

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

PROGRAM SOLICITATION

NSF 12-522

REPLACES DOCUMENT(S): NSF 10-554



National Science Foundation

Directorate for Geosciences

Directorate for Mathematical & Physical Sciences

Directorate for Social, Behavioral & Economic Sciences

Office of Polar Programs



U.S. Dept. of Energy

Office of Science, Office of Biological and Environmental Research



U.S. Dept. of Agriculture

National Institute of Food and Agriculture

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

May 11, 2012

IMPORTANT INFORMATION AND REVISION NOTES

This is the second in a series of EaSM solicitations (see [NSF Program Solicitation 10-554](#) for the first 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 is 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, some of the specific areas of interest related to those goals have changed.

Less emphasis on:

- Model building

Greater emphasis on:

- Predictability studies
- Extreme events
- Prediction and attribution
- Upscaling/downscaling
- Interactions between natural and human systems
- Research on metrics, methods, and tools for testing, evaluating, and validating climate and climate impact predictions and their uncertainty characterization.

Unlike EaSM 1, this solicitation will not consider proposals for incubator or pilot project activities.

Important Reminders

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), [NSF 11-1](#), was issued on October 1, 2010 and is effective for proposals submitted, or due, on or after January 18, 2011. Please be advised that the guidelines contained in [NSF 11-1](#) apply to proposals submitted in response to this funding opportunity.

Cost Sharing: The PAPPG has been revised to implement the National Science Board's recommendations regarding cost sharing. Inclusion of voluntary committed cost sharing is prohibited. In order to assess the scope of the project, all organizational resources necessary for the project must be described in the Facilities, Equipment and Other Resources section of the proposal. The description should be narrative in nature and must not include any quantifiable financial information. Mandatory cost sharing will only be required when explicitly authorized by the NSF Director. See the PAPP Guide Part I: *Grant Proposal Guide (GPG) Chapter II.C.2.g(xi)* for further information about the implementation of these recommendations.

Data Management Plan: The PAPPG contains a clarification of NSF's long standing data policy. All proposals must describe plans for data management and sharing of the products of research, or assert the absence of the need for such plans. FastLane will not permit submission of a proposal that is missing a Data Management Plan. The Data Management Plan will be reviewed as part of

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. Important impacts have highlighted 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. Such aspects include 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.

The EaSM funding opportunity enables interagency cooperation on one of the most pressing problems of the millennium: climate change, how it is likely to affect our world, and how we can plan for its consequences. It allows the partner agencies -- National Science Foundation (NSF), U.S. Department of Agriculture (USDA), and U.S. Department of Energy (DOE) -- to combine resources to identify and fund the most meritorious and highest-impact projects that support their respective missions, while eliminating 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 things as ocean and atmospheric currents, human activities, agricultural working lands and forests, urban environments, biogeochemistry, atmospheric chemistry, the water cycle and land ice. This solicitation seeks to attract scientists from the disciplines of geosciences, social sciences, agricultural and biological sciences, mathematics and statistics, physics, and chemistry. 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.
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 following are specific areas of interest to the funding agencies for EaSM 2: (i) Research that has the potential to dramatically improve predictive capabilities; (ii) Prediction and attribution studies; (iii) Research that addresses critical issues linking relevant Earth system processes over a variety of spatial and temporal scales; (iv) Research that examines the relationships between climate variability and change to human and natural environments from the human perspective; (v) Development and applications of metrics, methods, and tools for testing and evaluating climate and climate impact predictions and their uncertainty characterization.

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.

