# ESR STUDENT ACHIEVEMENT DATA SET ANALYSES

Special Solicitation

NSF 99-122

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES

DIVISION OF RESEARCH, EVALUATION AND COMMUNICATION

DEADLINE DATE: SEPTEMBER 15, 1999



\* ESR is the acronym for Educational System Reform



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#### **GENERAL INFORMATION**

Name: ESR Student Achievement Data Set Analyses

**Short Description/Synopsis:** The Foundation seeks to support studies to advance the field in appropriate use and analysis of student achievement data in systemic reform program accountability. Each proposal must provide a plan for examining the utility of the data sets to determine meaningful analyses linking assessment results across comparable tests; specify study questions and identify assessment issues relating to conducting analyses of multiple student achievement data sets within and among SI sites; describe in sufficient detail the statistical methods for conducting in-depth analyses of performance results; and discuss dissemination efforts for increasing awareness of various uses of achievement results in systemic reform programming.

**Cognizant Program Officer(s):** Dr. Bernice Anderson, Room 855, Division of Research, Evaluation and Communication, telephone 703. 306.1650, e-mail: banderso@nsf.gov; Dr. Eric Hamilton, Division of Educational System Reform, telephone 703. 306.1690; e-mail: ehamilto@nsf.gov.

**Applicable Catalog of Federal Domestic Assistance (CFDA) No.:** 47.076 — Education and Human Resources

#### ELIGIBILITY

- Limitation on the categories of organizations that are eligible to submit proposals: Proposals may be submitted by universities, colleges, or other non-profit organizations in support of individual investigators or small groups.
- PI eligibility limitations: **None**
- Limitation on the number of proposals that may be submitted by an organization: Only one proposal may be submitted by a Principal Investigator and he/she may only collaborate in one other proposal as a co-Investigator.

#### AWARD INFORMATION

- Type of award anticipated: Standard Grant
- Number of awards anticipated in FY 2000: The Foundation anticipates multiple studies and expects to fund 2 to 4 standard one-year awards depending on the quality of submission and availability of funds, but reserves the right to make *no* awards under this solicitation.
- Amount of funds available: Approximately \$1.5 million will be available for this initiative in FY 2000, pending availability of funding..
- Anticipated date of award: **December 1999**

#### **PROPOSAL PREPARATION & SUBMISSION INSTRUCTIONS**

#### Proposal Preparation Instructions

- Letter of Intent requirements: None
- Preproposal requirements: None
- Proposal preparation instructions: Standard NSF Grant Proposal Guide instructions
- Supplemental proposal preparation instructions: None
- Deviations from standard (GPG) proposal preparation instructions: None

#### • Budgetary Information

- Cost sharing/matching requirements: None
- Indirect cost (F&A) limitations: None
- Other budgetary limitations: Award amounts up to \$400,000 for one year for proposals submitted in response to this announcement with \$1.5 million available for FY2000.
- FastLane Requirements
  - FastLane proposal preparation requirements: FastLane use required
  - FastLane point of contact: < DeMonica Parks, 703.306.1650, dparks@nsf.gov>
- Deadline/Target Dates
  - Full Proposal Deadline 5:00 PM, LOCAL TIME, September 15, 1999 (FastLane)

#### **PROPOSAL REVIEW INFORMATION**

• Merit Review Criteria: Standard National Science Board approved criteria

## AWARD ADMINISTRATION INFORMATION

- Grant Award Conditions: GC-1 or FDP III
- Special grant conditions anticipated: None anticipated
- Special reporting requirements anticipated: None

# ESR Student Achievement Data Set Analyses

## INTRODUCTION

The implementation of high quality K-12 mathematics and science education for all children undergirds the National Science Foundation's (NSF) three systemic reform initiatives known as Statewide Systemic Initiatives, Urban Systemic Initiatives<sup>1</sup>, and the Rural Systemic Initiatives programs. The ultimate goal of systemic reform is improved student achievement. In 1999, initiatives funded under these three Systemic Initiatives (SI) programs submitted to the Foundation student performance data in mathematics and science. The SI sites provided school, district, and/or state reports of student achievement results on multiple tests/assessment measures for multiple grades (elementary, middle, and high school levels) for three- or five-year comparisons. Analyses of these data will enable a better understanding of student performance associated with NSF systemic reform programming and advance the assessment field in the area of linking assessment results.

