

# Comparative Analysis of Marine Ecosystem Organization (CAMEO)

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## PROGRAM SOLICITATION NSF 10-611

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**National Science Foundation**  
Directorate for Geosciences  
Division of Ocean Sciences



**National Oceanic and Atmospheric Administration**

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

January 07, 2011

### IMPORTANT INFORMATION AND REVISION NOTES

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Please be advised that the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) includes guidelines implementing the mentoring provisions of the America COMPETES Act (ACA) (Pub. L. No. 110-69, Aug. 9, 2007.) As specified in the ACA, each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Proposals that do not comply with this requirement will be returned without review (see the PAPP Guide Part I: *Grant Proposal Guide* Chapter II for further information about the implementation of this requirement).

### SUMMARY OF PROGRAM REQUIREMENTS

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#### General Information

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**Program Title:**

Comparative Analysis of Marine Ecosystem Organization (CAMEO)

**Synopsis of Program:**

The purpose of the CAMEO program is to strengthen the scientific basis for an ecosystem approach to the stewardship of our ocean and coastal living marine resources and ecosystems. The goal is to provide an understanding of and predictive capability for marine ecosystem organization and production, particularly as the dual drivers of climate variability and fishing pressure affect them. Comparative analyses provide an ideal way to achieve this goal. They can be employed in lieu of direct experimentation where controlled manipulation at relevant temporal and spatial scales is not possible. Well-designed comparative studies use existing gradients in ecosystem features to reveal how those features are manifest in processes and structures. Comparative analysis may be applied across ecosystems, within ecosystems through time, or across modeling approaches.

As a partnership initiated in FY2009 between the National Science Foundation (NSF) and the US Department of Commerce, NOAA-National Marine Fisheries Service (NOAA NMFS), CAMEO-supported research will focus on basic science to understand ecosystem processes - basic research that will ultimately contribute to management of marine species, habitats and ecosystems. Central to the program is an emphasis on collaborative partnerships between academic and federal agency scientists.

**Cognizant Program Officer(s):**

- Cynthia Suchman, NSF Division of Ocean Sciences (OCE), telephone: (703)292-8582, email: [csuchman@nsf.gov](mailto:csuchman@nsf.gov)
- David Garrison, NSF Division of Ocean Sciences (OCE), telephone: 703/292-8582, email: [dgarriso@nsf.gov](mailto:dgarriso@nsf.gov)
- Michael Ford, NOAA Fisheries, Office of the Assistant Administrator for Fisheries, telephone: (301)713-2239, email: [michael.ford@noaa.gov](mailto:michael.ford@noaa.gov)
- Lora Clarke, NOAA Fisheries, Office of the Assistant Administrator for Fisheries, telephone: (301)713-2239, email: [lora.clarke@noaa.gov](mailto:lora.clarke@noaa.gov)

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

- 47.050 --- Geosciences

#### Award Information

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**Anticipated Type of Award:** Standard Grant or Continuing Grant

**Estimated Number of Awards:** 5 to 10

**Anticipated Funding Amount:** \$6,000,000 Up to \$6,000,000 is available in FY2011, subject to availability of funds

## Eligibility Information

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### Organization Limit:

Proposals may only be submitted by the following:

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

### PI Limit:

None Specified

### Limit on Number of Proposals per Organization:

None Specified

### Limit on Number of Proposals per PI:

None Specified

## Proposal Preparation and Submission Instructions

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### A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposals:**
  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](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](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide))

### B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required under this solicitation.
- **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 07, 2011

## Proposal Review Information Criteria

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**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

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**Award Conditions:** Standard NSF award conditions apply.

**Reporting Requirements:** Standard NSF reporting requirements apply.

## TABLE OF CONTENTS

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[Summary of Program Requirements](#)

I. [Introduction](#)

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

## I. INTRODUCTION

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The purpose of the Comparative Analysis of Marine Ecosystem Organization (CAMEO) program is to strengthen the scientific basis for an ecosystem approach to the stewardship of our ocean and coastal living marine resources. It was implemented in FY2009 as a partnership between the NOAA National Marine Fisheries Service and National Science Foundation Division of Ocean Sciences. The program supports fundamental research to understand complex dynamics controlling ecosystem structure, productivity, behavior, resilience, and population connectivity, as well as effects of climate variability and anthropogenic pressures such as fishing on living marine resources and critical habitats. Fishing, climate variation and change, and their interaction, are prioritized because they are globally pervasive and important drivers of managed species and habitats with ramifications for the sustainability of marine ecosystems and the people who depend on their services. Comparison within and between ecosystems is a fundamental approach that can foster greater understanding of the factors that influence productivity and critical processes. By comparing similar ecosystems across environmental gradients, management regimes, or comparing between different ecosystems, we increase our understanding of the underlying principles that organize marine ecosystems.

