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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 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

A Major Study and Summit on Climate Change

The National Academies are seeking nominations of potential committee members and panelists for the major climate change study. In response to a request from Congress, the Board on Atmospheric Sciences and Climate, in collaboration with many other units around the National Academies, is planning to launch a series of coordinated activities to study the serious and sweeping issues associated with global climate change, including the science and technology challenges involved, and provide advice on actions and strategies the nation can take to respond. Collectively, the study will produce a broad, action-oriented, and authoritative set of analyses to inform and guide responses to climate change across the nation. To submit nominations, please use the online form, be sure to indicate the committee or panel(s) for which you are nominating the person, and briefly describe why you are nominating them for this particular activity. Priority consideration will be given to nominations received by July 31, 2008.

<http://dels.nas.edu/basc/climate-change/> or <http://dels.nas.edu/basc/index.shtml>

CALL FOR PAPERS

2009 TRB 88th Annual Meeting: Transportation, Energy, and Climate Change

The spotlight theme for the 2009 Transportation and Research Board (TRB) 88th Annual Meeting, January 11-15, 2009, in Washington, D.C., is Transportation, Energy, and Climate Change. The theme recognizes that the dependence of the economy and lifestyles on existing sources of fuel--combined with rapidly rising prices and the desire for long-term energy security--has renewed interest in alternative fuels, increased domestic production, and conservation. In addition, given the growing consensus associating global climate change with fossil fuel consumption, the theme addresses the transportation sector's contributions to climate change as well as the potential impacts of climate change on transportation systems. In addition to the general calls for papers produced by many of TRB's standing committees, the TRB Special Task Force on Climate Change and Energy in conjunction with the TRB Joint Subcommittee on Climate Change and the TRB Standing Committees on Energy, Alternative Fuels, and Sustainability invite you to submit papers associated with the upcoming Annual Meeting's spotlight theme. Please submit papers in non-PDF format by July 28, 2008, and papers in PDF format by August 1, 2008.

http://www.trb.org/news/blurb_detail.asp?id=9120

NEW REPORTS

Hydrologic Effects of a Changing Forest Landscape

Of all the resources that forests produce, water may be the most important--streamflow from forests provides two-thirds of the nation's clean water supply. Forest managers face increasing pressure to cut trees to increase water supply for human uses, especially in western states where population is rising. However, cutting trees for short term water gains does not guarantee that water will be available in dry seasons, and it can ultimately degrade water quality and increase flooding vulnerability. At the request of the U.S. Bureau of Reclamation and the U.S. Forest Service, the National Research Council convened a committee to examine the present understanding of forest hydrology (the study of how water moves through forests), connections between forest management and attendant hydrologic effects, and directions for future research and management needs to sustain water

resources from forests. The report concludes that forest hydrology must advance if it is to deal with today's complexities, and it identifies actions that scientists, forest and water managers, and citizens can take to help sustain water resources from forests.

http://www.nap.edu/catalog.php?record_id=12223

Great Lakes Shipping, Trade, and Aquatic Invasive Species

Since its opening in 1959, the St. Lawrence Seaway has provided a route into the Great Lakes not only for trade, but also unfortunately for aquatic invasive species (AIS) that have had severe economic and environmental impacts on the region. Prevention measures have been introduced by the governments of Canada and the United States, but reports of newly discovered AIS continue, and only time will tell what impacts these species may have. Pressure to solve the problem has even led to proposals that the Seaway be closed. At the request of the Great Lakes Protection Fund, the National Research Council assembled a committee of experts to identify and explore options that would both enhance the potential for global trade in the Great Lakes region and eliminate further introductions of aquatic invasive species from ships transiting the St. Lawrence Seaway. This report concludes that trade should continue on the St. Lawrence Seaway but with a more effective suite of prevention measures that evolves over time in response to lessons learned and new technologies.

http://www.nap.edu/catalog.php?record_id=12439

Transitions to Alternative Transportation Technologies: A Focus on Hydrogen

Hydrogen fuel cell vehicles (HFCVs) could alleviate the nation's dependence on oil and reduce U.S. emissions of carbon dioxide, the major greenhouse gas. Industry-and government-sponsored research programs have made very impressive technical progress over the past several years, and several companies are currently introducing pre-commercial vehicles and hydrogen fueling stations in limited markets. However, to achieve wide hydrogen vehicle penetration, further technological advances are required for commercial viability, and vehicle manufacturer and hydrogen supplier activities must be coordinated. In particular, costs must be reduced, new automotive manufacturing technologies commercialized, and adequate supplies of hydrogen produced and made available to motorists. These efforts will require considerable resources, especially federal and private sector funding. This book estimates the resources that will be needed to bring HFCVs to the point of competitive self-sustainability in the marketplace. It also estimates the impact on oil consumption and carbon dioxide emissions as HFCVs become a large fraction of the light-duty vehicle fleet.

http://www.nap.edu/catalog.php?record_id=12222

UPCOMING MEETINGS

July

Committees on Environmental Analysis in Transportation; Ecology and Transportaton; and Transportation Needs for National Parks and Public Lands 2008 Joint Summer Meeting, July 28-31, 2008, Denver, CO
<http://www.trb.org/conferences/Gerencher2008SummerMeeting.pdf>

Symposium on "Making Big Solar Work: Achievements, Challenges, and Opportunities," July 29, 2008

