

National Council for Science and the Environment

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**Testimony of the
NATIONAL COUNCIL FOR SCIENCE AND THE ENVIRONMENT
Craig M. Schiffries, Ph.D., Director of Science Policy
Peter D. Saundry, Ph.D., Executive Director**

**To the
UNITED STATES SENATE
Committee on Health, Education, Labor, and Pensions**

**Hearing on
NATIONAL SCIENCE FOUNDATION AUTHORIZATION**

June 19, 2002

Summary

The National Council for Science and the Environment (NCSE) strongly supports bipartisan efforts to double the budget of the National Science Foundation (NSF) in five years. To that end, we encourage the Senate to authorize at least \$5.5 billion for NSF in FY 2003, an increase of \$719 million or 15 percent relative to the FY 2002 level.

Federal investments in R&D and science education are essential to the future well-being and prosperity of the nation and deserve the highest priority of Congress. The long-term prosperity of the nation and the maintenance of our quality of life depend on a steady and growing commitment of federal resources to science and technology. Environmental R&D is a critical component of the nation's R&D portfolio and an essential element of homeland security. We encourage Congress to explore the role of environmental R&D in homeland security and counterterrorism and to recommend actions that would improve the nation's capacity in this area.

We encourage Congress to strongly support full and effective implementation of the National Science Board (NSB) report, *Environmental Science and Engineering for the 21st Century: The Role of the National Science Foundation*, within the context of efforts to double the budget of the NSF. The NSB report calls for significant improvements in the way that NSF supports environmental research, assessment and education, and proposes that the Foundation invest an additional \$1 billion per year in these areas, to be phased in over five years. NSF has begun to implement the NSB report and deserves full support from Congress. We also emphasize the need for increased funding for NSF's priority area on Biocomplexity and the Environment. In addition, we recommend full funding for two large projects—the National Ecological Observatory Network (NEON) and EarthScope—which are included in NSF's budget request for Major Research Equipment and Facilities Construction. These projects would create unprecedented opportunities for environmental research.

Introduction

The National Council for Science and the Environment appreciates the opportunity to provide testimony on authorization of the National Science Foundation.

NCSE is a nonprofit, nonpartisan organization that has been working since 1990 to improve the scientific basis for environmental decisionmaking. Our work is endorsed by nearly 500 organizations, ranging from the U.S. Chamber of Commerce to the Sierra Club, including the National Association of Attorneys General, National Association of Counties, some 300 colleges and universities, and more than 80 scientific and professional societies. As a neutral science-based organization, NCSE promotes science and its relationship with decisionmaking but does not take positions on environmental issues themselves.

We greatly appreciate the Committee's sustained support for the National Science Foundation. Investments in the National Science Foundation continue to pay enormous dividends to the nation.

Federal Investments in Environmental R&D

Federal investments in R&D and science education are essential to the future well-being and prosperity of the nation and deserve the highest priority of the Congress. The long-term prosperity of the nation and the maintenance of our quality of life depend on a steady and growing commitment of federal resources to science and technology.

Environmental R&D is a critical component of the nation's R&D portfolio. Based on NCSE's *Handbook of Federal Funding for Environmental R&D*, we estimate that federal funding for environmental R&D in FY 2002 is approximately \$7.5 billion, an increase of \$315 million or 4.4 percent relative to FY 2001 (Table 1). In FY 2002, federal funding for environmental R&D grew at less than one-third the rate of total R&D, which increased by 13.5 percent to \$103.7 billion. Federal investments in environmental R&D need to keep pace with the growing need to improve the scientific basis for environmental decisionmaking.

Appended to our testimony is a letter signed by more than 120 university and college presidents, as well as business, scientific and environmental leaders calling for significantly increased funding for scientific programs about the environment at the National Science Foundation, EPA, NASA, and other federal agencies. We encourage Congress to support this initiative.

