NSB-05-76

APPROVED MINUTES[1]
OPEN SESSION
386TH MEETING
NATIONAL SCIENCE BOARD

The National Science Foundation
Arlington, Virginia
May 25-26, 2005

Members Present:

Warren M. Washington, Chair
Diana S. Natalicio, Vice Chair
Dan E. Arvizu
Barry C. Barish
Steven C. Beering
Ray M. Bowen
G. Wayne Clough
Kelvin K. Droegemeier
Delores M. Etter
Kenneth M. Ford
Nina V. Fedoroff
Daniel E. Hastings
Elizabeth Hoffman
Louis J. Lanzerotti
Alan I. Leshner
Jane Lubchenco
Douglas D. Randall
Michael G. Rossmann
Daniel Simberloff
Jon C. Strauss
Kathryn D. Sullivan
John A. White, Jr.
Mark S. Wrighton
Jo Anne Vasquez

Arden L. Bement, Jr., *ex officio*

Members Absent:

(None)

[1] The minutes of the 386th meeting were approved by the Board at the August 2005 meeting.

The National Science Board (NSB, the Board) convened in the Open Session at 1:25 p.m. on Thursday, May 26, with Dr. Warren Washington, Chairman, presiding (Agenda NSB-05-60). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 7: Approval of Open Session Minutes, March 2005

> The Board unanimously APPROVED the Open Session minutes of the March 2005 Board meeting (NSB-05-47, Board Book Tab 13C).

AGENDA ITEM 8: Closed Session Items for August 2005

> The Board unanimously APPROVED the Closed Session items for the August 10-11, 2005 meeting (NSB-05-49, Board Book Tab 13D).

AGENDA ITEM 9: Chairman's Report

a. Board Meeting Calendar for 2006

As part of the annual business conducted each May, the Board reviewed a draft meeting schedule for the next calendar year. Dr. Washington asked Dr. Michael Crosby, NSB Executive Officer, to report on the process to develop the schedule. Dr. Crosby reported that the Board members were polled to ensure attendance by the highest number of voting Members possible. A draft meeting calendar was presented to Board Members in March for final review and comment. Following Dr. Crosby's report:

> The Board unanimously APPROVED the NSB meeting calendar for 2006 (NSB-05-51) (Appendix A)

Dr. Washington asked Dr. Crosby to develop a short list of candidate locations for the 2006 annual retreat and site visit to an NSF-supported facility. He asked Dr. Crosby to present the list at the August 2005 NSB meeting.

b. Executive Committee Elections

Dr. Washington announced the results of the Executive Committee elections. Drs. Barry Barish and Delores Etter were re-elected to the Executive Committee, each for a 2-year term.

c. Joint NSB-PCAST Roundtable

Dr. Washington presented a draft charge for a Joint NSB-PCAST Roundtable Discussion on Federal-State Policies for Research and Development. The Office of Science and Technology Policy (OSTP) had suggested such a roundtable to address the Federal and state roles and relationships in support of the U.S. research and development base. Dr. Washington asked the Board to endorse the continued discussion on this subject with OSTP and the President's Council of Advisors on Science and Technology (PCAST). There were no concerns expressed by Board members on this issue and continuation of these discussions was approved.

d. Commission on Education in Mathematics, Science, and Technology

Dr. Washington asked Dr. Crosby to report on the development of an NSB Commission on Education in Mathematics, Science, and Technology. At the request of Congress, the Board will establish a new Commission similar to the 1982-1983 Commission on Precollege Education in Mathematics, Science, and Technology. During the 1980s, the Board established a Commission to focus on the role of NSF in K-12 math and science education.

Congress has now requested that the Board include as part of the new education Commission focus, an examination of successful models that NSF research identified for improving K-12 math and science education. Congress also expressed specific interest in having the Board quantify and qualify the numbers of students presently in U.S. school systems that have a qualified science teacher and the number of school systems that offer a rigorous science and math curriculum.

Since the NSB meeting in March, the Chairman received letters (Board Book, Tab 10B) from a number of organizations and a former Board Member expressing concern about funding for NSF education programs and urging an activity similar to the 1982 Commission. Additional letters of support have been received since the Board Book was compiled.