## DESCRIPTION

The Foundation seeks to support studies that will advance the field in appropriate use and reporting of student achievement data for systemic reform program improvement and accountability. Diverse teams with expertise in assessment and measurement and systemic reform are encouraged to develop innovative methodologies and analytical frameworks of high technical rigor for assessing achievement outcomes attributable to systemic reform, particularly the NSF SI investment. Specifically, each proposer must:

- 1. provide a plan for examining the utility of the data sets to determine meaningful analyses linking assessment results across comparable tests;
- 2. specify study questions and identify assessment issues relating to conducting analyses of multiple student achievement data sets within and among SI sites;
- 3. describe in sufficient detail the statistical methods for conducting in-depth analyses of performance results; and
- 4. discuss dissemination efforts for increasing awareness of various uses of achievement results in systemic reform programming.

## **Design Issues and Considerations**

In general, sites have been able to document and show achievement gains for participating schools and districts in several ways. To date, a standardized format for reporting results has not been required. Sites vary greatly in how they report achievement information, depending on state and local policies and decision-making. Some sites provided percentages by quartiles, some provided mean scores, some

<sup>&</sup>lt;sup>1</sup> And the successor program, Urban Systemic Program (USP)

provided percentages for proficiency levels, etc. The study design should address the challenges of examining gains due to differences in scoring and reporting performance results, and whether the data sets are amenable to meaningful meta-analysis.

The data sets submitted also reflect performance on different types of tests for different grade levels for different purposes. The study team will need to gather information about similarities and differences regarding test use, specifications, administration conditions, examinees, and score reporting for the tests selected for these in-depth analyses. In addition to addressing these differences in planning the analytical framework, consideration should be given to whether the tests/assessments are aligned with standards-based curriculum.

In addition, the data sets must be considered in the context of the approaches used by the initiatives. Sites were expected to be strategic and innovative in operationalizing the four SI process drivers (see Appendix ). Therefore, the analysis plan and interpretation of results would need to give appropriate consideration to approaches or intervening practices and the level of saturation attained by the various sites.

Analyses and interpretation of data reported for multiple data points represent both an opportunity and a challenge. A study of achievement changes over time may broadly capture information in the data sets. However, lack of baseline information, in some cases, and/or changes in assessments will impact trend analyses. Additionally, the disaggregation of that data for more in-depth analyses is strongly encouraged, where feasible.

In general, the proposed studies of achievement testing results will complement other evaluation-related studies in assessing the quality of the evidence being used to support NSF's vision that comprehensive changes in the educational system to promote high quality mathematics and science education for all students will lead to improved student achievement. There is a need to enhance our understanding of performance gains and/or differences due to differences in content emphasis, test formats, and intended use of tests. For example, it would be useful to know about variations in performance due to test use or differences found when comparing student performance on low and high stake tests. It may be useful to conduct an in-depth analysis of assessment practices and results for a specific grade level across the SI sites.

## ELIGIBILITY

Proposals may be submitted by individual investigators or small groups from colleges, universities or other non-profit organizations. The Principal Investigators and their study teams should reflect a diversity of experiences, including expertise in assessment and measurement and systemic reform. Only one proposal may be submitted by a Principal Investigator and he/she may collaborate in only one other proposal as a co-Investigator. Group and collaborative proposals involving more than one institution must be submitted as a single administrative package from one of the institutions involved. Prospective applicants are strongly urged to contact one of the program officers listed at the end of this document for guidance prior to developing and submitting proposals.

#### AWARD INFORMATION

Under this announcement, NSF solicits proposals requesting up to \$400,000 for one year. NSF expects to fund approximately 2 to 4 standard one year awards depending on the quality of submissions and the availability of funds. Approximately \$1.5 million will be available for this initiative in FY 2000, pending availability of funds. Anticipated date of awards: December 1999.

## **PROPOSAL PREPARATION & SUBMISSION INSTRUCTIONS**

#### A. <u>Proposal Preparation Instructions.</u>

Full proposals must be submitted electronically using the NSF FastLane system for electronic proposal submission and review, available through the World Wide Web at the FastLane home page (<u>http://www.fastlane.nsf.gov</u>).

Proposals submitted in response to this program announcement should be prepared and submitted in accordance with the general guidelines contained in the *Grant Proposal Guide* (GPG), NSF 99-2. The complete text of the GPG (including electronic forms) is available electronically on the NSF Web site at: <u>http://www.nsf.gov</u>. Paper copies of the GPG may be obtained from:

NSF Publication Clearinghouse P.O. Box 218 Jessup, MD 20794-0218 Phone: 301-947-2722 E-mail: pubs@nsf.gov.

Proposers are reminded to identify the program announcement number (NSF 99-122) 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. Proposal Due Date.

