

**WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY**  
Control No. (TCN) 08152 with Battelle Chapel Hill Operations for the U.S. Army Environmental Policy Institute

**JANUARY 2010 REPORT**

Note to Readers: Pages 1-17 comprise the summary and analysis of this report. Expanded details for some items are in the Appendix beginning on page 18.

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## **Item 1. The Haiti Earthquake Disaster Could Stimulate Improved Resilience Planning**

The current chaotic situation and humanitarian disaster resulting from the 7.3 magnitude earthquake on January 12, 2010 in Haiti demonstrates the need for improved early warning, resilience training, and post-disaster international coordination. Since scientists warn that the number and intensity of natural disasters will increase, the need for such systems and training will increase. Unique preparation is needed for poorer, less resilient countries like Haiti.

UNEP is working for the Haiti Regeneration Initiative to be implemented by a wide range of partners for long-term sustainable development and reduction of vulnerability to natural hazards through ecosystem restoration and sustainable natural resource management. [Related item: *International Early Warning Programme to Begin Operations* in March 2007 environmental security report.]

### **Military Implications:**

Military organizations should use the Haitian disaster to refine mechanisms for cooperation with UN agencies, NGOs, and governmental aid agencies to improve systems and training, preparedness and response capacity to natural disasters. While joint regulations governing operations other than war (OOTW) were significantly revised in the 1990's, they should be reviewed with regard to shortening the time to get boots and commodities on the ground. Of particular concern would be improving mechanisms for unleashing military capabilities almost instantly upon realization of a major disaster.

### **Sources:**

United Nations Stabilization Mission in Haiti

<http://www.un.org/en/peacekeeping/missions/minustah/>

Earthquake jeopardizes Haiti's security and stability

[http://www.isria.com/M/Weekly\\_Report\\_20100118.htm](http://www.isria.com/M/Weekly_Report_20100118.htm)

Haiti earthquake: death toll may hit 200,000

<http://www.telegraph.co.uk/news/worldnews/centralamericaandthecaribbean/haiti/7003057/Haiti-earthquake-death-toll-may-hit-200000.html>

UNEP to lead environmental recovery efforts in Haiti

<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=608&ArticleID=6448&l=en>

## **Item 2. Yemen's Internal Conflicts Are Water-Induced**

A new analysis of Yemen's drastic water situation points out that an estimated 80% of conflicts in Yemen are over water. The country's water table is dropping about 6.6 feet per year, and in the capital, Sana'a, water extraction rates are about four times that of replenishment. At this rate Sana'a could become the first waterless capital in the world in five to seven years. Water used for agriculture accounts for about 90% of all consumption, and about 50% of it goes to growing qat (khat), a mild narcotic plant. Since plantations are often controlled by the so-called qat mafia, if farmers would be offered an alternative to qat, the critical water, food, and security situations would be addressed together.

**Military Implications:**

Military aid to Yemen is not likely to prevent increased instability unless a major effort is included to turn around the water situation. Those planning military cooperation with Yemen should include significant efforts to improve water and agricultural development in their deliberations.

**Sources:**

Water woes could undermine Yemen's drive against

Al-Qaeda <http://www.google.com/hostednews/afp/article/ALeqM5hRiwhJYeUXY1B3Ma2oCfQVE0G9vA>

Private sector considers desalination to save Yemen from drought

<http://www.zawya.com/Story.cfm/sidZAWYA20100125113425/Private%20sector%20considers%20desalination%20to%20save%20Yemen%20from%20drought>

**Item 3. International Lawsuits for Environmental Crime Proliferate**

International lawsuits for environmental crimes are increasing, including those based on damages due to climate change, which is a new phase in the international environmental legal system. For example, Micronesia filed a case with the Czech Environment Ministry against the extension of the Prunerov, CEZ's largest coal-powered generator, on grounds of potential increase of CO<sub>2</sub> emissions with subsequent consequences to global warming and rising sea levels. Consequently, the Czech government ordered an international assessment of the project. Another example is Kivalina, an Inupiat Eskimo village on a barrier island north of the Arctic Circle. It has created a case against a group of fuel and utility companies (including ExxonMobil and Shell Oil) for their contribution to climate change that is accelerating the island's erosion. A third example is four Nigerian farmers and Friends of the Earth Netherlands who filed a pollution lawsuit in the Netherlands against Royal Dutch Shell for environmental degradation caused in Nigeria.

In a related activity, Bolivia's President Evo Morales is organizing an international conference April 20-22, 2010 in Cochabamba to explore creation of an international court on environmental crimes and a "universal proposal for the rights of mother earth." Government officials, indigenous people, other social movement representatives, environmentalists, and scientists will be invited.

**Military Implications:**

These activities increase the future likelihood of lawsuits against the military for its environmental footprint and GHG emissions, leading to financial damage claims regarding climate change. The military should identify all its resources and programs for reducing GHGs and how to improve them. Where possible, principles embodied in the Army Strategy for the Environment should be applied and cited.

**Sources:** (see a more expanded list in the [Appendix](#))

Morales Calls Alternative Climate Meeting

<http://www.cbsnews.com/stories/2010/01/06/tech/main6063924.shtml?tag=contentMain;contentBody>

Courts as Battlefields in Climate Fights

<http://www.nytimes.com/2010/01/27/business/energy-environment/27lawsuits.html>

Czechs Cede To Micronesia Demands Seeking Power Plant Review

<http://www.foxbusiness.com/story/markets/commodities/czechs-cede-micronesia-demands-seeking-power-plant-review/>

Shell must face Friends of the Earth Nigeria claim in Netherlands

<http://www.guardian.co.uk/business/2009/dec/30/shell-oruma-alleged-pollution-claim>

#### **Item 4. Geoengineering May Require International Environmental Regulations**

Several national authorities are assessing the potential need for national or international regulations for safe development and use of geoengineering to address climate change and global warming. A committee in Britain's House of Commons began its assessment and is cooperating with the U.S. House Science and Technology Committee, which is also planning to begin hearings this year on scientific, engineering, ethical, economic, and governance aspects related to geoengineering. This March a group of scientists will meet in California to set guidelines for large-scale field tests of proposed geoengineering techniques—ranging from genetically modified trees to absorb CO<sub>2</sub>, to spewing sunlight-deflecting sulfate particles into the upper atmosphere. Some scientists argue that new environmental regulations should be established even before field tests begin, due to potentially large geographic effects of some geoengineering techniques. Others, while comparing geoengineering to nuclear weapons, which have been successfully managed through international agreements, point out the possibility of serious long-term risks, and propose an international annual research budget growing from \$10 million to \$1 billion by the end of 2020.

##### **Military Implications:**

Since some geoengineering techniques might also be used as weapons, the military should be involved from the very beginning in the discussions and negotiations for drawing guidelines and regulations for testing, as well as use, of geoengineering technologies.

##### **Sources:**

A Search for Rules Before Climate-Changing Experiments Begin

<http://www.nytimes.com/cwire/2010/01/18/18climatewire-a-search-for-rules-before-climate-changing-e-40048.html>

Time to start researching global 'sun block': scientist

<http://www.lfpres.com/news/canada/2010/01/27/12637061.html>

Research on Global 'Sun Block' Needed Now, Experts Argue

<http://www.sciencedaily.com/releases/2010/01/100127134243.htm>

#### **Item 5. International Year of Biodiversity is 2010 and Convention on Biological Diversity COP10 to Meet in Japan This Year**

The year 2010 is designated as the International Year of Biodiversity by the United Nations. A panoply of events is planned to take place around the world for raising awareness and generating public pressure on leaders to develop new mechanisms to curb loss of the world's species due to human activity (estimated by some experts at 1,000 times more than natural evolution). Scientists and officials agree that methods are needed to price the impact of decisions on biodiversity and set policies that will help create a better balance. The international community is expected to agree on some post-2010 goals on biodiversity at the COP10 of the Convention on Biological Diversity to be held October 18-29, in Nagoya, Japan.

