

MEMORANDUM TO MEMBERS OF THE NATIONAL SCIENCE BOARD

SUBJECT: Summary Report of the November 30 – December 1, 2005 Meeting

The major actions of the National Science Board (NSB, the Board) at its 389th meeting on November 30 – December 1, 2005 and a preliminary summary of the proceedings are provided. This memorandum will be publicly available for any interested parties to review. A more comprehensive set of NSB meeting minutes will be posted on the Board's public Web site (<http://www.nsf.gov/nsb/>) following Board approval at the February 2006 meeting.

1. Major Actions of the Board (not in priority order):

- a. The Board approved the minutes of the Plenary Open Session (NSB-05-140) for the September 2005 meeting (http://www.nsf.gov/nsb/meetings/2005/0928/open_min.pdf). Minutes for the Plenary Executive Closed and Closed Sessions for the September 2005 meeting of the NSB were also approved.
- b. The Board approved the minutes of the NSB teleconference (NSB-05-157) held on November 22, 2005.
- c. The Board approved a resolution to close portions of the upcoming February 10, 2006 NSB meeting dealing with staff appointments; future budgets; pending proposals/awards for specific grants, contracts, or other arrangements; those portions dealing with specific Office of the Inspector General investigations and enforcement actions; and NSF participation in a civil or administrative action, proceeding, or arbitration (NSB-05-145) (Attachment 1).
- d. The Board authorized the Director, at his discretion, to renew the existing cooperative agreement with Associated Universities, Inc., for the management and operation of the National Radio Astronomy Observatory (NRAO), over the 42-month period April 1, 2006 - September 30, 2009. If any significant changes to the budget or activities of the NRAO would likely occur as a result of recommendations of the Senior Review, the NSB will be promptly informed and, if it deems necessary, concur in the contemplated changes.
 - a. The Board authorized the Director, at his discretion, to make an award to the Association of Universities for Research in Astronomy, Inc., for operation of the International Gemini Observatory for 60 months (FY 2006 through FY 2010).

- e. The Board approved the *National Science Board 2020 Vision for the National Science Foundation* (NSB-05-142), subject to final editing by the NSB Chairman, Dr. Warren Washington, and the Board lead for the development of this document, Dr. Kathryn Sullivan.
- c. The NSB Chairman announced the membership of the NSB Task Force on International Science with Dr. Jon Strauss, chair, and Drs. Dan Arvizu, Steven Beering, Ray Bowen, Alan Leshner, Jane Lubchenco, Diana Natalicio, Kathryn Sullivan, and Warren Washington as members.
- d. The Board approved a modification to the Board's process for electing the *ad hoc* Committee on Nominating for NSB Elections (Elections Committee) to allow the NSB Chairman to appoint Members to the Elections Committee for Executive Committee membership elections in odd-numbered years, or when one of the elected members of the Executive Committee is unable to complete his/her term of office.
- e. The NSB Chairman appointed the *ad hoc* Committee on Nominating for NSB Elections, with Dr. Douglas Randall, chair, and Drs. Alan Leshner and Jo Anne Vasquez as members. The committee will develop a list of candidates to fill the vacancy on the Executive Committee for a term ending in May 2007, created by the resignation of Dr. Delores Etter.
- f. The Board approved establishment of the Committee on Programs and Plans Task Force on Hurricane Science and Engineering (NSB-05-167) (Attachment 2). The NSB Chairman appointed Drs. Kelvin Droegemeier and Kenneth Ford, co-chairs, and Drs. Daniel Hastings, Elizabeth Hoffman, and Alan Leshner as members.
- g. The Board approved revised *Attendance Guidelines for the National Science Board and its Committees and other Subdivisions* (NSB-05-161) (Attachment 3).
- h. The Board approved *National Science Board Guidance for National Science Foundation Centers Programs* (NSB-05-166) (Attachment 4).
- i. The Board approved the transmittal letter and NSF management response to the Office of Inspector General, *Semiannual Report to the Congress*, September 2005.
- i. The Board concurred that the Advanced Technology Solar Telescope has attained Readiness Stage status by the appropriate process as described in *Setting Priorities for Large Research Facilities Projects Supported by the NSF* (NSB-05-77).
- k. The Board approved a letter from the NSB Chairman to the IBM Foundation President, commending the IBM Corporation for its efforts in addressing U.S. education in science, mathematics, engineering, and technology by enabling qualified employees to explore career changes to precollege teaching.

2. NSB Chairman's Report

Dr. Warren Washington, NSB Chairman, noted the 55th anniversary of the National Science Board and the National Science Foundation. On December 12, 1950, the National Science Board held its first meeting in the Cabinet Room of the White House with President Harry Truman. There they discussed the appointment of the NSF Director and budget for the NSF. As an independent Federal agency, NSF does not fall under a cabinet department. Instead, the agency's activities are guided by the National Science Board. The Board and the Foundation have shared a rich and productive relationship over this 55-year period.

Dr. Washington asked Dr. Michael Crosby, NSB Executive Officer, to provide an update on the NSB retreat, visit, meeting, and other NSB activities planned for February 2006 in Boulder, Colorado. Dr. Crosby summarized planned activities:

- Tuesday, February 7: NSB-sponsored Workshop on Hurricane Science and Engineering.
- Wednesday, February 8: Travel day.
- Thursday, February 9: Series of briefings from the National Center for Atmospheric Research; NSB Retreat; evening reception at the HIAPER aircraft hangar facility.
- Friday, February 10: Breakfast with the board, faculty, and students of the University of Colorado, Boulder; NSB committee meeting sessions and Plenary Sessions; second hearing on the NSB Education Commission.

At the September 2005 meeting, the Board approved the establishment of an NSB Task Force on International Science. Dr. Washington appointed Dr. Jon Strauss to chair the task force, with Drs. Dan Arvizu, Steven Beering, Ray Bowen, Alan Leshner, Jane Lubchenco, Diane Natalicio, Kathryn Sullivan, and Warren Washington as members.