For electronic submission of proposals, the proposal **MUST** be submitted by 5:00 PM, local time, September 15, 1999. Proposals received after this deadline will not be considered for this competition. Copies of the signed proposal cover sheet must be submitted in accordance with the instructions below.

*Submission of Signed Cover Sheets.* A printed (paper) copy of the proposal Cover Sheet (NSF Form 1207) must be endorsed by the Principal Investigator(s) and authorized institutional representative and forwarded to the following address for receipt within five working days of the deadline for electronic submission:

National Science Foundation DIS-FastLane Cover Sheet 4201 Wilson Blvd. Arlington, VA 22230

A proposal may not be processed until the complete proposal (including signed Cover Sheet) has been received by NSF. **Proposals that do not adhere to the format or page limitation will not be reviewed.** 

## C. <u>FastLane Requirements.</u>

The NSF FastLane system is available for electronic preparation and submission of a proposal through the Web at the FastLane Web site at <u>http://www.fastlane.nsf.gov</u>. The Sponsored Research Office (SRO or equivalent) must provide a FastLane Personal Identification Number (PIN) to each Principal Investigator (PI) to gain access to the FastLane "Proposal Preparation" application. PIs that have not submitted a proposal to NSF in the past must contact their SRO to be added to the NSF PI database. This should be done as soon as the decision to prepare a proposal is made.

In order to use NSF FastLane to prepare and submit a proposal, the following are required:

Browser (must support multiple buttons and file upload)

- Netscape 3.0 or greater
- Microsoft Internet Explorer 4.01 or greater

PDF Reader (needed to view/print forms)

• Adobe Reader 3.0 or greater

PDF Generator (needed to create project description)

- Adobe Acrobat 3.X or greater
- Aladdin Ghostscript 5.10 or greater

A list of registered institutions and the FastLane registration form are located on the FastLane Web page.

#### **PROPOSAL REVIEW INFORMATION**

#### A. Merit Review Criteria.

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, adjacent disciplines to that principally addressed in the proposal.

Proposals will be reviewed against the following general merit 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. Each reviewer will be asked to address only those that are relevant to the proposal 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 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?

#### **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 learner perspectives.

PIs should address this issue in their proposal to provide reviewers with the information necessary to respond fully to both NSF merit review criteria. NSF staff will give it careful consideration in making funding decisions.

#### **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 -- are 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. PIs should address this issue in their proposal to provide reviewers with the information necessary to respond fully to both NSF merit review criteria. NSF staff will give it careful consideration in making funding decisions.

## B. Merit Review Process.

Most of the proposals submitted to NSF are reviewed by mail review, panel review, or some combination of mail and panel review. Proposals submitted in response to this announcement will be reviewed by panel review only.

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Reviewers will be asked to formulate a recommendation to either support or decline each proposal. A Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation. 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 his or her supervisor, the Division Director. This informal notification is not a guarantee of an eventual award. NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of proposals in this category. The time interval begins on the proposal deadline or target date or from the date of receipt, if deadlines or target dates are not used by the program. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after final programmatic approval has been obtained, award recommendations are then 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 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 an 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 Officer does so at its own risk.

#### 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 (DGA). 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.

## B. Grant Award Conditions.

An NSF grant consists of: (1) the award letter, which includes any special provisions applicable to the grant 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 grant conditions, such as Grant General Conditions (NSF GC-1)\* or Federal Demonstration Partnership Phase III (FDP) Terms and Conditions\* and (5) any NSF brochure, program guide, announcement or other NSF issuance that may be incorporated by reference in the award letter. Electronic mail notification is the preferred way to transmit NSF grants 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: <u>http://www.nsf.gov</u>. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone 301.947.2722 or by e-mail from <u>pubs@nsf.gov</u>.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, (NSF 95-26) available electronically on the NSF Web site. The GPM also is available in paper copy by subscription from the Superintendent of Documents, Government Printing Office, Washington, DC 20402. The GPM may be ordered through the GPO Web site at: <a href="http://www.gpo.gov">http://www.gpo.gov</a>.

#### C. <u>Reporting Requirements.</u>

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 expiration of a grant, 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 a new electronic project reporting system, available through FastLane, which 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. Reports will continue to be required annually and after the expiration of the grant, but PIs will not need to re-enter information previously provided, either with the proposal or in earlier updates using the electronic system.

