Worldwide Emerging Environmental Issues with Potential Military Implications

Summarizing Environmental Security Monthly Scanning
July 2006—June 2008

The purpose of the monthly scanning reports is to assess worldwide environment-related events in order to identify and analyze issues that might trigger future international environmental regulations and/or modifications to the existing ones with potential implications for the military.

The dramatic increase in world attention to climate change is helping more people understand that the world’s environment is a matter of national and global security. Environment is an increasingly important component in forecasting future conflicts. Scientists, policy analysts, and military planners are collaborating to prevent or reduce security threats. The Army Strategy on the Environment reflects this new direction.

International environmental governance is improving, and the technological ability to identify environmental threats and crimes is becoming cost-effective through new sensors and communication systems. Environmental damages that people and organizations got away with in the past are less likely to escape detection and punishment in the future.

Environmental diplomacy is increasingly being used to support conflict prevention efforts and to build international confidence, while human security is gaining recognition in both military and diplomatic circles. Environmental security is a link between the two.

The Millennium Project defines environmental security as environmental viability for life support, with three sub-elements:

- preventing or repairing military damage to the environment,
- preventing or responding to environmentally caused conflicts, and
- protecting the environment due to its inherent moral value.

This summarizing paper presents the events and emerging environmental security–related issues identified since July 2006, organized around this definition.

Some 400 items have been identified during July 2006–June 2008 and over 1,000 items since August 2002 when the Millennium Project began this monthly scanning. All the items and their sources, organized by the month when they were identified, are available on the Millennium Project’s Web site, http://www.millennium-project.org/millennium/env-scanning.html and the version with Military Implications is available on the AEPI web site http://www.aepi.army.mil/rpt-weei.html.
Taking ecological considerations into account is crucial if we are to avoid longer-term environmental problems that can undermine security and development, and lead to further cycles of conflict and displacement.

UN Secretary-General Ban Ki-moon
International Day for Preventing the Exploitation of the Environment in War and Armed Conflict, November 6, 2007

The world has moved from a global threat once called the Cold War to what now should be considered the Warming War.

Afelee Pita, Tuvalu Ambassador to the UN
1. Executive Summary

The dramatic increase in world attention to climate change is helping more people understand that the world’s environment is a matter of national and global security. Half the world is vulnerable to social instability and violence due to numerous pressures: rising oil and food prices; decreasing water-food-energy supply per person; climate change; and increasing migrations stemming from political, environmental, and economic conditions.

Environment is an increasingly important component in forecasting future conflicts. Scientists, policy analysts, and military planners are collaborating to prevent or reduce security threats. Environmental diplomacy is increasingly being used to support conflict prevention efforts and to build international confidence. International environmental governance is improving, and the technological ability to identify environmental threats and crimes is becoming cost-effective through new sensors and communication systems. Environmental damages that people and organizations got away with in the past are less likely to escape detection and punishment in the future.

General Patterns and Insights

The need for strategic planning to address climate change and environmental degradation tops the agendas of the United Nations, many national governments, official forums, corporations, NGOs, and academic institutions.

The trend toward adopting the precautionary principle versus reactive actions is increasing. Scientists recommend that nations integrate climate change into their security policy to prepare for worst-case scenarios.

The time between the design of a multilateral environmental agreement and its coming into force as well as the time it takes to reach a high ratification level is shortening. International attention is shifting from designing new MEAs to improving the effectiveness of existing agreements.

The increasing ratification of MEAs, the growing numbers of environmental watchdogs, as well as increasing public awareness are improving environmental management globally. The number, precision, and breadth of analytical tools to measure environmental change are improving rapidly.

Efforts are increasing to strengthen international environmental governance by improving institutional structures and interlinkages among treaties, enhancing monitoring systems, and developing international guidelines and frameworks for environmentally sound management.

The decision by the regime in Myanmar (Burma) in May 2008 to block international assistance to 2.5 million cyclone victims raises the question of when human rights and environmental security overrule sovereignty. In the 1990s, UN peacekeeping forces protected the delivery of
food in Somalia without regard to sovereignty. Since similar situations are likely in the future, many are increasingly aware that a framework and international agreement is needed to guide decisions on when international intervention is warranted.

More cooperation is occurring among a variety of institutions for better, more synergistic environmental policy and activities, which expands the scope of environmental considerations among a broader set of actors and the public.

Militaries are increasingly called upon to assist in environmentally related issues, such as natural disasters or conflicts triggered by or affecting the environment, MEA enforcement, and reduction of their own environmental impacts.

Nontraditional security issues—including environment, migration, and social development—increasingly dominate traditional security planning. Since they cannot be addressed by any nation alone, military strategies and geopolitics are being reshaped around complex issues and within international cooperation frameworks.

When international negotiations under the UN fail, nations form coalitions to carry out negotiations and procedures for an international accord. A successful example is the Oslo Process for the Cluster Bombs Convention, which started in 2007 after the 2006 UN negotiations failed. The process led to an agreement formally adopted in May 2008. Similarly, when MEA negotiations prove difficult or government reaction inadequate, idea-centered initiatives emerge and adopt local regulations.

As the world’s population grows and biodiversity diminishes, the threat of conflict over resources increases. Environmental problems worsen faster than response policies are currently being adopted. Increased focus for adaptation and mitigation is needed in the multilateral arena (such as the G8, UN Security Council, and UN specialized bodies) to strengthen international regulations, improve capacity building from detection to adaptation, address migration issues, and adapt cooperation among countries to the new realities induced by climate change.

Rising sea levels and melting ice caps will redraw physical boundaries, potentially forcing the evacuation of island nations like Tuvalu in the South Pacific and causing tensions over new shipping routes, such as the Northwest Passage. The panoply of issues triggered by Arctic ice thawing reflects the amplifying debate between environmental aspects and political and military interests.

MEAs often conflict with national economic or political interests, generating issues of noncompliance with international treaties, lack of cooperation with international organs, and deadlock in many international treaty–related negotiations. Matters of disagreement are mostly related to strategies for greenhouse gas emission cuts, nuclear nonproliferation, addressing security aspects of environmental implications, and outer-space security issues.

Environmental issues are a “conflict threat multiplier.” Most conflicts are occurring in the least environmentally sustainable regions, and unless environmental and conflict factors are simultaneously addressed, neither are likely to be resolved successfully.
Without more serious mitigation and adaptation measures, mass migration and conflicts seem inevitable due to climate change, falling water tables, and other contributing environmental factors. Nevertheless, there is no adequate international system or framework to cope with environmental refugees, estimated to reach 250 million by 2050.

The accelerating rate of technological change has fundamentally changed the spectrum of threats to the environment and human health, such as e-waste, possible risks of using nanotechnology and biotechnology, use of chemicals, and the spread and safety of nuclear, chemical, and biotechnology labs.

Work is under way to develop a global system for countering pandemics from either natural or terrorist causes.

Developing countries are rapidly adopting environmentally sound policies and increasingly restricting richer countries’ export of polluting industries to poorer regions. Nevertheless, stronger international and transinstitutional coalitions and frameworks are needed to counter global environmental crime, such as illegal trade in hazardous wastes, smuggling proscribed hazardous materials, and exploiting and trafficking protected natural resources.

Earth observation data provided by satellite systems are becoming an essential tool for designing sustainable development policies and early warning mechanisms. Although space technology enhances Earth surveillance, provides early warnings of natural disasters, improves compliance mechanisms, and increases understanding of space and Earth phenomena, local on-the-ground coordination and applications are still deficient.

The costs are falling for nanotech environmental sensors, which can be connected to global information systems via satellite, potentially making environmentally damaging actions known instantaneously and worldwide.

ICT and robotics, new detection and cleanup techniques, and more environmentally friendly warfare contribute to reducing the military environmental footprint.

Preventing or Repairing Military Damage to the Environment

The UN reports that about half of all conflicts over the past 20 years were “re-conflicts”—those that recurred within five years of peace accords. Many had environmental backgrounds. There is consensus that failed states are the most vulnerable to climate change and possible conflicts due to environment-related issues.

Environmental degradation and hazardous ordnance leftovers in post-conflict areas threaten the livelihoods and health of current and future generations and may constitute an impediment for
lasting peace. There should be a “green chapter” in the Geneva Conventions for safeguarding the rights of the environment.

_National Security and the Threat of Climate Change_, a report by a group of high-ranking U.S. military officers and national security experts, warns that “climate change could seriously exacerbate already marginal living standards… causing widespread political instability and the likelihood of failed states…. The chaos that results can be an incubator of civil strife, genocide, and the growth of terrorism.”

The military is increasingly called to take part in post-conflict reconstruction efforts and environmental restoration to build stability, as well as in mitigation of environmental effects to avoid conflict. The report entitled _A Climate of Conflict_ by Dan Smith and Janani Vivekananda published by International Alert in London warns that unless adequate and timely adaptation policies are implemented, more than half of the world’s nations are at risk. It identifies 46 countries—home to 2.7 billion people—at high risk of armed conflict, while another 56 states—with a total population of 1.2 billion—are at risk of political instability.

Conflict and environmental degradation exacerbate each other. Middle East countries are among the least environmentally sustainable, and conflict has caused massive damages to ecosystems from Iraq to Lebanon and North Africa. Refugees, human rights groups, and legal experts have urged the International Criminal Court to consider human-made environmental crimes along with terror and mass killings in the prosecution of Sudanese officials and Arab Janjaweed. They argue that the crisis was aggravated by the ecological destruction used by the government as a weapon to force people to move. The number of refugees in camps reached 2.2 million and the risk of unrest is increasing as resources are getting exhausted. The deployment and work of the joint UN-African Union force of 26,000 peacekeepers is jeopardized by lack of water. In 2007, an estimated 26 million people were internally displaced by armed conflicts and violence worldwide.

Many post-conflict health and environmental impact assessments are ongoing, as are liability disputes. The Portfolio of Mine Action Projects 2007 found that 26 out of 29 war-ravaged countries or territories surveyed are beleaguered with the lurking remnants of cluster bombs and other explosives. Protocol V on Explosive Remnants of War of the Convention on Certain Conventional Weapons came into force in November 2006. The Convention on Cluster Munitions was formally adopted in May 2008, legally binding the use, production, transfer, and stockpiling of cluster munitions and committing countries to clear areas contaminated by cluster munitions and to assist victims and affected communities.

Concerns over the environmental and health effects of the use of depleted uranium munitions are resurfacing and increasing worldwide. The European Parliament adopted a resolution calling on the EU to lead negotiations “through the UN or through a ‘coalition of the willing’” for a global treaty to ban depleted uranium weapons.

Over the past 10 years, only 30% of known chemical weapons stocks have been destroyed. The remaining 70% are supposed to be totally destroyed by 2012 to meet the Chemical Weapons Convention. Japan is not on schedule to meet its obligations toward China in the recovery and destruction of hundreds of thousands of chemical weapons abandoned at the end of World War II.
and will most probably not meet the April 2012 deadline. Some experts argue that “nonlethal” materials such as “incapacitating agents” are toxic chemicals that would violate the CWC if used on the battlefield. Clarification of what chemicals will be allowed under the treaty’s exceptions is needed.

Advances in biosciences not met by adequate security systems increase the risks of their potential misuse, the threat of biological weapons, and the likelihood of SIMAD, for Single Individuals Massively Destructive. The Biological Weapons Convention might need to be revised in view of the new synthetic biology developments, and verification and monitoring regimes would need to be developed to ensure compliance. Over 150 nations have fulfilled their reporting responsibilities to the Security Council regarding efforts to combat the proliferation of weapons of mass destruction by non-State actors.

New technologies are offering improved detection, cleanup, monitoring, and surveillance possibilities. WHO is developing a global epidemic simulator based on the model of climate monitoring systems. Small robotic helicopters operated by radio control could be used for reconnaissance and surveillance. High-sensitivity portable chemical and biological devices offer high accuracy detection, monitoring, and cleanup possibilities with rapid response time. However, future autonomous robotic weapon systems (without human decision-making control) are increasing vulnerability and concern over possible catastrophes.

In order to prevent the misuse of science, it is important to strengthen the scientific expertise of security organizations and to create an independent science and technology advisory committee for intelligence agencies, as well as to promote within the international scientific community a common culture of awareness and responsibility.

Source: Fund for Peace
Preventing or Responding to Environmentally Caused Conflicts

Increasingly scarce resources, climate change, biofuels, and growing population and higher living standards are all contributing to the long-term rise of food prices. In 2007, dairy prices rose nearly 80% and grain 42%. If this trend continues, the number of people facing famine or malnutrition is expected to grow from at least 850 million today to 1 billion, increasing instability. Food riots have already occurred in some 30 countries, including recently conflict-torn nations such as Haiti, Côte d’Ivoire, Senegal, and Somalia. Meantime, a few agricultural biotechnology companies are trying to concentrate corporate power and gain monopoly over a large part of global food, in some cases undermining agricultural productivity and jeopardizing national food security. With nearly 3 billion people making $2 or less per day, long-term global social conflict seems inevitable without more serious food policies, scientific breakthroughs, and dietary changes. A new UN Task Force on the Global Food Crisis was designated to prepare a comprehensive plan of action to tackle the rise in food prices.

The UN, OSCE, and NATO are paying increasing attention to environmental security. The UN Security Council debated the relationship of security and the environment for the first time in history in April 2007 and more recently acknowledged that the UN should move from a culture of “reaction” to one of conflict “prevention” and should develop potential tension detection mechanisms. The OSCE adopted a Ministerial Declaration on Environment and Security, and the NATO Security Science Forum on Environmental Security addressed the security implications of environmental issues, forecasting, and cooperation with other international organizations.

The number of weather-related disasters worldwide now averages 400–500 a year compared with 125 in the early 1980s. The number of people affected by natural disasters in 2007 reached 200 million. The UN notes that seven times more livelihoods have been devastated by natural disasters than by war worldwide, and this is likely going to be worsening due to climate change. The intensity of Atlantic storms has nearly doubled over the last 30 years, and computer models show a direct link between climate change and the strength of storms. Some officials say that climate change should be addressed like World War III.

UNEP warns that changing temperatures, rapid rates of species extinction, and unsustainable depletion of the world’s scarce resources are the most important threats to human survival. The Climate Change and International Security paper to the European Council notes that the “impact of climate change on international security is not a problem of the future but already of today and one which will stay with us” and underlines that the European Security Strategy and related proposals “should take account of the security dimension of climate change.”

The WMO reports that the decade of 1998–2007 was the warmest on record, with the global mean surface temperature for 2007 estimated at 0.41°C (0.74°F) above the 1961–1990 annual average of 14°C (57.20°F). Extreme temperatures in 2007 included unusually cold winters in South America and heat waves in Europe. Some scientists believe that weird weather patterns might become the norm and that the world is more than 50% likely to experience serious climate change, for we are unlikely to keep greenhouse gas levels low enough to avoid the critical 2°C (3.6°F) temperature rise.
Climate modelers at the UK’s Hadley Centre for Climate Prediction and Research show that by 2015 the average global temperature will be 0.5°C above the average value for the last 30 years and that between 2009 and 2015, half the years will be warmer than the current warmest year on record. The IPCC projects that in 2090–2099 relative to 1980–1999, temperature rise could range between 0.3°C and 6.4°C.

The Arctic is warming faster than the rest of the world. The region might be ice-free in summer in the next 10–20 years, although some scientists say that there is a 50% chance for that to happen in 2008. In 2007, the Arctic sea ice shrunk to 22% less than the record since satellite measurements began nearly 30 years ago, looking similar to some forecasts for 2030 to 2050. The thawing of Arctic sea ice opens up the Northwest Passage as an international shipping route, with access to rich resources—including oil—triggering international disputes over sovereignty and ecological implications. The debate is intensifying as several countries are building their political and legal cases to claim jurisdiction over different (and sometimes overlapping) areas. The Ilulissat Declaration signed in May 2008 by Canada, Denmark, Norway, Russia, and the U.S. is a commitment for applying the UN Law of the Sea “to the orderly settlement of any possible overlapping claims,” stipulating that there is “no need to develop a new comprehensive international legal regime to govern the Arctic Ocean.” Critics say that this opens the possibility for a polar “carve up” by the five countries.

Although the Antarctic should be protected by the 1959 Antarctic Treaty and related agreements, Britain’s Foreign Office plans to claim 1 million square kilometers (386,000 square miles) of seabed off the coast of the British Antarctic Territory. Similar claims for seabed areas might also be submitted by Chile and Argentina, which might overlap some of the British territorial claims. Greenpeace and WWF warned that Britain’s possible oil, gas, and mineral exploration in the region would represent an environmental disaster for the fragile ecosystem.

Glaciers—representing the only freshwater source for millions of people around the globe—are melting and thinning at an accelerating rate over the past decade. The most vulnerable are Earth’s subtropic zones—home to 70% of the world’s population—including parts of the Middle East, southern Africa, the U.S., South America, and the Mediterranean. The IPCC estimates that rising temperatures could melt most of Latin America’s glaciers by 2022, affecting the livelihood of people in Peru, Ecuador, and Bolivia. In some regions, demand for water might exceed supply as soon as 2009. Himalayan glaciers are the main source for Asia’s nine largest rivers. UNEP estimates that by 2025, some 1.8 billion people will live in countries with absolute water scarcity. The Human Rights Council is considering adopting water as a human right and is assessing the relationship between climate change and human rights.

Ice caps and glaciers contribute 60% of the ice melting that is one cause of increasing sea levels; 28% of this comes from Greenland and 12% from Antarctica. Estimates of sea level rise by 2100 due to global warming vary from the 9–88 centimeters projected by the IPCC to as much as 140 centimeters. Satellite measurements show that since 1993 global averaged sea level has been rising at about 3 millimeters per year, considerably more than the twentieth century average of about 1.7 millimeters per year. By 2025 coastal population is expected to reach 6 billion.
The small island-state of Tuvalu could disappear in 30–50 years. Indonesia said it has lost 26 islands to climate change. Bangkok, with a population of more than 10 million, might be submerged within the next 15–20 years. It is one of 13 of the world’s 20 largest cities at risk of being swamped as sea levels rise in coming decades. Increased salinity and flooding could displace over 70 million people in Bangladesh, 22 million in Vietnam, and 6 million in Egypt. China’s Pearl River Delta, the country’s most economically dynamic region, is expected to be the worst hit by rising sea levels by 2050. Maldives President Maumoon Abdul Gayoom called for recognition of “environmental protection as a fundamental human right” and announced that the Maldives will initiate a debate on the issue with the Human Rights Council.

Disasters could be exacerbated by other consequences of glaciers melting, such as dilution in salinity of the sea around Antarctica, which could have significant effects on the world’s climate and ocean currents, and melting ice caps that may trigger more volcanic eruptions.

Most of the countries with the highest birth rates are those already affected by the world’s worst wars. Growing pressure of people on land and resources is likely to exacerbate conflict in those areas. Desertification affects more than 250 million people, and 1 billion more are at risk. In Africa, the worst rains in 30 years caused flooding affecting an estimated 1.5 million people in 22 countries, including Ethiopia, Niger, and Sudan. Semi-arid areas of sub-Saharan Africa with some of the highest concentrations of poverty in the world face potential productivity losses of 25% by 2060.

By 2050, some 250 million people could be permanently displaced by climate change–related phenomena. UNHCR remarks that after several years of decline, the number of refugees began rising again. Without a legal framework to address environmental refugees’ situation, their rights will not be addressed and conflicts will be difficult to avoid. The Global Humanitarian Forum, launched in October 2007, is being set up by former UN Secretary-General Kofi Annan to address in a preventive and proactive way global refugee movements and humanitarian crises triggered mainly by climate change. It will act as a catalyst among the different interest groups involved in international disaster relief and prevention: governments, aid agencies, the military, the business world, and academics.

The World Health Organization warns of the increasing risk of disease outbreaks, epidemics, industrial accidents, natural disasters, and other health emergencies, which could become threats to global public health security. The International Health Regulations, which came into force in 2007, are helping countries collaborate to identify and contain risks from outbreaks and other health hazards. WHO points out pandemic influenza as the most feared threat to health security.

Increased research is needed to identify areas of highest vulnerability and instability and to consider climate change in foreign aid programs. Military and police will have to change from reactive to proactive strategies in order to prevent and manage security issues triggered by climate change. Unrest could range from protests against polluting companies and government inaction to new forms of ecoterrorism.

The Bali Action Plan provides a roadmap of adaptation and mitigation measures. However, the funding of programs and technology transfer is falling short. While it is difficult to have the
world commit $30 billion a year to prevent conflicts over food, the subsidies to fossil fuel industries amount to over $200 billion per year, $1.2 trillion is spent on the military, and $1.5 trillion is spent on oil.

Expenditures and estimated costs of various programs
(yearly, billion $, various years, 2003–2007)

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<thead>
<tr>
<th>Expenditure</th>
<th>Estimated Funds Needed</th>
<th>World Expenditure Total</th>
<th>Share of World Total</th>
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<td>Water &amp; sanitation</td>
<td>20</td>
<td>210</td>
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<tr>
<td>Hunger</td>
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<td>Climate change mitigation</td>
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<td>Poverty alleviation</td>
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<td>World fossil fuel subsidies</td>
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<td>Military expenditures</td>
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<td>Oil</td>
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**Protecting the Environment Due to Its Inherent Moral Value**

Plant and animal species are being lost at a rate between 100 and 1,000 times natural extinction rates. WWF and the Global Footprint Network report that humanity’s impact on the planet has more than tripled since 1961 and that Earth’s resources are being used faster than they can be replaced by nature. If present trends continue, by 2050 humanity will demand twice as much as the planet can supply. The Millennium Ecosystem Assessment reported that 60% of Earth’s vital ecosystem services are being degraded or used unsustainably.

There are more than 700 MEAs. The focus of international negotiations is switching from designing new treaties to reinforcing existing ones and strengthening international environmental governance. Evaluation mechanisms of the effectiveness of these agreements are improving. Nevertheless, noncompliance with international treaties and lack of cooperation with international organs, as well as deadlock in many international treaty–related negotiations, continue to be an international concern.

The 2007 UNEP Governing Council adopted decisions on issues related to strengthening international environmental governance (including the draft Environment Watch Strategy Vision 2020 and coordination and synergies among multilateral environmental agreements) and improving the assessment of the world environmental situation and mitigation actions. There are efforts for better integration of the existing MEAs that cover related issues, such as the Basel Convention on Waste and the Stockholm Convention on POPs for developing a framework for environmentally sound waste disposal.

The EC’s three-year program to modernize EU legislation—as part of its commitment to simplify the EU system of rules—started with the environment-related sector, since it is the most
heavily regulated. The EU is also adopting the protection of the environment through criminal law. The European Environmental Liability Directive came into force, establishing a comprehensive responsibilities framework based on the “polluter pays” principle. The European Commission opened several infringement procedures against member states for not complying with EU environmental legislation.

Increasingly powerful analytic models and tools are being created to compare national environmental status. New international watchdog bodies emerge and others are being proposed to assist legal action against environmental crimes.

Some noteworthy environmental agreements or regulations that were recently adopted or strengthened or are in negotiation are presented in Box 1. A complete list and further details on the agreements are available in sections 1 and 2.

Negotiations have begun for a post-2012 treaty to reduce greenhouse gas emissions. The Bali Action Plan adopted in December 2007 outlines a two-year agenda of negotiations for a global climate regime to enter into force by 2013 but does not include emissions reduction targets, despite strong support by the EU and other countries. The final agreement is to be adopted at the end of 2009 at the Copenhagen summit. It should include both national and international mitigation and adaptation actions to address the effects of climate change, methods to reduce greenhouse gas emissions, development and transfer of climate-friendly technologies, and financing and investment measures. Meantime, questions are growing about better enforcement mechanisms of the Kyoto Protocol to compel governments to respect their commitments.

Aviation and shipping, industries not covered by the Kyoto Protocol, account for some 5–8% of global greenhouse gas emissions. IMO estimates that the shipping industry’s share of global CO₂ emissions could grow from about 4.5% in 2007 to 6% in 2020. Europe projects shipping emissions to grow by 32% and aviation by up to 90% over the same period and therefore is advocating emission reduction targets for these two sectors.

A growing number of industries and local governments are developing appropriate environmental and energy policies and regulations in the absence of national leadership. In many cases these are based on international standards or agreements. Civil society in some countries is increasingly involved in the design of local and regional regulations, in many cases with the help of international NGOs.

Trade of endangered species and hazardous substances is increasingly profitable, difficult to tackle, and involved with international organized crime. Custom administrations reported more than 9,800 endangered species (CITES violations) and 220 hazardous waste seizures in the last few years. The Basel Convention estimates international hazardous waste movement to be at least 8.5 million tons per year. Although it is difficult to estimate the illegal portion of this, a project undertaken in 13 European countries found that over 50% of the waste shipments examined were illegal. There could be even higher percentages in countries with fewer inspection capabilities and in failed states. The 20–50 million tons of e-waste generated annually is growing worldwide, and about 70% of it is dumped in developing countries in Asia and Africa.
### Box 1

**Some accords and regulations related to environmental security recently adopted, strengthened, in negotiation, or proposed**

- Convention on Cluster Munitions (adopted in May 2008)
- EU resolution to lead negotiations for a global treaty to ban depleted uranium weapons (adopted in May 2008)
- Stockholm Convention evaluation mechanisms (adopted in May 2007) and continued negotiations for noncompliance mechanisms (expected for 2009)
- Non-Legally Binding Instrument on All Types of Forests (adopted in December 2007)
- International Declaration of Reef Rights (received first signatures)
- Network of Marine Protection Areas, to be adopted by 2012
- Bali Action Plan and other negotiations for post-2012 treaty to curb greenhouse gases
- Tougher regulations for mandatory greenhouse gas emission targets are being adopted by countries, regional authorities, local governments, and industries
- European Environmental Liability Directive (entered into force in April 2007)
- EU protection of the environment through criminal law (proposal approved in May 2008)
- Registration, Evaluation and Authorization of Chemicals (REACH) (entered into force in June 2007)
- EU Revised Green List of the Waste Shipment Regulation (entered into effect in December 2007)
- EU legislation on transboundary shipments of waste (entered into force in July 2007)
- International Convention on the Control of Harmful Anti-Fouling Systems on Ships (enters into force in September 2008)
- EU airlines mandatory participation in carbon trading scheme to start in 2011
- Fine Particles Air Quality Directive (adopted in December 2007)
- Tougher European waste management strategy with reduction targets to 2008, 2012, 2020
- China’s restrictions on plastic bags (effective June 2008)
- Restrictions for harmful underwater sonar to protect marine mammals (proposed)
- A global ban on mercury (in negotiation)
- Conventional light bulbs to be banned in many parts of the world by 2012
At a high-level meeting in April 2008, the World Customs Organization, representatives of UNEP, customs administrations, and other interested organizations agreed on an Action Plan to improve enforcement and tackle increasing environment crime. The plan calls for increased detection efficiency by customs offices, creation of environmental crime units, and international cooperation and information exchange.

The EU legislation on transboundary shipments of waste came into effect in July 2007, establishing a legal framework to ensure that waste is properly handled from the time it is shipped to the time it is disposed of or recovered.

More than 50,000 chemical compounds are used commercially, hundreds more are added annually, and UNEP estimates global chemical production to increase by 85% over the next 20 years. There are fears that the International Strategy for Chemicals Management adopted in 2006 is not strong enough to ensure adequate security and that a biosecurity watchdog and codes of conduct for scientists should therefore be established. Policymakers and experts reinforce the need to apply the precautionary principle in the context of chemical safety, to extend globally the regulations on heavy metals, and to tackle the widening gaps among countries in following chemical safety policies.

Studies on the environmental and health impacts of various forms of nanotechnology, as well as international research projects on regulating nanotechnologies and adopting nanotechnology standards, are increasing rapidly around the world. The first nanotechnology genotoxicity tests found that carbon nanotubes could damage DNA. China was the first nation to set standards; the European Commission has adopted a Code of Conduct for Responsible Nanosciences and Nanotechnologies Research; the UK’s Royal Society and a group of other organizations have begun an initiative to develop a “Responsible NanoCode” for businesses working with nanotechnologies, while Indian scientists warn that India faces serious nanotech environmental health and safety issues due to absence of guidelines on nanoparticle toxicity and biosafety regulations in India and worldwide.

Biotechnology industry is expanding rapidly, and the supervision of controversial experiments is voluntary and irregular at universities and private laboratories around the world. The Convention on Biological Diversity needs to be adapted in view of the new developments, and verification and monitoring regimes should be developed to ensure compliance. In May 2008, the timetable and framework were set for a liability and redress regime concerning potential damage caused by the movements of GMOs, which will be further discussed in October 2010 at the next meeting of the Parties to the Cartagena Protocol on Biosafety. An ad hoc technical expert group was mandated to consider the risk assessment and risk management issues of GMOs.

UNESCO’s Man and the Biosphere network is expanding, comprising now 529 sites in 105 countries. The UN notes that only 0.6% of the oceans are protected compared with 12% of the world’s land, and a roadmap was launched in 2007 to meet the goal of establishing a network of marine protected areas by 2012. The global map of human impacts to marine ecosystems reveals that while no ecosystem is completely unaffected, human activities had high impact on over 40% of the world’s ocean-covered area, with the most affected being the North Sea, the South and
East China Seas, the Caribbean, and North America’s East Coast. Although the UN Convention on the Law of the Sea is recognized as the legal framework for all activities in the oceans and seas, the debate continues on how the convention applies to marine genetic resources in areas outside national jurisdictions. The EU Marine Strategy Directive requests member states to adopt by 2015 strategies to attain good environmental status by 2020.

Space observations have become a major tool for monitoring environmental change, helping policymakers develop adequate strategies, assisting in the enforcement of environment-related regulations, and improving early warning and disaster management. Examples of these include NASA’s computer model to anticipate food shortages/crises, a new UN Outer Space Affairs office as part of a future network dedicated to carry out the UN Platform for Space-based Information for Disaster Management and Emergency Response, the Global Monitoring for Environment and Security, and support for early warning systems at global and regional levels.

* * *

Environmental security analysis should include the impacts of new kinds of weapons; asymmetrical conflicts; increasing demands on natural resources; urbanization (which makes more people dependent on vulnerable public utilities); impacts of environmental degradation and climate change; continued advances in environmental law, with escalating environmental litigation; and the globalization that is increasing interdependencies. In view of increased threats of conflicts triggered by environmental factors, enforcement of international multilateral agreements should be strengthened. The following graphs reveal significant efforts on ratifications; however, more efforts are needed in the area of implementation of the regulations, as well as in developing a global environmental consciousness.

Ratifications of 12 multilateral environmental agreements, by UNEP GEO regions (in parenthesis, number of countries in the region)

Source: UNEP GEO Data Portal with updates by the Millennium Project
Number of parties to multilateral environmental agreements, 1975–2008

Source: UNEP GEO Data Portal with updates by the Millennium Project
2. Environmental Security Monthly Scanning Items
July 2006—June 2008

A Preventing or repairing military damage to the environment
B Preventing or responding to environmentally caused conflicts
C Protecting the environment due to the moral value of the environment itself

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Environment a Key Element in the First European 18-month Work Program
The Institute for Environmental Security in The Hague to Hold Annual Peace and Sustainability Sessions
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Climate Change a Serious Threat to Security, Conclude Eminent Military Officers
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Environmental Change and Security 12th Annual Report—Focus on Africa
Disputes over Oil Might Reignite Congo-Uganda Conflict
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UK to Establish an Independent Climate Committee
EU, Latin American and Caribbean Countries Environment Cooperation
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Ecuador Gets an Environmentalist Foreign Minister
Iran and Iraq Sign Environment Protection Agreement
Israel to Participate in UNEP and UN HABITAT
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The Environmental Dimension of Asian Security
Environmental security among top three priorities in Australia-China talks
China May Restructure Environmental Effort
China Calls for Enhanced Cooperation on Environmental Protection in Northeast Asia
China’s Climate Change and S&T Action Plan
China to Invest $175 Billion in Environmental Protection over Five Years
China Creates 11 Independent Environmental “Watchdog” Centers
China's Energy Conditions and Policies—White Paper
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- Global Security linked to Climate Change
- Economic and Security Implications of Climate Change
- Developing Countries Most Affected by Global Warming
- Population and Resources Affecting the Risk of Conflict
- International Conferences Put Climate Change among Top Security Issues
- Increased Role of the Military in Environment-related Crises
- International Security Responses to a Climate Changed World
- National Security Implications of Global Climate Change Through 2030
- An Uncertain Future: Law Enforcement, National Security and Climate Change
- IISS’s Strategic Survey 2007 Warns of Global Security Implications of Climate Change
- Security Implication of Climate Change to the EU
- Reports highlighting the link between environment and security
- Global Risk 2007, the World Economic Forum
- Fourth Assessment Report Climate Change 2007
- Worldwatch Institute: Assessing the Relation between Disasters and Conflict
- Adaptation and Vulnerability Report by the IPCC
- Global Environment Outlook
- UNEP Year Book 2007
- UNEP’s Year Book 2008
- Twenty Years of Environmental Security
- World in Transition –Climate Change as a Security Risk
- Six places in the world where climate change could cause political turmoil
- Recommendations for Addressing U.S. Environmental Security
- Climate Change: A New Threat to Middle East Security
- Arctic Debate
- Disputes over Polar Regions Expands
- Indian and Chinese Assessments of Climate Change Consequences

Migration Triggered by Environmental Causes

- Number of People of Concern Rising
- Climate Change Refugees
- Increasing Weather Extremes and Environmental Refugees due to Climate Change
- New Strategies Needed to Deal with Global Displacement and Migration
- Population Trends and Environmental Impact
- Demographics and Destiny: Trends We Need to Understand in the 21st Century
- Desertification Triggering Migration
- Kyrgyzstan’s Deforestation Threatens Central Asia’s Security

Natural Disasters

- Scientific evidences and possible consequences
Melting Sea Ice and Glaciers
Scientific evidences and possible consequences

Sea Levels Rise
Scientific evidences and possible consequences
Rising Sea Levels Claim First Inhabited Island and Threaten Coastal Populations Worldwide
Coastline Erosion due to Rising Sea Waters Signaled Around the World
Polar Bear, the First Species declared Endangered Due to Global Warming

Food and Freshwater
Living Planet Report 2006
Food Crisis
Actions for addressing Food Crises
Water Scarcity
Actions for addressing Water Security
Climate Change and Access to Water Addressed as Human Rights

Prevention and Adaptation
Adaptation Needs and Actions
Global Facility for Disaster Reduction and Recovery to Mitigate Impact of Natural Disasters
International Early Warning Programme to Begin Operations
Indian Ocean Tsunami Warning System Declared Operational, but Local Coordination still Lacking
Regional Strategies
Indigenous Peoples Demand More Involvement in Environmental Policies

Health
Global Health Security Threats
Changes in Disease Patterns
Actions to Address Health Threats

Energy Security
Trends of Energy Use in IEA Countries
EU Energy and Climate Change Policy
European Action Plan on Energy Efficiency
China’s Climate Change and S&T Action Plan

Computer Modeling
C Protecting the Environment Due to Its Inherent Moral Value

Environmental Security-related International Regulations that Have Been or Are Close to Coming into Force since July 2007

- UN Nuclear Terrorism Convention Enters into Force on July 7, 2007
- UN General Assembly Adopts Global Forest Agreement
- Waste Export Regulations Revised and Tightened
- Shipwrecks Removal Treaty Received First Signature
- Environmental Damage to Be Criminalized in the EU
- European Environmental Liability Directive Came Into Force
- REACH, Europe’s Chemical Regulations Entered into Force on June 1, 2007
- EU New Directive on Air Pollution
- European Parliament Passed the Fine Particles Air Quality Directive
- EU Airline Carbon Trading to Start in 2011—a Year Earlier than Planned
- Europe to Begin Penalizing Jet Pollution in 2011
- EU to Introduce New Regulations to Combat Surface Waters Pollution
- European Directive on Ship-Source Pollution Became Effective on April 1, 2007
- Anti-Fouling Systems on Ships Convention to Enter into Force in September 2008
- Micronesian Nations Sign Coral Reef Protection Document
- France Bans 30 Pesticide Components
- China Issues Electronic Waste Rules

Proposed Treaties and/or Changes to Existing Ones

- Waste Management
  - Toxic Waste Disposal of Global Growing Concern
  - Basel Convention Needs Revision and Update
  - UN E-Waste Forum and Basel Convention’s Conference of Parties
  - EU Preparing New Directives on Waste Management and Water Quality
  - European Parliament Proposes Tougher Waste Management Strategy
  - EU Vote on Revision of Waste Directive

- Chemical, Biological, Nuclear
  - Stockholm Convention on POPs Adopts Evaluation but not Non-compliance Mechanisms
  - Stockholm Convention on Persistent Organic Pollutants Is Succeeding in Europe
  - Call for Reinforcements to Chemical Safety
  - EU to Add Carbon and Graphite to REACH Program
  - IAEA to Upgrade International Nuclear Event Scale
  - IAEA Director’s Recommendations to Improve Nuclear Safety
  - International Norms Led by IAEA Are Needed to Stop Smuggling of Nuclear Materials and Nuclear Proliferation
  - Better International Controls Needed to Prevent Bioterrorism
Canada Prepares to Ban More Chemicals
Canadian Chemical Plan May Go beyond REACH as Environmentalists Get New Political Support
Reactive Nitrogen Beginning To Be Recognized As Environmental Hazard

Pollution and Greenhouse Gases
Call for Expanding Montreal Protocol on Ozone-Depleting Substances
2007—The International Year of the Ozone Layer
Countries Contemplating Tougher Regulations for Mandatory Emission Targets
Air Travel in the EU to Join the Carbon Emissions Trading System by 2011
European Commission Proposed Binding Legislation for Vehicle Emissions Cuts
UK Proposes Individual Carbon Trading
European Parliament Approves New Water Quality Standards Directive

Post-Kyoto Protocol negotiations
Moves Forward on the Post-Kyoto Negotiations
Bali Roadmap for Post-Kyoto Negotiations
National and Regional Initiatives
Clean Development Mechanism Successful
Other post-Kyoto Treaty-related Conferences and reports

Energy Saving
Vanishing Supply of World's Helium Calls for Conservation
Ban on Incandescent Light Bulbs Expands
Compact Fluorescent Light Bulbs (CFLs) May Surge to Fore
European Lamp Companies Push Compact Fluorescents, as Does the EU

Biological Diversity
New Mechanisms for Enforcing Biosafety and Biological Diversity Treaties
United Nations Agreement to Protect the World’s Forests Adopted
Deforestation Not Yet Adequately Addressed by International Regulations
UNESCO Added 23 New Reserve Sites in 18 Countries
New Sites Added to World’s Protected Biosphere Reserves
New Strategy of UNESCO World Heritage Committee for Heritage Sites and Climate Change
International Polar Year 2007-2008

Marine Environment
International Conference and Assessments Find Rising Ocean Pollution
Roadmap for Establishing the Global System of Marine Protected Areas
New Marine Protected Areas Proposed
IMO Sets New Limits on Ship Fuel Pollution
Marine Protection to Increase
Tougher Law of the Sea Regulations Suggested for Marine Genetic Resources
Shipping to Face New Regulations to Reduce Air Pollution
Concerns over Maritime Air Pollution Increase
Shipping Regulations for Protecting Whales
Whale Conservation Protected Efforts Increasing
Commercial Whaling Ban Strengthened by International Whaling Commission (IWC)
London Convention Might be Expanded to Include Ocean-based Geoengineering
Micronesian Nations Sign Coral Reef Protection Document
Baltic Ministers Recommend Additions to Baltic Sea Action Plan
EU Integrated Maritime Policy
Political Agreement Reached on the European Marine Strategy Directive
European Parliament Passed the Marine Strategy Directive
Transport Canada Proposes New Vessel Operation Regulations
Malacca Straits Need Increased Protection from Various Security Threats
Network of Marine Educators Formed to Protect Pacific
Website for Marine Protected Areas and Cetaceans’ Sanctuaries
New Pacific Marine Protected Area Is World’s Largest
Plastic Threats to the Marine Environment

Heavy Metals
Call for Global Ban on Lead-based Paints
Progress on Global Mercury Ban

Weapons-related
European Parliament Passed Resolution Calling for Global Ban of DU Weapons
International Convention on Cluster Munitions Adopted by 111 Countries
Non-Proliferation Treaty Deadlock Continues
Australia to Propose Panel to Advance Work for the NPT Review in 2010
Progress on the Nuclear-Test-Ban Treaty
Revitalizing Nuclear Disarmament
Progress for Enforcing Biological Weapons Convention
Chemical Weapons Convention Gets New Boost
New Concerns Rising over Chemical Weapons
Problems with Destruction of Chemical Weapons and Potential Proliferation

**Improved Compliance with Environmental Regulations**

European Environmental Liability Directive Came Into Force
Environmental Crime Could Become a Felony in the EU
Calendar with Environmental Deadlines Compliance
IAEA to Improve Nuclear Security in 35 Countries
IAEA Nuclear Terror Prevention Guide
International Alliance of Forest Peoples
North America’s Commission for Environmental Cooperation to Increase Enforcement of Environmental Regulations and Public Participation
Kyoto/Climate Change-related Lawsuits
Global Map of Human Impacts to Marine Ecosystems
North American Environmental Atlas Online
Water Footprint Measuring System
Environmental Damage to Be Criminalized in the EU
EC Enforces Compliance with EU Environmental Regulations
China’s Emergency Response Law to Punish Falsifying Environmental Information
United Arab Emirates Establish Nuclear Agency

**New Standards with Implications for Environmental Security**
- New ISO Standard on Sustainable Building
- Green Standards to Counter E-waste
- ASTM Issues Standard Terminology for Nanotechnology
- New Standards for Handling Robotic Environmental Equipment
- Chemical Emission Certification Extended to Electronic Devices

**Safety Issues**
- Chemical and Biological safety issues
  - Half of Transported European Hazardous Waste Could Be Illegal—How Much More Elsewhere?
  - Terrorists Could Tap Pharmaceutical Toxins
  - Biotechnology Risk in Africa
  - Bioviolence; Preventing Biological Terror and Crime
  - Middle East Biosecurity Assessment
  - Toxicogenomics Risk Assessment
  - SIPRI Year Book 2007 Points out Environmental, Nuclear, and Energy Threats
  - Scientific Community’s Questions Concerning Biodefense Standards
  - Human Biomonitoring for Environmental Chemicals
  - Proceedings of the Workshop ‘Risk, Uncertainty and Decision Analysis for Environmental Security and Non-chemical Stressors’
  - ETC Report Warns of the Threat of Synthetic Biology and Calls for Global Regulations
  - Methyl Bromide a Continuing International Concern
  - Possible Risk with Bisphenol A Receiving Increased Attention

**Nuclear safety issues**
- Reports Addressing Nuclear Safety
- Russia’s Floating Nuclear Plants Pose International Security Risk

**Pandemics and Other Health Issues**
- WHO Report 2007 Addresses Global Health Security Threats
- Environment and Human Health Integration
- Proposed Global Early Warning System for Monitoring Pandemics
- FAO Launched New Pandemic Crisis Management Centre
- WHO-sponsored pandemic flu task force holds first meeting in Geneva

**Potential Health and Environmental Threats of Some New Technologies**
- Nanotechnology
- Electromagnetic Fields
- Underwater Sounds from Human Sources Endangering Marine Life
Pollution Issues

Human Ecological Footprint Increasing Each Year
Greenhouse Gas Emissions
New Predictions for the Atmosphere by 2030
Polluted Skies and Global Warming Puzzle Decoded
European New Web-based Air Pollution Monitoring System
Ozone Hole Worst Ever Recorded
Burning Fossil Fuels Acidifies Oceans, Erodes Coral Reefs
New Research Finds Human Energy Usage is a Long-Term Heating Problem
  Independent of Greenhouse Gases and Solar Radiation
Asia’s Progress Jeopardized by Environmental Degradation
Accelerating Environmental Health Crises in China
China’s ASAT Test Created Serious Long-Range Low-Earth Orbital Pollution
Bottled Water Becomes Target of Environmentalists
Restrictions on Plastic Bags Expanding

New Organizations with Mandates with eventual ES Implications

UN Creates Secretariat of the Global Bioenergy Partnership at FAO
‘3R’—Reduce, Reuse and Recycle New Environmental Think Tank for Asia
Asian Consortium on Non-traditional Security Issues
UN StEP Initiative for Reducing E-Waste

New Initiatives Aiming to Increase Eco-Efficiency

Corporate CEOs Pledge Actions on Climate Change at UN Global Compact Summit
New International Financial Alliance to Support Biodiversity
Renewable Energy Projects May Face New Scrutiny
US EPA recommendations for Green Infrastructure
Green Un-building Becomes Major Environmental Goal
Green Information Technology is forecasted as 2008 Top IT Strategy
State of Green Business 2008
New “Green IT” Software under Development
Energy/Performance Benchmark for Workstations under Development
Environmentally Friendly City in UAE Offers Cooperation Opportunity
New International Financial Alliance to Support Biodiversity
Switching to Green: A renewable energy guide for office and retail companies
Cleantech Report™ by Lux Research
Idle Nighttime Computers Cited as Energy Wasters
ENVIRONMENTAL SECURITY RISES ON THE INTERNATIONAL POLITICAL AGENDA

UN to Shift Attention from Reaction to Prevention of Conflicts
The UN Security Council agreed that the UN should improve its capacity to prevent conflicts rather than just react after the conflicts have occurred. To move from a culture of ‘reaction’ to one of effective ‘prevention,’ more UN resources should be focused to identify possible causes of conflict and set up potential conflict detection systems, to promote preventive action in response to threats to international peace and security. Thus, efforts should increase to address the root causes of conflicts, develop early warning systems, mediate disputes, and coordinate efforts of UN bodies, regional organizations and others trying to prevent wars. Along the same lines, in fragile post-conflict countries, peacebuilding should be focused on issues that are potential causes for relapsing into conflict. Over the past five years, the UN has spent $18 billion on peacekeeping operations but has not devoted similar resources to conflict prevention. [See also UN Conflict Prevention Strategy Includes Environmental Dimension in August 2006 and UN Security Council Adds Natural Resources Management and Environmental Issues to Future Peacekeeping Missions in June 2007 environmental security reports]

Meantime, the International Policing Advisory Council (IPAC), which held a 2-day meeting in Canberra, Australia, highlighted the unprecedented global demand for UN peacekeepers and police officers, and stressed the importance of better cooperation with the UN to prevent and face conflict-related challenges. [August 2007. Military Implications, Sources]

UN General Assembly Focuses Government Leaders on Climate Change
The theme of the 62nd session of the UN General Assembly was “Responding to Climate Change.” Speeches by heads of state and governments talked about climate change, rising sea levels, droughts and floods—as issues in themselves, but also as related to poverty and social problems, and ultimately to global security. There was again mention of strengthening the UNEP by transforming it into a UN Environmental Organization. This annual General Assembly was preceded by a high-level meeting convened by the UN Secretary General focusing specifically on climate change and actions to address it. Prior to this meeting was the annual UN-NGO conference that also focused on climate change. These meetings demonstrated a near consensus that urgent action is necessary, and that the UN Framework for Climate Change is the appropriate forum for discussions. The President of the UN General Assembly is preparing to create a Global Compact on Climate Change tentatively planned for release in early 2008 from which many agreements could flow. All of this focuses on the next high-level meeting on climate change to be held in December, in Bali, Indonesia. [September 2007. Military Implications, Sources]
UN General Assembly 61st Session Pinpoints Global Warming as a Central Issue for Security

Tackling climate change and environmental degradation were mentioned at par with terrorism, fair trade, HIV/AIDS, and human rights as essential issues to be addressed by global action by world leaders at the UN General Assembly, September 2006 Session 19-29. Since the small island developing states are particularly vulnerable to the impacts of global warming and sea level rise, they reiterated the call for renewable energy, a global fund to support these efforts, recognition of the “polluter pays” principle, and the placement of climate change in the center of development considerations. Some declared that the impacts of climate change are the most serious threat to global security. [September 2006. Military Implications, Source]

UN Conflict Prevention Strategy Includes Environmental Dimension

UN Secretary-General Kofi Annan’s Progress report on the prevention of armed conflict is an in-depth review of UN capacities to help prevent crises from escalating into armed conflicts; it outlines a wide range of recommendations to strengthen the UN’s conflict-prevention capacity around the world. Environmental factors are mentioned several times in this 54-page document; e.g., “Environmental degradation has the potential to destabilize already conflict-prone regions, especially when compounded by inequitable access or politicization of access to scarce resources.” (par. 22) The report will be submitted for discussion to the General Assembly on September 7, 2006. [August 2006. Military Implications, Sources]

UK Initiates UN Security Council Debate on Climate Change and Security

Britain’s foreign secretary argued that future climate change might cause wars: “An unstable climate will exacerbate some of the core drivers of conflict, such as migratory pressures and competition for resources,” and hence it is a matter for the UN Security Council to address. About 50 nations urged the UK to take the issue to the Council. During the debate on April 17, 2007, China argued against this position along with Russia, Qatar, Indonesia, and South Africa, saying that the Security Council is the wrong forum to discuss this and act on climate change-related issues. On behalf of 130 developing nations, Pakistan argued that the issue should be a matter for the UN General Assembly since it was a more democratic institution than the Council. [Yet it is the Council not the Assembly that can authorize peacekeeping forces.] Secretary-General Ban Ki-moon, acknowledging, “issues of energy and climate change can have implications for peace and security,” called for a “long-term global response” and noted, “this Council has a role to play in working with other competent intergovernmental bodies to address the possible root causes of conflict discussed.” The US supported the development of alternative fuels, energy efficiency, and other voluntary approaches that did not affect economic growth. The EU, Peru, Panama, and Papua New Guinea (head of the Pacific small island states), were among the supporters of the initiative. “The dangers that the small island states and their populations face are no less serious than those nations threatened by guns and bombs,” stated Ambassador Robert Guba Aisi of Papua New Guinea. [April 2007. Military Implications, Sources]

Britain to Push on Adding Climate Change to Security Council Agenda

Britain intends to put climate change on the UN Security Council agenda in April—when it assumes the presidency. The intention is to stress that climate change is a matter of international
security—from disputes over diminishing natural resources to mass migrations that could exacerbate conflicts. AIDS was similarly put on the Security Council agenda in 2001 and had positive results. Britain began lobbying the other 14 Security Council member states but seems to meet resistance from countries such as the U.S., China, and South Africa. [March 2007. Sources]

UN Security Council Adds Natural Resources Management and Environmental Issues to Future Peacekeeping Missions
A Security Council session dedicated to assessing the link between natural resources and conflict concluded that efforts should increase to improve natural resources management—mainly in failed or vulnerable states—so that their use contributes to post-conflict recovery, rather than fueling conflict. Monitoring and certification systems similar to the Kimberley Process Certification Scheme—concerning “conflict diamonds”—should be developed or emulated to stop illegal exploitation of resources, which triggers, exacerbates, or maintains conflict. The Council report added: In the case of peacekeeping and peacebuilding, the Council should ensure that the root causes of conflicts and the role of resources as a contributing factor were addressed in peace agreements as a way of ensuring that countries did not relapse into the vicious cycle of conflict. Therefore, in order to be more successful, peacekeeping operations should include an environmental and natural resources management dimension. [June 2007. Military Implications, Source]

UN Establishes the International Panel for Sustainable Resource Management
The International Panel for Sustainable Resource Management (IPSRM) is a new international think tank established by UNEP to provide expert global assessments on the use, security, and environmental impact of global resources. Just as the Intergovernmental Panel on Climate Change (IPCC) founded in 1988 has evolved with the participation of 2,500 scientists from 60 countries to produce the state of knowledge of global climate change, so too could IPSRM do one day for the global knowledge of resource management. It will begin by providing a systemic and holistic framework for understanding resources from all phases of the resources’ life cycles to help identify interlinkages, gaps, and opportunities for policy makers to take action. The Panel is supported by a Secretariat, hosted by the Sustainable Consumption and Production Branch of UNEP's Division of Technology, Industry and Economics, based in Paris. National participation in the panel has been expressed so far from Canada, China, Egypt, Finland, Germany, Hungary, Italy, Japan, Netherlands, Norway, Russia, South Africa, and Tanzania. NGOs such as the World Business Council on Sustainable Development and the International Council for Science (ICSU) have also asked to participate. [November 2007. Military Implications, Sources]

New UN Secretary-General Announced Climate Change a Top Priority
UN Secretary-General Ban Ki-Moon took office on January 1, 2007 and listed addressing global climate change as a top priority during all of his major meetings, including his first press conference at the UN, his meeting with President George Bush, and public talks in Washington and with the EU leaders in Brussels. Climate change also topped the agenda of the World Economic Forum Annual Meeting at Davos, where Tony Blair said that addressing climate change was the “supreme expression of interdependence.” President Bush for the first time included the issue in his State of the Union address, the new Democratic leadership in the US
Congress has it among its top priorities, and corporations are forming relationships with environmental groups. Hence, it is clear that the international politics of climate change could have dramatic changes over the next several years. [January 2007. Military Implications, Sources]

UN Appoints Special Envoys for Climate Change
As part of his commitment to enhance the UN's action in addressing climate change, Secretary-General Ban Ki-moon appointed three Special Envoys, former Norwegian Prime Minister Gro Harlem Brundtland, the President of the 56th Session of the UN General Assembly Han Seung-soo, and former President of Chile Ricardo Lagos. The Special Envoys will work with the Secretary-General, government leaders, and key stakeholders from around the world to advance negotiations and develop mitigation strategies to address climate change and its impacts. [May 2007. Military Implications, Sources]

UNEP Governing Council/Global Ministerial Forum Makes Progress on Global Environmental Governance
The 24th session of the United Nations Environment Programme (UNEP) Governing Council/Global Ministerial Environment Forum (GC-24/GMEF) took place 5-9 February 2007, in Nairobi, Kenya. Delegates from 141 countries discussed issues related to globalization and environment (including developing a range of clear and specific policy options for improving environmental governance at national, regional, and global levels), the state of the world environment, and cooperation at different international levels. The GC/GMEF adopted 15 decisions, including issues related to waste management (adequacy of the Basel Convention and eventual further developments), strengthening international environmental governance (including the draft Environment Watch Strategy Vision 2020, and coordination and synergies among multilateral environmental agreements), chemicals management (heavy metals and hazardous chemicals), the world environmental situation (improved assessment and mitigation actions), water policy and strategy, recommending that the UN General Assembly declare the decade 2010-2020 as the UN Decade for Deserts and the Fight Against Desertification, and Africa’s environmental management and protection. Egypt offered to host an international center to build judicial capacity in environmental law. The next GC/GMEF will be held in February 2009. [February 2007. Military Implications, Sources]

Environmental Ministers Advance Global Consensus at UNEP Forum
More than 100 environment ministers met in Monaco for the 10th Special Session of the Governing Council/Global Ministerial Environment Forum of the United Nations Environment Programme (UNEP) on February 20-22. The UNEP Medium-term Strategy 2010-2013 was adopted, which upgrades UNEP’s ability to be more effective in addressing climate change, disasters and conflicts, ecosystem management, environmental governance, harmful substances and hazardous waste, and resource efficiency – sustainable consumption and production. The theme of the Special Session was “Globalization and the Environment—Mobilizing Finance for the Climate Challenge”. Issues discussed included long-term predictable carbon prices, building public-private partnerships, regionally balanced distribution of funds, UNEP management to implement the Bali Strategic Plan, and better implementation of multi-lateral environmental agreements.
The discussions and ministerial consultations focused on:

- policy issues and strategies for mobilizing finances to address climate challenges, with the main issues being related to: a coherent international framework for addressing climate change; long-term predictable carbon prices; building public-private partnerships; and a balanced distribution of funds by region and scope;
- strengthening international environmental governance and UN reform, mainly related to UNEP organizational aspects, and to improving the environmental international regulations system, by addressing synergies between existing multilateral environmental agreements in order to simplify understanding of the MEAs’ implementation, and compliance monitoring. Although there is consensus on the need to strengthen international environmental governance (IEG), there is no agreement on how to do it. Views range from supporting a more powerful and coherent IEG (including an eventual UNEO) with reform negotiations starting at the General Assembly’s 63rd session, to favoring the status quo with slight improvements. An interesting suggestion was made by Botswana, who noted that for an effective transboundary ecosystem management, neighboring countries should be parties to the same conventions. The US asked that the final report include language requesting that cooperation among MEAs should be subject to the approval of their governing bodies.

The Forum adopted decisions in five areas:

- the UNEP Medium-term Strategy 2010-2013—formulating the strategic frameworks and programs of work and budgets
- chemicals management, mainly concerning the implementation of the decisions related to reducing hazards from mercury, and improving waste management;
- improving the Global Environment Outlook (GEO), including the development of a global assessment of environmental change and its implications;
- inviting ECOSOC to declare 2010-2020 the International Decade for Addressing Climate Change;
- sustainable development of the Arctic region, mainly continuous environmental assessment (including increased international scientific collaboration) and addressing legal aspects.

At the Forum, UNEP also launched the Climate Neutral Network (CN Net) to assist nations and interested actors with reducing greenhouse as emissions ([http://www.climateneutral.unep.org](http://www.climateneutral.unep.org)) [February 2008. Military Implications, Sources]

**Controversy over a United Nations Environmental Organization Continues**

Last February France along with 46 other countries proposed the establishment of a UN Environmental Organization to encourage and coordinate research and government actions to address climate change. During the Security Council’s debate over security implications of climate change, Italy’s deputy foreign minister, Vittorio Craxi, renewed support for creating a UN environmental organization. The U.S. affirmed support for strengthening the United Nations Environment Programme, but saw no need to create a new UN agency, arguing that the existing UNEP is sufficient for helping countries honor environmental treaty obligations. [See also French President Jacques Chirac issues Paris Call for Action for Global Ecological Governance, and New International Strategy for Chemicals Management and 9th Special Session of the UNEP Governing Council] [April 2007. Military Implications, Sources]
OSCE to Develop an Environmental Security Strategy

The Economic and Environmental Forum of the Organization for Security and Co-operation in Europe (OSCE), held in May 2007 in Prague focused on constructive actions that would help its 56 participating States and 11 Partners tackle environmental security threats and promote stability. OSCE Chairman-in-Office, Spanish Foreign Minister Miguel Angel Moratinos said: “Environmental co-operation can be an effective catalyst for reducing tensions, broadening cooperation and promotion of peace.” There was consensus that environmental security should top the Organization’s agenda and the parties agreed to study the implications of climate change on security, the role of environmental sustainability, and how OSCE's actions could complement other organizations’ efforts. An Environmental Security Strategy for the Organization will be developed over the coming year and debated at the OSCE Ministerial Council to be held in November in Madrid. Several follow-up events to the environmental forum are planned. A resolution may be introduced in the OSCE Parliamentary Assembly to further support this governmental initiative to help insure its implementation under the next Chairman-in-Chief of the OSCE. [May 2007. Military Implications, Sources]

OSCE Adopts Ministerial Declaration on Environment and Security

On November 30, the Organization for Security and Cooperation in Europe (OSCE) agreed on a Ministerial Declaration on Environment and Security. However, the OSCE failed to reach consensus on a detailed environmental security strategy. Nevertheless, Ambassador Bernard Snoy, Coordinator of OSCE Economic and Environmental Activities, is confident that the level of OSCE’s commitment in the field of environmental security will increase, especially since countries east of Vienna stress their specific needs regarding these issues. [November 2007. Military Implications, Source]

OSCE Parliamentary Assembly Agrees to Advance Work on Environmental Security Strategy

The OSCE Parliamentary Assembly passed the resolution to support efforts of OSCE’s 56 participating States and 11 Partners “to tackle environmental security threats and thus to promote stability;” to continue work, “to develop an Environmental Security Strategy for the Organization to be debated at the OSCE Ministerial Council in November in Madrid;” to recommend that “the OSCE works closely together with OSCE participating states as well as national and other international organizations experienced in the field of environmental security; and “Calls upon OSCE participating countries to develop their own environmental security strategies.” [July 2007. Military Implications, Sources]

Briefings on Environmental Security at NATO Conference

Prior to the NATO Summit in April, the NATO Security Science Forum on Environmental Security held in Brussels on March 12th addressed security implications of environmental issues such as climate change, water, energy security, and natural catastrophes. It also looked at environmental security forecasting and cooperation with other international organizations to increase environmental security. Webcasts of the presentations are available on the first website listed below. After the NATO Summit in April in Romania, Russian President Vladimir Putin and NATO leaders agreed to cooperate in several areas, including environmental security. [April 2008. Military Implications, Sources]
OSCE-NATO Workshop on Environmental Security in the Mediterranean

The "Water Scarcity, Land Degradation and Desertification in the Mediterranean region—Environment and Security Aspects" workshop held in Valencia, December 10-11, was organized jointly by the NATO Public Diplomacy Division and the Organization for Security and Co-operation in Europe (OSCE) Office of the Coordinator for Economic and Environmental Activities. Policymakers, scientists and experts assessed implications that water scarcity, land degradation, and desertification might have on population movements and security in the Mediterranean region. Since water management also offers opportunities for cooperation and conflict prevention, specific roles for the OSCE, NATO and other organizations were explored with OSCE Mediterranean Partners for Co-operation and the NATO Mediterranean Dialogue, which include Algeria, Egypt, Israel, Jordan, Mauritania, Morocco and Tunisia. [See also OSCE Adopts Ministerial Declaration on Environment and Security in November 2007 and other previous environmental security reports on similar issues.] [December 2007. Military Implications, Sources]

Environmental Security Focus of the Nobel Peace Prize for 2007

The Nobel Committee said it wanted to bring into sharper focus the “increased danger of violent conflicts and wars, within and between states”, posed by climate change. As a result, the Intergovernmental Panel on Climate Change (IPCC) and Al Gore were awarded the Nobel Peace Prize 2007 “for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change.” Awarding this year’s Nobel Peace Prize for climate change work and the 2004 Prize to Wangari Maathai “for her contribution to sustainable development, democracy and peace” compellingly acknowledges the importance of the environmental issue to international security. [October 2007. Military Implications, Sources]

UK Defence Ministry Highlights the Link between Environment and Security

UK Ministry of Defence published its second annual Sustainable Development Report. The 2005 report identified potential risks from nanotechnology, chemical weapons from the WWII, risks from military sonar, and tungsten and its alloys as emerging sustainability issues related to military activities; and most importantly, acknowledged the link between conflict, security and sustainable development. ‘We must also be ready to act, anywhere in the world, where environmental, social or economic stresses may contribute to the destabilization of society… we have a significant role to play in helping to address these concerns and exploring links between security, conflict and SD with Foreign and Commonwealth Office and Department for International Development,’ the report said (DFID). [For the first Annual report, 2004, See the item UK Defense Ministry released its first Sustainable Development Report in the August 2005 environmental security monthly report] [September 2006. Military Implications, Sources]

Civil Society Regional Consultations Worldwide Prior to the Global Ministerial Environment Forum

In preparation for the 8th Global Civil Society Forum (GCSF) and the 24th session of the Governing Council/Global Ministerial Environment Forum (GC-24/GMEF) to be held in Nairobi, Kenya, in February 2007, representatives of major groups of civil society held regional
consultations around the world. The European Regional Consultation took place in Geneva, October 23–25, and the African Civil Society meeting was held in Nairobi, October 26-27. The discussions were structured around the February GCSF’s central themes—globalization and environment, and UN Reform—with focus on such regional aspects as water, chemicals management, sustainable procurement policies and practices, and international and regional processes. [October 2006. Military Implications, Sources]

**UK Scientists List 100 Most Vital Ecological Policy Questions**

UK scientists have prepared a list of the 100 biggest questions facing the country's environment. According to Guardian Unlimited, "the list … of Britain's most pressing ecological problems is based on the suggestions of more than 650 experts in universities, conservation groups and government institutes. It is intended to inform policy-makers and steer research over the next decade to answer key questions in areas such as farming, climate change, pollution and urban development." [August 2006. Military Implications, Source]

**Environment a Key Element in the First European 18-month Work Program**

For the first time, the European Council adopted an 18-month work program for the following three European Presidencies to be held from January 2007 to June 2008 by Germany, Portugal, and Slovenia. Along with economic and security matters, it covers environment and sustainable development issues, a reassurance that the EU Strategy for Sustainable Development remains in the focus of policymaking. The Environment chapter includes climate change, biodiversity, environmental technologies, and international environmental governance. The 18-month Programme confirms the EU's strong commitment to environmental matters. [January 2007. Military Implications, Source]

**The Institute for Environmental Security in The Hague to Hold Annual Peace and Sustainability Sessions**

The Institute for Environmental Security will convene annual Peace and Sustainability sessions to address the challenges related to conflict prevention and post-conflict issues. The first session, entitled Forces for Sustainability, will be held on 14-15 March 2007 at the Peace Palace in The Hague. It intends to promote cooperation between different actors (such as the security and development sectors) involved in conflict prevention and/or transition to sustainable development in post-conflict situations. “Challenges to be addressed include—how to: formulate scenarios for change towards transparent governance structures; give priority to supervision of the phasing out of illegal economic activities; retrain and employ militias in professions for the restoration and management of ecosystems and natural resources; create new models of empowerment for local communities” says the announcement. [February 2007. Military Implications, Source]

**French President Jacques Chirac issues Paris Call for Action for Global Ecological Governance**

An international conference on global ecological governance, “Citizens of the Earth,” was held in Paris at the instigation of President Jacques Chirac, who issued the Paris Call for Action for Global Ecological Governance and invited all nations to come to Paris to make progress on the
call to action. The resulting conference, held in February, addressed new approaches to climate change, biodiversity, pollution, environmental health, water, environmental governance, and changing patterns of production and consumption. Within the nine points of the Paris Call for Action that inspired the meeting was the proposal for a Universal Declaration of Environmental Rights and Duties (the right to a sound environment) and the transformation of UNEP into a WHO-like organization to be called the United Nations Environment Organization. Green Cross International renewed its call for the adoption of an international legal instrument that would assure the right to water. Environmental degradation “could even come to jeopardize international peace and security” said UN Secretary-General Ban Ki-moon's message to the conference, and the UN General Assembly President Sheikha Haya Rashed Al Khalifa, addressing the Conference, called for “clear objectives and strong ecological governance at the global level, a concept that continues to elude us.” [February 2007. Military Implications, Sources]

Climate Change a Serious Threat to Security, Conclude Eminent Military Officers

*National Security and the Threat of Climate Change*, a report by the CNA Corporation, presents the conclusions of an eminent Military Advisory Board (consisting of retired senior military officers and national security experts) on the security implications of climate change. The report looks at the geo-strategic implications of climate change in general and its effects on international security. It explores specific regional security challenges in Africa, Asia, the Middle East, Europe, and the Americas; discusses the direct impact of some climate change aspects on military systems and operations; and presents a set of findings and recommendations related to mitigation, adaptation, and preparation, as well as policies in response to climate change. It warns that climate change could seriously exacerbate already marginal living standards… causing widespread political instability and the likelihood of failed states…. The chaos that results can be an incubator of civil strife, genocide, and the growth of terrorism… The U.S. may be drawn more frequently into these situations, either alone or with allies, to help provide stability before conditions worsen and are exploited by extremists. The U.S. may also be called upon to undertake stability and reconstruction efforts once a conflict has begun, to avert further disaster and reconstitute a stable environment.” Therefore, “The consequences of climate change can affect the organization, training, equipping, and planning of the military services.” [April 2007. Military Implications, Sources]

Report on Environment, Security, and Sustainable Development

The *Inventory of Environment and Security Policies and Practices* report by the Institute for Environmental Security (IES) in the Netherlands "provides an easy to use comparative overview of existing governmental and inter-governmental positions and actions dealing with the relationship between environment, security and sustainable development.” The report describes the environmental security activities of 13 (largely OECD) countries and 7 international NGOs. It also furnishes background information on IES's program, Greening European Security, which focuses on mainstreaming environmental and sustainable development factors into European foreign and security policy. [March 2007. Military Implications, Source]
World Leaders Discuss Environmental Security Policies at Davos

Business and political leaders exchanged ideas for addressing climate change, water shortages, conflict, terrorism, UN Millennium Development Goals, globalization, and new technologies at the World Economic Forum held in Davos, Switzerland, January 23-27, 2008. Japan’s Prime Minister Yasuo Fukuda advocated new climate-change initiatives, including national CO₂ reductions for major emitters, increasing global energy efficiency 30% by 2020, and a new multilateral fund to mitigate climate change and to support developing countries to cope with global warming. He also announced that Japan—holding this year’s G8 presidency—will place climate change at top of the July G8 summit agenda. U.N. Secretary-General Ban Ki-moon asked business and political leaders to make water issues and scarce supplies top priorities, citing environmental factors increasing and/or maintaining conflicts. Business leaders pledged millions of dollars for helping development and agriculture in poor countries by also improving the environment and water use and access. It was suggested that a certain amount of clean water for drinking should be seen as a human right, but water used for economic reasons should be priced to assure its efficient use. [January 2008. Military Implications, Sources]

Branson calls for War Room on Climate Change at the United Nations

During the special UN General Assembly session “Addressing Climate Change: The United Nations and the World at Work,” Sir Richard Branson, chairman of the Virgin Group, offered a $25 million prize for technology to clean CO₂ from the atmosphere and challenged the world to help him create a war room to manage the attack on climate change. Although it would be independent of the UN, it would include the participation of the UN, corporations, governments, NGOs, and universities in its design, information systems, and management. Key themes of the General Assembly speeches were: 1) partnerships among UN, government, business, NGOs, and universities; 2) global alliances for action; 3) better UN coordination to address Climate Change; 4) rich nations pay for poorer nations’ adaptations to meet climate change challenges (since the poorer countries contribute the least to greenhouse gases, but will suffer the most from global warming; hence, the richer nations should pay for the poorer nations’ adaptation measures); 5) need for a global long-term strategy; 6) shared but differential responsibilities among nations to address climate change; 7) technology transfer and issues of intellectual property rights; 8) early warning systems for adaptation; and 9) “it is too late to say later.” [February 2008. Military Implications, Sources]

New Environmental Security Blog

The Environmental Change and Security Program of the Woodrow Wilson International Center for Scholars has launched a blog on new security threats. The blog provides frequent updates and commentary on the latest news stories and reports pertaining to environmental security, such as global water scarcity, climate change and terrorism. [February 2007. Military Implication, Sources]
INTERNATIONAL TREATIES RELATED TO ENVIRONMENTAL SECURITY AND MILITARY ACTIONS


Protocol V on Explosive Remnants of War (ERW) of the Convention on Certain Conventional Weapons came into force on 12 November 2006, almost three years after it was adopted. The Protocol stipulates that Parties should take “remedial measures to mark and clear, remove or destroy unexploded ordnance or abandoned explosive ordnance” as early as possible after hostilities have ended, whether they control the territory or not, by cooperating directly or indirectly with all parties involved through quick and accurate information exchange. The Protocol is not retroactive, covering only wars occurring after its entry into force. As of the end of November, there were 27 States Parties to the Protocol.

The Portfolio of Mine Action Projects 2007 found that 26 out of 29 war-ravaged countries or territories surveyed are beleaguered with the lurking remnants of cluster bombs and other explosives. In 2007, the focus of the Projects will be on unexploded ordnance, aiming to deal with the aftermath of conflicts that took place before Protocol V entered into force. [November 2006, Military Implications, Sources]

Progress Made on Banning Cluster Bombs

Negotiations Continue for an International Instrument to Ban Cluster Munitions

Cluster munitions were the focus of the Convention on Certain Conventional Weapons (CCW) meeting held in Geneva this month that resulted in a weak mandate with no legally binding document or language referring to cluster bomb prohibition or timeline. The EU’s proposal to negotiate a treaty in 2008 banning cluster munitions was rejected. UN Secretary-General Ban Ki-moon underlined in his message to the delegates the necessity of a legally binding international instrument that would prohibit the use, development, stockpiling and transfer of cluster munitions; while promoting the destruction of current stockpiles, battlefield clearance and risk mitigation activities. This is consistent with the aim of the Oslo Process to negotiate a ban on cluster munitions. On November 5, the Global Day of Action to Ban Cluster Bombs, public actions took place in 40 countries, calling on governments to take actions for banning cluster munitions. Supporters hope that momentum was created to advance the negotiations next month, when more than 100 countries will gather in Vienna to discuss a draft treaty. [See also Progress Made on Banning Cluster Bombs in March 2007 and other items on this theme in previous environmental security reports.] [November 2007. Military Implications, Sources]

At the Conference on Cluster Munitions held in February 2007 in Oslo, 46 states and several international organizations decided to develop, by 2008, a legally binding international instrument to ban the use, production, transfer, and stockpiling of cluster munitions, as well as to create a framework for dealing with the consequence of cluster munitions’ use in the affected areas. Environmental damage and civil casualties are the highest concern for banning cluster bombs. Next meetings are planned for May/June in Lima, November/December in Vienna and early 2008 in Dublin. Last year Belgium has become the first country to ban cluster bombs, and this month [March 2007] the Belgian Senate passed legislation that criminalizes investment in companies that make cluster munitions. The Belgian Parliament plans to publish a list of companies that manufacture such munitions. Austria announced a moratorium on the use,
production, or trade of cluster munitions. Canada promised to destroy its stockpile of cluster munitions. The U.S. Democrats recently introduced a bill in the U.S. Senate proposing to “restrict federal funds for the use, sale or transfer of cluster bombs.” Presently there are 34 countries producing cluster munitions and about 75 countries that stockpile them. [See also related items CCW Protocol V on Explosive Remnants of War Entered into Force in November 2006, NGOs Launch Campaign to Ban Cluster Bombs, and Draft Protocol on Cluster Bombs Cleanup Liability] [March 2007. Military Implications, Sources]

African Countries Call for International Ban on Cluster Bombs
The first meeting of African countries on cluster bombs adopted the “Livingstone Declaration,” endorsed by 38 out of 39 countries (South Africa, one of the continent’s two producer states was the exception.) The strong political declaration is formally committing the African countries to the negotiations for a global cluster munitions ban treaty to be held in Dublin, Ireland, May 19-30, 2008. There was widespread support for a broad definition of cluster munitions to avoid exceptions based on so-called “technical fixes,” and on the need for comprehensive liability provisions for the affected communities. The Dublin meeting should conclude the Oslo process and agree on the final terms and language of a cluster bombs ban treaty, which would then be opened for signature before the end of 2008. [See also Negotiations Continue for an International Instrument to Ban Cluster Munitions in November 2007 and other items on this issue in previous environmental security reports.] [April 2008. Military Implications, Sources]

Chemical Weapons Convention Gets New Boost
The Second Review Conference for the Chemical Weapons Convention was held in The Hague, April 7-18, 2008, attended by delegates from 114 of the 183 treaty states. The main issues brought up by participants were: threats posed by the use of chemical weapons by nonstate actors; deadlines for chemical weapons destruction (specifically named were Russia and the U.S., which have to destroy their chemical warfare agents by April 29, 2012, and Japan for destruction of its chemical weapons stockpiles in China); and universal adherence to the treaty. Delegates produced a report that reviews the treaty procedures and implementation issues, and urges the 12 countries that are not yet Party (Angola, the Bahamas, Dominican Republic, Egypt, Guinea-Bissau, Iraq, Israel, Lebanon, Myanmar, North Korea, Somalia and Syria) to join the international disarmament and nonproliferation treaty “as a matter of urgency and without preconditions.” The report does not address the convention’s relation to some new science and technology developments that could produce new threats—such as development of new incapacitating agents, advances in biology and nanotechnology, and industry verification mechanisms. It was proposed that, from now on, the Scientific Advisory Board of the Organization for the Prohibition of Chemical Weapons meet twice a year, not just once as it has previously. [See also New Concerns Rising over Chemical Weapons in April 2007 and other related items in previous environmental security reports.] In the meantime, Pacific Consultants International warns that Japan is not on schedule for meeting its obligations towards China in the recovery and destruction of hundreds of thousands of chemical weapons abandoned at the end of World War II and will most probably not meet the April 2012 deadline, due to management problems. [See also Japanese Chemical Weapons Cleaning in China Yet to be Completed in June 2007, and other previous environmental security reports on this issue.] [April 2008. Military Implications, Sources]
Eleventh Chemical Weapons Convention

The 11th Conference of States Parties to the Chemical Weapons Convention (CWC) was held in The Hague, December 5-8. One of the controversial issues discussed concerned “incapacitating agents,” which Peter Herby, head of the Mines-Arms Unit at the International Committee of the Red Cross, considered toxic chemicals. Some experts also argued that using “nonlethal” materials on the battlefield would violate the CWC. There was also a call to clarify which chemicals—other than riot control agents—are allowed under the treaty’s exception for law enforcement, and that all these chemicals be publicly declared. The Conference approved the requests from Russia, the U.S. and several other nations for additional time to eliminate their stockpiles of toxic agents. There are now 181 nations party to the CWC, representing about 98% of the world’s population and there are calls that all nations become Party to the Convention before its 10th anniversary, next year. [See also Five Countries Organize CWC National Authorities in May 2006, Micro-reactors Challenge Chemical Weapons Convention Effectiveness in August 2005, and Chemical Weapons Convention Annual Conference in December 2004 environmental security reports.] [December 2006, Military Implications, Sources]

Conflict and Post-Conflict Environmental Security Issues

International Crisis Group to Debate Considering Climate Change Variable in Conflicts

The International Crisis Group, which tries to prevent conflicts by monitoring vulnerable regions based on indicators such as political instability, began in June to debate whether to include climate change as a new variable in its analysis. [June 2007. Military Implications, Sources]

UN Secretary-General on the International Day for Preventing the Exploitation of the Environment in War and Armed Conflict

In advance of the November 6th International Day for Preventing the Exploitation of the Environment in War and Armed Conflict, UN Secretary-General Ban Ki-moon urged all nations to renew their commitments preventing environmental exploitation in war and armed conflict. “Taking ecological considerations into account is crucial if we are to avoid longer-term environmental problems that can undermine security and development, and lead to further cycles of conflict and displacement,” he said in a message and added that massive migrations caused by conflicts also severely damage the environment. UNEP found that more than 2 million displaced people since 2003 had caused severe deforestation, land degradation, and overexploitation of groundwater resources around the larger camps for displaced persons. [October 2007. Military Implications, Sources]

Report on Lebanon After-war Environmental Assessment

Lebanon Rapid Environmental Assessment for Greening Recovery, Reconstruction & Reform—2006 report is a comprehensive review of the major environmental impacts caused by the July-August 2006 war, proposes some action plans to mitigate them, and explores opportunities for green reconstruction and recovery. It also looks at such environment-related legal aspects as
improving national legislation and the options available to the Government of Lebanon to seek compensation for environmental damage. [February 2007. Military Implications, Sources]

Hezbollah-Israeli War Threatens an Already Precarious Environment
Arab countries are among the least environmentally sustainable in the world. The current wars are making this situation worse. The impact of the oil slick caused by Israeli bombing of the Jiyyeh power station is an “environmental tragedy which is rapidly taking on a national but also a regional dimension,” warned UNEP Executive Director Achim Steiner. Long-term implications also include the loss to fishing for the Lebanese people, and decline in tourism. Presently the ecological damage spreads along 50 miles of the Lebanese coast; 10,000 tons of crude oil have been released into the Mediterranean, with another 15,000 tons expected to spill very soon. According to the Environmental Sustainability Index of Yale University, Iraq, Sudan, and Kuwait fall within the bottom 5% of the world for sustainability and half of the remaining Arab States scored in the lowest 25%. Without major changes, environmentally induced migrations and more conflicts in the region seem inevitable. [July 2006, Military Implications, Sources]

Addressing Post-Conflict Environmental Security Issues
Further on last month’s item on the environmental consequences of the Hezbollah-Israeli war, UNEP announced the beginning of the cleanup operation of the massive oil spill caused by Israeli bombing of a fuel depot, which affected some 150 kilometers of Lebanese and Syrian coastline. It is estimated that the cleanup could take up to one year and might cost over $64 million. The massive damages to the ecosystem are already noticeable. [See also Hezbollah-Israeli War Threatens an Already Precarious Environment in July 2006 environmental security report.]
At the end of July 2006, the UN Compensation Commission announced the last disbursement to individuals who suffered because of Iraq’s 1990 invasion of Kuwait. The total paid out to date is nearly $21 billion, while 49 other claims, including environmental ones are still pending. [August 2006. Military Implications, Sources]

Environmental Legacy of Hezbollah-Israeli War
Lebanon—Post-Conflict Environmental Assessment, UNEP’s Post Conflict Branch report, is a comprehensive assessment of the legacy of last summer’s Hezbollah-Israeli war in Lebanon and its impact on the environment and human health. The report details serious environmental challenges confronting the Lebanese authorities and threatening the population’s health, and calls for urgent remediation actions. The highest risks are posed by leaked toxic and health hazardous substances, disposal of significant quantities of war-related debris, unexploded cluster bombs, and damaged water supply and sewage networks. [January 2007. Military Implications, Sources]

Environmental Aspects of the Darfur Conflict
ICC Urged to Consider Environmental Crimes in Darfur Cases
The International Criminal Court (ICC) has begun the prosecution process related to the Darfur conflict, but so far there is no mention of environmental crime, although environmental degradation is recognized as one of the underlying causes of the region’s devastating war. Refugees, human rights groups and legal experts have urged the ICC to consider man-made
environmental crimes along with terror and mass killings in the prosecution of Sudanese officials and Arab Janjaweed. They argue that the ecological crisis—recognized as partly caused by climate change—was aggravated by the destruction of vegetation, land, and food and water sources that was ordered by government officials to force people to move. [August 2007. Military Implications, Sources]

**Water Shortage for 2.2 Million in Refugee Camps Could Increase Darfur Conflict**

Water shortage might impede the peace process in Darfur. The number of refugees in camps reached 2.2 million in July 2007 and the risk of unrest is increasing as the water wells are running dry. As stipulated by the UN Security Council’s resolution adopted in July, a joint UN-African Union force of 26,000 multinational peacekeepers should be deployed in the area. However, their deployment and work are jeopardized by lack of resources, mainly water. [August 2007. Military Implications, Sources]

**Environment to Get Crucial Role in Sudan's Future Peace and Prosperity Strategy**

UNEP is conducting detailed environmental assessments in order to identify environmental impacts, pressures, risks, and priorities for Sudan’s post-conflict reconstruction plans. Since December 2005, four field missions were conducted in each of the main geographic areas. These findings will be presented in the UNEP report Sudan – Post-Conflict Environmental Assessment scheduled for release in October 2006 and then incorporated into national policies, plans, and laws for resource management in Sudan. UNEP is also currently preparing a program entitled Capacity Building for Environmental Governance in Sudan, which will cover the period 2007-2009. The UNEP study and recommendations are another example of the importance being accorded to the environmental dimension in post-conflict reconstruction. [July 2006. Military Implications, Source]

**UNEP Warns No Peace in Sudan without Environmental Management Plan**

The UNEP report Sudan Post-Conflict Environmental Assessment underscores that the conflict-torn region is unlikely to achieve a lasting peace unless it switches to sound natural resources management. Desertification and deforestation, spread of deserts southwards, increased pressure by unsustainable agriculture, and environmental degradation exacerbated by oil exploitation all contribute to increasing scarcity of resources, the main cause of the Sudan conflict. The report emphasizes that if these problems are not quickly and appropriately addressed the conflict might spread. [June 2007. Military Implications, Sources]

**Environmental Change and Security 12th Annual Report—Focus on Africa**

The 12th annual report of the Woodrow Wilson Center's Environmental Change and Security Program explores the link between environment, conflict, and cooperation in Africa, focusing on fragile states. It calls attention to other smaller—local—conflicts triggered by increasingly shrinking resources due to population growth, climate change, and accelerated environmental degradation. It warns that unless timely measures are taken, those small conflicts might escalate into wars and humanitarian disasters, such as in Sudan's Darfur region. However, "efforts to promote sustainability—and use natural resources as peacebuilding tools—could help turn deadly environments into safe, sustainable neighborhoods” say the authors. The report includes
the contributions of eight African leaders and scholars. [June 2007. Military Implications, Source]

**Disputes over Oil Might Reignite Congo-Uganda Conflict**

Since the discovery of oil at Lake Albert in the border region of Uganda and Congo, tension between the two counties has escalated. Uganda responded to a series of violent incidents with several casualties by increasing troops along the border, and the media were talking of a “possible invasion of Congo”. “This is about oil. The stakes are enormous,” says Congo's petroleum minister, Lambert Mende. Both Uganda—a poor country, and Congo—seeking to rebuild after a ruinous war, have high hopes in a better, oil-fueled, future. Negotiations on the future joint management of reserves began, although the reserves are not yet assessed. [August 2007. Military Implications, Source]

**Depleted Uranium Environmental Concerns Resurfacing**

Concerns over the environmental and health effects of the use of depleted uranium munitions are resurfacing and increasing worldwide. The debate ranges from extensive articles in the news to testimonials by scientists and health tests of military veterans and active duty personnel who may have been exposed to depleted uranium. A British study by the University of Leicester—using MC-ICP mass spectrometry for detecting an individual’s exposure to depleted uranium—reveals that, depending on the rate of exposure, depleted uranium can be traced in urine 20 years after inhalation, even when the concentration was at the low end of the normal range. [See also Conclusions on Health and Environmental Impact of 1990-1991 Gulf War in July 2005 and other previous items on this theme, as well as Sensitive Uranium Detector Using DNA in February 2007 environmental security reports.] [November 2007. Military Implications, Sources]

**Japanese Chemical Weapons Cleaning in China Yet to be Completed**

June 2007 was the deadline agreed to by Chinese and Japanese authorities for cleaning up the Japanese chemical weapons littering China since the Japanese war against China. Yet, this month, a number of Chinese construction workers suffered health problems after being exposed to a ruptured mustard agent bomb believed to have been dropped by a Japanese warplane many years ago. The unexploded bomb was hit by the construction team while excavating for a residential building in Bayannaoer City in Inner Mongolia. The Japanese government is expected to receive a request to destroy the weapon, sources said. In May 2007, Japan’s Supreme Court ruled that Chinese victims of Japanese biological warfare and other atrocities that occurred before and during World War II are not eligible for compensation. [June 2007. Military Implications, Sources]

**Japanese Supreme Court Denies Chinese Wartime Claims**

Japan’s Supreme Court ruled that Chinese victims of Japanese biological warfare and other atrocities occurred before and during World War II are not eligible for compensation. Two cases involving about 200 Chinese required compensation and Japanese government apologies for biological weapons experiments, the firebombing of a Chinese city and other atrocities happened in the 1930s and 1940s. The majority of the plaintiffs were relatives of the victims. “These are unjust rulings that ignore the human rights and personal suffering of the defendants. […] The
Supreme Court has completely neglected its responsibility to uphold justice.” Historians estimate that up to 250,000 people might have died in Japan’s Unit 731 experiments that involved germ testing and vivisection. No unit personnel ever faced prosecution and Japan argues that the cases brought up happened before Japan’s ratification of relevant treaties. [See also Discussions over World War II Japanese Warfare Program in China not Settled Yet, China: Japan to Pay $2.7 Million for War Gas Leak, and Effects of Poison Gas Used in WWII by Japan.] [May 2007. Military Implications, Sources]

Environment and Security Program in the East-Caspian Region
The regional meeting of the Environment and Security (ENSVEC) Program in the East-Caspian region was held in Ashgabat, Turkmenistan, and was attended by leading specialists from Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, Russia, Italy, Iran, and Afghanistan, as well as representatives of OSCE, NATO, UNEP and UNDP. In the framework of implementation of the ENSVEC program for environmental protection and cooperation in the region, the focus was on the East-Caspian Sea’s coastal area development, pollution reduction, and ecological preservation and restoration. The start of the ENSVEC program in the Atyrau and Mangistau oblasts of Kazakhstan and Turkmenistan was also announced. The Central Asia ENSVEC program priority regions include: the Fergana Valley, the Caspian Sea’s Eastern Coast, the Semipalatinsk Nuclear Ground, the Amu-Darya river basin, and the Aral Sea. [September 2007. Military Implications, Sources]

Environment and Security Initiative Progress Report 2006
The Environment and Security Initiative—An international partnership for managing conflict and risk, progress report 2006, highlights advancement of ENVSEC sub-regional projects’ implementation in the Southern Caucasus, Central Asia and South Eastern and Eastern Europe, as well as the initiation of an environment and security risk assessment in the Belarus, Moldova and Ukraine sub-region. The issues identified for urgent attention by ENVSEC include: wastes, stocks of rocket fuel and obsolete pesticides from Soviet times, shared waters, and the continuing environmental consequences of the Chernobyl disaster. “Activities conducted under the ENVSEC Initiative show that environment can act as a bridge for crossboundary cooperation” says the report. The 2007–2009 work program includes over 70 projects based on region-specific priorities “related to need of further assessments, policy development, institution and capacity building as well as technical cooperation.” [April 2007. Military Implications, Source]

Sustainable Development Strategies
The Intergovernmental Preparatory Meeting for the 15th session of the Commission on Sustainable Development (CSD-15) took place February 26-March 2, 2007 and discussed policy options and possible actions related to four thematic areas: energy, industrial development, air pollution/atmosphere, and climate change in the context of sustainable development, as well as the situation of small island developing states (SIDS), and inter-linkages and cross-cutting issues in the framework of the thematic areas. The draft Chair’s “negotiating document” that will be transmitted directly to CSD-15 has six sections, covering the four thematic areas, inter-linkages...
and crosscutting issues, and review and follow up. The 15th session of the CSD will be held April 30–May 11, 2007, in New York. Climate change also topped the agenda of the G-8 meeting held in Potsdam, Germany, March 16-17. The meeting, attended by environmental ministers of the G-8 countries plus China, India, Brazil, Mexico and South Africa, aimed to prepare for the G8 summit to be held in June, in Heiligendamm and the discussions for the December Climate Change Conference. Although consensus was reached on the need to protect the world's environment, consensus was not yet achieved on either post-Kyoto strategies nor on a global carbon emissions trading scheme like the one used in the EU. [March 2007. Military Implications, Sources]

North American Environmental Security Action Plan
The 15th Regular Session of the Council of the Commission for Environmental Cooperation (CEC) was held June 25-26, in Ottawa, Canada. Key issues discussed included, inter alia: raising and harmonizing environmental standards across North America and effective enforcement of environmental law; reducing the risks of toxic substances to human health and the environment by improving chemicals management—implementation of SMOC (Sound Management of Chemicals) Program and of the North American Regional Action Plans, and improving border security by increasing the Parties’ cooperation on intelligence sharing and operational support to combat the importation, use, and production of such products (the list of hazardous chemicals is being revised); energy security and reducing greenhouse gas emissions (by encouraging green technologies in building and motor vehicles industries and the establishment of Green Suppliers Partnerships); continuing cooperation for marine and biodiversity protection; and climate change expected impacts for North America and mitigation and adaptation challenges.

As a preamble to the meeting, the CEC prepared North America 2030: An Environmental Outlook, a succinct overview of the region’s environmental stress factors and their trends. It includes a subchapter on environmental security, focusing mainly on the Northwest Passage, and food and energy security. A more detailed report on factors likely to impact North America’s environment to 2030 is expected to be published later in 2008. These papers are intended to assist the CEC in developing its 2010–2015 Strategic Plan. [June 2008. Military Implications, Sources]

U.S. Created Committee to Address Climate Change and Energy Security Issues
The U.S. Congress created a 15-member Select Committee on Energy Independence and Global Warming to provide information and advice on the best policies to address America’s energy security and climate-change issues. "Energy independence and climate change are issues of national security and national urgency," said House Speaker Nancy Pelosi (D-Calif.) announcing the creation of the committee. [Note: A nationwide poll conducted for the Yale Center for Environmental Law and Policy revealed that 63% of Americans agree that the U.S. "is in as much danger from environmental hazards, such as air pollution and global warming, as it is from terrorists" and 81% of Americans are ready to take action personally in response to climate change.] [March 2007. Military Implications, Sources]

EU and US to Cooperate on Environmental Research
The US Environmental Protection Agency and the EU Commission's Directorate of Research have signed an agreement, Implementing Arrangement on Environmental Research and
Ecoinformatics, setting up a bilateral research framework to more strategically address common environmental challenges. Among the collaborative research topics are: uses and impacts of nanotechnology; environmental information systems; development of environmental and sustainability indicators; environmental modeling; decision support tools; environment and health; sustainable chemistry and materials; environmental technologies; and air quality management. [February 2007. Military Implications, Sources]

European Temporary Committee on Climate Change to Begin Operations in May
The European Parliament approved the establishment of a new temporary committee on climate change. The 60-member committee will start work on May 10, 2007. It will design and suggest strategies and policy options for the 27 EU states to address energy and climate change issues. It is also expected that the committee will strengthen EU’s international role in intensifying action to tackle climate change, pushing it to the top of the international agenda and furthering post-Kyoto Protocol's negotiations. [See also EU Energy and Climate Change Policy.] [April 2007. Military Implications, Sources]

European Commission’s New Low-carbon 20/20/20 by 2020 Energy Plan
The European Commission has proposed a package of measures to reach its “20/20/20 by 2020” targets — produce 20% of its energy from renewable sources and increase energy efficiency by 20%, cut greenhouse gas emissions by 20% of 1990 levels (or 30% in case of a global accord), and considerably reduce reliance on energy imports. The detailed roadmap includes specific renewable energy and CO₂ emission targets for each EU member state; new rules for carbon sequestration; and an updated Emissions Trading System for fair greenhouse gas emissions cuts for different emitters, with the aim of gradually including all industries in the emissions auction scheme. The Commission's proposals have to be endorsed by the European Council and Parliament, with the final package expected to come into force by the end of 2009. The European Commission hopes that the plan will trigger strong momentum towards a global agreement. Meantime, the European Commission is also considering introducing a climate tax on imports from states failing to tackle greenhouse gas emissions, and toughening EU’s emission trading system. [See also EU Energy and Climate Change Policy in March 2007 environmental security report.] [January 2008. Military Implications, Sources]

EU Leaders Support the 20/20/20 Energy Plan
At the recent EU summit (March 13-14), member states’ leaders indicated support for the EU’s 20/20/20 energy plan. The package should receive full political backing by all governments by the end of 2008 in order to be discussed at the EU Parliament in the first week of 2009. In spite of the tight deadline, EU officials are confident that the plan will pass in time to give the EU a better negotiating position at the December 2009 UN climate change summit. At the same time, despite some countries’ disagreements and complaints, the European Commission reaffirmed that it is not willing to change the timetables and national targets. However: 1) some concessions were agreed for energy intensive industries such as steel and cement factories, which could get free pollution permits—instead of having to buy them by auction, and 2) foreign companies might also be made to take part in the emissions trading system (ETS). [March 2008. Military Implications, Sources]
Russian Focus on Environmental Security

Russia’s new President Dmitry Medvedev said: “Our country is in a threatened state. If we don't deal with this [environmental matters], then in 10, 20, 30 years we could be in a situation where part of the country’s territory is unfit for habitation…Ecology is a question of national security.” [June 2008. Military Implications, Sources]

President Putin Cites Environmental Security as Key Criterion for Caspian Energy Projects

During the summit of five Caspian nations in Iran, Russian President Vladimir Putin said “Environmental security must become a yardstick for measuring the safety of all projects”, and “projects that may inflict serious environmental damage to the region cannot be implemented without prior discussion by all five Caspian nations,” suggesting that each country should have a virtual veto on energy projects in the region. Note: in September 2006, Russia threatened to revoke environmental authorization for the Sakhalin II project. However, in April 2007, when Gazprom (state owned company) gained 50%+1 share in the Sakhalin Energy Investment Company, the President announced that the alleged environmental problems were adequately addressed. [October 2007. Military Implications, Sources]

To Join the EU, Balkan Countries Should Increase Environmental Efforts

Balkan countries wanting to join the EU—Croatia, Bosnia, Serbia, FYR Macedonia, Montenegro and Albania—must pay as much attention to environmental protection as they do to economic development if they want to join the bloc, says the UNDP report Balkan Vital Graphics: environment without borders. Spending on environmental protection should increase from the present share of less then 0.1% to 0.7% of the GDP, to at least 1.5-2%. The six Balkan countries are working on a joint environmental strategy, but an agreement is yet to be reached. [October 2007. Military Implications, Sources]

New Construction on Mediterranean Coastlines to be Banned

The recent meeting of the Barcelona Convention [for the Protection of the Marine Environment and the Coastal Region of the Mediterranean] added a new protocol on Integrated Coastal Zone Management to strengthen regional co-operation for harmonious and sustainable use of the Mediterranean coastal zone, including banning any construction within 100 meters (about 328 feet) to the water all along the Mediterranean shore. The participants also issued the Almería Declaration that requires all member states to catalog threatened marine species by 2011 and establish a network of protected coastal areas by 2012. To ensure that the convention’s provisions are enforced, the first compliance system was established, and the parties agreed to create an enforcement committee. [See also OSCE-NATO Workshop on Environmental Security in the Mediterranean and European Parliament Passed the Marine Strategy Directive in December 2007 and other related items in previous environmental security reports.] [January 2008. Military Implications, Sources]

France Could Add Teeth to the Kyoto Protocol

France’s President Nicolas Sarkozy is proposing a tax revision that would favor environmentally friendly practices and lower labor taxes, while increasing taxes on highly polluting vehicles and
imports from countries that do not respect the Kyoto Protocol. Sarkozy's proposals are expected to be passed by parliament early next year. France also intends to expand its strategy to the EU, urging Brussels to consider EU tariffs for imports from non-Kyoto protocol countries. [October 2007. Military Implications, Sources]

**UK to Establish an Independent Climate Committee**

The parliament of the UK plans to establish an independent climate committee that would report to the parliament on an annual basis, said MP Elliot Morley, member of the UK Parliament and the Government’s Special Representative on the Gleneagles Dialogue on Climate Change, Clean Energy and Sustainability, addressing NATO’s Advanced research Workshop on “Energy and Environmental Challenges to Security.”

