

Coastal SEES (Coastal SEES)

Science, Engineering and Education for Sustainability

PROGRAM SOLICITATION

NSF 14-502

REPLACES DOCUMENT(S):
NSF 12-594



National Science Foundation

Directorate for Geosciences

Directorate for Engineering

Directorate for Biological Sciences

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

January 21, 2014

October 02, 2015

IMPORTANT INFORMATION AND REVISION NOTES

Revision Summary

- The Directorate for Social, Behavioral and Economic Sciences (SBE) is no longer formally participating in Coastal SEES.
- Track 1 and Track 2 proposal options have been eliminated. Proposals are invited for projects of 3-5 years in duration with total budgets in the range of \$800,000 to \$2 million (maximum).

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised NSF Proposal & Award Policies & Procedures Guide (PAPPG) ([NSF 15-1](#)), which is effective for proposals submitted, or due, on or after December 26, 2014. The PAPPG is consistent with, and, implements the new Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance) (2 CFR § 200).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Coastal SEES (Coastal SEES)

Synopsis of Program:

Coastal SEES is focused on the sustainability of coastal systems. For this solicitation we define coastal systems as the swath of land closely connected to the sea, including barrier islands, wetlands, mudflats, beaches, estuaries, cities, towns, recreational areas, and maritime facilities; the continental seas and shelves; and the overlying atmosphere.

Humans benefit from their use of coastal environments for enjoyment, dwelling, food, industry, and commerce, and benefit from the myriad of ecosystem services that coastal environments provide. However, human activities often result in physical, chemical, and ecological alterations that influence and interact with natural state and variability, over a range of spatial and temporal scales. A major challenge is to understand the dynamics of this coupled human-natural system in order to inform societal decisions about the uses of coastal systems, including for economic, aesthetic, recreational, research, and conservation purposes.

Scientific understanding is foundational and must include an understanding of reciprocal feedbacks between humans and the natural environment; how people and organizations interpret, assess, and act upon scientific and other evidence; and how they weigh these interpretations against other interests to influence governance and decision-making. Thus, coastal sustainability relies on broad and intimately interconnected areas of scholarship about natural and human processes. Coastal SEES projects will be expected to lead to generalizable theoretical advances in natural sciences and engineering while, at the same time, integrating key aspects of human processes required to address issues of coastal sustainability.

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.

- Mete Uz, Program Director, Ocean Sciences, telephone: (703) 292-4557, email: bmuz@nsf.gov

- H. R. Lane, telephone: (703) 292-8551, email: hlane@nsf.gov
- Richard J. Fragaszy, Program Director, Engineering, telephone: (703) 292-7011, email: rfragasz@nsf.gov
- Cynthia Suchman, telephone: (703) 292-2092, email: csuchman@nsf.gov
- Alan E. Wilson, telephone: (703) 292-5190, email: aewilson@nsf.gov

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

- 47.041 --- Engineering
- 47.050 --- Geosciences
- 47.074 --- Biological Sciences

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 10

Anticipated Funding Amount: \$13,000,000

Pending availability of funds

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Coastal SEES proposals may only be submitted by U.S. academic institutions that have research and degree-granting education programs in any area of research supported by NSF. U.S. academic institutions include universities as well as four-year colleges accredited in, and having a campus located in the U.S., acting on behalf of their faculty members. Proposals may also be submitted by non-profit, non-academic organizations, including independent museums, observatories, research laboratories, professional societies and similar organizations in the U.S. associated with educational or research activities.

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: 1

An individual may appear as Principal Investigator (PI), Co-PI, other Senior Personnel, Consultant, or elsewhere in the proposal budget in no more than one proposal for each competition of this solicitation. Proposers are responsible for ensuring that no individual is listed as PI, Co-PI, Senior Personnel, Consultant or elsewhere in the proposal budget on more than one proposal.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **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:** Not Applicable

C. Due Dates

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

January 21, 2014

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.

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I. INTRODUCTION

A sustainable world is one in which human needs are met equitably and without sacrificing the ability of future generations to meet their needs. Meeting this formidable challenge requires a substantial increase in our understanding of the integrated system of society, the natural world, and the alterations humans bring to Earth. NSF's Science, Engineering, and Education for Sustainability (SEES) activities aim to address this need through support for interdisciplinary research and education.

