

**WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY**  
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Note to Readers: Pages 1-11 comprise the summary and analysis of this report. Expanded details for some items are in the Appendix beginning on page 12.

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## Item 1. UN to Shift Attention from Reaction to Prevention of Conflicts

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

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

### **Military Implications:**

Military resources have studied the nature of conflict in many situations for many years. Lessons learned about conflict precursors, forecasting and prevention should be made available through relevant channels to support the UN’s change of emphasis from reaction to prevention. Alternative scenarios could be created about how military forces could be better deployed for prevention. Since environmental issues are increasingly recognized as a contributing cause of future conflicts, the military might consider increasing cooperation with environmental forecasting organizations in order to improve its capacity to anticipate and prevent conflicts.

### **Sources:**

Security Council Reiterates Commitment to Conflict Prevention in Africa; Presidential Statement Follows Day-Long Debate

<http://www.un.org/News/Press/docs//2007/sc9105.doc.htm>

U.N. spent \$18 billion on peacekeeping in past five years, but not enough on conflict prevention

<http://www.iht.com/articles/ap/2007/08/29/news/UN-GEN-UN-Conflict-Prevention.php>

New York, 28 August 2007 - Secretary-General's remarks to the Security Council at open debate on conflict prevention and resolution, particularly in Africa

<http://www.un.org/apps/sg/sgstats.asp?nid=2712>

UN highlights growing role of international policing as global meeting opens in Australia

<http://www.un.org/apps/news/story.asp?NewsID=23643&Cr=police&Cr1=>

## Item 2. International Conferences Put Climate Change among Top Security Issues

Experts and politicians participating at a seminar on climate change held in Ny Alesund, Norway, called climate change the biggest security challenge since the Cold War. British climate change

ambassador John Ashton said global warming should be considered a security issue on a par with terrorism, in order to increase global action to cut greenhouse gas emissions from fossil fuels.

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

**Military Implications:**

If the military were told that indeed climate change is a threat on a par with terrorism or the Cold War, what changes in the military would be required? Since the environmental and international political trends are moving in this direction, it would be wise to initiate studies to explore options.

**Sources:**

Climate change called security issue like Cold War

[http://www.enn.com/top\\_stories/article/22093](http://www.enn.com/top_stories/article/22093)

Natural disasters more destructive than wars: Egeland

[http://news.yahoo.com/s/afp/20070828/sc\\_afp/environmentclimate](http://news.yahoo.com/s/afp/20070828/sc_afp/environmentclimate)

Vienna UN conference shows consensus on key building blocks for effective international response to climate change

[http://unfccc.int/files/press/news\\_room/press\\_releases\\_and\\_advisories/application/pdf/20070831\\_vienna\\_closing\\_press\\_release.pdf](http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/20070831_vienna_closing_press_release.pdf)

### **Item 3. Environmental Aspects of the Darfur Conflict**

#### **3.1 ICC Urged to Consider Environmental Crimes in Darfur Cases**

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

**Military Implications:**

Although making a case based on environmental crime is very difficult under the stipulations of the Rome Statute (see *Environmental Crimes in Military Actions and the International Criminal Court (ICC)—UN Perspectives*, by the Millennium Project, available from AEPI), the fact that there is pressure to consider it increases the attention given to the environment in conflict

situations and contributes to other efforts to change the Rome Statute to better address environment-related actions. Hence, military legal personnel monitoring the evolution of the ICC should keep track of these developments. Likewise, personnel writing and updating regulations need to make themselves aware of these developments in order to incorporate changing philosophies and requirements in training, operations and materiel development guidance at appropriate times. [See also *UNEP Warns No Peace in Sudan without Environmental Management Plan* in June 2007 environmental security report]

**Sources:**

Court Urged to Consider Environmental Crimes

[http://www.iwpr.net/?p=acr&s=f&o=338199&apc\\_state=henh](http://www.iwpr.net/?p=acr&s=f&o=338199&apc_state=henh)

*Environmental Crimes in Military Actions and the International Criminal Court (ICC)—UN Perspectives*

<http://www.millennium-project.org/millennium/es-icc.html>

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

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

**Military Implications:**

U.N. and military planners involved in the Darfur and similar peacekeeping operations should incorporate environmental and infrastructure dimensions into their strategies and operations and eventually consider alternative relocation of the refugees. Implementation of new technologies for water supply should be contemplated as a priority in peace operations in such conditions. Lessons learned in Darfur need to be heeded in generalized planning guidance for future crises that might occur elsewhere.

**Sources:**

Darfur refugees strain tight water supplies

<http://www.mcclatchydc.com/226/story/19262.html>

New York, 28 August 2007 - Secretary-General's press conference

<http://www.un.org/apps/sg/offthecuff.asp?nid=1060>

**Item 4. Disputes over Oil Might Reignite Congo-Uganda Conflict**

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

**Military Implications:**

This could be an opportunity for the military to take up the UN Security Council's increased focus on prevention (see Item 1 in this report) by offering collaboration with the UN Resident Representatives in the two countries in cooperation with the African Union to prevent a potential war.

**Source:**

Do you want to share or to fight?

[http://www.economist.com/research/articlesBySubject/displayStory.cfm?story\\_id=9687573&subjectID=381586&fsrc=nwl&emailauth=%2527%252D5%2527%253EP%255CGJ%2523%2520%2520D%250A](http://www.economist.com/research/articlesBySubject/displayStory.cfm?story_id=9687573&subjectID=381586&fsrc=nwl&emailauth=%2527%252D5%2527%253EP%255CGJ%2523%2520%2520D%250A)

**Item 5. Asian New Strategy to Improve Health and Environment**

At the First Ministerial Regional Forum on Environment and Health, held in Bangkok, August 8-9, 2007, top environmental and health officials from Southeast and East Asian countries adopted the Bangkok Declaration on Environment and Health. The Declaration aims to set up strategies to reduce the estimated 6.6 million annual deaths—representing approximately 25% of all deaths in the region in a year—attributable to various environmental health risks such as air pollution, solid and hazardous wastes, and numerous man-made disasters. The Declaration provides a mechanism for improving collaboration in policy and regulatory frameworks at the national and regional level, and promotes the implementation of integrated environmental health strategies and regulations. It covers areas from air and water quality, to hazardous substances and climate change—including contingency planning, preparedness and response to environmental health emergencies. A second Ministerial Regional Forum is planned for 2010.

