January 2008

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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.

NEW REPORTS

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

Bioinspired Chemistry for Energy: A Workshop Summary to the Chemical Sciences Roundtable

Faced with the steady rise in energy costs, dwindling fossil fuel supplies, and the need to maintain a healthy environment - exploration of alternative energy sources is essential for meeting energy needs. Biological systems employ a variety of efficient ways to collect, store, use, and produce energy. By understanding the basic processes of biological models, scientists may be able to create systems that mimic biomolecules and produce energy in an efficient and cost effective manner. On May 14-15, 2007 a group of chemists, chemical engineers, and others from academia, government, and industry participated in a workshop sponsored by the Chemical Sciences Roundtable to explore how bioinspired chemistry can help solve some of the important energy issues the world faces today. The workshop featured presentations and discussions on the current energy challenges and how to address them, with emphasis on both the fundamental aspects and the robust implementation of bioinspired chemistry for energy.
http://www.nap.edu/catalog.php?record_id=12068

Achievements of the National Plant Genome Initiative and New Horizons in Plant Biology

Life on Earth would be impossible without plants. Humans rely on plants for most clothing, furniture, food, as well as for many pharmaceuticals and other products. Plant genome sciences are essential to understanding how plants function and how to develop desirable plant characteristics. For example, plant genomic science can contribute to the development of plants that are drought-resistant, those that require less fertilizer, and those that are optimized for conversion to fuels such as ethanol and biodiesel. The National Plant Genome Initiative (NPGI) is a unique, cross-agency funding enterprise that has been funding and coordinating plant genome research successfully for nine years. Research breakthroughs

from NPGI and the National Science Foundation's Arabidopsis 2010 Project, such as how the plant immune system controls pathogen defense, demonstrate that the plant genome science community is vibrant and capable of driving technological advancement. This report from the National Research Council concludes that these programs should continue so that applied programs on agriculture, bioenergy, and others will always be built on a strong foundation of fundamental plant biology research.
http://www.nap.edu/catalog.php?record_id=12054

Agriculture, Forestry, and Fishing Research at NIOSH
The agriculture, forestry, and fishing sectors are the cornerstone of industries that produce food, fiber, and biofuel. The National Institute for Occupational Safety and Health (NIOSH) conducts research in order to improve worker safety and health in these sectors. This National Research Council report reviews the NIOSH Agriculture, Forestry, and Fishing Program to evaluate the 1) relevance of its work to improvements in occupational safety and health and 2) the impact of research in reducing workplace illnesses and injuries. The assessment reveals that the program has made meaningful contributions to improving worker safety and health in these fields. To enhance the relevance and impact of its work and fulfill its mission, the NIOSH Agriculture, Forestry, and Fishing Program should provide national leadership, coordination of research, and activities to transfer findings, technologies, and information into practice. The program will also benefit from establishing strategic goals and implementing a comprehensive surveillance system in order to better identify and track worker populations at risk.
http://www.nap.edu/catalog.php?record_id=12088

UPCOMING MEETINGS

January

America's Energy Future: Technology Opportunities, Risks, and Tradeoffs: Nuclear Subgroup, January 22-23, 2008
http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2502
Toward Sustainable Critical Infrastructure Systems -- Framing the Challenges: A Workshop, January 22, 2008
http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2387
Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy, January 24-25, 2008
http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2515
Evaluation of the Research Plan of the Department of Housing and Urban Development, January 24-25, 2008
http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2509
America's Energy Future: Technology Opportunities, Risks, and Tradeoffs: Transmission and Distribution Systems, January 24-25, 2007
http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2501
Independent Scientific Review of Everglades Restoration Progress, January 30-31, 2008
http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2510
Panel on Strategies and Methods for Climate-Related Decision Support, January 30-31, 2008
http://www8.nationalacademies.org/cp/projectview.aspx?key=48846

February

Potential Energy Savings and Greenhouse Gas Reductions from Transportation, February 7-8, 2008
http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2485
Chemical Sciences Roundtable, February 20-21, 2008
http://dels.nas.edu/bcst/csr.shtml
Effectiveness of International and National Measures to Prevent and Reduce Marine Debris and Its Impacts, February 20-22, 2008, Irvine, CA
http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2500
The Earth System Context for Hominin Evolution, February 21-23, 2008, Irvine, CA
http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2383
The Importance of Deep-Time Geologic Records for Understanding Climate Change Impacts, February 25-27, 2008
http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=2507
Gilbert F. White Lecture Series: "Managing American Water Resources: Recognizing the Realities of Geography" February 27, 2008
http://dels.nas.edu/besr/gsc.shtml.

March

GeoCongress 2008: The Challenge of Sustainability in the Geoenvironment, March 9-12, 2008, New Orleans, Louisiana
http://content.asce.org/conferences/geocongress2008/index.html
The National Academies Summit on America's Energy Future, March 13-14, 2008
http://www7.nationalacademies.org/energysummit/
Data for Goods Movement Impacts on Air Quality Workshop, March 17-18, 2008
http://www.trb.org/news/blurb_detail.asp?id=8355

April

Disaster's Roundtable Meeting, April 3, 2008
http://dels.nas.edu/dr/f22.shtml
Arthur M. Sackler Lecture Series, April 3, 2008
Click here for free registration for the reception and lecture only. For additional information, please contact Susan Marty at sackler@nas.edu or at 949-387-5783.
Sackler Colloquium: Linking Knowledge with 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

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
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

Advancing Desalination Technology
http://www8.nationalacademies.org/cp/CommitteeView.aspx?key=48674
A Strategy to Mitigate the Impact of Sensor Descopes 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

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/committeeview.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
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
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
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/committeeview.aspx?key=48867
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/grainger.nsf?OpenDatabase
Strategic Directions for the Geographical Sciences in the Next Decade
http://dels.nas.edu/dels/sot.php?pin=BESR-U-06-02-A
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
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
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

PNAS Sustainability Science, Special Features

PNAS offers a series of special feature issues that highlight emerging fields in the physical, social, and biological sciences and are edited by leaders in the field. Special Features include a cluster of Perspectives and peer-reviewed research articles. As a service to readers, Special Features are freely available online from the date of publication.
Land Change Science, http://www.pnas.org/cgi/collection/land_change_science
Climate Change and Food Security,
http://www.pnas.org/cgi/collection/climate_change_and_food_security

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