

The BASC Newsletter, Volume 5, Number 3, is your update on the activities of the Board on Atmospheric Sciences and Climate of the National Academies. The Board seeks to advance understanding of the Earth's atmosphere and climate, to help apply this knowledge to benefit the public, and to advise the federal government on issues within the Board's areas of expertise. This newsletter can be viewed in its entirety at the [BASC website](#).

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1. Message from the Director

The National Academies has launched a new, congressionally requested study called "**America's Climate Choices**." This suite of five coordinated activities (a Committee and four Panels) will address the actions and strategies available to limit the magnitude of future climate change, adapt to climate change impacts, advance climate change science, and inform effective decisions and actions. More than 80 top scientists, engineers, and other experts will participate, examining the scientific and technical questions underlying the various short-term actions and long-term strategies, investments, and opportunities that are available to meet climate-related challenges. Five consensus reports will be released in 2009 and 2010, organized to respond to eight broad questions:

- 1) What can be done to limit the magnitude of future climate change?
- 2) What can be done to adapt to expected impacts?
- 3) What can be done to better understand climate change?
- 4) What can be done to inform effective decisions and actions?
- 5) What short-term actions can be taken to respond effectively to climate change?
- 6) What promising long-term strategies, investments, and opportunities could be pursued to respond to climate change?
- 7) What are the major scientific and technological advances needed to better understand and respond effectively to climate change?
- 8) What are the major impediments (e.g., practical, institutional, economic, ethical, intergenerational, etc.) to responding to climate change, and what can be done to overcome these impediments?

As the study moves ahead, watch for news and information about the study at <http://americasclimatechoices.org>. Register at this site to receive periodic email updates about committee and panel meetings and progress.

The America's Climate Choices suite of activities was requested by Congress and funded by the National Academies with support from the National Oceanic and Atmospheric Administration (NOAA). While admittedly ambitious in design, this suite of activities is coming at a critical time in our nation's discussions of climate change and how to respond.

Chris Elfring, BASC Director

2. Upcoming Events

- December 11-12, 2008: **Committee on the Scientific Value of Arctic Sea Ice Imagery Derived Products**, Meeting 2, Seattle, WA.
<http://webapp/cp/meetingview.aspx?MeetingID=3057&MeetingNo=2>
- December 18, 2008: **Town Hall opportunity to discuss America's Climate Choices**. American Geophysical Union Fall Meeting, Thursday, 6:15 pm in Room 2006, 1815h of The Moscone Center West, San Francisco, CA.
<http://www.agu.org/meetings/fm08/>
- December 18, 2008: **Committee on Climate, Energy, and National Security**, Meeting 1, Washington, DC.
<http://webapp/cp/meetingview.aspx?MeetingID=3104&MeetingNo=1>
- January 5-6, 2009: **America's Climate Choices Committee**, Meeting 2, Irvine, CA.
<http://webapp/cp/meetingview.aspx?MeetingID=3081&MeetingNo=2>
- January 12, 2009: **Town Hall opportunity to discuss America's Climate Choices**. 89th American Meteorological Society Annual Meeting, Phoenix, AZ, 7:00 PM (room to be announced). <http://www.ametsoc.org/MEET/annual/index.html>
- February 3-4, 2009: **Committee on the Significance of International Transport of Air Pollutants**, Irvine, CA.
- February 14, 2009: **Town Hall opportunity to discuss America's Climate Choices**. 2009 AAAS Annual Meeting, Chicago, IL. 4:00-5:30 PM, Water Tower Room, Hyatt Regency Chicago. <http://www.aaas.org/meetings/>
- March 30-31, 2009: **Summit on America's Climate Choices**, Washington, D.C.
<http://americasclimatechoices.org>

3. Special Feature: America's Climate Choices—Committee and Panel Memberships Announced, plus upcoming Summit and Workshops

The provisional membership of the America's Climate Choices committee and four panels have been approved and posted for public comment at:
<http://www8.nationalacademies.org/cp/>.