Dr. Washington asked Drs. Diana Natalicio and Elizabeth Hoffman to work with Dr. Crosby to establish the Board Office in setting up the new Commission, which will report to the full Board. At the August NSB meeting, Dr. Crosby will report to the Board on progress in that regard. Dr. Washington anticipates the Commission to be established in early 2006. He encouraged Board Members to send names of potential members to him, Drs. Natalicio and Hoffman as well as Dr. Crosby.

Dr. Alan Leshner stated that in the early 1980s the Commission was directed at the Nation and recommendations were promulgated for all sectors. He noted the exact charge and the designated recipients of the report would be important to the new Commission.

e. Annual Awards Dinner

The Board held its annual Awards Dinner at the U.S. Department of State on May 25. The annual dinner is one of the few opportunities to recognize distinguished contributions of individuals and organizations to the advancement of science. The Board was also honored to receive a message from the President.

The major purpose of the Awards Dinner is to recognize recipients of the Board's honorary awards. The following awards were presented:

- Mr. Robert W. Galvin, Chairman and CEO (Retired) of Motorola, Inc. received the Vannevar Bush Award.

- Dr. Dalton Conley, Professor of Sociology and Public Policy and Director, Center for Advanced Social Sciences Research, New York University, received the Alan T. Waterman Award.

- Mr. Ira Flatow, Host and Executive Producer of *Talk of the Nation: Science Friday* received the individual NSB Public Service Award.

- Computer Research Association's Committee on the Status of Women in Computing Research received the group NSB Public Service Award.

On behalf of the Board, the Chairman thanked Ms. Susan Fannoney, Ms. Ann Noonan, and other staff responsible for the smooth operation of the Awards Dinner.

f. *ad hoc* Committee for the Vannevar Bush Award

The *ad hoc* Committee for the Vannevar Bush Award completed its work for this year. Dr. Washington discharged the committee with thanks to the chairman, Dr. Kenneth Ford, and committee members, Drs. Steven Beering, Ray Bowen, Wayne Clough, Daniel Hastings, and Kathryn Sullivan.

g. *ad hoc* Committee on Nominating for NSB Elections

The *ad hoc* Committee on Nominating for NSB Elections also completed its work. Dr. Washington discharged the committee with thanks to Dr. Daniel Hastings, chairman, and members Drs. Kenneth Ford, Michael Rossmann, and Jo Anne Vasquez.

h. Recognition of Mr. William Noxon, Office of Legislative and Public Affairs, NSF

Dr. Washington recognized Mr. William Noxon from the NSF Office of Legislative and Public Affairs on his retirement. Mr. Noxon assisted the NSB staff for many years with public outreach activities and the honorary awards programs. He had been the Board's

herald and buffer with the media. The Board was grateful to him for helping to prepare media events and for his diligence in making sure that those events were so successful.

i. Recent Honors Bestowed Upon Board Members

Dr. Washington announced the following recent awards to Board Members:

- Drs. Barish and Leshner, were newly elected members of the 225th Class of Fellows and Foreign Honorary Members of the American Academy of Arts and Sciences.

- Dr. Sullivan, along with her fellow women astronauts from the 1978 NASA shuttle class, was named 2004 Laurel Legends by Aviation Week and Space Technology for the 48th Annual Aerospace Laurels. The class was significant in that it was the first to include women in the astronaut corps.

- Dr. Vasquez was appointed to the NASA Education Board, the governing board that oversees all the education initiatives within NASA.

Dr. Natalicio, Vice Chair, announced that Dr. Washington's book, *An Introduction to Three-Dimensional Climate Modeling*, Second Edition, which he co-authored with Clair Parkinson, was recently published.

AGENDA ITEM 10: Director's Report

Dr. Arden Bement, NSF Director, reported on new NSF staff positions and congressional items.

a. NSF Staff Announcements

Dr. Bement announced that Dr. Kathie Olsen, Office of Science and Technology Policy Associate Director, had been nominated by the President to become the new NSF Deputy Director. He stated that Dr. Olsen is very familiar with NSF as she had been in the worked at Office of Integrative Activities in the 1990s.

