

Geoscience Education (GeoEd)

Program Solicitation

NSF 05-609

Replaces Document(s):

NSF 04-598



National Science Foundation

Directorate for Geosciences
Division of Atmospheric Sciences
Division of Earth Sciences
Division of Ocean Sciences

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

November 17, 2005

November 15, 2007

REVISION NOTES

In furtherance of the President's Management Agenda, in Fiscal Year 2006, NSF has identified programs that will offer proposers the option to utilize Grants.gov to prepare and submit proposals, or will require that proposers utilize Grants.gov to prepare and submit proposals. Grants.gov provides a single Government-wide portal for finding and applying for Federal grants online.

In response to this program solicitation, proposers may opt to submit proposals via Grants.gov or via the NSF FastLane system. In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.3 of the Grant Proposal Guide provides additional information on collaborative proposals.

Changes to the Previous Solicitation

- The Geoscience Education (GeoEd) program will now consider proposals submitted under one of two tracks.
 - **Track 1 Pilot Projects:** Proposals should describe a plan to initiate or pilot highly innovative geoscience education activities. The maximum award size for Track 1 projects is \$150,000 (total) for a maximum duration of two years.
 - **Track 2 Integrative Collaborations:** Proposals should describe a plan to develop an integrative collaboration with one or more existing Louis Stokes Alliances for Minority Participation (LSAMP), Alliances for Graduate Education and the Professorate (AGEP), or Centers of Research Excellence in Science and Technology (CREST) projects. Documentation of collaboration with an ongoing LSAMP, AGEP, or CREST project must

be included with Track 2 proposals. The maximum award size for Track 2 projects is \$500,000 (total) for a maximum duration of four years.

- An individual may be a Principal Investigator or co-Principal Investigator on only one proposal submitted per competition (regardless of Track) to the GeoEd Program. Proposals may be submitted for consideration under only one of the two Tracks described in this solicitation.
- Proposals to the GeoEd Program will now be solicited every other year.
- Proposal Preparation Instructions have been revised and clarified.
- The total anticipated funding amount is \$1.5 million per year for Track 1 and \$1.0 million per year for Track 2.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Geoscience Education (GeoEd)

Synopsis of Program:

The goals of the Geoscience Education (GeoEd) Program are to:

- improve the quality of geoscience education at all educational levels;
- increase the number and competency of Earth and Space Science teachers at K-12 levels;
- demonstrate the relevance of the geosciences by identifying and promoting traditional and non-traditional career opportunities in the field;
- increase the number of students enrolling in geoscience courses and degree programs at all educational levels;
- increase the number of students drawn from groups underrepresented in science, technology, engineering and mathematics (STEM) fields in geoscience courses and degree programs; and
- increase the public's understanding of geoscience-related issues.

The GeoEd Program considers proposals submitted under one of the two tracks described in this solicitation.

Track 1 Pilot Projects: Proposals should describe a plan to initiate or pilot innovative geoscience education activities. Track 1 projects should integrate research and education. Proposals for projects that will make use of current geoscience research results and/or methods are sought, as are proposals that will promote the geosciences and geoscience careers as highly relevant to modern society. Projects that are informed by the results of current education-related research or will conduct new educational research within a geoscience education venue will be considered under this solicitation. Awards are intended to provide start-up or proof-of-concept funding to enable projects to reach a level of maturity that will allow them to compete for longer-term funding from other sources or become self-sustaining. All proposed projects should have strong evaluation and dissemination plans.

Projects designed to recruit and retain students during the critical transition from high-school to college are highly appropriate for consideration by the GeoEd Program.

Track 2 Integrative Collaborations: Proposals should describe a plan to integrate geoscience research and education activities into existing Louis Stokes Alliances for Minority Participation (LSAMP), Alliances for Graduate Education and the Professoriate (AGEP), and/or Centers of Research Excellence in Science and Technology (CREST) projects. Track 2 proposals must provide documentation of collaboration between the proposed GeoEd project and the associated LSAMP, AGEP, and/or CREST project(s).

The LSAMP program supports sustained and comprehensive projects designed to increase the number of students from populations underrepresented in science, technology, engineering, and mathematics (STEM)

that earn doctoral degrees.

The specific objectives of the AGEP program are to (1) develop and implement innovative models for recruiting, mentoring, and retaining minority students in STEM doctoral programs; and (2) develop effective strategies for identifying and supporting underrepresented minorities who want to pursue academic careers.