**Military Implications:**

In preparation for the COP10 of the CBD, it is likely that some new framework and regulations will be set to expand and better enforce the treaty. The military and its contractors should be prepared to comply with potential new regulations.

**Sources:**

2010 UN Year of Biodiversity

<http://www.cbd.int/2010/welcome/>

UN opens Biodiversity Year with plea to save world's ecosystems

<http://www.un.org/apps/news/story.asp?NewsID=33393&Cr=environment&Cr1=>

Benn to call on world leaders to adopt biodiversity pricing

<http://www.guardian.co.uk/science/2010/jan/25/hilary-benn-biodiversity-pricing>

Reformed Common Agricultural Policy should incentivise biodiversity

<http://www.greenwisebusiness.co.uk/news/reformed-common-agricultural-policy-should-incentivise-biodiversity-1102.aspx>

**Item 6. Technological Advances with Environmental Security Implications****6.1 New Detection and Cleanup Techniques****6.1.1 Genetically Engineered Bacteria Might Provide Landmine Detection**

Alistair Elfick, of the University of Edinburgh's Centre for Biomedical Engineering, and his team have genetically modified *E. coli* bacteria to produce a protein in the cell membrane that senses TNT, one of the explosives used in landmines. The group introduced the gene for the luciferase enzyme, which produces light in fireflies. According to scidev.net, "When proteins on the surface of *E. coli* detect TNT, this 'switches on' the gene responsible for light production."

**Military Implications:**

This approach has not yet been tested outside the laboratory, and the use of *E. coli* bacteria, especially genetically modified, raises obvious questions, but the military should keep in touch with this work in case it results in a practical environment-sensing technique.

**Source:**

Bacteria make light work of detecting landmines

<http://www.scidev.net/en/news/bacteria-make-light-work-of-detecting-landmines.html>

**6.1.2 Work Proceeds on Optical Fiber Detector for Bacterial Agents**

Thomas Inzana, a bacteriologist at the Virginia-Maryland Regional College of Veterinary Medicine at Virginia Tech, and his team have received a grant by NIH to continue their work on development of nanoscale optical fiber biosensor tests for detection of biological agents such as might be used in a terrorist attack. According to the story in *Nanowerk News*, "the optical fiber is coated with antibodies or DNA that will bind to antigens or DNA in the specimen. When this happens, the light that normally passes through the fiber will be decreased, indicating the presence of a biological agent."

**Military Implications:**

The military should follow this work as it continues toward development of fast, reliable sensor systems for identifying environmental hazards.

**Source:**

Nanoscale optical fibers to detect bioterrorist agents:  
<http://www.nanowerk.com/news/newsid=14320.php>

**6.2 Increasing Energy Efficiency Technologies****6.2.1 New Selective Radiation Surfaces May Save on Cooling Energy**

Prof. Geoff Smith and Dr Angus Gentle of the Institute of Nanotechnology at the University of Technology, Sydney, Australia, are conducting research on materials for building surfaces that radiate back into the atmosphere at night, heat that was absorbed during the day. The heat is radiated at wavelengths which are not absorbed by the atmosphere but continue on out into space. The surfaces are coated with a mixture of silicon carbide and silicon dioxide nanoparticles, and have cooled surfaces to 15°C less than ambient temperature in Sydney. The scientists point out that the surfaces could cool air or water, which could then be pumped through buildings to cool them.

**Military Implications:**

The military should keep in touch with this research, as possibly leading to energy-saving cooling systems for military installations and systems.

**Source:**

Nanocoating that acts as efficient heat pump could reduce need for energy-guzzling air conditioning  
<http://www.nanowerk.com/news/newsid=14466.php>

**6.2.2 Power-generating Flexible Films Might Power Body-worn Devices**

Michael McAlpine, a professor of mechanical and aerospace engineering at Princeton University, and colleagues have developed power-generating rubber films that are highly efficient in generating electrical energy when flexed. The films combine silicone and nanoribbons of lead zirconate titanate (PZT), a piezoelectric ceramic material that the developers say is 100× as piezo-efficient as quartz.

**Military Implications:**

The military should investigate this technology as a possible way of using body movements to power body-mounted environmental sensing devices or to generate power from other sources, like wind acting on flexible panels or “sails” or recapture of energy lost in vibration of vehicles in motion.

**Sources:**

Energy-harvesting rubber sheets could power pacemakers, mobile phones  
<http://www.physorg.com/news183832835.html>  
Piezoelectric Ribbons Printed onto Rubber for Flexible Energy Conversion  
<http://pubs.acs.org/doi/abs/10.1021/nl903377u>

**6.2.3 New Membranes Claim to Cut Desalination Energy Requirements**

A start-up company, NanoH2O, is claiming a 20% reduction in the energy required for reverse osmosis desalination using its new membranes. Other companies (Danfoss, Novozymes, Aquaporin) are engaged in similar efforts.

**Military Implications:**

The military should investigate and follow these developments, as they appear to offer desalination system energy-efficiency improvements.

**Source:**

NanoH<sub>2</sub>O to Change the Economics of Desalination  
<http://www.greentechmedia.com/articles/print/nanoh2o/>

**Item 7. Updates on Previously Identified Issues****7.1 The EU's Chemical Regulatory Regime might be adjusted to Include Nanomaterials**

The Institute for Health and Consumer Protection of the European Commission's Joint Research Centre (JRC) awarded two contracts to a consortium led by SAFENANO (Institute of Occupational Medicine) for the development of specific advice on the assessment of nanomaterials under REACH (the EU's Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals). The two projects, REACH-NanoInfo (aka RIP-oN2), and REACH-NanoHazEx (RIP-oN3), address the REACH information requirements on intrinsic properties of nanomaterials, and the processes for undertaking exposure assessments and conducting hazard and risk characterization for nanomaterials within the REACH context. The work will be carried out in consultation with a range of stakeholders and will be used by the EC to support further developments in REACH Guidance on Information Requirements and Chemical Safety Assessment. Along the same lines, *Nanomaterials under REACH* report by the Netherlands' National Institute for Public Health and the Environment (RIVM) indicates that REACH doesn't adequately cover nanomaterials and points out the differences in risk assessment requirements between nano- and macro-sized materials. [Related item: *EU to Add Carbon and Graphite to REACH Program* in the June 2008 environmental security report.]

**Military Implications:**

Relevant military personnel and contractors to the military should follow the work on these projects for new insights into potential nanotech-related risks and related regulations, as well as for assessing potential implications of eventual changes to the REACH system.

**Sources:**

Consortium awarded crucial advisory contracts on the regulation of nanomaterials under REACH  
[http://www.nanowerk.com/news/newsid=14573.php?utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29](http://www.nanowerk.com/news/newsid=14573.php?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29)  
 Consultancy & Review Activities - EC & SAFENANO  
<http://www.safenano.org/REACHnanoInfo.aspx>  
 REACH-NanoHazEx: Rip-oN 3  
<http://www.safenano.org/REACHnanoHazEx.aspx>  
*Nanomaterials under REACH* report  
<http://www.rivm.nl/bibliotheek/rapporten/601780003.pdf>  
 Nanomaterials under REACH: Some Adjustments Needed  
<http://www.innovationsgesellschaft.ch/index.php?section=news&cmd=details&newsid=274&teaserId=>

## 7.2 Monopoly over Rare Earth Elements Raises Security and Environmental Concerns

Most new technologies—from low-carbon energy production to defense—require rare earth elements (REEs) for their manufacture. However, the distribution and exploitation of these elements is limited, with over 95% of all REEs for world consumption being produced in China. China's own increasing technological and green energy generation needs might considerably impact the supply and/or price of some REEs (such as neodymium, praseodymium, dysprosium, and erbium used for wind turbine generators). John Kaiser, a California-based mining expert and rare-earths specialist, warns, "If the world gets really serious about green technology, it could result in a scale of demand that rare-earth suppliers would be unable to cope with." Pricing and different work and environmental standards are among the main factors impeding exploitation outside China. Business and political leaders should re-assess the supply situation of REEs in view of new technological and security needs. [Related item: *Future Lithium Dependency Raises New Energy Security Concerns* in March 2009 environmental security report.]

