Dynamics of Coupled Natural and Human Systems (CNH)

PROGRAM SOLICITATION
NSF 10-612

REPLACES DOCUMENT(S):
NSF 07-598

National Science Foundation

Directorate for Social, Behavioral & Economic Sciences

Directorate for Biological Sciences

Directorate for Geosciences

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

December 09, 2010

November 15, 2011

Third Tuesday in November, Annually Thereafter

IMPORTANT INFORMATION AND REVISION NOTES

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 the intellectual merit or broader impacts of the proposal, or both, as appropriate. Links to data management requirements and plans relevant to specific Directorates, Offices, Divisions, Programs, or other NSF units are available on the NSF website at: http://www.nsf.gov/bfa/dias/policy/dmp.jsp. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

Postdoctoral Researcher Mentoring Plan: As a reminder, each proposal that requests funding to support postdoctoral researchers must include, as a supplementary document, a description of the mentoring activities that will be provided for such individuals. Please be advised that if required, FastLane will not permit submission of a proposal that is missing a Postdoctoral Researcher Mentoring Plan. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

Revision Summary

This solicitation notes that the Dynamics of Coupled Natural and Human Systems (CNH) is one of many standing programs contributing to the NSF portfolio of investments for Science, Engineering, and Education for Sustainability (SEES). CNH encourages submission of SEES-relevant proposals.

This solicitation identifies two additional forms of support for CNH research beyond the large CNH interdisciplinary research projects previously supported by CNH. One mechanism consists of CNH interdisciplinary team exploratory awards. The second mechanism consists of research coordination network (RCN) awards.

This solicitation reaffirms recent and forthcoming NSF-wide guidance regarding relevant requirements, such as the need for a mentoring plan for postdoctoral researchers (if postdoctoral researchers will be supported with CNH award funds) and the need to submit a data-management plan.

This solicitation specifies that only one proposal may be submitted for a project. If multiple organizations are participating in the project, support for secondary organizations must be made via subawards from the lead organization. Of the two types of collaborative proposal formats described in the *Grant Proposal Guide*, this solicitation allows only a single proposal submission with subawards administered by that lead organization.

This solicitation identifies a template to be used for letters of collaboration from other organizations and individuals.

The U.S. Department of Agriculture Forest Service (USFS) no longer is participating as a formal partner in the Dynamics of Coupled Natural and Human Systems (CNH) competition. USFS will continue to work with NSF in a number of other competitions.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Dynamics of Coupled Natural and Human Systems (CNH)

Synopsis of Program:

The Dynamics of Coupled Natural and Human Systems (CNH) Program promotes interdisciplinary analyses of relevant human and natural system processes and complex interactions among human and natural systems at diverse scales.

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.

- Thomas J. Baerwald - Lead for 2014, telephone: (703) 292-7301, email: tbaerwal@nsf.gov

- Sarah Ruth, telephone: (703) 292-7594, email: sruth@nsf.gov

- Peter Alpert, telephone: (703) 292 2273, email: palpert@nsf.gov

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

- 47.050 --- Geosciences
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 15 to 18

Anticipated Funding Amount: $17,000,000 This total is for awards to be made annually, pending availability of funds.

Eligibility Information

Who May Submit Proposals:

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

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There are no restrictions or limits.

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:** Not Applicable

- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further

information.

C. Due Dates

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

    December 09, 2010

    November 15, 2011

    Third Tuesday in November, Annually Thereafter

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: Standard NSF award conditions apply.

Reporting Requirements: Standard NSF reporting requirements apply.

TABLE OF CONTENTS

I. INTRODUCTION

The Dynamics of Coupled Natural and Human Systems (CNH) is a multidirectorate program jointly operated by three NSF directorates (Biological Sciences; Geosciences; and Social, Behavioral, and Economic Sciences). In addition to those three directorates, other NSF units (including the Directorate for Engineering, the Directorate for Education and Human Resources, the Office of International Science and Engineering, and the Office of Polar Programs) participate in evaluation of proposals and, when appropriate, in funding awards.

The CNH Program is one of a portfolio of existing and new programs and competitions that are part of an NSF-wide investment effort focusing on Science, Engineering, and Education for Sustainability (SEES). SEES aims to generate the discoveries and capabilities in climate and energy science and engineering needed to inform societal actions that lead to environmental and economic sustainability. CNH proposals consistent with SEES objectives are encouraged to articulate the connections to SEES. (For more information about SEES, go to http://www.nsf.gov/geo/sees/.)

