

## MEMORANDUM TO MEMBERS AND CONSULTANTS OF THE NATIONAL SCIENCE BOARD

**SUBJECT:** Summary Report of the December 13-14, 2011 Meeting

The major actions and approvals of the National Science Board (Board, NSB) and a preliminary summary of the proceedings at the Board's December 2011 meeting are provided. This memorandum is also made available for public review. The minutes of the Plenary Open Session for the December 2011 meeting will be posted on the Board's public Web site (<http://www.nsf.gov/nsb/>) following Board approval.

### 1. Major Actions and Approvals at the 423rd NSB Meeting (not in priority order):

- a. The Board approved a revised charge to the Committee on Programs and Plans (CPP), Task Force on Unsolicited Mid-Scale Research (MS) (NSB-10-59), which includes a revised timeline.
- b. The Board approved the Committee on Strategy and Budget (CSB), Subcommittee on Facilities (SCF) draft *Report to Congress on Mid-Scale Instrumentation at NSF* (NSB/CSB-11-25), subject to final edits approved by the SCF chairman, CSB chairman, and the Board Chairman.
- c. The Board approved the CSB Task Force on Data Policies (DP) draft report, *Digital Research Data Sharing and Management* (NSB/CSB-11-24), subject to final edits approved by the DP chairman, CSB chairman, and Board Chairman.
- d. The Board approved the Committee on Science and Engineering Indicators (SEI) motion to prepare a second Companion Piece to *Science and Engineering Indicators*, on the topic of state funding for public universities.
- e. The Board approved the Task Force on Merit Review draft report, *NSF's Merit Review Criteria: Review and Revisions* (NSB/MR-11-22), subject to final edits approved by the MR chairman and the Board Chairman.
- f. The Board Chairman discharged the *ad hoc* Committee on Nominations for the Class of 2012-2018 with thanks to Dr. Kelvin Droegemeier, chairman, and Drs. France Córdova, Carl Lineberger, Douglas Randall, and Bud Peterson, members.
- g. The Board approved the recipients for the 2012 Vannevar Bush Award and the 2012 NSB Public Service Awards. The names of the awardees will be revealed in a public announcement this spring.

- h. The Board approved the minutes of the Plenary Open Session for the September 13, 2011 meeting (NSB-11-70) <http://www.nsf.gov/nsb/meetings/2011/0913/minutes.pdf>. Also approved were the Board minutes for the Plenary Executive Closed Session for September 13, 2011 (NSB-11-69) as well as minutes for the Plenary Closed Sessions for July 2011 (NSB-11-55) and September 6, 2011 (NSB-11-65).

## 2. Board Chairman's Report

Dr. Ray Bowen, NSB Chairman, made the following announcements regarding a recent Board Member nomination and several confirmations:

- Dr. Bonnie Bassler was nominated by the President on October 20, 2011, and replaces Dr. Steven Beering, for the Class of 2016.
- Dr. Anneila Sargent was confirmed by the Senate on November 18, 2011 and replaces Dr. G. Wayne Clough, for the Class of 2016.
- Dr. Arnold Stancell was confirmed by the Senate on September 26, 2011, and replaces Dr. Barry Barish, for the Class of 2014.
- Dr. Claude Steele was confirmed by the Senate on November 18, 2011, and replaces Dr. Elizabeth Hoffman, also for the Class of 2014.
- Dr. Robert Zimmer was confirmed by the Senate on September 26, 2011 and replaces Dr. Jon Strauss, for the Class of 2016.

Dr. Bowen recognized the following Board Members who received recent honors.

- Dr. Mark Abbott received the 2011 Jim Gray eScience Award, which is presented to a researcher who has made an outstanding contribution to the field of data-intensive computing.
- Dr. Bonnie Bassler was named the 2012 Laureate for North America of the L'OREAL - UNESCO Awards "For Women in Science," which recognized five outstanding women researchers who have contributed to scientific progress.
- Dr. France Córdova was elected to a 3-year term as chairman of the Smithsonian Board of Regents. She will represent the Board of Regents in dealings with the Smithsonian Secretary and senior management.
- Dr. Louis Lanzerotti was selected as the 2011 American Geophysical Union William Bowie Medalist, which is awarded for "outstanding contributions to fundamental geophysics and for unselfish cooperation in research."

Additionally, Dr. Bowen recognized Dr. Richard Tapia, a Member of the Board from 1996 to 2002 and a Rice University mathematician who received the National Medal of Science from President Obama in October 2011.

