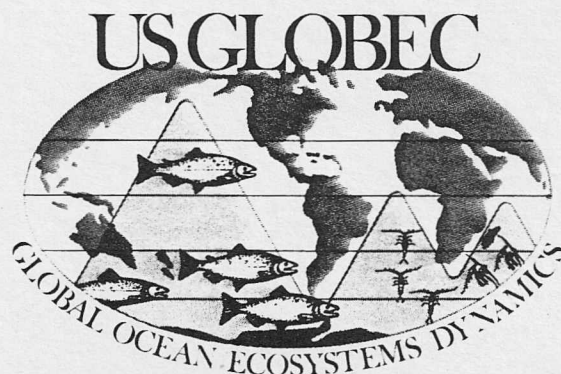


THE U.S. GLOBAL OCEAN ECOSYSTEMS DYNAMICS PROGRAM

NORTHWEST ATLANTIC FIELD STUDIES, PHASE 2

Announcement of Opportunity

Deadline: 15 January 1996



NATIONAL SCIENCE FOUNDATION
Directorate for Geosciences, Division of Ocean Sciences

and



NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Coastal Ocean Program and National Marine Fisheries Service

INTRODUCTION

The Division of Ocean Sciences of the National Science Foundation (NSF), and the Coastal Ocean Program and National Marine Fisheries Service of the National Oceanic and Atmospheric Administration (NOAA) announce an opportunity for ecosystem dynamics studies in the Northwest Atlantic on Georges Bank and surrounding regions as part of the U.S. *Global Ocean Ecosystems Dynamics (U.S. GLOBEC)* research program. This announcement solicits proposals for field observation and process studies commencing in 1997, for modeling investigations, and for retrospective data analysis, as described below and in planning documents of the U.S. GLOBEC program. This is the second in a sequence of announcements for U.S. GLOBEC studies in the Northwest Atlantic, a program which began in 1993.

The deadline for proposals is Monday, 15 January 1996. Contingent on the availability of funds and facilities, final decisions on awards will be made by 1 July 1996. Funding of individual proposals may be provided by NSF and/or NOAA.

DESCRIPTION

U.S. GLOBEC Background: The primary objective of the U.S. GLOBEC Program is to understand how climate variability affects the distribution, abundance, production and population dynamics of zooplankton and fish populations in the sea. The approach is to develop a fundamental understanding of how physical and biological processes interact to control the population dynamics of marine animals, with a focus on those animals that spend all or some of their lives as plankton. U.S. GLOBEC is the U.S. component of the international GLOBEC program sponsored by the Scientific Committee on Oceanic Research (SCOR) of the International Council of Scientific Unions and by the Intergovernmental Oceanographic Commission (IOC) of UNESCO. The U.S. GLOBEC studies in the Northwest Atlantic/Georges Bank region are integral parts of the pan-North Atlantic Cod and Climate Change Program sponsored by the International Council for the Exploration of the Sea (ICES).

The overall objectives of the U.S. GLOBEC Program have been articulated by the U.S. GLOBEC Scientific Steering Committee (SSC) in the U.S. GLOBEC Initial Science Plan (available as U.S. GLOBEC report no.1, February 1991) and Global Ocean Ecosystems Dynamics and Climate Change: A Long Range Science Plan 1995-2005 (report no.12, April 1995). Prospective investigators who intend to respond to this Announcement of Opportunity should obtain a copy of the Implementation Plan for U.S. GLOBEC, NW Atlantic/Georges Bank, (report no.6, June 1992). Important details on research objectives and hypotheses to be tested during Phase Two of the program are given in that report. These details are NOT repeated in this Announcement of Opportunity. As background, (1) a brief description of Phase One activities can be found in the U.S. GLOBEC Newsletter, No. 4., and (2) U.S. GLOBEC report no. 2, February 1991, "GLOBEC: Northwest Atlantic Program, GLOBEC U.S./Canada Meeting on Northwest Atlantic Fisheries and Climate." All of the above-mentioned reports and the newsletter are available from the U.S. GLOBEC Office, Department of Integrative Biology, University of California, Berkeley, CA 94720-3140. Most are also available on the U.S. GLOBEC home page on the World-Wide Web at <http://www.usglobec.berkeley.edu/usglobec/globec.homepage.html>

Additional Guidance: This opportunity is open to all interested, qualified and eligible researchers irrespective of whether they have been previously involved in the U.S. GLOBEC, NW Atlantic/Georges Bank program. NSF and NOAA encourage the submission of multiple/competitive proposals for the components

of the Phase Two program of research. To facilitate access by all prospective investigators to the information derived from Phase One, the U.S. GLOBEC Program Managers have asked that all presently funded PIs make available a summary of the status of their present work and findings. Summaries of the objectives, methods, and key findings (to date) of the currently funded projects are available on the U.S. GLOBEC Georges Bank Program's World-Wide Web homepage: <http://globec.whoi.edu> and on the U.S. GLOBEC homepage listed above. Also available on the Georges Bank homepage is the text of all cruise reports from the efforts during winter/spring 1995. If you are unable to access any of this information, either call or send an e-mail message to Dr. Bob Groman (508-457-2000; groman@whoi.edu) or Dr. Phil Taylor (703-306-1587; prtaylor@nsf.gov).