The CNH Program aims to support basic research and related activities that enhance fundamental understanding of the complex interactions within and among natural and human systems, with special emphasis placed on the coupling between human and natural systems. Through its annual competitions, CNH intends to support three types of activities:

A. CNH Large Interdisciplinary Research Projects. Large interdisciplinary research projects may be supported by awards across a range of sizes from roughly $500,000 to no more than $1,500,000. Budgets should be developed at scales appropriate for the project to be conducted. Most projects will extend from two to five years in duration.

B. CNH Interdisciplinary Team Exploratory Projects. Support for exploratory efforts by emerging multidisciplinary teams is designed to facilitate the kinds of contact, interaction, and active research activities necessary to enable researchers from multiple fields to engage in effective interdisciplinary research. Emphasis is to be placed on the conduct of research and potential outcomes, not on the preparation of plans and proposals for future research. Exploratory projects may be supported in a range from roughly $150,000 to no more than $250,000. Most exploratory projects will extend from one to two years in duration.

C. CNH Research Coordination Networks (CNH-RCNs). Research coordination networks focusing on the dynamics of coupled natural and human systems will aim to advance CNH research or create new directions in research or education, with innovative ideas for implementing novel networking strategies especially encouraged. CNH-RCNs may be supported in a range from roughly $250,000 to no more than $500,000. CNH-RCNs will extend five years in duration.

For any additional updates regarding CNH, consult the CNH web site at http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13681&from=fund .

II. PROGRAM DESCRIPTION

The Dynamics of Coupled Natural and Human Systems (CNH) Program supports basic research and related activities that enhance fundamental understanding of the complex interactions within and among natural and human systems. CNH focuses on the complex interactions among human and natural systems at diverse spatial, temporal, and organizational scales. CNH seeks to advance basic knowledge about the system **dynamics** -- the processes through which systems function and interact with other systems. CNH-supported projects must examine relevant **natural AND human systems**. Proposals cannot focus solely or largely on either human systems or on natural systems. Projects also must examine the full range of **coupled** interactions and feedbacks among relevant systems. The arrows in the accompanying figure symbolize these relationships.
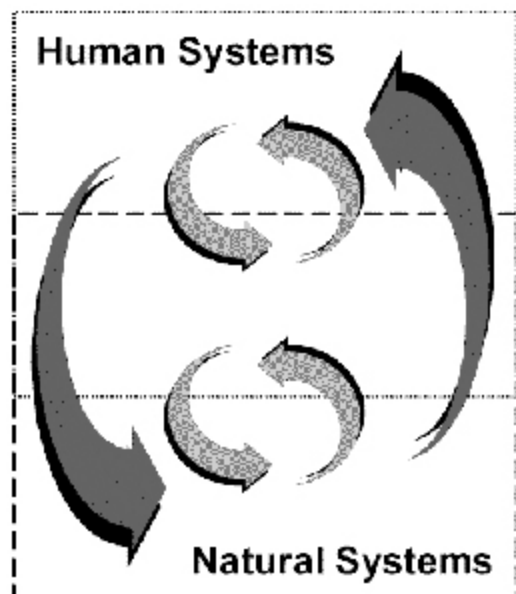
Starting in Fiscal Year 2011, CNH will provide support for three types of activities:

A. Large CNH Interdisciplinary Research Projects

In order to be most competitive, large CNH interdisciplinary research proposals must demonstrate how the proposed research is well grounded in relevant theory from a range of appropriate fields. They generally will focus on one or a limited number of specific questions that emanate from the theoretical discussion and review of relevant literature. They must outline and specify a scientifically sound research plan, typically cast in terms of testable hypotheses, and they must show considerable promise that the research results will contribute to enhancement of theory within and across relevant fields. To the extent possible, projects should try to improve capabilities for predicting the responses of systems to endogenous and exogenous changes, including appropriate estimates of uncertainty in model predictions.

To attain project goals, the investigative teams conducting CNH research should have expertise that matches the range of systems to be examined and activities to be undertaken. The team should include expertise from the natural sciences (biological sciences, geosciences, and/or physical sciences) and human sciences (social sciences, behavioral sciences, and/or engineering). Involvement of individuals with expertise in quantitative approaches and in education is also expected.

In addition to basic new knowledge and enhanced theory regarding the complex ways that people and natural systems interact, CNH seeks to develop the capabilities of people and tools needed to advance these areas of research in the future. CNH seeks to foster and develop interdisciplinarity by bringing researchers from different disciplines into teams, by developing new methods and expertise, and by reaching beyond the borders of the United States for partners in inquiry. In the process, the next generation of researchers will learn to work in diverse teams, cross disciplinary boundaries, and use advanced sensing and monitoring, communication, and information technologies to work across many scales of time and space.

