

MINUTES¹
OPEN SESSION
387TH MEETING
NATIONAL SCIENCE BOARD

The National Science Foundation
Arlington, Virginia
August 10-11, 2005

Members Present:

Warren M. Washington, Chair
Dan E. Arvizu
Barry C. Barish
Steven C. Beering
Ray M. Bowen
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
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:

Diana S. Natalicio, Vice Chair
G. Wayne Clough
Douglas D. Randall

¹ The minutes of the 387th meeting were approved by the Board at the September 2005 meeting.

The National Science Board (NSB, the Board) convened in the Open Session at 1:20 p.m. on Thursday, August 11, with Dr. Warren Washington, Chairman, presiding (Agenda NSB-05-92, Board Book Tab 12). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 4: Approval of Open Session Minutes, May 2005

The Board unanimously APPROVED the Open Session minutes of the May 2005 Board meeting (NSB-05-76, Board Book Tab 12C).

AGENDA ITEM 5: Closed Session Items for September 2005

The Board unanimously APPROVED the Closed Session items for the September 28-29, 2005 meeting (NSB-05-83, Board Book Tab 12D).

AGENDA ITEM 6: Chairman's Report

a. NSF Authorization Act of 2002, Section 14 Report

Dr. Washington reported that, as required by Congress under Section 14 of the NSF Authorization Act of 2002, he would send a report to appropriate congressional committees concerning any delegations of authority related to the use of Major Research Equipment and Facilities Construction (MREFC) account. The report is due on September 15, and will state that no delegation of authority occurred during the last year.

b. Annual Board Retreat, Site-Visit, and Meeting for 2006

At the May meeting, Dr. Washington asked Dr. Michael Crosby, NSB Executive Officer, to develop a list of proposed sites for the 2006 annual Board retreat, site-visit, and meeting. The Executive Committee and chairs of the standing committees reached a consensus that the Board's retreat and meeting site for February 2006 should take place at Boulder, Colorado. Dr. Crosby will develop the logistics and agenda and provide updates to the Board at the next meetings in September and November-December.

c. Joint NSB-PCAST Roundtable

At the May meeting, the Board reviewed a draft charge for a Joint NSB-PCAST [President's Council of Advisors on Science and Technology] Roundtable Discussion on Federal-State Policies for Research and Development focused on Federal and state roles and relationships in support of U.S. research and development. The Board endorsed moving forward with this discussion. Drs. Ray Bowen, Wayne Clough, Diana Natalicio, and John White agreed to represent the Board at the roundtable discussion. The roundtable is tentatively scheduled for October 2005 in Washington, DC.

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

Drs. Diana Natalicio and Elizabeth Hoffman have been working with Dr. Crosby to draft a charge for the NSB Commission on Education in Mathematics, Science, and Technology, which was created at the request of Congress. The Commission was asked to examine science, math, and technology education in the U.S. and to advise Congress on the role of NSF and Government at large. A draft charge to the Commission was provided to each Board Member for possible approval at the September meeting.

Dr. Washington stated that some of the difficulties concerning the direction of this Commission stemmed from diverse opinions on how the Board should address this issue and how to attract the most effective people, whose recommendations would not be ignored, to support this Commission.

Dr. Washington asked for comments from each Board Member on the proposed Education Commission, and proceeded to go around the table for each Member's opinion.

Key suggestions and concerns by Board Members on the Education Commission included the following. The general opinion was that the K-12 education system in the U.S. is a very important issue that warrants serious attention. The Commission should look at K-12 science, technology, engineering, and mathematics (STEM) education, along with higher education, with special attention to transition points in STEM education, including the role of community colleges. The scope for the Commission should be broad, national in scale, and should not focus solely on NSF. The Board will have to consider the unique niche for this Commission. More limited, focused activities other than a Commission should also be considered. In view of the mixed success of past reports to catalyze reform in STEM education, there should be a strong focus on implementation. The charge to the Commission should be clear and focused, and should include specific guidelines and goals.

