



Division of Ocean Sciences

Spring 1998 Newsletter

Academic Research Fleet Review: 1998

The nation depends on the U.S. Academic Research Fleet for support of effective and productive research in the ocean sciences. To ensure that the fleet continues to be operated in an efficient, responsive, and cost-effective manner, NSF is conducting a comprehensive study of many aspects of the fleet. This study includes determining optimal fleet composition and capabilities required to support anticipated future research needs, and reviewing and evaluating the overall fleet management structure. Success in fulfilling research plans and priorities is dependent on an effective sea-going science support infrastructure.

Fleet History

The academic fleet can be broadly divided into three categories of ships with capabilities and operating modes responsive to different components of the national research requirements. (Table 2, page 4).

Six large ships have capabilities for extended global research cruises to regions distant from home port. Five are Navy-owned, one is NSF-

owned. Twelve intermediate and large coastal ships have capabilities for multidisciplinary and single investigator studies throughout U.S. waters and adjoining regions. One is Navy-owned, six are NSF-owned, and five are institute-owned.

Ten regional and local research ships have capabilities for smaller projects close to home port and in near-shore waters. Nine are institute-owned, one is NSF-owned.

Our primary objective at NSF is to ensure the availability of appropriate sea-going facilities and support services to investigators supported by NSF research programs. There is no "NSF Fleet." The institutions that operate research ships also receive support from other federal agencies, state and local governments, and private sources. The research fleet is a "distributed asset" with multiple operations, multiple sponsors and owners, and differing capabilities and operating modes responsive to different components of national research needs.

We work closely with the academic community through the University-National Oceanographic Laboratory System (UNOLS) and with other federal agencies through the Federal Oceanographic Fleet Coordination Committee (FOFCC) to provide an appropriate match of ship capabilities and size, composition, number of ships available, and availability of research and operating funds to meet the needs of the research community.

A number of "system parameters" must be met if the research fleet is to be operated in a cost-effective manner. First, the capabilities and operating modes of the ships comprising the fleet must match the needs of the research community. For academic research in the U.S., this means the fleet profile must include a number of ships in each of the broad categories identified above, i.e. large ships with global range, intermediate ships for regional or ocean basin scale studies and small ships for local near-shore studies.

Second, the total number of ships and distribution within size categories must be consistent with the level of research support and type of seagoing research projects funded. Third, the geographic distribution of the ships in the various size and capability classes must be appropriate to research requirements. Finally, within the overall fleet profile, specialized capabilities to meet research priorities that cannot be met by general-purpose ships must be maintained as needed.

Benefits from the current method of operating the academic fleet include:

Research and service competition. The operating institutions must compete for many projects, providing incentive for effective and innovative service to research programs.

Diversity of capability. The active involvement of institutional scientists

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Letter from the Division Director

Dear Colleagues,

The President's budget request for fiscal year 1999 includes a magnificent 13.7% (\$15.35 million) increase for our Research Section and an 11.8% (\$24.23 million) increase overall for the Division, relative to the fiscal year 1998 Current Plan (see Table 1). Budget prospects like this stimulate substantial optimism but it is important that this optimism be measured.

Internally our current priority is to work through the current fiscal year. None of the programs within our Research Section will receive increased funding in FY1998 (relative to 1997). Our managers continue, under growing pressure, to identify the very best of your research projects among the usual crop of superb candidates. Please be assured that we understand that our management difficulties pale compared with those being experienced by you, the community, as you grapple with mechanisms to keep your research supported in the face of increasingly intense competition for funding. We will work hard to continue to make the best possible decisions based upon rigorous and fair criteria, and commit to maintaining the most open dialog so you can understand the reasoning behind our decisions.

So much for the "bad news". The "good news" about the state of our science is of much greater significance in the long-term. In compiling material in recent months for a number of talks, I have been overwhelmed by the magnitude of some of the recent accomplishments in ocean sciences research. Substantial and exciting advances have been made in all the major disciplines. The high quality debates at the *Futures* workshops (see summaries on page 5) clearly establish the reality of the potential for major progress in ocean sciences during the next decade.

The oceans will receive growing attention as the year proceeds. 1998 has been designated *Year of the Ocean* by the United Nations. Many celebratory public outreach activities are planned (see websites www.yoto.com and <http://ioc.unesco.org/iyo>), as well as high-level policy debates such as the National Conference on the Oceans scheduled 11-12 June in Monterey, California. These will bring new visibility in the national arena to the significant role that the oceans play in the well-being of all U.S. citizens.

Most importantly we have the optimistic 1999 budget request to look forward to - although far from being a reality at this time, it is an important and tangible demonstration of our nation's commitment to basic research. If this commitment can be maintained into the future, then the tough times of 1998 will be only a memory.

I am told that the official U.S. motto for the Year of the Ocean is *The Ocean - Get Into It*. If it is warm enough, I guess *Getting Into It* is okay, but I think the most important point we should all try to make during the Year of the Ocean, is the *Oceans of Opportunity* that exist out there in the vast unknowns of our rapidly-advancing field.



- G. Michael Purdy

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in planning, monitoring and developing shipboard systems leads to improved specialized capabilities.

Assistance to local studies. Most institutions include emphasis on local studies of interest to the faculty and institutional sponsors (often state governments). Such studies are significantly aided by a locally-based ship.

Institutional support for facilities. Shore facilities, engineering support, new instrumentation, and student training are all provided by institutions with faculty actively involved in research ship operations.

Reduced non-research transit costs. The match between ship locations and research project field areas enables unproductive transits between study areas to be minimized.

I believe there is no dispute that the U.S. Fleet provides the scientific capabilities required for world leadership in ocean and environmental science research. However, the overall academic fleet profile today reflects "system parameters" that evolved over the last decade and includes historical interests as well as future needs. Although concerns are usually expressed in terms of costs of operating the academic research fleet, an overall balance between research funding and ship operations funding must be maintained.

The primary driver is the requirements of funded research projects. The required research fleet profile, size, and geographic distribution follow from this: the operational capabilities of the fleet must be determined by the research requirements. Research ships are service facilities to assist funded research projects and not independent operations.

The research and operations costs for

Table 1. Division of Ocean Sciences Fiscal Year 1999 Budget Request.

