Integrated Carbon Cycle Research Program

Program Announcement

NSF 02-016

DIRECTORATE FOR GEOSCIENCES
DIVISION OF ATMOSPHERIC SCIENCES
DIVISION OF EARTH SCIENCES
DIVISION OF OCEAN SCIENCES

FULL PROPOSAL DEADLINE(S): March 5, 2002

NATIONAL SCIENCE FOUNDATION

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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: Integrated Carbon Cycle Research Program

Synopsis of Program: The purpose of this Program Announcement is to solicit innovative proposals from U.S. academic institutions to conduct basic research into the scientific aspects of the global carbon cycle. Studies of the chemical, biological, ecological, and physical processes driving carbon distribution, transformation and transport within and between terrestrial, atmospheric, and oceanic environments are appropriate for this competition. The five topical foci of this Announcement include (1) focused process studies, (2) drainage basin and ocean margin studies, (3) global modeling and empirical studies, (4) effects of climatic change and variability on the carbon cycle, and (5) data management and development of standards and methods.

Cognizant Program Officer(s):

- Enriqueta C. Barrera, Geology & Paleontology, Program Director, Directorate for Geosciences, Division of Earth Sciences, 785, telephone: 703-292-8551, e-mail: ebarrera@nsf.gov.
- Donald L. Rice, Chemical Oceanography, Program Director, Directorate for Geosciences, Division of Ocean Sciences, 725, telephone: 703-292-8582, e-mail: drice@nsf.gov.
- Anne-Marie Schmoltner, Atmospheric Chemistry, Program Director, Directorate for Geosciences, Division of Atmospheric Sciences, 775, telephone: 703-292-8522, e-mail: aschmolt@nsf.gov.
- Rodey Batiza, Marine Geology & Geophysics, Associate Program Director, Directorate for Geosciences, Division of Ocean Sciences, 725, telephone: 703-292-8583, e-mail: rbatiza@nsf.gov.
- Eric C. Itsweire, Physical Oceanography, Program Director, Directorate for Geosciences, Division of Ocean Sciences, 725, telephone: 703-292-8582, e-mail: eitsweir@nsf.gov.
- Phillip R. Taylor, Biological Oceanography, Program Director, Directorate for Geosciences, Division of Ocean Sciences, 725, telephone: 703-292-8582, e-mail: prtaylor@nsf.gov.

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.050 --- Geosciences

ELIGIBILITY INFORMATION

- **Organization Limit:** None
- **PI Eligibility Limit:** None
- **Limit on Number of Proposals:** None

AWARD INFORMATION

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 20 - 35
- **Anticipated Funding Amount:** $11M in FY 2002

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

- **Full Proposals:** Standard Preparation Guidelines
    - Standard GPG Guidelines apply.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

C. Deadline/Target Dates

- **Letters of Intent (*optional*):** None
- **Preliminary Proposals (*optional*):** None
- **Full Proposal Deadline Date(s):** March 5, 2002

D. FastLane Requirements

- **FastLane Submission:** Required
- **FastLane Contact(s):**
    - Kandace S. Binkley, Integrative Programs, Assistant Program Director, Directorate for Geosciences, Division of Ocean Sciences, 725, telephone: 703-292-8583, e-mail: OCEFL@nsf.gov.

PROPOSAL REVIEW INFORMATION

- **Merit Review Criteria:** National Science Board approved criteria apply.

AWARD ADMINISTRATION INFORMATION

- **Award Conditions:** Additional award conditions apply. Please see the program announcement/solicitation for further information.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

I. INTRODUCTION

The NSF Directorate for Geosciences announces a new competition in FY 2002 to support cutting-edge basic research in carbon cycle science. This solicitation reflects NSF's commitment to a national effort to increase significantly our understanding of the processes that regulate the transport and transformation of carbon within and among the terrestrial, oceanic, and atmospheric environments of the Earth.

In keeping with the planning goal articulated in NSF Geosciences Beyond 2000 "to provide a strategy to advance and integrate scientific knowledge across the broad range of geosciences and to provide essential services to the country," the Directorate anticipates this as the first of a series of announcements over the next several years to provide continuing support for integrated carbon cycle research. The NSF will continue to coordinate its support of fundamental research on the Earth's carbon cycle with that of other federal agencies and international partners.

The 1999 publication of A U.S. Carbon Cycle Science Plan (CCSP) under the auspices of the U.S. Global Change Research Program (USGCRP) marked the beginning of concerted planning for the next decade of global carbon cycle research in the United States. This document provided an evaluation of the current state of knowledge of carbon biogeochemistry, including its anthropogenic aspects, and suggested a course of coordinated federal action for advancing carbon cycle science. The document provides a general blueprint for different themes of an overall scientific effort and it points to the need for coordinated and complementary programs of basic and applied research from the U.S. Federal agencies (NSF, DOE, NASA, NOAA, USDA, USGS) with interests and responsibilities in global carbon cycle science. The explicit goals laid out in CCSP for the next decade are to:

· Establish accurate estimates of the magnitude of the potential Northern Hemisphere terrestrial carbon sink and the underlying mechanisms that regulate it.