### Military Implications:

In addition to continued research on substitute materials and processes, defense authorities should encourage political leaders to consider all options, including government subsidies, if necessary, to secure supply of critical REEs. The focus for assuring at least national defense needs should be on national sources and regions that are reliable and practice fair environmental, work, and pricing policies.

### Sources:

The Battle Over Rare Earth Metals

[http://www.ensec.org/index.php?option=com\\_content&view=article&id=228:the-battle-over-rare-earth-metals&catid=102:issuecontent&Itemid=355](http://www.ensec.org/index.php?option=com_content&view=article&id=228:the-battle-over-rare-earth-metals&catid=102:issuecontent&Itemid=355)

EXCLUSIVE: Inside China's secret toxic unobtainium mine

<http://www.dailymail.co.uk/news/article-1241872/EXCLUSIVE-Inside-Chinas-secret-toxic-unobtainium-mine.html>

## 7.3 New Evidence on Silver Toxicity

Researchers of the Dept. of Pharmacology and Cancer Biology at Duke University Medical Center conducted a study whose results, "...provide evidence that silver has the potential to kill developing nerve cells and is even more potent than currently known neurotoxicants."... Effects varied widely with test conditions, making interpretation difficult. [Related items: *UK Defra Committee Report on Nanosilver* and *Industry Silver Nanotech Group Opposes "New Material" Designation* in December 2009, and *Petition Filed for EPA to Regulate Nanosilver* in November 2009 environmental security reports.]

### Military Implications:

The military should evaluate this study and the use of silver, especially silver nanoparticles, in materiel, in the light of these and future findings in this research.

### Sources:

Silver Impairs Neurodevelopment: Studies in PC12 Cells

<http://ehp.niehs.nih.gov/members/2009/0901149/0901149.pdf>

Silver is a potent nerve cell toxicant

<http://www.environmentalhealthnews.org/ehs/newscience/silver-is-potent-neurotoxicant/>

#### 7.4 Botox Creates Basis for New Terrorist Weapon

Counterterrorist experts claim Al-Qaeda has tried to acquire botulinum toxin (an extremely deadly poison), which is found in the Botox beauty treatment. Chechnya and other parts of the world may have counterfeit Botox production facilities that can produce and sell botulinum on the Internet. Increasing markets for counterfeit beauty and pharmaceutical products could lead to increased access for biological terrorism. Although it is known that such illicit facilities exist, they are difficult to find. Due to specific characteristics, the most likely attack is contamination of food or water supplies. [Related item: *New Technologies Need New Regulations Systems* in March 2009 and other items on similar issues in previous environmental security reports.]

##### **Military implications:**

Since most sales and acquisitions of counterfeit pharmaceuticals are made over the Internet, efforts should increase for enforcing homogeneous global regulations and monitoring of online activities. The military should increase its collaboration with counterparts around the world as part of their antiterrorism activities.

##### **Sources:**

Officials fear toxic ingredient in Botox could become terrorist tool

<http://www.washingtonpost.com/wp-dyn/content/article/2010/01/24/AR2010012403013.html>

Toxin Found in Botox Could Pose Bioterrorism Threat

[http://gsn.nti.org/gsn/nw\\_20100125\\_2898.php](http://gsn.nti.org/gsn/nw_20100125_2898.php)

#### 7.5 France Proposes Carbon Tax Across EU and on Imports

President Nicolas Sarkozy announced that France would propose a carbon tax across the EU, and carbon tariffs on products imported from countries with weaker environmental regulations. Nationally, a bill expected to be presented soon to the Parliament is proposing a progressive carbon tax similar to the income tax, taxing big polluters on their CO<sub>2</sub> emissions. The French government hopes the regulation will come into force on July 1, 2010, and be effective until the EU emissions permits scheme enters into force. [Related item: *EU Potential New Measures For Reducing CO<sub>2</sub> Emissions* in October 2009 environmental security report.]

##### **Military Implications:**

It is not clear at this point if there would be any carbon tax exemptions for the military and its contractors. Military stationed in France (EU generally) and its contractors should intensify efforts to reduce their carbon footprint and be prepared for responding to new regulations and taxes.

##### **Sources:**

Paris wants pan-European carbon tax

<http://euobserver.com/9/29221/?rk=1>

The Coming Battles Over Green Trade - by Mac Margolis

<http://www.eu-digest.com/2010/01/coming-battles-over-green-trade-by-mac.html>

France to tax big polluters under revised scheme

<http://www.reuters.com/article/idUSTRE60J4FA20100120>

## 7.6 U.S. to Strengthen Environmental Regulations

### 7.6.1 New Measures on Chemicals Safety

The U.S. Environmental Protection Agency has created a ‘Chemicals of Concern’ list and adopted additional measures for reducing risks posed by compounds raising serious potential health or environmental concerns: phthalates and polybrominated diphenyl ethers (PBDEs) were added to the list; risk-reduction actions should begin for several phthalates, short-chain chlorinated paraffins, and perfluorinated chemicals; and the three-year DecaBDE phaseout will be reinforced. [Related item: *New Chemicals Considered for Toxic Lists* in January 2009 environmental security report.]

The U.S. Congress is proposing to update the 34-year-old federal Toxic Substances Control Act (TSCA), requiring more thorough testing for chemicals. In the preamble to the debate, the Safer Chemicals, Healthy Families coalition released a report which notes that since 1976, when the federal TSCA became law, the EPA has required testing on only 200 of the 83,000 chemicals in common use and issued regulations for only five, while 60,000 chemicals received approval without preliminary government testing. Highlighting the health and cost issues associated with toxic chemicals, it estimates that the new regulations would reduce the incidence of chronic diseases by 0.1% and direct health care costs by \$5 billion a year in the U.S. [Related item: *U.S. to Revise the Toxic Substances Control Act* in October 2009 environmental security report.]

#### **Military Implications:**

As the military reviews its usage of chemicals, it should note where it should be prepared to comply with the new measures and look into safe replacements where possible. When researching novel alternative materials, priority should be given to technologies for which the associated potential risks were thoroughly investigated. Also, transport and disposal protocols of hazardous chemicals should include the necessary precautions to minimize exposure.

#### **Sources:**

EPA Announces Actions to Address Chemicals of Concern, Including Phthalates: Agency continues efforts to work for comprehensive reform of toxic substance laws

<http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/2852c60dc0f65c688525769c0068b219!OpenDocument>

Existing Chemicals Action Plans

<http://www.epa.gov/oppt/existingchemicals/pubs/ecactionpln.html>

Stricter rules urged on toxic chemicals

<http://www.post-gazette.com/pg/10022/1030212-114.stm>

### 7.6.2 EPA Proposes Tougher Air-Quality Rules

The EPA tougher National Ambient Air Quality Standards proposal sets a primary standard for ground-level ozone at no more than 0.060 to 0.070 parts per million (measured over eight hours), to be phased in over the next two decades (extended for regions with highest smog pollution). A secondary smog standard is proposed to protect the environment, especially plants and trees. [Related item: *EPA Warnings on Various Potential Health Hazards* in October 2009 environmental security report.]

#### **Military Implications:**

The military should review how the new standards affect its activities and take adequate measures to reduce smog-forming pollutants. Note also that trees and other vegetation are

significant elements of security screening and of training range realism and represent investments to be protected on military installations.

**Sources:**

EPA pushes tougher air-quality rules

<http://thehill.com/blogs/e2-wire/677-e2-wire/74733-epa-proposing-tougher-smog-standards>

EPA Strengthens Smog Standard/Proposed standards, strictest to date, will protect the health of all Americans, especially children

<http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/d70b9c433c46faa3852576a40058b1d4!OpenDocument>

E.P.A. Seeks Stricter Rules to Curb Smog

<http://www.nytimes.com/2010/01/08/science/earth/08smog.html?th&emc=th>

7.6.3 California Proposes Reducing the Level of Chromium 6 in Water

The California Office of Environmental Health Hazard Assessment has proposed a “public health goal” of 0.06 ppb of hexavalent chromium (Cr 6) for the state’s drinking water. The current state and national standards for total Cr compounds are 50 ppb and 100 ppb, respectively. (EPA is reevaluating the latter.) The new California value was set as a result of a recent federal study setting a threshold of one cancer among every one million people exposed for a lifetime. After public comments, the California Department of Public Health will adopt a regulation setting a maximum allowable level for water supplies based on the health goal but also considering economic and technological factors. [Related item: *New Substances Identified as Harmful to Human Health and the Environment* in June 2009 environmental security report.]