Ocean Sciences Division Budget in \$M		
	FY 1999 Request	% Change 98 to 99
Research Section	127.50	13.70%
Centers & Facilities Section	56.96	9.00%
Drilling Program	45.93	10.00%
TOTAL	\$230.39	11.80%

the academic fleet are dominated by the ships in the large and intermediate size classes. The annual operating cost for full use of each of the six large ships is between \$4.4 and \$5.0 million depending on cruise specifics (\$26.4-\$28.2 million total). The annual operating costs for the 12 intermediate and large coastal ships range from \$1.5-\$2.5 million depending on size and cruise specifics (\$22.0 - \$24.0 million total). The annual operating costs for the individual regional and local ships vary significantly owing to size differences (60 to 120 ft. length) and local operations mode from several \$100,000 to about \$1.0 million (\$4.0-\$5.0 million total).

The projected ship operations support from all sources (i.e. federal agencies, state, and local government and private sources) required for full use of the academic fleet is between \$52.4 and \$57.2 million. The projection includes a lower bound that includes "minimal" full operations for all ships but recognizes that not all ships in all classes will have cruise profiles in a given year that require funds at the maximum level.

In 1997, the last year with complete data, the total support for the fleet was \$52.0 million, minimal full operation, with NSF providing \$31.3 million or 60% of the total (Figure 1). In 1998, two expeditionary ships (EWING and MELVILLE) have short schedules with partial lay-ups and several regional ships have marginal schedules with the lay-up of one ship (ENDEAVOR). The good news is that

local ships have favorable schedules for 1998 with multiple research sponsors.

The key to determining actions to reduce stress on the system is to determine the longer term research requirements and anticipated support for sea-going projects. This is a difficult, and many would say daunting, task.

Ship Operations Review

We are convening an external review committee to examine: the cost-effectiveness of ship operations, the size and composition of the academic fleet, and related questions. The Terms of Reference for the Committee are:

1. Review and evaluate the current and projected research vessel fleet required for research sponsored by NSF within a national framework that includes research requirements of other federal agencies, state and local governments, and private sources;
2. Review and evaluate the overall management structure of the Academic Research Fleet; review and evaluate existing capabilities and services provided by the operating organizations; and review and evaluate possible future changes in academic fleet operations to ensure optimal operations of the academic fleet to support research requirements; and
3. Provide recommended actions by NSF to improve the organization,

management, and cost effective operation of the Academic Research Fleet in support of scientific capabilities required to maintain world leadership in ocean and environmental science research.

The committee report is scheduled for delivery to OCE in December 1998. This report will be presented to the National Science Board (NSB), NSF's governing body, in February 1999 along with the Division of Ocean Sciences management response, including potential changes for the research fleet size or operations in the year 2000 and beyond.

The review will draw on formal input from the UNOLS advisory structure, ship operator institutions, science program managers, industry, ONR, and other federal agencies. We have also identified the requirement for input from sea-going scientists. According to UNOLS summary data, last year about 550 science projects went to sea for 5000 days around the world's oceans. Over 2000 researchers and students supported by at least 10 sponsor organizations used the 28 research ships. Your input is essential, if the review committee is to meet its charge. *You and your research projects are the reason research ships are required!*

I use this opportunity to ask for your participation in this comprehensive review. Your views, comments, concerns, and recommendations are

Table 2. – Academic Research Fleet. Ships organized by size and operating institution.

OPERATING INSTITUTION	SHIP	OWNER	LENGTH
LARGER EXPEDITIONARY SHIPS			
Scripps Institution of Oceanography	MELVILLE	Navy	279 ft.
Woods Hole Oceanographic Institution	KNORR	Navy	279 ft.
Scripps Institution of Oceanography	ROGER REVELLE	Navy	274 ft.
Woods Hole Oceanographic Institution	ATLANTIS	Navy	274 ft.
University of Washington	THOMAS G. THOMPSON	Navy	274 ft.
Lamont-Doherty Earth Observatory	MAURICE EWING	NSF	239 ft.
INTERMEDIATE REGIONAL SHIPS			
University of Hawaii	MOANA WAVE	Navy	210 ft.
Harbor Branch Oceanographic Institution	SEWARD JOHNSON	HBOI	204 ft.
Oregon State University	WECOMA	NSF	185 ft.
University of Rhode Island	ENDEAVOR	NSF	184 ft.
Texas A&M University	GYRE	TAMU	182 ft.
Woods Hole Oceanographic Institution	OCEANUS	NSF	177 ft.
Scripps Institution of Oceanography	NEW HORIZON	SIO	170 ft.
Harbor Branch Oceanographic Institution	EDWIN LINK	HBOI	168 ft.
Moss Landing Marine Laboratories	POINT SUR	NSF	135 ft.
Duke University/UNC	CAPE HATTERAS	NSF	135 ft.
University of Alaska	ALPHA HELIX	NSF	133 ft.
Scripps Institution of Oceanography	ROBERT G. SPROUL	SIO	125 ft.
LOCAL NEAR-SHORE SHIPS			
University of Delaware	CAPE HENLOPEN	UD	120 ft.
Bermuda Biological Station for Research	WEATHERBIRD II	BBSR	115 ft.
Harbor Branch Oceanographic Institution	SEA DIVER	HBOI	113 ft.
Louisiana Universities Marine Consortium	PELICAN	LUMCON	105 ft.
University of Texas	LONGHORN	UT	105 ft.
Smithsonian Institution	URRACA	SI	96 ft.
University of Michigan	LAURENTIAN	UM	80 ft.
University System of Georgia	BLUE FIN	UG	72 ft.
University of Miami	CALANUS	UM	68 ft.
University of Washington	CLIFFORD A. BARNES	NSF	66 ft.

requested on any and all aspects of academic fleet operations and support services. All responses will be compiled and included in the formal input to the committee. I encourage email responses but letters are fine. Send an email to dheinric@nsf.gov, with cc to edieter@nsf.gov, using the subject:

“Academic Fleet Review: 1998.”

I should note that, separate from the review, the Oceanographic Centers and Facilities Section identified the enhancement of technical and shared-use instrumentation support for research projects to reduce financial and management burdens on research project awards to sea-going scientists as a priority in FY 1999. We also solicit your views and recommendations to accomplish this goal. Email dheinric@nsf.gov, with a copy to ashor@nsf.gov, using the title “ITS Enhancement: 1999” to voice your views. (ITS is short for Instrumentation and Technical Services).

I thank you in advance for your assistance.