Dr. Bement stated that NSF had been very fortunate to have worked with the outgoing NSF Deputy Director, Dr. Joseph Bordogna, for the past 14 years. For 6 years, he had served as NSF Deputy Director, and for 3 years prior as NSF Acting Deputy Director, which makes Dr. Bordogna the longest-serving deputy in NSF history. On a personal note, Dr. Bement stated that he was privileged to have been associated with Dr. Bordogna in the past year. Dr. Bement noted and concurred with the House Science Committee Chairman Sherwood Boehlert in wishing the best to Dr. Bordogna, who "has always had an open door, and he has been a stabilizing force at NSF with boundless enthusiasm for science and his agency. His institutional knowledge and his openness to new ideas have made him a bulwark of the Federal science establishment." Dr. Washington stated that

he asked Dr. Bordogna to join the Board for the August meeting for a special event and recognition for his many contributions.

Ms. Shirley Ruffin joined NSF as Director, Division of Financial Management and Deputy Chief Financial Officer on May 1, 2005. Prior to her NSF appointment, Ms. Ruffin served in the Senior Executive Service as Director, Office of Financial Policy in the Office of the Assistant Secretary for Budget, Technology, and Finance in the Department of Health and Human Services. Ms. Ruffin received her MBA in Finance and Accounting in 1982 from American University.

b. Congressional Update

Appropriations Update:

On Tuesday, May 24, the House Science, State, Commerce, and Justice Appropriations Subcommittee marked up the appropriations bill for the agencies under its jurisdiction. NSF's budget would be increased $171 million over last year and $38 million above the request. Education and Human Resources would be increased to $807 million, $70 million above the request. Specific details about the appropriation would not be available until the full Appropriations Committee mark-up, scheduled for June 7. The Senate would be expected to take up its bill sometime in late June or early July.

In January, NSF submitted a plan for allocating the FY 2005 appropriations. The House appropriators approved NSF's plan, but the Senate Commerce, Justice, and Science Appropriations Subcommittee proposed adjusting the funding levels for the research directorates. Because the responses of the two subcommittees are not identical, NSF was waiting for guidance from the subcommittees on reconciling the differences.

Hearings:

NSF had been invited to testify before the Senate Commerce, Science and Transportation Committee, Subcommittee on Disaster Prevention and Prediction on June 8. The focus of the hearing would be research on disaster prediction and mitigation.

Science and Engineering Legislation:

Several bills of interest to NSF have been introduced since the last NSB Meeting.

On April 12, Senator Kit Bond introduced S. 767, legislation that would establish a *Division of Food and Agricultural Science* within NSF and authorize support of fundamental agricultural research at NSF. Dr. Bement met with Dr. William Danforth, who chaired a task force on whose recommendations the bill was based, and expressed concerns that the program envisioned in the bill would be more appropriate within the Department of Agriculture. Dr. Bement was scheduled to meet with Senator Bond in early June to discuss the bill.

On April 13, Senator Carl Levin and Representative Vernon Ehlers introduced the *National Aquatic Invasive Species Act* of 2005, which would authorize $2.5 million to NSF for research grants on the systematics and taxonomy of invasive species and to support marine and freshwater research programs to prevent, control, and eradicate invasive species.

On April 5, Representative Mark Udall introduced the *Rural Access to Broadband Service Act*, authorizing $25 million for NSF to conduct research to expand or facilitate access broadband telecommunications services in rural and remote areas.

A list of bills introduced since the last NSB meeting was included in the package of materials provided to the Board (Board Book, Tab 13F). These bills generally establish an advisory role for the Foundation and would not materially affect NSF programs.

AGENDA ITEM 11: Committee Reports

a. Executive Committee (EC)

Dr. Washington stated that as a followup to the March meeting, the Executive Committee reviewed a revised sample memorandum transmitting NSB Member proposed awards to NSB Members to the NSB Office Director from an NSF Assistant Director (Board Book, Tab 8B). The revised memo includes the following added language: "On behalf of the program officer and division director, I verify that our review and decision-making processes for making this recommendation were not influenced by the fact that this proposal involves a Board Member."

Dr. Bement, Executive Committee chairman, reported that the committee endorsed the transmittal memo on proposed awards to NSB Members. In discussion, the committee included a recommendation that the memo be sent to the Board Office Director through, and with concurrence of, the NSF Director. The cover memo would be attached to supporting materials. Based on these recommendations:

> The Board unanimously APPROVED the cover memo on the subject of proposed awards to NSB Members that includes the added language (as stated above) and added routing through the NSF Director (Appendix B).

