

**APPROVED MINUTES¹
OPEN SESSION
424TH MEETING
NATIONAL SCIENCE BOARD**

National Science Foundation
Arlington, Virginia
February 2-3, 2012

Members Present:

Ray M. Bowen, Chairman
Esin Gulari, Vice Chairman[#]
Mark R. Abbott
Kelvin K. Droegemeier[#]
Patricia D. Galloway
José-Marie Griffiths
W. Carl Lineberger[#]
Douglas D. Randall
Arthur K. Reilly
Anneila I. Sargent
Diane L. Souvaine
Arnold F. Stancell
Thomas N. Taylor

Subra Suresh, *ex officio*

Members Absent:

Dan E. Arvizu
Camilla P. Benbow
John T. Bruer
France A. Córdova
Alan I. Leshner
G.P. “Bud” Peterson
Claude M. Steele
Richard F. Thompson
Robert J. Zimmer

¹The minutes of the 424th meeting were approved by the Board at the May 2012 meeting.

[#] Participated by telephone

The National Science Board (Board, NSB) convened in Open Session at 1:32 p.m. on Friday, February 3, 2012, with Dr. Ray Bowen, Chairman, presiding (Agenda NSB-12-5, Board Book page 167). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 8: Approval of Open Session Minutes, December 2011

The Board unanimously APPROVED the Open Session minutes of the December 2011 Board meeting (NSB-11-85, Board Book page 177).

AGENDA ITEM 9: Chairman's Report

In the Chairman's Introduction on Thursday, February 2, 2012 and during the Chairman's Report in the Plenary Open Session on Friday, February 3, 2012, Dr. Bowen announced and reported on several items.

a. Release of *Science and Engineering Indicators 2012*

On January 17-18, 2012, *Science and Engineering Indicators 2012 (Indicators)* and the *2012 Indicators Digest* were publicly released.

On January 17, Dr. José-Marie Griffiths and Mr. Rolf Lehming, Director, National Center for Science and Engineering Statistics (NCSES), joined Dr. Bowen in two virtual press conferences. The first focused on *Indicators'* findings on the loss of high-tech manufacturing jobs, and the second centered on the reduction in per student funding at our public research universities. As a result of these two briefings, *Indicators* received significant press attention with coverage in major news venues such as *The Wall Street Journal*, *The New York Times*, *The Washington Post*, *Time*, *Forbes*, among others. A list of articles and links pertaining to the *Indicators* release was provided to Board Members (Board Book page 145).

On January 18, the Board held a briefing sponsored by the Research and Development (R&D) Caucus on Capitol Hill with congressional staff and representatives from various scientific and professional societies. Congressman Rush Holt of the 12th District of New Jersey, co-chairman of the R&D Caucus, gave a talk on the importance of science and the utility of the *Indicators* to policy makers. Dr. Subra Suresh, NSF Director, also spoke on the importance of *Indicators*, and Dr. Griffiths gave an overview of *Indicators*. Mr. Lehming and Ms. Jeri Mulrow, NCSES Program Director, provided the audience with an in depth look at some of the most interesting data and trends in *Indicators* as well as Web tools for easy access to the data. The purpose of briefing was to help congressional staff and other constituencies learn what types of data are available from *Indicators* and how they can use *Indicators* in their everyday work.

The media press conferences and the briefing on the Hill were very successful. The Committee on Science and Engineering Indicators (SEI) would further address the public release of *Indicators* at its meeting.

b. Continued Discussion of Issues from the Board Retreat

As part of the continued discussion of the issues brought up at the Board Retreat in September 2011, several items were provided to Board Members that address the topics brought forth at the December 2011 meeting – such as background information on the prioritization process (Board Book page page 241), background information on the Subcommittee on Polar Issues (SOPI) (Board Book page 309), and information from the White House and the Office of Management and Budget (OMB) on Government efficiency (Board Book page page 197). The set of topics that were addressed were in the Plenary Open Minutes for December 2011 on page 3 (Board Book on page 179).

