

MEMORANDUM TO MEMBERS AND CONSULTANTS OF THE NATIONAL SCIENCE BOARD

SUBJECT: Summary Report of the February 20-21, 2013 Meeting

The major actions and approvals of the National Science Board (Board, NSB) and a preliminary summary of the proceedings at the Board's February 20-21, 2013 meeting are provided. This memorandum is also made available for public review. The minutes of the Plenary Open Session for the February 2013 meeting will be posted on the Board's public Web site (<http://www.nsf.gov/nsb/>) following Board approval. The archived webcast of the meeting is located at the following URL: <http://www.tvworldwide.com/events/nsf/130220/>.

1. Major Actions and Approvals at the 430th NSB Meeting (not in priority order):

- a. The Board authorized the Director, at his discretion, to make an award to the National Ecological Observatory Network, Inc. for initial operations of the National Ecological Observatory Network (NEON) (NSB-13-7).
- b. The Board authorized the Deputy Director, at her discretion, to fund *Sustained-Petascale in Action: Blue Waters Enabling Transformative Science and Engineering* (NSB-13-8).
- c. The Board approved the recipient for the 2013 Alan T. Waterman Award. The name of the awardee will be revealed in a public announcement this spring.
- d. The Chairman announced that the next annual site visit will be held in Seattle, Washington on September 19-20, 2013.
- e. The Board Chairman established the *ad hoc* Committee on Nominating for NSB Elections (Elections Committee) with Dr. Douglas Randall, chairman, and Members Drs. Esin Gulari and Arnold Stancell.
- f. The Board approved the minutes of the Plenary Open Session (NSB-12-66) for the December 2012 meeting (<http://www.nsf.gov/nsb/meetings/2012/1204/minutes.pdf>). Also approved were the minutes for the Plenary Executive Closed Session (NSB-12-64) and the Plenary Closed Session (NSB-12-65) held in December 2012.

[signed]
Michael L. Van Woert
Executive Officer

2. Board Chairman's Introduction and Report

Dr. Dan Arvizu, NSB Chairman, congratulated Dr. Subra Suresh, NSF Director, on his appointment as Carnegie Mellon University's ninth President effective July 1, 2013. Dr. Suresh will step down from his current role as NSF Director at the end of March 2013. The Chairman thanked Dr. Suresh for his vision and leadership of NSF during the past 2 years, and wished him success at his future post. On behalf of the Board, Dr. Arvizu presented Dr. Suresh with a plaque and letter of appreciation.

The Chairman reported that a final letter was sent to the Office of Science and Technology Policy (OSTP) on February 15, 2013 on scientific communication and travel restrictions. Since the December 2012 meeting, the letter was revised to include updated information on travel reductions and more specific examples of how travel budget restrictions create difficulties for the agency. (Attached)

There will be two vacancies on the Executive Committee in May 2013 as the terms for Drs. Carl Lineberger and Diane Souvaine end. Dr. Arvizu established the *ad hoc* Committee on Nominating for NSB Elections (Elections Committee), and appointed Dr. Randall as chairman, and Drs. Gulari and Stancell as members. The Elections Committee will prepare a slate of candidates for consideration and election at the May 2013 meeting for two 2-year terms from 2013 to 2015.

In the Plenary Executive Closed Session, the Board approved the recipient for the 2013 Alan T. Waterman Award (see 1.c.). Board also reviewed and discussed proposed sites for the 2013 Board off-site visit, which is slated for September 19-20, 2013. The Board agreed to hold its off-site visit in Seattle, Washington (see 1.d.). The Board Office will begin to make appropriate arrangements.

Dr. Arvizu made the following announcements regarding Board Office staff: Ms. Betty Wong, Program Analyst, left the agency on December 28, 2012 to work as a Program and Management Analyst with the Federal Housing Finance Agency, Office of Inspector General, after 26 years at NSF. Also on December 28, 2012, Ms. Kim Silverman, a Science Policy Analyst with the Board Office, began a Brookings Institute Congressional Fellowship for 1 year.