Individual members suggested that the Commission engage high caliber people to issue recommendations that will not be ignored and include visible leaders from as many different areas as possible, to allow proactive and productive approach, and include representatives of those who actually teach, such as a school superintendent. They also raised concerns about: the full cost of the Commission, the need for highly competent staff, the need to publicize the Commission, and build-in dissemination activities early. Some Board Members suggested that NSB may want to investigate alternatives, including completing several activities that are tighter in scope, rather than an expansive Commission, and work in conjunction with other agencies, especially the Department of Education. The Commission should look more seriously on the role of community colleges. They also noted that there have been many reports issued on the subject of K-12 education, and the Board should not have another Commission with recommendations that have already been addressed.

e. *ad hoc* Committee on Nominations for NSB Class of 2006 - 2012

The *ad hoc* Committee on Nominations for NSB Class of 2006-2012 completed its work. Dr. Washington would send the recommendations forward to the White House. The Chairman discharged the committee with thanks to the chairman, Dr. Mark Wrighton, and committee members, Drs. Barry Barish, Kenneth Ford, Diana Natalicio, Douglas Randall, and Daniel Simberloff.

f. Reception in Honor of Dr. Joseph Bordogna, Outgoing NSF Deputy Director

The NSB held a reception to honor Dr. Joseph Bordogna, outgoing NSF Deputy Director, for his dedicated service and accomplishments. Dr. Bordogna was the longest serving deputy director in the agency's history. He was appointed acting deputy director in 1996, and in 1999, he was named deputy director. He served three NSF directors: Drs. Neal Lane, Rita Colwell, and Arden Bement. Dr. Bordogna also served three Board Chairmen: Drs. Richard Zare, Eamon Kelly, and Warren Washington.

g. Welcome to Dr. Kathie Olsen, Incoming NSF Deputy Director

Dr. Washington was pleased to welcome Dr. Kathie Olsen as the new NSF Deputy Director. The Board enjoyed working with Dr. Olsen in her most recent capacity as Associate Director for Science with the Office of Science and Technology Policy (OSTP) in the Executive Office of the President.

AGENDA ITEM 7: Director's Report

Dr. Arden Bement, NSF Director, reported on staff introductions, staff awardees, and congressional items.

a. NSF Staff Announcements

Dr. David Lightfoot began serving as Assistant Director for Social, Behavioral and Economic Sciences on June 1, 2005 under an Intergovernmental Personnel Act (IPA) assignment between NSF and Georgetown University where he serves as Dean of the Graduate School for Arts and Sciences. Before coming to Georgetown in 2001, Dr. Lightfoot had established a new Department of Linguistics at the University of Maryland and chaired it for 12 years. He received his Ph.D. in Linguistics in 1970 from the University of Michigan.

Dr. Richard O. Buckius will begin serving as Acting Assistant Director for Engineering on September 1, 2005. Dr. Buckius joined the Foundation as Director, Division of Chemical and Transport Systems in September 2004 under an IPA assignment between NSF and the University of Illinois, Urbana-Champaign. Dr. Buckius currently holds the position of Professor and Head of the Department of Mechanical and Industrial Engineering. He received his Ph.D. in Mechanical Engineering in 1975 from the University of California, Berkeley.

Dr. Usha Varshney began serving as Director, Division of Electrical and Communications Systems on August 7, 2005 on a Senior Executive Service (SES) Limited Term appointment basis. Dr. Varshney is currently a Program Director in the Electronics, Photonics, and Device Technologies Program in Electrical and Communications Systems. Previously she served as the Director of Research at the American Research Corporation of Virginia (1995-1997). Dr. Varshney received her Ph.D. in 1983 in Physics from the Indian Institute of Technology.

Dr. Pius Egbelu began serving as Dean for the NSF Academy on July 18, 2005 under an IPA assignment between NSF and Louisiana State University where he served as Dean of Engineering and Bert Turner Distinguished Professor. He received his Ph.D. in Industrial Engineering and Operations Research in 1982 from Virginia Polytechnic Institute.

b. Presidential Rank Awards

The Presidential Rank Awards Program recognizes and celebrates career SES members who are strong leaders and who consistently demonstrate strength, integrity, industry and a relentless commitment to public service. The President selects award recipients after a rigorous review process coordinated by the U. S. Office of Personnel Management.