**Military Implications:**

Military personnel with environmental health responsibilities in Southeast and East Asian countries should review the Bangkok Declaration on Environment and Health to see where collaboration is possible, and explore ways of applying the Army's Strategy on the Environment.

**Sources:**

Bangkok Declaration calls for coordinated action on environment and health

<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=516&ArticleID=5652&l=en>

Asian States adopt UN-backed plan to cut millions of deaths due to man-made disasters

<http://www.un.org/apps/news/story.asp?NewsID=23474&Cr=pollution&Cr1=>

**Item 6. Transport Canada Proposes New Vessel Operation Regulations**

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

Canada will finalize the regulations and publish them in the *Canada Gazette*, Part II, at which time they will come into effect.

### **Military Implications:**

Although the proposed Vessel Operation Restriction Regulations concern just commercial and recreational navigation, considering the extent of waterways common to U.S. and Canada, relevant military personnel should review the regulations and consider providing comments to ensure that the Regulations do not impede future U.S. military operations. Also, the military should instruct its contractors to review the new regulations to assure compliance.

### **Source:**

Transport Canada Proposes Vessel Operation Restriction Regulations  
<http://www.tc.gc.ca/mediaroom/releases/nat/2007/07-h156e.htm>

## **Item 7. Technological Breakthroughs with Environmental Security Implications**

### **7.1 New Detection and Cleanup Technologies**

More detailed descriptions of the items are available in the [Appendix](#)

Portable sensor detects exposure to chemical or nerve agents by testing blood or saliva samples, with high sensitivity and quick response time, to be available in about five years.

Antibody-bearing gel for disinfecting biologically contaminated areas will allow biohazard detection, containment, and decontamination by spraying the area and then discarding the gel. It is expected to be ready for use in field operations worldwide within two years.

Method for assessing metabolites of diesel exhaust component 1-nitropyrene in human urine is being developed, helping to evaluate human health effects of diesel engine emission inhalation.

Using ground-penetrating radar technique promises improved capability for landmine detection.

Porous semiconducting aerogels purify water with 99.99% efficiency, removing contaminants like heavy metals and also filtering catalyst-poisoning impurities from hydrogen for fuel cells.

### **Military Implications:**

The military should consider following and exploring these new technique developments in order to improve detection of safety and health hazards and cleanup capabilities.

### **Sources:**

Truly sick or simply scared?

<http://www.pnl.gov/topstory.asp?id=265>

Anadis receives \$480k Government grant for biohazard “Ectoplasm” project

<http://64.233.169.104/search?q=cache:VUs7GqNm4JQJ:www.anadis.com.au/admin/managedFiles/4/Government%2520grant%2520for%2520biohazard%2520Ectoplasm%2520project.pdf+anadis+ectoplasm&hl=en&ct=clnk&cd=1&gl=us>

Antibody-laden gel can clean up after anthrax attacks

<http://www.newscientist.com/channel/health/mg19526156.500?DCMP=NLC-nletter&nsref=mg19526156.500>

Identification and Quantification of 1-Nitropyrene Metabolites in Human Urine as a Proposed Biomarker for Exposure to Diesel Exhaust

<http://pubs.acs.org/cgi-bin/abstract.cgi/crtoec/2007/20/i07/abs/tx700015q.html> (abstract only; payment or paid membership required for full article)

Measurement of 1-Nitropyrene Metabolites in Human Urine: A Potential Marker for Exposure to Diesel Exhaust (text in the [Appendix](#))

Ground-breaking antilandmine radar

<http://www.physorg.com/printnews.php?newsid=107092841>

New aerogels could clean contaminated water, purify hydrogen for fuel cells

[http://www.anl.gov/Media\\_Center/News/2007/news070727.html](http://www.anl.gov/Media_Center/News/2007/news070727.html)

## 7.2 Increasing Energy Efficiency Technologies

More detailed descriptions of the items are available in the [Appendix](#)

Silicon nanocrystals can increase the efficiency of conventional solar cells from its present 20% to 40%, at much lower cost than other approaches to high efficiency cells.

Synthetic biology could produce hydrocarbon-based fuels within three to five years.

Battery/capacitor resembling a sheet of paper, produced using nanotechnology, could be soaked with any of a variety of fluids (including sweat or blood) to serve as electrolytes – planned or expedient.

### **Military Implications:**

The military should follow these developments for their possible use in more efficient power supplies.

### **Sources:**

Silicon Nanocrystals for Superefficient Solar Cells

<http://www.technologyreview.com/Energy/19256>

Making Gasoline from Bacteria

[http://www.technologyreview.com/read\\_article.aspx?id=19128](http://www.technologyreview.com/read_article.aspx?id=19128)

Beyond Batteries: Storing Power in a Sheet of Paper

[http://news.rpi.edu/update.do?artcenterkey=2280&setappvar=page\(1\)](http://news.rpi.edu/update.do?artcenterkey=2280&setappvar=page(1))

## 7.3 Anti-microbial Protective Coating

BioQuest Technologies, Inc. of Jupiter FL has produced an anti-microbial surface protectant, Bioshield®75, which greatly reduces the possibility of bacteria, mold, and mildew damage to surfaces subsequently exposed to such environmental occurrences as hurricanes. The material differs from other anti-microbial protective materials in being non-toxic; its efficacy results from the action of "sharp-pointed" molecules that puncture the cell walls of microbes. The puncturing atomic chains are too small to damage the cells of larger organisms.

MCH Nano Solutions, of Toronto ON, has introduced a protective product, Gens Nano, having the same objective. Their compound works through the photocatalytic action of nanoparticles of titanium dioxide that decompose the adhesive organic material holding pollutants onto a surface.

### **Military Implications:**

The military should investigate the applicability of these materials to protection of vulnerable portions of installations, personal gear and materiel likely to be exposed to hostile environmental conditions.

**Sources:**

How Bioshield®75 Works

<http://www.bioquestech.com/bioshield75how.shtml>

Antimicrobial Nanotech Product Set To Protect Homes In Hurricane Areas

<http://www.azonano.com/news.asp?newsID=4714>

Self-Cleaning Buildings Thanks to Nanotechnology and Green Chemistry

<http://www.pr.com/press-release/46970>

**Item 8. Updates on Previously Identified Issues****8.1 Arctic Debate Intensifies**

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

**Military Implications:**

This could be another opportunity to take up the UN Security Council's increased focus on prevention (see Item 1 in this report) by offering collaboration in design of a multilateral agreement to prevent conflict, and applying the Army's Strategy on the Environment in any military activities that could have environmental impacts on the region.