**Military Implications:**

The military should consider these new limits in carrying out environmental risk assessments for drinking water.

**Sources:**

California unveils new goal for controversial carcinogen in water

<http://www.environmentalhealthnews.org/ehs/news/chromium-6-goal>

Public Health Goal for Hexavalent Chromium in Drinking Water (Draft). Office of Environmental Health Hazard Assessment California Environmental Protection Agency

<http://www.oehha.ca.gov/water/phg/pdf/Cr6PHGdraft082009.pdf>

7.6.4 First U.S. National Health Security Plan Released

The U.S. Health and Human Services Department released the first National Health Security Strategy for the event of a bioterrorism incident or other large-scale health crisis. The strategy outlines objectives for different government areas and for nongovernmental groups to focus on over the next four years, and recommends a review of the national countermeasure system. [Related item: *Global Influenza Pandemic Declared* in June 2009 environmental security report.]

**Military Implications:**

Relevant military personnel should study the report to assist in implementation of the new strategy.

**Sources:**

First U.S. National Health Security Plan Released

[http://gsn.nti.org/gsn/nw\\_20100108\\_9470.php](http://gsn.nti.org/gsn/nw_20100108_9470.php)

HHS Delivers the Nation's First Health Security Strategy

<http://www.hhs.gov/news/press/2010pres/01/20100107a.html>

**7.7 Building Contaminants Linked to Parking Lots with Coal Tar Sealant**

Scientists at the U.S. Geological Survey have published a paper linking high concentrations of the contaminants polycyclic aromatic hydrocarbons (PAHs) in house dust to coal tar sealants used on parking lots. PAHs are an environmental hazard because several are probable human carcinogens. [Related item: *Study Shows Nanotube Manufacture May Pollute Environment* in August 2007 environmental security report.]

**Military Implications:**

The military should investigate these findings to determine if they require changes in construction and maintenance practices for military installations.

**Sources:**

Parking Lot Problems

[http://www.enn.com/top\\_stories/article/40920](http://www.enn.com/top_stories/article/40920)

Contaminated House Dust Linked to Parking Lots with Coal Tar Sealant

<http://www.sciencedaily.com/releases/2010/01/100113112056.htm>

Coal-Tar-Based Parking Lot Sealcoat: An Unrecognized Source of PAH to Settled House Dust

<http://pubs.acs.org/doi/abs/10.1021/es902533r>

**7.8 Scientists Say Dolphins Should Be Treated As 'Non-Human Persons'**

New study of dolphins' behavior, backed up by anatomic research, has led scientists to declare dolphins second to humans in intelligence and suggesting that they should be treated as "non-human persons". [Related item: *Greenhouse Gas Emissions Increase Ocean Noise Pollution* in December 2009 environmental security report.]

**Military Implications:**

Declaring dolphins as "non-human persons" (or even a sustained claim of it) might give them new "rights." Legislation concerning sonar and other activities that could cause ocean pollution and harm dolphins might be applied more severely.

**Source:**

Scientists say dolphins should be treated as 'non-human persons'

<http://www.timesonline.co.uk/tol/news/science/article6973994.ece>

**7.9 Arctic Opens to International Commercial Use**

The first telecommunication project in the Arctic is to link Tokyo and London by underwater fiber optic cable through the Northwest Passage, thus cutting the transmission delay from 140 milliseconds to 88 milliseconds. Branch lines would also link to the U.S. East Coast, ensuring quicker transmission times between Tokyo and New York. In addition to being faster, these lines are apparently also more secure, avoiding critical regions.

A report by UNESCO, “Climate Change and Arctic Sustainable Development” is a comprehensive assessment of the environmental and social transformations of the Arctic due to climate change, proposing an integrated approach for monitoring and adapting to climate change in the Arctic based on multilateral collaboration among scientists, circumpolar communities and decisionmakers. [Related item: *Arctic “Pole of Peace” Suggested to Address Arctic Security Issues* in December 2009 environmental security report.]

### **Military Implications:**

In view of the opening of the Arctic for the first commercial projects, the coalition forces in the region should accelerate developing strategies for both national security and protection of ecosystems. Relevant military personnel should seek improved cooperation with counterparts in other countries and international organizations in developing proactive strategies, regulations, and enforcement procedures.

### **Sources:**

Global warming opens up Arctic for undersea cable

<http://www.nation.co.ke/InDepth/Africa%20Insight/-/625262/847148/-/wxhyixz/-/index.html>

Climate Change and Arctic Sustainable Development

[http://publishing.unesco.org/details.aspx?&Code\\_Livre=4722&change=E](http://publishing.unesco.org/details.aspx?&Code_Livre=4722&change=E)

## **7.10 Climate Change**

### 7.10.1 Scientific Evidence and Natural Disasters

A preliminary analysis from the National Climatic Data Center of the National Oceanic and Atmospheric Administration (NOAA) found that the decade 2000-2009 is the warmest decade since instrumental measurements of temperatures began in the 1880s, and 2009 (tied with 2006) was the fifth warmest year on record, based on measurements taken on land and at sea. The average trend over the past three decades is warming at about 0.36°F (0.2°C) per decade, while average global temperatures have risen by about 1.5°F (0.8°C) since 1880. (see [graph](#))

According to the Met Office’s forecast made using the Decadal Prediction System (DePreSys), 2010 could yet be the hottest year on record, due to a new El Niño warming period that has just started in the Pacific. Additionally, the sun should also begin to brighten, as part of its 11-year brightness fluctuation cycle (in 2009 it was at the bottom of the cycle.) Further, if not for 2010, then “a record breaker will still occur in the next few years” says Doug Smith, climate expert at the Met Office.

*Oddball Winter Weather: Global Warming’s Wake-Up Call for the Northern United States*, a study by the National Wildlife Federation, documents how climate change is linked to precipitation increase, including intense snowstorms, as warmer winter weather causes more surface water evaporation (and less freezing), thus recharging the atmosphere with moisture. This explains the unusually heavy snowfall in many parts of the world.

### 7.10.2 Food and Water Security

A new report by the Division for Sustainable Development of the UN Department of Economic and Social Affairs assessed the impact of foreign land purchase for agriculture. Foreign governments and private investors are increasingly purchasing or leasing key farmland in Africa on a long-term basis. The report notes that it is critical to ensure that such contracts promote shared food security interests and meet the need for improving legal and technical

capacities of host countries, as well as to conduct impact assessments for the host country on the benefits, costs, and risks associated with land acquisition.

Scientists warn that more attention should be given not only to the impact of climate change on food quantity, but to its nutritional quality too. They found that increasing levels of CO<sub>2</sub> in the atmosphere reduces the nutritional value of many basic food crops. It is estimated that the approximate 20% CO<sub>2</sub> rise since 1960 may have already decreased protein concentration in wheat flour by 5%–10%. A study by researchers at Southwestern University, Georgetown TX, shows that if atmospheric CO<sub>2</sub> reaches 540–960 ppm, it could result in a significant decline (10%–15%) in protein content of major food crops including barley, wheat, soya bean and potato. Additionally, higher CO<sub>2</sub> levels may reduce water flow through a plant, affecting the uptake of micronutrients from the soil, such as sulphur, magnesium, iron, zinc, and manganese.

### 7.10.3 Health

The WHO report “Protecting Health from Climate Change: Connecting Science, Policy and People” provides an update of the scientific evidence on health risks caused by climate change. It outlines necessary action to protect health from negative impacts of climate change and describes a number of effective interventions that can save lives in the present and reduce vulnerability in the future. In addition, the report singles out several policy options in other sectors, such as transport and energy production, that could simultaneously improve health and reduce greenhouse gas emissions.