Each year, the Executive Committee summarizes its activities for the preceding year in its Annual Report. The committee endorsed the 2004 Annual Report of the Executive Committee (NSB/EC-05-8, Board Book Tab 13G), covering the period from May 2004 to April 2005, for delivery to the full Board with the recommendation that it be accepted. Dr. Bement noted that the key sentence in this report is, "During this period, the Executive Committee took no actions on behalf of the NSB." On this recommendation:

The Board unanimously APPROVED the 2004 Annual Report of the Executive Committee.

Dr. Bement also reported that he presented two information items to the Executive Committee. The first was U.S. deemed export controls that had received a fair amount of concern by the academic community because of its possible impact on the open research environment as well as the administrative and financial burdens to the research community. NSF is participating in an interagency working group seeking to address issues presented by the proposed rulemaking.

The second information item related to a letter from Dr. John Marburger, OSTP Director, requesting NSF pay the U.S. membership contribution to the International Institute for Applied Systems Analysis (IIASA). The amount of the membership is $1.8 million Euros, about $2.5 million given current exchange rates. The contribution merely complies with a request for membership.

b. Audit and Oversight (A&O) Committee

Dr. Mark Wrighton, chairman of the A&O Committee, reported that the NSF Office of Inspector General presented the *Semiannual Report to the Congress, March 2005, Office of the Inspector General*. The NSF management response was also presented along with the cover letter to Vice President Cheney (Board Book, Tab 12B). Based on the recommendation by the A&O Committee:

The Board unanimously APPROVED the transmittal letter and management response to the *Semiannual Report to the Congress, March 2005, Office of the Inspector General*.

Dr. Etter, chair of the *ad hoc* Task Group on NSF Vision, led a discussion on this topic. The committee reaffirmed the importance of working on a vision that would be enduring and encourage investments in science, engineering, and education as well as research. The committee noted that the Board needs to consider vision in the long-term, as well as documenting for the reader the formal responsibilities of NSB, particularly in connection with its oversight role.

Dr. Crosby presented a revised draft process outline for development of a Board response to the congressionally requested Board examination of the NSF merit review system (Board Book, Tab 12C). The committee intends to inform the public, via the Board's Web site, that comments on the policy issues related to the merit review system are welcome. However, individual complaints on specific proposal actions should be submitted to NSF by means of the normal process for that purpose. The Board's report to Congress will need to be concluded by the end of the fiscal year. A draft would be prepared before the August meeting, for review by the A&O Committee and the Board. A final document would be completed by the September Board meeting.

Ms. Deborah Cureton, Associate Inspector General for Audit, presented information on the Sarbanes-Oxley Act (SOX). The most significant implications would be in the area of management, certified financial statements, and the control environment. In response to SOX, the Office of Management and Budget (OMB) announced that NSF would be required to conduct a more rigorous assessment of its control environment and prepare a separate assurance report in FY 2006. Currently, there is no requirement for an auditor to render an opinion on NSF controls over financial reporting.

Mr. Thomas Cooley, NSF Chief Financial Officer, discussed the agency's plans to implement the internal control required by government-wide OMB Circular A-123, effective in FY 2006. Mr. Cooley also described the considerable progress made on addressing reportable conditions of the FY 2004 audit. Mr. Dan Kovlak, KPMG, agreed with Mr. Cooley that much progress was achieved. The committee will finalize this corrective action plan and implement it before a reportable condition can be relieved.

In closed session, the committee was provided information about several ongoing investigations.

c. Education and Human Resources (EHR) Committee

Dr. Hoffman, EHR chair, reported that the committee heard reports from the NSF Assistant Directors of the Computer and Information Science and Engineering (CISE) and the Geosciences (GEO) Directorates on the subject of their activities for the integration of research and education. Following these presentations, the committee participated in a discussion of the development of the Board's vision for the NSF in education for the 21st century workforce.