The CREST program provides substantial support for research at minority-serving institutions across the United States. The main goal of CREST and its awardees is to build the research competitiveness of minority-serving institutions while increasing the recruitment and retention of individuals from diverse backgrounds in STEM fields.

Cognizant Program Officer(s):

- Jill L. Karsten, Program Director for Diversity and Education, 705 N, telephone: (703) 292-7718, fax: (703) 292-9042, email: jkarsten@nsf.gov

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

- 47.050 --- Geosciences

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant or Other Grant Standard or Continuing Grants or Supplements

Estimated Number of Awards: 45 (Of the awards, 40 are anticipated under Track 1 and five are anticipated under Track 2.)

Anticipated Funding Amount: \$5,000,000 (It is anticipated that \$3 million will be available to support Track 1 proposals and \$2 million will be available to support Track 2 proposals submitted for consideration during the FY 2006 and FY 2008 competitions.)

Eligibility Information

Organization Limit:

None Specified

PI Limit:

An individual may be Principal Investigator or co-Principal Investigator on only one proposal submitted per competition to the GeoEd Program, regardless of whether the proposal is submitted under Track 1 or Track 2.

Limit on Number of Proposals per Organization:

An organization (e.g., a university or museum) may be the lead organization on only one Track 2 proposal submitted per competition.

Limit on Number of Proposals per PI:

None Specified

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable

- Full proposals submitted via FastLane:
 - Grant Proposal Guide (GPG) Guidelines apply
- Full proposals submitted via Grants.gov:
 - NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: <http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf/>) To obtain copies of the Application Guide and Application Forms Package: click on the Apply tab on the Grants.gov website, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required by NSF.
- **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)** (due by 5 p.m. proposer's local time):

November 17, 2005

November 15, 2007

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions: Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

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I. **INTRODUCTION**

The goals of the Geoscience Education (GeoEd) Program are to:

- improve the quality of geoscience education at all educational levels;
- increase the number and competency of Earth and Space Science teachers at K-12 levels;
- demonstrate the relevance of geoscience by identifying and promoting traditional and non-traditional career opportunities in the field;
- increase the number of students enrolling in geoscience courses and degree programs at all educational levels;
- increase the number of students drawn from groups underrepresented in science, technology, engineering and mathematics (STEM) fields in geoscience courses and degree programs; and
- increase the public's understanding of geoscience-related issues.

The comprehensive scope of the GeoEd Program is in accordance with recommendations made in the report of the Geoscience Education Working Group (GEWG), "Geoscience Education: A Recommended Strategy", (NSF 97-171). The report is available at <http://www.nsf.gov/pubs/1997/nsf97171/nsf97171.htm>. The GEWG recognized that geoscience educators need to explicitly address the question: "What are we educating students for?" and update courses, curricula, and other geoscience-related educational activities accordingly. Geoscience educators need to identify the types of careers that are being filled by geoscientists and promote those career options to students and their families. The geoscience curricula at all educational levels should prepare students to be productive and valued members of the STEM workforce.

The structure of the GeoEd Program also conforms to recommendations made by the second Geoscience Education Working Group (GEWG II), a subcommittee of the Advisory Committee to the NSF Directorate for Geosciences (GEO). In their report "Geoscience Education and Diversity: Vision for the Future and Strategies for Success" the GEWG II provided recommendations about how the geoscience community and GEO can best promote future improvements in geoscience education. The GEWG II recognized that modern scholarship in geoscience education encompasses both geoscience-oriented and education-oriented research. The GEWG II recommended that GEO support efforts that will integrate basic geoscience research with education in ways that take into account current developments in cognitive science. Information about multiple ways in which research on learning can be used to improve geoscience education can be found in the report "Bringing Research on Learning to the Geosciences" (available at: http://dlesecommunity.carleton.edu/research_on_learning/workshop02/). The GEWG II further specified that evaluation should be a key component of all GeoEd projects.

II. **PROGRAM DESCRIPTION**

The Geoscience Education (GeoEd) program considers proposals that are submitted under one of two tracks (*Track 1 Pilot Projects* and *Track 2 Integrative Collaborations*). Although the two tracks are designed to accommodate proposals with different goals, all proposals considered by the GeoEd program should focus on improving the quality of geoscience education. Proposals for projects that will make use of current geoscience research results and/or methods are sought, as

are proposals that will promote the geosciences and geoscience careers as highly relevant to modern society.

