

MEMORANDUM TO MEMBERS AND CONSULTANTS OF THE NATIONAL SCIENCE BOARD

SUBJECT: Summary Report of the May 9-10, 2006 Meeting

The major actions of the National Science Board (NSB, the Board) at its 392nd meeting on May 9-10, 2006 and a preliminary summary of the proceedings are provided. This memorandum will be publicly available for any interested parties to review. A more comprehensive set of NSB meeting minutes will be posted on the Board's public Web site (<http://www.nsf.gov/nsb/>) following Board approval at the August 2006 meeting.

1. Major Actions of the Board (not in priority order):

- a. The Board approved the minutes of the Plenary Open Session (NSB-06-44) for the March 2006 meeting (http://www.nsf.gov/nsb/meetings/2006/0329/open_sess.pdf). Minutes for the Plenary Executive Closed and Closed Sessions for the March 2006 meeting of the Board were also approved.
- b. The Board approved a resolution to close portions of the upcoming August 9-10, 2006 Board meeting dealing with staff appointments; future budgets; grants and contracts; specific Office of the Inspector General investigations and enforcement actions; and National Science Foundation participation in a civil or administrative action, proceeding, or arbitration (NSB-06-50) (<http://www.nsf.gov/nsb/meetings/2006/0809/closing.pdf>).
- c. Dr. Steven Beering was elected to a 2-year term as Chairman of the Board and Dr. Kathryn Sullivan was elected to a 2-year term as Vice Chairman. Drs. Beering and Sullivan were elected by acclamation to 2-year terms as members of the Executive Committee.
- d. Dr. Ray Bowen was elected to the Executive Committee to complete the unexpired term May 2006-May 2007 created by Dr. Beering's election as Board Chairman.
- e. The Board authorized the NSF Director, at his discretion, to make an award to the Incorporated Research Institutions for Seismology (IRIS) for renewed support of the seismology facilities and programs operated by IRIS.
- f. The Board authorized the NSF Deputy Director, at her discretion, to provide support to Columbia University for the U.S. Large Hadron Collider (LHC) ATLAS Detector Operations starting in FY 2007, and to UCLA for the U.S. Large Hadron Collider (LHC) CMS Detector Operations starting in FY 2007.

- g. The Board authorized the Director, at his discretion, to increase the spending authority for the Atacama Large Millimeter Array (ALMA) under cooperative agreement AST-0223851 and its successor agreements to extend the duration of the award through September 30, 2012.
- h. The Chairman announced the members of the Commission on 21st Century Education in Science, Technology, Engineering, and Mathematics (NSB/STEMComm-06-1) (Attachment 1).
- i. The Board approved a schedule of meetings for calendar year 2007 (NSB-06-65) (Attachment 2) and asked Dr. Michael Crosby, Executive Officer of the Board, to report at the August meeting on candidate locations for the February 2007 annual retreat and site visit.
- j. The Board accepted the Annual Report of the Executive Committee as presented by the committee chairman, Dr. Arden L. Bement, Jr., NSF Director (NSB/EC-06-3) (Attachment 3).
- k. The Board approved, as edited, a letter to Senator John McCain in response to his request for the Board to examine existing policies of Federal science agencies concerning the suppression and distortion of research findings and the impact these actions could have on quality and credibility of future Government-sponsored scientific research results (Attachment 4).
- l. The Board Chairman discharged the *ad hoc* Committee for the Vannevar Bush Award with thanks to Dr. Kenneth Ford, chairman, and Drs. Dan Arvizu, Kelvin Droegemeier, and Kathryn Sullivan.
- m. The Board Chairman discharged the *ad hoc* Committee on Nominating for NSB Elections, with thanks to Dr. John White, chairman, and Drs. Jane Lubchenco, Daniel Simberloff, and Mark Wrighton.
- n. The Board approved the transmittal letter and management response for the Office of Inspector General's semiannual report to Congress.

2. Board Chairman's Report

Dr. Warren Washington, Board Chairman, recognized and thanked Board Members of the Class of 2006, who completed their service with the May 2006 Board meeting. The following Members served for the past 6 years: Drs. Nina Fedoroff, Michael Rossmann, Daniel Simberloff, and Mark Wrighton. Dr. Jane Lubchenco served for 10 years, and Drs. John White, Diana Natalicio, (as well as Dr. Washington) served for 12 years on the Board.