CNH projects should employ an integrated, quantitative, systems-level method of inquiry. Because of the complex nature of systems under investigation, treatment of non-linearities, feedback processes, and integration across temporal or spatial scales is necessary. Qualitative and other approaches may complement quantitative approaches, but projects must use appropriate quantitative methods, and teams should include one or more individuals with demonstrated expertise in the quantitative methods to be used during the conduct of the project. Quantitative methods may include conceptual, mathematical, or computational models; numerical simulation; artificial intelligence techniques; statistics; visualization; or database development. Mathematical models should include appropriate estimates of uncertainty, and experiments should assess power and precision.

Education must be addressed and integrated effectively into CNH projects. Those benefiting from educational experiences can include participants (such as undergraduates, graduate students, teachers, and postdoctoral associates) and individuals beyond those directly involved in the project. Investigators are encouraged to include students as active participants on interdisciplinary teams. Informal education channels, such as science centers, aquariums, and similar facilities, may be used to help enhance the public's ability to deal with complex environmental information and make informed decisions about the environment. Educational efforts at the K-12 level should promote the acquisition of scientific inquiry skills and take advantage of technology and use it appropriately. Investigators may target their education plans at any groups for which they believe their educational activities can be especially effective, but they must identify clearly what those groups are, what educational activities will be undertaken, who on the project team has the expertise to conduct the educational activities successfully, and how the performance of the educational activities will be evaluated. Investigators are encouraged to disseminate information about their educational activities (including assessment of the effectiveness of those activities) through publications and other appropriate media.

International collaborations for research and education are encouraged when appropriate. CNH research projects may offer excellent opportunities for students at U.S. and foreign institutions to gain experience in the conduct of research in other countries. NSF awards normally are limited to the support of the U.S. portion of the collaboration. In the case of some developing countries, limited funds may be available to support the involvement of the foreign collaborator.

A full list of awards supported in past CNH competitions can be accessed at http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13681.

B. CNH Interdisciplinary Team Exploratory Projects

CNH interdisciplinary team exploratory projects are expected to contribute to the broader base of scientific knowledge regarding the dynamics of coupled natural and human systems in the same way that CNH large interdisciplinary projects would, with emphasis placed on exploring the processes through which relevant natural and human systems function and especially the coupled interactions among those systems. Teams of investigators with relevant expertise should focus on one or a few targeted research activities that will enable the team to work together more effectively and to conduct research that will yield basic knowledge and positive broader impacts. Emphasis is to be placed on the conduct of research and expected outcomes rather than on the preparation of plans and proposals for future research. Primary products of CNH interdisciplinary team exploratory projects are expected to be publications and presentations for scholarly audiences that disseminate research results, especially publications in peer-reviewed journals.

Because funding levels are reduced and emphasis is placed on developing collective team capabilities, less emphasis is placed on education, but investigators still are encouraged to involve students and scholars at early stages of their careers in the team's work to the greatest extent possible.

C. CNH Research Coordination Networks

CNH research coordination networks aim to advance CNH research or create new directions in research or education, with innovative ideas for implementing novel networking strategies especially encouraged. CNH-RCNs are expected to facilitate open communication and exchange of information and resources, to integrate activities of researchers working independently on topics of common interest, to nurture a sense of community among researchers, and to minimize isolation and maximize cooperation in research on the dynamics of coupled natural and human systems.

A CNH-RCN should have a common theme as a focus of its activities. The proposal should spell out the theoretical and/or methodological foundations of the network's proposed activities, and it should specify what activities will be undertaken, what products will be generated by network activities, and how information about the network and opportunities to participate will be disseminated. The proposal also should outline the expected benefits of the network's activities for the broader community of researchers engaged in research on coupled human and natural systems.

The size of a network may vary depending on the theme and the needs of the proposed activity. The network may be regional, national, or international. It is expected that a proposed network will involve investigators at diverse organizations. The inclusion of new researchers, post-docs, graduate students, and undergraduates is encouraged. Specific efforts to increase participation of underrepresented groups must be included. The proposal should identify an initial network of participants, but it also should specify mechanisms to maintain openness, ensure access, and actively promote participation by interested parties outside of the initial set of participants.