The *ad hoc* Task Group on Vision for the NSF held a teleconference on November 22, 2005 to discuss a draft vision document and public comments. Dr. Kathryn Sullivan, task group leader, reported on the development of Vision document. After discussion, the Board approved the *National Science Board 2020 Vision for the National Science Foundation* ([NSB-05-142](#)), subject to final editing by the NSB Chairman and the task group leader.

3. NSF Director's Report

Dr. Arden Bement, NSF Director, announced the recipients of the Presidential Rank Awards to Senior Executive Service members who were selected for their strong leadership and consistent demonstrations of strength, integrity, industry, and a relentless commitment to public service: Dr. Jarvis Moyers, Division Director, Atmospheric Science received the Distinguished Executive Rank Award; Dr. Judith Sunley, Deputy Assistant Director, Mathematical and Physical Sciences received the Meritorious Executive Presidential Rank Award.

The NSF Director reported that the Chairman submitted, *Report of the National Science Board on the National Foundation's Merit Review System* ([NSB-05-119](#)), to Congress on September 30, 2005. The report acknowledged the efforts of the Board and NSF to ensure that NSF's merit review system remains an international gold standard for review of scientific and engineering research and educational proposals. The merit review system is at the core of NSF's success in identifying projects that advance the frontiers of science and engineering. Although the report was supportive of NSF's merit review system and use of expert judgment exercised by NSF

staff, the NSB recommended areas for continued process improvement. During FY 2006, NSF staff will focus on issues concerning the transparency and quality of the NSF merit review system.

Dr. Bement stated that on November 22, 2005, the President signed into law the Science, State, Justice, Commerce and Related Agencies (SSJC) Appropriations bill which contains NSF's 2006 appropriation. Total NSF funding for FY 2006 is \$5.6 billion – about \$165 million (3 percent) above FY 2005 and \$33 million (0.6 percent) above the FY 2006 request. This funding level reflects an across-the-board rescission of 0.28 percent (almost \$16 million) contained within the SSJC bill.

On November 8, 2005, Dr. Joseph Hennessey, Senior Advisor for the Office of Industrial Innovation, Directorate for Engineering, testified on behalf of NSF before the House Small Business Committee on the Small Business Innovation Research Program.

Dr. Bement reported that NSF sent a letter to the House and Senate Conferees on the NASA Authorization bill requesting that two provisions mentioning NSF be deleted from the bill. The first would allow design and development work for large projects to be funded out of the Major Research Equipment and Facility Construction (MREFC) account instead of the Research and Related Activities account. The second provision would require the Bureau of the Census to include an item on field of degree in the American Community Survey. In lieu of this latter provision, NSF will work with the Bureau of the Census to determine how best to meet the need to obtain regular information on field of degree. Since the last update, no new legislation having a significant impact on the National Science Foundation was identified.

4. NSB Committee Reports

a. Executive Committee (EC)

EC Open Session

The committee approved a recommendation from the NSB Chairman that the committee modify the Board's process for electing members of the *ad hoc* Committee on Nominating for NSB Elections (Elections Committee). The modification allows the NSB Chairman to appoint Members to the Elections Committee for EC membership elections in odd-numbered years or when one of the elected members of the EC is unable to complete his/her term of office. There is no change to the process for electing Elections Committee members for developing a slate of nominees for the Board Chair and Vice Chair. *[The full Board subsequently approved the modification of the NSB process for electing the ad hoc Committee on Nominating for NSB Elections.]*

The committee reviewed and discussed revised NSB meeting attendance guidelines. The revisions limit attendance in Executive Closed meetings to Board Members and Consultants, the NSB Executive Officer, and other staff as designated by the Board Chair or committee chair. The Deputy Director generally attends the Board's Executive Closed meetings except where the discussion involves Board Elections, Member proposals, or other especially sensitive matters at the discretion of the Board Chair or Committee Chair. The revisions also specify exemptions used to close an NSB meeting to make the guidelines more consistent with the statutory language

that allows for the closure. The revised guidelines make it clear that, by default, NSB meetings are open, as required by law, unless certain specific exemptions apply. *[The full Board subsequently approved the revised Attendance Guidelines for the National Science Board and its Committees and other Subdivisions (NSB-05-161) (Attachment 3).]*

Dr. Crosby updated the committee on the NSB retreat, visit, meeting, and other NSB activities planned for February 2006 in Boulder, Colorado.

EC Closed Session

Dr. Bement, EC chair, informed the committee on the status of several executive staff searches.

b. Committee on Audit and Oversight (A&O)

A&O Open Session

Dr. Christine Boesz, Inspector General, discussed the Office of the Inspector General (OIG) *Semiannual Report to the Congress*, September 2005. Dr. Fae Korsmo presented the NSF management response and data tables. The committee approved the draft transmittal letter and recommended that the full Board approve it. *[The full Board subsequently approved the transmittal letter.]*

KPMG Partner Dan Kovlak presented the results of NSF's FY 2005 financial statement audit. NSF received its eighth consecutive unqualified or "clean" opinion. The auditors found no material weaknesses but identified two reportable conditions. First, although the auditors believe NSF has made progress, improvements are still needed in the areas of grantee risk assessment and monitoring of high-risk awards ("high risk" in this context refers to the business risks of awards, not scientific frontiers). Second, contract monitoring was cited for deficiency pertaining to the adequacy with which NSF reviews quarterly expenditure reports submitted by contractors. No other significant issues emerged from the audit.

Mr. Thomas Cooley, Chief Financial Officer, commented on the financial statement audit, which is part of NSF's *FY 2005 Performance and Accountability Report*. He noted the importance of high quality post-award monitoring and the considerable effort and progress NSF has made towards the goal of being the "gold standard" in this area. In discussion, Board Members noted that balancing available resources is an important factor, as well as minimizing burden to awardees. Members observed that most awardees have additional accountability processes in place, including OMB-mandated A-133 audits, reviews by other agencies as well as state and institutional audits and reports.

