

## Southern Ocean GLOBEC Synthesis and Modeling

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### Program Solicitation

NSF 05-516



**National Science Foundation**  
Office of the Director  
Office of Polar Programs

### Full Proposal Target Date(s):

February 03, 2005

### SUMMARY OF PROGRAM REQUIREMENTS

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#### General Information

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#### Program Title:

Southern Ocean GLOBEC Synthesis and Modeling

#### Synopsis of Program:

The Antarctic Sciences Section supports research leading to an improved understanding of physiology, behavior, adaptations, and processes related to life forms and ecosystems in Antarctica. Much of its work is focused on oceanography and marine ecosystems, with the goal of strengthening correlations between the structure and function of the marginal ice-zone ecosystem and larger-scale oceanic and atmospheric processes.

The overall goals of the United States Southern Ocean Global Oceans Ecosystems Dynamics (U.S. SO GLOBEC) program are to elucidate shelf-circulation processes and their effect on sea-ice formation and krill distribution, and to examine the factors that govern krill survivorship and availability to higher trophic levels, including penguins, seals and whales. These goals were accomplished in part through broad-scale synoptic studies and process-oriented investigations, which were conducted primarily during the austral winter (2001-2003). The program also seeks to improve the predictability of living marine resources, especially with respect to local and global climatic shifts. The SO GLOBEC Synthesis and Modeling initiative will address the above goals. The integration of other data sets and modeling studies that also address the goals of the SO GLOBEC program is encouraged. Furthermore, the activity will provide information supporting anticipated environmental studies associated with the upcoming 2007-2008 International Polar Year (IPY).

#### Cognizant Program Officer(s):

- Polly A. Penhale, Biology & Medicine Program Manager, Office of the Director, Office of Polar Programs, 755 S, telephone: (703) 292-8033, fax: (703) 292-9079, email: [ppenhale@nsf.gov](mailto:ppenhale@nsf.gov)
- Marie H. Bundy, Biology & Medicine Associate Program Manager, Office of the Director, Office of Polar Programs, 755 S, telephone: (703) 292-8033, fax: (703) 292-9079, email: [mbundy@nsf.gov](mailto:mbundy@nsf.gov)

- Bernhard Lettau, Ocean & Climate System Program Manager, Office of the Director, Office of Polar Programs, 755 S, telephone: (703) 292-8033, fax: (703) 292-9079, email: [blettau@nsf.gov](mailto:blettau@nsf.gov)

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

- 47.078 --- Office of Polar Programs

#### Eligibility Information

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- **Organization Limit:** None Specified.
- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** None Specified.

#### Award Information

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- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 5 to 10 - most with an expected duration of three years
- **Anticipated Funding Amount:** \$4,000,000 total funding, pending the availability of funds

#### Proposal Preparation and Submission Instructions

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##### A. Proposal Preparation Instructions

- **Full Proposal Preparation Instructions:** This solicitation contains information that supplements the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

##### B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

##### C. Due Dates

- **Full Proposal Target Date(s):**  
February 03, 2005

#### Proposal Review Information

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

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### I. INTRODUCTION

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The U.S. Global Ocean Ecosystems Dynamics (U.S. GLOBEC) program is part of the U.S. Global Change Research Program, and is the U.S. component of the International GLOBEC program, a core project of the IGBP (International Geosphere-Biosphere Program). The GLOBEC program has the goal of understanding and ultimately predicting how populations of marine animal species respond to natural and anthropogenic changes in climate. Research in the Southern Ocean (SO) indicates that there is a strong coupling between climatic processes and ecosystem dynamics via the annual formation and destruction of sea ice. The U.S. SO GLOBEC program has advanced the general understanding of the relationships between climate and ecosystem dynamics in the SO through broad-scale synoptic studies and process oriented investigations that took place primarily during the austral winter.

Through group interactions and modeling activities, this initiative will foster integration and synthesis of data, collected during the field phase of the U.S. SO GLOBEC program, with other relevant data and knowledge. Modeling and synthesis of these important data sets is critical to bringing the SO GLOBEC effort to a successful conclusion in a timely way. The participation of investigators that have not been funded in past U.S. SO-GLOBEC activities is encouraged, as is the inclusion of and comparisons to results from studies of other Antarctic regions, satellite imagery, and retrospective data sets.

