

**WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY**  
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Note to Readers: Pages 1-14 comprise the summary and analysis of this report. Expanded details for some items are in the Appendix beginning on page 15.

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## Item 1. World Food Crisis

### 1.1 Food Security Summit Usefulness Debatable

About 5,100 people from 181 countries, including 43 heads of state or government and 100 ministers, participated in the June 3-5 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.]

#### **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:** (additional sources in the [Appendix](#))

FAO June Food Summit

<http://www.fao.org/newsroom/en/focus/2008/1000829/index.html>

"Failure as Usual" Food Summit

[http://www.etcgroup.org/en/materials/publications.html?pub\\_id=698](http://www.etcgroup.org/en/materials/publications.html?pub_id=698)

### 1.2 Food Security Observatory Proposed for Sahel-Saharan Region

Food security was the main theme of the 10<sup>th</sup> 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.

#### **Military Implications:**

AFRICOM should explore how to assist the proposed observatory with early warning management concepts, software, and methods.

**Sources:**

Tunisia pleads for creation of CEN-SAD food security observatory

[http://www.apanews.net/apa.php?page=show\\_article\\_eng&id\\_article=66771](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](http://www.apanews.net/apa.php?page=show_article_eng&id_article=67897)

## Item 2. North American Environmental Security Action Plan

The 15<sup>th</sup> 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.

### **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

<http://www.cec.org/calendar/details/index.cfm?varlan=english&ID=2097>

*North America 2030: An Environmental Outlook*

<http://www.cec.org/outlook/>

Sound Management of Chemicals

[http://www.cec.org/programs\\_projects/pollutants\\_health/project/index.cfm?projectID=25&varlan=english](http://www.cec.org/programs_projects/pollutants_health/project/index.cfm?projectID=25&varlan=english)

Input from Millennium Project staff attending the meetings (online)

## Item 3. Asian Environmental Security Policies

### **3.1 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 affairs,” 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.

**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

<http://www.iiss.org/whats-new/iiss-in-the-press/june-2008/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>

**3.2 Singapore's New Institute of Water Policy**

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.

**Military Implications:**

Liaison should be sought with the new institute for mutual benefit to improve water security in the region.

**Source:**

Singapore's PM says water security may spark conflicts

<http://www.reuters.com/article/environmentNews/idUSSIN27852320080624>

**Item 4. 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."

**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>

**Item 5. Technological Advances with Environmental Security Implications****5.1 New Detection and Cleanup Techniques****5.1.1 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.

**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

<http://www.physorg.com/news131372301.html>

**5.1.2 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.

**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 Nanobatoms Self Assemble Around Oil Droplets for Cleaning Oils Spills and Polluted Water

<http://www.azonano.com/news.asp?NewsID=6521>

**5.1.3 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.

**Military Implications:**

The military should investigate this technology for its usefulness in testing possibly contaminated environments.

**Source:**

Using carbon nanotubes, MIT chemical engineers have built the most sensitive electronic detector yet for sensing deadly gases such as the nerve agent sarin

<http://www.physorg.com/news131977245.html>

**5.2 Increasing Energy Efficiency Technologies****5.2.1 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 mm<sup>2</sup>, 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.

**Military Implications:**

The military should investigate this development for use in environmental sensing systems.

**Source:**

Microchip sets low-power record with extreme sleep mode

<http://www.physorg.com/news132583292.html>

**Item 6. Updates on Previously Identified Issues****6.1 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.

**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.news.com.au/heraldsun/story/0,21985,23836647-5005961,00.html>

Financial Action Task Force, plenary meeting, London, June 18-20, 2008. Chairman's Summary

<http://www.fatf-gafi.org/dataoecd/50/1/40879782.pdf>

Funding Channels Aid Proliferation, Task Force Says

[http://www.nti.org/d\\_newswire/issues/2008\\_6\\_24.html#47DF9DAF](http://www.nti.org/d_newswire/issues/2008_6_24.html#47DF9DAF)

**6.2 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 on 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.]

**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

<http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/08/298&format=HTML&aged=0&language=EN&guiLanguage=en>

Nanotech Worries Push EU To Seek Full Safety Data For Carbon

<http://www.nasdaq.com/aspxcontent/NewsStory.aspx?cpath=20080609%5CACQDJON200806090702DOWJONESDJONLINE000171.htm&&mypage=newsheadlines&title=Nanotech%20Worries%20Push%20EU%20To%20Seek%20Full%20Safety%20Data%20For%20Carbon>

**6.3 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.]

**Military Implications:**

[Same as previous 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

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1025&format=HTML&aged=0&language=EN&guiLanguage=en>

**6.4 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 CO<sub>2</sub> 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.]