· Establish accurate estimates of the oceanic carbon sink and the underlying mechanisms that regulate it.

· Establish accurate estimates of the impact of historical and current land use patterns and trends on the evolving carbon budget at local to continental scales.

· Improve projections of future atmospheric concentrations of carbon dioxide through a combination of manipulative experiments and model development that incorporates appropriate biophysical and ecological mechanisms and carbon cycle-climate feedbacks into global climate and carbon cycle models.

· Develop a scientific basis for evaluating potential management strategies for enhancing carbon sequestration in the environment and for capture/disposal strategies.

The CCSP document also points to the need for the national effort in carbon cycle science to give priority to understanding the carbon balance in the Northern Hemisphere, and in particular to the North American region and the adjacent ocean basins.

Following the publication of CCSP, there has been considerable community interest and planning in the area of carbon cycle research. The original CCSP focus on atmospheric carbon dioxide has been expanded to include methane and carbon monoxide. The resulting reports listed below have provided focused guidance to NSF on the range of forefront research directions that are critical to making progress in our understanding of the Earth's carbon cycle, and in meeting the goals stated in CCSP.

· North American Carbon Program (NACP)

· The Changing Carbon Cycle: A Terrestrial Focus

· Large-scale CO2 Observing Plan: Oceans and Atmosphere (LSCOP)

· Ocean Carbon Transport, Exchanges, and Transformations (OCTET)

· Ecological Determinants of Ocean Carbon Cycling (EDOCC)

· Ocean Carbon Cycle Research Planning (OCCR)

· Transport, Transformation, and Fate of Organic Carbon in River-dominated Ocean Margins (RIOMAR)

Investigators interested in submitting proposals in response to this announcement should familiarize themselves with the CCSP recommendations and any relevant documents that have resulted from the subsequent planning efforts. The CCSP plan can be viewed at the USGCRP program web site: <"http://www.carboncyclescience.gov . The reports of the additional community workshops/plans listed above are available by hypertext linkage from this same web site under the subheading Carbon Cycle Community Planning Efforts.

The USGCRP program web site above also features up-to-date linkages to carbon cycle programs and funding opportunities currently active or under development in other U.S. federal agencies, as well as internationally. NSF proponents will find the information available through those linkages to be a valuable asset for discovering features of the current carbon observational network in the U.S. and elsewhere, for designing research projects with links to other ongoing and forthcoming efforts, and for arranging mutually beneficial collaborations with other carbon cycle scientists.

II. PROGRAM DESCRIPTION

The scope of this Program Announcement is research that contributes to the goals of the CCSP, broadly considered. The research community supported by NSF has a special role to play in advancing current knowledge of the global carbon cycle. Federal agencies other than NSF bear primary responsibility for developing and maintaining the national environmental observational infrastructure required for assessing the spatial and temporal distribution of carbon in its various forms in the United States. With this Program Announcement, NSF invites the U.S. scientific

community to submit proposals to conduct innovative research into the fundamental bio-ecological, geochemical, and geophysical processes underlying this distribution.

For the FY 2002 competition, research proposals with a vision for laying the groundwork for the next decade of carbon cycle research are solicited. In keeping with the goals of the CCSP, some projects might be most profitably directed toward the geographic region of North America (Canada, United States, Mexico, and adjacent ocean basins). In other cases, scientific expediency may require that investigations be conducted at sites outside North America and adjacent marine environments. Proposals with any level of organizational complexity -- from single-investigator to multi-investigator, multi-institutional -- will be considered. Investigators are encouraged to take advantage of the wealth of information in the community planning documents above and to organize themselves into interdisciplinary research teams whenever possible and appropriate.

Proposals addressing the following five areas of carbon biogeochemistry and carbon cycling are of special interest:

1. Focused Process Studies.

Process studies improve our knowledge of poorly understood chemical, biological, and physical processes operating at a variety of spatial and temporal scales within the carbon cycle by helping to define and quantify key mechanisms responsible for carbon transformations and exchanges between land, sea, and air. Coupled with a program of empirical observations and modeling, process studies may be directed to identify and quantify the major phenomena regulating carbon cycling at the level of continents, ocean basins, or in critically important ecological, geological, or hydrographic provinces within them. Recent process studies of the carbon cycle have included, among others, interdisciplinary synoptic field studies in priority terrestrial and marine regions, experimental manipulation of mesocosms and other whole-ecosystem field sites, and ocean biological pump and solubility pump studies. For both terrestrial and marine systems, process studies of innovative design may provide the most important path for understanding the fundamental interactions between micronutrients, biological communities, and the physical regime. Some key questions are:

· What are the fundamental chemical, biological, ecological, and physical processes regulating the transformations of carbon in terrestrial, atmospheric, and marine environments?