The international community of polar researchers and funding agents has begun planning for an International Polar Year, with focused activities taking place in 2007 and 2008 (<http://dels.nas.edu/us-ipy/> and <http://www.ipy.org/>). The SO GLOBEC modeling and synthesis effort is important preparation for the upcoming International Polar Year (IPY), because the work will be ongoing during planning and initial implementation for IPY. As a means of exploring the linkages between large-scale ocean and atmospheric processes and the marine food web, this effort is a key component of the investigation of influences of environmental change on ocean ecosystems for IPY. At the culmination of this effort, a workshop to highlight the results of the synthesis and modeling work will be organized as a formal contribution to IPY.

ELECTRONIC ACCESS: Data collected during under the U.S. SO GLOBEC Program and associated documentation is available to all researchers at [http://www.ccpo.odu.edu/Research/globec\\_menu.html](http://www.ccpo.odu.edu/Research/globec_menu.html) under protocols established under the U.S. GLOBEC Data Policy. The U.S. GLOBEC Data Policy (U.S. GLOBEC Report 10) is available at <http://www.usglobec.org/reports/datapol/datapol.contents.html>.

The U.S. SO GLOBEC Implementation plan (International GLOBEC Report No. 7A) is based on reports from community-wide meetings, sponsored by International (Reports No. 5 and 7) and U.S. GLOBEC (Report No. 5), where researchers specified key scientific issues and research priorities for the Southern Ocean. Copies of these documents are available from the Southern Ocean Planning Office, Crittenton Hall, Old Dominion University, Norfolk, VA 23529, the GLOBEC International Planning Office, Plymouth Marine Laboratory, Prospect Place, Plymouth, Devon, England PL1 3DH, and via the websites:

- [http://www.ccpo.odu.edu/Research/globec\\_menu.html](http://www.ccpo.odu.edu/Research/globec_menu.html)
- <http://www.globec.org>
- <http://www.usglobec.org>.

These reports should be consulted in responding to this program solicitation.

## II. PROGRAM DESCRIPTION

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The goals of the US GLOBEC include improving the predictability of living marine resources, especially with respect to local and global climatic shifts. The overall goals of the U.S. Southern Ocean Global Ocean Ecosystems Dynamics (U.S. SO GLOBEC) program are to elucidate shelf circulation processes and their effect on sea ice formation and krill distribution, and to examine the factors that govern krill survivorship and availability to higher trophic levels, including penguins, seals and whales.

The goals of the first phase of the US SO GLOBEC program were accomplished through broad-scale synoptic studies and process-oriented investigations, conducted primarily during the austral winter (2001-2003). These studies addressed the following questions:

*What is the physical environment of the Western Antarctic Peninsula shelf and how does it govern the distribution of and the resources available to krill?*

*What physical, chemical and biological factors govern krill recruitment?*

*What is the relationship between the physical environment, krill ecology and the success of krill-dependent predators?*

The field and process studies undertaken in the first phase of SO-GLOBEC resulted in new data sets and an increased understanding of climatic and geophysical forcing factors that structure ecological communities in the Southern Ocean (SO). The present solicitation is for proposals to conduct synthesis and modeling of data from U.S. SO GLOBEC field studies and to incorporate comparative studies using data sets from other appropriate regions and programs. No new field work will be supported.

Synthesis and modeling studies can include diagnostic or prognostic models that elucidate ecosystem dynamics and responses on a range of time scales, including inter-annual fluctuations in relevant processes and parameters. The use of other data sets and modeling studies that address the goals of the SO GLOBEC program is also encouraged in this initiative. In addition, all proposals should address the ways in which education and training will be integrated into the research program.

Anticipated products of the projects supported under this solicitation will be 1) improved knowledge (e.g., mechanistic understanding) of the impact of environmental and climate variability on specific marine species, communities, and

ecosystems of Antarctic continental shelf waters; 2) circulation, sea ice, ecosystem, and coupled physical-biological models that can be used to examine impacts of environmental and climate variability on Antarctic ecosystems and are capable of integrating disparate observations; 3) detailed and quality controlled datasets of physical, chemical and biological conditions that will be used in model validation and can provide a baseline and basis for future research in the region, and 4) new tools, indices or strategies that provide increased understanding of the structure and function of Antarctic marine food webs.

