

THE U. S. GLOBAL OCEAN ECOSYSTEMS DYNAMICS PROGRAM

and

THE COASTAL OCEAN PROCESSES PROGRAM

**The Northeast Pacific Study: Co-ordinated Coastal Research
Phase I: Modeling, Retrospective Analysis and Pilot Observing
Projects**

Announcement of Opportunity

Deadline: *14 February 1997*

US GLOBEC Logo

CoOP Logo

NSF Logo

NATIONAL SCIENCE FOUNDATION
Directorate for Geosciences, Division of Ocean Sciences

NOAA Logo

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

INTRODUCTION

Research activities in the coastal Northeast Pacific Ocean are supported by a number of organizations including the National Science Foundation's (NSF) Division of Ocean Sciences (OCE) and the National Oceanic and Atmospheric Administration's (NOAA) Coastal Ocean Program (COP) and National Marine Fisheries Service (NMFS). NSF/OCE generally supports research projects focused on basic oceanographic and ecological processes and the study of natural systems. A component of NOAA's COP focus is directed towards developing tools and capabilities to improve ecosystem management. Environmental and resources management decisions are most appropriately based on knowledge gained from both basic and applied research.

This Announcement of Opportunity is under the auspices of the Global Ocean Ecosystems Dynamics (U. S. GLOBEC) and Coastal Ocean Processes (CoOP) programs within NSF/OCE, and the regional ecosystem studies and U. S. GLOBEC initiatives of NOAA's COP. An opportunity exists for U.S. scientists to propose **modeling, retrospective analysis, and pilot monitoring** projects that address the broad intersection of basic and applied research interests of NSF/OCE and NOAA/COP in the above programs and as described below. The U.S. GLOBEC and CoOP plans envision the larger Northeast Pacific/West Coast of North America program proceeding in stages. The present Announcement of Opportunity addresses three initial activities: modeling, retrospective studies, and a modest pilot observational program. Subsequent announcements, contingent upon the availability of funds, will be directed toward detailed process studies and extended monitoring efforts and will be formulated using the results of the initial studies carried out under the present Announcement.

The anticipated funding for the initial activities in the Northeast Pacific Study: Co-ordinated Coastal Research Program is approximately \$2.5M per year, for up to three years. The agencies anticipate making up to 20 awards. The deadline for proposals is **14 February 1997**. Preliminary decisions on which projects will be recommended for awards will be made by 1 July 1997. Awards will start either 1 August or 15 October 1997.

DESCRIPTION

Coastal Ocean Processes (CoOP) is an inter-disciplinary program with goals to obtain a quantitative understanding of the processes that control the transport, transformation and fate of biological, geological and chemical material on the continental margins. CoOP's goal in studying the California Current System of the Northeast Pacific is to understand the processes which contribute to cross-shelf transport processes where the circulation is strongly wind-driven. While all continental shelves experience some wind-driven transport, the along-shore wind is the dominant forcing agent along much of the U. S. west coast.

Global Ocean Ecosystems Dynamics (U. S. GLOBEC) is a component of the U.S. Global Change Research Program, with the goals of understanding and ultimately predicting how populations of marine animal species (holozooplankton, fish and benthic invertebrates) respond to natural and anthropogenic changes in global climate. There is a close connection between the ecosystem dynamics in both gyres in the northeast Pacific Ocean - the California Current System (CCS) and the Coastal Gulf of Alaska (CGOA). Changes in these two systems are linked to climatic changes in basin-scale oceanic and atmospheric circulation patterns. This linkage makes the northeast Pacific Ocean an important region in which to pursue U.S. GLOBEC goals. The rich historical data sets available in the northeast Pacific help make it possible to accomplish these goals with respect to processes which occur over longer time scales.

The research community has produced, through CoOP and U. S. GLOBEC, science plans which describe program goals and approaches. These are available from the respective program offices (see below). The planning assumption unifying both programs is that a series of inter-disciplinary process and modeling studies will provide significant new information to advance our understanding of oceanic processes along the northeast margins of the Pacific Ocean. This increased understanding will have applicability to environmental impact and resource management issues.

