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WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY

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Item 1. World Water Forum

"Lack of water or its poor quality, last year [2005], caused 10 times more deaths than all the wars waged on the planet together," noted Loïc Fauchon, President of the World Water Council, in addressing the 4th World Water Forum held March 16-22 in Mexico City. About 20,000 participants from 141 countries participated. There were over 200 sessions and 1,600 local actions were presented. The dominating discussions were on: universal access to clean water—without border constraints; recognition of water as a fundamental human right and key to development; access to water-related technologies; and improved water management and capacity building. At the Ministerial Conference concluding the Forum, high-level officials adopted the Ministerial Declaration, calling for intensified national and international action on water and sanitation issues by including water and sanitation as priorities in national processes, and support for integrated water resources management. See Appendix for sample of reports launched in conjunction with World Water Forum.

Military Implication:
Military personnel who assess potential conflicts related to water and other water management issues should review the actions and reports produced in conjunction with the World Water Forum for implications to 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 for the 5th World Water Forum to be held in Istanbul, Turkey, in March 2009.

Sources:
4th World Water Forum
http://www.worldwaterforum4.org.mx

At Mexico forum, UN official outlines plans to improve water access globally
http://www.un.org/apps/news/story.asp?NewsID=17827&Cr=water&Cr1=

Summary Of The 4th World Water Forum
http://www.iisd.ca/ymb/worldwater4/html/ymbvol82num15e.html

Item 2. Stronger Regulations to Protect Ocean Marine Environments

2.1 The Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter Enters Into Force

The 1996 Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention) entered into force on March 24, 2006. The Protocol is a comprehensive and restrictive set of regulations regarding dumping of wastes at sea. The new rules prohibit dumping of any materials except for those on an approved list. The 1972 Convention permitted dumping of wastes at sea, except for those materials on a banned list. This is the first international maritime treaty regulating storage of wastes in the seabed, as well as the abandonment or toppling of offshore installations, and it includes the "polluter pays" principle. Although the Protocol's dumping provisions do not cover internal waters, Parties to the Protocol have the option to apply its rules to their internal waters if they wish (Article 7). The Protocol also has linkages with other international environmental agreements that have been developed since 1972; for instance, the Basel Convention on the Control of Transboundary Movements of

Hazardous Wastes and their Disposal. The U.S. is a Party to the 1997 London Convention, but is not a Contracting Party to the 1996 Protocol.

Military Implications:
Since the 1996 Protocol is more restrictive and pragmatic in regulating dumping of contaminants, the military should ensure that its procedures comply with the new requirements—even if the U.S. is not a Contracting Party—to avoid critics and eventual penalties, depending on the region where the incident might occur. Also, it is important to study the key provisions included in Annex 2 to the Protocol, since all permits and permit conditions have to comply with those provisions.

Source:
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 and 1996 Protocol Thereto
http://www.londonconvention.org/

2.2 Greenpeace Calls for Oceans Natural Reserves

A new report by Greenpeace, *Roadmap to Recovery: A global network of marine reserves*, is a comprehensive assessment of the present status of the high seas and threats to them, suggesting that 40% of the world's oceans should be declared natural reserves and protected in the same way as land areas are (according to UN data, at present just 0.6% of the oceans are protected compared with 12% of the world's land). The report outlines a global marine reserve network for the high seas, documenting why it is needed, investigating candidate sites for protection, and indicating some principles of marine reserve networking, as well as suggesting implementation strategies.

Military Implications:
Well-documented reports with concrete policy suggestions, such as the one by Greenpeace, could trigger some new international regulations for improving oceans' protection. The military should consider the training and operations implications, if these recommendations were eventually to find their way into international agreements.

Sources:
Roadmap to Recovery: A global network of marine reserves
http://www.greenpeace.org/international/press/reports/ocean-maps
http://www.greenpeace.org/raw/content/international/press/reports/ocean-maps.pdf (the report)

2.3 Stronger Guidelines for UN Fish Stocks Agreement

Delegates attending a preparatory meeting for the review of the UN Agreement for Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, agreed on guidelines to strengthen the treaty in order to better manage the world's fish stocks. The guidelines will serve to: evaluate the adequacy and implementation status of the Agreement, assess what new political commitments are needed, establish new regional management organizations, and strengthen international cooperation. The "Fish Agreement" entered into force in December 2001; the review conference will be held in New York, May 22–26, 2006.

Military Implications:
Since the U.S. is Party to the treaty, military activities might be affected by any changes to the Agreement. Also, it is likely that fostering international cooperation and creating regional

management organizations will call for military know-how and eventual help for the treaty's enforcement.