Dr. Bowen opened the floor to Board Members for comments. Concerning the issue relating to SOPI and whether to leave it as a separate subcommittee or rolled back into the regular business of the Committee on Programs and Plans (CPP), it was suggested that a small group of Board Members and NSF staff look into the history of the advantages and disadvantages of the subcommittee, and possibly give a presentation at the May 2012 meeting. Another suggestion was to have a small group review all of the NSB committee charges in an effort to plan future Board activities. Dr. Bowen encouraged Board Members to contact him with any further comments.

c. Issues Relating to Senate Confirmation of Board Member Nominations

The Board's Legal Counsel, Ms. Ann Bushmiller, prepared a White Paper on the subject of "Issues Relating to Senate Confirmation of Board Member Nominations" (Board Book Addendum, NSB-12-9). Dr. Bowen stated that he intends to interact with the Executive Committee and decide on an approach, and that it is evident that the Board needs to indicate its views about this legislation to the leadership of the House and Senate.

d. Congressional Testimony

On February 28, 2012, Dr. Bowen will testify before the House Committee on Science, Space, and Technology, Subcommittee on Research and Science Education. The testimony will be on the NSF FY 2013 Budget Request.

e. Candidate Site for 2012 Board Retreat and Off-Site Meeting

In the Plenary Executive Closed Session, the Board reviewed and discussed proposed sites for the 2012 Board off-site meeting and retreat. The Board recommended that the off-site meeting and retreat for September 19-20, 2012 take place in San Diego, California. Dr. Bowen asked Dr. Michael Van Woert, Executive Officer and Board Office Director, to begin making appropriate arrangements.

f. Committee Announcements

During Plenary Executive Closed Session, the following Board Members were elected to the *ad hoc* Committee on Nominating for NSB Elections (NOMCOM), otherwise known as the Elections Committee. Members of the committee are: Dr. John Bruer, chairman, and members Dr. Patricia

Galloway, Dr. José-Marie Griffiths, and Mr. Arthur Reilly. Dr. Bowen thanked them for their willingness to serve on this committee.

The Chairman discharged the Task Force on Merit Review (MR) with thanks to Drs. John Bruer and Alan Leshner, co-chairmen, and members Drs. Louis Lanzerotti, Douglas Randall, Diane Souvaine, and Thomas Taylor as well as Dr. Joanne Tornow, who served as Executive Secretary, and Ms. Kim Silverman, Board Office Liaison.

g. Board Member Recognition

Dr. Bowen announced the following recent recognitions bestowed upon Board Members.

Dr. Diane Souvaine was elected as a fellow to the Association for Computing Machinery - the world's largest educational and scientific computing society. Dr. Souvaine, a Professor at Tufts School of Engineering, was named a fellow for her contributions to computational geometry and for her work on behalf of the computing community.

Dr. Patricia Galloway received an Honorary Doctorate of Science degree from the South Dakota School of Mines. She gave a commencement speech at that school in December 2011. Dr. Galloway is Chief Executive Officer of Pegasus Global Holdings, Inc., an international management consulting firm that provides services to the energy and infrastructure industries.

h. Board Office Staff Introductions

Dr. Bowen welcomed Dr. Matthew Wilson as a permanent member of the Board Office staff as a Science Policy Analyst. Prior to joining the Board Office as an American Association for the Advancement of Science (AAAS) Science and Technology Policy Fellow in 2008, Dr. Wilson was a visiting postdoctoral fellow at the University of California, San Francisco where he performed research in the area of breast cancer. During his 2-year term as a AAAS Fellow, he was the staff lead on the Board's STEM Innovators project and Board Office Liaison to the Committee on Education and Human Resources (CEH). Dr. Wilson was hired by the Board Office as a temporary Federal employee in 2010 and has since continued to work with CEH, SEI, and the Task Force on Unsolicited Mid-Scale Research (MS).