Dr. Bowen welcomed a new member of the Board Office staff, Dr. Lisa Nichols, a AAAS Science and Technology Policy Fellow who is working on a number of STEM-related issues for the Board Office. Dr. Nichols earned a Ph.D. in Neuroscience from Purdue University.

Dr. Bowen discharged the *ad hoc* Committee on Nominations for the Class of 2012 – 2018. (See 1.f)

### **3. NSF Director's Report**

Dr. Subra Suresh, NSF Director, introduced the following NSF staff:

- Dr. John C. Wingfield, Assistant Director, Directorate for Biological Sciences (BIO) (as of September 6, 2011).
- Dr. Cynthia Dion-Schwarz, Deputy Assistant Director, Directorate for Computer and Information Science and Engineering (CISE) (as of August 28, 2011).
- Mr. Paul Perez, Director, Division of Administrative Services (DAS), Office of Information and Resource Management (OIRM) (as of August 14, 2011).

For the congressional update, Dr. Suresh reported that on December 1, 2011, Dr. Kelly Falkner, Deputy Director, Office of Polar Programs (OPP) testified on behalf of NSF before the House Committee on Transportation and Infrastructure's Subcommittee on Coast Guard and Maritime Transportation. The subject of the hearing was Protecting U.S. Sovereignty: Coast Guard Operations in the Arctic. Dr. Falkner discussed how NSF is meeting its icebreaking needs for research in the Arctic, as well as for research and operations of the U.S. Antarctic Program.

Since the September 2011 meeting, Congress passed the "mini-bus" on November 17, 2011 that included the NSF FY 2012 appropriations bill. The bill provided NSF with \$7.033 billion, a \$173 million, or 2.5 percent, increase above the FY 2011 enacted level. The bill also provided NSF the authority, for the first time, to transfer funds between Appropriation accounts such as Major Research Equipment and Facilities Construction (MREFC) or Agency Operations and Award Management (AOAM).

### **4. Board Committee Reports**

[Note: The Executive Committee (EC) did not meet in December 2011.]

#### **a. Committee on Audit and Oversight (A&O)**

In A&O Open Session, Ms. Allison Lerner, Inspector General (IG), presented an update on OIG's recent activities. Mr. Sal Ercolano of Clifton Gunderson LLP and Partner-in-Charge of the NSF financial statement audit, presented the results of his final report. The auditors gave NSF its 14th consecutive unqualified ("clean") opinion, and found no material weaknesses. However, although NSF had substantially corrected last year's one significant deficiency, Monitoring of Cost Reimbursement Contracts, a part relating to the manner in which the agency budgets and manages contingency costs, remains a concern. Regarding the Federal Information Security Management Act (FISMA) report on NSF's IT security program, Mr. Ercolano reported that no significant deficiencies were found.

Ms. Martha Rubenstein, NSF Chief Financial Officer (CFO), at the request of Dr. Bowen, gave a brief tutorial on the difference between risk-based contingency budgeting and actual expenditures of funds in accordance with the applicable cost principles. She noted that NSF disagrees with the auditors' conclusions on the Clifton Gunderson finding of a significant deficiency, but NSF will work to improve business practices. She also discussed progress on the new financial system, NSF membership on the new interagency Council on Financial Assistance Reform (COFAR) as well as the myriad of new Administration issuances that will require significant work by NSF on addressing cost efficiencies, American Recovery and Reinvestment Act (ARRA) spending acceleration, and oversight of conference expenditures.

Ms. Amy Northcutt, Chief Information Officer (CIO), announced that the Department of Homeland Security awarded NSF the 2011 Federal Cybersecurity Award for Best Security Posture for a Small Agency. Dr. Judy Sunley, Acting Chief Human Capital Officer, covered two items: the Staff Engagement, Education and Development (SEED) Program, and the new requirement that NSF develop a plan for diversity and inclusion in its workforce. Dr. Brett Baker, Assistant IG for Audit, presented the OIG's FY 2011 Audit Plan. Dr. Dedric Carter, the NSF Director's Senior Advisor for Strategic Initiatives, reported on NSF's Committee on Sensitive Information and Personally Identifiable Information.

In A&O Closed Session, the committee heard about the status of a pending procurement. The committee was also presented information about an ongoing OIG investigation.