Sources:
At UN, countries agree on guidelines to better manage the world's fish stocks
http://www.un.org/apps/news/story.asp?NewsID=17937&Cr=fish&Cr1=

Review Conference on the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks
http://www.un.org/Depts/los/convention_agreements/review_conf_fish_stocks.htm

Item 3. European Waters to Get More Protection

3.1 New Baltic Sea Action Plan Based on Ecosystem Approach

The kick-off Stakeholder Conference of the Helsinki Commission approved the first steps in drafting the Baltic Sea Action Plan (BSAP) to protect and restore the Baltic Sea marine environment. The Plan includes intergovernmental cooperation among the countries bordering the sea—Denmark, Estonia, the European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden. The BSAP will be part of the new EU Marine Strategy for a healthy marine environment. "The BSAP will apply the ecosystem-based approach to management of the Baltic Sea. In setting a definition of 'good ecological status' for the Baltic Sea, as well as specific environmental targets and necessary measures, the BSAP will be instrumental to the successful implementation of the [EU Marine] Strategy in the region," said Peter Gammeltoft, Head of the Water and Marine Unit in the Directorate General for Environment at the European Commission. The Plan is expected to be adopted in late 2007.

Military Implications:
The military in the region should study the available documents and follow the drafting process in order to be prepared to cooperate and comply with the Baltic Sea Action Plan requirements.

Sources:
HELCOM Baltic Sea Action Plan receives strong support at Stakeholder Conference
http://www.helcom.fi/press_office/news_helcom/en_GB/StakeholderConf_Outcome/

New Baltic Sea Action Plan Relies on Ecosystem Approach
http://www.ens-newswire.com/ens/mar2006/2006-03-10-01.asp

3.2 The Agreement on International Carriage of Dangerous Goods by Inland Waterways (ADN) Closer to Entry into Force

The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) is two ratifications away for entering into force. The ADN aims to set up high-level safety standards for the entire European Inland Waterways Network by a main legal text and regulations concerning the international carriage of dangerous goods by inland waterways; and effective prevention of pollution resulting from accidents or incidents during the carriage; while facilitating transport operations and promoting international trade in chemicals.

Military Implications:
[Similar to the above] The military in the region should study the available documents [the Agreement will be similar to the already existing one for the Rhine] and follow the drafting process in order to be prepared to cooperate and comply with the new requirements.

Sources:
Bulgaria joins the ADN Agreement http://www.unece.org/press/pr2006/06trans_p02e.htm

The ADN http://unece.org/trans/danger/adn-agree.html

Item 4. International Biodiversity Meetings Make Decisions

The third Meeting of the Parties to the Cartagena Protocol on Biosafety (COP/MOP-3) was held from 13-17 March 2006, in Curitiba, Brazil, preceding the eighth meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP-8) held 20–31 March. COP/MOP-3 adopted 18 decisions ranging from requirements for handling, transport, packaging and identification of living modified organisms (LMOs) to capacity building and funding. The most important achievement was the adoption of the documentation requirements for LMO shipments for food, feed and processing (LMO-FFPs).

The Conference of the Parties to the Convention on Biological Diversity (CBD COP-8) focused on concrete actions and policies to achieve the 2010 biodiversity target. *Global Biodiversity Outlook 2*, by the secretariat of the UN CBD, released at the opening of the Conference, reveals that human activity might be the cause of the worst extinction since the dinosaurs' era. Some notable outcomes of the CBD COP-8 include:

- call to use zoning schemes, special management areas, and policies to preserve endangered species
- designation of several new protected areas
- rejection of lifting the moratorium on terminator seeds
- set of measures and objectives for the protection and sustainable use of the vulnerable biodiversity of islands, and another on arid lands
- new initiatives to raise awareness globally on the consequences of the biodiversity loss
- an alliance among the world's top research centers and agencies specializing in biodiversity to cooperate with the UN CBD to reduce the rate of loss of biodiversity by 2010
- Conservation of Biodiversity Rich Sacred Natural Sites initiative
- a 2010 Biodiversity Forum with preparations to begin this year

The ninth Conference of Parties will be held in 2008, in Germany. The Convention on Biological Diversity has 188 Parties (168 Signatures), and the Cartagena Protocol on Biosafety has 132 Parties (103 Signatures). The United States is not Party to any of them.

Military Implications:
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:
Third meeting of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety http://www.biodiv.org/doc/meeting.aspx?mtg=MOP-03

Summary of The Third Meeting of The Parties to The Cartagena Protocol on Biosafety http://www.iisd.ca/vol09/enb09351e.html

Africans missing at key biosafety talks http://www.panos.org.uk/global/cbd2006_summit1.asp

Eighth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity http://www.biodiv.org/doc/meeting.aspx?mtg=COP-08

Global Biodiversity Outlook 2 http://www.enn.com/today.html?id=10107

Conserving Biological Diversity Becomes a Sacred Quest http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=471&ArticleID=5162&l=en

Eighth Conference of the Parties to the Convention on Biological Diversity (COP-8) http://www.iisd.ca/biodiv/cop8/

Item 5. Technological Breakthroughs with Environmental Security Implications

5.1 New Microcantilever for Biochemical Detection

Researchers at the Nanomaterials for Cancer Diagnostics and Therapeutics Center for Cancer Nanotechnology Excellence at Northwestern University have developed a new device that generates a direct electrical signal from the bending that occurs when a suspect biological molecule bends a cantilever in binding to an antibody or complementary nucleic acid sequence attached to it. The cantilever's motion has been detected optically in previous devices, but here the tiny beam forms part of a MOSFET semiconductor, and causes a sharp change in current when displaced. The device can be mass-produced using standard computer chip design and manufacturing techniques, and can detect bending of as little as 5 nm when triggered by DNA or antigens.