Mr. Joseph Burt, Division Director, Human Resource Management, provided an update on the status of the NSF business analysis project, a comprehensive and integrated review and assessment of the agency's business processes, human capital, and information technology. The project began in July 2002 and is now scheduled to conclude in September 2006. During the last year, the business analysis accomplished important results for the Foundation, including:

- Options for reducing administrative workload on Program Officers and creating improved career paths for over 300 administrative staff in the program directorates;

- Initiation of a performance-focused approach to administration and management of the agency that integrates strategic planning and performance measurement, budget formulation and execution, and NSF's core business processes; and
- Progress on the development of NSF's enterprise architecture, which integrates NSF's future technology and information needs with the agency's business processes, people, strategy, performance and policy.

The business analysis has identified a very ambitious agenda again in FY 2006, and the committee looks forward to future updates on the very positive impact of this project on the Foundation.

Closed Session:

In closed session, OIG staff reviewed pending investigations.

c. Committee on Education and Human Resources (EHR)

Dr. Elizabeth Hoffman, EHR chair, invited Members to report on recent EHR-related activities.

Dr. Wayne Clough briefed the committee on the Innovation Summit he attended at the Georgia Institute of Technology on October 30 and 31, 2005. The Council on Competitiveness in cooperation with the Georgia Institute of Technology and the Georgia Research Alliance launched the first regional summit of the National Innovation Initiative at Georgia Institute of Technology. The Summit participants included CEO's, university presidents, and labor leaders to discuss how to promote innovation in the Southern region's economy, institutions and culture in the 21st century.

Dr. Jo Anne Vasquez briefed the committee on an NSF-sponsored workshop she attended at the National Academies on October 28 and 29, 2005. The workshop was the final one in a series held by the National Academies and NSF grantees of the Mathematics and Science Partnership (MSP) program through the National Research Council Center for Education and the National Science Resources Center (NSRC), an organization that assists MSP grantees. The series of MSP workshops were designed to support and encourage MSP grantees to implement evidence-based research in their individual projects. She observed that (1) frequent administrative turn-over leads to disconnects between MSPs and local districts, (2) teacher retirements result in loss of needed leadership, (3) release time is difficult to obtain, and (4) finding support after NSF funding terminates is a concern.

Dr. Daniel Hastings briefed the committee on the NSB "Workshop on Engineering Workforce Issues and Engineering Education: What are the Linkages?" held at MIT on October 20, 2005. He noted that engineering provides many exciting opportunities (nanotechnology, biotechnology, information technology) and offers challenges with large-scale systems for modern engineers. Major issues raised at the workshop include: how to produce value given cost discrepancies, how to attract and retain the best and brightest, how to produce a more technologically literate workforce, and how to address outsourcing. The workshop participants recognized that the engineers of the future need a new set of skills, and many institutions are introducing innovative approaches to inject new thinking in engineering education. Young people need to have a

positive perception of the engineering workplace and more opportunities for hands-on engagement.

Dr. Donald Thompson, Acting Assistant Director, Directorate for Education and Human Resources, provided a few examples of NSF investments in the integration of research and education projects that have worked well to establish meaningful collaborations and broaden participation. The committee found the presentation very informative and requested additional presentations from Dr. Thompson on the integration of research and education.

Dr. Steven Beering addressed the committee on progress made to date with the NSB Commission on 21st Century Education in Science, Mathematics and Technology. Three hearings are scheduled: December 7 in the Cannon House Office Building in Washington DC; February 10, 2006 at the University of Colorado, Boulder; and sometime in early March 2006 at the University of Southern California. Dr. Beering remarked on the enthusiastic response of the Congressional panelists for the December hearing, and gave a special note of thanks to the extraordinary support of Congressman Frank Wolf and the assistance of his staff in organizing the hearing. The February and March meetings will include an invitation to the public to address the Board directly with their concerns. This series of three hearings will provide the Board with expert advice on the establishment of an education commission.

At the September meeting, Dr. Vasquez identified an activity that IBM has established that provides financial support to selected employees to become mathematics and science teachers. The committee recommended that NSB send a letter to IBM management, encouraging them in this effort and approved a draft letter. [*The full Board subsequently approved transmission of the letter by the NSB Chairman.*]

Dr. Beering reported on the status of the *Science and Engineering Indicators* report. Dr. Hoffman thanked Drs. Beering and Washington, and the NSF staff for their hard work and dedication in preparing this important work for the Board.

d. EHR Subcommittee on Science and Engineering Indicators (SEI)

Dr. Beering, SEI chair, reported on the status of the *Science and Engineering Indicators* report. The final versions of all the Indicator chapters have been approved. Front matter for the Indicator volumes is being finalized. Final editing of the Companion Piece is in progress.

Dr. Pam Ebert Flattau, Institute for Defense Analysis, Science and Technology Policy Institute (STPI), made a presentation to the subcommittee on ideas and models for the future evolution of the Indicators report.

e. Committee on Programs and Plans (CPP)

CPP Open Session

Dr. Daniel Simberloff, CPP chair, called for status reports from several CPP task forces and task groups.

Dr. Nina Fedoroff, chair of the Task Force on Transformative Research (TR) reported that TR has reviewed the program for its second workshop, December 15, 2005 at the Santa Fe Institute, and discussed options for a third workshop.

Dr. Jon Strauss, chair of the Task Force on International Science, reported that the task force held its first meeting and discussed potential topic areas for the task force to address.