CAMEO encourages the development of multiple approaches, such as ecosystem models and comparative analyses of managed (e.g. marine protected areas) and unmanaged areas that can ultimately form a basis for forecasting and decision support. Central to the program is the emphasis on collaborations between academic researchers and federal agency scientists with mission responsibilities to inform ecosystem management activities. The interests of the two agencies overlap in funding the best science to advance understanding of marine ecosystems. NOAA and its scientists maintain direct connection to fisheries management and protected resources. NOAA also collects a vast amount of monitoring data, and these are likely to provide a strong foundation for many CAMEO proposals. NSF brings experience in funding the highest quality basic science -- usually conducted by university faculty, students, and postdoctoral scientists -- through rigorous peer review. Together, through the CAMEO program, the agencies will provide funding for federal and academic scientists to collaborate, share data sets, and develop new modeling and analytical approaches.

The agencies will not recreate or duplicate existing programs. For example, CAMEO is a basic science program and will not focus on explicit development or assessment of Decision Support Tools for management. Other NOAA programs (Integrated Ecosystem Assessment, Fisheries and the Environment) have this role. At the same time, it is entirely appropriate for CAMEO to facilitate transfer of fundamental scientific information to managers and to consider effective means to do so. One of the strengths of encouraging federal and academic partnerships is the management perspective federal scientists bring to research. Similarly, CAMEO will not duplicate existing programs and foci of the Division of Ocean Sciences at NSF. These include but are not restricted to: ocean acidification, harmful algal blooms, ecology of infection disease, and ocean ecology associated with biogeochemical cycles.

The grand challenge for CAMEO investigators will be to propose innovative, interdisciplinary projects to address the following broad goals: 1). Develop improved understanding of the relationships among an ecosystem's structure and function, with a focus on response of managed species assemblages to climate or environmental variability and anthropogenic perturbations such as fishing; 2). Identify ecosystem-level, process-based measures that gauge or reflect ecosystem status and resilience; and 3). Develop capacity to predict responses of ecosystem structure and function to climate variability and fishing, including interactions between the two.

## II. PROGRAM DESCRIPTION

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Our ability to predict ecosystem responses to natural changes and management actions, including any unintended ecosystem responses, and make informed management decisions requires understanding the linkages within and among ecosystems, the nature and extent of anticipated impacts, which systems and linkages are most sensitive to change, and the interdependence of human and natural systems. The CAMEO program is designed to address these issues by supporting research under five themes: (1) **Connectivity of Marine Ecosystems** defines the fundamental structural and functional attributes of ecosystems and interactions among ecosystems; (2) **Responsiveness of Ecosystems to Perturbations**, examines the factors that control ecosystem responses to perturbations and stresses; (3) **State Transitions and Stability** identifies equilibrium states of ecosystems and the role of attributes (e.g. resilience, biodiversity) in determining the transitions between these states (4) **Human Society and Marine Ecosystems** examines the critical interactions between humans and marine ecosystem processes; and (5) **Comparative Analysis, Synthesis and Forecasting** explores new approaches of synthesizing existing information on ocean ecosystems and predicting the response to fishing and climate variation and change.

The scientific questions underlying CAMEO research in these theme areas are:

Theme 1 - How do patterns of connectivity within and among ecosystems, and human impacts on those patterns, influence the productivity and resilience of populations and ecosystems?

Theme 2 - What determines the responsiveness of marine ecosystems to perturbations?

Theme 3 - How do different properties of ecological systems and coupled human-natural systems influence the potential for transitions between different system states and their reversibility?

Theme 4 - What is the nature and extent of the feedbacks and interactions between humans and marine ecosystems?

Theme 5 - How can the comparative approach to ecosystems best be used to improve synthesis and forecasting in marine ecosystems?

A fuller description and justification for the themes, as well as key questions within each, can be found in the Draft CAMEO Science Plan (see <http://cameo.noaa.gov/>).