#### **b. Committee on Education and Human Resources (CEH)**

The committee discussed some of the context that will inform development of NSF's strategic priorities for STEM education and education research, which is anticipated to be the major agenda topic of the February 2011 CEH meeting. Dr. Michael Feder, Policy Analyst, Office of Science and Technology Policy (OSTP), provided an update on activities of the National Science and Technology Council (NSTC) Committee on STEM Education (Co-STEM) and summarized key findings of their recent inventory of STEM education investments at 11 Federal agencies. A 5-year strategic framework for Federal STEM education investments, to be released by OSTP in February 2012, is expected to better define Federal agency roles and objectives. Dr. Joan Ferrini-Mundy, Assistant Director, Directorate for Education and Human Resources (EHR), and Dr. Timothy Killeen, Assistant Director, Directorate for Geosciences (GEO), provided additional comments about internal conversations underway regarding NSF's STEM education priorities. Dr. Douglas Clements, Distinguished Professor of Learning and Instruction, University of Buffalo, State University of New York (SUNY), presented some of his elementary math education research, including the steps for transitioning models to a large scale.

#### **c. Committee on Science and Engineering Indicators (SEI)**

*Science and Engineering Indicators 2012 (Indicators)* and the Digest are on schedule for the January 2012 release date. For this edition, *Indicators* and related products will have a QR code to enable access via mobile devices. An app that will enable people to access the state data tool is being developed for later release.

The committee will hold a teleconference to discuss its companion piece on how research and development fosters innovation and implications for the workforce. At the teleconference, the committee plans to finalize a draft and a title that it will then recommend for final Board approval.

The committee agreed to recommend that the Board approve preparation of an additional companion piece, which will deal with state funding for public research universities. Drs. Bowen, Córdoba, Droegemeier, and Benbow and Mr. Reilly volunteered to serve on an *ad hoc* group to develop this companion piece. *[The full Board subsequently approved the preparation of a second Companion Piece to Indicators.]* (See 1.d.)

The public release strategy for *Indicators* is being designed to generate sustained interest over a period of months in the various issues that *Indicators* data address. The strategy emphasizes outreach to state and local media and specialized business and education media, in addition to the traditional focus on “tier one” national media and the science press.

#### **d. Committee on Programs and Plans (CPP)**

In CPP Open Session, the committee discussed the next steps for the CPP Program Portfolio planning process. The CPP working group has continued to hold discussions with NSF staff during the last few meetings and anticipates finalizing the CY 2012 portfolio planning at the February 2012 meeting.

Drs. Patrick Haggerty and Renee Crain, both OPP Research Support and Logistics Managers, provided an update on Polar contracts. Dr. Haggerty told the committee about the new contract that was awarded in September 2011, and Dr. Crain provided an update about some of the Polar research in Greenland.

Dr. Mark Coles, Deputy Director, Large Facilities Office, led a discussion on the actions of the Business and Operations Advisory Committee (BOAC) Subcommittee on Recompetition of NSF Facilities. NSF currently is working to develop an implementation strategy that addresses the Board’s recompetition policy. BOAC is expected to provide a set of recommendations for the strategy and will engage in discussions with NSF during the first quarter of 2012, after which a report will be provided to NSF and then made public. NSF will report back on the implementation strategy at an upcoming Board meeting.

Mr. Alan Blatecky, Director, Office of Cyberinfrastructure (OCI), led a discussion on NSF’s High Performance Computing (HPC) Strategy. Several other NSF Assistant Directors (ADs) also participated, including: Dr. Ferrini-Mundy, EHR; Dr. Myron Gutmann, Directorate for Social, Behavioral, and Economic Sciences (SBE); Dr. Farnam Jahanian, CISE; Dr. Joann Roskoski, BIO; and Dr. Edward Seidel, Directorate for Mathematical and Physical Sciences (MPS). Mr. Blatecky also provided comments from Dr. Killeen, GEO. The ADs provided an overview of the big issues for NSF in the HPC field, as well as details relevant to their own directorates.

Dr. Roskoski and Dr. Jane Silverthorne, Acting Division Director, BIO Integrative Organismal Systems, presented an update on changes to the process in receipt of proposals. Dr. Silverthorne told the committee about measures that BIO has taken to manage an ever-increasing workload, including requiring pre-proposals and extending the length of the proposal cycle. They anticipate this will lessen the burden of reviewing proposals for the scientific community as well.

In CPP Closed Session, the committee considered one action item and decided to defer action until the February 2012 meeting.

### CPP Subcommittee on Polar Issues (SOPI)

Dr. Karl Erb, OPP Director, provided an update on the U.S. Antarctic Program Blue Ribbon Panel. Panel review activities are underway, and they expect to brief the Board on preliminary findings this spring. Dr. Erb also briefed SOPI on other items, including a draft Memorandum of Understanding between the U.S. and the Russian Federation for cooperation in Antarctica, interagency research programs in development by the Interagency Arctic Policy Coordinating Committee chaired by Dr. Suresh, and hosting of a Norwegian Delegation at the Amundsen-Scott South Pole Station to commemorate the 100th anniversary of Amundsen reaching the South Pole.