- Donald F. Heinrichs

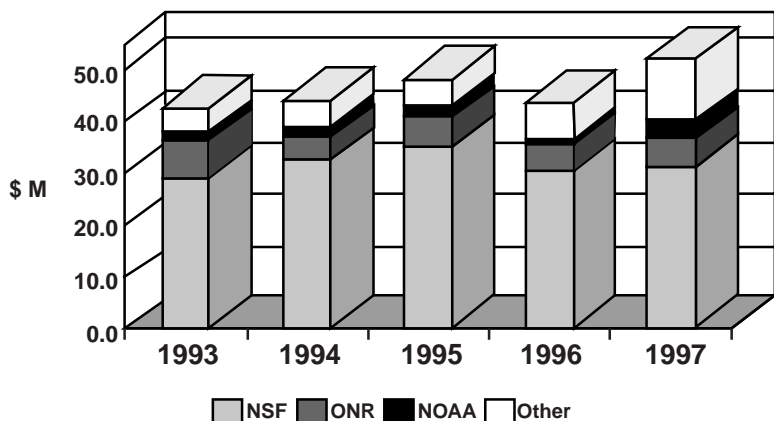


Figure 1. Support of the Academic Research Fleet

The Future of Ocean Sciences Research

Just as investigators and facility operators prepare and submit proposals to NSF for funding to make scientific progress in their respective fields, so too must Divisions within NSF continuously justify the maintenance and perhaps growth of resources to support their scientific communities. To advocate for the ocean sciences community, the Division's management receives regular advice on what's new and exciting from a variety of sources — program managers, individual investigators, advisory committees, and workshops to name a few. But it's necessary from time to time to undertake a more formal forward-looking, long-range study of potential new areas of research, new opportunities, and perhaps different approaches to the conduct of ocean science research.

In March, the fourth and final disciplinary workshop (in Biological Oceanography) was held to gather community input and reach consensus as to what are the areas of opportunity and future directions for each of the major OCE research programs (Marine Geology and Geophysics, Chemical, Physical and Biological Oceanography). The workshop summaries follow this discussion. Full reports from each workshop and background material are posted on the web site: http://www.joss.ucar.edu/joss_psg/project/oce_workshop/ in the hope and expectation that the workshop organizers and OCE will receive continuing input and advice from the community.

This process of looking into the future of ocean sciences research does not stop with the four disciplinary workshops. A set of activities will be necessary to identify gaps, consider facility implications of future research directions, integrate the disciplinary findings into an overall ocean sciences plan, and, most importantly, make sure that the exciting research that crosses disciplinary boundaries plays a

deservedly prominent role in our future thinking.

At the time of writing, the plan for how these activities will be organized is being established. Needless to say, it will be a community led effort. The extent of community involvement will determine the credibility and effectiveness of the resulting document, and perhaps the health and vigor of the field.

Summaries of the four disciplinary workshops follow:

Workshop Summaries

APROPOS, Advances and Primary Research Opportunities in Physical Oceanography Studies

The NSF-sponsored workshop on the future of physical oceanography (APROPOS) took place December 15-17, 1997, in Monterey, California. Chaired by Dr. William R. Young, forty-seven scientists from twenty-five U.S. academic institutions met for three days to discuss past accomplishments, future directions in the field, and the way the community conducts its research. The discussions covered infrastructure needs, interactions within the community and with other communities. Thanks to the hard work and creativity of the steering committee, the format of the workshop led to very congenial and productive discussions, and most participants felt that it was time well spent.

As a follow-on activity to the workshop, the Steering Committee hosted an evening session at the Ocean Sciences Meeting in San Diego to preview some of the conclusions reached at the workshop and engage the broader community in the dialog with NSF. A draft report should be available for public comments at the end of March 1998 on the APROPOS web page set up on the UCAR site shown above.

Currently the web page contains basic information about the workshop format, a list of the Steering Committee members and workshop participants, comments from the community and a set of six thematic talks, responses and discussions. We encourage you to post your own views and comments, both positive and critical. This is especially important if you think that the report doesn't include important aspects of physical oceanographic research in terms of recent achievements and future directions.

FOCUS, Future of Ocean Chemistry in the U.S.

Held January 6-9 at Seabrook Island, South Carolina, the FOCUS workshop, was a truly intense affair for the 40 academic and 8 federal scientists attending. With the help of the FOCUS Steering Committee, cochairs Larry Mayer (U.Maine) and Ellen Druffel (UC-Irvine), did a marvelous job of running the meeting and facilitating the group's negotiation of a myriad of (predictably) contentious issues.

It would be fair to say that the FOCUS 'process' did not end after the workshop attendees left Seabrook and went back to their day jobs. More than 250 persons attended a Wednesday evening session at the Ocean Sciences Meeting in San Diego in February to hear and respond to a report of the FOCUS workshop proceedings. As of this writing, the FOCUS synthesis is still underway. To get involved (and you should!) log onto the website mentioned above.

FUMAGES, The Future of Marine Geology and Geophysics

The first in this series of workshops, the FUMAGES workshop took place in December, 1996, in Ashland, Oregon. Marine Geology and Geophysics and Ocean Drilling Programs

at the National Science Foundation together spend approximately \$29M on science annually in the United States (not including ship costs). Although this is an impressive figure, increases to the program budgets have barely kept up with inflation, the pool of potential investigators has been ever increasing, and other Federal agencies that traditionally supported research and technology development in MG&G have had their budgets cut drastically. The net effect is a stressed research community in which innovative science, novel collaborations, and the next generation of technology development are more difficult to support.

In this type of environment, there is the danger that creativity, the lifeblood of science, will become stifled in an overly conservative peer-review system unless there is some community coordination and consensus that allows bold, new ideas to be pursued. Thus the questions asked of the participants at the Ashland Hills workshop were: What are the most promising and exciting directions for future research in marine geology and geophysics? What research strategies will best address these problems? For more information on FUMAGES, visit the website shown above.

OEUVRE, Ocean Ecology: Understanding and Vision for Research

The OEUVRE workshop was held in Keystone, Colorado in February, 1998, under the able chairmanship of Drs. Peter Jumars and Mark Hay. We have an excellent first draft prepared by the chairs along with four rapporteurs and the entire group of 50 scientists that participated. The report will soon be released for comment by the community. Suffice it to say now that the workshop was a success and laid out some real challenges in research across the sweep of ocean ecology for the coming decade and beyond. Keep in touch with progress by checking the highlighted website.

Program News

Ocean Drilling Program

Planning for the support of scientific ocean drilling beyond the year 2003, as reported in the previous newsletter, continues to command increasing attention within NSF. This activity is complemented by efforts in the U.S. and international scientific communities which seek to articulate the compelling scientific issues that can only be addressed by an enhanced drilling program.

