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**International Marine Science Research Projects:  
Second Inventory of International Projects  
at Sea Grant Institutions--1990**

by

Judith Fenwick, David A. Ross and Cynthia T. Schramm

March 1991

**Technical Report**

Funding was provided by the National Oceanic and Atmospheric Administration, National Sea Grant College Program Office, Department of Commerce, under Grant No. NA90-AA-D-SG480, Woods Hole Oceanographic Institution Sea Grant Project Number E/L-1.

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***INTERNATIONAL MARINE SCIENCE RESEARCH PROJECTS:  
SECOND INVENTORY OF INTERNATIONAL PROJECTS  
AT SEA GRANT INSTITUTIONS--1990***

by

Judith Fenwick, David A. Ross and Cynthia T. Schramm

International Marine Science Cooperation Program / WHOI Sea Grant Program  
Woods Hole Oceanographic Institution  
Woods Hole, Massachusetts 02543 US

March 1991

**TECHNICAL REPORT**

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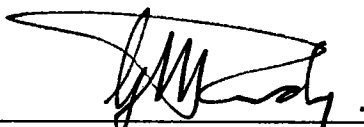
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G. M. Purdy, Chairman  
Department of Geology & Geophysics





**INTERNATIONAL MARINE SCIENCE RESEARCH PROJECTS:**

**SECOND INVENTORY OF INTERNATIONAL PROJECTS  
AT SEA GRANT INSTITUTIONS--1990**

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## ***ABSTRACT***

This inventory of marine science projects at Sea Grant institutions was completed in order to gauge the level and enhance a database of U.S. / foreign collaboration in international marine research initiated at U.S. Sea Grant institutions. The inventory was done by the International Marine Science Cooperation Program at the Woods Hole Oceanographic Institution's Sea Grant Office. The first inventory of projects with international components at Sea Grant institutions was done in 1984-85 by the International Program. This second inventory continues in the tradition of the first to "take the pulse" of international interest at Sea Grant institutions. The pulse is very active despite the lack of direct funding accorded the formal Sea Grant International Program at the national level. Of the 122 projects at Sea Grant institutions, however, only 29 were directly funded in part or entirely by Sea Grant. The inventory analyzes data from 122 international projects initiated at 20 Sea Grant institutions by profiling and explicating the extent of project foreign locations, sources of funding, areas of expertise for principal investigators, and contacts at foreign and U.S. agencies and institutions. It presents one-page summaries of the 122 projects along with indexes by geographic location, funding source, PI discipline, PI name, and keywords. In addition, this report compares the data from the 1989-90 inventory with that of the 1985 inventory.

## ***INTRODUCTION***

This inventory of marine science projects at Sea Grant institutions was compiled in 1989-90 in order to gauge the level and enhance a database of U.S. / foreign collaboration in international marine research initiated at U.S. Sea Grant institutions. An earlier inventory of projects with international components at Sea Grant institutions was done in 1984-85 (Ross & Fenwick, WHOI Tech. Rept. 85-22) and resulted in a database on 98 international marine research projects. At the time of the first inventory, an office for international marine science cooperation at Woods Hole was in the concept stage. That concept has since materialized as the International Marine Science Cooperation Program, funded by Sea Grant and based at the Woods Hole Oceanographic Institution. Since its inception in 1985, the International Program has attempted to demystify jurisdictional issues for marine scientists, administrators, and policymakers; to monitor and map the global patchwork of maritime claims; and to exchange marine science expertise with marine science communities in developing countries.

### ***The International Marine Science Cooperation Program***

The broad objectives of the International Marine Science Cooperation Program are to improve opportunities for collaborative research between U.S. and foreign scientists through information exchange and outreach; to increase and improve access for coastal countries to U.S. marine science expertise and education; to increase opportunities for U.S. scientists to work in foreign waters; and to strengthen a global approach to ocean studies.

In meeting these objectives, the International Program has been offering assistance to researchers through its active projects. These include:

- ◇ Maintaining a database of over 200 funding sources for scientists to undertake international marine science research. In 1990, the database was published by the WHOI Sea Grant Program as the *International Marine Science Funding Guide*, free upon request and already distributed to 1,100 institutions outside the U.S. and 1,000 institutions and individuals within the U.S.
- ◇ Establishing a Portuguese-U.S. Sea Grant cooperative marine science program for U.S. and Portuguese marine scientists to exchange information concerning scientific research projects and publications, to establish cooperative research projects between the two countries, to provide scientific and technical assistance from U.S. institutions to Portuguese marine science institutions, and to assist in placement and exchange of students and staff with marine science interests between U.S. Sea Grant institutions and Portuguese institutions.
- ◇ Maintaining a database that profiles 145 coastal countries, their maritime boundaries and claims, jurisdiction over marine science research, and records (since 1972) of past U.S. research clearance requests. Appropriate portions of this database will be

published periodically to assist marine science institutions, individual scientists, and administrators worldwide in planning research cruises and collaborative research programs.

- ◇ Preparing the second edition of a world map showing maritime boundaries and jurisdiction over marine scientific research. Fifteen hundred copies of the 1986 edition of the map, which is out of print, were distributed free worldwide to marine science institutions, individuals, and agencies.
- ◇ Establishing the International Red Tide Information and Assistance Service, a database of 400 experts in the field of toxic algal blooms from which a directory of experts was published in 1990.
- ◇ Maintaining a database of international marine science projects at Sea Grant institutions; data was collected from Sea Grant programs via questionnaires in 1984-85 and 1989-90. This technical report presents the data from the 1989-90 collection and compares it with data from the 1984-85 collection.
- ◇ Hosting foreign visitors, fulfilling literature searches and publication requests.

New program efforts include development of a database of Caribbean/Latin America marine science institutions and research areas and assistance to the U.N. Industrial Development Organization in developing a Caribbean Marine Technology Regional Center.