During his first speech as the UK’s Prime Minister, Gordon Brown stressed the importance of addressing climate change in a global framework and said, “As we move to a post 2012 global climate change agreement, we need a strengthened UN role for environmental protection.” Scientists and policymakers attending the UK Environment Agency annual conference called for increased efforts to address climate change effects. The Agency’s chief executive, Lady Young, said that climate change needs to be addressed like “World War Three”, noting that current adaptation measures are “too little, too slowly.” UK Environment Secretary Hilary Benn warned that climate change “is not just an environmental challenge. It’s also a security challenge, a migration challenge, a political challenge and an economic challenge as well.” [November 2007. Military Implications, Sources]

**EU, Latin American and Caribbean Countries Environment Cooperation**

The first meeting of the EU, Latin American, and Caribbean countries’ environment ministers took place in Brussels, March 4, 2008, in a pre-meeting to the high level summit to be held in Lima, in May. More than two dozen environment ministers attended the meeting aiming to identify common priorities in order to increase environmental efforts and better integrate them in the EU–LAC countries’ areas of cooperation. The focus was on collaboration strategies between the two regions for addressing climate change, renewable energy, biodiversity loss, and deforestation. The EU has already pledged considerable funds to help the region in domains such as natural resource management, renewable energy and energy efficiency, forest management, climate change mitigation, greenhouse gas reduction, carbon sequestration, and governance. [March 2008. Military Implications, Source]

**Argentina Redeploys Military to Defend Water and Oil**

The Argentine government is changing its military strategy based on the forecast that conflicts over water and oil are the most likely long-term national security threats. The most vulnerable area is the Guarani aquifer that neighbors Uruguay, Brazil, and Paraguay. The Army "Plan 2025" was launched last year and includes parceling the country into regions based on their resource potential—mainly oil and fresh water. "Each division will be based in the geographical areas where the natural resources that we hypothetically must defend are located," Argentine Army Commander-in-Chief Roberto Bendini said in revealing the plan. [March 2007. Military Implications, Sources]
US-Uruguay Treaty on S&T Cooperation
On April 29th the US and Uruguay signed a treaty to increase government, academic, business, and NGO scientific cooperation between the two countries. The agreement gives special attention to the study of biodiversity to improve agriculture, medicine, and understanding of the impact of climate change on the environment. [May 2008. Military Implications, Source]

Ecuador Gets an Environmentalist Foreign Minister
President Rafael Correa of Ecuador (to take office in January) has named a US-trained environmentalist, Maria Espinosa, as his foreign minister. The new cabinet member is head of the World Conservation Union in South America and an expert on nature reserves. The nomination comes at a time of growing tensions with neighboring Colombia over spraying of drug crops near the border, which damages Ecuadorian legal crops and the health of people living in the area. [December 2006, Military Implications, Source]

Iran and Iraq Sign Environment Protection Agreement
Iranian and Iraqi chief environment officials signed an agreement for increasing the two countries’ cooperation in areas related to the environment. The eight-article document covers issues of natural resources, industrial and oil-exploitation pollution control, wildlife protection, and promoting ecotourism, as well as addressing environmental damage caused by wars. [January 2008. Military Implications, Source]

Israel to Participate in UNEP and UN HABITAT
The Western European and Others Group regional bloc within the UN elected Israel to represent the regional group in consultations with the UN Environmental Programme and the UN Human Settlements Programme (UN–HABITAT). This could create unique opportunities to address environmental security issues in the Palestinian territories, which are among the most severe in the world. [January 2008. Military Implications, Source]

Waste Disposal a Matter of Discord or Cooperation between Palestine and Israel
Waste disposal might additionally fuel the increasingly tense relations between Israel and the Palestinian Authority as waste is transferred from Israel to areas of the West Bank. The main problem is that large quantities of building waste are deposited in pirate sites near Palestinian villages. Some contain toxic substances polluting the environment, leaking into the water system, and endangering the public health of both Palestinian and Israeli people. Scientists and environmentalists call on the two parties to leave aside diplomatic disagreements and develop collaborative relations on environmental issues generally and on solving the waste problem specifically. [March 2008. Military Implications, Source]

Asian New Strategy to Improve Health and Environment
At the First Ministerial Regional Forum on Environment and Health, held in Bangkok, August 8-9, 2007, top environmental and health officials from Southeast and East Asian countries adopted the Bangkok Declaration on Environment and Health. The Declaration aims to set up strategies to reduce the estimated 6.6 million annual deaths—representing approximately 25% of
Summarizing Environmental Security Scanning July 2006—June 2008

all deaths in the region in a year—attributable to various environmental health risks such as air pollution, solid and hazardous wastes, and numerous man-made disasters. The Declaration provides a mechanism for improving collaboration in policy and regulatory frameworks at the national and regional level, and promotes the implementation of integrated environmental health strategies and regulations. It covers areas from air and water quality, to hazardous substances and climate change—including contingency planning, preparedness and response to environmental health emergencies. A second Ministerial Regional Forum is planned for 2010. [August 2007. Military Implications, Sources]

Asia-Pacific Should Intensify Green Growth Efforts

The State of the Environment in Asia and the Pacific 2005 report, published by the United Nations Economic and Social Commission for Asia and the Pacific, notes that the region needs to shift towards ecologically efficient, ‘green growth’ patterns, if it wants to continue its growth. Acknowledging some efforts on new regulations, it documents that many areas are still in great need of improvement. High population density, low freshwater availability and biologically productive area per capita of all global regions, and the growth of highly energy-intensive and polluting industries, along with increasing waste, are some of the most important concerns. The report offers a comprehensive picture of the region’s trends both as problems, and as shortfalls that still have to be regulated. [December 2006. Military Implications, Sources]

UNEP and South Korea to Help North Korea’s Environmental Management

UNEP and the Republic of Korea agreed to set up a Trust Fund for projects addressing key environmental issues in the Democratic People’s Republic of Korea. This first collaboration of the two countries on environmental matters aims to address urgent problems in the DPRK related to forest, water quality, air pollution, land degradation and biodiversity, as well as support eco-housing initiatives, conservation management, environmental education, clean development mechanisms and renewable energy technology, and environmental monitoring. [November 2007. Military Implications, Source]

Climate Change Issues May Have Determined Australian Election

Environmental policy seems to have been one of the determining factors in Australia’s election and the success of the Labor Party, which has environmental issues such as climate change and signing the Kyoto Protocol as top priorities. It is therefore expected that Australia will adopt more environmentally protective policies. Given its status as a major regional power, Australia’s attitude could affect international and regional environmental deliberations. [November 2007. Military Implications, Sources]

Environment and Security Program in the East-Caspian Region

The regional meeting of the Environment and Security (ENSVEC) Program in the East-Caspian region was held in Ashgabat, Turkmenistan, and was attended by leading specialists from Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, Russia, Italy, Iran, and Afghanistan, as well as representatives of OSCE, NATO, UNEP and UNDP. In the framework of implementation of the ENSVEC program for environmental protection and cooperation in the region, the focus was on the East-Caspian Sea’s coastal area development, pollution reduction, and ecological
preservation and restoration. The start of the ENSVEC program in the Atyrau and Mangistau oblasts of Kazakhstan and Turkmenistan was also announced. The Central Asia ENSVEC program priority regions include: the Fergana Valley, the Caspian Sea's Eastern Coast, the Semipalatinsk Nuclear Ground, the Amu-Darya river basin, and the Aral Sea. [September 2007. Military Implications, Sources]

The Environmental Dimension of Asian Security

*The Environmental Dimension of Asian Security. Conflict and Cooperation over Energy, Resources, and Pollution* “published by the U.S. Institute of Peace, analyzes the nexus between environmental and natural resources (ENR) problems and security in Northeast Asia” says a book review. The book argues that in the region “there is very little regional cooperation, despite the need to manage disputes over energy, natural resources, and pervasive pollution.” [November 2007. Military Implications, Source]

Environmental security among top three priorities in Australia-China talks

Among other things, China and Australia agreed during private talks during the September APEC meeting to cooperate on clean coal and nuclear energy to reduce greenhouse gas emissions. They plan to continue annual strategic security meetings including environmental security matters. [September 2007. Military Implications, Source]

China May Restructure Environmental Effort

Chinese President Hu Jintao, opening the ruling Communist Party’s five-yearly Congress, called the environment key to “the survival and development of the Chinese nation” and said that China should improve its economic/environment balance. There are speculations that China’s State Environmental Protection Administration may be given more status and power as early as next year. “It is still under discussion how the new organization should be,” said Xia Guang, director of the Policy Research Center for Environment and Economy, a think tank within SEPA, during a recent talk at Brown University. [See also China’s Climate Change and S&T Action Plan in June 2007, China’s President Hu Ordered Environmental Regulations for Military Activities in April 2006, and other related items in previous environmental security reports.] [October 2007. Military Implications, Source]

China Calls for Enhanced Cooperation on Environmental Protection in Northeast Asia

At the Opening of the 12th Senior Officials Meeting of the North-East Asia Sub-regional Program for Environmental Cooperation, Cui Tiankai, Assistant Foreign Minister of China, said environmental protection is an integral part of international and regional cooperation as nations face a number of traditional and non-traditional security threats. He urged six member countries (China, Japan, North Korea, Mongolia, Russia and South Korea) to enhance cooperation on environment and sustainable development. [See also Asia-Pacific Should Intensify Green Growth Efforts, New Environmental Think Tank for Asia, and Meeting of Asia-Pacific Partnership on Clean Development and Climate.] [March 2007. Military Implications, Sources]
China’s Climate Change and S&T Action Plan

China launched its first national climate change program in June 2007. Although it does not include mandatory caps on emissions, it shows a strong commitment to reducing greenhouse gas emissions. The program highlights some major targets and actions to achieve them by 2010: reducing energy consumption by about 20% per GDP unit; increasing the share of renewable energy to 10% of the primary energy supply; keeping emissions of nitrous oxide from industrial processes at 2005 levels; increasing reforestation by 20%, and increasing international cooperation. The program notes that “China’s energy efficiency is about 10% lower than that of the developed countries, and its per unit energy consumption of energy-intensive products is about 40% higher than the advanced international level. Science and technology are the ultimate resort for humankind to tackle climate change.” In view of this, the Chinese Ministry of Science and Technology has released an action plan for the science and technology (S&T) aspects of China's new climate change initiative.

Note: The Chinese State Environmental Protection Administration report released in June reveals a continuous deterioration of air and water quality in Chinese cities despite national efforts to reduce pollution levels. Concomitantly, preliminary estimates by the Netherlands Environmental Assessment Agency reveal that in 2006 China surpassed the U.S., becoming the world’s largest CO2 emitter. [June 2007. Military Implications, Sources]

China to Invest $175 Billion in Environmental Protection over Five Years

China plans to invest $175 billion (about 1.5% of GDP) in environmental protection in the next five years, to curb severe water and air pollution, which is causing riots and health problems. The money is to be spent on such measures as control of water pollution, improving air quality in cities, and halting soil erosion. China has 20 of the world's 30 most smog-affected cities, and 2.5% of its grain is estimated to be contaminated by heavy metals. [See also China Creates 11 Independent Environmental “Watchdog” Centers in the July 2006, China's President Hu Ordered Environmental Regulations for Military Activities in April 2006, Chinese Research Priorities for the Next Fifteen Years in March 2006, and other related items in previous environmental security reports.] [September 2006. Military Implications, Sources]

China Creates 11 Independent Environmental “Watchdog” Centers

China is establishing eleven watchdog centers to monitor and investigate environmental issues free from local government interference. The centers will operate under direct control of the State Environmental Protection Administration (SEPA) and will include five centers for environmental supervision, and six centers to monitor nuclear and radiation security. The main role of this nationwide network is to enforce environmental laws and regulations independent of local governments. The 11 centers will be included in SEPA's 24-hour emergency response system. [See also China’s President Hu Ordered Environmental Regulations for Military Activities in April 2006, and Chinese Research Priorities for the Next Fifteen Years in March 2006, and other related environmental security reports] [July 2006. Military implications, Source]
China’s Energy Conditions and Policies—White Paper
China’s Information Office of the State Council issued the country’s first-ever, white paper on its energy conditions and policies. The paper indicates a shift towards a more environment-centered energy policy, prioritizing sustainable development based on S&T, and strengthened international cooperation in the field of energy. It emphasizes, “China did not, does not and will not pose any threat to the world’s energy security.” [See also China May Restructure Environmental Effort in October 2007, and other related items in previous environmental security reports.] [December 2007. Military Implications, Sources]

China’s New Ministry of Environmental Protection
China announced the creation of five new “super ministries”: Ministry of Industry and Information, Ministry of Human Resources and Social Security, Ministry of Environmental Protection, Ministry of Housing and Urban-Rural Construction, and Ministry of Transport, and a ministerial-level national energy body to oversee energy policy across all ministries. Establishing the new environment ministry is intended to help tackle China’s growing pollution problems. Environmental monitoring and law enforcement will be high priorities, said future minister of environmental protection, Zhou Shengxian, at the 2008 National Environmental Law Enforcement Conference. [March 2008. Military Implications, Source]

Environmental Courts Established in the Philippines
The Philippine Supreme Court has designated 117 trial courts as ‘environmental courts’ to hear cases involving violations of laws protecting the country’s natural resources and to speed up their resolution. [January 2008. Military Implications, Source]

Pan-African Parliament Upgrades Environmental Policy
Environmental issues were given increased emphasis during the Pan-African Parliament (PAP) Seventh Ordinary Session held in May 2007. Deputies and experts discussed the liability of Western countries relating to the continent’s environmental degradation, and called for financial compensation and technological assistance to correct the situation. The recommendations of the committee on the environment included: request the PAP strengthen legislation for protection of the environment and fighting against pollution; establish synergy among African scientific research institutions related to protecting the environment; create a network of environmental centers; create an African Environment Protection Observatory (AEPO); support regional initiatives; improve global cooperation and implementation of the Convention on Desertification; and strengthen international cooperation in scientific research and technology transfer. There were important debates about an African integration—a United States of Africa model—and the final document recommends that the African Union further consider such a union’s feasibility. It also recommends giving PAP, which started in 2004, the powers of a legislative organ. [May 2007. Military Implications, Sources]

Nigerian Government Resolves to Push Effective Environmental Enforcement
On the occasion of a visit from a UK Environment Agency team, the director-general of the Nigerian National Environmental Standards and Regulations Enforcement Agency (NESREA) stated the government’s increased commitment to ensure a cleaner and healthier environment for
Nigerians through effective enforcement of environmental laws. [February 2008. Military Implications, Source]

TECHNOLOGICAL BREAKTHROUGHS WITH ENVIRONMENTAL SECURITY IMPLICATIONS

Computer Technology and Robotics

NASA-Developed Model to Help Reduce Famine
Software Package Monitors Buildings' Power
Google to Support Development of Early Warning System in Vulnerable Regions
UNEP and Google Earth to Pinpoint Environmental Hotspots

NASA-Developed Model to Help Reduce Famine
Researchers from NASA’s Goddard Space Flight Center have developed a computer model to anticipate food shortages brought on by drought, combining data from satellite remote sensing of crop growth, and food prices. [July 2007. Military Implications, Source]

Software Package Monitors Buildings' Power
The Sun Flow Monitor System software package marketed by Live Data Systems, Inc., Branchburg NJ, monitors a building’s power sources, conventional or alternative, and its building management systems. This new software produces reports, which can aid in minimizing the structure’s environmental demand. [July 2007. Military Implications, Source]

Google to Support Development of Early Warning System in Vulnerable Regions
Google.org, the philanthropic arm of Google Inc., unveiling its charity plan over the next five to ten years, announced $25 million in grants aimed at addressing global challenges. One of the five core initiatives, ‘Predict and Prevent’ aims to empower communities to predict and prevent ecological, health or social crises before they become local, regional, or global crises, by identifying ‘hot spots’ and enabling rapid response. InSTEDD (Innovative Support to Emergencies, Diseases and Disasters) is allocated $5 million to improve early detection, preparedness, and response capabilities for global health threats and humanitarian crises. Other recipients in this category include the Global Health and Security Initiative (GHSI) and Clark University. [January 2008. Military Implications, Sources]

UNEP and Google Earth to Pinpoint Environmental Hotspots
The United Nations Environment Programme has joined together with Google Earth to highlight environmentally plagued regions of the world and to compare them to previous maps of the same regions. This technology grants millions of people around the world access to accurate, easily comprehensible, and timely visuals of rapidly changing environments. This information could help increase public awareness, as well as alerting authorities to prevent eventual security issues due to environmental changes. Additionally, dissemination of this type of information will be beneficial for capacity building, teaching, and stimulating action against environmental degradation. Presently, the “UNEP: Atlas of our Changing Environment,” offers satellite images
of 100 environmental hotspots from around the world. Google Earth images are not real-time images but have all been taken in the last three years. The continual improvement and widespread use of the “Atlas of our Changing Environment” could provide unique opportunities to help prevent environmentally related conflicts. [September 2006. Military implications, Sources]

**New Detection and Cleanup Techniques**

- Synthetic Biology to Combat Harmful 'Biofilms'
- Tiny Cantilevers Detect Contaminants
- Nanotube-based Biosensor Sensitive to Trace Amounts
- Emerging Contaminants: Most Effective Treatment Strategies
- Nanowire “Paper” Selectively Absorbs Oils in Water
- Carbon-gold Nanoparticle Sacs Trap Oil Droplets
- More New Improvements in Nanotube-based Environmental Sensors
- Chemical Agent Cleanser Developed in Canada
- Animal-Robot Team Effective for UXO Clearance
- Portable Sensor to Detect Exposure to Chemical or Nerve Agents
- Miniature Chemical Agent Sensor
- New Rapid Portable Chemical Sensor
- Model Helps Evaluate Performance of Biosensors
- Antibody-bearing Gel Can Disinfect Biologically Contaminated Areas
- Reusable Carbon Aerogel Adsorbs Organic Solvent Pollutants
- Advance in Assessing Metabolites of Diesel Exhaust component 1-nitropyrene in Humans
- Landmine Detection by Using Ground-penetrating Radar Technique
- Porous Semiconducting Aerogels Purify Water and Hydrogen
- Water Purification Techniques
- Millimeter-wave Spectroscopy Provides Environmental Sensing
- New Chemical Helps Protect Burned-over Soil from Erosion
- New Technique Promises Ultra-sensitive Biosensors
- EU Launches Mobile Carbon Tracking
- New Approach May Ease Uranium Decontamination
- New Material Strips out Radioactive Debris
- New Type Nanoscale Transistor Would Aid DNA Detectors
- Chemical Tests on Cells Rather than Animals
- FAO/IAEA Meeting Discusses Portable Disease Detection Devices
- Portable Mass Spectrometer and Gas Chromatograph
- Nanotech-based Explosives Detector
- Detector Materials for Cyanogen Halides from Chemical Weapons
- New Spectroscopy Technique Speeds Up Virus Detection
- Nanofibrils Film Improves Explosives Sensing Performance
- Bacterial Proteins Help Nanoparticle Cleanup
- New Material Has High Absorbency for Organic Solvents
- New Production Technique for Nanofiber Filters for Chemical Warfare Protection
Sugar-coated Nanotubes Stop Anthrax Inhalation
New Spectroscopy Sensor for Environmental Monitoring
Nanocantilevers for Ultra-small Sensors
Digital Magnetofluidics Improves Biochemical Analysis
Biosensors Sniff out TNT and Possibly Other Dangers
Reliable Anthrax Antibodies Developed
Bar-coded Nanowires May Yield Small, Fast Bio Detectors
New Low-cost System for Bacteria Identification
Quantum Dot Device Provides Fast Detector for DNA Sequences
Sensicore’s Lab on a Chip Water Profiler Automates Lab Functions
Deep Cooling Improves Uranium Detection
Biodetecting Wipes
Fish Provide Early Warning of Toxic Chemicals
Ultrasound Soil Cleanup Technique
New Surface Decontamination Method
Virus Detection Technique—Fast, Convenient, and Sensitive
New Technique for DNA Isolation
Sensitive Uranium Detector Using DNA
New and Improved Water Purification Method

Synthetic Biology to Combat Harmful 'Biofilms'
A team of researchers from MIT and Boston University has genetically engineered an E. coli bacteriophage to produce an enzyme that degrades the biofilm that the bacterium often produces and which interferes with the action of the phage. The researchers applied this technique to E. coli biofilms, (producing a hundred-fold phage performance improvement) but they believe that their approach can be used with many other bacteria. For example, it might be possible for a modified anthrax bacteriophage to be sprayed on an area affected by anthrax, and then wiped off. [July 2007. Military Implications, Sources]

Tiny Cantilevers Detect Contaminants
Prof. Anja Boisen and colleagues at the Department of Micro- and Nanotechnology, Technical University of Denmark, have created a detection device for contaminants, based on the change in resistance of a cantilever, 40×200 microns in size, when a contaminant molecule or bacterium binds to its antibody-coated surface and bends it. A variation works by using a similar element as the lid of a pigment-containing box, so when the strip bends, it releases a detectable color. [July 2007. Military Implications, Sources]

Nanotube-based Biosensor Sensitive to Trace Amounts
Early Warning Inc. of Troy NY has licensed from NASA’s Moffett Field Ames Research Center technology for a nanotube-based biosensor sensitive to trace amounts of specific bacteria, viruses and parasites. According to a company release, “The biosensor works when a single strand of nucleic acid comes into contact with a matching strand of nucleic acid attached to the end of an ultra-conductive nanotube. The matching strands form a double helix that generates an electrical signal, which is used to determine the presence of specific microorganisms in the sample.
Because of their tiny size, millions of nanotubes can fit on a single biosensor chip allowing identification of very low levels.” [May 2008. Military Implications, Sources]

Emerging Contaminants: Most Effective Treatment Strategies
Endocrine disruptor chemicals (EDCs) and pharmaceuticals and personal care products (PPCPs) have been discussed as emerging issues for water supply and wildlife protection for more than a decade. The American Water Works Association’s (AWWA) May 2008 Opflow carries an article describing three processes for treating these substances in public water supplies. Additionally, AWWA has added a special session to its June 8-12, 2008 annual conference in Atlanta, Georgia. Taken together, these indicate that public and water industry interest in remedial action has run ahead of legislation and regulation – leaping over at least one of the common four steps through which an issue progresses in evolving from a scientific discovery to become a societal action item. The three processes discussed in the article are: additional processing of wastewater effluents, reverse osmosis treatment of potable water, and combined ultraviolet/reverse osmosis treatment of potable water. [May 2008. Military Implications, Sources]

Nanowire “Paper” Selectively Absorbs Oils in Water
Prof. Francesco Stellacci, of MIT’s Department of Materials Science and Engineering, and colleagues have developed a paper-like membrane comprising a mat of potassium manganese oxide nanowires. The new (and inexpensive) material is completely impervious to water but can absorb up to 20 times its weight in oil or other hydrophobic substances, and can be recycled indefinitely often by heating it to evaporate the oil. [June 2008. Military Implications, Source]

Carbon-gold Nanoparticle Sacs Trap Oil Droplets
Rice University’s Pulickel Ajayan, Professor of Mechanical Engineering and Materials Science, and his research team have developed carbon-gold segmented nanowires that assemble to form BB-sized sacs around droplets of oil in water. [June 2008. Military Implications, Source]

More New Improvements in Nanotube-based Environmental Sensors
In a paper published in the online edition of Angewandte Chemie, Michael Strano, Associate Professor of Chemical Engineering at MIT, and his team describe a new highly sensitive technology for detecting gases in the environment. The system consists of carbon nanotubes, whose conductivity selectively changes when a gas binds to them, coupled with a miniature gas-chromatography column etched onto a silicon chip. The column separates the different gases in the environment before they reach the nanotubes, to achieve a sensitivity of 25 parts/trillion. A further improvement adds a coating to the tubes which causes the gas molecule to detach a few milliseconds after attaching, allowing the movement of the triggering component to be tracked as it moves. [June 2008. Military Implications, Source]

Chemical Agent Cleanser Developed in Canada
A new non-toxic method for rapidly and safely destroying toxic agents, such as chemical weapons and pesticides, has been developed by researchers from Queen’s University, Canada.
The alcohol-based system is non-corrosive, acts within minutes, and proved to be more than 99% effective in eliminating organophosphorus agents, such as Tabun, Soman and VX. It might represent a safe and environmentally friendly option for destroying stockpiles of chemical weapons, environmental spill cleanup, and rapid response to possible terrorist attacks using chemical weapons agents. It is safe in most conditions and has no special storage requirements. [April 2008. Military Implications, Sources]

Animal-Robot Team Effective for UXO Clearance
Animal-robot teams can be a safe and efficient alternative for post-conflict area scanning and clean-up. A remotely controlled robot leading a dwarf mongoose (Helogale parvula) trained to sniff out explosives is an approach demonstrated by Thrishantha Nanayakkara and colleagues at the University of Moratuwa in Sri Lanka. The group APOPO in Tanzania has been training Gambian giant pouched rats for similar manually-led operations, but the robot guidance eliminates the human risk factor. The two animals mentioned are more easily trained and perform better than dogs. [April 2008. Military Implications, Sources]

Portable Sensor to Detect Exposure to Chemical or Nerve Agents
The U.S. Pacific Northwest National Laboratory is developing a portable sensor able to identify exposure to chemical or nerve agents by testing blood or saliva samples. The device will be based on higher sensitivity test strips. Its development is funded by the National Institutes of Health and the project is estimated to take five years. [August 2007. Military Implications, Source]

Miniature Chemical Agent Sensor
Gas chromatography and mass spectrometry devices for detection of various dangerous gases are being further reduced in size, while their sensitivity and rapidity of reaction is increasing. The prototype of a new tiny device produced results in about four seconds from minimal gas amounts and operates on limited amounts of power. The sensor, developed by researchers from MIT, Cambridge University, University of Texas at Dallas, Clean Earth Technology and Raytheon, is expected to be completed in the next two years. [January 2008. Military Implications, Sources]

New Rapid Portable Chemical Sensor
Guardion-7, a 28-pound, briefcase-sized unit is a portable chemical sensor that can identify nerve agents, explosives and other substances within five minutes, with high accuracy, even in extreme climates, apparently without false-positive readings found in current sensors. It was developed by Brigham Young University scientist Milton Lee and has been successfully tested at the Dugway Proving Ground in Utah. The U.S. Defense Threat Reduction Agency certified its accuracy in February. Research continues to make the device even smaller and lighter. [March 2008. Military Implication, Source]

Model Helps Evaluate Performance of Biosensors
A new modeling technique allows the study of miniature biosensors used to identify pathogens, DNA or other substances. The technique, developed by scientists of the School of Electrical and
Computer Engineering at Purdue University, comprises a new conceptual framework and corresponding computational model to relate the shape of a sensor to its performance and explain why certain designs perform better than others. [January 2008. Military Implications, Sources]

**Antibody-bearing Gel Can Disinfect Biologically Contaminated Areas**
The Ectoplasm Project is developing an environmental cleanup material consisting of a polymer solution that contains antibodies to a biological agent, like anthrax. It is being developed by Anadis, of Melbourne, Australia, with funding from the Research Support for Counter Terrorism (RSCT) Programme. The antibody–based gel will allow decontamination teams to spray a possibly contaminated area with the substance, for biohazard detection, containment, and decontamination. The gel layer can be stripped off surfaces without damaging them, and discarded using safety precautions. The substance is expected to be ready for use in field operations worldwide within two years. [August 2007. Military Implications, Sources]

**Reusable Carbon Aerogel Adsorbs Organic Solvent Pollutants**
A monolithic carbon aerogel that will adsorb organic solvent pollutants such as benzene, toluene and xylene, and that can be easily regenerated and used repeatedly has been produced by David Fairén Jiménez and other researchers at the Univ. of Granada in Spain. [March 2008. Military Implications, Source]

**Advance in Assessing Metabolites of Diesel Exhaust component 1-nitropyrene in Humans**
Researchers at Kanazawa University and the University of Washington reported developing a method for measuring metabolites of 1-nitropyrene (1-NT) in human urine. 1-NT is abundant in diesel exhaust particulates and a significant mutagenic agent. This appears to be a breakthrough in the quest for ways to evaluate human health effects of diesel engine emission inhalation. [August 2007. Military Implications, Sources]

**Landmine Detection by Using Ground-penetrating Radar Technique**
A wide-band earth-penetrating radar offering promise of improved capability for landmine detection was developed by A. G. Yarovoy, P. van Genderen, and colleagues at the International Research Centre for Telecommunications-transmission and Radar of the Delft University of Technology, the Netherlands. [August 2007. Military Implications, Source]

**Porous Semiconducting Aerogels Purify Water and Hydrogen**
Scientists of the Argonne National Laboratory, together with colleagues at Northwestern and Michigan State Universities, have developed chalcogenide-based porous semiconducting aerogels which efficiently (99.99%) remove contaminants like heavy metals from water and also filter out catalyst-poisoning impurities from hydrogen intended for use in fuel cells. [August 2007. Military Implications, Source]

**Water Purification Techniques**
Researchers at the University of Nottingham have developed a technique that uses bacteria to consume contaminants that build up on the membranes used in some water purification systems.
This allows the filters to be cleaned within the closed system, without removing the membranes. In another advance, researchers at the University of South Australia have developed a low cost, efficient technique for removing organic material from water. It involves the use of silica particles coated with a nanometer-thin layer of active material based on a hydrocarbon with a silicon-containing anchor. The coated particles are stirred in the contaminated water for up to an hour and the powder is then filtered out. [February 2008. Military Implications, Sources]

**Millimeter-wave Spectroscopy Provides Environmental Sensing**

Scientists from the Argonne National Laboratory developed a new technology, passive millimeter-wave spectroscopy (PmmWS), which can detect specific molecules in concentrations as low as 100-1000 ppm at ranges of up to a few kilometers. The new system improves on earlier ones by being less susceptible to interference from clouds and other atmospheric phenomena, having a much longer range, and being less expensive. [September 2007. Military Implications, Source]

**New Chemical Helps Protect Burned-over Soil from Erosion**

ENCAP of Green Bay WI, a lawn care small business, introduced a new product, PAM-12, that claimed to be more effective and less costly in treating flame- and smoke-damaged soil than previous approaches so that it becomes more absorbent and less susceptible to erosion. It does this by causing the soil to form into tiny clumps around which water will flow instead of running off, aiding in the process of restoring the natural environment for vegetation re-growth. [September 2007. Military Implications, Sources]

**New Technique Promises Ultra-sensitive Biosensors**

Scientists at MIT, led by Ned Thomas and Patrick Doyle, have developed a technique for producing millions of bar-coded 3D latticework microparticles in which DNA or other biotags can be attached. According to an announcement, “With conventional solid microarrays and particles, biotags only adorn the probe's surface. In contrast, biotags can attach inside the latticework particles, increasing the number of target molecules that bind to a particle, and therefore producing a more intense fluorescent signal”. The developers believe this technique may increase the biosensing device’s sensitivity by a factor of 10,000. Commercialization of this diagnostic tool is expected within two years. [December 2007. Military Implications, Source]

**EU Launches Mobile Carbon Tracking**

The mobGAS program is a personal mobile phone application that enables users to learn the amount of greenhouse gases produced by their daily activities. The software is available in 21 languages and is free to download to a mobile phone. Users can input daily activities and calculate the daily, weekly, and yearly emissions via a secure website. The system compares the user’s emissions with national and world averages. The system was developed by the Joint Research Center of the European Commission to help raise public awareness and motivation to reduce GHG emissions. [December 2007. Military Implications, Source]
New Approach May Ease Uranium Decontamination

A new technique may lead to methods for removing dissolved uranium (e.g., from depleted uranium munitions) from liquids, such as groundwater. The method uses large organic molecules called macrocycles that essentially envelop a uranyl ion (\(\text{UO}_2^{2+}\)), leaving one of its oxygen atoms exposed, showing that the normally strong bond between the uranium and oxygen has been weakened. The scientists, Polly Arnold and Jason Love of the University of Edinburgh, believe “that the uranyl ion's bonds can be loosened is a first step towards finding substances that can transform dissolved uranyl into an insoluble compound.” The macrocycle is destroyed by water, so further work will be necessary to produce a practical decontamination technique. [January 2008. Military Implications, Sources]

New Material Strips out Radioactive Debris

Scientists at the U.S. Department of Energy’s Argonne National Laboratory and Northwestern University developed a layered sulfide compound, which very efficiently strips out radioactive strontium-90 from nuclear waste. They are now experimenting with the compound’s ability to isolate such other common radioactive elements as cesium and uranium. [March 2008. Military Implications, Source]

New Type Nanoscale Transistor Would Aid DNA Detectors

A mathematical simulation developed by Samuel Afuwape of National University, in San Diego, helps to design a new type of nanoscale transistor for a portable DNA detector for testing contaminated sites. The new nanoscale ion-selective field-effect transistor (ISFET) could be integrated into a biosensor containing thousands of DNA sequences that would bind with DNA sequences in a sample, producing changes in conductivity detectable by the ISFET. The miniature DNA detector would have broad application, including bioweapons detection. [March 2008. Military Implications, Source]

Chemical Tests on Cells Rather than Animals

The U.S. Environmental Protection Agency, the NIH Chemical Genomics Center, and the National Institute of Environmental Health Sciences have announced collaboration to change how chemicals are tested for risks they pose to humans. The agencies will research and implement a new approach that will move away from traditional animal testing and toward tests that use cells. The approach is explained in the National Research Council’s 2007 report Toxicity Testing in the 21st Century: A Vision and a Strategy. [February 2008. Military Implications, Sources]

FAO/IAEA Meeting Discusses Portable Disease Detection Devices

A five-day meeting in Verona, Italy discussed new mobile rapid disease detection technology that experts say could revolutionize the fight against bird flu and many other livestock disorders. One of the topics at the conference, sponsored by the Joint FAO/IAEA Programme, a Vienna-based partnership between FAO and the International Atomic Energy Agency, was a $1,000 mobile test system and reader the size of a small portable television. Further work is in progress to reduce it to what researchers call a "laboratory in a pen". [March 2007. Military Implications, Source]
Portable Mass Spectrometer and Gas Chromatograph
Researchers at Brigham Young University in Utah have developed a portable mass spectrometer and gas chromatograph for detecting biological and chemical agents. This easy to use and portable instrument can analyze a sample and—based on an internal library of known chemicals and biological agents—identify the material and the level of danger. The researchers intend to create a palm-sized version of the device. [March 2007. Military Implications, Source]

Nanotech-based Explosives Detector
Prof. Li Guang-tao of the Key Laboratory of Organic Optoelectronics & Molecular Engineering of the Ministry of Education at Tsinghua University, Beijing, and his group have developed nanocomposite silica films doped with porphyrins (nitrogen-containing macrocyclic molecules) which produce a very fast fluorescence response to trace vapors of explosives such as TNT, DNT and NB (nitrobenzene). These films can be used as the basis for small, cheap, and fast environmental detectors. [December 2006, Military Implications; Source]

Detector Materials for Cyanogen Halides from Chemical Weapons
Researchers at the Dept. of Chemistry at MIT, led by Samuel W. Thomas III, have developed new phosphorescent detecting compounds for cyanogen halides, used in chemical weapons. The new materials have greatly improved sensitivity to trace amounts of the toxins in the environment. [December 2006, Military Implications, Source]

New Spectroscopy Technique Speeds Up Virus Detection
A nanotech-based diagnostic test that can detect viruses as diverse as influenza, HIV, and respiratory syncytial virus in a minute or less was developed by a veterinary research team at the University of Georgia. The technique referred to as surface enhanced Raman spectroscopy (SERS) measures the Raman frequency shift of a near-infrared laser as it scatters off viral DNA or RNA. The test has the advantage of detecting the viral DNA or RNA itself rather than the indirectly produced antibodies that are the basis of other viral testing. This provides a much more rapid and reliable evaluation of the threat. The basic method was well known but the signals produced were unusably weak. The breakthrough here was placing silver nanorods at an 86° angle on the specimen slides, an addition that enormously increased the strength of the returns. [November 2006. Military Implications, Source]

Nanofibrils Film Improves Explosives Sensing Performance
A team of scientists from the University of Illinois and the Chinese Academy of Sciences developed a new fluorescent film, made from nanofibrils, which offers greatly improved performance in the detection of such explosive vapors as TNT. These sensors indicate the presence of explosives by losing their glow. They can be recycled repeatedly and also resist deterioration from exposure to sunlight. [June 2007. Military Implications, Source]
Bacterial Proteins Help Nanoparticle Cleanup
A new discovery indicated that bacteria could excrete proteins causing metal nanoparticles to aggregate, making them easier to remove from the environment. Apparently the bacteria produce the proteins to protect themselves from potentially toxic nanoparticles. The team of researchers from the Lawrence Livermore National Laboratory, UC Berkeley, and the Lawrence Berkeley National Laboratory found the bacteria at the abandoned Piquette Mine, in southwestern Wisconsin. Peter Weber from the LLNL notes that the discovery indicates that cysteine or cysteine-rich polypeptides or proteins could potentially be used for nanoparticle clean up. “With the boom in nanoscience, people are naturally asking questions about the potential environmental impacts. Here, we see that naturally produced nanoparticles can be naturally controlled,” he commented. [June 2007. Military Implications, Source]

New Material Has High Absorbency for Organic Solvents
Researchers at Kyushu University in Fukuoka have developed a new material, which can absorb large amounts of organic solvents such as chloroform. The material can absorb 300-480 times its weight of various agents. [June 2007. Military Implications, Source]

New Production Technique for Nanofiber Filters for Chemical Warfare Protection
A new 3D honeycomb structure of polymer nanofibers, which, when incorporated into protective gear, would be much more efficient in adsorbing and possibly destroying dangerous chemical warfare agents in the environment was developed by scientists led by Dr. Seshadri Ramkumar, Asst. Prof. at the Institute of Environmental and Human Health at Texas Technology University. [October 2006. Military Implications, Source]

Sugar-coated Nanotubes Stop Anthrax Inhalation
Clemson University chemist Ya-Ping Sun and his team have developed a technique that uses sugarcoated carbon nanotubes to render weaponized anthrax harmless. Finely divided anthrax spores in the environment bind to the sugar coating, forming clusters too large to be inhaled, rendering the weapon useless. [See also Sugar-Coated Gold Nanoparticles Detect Toxins in April 2006 environmental security report] [October 2006. Military Implications, Source]

New Spectroscopy Sensor for Environmental Monitoring
University of Wyoming researchers have developed and patented a sensor that can be used with surface plasmon resonance (SPR) spectroscopy to produce a low-cost system for rapid detection of biological signatures, explosives, and other volatile chemical targets in the environment. The sensor element comprises a specially designed surface optically coupled to an SPR spectrometer. Molecules such as antibodies are held close to the SPR surface, with no intervening liquid/hydrogel layer, maximizing sensitivity. [September 2006. Military Implications, Source]

Nanocantilevers for Ultra-small Sensors
Researchers at Purdue University are investigating the use of nanocantilevers in designing a new class of ultra-small sensors for quick detection of viruses, bacteria and other contaminants in air and fluids by coating the cantilevers with proteins, including antibodies that attract the
contaminants. Nanocantilevers vibrate at different frequencies when contaminants stick to them, revealing the presence of dangerous substances. The work is funded by the National Institutes of Health. [September 2006. Military Implications, Source]

**Digital Magnetofluidics Improves Biochemical Analysis**
A technique for more rapid, more accurate, and less costly analysis of biochemical fluids, such as is needed in biological warfare surveillance, was developed by the Department of Bioengineering of the University of Arizona in cooperation with other scientists. Based on magnetic forces, this form of "lab on a chip" minimizes contamination of the sample by the substrate, and saves both time and expensive chemicals. [August 2006. Military Implications, Sources]

**Biosensors Sniff out TNT and Possibly Other Dangers**
Temple University School of Medicine Fels Institute researcher Prof. Danny Dhanasekaran and colleagues have developed a new biosensor that uses a yeast strain genetically engineered with mammalian (rat) olfactory signaling machinery, linked to the expression of green fluorescent protein, to detect a chemical signature of TNT. The technique should be extendable to spot other chemical agents, such as sarin.
Biosensor 2200R, developed by Mine Safety Appliances Inc. of Pittsburgh, is a new biosensor able to determine the presence of a suspicious biological agent such as anthrax or ricin. The response time is less than 5 minutes (compared to about 45 minutes for the devices presently in use) and the unit has a very high accuracy, with only a one in a million chance of producing a false reading. [May 2007. Military Implications, Source]

**Reliable Anthrax Antibodies Developed**
Swiss scientists have developed reliable anthrax-specific antibodies. This is an important achievement, since the similarity of the anthrax spore surface to that of spores of other bacteria, which commonly occur in humans, has previously prevented development of an antibody that would be reliably anthrax-specific for identification. [August 2006. Military Implications, Sources]

**Bar-coded Nanowires May Yield Small, Fast Bio Detectors**
A "nanowire bar-code" system developed by researchers at Lawrence Livermore National Laboratory in cooperation with several other institutions may facilitate creating portable sensors capable of identifying multiple airborne pathogens within minutes. The technique consists of coating a nanowire with a distinctive pattern of gold and silver stripes—analogous to a barcode—and then with an antibody for the target threat. The applications of such a system range from detection of biowarfare agents to use during an outbreak of an infectious disease. [August 2006. Military Implications, Sources]

**New Low-cost System for Bacteria Identification**
Researchers at Purdue University's Bindley Science Center have developed a new low-cost high-speed system that analyzes scattered laser light to quickly identify bacteria. The technique uses
computer analysis of 120 factors in laser light scattered by bacterial colonies growing in a petri dish, costs a tenth as much as conventional methods, and can be completed in five minutes after the culture has grown. [August 2006. Military Implications, Sources]

**Quantum Dot Device Provides Fast Detector for DNA Sequences**
Researchers at Quantum Logic Devices, of Austin TX, have constructed a DNA sequence detector that can detect a piece of DNA in less than 30 minutes, compared to 24 hours for a fluorescence technique. [August 2006. Military Implications, Sources]

**Sensicore’s Lab on a Chip Water Profiler Automates Lab Functions**
This system applies chip technologies in a WaterPOINT device that dramatically shrinks the space and time required to perform sixteen standard water quality and treatment tests. Memory and software permit rapid comparisons and mapping of results for entire systems. The 0.4-millimeter pH electrode illustrates the degree of miniaturization achieved. Several wet chemistry procedures are reduced from hours to minutes in duration without the need for reagents. Additional testing capabilities are in development for promised availability in the near future. [August 2006. Military Implications, Sources]

**Deep Cooling Improves Uranium Detection**
Zheming Wang, at the Department of Energy's Pacific Northwest National Laboratory in Richland, Wash., has applied cryogenic fluorescence spectroscopy to detect uranium in contaminated soil at a former nuclear fuel manufacturing site. Use of an ultraviolet laser on the sample cooled to –267° C produced fluorescence intensity of more than five times that at room temperature, and brought out additional spectral features enabling different forms of uranium, including uranium carbonate, to be distinguished. [September 2006. Military Implications, Source]

**Biodetecting Wipes**
Scientists at Cornell University have started development of an inexpensive and easy-to-use biodegradable absorbent wipe containing polymer nanofibers attached to antibodies for biohazards and chemicals. By changing color, or through another effect, the wipes signal when the antibodies bond to their targets. The 100 nm fibers provide very large surface areas for sensing, and increased absorbency compared to conventional fibers. [September 2006. Military Implications, Source]

**Fish Provide Early Warning of Toxic Chemicals**
Bluegills, a small, hardy fish species, are highly sensitive to chemical disturbances in their environment, and react to toxins by convulsively flexing their gills to expel contaminating material. They can be used to monitor the chemical purity of a water supply by keeping them in a continuously re-supplied tank equipped with sensors to watch for changes in their breathing, heartbeat, and swimming patterns. The fish have successfully detected 30 alien chemicals, and have the advantage of requiring no "programming" for specific hazards. Their sensitivity was demonstrated on one occasion when they detected a diesel spill two hours before other sensors.
The fish have been incorporated into an operational system by Intelligent Automation Corp. of Poway, CA. [September 2006. Military Implications, Source]

Ultrasound Soil Cleanup Technique
Researchers at CSIRO Industrial Physics near Sydney, Australia have shown that high-intensity ultrasound can destroy toxic or carcinogenic persistent organic pollutants (POPs) that commonly contaminate land. According to New Scientist, "Cleaning them up is difficult. Incineration can produce toxic breakdown products, while chemical treatment methods can require huge amounts of energy or involve substances almost as toxic as those being cleaned up – risking dangerous leakages." The new technique, which avoids those problems, mixes the soil with water and then passes it through a chamber where the ultrasound produces localized temperatures of 4000° C and pressures of 1000 atmospheres, destroying up to 97% of the contaminants in a few minutes. [October 2006. Military Implications, Source]

New Surface Decontamination Method
Bradley D. Veatch of Westminster, CO and associates have filed a patent application for a novel means of removing contamination, including radioactive material, from surfaces. An abrasive foam pad soaked in a mix of latex gel and conductive iodine solution is rubbed over the contaminated area, loosening any surface material and applying a layer of latex, while a high current is passed through it. An electrolytic reaction transfers the contaminant from the surface into the latex gel, and also polymerizes the gel, producing a strong rubbery skin, which can be peeled off and safely discarded. [January 2007. Military Implications, Sources]

Virus Detection Technique—Fast, Convenient, and Sensitive
Aurel Ymeti and associated researchers at the Univ. of Twente, Enschede, the Netherlands, and elsewhere, have developed an improved new technique for virus detection and identification. As is the case with a number of other methods, it depends on the adhesion of the virus to an antibody-coated surface, but here the adhesion is detected optically, greatly improving the device's characteristics. A monochromatic laser beam is sent down a path which branches into two parallel channels and then rejoins. One of the channels is coated with the antibody; the beam in that channel undergoes a phase shift if the sample has attached to the antibody. When the beams from the channels are recombined, the phase shift produces a pattern of interference fringes if the virus was present. This detector is able to detect the herpes virus at just 850 particles per milliliter under physiological conditions (e.g. in human serum). [January 2007. Military Implications, Source]

New Technique for DNA Isolation
TNO, in Delft, Netherlands, has developed a new tool, SamPrep, for the rapid automatic pre-treatment of biological material to separate out pure DNA for further analysis. The new automated system can produce results from a sample in 20 minutes instead of the hours required for manual manipulation. [January 2007. Military Implications, Source]

Sensitive Uranium Detector Using DNA
Researchers at the University of Illinois and elsewhere, led by chemistry Professor Yi Lu, have developed a uranium sensor which they say "combines the high metal ion selectivity of catalytic
DNA with the high sensitivity of fluorescence detection [and] provides a fast, on-site test for assessing uranium contamination in the environment and the effectiveness of remediation strategies”. The sensor has a sensitivity of 11 parts per trillion. [February 2007. Military Implications, Sources]

New and Improved Water Purification Method
Delft University of Technology (Netherlands), with Merle de Kreuk as principal researcher, and the DHV engineering consultancy, has developed a compact and environmentally friendly water purification method, in which aerobic bacteria form granules that sink quickly. In this new aerobic granular sludge technology (Nereda™), aerobic bacterial granules are formed in the water that is to be purified. These granules not only sink quickly but their use also has the advantage that only one vessel is needed for the process. The new technique requires 25% of the space and 70% of the energy needed for earlier methods. [July 2006. Military Implications, Source]

Space Technology for Environmental Security

Space Technology for Environmental Security
The 2007 ESA Envisat Symposium discussed how ESA (European Space Agency) satellites could improve understanding of the carbon cycle and thus advance climate change forecasting, improve decisionmaking, and also improve monitoring of international treaties aimed at reducing greenhouse gas emissions, such as the Kyoto Protocol. Special sessions were dedicated to the Global Monitoring for Environment and Security (GMES) program, and use of Earth observation satellites in support of international environmental conventions. Prior to the Symposium a high-level conference was held: “The Way to the European Earth Observation System GMES—Munich Roadmap” regarding the first GMES services, the Commission’s proposal for GMES long-term sustainability, and the proposal for adoption by the Council and implementation of the first generation of GMES-dedicated satellites. GMES is also a key part of the new European Space Policy adopted by the European Commission, to be presented for discussion and endorsement to the Space Council on 22 May 2007. [See also Space Technology for Improving Planetary Knowledge and Security, Space Technology to Help Enforce Environmental Regulations in November and Climate Change--Improved Satellite Climate Change Monitoring and other related items.] [April 2007. Military Implications, Sources]

Space-Based Services for Improving Emergency Response
The Health Early Warning System will improve warning and emergency response in case of natural disasters and pandemics by using satellite communication. HEWS consists of a communication network via satellite to survey and monitor risk indicators. It is connecting end-user relieve agencies with command centers, provides wide, real-time perspective of the events and knowledge related to the threat, and helps with logistical support, thus improving the emergency effort efficiency. HEWS is an open platform, widely implementable. Another European initiative, Eurisy programme dedicated to Local and Regional Authorities, aims to help end-user communities understand how space technology-based tools can help them in some complex activities such as monitoring environment matters, handling natural disaster, and e-
Government. The Conference “Future Challenges for Local and Regional Authorities: How can Space Technology help?” held May 29-30 in Barcelona, is the first event of Eurisy’s 3-year programme. The China National Space Administration joined on May 24, 2007, the International Charter “Space and Major Disasters,” an international network of international, private and government space agencies that aims to provide satellite data free of charge in emergency situations to those affected by disasters anywhere in the world. At the Pan African Parliament’s (PAP) Seventh Ordinary Session held in May 2007, delegates recommended increased international cooperation in scientific and technological research, including the use of space tools to help decisionmaking related to fight against desertification and climate change. [May 2007. Military Implications, Source]

New UN Office Using Space Technology to Assist Mitigation of Disasters
A new UN Outer Space Affairs office (UNOOSA) has opened in Bonn, Germany, as part of a future network dedicated to carrying out the UN Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER). Providing universal access to space-based information to all countries and relevant organizations, UN-SPIDER covers all stages of disaster, including risk reduction. The program will improve disaster management and help developing countries strengthen their institutional capacities. UN-SPIDER offices are also scheduled to open in Beijing and Geneva. [See also Space Technology for Improving Planetary Knowledge and Security in April 2006, and other related items in previous environmental security reports.] [November 2007. Military Implications, Source]

Technologies that Could Trigger New Forms of Arms Race

Modern Warfare Increasingly Harmful to the Environment
Future Proliferation of Autonomous Ground and Air Robot Weapons
Accelerating Synthetic Biology Applications Need Better Monitoring and Regulation
Futuristic Nanotech and Synthetic Bioweapons Regulation

Modern Warfare Increasingly Harmful to the Environment
War and the environment, an article published by Worldwatch Institute, shows that modern warfare tactics have an increasingly devastating impact on the ecosystems. By thoroughly analyzing the ecological effect of the American war in Vietnam, the Rwandan and Congolese civil wars, and the current war in Iraq, the article illustrates the long-term damage caused by modern “ecocide.” [See also Addressing Post-Conflict Environmental Security Issues in August 2006, and other similar items in previous environmental security reports.] [December 2007. Military Implications, Sources]

Future Proliferation of Autonomous Ground and Air Robot Weapons
Although today's robotic weapon systems include humans in decisionmaking, future autonomous systems may be developed by major military powers to act without human intervention. This technology could be relatively easy to build and at relatively low costs, making proliferation possible. One robotics expert has called on national governments and the international
community to assess these risks and seek controls before they become more commonly available. [February 2008. Military implications, Sources]

Accelerating Synthetic Biology Applications Need Better Monitoring and Regulation

Recently, there were some significant synthetic biology advances, such as the Genome transplant by the J. Craig Venter Institute (transforming one type of bacterium into another by transplanting of donor chromosome into the host), and MIT and Boston University built viruses to combat harmful 'biofilms' (see item 5.2 above). These developments increased the discourse around security issues related to synthetic biology, thus intensifying the regulations debate. International treaties such as the Convention on Biological Diversity might need to be revised in view of the new synthetic biology field. Along the same line, the International Consortium for Polynucleotide Synthesis appeals for improved regulation and surveillance of DNA synthesis products. They propose an oversight framework to improve biosecurity in the gene-synthesis sector, to prevent ill-intentioned individuals from accessing and using such materials. [See also Futuristic Nanotech and Synthetic Bioweapons Regulation in November 2006 and ETC Report Warns of the Threat of Synthetic Biology and Calls for Global Regulations in January 2007 environmental security reports.] [July 2007. Military Implications, Sources]

Futuristic Nanotech and Synthetic Bioweapons Regulation

With the forthcoming ability to write genetic code to create new kinds of life forms from scratch, opening a vast potential for new kinds of synthetic bioweapons, a new regulatory environment should be considered. These developments, along with potentials for nanotech weapons, create unique problems of proliferation, health effects, environmental impacts, and post-conflict cleanups that are not well covered by international treaties. It seems inevitable that treaties governing such futuristic weapons – like treaties that were created for other kinds of weapons in the past – will be negotiated. The factors that make such weapons possible (such as improved computer chips, increased bandwidth, software, nano-engineering) are producing synergistic improvements at an accelerating pace. This makes their speed of development faster than might have been expected. [November 2006. Military Implications, Sources]

Promising Environmental-friendly Technologies

- All-Electric cars coming from Norway and China with More than Hundred Mile Ranges
- New “Nanohybrid” Plastic Is Stronger and More Biodegradable
- Polymer Dielectric Promises Higher Energy Storage
- Nano-based Solar Cell Material Offers Inexpensive Alternative
- New Solar Cell Design Raises Efficiency
- New Lithium-ion Battery Offers Multiple Advantages
- Improved Solar Cell Promised in a Year
- New Inter-electrode Material Yields 50% Fuel Cell Power Increase
- Formic Acid Provides New Fuel Cell Medium
- New Insight into Methane-converting Catalyst
- New Low Power Chip Suitable for Tiny Environmental Sensors
- New Material for Storing Hydrogen
New Capacitor Promises 100× Improvement over Batteries in Charge/Weight Ratio
Bacteria-Generated Electricity from Waste to Power Fuel Cell
New Sunshine Distribution System Provides Energy-free Lighting
Converting CO2 into Fuels using Sunshine
New Project for Nanowire Solar Cells
Magnetic Resonance Provides Short-range Power Source
Silicon Nanocrystals Promise More Efficient Solar Cells
Synthetic Biology to Produce Hydrocarbon-based Fuels
Nanotechnology Produces Battery/Capacitor in a Sheet of Paper
Space-based Solar Power Has Significant Environmental Security Potential
Reducing Military Footprint with Solar Energy at 30 Cents per Watt
Energy-free Glow Material
Dye-sensitized Solar Cells Offer Shorter Energy Payback Time
Nanotech Lithium-Ion Battery Material Promises 10× Capacity Increase
New Biological Discovery Should Bring More Efficient Water Treatment
NanoRadio Offers Low Impact Environmental Monitoring and Communications
New Technique Might Power Nano-based Environmental Devices
Ionic Liquids Provide Safe Alternative to Mercury
Clean Green Hydrogen-Making Process
New Generator Produces Hydrogen from Aluminum and Water
World Record solar cell efficiency achieved
Enzyme-based Biofuel Cells Using Nanotechnology
Photonic Crystal Provides 50% Cost Reduction
Refrigerator Temperature Sensor Mod Saves Energy
Printing Fuel Cells
Biologically Based Dyes Dramatically Lower Solar Cell Costs
New Solar Cell/Battery Combination Saves Size and Weight
Advanced Membrane Technology for Water Treatment to Counter Water Scarcity
New Device to Suck CO2 from the Air
Smog-Eating Materials

All-Electric cars coming from Norway and China with More than Hundred Mile Ranges
An all-electric car is expected to be available for purchase next year (2009) in the U.S.; it is called “Think City” from Think North America, a Norwegian-California joint venture startup. The car runs on sodium or lithium batteries and can travel up to 110 miles on one charge. In 3-5 years BYD Auto Co. of Shenzhen, China, plans to market its all-electric car in the U.S. with a 185-mile range on a single full charge. [April 2008. Military Implications, Sources]

New “Nanohybrid” Plastic Is Stronger and More Biodegradable
A new biodegradable ‘nanohybrid’ plastic that can be engineered to decompose much faster than existing plastics was developed by researchers of Cornell University. The plastic is a modified form of polyhydroxybutyrate (PHB), a promising biodegradable plastic produced from bacteria. The use of PHB has been limited because of its brittleness and unpredictable biodegradation rates. The new material, which is also stronger than the original, contains nanoparticles of clay; its biodegradation rate depends on the amount of clay added. In one case it had almost
completely decomposed after seven weeks, while the unmodified version was barely affected. However, bioplastics definition and recycling procedures are yet to be agreed upon and the need for international standards and regulations is increasing as the research and applications expand. [December 2007. Military Implications, Source]

**Polymer Dielectric Promises Higher Energy Storage**
North Carolina State Univ. physicist Vivek Ranjan and colleagues have discovered that combining the polymer polyvinylidene fluoride (PVDF) with chlorotrifluoroethylene (CTFE)—another polymer—produces a dielectric material that may allow capacitors to store up to seven times more energy than those currently in use. [July 2007. Military Implications, Source]

**Nano-based Solar Cell Material Offers Inexpensive Alternative**
Scientists at New Jersey Institute of Technology's Department of Chemistry and Environmental Sciences have developed an inexpensive polymer solar cell material that can be painted or printed on flexible plastic sheets. The material uses a carbon nanotube complex combined with buckyball fullerenes, and offers a cost advantage over purified silicon. [See also Biologically Based Dyes Dramatically Lower Solar Cell Costs in April 2007 and Photonic Crystal Provides 50% Cost Reduction in March 2007 environmental security reports.] [July 2007. Military Implications, Source]

**New Solar Cell Design Raises Efficiency**
Prof. Ely Sachs and colleagues at MIT have developed a solar cell design that offers a 27% increase in efficiency over existing devices. They predict that the cells’ present cost of $1.85/watt can be reduced to about $1.35/watt. The new multi-crystalline silicon cells embody several improvements, which increase the amount of light reaching the active elements in the cells. Commercialization of the development is being done by 1366 Technologies. [See also New Project for Nanowire Solar Cells in January 2008, Reducing Military Footprint with Solar Energy at 30 Cents per Watt in November 2007, and other similar items in previous environmental security reports.] [April 2008. Military Implications, Sources]

**New Lithium-ion Battery Offers Multiple Advantages**
A123 Systems of Watertown MA developed a new lithium-ion battery design with significant advantages for demanding mobile applications, such as electric vehicles and portable electronic devices. The new units feature greatly increased safety (not bursting and igniting, when overheated or damaged), longer life, and greater energy capacity, stemming from an innovative electrode material that contains nanoparticles of lithium iron phosphate modified with trace metals. [May 2008. Military Implications, Sources]

**Improved Solar Cell Promised in a Year**
SUNRGI Company announced the development of a solar cell technology which they say will deliver power at 7¢/kWh, around the price of coal-fired energy. Their panels use lenses to concentrate sunlight, and a proprietary cooling system to prevent consequent cell damage from
heating. Start of production is scheduled for mid-2009. IBM has also released details on a similar technique. [Mau 2008. Military Implications, Sources]

**New Inter-electrode Material Yields 50% Fuel Cell Power Increase**

MIT Professor Paula T. Hammond and her team produced a new thin film material for the membrane separating the electrodes in direct methanol fuel cells. The current material is not impervious to methanol leakage across the boundary. Applying the new film produced a 50% gain in power output from the cell. Drexel University chemical engineering professor Yossef Elabd had earlier investigated the leakage mechanism in the present membranes, and produced several other alternatives. [May 2008. Military Implications, Sources]

**Formic Acid Provides New Fuel Cell Medium**

Matthias Beller and colleagues at the Leibniz Institute for Catalysis, in Rostock, Germany have developed a technique to convert formic acid into hydrogen at low temperatures (26°C to 40°C). The new process is suitable for low-power fuel cell applications, like mobile electronic devices, rather than for vehicle usage. It does not require a high-temperature steam reforming unit, as methanol does (instead, it is converted to hydrogen by a ruthenium-based catalyst) and its power/weight ratio is only one-third that of methanol. [May 2008. Military Implications, Source]

**New Insight into Methane-converting Catalyst**

New work reported by the International Consortium for Clean Energy, a collaboration among DOE's Pacific Northwest National Laboratory, the Chinese Academy of Sciences' Dalian Institute of Chemical Physics, and China's Institute of Coal Chemistry, sheds light on the optimum structure for a catalytic material, molybdenum oxide on a zeolite substrate, which can turn methane into benzene. [May 2008. Military Implications, Source]

**New Low Power Chip Suitable for Tiny Environmental Sensors**

The new Phoenix Processor, developed by Scott Hanson and Mingoo Seok at the Univ. of Michigan’s Dept. of Electrical Engineering and Computer Science, uses just 30 picowatts in sleep mode and only 90 nanowatts in active mode. The chip measures 1 mm², the same as its battery, which can be so small because of the low power requirement. The small size means that the sensors using the chip could be scattered around in an environment-sensing network. The chip contains a built-in low power timer that causes it to run on a 0.1 sec/10 min awake cycle, suitable for sensing applications. [June 2008. Military Implications, Source]

**New Material for Storing Hydrogen**

Physicists Adam Phillips and Bellave Shivaram of the University of Virginia have found a new class of materials, transition metal-ethylene complexes, which may offer a much more efficient way of storing hydrogen for fuel cell applications than previous substances. An example uses titanium with an ethylene nanostructure, which their measurements indicate will hold 12% by weight of hydrogen, more than twice the target of 5.4% set by DOE to support the development of hydrogen fuel cell vehicles. [April 2008. Military Implications, Source]
New Capacitor Promises 100× Improvement over Batteries in Charge/Weight Ratio
Lockheed Martin has signed an agreement with EEStor of Cedar Park, Texas for the military applications of a new type of ultracapacitor based on barium titanate that Lockheed Martin believes will be able to hold 10 times the energy in 1/10th the weight of typical batteries. [January 2008. Military Implications, Source]

Bacteria-Generated Electricity from Waste to Power Fuel Cell
Microbial fuel cell technology, being developed by scientists from Arizona State University’s Biodesign Institute, is based on the use of bacteria to convert a variety of liquid organic waste (such as sewage or pig manure) into electricity. [January 2008. Military Implications, Source]

New Sunshine Distribution System Provides Energy-free Lighting
The Solatube system collects sunlight from a rooftop unit and distributes it to interior spaces through specially designed optical tubes, eliminating the need for external power for illumination when daylight is sufficient. [January 2008. Military Implications, Sources]

Converting CO₂ into Fuels using Sunshine
The Sunlight to Petrol (S2P) project developed by researchers at Sandia National Laboratories in New Mexico is using sunlight to convert CO₂ into fuels like methanol or gasoline. Although the innovation seems to be working, large-scale implementation could take 15-20 years to reach industrial scale. [January 2008. Military Implications, Sources]

New Project for Nanowire Solar Cells
The Department of Engineering Physics at McMaster University in Hamilton ON, Cleanfield Energy, and the Ontario Centres of Excellence (OCE) have formed a partnership for a three-year project to pursue the commercialization of nanowire technology in the production of more affordable solar cells. [January 2008. Military Implications, Source]

Magnetic Resonance Provides Short-range Power Source
Marin Soljacic of the Massachusetts Institute of Technology has developed a technique for transmitting electric power at usable efficiency over distances of a few meters, using tailored oscillating electric and magnetic fields. Dr. Zhong Lin Wang and colleagues at the Georgia Institute of Technology have succeeded in using nanotechnology to produce an electric generator that can be embedded in the human body and may have the potential, when fully developed, of producing usable amounts of power from such mechanical sources as the pulsation of the arterial system. The combination offers locally produced, locally consumed, and environmentally friendly electricity. [July 2007. Military Implications, Source]

Silicon Nanocrystals Promise More Efficient Solar Cells
Scientists at the National Renewable Energy Laboratory (NREL), in Golden CO, have shown that silicon nanocrystals can increase the efficiency of conventional solar cells from its present 20% to 40%, at much lower cost than other approaches to high efficiency cells. [See also Nano-
Synthetic Biology to Produce Hydrocarbon-based Fuels
LS9, a synthetic biology company based in San Carlos, CA, has genetically engineered various bacteria, including E. coli, to custom-produce hydrocarbons that could be processed into fuel. A pilot plant is planned for 2008, and sales of synthetic biocrudes to refineries for further processing are expected within three to five years. Another company, Amyris Biotechnologies, of Emeryville, CA, is using plant and animal genes to make microbes produce renewable hydrocarbon-based fuels. [August 2007. Military Implications, Sources]

Nanotechnology Produces Battery/Capacitor in a Sheet of Paper
Scientists from the Rensselaer Polytechnic Institute have developed a device that resembles a sheet of paper in all respects, but that can serve as a battery or capacitor. The material is formed from cellulose and carbon nanotubes, and can be soaked with any of a variety of fluids (including sweat or blood) to serve as an electrolyte. It can operate at temperatures between -100 and +300 degrees Fahrenheit and can be printed like paper. [August 2007. Military Implications, Sources]

Space-based Solar Power Has Significant Environmental Security Potential
A US National Security Space Office (NSSO) report, Space-Based Solar Power: As an Opportunity for Strategic Security, states that Space Based Solar Power (SBSP) can reduce half a trillion dollars a year in military costs by stopping energy-related wars before they start, and that SBSP can be tested in orbit within five years. SBSP has the potential to provide base load electricity on a global basis without producing greenhouse gases or nuclear waste. Geostationary satellites could convert solar energy into electromagnetic beams that are transmitted to receivers around the world that feed local electric grids. The report argues that military leadership in development and demonstration is probably necessary to speed civilian commercialization, as was the case with the Internet. One hundred and seventy academic, scientific, technical, legal, and business experts around the world participated in the study. The Executive Summary of the NSSO report states that, “…perhaps the greatest military benefit of SBSP is to lessen the chances of conflict due to energy scarcity by providing access to a strategically secure energy supply.” [October 2007. Military Implications, Sources]

Reducing Military Footprint with Solar Energy at 30 Cents per Watt
Current solar photovoltaic technology costs about $3.00 per watt. Nanosolar Inc. has announced that it will lower costs to $0.30 per watt, commercially available next month. The new production process makes the solar cell sheets 100 times thinner and 100 times faster with solar-absorbing nano-ink that can transfer sunlight into electrical power. [See also Nano-based Solar Cell Material Offers Inexpensive Alternative in July 2007 and other similar items in previous environmental security reports.] [November 2007. Military Implications, Sources]
Energy-free Glow Material
MPK Co. of Clayton, WI has developed a tritium-based material, “Litrosphere”, which produces a low-level glow for more than 12 years without energy input. Trace tritium beta decay in phosphor microsperes provides the energy source. Safety is claimed. It can cover a standard sheet of paper for about 35 cents, comes in a variety of colors, and can take the form of either paint or injection-molded plastic. Its luminous output cannot compete with conventional lighting sources, but it is highly suitable for marking objects that need to be spotted in the dark, saving energy and lowering maintenance requirements. [December 2007. Military Implications, Source]

Dye-sensitized Solar Cells Offer Shorter Energy Payback Time
It is estimated that conventional photovoltaic solar cells must be in service for around three years before they have produced as much energy as that required to manufacture them. However, the “Gräetzel” or “dye-sensitized” solar cell has now gone into large-scale production. This type of device uses a combination of titanium dioxide and an organic dye molecule, often containing ruthenium, which are immersed together in a liquid electrolyte. A Netherlands independent photovoltaic-research firm has estimated that such dye-sensitized cells installed in southern Europe would have as short an energy payback time as six months. G24 Innovations, in Cardiff, Wales, has announced that it expects to be able to make enough dye-sensitized photovoltaic cells each year to provide 30 megawatts of peak generation capacity. Other companies are also pursuing this development. [December 2007. Military Implications, Source]

Nanotech Lithium-Ion Battery Material Promises 10× Capacity Increase
Stanford University Assistant Professor Yi Cui has developed an electrode material for lithium-ion batteries (used in laptops, iPods, video cameras, and cell phones) that increases their energy storage capacity ten times above current batteries. This could help make future electric cars more attractive. The material uses silicon nanowires to hold the charge-bearing lithium ions. Silicon structures can hold more lithium than the conventional carbon, but tend to disintegrate because of size changes during recharge cycles; the nanowires do not exhibit this characteristic. [December 2007. Military Implications, Source]

New Biological Discovery Should Bring More Efficient Water Treatment
Scientists at the Environmental Biotechnology Cooperative Research Centre (EBCRC), Eveleigh NSW, Australia, have discovered a cell signaling pathways that can control bacterial slime on membranes, which will lead to more efficient desalination and water recycling plants. According to the project leader, “Membrane fouling is one of the greatest contributors to increased energy usage and cost in the desalination and water recycling processes. Reducing fouling will significantly decrease operating costs through reduced energy consumption, a reduction in chemical usage and an overall reduction in a plant’s environmental footprint”. This signaling system initiates dispersal in established fouling biofilms and prevents the formation of new biofilms. EBCRC is developing a range of biofilm control formulations that will stimulate natural bacterial dispersal events. [October 2007. Military Implications, Source]
NanoRadio Offers Low Impact Environmental Monitoring and Communications
Prof. Alex Zettl of the Univ. of California’s Berkeley Nanosciences & Nanoengineering Institute and his group have developed a nanoscale radio, in which the key circuit consists of a single carbon nanotube. This work derived from an effort to create inexpensive wireless environmental sensors. [April 2008. Military Implications, Source]

New Technique Might Power Nano-based Environmental Devices
Researchers at the Georgia Institute of Technology have developed a microfibre–nanowire hybrid structure for energy scavenging. According to the abstract, “Solar, thermal and mechanical (wind, friction, body movement) energies are common and may be scavenged from the environment”, and the Editor’s Summary describes their work as “a system that converts low-frequency vibration/friction energy into electricity using piezoelectric zinc oxide nanowires grown radially around textile fibres. By entangling two fibres and brushing their associated nanowires together, mechanical energy is converted into electricity via a coupled piezoelectric-semiconductor process. This work shows a potential method for creating fabrics which scavenge energy from light winds and body movement.” [February 2008. Military Implications, Source]

Ionic Liquids Provide Safe Alternative to Mercury
Robin Rogers of Queen's University, Belfast, UK, and his colleagues have discovered that ionic liquids (IL)—salts in liquid form—are an environmentally safe substitute for mercury in thermometers. Gary Baker, of the Oak Ridge National Laboratory in the U.S., also points out that ILs are potentially green replacements for conventional solvents in other applications. [March 2008. Military Implications, Source]

Clean Green Hydrogen-Making Process
Lanny Schmidt, Brandon Dreyer and colleagues at the University of Minnesota's Department of Chemical Engineering and Material Science have developed a new process called "flash volatilization" that can turn waste biomass into hydrogen. It uses rhodium and cerium as chemical catalysts, is supposed to be 100 times faster than existing techniques, and is scalable. It generates a hydrogen and carbon monoxide gas mixture called synthesis gas, or "syngas" which can be used to make fuels, or its hydrogen can be separated in order to power fuel cells. [December 2006, Military Implications, Source]

New Generator Produces Hydrogen from Aluminum and Water
Prof. Jerry Woodall of Purdue University and associates have developed a new technique that uses aluminum-gallium alloy pellets to generate hydrogen from water, providing a novel source for the new "green fuel". Aluminum reacts with the oxygen in water, releasing hydrogen and transforming into aluminum oxide (alumina). The key to the new process is the use of gallium, which prevents the formation of a skin over the aluminum that would stop the process—with the gallium, all the aluminum in a container can contribute to the reaction. The researchers envision that the alumina could be recycled back into aluminum by electricity derived from nuclear plants. The advantage of this indirect hydrogen fuel process is that aluminum is much more easily stored and transported than hydrogen, so there are potential gains in producing the hydrogen at the point of use in an “aluminum-fueled” engine. However, serious questions come
to mind about the environmental effects and the overall cost and energy efficiency of producing and recycling the aluminum, and transporting it and the alumina, and about driving range with a feasible load of metal. This complex “non-rechargeable battery” will require much careful end-to-end analysis in order to gain acceptance, but it is an interesting approach. [May 2007. Military Implications, Source]

World Record solar cell efficiency achieved
Spectrolab, a subsidiary of Boeing, announced the development of a new solar cell that can convert 40.7% of the sunlight into electricity. The conversion efficiency of today's conventional solar cells is between 12% and 18%. The Department of Energy claims that ‘this breakthrough may lead to systems with an installation cost of only $3 per watt, producing electricity at a cost of 8-10 cents per kilowatt/hour, making solar electricity a more cost-competitive and integral part of our nation’s energy mix.’ [January 2007. Military Implications, Sources]

Enzyme-based Biofuel Cells Using Nanotechnology
A team of Japanese scientists from Kyoto University in Japan has engineered carbon electrodes with carbon nanoparticles to develop a simple biofuel cell based on direct electron transfer-type bioelectrocatalysis. The cell uses enzymes to catalyze oxidation of D-fructose and reduction of dioxygen to generate electricity, without needing a mediator molecule. This might represent a significant development for simplifying the construction of biofuel cells. [February 2007. Military Implications, Source]

Photonic Crystal Provides 50% Cost Reduction
StarSolar, in Cambridge MA, has developed a technology which allows a solar cell to produce the same amount of electricity with much less silicon, thereby cutting the cost of the energy by up to half, according to the developing organization, a licensee of MIT. The technique uses a so-called photonic crystal to reflect the incident light in such a way that more of it reaches the silicon layer, which can therefore be thinner. [March 2007. Military Implications, Source]

Refrigerator Temperature Sensor Mod Saves Energy
The UK firm eCube Distribution Ltd., of Ilford, Essex, is marketing a device that modifies the operation of a refrigerator's temperature sensor in a way that may significantly reduce the unit's energy consumption. It consists of a wax sleeve that fits around the sensor and which has the thermal characteristics of a solid like food. An unmodified refrigerator senses the temperature of the air in the unit, rather than that of the contained food. When the door is opened, the temperature of the air rises rapidly, often triggering the cooling element to start, even though that of the food remains unchanged. The modified sensor causes cooling to be activated only when the temperature of the actual contents exceeds the preset limit. In a test in a hotel, where the doors are frequently opened and closed, the device reduced energy consumption by 30%. [March 2007. Military Implications, Source]
Printing Fuel Cells
EoPlex Technologies, in Redwood City, CA has developed a process, which allows the printing of three-dimensional structures with "ink" containing various materials, such as polymers, metals, and ceramics, layer by layer. Microreactors for chemical and drug processing, miniature fuel cells, wireless sensors, and thermal management systems are just some of the envisioned applications of this technology able to cheaply and easily create microscale devices. [October 2006. Military Implications, Source]

Biologically Based Dyes Dramatically Lower Solar Cell Costs
Massey University's Nanomaterials Research Centre in Wellington, New Zealand, has developed a range of colored dyes for use in dye-sensitized solar cells that promises to lower costs by 90% compared to silicon-based photo-electric solar cells. The dyes are related to such organic molecules as chlorophyll and hemoglobin. The cells have the added advantage of working well in low-light environments. [April 2007. Military Implications, Source]

New Solar Cell/Battery Combination Saves Size and Weight
A new family of batteries incorporating solar cells for self-charging is being developed by an international partnership of Konarka Technologies of Lowell MA, a maker of thin-film "plastic" solar cells, and the German company VARTA-Microbattery, which layered Konarka's technology onto a lithium-polymer battery. Not only are the new devices small and light, they also operate even at lower levels of illumination. [April 2007. Military Implications, Source]

Advanced Membrane Technology for Water Treatment to Counter Water Scarcity
The Advanced Membrane Technology for Water Treatment project conducted under the auspices of the Australian Commonwealth Scientific and Industrial Research Organization (CSIRO) seeks to develop advanced membrane technology for efficient, low energy processes to produce clean water from industrial and/or salt water resources, thus reducing the financial and environmental costs of addressing water scarcity problems. The research area consists of the following projects: low energy desalination membranes; membrane technology for industrial water reuse; and carbon nanotube (CNT) membranes. [May 2007. Military Implications, Source]

New Device to Suck CO2 from the Air
Towers with materials that absorb carbon dioxide (CO2) directly from the air and then release it as a pure stream of carbon dioxide for sequestration have been developed by scientists from Columbia University and Global Research Technologies, LLC. It is estimated that if these devices had openings 10 meters by 10 meters they could each extract about 1,000 tons each year; hence, one million of these units could remove 1 billion tons of CO2 from the air per year. These could be placed at the best locations for carbon sequestration, regardless of carbon source. [April 2007. Military Implications, Sources]

Smog-Eating Materials
Environment-friendly materials such as "smog-eating" products are increasingly in demand by architects and are developed not just for the façades of buildings, but also for paint, plaster, and
paving materials for roads. An EU initiative for "smart" antipollution materials has found that construction products containing titanium dioxide help to destroy air pollutants found in car exhaust and heating emissions. The new environment-friendly substances are being tested in buildings, squares and highways in Europe as well as Japan. [November 2006. Military Implications, Source]
B Preventing or Responding to Environmentally Caused Conflicts

SECURITY IMPLICATIONS OF CLIMATE CHANGE

Global Security linked to Climate Change
“Violence within and between communities and between nation states, we must accept, could possibly increase, because the precedents are all around”, warned Sir Crispin Tickell, Britain's former ambassador to the UN at the recent London conference, Climate Change: the Global Security Impact, hosted by the Royal United Services Institute. Security and climate experts assessed the impact of global warming on world security, noting again that in many cases, climate change consequences happen in already conflict-torn regions. Poverty and despair will increase as millions of people around the world are threatened by desertification, poor fresh water conditions, and rising sea levels. Unless global efforts to accommodate these people increase, the risk of conflict and terrorism grows. At the Economic Forum of Davos, there was a workshop on climate change and security, where panelists discussed the undeniable consequences of climate change on global security. [January 2007. Military Implications, Sources]

Economic and Security Implications of Climate Change
The Economics of Climate Change, an authoritative report by Sir Nicholas Stern, former chief economist with the World Bank, warns that unless rapid action is taken globally to reduce emissions and tackle climate change within a decade, the world will face deep economic recession, with annual costs of climate change consequences ranging between 5% to 20% of the global economic output (about £3.68 trillion--approx. $7 trillion US dollars). The report calls for a global framework on climate change that is flexible—considering different countries/regions' specifics. Another report, Africa—Up in Smoke 2, by a coalition of UK aid agencies and environmental groups warns that climate change might annihilate efforts to tackle poverty in Africa and emphasizes the need for human progress and development models that are climate proof and climate friendly. Africa is already 0.5°C warmer than it was 100 years ago and temperature increases over many areas of Africa might be double the global average increase, worsening drought patterns and the strain on already feeble water resources, and therefore aggravating the security situation of the conflict-torn continent. As noted by UK Foreign Secretary, Margaret Beckett, climate change is not any longer just an environmental problem, but is “a defence problem. It is a problem for those who deal with economics and development, conflict prevention, agriculture, finance, housing, transport, innovation, trade and health.” [October 2006. Military Implications, Sources]

Developing Countries Most Affected by Global Warming
Consequences of global warming are increasingly felt, mostly by developing nations. Rising sea levels force inhabitants of some South Pacific islands to relocate. The World Bank warns that development programs are jeopardized by climate change in many regions around the world and
urges the international community to integrate climate risk concerns in development strategies. [September 2006. Military Implications, Sources]

**Population and Resources Affecting the Risk of Conflict**

The *UN Population Prospects 2006 Revision* report reveals that most of the countries that top the birthrate list are those already affected by the world’s worst wars. Growing pressure of people on land and resources is likely to exacerbate conflict in those areas. At a Woodrow Wilson Center event, ‘Demography and Conflict: How Population Pressure and Youth Bulges Affect the Risk of Civil War’, Henrik Urdal, Researcher at the Centre for the Study of Civil War, International Peace Research Institute, Oslo (PRIO), discussed the results of an empirical research on the links among global demographics and the potentials for civil unrest. Concluding that certain forms of population pressure—particularly youth bulges—increase the risk for conflict, he makes several recommendations for attempting to minimize conflict, including: measures to enhance local resource management capacity; programs aimed at curbing population pressure, and more research focusing on youth bulges and political stability and conflict prevention. Another Woodrow Wilson Center event, ‘Climate-Security Connections: An Empirical Approach to Risk Assessment,’ analyzed the potential relationship between environment and conflict by integrating environment data with conflict data and using the results to improve conflict risk assessments. The outcomes show that although environmental scarcity doesn’t necessarily represent a cause of conflict, it might become an important reason in poor and war- torn societies or with other inter-group (horizontal) inequalities. Hence, it is important for preventing and mitigating escalating conflicts to map and watch different environmental anomalies that might lead to food and/or water scarcity and vice-versa and to identify conflict-prone zones that might be exposed to destabilizing environmental factors. Such a world map of areas worth watching for possible crises situations that might lead to conflict was presented. [March 2007. Military implications, Sources]

**International Conferences Put Climate Change among Top Security Issues**

Experts and politicians participating at a seminar on climate change held in Ny Alesund, Norway, called climate change the biggest security challenge since the Cold War. British climate change ambassador John Ashton said global warming should be considered a security issue on a par with terrorism, in order to increase global action to cut greenhouse gas emissions from fossil fuels.

“Already seven times more livelihoods are devastated by natural disasters than by war worldwide, at the moment, and this is going to be much worse, the way the climate is developing,” noted Jan Egeland, special adviser on conflict prevention to UN Secretary-General Ban Ki-moon, and former head of UN humanitarian affairs. He underlined again that “those most affected by climate change are the poorest since droughts and flooding will be getting worse.” The Vienna climate change talks organized by the UN Framework Convention on Climate Change this month and attended by about 1,000 politicians, experts, activists, and representatives from the media from over 150 countries give equal importance to adaptation and mitigation. [See also UN General Assembly 61st Session Pinpoints Global Warming as a Central Issue for Security in September 2006 and UK Initiates UN Security Council Debate on Climate Change and Security in April 2007 environmental security reports] [August 2007. Military Implications, Sources]
Increased Role of the Military in Environment-related Crises

Senior security policy-makers from 27 countries attended this year’s Shangri-La Dialogue in Singapore May 30–June 1, 2008 to improve military anticipation and response to natural disasters such as those of last year in Bangladesh and this year in Myanmar. Ministers from ASEAN recognized that diverging views on military involvement should be addressed. A French politician suggested that a system of sanctions should be established to “stop this scandal of having hundreds of thousands of people dying with help waiting outside and having a lecture about non-interference in domestic aff airs,” and that he will advise the French government to propose that Myanmar government be held liable before the International Criminal Court. Singapore’s Prime Minister Lee Hsien Loong made a few recommendations for addressing climate change, including establishing a ‘technology transfer board’ for helping the LDCs, and an International Food Fund to address food security. “Between countries, competition for food supplies and displacement of people across borders could deepen tensions, and provoke conflict and wars” he said. [June 2008. Military Implications, Sources]

International Security Responses to a Climate Changed World

Delivering Climate Security: International Security Responses to a Climate Changed World, by Nick Mabey, published by Britain’s Royal United Services Institute for Defence and Security Studies, outlines a framework for climate security analysis and some of its implications for security policy, practice and institutional change. Noting that international response to climate security threats has been ‘slow and inadequate’, it recommends that nations integrate climate change into their security policy to prepare for worst-case scenarios. Otherwise, says the author, climate change might have security implications of “similar magnitude to the World Wars, but which will last for centuries.” [April 2008. Military Implications, Sources]

National Security Implications of Global Climate Change Through 2030

National Security Implications of Global Climate Change Through 2030 by the National Intelligence Council, is an assessment of climate change security implication for the US in the next 20 years. It is a comprehensive assessment of the impact of climate change in different parts of the world and the possible political instabilities, mass movements of refugees, terrorism, or conflicts over water and other resources in speciﬁc countries. The next effort is a scenario exercise and the third effort will be to explore the geopolitics of climate change and how that may shift the relationships between major powers. NIC’s Global Trends out to 2025 is expected to be published in December 2008. [June 2008. Military Implications, Sources]

An Uncertain Future: Law Enforcement, National Security and Climate Change

An Uncertain Future: Law Enforcement, National Security and Climate Change is a comprehensive analysis of the security implications of climate change, including some recommendations. It warns that “traditional attempts to maintain the status quo and control insecurity” and use “military force to secure resources overseas, while attempting to create a fortress state at home” are doomed to failure. Mentioning “almost certain” future mass movement of 200 million people by 2050 due to climate change, the report calls for an international legal framework for environmental refugees’ management. Climate change has the
potential to change the geographical and political world map and in addition to being a “threat multiplier” in already vulnerable areas like the Horn of Africa and the Persian Gulf, it could also cause civil unrest in developed countries of North America and Europe. Increased research is needed to identify areas of highest vulnerability and instability and to consider climate change in foreign aid programs. Military and police will have to change from reactive to proactive strategies in order to prevent and manage security issues triggered by climate change. Unrest could range from protests against polluting companies and government inaction to new forms of ecoterrorism (although the author considers the term misleading).

Recommendations include changes in “Policing new legislation” and “important operational and strategic concerns that military planners will need to consider over the coming decades:
1 Difficulties maintaining military capability; 2 Loss of strategic defence assets; 3 Greater calls for peacetime deployments; 4 Instability in strategically important regions.” A whole chapter covers “Implications for National Security and the Military”, including “Difficulties maintaining military capability; Loss of strategic defence assets; Greater calls for peacetime deployments; and Instability in strategically important regions.” The report concludes: “The risks of climate change demand a rethink of approaches to security.”

The report is authored by Chris Abbott of Bristol University's Centre for Governance and International Affairs, published by Oxford Research Group “building bridges for global security.” [January 2008. Military Implications, Sources]

IISS’s Strategic Survey 2007 Warns of Global Security Implications of Climate Change

Strategic Survey 2007 by the International Institute for Strategic Studies (IISS) is a comprehensive analysis of the world security situation in general and by region. The “Strategy Policy Issues” chapter includes ‘Climate Change: Security Implications and Regional Impacts’ and ‘The Military Use of Space’. The report lists the effects of climate change and nuclear proliferation as being on a par with growing Islamist extremism as the biggest security threats. It warns that “Even if effective measures are adopted, there will still be unavoidable impacts on the environment, economies and human security”; and, unless the right preparedness actions are taken, global security consequences of climate change could be equal in disruption to those of nuclear war. [September 2007. Military Implications, Sources]

Security Implication of Climate Change to the EU

Climate Change and International Security. Paper from the High Representative and the European Commission to the European Council analyses the security implications of climate change in general and with specific implications to the EU, and makes some recommendations for EU policies. It reviews the main categories of threats posed by climate change to security (Conflict over resources; Economic damage and risk to coastal cities and critical infrastructure; Loss of territory and border disputes; Environmentally-induced migration; Situations of fragility and radicalization; Tension over energy supply; and Pressure on international governance) and then addresses vulnerabilities by specific regions (Africa; Middle East; South Asia; Central Asia; Latin America and the Caribbean; and The Arctic). The report concludes that “The impact of climate change on international security is not a problem of the future but already of today and one which will stay with us” and underlines that the European Security Strategy and related proposals “should take account of the security dimension of climate change.” Some specific recommendations include “Focus attention on the security risks related to climate change in the
multilateral arena; in particular within the UN Security Council, the G8 as well as the UN specialised bodies (among others by addressing a possible need to strengthen certain rules of international law, including the Law of the Sea),” capacity building from detection to adaptation, addressing migration issues, and adapting cooperation with other countries to the new realities induced by climate change. [March 2008. Military Implications, Sources]

Reports highlighting the link between environment and security

*Human Development Report 2007-08. Fighting climate change: Human solidarity in a divided world.* The 2007-08 edition of UNDP’s Human Development Report focuses on the threat of climate change. Climate change, according to the report, is the ‘defining human development challenge of the 21st Century’ and the world must take actions today to avoid catastrophic consequences. For example, by 2080 an additional 600 million people in sub-Saharan Africa could suffer from malnutrition due to climate change, and a 3–4°C increase in global temperature could result in 330 million people being permanently or temporarily displaced through flooding. Pointing to the fact that the poorest are most vulnerable and suffer the earliest and most damaging setbacks, the report warns that actions taken—or not taken—in the years ahead will have a profound bearing on the future course of human development. [November 2007. Military Implications, Sources]

*A Climate of Conflict* by the London-based International Alert conflict resolution group analyzes the possible link between climate change and conflict. The report warns that unless adequate and timely adaptation policies are implemented, more than half of the world's nations are at risk. It identifies 46 countries—home to 2.7 billion people—at high risk of armed conflict, while another 56 states—with a total population of 1.2 billion—are at risk of political instability. Fragile states have particular vulnerability; therefore, reconstruction policies should include environmental and climate change adaptability strategies, underlines Dan Smith, Secretary General of International Alert. [November 2007. Military Implications, Sources]

*The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change,* by the Center for Strategic and International Studies and the Center for a New American Security presents the possible security implications of climate change by three plausible scenarios:

- **scenario 1:** Expected Climate Change to 2040 (based on the medium IPCC projections, temperature rise 1.3°C above 1990 levels and sea level rise 0.23m);
- **scenario 2:** Severe Climate Change to 2040 (more severe warming at 2.6°C and 0.52m sea level rise has exponentially more devastating effects on agriculture, ecosystem and population, and water scarcity is affecting 2 billion people);
- **scenario 3:** Catastrophic Climate Change to 2100 (an expansion of Scenario 2 from 2040 to 2100, assuming average global temperature rises of 5.6°C above 1990 levels, mountain glaciers virtually gone, and sea level rise by 2 m relative to 1990, rendering low-lying coastal regions uninhabitable, and severely affecting all areas of life and ecosystems).