Numerous activities over the past several years, as well as on-going efforts, are refining the nature of such a program and defining the facilities needed to adequately address these scientific issues. The International Working Group for the proposed *Integrated Ocean Drilling Program* (IWG/IODP), mentioned in the previous newsletter, decided at their second meeting, hosted by NSF in September, to ask JOIDES to play a leading role in the science planning and identification of facilities requirements for the IODP.

In early 1997, NSF requested that the U.S. Science Advisory Committee (USSAC) to the Ocean Drilling Program assess the degree of U.S. commitment to scientific ocean drilling beyond 2003. USSAC formed the U.S. Committee to Consider Post-2003 Scientific Ocean Drilling (COM-POST-II). This committee developed a report that was delivered to NSF. A full copy of the report can be seen on the JOI, Inc. home page at: <http://www.joi-odp.org/joi/USSSP/USSSPpubs.html>. Comments are encouraged and welcomed.

The committee intends to publish an abbreviated version of the report with their recommendations in *EOS* in the near future, along with comments from NSF.

Meanwhile, the *JOIDES Resolution* is operating in the Southern Hemisphere drilling in Antarctic waters. Drilling has begun on the Pacific margin of the Antarctic Peninsula in an effort to study Antarctic glacial history and sea level change (Leg 178).

A two-part drilling program at Ninetyeast Ridge in the Indian Ocean will follow this leg. The first objective of Leg 179 is to test a hammer drill-in casing system recently developed by ODP that could dramatically increase ODP's ability to establish a borehole in a hard-rock environment.

Secondly, a cased hole will be drilled for the Ninetyeast Ridge Observatory project.

This observatory will be part of the future network of seafloor observatories proposed by the International Ocean Network (ION) program to study global geodynamics and earthquakes.

Field programs in 1998 being supported by the NSF ODP Grants activity include:

- 1) A detailed mapping and sampling program in the vicinity of site 735B in the Indian Ocean under the direction of Henry Dick (WHOI) with Canadian and British colleagues.
- 2) A near bottom gravity study of sites drilled in Middle Valley off the Washington coast led by Marc Zumberge (SIO).



ODP Drilling Cores

3) Deployment of seismometers at the Ocean Seismic Network (OSN) site near Hawaii by Ralph Stephen (WHOI) and John Orcutt (SIO).

4) High-resolution seismic studies along the New Jersey transect by Greg Mountain (LDEO).

5) Two programs under the direction of Keir Becker (RSMAS) to service existing CORK sites in Middle Valley and at Barbados in collaboration with Canadian and French colleagues.

6) Initiation of experiments at Oregon margin CORK sites to study formation of gas hydrates by Bobb Carson (Lehigh) and Miriam Kastner (SIO).

7) A U.S. Japan collaborative program involving 3-D seismic reflection, active refraction and passive ocean bottom seismicity in the Nankai Trough region off Japan. This effort will be led by Nathan Bangs and Tom Shipley (UTIG), Greg Moore and Julia Morgan (UH), and J. Casey Moore (UC Santa Cruz) along with Japanese colleagues.

Recently, NSF staff from the Divisions of Ocean Sciences and Earth Sciences met with the steering committee of the MARGINS initiative; a bold new activity to “understand the complex interplay of processes that govern the evolution of continental margins.”

A planning office has been established at the University of Hawaii under the direction of Brian Taylor, Chair, MARGINS steering committee. More information can be found at the MARGINS web site: <http://www.soest.hawaii.edu/margins/>.

As a final note, we are pleased to welcome Jamie Allan to the Ocean Drilling Program. Dr. Allan comes to us from Texas A & M University where he was the Interim Manager of Science Services for ODP. He brings with him a strong understanding of the scientific objectives of the program, an appreciation of its technical challenges, and a lot of cheerful

Table 3. Physical Oceanography Program Award Duration. (Data shown includes all active awards except supplements, Small Grants for Exploratory Research, Interagency transfers, and support for IPA's.)

Duration (Years)	Number of Awards					
	FY93	FY94	FY95	FY96	FY97	FY98*
1	5	2	3	0	0	1
2	38	22	31	26	17	7
3	90	103	112	122	124	93
4	19	17	20	13	18	19
5	27	18	31	36	38	39
Average Duration	3.14	3.32	3.23	3.35	3.43	3.55

* Numbers for FY98 are not final as they do not include the recommendations to be made after the May 1998 panel.

enthusiasm. We look forward to working with him. He will be filling the rotator position that was recently vacated by Sandy Shor.

Physical Oceanography Program

Trends in Proposals and Awards. With the completion of the field work in TOGA and WOCE, we are receiving a larger number of multi-investigator proposals for medium-size process studies (\$1-2 million/year). Many of these proposals also include a modeling component to complement the field observations. This combination of approaches (observations, laboratory experiments, theory, and modeling) is part of a larger and healthy trend in the proposals submitted to the OCE target dates that seems to be well received by the mail reviewers and panelists. Sharp decreases in funding opportunities at other agencies have also resulted in an increase in proposal pressure.

The February 15 target date resulted in the submission of over 100 projects, counting each collaborative and group proposal as one. Maintaining a balanced program in terms of topics and project sizes is an ever increasing challenge in the context of flat or decreasing budgets of the past five years.

Recent Awards of Note. Our congratulations to Drs. Rick Salmon (SIO) and Andrew Bennett (OSU) for having been awarded 2-year creativity extensions for their innovative work on the general ocean circulation and the use of inverse models in oceanography, respectively.

In other news, we have funded several rapid response projects to enhance the observations of the 1997-98 El Niño event, both in terms of the internal dynamics of the phenomenon and its impact on the coastal ocean along the west coast of the North American continent:

- ENSO 97 Halocline Study: Hawaii to Christmas Island Transit Richard Fairbanks, LDEO (with Chemical Oceanography)
- El Niño Rapid Response Study Off Baja California, Myrl Hendershott, SIO
- Physical Oceanographic Conditions off central California in 1998 Curtis Collins, NPS

Finally, we would like to dismiss the myth that the Physical Oceanography Program only funds 2- and 3-year awards. In fact quite the opposite is true. Our program, following NSF's policy of increasing award duration, is supporting an increasing number of 4

and 5-year awards. Table 3 shows the number of active awards with duration of 1 to 5 years for the past 5 fiscal years and preliminary numbers for the current fiscal year (FY98). Excluded in the totals are awards for workshops and Small Grants for Exploratory Research.

