National Science Board

NSB-05-137
October 19, 2005

MEMORANDUM TO MEMBERS OF THE NATIONAL SCIENCE BOARD

SUBJECT: Summary Report of the September 28-29, 2005 Meeting

The major actions of the National Science Board (NSB, the Board) at its 388th meeting on September 28-29, 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 posed on the Board's public Web site (http://www.nsf.gov/nsb/) following Board approval at the November-December 2005 meeting.

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

a. The Board approved the minutes of the Plenary Open Session (NSB-05-105) for the August 2005 meeting (http://www.nsf.gov/nsb/meetings/2005/0805/open_min.pdf). Minutes for the Plenary Executive Closed and Closed Sessions for the August 2005 meeting of the NSB were also approved.

b. The Board approved a resolution to close portions of the upcoming November 30-December 1, 2005 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, or agency audit guidelines; and NSF participation in a civil or administrative action, proceeding, or arbitration (NSB-05-114) (Attachment 1).

c. The Board approved the issuance of a Request for Proposals (RFP) and the award of any resulting contract to be determined by competitive procurement for helicopter services to support the United States Antarctic Program.

d. The Board approved the process for establishing an NSB Commission on 21st Century Education in Science, Mathematics, and Technology (NSB-05-133) (Attachment 2).

e. The Board approved a report to Congress, *Report of the National Science Board on the National Science Foundation's Merit Review System* (NSB-05-119) (http://www.nsf.gov/nsb/documents/2005/0930/merit_review.pdf)

f. The Board approved a policy statement, *Respective Roles of NSF and OIG in the Settlement of Administrative Investigatory Matters* (NSB-05-132) (Attachment 3).

g. The Board approved a report, *America's Pressing Challenge – Building a Stronger Foundation,* A Companion Piece to *Science and Engineering Indicators 2006*, which will be released in 2006.

h. The Board approved the establishment of a Task Force on International Science, and approved the Charge to the Task Force on International Science (NSB-05-134) (Attachment 4).

i. The Board approved a recommendation by several Board Members to convene a series of workshops, drawing from key members of the research community and relevant Federal agencies, to examine the need for an integrated national effort to address major science questions related to hurricanes.

2. NSB Chairman's Report

Dr. Warren Washington, NSB Chairman, asked Dr. Michael Crosby, NSB Executive Officer, to report on the status of the Board's 2006 annual retreat, visit, and meeting at Boulder, Colorado on February 9-10, 2006. Dr. Crosby stated that he and the NSB Office staff are working on the logistics and agenda. Specifically, Dr. Crosby was in contact with the National Center for Atmospheric Research (NCAR) and the University Cooperation for Atmospheric Research (UCAR), which will be providing facilities for NSB activities. The 2-day event will include information briefings and tours of NCAR and UCAR, a closed retreat for Board Members, a meeting with students studying science and technology, and the Board's formal committee and plenary meetings.

A draft document on a process for establishing an NSB Commission on 21st Century Education in Science, Mathematics, and Technology was distributed to Board Members. At the request of Congress, the Board was asked to establish a Commission to examine science, math, and technology education in the U.S. and to advise Congress on the role of the NSF and the Federal Government in those areas. Dr. Washington asked Dr. Elizabeth Hoffman, chair of the NSB Education and Human Resources Committee, to report on that committee's discussion on the Commission. Dr. Hoffman stated that she and Drs. Washington and Crosby met with Members of the House and Senate to discuss priorities for this Commission. Following discussion, the Board approved the process for establishing an NSB Commission on 21st Century Education in Science, Mathematics, and Technology. (NSB-05-133) (Attachment 2) Dr. Steven Beering agreed to coordinate the first round of hearings from interested stakeholders before the Board finalizes a formal charge to the Commission.

Dr. Washington informed the Board that on September 6, 2005, the President announced his intention to nominate Dr. Delores Etter to be Assistant Secretary of the Navy for Research, Development, and Acquisition. Dr. Etter serves as a professor for the Electrical Engineering Department at the U.S. Naval Academy. Dr. Washington also recognized the accomplishments of

Dr. Dan Arvizu, whom *Science Spectrum* magazine named one of the "Most Important Hispanics in Technology in Government and Academia."