- Anjali S. Bamzai, Directorate for Geosciences (GEO), telephone: (703) 292-8527, email: easm2@nsf.gov
- Eric C. Itsweire, Directorate for Geosciences (GEO), telephone: (703) 292-8582, email: easm2@nsf.gov
- Thomas F. Russell, Directorate for Mathematical & Physical Sciences (MPS), telephone: (703) 292-4863, email: easm2@nsf.gov
- Michael Steuerwalt, Directorate for Mathematical and Physical Sciences (MPS), telephone: (703) 292-4860, email: easm2@nsf.gov
- David McGinnis, Directorate for Social, Behavioral and Economic Sciences (SBE), telephone: (703) 292-7307, email: easm2@nsf.gov
- William J. Wiseman, Office of Polar Programs (OPP), telephone: (703) 292-4750, email: easm2@nsf.gov
- Peter Milne, Office of Polar Programs (OPP), telephone: (703) 292-4714, email: easm2@nsf.gov

- Nancy Cavallaro, U.S. Department of Agriculture, telephone: (202) 401-5176, email: easm2@nsf.gov
- Mary Ann Rozum, U.S. Department of Agriculture, telephone: (202) 401-4533, email: easm2@nsf.gov
- Renu Joseph, Department of Energy, Office of Science (DOE-SC), Office of Biological and Environmental Research, telephone: (301) 903-9237, email: easm2@nsf.gov
- Dorothy Koch, Department of Energy, telephone: (301) 903-0105, email: easm2@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
- 47.078 --- Office of Polar Programs
- 47.079 --- Office of International Science and Engineering
- 47.080 --- Office of Cyberinfrastructure
- 47.081 --- Office of Experimental Program to Stimulate Competitive Research

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 7 to 12

7-12 depending on the mix and size of projects submitted. This estimate is based on the total for all funding sources (NSF, USDA, DOE) combined.

Awards are expected to be in the range of \$300,000 to \$1,000,000 per year.

Budgets are to be no more than \$3M, \$4M and \$5M, for 3-year, 4-year, and 5-year projects, respectively. The budget should accurately reflect the effort of all parties, as detailed in the budget justification.

Anticipated Funding Amount: \$35,000,000 to \$39,000,000 in FY 2012 and FY 2013 pending availability of funds.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.
- Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs): Contact the appropriate program before preparing a proposal for submission.

PI Limit:

PIs from NSF-funded FFRDCs may submit proposals to this competition. Projects involving USDA or DOE 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 or DOE 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. It is anticipated that DOE lab scientists whose projects are recommended for funding would be funded by DOE. 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: 2

An individual may appear as PI or co-PI on **only two proposals** in response to this solicitation. We encourage PIs and co-PIs to limit themselves to one proposal submission. No more than two submissions per PI or co-PI will be accepted.

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 1462(a) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3310(a)) limits the recovery of indirect costs to 22 percent of total federal funds awarded. 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):
May 11, 2012

Proposal Review Information Criteria

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

Award Administration Information

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

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

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I. INTRODUCTION

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 problem.

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 is 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 more than incremental results in individual models, but instead will transform the conduct of climate science, greatly increasing the impact of research outcomes.

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 substantively 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.
2. Quantify the impacts of climate variability and change on natural and human systems, and identify and quantify feedback loops through which human systems help determine environmental outcomes.
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 regional and decadal scales. Proposers should clearly state how their efforts contribute to the overall long-term goals of the program and will have broad interdisciplinary impacts. 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 \$1,000,000 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 2 or an established grant program, please contact a relevant Program Director by email (identified later 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.

Examples of areas of interest are (the ordering does not imply priority):

- Research into predictability of the climate system at times 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. Relevant to this process is a better understanding of how climate information is conveyed to the public, how it is perceived, and how decisions are made as a result.
- 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 ENSO 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.
- Research on methods of coupling different elements of the earth system to account for multi-scale interactions. Studies

may include, for example: coupling between system components that work at widely different scales of time or space (such as global atmospheric circulation, hydrologic systems, and human systems), upscaling local and regional information to inform regional and global models, and downscaling global and regional model predictions in order to inform regional and local applications.

- Research that examines the relationships between climate variability and change to human and natural environments from the human perspective. Studies may include, for example, linking physical conditions and societal activities at relevant regional scales; incorporating social system models into climate model outputs; enhancing understanding about human perception and cognition of climate variability and change through Earth System modeling outputs; visualizing model output appropriate for decision making; and adapting to a changing environment.
- Development and applications of metrics, methods, and tools for testing, evaluating, and validating predictions of climate and of climate impacts, their uncertainty characterization, and error estimates. Studies may include, for example: methods to improve the perception, cognition and understanding of uncertainties and biases in results; analysis of paleoclimate and historical records to evaluate simulations and retrospective predictions for the past several decades; quantification of uncertainties; and related risk assessments.