### ***Sea Grant and International Research***

The international spread of Sea Grant research is illustrated in Figure 1. The projects which make up the black bars (1990 data) are described individually in one-page summaries further along in this report. This second inventory continues in the tradition of the 1985 inventory to "take the pulse" of international interest at Sea Grant institutions. The pulse is very active despite the lack of direct funding accorded the formal Sea Grant International Program at the national level. We hope that publication of the database (the first part being the 1985 technical report and the second part herewith) will:

- ◇ assist other U.S. scientists with similar research interests in specific foreign countries;
- ◇ improve access for foreign scientists and institutions to U.S. marine science research, education, and training opportunities;
- ◇ assist in the development of multidisciplinary and/or multinational teams; and
- ◇ document the interest and activity of Sea Grant in international efforts.

This report presents the one-page summaries of 122 projects, explicating the extent of project foreign locations, sources of funding, areas of expertise for principal investigators, and contacts at foreign and U.S. agencies and institutions; and it provides indexes to these summaries by funding sources, PI names and disciplines, geographic locations, and key words. In addition, this report compares the data from the 1989-90 inventory with that of the 1985 inventory.

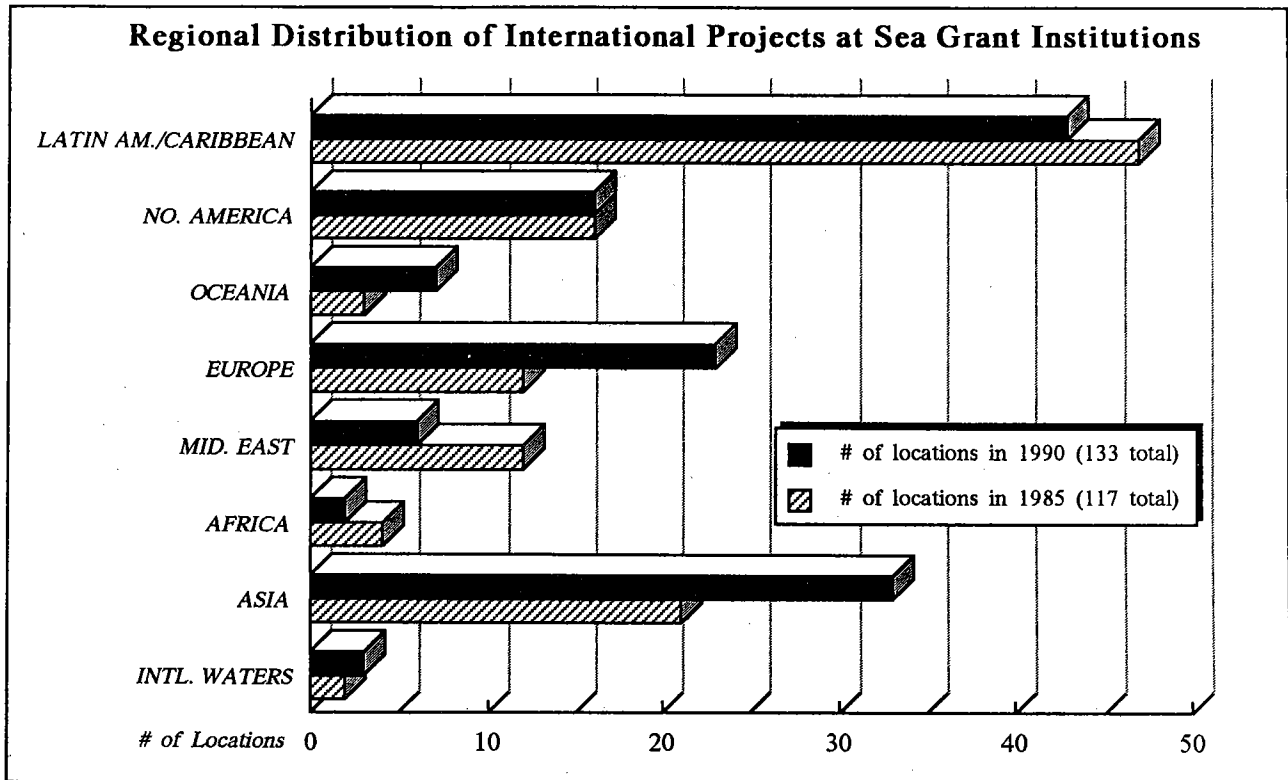


Figure 1: Regional distribution of international projects sponsored at Sea Grant institutions as of 1985 and 1990.

Many of the projects represented in this inventory are cooperative programs. Cooperative programs in marine science, whether they are land-based or sea-going, fit into all sizes of research agendas: global, bilateral (between governments or institutions) or simply scientist to scientist. The need to promote cooperative marine research programs worldwide is underscored by the growth of global science programs (which often do not include less developed countries as research partners), and by the heightened interest of developing coastal states in their marine territory and resources.

As global programs continue, the flow of international cooperative research will grow. As part of this growth and by providing access for developing countries to U.S. marine science expertise (through collaborative programs such as Sea Grant supports), we can pull more scientists from the developing countries into international collaborative programs. This process will help these countries to assess and manage their own marine resources, and most important of all, to build the educational bases from which successive generations of "global" marine scientists will come.



## ***REPORT AND ANALYSIS OF THE INVENTORY***

### ***Criteria for the Inventory***

The questionnaire upon which this inventory is based was distributed by the International Marine Science Cooperation Program in June 1989 to the Sea Grant Directors (30) and marine advisory leaders (32) at all Sea Grant institutions, as well as to all principal investigators (60) who completed questionnaires in the 1985 survey. A sample of the questionnaire mailing is at the back of this report (Appendix 1). The Sea Grant institutions represent a broad geographic network of colleges and universities engaged in marine science research; and although they do not encompass all U.S. institutions engaged in this vein of research, they do contain a wide variety of researchers with specific interests in international marine science.

We asked of the questionnaire's recipients that a questionnaire be completed for each international marine project (scientific, advisory or educational) which had been initiated at their participating institution. Project specifications included:

- 1) Projects where the principal investigator or a project staff member worked in a foreign country (land-based or research vessel-based in foreign waters);  
or
- 2) Projects on which foreign scientists collaborated; on which foreign scientists worked with a P.I. at the P.I.'s home institution or were sponsored to work in the U.S. by P.I.'s project funding;  
or
- 3) Projects which were funded in whole or in part by foreign sources.