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

Who resolves Arctic oil disputes?

<http://www.csmonitor.com/2007/0820/p01s02-woeu.html>

Canada Announces Arctic Base, Port

[http://www.newsvine.com/\\_news/2007/08/10/890132-canada-announces-arctic-base-port](http://www.newsvine.com/_news/2007/08/10/890132-canada-announces-arctic-base-port)

Drawing lines in melting ice

[http://economist.com/world/international/displaystory.cfm?story\\_id=9660012](http://economist.com/world/international/displaystory.cfm?story_id=9660012)+

Preliminary results of Russian Arctic expedition released

[http://english.pravda.ru/russia/economics/28-08-2007/96385-arctic\\_expedition-0](http://english.pravda.ru/russia/economics/28-08-2007/96385-arctic_expedition-0)

**8.2 Biotechnology Risk in Africa**

Advancing developments in biosciences in Africa raise the risks of their potential misuse, thus increasing the need to develop adequate mechanisms for preventing the development and spread of biological weapons. For raising awareness on biosecurity issues and discussing the development of strategies that would encourage biotechnology research without jeopardizing security, a series of workshops were held—notably in Kenya and Uganda, two emerging biotech nations that are not yet properly engaged in international biosecurity policy deliberations. It was emphasized that

Africa has to develop its own strategy, adapted to its own specific needs and conditions to reduce the risk of misuse, as well as to mitigate the damage to African scientific development in case of the use of biotechnology for harmful purposes. Africa should also develop a stronger position on regulatory issues and get more engaged in international negotiations related to biosecurity. [See also *ETC Report Warns of the Threat of Synthetic Biology and Calls for Global Regulations* in January 2007 and other environmental security reports on the same issue.]

**Military Implications:**

Military personnel with biosecurity responsibilities should consider contacting relevant African counterparts to help in the creation of standards and treaties to improve the security of biotech labs and applications, and to involve Africans in the international negotiations for biosafety regulations.

**Source:**

Africa must commit to biosecurity measures

<http://www.scidev.net/Opinions/index.cfm?fuseaction=readOpinions&itemid=654&language=1>

**8.3 Climate Change**

More detailed descriptions of each item are available in the [Appendix](#)

**8.3.1 Intensified Disasters**

Between 2004 and 2006, the number of emergencies due to natural disasters doubled, from 200 to 400. This year's monsoon affected an estimated 30 million in South Asia, and millions of Africans were also affected by flooding throughout the continent. Scientists expect increased natural disasters over the next decades and researchers warn that risks of flooding might be underestimated.

**8.3.2 Melting Glaciers and Sea Ice**

Arctic sea ice shrank to the lowest extent ever recorded by satellite, and it might be close to reaching a "critical threshold"—which could mean that the region might be ice-free in summer in the next 10 to 20 years. The Tibet Meteorological Bureau reported accelerating melting due to rising annual temperatures at a rate of 0.3° Celsius (0.54° Fahrenheit) every 10 years.

**8.3.3 Rising Sea Levels**

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

**8.3.4 Adaptation**

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

**8.3.5 Climate Modeling**

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

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

The NASA Goddard Institute for Space Studies has developed the first climate model that can estimate the effect of atmospheric warming on the strength of storms.

### 8.3.6 Post-Kyoto Negotiations

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

### **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](#))

The ISDR urges every country to implement the Hyogo Framework for action to reduce climate-related risks Disaster risk reduction is not an option; it is an urgent priority

<http://www.unisdr.org/eng/media-room/press-release/2007/pr-2007-10-hfa.pdf>

Press Conference by UN Deputy Emergency Relief Coordinator on Recent Floods in South Asia

[http://www.un.org/News/briefings/docs//2007/070809\\_Wahlstrom.doc.htm](http://www.un.org/News/briefings/docs//2007/070809_Wahlstrom.doc.htm)

Leaf 'sweat glands' to worsen future flooding

<http://environment.newscientist.com/article/dn12559-leaf-sweat-glands-to-worsen-future-flooding.html>

Rising sea threatens China's south: report

<http://www.terradaily.com/2007/070830061011.swmxva5e.html>

Global warming threatens Egypt's Nile Delta

[http://www.usatoday.com/news/world/2007-08-23-egypt-nile-threat\\_N.htm](http://www.usatoday.com/news/world/2007-08-23-egypt-nile-threat_N.htm)

*Investment and financial flows relevant to the development of effective and appropriate international response to Climate Chang*

[http://unfccc.int/cooperation\\_and\\_support/financial\\_mechanism/items/4053.php](http://unfccc.int/cooperation_and_support/financial_mechanism/items/4053.php)

Australia First to Model Continental Shoreline Climate Impacts

<http://www.ens-newswire.com/ens/aug2007/2007-08-23-01.asp>

Prepare for another ten scorching years

<http://environment.newscientist.com/article/dn12453-prepare-for-another-ten-scorching-years.html>

NASA Study Predicts More Severe Storms With Global Warming

[http://www.nasa.gov/centers/goddard/news/topstory/2007/moist\\_convection.html](http://www.nasa.gov/centers/goddard/news/topstory/2007/moist_convection.html)

Vienna Climate Change Talks 2007

[http://unfccc.int/meetings/intersessional/awg\\_4\\_and\\_dialogue\\_4/items/3999.php](http://unfccc.int/meetings/intersessional/awg_4_and_dialogue_4/items/3999.php)

Australian PM Says APEC to Tackle Energy Savings

<http://www.planetark.com/dailynewsstory.cfm/newsid/43975/story.htm>

## 8.4 Nanotechnology Safety Issues

Some noteworthy nanotechnology safety activities from August 2007 (more detailed descriptions of each are available in the [Appendix](#)) are:

- *Current Developments/Activities on the Safety of Manufactured Nanomaterials/Nanotechnologies* report by the Organization for Economic Co-operation and Development (OECD) catalogs the initiatives in industrialized countries to address the health and environmental safety implications of manufactured nanomaterials
- EPA Conference on Nanoscale Materials, September 6-7, 2007, in Rosslyn VA
- Study shows nanotube manufacture may pollute environment with various toxic hydrocarbons that are harmful to the atmosphere and human health
- Canada published a new Substances Program Advisory Note 2007-06, Requirements for nanomaterials under the New Substances Notification Regulations (Chemicals and Polymers)
- The Nanotechnology Engagement Group published its final report, *Democratic technologies?* addressing public involvement, dialogues, and ethical aspects of nanotechnology.