The steady increase in award duration can be mostly attributed to two factors: 1) most recent proposals for field work include several years of analysis as part of the project and 2) research problems tackled by our community are becoming increasingly complex, requiring more time to complete. This latter factor holds true for both observational and modeling work.

Program News. On March 2nd, we welcomed Dick Lambert back as head of the program after an eight-month leave of absence during which he researched the history and management of large coordinated programs like TOGA and WOCE. Dick will contribute his findings to panel discussions at the Ocean Studies Board's symposium "50 years of Oceanography at NSF," to be held this fall in Washington, D.C. as part of the Year of the Ocean celebrations.

Important reminder to all our grantees. Please send in your progress and final reports on time to avoid delays in processing new or continuing awards. Progress reports are due three months prior to the anniversary date (the date stated on the award letter sent to the grantee institution). Final reports are due



within 90 days of an award's end date. Finally, a note of caution when submitting proposals via FastLane: NSF does not currently have the capability to print color copies of FastLane proposals. If color or grayscale graphics are an integral part of your proposal, we recommend that, for the time being, you submit it the regular way or contact us beforehand to make arrangements for including the color pages.

For further information about the program, please contact Richard B. Lambert (rlambert@nsf.gov), Eric Itsweire (eitsweir@nsf.gov) or Dick Ou (hou@nsf.gov).

Marine Geology & Geophysics Program

MG&G is the first program in OCE to try a new management structure. The two permanent Associate Program Directors, Connie Sancetta and Dave Epp, have been promoted to Program Director (PD) level and each has been assigned to manage a discrete part of the old MG&G areas of interest. Dave Epp was already managing the RIDGE program before the change and will continue to do so. Connie Sancetta will manage the marine part of the Earth System History (MESH) program. Bil Haq will oversee the new MARGINS initiative and will continue to provide overall coordination for the MG&G programs.

All PDs, including Don Elthon (IPA from the University of Houston), will be responsible for and continue to manage the "core" areas of MG&G. We hope that the new structure will more clearly identify the responsible PDs to the PIs and enhance communication between OCE and the scientific community.

The MG&G budget has remained level since fiscal year 1995, and in FY 1998 is slightly lower than the 1997 level. But the number of proposals and

the number of PIs proposing to the program has increased since 1995. Over the years many new PIs have appeared, but we have also noticed that a substantial number of former PIs are no longer proposing to MG&G. Out of curiosity, we compared the list of PI's for 1986 with that of 1996, as a rough indicator of population replacement and turnover rates. This list includes all active awards during each year as well as all the proposals submitted.

The total number of PIs increased by almost 45% during this period, from 213 in 1986 to 309 in 1996. Only 76 people appear in both lists, meaning that only 35% of the 1986 PIs were still submitting proposals to MG&G in 1996 (alternatively, one can say that only 25% of the 1996 PIs were also PIs in 1986).

Of course, many people submit proposals to other NSF programs and agencies, so that MG&G may not be their primary source of support; many of the 137 who "disappeared" between 1986 and 1996 are still active in the field, but are no longer submitting proposals to MG&G. However, to our knowledge at least 40 of these people (about 30%) are no longer doing academic research, having retired or moved into other careers.

The Marine Geology and Geophysics Program continues to respond promptly to events on the seafloor that present unique research opportunities. The RIDGE program, together with the NOAA VENTS program, supported a rapid-response cruise to investigate another seismic event on the Juan de Fuca Ridge. This event was detected by the NOAA VENTS T-phase monitoring system that uses Navy hydrophone arrays in the northeast Pacific. The intense seismicity began on January 25, 1998 and was located on the summit and southern flank of Axial seamount.

The R/V Wecoma sailed on February 9, and despite bad weather

managed to deploy eight ocean-bottom hydrophones and occupy 16 CTD/water sampling stations. Hydrothermal discharge from the summit is roughly an order of magnitude greater than before the event, and preliminary data suggest a lava eruption on the summit. The scientists and the crew of the *Wecoma* are to be commended for accomplishing all the goals of the cruise despite high winds and seas. The unfolding saga of this seismic event can be monitored on the NOAA web site at: <http://newport.pmel.noaa.gov/axial/98.html>.

The MARGINS program is acquiring a more concrete structure as the community defines its specific objectives in greater detail. A workshop to plan a seismogenic zone experiment proposed three possible locations for the first experiment: Nankai Trough, the Mid-Americas Trench and Cascadia. The experiment will involve 3D seismic imaging, seismic monitoring, tomography and eventual drilling.

Another workshop for detailed planning of a study of the "subduction factory" is planned for June 1998. This will be aimed at investigating the recycling of materials at the subducting margin, including the incoming plate, the forearc, the subducting slab, the mantle wedge and the volcanic arc. Much of the planning for MARGINS also contributes toward scientific objectives that require possible future drilling in the riser mode on continental margins.

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Chemical Oceanography Program

The CO Program continues to experience a proposal success rate in

the 25-30% range – significantly less than the "good old days" of the 70's and 80's. Approximately 40% of program funds expended in FY 1997 were for interdisciplinary awards, our major funding partner (by far) being the Biological Oceanography (BO) Program. Like the other programs in the Research Section (OSRS), CO has received a small budget cut in FY 1998 (ca. 1.8%, or one-tenth of what CO normally spends on new proposals each panel), but we have taken steps to minimize the impact on the community.

The first round of awards in the U.S.JGOFS Synthesis and Modeling Project (SMP) has been made through joint funding with the NSF's BO Program and NASA's Ocean Biology Program. CO/BO at NSF contributed \$1.4M and NASA \$2.1M to support the first year efforts of 20 U.S.JGOFS projects, many of which will be taking advantage of the newly-available ocean color SeaWiFS technology.

Beginning this year and extending through 2002, we plan to receive SMP proposals *once each year* with a *submission deadline of 15 August* (the same time as the *target date* for the usual Fall OSRS Panel). The NSF/NASA partnership is proving to be one of great mutual benefit, so we hope that it can continue through the remainder of U.S.JGOFS. A formal SMP announcement is forthcoming.

We were pleased to see that more than 360 persons turned out at the AGU Ocean Sciences Meeting in February to attend a community forum on the future of marine biogeochemical research. It was easily the most heavily attended event of the week. Jim Murray (UW) and Gus Paffenhofer (Skidaway) set about organizing the forum shortly after the Santa Fe meeting in February 1997 to provide a vehicle for sharing ideas and developing an ocean community vision for biogeochemical research in the post-JGOFS era. As was the case for

FOCUS, we in the CO Program were immensely impressed by the breadth and depth of research possibilities and issues raised in this forum.