Projects need not have Sea Grant funding to be included (only 29 of the 122 projects received Sea Grant funding). Projects were to be current or recent (active within the past five years). There were no limits as to dollar amounts or time involved in reported projects, since relatively low-cost activities often yield significant returns. In most instances questionnaires were completed by the principal investigator. Returns were received between June 1989 and May 1990.

### ***Results of the Inventory***

We have organized this report to serve two immediate functions. First, to analyze the data obtained from 122 inventory questionnaires (each representing an international project) completed by individuals through 20 of 29 Sea Grant programs. Second, to serve as a reference piece for persons seeking information and assistance on initiating cooperative international marine science projects. Indexes give the reader quick access to pertinent

areas of the project summaries, and addresses of the principal investigators are offered as part of each project summary for direct contact.

This inventory is a partial representation of active international programs at Sea Grant institutions. When we completed the first inventory in 1985 we had no yardstick against which to measure the response rate. Now with two sets of data on international projects we still cannot boast a yardstick or measure how encompassing our inventory has been. The rate of return on completed questionnaires, however, improved substantially with this second inventory, up from 98 returns in 1985 to 122 returns in 1990. A broader base of Sea Grant institutions was also represented, climbing from 17 institutions in 1985 to 20 institutions in 1990. Six new institutions joined the ranks of those with international projects, while three dropped from the ranks reporting no active international projects, along with six institutions who had no appropriate international projects for this or the previous inventory. Overall institutional response to the 1985 and 1990 inventories is shown on page 8. The charts and tables which follow track some of the trends in international cooperative research, utilizing data from the 1985 and 1990 inventories.

**Geographic Distribution:** (Chart 1, Table 1)

The data from 1990 shows a substantial increase over 1985 in research projects located in Europe (↑ 11), Asia (↑ 12), Canada (↑ 5), and Oceania (↑ 4). The number of projects in Central America and the Caribbean has remained constant, whereas projects have declined in South America (↓ 8), Africa (↓ 2) and the Middle East (↓ 6) with project numbers decreasing there by 50% or more from 1985 to 1990.

**Principal Investigators' Disciplines:** (Chart 2, Table 2)

The distribution of P.I. disciplines has changed markedly since the 1985 inventory, particularly in the biological sciences. The 1990 results indicate that fewer researchers in the biological sciences (Biology, Fisheries, Ecology) have been working on international projects with numbers decreasing (↓ 19) from 105 researchers in 1985 to 86 in 1990. Scientists in the fields of geology (↑ 5), engineering (↑ 3), and chemistry (↑ 8) have increased slightly. The largest increase in discipline of P.I., perhaps indicative of the types of projects reported, are in the fields of Administration/Education (↑ 11, tripling since 1985) and Social Sciences (↑ 13, more than doubling since 1985).

**Funding Sources:** (Chart 3, Table 3)

The majority of international research in this survey was funded by the U.S. federal government through its various departments and agencies, with U.S. federal and foreign governments funding more projects than in the 1985 survey. Of the 122 projects at Sea Grant institutions, only 29 were directly funded in part or entirely by Sea Grant. Educational institutions (both foreign and U.S.) have slightly increased their research support. Unfortunately, a substantial decline is evident in the number of projects supported by private monies and foundations.

Based on our inventory, there is no way to ascertain the level of financial commitment by the various funding sources. It is possible that a decline in the numbers of projects funded by a particular type of agency is compensated for by the size and cost of individual research projects. It is clear, however, that contrary to the desires of the U.S. federal government in the last decade, funding source alternatives to federal support have actually declined.

**INSTITUTIONAL RESPONSE TO INVENTORY OF  
INTERNATIONAL PROJECTS AT SEA GRANT INSTITUTIONS**

<b><i>Sea Grant Institutions Responding to Survey</i></b>	<b><i># of Projects 1990</i></b>	<b><i># of Projects 1985</i></b>
Univ. of California Sea Grant College Program	15	2
Univ. of Southern California Sea Grant Program	5	0
Univ. of Connecticut Sea Grant Program	2	0
Univ. of Delaware Sea Grant College Program	3	7
Florida Sea Grant College Program	10	2
Georgia Sea Grant College Program	3	2
Univ. of Hawaii Sea Grant College Program	4	0
Illinois / Indiana Sea Grant Program	4	2
Louisiana Sea Grant College Program	3	2
Maine / New Hampshire Joint Sea Grant College Program	7	3
Michigan Sea Grant College Program	5	2
New Jersey Marine Sciences Consortium Sea Grant Program	1	1
New York Sea Grant Institute	10	8
Univ. of North Carolina Sea Grant College Program	1	0
Oregon Sea Grant College Program	4	0
Univ. of Puerto Rico Sea Grant Program	17	31
Rhode Island Sea Grant College Program	5	0
South Carolina Sea Grant Consortium	7	3
Texas A & M Univ. Sea Grant College Program	5	6
Woods Hole Oceanographic Institution Sea Grant Program	11	4
<hr/>		
<b><i>Sea Grant Institutions that reported no international projects</i></b>		
Univ. of Alaska Sea Grant College Program	0	0
Maryland Sea Grant Program	0	0
Massachusetts Institute of Technology Sea Grant College Program	0	0
Minnesota Sea Grant Program	0	0
Mississippi / Alabama Sea Grant Consortium	0	0
Ohio Sea Grant College Program	0	1
Wisconsin Sea Grant Institute	0	0
Virginia Graduate Marine Science Consortium Sea Grant Program	0	1
Washington Sea Grant College Program	0	21
<hr/>		
<b>Total Projects</b>	<b>122</b>	<b>98</b>