3. NSF Director's Report

At the request of the Chairman, Dr. Suresh presented information on NSF's implementation of the recommendations in the Board's December 2011 report, *National Science Foundation's Merit Review Criteria, Review and Revisions* ([NSB-11-86](#)).

Dr. Suresh thanked Ms. Jean Feldman, Head of the Policy Office in the Division of Institution and Award Support, and her staff who led the Merit Review Criteria implementation working group. Dr. Suresh also thanked Dr. Joanne Tornow for her efforts in support of this activity. Staff has conducted a variety of internal and external communications and outreach activities in an effort to inform both NSF staff and the community about these changes. NSF will continue to monitor usage of the revised criteria and make adjustments to the outreach and resource materials as needed to assist the community in using these criteria most effectively.

Dr. Suresh announced the following NSF staff changes:

- Dr. Pramod P. Khargonekar was appointed Assistant Director, Directorate for Engineering (ENG) effective March 2013.
- Dr. Roger M. Wakimoto will be appointed Assistant Director, Directorate for Geosciences (GEO) effective February 25, 2013.
- Dr. Mary Galvin-Donoghue was appointed Division Director, Division of Materials Research, Directorate for Mathematical and Physical Sciences on January 13, 2013.
- Mr. John Gawalt was appointed Division Director, National Center for Science and Engineering Statistics (NCSES), Directorate for Social, Behavioral, and Economic Sciences (SBE) on December 16, 2012.
- Dr. Wendy Harrison was appointed Division Director, Division of Earth Sciences, GEO on August 27, 2012.
- Dr. Susan Singer was appointed Division Director, Division of Undergraduate Education, Directorate for Education and Human Resources (EHR) on January 29, 2013.

Dr. Suresh informed the Board that if Congress does not act by March 1, 2013, the President will issue a sequestration order. Agencies will have 30 days to submit their new operating plans to Congress. For NSF this would mean across-the-board reductions in budgetary resources (both discretionary and mandatory accounts) of approximately 5% compared to FY 2012. During this 30-day period, Congress must also act on the FY 2013 Continuing Resolution (CR), which is set to expire on March 27, 2013. Dr. Suresh reminded the Board that Congress acted in January to temporarily raise the debt ceiling, but only through May 2013, and this may have ramifications for the budget negotiations. The FY 2014 budget request to Congress is expected in mid to late March, and testimony is being scheduled for late March.

Dr. Suresh stated that the House and Senate appropriations and authorization committees recently completed organizing and announced several changes to chairman and ranking members:

- House Science, Space, and Technology Committee: New chairman, Lamar Smith (R-TX), replaces Ralph Hall (R-TX) who was term limited but remains on the committee; Eddie Bernice Johnson (D-TX) remains ranking member.
- Subcommittee on Research: New chairman, Larry Bucshon (R-IN), replaces Mo Brooks (R-AL) who remains on the subcommittee; Dan Lipinski (D-IL) remains ranking member.
- House Appropriations Subcommittee on Commerce, Justice, Science (CJS): No changes
- Senate Appropriations Subcommittee on Commerce, Justice, Science (CJS): Barbara Mikulski (D-MD) will remain chair. Richard Shelby (R-AL) returns as ranking member following Kay Bailey Hutchison's (R-TX) retirement.
- Senate Committee on Commerce, Science, and Transportation: Jay Rockefeller (D-WV) remains chairman until his retirement at the end of 2014. John Thune (R-SD) takes over as ranking member for Kay Bailey Hutchison.
- Subcommittee on Science and Space: Bill Nelson (D-FL) remains chairman; new ranking member, Ted Cruz (R-TX), replaces Senator John Boozman (R-AR) who is no longer on the committee.
- Senate Committee on Health, Education, Labor, and Pensions (HELP): Tom Harkin (D-IA) remains chairman; Lamar Alexander (R-TN) takes over as ranking member, replacing Mike Enzi (R-WY) who remains on the committee.

4. Board Committee Reports

[Note: The Executive Committee (EC) did not meet at the February 2013 Board meeting.]

