



## November 2009

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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 Emi Kameyama at 202-334-2694 or [Sustainability@nas.edu](mailto:Sustainability@nas.edu) or visit our website.

### NEWS

#### Summit Series on the NAE Grand Challenges

The Grand Challenge Summit Series represents a commitment to sustain critical dialogue and engagement with grand challenge problems and to change the way we educate our students in order to better prepare them for the challenges ahead. For information on upcoming summits, scheduled for 2010, please visit <http://summit-grand-challenges.pratt.duke.edu>.

## NEW REPORTS

### **Landscapes on the Edge: New Horizons for Research on Earth's Surface Book**

Chemical, physical, biotic, and human processes constantly reshape Earth's surface from particles to continents, over timescales from nanoseconds to millions of years. These processes form a complex network of interactions and feedbacks, but these interplays are not well understood, and challenging questions face science and society: How did Earth surface processes interact to create the landscapes of today? How will changing processes shape Earth's surface in coming years? This report identifies nine grand challenges in the emerging science of Earth surface processes, and proposes four high-priority research initiatives to reach a new understanding of the processes that build the planet's dynamic surface and underpin its habitability.

[http://www.nap.edu/catalog.php?record\\_id=12700](http://www.nap.edu/catalog.php?record_id=12700)

### **A Transportation Research Program for Mitigating and Adapting to Climate Change and Conserving Energy: Special Report 299**

Transportation Research Board (TRB) Special Report 299 suggests that federal, state, and local policy makers need informed guidance about the effectiveness, costs, feasibility, and acceptability of transportation strategies to mitigate transportation greenhouse gas emissions and conserve energy and to adapt to climate change. The report covers strategies affecting travel and mode choice, models and decision tools, infrastructure investment options, and infrastructure construction, operation, and maintenance.

[http://books.nap.edu/catalog.php?record\\_id=12801](http://books.nap.edu/catalog.php?record_id=12801)

### **Nanotechnology in Food Products: Workshop Summary**

Nanotechnology – an emerging technology that enables researchers to manipulate matter at the atomic level – is providing scientists with the ability to enhance food safety and make foods more nutritious and satisfying by enhancing their nutrition content and other characteristics. However, researchers still have much to learn about the result of using nanotechnology to create food packaging or to modify a food, including both benefits and unanticipated adverse effects. On December 10, 2008, the Institute of Medicine held a one-day workshop, summarized in this volume, to explore the use of nanotechnology in food products.

[http://books.nap.edu/catalog.php?record\\_id=12633](http://books.nap.edu/catalog.php?record_id=12633)

### **Integrative Medicine and the Health of the Public: A Summary of the February 2009 Summit**

Integrative medicine can be described as orienting the health care process to create a seamless engagement by patients and caregivers of the full range of physical, psychological, social, preventive, and therapeutic factors known to be effective and necessary for the achievement of optimal health throughout the life span. Integrative medicine envisions a health care system that focuses on efficient, evidence-based prevention, wellness, and patient-centered care that is personalized, predictive, preventive and participatory. On February 25-27, 2009, the Institute of Medicine (IOM) convened the Summit on Integrative Medicine and the Health of the Public in Washington, DC. This publication summarizes the background, presentations, and discussions that occurred during the summit.

[http://books.nap.edu/catalog.php?record\\_id=12668](http://books.nap.edu/catalog.php?record_id=12668)

### **Science in Action: Saving the Lives of Africa's Mothers, Newborns, and Children**

This report presents an overview of the current status of maternal, newborn, and child health (MNCH) in sub-Saharan Africa and estimates that the lives of nearly 4 million women, newborns, and children in sub-Saharan Africa could be saved every year if already well-established, affordable health interventions reached 90 percent of families. This publication was prepared for the Fifth Annual Meeting of the African Science Academy Development Initiative (ASADI), hosted by the Ghana Academy of Arts and Sciences on November 10-11, 2009 as part of its 50th anniversary celebration.

[http://www.nationalacademies.org/asadi/2009\\_Conference/PDFs/ScienceInActionFullReport.pdf](http://www.nationalacademies.org/asadi/2009_Conference/PDFs/ScienceInActionFullReport.pdf)

### **Advancing the Competitiveness and Efficiency of the U.S. Construction Industry**

Construction productivity – how well, how quickly, and at what cost buildings and infrastructure can be constructed – directly affects prices for homes and consumer goods and the robustness of the national economy. Industry analysts differ on whether construction industry productivity is improving or declining. Still, advances in available and emerging technologies offer significant opportunities to improve construction efficiency substantially in the 21st century and to help meet other national challenges, such as environmental sustainability. This report identifies five interrelated activities that could significantly improve the quality, timeliness, cost-effectiveness, and sustainability of construction projects.