The Committee heard a presentation from Dr. Hastings on the NSB Workshop on Engineering Workforce Issues and Engineering Education: What are the Linkages? The work plan proposed by Dr. Hastings for the workshop was approved, with the workshop scheduled for Thursday, October 20, 2005 at Massachusetts Institute of Technology (MIT). It will include three panels followed by breakout groups and a final wrap-up session and reception. The panels would be (1) an agenda setting panel providing an overview, with motivating speakers to stimulate thinking; (2) a panel focused on issues in education including retention of students and broadening of education and, (3) employers on both global and domestic issues. After completing this workshop the desirability of follow-on workshops will be assessed. The committee approved the work plan of the workshop for recommendation to the Board. During Plenary Open Session:

> The Board unanimously APPROVED the work plan for the Workshop on Engineering Workforce Issues and Engineering Education: What are the Linkages?

A letter was drafted in response to a request from Congressman Vernon Ehlers (Board Book, Tabs E and F). The first sentence of the third paragraph was modified as follows: "The proposed NSF-wide 2006 budget begins an end to the commitment for large

experimental programs in the Math and Science Partnerships (MPS) program, which builds on NSF experience in large-scale precollege and service experiments;" and the first sentence of page 2, "NSF has a mandate, depth of experience under its Systemic Initiatives and other large-scale, multifaceted education activities and well-established relationships…" Based on those changes recommended by the EHR Committee:

> The Board unanimously APPROVED the revised letter to Congressman Ehlers as indicated above.

Dr. Hoffman called on Dr. Beering to report on the Subcommittee on Science and Engineering Indicators.

d. EHR Subcommittee on Science and Engineering (S&E) Indicators

Dr. Beering, S&E Indicators chairman, reported that the subcommittee had completed review of all eight draft chapters of the *Science and Engineering Indicators 2006* report. The next step would be to distribute the comprehensive draft report, the so-called "Orange Book". He thanked Members of the Board for their diligent review of the individual chapters and NSF staff for their careful work in preparing the draft chapters. He noted that *Indicators* is scheduled to be released in early 2006.

Dr. Beering reported the subcommittee's concern with the condition of U.S. K-12 education in the global context. Therefore, it had endorsed the preparation of a Board policy statement on the K-12 education experience. He recommended that the Board approve this topic as the subject of the "Companion Piece" to *Science and Engineering Indicators* 2006. On this recommendation:

> The Board unanimously APPROVED the "K-12 education" topic for the "Companion Piece" to *Science and Engineering Indicators* 2006.

e. Committee on Programs and Plans (CPP)

Dr. Daniel Simberloff, CPP chairman, reported that the Committee met in three sessions, first jointly with the Committee on Strategy and Budget (CSB), then in an open session on May 25, and in closed session on May 26.

In open session, CPP discussed the report of the task group on the Board's vision for NSF, lead by Dr. Etter. Dr. Etter asked for the assistance of the Task Group on Transformative Research in drafting the next version of the vision document. She noted that the next step would be to get input from all of the standing committees and revise the draft. The draft will then be shared with the NSF management and brought back to the Board at the August meeting. The primary discussion was the possibility of identifying grand challenges for each directorate.

The committee discussed the update of the Board's 2001 policy report, *Toward a More Effective Role for the U.S. Government in International Science and Engineering* (NSB-01-187). Dr. Simberloff explained that the committee would be forming an *ad hoc* Task Group on International Science to draft a charge and a proposal for a task force for this activity. Drs. Natalicio and Lubchenco volunteered to serve on the new task group. Other volunteers were also welcomed.

For the report on *Long-Lived Digital Data Collections: Enabling Research and Education in the 21st Century* (NSB-05-40), Dr. Rossmann reviewed the public comments that had been received, which were primarily concerned with the need for more interagency coordination and collaboration. A copy of the revised report taking into account the public comments was provided to members. The committee recommended approval of the report to the Board. Following this recommendation:

> The Board APPROVED the *Long-Lived Digital Date Collections* report with minor editorial changes to be handled by the NSB Office.

Dr. Simberloff also reported the committee's recommendation that NSF develop a preliminary strategy for implementing the recommendations and report to the CPP on the progress toward that goal at the September meeting. Following this recommendation:

> The Board APPROVED the recommendation that NSF develop a preliminary strategy for implementing the recommendations of the report on *Long-Lived Digital Data Collections* and report to CPP on the progress in developing the strategy at the September committee meeting.

The committee heard a report from Dr. Droegemeier on the meeting of the Task Force on Transformative Research. The meeting focused on the agenda for the upcoming workshop, whose objective is to attain an overview of the NSF culture with respect to transformative research.