The Chairman reported that Board Members had expressed interest in having more discussion about the science and education projects and programs that NSF supports, as well as learning more about how each directorate operates and interacts with the external community. He asked Dr. Crosby to work with Dr. Kathie Olsen, NSF Deputy Director, and the assistant directors to structure periodic half-day briefings for the Board meeting that will take place the day before future Board meetings. Dr. Crosby will also be arranging periodic lunchtime briefings for Board Members, to focus on a single NSF directorate, and will look into having a few NSF-funded principal investigators and students display posters on their activities and research during Board receptions. A target date to begin these activities on a trial basis will be the November-December Board meeting.

3. NSF Director's Report

Dr. Arden Bement, NSF Director, introduced Dr. James P. Collins, Assistant Director, Biological Sciences (as of October 15, 2005); Dr. Adnan Akay, Director, Division of Civil and Mechanical Systems (as of July 1, 2005); and Dr. Ann Carlson, Office of the Director as a Senior Staff Associate for Policy and Planning (as of September 6, 2005).

Dr. Bement announced that NSF had once again been ranked the second best place to work in the Federal Government by the Partnership for Public Service and the American University's Institute for the Study of Public Policy Implementation. The rankings were based on the results of the 2004 Federal Human Capital Survey conducted by the Office of Personnel Management.

The Director reported that the entire staff at NSF was saddened by the devastation and suffering of the people in the areas affected by Hurricane Katrina on September 7, 2005. NSF issued a notice to presidents of universities, colleges, and other NSF awardee organizations, assuring them of NSF's support, flexibility, and willingness to assist in the transfer of awards for faculty and students who temporarily change institutions.

On September 15, 2005 the Senate passed the Commerce, Justice, and Science Appropriations bill that included FY 2006 funding for NSF.

NSF anticipated a Continuing Resolution through November 18, 2005, and worked with the Office of Management and Budget (OMB) and Appropriations Committee staff to minimize the inevitable disruptions of operations caused by Continuing Resolutions.

Under science and engineering legislation, Dr. Bement reported that two provisions in the Senate National Air and Space Administration (NASA) authorization bill would affect NSF. The first would allow NSF to include an item on the American Community Survey, which replaces the Census Bureau's decennial census. This item will ask individuals the field of their degree, and as such will allow NSF to gain insight into such things as the country of origin of science, engineering, mathematics and technology degree holders and to track their career patterns across time. The second provision was included at the request of supporters of the Giant Segmented

Mirror Telescope project. It would allow funds from the Major Research Equipment and Facilities Construction (MREFC) account to be used for preliminary design of large-scale projects.

4. NSB Committee Reports

a. Executive Committee (EC)

EC Open Session

Dr. Bement, EC chairman, reported on the update that Dr. Washington provided regarding the Board's congressional requirement of the NSF Authorization Act of 2002, Section 14. Dr. Washington informed EC that on September 9, 2005, he formally notified Congress that no delegation of MREFC authority was made by the Board during the last year. EC also heard an update on the plans for the 2006 NSB retreat, visit, and meeting in Boulder, Colorado, and a presentation on NSF sexual harassment policies.

EC Closed Session

In closed session, EC voted to bring a Member proposal before the Board for approval in the Plenary Executive Closed Session. *[The full Board subsequently approved the Member proposal.]* Dr. Bement also informed members of the committee on the status of several executive staff searches and future budget issues.

b. Audit and Oversight (A&O) Committee

A&O Open Session

The Committee discussed the most recent draft report of *Report of the National Science Board on the National Science Foundation's Merit Review System,* due to Congress this month. Considerable work had been done on this document, including a committee teleconference in mid-September. The report emphasizes the Board's full support of the current NSF system of merit review and its endorsement of the discretionary authority exercised by NSF's program officials. It also offers recommendations for enhancements to the system. The committee approved the document and recommended it for full Board approval, subject to additional edits. *[The report was subsequently approved by the full Board.]*

Dr. Delores Etter led a discussion of the draft 2020 Vision for NSF document with specific emphasis on the coverage of NSB's roles and responsibilities. Dr. Kathryn Sullivan will co-chair this effort with Dr. Etter to assure continuity, in the event that Dr. Etter's new appointment requires her to leave the Board before the work is completed. The chairman asked Dr. Ray Bowen to work with Dr. Sullivan to ensure that the next draft includes language that addresses the roles of the Board and the Director and accurately characterizes the Board consistent with statutory language.