The principal investigator of the CNH-RCN award should play a strong leadership role in fully coordinating and integrating the activities of the network. A number of other network participants who will serve on a steering committee to work with the PI also should be designated, with those steering committee members considered as senior personnel. The CNH-RCN proposal should include a clearly defined management plan. The plan should include a description of the specific roles and responsibilities of the PI and the steering committee. Mechanisms for allocating funds, such as support for the work of a steering committee, should be clearly articulated. The plan should include provisions for flexibility to allow the structure of the group to change over time as membership and the network's foci evolve. Mechanisms for assessing progress and the effectiveness of the networking activities should be part of the management plan.

When participation by researchers from outside the U.S. will strengthen the proposed project activities, a CNH-RCN may involve international collaborators. Participants from organizations outside the U.S. should seek support from their respective funding organizations. NSF funds may not be used to support the expenses of the international scientists and students within their own organizations, but in RCN projects that involve international partners, NSF funds may be used for travel expenses for (1) U.S. scientists and students participating in exchange visits integral to the RCN project; (2) RCN-related expenses for international partners to travel to and participate in networking activities in the U.S.; and (3) RCN-related expenses for U.S. participants to conduct networking activities in the international partner's nation.

For more information about Research Coordination Networks, consult the RCN solicitation (NSF 10-566; accessible at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf10566).

III. AWARD INFORMATION

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

NSF expects to have at least $17,000,000 available to support awards resulting from this competition. Support provided through this competition for awards consists of a range of sizes from roughly $500,000 to no more than $1,500,000 for CNH Large

Interdisciplinary Research Projects; $150,000 to no more than $250,000 for CNH Interdisciplinary Team Exploratory Projects; and $250,000 to no more than $500,000 for CNH Research Coordination Networks. Budgets should be developed at scales appropriate for the project to be conducted.

Projects should be conducted for the length of time necessary to effectively conduct the project. No CNH Large Interdisciplinary Research Project award may be more than five years in duration. No CNH Interdisciplinary Team Exploratory Project award may be more than two years in duration. CNH-RCNs will extend five years in duration. Depending on the quality of proposals for projects of different size and the availability of funds, NSF anticipates making 15 to 18 awards annually.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

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

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There are no restrictions or limits.

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.

The following information deviates from the Grant Proposal Guide (*GPG*) and the NSF Grants.gov Application Guide:

Proposal Format

Proposals not in conformance with the proposal-preparation requirements of the GPG or NSF Grants.gov Application Guide will be returned without review. Please note, however, that the page limits contained in this solicitation take precedence over those given in the GPG and NSF Grants.gov Application Guide.

Proposals submitted for this competition should clearly specify all relevant parts of the proposed project. With respect to the proposed research, the proposal should outline the theoretical foundations of the project as based in relevant literature. It should specify the questions on which the research will focus, the research methods that will be used, the expertise that different researchers will bring to different facets of the project, and how and where results will be disseminated. With respect to education, the proposal should specify educational goals, what methods will be used to attain those goals, and the expertise of individuals who will participate in educational efforts. The proposal should also identify the proposed educational products, how those products will be disseminated, and how the effectiveness of educational activities will be evaluated.

This program solicitation requests material about the personnel involved in the project. Please use the following definitions to provide the corresponding information.

- ***Principal Investigators*** -- Individuals who will assume responsibility for an award resulting from this competition, will help manage the award, and are listed on the cover sheet of the proposal.
- ***Senior Personnel*** -- All Principal Investigators, any other named senior personnel who will receive salary support, and any non-salaried senior investigators who will play lead roles in the conduct of the project. This group may include active participants in the research team from outside the U.S. (For CNH-RCN proposals, all members of the proposed steering

committee are considered to be senior personnel.)

- **Project Participants** -- Every person involved with the research project, including students.

Proposal Cover Sheet

Work on the Cover Sheet first. Check that the Awardee and Performing Organizations are correct. Highlight the Program Solicitation Number and click on the "Select" button. Highlight the appropriate division and click on the "Select Division" button. Click on the "Go Back" button and prepare the remainder of the Cover Sheet. (Note that although three or more separate NSF divisions may be listed, all proposals will be brought together to be managed by one of the participating divisions during a specific year. Program officers from all participating divisions will work together to coordinate evaluation of all proposals. The CNH program in only one division therefore needs to be listed on the cover sheet.)

The title of the proposal should specify one of the following prefixes to designate the specific kind of proposal being submitted:

- **CNH:** (This prefix is used for a large CNH interdisciplinary project.)
- **CNH-Ex:** (This prefix is used for a CNH interdisciplinary team exploratory project.)
- **CNH-RCN:** (This prefix is used for a CNH research coordination network.)