### Military Implications:

Military personnel concerned with nanotech issues 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:

Environment Directorate. Joint meeting of the chemicals committee and the working party on chemicals, pesticides and biotechnology current developments/ activities on the safety of manufactured nanomaterials/ nanotechnologies

[http://appli1.oecd.org/olis/2007doc.nsf/linkto/env-jm-mono\(2007\)16](http://appli1.oecd.org/olis/2007doc.nsf/linkto/env-jm-mono(2007)16)

EPA Conference on Nanoscale Materials meeting website

<http://www.epa.gov/oppt/nano/mc-mtginfo.htm>

Nanoscale Materials Stewardship Program

<http://www.epa.gov/oppt/nano/index.htm#stewardship>

Helping the carbon nanotube industry avoid mega-mistakes of the past

<http://www.physorg.com/news106894749.html>

New Substances Program Advisory Note 2007-06. Requirements for nanomaterials under the New Substances Notification Regulations (Chemicals and Polymers)

[http://www.ec.gc.ca/substances/nsb/eng/a200706\\_e.shtml](http://www.ec.gc.ca/substances/nsb/eng/a200706_e.shtml)

*Democratic technologies?* The final report of the Nanotechnology Engagement Group (NEG)

[http://83.223.102.125/involvenew/mt/archives/blog\\_37/Democratic%20Technologies.pdf](http://83.223.102.125/involvenew/mt/archives/blog_37/Democratic%20Technologies.pdf)

## Item 9. Reports Suggested for Review

### 9.1 WHO Report 2007 Addresses Global Health Security Threats

*The World Health Report 2007 - A safer future: global public health security in the 21st century* addresses for the first time health issues as security issues. It notes the increasing risk of disease outbreaks, epidemics, industrial accidents, natural disasters and other health emergencies, which could become threats to global public health security. The report explains the role of the International Health Regulations, which came into force this year, in helping countries'

collaboration to identify and contain risks from outbreaks and other health hazards. The report points out pandemic influenza as the most feared threat to health security.

**Military Implications:**

The report is a good source for understanding and acting on possible global health threats; and hence should be studied by relevant military personnel.

**Sources:**

*The world health report 2007 - A safer future: global public health security in the 21st century*  
<http://www.who.int/whr/2007/en/index.html>

Feathered fiends. Economist.com, Aug 28th 2007

[http://www.economist.com/daily/news/displaystory.cfm?story\\_id=9688994&fsrc=nwl](http://www.economist.com/daily/news/displaystory.cfm?story_id=9688994&fsrc=nwl)

## APPENDIX

### Reference Details

This Appendix contains expanded background information on some items.

### Item 7. Technological Breakthroughs with Environmental Security Implications

#### 7.1 New Detection and Cleanup Technologies

##### 7.1.1 Portable Sensor to Detect Exposure to Chemical or Nerve Agents

The U.S. Pacific Northwest National Laboratory is developing a portable sensor able to identify exposure to chemical or nerve agents by testing blood or saliva samples. The device will be based on higher sensitivity test strips. Its development is funded by the National Institutes of Health and the project is estimated to take five years.

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

As stated by the researchers working on the project, in addition to timely and more accurate information, the portable sensor will allow rescue workers to better focus on those who are really affected by chemical or biological agents, over those just scared or not needing immediate attention. The military should follow and provide input to the project in order to develop the most field-useful device.

##### **Source:**

Truly sick or simply scared?

<http://www.pnl.gov/topstory.asp?id=265>

##### 7.1.2 Antibody-bearing Gel Can Disinfect Biologically Contaminated Areas

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

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

The military should follow this development and assess its possible use in cleanup after biological or chemical attacks or accidents.

##### **Sources:**

Anadis receives \$480k Government grant for biohazard“Ectoplasm” project

<http://64.233.169.104/search?q=cache:VUs7GqNm4JQJ:www.anadis.com.au/admin/managedFiles/4/Government%2520grant%2520for%2520biohazard%2520Ectoplasm%2520project.pdf+anadis+ectoplasm&hl=en&ct=clnk&cd=1&gl=us>

Antibody-laden gel can clean up after anthrax attacks

<http://www.newscientist.com/channel/health/mg19526156.500?DCMP=NLC-nletter&nsref=mg19526156.500>

### 7.1.3 Advance in Assessing Metabolites of Diesel Exhaust component 1-nitropyrene in Humans

Researchers at Kanazawa University and the University of Washington reported developing a method for measuring metabolites of 1-nitropyrene (1-NT) in human urine. 1-NT is abundant in diesel exhaust particulates and a significant mutagenic agent. This appears to be a breakthrough in the quest for ways to evaluate human health effects of diesel engine emission inhalation.

#### **Military Implications:**

Military preventive health organizations should review the latest research literature on this topic to determine how to use the new tool for force health protection. Materiel managers should study the same literature and seek health professional assistance in applying the findings to development, maintenance and training.

#### **Sources:**

Identification and Quantification of 1-Nitropyrene Metabolites in Human Urine as a Proposed Biomarker for Exposure to Diesel Exhaust

<http://pubs.acs.org/cgi-bin/abstract.cgi/crtoec/2007/20/i07/abs/tx700015q.html> (abstract only; payment or paid membership required for full article)

Measurement of 1-Nitropyrene Metabolites in Human Urine: A Potential Marker for Exposure to Diesel Exhaust (text available further in this [Appendix](#))

### 7.1.4 Landmine Detection by Using Ground-penetrating Radar Technique

A wide-band earth-penetrating radar offering promise of improved capability for landmine detection was developed by A. G. Yarovoy, P. van Genderen, and colleagues at the International Research Centre for Telecommunications-transmission and Radar of the Delft University of Technology, the Netherlands.

#### **Military Implications:**

The development has been underway for some time. The military should investigate its current status, in order to consider its application to conflict operations and post-conflict environmental cleanup.