Dr. Kelvin Droegemeier summarized recent activities of the Hurricane Science and Engineering Task Group. This effort is intended to include discussion with and input from various appropriate agencies with a focus on fundamental research and engineering and identifying a specific role for NSF. The task group proposed three tentative dates for workshops and has developed questions to frame a first workshop on January 24, 2006. An ambitious timeline was proposed that would produce a draft report by August 2006 and a final report for NSB approval in September 2006. The committee approved a charge for establishment of a CPP Task Force on Hurricane Science and Engineering and recommended it to the full NSB. *[The full Board subsequently approved establishment of a CPP Task Force on Hurricane Science and Engineering (NSB-05-167) (Attachment 2).]*

Dr. Margaret Leinen reported to the committee on the linkages between the United Nations Millennium Ecosystem Assessment (MEA) report and NSF's environmental activities. She noted that the NSF environmental community was involved in the MEA effort and that NSF documents anticipated the findings of the MEA report. Dr. Leinen noted some gaps between the MEA report and NSF environmental research and education funding, and pointed out that NSF does not fund applied research, such as applied fisheries research, which is a feature of the MEA report. In response to Member questions regarding interagency coordination, Dr. Leinen described strong interagency connections through the Committee on Environment and Natural Resources at the National Science & Technology Council of the White House Office of Science and Technology Policy.

The committee considered several items related to major research facilities. At the last meeting, the Director informed the committee that the Advanced Solar Technology Telescope (ATST) had been advanced into the Readiness Stage. The committee reviewed the documentation provided at the last meeting and formally concurred that the ATST has achieved the Readiness Stage by an appropriate process. The committee discussed the recently released "Guidelines for Planning and Managing the Major Research Equipment and Facilities Construction (MREFC) Account." NSF presented a draft of Chapter 3 of the Cyberinfrastructure Vision document – "Data, Data Analysis & Visualization." The committee agreed to attempt to schedule a CPP teleconference in mid-December to provide comments on the chapter. The first two chapters are posted for public comment and the committee asked for information on comments received.

CPP Closed Session

The committee considered and recommended NSB approval of two awards:

- Renewal of the Cooperative Agreement for the Management and Operation of the National Radio Astronomy Observatory, Associated Universities Inc. (NSB-05-144), and
- Operation of the International Gemini Observatory, The Association of Universities for Research in Astronomy, Inc. (NSB-05-143).

[The full Board subsequently authorized the Director to take action on both awards.]

Two information items were presented to the committee in closed session: the National Center for Atmospheric Research (NCAR), and Atacama Large Millimeter Array (ALMA).

g. CPP Task Force on Transformative Research (TR)

Dr. Nina Fedoroff, TR chair, discussed the upcoming TR workshops. Dr. Crosby provided an overview of the forthcoming workshop at Santa Fe Institute, Santa Fe, New Mexico on December 16, 2005. The task force discussed a third workshop, which was tentatively scheduled for late spring that will focus on transformative research perspectives from non-government organizations, including industry and private foundations.

h. Committee on Strategy and Budget (CSB)

CSB Open Session

Dr. Ray Bowen, CSB chair, reported that NSF has started updating its Strategic Plan (FY 2003 – 2008) as required by the Government Performance and Results Act (GPRA). Dr. Kathie Olsen, Deputy Director, gave the committee an overview of the process and timeline. The Board's 2020 Vision report to Congress will serve as the basis for the new NSF Strategic Plan and NSF is already using a draft of the NSB Vision document to guide its strategic planning process. The committee will work with NSF to ensure that the Strategic Plan effectively implements the Board's Vision. As the Strategic Plan develops, NSF will provide drafts and meet regularly with CSB.

Dr. Bement gave the committee an overview of NSF's FY 2006 appropriations and conference report.

CSB Closed Session

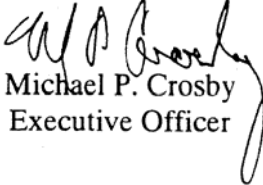
Dr. Bement discussed NSF's FY 2007 budget request.

i. CPP and CSB Joint Session

Dr. Nathaniel Pitts, Director NSF Office of Integrative Activities, responded to questions posed by the Board at the September 2005 meeting regarding centers and the NSF portfolio. NSF senior management recently reviewed the portfolio of NSF centers and determined that many items listed on the centers page of the NSF budget book did not meet the criteria for centers as originally considered by NSF and NSB. By rigorously applying "Principles of National Science Foundation Research Centers" to reclassify center-like projects in FY 2005, the percentage of center support in the Research and Related Activities (R&RA) account dropped from 8.3 percent under the former classification, to 5.5 percent under the reclassification. The principles are based on NSB criteria established in 1988 and emphasize adding value to research and education activities beyond what could be achieved through individual investigator awards. The reclassification has no budget impact on former centers. The committees approved a motion to forward *NSB Guidance for NSF Centers Programs* to NSB for approval, subject to final edits to be approved by the CSB, CPP, and NSB chairs.

[The full Board subsequently approved the guidance document (NSB-05-166) (Attachment 4).]

Mr. Thomas Cooley, Director, Office of Budget, Finance, and Award Management, and Chief Financial Officer, described NSF strategies to increase proposal success rates and discussed 10-year trends in proposal submissions, awards, and funding rates among institutional categories. The committees expressed concern about the tradeoffs of increasing the size of each award, and the associated reduction in the absolute number of awards and loss of researchers and students to the science and engineering workforce. Based on NSB interest, Dr. Olsen has initiated a thorough analysis of the various activities and policies in the different parts of the Foundation, and within the Office of the Director, for addressing proposal success rates. The director agreed that the analysis would include an estimate of the cost to NSF of issuing proposal solicitations, especially in situations with expectations of low funding rates, and consideration of issues related to the use of pre-proposals. The joint committees will withhold final decision on issuing NSB guidance until after Dr. Olsen has completed her work and reported to the committees at the March 2006 meeting. Board discussion of the award size, duration and proposal success rate will continue in March.