After twenty years of service to the ocean chemistry community, Rodger Baier has retired from NSF to lead the good life back in Morehead City, North Carolina, not far from his pre-NSF post at the Duke Marine Laboratory (see *OCE profile in this issue*). Those of us remaining behind in the CO Program owe him much and we will miss him tremendously.

Because Ken Buesseler's tour as rotator will end in August, the Program is searching for candidates to fill two Associate Program Director vacancies. Official vacancy announcements from NSF should appear soon, but meanwhile if you have questions, contact one of us by email.

Ken Buesseler (kbuessel@nsf.gov)
Don Rice (drice@nsf.gov)

Ocean Technology & Interdisciplinary Coordination Program

On the technology front, there is considerable excitement around the real-time data coming from HUGO (Hawaii Undersea Geo-Observatory). The backbone of HUGO was installed at Loihi seamount southeast of Oahu in October 1997. Continuous 64 KHz real-time data from a broad-band hydrophone are being received at the shore station at Honuapo, Hawaii. PIs are currently listening to whales, ships, and Loihi eruptive sounds. Early next year, University of Hawaii expects to be able to install the first experiments from other scientists, and inquiries about installation of experiments at Loihi are welcome. Visit the HUGO web site for news and details: www.soest.hawaii.edu/HUGO/hugo.html.

HUGO is one of several efforts underway to develop better long-term observational capabilities for ocean science research. The Bermuda Testbed Mooring (BTM) project has been renewed through CY2000. The BTM serves as a platform for testing new instruments and for collecting long time series data. Developing the capability to better make long-term scientific measurements and observations remains a priority for the Oceanographic Technology component of the OTIC program.

The Great Lakes initiative of the Coastal Ocean Processes (CoOP) program is entering the first of three, year-long field seasons to study cross-shelf transport processes in two of the Great Lakes. The EEGLE (Episodic Events in the Great Lakes) project is focusing on southern Lake Michigan and the KITES (Keweenaw Interdisciplinary Transport Experiment in Superior) project represents one of the first ever major interdisciplinary studies in Lake Superior. Both projects have excellent and informative web sites: www.glerl.noaa.gov/eegle/eegle.html and <http://chmac2.chem.mtu.edu/KITES/kites.ssi>.

The CoOP program plans to issue an Announcement of Opportunity (AO) in 1999 for a wind-driven transport process study with field work to start in FY2000. As in past CoOP AOs, it is anticipated that integrated, interdisciplinary proposals to study important processes in cross-margin transport will be required.

CoOP will be hosting a workshop in the Fall 1998, to further define a buoyancy-driven transport study. The focus of this study will be on the Gulfs of Mexico and Alaska, two areas where cross-margin transport can be dominated by buoyancy-driven flows. The best source of information on these CoOP activities is the CoOP web site: www.hpl.umces.edu/coop/.

Biological Oceanography Program

At the beginning of 1998 the Program welcomed Dr. David Garrison back to the Division in his new capacity as Associate Program Director. Dave had served as a visiting scientist in the Biological Oceanography Program several years ago and has now returned to serve the division and the community in a permanent status.

Dave comes from the University of California at Santa Cruz. His forte is phytoplankton ecology with interests in harmful algal blooms along the west coast, as well as southern ocean ecosystems. We would have preferred moving the division to Santa Cruz but Dave came this way instead.

Dr. Sean Powers has completed his Sea Grant Fellowship with the Biological Oceanography Program. His contributions to the Program were exemplary over the past year, assisting in everything from panel activities (core, ECOHAB, GLOBEC, and LTER) to accumulation of Program statistics, to representation of the Program at meetings (Benthic Ecology, ICES), to assistance with the initiation of the OEUVRE workshop (see page 6 for details).

El Niño has prompted us to award a few rapid response grants for associated exploratory research. To date, support has been given for the following projects:

James Bauer, VIMS and Ellen Druffel, UC Irvine
Carbon Isotopes in Particulate and Dissolved Organic

Carbon in the NE Pacific during the ENSO event 1997-1998.
(with Chemical Oceanography)

Kenneth Smith, Scripps Impact of the 1997-98 El Niño Event on Abyssal Benthic Boundary Layer Communities in the NE Pacific.
(with Chemical Oceanography)

Cliff Cunnigham, Duke Documenting the effects of the 1997 El Niño Southern Oscillation event on a broadly dispersing barnacle species at a major biogeographic boundary. (with the Division of Environmental Biology)

Thomas Ebert, John Dixon, Stephen Schroeter, San Diego State Univ. Effects of El Niño Oceanographic Conditions on the Settlement Patterns of Marine Invertebrates in Southern, Central and Northern California.

continued on page 12...

Top 20 Academic Institutions receiving OCE funds for research (total amount of FY97 awards not including ship support)

Woods Hole Ocean Inst	\$18,902,724
U of Cal SD Scripps Inst	7,451,692
U of Washington	7,192,777
Oregon State University	5,310,827
U of Hawaii Manoa	4,903,427
Columbia University	4,302,348
U of Rhode Island	3,541,339
U of Miami Sch Mar&Atmos	3,475,185
MIT	1,886,591
SUNY Stony Brook	1,824,050
U of Cal Santa Barbara	1,753,308
Texas A&M Research Fdn	1,647,593
University of Delaware	1,616,342
U of Texas Austin	1,455,784
Rutgers Univ New Brunswick	1,419,123
Bermuda Biol Sta Research	1,306,961
Florida State University	1,266,547
Skidaway Inst of Ocngrophy	1,264,784
U of SC Columbia	1,050,134
U of New Hampshire	961,056



Rodger Baier, admiring his retirement gift.

On Friday, February 27, 1998, we hosted a party and dinner to honor the career of Dr. Rodger Baier, who retired on March 3 after 20 years of service at NSF. As co-architect with Neil Andersen of the modern Chemical Oceanography Program, Rodger has had a major impact over the direction taken by federally-funded ocean science for two decades. During that time he gained well-deserved recognition as a fair and compassionate program manager and as an unrelenting advocate for NSF's obligation to support science proposed by the individual investigator.

With an undergraduate degree in Applied Chemistry from Cal Tech in hand (Class of '52), Rodger set out on what he expected to be a career in chemical engineering. And so he began a fifteen-year sojourn in the chemical industry by getting involved in a project to extract salts from desert brines. Prompted by defense interest in

OCE PROFILE - RODGER BAIER

BY Don Rice

what appeared to be boron in the exhaust of Soviet rockets, he went on to work on extracting elemental boron from boric acid. Later, at the Ford Motor Company, he worked on a variety of projects, including the development of anti-nerve gas agents and the production of catalytic converters for the automobile engine.