The substantive title of the project should follow the prefix.

Prepare the remainder of the cover sheet. Be sure that contact information for all PIs is current.

Project Description

1. Large CNH Interdisciplinary Projects.

All project descriptions for large CNH interdisciplinary projects are limited to 20 pages in length. With the exceptions noted below, proposers may organize the different components of the project description as they wish.

The following sections **MUST** be included under separate headings in the project description:

- **Results from Prior NSF Support.** This section is required only for principal investigators and co-investigators who have received NSF funding in the last five years. (This section may be up to five pages in length.)
- **Education Plan**. The research plan should include integrated educational activities as a part of the narrative. Highlight these integrated activities in this separate section by specifying the project's educational goals, the methods that will be used to attain those goals, how the educational activities will be evaluated, and the role of project personnel in educational efforts. If educational products are expected to result, describe those products and indicate how they will be disseminated. (This section is usually between 1 and 2 pages in length).
- **Management Plan**. The following information should be provided: (1) a description of the management structure that will enable the team to work effectively; and (2) specification of the qualifications of each of the senior personnel as well as the contribution they are expected to make to the project. This section increases in importance as the number of senior personnel or institutions involved in the project increases. (This section is usually between 1 and 2 pages in length).
- **Expected Project Significance**. This section should clearly specify what proposers expect will be the results and contributions of the project. The section should describe both the anticipated intellectual merit of the proposed work as well as its anticipated broader impacts. Intellectual merit and broader impacts are NSF's two primary merit review criteria, and major items to be considered in each one are specified in Section VI.A. of this solicitation. Examples illustrating activities likely to demonstrate broader impacts also are available electronically at http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf. Education and international activities are among the examples. (This section is usually about 1 page in length.)

2. CNH Interdisciplinary Team Exploratory Projects

All project descriptions for CNH interdisciplinary team exploratory (CNH-Ex) projects are limited to 15 pages in length. With the exceptions noted below, proposers may organize the different components of the project description as they wish.

The following sections **MUST** be included under separate headings in the project description:

- **Results from Prior NSF Support**. This section is required only for principal investigators and co-investigators who have received NSF funding in the last five years. (This section may be up to five pages in length.)
- **Expected Project Significance**. This section should clearly specify what proposers expect will be the results and contributions of the project. The kinds of publications and presentations the team expects to produce to disseminate research results should be specified, as should the journals where articles likely will be published and the venues where presentations will be made. The section should describe both the anticipated intellectual merit of the proposed work as well as its anticipated broader impacts. (This section is usually about 1 page in length.)

3. CNH Research Coordination Networks

All project descriptions for CNH research coordination networks (CNH-RCNs) are limited to 15 pages in length. With the exceptions noted below, proposers may organize the different components of the project description as they wish.

The following sections **MUST** be included under separate headings in the project description:

- **Results from Prior NSF Support**. This section is required only for principal investigators and co-investigators who have received NSF funding in the last five years. (This section may be up to five pages in length.)
- **Management Plan**. This section should describe plans and procedures for the development and assessment of the proposed activity, including formal mechanisms to ensure fair and equitable allocation of group resources. This section should clearly define the responsibilities for leadership and the role of the PI and the steering committee, and it should delineate the procedures used for the selection of initial network participants as well as the plans for maintaining an appropriate degree of openness and for encouraging the involvement of additional interested parties. The management plan also should identify how the CNH-RCN will evaluate progress toward the network goals.
- **Coordination Plan**. If the proposed CNH-RCN will work with an established network or group, or if there is a similar activity being planned or ongoing in other nations, this section should describe the plans for coordination and cooperation among the relevant networks.
- **Plans for Increasing Diversity**. Because a CNH-RCN provides special opportunities for encouraging the involvement of investigators from underrepresented groups and investigators located in a diverse range of organizations, this section should describe (a) a well-designed plan to increase participation of members of underrepresented groups that is specific to the proposed project; (b) a plan to involve investigators at a variety of organizational settings; (c) if applicable, a plan to include new researchers, post-docs, graduate students, and undergraduates; and (d) the ways in which plans for increasing diversity will be integrated with the proposed project plan.

- *Expected Project Significance*. This section should clearly specify what proposers expect will be the results and contributions of the project. The section should describe both the anticipated intellectual merit of the proposed work as well as its anticipated broader impacts. (This section is usually about 1 page in length.)