Michael P. Crosby
Executive Officer

- Attachment 1: [NSB-05-145](#)
- Attachment 2: [NSB-05-167](#)
- Attachment 3: [NSB-05-161](#)
- Attachment 4: [NSB-05-166](#)

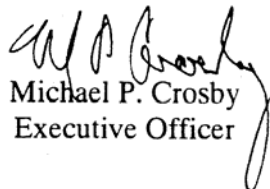
MEMORANDUM TO MEMBERS OF THE NATIONAL SCIENCE BOARD

SUBJECT: Closed Session Agenda Items for February 9-10, 2006 Meeting

The Government in the Sunshine Act requires formal action on closing portions of each Board meeting. The following are the closed session agenda items anticipated for the February 9-10, 2006 meeting.

1. Staff appointments
2. Future budgets
3. Grants and contracts
4. Specific Office of Inspector General investigations and enforcement actions
5. NSF participation in a civil or administrative action, proceeding, or arbitration

A proposed resolution and the General Counsel's certification for closing these portions of the meetings are attached for your consideration.


Michael P. Crosby
Executive Officer

Attachments

PROPOSED
RESOLUTION
TO CLOSE PORTIONS OF
390th MEETING
NATIONAL SCIENCE BOARD

RESOLVED: That the following portions of the meeting of the National Science Board (NSB) scheduled for February 9-10, 2006 shall be closed to the public.

1. Those portions having to do with discussions regarding nominees for appointments as National Science Board members and National Science Foundation (NSF) staff appointments, or with specific staffing or personnel issues involving identifiable individuals. An open meeting on these subjects would be likely to constitute a clearly unwarranted invasion of personal privacy.
2. Those portions having to do with budgets for a particular fiscal year not yet submitted by the President to the Congress.
3. Those portions having to do with proposals and awards for specific grants, contracts, or other arrangements. An open meeting on those portions would be likely to disclose personal information and constitute a clearly unwarranted invasion of privacy. It would also be likely to disclose research plans and other related information that are trade secrets, and commercial or financial information obtained from a person that are privileged or confidential. An open meeting would also prematurely disclose the position of the NSF on the proposals in question before final negotiations and any determination by the Director to make the awards and so would be likely to frustrate significantly the implementation of the proposed Foundation action.
4. Those portions having to do with specific Office of the Inspector General investigations and enforcement actions, or agency audit guidelines.
5. Those portions having to do with NSF participation in a civil or administrative action, proceeding, or arbitration.

The Board finds that any public interest in an open discussion of these items is outweighed by protection of the interests asserted for closing the items.

CERTIFICATE

It is my opinion that portions of the meeting of the National Science Board (NSB) or its subdivisions scheduled for February 9-10, 2006 having to do with nominees for appointments as NSB members and National Science Foundation (NSF) staff, or with specific staffing or personnel issues or actions, may properly be closed to the public under 5 U.S.C. § 552b(c) (2) and (6); those portions having to do with budgets for a particular fiscal year may properly be closed to the public under 5 U.S.C. § 552b(c) (3) and 42 U.S.C. 1863(k); those portions having to do with proposals and awards for specific grants, contracts, or other arrangements may properly be closed to the public under 5 U.S.C. § 552b(c) (4), (6), and (9) (B); those portions disclosure of which would risk the circumvention of a statute or agency regulation under 5 U.S.C. § 552b(c) (2); and those portions having to do with specific Office of the Inspector General investigations and enforcement actions may properly be closed to the public under 5 U.S.C. § 552b(c) (5), (7) and (10).



Lawrence Rudolph
General Counsel
National Science Foundation

**Committee on Programs and Plans
Charge to the Task Force on Hurricane Science and Engineering**

Statutory Basis

"The Board shall render to the President for submission to the Congress reports on specific, individual policy matters related to science and engineering and education in science engineering, as the Board, the President, or the Congress determines the need for such reports." (*42 U.S.C. Section 1863*) SEC. 4. (j) (2); and "...the Board shall establish the policies of the Foundation, within the framework of applicable national policies as set forth by the President and the Congress." (SEC. 4. (a))

Action Recommended

The National Science Board (NSB, the Board) should take action, in collaboration with NSF management and other organizations in the U.S. and abroad, to accomplish the following for hurricane related science and engineering research exclusive of operational decision making, organized civil response and human health issues: (a) summarize current activities, (b) identify gaps and opportunities, and (c) recommend priorities for action within a national agenda.

The Board will involve relevant Federal science agencies and appropriate organizations to produce a report and recommendations on hurricane science and engineering research for submission to the President and the Congress.

Background

The devastation resulting from hurricanes is significant and widespread, including but not limited to loss of life, dislocation and destruction of families, and economic consequences having national reach and lasting impact. Despite this enormous tragedy, it is important to note that severe, hurricane-related loss of life and property are by no means unique to this year. Given that 90 percent of the U.S. population lives within 200 miles of a coastline, and that the built infrastructure in these regions continues to expand, the U.S. increasingly is vulnerable to hurricanes. However, two important questions have never to our knowledge been adequately addressed: First, to what extent does the Nation understand the hurricane as an integrated science and engineering problem? Second, how can such understanding be used to improve the Nation's ability to predict, mitigate and react? The relevance of these questions transcends U.S. borders as numerous other nations routinely deal with hurricanes and typhoons.

It is appropriate for the National Science Board to engage a multi-agency, multi-disciplinary dialog aimed at answering elements of the questions posed above. This effort is intended to focus on the "hurricane problem" in a more holistic manner than employed to date. Physical, social, behavioral, economic, biological, ecological, information technology and other appropriate

sciences, as well as engineering (e.g., civil, environmental, mechanical) disciplines, will be considered as part of a truly integrative approach to address *deep fundamental science questions regarding hurricanes as natural disasters*. Given its national independent advisory role to the President and Congress, the Board is uniquely and ideally suited to framing this challenge and recommending a national agenda.

The need for understanding hurricanes in a broad context is made clear when one examines hurricane-related research conducted during the past decade. For the most part it has existed as a relatively modest, loosely coordinated enterprise that encompasses topics ranging from basic research in hurricane dynamics and atmospheric and hydrologic numerical prediction to human behavior and economic impacts. Although the quality of this research is quite high, much of it is performed within the boundaries of traditional disciplines whereas in reality, the hurricane is an exemplar multidisciplinary integrative problem.