Dr. Washington announced that the Board elected Dr. Steven Beering, as Chairman, and Dr. Kathryn Sullivan, as Vice Chairman for the 2006-2008 term. Both will also serve as members of the Executive Committee from 2006 to 2008. Dr. Ray Bowen was elected to the

Executive Committee to complete the unexpired term May 2006 – May 2007 created by Dr. Beering's election at Board Chairman.

The Chairman announced the members of the Commission on 21st Century Education in Science, Technology, Engineering, and Mathematics ([NSB/STEMComm-06-1](#)) (Attachment 1).

With the Board approval of the meeting schedule for the 2007 calendar year ([NSB-06-65](#)) (Attachment 2), the Chairman asked Dr. Crosby to develop a short list of candidate locations for the annual retreat and site visit next year.

The Board approved a formal response to Senator John McCain on policies of Federal science agencies concerning the suppression and distortion of research findings and the impact on quality and credibility of all future Government-sponsored scientific research results (Attachment 4).

Dr. Washington described the annual Awards Dinner at the Smithsonian's Museum of Natural History. The Board was honored to receive a message from President Bush, and recognized Congressman Sherwood Boehlert in appreciation of his valuable contributions to the science and education communities. The following award recipients were recognized for their distinguished contributions:

- Dr. Raj Reddy, Mozah Bint Nasser University Professor of Computer Science and Robotics, School of Computer Science, Carnegie Mellon University received the Vannevar Bush Award;
- Dr. Charles H. Townes, Professor in the Graduate School, University of California, Berkeley also received the Vannevar Bush Award;
- Dr. Emmanuel J. Candes, Professor of Applied and Computational Mathematics, California Institute of Technology received the Alan T. Waterman Award;
- Mr. Alan Alda, Host of *Scientific American Frontiers* and an actor, writer, and director received the individual NSB Public Service Award;
- Dr. Craig R. Barrett, Chairman of the Board for Intel Corporation also received the individual NSB Public Service Award; and
- Association of Science-Technology Centers received the group NSB Public Service Award.

On May 2, 2006, in his last statement to Congress as Chairman of the Board, (<http://www.nsf.gov/nsb/documents/2006/0502/testimony.pdf>) Dr. Washington testified before the Committee on Commerce, Science, and Transportation; Subcommittee on Science and Space. In his statement, Dr. Washington discussed the NSF FY 2007 budget request, the Board's budget for FY 2007, and the Board activities during the last year.

Dr. Washington also made three committee announcements. He discharged the *ad hoc* Committee for the Vannevar Bush Award with thanks to Dr. Kenneth Ford, chairman, and Drs. Dan Arvizu, Kelvin Droegemeier, and Kathryn Sullivan. Also discharged was the *ad hoc* Committee on Nominating for NSB Elections with thanks to Dr. White, chairman, and Drs. Lubchenco, Simberloff, and Wrighton. The Chairman deferred the appointment of members to serve on the *ad hoc* Committee on NSB Nominations for the Class of 2008 – 2012 to the new Board Chairman.

Lastly, Dr. Washington recognized Ms. Amanda Slocum, the first Science Assistant for the Board, who completed her appointment. Ms. Slocum is departing to work towards her Ph.D. degree at Carnegie Mellon University.

3. NSF Director's Report

Dr. Arden Bement, NSF Director, introduced a new member of the NSF staff: Dr. Julie D. Morris, Director of the Division of Ocean Science, Directorate for Geosciences (as of April 2006).

The NSF Web site won the People's Voice award in the "Government" category of the annual *Webby* competition, regarded as the "Oscar" contest for Web sites. NSF was selected as one of five finalists worldwide.

A congressional update, which listed numerous hearings and legislation relating to NSF, was submitted for the record and included as part of the Board Book.