Biographical Sketches

A biographical sketch with a 2-page limit must be provided for each investigator and each person identified as senior personnel. All biographical sketches should be prepared in conformance with the requirements in Chapter II, Section C.2.f of the Grant Proposal Guide and should include identification of collaborators and advisors/advisees.

Current and Pending Support

Each person identified as a principal investigator or as senior personnel must submit a current and pending support form. This proposal is considered a pending activity and should be listed on the form for all investigators and senior personnel.

Supplementary Documentation

Items 1 and 2 below are required to be included in this section for all proposals. Items 3, 4, and 5 should be included here if needed.

1. Conflict of Interest Table. Provide a list in a single, alphabetized table with the full names and institutional affiliations of all people in conflict of interest with any of the senior personnel (PI, Co-PIs, and any named personnel whose salary is requested in the project budgets). Conflicts to be identified are (a) primary Ph.D. thesis advisors and advisees, (b) collaborators or co-authors, including postdocs, for the past 48 months, and (c) any other individuals or organizations with which the investigator has financial ties. (Please specify the type of conflict(s) for each person listed on the chart.) An example of the kind of table to be included is accessible at http://www.nsf.gov/sbe/bcs/CNH/CNH_ExampleCOIList.pdf (This list generally replicates information that should be provided in the biographical sketches, but it is collated into one alphabetized table to facilitate the identification of individuals who would have conflicts of interest in the review of the proposal.)

2. Data Management Plan. Provide a description of the project's data management plan, as a maximum 2-page supplementary document. This information should be clearly identified by the subheading "Data Management Plan." NSF realizes that individual cases may differ widely and that an absolute timeline or rigid set of rules is not possible. However, plans should address some or all of the following issues:

- The types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project;
- The standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies);
- Policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements;
- Policies and provisions for re-use, re-distribution, and the production of derivatives; and
- Plans for archiving data, samples, and other research products, and for preservation of access to them.

The data management plan is considered an integral part of the project and therefore subject to reviewer, panel, and program evaluation. Successful applicants will be expected to address this issue in annual and final project reports.

If no data will be generated during the conduct of a project, this section must state that fact.

3. Postdoctoral Researcher Mentoring Plan. As specified in the NSF Grant Proposal Guide (Chapter II, Section C.2.j), a Postdoctoral Researcher Mentoring Plan must be submitted as supplementary documentation to describe mentoring activities that will be provided for any postdoctoral researchers who will be supported through an award based on this proposal. Proposals that include funding to support postdoctoral researchers, and, do not include the requisite mentoring plan will be returned without review.

The Postdoctoral Researcher Mentoring Plan is considered an integral part of the project and therefore subject to reviewer, panel, and program evaluation. Successful applicants will be expected to address this issue in annual and final project reports.

4. Letters of Collaboration. This section should include any letters of collaboration from individuals or organizations that are integral parts of the proposed project, such as the involvement of collaborator organizations that are not supported by subawards or documentation of permission to access sites, materials, or data for research or other associated project activities. Letters of collaboration should focus solely on affirming that the individual or organization is willing to collaborate on the project as specified in the project description of the proposal. No additional text, especially elaboration of the nature of activities to be undertaken by the collaborator and endorsements of the potential value or significance of the project for the collaborator, may be included. A template that should be used for the preparation of letters of collaboration is provided below.

Letters of collaboration are not required for any individual designated as a principal investigator or senior personnel, nor are letters of collaboration required for any organization that will be a subawardee in the proposal budget. (Inclusion of biographical sketches and current and pending support statements for individuals and subaward budgets for organizations are considered to be implicit statements affirming involvement in the proposed project.)

The project description should document the nature and need for all collaborations. Each statement must be signed by the designated collaborator. Requests to collaborators for letters of collaboration should be made by the PI well in advance of the proposal submission deadline, because they must be included at the time of the proposal submission. Letters deviating from this template are not accepted and may be grounds for returning the proposal without review.

> ### Template to be used for letters of collaboration
>
> To: NSF CNH Program
> From: _____
> (Printed name of the individual collaborator or name of the organization and name and position of the official submitting this memo)
>
> By signing below (or transmitting electronically), I acknowledge that I am listed as a collaborator on this CNH proposal, entitled "_____(proposal title)_____," with _____(PI name)_____ as the Principal Investigator. I agree to undertake the tasks assigned to me, as described in the proposal, and I commit to provide or make available the resources designated in the proposal.
>
> Signed: _____
> Organization: _____
> Date: _____

5. IRB and/or IACUC Certifications*. IRB certifications associated with the use of human subjects and/or IACUC certifications associated with the use of vertebrate animals may be submitted as supplementary documentation.