Rodger attributes his shift of scientific horizon seaward to an inspiring lecture by Francis Richards. When the proper conjunction of stars – a dismal job market, a student loan, and a successful application to graduate school – came in the late 60's, he left chemical engineering and went on to get his M.S. and Ph.D. in chemical oceanography at the University of Washington.

After UW and 103 job applications, he was offered a research and teaching position at Duke Marine Lab where he remained for six years until, in 1977, he came to NSF for an *intended* one-year rotation. The next year, he says, he spent the better part of a day in the Hirschorn Museum pondering whether or not to leave the University and accept a permanent appointment at NSF.

To the happy fortune of three generations of ocean chemists, he did. After six years running the chemistry part of IDOE, he joined Neil Andersen in the Marine

Chemistry Program, thus completing the outlines of the present-day Chemical Oceanography Program.

Rodger is quick to admit that his life and career have been a joint effort with his wife, Jeanne, whom he met, with the assistance of a match-making sister, in his early days at Cal Tech. "I didn't come from a telegram-sending family, but right after my sister introduced us I sent one to Jeanne inviting her to go with me to the theater. And that was the beginning." In recognition of their loving involvement with the DISCO Symposium since its inception in 1978, Rodger and Jeanne were honored at the closing banquet by the participants of DISCO XIV last October where they were proclaimed the first 'DISCO Emeriti'.

They plan to be settled back in their house in Morehead City, North Carolina, by the beginning of April, but continuing ties in the Washington, D.C. area will bring them back to the old Ballston neighborhood from time to time – a fact for which we in OCE are immensely thankful.

Rodger and Jeanne, we wish you both oceans of happiness...

continued from page 10...

Peter Klimley, UC Davis
Automated Monitoring of Pelagic
Fish Assemblage during El Niño/
Southern Oscillation. (with the Inter-
American Institute for Global Change
Research and International Programs)

Lisa Levin, Scripps
Oxygen Minimum Zone Control
of Benthic Processes on the Peru-
Chile Margin: El Niño Influence.
(with International Programs)

Jesus Pineda, WHOI
Impacts of El Niño on Settlement

Patterns of Nearshore Inverte-
brates in Southern California. (with
the Inter-American Institute for
Global Change Research)

Robert Smith, Patricia Wheeler,
Adriana Huyer, Michael Kosro,
Oregon State. Supplementary
Monitoring of ENSO Signals in the
Eastern North Pacific.

Gerard Wellington, Univ. Houston
Impact of Severe ENSO Events on
Insular Endemic Shorefish Populations.

James Estes, UCSC
"Disaster and recovery in kelp
forest communities: the effects
of EL Niño Southern Oscillation
events in the Northeast Pacific."

Howard Lasker, Univ. Buffalo
"El Nino related bleaching of
Caribbean corals" University at
Buffalo. ●

- Phil Taylor

Sites of Interest:

OCE <http://www.geo.nsf.gov/oce/start.htm>

JGOFS <http://www1.whoiedu/jgoofs.html>

ODP <http://www-odp.tamu.edu/>

JOI <http://www.joi-odp.org>

RIDGE <http://ridge.unh.edu/>

JOIDES <http://www.whoiedu/joides>

CoOP <http://www.hpl.umces.edu/coop>

CLIVAR <http://www.clivar.ucar.edu/hp.html>

ECO HAB <http://www.redtide.whoiedu/hab/>

UNOLS <http://www.gso.uri.edu/unols/unols.html>

MARGINS <http://www.soest.hawaii.edu/margins>

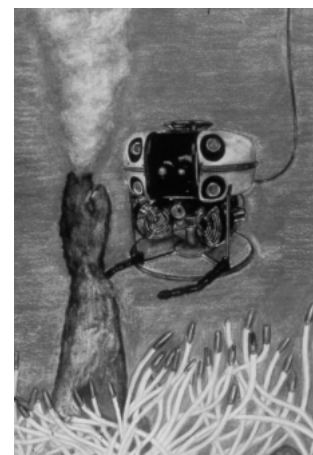
MESH <http://mystipc.oce.orst.edu/MESH/mesh.htm>

WOCE <http://www-ocean.tamu.edu/WOCE/uswoce.html>

LEXEN <http://www.nsf.gov/home/crssprgm/lexen/start.htm>

LMER <http://www.mbl.edu/html/ECOSYSTEMS/lmer/lmer.html>

GLOBEC <http://www.usglobec.berkeley.edu/usglobec/globec.homepage.html>





Ocean Sciences Symposium in Celebration of the Year of the Ocean and NSF's 50th Anniversary

The Act of Congress establishing the National Science Foundation (NSF) for the support of basic research in the sciences was signed into law in 1950 by President Truman.

Although oceanography did not always have its own division within NSF as it does today, studies of the ocean and its interactions with the land and atmosphere received significant NSF support in the first decade, through the International Geophysical Year (IGY). The second decade saw the origins of UNOLS, ocean drilling programs, Sea Grant originally at NSF, and the Stratton Commission Report. The decade of the seventies witnessed the International Decade of Ocean Exploration and establishment of NSF's Division of Ocean Sciences, followed by inception of the Global Change programs in the eighties.

To highlight the role of NSF in the achievements of U.S. oceanography since 1950, the National Research Council's *Committee on Fifty Years of Ocean Sciences at*

the National Science Foundation, chaired by Dr. John Steele, will convene a public symposium October 28-30, 1998. The Symposium will be held in the National Academy of Sciences Auditorium located at 2101 Constitution Avenue, NW, Washington, D.C.

The Symposium will also serve as a major component of NSF's contribution to the international "Year of the Ocean". The event will provide the public an opportunity to hear about the major accomplishments and discoveries in ocean sciences over the past five decades and to catch a glimpse of the field's future directions. The organizing committee is composed of members of the academic community (Marcia McNutt, John Knauss, Walter Munk, Karl Turekian, Andrew Solow) and former NSF administrators (Bob Wall, Sandra Toye, Feenan Jennings).

Papers by distinguished oceanographers will be augmented by panel discussion and posters, some of which will serve as input to a

volume to be published for NSF's 50th anniversary.

All interested individuals are invited to participate in this event. The committee has invited former NSF personnel and individuals from oceanographic institutions nationwide to present their views of NSF's history and future in ocean sciences.