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

In A&O Open Session, Ms. Allison Lerner, NSF Inspector General (IG), gave a brief orientation to new Board Members. She also noted that she will testify twice to Congress over the next three weeks on NSF's management challenges. A public webinar about the Office of Inspector General (OIG) use of data analytics in OIG's audits is planned for April 16, 2013. An audit of the NSB's compliance with the Sunshine Act was just completed; results show that the Board Office has substantially complied. She announced that Deputy IG, Mr. Thomas "Tim" Cross, will retire from Federal service in May 2013. Chief Financial Officer Ms. Martha "Marty" Rubenstein also gave an update on NSF business and operations in the context of appropriations uncertainties. The committee took initial steps towards updating the committee's charge.

During the Closed Session of A&O, the committee discussed FY 2014 planning.

b. Committee on Education and Human Resources (CEH)

The primary purpose of the CEH meeting was to begin the process of identifying one or two topic areas related to science, technology, engineering, and mathematics (STEM) education and workforce development that are high priority focus areas for the committee for the next 1-2 years. The agenda focused on two main topic areas: (1) issues related to graduate STEM education and (2) issues related to undergraduate STEM education.

Dr. Richard Linton, the Council of Graduate Schools/NSF Dean-in-Residence began a discussion on the topic of modernization of graduate STEM education. Dr. Linton provided an overview on the state of graduate education in STEM. Dr. Linton indicated that NSF has launched a Year of Dialogue on STEM Graduate Education and invited the Board to become involved.

The discussion on undergraduate STEM education began with comments from Dr. Susan Singer, Division Director, Undergraduate Education, EHR, and Dr. Judith Verbeke, Acting Division Director, Biological Infrastructure, Directorate for Biological Sciences (BIO). Dr. Singer summarized findings in the recent National Research Council report on discipline-based STEM education research. Dr. Verbeke described efforts underway to implement the recommendations of the Vision and Change report, which is focused on modernization of the undergraduate Biological and Life Sciences curriculum, and specific efforts to promote cultural changes within academic institutions.

The final segment of the agenda was to identify additional topics, beyond those already raised, on which the committee might focus. Dr. Claude Steele, chairman, described some of the opportunities and challenges associated with massive, open online courses, or MOOC's, as well as some of the drivers that are catalyzing this approach.

The committee welcomed Dr. Karen King as the new executive secretary and acknowledged departing executive secretary, Dr. Jill Karsten, for her exemplary service and support to the committee over the past three years.

c. Committee on Science and Engineering Indicators (SEI)

SEI approved the cover for *Science and Engineering Indicators (Indicators) 2014*. An icon was chosen for the *Indicators 2012* mobile application, which will be publicly released as soon as it is published to the Apple App Store. Within the next two weeks, Board Members will receive reviewer and lead reviewer assignments for the eight chapters of *Indicators 2014*. NCSSES provided an overview of a project to redesign *Indicators* as a primarily digital document that takes fuller advantage of the capabilities of electronic publication.

The committee discussed topics for the *Indicators 2014* companion report. It asked Board staff to develop a new topic that combines two of the proposed topics: the opportunities afforded by a science and engineering degree and the globalization of higher education. The Board Office staff will continue to work with members on a plan for a panel discussion on the challenges facing public universities. The committee saw a demonstration of the updated and enhanced STEM Education Data and Trends online tool.

d. Committee on Programs and Plans (CPP)

During CPP Open Session, the committee discussed the next draft of its revised charge and requested additional feedback from the Board over the next few months. A final draft will be compiled and presented for approval at the May 2013 meeting.

CPP heard five information items: the Arctic Support Contract Annual Update; an update on two new cooperative agreements for GEO facilities, the Seismological Facilities for the Advancement of Geosciences and EarthScope (SAGE) and Geodesy for the Advancement of Geoscience and EarthScope (GAGE); an information item on the University Corporation for Atmospheric Research (UCAR) Award for Management of the National Center for Atmospheric Research (NCAR); an update on the Science of Learning Centers; and plans for recompetition of the Atacama Large Millimeter Array (ALMA).

CPP also engaged in a Program Portfolio Planning discussion on Water, resulting in a summary document ([NSB/CPP-13-9](#)).