Military Implications:
This application might be useful for future environment surveillance systems in conflict situations due to its biochemical high sensitivity and connectability to multiplexed and remotely addressable, networked systems. The military should follow this development for its possible future field applications.

Source:
Transistor-Cantilever Combo Detects Biomolecules with High Sensitivity http://nano.cancer.gov/news_center/nanotech_news_2006-02-27b.asp

5.2 Chopped-up DNA Strands Speed Bacterial Identification

A team of researchers at the Brookhaven National Laboratory has developed a new technique for rapid and efficient identification of pathogenic bacteria within an unknown mixture of microbes. An enzyme is added to the mixture that chops up the bacterial DNA into short segments, which can be individually isolated and identified, thus enabling the detection of harmful organisms in the environment. This is much faster than preparing bacterial cultures and avoids the possibility of favoring the detection of certain bacteria over others.

Military Implications:
The military should follow the course of this research and investigate its application in new field-oriented environmental data acquisition systems.

Source:
New Technique Rapidly Detects Harmful Bacteria
http://www.nationalacademies.org/headlines/20060313.html

5.3 New Spectroscopy Technique with Superior Results

Scientists at JILA (originally the Joint Institute for Laboratory Astrophysics, but presently having no definition), the institute jointly sponsored by the National Institute of Standards and Technology and the Univ. of Colorado – Boulder, have developed a new technique for spectroscopy as used in the identification of minute quantities of chemicals in gas samples, such as in environmental monitoring stations, or screening for explosives or biochemical weapons. The JILA system uses an ultrafast laser-based "optical frequency comb" as both the infrared source and as a means for precisely measuring the wavelengths produced after interactions. Its sensitivity of one part in 10^8, and an acquisition time of 7 ms for its 100 nm wavelength range indicate its increased capability for use in systems for monitoring the environment.

Military Implications:
The military should follow the further development of this technique, which promises even higher sensitivity, and should investigate it for field environmental surveillance applications.

Source:
New JILA Technique Using Infrared Laser Light to Identify Trace Levels of Different Molecules
http://www.azonano.com/news.asp?newsID=1999

5.4 Sanitizing Fabrics for Environmental Workers

Researchers from Cornell University and the University of California, Davis, have developed a technique for incorporating bacteria-killing halamides into fabrics that can then be used to produce protective clothing for personnel working in biologically hazardous environments, such as where anthrax may be present.They expect testing in 2006 and commercialization in 2008.

Military Implications:
The military should continue to follow this development and, as appropriate, plan for the use of these materials in operational situations.

Source:
New Nano-Fabrics to Safeguard Agricultural, Medical, and Military Workers
http://www.nanotechbuzz.com/50226711/new_nanofabrics_to_safeguard_agricultural_medical_and_military_workers.php

Item 6. Drug Metabolites Identified in Wastewater––Removal Possible

University of Buffalo researchers announced (Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy in Orlando, FL, March 16, 2006) that metabolites of two antibiotics and a medical imaging agent have been found in wastewater treatment plants. "Current wastewater

treatment processes are optimized to reduce nitrates and phosphates and dissolved organic carbon, the major pollutants of concern in domestic wastes," said Diana Aga, UB's research leader, "However, treatment facilities don't monitor or measure organic microcontaminants like residues of pharmaceuticals and active ingredients of personal care products." The team described methods for identification and treatment of these pollutants. Such antibiotics and their metabolites can increase drug resistance among disease organisms and synthetic hormones can act as endocrine disruptors. Italian researchers also found high concentrations of pharmaceuticals in aquatic environments at levels close to those that may induce adverse ecotoxicological effects.

Military Implications:
Military organizations charged with medical waste and wastewater treatment research and operations should evaluate the University of Buffalo findings and consider their application by military facilities and field waste treatment units.

