Division of Environmental Biology (core programs) (DEB)

PROGRAM SOLICITATION
NSF 13-508

REPLACES DOCUMENT(S):
NSF 11-573

National Science Foundation

Directorate for Biological Sciences
Division of Environmental Biology

Preliminary Proposal Due Date(s) *(required)* (due by 5 p.m. proposer's local time)*:*

January 23, 2013

Preliminary Proposal

January 16, 2014

January 16, Annually Thereafter

Preliminary Proposals

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

August 02, 2013

August 2, Annually Thereafter

Full proposals, by invitation only

IMPORTANT INFORMATION AND REVISION NOTES

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

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

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

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

Revision Notes

This revision clarifies the proposal preparation instructions for the cover sheet, project description, biographical sketches, and supplementary documentation for preliminary and full proposals.

Additional guidance is provided for requesting Research Experiences for Undergraduates (REU), Research Experiences for Teachers (RET) or Research Assistantships for High School Students (RAHSS) funds as part of the full proposal.

Small Grants: The Division welcomes proposals for Small Grants to the core programs via this solicitation. These awards are intended to support full-fledged research projects that simply require total budgets of $150,000 or less. Small Grant proposals follow the same two-stage review process and will be assessed based on the same merit review criteria as all other proposals to this solicitation.

Reminder: The Division no longer accepts full proposals without invitation to its core programs except in the case of (1) proposals submitted in response to the CAREER, OPUS, RCN, or DDIG solicitations; or (2) special proposals that are described in the Grant Proposal Guide, i.e., RAPID, EAGER, workshops, and supplement requests. All other submissions to the DEB core programs must first be in the form of a preliminary proposal, with full proposals submitted only after invitation.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

> Division of Environmental Biology (DEB)
> Core programs

Synopsis of Program:

> The Division of Environmental Biology (DEB) supports fundamental research on populations, species, communities, and ecosystems. Scientific emphases range across many evolutionary and ecological patterns and processes at all spatial and temporal scales. Areas of research include biodiversity, phylogenetic systematics, molecular evolution, life history evolution, natural selection, ecology, biogeography, ecosystem structure, function and services, conservation biology, global change, and biogeochemical cycles. Research on organismal origins, functions, relationships, interactions, and evolutionary history may incorporate field, laboratory, or collection-based approaches; observational or manipulative experiments; synthesis activities; as well as theoretical approaches involving analytical, statistical, or computational modeling.

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.

- Division of Environmental Biology, telephone: (703) 292-8480, email: debquestions@nsf.gov

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

- 47.074 --- Biological Sciences

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 200 each year pending availability of funds.

Anticipated Funding Amount: $72,000,000 for new awards each year pending availability of funds.

Eligibility Information

Organization Limit:

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

PI Limit:

> None Specified

Limit on Number of Proposals per Organization:

> None Specified

Limit on Number of Proposals per PI: 2

> In a given year, an individual may participate as a PI, co-PI, or lead senior investigator of a subaward on **no more than two** preliminary proposals submitted in response to this solicitation. Preliminary proposals in excess of the limit for any person may be returned without review in the reverse order received. "PI, co-PI, or lead senior investigator of a subaward" refer to the role an individual would play in a full proposal including all parts of a collaborative proposal. Participating in a proposal as other senior personnel does not count in this limit. **It is the responsibility of the submitters to confirm that the entire team is within the eligibility guidelines.** Changes to the team post-submission to meet the eligibility limits will not be allowed.

> This limit does not include proposals to other solicitations [e.g., Research Coordination Networks (RCN), Opportunities for Promoting Understanding through Synthesis (OPUS), Ecology and Evolution of Infectious Diseases (EEID), Dynamics of Coupled Natural and Human Systems (CNH), Doctoral Dissertation Improvement Grants (DDIG), Assembling the Tree of Life (AToL), Long-Term Ecological Research (LTER), Faculty Early Career Development Program (CAREER)] or to core programs in other BIO Divisions [Molecular and Cellular Biosciences (MCB), Integrative Organismal Systems (IOS) and Division of Biological Infrastructure (DBI)]. However solicitations may have their own limit guidelines so be sure to review those carefully for details. Please consult the DEB website for answers to frequently asked questions.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable

- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.

