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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. Please visit our **NEW** website for additional information on these and other activities at <http://sustainability.nationalacademies.org>.

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 or visit our website.

NEW WEB RESOURCE

The National Academies' Federal Sustainability Research and Development Forum

The Roundtable on Science and Technology for Sustainability held a workshop ("forum") on October 17-18, 2007. Forum participants discussed research gaps, needed analytical tools, and opportunities for collaboration among federal research and development programs focused on selected high priority challenges to sustainability in the areas of biofuels and ecosystem services. To view presentations from the Forum, please visit:

<http://sustainability.nationalacademies.org/current.shtml>

NEW REPORTS

Earth Observations from Space: The First 50 Years of Scientific Achievements

Over the past 50 years, thousands of satellites have been sent into space on missions to collect data about the Earth. Today, the ability to forecast weather, climate, and natural hazards depends critically on these satellite-based observations. At the request of NASA, the National Research Council convened a committee to examine the scientific advances that have resulted from space-based observations. This report describes how the ability to view the entire globe at once, uniquely available from satellite observations, has revolutionized Earth studies and ushered in a new era of multidisciplinary Earth sciences. In particular, the ability to gather satellite images frequently enough to create "movies" of the changing planet is improving the understanding of Earth's dynamic processes and helping society to manage limited resources and environmental challenges. The report concludes that continued Earth observations from space will be required to address scientific and societal challenges of the future. http://www.nap.edu/catalog.php?record_id=11991

Increasing Capacity for Stewardship of Oceans and Coasts: A Priority for the 21st Century

Marine environments support the livelihoods, economies, and quality of life for communities around the world. But growth of coastal populations and increasing demands on marine resources are putting the future of ocean and coastal resources at risk through impacts such as overfishing, wetland drainage, climate change, and pollution of coastal waters. Given these demands, it is vital to build capacity--the people, the institutions, and technology and tools--needed to manage ocean resources. Unfortunately, many capacity building efforts focus on specific projects rather than on capacity building as goal unto itself, resulting in activities that are not funded or sustained past the typical short project lifetime. This report finds that the most successful capacity-building efforts meet the needs of a specific locale or region based on periodic assessments and include plans to maintain and expand capacity after the project ends. The report recommends ways that governments and organizations can help strengthen marine protection and management capacity, including conducting periodic program assessments, making plans to sustain funding, and developing leadership and political will.

http://www.nap.edu/catalog.php?record_id=12043

Integrating Multiscale Observations of U.S. Waters

Water is essential to life for humans and their food crops, and for ecosystems. Effective water management requires tracking the inflow, outflow, quantity and quality of ground-water and surface water, much like balancing a bank account. Currently, networks of ground-based instruments measure these in individual locations, while airborne and satellite sensors measure

them over larger areas. Recent technological innovations offer unprecedented possibilities to integrate space, air, and land observations to advance water science and guide management decisions. This report concludes that in order to realize the potential of integrated data, agencies, universities, and the private sector must work together to develop new kinds of sensors, test them in field studies, and help users to apply this information to real problems.

http://www.nap.edu/catalog.php?record_id=12060

Options to Ensure the Climate Record from the NPOESS and GOES-R Spacecraft: Workshop Report

In June 2006, changes were announced by NOAA that reduced the scope of the next generation of polar and geostationary environmental monitoring satellites, NPOESS and GOES-R. At the request of NASA and NOAA, a committee of the Space Studies Board organized a major workshop, which was held in June 2007 that examined the impacts of these changes, particularly those associated with climate research, and ways to mitigate those impacts. This report presents summaries of discussions at the workshop, which included sessions on the measurements and sensors originally planned for NPOESS and GOES-R; generation of climate data records; mitigation options, including the role of international partners; and cross-cutting issues. A follow-on report, which will include recommended strategies for recovery of lost capabilities, is due in 2008.