Dr. Bement announced that three NSF employees were awarded President Bush's Selection for 2004 Presidential Rank Awards. Mr. Thomas Cooley, Chief Financial Officer, received the Distinguished Executive Rank Award for sustained extraordinary accomplishment. The President recognized the Distinguished Rank Awardees in a White House ceremony on July 25. Dr. Maryanna Henkart, Division Director, Molecular and Cellular Biosciences and Mr. Gerard Glaser, Division Director, Grants and Agreements both received the Meritorious Executive Presidential Rank Award for sustained accomplishment.

c. Congressional Update

Hearings:

On June 8, Dr. Bement testified on NSF's research related to Homeland Security before the Senate Science, Commerce, and Transportation Committee, Subcommittee on Disaster Prevention and Prediction.

Appropriations Update:

On May 25, the House Science, Commerce, Justice, and State Department Appropriations Subcommittee marked up its bill for the FY 2006. The full Appropriations Committee passed the bill on June 7, and the full House approved the bill on June 16 for \$38 million above the President's request.

On June 21, the Senate Commerce, Justice, and Science Appropriations Subcommittee markup provided NSF with \$74 million less than the request. The full Appropriations Committee passed the bill on June 23 and full Senate action should occur in September. The differences between the House and Senate bills would be settled in conference next month.

In a letter dated July 13, House Appropriations Subcommittee Chairman Frank Wolf formally approved NSF's plan to establish an Office of Cyberinfrastructure as a separate entity reporting directly to the NSF Director. The Senate also endorsed the change.

Science and Engineering Legislation

Dr. Bement met with Senator Christopher "Kit" Bond on June 8 to discuss S. 767, legislation that would establish a Division of Food and Agricultural Science at NSF. The bill has serious long-term consequences to the Foundation if enacted as written. Senator Bond explained that he intended to work with NSF to craft legislation that would not impede NSF's contributions, but still allow him to move forward with a bill.

The Senate Appropriations bill called on OSTP to "assess the merit-based, peer-reviewed basic science to support food and agriculture research across all Federal agencies" and to "assess future opportunities and avenues for improving merit-based, peer-reviewed basic science to support food and agriculture research and to report their findings to the Committee." OSTP had already begun working on the request.

Dr. Bement reported that other legislation affecting NSF was included in the Board Book (Tab 12E) for further reference.

AGENDA ITEM 8: Committee Reports

a. Executive Committee (EC)

Dr. Bement, Executive Committee chairman, had no business to report for the committee's open session.

b. Audit and Oversight (A&O) Committee

Dr. Mark Wrighton, chairman of the A&O Committee, stated that Dr. Norine Noonan gave a report on the work of the NSF Advisory Committee on GPRA [Government Performance and Results Act] Performance Assessment (AC/GPA), of which she was the outgoing chair. She reported that NSF demonstrated significant achievement for indicators under Ideas, Tools, and Organizational Excellence, including merit review. She also stated that the advisory committee determined that NSF did not demonstrate significant achievement in one indicator under People relating to research on learning, teaching, and mentoring. The advisory committee also discussed the bottoms-up framework on characterizing transformative research that was developed by NSF, and concluded that additional work was needed. Further, the advisory committee recommended that the next NSF Strategic Plan would need to refine the concept of "significant achievement" used for assessment of GPRA performance.

The A&O Committee discussed its charge to develop a statement on NSB roles and responsibilities for the Board's new vision document. Dr. Wrighton noted the public nature of the final document and the importance of recording the success of NSF and its work, which stems from a strong partnership between the Board, the NSF Director, and the NSF leadership.

The committee is undertaking an examination of the NSF Merit Review System, and past NSF annual merit review reports have been helpful to A&O in this regard. The committee expects to review the draft by teleconference in early September with final approval anticipated at the September Board meeting. The Board's report on this matter is due to Congress by the end of the fiscal year.

A draft NSB policy statement on the respective roles of the Office of Inspector General (OIG) and NSF Management in the Pursuit and Settlement of Administrative Investigatory Matters was circulated. The policy reaffirms the committee's understanding that the OIG and NSF would work cooperatively to bring closure to these cases. The committee briefly discussed the draft policy discussed at this meeting with the intention of bringing the statement to the Board with a recommendation for approval in September.