This program therefore constitutes an important activity to bring the US SO GLOBEC investment to a productive and successful conclusion, and as a means of investigating the linkages between large-scale ocean and atmospheric processes and the marine food web, will also be an important component of the investigation of influences of environmental change on ecosystems for the upcoming 2007- 2008 International Polar Year (IPY). The effort is an important part of preparation for IPY because the work will be ongoing during IPY planning and initial implementation. A workshop to highlight the results of this synthesis work will be organized as a formal contribution to IPY.

## Research Approach

This initiative will emphasize a number of topic areas. Examples of appropriate topics to be considered are described below (this list is not meant to be exhaustive). The intent is for coordinated activities that collectively address the overall SO GLOBEC program objectives. It is anticipated that proposed work might address more than one of these or other topic areas. Proposals are encouraged from well-integrated multidisciplinary teams that undertake synthesis and integration of data sets across species or disciplinary boundaries.

### 1. Synthesis of Data Sets

Integration of multidisciplinary data sets from the SO GLOBEC process and survey cruises, and of remote sensing data, retrospective data sets, and modeling analyses are critical in the development of the synthesis research efforts. Investigators who have not been involved in the SO GLOBEC program, but who wish to propose research projects directed at analyses or modeling of currently available data sets are encouraged to participate. Investigators involved in the SO GLOBEC field program are encouraged to collaborate in the integration of their data sets with other data sets to facilitate multidisciplinary approaches to understanding factors affecting the dynamics of the SO GLOBEC target species and the overall functioning of the marine food web. Potential topics under this initiative include, but are not limited to:

#### a. Abundance and distribution of target species:

The emphasis in SO GLOBEC is on the factors affecting the distribution and abundance of Antarctic krill and its predators and competitors. This includes top predators, such as seals, seabirds, penguins and whales, as well as other zooplankton and fish. The understanding of abundance and distribution of Antarctic krill and related animals also includes environmental factors, such as local circulation and sea ice. Creation of integrated data sets that can be used for investigation of species-level and population processes and their coupling to the physical structure and variability of the environment is of fundamental importance.

#### b. Processes that contribute to overwintering capability of the target species:

What strategies allow Antarctic krill and other animals (e.g., penguins and seals) to survive during austral winter? What are the roles of sea ice, circulation and other environmental factors in structuring the distribution and abundance of overwintering populations? Are krill available to krill predators throughout the austral winter, or do other prey species become more important? How do krill predators adjust to changes in the distribution and abundance of krill during the austral winter? Are there hotspots in the abundance and distribution of krill? If so, what biophysical features drive the creation of these hotspots? Are higher densities of krill predators associated with krill hotspots? Are there common processes that cause aggregations of krill predators during the austral winter? Answering these and similar questions will require a concerted effort to integrate the results of physical observations, estimates of *in situ* animal abundances, condition and physiological rates,

and the distributions of predators.

## 2. Modeling

The development and use of conceptual and quantitative models to investigate physical, biological, and coupled physical-biological processes have been emphasized throughout all U.S. and International GLOBEC programs. This initiative seeks to expand modeling efforts in the areas of circulation, sea ice dynamics, sea ice biological production, ecosystem (including individual species and populations), and coupled models. Proposals directed at the development of these and other model types (e.g., prognostic and data assimilative) are encouraged. The intent of the modeling component of this solicitation is to 1) improve understanding of the key physical and biological processes that affect the distribution, abundance and productivity of the target species identified by SO GLOBEC; 2) to understand how climate variability modifies these processes; 3) to help integrate and synthesize the various multidisciplinary data sets collected during the U.S. SO GLOBEC field programs and those available from other sources; and (d) to begin coupling the lower and upper trophic level models of the Antarctic ecosystem.

## 3. Comparative Regional Studies

As part of the synthesis activities supported under this solicitation, emphasis will be placed on inter-regional comparisons and coupling of target species populations. This will provide an opportunity to include historical data from other regions, as well as data from other ongoing programs, for investigation and evaluation of environmental influences at a circum-Antarctic scale. Integration and collective analysis of recent and historical data sets from other areas of Antarctic continental shelf waters can be used to evaluate the effects of sea ice, circulation and atmospheric processes on the distribution, abundance and productivity of Antarctic krill and top predator populations at multiple spatial and temporal scales.

