Message from the DELS Executive Director

On March 30 and 31, the Academies hosted a Summit to help inform the America's Climate Choices committee and its four panels early in their deliberations. Speakers presented a wide variety of perspectives, but three thoughts particularly caught my attention. One was the synthesis of the climate change issue with the following quote: "Never have so few asked so much of so many," with the "few" referring to the climate science community. The second was the statement by Rep. Bart Gordon, Chair of the House Science and Technology Committee, who advised us that the scientific community has yet to make climate change a compelling issue to the public and that indeed even the term "climate change" fails to convey a sense of urgency. The third was a question asking why the Academies thought that these reports would have greater influence than the more than two dozen reports on climate change topics that have preceded it. These collectively point to the challenges facing the America's Climate Choices Committee and panel members, not only in presenting well supported conclusions, but also in communicating them.

Another challenge, not only for BASC and all the units under the Division on Earth and Life Studies, but for the entire Academies, is the dramatically changing environment in which we are operating, from a new Federal Government with different priorities to an economic crisis and responses to it of an unprecedented nature. It's still too early to tell exactly where 2009 will take us, but one thing is clear: the dynamic environment will require flexibility on our part, as well as an ability to be open and responsive to new types of work and new ways of thinking.

Warren Muir, Executive Director
Division of Earth and Life Studies
(parent division to BASC)

Special Feature: Summit Explores the Climate Challenge

On March 30-31, hundreds of participants gathered at the NAS building on Constitution Avenue and also on the Web to begin a dialog to frame the nation's response to climate change. This
event, the Summit on America's Climate Choices, provided an opportunity for Administration officials, members of Congress, and leaders from industry, environmental groups, academia, and government to provide input to the America's Climate Choices suite of studies. Under the leadership of DELS Board on Atmospheric and Climate Sciences, the studies are underway and will be released in late 2009 and 2010.

Representative Alan Mollohan (D-WV), who initiated the congressional request for the study, talked about the importance of the Academies independent voice, and the need for actionable advice, based on scientific analysis, to guide policymaker decisions. Other day-one speakers included James Mulva, CEO of ConocoPhillips, who discussed climate change mitigation from an industry perspective and Representative Bart Gordon (D-TN) who, in response to a question from the audience about target CO2 concentrations, quipped that the magic number is 218, the number of votes in the House of Representatives needed to pass legislation by majority.

Several speakers emphasized the need to move on from debating whether climate is changing: there is now broad consensus that Earth is warming, that human activities are a contributor, and that we have enough knowledge in many areas to take steps to respond. Susan Solomon, a member of the Committee on America's Climate Choices and also co-chair of the climate science working group of the most recent assessment by the International Panel on Climate Change (IPCC), reiterated the IPCC conclusion that "warming is unequivocal" and that "human activities are very likely" the cause.

The second day of the Summit saw more in-depth discussions of the unique challenges of climate change and the available tools to meet those challenges. Eileen Claussen of the Pew Center on Global Climate Change spoke of the difficulty in integrating a national response into a global framework. Carter Roberts of the World Wildlife Federation, Howard Frumkin of the Center for Disease Control and Prevention, and James Woolsey of VantagePoint Venture Partners gave a comprehensive overview of ecosystem, health, and national security impacts of climate change.

The full webcast of the Summit is available at the study website http://americasclimatechoices.org. A video based on the Summit and on interviews with several of the of the America's Climate Choices steering committee and panel members, is being produced and expected to be released by June 2009.

New Study - Call for Nominations

Golden, CO
Details and Agenda TBA
Stabilization Targets for Atmospheric Greenhouse Gas Concentrations
Deadline: Thursday, April 30

The Board on Atmospheric Sciences and Climate is pleased to announce a new study, "Stabilization Targets for Atmospheric Greenhouse Gas Concentrations." Using the most current science available, this study will evaluate the implications of different atmospheric concentration target levels and explain the uncertainties inherent in the analyses to assist policy makers as they make decisions about stabilization target levels for atmospheric greenhouse gas concentrations.