The committee discussed and approved the September 29, 2005 draft of the "NSB Policy Statement on the Respective Roles of the NSF and OIG (Office of Inspector General) and in

the Settlement of Administrative Investigatory Matters." *[As recommended by the A&O Committee, the full Board approved the policy statement.]* (NSB-05-132) (Attachment 3) As part of that approval, the committee recommended that Dr. Washington implement one aspect of the policy by requesting Congress to provide NSF authority under the Program Fraud Civil Remedies Act. This would give NSF authority, comparable to other OIG Act agencies, to execute civil settlements under $150,000 that would otherwise need to be handled by the Department of Justice.

Mr. Thomas Cooley provided updates on the status of the financial statement audit, end of year spending, and NSF's work to meet new Government-wide internal control requirements. Mr. Dan Kovlak, KPMG, also noted that the financial statement audit was underway and on track.

Mr. William Harrison, a senior OIG audit manager, presented OIG FY 2006 Audit Plan. In the past, 48 percent of audits originate from either the law (e.g., the financial statement audit; audit of NSB's compliance with Sunshine Act), or requests from NSF and NSB (e.g., audits of polar contractors; specific high-risk awardees and technology centers). Other audits are initiated from OIG's own risk analysis. This year such audits include select issues related to merit review, and effort reporting among major universities. Audit resources would also be reserved for work related to NSF recovery programs to help in the Gulf Coast.

Closed Session:

The OIG briefed the committee about several ongoing investigations.

c. Education and Human Resources (EHR) Committee

The EHR Committee heard a presentation from Dr. Robert Lichter, Chairman of the Committee on Equal Opportunities in Science and Engineering (CEOSE). CEOSE was established by an act of Congress and reports to Congress biennially and decennially. CEOSE also provides advice to NSF on programs and activities, and broadening participation in scientific, engineering, professional, and technical fields.

Dr. Donald Thompson, Acting Assistant Director of the EHR Directorate, addressed current practices in integrating research and education in EHR, interactions and linkages with the NSF research directorates, tools for evaluating progress, and next steps for improvement of the integration of research and education.

The EHR committee discussed a process for undertaking a Commission on education. The process would include a series of public hearings to gather information on how to proceed. Dr. Steven Beering will lead the initial Board effort.

A draft statement on education issues that may be included in the Board's 2020 Vision for NSF was discussed. Members expressed concern that more emphasis is needed on preparing a well-educated citizenry and populace with broad scientific education.

Dr. G. Wayne Clough briefed the committee on the progress of the NSB "Workshop on Engineering Workforce Issues and Engineering Education: What are the Linkages?" to be

held on October 20, 2005 at the Massachusetts Institute of Technology.

The committee approved a motion by the Science and Engineering Indicators Subcommittee to transmit the draft Companion Piece to the full board for approval, subject to final edits by Drs. Washington and Beering. *[The full Board subsequently approved America's Pressing Challenge – Building a Stronger Foundation, a* Companion Piece *to Science and Engineering Indicators 2006.]*

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

The subcommittee agreed to make a motion to EHR that the National Science Board approve *America's Pressing Challenge – Building a Stronger Foundation,* a Companion Piece to *Science and Engineering Indicators 2006,* pending final edits approved by the chairs of NSB and SEI.

The subcommittee also heard a progress report on *Science and Education Indicators 2006.*

e. Committee on Programs and Plans (CPP)

CPP Open Session

Dr. Daniel Simberloff, CPP chairman, reported that the CPP Committee recommended that the Board approve the establishment of a formal Task Force on International Science under the Committee on Programs and Plans, and recommended that the Board approve the draft charge to the Task Force. *[The full Board subsequently approved the establishment of a Task Force on International Science, and a charge to the Task Force on International Science.]* (NSB-05-134) (Attachment 4)

The committee also approved a recommendation by several Board Members to convene a series of workshops, drawing from key members of the research community and relevant Federal agencies, to examine the current state of knowledge about hurricanes from multiple perspectives—as a physical, social, behavioral, and biological problem.

The committee announced the release of two reports: *Long-Lived Digital Data Collections: Enabling Research and Education in the 21st Century* (NSB-05-40) and the Joint NSB-NSF Management Report, *Setting Priorities for Large Research Facility Projects Supported by the NSF* (NSB-05-77). The committee acknowledged and thanked Dr. Michael Rossmann, Dr. Chris Greer, and Dr. Anita Jones, former Chair of CPP, for their efforts on the *Long-Lived Digital Data Collections* report. The committee also acknowledged Dr. Joseph Bordogna, former Deputy Director, and Dr. John Hunt for their hard work on the *Setting Priorities* document.

