

## **Earth Sciences Research at the National Science Foundation (EAR)**

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### **Program Solicitation**

**NSF 03-590**

*Replaces Document NSF 96-50*



**National Science Foundation**

Directorate for Geosciences

Division of Earth Sciences

Division of Ocean Sciences

### **Full Proposal Deadline(s):**

The deadlines for proposal submission vary by program and are listed below. Proposals must be submitted within an acceptance window from two weeks before each deadline to the deadline date (by 5 p.m. proposers local time on the deadline date). All proposals must be submitted through FastLane. Proposals submitted either before or after the acceptance window will be returned without review.

*Geology and Paleontology:* January 16 and July 16, annually.

*Geophysics; Hydrologic Sciences; Petrology and Geochemistry; Tectonics:* June 1 and December 1, annually.

*Continental Dynamics:* Pre-proposals on June 1, full proposals on November 15, annually.

*EarthScope:* August 24, 2004; July 16, 2005 and annually thereafter.

*Education and Human Resources:* General proposals accepted at any time. REU-Site proposals accepted once per year on the NSF-wide deadline of August 17th.

*Instrumentation and Facilities:* January 16 and July 16, annually.

### **REVISIONS AND UPDATES**

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The full proposal deadline date for Continental Dynamics has been changed to November 15 annually. This will allow enough time for the review and funding of field projects to be conducted in the summers following the receipt of proposals.

The full proposal deadline dates for EarthScope have been changed to August 24, 2004 and July 16 annually thereafter.

The full proposal deadline date for Education and Human Resources has been updated to reflect the new NSF-wide REU-Site proposal deadline of August 17th annually.

### **SUMMARY OF PROGRAM REQUIREMENTS**

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## General Information

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### Program Title:

Earth Sciences Research at the National Science Foundation (EAR)

### Synopsis of Program:

The Division of Earth Sciences (EAR) supports research and education related to the earth's terrestrial regions, interior, and freshwater systems. Projects may employ any combination of field, laboratory, and computational studies with observational, theoretical, or experimental approaches. Support is available for research and research infrastructure through grants, contracts, and cooperative agreements awarded in response to investigator-initiated proposals from U.S. universities and other eligible institutions. Human resource development and education are expected to be an integral part of most research proposals, but are also eligible for direct support. Multidisciplinary work is strongly encouraged. Projects involving disciplines outside the earth sciences will be recommended for joint support with other programs within the Foundation. EAR will consider co-funding of projects with other agencies and supports international work and collaborations.

This program solicitation is a compilation of information about EAR's various programs. Prospective proposers should contact the cognizant program officer for more information. Some of these programs also have separate program announcements or solicitations that prospective proposers should read for specific requirements.

### Cognizant Program Officer(s):

- Robin Reichlin, Program Director, Geophysics, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8556, fax: (703) 292-9025, email: [rreichli@nsf.gov](mailto:rreichli@nsf.gov)
- Sonia Esperanca, Program Director, Petrology and Geochemistry, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8554, email: [sesperan@nsf.gov](mailto:sesperan@nsf.gov)
- Herman B. Zimmerman, Division Director, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8550, fax: (703) 292-9025, email: [hzimmerm@nsf.gov](mailto:hzimmerm@nsf.gov)
- James H. Whitcomb, Section Head, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8553, fax: (703) 292-9025, email: [jwhitcom@nsf.gov](mailto:jwhitcom@nsf.gov)

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

- 47.050 --- Geosciences

## Eligibility Information

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

## Award Information

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- **Anticipated Type of Award:** Standard or Continuing Grant or Cooperative Agreement

- **Estimated Number of Awards:** 600 to 700
- **Anticipated Funding Amount:** \$140,000,000

## Proposal Preparation and Submission Instructions

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### A. Proposal Preparation Instructions

- **Full Proposal Preparation Instructions:** This solicitation contains information that deviates from the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

### B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is Specialized. Please see the full text of this solicitation for further information.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

### C. Due Dates

- **Full Proposal Deadline(s):**

The deadlines for proposal submission vary by program and are listed below. Proposals must be submitted within an acceptance window from two weeks before each deadline to the deadline date (by 5 p.m. proposers local time on the deadline date). All proposals must be submitted through FastLane. Proposals submitted either before or after the acceptance window will be returned without review.