### 7.10.4 Migration

The small island developing states continue efforts to have their fate stipulated in a binding treaty on climate change. “It is important that the recognition of SIDS as most vulnerable countries be preserved in a legally binding outcome and that these countries receive priority access to resources for urgent adaptation and mitigation projects,” said Mark Jariabka, executive director of Islands First, an organization that promotes and protects the interests of SIDS. In addition to vulnerability, they are concerned about lack of any bilateral or multilateral agreements for eventual relocation. “Even if such an agreement is signed between an island nation and another host country, this itself will raise a number of issues regarding international law - sovereignty status, U.N. membership etc. etc.” says Ambassador Abdul Ghafoor Mohamed, the permanent representative of Maldives to the United Nations. “Do these people relocate as a ‘nation’ or as individual refugees who are then subsumed into the host nation as their own citizens, or would they enjoy ‘sovereign rights’? Would they continue to have claim to the territory of the land they had vacated? If not, who would have claim on it, if at all?” questions the Ambassador.

### 7.10.5 Adaptation

The World Meteorological Organization (WMO) announced its ongoing work towards the establishment of a Global Cryosphere (global solid water system) Watch to serve societal needs for weather, climate and water, and related environmental information and services. The World Meteorological Congress, WMO’s supreme governing body, is to consider ways and means of developing and implementing a Global Cryosphere Watch at its next quadrennial session in 2011. Once established, a Global Cryosphere Watch should enhance the capability of the research community and operational services to predict the future state of the cryosphere and

facilitate assessments of the cryosphere and its components on a regional to global scale to support climate change science, decision-making and formulation of environmental policy.

The Joint Session of the Executive Boards of the UNDP, UNFPA, UNICEF, and WFP held on January 15, 2010 focused on the issue of climate change. Noting that 40% of development investment from ODA and concessional lending is sensitive to climate risk, UNDP Administrator Helen Clark spoke on how the UN agencies can support countries in addressing the climate change challenge through their programmatic activities at the country level to support capacity building for adaptation and mitigation, and access to climate financing. She also said that the UN Development Group (UNDG) developed guidelines to support the UN Country Team on how to mainstream disaster risk reduction and environmental sustainability into the programmatic activities at the country level. Specific guidelines on climate change will be issued soon.

The UN Economic Commission for Europe (UNECE) released a study, “Transboundary flood risk management: experiences from the UNECE region,” which describes problems and progress made regarding transboundary flood management in 10 transboundary river basins in the UNECE region; tools for improving resilience against transboundary flood risk; and useful legal and institutional arrangements for cooperation.” The study also notes that climate change is expected to increase both the magnitude and the frequency of floods, although there is considerable uncertainty. The study was prepared by the Task Force on Water and Climate, under the UNECE Water Convention.

#### 7.10.6 Climate Modeling and Scenarios

Scientists from NOAA, combining three models into one tool, were able to simulate with higher accuracy storms’ evolution and categories across the Atlantic. They found that by the end of the century, although storms will in general decrease in number, they will be more powerful; category 4 (210-249 kilometers per hour) and category 5 (over 250 kilometers per hour) will double in frequency. The hardest hit will be Haiti and the Dominican Republic, the Bahamas and the northeastern coast of the U.S. These results corroborate results of other climate models.

#### 7.10.7 Post-Copenhagen Negotiations

States that signed the Copenhagen accord agreed to announce (by end-January 2010) their official CO<sub>2</sub> emissions reduction commitments. The EU decided to maintain its commitment of 20% greenhouse gas emissions reduction by 2020 compared to 1990 levels, and 30% if other powers make comparable pledges. Australia announced that it will cut greenhouse gas emissions by 5% of 2000 levels by 2020 unconditionally, and 15% to 25%, depending on other countries’ commitments.

The environment ministers of the BASIC countries (Brazil, South Africa, India, and China) met on January 24 to discuss cooperation in future climate negotiations and decided to adhere to the agreements made in the Copenhagen Accord regarding the submission of their emission reduction actions. Cooperation among these countries may shape future climate change negotiations and influence the adoption of a binding climate agreement. The next round of climate talks is scheduled for November 29, 2010, with pre-conference negotiations slated to take place May 31 to June 11, 2010.

**Military Implications:**

[Same as previous on this issue] The military should identify all its resources and programs for reducing GHGs and responding to effects of climate change, update information continuously, forecast how it might be called upon for both mitigation and adaptation, and perform a gap analysis in anticipation of future requests. International discourse over climate change is increasing the development of international policies and strategies to mitigate and adapt to climate change.

**Sources:** (see a more expanded list in the [Appendix](#))

The resurgence of El Niño means that 2010 could yet be the hottest year on record

<http://www.guardian.co.uk/uk/2010/jan/10/climate-change-uk-big-freeze>

Past Decade Warmest on Record, NASA [NOAA] Data Shows

<http://www.nytimes.com/2010/01/22/science/earth/22warming.html>

Foreign land purchases for agriculture: what impact on sustainable development?

[http://www.un.org/esa/dsd/resources/res\\_pdfs/publications/ib/no8.pdf](http://www.un.org/esa/dsd/resources/res_pdfs/publications/ib/no8.pdf)

The 'hidden hunger' caused by climate change

<http://www.scidev.net/en/opinions/the-hidden-hunger-caused-by-climate-change.html>

Protecting Health from Climate Change: Connecting Science, Policy and People:

[http://whqlibdoc.who.int/publications/2009/9789241598880\\_eng.pdf](http://whqlibdoc.who.int/publications/2009/9789241598880_eng.pdf)

Climate Change: Small Islands Await Haitian-Type Disaster

<http://www.ipsnews.net/news.asp?idnews=50036>

WMO Information Note

<http://www.wmo.int/pages/mediacentre/infonotes/GlobalCryosphere.html>

Transboundary flood risk management: experiences from the UNECE region

[http://www.unece.org/env/water/mop5/Transboundary\\_Flood\\_Risk\\_Managment.pdf](http://www.unece.org/env/water/mop5/Transboundary_Flood_Risk_Managment.pdf)

Models Foresee More-Intense Hurricanes in the Greenhouse

<http://www.sciencemag.org/cgi/content/full/327/5964/399?ijkey=EFIfVe870I6Bg&keytype=ref&siteid=sci>

EU climate offer unchanged

<http://euobserver.com/9/29357/?rk=1>

Australia to put forward unchanged carbon cuts to UN

[http://www.terradaily.com/reports/Australia\\_to\\_put\\_forward\\_unchanged\\_carbon\\_cuts\\_to\\_UN\\_999.html](http://www.terradaily.com/reports/Australia_to_put_forward_unchanged_carbon_cuts_to_UN_999.html)

China, 3 others to chart climate roadmap

[http://www.chinadaily.com.cn/world/2010-01/15/content\\_9324199.htm](http://www.chinadaily.com.cn/world/2010-01/15/content_9324199.htm)

**7.11 Nanotechnology Safety Issues**

More detailed descriptions of the following nanotechnology issues are in the [Appendix](#)

- European FramingNano Governance Platform setting out a proposal for the framing of policy on nanotechnology in Europe ([more](#))
- Comprehensive Review of Engineered Nanomaterials Health and Safety, a 426-page report ([more](#))
- Nanotechnology--Assessment of Health Safety and Environmental Factors (Technical Insights) report on the HSE implications of nanotechnology ([more](#))
- UK House of Lords Committee report, Nanotechnologies and Food, Urges Nanosafety Transparency ([more](#))