Effective October 1, 1998, PIs are required to use the new reporting format for annual and final project reports. PIs are strongly encouraged to submit reports electronically via FastLane. For those PIs who cannot access FastLane, paper copies of the new report formats may be obtained from the NSF Clearinghouse as specified above. NSF expects to require electronic submission of all annual and final project reports via FastLane beginning in October, 1999.

## D. <u>New Awardee Information.</u>

If the submitting organization has never received an NSF award, it is recommended that the organization's appropriate administrative officials become familiar with the policies and procedures in the NSF *Grant Policy Manual* which are applicable to most NSF awards. The "Prospective New Awardee Guide" (NSF 97-100) includes information on: Administration and Management Information; Accounting System Requirements and Auditing Information; and Payments to Organizations with Awards. This information will assist an organization in preparing documents that NSF requires to conduct administrative and financial reviews of an organization. The guide also serves as a means of highlighting the accountability requirements associated with Federal awards. This document is available electronically on NSF's Web site at: <a href="http://www.nsf.gov/cgibin/getpub?nsf97100">http://www.nsf.gov/cgibin/getpub?nsf97100</a>>.

## CONTACTS FOR ADDITIONAL INFORMATION

Dr. Bernice Anderson, Division of Research, Evaluation & Communication (703/306-1650; <u>banderso@nsf.gov</u>) or Dr. Eric Hamilton, Division of Educational System Reform (703/306-1684; <u>ehamilto@nsf.gov</u>).

For questions related to use of FastLane, please send an e-mail message to fastlane@nsf.gov or call 703/306-1142.

## **OTHER PROGRAMS OF INTEREST**

The NSF Guide to Programs is a compilation of funding opportunities for research and education in science, mathematics, and engineering. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter. Beginning in fiscal year 1999, the NSF Guide to Programs

only will be available electronically, at <http://www.nsf.gov/cgi-bin/getpub?gp>. Many NSF programs offer announcements concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices listed in Appendix A of the GPG.

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, available electronically on the NSF Web site at: <u>http://www.nsf.gov/home/ebulletin</u>. Subscribers can also sign up for NSF's Custom News Service to find out what funding opportunities are available.

# Appendix

## Six Drivers for Educational System Reform

## **PROCESS DRIVERS**

- 1. Implementation of comprehensive, standards-based curricula as represented in instructional practice, including student assessment, in every classroom, laboratory, and other learning experience provided through the system and its partners.
- 2. Development of a coherent, consistent set of policies that supports: provision of high quality mathematics and science education for each student; excellent preparation, continuing education, and support for each mathematics and science teacher (including all elementary teachers); and administrative support for all persons who work to dramatically improve achievement among all students served by the system.
- 3. Convergence of the usage of all resources that are designed for or that reasonably could be used to support science and mathematics education--fiscal, intellectual, material, curricular, and extra-curricular--into a focused and unitary program to constantly upgrade, renew, and improve the educational program in mathematics and science for all students.
- 4. Broad-based support from parents, policymakers, institutions of higher education, business and industry, foundations, and other segments of the community for the goals and collective value of the program, based on rich presentations of the ideas behind the program, the evidence gathered about its successes and its failures, and critical discussions of its efforts.

# **OUTCOME DRIVERS**

- 5. Accumulation of a broad and deep array of evidence that the program is enhancing student achievement, through a set of indices that might include achievement test scores, higher level courses passed, College admission rates, college majors, Advanced Placement Tests taken, portfolio assessment, and ratings from summer employers, and that demonstrate that students are generally achieving at a significantly higher level in science and mathematics.
- 6. Improvement in the achievement of all students, including those historically underserved.

#### ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Grantees 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 or contact the program coordinator at (703) 306-1636.

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 regarding NSF programs, employment, or general information. TDD may be accessed at (703) 306-0090 or through FIRS on 1-800-877-8339.

#### 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 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 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.

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: Reports Clearance Officer; Information Dissemination Branch, DAS; National Science Foundation; Arlington, VA 22230.

#### YEAR 2000 REMINDER

In accordance with Important Notice No. 120 dated June 27, 1997, Subject: Year 2000 Computer Problem, NSF awardees are reminded of their responsibility to take appropriate actions to ensure that the NSF activity being supported is not adversely affected by the Year 2000 problem. Potentially affected items include: computer systems, databases, and equipment. The National Science Foundation should be notified if an awardee concludes that the Year 2000 will have a significant impact on its ability to carry out an NSF funded activity. Information concerning Year 2000 activities can be found on the NSF web site at <a href="http://www.nsf.gov/oirm/y2k/start.htm">http://www.nsf.gov/oirm/y2k/start.htm</a>

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.

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