· What are the major mechanisms regulating the distributions and cycling of carbon in North America and adjacent ocean basins?

· What are the major mechanisms and associated rates of carbon transfer within and among land, sea, and air reservoirs?

Although process studies coordinated with current or forthcoming observational studies in North America and adjacent ocean basins would be particularly appropriate for FY 2002, there may be compelling scientific reasons to begin comparative studies in other regions as well. Ideally, small laboratory and field projects addressing these questions should be related to or coordinated with larger regional- and global-scale investigations or research at time-series stations.

For both terrestrial and ocean-based process studies, coordination with research teams involved in other types of carbon cycle research is strongly encouraged. Investigators seeking support under this Announcement are also encouraged to seek out and take advantage of opportunities to collaborate with researchers associated with other domestic and international research programs such as CLIVAR, the Ameriflux Program, and the HOT and BATS (and other) ocean time-series stations.

2. Drainage Basin and Ocean Margin Studies

Continental margins are the active interface between terrestrial and marine environments. Because the contributions of drainage basin and continental margin processes to global carbon dynamics on climate-relevant time scales are still poorly constrained, there is a need for field and modeling studies to resolve this issue. In FY 2002, there is a special need to initiate research directed toward the following questions:

· What are the major drainage basin and fluvial patterns and mechanisms regulating the distribution and redistribution of carbon in terrestrial environments (including soils), its delivery to the ocean margins, and its exchange with the atmosphere?

· What is the size and character of the riverine carbon pool and the timing of its mobilization?

· On ocean margins, what are the mechanisms and rates of carbon (including methane hydrates) transformations, transport, and burial, and exchange with the open ocean?

· What factors control the efficiency of the solubility and biological pumps in coastal environments, and how do biogeochemical processes on the ocean margins influence the chemistry and biology of open ocean surface waters?

3. Global Modeling and Empirical Studies

One of the important lessons learned from two decades of global carbon cycle and climate research is that the utility of focused process studies can be maximized by including global data synthesis and modeling activities as integral components of the research initiative at the outset. The following are a few of the many opportunities for incorporating a vigorous modeling and data synthesis effort into the next decade of carbon cycle research:

· Studies to model carbon and nutrient dynamics in soils and terrestrial ecosystems over broad continental regions.

· Studies that contribute to a global hydrographic and tracer re-survey aimed at determining how the distribution of carbon dioxide, including that generated by human activities, vary in space and time in the surface and deep waters of the world ocean.

· Studies to optimize the design of observational networks.

· Studies to identify and develop proxy records that could be used to model the historical and contemporary carbon cycle, understand its history, and predict its future behavior.

· Studies to improve the representation of interactive physical and biogeochemical processes in carbon cycling and climate models.

4. Effects of Climatic Change and Variability on the Carbon Cycle
Proposals advocating innovative approaches to predict the effects of climatic change and climate variations (rainfall, length of growing season, soil moisture, etc.) are encouraged. In addition to prospective studies, retrospective (paleoclimate and paleoenvironment) investigations of the geologic record of the last 2000 years are appropriate. Research foci include but are not limited to:

· Studies that integrate physical, biogeochemical, and biological measurement, experimentation and modeling approaches over relevant time and space scales in order to determine probable response of marine and terrestrial systems to climatic change and variability, and to identify feedbacks to the climate system.

· Studies that address factors and processes that contribute significantly to system stability and resilience are appropriate in the context of understanding system behavior in the future.

5. Data Management and Development of Standards and Methods

To support a fully integrated global effort to understand carbon biogeochemistry and its relation to climate, a system for data management and quality control is essential. To build the necessary infrastructure, innovative approaches to efficient management of large databases generated from multiple sources are required. Priority areas of research include:

· Development of innovative approaches to data collection, assimilation, storage, sharing, retrieval, and archiving.

· Development of standard reference materials (SRM) and/or standard methods (SM) relevant to the determination of carbon and associated nutrients in priority matrices for which SRMs or SMs currently do not exist.

· Development of lower-cost sensors and improved methods for determining concentrations and fluxes of atmospheric greenhouse gases.

· Development and intercomparison of methods for estimating fluxes of gases between the atmosphere and the earth's surface.

III. ELIGIBILITY INFORMATION

The categories of proposers identified in the Grant Proposal Guide are eligible to submit proposals under this program announcement/solicitation.