#### **Source:**

Ground-breaking antilandmine radar

<http://www.physorg.com/printnews.php?newsid=107092841>

### 7.1.5 Porous Semiconducting Aerogels Purify Water and Hydrogen

Scientists of the Argonne National Laboratory, together with colleagues at Northwestern and Michigan State Universities, have developed chalcogenide-based porous semiconducting aerogels which efficiently (99.99%) remove contaminants like heavy metals from water and also filter out catalyst-poisoning impurities from hydrogen intended for use in fuel cells.

#### **Military Implications:**

The military should follow the development of this family of materials to evaluate its usefulness in environmental cleanup systems.

**Source:**

New aerogels could clean contaminated water, purify hydrogen for fuel cells

[http://www.anl.gov/Media\\_Center/News/2007/news070727.html](http://www.anl.gov/Media_Center/News/2007/news070727.html)

**7.2 Increasing Energy Efficiency Technologies****7.2.1 Silicon Nanocrystals Promise More Efficient Solar Cells**

Scientists at the National Renewable Energy Laboratory (NREL), in Golden CO, have shown that silicon nanocrystals can increase the efficiency of conventional solar cells from its present 20% to 40%, at much lower cost than other approaches to high efficiency cells. [See also *Nano-based Solar Cell Material Offers Inexpensive Alternative* in July 2007 and other previous environmental security reports.]

**7.2.2 Synthetic Biology to Produce Hydrocarbon-based Fuels**

LS9, a synthetic biology company based in San Carlos, CA, has genetically engineered various bacteria, including *E. coli*, to custom-produce hydrocarbons that could be processed into fuel. A pilot plant is planned for 2008, and sales of synthetic biocrudes to refineries for further processing are expected within three to five years. Another company, Amyris Biotechnologies, of Emeryville, CA, is using plant and animal genes to make microbes produce renewable hydrocarbon-based fuels.

**7.2.3 Nanotechnology Produces Battery/Capacitor in a Sheet of Paper**

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

**Military Implications:**

The military should follow these developments for their possible use in more efficient power supplies.

**Sources:**

Silicon Nanocrystals for Superefficient Solar Cells

<http://www.technologyreview.com/Energy/19256>

Making Gasoline from Bacteria

[http://www.technologyreview.com/read\\_article.aspx?id=19128](http://www.technologyreview.com/read_article.aspx?id=19128)

Beyond Batteries: Storing Power in a Sheet of Paper

[http://news.rpi.edu/update.do?artcenterkey=2280&setappvar=page\(1\)](http://news.rpi.edu/update.do?artcenterkey=2280&setappvar=page(1))

**Measurement of 1-Nitropyrene Metabolites in Human Urine: A Potential Marker for Exposure to Diesel Exhaust**

[ISEE/ISEA 2006 Conference Abstracts Supplement: Poster Abstracts: Abstracts]

Epidemiology: Volume 17(6) Suppl November 2006p S303

Simpson, C\*; Paulsen, M\*; Miller-Schulze, J\*; Toriba, A†; Hayakawa, K†

\*University of Washington, Seattle. †Kanazawa University, Kanazawa.

P-156

### Introduction:

Diesel exhaust represents a major source of ambient fine particulate air pollution (PM), and has been associated with both acute and chronic health effects. The nitro-PAH, 1-nitropyrene (1-NP) has been proposed as a unique marker for diesel exhaust, and could be used to quantify exposure to diesel exhaust. In this paper we describe development and application of an analytical method for measuring 1-NP metabolites in human urine samples.

### Methods:

Personal PM samples were collected from taxi and lorry drivers with elevated occupational exposures to diesel exhaust (n=17), and from subjects exposed to ambient levels of diesel exhaust (n=10). First morning void urine samples were obtained concurrent with the PM samples. PM<sub>2.5</sub> exposures in the taxi and lorry drivers were in the range 67-165 µg/m<sup>3</sup>, and 1-46 µg/m<sup>3</sup> in the subjects exposed to ambient levels of diesel exhaust.

1-NP in PM samples was measured by using HPLC with fluorescence detection. To facilitate fluorescence detection the 1-NP is reduced to 1-aminopyrene in an on-line reduction column packed with Pt/Rh catalyst. Using this technique we obtained a detection limit of 0.25 pg for 1-NP. An analytical method based on GC-NICI-MS was developed for the sensitive and specific detection of 1-NP metabolites in human urine. The analytical method involved two solid phase extraction steps using Blue Rayon and Alumina, nitro-reduction using granular zinc, and derivatization with heptafluorobutyric anhydride. The limit of detection for this assay is □0.1-0.5 fmol/mL assuming a 50 mL urine sample. Deuterium-labelled nitropyrene metabolites were synthesized and used as recovery standards.

### Results:

NP metabolites were ammended into human urine from subjects in Seattle, WA and Kanazawa, Japan without known exposure to elevated levels of diesel exhaust. Using the above method, recoveries of the 1-NP metabolites ranged from 35% for 1-aminopyrene to >90% for the hydroxynitropyrene isomers.

1-NP concentrations were then measured in the urine specimens obtained from taxi and lorry drivers and from subjects exposed to ambient levels of diesel exhaust. We were able to detect the hydroxylated metabolites of 1-NP in human urine samples in the range 1-50 fmol/mL. Based on rat studies the major urinary metabolites of 1-NP are anticipated to be hydroxylated metabolites, however this is the first report to identify these compounds in human urine. Seidel et al. (*Int. J. Hyg. Environ. Health*, 2002, 204(5-6):333-8) previously reported concentrations of 1-aminopyrene in the range 8-800 fmol/mL in urine from underground mine workers, but their analytical method was not suitable to detect the hydroxylated metabolites.

### Conclusions:

A sensitive and specific analytical method was developed to measure hydroxylated metabolites of 1-NP in human urine samples. The assay has a limit of detection of □0.1-0.5 fmol/mL assuming a 50 mL urine sample, and recoveries ranged from 35% for 1-aminopyrene to >90% for the hydroxynitropyrene isomers. Hydroxylated metabolites of 1-NP were detected in human urine samples in the range 1-50 fmol/mL. These metabolites offer the possibility of a specific biomarker of exposure to diesel exhaust, and their association with diesel exhaust exposures will be investigated.