Dr. Simberloff announced that the NSF released the *National Science Foundation Facility Plan* for 2005, the next version will be released in March 2006. He noted that Dr. Bement brought to the committee's attention that the Advanced Technology Solar Telescope (ATST) had passed into the Readiness Stage.

The committee also discussed the annual timeline for integration of the NSB large facility process with the NSF budget process. A proposal by the Director to shift the annual re-

prioritization meeting from May to August every year was approved. Any changes in prioritization would be incorporated into NSF's annual budget submission to the Office of Management and Budget (OMB).

The committee was updated on the process for NSF to send information to CPP and NSB. The new process is a result of ongoing discussions between Dr. Crosby and Dr. Olsen. One of the changes would have NSF provide an annual calendar, updated quarterly, which estimates all NSB actions. The committee approved the new guidelines for sending information and actions to CPP and NSB.

Dr. Deborah Crawford, Acting Director, Office of Cyberinfrastructure (OCI) updated the committee on NSF's continuing cyberinfrastructure (CI) strategic planning efforts. The new draft of the CI vision document was posted for public comment. The High Performance Computing (HPC) acquisition solicitation will be released within days. NSF will submit the final chapters to the CI vision document to NSB in November and February with final chapters to the CI vision document.

CPP Closed Session

The committee discussed and approved the action item, Helicopter Services to Support the U.S. Antarctic Program resolution for issuance of a Request for Proposals (RFP) and the award of any resulting contract to be determined by competitive procurement for helicopter services to support the U.S. Antarctic Program (USAP). *[The full Board subsequently approved the Helicopter Services to Support the U.S. Antarctic Program resolution.]* (NSB-05-113)

f. CPP Subcommittee on Polar Issues (SOPI)

SOPI Open Session

Dr. John White, SOPI chairman, asked Dr. Karl Erb, Director of the Office of Polar Programs (OPP), to provide a fiscal update to SOPI on polar icebreaker issues. Dr. Erb noted that OPP secured a contract for use of the *Krasin* icebreaker in the upcoming Antarctic season. The *Polar Star* will be on stand-by and will be deployed on an as-needed basis. NSF is in the process of developing a response to lack of funding for icebreakers within the Coast Guard budget.

SOPI also heard informative presentations on two research projects: the Antarctic geological drilling program, ANDRILL; and a community collaboration project involving Oregon State University and the King Island Inupiaq community.

SOPI Closed Session

The focus of the closed discussion was an NSB action item on release of a RFP to obtain helicopter services for the USAP. The resolution was approved by SOPI (and CPP), and forwarded to the full Board for approval. *[The full Board subsequently approved the Helicopter Services to Support the U.S. Antarctic Program resolution.]* (NSB-05-113)

g. CPP Task Force on Transformative Research (TR)

Dr. Nina Fedoroff, TR chair, provided a brief overview of Workshop I that was held on August 12, 2005 at the National Science Foundation that focused on understanding transitional research programs at NSF. The task force discussed plans for Workshop II, which will focus on key factors in identifying transformative science. Workshop II will be held at the Santa Fe Institute, Santa Fe, New Mexico on December 16, 2005. A third workshop, which will focus on input from foundations and other non-Governmental organizations, was discussed and tentatively scheduled for early next year.

h. Committee on Strategy and Budget (CSB)

Dr. Ray Bowen, CSB chair, led discussions regarding CSB's input to the 2020 Vision for NSF document. He emphasized that it was important for the committee to factor in fiscal realities. Dr. Bowen announced that the committee would be holding a public teleconference on October 11, 2005 to provide committee members with an additional opportunity to discuss CSB's contribution to the 2020 Vision for NSF document.

Dr. Bement presented a report on the status of the NSF FY 2006 budget request to Congress. He stated that the Senate had passed language for the budget unchanged from committee language but no conference had been scheduled. He also noted that NSF is planning for a Continuing Resolution, under which to operate for at least 7 weeks.

CSB Closed Session

Dr. Bement provided the committee with the status of the FY 2007 budget submission to the OMB.

i. CPP and CSB Joint Session

The joint session of CSB and CPP examined the topic of NSF centers programs. Dr. Simberloff explained that draft NSB guidance for NSF centers programs had been revised since the August Board meeting to incorporate changes discussed at that meeting, including the following modifications: to present NSF's investment in centers as a percentage of the research and related activities (R&RA) account and of the total NSF budget; to reflect the new NSF definition of centers; and to include a statement that clearly states the NSB endorsement of the practice of NSF recompeting centers. The joint session agreed that occasional reclassification is part of a normal management process. The group agreed to revise the draft guidance based on discussion and review it again at the November-December meeting.

