



## SUSTAINABILITY AT THE NATIONAL ACADEMIES March 2007

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## INTRODUCTION

We are pleased to present you with *Sustainability at the National Academies*, a monthly update highlighting activities related to sustainable development from throughout the National Academies. Additional information on these and other activities is also available at <http://www7.nationalacademies.org/sustainabilityroundtable/>

The [Roundtable on Science and Technology for Sustainability](#) provides a unique forum for sharing views, information, and analyses related to sustainability. The goal for the Roundtable is to mobilize, encourage, and use scientific knowledge and technology to help achieve sustainability goals and to support the implementation of sustainability practices. Through its activities, the Roundtable identifies new ways in which science and technology can contribute to sustainability. What follows is a brief summary of sustainability-related activities being conducted throughout The National Academies.

You are receiving this update based on your participation in ongoing or past activities of the Roundtable. If you would prefer not to receive future monthly updates or would like to be added to the recipient list, please contact Kathleen McAllister at 202-334-2047 or [Sustainability@nas.edu](mailto:Sustainability@nas.edu)

## RECENT PUBLICATIONS AND OTHER NEWS

### **Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability**

Recent studies of past climate and streamflow conditions have broadened understanding of long-term water availability in the Colorado River, revealing many periods when streamflow was lower than at any time in the past 100 years of recorded flows. That information, along with two important trends--a rapid increase in urban populations in the West and significant climate warming in the region--will require that water managers prepare for possible reductions in water supplies that cannot be fully averted through traditional means. This National Research Council report assesses existing scientific information, including temperature and streamflow records, tree-ring based reconstructions, and climate model projections, and how it relates to Colorado River water supplies and demands, water management, and drought preparedness. The report concludes that successful adjustments to new conditions will entail strong and sustained cooperation among the seven Colorado River basin states. The report recommends conducting a comprehensive basinwide study of urban water practices that can be used to help improve planning for future droughts and water shortages.

<http://www.nap.edu/catalog/11857.html>

### **Exploring Opportunities in Green Chemistry and Engineering Education: A Workshop Summary to the Chemical Sciences Roundtable**

This publication summarizes a workshop convened by the National Research Council to explore the widespread implementation of green chemistry and chemical engineering concepts into undergraduate and graduate education and how to integrate these concepts into the established and developing curricula. The goal of the workshop was to inform the Chemical Sciences Roundtable, which provides a science-oriented, apolitical forum for leaders in the chemical sciences to discuss chemically related issues affecting government, industry, and universities.

<http://books.nap.edu/catalog/11843.html>

### **Grainger Challenge Prize for Sustainability**

On February 1, 2007, The National Academy of Engineering announced the winners of the 2007 Grainger Challenge Prize for Sustainability. The contest sought innovative solutions for removing arsenic from drinking water that is slowly poisoning millions of people in developing countries.

<http://www.nae.edu/nae/granger.nsf?OpenDatabase>

**Green Schools: Attributes for Health and Learning** Evidence has accumulated that shows that the quality of indoor environments can affect the health and productivity of adults and children. One consequence is that a movement has emerged to promote the design of schools that have fewer adverse environmental effects. To examine the potential of such design for improving education, several private organizations asked the NRC to review and assess the health and productivity benefits of green schools. This report provides an analysis of the complexity of making such a determination; and an assessment of the potential human health and performance benefits of improvements in the building envelope, indoor air quality, lighting, and acoustical quality, while also presenting an assessment of the overall building condition and student achievement, and offers an analysis of and

recommendations for planning and maintaining green schools including research considerations.

<http://www.nap.edu/catalog/11756.html>

**Review of the U.S. Climate Science Program's Synthesis and Assessment Product 5.2, "Best Practice Approaches for Characterizing, Communicating, and Incorporating Scientific Uncertainty in Climate Decision Making"**

This report reviews the U.S. Climate Change Science Programs new draft assessment product on characterizing and communicating uncertainty information for climate change decision making, one of 21 climate change assessment products that the program is developing to meet the requirements of the 1990 Global Change Research Act. Although the draft assessment is effective in discussing methods of characterizing uncertainty, it falls short in several ways. It is written for researchers involved in assessment efforts and will likely be of use to them, but does not address other key audiences, particularly policymakers, decision-makers, and members of the media and general public. In addition, it does not assess the full range of "best practice approaches" for characterizing, incorporating, and communicating uncertainty. These weaknesses were due in part to a change in the prospectus after the process had begun to include new target audiences and a different scope of work.