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## Item 8. Updates on Previously Identified Issues

### 8.1 Arctic Debate Intensifies

**Sources:** (more expanded list)

Canada and Denmark join rush to claim Arctic

<http://www.telegraph.co.uk/news/main.jhtml;jsessionid=XBKYMMSKBIQC3QFIQMFSFFWAVCBQ0IV0?xml=/news/2007/08/11/warctic111.xml>

Canada Announces Arctic Base, Port

[http://www.newsvine.com/\\_news/2007/08/10/890132-canada-announces-arctic-base-port](http://www.newsvine.com/_news/2007/08/10/890132-canada-announces-arctic-base-port)

Drawing lines in melting ice

[http://economist.com/world/international/displaystory.cfm?story\\_id=9660012+](http://economist.com/world/international/displaystory.cfm?story_id=9660012+)

Preliminary results of Russian Arctic expedition released

[http://english.pravda.ru/russia/economics/28-08-2007/96385-arctic\\_expedition-0](http://english.pravda.ru/russia/economics/28-08-2007/96385-arctic_expedition-0)

Nations scramble for oil in Arctic

<http://www.newscientist.com/channel/opinion/mg19526172.700-nations-scramble-for-oil-in-arctic.html> (by subscription only; full text available further in this [Appendix](#))

Climate change may open a new route between the Atlantic and Pacific Oceans

<http://clipsyndicate.com/publish/video/381242?wpid=47> (video clip)

Denmark Maps Arctic Ridge in Claim Race

<http://www.guardian.co.uk/worldlatest/story/0,,-6840878,00.html>

Denmark joins race to claim North Pole

<http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2007/08/12/wpole112.xml>

Who resolves Arctic oil disputes?

<http://www.csmonitor.com/2007/0820/p01s02-woeu.html>

Tougher rules urged to protect Arctic

<http://www.ft.com/cms/s/0/4b6e821e-4e74-11dc-85e7-0000779fd2ac.html>

German Foreign Minister Warns Against Exploiting Arctic

<http://www.dw-world.de/dw/article/0,2144,2756813,00.html>

#### **Nations scramble for oil in Arctic**

NewScientist.com news service, 17 August 2007

<http://www.newscientist.com/channel/opinion/mg19526172.700-nations-scramble-for-oil-in-arctic.html>

(by subscription only)

THE sabre-rattling continues around the Arctic Circle. In July, Canada said it will spend CAN\$3 billion on new ice-breakers to patrol the region. Russia responded this month by apparently planting its flag on the seabed beneath the North Pole. Now Denmark has dispatched researchers to assess whether it can lay claim to the major source of the dispute: the Arctic's untapped oil and gas reserves.

The team set off from Tromsø on 12 August towards the Lomonosov Ridge, a seabed structure that cuts across the pole from Greenland to Russia. No one owns the ridge, but Russia has put in a sovereignty claim to the United Nations. Any country that can show that the ridge is an extension

of its own coastal continental shelf can attempt to gain ownership. Lawyers say that the claims to the Arctic - and its oil and gas riches - will be decided by the UN Commission on the Limits of the Continental Shelf. Denmark, Canada and Norway will resist Russia's claims.

Canada seems to be going for the military option and last week announced plans for an army training centre on Nunavut - its northernmost territory - and a deep-water port. Prime minister Stephen Harper said the installations would underline Canada's claim to the North-West Passage, which connects the Atlantic and the Pacific oceans. The ownership of the passage is the other reason for the territorial dispute: the retreat of sea ice through global warming could open it up, creating a valuable shipping route to and from Asia.

“The retreat of sea ice from the North-West Passage may open up a valuable shipping route”

The fifth Arctic nation, the US, faces a slightly more difficult decision. It never ratified the UN treaty that covers claims to the continental shelf and so cannot appeal via that route. Despite opposition from some conservatives, who dislike ceding power to the UN, President George W. Bush says he wants Congress to adopt the treaty so that the US can enter the fray.

## **8.2 China Enhancing Environmental Regulations**

### **Legislators take a green path**

ShanghaiDaily.com, 2007-8-27

[http://www.shanghaidaily.com/sp/article/2007/200708/20070827/article\\_328768.htm](http://www.shanghaidaily.com/sp/article/2007/200708/20070827/article_328768.htm) (page available randomly)

CHINA'S top legislators yesterday began deliberating a draft law that covers recycling, energy saving and emission reduction.

The draft law was submitted to the 29th session of the Standing Committee of the National People's Congress for a first reading.

It stipulates that governments at all levels should control energy use and emissions, strengthen management of resource-intensive companies and divert capital into environmentally friendly industries.

The draft also introduces reward and punishment systems for companies, encouraging them to develop a recycling mindset and making them responsible for the recycling of their products.

Officials guilty of dereliction of duty will receive administrative punishment or even be subject to criminal prosecution, the draft says.

Companies which violate the import ban on equipment, materials or products that cause high energy consumption and pollution will be fined from 100,000 yuan (US\$13,333) to one million yuan, according to the draft. It says companies which use fuel generators or fuel boilers that fail to meet national standards will be fined from 10,000 yuan to 500,000 yuan.

"China has been facing serious environmental and resources problems during its economic development since the 1980s, which were mainly caused by the low resources efficiency," Feng Zhijun, vice chairman of the NPC Environmental Protection and Resources Conservation Committee, said at the legislative session.

Law makers were also deliberating a draft amendment to the Water Pollution Prevention and Control Act, intended to mete out harsher punishments to enterprises and officials who fail to implement controls.

The draft stipulates that offenders will be fined 100,000 yuan to one million yuan if factories discharge into water more than a set level of pollutants.

Those who discharge pollutants to drinking water sources will be fined 100,000 yuan to 500,000 yuan, according to the draft amendment.

Xinhua/Shanghai Daily

## **8.5 Climate Change**

More detailed description of each item.

### 9.5.1 Intensified Disasters

Between 2004 and 2006, the number of emergencies due to natural disasters doubled, from 200 to 400, reports the UN International Strategy for Disaster Reduction (ISDR). This year's monsoon affected an estimated 30 million in South Asia. Millions of Africans were also affected by flooding throughout the continent, hundreds of thousands being forced from their homes, and many more deprived of food and other supplies. Noting that over the next 20 years more serious weather-related events are expected, UN Deputy Emergency Relief Coordinator Margareta Wahlström called for swift preparedness strategies and early warning systems.

Researchers warn that risks of flooding might be higher than expected, if factoring in the "stomata effect"—reduced ability of plants to suck water out of the ground due to higher CO<sub>2</sub> levels. The regional impact of this phenomenon will differ, but in Asia, Europe, and North America, it could mean worse flooding.

