

**APPROVED MINUTES
OPEN SESSION
371st MEETING
NATIONAL SCIENCE BOARD**

The National Science Foundation
Arlington, Virginia
November 21, 2002

Members Present: Members Absent:

Warren M. Washington, Chair
Diana S. Natalicio, Vice Chair
Nina V. Fedoroff
Pamela A. Ferguson
Anita K. Jones
George M. Langford
Jane Lubchenco
Robert C. Richardson
Michael G. Rossmann
Luis Sequeira
Daniel Simberloff
John A. White, Jr.
Mark S. Wrighton

Rita R. Colwell, NSF Director

Members Absent:

Joseph A. Miller, Jr.
Maxine Savitz

Consultants Present:

Barry C. Barish
Steven C. Beering
Ray M. Bowen
Delores M. Etter
Kenneth M. Ford
JoAnne Vasquez

Consultants Absent:

Daniel E. Hastings
Elizabeth Hoffman
Douglas D. Randall

The National Science Board (NSB) convened in Open Session at 12:30 p.m. on Thursday, November 21, 2002, with Dr. Warren M. Washington, Chair, presiding (Agenda NSB-02-172 revised). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

NON-AGENDA ITEM: Dr. Chang-Lin Tien

Dr. Washington commented on the significant contributions that the late Dr. Chang-Lin Tien, University Professor and NEC Distinguished Professor of Engineering, University of California at Berkeley, made to the Board and to the broader scientific community. He noted that among Dr. Tien's many contributions was his work on the Board's Statement on Open Communication and Access in Science and Engineering, adopted in 2000.

NON-AGENDA ITEM: Presidential Nominees

Dr. Washington announced the nine Presidential nominees who are serving as Board consultants while awaiting Senate

confirmation as Board members and introduced the six who were in attendance.

AGENDA ITEM 3: Presentation

(1) Mathematical and Physical Sciences

Dr. Rita Colwell, National Science Foundation (NSF) Director, introduced Dr. John Hunt, Acting Assistant Director of the Mathematical and Physical Sciences Directorate (MPS).

Dr. Hunt described a sampling of the environmental research being done in MPS through environmental molecular science institutes. He highlighted research related to the role of diatoms in the carbon cycle in the ocean, the active transport of iron and iron-binding in bacteria, the use of anion exchange beads to remove heavy metal contaminants, the role of aerosols in atmospheric chemistry, the use of liquid carbon dioxide in place of organic solvents as a medium for reactions, a physical process for converting polymers into useful copolymers, modeling and simulation in collaboration with the Geosciences Directorate, and development of algorithms to analyze contamination and the flow of contaminants through the earth.

AGENDA ITEM 4: Open Session Minutes, October 2002

The Board APPROVED the Open Session minutes of the October 2002 meeting (NSB-02-163, Board Book Tab C).

AGENDA ITEM 5: Closed Session Items for February 2003

The Board APPROVED the Closed Session items for the February 2003 Board Meeting (NSB-02-174, Board Book Tab D).

AGENDA ITEM 6: Chair's Report

a. Congressional actions affecting the Board

Dr. Washington reported that the Senate and House had passed the NSF Authorization Act and the President is expected to sign it. The Act authorizes funding for 3 years and puts NSF's budget on a path toward substantial increases. It also contains provisions intended to ensure more independence and accountability for the Board in its oversight role. Dr. Washington noted that several provisions address openness of Board meetings, including committee and task force meetings, under the Government in the Sunshine Act, and he has already discussed with the NSF's General Counsel how best to implement these provisions. Before the February 2003 meeting, members will be asked to comment on a possible course of action to ensure compliance with legislated requirements. Subsequently, the Executive Committee will discuss and recommend procedures for the February meeting. Dr. Washington stated his commitment to adhere to the letter and the spirit of the Sunshine Act.

b. NSB Retreat

Dr. Washington reminded Board members that at the October meeting he had asked them to consider possible topics and locations for the retreat on February 7, 2003. He received several suggestions for topics: issues raised in the Audit and Oversight (A&O) Committee concerning how the Board can best meet its policy and oversight responsibilities, Board oversight of and support for NSF as its budget increases, openness concerns, and the option of meeting at a major facility once a year. Board members agreed to hold the 2003 retreat in the Washington, DC, area. Dr. Washington stated that he would ask a few Board members to plan the February retreat.