Dr. Bowen also welcomed Dr. John Veysey who accepted a position in the Board Office as a Science Policy Analyst. In March 2012, he will be coming to the Board Office after serving as Legislative Director for Congressman Daniel Lipinski, whose office he joined in 2009 after a 2-year AAAS Congressional Science Fellowship with Senator Robert Menendez. Dr. Veysey received his Ph.D. in Physics from the University of Illinois at Urbana-Champaign. He was the recipient of the John Bardeen Award for theoretical condensed matter physics research and has published in leading journals.

i. Webcast of Board Meeting

For the third time, the Board meeting held in Arlington, Virginia, was Webcast and simultaneously available to viewers over the Internet. The Webcast included all Plenary Open Sessions of the full Board as well as Open Sessions of its committees, subcommittees, and task forces. The

Webcast link, <http://www.tvworldwide.com/events/nsf/120202/>, is available from the NSB and NSF Web sites.

AGENDA ITEM 10: Director's Report

Dr. Subra Suresh, NSF Director, reported on the following items:

a. NSF Staff Introductions

Dr. Parag R. Chitnis was appointed Division Director, Division of Molecular and Cellular Biosciences (MCB), Directorate for Biological Sciences (BIO) as of January 15, 2012. Prior to this assignment, Dr. Chitnis served as MCB Deputy Division Director from 2008. Since joining NSF in 2000, he served in a number of capacities including Program Director, Biomolecular Systems Cluster. Prior to coming to NSF, he was Professor, Department of Biochemistry, Biophysics and Molecular Biology, Iowa State University. Dr. Chitnis received his Ph.D. in Biology from the University of California, Los Angeles in 1987.

Ms. Judith B. Gan joined NSF on December 18, 2011 as Head, Office of Legislative and Public Affairs (OLPA). Ms. Gan came to NSF from the National Oceanic and Atmospheric Administration (NOAA) where she was Director, Office of Communications and External Affairs for NOAA Fisheries. Previously, Ms. Gan served as the Communications Vice President with the Lockheed Martin Corporation and as a Communications Specialist with IBM. She holds a M.S. in Journalism/Science Communication from Boston University and a B.A. in Chemistry and Biology from the University of Virginia.

Mr. Eugene F. Hubbard became Head, Office of Information Resource Management (OIRM) and Chief Human Capital Officer (CHCO) on January 2, 2012. Prior to joining NSF, Mr. Hubbard served as Chief Management Officer, Naval Facilities Engineering Command. Mr. Hubbard has also served as NOAA Deputy Chief Administrative Officer and Director of Facilities Engineering and Real Property, National Aeronautics and Space Administration (NASA). Mr. Hubbard holds a M.S. in Public Administration from Troy State University, an M.S. in Engineering (Civil) from the University of Florida, and a B.S. in Chemistry from the U.S. Naval Academy.

Ms. Amy Northcutt is the NSF Chief Information Officer (CIO) effective January 2, 2012. Prior to becoming CIO, Ms. Northcutt was the NSF Deputy General Counsel. Additionally, she served as OIRM Acting Head from October 2010 to January 2012. Ms. Northcutt joined NSF from Wesley Theological Seminary where she served as Vice President for Administration. She has also held positions as Chief Executive Officer, Chief of Staff, and Attorney Advisor, Interstate Commerce Commission.

Dr. Muriel Poston joined NSF on September 12, 2011 as Division Director, Division of Human Resource Development (HRD), Directorate for Education and Human Resources (EHR). Dr. Poston comes to NSF from Skidmore College where she is Dean of the Faculty and Professor of Biology. She previously served at NSF on an Intergovernmental Personnel Act (IPA) assignment from 2002 to 2005, first as Program Director and then as Deputy Division Director, Division of Biological Infrastructure, Directorate for Biological Sciences (BIO). She received her

Ph.D. in Biology from the University of California, Los Angeles in 1979 and J.D. from the University of Maryland in 2001.

b. Congressional Update

On February 13, 2012, President Obama will release his FY 2013 budget request to Congress. NSF will hold a public rollout of the NSF FY 2013 budget request that afternoon.