Recent events have shown us that, although the U.S. possesses the most powerful research enterprise, the largest economy, and the most sophisticated societal infrastructure in the world, it remains notably vulnerable to natural hazards. Future land-falling hurricanes of tremendous destructive potential are inevitable. Thus, the research community owes to its fellow citizens – in this and future generations – a serious effort to maximize scientific understanding of hurricanes and ensure its effective application for the protection of life and property.

Objectives

The *ad hoc* Task Group on Hurricane Science and Engineering recommends that the Board approve the creation of a formal Task Force on Hurricane Science and Engineering (HSE) under the NSB Committee on Programs and Plans (CPP). The HSE Task Force will use a broad-based multi-disciplinary approach to summarize the current status of research relevant to understanding hurricanes as an integrated science and engineering problem. The task force will then develop recommendations to address the following issues and submit a report, through CPP, to the Board:

- Assess how increased understanding of hurricanes as natural disasters can be used to improve the Nation's ability to predict, mitigate, and react to future events.
- Recommend an integrative approach for addressing deep fundamental science questions regarding hurricanes as natural disasters.
- Recommend priorities for meeting critical research needs.
- Recommend an agenda for support of essential hurricane-related research within the Federal government and among research organizations.
- Identify a specific role for NSF to fill in addressing national needs for essential hurricane-related research.

Logistics

The HSE Task Force will convene a series of workshops to define the challenges, frame the issues, and recommend an agenda of appropriate depth and scope. Particularly important to this task will be coordination with mission agencies (especially the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, and the

military), which conduct basic and applied research as well as provide operational infrastructures, along with but not limited to the Office of Science and Technology Policy, the National Science and Technology Council, the President's Council of Advisors on Science and Technology, the National Academies and private enterprise. The series of workshops will be held during winter and spring 2006 to address the issues identified above. The NSB Office will serve as the focal point for coordination and implementation of all task force activities.

It is anticipated that the task force will produce a final report that synthesizes the contributions from its own deliberations, workshops, and working groups, and from the activities of numerous others that are engaging similar topics from largely agency or disciplinary points of view. The report will be produced and broadly distributed during 2006. Printed copies of a final NSB report will be widely distributed and available on the NSB Web site for the public, universities, the Congress, various special interest groups, and the broad scientific community. Briefings will be given as appropriate. The task force expects to conclude its activities during 2006.

Milestones

September 29, 2005 – NSB establishes *ad hoc* Task Group on Hurricane Science and Engineering (HSE) under CPP.

October/November 2005 – HSE Co-chairs and NSB Executive Officer contact appropriate agencies and organizations informing them of HSE and inviting collaborative participation to enhance HSE impacts and mitigate inefficient overlap of efforts.

November 30/December 1, 2005 – *ad hoc* Task Group reports to CPP on progress and recommends creation of Task Force with formal charge.

January-May 2006 – The task force organizes workshops and series of teleconferences.

August 2006 – Draft report to CPP.

September 2006 – Final report to the Board for approval.

National Science Board
Attendance Guidelines
for the National Science Board and its Committees and other Subdivisions

Summary of Attendance Guidelines

The Board meets in plenary session or as committees or other subdivisions. Board Members and Board Consultants¹ may attend any Board meeting (unless the NSF's Designated Agency Ethics Officer determines there is a conflict of interest) and there are no restrictions on the attendance by the general public at the Board's open meetings. Attendance is limited for the Board's closed Plenary, committee, or subdivision meetings, which are designated either as 'closed' or 'executive closed.'

Open Meetings – General public, media, and NSF staff are permitted to attend.

Closed Meetings – In addition to Board Members and Board Consultants, attendance is limited to NSF staff and others needed to support the meeting discussions, including the NSB Executive Officer, the Deputy Director, Inspector General, Assistant Directors and O/D Office Heads, any staff who have prepared presentations for the closed meeting or are expected to answer questions from Board or Committee members during the closed meeting, and other staff designated by the Board Chair or Committee Chair.

Executive Closed Meetings – In addition to Board Members and Board Consultants, attendance is limited to the NSB Executive Officer, and other staff only as designated by the Board Chair or Committee Chair. The Deputy Director generally attends the Board's *Executive Closed* meetings except where the discussion involves Board Elections, Member proposals, or other especially sensitive matters at the discretion of the Board Chair or Committee Chair.

Discussion of Attendance Guidelines

Open Meeting Attendance

Most of the Board's meetings are open to the public, media, and NSF staff. The Board invites the general public, the media, and NSF staff to attend its open meetings.

Closed Meeting Attendance

The Government in the Sunshine Act permits the Board to close any portion of any meeting if it properly determines that the portion of the meeting is likely to involve specific open meeting exemptions. The Sunshine Act describes procedures that must be followed when a meeting is closed and requires the public have access to transcripts from the closed meetings (with exempted material withheld). The Board has traditionally designated two types of closed sessions: regular *Closed Sessions* and *Executive Closed Sessions*. The scope of staff attendance depends significantly upon the degree of sensitivity of the matters being discussed.²

¹ Board Consultants in this context are outgoing Board Members and Presidential Appointees to the Board not yet confirmed by the Senate.

² For closed sessions, this must always include some individual responsible for creating the transcript or electronic recording of the closed meeting as required by section (f)(1) of the Sunshine Act.

1. *Closed Sessions* are primarily devoted to the Board's consideration of proposed grants and agreements. They may also involve discussions of the NSF budget for a particular fiscal year before submission of the President's budget to Congress for that fiscal year. Board Consultants, the NSB Executive Officer, the Deputy Director, Assistant Directors and Heads of O/D Offices, and the Inspector General may routinely attend the Closed Sessions of Board and Committee meetings, unless the Chair determines otherwise. NSF staff who prepared items to be discussed by the Board or its subdivisions should normally be present during the Closed Session to make presentations or to answer questions from the Board or Committee members,³ along with any other staff the Chair invites.⁴ Such staff may attend the entirety of the closed session unless informed otherwise. The Chair may admit or exclude NSF staff as appropriate.