http://books.nap.edu/catalog.php?record_id=12033

Prospects for Managed Underground Storage of Recoverable Water

Growing demands for water in many parts of the nation are fueling the search for new approaches to sustainable water management, including how best to store water. Society has historically relied on dams and reservoirs, but problems such as high evaporation rates and a lack of suitable land for dam construction are driving interest in the prospect of storing water underground. The National Research Council convened a committee to assess past experiences with managed underground water storage systems and to identify research priorities for development of future underground storage projects. The resulting report concludes that managed underground storage should be considered a valuable tool in a water manager's portfolio and recommends ways to address the unique challenges posed by managed underground storage systems through research and regulatory measures.

http://books.nap.edu/catalog.php?record_id=12057

Review of DOE's Nuclear Energy Research and Development Program

This report recommends that the U.S. Department of Energy scale back the research and development aspects of its Global Nuclear Energy Partnership (GNEP) program, which aims to reprocess spent nuclear fuel that could be shared with partner countries. GNEP is part of DOE's Office of Nuclear Energy, which should instead focus on the startup of new commercial nuclear power plants, the report says.

http://books.nap.edu/catalog.php?record_id=11998

The Metropolitan Planning Organization, Present and Future

TRB's Conference Proceedings 39: The Metropolitan Planning Organization, Present and Future summarizes an August 2006 conference that explored the organizational structure of metropolitan planning organizations (MPOs), the current state of the practice for regional decision making among MPOs of various sizes, and approaches to integrating a wide array of additional considerations into the MPO planning process. The conference also examined approaches to institutionalizing an integrated approach to comprehensive planning, and

development of relationships with local decision-making bodies within the MPO region. The conference proceeding includes summaries of the presentations made in each conference session, as well as a summary of the participants' discussions in the final breakout sessions, focused on research and capacity building.

<http://trb.org/news/newsletter.asp?259#B8340>

NEW PROJECTS

Challenges and Opportunities in Earth Surface Processes

Earth's surface is a dynamic interface where physical, chemical, biological, and human processes cause and are affected by forcings in the Earth System. This impact-feedback loop occurs over a wide range of temporal and spatial scales. It binds the Earth's surface to a host of scientific and societal issues, and within this context the committee will: Assess the state-of-the-art of the disciplinary field of Earth surface processes and the fundamental research questions in the field; Identify rate-limiting challenges or opportunities for making significant advances in the field; and Identify the necessary intellectual collaborations and high-priority needs to meet these challenges.

International and National Measures to Reduce Marine Debris and Its Impacts

An ad hoc committee will be formed to examine the effectiveness of international and national measures to prevent and reduce marine debris and its impact. The committee will prepare a report that includes: An evaluation of international and domestic implementation of MARPOL Annex V and the Act to Prevent Pollution from Ships (33 U.S.C. 1901 et seq.) and identification of cost-effective, innovative approaches that could be taken to improve implementation and compliance; A review and assessment of technologies, strategies, and management practices for further reducing the impact of marine debris, including derelict fishing gear. As part of this review, the committee will examine the International Maritime Organization's Guidelines for the Implementation of Annex V of MARPOL and recommend additional federal or international actions that could be taken to further reduce debris and its impacts; An evaluation of the role of floating fish aggregation devices in the generation of marine debris and existing legal mechanisms to reduce impacts of such debris, focusing on impacts in the Western Pacific and Central Pacific regions; and An overview of the existing federal statutes on marine debris (including land-based sources) with a description of the responsibilities of the designated federal agencies

<http://www8.nationalacademies.org/cp/ProjectView.aspx?key=OSBX-U-07-02-A>

Strategic Directions for the Geographical Sciences in the Next Decade

An ad hoc committee will formulate a short list of high priority research questions in the geographical sciences that are relevant to societal needs. The questions will be written in a clear, compelling way and will be supported by text and figures that summarize research progress to date and outline future challenges. For more information on this study, contact: Caetlin Ofiesh (cofiesh@nas.edu) <http://dels.nas.edu/dels/sot.php?pin=BESR-U-06-02-A>

Toward Sustainable Critical Infrastructure Systems -- Framing the Challenges: A Workshop