The NRC Committee on *Competing in the 21st Century: Best Practice in State and Regional Innovation Initiatives* invites you to attend an upcoming symposium on "Making Big Solar Work: Achievements, Challenges, and Opportunities." The meeting will be held on Tuesday, 29 July, at the OLD National Academy of Sciences building at 2100 C Street, NW, directly across from the State Department, from 8:45am to 5:00pm. The goal of the meeting is not to focus on promising technologies, but rather the practical steps needed to bring existing technologies forward. The plan is to bring together representatives of the private sector, officials from the Department of Energy, its laboratories and other federal agencies, officials from state-based initiatives, Washington think-tanks, interested foundations, and key Congressional staff. The meeting should provide a valuable opportunity to review the conditions necessary to enhance the use of solar technologies in meeting the nation's energy needs. Please confirm your attendance by contacting Adam Gertz at agertz@nas.edu or 202-334-1529. The draft agenda can be accessed at:

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingID=2849&MeetingNo=1>.

America's Energy Future: Alternative Liquid Transportation Fuels: Technology Opportunities, Risks, and Tradeoffs, July 30-31, 2008

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2811>

August

Meeting and Workshop on Twenty-first Century Systems Agriculture, August 4-6, 2008

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2827>

Energy Efficiency Standards: Alternative Approaches to Measurement, August 5-6, 2008

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2809>

September

America's Energy Future: Technology Opportunities, Risks, and Tradeoffs, September 18-19, 2008

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2845>

PROJECTS IN DEVELOPMENT

Certification of Sustainable Products and Services

Shifting consumption toward a more sustainable path is a crucial element of a sustainability transition, given the large role that consumption plays in economic activity. Certification of goods and services is one approach that has emerged over the last 15 years, and although there has been anecdotal evidence of success, particularly in niche markets, the overall impact has been small. Moreover, definitions of 'sustainable' vary across sectors and markets, and scientific information has been at best inconsistently applied. Consumption is an understudied area but one of fundamental significance to sustainability. In order to take the first step in learning from this emerging field of practice, the National Academies' Science and Technology for Sustainability Program (which includes the Sustainability Roundtable ("Roundtable")) plans to organize a workshop aimed at understanding the

situation of those making key decisions to purchase and produce certified goods and services, and to clarify the scope and limitations of the scientific knowledge that might contribute to the economic success of certified products.

Energy Task Force Portfolio

The “Energy Task Force, a subset of the Roundtable, is exploring three possible energy projects / workshops intended to complement other activities at the Academies including the study, *America’s Energy Future: Technology Opportunities, Risks and Tradeoffs*. The first activity discussed would explore the transportation issues associated with biofuels and sustainability. Another possible activity includes a pilot, regional workshop examining the environmental, economic and social impacts of biofuel production and use in multiple US regions (e.g. Minnesota, Iowa and Wisconsin) with active programs supporting biofuels. The third proposed activity relates to sustainable urban energy use and would focus on a set of US cities which appear to be leading the way in planning for sustainable urban energy use. The workshop would provide a forum for analyzing the lessons learned and exploring how state and federal policies might be leveraged to accelerate progress towards sustainability.

ONGOING ACTIVITIES

Sustainability---The Issue

The Roundtable on Science and Technology for Sustainability

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

Partnerships for Sustainability

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

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

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48850>

Life Support Systems: Atmosphere, Water, and Food

A Strategy to Mitigate the Impact of Sensor Desscopes 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>

Ecological Impacts of Climate Change

<http://www8.nationalacademies.org/cp/ProjectView.aspx?key=BLSX-K-07-03-A>

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

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

International and National Measures to Reduce Marine Debris and Its Impacts

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

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/committeevi.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: 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>

The Significance of International Transport of Air Pollutants

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

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>

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

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

Strategic Directions for the Geographical Sciences in the Next Decade

<http://www8.nationalacademies.org/cp/ProjectView.aspx?key=BESR-U-06-02-A>

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>

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>

The Importance of Deep-Time Geologic Records for Understanding Climate Change Impacts

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48865>

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

Challenges and Opportunities in Earth Surface Processes

<http://www8.nationalacademies.org/cp/committeevi.aspx?key=48867>

Design Issues for the NOAA Sector Applications Research Program

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

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 Efficiency Standards: Alternative Approaches to Measurement

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48884>

Potential Energy Savings and Greenhouse Gas Reductions from Transportation

<http://www8.nationalacademies.org/cp/projectview.aspx?key=48864>

Relationship of Development Patterns, Vehicle Miles Traveled, Energy Consumed

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

Review of the DOE-BES Catalysis Research Activities and their Impact

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

Review of the 21st Century Truck Partnership

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

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>

PNAS Sustainability Science, Special Features: “Ecosystem Services: From Theory to Implementation”

Around the world, leaders are increasingly recognizing ecosystems as natural capital assets that supply life-support services of tremendous value. The challenge is to turn this recognition into incentives and institutions that will guide wise investments in natural capital, on a large scale. Advances are required on three key fronts, each featured here: the science of ecosystem production functions and service mapping; the design of appropriate finance, policy, and governance systems; and the art of implementing these in diverse biophysical and social contexts. Scientific understanding of ecosystem production functions is improving rapidly but remains a limiting factor in incorporating natural capital into decisions, via systems of national accounting and other mechanisms. Novel institutional structures are being established for a broad array of services and places, creating a need and opportunity for systematic assessment of their scope and limitations. Finally, it is clear that formal sharing of experience, and defining of priorities for future work, could greatly accelerate the rate of innovation and uptake of new approaches.

<http://www.pnas.org/content/105/28/9455>

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