A CoOP community workshop report entitled "Coastal Ocean Processes: Wind-Driven Transport Process on the U.S. West Coast" defines areas for study that would lead to better quantitative understanding of the processes that dominate the transport, transformations, and fates of biologically, chemically, and geologically important matter in a strongly wind-driven system. Copies of the workshop

report (CoOP Report No. 4, see References for all report titles) are available from the following address or the CoOP homepage:

The CoOP Office

Horn Point Laboratory
University of Maryland
P.O. Box 775
Cambridge, MD 21613-0775
Phone: 410-221-8416; Fax: 410-221-8490
Internet: hawkey@hpel.umd.edu
<http://www.coop.hpel.cees.edu>.

The U.S. GLOBEC Northeast Pacific Implementation Plan (U. S. GLOBEC Report No. 17) is based on U.S. GLOBEC documents resulting from several community-wide meetings where U.S. scientists from the oceanographic and fisheries communities specified key scientific issues and research prospectuses for the eastern Pacific. For the California Current System, these are U.S. GLOBEC Report No. 7 and U.S. GLOBEC Report No. 11. For the coastal Gulf of Alaska, the relevant reports are U.S. GLOBEC Report No. 15 and U.S. GLOBEC Report No. 16. Copies of these documents are available from the following address or homepage:

The U.S. GLOBEC Coordinating Office

Department of Integrative Biology
University of California
Berkeley, CA 94720-3140
Phone: 510-643-0877; Fax: 510-643-1142
Internet: kaygold@uclink4.berkeley.edu
<http://www.usglobec.berkeley.edu/usglobec/globec.ho>
[mepage.html](http://www.usglobec.berkeley.edu/usglobec/globec.ho).

THE COASTAL NORTHEAST PACIFIC.

The effect of strong along-shore wind in driving the coastal currents and the resulting cross-shelf transport in the surface and bottom boundary layers is of first order importance in determining the cross-margin transport along the U.S. West Coast. Along-shore winds blowing towards the equator force near-surface waters offshore. In turn, deeper waters are drawn onshore and upward, bringing cold, nutrient rich waters to the surface. High nutrient levels result in enhanced primary production which in turn fuels the entire ecosystem. Current fluctuations are driven by the wind, either locally, or at a distance through a mechanism of waves being trap by the coast. Strong onshore-offshore transport can result in short residence times over the shelf (days). Despite such short residence times, wind-driven systems such as occur in the Northeast Pacific show pronounced, persistent biological zonations that are not understood in terms of how they continue to exist within the dynamic physical setting.

Strongly correlated signals exist in physical and biological variables along the eastern boundaries of the subarctic and subtropical gyres in the northeast Pacific Ocean -- the currents of the CGOA and the CCS. These signals vary over a wide range of time scales (from seasonal to interdecadal). Tide gauge and altimeter data suggest that the strengths of the boundary currents in these gyres covary out of phase on annual and interannual time scales (the equatorward CCS strengthens, while the poleward and westward current in the CGOA weakens, and vice versa). On interdecadal time scales, there are data suggesting that zooplankton and salmon covary out of phase in the two boundary currents. The interdecadal fluctuations of these populations, and others, coincide with basin-scale physical changes in atmospheric forcing and surface ocean conditions (temperature, mixed-layer depth), although the mechanisms responsible for the coupled variability are not known.

THE CO-ORDINATED RESEARCH PROGRAM

The recommendations contained in the U.S. GLOBEC Northeast Pacific Implementation Plan and the CoOP report on Wind-Driven Transport on the U.S. West Coast present the rationale for a co-ordinated study in the Northeast Pacific along the west coast of North America. The Northeast Pacific Study is not restricted to the continental margin and shelf, but encompasses the larger oceanic boundary region and the processes and phenomena that effect the coastal ocean. The initial phases of this cooperative, inter-agency research program will support integrated, multi-investigator, inter-disciplinary programs of modeling, retrospective analysis, and monitoring studies of a pilot nature; process studies will be supported in the future. The pilot monitoring and retrospective studies are primarily directed to goals of the U.S. GLOBEC program, while the modeling and process studies address the goals of the CoOP, U.S. GLOBEC, and the NOAA/COP program. This co-ordinated effort has the overall goal of improving predictability and management of U.S. marine resources through understanding of the Northeast Pacific ecosystem.