An ad hoc committee will plan and conduct a public workshop to identify and frame fundamental challenges in moving toward critical infrastructure systems that are physically, socially, economically, and environmentally sustainable. The workshop will feature invited presentations and discussions. An agenda for the workshop will be developed that will focus

on power, transportation, water supply, waste management, and telecommunications systems and on potential lines of inquiry/research that may be helpful in addressing these challenges. A report will be issued based on the workshop as the principal data-gathering event in the project. <http://www8.nationalacademies.org/cp/projectview.aspx?key=48850>

UPCOMING MEETINGS

November

Independent Scientific Review of Everglades Restoration Progress, Nov 14-16, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2304>

America's Energy Future: Alternative Liquid Transportation Fuels: Technology Opportunities, Risks, and Tradeoffs, November 19-20, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2413>

Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy, November 27-28, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2406>

Committee on the Human Dimensions of Global Change, November 28-29, 2007

<http://www7.nationalacademies.org/hdgc/index.html>

International Polar Year: Exploring the Changing Poles, November 29, 2007

<http://www.koshlandscience.org/events/upcomingevent.jsp?id=280>

Environmental Health, Energy, and Transport: Bringing Health to the Transportation Fuel Mixture, November 29-30, 2007

<http://www.iom.edu/CMS/3793/4897/46788.aspx>

December

Global Climate Change and Extreme Weather Events: Potential Contributions to Emergence, Reemergence and Spread of Infectious Disease, December 4, 2007

<http://www8.nationalacademies.org/publicmeeting/meetingview.aspx?meetingid=224>

Goods Movement Impacts on Air Quality Workshop, *Abstract Deadline*: Dec 10, 2007

http://www.trb.org/news/blurbs_detail.asp?id=8355

America's Energy Future: Energy Efficiency Technologies, December 12-13, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2293>

International and National Measures to Reduce Marine Debris, Dec 17-18, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2423>

Reducing Stormwater Discharge Contributions to Water Pollution, Dec 17-19, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2100>

January

Development and Implementation of a Cleanup Technology Roadmap for DOE's Office of Environmental Management, January 8-10, 2008

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2245>

March

Data for Goods Movement Impacts on Air Quality Workshop, March 17-18, 2008

(*Abstract Deadline Dec 10, 2007*) http://www.trb.org/news/blurbs_detail.asp?id=8355

April

Linking Knowledge to Actions for Sustainable Development, April 3-4, 2008

http://www.nasonline.org/site/PageNavigator/SACKLER_sustainable_development

Toward Sustainable Critical Infrastructure Systems Workshop, April 9-11, 2008

www8.nationalacademies.org/cp/meetingview.aspx?MeetingID=2387&MeetingNo=1

May

National Sustainable Design Expo featuring EPA's P3 Award, May 9-11, 2008

<http://www.nae.edu/nae/engenvcom.nsf/weblinks/MKEZ-6NQQFG?OpenDocument>

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 spring, 2008. For more information on the Roundtable on Science and Technology for Sustainability, visit:

http://sustainability.nationalacademies.org/proj_dev.shtml

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://sustainability.nationalacademies.org/proj_dev.shtml

ONGOING ACTIVITIES

Sustainability---The Issue

The Roundtable on Science and Technology for Sustainability

<http://sustainability.nationalacademies.org/index.shtml>

People and Their Communities

Public Health Decision-Making Under Uncertainty

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48847>

Public Participation in Environmental Assessment and Decision Making

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

The Committee on the Human Dimensions of Global Change

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

Life Support Systems: Atmosphere, Water, and Food

Advancing Desalination Technology

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

A Strategy to Mitigate the Impact of Sensor Descope and De-manifests on the NPOESS and GOES-R Spacecraft