Three FY 2013 budget hearings were scheduled: (1) February 28, 2012, before the House Committee on Science, Space, and Technology, Subcommittee on Research and Science Education. Drs. Suresh and Bowen will be the witnesses for this hearing. (2) March 6, 2012 (morning), before the House Commerce, Justice, Science, and Related Agencies Appropriations Subcommittee. Dr. Suresh will be the sole witness at this hearing. (3) March 6, 2012 (afternoon), before the Senate Committee on Commerce, Science, and Transportation Subcommittee on Science and Space. Dr. Suresh will be joined by Dr. John Holdren, Director, Office of Science and Technology Policy (OSTP), and Dr. Patrick Gallagher, Director, National Institute of Standards and Technology (NIST). This budget hearing will focus on the America COMPETES Reauthorization Act as it relates to the FY 2013 budget request.

AGENDA ITEM 11: Open Committee Reports

[Note: The Executive Committee (EC) did not meet in February 2012.]

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

Mr. Arthur Reilly, A&O chairman, reported that Ms. Allison Lerner, NSF Inspector General (IG), discussed three recent investigations and their outcomes. She also mentioned that her audit staff was continuing to focus on the development and use of contingency budgets for large infrastructure projects. Additionally, she stated that the Office of Inspector General (OIG) is consulting with OMB and other Federal agencies on revisions to the circulars pertaining to grant management. Mr. Reilly noted that Ms. Lerner continues to be active within the IG community, helping the Small Business Administration (SBA) to improve awardee certifications that prevent fraud, waste, and abuse; and by agreeing to serve on the Integrity Committee of IGs that reviews allegations of misconduct committed by their colleagues.

Ms. Martha Rubenstein, NSF Chief Financial Officer (CFO) affirmed the considerable efforts of NSF staff to address the contingency cost issue, and to work with the IG, auditors, programs, awardees and internal groups to ensure that construction funding, including budgeting for contingencies, was appropriately managed. She noted that the implementation of a new financial system for NSF, “iTRAK,” was on track. She also reported on how NSF was handling the mandate by OMB to responsibly accelerate American Recovery and Reinvestment Act (ARRA) grant spending, and assured the committee that NSF was clear on the Board’s request to be transparent in matters relating to the Financial Accounting Standards Board (FASB) “related parties disclosure rule.”

Dr. Judith Sunley, EHR Division Director, Human Resources Management (HRM), indicated that NSF was committed to supporting a healthy career/life balance for both the scientific community and the NSF staff. She also reported on NSF's continuing efforts and successes to make telework an important part of the NSF culture.

b. Committee on Education and Human Resources (CEH)

Dr. Patricia Galloway reported on behalf of Dr. Camilla Benbow, CEH chairman. The Committee - in its pursuit to better understand the practices and challenges of education research – heard from two experts: Dr. Adam Gamoran, the John D. MacArthur Professor of Sociology and Educational Policy Studies, University of Wisconsin-Madison, and Dr. Paul Cobb, who holds the Peabody Chair in teaching and learning and is Professor of Mathematics Education, Vanderbilt University. Both speakers gave presentations about the current landscape, challenges, and future opportunities of education research, both from a national perspective as well as at the practitioner level.

The presenters addressed the following key issues:

- Successful K-12 STEM requires sustained, long-term commitment and has direct, long-term implications on scientific discovery, U.S. leadership within the global scientific enterprise, and national economic growth.
- Education research is strengthened when there are collaboration and feedback opportunities between education researchers and educators as well as education administrators.
- Much of research education has focused on effective STEM instruction/learning issues. However, we must also look beyond the classroom and deepen understanding of how organizational elements impact STEM learning, such as school leadership, professional capacity of staff and faculty, parent-community ties, and overall learning climate at school, to name a few.
- Good STEM learning can occur in all types of schools and school systems, but a variety of challenges, such as personnel turnovers and teaching to the test, impact instruction and learning.
- Specialized content when combined with high-leverage, instructional practices promote enhanced STEM learning achievement.

Both speakers noted the considerable underexplored research “space” in education research and offered a number of opportune areas to further explore.