- **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

- **Preliminary Proposal Due Date(s)** *(required)* (due by 5 p.m. proposer's local time)*:*

    January 23, 2013

       Preliminary Proposal

    January 16, 2014

    January 16, Annually Thereafter

       Preliminary Proposals

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

    August 02, 2013

    August 2, Annually Thereafter

       Full proposals, by invitation only

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria apply.

Award Administration Information

Award Conditions: Standard NSF award conditions apply.

Reporting Requirements: Standard NSF reporting requirements apply.

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I. INTRODUCTION

The Division of Environmental Biology (DEB) supports fundamental research on populations, species, communities, and ecosystems. Scientific emphases range across many evolutionary and ecological patterns and processes at all spatial and temporal scales. Areas of research include biodiversity, phylogenetic systematics, molecular evolution, life history evolution, natural selection, ecology, biogeography, ecosystem structure, function and services, conservation biology, global change, and biogeochemical cycles. Research on organismal origins, functions, relationships, interactions, and evolutionary history may incorporate field, laboratory, or collection-based approaches; observational or manipulative experiments; synthesis activities; as well as theoretical approaches involving analytical, statistical, or computational modeling.

II. PROGRAM DESCRIPTION

Proposals are welcome in all areas of science supported by the Ecosystem Science Cluster:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503663&org=DEB&from=home

Ecosystem Studies Program

Proposals are welcome in all areas of science supported by the Evolutionary Processes Cluster:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503664&org=DEB&from=home

- **Evolutionary Ecology Program**
- **Evolutionary Genetics Program**

Proposals are welcome in all areas of science supported by the Population and Community Ecology Cluster:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503665&org=DEB&from=home

- **Population and Community Ecology Program**

Proposals are welcome in all areas of science supported by the Systematics and Biodiversity Science Cluster:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503666&org=DEB&from=home

- **Biodiversity: Discovery and Analysis**
- **Phylogenetic Systematics**

Small Grants

The Division welcomes proposals for Small Grants to the core programs via this solicitation. Projects intending total budgets of $150,000 or less should be identified as such with the designation "SG:" as a prefix to the project title. These awards are intended to support full-fledged research projects that simply require smaller budgets. Small Grant projects will be assessed based on the same merit review criteria as all other proposals.

Review Process

A two-stage review process will be used by all Division core programs:

Preliminary Proposals: All proposers must submit a preliminary proposal that outlines the major goals of the project including the components described below. Preliminary proposals typically will be reviewed by a panel of outside experts. The Program Directors will communicate the decision to Invite/Do Not Invite full proposals via FastLane and those decisions will be based on the panel recommendations and additional portfolio considerations. Invite/Do not Invite decisions are binding. A proposer who was invited, but did not submit a full proposal in the previous year, may do so in a following year but must contact a Program Officer for submission guidance.

Full Proposals: Invited full proposals will receive panel review and *ad hoc* review at the discretion of the program as described in Section VI of this Solicitation. Full proposals that were not invited will be returned without review.

Additional Funding Opportunities

The guidelines in this solicitation do not apply to proposals submitted through other solicitations, such as CAREER or DDIG.

This solicitation does not apply to conference and workshop proposals, requests for supplemental funding, and RAPID or EAGER applications, all of which should follow the Special Guidelines in the GPG (GPG, Chapter II.D). These requests should be submitted by selecting the GPG for the Program Announcement field on the proposal coversheet and then selecting the appropriate cluster.

The core programs will accept **Research in Undergraduate Institutions** (RUI) proposals. **Preliminary proposals for RUIs must be submitted to this DEB solicitation by the listed deadlines.** Additional information on the scope of RUI projects and the format of those proposals can be found at (http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5518&org=NSF&sel_org=NSFW&from=fund).

The core programs will accept **Research Coordination Network** (RCN) proposals. Such proposals should be **submitted for the August full proposal deadline**. Information on the scope of RCN projects and the format of those proposals can be found at (http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=11691&org=BIO&from=home).