Table 1. Environmental R&D by Federal Agency
(budget authority in millions of dollars)

Agency	Environmental R&D (\$ Millions)				Change from FY2001 (Percent)	
	FY 2000	FY 2001	FY 2002	FY 2002	FY 2002	FY 2002
	Actual	Estimate	Request	Enacted	Request	Enacted
National Aeronautics and Space Admin.	1,690	1,716	1,515	1,573	-11.7%	-8.3%
Department of Energy	1,502	1,774	1,398	1,862	-21.2%	5.0%
National Science Foundation*	671	752	829	829	10.2%	10.2%
Environmental Protection Agency	558	609	569	702	-6.5%	15.4%
Department of Defense	399	450	382	410	-15.1%	-9.0%
Department of Commerce - NOAA	643	726	772	836	6.4%	15.3%
Department of the Interior	618	631	593	673	-6.1%	6.5%
U.S. Department of Agriculture	370	410	411	451	0.2%	9.9%
National Institutes of Health	60	63	70	81	11.7%	28.4%
Department of Transportation	37	41	61	71	47.0%	72.2%
Smithsonian Institution	14	14	14	14	1.4%	1.4%
Corps of Engineers	11	10	11	11	1.4%	1.4%
TOTAL	6,573	7,197	6,624	7,512	-8.0%	4.4%

Source: AAAS/NCSE estimates of environmental R&D based on enacted appropriations bills, OMB R&D data, *Budget of the United States Government*, agency budget documents, and information from agencies.

*NSF Environmental R&D provided by NSF.

National Science Foundation Budget Request for FY 2003

The National Council for Science and the Environment strongly supports bipartisan efforts to double the budget of the National Science Foundation in five years. We encourage the Senate to authorize at least \$5.5 billion for NSF in FY 2003, an increase of \$719 million or 15 percent relative to the FY 2002 level. This level of funding is specified in the NSF authorization bill (H.R. 4664) that passed the House of Representatives on June 5, 2002. It is also recommended by the Coalition for National Science Funding, which includes NCSE and 70 other scientific organizations and academic institutions.

Biocomplexity in the Environment Priority Area. NCSE is particularly supportive of NSF's priority area on Biocomplexity in the Environment. This initiative provides a focal point for investigators from different disciplines to work together to understand complex environmental systems, including the roles of humans in shaping these systems. The resolution of many important environmental and societal problems is lagging, in part, because of insufficient scientific understanding of complex issues that span the boundaries of traditional scientific disciplines.

NSF is already a leading federal sponsor of peer-reviewed research regarding the environment, with a portfolio exceeding \$700 million. Most of this investment is directed at scientific advances within particular disciplines. An interdisciplinary approach is needed to build on this base to truly understand the environment and the relationships between people and the environment. The Biocomplexity in the Environment priority area is an important step towards a comprehensive understanding.

NSF proposes to increase funding for its priority area on Biocomplexity in the Environment by 36 percent to \$79 million. This priority area would be expanded to include research in two new areas this year—microbial genome sequencing and ecology of infectious diseases—to help develop strategies to assess and manage the risks of infectious diseases, invasive species, and biological weapons. We urge Congress to support this critical initiative and to consider funding it at a level of \$136 million, as proposed in the FY 2000 budget request for NSF.

Major Research Equipment. The NSF budget request includes initial funding for two large projects, the National Ecological Observatory Network (NEON) and EarthScope, under its account for Major Research Equipment and Facilities Construction (MRE). These projects would provide major new opportunities for environmental research.

- **National Ecological Observatory Network.** NEON would be a continental scale research instrument consisting of 10 geographically distributed observatories, networked via state-of-the-art communications, for integrated studies to obtain a predictive understanding of the nation's environments. In addition, NEON would serve as a "biological early detection system" that is designed to provide an invaluable resource and a front line of homeland defense—both for its scientific potential and for enabling rapid detection of chemical and biological terrorist threats. NSF is requesting \$12 million in initial funding for this project for proof of concept prototyping and for construction and networking of two initial sites.
- **EarthScope.** EarthScope would be a distributed, multi-purpose geophysical instrument array that is designed to make major advances in our knowledge and understanding of the structure and dynamics of the North American continent. Three components of the project would be the United States Seismic Array (USArray), the San Andreas Fault Observatory at Depth, and the Plate Boundary Observatory. NSF is requesting \$35 million for initial funding of this project.