- UK Report Calls on Government to Support Nanotech Risk Assessment ([more](#))
- Public Disruptions Force Cancellation of French Public Nano Debates ([more](#))
- Research paper, The Slings and Arrows of Communication on Nanotechnology, Calls for Better Explanations and Sources in Nano Risk Communication ([more](#))
- 5th International NanoRegulation Conference report available ([more](#))
- New studies by NIST add to knowledge on nanoparticles and biological reactions ([more](#))
- Applications of Micro and Nanosensors in Security, Health and Environmental Monitoring conference on new-technology sensors to be held in UK ([more](#))
- UK's SAFENANO report provides key 2009 nano environmental health and safety developments ([more](#))

## Item 8. Reports and Information Suggested for Review

### 8.1 *Protecting the environment during armed conflict. An inventory and analysis of international law*

*Protecting the environment during armed conflict. An inventory and analysis of international law* report by UNEP is a comprehensive overview of existing legislation protecting the environment in case of conflict and gaps and areas that should, but are not yet, covered by regulations. The report notes that there are no mechanisms to protect natural resources during armed conflict, and no permanent international authority to monitor violations and address liability and redress claims for environmental damage caused during armed conflicts. There are also terminology issues, such as lack of clear definition for “widespread,” “longlasting,” and “severe”, as well as a standard definition of what constitutes a “conflict resource” or their illegal exploitation and trade. While the majority of international legal provisions protecting the environment during armed conflict—including the ICRC Guidelines on the Protection of the Environment during Armed Conflict (1994)—were designed for international armed conflicts, the majority of today’s conflicts are internal; hence the legal instruments do not apply. The report recommends, inter alia, that the Permanent Court of Arbitration and its “Optional Rules for Conciliation of Disputes Relating to the Environment and/or Natural Resources” should be considered to address disputes related to environmental damage during armed conflict. It concludes that “A summary report on the environmental impacts of armed conflicts should be presented on an annual basis to the UN General Assembly, in conjunction with the International Day for Preventing the Exploitation of the Environment in War and Armed Conflict.”

#### **Military Implications:**

This report should be studied by those military personnel with operational planning and environmental responsibilities during and in post-conflict conditions, since it is reasonable to speculate that the report’s recommendations will be considered for further shaping international regulations concerning protection of the environment in armed conflicts.

#### **Sources:**

Laws Protecting the Environment during Wars Need Enforcing and Strengthening to Deal with New Challenges  
<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=602&ArticleID=6362&l=en>

*Protecting the environment during armed conflict. An inventory and analysis of international law*  
[http://postconflict.unep.ch/publications/int\\_law.pdf](http://postconflict.unep.ch/publications/int_law.pdf)

### **8. 2. Environmental Performance Index 2010 Score Worse for Vulnerable States**

The 2010 Environmental Performance Index ranks 163 countries on 25 performance indicators tracked across ten policy categories. It facilitates cross-country comparisons as well as analysis of how the global community and individual countries are performing in particular sectors and policy issues, therefore helping assess the sectors that should be improved. The 2010 EPI reveals that most of the lower ranked nations are also vulnerable states, hence proving again the importance of including environmental aspects in peace and vulnerability strategies.

#### **Military Implications:**

Military personnel involved in rebuilding and vulnerability assessments should study this report and its indicators to determine how their own assessments can be improved.

#### **Source:**

Environmental Performance Index 2010  
<http://epi.yale.edu/>

### **8.3 European Space Agency First International Security Symposium**

On February 9-10, 2010, the European Space Agency will hold its First International Security Symposium to “share information on security approaches, challenges and evolution that international organizations face in the current geopolitical situation.”

#### **Military Implications:**

Relevant military personnel should attend the symposium for increased collaboration on security issues.

#### **Source:**

First International Security Symposium  
[http://www.esa.int/esaCP/SEM08TRJR4G\\_Benefits\\_0.html](http://www.esa.int/esaCP/SEM08TRJR4G_Benefits_0.html)

## APPENDIX

### Reference Details

This Appendix contains expanded background information on some items.

#### Item 3. International Lawsuits for Environmental Crime Proliferate

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

Morales Calls Alternative Climate Meeting

<http://www.cbsnews.com/stories/2010/01/06/tech/main6063924.shtml?tag=contentMain;contentBody>

Courts as Battlefields in Climate Fights

<http://www.nytimes.com/2010/01/27/business/energy-environment/27lawsuits.html>

Pacific islanders bid to stop Czech coal plant

<http://www.reuters.com/article/idUSTRE60B36U20100112>

Czechs Cede To Micronesia Demands Seeking Power Plant Review

<http://www.foxbusiness.com/story/markets/commodities/czechs-cede-micronesia-demands-seeking-power-plant-review/>

Shell must face Friends of the Earth Nigeria claim in Netherlands

<http://www.guardian.co.uk/business/2009/dec/30/shell-oruma-alleged-pollution-claim>

Dutch Court To Take On Shell Nigeria Cases

<http://planetark.org/wen/56156>

Shell headed to Dutch court over Nigerian spills

<http://www.chron.com/dispatch/story.mpl/business/energy/6793372.html>

Group tasks Shell on welfare of oil spill victims

[http://www.ngrguardiannews.com/business/article03/indexn2\\_html?pdate=221209&ptitle=Group%20tasks%20Shell%20on%20welfare%20of%20oil%20spill%20victims](http://www.ngrguardiannews.com/business/article03/indexn2_html?pdate=221209&ptitle=Group%20tasks%20Shell%20on%20welfare%20of%20oil%20spill%20victims)

#### 7.10 Climate Change

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

##### 7.10.1 Scientific Evidence and Natural Disasters

The resurgence of El Niño means that 2010 could yet be the hottest year on record

<http://www.guardian.co.uk/uk/2010/jan/10/climate-change-uk-big-freeze>

Past Decade Warmest on Record, NASA [NOAA] Data Shows

<http://www.nytimes.com/2010/01/22/science/earth/22warming.html>

Harsh winter a sign of disruptive climate change, report says

<http://www.washingtonpost.com/wp-dyn/content/story/2010/01/28/ST2010012800310.html?sid=ST2010012800310>

Global Warming Bringing More Oddball Winter Weather

<http://www.nwf.org/News-and-Magazines/Media-Center/News-by-Topic/Global-Warming/2010/01-28-10-Global-Warming-Bringing-More-Oddball-Winter-Weather.aspx>

### 7.10.2 Food and Water Security

Foreign land purchases for agriculture: what impact on sustainable development?

[http://www.un.org/esa/dsd/resources/res\\_pdfs/publications/ib/no8.pdf](http://www.un.org/esa/dsd/resources/res_pdfs/publications/ib/no8.pdf)

The 'hidden hunger' caused by climate change

<http://www.scidev.net/en/opinions/the-hidden-hunger-caused-by-climate-change.html>

Water woes could undermine Yemen's drive against Al-Qaeda

[http://www.terraily.com/reports/Water\\_woes\\_could\\_undermine\\_Yemens\\_drive\\_against\\_Al-Qaeda\\_999.html](http://www.terraily.com/reports/Water_woes_could_undermine_Yemens_drive_against_Al-Qaeda_999.html)

### 7.10.3 Health

Protecting health from climate change. Connecting science, policy and people

<http://www.who.int/globalchange/publications/reports/9789241598880/en/index.html>

Protecting Health from Climate Change: Connecting Science, Policy and People:

[http://whqlibdoc.who.int/publications/2009/9789241598880\\_eng.pdf](http://whqlibdoc.who.int/publications/2009/9789241598880_eng.pdf)

### 7.10.4 Migration

Climate Change: Small Islands Await Haitian-Type Disaster

<http://www.ipsnews.net/news.asp?idnews=50036>

### 7.10.5 Adaptation

WMO Information Note

<http://www.wmo.int/pages/mediacentre/infonotes/GlobalCryosphere.html>

Helen Clark Remarks at Joint Session of Executive Board

<http://content.undp.org/go/newsroom/2010/january/helen-clark-remarks-at-joint-session-of-executive-board.en>

UNDG, Integrating Disaster Risk into the CCA and UNDAF:

[http://www.undg.org/docs/9866/UNDG-DRR-Guidance-Note-2009\\_DUP\\_08-07-2009\\_11-43-02-734\\_AM.PDF](http://www.undg.org/docs/9866/UNDG-DRR-Guidance-Note-2009_DUP_08-07-2009_11-43-02-734_AM.PDF)