The core programs will accept **Opportunity for Promoting Understanding through Synthesis** (OPUS) proposals. Such proposals should be **submitted for the August full proposal deadline**. Information on the scope of OPUS projects and the format of those proposals can be found at (http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13403&org=BIO&sel_org=BIO&from=fund).

III. AWARD INFORMATION

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. For FY13, it

is estimated that $72 million will be available to fund approximately 200 new awards.

IV. ELIGIBILITY INFORMATION

Organization Limit:

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

PI Limit:

>None Specified

Limit on Number of Proposals per Organization:

>None Specified

Limit on Number of Proposals per PI: 2

>In a given year, an individual may participate as a PI, co-PI, or lead senior investigator of a subaward on **no more than two** preliminary proposals submitted in response to this solicitation. Preliminary proposals in excess of the limit for any person may be returned without review in the reverse order received. "PI, co-PI, or lead senior investigator of a subaward" refer to the role an individual would play in a full proposal including all parts of a collaborative proposal. Participating in a proposal as other senior personnel does not count in this limit. **It is the responsibility of the submitters to confirm that the entire team is within the eligibility guidelines.** Changes to the team post-submission to meet the eligibility limits will not be allowed.

>This limit does not include proposals to other solicitations [e.g., Research Coordination Networks (RCN), Opportunities for Promoting Understanding through Synthesis (OPUS), Ecology and Evolution of Infectious Diseases (EEID), Dynamics of Coupled Natural and Human Systems (CNH), Doctoral Dissertation Improvement Grants (DDIG), Assembling the Tree of Life (AToL), Long-Term Ecological Research (LTER), Faculty Early Career Development Program (CAREER)] or to core programs in other BIO Divisions [Molecular and Cellular Biosciences (MCB), Integrative Organismal Systems (IOS) and Division of Biological Infrastructure (DBI)]. However solicitations may have their own limit guidelines so be sure to review those carefully for details. Please consult the DEB website for answers to frequently asked questions.

Additional Eligibility Info:

>Full proposals may be submitted only at the invitation of the program except as noted under Additional Funding Opportunities.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals *(required):* Preliminary proposals are required and must be submitted via the NSF FastLane system, even if full proposals will be submitted via Grants.gov.

The following exceptions and additions to the GPG guidelines apply to preliminary proposals submitted to this solicitation:

Submission of a preliminary proposal is required to be eligible for invitation for a full proposal. Preliminary proposals that are not compliant with the guidelines may be returned without review. It is the submitting organization's responsibility to ensure that the proposal is compliant with all applicable guidelines.

For collaborative proposals, a single preliminary proposal should be submitted by **ONLY** the lead institution. The collaborative partners should be indicated on the list of personnel in the project description (see below).

Preliminary proposals must contain the items listed below and strictly adhere to the specified page limitations. No additional information may be provided as an appendix or by links to Web pages. Figures and tables must be included within the applicable page limit. All elements of the proposal, including legends and tables, must meet the formatting requirements for font size, characters per inch, margins, etc. as specified in the GPG.

Preliminary proposals should contain an overview of the proposed research with sufficient detail to allow assessment of the major ideas and approaches to be used. Preliminary proposals must include the following components.

- **Cover Sheet:** Select the program solicitation number from the pull-down list. The DEB Programs will automatically appear. Check the box indicated for the preliminary proposal. Entries on the Cover Sheet are limited to the Principal Investigator and a maximum of four co-Principal Investigators. Beginning Investigators (individuals who have not been a Principal Investigator [PI] or co-Principal Investigator [co-PI] on a Federally-funded award with the exception of doctoral dissertation, postdoctoral fellowship or research planning grants) must check the box for "Beginning Investigator" on the proposal Cover Sheet. Leave blank the fields for Requested Amount, Requested Duration and Start Date for the grant. For more FastLane instructions, see section V.D. below.

- **Title of Proposed Project:** Title should begin with the prefix:"Preliminary Proposal:..." and additional acronyms for Small Grants "SG:", Accomplishments Based Renewal "ABR:", or Research in Undergraduate Institutions "RUI:" if applicable.