Effective geoscience educators communicate technically sound information in ways that engage and stimulate learners. Because an understanding of both geoscience content and education theory are needed to develop high-quality geoscience education materials and methods, successful GeoEd project teams (PI, coPIs, and Other Senior Personnel) commonly include representatives of both the geoscience and education communities. Clearly, implementation of innovative pedagogical strategies within the geoscience education arena can lead to both improved educational outcomes and new avenues for educational research that will result in further improvements in geoscience education in the future.

Desirable attributes of projects funded by the GeoEd Program include:

- an Earth System Science approach;
- a focus on the fundamental concepts that unify the geosciences;
- an emphasis on processes rather than facts;
- mathematical rigor designed to build and demonstrate the application of quantitative skills;
- incorporation of concepts from the other basic sciences;
- alignment of education activities with workforce needs, including problem-solving and critical-thinking skills;
- opportunities for participants to work in culturally diverse teams, and
- the use of data and the scientific method.

Criteria for identifying potentially successful projects include:

- the inclusion of data and a rationale that indicate need and identify the specific audience to be targeted;
- enumeration of goals and objectives that are few in number, but clearly stated;
- identification of quantitative or qualitative measures that will be used to determine the project's effectiveness at attaining its goals and objectives;
- use of timelines and benchmarks that are tied to the project's objectives;
- plans for dissemination of project results.

Successful GeoEd projects have demonstrable lasting impact by:

- improving the quality of geoscience education for a large number of individuals;
- increasing the number of students enrolled in geoscience courses and degree programs;
- increasing participation in the geosciences by members of groups underrepresented in STEM fields; and/or
- serving as a model that can be replicated at other sites or with different types of participants.

Proposals submitted to this program should be grounded in one or more of the scientific disciplines funded by the Directorate for Geosciences (GEO) at NSF. These are identified on the GEO home page at <http://www.nsf.gov/home/geo/>. The term "geosciences" as used in this program solicitation refers collectively to those disciplines supported by GEO.

An individual may be Principal Investigator or co-Principal Investigator on only one proposal submitted per competition to the GeoEd Program.

Proposals that demonstrate collaboration with professional societies are encouraged. Letters providing evidence of commitment to the project by participating institutions, organizations, and/or industrial partners, may be included in the Supplementary Documents section of the proposal. These documents should describe how the proposed activities would support the mission and goals of all participating entities.

Track 1 Pilot Projects: Track 1 of the GeoEd program considers proposals to initiate or pilot highly innovative geoscience education activities. Projects should integrate geoscience research with education. Projects that are informed by the results of current education-related research or that will conduct new educational research within a geoscience education venue appropriate for submission under Track 1 of the GeoEd program.

Proposals to the GeoEd Program may target any formal or informal educational level or venue. Proposals should not request funding for activities typically supported by basic research grants. Awards may be made to supplement active research grants when the specified supplemental activity will make a substantive contribution to geoscience education. Proposals should not request funding to support activities that would be viewed by reviewers as part of an educator's normal responsibilities.

Proposals to develop or improve the quality of geoscience-oriented pre-service teacher training and in-service professional development programs are encouraged. Proposals to develop or strengthen introductory-level geoscience courses at the community college, four-year college, or university level are similarly encouraged. Proposals that build bridges between high

schools, two-year colleges, and four-year colleges or universities to recruit and retain students during the critical transition from high-school to college are particularly sought.

Many projects funded under this solicitation are based-on high-risk new approaches. Other projects are designed to test the effectiveness of new projects that are modeled after existing programs or approaches that have been successful at improving education in other disciplines, at other sites, or with other types of participants.

Track 1 awards are intended to provide start-up or proof-of-concept funding that will enable projects to reach a level of maturity that will allow them to compete for longer-term funding from other sources, or become self-sustaining. Proposals should include a discussion of plans for, and potential sources of, follow-on funding if such will be required. If the project described in the Track 1 proposal is part of a larger plan to improve geoscience education, the proposal should clearly describe how the proposed project fits in with the overall plan.

Track 2 Integrative Collaborations: Projects that promote active linkages and collaborations among geoscience researchers and education professionals are encouraged for submission under Track 2 of the GeoEd program. Track 2 proposals should include geoscience content and promote the geoscience disciplines within the framework of existing Louis Stokes Alliances for Minority Participation (LSAMP), Alliances for Graduate Education and the Professoriate (AGEP), or CREST projects.

LSAMP projects utilize sustained and comprehensive approaches to facilitate achievement of the long-term goal of increasing the number of students who earn doctorates in STEM fields, particularly those from populations underrepresented in STEM fields.

