

Decadal and Regional Climate Prediction using Earth System Models (EaSM)

PROGRAM SOLICITATION

NSF 13-607

REPLACES DOCUMENT(S):

NSF 12-522



National Science Foundation

Directorate for Geosciences

Directorate for Mathematical & Physical Sciences



National Institute of Food and Agriculture

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

December 23, 2013

IMPORTANT INFORMATION AND REVISION NOTES

A revised version of the *NSF Proposal & Award Policies & Procedures Guide (PAPPG)*, [NSF 13-1](#), was issued on October 4, 2012 and is effective for proposals submitted, or due, on or after January 14, 2013. Please be advised that the guidelines contained in [NSF 13-1](#) apply to proposals submitted in response to this funding opportunity.

Please be aware that significant changes have been made to the PAPPG to implement revised merit review criteria based on the National Science Board (NSB) report, [National Science Foundation's Merit Review Criteria: Review and Revisions](#). While the two merit review criteria remain unchanged (Intellectual Merit and Broader Impacts), guidance has been provided to clarify and improve the function of the criteria. Changes will affect the project summary and project description sections of proposals. Annual and final reports also will be affected.

A by-chapter summary of this and other significant changes is provided at the beginning of both the [Grant Proposal Guide](#) and the [Award & Administration Guide](#).

Please note that this program solicitation may contain supplemental proposal preparation guidance and/or guidance that deviates from the guidelines established in the [Grant Proposal Guide](#).

This is the third EaSM solicitation (see NSF Program Solicitation 12-522 for the second EaSM solicitation). It remains focused on the prediction of future climates and their consequences for human systems on time scales of several decades and shorter and global to regional and finer spatial scales. A time span of several decades is chosen because within this timeframe modeled climate change responses appear to be insensitive to CO₂ forcing scenarios. Moreover, adaptation planning and implementation are carried out on roughly these time scales. This solicitation will not consider research involving varying CO₂ forcing scenarios beyond the next several decades. The long-term EaSM Program goals (see the Synopsis and Program Description Section) remain essentially the same; however, the EaSM-3 solicitation focuses on the subset of the specific areas of interest that are primarily related to Goal 1: to achieve comprehensive, reliable global and regional predictions of decadal climate variability and change through advanced understanding of the coupled interactive physical, chemical, biological, and human processes that drive the climate system, including as they pertain to agriculture, forestry or land cover/use.

The emphasis in EaSM-3 is only on the decadal aspect of:

- Predictability studies
- Prediction and attribution
- Research on metrics, methods, and tools for testing, evaluating, and validating climate and climate impact predictions and characterizing their uncertainty.

For each of these areas, prediction, attribution, and tools may be applicable to terrestrial (including terrestrial aquatic), oceanic, and atmospheric systems and their interactions, and may relate to scenarios of human actions and adaptation, particularly as these pertain to agriculture, forestry or land cover/use.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Decadal and Regional Climate Prediction using Earth System Models (EaSM)

Synopsis of Program:

The consequences of climate variability and change are becoming more immediate and profound than previously anticipated. Over recent decades, the world has witnessed the onset of prolonged droughts on several continents, increased frequency of floods, loss of agricultural and forest productivity, degraded ocean and permafrost ecosystems, global sea level rise and the rapid retreat of ice sheets and glaciers, loss of arctic sea ice, and changes in ocean currents. These important impacts highlight that climate variability and change can have significant effects on decadal and shorter time scales, with significant consequences for plant, animal, human, and physical systems.

The EaSM funding opportunity enables interagency cooperation on one of the most pressing problems of the millennium: climate change and how it is likely to affect our world. It allows the partner agencies -- National Science Foundation (NSF) and U.S. Department of Agriculture (USDA) -- to combine resources to identify and fund the most meritorious and highest-impact projects that support their respective missions, while avoiding duplication of effort and fostering collaboration between agencies and the investigators they support.

This interdisciplinary scientific challenge calls for the development and application of next-generation Earth System Models that include coupled and interactive representations of such components as ocean and atmospheric currents, agricultural working lands and forests, biogeochemistry, atmospheric chemistry, the water cycle and land ice. This solicitation seeks to attract scientists from the disciplines of geosciences, agricultural sciences, mathematics and statistics. Successful proposals will develop intellectual excitement in the participating disciplinary communities and engage diverse interdisciplinary teams with sufficient breadth to achieve the scientific objectives. We encourage proposals that have strong broader impacts, including public access to data and other research products of general interest, as well as educational, diversity, or societal impacts.

The long-term goals of this solicitation are to improve on and extend current Earth System modeling capabilities to:

1. Achieve comprehensive, reliable global and regional predictions of decadal climate variability and change through advanced understanding of the coupled interactive physical, chemical, biological, and human processes that drive the climate system, including as they pertain to agriculture, forestry or land cover/use.
2. Quantify the impacts of climate variability and change on natural and human systems, and identify and quantify feedback loops.
3. Maximize the utility of available observational and model data for impact, vulnerability/resilience, and risk assessments through up/downscaling activities and uncertainty characterization.
4. Effectively translate climate predictions and associated uncertainties into the scientific basis for policy and management decisions related to human interventions and adaptation to the projected impacts of climate change.