**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.

**Source:**

EU Lawmakers Confirm Deal on Airline CO<sub>2</sub> Emissions

<http://www.planetark.com/dailynewsstory.cfm/newsid/49072/story.htm>

**6.5 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.]

**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

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/958&format=HTML&aged=0&language=EN&guiLanguage=en>

**6.6 Waste Management Policies****6.6.1 Basel Convention Needs Revision and Update**

The 9<sup>th</sup> 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.]

### **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

<http://www.iht.com/articles/ap/2008/06/27/asia/AS-GEN-Indonesia-Toxic-Trade.php>

UN conference in Bali tackles toxic-waste management

<http://www.cbc.ca/world/story/2008/06/26/toxic.html>

### 6.6.2 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.]

### **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

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/950&format=HTML&aged=0&language=EN&guiLanguage=en>

DG ENV waste policy homepage: <http://ec.europa.eu/environment/waste/index.htm>

### **6.7 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 (see map in the [Appendix](#)). 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.]

**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](http://www.iwcoffice.org/sci_com/screport.htm)

Oxygen-starved oceans rapidly dying

<http://canberra.yourguide.com.au/news/local/news/general/oxygenstarved-oceans-rapidly-dying/796215.aspx>

Ministry of the Environment, New Zealand's ocean: [http://www.mfe.govt.nz/issues/oceans/Legislation to safeguard ocean ecosystems](http://www.mfe.govt.nz/issues/oceans/Legislation%20to%20safeguard%20ocean%20ecosystems)

<http://www.scoop.co.nz/stories/PA0806/S00460.htm>

**6.8 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.

**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-b3c3c0928ae7&k=51152>

Northern Edge 2008 (NE08) Exercise Underway

<http://www.elmendorf.af.mil/news/story.asp?id=123098685&page=2>

## 6.9 Climate Change

### 6.9.1 Scientific Evidences

The Northern hemisphere spring of 2008 was the seventh warmest on record, nearly one degree warmer than the 20<sup>th</sup> 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.

### 6.9.2 Food and Water Security

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.

### 6.9.3 Melting Glaciers and Sea Ice

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.

### 6.9.4 Rising Sea Levels

A new study by Australian and US researchers shows that ocean waters are heating up 50% faster at the surface than 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.

#### 6.9.5 Migration

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.

#### 6.9.6 Post-Kyoto 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<sub>2</sub> 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. CO<sub>2</sub> 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 CO<sub>2</sub> emissions by 49% compared to 1990 levels.

#### **Military Implications:**

[Same as previous 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:** (see a more expanded list in the [Appendix](#))

Weather Extremes Mark Spring 2008

<http://www.thedailygreen.com/environmental-news/latest/weather-extremes-47061601>

Suffer the Environment at Your Cost!

<http://www.kanglaonline.com/index.php?template=kshow&kid=1223>

Water crisis to be biggest world risk

<http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2008/06/05/ccwater105.xml>

Most Experts Foresee a Repeat, at Least, of 2007 Arctic Ice Loss

SEARCH <http://www.arcus.org/search/index.php>

Exclusive: No ice at the North Pole

<http://www.independent.co.uk/environment/climate-change/exclusive-no-ice-at-the-north-pole-855406.html>

Rising sea levels threaten cities

<http://canberra.yourguide.com.au/news/local/news/general/rising-sea-levels-threaten-cities/785840.aspx>