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*Instrumentation and Facilities:* January 16 and July 16, annually.

## Proposal Review Information

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

## Award Administration Information

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- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Additional reporting requirements apply. Please see the full text of this solicitation for further information.

**Summary of Program Requirements**

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**I. INTRODUCTION**

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The Division of Earth Sciences (EAR) supports research and education focused on understanding earth dynamics. Deciphering the complex record of the planet's past or investigating the forces actively changing it today, EAR's research portfolio centers on the earth's interior and terrestrial surface, including freshwater systems and interactions with the biosphere and atmosphere. Support is available for field, laboratory, and theoretical studies in any discipline of earth science including geology, geobiology, geophysics, geochemistry, geodesy, geolimnology, geomorphology, economic geology, environmental science, hydrology, paleontology, petrology, sedimentology, seismology, stratigraphy, structural geology, tectonics, and volcanology. Given the complexity of earth systems, multidisciplinary research is strongly encouraged and supported. Recent examples include:

- Cooperative Studies of the Earth's Deep Interior (CSEDI) involving geochemistry, mineralogy, and geophysics and using the nation's advanced X-ray synchrotron facilities;
- Continental scientific drilling in California, Hawaii, and Japan to understand the mechanisms of earthquakes and volcanic eruptions;
- Studies of the nation's watersheds to understand the processes that occur at the intersection of the hydrosphere, geosphere, and biosphere;
- Geoinformatics initiatives involving earth scientists and information technology specialists to synthesize data between disciplines and promote modeling of earth systems;
- Multidisciplinary studies of the evolution of the North American continent and the processes responsible for earthquakes and volcanic eruptions using the Earthscope Facility.

Societally relevant applications of EAR's research are wide-ranging, and help improve our understanding of natural and anthropogenic hazards; global climate change; and water, mineral, and energy resources. Consequently, many activities occur in partnership with other federal and state agencies. EAR also encourages the integration of research, education and public awareness through the support of outreach projects, digital libraries and other human resources activities.

## II. PROGRAM DESCRIPTION

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For convenience in evaluation, proposals are assigned to one of the programs listed below. The program titles illustrate the general subject matter covered, but should not be considered restrictive. EAR is committed to supporting the most meritorious research in any relevant area, including interdisciplinary or multidisciplinary research, and are especially interested in proposals in emerging areas of science that may not fit easily into one of these categories. Where appropriate, proposals may be considered for joint support with other Divisions at the National Science Foundation.

Assignment to a program is normally made by EAR staff on the basis of proposal content, program officer workload, or other considerations. Where the Principal Investigator requests assignment to a specific program, those requests will be honored insofar as possible. In some cases proposals may be transferred to other Divisions within the Foundation. In such cases, Principal Investigators will be notified by the Division assigned to handle their proposals.

### Core Research Grant Programs

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#### Geology and Paleontology

The Geology and Paleontology Program (GE) supports research in three general areas:

*Geobiology and Low-Temperature Geochemistry:* Basic research in biogeosciences, low-temperature geochemistry, and terrestrial environmental geochemistry. The Program supports studies of (1) the interactions between biological and geological systems across spatial and temporal scales, and the processes influencing those interactions; (2) the role of life in the evolution of the earth's systems; (3) processes, rates, and mechanisms of inorganic and organic geochemical phenomena occurring at or near the earth's surface now and in the past; (4) surficial chemical and biogeochemical systems and cycles and their modification through natural and anthropogenic change; and (5) geochemical phenomena at the broad spectrum of environmental interfaces ranging in scale from planetary and regional to mineral-surface and supramolecular.

*Land Use Dynamics and Geomorphology:* Studies of (1) the physical, chemical, and biological controls on processes producing the landforms, sediments, and soils of the earth's surface; (2) the history of geologic changes as recorded by modern and ancient surface features; and (3) human or natural changes in land use and covers critical to ecosystem functioning, services, and human welfare.