The report includes a Summary of key environmental and national security implications of the three scenarios, which “makes clear, climate change has the potential to be one of the greatest national security challenges that this or any other generation of policymakers is likely to confront.” [November 2007. Military Implications, Sources]
Global Risk 2007, by the World Economic Forum

*Global Risks 2007; A Global Risk Network Report* by the World Economic Forum (WEF) explores three risk scenarios: Pandemic and Its Discontents; Out of the Global Warming Frying Pan (and Into the Fiscal Fire), and Oil Shock and Its Consequences. It also addresses policy issues related to mitigation and risk prioritization, the risk of water shortages, tropical storms and inland flooding, international terrorism and civil war. The report warns that climate change could cause up to $250 billion loss over the next 10 years, and a sharp increase in oil prices could cause up to $1 trillion of economic losses and trigger a global recession. [January 2007. Military Implications, Sources]

Fourth Assessment Report Climate Change 2007

The first part of the four-volume *Climate Change 2007, the Fourth Assessment Report* of the Intergovernmental Panel on Climate Change (IPCC) will be released on February 2, 2007. News released in advance shows that climate change could be far worse than previously expected. A report on this first part of the IPCC Assessment will appear in next month’s environmental security report. The other three parts of the Assessment focus on: impacts, adaptation and vulnerability to climate change—to be released in April; mitigation—to be released in May; and the Synthesis Report—to be published in November 2007. [January 2007. Military Implications, Sources]

Worldwatch Institute: Assessing the Relation between Disasters and Conflict

*Beyond Disasters: Creating Opportunities for Peace*, a report by Worldwatch Institute: analyses the nature and effect of disasters over the past 20 years and the impacts of human activities on the climate; highlights the factors of vulnerability; and makes a few recommendations to reduce the social consequences of disasters and to eventually use post-disaster reconstruction as an opportunity for building lasting peace. The report considers three case studies: Aceh, 2004 Indian Ocean tsunami—that became a catalyst for peace; Sri Lanka—despite the ceasefire, the conflict continued mainly because of an inadequate post-disaster reconstruction strategy; and Kashmir—the earthquake didn’t influence the stalled reconciliation process. [June 2007. Military Implications, Source]

Adaptation and Vulnerability Report by the IPCC

The Intergovernmental Panel on Climate Change (IPCC) report *Climate Change 2007: Impacts, Adaptation and Vulnerability* reinforced the scale of the implications of climate change and focused the international community on the emergency of acting on mitigation and adaptation strategies. The report shows that the most severe impacts of climate change will be experienced by people in the poorest regions who have emitted the least amount of greenhouse gases. Billions of people would face water scarcity and hundreds of millions, hunger. Vulnerability to climate change could be exacerbated by other stresses—such as poverty, unequal access to resources, and conflict. Africa will be mostly affected by water and food shortage; low-lying areas worldwide are threatened by floods, erosion, and rising sea levels; changes in precipitation patterns and the disappearance of glaciers from Asia to Latin America will affect water availability for human consumption, agriculture and energy generation; heat waves, forest fires, and extreme weather conditions will increase mainly in North America and Europe. “These
projected impacts tell us that we urgently need to launch an agreement on future international action to combat climate change, as well as look for effective ways to generate the funds needed for adaptation,” says Yvo de Boer, executive secretary of the United Nations Framework Convention on Climate Change. The “Summary for Policymakers” suggests that a portfolio of adaptation and mitigation measures is needed to diminish the risks associated with climate change. The Summary, approved by government officials, will most probably guide future strategies such as a post-Kyoto policy, and establishing global mitigation and adaptation frameworks. The third report, Mitigation of Climate Change is scheduled for release in May, and the final Synthesis Report for November 2007. [April 2007. Military Implications; Sources

Global Environment Outlook

UNEP’s fourth Global Environment Outlook: environment for development (GEO-4) warns once more that changing temperatures, rapid rates of species’ extinction, and unsustainable depletion of the world’s scarce resources are the most important threats to human survival. The report reiterates that in order to avoid catastrophe, a new proactive policy approach is needed, since environmental problems worsen faster then response policies are presently adopted. An analysis by region shows that in Africa, the biggest problem is caused by land degradation due to unsustainable use and climate change; in Asia and Pacific, despite improvements in many domains, the environment is further threatened by increasing consumption and associated waste—including hazardous waste; Europe, although a leader in environmental policy, has to make greater efforts to reduce greenhouse gas emissions and change its unsustainable patterns of production and consumption; the Latin America and Caribbean environment is threatened by lack of land-use planning—including urbanization and deforestation, and high income inequality; in North America, high energy consumption and low efficiency, low fuel economy standards, and urban sprawl are the main environmental problems. [October 2007. Military Implications, Sources

UNEP Year Book 2007

UNEP fourth annual report, GEO Year Book 2007, was released at the opening of the Global Ministerial Environment Forum in Nairobi [see item Governing Council/Global Ministerial Forum Makes Progress on Global Environmental Governance]. The report offers a comprehensive overview of global and regional developments over the past year; focuses on implications of globalization on the environment (linkages among ecosystem health, human well-being, and economic development and assesses how policy decisions respond to global change); analyses the environmental implications of nanotechnology; and features several key indicators related to the environment. [February 2007. Military Implications, Source

UNEP’s Year Book 2008

UNEP’s Year Book 2008 highlights the impacts of global warming (from the melting of permafrost and glaciers to extreme weather events), also showing the changes in policies and actions of leaders of governments, companies, and the UN itself in addressing issues related to climate change. It shows that business begins to see climate change as an opportunity rather than a burden, as a growing numbers of companies embrace environmental policies and investments in clean technology and renewable energies are increasing. [February 2008. Military Implications, Sources
**Twenty Years of Environmental Security**

*An Uncommon Peace: Environment, Development, and the Global Security Agenda* by Geoffrey D. Dabelko, ECSP Director, published on the 20th anniversary of *Our Common Future* (commonly known as the Brundtland report) is an assessment of the evolution of our understanding of environmental concerns with implications for national and international security. It addresses changes in the traditional state-centered approach to new security threats such as: the possible environmental consequences of nuclear war replaced by the increased threat of dirty bombs; new threats such as genetic mutations; and health and poverty. Dabelko notes that these new realities outline the pathway to “one facet of our common future: environmental peacemaking.” [May 2008. Military Implications, Source]

**World in Transition –Climate Change as a Security Risk**

*World in Transition –Climate Change as a Security Risk*, a report by the German Advisory Council on Global Change based on the work of international experts and organizations including the UN Environmental Program (UNEP), assesses the possible security implications of climate change and warns that inaction might lead to destabilization and raise the threats to international security to a new level. It suggests four 'climate-induced conflict constellations': 1) freshwater scarcity, 2) decline in food production, 3) increased natural disasters, and 4) environmentally-induced migration. The geographic areas at greater risk include: northern and southern Africa and the Sahel zone; central Asia, India, Pakistan and Bangladesh; and Andean and Amazonian regions of Latin America. The report makes extensive recommendations, including: shaping global political change, reforming the UN, developing pro-active climate protection and adaptation policies, and “financing international conflict prevention.” It also underlines the need to develop strategies for avoiding destabilization and conflict in the event that climate protection fails. [December 2007. Military Implications, Sources]

**Six places in the world where climate change could cause political turmoil**

A Christian Science Monitor article, *Six places in the world where climate change could cause political turmoil* gives another view of areas vulnerable to consequences of global warming: 1) Nepal (lack of freshwater due to melting glaciers causes migration and increased power of Maoists); 2) Indonesia (deforestation); 3) Lagos, Nigeria (sea-level rise in an overpopulated and unstable region); 4) U.S. (overstretched America's armed forces due to disaster relief and war-fighting); 5) Arctic (race for natural resources and navigation change sovereignty questions as Arctic ice melts); 6) East Africa (desertification and decreased food production induced migration). [December 2007. Military Implications, Sources]

**State of the World 2007: Our Urban Future**

Worldwatch Institute’s *State of the World 2007: Our Urban Future* warns of possible perils from urbanization, if policies, technologies, and behaviors are not changed. The report assesses social and economic impacts of rapid urbanization, and suggests policies. (50% of the world is expected to be urban within a year.) The chapter Reducing Natural Disaster Risk in Cities notes that of the 33 cities projected to have at least 8 million residents by 2015, at least 21 are coastal...
cities that will be affected by possible sea-level rise due to climate change. [January 2007. Military Implications, Source]

**Recommendations for Addressing U.S. Environmental Security**

*Insecure About Climate Change* is an essay summarizing a recent special report for the Council on Foreign Relations, *Climate Change and National Security: An Agenda for Action*. It makes some specific recommendations to “strengthen national security by reducing U.S. vulnerabilities to climate change at home and abroad,” such as: establishing a new “deputy undersecretary of defense position for environmental security [emphasis added]… to redress the insufficient institutionalization of climate and environmental concerns in the Department of Defense; … several senior positions in the National Security Council dedicated to environmental security” and eventually a “special advisor to the president on climate change with some budgetary authority.” The author also makes some financial suggestions to help developing countries prepare for climate change, “including $100 million (over several years) for military-to-military environmental security workshops; …another $100 million per year to support an African Risk Reduction Pool” as “part of a broader international risk reduction effort that… should be on par with the president’s five-year, $15 billion emergency plan for AIDS relief.” The author of the essay and report, Joshua Busby, is assistant professor at the LBJ School of Public Affairs at the University of Texas at Austin and fellow with the Robert S. Strauss Center for International Security and Law. [March 2008. Military Implications, Sources]

**Climate Change: A New Threat to Middle East Security**

The *Climate Change: A New Threat to Middle East Security* report by Friends of the Earth Middle East (FoEME) highlights that consequences of climate change—mainly rising sea levels and freshwater shortage could exacerbate security risks in the Middle East. Unless adequate adaptation actions, the large-scale consequences include threat to “national, regional, and global security” warns Nader Khatib, Palestinian Director of FoEME. [December 2007. Military Implications, Sources]

**Arctic Debate**

*Arctic Access, Territorial Claims, Energy Resources and Environmental Management*

Global warming is expected to increase access to the Northwest Passage and other Arctic areas. Canada announced the construction of up to eight Polar Class 5 Arctic Offshore Patrol Ships and the establishment of a deep-water port in the far North. A Canadian opposition party and some Canadian analysts say Canada should do much more to assure its sovereignty over the area. The status of some Canadian Arctic waters is not clear among the relevant neighboring counties with varying territorial claims in the Arctic. Russia planted its flag on the seabed 4.2 km below the North Pole to strengthen its claims over a large Arctic area. [See also *The Disputes over the Northern Territories Set to Continue* in June 2007, *New Canadian Strategies for Monitoring the Northwest Passage* in August 2006, and *Arctic Northern Passage Opens New International Issues of Regulation* in February 2006 environmental security reports.] [July 2007. Military Implications, Sources]
Arctic Debate Update
Less than one month after the five Arctic countries agreed at the summit to follow the Law of the Sea in resolving the Arctic disputes, Russian Lt. Gen. Vladimir Shamanov, head of the Defense Ministry’s combat training directorate said that Russia started the revision of their military training program to be prepared for fast deployment in “the Arctic in case of a potential conflict.” He invoked the “reaction of a certain number of heads of state to Russia’s territorial claims to the continental plateau of the Arctic” and the large-scale U.S. Northern Edge 2008 military exercise conducted in Alaska in late May. [June 2008. Military Implications, Sources]

Arctic Debate Intensifies
Debate over the Arctic ownership is intensifying, as Canada, Denmark, Norway, Russia and the U.S. are all building their political and legal cases to claim jurisdiction over different (sometimes overlapping) areas. Russia declared that the first results show that the Lomonosov Ridge is an extension of Siberia, thus backing the country’s bid to take control of the region. Denmark sent scientists on a month-long expedition seeking evidence that the Lomonosov Ridge is a geological extension of Greenland. Canada is determined to defend its sovereignty over the region’s Northwest Passage and some Arctic territory; “We either use it or lose it. And make no mistake, this government intends to use it,” said Canadian Prime Minister Stephen Harper. Canada is establishing an army training center at Resolute Bay (about 370 miles south of the North Pole) and a deepwater port on the north end of Baffin Island. “The Russians, Canadians and Danes all have overlapping claims in the polar region. It is unclear how this can be resolved,” said Øystein Jensen, a maritime law expert with Oslo's Fridtjof Nansen Institute. [August 2007. Military Implications, Sources]

Canada to Begin Monitoring Traffic in Northwest Passage by mid-2008
In view of increasing disputes over the Northwest Passage, Canada announced that it will begin monitoring the area’s sea traffic by underwater listening devices. Beginning in mid-2008, Canada's military will monitor ships and submarines using detection technology installed at Gascoyne Inlet on Devon Island, near one of the main arteries of the passage. Canada is at odds with Russia, Denmark, Norway and the United States over the Northwest Passage. [September 2007. Military Implications, Sources]

New Canadian Strategies for Monitoring the Northwest Passage
Further on the opening of the Northwest Passage, the Canadian government is undertaking serious military and strategic operations for increased monitoring of the area for actions that might affect its sovereignty over the territory, as well as ecological impacts. In spite of strong disagreement between the Canadian Department of National Defence and Environment Canada on projections concerning the timing of the Passage’s accessibility for commercial and other navigation, new capabilities, funding and apparatus are being considered for increasing control. Those include: enforcing the Arctic Waters Pollution Prevention Act for avoiding ecological disasters; a highly mobile Rapid Reaction Battalions (based in B.C., northern Quebec, Newfoundland, and Ontario); armed icebreakers; and a deep-water port at the passage’s eastern entrance. [See also Northwest Passage to Become “Canadian Internal Waters” in April 2006, and Arctic Northern Passage Opens New International Issues of Regulation in February 2006 environmental security reports.] [August 2006. Military Implications, Source]
The Disputes over the Northern Territories Set to Continue
As the North is warming up, opening access to its rich resources, the territorial claims over the Arctic region are set to increase. Reportedly, Russia is prepared to challenge the international community and claim sovereignty over large parts of the Arctic region that is now under the International Seabed Authority, on grounds of the region’s geological continuity and similarity with continental Russia. [June 2007. Military Implications, Source]

Arctic Disputes Continue
An authoritative report, *Climate Change and International Security*, to the European Council, among other recommendations for addressing security issues in the new context of climate change, recommends “Develop an EU Arctic policy based on the evolving geo-strategy of the Arctic region, taking into account i.a. [inter alia] access to resources and the opening of new trade routes.” It notes, “The increased accessibility of the enormous hydrocarbon resources in the Arctic region is changing the geo-strategic dynamics of the region.” A recent U.S. survey revealed that the Alaska continental shelf might extend more than 100 nautical miles farther from the U.S. coast than previously assumed, therefore eventually giving the U.S. the right to claim access to extra seabed resources if it were party to the Law of the Sea treaty. In the meantime, the US-based Arctic Oil & Gas Company has filed a claim with the UN to act as the sole “development agent” in the Arctic region, with exclusive rights to extract oil and gas from the central Arctic Ocean currently beyond the territorial control of the polar nations. [March 2008. Military Implications, Sources]

Arctic Issues Still at the Debate Stage
Officials from the Arctic coastal countries Canada, U.S., Russia, Denmark, and Norway met in Ilulissat, Greenland, May 27-29, 2008, to address issues related to the Arctic territory. The meeting concluded with The Ilulissat Declaration, by which the five nations reaffirm their commitment for applying the UN Law of the Sea “to the orderly settlement of any possible overlapping claims,” stipulating that there is “no need to develop a new comprehensive international legal regime to govern the Arctic Ocean.” Critics say that this opens the possibility for a polar “carve up” by the five countries. Other Arctic Council group nations (Sweden, Iceland and Finland) as well as the indigenous communities—who are the majority of the population within the Arctic Circle—were not invited to the meeting. Environmentalists and the indigenous groups call for an international treaty similar to the one for Antarctica, which bans all military activity and mineral exploitation. A UN panel is supposed to rule on Arctic control by 2020. By the Ilulissat Declaration, the Arctic coastal nations also agree to cooperate on scientific research, improving navigation safety, and development of environmental monitoring and disaster response systems.

However, there is speculation that Russia has the strongest position for increasing its influence in the region and support for its expansion claims. It has infrastructure along the North Sea Route (including ports), has for a long time performed extensive research and possesses essential knowledge about the region. Most of all, Russia has the most powerful fleet and military potential permanently deployed in the Arctic. Russia is also working on gathering more evidence to support its claim for territorial expansion under the Law of the Sea. [May 2008. Military Implications, Sources]
Disputes over Polar Regions Expands

The race for claiming polar territories expands from the Arctic to Antarctica. The Antarctic should be protected by the 1959 Antarctic Treaty and related agreements that protect the continent against activities relating to mineral resources except scientific ones. Nonetheless, Britain’s Foreign Office plans to claim 1 million sq km (386,000 sq miles) of seabed off the coast of the British Antarctic Territory. Greenpeace and WWF warned that Britain’s possible oil, gas, and mineral exploration in the region would represent an environmental disaster for the fragile ecosystem. Similar claims for seabed areas might also be submitted by Chile and Argentina, which might overlap some of the British territorial claims.

Meantime, the Arctic disputes continue. Encouraged by the prospect of increased oil and minerals access due to global warming, Greenland is contemplating eventual independence from Denmark. Warning that climate change is becoming a threat to worldwide peace and security, German Foreign Minister Frank-Walter Steinmeier noted with concern that the rival territorial claims in the Arctic could turn into a Cold War. “Policies to fight climate change can, and will, become an important part of peace policies,” he added. Note: On August 21st this year, for the first time on record, the Northwest Passage was opened to ships not accompanied by or armored as icebreakers. [See also Arctic Debate Intensifies in August 2007, Arctic Access, Territorial Claims, Energy Resources and Environmental Management in July 2007, and other similar items in previous environmental security reports] [October 2007. Military Implications, Sources]

Indian and Chinese Assessments of Climate Change Consequences

Indian and Chinese authorities have increased warnings on the consequences of global warming on the coastal areas. In India, the National Coastal Zone Management Authority notes that millions of people living along India's 3,700 km (2,300 mile) eastern coast are vulnerable to storms, flooding and tsunamis; sea levels in some parts of the Bay of Bengal were rising at a rate of 3.14 mm annually, while off the coast of Khulna in Bangladesh the rate is 10 mm every year, and rising sea levels are eroding 1 meter (3.2 feet) of land every year along the coast of West Bengal state. India plans to conduct a study next year on how to mitigate the vulnerability to climate change of its 7,500 km (4,660 mile) coastal area. The first Chinese official National Climate Change Assessment also warns on devastating consequences of climate change on the Chinese economy (mainly agriculture) and increasing vulnerability of its coastal areas. Nevertheless, economic development remains the country's primary task, neglecting radical measures to address greenhouse gas emissions and pollution, states a report. [April 2007. Military Implications, Sources]
Migration Triggered by Environmental Causes

Number of People of Concern Rising
The United Nations High Commissioner for Refugees stated that the number of people of concern rose for the past two years. One of the factors cited was climate change making resources scarcer. UNHCR’s 2007 Global Trends reports that the number of international refugees rose from 9.9 million to 11.4 million by the end of 2007, while the number of internally displaced people increased from 24.4 million to 26 million. As conflict and environmental degradation exacerbate each other, unless adequately addressing the situation in its whole complexity, forced displacement will continue to rise. The most at risk are the already vulnerable areas of Africa and the Indian sub-continent. [June 2008. Military Implications, Sources]

Climate Change Refugees
Janos Bogardi, director of the UNU Institute for Environment and Human Security, called for the UN to create a legal framework to address future environmental refugees, while taking into account fears that by including environmental migrants in the international legislation protecting refugees, “we are weakening one of the strongest tools for protecting refugees.” Hence, the UN “should find other means of helping environmental migrants.” He also emphasized that environmental factors often lie at the root of more obvious causes of migration.

Christian Aid estimates that a billion people might be forced to migrate over the next 50 years, mostly as a consequence of environmental conditions. The vast majority will be from the world’s poorest countries, the Sahara belt, south Asia, and the Middle East. Their report estimates that in 2007 there are 25 million displaced by conflict and human rights abuses, 25 million by natural disasters, such as earthquakes, and 105 million by large development projects, with 8.5 million now officially recognized as refugees. By 2050, it says, 250 million could be permanently displaced by climate change-related phenomena.

Bangladesh, with its 140 million people, is one of the most vulnerable places to climate change. It is likely to face increasingly violent storms, saltwater getting further into the country's rivers, erosion in the coastal areas, severe droughts in the north, and possibly a fifth of the country vanishing under water, if sea level rises by 3 feet by the end of the century. “One island here has more people than all of the small island states put together,” said Atiq Rahman, executive director of the Bangladesh Center for Advanced Studies. [May 2007. Military Implications, Sources]

Increasing Weather Extremes and Environmental Refugees due to Climate Change
There might be 200 million climate refugees by 2050, which could increase the likelihood of conflicts in many locations around the world. Experts warn that in addition to the South Pacific low-lying islands that are already affected, millions of people in densely populated countries such as Bangladesh and parts of China, Indonesia, and Vietnam might be forced to move by rising sea levels, while extreme drought might affect 10% of world land by 2050—five times more than now, and 30% by the end of the century (estimate by UK Met Office Hadley Centre). Another study, Going to the Extremes, based on advanced computer modeling, warns that by the century’s end, the planet will face more weather extremes such as deadly heat waves, prolonged
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drought, and intense rainstorms due to global warming caused by human emissions of greenhouse gas. [October 2006. Military Implications, Sources]

New Strategies Needed to Deal with Global Displacement and Migration

The annual meeting of the UN High Commission for Refugees (UNHCR) governing Executive Committee concluded that new strategies are needed to deal with increasing global displacement and migration, as well as approaches to tackle their causes, scale, and complexity. In addition to conflict and persecution, environmental degradation, and frequency and magnitude of natural disasters, are among the main causes of increased numbers of refugees. After several years of decline, in 2006 the number of refugees began rising again and continues to mount, remarks UNHCR. The difference between categories of migrants is increasingly blurry. “War is many times driven by scarcity of resources; scarcity of resources can be driven by climate change,” said UN High Commissioner for Refugees, Antônio Guterres. Note: A study by Rafael Reuveny from Indiana University, Climate Change-induced Migration and Violent Conflict, reveals that of 38 cases of migration directly attributable to climate change during the 20th century, half led to conflicts, some of which were violent. [See also Climate Change Refugees in May 2007, UNU Calls for International Framework for Environmental Refugees in October 2005, and other similar items in previous environmental security reports.] [October 2007. Military Implications, Sources]

Population Trends and Environmental Impact


U.S. National Report on Population and the Environment by the Center for Environment and Population (CEP) is the first comprehensive assessment of the impact of U.S. national and regional population trends on the environment. The report addresses the main “America’s Population-Environment Challenges”: land use; water; forests; biodiversity; fisheries and aquatic resources; agriculture; energy; climate change; and solid and toxic waste. It highlights that from 1995 to 2005, the U.S. population increased by 10.6% (29 million people)—the highest rate of industrialized countries—and raises concerns over environmental consequences, since the U.S. already has the largest per-capita environmental impact in the world. It warns that in the future the situation might become more critical due to uneven distribution of the population, climate change, rising sea levels, and pollution.

World Population in 2025

Mapping Future Population Growth by the Earth Institute at Columbia University is mapping projected population change for the year 2025. It notes that most population growth will continue to be in already densely populated developing countries like India and China, and coastal population will increase by 35%, to 2.75 billion people living within 60 miles of the ocean; therefore, there will be increasing vulnerability to disasters resulting from climate-change and rising sea level. [September 2006. Military Implications, Sources]

Demographics and Destiny: Trends We Need to Understand in the 21st Century

Demographics and Destiny: Trends We Need to Understand in the 21st Century by Endy Zemenides, argues that demographics is one of the important factors framing the 21st century
security agenda, and points out 10 key demographic trends: 1) aging of the developed world; 2) youth bulges in the Islamic world; 3) long term population decline in Russia; 4) rise of urbanization/megacities in the developing world; 5) negative birth rates in Europe; 6) developed world’s reliance on immigration; 7) Islamization of Europe; 8) steep increase in the number of Chinese and Russians with lung cancer, heart disease and other pollution-related health problems; 9) population growth around limited renewable resources; and 10) high fertility rates in the developing world. Demographics, the article argues, can change the way we fight war and add reasons for fighting wars. The author concludes that the U.S. must recognize the looming demographic issue and develop a comprehensive demographic strategic plan. [October 2007. Military Implications, Sources]

Desertification Triggering Migration
Increasing desertification of West Africa is forcing people to relocate, causing more conflict among communities. The executive director of UNEP warned that Africa's next major war might be over water, giving Burkina Faso as an example. The Conference of the Parties to the United Nations Convention to Combat Desertification (UNCCD COP8) noted that desertification affects more than 250 million people, and 1 billion more are at risk, and asked for increased and swift action. The Global Humanitarian Forum, to be launched on October 17, 2007, is being set up by former UN Secretary General, Kofi Annan, to address in a preventive and proactive way global refugee movements and humanitarian crises triggered mainly by climate change. Climate change is, “perhaps the single most important humanitarian challenge of years to come,” says Kofi Annan. The forum will act as a catalyst among the different interest groups involved in international disaster relief and prevention: governments, aid agencies, the military, the business world and academics. [September 2007. Military Implication, Sources]

Conference on Desertification Calls for Policies to Address Environmental Refugees
The UN International Year for Deserts and Desertification concluded with a Conference held in Algiers, Algeria, December 17-19, convened by the Canadian-based UNU International Network on Water, Environment and Health (UNU-INWEH), with ten other international agencies and hosted by the Algerian government. About 200 experts from 25 countries discussed policies to address desertification and its consequences, including health, economic, and environmental refugee-related issues. UN experts estimate that desertification threatens 2 billion people and could create more than 135 million refugees. In Africa, if current trends of soil degradation continue, the continent might be able to feed just 25% of its population by 2025, according to Karl Harmsen, Director of UNU's Ghana-based Institute for Natural Resources in Africa. The international community should swiftly adopt adequate policies both to counter the desertification trend and to address desertification-induced migration. "Environmental refugees," although not recognized yet in world conventions, are estimated to outnumber political refugees. [See also International Year of Deserts and Desertification—2006 in January 2006, and Desertification Synthesis (MA report 3) in June 2005 environmental security monthly reports.] [December 2006, Military Implications, Sources]

Kyrgyzstan’s Deforestation Threatens Central Asia’s Security
The Kyrgyz government’s Agency for Environmental Protection and Forestry and environmentalists have issued warnings about the country’s rate of deforestation and its

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consequences. It is estimated that over the past 50 years, half of the forest cover was lost, and illegal logging continues at a rate about at par with the legal one, maintained by corruption and the population’s low living standard. Kyrgyzstan forests are crucial for the whole Central Asian ecosystem, their disappearance causing water scarcity, health problems, and more frequent natural disasters such as floods, landslides and droughts. Experts demand better enforcement of international environmental regulations to which the country is party. [See also UN General Assembly Adopts Global Forest Agreement in December 2007 and Environment and Security Program in the East-Caspian Region in September 2007, Network of Environment Centres in Central Asia in February 2004, and Prospective International Agreements for Mountain Regions in October 2002 environmental security reports.] [March 2008. Military Implications, Source]

NATURAL DISASTERS

Scientific evidences and possible consequences

The Northern hemisphere spring of 2008 was the seventh warmest on record, nearly one degree warmer than the 20th century average, according to the National Climatic Data Center. It was also marked by weather extremes around the world: Cyclone Nargis which devastated Myanmar (Burma); record low spring snow in Europe and Asia; severe drought in China; North America devastated by strong storms, flooding, tornadoes (reported number for half-year exceeding 10-year annual average) and drought (in the West); and the first two big tropical storms hitting Central America. Meantime, Australia’s fall is unusually dry, aggravating the drought in many parts of the country. [June 2008. Military Implication, Sources]

The number of people affected by natural disasters in 2007 reached 200 million, considerably higher than the 135 million in 2006, according to the annual study by the Belgian research center Centre for Research on the Epidemiology of Disasters (CRED) of the Catholic University of Louvain. Except for the August earthquake in Peru, the ten deadliest disasters were all climatic, with flooding affecting the most people and being the deadliest. Asia was the region most touched by climatic disasters, but overall, the U.S. experienced the highest number of natural disasters (22), ahead of China (20) and India (18).

Heavy rains for several weeks caused heavy flooding in Zambia, Mozambique, Zimbabwe and Malawi, displacing thousands of villagers and devastating the largely agriculture-based economies of the region. The UN noted that the Mozambique floods could be the worst in memory.

Australian meteorologists suggest that the country’s weather patterns are changing and that stronger storms, droughts, and higher temperatures might become the norm. Statistics show that 2007 was the warmest year on record for New South Wales and the Murray-Darling Basin, and the 11th year in a row experiencing above normal temperatures and the 7th with below-average rain, with the southeast of Australia facing the worst drought in living memory. [January 2008. Military Implication, Sources]

Between 2004 and 2006, the number of emergencies due to natural disasters doubled, from 200 to 400. This year’s monsoon affected an estimated 30 million in South Asia, and millions of Africans were also affected by flooding throughout the continent. Scientists expect increased natural disasters over the next decades and researchers warn that risks of flooding might be underestimated. [August 2007. Military Implication, Sources]
In Africa, the worst rains in 30 years caused flooding affecting an estimated 1.5 million people in 22 countries, including Ethiopia, Niger and Sudan, increasing the humanitarian crisis, reports the UN Office for the Coordination of Humanitarian Affairs (OCHA). Hundreds of thousands of people have been displaced and the risks of epidemics are rising. In other parts of the world, strong hurricanes also produced serious damages during September. [September 2007. Military Implication, Sources]

The International Federation of Red Cross and Red Crescent Societies have stated that more than 250 million people a year are now affected by so-called natural catastrophes, a third more than ten years ago. The federation has already responded to more than 100 floods in 2007; in 2006, the humanitarian groups responded to 482 disasters, up from 278 in 2004.

Climate change is cited as one of the causes that led to 60% of Georgian farmers losing all of their crops. Australia’s first bush fires also triggered fears over the intensifying effects of climate change. By 2030, the already dry continent might get warmer by about 1.8 degrees Fahrenheit, and drier due to estimated 3% annual rainfall reduction, forecasts the Climate Change in Australia report produced by the Commonwealth Scientific and Industrial Research Organization and the Bureau of Meteorology. Note: a survey of 1,213 people conducted in July showed that 40% of Australians consider global warming a greater threat to security than Islamic fundamentalism; only 20% deemed it less. In Southern Africa, environmental degradation and global warming change rainfall patterns, decreasing in some regions—thus causing drought, and increasing in others, which might produce floods, warned scientists attending the Southern Africa Development Community meeting at mid-September. They also discussed adaptation strategies. [October 2007. Military Implication, Sources]

The number of weather-related disasters worldwide now averages 400–500 a year, compared to 125 in the early 1980s, and the world should increase mitigation and preparedness efforts, notes Oxfam report Climate Alarm Disasters increase as climate change bites. Geological disasters—such as earthquakes, are about the same, indicating that global warming is to blame, remarks the report. Factoring in population growth, the number of people affected also rises considerably. As of August 2007, some 248 million people were affected by flooding in 11 Asian countries alone. The November cyclone Sidr claimed another estimated 10,000 human lives and left about 3 million homeless in Bangladesh. [November 2007. Military Implication, Sources]

Summarizing the notable climate events of 2007, the World Meteorological Organization (WMO) remarks on devastating floods; drought and falling freshwater reserves; intense storms in various places around the world; and record-low Arctic sea ice extent that opened the Canadian Northwest Passage for the first time. It reports that the decade of 1998-2007 is the warmest on record, with the global mean surface temperature for 2007 estimated at 0.41°C (0.74°F) above the 1961-1990 annual average of 14°C (57.20°F). Extreme temperatures included unusually cold winters in South America, heat waves affecting Europe, and making 2007 probably the hottest year on record in the Northern Hemisphere. Some scientists believe that weird weather patterns might become the norm and that the world is more than 50% likely to experience serious climate change as it is unlikely to keep greenhouse gases levels low enough to avoid the critical 2°C (3.6°F) temperature rise. [December 2007. Military Implication, Sources]
Tens of thousands of people died and hundreds of thousands lost everything in Myanmar as tropical cyclone Nargis hit the Southeast Asian country, also known as Burma. The tragedy was increased by the lack of preparedness and response capability of the country and the ban on intervention by foreign aid agencies.

Although there is no consensus on linking storms’ number and strength to climate change, some experts say that there is evidence of a probable trend that storms are becoming more powerful as global warming heats up the oceans. Professor Kerry Emanuel, an MIT meteorologist says that the power of tropical cyclones has roughly doubled since the 1950s, with the most increase occurring over the last three decades, consistent with man-made global warming.

Considering the rate so far, 2008 might be the year with the most tornadoes in the U.S. since 1950—when modern recordkeeping began—and the deadliest in a decade, reports The Weather Channel. In some states, the number to date of such storms already exceeds the yearly average: Mississippi had 49 tornadoes compared to an annual average of 39 twisters average; Alabama 45 versus 42, and Arkansas 49, compared to 48. [May 2008. Military Implication, Sources]

Scientists have detected dilution in salinity of the sea around Antarctica and warn that this could have significant effects on the world's climate and ocean currents. The so-called Antarctic bottom water of this region controls the system of ocean currents spanning the Southern, Pacific, Indian and Atlantic Oceans that shift heat around the globe. The phenomenon might be due to global warming, and in its turn will influence climate change.

For the past 20 years, no significant correlation can be established between climate change and the Sun’s activity, found UK Lancaster University scientists, using three different research methods. The findings support the assessment of the Intergovernmental Panel on Climate Change that man-made greenhouse gas emissions outweigh solar activity variations as a cause of global warming.

Climate change-induced effects might prove costly for the US. Although there is no consensus on the link between global warming and the number of hurricanes, scientists agree that climate change could increase storms’ damaging forces. The National Hurricane Center estimates that the US might be hit by a hurricane that could cause more than $100 billion in damage. Highly populated coastal areas are at highest risk. A category 5 hurricane could produce at least $140 billion in damage to South Florida. [April 2008. Military Implication, Sources]

A comprehensive study conducted by an international research team from 10 institutions around the world, led by NASA's Goddard Institute for Space Studies, found conclusive evidence of the link between human-caused climate change and the trends of change of Earth’s natural systems. The research analyzed a database of more than 29,000 data series of physical and biological systems, and natural phenomena, on land and in water, with at least 20 years of records between 1970 and 2004. In about 90% of the cases from North America, Europe, and Asia, a link could be established between warming and changes of the systems’ patterns or behavior. The results for Africa, South America, and Australia are not conclusive, due to lack of enough historical scientific data.

Scientists from Switzerland, France and Germany, working on the European Project for Ice Coring in Antarctica, found that “today's concentrations of carbon dioxide and methane are 28% and 124% higher respectively than at any time during the last 800,000 years," increasing the likelihood that human activity is a cause of climate change.
Chinese and Australian scientists are examining possibilities for deeper drilling in parts of Antarctica to find atmospheric records dating back 1.5 million years.

The Living Planet Index reveals dramatic biodiversity reduction since 1970: land species have declined by 25%, marine life by 28%, and freshwater species by 29%. Scientists estimate the current extinction rate being 10,000 times faster than the historical rate. The main causes of species decline are consequences of human behavior: climate change, pollution, destruction of animals’ natural habitat, spread of invasive species, and overexploitation of species.

The Arctic is warming at about twice the global average and the changes of climate and moisture highly impact the region’s vegetation, with possible negative consequences that will further influence global climate. The tundra is shrinking due to the expansion to the north of the boreal forests, which creates large dark surfaces that will absorb—instead of reflecting—solar heat. Reduced moisture increases wild fire potential in the tundra (in 2007, about 250,000 acres of Alaskan tundra burned), further improving the conditions for forest expansion. However, due to likely future drought in the region, the death of trees will be releasing carbon into the atmosphere instead of absorbing it, thus increasing greenhouse gas emissions. [May 2008 Military Implication, Sources]

"The world has moved from a global threat once called the Cold War, to what now should be considered the Warming War," Afelee Pita, Tuvalu Ambassador to the UN, told the Security Council in warning of the threat of rising sea levels to small island nations such as his country. The first session of the multi-stakeholder Global Platform for Disaster Risk Reduction was held in Geneva, June 5-7, 2007. Focusing on systematic implementation strategies of the "Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters," the session highlighted the need for raising awareness and stimulating action at government and grassroots levels for improving disaster reduction preparedness in areas increasingly vulnerable to risk. The meeting’s outcomes will be presented at the 62nd UN General Assembly. The next meeting of the Global Platform is planned for 2009. [June 2007. Military Implication, Sources]

Prior to the G8 Summit, representatives of 20 leading financial service companies—members of the UNEP Finance Initiative—called on G8 leaders to adopt deep emission reduction targets no later than 2009. They highlighted that in addition to climate-related disaster consequences for human security, inaction could lead to annual economic losses of as much as $1 trillion by 2040. However, the economic aspect is just a small part of the post-disaster suffering, highlights the Worldwatch Institute report, Beyond Disasters: Creating Opportunities for Peace. The report notes that over the past decade, there were an average of 348 disasters per year—nearly one per day—with 1 billion people affected by floods alone. In 2006, human deaths from natural disasters were up 24% and 87 countries were affected by floods, which were responsible for most weather-related disasters. Sophisticated Japanese and Taiwan computer models show that tropical storms—typhoons—in the highly populated areas of the northwest Pacific will be getting worse for the next 100 years. [June 2007. Military Implication, Sources]

The UN University report Re-thinking Policies to Cope with Desertification warns that desertification reached global environmental crisis proportions and is representing “imminent threats to international stability." Unless appropriate mitigation strategies are implemented, about
2 billion people might be affected by desertification effects; and, over the next decade, 50 million might be displaced.

Accelerating temperature rise over the past 10 years increased the drought in Australia—worse in the most populated areas—so that the situation got to national crisis proportions. Although equipped with the highest water storage capacity per capita in the world, in the major cities supply might fall 40% short of demand by 2025 due to growing population and possibly more severe drought. In China, because of drought, more than 8 million people are short of water, and many livestock perish. In Sichuan province, armed police deliver water to the nearly 4 million people affected by severe drought.

The European Commission Green Paper ‘Adapting to Climate Change in Europe - Options for EU Action’ warns that unless advanced planning occurs, European countries will suffer “increasingly frequent crises and disasters” that will “threaten Europe’s social and economic systems and its security.” [June 2007. Military Implication, Sources]

Climate Change 2007: Impacts, Adaptation and Vulnerability, third report of the UN Intergovernmental Panel on Climate Change (IPCC), calls for quick action to stabilize greenhouse gas emissions in order to avoid the worst climate change impacts. It states that greenhouse gas emissions must start declining by 2015 if the increase in global average temperature is to be capped at 2–2.4 degrees Celsius. The report points out that the more time passes, the costlier it will be. It estimates that stabilizing emission levels at 445–535 parts per million (ppm) would cost between 0.2% and 3% of world GDP by 2030 (about 0.12% per year); while after 2050, stabilizing emissions between 445–710 ppm would require a reduction of 5.5% in the world's GDP. This is consistent with the Stern report and other estimates. The report highlights that multiple strategies are already available for reducing global greenhouse gas emissions, such as utilizing cost-effective policies and current and emerging technologies. Just before the IPCC report was released, the World Wildlife Fund issued its own report, Stop Climate Change: It Is Possible, which presented 15 actions to reduce CO2 emissions. The World Resources Institute analyzed the impact of climate change on the ecosystem and its services for humans and suggested actions for ecosystem restoration in its report Restoring Nature's Capital: An Action Agenda to Sustain Ecosystem Services. WRI president Jonathan Lash said we should “urgently expand the climate debate beyond reducing greenhouse gases to focus on how climate change is altering ecosystem services.” [May 2007. Military Implication, Sources]

The United Nations Intergovernmental Panel on Climate Change 4th Assessment Report, Climate Change 2007: The Physical Science Basis, intensified the debate and worries about global warming and is likely to increase response efforts. The report assesses the global situation as a whole (changes in the Earth's climate including atmospheric composition, global average temperatures, melting glaciers, rising sea levels, ocean conditions, and other climate changes) and presents global and regional future climate projections. It states with “very high confidence” that global warming is being caused by human activity and that “carbon dioxide emissions will continue to contribute to warming and sea level rise for more than a millennium, due to the timescales required for removal of this gas from the atmosphere.” It presents a grim picture of the future — rising sea levels, more intense storms, extensive drought, and spread of some diseases. “We must, without further ado, agree on the definition of an institutional framework that will enable us to take more effective and efficient collective action,” said UN General Assembly President Sheikha Haya Rashed Al Khalifa. “Momentum for action is building; this
new report should spur policymakers to get off the fence and put strong and effective policies in place to tackle greenhouse gas emissions,” said Achim Steiner, Executive Director of the United Nations Environment Programme. [February 2007, Military Implications, Sources]

In addition to melting glaciers, global warming is causing the volume of seawater to expand, rising the sea level. The U.N. Intergovernmental Panel on Climate Change projects that sea levels would rise by 18 to 59 centimeters (7 to 23 inches) by the end of this century. A new World Bank working paper, The impact of sea level rise on developing countries: a comparative analysis, estimates that sea levels could rise 1-3m by the end of the century, but even 5m could be possible in the event of an unexpectedly rapid breakup of the Greenland and West Antarctic ice sheets. In a comprehensive assessment of the consequences of sea level rise for 84 developing countries, the paper estimates that a one meter rise by the end of the century would displace hundreds of millions of people in the developing world, generating at least 60 million environmental refugees. The impacts are potentially catastrophic for some countries such as Vietnam, Egypt, and the Bahamas, while for larger ones such as China the absolute magnitudes are huge. The most affected regions will be East Asia, the Middle East, and North Africa. The paper warns that the severity of the situation is increased by inadequate attention from the international community in addressing the implications and planning for adaptation. Maldivian President Maumoon Abdul Gayoom warned that at only 1.5m above sea level, the Maldives are at risk of disappearing from increasing sea levels due to global warming, forcing over 300,000 refugees to migrate. An internal report of the Royal Canadian Mounted Police, External Trends Influencing Policing in B.C., notes that implications of climate change could pose serious challenges for the police in British Columbia from local disorder during natural disasters increasingly affecting coastal areas, to climate refugees fleeing flooded countries. The report notes that “mass movements of that kind” might require increasing military and policing actions. Meanwhile, critical water scarcity could impact between 1.1 and 3.2 billion people by 2100, notes an IPCC report to be published in April. Melting glaciers are endangering future water supplies to farming areas around the world, from the Andes to the Himalayas and Kilimanjaro. [February 2007. Military Implication, Sources]

According to the Office of Maritime Transportation and Hydrography in Hamburg, the North Sea was 2.4°C warmer in October 2006 than the 1968-1993 average; and, since 1988 is in its strongest heating period since the start of recording (1873). Another German institute of research, WGBU, notes that everywhere seas and oceans are transformed by the climatic change: the surface water is heated, the sea level rises, the oceans become more acid, the storms are stronger. [November 2006. Military Implications, Sources]

Preliminary findings by the World Meteorological Organization (WMO) show that 2006 might be the sixth warmest year on record, with the average temperature estimated to be 0.42°C above the 1961-1990 annual average. It notes heat waves and prolonged drought in some regions, heavy rainfall, storms, and flooding in others, and the continuously decreasing Arctic sea ice. Along the same lines, analysts note that in Europe, this fall, continental temperatures were 1.8°C higher than the long-term average, and the past ten autumns have been the warmest on record. Also in Australia, this year the weather has been exceptionally warm and rainfall in many regions has been at near record lows. Drying has increased significantly in Africa in the past
three years, reveals Gravity Recovery and Climate Experiment satellite data. [December 2006, Military Implications, Sources]

The Chinese Ministry of Science and Technology warns that global climate change will increase "extreme weather events", threatening China’s food production. (A comprehensive government assessment is likely to be released in the first half of 2007.) Central India’s extreme rainstorms rose in number and strength over the past fifty years, most probably due to global warming [December 2006, Military Implications, Sources]

With extreme heat waves in Europe and the hottest summer in North America, scientists argue whether global warming is the cause; most of them agree that it is. “Ten of the last 12 years were the warmest since 1850. The global temperature (since then) rose 0.7 degrees Celsius and most climate models suggest it’s going to continue to warm by 2 to 5 degrees Celsius this century,” says Philip Jones, climate research professor at Britain’s East Anglia University. He also adds that globally, sea levels are rising by around 1.5 millimeters (0.06 inches) per year and have risen some 20 centimeters (7.8 inches) since the late 19th century. Warmer seas due to global warming will most probably also cause changes in precipitation patterns and increase intensity of hurricanes. (The IPCC’s Fourth Assessment draft text, which will be released next year, forecasts a 2–4.5º C warming by 2050—a faster change than their 2001 forecast of 1.4–5.8º C warming by 2100). [July 2006, Military Implications, Sources]

During the Climate Change Conference held in Nairobi many reports and papers documenting new climate change-related evidence and challenges were released. Noteworthy ones include: A report by German scientists is renewing the call on nations to promptly consider strategies for dealing with "sea level refugees"—population living in coastal areas endangered by the rising sea levels and increasing frequency of extreme storms. Canada’s northern native peoples might become environmental refugees, being increasingly isolated as their ice roads and paths to supplies melt. [November 2006, Military Implications, Sources]

The US National Oceanic and Atmospheric Administration revealed that the CO2 growth rate for 2006 was 2.05 ppm and the yearly average rise since 2001 was 2.1 ppm, meaning a faster accumulation in the atmosphere than scientists expected, and raising fears over the time available to tackle climate change. Preliminary data compiled by the World Meteorological Organization show that globally, the year 2006 is estimated to be the sixth warmest year since recordkeeping began in 1880. Also, 2006 registered the largest ever ozone hole area (September 21-30, 2006) and the second lowest average sea ice extent for the month of September. The organization notes that the September sea ice decline rate is about 9% per decade. Heat waves and droughts hit many parts of the world. The final figures will be released in March 2007. Newly released data by the World Glacier Monitoring Service reveal that in the period 2000–2005, mountain glaciers around the world melted at 1.6 times the average rate of the 1990s and 3 times that of the 1980s. A new study presents a doom-laden future for Europe, arguing that Europe is warming faster than the global average, and climate change will transform the face of the continent, affecting all sectors, but mainly its economy—particularly agriculture and tourism—and health.[January 2007. Military Implications, Sources]

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Japan's Meteorological Agency announced that the ocean around Japan has warmed up by 0.7 to 1.6 degrees Celsius over the last century, far higher than the world average of 0.5 degree Celsius. [May 2007. Military Implications, Sources]
**MELTING SEA ICE AND GLACCIERS**

Scientific evidences and possible consequences

Out of 14 research teams studying global warming impacts in the Arctic, 11 estimate retreat at least as extraordinary as in 2007, while the other 3 groups estimate ice extent heading back toward, but not equaling, the average minimum for summers since 1979, when satellite-based Arctic sea ice monitoring began. Five other groups chose not to issue a numerical estimate. The ongoing Study of Environmental Arctic Change, SEARCH, continuously presents updated information on ice assessments and explanations.

Meantime, some polar scientists believe that there is a 50% chance of a totally ice-free North Pole this summer. [June 2008. Military Implication, Sources]

Arctic sea ice has declined by about 10% in the past decade, note scientists from the University of Colorado’s Center for Astrodynamics Research. They estimate that there is a 59% chance that this year in September the ice cover will reach a new record low, as currently the ice is thinner and younger than at any time since observations have been recorded. In September 2007, the extent of Arctic sea ice was the smallest on record.

Scientists are increasingly confident that human activity is the cause of the new weather patterns seen at both poles. Their findings are based on computer models that analyzed natural and human-caused variables, and were compared with the observed real conditions. The models revealed an ice-free Arctic by 2030—about two decades ahead of the predictions in the United Nations’ Intergovernmental Panel on Climate Change reports. [May 2008. Military Implication, Sources]

Ice caps and glaciers contribute 60% of the ice melting that is one cause of increasing sea levels. According to scientists from the University of Colorado-Boulder's Institute of Arctic and Alpine Research, INSTAAR, and the Russian Academy of Sciences, the rate has been accelerating over the past decade and 28% of this comes from Greenland, and 12% from Antarctica.

In the Andes, many of the lower glaciers might be gone over the next decade or so, raising concerns over water and power supplies, and thus affecting economic development and the fight against poverty in the region—mainly in Peru.

Scientists observing the modifications in Greenland are also warning of fast paced melting and increasing temperatures in the region. Arctic climatologist Konrad Steffen who spent the past 18 springs on the Greenland ice cap, noted that over the last decade, the average winter temperature rose by 7°F, and cracks and ice quakes are more frequent, as if Greenland is “coming apart.” The Greenland Climate Network established by Steffen serves climate scientists worldwide and is one of the main instruments used by scientists from 60 nations participating in interdisciplinary research focusing on the Polar Regions, during the International Polar Year.

The Chinese Academy of Sciences reports that the Qinghai-Tibetan plateau is warming at 0.7°F a decade, and that the 18,000 square mile area covered by glaciers has shrunk by 30% over the past decades, threatening to dry up the Yellow River and thus causing more droughts, sandstorms and desertification. The Chinese government already had to relocate some of the local population. [July 2007. Military Implication, Sources]
Arctic sea ice shrank to the lowest extent ever recorded by satellite, and it might be close to reaching a “critical threshold”—which could mean that the region might be ice-free in summer in the next 10 to 20 years. The Tibet Meteorological Bureau reported accelerating melting due to rising annual temperatures at a rate of 0.3°C Celsius (0.54°Fahrenheit) every 10 years. [August 2007. Military Implication, Sources]

This year, the area covered by sea ice in the Arctic shrank to its lowest level since satellite measurements began nearly 30 years ago. The U.S. National Snow and Ice Data Center noted that on Sept. 16, 2007, the Arctic sea ice reached a record low 4.13 million square kilometers (1.59 million square miles), 22% less than the previous record. Himalayan glaciers are melting fast in Indian Kashmir as a result of global warming, noted a report by ActionAid, On the Brink? Himalayan glaciers are the main source for Asia’s nine largest rivers; water levels of regional streams and rivers already dropped by two-thirds. Rajendra K. Pachauri, the Chair of the UN Intergovernmental Panel on Climate Change, warned that some one billion people could be threatened by water shortage in South Asia, China and Africa as result of melting glaciers. [September 2007. Military Implication, Sources]

Many studies are showing greater warming in the Arctic than in the rest of the world and that the reduction in the sea ice extent has been much faster than global climate models predict. Douglas Bancroft, Director of the Canadian Ice Service, notes that the “overall extent was similar to what some of the models envisioned but decades in advance of when they expected that would occur. In fact, the summer of 2007 looked very similar to some climate model forecasts for 2030 to 2050.” One research station in the Canadian High Arctic recorded temperatures as high as 22°C on Melville Island, where the long-term average is 5°C. According to Walt Meir of the US National Snow and Ice Data Center in Colorado, the wider polar region may have experienced its hottest summer on record.

ESA’s Earth Explorer ice mission, CryoSat-2, to be launched in 2009, will be specifically designated for polar region research, with observations over three-years, providing conclusive data on the rates at which ice cover is diminishing. To complement submarine and satellite measurements and determine with highest accuracy how rapidly Arctic ice is thinning, next year three British polar explorers will chart sea ice melt to better estimate when Arctic summer sea ice will vanish due to global warming. [October 2007. Military Implication, Sources]

Rapid melting of Andes glaciers indicates that they might disappear by mid-century, threatening agriculture, drinking water sources, and hydroelectric plants. The livelihood of more than 11 million people living in growing cities of Bolivia, Ecuador, and Colombia is jeopardized. As some of the poorest countries of Latin America, they do not have the funds necessary for preparedness and for developing adequate infrastructure to cope with water scarcity and other related challenges. [November 2007. Military Implication, Sources]

Scientists attending the American Geophysical Union meeting in San Francisco revealed that ice sheets melt faster then expected. The Arctic ice is shrinking and thinning at a much faster pace then expected and latest modeling studies indicate that the northern polar waters could be ice-free in summers within just 5-6 years. Similarly, the Greenland ice sheet melted at a record rate this year, the largest ever since satellite measurements began in 1979.
Scientists observed that over the past few years the speed at which some of Greenland’s glaciers flow towards the sea has doubled. They think that one factor might be the holes created in the ice due to warming, through which the water of melting surface ice is penetrating below the ice and thus speeding the flow of ice toward the open ocean. While Greenland's melt water presently increases global sea level by about a quarter of an inch per decade, an accelerated melt would seriously endanger world’s shorelines. [December 2007. Military Implication, Sources]

Modifications of atmospheric energy transport, heat moving toward the North Pole, and changes in the vertical temperature structure might represent the accelerating factor of the Arctic warming, reveals the article Vertical structure of recent Arctic warming by a group of scientists from the Department of Meteorology, Stockholm University, Sweden, published in Nature. In recent decades, the near-surface Arctic temperature rise was almost double the global average, and the study found that during the summer, the Arctic upper atmosphere was warming up twice faster each decade, thus accelerating thawing of sea ice and snow. Increasing GHG emissions seems to be an influencing factor of the atmospheric heat transport.

Antarctica is losing almost as much ice as Greenland, according to data gathered by an international satellite network measuring the thickness of the glaciers. Analyzing 10 years data (1996-2006), the international team led by Eric Rignot of NASA’s Jet Propulsion Laboratory, Pasadena, CA, found that ice loss in Antarctica increased by 75% in the last 10 years. Mapping patterns of ice loss on a glacier-by-glacier basis, they remark that West Antarctica lost about 49 billion metric tons more ice in 2006 than the approximately 83 billion metric tons in 1996, and that total loss of ice from Antarctica in 2006 was enough to raise global sea level by 0.5 mm.

In September 2007 the Arctic ice cap had shrunk to 4.13 million square kilometers (1.6 million square miles), down from 5.3 million square kilometers in 2005, a loss about twice the size of France, notes Jean-Claude Gascard, coordinator of the European scientific mission Damocles, which is monitoring the effects of climate change across the Arctic. 2008 might be a critical year and could result in the loss of another million square kilometers, he added.

The IPCC is inviting scientists to submit material on both Antarctic and Greenland ice sheets, given the huge effect their potential simultaneous melting might have on sea level raise. The aim is to gather information and evidence on the impact of global warming at the poles, and to assess potential consequences to be addressed in an eventual IPCC fifth report. [January 2008. Military Implication, Sources]

The Japan Agency for Marine-Earth Science and Technology revealed that permafrost in Siberia is thawing at an alarming pace. In some areas the depth of the melted permafrost doubled compared to 2000. Thus the lakes and marshes expand, in some areas being about 3.5 times larger in 2007 than in 2000, consequently accelerating the melting process even more. The research also shows that the annual average ground temperatures at the depth of 1.2 meters from the surface rose gradually from minus 2.4°C in the period from 1998–2004 to minus 0.4°C in 2006. An additional negative result of permafrost melting is the release of high quantities of methane, further promoting global warming.

New research by climatologists from Bern University on ice cores from Greenland and Antarctica shows that Earth warmed faster in the 20th century than at any other time in the past 22 millennia, and concentrations of greenhouse gases are increasing at a faster rate.

UK scientists have found instability trends in the ice of part of West Antarctica, which could lead to a significant rise in global sea level. They warn that if the discharge of glacier ice into the
sea continues, the Pine Island Glacier alone could raise global sea level by 25 cm and accelerate neighboring glaciers’ discharge, which could raise the sea by 1.5m. [February 2008. Military Implication, Sources]

At the southwestern edge of the Wilkins Ice Shelf of western Antarctica, a chunk of ice with an area of about 400 sq km broke up into icebergs. This might trigger the disintegration of a larger part of the Wilkins Ice Shelf, which totals about 14,500 sq km, and is now connected by only a 6 km strip of ice.

According to data of UNEP’s World Glacier Monitoring Service (WGMS), the average rate at which the world’s glaciers are melting and thinning has more than doubled between the years 2004-2005 and 2005-2006. Analyzing data from around 100 glaciers, with continual annual data series for 30 reference glaciers since 1980, WGMS found that average ‘water equivalent’ loss has risen from 0.3 meter per year between 1980 and 1999, to about 0.5 meter per year after the year 2000, and estimates of 1.4 meters in 2006. Out of the 30 reference glaciers only one (Echaurren Norte in Chile) thickened in 2006 compared to 2005, while all the others shrank, with European glaciers being among the most affected. Glaciers represent the only fresh water source for millions of people around the globe. [March 2008. Military Implication, Sources]

Melting ice caps because of global warming may trigger more volcanic eruptions, scientists estimate. Thinning ice and thus reduced weight on the earth’s crust changes the geological stresses inside the crust in general, and also intensifies the rate of magma melting, increasing the possibility of eruptions, explain scientists Carolina Pagli of the University of Leeds, UK, Freysteinn Sigmundsson of the University of Iceland, and Bill McGuire of University College London in the UK.

Arctic permanent ice shelves are breaking off or cracking at a higher rate than feared, noted polar ice researchers who accompanied Canadian Rangers on a patrol around Ellesmere Island. They estimate that the High Arctic ice shelves could all be fragmented in a matter of years. Another study, by scientists of the National Center for Atmospheric Research (NCAR) and Colorado State University (CSU), reveals that new Arctic sea ice is on average so extremely thin, that it melts under the sunshine of clear summer skies it once could survive. U.S. submarines’ readings reveal a 40% reduction in sea ice thickness since 1960.

The Arctic Climate Impact Science – An Update Since the Arctic Climate Impact Assessment report, produced for the World Wildlife Fund, presented to the Arctic Council, says that there could be factors contributing to climate change that were not even considered, since the real changes are happening much faster than predicted by computer models and scientists. The report estimates that the summer ice pack could be gone in 5 to 32 years.

Release of long-stored methane gas from the thawing of the Arctic is one of the phenomena that could have catastrophic warming effects. At the annual conference of the European Geosciences Union held in Vienna, Russian polar scientists presented evidence that the first stages of melting have already begun off the coast of Siberia, as well as on land in northern Siberia.

There is research underway for the use of this methane as fuel. The state-owned Japan Oil, Gas and Metals National Corporation announced that it wants to extract some 7 trillion tonnes of methane estimated to exist in Japanese coastal waters. However, there are fears that this might release huge volumes of gas with possible disastrous environmental consequences. [April 2008. Military Implication, Sources]
New findings show that glaciers are melting fast around the world from Africa's Kilimanjaro—projected to completely disappear sometime in the next 20—50 years, to South America's Andes Mountains, Europe's Alps, and Asia's Himalayas. Tibet's glaciers may disappear within 100 years, threatening hundreds of millions of farmers in China's western regions. [December 2006, Military Implication, Sources]

NASA satellite observations revealed Greenland snow is melting faster then expected. In 2006, in some monitored areas there were 10 days more of melting snow than the average over the past 18 years. This is consistent with the pattern observed since 1988. "We need to do more. The situation is very dramatic," remarked European Commission President, José Manuel Barroso after visiting Greenland to personally observe the effects of global warming. The hunting and fishing season has shortened to four to five months compared to eight months a few years ago. The UN choice to celebrate World Environment Day 2007 in Tromsø, the Nordic Norway city, was to stress the global environmental impact of melting ice and snow and the role of satellite technology in identifying and analyzing long-term climatic trends and changes in polar regions. [June 2007, Military Implication, Sources]

Greenland’s ice melting rate had tripled between April 2002 and November 2005, compared to the rate between 1997 and 2003, according to research by Jianli Chen and colleagues at the University of Texas in Austin and published in the journal Science. Although controversial, the results definitely indicate that rise in sea levels this century will likely be higher than originally forecasted. "If the Greenland cap melted completely, it would raise global mean sea level by about 6.5 meters. If this were to occur, most of the world’s coastal regions would be subject to flooding," warn the authors. Meanwhile, the glaciers of Southeast Alaska are shrinking twice as fast as previously estimated, according to a study by Fairbanks and Juneau glaciologists, published in the Journal of Geophysical Research. Sea ice is also melting at a record pace near the North Pole, due to a record hot summer that arrived in many northern settlements a full month earlier, following an unusually mild winter and spring, say locals. Inuit peoples of the far north in Canada began ordering air conditioning. The town of Kuujjuaq, at about 1,500 kilometers north of Montreal, has purchased 10 air-conditioning units as the inside temperature reached 31° Celsius (88° F.) in late July. Ice is melting at an increasing rate around the globe, and scientists warn that this might indicate that the effects of global warming are showing up faster than previously expected. Based on the latest calculations, Greenland ice loss increased by 250% between May 2004 and April 2006 compared with the two years between April 2002 and April 2004, which translates to an equivalent global sea level rise of about 0.5mm (0.02 inches) per year. Likewise, 95% of the glaciers in southeast Alaska (stretching from Yakutat Bay to the Stikine Icefield in British Columbia) are thinning at twice the rate that was previously estimated, according to a new study.

The National Snow and Ice Data Center reported that the North Pole ice melted again at a record rate this summer, meaning that the Arctic could be ice-free in summer far sooner than predicted a year ago. Similarly, based on data from Envisat’s Advanced Synthetic Aperture Radar (ASAR), European scientists determined that around 5%-10% of the Arctic’s perennial sea ice has been fragmented by late summer storms and the ice had retreated to the point of opening a navigation passage from northern Siberia or the Norwegian island of Spitzbergen to the North Pole. "If this anomaly trend continues, the North-East Passage or ‘Northern Sea Route’
between Europe and Asia will be open over longer intervals of time, and it is conceivable we might see attempts at sailing around the world directly across the summer Arctic Ocean within the next 10-20 years" says Mark Drinkwater of ESA’s Oceans/Ice Unit. New evidence also suggests that Antarctica has warmed about 1.4° per century—a fact that was masked at the end of the 20th century by large temperature variations. [September 2006. Military Implication, Sources]

Mission to Study Arctic Environmental Changes
The UN launched a two-year scientific mission in the Arctic to monitor changes in global climate, thinning of the ozone layer, and impacts of chemical pollution. There is evidence that the Arctic climate is warming rapidly and that more serious changes are looming, which, although with global effect, would most drastically affect indigenous communities and polar biodiversity. [July 2006. Military Implications, Sources]

SEA LEVELS RISE

Rising sea levels and melting ice-caps will redraw physical boundaries, potentially forcing the evacuation of island nations like Tuvalu in the South Pacific, and causing tensions over new shipping routes through the Arctic, like the North-West Passage.

Scientific evidences and possible consequences

Six of the 18 inhabited low-lying Australian Torres islands have little or no elevation and are in danger of being swallowed by the sea. The islanders are already suffering because of abnormally high tides, land erosion, shifting seasons, and increasingly scarce marine life that traditionally constitutes their food source. Aborigines and Torres Strait islanders regained ownership of their traditional lands in 1992. Already socially and economically marginalized, the roughly 7,000 people are unhappy with the lack of attention and care on the part of the Australian government.

The Ocean Surface Topography Mission (OSTM)/Jason 2 mission to be launched in June will provide data for better understanding ocean currents and the rises in sea levels. Current marine measurements show that sea levels have risen on average by 0.3 centimeters since 1993, twice that, in the whole 20th century. The Jason 2 mission is a partnership between NASA, the National Oceanic and Atmospheric Administration, the French National Center of Space Studies (CNES), and the European satellite agency EUMETSAT. [May 2008. Military Implication, Sources]

A new study by Australian and US researchers shows that ocean waters are heating up 50% faster at the surface then previous estimates (including those in the IPCC report). This explains the more rapid than estimated sea level rise. They also underline that sea ice melting is not of great concern to sea level rise; nevertheless, land ice melting is: if it all melted, sea levels would rise 70m (however, fortunately, they say, 57m of those are locked up in Eastern Antarctica, which seems to be stable for 20 million years and is not affected much by global warming).
Rising sea levels and coastal erosion will render small Pacific islands uninhabitable by the end of the century. Anote Tong, president of the Republic of Kiribati, has appealed to the international community to take responsibility for relocating the country’s 97,000 citizens.

Bangladesh, the world’s most densely-populated nation, is at risk of disappearing under the water by the end of this century as result of ‘saline inundation’ in the inland region, and coastal erosion and flooding at the coastal area. India has already begun to take security measures against the expected mass migration.

Cities along Australia’s northern and western coastline became vulnerable to ‘the Venice effect’ with increased frequency of flooding during seasonal high tides, revealed scenarios outlined in more than 40 submissions to a federal inquiry on the environmental impacts of climate change on coastal communities. Climate models suggest that mean sea-level rises on the east coast of Australia could exceed global averages, said the Bureau of Meteorology.

A report by the Japanese Ministry of the Environment urges the government to consider the effects of global warming—mainly rising seas and stronger storms—in long-term strategies, such as urban planning. It also suggests that residents in vulnerable areas should be relocated to safer places. [June 2008. Military Implication, Sources]

During the recent meeting at the UN Open-ended Informal Consultation Process on Oceans and the Law of the Sea, Indonesia said it has lost 26 islands to climate change.

A team of scientists from the University of Colorado-Boulder's Institute of Arctic and Alpine Research, INSTAAR, and the Russian Academy of Sciences estimates that by 2100 accelerating melt of glaciers and ice caps could cause 0.1–0.25m (4–9.5 inches) additional sea level rise. This rise might be doubled if the expansion of ocean water warming is factored in. [July 2007. Military Implication, Sources]

The coastline along the Pearl River Delta—China’s most economically dynamic region—is expected to be the worst hit by rising sea levels by 2050. Egypt is facing similar worries as rising waters of the Nile Delta threaten millions of people and Egypt's food supply. [August 2007. Military Implication, Sources]

At recent UN meetings, low-lying states reiterated their call for increased action against global warming. The small island-state of Tuvalu could disappear in 30 to 50 years. Increased salinity and flooding could displace millions in Bangladesh. [September 2007. Military Implication, Sources]

Bangkok, Thailand's sprawling capital of more than 10 million people might be submerged within the next 15 to 20 years, due to sinking ground and the seawater rising, warn experts. Bangkok is one of 13 of the world’s 20 largest cities at risk of being swamped as sea levels rise in coming decades, according to the Intergovernmental Panel on Climate Change. [October 2007. Military Implication, Sources]

Rising sea levels, increasingly destructive and more frequent storms, erosion, and floods will cause some areas of Britain to sink into the sea over the next 30 years, warn some experts. It seems that some parts of the Norfolk and Suffolk coastline could not be saved, according to leaked findings of a study conducted by the UK Environment Agency and to be published in June 2008. A Department for Environment, Food and Rural Affairs spokesman said, “Spending
on flood and coastal erosion risk management has nearly doubled in cash terms, from £307 million in 1996-97 to an estimated £600 million in 2007-08. The Government will further increase spending to £800 million in 2010-11.”

Erosion, flooding and permafrost thawing are also menacing some Alaskan areas and peoples’ livelihood. On the island of Kivalina, uncertainty and frustration raise tension among the 400 residents whose relocation is yet to be decided. [November 2007. Military Implication, Sources]

WMO reports that global averaged sea-level in 2007 is estimated about 20 cm higher than the 1870 estimate. Satellite measurements show that, since 1993, global averaged sea-level has been rising at about 3 mm per year, considerably more than the 20th century average of about 1.7 mm per year.

At the Bali Climate Change Conference, small island states reiterated the catastrophic impacts that global warming and rising sea levels could have for their nations and called for swift action to reduce man-made causes and increase adaptation measures.

According to U.S. government reports, more than 180 Alaskan villages are in danger because of shoreline erosion and permafrost melting due to global warming. Some are in immediate need of moving, although there are no clear relocation plans, nor adequate funding.

The Climate Change: A New Threat to Middle East Security report by Friends of the Earth Middle East (FoEME) highlights that consequences of climate change—mainly rising sea levels and freshwater shortage could exacerbate security risks in the Middle East. Unless adequate adaptation actions, the large-scale consequences include threat to “national, regional, and global security” warns Nader Khatib, Palestinian Director of FoEME. [December 2007. Military Implication, Sources]

A forecast model shows that coastal erosion might increase 2-5 times over the next 50 years due to rising sea levels and more powerful storms. One of the most affected areas seems to be Russia’s East Arctic coast, which might lose 5 to 15 meters per year in 2040-2045. Russia is already recording high retreat along its 50,000-km northern coastline because of permafrost melt and Arctic Ocean rising levels, waves and tides and subsequent thermal abrasion. About 33% of Russia's eastern Arctic coast also suffers from thermal abrasion. In some places, the coast’s annual retreat reaches 15 meters.

Along China’s 18,000-km (11,185 miles) coastline, sea levels have risen by an average of 9 centimeters (3.54 inches) over the past 30 years, and coastal waters are getting slightly warmer, reports the country’s State Oceanic Administration. The most affected is the northern part, where, over the same period, sea level rise reached 19.6 centimeters (7.72 inches) at Tianjin port city, and 11.5 centimeters (4.53 inches) at Shanghai, causing increasingly huge problems in highly populated areas. Meanwhile, the China 2007 Sea Environmental Quality Report reveals increased pollution of coastal waters as a result of human activity.

The situation of the small islands of Tuvalu becomes increasingly critical. While the highest point of the islands is barely over 4 meters, a typical high tide reaches about 2 1/2 meters and a King Tide can be over 3 meters high; the forecast is that they will get higher due to global warming. The seawater is also surging up through the coral that forms the islands, salinizing the soil and groundwater.

The level of the Mediterranean is rising rapidly and could produce “catastrophic consequences”, warns the study Climate Change in the Spanish Mediterranean by the Spanish
Oceanographic Institute. Since 1990, the study estimates that the Mediterranean has risen between 2.5 and 10 millimeters (0.1 and 0.4 inches) per year, meaning that if present trends continue, the water levels will rise between 12.5 centimeters (5 inches) and 0.5 meter (20 inches) in around 50 years. Mediterranean water temperatures also rose by 0.12 to 0.50 degrees Celsius since the 1970s. [January 2008. Military Implication, Sources]

Bangladesh, chair of the Least Developed Countries, insists that developed countries increase LDC’s access to investment, resources and technologies needed to adapt to climate change effects. Of more than $1 billion pledged at the 2002 Johannesburg Earth summit for improving preparedness of vulnerable countries, less than $180 million have been delivered, and no contributions were yet made to the investment fund set at Bali. Being the most at risk, LDCs demand to take an active part in the global climate talks. At Bangladesh’s request, Britain offered financial support for LDCs participation in negotiations and will host a conference in May addressing Bangladesh’s vulnerability. A one-meter sea level rise would flood about one-third of Bangladesh, affecting about 25–30 million people.

Recent data from the U.S. Geological Survey warns of the danger that rising sea levels over the next 50 years represent to the U.S. coastal population. Among the most threatened are the islands of California’s Sacramento-San Joaquin delta, the islands in Chesapeake Bay, parts of the Louisiana coast, and the New York subway system. However, the 5,000 residents of the California’s delta islands are likely to become the first environmental refugees in the United States. The threat is the result of the interplay of two factors both effects of climate change: rising sea levels, and increased rainfalls over snow in the Sierra Mountains as a result of warming temperatures, thus raising the risk of floods. [March 2008. Military Implication, Sources]

Rising Sea Levels Claim First Inhabited Island and Threaten Coastal Populations Worldwide

Scientists emphasize that extreme scenarios—as effects of climate change—have to be integrated into the decision-making process. Latest estimates by climatologist Stefan Rahmstorf of the Potsdam Institute for Climate Impact Research show that the world's oceans may rise up to 140 cm (4 ft 7 in) by 2100 due to global warming, considerably higher then the 9-88 cm projected by IPCC. His study is based on air temperatures and past sea level changes rather than computer models. The scientist underlines that the different results obtained “with reasonable methods” show the serious uncertainty concerning sea level forecasts; however, there is compelling evidence that shore communities are particularly at risk.

Rising sea levels have submerged two islands in India's part of the Sundarbans—where the Ganges and the Brahmaputra rivers empty into the Bay of Bengal—and a dozen more islands in the area are at risk, threatening nearly 100,000 people who will have to be evacuated in the next decade. Lohachara, which had a population of 10,000 people, is the first inhabited island to disappear due to rising seas caused by global warming. The people of the Carteret Islands off Papua New Guinea also live under the continuous fear of stronger and more frequent rising tides threatening their entire livelihood and eroding their land. The islands are expected to disappear in about eight years. Similarly, whole island nations, from the Maldives to the Marshall Islands, vast areas of countries from Bangladesh to Egypt, and many coastal cities are at risk as sea levels continue to rise. In Alaska, 184 out of 213 native villages are at some point affected by erosion and flooding due to global warming, threatening the culture and the very survival of the
Coastline Erosion due to Rising Sea Waters Signaled Around the World

Coastline erosion as one of the effects of rising sea levels is increasingly felt around the world by low-lying communities. Hundreds of people are being displaced on the Carteret Islands, Papua New Guinea, and millions are threatened along the shorelines from Sri Lanka and Bangladesh, to coastal Louisiana and England. Experts warn that England's coastline erosion might accelerate as global warming leads to rising sea levels and harsh weather. Over the next century, half of the 1,125 kilometer coastline in the administration of the National Trust charity—Britain's largest owner of coastline—is expected to be severely affected by erosion. Lyme Regis in Southwestern England is already threatened by rising seawaters that are carving away its harbor and coast. To this, should be added the increasing acidity of ocean waters—due to CO2 levels that are over the ocean's natural buffering capacity—dissolving calcium and therefore severely affecting marine ecosystems, especially coral reefs that are the main support to many geologically new islands. [See also Climate change—Research Documents Continued Global Warming Effects and Rising Sea Level Triggers Rising Refugee Move in April 2006 and other previous environmental security reports.] [August 2006. Military Implications, Sources]

Polar Bear, the First Species declared Endangered Due to Global Warming

Polar bears were declared a “threatened” species under the U.S. Endangered Species Act, becoming the first species officially designated in danger of extinction because of global warming. Environmental groups are not pleased with the new regulation, since important greenhouse gas emission-related activities, such as offshore oil and gas exploitation, are exempted from compliance with the law. [See also Melting Glaciers and Sea Ice in August 2007 and other similar items in previous environmental security reports.] [May 2008. Military Implications, Sources]

FOOD AND FRESHWATER

Living Planet Report 2006

Living Planet Report 2006, by the WWF and the Global Footprint Network, reveals that humanity's impact on the planet has more than tripled since 1961 and Earth's resources are being used faster than they can be replaced by nature, and it warns that, if present trends continue, by 2050 humanity will demand twice as much as the planet can supply. The report breaks down the ecological footprint into components, such as CO2, food production needs, infrastructure requirements, etc. The countries with the highest ecological footprint are: the United Arab Emirates, U.S., Finland, Canada, Kuwait, Australia, Estonia, Sweden, New Zealand, Norway and Denmark. [October 2006. Military Implications, Sources]
Food Crisis

As the food crisis intensifies around the world over the past few months, an additional 100 million people began suffering from hunger and there were food riots in some 30 countries, including recently conflict-torn countries such as Haiti, Côte d'Ivoire, Senegal, and Somalia. Some argue that the Security Council should consider the issue in order to stop escalation into larger global security crises. "The Security Council would be remiss in carrying out its responsibility for maintaining peace and security if it fails to take the much needed preemptory steps to stop further deterioration of the security dimensions of the global food crisis," says Anwarul Karim Chowdhury, a former Bangladeshi ambassador and UN High Representative for Least Developed Countries (LDC). He compared the food crises to others—such as HIV/AIDS—that were discussed at the Security Council level and recalls that the bodies dealing with the food situation (ECOSOC and FAO) do not have security-related mandates. [May 2008. Military Implication, Source]

Continually Rising Food Prices Threaten Long-Term Global Stability. According to UN data, global food prices rose 35% this year and have already risen 65% since 2002. Biofuels competition for land and water, climate change, oil prices, and increasing population and incomes all contribute to the long-term increases in food prices. The Food and Agriculture Organization found that dairy prices rose nearly 80% and grain 42% in 2007. With nearly 3 billion people making $2 or less per day, long-term global social conflict seems inevitable without more serious food policies, scientific breakthroughs, and dietary changes. [March 2008. Military Implication, Source]

UN Food and Agriculture Organization warns that world food supply is diminishing rapidly and food prices reached historic highs, increasing the “very serious risk that fewer people will be able to get food,” particularly in the developing world. FAO records show that world grain stock—corresponding to the world’s total consumption—declined to 12 weeks for wheat and only 8 weeks for corn. Population growth, the effects of global warming and increase of biofuels industry are among the main factors. Josette Sheeran, executive director of the World Food Program expressed concerns that we are “facing the perfect storm for the world’s hungry.”

New computer projections also warn of possible future crop production reduction due to climate change. NOAA models show the effects that climate changes could have on the tropical belt and the possible consequences to ecosystems and human settlements. New projections by the Massachusetts Institute of Technology indicate that unless there are serious emission cuts, ozone pollution might increase 50% by 2100, which could result in a decrease of global economic value of crop production by 10% to 12%. Nevertheless, the present situation shows that changes are happening faster then computer-based climate simulations have forecast.

Three studies coauthored by researchers from prestigious organizations in North America, Europe and Australia, published by the National Academy of Sciences, warn that the future food situation might be worse then presently estimated, since many parameters that would influence crops were not efficiently factored in. “Many people assume that we will never have a problem with food production on a global scale. But there is a strong potential for negative surprises,” said Francesco Tubiello, a physicist and agricultural expert at NASA's Goddard Institute of Space Studies, who coauthored all three studies. [December 2007. Military Implication, Sources]
The number of riots is likely to rise around the world as the number of people at risk of malnutrition grows due to commodity prices’ increase, warn UN officials. The WFP, which feeds 73 million people in 78 countries (representing less than 10% of world’s total undernourished) noted that it will face serious difficulties this year in helping to mitigate malnutrition. Food prices rise rapidly, driven mainly by decrease of supply as harvests are reduced by climate change effects (drought, floods, and extreme weather conditions); increasing food demand from countries such as China and India; increasing demand by the biofuel industry; and soaring oil prices. Additionally, the governments of some important food-exporting countries tend to put restrictions on exports, in order to assure their own food security.

Using computer models, analysts assessed how the 12 most food-vulnerable areas are likely to be affected by climate change in the next 20 years. This included the regions where most of world’s malnourished people live: much of Asia, sub-Saharan Africa, and the Caribbean and Central and South America. The findings reveal that South Asia and southern Africa are the areas where climate change could cause severe crop losses, unless intense adaptation strategies are undertaken. The study also identified the likely effects by crop, therefore providing governments and aid agencies important information for building a comprehensive adaptation approach.

Food’s Failed Estates = Paris’s Hot Cuisine; Food Sovereignty – à la Cartel? by ETC Group analyzes food security prospects and policy failures and needs. It looks at all aspects that might drive food out of the reach of the marginalized, and warns that, without adequate action, the number of hungry people could increase by 50% by 2025.

The west of North America is seriously threatened by possible future lack of access to fresh water, as snowpack across the mountain ranges is shrinking, according to a computer analysis published in the journal Science. Using a complex system of factors’ interplay, the results show that up to 60% of the climate change trends in the area are human-induced.

The World Wide Fund for Nature - South Africa (WWF-SA) is warning the country’s government about a “looming water crisis for South Africa in the same way that it was warned a decade ago about the present energy crisis.” The country already uses 98% of available water resources and it could run out of water by 2025. [February 2008. Military Implication, Sources]

An EU report, Climate Change and International Security, warns that water scarcity and food insecurity caused by rising prices and diminishing harvests, particularly in the Middle East, are likely to cause “serious security risks” for Europe and internationally.

African Environment Day, organized by the African Union (AU) Commission to raise awareness of the impact land degradation and desertification have on Africa’s development, was observed under the theme “Adapting to Climate Change for Livelihood Security in Africa.” [March 2008. Military Implication, Sources]

Continuous escalation of food prices worldwide increases distress in poor regions, raising the danger of social and political unrest. Demonstrations and/or riots due to unaffordable basic needs have already erupted in Egypt, Cameroon, Haiti, Burkina Faso, Indonesia, Ivory Coast, Mauritania, Mozambique and Senegal. FAO says that six countries have an “exceptional shortfall” of food supplies: Lesotho, Somalia, Swaziland, Zimbabwe, Iraq, and Moldova, while another six suffer of “widespread lack of access” to food: Eritrea, Liberia, Mauritania, Sierra Leone, Afghanistan and North Korea. Out of the estimated ~40 countries at “food crisis” risk,
some 20 are or were recently affected by internal conflicts, and 21 have suffered from floods, droughts, and other weather disasters.

The International Assessment of Agricultural Science and Technology for Development Synthesis Report presents statistical analyses of basic food prices, an assessment of the state of world agricultural regions and threats to production; suggests several strategies and methods to increase agricultural efficiency, such as how to produce food that is less dependent on fossil fuels and favors natural fertilizers and traditional seeds; and offers suggestions for rational use and preservation of soil and water supply.

In Australia, a six-year-long drought reduced Australia’s rice crop by 98% affecting local population, prices, and importing countries’ food source. [April 2008. Military Implication, Sources]

Actions for addressing Food Crises

Secretary-General Ban Ki-moon announced a new international UN Task Force on the Global Food Crisis, composed of the heads of key UN agencies and institutions, to prepare a comprehensive plan of action to tackle the global rise in food prices. The elements of the task force’s plan will be presented at the UN and FAO High-Level Conference on World Food Security, Climate Change and Bioenergy to be held in Rome, June 3-5, 2008.

The International Planning Committee for Food Sovereignty suggests the creation of a UN Commission on Food Production, Consumption and Trade, as a more inclusive mechanism to replace the UN Task Force. It also advocates that the food emergency situation should override previous trade and international agreements and a new trade dialogue should begin under the auspices of the UN. [May 2008. Military Implication, Source]

About 5,100 people from 181 countries, including 43 heads of state or government and 100 ministers, participated in the June3-5 FAO conference on World Food Security. The governments adopted the “Comprehensive Framework for Action” and pledged $13 billion during the conference. FAO Director-General Jacques Diouf estimates that $30 billion a year will be needed to re-launch agriculture and avert future threats of conflicts over food, and UN Secretary General Ban Ki-moon reiterated that food production should increase by 50% by 2030 to overcome the long-range food crisis. The next forums to address the food crises are the G8 summit in Japan in July, the UN/FAO Food Security Committee meeting in October, and the FAO Conference in November. [See also Continually Rising Food Prices Threaten Long-Term Global Stability in March 2008.] [June 2008. Military Implication, Source]

The International Federation of Red Cross and Red Crescent Societies launched a new five-year food security strategy in Africa focusing on long-term investments to improve food security programmes in 15 African countries. The new plan will include new technologies, seed banks and soil nutrient management, and the establishment of community-based food security monitoring systems.

The Twenty-Fifth Special Meeting of the Council for Trade and Economic Development (COTED) on the Environment held in Greater Georgetown, Guyana, April 17-18, 2008 focused on critical environmental issues that affect the lives of people of Small Island Developing and Low-Lying Coastal States. It was agreed that the Caribbean Community Environmental and Natural Resource Framework should address adaptation to climate change effects and food security and freshwater resources.
A conference hosted by the European Water Forum in the European Parliament on 16 April increased the warnings of growing water scarcity concerns, calling for speedy solutions to combat water shortages, which might include higher water prices to deter overuse.

In order to assist countries to adopt a new strategy for addressing food and water security by engaging international action to combat desertification, land degradation and drought, the UN Convention to Combat Desertification Secretariat is convening a high-level policy dialogue to be held in Bonn, Germany on May 27. [April 2008. Military Implication, Source]

Food security was the main theme of the 10th Summit of the Community of Sahel-Saharan States (CEN-SAD). The Tunisian delegation has submitted a proposal to set up a food security observatory for the Sahel-Saharan States (CEN-SAD) region, to prevent and/or deal with food crises. The role of the observatory would be to monitor agricultural products’ availability and prices, and investments in agricultural growth, as well as natural resources such as water and soil, and formulate strategies and policies based on food availability and needs. The project should be funded by member states and partners, and the stakeholders should be member states and executive organs of the African Union and sub-regional organizations. [June 2008. Military Implication, Source]

Food Crises and Biotechnology

At this time, when food security threatens stability around the world, a few agricultural biotechnology companies are trying to concentrate corporate power, gain a monopoly over a large part of global food, undermine small farming and farmers rights, and most likely drive up costs. “Globally, the top 10 seed corporations already control 57% of commercial seed sales. This is a bid to capture as much of the rest of the market as possible,” explains Hope Shand, Research Director of ETC Group. According to ETC Group’s report, Patenting "Climate Genes"...And Capturing the Climate Agenda, Monsanto, BASF, DuPont, Syngenta, Bayer and Dow—along with some biotech partners—have filed 532 patent documents on genes related to environmental stress tolerance at patent offices around the world. In the meantime, poor countries complain that unfair policies are threatening their local seeds, undermining agricultural productivity and jeopardizing national food security. Some Indian farmers are giving up planting rice, because it is not cost-effective anymore, due to the high prices of fertilizer, seeds and pesticides. [May 2008. Military Implication, Source]

Water Scarcity

Experts (including Nicholas Stern) attending the Goldman Sachs ‘Top Five Risks’ conference, reiterated the warning that the possible future water shortage would be a bigger threat to mankind this century than the food crises and exhaustion of energy reserves. The Himalayas for instance are the source for all the major rivers of Asia and for almost half the world's population.

In Africa, to shrinkage of mountain glaciers from Mount Kilimanjaro to Uganda’s Rwenzori mountains—which decreased by 50% between 1987 and 2003, drying lakes such as Lake Chad, and falling water levels in Lake Victoria, the atlas adds new cases of disappearing water bodies like Lake Faguibine, as well as the many examples of desertification, unsustainable large-scale
irrigation and degraded coastal areas that are further increasing the threat to already scarce water reserves. [June 2008 Military Implications, Sources] Global warming is most probably the cause of changing rainfall patterns in Australia, concluded scientists gathered to discuss recent findings by the South-Eastern Australia Climate Initiative (SEACI). Assessing specifically the decline of rainfall and inflows into the Murray-Darling river systems over the past decade, SEACI, a three-year project that began in 2006, reveals that the Southeast Australian water system will most likely be increasingly stressed in the future as rainfall is expected to be significantly reduced, concomitantly with suspected warmer temperatures. Dr Wendy Craik, chief executive of the Murray-Darling Basin Commission, notes that in some parts of the basin the drought is more severe than the worst climate change predictions for 2055. Since future prospects are not encouraging, drought-adaptation strategies should be considered. [May 2008. Military Implications, Sources]

Water security will be affected by earlier melting of glaciers and mountain snow, leaving millions of people in need during the summer when rainfall is lower, warn scientists. The earth's sub-tropic zones, home to 70% of the world's population, are the most vulnerable. The areas most at risk include parts of the Middle East, southern Africa, the United States, South America and the Mediterranean.

The fast melting high altitude glaciers in Andean mountains alter eco-systems, affecting the livelihood of people of Peru, Ecuador and Bolivia. The IPCC estimated that rising temperatures could melt most of Latin America’s glaciers by 2022. In some regions, demand for water might exceed supply as soon as 2009. [April 2008. Military Implications, Sources]

World Water Day theme in 2007 was ‘Coping with Water Scarcity’ to highlight limited water resources and the imbalances between availability and demand.’ If today water scarcity affects 700 million people around the world, by 2025, this could rise to more than 3 billion. Since many of the world's rivers and aquifers are shared among countries, conflicts are likely to be exacerbated, unless integrated cross-border water management systems are implemented. Several reports released on the occasion of World Water Day reveal today’s realities, suggesting policies and future possible developments. The WWF report, World's Top Rivers at Risk, warns that global warming and man-made causes destroy some of the world's largest rivers, threatening ecosystem and people’s livelihood. The report assesses pollution, development, and water management of ten of the world's most important rivers: the Nile, the Danube, the Rio Grande, La Plata, Yangtze, Mekong, Salween, Ganges, Indus, and Murray-Darling. It is calling on policymakers to take notice of the emergency nature of the situation and to set up strategies to reverse damage to freshwater sources. “Conservation of rivers and wetlands must be seen as part and parcel of national security, health and economic success,” stressed Jamie Pittock, WWF Global Freshwater Programme Director. The IPCC report Impacts, Adaptation and Vulnerability, forecasts that “hundreds of millions of Africans and tens of millions of Latin Americans who now have water will be short of it in less than 20 years. By 2050, more than 1 billion people in Asia could face water shortages. By 2080, water shortages could threaten 1.1 billion to 3.2 billion people, depending on the level of greenhouse gases that cars and industry spew into the air.” The report will be released at the beginning of April. As Peru’s glaciers are melting, the country might run out of water. In China, air pollution is causing reduced rainfall, increasing drought in northern China. [See also World Water Forum 2006, Unless Water Management]
Improves, Conflicts over Water Are Inevitable, and other previous environmental security reports on the water issue. [March 2007. Military Implications, Sources]

Actions for Addressing Water Security

A Review of Decision-Making Support Tools in the Water, Sanitation, and Hygiene Sector, a study directed by Peter H. Gleick at the Pacific Institute and by Geoffrey D. Dabelko at the Wilson Center's Environmental Change and Security Program, evaluates 120 existing resources in the sector, analyses the world’s situation on access to water and sanitation, and assesses existing technologies and methodologies. The report recommends development of a set of tools to help decision-makers with infrastructure development, available technologies, and possible approaches. The tools would also outline specific needs of geographic locations, evaluate community particularities, and use case studies to demonstrate available technologies. [May 2008. Military Implications, Source]

Improvements in the International Stormwater BMP Database (www.bmpdatabase.org) were recently announced. They will ease BMP searches, data collection and uploading, and access to BMP performance analyses. The changes include more data, new data analysis results, easier Web site navigation, and simplified data entry. [May 2008. Military Implications, Source]

Unless Water Management Improves, Conflicts over Water Are Inevitable

The 16th annual conference on water took place in Stockholm, during World Water Week, August 20-26. Reports released during this week warned of possible consequences of future water scarcity, such as increased cost of water, civil unrest, mass migration, and economic collapse. There was consensus that poor management of water resources and soaring water usage are the main causes of water scarcity increasing worldwide faster than expected; and, unless there are drastic policy changes around the world, the grim statistics will only worsen, mostly in the densely populated and poor regions of China, Mexico, and India. A report by The World Wildlife Federation (WWF), Rich countries, poor water, warns that wealthy nations are threatened by a water crisis similarly to the drought-plagued poor countries, due to climate change, drought, loss of natural wetlands, and over-consumption by industry, agriculture and big cities. The report suggests seven ways to address the problem. The International Water Management Institute notes that while over the past 100 years water usage had increased six-fold, it is expected to double again by 2050.

The World Bank estimates that 20-40% of water sector finances are lost to corruption. Water experts and businesses formed the Water Integrity Network (WIN) to combat corruption in the water sector. WIN is open to all. Transparency International and water corporations are the initial principal members. WIN seeks reforms to improve regulations and transparency, as well as increase public awareness.

Asia's Coming Water Wars, a comprehensive analysis by The Power and Interest News Report, warns of water problems increasing conflicts in some Asian regions already beleaguered by long-standing historical animosities and internal instabilities. The most vulnerable regions for water-related conflicts are Central Asia, South Asia and the Mekong sub-region in Southeast Asia. Considering these regions’ rapid development, growing populations and instabilities, water-related tensions might have wider regional and global significance.
Business in the world of water—WBCSD Water Scenarios to 2025 presents the critical future water situation in three “H2O” scenarios: “H” (Hydro)—urbanization, technical and efficiency-focused, with serious water allocation problems; “2” (Rivers) is a world of water security based on compromise; “O” (Ocean) describes a functional society based on interconnectivity and cooperation of all systems’ actors. [August 2006. Military Implications, Sources]

OSCE Environmental Security Conference Focuses on Land and Water
On January 22-23, 2007 the Organization for Security and Co-operation in Europe (OSCE) held a conference with the theme: “Key challenges to ensure environmental security and sustainable development in the OSCE area: Land degradation, soil contamination and water management.” The speakers were a diverse mix of mostly European political, governmental, environmental, and security experts, who further developed OSCE’s role in environmental security for the region. Germany offered to take the leadership in environmental cleaning up of closed military facilities in the region. OSCE is composed of 56 countries. "The most significant issue presented was the critical rate of loss of arable lands in the arid regions of Eastern Europe. Experts from these countries requested urgent assistance from the OSCE to stem this impending crisis," said Dr. King of the U.S. Army Command and General Staff College, who led the first panel.[January 2007. Military Implications, Source]

Singapore established an Institute of Water Policy with a US$5.5 million 5-year budget to research Asia’s water problems, address water security, and consult to governments and international organizations. [June 2008. Military Implications, Source]

EC Proposal for Water Pricing
The European Commission released a green paper proposing a water framework directive to deal with possible future water scarcity and assure sustainable water use in Europe. Feedback on specific proposals for pricing water on the “user pays” principle is expected from both the European Council and the Parliament. The EC warns that water shortage and drought might become the norm in Europe by 2070. [July 2007. Military Implications, Sources]

Climate Change and Access to Water Addressed as Human Rights
The seventh regular session of the Human Rights Council adopted 36 resolutions on a wide range of issues, including two major reports to be delivered in three years to the tenth session of the Council: one on water as a human right, and another on the relationship between climate change and human rights. In the meantime, 2008 is the 60th anniversary of the Universal Declaration of Human Rights, which will also increase reflections on these two topics. [April 2008. Military Implications, Sources]

Proposal for Recognizing Water as a Basic Human Right
The declaration of the first Meeting of the Parties to the Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes includes a paragraph on water as a basic human right. The meeting adopted several decisions, mostly related to the implementation and compliance procedures of the Protocol, transparency, and involvement of local authorities into the Protocol’s implementation at early stage. The
European ECO-Forum proposed the development of guidelines for governments (national and local authorities) to help in the implementation of the Protocol and urged that they be adopted at the Second Meeting of Parties that would be hosted by Romania in 2010. The first meeting was held January 17-19, 2007 at the Palais des Nations, in Geneva, Switzerland. The Protocol entered into force on August 4, 2005 and as of January 2007, has been ratified by 21 countries. [January 2007. Military Implications, Sources]

PREVENTION AND ADAPTATION

Adaptation Needs and Actions

Tackling climate change in the next quarter-century will require major changes to patterns of investment and financial flows, according to the report Investment and financial flows relevant to the development of effective and appropriate international response to Climate Change by the UN Framework Convention on Climate Change. [August 2007. Military Implication, Sources]

The 2007 droughts in parts of southern Africa reduced maize production by about 40% to 60%. A workshop of over 140 experts on Adaptation Planning and Strategies organized by the UNFCCC and FAO in Rome underlined the long-term implications of abnormal changes in air temperature and rainfall and the increasing frequency and intensity of drought and floods, mainly on the developing nations. Due to the melting of Himalayan glaciers, the Pakistani government established a high-level committee and a study center to study adaptation strategies, including developing efficient water management systems, raising mass awareness campaigns, and changing cropping patterns. [September 2007. Military Implication, Sources]

Asia, being one of the continents most affected by climate change, is increasing its efforts for adaptation and disaster management. The UN University launched a 14-week pilot program to help Asian countries in flood risk assessment and planning for and managing floods. A Japanese initiative using satellite data to provide disaster information in Asia could extend its coverage to other developing countries. The Sentinel Asia project, a Japanese initiative using satellite data to provide disaster information in Asia will be expanded to cover more end users in Asia and could be extended to other developing countries in Africa and Latin America. China also offers its expertise and technology for disaster forecasting and management to other developing countries. [October 2007. Military Implication, Sources]

The Fourth Assessment Report (AR4) Summary for Policymakers by the International Panel for Climate Change is a comprehensive scientific assessment of world climate, dedicated to support and encourage policy negotiations and action. It states with “very high confidence” that post-industrial human activities have warming effects, and with “high confidence” that although the impact of global warming may be “abrupt and irreversible”, adequate adaptation and mitigation policies “can significantly reduce the risks of climate change.” It projects that in 2090-2099 relative to 1980-1999, temperature rise could range between 0.3°C and 6.4°C, and sea level rise up to 0.59m—not including important factors such as changes in ice flow. The regions most affected by climate change are the Arctic, Africa, the small islands, and the highly populated Asian and African megadeltas.
The Synthesis Report addresses: 1. Observed changes in climate and their effects (highlighting observations of increases in global temperatures, melting of snow and ice, rising sea level, and health implications); 2. Causes of change (the likely role of anthropogenic warming); 3. Projected climate change and its impacts (different near and long term scenarios depending on climate policies, and examples of some impacts on systems, sectors, and regions) 4. Adaptation and mitigation options (with examples for several sectors of adaptation option/strategy, policies and measures, technologies, constraints and opportunities); and 5. Long-term perspective (key vulnerabilities, risks and threats, as well as scientific and socio-economic aspects relevant to adaptation and mitigation).

The report underlines that “A wide variety of policies and instruments are available to governments to create the incentives for mitigation action. Their applicability depends on national circumstances and sectoral context.” The AR4 was released in Valencia, Spain, on November 17, 2007 and the key findings will be discussed at the December UN Climate Change Conference in Bali. [November 2007. Military Implication, Sources]

Change in cultivation patterns due to climate change, population growth, increasing oil prices, expansion of biofuels, instability of financial markets, and other economic factors highly affect agricultural commodity prices. Large price fluctuations of agricultural products can have a destabilizing effect on countries’ economies, hindering poverty reduction efforts, potentially even leading to civil rebellion and political instability. The IPCC estimates that in some African countries, yields from rain-fed agriculture would be reduced by 50% due to climate change. According to the UN Food and Agriculture Organization (FAO) Food Outlook report, prices are rising considerably for nearly all major food and feed commodities. Another FAO report, The State of Food and Agriculture 2007, presents a comprehensive assessment of the world’s food situation, including projections up to 2050. ‘Part II - World and Regional Review: a longer term perspective’ highlights the challenges posed to food security by population growth, rapid economic development, increasing demand for biofuels, and climate change. However, FAO’s projections are optimistic, estimating the number of well-nourished people in developing countries to rise from 3.9 billion in 1999–2001 (83% of the population) to 6.2 billion (93%) in 2030, and to 7.2 billion (96%) by 2050. [November 2007. Military Implication, Sources]

“It is now recognized that mitigation alone is unlikely to fully address, in a reasonable time, the challenges that human-induced climate change is likely to bring and that, therefore, much greater attention needs to be given to adaptation to climate change,” said WMO Secretary-General Michel Jarraud, addressing the UN Climate Change Conference in Bali, Indonesia.

Small island states called for help with adaptation programs. Grenada mentioned that the two devastating hurricanes over the last seven years caused damage that amounted to 200% of the country’s GDP. Maldives is spending considerable sums on adaptation efforts, which include building 14 ‘safe islands.’

The Bali roadmap includes, as key issues for the upcoming negotiations, taking action to adapt to the negative consequences of climate change—such as droughts and floods; developing ways to reduce greenhouse gas emissions; finding ways to deploy climate-friendly technology; and financing adaptation and mitigation measures.

At the "Emergency Preparedness and Response Workshop" organized by the UN Office for the Coordination of Humanitarian Affairs (OCHA) in Johannesburg, eight South African and Indian Ocean nations—the Comoros, Madagascar, Malawi, Mozambique, Namibia, Zambia,
Zimbabwe and South Africa—decided to enhance regional cooperation for emergency response in case of natural disasters. The draft Declaration of Intent stipulates cooperation for improved information sharing, establishing regional rapid response teams, and developing measures for free movement of emergency personnel and relief materials in the region.

The first international symposium on public weather services, organized by the WMO has brought together about 120 experts to prepare a road map for improving communities’ protection from natural disasters and adaptation to climate change. The discussions covered issues from weather information gathering and dissemination by national meteorological and hydrological services, to use of weather forecasts and reaction in case of emergencies. The symposium was held in Geneva, 3-5 December 2007.

The UN International Telecommunications Union three-day global forum on "Effective Use of Telecommunications/ICT for Disaster Management: Saving Lives" held in Geneva, launched the ITU Framework for Cooperation in Emergencies (IFCE), which outlines actions helping government and relief agencies to improve disaster preparedness, early warning, and response by using telecommunications resources.

The Convention on Biological Diversity, launched a new adaptation website http://adaptation.cbd.int to help governments and agencies to include biodiversity considerations in their adaptation planning. [December 2007. Military Implication, Sources]

Scientists are increasing efforts to assess the ‘hot spots’ that will be most affected by climate change in order to orient policy making and businesses to help those areas to adapt and cope with new challenges. Investors are already funding projects ranging from new agriculture practices and flood defense systems to renewable energy sources. In Australia, where drought might become the rule and fresh water is already scarce, nearly every major coastal city has a desalination plant, with some, like Perth, with almost all fresh water coming from the ocean, and Melbourne and Sydney soon to desalinate 20%. The energy required by desalination will be mostly green.

Over half of the Republic of Maldives' 200 inhabited islands are eroding at an alarming rate, in some cases forcing relocation of entire island communities. Adaptation actions began already, by raising a massive seawall made of concrete tetrapods that surrounds the entire capital of Malé, and even constructing new artificial, taller islands, such as Hulhumalé. [January 2008. Military Implication, Sources]

“The UN estimates that all but one of its emergency appeals for humanitarian aid in 2007 were climate related,” notes the Climate Change and International Security report.

The Kyoto Protocol’s Adaptation Fund Board held its inaugural meeting in Bonn, Germany, on March 28, 2008. The Fund will finance concrete adaptation projects and programs in developing countries. The fund now estimated at about $58.4 million is expected to increase to $80-300 million over 2008-2012. The finance source is a 2% levy of the Clean Development Mechanism, so it is “not reliant on donor funding or overseas development assistance. This is the climate regime beginning to become self-financing,” noted Yvo de Boer, Executive Secretary of the UN Framework Convention on Climate Change.

The Caribbean states agreed to set up a joint tsunami early warning center by 2010. The center will relay information from national geological institutes across the region. Barbados, Puerto
Rico, and Venezuela were named as possible hosts of the center, which would have a $250,000 annual budget funded by national governments, France, the U.S., and UNESCO. [March 2008. Military Implication, Sources]

Global Facility for Disaster Reduction and Recovery to Mitigate Impact of Natural Disasters

The Global Facility for Disaster Reduction and Recovery, set up by the UN International Strategy for Disaster Reduction in cooperation with the World Bank, is a new initiative aiming to improve preparatory and recovery actions to lower the risks and consequences of natural disasters. The Facility will mainly ensure that disaster risk reduction is considered a priority in development projects in countries at risk, and will provide expertise and technical assistance for including risk reduction in strategic planning. The World Bank Global Hotspots Study identifies 86 vulnerable countries with risks of high mortality and economic loss. [See also ICSU Launched Global Disaster Research Program in October 2005, and New Developments for Addressing Natural Disasters in July 2005 environmental security reports.] [October 2006. Military Implications, Sources]

International Early Warning Programme to Begin Operations

The First Advisory Group Meeting of the International Early Warning Programme (IEWP) was held March 26-27, at the UN Campus in Bonn, Germany. Relevant representatives from 20 specialized UN agencies attended the meeting to set a framework for the program’s operations, discussing the best strategies to help mitigate the impact of natural disasters—from earthquakes, tsunamis and hurricanes to floods and wildfires—and to decide how the early warning system could be implemented worldwide. The outcomes of the meeting were not yet available at the time of this writing. [See also Tsunami Warning and Mitigation System in the Indian Ocean, and other related items in previous environmental security reports.] [March 2007. Military Implications, Sources]

Indian Ocean Tsunami Warning System Declared Operational, but Local Coordination still Lacking

At the end of June, UNESCO announced that the Indian Ocean tsunami warning system, coordinated by its Intergovernmental Oceanographic Commission, is on schedule to become operational for the entire region by the end of July. A network of 26 national information centers will allow countries to receive and distribute warnings of potential tsunamis. However, the tsunami that struck Indonesia on July 17th, caused by an earthquake off the south coast of Java, killed more than 500 people. Although the wave hit the coast 40 minutes after the quake was detected, no warning was issued to the population. [See also Tsunami Warning and Mitigation System in the Indian Ocean in December 2005, and other related items in previous environmental security reports.] [July 2006. Military Implications, Sources]
Regional Strategies

EU Climate Change Policy
The European Commission launched a six-month public debate on approaches for adapting to climate change. Citizens, Parliaments, Member States and international partners will contribute views along the lines set by the Green Paper “Adapting to Climate Change in Europe - Options for EU Action” launched in June 2007 [see last month’s report item on Climate Change]. The results, available at the beginning of 2008, will be considered in policymaking and setting priorities for developing a EU adaptation strategy by the end of 2008.