AGENDA ITEM 7: Director's Report

a. Introduction of new NSF staff

Dr. Colwell introduced new NSF staff: Dr. Kerri-Ann Jones, director of the Office of International Science and

Engineering; Dr. Michael Pazzani, director of the Division of Information and Intelligent Systems, Computer and Information Science and Engineering Directorate; Dr. William Rundell, director of the Division of Mathematical Sciences, Math and Physical Sciences Directorate; and Dr. Margaret Tolbert, senior advisor in the Office of Integrative Activities.

b. NSF staff honors

Dr. Colwell announced that two NSF staff had received the 2002 President's Distinguished Service Award for their commitment to excellence in public service and their long-term accomplishments: Mr. Lawrence Rudolph, General Counsel, and Dr. Machi Dilworth, director of the Division of Biological Infrastructure, Directorate for Biological Sciences.

c. Congressional Update

Dr. Colwell reported on recently passed legislation. The Authorization Act reauthorizes funding for NSF up to \$9.84 billion in 2007 and is awaiting the President's signature. Also awaiting signature is the Cybersecurity Research and Development Act, which authorizes NSF and the National Institute of Standards and Technology to undertake research on network security, build research capacity, and establish network security centers. Dr. Colwell noted that the appropriations bill for the current fiscal year has yet to be enacted. She commented that the recent national election results are unlikely to have much impact on NSF in the near term because NSF has wide bipartisan support in both the House and Senate.

d. Update on the Advisory Committee for GPRA

Dr. Colwell introduced Dr. Maryellen Cameron, a senior advisor in the Budget Division, Office of Budget, Finance and Award Management, and NSF coordinator of the Advisory Committee for GPRA Performance Assessment (AC/GPA). The AC/GPA has 19 members, about half of whom are members of other directorate office advisory committees. Dr. Cameron pointed out that AC/GPA is one of the few advisory committees to examine the NSF-wide portfolio in the context of the outcome goals: people, ideas, and tools. The AC/GPA concluded that NSF's retrospective portfolio demonstrates significant achievement for all indicators associated with the people, ideas, and tools. The AC/GPA recommends that NSF continue the advisory committee process for at least one more cycle and that improvements be implemented for sampling, descriptions of discoveries and accomplishments, and some process matters.

AGENDA ITEM 8: Cost Sharing Resolution

Dr. Mark Wrighton, chair of the A&O Committee, presented a resolution to change the language in NSF's policy statement on cost sharing. The changes would clarify that cost sharing is to be involved only as required by law. For a few exceptions, such as major research equipment or large center proposals, cost sharing would be part of the process. In budget negotiations, any reduction of 10 percent or more should be accompanied by a corresponding reduction in the scope of the project.

During discussion, two related topics were noted: (1) programs that have a special purpose for which NSF announces that there will be a low indirect cost rate compared to the average indirect cost rate that prevails at most universities, and (2) the mandatory 10 percent cost share for some programs that results in the university paying indirect costs on that cost share, with less money going to science.

In response to Board member comments during discussion, Dr. Wrighton agreed that the A&O Committee would undertake a comprehensive analysis of the entire package of cost-sharing issues.

With that understanding, the Board took the following action:

RESOLVED, That the National Science Board approves the proposed revision to the National Science Foundation's cost sharing policy (NSB 99-92) as recommended by the Audit and Oversight Committee, as follows:

That the third paragraph of the section in the policy entitled "Budget Negotiations" be deleted and replaced with the following: "In budget negotiations, any reduction of 10% or more from the amount proposed should be accompanied by a corresponding reduction in the scope of the project."