The research themes are interconnected, and therefore CAMEO projects will likely cross-cut multiple theme areas. In particular, studies addressing interactions between humans and marine ecosystem processes should also make significant advances in our understanding or predicting ecosystem structure, function, or response.

As in previous solicitations, we expect that CAMEO proposals supported from this solicitation will focus on comparisons of systems where there is a rich base of environmental and biological data, where there are clear and compelling management issues, and where further research is likely to result in a deeper understanding of ecosystem processes that ultimately can lead to management tools or solutions. Projects with a strong probability of producing results that can be widely applied are likely to be most compelling. The focus should remain on managed populations or assemblages, and studies should involve multiple species and multiple trophic levels. The spatial or temporal scale should be appropriate to the ecosystem properties and management considerations. In some cases, the use of a hierarchy of nested scales may be appropriate.

The agencies do not intend to prescribe specific approaches within this solicitation, but we anticipate that many will involve synthesis of data sets and development or refinement of models. Projects may draw on a wide range of existing data and observations, including historical data sets and ongoing programs. Any new field studies must be well justified or integrated with existing data. Modeling is likely to be another approach common to many CAMEO proposals. These efforts may range from the development of conceptual models for emergent properties such as connectivity or resilience to more specific numerical models (e.g. dynamical, statistical, or empirical) used for ecosystem comparisons or predictions. Among the many possible modeling approaches, different models (or sets of assumptions) may be compared for the same ecosystem, or the same (or similar) models may be applied to compare different ecosystems. Models that incorporate assessment of modeling skill are strongly encouraged.

In addition, the agencies urge investigators to take the following into consideration as they develop proposals to CAMEO:

- Interdisciplinary teams, involving some combination of fisheries scientists, ecologists, oceanographers, climate scientists, and social scientists are highly encouraged.
- Collaborative partnerships between academic researchers and NOAA/NMFS scientists are highly encouraged.
- While there is no narrowly-defined geographic or topical focus for this solicitation, investigators are invited to submit complementary projects to make substantially more progress in one research topic or region than would be permitted in a single project. These projects will be evaluated separately, however, and each must stand alone in the event that they review unevenly.
- This solicitation is primarily to solicit research proposals. However, to address critical issues requiring significant interaction among individuals, convening workshops may be a more appropriate means to meet program goals. Therefore, stand-alone workshop proposals will be considered so long as the need for that approach to solve key problems is clearly articulated.
- While CAMEO does not emphasize direct development of tools for management, interaction or communication with managers is strongly encouraged as a significant Broader Impact. An example would be connections to NOAA teams developing tools such as Integrated Ecosystem Assessments. Facilitation of development of these types of tools and information products that ultimately transfer scientific results to managers, or give scientists exposure to information required by managers, will enhance the appeal and increase the relevance of CAMEO projects.
- Investigators are encouraged to leverage existing NSF (COSEE) (<http://www.cosee.net/>) or NOAA Education programs if they wish to incorporate educational outreach into their projects.

Other specific information is included as Frequently Asked Questions in an appendix to this solicitation. Further questions should be directed to one of the NSF or NOAA Program Officers listed as CAMEO contacts.

### III. AWARD INFORMATION

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**Anticipated Type of Award:** Continuing Grant or Standard Grant

**Estimated Number of Awards:** 5 to 10

**Anticipated Funding Amount:** Up to \$6,000,000 is available in FY2011, subject to availability of funds. Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

### IV. ELIGIBILITY INFORMATION

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**Organization Limit:**

Proposals may only be submitted by the following:

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

**PI Limit:**

None Specified

**Limit on Number of Proposals per Organization:**

None Specified

**Limit on Number of Proposals per PI:**

None Specified

**Additional Eligibility Info:**

Collaborations with NOAA NMFS scientists are highly encouraged. However, participation must adhere to the following guidelines:

1. federal scientists may participate as unfunded collaborators;
2. NOAA NMFS scientists may serve as PI on non-lead collaborative proposals where the lead proposal is from a non-Federal lead PI and institution.

Proposals must comply with NSF budget guidelines and may not include costs already covered by federal funds. Information about preparation and submission of collaborative proposals to NSF is available in the Grant Proposal Guide ([http://www.nsf.gov/pubs/policydocs/pappguide/nsf10\\_1/gpg\\_2.jsp#IID4](http://www.nsf.gov/pubs/policydocs/pappguide/nsf10_1/gpg_2.jsp#IID4)). Further questions about preparation of collaborative proposals involving NOAA NMFS scientists should be directed to the Agency Contacts.