Meantime, UK Foreign Secretary, David Miliband, listed climate change among the UK Foreign Office’s ten ‘strategic priorities’, on a par with consequences of extremism, radicalization, and conflict. He noted that climate change might become the “new raison d’être” for the EU, as “one of the greatest threats to our future prosperity and security… Creating an Environmental Union is as big a challenge in the 21st century as peace in Europe was in the 1950s” he said. [July 2007. Military Implications, Sources]

Asia-Pacific to Increase Responses to Climate Change
Anticipating that Asia and the Pacific could be one of the regions most severely affected by climate change, a two-day meeting organized by the UN and other international agencies focused on identifying strategies, business models, and financial frameworks to reduce the impact of climate changes and promote clean energy while pursuing economic growth. Recommendations were made by government policymakers, business leaders, academics, and representatives of NGOs from across the region. Meanwhile, Australia’s opposition Labor Party announced that it would give its poorer neighbors $US132 million to address impacts of climate change. [July 2007. Military Implications, Sources]

U.S. Climate Change Science Program Progress Assessment
Evaluating Progress of the U.S. Climate Change Science Program: Methods and Preliminary Results by the National Research Council acknowledges advancements made by the CCSP in documenting and understanding global changes, but finds that more work is needed concerning regional impacts, human vulnerabilities, and mitigation and adaptation options, as well as improving communication with stakeholders and decision makers at all levels. Lack of adequate high-quality data from satellites—crucial to the advancement of climate change science—is identified as the single greatest threat to the future success of CCSP. [September 2007. Military Implications, Source]

China to Launch Climate Adaptation Program
China is preparing to launch its first four-year comprehensive national program to address the effects of climate change on China. The program, to be launched in two months, will outline goals for reducing emissions of greenhouse gases and developing green technologies, and mitigation measures to address the implications of global warming on China's food production and on coastal cities. A comprehensive report, produced by six Chinese academic and government organizations, warns that because of continuous temperature rise, China’s grain
production might be reduced by up to 37% in the second half of this century, and water scarcity increase considerably due to rapidly melting glaciers. [February 2007. Military Implications, Sources]

**Indigenous Peoples Demand More Involvement in Environmental Policies**

Climate change was the special focus of the UN Permanent Forum on Indigenous Issues, held in New York, April 21-May 2, 2008. The approximately 3,300 delegates representing the 370 million indigenous people from around the world stressed that indigenous peoples should be included in the international debate on climate change. The Forum suggested that a working group on local adaptation measures and traditional knowledge of indigenous peoples be established, since they can provide important insights for designing and implementing sustainable mitigation and adaptation strategies. [May 2008. Military Implications, Sources]

**Indigenous Peoples Highly Vulnerable to Climate Change**

An international symposium at Oxford University focused on the threat of climate change to the world’s indigenous peoples. They have already begun feeling the consequences of climate change and in some cases their whole way of life has to change radically, as they depend directly on natural resources threatened by global warming. It was agreed that indigenous communities have to work together with scientists and decision makers for designing and implementing adaptation measures for preventing possible catastrophic consequences of global warming on their people. [April 2007. Military Implications, Sources]

**Health**

**Global Health Security Threats**

*World Health Organization: Stress Environmental Impact on Human Health*

The World Health Organization published a report showing correlation between disease and environmental factors for the first time at country levels. The analysis reveals that reducing environmental risks including pollution, unsafe water, ultraviolet radiation, and climate change could save 13 million lives per year. WHO estimates that in some countries, more than one third of the disease burden could be prevented through environmental improvements. Each country profile provide an overview of the health risks caused by the specific environmental situation of the country, thus helping policy making in setting priorities for disease prevention. [June 2007. Military Implications, Sources]

*WHO Launched Website on Environmental Health in Emergencies*

The ‘Environmental health in emergencies’ website launched by the World Health Organization (WHO) provides information and resources for health management related to environmental disasters and emergency situations. Topics include: natural events, technological incidents, complex emergencies, prevention, preparedness and detection, and response and recovery. The subordinate web pages have links to websites and sources specific for different domains. WHO estimates that, in some countries, more than one third of the disease burden could be prevented

WHO Report 2007 Addresses Global Health Security Threats
The World Health Report 2007 - A safer future: global public health security in the 21st century addresses for the first time health issues as security issues. It notes the increasing risk of disease outbreaks, epidemics, industrial accidents, natural disasters and other health emergencies, which could become threats to global public health security. The report explains the role of the International Health Regulations, which came into force this year, in helping countries’ collaboration to identify and contain risks from outbreaks and other health hazards. The report points out pandemic influenza as the most feared threat to health security. [August 2007. Military Implications, Sources]

Global Health Security Initiative Upgrades Its Strategic Policy Process
The eighth ministerial meeting of the Global Health Security Initiative reviewed the risks and threats of highest priority to global health security, such as chemical, biological, and radio-nuclear terrorism, and pandemic influenza and agreed on a strategy for addressing them. In that view, the group decided “to strengthen its role as a policy forum by identifying emerging issues and coordinating policy development processes to address chemical, biological and radio-nuclear threats” and to strengthen its network and communication capacities. The Global Health Security Initiative is an informal effort involving top health officials from Canada, France, Germany, Italy, Japan, Mexico, UK, U.S., and the E.U. [See also Asian New Strategy to Improve Health and Environment in August 2007, Proposed Global Early Warning System for Monitoring Pandemics in May 2007, and other related environmental security reports.] [November 2007. Military Implications, Source]

Environment and Human Health Integration
Integrating Environment and Human Health, and Climate, Poverty and Health: Time for Preventive Medicine published by the National Council for Science and the Environment (NCSE) address the interconnection between human health and environmental components. The recommendations include: interdisciplinary approaches for better integration of environmental and health perspectives; improved communication between environmental and health communities, and between scientists and decision makers and the public; and improving priority setting in science. The NCSE activities in this area are continuing. [March 2008. Military Implications, Sources]

Changes in Disease Patterns
Scientists increasingly note the emergence of fatal diseases in places where they were never seen or expected before, heightening concerns that climate change favors the spread of viruses, bacteria, insects, and plants to cold areas where local organisms do not have immunity to fight them. A fungus normally found in tropical or subtropical regions, Cryptococcus gattii, has suddenly become endemic on Vancouver Island, on the Pacific coast of Canada, sickening humans and animals. Oysters in Alaska are being infected by the bacterium Vibrio
parahaemolyticus specific to warmer waters, like the Gulf of Mexico. In Africa, mosquitoes are causing malaria in high villages at Mt. Kenya that had never been exposed to it before. IPCC’s 4th Assessment Report, *Climate Change 2007*, warns that global warming might trigger unprecedented health risks such as the spread of mosquito-borne illnesses like malaria, dengue fever, yellow fever and encephalitis; increased respiratory illnesses due to pollen and mold spores; and health problems induced by increased flooding and drought. [February 2007. Military Implications, Sources]

Some diseases such as malaria, heart ailments and dengue fever appear on the rise with warmer temperatures, reported health experts, citing surges of such diseases in Kenya, China and Europe. [November 2006. Military Implications, Sources]

**Actions to Address Health Threats**

**FAO Launched New Crisis Management Centre**

In collaboration with the World Organisation for Animal Health, the UN Food and Agriculture Organization launched a new Crisis Management Centre to fight avian influenza outbreaks and other major animal health or food health-related emergencies. The center continuously monitors disease information around the globe and is able to respond in less then 48 hours, when a suspected outbreak is reported. [See also *Bird Flu Spreads Increasing Threats of a Human Pandemic* in February 2006 and other previous environmental security reports on this issue.] [October 2006. Military Implications, Sources]

**WHO-sponsored pandemic flu task force holds first meeting in Geneva**

The Ad Hoc Influenza Pandemic Task Force held its first meeting to discuss best actions in case of an outbreak. The Task Force is providing independent risk assessments and advising WHO on possible measures to be taken. These could include rapid containment effort, warning governments of risks and accelerating vaccine production. The Task Force includes 21 experts and will function until June 15, 2007, when WHO’s revised International Health Regulations come into effect. [October 2006. Military Implications, Sources]

**Antigenic Maps Help Trace Development of Diseases**

Derek Smith, professor of infectious disease informatics at Cambridge University’s Department of Zoology, and colleagues at Los Alamos National Laboratory and Erasmus Medical Center in Rotterdam, have developed software that, according to a *Scientific American* article, “create[s] an antigenic [stimulates the production of antibodies] map that documents 13,000 human flu strains isolated over the past five years When these results are plotted on a digital antigenic map, researchers can see in fine detail how the body’s immune system responds to different mutations of the virus.” [April 2008. Military Implications, Source]

**A Community Guide to Environmental Health Available for Liaison Activities**

The Hesperian Foundation is making available *A Community Guide to Environmental Health*, a tool kit for communities working on environmental problems. According to the announcement,
the new work “is a collection of best practices from communities worldwide that address both the immediate symptoms of environmental threats as well as the root causes of environmental problems” and “contains numerous easy to follow actions and educational activities, ranging from the simple to the more complex based on a community’s needs and resources.” [June 2008. Military Implications, Source]

**ENERGY SECURITY**

**Trends of Energy Use in IEA Countries**
The International Energy Agency’s *Energy Use in the New Millennium: Trends in IEA Countries* is an analysis of trends in energy use and efficiency, as well as CO2 emissions in IEA countries. It concludes that the rate of energy efficiency improvement is too slow compared to increasing energy demands and it should at least double for a sustainable energy future and reduced impact on climate change. Rich in indicators on current energy use and CO2 emission patterns, the report is a good tool for policymakers for setting priorities for future actions. [September 2007. Military Implications, Source]

**World Energy Outlook 2006 Warns on Energy Security and Environmental Implications of Increasing Energy Demands**
The IEA’s *World Energy Outlook 2006*, looking ahead to 2030, names two major issues facing the world over the next 24 years: the threat of “insecure” and “inadequate” energy supplies at reasonable prices, and environmental damages caused by increasing energy demands. The report also suggests that the solutions to these problems are cost effective and reiterates that investment in cleaner energy supplies and more efficient use of energy are vital to cutting energy demand by a significant margin – 10% by 2030. The report notes that energy demand will rise 53% by 2030 and increased nuclear energy and biofuel use are vital to cutting emissions. [November 2006. Military Implications, Sources]

**EU Energy and Climate Change Policy**
The European Council adopted its new Energy Policy to reduce CO2 emissions by 20% of 1990 levels by 2020—a target that could rise to 30% if the U.S., China, and other economic powers agreed to comparable reductions; and by 2020 to have 20% if its energy from renewable sources and 10% of its transport fuel be biofuels. The EU Conference of Presidents decided on March 15 to set up a temporary committee on climate change to provide clear information and suggest strategies to address the issue.
On March 28, the Commission unveiled its “green taxes” strategy that suggests splitting the EU-wide minimum excise duties into an energy tax and an environmental tax to reflect products’ impact on the environment and encourage environmentally friendly goods. [See also EU Plans Tougher CO2 Emissions Cuts in February 2007, and New European Energy Policy Developments in March 2006 environmental security reports.]
Britain’s draft Climate Change Bill is pushing for a drastic emissions’ reduction policy and could make the country the first to limit greenhouse gases by law. The proposal—to become law next year if it passes public and parliamentary consultation—stipulates that an independent panel should set a "carbon budget" every five years, with the goal to cut CO2 emissions by 60% by
2050, from 1990 levels, and between 26% and 32% by 2020. Governments that miss the set target could be held liable. [March 2007. Military Implications, Sources]

European Action Plan on Energy Efficiency
The European Commission outlined its Energy Efficiency Action Plan (EEAP) to cut Europe's energy consumption by 20% before 2020. It includes over 75 measures including new energy efficiency standards, and more energy-efficient products and services. The action plan will be introduced over the next six years and targets several priority areas, including: energy-efficiency labeling, possible legislation for meeting car emissions targets; encouraging investment in energy efficiency; more efficient power plants and energy transmission systems; and energy saving taxes and incentives. [See also New European Energy Policy Developments in March 2006 environmental security report.] [October 2006. Military Implications, Sources]

China’s Climate Change and S&T Action Plan
China launched its first national climate change program in June 2007. Although it does not include mandatory caps on emissions, it shows a strong commitment to reducing greenhouse gas emissions. The program highlights some major targets and actions to achieve them by 2010: reducing energy consumption by about 20% per GDP unit; increasing the share of renewable energy to 10% of the primary energy supply; keeping emissions of nitrous oxide from industrial processes at 2005 levels; increasing reforestation by 20%, and increasing international cooperation. The program notes that “China’s energy efficiency is about 10% lower than that of the developed countries, and its per unit energy consumption of energy-intensive products is about 40% higher than the advanced international level. Science and technology are the ultimate resort for humankind to tackle climate change.” In view of this, the Chinese Ministry of Science and Technology has released an action plan for the science and technology (S&T) aspects of China's new climate change initiative.

Note: The Chinese State Environmental Protection Administration report released in June reveals a continuous deterioration of air and water quality in Chinese cities despite national efforts to reduce pollution levels. Concomitantly, preliminary estimates by the Netherlands Environmental Assessment Agency reveal that in 2006 China surpassed the U.S., becoming the world’s largest CO₂ emitter. [June 2007. Military Implications, Sources]

Computer Modeling

Climate scientists and modelers warn that climate change forecasting abilities are still relatively weak and that some of those considered in policymaking—such as the IPCC assessments—are highly debatable, being too conservative and not taking into account the latest research.

Climate modelers from around the world met at the World Modelling Summit for Climate Prediction, held in Reading (UK), May 6-9, 2008, to try to improve forecasting abilities, including measures that will allow a better understanding of how the climate will be affected locally as well as globally. At the end of the four-day summit, scientists made the case for a climate-prediction project on the scale of the Human Genome Project. A key component of this
scheme would be a world climate research facility with computer power far beyond that currently used in the field. [May 2008. Military Implication, Sources]

The results of a new study by MIT researchers reinforce the connection between climate change and the intensity of storms. The new findings, based on pure theoretical computer simulation analysis using the Global Circulation Models, are consistent with the results of an earlier study, based on historical data, which showed a near doubling in the intensity of Atlantic storms over the last 30 years. Both studies confirm an increase in the intensity and duration of tropical cyclones, but, as for the future, many clarifications are still needed to determine the effects of global warming and CO₂ on storms’ number and intensity. [April 2008. Military Implication, Sources]

The newly established Centre for Climate Change Adaptation in Australia developed a model to study coastal vulnerability to climate change.

Climate modelers from the Hadley Centre for Climate Prediction and Research in Exeter, UK, show that by 2015 the average global temperature will be 0.5°C above the average value for the last 30 years, and that between 2009 and 2015, half of the years will be warmer then the current warmest year on record.

The NASA Goddard Institute for Space Studies has developed the first climate model that can estimate the effect of atmospheric warming on the strength of storms. [August 2007. Military Implication, Sources]

At a meeting held in Geneva, Switzerland, the World Meteorological Organization (WMO) urged scientists to improve climate predictions that would help adaptation to climate change. The session focused on improving the science of seasonal climate prediction to help save human lives. The three-day convention was a preamble for the World Climate Conference focusing on climate prediction and its impact for decision-making, scheduled to be held next year.

A study by some of the most respected climate policy researchers revealed that there is no time to postpone cutting CO₂ emissions. By quantifying the impact of every year of delay, they found that the more reduction action is delayed, the more difficult mitigation becomes, and at some point, it becomes too late and no mitigation action could help. The maxim limit delay is much closer then expected—a maximum of 10–20 years. [February 2008. Military Implication, Sources]

The results of a new study by MIT researchers reinforce the connection between climate change and the intensity of storms, showing an increase in the intensity and duration of tropical cyclones. [April 2008. Military Implication, Sources]

A group of climate scientists from NASA and Columbia University Earth Institute found that climate change is “close to critical tipping points, with potentially dangerous consequences for the planet.” In a related interview, Dr. James Hansen of NASA said that the point of no return might be reached as soon as in 10 years, if world governments fail to curb GHG emissions. He also noted that the IPCC report underestimated sea level rise, which, he warns, might reach 1-2 meters by the end of the century, if West Antarctic and Greenland melting are factored in. The Dangerous human-made interference with climate: a GISS modelE Study outlines two scenarios: ‘business-as-usual’, which shows disastrous consequences, and an ‘alternative scenario’
assuming controlled GHG emissions generating more moderate effects. [June 2007, Military Implications, Sources]

Global warming will increase the risk of natural disasters over the next two centuries, even if harmful emissions were cut now, warn climate scientists from the University of Bristol's Department of Earth Sciences. Compiling data from more than 52 climate models looking at the impact of greenhouse gas emissions, the researchers calculated the risks induced by climate change to the world's key ecosystems based on levels of warming (less than 2°C (3.6°F) to over 3°C (5.4°F)) and for each group assessed the probability of changes in forest cover, the frequency of wildfires, and changes to freshwater supplies over the next 200 years. The findings are expected to be used to explore measures to reduce hazards as much as possible. [August 2006. Military Implications, Sources]

A new study, Global temperature change, by a group of scientists, reveals that global surface temperature has increased approx. 0.2°C per decade in the past 30 years, and the world is the warmest it has been in the last 12,000 years. Scientists estimate that pollution from human activity, combined with the loss of snow and ice cover, will accelerate future temperature increase. Also, since warming is not uniform around the globe, the likelihood of strong El Niños and other harsh weather phenomena increases. A global temperature rise of approx. 1°C might represent a threshold with “dangerous” consequences, as sea levels rise and species become extinct.

Strong correlation between global warming and severe storms is also revealed by a study based on more than 80 simulations using 22 sophisticated computer models of the climate system. The simulations show with 84% probability that for the period 1906-2005, human activity—mainly greenhouse gas emissions—are responsible for about two-thirds of the temperature increases in hurricane formation regions of the Atlantic and Pacific Oceans. The research team that produced the study includes 19 hurricane and climate scientists from ten research centers. [September 2006. Military Implications, Sources]

A new index developed by scientists of the Swiss Federal Institute of Technology in Zurich, allows mapping the different ways that climate change will affect different parts of the world. This is the first map to show how global warming combined with natural variations in the climate would affect our planet, highlighting the frequency of extreme climate events—such as heat waves and floods—by 2100 compared with the late 20th century. It is intended to “help policy-makers gain a quick overview of the scientific facts without getting lost in the detail,” says Michèle Bättig, member of the team. [January 2007. Military Implications, Sources]

New research and models by the National Center for Atmospheric Research and the University of Colorado's National Snow and Ice Data Center found that the Arctic could be seasonally free of sea ice by 2020, 30 years sooner than predicted by the IPCC report. In addition to all the consequences for the ecosystem and the Nordic inhabitants, this might accelerate even more global warming, as reflection of the sun’s heat and light will be strongly diminished. [May 2007. Military Implications, Sources]
C Protecting the Environment Due to Its Inherent Moral Value

ENVIROMENTAL SECURITY-RELATED INTERNATIONAL REGULATIONS THAT HAVE BEEN OR ARE CLOSE TO COMING INTO FORCE SINCE JULY 2007


Protocol V on Explosive Remnants of War (ERW) of the Convention on Certain Conventional Weapons came into force on 12 November 2006, almost three years after it was adopted. The Protocol stipulates that Parties should take “remedial measures to mark and clear, remove or destroy unexploded ordnance or abandoned explosive ordnance” as early as possible after hostilities have ended, whether they control the territory or not, by cooperating directly or indirectly with all parties involved through quick and accurate information exchange. The Protocol is not retroactive, covering only wars occurring after its entry into force. As of the end of November, there were 27 States Parties to the Protocol.

The Portfolio of Mine Action Projects 2007 found that 26 out of 29 war-ravaged countries or territories surveyed are beleaguered with the lurking remnants of cluster bombs and other explosives. In 2007, the focus of the Projects will be on unexploded ordnance, aiming to deal with the aftermath of conflicts that took place before Protocol V entered into force. [November 2006, Military Implications, Sources]

UN Nuclear Terrorism Convention Enters into Force on July 7, 2007

The International Convention for the Suppression of Acts of Nuclear Terrorism enters into force on July 7, 2007; about two years after Member States adopted it, in April 2005. It is one of the measures to reduce risks posed by nuclear, biological, and chemical weapons, and is the 13th international instrument on terrorism. The Nuclear Terrorism Convention creates an international legal framework that will help countries enhance their nuclear security and collaborate to prevent terrorist groups from gaining access to nuclear material. It should also add strength to the Global Counter-Terrorism Strategy. As of the end of June, the Convention has 115 signatories and 23 Parties. [June 2007, Military Implications, Sources]

UN General Assembly Adopts Global Forest Agreement

The “Non-Legally Binding Instrument on All Types of Forests” adopted by the UN General Assembly on December 17, 2007 sets the political framework and standards for sustainable forest management and monitoring to stabilize climate change and protect biodiversity and ecosystems. The agreement suggests mechanisms for systematic monitoring and reporting at the national level, as well as means for international collaboration, ranging from funding developing countries for reducing deforestation, to technology transfer and capacity building for forest management. Although not binding, the forests agreement is an important political instrument to improve nations’ forest management. [See also United Nations Agreement to Protect the World’s Forests Adopted in May 2007 environmental security report] [December 2007, Military Implications, Sources]
Waste Export Regulations Revised and Tightened
The ‘Green’ list of the Waste Shipment Regulation, which controls the movement of non-hazardous recyclable waste within, into, or out of the EU, has been updated to better protect the non-OECD countries against receiving from wealthier nations materials they do not want or cannot process in an environmentally sound way. The Revised Green List Regulation 1418/2007 came into effect on 18 December 2007 with a transition period of 60 days for certain wastes and countries. The complementary changes to the UK Transfrontier Shipment of Waste Regulations will come into effect on 5 February. [See also EU Waste Shipment Legislation Came into Force in July 2007 and other related items in previous environmental security reports.] [January 2008. Military Implications, Sources]

Shipwrecks Removal Treaty Received First Signature
The Nairobi International Convention on the Removal of Wrecks adopted in May 2007 provides an international legal framework to deal with shipwrecks presenting possible safety and/or environmental hazards. According to the International Maritime Organization, the number of abandoned shipwrecks worldwide is estimated to be 1,300, and the threat they represent has been increasing. The convention provides the legal basis for States to remove the wrecks, or have them removed, and have the registered owner liable for costs incurred. The Convention is open for signature until November 18, 2008, thereafter being open for ratification, accession or acceptance; it will enter into force 12 months after the date it receives ten ratifications (or accessions or acceptances). [March 2008. Military Implications, Sources]

Environmental Damage to Be Criminalized in the EU
The Permanent Representatives Committee approved the proposal on the protection of the environment through criminal law. EU national governments will have to apply criminal sanctions to those causing “deliberate or negligent damage to the environment.” The list of punishable crimes will include: unlawful discharge of pollutants which could cause “death or serious injury to any person” or “substantial damage” to the environment; illegal waste shipment; killing or possession of protected fauna or flora; significant deterioration of habitats within protected sites; and any action related to ozone-depleting substances. The penalties are left to the discretion of member states as long as they are “effective, proportionate and dissuasive.” The Directive is pending final approval by the Parliament and the EU Council, and is expected to enter into force in 2010. [See also Environmental Crime Could Become a Felony in the EU in February 2007 environmental security report.] [May 2008. Military Implications, Sources]

European Environmental Liability Directive Came Into Force
The Environmental Liability Directive establishes a comprehensive framework on liability for damage to the environment, based on the “polluter pays” principle. It aims to ensure that the financial liability for environmental damage prevention or remediation falls on the polluters who caused it, rather than on the taxpayers. Operators are financially responsible for ensuring that they have preventive or remedial measures. When the environmental situation involves more than one member state, then they must cooperate on the necessary preventive or remedial actions. The Directive was adopted in April 2004 and member states were supposed to bring into
force the appropriate laws and regulations by April 30, 2007. [See also European Union Polluter Pays Law] [April 2007. Military Implications, Sources]

REACH Entered into Force on June 1, 2007
The EU chemicals law, Registration, Evaluation, Authorization and Restrictions of Chemicals (REACH) entered into force on June 1. The law’s managerial body, the European Chemicals Agency (ECHA) in Helsinki, officially began its operations. REACH is regulating the manufacturing, marketing, import, and use of all chemicals in the EU through a single system. The chemicals have to be registered over the next 11 years with the ECHA. REACH will significantly improve protection of human health and the environment while encouraging innovation and keeping the EU's chemical industry competitive. "[REACH] is the most progressive chemicals legislation in the world," said EU Environment Commissioner Stavros Dimas. [June 2007. Military Implications, Sources]

REACH, Europe’s Chemical Regulations to Enter into Force on June 1, 2007
The REACH regulation (Registration, Evaluation, Authorization and Restriction of Chemicals) was approved by the European Parliament and the European Commission and will enter into force on June 1, 2007. REACH is regulating the manufacturing, marketing, import, and use of some 30,000 chemicals and is replacing 40 existing pieces of legislation, thus creating a single system for all chemicals in the European Union. The chemicals have to be registered over the next 11 years with the new European Chemicals Agency (ECHA) in Helsinki, which will be responsible for management of the new requirements. [See also International Controversies over REACH in June 2006, Integration of Chemical Regulations (REACH) Approved by European Council in December 2005, and other related items in previous environmental security reports.] [December 2006, Military Implications, Sources]

The European Commission's Waste Electrical and Electronic Equipment (WEEE) Directive entered into effect in the United Kingdom on July 1, 2007, after having been effective in the rest of Europe since August 2005. The WEEE Directive is a framework concerning electrical and electronic appliances disposal in order to minimize impacts of this kind of waste on the environment. Among other stipulations, the directive requires that all such devices manufactured in the EU bear a label requiring mandatory recycling. [See also E-waste Management Directive Came into Effect on August 13, 2005 in August 2005 environmental security report] [July 2007. Military Implications, Sources]

EU New Directive on Air Pollution
A new air quality directive approved by the Environment Council is fixing an annual concentration limit for fine dust particles (known as PM2.5) to 25 micrograms per cubic meter averaged over a year, with effect from 1 January 2015 and will require Member States to reduce people's exposure to this group of particles by 20% between 2010 and 2019. The new directive would not change existing air quality standards for other pollutants but would give Member States more flexibility in meeting some of these in zones where they face difficulties. [See also EU Thematic Strategy on Air Pollution for the CAFE Programme in September 2005, and The
European Parliament Passed the Fine Particles Air Quality Directive
The European Parliament approved the text of a new directive on ambient air quality and cleaner air for Europe. The new legislation replaces and updates five existing laws and for the first time sets binding standards and target dates for fine particles PM2.5 (particulate matter that is 2.5 micrometers or smaller in size). EU States will have to reduce exposure levels in their urban areas to PM2.5 by an average of 20% by 2020 compared to 2010 levels, and bring them below 20 micrograms/m3 by 2015, while keeping the 25 micrograms/m3 levels throughout their countries. Member States will have two years to adopt the necessary national laws after the directive’s entry into force. [See also EU New Directive on Air Pollution in October 2006 environmental security report.] [December 2007. Military Implications, Sources]

EU Airline Carbon Trading to Start in 2011—a Year Earlier than Planned
The European Parliament's Environment Committee voted to include aviation in Europe's emissions trading scheme from 2011—a year earlier than planned. Airlines should bid for at least 25% of pollution permits. Members of the European Parliament want to set CO$_2$ emissions cap at 90% of the levels between 2004 and 2006 rather than 100%, with the cap lowered in subsequent years from 2013. [See also New European Environmental Regulations in December 2007 and Europe to Propose Emissions Targets for All Flights to/from or within Europe in November 2006 environmental security reports.] [May 2008. Military Implications, Sources]

Europe to Begin Penalizing Jet Pollution in 2011
The European Commission is moving forward with its proposal for a directive to bring civil aviation into the EU Emissions Trading Scheme (EU ETS) by imposing extra charges on highly polluting carriers. The legally binding rules will apply to all flights within the EU starting in 2011, and from 2012 to foreign carriers landing and taking off from European airports. [See also Europe to Propose Emissions Targets for All Flights To/From or Within Europe in November 2006 and EC Proposed Strategy to Curb Greenhouse Gas Emissions from Air Travel in September 2005 environmental security reports.] [December 2006. Military Implications, Sources]

November 2006: Europe to Propose Emissions Targets for All Flights To/From or Within Europe
The European Commission is proposing to introduce a new policy that would impose emissions controls on all flights within and coming into Europe, seeking to strengthen pollution reduction regulations around the world. The proposal, expected to be presented around December 20, requires airlines to meet emissions targets starting January 1, 2011, for all flights within Europe and round-trips to the European Union from any other part of the world. The proposal also outlines a system and timeframe for airlines to buy carbon credits. [See also EC Proposed Strategy to Curb Greenhouse Gas Emissions from Air Travel in September 2005 environmental security report.] [November 2006. Military Implications, Sources]

July 2006: Europe Considers Aviation Policies to Reduce Greenhouse Gases
The European Parliament is increasing its discussions on the impact of aviation on climate change, considering introducing kerosene taxes, and having the industry join the Kyoto Protocol-induced obligations. The World Travel & Tourism Council opposes such measures, which—they say—do not take into consideration the larger picture of the challenges which need to be managed, including jobs, economic impact, and even a negative effect on pollution. [July 2006, Military Implications, Sources]

EU to Introduce New Regulations to Combat Surface Waters Pollution
The European Commission has proposed new rules regulating the amount of chemicals and toxic substances seeping into the continent's surface waters. The new regulation will apply to the 25-nation bloc, and would set new limits on the concentration levels of 41 hazardous chemicals in rivers, lakes and coastal waters. The directive, if approved by member states and the European Parliament, would require EU nations to "achieve the proposed limits for all priority substances by 2015 and cease discharges and emission of priority hazardous substances into water by 2025," says the Commission statement. [July 2006. Military Implications, Sources]

EU Waste Shipment Legislation Came into Force in July 2007
The EU legislation on transboundary shipments of waste adopted in 2006 came into effect July 12, 2007. The regulation establishes a legal framework to ensure that waste is properly handled from the time it is shipped to the time it is disposed of or recovered at destination, and bans the export and/or disposal of hazardous waste to certain countries. The new law replaces the 1993 waste shipment regulation, stipulating a more clear and simplified framework, as well as more severe enforcement measures. [See also EU to Increase Environmental Regulations Enforcement in October 2006, Toxic Waste Disposal of Global Growing Concern in September 2006, and other related items in previous environmental security reports.] [July 2007. Military Implications, Sources]

European Directive on Ship-Source Pollution Became Effective on April 1, 2007
Directive 2005/35 on ship-source pollution and the introduction of penalties for infringements became effective April 1, 2007 across all 27 EU member states. The Directive introduces application of criminal penalties for gross negligence or illegal discharges of polluting substances at sea. It came into force in October 1, 2005 with implementation on March 1, 2007, and the EU member states were obligated to incorporate it into their national laws by March 31, 2007. Note: by 2011, the International Maritime Organization will require all ships to be equipped with a voyage data recorder, similar to the black box on an aircraft. This will greatly help the new directive’s enforcement. [See also Political Agreement Reached on the European Marine Strategy Directive, Europe to Harmonize Marine Pollution Legislation, and International Maritime Organization (IMO) wants global rather than many different local or regional rules] [April 2007. Military Implications, Sources]

Anti-Fouling Systems on Ships Convention to Enter into Force in September 2008
The International Convention on the Control of Harmful Anti-Fouling Systems on Ships (AFS Convention) will enter into force on September 17, 2008 (12 months after fulfilling the criteria for entry-into-force.) The AFS Convention bans the use of organotin compounds on ships’ hulls
or external surfaces, requires the application of an isolating coating for ships already carrying
such compounds, and establishes a mechanism to assess other anti-fouling systems to prevent the
use of potentially harmful substances in these systems. The Convention will apply to all ships
and floating units operating under the flag of a Party to the Convention and/or entering the port,
shipyard, or offshore terminal of a Party. [September 2007. Military Implications, Sources]

**Micronesian Nations Sign Coral Reef Protection Document**
The presidents of Palau, Micronesia, and the Marshall Islands became the first heads of state to
sign the International Declaration of Reef Rights, created by the Reef Check Foundation to raise
awareness about the value of coral reefs and how to protect them. 2008 is the International Year
of the Reef. [September 2007. Military Implications, Sources]

**France Bans 30 Pesticide Components**
As of February 2008, France banned the sale of 1,500 pesticides containing any of 30 chemicals
deemed hazardous, planning to gradually phase out a total of 53 phytosanitary substances.
[February 2008. Military Implications, Sources]

**China Issues Electronic Waste Rules**
The Chinese State Environmental Protection Administration has issued new rules to require
manufacturers, retailers and users to take responsibility for electronic waste. The rules are partly
inspired by China's thriving (and illegal) industry of importing electronic waste and scavenging it
in occupationally unsafe small or family workshops. [See also Global Environmentally Sound E-
Waste Disposal System is Needed in November 2005 environmental security report.] [August
2006. Military Implications, Sources]

**Proposed Treaties and/or Changes to Existing Ones**

**Waste Management**

**Toxic Waste Disposal of Global Growing Concern**
The scandal around the dumping of toxic waste at Abidjan, Ivory Coast has intensified the global
debate concerning trade in waste and the adequacy of the Basel Convention. Some African and
Asian countries became dumping grounds for hazardous waste, such as radioactive uranium
waste, lead, cadmium, mercury, industrial and hospital chemicals, and the rising volume of
electronic waste. Although the Basel Convention and its 1995 amendment ban dumping of toxic
waste in countries without proper facilities for handling it, the process continues illegally in
countries that are not party to the Convention. In addition to environmental and health
consequences, a Senegalese ecologist points out the security aspect associated with illegal
dumping since "the waste is often accepted by corrupt people or factions who want money to buy
weapons". As a consequence of the Ivory Coast scandal, the Prime Minister dissolved his cabinet
and elections are jeopardized in a country already tormented by conflicts. [See also New
Measures for Regulating E-waste in August 2006, as well as Basel Convention on Hazardous
Wastes to be Made More Effective in July 2005 and other related items in previous
environmental security scanning reports.] [September 2006. Military Implications, Sources]
**Basel Convention Needs Revision and Update**

The 9th meeting of the Conference of the Parties to the Basel Convention (COP9) on the Control of Transboundary Movements of Hazardous Wastes and their Disposal took place June 23-27, in Bali, Indonesia. The focus was a stronger regulation on the export of hazardous waste, mainly electronics which litter poor nations. Despite support from the African delegates and the EU, the representatives from 170 countries to the conference decided against banning toxic waste exports, rather encouraging voluntary actions at national level using some new guidelines to create their own recycling laws. [See also *Half of Transported European Hazardous Waste Could Be Illegal—How Much More Elsewhere?* in April 2008, *UN E-Waste Forum and Basel Convention’s Conference of Parties* in December 2006, and other related items in previous environmental security reports.] [June 2008. *Military Implications, Sources*]

**UN E-Waste Forum and Basel Convention’s Conference of Parties**

Electronic devices account for 20-50 million metric tons of waste per year around the world that introduce lead, cadmium, mercury and other hazardous wastes into the land and water supplies. To counter the acceleration of this problem, over 500 experts from more than 150 countries met at the UN offices in Nairobi, Kenya, November 27–December 1 for the Conference of the Parties (COP8) to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. The conference theme was “Creating innovative solutions through the Basel Convention for the environmentally sound management of electronic waste.” An e-waste declaration and more than 30 decisions were adopted, including synergies and cooperation among the Basel, Rotterdam and Stockholm Conventions (UNEP/CHW.8/CRP.8), safer ship dismantling procedures, amendments to the guidelines for the environmentally sound management (ESM) of persistent organic pollutant wastes, the 2007-2008 program, and implementation of the Strategic Plan for the Implementation of the Basel Convention to 2010. The E-waste Declaration called for wider transfer of information on technologies and e-waste management from developed to developing countries, prevention and fighting e-waste trafficking, introduction of broader and stronger national legislation to control e-waste management, promotion of eco-friendly technologies and phasing-out toxic components, and raising awareness of e-waste issues and integrated systems to reduce and limit damage due to e-waste. The meeting also discussed environmentally sound management of ship dismantling and agreed to a draft ship recycling convention, as well as the need for greater guidance in managing abandoned ships. The next COP will take place in fall 2008, in Indonesia. [See also *Toxic Waste Disposal of Global Growing Concern* in September 2006, *Basel Convention on Hazardous Wastes to be Made More Effective* in July 2005, and other related items in previous environmental security reports.]

[Note: By 2010, an estimated 100 million phones and 300 million personal computers might become waste. In the U.S., it is estimated that 14–20 million personal computers are thrown out each year; developing nations are expected to triple their output of all electronic waste by 2010.] [December 2006, *Military Implications and Sources*]

**EU Preparing New Directives on Waste Management and Water Quality**

The EU Environment Council reached political agreement on revising the EU's waste legislation—combining three existing laws: the Waste Framework Directive, the Hazardous

European Parliament Proposes Tougher Waste Management Strategy
The European Parliament has voted for a tougher waste management strategy, which stipulates that EU production of waste should be stabilized at 2008 levels by 2012, and scaled back by 2020, requiring that 50% of municipal waste and 70% of industrial waste be recycled by 2020. Although the new directive would not impose firm obligations on member states it would establish a "general rule or guiding principle" influencing future waste management practices. EU member states have different waste management strategies and efficiency and are expected to fight the Parliament's proposal. [See also EU New Strategy on Waste Recycling in December 2005, New EU Environmental Strategies in September 2005, and Recycling Regulations in the EU in August 2005 environmental security reports.] [February 2007. Military Implications, Sources]

EU Vote on Revision of Waste Directive
The European Parliament approved the revision of the waste framework directive, which is the basis of the EU waste management policy. The new directive will replace three others—Waste Framework Directive, the Hazardous Waste Directive and the Waste Oils Directive, setting clear definitions and waste management principles and creating a sound, harmonized legal framework for waste treatment. [See also EU New Strategy on Waste Recycling in December 2005 and other similar items in previous environmental security reports.] [June 2008. Military Implications, Sources]

Chemical, Biological, and Nuclear Safey

Stockholm Convention on POPs Adopts Evaluation but not Non-compliance Mechanisms
The third meeting of the Conference of the Parties (COP-3) to the Stockholm Convention on Persistent Organic Pollutants (POPs) occurred April 30-May 4, 2007, in Dakar, Senegal, with over 450 participants representing more than 180 governments and international and non-governmental organizations. Twenty-two decisions were adopted, including: measures to reduce or eliminate releases from wastes (integration with the Basel Convention for developing a framework for environmentally sound waste disposal); guidelines on best available techniques and draft guidance on best environmental practices; improving the reporting system; evaluation of implementation effectiveness through the Global Monitoring Programme (establishing a coordination group formed of three representatives from each of the five UN regions); technical assistance; and non-compliance (negotiations to continue and mechanisms to be considered for COP-4). COP-4 will be held May 4-8, 2009, in Geneva, Switzerland. [May 2007. Military Implications, Sources]
Stockholm Convention on Persistent Organic Pollutants Is Succeeding in Europe

A recent study has evaluated the effectiveness of the Convention on Long-range Transboundary Air Pollution (LRTAP) in the UN Economic Commission for Europe countries, excluding Canada and the US. The research revealed that many persistent organic pollutants (POPs) decreased considerably and will continue to decrease as the LRTAP POP protocol is becoming fully implemented by all countries. These results are significant for the global Stockholm Convention on Persistent Organic Pollutants and for developing a global monitoring plan for POPs. The study also included preliminary assessments for eight “candidate” POPs (Hexachlorobutadiene (HBU); Pentabromodiphenyl ether (PBDE); Pentachlorobenzene (PCBe); Polychlorinated naftalenes (PCN); Pentachlorophenol (PCP); Endosulfan, Dicofol; and short chain chlorinated paraffins (SCCPs)) which could be added to the POP list in the future. [See also Stockholm Convention on POPs Adopts Evaluation but not Non-compliance Mechanisms in May 2007, New Chemicals Proposed to be Added to Stockholm Convention on POPs in 2005, and other related items in previous environmental security scanning reports.] [February 2008. Military Implications, Source]

Call for Reinforcements to Chemical Safety

At the Fifth Session of the Intergovernmental Forum on Chemical Safety, held 25-29 September 2006 at Budapest, Hungary, policymakers and experts reinforced the need for applying the precautionary principle in the context of chemical safety; extending globally the regulations on heavy metals; and tackling the widening gaps among countries in following chemical safety policies. Prior to the Session, a side event was held on health and environmental concerns associated with heavy metals and global needs for further action. [See also Stockholm Convention Updates in November 2005, First Conference of the Parties to Rotterdam Convention in September 2004, New Strategy for International Chemicals Management Launched in November 2003, and other related items in previous environmental security scanning reports.] [September 2006. Military Implications, Sources]

EU to Add Carbon and Graphite to REACH Program

Carbon and graphite were deleted from the list of exemptions (Annex IV) of the EU’s Registration, Evaluation, Authorization and Restrictions of Chemicals (REACH) regulation, due to possible health hazards when they are used in nano-sized form (as in carbon nanotubes). Therefore, companies producing, using, or trading with carbon and graphite now have to comply with the REACH requirements. REACH entered into force on June 1, 2007 and its administrative office, the European Chemicals Agency, was inaugurated in Helsinki on June 3, 2008. [See also New Study Raises Asbestos-type Health Worries for Nanotubes in May 2008, and REACH Entered into Force on June 1, 2007 environmental security reports.] [June 2008. Military Implications, Sources]

IAEA to Upgrade International Nuclear Event Scale

The International Atomic Energy Agency (IAEA) will upgrade the International Nuclear Event Scale (INES) system to enhance international safety by promptly informing the public on the scale of a nuclear or radiological incident. The improvements will make the system more versatile and informative, the terminology will be standardized, and issues related to sources and
transportation of radioactive material will be better addressed. The INES was originally developed in the 1990s by the UN IAEA and the Nuclear Energy Agency of the OECD to consistently communicate the severity of reported nuclear and radiological events, with a scale ranging from 1 (anomaly) to 7 (major accident). The updated scale is expected to be issued at the end of 2008, after being reviewed by INES members. [September 2007. Military Implications, Sources]

**IAEA Director’s Recommendations to Improve Nuclear Safety**

At the IAEA’s 51st annual General Conference held in Vienna, Director General Mohamed ElBaradei called on all countries to ratify the Amendment on the Physical Protection of Nuclear Material of the International Convention on the Suppression of Acts of Nuclear Terrorism, to strengthen the protection of nuclear materials and increase nuclear security. In the meantime, experts attending the scientific forum convened by the IAEA’s ‘Global Challenges and the Development of Atomic Energy: The Next 25 Years’ noted that in view of the world’s energy needs’ likely to increase by 50% over the next 25 years, nuclear technology is expected to expand, increasing the risks associated with the spread of sensitive nuclear know-how, including enrichment and reprocessing technologies. [See also Increasing Nuclear Safety and Security in March 2006 and other related items in previous environmental security reports.] [September 2007. Military Implications, Sources]

**International Norms Led by IAEA Are Needed to Stop Smuggling of Nuclear Materials and Nuclear Proliferation**

During a Security for a New Century briefing at the U.S. Capitol, November 27, 2007, David Albright, President of the Institute for Science and International Security said that A.Q. Khan’s nuclear smuggling network may be just the tip of an iceberg, and national systems of enforcement are dangerously inadequate. He recommended that the International Atomic Energy Agency lead the creation of new international norms for everything from export controls for nuclear-related materials to a determination of what is classified information about nuclear energy. He also said that corporations should not do business with any trading company unless they can show that the end user could not contribute to nuclear proliferation. Financial loss due to discovery that their materials ended up in illegal nuclear programs will be higher than the financial loss from not selling the products.

In a related development, Edit Herczog, Member of the European Parliament, declared at NATO’s November 23, 2007 Advanced Research Workshop held in Budapest on “Energy and Environmental Challenges to Security” that the EURATOM treaty may need a new focus on such security issues as non-proliferation and radiation protection. The EURATOM treaty has never been amended since its establishment 50 years ago. [See also Nuclear Safety in September 2007, Increasing Nuclear Safety and Security in March 2006 and other related items in previous environmental security reports.] [November 2007. Military Implications, Sources]

**Better International Controls Needed to Prevent Bioterrorism**

“The biological weapons threat is multiplying and will do so regardless of the countermeasures we try to take,” warns Steven Block, a Stanford University biophysicist and former president of the Biophysical Society. The likelihood of SIMAD (Single Individual Massively Destructive), motivated by ideology or personal issues, is increasing fast and there is no adequate international
treaty (the Biological Weapons Convention is not enough) or oversight agency to prevent malicious use of biotechnology work. There is no monitoring of the expanding gene-synthesis industry and the supervision of controversial experiments is voluntary and irregular at universities and private laboratories around the world. While scientists are still arguing on what approach would be the best to increase protection against bioterrorism, they agree on the need for swift and intensified international control to impede the accidental or deliberate release of genetically modified organisms. Along the same lines, China has updated its 2002 list of controlled export materials that could be used to produce biological weapons to fight terrorism. The new list added 14 types of viruses, toxins, bacteria, and equipment, and strengthened export control. [July 2006. Military Implications, Sources]

Canada Prepares to Ban More Chemicals
The government of Canada announced that it is preparing to issue a ban on a number of chemicals in common use in various applications, because of possible harm to human health or the environment. The 11 chemicals include vinyl acetate, ethylene oxide, thiourea, isoprene, and cyclohexasiloxanes. Industry has 60 days to offer countervailing evidence. [See also Questions on Bisphenol A Risk Raised Again in April 2008 environmental security report.] [May 2008. Military Implications, Source]

Canadian Chemical Plan May Go beyond REACH as Environmentalists Get New Political Support
The Canadian government has launched a plan to regulate the use of chemicals harmful to human health and the environment. Although the initial plan targets only 200 chemicals for regulation over the next four years, more could be added to eventually go beyond initiatives in Europe and the U.S. The Canadian efforts to strengthen such environmental policies will be improved by election of Stéphane Dion (former Environmental Minister) this month as the Liberal Opposition Leader. Sources report a rising environmental tide among the public. Previous negotiations for regulations mostly related to climate change, but pollutants are also expected to be revived as the Conservatives’ efforts in the environment arena are strongly criticized by the other parties, citizens, and the international community. [Note: This month, the Secretariat of the Commission for Environmental Cooperation (CEC, NAFTA’s “environmental arm”) issued a determination requesting a response from Canada to a submission asserting that Canada is failing to effectively enforce the federal Species at Risk Act.] [December 2006, Military Implications, Sources]

Reactive Nitrogen Beginning To Be Recognized As Environmental Hazard
Two papers in the May 16 issue of Science discuss the problem of excessive reactive nitrogen in the environment. According to Univ. of Virginia environmental sciences professor James Galloway, “We are accumulating reactive nitrogen in the environment at alarming rates, and this may prove to be as serious as putting carbon dioxide in the atmosphere.” Atmospheric nitrogen can appear as nitric acid in water and vegetation or can contribute to the greenhouse effect. The International Nitrogen Initiative ((www.initrogen.org) has been established to serve as a center for efforts to cope with this problem. [See also New Predictions for the Atmosphere by 2030 in October 2006 environmental security report.] [May 2008. Military Implications, Source]
Pollution and Greenhouse Gases

Call for Expanding Montreal Protocol on Ozone-Depleting Substances
On the 20th anniversary of the Montreal Protocol to curb the release of harmful substances into the atmosphere, 191 signatories of the Protocol gathered in Montreal to celebrate this highly successful international treaty and to discuss its expansion. Delegates agreed to accelerate the freeze and phase-out of hydrochlorofluorocarbons (HCFCs)—chemical compounds used in refrigeration systems and air conditioners, and which accelerate both ozone layer damage and climate change. They agreed to halt the production of HCFCs in 2013 and pull forward their elimination by ten years from the previous scheduled phase-out of 2030 for developed countries, and 2040 for developing ones. The United Nations meteorological agency revealed that greenhouse gases could aggravate ozone loss and slow recovery. The theme of this year’s Ozone Day (September 16) was “Celebrating 20 years of progress in 2007”. [See also 2007—the International Year of the Ozone Layer in January 2007, Ozone Hole Worst Ever Recorded (under Climate Change item) in October 2006, and other similar items in previous environmental security reports.] [September 2007. Military Implications, Sources]

2007—the International Year of the Ozone Layer
The year 2007 is designated The International Year of the Ozone Layer, marking the 20th anniversary of the signing of the Montreal Protocol. Since its entry into force, January 1, 1989, the Montreal Protocol has undergone five revisions, the last one in 1999. “Perhaps the single most successful international agreement to date” (as noted by Kofi Annan, former UN Secretary-General), the treaty is widely adopted and implemented. Nevertheless, due to the accumulative effect, the ozone hole was the largest recorded last September. The next meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer will be hosted by Canada in Montreal, September 17-21, 2007. [January 2007. Military Implications, Sources]

Countries Contemplating Tougher Regulations for Mandatory Emission Targets
In light of last month’s report, The Economics of Climate Change, the UK announced its intention to introduce new "green" measures to reduce carbon emission, including the Climate Change Bill—to reduce CO$_2$ emissions by 60% by 2050, and to strengthen official monitoring and reporting. The UK also proposes to set an emissions reduction target of 30% by 2020, and at least 60% by 2050 Europe-wide. Australians polled would favor ratification of the Kyoto Protocol and more stringent reductions, and its government advocates an Asia-wide emissions trading system as part of a planned "new-Kyoto" pact and would invest US$46.5 million into the world's biggest carbon capture and storage system. [Note: A proposal to allow Clean Development Mechanism (CDM) funds to be used for carbon capture and storage (CCS) projects was deferred by the Climate Change Conference on grounds that the technology is not yet mature.] Japan cannot meet its obligations under the Kyoto Protocol unless it imposes mandatory emission targets on industry and increases spending for carbon credits using Kyoto tools such as the Clean Development Mechanism. [See also UK Proposes Individual Carbon Trading in July 2006, Possible Tougher European Carbon Limits in May 2006, and other related items in previous environmental security reports.] [November 2006. Military Implications, Sources]

Millennium Project www.millennium-project.org......................................................................................140
Air Travel in the EU to Join the Carbon Emissions Trading System by 2011

The European Parliament voted to have EU internal and intercontinental flights join the bloc’s carbon emissions trading system by 2011 and that the pollution cap be set at 90% of average emissions from the period 2004-2006. The bill will now be debated by member states. [November 2007. Military Implications, Sources]

EU Advances the Inclusion of Airlines into the Emissions Trading System to 2010

The EU criticized the recent 36th Assembly of the International Civil Aviation Organization for failing to adopt a framework to reduce greenhouse gas emissions from international aviation. In turn, EU lawmakers proposed to move ahead—to 2010—the inclusion of all airlines flying to, from, and within the EU into the Emission Trading Scheme. The original proposal suggested 2011 for the inter-EU flights and 2012 for international flights landing in or departing from the 27 EU countries. The European Parliament is expected to vote on the bill in November. [See also Europe to Propose Emissions Targets for All Flights to/from or within Europe in November 2006, and EC Proposed Strategy to Curb Greenhouse Gas Emissions from Air Travel in September 2005 environmental security reports.] [October 2007. Military Implications, Sources]

Provisional Agreement for Including Aviation in the Emission Trading Scheme from 2012

The EU lawmakers reached agreement with Member States to include aviation in the greenhouse gas emissions trading scheme from 2012. The airlines will have to cut emissions by 3% in the first year, and by 5% from 2013 onwards, paying for 15% of their permits to pollute. Presently, aviation generates an estimated 3% of EU CO2 emissions, but air traffic is expected to double by 2020. [See also EU Airline Carbon Trading to Start in 2011—a Year Earlier than Planned in May 2008 and other similar items in previous environmental security reports.] [June 2008. Military Implications, Source]

EU Airline Carbon Trading to Start in 2011—a Year Earlier than Planned

The European Parliament's Environment Committee voted to include aviation in Europe's emissions trading scheme from 2011—a year earlier than planned. Airlines should bid for at least 25% of pollution permits. Members of the European Parliament want to set CO2 emissions cap at 90% of the levels between 2004 and 2006 rather than 100%, with the cap lowered in subsequent years from 2013. [See also New European Environmental Regulations in December 2007 and Europe to Propose Emissions Targets for All Flights to/from or within Europe in November 2006 environmental security reports.] [May 2008. Military Implications, Sources]

European Commission Proposed Binding Legislation for Vehicle Emissions Cuts

The European Commission proposed binding legislation to cap CO2 emissions from some new passenger cars to 120g/km by 2012. In this way, European carmakers will have to reduce the fleet average CO2 emissions of new vehicles to 130g/km by 2012 through cleaner engines, while the remaining 10g/km would be reduced by improved fuel-efficiency, increased biofuels use, and better traffic management (presently cars count for 12% of the EU’s total CO2 emissions at an average of around 160g/km). The regulation will be enforced by penalties starting in 2012 at €20 per extra gram of CO2, increasing gradually to €95 in 2015. The legislation has to be approved by member states. [See also EU Commission to Propose Binding Cuts on Car Emissions in Millennial Project www.millennium-project.org.................................................................141

Similarly, the Euro VI proposal for heavy motor vehicles establishes a reduction of 80% in nitrogen oxides and 66% in particulate matter emissions compared to the current Euro V limits. After approval by the European Parliament and the Council of Ministers, the new regulation is expected to enter into force in 2013. [December 2007. Military Implications, Sources]

**UK Proposes Individual Carbon Trading**
The UK Minister of the Environment has proposed a plan for individual carbon-trading procedures. Under the proposal, all UK citizens would be allocated a certain annual amount of carbon credits that will be reduced each time they purchase non-renewable energy. The points will be stored on an electronic card and those who did not use their full allocation would be able to sell their surplus carbon points into a central bank, while those who run out of points will be charged additionally at the point of sale for the equivalent of the missing points. To reduce total UK emissions, the overall number of points would be reduced each year. Details and the place for launching the pilot project should be announced shortly. If the new UK carbon-trading scheme proves feasible and efficient, it is likely that it will be emulated in other (if not all) EU countries and possibly even other regions of the world strongly committed to reducing their carbon emissions. [See also Possible Tougher European Carbon Limits in May 2006 and other related items in previous environmental security reports.] [July 2006. Military Implications, Source]

**European Parliament Approves New Water Quality Standards Directive**
The European Parliament approved the new directive on water environmental quality standards to harmonize quality standards across the EU and thereby better protect surface waters (rivers, lakes and coastal waters) against pollution from a range of 33 priority chemicals. The new directive is the final major piece of legislation in the Water Framework Directive and replaces five existing directives, simplifying water-related reporting within the newly created Water Information System for Europe. Member States have until December 2009 to comply. [See also EU to Introduce New Regulations to Combat Surface Waters Pollution in July 2006 environmental security report.] [June 2008. Military Implications, Sources]

**Post-Kyoto Protocol Negotiations**

The theme for World Environment Day 2008 was “Kick the Habit: Towards a Low Carbon Economy”, recognizing the need for a strategy to reduce greenhouse gas emissions from fossil fuel.

The group of 16 nations accounting for about 80% of the world’s CO$_2$ and other greenhouse gas emissions—G8 plus Australia, Brazil, China, India, Indonesia, Mexico, South Korea and South Africa—attending the Major Economies Meeting held in Seoul, failed to agree on clear targets to cut greenhouse gas emissions. The draft agreement mentions rather generic “deep cuts” based on the “ambitious” scenario outlined by the IPCC (although its target of 50% reduction by 2050 is not mentioned in the draft statement.) The statement is expected to be adopted at the July G8 summit to be held in Japan. Nevertheless, Yvo de Boer, head of the UN Framework
Convention on Climate Change expressed hope and the urgency that the Japan G8 summit set clear emission targets for a post-2012 treaty.

The EIA International Energy Outlook 2008 looks at energy trends up to the year 2030, estimating global energy consumption will grow by 50% with 85% of that in non-OECD states. CO₂ emissions will likely increase by 51% (1.7% annually), with non-OECD states expected to exceed OECD members’ emissions by 72% in 2030.

Meantime, James Hansen of NASA warned again that the world has passed the “dangerous level” for greenhouse gases in the atmosphere and should cut to 1988 levels. He said “This is the last chance,” to avoid “changes such as mass extinction, ecosystem collapse and dramatic sea level rises.”

The German government approved a climate package—focusing mainly on the transport and construction sectors—designed to help reach by 2020 the target of reducing CO₂ emissions by 49% compared to 1990 levels. [June 2008. Military Implications, Sources]

**Moves Forward on the Post-Kyoto Negotiations**

The European Environment Council agreed to significantly accelerate global negotiations for a post-Kyoto framework to reduce greenhouse gas emissions. It is ready to assume leadership for completing global negotiations by the end of 2009. [December 2006. Military Implications, Source]

Leaders attending the recent Heiligendamm (Germany) G8 summit agreed to seek “substantial” cuts in greenhouse gas emissions, and to launch negotiations at the December 2007 UN Summit for eventually reaching agreement on a new—more inclusive—UN-led treaty by 2009. EU, Canada, and Japan supported a target of a cut to 50% of the 1990 emissions level by 2050. [June 2007. Military Implications, Source]

Denmark began preparing for the 2009 UN climate summit that it will host. However, it admits that reaching a political agreement on a new global climate treaty to replace the current Kyoto Protocol will not be easy. [June 2007. Military Implications, Source]

Ahead of the September Asia Pacific Economic Cooperation summit, Australia's Prime Minister John Howard is seeking to launch negotiations for an Asia-Pacific new climate agreement and to use the summit for including emerging high emitters as China and India in a post-Kyoto accord. [June 2007. Military Implications, Source]

Norway plans to become the world’s first “carbon neutral” country, by reducing its emissions to zero by 2050, or paying for equivalent reductions elsewhere. [June 2007. Military Implications, Source]

The UN Secretary General will hold a special high-level meeting on climate change prior to the September Heads of State and Government summit. He called climate change the “defining issue of our era.” [June 2007. Military Implications, Source]
UN Climate Change Conference Explores Post-Kyoto Regulations
The twelfth Conference of the Parties (COP 12) to the UN Framework Convention on Climate Change and the second Meeting of the Parties to the Kyoto Protocol (COP/MOP 2), as well as some 130 related side events took place in Nairobi, Kenya, November 6-17, 2006, attended by over 5,900 participants, including 2,300 government officials. The foci were on the future of the Protocol and the Convention, and longer-term action to combat climate change and cope with its consequences. The meetings resulted in the adoption of 10 COP decisions and 11 COP/MOP decisions and in the approval of a number of conclusions by the subsidiary bodies, but no agreements were reached on post-Kyoto cuts or a negotiations timetable. However, the governments recognized that there is compelling scientific evidence for global warming and thus global emissions need to be reduced 50% by 2050. At the insistence of the European Union, a thorough examination of the Protocol will take place in 2008. Important achievements include: a) establishment of the Least Developed Countries (LDC) Fund, Special Climate Change Fund (SCCF), and Adaptation Fund; b) launch of the Ad Hoc Working Group on Annex I future commitments; c) the Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention; and d) the assignment of high priority to adaptation activities, mainly in developing countries. It is expected that, at next year’s meeting, to be held in Indonesia, governments will start full negotiations for deeper cuts in emissions to keep the rise in global temperatures below the critical 2°C level. [November 2006. Military Implications, Sources]

Possible Tougher Policies Concerning Climate Change
Environment ministers from around the world will meet next month (November 2006) in Nairobi, Kenya, for talks on post-Kyoto policies. Some want clearer timetables and frameworks on the next phase of greenhouse gases cuts. German Chancellor Angela Merkel wants to make addressing climate change a top priority on the agenda as she assumes the top position in both the G8 and the EU in 2007. She also wants to use Germany's presidency of the EU to push for the reduction of energy use, including bringing around the big greenhouse gases emitters that do not yet have adequate reduction policies. [October 2006. Military Implications, Sources]

Bali Roadmap Sets Framework for Post-Kyoto Negotiations
About 10,800 participants, including high-level delegations from 187 countries, attended the UN Climate Change Conference in Bali, Indonesia, December 3-15, 2007. The most significant result was the "Bali Action Plan", also called the Bali roadmap. It outlines a two-year agenda of negotiations for a post-2012 global climate regime to enter into force by 2013, but does not include emissions reduction targets, despite strong support by the EU and other countries. The roadmap calls for agreements by the end of 2009 at a major summit in Copenhagen. The agreement is to include both national and international mitigation and adaptation actions to address the effects of climate change, including methods to reduce greenhouse gas emissions, development and transfer of climate-friendly technologies, and financing and investment measures. Four major UNFCCC meetings to implement the Bali roadmap are planned for 2008. Other results of the Bali Convention included the launch of the Kyoto Protocol’s Adaptation Fund to finance projects in developing countries; a Forest Carbon Partnership Facility, an addition of deforestation to a post-2012 treaty agenda; and other capacity-building, financial, administrative, and methodological issues. A consortium of mayors and local governments
launched the World Mayors and Local Governments Climate Protection Agreement, with six commitments addressing climate change, including the reduction of carbon emissions by 60% to 80% worldwide by mid-century (cities account for 80% of humanity’s production of greenhouse gases). [December 2007. Military Implications, Sources]

The report *From Bali to Poznan: New Issues, New Challenges* summarizes the discussions and outcomes of the conference with the same name held at the European Parliament in Brussels, December 18, 2007, convened by the Institute for Environmental Security in cooperation with other interested organizations. It assesses the impact of climate change on international security and sustainable development, a switch to solar energy as an alternative to fossil fuels, implications of illegal trade in natural resources, and the ways climate change influences European foreign policy. The report can be seen as background policy information for the next UNCCC to be held in Poznan in December 1-12, 2008. [May 2008. Military Implications, Sources]

The two-day GLOBE forum (Global Legislators Organization for a Balanced Environment) was organized as a preamble to the G8 summit to be held in July. It was attended by about 100 lawmakers from the Group of Eight industrial countries (Britain, the United States, France, Germany, Italy, Russia, Canada and Japan) and fast-developing nations (China, Brazil, India, South Africa and Mexico). The main subjects were: discussing a draft post-Kyoto Protocol treaty, the need for G8 countries to intensify efforts to meet the Kyoto targets, and strategies to help developing nations improve practices for reducing emissions.

UN Secretary-General Ban Ki-moon’s message to the UNEP Global Ministerial Environment Forum called for a “decisive and deep regime for emissions reductions after 2012” and for the development of “financial incentives and mechanisms so markets can respond to the opportunities of a rising carbon price” under the guidance of the Bali road map. [February 2008. Military Implications, Sources]

The first meeting since the December Bali conference for negotiating a post-Kyoto climate change treaty is being held in Bangkok, March 31-April 4. It aims to move forward the Bali Roadmap. Key issues on the agenda include limiting greenhouse gas emissions, adaptation, mitigation, deployment of climate-friendly technologies, and financing. [Note: the meeting was ongoing at the time of this writing and the outcomes will be included in next month’s report.] It is hoped that negotiations will be concluded next year at a major Copenhagen summit.

Humanity lost an important decade of actions to curb global warming, because of protracted negotiations, noted Robert Watson, now chief scientific adviser at the U.K. environment ministry, and former chairman of the UN Intergovernmental Panel on Climate Change. He emphasized the swift need for a new treaty that would set more ambitious long-term goals for reducing greenhouse gas emissions in order to limit temperature rise to 2°C by the end of the century. Mr. Watson considers that the targets for developed countries should be 80% rather than the projected 60%, while for developing countries the allowed rise should be 60% rather than a projected 140%. He underlined that such goals imply the implementation of a mixture of technologies and increased technology transfer. [March 2008. Military Implications, Sources]

The first session of the working groups for negotiating a post-Kyoto treaty to address greenhouse gas emissions reductions took place from March 31 to April 4, 2008 in Bangkok,
Thailand. Delegates from 163 countries participated. The main outcome is a work plan to advance the Bali roadmap. Many delegates proposed workshops on issues they wanted to be addressed by the new treaty. Generally, the discussions went well, the main disagreement area being the Japanese proposal on a “sectoral approach” for greenhouse gas emissions targets based on energy-efficiency standards by industry, and the concept of “measuring, reporting and verifying.” Seven more sessions will be held—three this year and four in 2009.

The next meeting will be held in June, in Bonn, addressing developing countries’ adaptation strategies and clean technology transfer. In-depth discussions of the Japanese proposal on greenhouse gas emissions and energy efficiency targets were postponed to the August meeting to be held in Ghana. China, India, and other developing countries strongly oppose the Japanese plan that would require developing countries to stabilize greenhouse gases over the next 10–15 years and cut them in half by 2050. Significant disagreements remain over demands from the U.S. and Japan for developing countries to accept binding targets as part of a pact to stabilize greenhouse gases in the next 10–15 years and cut them in half by 2050.

Aviation and shipping industries account for some 5%-8% of greenhouse gas emissions and are sectors not covered by the Kyoto Protocol, due to the difficulty in classifying them under individual nations. However, the European community estimates that emissions might grow by 32% from shipping and 90% from aviation. Therefore, Europe is advocating clear and meaningful greenhouse gas emission reduction targets for the two sectors. [April 2007. Military Implications, Sources]

National and Regional Initiatives

The meeting of the environment ministers from the Group of Eight industrialized nations held in Kobe, Japan, concluded with an agreement on the long-term goal of cutting greenhouse gas emissions in half by 2050, but without any specific emissions reduction targets for 2020. [May 2008. Military Implications, Sources]

While negotiations for a post-2012 treaty continue, questions are growing about better enforcement mechanisms of the Kyoto Protocol to compel governments to respect their commitments. Change of government shouldn’t allow policy changes relative to a country’s international commitments and ratified regulations. Canada, Japan and some southern European countries are all well behind their targets. “The biggest concern comes from countries like Canada that have openly begun voicing doubts about whether they will comply or even care about complying,” said Antonio Hill, from Oxfam. [April 2008. Military Implications, Sources]

China’s CO₂ emissions grew much more than previous estimates, revealed a new analysis by economists at the University of California. The Intergovernmental Panel on Climate Change estimated annual CO₂ increase in the region that includes China at 2.5%-5% for 2004–2010, while the new University of California analysis estimates a growth rate of at least 11% for the same time period. This finding reinforces beliefs that any climate change treaty should include mandatory emission targets for big emitter developing countries. [March 2008. Military Implications, Sources]

Japan is considering strengthening national regulations (such as introducing compulsory caps on greenhouse gas emissions and a domestic emissions trading scheme for the companies that
resist reducing emissions). It is also expected to make tougher commitments in the post-Kyoto Protocol phase. [February 2008. Military Implications, Sources]

The newly elected Australian government sponsored a 2020 summit during April 2008. One thousand selected invitees spent two days considering ten themes, including Australia’s long-term role in the region. A detailed response to the summit is expected from the Government by the end of 2008. The new Australian government has taken a more aggressive approach to CO₂ emissions reduction and the 2020 summit held in April 2008 encouraged the government to further take a regional lead in this area. The government has committed Australia to a carbon-trading scheme by 2010. [April 2008. Military Implications, Sources]

Governors of 20 U.S. states signed the Governors’ Declaration on Climate Change at the 2008 Conference on Climate Change held at Yale University. The Declaration is establishing a partnership between the states and the federal government to increase efforts to control and reduce greenhouse gas emissions. At the same meeting, Premier Jean Charest of Quebec, Canada, announced that Quebec is joining the Western Climate Initiative, which calls for a 15% reduction in greenhouse gas emissions below 2005 levels by 2020. [April 2008. Military Implications, Sources]

Clean Development Mechanism (CDM) successful
The UNFCCC Secretariat Director considers the Kyoto Protocol’s Clean Development Mechanism (CDM) successful so far, with some 645 CDM projects being registered in 44 countries, covering a wide range of sectors. At the same time, he cautioned that serious negotiations on a post-2012 regime would only be launched at the Bali conference, and not concluded there, given experience with the Kyoto Protocol, which took two years to negotiate and another two to ratify and bring into force. Australia's government is developing a carbon emissions reduction plan that would recommend a trading scheme built on the six-nation Asia-Pacific Partnership on Clean Development and Climate (which includes Australia, China, India, Japan, South Korea, and the U.S.) The proposal is planned to be put forward at the 2007 Summit of the Asia-Pacific Economic Cooperation to be held in Sydney, in September. [May 2007. Military Implications, Sources]

Other post-Kyoto Treaty-related Conferences and reports
The climate change talks organized by the UN Framework Convention on Climate Change in Vienna, Austria, agreed that a global approach is crucial in tackling climate change and its effects, and prepared the way for further negotiations for a post-Kyoto treaty to be discussed at the December summit in Bali. Climate change and post-Kyoto strategies are also expected to top the agenda of the Asia Pacific Economic Cooperation (APEC) summit to be held on September 8. Meanwhile, the secretariat of the UNFCCC released first results indicating that countries will meet criteria to begin trading in Kyoto emission allowances for 2008, the first year of the Treaty’s first commitment period. [August 2007. Military Implications, Sources]

The UN's "The Future in our Hands: Addressing the Leadership Challenge of Climate Change", the largest-ever meeting of world leaders on climate change, was held on 24 September at the UN headquarters in New York, as a preamble to the UN high-level General Assembly, to set the
stage for the December Bali negotiations on a post-Kyoto treaty to address climate change and GHG emissions. It addressed aspects related to adaptation, mitigation, technology, and financing. Participants agreed that a new treaty to address climate change was needed, and that the UNFCCC is the most appropriate forum to conduct the negotiations.

Meanwhile, the number of lawsuits dealing with global warming is increasing around the world. Environmentalists are hoping to increase pressure on policymakers and companies to change to more environment-friendly and low-GHG emission policies. Initiatives such as the Carbon Disclosure Project (which sent letters to 2,400 large firms around the world) are demanding that corporations be more transparent and accountable in disclosing their GHG emissions and their activities’ impact on climate change. [September 2007, Military Implications, Sources]

As a prelude to the December Bali summit, environment ministers from about 40 nations held an informal meeting in Indonesia, agreeing that the world must finalize a climate change treaty by 2009, to leave enough time for countries to ratify it before the Kyoto Treaty expires in 2012. Countries key for the negotiations were represented in the meeting—low-lying countries such as the Maldives, OPEC such as Saudi Arabia, the U.S., Australia, China, and India. Also in preparation for the Bali Summit, in November the Government of Maldives will be hosting an international conference, “The Human Dimension of Global Climate Change,” with the theme “Recognizing environmental security as a fundamental human right,” said Maldives President, Maumoon Abdul Gayoom.

Contributions to accelerating atmospheric CO\textsubscript{2} growth from economic activity, carbon intensity, and efficiency of natural sinks, a study conducted by the Global Carbon Project in cooperation with other research institutions, reports that increase in atmospheric CO\textsubscript{2} is due to faster economic growth coupled with slowing improvements in carbon intensity, and decreasing efficiency of natural sinks in removing emissions from human activities. The paper says that 2006 CO\textsubscript{2} releases were 35% above the 1990 level. “The longer we delay reducing emissions, the more restorative capacity will be lost,” added CSIRO scientist Dr Mike Raupach, co-chair of the Global Carbon Project. [October 2007, Military Implications, Sources]

The IPCC Fourth Assessment Report (AR4) Summary for Policymakers [see item above] is a fundamental document for policymakers in preparation for the UN Climate Change Conference to be held in Bali, Indonesia, 3 -14 December 2007.

The "Singapore Declaration on Climate Change, Energy and the Environment" adopted at the East Asia Summit attended by leaders of 16 Asian nations, including China and India, pledges action on climate change and declares support of the UN plan as the “core mechanism” for tackling global warming, and commits to support efforts to negotiate an effective post-2012 international arrangement under the United Nations Framework Convention on Climate Change (UNFCCC) process. The same position emerged from the Asia Southeast Asian Nations – European Union (ASEAN-EU) United Summit, where delegates acknowledged that “developing countries should also play their part [in GHG emissions reduction], supported by developed countries through positive incentives, including through a strengthened global carbon market.” Government representatives attending the Alliance of Small Island States (AOSIS) discussed collaboration on coping with the devastating effects that climate change has on their nations, and on advancing the international negotiations for a comprehensive post-Kyoto Treaty during ‘The Human Dimension of Global Climate Change’ conference with the theme ‘Recognizing environmental security as a fundamental human right’. The Maldives President, Maumoon
Abdul Gayoom, reiterated the importance of recognizing “environmental protection as a fundamental human right” and announced that the Maldives will initiate a debate on the issue with the Human Rights Council. [November 2007. Military Implications, Sources]

Energy Saving

Energy ministers for Canada, Mexico and the U.S. endorsed the first trilateral agreement on energy science and technology—a framework designed to enhance North American energy security and environmental protection. It focuses on cooperation in energy science and technology to increase energy efficiency and advance clean energy technologies across North America and the world. Energy security will also be high on the agenda of the North American Leaders’ Summit to be held August 20-21 in Montebello, Quebec. [July 2007. Military implications, Source]

Vanishing Supply of World's Helium Calls for Conservation
The world's largest reserve of helium may be depleted in as short a time as eight years, experts say; they also point out that the gas is non-renewable and irreplaceable. It has a number of applications in science and technology, and in industry, e.g., nuclear magnetic resonance, mass spectroscopy, welding, fiber optics and computer microchip production. Helium is found in some natural gas reservoirs, and Russia may be a future supplier. Its separation from the atmosphere is prohibitively expensive. [January 2008. Military Implications, Source]

Ban on Incandescent Light Bulbs Expands
As part of the plan to cut down on energy consumption and greenhouse gas emissions, the phase-out of incandescent bulbs expands. Canada is expected to introduce new regulations by the end of this year, requesting the phase-out of inefficient incandescent lighting in common uses be completed by 2012. Canada is the second country to introduce such a nationwide regulation, after Australia, where the ban is scheduled for 2009–10. [See also Compact Fluorescent Light Bulbs (CFLs) May Surge to Fore, European Lamp Companies Push Compact Fluorescents, as Does the EU.] [April 2007. Military Implications, Sources]

Compact Fluorescent Light Bulbs (CFLs) May Surge to Fore
A bill to be introduced in the California legislature to ban the use of incandescent light bulbs by 2012, in favor of compact fluorescents, may presage a worldwide tendency in this direction. With global warming concerns burgeoning and CFLs using 75% less energy, this action by California (if it becomes law) could trigger similar measures around the world over the next few years. [February 2007. Military Implications, Source]

European Lamp Companies Push Compact Fluorescents, as Does the EU
The European Lamp Companies Federation, whose members include the world's three largest light bulb manufacturers, has said they will push European consumers to switch to energy-saving
compact fluorescent bulbs (CFLs). According to an AP dispatch, “The European Union is already encouraging its 27 member governments to promote the use of efficient lights on streets and in offices. The ELC Federation statement said its members 'urge the European Commission to adopt a similarly proactive approach to domestic lighting’.” [March 2007. Military Implications, Source]

**Biological Diversity**

**New Mechanisms for Enforcing Biosafety and Biological Diversity Treaties**
The focus of the fourth Meeting of the Parties to the Cartagena Protocol on Biosafety (COP/MOP 4), held from 12-16 May 2008 in Bonn, Germany, was on enforcement measures. It adopted 18 decisions on issues related to: the Biosafety Clearing-House; identification and handling of living modified organisms; notification requirements; risk assessment and risk management; and monitoring and reporting. The timetable and framework were set for a liability and redress regime concerning potential damage caused by the movements of genetically modified organisms, which will be further discussed at the next meeting of the parties to take place in October 2010, in Nagoya, Japan. An ad hoc technical expert group was mandated to consider risk assessment and risk management issues. The Rules, Procedures and Mechanisms Applicable to Processes under the Cartagena Protocol on Biosafety was also published at this meeting.
The Ninth Meeting of the Parties to the Convention on Biological Diversity followed, May 19-30, 2008, also in Bonn, Germany, assessing mechanisms to reduce loss of biodiversity. The CBD COP 9 adopted the “Bonn roadmap” that addresses issues concerning an international regime on access and benefit-sharing; a mechanism for assessing marine areas in need of protection; a resolution on biodiversity and climate change, including language cautioning against ocean fertilization; and an agreement on biofuels. [See also International Biodiversity Meetings Make Decisions and Tougher Systems to Control GMO Suggested in March 2006 environmental security report.] [May 2008. Military Implications, Sources]

**United Nations Agreement to Protect the World’s Forests Adopted**
Although not a legally binding document, the agreement on international forest policy and cooperation is an important instrument for sustainable forest management. By setting international standards for forest management, the agreement is expected to advance international cooperation on forest conservation, improve forest products trade, and develop national policies that would reduce deforestation, prevent forest degradation, and improve the living standard of all forest-dependent peoples. The agreement was adopted at the United Nations Forum on Forests, following 15 years of negotiations and debates on whether a treaty or an agreement is needed for improving the world’s forests management. A voluntary global financing mechanism for forest management is supposed to be adopted by 2009. [May 2007. Military Implications, Sources]

**UN General Assembly Adopts Global Forest Agreement**
The “Non-Legally Binding Instrument on All Types of Forests” adopted by the UN General Assembly on December 17, 2007 sets the political framework and standards for sustainable forest management and monitoring to stabilize climate change and protect biodiversity and
ecosystems. The agreement suggests mechanisms for systematic monitoring and reporting at the national level, as well as means for international collaboration, ranging from funding developing countries for reducing deforestation, to technology transfer and capacity building for forest management. Although not binding, the forests agreement is an important political instrument to improve nations’ forest management. [See also United Nations Agreement to Protect the World’s Forests Adopted in May 2007 environmental security report] [December 2007. Military Implications, Sources]

Deforestation Not Yet Adequately Addressed by International Regulations
The UN Convention on Biological Diversity held a five-day meeting in Rome, Italy, to discuss how agricultural and forest biodiversity are affected by climate change. A focus was on mangrove: according to scientists, 20% of mangrove forests have been lost, and economic and environmental damages should be addressed. Mangroves’ destruction could cause biodiversity loss in tropical areas, increase CO₂ emissions, and destroy people’s livelihoods. There are no strategies yet to deal with the situation, although scientists warn that if not addressed now, in the next ten years the crisis could get out of control. Along the same lines, African forestry protection organizations and the Food and Agricultural Organization (FAO) held a meeting on specific climate change issues, discussing strategies to find the best compromise between humans’ interests, food crops, deforestation, and wildlife. Environmental degradation and loss of livelihood due to deforestation are underlying and/or multiplier causes of conflict, mainly in already fragile states or conflict-torn regions. [February 2008. Military Implications, Sources]

UNESCO Added 23 New Reserve Sites in 18 Countries
UNESCO added 23 new sites in 18 countries to the World Network of Biosphere Reserves that are managed on sustainable development principles to reduce biodiversity loss. Three countries join the global network—El Salvador, Qatar, and the United Arab Emirates. The new additions include 2 sites in each: Argentina, Canada, China, El Salvador, and Portugal, and 1 site in each: Australia, Chile, Costa Rica, Ecuador, Lebanon, Mexico, Federated States of Micronesia, Mongolia, Qatar, South Africa, Spain, United Arab Emirates, and Viet Nam. UNESCO’s Man and the Biosphere (MAB) network now comprises 529 sites in 105 countries. [See also New Sites Added to World’s Protected Biosphere Reserves in October 2006 and others on the same issue in previous environmental security reports.] [September 2007. Military Implications, Source]

New Sites Added to World’s Protected Biosphere Reserves
UNESCO added 25 new sites to the UN global network of protected biosphere reserves that are managed on sustainable development principles. The new additions include 18 sites in Mexico, three in Spain, one trans-boundary site shared between Spain and Morocco, and one in each of the Russian Federation, Viet Nam, and Malawi. UNESCO’s network Man and the Biosphere (MAB) Programme now comprises 507 reserves in 102 countries. [See also New Protected Ecological Sites in July 2005 and other previous environmental security reports.] [October 2006. Military Implications, Sources]
New Strategy of UNESCO World Heritage Committee for Heritage Sites and Climate Change

UNESCO’s World Heritage Committee is registering protected sites threatened by climate change. These sites will be monitored and actions will be suggested to prevent their damage from climate change. A policy document on the impact of climate change on World Heritage properties will be presented to the World Heritage Committee in 2007. Created in 1972, UNESCO's World Heritage List covers 812 sites around the world. Located in 137 countries, 628 of the World Heritage sites are cultural, 160 are natural and 24 are mixed. [See also New Protected Ecological Sites in July 2005, Nine New Hotspots Added to World's Protected Areas in February 2005, Intensified Efforts Needed to Save Biodiversity in January 2005, and related items on UNESCO World Heritage Sites in November and June 2004, and October 2003 environmental security monthly reports.] [July 2006. Military Implications, Sources]

International Polar Year 2007-2008

The International Polar Year, the largest polar research program for 50 years, officially started on 1 March 2007 and will involve thousands of scientists, from more than 60 countries, working on 220 projects focused on the Arctic and Antarctic regions. Its purpose is to enhance the understanding of physical, biological and social processes of those regions, and Earth's climate and ecosystems. The outcomes are expected to improve assessments and forecasts, and eventually generate recommendations for further research and policies. In 2009, after the IPY ends, ESA will launch the Cryosat 2 spacecraft to continue monitoring the Polar Regions mainly for changes in the thickness of the polar ice sheets and floating sea ice. [March 2007. Military Implications, Sources]

Marine Environment

International Conference and Assessments Find Rising Ocean Pollution

The Second Intergovernmental Review (IGR-2) meeting of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) attended by over 700 participants from some 115 countries was held in Beijing, October 16-20. The delegates assessed progress so far and the main issues concerning ocean pollution, and addressed the actions needed for the next period 2007-2011. Although no legally binding instruments were adopted, “soft law” timetables and measures offering more flexibility and adaptability to countries’ and regions’ specifics were discussed. New scientific estimates released at the meeting reveal that due to pollution, the number of marine ‘dead zones’ or low oxygenated areas may have reached 200, threatening fish stocks and the livelihood of people who depend on fisheries. And, an estimated 16% of the world’s coral reefs suffered up to 90% mortality. UNEP new report, The State of the Marine Environment: Trends and Processes, is a comprehensive assessment of pollution evolution and trends, warning of critical areas and suggesting recommendations to improve control and reduce contamination caused mainly by discharge of untreated wastewater. The report also notes that the number of coastal dead zones has doubled every decade since 1960, and that coastal ecosystems will be further endangered by rising populations in those areas. Highly populated East Asia discharges 90% of its untreated sewage into water. The Beijing Declaration on Furthering the Implementation of the GPA will be
Roadmap for Establishing the Global System of Marine Protected Areas

Establishing a Marine Protected Areas network by the year 2012 was proposed at the First International Marine Protected Areas Congress held in October 2005. Establishing Networks of Marine Protected Areas – Making It Happen is a roadmap for helping to meet that goal. Launched at the World Conservation Union (IUCN) Marine Protected Area Summit in Washington, DC, April 11, 2007, it was published by the National Oceanic and Atmospheric Administration, in collaboration with the IUCN World Commission on Protected Areas, the Great Barrier Reef Marine Park Authority, the World Wildlife Fund–Australia, and The Nature Conservancy. [See also Network of Marine Protection Areas to be Adopted by 2012, Marine Environment Needs More Protection, Stronger Regulations to Protect Ocean Marine Environments.] [April 2007. Military Implications, Sources]

New Marine Protected Areas Proposed

New proposals aim to protect critical marine ecosystems and whale and dolphin habitats in several Mediterranean Sea areas and the Black Sea from excessive fishing, intense shipping traffic, and maritime pollution. The proposed areas include (see map in the Appendix): the entire Alborán Sea and Straits of Gibraltar; the Strait of Sicily; the Amvrakikos Gulf (NW Greece); two Black Sea areas; and seven other Mediterranean areas—5 in Greece, 2 in Italy. The proposals will be put forward to the 20-country parties Agreement on the Conservation of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS) by its Scientific Committee at the Meeting of the Parties to be held in Croatia, in October. Meanwhile, the Spanish Navy has asked ships to slow to 15 knots and sail "in a maximum state of vigilance" to avoid colliding with whales in the Strait of Gibraltar. [Note: The state of World Fisheries and Aquaculture 2006 report released this month by FAO warns that several species of fish in high seas outside of national jurisdictions are in danger.]

The World Wildlife Fund (WWF) launched a campaign for creating a network of conservation areas in the Southern Ocean by 2012, to protect it against unsustainable fishing, marine pollution, and effects of climate change. WWF will put forward the Southern Ocean protection proposal at the next Antarctic Treaty Consultative meeting, to be held from 30 April to 11 May 2007 in New Delhi, India. [Note: see itemWebsite for Marine Protected Areas and Cetaceans’ Sanctuaries further in this report] [March 2007. Military Implications, Sources]

IMO Sets New Limits on Ship Fuel Pollution

The International Maritime Organization has agreed on severe new limits on ship fuel pollutants, especially sulphur (sulfur). The restrictions are to be implemented by 2015, and will impose a change in sulphur limits in special Sulphur Emission Control Areas (SECA) to 0.1% from the current 1.5%. The set of SECAs, now including only Baltic and North Sea areas, is likely to be expanded to other coastal regions in the world. [May 2008. Military Implications, Source]
Marine Protection to Increase
The International Whaling Commission 2008 Scientific Committee report reveals alarming results that the number of ocean dead zones has grown to 400, from only 44 areas reported in 1995. UNEP says that man-made activities such as use of fertilizers, and sewage and other pollutants, combined with the impact of climate change, have led to the doubling of the number of oxygen-deficient dead zones every decade since the 1960s. Meantime, New Zealand put forward a new Exclusive Economic Zone Environmental Effects Bill, expected to be introduced by late August, which will apply to environmental effects of currently unregulated activities in the EEZ. [See also International Conference and Assessments Find Rising Ocean Pollution in October 2006 and other similar items in previous environmental security reports.] [June 2008. Military Implications, Sources]

Tougher Law of the Sea Regulations Suggested for Marine Genetic Resources
The UN Open-ended Informal Consultation Process on Oceans and the Law of the Sea produced some recommendations for improving the management and protection of marine genetic resources, including designing enforceable regulations along with liabilities and responsibilities related to marine genetic resources; increasing protection of the marine environment from the effects of man-made factors; and encouraging collaborative research, access and use of marine resources in areas beyond national jurisdiction. Although the UN Convention on the Law of the Sea is recognized as the legal framework for all activities in the oceans and seas, there is disagreement on how the Convention applies to marine genetic resources in areas outside national jurisdictions. The G-77 group of developing countries and China consider marine genetic resources “common heritage of mankind”; while Japan, the U.S. and some other developed countries argue that they fall under the provisions relating to the high seas. The debate will continue in 2008 at the UN Ad Hoc Open-ended Informal Working Group on issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction. [July 2007. Military Implications, Sources]

Shipping to Face New Regulations to Reduce Air Pollution
Concerns over air pollution by marine navigation are rising and, similarly to the aviation industry, it is likely that the shipping industry will one day be held responsible and asked to act on its GHG emissions. Given the industry’s global extent, global regulations are needed and expected. The International Maritime Organization (IMO) launched in July a comprehensive study to assess the shipping industry’s contribution to CO₂, sulfur dioxide, toxic nitrous oxide, and particulate emissions, and the impacts on air quality. Results are expected by the end of this year. Along the same lines, the theme of World Maritime Day 2007 was “IMO’s response to current environmental challenges” in order to enhance awareness of the industry’s environmental impact, and trigger compelling action.
Note: This month, Friends of the Earth sued the U.S. EPA in federal district court for failing to meet the April 2007 deadline to regulate air pollution from large ships. Meanwhile, the Marine Vessel Emissions Act of 2007—that would require cleaner fuels and engines in all ocean-going vessels calling at U.S. ports—was introduced in the Senate (SB 1499) and the House of Representatives (HR 2548). [September 2007. Military Implications, Sources]
Concerns over Maritime Air Pollution Increase

A new report by the International Maritime Organization reveals that emissions from shipping are rising rapidly; annual CO₂ emission from the world shipping industry reached 1.12 billion tonnes in 2007, representing about 4.5% of global CO₂ emission—three times higher than previously thought—and by 2020 is expected to rise by 30%, making shipping responsible for nearly 6% of global emissions. Sulphur dioxide emissions from ships now stand at 16.2m tonnes a year and are expected to increase by 40%, to 22.7m tonnes by 2020. Nevertheless, emissions from shipping are difficult to regulate by international treaties, due to the complexity of attributing them to individual states. The International Maritime Organization is now assessing regulation proposals and the Sub-Committee on Bulk Liquids and Gases submitted draft amendments to the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI and amendments to the Emission of Nitrogen Oxides from Marine Diesel Engines Technical Code. If approved by the Marine Environment Protection Committee (which meets at the end of March) the amendments could enter into force in March 2010 (or on a date to be decided.) The EPA put forward to the IMO a proposal that vessels be required to switch to cleaner fuel or use clean-up technology to reduce toxic grit from emissions when they are closer to shore, and it hopes that it would be adopted as an international regulation by 2011. EPA also plans to issue its own rules in 2009. Designing more efficient ships, reducing speed, and using higher quality fuel might be some of the easiest and fastest measures for reducing emissions. [February 2008. Military Implications, Sources]

Shipping Regulations for Protecting Whales

Transport Canada, Environment Canada, and a group of marine mammal researchers submitted a proposal to the IMO calling for diversion of large vessels in the Roseway Basin (southwest of Nova Scotia) to protect the endangered North Atlantic right whale. Several right whales are killed annually by collisions with large ships. The ban would prohibit shipping traffic in a 1,780 square kilometer area around Roseway Basin. Also to protect the North Atlantic right whale, the U.S. Fisheries Service proposed speed limits on the east coast. Similarly, a petition by the U.S. Center for Biological Diversity calls upon the National Marine Fisheries Service to protect endangered blue whales by setting a speed limit of 10 knots in the Santa Barbara Channel (California) for vessels 65 feet or larger while whales are in the area. [September 2007. Military Implications, Sources]

Whale Conservation Protected Efforts Increasing

The U.S. National Marine Fisheries Service has released its recovery plan for Puget Sound's endangered killer whales. The plan covers about 2500 square miles, including the waters around the San Juan Islands, the Strait of Juan de Fuca and all of Puget Sound. One of its aspects includes assessing and improving vessel traffic guidelines in and around protected areas.