Both NEON and EarthScope were included in NSF's budget request for FY 2001 but funding for the projects was not included in the enacted appropriations bill. NSF's budget request for FY 2002 did not contain any new starts for the MRE account. We urge Congress to provide full funding for NEON and EarthScope.

National Science Board Report on Environmental Science and Engineering

The National Council for Science and the Environment is the primary proponent of an effort to expand, improve and enhance the relevancy of the scientific efforts of the National Science Foundation regarding the environment. We believe that NSF—as an independent, non-regulatory science-funding agency—is an important source of credible scientific knowledge about the environment.

NCSE's efforts have had considerable support from Congress. The House Appropriations Committee report to accompany the FY 1998 appropriations bill directed NSF to study how it would establish and operate a National Institute for the Environment that, “provides a major role for stakeholders in defining questions needing scientific attention and which funds ongoing knowledge assessments, extramural research, on-line information dissemination, and education and training through a competitive peer reviewed process.”

The National Science Board responded to Congress by unanimously approving a report, *Environmental Science and Engineering for the 21st Century: The Role of the National Science Foundation*, on February 2, 2000. The NSB report sets out a bold, ambitious set of recommendations that could dramatically improve the scientific basis for environmental decisionmaking. The first keystone recommendation is as follows:

“Environmental research, education, and scientific assessment should be one of NSF's highest priorities. The current environmental portfolio represents an expenditure of approximately \$600 million per year. In view of the overwhelming importance of, and exciting opportunities for, progress in the environmental arena, and because existing resources are fully and appropriately utilized, new funding will be required. We recommend that support for environmental research, education, and scientific assessment at NSF be increased by an additional \$1 billion, phased in over the next 5 years, to reach an annual expenditure of approximately \$1.6 billion.”

The National Council for Science and the Environment encourages Congress to support full and effective implementation of the National Science Board's report, *Environmental Science and Engineering for the 21st Century: The Role of the National Science Foundation*, within the context of a doubling of the budget for the NSF.

NSF has begun to implement the recommendations of the NSB. It has appointed an environmental coordinator and created a new position in the office of the Director. NSF has formed an Advisory Committee on Environmental Research and Education. It has established a priority area on Biocomplexity and the Environment that provides new opportunities for multidisciplinary research on the interactivity of biota and the environment.

Full implementation of the NSB report will require strong support from Congress and a significant increase in funding for NSF's portfolio of environmental science, engineering and education.

Homeland Security and Environmental R&D

Environmental R&D is a critical component of homeland security. For example, understanding the dispersal of radionuclides and toxic substances in air, water, and land is directly relevant to homeland defense. NSF has supported research in these areas for many years. NSF is requesting funding for new environmental projects that could strengthen homeland security. For example, NSF Director Rita Colwell said that NSF's proposed National Ecological Observatory Network (NEON) could detect abrupt changes or long-term trends in the environment and could also serve as "an early warning and detection system for a wide array of chemical and biological warfare agents." We encourage Congress to explore the role of environmental R&D in homeland security and counterterrorism and to recommend actions that would improve the nation's capacity in this area.

Thank you very much for your interest in improving the scientific basis for environmental decisionmaking.

Attachments

1. Letter calling for significant funding increases for environmental science, engineering, and education programs signed by more than 120 national leaders of academic, scientific, environmental, and business organizations.
2. Biographical sketches of Dr. Craig M. Schiffries and Dr. Peter D. Saundry.

March 8, 2001

President George W. Bush
The White House
1600 Pennsylvania Avenue NW
Washington, DC 20500

Dear President Bush:

During your recent election campaign, you talked about the importance of basing environmental decisions on science. We, as a diverse coalition of academic, business, environmental, governmental and community leaders, working with the National Council for Science and the Environment agree with you in this regard.