In addition to the SO GLOBEC program, the U.S. GLOBEC program includes research programs conducted at sites in the Northwest Atlantic and the Northeast Pacific. Through the International GLOBEC program, SO GLOBEC studies have been undertaken by several nations in various parts of the Antarctic. Also, non-GLOBEC funded, but conceptually related, research programs currently exist in the Antarctic. These related studies provide an opportunity for broader syntheses and comparative analyses that integrate data sets, models and knowledge gained for the west Antarctic Peninsula region with similar information from comparable ecosystems. This solicitation encourages comparative studies of this broader nature to increase the understanding of ecosystem response to changing conditions at a circum-Antarctic scale. Comparative studies might include such topics as inter-region analyses of Antarctic krill or predators with other species having similar (or contrasting) life histories; comparative studies of regional circulation and sea ice; ecosystem responses to climate influences; and regional contrasts of the effects of circulation and sea ice on ecosystem structure and function. Comparative studies can also use physical, biological or coupled models to analyze ecosystem responses to environmental and climate variability in different regions. It is important that proposed comparative studies clearly identify the processes and characteristics of the comparison that will further the understanding of the goals of the SO GLOBEC program. By encouraging proposals that reach beyond the U.S. SO GLOBEC program, this solicitation seeks to point out the increased understanding of processes that may be achieved by extending the proposed activities beyond the geographic region included in the U.S. SO GLOBEC program. These extensions will also begin the broader synthesis activities that are expected to provide the basis for future Southern Ocean research programs.

## 4. Integrative Analysis of the U.S. GLOBEC Programs

Proposals are encouraged that enable synthesis of data and results from the U.S. SO GLOBEC program with those from the U.S. GLOBEC programs that have been undertaken in the Northwest Atlantic and the Northeast Pacific. For example, studies directed at understanding the broader issues related to how transport processes provide connections between regional, local and small scales and how this affects the dynamics of the target species cut across all these programs. Understanding the processes that underlie the functioning of these systems will allow for the design of projects to explore commonalities and differences in these systems, including circulation patterns and dynamics of target populations.

### III. ELIGIBILITY INFORMATION

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The categories of proposers identified in the [Grant Proposal Guide](#) are eligible to submit proposals under this program announcement/solicitation.

### IV. AWARD INFORMATION

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Estimated program budget, number of awards, average award size, and award duration are subject to the availability of funds. The estimated number of awards is 5 -10 for integrated, inter-disciplinary projects that include collaborative projects. The total anticipated funding amount is \$4,000,000, depending on the quality of the proposals and the requested amount for individual awards. Most awards are expected to have a duration of three years.

### V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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#### A. Proposal Preparation Instructions

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##### **Full Proposal Instructions:**

Proposals submitted in response to this program announcement/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/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

The following instructions supplement the GPG guidelines.

Proposal titles should include the prefix "U.S. SO GLOBEC Synthesis and Modeling:" as an identifier. The normal 15-page limit for the project description (including results of prior research) specified in the GPG will be strictly enforced for proposals submitted by one PI and/or one organization. Group or collaborative proposals involving investigators from different organizations should adhere to the specifications outlined in Section II.D.3 of the GPG. PI's wishing to submit collaborative proposals that might exceed the 15-page limitation on the project description should discuss that possibility with the cognizant Program Officer prior to submission. Group or collaborative proposals should include, for each organization and its PIs/CoPIs, a signed cover sheet, budget pages and explanation, results from prior NSF support, biographic sketches (up to two pages per person), current and pending support for each PI/CoPI, and facilities and other resources unique to each organization.

Proposers are reminded to identify the program announcement/solicitation number (05-516) in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

#### B. Budgetary Information

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##### **Cost Sharing:**

Cost sharing is not required in proposals submitted under this Program Solicitation.

#### C. Due Dates

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Proposals must be submitted by the following date(s):

**Full Proposal Target Date(s):**

February 03, 2005

**D. FastLane Requirements**

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Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal 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 announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

*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. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: <http://www.fastlane.nsf.gov>

**VI. PROPOSAL REVIEW INFORMATION**

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**A. NSF Proposal Review Process**

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Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 ([NSB 97-72](#)). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued [Important Notice 127](#), Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.



The two National Science Board approved merit review criteria are listed below (see the [Grant Proposal Guide](#) Chapter III.A for further information). 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 he/she 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 and original 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?