The EaSM-3 solicitation focuses primarily on **Goal 1** (above) with the following specific areas of interest related to decadal scales: (i) Research that has the potential to dramatically improve predictive capabilities; (ii) Prediction and attribution studies; (iii) Development and applications of metrics, methods, and tools for testing and evaluating climate and climate impact predictions and characterizing their uncertainty.

These subareas of particular interest are described in greater detail below under Program Description: Areas of interest.

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of contact.

- Eric C. Itsweire, Directorate for Geosciences (GEO), telephone: (703) 292-8582, email: eam3@nsf.gov
- William J. Wiseman, Directorate for Geosciences (GEO), telephone: (703) 292-4750, email: eam3@nsf.gov
- Anjali S. Bamzai, Directorate for Geosciences (GEO), telephone: (703) 292-8527, email: eam3@nsf.gov
- Peter Milne, Directorate for Geosciences (GEO), telephone: (703) 292-4714, email: eam3@nsf.gov
- Michael Steuerwalt, Directorate for Mathematical and Physical Sciences (MPS), telephone: (703) 292-4860, email: eam3@nsf.gov
- Thomas F. Russell, Directorate for Mathematical & Physical Sciences (MPS), telephone: (703) 292-4863, email: eam3@nsf.gov
- Nancy Cavallaro, U.S. Department of Agriculture, telephone: (202) 401-5176, email: eam3@nsf.gov
- Mary Ann Rozum, U.S. Department of Agriculture, telephone: (202) 401-4533, email: eam3@nsf.gov

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

- 10.310 --- Agriculture and Food Research Initiative
- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.079 --- International and Integrative Activities (IIA)

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 5 to 8

5-8 depending on the mix and size of projects submitted. This estimate is based on the total for all funding sources (NSF, USDA) combined.

Awards for each project are expected to be in the range of \$300,000 to \$600,000 per year.

Budgets are to be no more than \$3M for 3 to 5-year projects. The budget should accurately reflect the effort of all parties, as detailed in the budget justification.

Anticipated Funding Amount: \$15,000,000 to \$18,000,000 in FY 2014 pending availability of funds. This solicitation is being released prior to the passage of an Appropriations Act for FY 2014. Enactment of Continuing Resolutions or an Appropriations Act may affect the availability or level of funding for this program. USDA may use FY2014 and/or FY2015 funds.

Eligibility Information

Organization Limit:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

PI Limit:

PIs from NSF-funded FFRDCs (Federally Funded Research and Development Center) may submit proposals to this competition. Projects involving USDA FFRDCs will only be considered for co-funding by NSF if they are collaborative efforts that include non-federally funded institutions. To facilitate possible interagency funding of such collaboratives, an institution other than the USDA FFRDC must serve as the lead institution. This is necessitated solely by NSF rules for funding collaborative grants and should not be construed as a comment on capability or leadership. USDA research laboratories submitting proposals as the lead institution will only be considered for funding by USDA-NIFA.

Proposals from FFRDCs must obey NSF budget guidelines and may not include costs already covered by federal funds.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI or Co-PI: 1

An individual may appear as PI, co-PI, co-investigator or senior personnel on **only one proposal** in response to this solicitation.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposals:**
 - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. 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.
 - 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/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:**

For awards made by USDA/NIFA, section 720 of the General Provisions in Title VII of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Programs (HR 112-284), limited indirect costs to 30 percent of the total Federal funds provided under each award. Applicants should anticipate that the FY 2014 (and 2015) appropriation will contain a similar limitation. Revised budgets will be solicited if these guidelines are not met by an application to be awarded by USDA/NIFA.

- **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):

December 23, 2013

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.

TABLE OF CONTENTS

Summary of Program Requirements

- I. Introduction
- II. Program Description
- III. Award Information
- IV. Eligibility Information
- V. Proposal Preparation and Submission Instructions
 - A. Proposal Preparation Instructions
 - B. Budgetary Information
 - C. Due Dates
 - D. FastLane/Grants.gov Requirements
- VI. NSF Proposal Processing and Review Procedures
 - A. Merit Review Principles and Criteria
 - B. Review and Selection Process
- VII. Award Administration Information
 - A. Notification of the Award
 - B. Award Conditions
 - C. Reporting Requirements
- VIII. Agency Contacts
- IX. Other Information
- X. Appendix

I. INTRODUCTION

Climate prediction at time scales of several decades and shorter is a scientific challenge that underscores the complexity of the Earth's natural and human systems while also highlighting the many unknowns that shape our climate and its impacts. These include natural drivers of climate variability; the transient sensitivity of the climate system to radiative forcing; cloud feedbacks; short-lived greenhouse gases such as ozone and methane, and particles affecting the Earth's albedo such as soot and other aerosols; the roles of oceanic and terrestrial ecosystems, land use, and biogeochemical cycles; and feedbacks imposed by human response to climate change. The nonlinear nature of these interactions greatly increases the complexity of the challenge.

