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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.

CALL FOR NOMINATIONS

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 at cofiesh@nas.edu.

<http://dels.nas.edu/dels/sot.php?pin=BESR-U-06-02-A>

SUSTAINABILITY SCIENCE IN PNAS

PNAS has launched a new section of the journal dedicated to sustainability science, an emerging field of research dealing with the interactions between natural and social systems, and with how those interactions affect the challenge of sustainability: meeting the needs of present and future generations while substantially reducing poverty and conserving the planet's life support systems. PNAS seeks original research contributions for this new section on both the fundamental character of interactions among humans, their technologies, and the environment, and on the use of such knowledge to advance sustainability goals relevant to water, food, energy, health, habitation, mobility, and ecosystem services. William C. Clark is the Associate Editor for this section and is joined by PNAS Editorial Board members Barry R. Bloom, Partha Sarathi Dasgupta, Robert W. Kates, Pamela A. Matson, Elinor Ostrom, and Hans Joachim Schellnhuber.

Several recent issues have featured:

- Poverty And Hunger Special Feature: The African Millennium Villages, October 23, 2007
http://www.pnas.org/cgi/collection/sustainability_sci
- Sustainable Health: A New Dimension of Sustainability Science, October 9, 2007
<http://www.pnas.org/cgi/content/full/104/41/15969>
- Going Beyond Panaceas Special Feature, September 25, 2007
http://www.pnas.org/content/vol104/issue39/#SPECIAL_FEATURE
- To view all articles in the Sustainability Science collection, please visit
http://www.pnas.org/cgi/collection/sustainability_sci.

NEW REPORTS

Assessment of the NASA Applied Sciences Program

Remote sensing data and models from the National Aeronautics and Space Administration (NASA) are the basis for a wide spectrum of scientific research endeavors and are key inputs to many public and private services. The NASA Applied Sciences Program (ASP) and its precursors have been tasked with ensuring the extension of NASA Earth observation data and associated research into practical applications for society through external partnerships. With approximately five years having elapsed under the current ASP structure, and a growing government-wide emphasis on societal benefits in its Earth observing programs, NASA and the ASP leadership asked the National Research Council to assess ASP's

approach in extending NASA research results to practical, societal applications. The report recommends that ASP partnerships focus not only federal agencies but also on direct engagement of the broader community of users. The report also recommends that ASP enhance communication and feedback mechanisms with its partners, with the end users and beneficiaries of NASA data and research, and with the NASA organization.

http://books.nap.edu/catalog.php?record_id=11987

Best Practices to Enhance the Transportation-Land Use Connection in the Rural United States

TRB's National Cooperative Highway Research Program (NCHRP) Report 582: Best Practices to Enhance the Transportation–Land Use Connection in the Rural United States explores how to integrate land use and transportation in rural communities. The report also highlights programs and investment strategies designed to support community development and livability while providing adequate transportation capacity.

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_582.pdf

Lighting the Way: Toward a Sustainable Energy Future, A Report by the InterAcademy Council

Commissioned by the governments of Brazil and China, this report identifies a scientific consensus framework for directing global energy development. It lays out the science, technology and policy roadmap for developing energy resources to drive economic growth in both industrialized and developing countries while also securing climate protection and global development goals. The report was produced by a study panel of 15 world-renowned energy experts, co-chaired by Nobel Laureate Steven Chu, Director of the Lawrence Berkeley National Lab in the United States, and José Goldemberg, former Secretary of State for the Environment for the State of São Paulo, Brazil. Lighting the way establishes the best practices for a global transition to a clean, affordable and sustainable energy supply in both developing and developed countries. The complete report is available at the website below in HTML format through the links on the left. The complete report is also available for download in chapters in PDF files.

<http://www.interacademycouncil.net/?id=12161>

Metropolitan Travel Forecasting: Current Practice and Future Direction

TRB Special Report 288, Metropolitan Travel Forecasting: Current Practice and Future Direction, examines metropolitan travel forecasting models that provide public officials with information to inform decisions on major transportation system investments and policies. The report explores what improvements may be needed to the models and how federal, state, and local agencies can achieve them. According to the committee that produced the report, travel forecasting models in current use are not adequate for many of today's necessary planning and regulatory uses. The findings of the surveys of metropolitan planning organizations used to help develop this report are available online.