2. *Executive Closed Sessions* normally include discussions involving Board or Executive Committee elections, hiring or other personnel matters involving identifiable individuals, and awards to specific individuals such as Bush or Waterman awardees where there is likely to be a clearly unwarranted invasion of personal privacy, and Board Member proposals to NSF. Plenary *Executive Closed Sessions* of the full Board are normally limited to NSB Members (including the Director) and Board Consultants, the NSB Executive Officer, other staff invited by the Chair, a "court reporter," and, unless instructed otherwise, an NSB staff assistant(s) for administrative support. *Executive Closed Sessions* of Board Committees or other subdivisions will normally include Board Members, Board Consultants, the NSB Executive Officer, the Committee's Executive Secretary(ies), other staff invited by the Chair, a "court reporter," and, unless instructed otherwise, an NSB staff assistant(s) for administrative support. The Deputy Director generally attends Plenary or committee *Executive Closed Sessions*, except where the discussion involves Board Elections, Member proposals, or other especially sensitive matters at the discretion of the Board Chair or Committee Chair.

Procedure

The decision on NSF staff attendance at closed NSB sessions lies with the Chair presiding over a closed meeting of the Board, its Committees, or other subdivisions.⁵ The Chairs' decisions, if they differ from the routine attendance guidance above, should normally be made before meetings to give staff adequate notice of permitted or required staff attendance. These decisions can, however, be made or changed during the course of the meeting either to permit additional input from staff, or to exclude staff as determined by the Chair.⁶

Once the agenda for a closed session is final, it is the responsibility of the NSB Executive Officer or Executive Secretary for that entity to discuss attendance with the Chair. The Chair should strive to make a determination sufficiently in advance of a meeting to permit notice to staff, normally through notation on the meeting agendas. When a closed meeting begins, the Chair, with the help of the NSB Executive

³ For proposed awards and agreements, this will normally include the Program Officer(s), the Division Director(s), and/or the Assistant Director(s). For future budgets, this may include appropriate staff from the Budget Office and/or the Office of Legislative and Public Affairs.

⁴ The Chair may have a standing list of invitees to meetings and/or determine those admitted by meeting, or even ad hoc by agenda item, as he or she deems appropriate. Staff in some instances could include NSF contractors, experts, or consultants.

⁵ The principles underlying the exemptions in the Government in the Sunshine Act should guide Chairs in making decisions about NSF staff attendance at closed meetings. Attendance at closed meetings may be limited as necessary to protect, e.g., personal privacy, future agency budgets, or ongoing investigations that may be discussed during a meeting. However, this will require balancing the Board's need for information, and for efficient and effective operation, with the need to protect confidentiality.

⁶ Where the Board or a subdivision is to discuss especially sensitive issues such as, e.g., a personnel matter involving an identifiable NSF employee, the Chair may restrict staff attendance to only those essential to the discussion, and in some instances to Board members only, provided there is a means of creating the transcript or electronic recording of the closed meeting as required by section (f)(1) of the Sunshine Act.

Officer or Secretary and such others as the Chair may ask, should monitor staff presence in accordance with the meeting agenda and the Chair's decisions.

In accordance with section (f) of the Sunshine Act, the agency shall maintain a transcript of each closed meeting. The Board staff, with the advice and assistance of the NSF General Counsel and staff, shall in accordance with section (f) of the Act and section 45 CFR 614.4 of NSF regulations make a copy of transcripts available to the public upon request with portions involving the Sunshine Act's open meeting exemptions withheld.

National Science Board Guidance for National Science Foundation Centers Programs

Introduction/Thesis

The National Science Foundation (NSF) is mandated with the broad responsibility that includes both the vitality of the basic research and education base in science and engineering as well as the utilization of science and engineering for the furtherance of national goals. To meet these ends, NSF must support a broad range and balance of alternative support strategies for the conduct and facilitation of research. In a constrained budgetary environment with intense and increasing competition for research dollars, the National Science Board (NSB, the Board) considers the importance of examining the relative balance within the NSF research portfolio, including NSF's investment in centers.

At the March 2005 Board meeting, Dr. Warren Washington, Chairman of the Board, asked the Committee on Programs and Plans and the Committee on Strategy and Budget to examine NSF's relative balance of center-like awards and smaller, more basic principal investigator (PI) oriented grants. At the May 2005 Board meeting, the Board received and discussed a report from NSF on the investment in centers along with other information. At the September 2005 Board meeting, the Director presented the results of a reexamination of the existing classification of awards categorized as NSF centers. Based on the existing Board guidance established in 1988, NSF substantially reduced the number of grants and agreements classified as "centers." This paper reflects the Board's view regarding NSF centers programs and has been prepared based on Board discussions.

The Board maintains that NSF's current investment in centers is appropriate. NSB strongly endorses the practice of recompetiting centers, to ensure the best use of NSF funds for supporting research at the frontiers of science and engineering. One of the critical requirements for centers is to demonstrate the "value added" nature of activities expected from investing in research and education through this mode of support; in other words, research that cannot be performed by single investigators or small groups. To ensure that each center is providing this value, investments in centers should be periodically reviewed by NSF to make certain that supported centers maintain the highest levels of excellence and have not evolved into activities that should be done by single or a small group of investigator grants. A second critical requirement is to ensure the education of a diverse set of students in substantive programs related to the center's research mission in order to provide for the next generation of U.S. researchers and to prepare them for a broad set of career paths. A final critical requirement is the effective management of centers through strategic planning and implementation of proven effective management practices. This management requirement applies to both the management at the centers and within the NSF.