In order to plan for future infrastructure, stakeholders from various application sectors (e.g. agriculture, energy, and the water resources community) need information about the likely climate trajectory for the next 5-30 years. However, the inherent natural variability of climate can mask both long-term trends and changes in system responses due to changes in driving forces, such as anthropogenic forcing. It is thus crucial to be able to make better decadal time scale predictions that account for natural variability.

Additional challenges are faced in the development and application of the models themselves. These include scaling, model parameterization, uncertainty quantification, model validation, more efficient algorithms, and realistic representation of underlying biogeochemical, physical, chemical, agricultural, ecological, and socioeconomic processes.

Further problems arise in model initialization and climate change attribution when the sparseness and heterogeneity of available data are considered. Mathematical and statistical techniques are needed to optimize the merging of available data towards the development of equilibrium climate states for model initialization. As these many issues are addressed, the new knowledge generated becomes the basis for continuing improvements in the reliability of future, more complete versions of Earth System Models.

Scientific challenges such as these cannot be met in isolation. Diverse teams of researchers involved in parallel, interdisciplinary,

and complementary activities are required to advance the field of Earth System Modeling. Cyberinfrastructure should be utilized to support the development, growth, and effectiveness of collaborating teams while also supplying shared compute and data platforms to a wide range of users of climate and climate impact predictions and information. It is anticipated that projects funded by EaSM will yield transformative results.

II. PROGRAM DESCRIPTION

This solicitation will capitalize on the synergy between development of climate models, their use in both the assessment and attribution of climate variability and impacts, and the development of approaches to effectively inform adaptation policy. The overall goal of the EaSM solicitation is to improve on and expand upon current modeling capabilities to substantially advance reliable regional and decadal climate predictions and their connection to human systems. Long-term goals are to:

1. Achieve comprehensive, reliable global and regional predictions of decadal climate variability and change through advanced understanding of the coupled interactive physical, chemical, biological and human processes that drive the climate system, including as they pertain to agriculture, forestry or land cover/use.
2. Quantify the impacts of climate variability and change on natural and human systems, and identify and quantify feedback loops.
3. Maximize the utility of available observational and model data for impact and vulnerability/resilience and risk assessments through up/downscaling activities and uncertainty characterization.
4. Effectively translate climate model predictions and associated uncertainties into the scientific basis for policy and management decisions related to human interventions and adaptation to the projected impacts of climate change.

New research efforts should leverage existing modeling frameworks and existing cyberinfrastructure as appropriate and encourage the participation of postdoctoral and early career scientists.

Proposals should describe collaborative, interdisciplinary efforts that advance the state of Earth System Modeling on decadal scales. Proposers should clearly state how their efforts contribute to long-term Goal 1 of the EaSM program and will have broad interdisciplinary impacts and implications. For USDA-NIFA funding, these broader interdisciplinary impacts should relate to agriculture, forestry or land cover/use. Where appropriate, investigators are encouraged to incorporate methods and metrics that assess the reliability of predictions. It is anticipated that EaSM projects will be 3 to 5 years in duration. The scope of proposals should justify total budgets in the range of \$300,000 to \$600,000 per year.

Prospective PIs whose projects fit the description above are invited to submit proposals to this solicitation. If in doubt whether to submit to EaSM-3 or an established grant program, please contact a cognizant Program Officer by email (identified in the Summary and Section VIII in this solicitation).

Areas of Interest:

This solicitation is intended to support development of reliable regional and decadal climate predictions that take into account the influences of living systems and are essential for projecting how living systems might adapt to climate change and its consequences for their physical environment. These predictions are necessary for well-informed human adaptation to climate change in planning future infrastructure, ensuring adequate food and water supplies, and developing sound, informed policy and stewardship for our natural and managed ecosystems.

Example areas of interest include (the ordering does not imply priority, and the list is not exhaustive):