<http://onlinepubs.trb.org/onlinepubs/sr/sr288.pdf>

Minerals, Critical Minerals, and the U.S. Economy

Minerals are part of virtually every product we use. Common examples include copper used in electrical wiring and titanium used to make airplane frames and paint pigments. The Information Age has ushered in a number of new mineral uses in number of products including cell phones (e.g., tantalum) and liquid crystal displays (e.g., indium). For some

minerals, such as the platinum group metals used to make catalytic converters in cars, there is no substitute. If the supply of any given mineral were to become restricted, consumers and sectors of the U.S. economy could be significantly affected. Risks to minerals supplies can include a sudden increase in demand or the possibility that natural ores can be exhausted or become too difficult to extract. Minerals are more vulnerable to supply restrictions if they come from a limited number of mines, mining companies, or nations. Baseline information on minerals is currently collected at the federal level, but no established methodology has existed to identify potentially critical minerals. This report develops such a methodology and suggests an enhanced federal initiative to collect and analyze the additional data needed to support this type of tool.

http://books.nap.edu/catalog.php?record_id=12034

Mississippi River Water Quality and the Clean Water Act: Progress, Challenges, and Opportunities

The Clean Water Act has reduced much of the pollution in the Mississippi River from “point sources” such as industries and water treatment plants, but problems stemming from urban runoff, agriculture, and other “non-point sources” have proven more difficult to address. Too little coordination among the ten states along the river has left the Mississippi River an “orphan” from a water quality monitoring and assessment perspective. Stronger leadership from the U.S. EPA, along with better interstate coordination, is needed to address these problems. Specifically, the EPA should establish a water quality data-sharing system for the length of the river, and work with the states to establish and achieve water quality standards. For this effort, the EPA and the Mississippi River states should draw upon the lengthy experience of federal-interstate cooperation in managing water quality in the Chesapeake Bay.

<http://www.nationalacademies.org/morenews/20071016.html>

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

Water Implications of Biofuels Production in the United States

National interests in greater energy independence, concurrent with favorable market forces, have driven increased production of corn-based ethanol in the United States and research into the next generation of biofuels. The trend is changing the national agricultural landscape and has raised concerns about potential impacts on the nation's water resources. To help illuminate these issues, the National Research Council held a colloquium on July 12, 2007 in Washington, DC. This report, based in part on discussions at the colloquium, concludes that

if projected future increases in use of corn for ethanol production do occur, the increase in harm to water quality could be considerable from the increases in fertilizer use, pesticide use, and soil erosion associated with growing crops such as corn. Water supply problems could also develop, both from the water needed to grow biofuels crops and water used at ethanol processing plants, especially in regions where water supplies are already overdrawn. The production of "cellulosic ethanol," derived from fibrous material such as wheat straw, native grasses, and forest trimmings is expected to have less water quality impact but cannot yet be produced on a commercial scale. To move toward a goal of reducing water impacts of biofuels, a policy bridge will likely be needed to encourage growth of new technologies, best agricultural practices, and the development of traditional and cellulosic crops that require less water and fertilizer and are optimized for fuel production.

http://dels.nas.edu/dels/reportDetail.php?link_id=4576

NEW PROJECTS

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

An ad hoc committee will conduct an assessment and prepare a report that will prioritize capabilities, especially those related to climate research that were lost or placed at risk following recent changes to NPOESS and the GOES-R series of polar and geostationary environmental monitoring satellites, and present strategies to recover these capabilities. The committee will build on information from the workshop that was conducted in June 2007 by the NRC panel on "Options to Ensure the Climate Record from the NPOESS and GOES-R Spacecraft" and on the panel's report.

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

The Earth System Context for Hominin Evolution

Earth scientists, paleoanthropologists, and archaeologists who study human evolution have long recognized the likelihood that environmental parameters, particularly paleoclimate, significantly impacted the evolution of our species. Nevertheless, many of the details of the paleoenvironmental context for the more than 7 million years of hominin evolution are poorly constrained, making inferences concerning the nature and extent of such impacts problematic. To address this shortcoming, an NRC committee will: 1) Assess the present understanding of the earth system context for hominin evolution during the past 8 million years, 2) Describe high priority research directions for an enhanced understanding of the paleoenvironmental context for hominin evolution, and 3) Describe optimum strategies for achieving the priority research objectives, with particular emphasis on interdisciplinary initiatives. In addition, the committee will suggest strategies for broad scientific and public dissemination of credible information concerning the earth system context for hominin evolution. The project is sponsored by the National Science Foundation. A report will be issued approximately 18 months after the start of the project (September 2007).