During the Closed Session of the CPP meeting, the committee considered two action items and one information item:

- Action item: National Ecological Observatory Network (see 1.a.)
- Action item: Blue Waters (see 1.b.)
- Information item: Continuing discussion on the Antarctic Blue Ribbon Panel recommendations

e. Committee on Strategy and Budget (CSB)

During the CSB Open Session, Dr. Suresh provided updates on FY 2013 budget related activities. The first update was on mandatory sequestration as a result of the 2011 Budget Control Act. If sequestration goes into effect, NSF will be subject to an across-the-board cut of 5.1% from FY 2012 funding levels. NSF senior management has developed a set of principles that would be followed should sequestration be implemented. These have been communicated to NSF staff. Dr. Suresh stated that the primary impact will be on new research grants. Sequestration will result in approximately 1,000 fewer awards and will in turn cut support to an estimated 12,000 people supported by these grants.

Dr. Suresh provided an update on the FY 2013 CR, which is set to expire on March 27, 2013. He stated that it is unclear what will occur at this juncture and that if no action is taken by that date the Federal government would shut down. He reminded the Board that NSF faced this possibility a few years ago and has a plan in place should this occur.

The committee received an update on NSF Strategic Plan development from Dr. Joseph Dehmer, Senior Advisor for Strategic Planning. Dr. Dehmer provided an overview of the process and a timeline for development and submission of the plan.

The committee also received an update on the study on science budget trends. The work group will continue its conversations with Board Office and Science and Technology Policy Institute (STPI) staff and expects to bring a progress report to CSB at the Board's May meeting.

During CSB Closed Session, Dr. Suresh provided Board Members with an update on the status of FY 2014 budget development.

f. Joint Meeting – CPP and CSB

During the Open Session of the joint CPP-CSB meeting, Dr. Diane Souvaine, CPP chairman, opened the discussion noting that the decision to hold a joint session resulted from the interest of both committees in the NSF Annual Facilities Plan as well as the importance of the Facilities Plan for development of the CSB Subcommittee on Facilities (SCF) Annual Portfolio Review.

The Annual Facilities Plan was presented by Dr. Scott Horner, Acting Director, Large Facilities Office. The presentation provided a high level overview of the large facilities process, facility investments, duration of ongoing projects, and a list of facilities in operation.

During the Closed Session of the CPP-CSB joint meeting, the committees discussed the Annual Facilities Plan.

g. Task Force on Administrative Burdens (AB)

Dr. Arthur Bienenstock, AB chairman, provided background on the establishment of the task force for new Board Members.

The task force heard presentations from two invited speakers: Dr. Susan Sedwick, Chair of the Federal Demonstration Partnership (FDP), provided an overview of current FDP projects which are aimed at streamlining and improving administrative processes; Dr. Susan Schneider, Vice-

chair of the FDP, and the Principal Investigator for the FDP's Faculty Workload Survey, briefed the task force on the results of their latest survey. The data presented provided a detailed look at the administrative burdens associated with Federally-funded projects. Dr. Schneider's presentation also provided the task force with some results as they relate specifically to the administrative workload associated with the NSF proposal and award process.

Dr. Clifford Gabriel, Senior Advisor to the NSF Director, provided background on the ongoing work of the Research Business Models (RBM) Working Group, an interagency working group of the Committee on Science (CoS) and a committee of the National Science and Technology Council (NSTC). Ms. Jean Feldman then briefed the task force on the development of the Research Performance Progress Report (RPPR) and its implementation for reporting of annual, final and interim project reports at NSF.

The task force agreed to hold a subsequent teleconference to discuss agenda items that were not discussed due to time constraints.

[signed]
Michael L. Van Woert
Executive Officer

Attachment:

Letter from Dr. Dan E. Arvizu, NSB Chairman to Dr. John Holdren, Director, Office of Science and Technology Policy, regarding scientific communication and travel restrictions



February 15, 2013

John Holdren, Ph.D.
Director, Office of Science and Technology Policy
Executive Office of the President
Eisenhower Executive Office Building
Washington, DC 20504

Dear Dr. Holdren,

I am writing on behalf of the National Science Board (NSB, Board), the independent governing body responsible for oversight and policy for the National Science Foundation (NSF). The Board has requested that I share some thoughts with you about the importance of travel funds for NSF's ability to accomplish its mission. Some of the Foundation's strategies for efficiency, effectiveness, and fairness of operations are tied to this budget item in ways that may not be fully understood outside the agency. The Board is concerned that continuing pressure on NSF's travel funds can impede the agency's capacity to lead the scientific community and perform as a wise steward of basic science and engineering research.