# Geographic Distribution of Projects in 1985 and 1990 Inventories

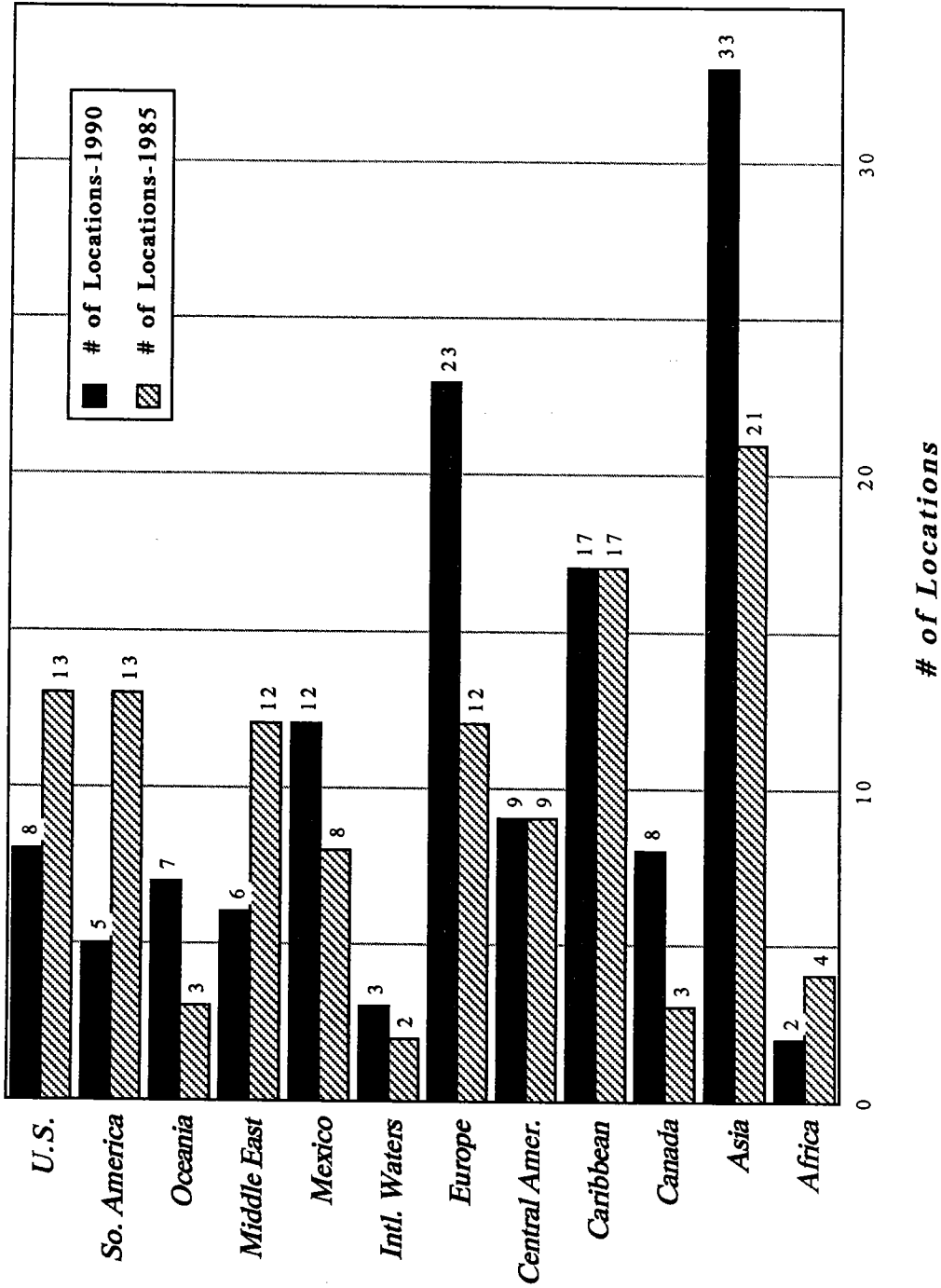


Chart 1: Geographic distribution of projects; illustrates distribution of 98 projects (117 locations) from 1985 data and 122 projects (133 locations) from 1990 data. Since some projects took place in more than one geographic location, the number of locations exceeds the base number of projects.