IV. AWARD INFORMATION

The total funding under this Announcement in FY 2002 is expected to be approximately $11M, from which 20 - 35 standard or continuing awards will be made with durations up to five years. Roughly one-half of the total funding will be directed to support projects with a primarily oceanographic (including sea-air) focus , and roughly one-half will be directed to support projects with a primarily terrestrial and/or atmospheric focus.

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Web Site at: http://www.nsf.gov/cgi-bin/getpub?gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

Proposers are reminded to identify the program solicitation number (NSF 02-016) in the program announcement/solicitation block on the NSF Form 1207, *Cover Sheet For Proposal to the National Science Foundation*. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost sharing is not required in proposals submitted under this Program Announcement.

C. Deadline/Target Dates

Proposals must be submitted by the following date(s):

Full Proposals *by 5:00 PM local time*: March 5, 2002

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Announcement through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: http://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call 1-800-673-6188 or e-mail fastlane@nsf.gov.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the

certifications). The AOR must provide the required certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane website at: http://www.fastlane.nsf.gov.

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

Proposals will be reviewed against the following general review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Proposers are reminded that both the intellectual merit and the broader impacts of the work to be accomplished should be addressed. While reviewers are expected to address both merit review criteria, each reviewer will be asked to address only considerations that are relevant to the proposal and for which he/she is qualified to make judgements.

What is the intellectual merit of the proposed activity?
How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?
How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF

merit review criteria. NSF staff will give these elements careful consideration in making funding decisions.

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Mail Review followed by Panel Review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 70 percent of proposals. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at its own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1)* or Federal Demonstration Partnership (FDP) Terms and Conditions;* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Web site at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Web site at http://www.nsf.gov/cgi-bin/getpub?gpm. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at http://www.gpo.gov.

Special Award Conditions
As a special condition of awards made under this Announcement, principal investigators will be required to participate in two project research workshops funded through the participating science programs in the Directorate for Geosciences. The first workshop will be convened in Spring of 2003 to allow investigators to present, discuss, and coordinate their research plans and to promote the development of collaborative alliances. The second will be held in Autumn 2005 for the delivery of progress reports and to promote data sharing and synthesis activity. Both workshops will be open to participation by members of the scientific community who are not recipients of awards under this Announcement.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented an electronic project reporting system, available through FastLane. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding Integrated Carbon Cycle Research Program should be made to:

- Enriqueta C. Barrera, Geology & Paleontology, Program Director, Directorate for Geosciences, Division of Earth Sciences, 785, telephone: 703-292-8551, e-mail: ebarrera@nsf.gov.
- Donald L. Rice, Chemical Oceanography, Program Director, Directorate for Geosciences, Division of Ocean Sciences, 725, telephone: 703-292-8582, e-mail: drice@nsf.gov.
- Anne-Marie Schmoltner, Atmospheric Chemistry, Program Director, Directorate for Geosciences, Division of Atmospheric Sciences, 775, telephone: 703-292-8522, e-mail: aschmolt@nsf.gov.
- Rodey Batiza, Marine Geology & Geophysics, Associate Program Director, Directorate for Geosciences, Division of Ocean Sciences, 725, telephone: 703-292-8583, e-mail: rbatiza@nsf.gov.
- Eric C. Itsweire, Physical Oceanography, Program Director, Directorate for Geosciences, Division of Ocean Sciences, 725, telephone: 703-292-8582, e-mail: eitsweir@nsf.gov.
- Phillip R. Taylor, Biological Oceanography, Program Director, Directorate for Geosciences, Division of Ocean Sciences, 725, telephone: 703-292-8582, e-mail: prtaylor@nsf.gov.

For questions related to the use of FastLane, contact:

- Kandace S. Binkley, Integrative Programs, Assistant Program Director, Directorate for Geosciences, Division of Ocean Sciences, 725, telephone: 703-292-8583, e-mail: OCEFL@nsf.gov.

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at http://www.nsf.gov/cgi-bin/getpub?gp. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF E-Bulletin, which is updated daily on the NSF web site at http://www.nsf.gov/home/ebulletin, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's Custom News Service (http://www.nsf.gov/home/cns/start.htm) to be notified of new funding opportunities that become available.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement/solicitation for further information.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090, FIRS at 1-800-877-8339.

The National Science Foundation is committed to making all of the information we publish easy to understand. If you have a suggestion about how to improve the clarity of this document or other NSF-published materials, please contact us at plainlanguage@nsf.gov.

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Information Dissemination Branch, Division of Administrative Services, National Science Foundation, Arlington, VA 22230, or to Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for National Science Foundation (3145-0058), 725 17th Street, N.W. Room 10235, Washington, D.C. 20503.

OMB control number: 3145-0058.