Mr. Joel Grover, OIG audit manager, reported that the competitive procurement process to engage an independent auditor for a 5-year period beginning October 1, 2005 was on schedule. The NSF Chief Financial Officer, Mr. Thomas Cooley, reported on the considerable progress made on the FY 2004 reportable conditions from that audit. In connection with the FY 2005 financial statement audit, Mr. Dan Kovlak, KPMG, indicated that it was progressing according to schedule.

In closed session, the committee considered the proposed FY 2007 budget proposal made by the OIG and heard about an investigation related to scientific misconduct.

c. Education and Human Resources (EHR) Committee

Dr. Hoffman, EHR chair, briefly mentioned three items that were provided to each Board Member: (1) *Declining by Degree: Higher Education at Risk*, edited by Richard H. Hersh and John Merrow, which calls attention to the criticism of higher education, particularly research universities. (2) Material from the American Council of Trustees and Alumni (ACTA) Web site. Members of ACTA were part of the group that organized *Declining by Degrees*. (3) The new report by the Committee on Equal Opportunities in Science and Engineering (CEOSE), *Broadening Participation in America's Science and Engineering Workforce*.

The committee briefly discussed the EHR contribution to the development of the Board's vision for NSF regarding education in the 21st century. The committee planned to discuss this subject further at the next meeting to develop overarching goals for the future of science and engineering education.

The EHR Committee discussed the next steps for the proposed new NSB Education Commission. A draft charge was provided to all Board Members for consideration and discussion. The committee discussed comments from Capitol Hill and the Administration

regarding the Education Commission. Those comments ranged from total support for a broad look at K-12 education to a recommendation to focus more on undergraduate education, and specifically on the NSF. Staff and representatives of the Administration discouraged undertaking any Education Commission unless it can contribute beyond the many past studies on this topic. Report language accompanying the House Appropriations bill strongly endorsed NSB establishing this Commission. In summary, members of the EHR Committee expressed viewpoints that: NSB should establish such a Commission; the Commission look broadly at K-12 STEM education and higher education as it related to K-12 education; and Commission member appointments should be highly visible individuals.

Dr. Hoffman also reported that NSF staff reviewed the history and purpose of the Math and Science Partnership (MPS), that included projects funded, impacts, and results to date. The committee discussed the unique aspects and value-added of the MPS Program.

The committee also heard reports from NSF assistant directors in the Directorate for Engineering as well as the Directorate for Mathematical and Physical Science, completing the series of staff presentations on the topic of integration and research and education at NSF, which began in March 2005. The committee would like to look at how NSF can highlight the integration of education and research opportunities for young people in research at a future meeting.

Dr. Crosby reported on a June 23 presentation by Dr. George Langford, former Board Member and vice chairman of the Task Force on National Workforce Policies for Science and Engineering, at a roundtable discussion of the Science and Technology Workforce organized by Science Committee minority staff. Dr. Crosby also provided an update on an innovation summit being organized by House Science Committee Chairman, Sherwood Boehlert; Chairman Vernon Ehlers of the Subcommittee on Environment, Technology, and Standards of the Science Committee; and Chairman Frank Wolf of the House Appropriations Subcommittee on Science, State, Justice, and Commerce.

Dr. Hastings briefed the committee on the progress of the NSB “Workshop on Engineering Workforce Issues and Engineering Education: What are the Linkages?” to be held on October 20, 2005 at the Massachusetts Institute of Technology (MIT).

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

Dr. Beering, S&E Indicators chairman, reported that the subcommittee heard a review of the “Orange Book” draft for the *Science and Engineering Indicators 2006* report, which was provided to Board Members. The subcommittee approved the draft subject to final revisions and copy-editing approved by the NSB Chairman and the chairman of the SEI subcommittee with the cover illustration of gravitational waves selected by the subcommittee, and recommended for approval by the Board. Following this recommendation:

The Board unanimously APPROVED the Science and Engineering Indicators 2006 “Orange Book,” subject to final revisions and copy-editing approved by the NSB Chairman and the chairman of the subcommittee on SEI, with the cover illustration recommended by the SEI subcommittee.

e. Joint Session of Committee on Programs and Plans (CPP) and Committee on Strategy and Budget (CSB)

Dr. Daniel Simberloff, CPP chairman, reported on the Joint Session of CPP and CSB, which dealt with two items.