- The **Committee on America's Climate Choices** will be responsible for providing overall direction, coordination, and integration of the on America's Climate Choices suite of activities. The committee will organize the Summit on America's Climate Choices, facilitate coordination and collaboration among the study panels, convene additional workshops or joint meetings as needed, and write a final report that integrates the panel reports and answers the final four key questions to be addressed by the study. The chair of the Committee on America's Climate Choices will be Dr. Albert Carnesale, Chancellor Emeritus of the University of California, Los Angeles. Dr. William Chameides, Dean of the Nicholas School of the Environment at Duke University, will serve as Vice Chair. Committee membership may be viewed at <http://dels.nas.edu/basc/climate-change/ccstudycte.shtml>.
- The **Panel on Limiting the Magnitude of Climate Change** will assess strategies for reducing the net future human influence on climate, including both technology and policy options (also referred to as "mitigation of climate change"). The panel will focus on actions to reduce domestic greenhouse gas emissions and other human drivers of climate change, such as changes in land use, but will also consider the international dimensions of climate stabilization. Dr. Robert W. Fri, Resources for the Future, will serve as Chair of the committee, and Dr. Marilyn A. Brown, Georgia Institute of Technology, will serve as Vice-Chair. Panel membership may be viewed at <http://dels.nas.edu/basc/climate-change/panelmitigation.shtml>.
- The **Panel on Adapting to the Impacts of Climate Change** will assess actions and strategies to reduce vulnerability, increase adaptive capacity, improve resiliency, and promote successful adaptation to climate change in different regions, sectors, systems, and populations. The costs, benefits, limitations, tradeoffs, and uncertainties associated with different options and strategies will be assessed. Ms. Katharine L. Jacobs, Arizona Water Institute, will serve as Chair of the committee, and Dr. Thomas J. Wilbanks, Oak Ridge National Laboratory, will serve as Vice-Chair. Panel membership may be viewed at <http://dels.nas.edu/basc/climate-change/paneladaptation.shtml>.
- The **Panel on Advancing the Science of Climate Change** has been approved and posted for public comment. The panel will first provide a concise overview of past, present, and future climate change, including its causes and its impacts, then recommend steps to advance our current understanding. The panel will address the observations, research programs, next-generation models, and the physical and human assets needed to better understand the climate system, related human and ecological systems, and the effectiveness of actions taken to limit the magnitude of future climate change (including "geo-engineering" approaches) and adapt to its impacts. Dr. Pamela Matson, Stanford University, will serve as Chair of the committee and Dr. Thomas Dietz, Michigan State University, will serve as Vice-Chair. Panel Membership may be viewed at <http://dels.nas.edu/basc/climate-change/panelscience.shtml>.
- The **Panel on Informing Effective Decisions and Actions Related to Climate Change** will describe the different types of climate change-related decisions and actions being made at various levels and in different sectors and regions; develop a framework for analyzing and informing these actions and decisions; and evaluate the

activities, products, and tools that could help ensure these actions and decisions are informed by the best available technical knowledge. Dr. Peter H. Raven, Missouri Botanical Garden, will serve as Chair of the committee, and Dr. Diana M. Liverman, University of Oxford and University of Arizona, will serve as Vice-Chair. Panel membership may be viewed at <http://dels.nas.edu/basc/climate-change/panelinforming.shtml>.

Three opportunities for community input to the America's Climate Choices Study will take place in the near future. The purpose of these workshops is to solicit community input on questions and topics the study should address. Representatives of the Academy and the Study Committee will provide a study overview and lead discussions.

The first workshop will take place at the **AGU Fall Meeting** in San Francisco, CA on **Thursday, December 18** at 6:15 pm in Room 2006, 1815h of The Moscone Center West. For more information, see the meeting website, <http://www.agu.org/meetings/fm08/>.

The second will take place at the **AMS Annual Meeting** in Phoenix, AZ on **Monday, January 12**, from 7:00 to 8:30. Further information may be found at <http://www.ametsoc.org/MEET/annual/index.html>.

Another opportunity for community input for the study will take place **February 14, 2009** from 4:00 to 5:30 PM at the **2009 AAAS Annual Meeting** in Chicago. The workshop will be in the Water Tower Room at the Hyatt Regency Chicago. For more information, see <http://www.aaas.org/meetings/>.

Also, save the date for the **Summit on America's Climate Choices** to be held **March 30-31** at the National Academy of Sciences building in Washington, D.C. The Summit provides an opportunity for the experts serving on the America's Climate Choices committee and panels to hear from major thought leaders and to work with key constituencies to frame study issues. Space is limited for the event. Public registration will begin in February. Watch <http://americasclimatechoices.org> for details.