At the conclusion of the meeting, it was announced that the upcoming WebEx meeting on February 28, 2012, will feature the OSTP Associate Director of Science, Dr. Carl Wieman.

c. Committee on Science and Engineering Indicators (SEI)

Dr. José-Marie Griffiths, SEI chairman, reported that the rollout of *Indicators* was successful. Although time constraints precluded describing the rollout at the meeting, Dr. Griffiths' report on rollout activities will be included in the committee minutes.

The committee discussed the Board's Companion Piece on “Trends in State Funding for Public Research Universities.” SEI agreed on the need to develop a clear consensus on the purpose and

intended audience and to be attentive to the quality of the data underlying any findings and recommendations. The *ad hoc* group that is developing this Companion Piece intends to meet on a monthly basis, and will report at the May 2012 Board meeting. The *ad hoc* group includes Drs. Camilla Benbow, Ray Bowen, France Cordova, and Kelvin Droegemeier, José-Marie Griffiths, and Mr. Arthur Reilly and welcomed participation by other interested Board Members.

Dr. Myron Gutmann, Assistant Director, Social, Behavioral, and Economic Sciences (SBE), provided a brief overview on the President's plan for Government reorganization and consolidation and NSF's role. Dr. Gutmann also reminded Board Members of a farewell event in honor of Dr. Lynda Carlson, who retired on February 2, 2012. As head of what is now the NCSES, Dr. Carlson was an outstanding partner to the Board in producing *Indicators* for a number of years.

At the December 28, 2011 teleconference meeting, the committee approved the Companion Piece to *Indicators* entitled, *Research and Development, Innovation and the Science and Engineering Workforce (NSB-12-3)*, and recommended it to the full Board for approval. Based on this recommendation:

The Board unanimously APPROVED the Companion Piece to *Science and Engineering Indicators 2012* entitled, *Research and Development, Innovation and the Science and Engineering Workforce (NSB-12-3)* for publication, subject to final edits approved by the Chairman of the Board and the SEI Chairman.

d. Joint Committee on Programs and Plans and Committee on Strategy and Budget (Joint CPP-CSB)

Dr. Mark Abbott, CPP chairman, reported that CPP and CSB held a joint session to discuss the NSF Annual Facilities Plan (Presentation Book page 3), which is an area where the committees have an overlapping charge. Dr. Mark Coles, Deputy Director, Large Facilities Office, presented information on the facility landscape for the portfolio review in May 2012 and for future budgets. Dr. Coles spoke on several aspects of NSF facilities, including the selection and prioritization process, current budget and maintenance and operation issues, contingency development and oversight, specific information for on-going facilities, and other issues relating to large scientific facilities. Board Members asked many questions, including how to navigate roles of international partners and where off-ramps exist for projects that are going through internal review.

e. Committee on Programs and Plans (CPP)

Dr. Mark Abbott, CPP chairman, reported that he drew the committee's attention to the updated "Calendar Year 2012 Schedule of Action and Information Items for NSB Review" (NSB/CPP-12-5, Board Book page 73), and noted that CPP will have a full agenda at its May 2012 meeting.

NSB Discussion Item: Status of CPP Program Portfolio Planning

CPP continued the ongoing discussion about program portfolio planning. The goal is to provide advice to NSF on a broader portfolio of programs, intended to complement the strong involvement

of the committee via thresholds and approval of actions. CPP continued to refine the process over the last several meetings. Dr. Abbott noted that this process and discussion was not a new one, and referred the committee to the memorandum, “NSB Review and Oversight of NSF Programs” dated January 16, 1985 from Dr. Erich Bloch, former NSF Director (Board Book, page 78), who laid out characteristics of Board program reviews and how they could be constructed. The committee discussed the final programs for planning consideration, which had already selected international programs and STEM education as topics for this process at meetings held in 2011. To round out these discussions, CPP asked NSF to present potential topics that were more science-focused. Dr. Clifford Gabriel, Acting Head, Office of Integrated Activities (OIA), discussed two potential topics: neuroscience and software issues, and the committee discussed with Dr. Gabriel and Dr. Cora Marrett, NSF Deputy Director, potential questions to consider with each of these topics. CPP members agreed that both of these issues were viable candidates, but both need additional analysis and focus. NSF agreed that it will select a topic as a prototype for discussion and presentation at the May 2012 meeting.