## Disciplines of Principal Investigators--1985 and 1990 Inventories

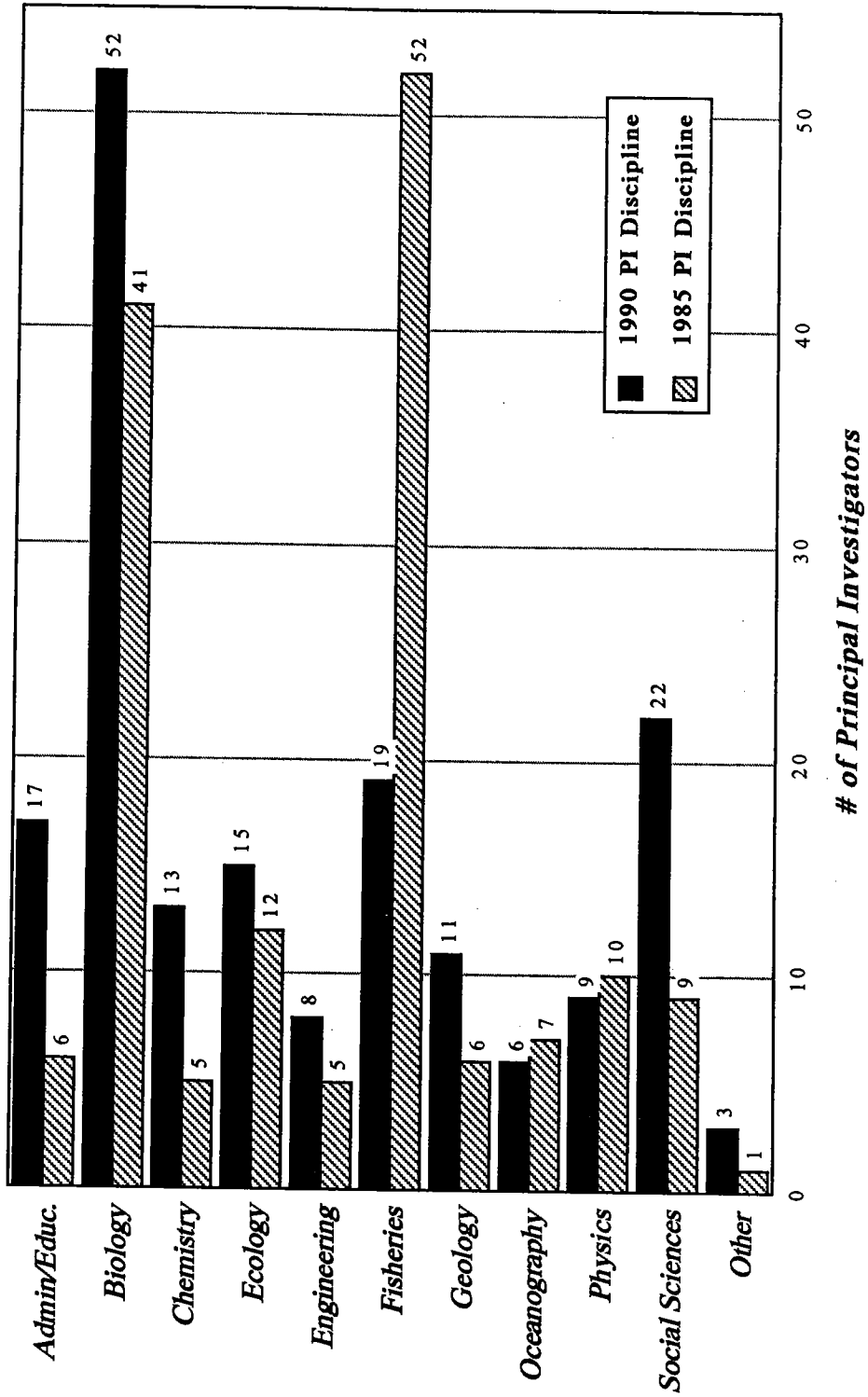
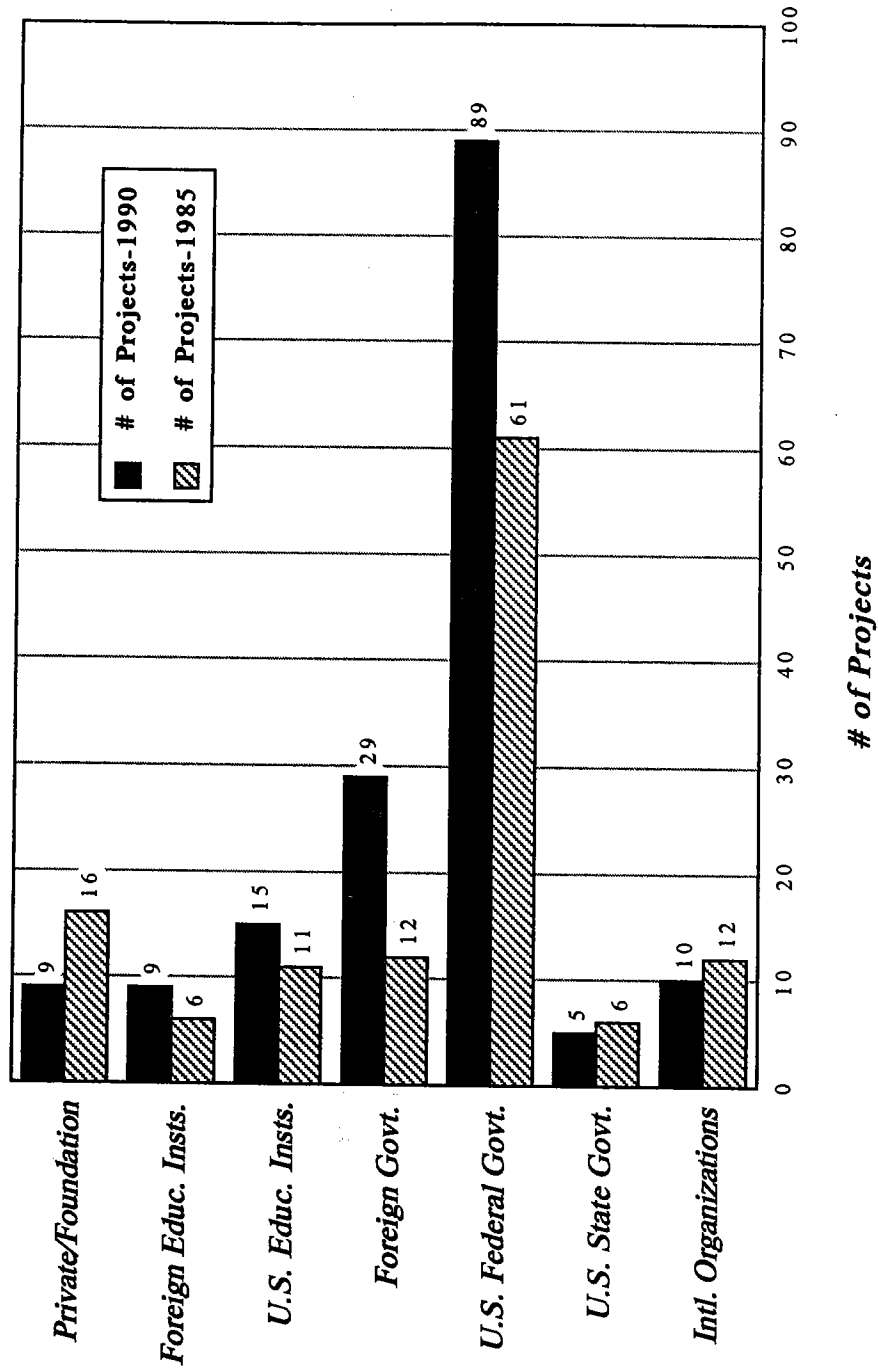


Chart 2: Disciplines of principal investigators; illustrates the distribution of principal investigators from 98 projects in 1985 and 122 projects in 1990 inventories. Since some projects had multiple PIs, the number of PIs exceeds the base number of projects.