Unless authorized here or in the *Grant Proposal Guide*, no other materials should be included in this section. Survey or interview protocols are not permitted in this section, nor are reprints of articles previously published by the investigators. Proposals that include materials in this section that belong in the project description may be returned without review.

Appendices

No appendices are permitted.

Proposals Involving Multiple Institutions

In the case of proposals involving multiple organizations, a single organization must be identified as the lead, and a single proposal describing the entire project must be submitted by that organization. Funds may be distributed among partner organizations via subawards from the lead organization. A budget on the standard NSF budget form should be submitted for each subawardee. The requirement for a single organization to submit the sole proposal for a project is designed to facilitate effective coordination among participating organizations and to avoid difficulties that ensue in funded projects when individuals change organizations and/or cease to fulfill project responsibilities.

Of the two types of collaborative proposal formats described in the *Grant Proposal Guide*, this solicitation allows only a single proposal submission with subawards administered by that lead organization.

Proposals Involving Collaborators at Foreign Organizations

Proposers are reminded they must provide biographical sketches of all senior project personnel, including those associated with foreign organizations, and letters of collaboration should be provided as supplementary documents from organizations that will not be supported through subawards.

While non-U.S. institutions are generally not eligible to submit proposals to this competition, the lead U.S. institution may, in limited cases, request funding for non-U.S. institutions through subawards. As described in Chapter V, Section D.1.b of the NSF *Award and Administration Guide* (accessible at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag), indirect costs may not be charged by a non-U.S. organization unless that organization has a previously negotiated rate with a U.S. federal agency.

Subawards

In accordance with the applicable award terms and conditions, proposers are reminded of their responsibilities with regard to subawardees. Should an award be made, the prime awardee is responsible for flowing down the appropriate terms and conditions to, as well as management and oversight of, any subawardees on the project, including any foreign subawardees.

Human Subjects

If the project involves human subjects, the Institutional Review Board (IRB) of the submitting organization must certify that the proposed project is in compliance with the Federal Government's "Common Rule" for the protection of human subjects. If IRB approval has been obtained and the date of approval is listed on the cover sheet, no other certification is required. If IRB approval is still pending, submit certification of IRB approval in electronic form as soon as approval is obtained to the cognizant program officer. (The name of this program officer will be listed in the Proposal Status module of FastLane.) Delays in obtaining IRB certification may result in NSF being unable to make an award. For more information regarding the protection of human subjects, consult http://www.nsf.gov/bfa/dias/policy/human.jsp.

Vertebrate Animals

If the project involves vertebrate animals, the Institutional Animal Care and Use Committee (IACUC) of the submitting organization must certify that the proposed project is in compliance with the Animal Welfare Act and the regulations promulgated thereunder by the Secretary of Agriculture pertaining to the humane care, handling, and treatment of vertebrate animals. If IACUC approval has been obtained and the date of approval is listed on the cover sheet, no other certification is required. If IACUC approval is still pending, submit certification of IACUC approval in electronic form as soon as approval is obtained to the cognizant program officer. (The name of this program officer will be listed in the Proposal Status module of FastLane.) Delays in obtaining IACUC certification may result in NSF being unable to make an award.

Pre-Submission Checklist

CNH proposals must be in compliance with the GPG and special requirements in the solicitation in order to be considered for review. Proposals not in compliance with these requirements will be returned without review. Please refer to the following checklist to address some of the items required in all proposals:

- Font and margin requirements
- Page numbers on pages
- Project summary that includes a description of broader impacts
- Project description that is 20 pages or less for large CNH interdisciplinary projects (or 15 pages or less for CNH interdisciplinary team exploratory projects or CNH research coordination networks) and includes separate sections as specified in the Project Description section above
- Biographical Sketches (including specification of collaborators and advisors/advisees) for investigators and all senior personnel
- A single, alphabetized conflict-of-interest spreadsheet submitted in the Supplementary Documentation section
- Data Management and Access Plan submitted in the Supplementary Documentation section
- Postdoctoral Researcher Mentoring Plan (if necessary) in the Supplementary Documentation section.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Other Budgetary Limitations:

Almost all CNH funding is expected to be available for awards to be made based on evaluation of proposals submitted for this competition. NSF intends to make awards across a range of sizes as specified for the following types of awards.

A. Large CNH Interdisciplinary Research Projects. Large interdisciplinary research projects may be supported by awards across a range of sizes from roughly $500,000 to no more than $1,500,000. Most projects will extend from two to five years in duration.