We are writing to urge you to implement your campaign commitment by making investment in science for environmental decisionmaking a priority in your administration. In particular, we are asking you to provide significantly increased funding for scientific programs to:

- Assess what is known about the environment
- Better understand the environment
- Provide scientific information about the environment
- Support science-based education about the environment.

These programs include:

- National Science Foundation's biocomplexity in the environment initiative and portfolio of environmental science, engineering and education programs
- U.S. Geological Survey's biological, geological, hydrological, and mapping divisions
- U.S. Environmental Protection Agency's Office of Research and Development, especially the Science To Achieve Results (STAR) research and fellowship programs
- National Oceanographic and Atmospheric Administration
- US Department of Agriculture's environmental research programs through CSREES and the Agricultural Research Service, particularly the Natural Resource Initiative
- US Forest Service forestry research
- Department of Energy's environmental science programs
- National Aeronautics and Space Administration earth exploration programs.
- National Institute of Environmental Health Sciences

We hope that your initial budget will support science as an investment that will lead to a stronger economy, healthy people, and a healthy environment.

Sincerely,

Peter D Saundry, Ph.D.
Executive Director
National Council for Science & the Environment
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(See attached pages for additional signatures)

Mary Lynne Bird, Executive Director The American Geographical Society	Joan Verplanck, President NJ Chamber of Commerce	Gloria R. Scott, President Bennett College
Mark F. Deering, President- Ohio Section American Institute of Professional Geologists	Gerlad M. Meral, Executive Director Planning and Conservation League	Larry Shinn, President Berea College
Michael S. Giaimo, V.P. Business and Industry Association of New Hampshire	Robert Engelman, Vice President for Research Population Action International	Oswald P. Bronson, President Bethune-Cookman College
Roger McManus, President Emeritus Center for Marine Conservation	Eugene V. Coan, Sr. Advisor to the Executive Director The Sierra Club	Jon Westling, President Boston University
William C. Baker, President Chesapeake Bay Foundation	John G. Robinson, Senior Vice President Wildlife Conservation Society	Jehuda Reinharz, President Brandeis University
George Colvin, Craig Cox, and Martin Schmidt Certified Professional Geologists Cox-Colvin & Associates	Donald Brunning, Chairman and Curator Wildlife Conservation Society	Gwen Fountain, Interim President Butler University
Rita McManamon, Director Conservation Action Resource Center	G. Thomas Bancroft, Vice President The Wilderness Society	James Rosser, President California State University, L.A.
James Lazell, President The Conservancy Agency	Gregory H Aplet, Forest Ecologist The Wilderness Society	John D. Welty, President California State University- Fresno
Mark Shaffer, Senior Vice President Defenders of Wildlife	Richard A. Anthes, President University Corporation for Atmospheric Research	Mathew Goldstein, Chancellor City University of New York
Martin J. Muggleton, President Greater Corning Area Chamber of Commerce	<u>Universities</u>	Claire A. Van Ummerson, President Cleveland State University
T. Nejat Veziroglu, President International Association for Hydrogen Energy	John T. Gibson, President Alabama A&M University	Henry N. Tisdale, President Claflin University
Elliot Norse, President Marine Conservation Biology Institute	Richard J. Cook, President Allegheny College	Steven K. Katona, President College of the Atlantic
Dick Bartlett, Vice Chairman Mary Kay Holding Corp.	Tom Gerety, President Amherst College	Albert C. Yates, President Colorado State University
Daniel A. Lashof, Senior Scientist Natural Resources Defense Council	Lattie Coor , President Arizona State University	George Rupp, President Columbia University
	Jeanne O'Laughlin, President Barry University	William Cibes, Chancellor Connecticut State University System
	David H. Swinton, President Benedict College	Joseph R. Fink, President Dominican University of California
		Nannerl O. Keohane, President Duke University
		David R. Black, President Eastern College

