

# THE NATIONAL ACADEMIES

*Advisers to the Nation on Science, Engineering, and Medicine*

National Research Council  
Office of the Chairman

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June 1, 2005

The Honorable [Name of Member]  
U.S. Senate / House of Representatives  
Washington, DC 20515-2006

Dear [Name of Member]:

In Senate Resolution 466, Congress asked the National Academy of Sciences, as well as the National Science Foundation and National Aeronautics and Space Administration, to report on the steps being taken to carry out a worldwide campaign of scientific activity for International Polar Year (IPY) 2007-2008. We are pleased to report that planning for IPY 2007-2008 has proceeded rapidly and with increasing momentum. More than 35 nations are now committed to participating in IPY. Expeditions and experiments are being planned for both the Arctic and the Antarctic to study a wide range of issues, from trends in extent and thickness of the polar ice sheets and sea ice, to how organisms live and prosper during the dark polar winter, to engineering challenges posed by changing permafrost, to the health impacts of social change in northern regions.

The United States has played a key role in planning this IPY. The attached report, *A Vision for the International Polar Year 2007-2008*, was prepared by a committee of volunteers appointed by the National Academies. The committee used input from hundreds of scientists, agency staff, and educators representing a wide range of disciplines and interests. This report outlines a rationale for why IPY should happen and what it can contribute to today's issues; it discusses the scientific and technological challenges and provides initial ideas for education and outreach activities to ensure that this IPY serves to involve and excite the public.

According to this report and international consensus, IPY 2007-2008 should be an intense, coordinated field campaign of polar observations, research, analysis, and educational activities that will be multidisciplinary in scope and international in participation. The report highlights five broad scientific challenges that can serve as an organizing framework for U.S. IPY 2007-2008 activities:

- Assess large-scale environmental and social change, such as whether and how fast sea ice and permafrost are changing and what this means to biodiversity, native cultures, roads, and pipelines.
- Explore new frontiers in the polar regions, such as using robotic devices to investigate the once-inaccessible deep seafloor, or using the new tools of genomics to study once-unanswerable questions about biological adaptation to extreme environments.

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- Coordinate in-depth observations and enhance international compatibility of observation systems, so that we have adequate coverage of the vast and challenging polar landscape and the long-term information needed to understand variability and trends, as well as global teleconnections.
- Improve our understanding of human-environment dynamics, including studies of importance to U.S. societal, economic, and strategic interests such as the effects of environmental change on buildings, resource-dependent communities, and northern sea transportation.
- Use the opportunity of IPY, like the International Geophysical Year of 1957-1958, to excite and engage the public, with the goals of developing the next generation of scientists and engineers and at the same time advancing general science literacy.

Successful U.S. participation in IPY 2007-2008 will require strong participation from the federal government and particularly the agencies with relevant research and management responsibilities. Thus the National Academies have been careful to communicate and involve agencies in the planning discussions. In July 2004, the National Academies held a workshop to engage agencies in thinking about how IPY could be used to advance their work, and another Academies report, *International Polar Year 2007-2008: Report of the Implementation Workshop*, is also included in this package. With strong leadership from the National Science Foundation and active discussion by at least 15 other agencies, including the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, the U.S. Geological Survey, and the National Institutes of Health, agencies are moving to identify where their programs fit IPY goals and could benefit from interagency and international collaboration. Agency planning is still evolving, and congressional leadership at this stage would have great impact.

IPY is being coordinated at the international level by the International Council for Science and the World Meteorological Organization. An international program office has been formed, an international planning committee is meeting, and more than 35 nations, including Australia, Canada, Denmark, United Kingdom, China, Germany, Japan, and Russia, are now working together on IPY. In response to a call for expressions of interest, ICSU-WMO received more than 800 project descriptions, with about 40 percent involving U.S. participants.

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We hope Congress will seek to make the United States a leader in International Polar Year 2007-2008 and use this opportunity to leverage U.S. national interests. We recognize that this is a time of fiscal constraint. The International Geophysical Year of 1957-1958 (IGY) also occurred at such a time, with deep international tensions, and yet Congress had the foresight to see that the potential benefits were great. It encouraged the Eisenhower Administration to support the IGY, and it authorized and appropriated needed funds. Like then, today's IPY planners are setting an ambitious agenda, but one with important potential payoffs.

Why should the majority of us who live in the warmer regions of Earth care about these questions? The polar regions, while physically distant, are central to many of the key science issues of our time. Environmental changes currently being witnessed in the polar regions are vivid and in many cases greater than changes observed in the mid-latitudes or tropics. Ice cover in the Arctic is decreasing in extent and area; some ice shelves in Antarctica are retreating and thinning; glaciers across the globe are shrinking; Alaskan villages are being moved to higher ground in response to coastal erosion; and permafrost thawing is causing the collapse of roads and buildings. Understanding these changes, in the context of past changes and natural variability, provides us with the basis to make informed choices in the future.

Sincerely,

Bruce Alberts  
President

Enclosures:

*A Vision for the International Polar Year 2007-2008  
International Polar Year 2007-2008 Report of the Implementation Workshop  
Summary of the Vision Report*