To receive periodic email updates on the study, sign up at http://dels.nas.edu/basc/climate-change/exact_target_form.shtml.

4. Recently Released Reports

(To obtain copies of the reports, click on the links to go to the National Academies Press website.)

[Evaluation of the Multifunction Phased Array Radar Planning Process](#)

Approximately 150 ground-based radars currently provide most of the weather surveillance data in the United States; other radar networks provide surveillance for civil aviation and other important airspace surveillance functions. However, many of the radars in these networks are aging--some equipment is more than 40 years old--prompting several government agencies to undertake planning for upgrades or replacements of these systems. At the request of the Office of the Federal Coordinator for Meteorological Services and Supporting Research, the National Research Council

convened a committee to evaluate the planning process for a proposed replacement system known as the Multifunction Phased Array Radar. The committee's report concludes that development efforts for the Multifunction Phased Array Radar, a system that could fulfill both weather and aircraft surveillance needs, should go forward, and that continued research should resolve key technical issues and determine whether the system could operate cost-effectively.

[Observing Weather and Climate from the Ground Up: A Nationwide Network of Networks](#)

Detailed weather observations on local and regional levels are essential to a range of needs from forecasting tornadoes to making decisions that affect energy security, public health and safety, transportation, agriculture, and all of our economic interests. As technological capabilities have become increasingly affordable, businesses, state and local governments, and individual weather enthusiasts have set up observing systems throughout the United States. However, because there is no national network tying these systems together, data collection methods are inconsistent and public accessibility is limited.

This report identifies steps that can be taken by the study's federal government sponsors—the Departments of Commerce, Transportation, Homeland Security, the Environmental Protection Agency, and the National Aeronautics and Space Administration—and other public and private partners in establishing a coordinated nationwide “network of networks” of weather and climate observations. These steps include bringing together stakeholders from various sectors to determine common needs, setting standards for the network, and creating a centralized authority to provide core services, which are essential to enable coordination among existing networks. Longer term goals recommended in the report include the deployment of infrastructure needed to resolve the vertical dimension, including a nationwide network of ground-based remote sensing systems to provide profiles of wind, temperature, humidity, and chemical constituents; and a network of soil moisture sensors. The report recognizes that the observational improvements needed to facilitate increased skill in mesoscale weather prediction and the organizational structure required to support such observations must begin *From the Ground Up*.

5. Studies in Progress: for more information about a specific project, click on the link.

[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.

Ecological Impacts of Climate Change. The Board on Life Sciences (BLS) has been asked by the United States Geological Survey to develop a booklet on the ecological impacts of climate change, similar to other booklets recently published by DELS on stem cells ([Understanding Stem Cells](#)) and microbial ecology ([Understanding Our Microbial](#)

[Planet](#)) that were based on BLS reports. The “Ecological Impacts of Climate Change” booklet will be based on a NRC committee-authored report that will summarize and draw examples from published consensus documents like the recent report "Climate Change 2007: Impacts, Adaptation and Vulnerabilities" by Working Group II of the Intergovernmental Panel on Climate Change, as well as other NRC reports and published literature.

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We encourage your comments on this newsletter as well as on the reports and activities of BASC. To provide input, contact basc@nas.edu. To unsubscribe, contact basc@nas.edu.

BASC is a unit of the National Academies. 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. BASC members include: F. Sherwood Rowland (chair), University of California, Irvine; Rosina M. Bierbaum, University of Michigan; Antonio J. Busalacchi, Jr., University of Maryland; Richard (Rit) Carbone, National Center for Atmospheric Research; Walter F. Dabberdt, Vaisala Inc.; Kirstin Dow, University of South Carolina; Greg S. Forbes, The Weather Channel, Inc.; Isaac Held, National Oceanic and Atmospheric Administration; Arthur Lee, Chevron; Kirk R. Smith, University of California, Berkeley; John T. Snow, The University of Oklahoma; Thomas Vonder Haar, Colorado State University; Xubin Zeng, University of Arizona; Chris Elfring (director, BASC).

We encourage you to share this newsletter with colleagues. If they would like to be added to the email list, a simple request to basc@nas.edu is all that is needed.