4. NSB Committee Reports

a. Executive Committee (EC)

EC Open Session

The committee endorsed the Annual Report of the Executive Committee, which summarized the activities from May 2005 through April 2006, as presented. *[The EC Annual Report was subsequently accepted by the full Board.]*

EC Closed Session

In closed session, the committee discussed a situation relating to a Board Member proposal.

b. Audit and Oversight (A&O) Committee

A&O Open Session

Dr. Christina Boesz, NSF Inspector General, discussed the latest Office of the Inspector General (OIG) Semiannual Report. Dr. Fae Korsmo, NSF Director's Office, relayed the management response with data tables. The committee approved the draft transmittal letter and recommended that the full Board approve it. *[The full Board subsequently approved the transmittal letter and management response.]*

Mr. Thomas Cooley, NSF Chief Financial Officer, provided an update on the status of the reportable conditions under the FY 2005 financial statement audit, oversight of large facilities, and agency efforts to implement the Office of Management and Budget (OMB) Circular A-123, "Management's Responsibility for Internal Control." He also noted that a larger number of "high risk" institutions were identified for FY 2006 than FY 2005, and that contractor help will

assure NSF oversight coverage of all designated high risk institutions. Mr. Cooley further stated that the Defense Contract Audit Agency had been engaged by NSF to help with cost reviews of large contracts.

A&O Closed Session

In closed session, OIG staff reviewed six pending investigations.

c. Education and Human Resources (EHR) Committee

The committee was briefed by two distinguished speakers, Dr. Michael S. Teitelbaum, Vice President of the Alfred P. Sloan Foundation in New York, and Dr. Carol Lynch, Senior Scholar at the Council of Graduate Schools (CGS). Drs. Teitelbaum and Lynch provided background on the Sloan Science Master's Program, which led to the partnership with CGS and the Professional Science Master's Degree program.

Dr. Donald Thompson, Acting Assistant Director, NSF Education and Human Resources Directorate (NSF/EHR), continued with the series of presentations to the committee on the unique role of NSF in science, technology, engineering, and mathematics (STEM) education and the evaluation of NSF's education investments.

Dr. Daniel Hastings briefed the committee on the work for the Engineering Education Workshop. Drs. Louis Lanzerotti, Wayne Clough, and Hastings planned to hold discussions with the NSF Engineering Directorate leadership and the National Academy of Engineers. Following these discussions, they would move forward with plans for a workshop on November 7, 2006 at the Georgia Institute of Technology with leading deans of engineering institutions. Workshop participants will discuss how NSF programs and activities can address the issues raised during the October 20, 2005 Engineering Workshop at the Massachusetts Institute of Technology (MIT).

Dr. Crosby noted that discussions were taking place with Department of Defense (DoD) officials concerning U.S. workforce concerns. DoD, which employs significant numbers of Federal scientists and engineers, currently had programs to increase the number of scientists and engineers in the workforce areas that DoD needs. The committee agreed that it would be of mutual interest to have Dr. William Berry, Deputy Under Secretary of the Defense Laboratories and Basic Sciences, as an invited speaker at a future EHR meeting.

Dr. Sullivan introduced a new publication, *Science Can Take Her Places! A Guide for Parents Grades 4-7 for Encouraging Your Daughter's Interests in Science, Math and Technology*, published by Sally Ride Science. The material is based upon work supported by NSF. Dr. Sullivan and Dr. Elizabeth Hoffman would attend the First National Summit on the Advancement of Girls in Math and Science held at the U.S. Department of Education later in the month. Dr. Kathie Olsen, NSF Deputy Director, and Dr. Jo Anne Vasquez would also be participants.

d. EHR Subcommittee on Science and Engineering Indicators (SEI)

Dr. Beerling, SEI chairman, and Dr. Vasquez informed the Board that they had accepted several invitations from outside groups to speak about *Science and Engineering Indicators 2006* (NSB-06-1) and the Companion Piece, *America's Pressing Challenge -- Building a Stronger Foundation* (NSB-06-2).

Ms. Jean Pomeroy, Board Office staff, discussed the schedule and possible formats for the "Digest" or condensed form of *Indicators 2008*. The issue of whether to prepare a statistical/fact digest or a policy digest was discussed and these discussions will be continued at future meetings.