Background

Definition of Centers

NSB (1988) defined a research center as: "an organized academic research activity that receives budgetary support from sources independent of departmental allocations; occupies space with access to university operated physical facilities and support services; is directed by an administrator drawn from faculty ranks; participates in the institution's educational function, but is not degree-granting; and is more than a facilitator of research."ⁱ However, NSB (1988) recognized that the NSF's funding modes are not discrete, but rather form a continuous spectrum of activities. But for the purposes of the 1988 study, the

modes of funding support were divided into three broad, albeit artificially constructed, categories: scientific research project, facility, and research center.

As part of the FY 2007 Office of Management and Budget budget formulation process, all directorates were asked to review programs reported as centers against the criteria outlined in *Principles of National Science Foundation Research Centers*ⁱⁱ. Those that did not meet the stated principles were recharacterized and funding was moved to the Fundamental Science and Engineering (FS&E) investment category. As a result of this reclassification process, center programs were characterized as representing investments that enable organizations to integrate ideas, tools, and people on scales that are large enough to significantly impact important S&E fields and cross-disciplinary areas. Centers exploit opportunities in science, engineering, and technology in which the complexity of the research problem or the resources needed to solve the problem require the advantages of scope, scale, change, duration, equipment, facilities, and students that can only be provided by an academic research center.

Rationale for Centers

NSB (1988) cited that the use of centers was increasing because centers epitomize the growing complexity, cost, and organization of modern research. A multitude of rationale to support centers exists and generally applies in different combinations for specific centers. The following reasons were listed by NSB in its 1988 report on centers:

- Exploit opportunities in science where the complexity of the research problem can benefit from the sustained interaction among disciplines and/or subdisciplines.
- Stimulate new directions and styles of inquiry in research including collaborative, cross-disciplinary, and interdisciplinary approaches.
- Provide experimental facilities, professional staff, technical support and services, and related infrastructure support.
- Conduct research that is impossible or unfeasible under traditional support, such as research on large systems, research centered on a major experimental capability, or research requiring extensive regional coordination.
- Assist education programs of the institutions including research training and exposure to multidisciplinary approaches.
- Enhance the visibility of activity to provide a focus for interactions with the academic communities, industrial interests, and national or local government agencies.
- Respond to an identified national concern or the furtherance of specific national goals and priorities.

Current Board Guidance on Centers

The 1988 NSB report on centers stated, “It is the conclusion of the National Science Board that there should be no numerical targets specified for funding by any of these modes [which cover a continuous spectrum ranging from individual investigators through groups to centers], but that the balance among them should be determined by the requirements of research and education in science and engineering in accord with the purposes specified in the National Science Foundation Act...”ⁱⁱⁱ The range of support for NSF centers, as defined in 1988, has been 8-12 percent of total NSF funding.^{iv}

As NSF defined centers in FY 2004, approximately 200 NSF centers accounted for 6.7 percent of the total NSF budget, and 8.5 percent of the Research and Related Activities (R&RA) account.^v This was a reduction from FY 2000, in which approximately 250 NSF centers accounted for 7.3 percent of the total budget, and 9.2 percent of the R&RA account.^{vi} Under the 2005 revised classification of centers, in FY 2004 there would have been approximately 84 NSF centers accounting for 4.2 percent of the total NSF budget, and 5.6 percent of the R&RA account.

New NSB Guidance

Portfolio Balance

NSF's investment in centers should be reported as both a percentage of the R&RA account and as a percentage of the total NSF budget, with the range of support for NSF centers being 6-8 percent of R&RA. However it is important to consider that the relative balance of funding for principal investigators, large facilities, and centers will vary considerably across disciplines.

Review Investment in Centers

The Foundation will periodically review the investment in centers to ensure that no center is being supported that has evolved into activities that could best be done by single/small group of investigator grants. To this end, centers programs (as opposed to individual centers) should be reviewed by the Board on a regular basis. While centers are an important part of the portfolio, they should not be created and supported without considerable justification on the part of NSF.

Endorse Practice of Recompensation

NSB reaffirms its endorsement of the practice of NSF recompeting centers. In 1997, the Board affirmed its "strong support for the principle that expiring awards are to be recompeted unless it is judged to be in the best interest of U.S. science and engineering not to do so."^{vii} Many, although not all, center awards are limited to a maximum duration – usually on the order of 10 years although subject to mid-course external peer reviews. After this time, the Board stated that continued funding requires success in open, merit-reviewed competition. Specifically regarding centers, the Board suggested that guidelines be established for the review and renewal of centers, to make the procedure as uniform and explicit as is practical. These procedures should also address the issue of phase-down of support for centers that are not renewed.^{viii}

Management Practices

Effective management of centers for successful research and education results is imperative to ensure the accountability of public investments. The Board endorses the implementation of proven management principles, including strategic planning, the use of strong cooperative agreements, and the commitment of ample resources for management both at the center and within the NSF.

ⁱ National Science Board (1988) *Report of the National Science Board Committee on Centers and Individual Investigator Awards*. February 1988. (NSB-88-35).

ⁱⁱ Senior Management Integration Group, June 21, 2005, *Principles of National Science Foundation Research Centers*.

ⁱⁱⁱ National Science Board (1988) *Report of the National Science Board Committee on Centers and Individual Investigator Awards*. February 1998. (NSB-88-35).

^{iv} "NSF Centers," presentation by Dr. Nathaniel Pitts, Joint Session of the Committee on Strategy and Budget and the Committee on Programs and Plans, May 25, 2005.

^v NSF Office of Budget, Finance, and Award Management. Background data on the portfolio balance of centers and individual investigator support provided for the May 2005 Board meeting.

^{vi} NSF Office of Budget, Finance, and Award Management. Background data on the portfolio balance of centers and individual investigator support provided for the May 2005 Board meeting.

^{vii} National Science Board, Resolution on *Competition, Recompensation and Renewal of NSF Awards*. (NSB-97-224).

^{viii} National Science Board, Statement on *Competition, Recompensation and Renewal of NSF Awards*. (NSB-97-216).