Northwest Atlantic Project Description and Rationale:

The Georges Bank region was selected by the U.S. GLOBEC Program because (1) ecosystems in and around Georges Bank are thought to be highly sensitive to climatic variability as the Bank is situated in a faunal, climatic and oceanic boundary region; (2) physical transport processes in the Georges Bank region are predicted to be more heavily impacted by climatic variation than other areas in the North Atlantic Ocean; (3) primary and secondary production on Georges Bank has supported a commercially valuable fishery; and (4) Georges Bank is of sufficient size, with a physical circulation pattern enabling distinct, and trackable populations to develop and persist for long periods, making them amenable for time-series studies.

The Georges Bank ecosystem has recently undergone significant perturbations. Many of the traditional fisheries have collapsed, with a shift in biomass and production to other fish species. There have been changes in fish predator-prey interactions as well, an issue being addressed by a NOAA Coastal Ocean Program (COP) study. Management plans have been initiated to limit fishing and to rebuild the groundfish stocks. Knowledge of the physical and biological processes acting at the present time will contribute to a better understanding of changes in the fish stocks during recovery. On-going monitoring, process research, modeling and retrospective analyses of past conditions will contribute to an assessment of when commercially-important stocks will recover. Information produced by these studies will lead to more effective advice to fishery management councils to help guide the recovery process.

U.S. GLOBEC research will continue to focus on target species chosen to represent key elements of the planktonic assemblages on Georges Bank and surrounding regions. These are the pelagic eggs, larvae and juvenile stages of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*) and the copepods, *Calanus finmarchicus* and *Pseudocalanus* spp.

Observational evidence suggests that five physical processes are of greatest importance to biological activities on the Bank: advection, turbulent mixing, stratification, frontal exchange, and bottom boundary layer phenomena. Hypotheses concerning the linkages between these physical processes and the population dynamics of target species are listed in US GLOBEC Report No. 6, pages 23 and 24; the appropriate one(s) should be addressed in your proposals. In testing the hypotheses related to Phase Two of this program (i.e., source, retention, and loss of water and animals to/from the Bank), four activities and objectives must be addressed:

- quantification of the abundances of target species in time and space on Georges Bank over the winter/spring period;
- measurement of the vital rates of target species as they relate to population dynamics;

- quantification of rates of physical exchanges of water and biota across the boundaries of the Bank; and
- determination of how physical exchange processes and vertical migration behavior influence retention/loss of planktonic animals on the Bank.

The Structure of the Research Program: The U.S. GLOBEC Northwest Atlantic/Georges Bank research program comprises four major components: broad-scale field survey and observation studies; process-oriented field studies; modeling investigations; and retrospective analyses. Research conducted during Phase Two will continue to follow this four-pronged approach.

Broad-Scale Studies. The broad scale studies include ship-board surveys, multi-disciplinary moorings, and analysis of satellite data. Ship-board studies help to determine the distribution and abundance of the target organisms in relation to their physical environment. In addition, there is a continuing need for long-term mooring-based observations and interpretation of regional satellite data. The fundamental objective of the broad-scale studies is to provide the basis for interannual comparison of the population processes and their coupling to the physical structure and variability of the environment.

Process Studies. Process studies are nested within the broad-scale observations to investigate specific biological and physical processes. The focus in 1995 was on the influence of water column stratification on vital rates of the target species. The focus in 1997 will be on processes associated with source, retention, and loss of water and organisms, and on how these processes effect the population dynamics of target species on the Bank (See U.S. GLOBEC Report 6, pages 36-39 for details). Close cooperation and interaction between the broad-scale and process components of the program is essential.

Modeling. Modeling investigators are expected to participate in the formulation and interpretation of the field studies, and provide the context for integration of the results. Modeling studies to date have focused on the development of 3-D models of the flow field of the Georges Bank and the surrounding regions, and linkages to the population dynamics of target species. In addition to site-specific modeling, there is a vital need for modeling which is more regional in scope. Thus, proposals for modeling studies that include the influence of remote physical forcing on Georges Bank and adjacent seas are strongly encouraged (e.g., projects that consider the forcing of Georges Bank dynamics by the Gulf Stream or Labrador Current, or forcing processes that operate over the entire Northwest Atlantic basin). Further, modeling efforts that incorporate details of realistic biological/physical interaction and that allow for data assimilation are encouraged.

Retrospective Analyses. Retrospective studies of existing data are a useful means of investigating the biological and physical consequences of climatic variation. Previous studies have included processing of archived samples and interpretation of existing data sets. Future retrospective analyses are encouraged that will allow integration, coordination, and comparison of Georges Bank data with those from other North Atlantic regions.