- Research into predictability of the climate system at time scales of several decades and shorter and on regional spatial scales. Studies may include, for example: predictability of the statistics of extreme events, the roles of climate data assimilation and initialization, and model multi-ensemble methods and error propagation control.
- Prediction and attribution studies to determine whether observed changes in frequency and intensity of extreme weather and climate events, such as floods, droughts, hurricanes and multi-year heat waves covering large hemispheric regions, are primarily related to human activities driving long-term trends, or are manifestations of shorter term natural drivers of climate variability. Studies may include, for example: the identification, evaluation, and understanding of low frequency natural modes of climate variability such as El Nino/Southern oscillation and multidecadal ocean variability, and how these may change in a changing climate; and the roles of short-lived radiative forcing, such as aerosols and clouds, methane, ozone, and decadal solar variability.
- Development and applications of metrics, methods, and tools for testing, evaluating, and validating predictions of climate and of climate impacts, characterizing their uncertainties, and estimating their errors. Studies may include, for example: methods to improve the understanding of uncertainties and biases in results; theoretical frameworks for addressing multi-scale interactions in a consistent manner; analysis of paleoclimate and historical records to evaluate simulations and retrospective predictions for the past several decades; and quantification of uncertainties.
- Topics of particular interest to USDA include the following: incorporation into predictive models of adaptive responses of ecosystem function (including agroecosystems) to climate variability and change, potential feedbacks on the climate system, and analysis of subsequent consequences for sustainability and implications of climate change mitigation strategies. This may include modeling anticipated changes in land cover and land use, and adaptation to climate change in production agriculture through adjustments to system inputs, management practices, crop and livestock choices, and harvest strategies.

III. AWARD INFORMATION

The duration of awards is expected to be from 3 to 5 years. Estimated program budget, number of awards, and average award size/duration are subject to the availability of funds.

This is an interagency partnership between NSF and USDA, therefore meritorious proposals may be funded by one or both agencies at the option of the agencies, not the proposer. For proposals selected for funding entirely by USDA, PIs will be asked to withdraw their proposal from NSF and resubmit it to USDA-NIFA in accordance with instructions given by the cognizant USDA-NIFA Program Officer. Subsequent grant administration procedures will be in accordance with the individual policies of the awarding agency. See Section X. Appendix of this solicitation for information about USDA-NIFA Policies and Requirements for USDA-NIFA Awardees.

IV. ELIGIBILITY INFORMATION

Organization Limit:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

PI Limit:

PIs from NSF-funded FFRDCs (Federally Funded Research and Development Center) may submit proposals to this competition. Projects involving USDA FFRDCs will only be considered for co-funding by NSF if they are collaborative efforts that include non-federally funded institutions. To facilitate possible interagency funding of such collaboratives, an institution other than the USDA FFRDC must serve as the lead institution. This is necessitated solely by NSF rules for funding collaborative grants and should not be construed as a comment on capability or leadership. USDA research laboratories submitting proposals as the lead institution will only be considered for funding by USDA-NIFA.

Proposals from FFRDCs must obey NSF budget guidelines and may not include costs already covered by federal funds.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI or Co-PI: 1

An individual may appear as PI, co-PI, co-investigator or senior personnel on **only one proposal** in response to this solicitation.

Additional Eligibility Info:

Projects involving USDA FFRDCs will only be considered for co-funding by NSF if they are collaborative efforts that involve non-federally funded institutions and/or NSF-funded FFRDCs. Proposals for FFRDCs must obey NSF budget guidelines and may not include costs already covered by federal funds. To facilitate possible interagency funding of such collaboratives, an institution other than the USDA facility must serve as the lead institution.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Preparation 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 nsfpubs@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/publications/pub_summ.jsp?ods_key=grantsgovguide). 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 nsfpubs@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.4 of the Grant Proposal Guide provides additional information on collaborative proposals.

Important Proposal Preparation Information: FastLane will check for required sections of the full proposal, in accordance with *Grant Proposal Guide* (GPG) instructions described in Chapter II.C.2. The GPG requires submission of: Project Summary; Project Description; References Cited; Biographical Sketch(es); Budget; Budget Justification; Current and Pending Support; Facilities, Equipment & Other Resources; Data Management Plan; and Postdoctoral Mentoring Plan, if applicable. If a required section is missing, **FastLane will not accept the proposal**.

Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions. If the solicitation instructions do not require a GPG-required section to be included in the proposal, insert text or upload a document in that section of the proposal that states, "Not Applicable for this Program Solicitation." Doing so will enable FastLane to accept your

proposal.

Please note: All materials must be submitted to NSF. NSF will share all submitted materials with USDA-NIFA throughout the review process.

In addition to criteria specified in the NSF Grant Proposal Guide or NSF Grants.gov Application Guide, additional submission materials will be required. Proposals failing to include these additional materials will be returned without review. Please refer to the list below when submitting proposals to ensure compliance.