Japan continues its whaling in waters off a section of Antarctica that Australia declared a whale sanctuary and over which it claims sovereignty. In January, an Australian Federal Court declared that whaling in the sanctuary was illegal and should stop. Australia’s new Prime Minister, Kevin Rudd, also calls for an end to whaling and New Zealand Prime Minister Helen Clark warned that photos of the Japanese whaling fleet revealing their location would be published if they entered New Zealand’s Antarctic waters.
A Pew Whale Symposium, entitled “A change in climate for whales,” was held at UNU Headquarters in Tokyo, Japan, January 30-31, 2008, as a prelude to an intersessional meeting on strengthening the International Whaling Commission, to be held March 6-8, 2008, in London. [See also Shipping Regulations for Protecting Whales in September 2007, New Marine Protected Areas Proposed in March 2007, Commercial Whaling Ban Strengthened by International Whaling Commission (IWC) in June 2007, and other items on similar issues in previous monthly reports.] [January 2008. Military Implications, Sources]

**Commercial Whaling Ban Strengthened by International Whaling Commission (IWC)**
Delegates to the IWC meeting adopted a resolution to keep the moratorium banning commercial whaling in effect, despite Japan’s lobbying for its suspension. Conservation organizations and anti-whaling countries argue that Japan’s lethal “scientific research on whales,” violates international regulations for whales’ protection. Japan threatens to leave the IWC and form another organization to deal with regulations on whale-related issues. [June 2007. Military Implications, Sources]

**London Convention Might be Expanded to Include Ocean-based Geoengineering**
Parties to the London Convention on dumping of wastes at sea unanimously decided that a more cautious approach is needed concerning ocean-based geoengineering, which is scientifically unjustified and should be internationally regulated. A coalition of civil society groups suggested that an international process should begin, “to put all geoengineering technologies under intergovernmental oversight.” Thus, other international regulations—such as the UN Convention on Biological Diversity—might also be expanded. The Jeddah Declaration adopted on November 1st by the ninth global meeting of the Regional Seas Conventions and Action Plans also highlights the importance of a healthy marine environment to human security. [See also Tougher Law of the Sea Regulations Suggested for Marine Genetic Resources in July 2007, The Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter Enters Into Force in March 2006, Accelerating Synthetic Biology Applications Need Better Monitoring and Regulation in July 2007 and other previous environmental security reports on similar issues.] [November 2007. Military Implications, Sources]

**Micronesian Nations Sign Coral Reef Protection Document**
The presidents of Palau, Micronesia, and the Marshall Islands became the first heads of state to sign the International Declaration of Reef Rights, created by the Reef Check Foundation to raise awareness about the value of coral reefs and how to protect them. 2008 is the International Year of the Reef. [September 2007. Military Implications, Sources]

**Baltic Ministers Recommend Additions to Baltic Sea Action Plan**
The meeting of the environment ministers of the Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden), held in Finland at the end of August, focused on the condition of the Baltic, the Nordic countries’ actions on climate change, and the future of international environment management (including the Nordic initiative to strengthen UNEP.) The ministers called for tangible measures to protect the Baltic Sea (e.g., a ceiling on emissions of nutrients) and their inclusion in the Baltic Sea Action Plan (BSAP) due to be approved by the Baltic
nations environment ministers at the meeting of the Helsinki Commission for the Protection of the Baltic Sea Environment (HELCOM) to be held on November 15, in Krakow, Poland. [September 2007. Military Implications, Sources]

EU Integrated Maritime Policy

Political Agreement Reached on the European Marine Strategy Directive
The European Environment Council reached political agreement on the framework directive for EU action on marine environment policy. The Marine Strategy Directive aims to ensure that all EU marine waters are environmentally healthy by 2021 and it is the main component of the Thematic Strategy on the Protection and Conservation of the Marine Environment, which was adopted in October 2005. The Strategy is based on regional assessment of the marine situation, exchange of information, and design of policies to improve ecosystem conservation or rehabilitation, as well as pollution reduction and clean-up. [See also New EU Environmental Strategies in September 2005, Europe to Harmonize Marine Pollution Legislation in July 2005, The European Union Environmental Initiatives in January 2005, and International Maritime Organization (IMO) wants global rather than many different local or regional rules of January 2003 environmental security monthly reports.] [December 2006. Military Implications, Sources]

European Parliament Passed the Marine Strategy Directive
The European Parliament approved the text of the Marine Strategy Directive that calls for the establishment of marine regions and sub-regions to be managed by Member States on a coherent and coordinated ecosystem-based approach and for ensuring that the marine strategies affecting the regions are coherent and coordinated. Member States are to assess the status of their region’s marine environment, set objectives, and establish targets and programs by 2015 to attain good environmental status by 2020 and establishment of marine protected areas. [See also Political Agreement Reached on the European Marine Strategy Directive in December 2006 and other similar items in previous environmental security reports.] [December 2007. Military Implications, Sources]

Transport Canada Proposes New Vessel Operation Regulations
The Canadian Ministry of Transport, Infrastructure and Communities is proposing Vessel Operation Restriction Regulations as part of the Canada Shipping Act 2001 (CSA 2001), which came into effect on July 1, 2007. The new regulation will replace the existing Boating Restriction Regulations and includes restrictions on boating activities and navigation in Canadian waters as to type or speed of vessels, mode of propulsion and engine power, and access by vessels to specific areas. A 60-day comments period began on August 18, 2007, after the
publication of the proposed regulations in the Canada Gazette. After consideration of all
comments received, Transport Canada will finalize the regulations and publish them in the
Canada Gazette, Part II, at which time they will come into effect. [August 2007. Military
Implications, Sources] 

Malacca Straits Need Increased Protection from Various Security Threats
The Malacca Strait, one of the most important shipping lanes in the world, faces many
challenges, including piracy, terrorists’ attacks and environmental degradation. If terrorists were
to sink a ship at the shallowest part of the strait, no ship could pass through, and all traffic would
be blocked. At the same time, increased traffic volumes add pressures to the ecosystem of the
straits. In an address jointly hosted by the embassy of Malaysia and the Institute of Foreign
Affairs and National Security, the Hon Dato' Sri Najib Tun Abdul Razak, Deputy Prime Minister
of Malaysia, urged the need for united efforts by all users of the straits to address these

Network of Marine Educators Formed to Protect Pacific
According to Environmental News Network, the International Pacific Marine Educators
Conference (IPMEC), held 15-18 January 2007, in Honolulu, "has resulted in the establishment
of a Pacific network of marine educators designed to ensure the health of the Pacific and the
communities that depend upon it. The network aims to facilitate real action in marine education
and highlight the need for ocean stewardship across the Pacific." [February 2007. Military
Implications, Sources] 

Website for Marine Protected Areas and Cetaceans’ Sanctuaries
A new website, cetaceanhabitat.org, sponsored by the Whale and Dolphin Conservation Society,
provides comprehensive information on the nearly 600 proposed and existing marine protected
areas and sanctuaries for cetaceans. It has summaries and links to international treaties on MPAs;
definitions of key MPA terms; updated news on proposals for new MPAs, and other related
resources. [March 2007. Military Implications, Sources] 

New Pacific Marine Protected Area Is World’s Largest
Kiribati has established the Phoenix Islands Protected Area, covering 410,500 square kilometers
in the central Pacific. A representative of the New England Aquarium, which is advising the
Kiribati government, stated, “The new boundary includes extensive seamount and deep-sea
habitat, tuna spawning grounds and as yet un-surveyed submerged reef systems.” [February
2008. Military Implications, Source] 

Plastic Threats to the Marine Environment
Researchers are increasingly warning of the long-term threat from plastic waste to the marine
environment as studies confirm the risks from hidden contamination. While most attention is
focused on dangers that visible items of plastic waste pose to wildlife, new researches investigate
the impact of underwater microscopic plastic fragments on tiny marine organisms. Researchers
note that all continents experience plastic contamination and plastic particles could represent as
much as one-quarter of the total weight of sandy material samples gathered on shorelines at the high tide mark. [See also The Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter Enters into Force in March 2006 and other previous environmental security reports on similar issues.] [March 2008. Military Implications, Source]

Heavy Metals

Call for Global Ban on Lead-based Paints
Scientists are calling for international regulations to ensure that paints have lower than critical lead levels, with the ultimate goal of eliminating all lead from paint. The call comes as a result of a study on consumer paint lead levels in Africa, conducted by a multinational team of environmental and occupational health researchers. Note: The Budapest Statement on Mercury, Lead and Cadmium adopted at the fifth session of the Intergovernmental Forum on Chemical Safety held in September 2006 invites the UNEP GC “to give high priority to considering […] measures, as appropriate, on lead and cadmium, by assessing the need for further action and considering a range of options, including the possibility of establishing a legally binding instrument.” [October 2007. Military Implications, Sources]

Progress on Global Mercury Ban
The negotiations for a global ban of mercury progressed at the GC-24/GMEF (see Item 2. UNEP Governing Council/Global Ministerial Forum Makes Progress on Global Environmental Governance). Although a legally binding treaty imposing clear targets on cutting mercury use worldwide was not adopted, it was agreed that over the next two years an ad hoc open-ended working group will study the options for enhanced voluntary measures and international legal instruments to phase out mercury use. The group will provide a progress report to GCSS-10/GMEF, and a final report to GC-25/GMEF, which will make a decision on the matter. [February 2007. Military Implications, Sources]

EU Seeking Global Mercury Ban
Health and environmental NGOs launched on January 10, 2007, the campaign “Stay Healthy, Stop Mercury” calling on the EU to promote global control on mercury pollution. The EU is expected to raise the global mercury ban issue at next month’s UN Global Ministerial Environment Forum to be held in Nairobi, Kenya, February 5-9. [January 2007. Military Implications, Sources]

Europe Proposes Ban on Mercury Exports
The European Commission has proposed legislation to ban all European Union exports of mercury starting in 2011, and the European Parliament has drafted a measure that would forbid its use in non-electrical measuring devices, with the exception of barometers and antique instruments. [See also Mercury Instruments May Be Banned in EU in February 2006, EU Sets 2011 Deadline to Ban Mercury Exports in June 2005, and Governments Call for Global Assessment and Control of Mercury Pollution in February 2005 environmental security reports.] [November 2006. Military Implications, Sources]
**Weapons-related**

**European Parliament Passed Resolution Calling for Global Ban of DU Weapons**
The European Parliament agreed, with 491 out of 521 votes, to accept a resolution calling on the EU to lead negotiations “through the UN or through a 'coalition of the willing'” for a global treaty to ban depleted uranium weapons. The resolution “Strongly reiterates its call on all Member States and NATO countries to impose a moratorium on the use of depleted uranium weapons and to redouble efforts towards a global ban, as well as systematically to halt production and procurement of this type of weaponry.” It also recommends inclusion of this wording in the European Security Strategy, “the need to give serious thought to the future utility of unguided munitions, as well as cluster bombs, mines and other weapons of indiscriminate effect, such as depleted uranium weapons;” and “not to deploy military and civilian personnel in regions where no guarantee can be given to the effect that depleted uranium has not been, or will not be, used.” [See also Depleted Uranium Environmental Concerns Resurfacing in November 2007 and other items on this issue in previous environmental security reports.] [May 2008. Military Implications, Sources]

**International Convention on Cluster Munitions Adopted by 111 Countries**
The Convention on Cluster Munitions was formally adopted by 111 countries in Dublin, Ireland, on May 30, 2008. The Convention is a legally binding instrument that outlaws the use, production, transfer, and stockpiling of cluster munitions, and commits countries to clear areas contaminated by cluster munitions and assist victims and affected communities. The President of the International Committee of the Red Cross, Jakob Kellenberger, urged all countries to adhere to the Convention and noted “these weapons are not only morally unacceptable but also now illegal under international humanitarian law.” The Cluster Munitions Convention will be opened for signature in Oslo, December 2-3, 2008, and will enter into force after 30 ratifications. The U.S., China, and Russia did not participate in the meeting. [See also Negotiations Continue for an International Instrument to Ban Cluster Munitions in November 2007 and other related items in previous environmental security reports.] [May 2008. Military Implications, Sources]

**Non–Proliferation Treaty Deadlock Continues**
The second of three sessions of the Preparatory Committee for the 2010 Review Conference of the Parties to the Treaty on the Non–Proliferation of Nuclear Weapons (NPT) was held from April 28 to May 9 at the UN Office at Geneva, Switzerland. Participation included delegates of 106 States parties, representatives of specialized international organizations, and of 64 NGOs. The main issues discussed included: nuclear non-proliferation, disarmament and international security; nuclear-weapon-free zones; nuclear safeguards; the peaceful use of nuclear energy; and the Middle East situation. No special agreements were reached. The third session will be held May 4-15, 2009, and the Review Conference will be April 26–May 21, 2010, both in New York. [See also Nuclear Nonproliferation Treaty Stalemate Continues in May 2007, Review Conference of the Non–Proliferation Treaty in May 2005, and other related items in previous environmental security reports.] [May 2008. Military Implications, Sources]
Nuclear Nonproliferation Treaty Stalemate Continues
No progress was achieved by the two-week annual session for preparing the 2010 NPT Review Conference. After having its work delayed for six days due to Iran’s disagreement with the agenda, the conference ended with disputes over the session’s final statement. Iran and other Nonaligned Movement nations criticized the statement as being too focused on compliance and not enough on the need for nuclear-weapon states to move toward disarmament. [See also Review Conference of the Non-Proliferation Treaty, and Increasing Calls for Improved Management of Nuclear Materials and Nonproliferation]
Meanwhile, eight more nations joined the Global Initiative to Combat Nuclear Terrorism. Led by Russia and the U.S., this global effort was initiated in 2006, to improve security over nuclear materials and to deter nuclear smuggling. The group now includes 31 nations. The next meeting is scheduled to be held in June, in Kazakhstan. [May 2007. Military Implications, Sources]

Australia to Propose Panel to Advance Work for the NPT Review in 2010
Australian Prime Minister Kevin Rudd announced plans to create an International Commission on Nuclear Nonproliferation and Disarmament to make constructive recommendation for the 2010 Nuclear Nonproliferation Treaty Review Conference. The commission would follow on the work of Australian-led 1996 Canberra Commission and Japan’s Tokyo Forum. The first report of the panel is supposed to be presented at a major international conference of experts in Australia late 2009. [See also Non-Proliferation Treaty Deadlock Continues in May 2008 and other similar items in previous environmental security reports.] Meantime, the intergovernmental Financial Action Task Force warns that the international community is failing to efficiently control financial transactions that help fund illegal production, technology transfer, and trade of chemical, biological and nuclear weapons. Free-trade zones and transshipment hubs in the Netherlands, Singapore and the UAE are specifically vulnerable sites. [June 2008. Military Implications, Sources]

Progress on the Nuclear-Test-Ban Treaty
The 5th Conference on Facilitating the Entry into Force of the Comprehensive Nuclear-Test-Ban Treaty applauded progress made by the Treaty’s Preparatory Commission in preparing to establish the future CTBT Organization and the Treaty’s verification regime. It also called on the ten states of Annex 2 whose ratification is essential for the treaty’s entry into force to do so. These countries are China, U.S., Democratic People’s Republic of Korea, India, Pakistan, Egypt, Israel, Indonesia, Iran and Colombia. [See also Call for Comprehensive Nuclear-Test-Ban Treaty Entry into Force in September 2004 and other related items in previous environmental security reports.] [September 2007. Military Implications, Sources]

Revitalizing Nuclear Disarmament
‘The Challenge of Abolishing Nuclear Weapons’ conference discussed a variety of measures to eliminate the threat of nuclear weapons. Emphasis was on a Nuclear Weapons Convention, a draft of which (created by civil society organizations) was already submitted to the UN by Costa Rica. Along the same lines, nuclear experts attending the Pugwash 50th Anniversary workshop ‘Revitalizing Nuclear Disarmament’ discussed actions that both nuclear and non-nuclear states
should take in order to further the goal of declaring nuclear weapons illegal and eliminating them entirely. [September 2007. Military Implications, Sources]

**Progress for Enforcing Biological Weapons Convention**

This year’s meeting of states parties to the Biological Weapons Convention focused on strengthening the treaty’s implementation at the national level and advancing regional cooperation. The Implementation Support Unit established last year presented its report on helping member states implement the convention. Also discussed were efforts to increase the pact’s membership beyond the present 159 nations. The Nonaligned Nations Movement presented several recommendations to strengthen the BWC, such as a verification regime to ensure compliance, and seven issues to be considered at BWC meetings through 2010, including stricter export and import controls mechanisms, and monitoring of viruses that could be spread intentionally or accidentally. The next Meeting of States Parties is scheduled for December 1-2008 to consider measures to improve biosafety and biosecurity, scientific codes of conduct, and approaches for increasing awareness. The next review conference of the BWC is scheduled for 2011. [See also Sixth Review Conference of the Biological Weapons Convention in December 2006 and other related environmental security reports.] [December 2007. Military Implications, Sources]

**Biological Weapons Convention Lacks Enforcement Mechanism, Warns Russian General**

Col. Gen. Vladimir Filippov, commander of Russia’s WMD protection force, warned that the Biological Weapons Convention lacks enforcement mechanisms that would help prevent nations and terrorists from producing biological warfare agents. The issue was also previously raised by the Nonaligned Nations Movement at the 2007 meeting of states parties. The next Meeting of States Parties is scheduled for December 2008 and the review conference of the BWC is planned for 2011. [See also Progress for Enforcing Biological Weapons Convention in December 2007 and Sixth Review Conference of the Biological Weapons Convention in December 2006 and other related environmental security reports.] [March 2008. Military Implications, Source]

**Sixth Review Conference of the Biological Weapons Convention**

The three-week review Conference of the Biological Weapons Convention made some positive steps forward that included giving more power to the present temporary secretariat to oversee the treaty and monitor compliance, and holding, by 2011, four intersessional meetings on the treaty topics—enhancing national implementation, measures to improve biosecurity, scientific codes of conduct, peaceful scientific cooperation, and assistance to any country that does fall victim to biological weapons. One representative criticized the conference for not addressing future issues such as new nonlethal agents and nanotech-related methods for delivering biological agents. [See also PrepCom to Set Agenda for the BWC Review Conference in April 2006, Recommendation for a Biosecurity Watchdog in February 2006, and Time to Strengthen the 1972 Biological Weapons Convention in December 2004 environmental security reports.] [December 2006. Military Implications, Source]
Chemical Weapons Convention Gets New Boost

The Second Review Conference for the Chemical Weapons Convention was held in The Hague, April 7-18, 2008, attended by delegates from 114 of the 183 treaty states. The main issues brought up by participants were: threats posed by the use of chemical weapons by nonstate actors; deadlines for chemical weapons destruction (specifically named were Russia and the U.S., which have to destroy their chemical warfare agents by April 29, 2012, and Japan for destruction of its chemical weapons stockpiles in China); and universal adherence to the treaty. Delegates produced a report that reviews the treaty procedures and implementation issues, and urges the 12 countries that are not yet Party (Angola, the Bahamas, Dominican Republic, Egypt, Guinea-Bissau, Iraq, Israel, Lebanon, Myanmar, North Korea, Somalia and Syria) to join the international disarmament and nonproliferation treaty “as a matter of urgency and without preconditions.” The report does not address the convention’s relation to some new science and technology developments that could produce new threats—such as development of new incapacitating agents, advances in biology and nanotechnology, and industry verification mechanisms. It was proposed that, from now on, the Scientific Advisory Board of the Organization for the Prohibition of Chemical Weapons meet twice a year, not just once as it has previously. [See also New Concerns Rising over Chemical Weapons in April 2007 and other related items in previous environmental security reports.]

In the meantime, Pacific Consultants International warns that Japan is not on schedule for meeting its obligations towards China in the recovery and destruction of hundreds of thousands of chemical weapons abandoned at the end of World War II and will most probably not meet the April 2012 deadline, due to management problems. [See also Japanese Chemical Weapons Cleaning in China Yet to be Completed in June 2007, and other previous environmental security reports on this issue.] [April 2008. Military Implications, Sources]

Eleventh Chemical Weapons Convention
The 11th Conference of States Parties to the Chemical Weapons Convention (CWC) was held in The Hague, December 5-8. One of the controversial issues discussed concerned “incapacitating agents,” which Peter Herby, head of the Mines-Arms Unit at the International Committee of the Red Cross, considered toxic chemicals. Some experts also argued that using “nonlethal” materials on the battlefield would violate the CWC. There was also a call to clarify which chemicals—other than riot control agents—are allowed under the treaty’s exception for law enforcement, and that all these chemicals be publicly declared. The Conference approved the requests from Russia, the U.S. and several other nations for additional time to eliminate their stockpiles of toxic agents. There are now 181 nations party to the CWC, representing about 98% of the world’s population and there are calls that all nations become Party to the Convention before its 10th anniversary, next year. [See also Five Countries Organize CWC National Authorities in May 2006, Micro-reactors Challenge Chemical Weapons Convention Effectiveness in August 2005, and Chemical Weapons Convention Annual Conference in December 2004 environmental security reports.] [December 2006, Military Implications, Sources]

New Concerns Rising over Chemical Weapons
The Organization for the Prohibition of Chemical Weapons (OPCW), the Chemical Weapons Convention’s (CWC) secretariat, focuses on issues related to existing weapons, but specialists
argue that new, modern chemicals and production plants could represent even higher risk. Jonathan Tucker of the German Institute for International and Security Affairs in Berlin remarks that a “new generation of small, flexible batch-processing chemical plants that can quickly be switched to producing any number of chemicals are not being inspected at all… and there are five times as many of them as there are declared dual-use plants.” New molecules, such as the "novichok" nerve agents, or "incapacitants" such as fentanyl are overlooked, undermining the "international norm" and confidence in the CWC. [See also Eleventh Chemical Weapons Convention, Five Countries Organize CWC National Authorities, and other related items.] [April 2007. Military Implications, Sources]

**Problems with Destruction of Chemical Weapons and Potential Proliferation**

Only 30% of known chemical weapons stocks have been destroyed over the past ten years. The remaining 70% are supposed to be totally destroyed by 2012 to meet the Chemical Weapons Convention. Also during the UN First Committee (Disarmament and International Security) session, it was reported that while reliable safeguards structures have been established in many countries, moving chemical and biological production to Africa, Asia, Eastern Europe, and Latin America, where industrial regulations are inadequate, creates new verification challenges. The first Industry and Protection Forum to promote the implementation of the Chemical Weapons Convention and to discuss practical implementation issues will be held at the World Forum Convention Center in The Hague, November 1-2. [See also New Concerns Rising over Chemical Weapons in April 2007 and other related items in previous environmental security reports.]

Concerning nuclear disarmament, Mexico’s representative introduced a draft resolution on behalf of the New Agenda Coalition (Brazil, Egypt, Ireland, Mexico, New Zealand, South Africa and Sweden): “Towards a nuclear-weapon-free world, accelerating the implementation of nuclear disarmament commitment.” [October 2007. Military Implications, Sources]

**Improved Compliance with Environmental Regulations**

**European Environmental Liability Directive Came Into Force**

The Environmental Liability Directive establishes a comprehensive framework on liability for damage to the environment, based on the “polluter pays” principle. It aims to ensure that the financial liability for environmental damage prevention or remediation falls on the polluters who caused it, rather than on the taxpayers. Operators are financially responsible for ensuring that they have preventive or remedial measures. When the environmental situation involves more than one member state, then they must cooperate on the necessary preventive or remedial actions. The Directive was adopted in April 2004 and member states were supposed to bring into force the appropriate laws and regulations by April 30, 2007. [See also European Union Polluter Pays Law] [April 2007. Military Implications, Sources]

**Environmental Crime Could Become a Felony in the EU**

The EU Commission has proposed that environmental crimes such as pollution with hazardous substances, illegal dumping of waste, or performing environmentally "dangerous activity" be treated as criminal offenses with minimum levels of punishment that could reach prison sentences or fines for serious cases. By applying the “polluter pays” principle, European courts
could also put offenders out of business or order them to clean up the environment. If the proposal is approved by the European Parliament and member governments, it will become law for all 27 member nations. This would be the first criminal law drafted by the Commission after a 2005 EU Court of Justice ruling that the Commission has the power to draft criminal laws and decide what constitutes a crime, notably in the area of the environment. Environmental groups welcomed the plan but said the list of punishable crimes should be expanded. [February 2007. Military Implications, Sources]

EU to Increase Environmental Regulations Enforcement
The European Commission intends to increase the enforcement of environmental regulations by introducing criminal sanctions for serious environmental offences. In light of last month’s Ivory Coast incident of toxic waste dumping, it aims to strengthen enforcement of the EU Waste Shipment Regulation and improve international cooperation to prevent illegal waste shipments. The issue will be addressed at the next Basel Convention conference to be held in Nairobi, November 27-December 1, 2006. [See also Toxic Waste Disposal of Global Growing Concern in September 2006, as well as Basel Convention on Hazardous Wastes to be Made More Effective in July 2005 and other related items in previous environmental security scanning reports.] [October 2006. Military Implications, Source]

Calendar with Environmental Deadlines Compliance
The 2008 Compliance Calendar by the Environmental Resource Center is an excellent tool summarizing the most important deadlines for compliance with U.S. environmental regulations and reporting. In addition to highlighting the deadlines, it also contains a summary of the most important environmental regulations and responsible organizations. [September 2007. Military Implications, Sources]

IAEA to Improve Nuclear Security in 35 Countries
The EU contributed €7 million to IAEA’s Nuclear Security Fund to improve nuclear security in 35 countries, including 27 in Africa. The focus will be to secure radioactive materials and sites at risk of sabotage and improve capabilities to detect and respond to illicit trafficking in some African countries, including Ghana, South Africa, Morocco, Nigeria, Sudan, Tanzania, Uganda and Zambia. The program will also work to strengthen national legislation and regulatory infrastructures related to nuclear and radioactive material in—among other countries—Azerbaijan, Cape Verde, Comoros, Croatia, Swaziland, and the Former Yugoslavia Republic of Macedonia. Despite the latest contribution, “IAEA’s nuclear security programme remained 90 per cent funded through unpredictable and heavily conditioned voluntary contributions,” notes IAEA Director General Mohamed ElBaradei. [July 2007. Military Implications, Source]

IAEA Nuclear Terror Prevention Guide
The International Atomic Energy Agency published a new manual, Combating Illicit Trafficking in Nuclear and Other Radioactive Material, to help harmonize the activities of the organizations involved in the process of detecting and/or responding to nuclear terror-related incidents. The 156-page manual is a cooperative effort of Interpol and the World Customs Organization. [January 2008. Military Implications, Source]
International Alliance of Forest Peoples
The International Alliance of Forest Peoples was established by the participants in the Peoples of the Forest and Climate Change workshop held in Manaus, Brazil. The scope of the Alliance is to improve international collaboration to guarantee the respect of forest people’s rights to land and natural resources and to their traditional livelihoods, facilitate their adaptation to climate change, and improve their participation in the mechanisms for the reduction of emissions from deforestation and forest degradation. The Declaration was signed by 11 countries: Brazil, Ecuador, Colombia, Costa Rica, Guyana, French Guiana, Paraguay, Nicaragua, Venezuela, Suriname, and Panama. Delegations from Africa (Democratic Republic of the Congo) and Asia (Indonesia) and observers from the UN and NGOs from Brazil, England and the U.S. also attended the meeting. [April 2008. Military Implications, Source]

North America’s Commission for Environmental Cooperation to Increase Enforcement of Environmental Regulations and Public Participation
The Joint Public Advisory Committee (JPAC) of the Commission for Environmental Cooperation (CEC) of Canada, the United States, and Mexico held its third Regular Session for 2006 on 15 September in Montreal, Quebec, to discuss the proposed 2007-2009 Operational Plan. Participants assessed progress on cooperative projects the CEC is implementing to meet the goals and objectives of Looking to the Future: Strategic Plan of the Commission for Environmental Cooperation 2005–2010. The focus was on the implementation of the three program priorities as established by the CEC Council: information for decision-making; capacity building; and trade and environment, mutually reinforcing each other. Proposals called for increased comparability and reliability of environmental data and networks among the U.S., Canada, and Mexico; improved submission and enforcement procedures—to speed the process and increase citizen participation and responsibilities; and creating a North-American comprehensive atlas of all resources, ecosystems, and pollution matters. The Operational Plan will be updated annually, with a rolling three-year horizon, to reflect shifts in programming and associated budget reallocations. [September 2006. Military Implications, Source]

Kyoto/Climate Change-related Lawsuits
Lawsuits over Failure to Meet Kyoto Commitments
The Friends of the Earth threaten to sue the government of Canada over its refusal to adopt adequate policies to cut greenhouse-gas emissions and meet its commitments as agreed under the Kyoto Protocol. The environmental group will file the lawsuit with the Canadian federal court and the Kyoto Protocol Compliance Committee, unless the government changes its position. In May, South Africa filed with the international Kyoto Committee a complaint against Canada and 14 other countries over failure to report on their progress, as required. [See also Global Warming Goes to Court in October 2006 environmental security report.] [November 2006. Military Implications, Source]
Global Warming Goes to Court
The New Zealand High Court has ruled that climate change factors can be considered during Greenpeace’s upcoming appeal against the proposed Marsden B coal-burning power station. Greenpeace appealed the permission granted to the Marsden B power station to start burning coal, on grounds of environmental and mainly climate change consequences. Although this ruling is limited to New Zealand and to a specific industry, it creates a precedent with effects likely to be felt in other jurisdictions and sectors. In November, the U.S. Supreme Court will hear the case of Massachusetts v. Environmental Protection Agency (case 05-1120) filed by twelve states and several cities on EPA’s role to regulate CO2 as a greenhouse gas pollutant under the Clean Air Act. Over 16 other litigations are pending in U.S. federal and state courts against companies whose emissions are linked to global warming; more are expected to come. Swiss Re, the world’s largest reinsurance company, estimates that the annual liability costs of global warming will be $150 billion dollars per year within ten years. [October 2006. Military Implications, Sources]

Global Division of Financial Responsibility for Global Warming Impacts
Oxfam has called for a system to allocate costs of global warming damage per country based on its percentage of greenhouse contribution. Poorer countries are not included. They list the US with 44%, Japan with 13%, Germany 7%, and so forth. With China’s increasing role, the percentages would be continually adjusted. China will release its first national plan to address climate change just prior to the G8 Meeting, which it will attend in Germany. [May 2007. Military implications, Source]

Global Map of Human Impacts to Marine Ecosystems
The first-ever comprehensive atlas showing the impact of human activities on the planet’s marine environment is now available online. The international team of scientists combined the impact data of 17 different activities—ranging from fishing and commercial shipping to pollution and climate change—for 20 different marine ecosystems. The database could be used to monitor further future modifications in the global marine environment. The map reveals that while no ecosystem is completely unaffected, human activities had high impact on over 40% of the world’s ocean-covered area. The biggest human impact seems to be in the North Sea, the South and East China Seas, the Caribbean, and North America’s East Coast. Although the Arctic and the Antarctic areas are the least affected today, scientists are concerned that increased melting of the ice sheets will increase human activities into these areas. [February 2008. Military Implications, Sources]

North American Environmental Atlas Online
The Commission for Environmental Cooperation (CEC) launched the online North American Environmental Atlas, http://www.cec.org/naatlas, which allows visualizing significant North American environmental issues at a continental scale. It features the terrestrial ecological regions of North America and interactive thematic maps such as priority conservation areas, renewable energy capacity, and population, as well as links to data and related sources. The Atlas is in continuous development with new features and information to be added in the coming months,
Water Footprint Measuring System

On the occasion of World Water Day, reminding of possible conflicts over water, UN Secretary-General Ban Ki-moon urged the international community to create strategies for using water more efficiently and sharing it more fairly. Similarly, researchers suggest that it is timely to use a system to measure water footprint similar to that used for carbon footprint. A symposium held by the UNESCO-IHE (Institute for Water Education) discussed the “virtual water” issue specifically related to the world energy markets. It was pointed out that present practices are not sustainable and therefore it is necessary to introduce a system to measure water footprint in order to help better understand water issues, identify areas with highest impact, and develop adequate policies. Calculating a water footprint might increase awareness and influence practices, similar to the impact that carbon footprint has. [See also World Leaders Discuss Environmental Security Policies at Davos in January 2007, Water Scarcity in March 2007, World Water Forum in March 2006, and other previous environmental security reports on the water issue.] [March 2008. Military Implications, Sources]

Environmental Damage to Be Criminalized in the EU

The Permanent Representatives Committee approved the proposal on the protection of the environment through criminal law. EU national governments will have to apply criminal sanctions to those causing “deliberate or negligent damage to the environment.” The list of punishable crimes will include: unlawful discharge of pollutants which could cause “death or serious injury to any person” or “substantial damage” to the environment; illegal waste shipment; killing or possession of protected fauna or flora; significant deterioration of habitats within protected sites; and any action related to ozone-depleting substances. The penalties are left to the discretion of member states as long as they are “effective, proportionate and dissuasive.” The Directive is pending final approval by the Parliament and the EU Council, and is expected to enter into force in 2010. [May 2008. Military Implications, Sources]

EC Enforces Compliance with EU Environmental Regulations

Nine EU Member States are being referred to the European Court of Justice for failing to transpose into national law the European Environmental Liability Directive by the April 30, 2007 deadline. On June 1, 2007, the Commission sent a first written warning to 23 Member States; 14 have complied and the nine who did not are: Austria, Belgium (concerning the Brussels region only), Greece, Finland, France, Ireland, Luxembourg, Slovenia and the United Kingdom. [See also European Environmental Liability Directive Came Into Force in April 2007 and EC Enforces Compliance of National Legislation with EU Environmental Regulations in October 2007 environmental security reports.] [June 2008. Military Implications, Sources]

EC Enforces Compliance of National Legislation with EU Environmental Regulations

The European Commission opened several infringement procedures against Member States for not complying with EU environmental legislation. Some of the EC legal actions include: referring Ireland to the European Court of Justice over inadequacy of its national legislation for
the implementation of the Environmental Impact Assessment Directive; legal action against the UK for not fully complying with ECJ judgments in two separate cases; Luxembourg and Belgium for non-compliance with the EU Directive on urban waste water treatment; final written warning to 12 EU Member States for failing to adopt emergency plans for chemical plants; action against several EU countries for exceeding EU limits on ambient concentrations of SO2; “Letter of Formal Notice” to Estonia, Latvia, and Lithuania for not correctly transposing certain provisions of the WEEE Directive into national legislation, and to Belgium, Denmark, Lithuania, Malta, Finland, and Sweden for inadequate implementation of the RoHS Directive into national law. [See also E-waste Management Directive Came into Effect on August 13, 2005 in August 2005, and RoHS Closer to Deadline in May 2006 environmental security reports.] [October 2007. Military Implications, Sources]

China’s Emergency Response Law to Punish Falsifying Environmental Information
The Emergency Response Law, which came into effect in China on November 1st, has the objective of improving public security and reducing the environmental and health effects of natural disasters and industrial accidents. It requires government to provide accurate and timely information on public emergencies, and false reporting is banned and punishable. The law also says that in extremely serious emergency situations, which “severely threaten life and property, state security, public security, environmental security or public order (which are not specifically covered by the provisions in the law), the NPC Standing Committee or the State Council can declare a ‘state of emergency’ in accordance with the Constitution and relevant laws.” [See also China May Restructure Environmental Effort in October 2007 and other related items in previous environmental security reports.] [November 2007. Military Implications, Source]

United Arab Emirates Establish Nuclear Agency
The United Arab Emirates’ governing Cabinet approved the establishment of the new Nuclear Energy Authority, with “the mandate to evaluate and develop a peaceful nuclear energy program in line with the recommendations of the International Atomic Energy Agency” as part of its civilian nuclear power program. [March 2008. Military Implications, Source]

NEW STANDARDS WITH IMPLICATIONS FOR ENVIRONMENTAL SECURITY

New ISO Standard on Sustainable Building
ISO 21930:2007—Sustainability in Building Construction -- Environmental Declaration of Building Products complements ISO 14025 for the environmental product declarations (EPD) of building products, containing specifications, principles, and requirements, to encourage sustainable building. It sets the framework for environmental declarations of building products and takes into consideration the entire life cycle of a building. [December 2007. Military Implications, Sources]

Green Standards to Counter E-waste
In view of e-waste being the fastest growing category of waste, Greenpeace launched a new e-waste campaign on August 25th. In a preamble to the campaign, it compiled data on progress in
eliminating hazardous chemicals and in recycling policies of the main mobile phone and PC-makers and ranked the companies based on their scores. The criteria used in the Greenpeace assessment are tougher than those stipulated by the European Restriction of Hazardous Substances (RoHS) directive, including polyvinyl chloride (PVC) and some brominated flame retardants (BFRs) on the restrictions list. Greenpeace also advocates the “precautionary principle”, requesting companies to avoid chemicals with uncertain environmental impacts. [See also RoHS Closer to Deadline in May 2006, Recycling Regulations in the EU in August 2005 and Two E-waste laws entered into force in the EU in February 2003 environmental security reports.]

The Electronic Product Environmental Assessment Tool (EPEAT) produced by EPA also aims to encourage “green computers.” After working for three years with major computer manufacturers, EPA produced a "greener computers" list that consumers can consult to see what models are more environmentally friendly and why. The standards were developed by the Institute of Electrical and Electronics Engineers and consider 23 required criteria and 28 optional criteria in eight categories, including: content of environmentally sensitive materials (such as mercury, lead and cadmium); power requirements; lifespan; and the "end of life" recycling plans offered by the manufacturers. [August 2006. Military Implications, Sources]

**ASTM Issues Standard Terminology for Nanotechnology**

The American Society for Testing and Materials (ASTM) International Committee E56 on Nanotechnology has approved its first standard, E 2456, Terminology for Nanotechnology, under the jurisdiction of Subcommittee E56.01 on Terminology and Nomenclature. [December 2006. Military Implications, Sources]

**New Standards for Handling Robotic Environmental Equipment**

ASTM International has released a new standard, ASTM E2592-07 - “Standard Practice for Evaluating Cache Packaged Weight and Volume of Robots for Urban Search and Rescue”, that lays out specific ways to describe requirements for the storage, shipping and deployment of urban search and rescue robots. These recommendations apply equally well to the handling of robotic devices for environmental assessment and cleanup. [February 2008. Military Implications, Sources]

**Chemical Emission Certification Extended to Electronic Devices**

GREENGUARD Environmental Institute (GEI), the country’s largest certifier of chemical emissions from building products and furnishings, is expanding its certification efforts to include computers and other electronic devices. According to an Institute announcement, “The GREENGUARD program measures chemical ‘outgassing’ of the product during normal use and operation. Measured emissions are then compared to an extensive list of publicly available short term and long term health risk exposure levels available from the US Environmental Protection Agency, Occupational Safety Health Administration, the state of California, and CDC’s Registry of Toxic Substances.” [March 2008. Military Implications, Source]
SAFETY ISSUES

Chemical and Biological safety issues

Half of Transported European Hazardous Waste Could Be Illegal—How Much More Elsewhere?

Hazardous substances such as ozone-depleting substances and toxic chemicals are increasingly profitable, difficult to tackle, and involve international organized crime. Estimates from the early 2000s suggest that 10-20% of the ozone-depleting substance trade was illegal (a value of $25-60 million). The Basel Convention estimates international hazardous waste movement to be at least 8.5 million tonnes per year. Although it is difficult to estimate the illegal portion of this, a project undertaken in 13 European countries found that over 50% of the waste shipments examined were illegal. One could imagine higher percentages in countries with fewer inspection capabilities and in failed states. E-waste (electronic waste, some of which is hazardous) is growing worldwide. About 70% of it is dumped in developing countries in Asia and Africa. At a recent high-level meeting on enforcement issues held by the World Customs Organization, representatives of the United Nations Environmental Programme (UNEP), customs administrations, and other interested organizations agreed on an Action Plan to improve enforcement and tackle increasing environment crime. The Plan calls for increased detection efficiency by customs offices, creation of environmental crime units, and international co-operation and information exchange. [April 2008. Military Implications, Sources]

Terrorists Could Tap Pharmaceutical Toxins

Old Plagues, New Threats by the Cooperative Nonproliferation Program at the Stimson Center is a comprehensive analysis of the state of monitoring and regulation of emerging products and technologies. It uses the pharmaceutical industry as a case study and outlines the threats—from research and distribution to injection into patients of products derived from select agents. The growing interest in dangerous pathogens and toxins increases the potential of their use in biological weapons by nefarious actors. Lack of adequate regulations increases the possibility of such scenarios. [See also Accelerating Synthetic Biology Applications Need Better Monitoring and Regulation in July 2007 and other similar items in previous environmental security reports.] [April 2008. Military Implications, Source]

Biotechnology Risk in Africa

Advancing developments in biosciences in Africa raise the risks of their potential misuse, thus increasing the need to develop adequate mechanisms for preventing the development and spread of biological weapons. For raising awareness on biosecurity issues and discussing the development of strategies that would encourage biotechnology research without jeopardizing security, a series of workshops were held—notably in Kenya and Uganda, two emerging biotech nations that are not yet properly engaged in international biosecurity policy deliberations. It was emphasized that Africa has to develop its own strategy, adapted to its own specific needs and conditions to reduce the risk of misuse, as well as to mitigate the damage to African scientific development in case of the use of biotechnology for harmful purposes. Africa should also develop a stronger position on regulatory issues and get more engaged in international
Bioviolence; Preventing Biological Terror and Crime

*Bioviolence: Preventing Biological Terror and Crime*, by Barry Kellman is a very well written and documented analysis of the increasing threat of bioterrorism. He argues that the international community is not prepared to counter these dangers, and makes many recommendations that are carefully explained, including strengthening international law. [October 2007. Military Implications, Sources]

Middle East Biosecurity Assessment

Experts from more than 30 countries from the Middle East, Europe, and Asia addressed biosecurity-related issues in the Middle East and produced an initial assessment of the region’s biological defense capabilities. The three-day ‘Seminar for the Life Sciences and Policy Communities in the Gulf and Middle East and North Africa (MENA),’ held November 12-14 in Abu Dhabi, was organized by the International Council for the Life Sciences in collaboration with the Environment Agency of Abu Dhabi. It examined biological risks and threats in the conditions of the region’s growing biotechnology capabilities and its special security vulnerability. The issue was addressed in its whole complexity from possible causes, to necessary security measures, as well as preparedness in case of natural outbreak, accidental release of laboratory pathogens, or bioterrorism. Participants agreed that international collaboration and developing global standards and codes of conduct are essential in order to address biological risks and threats. An experts’ panel will continue working on Middle East biosecurity issues, and eventually a regional training center for specialists will be created. [See also *ETC Report Warns of the Threat of Synthetic Biology and Calls for Global Regulations* in January 2007 and other items in previous environmental security reports on this theme.][November 2007. Military Implications, Sources]

Toxicogenomics Risk Assessment

The Use of Toxicogenomics to Understand Toxic Effects and Improve Risk Assessment workshop held by the U.S. National Research Council, Committee on Emerging Issues and Data on Environmental Contaminants, sought to identify how current toxicogenomic information can be used to inform risk assessment today and to identify toxicogenomic research directions to facilitate risk assessment in the future. Two chemicals of regulatory and scientific interest, dibutyl phthalate and benzene, were used as case studies to highlight the current use, controversies, and potential for using toxicogenomic information in risk assessment. [November 2006. Military Implications, Source]

SIPRI Year Book 2007 Points out Environmental, Nuclear, and Energy Threats

The 2007 edition of the authoritative Stockholm International Peace Research Institute (SIPRI) Yearbook, along with statistics on conflict and weapons expenditure, highlights the main categories of threats to peace that the world faces. Among the main threats, it lists: energy, which “could become a weapon”; and the environment, highlighting that “Using the world’s resources
to address hunger, environmental factors and poverty is likely both to improve human survival and to strengthen international security.” Concerning nuclear, chemical and biological threats, the report warns on high uncertainties of the stockpiles and research around the world and calls for increased transparency and better policies for risk assessments and risk-remediation strategies. [June 2007. Military Implications, Sources]

Scientific Community’s Questions Concerning Biodefense Standards
The American Type Culture Collection (ATCC) convened an Expert Panel on the Development of Standards for Biodefense in Washington, DC, 5-6 April 2006. Considering the critical point reached in the evolution of the biodefense industry, the scientific community agreed that standards are needed to accelerate product development for biodefense-related diagnostics, therapeutics, and reagents. However, on debating the standards issue, a panel of experts generated a range of questions that still require resolution in several areas, including standard handling protocols—that would include protocols for handling, storage, transport, inactivation, and disposal of biomaterials. [See also Better International Controls Needed to Prevent Bioterrorism in July 2006, Assessment and Recommendations for Biosecurity in June 2006, and Recommendation for a Biosecurity Watchdog in February 2006 environmental security reports.] [August 2006. Military Implications, Source]

Human Biomonitoring for Environmental Chemicals

*Human Biomonitoring for Environmental Chemicals* is an independent study by the National Research Council (NRC) of the National Academies to address the challenges related to biomonitoring, including improving biomonitoring systems, interpreting the results of biomonitoring data to the public health, addressing ethical uses of the data, and communicating the results of biomonitoring to different forums. The report recommends improving the interpretation of biomonitoring results by expanding the scientific database on many chemicals; better coordination between biomarker development and population biomonitoring and the potential health implications; improved ability to assess the real health risks of detected chemicals; development of strategies for efficient communication of biomonitoring studies’ results; and a review of the bioethical issues concerning biomonitoring, including confidentiality and reporting. [November 2006. Military Implications, Source]

Proceedings of the Workshop Risk, Uncertainty and Decision Analysis for Environmental Security and Non-chemical Stressors
The workshop “Risk, Uncertainty and Decision Analysis for Environmental Security and Non-chemical Stressors” was held April 26-29, 2007 in Lisbon, Portugal. The objective of the workshop was to explore how to improve risk assessment and modeling for non-chemical environmental stressors by adapting chemical risk assessment approaches and tools. The outcomes of the workshops were not available at the time of this writing. [April 2007. Military Implications, Source]

ETC Report Warns of the Threat of Synthetic Biology and Calls for Global Regulations
An ETC Group report, *Extreme Genetic Engineering: An Introduction to Synthetic Biology*, covers five major areas of research in synthetic biology: making minimal microbes; assembly
line DNA; building artificial cells from the bottom up; and pathway engineering and expanding earth’s genetic system. The report looks at implications for trade, a synthetic energy agenda, intellectual property, the politics of biodiversity, and it warns, “today’s synbio industry has made the work of bioweaponeers a whole lot easier.” It looks at ‘synthetic governance’ and gives some recommendations including the need for establishing an international body to monitor and assess societal impacts of emerging technologies—including synthetic biology—to facilitate coordinated global action, and the fact that “building blocks of life” shouldn’t be privatized. The ETC Group presented the report and its recommendations at the World Social Forum held in Nairobi, Kenya, January 20-25.

Note: In September 2006, the European Commission 6th Framework Programme, NEST–New and Emerging Science and Technology published the report Synbiology: An Analysis of Synthetic Biology Research in Europe and North America, which is a synthesis of “1100 papers connected to the Synthetic Biology field in peer-reviewed journals published since 1990.” [January 2007. Military Implications, Sources]

Methyl Bromide a Continuing International Concern
The Green Party in New Zealand is calling for an immediate halt to methyl bromide fumigation at Wellington's port, after it was learned that the ozone-destroying chemical, regulated under the Montreal Protocol, was being used in the heart of the city. This action, together with the coming into force in January of Indonesia’s ban on its import, is likely to increase international attention to the hazards it presents and support for adherence to the Protocol. [See also Call for Expanding Montreal Protocol on Ozone-Depleting Substances in September 2007, and other similar items on this issue in previous environmental security reports.] [February 2008. Military Implications, Sources]

Possible Risk with Bisphenol A Receiving Increased Attention
Opinions continue to be divided on the environmental danger posed by bisphenol A, a chemical widely used to harden plastics. The NIH National Toxicology Program issued a controversial preliminary report citing minimal risk to adults, but another panel, led by Prof. Fred vom Saal of the Univ. of Missouri, expressed “a very high level of concern”, according to one of its members. An EPA spokeswoman has conceded that its 14-year-old safe level for the chemical is out of date, and says the agency is now studying it. Various studies around the world have not yet produced a clear indictment of the compound as a serious environmental hazard. [December 2007. Military Implications, Source]

Questions on Bisphenol A Risk Raised Again
The Canadian health ministry is said to be ready to declare BPA a dangerous substance, and the US National Toxicology Program, part of the National Institutes of Health, has expressed concern over its effects on the very young. [See also Possible Risk with Bisphenol A Receiving Increased Attention in December 2007 environmental security report] [April 2008. Military Implications, Sources]
Nuclear Safety Issues

Reports Addressing Nuclear Safety

*Nuclear Security Report 2007*; Measures to Protect Against Nuclear Terrorism outlines concerns and strategies to consider in order to improve international nuclear security, mainly based on international collaboration. *Securing the Bomb 2007*, commissioned by the Nuclear Threat Initiative, provides a comprehensive assessment of vulnerable nuclear stockpiles around the world and makes recommendations for reducing the nuclear terrorism threat, including establishing a database with unclassified information on actual nuclear incidents. IAEA Illicit Trafficking Database reveals that in the period 1993–2006, the agency confirmed 275 cases of illicit possession and connected activities involving nuclear materials and radioactive sources. [September 2007. Military Implications, Sources]

New Report on Dangers of Radiation Sources

According to announcements, the US National Research Council has released a report, *Radiation Source Use And Replacement*, that “examines the use of high-risk radioactive materials [e.g. cesium chloride] found in medical and research equipment that could be accidentally dispersed or utilized to make a dirty bomb in a terrorist attack.” It also “identifies lower-risk alternatives that would not change the performance of the devices, and recommends options to remove and replace the high-risk sources.” The National Research Council recommends that U.S. research and medical facilities reduce their use of devices containing cesium chloride and urged U.S. officials to “stop licensing the cesium chloride irradiators, halt their import and export and promote decommissioning of existing machines.” [See also Millennium Project’s January 2003 report on this issue: Commercial radioactive components recognized as “dirty bomb” hazard.] [February 2008. Military Implications, Sources]

Russia’s Floating Nuclear Plants Pose International Security Risk

Russia has started building the world’s first floating nuclear power plant. A ship with two 35-megawatt reactors is expected to be operational in three years and supply electricity in remote areas in Russia as well as potential foreign markets. Despite warnings from environmentalists, Russia plans to build seven of these nuclear ships. [See also Increasing Nuclear Safety and Security] [April 2007. Military Implications, Source]

Pandemics and Other Health Issues

WHO Report 2007 Addresses Global Health Security Threats

*The World Health Report 2007* - *A safer future: global public health security in the 21st century* addresses for the first time health issues as security issues. It notes the increasing risk of disease outbreaks, epidemics, industrial accidents, natural disasters and other health emergencies, which could become threats to global public health security. The report explains the role of the International Health Regulations, which came into force this year, in helping countries’ collaboration to identify and contain risks from outbreaks and other health hazards. The report
points out pandemic influenza as the most feared threat to health security. [August 2007. Military Implications, Sources]

Environment and Human Health Integration

Integrating Environment and Human Health, and Climate, Poverty and Health: Time for Preventive Medicine published by the National Council for Science and the Environment (NCSE) address the interconnection between human health and environmental components. The recommendations include: interdisciplinary approaches for better integration of environmental and health perspectives; improved communication between environmental and health communities, and between scientists and decision makers and the public; and improving priority setting in science. The NCSE activities in this area are continuing. [March 2008. Military Implications, Sources]

Proposed Global Early Warning System for Monitoring Pandemics

Scientists propose a global early warning system to monitor possible pandemic outbreaks. A recent study led by Nathan Wolfe, professor of epidemiology at the University of California, Los Angeles, revealed that the “emergence of the major diseases of humanity is not a random process.” Understanding the patterns between origins of major infectious diseases in temperate and tropical countries and individuals exposed to wild or domestic animals might help prevent eventual migration to humans, as well as forecast and avoid eventual pandemics. Delegates to the 59th World Health Assembly also stressed the importance of rapid, worldwide sharing of knowledge on diseases, since “in a globalized world, health issues have an impact on the collective security of people around the world.” [May 2007. Military Implications, Sources]

FAO Launched New Crisis Management Centre

In collaboration with the World Organisation for Animal Health, the UN Food and Agriculture Organization launched a new Crisis Management Centre to fight avian influenza outbreaks and other major animal health or food health-related emergencies. The center continuously monitors disease information around the globe and is able to respond in less then 48 hours, when a suspected outbreak is reported. [October 2006, Military Implications, Sources]

WHO-sponsored pandemic flu task force holds first meeting in Geneva

The Ad Hoc Influenza Pandemic Task Force held its first meeting to discuss best actions in case of an outbreak. The Task Force is providing independent risk assessments and advising WHO on possible measures to be taken. These could include rapid containment effort, warning governments of risks and accelerating vaccine production. The Task Force includes 21 experts and will function until June 15, 2007, when WHO's revised International Health Regulations come into effect. [October 2006, Military Implications, Sources]
Potential Health and Environmental Threats of Some New Technologies

Nanotechnology

The Chinese Academy of Science's National Center for Nanoscience and Technology and Institute of High Energy Physics have opened a Laboratory for Biological Effects of Nanomaterials and Nanosafety in Beijing on the IHEP campus. Russia has opened the Pilot Scientific and Technical Center of Excellence for Nanotechnology Development in Moscow.

The UK government has asked the Council for Science and Technology to review national nanotechnology policy commitments and provide written evidence of their findings. This review is in part a follow-up to the 2004 Royal Society report, Nanoscience and nanotechnologies: opportunities and uncertainties. [July 2006. Military Implications, Sources]

The US Food and Drug Administration has announced the formation of an internal Nanotechnology Task Force for determining regulatory approaches that encourage the continued development of innovative, safe and effective FDA-regulated products that use nanotechnology materials, and to identify and recommend ways to address any knowledge or policy gaps that exist, so as to better enable the agency to evaluate possible adverse health effects from FDA-regulated products that use nanotechnology materials.

According to an announcement from its coordinator, "Nano2Life (N2L) is the first European Network of Excellence in nanobiotechnology supported by the European Commission under the 6th Framework Programme. Its objective is to support … [Europe's] position as a competitive player and to make it a leader in nanobiotechnology transfer by merging existing European expertise and knowledge in the field of Nanobiotechnology." It comprises 64 organizations and companies, with associate members from South Korea, Japan, Australia, and North America. One of the points in its Programme of Activity is founding the first European Ethical, Legal and Social Aspects Board (ELSA) in the field of Nanobiotechnology. This body will undoubtedly concern itself in a major way with questions of nanotechnology risk, the environment, and regulation. [August 2006. Military Implications, Sources]

The International Council on Nanotechnology (ICON), managed by Rice University's Center for Biological and Environmental Nanotechnology, has established the ICON Environmental, Health and Safety (EHS) database, containing summaries (abstracts) and citations for research papers related to the EHS implications of nanoscale materials. The database allows search by keywords and by aspects of the research reported, such as "exposure pathway = inhalation".

The German Federal Institute for Risk Assessment (Bundesinstitut für Risikobewertung (BfR)) is undertaking a major assessment of the potential dangers of nanotechnology in the food industry. The study will involve 100 experts from research, industry, public agencies, consumer associations, and NGOs in a multi-phase interviewing and mutual commenting process. According to Food Production Daily, "the objective is to identify … nanomaterials, assign them to concrete applications, and then draw conclusions on consumer exposure. … The applications will then be classified according to the level of probable risk and risk reduction strategies developed." The project is expected to be finished by the end of the year.

Researchers from the Institute of Toxicology and Genetics at the Karlsruhe Research Center in Germany may have discovered why carbon nanotubes toxicity tests are not consistent. Their investigation revealed that a reaction between the nanotubes and two non-soluble toxicity test
reagents, formazan and methylthiazol tetrazolium (MTT), was causing a "false positive" outcome. Three other tests on the same nanomaterial had yielded negative results.

Studies by scientists at the University of Rochester Medical Center found that nano-sized materials inhaled by rats had rapid and efficient pathways from the nasal cavity to several regions of the brain. They also caused changes in gene expression in the invaded regions. These are preliminary results, in an animal model, and have not shown actual cellular damage, but later proof of deleterious effects in higher models would have a strong effect on the regulation of airborne nanoparticles. [See also Nanotechnology Health Concerns Highlight Need for International Technology Convention in April 2004 and Nanotech Health Dangers Increasingly Understood around the World in January 2004 environmental security reports.]

Research by Prof. Baoshan Xing, of the Department of Plant, Soil & Insect Sciences at the University of Massachusetts has indicated that fullerenes and carbon nanotubes may exhibit reversible adsorption of polycyclic aromatic hydrocarbons, releasing into their environments toxic substances previously adsorbed by them. [September 2006. Military Implications, Sources]

The Environmental, Health, and Safety Research Needs for Engineered Nanoscale Materials report by the Nanoscale Science, Engineering, and Technology (NSET) Subcommittee of the U.S. National Science and Technology Council's Committee on Technology identifies environmental, health, and safety (EHS) research and information needs related to understanding and management of potential risks of engineered nanoscale materials. A Matter of Size: Triennial Review of the National Nanotechnology Initiative, a new report from the National Research Council's Committee to Review the National Nanotechnology Initiative, although generally positive on the initiative's work in overseeing the U.S. government's role in developing nanotechnologies, suggests that improvements are needed mostly in the areas of measuring economic return, and addressing potential safety risks associated with nanomaterials. "The body of published research addressing the toxicological and environmental effects of engineered nanomaterials is still relatively small," states the report. Accepting the report’s recommendations, in an interview with The Scientist, E. Clayton Teague, director of the federal National Nanotechnology Coordination Office, pointed out that the federal budget for environment, health, and safety research regarding nanotechnology will expand from $38 million in 2005 to $44 million in 2007, trying to fulfill the research needs suggested by the NSET report in addressing EHS issues related to nanotechnology.

Nanotechnology in Agriculture and Food Production: Anticipated Applications, by Jennifer Kuzma and Peter VerHage from the University of Minnesota's Center for Science, Technology, and Public Policy, discusses possible future nanotech-based food and agriculture applications, their potential benefits and risks, and requirements for environmental, health and safety oversight. Their investigation also resulted in creation of a searchable, online database covering more than 160 research projects.

According to Meridian Nanotech News, "The U.K. Department for Environment, Food, and Rural Affairs (Defra) has released a document summarizing and responding to the results of a consultation it published in March seeking opinions on a 'Voluntary Reporting Scheme' for [the properties of] engineered nanomaterials." The scheme met with general support, as did its underlying evidence-based approach for determining the need for risk controls. [September 2006. Military Implications, Sources]
Andre Nel and his team at UCLA's Johnson Cancer Center have been investigating the relationships between the structural characteristics of nanoparticles and their toxicity. According to Meridian Nanotechnology and Development News, this work "contributes to efforts to identify key factors or tests that can be used to predict toxicity, permit targeted screening, and allow materials scientists to generate new, safer nanoparticles with this structure-toxicity information in mind…. [They] found that ambient particles and positively charged polystyrene spheres generated high levels of reactive molecules, and induced oxidative stress in defense cells from the lung called macrophages. Little activity was observed for carbon black, titanium dioxide, and negatively charged polystyrene spheres."

Options for a National Nanotechnology Strategy, a report by an Australian federal government taskforce, outlines the establishment of a national nanotechnology office and a public awareness campaign on the potential social and ethical implications of nanotechnology. The report notes the insufficient information about the potential health risks of nanoparticles and calls for more research on toxicity and occupational and environmental risks. NanoSafe Australia is a new group of nanotechnology toxicologists formed for investigating risks associated to nanoparticles use and handling.

A new 780-page Nanomaterials Handbook has been published by CRC Press. With 27 chapters by 62 authors, this encyclopedic work thoroughly covers the field, and received a very favorable review in Nature. The only significant criticism was its lack of almost all 2005 and later work (a type of problem difficult to avoid in a very large compendium in a rapidly advancing field). [October 2006. Military Implications, Sources]

Characterising the potential risks posed by engineered nanoparticles—UK Government research—a progress report by the UK Department for Environment, Food and Rural Affairs (DEFRA), covers the work of five Task Forces: Metrology, Characterisation, Standardisation and Reference Materials; Exposures – Sources, Pathways, and Technologies; Human Health Hazard and Risk Assessment; Environmental Hazard and Risk Assessment; and Social and Economic Dimensions of Nanotechnologies. According to the DEFRA announcement, the report includes details of the UK’s action plans and assesses progress made towards meeting the 19 research objectives presented in the 2005 report.

A Review of Safety Practices in the Nanotechnology Industry - Phase One Report: Current Knowledge and Practices Regarding Environmental Health and Safety in the Nanotechnology Workplace was prepared for the International Council on Nanotechnology by the University of California, Santa Barbara. According to the press release, the report “offers a review and analysis of existing efforts to develop 'best practices'” but “finds that efforts to catalogue workplace practices have not systematically documented current environment, health and safety practices in a variety of workplace settings and geographies.” [October 2006. Military Implications, Sources]

A group led by Andrew Maynard of the Woodrow Wilson Center’s Project for Emerging Nanotechnologies suggest five "grand challenges" for nanotechnology over the next 15 years:

- develop instruments to assess exposure to engineered nanomaterials in air and water within next 3-10 years
- create and test ways of evaluating the toxicity of nanomaterials in 5-15 years
- generate models to predict their possible impact on the environment and human health over the next 10 years
• develop ways to assess the health and environmental impact of nanomaterials over their entire lifetime, within the next five years
• organize programs to enable risk-focused research into nanomaterials, within the next 12 months

The leadership of the House of Representatives Science Committee commented, "This paper should be a landmark in the history of nanotechnology research. It lays out a clear, reasonable, prioritized, consensus-based set of priorities for examining the potential environmental and health consequences of nanotechnology over the next decade and a half." [November 2006. Military Implications, Sources]

The UK Department of Trade and Industry has announced that a new nanotechnology risk information service, Safenano.org, is due for launch in April 2007, and "will take the form of a web-based information service … with a regular bulletin service and comprehensive database of relevant publications. Emerging scientific evidence concerning the potential risks of nanoparticles and nanotubes, together with information about Health and Safety, Occupational Hygiene, Toxicology and Risk Assessment will be interpreted and delivered to the audience in an integrated way, to support effective risk management."

A recent article in Nanowerk pointed out the increasing use of nanomaterials in building construction, and the consequent rise in health and environmental risks because of this usage.

The city of Berkeley, California is proposing the world's first local regulation of nanomaterials. It would add a nanoparticles health and safety disclosure to a city law that already requires an inventory and safety plan from any business or other person handling large quantities of hazardous materials. Other localities have discussed such measures, but this is the furthest any has progressed. [November 2006. Military Implications, Sources]

A study by Jaehong Kim and colleagues at Georgia Institute of Technology has shown that carbon nanotubes, which are hydrophobic and clump together in water, may nevertheless interact with natural organic matter found in lakes and rivers, in ways that lead to their wider dispersion. [December 2006. Military Implications, Sources]

UNEP’s annual report on the global environment, GEO 2007, dedicates a whole chapter, Emerging Challenges – New Findings, to nanotechnology implications for the environment, looking at ‘The environmental benefits of nanotechnology’, ‘The environmental risks of nanotechnology’, and future developments. The report notes that "swift action" is needed to adjust the legislative processes to properly address the challenges presented by nanotechnology, with priority given to assessing the potential risks of nanomaterials already being mass-produced, and calls for global test protocols and greater cooperation between private- and public-sector industries and between the developing and industrialized worlds.


Nanotechnology-based techniques are highly successful in removing both organic and inorganic contaminants from water. The consulting firm of Frost & Sullivan has issued a new report, Impact of Nanotechnology in Water and Wastewater Treatment, which outlines key nanotech
water treatment applications and analyzes market and industry factors. It also provides a
directory of contact information.

The French National Research Council (CNRS) is beginning a three-year project to study the
"eco-toxicity" of carbon nanotubes, as part of a National Research Agency project. The project
will investigate three main aspects: the polluting effects of nanotubes in the environment;
toxicity in humans; and how to produce nanotubes using cleaner methods. [February 2007.
Military Implications, Sources]

According to an article from www.in-pharmatechnologist.com, the Swiss firm The Innovation
Society "has developed the Cenarios system (Certifiable Nanospecific Risk management and
Monitoring System) … to collate risk related information from scientific, regulatory,
technological and market sources and to generate a database of material to be applied to specific
products and processes using nanotechnology." The system includes capabilities for managing
risk assessment, and a continually updated database of current scientific and technical results.
[March 2007. Military Implications, Sources]

The UK's Council for Science and Technology (CST) has released a review of the government's
response to the recommendations on nanotech risk studies made in the Royal Society's 2004
report. The review states that the government's efforts to provide support for such research are
progressing too slowly. It equally criticizes the US and other countries for similar failures.

Two research projects at Rensselaer Polytechnic Institute, led by Asst. Prof. of Biomedical
Engineering Deanna M. Thompson and Asst. Prof. of Earth and Environmental Sciences Anurag
Sharma, have shown that the size, type, and dispersion of nanomaterials all may affect the
materials' biological effects. Prof. Thompson's work dealt with the effect of nanotubes' degree of
dispersion on their impact on cell growth, while Prof. Anurag's study was on long-duration
effects on bacteria of nanotubes as compared with activated carbon or C60 fullerenes. [April
2007. Military Implications, Sources]

According to an announcement from the EU, "The [European] Commission has … launched a
public consultation of the preliminary opinion of the Scientific Committee on Emerging and
Newly Identified Health Risks (SCENIHR) on the appropriateness of the EU Technical
Guidance Documents for chemicals in regard to nanomaterials. The online consultation, which
will run until 23 May 2007, aims to gather feedback on proposed modifications to the Technical
Guidance Documents and on needs for further research and development." The report notes that
"… special characteristics of nanomaterials - potentially differing considerably from the
conventional chemicals - have to be appropriately characterised. Furthermore, their toxicological
behaviour and effects on health and the environment need to be assessed properly." Further, "The
SCENIHR identifies issues requiring improvements in the technical guidance and
methodologies, and proposes a staged strategy for the risk assessment of nanomaterials." [April
2007. Military Implications, Sources]

The Institute of Nanotechnology has announced the official launch of the European
Nanotechnology Masters Recognition Scheme, for 10:30 a.m., 20 June 2007, at the Congress
Center, Düsseldorf, as part of EuroNanoforum 2007, The Scheme site, which can be visited at
http://www.nano.org.uk/nanomasters/, offers online access to descriptions of nanotechnology-
related master's degree programs throughout Europe.
Scientists at the Swiss Federal Institute of Technology (ETH) Zurich and the Swiss Federal Laboratories for Materials Testing have discovered that metal oxide nanoparticles had up to 8 times the toxicity of the same metals in salt forms when brought into contact with lung epithelial cells. The explanation by one researcher is that "cell membranes provide a selective barrier against ions, preventing the dissolved metal salts from entering. Once a metal-containing nanoparticle has penetrated a cell, however, metal ions can leach from the particle and generate ROS [reactive oxygen species] in the cell interior". The degree of the toxicity is related to the specific metal being introduced. [May 2007. Military Implications, Sources]

The European Commission (EC) invites comments on the proposed Recommendation on a Code of Conduct for Responsible Nanosciences and Nanotechnologies Research. The Commission intends to collect views on the safe development of NST from a broad audience, ranging from research, industry, civil society, policy and media, and the general public.

The UK’s Royal Society and a group of other organizations have begun an initiative to develop a "Responsible NanoCode" for businesses working with nanotechnologies. According to Nanowerk, "The aim of the Code will be to establish a set of internationally relevant principles which outline good practice for businesses involved in all aspects of these emerging technologies and their applications including research, development, manufacturing, distribution and retailing." The code will be developed by a working group of representatives from a variety of stakeholders.

A U.S. Congressional bill ‘To ensure the development and responsible stewardship of nanotechnology’ was referred on July 31, 2007 to the Committee on Science and Technology, and in addition to the Committees on Ways and Means, Energy and Commerce, and Homeland Security.

A "Pollution Prevention through Nanotechnology" conference will be held September 25-26, 2007, in Arlington, VA. The forum is organized by EPA to improve understanding of nanotechnology and to “encourage responsible development of nanotechnology that prevents pollution.” [July 2007. Military Implications, Sources]

Current Developments/Activities on the Safety of Manufactured Nanomaterials/Nanotechnologies report by the Organization for Economic Co-operation and Development (OECD) summarizes the 2nd Meeting of the Working Party on Manufactured Nanomaterials held in Berlin, Germany, April 25-27 2007. It catalogs the initiatives in industrialized countries to address the health and environmental safety implications of manufactured nanomaterials organized by progress since the first meeting and work underway or planned in the country or organization. The recommended headings were:
1. Any national regulatory developments on human health and environmental safety including recommendations or discussions related to adapting existing regulatory systems or the drafting of laws/ regulations/ guidance materials;
2. Developments related to voluntary or stewardship schemes;
3. Information on any risk assessment decisions;
4. Information on any developments related to good practice documents;
5. Research programmes or strategies designed to address human health and/ or environmental safety aspects of nanomaterials;
EPA Conference on Nanoscale Materials. On 13 August EPA announced that it will be holding a Peer Consultation on Materials Characterization of Nanoscale Materials: September 6-7, 2007, in Rosslyn VA. The meeting's goal is to help develop EPA's Nanoscale Materials Stewardship Program (NMSP) under the Toxic Substances Control Act (TSCA). EPA is requesting comment on characteristics currently used or potentially available to characterize nanoscale materials, rationale for the use of these characteristics, and issues to consider regarding use of these characteristics in the NMSP.

Study Shows Nanotube Manufacture May Pollute Environment. A study by Desirée L. Plata and colleagues at MIT, reported at the 234th national meeting of the American Chemical Society, has shown that chemical vapor deposition, one of the main methods for making carbon nanotubes, can release into the environment various toxic polycyclic aromatic hydrocarbons, and other hydrocarbons that are harmful to the atmosphere and human health.


REFNANO: Reference materials for engineered nanoparticle toxicology and metrology addresses the potential role of reference materials in toxicology and metrology created by a team of UK scientists, commissioned by the UK Department for Environment, Food and Rural Affairs (Defra). It provides a prioritized list of reference materials relevant to nanotechnology, focusing on materials produced and used in the UK.

The Director of the Woodrow Wilson Center’s Project on Emerging Nanotechnologies has indicated disappointment with a recent report, Prioritization of Environmental, Health, and Safety Research Needs for Engineered Nanoscale Materials, prepared by a working group of the Nanoscale Science, Engineering, and Technology Subcommittee (NSET), part of the federal government’s National Science and Technology Council. The Director states, "Notably absent are important details like budget allocations, implementation time frames, and assigned responsibilities." [September 2007. Military Implications, Source]

UK Government Nanotechnology Policy Workshop for Industry held on October 19, 2007, organized by the Department for Environment, Food and Rural Affairs (Defra) and the European Nanotechnology Trade Alliance (ENTA) to provide updates from the UK government regarding: research progress from the nanotechnology research coordination group; Defra’s voluntary reporting scheme; Council for Science and Technology report on government progress against nanotechnology commitments; overview of the international efforts; and industry perspectives. BSI British Standards is publishing nine documents addressing nanotechnology health and safety issues for UK industry; seven deal with terminology—from fabrication to labeling—and two provide guidance for safe handling and disposal of free engineered nanoparticles, and for specifying nanomaterials. Indian scientists warn that India faces serious nanotech environmental health and safety issues due to absence of guidelines on nanoparticle toxicity and biosafety regulations in India and worldwide. Scientists from the Energy Resources Institute in Delhi launched a study this year to investigate the opportunities and risks associated with the technology. [October 2007. Military Implications, Source]
Scientists at Cambridge Univ. and the Daresbury Laboratory have developed a new method of studying the effects of carbon nanotubes on living cells. Alexandra Porter, a lead scientist at Cambridge, has explained that, by using transmission electron microscopy (TEM) and confocal microscopy, the entry and migration of nanotubes into and within cells can be visualized. First results, published in the October 28 online edition of Nature Nanotechnology, showed that cell death caused by certain nanotubes depended on the dose and exposure time and suggest that the toxicity is linked to the movement of the tubes into the cytoplasm and nucleus of a cell. This might help to elucidate the relationship between the physics and chemistry of nanomaterials and their biological effects, and hence help nanotech EHS research.

*Nanotechnology large risks with tiny particles* report by KemI, Sweden’s chemical regulators, proposes that the Government: allocate special research funds to the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas) for research on health and environmental risks of nanomaterials; instruct the Swedish Chemicals Agency to: follow developments in the area and propose measures whenever justified, and to participate actively in the development of new or modified testing methods within the OECD cooperative framework; instruct the Swedish Chemicals Agency to produce a deeper analysis of the use of nanomaterials in chemical products and articles after consultation with the trade organizations concerned; instruct the governmental agencies concerned to review the need for complementing existing legislation; arrange, in the context of Sweden’s EU presidency in 2009, a workshop on how the health and environmental risks of nanotechnology should be dealt with by legislation.

The U.S. Agency for Toxic Substances and Disease Registry (ATSDR) (part of the Department of Health and Human Services) has requested nominations from a list of proposed substances that it will evaluate for toxicological profile development. The list of proposed substances includes nanomaterials. The list of selected substances will be published late winter or early spring in the Federal Register. The added profiles will be publicly available in October 2008. Interested parties can monitor the profile list for the latest information at [http://www.atsdr.cdc.gov/toxpro2.html](http://www.atsdr.cdc.gov/toxpro2.html).

A U.S. national survey on the potential impacts of nanotechnology reveals that while more optimistic about the possible benefits of nanotechnology, nanoscientists are significantly more concerned than the general public for some issues related to the environmental and health impacts of nanotechnology. They say that more research is needed to assess nanotech long-term implications. Only 15% to 20% of the public expressed concern related to nanotech risks, versus 20%-30% by nanoscientists. The study was published in *Nature Nanotechnology* (November 25).

*The challenge of regulating nanomaterials* is a well-documented article published in the Environmental Science and Technology journal, offering an excellent overview of the nanotechnology-related risks and regulations picture.

EuroNanOSH, the first European Conference focusing on occupational safety and health from the viewpoint of nanotechnology and engineered nanoparticles in workplaces, will be held in Helsinki 3-5 December 2007. According to the announcement, “The Conference will evaluate the current safety situation of engineered nanoparticles in Europe and consider what actions are required in the near future. … one of the main objectives of the Conference is to present the current understanding regarding the safety of engineered nanoparticles and to draw conclusions to protect workers both within and outside of Europe.”
The Nanotechnology for Security and Crime Prevention III conference, organized by the Institute of Nanotechnology, will be held January 17, 2008, at The Royal Society, London. The conference will provide an update on the latest advances in nanotechnology with applications for security and fight against crime. Several papers on chemical detection will be presented. [November 2007. Military Implications, Source]

The first nanotechnology genotoxicity (toxicity at the molecular level) tests found that carbon nanotubes could damage DNA. Researchers at the University of Dayton have assessed the DNA damage response to multi-walled carbon nanotubes (MWCNT) in mouse embryonic stem cells. The methodology used is highly versatile for testing genotoxicity and hence can be expanded for genotoxicity tests of other nanomaterials.

The “Nanotechnology & the Media: The Inside Story” meeting held at the Woodrow Wilson Center discussed the results of a study analyzing media coverage of nanotechnology risks in the U.S. and UK. The study reveals a large increase in the number of articles, with the focus being mainly on health, environmental and security aspects. Coverage is higher for regulatory and reports related issues than for scientific matters. Concerns about nanotech risk are increasing at non-profits and governments, and governments are responding most strongly to risk concerns. In general, there was a strong feeling that there is not enough media coverage on the nanotech risk issues. [December 2007. Military Implications, Source]

The First Annual Conference on Nanotechnology Law, Regulation and Policy will be held February 28-29 in Washington, DC. The conference will include discussions of whether the FDA will implement its Nanotechnology Task Force Report, how OSHA will address nanotechnology-related issues in the workplace, and how the European and Asian approaches to nanotechnology regulation differ from that of the U.S. The conference is co-sponsored by the Food and Drug Law Institute, and the Woodrow Wilson International Center for Scholars Project on Emerging Nanotechnologies, in partnership with Arizona State University and the Burdock Group.

The UK Institute of Occupational Medicine’s SAFENANO Information Service and Community Portal has set up SAFENANO Scientific Services to provide multidisciplinary risk management solutions to companies operating in the nanotechnology industry. The services, planned to assist with safety issues ranging from employees’ working conditions to end products, include training, laboratory tasks, and toxicology information update. [January 2008. Military Implications, Source]

The European Commission has adopted a Code of Conduct for Responsible Nanosciences and Nanotechnologies Research, and is recommending to the Member States the adoption of the Code to govern research in this field. The Code is based on seven principles such as sustainability (non-threatening to the present or future environment) and accountability, and provides guidelines for their implementation.

European Commission grants $587,000 to London School of Economics researchers to conduct an international research project on regulating nanotechnologies in the European Union and the United States.

Technology Roadmap for Productive Nanosystems by Foresight Nanotech Institute and Battelle, according to the announcement, “… is a first attempt to map out the R&D pathways across multiple disciplines to achieve atomically precise manufacturing.” It provides a detailed
technical background for consideration of the environmental problems that might arise during these processes.

*Strategy for Nanotechnology-Related Environmental, Health, and Safety Research* published February 2008 by the National Science and Technology Council describes the National Nanotechnology Initiative’s (NNI) strategy for addressing priority research on the environmental, health, and safety (EHS) aspects of nanomaterials. The report assigns priorities to research and information needs that were identified in the NSET Subcommittee document Environmental, Health, and Safety Research Needs for Engineered Nanoscale Materials, published on September 21, 2006.

*Risks of nanotechnology remain uncertain* published in the American Chemical Society’s Environmental Science & Technology Online is a comprehensive overview of the current state of nanotechnology risk assessment, emphasizing the paucity of solid scientific results in that important field and giving useful examples and references. [February 2008. Military Implications, Source]

Federal Toxics Disclosure Law Could Provide Data on Nanotechnology Risks. According to a news release, the Project on Emerging Nanotechnologies (PEN) of the Woodrow Wilson Center and the Pew Charitable Trusts has released a legal analysis that finds that EPA’s Toxic Release Inventory (TRI) could be applied to the production and commercialization of nanotechnology, although the applicable statute may need to be amended to take care of the special aspects of nanotechnology risk assessment. The report also emphasizes that additional disclosure-related measures for nanotechnology risks should be considered and that “additional research is required to determine whether application of TRI to nanomaterials should be pursued as a policy priority in the near term”.

Nanotechnologies at the OECD. According to nanoforum.org, “The OECD has prepared an overview of its work on nanotechnologies for Forum VI of the Intergovernmental Forum on Chemical Safety (IFCS). The paper, titled Nanotechnologies at the OECD, describes the two activities of OECD related to nanotechnologies: i) the activities of the Working Party on Manufactured Nanomaterials (WPMN); and ii) the Working Party on Nanotechnology (WPN).” The stated objective of WPMN is “to promote international co-operation in human health and environmental safety related aspects of manufactured nanomaterials (MN), in order to assist in the development of rigorous safety evaluation of nanomaterials.”

Explosivity and Flammability of Nanopowders. An item from nanoforum.org announces a new report on this subject from the NANOSAFE2 project, “One of the main questions asked about nanopowders, when it comes to explosivity and flammability, is: do nanopowders behave like other powders and, as such, can they more readily ignite and explode? During this study, carried out in the frame of the European Nanosafe2 project, safety parameters of nanopowders and their associated techniques and practices have been characterised for a representative set of particles of industrial relevance.” It concludes that behavior depends on the materials and surfaces on which nanopowders are applied and hence, “Specific prevention and protection measures should then be taken.”

Report Warns of Nano Hazards in Foods. A new report from Friends of the Earth notes that “Untested nanotechnology is being used in more than 100 food products, food packaging and contact materials currently on the shelf, without warning or new FDA testing.” and “calls on the FDA to stop the sale of all nano food, packaging, and agricultural chemicals until strong
scientific regulations are enacted to ensure consumer safety and until ingredients are labeled.” [March 2008. Military Implications, Source]

The EU FP7 (EU’s Seventh Research Framework Programme) project “ObservatoryNANO” has begun operation. According to nanoforum.org, it is funded for four years and “will collate and analyze data regarding scientific and technological (ST) trends and economic realities and expectations. The ST and economic analysis will be further supported by assessment of ethical and societal issues, impacts on health, environment and safety, as well as regulation, standardization, and legislative issues.”

New Analysis of Nanotech Risk Assessment Funding by the Project on Emerging Nanotechnologies, analyzing nanotech spending for fiscal year 2006, found that only $13 million—representing less than 1% percent of the $1.4 billion U.S. National Nanotechnology Initiative budget—was spent on federal research projects highly relevant to addressing possible environment, health and safety risks related to nanotechnology. The same year, European countries invested nearly double—$24 million —on similar nanotech risk-assessment projects. Draft legislation proposed by the U.S. House of Representatives Science Committee would require that in the future, a minimum 10% of the NNI budget be devoted to risk assessment research.

The NSTI Nanotech 2008 Conference is scheduled to be held in Boston 1-5 June. Two sessions on “Environmental [sic], Health and Toxicology”, including a paper on “Legislative, Regulatory [sic] and Risk Management for Nanotech EHS”, are on the program for 5 June. [April 2008. Military Implications, Source]

According to a story in PhysOrg.com, “A major study … in Nature Nanotechnology suggests some forms of carbon nanotubes … could be as harmful as asbestos if inhaled in sufficient quantities.” Reporting experiments carried out on mouse tissue, one of the researchers, Prof. Kenneth Donaldson of the University of Edinburgh, stated, “Long, thin carbon nanotubes showed the same effects as long, thin asbestos fibers”, causing pathological responses known to be precursors of mesothelioma. The scientists noted that it is still unknown if the tubes can be inhaled and reach sensitive portions of the lungs. [May 2008. Military Implications, Source]

A petition filed by a citizens’ coalition with the U.S. Environmental Protection Agency is demanding the agency exercise its pesticides’ regulating authority and stop the sale of about 260 products containing nano-silver, due to the compound’s possible risks to human health and the environment. The coalition of consumers, health, and environmental groups is led by the nanotech watchdog International Center for Technology Assessment. [May 2008. Military Implications, Source]

The European Commission is planning to launch a large-scale public consultation for raising awareness about nanotechnologies’ potentials and at the same time for addressing citizens’ concerns about nanotech’s possible health and environmental impacts.

Stanley Shaw, a chemical biologist at Massachusetts General Hospital Center for Systems Biology, and his colleagues at the Broad Institute of Harvard and MIT have designed a high-throughput screening method for assessing the biological effects of nanomaterials. The technique uses robotic equipment to place individual nanoparticle types and cell types in various combinations into hundreds of tiny wells in a plate, where an automatic screening system
determines the resulting biological effects. Software then analyzes the data, seeking relationships among the different combinations.

The Project on Emerging Nanotechnologies of the Woodrow Wilson Center, in cooperation with the Grocery Manufacturers Association, has issued a report that examines the path of several hypothetical applications of nanotechnology-enabled food packaging through the current regulations and examines potential future challenges related to this issue. [June 2008. Military Implications, Source]

Various Reports and Conferences Addressing Nanotechnology Safety

Assessing exposure to airborne nanomaterials: Current abilities and future requirements. [April 2007. Military Implications, Sources]

New Nanotoxicology Journal Features Article on Airborne Nanomaterials
Informa Healthcare has started publication of a new quarterly journal, Nanotoxicology, in both online and print versions. Information about it can be found at http://www.informaworld.com/smpp/title~content=t716100760 The inaugural issue features a 16-page article, Assessing Exposure to Airborne Nanomaterials: Current Abilities and Future Requirements," written by Andrew Maynard, chief science advisor at the Wilson Center's Project on Emerging Nanotechnologies, and Robert Aitken, director of strategic consulting at the Institute of Occupational Medicine (Edinburgh, UK) [April 2007. Military Implications, Sources]


Nanotech Products Meeting to Be Held in London, 16-17 May—updated information is now available at www.nano.org.uk/events/ionevents.htm The meeting examined nanotechnologies that are described as “offering real environmental benefit, and will also review the findings of the recently published STOA report on the Role of Nanotechnology in Chemical Substitution.” [April 2007. Military Implications, Sources]

The International Council on Nanotechnology and the University of California at Santa Barbara have issued a new report, A Review of Current Practices in the Nanotechnology Industry, the second in a series. [See Review of Safety Practices in the Nanotechnology Industry]. According to the announcement, it is "the first comprehensive, international survey of workplace safety practices in the nanotechnology industry" and "documents results from survey data collected from 64 organizations in North America, the European Union, Asia and Australia." The release also says it, ..."finds that many nanotech companies and laboratories believe nanoparticles … may pose specific environmental and health risks for workers. In response, companies are reporting that they are developing special programs and procedures for mitigating risks to workers and consumers. Yet, due in part to a lack of general information regarding nanomaterials
risks, companies and labs have workers using conventional environmental, health and safety (EHS) practices when handling nanomaterials, even though the practices were developed to deal with bulk materials that can have markedly different chemical properties than their nano-sized counterparts." The Director of ICON says "The use of conventional practices for handling nanomaterials appears to stem from a lack of information on the toxicological properties of nanomaterials, as well as nascent regulatory guidance regarding the proper environmental, health and safety practices that should be used with them." [November 2006. Military Implications, Sources]

RCRA Regulation of Wastes from the Production, Use, and Disposal of Nanomaterials, by the American Bar Association's Section of Environment, Energy, and Resources, discusses a number of issues related to the EPA's regulation of nanomaterial wastes under the Resources Conservation and Recovery Act (RCRA). Topics include the possible need for new definitions of hazardous nanomaterial characteristics, injunctive relief against imminent and significant risks, and the current practice of relying on the waste generator's process knowledge. [August 2006. Military Implications, Sources]

The Nano Science and Technology Institute (NSTI) has published the Proceedings of its 2006 Conference. Vol. 1, Chapter 6 of that work is entitled Environmental, Health and Societal Impacts of Nanotechnology, and includes a paper, A Framework for Responsible Nanotechnology Standards, describing a joint effort of Environmental Defense and DuPont. The Proceedings are available in print, or in a 2677-pp. CD-ROM. [August 2006. Military Implications, Sources]

The new report by Woodrow Wilson International Center's Project on Emerging Nanotechnologies, Nanotechnology: A Research Strategy for Addressing Risk, makes several recommendations for nanotechnology risk assessment, including that the government: institute a top-down strategic framework for risk-based nanotechnology research, prioritize research, establish joint industry funding, and coordinate research activities internationally. [August 2006. Military Implications, Sources]

The final report of Defra (UK organization), Environmental Regulatory Gaps Study on Nanotechnologies, addresses environmental regulation gaps concerning potential risks posed by products and applications of nanotechnologies, and it identifies measures that can be put in place to ensure adequate protection for human health and the environment. It is a comprehensive overview, analyzing each sector concerning nanotech—from substances, production and application, to environmental impacts—with respect to existing regulations, and highlighting the eventual gaps. [August 2006. Military Implications, Sources]

The International Risk Governance Council (www.irgc.org) has issued a white paper, Nanotechnology Risk Governance, which uses the IRGC’s risk governance framework, published in 2005, to analyze and identify current deficits in nanotechnology risk governance, separately considering current and future developments. It then offers initial recommendations for how decision makers may choose to deal with these risk governance gaps. These recommendations will be subject to further work, including discussions with appropriate stakeholders. [July 2006. Military Implications, Sources]

The UNESCO World Commission on the Ethics of Scientific Knowledge and Technology has published a 25-page report, The Ethics and Politics of Nanotechnology. The work discusses "Nanotechnology Research Now" and "Ethical, legal, and political implications of nanotech",...
and it concludes with a list of the most recent reports that have been released covering nanotechnology, its implications, and the social, political and ethical issues surrounding it. [July 2006. Military Implications, Sources]

The European Commission Scientific Committee on Emerging and Newly Identified Health Risks has issued a 79-page "modified opinion" on the appropriateness of existing methodologies to assess the potential risks associated with engineered and adventitious products of nanotechnologies. This report discusses in detail the scientific rationale, including risk assessment methodologies and prioritization of needs in knowledge, and concludes with Committee and minority opinions, and references. [July 2006. Military Implications, Sources]

CDC's National Institute for Occupational Safety and Health (NIOSH) has announced the release of a new progress report, Progress Toward Safe Nanotechnology in the Workplace, which, according to the release, details the advancements made by NIOSH in advancing scientific knowledge in understanding the occupational safety and health implications of engineered nanoparticles, and also suggests potential areas where future research could further expand this knowledge. [March 2007. Military Implications, Sources]

National Nanotech Initiative Issues Risk Assessment Report
The US National Nanotechnology Initiative has issued a report, Understanding Risk Assessment of Nanotechnology, which manages in eight pages to offer a comprehensive, technically oriented introduction to nanotech risk assessment. The document contains 44 endnotes, listing hundreds of Web sites and paper citations. [March 2007. Military Implications, Sources]

EPA Publishes White Paper on Nanotechnology

The International Council on Nanotechnology (ICON) and Rice University's Center for Biological and Environmental Nanotechnology (CBEN) have been maintaining an online database of references to current work in nanotech environmental health and safety issues. They have now announced the launch of a new monthly online review journal, The Virtual Journal of Nanotechnology Environment, Health & Safety (VJ-Nano EHS). The new publication will contain primarily items added to the database during the current month, so that users can easily keep up with progress in the field. The site will also provide a series of occasional papers, access to the whole database, and a capability for search by a number of different aspects of the work reported, such as risk exposure group, particle type, and exposure pathway. The journal may be accessed at http://icon.rice.edu/virtualjournal.cfm. [March 2007. Military Implications, Sources]

Green Nanotechnology: It's Easier Than You Think, from the Project on Emerging Nanotechnologies of the Woodrow Wilson International Center, discusses links between nanotechnology and environmentally friendly development and production. It also presents recommendations for proactive federal policy measures to encourage such applications of nanotech. [May 2007. Military Implications, Sources]
The U.S. National Nanotechnology Coordination Office (NNCO) will hold a public meeting on January 4, 2007, to address the needs and priorities of environmental, health, and safety (EHS) research on engineered nanoscale materials. According to the announcement, the purpose of the meeting is to lay-out "strategic and interim goals for filling the EHS information needs gaps for nanomaterials." It will be structured around the following research areas: instrumentation, metrology, and analytical methods; nanomaterials and human health; nanomaterials and the environment; health and environmental surveillance; and risk management methods. [December 2006. Military Implications, Sources]

A conference, Nanotechnology - Products and Processes for Environmental Benefit, is to be held in London on 16-17 May 2007 under the auspices of the Royal Society. More information will be available shortly. [December 2006. Military Implications, Sources]

The 'Nanotechnologies - Safety for Success' conference, held 14-15 September in Espoo, Finland, has published its final report. The conference was attended by 180 specialists from 20 countries. According to the announcement, speakers introduced the audience to the opportunities, unknowns, and potential risks of evolving nanotechnologies, facilitated dynamic stakeholder discussion and identification of coordinated and concerted actions, and identified the key actions for efficient and well coordinated policies on nanotechnologies in Member States, in the European Union and internationally. [December 2006. Military Implications, Sources]


“Health & Environmental Summit on Nano” will be held during Nanotech 2007, May 20-24, 2007 in Santa Clara, California, convened by the Nano Science and Technology Institute (NSTI) in collaboration with the U.S. Food and Drug Administration, to assist with the FDA’s fact-finding programs for Nanotechnology in Consumer Goods, including drugs, biologics, food and cosmetics. [November 2006. Military Implications, Sources]

The 4th NanoSpain Workshop will be held in Seville, 12-15 March 2007, bringing together several hundred participants to discuss the latest developments in nanotechnology. [November 2006. Military Implications, Sources]

EU Conference on Nanotechnology Safety Policies

The current Finnish Presidency of the EU held a conference, Nanotechnologies - Safety for Success, in Otaniemi, Finland on 14-15 September 2006, with the goal of facilitating a dialogue on the opportunities and concerns presented by nanotechnologies. Another objective was the development of specific safety recommendations for the application of nanotechnologies. The conference was attended by 180 experts from 20 countries. The presentations, covering the key actions for efficient and well-coordinated policies, are available on the conference's Web site.

International Nanotech Conference to be Held in Egypt, March 2007
An international conference, NanoTech Insight 2007 will be held in Luxor, Egypt, 10-17 March 2007, to discuss the latest trends and discoveries in nanoscience. Topics will include scientific and technical developments, applications, and ethical and environmental impacts. [October 2006. Military Implications, Sources]

OECD Meeting on Manufactured Nanomaterials
The OECD will hold a meeting of the recently established Working Party on Manufactured Nanomaterials in London on 26-27 October 2006 to finalize recommendations for the 2006-2008 Programme of Work regarding human health and environmental safety aspects of manufactured nanomaterials in the chemical sector, to be forwarded to the Chemicals Committee of OECD. The meeting will discuss reports on recent developments in nanotechnologies and nanomaterials, their safety, and related activities in other International Organizations. For example, there will be discussions of taking over the Woodrow Wilson Center’s database and cooperating with other databases, such as the International Council for Nanotechnology (ICON)'s. [September 2006. Military Implications, Sources]

Growing Health Concerns over Electromagnetic Fields Might Trigger New Regulations

Warnings on Possible Wi-Fi Dangers
The expansion of wireless connections and use increases experts’ concerns and warnings on possible health effects of electronic smog. Recent research suggesting that use of mobile phones might increase brain tumor occurrence worsens concerns about the possible impact of the spreading Wi-Fi networks that expose people to electronic waves involuntarily. The spread of wireless connections might be dangerous mostly to the health of children and to the additional ~3% of population that the World Health Organization estimates are “electrosensitive.” Sir William Stewart—chairman of the UK Health Protection Agency and former chief scientific adviser to the UK Government—along with some European governments, school boards and parents, scientists, and doctors are calling for an official investigation of the risks that electronic waves might pose to human health and the environment. [See also Conviction in Transborder Electromagnetic Pollution Case, Study Says Mobile Phones Raise Tumor Risk, and Cell Phones Damage Rat Brains] [April 2007. Military Implications, Sources]

Potential Magnetic Fields Regulations in Japan
The Japanese Ministry of Economy, Trade and Industry plans to introduce regulations concerning magnetic fields around power-transmission cables and other electric facilities. Although the country has regulations on electric fields, per se, magnetic fields are not subject to any standards. A working group will be created in June under the Subcommittee on Electric Power Safety to conduct investigations on the link between electromagnetic fields and human health problems, and to advise the ministry. The initiative seems to be partly triggered by a study to be released soon by the World Health Organization on environmental health standards regarding electromagnetic fields. Along the same lines, the UK is finalizing a report that assumes a link between power lines and cancer, and that therefore recommends regulations for building around high-voltage power cables because of possible health risks. [April 2007. Military Implications, Sources]
Underwater Sounds from Human Sources Endangering Marine Life

Sonar Restrictions Debate Continues
Earlier in January, a U.S. District Court judge in Los Angeles ordered clear rules for the U.S. Navy's training with mid-frequency sonar off the coast of Southern California. The restrictions include: a minimum 12-nautical-mile no-sonar zone along the California coastline; shutdown of sonar when marine mammals are spotted within 2,200 yards; mandatory monitoring for marine mammals one hour prior to sonar exercises; and aerial surveillance prior to and during the exercise. However, later in the month, President Bush overruled the Court's decision and signed an exemption for the Navy to use sonar in its training, then a federal judge temporarily lifted certain measures, and the Navy has resumed sonar training off the coast of Southern California. [See also U.S. to Study Sonar Impact on Marine Mammals in May 2007, and other previous environmental security reports on the same issue.] [January 2008. Military Implications, Sources]

The Debate over Use of Sonar by the Navy Continues; Legal Settlement Approved
After a temporary restraining order issued July 3, blocking the use of high-intensity, mid-frequency sonar by the U.S. Navy during international Rim of the Pacific (RIMPAC) war games taking place in waters around Hawaii, on July 7, the judge has approved a settlement between the Navy and conservation groups, permitting the use of mid-frequency sonar during the eight-nation military exercises. The settlement agreement requires new safeguards, including a buffer zone, increased monitoring for marine mammals through underwater detection and aerial surveillance for marine mammals during sonar drills and the reporting of sightings to a marine mammal response officer. This type of sonar has been associated with mass strandings and deaths of whales, dolphins, and other marine species in U.S. waters and around the world. The conservation groups that filed the lawsuit were: Natural Resources Defense Council, the International Fund for Animal Welfare, the Cetacean Society International, the Ocean Futures Society (OFS), and (OFS) founder and director Jean-Michel Cousteau. [See also Underwater Sounds from Human Sources Endangering Marine Life in November 2005, Coalition Urges UN to Consider Legislation to Curb Harmful Ocean Sounds in June 2005, and other previous environmental security reports on the same issue.] [July 2006. Military Implications, Sources]

U.S. to Study Sonar Impact on Marine Mammals
The U.S. government approved a budget to research the effects of military sonar systems on whales and dolphins. Several scientists and environmental groups claim that underwater sonar to detect submarines interferes with the ecolocation system of whales and dolphins, sometimes causing mass strandings. The research will be conducted in Hawaii and will include studying the effects of military sonar systems on marine mammal hearing, as well as the development of electronic systems to detect the presence of marine mammals in naval training areas. The Hawaii research will provide an independent scientific view and reliable data on the effects of sonars on marine mammals and hopefully will elucidate the concerns. [See also The Debate over Use of Sonar by the Navy Continues; Legal Settlement Approved, Underwater Sounds from Human Sources Endangering Marine Life] [May 2007. Military Implications, Sources]
**Pollution Issues**

**Human Ecological Footprint Increasing Each Year**

The 2007 ‘Ecological Debt Day’ was on October 6, three days earlier than in 2006, noted the New Economics Foundation. ‘Ecological Debt Day’ marks the day of the year when human consumption begins surpassing the Earth's ability to sustain it. The point has been reached earlier every year since the 1980s, when the world began to live beyond its means. The results of a study using the ecological footprint index also revealed that the world is developing very unsustainably. The study is looking at how the lifestyles and ecological footprints of 93 nations have changed in the last 30 years. It is the first study of this kind and was conducted by an international team of the Global Footprint Network. [October 2007, Military Implications, Sources]

**Greenhouse Gas Emissions**

Scientists at the Mauna Loa observatory in Hawaii found that the levels of CO₂ are at least 34% higher than pre-Industrial Revolution levels and near the suspected climate-tipping point of 400 ppm. They note that the rise was 2.14 ppm in 2007, while from 1970 to 2000 the concentration rose by an average of about 1.5 ppm each year.

“Present global mean CO₂, 385 ppm, is already in the dangerous zone” and “prompt policy changes” are needed, suggests the Target Atmospheric CO₂: Where Should Humanity Aim? paper by a group of scientists led by Jim Hansen, director of the NASA Goddard Institute for Space Studies. Based on an analysis of paleoclimate data and ongoing climate change, the authors argue that CO₂ should be reduced to a maximum of 350 ppm in order to avoid reaching irreversible tipping points and maintain the Earth conditions supporting life as we know it. The main policy suggestions include increasing efforts to find energy sources beyond fossil fuels, and ending fossil fuel exploitation and use without adequate CO₂ capture and sequestration. The ultimate task is phaseout over the next 20-25 years of coal plants that are not equipped with carbon sequestration technology. The paper admits that establishing a clear time frame of climate change is difficult, since the models are still deficient. Nevertheless, it underlines the urgency of the situation and concludes that although the task of curbing man-made CO₂ emission is difficult, it is “feasible when compared with the efforts that went into World War II.”