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, USDA, and DOE, therefore meritorious proposals may be funded by one or more agencies at the option of the agencies, not the proposer. For proposals selected for funding entirely by USDA or DOE, PIs will be asked to withdraw their proposal from NSF and resubmit it to USDA-NIFA or DOE-SC in accordance with instructions given by the cognizant USDA-NIFA or DOE-SC Program Officer. Subsequent grant administration procedures will be in accordance with the individual policies of the awarding agency.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.
- Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs): Contact the appropriate program before preparing a proposal for submission.

PI Limit:

PIs from NSF-funded FFRDCs may submit proposals to this competition. Projects involving USDA or DOE 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 or DOE 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. It is anticipated that DOE lab scientists whose projects are recommended for funding would be funded by DOE. 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: 2

An individual may appear as PI or co-PI on **only two proposals** in response to this solicitation. We encourage PIs and co-PIs to limit themselves to one proposal submission. No more than two submissions per PI or co-PI will be accepted.

Additional Eligibility Info:

Projects involving USDA or DOE 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-NIFA or DOE-SC 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.

Please note: All materials must be submitted to NSF. NSF will share all submitted materials with USDA-NIFA and DOE-SC 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 belowlist when submitting proposals to ensure compliance.

- **Cover Sheet:**
 - **Proposals Involving USDA or DOE National Laboratories:** Proposals that are collaborative efforts that involve USDA and DOE National Laboratories must be submitted with an institution other than the USDA or DOE Laboratory as the lead institution.
- **Title:** The title of each proposal must start with "Ea SM 2".
- **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 for the annual 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. The additional cost of using computing center facilities will be borne by funds associated with the EaSM 2 competition.
- **Supplementary Documents:**
 - **Program 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.
- **Conflicts of Interest Spreadsheet:** No later than 24 hours after the stated proposal deadline, the PI must submit as an electronic document a spreadsheet containing a list of all project participants, their institutional affiliations, and a list of all of 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 files 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 1462(a) of the National Agricultural Research, Extension, and Teaching Policy Act of

1977 (7 U.S.C. 3310(a)) limits the recovery of indirect costs to 22 percent of total federal funds awarded. 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 \$1,000,000 per year.

Budgets are to be no more than \$3M, \$4M and \$5M, for 3-year, 4-year, and 5-year projects, respectively. 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):

May 11, 2012

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

A. NSF Merit Review Criteria

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

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgements.

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative 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?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: <http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>.

Mentoring activities provided to postdoctoral researchers supported on the project, as described in a one-page supplementary document, will be evaluated under the Broader Impacts criterion.

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 and the extent to which multiple disciplines are engaged in moving toward a systems approach to regional and decadal modeling.
- 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.

NSF staff also will give careful consideration to the following in making funding decisions:

Integration of Research and Education

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

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

B. Review 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 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, USDA-NIFA, and/or DOE-SC. No funds will be transferred between agencies. Therefore, for awards not funded by NSF alone, a PI whose secondary proposal is to be funded by USDA-NIFA or DOE-SC will be asked to withdraw that proposal from NSF and resubmit it to the other agency according to that agency's policies and procedures under the guidance of the cognizant USDA or DOE Program Officer listed in the solicitation.

C. Reporting Requirements

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

PIs are required to use NSF's electronic project-reporting system, available through FastLane, for preparation and submission of annual and final project reports. Such reports provide information on activities and findings, project participants (individual and organizational), publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report 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.

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 and DOE-SC will conform to those specified by the agency funding the proposal.
- For collaborative projects that are funded by NSF and either DOE-SC or 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.