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

NEW WEB RESOURCE

Sounds of Science Podcasts

Sounds of Science is an informative and entertaining weekly series of audio podcasts that puts a spotlight on the high-impact work of the National Academies. Focusing on a wide range of critical issues in science, engineering, and medicine, these short 10-minute episodes are a

quick and easy way to tune in to all the key findings and important recommendations made by the Academies. To view the full menu of podcasts, go to
<http://media.nap.edu/podcasts>.

A recent podcast: ***Gone with the Wind: Environmental Impacts of Wind Energy*** featured how rising gas prices and concerns about the limited sources of fossil fuels have garnered a renewed interest in alternative sources of energy. This podcast investigates the impacts Wind Energy has on our planet and its possibility as an expanded energy source for the future. <http://media.nap.edu/podcasts/nax36gonewithth.mp3>

UPCOMING MEETINGS

October

America's Energy Future: Energy Efficiency Technologies: Opportunities, Risks, and Tradeoffs, October 22-23, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingID=2292&MeetingNo=1>

Meeting of the Committee on Earth Resources, October 23-24, 2007

http://dels.nas.edu/besr/cer_events.shtml

The Science of Saving Species, October 24, 2007

http://www.nasonline.org/site/PageServer?pagename=Beckman_Fall07event6_Alberts

Committee on Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy, October 25-26, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2369>

Developing Mesoscale Meteorological Observational Capabilities to Meet Multiple National Needs, October 29-31, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2391>

You Eat What You Pay For: The 2007 Farm Bill and Public Nutrition, October 31, 2007

<http://www8.nationalacademies.org/publicmeeting/meetingview.aspx?meetingid=225>

Risk of Oil Spills in the Aleutian Islands: A Study to Design a Comprehensive Risk Assessment, October 29-November 2, 2007, Anchorage and Dutch Harbor, Alaska

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingID=2376&MeetingNo=1>

Development and Implementation of a Cleanup Technology Roadmap for DOE's Office of Environmental Management, October 31-November 2, 2007, Hanford, WA

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2244>

November

Public Health Decision-Making Under Uncertainty, November 1-2, 2007

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2395>

Climate Research Committee Meeting, November 5-6, 2007

<http://dels.nas.edu/basc/crc.shtml>

Bus Rapid Transit (BRT) Forum, November 11, 2007

<http://www.trb.org/calendar/event.asp?id=410>

Nuclear Renaissance: Is It Really Green? November 14, 2007

<http://www8.nationalacademies.org/publicmeeting/meetingview.aspx?meetingid=227>

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

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

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: Understanding the Potential Contributions to the Emergence, Reemergence and Spread of Infectious Disease, December 4, 2007

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

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

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

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

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

April

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

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

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

GRADUATE FELLOWSHIP OPPORTUNITY AT THE NATIONAL ACADEMIES

Christine Mirzayan Science and Technology Policy Graduate Fellowship Program, Washington, D.C.

This Graduate Fellowship Program of the National Academies—consisting of the National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council—is designed to engage graduate science, engineering, medical, veterinary, business, public policy, and law students in the analytical process that informs the creation of national policy-making with a science/technology element. As a result, students develop basic skills essential to working in the world of science policy. The fellowship is 10 weeks long, and applications are now being accepted for all three 2008 sessions (winter, summer, and fall). Application materials as well as additional program information are available on the Web at <http://national-academies.org/policyfellows>. Questions should be directed to: policyfellows@nas.edu.

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>

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 to Meet Multiple National Needs

<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>

Estimating 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/committeerview.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>
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>
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

Effectiveness of International and National Measures to Prevent and Reduce Marine Debris and Its Impacts
<http://dels.nas.edu/dels/sot.php?pin=OSBX-U-07-02-A>
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 the Protection and 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: A Study to Design a 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 Environmental Protection Agency

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

Evaluation of the Research Plan of the Department 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/grainger.nsf?OpenDatabase>

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 and 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>

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>

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

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

Relationships Among Development Patterns, Vehicle Miles Traveled, and Energy Consumption

<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>

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

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

Transitions to Sustainable Energy
<http://www.interacademycouncil.net/?id=9481>

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