Coastal SEES is focused on the sustainability of coastal systems. For this solicitation we define coastal systems as the swath of land closely connected to the sea, including barrier islands, wetlands, mudflats, beaches, estuaries, cities, towns, recreational areas, and maritime facilities; the continental seas and shelves; and the overlying atmosphere. These systems are subject to complex and dynamic interactions among natural and human-driven processes. Coastal systems are crucial to regional and national economies, hosting valued human-built infrastructure and providing ecosystem services that sustain human well-being. More than half of the world's human population lived in coastal areas in 2000, and this proportion is predicted to increase to 75 percent by 2025.

Humans benefit from their use of coastal environments for enjoyment, dwelling, food, industry, and commerce, and benefit from the myriad of ecosystem services that coastal environments provide. However, human activities often result in physical, chemical, and ecological alterations that influence and interact with the coastal system's natural state and variability over a range of spatial and temporal scales. A major challenge is to understand the dynamics of this coupled human-natural system in order to inform societal decisions about the uses of coastal systems, including for economic, aesthetic, recreational, research, and conservation purposes. Scientific understanding is foundational, and includes an understanding of reciprocal feedbacks between humans and the natural environment; how people and organizations interpret, assess, and act upon scientific and other evidence; and how they weigh these interpretations against other interests to influence governance and decision-making. Thus, coastal sustainability relies on broad and intimately interconnected areas of scholarship about natural and human processes. Coastal SEES projects will be expected to lead to generalizable theoretical advances in natural sciences and engineering while, at the same time, integrating key aspects of human processes required to address issues of coastal sustainability.

II. PROGRAM DESCRIPTION

The Coastal SEES program is a multi-directorate program that seeks to:

- advance understanding of fundamental, interconnected processes in coastal systems on a variety of spatial and temporal scales;
- improve capabilities for predicting future coastal system states and impacts; and
- identify pathways by which research results will be translated to policy and management domains and used to enhance coastal sustainability.

An integral component of all proposals should be communication of outcomes and connection to related national and international activities where applicable. Sustainability is a global concern, and research findings and approaches should have broad application and transferability of knowledge.

Successful proposals will incorporate multiple disciplines to contribute to our understanding of complex dynamics in coastal systems. Concepts that underlie the science of sustainability include complex adaptive systems, emergent behavior, and multi-scale processes, as well as the feedbacks, adaptive capacity, vulnerability, and resilience of coupled human and natural systems. An important research goal is to understand how patterns and processes at local and regional scales are shaped by, and shape, processes and patterns that manifest at the global scale over the long term. Relevant issues may include, for example, sea-level rise; salinity intrusion; changes in coastal morphology, land use, and vegetation; ocean ecosystems; erosion and land defense; coastal energy development; and human perceptions, attitudes and responses to these issues. In some cases, comparative approaches may be particularly instructive, and projects that include multiple domestic sites and international collaborations will be considered.

The Coastal SEES Program seeks proposals that create inter/trans-disciplinary research teams to conduct major new integrated coastal systems research. These may include theoretical, field, laboratory and/or modeling activities. Proposal budgets should be in the range of \$800,000 - \$2 million (maximum) total over a period of 3-5 years.

When developing proposals, investigators are encouraged to look for synergies with other activities that may provide data, infrastructure support, and/or intellectual linkages. However, funding for Coastal SEES is distinct from funding for other activities that take place in the coastal zone. Whereas a proposal to Coastal SEES may include elements that are being investigated in one or more of these other programs, a distinguishing feature of a proposal to Coastal SEES should be its integrated, systems-oriented approach and its holistic and long-term viewpoint. Successful proposals will fit clearly and convincingly within the broader context of human-natural system interactions and sustainability, and the proposal must make this case.

Broader Impacts: Sustainability science offers many opportunities for education, training, and outreach. In addition, two of the goals of Coastal SEES are to (1) build a community of scholars who work in this interdisciplinary field, and (2) identify pathways by which project outcomes could be used to enhance coastal sustainability. The Broader Impact section of proposals should include a description of how the proposed activities contribute to education, training, and/or outreach, and specifically how they will advance the two aforementioned goals of Coastal SEES.

III. AWARD INFORMATION

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 10

Anticipated Funding Amount: \$13,000,000

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

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Coastal SEES proposals may only be submitted by U.S. academic institutions that have research and degree-granting education programs in any area of research supported by NSF. U.S. academic institutions include universities as well as four-year colleges accredited in, and having a campus located in the U.S., acting on behalf of their faculty members. Proposals may also be submitted by non-profit, non-academic organizations, including independent museums, observatories, research laboratories, professional societies and similar organizations in the U.S. associated with educational or research activities.