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:

- Anjali S. Bamzai, Directorate for Geosciences (GEO), telephone: (703) 292-8527, email: easm2@nsf.gov
- Eric C. Itsweire, Directorate for Geosciences (GEO), telephone: (703) 292-8582, email: easm2@nsf.gov
- Thomas F. Russell, Directorate for Mathematical & Physical Sciences (MPS), telephone: (703) 292-4863, email: easm2@nsf.gov
- Michael Steuerwalt, Directorate for Mathematical and Physical Sciences (MPS), telephone: (703) 292-4860, email: easm2@nsf.gov
- David McGinnis, Directorate for Social, Behavioral and Economic Sciences (SBE), telephone: (703) 292-7307, email: easm2@nsf.gov

- William J. Wiseman, Office of Polar Programs (OPP), telephone: (703) 292-4750, email: eamsm2@nsf.gov
- Peter Milne, Office of Polar Programs (OPP), telephone: (703) 292-4714, email: eamsm2@nsf.gov
- Nancy Cavallaro, U.S. Department of Agriculture, telephone: (202) 401-5176, email: eamsm2@nsf.gov
- Mary Ann Rozum, U.S. Department of Agriculture, telephone: (202) 401-4533, email: eamsm2@nsf.gov
- Renu Joseph, Department of Energy, Office of Science (DOE-SC), Office of Biological and Environmental Research, telephone: (301) 903-9237, email: eamsm2@nsf.gov
- Dorothy Koch, Department of Energy, telephone: (301) 903-0105, email: eamsm2@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, National Science Foundation Update is a free e-mail subscription service designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the [NSF web site](#).

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 keyword files and 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 program directors named in the solicitation prior to preparing a proposal. Similarly, for proposals that involve USDA or DOE Laboratories, investigators are strongly encouraged to speak with the USDA-NIFA or DOE program directors named in the solicitation prior to preparing their 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 Department of Energy's Office of Science, Office of Biological and Environmental Research

The Department of Energy's Office of Science sponsors fundamental research programs in basic energy sciences, biological and environmental sciences, and computational science including vital parts of U.S. research in climate change, geophysics, genomics, life sciences, and science education. Within the Office of Science, the Office of Biological and Environmental Research (BER) supports world-class biological and environmental research programs and scientific user facilities to support DOE's energy, environment, and basic research missions.

BER's activity in Regional and Global Climate Modeling focuses on development, evaluation and application of regional and global climate models with the objective to understand high resolution patterns and causes of climate change. Core research includes development of methods to produce reliable projections at regional scales, climate model diagnosis and intercomparison through the use of appropriate metrics, analysis of multi-model climate change simulations and projections, detection and attribution of climate change, and understanding of natural and forced variability of the climate system. The DOE climate modeling program also focuses on regions of vital interest to future climate assessments including the tropics and the Arctic.

Regional and Global Climate Modeling Web site: <http://science.energy.gov/ber/research/cesd/regional-and-global-modeling/> Office of Science, Office of Biological and Environmental Sciences Division

Climate and Environmental Sciences Division, SC-23.1

Department of Energy, GTN Bldg.

1000 Independence Ave, SW

Washington, DC 20585-1290

Phone: (301) 903-9237

Fax: (301) 903-8519

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and 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
Division of Administrative Services
National Science Foundation
Arlington, VA 22230

X. APPENDIX

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

ELIGIBILITY LIMITATIONS:

Eligible applicants for the grant program implemented under this subpart include: (1) State agricultural experiment stations; (2) colleges and universities (including junior colleges offering associate degrees or higher); (3) university research foundations; (4) other research institutions and organizations; (5) Federal agencies; (6) national laboratories; (7) private organizations or corporations; (8) individuals who are U.S. citizens, nationals, or permanent residents; and (9) any group consisting of 2 or more entities identified in (1) through (8). Eligible institutions do not include foreign and international organizations.

LEGISLATIVE AUTHORITY:

The legislative authority [\[JM1\]](#) for NIFA is section 2 of the Competitive, Special, and Facilities Research Grant Act (7 U.S.C. §450i).