Sources:
Pharmaceutical Metabolites Found in Wastewater. March 15, 2006
http://www.buffalo.edu/research/article.html?id=78260009

Pharmaceuticals in the Environment
http://europa.eu.int/comm/environment/integration/newsalert/pdf/13na3.pdf

Item 7. Chinese Research Priorities for the Next Fifteen Years

The Chinese Academy of Sciences (CAS) announced its research priority for the next fifteen years. Areas of research are: drug and biofuel development; nanotechnology and new materials; genomics and proteomics; renewable energy and technologies for capturing carbon dioxide emissions; sustainable agriculture; and the next generation of information technology (IT). The academy investment is expected to grow by 70% in the next five years and then by about 12% annually until 2020 making it a major player in the future of science and technology.

Note: *East Asian Strategic Review 2006*, a recent report by the Japanese National Institute for Defense Studies, warns that increasing Chinese research on the development of technologies for mounting “China’s military muscle can be seen as major destabilizing factors in East Asia.”

Military implications:
Considering that China is emerging as an important player in new technologies, the international community should keep track of their R&D status for potential environmental and health implications as well to seek synergies among other national research programs to improve environmental security.

Sources:
Chinese Academy of Sciences gets first constitution
http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=2735&language=1

CAS publishes its blueprint for development
http://english.cas.cn/eng2003/news/detailnewsb.asp?InfoNo=25962

East Asian Strategic Review 2006 Executive Summary
http://www.nids.go.jp/english/dissemination/east-asian/pdf/east-asian_e2006s.pdf

Item 8. Updates on Previously Identified Issues

8.1 Increasing Nuclear Safety and Security

The first International Conference on Effective Nuclear Regulatory Systems was held in Moscow, 27 February–3 March 2006. The 216 participants from 57 countries and seven international organizations discussed the full range of issues of nuclear security and safety in light of the potential revitalization of nuclear energy for meeting world energy requirements without greenhouse gas production. Triennial forums will review progress in creating effective nuclear regulatory systems and deepening international collaboration.

On March 23, Slovakia became the first country to ratify the International Convention for the Suppression of Acts of Nuclear Terrorism; to date, 100 States have signed it. [See also *Nuclear Terrorism Convention Signed by 82 Countries at the UN Summit* in the September 2005, and *UN Agency to Intensify Tracking of Illicit Nuclear Trafficking* in the September 2004 environmental security reports.]

Military Implications:

[Similar to previous on the same issue] The military should assess what new opportunities have been made possible as a result of this international meeting and agreements for improving security; and then recommend policy, training, and institutional or physical changes needed to exploit these opportunities.

Sources:

International Conference On Effective Nuclear Regulatory Systems
http://www-pub.iaea.org/MTCD/Meetings/Announcements.asp?ConfID=150

World nuclear regulators agree to meet again in three years
http://www.platts.com/HOME/highlights/2006/homep_inrc_031306.xml

Slovakia first to ratify UN-administered pact on nuclear terrorism
http://www.un.org/apps/news/story.asp?NewsID=17912&Cr=terror&Cr1

8.2 Climate Change

8.2.1 Compliance Body Set Up for Kyoto Protocol

The Compliance Committee for the Kyoto Protocol "designed to ensure the environmental integrity of the agreement and to contribute to the credibility of the carbon market created by the Protocol" has begun its operations, announced the UN Framework Convention on Climate Change. The 20-member Committee has two branches: the Enforcement Branch of the Committee that deals with non-compliance consequences for Parties that do not meet their commitments under the Protocol, and the Facilitative Branch of the Committee, that would provide advice and assistance to countries having difficulties meeting their commitments. The Committee deals with individual cases as they come up, and reports annually to the meeting of the Parties to the Protocol.

A European study, *An economic assessment of the Kyoto Protocol application*, states that the United States' stand on the Kyoto Protocol influences the economic consequences of the Protocol implementation more than any other factor or region. The analysis considered four main factors: the participation of the United States—the major emissions-producing country; and the role of Russia—the potential major emission credit seller; the Marrakech Accords' CO_2 sinks; and the trading mechanisms and related trade restrictions defined by the Protocol; and boycott movements.

The report aims to help assess the most cost-effective options to reduce greenhouse gases emissions globally. [See also *Montreal Conference on Climate Change Reached New Agreements* in December 2005, *UN Meeting Fails to Agree on Post-Kyoto Strategy* in May 2005 and other previous environmental security reports.]

8.2.2 Polar Ice Melting Faster than Forecasted

Several studies have recently revealed that ice at both poles is melting faster than previously forecast. Using satellite technology, scientists found that sea levels rise by 0.4 millimeters a year, due to water pouring into the seas, mainly caused by the bulk loss of ice sheets. Although there is evidence that while the West Antarctic is thinning the East of the continent is thickening, and similarly, Greenland's interior is becoming heavier due to more snowfall, while the edges are thinning, the overall melting is more. A model developed by the National Center for Atmospheric Research (NCAR), also reveals that ice sheets and glaciers in the Arctic and Antarctic have been melting steadily. The model is based on observations of the Last Interglaciation period when shifts in Earth's orbit caused the Arctic to warm by 3-5 ºC and the sea level to rise by some 5 meters. The scientists note that half of the sea level rise predicted in 2001 by the Intergovernmental Panel on Climate Change (IPCC) to occur this century has already taken place in the past decade. They warn that passing the 560 ppm CO_2 concentration threshold in the atmosphere (now it's about 380ppm) might trigger unpredictable changes with catastrophic consequences, and are calling for increased efforts to curb greenhouse gases emission and tackle global warming.