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

<http://www.nature.com/news/2008/080606/full/news.2008.880.html>

2007 Global Trends: Refugees, Asylum-seekers, Returnees, Internally Displaced and Stateless Persons. UNHCR, June 2008

<http://www.unhcr.org/statistics/STATISTICS/4852366f2.pdf>

Big emitters agree on 'deep cuts,' not targets

<http://www.asahi.com/english/Herald-asahi/TKY200806250059.html>

International Energy Outlook 2008

<http://eia.doe.gov/oiaf/ieo/>

NASA warming scientist: 'This is the last chance'

[http://seattlepi.nwsourc.com/national/1501ap\\_sci\\_warming\\_scientist.html](http://seattlepi.nwsourc.com/national/1501ap_sci_warming_scientist.html)

## 6.10 Nanotechnology Safety Issues

Some noteworthy nanotechnology safety activities from this month (more detailed descriptions of each are available in the [Appendix](#)) are:

- European Commission launches public nanotech consultation ([read more](#))
- high throughput multi-dimensional analysis of nanomaterials gives new insights on the biological effects of nanomaterials ([read more](#))
- new report assessing the safety of nanomaterials in food packaging ([read more](#))

### Military Implications:

[Same as previous on this issue] Military personnel concerned with nanotech issues should contribute their views to these activities. Also, relevant military personnel should review the information generated by such 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:

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>

Assuring the Safety of Nanomaterials in Food Packaging. The Regulatory Process and Key Issues  
[http://www.nanotechproject.org/publications/archive/nano\\_food\\_packaging/](http://www.nanotechproject.org/publications/archive/nano_food_packaging/)

## **Item 7. Reports and Sources Suggested for Review**

### **7.1 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.

#### **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

[http://www.dni.gov/testimonies/20080625\\_testimony.pdf](http://www.dni.gov/testimonies/20080625_testimony.pdf)

Climate change may challenge national security, classified report warns

[http://www.eurekalert.org/pub\\_releases/2008-06/teia-ccm062408.php](http://www.eurekalert.org/pub_releases/2008-06/teia-ccm062408.php)

### **7.2 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."

#### **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](http://www.enn.com/press_releases/2529)

### **7.3 New Content Analysis Technique Helps Smooth Environmental Discussions**

Researchers at the Universities of Sheffield and York have developed a new tool for improving the conduct of discussions over environmental issues between contending parties. Their work

showed that the two sides in a particular example were using markedly different vocabularies in formulating positions and arguments, and that these differences impeded progress toward a settlement.

**Military Implications:**

The military should investigate this work to see how it can be applied to developing practical guidance and tools for military personnel involved in possibly contentious discussions over environmental issues. Details can be found in the paper cited in Source, and the announcement notes give contact information for the authors.

**Source:**

It's The Way You Say it: How Using The Right Words Can Cut Environmental Conflicts

<http://www.blackwellpublishing.com/press/pressitem.asp?ref=1785>

Conversations in conservation: revealing and dealing with language differences in environmental conflicts

<http://www.blackwell-synergy.com/doi/pdf/10.1111/j.1365-2664.2008.01495.x>

## APPENDIX

### Reference Details

This Appendix contains expanded background information on some items.

#### Item 1. World Food Crisis

**Sources:** (additional sources)

The world only needs 30 billion dollars a year to eradicate the scourge of hunger

<http://www.fao.org/newsroom/en/news/2008/1000853/index.html>

FAO June Food Summit

<http://www.fao.org/newsroom/en/focus/2008/1000829/index.html>

"Failure as Usual" Food Summit

[http://www.etcgroup.org/en/materials/publications.html?pub\\_id=698](http://www.etcgroup.org/en/materials/publications.html?pub_id=698)

Food summit draws up plan to "eliminate hunger

<http://ca.reuters.com/article/topNews/idCAL2923668720080603>

US\$30 Billion a Year Would Eradicate World Hunger

<http://www.ens-newswire.com/ens/jun2008/2008-06-03-04.asp>

\$13 Billion Pledged to Feed the World's Hungry

<http://www.ens-newswire.com/ens/jun2008/2008-06-06-02.asp>

#### 6.7 Marine Protection to Increase

Oxygen-starved oceans rapidly dying

By Rosslyn Beeby, Science and Environment Reporter. The Canberra Times, 25/06/2008



Source: <http://canberra.yourguide.com.au/multimedia/images/full/180786.jpg>

## 6.9 Climate Change

**Sources:** (a more expanded list)

Weather Extremes Mark Spring 2008

<http://www.thedailygreen.com/environmental-news/latest/weather-extremes-47061601>

A dry autumn over much of Australia

<http://www.bom.gov.au/climate/drought/drought.shtml>

Suffer the Environment at Your Cost!