[http://books.nap.edu/catalog.php?record\\_id=12717](http://books.nap.edu/catalog.php?record_id=12717)

### **Approaches to Integrating Airport Development and Federal Environmental Review Processes**

TRB's Airport Cooperative Research Program (ACRP) Synthesis 17 explores practices that airport sponsors, U.S. Federal Aviation Administration (FAA) planners and environmental specialists have used to integrate airport planning efforts and the FAA's environmental review processes.

[http://onlinepubs.trb.org/onlinepubs/acrp/acrp\\_syn\\_017.pdf](http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_017.pdf)

## **NEW PROJECTS**

### **Challenges and Opportunities in the Hydrologic Sciences**

This study will identify the challenges and opportunities in the hydrologic sciences, including a review of the current status of hydrology and its subfields and of their coupling with related geosciences and biosciences, and the identification of promising new opportunities to advance hydrologic sciences for better understanding of the water cycle that can be used to improve water resources and environmental engineering and management. The goal is to target new research directions that utilize the capabilities of new technologies and not to critique existing programs at NSF or elsewhere.

<http://www8.nationalacademies.org/cp/projectview.aspx?key=49153>

### **Offshore Oil and Gas Platform Inspection Program of the Minerals Management Service: A Review**

This study will review the US Department of the Interior's Minerals Management Service (MMS) Inspection Program for offshore facilities to assess its effectiveness in protecting human safety and the environment. The study committee appointed to conduct the review

will examine changes in the inspection program and process since the 1990 study by the Marine Board; review available trend data on inspections, safety, and environmental damage; examine analogous safety inspection programs in other regulatory agencies and other nations for lessons that could be applied to MMS inspections; and consider the effects of the current inspection program on offshore safety and environmental protection.

<http://www8.nationalacademies.org/cp/projectview.aspx?key=49165>

### **A Framework and Guidance for Health Impact Assessment**

An NRC/IOM committee will develop a framework, terminology, and guidance for conducting health impact assessment (HIA) of proposed policies, programs, and projects (for example, transportation, land use, housing, agriculture) at federal, state, tribal, and local levels, including the private sector. The committee will assess the value and potential value of such assessments; the impediments and countervailing factors that have limited the practice of HIA to date; the circumstances and criteria for conducting them; the concepts, tools, and information required; and the types, structure, and content of HIAs.

<http://www8.nationalacademies.org/cp/ProjectView.aspx?key=DELS-BEST-09-06>

## **UPCOMING MEETINGS**

### **December**

**TRB Webinar: A Transportation Research Program for Mitigating and Adapting to Climate Change and Conserving Energy**, December 2, 2009 2:00PM–3:00PM EST

<https://www1.gotomeeting.com/register/542178345>

**When the Mountains Come to You**, December 2, 2009, Irvine, CA

[http://www.nasonline.org/site/PageServer?pagename=Beckman\\_DV\\_Fall2009](http://www.nasonline.org/site/PageServer?pagename=Beckman_DV_Fall2009)

**Addressing the Challenges of Climate Change through the Behavioral and Social Sciences - Workshop #1**, December 3-4, 2009, Washington, DC

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=3984>

**Independent Scientific Review of Everglades Restoration Progress**, December 3-4, 2009, Jacksonville, FL

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=3408>

**Private-Public Sector Collaboration to Enhance Community Disaster Resilience**, December 3-4, 2009, Irvine, CA

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=4012>

**Review of EPA's Title 42 Hiring Authority for Highly Qualified Scientists and Engineers**, December 3-4, 2009, Washington, DC

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=3973>

**Offshore Oil and Gas Platform Inspection Program of the Minerals Management Service: A Review**, December 8-9, 2009, Washington, DC

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=3981>

**Evolution and the Future of the Earth**, December 10, 2009, Irvine, CA

[http://www.nasonline.org/site/PageServer?pagename=Beckman\\_DV\\_Fall2009](http://www.nasonline.org/site/PageServer?pagename=Beckman_DV_Fall2009)