### 8.5.2 Melting Glaciers and Sea Ice

At the beginning of August, the Arctic sea ice shrank to the lowest extent ever recorded by satellite, and it might be close to reaching a "critical threshold"—which could mean that the region might be ice-free in summer in the next 10 to 20 years, notes the US National Snow and Ice Data Center in Boulder, Colorado. Scientists and politicians from 13 countries attending a seminar at Ny Alesund, Norway (the world's most northern permanent settlement, and a base for Arctic research), also said that the Arctic might be ice-free in summer by the middle of the century, much earlier than estimated by the Intergovernmental Panel on Climate Change (IPCC).. They also noted the appearance of previously unknown islands in the region as glaciers recede, as well as the implications for the wildlife—mainly polar bears and seals.

Meanwhile, the Tibet Meteorological Bureau reported that the average annual temperatures in Tibet are rising at a rate of 0.3° Celsius (0.54° Fahrenheit) every 10 years, due to global warming, thus accelerating the melting of the region's glaciers.

### 8.5.3 Rising Sea Levels

A report by Guangdong weather authorities estimates that 1,153 square kilometers of coastline along the Pearl River Delta would be flooded by the rising sea-levels by 2050 due to global warming. Major cities such as Guangzhou, Zhuhai and Foshan in the most economically dynamic region of China are expected to be the worst hit. Egypt is facing similar worries, as rising waters of the Nile Delta might force millions of people to move. The population of the already densely populated Delta—about 4,000 people per square mile—is expected to double by the middle of the century. Since nearly half of Egypt's crops, including wheat, bananas and rice, are grown in the Delta, the flooding would also gravely damage Egypt's food supply.

### 8.5.4 Adaptation

Tackling climate change in the next quarter-century will require major changes to patterns of investment and financial flows, according to the report *Investment and financial flows relevant to the development of effective and appropriate international response to Climate Change* by the UN Framework Convention on Climate Change. The report found that an annual \$67 billion in 2030 “may represent the lower bound of the amount actually required” to help people in developing countries cope with climate change effects, and the additional amount of investment and financial flows might reach 1.1–1.7% of global investment. The report calls for changes in patterns of investment and policy in order to adapt to climate change, as well as to reduce emissions in the next 25 years to 2004 levels.

### 8.5.5 Climate Modeling

The newly established Centre for Climate Change Adaptation in Australia has developed a model to study coastal vulnerability to climate change—the effects of storms, floods and tsunamis on Australia's coastal infrastructure, communities and ecosystems, providing decision-makers the information and tools for better strategies and policies to address climate change impacts.

Climate modelers from the Hadley Centre for Climate Prediction and Research in Exeter, UK, have developed a new methodology that predicts more accurately climate changes a decade ahead. The model shows that by 2015 the average global temperature will be 0.5 °C above the average value for the last 30 years, and that between 2009 and 2015, half of the years will be warmer than the current warmest year on record.

The NASA Goddard Institute for Space Studies has developed the first climate model that can estimate the effect of atmospheric warming on the strength of storms. Considering a hypothetical warming of 5° Fahrenheit over today's temperature, it reveals that violent storms and tornadoes may become more common with warming.

### 8.5.6 Post-Kyoto Negotiations

The climate change talks organized by the UN Framework Convention on Climate Change in Vienna, Austria, August 27-31, 2007, represented the fourth session of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG 4) and the fourth workshop under the dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention. Over 1,000 delegates from 158 countries agreed that a global approach is crucial in tackling climate change and its effects, and prepared the way for further negotiations for a post-Kyoto treaty to be discussed at the December summit in Bali.

Climate change and post-Kyoto strategies are also expected to top the agenda of the Asia Pacific Economic Cooperation (APEC) summit to be held on September 8. The 21 APEC countries account for 60% of global energy demand, and their needs are expected to double by 2030.

Meanwhile, the secretariat of the UNFCCC released first results indicating that countries will meet criteria to begin trading in Kyoto emission allowances for 2008, the first year of the Treaty's first commitment period.

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

The ISDR urges every country to implement the Hyogo Framework for action to reduce climate-related risks Disaster risk reduction is not an option; it is an urgent priority

<http://www.unisdr.org/eng/media-room/press-release/2007/pr-2007-10-hfa.pdf>

In face of devastating Asian floods disaster risk reduction is urgent priority – UN

<http://www.un.org/apps/news/story.asp?NewsID=23472&Cr=flood&Cr1=>

Tougher rules urged to protect Arctic

<http://www.ft.com/cms/s/0/4b6e821e-4e74-11dc-85e7-0000779fd2ac.html>

Climate flooding risk 'misjudged'

<http://news.bbc.co.uk/2/hi/science/nature/6969122.stm>

Long-Term Efforts Needed for South Asian Flood Recovery, Says UN Agency

<http://www.un.org/apps/news/story.asp?NewsID=23463&Cr=flood&Cr1=>

Press Conference by UN Deputy Emergency Relief Coordinator on Recent Floods in South Asia

[http://www.un.org/News/briefings/docs//2007/070809\\_Wahlstrom.doc.htm](http://www.un.org/News/briefings/docs//2007/070809_Wahlstrom.doc.htm)

Ice cap meltdown to cause 22ft floods

<http://www.telegraph.co.uk/earth/main.jhtml?xml=/earth/2007/08/16/eaice116.xml>

Flooding Affecting Millions

<http://allafrica.com/stories/printable/200708220836.html>

19 million are made homeless after monsoon deluges India

<http://news.scotsman.com/international.cfm?id=1212122007>

Leaf 'sweat glands' to worsen future flooding

<http://environment.newscientist.com/article/dn12559-leaf-sweat-glands-to-worsen-future-flooding.html>

Islands emerge as Arctic ice shrinks to record low

<http://www.reuters.com/article/topNews/idUSL2069726720070821?feedType=RSS&feedName=topNews&pageNumber=2>

Rising sea threatens China's south: report

<http://www.terraily.com/2007/070830061011.swmxva5e.html>

Global warming threatens Egypt's Nile Delta

[http://www.usatoday.com/news/world/2007-08-23-egypt-nile-threat\\_N.htm](http://www.usatoday.com/news/world/2007-08-23-egypt-nile-threat_N.htm)

UN Seeks Measures to Combat Climate Change Crises (Update1)