Mr. John Gawalt, NSF Division of Science Resource Statistics, gave a brief presentation on the dissemination process for *Indicators 2006* for print and electronic versions. Strategies for the dissemination of *Indicators 2006* and dissemination of future *Indicators* will be discussed at the August 2006 meeting.

e. Committee on Programs and Plans (CPP)

CPP Open Session

The committee held discussions on the NSF process used to determine compete, recompile, and renew awards. Background information was provided regarding the current Board policy developed in the late 1990's. The Board Office was requested to compile a history of the development of the current policy, with appropriate recommendations. Dr. Lanzerotti volunteered to review the history and past documents and report at the next CPP meeting in August 2006. Additional discussion was initiated on NSF actions and items requiring Board review and delegation of authority. CPP agreed to discuss its policies regarding this topic at its next meeting.

Two information items were presented to the committee. The first, an update on the status of planning for NSF's role in the renewal of the National Academic Research Fleet, was given by Dr. Margaret Leinen, Assistant Director, Directorate for Geosciences; the second, on an MREFC (Major Research Equipment and Facilities Construction) horizon project – the Global Environment for networking Innovations (GENI) – was given by Dr. Peter Freeman, Assistant Director, Directorate for Computer and Information Sciences and Engineering.

The draft NSF *Facility Plan 2006* was provided to the Board for comment. Mr. Cooley gave an overview of the plan. Three items were identified for further discussion or action at the next CPP meeting: addition of horizon projects to the plan, modification on timing for release of the report annually, and comments from the Board by end of the month.

CPP Closed Session

The committee considered and approved three action items: IRIS: Cornerstone Facilities for Seismology and Earth Sciences, Incorporated Research Institutions for Seismology (NSB-06-58); Support for the U.S. Large Hadron Collider (LHC) Detector Operations for

FY 2007 – FY 2011 (NSB-06-52); and Additional Budget Authority to Support Construction of the Rebaselined Atacama Large Millimeter Array (ALMA) Project (NSB-06-57). *[The full Board subsequently approved the above three action items.]*

f. CPP Subcommittee on Polar Issues (SOPI)

Dr. Karl Erb presented a brief overview of the status of the International Polar Year (IPY) competition. Mr. Simon Stephenson, newly appointed Section Head for the Arctic Sciences Section in Office of Polar Programs (OPP), reported on IPY planning for an Arctic Observing Network (AON). Twenty million dollars will be available for AON in FY 2007. Mr. Stephenson noted that there will be a strong reliance on cyberinfrastructure for data-sharing, and also commented on the progress toward integrating the European and U.S. AON activities.

Dr. Polly Penhale, OPP Environmental Officer, provided a brief overview on efforts to control the introduction of non-native species in Antarctica. She described current treaty provisions, a number of scientific activities, and the outcomes of a recent Workshop on Non-Native Species in Antarctica.

Two Board Members, Drs. Ford and Vasquez, who recently traveled to Antarctica, summarized their experiences.

g. CPP Task Force on Transformative Research (TR)

Dr. Fedoroff, TR chair, discussed the upcoming Board-sponsored workshop on May 16, 2006 at NSF that will focus on transformative research perspectives from non-government organizations, including industry and private foundations. An initial draft report is scheduled for delivery to the Board for comments in August 2006.

h. CPP Task Force on International Science (INT)

Dr. Jon Strauss, INT chairman, discussed the Board-sponsored Hearing and Roundtable Discussion on International Science Partnerships, to be held on May 11, 2006 in Washington, DC at George Washington University. The task force received an excellent response from Federal agency representatives and representatives from U.S. and international organizations who will be participating in this hearing and roundtable discussion. The task force is developing two additional roundtables for international locations.

i. CPP Task Force on Hurricane Science and Engineering (HSE)

Dr. Droegemeier, HSE co-chairman, reported that all HSE workshops were completed and that a draft of the report with recommendations was expected to go to the Board in June 2006. Further discussion on the report is planned for the August 2006 Board meeting with the draft report to be available for public comment shortly after the August meeting.

j. Committee on Strategy and Budget (CSB)

CSB Open Session

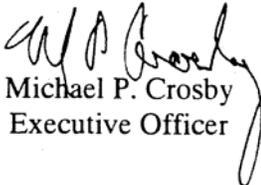
The committee heard a briefing from Mr. Larry Rudolph, NSF General Counsel, on Title IX and its impacts on NSF. The committee expressed the desire to be kept informed on the evolution of Title IX compliance procedures relating to NSF.