8.2.3 Greenhouse Gases at Rise, Show Several Recent Reports

Greenhouse-gas concentrations reached new highs in 2004, reveals the first annual Greenhouse Gas Bulletin published by WMO. Globally, average concentrations of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) in the Earth's atmosphere exceed those of pre-industrial times by 35%, 155%, and 18% respectively, reaching their highest-ever recorded levels. The WMO prepared the Greenhouse Gas Bulletin in cooperation with the World Data Centre for Greenhouse Gases (that archives observations from some 44 WMO Members), and with assistance of the U.S. National Oceanic and Atmospheric Administration's Earth System Research Laboratory. The bulletin with 2005 data is expected in November 2006. NOAA reports that in 2005, the CO_2 average atmospheric concentration reached 381 ppm, an increase of 2.6 ppm since 2004 (although compared to WMO data, the difference would be 3.9 ppm), noting that half a century ago, the annual increase was less than 1 ppm.

Military Implications:

[Similar to previous on the same issue] There is compelling evidence of the consequences of climate change, that humans have an important role in it, and that generally, the world wants to act upon it. New international environmental security policies and cooperation to avoid potentially large scale disasters and conflicts are likely.

Sources:

Groundbreaking Kyoto Protocol Compliance system launched
http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/20060303_compliance_committee_1st_meeting.pdf

Economic Implications of the Kyoto Protocol
http://europa.eu.int/comm/environment/integration/newsalert/pdf/14na4.pdf

Polar ice sheets show net loss http://news.bbc.co.uk/2/hi/science/nature/4790238.stm

Arctic, Antarctic Melting May Raise Sea Levels Faster than Expected
http://www.ucar.edu/news/releases/2006/melting.shtml

Ice and History. Donald Kennedy and Brooks Hanson, *Science*, 24 March 2006
http://www.sciencemag.org/cgi/content/summary/311/5768/1673

First WMO Greenhouse Gas Bulletin
http://www.wmo.int/web/arep/gaw/ghg/ghg-bulletin-en-03-06.pdf

Global Atmosphere Watch http://www.wmo.int/web/arep/gaw/gaw_home.html

8.2.4 Future Sea-level Rise will make Freshwater Brackish

The southern Pacific region experienced "king tides" on February 28, 2006, as a result of the 26-year cycle of essentially perfect gravitational alignments of the Sun, Moon and Earth. The island of Funafuti, Tuvalu (max. elevation = 3.7 meters) had tide swells of 3.4 meters above normal in calm weather. While this rise is only minimally attributable to global warming sea-level rise at this stage, it does point to impacts to be expected well before actual inundation of low-lying regions might result from that phenomenon. While only three of the lowest situated homes experienced yard flooding, Dr. Mark Hayes of the University of Queensland observed water bubbling up to emerge on top of the soil. This would have occurred from rapid, significant intrusion of seawater below the lens of brackish and freshwater held in pores and cavities of the island's rocky structure and soil. Such intrusion will have contaminated some of the freshwater upon which residents depend for direct use and for agriculture. In low rainfall regions, such damage will not self-repair quickly. It is likely that well before physical inundation from general sea-level rise forces residents to flee, they will have to abandon the island owing to unavailability of potable water and water for even salt-tolerant crops and trees. Funafuti is one extreme case, but represents a snapshot of the future for all low-lying islands and littoral zones. [See also *Several Small Asia/Pacific Countries at Risk because of Rising Sea Levels* in January 2006, *First People Displaced Due to Rising Sea Levels* in December 2005 and other related items in previous environmental scanning reports.]

Military Implications:

[Same as in previous reports on the same issue] Combined effects of seal-level rise and forecasted weather extremes expected from global warming are highly likely to generate requirements for rescue and social instability management missions. Also, plans will be required for "hardening" and moving military installations now on low-lying islands and littoral areas, such as the Pacific islands and Diego Garcia (which relies heavily on a fresh water lens water supply).