William M. Chace, President Emory University	Clara Lovett, President Northern Arizona University	Roger W. Bowen, President State University of New York- New Paltz
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Eugene M. Tobin, President Hamilton College	Robert Glidden, President Ohio University	Beheruz N. Sethna, President State University of West Georgia
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Thomas R. Tritton, President Haverford College	Daniel O. Bernstine, President Portland State University	Henry T. Yang, Chancellor University of California Santa Barbara
Myles Brand, President Indiana University	Alice Chandler, Interim President Ramapo College of New Jersey	M.R.C. Greenwood, Chancellor University of California- Santa Cruz
David F. Brakke, Dean College of Science & Mathematics James Madison University	William Nevious, President Reinhardt College	Anibal Colon Rosado, President Universidad Central de Bayamon
Laurence I. Peterson, Dean Kennesaw State University	Malcolm Gillis, President Rice University	Linda Bunnell Shade, Chancellor, University of Colorado- Colorado Springs
Wesley C. McClure, President Lane College	Paul B. Ranslow, President Ripon College	Georgia Lesh-Laurie, Chancellor University of Colorado- Denver
Michael Mooney, President Lewis and Clark College	Richard Yanikoski, President Saint Xavier University	Kenneth P. Mortimer, President University of Hawaii
David B. Henson, President Lincoln University	Paul Locatelli, S.J., President Santa Clara University	Freeman Hrabowski, President University of Maryland- Baltimore County
Constance Woo, Dean of Library Long Island University	James E. Walker, President Southern Illinois University	Donald N. Langenberg, Chancellor University of Maryland System
Michael S. McPherson, President Macalester College	John H. Keiser, President Southwest Missouri State University	Blanch Touhill, Chancellor University of Missouri- St. Louis
Geoffrey Gamble, President Montana State University	Audrey F. Manley, President Spelman College	William McCoy, Interim Chancellor University of North Carolina- Chapel Hill
Earl S. Richardson, President Morgan State University	Karen Hitchcock, President State University of New York - Albany	
Joanne V. Creighton, President Mount Holyoke College	Paul Yu, President State University of New York - Brockport	
Daniel H. Lopez, President New Mexico Institute of Mining and Technology		

James Woodard, Chancellor
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Steve Privett, President
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John M. Palms, President
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University of Virginia

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University of Wisconsin - Madison

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Virginia Polytechnic Institute and
State University

Bernard Franklin, President
Virginia Union University

Brian C. Mitchell, President
Washington & Jefferson College

Karen W. Morse, President
Western Washington University

M. Lee Pelton, President
Willamette University

Perry Moore, Provost
Wright State University

Biographical Sketches of Witnesses

Craig M. Schiffries is Senior Scientist at the National Council for Science and the Environment. He previously served as a Congressional Science Fellow on the staff of the United States Senate Judiciary Committee; Director of Government Affairs for the American Geological Institute; Director of the Board on Earth Sciences and Resources of the National Academy of Sciences / National Research Council; visiting faculty member at Yale University; and consultant with Monitor Company. Dr. Schiffries simultaneously earned his B.S. and M.S. degrees from Yale University, where he was elected to *Phi Beta Kappa*, graduated *summa cum laude*, and double-majored in Geology and Geophysics and in Economics and Political Science. He was a Marshall Scholar at Oxford University, where he earned an honors B.A. in Philosophy, Politics, and Economics. He received a Ph.D. in Geology from Harvard University, where he held a fellowship from the Hertz Foundation.

Peter D. Saundry is the Executive Director of the National Council for Science and the Environment, a nonpartisan organization of scientists, environmentalists, business people, and policy makers working to improve the scientific basis of environmental decisionmaking. Dr. Saundry specializes in the connection between science and environmental decisionmaking and policy, and programs involving scientists and policy makers and shapers. From 1991 - 92, Dr. Saundry was a Congressional Science Fellow with the U.S. Senate Appropriations Committee, where he was an advisor on science and technology issues related to the National Science Foundation, National Aeronautic and Space Administration, and the Environmental Protection Agency. Dr. Saundry has a Ph.D. in Physics from the University of Southern California.