*Sedimentary Geology and Paleobiology:* Studies of (1) life in past geologic time based on fossil plants, animals, and microbes, and their relationships to existing plants, animals, and environments; (2) stratified rocks and interpretation of the historical information they contain (history of surface morphology, life, climate, tectonism, magnetic polarity, etc); and (3) the science of dating and measuring the time sequence of events that formed the sedimentary crust of the earth and extraterrestrial bodies.

#### Geophysics

The Geophysics Program (PH) supports basic research in the physics of the solid earth to explore its composition, structure, and processes. Laboratory, field, theoretical, and computational studies are supported. Topics include seismicity, seismic

wave propagation, and the nature and occurrence of earthquakes; the earth's magnetic, gravity, and electrical fields; the earth's thermal structure; and geodynamics. Supported research also includes geophysical studies of active deformation, including GPS-based geodesy, and studies of the properties and behavior of earth materials in support of geophysical observation and theory.

## **Hydrologic Sciences**

Hydrologic Sciences (HS) focuses on processes occurring in water on land areas, including aqueous environmental geochemistry. These include physical, chemical and biological processes taking place in the time evolution of water bodies and those processes driven by water--solid, liquid, and vapor--movement at scales ranging from soil percolation to global circulation. Studies probing the spatial and temporal characteristics of the water balance from local to global scales--including water masses, residence times, interfacial fluxes, and pathways among system compartments--are supported; as is research in geolimnology, microbial alteration, and sediment, chemical, and nutrient transport. Since hydrologic processes involve the ocean, atmosphere, biosphere, and solid earth; and their study involves expertise from many basic sciences and mathematics, HS encourages interdisciplinary proposals.

## **Petrology and Geochemistry**

The Petrology and Geochemistry Program (CH) supports basic research on earth materials to explore the nature, origin, and evolution of the earth's crust, mantle, and core. The program generally focuses on the petrology and geochemistry of igneous and metamorphic processes. Topics include major and trace element geochemistry; stable and radiogenic isotope geochemistry and geochronology; experimental petrology, thermodynamic modeling, and chemical aspects of mineral physics; mineralogy and crystallography; ore deposit petrogenesis; volcanology, including physical volcanology; and analytical method development. Proposals to study extraterrestrial materials will be considered if applicable to understanding earth evolution.

## **Tectonics**

The Tectonics Program (TE) supports field, laboratory, and theoretical investigations aimed at understanding continental lithosphere deformation processes and how these processes have modified the lithosphere through geologic time. Because understanding such large-scale phenomena requires a variety of disciplines, TE supports integrated research involving structural geology, petrology, geochronology, sedimentology, stratigraphy, geomorphology, rock mechanics, paleomagnetism, geodesy, and other geophysical techniques. Proposals to elucidate the processes that act on the lithosphere at various time-scales, either at depth or the surface, are encouraged.

## **Continental Dynamics**

The Continental Dynamics Program (CD) considers proposals for multidisciplinary research that focus on an improved understanding of the processes governing the origin, structure, composition, and dynamical evolution of the continents and continental building blocks. The program is particularly oriented toward projects whose scope and complexity require a cooperative or multi-institutional approach and multi-year planning and execution. The intent of the program is to fund only relatively large projects that do not fit easily within other EAR programs and that have broad support of major sections of the earth science community. See [NSF 04-512](#) for details.

## **EarthScope (see Program Solicitation [NSF 03-567](#))**

The EarthScope Facility is a multi-purpose array of instruments and observatories that will greatly expand the observational capabilities of the earth sciences and permit us to advance our understanding of the structure, evolution and dynamics of the North American continent. The EarthScope observational facility provides a framework for broad, integrated studies across the earth sciences, including research on fault properties and the earthquake process, crustal strain transfer, magmatic and hydrous fluids in the crust and mantle, plate boundary processes, large-scale continental deformation, continental structure and evolution, and composition and structure of the deep earth. In addition, EarthScope offers a centralized forum for earth science education at all levels and an excellent opportunity to develop cyberinfrastructure to integrate, distribute, and analyze diverse data sets. The EarthScope program calls for single or collaborative proposals to conduct scientific research associated with EarthScope and support activities that further the scientific and educational goals of EarthScope.