Dr. Joanne Tornow, chair of the newly created NSF Working Group on the Impact of Proposal and award Management Mechanisms briefed CSB as part of the continuing discussions of possible changes in Board guidance on the issue of award size, duration and success rates. The purpose of this briefing was to discuss the plans of the working group and discuss directorate level strategies that are used to balance success rates versus award size and duration.

The committee reviewed the initial *NSF Strategic Plan FY 2006 – FY 2011*, which would require Board approval in August 2006 to be submitted to OMB in September 2006. NSF would make the draft *Strategic Plan* available for public comment during June-July 2006. Mr. Cooley also briefed the committee on the Long Range Plan that included an update on the membership of key congressional committees that maintain oversight of NSF.

CSB Closed Session

The committee was briefed by Dr. Bement on the current state of development of the FY 2008 Budget.



Michael P. Crosby
Executive Officer

Attachment 1: NSB/STEMComm-06-1

Attachment 2: NSB-06-65

Attachment 3: NSB/EC-06-3

Attachment 4: Response to Senator McCain

National Science Board

Attachment 1 to NSB-06-61

NSB/STEMComm-06-1

May 10, 2006; Revised May 23, 2006

National Science Board Commission on 21st Century Education in Science, Technology, Engineering, and Mathematics⁺

Dr. Leon M. Lederman (Co-Chair)

Resident Scholar, Illinois Mathematics and Science Academy

Dr. Shirley M. Malcom (Co-Chair)

Head, Directorate for Education and Human Resources Programs, American Association for the Advancement of Science (AAAS)

Dr. Jo Anne Vasquez (Vice-Chair)

Member, National Science Board; Mesa (AZ) Public Schools, Retired

Dr. George R. Boggs

President and CEO, American Association of Community Colleges

Mr. Ronald D. Bullock

Chairman and CEO, Bison Gear and Engineering, St. Charles, IL

Dr. Karen Symms Gallagher

Dean, Rossier School of Education, University of Southern California

Dr. James M. Gentile

President, Research Corporation, Tucson, AZ; Former Dean of Natural Sciences, Hope College (MI)

Dr. Dudley R. Herschbach

Frank B. Baird, Jr. Research Professor of Science, Harvard University

Ms. Maria A. Lopez-Freeman

Executive Director, California Science Project

Dr. Maritza B. Macdonald

Senior Director of Professional Development, American Museum of Natural History, New York City

Mr. Timothy D. McCollum

Science Teacher, Charleston (IL) Middle School

Dr. Cindy Y. Moss

Director of K-12 Science, Charlotte/Mecklenburg (NC) Public Schools

Mr. Larry G. Prichard

Superintendent, Carter County (KY) Schools

The Honorable Louis Stokes

Former United States Congressman (OH)

⁺ Dr. Steven C. Beering, Chairman of the National Science Board, will appoint one additional member to the Commission.

CALENDAR OF MEETINGS
NATIONAL SCIENCE BOARD¹

2007

February 7 – 8
(Wednesday – Thursday)
[Annual Retreat/Site Visit]

March 29-30
(Thursday – Friday)

May 14 – 15
(Monday – Tuesday)
[Annual Meeting and Awards Dinner]

August 7 – 8
(Tuesday – Wednesday)

October 2 3
(Tuesday – Wednesday)

December 5 – 6
(Wednesday – Thursday)

¹ Approved at the May 10, 2006 National Science Board meeting.

**2005 Annual Report of the Executive Committee
National Science Board**

In accordance with the requirements of Section 7(d) of the National Science Board (Board) Act of 1950, as amended, I hereby submit this annual report of the Board Executive Committee, as approved at the Executive Committee meeting on May 9, 2006. This report covers the period from May 2005 through April 2006. I have served as Director of the National Science Foundation and the Board's Executive Committee chairman during the above time period.