The first item for the CPP/CSB Joint Session concerned the draft “Guidance for NSF Centers Programs” (Board Book Tab 8B). The Board considered the current investment in centers appropriate and endorsed the concept of re-competing centers. One critical requirement that justified centers was that the centers provide added value beyond what could be attained with individual investigator awards. Dr. Bement noted that the Senior Management Integration Group (SMIG) had systematically reviewed centers and developed a set of principles for centers, which he distributed to the Board. The principles were used to re-categorize activities had have been termed centers, such as multidisciplinary clusters. After discussion, the CSB/CPP Joint Session endorsed the draft guidance pending clarification of the re-categorization of centers and subject to the minor changes discussed by the committee. The revised guidance would be discussed at the next meeting.

The next item concerned the draft guidance for “NSF Average Award Size and Duration, and Proposal Success Rate”(Board Book, Tab 8C). The guidance indicates that award size increased substantially in the last 5 years, duration of grants increased on average slightly, but success rate declined. Discussion brought forward a number of concerns, and the draft guidance would be revised and discussed again at the next meeting.

f. Committee on Programs and Plans (CPP)

Dr. Simberloff, CPP chairman, read a statement from the CPP closed session in which CPP concurred with the recommendation of the Director to terminate the Rare Symmetry Violating Processes (RSVP) project. This action was forwarded to the full Board in Plenary Closed Session, which also concurred with the recommendation and voted to terminate RSVP because of large projected increases in both construction and operating costs. (NSB-05-93)

The committee discussed CPP’s contribution to the *ad hoc* Task Group on Vision for NSF. The committee agreed to address mid-sized projects, which would be brought to the attention of the Vision Task Group. CPP also planned to draft a charge for approval at the next meeting on the international science effort. Drs. Natalicio, Jane Lubchenco, and Ray Bowen would work with the Board Office on this effort.

The report on *Long-Lived Digital Data Collections: Enabling Research and Education in the 21st Century* (NSB-05-40) was finalized, and printed copies would be available at the next meeting. NSF would be required to respond to important issues raised in the report at the November-December meeting.

Reporting for the Task Force on Transformative Research, Dr. Nina Fedoroff updated Board Members on the progress of the upcoming workshop to be held in December 2005.

Dr. Simberloff then reported that the NSB Office had been working with the Director's Office to refine the procedures for sending action items and information to CPP with the general agreement on the need for advanced lead-time and flexibility. There would be a report from the Board Office on this matter at the next meeting.

The committee asked that three minor changes be made to the *NSF Facility Plan* (Board Book supplement, no tab), which was approved by NSB at the May meeting and subject to minor editorial changes. Dr. Washington recommended that CPP establish a process to review the annual *NSF Facility Plan* released each March.

At the May meeting, Board Member Dr. Jane Lubchenco gave a presentation on the Millennium Ecosystem Assessment. As this subject received a strong response, Dr. Lubchenco asked the NSB Office to engage NSF in a discussion on this assessment, and CPP would develop a proposal on meeting the assessment challenges. The committee would discuss this proposal by teleconference before the next meeting in September.

Finally, Dr. Simberloff reported that NSF integrated the Strategic Plan for High Performance Computing, requested by the Board, to the cyberinfrastructure vision document. NSF initiated a search for a permanent director of the new Office of Cyberinfrastructure, and would establish an Advisory Committee for Cyberinfrastructure to report to the NSF Director and the Cyberinfrastructure Council. CPP would schedule a teleconference to discuss final changes before the report goes out for public comment.

g. CPP Subcommittee on Polar Issues (SOPI)

Reporting for Dr. White, SOPI chairman, Dr. Simberloff stated that the National Academies Icebreaker Requirements Committee had been established and received its statement of task. NSF and the U.S Coast Guard signed a memorandum of agreement that provided the framework for cooperation to meet annual icebreaking needs for the polar programs. Dr. White noted that a special solicitation for the International Polar Year (2007-2008) was nearing completion. Cross directorate involvement and a strong partnership between the HER Directorate and the Office of Polar Programs are highlighted.