The joint session also discussed the draft NSB guidance for NSF average award size and duration, and proposal success rate. The draft guidance gives NSF flexibility by providing an exception to general NSB emphasis or increased average award size and duration, to accept raising proposal success rates as appropriate short-term priority. The importance of addressing the variation of average award size among directorates was raised and the joint session agreed to take this into account in the next version of the guidance.

In response to an earlier NSB request, the joint session heard an informative presentation from Mr. Vernon Ross, Chief of the Budget Operations and Systems Branch, NSF Budget Division. He analyzed 25 years of NSF records and reported that in FY 2004, nearly a third of principal investigators on research grants had been supported by NSF for 11 or more years.

Michael P. Crosby
Executive Officer

Attachment 1: NSB-05-114
Attachment 2: NSB-05-133
Attachment 3: NSB-05-132
Attachment 4: NSB-05-134

Attachment 1 to NSB-05-137

NSB-05-114
September 6, 2005

MEMORANDUM TO MEMBERS OF THE NATIONAL SCIENCE BOARD

SUBJECT: Closed Session Agenda Items for November 30-December 1, 2005 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 November 30-December 1, 2005 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
389th MEETING
NATIONAL SCIENCE BOARD

RESOLVED: That the following portions of the meeting of the National Science Board (NSB) scheduled for November 30-December 1, 2005 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 future budgets 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 November 30-December 1, 2005 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 future budgets 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

Attachment 2 to NSB-05-137

NSB-05-133
September 29, 2005

THE NATIONAL SCIENCE BOARD COMMISSION ON 21st CENTURY EDUCATION IN SCIENCE, MATHEMATICS AND TECHNOLOGY

PREAMBLE

There is a growing dependence on science and technology around the world, and a growing investment in science and engineering workforce skills by governments of both developed and developing economies. In the U.S., the Federal Government has a long history of support for science, mathematics and technology education for two fundamental purposes: to advance the individual in our democratic society through the acquisition of knowledge and skills useful in the labor market and for full participation in American life; and to advance the Nation's economy, national security, and quality of life through investment in national capabilities in science and engineering fields. As other governments have emulated successful U.S. strategies in science and engineering higher education, effective Federal strategies to support U.S. education in science, mathematics and technology have become more critical to sustaining our Nation's preeminence in science and technology.

The National Science Board (NSB, the Board) was established with the National Science Foundation (NSF, the Foundation) by Federal statute in 1950 and assigned two broad areas of responsibility: (1) establishing the policies for and guiding the Foundation; and (2) serving as an advisor to the President and Congress on issues in science and engineering research and education. As part of the latter role, in 1982 the NSB established The Commission on Pre-college Education in Mathematics, Science and Technology that provided a "plan of action ... directed toward the Nation's achieving world educational leadership (as measured by student achievement and participation levels and other non-subjective criteria) in mathematics, science and technology in elementary and secondary schools by the year 1995."[1] This report was coordinated with the 1983 report of the U.S. Department of Education's National Commission on Excellence in Education report, *A Nation At Risk*, which raised national concern about the quality of pre-college education. Despite these two reports from two decades ago, one sounding the alarm the other focused on recommended solutions, we continue to slip further behind.

Subsequent reports and statements from eminent bodies representing the broad range of national interests in science and technology literacy in U.S. society and skills in the U.S. workforce continued to sound alarms concerning the condition of K-12 and K-16 education in science and technology areas. These included the U.S. House of Representatives Science Policy Study, *Unlocking Our Future*, 1998; the National Science Board, *Preparing Our Children*, 1999; the National Commission on Mathematics and Science Teaching for the 21st Century report to the Secretary of the Department of Education (the "Glen Commission" report) *Before It's Too Late*, 2000; the Commission on National Security/21st Century, *Road Map for National Security—Imperative for Change*, 2001; and the President's Council of Advisors on Science and Technology, *Sustaining the Nation's Innovation Ecosystem: Maintaining the Strength of Our Science & Engineering Capabilities*, 2004; among others.