The State and Trends of the Carbon Market 2008 report of the World Bank shows that the global carbon market grew to $64 billion in 2007, more than double the 2006 level. The European Union Emission Trading Scheme (EU ETS) also saw a doubling of both value and number of allowances transacted. [May 2008, Military Implications, Sources]

The Global Carbon Project report shows that carbon dioxide emissions over the last five years grew four times faster than in the preceding 10 years. Global growth rates in 2000–05 reached 3.2%, compared to 1990–1999's 0.8%. The report also draws attention to environmental inertia, by which the environment stores up part of the energy generated by greenhouse gas emissions; causing global temperatures to continue to increase for two or more centuries after emissions are stabilized or begin to drop. [November 2006, Military Implications, Sources]
The American National Academy of Sciences found that CO₂ emissions grew faster than forecasted by the International Panel on Climate Change (IPCC). Between 2000 and 2004, worldwide CO₂ emissions increased at 3.1% per year, three times the 1.1% per year during the 1990s. The growth was predominantly driven by developing and least-developed economies, which accounted for 73% of global emissions growth in 2004. [June 2007, Military Implications, Sources]

An international team of researchers has found that the Southern Ocean’s capacity to absorb man-made carbon dioxide from the atmosphere is weakening, stating that this is the first time they have “convincing evidence that a change in the uptake of CO₂ by the oceans is linked to climate change.” They didn’t expect that to happen until much later in the 21st century. [May 2007, Military Implications, Sources]

At the same time, methane—22 times more powerful than CO₂ for global warming—is emitted as result of melting permafrost at a rate five times faster than thought, and could become a significant factor in global warming, representing a “a climate time bomb,” warn scientists. Most of the methane-releasing permafrost is in Siberia. Another study reveals that carbon trapped in this type of permafrost could be 100 times the amount of carbon released into the air each year by the burning of fossil fuels. Deep ice drilled out of Antarctica confirms that carbon dioxide levels are substantially higher now than at any time in the last 800,000 years. [September 2006, Military Implications, Sources]

A strategic focus on just the U.S. and China is the most efficient use of environmental lobbying power, said Dr. Jessica Matthews, President, Carnegie Endowment for International Peace, at a recent session at the Woodrow Wilson International Center for Scholars’ Environment and Security Program. The magnitude of changes necessary to affect the growth of greenhouse gas emissions will require the leadership of the top two emitters. Without them, she argued, the changes in other countries are of insufficient significance. China may pass the U.S. in annual CO₂ emissions before the end of 2007. [March 2007, Military Implications, Sources]

New Predictions for the Atmosphere by 2030
Research funded by the EU network ACCENT assessed the state of the global atmospheric environment and evaluated the likely changes by 2030 in conjunction with current regulations. It presents three scenarios: Current Legislation Scenario—based on current air quality legislation; the Maximum technically Feasible Reduction scenario—based on implementation of technological breakthroughs to achieve maximum emissions reduction; and the Intergovernmental Panel on Climate Change (SRES-A2) scenario---a relatively pessimistic approach is shown in contrast to the two more optimistic scenarios. The results suggest that current international legislation on air pollutant emissions is not adequate to reduce ozone and ecosystem damage (mainly caused by elevated nitrogen pollution.) [October 2006, Military Implications, Source]

Polluted Skies and Global Warming Puzzle Decoded
A team of U.S. and Israeli scientists seem to have found the link between global warming and cloud formation. The pattern they identified shows that light-reflecting pollution favors cloud
formation, while light-absorbing aerosols impede it by warming the air, which impedes moisture condensation. This finding helps better understand and predict climate change, as well as the role of different kinds of pollution in cloud formation and rain activity. [July 2006. Military Implications, Sources]

**European New Web-based Air Pollution Monitoring System**

Users of the new Ozone Web released by the European Environment Agency can monitor and track ground level ozone across Europe. The Web site-based database is updated on an hourly basis with data from more than 500 air quality monitoring stations. Users can access the information on air quality in any part of Europe either by entering a place name or by clicking on a map of Europe. The Web site will also include information on the health implications of the respective ozone values. [July 2006. Military Implications, Sources]

**Ozone Hole Worst Ever Recorded**

In addition to pollution, climate change is increasingly recognized as a cause for upper atmosphere ozone depletion. A new UN report revealing continuous ozone depletion, notes that this year’s Antarctic ozone hole covered 29.5 million square kilometers and the ozone mass deficit was 40 million tonnes (European space Agency, ESA, measurements on October 2), the largest ever recorded. The assessment is based on a compilation of data provided by NASA and the ESA, and observations by the WMO Global Atmosphere Watch (GAW) ozone network. Scientists warn that the trend might continue for the next two decades unless measures are taken to curb climate change and diminish levels of ozone destroying substances in the atmosphere, and countries generally adhere to and enforce the Montreal Protocol and Vienna Convention on phasing out of ozone-destroying chemicals. At a Montreal Protocol meeting, held in New Delhi, October 28-November 3, UNEP will be presenting a 10-year road map for governments to follow in protecting the ozone layer. [October 2006. Military Implications, Sources]

**Burning Fossil Fuels Acidifies Oceans, Erodes Coral Reefs**

Impacts of Ocean Acidification on Coral Reefs and Other Marine Calcifiers, a report co-authored by scientists from Australia, Canada, France, Germany, Japan, Monaco, New Caledonia, and the United States, is a comprehensive analysis of marine calcifiers, documenting that worldwide emissions of carbon dioxide from fossil fuel burning is making the oceans more acidic, dramatically altering ocean chemistry and threatening marine biodiversity, mainly causing coral decalcification. Although recommending further research for determining the extent of the impacts, it predicts that calcification rates might decrease as much as 60% within the 21st century. [July 2006. Military Implications]

**New Research Finds Human Energy Usage is a Long-Term Heating Problem Independent of Greenhouse Gases and Solar Radiation**

In addition to greenhouse gases and rises in solar radiation, the planet could continue to be warmed by the increasing number of people who are using ever larger amounts of energy that add heat from their use (combustion engines, nuclear reactors, etc.). In a briefing by Professor Eric Chaisson of Tufts University to the Foundation for the Future this month [March 2007], he demonstrated that human energy use will continue to warm the planet: 1) If global non-
renewable energy use continues increasing at its current rate of ~2% annually and nothing else changes, then a 3 degree Celsius rise will occur in ~8 doubling times, or ~280 years (or ~350 years for a 10 degree Celsius rise); and 2) More realistically, if world population plateaus at 10 billion inhabitants by 2100, developed (OECD) countries increase non-renewable energy use at 1% annually, and developing (non-OECD) countries do so at ~5% annually until east-west energy equity is achieved in mid-22nd century after which they too continue generating more energy at 1% annually, then a 3 degree Celsius rise will occur in ~300 years, or 10 degrees Celsius in ~450 years. Hence, it is necessary to find energy sources, such as geothermal, tidal, wind, and photovoltaics that, unlike fossil or nuclear sources, do not add heat as they convert energy for human usage. [March 2007. Military implications, Source]

Asia’s Progress Jeopardized by Environmental Degradation

The Millennium Development Goals: Progress in Asia and the Pacific 2007 report by the Asian Development Bank and UNDP hails progress in Asia, showing that the continent might reach the UN Millennium Development Goals for poverty, gender parity, and primary education coverage before the 2015 plan. However, the report warns that this might be jeopardized by environmental degradation (including deforestation and land degradation), poor water management (including flooding), rising pollution in urban areas, and CO2 emission contributing to climate change. [October 2007. Military Implications, Sources]

Accelerating Environmental Health Crises in China

Tens of millions in southwest China suffer because of coal plants. The Yellow River, a water source for 140 million people, is drying up, due to agricultural and industrial demands, falling water tables, and changes in glacial and snow-cap melting patterns. On November 20, Beijing’s air quality was rated as ‘hazardous’ and residents were warned to stay indoors. While per capita emissions remain low compared to developed nations, the growing impact of China on climate change, along with severe intra-country air pollution, is of increasing concern to environmentalists and policy makers. The World Energy Outlook 2006 reports that China will surpass the U.S. in 2009 as the biggest emitter of carbon dioxide. This is nearly a decade ahead of previous predictions. [See also China Creates 11 Independent Environmental “Watchdog” Centers in July 2006, China’s President Hu Ordered Environmental Regulations for Military Activities in April 2006, and other related items in previous environmental security reports.] [November 2006. Military Implications, Sources]

China’s ASAT Test Created Serious Long-Range Low-Earth Orbital Pollution

The January 11, 2007 Chinese anti-satellite (ASAT) test created tens of thousands of new pieces of space debris in low-earth orbit (LEO) with size greater than 1 cm—large enough to cause significant damage to a satellite they might hit. So far about 900 pieces greater than 5-10 cm have been cataloged as being created by the Chinese test. Even without the Chinese test, a NASA model shows that some heavily used parts of LEO already have such a high density of debris that collisions of objects at these altitudes will increase the number of debris fragments by 200% in two hundred years. The January additions make this situation worse, and multiple future tests or uses of such ASATs—especially against much larger satellites—could greatly increase the threat to satellites, the Space Station, space shuttles and other space craft as they travel through this polluted space. At high altitudes, where the atmosphere is very thin, this debris can stay in orbit
for centuries, and so far there is no effective way to remove it. This is likely to steadily increase space insurance costs and without major changes could eventually seriously limit access to space. This shows that one actor can affect future access to space for all. Currently 41 nations own satellites. Since there is no mechanism to address this pollution event, some kind of anti-ASAT debris creating treaty seems inevitable, possibly drafted by the Inter-Agency Space Debris Coordination Committee in Vienna. [February 2007. Military implications, Sources]

**Bottled Water Becomes Target of Environmentalists**

Organizations around the world are becoming active in opposing the now rapidly increasing use of bottled water, and regulations and restrictions are beginning to be applied to its distribution. Shipping bottled water across the Atlantic and Pacific by oil-propelled ships does seem odd. One estimate puts the annual fossil fuel footprint of bottled water consumption in the United States at over 50 million barrels of oil equivalent—enough to run 3 million cars for one year. Beginning January 1, 2008 the city government of San Francisco has banned its departments and agencies from purchasing bottled water, and St. Louis is considering the same ban for its city employees in early 2008. With increased discourse around bottled water, it is likely that some international directives will be adopted to regulate its trade and distribution. [December 2007. Military Implications, Sources]

**Restrictions on Plastic Bags Expanding**

More than 40 jurisdictions around the world have imposed or are considering restrictions or taxes on plastic bags. China is outlawing plastic bags from all public transportation, prohibits their free distribution at shopping points, bans the production and use of ultra-thin (less than 0.025 mm) non-biodegradable plastic bags, and will establish new criteria for the production of plastic bags. Firms not complying will face penalties. The new regulation will come into effect on June 1, 2008. Similar regulations were introduced in Bangladesh, Uganda, and South Africa. The Australian Federal Environment Minister announced intentions to phase out plastic bags by the end of the year and, according to UNEP, the problem is also on the agenda of almost every African country. [See also Plastic Bags Taxed and/or Banned in October 2005 environmental security report.] [January 2008. Military Implications, Sources]

**NEW ORGANIZATIONS WITH MANDATES WITH EVENTUAL ES IMPLICATIONS**

**UN Creates Secretariat of the Global Bioenergy Partnership at FAO**

The recently inaugurated Secretariat of the Global Bioenergy Partnership (GBEP) will help UN efforts to promote “green” fuels by facilitating a global political forum to support bioenergy production, marketing and use, and assisting international exchanges of know-how and technology. The focus will be mainly on helping developing countries’ governments and institutions formulate sustainable bio-energy policies and strategies to help reduce dependency on fossil fuel, as well as encouraging investments in multilateral projects for bio-energy development. It will also assist in formulating guidelines for measuring greenhouse gas emission reductions due to the use of bio-fuels. The GBEP Secretariat is located at the UN Food and Agriculture Organization headquarters in Rome and is supported by the Italian Ministry for the Environment, Land and Sea. [See also UN Commission on Sustainable Development Fosters]

‘3R’—Reduce, Reuse and Recycle New Environmental Think Tank for Asia
The ‘3R’—Reduce, Reuse and Recycle—is a new initiative launched by the Asian Development Bank, Asian Institute of Technology, UNEP, and the UN Economic and Social Commission for Asia and the Pacific (UNESCAP) to promote sustainable use of natural resources and increase environmental efficiency. The center will be located at the Asian Institute of Technology in Bangkok. It will function as a think tank on environmental technology, knowledge dissemination, research capacity building, regulations, and policy related to 3R practices in cooperation with other related Asian initiatives. [August 2006. Military Implications, Source]

Asian Consortium on Non-traditional Security Issues
The Consortium of Non-traditional Security Studies in Asia (NTS-Asia) is made up of 14 research institutes and think tanks from Asia that will study issues including efforts to tackle pandemics, environmental degradation, and cooperation during disasters resulting from climate changes. Climate change, the avian flu, and other “invisible, diverse, and unpredictable” threats are becoming a top security concern in many Asian countries. The consortium will be hosted by Singapore and plans to hold annual conferences on non-traditional security issues with peer institutes from the U.S. and Europe. [January 2007. Military Implications, Sources]

UN StEP Initiative for Reducing E-Waste
Solving the E-waste Problem (StEP) is a global public-private initiative coordinated by the United Nations University with the overall aim of improving e-waste management by creating global standards for e-scrap and recycling. The partnership includes various UN organizations, major high-tech manufacturers, and governmental, NGO and academic institutions, along with recycling/refurbishing companies. Five task forces will help shape new e-waste standards: Policy & legislation (assessment of current e-waste policies and recommendations for future strategies); ReDesign (improve electronics design for better reuse, repair, refurbishment and recycling); ReUse (development of a global reuse system to minimize environmental impacts) ReCycle (develop sustainable e-waste recycling systems); and Capacity building (globally accessible documentation on e-waste). The initiative was officially launched on March 7. [See also UN E-Waste Forum and Basel Convention’s Conference of Parties, Toxic Waste Disposal of Global Growing Concern in September 2006, WEEE Comes into Effect, and other related items.] [March 2007. Military Implications, Sources]

NEW INITIATIVES AIMING TO INCREASE ECO-EFFICIENCY

Corporate CEOs Pledge Actions on Climate Change at UN Global Compact Summit
More than 150 CEOs signed the “Caring for Climate” platform at the UN Global Compact Summit held in Geneva July 5-7, including 30 from the Fortune Global 500. The pledge called for companies to reduce their carbon emissions and meet energy-efficiency targets, and called on
governments to establish post-Kyoto market mechanisms to reduce greenhouse gas emissions. [July 2007. Military implications, Sources]

**Global Trends in Sustainable Energy Investment 2007**


**New International Financial Alliance to Support Biodiversity**

Representatives of 191 Parties to the Convention on Biological Diversity and over 100 ministers met in Bonn to improve the set of rules that help protect biodiversity. Plant and animal species are being lost at a rate between 100 and 1000 times the natural extinction rates. One of the results of the meeting was the establishment of Life Web as a financing mechanism for protected areas. So far, more than 60 Parties have made financial pledges. For example, German Chancellor Angela Merkel pledged 500 million Euros for forest protection up to 2012 and 500 million Euros a year after that. [May 2008. Military Implications, Sources]

**Renewable Energy Projects May Face New Scrutiny**

According to a paper published in Inderscience's International Journal of Nuclear Governance, Economy and Ecology, some renewable energy sources might not be so green and might even be damaging to the environment. The paper’s author, Jesse Ausubel, Director of the Rockefeller University's Program for the Human Environment in New York, focuses primarily on land use efficiency of the various alternatives (e.g. wind, biomass, hydro), and points to nuclear as the best choice from the standpoint of minimizing environmental footprint. [July 2007. Military Implications, Source]

**US EPA recommendations for "Green Infrastructure"**

US EPA has a website for "green infrastructure," with information about improving relationships between the built and natural environments. [September 2007. Military Implications, Source]

**Green Un-building Becomes Major Environmental Goal**

The practice of "green un-building" – environmentally friendly demolition – is becoming a major goal of environmental groups worldwide. Reuse or recycling of materials from destroyed structures can save enormous amounts of scarce resources. [October 2007. Military Implications, Source]

**Green Information Technology is forecasted as 2008 top IT Strategy**

Gartner, Inc., a leading news source in information technology (IT), is predicting that concern for environmental issues will have a most significant impact on IT planning and operations over the next three years. The major factors involved here are energy conservation and efficiency,
material conservation and recycling, and “green building” of data processing installations. UN-GAID will co-sponsor a conference and exhibit, The Positive Impact of ICT (Information and Communications Technology) on the Environment and Climate Change, on 27-28 November 2007, at the United Nations. Tutorials will focus on the role of information and communication technologies in assuring environmental sustainability. They will address the broader issue of information and communication technologies’ impact on the environment and climate change. [October 2007. Military Implications, Source]

State of Green Business 2008
The State of Green Business report provides an example of a set of evaluations of environmental accomplishments. It takes stock of green business activities in the United States, and features the debut of the GreenBiz Index, a set of 20 indicators of green business progress that measures how efficiently companies are using resources, reducing toxics, purchasing green fleet vehicles and renewable power, and reporting social and environmental performance. It also features ten key green business trends of 2007 as well as lists of books, websites, reports, business initiatives, and other resources of the past year. [February 2008. Military Implications, Source]

New “Green IT” Software under Development
A group at Oxford University’s Environmental Change Institute started development of “software that is free and easy to download, which will make networked computers more energy-efficient and reduce carbon emissions by saving on electricity needs.” The software will eventually be available from the project website: http://projects.oucs.ox.ac.uk/lowcarbonict. [March 2008. Military Implications, Sources]

Energy/Performance Benchmark for Workstations under Development
A new, environmentally-oriented project of the Standard Performance Evaluation Corporation (SPEC) Graphics and Workstation Performance Group is “working on the benchmark for performance in relation to power consumption, incorporating current benchmarks for 3D graphics as well as looking at workloads for rendering, financial modeling, video encoding and other processes” announced a Greener Computing news story. SPEC will be submitting the benchmark to EPA for use in its Energy Star rating system. [March 2008. Military Implications, Source]

Environmentally Friendly City in UAE Offers Cooperation Opportunity
A new mini-municipality, Masdar City, being built adjacent to Abu Dhabi, is intended as a hub for academic and corporate research on nonpolluting energy technologies, according to an article in the International Herald Tribune. The walled city of 2.3 square miles will be car-free and produce all its own energy from sunlight. [February 2008. Military Implications, Source]

New International Financial Alliance to Support Biodiversity
Representatives of 191 Parties to the Convention on Biological Diversity and over 100 ministers met in Bonn to improve the set of rules that help protect biodiversity. Plant and animal species are being lost at a rate between 100 and 1000 times the natural extinction rates. One of the results
of the meeting was the establishment of Life Web as a financing mechanism for protected areas. So far, more than 60 Parties have made financial pledges. For example, German Chancellor Angela Merkel pledged 500 million Euros for forest protection up to 2012 and 500 million Euros a year after that. [May 2008. Military Implications, Sources]

Switching to Green: A renewable energy guide for office and retail companies
The World Resources Institute (WRI) published a guidebook, Switching to Green: A renewable energy guide for office and retail companies, to provide organizations with easily understandable information on how to switch to renewable energy. [October 2006. Military Implications, Source]

Cleantech Report™ by Lux Research
Cleantech Report™ by Lux Research is a comprehensive analysis of emerging energy and environmental technologies with information ranging from statistics to funding and policies on cleantech. It notes that cleantechs are rapidly expanding; 1,500 cleantech start-ups operate worldwide, there were 29,874 cleantech-related scientific journal articles published in 2006, and 4,093 patents issued in the U.S. alone. [June 2007. Military Implications, Source]

Idle Nighttime Computers Cited as Energy Wasters
A new report released by the energy management firm 1E and the Alliance to Save Energy points out the large amount of energy now being wasted by idle computers left running at night. The study calculated that 14.4 million tons of CO2 could be eliminated annually from atmospheric pollution in the U.S. if all of these machines were turned off when not being used for extended periods. [June 2007. Military Implications, Sources]
3. Military Implications and Sources

A Preventing or repairing military damage to the environment

ENVIRONMENTAL SECURITY RISES ON THE INTERNATIONAL POLITICAL AGENDA

UN to Shift Attention from Reaction to Prevention of Conflicts

Military Implications:
Military resources have studied the nature of conflict in many situations for many years. Lessons learned about conflict precursors, forecasting and prevention should be made available through relevant channels to support the UN’s change of emphasis from reaction to prevention. Alternative scenarios could be created about how military forces could be better deployed for prevention. Since environmental issues are increasingly recognized as a contributing cause of future conflicts, the military might consider increasing cooperation with environmental forecasting organizations in order to improve its capacity to anticipate and prevent conflicts.

Sources:
Security Council Reiterates Commitment to Conflict Prevention in Africa; Presidential Statement Follows Day-Long Debate
U.N. spent $18 billion on peacekeeping in past five years, but not enough on conflict prevention
New York, 28 August 2007 - Secretary-General's remarks to the Security Council at open debate on conflict prevention and resolution, particularly in Africa
UN highlights growing role of international policing as global meeting opens in Australia

UN General Assembly Focuses Government Leaders on Climate Change

Military Implications:
The military should bring together information on all its efforts to reduce climate change and its capacities to anticipate and respond to the effects of climate change (e.g., an executive information system) for continual review and improvement. This would be in anticipation for higher-level requests.

Sources:
UN General Assembly—General Debate (25 September - 3 October 2007); Statements and Webcast
Ban Ki-Moon Convenes Largest-Ever Meeting Of Global Leaders On Climate Change
As the waters rise
http://www.economist.com/world/international/displaystory.cfm?story_id=9867337
President of the UN General Assembly’s comments during private briefing by the director of the Millennium Project (Glenn jglenn@igc.org)
UN General Assembly 61st Session Pinpoints Global Warming as a Central Issue for Security

*Military Implications:*
In addition to the military implications of the increasing scientific evidence of climate change listed in previous Millennium Project monthly reports, the military should consider the opportunities created for collaboration on preparedness strategies; as well as, the increased political attention to the polluter pays principle.

*Source:*

UN Conflict Prevention Strategy Includes Environmental Dimension

*Military Implications:*
Relevant military personnel should study the Progress report to see if there are preventive measures that might be adapted to improve military practice and better anticipate emerging issues in UN policies to prevent conflicts, and to explore new areas for cooperation.

*Sources:*

UK Initiates UN Security Council Debate on Climate Change and Security

*Military Implications:*
Environmental security is likely to become a more common area for UN Security Council action; hence, the military should consider how this could change the nature, composition, and training requirements of future peacekeeping missions related to environmental security. This is not an issue of whether or what part of climate change is caused by humans, but of the consequences of scientifically documented climate change and actual impacts on societies.

*Sources:*
'Environmental security' essential
http://www.guardian.co.uk/uklatest/story/0,,6568208,00.html (article available for a limited time)
U.S. Rejects Call for Tougher U.N. Environment Role
http://www.enn.com/today.html?id=12588
UN Security Council to Debate Climate Change
http://www.planetark.com/dailynewsstory.cfm/newsid/41268/story.htm

Britain to Push on Adding Climate Change to Security Council Agenda
Sources:
British push on CO2 at Security Council
http://environment.guardian.co.uk/climatechange/story/0,,2028872,00.html
Britain puts climate change on UN agenda
http://www.timesonline.co.uk/tol/news/world/us_and_americas/article1485323.ece

UN Security Council Adds Natural Resources Management and Environmental Issues to Future Peacekeeping Missions
Military Implications:
Military peacekeeping liaisons should be made aware of experts on relevant natural resources and environmental issues who might be available to aid future peacekeeping missions. Such experts and peacekeeping commanders should be queried to see if there are any special needs for training and standards for such missions. It would be wise to apply similar approaches to pre-conflict situations, as conflict prevention tools.
Source:
Security Council Underscores Need for Peacekeeping Mandates to Consider Helping States Prevent Illegal Exploitation of Natural Resources from Fuelling Conflict

UN Establishes the International Panel for Sustainable Resource Management
Military Implications:
Since environmental security would have to be considered within the broad framework of the IPSRM, it would be wise to begin to explore how those involved in the Army Strategy on the Environment and military personnel with natural resources management responsibilities should communicate with the new organization. Because the next US administration could well choose to become an important member in the IPSRM, there could be opportunities for military scientists to participate on the panel. In any case, the military and its contractors should follow the Panel’s work.
Sources:
New Panel must boost resource-efficient growth and innovation, UN Environment Programme says
International Panel for Sustainable Resource Management (Resource Panel)
http://www.unep.fr/pc/sustain/initiatives/resourcepanel/
New UN Secretary-General Announced Climate Change a Top Priority

Military Implications:
The military should take advantage of this changing political environment to launch a higher national and international profile for the Army Strategy for the Environment and go into greater detailed planning to carry it out. The public still remains quite unaware of how far along the Army has moved in policy and practice compared to many other public and private institutions.

Sources:
UN official proposes global summit on climate change to plan next steps
UN's Ban Urged to Lead Global Climate Change Plans
http://www.planetark.com/dailynewsstory.cfm/newsid/39865/story.htm
New U.N. chief on first overseas tour
Could Corporate America take the lead in Climate Change?
Army Strategy for the Environment

UN Appoints Special Envoys for Climate Change

Military Implications:
[Similar to previous on related issues] Environmental security is likely to get increasing attention in the UN and other international forums. The military should consider how this could change the nature, composition, and training requirements of future peacekeeping missions related to environmental security. This is not an issue of whether or what part of climate change is caused by humans, but of the consequences of scientifically documented climate change and actual impacts on societies.

Sources:
Ban Ki-moon names 3 prominent Special Envoys on Climate Change
Secretary-General Appoints Three New Special Envoys on Climate Change
U.N. appoints three envoys on climate change
Climate change must be tackled at the international political level, say UN envoys

UNEP Governing Council/Global Ministerial Forum Makes Progress on Global Environmental Governance

Military Implications:
Military personnel with environmental security responsibilities should review the GC-24/GMEF decisions for areas of potential cooperation, as well as their potential for triggering future environmental regulations.
Environmental Ministers Advance Global Consensus at UNEP Forum

Military Implications:
The military should respond to UNEP’s increased focus on partnerships and linkages with other organizations by exploring alternative scenarios for a global alliance between UNEP and the world’s national militaries to improve environmental security.

Sources:
New and Forward Looking Strategy for UNEP Authorized
10th Special Session of the Governing Council/Global Ministerial Environment Forum
http://www.unep.org/gc/gcss-x/
Final Report: Mid-Term Strategy for the Period 2010-2013
http://www.emwis.net/thematicdirs/news/PDF/MTS_Final_Draft

Controversy over a United Nations Environmental Organization Continues

Military Implications:
Considering the rising concern over the importance of environmental issues for global security, and the need for a better international coordination of funds, research, and governmental guidance, it is likely that the debate for a stronger UN environmental agency will continue. In anticipation of such increased coordination, the military should: 1) consider developing a list of environmental security related priorities whose progress would be enhanced by such international coordination and 2) ask to participate in discussions/negotiations.

Sources:
U.S. Rejects Call for Tougher U.N. Environment Role
http://www.enn.com/today.html?id=12588
Security Council Holds First-Ever Debate on Impact of Climate Change on Peace, Security, Hearing Over 50 Speakers

OSCE to Develop an Environmental Security Strategy

Military Implications:
The militaries of OSCE countries are likely to be called upon to further detail their roles in environmental security. This is an opportunity for the US Army’s Strategy on the Environment to be used as a discussion document in this process. Russia and the CIS (Commonwealth of Independent States) were among the first to have a definition of environmental security; hence, military collaboration should be fruitful. If not already done, the relevant military personnel should contact the Office of the Coordinator of OSCE Economic and Environmental Activities
and the Environment and Security (ENVSEC) Initiative to collaborate on further development of
the environmental security strategy and its implementation.

Sources:
OSCE meeting transforms concern about environment security into action
http://www.osce.org/eea/item_1_24652.html
OSCE meeting fosters co-operation to reduce environmental threats, says Chairman
http://www.osce.org/eea/item_1_24589.html

OSCE Adopts Ministerial Declaration on Environment and Security

Military Implications:
Military personnel with environmental security responsibilities where OSCE operates should be
notified of this declaration, since it should strengthen the organization’s commitment to
environmental matters and consequently influence field missions.
Source:
15th OSCE Ministerial Council, Madrid, 29 and 30 November 2007
http://www.osce.org/conferences/mc_2007.html
Madrid Declaration on Environment and Security

OSCE Parliamentary Assembly Agrees to Advance Work on Environmental Security Strategy

Military Implications:
The militaries of OSCE countries are likely to be invited to comment on the draft strategy. This
is an opportunity for the U.S. Army’s Strategy on the Environment to be used as a discussion
document in this process. Russia and the CIS (Commonwealth of Independent States) were
among the first to have a definition of environmental security; hence, military collaboration
should be fruitful. If not already done, relevant military personnel should contact the Office of
the Coordinator of OSCE Economic and Environmental Activities and the Environment and
Security (ENVSEC) Initiative to collaborate on further development of the environmental
security strategy and its implementation.

Sources:
Kyiv Declaration of the OSCE Parliamentary Assembly and Resolutions Adopted at the
Sixteenth Annual Session; Kyiv, 5 to 9 July 2007
http://www.oscepa.dk/admin/getbinary.asp?FileID=1733
Resolution on Environmental Security Strategy
http://www.oscepa.dk/admin/getbinary.asp?FileID=1733
Annual Sessions & Declarations

Briefings on Environmental Security at NATO Conference

Military Implications:
The papers and PowerPoint presentations should also be reviewed and circulated to relevant
military personnel. If not already done, the Army Strategy for the Environment should be shared
with the participants in this Forum, seeking opportunities for joint implementation of the
international aspects and offering the Strategy as a model for other NATO nations.

Sources:
OSCE-NATO Workshop on Environmental Security in the Mediterranean

Military Implications:
Military personnel involved in environmental security issues should review the "Water Scarcity, Land Degradation and Desertification in the Mediterranean region - Environment and Security Aspects" background paper for the conference referenced in sources below and seek ways to support their colleagues in the Mediterranean region.

Sources:
Mediterranean countries discuss environmental security at OSCE, NATO workshop
http://www.osce.org/item/28784.html
"Water Scarcity, Land Degradation and Desertification in the Mediterranean region - Environment and Security Aspects," Background Paper

Environmental Security Focus of the Nobel Peace Prize for 2007

Military Implications:
It is likely that this Nobel Peace Prize will focus more political and public attention and action on environmental matters. This presents opportunities to raise awareness of the Army Strategy on the Environment. Military public relations officers should be tasked to explore how to connect this Army strategy with the Nobel Peace Prize, noting efforts to reduce the military environmental footprint, the environmental dimensions in its operations, its role in developing adaptation and mitigation plans, and the inclusion of environment-related factors in conflict prevention strategies.

Sources:
The Nobel Peace Prize 2007
Gore shares Nobel Peace Prize with U.N. panel
Ban Ki-moon hails Nobel laureates Al Gore, Intergovernmental Panel on Climate Change 
Global warming recast as security issue
http://www.ft.com/cms/s/0/3027a992-78f2-11dc-aaf2-0000779fd2ac.html?nclick_check=1

UK Defence Ministry Highlights the Link between Environment and Security

Military Implications:
Relevant military personnel should study the report for useful insights to improve U.S. military environmental strategy and assess how the military could coordinate with USAID and other potential partners on sustainability issues.

Sources:
Ministry of Defense Sustainable Development Annual Report 2005
Civil Society Regional Consultations Worldwide Prior to the Global Ministerial Environment Forum

*Military Implications:*
Review of the outputs of those recent meetings and subsequent discussions provides an important heads up on the agenda and issues to be discussed and the potential for new environment-related regulations likely to arise in the UNEP February 2007 Forum. If military cooperation with environmental NGOs is likely to increase, then a review of the positions of various NGOs in these meetings could provide information for deciding which environmental NGOs to cooperate with about what, and where in the world.

*Sources:*
Civil Society Regional Consultations Take Off in Geneva
Civil Society Regional Consultations Take Off in Nairobi

UK Scientists List 100 Most Vital Ecological Policy Questions

*Military Implications:*
It is very likely that this list, published in the August 2006 issue of the Journal of Applied Ecology, will serve as a source of future UK and EU environmental regulatory efforts. Military personnel should review the list and the accompanying material to determine which of these problems may have military applications and implications.

*Source:*
The key questions at the heart of the UK's environmental future
http://www.guardian.co.uk/science/story/0,,1854855,00.html

Environment a Key Element in the First European 18-month Work Program

*Military Implications:*
Relevant military personnel with environmentally-related responsibilities in Europe should review the Program for eventual implications for operational planning and training.

*Source:*
EU 18-months Work Programme

The Institute for Environmental Security in The Hague to Hold Annual Peace and Sustainability Sessions

*Military Implications:*

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Map on Oversea Deployment and Environmental Change in UK MoD, *Sustainable Development Report 2005*
Copies of the Army Strategy for the Environment should be sent to the conference organizers. If not already doing so, relevant military personnel should consider attending the annual Peace and Sustainability Sessions. The recommendations of these sessions should be widely publicized among military forces involved in conflict prevention, mitigation, and post-conflict rebuilding. 

Source: 
Forces for Sustainability Launch of the Peace and Sustainability Sessions 
http://www.envirosecurity.org/sustainability/

**French President Jacques Chirac issues Paris Call for Action for Global Ecological Governance**

*Military Implications:* Considering the high level of the participants and President Chirac’s commitment, it is likely that some of the elements in the call for action may shape new international agreements; and hence the Call for Action and how it is used by the French President and other leaders is a useful indicator of changes in environmental politics. 

Sources:
“Citizens of the Earth” Conference  http://www.citoyensdelaterre.fr/conference/?-English-
“Citizens of the Earth” Conference for Global Ecological Governance  
http://www.citoyensdelaterre.fr/conference/?PARIS-CALL-FOR-ACTION

Green Cross International defends the right to water at the Paris Conference for Global Ecological Governance 

UN officials urge global push to reverse environmental damage  

**Climate Change a Serious Threat to Security, Conclude Eminent Military Officers**

*Military Implications:* Although the military is well aware of the report and its findings, it is added here due to its importance to the overall record of developing international issues of environmental security. 

Sources:
National Security and the Threat of Climate Change 

Climate Change Poses Serious Threat to U.S. National Security  
http://securityandclimate.cna.org/news/

Could global warming cause war?  


*Military Implications:* The IES report is worth reviewing, as a source of information on European environmental security policies and activities, as well as for influences leading to establishment of future strategies. It might also provide useful ideas for other regions. 

Sources: 
Inventory of Environment and Security Policies and Practices (IESPP)
World Leaders Discuss Environmental Security Policies at Davos

Military Implications:
If clean water for human survival were to become a human right, how might military-to-military program priorities and training be altered to support that objective? The World Economic Forum conference has increased attention to environmental security cooperation between business and government. Military personnel with environmental security responsibilities should explore collaboration possibilities at the business-government interface to create roadmaps and design strategies to address the environmental aspects that might have security implications.

Sources:
World Economic Forum Annual Meeting 2008
Ban warns business on looming water crisis
http://www.ft.com/cms/s/8ca7e9c6-cadb-11de-a960-000077b07658.html
Time is Running Out for Water (video)
Fukuda unveils new climate strategy
http://search.japantimes.co.jp/cgi-bin/nn20080127a1.html
Fukuda faces post-Kyoto balancing act
http://search.japantimes.co.jp/cgi-bin/nn20080128a4.html

Branson calls for War Room on Climate Change at the United Nations

Military Implications:
The military should consider how it might participate in the creation of such a war room and its potential liaison protocols, and then contact Virgin Unite to determine appropriate modes of participation.

Sources:
Press Conference on General Assembly Climate Change Thematic Debate
‘War room’ to Battle Warming Proposed
http://www.msnbc.msn.com/id/23129533
Email traffic between Virgin Unite’s CEO and J. Glenn (Millennium Project) who was a special guest of the President of the UN General Assembly during the Climate Change session.

New Environmental Security Blog

Military Implication
While the Millennium Project staff regularly checks the blog and reports key insights, relevant military personnel should also check or subscribe to this blog for updates on new environmental security issues and resources.

Sources:
ECSP Launches Blog on New Security Threats
http://www.wilsoncenter.org/index.cfm/topics/index.cfm?topic_id=1413&fuseaction=topics.item&news_id=224705

INTERNATIONAL TREATIES RELATED TO ENVIRONMENTAL SECURITY AND MILITARY ACTIONS


Military Implications:
While the U.S. is not yet a party to Protocol V, it would be wise to assume and plan for the seeming eventuality that future international agreements will begin to include retroactive responsibilities. Protocol V is another example of the increasing international consensus in favor of the “polluter pays” principle. Protocol V has no clear implementation mechanisms or deadlines. To provide some leadership, if not already in existence, relevant military personnel might be tasked to create an information system to help responsible countries prioritize their future cleanup operations and, in anticipation, their legacy remnants of war.

Sources:
CCW Protocol V on Explosive Remnants of War Enters into Force
http://www.icbl.org/layout/set/print/news/ccw_protocol_v
Portfolio of Mine Action Projects http://www.mineaction.org/section.asp?s=projects
The need for urgent international action on cluster munitions http://www.icrc.org/web/eng/siteeng0.nsf/htmlall/cluster-munition-statement-061106?opendocument

Progress Made on Banning Cluster Bombs

Negotiations Continue for an International Instrument to Ban Cluster Munitions

Military Implications:
The military should be prepared for possible requirements to phase out cluster munitions use and to intensify efforts for helping other countries and regions do the same and/or deal with their aftereffects.

Sources:
Summarizing Environmental Security Scanning July 2006—June 2008

CMC media advisory: Vienna Conference
http://www.stopclustermunitions.org/news.asp?id=103
March 2007

Military Implications:
The military should be prepared for possible requirements to phase out cluster munition use and to intensify efforts for helping other countries and regions do the same and/or deal with the aftereffects.

Sources:
Oslo Conference on Cluster Munitions, 22-23 February 2007
Declaration - Oslo Conference on Cluster Munitions, 22 - 23 February 2007
Cluster Munitions: Statement to the Canadian Standing Committee on Foreign Affairs and International Development (by Steve Goose co-chair of the Cluster Munition Coalition)
http://hrw.org/english/docs/2007/03/01/canada15442.htm
Belgium criminalizes investment in cluster bomb manufacturers
Cluster Munitions Civilian Protection Act of 2007 (Introduced in Senate) S 594 IS
http://thomas.loc.gov/cgi-bin/query/z?c110:S.594:

African Countries Call for International Ban on Cluster Bombs

Military Implications:
[Same as previous on this issue] The military should be prepared for possible requirements to phase out cluster munitions use and to intensify efforts for helping other countries and regions do the same and/or deal with their aftereffects.

Sources:
Strong Landmark African Declaration to Ban Cluster Bombs - Only South Africa Calls for Exceptions to the Ban
http://www.icbl.org/news/zambia_pr
The Cluster Munitions Process http://www.clusterprocess.org

Chemical Weapons Convention Gets New Boost

Military Implications:
[Similar to previous on the same issue] Those with responsibilities in this area should: 1) consider assessing national and international opportunities for assisting in compliance and improving effectiveness of the CWC regulations, and 2) stress attention to and inclusion of new threats.

Sources:
Second Review Conference
http://www.opcw.org/rc2/index.html
Nations Demand Adherence to CW Disposal Deadlines
http://204.71.60.36/d%5Fnewswire/issues/2008/4/8/9cb5bc8a%2D5136%2D4594%2Da750%2Dc5108a7b58ec.html
Chemical arms disposal pricey / China project hit for opaque management, exorbitant costs
Eleventh Chemical Weapons Convention

Military Implications:
The state of current and potential future non-lethal weapons should be reviewed in light of possible violations of the CWC. [Similar to previous on the same issue] Those with responsibilities that might be affected by the results of the conference should visit the U.S. Chemical Weapons Convention website http://www.cwc.gov, noting national and international opportunities for assisting in compliance with the CWC regulations.

Sources:
Chemical Incapacitants Must Be Kept From War, Experts Say
http://www.nti.org/d_newswire/issues/2006_12_7.html#C1839F43
Weapons of Terror
Annan calls on governments to destroy ‘cruel and inhumane’ chemical weapons
U.S., Partners to Offer New Program of CWC Support
http://www.nti.org/d_newswire/issues/2006_12_7.html#95296BAD
Nations Get CW Treaty Extensions
http://www.nti.org/d_newswire/issues/2006_12_11.html#263C85C9

CONFLICT AND POST-CONFLICT ENVIRONMENTAL SECURITY ISSUES

International Crisis Group to Debate Considering Climate Change Variable in Conflicts

Military Implications:
Conclusions from this assessment should be reviewed by relevant military personnel with environmental security-related responsibilities.

Sources:
Rainfall records could warn of war
http://environment.newscientist.com/channel/earth/mg19426064.500?DCMP=NLC-nletter&nsref=mg19426064.500 (by subscription)

UN Secretary-General on the International Day for Preventing the Exploitation of the Environment in War and Armed Conflict

Military Implications:
Relevant military personal might use the November 9th International Day for initiating and/or furthering relations with such UN organizations as UNEP and its partners to help find approaches for improved sustainability for displaced communities to prevent re-conflicts.

Sources:
Preventing the Exploitation of the Environment in War
http://www.un.org/depts/dhl/environment_war
Massive displacement disrupts economic activities: Ban
Report on Lebanon After-war Environmental Assessment

Military Implications:
The report is a valuable source of information for: after-war environmental damage assessment; possible actions for remediation and mitigation; improved/green reconstruction after conflict; and legal aspects concerning possible compensations.

Sources:
Lebanon Rapid Environmental Assessment for Greening Recovery, Reconstruction & Reform—2006

Hezbollah-Israeli War Threatens an Already Precarious Environment

Military Implications:
Military liaisons with Arab countries should explore the possibilities of convening a regional or pan-Arab conference on environmental security. This could be an opportunity to further the Army Strategy on the Environment and communicate its value in the region. The conference might be hosted by Egypt, as part of post-conflict planning. Exploratory meetings should include those responsible for implementing the Abu Dhabi Declaration. Since 2006 is the International Year for Deserts and Desertification, military liaisons in the region might also explore how such an environmental security conference might build upon or complement plans already underway in relation to the international year.

Sources:
Environmental 'crisis' in Lebanon
http://news.bbc.co.uk/2/hi/science/nature/5233358.stm
UN environment agency backs response to Lebanon oil slick emergency
Rescue Lebanon’s Coast; Oil Spill Crisis
http://www.moe.gov.lb/rescuelebanon.htm
Abu Dhabi Declaration on Environment and Energy
http://www.unep.org.bh/Publications/DTIE%20Final/AbuDhabiDeclarationEn.pdf
Environmental Sustainability Index
"Environmental Sustainability in the Arab World"

Addressing Post-Conflict Environmental Security Issues

Military Implications:
The international community is still paying for environmental cleanups for past conflicts. Since weapons and technologies steadily become more sophisticated, resulting damages are worse and
so are costs of restoration, mainly those of the environment. Hence, it is likely that there will be increasing pressure for increased precision with decreased environmental impact in future R&D products. Events with consequences, such as the oil spill in Lebanon, are likely to increase calls for updating laws, assigning liability, and defining redress issues concerning environmental damages in war. [See also related items in Conflict and Post-Conflict Environmental Security Issues section of Chapter 9.1 Emerging Environmental Security Issues on the CD accompanying the 2006 State of the Future report by the ACUNU Millennium Project]

Sources:
UN environment agency set to begin aerial surveillance of Lebanese oil spill
Lebanon Oil Spill Cleanup May Take A Year
http://www.terradaily.com/reports/Lebanon_Oil_Spill_Cleanup_May_Take_A_Year_999.html
UN reparations panel pays out nearly $396.5 million for Iraq’s invasion of Kuwait

Environmental Legacy of Hezbollah-Israeli War

Military Implications:
[Similar to previous on the same issue] The international community is still paying for environmental cleanups for past conflicts. It is likely that there will be increasing pressure for increased precision with decreased environmental impact in future R&D products, updating laws, assigning liability, and defining redress issues concerning environmental damages in war. [See also related items in Conflict and Post-Conflict Environmental Security Issues section of Chapter 9.1 Emerging Environmental Security Issues on the CD accompanying the 2006 State of the Future report by the ACUNU Millennium Project]

Sources:
UNEP Report Highlights Environmental Legacy of the Lebanon Conflict
Lebanon—Post-Conflict Environmental Assessment
Global conference pledges billions of dollars for Lebanon
Paris, France, 25 January 2007 - Secretary-General's remarks at International Donor Conference on Reconstruction in Lebanon

Environmental Aspects of the Darfur Conflict

ICC Urged to Consider Environmental Crimes in Darfur Cases

Military Implications:
Although making a case based on environmental crime is very difficult under the stipulations of the Rome Statute (see Environmental Crimes in Military Actions and the International Criminal Court (ICC)—UN Perspectives, by the Millennium Project, available from AEPI), the fact that there is pressure to consider it increases the attention given to the environment in conflict situations and contributes to other efforts to change the Rome Statute to better address environment-related actions. Hence, military legal personnel monitoring the evolution of the ICC should keep track of these developments. Likewise, personnel writing and updating regulations...
need to make themselves aware of these developments in order to incorporate changing
philosophies and requirements in training, operations and materiel development guidance at
appropriate times. [See also *UNEP Warns No Peace in Sudan without Environmental
Management Plan* in June 2007 environmental security report]

**Sources:**
Court Urged to Consider Environmental Crimes

Environmental Crimes in Military Actions and the International Criminal Court (ICC)—UN
Perspectives

**Water Shortage for 2.2 Million in Refugee Camps Could Increase Darfur Conflict**

**Military Implications:**
U.N. and military planners involved in the Darfur and similar peacekeeping operations should
incorporate environmental and infrastructure dimensions into their strategies and operations and
eventually consider alternative relocation of the refugees. Implementation of new technologies
for water supply should be contemplated as a priority in peace operations in such conditions.
Lessons learned in Darfur need to be heeded in generalized planning guidance for future crises
that might occur elsewhere.

**Sources:**
Darfur refugees strain tight water supplies

New York, 28 August 2007 - Secretary-General's press conference

**Environment to Get Crucial Role in Sudan's Future Peace and Prosperity Strategy**

**Military Implications:**
Lessons learned by military and their civilian contractors from post-conflict environmental
reconstruction activities should be shared with UNEP and relevant Sudanese officials, as should
offers of military-to-military assistance in environmental reconstruction when more stable
conditions prevail.

**Source:**
UN Environment at Sudan National Planning Environmental Management Workshop

**UNEP Warns No Peace in Sudan without Environmental Management Plan**

**Military Implications:**
Military planning for Sudan should include environmental planning and capacity-building
experts in operations.

**Sources:**
Darfur conflict heralds era of wars triggered by climate change, UN report warns
[http://environment.guardian.co.uk/climatechange/story/0,,2109490,00.html](http://environment.guardian.co.uk/climatechange/story/0,,2109490,00.html)

Environmental Degradation Triggering Tensions and Conflict in Sudan
Environmental Change and Security 12th Annual Report—Focus on Africa

*Military Implications:* Those military and civilian personnel with international environmental responsibilities should review the report.

*Source:* ECSP Report 12
http://www.wilsoncenter.org/index.cfm?topic_id=1413&fuseaction=topics.publications&group_id=240703

Disputes over Oil Might Reignite Congo-Uganda Conflict

*Military Implications:* This could be an opportunity for the military to take up the UN Security Council’s increased focus on prevention (see Item 1 in this report) by offering collaboration with the UN Resident Representatives in the two countries in cooperation with the African Union to prevent a potential war.

*Source:* Do you want to share or to fight?
http://www.economist.com/research/articlesBySubject/displayStory.cfm?story_id=9687573&subjectID=381586&fsrc=nwl&emailauth=%2527%252D5%2527%253EP%255CGJ%2523%2520D%250A

Depleted Uranium Environmental Concerns Resurfacing

*Military Implications:* As discourse over the consequences of the use of depleted uranium continues, pressure could mount for new international regulations that would create a clear framework for assessment, consequences, and compensations/liabilities for the responsible countries. The military should ensure that it is prepared to provide reliable information to counter such allegations and continue pursuing R&D for substitutes.

*Sources:* "We Are Living Through Another Hiroshima," Iraq Doctor Says
http://www.opednews.com/articles/genera_sherwood_071121__22we_are_living_throu.htm
Attack on Iran would result in India feeling nuked: Moret
Officials to test military for depleted uranium levels
Depleted uranium can be detected in urine
http://www.upi.com/NewsTrack/Health/2007/10/26/depleted_uranium_can_be_detected_in_urine_/4838/

Japanese Chemical Weapons Cleaning in China Yet to be Completed

Japanese Supreme Court Denies Chinese Wartime Claims

*Military Implications:*
[Similar to previous on same issues] This is one more event that builds the case for an agreement for universal and ethical treatment of health damages induced by the use of chemical, biological or radiological weapons. The military should consider collaboration with diplomatic personnel on drafting provisions in anticipation of an agreement, and continue developing antidotes for such weapons.

Sources:
Japan rules against war claims
http://news.yahoo.com/s/ap/20070510/ap_on_re_as/japan_china_germ_warfare_2 (article available for a limited time on the website)
Japanese chemical bomb unearthed in north China
http://english.people.com.cn/200706/15/eng20070615_384705.html (article available for a limited time on the website)
Japan rules against war claims
http://www.guardian.co.uk/worldlatest/story/0,,6622616,00.html (article available for a limited time on the website)

Environment and Security Program in the East-Caspian Region

Military Implications:
CENTCOM and military stationed in the East Caspian region should consider the ENSVEC priorities in their planning and actions, adjust the regional engagement plan accordingly, and also offer support to their counterparts to improve environmental aspects of military operations in the framework of the ENSVEC program.

Sources:
Environment and Security program meeting held Ashgabat
http://www.turkmenistan.ru/?page_id=3&lang_id=en&elem_id=11050&type=event&sort=date_desc
Environment and Security; Transforming risks into cooperation
http://www.envsec.org/centasia/index.php

Environment and Security Initiative Progress Report 2006

Military Implications:
Relevant military personnel working on security issues in the sub-regions highlighted in the ENVSEC report might consider consulting the report for eventual inputs to future reports on areas of concern, as well as noting success stories and considering their possible emulation.

Source:
The Environment and Security Initiative—An international partnership for managing conflict and risk

NATIONAL/REGIONAL ENVIRONMENTAL STRATEGIES AFFECTING MILITARY ACTIVITIES

Sustainable Development Strategies

Military Implications:
The military should follow the developments of these proposals that might result in new environmental regulations and new standards policies, and consequently emerging strategies, to ensure that military activities comply with the new requirements.

**Sources:**
Global talks on new climate deal must start now, commissioner says  
http://euobserver.com/9/23797/?rk=1
Intergovernmental Preparatory Meeting (26 Feb - 2 Mar 2007)  
Summary of the Intergovernmental Preparatory Meeting for the Fifteenth Session of the Commission on Sustainable Development  
http://www.iisd.ca/vol05/enb05243e.html
Climate change conference of key nations achieves ‘important progress’ – UN official  
G8 climate consensus emerging, U.S. odd man out  

**North American Environmental Security Action Plan**

**Military Implications:**
Relevant military personnel should study the new chemicals management agenda for eventual implications emerging from the inclusion of new compounds to the list and changes to the reporting procedures, assessment of emissions and discharges. Also, the *Environmental Outlook* might give indications on environment-related security priorities.

**Sources:**
Fifteenth Regular Session of the CEC Council  
North America 2030: An Environmental Outlook  
http://www.cec.org/outlook/
Sound Management of Chemicals  
Input from Millennium Project staff attending the meetings (online)

**U.S. Created Committee to Address Climate Change and Energy Security Issues**

**Military Implications:**
The military should follow the developments of these proposals that might result in new environmental regulations and new standards policies, and consequently emerging strategies, to ensure that military activities comply with the new requirements.

**Sources:**
Pelosi Announces Members of Select Committee on Energy Independence and Global Warming  
http://speaker.gov/newsroom/pressreleases?id=0091
Pelosi on House Vote to Create Select Committee on Energy Independence and Global Warming  
http://speaker.gov/newsroom/pressreleases?id=0090
Environmental Poll: March 2007  
http://www.yale.edu/envirocenter/environmentalpoll.htm
Polling the People (interview with Dan Esty)
http://www.loe.org/shows/shows.htm?programID=07-P13-00011#feature6

EU and US to Cooperate on Environmental Research
Military Implications:
This is an opportunity to review military-environmental issues between the US and the EU to identify what could be areas for military participation in the collaborative research envisioned by this new agreement. Additionally, a review of the 7th EU Research Framework Programme at http://www.cordis.europa.eu/fp7 would provide background on some EU interests.
Sources:
EU and US agree to cooperate on environmental research and ecoinformatics
EU and US agree to cooperate on environmental research of nanotechnology impacts

European Temporary Committee on Climate Change to Begin Operations in May
Military Implications:
The military should follow the developments and proposals of the new committee for eventual implications for new environmental regulations, standards, or policies, and consequently emerging strategies, to help anticipate new requirements that might affect military operations.
Sources:
Commissioner Dimas welcomes European Parliament decision to set up temporary committee on climate change
Stavros Dimas. Member of European Commission, responsible for environment Climate change and sustainable use of energy ASEM Environment Minister's meeting Copenhagen, 25 April 2007

European Commission’s New Low-carbon 20/20/20 by 2020 Energy Plan
Military Implications:
The military should follow the outcomes of these proposals that might result in new environmental regulations and new standards policies, and consequently emerging strategies. The aim would be to ensure that military activities could adjust to any new requirements in Europe.
Sources:
January 2008:
Stavros DIMAS, Member of the European Commission, responsible for environment Climate action, Energy for a changing world, Press conference, Wednesday, 23 January 2008
Summarizing Environmental Security Scanning July 2006—June 2008

EU unveils comprehensive climate and energy package
http://euobserver.com/9/25513/?rk=1
Brussels considering climate tax on imports
http://euobserver.com/9/25400/?rk=1

March 2008:
EU to commit to tight legislative deadline for green goals
http://euobserver.com/9/25832/?rk=1
Brussels defends EU burden-sharing on climate change
http://euobserver.com/9/25829/?rk=1
Brussels to grant some concessions to industry in environment proposals
http://euobserver.com/9/25839/?rk=1

Russian Focus on Environmental Security

Military Implications:
Environmental security could form the focus of US-Russian military cooperation bilaterally and internationally. Relevant military personnel should explore what steps need to be taken to move in that direction.
Sources:
Russian leader says environment problems a security threat
http://afp.google.com/article/ALeqM5gRd76iVIzDU1XjWGgoUw0ShP-xhw

President Putin Cites Environmental Security as Key Criterion for Caspian Energy Projects

Military Implications:
There are signs that in some cases environmental security could become a political tool to achieve non-environmental objectives, which could create significant tensions (e.g. Russia stopping the natural gas pipeline to Ukraine/Europe because of its alleged environmental impact). The military should increase efforts to identify the areas where environmental issues could develop into security issues, and should work to prevent their escalation to eventual conflict.
Sources:
No Deal at Caspian Summit on Sharing Sea
http://ap.google.com/article/ALeqM5ihjRIJLEWgmjJgq1JUFxfoSFGX6wD8SAHU9G0
A summit of postponed problems
http://en.rian.ru/analysis/20071017/84254518.html
Caspian Sea leaders sign declaration
Sakhalin issues 'settled' - as Russia takes 50% stake
http://business.guardian.co.uk/story/0,,1977430,00.html

To Join the EU, Balkan Countries Should Increase Environmental Efforts

Military Implications:
Summarizing Environmental Security Scanning July 2006—June 2008

Military components operating in this region should be prepared for the possibility that these countries might adopt more stringent environmental restrictions, which may not have military exemptions.
Sources:
Environment Protection Key to Balkan EU Path – UNDP
Balkan Vital Graphics: environment without borders

New Construction on Mediterranean Coastlines to be Banned
Military Implications:
Military personnel involved in environmental security issues and operations in the Mediterranean area should study the new regulations and directives of the Barcelona Convention to ensure cooperative compliance with the new requirements in accordance with other agreements, such as international conventions and Status of Forces Agreements.
Sources:
Barcelona Convention and Mediterranean Action Plan: First-ever Legally-binding International Instrument on Coastal Zone Management Adopted
Barcelona Convention: Compliance System Established to Support Legal Framework and Actions
Mediterranean nations pledge restraints on coastal development
http://www.csmonitor.com/2008/0122/p04s02-woeu.html

France Could Add Teeth to the Kyoto Protocol
Military Implications:
The military should consider the effects of this increased taxation and restrictions on any operations in France and their potential for expansion throughout the EU.
Sources:
Sarkozy Promises Green Revolution for France
http://www.dw-world.de/dw/article/0,2144,2847015,00.html
Paris suggests EU tax on imports from non-Kyoto states
http://euobserver.com/9/25047/?rk=1

UK to Establish an Independent Climate Committee
Military Implications:
The UK’s strong policy with regard to environmental security issues will undoubtedly expand more forcefully in the international arena and also have implications for US-UK military operations that could affect other national military operations and hence military-to-military cooperation.
Sources:
Climate change is like 'World War Three'
NATO Advanced Research Workshop ‘Energy and Environmental Challenges to Security’
http://www.rec.org/natoworkshop/index.html
EU, Latin American and Caribbean Countries Environment Cooperation

*Military Implications:*
With the high priority EU gives to environmental regulations, it is reasonable to expect new regulations to increase environmental protection in the LAC region. Relevant military personnel should follow the outcomes of the May Lima Summit and identify opportunities for applications of the Army Strategy on the Environment to hemispheric security.

*Source:*
First ever meeting of environment ministers from EU and Latin America and Caribbean countries held in Brussels


Argentina Redeploys Military to Defend Water and Oil

*Military Implications:*
In addition to recognizing the increased role natural resources are playing in possible conflicts, Argentina’s "Plan 2025" might establish new protected or controlled areas that are important for planning future international actions in Argentina.

*Sources:*
Argentina’s New War Doctrine for Resources
(by subscription only)
The Ugly American Environmentalist
[http://www.time.com/time/world/article/0,8599,1595221,00.html](http://www.time.com/time/world/article/0,8599,1595221,00.html)
Eco-millionaire's land grab prompts fury
[http://www.guardian.co.uk/argentina/story/0,,2005494,00.html](http://www.guardian.co.uk/argentina/story/0,,2005494,00.html)

US-Uruguay Treaty on S&T Cooperation

*Military Implications:*
The agreement should be reviewed for military-to-military assistance and training opportunities to support environmental research that could reduce the military environmental footprint, and for other environmental security considerations.

*Source:*
The United States and Uruguay Sign a Science and Technology Cooperation Agreement
[http://www.state.gov/r/pa/prs/ps/2008/apr/104151.htm](http://www.state.gov/r/pa/prs/ps/2008/apr/104151.htm)

Ecuador Gets an Environmentalist Foreign Minister

*Military Implications:*
Military personnel in Quito involved in possible military-to-military contacts with the Ecuadorian forces might be able to use this appointment to aid in approaching them about discussions on the military's role in environmental security. For example, if the U.S. military is involved in the spraying of drug crops, new efforts could reduce the environmental impacts on...
the border area. And, the U.S. military could be a mediating agent between Colombia and Ecuador.

Source:
Environmentalist Named Ecuador Foreign Minister

Iran and Iraq Sign Environment Protection Agreement

Military Implications:
The Iranian–Iraqi environmental agreement might be another example where environmental diplomacy could foster peace in a conflict-torn region. U.S. military plans, training, and other military-to-military assistance should be updated to take this agreement into account.

Source:
Iran, Iraq ink agreement on environment protection

Israel to Participate in UNEP and UN HABITAT

Military Implications:
Israel’s participation in UNEP and UN–HABITAT deliberations might bring important environmental security benefits to the vulnerable Middle East region. Appropriate military liaisons should consider contacting their counterparts in the Israel Defense Forces to offer the benefit of US experience in the area of military participation in environmental security activities.

Source:
Israel gets seats on United Nations agency panels

Waste Disposal a Matter of Discord or Cooperation between Palestine and Israel

Military Implications:
Military liaisons assisted by military personnel with toxic waste management experience should explore opportunities for assistance and applying the Army Strategy for the Environment.

Source:
Apart from the security problems
http://www.haaretz.com/hasen/spages/960889.html

Asian New Strategy to Improve Health and Environment

Military Implications:
Military personnel with environmental health responsibilities in Southeast and East Asian countries should review the Bangkok Declaration on Environment and Health to see where collaboration is possible, and explore ways of applying the Army’s Strategy on the Environment.

Sources:
Bangkok Declaration calls for coordinated action on environment and health
Asian States adopt UN-backed plan to cut millions of deaths due to man-made disasters
Asia-Pacific Should Intensify Green Growth Efforts

Military Implications:
Military personnel with environmental security responsibilities in the Asian region should review the document for potential new regulations, areas for cooperation, and opportunities for military-to-military training and assistance.

Sources:
State of the Environment in Asia and the Pacific 2005
http://www.unescap.org/esd/environment/soe/2005
UNESCAP Report: Asia-Pacific Environment at Boiling Point
http://www.unescap.org/unis/press/2006/dec/g61.asp

UNEP and South Korea to Help North Korea’s Environmental Management

Military Implications:
Military personnel with environmental expertise should seek ways to support this initiative for North-South cooperation.

Source:
South Korea contributes more than US$4 million to First Environmental Project between Two Koreas

Climate Change Issues May Have Determined Australian Election

Military Implications:
The military should assess how potential changes in Australia’s environmental policies could affect its operations in the southwest Pacific region.

Sources:
His own boss. Economist.com, Nov 26th 2007
Australia ousts Bush ally, elects Labor Party

Environment and Security Program in the East-Caspian Region

Military Implications:
CENTCOM and military stationed in the East Caspian region should consider the ENSVEC priorities in their planning and actions, adjust the regional engagement plan accordingly, and also offer support to their counterparts to improve environmental aspects of military operations in the framework of the ENSVEC program.

Sources:
Environment and Security program meeting held Ashgabat
http://www.turkmenistan.ru/?page_id=3&lang_id=en&elem_id=11050&type=event&sort=date_desc
Environment and Security; Transforming risks into cooperation
http://www.envsec.org/centasia/index.php
The Environmental Dimension of Asian Security

*Military Implications:*
Military personnel involved with Northeast Asia, should consider reviewing this book for insights into environmental security issues and solutions in that strategically key region.

*Source:*

Environmental security among top three priorities in Australia-China talks

*Military Implications:*
Since China is a major user of energy and Australia is a major supplier of energy resources (uranium and liquid natural gas) input to and monitoring of the results of these annual talks should provide early indicators of changing emphases on environmental security in the Asian region.

*Source:*
Canberra, Beijing to hold annual security talks

China May Restructure Environmental Effort

*Military Implications:*
Falling water tables and water pollution in China could lead to increasing internal migration causing a variety of socio-economic instability conditions for the foreseeable future, making this a major environmental security issue to address. Relevant military personnel should consider increased cooperation with their Chinese counterparts to offer them and SEPA the benefit of U.S. experience in environmental security efforts.

*Source:*
China vows to rebalance economy, nurse environment
http://www.alertnet.org/theneWS/newsdesk/PEK288516.htm
China May Expand Environmental Watchdog Early '08
http://www.planetark.com/dailynewsstory.cfm/newsid/44818/story.htm

China Calls for Enhanced Cooperation on Environmental Protection in Northeast Asia

*Military Implications:*
Environment protection, especially management of air pollution at the regional level, can serve as a platform for stable and long-term cooperation in a region where political and historical issues often hamper communication among countries. Military personnel should monitor activity in regional cooperation on environmental issues. Progress could help improve regional (traditional) security. The monitoring would position the US military to assist through North-East Asian partners and allies.

*Sources:*
North-East Asia Sub-regional Program for Environmental Cooperation
http://www.neaspec.org/index.asp
Address by Mr. Cui Tiankai
http://www.fmprc.gov.cn/eng/zxxx/t305589.htm

China’s Climate Change and S&T Action Plan

Military Implications
This is another opportunity to explore ways of applying the Army’s Strategy on the Environment internationally. Military representatives in China should contact their counterparts to exchange ideas on how the military cooperation can contribute in environmentally oriented science and technology activities.
Sources:
China’s National Climate Change Programme
S&T to underpin China's climate activities
http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=3687&language=1
China Struggling to Control Urban Pollution
http://english.sepa.gov.cn/zwxx/hjyw/200706/t20070612_105064.htm
China now no. 1 in CO2 emissions; USA in second position
http://www.mnp.nl/en/dossiers/Climatechange/moreinfo/Chinanowno1inCO2emissionsUSAINsomethingposition.html

China to Invest $175 Billion in Environmental Protection over Five Years

Military Implications:
This decision may also result in China becoming a more active and positive influence in international environmental protection efforts. Military liaisons in Beijing might consider contacting the State Environmental Protection Administration to offer advice and assistance, especially on the military's role in environmental security.
Sources:
China to Invest US$175 Billion in Environment Clean-Up
China's growing air pollution reaches American skies

China Creates 11 Independent Environmental “Watchdog” Centers

Military implications:
These new centers could provide early warning of environmental security changes in China.
Source:
New environment watchdogs freed from local govt meddling

China's Energy Conditions and Policies—White Paper

Military Implications:
Relevant military personnel should consider increased cooperation with their Chinese counterparts to offer the benefit of U.S. experience in environmental security efforts.
Source:
China report says coal to remain top energy source
http://afp.google.com/article/ALeqM5jRdR9Nd-GnyWN1FainAfhONr-imA
China's Energy Conditions and Policies
China’s energy policy puts more emphasis on environment
http://www.cctv.com/program/bizchina/20071227/102997.shtml
China's energy policy puts more emphasis on environment (video)

China’s New Ministry of Environmental Protection

Military Implications:
China’s growing environmental problems could cause a variety of socio-economic instability conditions nationally and internationally, resulting in major environmental security issues for many countries around the world to address. Relevant military personnel should consider increased cooperation with their Chinese counterparts on environmental security matters that could assist the new Ministry of Environmental Protection.

Source:
China's parliament adopts government reshuffle plan
China announces 'super-ministries', including one for environment
http://afp.google.com/article/ALeqM5giPUHFKPnbJWleDQdRstP-tEg-0w
Environment chief vows to add muscle

Environmental Courts Established in the Philippines

Military Implications:
Military personnel responsible for environmental compliance in the Philippines should become familiar with these new tribunals in order to assess their possible effects on environmental obligations related to military activities and to their contractors.

Source:
SC designates 117 environment courts
http://newsinfo.inquirer.net/inquirerheadlines/nation/view/20080114-112156/SC_designates_117_environment_courts

Pan-African Parliament Upgrades Environmental Policy

Military Implications:
Military liaisons in the African region should be told about the Army Strategy on the Environment and be requested to seek areas of cooperation in response to the new PAP emphasis on the environment.

Sources:
PAP Concludes Seventh Ordinary Session
PAP Considers Committee Reports
Summarizing Environmental Security Scanning July 2006—June 2008

‘United States of Africa’ in doubt
http://www.sundaytimes.co.za/News/Article.aspx?id=463554
South Africa: AU Chair Attends Pan African Parliament
http://allafrica.com/stories/200705070262.html
African Parliament blames west for environmental mess

Nigerian Government Resolves to Push Effective Environmental Enforcement

*Military Implications:*
Appropriate personnel from AFRICOM should contact NESREA to explore potential military-to-military assistance in environmental security. This could also be a potential area for US-China military cooperation, due to China’s increasing role in Nigeria.

*Source:*
‘FG to ensure healthy environment’
http://www.thetidenews.com/article.aspx?qrDate=02/13/2008&qrTitle=%E2%80%98FG%20to%20ensure%20healthy%20environment%E2%80%99&qrColumn=ENVIRONMENT

**TECHNOLOGICAL BREAKTHROUGHS WITH ENVIRONMENTAL SECURITY IMPLICATIONS**

Computer Technology and Robotics

**NASA-Developed Model to Help Reduce Famine**

*Military Implications:*
The military should consider using the NASA-developed model in combination with other conflict-triggering factors for forecasting and eventually preventing conflicts.

*Source:*
NASA Researchers Find Satellite Data Can Warn of Famine

**Software Package Monitors Buildings' Power**

*Military Implications:*
The military should investigate to determine if this software is more effective than currently used software in reducing the environmental footprint of existing or new military installations.

*Source:*
New Software Helps Gauge Buildings' Energy Use, Emissions
Company site: http://s205030653.onlinehome.us/

Google to Support Development of Early Warning System in Vulnerable Regions

*Military Implications:*
Relevant military personnel should keep track of the grantees as potential collaborators to improve environmental security. A network of local communities that is able to “predict and
“prevent” crises could play important roles in enhancing environmental security. Someone at the Deputy Assistant Secretary level might contact Google.org to offer collaboration where possible to improve the effectiveness of grantees’ efforts and to share insights.

Sources:
Google.org Announces Core Initiatives to Combat Climate Change, Poverty and Emerging Threats
Google.org expands funding to attack world crises
http://www.reuters.com/article/latestCrisis/idUSN17226771
$25 Million Begins Google's Charity
http://www.washingtonpost.com/wp-dyn/content/article/2008/01/17/AR2008011703049.html

UNEP and Google Earth to Pinpoint Environmental Hotspots

Military implications:
The military should create procedures to review what parts of its more advanced means and images of earth observation and ground-truthing can be shared on an ongoing basis to continually improve the Atlas of our Changing Environment. It should also seek ways in which this new tool could help prevent environment-related conflicts. As precision improves, environmental damages caused by conflicts could be made more defined and available, increasing accountability and responsibility for military actions.

Sources:
Flying Around the Globe on a Time Machine

New Detection and Cleanup Techniques

Synthetic Biology to Combat Harmful 'Biofilms'

Military Implications:
This synthetic biology achievement opens possibilities for neutralizing the effect of some new biological weapons. Relevant military personnel should follow the development for its potential sanitizing effects and potential for deployment in fire extinguishers-like devices for rapid use.

Sources:
Team builds viruses to combat harmful 'biofilms'

Tiny Cantilevers Detect Contaminants

Military Implications:
The military should follow this development to see if it has possible uses in environmental and force health protection monitoring systems.

Source:
Using Nanotechnology to Detect Contaminants in Food and Water
Rapid molecular detection of food- and water-borne diseases
Nanotube-based Biosensor Sensitive to Trace Amounts

Military Implications:
The military should investigate this product for its usefulness in testing possibly contaminated environments.

Sources:
NASA Nanotechnology-Based Biosensor Helps Detect Biohazards
http://www.nasa.gov/centers/ames/news/releases/2008/08_45AR.html
Early Warning (the company)

Emerging Contaminants: Most Effective Treatment Strategies

Military Implications:
Military utility managers and water supply contractors, as well as preventive health authorities should follow developments on this topic in order to respond to any new regulatory and operational requirements that might arise.

Sources:
Conference session added to address microconstituents
http://www.awwa.org/publications/MainStreamArticle.cfm?itemnumber=35946

Nanowire “Paper” Selectively Absorbs Oils in Water

Military Implications:
The military should investigate this material for its application in the cleanup of oil and other pollutants from the environment.

Source:
Researchers develop nanowire 'paper towel' for oil spills

Carbon-gold Nanoparticle Sacs Trap Oil Droplets

Military Implications:
The military should follow development of this technology as it may become applicable to removing pollutants from water in the environment.

Source:
Elongated Nanoparticles Called Nanobatons Self Assemble Around Oil Droplets for Cleaning Oils Spills and Polluted Water

More New Improvements in Nanotube-based Environmental Sensors

Military Implications:
The military should investigate this technology for its usefulness in testing possibly contaminated environments.
Using carbon nanotubes, MIT chemical engineers have built the most sensitive electronic detector yet for sensing deadly gases such as the nerve agent sarin.


**Chemical Agent Cleanser Developed in Canada**

*Military Implications:*  
The military should investigate the applicability of this new decontamination system.

*Sources:*  
“Green” method decontaminates deadly nerve agents  
http://qnc.queensu.ca/story_loader.php?id=47fb870ea02f1  
New nerve agent cleansing method created  
http://www.upi.com/NewsTrack/Science/2008/04/15/new_nerve_agent_cleansing_method_created/8254/

**Animal-Robot Team Effective for UXO Clearance**

*Military Implications:*  
The military should investigate the advantages of this improved partnership technique for post-conflict cleanup. However, use of the mongoose, a species alien to most nations, must be accompanied by precautions to prevent feral breeding and endangerment of local species and the spread of rabies. Use of a single sex or neutering might be the solution to problems, such as were created decades ago by introduction of the mongoose to control snakes and rats in Grenada.

*Sources:*  
Mongoose-robot duo sniff out landmines on the cheap  
http://technology.newscientist.com/channel/tech/me19826535900?DCMP=NLC-nletter&nsref=mg19826535900  
Video of the mongoose and robot pair sniffing our landmines  
http://uk.youtube.com/watch?v=fSQpzh02JaA  
Giant Hero Rats Being Trained to Sniff Out Land Mines  
Trained Rats Sniff out TB, Land Mines in Tanzania  

**Portable Sensor to Detect Exposure to Chemical or Nerve Agents**

*Military Implications:*  
As stated by the researchers working on the project, in addition to timely and more accurate information, the portable sensor will allow rescue workers to better focus on those who are really affected by chemical or biological agents, over those just scared or not needing immediate attention. The military should follow and provide input to the project in order to develop the most field-useful device.

*Source:*  
Truly sick or simply scared?  
http://www.pnl.gov/topstory.asp?id=265
Miniature Chemical Agent Sensor

*Military Implications:* The military should explore these research programs for their potential use in improving environmental analysis.

*Sources:* MIT gas sensor is tiny, quick. Energy-efficient device could quickly detect hazardous chemicals.


New Rapid Portable Chemical Sensor

*Military Implications:* Since repercussions of hazardous chemicals know no boundaries, the military should consider sharing such devices with civilian and international military counterparts to reduce international environmental and health threats from the use of chemical agents and accidental releases of hazardous industrial substances and for use in discovering and delineating contaminated sites.

*Source:* BYU scientist creates chemical detector

http://www.deseretnews.com/article/1,5143,695263396,00.html

Model Helps Evaluate Performance of Biosensors

*Military Implications:* The military should explore these research programs for their potential use in improving environmental analysis.

*Sources:* Model Is First to Compare Performance of 'Biosensors'

http://www.sciencedaily.com/releases/2008/01/080102134121.htm

Antibody-bearing Gel Can Disinfect Biologically Contaminated Areas

*Military Implications:* The military should follow this development and assess its possible use in cleanup after biological or chemical attacks or accidents.

*Sources:* Anadis receives $480k Government grant for biohazard“Ectoplasm” project


Antibody-laden gel can clean up after anthrax attacks

http://www.newscientist.com/channel/health/mg19526156.500?DCMP=NLC-nletter&nsref=mg19526156.500

Reusable Carbon Aerogel Adsorbs Organic Solvent Pollutants

*Military Implications:* The military should investigate these materials for their use in systems for personal protection devices and for cleaning up polluted environments.

*Source:*
Creation of a new material capable of eliminating pollutants by the hydrocarbon industry

**Advance in Assessing Metabolites of Diesel Exhaust component 1-nitropyrene in Humans**

*Military Implications:*
Military preventive health organizations should review the latest research literature on this topic to determine how to use the new tool for force health protection. Materiel managers should study the same literature and seek health professional assistance in applying the findings to development, maintenance and training.

*Sources:*
Identification and Quantification of 1-Nitropyrene Metabolites in Human Urine as a Proposed Biomarker for Exposure to Diesel Exhaust
http://pubs.acs.org/cgi-bin/abstract.cgi/crtoec/2007/20/i07/abs/tx700015q.html (abstract only; payment or paid membership required for full article)
Measurement of 1-Nitropyrene Metabolites in Human Urine: A Potential Marker for Exposure to Diesel Exhaust (email newsletter)

**Landmine Detection by Using Ground-penetrating Radar Technique**

*Military Implications:*
The development has been underway for some time. The military should investigate its current status, in order to consider its application to conflict operations and post-conflict environmental cleanup.

*Source:*
Ground-breaking antilandmine radar

**Porous Semiconducting Aerogels Purify Water and Hydrogen**

*Military Implications:*
The military should follow the development of this family of materials to evaluate its usefulness in environmental cleanup systems.

*Source:*
New aerogels could clean contaminated water, purify hydrogen for fuel cells

**Water Purification Techniques**

*Military Implications:*
The military should investigate the usefulness of these advances for providing clean water for conflict, post-conflict, and humanitarian disaster environments.

*Sources:*
Bacteria and nanofilters — the future of clean water technology
http://research.nottingham.ac.uk/NewsReviews/newsDisplay.aspx?id=444
Cleaner water through nanotechnology
Millimeter-wave Spectroscopy Provides Environmental Sensing

*Military Implications:*  
The military should investigate this technique for its applications in battlefield management, environmental surveillance and cleanup.  
*Source:*  
New instrument covertly detects signals from illicit chemicals  

New Chemical Helps Protect Burned-over Soil from Erosion

*Military Implications:*  
The military should investigate this material as an aid in environmental restoration after training exercises, conflict, and natural and accidental fires.  
*Sources:*  
PAM-12 Erosion Granules  
Product Could Heal Soil After Fires  

New Technique Promises Ultra-sensitive Biosensors

*Military Implications:*  
The military should explore this development for its applicability to environmental surveillance and cleanup systems.  
*Source:*  
Mass-Producing 3-D Particles  

EU Launches Mobile Carbon Tracking

*Military Implications:*  
The military should experiment with mobGAS to assess its value in motivating military personnel to reduce emissions.  
*Source:*  
European Commission scientists launch first mobile application that uses your mobile phone to track your carbon footprint  

New Approach May Ease Uranium Decontamination

*Military Implications:*  
The military should follow this research in order to be ready to apply any resulting practical methods to post-conflict environmental cleanup.  
*Sources:*  
‘Pac-Man’ molecule chews up uranium contamination  
New Material Strips out Radioactive Debris

*Military Implications:* The military should follow this work to assess its applicability to cleanup of radioactive contamination.

*Source:* Compound removes radioactive material from power plant waste
http://www.anl.gov/Media_Center/News/2008/news080313a.html

New Type Nanoscale Transistor Would Aid DNA Detectors

*Military Implications:* The military should follow the development of this component for its possible applicability in nanotech-based biological monitoring systems for the environment.

*Source:* A handheld DNA detector may soon be a reality
http://www.topnews.in/health/handheld-dna-detector-may-soon-be-reality-21411

Chemical Tests on Cells Rather than Animals

*Military Implications:* The military should explore the usefulness of this work in the development of biosensors for environmental analysis and participate in the development of these new approaches with the civilian scientific agencies.

*Sources:* Agencies to Change How Chemicals are Tested for Safety
http://nationalacademies.org/headlines/20080219.html
NIH Collaborates with EPA to Improve the Safety Testing of Chemicals
Toxicity Testing in the 21st Century: A Vision and a Strategy
http://www.nap.edu/catalog.php?record_id=11970

FAO/IAEA Meeting Discusses Portable Disease Detection Devices

*Military Implications:* Relevant military personnel should contact the FAO/IAEA Programme and obtain information on the techniques and devices presented at the meeting, so that they can be evaluated for possible use in environmental surveillance systems for human and animal disease detection.

*Source:* Portable lab could revolutionize bird flu detection

Portable Mass Spectrometer and Gas Chromatograph

*Military Implications:* Such testing units would be indispensable to military, local authorities, and civilian companies in conflict and post-conflict areas, or regions under threat. The military should consider following...
and supporting the research and have the instruments available as soon as possible for its own use and distribution to other organizations in affected regions.

Source:
BYU Scientists Create Portable Spectrometer
http://newsnet.byu.edu/story.cfm/63705

**Nanotech-based Explosives Detector**

*Military Implications:*
The military should explore this technology for explosives detection, post-conflict clean up and other environmental monitoring usage. This information could also be forwarded to the Transportation Safety Agency, in case they are, as yet, unaware of the development.

Source:
Portable, cheap and fast explosives detector built with nanotechnology
http://www.nanowerk.com/spotlight/spotid=1138.php

**Detector Materials for Cyanogen Halides from Chemical Weapons**

*Military Implications:*
The military should investigate the possible applications of these materials for explosives detection and in environmental monitoring systems.

Source:
Out of the dark. Highly sensitive chemosensors for cyanogen halides. 14 December 2006
http://www.nature.com/materials/news/news/061214/portal/m061214-1.html (by subscription only)

**New Spectroscopy Technique Speeds Up Virus Detection**

*Military Implications:*
The military should follow this development for potential improved environmental biological weapons surveillance systems.

Source:
Researchers use laser, nanotechnology to rapidly detect viruses

**Nanofibrils Film Improves Explosives Sensing Performance**

*Military Implications:*
The military should follow up on this development for its possible application to environmental surveillance, range clearing, and battlefield cleanup.

Source:
U.S. and Chinese scientists have created a type of fluorescent sensing material that could lead to rapid detection of explosives in security screening
http://www.physorg.com/news99672192.html

**Bacterial Proteins Help Nanoparticle Cleanup**

*Military Implications:*

...
The military should follow this work in order to evaluate the possible use of this technology in environmental cleanup operations.

**Source:**
Microbes at work cleaning up the environment

**New Material Has High Absorbency for Organic Solvents**

*Military Implications:*
The military should investigate this development for possible use in industrial and maintenance spill remediation and post-conflict cleanup.

**Source:**
Kyushu University developed new material, which can absorb large amount of organic solvent such as chloroform. Japan Chemical Information of May/2007

**New Production Technique for Nanofiber Filters for Chemical Warfare Protection**

*Military Implications:*
The military should follow this development and its applicability to protect the personnel exposed to a chemically hazardous environment. The materials might also be useful for protecting hazardous material and wastes handlers.

**Source:**
Nanofilter suit for chemical warfare
http://www.hindu.com/seta/2006/10/12/stories/2006101200611500.htm

**Sugar-coated Nanotubes Stop Anthrax Inhalation**

*Military Implications:*
If not already done so, the military should follow this development for eventual field applicability.

**Source:**
Clemson Researchers Develop Nanotechnology to Stop Weaponized Anthrax in Its Tracks
http://clemsonews.clemson.edu/WWW_releases/2006/October/anthrax.html

**New Spectroscopy Sensor for Environmental Monitoring**

Military Implications:
The military should investigate the incorporation of this new technology into environmental surveillance and scanning systems.

**Source:**
UW Invention Targets Terrorist Weapons

**Nanocantilevers for Ultra-small Sensors**

*Military Implications:*
There are a wide range of applications of such sensors from protecting against food poisoning to detecting viruses, bacteria and other pathogens in the environment.
Summarizing Environmental Security Scanning July 2006—June 2008

Sources:

'Nanocantilevers' yield surprises critical for designing new detectors

Anomalous resonance in a nanomechanical biosensor
http://www.pnas.org/cgi/content/abstract/0602022103v1

Biosensors Sniff out TNT and Possibly Other Dangers

Military Implications:
The military should follow such developments as possibly suitable for handheld or remote unattended use.

Source:
Biosensor Sniffs Out Explosives
http://www.sciencedaily.com/releases/2007/05/070508185845.htm

Device makes quick work of suspected toxins
http://www.pittsburghlive.com/x/pittsburghtrib/business/s_507097.html

Digital Magnetofluidics Improves Biochemical Analysis

Reliable Anthrax Antibodies Developed

Bar-coded Nanowires May Yield Small, Fast Bio Detectors

New Low-cost System for Bacteria Identification

Quantum Dot Device Provides Fast Detector for DNA Sequences

Sensico’s Lab on a Chip Water Profiler Automates Lab Functions

Military Implications:
Those relevant military personnel with responsibilities for environmental surveillance, who are not already informed of these, should be made aware of these developments for potential applications.

Source:
Magnetism and mimicry of nature hold hope for better medicine, environmental safety

Anthrax Detector Developed

Nanowires built to fight bioterrorism

Purdue creates new low-cost system to detect bacteria

Digital DNA detector spots single molecules


Deep Cooling Improves Uranium Detection

Military Implications:
This technique should be studied for its feasibility for locating post-conflict areas needing cleanup of uranium contamination and managing the cleanup and disposal processes.

Source:
Cold Shot

**Biodetecting Wipes**

*Military Implications:*
The military should follow this development as it progresses toward practical application and, when it is available, consider its application to detection and cleanup of contaminated environments.

Source:
Biodegradable napkin could quickly detect biohazards

**Fish Provide Early Warning of Toxic Chemicals**

*Military Implications:*
The military should investigate this development for its applicability to environmental water supply monitoring, especially in a post-conflict areas, where chemical pollution might be taking place.

Source:
Fish Used to Detect Terror Attacks
http://www.enn.com/today.html?id=11282

**Ultrasound Soil Cleanup Technique**

*Military Implications:*
A scaled down and portable version of this system might have good field applicability for post-conflict and installation cleanup.

Source:
Treating toxic waste with sound waves
http://www.csiro.au/csiro/content/standard/ps9b,,.html

**New Surface Decontamination Method**

*Military Implications:*
The military should consider investigating this technique for its usefulness in accident and post-conflict cleanup.

Sources:
Wrap radiation in rubber
http://www.newscientisttech.com/article/dn10874?DCMP=NLC-nletter&nsref=dn10874 (see 3-rd article)

**Virus Detection Technique—Fast, Convenient, and Sensitive**

*Military Implications:*

Millennium Project www.millennium-project.org.................................................................242
The military should follow up on this research to explore its applicability to field virus detection systems.
*Source*
Virus detection encounters some useful interference
http://www.nature.com/materials/nanozone/news/070111/portal/m070111-3.html (free registration required)

**New Technique for DNA Isolation**
*Military Implications:*
The military should investigate this technique for its applicability as a front end for fieldable DNA-based environment scanning systems, some of which have been described in previous environmental security reports.
*Source:
Step forward in micro/nanotechnology
http://www.tno.nl/tno/actueel/tno_persberichten/2007/tno_ontwikkelt_generieke_/index.xml

**Sensitive Uranium Detector Using DNA**
*Military Implications:*
The military should investigate this new technique for its applicability to systems for environmental surveillance and post-conflict cleanup in situations in which uranium is a factor.
*Sources:*
Disposable uranium ion detector developed
A catalytic beacon sensor for uranium with parts-per-trillion sensitivity and millionfold selectivity
http://www.pnas.org/cgi/content/abstract/104/7/2056?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=uranium+DNA&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT

**New and Improved Water Purification Method**
*Military Implications:*
The military should investigate the application of this method to cleanup of post-conflict environments and force protection, as well as at permanent installations.
*Source:
New water-purification method promises radical improvement

**Space Technology**

**Space Technology for Environmental Security**
*Military Implications:*
[Same as previous on similar issues] Developing an integrated environmental monitoring capability to provide informed data to the public, and policy- and decision-makers, would considerably improve the assessment of potential environmental impacts of different actions, facilitate enforcement of international treaties worldwide, and could help mitigate environmental
and social consequences induced by conflict or natural disasters. The military should consider full cooperation in all the phases—from development to implementation and use of space-based observation systems.

Sources:
Satellites play vital role in understanding the carbon cycle
http://www.esa.int/esaEO/SEMLEHMJC0F_planet_0.html
2007 ESA ENVISAT Symposium http://www.envisat07.org/
Envisat Symposium 2007 kicks off in Switzerland
http://www.esa.int/esaEO/SEMNU9MJC0F_index_0.html
Satellites vital for environmental agreement
http://www.esa.int/SPECIALS/ESApod/SEMQ8DMJC0F_0.html
A high-level conference on Global Monitoring for Environment and Security
http://www.gmes.info/newsdetail+M5a32281b86a.0.html
EC has adopted the European Space Policy http://ec.europa.eu/enterprise/space/index_en.html

Space-Based Services for Improving Emergency Response

Military Implications:
The military should inform and facilitate emergency units around the world cooperate with programs using space technology-based tools. The HEWS model can be emulated for a variety of situation from disaster relief to conflict and post-conflict intervention.

Source:
Faster and better emergency response through satellite telecoms
http://www.esa.int/esaTE/SEMZ00V681F_index_0.html
Bridging the Gap between Space and Local and Regional Users
http://www.eurisy.org/
A Giant Leap For Space Activities In Europe
http://www.spacemart.com/reports/A_Giant_Leap_For_Space_Activities_In_Europe_999.html
Chinese space agency joins the International Charter ‘Space and Major Disasters’
http://www.esa.int/esaEO/SEMCG59RR1F_environment_0.html
PAP Considers Committee Reports
Europe’s Space Policy becomes a reality today
http://www.esa.int/esaCP/SEM4UU8RR1F_Benefits_0.html

New UN Office Using Space Technology to Assist Mitigation of Disasters

Military Implications:
Developing an integrated environmental monitoring capability to provide informed and timely data will considerably improve early warning, disaster management and response capability, and could help mitigate environmental and social consequences induced by natural disasters; and hence, improve environmental security. If not already in process, the military should develop cooperation protocols with UN-SPIDER.

Source:
UN Office Uses Space Info To Mitigate Disasters
New UN office utilizing space information to mitigate disasters opens in Bonn
Technologies that Could Trigger New Forms of Arms Race

Modern Warfare Increasingly Harmful to the Environment

*Military Implications:*
As international discourse on the environmental damages and related restoration costs intensifies, it is likely that there will be increasing pressure for updating laws, assigning liability, and defining redress issues concerning environmental damages in war.

*Sources:*
War and the environment; by Sarah DeWeerdt, World Watch, Vol.21, no.1, Jan/Feb 2008, Worldwatch Institute (by subscription only)
Modern Warfare Causes Unprecedented Environmental Damage
http://www.worldwatch.org/node/5544

Future Proliferation of Autonomous Ground and Air Robot Weapons

*Military implications:*
The distinctions between future systems of nanosensors to detect chemical, biological, and radiological presence and future support for ground and air robotic weapons could become blurred. Since it is likely that one day there will be an international agreement governing the use of robot weapons, the military should develop language to distinguish between defensive early warning or detection systems vs. offensive robot weapons and their support systems.

*Sources:*
Killer Military Robots Pose Latest Threat To Humanity, Robotics Expert Warns
http://www.sciencedaily.com/releases/2008/02/080226213451.htm
Robot wars 'will be a reality within 10 years'

Accelerating Synthetic Biology Applications Need Better Monitoring and Regulation

*Military Implications:*
In addition to biosafety issues, synthetic biology opens possibilities for new weapons. If not already in process, military forecasters of such weapons should meet with diplomats to establish an agenda to begin the process of creating treaties to better control such futuristic weapons and weapons systems and the effects of their residuals. Because ICT and nano-engineering are continuing to accelerate the pace of synthetic biology, the sooner such international negotiations are begun, the better.

*Sources:*
Synthetic Biology 3.0
First Bacterial Genome Transplantation Changes One Species To Another
http://www.sciencedaily.com/releases/2007/06/070628232413.htm
Genome Transplantation in Bacteria: Changing One Species to Another
http://www.sciencemag.org/cgi/content/abstract/1144622
Scientists Build Bacteria-Killing Organisms From Scratch
NBICS and the Convention on Biological diversity (CBD)
Government Oversight Sought for Gene Synthesis
http://www.nti.org/d_newswire/issues/2007_7_23.html#6805AC84
DNA synthesis and biological security
http://www.nature.com/nbt/journal/v25/n6/abs/nbt0607-
627.html;jsessionid=A7690C7549ADA0D4A2EC6D17EA7BCE2D (by subscription only)

Futuristic Nanotech and Synthetic Bioweapons Regulation

Military Implications:
Military forecasters of such weapons should meet with diplomats to create an agenda to begin the process of creating treaties to better control such futuristic weapons and weapons systems and the effects of their residuals.

Sources:
Military nanotechnology - how worried should we be?
http://www.nanowerk.com/spotlight/spotid=1015.php
Israel to pursue nanotechnology weapons http://www.foresight.org/nanodot/?p=2366
bionic-arsenal/2006/11/18/1163266789754.html

Promissing Environmental-friendly Technologies

All-Electric cars coming from Norway and China with More than Hundred Mile Ranges

Military Implications:
If DARPA does not already have more efficient batteries in R&D now, then the military should evaluate the Norwegian and Chinese batteries for retrofitting military equipment using large-battery power.

Sources:
BYD Company www.byd.com
China's BYD Auto Co. to Unveil All-Electric Car
http://online.wsj.com/article/SB120849294773525787.html
Kleiner Perkins Venture to Sell Electric Car in US
http://www.planetark.com/dailynewsstory.cfm/newsid/48084/story.htm

New “Nanohybrid” Plastic Is Stronger and More Biodegradable

Military Implications:
The military should consider using the new plastic alternatives where possible in anticipation of increasingly environment-friendly policies and reducing environmental footprints.

Source:
'Nanohybrid' Plastic May Expand Use Of Biodegradable Plastic
'Bioplastic' may become third option to paper or plastic
Polymer Dielectric Promises Higher Energy Storage

Military Implications:
The military should follow this development to assess its possible use in power supplies for portable environmental scanning equipment and other high-density energy storage needs in lieu of batteries.

Source:
Unique Material May Allow Capacitors to Store More Energy

Nano-based Solar Cell Material Offers Inexpensive Alternative

Military Implications:
The military should investigate this research for applications from roofing to portable systems.

Source:
NJIT Researchers Develop Inexpensive, Easy Process To Produce Solar Panels

New Solar Cell Design Raises Efficiency

Military Implications:
The military should follow evolution of this solar cell technology for implementation to improve materiel power systems and to reduce the military environmental footprint.

Sources:
MIT spinoff shoots for solar power at $1 per watt
http://www.news.com/8301-11128_3-9903728-54.html
MIT spin-off plans to manufacture cheap, efficient solar cells

New Lithium-ion Battery Offers Multiple Advantages

Military Implications:
The military should investigate the use of this battery design, both to reduce the environmental footprint of military vehicles and in power supplies for portable and mobile environmental monitoring systems.

Sources:
An Electrifying Startup. A new lithium-ion battery from A123 Systems could help electric cars and hybrids come to dominate the roads (note: requires free registration to access article)
http://www.technologyreview.com/read_article.aspx?ch=specialsections&sc=batteries&id=20570&a=

Improved Solar Cell Promised in a Year

Military Implications:
The military should follow the development of these improved power sources for their possible use in environmental surveillance systems and other military applications.

Sources:


http://www.technologyreview.com/read_article.aspx?ch=specialsections&sc=batteries&id=20570&a=

Millennium Project www.millennium-project.org......................................................................................247
Start-up: Affordable solar power possible in a year
SUNRGI Company: http://www.sunrgi.com
IBM today announced a research breakthrough in photovoltaics technology that could significantly reduce the cost of harnessing the Sun's power for electricity

**New Inter-electrode Material Yields 50% Fuel Cell Power Increase**

*Military Implications:*
The military should follow this development as it carries on into commercial application in power supplies for a variety of purposes, including environmental equipment.

*Sources:*
More-Powerful Fuel Cells
http://www.technologyreview.com/Energy/20813/page1/
MIT Creates New Material For Fuel Cells, Increases Power Output By 50 Percent
Chemical Engineer Discovers Way of Increasing Battery Life with Environmentally Friendly Fuel Cells

**Formic Acid Provides New Fuel Cell Medium**

*Military Implications:*
The military should follow this development for its applicability to power supplies for military systems and mobile environmental monitoring devices.

*Source:*
Hydrogen Fuel from Formic Acid
http://www.technologyreview.com/Energy/20778/?a=f

**New Insight into Methane-converting Catalyst**

*Military Implications:*
Although R&D remains to be done to exploit this new information, the military should establish and maintain contact with the work in order to be able to apply it to the reclamation of methane from sewage treatment plants and solid waste landfills that would otherwise pollute the environment.

*Source:*
Halting methane squanderlust

**New Low Power Chip Suitable for Tiny Environmental Sensors**

*Military Implications:*
The military should investigate this development for use in environmental sensing systems.

*Source:*
Microchip sets low-power record with extreme sleep mode
New Material for Storing Hydrogen

Military Implications:
Although the investigators say that it is critical to note that their work is at a very early stage, the military should follow this development in environment-friendly energy as it progresses toward a stage of practical application.

Source:
Physicists find new material for storing hydrogen
http://physicsworld.com/cws/article/news/33614 (Registration required)

New Capacitor Promises 100× Improvement over Batteries in Charge/Weight Ratio

Military Implications:
The military should investigate these developments for their positive energy-saving effects on the environmental footprint of military installations and utility in deployable systems. DOD is aware of the Sunlight to Petrol (S2P) project through its funding of the project by DARPA; however, it is included to notify the broader environmental security community.

Source:
Lockheed Martin Signs Agreement with EEStor
http://www.gm-volt.com/2008/01/10/lockheed-martin-signs-agreement-with-eestor

Bacteria-Generated Electricity from Waste to Power Fuel Cell

Military Implications:
The military should investigate these developments for their positive energy-saving effects on the environmental footprint of military installations and utility in deployable systems. DOD is aware of the Sunlight to Petrol (S2P) project through its funding of the project by DARPA; however, it is included to notify the broader environmental security community.

Source:
New insights into fuel cell that uses bacteria to generate electricity from waste

New Sunshine Distribution System Provides Energy-free Lighting

Military Implications:
The military should investigate these developments for their positive energy-saving effects on the environmental footprint of military installations and utility in deployable systems. DOD is aware of the Sunlight to Petrol (S2P) project through its funding of the project by DARPA; however, it is included to notify the broader environmental security community.

Sources:
Solatubes: Power-free lighting solution
http://www.enn.com/top_stories/article/28447

Converting CO₂ into Fuels using Sunshine

Military Implications:
The military should investigate these developments for their positive energy-saving effects on the environmental footprint of military installations and utility in deployable systems. DOD is aware of the Sunlight to Petrol (S2P) project through its funding of the project by DARPA; however, it is included to notify the broader environmental security community.

Source:
Sandia’s Sunshine to Petrol project seeks fuel from thin air

New Project for Nanowire Solar Cells

Military Implications:
The military should investigate these developments for their positive energy-saving effects on the environmental footprint of military installations and utility in deployable systems. DOD is aware of the Sunlight to Petrol (S2P) project through its funding of the project by DARPA; however, it is included to notify the broader environmental security community.

Source:
Nanowires hold promise for more affordable solar cells

Magnetic Resonance Provides Short-range Power Source

Military Implications:
The military should follow these developments as they proceed toward practical implementation. The wireless transmission has possible applications in power systems for environmental devices, for example, by providing a single central source for multiple units, eliminating the need for heavy and bulky batteries, or power cords. The body-embedded generator could power individual environment sensors, drug dosers and prosthetic devices.

Source:
Cutting the last cord could resonate with our increasingly gadget-dependent lives
http://www.sciencenews.org/articles/20070721/bob8.asp
Nanogenerator Could Draw Energy from Human Blood

Silicon Nanocrystals Promise More Efficient Solar Cells

Synthetic Biology to Produce Hydrocarbon-based Fuels

Nanotechnology Produces Battery/Capacitor in a Sheet of Paper

Scientists from the Rensselaer Polytechnic Institute have developed a device that resembles a sheet of paper in all respects, but that can serve as a battery or capacitor. The material is formed from cellulose and carbon nanotubes, and can be soaked with any of a variety of fluids (including sweat or blood) to serve as an electrolyte. It can operate at temperatures between -100 and +300 degrees Fahrenheit and can be printed like paper.

Military Implications:
The military should follow these developments for their possible use in more efficient power supplies.

Sources:
Silicon Nanocrystals for Superefficient Solar Cells
http://www.technologyreview.com/Energy/19256
Making Gasoline from Bacteria
http://www.technologyreview.com/read_article.aspx?id=19128
Beyond Batteries: Storing Power in a Sheet of Paper
http://news.rpi.edu/update.do?artcenterkey=2280&setappvar=page(1)

Space-based Solar Power Has Significant Environmental Security Potential

_Military Implications:_
Military personnel with energy and environmental security responsibilities should study this report to identify how SBSP could change their operations. Such implications should be transmitted to NSSO, which expects to continue to update this report periodically. The Army Strategy on the Environment calls for leadership in sustainability; SSP furthers energy security sustainability, and sustains the mission with wireless energy transmission for more flexible, mobile, and reliable energy supply and transmission, with a smaller environmental footprint than other energy options. It also reduces vulnerabilities of energy delivery via ground and oceans. Large-scale electricity on demand anywhere in the world will speed post-conflict and post-natural disaster recovery. Large military posts have both power needs and space for safety buffers that might be required for prototype power receiving stations.

_Sources:_
NSSO Report: Space-Based Solar Power: As an Opportunity for Strategic Security
Power from space? Pentagon likes the idea
http://www.msnbc.msn.com/id/21253268
Orbiting solar panels' day may be near

Reducing Military Footprint with Solar Energy at 30 Cents per Watt

_Military Implications:_
Military installation management, facility design, materiel development and procurement personnel should consider applications for lower cost solar energy, from building surfaces to mobile and remote energy requirements.

_Sources:_
Nanosolar: Power to the people
http://www.enn.com/energy/article/24430
Nanosolar’s Breakthrough - Solar Now Cheaper than Coal

Energy-free Glow Material

_Military Implications:_
The military should investigate this material for its energy-saving application to a variety of products from labeling materiel and safety hazards to illuminating watch faces and weapon scopes.