- **Project Summary (1 page):** Provide an overview of the proposed research, addressing separately the intellectual merit and broader impacts. The summary should be written in the third person, informative to those working in the same or related field(s), and understandable to a scientifically or technically literate reader. **Preliminary proposals that do not**

contain the Project Summary, including an overview and separate statements on intellectual merit and broader impacts will be returned without review.

- **Project Description.** Maximum 5 pages total, containing the two following sections:

  I. Personnel (This section is limited to one page. Any remaining space should be left blank.) Provide a list of project personnel plus each person's institutional affiliation, and one sentence describing that person's role(s) in the project. Divide the list into two sections. The first section of the list (1) must contain all PI(s), co-PI(s), and sub-award lead senior investigators, including those from all parts of a collaborative proposal. The second section of the list (2) should contain other senior personnel and may include post-doctoral scholars. Any individual for whom a biographical sketch is included in the preliminary proposal must be on one of these lists. You should not list undergraduate or graduate students, technicians, or other participants.

  II. Project (This section is limited to four pages. We suggest the use of the sub-sections listed below, organized as appropriate.)

    1. "Conceptual Framework" or "Objectives" or "Specific Aims"
    2. "Rationale and Significance" or "Background"
    3. "Hypotheses" or "Research Question(s)"
    4. "Research Approach" or "Experimental Plan"
    5. "Broader Impacts"

- **References Cited** are limited to 3 pages, see GPG for format.

- **Biographical Sketches** (2-page limit for each) should be included for each person listed on the Personnel page. It should include the individual's expertise as related to the proposed research, professional preparation, professional appointments, five relevant publications, five additional publications, and up to five synergistic activities. Advisors, advisees, and collaborators should not be listed on this document, but in a separate table (see below).

- **No budget should be submitted**; No budget justification should be submitted; please leave blank the Requested Amount box on the FastLane Cover Sheet.

- **A combined Conflict of Interest document**. The template found at http://www.nsf.gov/bio/deb/debcoitemplate.XLSX, contains a total of five tabs. Please read the Instructions carefully and follow guidance. Using the template, compile an Excel Workbook that identifies conflicts of interest for all persons listed on the Personnel page (i.e., first page) of the project description. Types of conflicts to include are (1) Ph.D. dissertation advisors or advisees, (2) collaborators or co-authors, including postdoctoral researchers, for the past 48 months, (3) co-editors within the past 24 months, (4) spouse or other relative, and (5) any other individuals with whom or institutions with which the senior personnel (PI, co-PIs, and any named personnel) have financial ties, including advisory committees, boards of directors, or prospective employers (specify type). Conflicts of interest involving junior authorship on a multi-authored papers (>5 authors) may be limited to the senior author. **Following the Instructions provided in the template, the completed workbook should be emailed to DEBCOI@nsf.gov immediately after you submit your proposal, but no later than the proposal deadline.** Please contact a Program Director for guidance if you are unable to download the template.

Applicants must include the above documents (prepared in accordance with standard NSF formatting guidelines).

Applicants must complete the Proposal Classification Form. The Proposal Classification Form is required for all submissions to BIO; FastLane will not allow processing of the proposal without it.

No other items, appendices or supplementary documents are permitted for preliminary proposals.

Preliminary Proposal Checklist For Compliance

- Prior to submission, please review your preliminary proposal against this checklist to ensure that it is fully compliant with the guidelines provided in this solicitation:
- On the Cover Page, nothing is entered into the Requested Amount or start date boxes; the Beginning Investigator box is checked if applicable.
- The Title begins with the prefix "Preliminary Proposal..." followed by any additional acronyms (e.g. RUI, ABR, SG), if applicable.
- The Project Summary is limited to 1 page, includes an overview and addresses both the Intellectual and the Broader Impacts of the proposed research.
- The Project Description is limited to 5 pages, the first page of which contains only a list of project personnel, including institution, title, planned status (e.g., PI, co-PI, subaward lead, other senior personnel), and one-sentence summary of role(s) in the project.
- The References Cited is limited to 3 pages and conforms to the GPG format.
- The Biographical Sketches do not include information about advisors, advisees, and collaborators.
- A Combined Conflict of Interest Document prepared using the provided template has been emailed to DEBCOI@nsf.gov.
- Ensure that your final submitted PDF conforms to the typeface size limits (10-11 pt depending on font), line spacing maximum (no more than six lines of text per vertical space of one inch) and margins (at least one inch on all sides of page) specified in the GPG.