Sources:

High Tides Flood Funafuti
http://www.tuvaluislands.com/news/archives/2006/2006-03-04.htm

Meteorologists Warn of King Tides to Sweep in Today
http://www.pacificislands.cc/pina/pinadefault2.php?urlpinaid=20566

'Move Tuvalu Population To A Fiji Island To Ensure Survival, Scientist Says' Feb.20th, 2006
http://www.tuvaluislands.com/news/archives/2006/2006-02-20.htm

"Hayes Tuvalu Radio New Zealand International" [See Appendix for transcript and email conversation with Millennium Project intern, Eric St-Pierre ericstpierre@gmail.com]

8.3 New European Energy Policy Developments

A European Commission new Green Paper sets the basis for a common energy strategy for the 25-nation European Union, since energy security and the fight against climate change are common challenges and therefore should be addressed by common and coordinated efforts. The paper includes six specific priority areas with over 20 suggestions: establishing an internal EU energy market; solidarity among EU Member States, including setting up a European Energy Supply Observatory and revision of the present supply framework; a sustainable, efficient, and diverse energy mix("This in turn may eventually lead to objectives being established at Community level regarding the EU's overall energy mix to ensure security of supply, whilst respecting the right of Member States to make their own energy choices" states the EU Press Release); global warming response, including an Action Plan on energy efficiency to be adopted by the Commission later this year; strategic energy technology plan that would assure EU competitiveness for efficient and low-emission technologies; and a common external energy policy to reflect an EU common view in the international arena, including a new Community mechanism to enable rapid and coordinated reactions to emergency external energy supply situations.

In order to reduce dependency on non-European countries' energy sources, European leaders are planning to raise the share of energy generated from renewables from 12% to 15% by 2010 and increasing the proportion of biofuels used in transport from the 5.75% target by 2010 to 8% by 2015. Meanwhile, the EC's "Euro 5" proposal seeks to impose stricter rules on new car emissions, calling for diesel particulates to be cut by 80%, gasoline hydrocarbons by 25%, and, for both gasoline and diesel, NOX cut by 20%. Individual countries advocate even stronger measures. The new standards, if approved, could enter into force in mid-2008.

Military Implications:

The military should consider following the EU new energy and car standards policies and the consequently emerging strategies, for eventual impacts on energy-related planning and to ensure that its activities in the region comply with the new energy policy framework. Also, since the car standards will apply as well to imported cars, the military should review its vehicles standards in/for the European theater to comply with the new standards.

Source:

Fuelling our future: the European Commission sets out its vision for an Energy Strategy for Europe
http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/282&format=HTML&aged=0&language=EN&guiLanguage=en

EU Leaders Seek Stronger Renewable Energy Targets
http://www.planetark.com/dailynewsstory.cfm/newsid/35802/story.htm

EU Ministers Push for Tougher Car Pollution Rules
http://www.planetark.com/dailynewsstory.cfm/newsid/35571/story.htm

8.4 Nanotechnology

8.4.1 German NanoCare Project to Evaluate Nanoparticles

This month marks the beginning of the NanoCare project under the auspices of the German Ministry of Education and Research. This project brings together thirteen companies, universities and research institutes, and focuses on "the properties of nanoparticles to ensure that they pose no risk to humans and the environment when used in chemical materials." It will operate for three years and has €7.6 million in funding from government and industry.

Military Implications:
The military should establish relations with the project, and ensure that it keeps informed about the results of the research efforts. NanoCare's work will also be available through a portal and data base on the Web.

Sources:
Bayer joins nanotechnology research project
http://www.pharmaceutical-business-review.com/article_news.asp?guid=30C47C4C-F0EC-42EA-84BA-2DA6FF8C92BF

Project site: http://www.nanopartikel.info/ (in German, under construction)

8.4.2 Nanotech Consumer Products Data Base

The Emerging Nanotechnologies Project of the Woodrow Wilson International Center for Scholars has launched the first publicly accessible on-line 'Nanotechnology Consumer Products Inventory.' The database lists over 200 nanotech-related consumer products by name, manufacturer, country of origin, and category, and includes a product photograph, description, and Web link. The database is available at http://www.nanotechproject.org/index.php?id=44 and is still being expanded.

Military Implications:
The database might provide useful input to nanotech risk assessments.

Source:
A Nanotechnology Consumer Products Inventory
http://www.nanotechproject.org/index.php?id=44

Online List Details 200+ First Generation Nano Products Available Today on Store Shelves and via Internet
http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=104&STORY=/www/story/03-10-2006/0004317584&EDATE

8.4.3 Grant for Review of Best Practices in Nanotech Safety

Researchers at the University of California, Santa Barbara received a grant from the International Council on Nanotechnology (ICON), a multi-sectoral consortium, to conduct a "Review of Best Practices for Nanotechnology Safety", to be completed by the end of 2006. The first phase will involve a comprehensive review of all existing "best practice" development efforts. The second will conduct interviews of a broad range of companies internationally to determine current practices, having as a goal, "to identify critical needs for the standardization and implementation of safe practices in the nanotechnology industry in different parts of the globe." A project official, Barbara Herr Harthorn, commented, "The ICON-funded study will provide essential data on current nanotech industry standards and practices for enhancing the environmental and health

safety of nanomaterials. By providing comparative data on companies in the US, Europe and Asia, it will help shed light on new safety models as they are being implemented and also help identify where they are most needed. This work will provide important baseline data for … research … UCSB is planning on risk and society issues."