*Source:* A company called MPK is designing a light source that will glow continuously for more than 12 years without any additional energy


**Dye-sensitized Solar Cells Offer Shorter Energy Payback Time**

*Military Implications:* The military should investigate this new technology for its possible application to power supplies for portable/mobile tactical and environmental sensing and communication systems.

*Source:* Solar Energy's Red Queen

http://www.americanscientist.org/template/AssetDetail/assetid/56471

**Nanotech Lithium-Ion Battery Material Promises 10× Capacity Increase**

*Military Implications:* The military should explore this development for its battery requirements from mobile environmental sensing systems to electric vehicles.

*Source:* Stanford's nanowire battery holds 10 times the charge of existing ones


**New Biological Discovery Should Bring More Efficient Water Treatment**

*Military Implications:* The military might consider this technology for applications in environmentally friendly field and installation water supply systems.

*Source:* Natural slime control aids desalination


**NanoRadio Offers Low Impact Environmental Monitoring and Communications**

*Military Implications:* The military should follow this work as it progresses toward applicability to fieldable environmental surveillance systems for both battlefield monitoring and environmental management.

*Source:* TR10: NanoRadio

http://www.technologyreview.com/read_article.aspx?ch=specialsections&sc=emerging08&id=20244

**New Technique Might Power Nano-based Environmental Devices**

*Military Implications:*
Although this work is at an early stage, the military should follow its further development as it might apply to power sources for nanotechnology-based environmental surveillance devices and augmenting electrical requirements on uniforms and portable equipment.  
*Source:*  
Microfibre–nanowire hybrid structure for energy scavenging  
http://www.nature.com/nature/journal/v451/n7180/abs/nature06601.html

### Ionic Liquids Provide Safe Alternative to Mercury

*Military Implications:*
Considering the call for a global ban on mercury, the military should investigate the use of these compounds as environmentally friendly substitutes to possibly hazardous materials, including mercury.  
*Source:*  
New ionic liquid in thermometers beats mercury on range, performance and safety  
http://www.rsc.org/AboutUs/News/PressReleases/2008/ILThermometers.asp

### Clean Green Hydrogen-Making Process

*Military Implications:*
The new technology should be explored and eventually encouraged for future applicability in green (hydrogen) power, as well as for biomass recycling aspects.  
*Source:*  
Clean green hydrogen-making machine created. NewScientist.com, 03 November 2006  
http://www.newscientisttech.com/article.ns?id=dn10441&feedId=energy-fuels_rss20

### New Generator Produces Hydrogen from Aluminum and Water

*Military Implications*
The military should follow this development and its evaluation, to determine its possible application to simplify logistics for environmentally friendly fuels.  
*Source:*  
New process generates hydrogen from aluminum alloy to run engines, fuel cells  

### World Record solar cell efficiency achieved

*Military Implications:*
Technological breakthrough like this could help the military significantly reduce its greenhouse gases emissions in the near future without increasing operating costs. The military should monitor the cost-effectiveness of such technologies and consider potential use and adaptation for military devices/equipment as the technologies become more competitive.  
*Sources:*  
New World Record Achieved in Solar Cell Technology  
http://www.energy.gov/news/4503.htm  
Solar cell breakthrough claimed  
http://www.planet2025news.net/ntext.rxml?id=3895&photo=  
Solar America Initiative website: http://www1.eere.energy.gov/solar/solar_america/
**Enzyme-based Biofuel Cells Using Nanotechnology**

*Military Implications:*
The military should consider following and encouraging such research for finding alternative fuel technologies to reduce environmental impacts.

*Source:*
Simple biofuel cells with nanotechnology
Fructose/dioxygen biofuel cell based on direct electron transfer-type bioelectrocatalysis
[http://www.rsc.org/publishing/journals/CP/article.asp?doi=b617650j](http://www.rsc.org/publishing/journals/CP/article.asp?doi=b617650j)

**Photonic Crystal Provides 50% Cost Reduction**

*Military Implications:*
The military should investigate this development for its possible use in energy-saving systems for military applications.

*Source:*
Cheaper, More Efficient Solar Cells

**Refrigerator Temperature Sensor Mod Saves Energy**

*Military Implications:*
The military should investigate whether and where this device could be installed to reduce energy consumption.

*Source:*
£25 fridge gadget that could slash greenhouse emissions
[http://environment.guardian.co.uk/climatechange/story/0,,2036183,00.html](http://environment.guardian.co.uk/climatechange/story/0,,2036183,00.html)

**Printing Fuel Cells**

*Military Implications:*
The military should consider investigating how this versatile technology could be useful for creating microscale devices (e.g. to fabricate fuel cells for recharging communication or other devices used in field operations), and hence reduce greenhouse gas emissions and other pollution. The technology could be adaptable for biological and chemical analysis.

*Source:*
Printing Fuel Cells

**Biologically Based Dyes Dramatically Lower Solar Cell Costs**

*Military Implications:*
The military should investigate this research for applications from roofing to portable systems.

*Source:*
Taking nature’s cue for cheaper solar power
New Solar Cell/Battery Combination Saves Size and Weight

Military Implications:
The military should investigate this research for applications in portable and self-sustaining energy units.

Source:
Gadget recharges itself -- shocking!
http://www.thestar.com/sciencetech/article/203401

Advanced Membrane Technology for Water Treatment to Counter Water Scarcity

Military Implications:
Military developers should follow Australian progress in these research fields in order to make early use of any new technologies developed. Benefits could apply to force protection and military assistance in areas with water problems.

Source:
Advanced membrane technology for water treatment research

New Device to Suck CO2 from the Air

Military Implications:
If this approach proves effective, then it could become an attractive carbon trade-off investment against military carbon-emitting activities, along with other approaches such as powdered iron in the ocean, tree plantings, and desert coastline seawater agriculture.

Sources:
First Successful Demonstration of Carbon Dioxide Air Capture Technology Achieved by Columbia University Scientist and Private Company

Giant carbon vacuums could cool Earth

Smog-Eating Materials

Military Implications:
If the "smog-eating" products prove to be useful, the military should request its contractors to consider them in new buildings and infrastructure development.

Source:
Architecture in Italy goes green
B. Preventing or Responding to Environmentally Caused Conflicts

**SECURITY IMPLICATIONS OF CLIMATE CHANGE**

Global Security linked to Climate Change

*Military Implications*
[Same as previous on similar issues] Extreme weather conditions, threats to food supply, and loss of livelihood (mostly in already problem-ridden regions) might increase unrest and threaten global stability. The U.S. Army Corps of Engineers—having the logistics and know-how—should consider, or expand, worldwide collaboration with counterparts and international organizations (e.g. the UNU Institute for Environment and Human Security in Bonn) to determine priorities on which communities need what kind of help from a network of state and international agencies. Also, the issue of environmental refugees should be tackled swiftly to avoid conflicts that this rising segment of world population might cause.

*Sources:*
Climate change seen fanning conflict and terrorism
http://www.sciam.com/article.cfm?chanID=sa003&articleID=F416D0FBCE436DDE50730DF3A12BBA3B
Nigerian houses swallowed by sand
http://news.bbc.co.uk/2/hi/africa/6288445.stm
Jean Charest panelist at the workshop on the implications of climate change on security
DAVOS Trade talks, climate change, Middle East set to dominate WEF UPDATE

Economic and Security Implications of Climate Change

Developing Countries Most Affected by Global Warming

*Military Implications:*
Extreme weather conditions, threats to food supply, and loss of livelihood (mostly in highly populated regions such as India and China) might increase unrest and threaten global stability. The U.S. Army Corps of Engineers—having the logistics and know-how—should consider worldwide collaboration with counterparts and international organizations (e.g. the UNU Institute for Environment and Human Security in Bonn) to determine priorities on which communities need what kind of help from a network of state and international agencies. Also, the issue of environmental refugees should be tackled swiftly to avoid conflicts that this rising segment of world population might cause.

*Sources:*
Tackle climate change or face deep recession, world's leaders warned
http://www.guardian.co.uk/frontpage/story/0,,1931685,00.html
Preparation Environment Council, 23 October 2006
Stern Review sets out economic imperative of climate change
£3.68 trillion: The price of failing to act on climate change
http://observer.guardian.co.uk/uk_news/story/0,1934381,00.html

British government report: global warming will devastate world economy
http://ca.news.yahoo.com/s/capress/britain_global_warming

Climate inaction 'has high cost'
http://news.bbc.co.uk/2/hi/science/nature/5398784.stm

Dangerous climate change is hitting Africa hard say top aid and environment groups
http://www.neweconomics.org/gen/afriacupinsmoke.aspx

Africa—Up in Smoke 2. The second report on Africa and global warming from the Working Group on
Climate Change and Development

Merkel to Target Climate Change as G8, EU Leader
http://www.dw-world.de/dw/article/0,2144,2188336,00.html

Rising sea forces islanders to relocate
http://www.earthsky.org/shows/show.php?date=20060814

Global warning: Devastation of an atoll
http://news.independent.co.uk/environment/article1222595.ece (article available free for a
limited time)

World Bank: Climate threatening programs
http://www.businessweek.com/ap/financialnews/D8JQ7V1G1.htm?sub=apn_home_up%26chan=db
(article available free for a limited time)

Development Under Climate Threat

Global warming is more than just a green issue, says Secretary-General

The ocean is slowly claiming Malasiga. They say it's global warming
http://www.chicagotribune.com/news/nationworld/chi-0608200380aug20_1,3457454.print.story?ctrack=1&cset=true (by free subscription only)

Britain is falling into the sea (or bits of it, anyway)
http://www.canada.com/montrealgazette/news/insight/story.html?id=f3247666-19da-4a02-9c8e-
ea2fe464b728 (article available free for a limited time)

Ocean acidification: the other CO2 problem
http://www.newscientist.com/channel/earth/mg19125631.200 (by subscription only)

Population and Resources Affecting the Risk of Conflict

Military implications:
The military should consider some of the recommendations such as: performing more research on youth bulges and political stability; age composition and exclusion in urban centers; micro-level studies of rebel recruitment; and youth bulges in post-conflict settings.

Sources:
New Population Projections Underline Urgency of Family Planning Needs in Developing Nations

World population may reach 9.2 billion by 2050
http://www.msnbc.msn.com/id/17605186/
Demography and Conflict: How Population Pressure and Youth Bulges Affect the Risk of Civil War
http://www.wilsoncenter.org/index.cfm?fuseaction=events.event&event_id=219250
Climate-Security Connections: An Empirical Approach to Risk Assessment
http://www.wilsoncenter.org/index.cfm?fuseaction=events.event&event_id=219458#

International Conferences Put Climate Change among Top Security Issues

Military Implications:
If the military were told that indeed climate change is a threat on a par with terrorism or the Cold War, what changes in the military would be required? Since the environmental and international political trends are moving in this direction, it would be wise to initiate studies to explore options.

Sources:
Climate change called security issue like Cold War
http://www.enn.com/top_stories/article/22093
Natural disasters more destructive than wars: Egeland
http://news.yahoo.com/s/afp/20070828/sc_afp/environmentclimate
Vienna UN conference shows consensus on key building blocks for effective international response to climate change

Increased Role of the Military in Environment-related Crises

Military Implications:
Since this meeting furthered regional military cooperation on environmental security, the US Army’s Strategy for the Environment should be evoked during follow-up environmental crises-management planning in the region. US Secretary of Defense Gates addressed the conference, saying that the US plays a role “as an agent of professionalism and capacity in service to a range of non-military needs, such as disaster response.”

Sources:
The IISS Shangri-La Dialogue
http://www.iiss.org/conferences/the-shangri-la-dialogue/
Channel News Asia - Ministers say military a crucial element that can help in humanitarian crises
Environmental approach to security
http://nation.ittefaq.com/issues/2008/06/02/news0257.htm
Singapore: Food Prices 'May Cause Wars'
http://foodsecurity.developmentgateway.org/News.10971+M524b934499e.0.html

International Security Responses to a Climate Changed World

Military Implications:
The report appears be a good information source for security sector actors who have to prepare contingency plans to respond to the challenges of climate change.

Sources:
Delivering Climate Security: International Security Responses to a Climate Changed World
http://www.informaworld.com/smpp/title~content=g792406239~db=mass
Climate change 'may put world at war'

National Security Implications of Global Climate Change Through 2030

Military Implications:
The military will most probably be called on to include the findings of this and other similar works into its planning.

Sources:
National Intelligence Assessment on the National Security Implications of Global Climate Change to 2030
Climate change may challenge national security, classified report warns

An Uncertain Future: Law Enforcement, National Security and Climate Change

Military Implications:
Relevant military personnel should study the report for its comprehensive analysis and the multi-faceted perspective of security implications of climate change, including changes in planning, funding and priorities.

Sources:
An Uncertain Future: Law Enforcement, National Security and Climate Change
http://www.oxfordresearchgroup.org.uk/publications/briefing_papers/uncertainfuture.php
New security threats caused by climate change
http://www.telegraph.co.uk/earth/main.jhtml?xml=/earth/2008/01/23/eaclimate123.xml
Armed Forces Face Strain of Climate Change – Report
http://www.planetark.com/dailynewsstory.cfm/newsid/46590/story.htm

IISS's Strategic Survey 2007 Warns of Global Security Implications of Climate Change

Military Implications:
Personnel with environmental security related responsibilities should read this document for new policy and training requirement implications.

Sources:
Strategic Survey 2007
Global warming impact like "nuclear war" – report

Security Implication of Climate Change to the EU

Military Implications:
Although with specific recommendations for the EU, the report is a good overview of the security implications of climate change that apply similarly to North America. Relevant military personnel should review the report for possible inputs for U.S. strategy.

Sources:
Climate Change and International Security. Paper from the High Representative and the European Commission to the European Council
EU must boost military capabilities in face of climate change
http://euobserver.com/9/25811/?rk=1

Reports highlighting the link between environment and security

Military Implications:
These reports by authoritative organizations are excellent analyses of the link between environmental conditions and conflict, detailing causes, consequences, and suggesting actions. Relevant military personnel should consider reviewing the reports for eventual inputs to conflict prevention planning and should prepare for the potential security challenges triggered or exacerbated by climate change.

Sources:
UNDP Human Development Report 2007/8
A Climate of Conflict
http://www.international-alert.org/climate_change.php
The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change
http://www.csis.org/component/option,com_csis_pubs/task,view/id,4154/type,1/
Climate change seen threatening national security
http://uk.reuters.com/article/environmentNews/idUKN0528470920071106

Global Risk 2007, the World Economic Forum

Military Implications:
The military should review the report for insights on potential security implications of these non-traditional risks mainly in already fragile regions.

Sources:
Global Risks 2007; A Global Risk Network Report
Global Risk Network: Mapping solutions to the greatest risks

Fourth Assessment Report Climate Change 2007

Military Implications:
Relevant military personnel should get the complete reports (and/or their drafts) for a comprehensive overview of the “state of the planet” and to review the policy considerations, since they might set the ground for further international negotiations and priority setting.

Sources:
Intergovernmental Panel on Climate Change (IPCC) http://www.ipcc.ch/
Assessment Reports http://www.ipcc.ch/activity/ar.htm

Worldwatch Institute: Assessing the Relation between Disasters and Conflict

_Military Implications:_
The Worldwatch report might be a source of information for future efforts to address disaster and conflict.

_Source:_
*Beyond Disasters: Creating Opportunities for Peace*
http://www.worldwatch.org/node/5126
Beyond Disasters: Creating Opportunities for Peace
http://www.wilsoncenter.org/index.cfm?fuseaction=events.event_summary&event_id=244464 (video)

Adaptation and Vulnerability Report by the IPCC

_Military Implications:_
[Same as previous on similar issues] Increasingly more compelling evidences and warnings on climate change amplify international discourse and increase the emergence of international policies trying to tackle the causes and develop strategies to mitigate climate change effects.

_Sources:_
*Climate Change 2007: Impacts, Adaptation and Vulnerability*
http://www.ipcc.ch/SPM6avr07.pdf
UN Climate Change Impact Report: Poor Will Suffer Most
Deep Pockets Needed for Climate Change Adaptation
UN Experts Near Deal on Climate After Disputes

Global Environment Outlook-4

_Military Implications:_
Military planners should review these reports on a regular basis. The Global Environment Outlook reports provide important indicators of the UN’s environmental concerns and policy directions, as well as essential planning information.

_Sources:_
Global Environment Outlook: environment for development (GEO-4)
http://www.unep.org/geo/geo4/media/index.asp
Planet's Tougher Problems Persist, UN Report Warns
UN Planetary Report Paints Bleak Regional Picture
http://www.planetark.com/dailynewsstory.cfm/newsid/45012/story.htm
Humanity's survival at stake: UN
http://www.thestar.com/sciencetech/Environment/article/270709
UNEP Year Book 2007

Military Implications:
The GEO reports are a valuable source of information on the global state of the environment and trends in future international policy aspects.

Source:
GEO Year Book 2007
http://www.unep.org/geo/yearbook/yb2007/

UNEP’s Year Book 2008

Military Implications:
As one of the most authoritative reports on environmental issues, it provides indications of UN priorities and eventual possible international regulations.

Sources:
UNEP Year Book 2008
http://www.unep.org/geo/yearbook/yb2008/

Climate Change Resulting in Shift to ‘Green’ Economies, Says UN Agency

Breaking Down the Barriers to a Green Economy

Twenty Years of Environmental Security

Military Implications:
The report is a comprehensive overview of 20 years of change and policies impacting global security, with useful insights for future security needs. It should be read by all who are tasked to plan future policy and actions.

Source:
An Uncommon Peace: Environment, Development, and the Global Security Agenda, by Geoffrey D. Dabelko

World in Transition –Climate Change as a Security Risk

Six places in the world where climate change could cause political turmoil

Military Implications:
These papers should be reviewed by those military personnel studying potential environmental security hot spots and interventions to prevent conflict.

Sources:
World in Transition –Climate Change as a Security Risk (Report PDF)
http://www.wbgu.de/wbgu_jg2007_engl.html

Climate Change and Conflict - New Report Weighs the Risks and Pin Points Likely Hotspots

Six places in the world where climate change could cause political turmoil

Climate Change: A New Threat to Middle East Security
Egypt, Jordan and Palestine threatened by global warming
http://www.albawaba.com/en/countries/Palestine/220130
Climate Change Threatens Middle East, Warns Report
Middle East: Rising Sea Levels Could Lead To Political Tensions – Report
http://yubanet.com/artman/publish/article_73048.shtml

**State of the World 2007: Our Urban Future**

*Military Implications:*
The report is a source of information on the implications of urbanization, trends, and possible future developments. It should prove helpful in understanding future situations related to human security; and thus aid planning improvement, resource prioritization and preparedness action.

*Source:*
http://www.worldwatch.org/node/4839

**Recommendations for Addressing U.S. Environmental Security**

*Military Implications:*
Relevant military personnel should review and consider the essay and the report as inputs for improving institutional and policy structures to better address climate change-related security issues.

*Sources:*
Insecure About Climate Change
http://www.washingtonpost.com/wp-dyn/content/article/2008/03/21/AR2008032102631.html?hpid=opinionsbox1
Climate Change and National Security. An Agenda for Action
http://www.cfr.org/publication/14862

**Climate Change: A New Threat to Middle East Security**

*Military Implications:*
These papers should be reviewed by those military personnel studying potential environmental security hot spots and interventions to prevent conflict.

*Sources:*
Climate Change: A New Threat to Middle East Security
Egypt, Jordan and Palestine threatened by global warming
http://www.albawaba.com/en/countries/Palestine/220130
Climate Change Threatens Middle East, Warns Report
Middle East: Rising Sea Levels Could Lead To Political Tensions – Report
http://yubanet.com/artman/publish/article_73048.shtml
Arctic Debate

Arctic Access, Territorial Claims, Energy Resources and Environmental Management

Military Implications:
It is likely that discussions for clear international regulations concerning the Arctic region will increase rapidly, opening the potential for new military roles in the region to ensure the safety of individuals and ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing timely, adequate national and international regulations and enforcement procedures regarding the Arctic.

Source:
Ottawa buying up to 8 Arctic patrol ships

Arctic patrol ship purchase met with skepticism

The Coming Conflict in the Arctic. Russia and the United States to Square off over Arctic Energy Reserves
http://www.russiaprofile.org/page.php?pageid=International&articleid=a1184076124

Russia plants flag under N Pole
http://news.bbc.co.uk/2/hi/europe/6927395.stm

Arctic Debate Update

Military Implications:
[Similar to previous on the same issue] Negotiations for clear international regulations concerning the Arctic region should be accelerated, to counter any possible escalation of unfriendly attitudes. In any instance, the likelihood of potential new military roles in the region increases, for both national security and protection of the ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing timely, adequate national and international regulations and enforcement procedures.

Sources:
Russia prepares for future combat in the Arctic
http://en.rian.ru/russia/20080624/111915879.html

Russian general fires Arctic warning
http://www.canada.com/topics/news/story.html?id=ac0d24df-dc10-43da-89f3-b3c3e0928ae7&k=51152

Northern Edge 2008 (NE08) Exercise Underway

Arctic Debate Intensifies

Military Implications:
This could be another opportunity to take up the UN Security Council’s increased focus on prevention by offering collaboration in design of a multilateral agreement to prevent conflict, and applying the Army’s Strategy on the Environment in any military activities that could have environmental impacts on the region.

Sources:
Canada and Denmark join rush to claim Arctic
Canada Announces Arctic Base, Port
Drawing lines in melting ice
http://economist.com/world/international/displaystory.cfm?story_id=9660012+
Preliminary results of Russian Arctic expedition released
Nations scramble for oil in Arctic
http://www.newscientist.com/channel/opinion/mg19526172.700-nations-scramble-for-oil-in- arctic.html (by subscription only; full text available further in this Appendix)
Climate change may open a new route between the Atlantic and Pacific Oceans
Denmark Maps Arctic Ridge in Claim Race
http://www.guardian.co.uk/worldlatest/story/0,,6840878,00.html
Denmark joins race to claim North Pole
Who resolves Arctic oil disputes?
Tougher rules urged to protect Arctic
http://www.ft.com/cms/s/0/4b6e821e-4e74-11dc-85e7-0000779fd2ac.html
German Foreign Minister Warns Against Exploiting Arctic
http://www.dw-world.de/dw/article/0,2144,2756813,00.html

Canada to Begin Monitoring Traffic in Northwest Passage by mid-2008

Military Implications:
[Similar to previous articles on the same issue] It is likely that discussions for clear international regulations concerning the Arctic region will increase rapidly, opening the potential for new military roles in the region to ensure the safety of individuals and ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing timely, adequate national and international regulations and enforcement procedures regarding the Arctic.

Sources:
Canada to monitor water traffic in Northwest Passage
The True North ... strong, but whose?
http://www.hfxnews.ca/index.cfm?sid=65248&sc=93
Canada to be forced to boost Arctic security, expert says
http://www.canada.com/ottawacitizen/story.html?id=66c15321-ea0c-4e04-a686- b9ae5f644394&k=64697
Fight for the Top of the World
http://www.time.com/time/world/article/0,8599,1663445,00.html
Satellites witness lowest Arctic ice coverage in history
http://www.esa.int/esaEO/SEMYTC13J6F_planet_0.html
New Canadian Strategies for Monitoring the Northwest Passage

Military Implications:
It is likely that discussions for clear international regulations concerning Northwest Passage navigation will increase rapidly and more military action will be called for to ensure the safety of individuals and ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing adequate national and international regulations and enforcement procedures regarding the Arctic region. By exercising sovereignty, Canada could regulate future shipping through the passage and impose its own rules for the Northwest Passage, including the right to require vessels to conform to certain environmental and construction standards to avoid disasters in this ecologically fragile region.

Source:
Northwest Passage 'could open in 2015'

The Disputes over the Northern Territories Set to Continue

Military Implications:
It is likely that discussions for clear international regulations concerning the Arctic region will increase rapidly, and more military action will be called for to ensure the safety of individuals and ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing timely, adequate national and international regulations and enforcement procedures regarding the Arctic.

Source:
Putin's Arctic invasion: Russia lays claim to the North Pole - and all its gas, oil, and diamonds

Arctic Disputes Continue

Military Implications:
[Similar to previous on the same issue] It is likely that discussions for clear international regulations concerning the Arctic region will increase rapidly, opening the potential for new military roles in that region to ensure the safety of individuals and ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing timely, adequate national and international regulations and enforcement procedures.

Sources:
Climate Change and International Security. Paper from the High Representative and the European Commission to the European Council
U.S. firm lays claim to 'potentially vast' Arctic oil resources
http://www.canada.com/ottawacitizen/news/story.html?id=2699b272-8fed-4da6-8c2a-d54390f7d54b
Arctic Melt Yields Hints of Bigger U.S. Seabed Claim
Continental Slope Off Alaska 100 Nautical Miles Further Off Coast Than Assumed
http://www.sciencedaily.com/releases/2008/02/080211134449.htm
Arctic Issues Still at the Debate Stage

Military Implications:
[Similar to previous on the same issue] It is likely that discussions for clear international regulations concerning the Arctic region will increase rapidly, opening the potential for new military roles in that region to ensure the safety of individuals and ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing timely, adequate national and international regulations and enforcement procedures.

Sources:
http://www.um.dk/NR/rdonlyres/BE00B850-D278-4489-A6BE-6AE230415546/0/ArcticOceanConference.pdf
Time for China and Saudi Arabia to start caring about the Arctic
Arctic declaration denounced as territorial 'carve up'
http://www.guardian.co.uk/environment/2008/may/29/fossilfuels.poles
Arctic states meet in Greenland. By Jan M. Olsen, The Associated Press
http://cnews.canoe.ca/CNEWS/World/2008/05/28/5693696-ap.html
Norwegian min says conf in Greenland will not carve up Arctic Ocean
http://itar-tass.com/eng/level2.html?NewsID=12721839&PageNum=0
Last-ditch bid to avert Arctic free-for-all
Reaching out in the Arctic
http://en.rian.ru/analysis/20080514/107378393.html
Russia complying with law in Arctic shelf claim – Ivanov
http://en.rian.ru/russia/20080418/105419030.html

Disputes over Polar Regions Expands

Military Implications:
[Similar to previous on related issues] It is likely that discussions for clear international regulations concerning the Polar Regions will increase rapidly, opening the potential for new military roles in those regions to ensure the safety of individuals and ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing timely, adequate national and international regulations and enforcement procedures regarding the Polar Regions.

Sources:
Britain Joins Race to Grab Seabeds
http://www.msnbc.msn.com/id/21351573/
Britain to claim more than 1m sq km of Antarctica
Green groups condemn UK's claim in Antarctica
http://www.guardian.co.uk/environment/2007/oct/18/climatechange.fossilfuels
Steinmeier: Climate Change Growing Threat to Peace
http://www.planetark.com/dailynewsstory.cfm/newsid/44972/story.htm
Record 22C temperatures in Arctic heatwave
http://environment.independent.co.uk/climate_change/article3021309.ece
Melting ice cap brings diamond hunters and hopes of independence to Greenland
http://www.guardian.co.uk/environment/2007/oct/04/1
Warming Revives Flora and Fauna in Greenland
Arctic Report Card 2007
http://www.arctic.noaa.gov/reportcard/about.html
Arctic Moving Toward Tipping Point

Indian and Chinese Assessments of Climate Change Consequences

Military Implications
[Same as previous on similar issues] Increasingly more compelling evidences and warnings on climate change amplify international discourse and increase the emergence of international policies trying to tackle the causes and develop strategies to mitigate climate change effects. Sources:
Bangladesh: A nation in fear of drowning
http://news.independent.co.uk/environment/climate_change/article2458848.ece
Global Warming to Devastate Indian Coast – Expert
http://www.planetark.com/dailynewsstory.cfm/newsid/41512/story.htm
China Says Global Warming Threatens Development

Migration Triggered by Environmental Causes

Number of People of Concern Rising

Military Implications
[Similar to others on this issue] It is important that the military community participates in the design of an eventual international framework addressing global displacement and migration; continuously reviews the possible causes of refugee flows and preventive measures; and cooperates with civilian agencies in preparing contingency plans for those circumstances when their assistance is needed.
Sources:
UN warns of growth in climate change refugees
http://www.timesonline.co.uk/tol/news/environment/article4159923.ece?token=null&offset=0
Climate Change Refugees

Military Implications:
[Same as previous on similar issues] The military should continue to reduce its environmental footprint, develop strategies to mitigate climate change effects, explore the military roles in addressing environmental refugee issues, and cooperate where possible with others to these ends.

Sources:
U.N. Professor Says Climate Change Is Creating New Refugees Who Deserve U.N. Protection
http://www.enn.com/today.html?id=12788

Human tide: the real migration crisis

Climate change to force mass migration
http://www.guardian.co.uk/international/story/0,,2078839,00.html

The first refugees of global warming. Bangladesh watches in horror as much of the nation gives way to sea
http://www.chicagotribune.com/news/nationworld/chi-0705010817may02,1,7033000.story?coll=chi-newsnationworld-bed&ctrack=1&cset=true (free registration required; full text in this Appendix)

Sessions of the Subsidiary Bodies, 7-18 May 2007, Bonn, Germany
http://unfccc.int/meetings/sb26/items/3919.php

UN meeting in Bonn moves world closer to action on climate change

Increasing Weather Extremes and Environmental Refugees due to Climate Change

Military Implications:
Extreme weather conditions, threats to food supply, and loss of livelihood (mostly in highly populated regions such as India and China) might increase unrest and threaten global stability. The U.S. Army Corps of Engineers—having the logistics and know-how—should consider worldwide collaboration with counterparts and international organizations (e.g. the UNU Institute for Environment and Human Security in Bonn) to determine priorities on which communities need what kind of help from a network of state and international agencies. Also, the issue of environmental refugees should be tackled swiftly to avoid conflicts that this rising segment of world population might cause.

Sources:
Expect a Warmer, Wetter World this Century, Computer Models Agree

Global Warming Could Spread Extreme Drought

The ocean is slowly claiming Malasiga. They say it's global warming
http://www.chicagotribune.com/news/nationworld/chi-0608200380aug20,1,3457454,print.story?ctrack=1&cset=true (by free subscription only)

Britain is falling into the sea (or bits of it, anyway)

Ocean acidification: the other CO2 problem
http://www.newscientist.com/channel/earth/mg19125631.200 (by subscription only)
New Strategies Needed to Deal with Global Displacement and Migration

Military Implications
[Similar to previous on this issue] It is important that the military community participates in the design of an eventual international framework addressing global displacement and migration; continuously reviews the possible causes of refugee flows and preventive measures; and cooperates with civilian agencies in preparing contingency plans for those circumstances when their assistance is needed.

Sources:
UNHCR Executive Committee concludes annual meeting
UN refugee chief calls for new strategies to tackle global displacement
People on the Move. Woodrow Wilson Center, October 10 2007 (live webcast)
http://www.wilsoncenter.org/index.cfm?topic_id=1413&fuseaction=topics.event_summary&event_id=274776
Is this what the world's coming to?

Population Trends and Environmental Impact

Military Implications:
Relevant military personnel should review these reports for population projections that are important for developing adequate early warning and preparedness systems, as well as for developing strategies for preventing eventual conflicts due to scarcities and increasingly probable disasters—mostly in coastal areas.

Sources:
http://www.cepnet.org/documents/USNatlReptFinal_000.pdf
Mapping Future Population Growth
Where will people live in the year 2025? (PDF) map

Demographics and Destiny: Trends We Need to Understand in the 21st Century

Military Implications:
These points should be included in any global assessment by military personnel concerned with demographic trends as they affect force planning.

Source:

Desertification Triggering Migration

Military Implications:
Military personnel should be asked to consider the following questions: If water were to become a human right in some countries, how might their militaries be called upon to insure that right? How might that affect military-to-military assistance? What new opportunities might that present to further international environmental security?

*Sources:*

**BURKINA FASO:** Innovation and education needed to head off water war

**Environment:** Parliaments Said to be "Weak" in Fighting Desertification
http://www.ipsnews.net/africa/nota.asp?idnews=39242

The eighth Conference of the Parties to the United Nations Convention to Combat Desertification (UNCCD COP8) kicked off on Monday in Madrid and will conclude on 14 September.
http://allafrica.com/stories/200709040686.html

Annan's aid forum tackles natural disasters
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Climate change change tops future humanitarian challenges: Annan
http://afp.google.com/article/ALeqM5jcSVcpfx1_Gb8aL1rNmai6Xh63_w

Annan's humanitarian forum to start work in October

Climate change affecting Pakistan’s environment: Faisal Saleh

**Conference on Desertification Calls for Policies to Address Environmental Refugees**

*Military Implications:*

Those developing military programs to prevent environmentally induced conflicts should follow the outcomes of such meetings and cooperate with other militaries, international agencies, and NGOs to create new policies and strategies to counter desertification and help cope with its consequences.

*Sources:*

Joint International Conference—Desertification and the International Policy Imperative
http://www.inweh.unu.edu/inweh/drylands/TYDD.htm

Experts Advise World Policies to Cope with Causes, Rising Consequences of Creeping Desertification
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Forced migration key issue at desert meeting
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Looming desertification could spawn millions of environmental refugees

Droughts to set off exodus
http://www.thestar.com/article/151381

**Kyrgyzstan’s Deforestation Threatens Central Asia’s Security**

*Military Implications:*

Given the vulnerability of the region, it is important that international efforts intensify to save biodiversity and ecosystems upon which livelihoods depend, in order to minimize the potential...
of social unrest. The military responsible for activities or stationed in the region should aid this effort by helping their counterparts develop monitoring and compliance mechanisms or taking physical actions, as may be appropriate under bilateral agreements.

Source:
Kyrgyz Greens Warn of Deforestation Risks

NATURAL DISASTERS AND SCIENTIFIC EVIDENCES

Military Implications:
[Similar for all climate change-related issues] Increasingly more compelling evidence and warnings on climate change amplify international discourse and increase the emergence of international policies trying to tackle the causes and develop strategies to mitigate climate change effects. Hence, the military should be doing its part in reducing greenhouse gas emissions and preparing to help mitigate the human-made and natural catastrophes that could ensue.

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New forms of insurance against ravages of climate change needed in poor nations – UN

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Suffer the Environment at Your Cost!

**MELTING SEA ICE AND GLACCIERS**

*Military Implications:*
[Similar for all climate change-related issues] Increasingly more compelling evidence and warnings on climate change amplify international discourse and increase the emergence of international policies trying to tackle the causes and develop strategies to mitigate climate change effects. Hence, the military should be doing its part in reducing greenhouse gas emissions and preparing to help mitigate the human-made and natural catastrophes that could ensue.

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Antarctic Ice Loss Speeds Up, Nearly Matches Greenland Loss
http://www.terradaily.com/reports/Antarctic_Ice_Loss_Speeds_Up_Nearly_Matches_Greenland_Loss_999.html
Arctic ice-cap loss twice the size of France: research
http://www.terradaily.com/reports/Antarctic_Ice_Loss_Speeds_Up_Nearly_Matches_Greenland_Loss_999.html

February 2008
Asia: Global warming thaws permafrost in Siberia
Ice cores show faster global warming
http://www.upi.com/NewsTrack/Science/2008/02/01/ice_cores_show_faster_global_warming/7287/
Antarctic glaciers surge to ocean
http://news.bbc.co.uk/2/hi/science/nature/7261171.stm

March 2008
Antarctic Ice Shelf Disintegration Underscores a Warming World
Antarctic ice shelf ‘hangs by a thread’
Earth from Space: Further break-up of Antarctic ice shelf
http://www.esa.int/esaEO/SEMMX4R03EF_index_0.html
Meltdown in the Mountains. Record Glacier Thinning Means No Time to Waste on Agreeing New International Climate Regime
Glaciers suffer record shrinkage
http://news.bbc.co.uk/2/hi/in_depth/7299561.stm

April 2008
Melting ice caps may trigger more volcanic eruptions
http://environment.newscientist.com/article/dn13583-melting-ice-caps-may-trigger-more-
volcanic-eruptions.html (by subscription only; full text in this Appendix)
Cracks in Arctic ice shelves even worse than feared: scientist
Arctic ice melting fast in summer sun
http://www.thestar.com/sciencetech/article/416901
Arctic Ice More Vulnerable to Sunny Weather, New Study Shows
http://www.ucar.edu/news/releases/2008/arcticice.jsp
Climate change hitting Arctic faster, harder - Polar bears may be at even greater risk
http://www.wwf.ca/NewsAndFacts/NewsRoom/default.asp?section=archive&page=display&ID
=1586&lang=EN
Arctic is thawing faster than expected, report says
A Storehouse of Greenhouse Gases Is Opening in Siberia
http://www.spiegel.de/international/world/0,1518,547976,00.html
'Flammable ice' could be mined for fuel
http://environment.newscientist.com/channel/earth/energy-fuels/mg19826523.400-methane-
could-be-mined-from-beneath-permafrost.html
Japan's Arctic methane hydrate haul raises environment fears
http://www.timesonline.co.uk/tol/news/environment/article3740036.ece

May 2008
CU-Boulder Researchers Predict 59 Percent Chance Of Record Low Arctic Sea Ice In 2008
http://www.colorado.edu/news/r/1fb96a0f5e60677e20ddafee67219e8d.html
Arctic on thin ice this fall
Climate at Both Earth's Poles Shows Clear Human Influence
Dramatic evidence of the break-up of the Arctic ice-cap has emerged from research during
an expedition by the Canadian military.
http://news.bbc.co.uk/2/hi/science/nature/7417123.stm

June 2008
Bangladesh set to disappear under the waves by the end of the century
http://www.belfasttelegraph.co.uk/news/environment/article3819427.ece
Rising sea levels threaten cities
Top of sea warming 50% faster than thought
http://www.telegraph.co.uk/earth/main.jhtml?xml=/earth/2008/06/18/scisea118.xml
"Too late" to save Pacific island nation from submersion
Residents in danger of flooding from global warming should be forcibly relocated: gov't report
http://mdn.mainichi.jp/national/news/20080618p2a00m0na025000c.html

Mission to Study Arctic Environmental Changes

Military Implications:
There is compelling evidence of the consequences of anthropogenic climate change, and a
growing world demand for action. The military should continue to accelerate efforts to reduce
their own greenhouse gas emissions. New international environmental security-related policies
and cooperation to avoid potentially large-scale disasters and conflicts seem inevitable.
Sources:
Swiss Map Permafrost After Signs Alps Crumbling
http://www.planetark.com/dailynewsstory.cfm/newsid/37442/story.htm
Global Warming Puts 12 US Parks at Risk – Report

RISING SEA LEVELS

Military Implications:
[Similar for all climate change-related issues] Increasingly more compelling evidence and
warnings on climate change amplify international discourse and increase the emergence of
international policies trying to tackle the causes and develop strategies to mitigate climate
change effects. Hence, the military should be doing its part in reducing greenhouse gas emissions
and preparing to help mitigate the human-made and natural catastrophes that could ensue.
Sources:
July 2007
United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea
States Reach Partial Agreement on Marine Genetic Resources at UN Talks
Asia-Pacific Examines Ways to Scale Up Responses to Climate Change

August 2007
Rising sea threatens China's south: report
Global warming threatens Egypt's Nile Delta
UN Seeks Measures to Combat Climate Change Crises (Update1)

September 2007
Climate change melting Kashmir glaciers: report
Climate change affecting Pakistan’s environment: Faisal Saleh
UN climate change expert stresses dangers of inaction
Fight for the Top of the World
http://www.time.com/time/world/article/0,8599,1663445,00.html
Rising sea levels would submerge third of Bangladesh
Tuvalu about to disappear into the ocean
http://www.enn.com/ecosystems/article/23020
UN General Assembly—General Debate (25 September - 3 October 2007); Statements and Webcast
Pacific Ocean countries take part in UN meeting on tsunami preparations

October 2007
Rising seas inch toward Thailand's capital

November 2007
Coast villages to be sacrificed to the sea
An Alaskan island is losing ground

December 2007
The global climate in 2007
Tiny Newtok, Alaska, against the tide
Climate Change: A New Threat to Middle East Security
Middle East: Rising Sea Levels Could Lead To Political Tensions – Report
http://yubanet.com/artman/publish/article_73048.shtml

January 2008
Global warming continues to erode Arctic coast. RIA Novosti, January 25, 2008
http://en.rian.ru/analysis/20080125/97753436.html
Rising Seas Threaten China's Sinking Coastal Cities
Tuvalu struggles to hold back tide
http://news.bbc.co.uk/2/hi/science/nature/7203313.stm
Spanish study warns of rising Mediterranean sea levels
Warning on rising Med Sea levels
http://news.bbc.co.uk/1/hi/sci/tech/7197379.stm

March 2008
Remote control
http://www.guardian.co.uk/environment/2008/mar/26/bangladesh
Rising sea levels could swallow California's delta islands
http://www.helenair.com/articles/2007/06/04/montana/000arise.txt

May 2008
Sinking without trace: Australia's climate change victims
French-US satellite set for June launch to track sea levels
http://afp.google.com/article/ALeqM5gv2lwkG8qxbEaQ-wL1FaeDj0RIxA

June 2008
Bangladesh set to disappear under the waves by the end of the century
http://www.belfasttelegraph.co.uk/news/environment/article3819427.ece
Rising sea levels threaten cities
Top of sea warming 50% faster than thought
http://www.telegraph.co.uk/earth/main.jhtml?xml=/earth/2008/06/18/scisea118.xml
"Too late" to save Pacific island nation from submersion
Residents in danger of flooding from global warming should be forcibly relocated: gov't report
http://mdn.mainichi.jp/national/news/20080618p2a00m0na025000c.html

Rising Sea Levels Claim First Inhabited Island and Threaten Coastal Populations Worldwide
Coastline Erosion due to Rising Sea Waters Signaled Around the World
Military Implications:
Extreme weather conditions, threats to food supply, and loss of livelihood (mostly in highly populated regions such as India and China) might increase unrest and threaten global stability. The U.S. Army Corps of Engineers—having the logistics and know-how—should consider worldwide collaboration with counterparts and international organizations (e.g. the UNU Institute for Environment and Human Security in Bonn) to determine priorities on which communities need what kind of help from a network of state and international agencies. Also, the issue of environmental refugees should be tackled swiftly to avoid conflicts that this rising segment of world population might cause.
Sources:
Disappearing world: Global warming claims tropical island
http://news.independent.co.uk/environment/article2099971.ece
Rising sea levels engulfing Indian world heritage islands
The last tide could come at any time. Then these islands at the end of the Earth will simply vanish
http://www.timesonline.co.uk/article/0,3-2513189,00.html
In many villages, Alaskans face physical and cultural erosion
Oceans May Rise up to 140 cms by 2100 Due to Warming
http://www.planetark.com/dailynewsstory.cfm/newsid/39504/story.htm
The ocean is slowly claiming Malasiga. They say it's global warming
Britain is falling into the sea (or bits of it, anyway)
http://www.canada.com/montrealgazette/news/insight/story.html?id=f3247666-19da-4a02-9e8e-ca2fe464b728 (article available free for a limited time)

Polar Bear, the First Species declared Endangered Due to Global Warming

Military Implications:
Declaring the polar bear as a threatened species creates a precedent for new actions to address consequences of climate change. It is fair to speculate that other countries will follow suit by declaring other animals and their habitats protected. The military should determine if the new status of the polar bears affects military activities in pertinent regions.
Sources:
Polar bear is listed as threatened species
Polar Bear Added to List of Threatened Species in U.S.
U.S. lists polar bears as threatened species
http://www.cbc.ca/world/story/2008/05/14/polar-bear.html

FOOD AND FRESHWATER

Living Planet Report 2006

Military Implications:
This report should be studied by those with responsibilities for implementing the Army’s Strategy for the Environment. This report is another addition in the long series warning on humanity’s unsustainable practices. It is expected that pressure to improve performance will increase mostly on the countries that top the ecological footprint list.
Sources:
Living Planet Report 2006 outlines scenarios for humanity's future
http://www.footprintnetwork.org/newsletters/gfn_blast_0610.html
"Living Planet Report 2006"
http://www.ourplanet.com/imgversn/footprint/living_planet_report.html
Food Crisis

Military Implications:
Global, regional, and selected national scenarios on rising food prices and resulting social conflicts should be created to help understand security priorities and points of intervention. The scenario teams should draw on the expertise of FAO, the World Food Program, UNHCR (UN High Commissioner for Refugees), USAID, and others with direct field data experience.

Sources:

December 2007
A worrisome forecast for the world’s crops
World food stocks dwindling rapidly, UN warns
Toll of Climate Change on World Food Supply Could Be Worse Than Thought

February 2008
Feed the world? We are fighting a losing battle, UN admits
http://www.guardian.co.uk/environment/2008/feb/26/food.unitednations
The World's Growing Food-Price Crisis
http://www.time.com/time/world/article/0,8599,1717572,00.html
http://www.sciencemag.org/cgi/content/abstract/319/5863/607 (abstract)
Climate 'could devastate crops'
http://news.bbc.co.uk/2/hi/science/nature/7220807.stm
Food’s Failed Estates = Paris’s Hot Cuisine; Food Sovereignty – à la Cartel?
Human-Induced Changes in the Hydrology of the Western United States. Science, Jan 31, 2008
http://www.sciencemag.org/cgi/content/abstract/1152538
Water troubles in the West may worsen
(Requires free subscription)
Lakes Mead and Powell could run dry by 2021
'SA's water could run out by 2025'
http://www.int.iol.co.za/index.php/set_id=1&click_id=14&art_id=vn20080214113314841C685433

March 2008
Tensions Rise As World Faces Short Rations
http://www.planetark.com/dailynewsstory.cfm/newsid/47716/story.htm
EU warns of climate change threat
http://news.bbc.co.uk/2/hi/europe/7287168.stm
Africa: AU Marks Environment Day
http://allafrica.com/stories/200803041273.html
April 2008
Global Hot Spots of Hunger Set to Explode
http://ipsnews.net/news.asp?idnews=41976
International Assessment of Agricultural Knowledge, Science and Technology for Development
http://www.agassessment.org/index.cfm?Page=IAASTD%20Reports&ItemID=2713
Modern agricultural practices must change, concludes report to be presented at UNESCO
U.N. Panel Urges Changes to Feed Poor While Saving Environment
http://www.nytimes.com/2008/04/16/world/europe/16food.html?_r=1&ref=world&oref=slogin
International Federation launches new five-year food security strategy in Africa focussing on long-term investments
http://www.ifrc.org/Docs/News/pr08/1508.asp
Region urged to make the environment a priority
A Drought in Australia, a Global Shortage of Rice
Water scarcity concerns growing
http://www.planet2025news.net/ntext.rxml?id=9837&photo=
Food, land crisis linked to environmental degradation, UNCCD says
http://africasciencenews.org/asns/index.php?option=com_content&task=view&id=314&Itemid=1
Melting mountains a "time bomb" for water shortages
Town in the Andes faces crisis as glaciers melt
http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/04/23/MNSDVIN7E.DTL

May 2008
Food Crisis Escapes Security Council Scrutiny
http://www.asiantribune.com/?q=node/10984
United Nations Sustainable Development Commission Set To Tackle Issues Underpinning Global Food Crisis, At Headquarters, 5-16 May
Secretary-General convenes inaugural meeting of food crisis task force
Task Force on global food crisis to move at ‘full speed’ – Ban Ki-moon
High-Level Conference on World Food Security: the Challenges of Climate Change and Bioenergy – Rome, FAO, 3-5 June
http://www.fao.org/newsroom/
Firms Seek Patents on 'Climate Ready' Altered Crops
http://www.washingtonpost.com/wp-dyn/content/article/2008/05/12/AR2008051202919.html
Patenting the “Climate Genes”…And Capturing the Climate Agenda
http://www.etcgroup.org/upload/publication/pdf_file/687
Gene Giants Grab "Climate Genes"
India's Rice Farmers Abandon Paddies, Deepening Global Shortage
http://www.bloomberg.com/apps/news?pid=20601091&sid=aKifVN0bm19E&refer=india

Global Warming Linked to Rainfall Decline in South-East Australia

Murray-Darling woes linked to global warming: report
http://www.abc.net.au/news/stories/2008/05/02/2233524.htm

Experts warn of never-ending drought


Actions for addressing Food Crises

Military Implications:
Relevant military personnel should review short- and long-term military resources that could respond to the world food problem and reduce food crises, famine, riots, and risks of conflicts, and should make recommendations to those preparing for the G-8, and FAO meetings in October and November. These recommendations could also be included in parallel discussions in security forums and aid-related forums with such organizations as USAID, WFP, UNHCR, and NGO forums like InterAction.

Sources:

April 2008
U.N. Panel Urges Changes to Feed Poor While Saving Environment
http://www.nytimes.com/2008/04/16/world/europe/16food.html?_r=1&ref=world&oref=slogin

International Federation launches new five-year food security strategy in Africa focussing on long-term investments
http://www.ifrc.org/Docs/News/pr08/1508.asp

Region urged to make the environment a priority

May 2008
Food Crisis Escapes Security Council Scrutiny
http://www.asiantribune.com/?q=node/10984

United Nations Sustainable Development Commission Set To Tackle Issues Underpinning Global Food Crisis, At Headquarters, 5-16 May

Secretary-General convenes inaugural meeting of food crisis task force

Task Force on global food crisis to move at ‘full speed’ – Ban Ki-moon

High-Level Conference on World Food Security: the Challenges of Climate Change and Bioenergy – Rome, FAO, 3-5 June
http://www.fao.org/newsroom/

June 2008
FAO June Food Summit
"Failure as Usual" Food Summit
Tunisia pleads for creation of CEN-SAD food security observatory
http://www.apanews.net/apa.php?page=show_article_eng&id_article=66771
Nobel laureate [sic] urges AU summit to prioritize the environment
http://www.apanews.net/apa.php?page=show_article_eng&id_article=67897

Food Crises and Biotechnology

Military Implications:
[Similar on others on food crisis issues] Global, regional, and selected national scenarios on social conflicts should be created to help understand security priorities and points of intervention. The scenario teams should draw on the expertise of FAO, the World Food Program, UNHCR (UN High Commissioner for Refugees), USAID, and others with direct field data experience.
Sources:
  Firms Seek Patents on 'Climate Ready' Altered Crops
http://www.washingtonpost.com/wp-dyn/content/article/2008/05/12/AR2008051202919.html
  Patenting the “Climate Genes”…And Capturing the Climate Agenda
http://www.etcgroup.org/upload/publication/pdf_file/687
  Gene Giants Grab "Climate Genes"
  India's Rice Farmers Abandon Paddies, Deepening Global Shortage
http://www.bloomberg.com/apps/news?pid=20601091&sid=aKifVN0bmi9E&refer=india

Water Scarcity

Military Implications:
The military should intensify efforts to improve and accelerate dialogue and cooperation for an international water management system and the design of an international adaptation and mitigation strategy addressing increased water scarcity and its effects.
Sources:

March 2007
Going nowhere fast: Top rivers face mounting threats
Peru's alarming water truth http://news.bbc.co.uk/1/hi/world/americas/6412351.stm
Polluted air 'triggering drought' in northern China
http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=3469&language=1
April 2008
A Drought in Australia, a Global Shortage of Rice
Water scarcity concerns growing
http://www.planet2025news.net/ntext.xml?id=9837&photo=
Melting mountains a "time bomb" for water shortages
Town in the Andes faces crisis as glaciers melt
http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/04/23/MNSDVIN7E.DTL

May 2008
Global Warming Linked to Rainfall Decline in South-East Australia
Murray-Darling woes linked to global warming: report
http://www.abc.net.au/news/stories/2008/05/02/2233524.htm
Experts warn of never-ending drought

June 2008
Nature laid waste: The destruction of Africa
Water crisis to be biggest world risk
http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2008/06/05/ccwater105.xml

Actions for Addressing Water Security

Military Implications:
Liaison should be sought with the new initiatives for mutual benefit to improve water security in those regions.
Sources:

May 2008
A Review of Decision-Making Support Tools in the Water, Sanitation, and Hygiene Sector
http://www.pacinst.org/reports/WASH_tool/index.htm
Bigger and Better Stormwater BMP Database
http://www.enn.com/press_releases/2480
WERF website http://www.werf.org//AM/Template.cfm?Section=Home

June 2008
Singapore's PM says water security may spark conflicts
http://www.reuters.com/article/environmentNews/idUSSIN27852320080624

Unless Water Management Improves, Conflicts over Water Are Inevitable

Military Implications:
These findings should be used to argue for increased military attention to how it can prevent water-related conflicts. Key military water and/or corruption experts should join the Water Integrity Network.

Sources:
World Water Week in Stockholm; 20-26 August, 2006
http://www.worldwaterweek.org/
Business in the world of water
Cost of water shortage: civil unrest, mass migration and economic collapse
http://www.guardian.co.uk/water/story/0,,1851712,00.html
WBCSD Floats Water Scenarios Project
Report: Water crisis hits rich countries
New Alliance Seeks to Fight Water Sector Corruption
http://www.enn.com/today.html?id=11110
"Asia's Coming Water Wars"
Water, water everywhere?
http://www.economist.com/agenda/displaystory.cfm?story_id=7815561&fsrc=nwl (by subscription only; see full text further in this Appendix)
A Third of the World Population Faces Water Scarcity Today

OSCE Environmental Security Conference Focuses on Land and Water

Military Implications:
Plans to conduct U.S. military training and operate facilities in Eastern Europe could be affected by future policies growing from these discussions. BG (R). Christopher King, Ph.D., P.E., Dean of Academics, U.S. Army Command and General Staff College, led the first panel, speaking about: Concepts of Strategic Environmental Security. Military personnel with related responsibilities should e-mail Dr. King at <Wendell.c.king@leavenworth.army.mil> for his paper and assessment of the conference.

Source:

EC Proposal for Water Pricing

Military Implications:
The military should forecast water-pricing impacts on all its operations in Europe.

Sources:
Commission opens debate on EU water scarcity
http://www.theparliament.com/EN/News/200707/58fe829f-2224-462f-a5bc-81eadd80e13e.htm
Water scarcity and droughts in Europe: Commission addresses key challenge
Water policy in the European Union
http://ec.europa.eu/environment/water/quantity/scarcity_en.htm

Climate Change and Access to Water Addressed as Human Rights

Military Implications:
Military personnel should be asked to consider the following questions: If water were to become a human right in some countries, how might their militaries be called upon to insure that right? How might that affect military-to-military assistance? What new opportunities might that present to further international environmental security?

Sources:
U.N. human rights body turns to climate change
http://www.reuters.com/article/environmentNews/idUSL277844982008080328?feedType=RSS&feedName=environmentNews&sp=true

Human Rights Council Adopts 36 Resolutions and Extends Mandates of 13 Special Procedures at Seventh Regular Session
http://www.unhchr.ch/huricane/huricane.nsf/view01/ADEFF2389520CC0C125741A0071BB93?opendocument

Proposal for Recognizing Water as a Basic Human Right

Military Implications:
[Similar to previous on the same issue] Military personnel who assess potential conflicts related to water and other water management issues should review the outcomes of the meeting for implications for their plans and collaboration opportunities for reducing water problems internationally. The militaries of leading countries should develop a panel on the role of the militaries around the world in solving water problems.

Sources:
First meeting of the Parties (Geneva, 17-19 January 2007)
http://www.unece.org/env/water/meetings/documents_MoPPWH.htm

Protocol on Water and Health

European ECO-Forum Newsletter No. 16, January 2007

PREVENTION AND ADAPTATION

Military Implications:
The military should increasingly include in its training and planning strategies actions related to preparation, adaptation, and mitigation of climate change effects to reduce security-related challenges. Scenarios at local, national, regional, and global level should be considered to identify the hotspots and focus efforts and strategies accordingly.

Sources:
Adaptation Needs and Actions

August 2007
UN Seeks Measures to Combat Climate Change Crises (Update1)
http://www.bloomberg.com/apps/news?pid=20601086&sid=a8EAvfD5BgtIA&refer=latin_america
Investment and financial flows relevant to the development of effective and appropriate international response to Climate Chang
http://unfccc.int/cooperation_and_support/financial_mechanism/items/4053.php

September 2007
Living with climate change. Adaptation strategies needed to build resilience
Immediate Action Crucial To Tackle Affects Of Global Warming, Un Official Warns
As Droughts Intensify, Water And Soil Management Vital To Ensure Food – UN
UN conference recommends WMO climate workshop as a model for enhancing knowledge to combat desertification
http://www.wmo.ch/pages/mediacentre/press_releases/pr794_e.html
Living with climate change. Adaptation strategies needed to build resilience
UN-backed workshop on climate change adaptation fosters policy exchange

October 2007
The Big Dry. Prolonged drought threatens Australia's people, wildlife, and economy
Forecasts predict 'rainfall divide' in Southern Africa
http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=3920&language=1
Rising seas inch toward Thailand's capital
Asian countries learn flood defence
http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=3979&language=1
Asian disaster management project to expand
http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=3931&language=1
China to share disaster expertise
http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=3937&language=1

November 2007
IPCC Fourth Assessment Report (AR4) Summary for Policymakers
UNEP and WMO Panel Puts Final Full Stop Behind Risks and Rewards of Combating Climate Change
Climate Change 2007: The Physical Science Basis (PDF)
http://news.bbc.co.uk/2/shared/bsp/hi/pdfs/02_02_07_climateresport.pdf
FAO publishes *The State of Food and Agriculture 2007*  

Global food crisis looms as climate change and fuel shortages bite  
http://www.guardian.co.uk/environment/2007/nov/03/food.climatechange

FAO forecasts continued high cereal prices  

Mr Pachauri's presentation at the IPCC Press Conference  

December 2007

Southern African nations band together to scale up disaster preparedness – UN  

African nations to coordinate fight against natural disasters: UN  
http://news.yahoo.com/s/afp/20071218/wl_africa_afp/africasadcdisasterun

WMO Hosts First International Symposium on Public Weather Services  

International Symposium on PWS: A Key to Service Delivery (Geneva, 3-5 December 2007)  
http://www.wmo.ch/pages/prog/amp/PWS_Symposium_en.htm

ITU Global Forum adopts actions to strengthen response in emergencies  

Integrating Biodiversity into Climate Change Adaptation Planning  
http://adaptation.cbd.int

January 2008

Under dry sky, Aussies turn to the sea  
http://marketplace.publicradio.org/display/web/2008/01/27/planb_mmr1_desalination

Maldives Builds Barriers to Global Warming  

March 2008

Latest round of UN climate talks to start next week  

Caribbean plans tsunami warning system by 2010  
http://www.alertnet.org/thenews/newsdesk/N13326240.htm

Caribbean Tsunami Warning System to Take Step Forward With Un-Backed Group  

Global Facility for Disaster Reduction and Recovery to Mitigate Impact of Natural Disasters

*Military Implications*

This new entity provides one more point of coordination and information sharing for military disaster support planners.

*Sources:*

World Bank-ISDR partnership to promote resilience of nations and communities to disasters  
Global Facility for Disaster Reduction and Recovery
Global Facility for Disaster Reduction and Recovery
Natural Disasters on the Rise, 2005 The Zenith Year

International Early Warning Programme to Begin Operations

Military Implications:
Relevant military personnel should review the Strategic Plan of the International Early Warning Programme (IEWP) and the outcomes of the First Advisory Group Meeting to find implications for military cooperation. Military logistics personnel should consider making recommendations for national preparedness plans and eventually update previous military plans to support disaster responses.
Sources:
International Strategy for Disaster Reduction. Platform for the Promotion of Early Warning
http://www.unisdr.org/ppew/
The International Early Warning Programme (IEWP) Strategic Plan
Pushing ahead with global disaster early-warning system, UN convenes experts meeting
First Advisory Group Meeting, 26-27 March 2007, Bonn, Germany
http://www.unisdr.org/ppew/iewp/meetings.htm

Indian Ocean Tsunami Warning System Declared Operational, but Local Coordination still Lacking

Military Implications:
Since the military has the capability to help in the event of another major tsunami, it should have some appropriate connection with the central warning system and eventually—until local connections are better established—try to help coordinate local warning and evacuation situations.
Sources:
Indian Ocean Tsunami Warning System up and running
UN-backed tsunami early warning system set to become operation in Indian Ocean
Latest tsunami shows need for complete warning system: UN regional group
Regional Strategies

EU Climate Change Policy

Asia-Pacific to Increase Responses to Climate Change

Military Implications:
Relevant military personnel stationed in these regions should seek opportunities to collaborate with regional leaders in implementing the Army Strategy on the Environment.

Sources:
Adaptation to climate change: it may be a matter of survival! Stavros Dimas, Member of the European Commission, responsible for environment
Climate change: Europe must take adaptation measures to lessen impacts of current and future warming
Adapting to Climate Change –Launching a public debate on options for EU Action
New Diplomacy: Challenges for Foreign Policy (Rt Hon David Miliband MP, Foreign Secretary)
Asian-Pacific countries discuss responses to climate change at UN-backed meeting
Asia-Pacific Examines Ways to Scale Up Responses to Climate Change
Australia's opposition ties Pacific climate to security

U.S. Climate Change Science Program Progress Assessment

Military Implications:
Although military assets are probably being shared for this or similar work, it appears that even greater sharing is needed and should be offered.
Source:
Progress of U.S. Climate Change Science Program Evaluated
http://www.nationalacademies.org/morenews/20070913.html

China to Launch Climate Adaptation Program

Military Implications:
Climate change is now among the highest priorities on the international agenda and it is expected that international efforts for planning for adaptation and mitigation will be intensified. The U.S. Army Corps of Engineers—having the logistics and know-how—should increase worldwide collaboration with counterparts and international organizations.
Source:
China prepares to launch climate adaptation plans
Indigenous Peoples Demand More Involvement in Environmental Policies

Military Implications:
The military, in cooperation with aid and environmental organizations, should work with indigenous peoples to develop sustainable mitigation and adaptation strategies, especially in communities prone to natural disasters and climate change effects. Indigenous people may request new regulations for more restricted and protected areas and/or restraint of specific environmentally damaging actions. Since ingenious people see their cultures increasingly threatened, the military, working with governments, should assess the “hot spots” and try to mitigate potential social unrest.

Sources:
Seventh Session of the United Nations Permanent Forum on Indigenous Issues
Climate Change: Indians Speak Out Against Carbon Markets
http://www.ipsnews.net/news.asp?idnews=42259
Climate change plea from tribe of herders who face extinction
World's Native Peoples Take on Climate Change
http://www.loe.org/shows/segments.htm?programID=08-P13-00019&segmentID=4
Indigenous peoples have crucial role in climate change debate – UN forum
Indigenous peoples most affected by climate change, Assembly President says

Indigenous Peoples Highly Vulnerable to Climate Change

Military Implications
[Same as previous on similar issues] Increasingly more compelling evidences and warnings on climate change amplify international discourse and increase the emergence of international policies trying to tackle the causes and develop strategies to mitigate climate change effects.

Sources:
Symposium: Indigenous Peoples and Climate Change. Thursday and Friday, 12-13 April 2007 Environmental Change Institute, University of Oxford
http://wwweci.ox.ac.uk/news/events/070412conference.php
Indigenous Peoples: the forgotten ‘polar bears’?
Indigenous Peoples on Climate Change Front Lines
HEALTH

Global Health Security Threats

World Health Organization: Stress Environmental Impact on Human Health

Military Implications:
Military health and planning personnel should consider their Area of Responsibility countries’ health profiles as a tool for improving living and health standards of the local population and estimating social instability, as well as for protecting U.S. troops from risks. Although it is not likely that the WHO research would trigger any legally binding regulations, the use of these countries’ profiles might generate national and regional environmental health policies.

Sources:
New country-by-country data show in detail the impact of environmental factors on health

WHO Launched Website on Environmental Health in Emergencies

Military Implications:
AEPI and USACHPPM should review the site to see if there are military environmental health and environmental website links that should be linked with the WHO site. Relevant military health and planning personnel should be notified of the existence of the WHO ‘Environmental health in emergencies’ website as an additional resource for preventing and reducing health implications in case of disasters and emergencies, and for improving response capacity and collaboration, as well as for protecting U.S. troops from risks. The strategies outlined on the WHO website should be reviewed for relevance to military operations and with the expectation that one day some elements might be included in future international agreements.

Source:
Environmental health in emergencies
http://www.who.int/environmental_health_emergencies/en/

WHO Report 2007 Addresses Global Health Security Threats

Military Implications:
The report is a good source for understanding and acting on possible global health threats; and hence should be studied by relevant military personnel.

Sources:
The world health report 2007 - A safer future: global public health security in the 21st century

Global Health Security Initiative Upgrades Its Strategic Policy Process

Military Implications:
If not already done, relevant military personnel should consider collaboration with the Global Health Security Initiative to provide input on possible threats and assistance in building an effective response capacity, as well as help for nations to develop capacity to identify emerging
threats and coordinate actions to address them. Emerging issue identification is an important element in the decision.

Source:
International Health Ministers Plan for Global Preparedness

Environment and Human Health Integration

Military Implications
Relevant military personnel should review and consider the reports for possible additional inputs of an interdisciplinary approach to reduce security threats and improve force protection.

Sources:
* Integrating Environment and Human Health
* Climate, Poverty and Health: Time for Preventive Medicine
* Environment and Health conference website
  http://www.ncseonline.org/2007conference

Changes in Disease Patterns

Military Implications:
Military health and planning personnel should consider estimating social instability, as well as for protecting U.S. troops from risks.

Sources:

February 2007
An island of natural airborne killers
http://www.theglobeandmail.com/servlet/story/RTGAM.20070209.wfungalfears0210/BNStory/Front
Dangerous fungus thrives on West Coast
http://www.theglobeandmail.com/servlet/story/RTGAM.20070209.wfungus0210/BNStory/Clim ateChange/home
Global warming: enough to make you sick

November 2006
Diseases appear on rise with temperature

Actions to Address Health Threats
FAO Launched New Crisis Management Centre

WHO-sponsored pandemic flu task force holds first meeting in Geneva

Military Implications:
The military should continue collaboration with these centers to strengthen military-to-military assistance and training in fighting pandemics, to become more globally integrated and for assisting in planning and performing emergency actions, if needed.

Sources:
New Crisis Management Centre launched by FAO
WHO-sponsored pandemic flu task force holds first meeting in Geneva

Antigenic Maps Help Trace Development of Diseases

Military Implications:
The military should investigate this technique to evaluate its usefulness in assessing the environment in a biological warfare situation.

Source:
Maps Point the Way to Fighting the Flu Virus
http://www.sciam.com/article.cfm?id=antigenic-cartography-maps

Google to Support Development of Early Warning System in Vulnerable Regions

Military Implications:
Relevant military personnel should keep track of the grantees as potential collaborators to improve environmental security. A network of local communities that is able to “predict and prevent” crises could play important roles in enhancing environmental security. Someone at the Deputy Assistant Secretary level might contact Google.org to offer collaboration where possible to improve the effectiveness of grantees’ efforts and to share insights.

Sources:
Google.org Announces Core Initiatives to Combat Climate Change, Poverty and Emerging Threats
Google.org expands funding to attack world crises
http://www.reuters.com/article/latestCrisis/idUSN17226771
$25 Million Begins Google's Charity
http://www.washingtonpost.com/wp-dyn/content/article/2008/01/17/AR2008011703049.html

A Community Guide to Environmental Health Available for Liaison Activities

Military Implications:
Military personnel working with communities on environmental problems should be aware of this publication, and be prepared to share it with their opposite numbers on the community side, as a means of helping them deal with their concerns.

Source:
"A Community Guide to Environmental Health," an Essential Tool Kit for Global Communities Tackling Environmental Problems To Be Released by Hesperian June 18, 2008
http://www.enn.com/press_releases/2529
ENERGY SECURITY

Trends of Energy Use in IEA Countries

Military Implications:
This is a good reference for those responsible for policies to improve military energy efficiencies around the world.

Source:
Energy Use in the New Millennium -- Trends in IEA Countries
http://www.iea.org/w/bookshop/add.aspx?id=312


Military Implications:
Military institutions have to develop rigorous strategies to combat the two main issues of insecure and inadequate energy supplies, and environmental damage, and to look beyond the upfront investment costs of making these changes in order for their operations to be more cost effective in the long run. There is a paradox to be resolved; the energy input to military materiel and operations has historically been on an upward curve, as potential and actual combatants seek to overwhelm opponents by sheer force.

Sources:

EU Energy and Climate Change Policy

Military Implications:
The military should follow the developments of these proposals that might result in new environmental regulations and new standards policies, and consequently emerging strategies, to ensure that military activities comply with the new requirements.

Sources:
European Council conclusions
Hope for major headway on climate protection
Business: 'Climate action useless without global support'
EU's 2020 energy goals to cost over €1 trillion
http://euobserver.com/9/23800

European Action Plan on Energy Efficiency

Military Implications:
The military should consider following the EU new environmental regulations and new standards policies and the consequently emerging strategies, to ensure that its activities in the region comply with the new requirements.

Sources:
- Saving 20% by 2020: European Commission unveils its Action Plan on Energy Efficiency

**China’s Climate Change and S&T Action Plan**

*Military Implications*

This is another opportunity to explore ways of applying the Army’s Strategy on the Environment internationally. Military representatives in China should contact their counterparts to exchange ideas on how the military cooperation can contribute in environmentally oriented science and technology activities.

Sources:
- China’s National Climate Change Programme
- S&T to underpin China's climate activities
  http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=3687&language=1
- China Struggling to Control Urban Pollution
  http://english.sepa.gov.cn/zwxx/hjyw/200706/t20070612_105064.htm
- China now no. 1 in CO2 emissions; USA in second position
  http://www.mnp.nl/en/dossiers/Climatechange/moreinfo/Chinanowno1inCO2emissionsUSAinsecondposition.html

**COMPUTER MODELING**

*Military Implications:*

[Similar for all climate change-related issues] Increasingly more compelling evidence and warnings on climate change amplify international discourse and increase the emergence of international policies trying to tackle the causes and develop strategies to mitigate climate change effects. Hence, the military should be doing its part in reducing greenhouse gas emissions and preparing to help mitigate the human-made and natural catastrophes that could ensue.

Sources:

**August 2006**

- More fires, droughts and floods predicted
  http://www.bristol.ac.uk/news/2006/1053.html
- A climate-change risk analysis for world ecosystems
  http://www.pnas.org/cgi/content/abstract/0601816103v1?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=Marko+Scholze&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT (Abstract)
- Disaster-Prone China Takes Heed of Global Warming
  http://www.planetark.com/dailynewsstory.cfm/newsid/37869/story.htm

**September 2006**
World 'warmest for 12,000 years'
http://news.bbc.co.uk/2/hi/science/nature/5381456.stm
Global temperature change
http://www.pnas.org/cgi/content/full/103/39/14288
Human Activities Are Boosting Ocean Temperatures in Areas Where Hurricanes Form, New Study Finds
Study Strengthens Link Between Global Warming, Fiercer Storms

January 2007
How global warming will change the face of Europe
http://www.thisislondon.co.uk/news/article-23381157-details/How%20global%20warming%20will%20change%20the%20face%20of%20Europe/article.do
http://environment.newscientist.com/article/mg19325874.000?DCMP=NLC-nletter&nsref=mg19325874.000

May 2007
Arctic Ice Retreating 30 Years Ahead of Projections
Arctic sea ice decline: Faster than forecast (abstract)
Arctic melt worse than predictions
Rapid rise in global warming is forecast
http://www.timesonline.co.uk/tol/news/uk/science/article1805870.ece

June 2007
Value of satellites highlighted at World Environment Day
http://www.esa.int/esaEO/SEMBUUEVL2F_planet_0.html
NASA Researcher Finds Days of Snow Melting on the Rise in Greenland

August 2007
Australia First to Model Continental Shoreline Climate Impacts
Prepare for another ten scorching years
http://environment.newscientist.com/article/dn12453-prepare-for-another-ten-scorching-years.html
Global warming will bring stronger storms and tornadoes
http://www.terradaily.com/reports/Global%20warming%20will%20bring%20stronger%20storms%20tornadoes%20study%20999.html
NASA Study Predicts More Severe Storms With Global Warming

February 2008
UN-backed meeting urges governments, scientists to bolster climate predictions
WMO plans conference on improving climate predictions
http://www.terradaily.com/reports/WMO_plans_conference_on_improving_climate_predictions_999.html
http://www.springerlink.com/content/v30j24p29m112g64/ (abstract)
No time to lose in cutting CO2 emissions. *New Scientist*, 27 February 2008

April 2008
New MIT study validates hurricane prediction
Climate Change Likely To Intensifies Storms, New Study Confirms
http://www.sciencedaily.com/releases/2008/04/080417170213.htm
MIT study confirms that climate change creates stronger storms
http://www.planet2025news.net/ntext.rxml?id=9769&photo=
Revisiting the global warming-hurricane link
http://www.csmonitor.com/2008/0414/p02s04-wogi.html

May 2008
Poor forecasting undermines climate debate
http://environment.newscientist.com/channel/earth/mg19826543.700-poor-forecasting-undermines-climate-debate.html (by subscription only; full text below)
They say they want a revolution
World Modelling Summit for Climate Prediction, 6 to 9 May 2008
http://www.ecmwf.int/newsevents/meetings/workshops/2008/ModellingSummit/presentations/index.html
C. Protecting the Environment Due to Its Inherent Moral Value

**ENVIRONMENTAL SECURITY-RELATED INTERNATIONAL REGULATIONS THAT HAVE BEEN COMING INTO FORCE SINCE JULY 2007**


*Military Implications:*
While the U.S. is not yet a party to Protocol V, it would be wise to assume and plan for the seeming eventuality that future international agreements will begin to include retroactive responsibilities. Protocol V is another example of the increasing international consensus in favor of the “polluter pays” principle. Protocol V has no clear implementation mechanisms or deadlines. To provide some leadership, if not already in existence, relevant military personnel might be tasked to create an information system to help responsible countries prioritize their future cleanup operations and, in anticipation, their legacy remnants of war.

*Sources:*
CCW Protocol V on Explosive Remnants of War Enters into Force
http://www.icbl.org/layout/set/print/news/ccw_protocol_v
Portfolio of Mine Action Projects http://www.mineaction.org/section.asp?s=projects
The need for urgent international action on cluster munitions http://www.icrc.org/web/eng/siteeng0.nsf/htmlall/cluster-munition-statement-061106?opendocument

UN Nuclear Terrorism Convention Enters into Force on July 7, 2007

*Military Implications:*
Although the U.S. is not yet Party to the Convention, the military should seek to enhance its international anti-nuclear terrorism collaboration within the framework of the Convention where possible. Environmental relatedness of this Convention derives from the extreme devastation possible from cheap, low-level radiation weapons within the budgets of terrorists.

*Sources:*
UN General Assembly Adopts Global Forest Agreement

*Military Implications:*
The military should review the agreement for military implications on land and forests usage, especially during future training missions.

*Sources:*
Non-legally Binding Instrument on All Types of Forests
General Assembly adopts new agreement to protect world’s forests
Intersessional Activities, Ad-Hoc Expert Groups. To Consider the Content of the Non-legally Binding Instrument
New Global Forest Agreement Depends on Local Support

Waste Export Regulations Revised and Tightened

*Military Implications:*
[Same as previous on related issues] The regulation on transboundary shipments of waste doesn’t seem to have exceptions for the military; hence, relevant military personnel should comply with the new regulation, as appropriate under Status of Forces Agreements.

*Sources:*
Trade and environment. Shipment of non-hazardous waste to certain non-OECD countries:
Green list waste
http://ec.europa.eu/trade/issues/global/environment/waste.htm
Regulation (EC) No 1418/2007
Waste exports: better protection for developing countries
Improved protection on waste exports for developing countries
http://www.morethanwaste.com/Site/Default.aspx/7B662DEFBE639810F0F4

Shipwrecks Removal Treaty Received First Signature

*Military Implications:*
The military/Navy should explore military-to-military opportunities for international cooperation on such ship removals.

*Sources:*
Estonia the first to sign UN-backed sea wreck treaty
New international treaty on wreck removal adopted in Nairobi
http://www.imo.org/About/mainframe.asp?topic_id=1472&doc_id=8070

Environmental Damage to Be Criminalized in the EU

*Military Implications:*

Millennium Project www.millennium-project.org
The Directive does not contain an exception clause for the military. Military organizations stationed in the EU countries should assess the impact of the Directive on their operations and in relation to existing Status of Forces Agreements (SOFAs) and other agreements, and as to whether or how it would affect its service members’, contractors’ and dependents’ activities.

Sources:
Protection of the environment through criminal law
EU criminal law to protect the environment
EU agrees to outlaw 'green' crimes

**European Environmental Liability Directive Came Into Force**

**Military Implications:**
The Directive’s Article 4 Exceptions includes a provision for the military: Paragraph 6 stipulates that “This Directive shall not apply to activities the main purpose of which is to serve national defence or international security nor to activities the sole purpose of which is to protect from natural disasters.” However, since the Army Corps of Engineers and other civil-type activities seem not to be covered by the exception, the military and its contractors acting in the European arena should increase attention to the environmental consequences of their activities.

Sources:
Environment: Liability Directive ensures polluters pay
Environmental liability – Directive

**Europe’s Chemical Regulation (REACH) Entered into Force on June 1, 2007**

**Military Implications:**
The military should assess the REACH system’s impacts on military operations in Europe in relation to existing SOFAs and other agreements, and intensify efforts to find safer alternatives to banned chemicals or those deemed to be of high concern for human health and the environment.

Sources:
June 2007
New European Chemicals Agency starts operations as REACH enters into force
December 2006
New European Chemicals Agency starts operations as REACH enters into force
REACH: Commission welcomes European Parliament vote on new EU chemicals legislation
Environment: Commission welcomes Council action on REACH, climate change and marine protection
Japan Chemical Industry Concerned over New EU Rules
EU law has Del. companies watching

Military Implications:
Military stationed in EU Member States should comply with the directive and make sure that sound e-waste disposal practices are adopted, as appropriate under Status of Forces Agreements.
Sources:
New obligations for end-of-life IT equipment
http://www.business4brunch.com/content/view/207/25/
The IT Chief's Guide to WEEE
http://greenercomputing.com/reviews_third.cfm?NewsID=35442

EU New Directive on Air Pollution
Military Implications:
The military should consider following the EU new environmental regulations and new standards policies and the consequently emerging strategies, to ensure that its activities in the region comply with the new requirements.
Sources:
Commission welcomes Council agreements on air quality directive, hazardous waste
Climate Change and Air Quality: Press Statement at the Environment Council

European Parliament Passed the Fine Particles Air Quality Directive
Military Implications:
The military should assess the effects of the new air quality directive on its operations and explore its role in meeting these new requirements.
Sources:
Environment: Commission welcomes EP vote on the air quality directive
EU Air Quality Directive: MEPs set maximum concentration of microparticles
http://www.env-health.org/a/2762
Progress on the legislative file of the directive on ambient air quality and cleaner air for Europe
http://ec.europa.eu/prelex/detail_dossier_real.cfm?CL=en&DosId=193497

EU Airline Carbon Trading to Start in 2011—a Year Earlier than Planned
*Military Implications:*
[Same as previous on similar issues] It is not clear at this point if the proposed EU regulation concerns just commercial and private flights, or all. The military should explore impacts on its European operations and consult with allied military forces on the status of military exemptions.
*Sources:*
EU backs early start for airline carbon trading
http://www.guardian.co.uk/environment/2008/may/28/travelandtransport.greenpolitics

Europe to Begin Penalizing Jet Pollution in 2011
*Military Implications:*
Although the proposed EU regulation now refers just to civil aviation, the military should explore impacts on its European operations and be prepared for an eventually more inclusive regulation.
*Sources:*
Climate change: Commission proposes bringing air transport into EU Emissions Trading Scheme
Europe Acts to Penalize Jet Pollution
http://www.nytimes.com/2006/12/21/business/worldbusiness

Europe to Propose Emissions Targets for All Flights To/From or Within Europe
*Military Implications:*
Since the proposed EU regulation mentions no exceptions, the military should explore impacts on its European operations and consult with allied military forces on the significance of that apparent omission.
*Sources:*
EU wants cap on airline emissions as of 2011
EU takes aim at airline emissions

Europe Considers Aviation Policies to Reduce Greenhouse Gases
*Military Implications:*
This issue should be monitored to see what new requirements might apply to military aviation.
*Sources:*
EU Parliament Wants Aviation Tax, Emissions Trade
EU to Introduce New Regulations to Combat Surface Waters Pollution

*Military Implications:*
The military units in the EU should follow the development of the new directive and prepare for eventual necessary changes in order to comply with the new regulations.

*Sources:*
Commission takes action to combat surface water pollution from dangerous substances
Priority substances under the Water Framework Directive

EU Waste Shipment Legislation Came into Force in July 2007

*Military Implications:*
The regulation on transboundary shipments of waste doesn’t seem to have exceptions for the military; hence, relevant military personnel should comply with the new regulation, as appropriate under Status of Forces Agreements.

*Sources:*
Environment: new EU waste shipment legislation comes into force today
Waste shipments
http://ec.europa.eu/environment/waste/shipments/legis.htm

European Directive on Ship-Source Pollution Became Effective on April 1, 2007

*Military Implications:*
Since the Directive stipulates no exception for the military, increased prudence to avoid any negligence or pollution should be considered, as appropriate under Status of forces Agreements. Although the Directive’s power is limited to EU waters, increased international cooperation could generate new regulations and marine environmental pollution monitoring systems elsewhere.

*Sources:*
New EU rules to crack down on sea pollution come into effect
Europe Tightens the Screws on Vessels Polluting Ocean Waters
Maritime safety, prevention of pollution caused by ships: penalties for infringements
Anti-Fouling Systems on Ships Convention to Enter into Force in September 2008

Military Implications:
The US is not Party to the AFS Convention, but, since there are no exemption stipulations, relevant military personnel should review the implications for military vessels’ compliance with the Convention’s requirements when entering waters of a State Party to the AFS Convention.

Sources:
Harmful ships' paint systems to be outlawed as international convention meets entry-into-force criteria
International Convention on the Control of Harmful Anti-fouling Systems on Ships
http://www.imo.org/Conventions/mainframe.asp?topic_id=529

Micronesian Nations Sign Coral Reef Protection Document

Military Implications:
Activities associated with the coming International Year of the Reef are likely to encourage other countries to accede to the Declaration. Relevant military personnel, especially in the western Pacific, should review the Declaration and consider new actions to help preserve these fragile and internationally valued environmental features. Over-the-shore training and operations are likely to be affected, as awareness and regulatory efforts develop. Joint and Service guidance could eventually require changes.

Sources:
Three Presidents of Micronesian Nations Sign Reef Check 'International Declaration of Reef Rights' - Pledge to Protect Coral Reefs
http://www.enn.com/press_releases/2153
Reef Check’s International Declaration of Reef Rights Receives Presidential Attention

France Bans 30 Pesticide Components

Military Implications:
The military should review its usage of any materials containing the 53 designated chemicals to ensure that it appropriately complies with this and is prepared for possible similar future bans wherever U.S. Forces are stationed or materiel is sold in nations that follow the French lead in such matters.

Sources:
France scraps licenses for 1,500 pesticides
http://www.enn.com/top_stories/article/30282
French Pesticide Ban Hits Major Listed Firms
http://www.planetark.org/dailynewsstory.cfm/newsid/46752/story.htm

China Issues Electronic Waste Rules

Military Implications:
Considering the huge problem of e-waste pollution from electronic imports in developing countries, Chinese measures are likely to inspire other countries in the region to institute tougher restrictions in line with the Environmentally Sound Management (ESM) of Electronic and Electrical Wastes (e-waste) program of action for the Asia-Pacific region. Military organizations,
especially those operating in East Asia, should review their policies and practices on electronic waste to ensure that they are prepared to cooperate with such actions.

Source:
China Targets Rising Mountain of High-Tech Junk
http://www.enn.com/today.html?id=11121

PROPOSED TREATIES AND/OR CHANGES TO EXISTING ONES

Waste Management

Toxic Waste Disposal of Global Growing Concern

Military Implications:
Considering the increasing attention to waste disposal processes and regulation enforcement, as well as their link to security, it is likely that the Basel Convention will be strengthened and/or special regulations will be set for toxic waste treatment. The military should carefully follow these new developments and be prepared to comply with eventual new directives. Furthermore, it should eventually incorporate observing hazardous waste disposal procedures and trade as part of its security actions in countries where it has peacekeeping forces. This would also be consistent with the stewardship goal in the Army’s Environmental Strategy.

Sources:
Deadly toxic waste dumping in Côte d’Ivoire clearly a crime – UN environmental agency
Africa: The world's 'septic tank'
Poisonous days
http://www.electroniceconomist.com/world/afirca/displaystory.cfm?story_id=7923227 (by subscription only)
Ivory Coast Tragedy Prompts Call for Stricter Toxic Waste Treaty
Toxic waste mystery in Ivory Coast deepens

Basel Convention Needs Revision and Update

Military Implications:
In the absence of a legal framework, the military should adopt its own guidelines based on the conference’s outcomes, and plans for future military-to-military assistance should consider training and logistics support to counter illegal environmental trade.

Sources:
Ninth meeting of the Conference of the Parties to the Basel Convention (COP9)
http://cop9.basel.int/
Delegates fail to agree on banning toxic waste exports at UN conference
UN conference in Bali tackles toxic-waste management
http://www.cbc.ca/world/story/2008/06/26/toxic.html
UN E-Waste Forum and Basel Convention’s Conference of Parties

Military Implications:
Relevant military personnel should review the 30 decisions to identify opportunities for international cooperation, furtherance of the Army’s Strategy on the Environment, and to better anticipate potential new directives, such as e-waste management additions to the Basel Convention and a ship recycling procedure.

Sources:
Basel Convention COP8 website http://cop8.basel.int/
Basel Convention website http://www.basel.int/
Summary of the Eighth Conference of the Parties to the Basel Convention http://www.iisd.ca/basel/cop8/
Dealing with toxic computer waste http://news.bbc.co.uk/2/hi/business/6110018.stm

EU Preparing New Directives on Waste Management and Water Quality

Military Implications:
Although it is not clear when the new directives will be put forward for adoption, relevant military personnel should study the suggestions, follow its developments, and identify what changes in waste management and water-pollution practices might be required.

Source:

European Parliament Proposes Tougher Waste Management Strategy

Military Implications:
Since no exception is stipulated for any sector, the Army should consider revising its waste management practices in the European arena to comply with the new directives.

Sources:
MEPs vote to cut waste mountain http://news.bbc.co.uk/1/hi/world/europe/6355845.stm

EU Vote on Revision of Waste Directive

Military Implications:
[Same as previous on similar issues] The military stationed in the EU should assess the impact of the new directive on their operations and prepare (in accord with Status of Forces Agreements) for eventual necessary changes in order to comply with the new regulations.

Sources:
Commission welcomes EP vote on revision of waste directive

Chemical, Biological, and Nuclear Safety

Stockholm Convention on POPs Adopts Evaluation but not Non-compliance Mechanisms

Military Implications
[Similar to previous on the same issue] Although the U.S. did not ratify the Convention, it should be prepared to comply with its requirements when acting in countries Party. Thus, in addition to the preparation for phase-out of the POPs banned, it should consider the military implications of the additional decisions adopted by the COP-3 and those proposed to be put forward at COP-4.

Sources:
Stockholm Convention COP-3
Summary of the Third Meeting of the Stockholm Convention on Persistent Organic Pollutants
http://www.iisd.ca/vol15/enb15154e.html
Stockholm Convention http://www.pops.int

Stockholm Convention on Persistent Organic Pollutants Is Succeeding in Europe

Military Implications
This study gives good insights for improving the monitoring system of POPs. Although the U.S. did not ratify the Stockholm Convention, it should be prepared to comply with its requirements when acting in countries Party. Thus, in addition to the preparation for phase-out of the POPs banned, it should consider the military implications of those proposed for addition to Convention coverage.

Source:
Evaluating emission protocols for persistent organic pollutants

Call for Reinforcements to Chemical Safety

Military Implications:
The military should follow the work of the Intergovernmental Forum on Chemical Safety and eventually provide input to new safety policies. Although these might not result in legally binding agreements, the discussions will most probably assess the effectiveness of existing chemical safety-related legislation and eventually generate new enforcement and/or safety issues for resolution.

Sources:
Forum V; Chemical Safety for Sustainable Development
Health and environmental concerns associated with heavy metals; global needs for further action?
Eleventh Chemical Weapons Convention

Military Implications:
The state of current and potential future non-lethal weapons should be reviewed in light of possible violations of the CWC. [Similar to previous on the same issue] Those with responsibilities that might be affected by the results of the conference should visit the U.S. Chemical Weapons Convention website http://www.cwc.gov, noting national and international opportunities for assisting in compliance with the CWC regulations.

Sources:
Chemical Incapacitants Must Be Kept From War, Experts Say
http://www.nti.org/d_newswire/issues/2006_12_7.html#C1839F43

Weapons of Terror

Annan calls on governments to destroy ‘cruel and inhumane’ chemical weapons

U.S., Partners to Offer New Program of CWC Support
http://www.nti.org/d_newswire/issues/2006_12_7.html#95296BAD

Nations Get CW Treaty Extensions
http://www.nti.org/d_newswire/issues/2006_12_11.html#263C85C9

EU to Add Carbon and Graphite to REACH Program

Military Implications:
Military procurement personnel should ensure that contractors are complying with these new provisions.

Sources:
"European Chemicals Agency: Turning REACH into Reality” Inauguration of the European Chemical Agency, Helsinki, 3 June 2008

Nanotech Worries Push EU To Seek Full Safety Data For Carbon

IAEA to Upgrade International Nuclear Event Scale

IAEA Director’s Recommendations to Improve Nuclear Safety

Military Implication:
If not already part of the process, relevant military personnel should seek to be involved in the upgrade and revision of the new INES system. It should also be completely informed about the new scales, terminology and strategies put forward by the updated system. Also, the other recent reports might provide input for reducing nuclear terrorism risks.

Sources:
Improving the INES Scale
International Nuclear Event Scale (INES)  
http://www-ns.iaea.org/tech-areas/emergency/ines.htm

International Experts Explore Challenge of Abolishing Nuclear Weapons  

Meeting the Challenge of Abolishing Nuclear Weapons  

The Imperative of Revitalizing Nuclear Disarmament  

Statement to the Fifty-First Regular Session of the IAEA General Conference 2007 by IAEA Director General Dr. Mohamed ElBaradei  

Secretary-General, in message, calls for rededication to ‘noble work’ of bringing Nuclear-test-ban into force  

Scientific Forum  
Global Challenges and the Development of Atomic Energy: The Next 25 Years  
http://www.iaea.org/About/Policy/GC/GC51/ScientificForum

IAEA Illicit Trafficking Database (ITDB). Fact Sheet  
http://www.iaea.org/NewsCenter/Features/RadSources/PDF/fact_figures2006.pdf

**International Norms Led by IAEA Are Needed to Stop Smuggling of Nuclear Materials and Nuclear Proliferation**

*Military Implications:*

The military should consider how to make its civilian contractors know the end user of their sales, and require that they should refuse to sell “when in doubt” and report all questionable requests. Relevant military should work with diplomats and IAEA personnel to identify enforcement mechanisms for new international norms to stop smuggling of nuclear-related materials. Amending the EURATOM treaty as suggested could present new opportunities for increasing US-European cooperation on nuclear non-proliferation and radiation protection.  

*Sources:*

A.Q. Khan’s Nuclear Wal-Mart: Out of Business or Under New Management?  

Highlights of the ISIS Web Site  
http://www.isis-online.org/#highlights

Roadmap to Responsible Export Controls: Learning from the Past  
http://www.exportcontrols.org

NATO Advanced Research Workshop ‘Energy and Environmental Challenges to Security’  
http://www.rec.org/natoworkshop/index.html

The Union’s Energy Policy: A European security challenge. Edit Herczog, member of the European Parliament  
http://www.rec.org/natoworkshop/downloads/session3/herzcog.ppt (power point presentation)

**Better International Controls Needed to Prevent Bioterrorism**

*Military Implications:*

Millennium Project www.millennium-project.org...
Relevant military and diplomatic personnel should liaise with those drafting improved international legal and enforcement frameworks to prevent bioterrorism, and then cooperate with their international counterparts for the improved control regimes.

Sources:
Custom-Built Pathogens Raise Bioterror Fears
http://www.washingtonpost.com/wp-dyn/content/article/2006/07/30/AR2006073000580.html (by subscription only)
The Secretive Fight Against Bioterror
http://www.washingtonpost.com/wp-dyn/content/article/2006/07/29/AR2006072900592.html?sub=AR (by subscription only)
A spy among us?
http://www.baltimoresun.com/news/nationworld/bal-te.detrick30jul30,0,2573448.story
No action on bio-terrorism loophole
http://www.guardian.co.uk/science/story/0,,1834550,00.html?gusrc=rss&feed=18
China to tighten biological export control

Canada Prepares to Ban More Chemicals

Military Implications:
In anticipation of the possibility of similar action being taken internationally or in other jurisdictions, the military should review the Canadian proposal, and military usage of these materials to see if steps need to be taken to prepare for their replacement.

Source:
Ottawa prepared to slap toxic label on widely used chemicals
http://www.canada.com/topics/news/national/story.html?id=b0eeb176-6b3d-4a3e-bb18-29033eb044cc

Canadian Chemical Plan May Go beyond REACH as Environmentalists Get New Political Support

Military Implications:
Considering the strong collaboration between Canada and the U.S., as well as the CEC rules on cross-border pollution, the military should follow the development of the new Canadian environmental policies and be prepared—along with its contractors—to comply with new regulations that might affect its operations.

Sources:
Harper's slow action on chemicals is toxic, says Dion
https://www.liberal.ca/news_e.aspx?type=news&id=12111
Rising tide
Conservatives cracking down on toxic chemicals
Species at Risk. Submmission ID: SEM-06-005
Reactive Nitrogen Beginning To Be Recognized As Environmental Hazard

Military Implications:
The military environmental community should ensure that this problem is receiving adequate attention, and should participate in the Initiative.

Source:
Addressing the 'nitrogen cascade'

Pollution and Greenhouse Gases

Call for Expanding Montreal Protocol on Ozone-Depleting Substances

Military Implications:
The Military and its developers and contractors should prepare to comply with the new HCFCs phase-out schedule.

Sources:
Secretary-General lauds push to hasten phase-out of ozone-depleting compounds
Ozone Treaty's Role in Combating Climate Change Tops Environment Ministers Meeting in Canada
Greenhouse gases could aggravate ozone loss and slow recovery, UN agency says
UN-backed conference ends with push to protect ozone, combat climate change

2007—The International Year of the Ozone Layer

Military Implications:
The anniversary of the Protocol could trigger additional meetings and research to better understand ozone-depleting factors, which might further expand the list of ozone-depleting substances covered by the Montreal Protocol. The military should follow these events to know if new material substitutes will be required.

Sources:
Gallon Newsletter (By e-mail)
UNEP Ozone Theme http://unep.org/themes/ozone/
The Ozone Hole http://www.theozonehole.com/montreal.htm
NASA and NOAA Announce Ozone Hole is a Double Record Breaker
http://www.nasa.gov/vision/earth/environment/ozone_resource_page.html

Countries Contemplating Tougher Regulations for Mandatory Emission Targets

Military Implications:
Leadership by the EU, Japan and Australia may stimulate others to set mandatory emission targets, eventually bringing increased attention to military emission practices. Military liaisons in these countries might seek opportunities for collaboration in emissions reductions.

Sources:
Factbox - UK Response to Stern Review on Climate Change
http://www.planetark.com/dailynewsstory.cfm/newsid/38740/story.htm
Analysis - Japan Needs Policy Overhaul to Avoid Kyoto Failure
http://www.planetark.com/dailynewsstory.cfm/newsid/38709/story.htm
Australia to Push for "New Kyoto" in Asia
Australia plans world's largest carbon storage system

**Air Travel in the EU to Join the Carbon Emissions Trading System by 2011**

*Military Implications:*
It is not clear at this point if the proposed EU regulation concerns just commercial and private flights, or all. The military should explore impacts on its European operations and consult with allied military forces on the status of military exemptions.

Sources:
MEPs back cuts in air travel CO2 emissions
http://euobserver.com/9/25134/?rk=1
EU body adopts strict rules for airline emissions
http://www.reuters.com/article/governmentFilingsNews/idUSL1365000020071113

**EU Advances the Inclusion of Airlines into the Emissions Trading System to 2010**

Sources:
Europe stands firm on ambitious action to cut Aviation Emissions
Written statement of reservation on behalf of the member states of the European Community (EC) and the other states members of the European Civil Aviation (ECAC) [made at the 36th Assembly of the International Civil Aviation Organization in Montreal, 18-28 September 2007]
Lawmakers say airline emissions have to be cut
http://www.neurope.eu/articles/78405.php
MEPs vote to tighten emission limits on aircraft

Provisional Agreement for Including Aviation in the Emission Trading Scheme from 2012
EU Lawmakers Confirm Deal on Airline CO2 Emissions
European Commission Proposed Binding Legislation for Vehicle Emissions Cuts

Military Implications:
Although applying only to EU carmakers, such standards may eventually expand to vehicles from outside the EU that operate in the EU area. The military should review its current and future procurements in light of the new regulations.