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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### A. Proposal Preparation Instructions

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**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](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](mailto: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](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](mailto: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.

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

**Cover page:** The title of the proposed project must begin with the word "CAMEO."

Projects of 3 years' duration are strongly suggested.

**Proposals Involving NOAA Laboratories:** All single-institution proposals as well as lead proposals as part of a collaborative effort must be submitted by non-Federal institutions. NOAA NMFS Centers with NOAA NMFS PIs may submit non-lead collaborative proposals. All materials should be submitted to NSF. NSF will share proposals with NOAA NMFS throughout the review process

**Budget:**

- Proposals should include travel costs for each PI to attend an annual PI meeting. The meetings will be conducted in the continental U.S. and last, on average, three days.
- NSF budgets submitted by non-Federal institutions should not include any funds (including travel costs) for Federal or international collaborators. These must all be unfunded collaborations. NOAA scientists working at NMFS Centers should submit budgets in non-lead collaborative proposals.
- Budgets from non-Federal institutions should include all costs charged to the project for platforms and facilities supporting the proposed research except those facilities separately supported by NSF (e.g. UNOLS research vessels). Questions about facilities costs should be directed to one of the Agency Contacts.

**Supplementary Documents.**

1. **Project Management Plan:** Each proposal must include a detailed project management plan of no more than two pages. It should outline the division of labor among team members, present a plan for establishing and maintaining communications and regular feedback, describe how the group effort will be coordinated, and discuss how the various

components of the project will be integrated. A clear time line, which includes milestones and expected outcomes, must be included.

- Data Management Plan** All proposals must include a data management plan of not more than two pages that conforms to the NSF Ocean Sciences Data Policy ([http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf04004](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04004)). Funded PIs are encouraged to contact the NSF-funded Biological and Chemical Oceanography Data Management Office (<http://www.bco-dmo.org/>) to learn what data can be archived there and in what form. Data related to this solicitation may take many forms including observational, theoretical, and model-generated output. For those projects where no data will be generated, a statement must be made to that effect. Data management plan, guidelines, and policies will also apply to all NOAA NMFS investigators. Issues with sensitive data sets must be discussed in advance with the NOAA Program Officers. All annual and final reports submitted by PIs should include updates and progress related to data management.
- Postdoctoral Mentoring Plan:** Proposals that request funding to support postdoctoral researchers must include a mentoring plan that is no more than one page. This plan should consist of activities and opportunities tailored specifically to the personal professional development of the post-doc(s) involved.
- Collaborative letters** are required for Federal collaborators not submitting a non-lead collaborative proposal, including an outline of the collaborator's role and responsibilities in the project
- Ship request form.** Proposals requiring UNOLS ship time must request it (<http://www.unols.org>) and attach a copy of the completed NSF-UNOLS Request Form (NSF Form 831) as supplementary material.

**Electronic Documents:** No later than 24 hours after the stated proposal deadline, each lead PI must email a list of conflicts of interest for all participants involved in the project to Lora Clarke ([lora.clarke@noaa.gov](mailto:lora.clarke@noaa.gov)). Instructions and templates can be found on the CAMEO website: <http://cameo.noaa.gov/>. This **Conflicts of Interest Spreadsheet** contains a list of all project participants, their institutional affiliations, and a list of all of the individuals conflicted with each participant. The list also contains information on the nature of the conflict as well as the institutional affiliation, if known, of the person in conflict. Guidelines for what constitutes a conflict of interest can be found on NSF's website: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=form1230p](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=form1230p)

## B. Budgetary Information

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**Cost Sharing:** Cost sharing is not required under this solicitation.

### **Budget Preparation Instructions:**

Federal agency scientists and scientists based in other countries may participate contingent on funding from other federal agency or foreign agency partners, but not via NSF funding. NSF budgets should not include any costs associated with these collaborators. NOAA NMFS collaborators should submit completely separate budgets and budget justifications as a supplementary document.

## C. Due Dates

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

January 07, 2011

## D. FastLane/Grants.gov Requirements

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- 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](mailto: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. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: <http://www.grants.gov/CustomerSupport>. 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](mailto: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

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Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not

review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal.