The subcommittee reviewed the logistic challenges for the South Pole station, icebreaker availability for the current year, and plans for opening a channel to McMurdo Station. A resolution on icebreaking issues for the U.S. Antarctic Program was supported by SOPI and CPP, and forwarded to the full Board for approval. Following this recommendation:

The Board unanimously APPROVED the resolution on Icebreaking Issues for the U.S. Antarctic Program. (NSB-05-100, Attachment)

h. Committee on Strategy and Budget (CSB)

Dr. Ray Bowen, CSB chairman, reported that the committee met in a joint session with CPP. At the CSB meeting, the committee discussed the CSB input to the vision project. The NSF Director also presented a status report from the FY 2006 budget request to Congress, which the NSF Director summarized in his Director's Report earlier in the meeting.

In closed session, the committee approved two budget proposals, one for the Board and one for the Foundation, which were subsequently approved in Plenary Closed Session by the full Board.

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

Dr. Etter, chair of the *ad hoc* Task Group on Vision for NSF, provided a chronology of the task group's progress. At the May meeting, the task group met with all the NSB committees and was in the process of visiting individually with the NSF assistant directors to obtain input. Members of the task group were Drs. Barish, Fedoroff, Ford, Randall, and Kathryn Sullivan. The task group would be revising a draft report for discussion by the Board in September, prepare a draft for public comments, and a final review at the November-December meeting in order to submit it on time to Congress.

Dr. Bement added that the NSF would be working with the task group to capture persistent themes of the vision document for the NSF Strategic Plan.

NON-AGENDA ITEM

Dr. Lubchenco raised the issue on the importance of teaching evolution in schools. She noted that in 1999, the Board issued a statement on this subject. Since that time, there was discussion about teaching evolution with respect to a new "intelligent design" theory. She pointed out that Board Member, Dr. Alan Leshner, wrote an editorial on this subject for a recent issue of *Science*. The history of some of this concept was reviewed in *Science and Engineering Indicators 2004*, and was a topic linked to many science deliberations and discussions. She suggested that the Board consider whether or not NSB actions with regard to this issue might be warranted again.

Dr. Washington adjourned the Open Session at 3:05 p.m.



Ann A. Ferrante
Writer-Editor
National Science Board Office

Attachment
Appendix: NSB-05-100

RESOLUTION

NATIONAL SCIENCE BOARD

ICEBREAKING ISSUES FOR THE U.S. ANTARCTIC PROGRAM

WHEREAS U.S. policy requires maintaining an active and influential presence in Antarctica through year-round occupation of South Pole Station and two coastal stations; and

WHEREAS NSF is the agency responsible for managing the U.S. Antarctic Program in support of this policy; and

WHEREAS the research supported by NSF in Antarctica is critical for understanding phenomena of global importance, and polar regions offer unique opportunities for forefront research in a broad range of disciplines; and

WHEREAS McMurdo Station and South Pole Station depend on icebreakers opening an annual supply channel to McMurdo Station; and

WHEREAS the Coast Guard has advised engaging two icebreakers to mitigate the risk that one might be inadequate this coming season; and

WHEREAS the *Polar Star* is the only Coast Guard Polar class icebreaker currently operational while the U.S. Coast Guard Cutter *Healy* is scheduled for maintenance after a research cruise in the Arctic; and

WHEREAS only one contractor responded to NSF's Request for Information requesting availability of icebreakers -- Far Eastern Shipping Company (FESCO) offered the *Krasin* which performed well in McMurdo Sound last year; and

WHEREAS engaging the *Krasin* to open the channel to McMurdo Station, holding the *Polar Star* in ready reserve to assist if needed, would both mitigate risk and reduce costs and has the potential to preserve the *Polar Star* for service in 2006/2007; and

WHEREAS NSB Resolution NSB-05-68 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;

Therefore, be it RESOLVED that the National Science Board supports the Director's actions to meet the polar icebreaking requirements of the U.S. Antarctic Program and to charter an ice-breaking vessel from a non-Federal source in order to obtain necessary icebreaking services.



Warren M. Washington
Chairman