Items that should NOT be included in a Preliminary Proposal:

Budget, Budget Justification, Facilities, Equipment and Other Resources, Current and Pending Support, Letters of Collaboration, Data Management Plan, Postdoctoral Mentoring Plan, RUI Impact Statement, Certification of RUI Eligibility, or any other Supplementary Documents. _____

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.4 of the Grant Proposal Guide provides additional information on collaborative proposals.

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

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

- **Full proposals will be accepted only from PIs who have submitted preliminary proposals and have been invited to submit a full proposal except as noted under Additional Funding Opportunities**.

- The full proposal should not deviate substantially from the preliminary proposal in the scope of the project or the list of personnel without prior approval of the relevant Program Officer. However, incorporating useful suggestions from reviews of the preliminary proposals is encouraged.

- **Research Experiences for Undergraduates.** Projects anticipating the inclusion of undergraduate research experiences are encouraged to include those as part of the research proposal itself, rather than as a supplemental request. Such requests should follow the guidelines for REU supplement requests in the REU solicitation (http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517&org=BIO&sel_org=BIO&from=fund). REU projects involve students in meaningful ways in ongoing research programs or in research projects specifically designed for the REU student. If the intent is to engage students as technicians, then an REU Supplement is not the appropriate support mechanism; instead, support should be entered on the Undergraduate Students line of the proposal budget.

- **REU, RET and RAHSS funds**. If Research Experiences for Undergraduates (REU), Research Experiences for Teachers (RET) or Research Assistantships for High School Students (RAHSS) funds are requested as part of the full proposal, descriptions of those activities should be included in Supplementary Documents. The description is limited to 3 pages in all circumstances. For example, if funds are requested for multiple categories of activity (REU, RET, RAHSS) or if multiple institutions on a collaborative proposal are requesting funds for one or more categories the 3 page limit still applies. The entire budget for these activities should be included in participant support costs, including stipends, travel, and supplies. A detailed breakdown of the budget for each separate category of request must be explained in the budget justification. Budgets for REU activities are generally under $6,250 per student. Budgets for RET activities are generally under $15,000 per teacher. Budgets for RAHSS activities are generally under $6,000 per student.

- **Small Grants.** Full proposals invited from preliminary proposals using the Small Grants designation should include the "SG:" designation in the project title. Projects that were reviewed as Small Grants at the preliminary proposal stage but request full proposal total budgets exceeding the $150,000 limit will be returned without review.

- **Biographical Sketches.** Biographical sketches should be submitted for all persons identified as PI, co-PI, Other Senior Personnel, or lead of any subaward in the full proposal and should follow the same format used for the preliminary proposal stage. Biographical sketches may also be included for post-doctoral fellows. Biographical sketches should not be included for anyone providing a "Letter of Collaboration".

- **A combined Conflict of Interest document**. The template found at http://www.nsf.gov/bio/deb/debcoitemplate.XLSX, contains a total of five tabs. Please read the Instructions carefully and follow guidance. Using the template, compile an Excel Workbook that identifies conflicts of interest for all persons listed on the Personnel page (i.e., first page) of the project description. Types of conflicts to include are (1) Ph.D. dissertation advisors or advisees, (2) collaborators or co-authors, including postdoctoral researchers, for the past 48 months, (3) co-editors within the past 24 months, (4) spouse or other relative, and (5) any other individuals with whom or institutions with which the senior personnel (PI, co-PIs, and any named personnel) have financial ties, including advisory committees, boards of directors, or prospective employers (specify type). Conflicts of interest involving junior authorship on a multi-authored papers (>5 authors) may be limited to the senior author. **Following the Instructions provided in the template, the completed workbook should be emailed to DEBCOI@nsf.gov immediately after you submit your proposal, but no later than the proposal deadline.** Please contact a Program Director for guidance if you are unable to download the template.