NSB Information Item: Atacama Large Millimeter Array (ALMA) Operations Update on Recompetition and No-cost Extension for Major Research Equipment Facilities and Construction (MREFC)

This information item concerned the annual report requested by a Board resolution on ALMA (NSB-11-9). Dr. Edward Seidel, Assistant Director, Directorate for Mathematical and Physical Science (MPS), and Dr. Philip Puxley, MPS ALMA Program Officer, presented the update. Dr. Puxley told the committee about the progress made on the ALMA facility in the last year, including near completion of roads and power systems and nearly tripling the number of antenna available at the site. He also informed the committee that science operations began in September 2011 as planned, and that ALMA received much interest from the scientific community. Dr. Puxley also provided information on preliminary plans for recompetition in 2015. CPP members asked that NSF continue to involve them in the process as the project heads towards the recompetition, and NSF agreed. (Presentation Book page 26)

CPP Subcommittee on Polar Issues (SOPI)

Dr. Mark Abbott reported that Dr. Thomas Taylor, SOPI chairman, and subcommittee members heard an update from Dr. Karl Erb, Director, Office of Polar Programs (OPP), on several topics. (Presentation Book page 36). Lockheed Martin was awarded the contract to provide logistical support to the U.S. Antarctic Program (USAP), and NSF is overseeing the transition from Raytheon, the incumbent contractor, to Lockheed Martin.

As agreed at the discussion at the December 2011 SOPI meeting, Dr. Bowen sent a letter on behalf of the Board dated January 20, 2012 (Board Book page 100) to Mr. Norman Augustine, Chairman of the USAP Logistics Review Panel (or Blue Ribbon Panel). The panel is tasked with conducting a review of the USAP to ensure a sustainable long-term strategy for support of science and the U.S. presence in Antarctica. The Board’s letter emphasized the importance of a long-term strategy for icebreaker support for the USAP and outlined several questions for the panel’s consideration. In its letter of January 29, 2012, the panel responded, thanking the Board for its input and indicating that the issues raised will be considered as the panel continues its work. The panel should conclude this spring. (Presentation Book page 44)

Dr. Edward Dunlea, National Academy of Sciences/National Research Council, presented an overview of a study into future science opportunities in Antarctica and the Southern Ocean. The study identified two major high level themes: global change and discovery. Both themes will drive scientific research in Antarctica over the next 2 decades. The study also identified several opportunities to improve support to Antarctic research. (Presentation Book page 54)

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

Dr. Mark Abbott also reported that Drs. Diane Souvaine and Kelvin Droegemeier, MS co-chairmen, presented a first draft of the MS final report, which focuses on the introduction, key findings, and recommendations. The key findings are that NSF funds mid-scale research in a wide range of forms, but that there are misperceptions in the community about NSF's willingness to do so, particularly for unsolicited proposals. The recommendations include: communicating the importance of mid-scale research internally and externally, enabling NSF staff to support mid-scale research, and enhancing the review process for mid-scale research. The report concluded that NSF is already on track to address some of the issues found in the study.

Board Members suggested that the findings seem to suggest that mid-scale research is being supported at the right level, and that the tone and length of the report should be scaled in a way that does not indicate that there is a major problem with mid-scale research at NSF. The task force will discuss strategies to address these concerns, including rethinking the form or nature of the final product.

f. Committee on Strategy and Budget (CSB)