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: 1

An individual may appear as Principal Investigator (PI), Co-PI, other Senior Personnel, Consultant, or elsewhere in the proposal budget in no more than one proposal for each competition of this solicitation. Proposers are responsible for ensuring that no individual is listed as PI, Co-PI, Senior Personnel, Consultant or elsewhere in the proposal budget on more than one proposal.

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.5 of the Grant Proposal Guide provides additional information on collaborative proposals.

See Chapter II.C.2 of the [GPG](#) for guidance on the required sections of a full research proposal submitted to NSF. Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions.

Standard NSF page length limitations apply.

Cover Sheet: The proposal title should begin with "Coastal SEES:" or "Coastal SEES Collaborative Research:" as appropriate.

Project Summary: a clear and convincing explanation of how the project fits within the Coastal SEES Program, including:

1. How the topic is relevant to sustainability of coastal systems and specifically to the program foci as outlined in the program synopsis and description.
2. How the conceptual framework for the project addresses the integration of natural and human processes.
3. How the proposal takes an integrated, systems-oriented approach and a holistic and long-term viewpoint on sustainability.
4. How the project will build a community of scholars working in the interdisciplinary field of sustainability science.
5. Why the assembled research team is suited to addressing the proposed task.

Project Management and Integration: A Project Management and Integration Plan (not to exceed three pages) is required as a supplementary document. The plan must include the following elements: 1) leadership, 2) coordination within the group, 3) integration across disciplines, 4) pathways by which project outcomes will be used, 5) education and workforce development, and 6) a project timeline. Note that this plan is required for all Coastal SEES projects. For "collaborative proposals," the plan should be much more detailed and explicit than the description of organizational roles and managerial arrangements required by the GPG (section II.D.4) in the Project Description.

Facilities Request: Projects that will be utilizing NSF research platforms (e.g. ships, airplanes) or other shared use facilities (e.g. field instrumentation, analytical or experimental facilities) are responsible for filing a Request for Facility Support, and providing a copy of that request as a **supplementary document** in their proposal. Pls should coordinate their requests with the appropriate facility to ensure that access is available and fits within the time line of the proposed research.

Collaborations and Other Synergies: Where appropriate, investigators are encouraged to work in association with existing projects, observational networks, long-term ecological research sites or research centers, or testing and evaluation facilities, whether supported by NSF, other agencies such as USEPA, USGS, USDA, USACE, DOE or NOAA, or other entities. The project description must make clear how the proposed work differs from, and is augmented by, activities already supported. Available resources (both physical and personnel) must be described in the Facilities, Equipment and Other Resources section of the proposal. In addition, letters of commitment (not to exceed two pages each) and biographical sketches (adhering to NSF requirements) must be included in the supplementary documents section, affirming planned contributions to the project from the collaborating individuals and organizations.

NSF welcomes proposals that involve collaborations with State and Federal agencies. Such collaborations must follow NSF guidelines (see PAPPG) and appear in proposals at no cost to the project. Letters of commitment must describe and affirm the proposed commitment of personnel time, data, facilities, etc. NSF will consider supporting analytical services, etc. provided by State agencies or FFRDCs when they are essential to the research goals and not available elsewhere. The case must be made for doing this. The preferred method for supporting these costs is as "fees for service" in an institutional (proposer's) budget. A subcontract to the lead proposal will be allowed. For participation of this nature, consultation with a Program Director early in proposal development is required. Submitted proposals not in compliance with these guidelines will be returned without review.

Conflicts of Interest Table: Proposals must include a table containing a single alphabetized list of the full names (last name, first name) and institutional affiliations of all people with conflicts of interest for all senior personnel and any named personnel whose salary is requested in the project budget. For "collaborative proposals," a single, consolidated table must be provided in the lead organization's submission. The table must be organized in three columns: person, institution, and nature of conflict. Conflicts to be identified are (1) Ph.D. thesis advisors or advisees, post-doctoral mentors and mentees; (2) collaborators or co-authors during the past 48 months; and (3) any other individuals with whom, or institutions with which, the senior personnel and any named personnel have financial ties, including advisory committees (please specify type). One entry per line. For institutional conflicts, begin with column 2. The Conflicts of Interest table must be submitted in the **Single Copy Documents** section of the proposal. (Submitting as

a Supplementary Document would make the table accessible to reviewers.)

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited.

Budget Preparation Instructions:

Budgets should be prepared in compliance with guidelines in the [Proposal and Award Policies and Procedures Guide](#) or NSF Grants.gov Application Guide.