[http://books.nap.edu/catalog.php?record\\_id=11873](http://books.nap.edu/catalog.php?record_id=11873)

**Implementing the Stockholm Convention on Persistent Organic Pollutants: Summary of a Workshop in China**

This report summarizes a workshop organized as part of the Academies' workshop series on strengthening science-based decision-making in developing countries. The workshop, "Implementing the Stockholm Convention on Persistent Organic Pollutants" was held June 7-10, 2004, in Beijing, China. The presentations and discussions summarized here describe the types of scientific information necessary to make informed decisions to eliminate the production and use of Persistent Organic Pollutants (POPs) banned under the Stockholm Convention; sources of information; scientifically informed strategies for eliminating POPs; elements of good scientific advice, such as transparency, peer review, and disclosure of conflicts of interest; and information dealing with POPs that decision makers need from the scientific community, including next steps to make such science available and ensure its use on a continuing basis. This workshop was organized by the Science and Technology for Sustainability Program of the Academies' Office of Policy and Global Affairs.

<http://www.nap.edu/catalog/11818.htm>

**CLEANER and NSF's Environmental Observatories**

Degradation of the nation's water resources threatens the health of humans and the functioning of natural ecosystems. To help better understand the causes of these adverse impacts and how they might be more effectively mitigated, especially in urban and human-stressed aquatic systems, the National Science Foundation (NSF) has proposed the establishment of a Collaborative Large-scale Engineering Analysis Network for Environmental Research (CLEANER). This program would provide a platform for near-real-time and conventional data collection and analysis; improve understanding and prediction of processes controlling large-scale environmental and hydrologic systems; help explain human-induced impacts on the environment; and help identify more effective adaptive management approaches to mitigate adverse impacts of human activities on water

and land resources. At NSF's request, the National Academies undertook a review this proposed program. The resultant report recommends that NSF proceed with its planning, implementation, and intra- and interagency coordination activities for the program, as a successful environmental observatory network could transform the environmental engineering profession and increase its already considerable contributions to society.  
[http://books.nap.edu/catalog.php?record\\_id=11657](http://books.nap.edu/catalog.php?record_id=11657)

### **Addressing Foodborne Threats to Health: Policies, Practices, and Global Coordination, Workshop Summary**

Foodborne agents have been estimated to cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,200 deaths in the United States each year. More than 250 different foodborne diseases, including both infections and poisonings, have been described, according to the Centers for Disease Control and Prevention. The U.S. Department of Agriculture estimates costs associated with medical expenses and losses in productivity due to missed work and premature deaths from five major types of foodborne illnesses at \$6.9 billion annually. This figure likely represents the tip of the iceberg, since it does not account for the broad spectrum of foodborne illnesses or for their wide-ranging repercussions for consumers, government, and the food industry. In order to examine issues critical to the protection of the nation's food supply, the Institute of Medicine's Forum on Microbial Threats hosted a public workshop on October 25 and 26, 2005, in Washington, D.C. to explore existing knowledge and unanswered questions on the nature and extent of foodborne threats to health. This report is a summary of that workshop.  
<http://www.nap.edu/catalog/11745.html>

### **Alternatives to the Indian Point Energy Center for Meeting New York Electric Power Needs**

Since the September 11, 2001 terrorist attacks on the World Trade Center, many in the New York City area have become concerned about the possible consequences of a similar attack on the Indian Point nuclear power plants—located about 40 miles from Manhattan, and have made calls for their closure. Any closure, however, would require actions to replace the 2000 MW of power supplied by the plants. To examine this issue in detail, the Congress directed DOE to request a study from the NRC of options for replacing the power. This report presents detailed review of both demand and supply options for replacing that power as well as meeting expected demand growth in the region. It also assesses institutional considerations for these options along with their expected impacts. Finally, the report provides an analysis of scenarios for implementing the replacement options using simulation modeling.  
[http://books.nap.edu/catalog.php?record\\_id=11666](http://books.nap.edu/catalog.php?record_id=11666)

### **Global Environmental Health in the 21st Century: From Governmental Regulation to Corporate Social Responsibility: Workshop Summary**

Global regulatory standards will always be a major driver in the field of environmental health, but there is a growing understanding of the value of voluntary standards to fill in gaps or to work in concert with formal regulations. The Roundtable on Environmental Health Sciences, Research, and Medicine held a workshop to examine some of the issues surrounding the impact international regulations and corporate social responsibility (CSR) has on environmental health. The workshop summary captures the dialogue on the

challenges and advancement of non-regulatory mechanisms to address complex environmental exposures and opportunities to improve environmental health.

<http://www.nap.edu/catalog/11833.html>

### **Enhancing Productivity Growth in the Information Age: Measuring and Sustaining the New Economy**

Starting in the mid 1990s, the United States economy experienced an unprecedented upsurge in economic productivity. Rapid technological change in communications, computing, and information management continue to promise further gains in productivity, a phenomenon often referred to as the New Economy. To better understand the sources of these gains and the policy measures needed to sustain these positive trends, the National Academies Board on Science, Technology, and Economic Policy (STEP) convened a series of workshops and commissioned papers on Measuring and Sustaining the New Economy. This report reviews the lessons learned from the project's focus on telecommunications, software, semiconductors, and computer components. The report also contains Committee findings and policy recommendations to improve measurement capabilities and on steps needed to sustain the substantial gains in productivity that characterize the American economy today.