PREPARATION AND SUBMISSION OF PROPOSALS

PROPOSAL FORMAT

Proposals should be clearly identified by a title starting with the acronym "U.S. GLOBEC." Proposals submitted in response to this Announcement of Opportunity should be prepared and submitted in accordance with the guidelines provided in the NSF

brochure, *Grant Proposal Guide* (GPG) NSF 95-27. Single copies of this brochure are available at no cost from the Forms and Publications Unit, phone (703) 306-1130, or via e-mail from pubs@nsf.gov (Internet). Proposals will be subjected to initial screening for the requirements in the GPG and will be returned without review or advance notification if deficiencies are found. Proposals will *NOT* be forwarded to other Programs if found to be inappropriate for this competition.

PROPOSAL SUBMISSION

All proposals involving Federal and/or academic scientists must be submitted to the address below. Federal scientists will be eligible for funding by NOAA but not NSF. **Proposals must be received by 15 January 1996;** proposals received after the deadline will be returned to the sender un-reviewed.

Prospective investigators are strongly encouraged to include a brief discussion of how their proposed programs may lend added value to work funded during Phase One of this program. Prospective investigators should provide in their proposals a full scientific justification for the research and not simply reiterate justifications laid out in the implementation plan. In addition, it would be helpful if a brief statement is included as to how your proposed efforts may be coordinated with efforts of other potential investigators. Because of the page limitation (GPG, page 5, Project Description), individual proposals with overly complex structure and large numbers of investigators are discouraged. Proposal should be written to allow adequate review of the details of such things as goals and objectives, conceptual framework, methodological approaches, integration with other likely projects and synthesis.

For reasons of program planning and development, investigators intending to submit proposals in response to this announcement are requested to send by 20 January 1996 a brief (1-2 page) statement of scope to Dr. Thomas Powell, Chair, U.S. GLOBEC Scientific Steering Committee (Department of Integrative Biology, University of California, Berkeley, CA 94720; phone 510-643-0877; fax: 510-643-1142; Internet: zackp@violet.berkeley.edu).

An original and twenty copies of the proposal should be sent directly to:

**Announcement number (NSF 95-143)
Biological Oceanography Program
Division of Ocean Sciences
National Sciences Foundation
4201 Wilson Blvd., Suite 725
Arlington, VA 22230**

Proposals may also be submitted electronically. For information, contact the Electronic Proposal Submission Program Director, Division of Information Systems, phone (703) 306-0214, or via e-mail, eps@nsf.gov (Internet).

If you have any questions or require further information, contact Dr. Phillip Taylor, Division of Ocean Sciences/NSF, (703) 306-1587, or Mike Dowgiallo, NOAA Coastal Ocean Program, (301) 713-3338.

PROPOSAL REVIEW

The review and support for the U.S. GLOBEC program will be handled cooperatively by NSF and NOAA. Proposals will be reviewed in accordance with established NSF and NOAA procedures for external merit review and the four general criteria described in the *Grant Proposal Guide*. Intrinsic merit of the research, technical soundness and utility, responsiveness of the stated goals of the U.S. GLOBEC Northwest Atlantic program,

and complementarity with other research projects will be considered in the evaluation by panel(s) of expert scientists.

All funded participants of the U.S. GLOBEC program are required to abide by the U.S. GLOBEC data policy (see U.S. GLOBEC report no. 10 on the U.S. GLOBEC home page) and the policies applying to recipients of federal funding in ocean sciences.

The National Science Foundation (NSF) and the National Oceanic and Atmospheric Administration (NOAA) provide awards for research in the sciences and engineering. The awardee is wholly responsible for the conduct of such research and preparation of the results for publication. The NSF and NOAA, therefore, do not assume responsibility for such findings or their interpretation. The NSF and NOAA welcome proposals on behalf of all qualified scientists and engineers, and strongly encourage women, minorities, and persons with disabilities to compete fully in any of the research and research-related programs described in this document.

In accordance with Federal statutes and regulations, and NSF and NOAA policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from the NSF and NOAA. Facilitation Awards for Scientists and Engineers with Disabilities provides funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on an NSF project. Contact the program coordinator in the Directorate for Education and Human Resources. The telephone number is (703) 306-1636. The Foundation has TDD (Telephonic Device for the Deaf) capability, which enables individuals with hearing impairment to communicate with the NSF Information Center about NSF

programs, employment, or general information. The telephone number is (703) 306-0090.

PRIVACY ACT AND PUBLIC BURDEN

Privacy Act and Public Burden Statements

The information requested on proposal forms is solicited under the authority of the National Science Foundation Act of 1950, as amended. It will be used in connection with the selection of qualified proposals and may be disclosed to qualified reviewers and staff assistants as part of the review process; to applicant institutions/grantees to provide or obtain data regarding the application review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers as necessary to complete assigned work; and to other government agencies in order to coordinate programs. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 60 Federal Register 4449 (January 23, 1995), and NSF-51, "Reviewer/Proposal File and Associated Records," 59 Federal Register 8031 (February 17, 1994). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of your receiving an award.

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 this burden estimate or any other aspect of this collection of information including suggestions for reducing this burden, to:

Herman G. Fleming
Reports Clearance Officer
Contracts, Policy and Oversight
National Science Foundation
Arlington, VA 22230

This program is described in the Catalog of Federal Domestic Assistance category 47.050.

NATIONAL SCIENCE FOUNDATION

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