

## MEMORANDUM TO MEMBERS OF THE NATIONAL SCIENCE BOARD

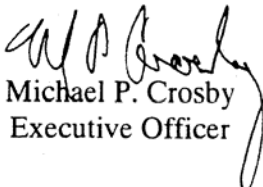
**SUBJECT:** Major Actions and Approvals at the March 29-30, 2007 Meeting

This memorandum will be made publicly available for any interested parties to review. A more detailed summary of the meeting will be posted on the National Science Board (Board) public Web site within approximately 10 business days. A comprehensive set of Board-approved Open Session meeting minutes will be posted on the Board's public Web site following its May 2007 meeting.

Major actions and approvals at the 397<sup>th</sup> meeting of the Board included the following (not in priority order):

1. The Board approved the minutes of the Plenary Open Session (NSB-07-20) for the February 2007 meeting (<http://www.nsf.gov/nsb/meetings/2007/0208/minutes.pdf>). Minutes for the Plenary Executive Closed and Closed Sessions for the February 2007 meeting of the Board were also approved.
2. The Board, by record vote, approved a resolution to close portions of the upcoming May 14-15, 2007 Board meeting dealing with staff appointments; future budgets; grants and contracts; specific Office of the Inspector General investigations and enforcement actions; and National Science Foundation (NSF) participation in a civil or administrative action, proceeding, or arbitration (<http://www.nsf.gov/nsb/meetings/2007/0514/closing.pdf>).
3. The Board, by record vote, approved a change to the published March 2007 Plenary Agenda to add the agenda item on the Elections Committee topic because this item was required by agency business and no earlier announcement of the change was possible. This item was addressed in the closure resolution approved by the Board on February 7, 2007 and the corresponding General Counsel's certificate.
4. The Board, by record vote, approved a change to the published March 2007 Committee on Programs and Plans Agenda to add the closed agenda item on the Scientific Ocean Drilling Vessel because this item was required by agency business and no earlier announcement of the change was possible. This item was addressed in the closure resolution approved by the Board on February 7, 2007 and the corresponding General Counsel's certificate.
5. The Board approved a revision to their nomination and election protocol to appoint, instead of elect, Board Members to the *ad hoc* Committee on Nominating for NSB Elections during odd-numbered years for the election of Executive Committee members.

6. The Chairman appointed the following Board Members to the *ad hoc* Committee on Nominating for NSB Elections, informally know as the Elections Committee: Drs. Hoffman, Randall, Sullivan, and Vasquez.
7. The Board approved the recipient for the 2007 Alan T. Waterman Award. The name of the recipient will be announced after the NSF Director and Board Chairman have notified the awardee of their selection.
8. The Board authorized the NSF Director, at his discretion, to extend the cooperative agreement “Management and Operations of the National Optical Astronomy Observatory and the National Solar Observatory.” (Excerpt from NSB-07-27, Attachment 1)
9. The Board authorized the NSF Director, at his discretion, to continue funding the current cooperative agreement with Cornell University to manage and operate the National Astronomy and Ionosphere Center for the period October 1, 2006 to March 31, 2010.
10. The Board approved a resolution (NSB-07-35) to support the recommendations of NSB/SOPI-07-2, to reaffirm its previous resolutions to support the NSF Director’s actions to meet requirements for polar icebreaking, and to urge a national policy review that could lead to recapitalizing the Coast Guard icebreaking fleet. (Attachments 2 and 3)
11. The Board approved the report, *Enhancing Support of Transformative Research at the National Science Foundation* (NSB-07-32) (<http://www.nsf.gov/nsb/documents/2007/tr.pdf>), subject to final editing by the Board Chairman and Task Force on Transformative Research chairman.
12. The Board approved the extension of the charge to the Task Force on Transformative Research through the end of the 2007 calendar year to review the NSF plan for implementation of the Transformative Research Initiative.
13. The Board determined that the Board Commission on 21<sup>st</sup> Century Education in Science, Technology, Engineering, and Mathematics (STEM) fulfilled its charge to provide the Board with advice and recommendations for a “bold new action plan” for U.S. K-12 STEM education. The Board discharged this Commission as a Federal advisory committee, with thanks to the Commission Co-Chairmen, Drs. Leon Lederman and Shirley Malcom, and Commission members.