## Education and Human Resources

The Education and Human Resources Program (E&HR) facilitates highly innovative educational activities in the earth sciences, including efforts to increase the diversity of participants and involve leading researchers in education. Activities at all levels are supported, including: 1) graduate and postdoctoral education outside the framework of normal NSF research grants; 2) undergraduate education, including the NSF-wide Research Experiences for Undergraduates Program; 3) elementary and secondary education; and 4) education outside of the classroom. E&HR also manages support of the Digital Library for Earth System Education (DLESE) on behalf of the Directorate for Geosciences.

## Instrumentation and Facilities

The Instrumentation and Facilities Program (IF) considers proposals for: (1) the acquisition of new research equipment or the modernization of existing equipment, (2) the development of new instrumentation or techniques that extend current research capabilities in the earth sciences, (3) the support of shared facilities that make complex and expensive instrument systems available on a national or regional basis, and (4) the support of research technicians. Cost sharing in the amount of 30% of the equipment listed on Line D of the proposal budget is required for proposals to the IF Program. *[Note: A separate Program Solicitation describing the Instrumentation and Facilities Program is in preparation.]*

## Special Emphasis Areas

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In addition to the Division's research programs, EAR participates in research areas selected for special emphasis. These are usually related to national research initiatives, such as the U.S. Global Change Research Program. They may also be selected by EAR on the basis of scientific opportunities identified by NSF Advisory Committees, the National Academy of Science, or community workshops. Areas of special emphasis are typically described in separate program announcements, and may involve special application and evaluation criteria. Some specific opportunities and other Foundation-wide research programs and initiatives are listed under Section IX.

## III. ELIGIBILITY INFORMATION

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The categories of proposers identified in the [Grant Proposal Guide](#) are eligible to submit proposals under this program announcement/solicitation. Proposals will generally be accepted from colleges, universities, and other institutions in the United States with formal research programs in the areas supported by EAR. Colleges and universities designated as Undergraduate or Predominately Undergraduate Institutions should consult the guidelines described in [Research in Undergraduate Institutions](#).

Proposals may involve individual scientists or collaborative efforts of associated researchers working on coordinated projects.

Proposals that have been declined are not eligible for resubmission for one year and must be substantially revised to be considered.

## IV. AWARD INFORMATION

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

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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## A. Proposal Preparation Instructions

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### Full Proposal Instructions:

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 Website at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

**Data Policy:** Principal investigators are required to adhere to the [EAR Data Policy](#) available on the NSF website. Proposals should include a statement describing how the data policy requirements will be met.

Proposers are reminded to identify the program announcement/solicitation number (03-590) in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

## B. Budgetary Information

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### Cost Sharing:

Cost sharing in the amount of 30% of the equipment listed on Line D of the proposal budget is required for proposals to the Instrumentation and Facilities Program.

The proposed cost sharing must be shown on Line M on the proposal budget. Documentation of the availability of cost sharing must be included in the proposal. Only items which would be allowable under the applicable cost principles, if charged to the project, may be included as the awardee's contribution to cost sharing. Contributions may be made from any non-Federal source, including non-Federal grants or contracts, and may be cash or in-kind (see OMB Circular A-110, Section 23). It should be noted that contributions counted as cost-sharing toward projects of another Federal agency may not be counted towards meeting the specific cost-sharing requirements of the NSF award. All cost-sharing amounts are subject to audit. Failure to provide the level of cost-sharing reflected in the approved award budget may result in termination of the NSF award, disallowance of award costs and/or refund of award funds to NSF.

### Other Budgetary Limitations:

Requests for scientific instrumentation and equipment included in standard research proposals shall not exceed \$30,000. Requests in excess of this amount require a separate proposal directly to the Instrumentation and Facilities Program.

## C. Due Dates

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### Full Proposal Deadline(s):

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#### **D. FastLane Requirements**

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Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail [fastlane@nsf.gov](mailto:fastlane@nsf.gov). The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

*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 electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: <http://www.fastlane.nsf.gov>

### **VI. PROPOSAL REVIEW INFORMATION**

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#### **A. NSF Proposal Review Process**

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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.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 ([NSB 97-72](#)). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued [Important Notice 127](#), Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria

within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the [Grant Proposal Guide](#) Chapter III.A for further information). The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which he/she is qualified to make judgments.