Additional information about the project and symposium can be obtained from Ed Urban, NAS Ocean Studies Board, (202) 334-2714 or www2.nas.edu/osb/2326.html. The meeting agenda will be posted on this website after speakers have been confirmed.

In addition, we welcome poster presentations from academic institutions, scientific programs, or planning offices to highlight their history and connections with the NSF Division of Ocean Sciences and its precursors. Potential poster contributions or attendance by former members of the NSF staff can be discussed with Mike Reeve (mreeve@nsf.gov or 703 306-1582). ●

Proposal Target Dates

Ocean Sciences Research Section (OSRS). Unsolicited Proposals for Biological Oceanography, Physical Oceanography, Chemical Oceanography, and Marine Geology & Geophysics. **Target dates:** August 15, 1998 and February 15, 1999. Proposals for field programs that require the use of University-National Oceanographic Laboratory Systems (UNOLS) ships in the following calendar year (2000) must be submitted by the February 15, 1999, target date.

OSRS Inter-Agency and Special Initiatives.

Climate Variability and Predictability (CLIVAR)	Feb. 15 & Aug 15
Earth System History (ESH)	January 15, 1999 (deadline)
Environmental Geochemistry & Biogeochemistry Program (EGB)	~January 1999 (deadline)
Joint Global Ocean Flux Study (JGOFS) / Synthesis And Modeling	August 15, 1998 (deadline)
Life in Extreme Environments (LEExEn)	TBA
Ridge Inter-Disciplinary Global Experiments	Feb. 15 & Aug. 15
World Ocean Circulation Experiment (WOCE)	Feb. 15 & Aug. 15

Oceanographic Centers & Facilities Section.

Ocean Drilling Program	Feb 15 and Aug 15
Oceanographic Instrumentation	Sept. 1
Shipboard Scientific Support Equipment	Sept. 1
Ship Operations	Oct. 1
Technical Services	Oct. 1
Ship Construction/Conversion	contact the program

Other NSF programs of interest to ocean scientists. The following announcements are available on homepage by searching the on-line document database data base for the indicated announce www.nsf.gov/cgi-bin/pubsys/browser/odbrowse.pl.

Professional Opportunities for Women in Research and Education (POWRE), NSF-97-91	Deadline Dates: December 9, 1998 new February 17, 1999 supp.
Research Planning Grants (MRPG) and Career Advancement Awards (MCAA) for Minority Scientists and Engineers, NSF 94-147	August 15, 1998 & February 15, 1999 (target dates)
Research Experiences for Undergraduates (REU) Program, NSF 96-102	Site Deadline: September 15, 1998 Supplements: contact the program
Faculty Early Career Development Program (CAREER) (www.nsf.gov/pubs/1997/nsf9787/nsf9787.txt).	July 22, 1998

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For additional copies, call (703) 306-1580 or visit <http://www.geo.nsf.gov/oce/ocenew.htm>. Editor: Amy Caicedo (acaicedo@nsf.gov)

Ship Scheduling Reminder

All proposals to NSF that anticipate use of a UNOLS ship must include a UNOLS Ship Time Request Form. The UNOLS ship time request form is available on the UNOLS website at: www.gso.uri.edu/unols/unols.html.

The UNOLS website is a key element to include your project in the ship scheduling process starting with the proposal stage. A "locally printed" copy of the electronic form must accompany your research proposal to NSF. The final logistics plans, coordination of research projects, and assignment of specific research

ships and cruise dates can only be done after the full mix of science projects is known.

All research proposals to NSF that request ship time on vessels operated by UNOLS member institutions must be submitted with lead time for support/decline decisions to be made by the research program office no later than July/August of the year before the cruise, i.e. July/August 1998 for January to December cruises in 1999. The merit review process for research projects submitted to most NSF program offices takes about 6 months.

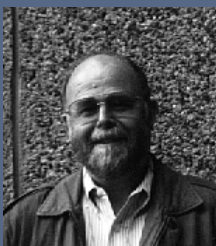
Proposals to the Ocean Sciences Programs must be submitted by the February 15 target date to be considered for next year cruises. Program Announcements for special competitions may have deadlines or target dates somewhat later in the year. In all cases the research program offices must provide support recommendations by July/August or the seagoing phase of a study may not be supported in the following year.

Comings and Goings

Something about the Spring always seems to bring us new employees! Although we only have two new faces on our staff, we have had several staff changes.

Richard Lambert is back from his eight-month sabbatical. He will be reporting on his project "50 Years of Oceanography at NSF" at the Ocean Studies Board Symposium this Fall. *Lisa Rom* is back from California, and is now working with Larry Clark as OTIC's Associate Program Director. *Sean Powers*, formerly a Sea Grant Fellow from Texas A&M University, is now working as a Science Assistant in OCE. Sean

recently earned his PhD - congratulations Dr. Powers! *Sandy Shor*, formerly an IPA, has been appointed as the Program Director for Instrumentation and Technical Services. *Rodger Baier* has chosen the retired life over NSF, and is headed for North Carolina (see OCE profile, page 10).



David Garrison arrived in January from the University of California, Santa Cruz. David rejoined the Biological Oceanography Program as a "permanent addition". He actually worked with us during 1992-1994 as an IPA. David's research interests are sea-ice

communities, toxic phytoplankton, and microzooplankton. *Jamie Allan*, also from Texas A&M, is the most recent addition to the Ocean Drilling Program.

Jamie's interest in igneous petrology has led him to do research at sites such as the Galapagos, North Atlantic, Columbia, and the East Pacific Rise seamounts. Jamie is serving as an IPA for ODP.



For further information on OCE staff members, including phone numbers and email addresses, as well as vacancy announcements please check the OCE website at www.geo.nsf.gov/oce/ocegen1.htm.

The Foundation provides awards for research and education in the sciences and engineering. The awardee is wholly responsible for the conduct of such research and preparation of the results for publication. The Foundation, therefore, does not assume responsibility for the research findings or their interpretation.

The Foundation welcomes proposals from all qualified scientists and engineers and strongly encourages women, minorities, and persons with disabilities to compete fully in any of the research and education related programs described here. In accordance with federal statutes, regulations, and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving financial assistance from the National Science Foundation.



Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF projects. See the program announcement or contact the program coordinator at (703) 306-1636.

The National Science Foundation has TDD (Telephonic Device for the Deaf) capability, which enables individuals with hearing impairment to communicate with the Foundation about NSF programs, employment, or general information. To access NSF TDD dial (703) 306-0090; for FIRS, 1-800-877-8339.

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