Dr. Simberloff further reported that Dr. Margaret Leinen, Assistant Director, Geosciences Directorate, provided an update on environmental research and education programs at NSF. Dr. Leinen focused on the evolution of the priority area Biocomplexity in the Environment. She distributed and discussed the new planning document from the Advisory Committee on Environmental Research and Education.

Next, Dr. Simberloff addressed the NSF Director's report to the Board concerning the NSF strategy for high performance computing. He noted that the vision presented was expansive and forward looking. NSF's proposed next step is a high performance computing requirements analysis to be completed by August 2005. Solicitation for initial high performance computing acquisition was also proposed for September 2005, with first awards expected in September 2006. The committee thought that the draft report from NSF was an excellent start, but were concerned with the lack of time to review the draft. Therefore, the committee planned to organize a teleconference within a month to

discuss Board comments on the report with NSF. The committee also expects to have further discussion on this issue at the August meeting.

Dr. Simberloff reported that Dr. Crosby reviewed changes made in the report, *Setting Priorities for Large Research Facility Projects Supported by the National Science Foundation* (NSB/CPP-04-20), in response to public comments. He stated that CPP approved the document with the proposed changes, and recommended Board approval. Following this recommendation:

> The Board unanimously APPROVED the report, *Setting Priorities for Large Research Facility Projects Supported by the National Science Foundation* (NSB/CPP-04-20) with proposed changes.

Next, Dr. Simberloff reported that NSF Deputy Director, Dr. Bordogna, presented CPP with a revised facility plan. The committee approved the facility plan subject to minor editorial changes, which would subsequently be approved by himself and the NSB Chairman, and recommended approval by the Board. Following this recommendation:

> The Board APPROVED the *National Science Foundation Facility Plan*, subject to subsequent editorial changes to be approved by the CPP chairman and NSB Chairman.

Dr. Bordogna also updated the committee on the status of the facilities management and oversight guide, reporting that the guide is near completion.

Dr. Simberloff reported that in closed session CPP heard a full presentation and held a discussion on the four candidate projects for new starts in the Major Research Equipment and Facilities Construction Account. Then, using the process developed for reprioritizing new starts in the Account, they unanimously agreed on the following ranking for the four projects: (1) Alaska Region Research Vessel (ARRV), (2) National Ecological Observatory Network (NEON), (3) Ocean Observatories Initiative (OOI), and (4) Advanced Laser Interferometer Gravitational-Wave Observatory (AdvLIGO). The only change, other than adding AdvLIGO, was the reversal of the order of the ARRV and NEON. He noted the decision on ranking the research vessel first was a result of rapid significant changes in the Alaska regional marine environment and the continuing inadequacy of the research vessel for gathering data on this change. He noted further that this project could constitute a major contribution to the International Polar Year (IPY).

Dr. Simberloff asked Dr. White to report on the action of the Subcommittee on Polar Issues.

f. CPP Subcommittee on Polar Issues (SOPI)

Dr. John White, SOPI chairman, reported that the SOPI and CPP had two resolutions to present concerning NSF fiscal responsibilities for the operation and maintenance of icebreakers. He noted that CPP had approved the first resolution, and moved approval of that resolution by the National Science Board:

WHEREAS the research supported by the National Science Foundation in polar regions depends heavily on polar icebreakers, both as research platforms and to enable transportation of cargo and fuel to the U.S. research stations at McMurdo Sound and the South Pole in Antarctica; and

WHEREAS that research is critical for understanding phenomena of global importance, including climate change, and polar regions offer unique opportunities for forefront research in a broad range of disciplines; and,

WHEREAS the two Coast Guard polar class icebreakers that support McMurdo and South Pole supplies are nearing the end of their design lifetimes and would require substantial costly upgrades within the next few years to keep them operational; and,

WHEREAS the Administration has proposed that the National Science Foundation assume responsibility for polar icebreaking operations in FY2006 and beyond; and,

WHEREAS a number of alternatives to the status quo deserve consideration;

THEREFORE BE IT RESOLVED that the National Science Board supports the National Science Foundation Director taking all necessary steps to meet the requirements for polar icebreaking among available options to best meet the needs of the research community in the most cost-effective manner.