Investigators are reminded that requests for salary support beyond 2 months per year for faculty with nine-month appointments must be explicitly justified in the budget justification. Without this documentation in the proposal prior to its being exposed to merit review, the proposal will not be able to be funded. This limit includes salary compensation received from all NSF grants. Postdoctoral researchers should be listed on the Postdoctoral line of the budget request, and may receive 12 months of support. Senior personnel cannot expect to receive full support on any single project.

Please remember that postdoctoral researchers must have a postdoctoral mentoring plan associated with their participation.

Investigators should anticipate and budget for funds to attend an all-PI meeting for SEES or Coastal SEES Investigators in the Washington, D.C. area in the first and third year of each project. Inclusion of junior scientists and postdoctoral researchers in this meeting is encouraged.

Research Platforms and Facilities Requests

The cost of facilities utilized by Coastal SEES proposals will be handled in the same manner as proposals submitted to relevant core programs. Proposal budgets must include all costs charged to the project for platforms and facilities supporting the proposed research except those facilities separately supported by NSF. Projects that will be utilizing NSF research platforms (e.g., ships, airplanes) or other shared-use facilities (e.g., field instrumentation, analytical or experimental facilities) are responsible for filing a copy of their Request for Facility Support as a supplementary document in their proposal. Any costs that will be associated with such facilities should be clearly documented, and PIs should coordinate their requests with the appropriate facility to ensure that access is available to the facility and fits within the time line of the proposed research. For projects that will be utilizing NSF computational facilities, a copy of the allocation request that would be submitted to the facility in question should be provided as a supplementary document. Research involving polar regions must follow established guidelines for requesting logistical support, as discussed in the relevant proposal solicitations (for Antarctic Sciences, see NSF 13-527; for Arctic Sciences, see NSF 13-592). If in doubt, please contact a cognizant NSF program director for information about which facility costs must be included in your proposal.

C. Due Dates

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

January 21, 2014

October 02, 2015

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 [Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014-2018](#). 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 strategic objectives 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 must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by investing in building the knowledge that informs improvements in STEM teaching and learning.

NSF's mission calls for the broadening of 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

SEES activities span the entire range of scientific domains at NSF and aim to: 1) support interdisciplinary research and education that can facilitate the move towards global sustainability; 2) build linkages among existing projects and partners and add new participants in the sustainability research enterprise; and 3) develop a workforce trained in the interdisciplinary scholarship needed to understand and address the complex issues of sustainability. Consequently, proposals submitted to this solicitation will be assessed for responsiveness to the following questions:

1. How relevant is the topic to sustainability of coastal systems?
2. How well does the conceptual framework for the project address the integration of natural and human processes?
3. Does the proposal take an integrated, systems-oriented approach and a holistic and long-term viewpoint of sustainability?
4. How will the proposed activities advance the development of a workforce skilled in the interdisciplinary scholarship needed to understand and address the complex issues of sustainability?
5. How will project goals be managed? This will be judged by the quality and appropriateness of the Management and Integration Plan, including: a) a well-defined management plan with a highly qualified project director, b) extent to which the group effort integrates across disciplines and is focused on a cohesive, well-delineated goal or set of goals, c) strength and appropriateness of proposed collaborations and partnerships, including, if appropriate, international collaborations; d) quality of the plans for dissemination and sharing of data, models, tools and ideas, including pathways by which project outcomes will be used; e) quality and expected significance of education and workforce development plan; f) the adequacy and appropriateness of the proposed timeline.

Proposals will be assessed by reviewers with expertise in a variety of disciplines relevant to coastal sustainability. The meaningful integration of all elements of the research plan will be a key feature of competitive proposals.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review, or Internal NSF Review.

Proposals are expected to be evaluated by panel review with ad hoc review in areas of special technical need. Panelists will be selected for their expertise in substantive areas of relevance to the solicitation, and efforts will be made to secure diversity among reviewers.

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:

- Mete Uz, Program Director, Ocean Sciences, telephone: (703) 292-4557, email: bmuz@nsf.gov
- H. R. Lane, telephone: (703) 292-8551, email: hlane@nsf.gov
- Richard J. Fragaszy, Program Director, Engineering, telephone: (703) 292-7011, email: rfragasz@nsf.gov
- Cynthia Suchman, telephone: (703) 292-2092, email: csuchman@nsf.gov
- Alan E. Wilson, telephone: (703) 292-5190, email: aewilson@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 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** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
 - Send an e-mail to: nsfpubs@nsf.gov
 - or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to

the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, [NSF-50](#), "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and [NSF-51](#), "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Office of the General Counsel
National Science Foundation
Arlington, VA 22230

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