A. Research Program Goals

Within the overall goal outlined above, this co-ordinated Northeast Pacific Program has three general goals:

* To understand the effects of climate variability and climate change on the distribution, abundance and production of marine animals (including salmon and

other commercially important living marine resources) in the eastern North Pacific.

- * To determine the processes that control the cross-margin (inshore to offshore) transport of biological, chemical, and geological materials in a strongly wind-driven system.

- * To embody this understanding in diagnostic and prognostic models, capable of elucidating ecosystem dynamics and responses on a range of time scales, including major climatic fluctuations.

The specific objectives and scientific questions related to these goals are described in greater detail in CoOP Report No. 4 and U.S. GLOBEC Report No. 17. These reports should be consulted in responding to this Announcement.

B. Research Approach

The U.S. GLOBEC emphasis in the Northeast Pacific Program will be on: 1) the effects of past and present climate variability on the population ecology and population dynamics of salmon and zooplankton within the ecosystem of the Northeast Pacific coastal ocean, and 2) the use of this information as a proxy for how these ecosystems may respond to future global climate change. The program will use the strong temporal variability in the physical and biological signals to examine the mechanisms through which zooplankton and salmon populations respond to physical forcing, and biological interactions in the northeast margins of the subarctic and subtropical gyres. Annual and interannual variability will be studied directly through monitoring activities (over a 5-7 year period) and detailed process studies (over a 5 year period); variability at longer time scales will be examined through retrospective analysis of directly measured and proxy data. Coupled bio-physical models of the ecosystems of these regions will be developed and tested using the process studies and data collected from the monitoring programs. The models will also be tested by hindcasting retrospectively analyzed time series.

CoOP interests involve modeling and intensive process studies in two regions over a five year period. Although the along-shore coastal winds are the dominant forcing from the northwest tip of Washington (48°N) to Point Conception (35°N) in southern California, there is a significant difference north and south of about 40°N. During summer, the along-shore winds are strongly favorable for coastal upwelling but are more variable north of about 40°N. During winter, low pressure systems from the Gulf of Alaska cause a strong northward component in the coastal winds and downwelling along the coast of

Oregon and Washington, while upwelling generally continues intermittently south of San Francisco (37°N), interrupted by occasional winter storms. These differences in forcing and response form a natural laboratory within which processes responsible for wind-driven cross-shelf transport can be studied intensively and incorporated into theoretical, numerical and laboratory models of these systems. The wide range of conditions within the CCS have led to a recommendation that parallel studies north and south of about 40°N be made. Possible locations are central Oregon and northern California. The logistical proximity, the historical oceanographic data, and the relative environmental simplicity of these regions (lack of major riverine, topographic, or tidal effects) makes them especially attractive for a study of wind-driven processes affecting cross-margin transport.

1. Modeling.

Planning activities for the co-ordinated Northeast Pacific Study (U.S. GLOBEC Report No. 11; U.S. GLOBEC Report No. 15; and CoOP Report No. 4.) have identified modeling efforts that are needed to help plan field studies. These reports, as well as the U.S. GLOBEC Northeast Pacific Implementation Plan (U.S. GLOBEC Report No. 17), should be consulted by investigators intending to address items contained in this Announcement. Those model types are:

- * Basin-scale, general circulation modeling with higher-resolution, nested coastal components (that could include coupled biological-physical elements). A link to entire North Pacific simulations that are coupled to large scale atmospheric models are desirable, especially for hindcasting studies.

- * High resolution models of physical processes that govern cross-shelf transport in both upwelling and downwelling regimes with the objective of providing assistance in the design of field studies and the dynamical interpretation of field measurements. Such models might include:

- * Models of physical processes that govern behavior of the coastal upwelling front.