[1] September 12, 1983 cover letter from The National Science Board Commission on Pre-college Education in Mathematics, Science and Technology to Lewis M. Branscomb, Chairman, National Science Board, *Educating Americans for the 21st Century—A plan of action for improving mathematics, science and technology education for all American elementary and secondary students so that their achievement is the best in the world by 1995.*

However, the 21st century is upon us and questions continue as to why the goals, recommendations and strategies provided by over 20 years of study and reports are yet to be fulfilled. Not since the Soviet Union's launch of Sputnik satellite – 47 years ago – has the need to improve science and mathematics education in America been as clear and as urgent as it is today. The converging trends and stresses within our Nation's system for educating students in mathematics, science and technology are clearly documented in the soon to be published NSB Report, *Science and Engineering Indicators 2006*. The rise of high technology economies around the globe—both developed and developing—underscores the urgency of finding solutions to what appears to be the intractable problem of raising U.S. student achievement to world class levels. We are becoming increasingly aware that the U.S. performance in science, mathematics and technology is not merely an issue of financial and physical resources but also of cultural factors. Among the poorest and the most affluent alike, cultural factors inhibit student interest in acquiring the base of knowledge and skills necessary to achieve and excel in science, technology, engineering and mathematics (STEM) fields, even while growing demand for technical skills by U.S. employers is evidenced by the absorption of a large number of foreign-born and foreign-educated S&T workers and the growing phenomenon of outsourcing of S&T work to other countries.

During recent congressional hearings, the Board was asked to re-constitute its 1982-83 Commission. A number of spokespersons for the science and engineering education communities have also urged the Board to undertake an effort similar to the 1982-1983 Commission. Congressional Appropriations report language for FY 2006 stated that they strongly endorse the Board taking steps to "… establish a commission to make recommendations for NSF and Federal Government action to achieve measurable improvements in the Nation's science education at all levels", and "expects the Board to provide an interim report by September 30, 2005, on the establishment of the commission, and to report the commission's findings and recommendations to the Committee at the conclusion of the commission's work" (H.R. Report 109-118).

The National Science Board is, therefore, initiating the process for establishing an NSB Commission on 21st Century Education in Science, Mathematics and Technology to formulate a national strategy for implementing an effective long-term approach to the well-known problems and opportunities of U.S. K-16 STEM education. This strategy must place special emphasis on educational transition points—in pre-college education and between high school and college, and during the college career, with special focus on the role of community colleges in STEM education. As part of its charge, the Commission will be asked to explicitly call out the role for NSF in the context of the larger, national K-16 STEM education system.

To guide the development of a final charge to the Commission, the National Science Board will undertake a series of hearings involving all stakeholder groups, in diverse locations throughout the Nation. These hearings will include spokespersons for employers, school systems, parents, students, academe, State and local government, professional organizations, and Federal agencies and policymakers with an interest in STEM education and the workforce.

AUTHORITY

Under 42 U.S.C. 1862 (d): "The Board and Director shall recommend and encourage the pursuit of national policies for the promotion of…education in science and engineering." 42 U.S.C. 1863(h) authorizes the Board "to establish such special commissions as it may from time to time deem necessary for the purposes of this chapter." The NSB Commission on 21st Century Education in Science, Mathematics, and Technology is governed by the NSF Act of 1950, as amended, the Federal Advisory Committee Act and other current regulations, including conflict-of-interest regulations of the National Science Foundation and the Sunshine Act for meetings of the National Science Board.

POTENTIAL PURPOSE AND FUNCTION

The Commission will make recommendations to the Nation through the National Science Board for a bold new approach or approaches to address the Nation's needs, with specific emphasis on the role of the NSF in such approach or approaches. In doing so, it will be necessary to summarize the health of primary and secondary school science, mathematics and technology education in the U.S. and its interconnections in these fields with the higher education system, including community colleges; teacher education; and social and cultural factors. To carry out this mission, the Commission must develop an understanding of the roles and potential of groups, organizations and institutions in the process, including but not limited to: Federal, State and local government agencies; parents, teachers and students; colleges—including community colleges, universities, museums and other agents of formal and informal education outside the K-16 systems; industry; and professional, labor and public interest organizations and seek to assure their involvement and cooperation during the life of the Commission and concern for science education after the termination of the Commission.

In developing their recommendations, the Commission will determine how NSF can contribute to:

- Improving the quality of K-12 education related to both general and pre-professional training in mathematics, engineering and the sciences, including, but not limited to: the availability of competent teachers; the adequacy and currency of curricula, materials, and facilities; standards and trends in performance, as well as promotion, graduation and higher-education entrance requirements; and comparison with performance and procedures of other countries.