Dr. George Blaisdell, Operations Manager, OPP Antarctic Infrastructure and Logistics, gave an update on icebreaker support for this year, which is being provided by a commercial shipping company. Dr. Erb presented the long-term plan for icebreaker support. NSF has a firm contract with options for service through 2014 under the current icebreaker support contract and then plans to use the U.S. Coast Guard *Polar Star*, which is scheduled for a refit completion in 2013. There is ongoing discussion between OPP, Congress, and the White House regarding a longer-term solution, and NSF's position is that the agency is uncomfortable with relying on non-U.S. sources to support such a critical point in the supply chain. The Board discussed the importance of a clear long-term icebreaker support strategy and agreed to send a letter to the Blue Ribbon Panel emphasizing this.

### CPP Task Force on Unsolicited Mid-Scale Research (MS)

The Science and Technology Policy Institute (STPI) provided an update on their analysis of 10 years worth of NSF data. They focused on how much mid-scale research NSF funds and if the funding is solicited or unsolicited. They found that over the past decade, 4-10 percent of awards were mid-scale research awards and this represented about 19-28 percent of funding, depending on the directorate. Board Members provided important feedback, and the task force agreed to continue to work with each directorate/office to refine the data further. When the analysis is complete, it will form an appendix in the final report. The task force also discussed the revised report outline. Board Members provided useful feedback on both high level issues and specific details for the report. Also, the task force provided an update on the customer satisfaction survey, which is targeted to both researchers and vice presidents for research of about 125 NSF-funded institutions. The analysis of the survey data will be completed by the end of January 2012 and will help inform the final report of the task force. Finally, CPP approved a minor revision to the timeline within the task force charge. *[The full Board subsequently approved the revised MS charge.]* (See 1.a.)

### **e. Committee on Strategy and Budget (CSB)**

In CSB Open Session, the committee heard Dr. Suresh's update on the NSF FY 2012 budget, noting a 2.5 percent increase over the FY 2011 enacted level for the agency. Dr. Sally Rockey, Deputy Director for Extramural Research and Director of Office of Extramural Research for the National Institutes of Health (NIH), visited with CSB to talk about NIH strategic planning in challenging budget times. Dr. Stephen Meacham, Senior Staff Associate, Office of Integrated Activities (OIA), presented the NSF Merit Review Working Group activities.

In CSB Closed Session, Dr. Suresh, presented information to CSB on the development of the transfer authority provided through the FY 2012 budget appropriation and the FY 2013 budget. CSB also discussed with NSF management policies and planning for budget processes for FY 2013, 2014 and outyears.

CSB Subcommittee on Facilities (SCF)

In SCF Open Session, the subcommittee discussed plans for the upcoming SCF meetings in February and May 2012 and how it could build on the information it learned from its work on the *Report to Congress on Mid-Scale Instrumentation at NSF*, which was approved by CSB. *[The full Board subsequently approved this report.]* (See 1.b.) SCF will also hear the NSF Facility Plan at the February 2012 meeting and any issues related to the FY 2013 budget request. The annual portfolio review will take place at the May 2012 meeting.

In SCF Closed Session, the subcommittee approved minutes from its July 2011 closed meeting.

CSB Task Force on Data Policies (DP)

The task force discussed the report *Digital Research Data Sharing and Management* that DP and CSB approved during a December 9 teleconference. *[The full Board subsequently approved this report.]* (See 1.c.) The report will be posted on the NSB Web site for public comment. Also, the task force heard an update from NSF on its data management efforts and discussed potential next steps.

**f. Task Force on Merit Review (MR)**

The main item on the MR agenda was the discussion and approval of the task force's final report on their review and revision of the merit review criteria. Dr. John Bruer, MR chairman, provided a summary of the process that the MR used to conduct their review of the criteria, including the identification of key issues and the development of a strategy to obtain input from key stakeholder groups and data from other relevant sources. He then described some of the major observations that emerged from the analyses of the data and the major conclusions of the report. Dr. Bruer concluded his presentation by describing the guiding principles MR developed to clarify the intent of the review criteria, and the common set of review elements that should be used in the review of both criteria. *[The full Board subsequently approved this report.]* (See 1.e.)

*[signed]*  
Michael L. Van Woert  
Executive Officer