Dr. White then offered an amended resolution, revising the fifth, and last, item beginning with "WHEREAS" to read:

WHEREAS the Administration and Congress have encouraged consideration of alternatives to the status quo;

Following these recommendations the National Science Board acted as follows:

The Board unanimously APPROVED the amendment to the resolution; and

The Board unanimously APPROVED the resolution as amended (NSB-05-68) (Appendix C)

g. Committee on Strategy and Budget (CSB)

Dr. Ray Bowen, CSB chairman, reported that the committee met in a joint session with CPP. The joint session heard a brief history on the investment in NSF incentives by Dr. Nathaniel Pitts, Director, Office of Integrative Activities. The committee was reminded that President Reagan's State of the Union address in 1987 proposed a doubling of the NSF budget and a commitment to science and engineering centers. During the period from 1983 to 1989, about 10 percent of NSF funding was for centers, which had been reduced to about 8.5 percent of the Research and Related Activities (R&RA) Account in FY 2004.

Mr. Cooley also reported to the CSB-CPP joint session on funding rates, award size, and duration. He provided 10-year trend data, which indicated an increase in award size over that period of time and a substantial increase in the numbers of competitive proposals processed by NSF largely for information technology research (ITR) and Small Business Innovation Research (SRIR) programs. Declining research budgets at the state level and less money available from other Federal agencies for basic research also contributed to the number of proposals received.

In the CSB Open Session, Dr. Etter led a discussion on the draft vision statement by the *ad hoc* Task Group on NSF Vision and focused on the way to express the vision and properly capture the long-term role and impact of NSF in the vision statement. The committee was also concerned with how this vision could be used to characterize the existing NSF budget environment. The committee also heard a presentation by Mr. Cooley, who provided a historical context for the long-range planning notebooks, which had been provided to Board Members since 1990.

In closed session, the committee held discussions on the process involving the 2007 budget submission to OMB in September.

h. *ad hoc* Task Group on Vision for NSF

Dr. Etter, chair of the *ad hoc* Task Group on Vision for NSF, reported that the NSB task group was initiated at the request of the Senate to develop and establish a new vision for NSF in the 21st century. The task group is expected to produce a document by the end of 2005. Other members of the task group are: Drs. Barish, Sullivan, and Douglas Randall. As of the May meeting, an additional Board Member joined the task group, Dr. Nina Fedoroff. The task group initially compiled a two-page draft document to initiate discussion among Board Members. The working document was revised considerably, as Dr. Etter met with each committee and received feedback.

The task group will use the framework of the document with a preamble that establishes NSF's critical role in the history of science and engineering of the past 50 years, emphasizing the investments that provided benefits from fundamental new ideas to vital new technology, and include information about changes to the environment. The document will also include a vision statement as well as strategic goals relating to

transformative research, building a diverse and broadly trained science and engineering workforce, and communicating with the public to promote understanding of the contributions of science and technology. Additionally, the document will contain investment principles and possible next steps. A second draft of the document will be available for the August Board meeting that will include further comments by Board Members, NSF leadership, and NSF Assistant Directors.

Dr. Washington left the room to attend congressional meetings, and Dr. White assumed Acting Chair duties for the Plenary Open Session.

AGENDA ITEM 12: Overview of Millennium Ecosystem Assessment

Board Member, Dr. Jane Lubchenco, Wayne and Gladys Valley Professor of Marine Biology and Distinguished Professor of Zoology at Oregon State University, gave a presentation on the Millennium Ecosystem Assessment (MA). MA is an international work program designed to meet the needs of decision makers and the public for scientific information concerning the consequences of ecosystem change for human well-being and options for responding to those changes. The program was launched by United Nations Secretary, General Kofi Annan, in June 2001 and was completed in March 2005. The focus of the report is on ecosystem services: provision of food, regulating services, cultural services, and supporting services. In the last 50 years, humans have changed ecosystems radically. The changes have brought benefits but are coming at increasing cost. The report uncovered huge scientific questions that require urgent answers. NSF is well positioned to be able to address this challenge.