Transboundary flood risk management: experiences from the UNECE region

[http://www.unece.org/env/water/mop5/Transboundary\\_Flood\\_Risk\\_Management.pdf](http://www.unece.org/env/water/mop5/Transboundary_Flood_Risk_Management.pdf)

### 7.10.6 Climate Modeling and Scenarios

Stronger hurricanes predicted for around Haiti

<http://www.scidev.net/en/news/stronger-hurricanes-predicted-for-around-haiti.html>

Models Foresee More-Intense Hurricanes in the Greenhouse

<http://www.sciencemag.org/cgi/content/full/327/5964/399?ijkey=EFIfVe870I6Bg&keytype=ref&siteid=sci>

Strongest Hurricanes May Double in Frequency, Study Says

<http://news.nationalgeographic.com/news/2010/01/100121-hurricanes-global-warming/>

Most powerful hurricanes on the rise

<http://www.nature.com/news/2010/100121/full/news.2010.24.html> (abstract; full text by subscription)

Global warming could lead to rise in powerful hurricanes

<http://news.oneindia.in/2010/01/22/globalwarming-could-lead-to-rise-in-powerfulhurricanes.html>

### 7.10.7 Post-Kyoto Negotiations

EU pushes for deeper carbon emissions cuts

<http://news.ph.msn.com/top-stories/article.aspx?cp-documentid=3793552>

EU climate offer unchanged

<http://euobserver.com/9/29357/?rk=1>

The Copenhagen Conference: How Should the EU Respond?

<http://www.iiea.com/publications/the-copengahen-conference-how-should-the-eu-respond>

Australia to put forward unchanged carbon cuts to UN

[http://www.terradaily.com/reports/Australia\\_to\\_put\\_forward\\_unchanged\\_carbon\\_cuts\\_to\\_UN\\_999.html](http://www.terradaily.com/reports/Australia_to_put_forward_unchanged_carbon_cuts_to_UN_999.html)

Copenhagen & beyond: Stage set for BASIC meet in Delhi

<http://economictimes.indiatimes.com/news/politics/nation/Copenhagen-beyond-Stage-set-for-BASIC-meet-in-Delhi/articleshow/5486475.cms>

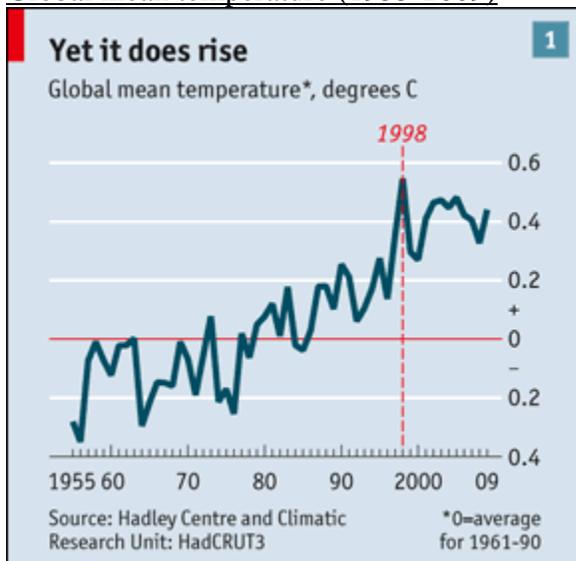
China-led group to meet ahead of climate deadline

<http://www.alertnet.org/thenews/newsdesk/SGE60C06X.htm>

China, 3 others to chart climate roadmap

[http://www.chinadaily.com.cn/world/2010-01/15/content\\_9324199.htm](http://www.chinadaily.com.cn/world/2010-01/15/content_9324199.htm)

### Global mean temperature (1955-2009)



Source: No hiding place? The Economist, Jan 7th 2010

[http://www.economist.com/sciencetechnology/displaystory.cfm?story\\_id=15211377](http://www.economist.com/sciencetechnology/displaystory.cfm?story_id=15211377)

## 7.11 Nanotechnology Safety Issues

More detailed descriptions of the nanotechnology issues

### 7.11.1 European FramingNano Governance Platform Draft Now Available

The draft FramingNano Governance Platform sets out a proposal for the framing of policy on nanotechnology in Europe; and, according to *Nanowerk News*, “highlights the major challenges to be overcome in order to successfully craft governance policies for nanotechnologies, and the communication issues that need to be addressed if Europe is to harness the full potential of this

rapidly growing area of technology.” The Governance Plan was discussed at the final International Conference of the FramingNano FP7 held in December 2009 and is being submitted to the European Commission “as a model of management to be followed by European policy makers and stakeholders.”

**Military Implications:**

Given the close collaboration between EU and U.S. nanotech experts and the high level of the Governance Platform, it is likely that it will set the stage for an international regulatory framework for responsible nanotech development. Military personnel concerned with nanotech regulation policy should review this document for potential guidelines and collaboration.

**Sources:**

A New Governance Framework for Nanotechnologies (conference page, with “Proceedings now available for members”)

<http://www.framingnano.eu>

Brussels conference discusses nanotechnology governance platform

[http://www.nanowerk.com/news/newsid=14269.php?utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29](http://www.nanowerk.com/news/newsid=14269.php?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29)

7.11.2 Comprehensive Review of Engineered Nanomaterials Health And Safety

A consortium led by Edinburgh Napier University and the Institute of Occupational Medicine published a 426-page final report of the project Engineered Nanoparticles - Review of Health & Environmental Safety (ENRHES), described by *Nanowerk News* as "A comprehensive and authoritative review of the health and environmental safety of engineered nanomaterials [that] considers sources, pathways of exposure, [and] the health and environmental outcomes of concern". The report contains prioritized recommendations to aid policymakers in formulating regulations.

**Military Implications:**

Military personnel concerned with nanotech risk assessment should review this report for new inputs to their own work.

**Sources:**

ENRHES report provides in-depth examination of nanomaterials safety

[http://www.nanowerk.com/news/newsid=14387.php?utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29](http://www.nanowerk.com/news/newsid=14387.php?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29)

Engineered Nanoparticles - Review of Health & Environmental Safety project final report

<http://nmi.jrc.ec.europa.eu/documents/pdf/ENRHES%20Review.pdf>

7.11.3 Nanotechnology--Assessment of Health Safety and Environmental Factors

Frost & Sullivan, and Research and Markets, are offering a new research report, Nanotechnology--Assessment of Health Safety and Environmental Factors (Technical Insights). According to the announcement, the report provides "an overview of the HSE implications of nanotechnology ... a forced field analysis of the industry drivers and challenges... [a] strategic evaluation of the possible initiatives... ..[and] Profiling of commonly used HSE nomenclature with a list of the ongoing research projects in North America and Europe." The report is available for €4533-€5928, depending on the scope of the license.

**Military Implications:**

[Same as previous on similar issues] Military personnel concerned with nanotech risk assessment should evaluate this rather expensive report for possible acquisition to provide new inputs to their own work.

**Source:**

Nanotechnology - Assessment of Health Safety and Environmental Factors

[http://www.researchandmarkets.com/product/02ab42/nanotechnology\\_assessment\\_o](http://www.researchandmarkets.com/product/02ab42/nanotechnology_assessment_o)

**7.11.4 UK House of Lords Committee Urges Nanosafety Transparency**

Nanotechnologies and Food, a 112-page report presented by the UK House of Lords science and technology committee, urges, "the government and research councils to carry out more checks into the use of nanomaterials in food and in particular the dangers for the human body." This call is the third in two years, following those for more stringent safety checks from the Royal Society and the Royal Commission on Environmental Pollution.

**Military Implications:**

Although this action is of quite limited scope, both geographically and topically, it adds to the continuing public and governmental pressure for better information on nanotech hazards, information which the military must continue strong efforts to elicit from researchers and contractors.