- **Cover Sheet:**
 - **Proposals Involving USDA National Laboratories:** To be considered for funding by NSF, proposals that are collaborative efforts that involve USDA National Laboratories must be submitted with an institution other than the USDA Laboratory as the lead institution.
- **Title:** The title of each proposal must start with "EaSM-3".
- **Project Description:**
 - Proposals will be allotted 15 pages for the Project Description. Detailed project and data management plans should be included as supplementary documents as indicated under the Supplementary Document heading below.
- **Budget:**
 - All proposals should include travel costs in years 1 and 3 for the EaSM PI meeting in the Washington, D.C. area.
 - Proposals that require special facilities (excluding computing facilities) normally covered by NSF for unsolicited proposals must explicitly include the cost of the facility (or estimated cost) in the budget. These costs should appear in the "Other" category and be explained in the budget justification. A financial estimate and letter of commitment from the facility operator must be included in the supplementary documents appended to the end of the proposal. Requirements for specific computer hours needed and their cost should *not* be included in the budget, but instead be included in the proposal as supplemental information (see below). The additional cost of using computing center facilities will be borne by funds associated with the EaSM-3 competition.
- **Supplementary Documents:**
 - **Project Management Plan:** Proposals must include a detailed project management plan of no more than three pages. It should include a timeline for the project and its activities, project milestones, a list of deliverables, and a communication strategy between the involved parties.
 - **Data Management Plan:** All proposals must include a data management plan of not more than two pages that conforms to the NSF Data Policy. Data related to this solicitation may take many forms including observational, theoretical, and model-generated output. For those projects where no data will be generated, a statement must be made to that effect. A copy of the NSF Data Policy is posted on the solicitation's companion website (<http://www.nsf.gov/crssprgm/climate/>).
 - **Postdoctoral Mentoring Plan:** Proposals that request funding to support postdoctoral researchers must include a mentoring plan that is no more than one page. This plan should consist of activities and opportunities tailored specifically to the personal professional development of the postdoc(s) involved.
 - **Requirements for Computing Resources (if applicable):** Requirements for specific computer hours needed and their cost should be identified and summarized in no more than one page.
 - **Conflicts of Interest Spreadsheet:** No later than 24 hours after the stated proposal deadline, the PI must submit (via e-mail; see below) as an electronic document a spreadsheet containing a list of all project participants, their institutional affiliations, and a list of all the people conflicted with each participant. The list should also contain information on the nature of the conflict as well as the institutional affiliation, if known, of the person in conflict. This list will be used by NSF to determine project conflicts of interest and must be generated according to instructions on the solicitation's companion website. Instructions, templates, and utilities to help create and submit this file can be found on this solicitation's companion website (<http://www.nsf.gov/crssprgm/climate/>). Note that for collaborative proposals, only the PI for the lead institution will submit this document.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Indirect Cost (F&A) Limitations:

For awards made by USDA/NIFA, section 720 of the General Provisions in Title VII of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Programs (HR 112-284), limited indirect costs to 30 percent of the total Federal funds provided under each award. Applicants should anticipate that the FY 2014 (and 2015) appropriation will contain a similar limitation. Revised budgets will be solicited if these guidelines are not met by an application to be awarded by USDA/NIFA.

Other Budgetary Limitations: Awards are expected to be in the range of \$300,000 to \$600,000 per year.

Budgets are to be no more than \$3M for 3 to 5-year projects. The budget should accurately reflect the effort of all parties, as detailed in the budget justification.

C. Due Dates

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

December 23, 2013

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

Detailed technical instructions regarding the technical aspects of 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 funding opportunity.

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. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

- **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. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: http://www07.grants.gov/applicants/app_help_reso.jsp. 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 for acknowledgement and, if they meet NSF 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 either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with 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 of interest with the proposal. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in the GPG as [Exhibit III-1](#).

A comprehensive description of the Foundation's merit review process is available on the NSF website at: http://nsf.gov/bfa/dias/policy/merit_review/.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in [Empowering the Nation Through Discovery and Innovation: NSF Strategic Plan for Fiscal Years \(FY\) 2011-2016](#). These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the core strategies in support of NSF's mission 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 variety of learning perspectives.

Another core strategy in support of NSF's mission is broadening opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of

the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. ([GPG Chapter II.C.2.d.i.](#) contains additional information for use by proposers in development of the Project Description section of the proposal.) Reviewers are strongly encouraged to review the criteria, including [GPG Chapter II.C.2.d.i.](#), prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
 - a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
 - b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

Additional Solicitation Specific Review Criteria

All proposals will be reviewed as a group, with all agencies collaborating, i.e., there will not be separate agency-specific review panels. In addition to the standard review criteria described above, the following additional criteria will be used in evaluating each proposal:

- Each project will be reviewed for its responsiveness to the goals of the solicitation.
- Proposals will also be evaluated on the extent to which they engage students at the undergraduate and graduate levels, postdoctoral researchers, and early career scientists from a diverse set of disciplines in team-oriented, cross-disciplinary activities focused on achieving the goals of the solicitation.
- Special attention will be given to: (1) the soundness of the project and data management plans and (2) the appropriateness of the budget for the work proposed.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review 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.