## Funding Sources in 1985 and 1990 Inventories



**Chart 3:** Funding sources in 1985 and 1990 inventories; illustrates the number of funding sources in seven funding categories for 98 projects in 1985 and 122 projects in 1990 inventories. Since some projects had more than one source of funding, the number of funding sources exceeds the base number of projects.

<i>Geographic Location</i>	# of Locations 1985	% of Locations 1985	# of Locations 1990	% of Locations 1990
U.S.	13	11.1	8	6.0
So. America	13	11.1	5	3.7
Oceania	3	2.6	7	5.3
Middle East	12	10.3	6	4.5
Mexico	8	6.8	12	9.0
Intl. Waters	2	1.7	3	2.3
Europe	12	10.3	23	17.3
Central America	9	7.7	9	6.8
Caribbean	17	14.5	17	12.8
Canada	3	2.6	8	6.0
Asia	21	17.9	33	24.8
Africa	<u>4</u>	<u>3.4</u>	<u>2</u>	<u>1.5</u>
<b>TOTAL</b>	<b>117</b>	<b>100.0</b>	<b>133</b>	<b>100.0</b>

**Table 1:** Geographic distribution of projects; tabulates the number of locations from 98 projects in 1985 and 122 projects in 1990 inventories. Since some projects took place in more than one geographic location, the number of locations exceeds the base number of projects.

<i>Disciplines of P.I.s</i>	# of P.I.s 1985	% of P.I.s 1985	# of P.I.s 1990	% of P.I.s 1990
Admin. / Educ.	6	3.9	17	9.7
Biology	41	26.6	52	29.7
Chemistry	5	3.3	13	7.4
Ecology	12	7.8	15	8.6
Engineering	5	3.3	8	4.6
Fisheries	52	33.8	19	10.9
Geology	6	3.9	11	6.3
Oceanography	7	4.5	6	3.4
Physics	10	6.5	9	5.1
Social Sciences	9	5.8	22	12.6
Other	<u>1</u>	<u>0.6</u>	<u>3</u>	<u>1.7</u>
<b>TOTAL</b>	<b>154</b>	<b>100.0</b>	<b>175</b>	<b>100.0</b>

**Table 2:** Distribution by discipline of principal investigators; tabulates the number of principal investigators from 98 projects in 1985 and 122 projects in 1990 inventories. Since some projects had multiple PIs, the number of PIs exceeds the base number of projects.

<i>Funding Sources</i>	# of Sources 1985	% of Sources 1985	# of Sources 1990	% of Sources 1990
Private/Foundation	16	12.9	9	5.4
Foreign Educ. Insts.	6	4.8	9	5.4
U.S. Educ. Insts.	11	8.9	15	9.0
Foreign Govt.	12	9.7	29	17.5
U.S. Federal Govt.	61	49.2	89	53.6
U.S. State Govt.	6	4.8	5	3.0
Intl. Organizations	<u>12</u>	<u>9.7</u>	<u>10</u>	<u>6.0</u>
<b>TOTAL</b>	<b>124</b>	<b>100.0</b>	<b>166</b>	<b>100.0</b>

**Table 3:** Funding sources; tabulates the number of funding sources from 98 projects in 1985 and 122 projects in 1990 inventories. Since some projects had more than one source of funding, the number of funding sources exceeds the base number of projects.





## ***SUMMARIES OF QUESTIONNAIRES***

### ***Guide to the Summaries***

These summaries have been condensed from 122 completed questionnaires (see Appendix A for a sample of the questionnaire). Each summary gives the name and address of the principal investigator to allow a direct contact for the curious reader who wishes further project information.

This guide offers an explanation and source for each entry shown on the summaries:

<i>Project number</i>	At the onset of the inventory each Sea Grant institution (by alphabetical order) was assigned a number, and each questionnaire as it was received was given a letter to follow the institution number. Thus the sequence of project numbers shows some gaps where a Sea Grant institution did not have applicable projects to include in the inventory.
<i>S.G. Institution</i>	This indicates the Sea Grant institution through which the questionnaire was passed.
<i>Project Title</i>	As indicated by preparer of the questionnaire.
<i>Project Location</i>	As indicated by preparer of the questionnaire; an index for this subject is found after the project summaries.
<i>Description</i>	As indicated by preparer of the questionnaire; some descriptions were shortened due to space constraints.
<i>Funding Source</i>	As indicated by preparer of the questionnaire; an index for this subject is found after the project summaries.
<i>Proj. Dates</i>	As indicated by preparer of the questionnaire.
<i>Assessment</i>	Excerpted from full questionnaire; this section offers comments and identifies problems the PI encountered working with or in particular locations, and sometimes offers advice on the mechanisms for dealing with problems.
<u><i>Involvement of</i></u>	
<i>U.S. Government</i>	As indicated by preparer of the questionnaire; this category specifically applies to U.S. government agencies, federal or state level.
<i>U.S. Institutions</i>	As indicated by preparer of the questionnaire; this category applies to U.S. academic and industrial organizations.
<i>Foreign Governments</i>	As indicated by preparer of the questionnaire; this category covers foreign government agencies and departments on national and regional levels; unless otherwise indicated, all agencies listed are in the country specified under "Project Location."

<i>Foreign Institutions</i>	As indicated by preparer of the questionnaire; this category lists foreign academic and industrial organizations; unless otherwise indicated, all institutions listed are in the country specified under "Project Location."
<i>Principal Investigator</i>	As indicated by preparer of the questionnaire; affiliations and addresses supplied by preparer of the questionnaire; an index for P.I. names is found after the project summaries.
<i>P.I. Disciplines</i>	As indicated by preparer of the questionnaire; an index for this subject is found after the project summaries.
<i>P.I. Skills</i>	As indicated by preparer of the questionnaire; questionnaire specified that preparer list particular skills that would be useful in consulting or collaborating on international projects.
<i>Proj. Keywords</i>	Keywords assigned to project by WHOI Sea Grant, based on project title, description and National Sea Grant Network "Keyword Listing"; an index for this subject is found after the project summaries.