**Sources:**

Press Notice: Science and Technology Committee - Nanotechnologies and Food

[http://www.parliament.uk/parliamentary\\_committees/lords\\_press\\_notices/pn080110st.cfm](http://www.parliament.uk/parliamentary_committees/lords_press_notices/pn080110st.cfm)

Nanotechnologies and Food. Science and Technology Committee, First Report

<http://www.publications.parliament.uk/pa/ld/ldsctech.htm>

Peers criticise food industry secrecy on nanotechnology

<http://www.guardian.co.uk/business/2010/jan/08/food-industry-nanotechnology-secrecy>

**7.11.5 UK Report Calls on Government to Support Nanotech Risk Assessment**

According to a story in the *Financial Times*, a report just issued by the UK's Nanotech Knowledge Transfer Network calls, "for the government to assuage public fears over nanotechnology by supporting risk assessments of new products", especially on behalf of small start-ups that may not have the resources for such activities.

**Military Implications:**

Military personnel concerned with nanotech risk assessment should review this 29-page report for its recommendations on the role of government in that kind of work.

**Source:**

Nanotechnology: a UK Industry View (report)

[http://mnt.globalwatchonline.com/epicentric\\_portal/binary/com.epicentric.contentmanagement.servlet.ContentDeliveryServlet/MNT/Knowledge%2520Centre/MiniIGTReport2010.pdf](http://mnt.globalwatchonline.com/epicentric_portal/binary/com.epicentric.contentmanagement.servlet.ContentDeliveryServlet/MNT/Knowledge%2520Centre/MiniIGTReport2010.pdf)

Business urges campaign over 'grey goo' fears

<http://www.ft.com/cms/s/0/82d93a8a-00ad-11df-ae8d-00144feabdc0.html> (Requires a free subscription registration.)

The three items 6.11.6, 6.11.7, and 6.11.8 describe a key stage in development of an emerging issue: the rise of general public interest and outcry. It can signal a turning from involvement of technocrats and some politicians to a more general political atmosphere.

#### 7.11.6 Public Disruptions Force Cancellation of French Public Nano Debates

Disruptions by environmentalists have forced the cancellation of three of the scheduled debates in France on nanotech issues. [See item *French Public Debate on Nanotechnology* in the October 2009 environmental security report.]

#### **Military Implications:**

Military personnel concerned with public communication of nanotech issues should take note of the depth of feeling on the subject, especially in Europe, indicated by these events.

#### **Source:**

Loud Starts End France's Nanotech Debates

<http://blogs.sciencemag.org/scienceinsider/2010/01/a-loud-start-to.html>

#### 7.11.7 Research Calls for Better Explanations and Sources in Nano Risk Communication

Johannes Simons, of the Institute for Food and Resource Economics at the University of Bonn, and colleagues have published a paper, *The Slings and Arrows of Communication on Nanotechnology*, that addresses the general problems of communicating nanotechnology risk. According to *Nanowerk Spotlight*, they utilized research from Germany, the US, and Australia to develop their recommendation, "...risk communication on nanotechnologies requires target-specific approaches...", and that "...it is important to involve trusted institutions in the risk communication process. This could help people to accept the information because they do not suspect the communicator of having some hidden interests or of deceiving them with misleading information."

The need for reforms in the process is supported by a study by Prof. Elizabeth Corley, of Arizona State University's School of Public Affairs, and Dietram A. Scheufele of the University of Wisconsin—Madison that, "found widening gaps in nanotech knowledge since 2004 between the least educated and most educated citizens. Americans with at least a college degree have shown an increase in understanding of the new technology, while knowledge about nanotechnology has declined over time for those with education levels of less than a high school diploma", according to a *Nanowerk News* story

#### **Military Implications:**

Military personnel concerned with nanotech risk assessment should review this report for new inputs to their own work.

#### **Sources:**

The slings and arrows of communication on nanotechnology

<http://www.springerlink.com/content/y6rxm682t4301353/>

Communicating nanotechnology

<http://www.nanowerk.com/spotlight/spotid=14344.php>

Nanotechnology outreach going wrong?

[http://www.nanowerk.com/news/newsid=14296.php?utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29](http://www.nanowerk.com/news/newsid=14296.php?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29)  
Outreach Going Wrong? When we talk nano to the public, we are leaving behind key audiences  
<http://www.the-scientist.com/2010/1/1/22/1/>

#### 7.11.8 5th International NanoRegulation Conference Report Available

The 5<sup>th</sup> International NanoRegulation Conference took place on November in Rapperswil, Switzerland, with the theme, " 'No Data, no Market?' - Challenges to Nano-Information and Nano-Communication along the Value Chain", presenting views and expectations regarding information and data exchange along the value chain, and possible approaches to the problem. A report is now available. According to Meridian Nanotechnology and Development News, "the debate at the conference revealed an urgent need for '...a coordinated information transfer of relevant nanospecific data along the value chain,' while recognizing the concerns that nano-labeling could be misunderstood as an indication of hazard by consumers."

#### **Military Implications:**

Military personnel and contractors concerned with nanotech risk assessment should review the report and available proceedings from the conference for new inputs to their own work.

#### **Source:**

NanoRegulation Conference Report Now Available

<http://www.innovationsgesellschaft.ch/index.php?section=news&cmd=details&newsid=263&teacherId=13>

#### 7.11.9 New Studies Add to Knowledge on Nanoparticles and Biological Reactions

Work being done by Silvia H. De Paoli Lacerda and Jack F. Douglas at the Polymers Division of the National Institute of Standards and Technology (NIST) is shedding new light on the effects of nanoparticle size (5nm to 100nm) on their association with a whole range of important blood proteins.

#### **Military Implications:**

The military should follow this research as it may help to clarify the mechanisms by which nanoparticles in the environment cause damage when introduced into biological organisms.

#### **Sources:**

Interaction of Gold Nanoparticles with Common Human Blood Proteins

<http://pubs.acs.org/doi/abs/10.1021/nn9011187>

Trying to understand the interaction of nanoparticles with blood

[http://www.nanowerk.com/spotlight/spotid=14327.php?utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29](http://www.nanowerk.com/spotlight/spotid=14327.php?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29)

#### 7.11.10 Conference on New-Technology Sensors to Be Held in UK

The Micro and Nano Sensors Interest Group (MiNSIG) of the UK's Sensors & Instrumentation Knowledge Transfer Network (KTN) is organizing a conference, Applications of Micro and Nanosensors in Security, Health and Environmental Monitoring, for 4 March 2010 at the National Physical Laboratory, Teddington, UK. The event will display novel sensing technologies developed by UK companies and universities leading to new applications in security, health and environmental monitoring. The keynote speakers will highlight some of the important developments in nanotechnology and sensor applications including future challenges, trends and opportunities, and will give an account of the requirements and opportunities for novel sensor developers.

#### **Military Implications:**

Military personnel in the area who are concerned with environmental monitoring should consider attending this event, to learn about current and future developments.

#### **Sources:**

Applications of Micro and Nanosensors in Security, Health and Environmental Monitoring

[http://sensors.globalwatchonline.com/epicentric\\_portal/site/sensors/minsig-page2/?mode=0](http://sensors.globalwatchonline.com/epicentric_portal/site/sensors/minsig-page2/?mode=0)

Conference to discuss future of nanotechnology enabled sensors

[http://www.nanowerk.com/news/newsid=14463.php?utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29](http://www.nanowerk.com/news/newsid=14463.php?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+nanowerk%2FagWB+%28Nanowerk+Nanotechnology+News%29)

#### 7.11.11 Key 2009 Nano Environmental Health and Safety Developments

According to the announcement, UK's SAFENANO's new report, "provides a summary of key nanoEHS developments from 2009, ... considers how these are likely to shape 2010 in nano ... [and] provides a personalised account of news, publications and legal developments from 2009, ...[c]overing scientific discoveries, regulatory and governmental developments, consumer issues, and developments in the nanotechnology community."

#### **Military Implications:**

Relevant military personnel should consider the report for potential input and support of their own work.

#### **Source:**

2009 - a big year for nano safety

<http://www.safenano.org/SingleNews.aspx?NewsID=957>