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 deadline or target date, or receipt date, whichever is later. 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 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.B. 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 (GC-1); * or Research Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

Special Award Conditions:

- All NSF-funded projects will be subject to the NSF Data Policy, a copy of which can be found on the solicitation's companion website (<http://www.nsf.gov/crssprgm/climate/>).
- For each award, one or more project representatives will be required to attend an annual PI meeting where they will report on project progress to other awardees, the funding agencies, and other interested parties, as well as to work to integrate their efforts with those of other awardees.
- Meritorious proposals that are deemed to be competitive may be funded by NSF or USDA-NIFA. No funds will be transferred between agencies. Therefore, for collaborative projects not funded by NSF alone, a PI whose non-lead (secondary) proposal is to be funded by USDA-NIFA will be asked to withdraw that proposal from NSF and resubmit it to USDA-NIFA according to that agency's policies and procedures under the guidance of the cognizant USDA Program Officer listed in the solicitation. Subsequent grant administration procedures will be in accordance with the individual policies of the awarding agency. See Section X. Appendix of this solicitation for information about USDA-NIFA Policies and Requirements for USDA-NIFA Awardees.

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 prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). Within 90 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. 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 Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

More comprehensive information on NSF Reporting Requirements and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

Additional Reporting Requirements Specific to the EaSM Solicitation

For awards funded by NSF, PIs will be required to include descriptions of their project milestones and their data management activities in their annual reports. Data reporting should conform to current NSF data policy guidelines; PIs should consult with the managing program officer.

- Reporting requirements for awards funded by USDA-NIFA will conform to those specified by the agency.
- For collaborative projects that are funded by NSF and USDA-NIFA, the annual report of the lead project in the collaborative that is resident at NSF must include a description of the activities and milestones of the parts of the project that are funded by the other agencies. See Section X. Appendix of this solicitation for information about USDA-NIFA Policies and Requirements for USDA-NIFA Awardees.

VIII. AGENCY CONTACTS

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Eric C. Itsweire, Directorate for Geosciences (GEO), telephone: (703) 292-8582, email: easm3@nsf.gov
- William J. Wiseman, Directorate for Geosciences (GEO), telephone: (703) 292-4750, email: easm3@nsf.gov
- Anjali S. Bamzai, Directorate for Geosciences (GEO), telephone: (703) 292-8527, email: easm3@nsf.gov
- Peter Milne, Directorate for Geosciences (GEO), telephone: (703) 292-4714, email: easm3@nsf.gov
- Michael Steuerwalt, Directorate for Mathematical and Physical Sciences (MPS), telephone: (703) 292-4860, email: easm3@nsf.gov
- Thomas F. Russell, Directorate for Mathematical & Physical Sciences (MPS), telephone: (703) 292-4863, email: easm3@nsf.gov
- Nancy Cavallaro, U.S. Department of Agriculture, telephone: (202) 401-5176, email: easm3@nsf.gov
- Mary Ann Rozum, U.S. Department of Agriculture, telephone: (202) 401-4533, email: easm3@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@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.

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, "My NSF" 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 [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. "My NSF" 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>.

Dedicated Website Containing Important Information for Applicants to this Solicitation

There is a dedicated website for this solicitation (<http://www.nsf.gov/crssprgm/climate/>). It contains utilities to help proposers create and submit the required integrated conflicts of interest spreadsheet. The website also contains links to the NSF Data Policy, Frequently Asked Questions, and other important resources.

Investigators considering submitting to this solicitation are strongly encouraged to examine the information on the solicitation's companion website before preparing their proposals.

Investigators considering submitting proposals in response to this solicitation are strongly encouraged to speak with one of the NSF or USDA-NIFA program directors named in the solicitation prior to preparing a proposal.

About the National Institute of Food and Agriculture

The National Institute of Food and Agriculture (NIFA) is an agency within the U.S. Department of Agriculture (USDA), part of the executive branch of the Federal Government. Congress created NIFA through the Food, Conservation, and Energy Act of 2008. NIFA replaced the former Cooperative State Research, Education, and Extension Service (CSREES), which had been in existence since 1994. NIFA's unique mission is to advance knowledge for agriculture, the environment, human health and well-being, and communities by supporting research, education, and extension programs in the Land-Grant University System and other partner organizations. NIFA doesn't perform actual research, education, and extension but rather helps fund it at the state and local level.

and provides program leadership in these areas. Through grants offered by NIFA, the USDA enables researchers throughout the United States to solve problems critical to our farmers, consumers, and communities. NIFA is the USDA's major extramural research agency, funding individuals, institutions, and public, private, and non-profit organizations. NIFA's education program supports and promotes teaching excellence, enhances academic quality, and develops tomorrow's scientific and professional workforce. In cooperation with public institutions, private sector partners, and the Land-Grant University System, NIFA provides national leadership to address critical educational issues. NIFA's extension projects deliver science-based knowledge and informal educational programs to people, enabling them to make practical decisions.

NIFA Web site:

<http://www.nifa.usda.gov/>

Phone: 202-720-4423

Street and Mailing Address:

Street Address:

National Institute of Food and Agriculture
Waterfront Centre
800 9th St. SW., Washington, DC 20024

Mailing Address:

United States Department of Agriculture
National Institute of Food and Agriculture
1400 Independence Avenue SW., Stop 2201
Washington, DC 20250-2201

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 55,000 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 Arctic 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: nsfpubs@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
Office of the General Counsel
National Science Foundation
Arlington, VA 22230

X. APPENDIX

ATTACHMENT I: USDA-NIFA Policies and Requirements for USDA-NIFA Awardees

REVIEW AND SELECTION PROCESS:

Applicants selected for funding by NIFA will be required to provide additional information in accordance with policies and procedures of the AFRI program. Applications selected for funding by NIFA will be forwarded to the USDA/NIFA Awards Management Division for award processing in accordance with the USDA/NIFA procedures.