<http://www.kanglaonline.com/index.php?template=kshow&kid=1223>

Nature laid waste: The destruction of Africa

<http://www.independent.co.uk/news/world/africa/nature-laid-waste-the-destruction-of-africa-844370.html>

Water crisis to be biggest world risk

<http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2008/06/05/ccwater105.xml>

Most Experts Foresee a Repeat, at Least, of 2007 Arctic Ice Loss

SEARCH <http://www.arcus.org/search/index.php>

Exclusive: No ice at the North Pole

<http://www.independent.co.uk/environment/climate-change/exclusive-no-ice-at-the-north-pole-855406.html>

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

<http://canberra.yourguide.com.au/news/local/news/general/rising-sea-levels-threaten-cities/785840.aspx>

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

<http://www.nature.com/news/2008/080606/full/news.2008.880.html>

Residents in danger of flooding from global warming should be forcibly relocated: gov't report

<http://mdn.mainichi.jp/national/news/20080618p2a00m0na025000c.html>

UN warns of growth in climate change refugees

<http://www.timesonline.co.uk/tol/news/environment/article4159923.ece?token=null&offset=0>

2007 Global Trends: Refugees, Asylum-seekers, Returnees, Internally Displaced and Stateless Persons. June 2008

<http://www.unhcr.org/statistics/STATISTICS/4852366f2.pdf>

Big emitters agree on 'deep cuts,' not targets

<http://www.asahi.com/english/Herald-asahi/TKY200806250059.html>

UN climate chief asks G8 summit to agree on 2020 emission targets

<http://afp.google.com/article/ALeqM5j5lcyEX3OISNxt1ovLMpfX3Rx-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/ALeqM5hfpZd7sSjQH6m99E7NkvDYVL-ywg>

NASA warming scientist: 'This is the last chance'

[http://seattlepi.nwsource.com/national/1501ap\\_sci\\_warming\\_scientist.html](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>

## 6.10 Nanotechnology Safety Issues

### European Commission Launches Nanotech Consultation

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.

#### **Military Implications:**

It is likely that the results of this consultation will also be used in designing EU's policy and regulations on nanotech. Military personnel should follow the evolution of this effort by monitoring the EC nanotech home page at <http://cordis.europa.eu/nanotechnology> as a heads up for eventual new regulations.

#### **Sources:**

Commission launches public dialogue on nanotechnologies

[http://cordis.europa.eu/fetch?CALLER=EN\\_NEWS&ACTION=D&SESSION=&RCN=29561](http://cordis.europa.eu/fetch?CALLER=EN_NEWS&ACTION=D&SESSION=&RCN=29561)

Commission starts public dialogue on nanotechnologies – tapping economic and environmental potential through safe products

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/947&format=HTML&aged=0&language=EN&guiLanguage=en>

Nanotechnology Homepage of the European Commission <http://cordis.europa.eu/nanotechnology/>

### High Throughput Multi-dimensional Analysis of Nanomaterials Gives New Insights

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.

#### **Military Implications:**

Military personnel concerned with nanotech risk assessment should follow the development of this technology as it helps to shed more light on the complex relationships between the physics and chemistry of nanoparticles and the biology of living cells.

**Sources:**

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/>

New Report on Assuring the Safety of Nanomaterials in Food Packaging

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.

**Military Implications:**

Military elements concerned with environmental safety, especially of procured rations, should review this report for pertinent information.

**Sources:**

Assuring the Safety of Nanomaterials in Food Packaging. The Regulatory Process and Key Issues

[http://www.nanotechproject.org/publications/archive/nano\\_food\\_packaging/](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](http://www.enn.com/top_stories/article/37487/print)