## A. NSF Merit Review Criteria

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

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

### **What is the intellectual merit of the proposed activity?**

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

### **What are the broader impacts of the proposed activity?**

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

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

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

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

#### ***Integration of Research and Education***

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

#### ***Integrating Diversity into NSF Programs, Projects, and Activities***

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

#### **Additional Review Criteria:**

All proposals will be reviewed as a group, and there will not be separate agency-specific review panels. In addition to the standard National Science Board review criteria described above, the following additional criteria will be used in evaluating each proposal:

- Relevance to CAMEO Program goals and alignment with themes and key questions as outlined in the draft CAMEO Science Plan
- Emphasis on fishing and climate variability as drivers of marine ecosystem organization and production
- Innovative or rigorous application of comparisons across time, space or approach
- Relevance and connection of results to management approaches or tools such as NOAA Integrated Ecosystem Assessments

## B. Review and Selection Process

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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

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### A. Notification of the Award

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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

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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](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](mailto: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](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag).

### C. Reporting Requirements

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

Failure to provide the required annual or final project reports, or the project outcomes report will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through FastLane, for preparation and submission of annual and final project reports. Such reports provide information on activities and findings, project participants (individual and organizational) publications; and, other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

## VIII. AGENCY CONTACTS

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General inquiries regarding this program should be made to:

- Cynthia Suchman, NSF Division of Ocean Sciences (OCE), telephone: (703)292-8582, email: [csuchman@nsf.gov](mailto:csuchman@nsf.gov)
- David Garrison, NSF Division of Ocean Sciences (OCE), telephone: 703/292-8582, email: [dgarriso@nsf.gov](mailto:dgarriso@nsf.gov)
- Michael Ford, NOAA Fisheries, Office of the Assistant Administrator for Fisheries, telephone: (301)713-2239, email: [michael.ford@noaa.gov](mailto:michael.ford@noaa.gov)
- Lora Clarke, NOAA Fisheries, Office of the Assistant Administrator for Fisheries, telephone: (301)713-2239, email: [lora.clarke@noaa.gov](mailto:lora.clarke@noaa.gov)

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: [fastlane@nsf.gov](mailto: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](mailto:support@grants.gov).

## IX. OTHER INFORMATION

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The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, National Science Foundation Update is a free e-mail subscription service designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail when new publications are issued that match their



identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the [NSF web site](#).

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

#### **About NOAA National Marine Fisheries Service:**

NOAA's National Marine Fisheries Service is the federal agency, a division of the Department of Commerce, responsible for the stewardship of the nation's living marine resources and their habitat. NOAA's National Marine Fisheries Service is responsible for the management, conservation and protection of living marine resources within the United States' Exclusive Economic Zone (water three to 200 mile offshore). Using the tools provided by the Magnuson-Stevens Act, NOAA's National Marine Fisheries Service assesses and predicts the status of fish stocks, ensures compliance with fisheries regulations and works to reduce wasteful fishing practices. Under the Marine Mammal Protection Act and the Endangered Species Act, NOAA's National Marine Fisheries Service recovers protected marine species (i.e. whales, turtles) without unnecessarily impeding economic and recreational opportunities. With the help of the six regional offices and eight councils, NOAA's National Marine Fisheries Service is able to work with communities on fishery management issues. NOAA's National Marine Fisheries Service works to promote sustainable fisheries and to prevent lost economic potential associated with overfishing, declining species and degraded habitats. NOAA's National Marine Fisheries Service strives to balance competing public needs.

NMFS Web site:

<http://www.nmfs.noaa.gov/>

General Contact Information:

NOAA Fisheries Service  
Partnerships & Communications  
1315 East West Highway  
Silver Spring, MD 20910

301.713.2334

## **ABOUT THE NATIONAL SCIENCE FOUNDATION**

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

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

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and 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](mailto:nsfpubs@nsf.gov)
  - or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

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

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

## X. APPENDIX

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### Frequently Asked Questions.

#### 1. What is CAMEO? What is CAMEO not?

CAMEO will fund basic scientific research to advance our understanding of marine ecological systems using a comparative approach. The focus should be on managed populations or assemblages and studies will likely involve multiple species and multiple trophic levels. The rationale for the program is that by comparing different systems, we increase our understanding of general underlying principles.

The agencies do not want to recreate existing programs. For example, CAMEO is a basic science program and will not focus on explicit development or assessment of Decision Support Tools for management. Similarly, CAMEO will not duplicate existing programs and foci within NSF's Division of Ocean Sciences such as ocean acidification, harmful algal blooms, ecology of infectious disease, and ocean ecology associated with biogeochemical cycles.