REVIEWER SELECTION:

USDA/ NIFA will identify reviewers based upon training and experience in relevant scientific, extension, or education fields, taking into account the following factors: (a) The level of relevant formal scientific, technical education, or extension experience of the individual, as well as the extent to which an individual is engaged in relevant research, education, or extension activities; (b) the need to include as reviewers experts from various areas of specialization within relevant scientific, education, or extension fields; (c) the need to include as reviewers other experts (e.g., producers, range or forest managers/operators, and consumers) who can assess relevance of the applications to targeted audiences and to program needs; (d) the need to include as reviewers experts from a variety of organizational types (e.g., colleges, universities, industry, state and Federal agencies, private profit and non-profit organizations) and geographic locations; (e) the need to maintain a balanced composition of reviewers with regard to minority and female representation and an equitable age distribution; and (f) the need to include reviewers who can judge the effective usefulness to producers and the general public of each application.

INDIRECT COST LIMITATIONS:

All awards made from USDA/NIFA will be limited to an indirect cost cap of 22% of the total Federal funds awarded. See section 1462(a) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3310(a)). Revised budgets will be solicited if these guidelines are not met by an application to be awarded by USDA/NIFA.

Also, no cost sharing is required.

AWARD ADMINISTRATION:

Within the limit of funds available for such purpose, the awarding official of NIFA shall make grants to those responsible, eligible applicants whose applications are judged most meritorious under the procedures set forth in this RFA. The date specified by the awarding official of NIFA as the effective date of the grant shall be no later than September 30 of the Federal fiscal year in which the project is approved for support and funds are appropriated for such purpose, unless otherwise permitted by law. It should be noted that the project need not be initiated on the grant effective date, but as soon thereafter as practical so that project goals may be attained within the funded project period. All funds granted by NIFA under this RFA shall be expended solely for the purpose for which the funds are granted in accordance with the approved application and budget, the regulations, the terms and conditions of the award, the applicable Federal cost principles (2 CFR 215, 2 CFR 220 and 2 CFR 230), and the Department's assistance regulations (parts 3015, 3019 and 3430 of 7 CFR).

The award document will provide pertinent instructions and information shall include at a minimum the following:

1. Legal name and address of performing organization or institution to which the NIFA Director has awarded a grant under the terms of this RFA;
2. Title of project;
3. Name(s) and institution(s) of PDs chosen to direct and control approved projects;
4. Identifying grant number assigned by NIFA;
5. Project period, specifying the amount of time NIFA intends to support the project without requiring re competition for funds;
6. Total amount of NIFA financial assistance approved by the NIFA Director during the project period;
7. Legal authority(ies) under which the grant is awarded;
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 grant award; and
11. Other information or provisions deemed necessary by NIFA to carry out its respective granting activities or to accomplish the purpose of a particular grant.

POST AWARD REQUIREMENTS:

(a) *Requirement.* All projects supported with Federal funds under this part must be documented in the Current Research Information System (CRIS).

(b) *Initial Documentation in the CRIS Database.* Information collected in the "Work Unit Description" (Form AD- 416) and "Work Unit Classification" (Form AD-417) is required upon project initiation for all new awards in CRIS (*i.e.*, prior to award).

(c) *Annual CRIS Reports.* Unless stated differently in the grant terms and conditions, an annual "Accomplishments Report" (Form AD-421) is due 90 calendar days after the award's anniversary date (*i.e.*, one year following the month and day of which the project period begins and each year thereafter up until a final report is required). An annual report covers a one-year period. In addition to the Form AD-421, the following information, when applicable, must be submitted to the programmatic contact person identified in block 4 of the Award Face Sheet (Form CSREES-2009): A comparison of actual accomplishments with the goals established for the reporting period (where the output of the project can be expressed readily in numbers, a computation of the cost per unit of output should be considered if the information is considered useful); the reasons for slippage if established goals were not met; and additional pertinent information including, when appropriate, analysis and explanation of cost overruns or unexpectedly high unit costs. The annual report of "Funding and Staff Support" (Form AD-419) is due February 1 of the year subsequent to the Federal fiscal year being reported.