We are seeking nominations of potential members for the committee that will be charged to conduct this study. The committee will be composed by approximately 14 volunteer experts with backgrounds in a range of areas, such as climate science (including experts in ocean/ice dynamics and sea-level rise), climate and integrated assessment modeling, climate change impacts and vulnerabilities (e.g., ecologists, meteorology and air quality specialists, and various social sciences such as vulnerability assessment, demographics, geography), economics, policy, and risk analysis.

To submit a nomination, send us the person's name, affiliation, contact information, area of expertise, and a brief statement on why the person is relevant to the study topic. Direct your ideas to Toby Warden, study director, at TWarden@nas.edu. Please submit your nominations NO LATER THAN THURSDAY, APRIL 30, 2009.

Recent Reports

Restructuring Federal Climate Research to Meet the Challenges of Climate Change -- Climate change is one of the most important global environmental problems facing the world today. Policy decisions are already being made to limit or adapt to climate change and its impacts, but there is a need for greater integration between science and decision making. This book proposes six priorities for restructuring the United States' climate change research program to develop a more robust knowledge base and support informed responses:

- Reorganize the Program Around Integrated Scientific-Societal Issues
- Establish a U.S. Climate Observing System
- Support a New Generation of Coupled Earth System Models
- Strengthen Research on Adaptation, Mitigation, and Vulnerability
- Initiate a National Assessment of the Risks and Costs of Climate Change Impacts and Options to Respond
- Coordinate Federal Efforts to Provide Climate Information, Tools, and Forecasts Routinely to Decision Makers
Informing Decisions in a Changing Climate -- Climate change will create a novel and dynamic decision environment that cannot be envisioned from past experience. Moreover, climatic changes will be superimposed on social and economic changes that are altering the climate vulnerability of different regions and sectors of society, as well as their ability to cope. Decision makers will need new kinds of information and new ways of thinking and learning to function effectively in a changing climate.

Climate change also poses challenges for federal agencies and for the scientific community. Scientific priorities and practices need to change so that the scientific community can provide better support to decision makers in managing emerging climate risks. The information that is needed is not only about climate, but also about changes in social and economic conditions that interact with climate change.

Informing Decisions in a Changing Climate provides a framework and a set of strategies and methods for organizing and evaluating decision support activities related to climate change. Based on basic knowledge of decision making; past experiences in other fields; experience with early efforts in the climate arena; and input from a range of decision makers, the book identifies six principles of effective decision support and recommends a strategy for implementing them in a national initiative to inform climate-related decisions.

Ecological Impacts of Climate Change -- The world's climate is changing, and it will continue to change throughout the 21st century and beyond. Rising temperatures, new precipitation patterns, and other changes are already affecting many aspects of human society and the natural world. In this book, the National Research Council provides a broad overview of the ecological impacts of climate change, and a series of examples of impacts of different kinds. The book was written as a basis for an illustrated booklet designed to provide the public with accurate scientific information on this important subject.

Studies in Progress

Climate, Energy, and National Security. The National Academy of Sciences is helping facilitate the increased involvement of scientists in answering questions related to climate, energy, and environmental change. The goal is both to advance scientific understanding of global climate and other environmental and disaster-related phenomena, and consider the implications for both fundamental scientific understanding and national security.

As part of a broader suite of activities, the Committee will:

1. Advise on the scope of national security related climate-change, environmental science and natural disaster research conducted as
part of the federal global climate change research activities. The Committee will obtain input, as needed, from other activities and reviews of specific applications of national classified assets and data sets for scientific studies of climate, energy, natural disasters, and related security questions, and interact with the intelligence community to evaluate the significance of research findings and priorities. The Committee will also review progress and provide advice on other specialized investigations/tasks requested by the government.

2. Develop a framework document that proposes a tentative suite of indicators, measurements (including locations around the globe), and metrics (including models and algorithms for calculating them) that are most important for understanding global climate change and for assessing sustainability issues.