(NSB-02-188)

AGENDA ITEM 9: Guidelines for Setting Priority for Major Research Facilities

Dr. Pamela Ferguson, on behalf of Dr. Maxine Savitz, chair of the Committee on Strategy and Budget (CSB), presented a resolution to revise NSF's guidelines for prioritizing the funding of Major Research Facilities projects. The committee presented the resolution jointly with the Committee on Programs and Plans (CPP). On the recommendation of both committees, the Board took the following action:

RESOLVED, that the National Science Board approves the attached revision to NSB-01-204, entitled "Guidelines for Setting Priority for Major Research Facilities," and dated November 15, 2001, as recommended by the Committee on Strategy and Budget and the Committee on Programs and Plans. (NSB-02-189)

(The revised guidelines, NSB-02-191, are attached as Appendix A.)

AGENDA ITEM 10: Infrastructure Task Force Report

Dr. Anita Jones, chair of the CPP, reported that the committee recommends approval of posting the draft report by the Task Force of Science and Engineering Infrastructure on the Board's website for thirty days to solicit public comment. Public comments will be incorporated into a revised draft, to be presented to the Board at the February 2003 meeting.

Upon the recommendation from CPP, the Board APPROVED the posting of the draft report, "Science and Engineering Infrastructure: The Role of the National Science Foundation" (NSB-02-190) on the Board's website in order to solicit public comment.

AGENDA ITEM 11: Committee Reports

a. Audit and Oversight (A&O)

Dr. Wrighton, chair, presented the draft NSF Management Response to the Inspector General's Semiannual Report to the Congress. The Board APPROVED the response, as read.

Dr. Wrighton reported that the committee heard presentations on procedures related to civil and criminal investigations conducted by the Office of Inspector General, with two cases as examples. Dr. Christine Boesz, Inspector General, described four issues from the management letter report that remain to be resolved: information technology security, award administration and oversight, cost accounting, and accounting for NSF-owned capital assets in the field.

The committee heard NSF staff presentations on the audit resolution process, new Office of Management and Budget policies and business rules applicable to intergovernmental funding transactions, and the Federal Managers Financial Integrity Act for FY 2002. In addition, the committee received a presentation from Dr. Norine Noonan, co-chair of the NSF AC/GPA, describing the group's activities and findings. The assessment of NSF programs was highly favorable.

Dr. Wrighton noted that the committee has reviewed a draft report on Board resources and policy dissemination prepared by Dr. Nina Fedoroff and asked for Board members' views on the current draft as a guide to the committee's further action.

Dr. Fedoroff reminded Board members that this A&O activity originated in a Board retreat that considered the time and resources spent on Board reports. Subsequently, the Board Chair asked the A&O Committee to gather data on the cost of Board reports and to provide recommendations for improving efficiency. Dr. Fedoroff summarized the A&O effort to assemble the information, its preliminary assessments, and several recommendations.

During discussion, several Board members stressed the importance of the Board maintaining ownership of any study and recommendations. Dr. Washington noted that the draft report would be discussed in more depth at the retreat in

February.

b. Committee on Programs and Plans (CPP)

Dr. Jones, chair, reported that, in addition to the actions on the infrastructure report and the major facilities guidelines, the committee discussed the International Ocean Drilling Program and recommended to the Board the issuance of a request for proposals (RFP) for retrofitting a light drilling vessel. In Closed Session, the Board approved the issuance of the RFP and a subsequent award. The committee heard presentations on the formation of University NAVSTAR Consortium, the effects of the South American financial crisis on the funding of Gemini, case studies illustrating the development of cost estimates for large facilities, and an update on activities in the environmental area.

c. CPP Subcommittee on Polar Issues

Dr. John White, chair, reported that Dr. Karl Erb, director of the Office of Polar Programs, reported on the status of three aircraft essential to South Pole modernization. Other presentations were on the history and recent developments in designing the planned Alaska Regional Research Vessel, research results on the retreating Alaska glaciers, and results from a swath bathymetry system that will allow scientists to study ocean floor structures in Antarctica. The subcommittee also previewed the film "Under Antarctic Ice," by Norbert Wu, which will air in January on the Public Broadcasting System.