**Project Title**      **Assessment of the Early Impacts of New Zealand's Individual Transferrable Quota Scheme (ITQs)**

**Project Location(s)**      NEW ZEALAND

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**Description**      Completed 77 in-depth case studies of fishermen, processors and agency staff to assess the effects of ITQs on their businesses and careers. Found that ITQs are motivating a reduction in fishing costs and an increased effort to obtain top prices. Results are now used by U.S. industry and agencies considering ITQs.

**Funding Source(s)**      New Zealand Ministry of Agric. & Fisheries (in-country travel, supplied office, secretarial and computer support), Univ. of California Cooperative Extension (PI salary), and personal funds (PI paid intl. travel and living costs)

**Project Dates**      *Start* Dec. 1986      *Completion* Aug. 1987

**Assessment**      Met and exceeded expectations. No complications. Recommendation: Work closely and openly with agency, industry or university staff

**Involvement of:**

**U.S. Government**      Regional Fisheries Management Councils are utilizing project results

**U.S. Institutions**      Univ. of California

**Foreign Governments**      New Zealand Ministry of Agriculture and Fisheries (shared results with them; they will publish technical report)

**Foreign Institutions**      New Zealand Federation of Commercial Fishermen (Peter Stevens)

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**Principal Investigator(s)**      Christopher M. Dewees  
Sea Grant Extension Program  
University of California  
Davis CA 95616

**Disciplines**      Marine Fisheries, Fisheries Management

**Skills**      Evaluation of fisheries management schemes, social science research with fishermen, fisheries extension

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**Project Keywords**      Fisheries Management

**Project Title**                      **Hormonal Enhancement of Fish Growth**

**Project Location(s)**      SCOTLAND: Marine Biological Laboratory, Aberdeen

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**Description**                      The goals of this project are to enhance hormonal treatment programs for stimulating fish growth by determining hormonal effects on growth rates and intestinal nutrient absorption, size effects on intestinal nutrient absorption, and intestinal hormone absorption.

**Funding Source(s)**              California Sea Grant College Program

**Project Dates**                      *Start*    Oct. 1987                                      *Completion*    Sept. 1989

**Assessment**                      Project met expectations.

**Involvement of:**

*U.S. Government*

*U.S. Institutions*

*Foreign Governments*

*Foreign Institutions*

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**Principal Investigator(s)**              Jared M. Diamond  
Dept. of Physiology  
University of California Medical School  
Los Angeles CA 90024-1751

**Disciplines**                      Physiology

**Skills**                                      Digestive physiology, nutrient transport

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**Project Keywords**                      Nutrient, Hormone



**Project # 02 D**      *Sea Grant Institution*    California Sea Grant College Program, Univ. of

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**Project Title**                      **Distribution, Abundance and Population Parameters of the Sardine and Anchovy Species of Northwest Mexico**

**Project Location(s)**    MEXICO: La Paz, Baja California Sur, Mazatlan, Fuaymas

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**Description**                      A study of the biochemical genetic and morphological divergence among three species of thread herring (*Opisthonema*) confirmed previous published taxonomy based on numbers of gillrakers and extended these results by demonstrating close genetic relationships.

**Funding Source(s)**              CONACYT (Mexico)

**Project Dates**                      *Start*    -    *Completion*    -

**Assessment**                      The project met expectations. Collaboration was productive and pleasant.

**Involvement of:**

**U.S. Government**

**U.S. Institutions**                      UC Davis/Aquaculture and Fisheries Program

**Foreign Governments**

**Foreign Institutions**              Centro de Investigaciones Biologicas (CIB) de Baja California Sur (Dr. Daniel Lluch Belda, Director)

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**Principal Investigator(s)**              Dennis Hedgecock  
Bodega Marine Lab  
Univ. of California/Davis  
Bodega Bay CA 94923

**Disciplines**                      Genetics

**Skills**                                      All facets of modern population, quantitative and aquacultural genetics

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**Project Keywords**                      Sardine, Anchovy, Genetic

**Project Title**      **Elasmobranchs as Living Resources: Recent Advances in Systematics, Physiology, and Ecology**

**Project Location(s)**      JAPAN: Tokai Univ. and the Univ. of Tokyo

---

**Description**      Collaboration with several Japanese ichthyologists on a comparative growth study of the two species of sharks, *Prionace glauca* ( the blue shark) and *Mustelus manazo* (the Japanese smooth-hound shark). Calcified structures were cross-exchanged for age determination and to see if differences between the populations of these sharks could be detected, relative to the technique used.

**Funding Source(s)**      National Science Foundation

**Project Dates**      *Start*    July 1985                              *Completion*    Jan. 1990

**Assessment**      All expectations were met and no changes in the project were necessary. Arrangements were made during the initial visit and specimens were exchanged by mail. Working with scientists in Japan was a very worthwhile experience. It broadens one's knowledge and understanding of the field of science and the differences in the ways that different individuals approach it.

**Involvement of:**

**U.S. Government**      National Science Foundation (funded initial trip to Japan and subsequent travel to Hawaii for the workshop)

**U.S. Institutions**      Calif. State Univ. (Moss Landing Marine Lab.), National Marine Fisheries Service (NOAA) involved in workshop.

**Foreign Governments**      Japan Society for the Promotion of Science

**Foreign Institutions**      Univ. Tokyo (Dr. Toru Taniuchi), Tokai Univ. (Dr. Sho Tanaka), Okinawa Expo Aquarium (Mr. Senzo Uchida ), Hokkaido Univ. (Dr. Kazuhiro Nakaya)

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**Principal Investigator(s)**      Gregor M. Cailliet  
Moss Landing Marine Laboratories  
P.O. Box 450  
Moss Landing CA 95039

**Disciplines**      Ichthyology

**Skills**

**Project Keywords**      Ichthyology, Sharks

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**Project Title**                      **Endocrinology of Salmonid Development and Seawater Adaptation**

**Project Location(s)**      JAPAN, FRANCE, CANADA, SWEDEN, ICELAND

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**Description**                      Endocrinology of salmonid development and seawater adaptation.