- Identifying critical aspects in the entry, selection, education and exploitation of the full range of potential talents, with special attention to transition points during the educational career where loss of students is greatest; and recommend means to assure the most effective education of all U.S. students as well as future scientists, engineers and other technical personnel.

- Improving mathematics and science programs, curricula, and pedagogy as a means of capitalizing on the Nation's investment in educational research and development; and appropriate models of exemplary education programs in other countries;

- Promulgating a set of principles, options and education strategies which can be employed by all concerned, nationwide, to improve the quality of secondary school mathematics and science education in the 21st Century, as an agenda for promoting American economic strength, national security, employment opportunities, and social progress that will support U.S. pre-eminence in discovery and innovation.

MEMBERSHIP AND STRUCTURE

The Commission on Education in Mathematics, Science, Engineering and Technology will consist of between twelve (12) and fifteen (15) members appointed by the Chairman of the National Science Board, in consultation with the full Board, the Executive Branch, Congress and other stakeholders, and who will include a representative of the pre-college system with in depth experience, such as a superintendent of a major school system. The NSB Chairman will designate a chairperson and vice chairperson from among the members. No more than three Commission members will be appointed from current Board membership. Commission members will be persons whose wisdom, knowledge, abilities, vision and national stature can promote an objective examination of mathematics, science and technology education in the K-16 system and develop a bold new national strategy for the 21st century.

A quorum of the commission will be a majority of its members.

Terms of service of members will end with the termination of the Commission.

Hearings on behalf of the Commission may be held by one or more members with the authorization of the chairperson.

The Commission may establish such working groups as it deems appropriate. Each working group may be composed of such individuals as the Commission deems appropriate, but at least one member of each working group shall be a member of the Commission. Each working group will be chaired by a Commission member. Standing committees will act under policies established by the Commission, in accordance with FACA and other applicable statutes and regulations. Each working group will present to the Commission findings and recommendations for consideration by the Commission. Timely notification of the establishment of a working group and any change therein, including its charge, membership and frequency of meetings will be made in writing to the Executive Secretary or his/her designee.

Management (including Executive Secretary and Designated Official) and staff services will be provided by the Board Office under the direct supervision of the Board's Executive Officer.

MEETINGS

The Commission will meet at the call of the chairperson, with advance approval of the National Science Board or the Designated Official, who will approve the agenda and will be present or represented at all meetings. Standing committees will meet as required at the call of their chairperson with the concurrence of the Commission chairperson. Meetings will be conducted, and records of proceedings will be kept, in accordance with applicable laws and regulations.

In accordance with the NSF Act and other applicable laws, Commission members and standing committee members not members of the Commission shall be entitled to compensation equal to that permitted in NSF Bulletin No. 00-13 for official business of the Commission. Their per diem and travel expenses will be paid in accordance to Federal Travel Regulations.

REPORTS

The Commission will develop an action plan that includes a plan for dissemination and outreach over the entire Commission process, with results to appear at 6-month intervals and a final set of findings and recommendations to coincide with an anticipated 18-month active life. The action plan will identify specific responsibilities of the Foundation, other Federal agencies, State government, local school districts, private foundations, business and industry, professional associations, scientific organization, and citizens interested in improving education in mathematics, science and technology for our Nation's children. In addition to its final report, which is expected 18 months from the initial meeting, the Commission will submit to the National Science Board periodic progress reports at a minimum of 6-month intervals.

Warren M. Washington
Chairman

Attachment 3 to NSB-05-137

NSB-05-132
September 29, 2005

National Science Board Policy Statement:
Respective Roles of NSF and OIG
in the Settlement of Administrative Investigatory Matters

The National Science Board (the Board) encourages the Office of Inspector General (OIG) of the National Science Foundation (NSF) and the management of NSF to continue cooperative efforts to resolve and bring closure to OIG investigations involving administrative settlement and/or compliance agreements in accordance with the statutory and fiduciary responsibilities of each. When OIG refers investigations to the Department of Justice (DOJ), and DOJ subsequently proposes the use of such settlement and/or compliance agreements, OIG will consult with NSF representatives on the investigative findings to-date and DOJ's proposed action. OIG will then discuss with DOJ the joint recommendations of OIG and NSF. Thereafter, NSF and OIG will work cooperatively to protect the interests of the government. Therefore, the Board establishes this as Board policy regarding the resolution of such matters. NSF and OIG are urged to collaboratively develop, and incorporate into appropriate internal guidance documents, written procedures that will govern the implementation of this policy statement.