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48834>

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>

Contaminated Drinking Water at Camp Lejeune

<http://www8.nationalacademies.org/cp/ProjectView.aspx?key=BEST-K-06-08-A>

Developing Mesoscale Meteorological Observational Capabilities

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48732>

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

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

Mortality Risk Reduction Benefits from Decreasing Tropospheric Ozone Exposure

<http://www8.nationalacademies.org/cp/CommitteeView.aspx?key=BEST-K-06-10-A>

FEMA Flood Maps: Accuracy Assessment and Cost-Effective Improvements

<http://www8.nationalacademies.org/cp/ProjectView.aspx?key=BESR-U-06-06-A>

Reducing Stormwater Discharge Contributions to Water Pollution

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

Review of CCSP Draft Synthesis and Assessment Products: 1.3 Re-analyses of historical climate data and implications for attribution

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48840>

Review of CCSP Draft Synthesis and Assessment Products: 2.4 Trends in Emissions of Ozone-depleting Substances and Recovery

<http://www8.nationalacademies.org/cp/ProjectView.aspx?key=BASC-U-06-05-A>

Review of CCSP Draft Synthesis and Assessment Products: 3.2, Climate Projections Based on Emissions Scenarios for Long-lived Radiatively Active Trace Gases

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

Review of Water and Environmental Research Systems (WATERS) Network

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48784>

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

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

Strategies and Methods for Climate-Related Decision Support

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48846>

Water Resources Activities at the U.S. Geological Survey

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48695>

Economy and Industry

Competitiveness and Workforce Needs of U.S. Industry

<http://www8.nationalacademies.org/cp/projectview.aspx?key=41210>

Critical Mineral Impacts on the U.S. Economy

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

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

http://www7.nationalacademies.org/nmab/current_activities.html

21st Century Systems Agriculture

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

Natural Systems

Hydrologic Impacts of Forest Management

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

Independent Scientific Review of Everglades Restoration Progress

<http://www8.nationalacademies.org/cp/projectview.aspx?key=WSTB-U-03-04-A>

International Capacity Building for Sustainable Use of Oceans and Coasts

http://dels.nas.edu/osb/capacity_building/capacity_building.shtml

The National Plant Genome Initiative: Achievements and Future

<http://www8.nationalacademies.org/cp/ProjectView.aspx?key=BLSX-K-07-01-A>

Review of Louisiana Coastal Protection and Restoration (LACPR) Program

<http://www8.nationalacademies.org/cp/CommitteeView.aspx?key=WSTB-U-06-04-A>

Risk of Oil Spills in the Aleutian Islands: Comprehensive Risk Assessment

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48853>

Institutions and Indicators

Key National Indicators Initiative (KNII)

Currently, this project is not available on the web. As soon as a web link becomes available, it will be included in this update.

Sustainability Research and Development

Design Issues for the NOAA Sector Applications Research Program

<http://webapp.nationalacademies.org/cp/projectview.aspx?key=48688>

Evaluating the Efficiency of Research and Development Programs at the EPA

<http://www8.nationalacademies.org/cp/CommitteeView.aspx?key=CSEP-Q-07-01-A>

Evaluation of the Research Plan of the Dept of Housing and Urban Development

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48755>

Grand Challenges for Engineering

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

Grainger Challenge Prize for Sustainability

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

The Earth System Context for Hominin Evolution

<http://www8.nationalacademies.org/cp/ProjectView.aspx?key=BESR-U-06-01-A>

Sustainable Energy

America's Energy Future: Technology Opportunities, Risks, and Tradeoffs

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48817>

Assessment of Resource Needs for Development of Fuel Cell Hydrogen Technology

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48717>

Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48843>

Cleanup Technology Roadmap for DOE's Office of Environmental Management

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

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

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

Relationship of Development Patterns, Vehicle Miles Traveled, Energy Consumed

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48808>

Review of the 21st Century Truck Partnership

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48722>

Review of the FreedomCAR and Fuel Research and Development Program, Phase 2

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48724>

Transitions to Sustainable Energy

<http://www.interacademycouncil.net/?id=9481>

Other Activities

Christine Mirzayan Science and Technology Policy Fellowship Program

<http://national-academies.org/policyfellows>

Sustainability Science in PNAS

<http://www.pnas.org/misc/sustainability.shtml>

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