INDIRECT COST LIMITATIONS:

For awards made by USDA/NIFA, section 720 of the General Provisions in Title VII of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Programs (HR 112-284), limited indirect costs to 30 percent of the total Federal funds provided under each award. Applicants should anticipate that the FY 2014 (and 2015) appropriation will contain a similar limitation. Revised budgets will be solicited if these guidelines are not met by an application to be awarded by USDA/NIFA.

AWARD ADMINISTRATION:

The award document will provide pertinent instructions and information including, at a minimum, the following:

- (1) Legal name and address of performing organization or institution to whom the Director has issued an award under the terms of this request for applications;
- (2) Title of project;
- (3) Name(s) and institution(s) of PDs chosen to direct and control approved activities;
- (4) Identifying award number assigned by the Department;
- (5) Project period, specifying the amount of time the Department intends to support the project without requiring recompetition for funds;
- (6) Total amount of Departmental financial assistance approved by the Director during the project period;
- (7) Legal authority(ies) under which the award is issued;
- (8) Appropriate Catalog of Federal Domestic Assistance (CFDA) number;
- (9) Applicable award terms and conditions (see <http://www.nifa.usda.gov/business/awards/awardterms.html> to view NIFA award terms and conditions);
- (10) Approved budget plan for categorizing allocable project funds to accomplish the stated purpose of the award; and
- (11) Other information or provisions deemed necessary by NIFA to carry out its respective awarding activities or to accomplish the purpose of a particular award.

REPORTING REQUIREMENTS:

Grantees are to submit initial project information and annual summary reports to USDA/NIFA's electronic, Web-based inventory system that facilitates both grantee submissions of project outcomes and public access to information on Federally-funded projects. The details of these reporting requirements are included in the award terms and conditions.

Any additional reporting requirements will be identified in the terms and conditions of the award (see below for a link to view the USDA/NIFA award terms and conditions).

AWARD PAYMENT AND ORGANIZATIONAL MANAGEMENT INFORMATION:

Administrative and National Policy Requirements

Awards issued as a result of this solicitation will have designated the Automated Standard Applications for Payment System (ASAP), operated by the Department of Treasury's Financial Management Service, as the payment system for funds. For more information see http://www.nifa.usda.gov/business/method_of_payment.html.

Several Federal statutes and regulations apply to USDA/NIFA grant applications considered for review and to project grants awarded under this program. These include, but are not limited to:

2 CFR Part 220 - Cost Principles for Educational Institutions (OMB Circular A-21).

2 CFR Part 225 - Cost Principles for State, Local, and Indian Tribal Governments (OMB Circular A-87).

2 CFR Part 230 - Cost Principles for Non-profit Organizations (OMB Circular A-122).

7 CFR Part 1, subpart A-USDA implementation of the Freedom of Information Act.

7 CFR Part 3-USDA implementation of OMB Circular No. A-129 regarding debt collection.

7 CFR Part 15, subpart A-USDA implementation of Title VI of the Civil Rights Act of 1964, as amended.

7 CFR Part 331 and 9 CFR Part 121-USDA implementation of the Agricultural Bioterrorism Protection Act of 2002.

7 CFR Part 3015-USDA Uniform Federal Assistance Regulations, implementing OMB directives (i.e., OMB Circular Nos. A-21, A-87, and A-122, now codified at 2 CFR Parts 220, 225 and 230), and incorporating provisions of 31 U.S.C. 6301-6308 (formerly the Federal Grant and Cooperative Agreement Act of 1977, Pub. L. No. 95-224), as well as general policy requirements applicable to recipients of Departmental financial assistance.

7 CFR Part 3016 - USDA Implementation of Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments.

7 CFR Part 3017-USDA implementation of Governmentwide Debarment and Suspension (Nonprocurement).

7 CFR Part 3018-USDA implementation of Restrictions on Lobbying. Imposes prohibitions and requirements for disclosure and certification related to lobbying on recipients of Federal contracts, grants, cooperative agreements, and loans.

7 CFR Part 3019-USDA implementation of OMB Circular A-110, Uniform Administrative Requirements for Grants and Other Agreements With Institutions of Higher Education, Hospitals, and Other Nonprofit Organizations (2 CFR Part 215).

7 CFR Part 3021-USDA Implementation of Governmentwide Requirements for Drug-Free Workplace (Grants).

7 CFR Part 3022 -Research Institutions Conducting USDA-Funded Extramural Research; Research Misconduct.

7 CFR Part 3052-USDA implementation of OMB Circular No. A-133, Audits of States, Local Governments, and Nonprofit Organizations.