**Review of the FreedomCAR and Fuel Research and Development Partnership, Phase 3**, December 10-11, 2009, Washington, DC

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=3796>

**Spatial Data Enabling USGS Strategic Science in the 21st Century**, December 10-11, 2009, Washington, DC

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=4005>

**Challenges and Opportunities in the Hydrologic Sciences**, December 15, 2009, San Francisco, CA

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=3991>

**Evaluation of Chesapeake Bay Program Implementation for Nutrient Reduction to Improve Water Quality**, December 16-17, 2009, Washington, DC

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=3894>

**Potential Energy Savings and Greenhouse Gas Reductions from Transportation**, December 17-18, 2009, Washington, DC

<http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=3966>

## **January**

**The Transportation Research Board (TRB) 89th Annual Meeting, Investing in Our Transportation Future – BOLD Ideas to Meet BIG Challenges**, January 10-14, 2010, Washington, DC

<http://www.trb.org/AnnualMeeting2010/Public/AnnualMeeting2010.aspx>

## **PROJECTS IN DEVELOPMENT**

### **A Sustainability Challenge: Food Security for All**

The National Academies' Roundtable on Science and Technology for Sustainability will convene two public workshops in 2010 to help establish the dimensions of the sustainability challenge and explore the risks and opportunities that will be involved if the world is to achieve sustainable global food security by 2050. A first workshop, *Measuring Food Insecurity and Assessing the Sustainability of Global Food Systems*, will examine the empirical basis for past trends, the current situation and projections for the future. A second workshop will discuss interactions between food security and natural resource management/climate change.

Funding is currently being sought for this project.

[http://sustainability.nationalacademies.org/proj\\_dev.shtml](http://sustainability.nationalacademies.org/proj_dev.shtml)

### **Regional Approaches to Urban Sustainability: Challenges and Opportunities**

The National Academies' proposes to organize a series of workshops beginning in Spring 2010 to foster discussion of regional approaches to making U.S. metropolitan areas more sustainable, with an emphasis on building the evidence base upon which policies and programs might be developed. Making our communities more sustainable often requires context-specific, place-based approaches – a “cookie-cutter” approach to development will not work, given our diverse regional economies, ecosystems, and communities. Key participants in these workshops will include local and state decision-makers (mayors, city/country administrators, planning directors), academic researchers, regional NGOs, and federal agency representatives. Funding is currently being sought for this project.

[http://sustainability.nationalacademies.org/proj\\_dev.shtml](http://sustainability.nationalacademies.org/proj_dev.shtml)

### **Trends, Challenges, and Pathways to Urban Sustainability, an International Symposium**

The National Academies will organize an international symposium in summer 2010 on the challenges and opportunities of finding ways to meet the needs of an increasingly urbanized world while sustaining critical resources and natural systems for future generations. The symposium will bring together city managers and planners, urban researchers from government and academia, and leaders from the donor and finance communities.

Participants will share lessons learned and discuss how to mobilize their collective knowledge on what works and why, so that this century's urban areas will become substantially more sustainable than existing cities are today, and so that urban impacts on global sustainability are recognized and minimized. This symposium will also attempt to build on existing initiatives, with an eye towards connecting and learning from these isolated activities, and catalyzing additional resources and partners to engage in this critically important issue. Cities are complex systems, and fostering sustainable urban areas requires an integrated, cross-sectoral, and multi-disciplinary approach; the proposed effort would be a promising first step along that path. Funding is currently being sought for this project.

[http://sustainability.nationalacademies.org/proj\\_dev.shtml](http://sustainability.nationalacademies.org/proj_dev.shtml)

## ONGOING ACTIVITIES

### 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.

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

#### From the November 2009 Issue:

##### Household Actions can Provide a Behavioral Wedge to Rapidly Reduce US Carbon Emissions

<http://www.pnas.org/content/106/44/18452.full>

##### Nitrogen Management is Essential to Prevent Tropical Oil Palm Plantations from Causing Ground-level Ozone Pollution

<http://www.pnas.org/content/106/44/18447.full>

##### Global Mapping of Al, Cu, Fe, and Zn In-use Stocks and In-ground Resources

<http://www.pnas.org/content/106/45/18920.full>

To learn more about sustainability activities, both in the STS program and throughout the other boards and committees of the National Academies, please visit our webpage at:

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

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