The AGEP program is designed to increase significantly the number of domestic students receiving doctoral degrees in the sciences, technology, engineering, and mathematics (STEM), with special emphasis on populations that are underrepresented in these fields (i.e., African Americans, Hispanics, American Indians, Alaska Natives, Native Hawaiians and other Pacific Islanders). AGEP projects are particularly focused on increasing the number of minorities who enter the professoriate in STEM disciplines. Specific objectives of the AGEP program are to: (1) develop and implement innovative models for recruiting, mentoring, and retaining minority students in STEM doctoral programs; and (2) develop effective strategies for identifying and supporting underrepresented minorities who want to pursue academic careers.

Centers of Research Excellence in Science and Technology (CREST) program provides a substantial source of Federal support for research at minority-serving institutions across the United States. By facilitating research projects in science, technology, engineering and mathematics (STEM) disciplines with multi-year, multi-million dollar cooperative agreements, the main goal of CREST and its awardees is to build the research competitiveness of minority-serving institutions while increasing the recruitment and retention of individuals from diverse backgrounds in STEM study and STEM-based careers.

Documentation of collaboration with an ongoing LSAMP, AGEP, or CREST project must be included with Track 2 proposals.

III. AWARD INFORMATION

It is anticipated that \$5.0 million will be made available to support this competition during FY 2006 and FY 2008. Of that amount, \$3.0 million will be made available to support Track 1 proposals and \$2.0 million will be made available to support Track 2 proposals.

It is anticipated that approximately 45 awards will be made in FY 2006 and FY2008. Forty of the awards per competition are anticipated to be made to Track 1 proposals and five are anticipated to be made to Track 2 proposals.

The maximum amount that can be requested by a Track 1 proposal is \$150,000, but the average award size is anticipated to be on the order of \$75,000. The maximum amount that can be requested by a Track 2 proposal is \$500,000, but the average award size is anticipated to be on the order of \$400,000.

Track 1 projects can have a maximum duration of two years. Track 2 projects can have a maximum duration of four years.

IV. ELIGIBILITY INFORMATION

Organization Limit:

None Specified

PI Limit:

An individual may be Principal Investigator or co-Principal Investigator on only one proposal submitted per competition to the GeoEd Program, regardless of whether the proposal is submitted under Track 1 or Track 2.

Limit on Number of Proposals per Organization:

An organization (e.g., a university or museum) may be the lead organization on only one Track 2 proposal submitted per competition.

Limit on Number of Proposals per PI:

None Specified

Additional Eligibility Info:

The categories of proposers identified in the [Grant Proposal Guide](#) are eligible to submit proposals under this program solicitation.

An individual may be Principal Investigator or co-Principal Investigator on no more than one proposal submitted per competition to the GeoEd Program, regardless of whether a proposal is submitted under Track 1 or Track 2.

An organization (e.g. university or museum) may be the lead organization on only one Track 2 proposal per competition.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program 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/publications/pub_summ.jsp?ods_key=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. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF 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.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (<http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf>). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.3 of the Grant Proposal Guide provides additional information on collaborative proposals.

Proposals submitted should include the following information that supplements the GPG and the Grants.gov Application Guide, and, unless otherwise noted, applies to both types of submissions:

1. The Project Description section of the proposal should include the following:

- A description of prior efforts of the Principal and co-Principal Investigators in the field of geoscience education. Such efforts might include: 1) integration of contemporary geoscience research results, techniques, and/or data into educational experiences; 2) contributing to the literature on geoscience teaching and learning; 3) developing or implementing plans to increase interest in the geosciences among pre-college students or the general public; 4) reforming geoscience courses or curriculum; and/or 5) applying the results of education research within geoscience education venues.
- A clear description of the activities to be undertaken, and the ways in which funds will be used to support those activities.
- A brief discussion of how the project is aligned with the long-term goals of all participating entities. Projects are expected to have potentially broad impacts that may lead to innovative intellectual developments and/or partnerships.
- A plan for making the project self-sustaining or obtaining follow-on funding for the project if necessary.
- A plan to evaluate the effectiveness of the project's activities. Evaluation plans should be appropriate for the scope of project. Because GeoEd projects are typically exploratory and short-term in nature, the evaluation plans do not necessarily include the use of external evaluators. All evaluations should however be conducted by an evaluator with some independence from the project. Project evaluations should provide credible evidence about the extent to which the project has achieved its goals and objectives. The evaluation should inform the PI about the effectiveness of the project, and should provide information that can be used in subsequent proposals or projects to increase the likelihood of future success. Awardees should plan to include the results of the project evaluation with their final project report. The following references may be helpful in designing an evaluation plan.
 - The User-Friendly Handbook for Project Evaluation, Directorate for Education and Human Resources, National Science Foundation (<http://www.nsf.gov/pubs/2002/nsf02057/start.htm>).
 - User Friendly Handbook for Mixed Method Evaluation (NSF 97-153) (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf97153).
 - Online Evaluation Resource Library (<http://oerl.sri.com>).
 - Field-tested Learning Assessment Guide (FLAG) (<http://www.wcer.wisc.edu/nise/CL1/flag>).
 - Evaluation Handbook, W.K. Kellogg Foundation (<http://www.wkkf.org/Programming/ResourceOverview.aspx?CID=281&ID=770>).
 - Shavelson, R. J. and Towne, L., eds., 2002, Scientific Research in Education: National Research Council, 188 p.
 - Wiggins, G.P. and McTighe, J., 2000, Understanding by Design: Prentice Hall, 201 pp.
 - Wiske, M. S., 1998, Teaching for Understanding: Linking Research with Practice: Jossey-Bass, 379 p.