B. CNH Interdisciplinary Team Exploratory Projects. Exploratory efforts may be supported in a range from roughly $150,000 to no more than $250,000. Most exploratory projects will extend from one to two years in duration.

C. CNH Research Coordination Networks. CNH-RCNs may be supported in a range from roughly $250,000 to no more than $500,000. CNH-RCNs will extend five years in duration.

Budgets should be developed at scales appropriate for the project to be conducted. No award may be more than five years in duration.

Budget Preparation Instructions:

Budgets should include travel funds for Principal Investigators to attend a workshop or meeting of those supported by the CNH Program every 1 to 2 years.

All subaward budgets with narrative justification should be submitted following the budget and narrative justification from the submitting organization. Submitting organizations should make sure that all subawardees are registered in the U.S. Government's Central Contractor Registration system (accessible at https://www.bpn.gov/ccr/default.aspx), and they should have DUNS numbers for all subawardees.

Research Platform Support:

Specific amounts for research cruises, polar logistics, arctic logistics, or use of aircraft or other atmospheric sciences field facilities should not be included in the budget request. However, the PI should submit the UNOLS request, OPP logistics form, or ATM facilities form with the proposal.

C. Due Dates

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

    December 09, 2010

    November 15, 2011

    Third Tuesday in November, Annually Thereafter

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

    To prepare and submit a proposal via FastLane, see detailed technical instructions 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.

- **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://www.grants.gov/web/grants/applicants.html. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical 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.

Proposers that submitted via FastLane are strongly encouraged to use FastLane to verify the status of their submission to NSF. For proposers that submitted via Grants.gov, until an application has been received and validated by NSF, the Authorized Organizational Representative may check the status of an application on Grants.gov. After proposers have received an e-mail notification from NSF, Research.gov should be used to check the status of an application.

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

Successful CNH proposals must be highly interdisciplinary, address the inherent complexity and highly coupled nature of natural and human systems, be well grounded in theory, and show great promise for enhancing basic theoretical understandings. Quantitative approaches, education, and global perspectives also are important. Research projects must include quantitative approaches or advanced conceptual models to study the systems chosen for investigation. Projects must also include specific plans for education.

In the evaluation of proposals submitted by an organization on behalf of teams of investigators, considerations in addition to standard NSF review criteria are:

- Degree of interdisciplinarity
- Strength of the proposed collaborations, including international collaborations
- Effectiveness of the group organization and management plan
- Quality and expected significance of the educational activities
- Strength of the dissemination plans

For proposals submitted by an organization on behalf of teams of investigators, including international collaborations, reviewers will consider:

- Mutual benefits
- Intellectual contributions by all partners
- Benefits to be realized from the expertise and specialized skills and resources of all partners
- Engagement of U.S. students and early-career researchers where such individuals are engaged in the research.

Descriptions of educational activities should specify goals, methods to attain those goals and the expertise of individuals to accomplish them, and quality of the evaluation plan. Thus, they will be evaluated based on:

- Potential interest to and appropriateness for the audience targeted
- Quality of planning and appropriateness of personnel
- Feasibility and potential for resulting in a product that can be disseminated
- Integration with the research efforts
- Focus on integrated learning and discovery and the preparation of U.S. students for a broad set of careers in environmental fields.

For CNH Research Coordination Projects: CNH-RCN proposals must establish the infrastructure to create new networks of scientists who have not previously worked together. RCNs cannot use resources to fund research or to sustain existing networks. RCN proposals will be evaluated for their creativity, innovation, and potential to advance, transform, or establish new, areas of science regarding the dynamics of coupled natural and human systems.

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 evaluate proposals using two National Science Board approved merit review criteria and, if applicable, additional program specific criteria. A summary rating and accompanying narrative will be completed and submitted by each reviewer. 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 strives to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

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. After an administrative review has occurred, Grants and Agreements Officers perform 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.

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, 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.

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 notice, 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 notice; (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 notice. 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.

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.

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:

- Thomas J. Baerwald - Lead for 2014, telephone: (703) 292-7301, email: tbaerwal@nsf.gov

- Sarah Ruth, telephone: (703) 292-7594, email: sruth@nsf.gov

- Peter Alpert, telephone: (703) 292 2273, email: palpert@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, "NSF Update" 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. "NSF Update" also is available on NSF's website at https://public.govdelivery.com/accounts/USNSF/subscriber/new?topic_id=USNSF_179.

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

NSF receives approximately 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**   (703) 292-5111
  (NSF Information Center)**:**

- **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.

| 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