Military Implications:
The military components concerned with nanotech occupational safety and health should establish liaison with the study to discuss issues of mutual interest, and should obtain a copy of the final results.

Source:
International Council on Nanotechnology studies occupational safeguards
http://www.physorg.com/news11773.html

8.4.4 Upcoming Conferences on Nanotechnology Safety
A conference on "Nanoparticles for European Industry – Manufacture, Scale-Up, Stabilization, Characterization and Toxicology'" will be held 2-3 May 2006, at the Olympia Conference Centre, London. The meeting, sponsored by the Institute of Nanotechnology and the European Nanotechnology Trade Alliance, will present the latest views on issues of critical importance to industry, including innovations in manufacturing techniques, and scale-up and stabilization of nanoparticles. The conference will include sessions on toxicology and characterization, plus presentations on current approaches to regulation.

The International Symposium on Nanotechnology in Environmental Protection and Pollution will be held in Hong Kong, China 18-21 June 2006. One of the three sections of the Symposium is directed toward Nanotechnology Toxicity and Environmental Pollution, including Environmental Cleanup, Filters and Membranes, Nanoelectromechanical Systems (NEMS) and Advanced Devices for Environmental Monitoring, Environmental Impact and Assessment, Nanotechnology Defense, Responsible Commercialization, and Nanotechnology Industry Standards.

Military Implications:
If not yet done, relevant military personnel should consider attending these conferences, for information sharing and also networking with others working on environmental problems in different other parts of the world.

Sources:
Nanoparticles for European Industry –Manufacture, Scale-Up, Stabilization, Characterization and Toxicology http://www.nano.org.uk/conferences/nanoparticles/flyer.pdf

International Symposium on Nanotechnology in Environmental Protection and Pollution
http://www.isnepp.org/

Item 9. Reports to Review

9.1 Environmental Change and Security Program 11th Report

The 11th report of the Woodrow Wilson Center Environmental Change and Security Program discusses the implications and eventual links among environmental problems and population dynamics, and conflict. According to the international panel of experts, stabilizing population growth, and protecting natural resources and the environment should be part of the long-term

strategy for resolution and avoiding of conflicts around the world. The report emphasizes that more research is necessary for understanding regional aspects of the links connecting environment, population, and security.

Military Implications:
Along with other similar reports, this edition of the Environmental Change and Security Program report is a source for those who need a better understanding of the complex interdependence among environment, population dynamics, and conflict, and its different regional aspects.

Source:
Environmental Change and Security Program Report
http://www.wilsoncenter.org/index.cfm?topic_id=1413&fuseaction=topics.publications&group_id=173708

9.2 Tougher Systems to Control GMO Suggested

GM Contamination Report 2005, by GeneWatch UK and Greenpeace International, warns that current practices and legal frameworks are not adequate to protect against GMO spread in unwanted places and to other plants. Reviewing cases of contamination and negative side effects of genetically modified organisms, the report reveals that over the past decade, GM crops have been planted illegally, or have pollinated non-GM food in 39 countries, which is nearly double the number of countries that introduced GM crops since 1996, when they were first commercialized. The report calls for an independent international commission to be set up to investigate, and for an international register of such incidents to be set up under the Cartagena Protocol on Biosafety.

Military Implications:
The recommendations of the report might find their way into a better-enforced framework to control GM products mixing and movement, including shipments of food aid. The military should be prepared to have up-to-date information on all the characteristics (including GMO content) of the food it moves around the world, in order to prevent avoidable embarrassment.

Sources:
Greenpeace and GeneWatch UK call for urgent adoption of international biosafety standards
http://www.genewatch.org/Press%20Releases/pr85.htm

GM Contamination Report 2005
www.genewatch.org/publications/reports/contamination report final.doc (might take longer to download)

9.3 Arctic Observing Integrated Network

Toward an Integrated Arctic Observing Network, by the Committee on Designing an Arctic Observing Network, National Research Council, discusses the need, scope, and implementation of an international observation system for the Arctic region. The Arctic Observing Network (AON) would coordinate existing national and international efforts for reliable and timely detection of conditions and variations in the Arctic for a better understanding of the arctic system's functions and changes. The network would serve both scientific and operational needs, also contributing to other programs and research studies that help understand the consequences of arctic changes and thus improve decision-making and timely-action.