AGENDA ITEM 13: Presentations by 2005 Alan T. Waterman and NSB Public Service Awardees

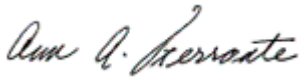
Dr. Dalton Conley, Professor of Sociology and Public Policy and Director, Center for Advanced Social Sciences Research at New York University, and recipient of the 2005 Alan T. Waterman Award for outstanding and exceptional promise for significant future achievements demonstrated through personal accomplishments in scientific research, gave a presentation on the effects of race, wealth, and socioeconomic attainment in higher education.

A presentation was also given by the co-chairs of the Computer Research Association's Committee on the Status of Women in Computing Research (CRA-W), which received the NSB Public Service Group Award. Drs. Carla Ellis and Mary Jean Harrold discussed CRA-W's commitment to public service through its various programs and projects aimed in computer science and engineering research and education.

NON-AGENDA ITEM

Dr. Ford discussed Dr. Richard Florida's new book, *Flight of the Creative Class*, which was provided to Board Members. The focus of the book is that the primary means of production is now, and will continue to be, talented and creative people. Cities will compete for these people, and the competition will provide the basis for the future economic success or failure of those cities. The author extends this model from cities competing for talent to nations competing for talent. This concept ties directly to the issues that the Board has been discussing with respect to science, technology, engineering, and mathematics (STEM) education, visa policies, and other issues. Dr. Florida, a Heinz Professor at Carnegie-Mellon University, is currently on sabbatical.

Dr. White adjourned the Open Session at 3:40 p.m.



Ann A. Ferrante
Writer-Editor
National Science Board Office

Attachments

Appendix A: NSB-05-51
Appendix B: Board Member Transmittal Memorandum
Appendix C: NSB-05-68

Appendix A to NSB-05-76
NSB-05-51

NSB Meeting Dates for Calendar Year 2006

February 9 – 10
(Thursday - Friday)
[Annual Retreat/Site Visit]

March 29 – 30
(Wednesday - Thursday)

May 9 – 10
(Tuesday - Wednesday)
[Annual Meeting and Awards Dinner]

August 9 – 10
(Wednesday - Thursday)

September 27 – 28
(Wednesday - Thursday)

November 29 – 30
(Wednesday - Thursday)

S A M P L E

[Month Day, Year]

MEMORANDUM

TO: Dr. Michael P. Crosby
NSB Executive Officer and NSB Office Director

THROUGH: Dr. Arden L. Bement
NSF Director

FROM: xxxx
Assistant Director, [Name of Directorate]

SUBJECT: Proposed Award to NSB Member

The attached material provides information to the National Science Board (NSB, Board) that supports a recommended award to a principal investigator who is an NSB Member.

The proposal [#] was submitted by and is under the direction of [Board Member name and institution]. In correspondence dated [date], [university] designated [name] as substitute negotiator with authority to negotiate with the National Science Foundation on behalf of Dr. [Board Member name] in matters related to this proposal/grant while Dr. [Board Member name] is a Member of NSB. The Division of [name] has recommended a [duration] award in the amount of $[dollar amount].

On behalf of the program officer and division director, I verify that our review and decision-making processes for making this recommendation were not influenced by the fact that this proposal involves a Board Member.

Attachments

Appendix C to NSB-05-76
NSB-05-68
May 26, 2005*

RESOLUTION

NATIONAL SCIENCE BOARD

SUPPORT TO NSF DIRECTOR FOR
POLAR ICEBREAKING ISSUES

WHEREAS the research supported by NSF in polar regions depends heavily on polar icebreakers, both as research platforms and to enable transportation of cargo and fuel to the U.S. research stations at McMurdo Sound and at the South Pole in Antarctica; and

WHEREAS that research is critical for understanding phenomena of global importance, including climate change, and polar regions offer unique opportunities for forefront research in a broad range of disciplines; and

WHEREAS the two Coast Guard polar class icebreakers that support McMurdo and South Pole supply are nearing the end of their design lifetimes and would require substantial costly upgrades within the next few years to keep them operational; and

WHEREAS the Administration has proposed that NSF assume responsibility for polar icebreaking operations in FY 2006 and beyond; and

WHEREAS the Administration and Congress have encouraged consideration of alternatives to the status quo;

Therefore, be it RESOLVED, that the National Science Board supports the NSF Director taking all necessary steps to meet the requirements for polar icebreaking among available options to best meet the needs of the research community in the most cost effective manner.

Warren M. Washington
Chairman

* Previously dated incorrectly as March 26, 2005