d. CPP Task Force on Science and Engineering Infrastructure (INF)

Dr. White, chair, encouraged Board members and consultants to read the task force's draft report and share any suggestions that would strengthen the final report. The task force is discussing dissemination options and will develop a plan to enhance the visibility of the report and engage the scientific community.

e. Education and Human Resources Committee (EHR)

Dr. George Langford, chair, reported that the committee heard updates from the Science and Engineering Indicators Subcommittee and the Task Force on National Workforce Policy. Dr. James Lightbourne, acting director of the Division of Graduate Education, Directorate for Education and Human Resources, presented a progress report on the activities of NSF's Working Group on the Workforce for the 21st Century. He engaged committee members in a discussion of student attitudes and the changing nature of scientific investigations. The committee also heard presentations on education and diversity activities from Dr. Margaret Leinen, Assistant Director for the Geosciences, and Dr. Judith Ramaley, Assistant Director for Education and Human Resources.

Dr. Washington suggested that the information on the education and diversity activities of each directorate be compiled into a report.

f. EHR Task Force on National Workforce Policies for Science and Engineering (NWP)

Dr. Daniel Simberloff reported on behalf of Dr. Joseph Miller, chair, that the task force discussed the full draft of its report and continues to edit the document. The key finding is that U.S. science and engineering are increasingly dependent on foreign-born talent at a time when both international competition for that talent and U.S. security concerns are increasing. The U.S. continues to under develop its domestic human resources, especially traditionally underrepresented minorities who are a growing fraction of the student age population. Institutions of higher education need to increase capacity for science and engineering studies at the two-year and four-year levels, and graduate studies need to accommodate various kinds of alternative programs. Also essential is a successful effort to attract and retain well-qualified pre-college teachers of science, math, and technology. The U.S. must ensure that U.S. students and scientists can participate internationally. A better database is needed on the status and flows of the scientific workforce. The task force's plan is to bring a draft report to the Board, through the EHR Committee, at the March 2003 meeting.

g. Science and Engineering Indicators Subcommittee (S&EI)

Dr. Robert Richardson, chair, called members' attention to the content list and production schedule for the 2004 volume. He noted that each member would be asked to review a chapter. The subcommittee proposes as the topic for a "companion piece" the shortage of skilled science teachers in high school and its implication for the future workforce.

h. Committee on Strategy and Budget (CSB)

Dr. Ferguson, reporting in the absence of Dr. Savitz, chair, stated that the committee discussed several topics in addition to the guidelines for prioritizing funding for major facilities. Dr. Bordogna led a discussion of how the NSB and NSF could support new mid-sized facilities through the Research and Related Activities account as well as the Major Research Equipment and Facilities Construction (MREFC) account. The committee determined that NSF's definition of which facilities fall under the MREFC account should remain unchanged but be reviewed periodically. It was agreed that the CSB and CPP with NSF staff should develop a policy statement on which facilities would be appropriate for the different NSF accounts. Dr. Bordogna also briefed the committee on the plans and schedule to revise NSF's GPRA Strategic Plan. The revised plan must be submitted to the Office of Management and Budget in March 2003.

Dr. Ferguson stated that the committee discussed its role in assessing the extent to which recommendations in NSB reports have been implemented.

AGENDA ITEM 12: Other Business

Dr. Washington discharged the Task Force on Digital Opportunity Investment Trust, formed to respond to a congressional request last spring. The Board made its recommendations to the Congress and has not received a reply.

After thanking the many NSF staff members who helped prepare for and who participated in the meeting, Dr. Washington adjourned the Open Session at 2:40 p.m.

Janice E. Baker
Policy Writer/Editor

Attachment
Appendix A: NSB-02-191

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