- * Formulations addressing cross-shelf exchange processes over the inner shelf (depth approximately < 30 m), especially the role of topographic irregularities for governing horizontal and vertical transport.

- * Coupled atmosphere-coastal ocean models that address small-scale spatial variability of winds, atmospheric and oceanic boundary layer depths.

* Simulations of the transport and distribution of biological and chemical properties as a result of physical processes. These should be linked with physical model development. Furthermore, they should provide results useful for designing the field program. Such models might include:

* Regional-scale, coupled biological-physical models. These might seek to assimilate available observations resolving the exchange of water and organisms between the coastal shelf and deeper oceanic waters.

* Mesoscale, coupled biological-physical formulations. Models of this type should aim to resolve fronts, include mixed-layer dynamics, and operate over diurnal time scales. In general, they should incorporate coastal transport processes and detailed biology, including food web relations and organism behavior.

* Modeling efforts that investigate the response of biological metapopulations (and spatially structured populations) to spatially and temporally varying physical forcing.

* Models of the processes that regulate solute and particulate exchange between the benthic boundary layer and the seafloor, emphasizing those aspects that influence cross- shelf transport.

* Comparisons that relate field measurements to model predictions, including the development of new techniques where necessary, with the goal of incorporating the results of such comparisons into improved models. This includes, but is not limited to coupled physical/biological models in which biological, as well as physical, data is assimilated into improved predictive schemes.

Several relevant and challenging lines of investigation cut across these model types. These include:

- the functional details of how to parameterize individual interactions between organisms (e.g., predator-prey);
- how to embed a regional model of coupled biological-physical processes within a basin-scale circulation model, or a mesoscale formulation within a regional model;
- the identification of which complex problems, especially coupled physical-chemical, or physical-biological problems, might best be attacked by idealized process models (or models in idealized domains);

- the specification of boundary conditions, particularly along open boundary segments; and
- the assimilation of physical, biological, chemical and sediment transport data into models of all kinds.

To meet the general goals of the U.S. GLOBEC Northeast Pacific program, the models can focus on a broad suite of species and issues. However, the construction of coupled physical-biological models that are most relevant to the effects of climate change on North Pacific coastal ecosystems are the ultimate objective of the program. Modeling studies may be developed with a focus on species targeted for the process studies (Table 3, U.S. GLOBEC Northeast Pacific Implementation Plan, U.S. GLOBEC Report No. 17) or other non-targeted species, which could be sampled in the monitoring or analyzed in retrospective studies (Table 4, same document).

U.S. GLOBEC and CoOP planning has proceeded with the intent that early model results will be used in planning the field programs in the coastal Northeast Pacific. Accordingly, proposals **MUST** contain a section specifically addressing the procedures and timing of the transfer of results from models to potential investigators for the field programs. This can be done through a variety of activities: open meetings; publications; or homepages. The most critical element in such a transfer of model results is timeliness; the communication of such results **MUST** come early in the planning stages of the field observation activities (see the timetables proposed in U.S. GLOBEC Report No. 17 and CoOP Report No. 4. This may require presentations at planning meetings, reports, etc., in advance of modeling results appearing in archival publications.

Finally, proposers must include a section where they explain how their proposal fits the requirements of this Announcement, and either U.S. GLOBEC Report No. 17 or CoOP Report No. 4.

2. Retrospective Analysis.

To augment the new data that will be collected during early monitoring and later process-study components of the U.S. GLOBEC Northeast Pacific study, existing data should be more thoroughly examined. Proposed retrospective analysis projects should address the documentation of natural variability in the ecosystems of the Northeast Pacific, the examination of linkages between processes occurring at different time scales, and the design of possible monitoring and process study observational programs. Examples of such projects might involve (but are not limited to):

* Widely-used existing data sets, such as the CalCOFI and COADS data, that have not been fully exploited for the understanding of ecosystem processes.

* Records of fish scale and microscopic organism abundances from layered anaerobic sediments. Some of these records extend into the past for thousands of years, with time resolution of a few years.