**Assessment of Intraseasonal to Interannual Climate Prediction and Predictability.** This study will review the current state of knowledge about estimates of predictability of the climate system on intraseasonal to interannual timescales, assess in what ways current estimates are deficient, and recommend ways to improve upon the current predictability estimates. The study will also recommend research and model development foci and efforts that will be most beneficial in narrowing the gap between the current skill of predictions and estimated predictability limits. The review of predictability estimates to be addressed will include oceanic and atmospheric variables such as sea surface temperature, sub-surface heat content, surface temperature, precipitation, and soil moisture, as well as indices like Nino 3.4 sea surface temperatures or the phases of the Madden-Julian Oscillation.

Specifically, the study committee will:

1. Review current understanding of climate predictability on intraseasonal to interannual time scales, including sources of predictability, the methodologies used to estimate predictability, current estimates of predictability, and how these estimates have evolved over time;

2. Describe how improvements in modeling, observational capabilities, and other technological improvements (e.g., analysis, development of ensemble prediction systems, data assimilation systems, computing capabilities) have led to changes in our understanding and estimates of predictability;

3. Identify any key deficiencies and gaps remaining in our understanding of climate predictability on intraseasonal to interannual timescales, and recommend research priorities to address these gaps;

4. Assess the performance of current prediction systems in relation to the estimated predictability of the climate system on intraseasonal to interannual timescales, and recommend strategies (e.g., observations, model improvements, and research priorities) to narrow gaps that exist between current predictive capabilities and estimated limits of predictability; and

5. Recommend strategies and best practices that could be used to quantitatively assess improvements in both predictability estimates
and prediction skill over time.

**The Significance of International Transport of Air Pollutants**
will summarize the state of knowledge regarding the international
flows of air pollutants into and out of the United States and across
its various regions, on continental and intercontinental scales. It
will also consider the impact of these flows on the achievement of
environmental policy objectives related to air quality or pollutant
deposition in the United States and abroad and impacts on
regional and global climate change. The pollutants to be
considered include ozone and its precursors, fine particles and
their precursors, mercury, and persistent organic pollutants.

**America’s Climate Choices.** The National Academies are
planning to conduct a series of coordinated activities designed to
advance the US response to climate change. These activities will:

- build on an extensive foundation of previous and ongoing
  work, including past NRC studies, current NRC activities,
  assessments and reports from other national and
  international organizations (including the Intergovernmental
  Panel on Climate Change, the U.S. Climate Change
  Science Program, and a wide range of nongovernmental
  organizations and private sector groups), and the scientific
  literature;
- tap experts and stakeholders from a range of communities
  including academia, business and industry, different levels
  of government, nongovernmental organizations, and the
  international community;
- analyze and assess different options and strategies for
  limiting the magnitude of future climate change, adapting to
  the impacts of climate change, advancing the science of
  climate change, and informing effective decisions and
  actions related to climate change;
- provide an integrated, cross-cutting assessment of
  important short-term actions and long-term strategies and
  investments, the most significant impediments to progress,
  and the major scientific and technical advances needed
  going forward; and
- produce forward-looking, action-oriented reports and
  derivative products that provide useful advice to decision
  makers at all levels and across the many sectors facing
  critical decisions related to climate change.

**Scientific Value of Arctic Sea Ice Imagery Derived Products.**
The National Academy of Sciences is helping facilitate the
increased involvement of scientists in answering questions related
to climate, energy, and environmental change. The goal is both to
advance scientific understanding of global climate and other
environmental and disaster-related phenomena, and consider the
implications for both fundamental scientific understanding and
national security.

For this particular activity, The National Academy of
Sciences/National Research Council will form a small ad hoc
committee of experts to assess the scientific value and usefulness of Imagery Derived Products on Arctic sea ice and identify the images that would be most valuable to Arctic ice research if publicly released. The committee will carry out the following tasks:

- Evaluate the collection of Arctic Ice Imagery Derived Products, a subset of the Global Fiducial Program data from U.S. National Imagery Systems, and assess their scientific value and usefulness in furthering the understanding of important climate parameters and processes.
- Identify those images from the Arctic Ice fiducials (observation sites) that would be most valuable to arctic ice research if released for open use. The analysis should identify the high priority images, explain why they are important, and describe what could be done with the data if such images were openly available.

The nation turns to the National Academies-National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council-for independent, objective advice on issues that affect people's lives worldwide.

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