NSF staff 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:**

In addition to the NSB-approved merit review criteria, proposals will be reviewed to insure that they foster integration and synthesis of data collected during the field phase of the U.S. SO GLOBEC program and other relevant data and knowledge (including comparison to results from other Antarctic regions, satellite data, and retrospective data sets), through group interactions and modeling activities. The research proposal should employ an interdisciplinary approach to the relevant data. The proposal's responsiveness to the goals of the SO GLOBEC program, and the integration and synthesis of data collected during the field phase of the U.S. SO GLOBEC program with other relevant data and knowledge will also be considered in the evaluation by a panel of expert scientists.

**B. Review Protocol and Associated Customer Service Standard**

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All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Ad Hoc 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.

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 Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

NSF is striving to be able to tell proposers whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation, or the date of proposal receipt, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

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 Division 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.A. 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 (NSF-GC-1); \* or Federal Demonstration Partnership (FDP) Terms and Conditions \* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

\*These documents may be accessed electronically on NSF's Website at [http://www.nsf.gov/home/grants/grants\\_gac.htm](http://www.nsf.gov/home/grants/grants_gac.htm). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Website at <http://www.gpo.gov>.

### C. Reporting Requirements

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For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

The Director of the Office of Polar Programs has established Guidelines and Award Conditions for OPP Scientific Data.

Principal Investigators of OPP awards should make their data available to all reasonable requests. Where applicable, the Principal Investigators should submit the data collected to designated data centers as soon as possible, but no later than two (2) years after the data are collected. For continuing observations, data inventories should be submitted periodically if and when there is a significant change in location, type or frequency of such observations.

Principal Investigators of OPP-funded awards are REQUIRED to submit to appropriate electronic data directories, a description of their data (i.e., metadata) resulting from OPP-funded research in the form of a Directory Interchange Format (DIF) entry. Submission of the DIF may be at any time during the tenure of the grant. For OPP-supported Antarctic projects, DIF submission should be to the Antarctic Master Directory, via the National Antarctic Data Coordination Center at <http://www-nsidc.colorado.edu/NSF/NADCC>. At the time of submission of the Final Report to NSF, a copy of the DIF must be sent to the cognizant program official in OPP.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. 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. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, 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.

#### VIII. CONTACTS FOR ADDITIONAL INFORMATION

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General inquiries regarding this program should be made to:

- Polly A. Penhale, Biology & Medicine Program Manager, Office of the Director, Office of Polar Programs, 755 S, telephone: (703) 292-8033, fax: (703) 292-9079, email: [ppenhale@nsf.gov](mailto:ppenhale@nsf.gov)
- Marie H. Bundy, Biology & Medicine Associate Program Manager, Office of the Director, Office of Polar Programs, 755 S, telephone: (703) 292-8033, fax: (703) 292-9079, email: [mbundy@nsf.gov](mailto:mbundy@nsf.gov)
- Bernhard Lettau, Ocean & Climate System Program Manager, Office of the Director, Office of Polar Programs, 755 S, telephone: (703) 292-8033, fax: (703) 292-9079, email: [blettau@nsf.gov](mailto:blettau@nsf.gov)

For questions related to the use of FastLane, contact:

- Desiree Marshall, Program Coordination Specialist, Office of the Director, Office of Polar Programs, 755 S, telephone: (703) 292-7433, fax: (703) 292-9079, email: [demarsha@nsf.gov](mailto:demarsha@nsf.gov)

#### IX. OTHER PROGRAMS OF INTEREST

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The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

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daily on the NSF Website at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's [Custom News Service](http://www.nsf.gov/home/cns/start.htm) (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

## Southern Ocean GLOBEC

- U.S. SO GLOBEC Program data and associated documentation: [http://www.ccpo.odu.edu/Research/globec\\_menu.html](http://www.ccpo.odu.edu/Research/globec_menu.html)
- The U.S. GLOBEC Data Policy (U.S. GLOBEC Report 10): <http://www.usglobec.org/reports/datapol/datapol.contents.html>

GLOBEC and Southern Ocean GLOBEC reports and documents are available at the following web sites:

- Southern Ocean GLOBEC: [http://www.ccpo.odu.edu/Research/globec\\_menu.html](http://www.ccpo.odu.edu/Research/globec_menu.html)
- U.S. GLOBEC: <http://www.usglobec.org/>
- GLOBEC International planning office: <http://www.pml.ac.uk/globec/>

## International Polar Year

For information concerning U.S. planning, see

<http://dels.nas.edu/us-ipy/>

For information about the international planning process, please see

<http://www.ipy.org>

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