Dr. Diane Souvaine, CSB chairman, reported that NSF established a Merit Review Working Group to evaluate stressors on the Merit Review system. Dr. Candace Major, Program Director, Marine Geology and Geophysics Program, Directorate for Geosciences (GEO), presented the NSF Merit Review Working Group provisional recommendations. The group recommended further development of a number of process enhancements and demand management strategies. Suggested process enhancements include: (1) increase the use of virtual panels from the current 1 percent to 5 percent or more, (2) use a streamlined *ad hoc* review process to rapidly screen proposal submissions, (3) make greater use of preliminary proposals for core programs, (4) asynchronous panels, and (5) automated compliance checking. Two suggested demand management strategies include: enhanced outreach to institutions, and resubmission of declined ideas by invitation only. (Presentation Book page 93)

Dr. Major outlined the next steps identified by the group, which include: (1) engaging NSF divisions and programs interested in pilot activities, (2) developing implementation plans for pilot efforts, (3) engaging the research community, (4) completing further detailed analysis of other potential merit review process enhancements, (5) seeking senior management review of recommendations, and (6) launching pilot activities. In FY 2012, the Merit Review Working Group plans to develop guidelines, policies, and training; implement any e-business changes needed; and, in FY 2013, conduct pilots. CSB noted its appreciation for the group's efforts.

On the topic of strategic planning for FY 2012 and beyond, Dr. Suresh reviewed the FY 2012 budget status, noting that this was the first time that the appropriation was higher than both the

House and Senate marks. He reminded committee members that although the budget was nearly a 3 percent increase over the FY 2011 level, the MREFC account remained an issue. After careful consideration, NSF decided to use the transfer authority provided in the appropriation to move \$30 million from Research and Related Activities (R&RA) account to the MREFC account. Despite the actual appropriation being lower than the request level, it remains in line with the overall priorities and four core principles: commitment to existing awards, human capital, cross-Foundation activities, and efficient organizational practices. CSB members discussed the potential impacts of limiting the number of awards per Principal Investigator (PI), and NSF is still collecting and evaluating data on this and other related questions.

For the agenda item on cost sharing, Ms. Jean Feldman, Head, Policy Office, Division of Institution and Award Support, Office of Budget, Finance, and Award Management (BFA), provided an update. Implementation of the Board's cost sharing policy change resulted in a cultural change and generated interest within the research community. NSF briefed the community at 26 different external meetings, 9 internal NSF Town Hall meetings and additional individual staff briefings. Only six programs have been approved to require cost sharing, and NSF's updated electronic-systems block proposers from including cost sharing in proposal budgets for all other programs. Board Members expressed appreciation for the hard work of Ms. Feldman and other NSF staff in implementing this complicated policy. This groundbreaking model creates a more level playing field in the competition for science funding and challenges other agencies to follow.

CSB Subcommittee on Facilities (SCF)

Dr. Souvaine reported that SCF chairman, Dr. José-Marie Griffiths, updated the committee on the Board's report entitled, *Report to Congress on Mid-Scale Instrumentation at NSF (NSB-11-80)*, which was submitted to Congress in response to the America COMPETES Reauthorization Act of 2010. OSTP was pleased with the report and a briefing is being scheduled for the House Committee on Science and Technology's Subcommittee on Research and Science Education staff. SCF also discussed the NSF facilities plan in the context of the SCF upcoming annual portfolio review, which it will undertake at the May 2012 Board meeting.

CSB Task Force on Data Policies (DP)

Dr. Souvaine also reported that the DP chairman, Dr. José-Marie Griffiths, and task force members discussed comments received from the public on the *Report on Digital Research Data Sharing and Management (NSB-11-79)*. It was noted that the report represents significant initial policy steps by the Board on the topic of scientific digital data and that the topic would merit additional consideration by DP. The task force will consider an addendum to the original charge (NSB-10-60) regarding additional aspects of data policy for NSF.

Before adjourning the meeting, Dr. Bowen thanked Drs. Suresh and Marrett for their contributions to the meeting, as well as the NSF assistant directors and other NSF leadership for all the assistance they provided. Additionally, Dr. Bowen expressed his appreciation for the NSF staff and Board Office staff preparations for the meetings, and making the meetings run smoothly.

Dr. Bowen adjourned the Open Session at 2:09 p.m.

[signed]
Ann A. Ferrante
Executive Secretary
National Science Board