The Board entirely concurs with the need to avoid wasteful government spending. NSF has been highly responsible in this regard, holding its administrative expenses, including salaries and travel, to approximately 5% of its budget for over a decade. NSF has maintained this impressive efficiency in the face of substantial workload increases by devising creative and extensive strategies constraining administrative costs, including travel costs. In this context, sustained low levels of travel funding threaten NSF's ability to achieve its mission by:

- reducing participation in scientific meetings,
- impairing the agency's ability to recruit key scientific talent, and
- reducing travel for purposes of providing advice to and oversight of major scientific infrastructure and centers.

With regard to participation in scientific meetings: NSF program directors conduct large amounts of crucial work at scientific workshops and conferences. In these meetings, program directors:

- share information about grant opportunities, priorities, review and funding processes, and policy changes efficiently in group forums and in numbers of one-on-one interactions;
- meet in person with grantees to monitor their progress and problems, which allows great richness of interaction but is less costly than site visits;
- facilitate new interactions among scientists who they know to have common interests and complementary capabilities;
- learn about recent advances and fruitful new areas for investment. As OSTP knows well, the leading edge of findings and ideas in science is typically not found in journals but rather in discussions at conferences and workshops prior to publication. When NSF cannot attend or convene such meetings, the staff and the organization as a whole are in danger of becoming out of date.

National Science Foundation

In other words, NSF has developed strategies for conducting much of its business at widely accessible science meetings in order to be as fair and effective as possible while keeping costs down. As a result, pressure to cut travel to scientific meetings threatens many aspects of the NSF's work.

With regard to recruitment: NSF is unusual in that many of its scientific staff serve only temporarily, for 1-4 years. These visiting scientists bring up-to-date knowledge and fresh thinking to the agency and keep the Foundation in close touch with the relevant communities. Unlike many other agencies, NSF has no branch locations in the U.S.. In this context, NSF's temporary personnel serve as regional ambassadors when they return to their home institutions. These visiting scientists make significant personal and professional sacrifices in order to serve as stewards for science. They are away from home for extended periods and have less time for their own research programs. They are disadvantaged if they must dramatically reduce their travel to conferences or to their home institutions in order to serve the Foundation. To the extent that the agency cannot promise them the ability to do the travel necessary to reasonably sustain their personal lives and their careers, NSF's ability to recruit key talent is hampered.

With regard to oversight: the Foundation needs to maintain careful, effective oversight and guidance of its investments. NSF is committed to proactive oversight to ensure that awardees avoid problems, instead of just holding them accountable after a problem is found. The Foundation therefore conducts both oversight and capacity building and it does so both in terms of the science, which involves program directors, and also in terms of institutional grants management and financial adequacy, which involves the agency's business process and grants experts. Telecommunications are used regularly to do this work, but in complex situations remote communications can be inadequate. For example, staff from NSF's Office of Polar Programs were recently unable to travel to work with a prime contractor for Antarctic vehicles. As a result, only a portion of the planned procurement was able to be executed and several of the vehicles received have flaws that will take time and money to rectify. The staff is convinced they could have achieved proper coordination and collaboration among all parties with one or two focused, face-to-face meetings.

In sum, severe restrictions on travel funds can impede NSF's ability to achieve its mission to promote the progress of science for the public good by significantly constraining its communications with science and engineering communities, reducing its ability to employ excellent scientists as expert and efficient participants in the agency's work, and limiting its ability to guide and oversee its investments.

Thank you for taking time to consider the concerns of the National Science Board.

Respectfully,

[signed]

Dan E. Arvizu, Ph.D.
Chairman,
National Science Board

CC: Mr. Danny Werfel, Controller of the Office of Management and Budget
Ms. Sally Ericsson, Principal Assistant Deputy, Office of management and Budget