(d) *CRIS Final Report.* The CRIS final report, "Accomplishments Report" (Form AD-421), covers the entire period of performance of the award. The report should encompass progress made during the entire time frame of the project instead of covering accomplishments made only during the final reporting segment of the project. In addition to providing the information required under paragraph (c) of this section, the final report must include the following when applicable: A disclosure of any inventions not previously reported that were conceived or first actually reduced to practice during the performance of the work under the award; a written statement on whether or not the awardee elects (or plans to elect) to obtain patent(s) on any such invention; and identify equipment purchased with any Federal funds under the award and indicate subsequent use of such equipment.

(e) *CRIS Web Site Via Internet.* The CRIS database is available to the public on the World Wide Web. CRIS project information is available via the Internet CRIS Web site at <http://cris.nifa.usda.gov/>. To submit forms electronically, the CRIS forms Web site can be accessed through the CRIS Web site or accessed directly at <http://cwf.uvm.edu/cris/>.

(f) Grantees may be required to submit other technical reports or submit the CRIS reports more frequently than annual. Additional requirements for a specific grant program are described in the applicable subpart after subpart F and are identified in the RFA. The Award Face Sheet (Form CSREES-2009) also will specify these additional reporting requirements.

AWARD PAYMENT AND ORGANIZATIONAL MANAGEMENT INFORMATION:

Awards issued as a result of this RFA 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.

Organizational Management Information

Specific management information relating to an applicant shall be submitted on a one time basis, with updates on an as needed basis, as part of the responsibility determination prior to the award of a grant identified under this RFA, if such information has not been provided previously under this or another NIFA program. NIFA will provide copies of forms recommended for use in fulfilling these requirements as part of the preaward process. Although an applicant may be eligible based on its status as one of these entities, there are factors which may exclude an applicant from receiving Federal financial and nonfinancial assistance and benefits under this program (e.g., debarment or suspension of an individual involved or a determination that an applicant is not responsible based on submitted organizational management information).

Administrative and National Policy Requirements

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 3017-USDA implementation of Government wide Debarment and Suspension (Non procurement) and 7 CFR Part 3021-Governmentwide Requirements for Drug Free Workplace (Grants).

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 (now located at 2 CFR Part 215).

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

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

7 CFR Part 3430 - NIFA Competitive and Noncompetitive Non formula Federal Assistance Programs-General Award 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).

REPORTING REQUIREMENTS:

USDA/NIFA grantees are required to submit annual and summary evaluation reports via the Current Research Information System (CRIS). CRIS is an electronic, Web-based inventory system that facilitates both grantee submissions of project outcomes and public access to information on Federally-funded projects. It can be accessed at <http://cris.nifa.usda.gov/>.

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:

A. Use of funds; changes

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 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. No cost extension of time are subject to the requirements of 7 CFR 3430.58.

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.

B. Confidential Aspects of Applications and Awards

When an application results in an award, it becomes a part of the record of NIFA transactions, available to the public upon specific request. Information that the Secretary determines to be of a confidential, privileged, or proprietary nature will be held in confidence to the extent permitted by law. Therefore, any information that the applicant wishes to have considered as confidential, privileged, or proprietary should be clearly marked within the application. The original copy of an application that does not result in an award will

be retained by the Agency for a period of three years. Other copies will be destroyed. Such an application will be released only with the consent of the applicant or to the extent required by law. An application may be withdrawn at any time prior to the final action thereon.


C. Regulatory Information

For the reasons set forth in the final Rule related Notice to 7 CFR part 3015, subpart V (48 FR 29114, June 24, 1983), this program is excluded from the scope of the Executive Order 12372 which requires intergovernmental consultation with State and local officials. Under the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. chapter 35), the collection of information requirements contained in this Notice have been approved under OMB Document No. 0524-0039.

D. Definitions

Please refer to 7 CFR 3430, Competitive and Noncompetitive Non-formula Grant Programs--General Grant Administrative Provisions, for the applicable definitions for this NIFA grant program.

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