Additional information regarding the CAMEO Program, including as the draft science plan and a previously-funded projects, is available here: <http://cameo.noaa.gov/>

Specific questions should be directed toward the agency contacts.

#### 2. Are there budget limits for proposed projects?

There is no explicit upper limit on project budgets, but the total budget should accurately reflect the effort of all parties, with details provided in the budget justification. However, keep in mind that the Program will only have up to \$6 million for projects funded as a result of this solicitation and the agencies are interested in supporting a number of awards (5-10), not just a few. Moderate-sized projects are encouraged but not required. Scaling the budget request to the work and questions proposed is most important.

#### 3. I am a federal scientist. Can I submit a proposal to the CAMEO Program?

Any federal scientist can participate in a CAMEO proposal as an unfunded collaborator. Unfunded collaborators should write a supporting letter (submitted as a Supplementary Document) outlining their role in the project.

NOAA NMFS scientists can also serve as PIs on non-lead collaborative proposals (and request funding in that proposal budget) so long as the lead proposal is submitted by a non-federal institution with a non-federal lead PI. NOAA NMFS scientists submitting non-lead collaborative proposals are encouraged to discuss their budgets and plan for obligating funds with the NOAA CAMEO Program Managers before any proposal is submitted to NSF.

All proposals should be submitted to NSF. None should be submitted to NOAA for this solicitation.

#### 4. Am I required to collaborate with state, federal or international collaborators? Can I request funds for their participation in the project?

Collaborations with non-academic scientists, managers, educators or policymakers are encouraged but not required. It is the responsibility of the investigators to initiate these collaborations. However, CAMEO funds cannot be requested for participation (including travel) of state, federal employees not working for NOAA NMFS, or international collaborators. These individuals are encouraged to participate in CAMEO using leveraged funding from their agency or institution.

NOAA NMFS scientists can participate as unfunded collaborators on any CAMEO proposal. They can also serve as PIs on non-lead collaborative proposals. See question #3 above.

#### 5. Is the direct development of a Decision Support Tool required as part of a proposal?

The purpose of CAMEO is to strengthen the scientific basis for an ecosystem approach to stewardship of ocean and coastal living marine resources. The program supports fundamental research that elucidates factors influencing a variety of ecosystem processes. It is envisioned that this research will ultimately form a basis for forecasting and decision support tools. These tools, however, are not required to be developed within CAMEO research.

However, interaction or communication with managers is encouraged in CAMEO, and connections between research results and management approaches will be evaluated during proposal review.

**6. Is a comparative approach a necessary component of each CAMEO proposal?**

Yes. Comparative approaches are an essential component of CAMEO research because these are powerful tools for understanding the complexity of marine ecosystems. However, CAMEO defines "comparative" broadly, as described throughout the program solicitation. For example, comparative analysis may be applied across ecosystems, within ecosystems through time or space, or across modeling or other approaches.

**7. Will proposals for field programs or large observational campaigns be supported by this solicitation?**

It is not the intention of the agencies to support large field programs or observational campaigns. Fundamental, innovative laboratory experiments or limited field studies may be considered if well justified.

**8. Should I include facilities costs in my budget?**

Non-federal PIs should request UNOLS ship time as appropriate and attach those forms to the proposal as a supplementary document. UNOLS costs should not be included in the budget.

NOAA NMFS investigators wishing to request NOAA ship time should contact the NOAA CAMEO Program Managers.

Questions about requests and budgeting for other facilities should be directed to the agency contacts.

**9. What is the purpose of the required annual PI meetings? Should I include travel funds for these meetings in the proposal budget?**

The purpose of the annual PI meeting is to facilitate interactions among CAMEO investigators as well as communication among investigators, the funding agencies and the CAMEO science steering committee. The goal is to form a cohesive program that moves beyond a series of disconnected research projects.

Travel funds should be included for each PI each year as outlined in the solicitation's Proposal Preparation Instructions.

**10. I have submitted a proposal to the Biological Oceanography Program (or NSF's Dynamics of Coupled Natural and Human Systems Program), but I also think the work is appropriate for CAMEO. Can I submit the same or a very similar proposal for the CAMEO Program deadline?**

No. If the proposal is currently in review for another NSF Program, this one will be returned without review.

**11. My project is large and complex; can I request additional space in the Project description?**

No. All proposals must adhere to the 15-page limit described in the NSF Grant Proposal Guide.