The elected Board membership of the Executive Committee during the past year was Dr. Warren M. Washington, Dr. Diana S. Natalicio, and Dr. Barry C. Barish. Dr. Steven Beering replaced Dr. Delores M. Etter during February 2006. Dr. Michael P. Crosby, the Board's Executive Officer and Office Director, served as Executive Secretary.

The Executive Committee met four times during this period at the National Science Foundation in Arlington, Virginia. Oral reports of its activities were made at meetings of the full Board and are reflected in the minutes of those meetings.

During this period, the Executive Committee took no actions on behalf of the Board.

/ s /

Arden L. Bement, Jr.
Chairman
Executive Committee

National Science Board

Attachment 4 to NSB-06-61
May 10, 2006

The Honorable John McCain
United States Senate
Washington, D.C. 20510-0001

Dear Senator McCain:

Your February 8, 2006 letter requested that the National Science Board (the Board) examine existing policies of Federal science agencies concerning the suppression and distortion of research findings and the impact these actions could have on the quality and credibility of future Government-sponsored scientific research results. As indicated in my initial February 17, 2006 letter of response to you, the Board has reviewed statutes, regulations, agency statements and internal documents related to this issue for the Environmental Protection Agency (EPA), the Fish and Wildlife Service (FWS), the National Aeronautics and Space Administration (NASA), the National Institutes of Health (NIH), the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS), and the Departments of Agriculture (USDA), Energy (DOE), and Health and Human Services (HHS). In addition, the Board requested that the Inspector General (IG) of the National Science Foundation (NSF) poll her counterparts at these agencies for additional relevant information.

The Board would like to acknowledge and thank EPA, NASA, NIH, NOAA, USGS, USDA, and DOE for their responses to our request for information. It is readily apparent from our positive interactions with these agencies that they believe it is important that agency research results be credible and objective. Many are also actively taking steps to re-examine their existing rules and procedures regarding communication of agency research results.

The findings of the Board's current review in response to your specific request, as well as background information and recommendations that the Board respectfully submits for consideration by relevant bodies of the Federal Government, are provided below.

OVERALL CONCLUSION

Upon review as per your request, the Board finds that there exists no consistent Federal policy regarding the dissemination of research results by Federal employees. An overarching set of principles for the communication of scientific information by Government scientists, policy makers, and managers should be developed and issued by the Administration to serve as the umbrella under which each agency would develop its specific policies and procedures. The Board believes a need exists for all Federal agencies that conduct research to establish policies and procedures to encourage open exchange of data and results of research conducted by agency scientists, while preventing the intentional or unintentional suppression or distortion of research findings and accommodating appropriate agency review. A clear distinction should be made between communicating professional research results and data versus the interpretation of data and results in a context that seeks to influence, through the injection of personal viewpoints, public opinion or the formulation of public policy. Delay in taking these actions may contribute to a potential loss of confidence by the American public and broader research community regarding the quality and credibility of Government sponsored scientific research results.

BACKGROUND

The National Science Board last studied the issue of scientific openness in 1988.¹ We continue to stand by the fundamentals we articulated in 1988 “[t]hat maintaining openness generally has a superior social claim over other objectives deriving from economics or national security. Restrictions on openness should be approached as exceptions rather than norms. Any restrictions Government or other institutions impose on the free flow of information must meet high standards of proof of their necessity.”²

The utilization of science in the creation of public policy is not part of the review that the Board has conducted. Rather our review is focused on the policies and procedures that Federal science agencies have in place to prevent the suppression and/or distortion of research findings of agency scientists. The question of when and how science is used to inform and serve as a foundation for public policy has been raised and discussed by others for years, extending over many Administrations and Congresses. The Board firmly believes that public policy should be based on the best available knowledge provided through objective science. The Board also recognizes that scientific understanding is one of a number of factors that are considered in developing public policy.

The Board believes it is imperative that results and data from research conducted by Federal employees be of the highest quality and openly communicated to the public in an unencumbered manner (with appropriate consideration of national security issues). The American public must have confidence that scientific information they receive from the Federal Government has not been suppressed or distorted. An informed and educated public can then develop its own interpretations and conclusions for how public policy should be shaped based on the objective results of science combined with other societal values, realities and desires.