Sources:
Commission proposal to limit the CO2 emissions from cars to help fight climate change, reduce fuel costs and increase European competitiveness
EU unveils controversial plans to make cars greener
http://euobserver.com/9/25367/?rk=1
The European car industry. Collision course
Brussels spars with Berlin over car emissions
http://euobserver.com/9/25381/?rk=1
Cleaner Trucks and Buses to Roll across Europe

UK Proposes Individual Carbon Trading

Military Implications:
It is not clear at this point if the points-based system will affect just individuals, or will also be extended to industry sectors including the military. If it is extended to military activities and personnel, then training for reduced carbon emissions should be explored for personnel based in the UK.

Source:
Miliband unveils carbon swipe-card plan
http://www.guardian.co.uk/climatechange/story/0,,1824241,00.html (article accessible free for a limited time; otherwise, subscription required)

European Parliament Approves New Water Quality Standards Directive

Military Implications:
The military stationed in the EU should assess the impact of the new directive on their operations and prepare for eventual necessary changes in order to comply with the new regulations.

Sources:
Environment: Commission welcomes EP vote on water quality standards

Post-Kyoto Protocol Negotiations

Military Implications:
[Same as others on similar issues] Increasingly more compelling evidence and warnings on climate change amplify international discourse and increase the emergence of international...
policies trying to tackle the causes and develop strategies to mitigate climate change effects. Hence, the military should be doing its part in reducing greenhouse gas emissions and preparing to help mitigate the human-made and natural catastrophes that could ensue.

Sources:
Big emitters agree on 'deep cuts,' not targets
UN climate chief asks G8 summit to agree on 2020 emission targets
http://afp.google.com/article/ALeqM5j5licyEX3OISNxt1ovLMpIX3Rxn-Hg
UN Climate Deal Said "Daunting" as Bonn Talks End
http://www.planetark.org/dailynewsstory.cfm/newsid/48793/story.htm
World must spend trillions to cut emissions: IEA
http://afp.google.com/article/ALeqM5hfpZd7sSijH6m99E7NkvDYVL-ywg
NASA warming scientist: 'This is the last chance'
http://seattlepi.nwsource.com/national/1501ap_sci_warming_scientist.html
Germany Approves New Climate Package
http://www.planetark.org/dailynewsstory.cfm/newsid/48865/story.htm

Moves Forward on the Post-Kyoto Negotiations

Military Implications:
The military should continue to accelerate efforts to reduce their own greenhouse gas emissions. These remarks are offered with the realization that the U.S. military may already be among the institutions most compliant with greenhouse gas emission standards, but that good performance might not be good enough in coming years. New international environmental security-related policies and cooperation to avoid potentially large-scale disasters and conflicts seem inevitable. Hence, the military should follow the evolution of these discussions to better anticipate future requirements.

Source:
Environment: Commission welcomes Council action on REACH, climate change and marine protection
Secretary-General Welcomes G-8 Agreement on ‘Strong and Early Action’ To Combat Climate Change
Australia's Howard Plans Asia-Pacific Kyoto Successor
http://www.planetark.com/dailynewsstory.cfm/newsid/42494/story.htm
Denmark seeks global climate deal in 2009
http://euobserver.com/877/24147/?rk=1
Climate Change 'Defining Issue of Our Era,' Says Ban Ki-Moon, Hailing G8 Action
Struggling to save the planet. The Economist, May 31st 2007
http://www.economist.com/world/international/displaystory.cfm?story_id=9261663
Call For “Disaster Diplomacy” as Millions Are Affected
http://www.worldwatch.org/node/5127
UN Climate Change Conference Explores Post-Kyoto Regulations

Military Implications:
The military should continue to accelerate efforts to reduce their own greenhouse gas emissions. These remarks are offered with the realization that the U.S. military may already be among the institutions most compliant with greenhouse gas emission standards, but that good performance might not be good enough in coming years. New international environmental security-related policies and cooperation to avoid potentially large-scale disasters and conflicts seem inevitable. Hence, the military should follow the evolution of these discussions to better anticipate future requirements.

Sources:
Summary of the Twelfth Conference of The Parties To The UN Framework Convention On Climate Change and Second Meeting of The Parties To The Kyoto Protocol
http://www.iisd.ca/vol12/enb12318e.html
United Nations Climate Change Conference - Nairobi 2006
http://unfccc.int/meetings/cop_12/items/3754.php

Possible Tougher Policies Concerning Climate Change

Military Implications:
There is compelling evidence of the consequences of anthropogenic climate change, and a growing world demand for action. The military should continue to accelerate efforts to reduce their own greenhouse gas emissions. New international environmental security-related policies and cooperation to avoid potentially large-scale disasters and conflicts seem inevitable.

Sources:
Dangerous climate change is hitting Africa hard say top aid and environment groups
http://www.neweconomics.org/gen/africaupinsmoke.aspx
Africa—Up in Smoke 2. The second report on Africa and global warming from the Working Group on Climate Change and Development
Merkel to Target Climate Change as G8, EU Leader
http://www.dw-world.de/dw/article/0,2144,2188336,00.html

Bali Roadmap Sets Framework for Post-Kyoto Negotiations

Military Implications:
The military should review the Bali roadmap for opportunities to apply the Army Strategy on the Environment and to contribute to negotiations on the role of the military on mitigation and adaptation to climate change. As suggested in the September 2007 monthly report, the military should bring together information on all its efforts to reduce climate change and its capacities to anticipate and respond to the effects of climate change (e.g., an executive information system) for continual review and improvement, noting efforts to reduce the military environmental footprint, the environmental dimensions in its operations, its role in developing adaptation and mitigation plans, and the inclusion of environment-related factors in conflict prevention strategies.

Sources:
December 2007
United Nations Climate Change Conference in Bali
http://unfccc.int/meetings/cop_13/items/4049.php
Bali Action Plan
Summary of The Thirteenth Conference of Parties to the UN Framework Convention on Climate Change and Third Meeting of Parties to the Kyoto Protocol
http://www.iisd.ca/vol12/enb12354e.html#REDUCING%20EMISSIONS%20FROM%20DEForestation%20IN%20DEVELOPING%20COUNTRIES
Secretary-General Ban welcomes climate change breakthrough in Bali
Countries Agree to Write New Climate Action Pact
World Mayors and Local Governments Climate Protection Agreement
http://www.iclei.org/index.php?id=7337
US Prevails on Climate Draft, Ban Says
Gore Exhorts UN Climate Conference to Act Now
World Bank Will Pay to Leave Forests Standing
So hard to see the wood for the trees
http://www.economist.com/world/international/displaystory.cfm?story_id=10329203
UN Climate Change Conference represents crossroads, Secretary-General says
EU and US at Loggerheads over Climate Change
http://euobserver.com/9/25338/?rk=1
Nobel laureates propose global CO2 tax
http://euobserver.com/9/25312/?rk=1
Some like it cool. The Economist, Dec 19th 2007
http://www.economist.com/opinion/displaystory.cfm?story_id=10335267

February 2008
Lawmakers Gather In Brazil To Discuss Climate Change
http://www.planetark.com/dailynewsstory.cfm/newsid/47050/story.htm
Brazil calls on G8 to meet Kyoto Protocol goals
Japan Considers Emissions Cap And Trade System
http://www.planetark.com/dailynewsstory.cfm/newsid/47080/story.htm
Secretary-General says environment ministers can offer ‘new generation of solutions’ in message to Monte Carlo global forum

March 2008
Bangkok Climate Change Talks - 31 March to 4 April 2008
http://unfccc.int/meetings/intersessional/awg-lca_1_and_awg-kp_5/items/4288.php

Latest Round of UN Climate Talks to Start Next Week

Global climate talks in Bangkok to set stage for future pact

Growth in China's CO2 Emissions Double Previous Estimates

Climate change action delayed by decade's debate

April 2008
Nations agree to look at planes, ships in climate deal
http://afp.google.com/article/ALeqM5j_veCL4RvqgD9xgkgi9R1JdBEjBA

UN Climate Talks Agree on Agenda
http://ap.google.com/article/ALeqM5jRIJomFc4kOiCDSizIKDQ6uLFzvwD8VR8IRG0

Tough road lies ahead for global climate deal

http://www.iisd.ca/vol12/enb12362e.html

Bangkok Climate Change Talks - 31 March to 4 April 2008
http://unfccc.int/meetings/intersessional/awg-lca_1_and_awg-kp_5/items/4288.php

Europe for aviation, shipping cuts
http://howrah.org/World/8720.html

May 2008
From Bali to Poznan: New Issues, New Challenges
http://www.envirosecurity.org/activities/diplomacy/gfsp/climate

National and Regional Initiatives

March 2008
Growth in China's CO2 Emissions Double Previous Estimates

Climate change action delayed by decade's debate

April 2008


Australia 2020 Summit a powerful symbol: editorial
Governors Call for Federal-State Climate Change Partnership
Do global warming pledges matter?

May 2008
G8 Environment Ministers Agree on 2050 Climate Goal

Clean Development Mechanism (CDM) successful

Military Implications
The military should continue to reduce its environmental footprint, develop strategies to mitigate climate change effects, have its contractors participate in the CDM, and cooperate where possible with others to these ends.
Sources:
Deadlock at climate talks mars Kyoto hopes
http://www.alertnet.org/thenews/newsdesk/L1840731.htm
EU rejects 'weak' UN paper on climate change
http://euobserver.com/9/24053/?rk=1 (by subscription only; full text in the Appendix)
Commission on Sustainable Development (CSD) 115th session
Australia demands "New Kyoto" in place of "Old"
http://www.alertnet.org/thenews/newsdesk/SYD71858.htm

Other post-Kyoto Treaty-related Conferences and reports

Military Implications:
[Similar to other on related issues] The military should continue to reduce its environmental footprint, develop strategies to mitigate climate change effects, have its contractors participate in the CDM, and cooperate where possible with others to these ends.
Sources:

August 2007:
Vienna Climate Change Talks 2007. AWG4 and the Dialogue 4
http://www.iisd.ca/climate/awg4/ (This site might be slow in opening, owing to many graphics.)
Kyoto Protocol Parties move closer to trading emission allowances
Countries agree on need of global response at UN climate change conference

September 2007:
BURKINA FASO: Innovation and education needed to head off water war
Environment: Parliaments Said to be "Weak" in Fighting Desertification
http://www.ipsnews.net/africa/nota.asp?idnews=39242
The eighth Conference of the Parties to the United Nations Convention to Combat Desertification (UNCCD COP8) kicked off on Monday in Madrid and will conclude on 14 September.
http://allafrica.com/stories/200709040686.html

Annan's aid forum tackles natural disasters
http://www.swissinfo.org/eng/front/detail/Annan_s_aid_forum_tackles_natural_disasters.html?siteSect=105&sid=8225163&cKey=1190040507000&ty=st
Climate change tops future humanitarian challenges: Annan
http://afp.google.com/article/ALeqM5jcSVcpfxI_Gb8al1rNmai6Xh63_w
Annan's humanitarian forum to start work in October
Climate change affecting Pakistan's environment: Faisal Saleh

October 2007
Environment ministers target 2009 climate treaty
http://www.alertnet.org/thenews/newsdesk/JAK103022.htm
Contributions to accelerating atmospheric CO2 growth from economic activity, carbon intensity, and efficiency of natural sinks
http://www.globalcarbonproject.org/activities/AcceleratingAtmosphericCO2.htm
A clog in the world's carbon dioxide 'sinks'
Carbon sinks failing to keep up with emissions. mongabay.com, October 22, 2007
The President announces that the Maldives was going to open a resident diplomatic mission in Singapore shortly

November 2007
The President grants an interview to BBC Radio’s World Today programme, on the human dimension of global climate change
Radio Interview with Maldives President, Maumoon Abdul Gayoom:
Climate change conference opens in Maldives
President Gayoom calls on the international community to grant universal recognition to the fact that environmental protection, preservation and security are part of an individual’s basic human rights.

April 2008
Delivering Climate Security: International Security Responses to a Climate Changed World
http://www.informaworld.com/smpp/title~content=g792406239~db=mass
Climate change 'may put world at war'
Energy Saving


Military implications:
Military personnel with responsibilities for advanced energy efficiencies with reduced environmental impacts should seek opportunities for collaboration within this agreement.

Source:
http://www.nrcan.gc.ca/media/newsreleases/2007/200766_e.htm

Vanishing Supply of World's Helium Calls for Conservation

Military Implications:
The military should conserve the supply of helium and seek substitutes and less expensive methods for its production. Recovery and recycling programs should also be considered by the military and civilian contractors.

Source:
Helium Supplies Endangered, Threatening Science and Technology
http://www.enn.com/top_stories/article/28495

Ban on Incandescent Light Bulbs Expands

Military Implications:
In anticipation of these restrictions (and because of CFLs' inherent advantages), the military should begin planning for an eventual worldwide switchover to the new devices.

Sources:
Lighting the Way to a Greener Future: Canada's New Government to Ban Inefficient Light Bulbs
Ontario turns out the lights on inefficient bulbs
Australia says lights out to incandescent bulbs

Compact Fluorescent Light Bulbs (CFLs) May Surge to Fore

Military Implications:
In anticipation of these restrictions (and because of CFLs' inherent advantages), the military should begin planning for an eventual worldwide switchover to the new devices.

Source:
California may Ban Conventional Lightbulbs by 2012
http://www.planet2025news.net/ntext.rxml?id=4032&photo=

European Lamp Companies Push Compact Fluorescents, as Does the EU

Military Implications:
These steps indicate that the military should give a high priority to planning for worldwide conversion to CFLs.

Source:
European Lighting Industry Agrees to Push Energy-Saving Bulbs
http://www.enn.com/today.html?id=12318

**Biological Diversity**

**New Mechanisms for Enforcing Biosafety and Biological Diversity Treaties**

*Military Implications:*
[Same as previous on similar issues] The military should note the outcomes of the two meetings and be prepared to comply with the new requirements, including genetically modified organism (GMO) labeling of food containers it brings into Protocol member countries and new measures for protecting biodiversity.

*Sources:*
Fourth meeting of the Parties to the Cartagena Protocol on Biosafety (COP-MOP 4)
http://www.cbd.int/mop4/
Agreement Reached to Work towards a Legally Binding Instrument on Liability and Redress with Regard to GMOs
Rules, Procedures and Mechanisms Applicable to Processes under the Cartagena Protocol on Biosafety
Loss of Animal Species and Crops Is ‘Devastating’ - Secretary-General Ban
Ninth Meeting of the Conference of the Parties to the Convention on Biological Diversity
http://www.iisd.ca/biodiv/cop9

**United Nations Agreement to Protect the World’s Forests Adopted**

*Military Implications:*
The document should be reviewed for implications on military usage of land and forests, especially during future training missions.

*Sources:*
UN adopts new International Agreement to protect world’s forests
New Agreement on Sustainable Management of World’s Forests Focus, As United Nations Forum Opens Two-Week Session
UNFF7 Documents

UN General Assembly Adopts Global Forest Agreement

*Military Implications:*
The military should review the agreement for military implications on land and forests usage, especially during future training missions.

Sources:
Non-legally Binding Instrument on All Types of Forests
General Assembly adopts new agreement to protect world’s forests
Intersessional Activities, Ad-Hoc Expert Groups. To Consider the Content of the Non-legally Binding Instrument
New Global Forest Agreement Depends on Local Support

Deforestation Not Yet Adequately Addressed by International Regulations

Military Implications:
In addition to considering forest protection in its planning, military deployed in areas vulnerable to undesirable deforestation should work with the local communities to find strategies to avoid unsustainable practices and help capacity-building to increase sustainable development.

Sources:
Forests play key role against climate change, UN tells African-Near East meeting
UN: Mangrove Forests Vanishing at an "Alarming" Rate
With Africa leading, UN says world fells trees at 'alarming' rate
http://canadianpress.google.com/article/ALeqM5gggsgsXc-FLgGsLpo3A2ZwqOADyw

UNESCO Added 23 New Reserve Sites in 18 Countries

Military Implications:
[Similar to previous on the same issue] The military should keep up-to-date with the list of protected sites and plan any operations near them accordingly. Citing the Army’s new Strategy for the Environment, the military should seek new opportunities to participate in dialogues among scientists, politicians, environmental NGOs, and economic decision-makers for improving biodiversity management strategies, as well as in planning its own operations.

Source:
Twenty-three new biosphere reserves join UNESCO’s Man and the Biosphere (MAB) network

New Sites Added to World’s Protected Biosphere Reserves

New Strategy of UNESCO World Heritage Committee for Heritage Sites and Climate Change

Military Implications:
The military should keep up-to-date with the list of protected and/or endangered sites and plan its operations accordingly. Citing the Army’s “Strategy for the Environment,” the military should
seek new opportunities to participate in dialogues among scientists, politicians, environmental NGOs, and economic decision-makers for improving biodiversity management strategies, as well as in planning its own operations. Also, Arctic missions may provide new information on global environmental changes and may be relevant to the U.S. military’s interest in the Northwest Passage. Military scenarios should also be considered to respond to disasters affecting indigenous arctic peoples.

Sources:
Twenty-five biosphere reserves added to UNESCO’s Man and the Biosphere (MAB) Network
World Heritage Committee adopts strategy on heritage and climate change
Swiss Map Permafrost After Signs Alps Crumbling
http://www.planetark.com/dailynewsstory.cfm/newsid/37442/story.htm
Global Warming Puts 12 US Parks at Risk – Report

International Polar Year 2007-2008

Military Implications:
In view of the increasing importance of the Arctic in military planning and the oil reserves that will eventually be accessible due to climate change in the Arctic, overlapping national boundaries of the U.S., Russia, Norway, Denmark, and Canada, appropriate military personnel should liaise with the body of IPY researchers to exchange information and ideas. They should focus especially on the environmental impact of military operations in the polar regions and to be updated on such developments as new scientific discoveries, long-range oil issues, and possible emerging new policies.

Sources:
ESA contribution to International Polar Year 2007-2008
http://www.esa.int/esaCP/SEMG1DN0LYE_Protecting_0.html
U.S. Launches International Polar Year on Feb. 26
Huge polar study ready to begin
http://news.bbc.co.uk/2/hi/science/nature/6389857.stm

Marine Environment

International Conference and Assessments Find Rising Ocean Pollution

Military Implications:
Environmental surveillance and data analysis is improving the amount and quality of the information needed to help reduce marine pollution. In addition to improving its own environmental performance, the military should consider offering assistance in regions where pollution control is inadequate.

Sources:
Integrated Water Management Key to Cleaning-up Oceans
Concern Over Oceans Despite Receding Oil & Chemical Threats
Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities
http://www.gpa.unep.org/bin/php/home/index.php
The State of the Marine Environment: Trends and Processes
Further Rise in Number of Marine ‘Dead Zones’
Curbing Coastal Pollution Aids Recovery of Heat-Stressed Corals

Roadmap for Establishing the Global System of Marine Protected Areas

Military Implications:
Relevant military personnel should consider reviewing the roadmap for eventual new directives and/or regulations that might be triggered by its implementation.

Sources:
New road map for establishing marine protected area networks
Establishing Networks of Marine Protected Areas – Making It Happen

New Marine Protected Areas Proposed

Military Implications:
The military should study the proposals’ impact on its activities in the respective areas and be prepared to comply with possible new restrictions.

Sources:
Whale Protections Proposed for Strait of Gibraltar
Urgent protection proposed for whale and dolphin habitats in the Mediterranean and Black Seas
http://www.cetaceanhabitat.org/view_all_news.php#
The state of World Fisheries and Aquaculture 2006
http://www.fao.org/docrep/009/A0699e/A0699e00.htm
Slow Down and Watch Out for Whales, Spain Tells Ships in Strait of Gibraltar
http://www.enn.com/today.html?id=12286
WWF launches marine protection campaign in the Southern Ocean

IMO Sets New Limits on Ship Fuel Pollution

Military Implications:
The military must take these tightening requirements on maritime fuel composition into account in planning future fuel and vessel acquisitions.

Source:
Short sea shipping at risk from IMO sulphur laws
IMO environment meeting to consider revised regulations on ship emissions
http://www.imo.org/
U.N. body to slash ship fuel pollution by 2015
http://www.reuters.com/article/environmentNews/idUSL0487267520080404

**Marine Protection to Increase**

*Military Implications:*
The Navy and the military involved in marine operations should monitor the course of new regulations to ensure compliance, as well as to reduce their activities’ possible negative effect on the marine ecosystem.

*Sources:*
2008 Scientific Committee report
http://www.iwcoffice.org/sci_com/screport.htm

Oxygen-starved oceans rapidly dying

Ministry of the Environment, New Zealand’s ocean: http://www.mfe.govt.nz/issues/oceans/
Legislation to safeguard ocean ecosystems
http://www.scoop.co.nz/stories/PA0806/S00460.htm

**Tougher Law of the Sea Regulations Suggested for Marine Genetic Resources**

*Military Implications:*
Although the United States is not Party to the Law of the Sea, it would be wise to keep track of these suggestions and comply where possible, for good stewardship and in case the U.S. does join at a later stage.

*Sources:*
United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea
States Reach Partial Agreement on Marine Genetic Resources at UN Talks
http://www.newsletterarchive.org/2007/06/30/180929-STATES+REACH+PARTIAL+AGREEMENT+ON+MARINE+GENETIC+RESOURCES+AT+UN+TALKS

Countries Address Marine Genetic Resources at UN Talks

Uncertainty Hindering Management of Marine Genetic Resources, UN Meeting Told

**Shipping to Face New Regulations to Reduce Air Pollution**

*Military Implications:*
It is likely that the IMO assessment and increasing pressure from environmental groups, and even political agents, will trigger regulations on pollution generated by the shipping industry. The military should seek to use the most environment-friendly technologies in order to reduce its pollution and also should be prepared for eventual new regulations.
Sources:
Shipping must act on air emissions
http://www.reuters.com/article/tnBasicIndustries-SP/idUSL1286905420070913
Curbing ship emissions seen needing global rules
http://uk.reuters.com/article/environmentNews/idUKL0754092020070907
from the Secretary-General of the International Maritime Organization, Mr. Efthimios E. Mitropoulos
http://www.imo.org/includes/blastDataOnly.asp/data_id%3D19507/9535.pdf
EPA Hauled into Court over Ship Smokestack Pollution
Concerns over Maritime Air Pollution Increase
Military Implications:
Although emissions from military ships make up only a tiny fraction of this polluting source, the
Navy should be prepared for new international anti-pollution regulations that may not exempt
military craft.
Sources:
BLG Sub-Committee agrees technical proposals for reduction of air pollution from ships
Ship CO2 emissions at 3.5 pct of global total: IMO
http://www.planet2025news.net/ntext.rxml?id=6196&photo=
Pollution from ships big worry
True scale of CO2 emissions from shipping revealed
http://www.guardian.co.uk/environment/2008/feb/13/climatechange.pollution
Shipping boom fuels rising tide of global CO2 emissions
http://www.guardian.co.uk/environment/2008/feb/13/climatechange.pollution1?gusrc=rss&feed=uknews
Emissions concerns rise over ships’ fuel
Shipping Regulations for Protecting Whales
Military Implications:
Military involved in maritime operations should plan and conduct enhanced vigilance in areas
with special ecological features and be prepared to comply with increasing maritime protection
regulations.
Sources:
Cdn proposal would divert ships from right whale conservation area
Shipping Lanes Into Boston Moved To Protect Whales
http://www.enn.com/top_stories/article/6841
Petition Seeks Ship Speed Limits in Santa Barbara Channel to Stop Blue Whale Killing
http://www.enn.com/press_releases/2167
Whale Conservation Protected Efforts Increasing

*Military Implications:*
Military operating in marine regions designated as conservation areas should increase vigilance and be prepared for new restrictions on activities that might threaten marine endangered species.

*Sources:*
Puget Sound Orca Recovery Plan Released
Salty shepherds. The Economist, Jan 24th 2008
New Zealand PM Warns Off Japanese Whalers
A Change in Climate for Whales. Second Pew-Sponsored Whale Symposium
http://www.pewwhales.org/tokyosymposium/
http://www.iwcoffice.org/meetings/intersession.htm

Commercial Whaling Ban Strengthened by International Whaling Commission (IWC)

*Military Implications:*
The overwhelming vote in favor of the resolution to keep the ban reveals a clear trend towards strengthening marine conservation regulations’ enforcement systems. However, precedents show that, in the case of whales, Japan repeatedly violated the moratorium. If so, then the military might at some point be asked to help in monitoring compliance.

*Sources:*
Commercial whaling ban strengthened at Anchorage whaling meeting
http://www.greenpeace.org/international/news/commercial-whaling-ban-strengt
Draft Resolution CITES, IWC/59/19 Agenda Item 14.3

London Convention Might be Expanded to Include Ocean-based Geoengineering

*Military Implications:*
The U.S. is Party to the 1972 London Convention and a signatory of the 1996 Protocol. It is reasonable to speculate that the discourse over ocean-based geoengineering might trigger new regulations or modifications of the existing ones to increase protection of the marine environment from human activities. It would be wise to keep track of these suggestions and apply the precautionary principle to show good stewardship and also to be prepared to comply with eventual new requirements.

*Sources:*
London Convention Puts Brakes on Ocean Geoengineering
Civil Society groups call on London Convention to halt marine dumping geoengineering experiments
Urea 'climate solution' may backfire
Global Forum Sets Out Program to Save Marine Environment
Micronesian Nations Sign Coral Reef Protection Document

Military Implications:
Activities associated with the coming International Year of the Reef are likely to encourage other countries to accede to the Declaration. Relevant military personnel, especially in the western Pacific, should review the Declaration and consider new actions to help preserve these fragile and internationally valued environmental features. Over-the-shore training and operations are likely to be affected, as awareness and regulatory efforts develop. Joint and Service guidance could eventually require changes.

Sources:
Three Presidents of Micronesian Nations Sign Reef Check 'International Declaration of Reef Rights' - Pledge to Protect Coral Reefs
http://www.enn.com/press_releases/2153
Reef Check’s International Declaration of Reef Rights Receives Presidential Attention

Baltic Ministers Recommend Additions to Baltic Sea Action Plan

Military Implications:
Military representatives should follow these developments to assess their possible effect on operations in the Baltic region.

Sources:
Baltic ministers call for ambitious Baltic plan
http://www.planet2025news.net/ntext.rxml?id=4909&photo=
Baltic Sea Acton Plan

EU Integrated Maritime Policy

Military Implications:
Military and civilian contractors with marine resources should review the EU Integrated Maritime Policy for eventual implications for its activities in the region.

Source:
EC unveils new EU maritime policy
http://www.esa.int/esaEO/SEM6DE2PL7F_environment_0.html

Political Agreement Reached on the European Marine Strategy Directive

Military Implications:
Relevant military personnel should be alert to new requirements imposed by the Marine Strategy Directive. Although the Directive’s power is limited to EU waters, increased international cooperation could generate new regulations and marine environmental pollution monitoring systems elsewhere.

Sources:
Environment: Commission welcomes Council action on REACH, climate change and marine protection
Strategy for the marine environment
A Marine Strategy to save Europe's seas and oceans
http://ec.europa.eu/environment/water/marine.htm
Regionalization of the EU waters

**European Parliament Passed the Marine Strategy Directive**

*Military Implications:*
Military personnel with environmental responsibilities should review the directive to identify ways to appropriately cooperate with the EU states in implementing the new directive. Although the directive’s power is limited to EU waters, elements of the directive could eventually be adopted in other regions of the world.

*Sources:*
A Marine Strategy to save Europe's seas and oceans
http://ec.europa.eu/environment/water/marine/index_en.htm

**Transport Canada Proposes New Vessel Operation Regulations**

*Military Implications:*
Although the proposed Vessel Operation Restriction Regulations concern just commercial and recreational navigation, considering the extent of waterways common to U.S. and Canada, relevant military personnel should review the regulations and consider providing comments to ensure that the Regulations do not impede future U.S. military operations. Also, the military should instruct its contractors to review the new regulations to assure compliance.

*Source:*
Transport Canada Proposes Vessel Operation Restriction Regulations
http://www.tc.gc.ca/mediaroom/releases/nat/2007/07-h156e.htm

**Malacca Straits Need Increased Protection from Various Security Threats**

*Military Implication:*
Relevant military personnel should liaise with counterparts in the region and explore opportunities for collaboration in both counter-piracy/terrorism measures and environmental protection and cleanup.

*Source:*
Malacca, Asia's Most Important Sea Lane
Network of Marine Educators Formed to Protect Pacific

_Military Implications:_
In view of increasing activity to protect the oceans, especially the Pacific, and of the high level of US operations in the area, appropriate military personnel, e.g. in USPACOM, should establish liaison with this network (through Sylvia.spalding@noaa.gov ) in order to exchange information and ideas with environmental security educators in the region.

_Sources:_
International Pacific Marine Educators Conference Establishes Network to Protect the Ocean, Presentations Available Online (Press release)  
[http://www.ipmec.info/pr.htm](http://www.ipmec.info/pr.htm)
International Pacific Marine Educators Conference Establishes Network to Protect the Ocean  
[http://www.enn.com/net.html?id=1816](http://www.enn.com/net.html?id=1816)

Website for Marine Protected Areas and Cetaceans’ Sanctuaries

_Military Implications:_
The cetaceanhabitat.org site might be a valuable “one stop shop” for information on protected marine areas. Relevant military personnel should consider consulting it regularly for possible new proposals and information relevant to its high sea activities.

_Sources:_
Whale Protections Proposed for Strait of Gibraltar  
Urgent protection proposed for whale and dolphin habitats in the Mediterranean and Black Seas  
[http://www.cetaceanhabitat.org](http://www.cetaceanhabitat.org)

New Pacific Marine Protected Area Is World’s Largest

_Military Implications:_
Naval authorities in the region should ensure that their operations conform to the restrictions imposed on this new Marine Protected Area.  
_Source:_
Kiribati creates world's largest marine reserve  
[http://uk.reuters.com/article/idUKSP23110320080214?pageNumber=3&virtualBrandChannel=0&sp=true](http://uk.reuters.com/article/idUKSP23110320080214?pageNumber=3&virtualBrandChannel=0&sp=true)

Plastic Threats to the Marine Environment

_Military Implications:_
Increased awareness and compelling evidence of the impact of plastics on the environment in general, and the marine one specifically, might trigger updates to such regulations as the Convention on the Prevention of Marine Pollution or even new rules specifically regulating plastics. The military should ensure that its procedures comply with the best practices, and reduce, as much as possible, dumping of polluting material (such as plastic) in marine or other non-appropriate environments to avoid criticism and eventual penalties. It should also increase efforts to use biodegradable materials whenever possible and replace the non-degradable ones.

_Source:_
Warning on plastic's toxic threat  
Heavy Metals

Call for Global Ban on Lead-based Paints

Military Implications:
It is likely that a binding instrument on lead will emerge – as on mercury [See Progress on Global Mercury Ban in February 2007 environmental security report] and as the Restriction of Hazardous Substances (RoHS) Directive in the EU. For personnel and dependent preventive health reasons, as well as in preparation for compliance with eventual international regulation, the military should consider eliminating—where possible—the use of heavy metals in paints.

Sources:
Scientists Call For Global Ban on Lead-Based Paints
Consumers: Chinese toys containing lead from Fisher Price recalled in Europe
US recalls more Chinese-made toys; lead paint mars bobble heads
http://ca.news.yahoo.com/s/afp/071025/usa/us_china_company_consumer_toys_recall_mattel_1
China governance system faulted in U.S. toy debate
http://www.reuters.com/article/domesticNews/idUSN1221109720070912
Agenda item 8: Heavy Metals: need for further global action? The Budapest Statement on Mercury, Lead and Cadmium

Progress on Global Mercury Ban

Military Implications:
Relevant military personnel should assess which areas would be affected by an eventual global regulation on the use of mercury and seek replacements.

Sources:
World leaders agree to phase out mercury
Ottawa's refusal to join protocol cutting mercury draws critics' fire
(by subscription only)

EU Seeking Global Mercury Ban

Military Implications:
Relevant military personnel should assess which areas would be affected by the mercury export ban (from Europe by 2011) and then by an eventual global regulation on the use of mercury. Such developments could complicate repatriation or movement of materiel.

Sources:
EU seeks global mercury ban
European Parliament Passed Resolution Calling for Global Ban of DU Weapons

*Military Implications:*
The military should continue pursuing R&D for substitutes and be prepared for increased political pressure for current and past battlefield cleanup.

*Sources:*
European Parliament passes far reaching DU resolution in landslide vote
Protection of the environment through criminal law

International Convention on Cluster Munitions Adopted by 111 Countries

*Military Implications:*
Although the U.S. does not support the Cluster Munitions Convention, it would be wise for the military to make plans for the elimination of cluster bombs, as international opinion continues to grow against these weapons, possibly resulting in changed policy during the next administration.

*Sources:*
Dublin Diplomatic Conference, May 19-30, 2008
http://www.clustermunitionsdublin.ie/
Cluster Munitions: Convention a major step forward for the protection of civilians
http://www.icrc.org/Web/Eng/siteeng0.nsf/html/cluster-munitions-news-290508
Cluster Bomb Treaty Breaks New Ground
http://hrw.org/english/docs/2008/05/30/18976.htm
Cluster bomb ban treaty approved
http://news.bbc.co.uk/2/hi/europe/7423714.stm
Constitution banning cluster bombs adopted
Norway: British support crucial to cluster bomb treaty
http://www.iht.com/articles/ap/2008/05/30/europe/EU-GEN-Norway-Britain-Cluster-Bombs.php
Ban 'delighted' at adoption of new cluster bomb convention
UN refugee agency welcomes adoption of pact to ban cluster bombs

Non-Proliferation Treaty Deadlock Continues

Military Implications:
[Same as others on this issue] The military should seek alternative means that might be more effective in working with the appropriate agencies to facilitate the NPT negotiations to improve global nuclear safety than is now the case.
Sources:
PREPCOM 2008, 2010 NPT Review
Nuclear States Joint Statement
Geneva Talks Pave Way to 2010 NPT Review
http://www.iaea.org/NewsCenter/News/2008/genevatalks.html
NPT Meeting Wraps Up in Geneva
http://www.nti.org/d_newswire/issues/2008_5_9.html#8360B7DE

Nuclear Nonproliferation Treaty Stalemate Continues

Military Implications:
[Same as previous on this issue] The military should seek alternative means that might be more effective to work with the appropriate agencies to facilitate the NPT negotiations to improve global nuclear safety than is now the case.
Sources:
Preparatory Committee for the 2010 Non-Proliferation Treaty Review Conference
Countries Join U.S.-Russia-led Global Initiative To Combat Nuclear Terrorism
http://www.state.gov/r/pa/prs/ps/2007/may/84503.htm
Current Partner Nations to the Global Initiative to Combat Nuclear Terrorism
http://www.state.gov/t/isn/82787.htm

Australia to Propose Panel to Advance Work for the NPT Review in 2010

Military Implications:
The military should explore the Australian initiative as an alternative to facilitate the NPT negotiations to improve global nuclear safety.
Sources:
Rudd takes up fight against nukes
http://www.fatf-gafi.org/dataoecd/50/1/40879782.pdf
Funding Channels Aid Proliferation, Task Force Says

Progress on the Nuclear-Test-Ban Treaty
Military Implication:
If not already part of the process, relevant military personnel should seek to be involved in the upgrade and revision of the new INES system. It should also be completely informed about the new scales, terminology and strategies put forward by the updated system. Also, the other recent reports might provide input for reducing nuclear terrorism risks.
Sources:
Improving the INES Scale
International Nuclear Event Scale (INES)
http://www-ns.iaea.org/tech-areas/emergency/ines.htm
International Experts Explore Challenge of Abolishing Nuclear Weapons
Meeting the Challenge of Abolishing Nuclear Weapons

Revitalizing Nuclear Disarmament
Military Implication:
If not already part of the process, relevant military personnel should seek to be involved in the upgrade and revision of the new INES system. It should also be completely informed about the new scales, terminology and strategies put forward by the updated system. Also, the other recent reports might provide input for reducing nuclear terrorism risks.
Sources:
The Imperative of Revitalizing Nuclear Disarmament
Statement to the Fifty-First Regular Session of the IAEA General Conference 2007 by IAEA Director General Dr. Mohamed ElBaradei
Secretary-General, in message, calls for rededication to ‘noble work’ of bringing Nuclear-test-ban into force
Scientific Forum
Global Challenges and the Development of Atomic Energy: The Next 25 Years
http://www.iaea.org/About/Policy/GC/GC51/ScientificForum
IAEA Illicit Trafficking Database (ITDB). Fact Sheet
http://www.iaea.org/NewsCenter/Features/RadSources/PDF/fact_figures2006.pdf
Progress for Enforcing Biological Weapons Convention

*Military Implications:* [Similar to previous on the same issue] Without better international controls, terrorist access to biological weapons seems inevitable. Great progress has been made on bioweapons sensors over the past several years, some of which have been referenced in these monthly reports for AEPI. Relevant military personnel should consider making recommendations at the upcoming intersessional meetings.

*Sources:*
From Adjacency To Synergy: Meeting of States Parties to Biological Weapons Convention Concludes
2007 Meeting of States Parties: 10-14 December 2007
NAM Concerned At Biological Weapons Convention
http://www.namnewsnetwork.org/read.php?id=35499

Biological Weapons Convention Lacks Enforcement Mechanism, Warns Russian General

*Military Implications:* Considering the pressure from high profile officials and organizations, it is reasonable to speculate that the enforcement issue will get on the agenda of the next BWC meetings. The military should collaborate with its counterparts in designing enforcement mechanism to help reduce as much as possible the threats of biological weapons or accidents.

*Source:*
Enforcement Needed for BWC, Russian General Says
http://www.nti.org/d_newswire/issues/2008_3_12.html#9729B07E

Sixth Review Conference of the Biological Weapons Convention

*Military Implications:* Without better international controls, terrorist access to biological weapons seems inevitable. Great progress has been made on bioweapons sensors over the past several years, some of which have been referenced in these monthly reports for AEPI. Relevant military personnel should consider making recommendations at the upcoming intersessional meetings.

*Source:*
BWC Review Conference Hailed as Success
http://www.nti.org/d_newswire/issues/2006_12_11.html#60E54D1D
Draft Declaration
http://www.unog.ch/80256EDD006B8954/(httpAssets)/1CEE7A27069559C5C125723E00647FBF/Sfile/BWC+CONF.V1+CRP.4-altered+as+ammended.pdf
Biological and Toxin Weapons Convention (BTWC) website http://www.opbw.org/

Chemical Weapons Convention Gets New Boost

*Military Implications:*
[Similar to previous on the same issue] Those with responsibilities in this area should: 1) consider assessing national and international opportunities for assisting in compliance and improving effectiveness of the CWC regulations, and 2) stress attention to and inclusion of new threats.

Sources:
Second Review Conference
http://www.opcw.org/rc2/index.html
Nations Demand Adherence to CW Disposal Deadlines
http://204.71.60.36/d%5Fnewswire/issues/2008/4/8/9cb5bc8a%2D5136%2D4594%2Da750%2Dc5108a7b58ec.html
Chemical arms disposal pricey / China project hit for opaque management, exorbitant costs
http://www.yomiuri.co.jp/dy/national/20080424TDY02307.htm
Japan’s efforts toward early destruction of ACW in China

Eleventh Chemical Weapons Convention

Military Implications:
The state of current and potential future non-lethal weapons should be reviewed in light of possible violations of the CWC. [Similar to previous on the same issue] Those with responsibilities that might be affected by the results of the conference should visit the U.S. Chemical Weapons Convention website http://www.cwc.gov, noting national and international opportunities for assisting in compliance with the CWC regulations.

Sources:
Chemical Incapacitants Must Be Kept From War, Experts Say
http://www.nti.org/d_newswire/issues/2006_12_7.html#C1839F43
Weapons of Terror
Annan calls on governments to destroy ‘cruel and inhumane’ chemical weapons
U.S., Partners to Offer New Program of CWC Support
http://www.nti.org/d_newswire/issues/2006_12_7.html#95296BAD
Nations Get CW Treaty Extensions
http://www.nti.org/d_newswire/issues/2006_12_11.html#263C85C9

New Concerns Rising over Chemical Weapons

Military Implications:
[Similar to previous on the same issue] The state of current and potential weaponizable chemicals and of chemical plants should continue to be reviewed in light of possible violations of the CWC or of eventual amendments to the CWC. Those with responsibilities in this area should consider assessing national and international opportunities for assisting in compliance and improving efficiency of the CWC regulations.

Sources:
Chemical weapons still causing concern
http://www.newscientisttech.com/channel/tech/mg19426014.700?DCMP=NLC-nletter&nsref=mg19426014.700
Chlorine bombs pose new terror risk  

New chemical rules spark controversy  

Problems with Destruction of Chemical Weapons and Potential Proliferation

Military Implications:
[Similar to previous on the same issue] The need to speed chemical weapons destruction should be raised on the international agenda. New efforts are needed. The state of current and potential weaponizable chemicals and of chemical plants should continue to be reviewed in light of possible violations of the CWC or of eventual amendments to the CWC. Those with responsibilities in this area should consider new ways to speed international compliance and improve efficiency of the CWC regulations.

Sources:
Chemical Weapons’ Convention Deadline of 2012 for Destruction of Remaining Chemical Weapons Stockpiles ‘Enormous Challenge’, First Committee Told  

1-2 November: A global convention to ban chemical weapons  
http://www.cefic.be/Templates/shwNewsFull.asp?HID=1&NSID=662&P=1&NID=1

EU Presidency Statement - United Nations 1st Committee: Other Weapons of Mass Destruction  

IMPROVED COMPLIANCE WITH ENVIRONMENTAL REGULATIONS

European Environmental Liability Directive Came Into Force

Military Implications:
The Directive’s Article 4 Exceptions includes a provision for the military: Paragraph 6 stipulates that “This Directive shall not apply to activities the main purpose of which is to serve national defence or international security nor to activities the sole purpose of which is to protect from natural disasters.” However, since the Army Corps of Engineers and other civil-type activities seem not to be covered by the exception, the military and its contractors acting in the European arena should increase attention to the environmental consequences of their activities.

Sources:
Environment: Liability Directive ensures polluters pay  

Environmental liability – Directive  

Environmental Crime Could Become a Felony in the EU

*Military Implications:*
At this stage, it seems that the proposal does not contain an exception clause for the military. It is important that the military follow the proposal’s progress and its impacts on military operations in Europe in relation to existing SOFAs and other agreements, and as to whether or how it would affect its contractors’ activities.

*Sources:*
Brussels seeks powers to put polluters in jail
http://euobserver.com/9/23436/?rk=1
EU may make harming environment a crime
Brussels in push for ‘green crime’ laws

EU to Increase Environmental Regulations Enforcement

*Military Implications:*
The military should consider following the EU new environmental regulations and new standards policies and the consequently emerging strategies, to ensure that its activities in the region comply with the new requirements.

*Source:*
Preparation Environment Council, 23 October 2006

Calendar with Environmental Deadlines Compliance

*Military Implications:*
Military personnel with environmental reporting responsibility, as well as Army contractors, should consider ordering the free calendar for its extremely useful functionality in helping achieve and maintain compliance with environmental regulations.

*Sources:*
New Calendar Ends Hunt for Environmental Deadlines

IAEA to Improve Nuclear Security in 35 Countries

*Military Implications:*
Military personnel with nuclear security responsibility might consider offering collaboration and know-how support for the new IAEA nuclear safety programs.

*Source:*
Nuclear Security in Africa Gets €7 Million Boost
IAEA Nuclear Terror Prevention Guide

Military Implications:
Relevant military personnel should review the guide as a source of inputs to their own work and cooperation with counterparts worldwide.

Source:
IAEA Publishes Advisory Guide to Address Nuclear Terror Threat
http://www.iaea.org/NewsCenter/News/2008/guideterrorthreat.html

International Alliance of Forest Peoples

Military Implications:
Most likely the International Alliance of Forest Peoples will increasingly expand and include forest people from other regions around the world. It is reasonable to speculate that new regulations concerning forest activities will emerge. The military should follow the Alliance’s activities both to help them achieve their goals, in order to increase peace and security, and to be prepared for eventual restrictions that might impact military activities.

Source:
International Alliance will unite the forest peoples of the world

North America’s Commission for Environmental Cooperation to Increase Enforcement of Environmental Regulations and Public Participation

Military Implications:
CEC projects are a relatively untapped source of information for relevant military personnel dealing with environment and health issues and potential future regulations affecting the military in North America. [Note: a staff member of the Millennium Project participated in the Montreal discussions of the Operational Plan.]

Source:
Operational Plan of the Commission for Environmental Cooperation 2006-2008

Kyoto/Climate Change-related Lawsuits

Lawsuits over Failure to Meet Kyoto Commitments

Military Implications:
[Similar to previous on related issues] Lawsuits may one day be filed against the military for its greenhouse gas emissions. The sooner military efforts to reduce greenhouse gas emissions are fully compliant with “best practices” and documented, the less likely it is that the military will be sued for damages. The military should be prepared for more stringent decisions and regulations worldwide against atmospheric emissions. These remarks are offered with the realization that the U.S. military may already be among the institutions most compliant with greenhouse gas emission standards, but that good performance might not be good enough in coming years.

Source:
Canada faces lawsuit over failure to meet Kyoto commitment
Global Warming Goes to Court

*Military Implications:*
Lawsuits may one day be filed against the military for its greenhouse gas emissions. The sooner military efforts to reduce greenhouse gas emissions are fully compliant with “best practices”, the less likely the military will be sued for damages. The military should be prepared for more stringent decisions and regulations worldwide against atmospheric emissions. These remarks are offered in realization that the U.S. military may already be among the institutions most compliant with greenhouse gas emission standards, but that good might not be good enough in coming years.

*Sources:*
Marsden B - A Bad Idea
http://www.greenpeace.org.nz/campaigns/climate/MarsdenB.asp
Update: Massachusetts v. EPA
Global Warming: Here Come The Lawyers
http://www.businessweek.com/magazine/content/06_44/b4007044.htm
Climate Security: Risks and Opportunities for the Global Economy
http://www.cfr.org/publication/11511/climate_security.html

Global Division of Financial Responsibility for Global Warming Impacts

*Military implications:*
Although Oxfam’s system is not likely to be accepted very soon, it seems inevitable that some system will be adopted eventually. If so, then the military should anticipate that it will be called upon to assess its share of national responsibilities.

*Source:*
Rich must pay bulk of climate change bill: Oxfam
http://www.reuters.com/article/topNews/idUSL2835543520070529

Global Map of Human Impacts to Marine Ecosystems

*Military Implications:*
The new Atlas might add focus for increased action to protect marine environments. The military should increase its efforts to reduce its environmental footprint, and anticipate how it might be called upon to help enforce environmental agreements on international waters.

*Sources:*
http://www.sciencemag.org/cgi/content/abstract/319/5865/948 (abstract)
A Global Map of Human Impacts to Marine Ecosystems
http://www.nceas.ucsb.edu/GlobalMarine

North American Environmental Atlas Online

*Military Implications:*
The *North American Environmental Atlas* offers a one-stop shop for the most important environmental issues, including protected areas (continuing to be developed), therefore being a useful reference tool for military planning activities.
Summarizing Environmental Security Scanning July 2006—June 2008

**Source:**
Mapping North American Environmental Issues
http://www.cec.org/naatlas/

**Water Footprint Measuring System**

*Military Implications:*

[Similar to others on this issue] The military should intensify efforts to improve and accelerate dialogue and cooperation for an international water management system and the design of an international adaptation and mitigation strategy addressing increased water scarcity. Formulating installation water footprints could be a tool for improving water resource use effectiveness and reducing costs.

*Sources:*
World's Water Needs Grow More Urgent
Experts Seek Answers on Water Footprint
http://www.washingtonpost.com/wp-dyn/content/article/2008/03/27/AR2008032702567.html
Waterfootprint http://www.waterfootprint.org
Water Trade–A Virtual Reality? UNESCO-IHE symposium
http://legacy.citg.tudelft.nl/wmg/dispuut/symposium/index.html

**Environmental Damage to Be Criminalized in the EU**

*Military Implications:*
The Directive does not contain an exception clause for the military. Military organizations stationed in the EU countries should assess the impact of the Directive on their operations and in relation to existing Status of Forces Agreements (SOFAs) and other agreements, and as to whether or how it would affect its service members’, contractors’ and dependents’ activities.

*Sources:*
Protection of the environment through criminal law
EU criminal law to protect the environment
EU agrees to outlaw 'green' crimes

**EC Enforces Compliance with EU Environmental Regulations**

*Military Implications:*
[Same as others on similar issues] EC efforts to enforce environmental regulations will trigger further changes in EU Member States’ national legislation. Military stationed in the EU countries should increase their vigilance in compliance with EU environmental regulations.

*Sources:*
Commission takes nine member states to Court over environmental liability
EC Enforces Compliance of National Legislation with EU Environmental Regulations

Military Implications:
EC efforts to enforce environmental regulations will trigger further changes in EU Member States’ national legislation. Military stationed in the EU countries should increase vigilance in compliance with EU environmental regulations.

Sources:
Ireland: Commission to bring environmental impact assessment case to the European Court of Justice

United Kingdom: Commission takes legal action for non-compliance with Court decisions

Waste water treatment: Commission gives Luxembourg final warning, seeks clarifications from Belgium

Major industrial accidents: Commission continues infringement proceedings against 12 Member States over failure to adopt emergency plans for chemical plants

Air pollution: Commission takes action over levels of sulphur dioxide and PM10 in member states

Waste: Commission starts legal action against eight Member States over electronic waste and hazardous substances

China’s Emergency Response Law to Punish Falsifying Environmental Information

Military Implications:
Environmental disasters (accidental or natural) could trigger large-scale socio-economic instability with possible serious security implications. Relevant military and diplomatic personnel should pre-establish protocols to increase cooperation with their Chinese counterparts on exchange of environmental information, particularly regarding such questions as: If non-Chinese military satellite photography of Chinese environmental conditions contradict public statements, should these images be released and address the spirit of the Emergency Response law? If so, how should they be released?

Source:
New law to ban falsifying information on accidents, disasters
United Arab Emirates Establish Nuclear Agency

*Military Implications:*
Although the UAE is working closely with the IAEA to assure security standards in the spirit of nuclear non-proliferation, relevant scientific and military community members should consider offering assistance to the new Nuclear Energy Authority on security procedures commensurate with the region’s vulnerability.

*Source:*
UAE to set up nuclear agency

NEW STANDARDS WITH IMPLICATIONS FOR ENVIRONMENTAL SECURITY

New ISO Standard on Sustainable Building

*Military Implications:*
ISO 21930:2007 is primarily intended for use in business-to-business communication. Hence the military should encourage its contractors to use it and also examine the impact that this new standard will have on the specification and procurement of military construction.

*Sources:*
ISO Creates Standard for Sustainable Building
ISO 21930:2007—Sustainability in building construction -- Environmental declaration of building products
http://www.iso.org/iso/catalogue_detail?csnumber=40435

Green Standards to Counter E-waste

*Military Implications:*
Considering the increasing e-waste issue and the influence these organizations have in the global arena, it is fair to speculate that versions of these green measures will be considered for future e-waste regulations. The military should follow these new developments and be prepared to comply with eventual new directives. Also, it should not wait to begin using the lists in its acquisition of electronics to encourage greener companies. That would be consistent with the stewardship goal in the Army’s Environmental Strategy.

*Sources:*
How green is your Apple? The Economist print edition, Aug 25th 2006
http://www.economist.com/business/displaystory.cfm?story_id=7836504 (by subscription only)
Your guide to green electronics
http://www.greenpeace.org/international/news/green-electronics-guide-ewaste250806
EPEAT http://www.epeat.net

ASTM Issues Standard Terminology for Nanotechnology

*Military Implications:*
Military organizations preparing nanotech-related documents should consult this work to ensure that industry-standard terminology is being used.
Sources:
Terminology for Nanotechnology Standard Now Available from ASTM International
http://69.7.224.88/viewnews.aspx?newsID=996&s=E56

New Standards for Handling Robotic Environmental Equipment
Military Implications:
Military personnel responsible for logistical planning for environmental services equipment and for managing emergency operations should familiarize themselves with the contents of this standard relating to the logistics attributes that would help field components integrate the devices into their operations.
Sources:
'Nitty-Gritty' but Vital Data Helps Field Rescue Robots
Department of Homeland Security Urban Search and Rescue Robot Performance Standards

Chemical Emission Certification Extended to Electronic Devices
Military Implications:
Responsible military personnel should investigate the use of these certifications, as they become available, for environmental evaluation of electronic equipment.
Source:
GREENGUARD Expands into Certifying Computers & Electronics

SAFETY ISSUES

Chemical and Biological safety issues

Half of Transported European Hazardous Waste Could Be Illegal—How Much More Elsewhere?
Military Implications:
Plans for future military-to-military assistance should consider training and logistics support to counter illegal environmental trade.
Sources:
UNEP correspondence with Millennium Project staff
Environment crime now high on the world agenda
The Growth and Control of International Environmental Crime—Background papers
Terrorists Could Tap Pharmaceutical Toxins

Military Implications:
This book should be reviewed by those responsible for anticipating vulnerabilities to bioterrorism.

Source:
Pharmaceutical Terrorism—The Bane of Biotech
http://www.stimson.org/pub.cfm?ID=596

Biotechnology Risk in Africa

Military Implications:
Military personnel with biosecurity responsibilities should consider contacting relevant African counterparts to help in the creation of standards and treaties to improve the security of biotech labs and applications, and to involve Africans in the international negotiations for biosafety regulations.

Source:
Africa must commit to biosecurity measures
http://www.scidev.net/Opinions/index.cfm?fuseaction=readOpinions&itemid=654&language=1

Bioviolence; Preventing Biological Terror and Crime

Military Implications:
Key military personnel with bio-security responsibilities should study this book to identify possible new policy and training requirements.

Sources:
Bioviolence: Preventing Biological Terror and Crime. Excerpt from the book
http://assets.cambridge.org/97805218/83252/excerpt/9780521883252_excerpt.pdf
Book launch at the Wilson Center
http://www.wilsoncenter.org/index.cfm?fuseaction=events.event&event_id=276519
BIOVIOLENCE; Preventing Biological Terror and Crime. Barry Kellman, Depaul University
International Weapons Control Center (IWCC)
http://www.law.depaul.edu/centers%5Finstitutes/iwcc/

Middle East Biosecurity Assessment

Military Implications:
Military personnel with biosecurity responsibilities should receive these assessments and be asked to comment and suggest military-to-military collaboration potentials with special attention to standards and treaties to improve the security of biotech labs and applications.

Sources:
Biosafety and Biosecurity International 2007
Biosafety and Biosecurity International Conference 2007 to be held in Abu Dhabi
Analysis: Biothreats in the Middle East
Toxicogenomics Risk Assessment

_Military Implications:_
Military personnel working in environmental risk assessment should review the available presentations from this meeting for eventual input in improving their own toxicogenomic risk assessment processes.

_Source:_

SIPRI Year Book 2007 Points out Environmental, Nuclear, and Energy Threats

_Military Implications:_
The report’s recommendations should be considered for improving compliance and international treaties enforcement, as well as developing international regulations to cover new types of threats.

_Sources:_
SIPRI Yearbook 2007
SIPRI Warns of Growing Nuclear Risks

Scientific Community’s Questions Concerning Biodefense Standards

_Military Implications:_
Although the panel focused on the U.S., the problem is of international concern. Relevant military personnel should consider the outcomes of this panel’s discussions along with other material on biosafety and advance the issue at the concerned forums to accelerate the adoption of international standards for the biodefense industry and related activities.

_Source:_
The Need for Biodefense Standards
[http://www.the-scientist.com/article/display/24075/](http://www.the-scientist.com/article/display/24075/) (by subscription only)
Expert Panel on the Development of Standards for Biodefense

Human Biomonitoring for Environmental Chemicals

_Military Implications:_
Military personnel concerned with biomonitoring should review the report since its findings and recommendations might find their way in new national and possibly international policies on biomonitoring. Also, they might be useful for improving military biomonitoring strategies.

_Source:_
Human Biomonitoring for Environmental Chemicals
[http://www.nap.edu/catalog/11700.html](http://www.nap.edu/catalog/11700.html)
Proceedings of the Workshop ‘Risk, Uncertainty and Decision Analysis for Environmental Security and Non-chemical Stressors’

Military Implications:
Military personnel concerned with risk assessment related to the environment should consider contacting their colleagues who are members of the Organizing Committee to get the proceedings or conclusions and recommendations generated by the workshop.

Source:

ETC Report Warns of the Threat of Synthetic Biology and Calls for Global Regulations

Military Implications
Relevant military personnel covering synthetic biology should consider reviewing the report for insights on social and safety implications. Also, since ETC Group reports are widely read and the group is taking its findings to international forums, it is likely that—along with other such recommendations from different sources—some international organization and regulations for synthetic biology might emerge. The military should consider collaborating in the establishment of international safety standards, and anticipate potential regulations in the planning of future R&D in these areas.

Sources:

Methyl Bromide a Continuing International Concern

Military Implications:
The military should review its and its contractors’ worldwide usage of methyl bromide to ensure compliance with existing restrictions, and be prepared for further regulatory actions.

Sources:
Hazardous fumigation must be halted – Greens http://www.scoop.co.nz/stories/PA0802/S00065.htm

Possible Risk with Bisphenol A Receiving Increased Attention

Military Implications:
Considering possible future restrictive regulation of this compound, the military should closely follow these investigations, review BPA usage in military materiel, and consider making plans for its replacement.

Source:
Peril in plastic?
Questions on Bisphenol A Risk Raised Again

*Military Implications:*
The military should be prepared to phase out its use of this chemical, if the projected determinations conclude that it poses a risk.

*Sources:*
Canada Could Ban Baby Bottles Containing Bisphenol A

Plastic bottle chemical may be harmful: agency
http://www.reuters.com/article/healthNews/idUSN1513929320080415?sp=true

Nuclear Safety Issues

*Reports Addressing Nuclear Safety*

*Military Implication:*
If not already part of the process, relevant military personnel should seek to be involved in the upgrade and revision of the new INES system. It should also be completely informed about the new scales, terminology and strategies put forward by the updated system. Also, the other recent reports might provide input for reducing nuclear terrorism risks.

*Sources:*
Nuclear Security Report 2007; Measures to Protect Against Nuclear Terrorism
http://www.iaea.org/About/Policy/GC/GC51/GC51Documents/English/gc51-15_en.pdf

Securing the Bomb 2007 http://www.nti.org/e_research/securingthebomb07.pdf

Nuclear Terror Remains Global Threat, Harvard Study Reports
http://www.nti.org/d_newswire/issues/2007_9_27.html#AFD60592

Report Cites Dangerous Gap in Efforts to Thwart Nuclear Terrorism; Calls for Urgent Global Campaign to Reduce the Risk

IAEA Illicit Trafficking Database Releases Latest Aggregate Statistics

New Report on Dangers of Radiation Sources

*Military Implications:*
Civilian-military cooperation should continue to improve methods of preventing abuse of these materials.

*Sources:*
Radiation Source Use and Replacement. National research Council (Prepublication copy)
http://books.nap.edu/openbook.php?record_id=11976&page=R1

Radioactive Cesium Chloride Should Be Replaced in Medical Equipment
http://nationalacademies.org/morenews/20080220a.html

U.S. urged to curb use of "dirty bomb" ingredient
http://www.reuters.com/article/topNews/idUSN2036258220080220

http://www.baltimoresun.com/news/opinion/ideas/bal-id.bpa23dec23,0,894641.story
Government Should Spur Replacement Of Radioactive Cesium Chloride In Medical And Research Equipment; Alternatives Could Lower Potential For Theft And Misuse

Russia’s Floating Nuclear Plants Pose International Security Risk

Military Implication
Mobile nuclear reactors could be vulnerable to both natural disasters such as tsunamis and potential attacks/hijacks by terrorists. Since 12 countries including China, Indonesia, Malaysia, Algeria and Argentina have already been listed as potential buyers, the military should start exploring possible responses if an accident or attack were to occur outside of Russian waters. Note: since the U.S. Corps of Engineers operated the Sturgis, a “nuclear barge” facility in a re-used Liberty ship for many years, the U.S. has some experience with the basic concept and its security aspects.
Source:
Floating nuclear power stations raise spectre of Chernobyl at sea
http://www.timesonline.co.uk/tol/news/world/europe/article1662889.ece

Pandemics and Other Health Issues

WHO Report 2007 Addresses Global Health Security Threats

Military Implications:
The report is a good source for understanding and acting on possible global health threats; and hence should be studied by relevant military personnel.
Sources:
The world health report 2007 - A safer future: global public health security in the 21st century

Environment and Human Health Integration

Military Implications:
Relevant military personnel should review and consider the reports for possible additional inputs of an interdisciplinary approach to reduce security threats and improve force protection.
Sources:
Integrating Environment and Human Health
Climate, Poverty and Health: Time for Preventive Medicine
Environment and Health conference website
http://www.ncseonline.org/2007conference
Proposed Global Early Warning System for Monitoring Pandemics

Military Implications:
The military should consider contributing to the study, seeking liaison with systems to distinguish between biological warfare and more naturally occurring phenomena, and/or procedures for coordination with the early warning system.

Sources:
http://www.nature.com/nature/journal/v447/n7142/full/nature05775.html#abs (by subscription only)
Scientists: Early warning system for disease needed
http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=3623&language=1
Fifty-ninth World Health Assembly

FAO Launched New Crisis Management Centre

WHO-sponsored pandemic flu task force holds first meeting in Geneva

Military Implications:
[Similar to previous on the same issue] The military should continue collaboration with these centers to strengthen military-to-military assistance and training in fighting pandemics, to become more globally integrated and for assisting in planning and performing emergency actions, if needed.

Sources:
New Crisis Management Centre launched by FAO
WHO-sponsored pandemic flu task force holds first meeting in Geneva

Potential Health Threats Of Some New Technologies

Nanotechnology

Military Implications:
Military personnel concerned with nanotech issues should review the information generated by these activities to improve military and contractor practices, as well as to assist and cooperate with the organizations working on those issues for enriching their studies.

Sources:

July 2006
Laboratory for Biological Effects of Nanomaterials and Nanosafety Established in China
Russia opens new nanotech center
UK. Nanotechnology Policy Review Announced
http://www.bymnews.com/new/content/view/31988/82/
August 2006
Nanotechnology report urges better safety standards
http://www.the-scientist.com/news/daily/24910/ (by subscription only)
A Matter of Size: Triennial Review of the National Nanotechnology Initiative
http://www.nap.edu/catalog/11752.html
Environmental, Health, and Safety Research Needs for Engineered Nanoscale Materials report
http://www.nano.gov/NNI_EHS_research_needs.pdf
Report and data base: http://www.nanotechproject.org/50
http://biz.yahoo.com/prnews/060907/dcw073a.html?v=1
Defra Consultation on a Voluntary Reporting Scheme for Engineered Nanoscale Materials: Summary of Findings and Government's Response, August 2006
FDA Forms Internal Nanotechnology Task Force
http://www.fda.gov/bbs/topics/NEWS/2006/NEW01426.html
Nano2Life www.nano2life.org

September 2006
ICON database: http://icon.rice.edu/research.cfm
Experts and consumers convene on nano risks
Carbon-Nanotube Toxicity Test Tricks Scientists
Tiny inhaled particles take easy route from nose to brain
http://www.urmc.rochester.edu/pr/news/story.cfm?id=1191
The Flip Side of Using Carbon Nanotubes for Environmental Pollutants Removal
http://www.nanowerk.com/spotlight/spotid=780.php

October 2006
Nanotoxicology: Signs of stress
http://www.nature.com/nnano/journal/v1/n1/full/nnano.2006.69.html
Options for a National Nanotechnology Strategy Report
http://www.industry.gov.au/content/itrinternet/cmscontent.cfm?objectId=E2FE4F8A-4E44-4785-A6A01BE137E0E524
NanoSafe Australia Newsletter
Nanotechnology - it's a small, small world
Nanomaterials Handbook. Yury Gogotsi, Drexel University, Philadelphia, Pennsylvania
Book Review: http://www.nature.com/nnano/journal/v1/n1/full/nnano.2006.64.html
Characterising the potential risks posed by engineered nanoparticles
Summarizing Environmental Security Scanning July 2006—June 2008

http://cohesion.rice.edu/CentersAndInst/ICON/emplibrary/Phase%20I%20Report_UCSB_ICON%20Final.pdf
Press release: www.icon.rice.edu

November 2006
Five-step check for nano safety
http://news.bbc.co.uk/2/hi/science/nature/6153814.stm
Nature report proposes nanotech safety strategy
Berkeley considering need for nano safety
Safe handling of nanotechnology. Nature 444, 267-269. Published online 15 November 2006 (by subscription only)
IOM's SAFEnano Initiative announced as DTI's newest Nanotechnology Centre
Risks in architectural applications of nanotechnology
http://www.nanowerk.com/spotlight/spotid=1007.php

December 2006
Carbon nanomaterials may disperse more widely in waterways

February 2007
Tighter controls needed for nanotechnology, says UN report
http://www.technologyreview.com/read_article.aspx?id=18144&ch=nanotech
GEO Year Book 2007
http://www.unep.org/geo/yearbook/yb2007/
Nanotechnology and the public: Effectively communicating nanoscale science and engineering concepts
http://springerlink.metapress.com/content/u276420455825217/?p=04e798d9a2d44481907da0176313de28&pi=0
Study points way to communicating nanotech
http://www.news.wisc.edu/13391.html
Multiple Benefits of Nanotechnology Encourages Widespread Uptake in Water and Wastewater Treatment
http://home.businesswire.com/portal/site/google/index.jsp?ndmViewId=news_view&newsId=20070201005476&newsLang=en
New study to assess toxicity of carbon nanotubes
http://nanotechweb.org/articles/news/6/1/9/1

March 2007
Calls for More Research (sic) into Potential Risks of Nanotechnology
When It Comes to Risk, Not All Nanomaterials Are Created Equal
http://news.rpi.edu/update.do?artcenterkey=2038&setappvar=page(1)

When It Comes To Risk, Not All Nanomaterials Are Created Equal
http://www.sciencedaily.com/releases/2007/03/070326095826.htm

Public consultation on SCENIHR Opinion on The appropriateness of the risk assessment methodology in accordance with the Technical Guidance Documents for new and existing substances for assessing the risks of nanomaterials

World's first nanospecific safety label

CENARIOS® - Managing Nano Risks
http://www.innovationsgesellschaft.ch/images/publikationen/Factsheet_CENARIOS_english_arial2.pdf

May 2007
Institute of Nanotechnology Nano Masters Course Directory
http://www.nano.org.uk/nanomasters/

A nano Trojan horse
http://pubs.acs.org/subscribe/journals/esthag-w/2007/apr/science/lt_nano.html

July 2007
Entry point to the survey (managed via Sinapse(r) communication system)

Responsible nanotechnology code for business to be developed

H.R.3235. Title: To ensure the development and responsible stewardship of nanotechnology.
http://thomas.loc.gov/cgi-bin/bdquery/z?d110:HR03235:@@@T

Pollution Prevention through Nanotechnology Conference: September 25-26, 2007
http://www.epa.gov/oppt/nano/nano-confinfo.htm

August 2007
Environment Directorate. Joint meeting of the chemicals committee and the working party on chemicals, pesticides and biotechnology current developments/activities on the safety of manufactured nanomaterials/ nanotechnologies

Meeting website: http://www.epa.gov/oppt/nano/mc-mtginfo.htm

Nanoscale Materials Stewardship Program
http://www.epa.gov/oppt/nano/index.htm#stewardship

Helping the carbon nanotube industry avoid mega-mistakes of the past

New Substances Program Advisory Note 2007-06. Requirements for nanomaterials under the New Substances Notification Regulations (Chemicals and Polymers)
http://www.ec.gc.ca/substances/nsb/eng/a200706_e.shtml
**Democratic technologies?** The final report of the Nanotechnology Engagement Group (NEG)  

September 2007  
REFNANO: The UK-led initiative on Reference Materials for Nanotechnology  
REFNANO: Reference materials for engineered nanoparticle toxicology and metrology  
Prioritization of Environmental, Health, And Safety Research Needs For Engineered Nanoscale Materials; an Interim Document for Public Comment  
Lack of Government Risk Research Strategy Jeopardizes Success of Technology  
[www.nanotechproject.org/136](http://www.nanotechproject.org/136)

October 2007  
UK Government Nanotechnology Policy Workshop for Industry  
BSI New Publications. Nine documents for nanotechnology terminology and guidance for UK industry are due to be published by BSI British Standards.  
India 'must regulate nanotechnology' urgently  

November 2007  
*Climate Alarm* Disasters increase as climate change bites  
Yet another calamity. Economist.com, Nov 19th 2007, DELHI  
Andes water supply in peril, scientists say  
Coast villages to be sacrificed to the sea  
An Alaskan island is losing ground  
IPCC Fourth Assessment Report (AR4) Summary for Policymakers  
Singapore Declaration on Climate Change, Energy and the Environment  
[http://www.aseansec.org/21116.htm](http://www.aseansec.org/21116.htm)  
Joint Declaration of the ASEAN-EU Commemorative Summit, Singapore, 22 November 2007  
[http://www.aseansec.org/21120.htm](http://www.aseansec.org/21120.htm)  
The President grants an interview to BBC Radio’s World Today programme, on the human dimension of global climate change  

Climate change conference opens in Maldives

December 2007
First nanotechnology genotoxicity tests find that carbon nanotubes could damage DNA

DNA Damage Induced by Multiwalled Carbon Nanotubes in Mouse Embryonic Stem Cells
[http://pubs.acs.org/cgi-bin/abstract.cgi/nalefd/2007/7/i12/abs/nl071303y.html](http://pubs.acs.org/cgi-bin/abstract.cgi/nalefd/2007/7/i12/abs/nl071303y.html)

Nanotechnology & the Media: The Inside Story. Tuesday December 18, 2007

January 2008
1st Annual Conference on Nanotechnology Law, Regulation and Policy

SAFENANO - The UK's premier site for information on Nanotechnology health and safety
[http://www.safenano.org](http://www.safenano.org)

SAFENANO officially launches SAFENANO Scientific Services

February 2008
European Commission adopts Code of Conduct for Responsible Nanosciences and Nanotechnologies Research

European Commission gives grant to investigate transatlantic oversight of nanotechnology

Regulating Nanotechnologies in the EU and US. Towards Effectiveness and Convergence
[http://www.lse.ac.uk/nanoregulation](http://www.lse.ac.uk/nanoregulation)

EU nanotechnology R&D in the field of health and environmental impact of nanoparticles provides summary information on each of 106 projects, 14 of them from the EU’s Framework Programme and the other 92 from the EU Member States, together representing a total of some €79 million in grants.

EU nanotechnology R&D in the field of health and environmental impact of nanoparticles

Technology Roadmap for Productive Nanosystems
[http://foresight.org/roadmaps/](http://foresight.org/roadmaps/)

From Here to There: Nanotechnology Roadmap

Strategy for Nanotechnology-Related Environmental, Health, and Safety Research

Strategy for nanotechnology-related environmental, health and safety research

Risks of nanotechnology remain uncertain
[http://pubs.acs.org/subscribe/journals/esthag-w/2008/feb/science/nl_nanorisks.html](http://pubs.acs.org/subscribe/journals/esthag-w/2008/feb/science/nl_nanorisks.html)
March 2008
Federal Toxics Disclosure Law Could Help Inform Public Of Nanotechnology Risks
http://www.nanotechproject.org/news/archive/toxics_law
Forum VI Sixth Session of The Intergovernmental Forum On Chemical Safety
http://www.who.int/ifcs/documents/standingcommittee/nano_oecd.doc
What about explosivity and flammability of nanopowders?
http://www.nanosafe.org/node/910
Nanotech Exposed in Grocery Store Aisles

April 2008
Observatory-NANO project http://www.observatory-nano.eu
ObservatoryNANO project kicks off in London
http://nanoforum.org/nf06~modul~showmore~folder~99999~ssc~news~scid~3573~.html?action=longview& (free membership required; full text of the article in this Appendix)
ObservatoryNANO: responsible nanotechnology for socio-economic benefit
Project on Emerging Nanotechnologies – Risk Research Inventory Update Analysis
Europe Spends Nearly Twice as Much as U.S. on Nanotech Risk Research

May 2008
Carbon nanotubes that look like asbestos, behave like asbestos
EPA Petitioned to Stop Sale of 260 Products Containing Nano-Silver

June 2008
Commission launches public dialogue on nanotechnologies
Commission starts public dialogue on nanotechnologies – tapping economic and environmental potential through safe products
Nanotechnology Homepage of the European Commission http://cordis.europa.eu/nanotechnology/
Perturbational profiling of nanomaterial biologic activity (abstract; full text by subscription only)
http://www.pnas.org/cgi/content/abstract/105/21/7387
Testing the Toxicity of Nanomaterials. A fast screening method could help separate the good from the bad
http://www.technologyreview.com/Nanotech/20861/
Assuring the Safety of Nanomaterials in Food Packaging. The Regulatory Process and Key Issues
http://www.nanotechproject.org/publications/archive/nano_food_packaging/
Use of nanomaterials in food packaging poses regulatory challenges
http://www.enn.com/top_stories/article/37487/print
Various Reports and Conferences Addressing Nanotechnology Safety

**Military Implications:**
Military personnel concerned with nanotech safety and regulation of environmental hazards from nanomaterials should consider reviewing these reports for insights on nanotech environmental risk assessment.

**Sources:**
Assessing exposure to airborne nanomaterials: Current abilities and future requirements. [http://www.informaworld.com/smpp/content~content=a776419006~db=all~order=page](http://www.informaworld.com/smpp/content~content=a776419006~db=all~order=page)
Nanotoxicology [http://www.informaworld.com/smpp/title~content=t716100760](http://www.informaworld.com/smpp/title~content=t716100760)
New methods and tools needed to measure exposure to airborne nanomaterials [http://www.physorg.com/news96032587.html](http://www.physorg.com/news96032587.html)

Nanotech Standards Workshop Report Released
Nanotech Products Meeting to Be Held in London, 16-17 May—updated information is now available at [www.nano.org.uk/events/ionevents.htm](http://www.nano.org.uk/events/ionevents.htm)
ICON website [http://icon.rice.edu](http://icon.rice.edu)
Nanotechnology Risk Governance [http://www.irgc.org/irgc/_b/contentFiles/IRGC_white_paper_2_PDF_final_version.pdf](http://www.irgc.org/irgc/_b/contentFiles/IRGC_white_paper_2_PDF_final_version.pdf)
SCIENTIFIC COMMITTEE ON EMERGING AND NEWLY IDENTIFIED HEALTH RISKS (SCENIHR) modified Opinion (after public consultation) on The appropriateness of existing methodologies to assess the potential risks associated with engineered and adventitious products of nanotechnologies [http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_003b.pdf](http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_003b.pdf)
Industry should become familiar with EPA white paper on nanotechnology
U.S. Environmental Protection Agency Nanotechnology White Paper (EPA 100/B-07/001)
Nanocoalition launches virtual journal on risk research
Green Nanotechnology: It's Easier Than You Think
http://www.nanotechproject.org/116/4262007-green-nanotechnology-its-easier-than-you-think
Nanotechnology Provides Green Path To Environmentally Sustainable Economy
http://www.spacemart.com/reports/Nanotechnology_Provides_Green_Path_To_Environmentally_Sustainable_Economy_999.html
https://nnco.nano.gov/public_ehs/
Nanotechnology - Products and Processes for Environmental Benefit
http://www.nano.org.uk
Success and Outcomes from the Finnish Presidency Conference on “Nanotechnologies – Safety for Success”
'Nanotechnology for Security and Crime Prevention', email
Health & Environment Summit on Nano” at Nanotech 2007
http://home.businesswire.com/portal/site/google/index.jsp?ndmViewId=news_view&newsId=20061026005829&newsLang=en
4th NanoSpain Workshop http://www.nanospain.org/Workshop4
Finland Conference site: http://www.fmnt.fi/ntss
Egypt Conference site: http://www.nanoinsight.net
Safety of Manufactured Nanomaterials
http://www.oecd.org/department/0,2688,en_2649_37015404_1_1_1_1_1,00.html

Growing Health Concerns over Electromagnetic Fields Might Trigger New Regulations

Warnings on Possible Wi-Fi Dangers

Potential Magnetic Fields Regulations in Japan

Military Implications:
Research for determining the possible impact of electromagnetic fields and electronic smog on human health and the environment is increasing. The military, in addition to closely following the scientific research, should be investigating what steps would need to be taken, if the fears prove well founded, and such devices become the subject of restrictive regulations. Future soldier support developments, not only in communication, but in such areas as robot-assist, weapon targeting, hostile fire tracking, battlefield monitoring, and personal physiological monitoring will add to the fog of electromagnetic fields on and within soldiers’ bodies and should be assessed in totality for possible additive and synergistic health impacts.

Sources:
Hi-tech horrors http://comment.independent.co.uk/leading_articles/article2472074.ece
Danger on the airwaves: Is the Wi-Fi revolution a health time bomb?
http://news.independent.co.uk/uk/health_medical/article2472140.ece
Apiculture world abuzz over theory that cellphone radiation may be killing bees
http://www.canada.com/topics/technology/news/gizmos/story.html?id=4734ad59-f543-4ac5-ae34-d33431e59be2&k=74835

Industry ministry to regulate magnetic fields
http://www.asahi.com/english/Herald-asahi/TKY200704260232.html (article not available anymore on the website)

Power lines in new link to childhood leukaemia

**Underwater Sounds from Human Sources Endangering Marine Life**

**Sonar Restrictions Debate Continues**

*Military Implications:*
Although this time overruled, the California Court’s decision might be reinstated and more research, circumstantial evidence, and increasing advocacy from conservation groups that sonar is harmful, might trigger negotiations for a general ban. Also, the Court’s ruling sets a precedent that might be expanded to other regions. If not already being done, preparation monitoring of marine mammals’ presence in case of sonar use should become incorporated in Navy policy to allow for responsiveness in the event that further oscillations of policy were to occur.

*Sources:*
Ruling curbs Navy sonar off Calif. Coast
http://www.upi.com/NewsTrack/Top_News/2008/01/04/ruiming_curbs_navy_sonor_off_calif_coast/3754/
Judge orders Navy to stay 12 miles off coast when using sonar
Bush exempts Navy from no-sonar rule
State files another challenge to Navy's sonar training off coast
Navy resumes sonar training off SD coast as legal battle goes on
http://www.sfgate.com/cgi-bin/article.cgi?f=/n/a/2008/01/27/state/n162935S45.DTL

The Debate over Use of Sonar by the Navy Continues; Legal Settlement Approved

*Military Implications:*
As pointed out by Joel Reynolds, a senior attorney at the Natural Resources Defense Council (NRDC) and director of its Marine Mammal Protection Project, "this settlement confirms that measures to protect our oceans can and must be part of the Navy’s training for submarine defense." Although this time a settlement was reached, it is likely that at some point, in case of more evidence that sonars are harmful, or more pressure from conservation groups, they might be banned completely. In any event, monitoring of marine mammals' presence in case of sonar use should become incorporated in Navy policy.

*Sources:*
Court Allows Sonar in RIMPAC War Games With New Restrictions

Millennium Project www.millennium-project.org......................................................................................
U.S. to Study Sonar Impact on Marine Mammals  

*Military Implications:*  
The military should follow the research and fully cooperate to make sure that the results will be the most conclusive possible. In the meantime, in view of growing public concerns, it should cooperate with environmental groups to ensure that its exercises do not affect the marine life. 

*Sources:*  
Military R&D worth $72M  
Navy Disappointed with Sonar Lawsuit  
[http://www.military.com/features/0,15240,136479,00.html](http://www.military.com/features/0,15240,136479,00.html)  
Navy sued over sonar testing off Hawaii  

**Pollution Issues**

Human Ecological Footprint Increasing Each Year  

*Military Implications:*  
The military should increase efforts to reduce its ecological footprint and consider the creation of indicators to show progress. Use of these indicators would materially assist long-range planning for force management and possible conflict outbreaks. 

*Sources:*  
October 6 is Ecological Debt Day  
World moves into the ecological red  
[http://www.enn.com/ecosystems/article/23676](http://www.enn.com/ecosystems/article/23676)  
World failing on sustainable development  
[http://environment.newscientist.com/channel/earth/mg19626243.100;jsessionid=HCBMNDHLH](http://environment.newscientist.com/channel/earth/mg19626243.100;jsessionid=HCBMNDHLH)  
PFG (abstract; full article by subscription only)

Greenhouse Gas Emissions  

*Military Implications:*  
[Same as others on similar issues] The military should document what it is doing to reduce its GHG emissions and what it could do next in anticipation of such requests from a new administration. Increasingly more compelling evidence and warnings on climate change amplify international discourse and increase the emergence of international policies trying to tackle the causes and develop strategies to mitigate climate change effects. Hence, the military should be doing its part in reducing greenhouse gas emissions and preparing to help mitigate the human-made and natural catastrophes that could ensue. 

*Sources:*  
Greenhouse gas hits record level  
NOAA ESRL 2008 Global Monitoring Annual Conference  
[http://www.esrl.noaa.gov/gmd/annualconference/](http://www.esrl.noaa.gov/gmd/annualconference/)
Target Atmospheric CO2: Where Should Humanity Aim?
Clock Running Out on Irreversible Climate Change – Part I
http://yaleglobal.yale.edu/display.article?id=10657
G8 Environment Ministers Agree on 2050 Climate Goal
State and Trends of the Carbon Market 2008
From Bali to Poznan: New Issues, New Challenges
http://www.envirosecurity.org/activities/diplomacy/gfsp/climate

September 2006
Climate ’time bomb' forecast
http://www.boston.com/news/nation/articles/2006/09/07/climate_time_bomb_forecast/ (article available free for a limited time; full text below)
Scientists find new global warming threat from melting permafrost
Diary: Siberia and climate change
http://news.bbc.co.uk/2/hi/science/nature/5323964.stm

November 2006
Carbon emissions rising faster than ever
Global Carbon Project
http://www.globalcarbonproject.org/

March 2007
Looking Forward: Sustaining the Earth and Humanity—Implications for the New UN Secretary-General
http://www.wilsoncenter.org/index.cfm?topic_id=1411&fuseaction=topics.event_summary&event_id=218883
China seen topping U.S. carbon emissions in 2007
http://www.alertnet.org/thenews/newsdesk/L22726612.htm

May 2007
Climate Change 2007: Impacts, Adaptation and Vulnerability
http://www.ipcc.ch/SPM6avr07.pdf
Stopping climate change is possible
Secretary-General Welcomes Report on Mitigation of Climate Change, Says Package on Way Forward Must Be Launched At Bali Conference
9th Session of IPCC Working Group III and 26th Session of IPCC: 30 April - 4 May 2007
http://www.iisd.ca/climate/ipwg3
Experts Meet on UN Report but Time Running Out
http://www.planetark.com/dailynewsstory.cfm/newsid/41638/story.htm
UN Climate Talks Down to Wire, EU and China Spar
http://www.planetark.com/dailynewsstory.cfm/newsid/41708/story.htm
China seen as a roadblock to U.N. climate report. Beijing wants the U.S. and Europe to bear
most of the blame and costs for controlling global warming.
By Alan Zarembo, Times Staff Writer, May 3, 2007
http://www.latimes.com/news/printedition/asection/la-sci-warming3may03_1_3027774_full_story?ctrack=2&cset=true
US Rejects 'High Cost' Global Warming Scenarios
http://www.planetark.com/dailynewsstory.cfm/newsid/41726/story.htm

June 2007
Research Finds That Earth's Climate is Approaching 'Dangerous' Point
http://www.nasa.gov/vision/earth/environment/danger_point.html
Dangerous human-made interference with climate: a GISS modelE Study
Rising sea level forecasts understated, say scientists
Global and regional drivers of accelerating CO2 emissions
http://www.pnas.org/cgi/content/abstract/0700609104v1
Alarming acceleration in CO2 emissions worldwide
Value of satellites highlighted at World Environment Day
http://www.esa.int/esaEO/SEMBUUEVL2F_planet_0.html
NASA Researcher Finds Days of Snow Melting on the Rise in Greenland
Barroso sees 'dramatic' climate change in Greenland
http://euobserver.com/9/24356/?rk=1

New Predictions for the Atmosphere by 2030

Military Implications:
Since these scenarios help identify and understand gaps in current legislation, they may also
become the basis for new international regulations and technological applications affecting the
military.
Source:
New Predictions for the Global Atmospheric Environment by 2030

Polluted Skies and Global Warming Puzzle Decoded

Military Implications:
This new discovery might increase attention to different pollutants, and consequently change or
trigger new regulations globally or by region, pending on weather patterns. Also, since weather
conditions (floods, drought, and related consequences) are increasingly incorporated in human
security strategies, the new findings might be useful to military activities relying on rain patterns.
Sources:
Polluted Skies and Global Warming Puzzle Decoded
Air Pollution’s Color Determines Its Effect On Clouds

European New Web-based Air Pollution Monitoring System
Military Implications:
Considering the increased role of citizens in shaping Europe’s regulations, it is reasonable to speculate that such Web-based information accompanied by health implications related to air pollution might trigger requests for even more stringent regulations on pollutants across Europe. The impacts of military bases could be made more evident and objective with such a system than has been true in the past.
Sources:
New web-based air pollution monitoring system
The Ozone Web
http://www.eea.europa.eu/maps/ozone/welcome

Ozone Hole Worst Ever Recorded
Military Implications:
There is compelling evidence of the consequences of anthropogenic climate change, and a growing world demand for action. The military should continue to accelerate efforts to reduce their own greenhouse gas emissions. New international environmental security-related policies and cooperation to avoid potentially large-scale disasters and conflicts seem inevitable.
Sources:
Antarctic ozone hole is worst ever recorded, UN reports
Record ozone loss during 2006 over South Pole
http://www.esa.int/esaCP/SEMBOKKBKSE_index_0.html
Ozone Depletion Crisis Not Yet Over
UNEP Ozone Secretariat
http://ozone.unep.org/Treaties_and_Ratification/index.asp

Burning Fossil Fuels Acidifies Oceans, Erodes Coral Reefs
Military Implications:
Citing the Army’s “Strategy for the Environment,” the military should seek new opportunities to participate in dialogues among scientists, politicians, environmental NGOs, and economic decision-makers for improving biodiversity management strategies, as well as in planning its own operations.
Sources:
Report Warns about Carbon Dioxide Threats to Marine Life
UN supports two-year expedition probing Arctic climate change
New Research Finds Human Energy Usage is a Long-Term Heating Problem Independent of Greenhouse Gases and Solar Radiation

*Military implications:*
Long range military R&D should find and explore ways to use energy sources and applications that generate little heat.

*Source:*
Energy, Ethics, and the Far Future DRAFT #2 by Eric J. Chaisson

Asia’s Progress Jeopardized by Environmental Degradation

*Military Implications:*
The military should look for opportunities to collaborate with counterparts in addressing the Millennium Development Goals.

*Sources:*
“The Millennium Development Goals: Progress in Asia and the Pacific 2007”
Asia's Growth can Provide Economic, Social Benefits to All - Joint MDG Report

Accelerating Environmental Health Crises in China

*Military Implications:*
Since future environmental migrations could lead to internal conflicts, and since China is about 20% of the world, alternative forecasts and plans for how to address potential instabilities in China should be explored. In the meantime, China is increasing pressure (as previously cited in these monthly reports) on its military to take the environment into account in all its activities. Hence, there are opportunities for military–to-military cooperation with the China Environmental Health Project (partially supported by the U.S. Agency for International Development) to encourage research and training projects focused on finding solutions to safe drinking water and reducing pollution in China.

*Sources:*
Environmental Health Crises in Southwest China (WWIC conference video archived)
http://www.wilsoncenter.org/index.cfm?fuseaction=events.event_summary&event_id=206921#
China to Pass U.S. in 2009 in Emissions
http://www.stopglobalwarming.org/sgw_read.asp?id=4393611102006
Beijingers told to stay indoors as smog hangs, China Daily (November 20, 2006)
http://www.iea.org/w/bookshop/add.aspx?id=279
China’s ASAT Test Created Serious Long-Range Low-Earth Orbital Pollution

Military implications:
Although military-to-military cooperation with China has been damaged by the ASAT test, it does offer an opportunity to explore joint research programs to reduce current space debris. In any case, the military should increase R&D to collect debris and improve modeling software to monitor and predict in greater detail, in addition to programs to harden satellites and space craft.

Sources:
Debris from China's Kinetic Energy ASAT Test
China's Anti-Satellite Test: Worrisome Debris Cloud Circles Earth
NASA Orbital Debris Program Office http://orbitaldebris.jsc.nasa.gov
Space debris spotlight http://www.esa.int/esaCP/SEMHDJXJD1E_FeatureWeek_0.html
United Nations Office for Outer Space Affairs (UNOOSA) http://www.unoosa.org
Inter-Agency Space Debris Coordination Committee http://www.iadc-online.org

Bottled Water Becomes Target of Environmentalists

Military Implications:
R & D to create alternatives to shipping massive quantities of bottled water in military deployments should be sought. Logistic plans and contracts for bottled water purchases should be reviewed for flexibility to be revised in the event restrictions spread. Necessity versus simple convenience data that might be needed for appeals should be accumulated for use in appeals.

Source:
Chicago plans bottled water tax

Restrictions on Plastic Bags Expanding

Military Implications:
The military should review its usage of plastic bags (especially the thinnest varieties) and plan for their eventual replacement. This would apply primarily to commissaries and PXs, but could extend to convenience uses for other functions.

Sources:
Plastic bag ban
http://www.chinadaily.com.cn/opinion/2008-01/10/content_6383869.htm
China boosts global war against menace of the plastic bag
http://www.guardian.co.uk/environment/2008/jan/12/plasticbags.recycling
China bans plastic shopping bags
http://www.cbc.ca/consumer/story/2008/01/08/china-bags.html
Retailers oppose bag ban
http://www.stuff.co.nz/4354751a13.html
China bans free plastic bags
NEW ORGANIZATIONS WITH MANDATES WITH EVENTUAL ES IMPLICATIONS

UN Creates Secretariat of the Global Bioenergy Partnership at FAO

Military Implications:
Military personnel involved in biofuel R&D should seek appropriate liaison with the GBEP Secretariat to explore potentials for mutual collaboration, new equipment, and exchanging views and regulations regarding biofuels.

Sources:
UN Efforts to Promote New “Green” Fuels Move Ahead
Global Bioenergy Partnership Secretariat up, running
Redesigning Crops to Harvest Fuel
Global meltdown feared: UN report
http://www.canada.com/vancouversun/features/energy/story.html?id=62464470-b75f-4b26-8360-f17b9a8e5249
Energy review ignores climate change 'tipping point'
http://www.guardian.co.uk/science/story/0,,1864802,00.html

‘3R’—Reduce, Reuse and Recycle New Environmental Think Tank for Asia

Military Implications:
Environmental security military personal with Asian regional responsibilities should liaise with this new think tank to share “best practices” and emerging environmental security issue information.

Source:
Partnership Launched to Create '3R' Knowledge Hub in Bangkok
http://unescap.org/unis/press/2006/aug/g33.asp

Asian Consortium on Non-traditional Security Issues

Military Implications:
The military should consider attending the annual conference on non-traditional security issues. Relevant military personnel might also consider collaborating with the consortium in exploring how the capacity of the military can be best mobilized in tackling such “unconventional” threats. If the Army’s Emerging Non-traditional Security Issues (ENSI) Program still exists, that would be an appropriate linking mechanism.

Sources:
Singapore to host consortium studying non-traditional security issues
http://www.channelnewsasia.com/stories/singaporelocalnews/view/251242/1/.html
Bird flu, climate change among Asia's threats
http://www.todayonline.com/articles/164675.asp
UN StEP Initiative for Reducing E-Waste

Military Implications:
Relevant military personnel should follow the StEP developments to identify opportunities for international cooperation and to better anticipate potential new directives. This applies particularly to the Defense Reutilization and Marketing system, which sells and disposes of “excessed” electronic materiel for all Services.

Sources:
Formal Launch of StEP 2007-03-06

NEW INITIATIVES AIMING TO INCREASE ECO-EFFICIENCY

Corporate CEOs Pledge Actions on Climate Change at UN Global Compact Summit

Military implications:
The Global Compact list of corporations should be reviewed to see which ones are military contractors. Those who are could be invited to help implement the Army Strategy on the Environment. Those military contractors who are not yet members, but who are involved in sustainability initiatives with the military might be encouraged to join the Global Compact to further their sustainability capacity. About 4,000 private companies, trade unions, and NGOs from 116 countries have subscribed to the Global Compact’s ten universal principles relating to human rights, labor rights, the environment and the struggle against corruption.

Sources:
Companies pledge at U.N. to cut carbon burdens
http://www.reuters.com/article/ousiv/idUSL065457292007070706
Participants Pledge to Pursue More Sustainable, Inclusive Economy
Caring For Climate: The Business Leadership Platform (text of the statement)
Companies Commit to Reducing Climate Risks
http://www.worldwatch.org/node/5194


Military Implications:
Military personnel with sustainable energy decision responsibility should review the report for potential inputs to their own R&D programs.

Source:
New International Financial Alliance to Support Biodiversity

*Military Implications:*
Relevant military personnel should follow the decisions of this alliance to anticipate impacts on international bases and training areas and for planning responses.

*Sources:*
A new universal global alliance for biodiversity protection established in Bonn

Renewable Energy Projects May Face New Scrutiny

*Military Implications:*
Criticism of some renewable energy technologies is increasing. Military representatives involved in international environmental discussions should review these arguments and be prepared to present an informed military viewpoint on them. It will be essential to be wary of special interests on all sides of this debate arguing with partial truths, since competition for projects will likely underlie many agendas.

*Source:*
Renewable energy wrecks environment, scientist claims
http://www.world-science.net/othernews/070724_renewable.htm

US EPA recommendations for "Green Infrastructure"

*Military Implications:*
Military personnel with installation planning responsibilities should visit this site for techniques in construction and remodeling that could be environmentally beneficial.

*Source:*
Green infrastructure
http://cfpub.epa.gov/npdes/home.cfm?program_id=298

Green Un-building Becomes Major Environmental Goal

*Military Implications:*
The military should ensure that all activities, installations, and civil works are aware of the importance of this concept, and are carrying it out to the maximum practical extent.

*Source:*
The House That Love Un-Built. Green un-building catching on in the U.S.

Green Information Technology Is Forecast as 2008 Top IT Strategy

*Military Implications:*
Military components responsible for IT installations should be sure that adequate attention is being paid to environmental considerations in planning future developments. Military personnel should consider attending the Conference, to hear the views of a large panel of distinguished experts.

*Sources:*
Conference site: http://www.aitglobal.com/
Green IT Will Be 2008's Top Strategic Technology: Gartner
State of Green Business 2008

Military Implications:
The report is a good reference for improving “green” practices.

Source:
Just published — State of Green Business 2008
http://stateofgreenbusiness.com

New “Green IT” Software under Development

Military Implications:
Military personnel responsible for the management of large computer installations or networks should test this software for possible large-scale use.

Sources:
Oxford University launches research project for low carbon computing
Oxford University to Develop Free Green Computing Software

Energy/Performance Benchmark for Workstations under Development

Military Implications:
Personnel responsible for acquisition of workstations should consider the use of this benchmark, when available, for equipment evaluation with respect to environmental impact.

Source:
SPEC Developing Benchmark for Workstation Power Use, Performance

Environmentally Friendly City in UAE Offers Cooperation Opportunity

Military Implications:
CENTCOM personnel should consider contacting UAE authorities to explore how environmental security issues could be included in research and training programs at the Masdar Institute, an MIT-affiliated graduate-level academic research center that will be the first phase of the project to be completed.

Source:
Car-free, solar city in Gulf could set a new standard for green design
http://www.iht.com/articles/2008/02/05/healthscience/05city.php

New International Financial Alliance to Support Biodiversity

Military Implications:
Relevant military personnel should follow the decisions of this alliance to anticipate impacts on international bases and training areas and for planning responses.

Sources:
A new universal global alliance for biodiversity protection established in Bonn
Switching to Green: A renewable energy guide for office and retail companies

Military Implications:
The military should make this available to those with responsibilities for increasing the use of renewable energy sources and promoting the Army Strategy on the Environment.

Source:
Switching to Green: A renewable energy guide for office and retail companies
http://www.wri.org/climate/pubs_description.cfm?pid=4250

Cleantech Report™ by Lux Research

Military Implications:
Relevant military personnel should review Cleantech Report™ for information on technologies and trends that might have military implications and possibilities for implementing the Army Strategy on the Environment. [Definition note: cleantech seems to encompass technologies, products and procedures that are typically called “green”, meaning beneficial or less damaging to the environment than others in current or past use.]

Source:
The Cleantech Report™
http://www.luxresearchinc.com/cleantech.php

Idle Nighttime Computers Cited as Energy Wasters

Military Implications:
Military installations should review their policies and operations and turn off all possible computers.

Sources:
Energy Awareness Campaign
http://www.1e.com/energycampaign/index.aspx
PC Energy Report Released Today Shows That Shutting Down Your PC at the End of the Work Day Will Have a Major Impact on Business Savings and Reducing CO₂
http://www.csrwire.com/News/8951.html