  
Michael P. Crosby  
Executive Officer

Attachment 1: NSB-07-27  
Attachment 2: NSB-07-35  
Attachment 3: NSB/SOPI-07-2

## RESOLUTION

### NATIONAL SCIENCE BOARD

#### SUPPORT FOR THE MANAGEMENT AND OPERATIONS OF THE NATIONAL OPTICAL ASTRONOMY OBSERVATORY AND THE NATIONAL SOLAR OBSERVATORY

WHEREAS the National Science Foundation conducted a Review in August 2006 of the performance of the Association of Universities for Research in Astronomy with respect to management of the National Optical Astronomy Observatory and the National Solar Observatory which review unanimously praised the performance of the Association of Universities for Research in Astronomy; and

WHEREAS the National Science Board takes note that the Management Review Panel recommended that:

- the management of the National Optical Astronomy Observatory and the National Solar Observatory be separated into two distinct Cooperative Agreements,
- Visiting Committees be re-instituted for the two observatories, and
- the Association of Universities for Research in Astronomy find innovative ways to promote a skilled and diverse workforce; and

WHEREAS the National Science Board recognizes that the Association of Universities for Research in Astronomy is taking action on these three recommendations, and that the National Science Board supports the Management Review Panel recommendations and their implementation; and

NOW, therefore, be it RESOLVED, that the National Science Board authorized the Director at his discretion to extend the Cooperative Agreement *Management and Operations of the National Optical Astronomy Observatory and the National Solar Observatory (AST-0132798, PI William S. Smith)*.

**RESOLUTION**

NATIONAL SCIENCE BOARD

U.S. ANTARCTIC PROGRAM ICEBREAKING RESOLUTION

WHEREAS research conducted in the earth's polar regions is critical for understanding phenomena of global importance and polar regions offer unique opportunities for forefront scientific research in a broad range of disciplines; and

WHEREAS the National Science Foundation (NSF) is the principal supporter of research conducted by U.S. scientists in the polar regions; and

WHEREAS the NSF is responsible for implementing U.S. policy calling for an active and influential presence in Antarctica through year-round scientific activity at the south pole and at two coastal research stations; and

WHEREAS the above activities depend critically upon the availability of heavy icebreaking services but two of the three U.S. icebreakers capable of supporting these activities are nearing the end of their design lifetimes, have become expensive to operate and maintain, and cannot be relied on indefinitely; and

WHEREAS Board Resolution (NSB-05-68) and (NSB-05-100) supports the NSF Director taking all necessary steps to meet the requirements for polar icebreaking among available options to best meet the needs of the research community in the most cost effective manner; and

NOTING that pursuant to these National Science Board (Board) Resolutions the Swedish icebreaker *Oden*, with state-of-the art icebreaking capabilities, was able to open the channel to McMurdo without assistance this past season, provided an excellent platform for U.S. research and education activities while en route to McMurdo Station, and was obtained at a fair market price; and

NOTING the recommendations of the National Research Council in *Polar Icebreakers in a Changing World: An Assessment of U.S. Needs*, September 26, 2006;

NOTING the discussion and recommendations in the White Paper on Support for Icebreakers prepared by the Subcommittee on Polar Issues, (NSB/SOPI-07-2), March 29, 2007;

Therefore, be it RESOLVED, that the Board supports the recommendations of (NSB/SOPI-07-2), March 29, 2007.

Moreover, be it RESOLVED that the Board reaffirms its previous Resolutions supporting the NSF Director taking all necessary steps to meet the requirements for polar ice-breaking among available options to best meet the needs of the research community in the most cost-effective manner.

Moreover, be it RESOLVED that the Board urges a national policy review that could lead to recapitalizing the Coast Guard icebreaking fleet, and agrees with the National Research Council recommendation that costs to operate and maintain the fleet should be budgeted for by the Coast Guard and that any fleet usage by NSF should be reimbursed by NSF only at the marginal cost rate. Furthermore, if national policy calls for recapitalization of the Coast Guard fleet, recapitalization costs should not be borne by the NSF.

National Science Board  
Committee on Programs and Plans  
Subcommittee on Polar Issues

**White Paper on Support for Icebreakers**

Dr. Anita K. Jones, former NSB member and Chair of the National Research Council (NRC) study, *Polar Icebreakers in a Changing World: An Assessment of U.S. Needs*, briefed the Board at its November 2006 meeting on the study and on its conclusions. Following the briefing and subsequent discussion, Dr. Barry Barish, Chair of the NSB Subcommittee on Polar Issues, suggested that the Board review its earlier statements on polar icebreakers in view of the new study report.