- A plan to disseminate information about the project, including aspects that are found to be effective and ineffective.

The Supplementary Documents section of the proposal should contain the following:

- Letters that describe how the proposed activities will support the long-term goals of all participating entities must be included in the "Supplementary Docs" section of the proposal. Track 2 proposals should include evidence of collaboration with an ongoing LSAMP, AGEP, or CREST project.

B. Budgetary Information

Cost Sharing: Cost sharing is not required by NSF in proposals submitted under this Program Solicitation.

Other Budgetary Limitations: It is important to assess the effectiveness of ongoing and newly developed programs. Awardees should plan to include the results of an evaluation with their final project report. Methods to assess program effectiveness must be included in program description. The proposal budget should include funds to support the evaluation component of the project.

C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

November 17, 2005

November 15, 2007

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

Detailed technical 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. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this 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/>

- **For Proposals Submitted Via Grants.gov:**

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: <http://www.grants.gov/CustomerSupport>. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

Submitting the Proposal: Once all documents have been completed, the Authorized Organizational

Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program and, if they meet NSF proposal preparation requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts with the proposer.

A. NSF Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. 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 the reviewer 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?

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.

Additional Review Criteria:

Is the project designed so that the funds provided through a GeoEd award will be catalytic and enable the project to reach a level of maturity that will allow it to compete successfully for longer-term funding from

other sources or become self-sustaining?

Will this project potentially serve as a model for other geoscience education efforts?

Is there evidence that the project is aligned with the mission and goals of participating entities?

If this project is part of a larger effort to improve geoscience education, is the vision for the larger framework compelling, and will the proposed project contribute to the success of the larger effort?

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed 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.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's 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 Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

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

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 Website at 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

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>.

Special Award Conditions:

Important award conditions apply to awards that involve pilot testing and evaluating materials. Proposers should see Section 711 of the [GPM](#). Additional award conditions may apply to projects involving commercial distribution or commercial publication of developed materials (see Sections 730-753 of the [GPM](#)). Projects that involve human subjects research should obtain approval for the project from their institution's or organization's Institutional Review Board. (Chapter II, Section D.6 of the Grant Proposal Guide provides additional information on proposals involving research with human subjects.) Human subjects research is subject to applicable federal regulations.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after expiration of a grant, the PI also is required to submit a final project report.

Failure to provide the required annual or final project reports will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. 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. Such reports provide information on activities and findings, project participants (individual and organizational) 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. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete.

It is important to assess the effectiveness of ongoing and newly developed programs. Awardees should plan to include the results of an evaluation with their final project report. Methods to assess program effectiveness must be included in program description. The proposal budget should include funds to support the evaluation component of the project.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Jill L. Karsten, Program Director for Diversity and Education, 705 N, telephone: (703) 292-7718, fax: (703) 292-9042, email: jkarsten@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.
- Brian E. Dawson, 705 N, telephone: (703) 292-4727, fax: (703) 292-9042, email: bdawson@nsf.gov

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

For questions related to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representative (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of the application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, MyNSF (formerly the Custom News Service) is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. MyNSF also is available on NSF's Website at <http://www.nsf.gov/mynsf/>.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at <http://www.grants.gov>.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

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 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
 - Send an e-mail to: pubs@nsf.gov
 - or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

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; and 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 proposer 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 or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; 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," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (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 the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Division of Administrative Services
National Science Foundation
Arlington, VA 22230