METHODS

Information for this rapid Board review was obtained through inquiries to agency heads or chief scientists, conversations with agency officials, searches of agency websites, as well as searches of proprietary legal and news databases. We limited our review to the release and dissemination of unclassified research results. This analysis did not address an individual agency’s rulemaking or policy development process.

In gathering information and conducting our review, the Board focused on policies and procedures for research conducted by Federal agencies, as opposed to research funded by agencies but conducted by the external science community. For example, NSF provides significant support for conducting research through over 13,000 grants that are awarded annually to the external research community through a rigorous merit review system. While NSF does not actually conduct research itself, it does have in place Board-approved policies encouraging principal investigators of NSF awards to freely disseminate and share their data and research

¹ National Science Board, *Report of the NSB Committee on Openness of Scientific Communications*, (1988) (NSB-88-215) <http://www.nsf.gov/nsb/documents/1988/openness.pdf>

² Id at 1.

results. Most other Federal science agencies also have mechanisms for providing support for extramural research to be conducted in a similar fashion as NSF, while also directly employing scientists to conduct and interpret research for the Government. Agency policies related to data release and communication of research results, and an agency's options for administrative actions for deviations from the policy, would differ between grantees and an agency's employees.

FINDINGS

Congressional aspirations for public access to the Federal agencies' scientific information is frequently reflected in statutory language, which generally requires³ or permits⁴ the generation, dissemination, and publication of the agencies' research results and information.⁵ We are only aware of one situation, involving agencies in the process of applying for Government-owned patents, where statutory language authorizes Federal agencies to withhold unclassified technical findings from public disclosure, and then only for a "reasonable" amount of time.⁶ We found only a few relevant Federal regulations for the disclosure of research findings, which generally encourage publication of research results.⁷

The Board found that the dissemination policies and practices of the agencies surveyed are inconsistent across the Government. NASA Administrator Michael Griffin, for example, recently issued an agency-wide notice of revised policies for the release of scientific and technical information, clearly stating what public affairs officers can and cannot do regarding such releases, describing the distinction between professional scientific conclusions and personal or policy opinions beyond an employee's work scope, establishing a dispute resolution process, and outlining responsibilities of the communications process. These policies, a "facts sheet", and three agency-wide e-mail messages provide NASA employees with clear explanations and relevant examples about what is and is not permitted or recommended.

NASA's clear agency-wide articulation of policy and a somewhat similar (albeit to a less comprehensive degree) recent agency-wide communication from NOAA Administrator, Conrad Lautenbacher, are in stark contrast to several of the other agencies, where the specifics of public dissemination of scientific research results by employees are determined by field or regional offices. Headquarters officials at those agencies indicated to us that it would be a difficult and time-consuming task for them to retrieve specific policies issued by their field offices. Field office researchers themselves may have similar difficulties locating the dissemination policies that apply to them. This may lead to confusion or may inhibit their decision to publicly disclose their research findings. Potential policy variations between an agency's different field offices regarding dissemination would further add to the confusion, particularly for inter-office research collaborations and when an employee transfers between an agency's offices.

³ See e.g., 7 U.S.C. § 3129(b), 5506(a); 15 U.S.C. § 7430(b)(2)(D); 42 U.S.C. §§ 299b(a), 299c-3(a)(1), 299a-1(a)(3), 300u-7(b)(3), 300cc-17, 290bb-34(b)(2), 285o-4(a)(5) and (b)(1), 285a-2(a)(2).

⁴ See e.g., 7 U.S.C. §§ 5925a(e)(1), 7628, ; 15 U.S.C. §§ 7508; 42 U.S.C. §§ 12403(e), 15063(c)(2), 285m-3(e)(2).

⁵ See also National Science and Technology Policy, Organization, and Priorities Act of 1976, Pub. L. 94-282 codified as 42 U.S.C. §§ 6601 and 6602.

⁶ 35 U.S.C. § 205.

⁷ See e.g., 30 C.F.R. §401.19; 50 C.F.R. § 82.21.