The Board also recognizes that many OIG investigations uncover matters that, when presented by OIG to NSF, could be best resolved by NSF under the authority of the Program Fraud Civil Remedies Act (PFCRA) of 1986, 31 U.S.C. 3801, if NSF were included in that statute's provisions. The Board fully supports the past efforts that both OIG and NSF have undertaken to amend PFCRA to afford NSF the investigative resolution authorities provided other federal agencies. The Board will request that the Congress secure PFCRA authorities for NSF.

Attachment 4 to NSB-05-137

NSB-05-134
September 29, 2005

Charge to the Task Force on International Science

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)

Action Recommended
The National Science Board (NSB, the Board) will examine the role of the U.S. Government in international science and engineering in response to the changes that have occurred in recent years to the global dynamics for science and engineering (S&E) research, education, politics, and technical workforce.

Background
In September 2001, the Board released a report entitled, *Towards a More Effective Role for the U.S. Government in International Science and Engineering* (NSB-01-187). Many of the recommendations from this report remain valid, and are largely unfulfilled. Since the time this report was prepared, there have also been considerable shifts in the international landscape. These shifts, along with the unfulfilled recommendations of the 2001 report, warrant a careful reexamination of the role of the U.S. Government in international S&E to address the many changes that have occurred in the global S&E dynamics related to research, education, politics, and technical workforce.

Policy Objectives
The *ad hoc* Task Group on International Science recommends that the Board approve the creation of a formal Task Force on International Science under the Committee on Programs and Plans (CPP). The following issues will be analyzed and discussed before constructive policy recommendations are brought to CPP and the full Board:

- Facilitating partnerships between U.S. and non-U.S. scientists and engineers in the U.S.
- Facilitating partnerships between U.S. and non-U.S. scientists and engineers outside the U.S. in both developed and developing countries
- Utilization of (S&E) partnerships for improving relations between countries.
- Utilization of (S&E) partnerships for improving quality of life and environmental protection in developing countries.

The role of U.S. and international students will be considered throughout all task force activities. As the world of scientific research becomes increasingly global and intensely competitive, it is important to establish an environment for future generations of researchers to perform in a more "globally aware" manner. Future generations of researchers will need to be more cognizant of,

and be able to successfully address, the various international and cultural issues that may influence the development and implementation of S&E partnerships; issues which current generations have been fairly insulated. Even U.S. scientists who have been active internationally in the past, may not be fully aware of the complexity of functioning in a rapidly changing and highly competitive world because they have often been the lead or "controlling" entity in previous partnerships.

U.S. Federal agencies currently fund a wide range of international (S&E) partnerships that support both basic and applied research, with NSF programs seeking to ensure that U.S. institutions and scientists are globally engaged and able to more fully advance their research via international collaboration. The task force will examine the experiences of various U.S. Government supported international S&E partnership programs with respect to their effectiveness in furthering research advancements, and their experience in utilizing S&E partnerships as vehicles for achieving more than research advances (i.e., improved relationships between countries; capacity building; and environmental awareness). While particular interest will be on the level of inter-agency coordination, and more specifically the role of NSF in both facilitating and directly supporting (S&E) partnerships outside the U.S., the task force will also examine international S&E partnership activities as they interplay with science policy, foreign policy and domestic policy objectives.

The task force will consult with science officials from other agencies and around the world as well as representatives of both U.S. and international science communities, to better understand a wide range of perspectives on the role of government in supporting international S&E partnerships that specifically address the issues identified above. The task force will also interact with other Federal agencies to understand how they may or may not have utilized the findings and recommendations made in the Board's 2001 report on international S&E.

Logistics

The task force will seek to bring together NSB Members, members of the international scientific community, U.S. Federal agency representatives, and NSF staff (along with representatives from the NSF Advisory Committee for International Science and Engineering). The NSB Office will serve as the focal point for coordination and implementation of all task force activities.

A series of workshops will be held during 2005-2006 to address the issues identified above. In addition, the task force will convene such working groups, as it deems necessary to obtain relevant information. 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 present recommendations regarding the role of the U.S. Government in international S&E, with specific recommendations for NSF policy in supporting international science partnerships. 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. However, a regular and pro-active outreach effort to communicate task force activities will be implemented throughout the duration of the task force life. The task force expects to conclude its activities within 2 years from the date that formation of the task force is approved.