[http://www.bloomberg.com/apps/news?pid=20601086&sid=a8EAvfD5BgIA&refer=latin\\_america](http://www.bloomberg.com/apps/news?pid=20601086&sid=a8EAvfD5BgIA&refer=latin_america)

*Investment and financial flows relevant to the development of effective and appropriate international response to Climate Chang*

[http://unfccc.int/cooperation\\_and\\_support/financial\\_mechanism/items/4053.php](http://unfccc.int/cooperation_and_support/financial_mechanism/items/4053.php)

Australia First to Model Continental Shoreline Climate Impacts

<http://www.ens-newswire.com/ens/aug2007/2007-08-23-01.asp>

Prepare for another ten scorching years

<http://environment.newscientist.com/article/dn12453-prepare-for-another-ten-scorching-years.html>

Global warming will bring stronger storms and tornadoes

[http://www.terradaily.com/reports/Global\\_warming\\_will\\_bring\\_stronger\\_storms\\_tornadoes\\_study\\_999.html](http://www.terradaily.com/reports/Global_warming_will_bring_stronger_storms_tornadoes_study_999.html)

NASA Study Predicts More Severe Storms With Global Warming

[http://www.nasa.gov/centers/goddard/news/topstory/2007/moist\\_convection.html](http://www.nasa.gov/centers/goddard/news/topstory/2007/moist_convection.html)

Vienna Climate Change Talks 2007

[http://unfccc.int/meetings/intersessional/awg\\_4\\_and\\_dialogue\\_4/items/3999.php](http://unfccc.int/meetings/intersessional/awg_4_and_dialogue_4/items/3999.php)

UN-backed global climate change meeting kicks off

<http://www.un.org/apps/news/story.asp?NewsID=23602&Cr=climate&Cr1=change>

Australian PM Says APEC to Tackle Energy Savings

<http://www.planetark.com/dailynewsstory.cfm/newsid/43975/story.htm>

Background paper on Analysis of existing and planned investment and financial flows relevant to the development of effective and appropriate international response to climate change

[http://unfccc.int/files/cooperation\\_and\\_support/financial\\_mechanism/application/pdf/background\\_paper.pdf](http://unfccc.int/files/cooperation_and_support/financial_mechanism/application/pdf/background_paper.pdf)

Vienna Climate Change Talks 2007. AWG4 and the Dialogue 4

<http://www.iisd.ca/climate/awg4/> (This site might be slow in opening, owing to many graphics.)

Kyoto Protocol Parties move closer to trading emission allowances

[http://unfccc.int/files/press/news\\_room/press\\_releases\\_and\\_advisories/application/pdf/070830\\_press\\_rel\\_itl.pdf](http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/070830_press_rel_itl.pdf)

Countries agree on need of global response at UN climate change conference

<http://www.un.org/apps/news/story.asp?NewsID=23671&Cr=climate&Cr1=>

## 8.6 Nanotechnology Safety Issues

More detailed descriptions of the items:

*Current Developments/Activities on the Safety of Manufactured Nanomaterials/Nanotechnologies*

report by the Organization for Economic Co-operation and Development (OECD) summarizes the 2nd Meeting of the Working Party on Manufactured Nanomaterials held in Berlin, Germany, April 25-27 2007. It catalogs the initiatives in industrialized countries to address the health and environmental safety implications of manufactured nanomaterials organized by progress since the first meeting and work underway or planned in the country or organization. The recommended headings were:

1. Any national regulatory developments on human health and environmental safety including recommendations or discussions related to adapting existing regulatory systems or the drafting of laws/ regulations/ guidance materials;
2. Developments related to voluntary or stewardship schemes;
3. Information on any risk assessment decisions;
4. Information on any developments related to good practice documents;
5. Research programmes or strategies designed to address human health and/ or environmental safety aspects of nanomaterials;
6. Information on any public/ stakeholder consultation.

Source:

Environment Directorate. Joint meeting of the chemicals committee and the working party on chemicals, pesticides and biotechnology current developments/ activities on the safety of manufactured nanomaterials/ nanotechnologies

[http://appli1.oecd.org/olis/2007/doc.nsf/linkto/env-jm-mono\(2007\)16](http://appli1.oecd.org/olis/2007/doc.nsf/linkto/env-jm-mono(2007)16)

### EPA Conference on Nanoscale Materials

On 13 August EPA announced that it will be holding a Peer Consultation on Materials Characterization of Nanoscale Materials: September 6-7, 2007, in Rosslyn VA. The meeting's goal is to help develop EPA's Nanoscale Materials Stewardship Program (NMSP) under the Toxic Substances Control Act (TSCA). EPA is requesting comment on characteristics currently used or potentially available to characterize nanoscale materials, rationale for the use of these characteristics, and issues to consider regarding use of these characteristics in the NMSP.

Sources:

Meeting website: <http://www.epa.gov/oppt/nano/mc-mtginfo.htm>

Nanoscale Materials Stewardship Program

<http://www.epa.gov/oppt/nano/index.htm#stewardship>

### Study Shows Nanotube Manufacture May Pollute Environment

A study by Desirée L. Plata and colleagues at MIT, reported at the 234th national meeting of the American Chemical Society, has shown that chemical vapor deposition, one of the main methods for making carbon nanotubes, can release into the environment various toxic polycyclic aromatic hydrocarbons, and other hydrocarbons that are harmful to the atmosphere and human health.

Source:

Helping the carbon nanotube industry avoid mega-mistakes of the past

<http://www.physorg.com/news106894749.html>

Canada published a new Substances Program Advisory Note 2007-06, Requirements for nanomaterials under the New Substances Notification Regulations (Chemicals and Polymers)

Source:

New Substances Program Advisory Note 2007-06. Requirements for nanomaterials under the New Substances Notification Regulations (Chemicals and Polymers)

[http://www.ec.gc.ca/substances/nsb/eng/a200706\\_e.shtml](http://www.ec.gc.ca/substances/nsb/eng/a200706_e.shtml)

The Nanotechnology Engagement Group published its final report, *Democratic technologies?* addressing public involvement, dialogues, and ethical aspects of nanotechnology.

Source:

*Democratic technologies?* The final report of the Nanotechnology Engagement Group (NEG)

[http://83.223.102.125/involvenew/mt/archives/blog\\_37/Democratic%20Technologies.pdf](http://83.223.102.125/involvenew/mt/archives/blog_37/Democratic%20Technologies.pdf)