* Records of growth recorded in fish scales and otoliths. For salmon in particular, scales have been collected from fish for over 50 years. Those scale data could be used to examine how growth may have varied through time, perhaps in response to large-scale shifts in climate and ocean conditions.

* Use of archival collections to determine the genetic composition of fish and invertebrate populations. Archived scales, otoliths and zooplankton samples could provide sources of DNA to examine spatial and temporal patterns of genetic differentiation in the northeast Pacific.

Potential proposers are directed to prior U.S. GLOBEC reports (see esp. U.S. GLOBEC Report No. 11, and U.S. GLOBEC Report No. 15) that review the types of data sets available for retrospective examination of the links between climate, ocean physics and marine animal populations. Those sets include: 1) repetitive observations from satellites; 2) time-series of point and gridded instrumental observations; 3) ocean surveys of *in-situ* biophysical data; 4) historical records of animal population changes; and 5) time series reconstructed from paleoecological data contained within marine sediments.

3. Pilot Monitoring.

The U. S. GLOBEC and CoOP reports suggest that a new, augmented set of long-term measurements is needed in the Northeast Pacific. These observations are required to interpret spatial variability along latitudinal gradients and temporal variability at all scales, (i.e., resolve event, seasonal, and interannual time scales). Such monitoring should be done near each of the major process study sites -- these are likely to be the regions off central Oregon, northern or central California, and the coastal Gulf of Alaska. Methods should be standardized to permit comparison among regions and over time. These measurements should permit the following three specific objectives to be accomplished.

- The data collected should allow an assessment of the relationship between the period of each process study, the entire 5-7 year Northeast Pacific study, and the phases of the basin-wide ENSO signal.

- Local forcing and biological, chemical and physical responses should be defined well enough by the measurements to help separate local and distant forcing.

- The data collections should be designed to allow investigators to distinguish anthropogenic climate impacts from natural variability, if such a distinction is possible.

Accordingly, the monitoring designs might require coordination with the retrospective analysis activity. Thus, sites chosen should have historical records that are as complete as possible.

Long-term monitoring will provide a link between the intensive, process-oriented studies from the CGOA and CCS sites, and the larger-scale, longer period climate variations. Due to the large spatial scale, and advective nature of west coast systems, regular occupation of a few selected onshore-offshore transect lines will be the foundation for monitoring ocean conditions and variability along the west coast. Satellite sensing and moored instrumentation are excellent tools for some observations, but many biological quantities require ship sampling. Quarterly or bimonthly sampling with large oceanographic vessels to 100-200 km offshore will be supplemented by more frequent sampling (perhaps monthly, or more frequently during critical times [e.g. spring bloom; spawning events; juvenile salmon migration]) of the nearshore end (out to perhaps 20-25 km) of these transects by smaller vessels. Frequent cruises on established lines will be needed for: 1) calibrating indirect measures from remote-instrumentation; 2) sampling ecosystem components directly, (e.g., zooplankton abundance and species composition, as well as salmonid juveniles and their competitors and predators, that cannot be collected remotely); and 3) relating the biological and physical observations from moorings to larger regions.

It is recommended that biological and physical observations be obtained at the basin (gyre) scale and incorporated into the data sets collected along the transect lines. Such large-scale observations may involve a substantial commitment to remotely-sensed information. This will enable the connection to be made between the large scale forcing and the regional process studies in the CGOA and CCS. These observations of the circulation and biology of the gyre are critical in connecting the CGOA to basin-scale forcing, the CCS to basin-scale forcing, and comparing the responses of the CGOA and CCS.