**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?

NSF staff will give careful consideration to the following 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.

**B. Review Protocol and Associated Customer Service Standard**

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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 Ad Hoc and/or 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.

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.

In most cases, proposers will be contacted by the Program Officer after his or her recommendation to award or decline funding has been approved by the Division Director. This informal notification is not a guarantee of an eventual award.

NSF is striving to be able to tell proposers whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation, or the date of proposal receipt, whichever is later. 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 their own risk.

## VII. AWARD ADMINISTRATION INFORMATION

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### A. Notification of the Award

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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

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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 Website at [http://www.nsf.gov/home/grants/grants\\_gac.htm](http://www.nsf.gov/home/grants/grants_gac.htm). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto: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 Website 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 Website at <http://www.gpo.gov>.

### C. Reporting Requirements

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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.

**Data Policy:** Principal investigators are required to adhere to the EAR Data Policy available on the NSF website. Final reports for all awards should include a statement describing how the data policy requirements have been met.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. PIs should examine the

formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project reporting system, available through FastLane, for preparation and submission of annual and final project reports. 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

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General inquiries regarding this program should be made to:

- Robin Reichlin, Program Director, Geophysics, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8556, fax: (703) 292-9025, email: [rreichli@nsf.gov](mailto:rreichli@nsf.gov)
- Sonia Esperanca, Program Director, Petrology and Geochemistry, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8554, email: [sesperan@nsf.gov](mailto:sesperan@nsf.gov)
- Herman B. Zimmerman, Division Director, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8550, fax: (703) 292-9025, email: [hzimmerm@nsf.gov](mailto:hzimmerm@nsf.gov)
- James H. Whitcomb, Section Head, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8553, fax: (703) 292-9025, email: [jwhitcom@nsf.gov](mailto:jwhitcom@nsf.gov)

For questions related to the use of FastLane, contact:

- None Specified.

## IX. OTHER PROGRAMS OF INTEREST

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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.

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### Related Programs:

- Faculty Early Career Development (CAREER) Program ([NSF 02-111](#))
- Digital Library for Earth System Education ([NSF 02-158](#))
- EarthScope: Science, Education and Related Activities for the USArray, San Andreas Fault Observatory at Depth

(SAFOD), and Plate Boundary Observatory (PBO) ([NSF 03-567](#))

- Geoscience Education ([NSF 03-515](#))
  - International Opportunities for Scientists and Engineers ([NSF 03-559](#))
  - Research in Undergraduate Institutions ([NSF 00-144](#))
  - Continental Dynamics ([NSF 04-512](#))
  - Earth Sciences: Instrumentation and Facilities ([NSF 04-507](#))
  - Information Technology Research for National Priorities ([NSF 04-012](#))
  - Earth System History ([NSF 02-191](#))
  - Collaboration in Mathematical Geosciences ([NSF 04-508](#))
  - Science and Technology Centers: Integrative Partnerships ([NSF 03-550](#))
  - Research Experiences for Undergraduates ([NSF 03-577](#))
1. Cooperative Studies of the Earth's Deep Interior (CSEDI) ([NSF 95-0155](#))
  2. Opportunities for Enhancing Diversity in the Geosciences (OEDG) ([NSF 02-104](#))
  3. National Earthquake Hazard Reduction Program (NEHRP) ([NSF 92-93](#))
  4. Biodiversity Surveys and Inventories ([NSF 02-186](#))
  5. U.S. Global Change Research Program ([homepage](#))

## Other Directorates

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Division of Ocean Sciences (OCE):

- Marine Geology & Geophysics Program
- Chemical Oceanography Program
- Ocean Drilling Program

Office of Polar Programs (OPP):

- Polar Earth Sciences Program
- Polar Glaciology Program

Division of Environmental Biology (DEB):

- Systematic and Population Biology Program
- Biotic Surveys and Inventories
- Ecology

Division of Civil and Mechanical Structures (CMS)

- Earthquake Hazard Mitigation Program
- Natural and Technological Hazard Mitigation Program

Division of International Programs (INT)

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