**Funding Source(s)**              Sea Grant, National Science Foundation

**Project Dates**                      *Start* 1977                                      *Completion* 1990

**Assessment**                      Build personal/professional relationship before research cooperation is initiated.

**Involvement of:**

**U.S. Government**                      Sea Grant, National Science Foundation: Funds for research and foreign researchers

**U.S. Institutions**                      Univ. of California, California State Dept. of Fish and Game

**Foreign Governments**

**Foreign Institutions**              Univ. Tokyo at Nakano (T. Hirano), Univ. Tokyo at Otsuchi (M. Iwata), Univ. of Hokkaido at Hakodate (K. Yamauchi), Natl. Inst. for Basic Biology (Y. Nagahama), INRA- Rennes, France (P. Prunet)

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**Principal Investigator(s)**              Howard A. Bern  
Dept. of Integrative Biology  
Univ. of California  
Berkeley CA 94720

Richard S. Nishioka  
Dept. Of Integrative Biology  
Univ. Of California  
Berkeley CA 94720

**Disciplines**                      Comparative Endocrinology and Fish Physiology

**Skills**

**Project Keywords**                      Physiology, Salmon

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**Project Title**            **Influence of Freshwater Inflow on Coastal Wetlands of Mediterranean-type Climate**

**Project Location(s)**    AUSTRALIA: Perth, Western Australia

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**Description**            Hypotheses developed in southern California coastal wetlands were tested experimentally in wetland ecosystems of south Western Australia. The role of salinity dilution in intertidal salt marshes was confirmed--where freshwater inflows are augmented, non-native vegetation invades the native marsh. Substrate disturbances are also needed to allow successful establishment of the invaders. Management recommendations followed.

**Funding Source(s)**    Calif. Sea Grant College Program, San Diego State Univ.

**Project Dates**            *Start*    July 1987                            *Completion*    Dec. 1987

**Assessment**              Project met expectations.

**Involvement of:**

**U.S. Government**        Sea Grant (NOAA)--funding

**U.S. Institutions**

**Foreign Governments**

**Foreign Institutions**    Univ. of Western Australia (Dr. Arthur McComb and Eric Paling), Waterways Commission (Bob Atkins)

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**Principal Investigator(s)**    Joy B. Zedler  
Biology Dept.  
San Diego State Univ.  
San Diego, CA

**Disciplines**              Ecology

**Skills**

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**Project Keywords**        Wetland, Ecology, Salt Marshes

**Project Title**      **Interamericas Program**

**Project Location(s)**      ARGENTINA, CHILE, MEXICO

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**Description**      The Interamericas Program at the Scripps Inst. of Oceanography serves to facilitate interaction between Latin American marine scientists and those of SIO. Liaison functions, information services, arranging meetings between investigators, promoting collaboration, and sharing surplus journals and texts are common tasks of the program.

**Funding Source(s)**      At this moment, 99% volunteer services, 1% State of California

**Project Dates**      *Start* 1977      *Completion* Continuing

**Assessment**      Recommendation: Learn the language, customs, and geography. Be aware of differences between Latin American cultures, be in for the long haul (trust is not won overnight), accept Latin priorities and pace.

**Involvement of:**

**U.S. Government**      Sea Grant International Cooperation Assistance Program (funding)

**U.S. Institutions**      Tinker Foundation, San Diego State Univ., Bodega Bay Marine Lab, NOAA-Southwest Fisheries Center (La Jolla), Calif. Dept. of Fish and Game, and others.

**Foreign Governments**      MEXICO: Secretaria de Pesca de Mexico, Secretaria de Marina, CICESE, CONACYT, Turismo; ECUADOR: Armada de Ecuador  
ARGENTINA: Inst. National de Inv. y Desarrollo Pesquera

**Foreign Institutions**      ARGENTINA: Univ. Nal. Mar de Plata  
CHILE: Pontificia Univ. Catolica de Chile, Sede Talcahuano; Univ. Nacional de Chile, Sede Concepcion  
MEXICO: Univ. Auton. de Baja Calif.  
Mailing list of contacts available on request (over 500 entries)

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**Principal Investigator(s)**      George T. Hemingway  
Marine Life Research Group A-027  
Scripps Inst. of Oceanography, UCSD  
La Jolla CA 92093

**Disciplines**      Marine Biology/Ecology

**Skills**      See above

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**Project Keywords**      Information, International Collaboration

**Project # 02 J**      *Sea Grant Institution*    **California Sea Grant College Program, Univ. of**

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**Project Title**            **International Technology and Information Transfer Program**

**Project Location(s)**    JAPAN, CHINA (PEOPLE'S REPUBLIC OF) , SOVIET UNION, FRANCE

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**Description**            This program is intended to establish a formal mechanism for transferring information to and from scientists and entrepreneurs in California and other nations.

**Funding Source(s)**    Foreign governments and institutions, U.S. state and federal for U.S. travel

**Project Dates**            *Start* Oct. 1, 1989                            *Completion* Sept. 30, 1992

**Assessment**            Project is still active. Recommendation: Personal contacts are essential.

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**Involvement of:**

**U.S. Government**

**U.S. Institutions**            Seafood and aquaculture industries, Univ. of California

**Foreign Governments**

**Foreign Institutions**    JAPAN: Oyster Research Inst. (Tetsuo Seki); FRANCE: IFREMER (Phillipe Paquote)

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**Principal Investigator(s)**    James J. Sullivan  
Calif. Sea Grant College Prog., A-032  
Univ. of California  
La Jolla CA 92093

**Disciplines**            Economist, Administrator/Director CA Sea Grant

**Skills**                    Languages, contacts

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**Project Keywords**        Information, Technology Transfer