Some of these agencies did provide detailed anecdotes about what had been permitted by their field offices in the past. A few of the agencies have published related policies in their public affairs manuals. In most instances, however, policies or directives issued in these manuals may not be readily accessible by, or directly applicable to, an agency's research staff. The Board believes that absent clear agency-wide written directives, future field managers in those agencies may exercise their discretion differently than their predecessors in ways that could lead to more restrictive research disclosure practices. Dr. Griffin's outreach to the NASA in-house researchers is one way to effectively articulate an agency's goals of scientific openness. Unambiguous and publicly stated support from the Administration could strengthen an agency's public dissemination policies and encourage Federal researchers to publicly release their research findings.

The survey of the agencies' IGs indicated that no reports were issued to indicate scientific information was suppressed or distorted at the agencies involved with the Board's review.

RECOMMENDATIONS

Based on our analysis, we offer the following recommendations:

- A Government-wide directive should be issued by the Administration that provides overarching principles and clearly articulates the requirement for all agencies to develop unambiguous policies and procedures to encourage open exchange of data and results of research conducted by agency scientists, while preventing the intentional or unintentional suppression or distortion of research findings and accommodating appropriate agency review. A developed set of principles should also state the concomitant responsibility of agency employees regarding the advocacy of public policy that might be implied by their research.
- Agency-wide policies covering the public disclosure of an agency's research results should be issued and uniformly applied, widely communicated, and readily accessible to all employees and the general public. Like those recently released by NASA, these policies should unambiguously describe what is and is not permitted or recommended. Responsibilities for communicating research results by researchers, public affairs officers, policy makers, and other agency employees should be clearly described. A clear distinction should be made between communicating professional research results and data versus the interpretation of data and results in a context that seeks to influence, through the injection of personal viewpoints, public opinion or formulation of public policy.
- An objective dispute resolution mechanism for disagreements involving the public dissemination of agency research findings should be implemented. This will help ensure the public has access to the research and that scientific findings presented are credible and of the highest quality.
- A Government-wide review should be established to ensure that implementation of these recommendations is conducted in a manner that meets the high standards expected and is consistent across agencies.

SUMMARY

The National Science Board continues to stand by the principles of scientific openness that were presented in our 1988 report. The utilization of science in the creation of public policy is not part of the review that the Board has conducted in response to your request. However, the Board firmly believes that public policy should be based on the best available knowledge provided through objective science. We also agree with the 1976 National Science and Technology Policy, Organization and Priorities Act in which Congress declares that “the development and maintenance of a solid base for science and technology in the United States include[s] . . . effective management and dissemination of scientific and technological information,”⁸ that “it is recognized as a responsibility of the Federal Government . . . to coordinate and unify its own science and technology information systems,”⁹ and that “Federal departments, agencies, and instrumentalities should establish procedures to insure among them the systematic interchange of scientific data and technological findings developed under their programs.”¹⁰

The Board believes that there exists a need for all Federal agencies that conduct science to establish policies and procedures to encourage open exchange of data and results of research conducted by agency scientists, while also preventing the intentional or unintentional suppression or distortion of research findings. An overarching set of principles for the communication of scientific information by Government scientists, policy makers, and managers should be developed and issued by the Administration to serve as the umbrella under which each agency would develop its specific policies and procedures. Delay in taking these actions may contribute to a potential loss of confidence by the American public and broader research community regarding the quality and credibility of Government sponsored scientific research results. NASA’s revised policies and NOAA’s recent statement to employees on this topic are steps in the right direction.

The Board appreciates the opportunity to assist in furthering this important dialog, which you have initiated. If you or your staff have any questions or would like to discuss the Board’s review findings and recommendation in greater detail, please contact either myself or the Director of the Board Office, Dr. Michael Crosby (703-292-7000; mcrosby@nsf.gov).

Sincerely,



Warren M. Washington
Chairman

and Members of the Board

⁸ 42 U.S.C. § 6602(a)(5)(C).

⁹ 42 U.S.C. § 6602(b)(2).

¹⁰ 42 U.S.C. § 6602(b)(10).

Diana S. Natalicio, Vice Chair

Dan E. Arvizu

Barry C. Barish

Steven C. Beering

Ray M. Bowen

G. Wayne Clough

Kelvin K. Droegemeier

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

Jo Anne Vasquez

John A. White, Jr.

Mark S. Wrighton