[http://www.nap.edu/catalog.php?record\\_id=11823](http://www.nap.edu/catalog.php?record_id=11823)

### **Analysis of Global Change Assessments: Lessons Learned**

Global change assessments inform decision makers about the scientific underpinnings of a range of environmental issues, such as climate change, stratospheric ozone depletion, and loss of biodiversity. Dozens of assessments have been conducted to date by various U.S. and international groups, many of them influencing public policies, technology development, and research directions. This report analyzes strengths and weaknesses of eight past assessments to inform future efforts. Common elements of effective assessments include strong leadership, extensive engagement with interested and affected parties, a transparent science-policy interface, and well defined communication strategies. The report identifies 11 essential elements of effective assessments and recommends that future assessments include decision support tools that make use of information at the regional and local level where decisions are made.

[http://books.nap.edu/catalog.php?record\\_id=11868#toc](http://books.nap.edu/catalog.php?record_id=11868#toc)

## **NEW PROJECTS**

### **Emerging Technologies in Agriculture to Benefit Farmers in Africa and South Asia**

This study aims to identify new scientific knowledge and promising technology with the potential to transform the production capabilities of farmers in Sub-Saharan Africa and South Asia. Looking beyond today's proven technologies, the study will focus on identifying emerging innovations to identify the next generation of tools, including those that may be highly uncertain but have the potential to be powerful, and that draw on cutting-edge developments in a broad range of scientific fields.

<http://dels.nas.edu/banr/index.shtml>

### **Grand Challenges for Engineering**

The National Academy of Engineering created a website, acting as a worldwide discussion forum on great engineering achievements in an effort to help solve the world's growing problems.

<http://www.engineeringchallenges.org/>

### **Review of CCSP (Climate Change Science Program) Draft Report 3.3: Weather and Climate Extremes in a Changing Climate.**

The committee to review the US CCSP draft Synthesis and Assessment Product (SAP) 3.3, "Weather and Climate Extremes in a Changing Climate," will carry out an independent peer review of the draft document, addressing issues such as its technical quality, the adequacy of supporting analysis, and its ability to communicate effectively with its target audiences. A number of additional analytical issues also will be addressed.

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48760>

### **Water Implications of Biofuels Production in the United States**

The Water Science and Technology Board will organize and host a colloquium that airs and addresses key water quality, water quantity, and related land resources implications of biofuel production in the United States. Topics to be addressed include: different scenarios for growth in biofuel demand, the form of biomass used for biofuel production, emerging technologies and other factors.

<http://dels.nas.edu/dels/sot.php?pin=WSTB-U-06-05-A>

## **UPCOMING MEETINGS**

### **March**

**Strategic Advice on the U.S. Climate Change Science Program**, March 19-20, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingID=1840&MeetingNo=5>

### **Disaster's Roundtable Workshop**

Disasters Roundtable 19, Protecting Lives and Property at Our Coastlines, March 28, 2007,

<http://dels.nas.edu/dr/>

**Materials Forum 2007: Corrosion Education in the 21st Century**, March 30, 2007

<http://www8.nationalacademies.org/publicmeeting/meetingview.aspx?meetingid=206>

### **April**

**Committee on Hydrology, Ecology, and Fishes of the Klamath River Basin**, April 11-13, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?meetingid=1925>

**Improving Risk Analysis Approaches Used By the U.S. EPA**, April 17-18, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?meetingid=1797>

### **May**

**Reducing Stormwater Discharge Contributions to Water Pollution**, May 1-3, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?meetingid=1965>

### **Chemical Sciences Roundtable Workshop**

Bio-inspired Fundamental Chemistry for Energy, May 14-15, 2007

<http://dels.nas.edu/bcst/csr.shtml#upcoming>

### **July**

**NRC Colloquium on Water Implications of Biofuels**, July 12, 2007



<http://dels.nas.edu/wstb/biofuels.shtml>

## **PROJECTS IN DEVELOPMENT**

### **Partnerships for Sustainability**

The Roundtable on Science and Technology for Sustainability plans to commission a series of review papers and use a symposium to develop a better understanding of key factors of success (and failure) for partnerships established to promote sustainability. A steering group will be appointed to develop a common framework for the reviews and organize the symposium, planned for fall, 2007. For more information on the Roundtable on Science and Technology for Sustainability, visit:

[http://www7.nationalacademies.org/sustainabilityroundtable/Sustainability\\_Roundtable\\_Homepage.html](http://www7.nationalacademies.org/sustainabilityroundtable/Sustainability_Roundtable_Homepage.html)