- **Letters of Collaboration.** Supplementary Documents may include letters of collaboration from individuals or organizations that are integral to the proposed project but are neither senior personnel nor supported by subawards. This may include subsidiary involvement in some aspect of the project, cooperation on outreach efforts, or documentation of permission to access materials or data. 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. No endorsements of the potential value or significance of the project may be included. The template that **must** be used for the preparation of letters of collaboration is provided below.

  Each letter of collaboration **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 will not be accepted and may be grounds for returning the proposal without review.**

    Template to be used for letters of collaboration

To: NSF _____ *(Program Title)* _____ 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 substitute: transmitting electronically), I acknowledge that I am listed as a collaborator (or substitute: contributor) on this proposal, entitled "_____ (*proposal title*) _____," with _____ (*PI name*) _____ as the Principal Investigator. I agree to _____ (*description up to 140 characters*) _____ , as described in the project description of the proposal, and I commit to provide or make available the resources specified therein.

Signed: _____
Organization: _____
Date: _____

Please note that generic letters of general support are not allowed.

Invited Full Proposal Checklist For Compliance

Prior to submission, please review your invited full proposal against this checklist to ensure that it is fully compliant with the guidelines provided in this solicitation:

- The intellectual merit and broader impacts of the proposed research are addressed in the Project Summary and in the Project Description.
- The Biographical Sketches do not include information about advisors, advisees, and collaborators.
- Planned REU, RET, and RAHSS activities are included in the budget request.
- The Data Management Plan, and (where applicable) Postdoctoral Mentoring Plan, have been uploaded into Supplementary Documents. Contact a cognizant Program Director if you have questions about these or other Supplementary Documents that you plan to upload.
- A Combined Conflict of Interest Document prepared according to the provided template and emailed to DEBCOI@nsf.gov by the full proposal deadline.
- It is recommended that a list of suggested reviewers be entered into the appropriate tab on the COI spreadsheet template, including the individuals' names, institutions, and areas of expertise, email addresses, and URLs if available.
- Letters of Collaboration conform to the provided template and are loaded into Supplementary Documents. Generic Letters of support are not allowed.
- Ensure that your final submitted PDF conforms to the typeface size limits (10-11 pt depending on font), line spacing maximum (no more than six lines of text per vertical space of one inch) and margins (at least one inch on all sides of page) specified in the GPG

The invited full proposal must be submitted to this Program Solicitation (not the GPG). From the pull-down menu, select the Program that reviewed the Preliminary Proposal.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

C. Due Dates

- **Preliminary Proposal Due Date(s)** *(required)* (due by 5 p.m. proposer's local time)**:**

    January 23, 2013

        Preliminary Proposal

    January 16, 2014

    January 16, Annually Thereafter

        Preliminary Proposals

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

    August 02, 2013

    August 2, Annually Thereafter

        Full proposals, by invitation only

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

    Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: https://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

    Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: https://www.fastlane.nsf.gov/fastlane.jsp.

- **For Proposals Submitted Via Grants.gov:**

    Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: http://www07.grants.gov/applicants/app_help_reso.jsp. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

    Submitting the Proposal: Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgement and, if they meet NSF requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in the GPG as Exhibit III-1.

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

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

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

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

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

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

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

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

B. Review and Selection Process

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

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (GC-1); * or Research Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

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

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

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:

- Division of Environmental Biology, telephone: (703) 292-8480, email: debquestions@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.

General inquiries regarding this program should be made to:

- Ecosystem Science Cluster, http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503663&org=DEB&from=home
- Evolutionary Processes Cluster, http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503664&org=DEB&from=home
- Population and Community Ecology Cluster, http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503665&org=DEB&from=home
- Systematics and Biodiversity Science, http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503666&org=DEB&from=home

IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "My NSF" is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "My NSF" also is available on NSF's website at http://www.nsf.gov/mynsf/.

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

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.

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

Suzanne H. Plimpton
Reports Clearance Officer
Division of Administrative Services
National Science Foundation
Arlington, VA 22230

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