The NRC report emphasized that “The United States has enduring national and strategic interests in the Arctic and Antarctic and the importance of these regions is growing with time” and addressed the fact that “... U.S. icebreaking capability is now at risk of being unable to support [those] national interests in the north and the south.”

Among the national interests discussed in the report is long-standing U.S. policy requiring an active and influential presence in Antarctica through year-round occupation of South Pole Station and two coastal stations for scientific research and environmental stewardship. The responsibility for implementing this policy was assigned to NSF in National Security Decision Memorandum 71 (July 1970) and reaffirmed in Presidential Decision Directive 6646 (February, 1982).

NSF’s ability to meet this responsibility has been compromised by the deteriorating condition of the two U.S. icebreakers capable of supporting this activity. The two Coast Guard “polar class” icebreakers are nearing the end of their design lifetimes and have not been well-maintained owing to lack of funds. As a consequence, their reliability has suffered. One has now been placed in caretaker status. NSF has had to contract for non-U.S. icebreakers in order to assure continued re-supply of McMurdo and South Pole Stations.

The NRC report and Dr. Jones, in her briefing, also stressed that climate change in the Arctic is likely to bring increased economic activity and more generally, greater human activity, all of which “will increase the need for the United States to assert a more active and influential presence in the Arctic....” Currently, U.S. presence in the Arctic Ocean is expressed almost completely by research expeditions aboard the Coast Guard cutter HEALY and supported by NSF and to a lesser extent, by NOAA through NSF. Should HEALY be called upon to support a potentially emerging range of additional national missions, the research community could lose access to this scientific frontier.

Against this background the NRC study motivates and provides important input to a future national policy review that would provide the framework for assuring the necessary icebreaker support for achieving key national goals in the Arctic and Antarctic over the long term, including those of the research community. NSF's icebreaking interests center on supporting fundamental research and maintaining the Antarctic research stations. The policy review would assess the full range of national interests in a capable U.S. icebreaker fleet and thus would elicit input from other federal agencies such as DOD, DOC, DOI, and DHS as well as the interests of Alaska residents, the research community and NSF and the Coast Guard. Dr. Jones strongly urged that a policy review be initiated at the earliest possible date.

The NRC committee concluded that "National interests in the polar regions require that the U.S. immediately program, budget, design, and construct two new polar icebreakers to be operated by the U.S. Coast Guard." It further recommended that "...the Coast Guard be provided [with] sufficient operations and maintenance budget to support an increased, regular, and influential presence in the Arctic."

The construction of new U.S. icebreakers would take perhaps eight to ten years after construction funds had been appropriated, and Dr. Jones noted that NSF will need to be creative during the interim in meeting the needs of the community it supports.

In the north even the most robust icebreakers have difficulty in accessing portions of the Arctic Ocean in winter, while scientific interest in this frontier has increased rapidly. This has led to a rapidly growing trend toward multi-ship expeditions, with ships from several countries participating and assisting each other in negotiating heavy ice regions.

In the south, because of concerns about the reliability of the Coast Guard polar class icebreakers NSF has chartered non-U.S. icebreakers during each of the last three years to assist in opening the ice channel that enables re-supply of McMurdo and South Pole Stations. Most recently NSF arranged with Sweden for the ODEN, a research icebreaker, to provide this assistance and arranged for scientific and educational activities aboard ship that involved U.S., Swedish and Chilean researchers and teachers. In the process, ODEN demonstrated the ability to open the supply channel through the ice working alone.

The advent of International Polar Year places extra emphasis on maintaining NSF's ability to provide leadership in polar regions research on behalf of the USG.

In view of these observations the Subcommittee on Polar Issues recommends:

- That the White House Office of Science and Technology Policy conduct a national policy review of the nation's needs for heavy icebreakers;
- That the NSF Director participate in that review;
- That the White House and the Congress decide how best to recapitalize, operate and maintain the Coast Guard icebreaker fleet, but that NSF be given responsibility only for meeting the needs of the research community in the most cost-effective, reliable manner;
- That NSF and the USCG work together to maintain POLAR SEA and HEALY in the interim;

- That NSF explore alternate short- and long-term options for securing USAP re-supply services in order to assess their potential cost-effectiveness and reliability;
- That NSF continue to work to develop durable partnerships with other countries on the basis of mutual scientific interest to augment U.S. capabilities for polar research and for meeting its responsibilities to the U. S. Antarctic Program.