The initial monitoring effort should be a relatively modest pilot study. Despite the modest level of anticipated activity, the plans for the coastal Northeast Pacific Study envision at least two pilot

monitoring lines: one north of the west- wind drift (CGOA), and one south of the west-wind drift (CCS). A detailed discussion of the proposed monitoring program appears in U.S. GLOBEC Report No. 17. Potential proposers are especially advised to consider Tables 5 and 6. These tables describe the minimum set of core measurements that would constitute an acceptable pilot monitoring program. Potential investigators are encouraged to propose ancillary measurements, in addition to the minimal set, that can be readily collected in an efficient and cost- effective fashion. The value of such ancillary data will be an additional criterion upon which pilot monitoring proposals will be evaluated. Efforts to cross-reference monitored quantities to other measurement efforts, past or present, will also be considered in evaluating pilot monitoring proposals.

Where feasible, monitoring data should be made available in real time, so that opportunistic studies can be conducted within a known physical and biological context. Further, consideration of the statistical power of the monitoring program (including some measure of the statistical properties of estimators derived from the monitored quantities) is advised.

PROPOSAL FORMAT

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, or the NSF homepage (<http://www.nsf.gov/>) 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 submitted in response to this Announcement of Opportunity must be received by 14 February 1997 and be identified by entering "CoOP-GLOBEC Northeast Pacific **NSF 97-25**" in the Program Announcement block of the cover page. Proposals received after the deadline will be returned to the sender without review.

Prospective investigators should provide in their proposals a full scientific justification for the research and not simply reiterate justifications laid out in the implementation plans. In addition, it would be helpful if a brief statement is included as to how proposed efforts may be co-ordinated with efforts of other potential investigators. Because of page limitations (GPG, page 5, Project Description), individual proposals with overly complex structure and large numbers of investigators are discouraged. Proposals 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.

An original and 20 copies of the proposals should be sent to:

Announcement Number (**NSF 97-25**)
Biological Oceanography Program
Division of Ocean Sciences
National Science Foundation
4201 Wilson Blvd., Room 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 questions or require further information, contact H. Lawrence Clark or Phil Taylor NSF Division of Ocean Sciences: 703- 306-1584 (e-mail: hclark@nsf.gov, prtaylor@nsf.gov), Judy Gray, NOAA Coastal Ocean Office, 301-713-3338, (e-mail: jgray@cop.noaa.gov).

PROPOSAL REVIEW

Review of proposals and support of the CoOP/U. S. GLOBEC Northeast Pacific program will be handled cooperatively by NSF and NOAA. Proposals will be evaluated based on the four general criteria described in the NSF Grant Proposal Guide and in accordance with established NSF and NOAA procedures for external merit review. The proposal's responsiveness to the stated goals of the CoOP and U. S. GLOBEC programs at NSF/OCE and the regional ecosystem studies and U. S. GLOBEC initiatives at the NOAA Coastal Ocean Program, and the degree to which the proposed project complements other proposed and ongoing research projects will also be considered in the evaluation by panel(s) of expert scientists.

Proposals should include plans for the documentation, archiving, and dissemination of CoOP/U. S. GLOBEC research data. All funded participants must adhere to data management policies applying to recipients of federal funding in geosciences. The CoOP and U.S. GLOBEC Data Policies are available through the respective offices and homepages. Following the review process, Federal scientists and others who are selected to receive funding from NOAA, may be required to submit additional forms and paperwork required by NOAA.

REFERENCES

CoOP report No. 4, 1994. Wind-driven Transport Processes on the U.S. West Coast.

U.S. GLOBEC Report No. 7, 1992. Eastern Boundary Current Program: Report on Climate Change and the California Current Ecosystem.

U.S. GLOBEC Report No. 11, 1994. Eastern Boundary Current Program: a Science Plan for the California Current.

U.S. GLOBEC Report No. 15, 1996a. Report on Climate Change and Carrying Capacity of the North Pacific Ecosystem.

U.S. GLOBEC Report No. 16, 1996b. Climate Change and Carrying Capacity Science Plan.

U.S. GLOBEC Report No. 17, 1996c. Northeast Pacific Implementation Plan.

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. To access NSF TDD, dial (703) 306-0090; for FIRS, 1-800-877-8339.

PRIVACY ACT AND PUBLIC BURDEN

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.

The 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

OMB 3145-0058
PT: 34
KW 1008004, 0103001
NSF97-XXX (Replaces 95-143)