Military Implications:
Considering the rapid changes of the arctic system in recent years, and their consequences for the environment, human health, and security, it is likely that the proposal for such an international

network will find its way into implementation. Potential oil reserves and overlapping jurisdictions could lead to security issues (The median line method for national control would divide the Arctic sea between countries according to their length of nearest coastline. This would give Denmark the Pole itself but Canada would gain as well. The sector method would take the North Pole as the center and draw lines south along longitudes. This would penalize Canada; but Norway and, to a lesser extent, Russia would gain.) The military should consider participating in the network from the very beginning, to contribute know-how and expertise for its design and later on to implementation and operations

Sources:
Toward an Integrated Arctic Observing Network
http://www.nap.edu/catalog/11607.html

Draft Political Turmoil Global Energy Scenario (See "The Arctic")
http://www.acunu.org/millennium/energy-political.html

APPENDIX

Reference Details

This Appendix contains expanded background information on some items, and the full text for the articles that are not available on the Internet or are usually stored for a limited time on the respective Web sites.

Item 1. World Water Forum

Some reports produced in conjunction with the WWF.

The second edition of the World Water Development Report, *Water: A Shared Responsibility*, was launched on World Water Day, which's theme this year was "Water and Culture," stressing the role of local practices for good water management. The comprehensive triennial assessment of freshwater resources addresses the consequences of climate change on water challenges, health and development implications of water scarcity and, emphasizing that water is shared responsibility, the report recommends improved water governance at all levels, including institutional capacity, legal frameworks, and resource distribution.

Other studies launched around the Forum also underline implications of poor fresh water management ranging from access and administration, to pollution and overexploitation. *Challenges to International Waters: Regional Assessments in a Global Perspective*, report by UNEP, addresses mainly water shortages, overfishing, and pollution, and their implications for health, food security, and development, making several recommendations to reverse the damage and declines. It warns that unless improved water management practices, many of the problems are expected to "increase in severity by 2020".

Access to clean water and sanitation might be worsened by high rate of urbanization, mainly in small urban centers, warns *Meeting the development goals in small urban centres?* report by UN-HABITAT. Considering that by 2015, more than half of world population will live in urban areas, and the urban population of Asia, Africa and Latin America is expected to reach 4 billion within the next three decades, increased efforts are necessary to develop socially and environmentally sustainable cities.

Changes in Surface Water Supply Across Africa with Predicted Climate Change, paper by Africa Earth Observatory Network, University of Cape Town, is a detailed assessment of the consequences of climate change on the water situation in Africa. It warns that without immediate implementation of adequate water management systems, by the end of the century a quarter of the continent would suffer of lack of surface water, and the access to clean water will continue to worsen with half of the African population expected to live in urban areas by 2030. Presently, it is estimated that out the approximately 800 million Africans, some 300 million lack access to safe drinking water, and 313 million do not have access to basic sanitation.

Sources:
Water: A Crisis of Governance. Says Second UN World Water Development Report
http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=471&ArticleID=5153&l=en

Global International Waters Assessment Report Launched
http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=471&ArticleID=5234&l=en

UN-HABITAT launches its second global report on water and sanitation
http://www.unhabitat.org/programmes/water/waterReport2006.asp

Changes in Surface Water Supply Across Africa with Predicted Climate Change
http://www.sciencemag.org/cgi/content/abstract/1119929v1 (abstract)

Water supply 'unstable' for most of Africa
http://www.scidev.net/news/index.cfm?fuseaction=printarticle&itemid=2702&language=1

Item 8. Updates on Previously Identified Issues

8.2 Climate Change

8.2.4 Future Sea-level Rise will make Freshwater Brackish

Radio New Zealand International
The Voice of New Zealand, Broadcasting to the Pacific
Te Reo Irirangi O Aotearoa, O Te Moana-Nui-A-Kiwa
Highest tides in thirty years cause flooding in Tuvalu
Posted at 22:45 on 28 February, 2006 UTC
An Australian journalist, Dr Mark Hayes, says Tuvalu has experienced its highest tides in almost 30 years.
Dr Hayes, a lecturer at the University of Queensland in Brisbane, was on Funafuti atoll when the 3.2 metre high swells occured (*sic*) and caused flooding in low lying areas.
He says the water just started bubbling up from the ground.

"Police and disaster people are cruising up and down the roads, and keeping an eye on things and a few roads have been blocked off. Its just a bit weird well rather very weird actually cause I have never seen seawater bubbling up from the ground to flood an island."
Dr Hayes, who is in Tuvalu doing research on global warming and climate change, says the north of Funafuti near the port complex was the worst hit by flooding.
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PO Box 123, Wellington, New Zealand

Email between Dr Hayes and Eric St-Pierre ericstpierre@gmail.com, Millennium Project intern in the Solomons, March 2nd, 2006:

Dr Hayes: Talofa Eric,
Eric: > I am following the situation in Tuvalu for the 2006 'State of the Future Report' and am curious to know the results of the February 28th tide prediction.
Dr Hayes:We had the highest tide ever recorded... just over 3.4 metres... See the Attached RNZI report...
…

We were extremely lucky the weather was fine and calm, so only low level nuisance flooding, and three houses flooded around North Funafuti.
Tofa from Funafuti