### **Federal Sustainability Research and Development Forum**

The Roundtable on Science and Technology for Sustainability is planning a workshop (“forum”) in late 2007 to discuss research gaps, needed analytical tools, and opportunities for collaboration among federal research and development programs focused on selected high priority challenges to sustainability. For more information on the Roundtable on Science and Technology for Sustainability, visit:

[http://www7.nationalacademies.org/sustainabilityroundtable/Sustainability\\_Roundtable\\_Homepage.html](http://www7.nationalacademies.org/sustainabilityroundtable/Sustainability_Roundtable_Homepage.html)

### **Pathways to Urban Sustainability Initiative**

The National Academies are planning a multi-year, multi-country initiative to address one of the central challenges and opportunities of the 21st century—the use of science and technology to help transform rapidly urbanizing regions of the developing world into “sustainable cities.” Over the past year, the Academies launched this ambitious program through on-the-ground planning activities in China, South Africa, Tanzania and Mexico. We are currently raising funds for the next phase of the initiative, which will include an international symposium to examine the major trends, challenges, and potential paths forward to urban sustainability in developing world cities, and a set of on-the-ground projects in China to be carried out in partnership with the Chinese Academies of Science and Engineering and other leading Chinese science and technology institutions. For more information on past urban sustainability activities, visit:

[http://www7.nationalacademies.org/sustainabilityroundtable/Urban\\_Sustainability\\_Homepage.html](http://www7.nationalacademies.org/sustainabilityroundtable/Urban_Sustainability_Homepage.html)

## **ONGOING ACTIVITIES**

### **Sustainability---The Issue**

**The Roundtable on Science and Technology for Sustainability**

<http://www7.nationalacademies.org/sustainabilityroundtable/>

### **People and Their Communities**

**Effective Use of Data, Methodologies, and Technologies to Estimate Subnational Populations at Risk**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=BESR-U-04-08-A>

**Public Participation in Environmental Assessment and Decision Making**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=34>

**Review and Assessment of the Health and Productivity Benefits of Green Schools**  
<http://www8.nationalacademies.org/cp/projectview.aspx?key=296>

## **Life Support Systems: Atmosphere, Water, and Food**

**Advancing Desalination Technology**

<http://www8.nationalacademies.org/cp/CommitteeView.aspx?key=48674>

**Climate Change and U.S. Transportation**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=186>

**Committee on Hydrology, Ecology, and Fishes of the Klamath River Basin**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=216>

**Energy Futures and Air Pollution in Urban China and the United States**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=131>

**Environmental Decision Making: Principles and Criteria for Models**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=50>

**Environmental Impacts of Wind Energy Projects**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=174>

**Reducing Stormwater Discharge Contributions to Water Pollution**

<http://www8.nationalacademies.org/cp/committeevew.aspx?key=48711>

**Review of CCSP Draft Report 3.3: Weather and Climate Extremes in a Changing Climate**

<http://www8.nationalacademies.org/cp/CommitteeView.aspx?key=BASC-U-06-03-A>

**Sustainable Underground Storage of Recoverable Water**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=WSTB-U-04-02-A>

**Strategic Advice on the U.S. Climate Change Science Program**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=209>

**The Scientific Bases of Colorado River Basin Water Management**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=172>

## **Economy and Industry**

**Critical Mineral Impacts on the U.S. Economy**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48725>

**Development and Implementation of a Cleanup Technology Roadmap for DOE's Office of Environmental Management**

<http://www8.nationalacademies.org/cp/ProjectView.aspx?key=NRSB-O-06-03-A>

**National Academies Materials Forum on Corrosion Education for the 21st Century**

[http://www7.nationalacademies.org/nmab/current\\_activities.html](http://www7.nationalacademies.org/nmab/current_activities.html)

## **Natural Systems**

**Hydrologic Impacts of Forest Management**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=1935>

**Panel on Land-use Change, Ecosystem Dynamics and Biodiversity**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=285>

**International Capacity Building for the Protection and Sustainable Use of Oceans and Coasts**

[http://dels.nas.edu/osb/capacity\\_building/capacity\\_building.shtml](http://dels.nas.edu/osb/capacity_building/capacity_building.shtml)

## **Institutions and Indicators**



**Key National Indicators Initiative (KNII)**

<http://www.keyindicators.org/>

## **Sustainability Research and Development**

**Coal Research, Technology, and Resource Assessments to Inform Energy Policy**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=189>

**Grand Challenges for Engineering**

<http://www.engineeringchallenges.org/>

**Grainger Challenge Prize for Sustainability**

<http://www.nae.edu/nae/granger.nsf?OpenDatabase>

**Prospective Benefits of DOE's Energy Efficiency and Fossil Energy R&D Programs:**

**Phase 2**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=299>

**Review of DOE's Office of Nuclear Energy, Science & Technology Research & Development Program**

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48668>

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