7 CFR Part 3407-USDA procedures to implement the National Environmental Policy Act of 1969, as amended.

7 CFR 3430-Competitive and Noncompetitive Non-formula Grant Programs--General Grant Administrative Provisions.

29 U.S.C. 794 (section 504, Rehabilitation Act of 1973) and 7 CFR Part 15b (USDA implementation of statute) -prohibiting discrimination based upon physical or mental handicap in Federally assisted programs.

35 U.S.C. 200 et seq. -Bayh Dole Act, controlling allocation of rights to inventions made by employees of small business firms and domestic nonprofit organizations, including universities, in Federally assisted programs (implementing regulations are contained in 37 CFR Part 401).

Responsible and Ethical Conduct of Research

The responsible and ethical conduct of research (RCR) is critical for excellence, as well as public trust, in science and engineering. Consequently, education in RCR is considered essential in the preparation of future scientists. In accordance with sections 2, 3, and 8 of 7 CFR Part 3022, institutions that conduct extramural research funded by USDA must foster an atmosphere conducive to research integrity, bear primary responsibility for prevention and detection of research misconduct and are to maintain and effectively communicate and train their staff regarding policies and procedures. In the event an application to NIFA results in an award, the AOR assures, through acceptance of the award that the institution will comply with the above requirements. Per award terms and conditions, grant recipients shall, upon request, make available to NIFA the policies and procedures as well as documentation to support the conduct of the training.

Note that the training referred to herein shall be either on-campus or the Collaborative Institutional Training Initiative (CITI) program for RCR (<https://www.citiprogram.org/rcrpage.asp>). The general content of the ethics training, at a minimum, will emphasize three key areas of research ethics: authorship and plagiarism, data and research integration and reporting misconduct. Each institution will be responsible for developing its own training system, as schools will need flexibility to develop training tailored to their specific student needs. Typically RCR education addresses the topics of: Data Acquisition and Management - collection, accuracy, security, access; Authorship and Publication; Peer Review; Mentor/Trainee Responsibilities; Collaboration; Conflict of Interest; Research Misconduct; Human Subject Research; and Use of Animals in Research.

Financial Reporting:

For informational purposes, the "Federal Financial Report," Form SF-425, consolidates into a single report the former Financial Status Report (SF-269 and SF-269A) and the Federal Cash Transactions Report (SF-272 and SF-272A). The [NIFA Agency-specific Terms and Conditions](#) include the requirement that Form SF-425 is due on a **quarterly basis no later than 30 days following the end of each reporting period. A final "Federal Financial Report," Form SF-425, is due 90 days after the expiration date of this award.**

CHANGES BY GRANTEES:

1. Delegation of Fiscal Responsibility

Unless the terms and conditions of the grant state otherwise, the grantee may not, in whole or in part, delegate or transfer to another person, institution, or organization the responsibility for use or expenditure of grant funds.

2. Changes in Project Plans

- a. The permissible changes by the grantee, PD(s), or other key project personnel in the approved project grant shall be limited to changes in methodology, techniques, or other similar aspects of the project to expedite achievement of the project's approved goals. If the grantee or the PD(s) is uncertain as to whether a change complies with this provision, the question must be referred to the Authorized Departmental Officer (ADO) for a final determination. The ADO is the signatory of the award document, not the program contact.
- b. Changes in approved goals or objectives shall be requested by the grantee and approved in writing by the ADO prior to effecting such changes. In no event shall requests for such changes be approved which are outside the scope of the original approved project.
- c. Changes in approved project leadership or the replacement or reassignment of other key project personnel shall be requested by the grantee and approved in writing by the ADO prior to effecting such changes.
- d. Transfers of actual performance of the substantive programmatic work in whole or in part and provisions for payment of funds, whether or not Federal funds are involved, shall be requested by the grantee and approved in writing by the ADO prior to effecting such transfers, unless prescribed otherwise in the terms and conditions of the grant.
- e. Changes in Project Period: The project period may be extended by USDA/NIFA without additional financial support, for such additional period(s) as the ADO determines may be necessary to complete or fulfill the purposes of an approved project, but in no case shall the total project period exceed ten years. Any extension of time shall be conditioned upon prior request by the grantee and approval in writing by the ADO, unless prescribed otherwise in the terms and conditions of a grant.
- f. Changes in Approved Budget: Changes in an approved budget must be requested by the grantee and approved in writing by the ADO prior to instituting such changes if the revision will involve transfers or expenditures of amounts requiring prior approval as set forth in the applicable Federal cost principles, Departmental regulations, or grant award.

[Policies and Important Links](#) | [Privacy](#) | [FOIA](#) | [Help](#) | [Contact NSF](#) | [Contact Web Master](#) | [SiteMap](#)



The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749

Last Updated:
11/07/06
[Text Only](#)