



# Division of Ocean Sciences

*Spring 2000 Newsletter*

## Sustained Time-Series Observations for Ocean Research

Since the earliest expeditions of H.M.S. Challenger in the 19th century, progress in ocean research has been driven strongly by the ability to make new observations - either located in new *places* (i.e. classical exploration – going to places on Earth that have not been observed before) or new *types* of measurements that permit natural phenomena or processes to be understood in different ways. The state of knowledge concerning our planet's oceans is built primarily upon this foundation of 'spatial' exploration.

As our knowledge of the oceans has improved, observational oceanography has evolved to include 'process studies' - where both location and observational strategies are chosen carefully to enhance the likelihood of gaining insight into the physics, chemistry, or biology of one particular active process.

Simultaneously, the realization has grown that few characteristics of the ocean are in steady state – the ocean and the seafloor beneath are highly dynamic environments. If these processes are to be understood, if new insights are to be gained, if quantitative models are to be validated satisfactorily, then observations are needed over the time scales appropriate to the dynamics of these processes. We know enough today to realize that these time scales span milliseconds to decades, centuries and beyond.

Today's data collection and experimentation in oceanography are carried out most commonly in an expeditionary mode – a one or two month-long research



*IMET buoy deployed in the Western Equatorial Pacific during TOGA COARE. Photo courtesy of R. Weller, WHOI.*

'cruise' focused upon a specific problem, or set of problems, led by one or more investigators who claim substantial rights to the data that results from their efforts.

We expect that this expeditionary mode of operation will evolve substantially over the next decade, driven primarily by the growing and well-justified need for sustained time-series observations. This need is clear, not only in our most reliable source of information concerning research trends (the proposals that we receive), but also in essentially all of the community-based planning documents that have been produced in recent years. It is important to the health of the science that the Division of Ocean Sciences

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(OCE) respond to this evolution by studying whether the facilities and support mechanisms that we provide are optimal to this new way of doing oceanography, and if not, to make the changes that are required.

In doing this we face many challenges. The role of NSF in the support of long-term measurements is often questioned.

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*Is this not just 'monitoring'? And is not 'monitoring' the purview of the mission agencies that can more appropriately tailor the measurement systems to their defined operational goals?*

The most effective response to these valid and important questions is as follows.

The Division of Ocean Sciences should support the data collection that its investigators need to tackle the most exciting and topical problems in the discipline. Today this means that, in many cases, sustained time-series of multiple years in duration are needed. Recent experience shows that new and unexpected discoveries are made when careful measurements are carried out over sustained periods of time. Such discoveries further confirm the complex dynamics of many of the Earth's processes. They challenge, and sometimes require the rejection of, long-standing models for the explanation of what were previously thought to be steady-state phenomena. Examples of this are too many to mention, but span the full range of OCE endeavors - from the unexplained changes in flow rate of water through deep sea boreholes over several years to the determination that pelagic sediment flux onto the seafloor is dominated by discrete 'bloom' events.

When investigators work to understand the ocean by making sustained time-series observations they are, in effect, *'exploring-in-time'*. The earliest oceanographers made the first great discoveries by conventional spatial exploration - they traveled to new places in the oceans and discovered unexpected phenomena that catapulted their understanding of a particular process to a new level. Today, innumerable examples exist in the published literature of important and sometimes unexpected discoveries resulting from the collection of long time-series data sets. But this is not 'monitoring' - it is the classical combination of hypothesis testing and exploration, but in the time domain, not the space domain. Researchers do not continuously measure some parameter for no good reason! They are continuously developing, changing, and improving measurement strategies and techniques to maximize understanding and insight.

In parallel with this intellectual evolution that is yielding new insights into the dynamics of Earth and ocean systems, the technology that is needed to make the required measurements is evolving at a comparably rapid rate. A number of highly successful pilot experiments using seafloor cables have revolutionized measurement strategies by bringing substantial power and data bandwidth to the seafloor. Satellite-telemetering profiling floats have been used to provide a synoptic view in real time of basin-scale circulation of the upper ocean. Autonomous underwater vehicles with decision-making capability are making measurements on temporal and spatial scales never before possible. And one of the jewels in the crown of the Joint Global Ocean Flux Study (JGOFS) Program is the breadth and significance of the discoveries yielded by the Hawaii Ocean Time-series (HOT) and Bermuda Atlantic Time-series Study (BATS) sites.

And so, if OCE is going to fulfill properly its responsibility to the community to facilitate the highest quality research, we should begin to investigate ways to better enable time-series based research activities. We provide research vessels to investigators at no cost to their research grants, to enable research to be carried out anywhere in the world's oceans. But if an investigator wants to go to one place (or several places) and make measurements for several years, then no standard community-wide infrastructure is available. The concept of the UNOLS fleet some thirty years ago revolutionized ocean sciences in the U.S. by providing open access to the oceans to NSF-supported researchers. Perhaps the time has come to enable a similar revolution today, but in the acquisition of time-series data sets.

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**When investigators work to understand the ocean by making sustained time-series observations they are, in effect, *'exploring-in-time'*.**

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With these thoughts in mind, we requested the Ocean Studies Board of the National Research Council to convene a workshop, think about all the issues I have described above, and evaluate their importance. This workshop was held in Key Largo, Florida in January 2000. It stimulated substantial high quality discussion, and we look forward to receiving the report in the near future.

It would not be wise for NSF to develop activities in ocean observations in isolation from the interests and requirements of our sister ocean agencies in the Federal government. Although the exclusive focus of this article has been fundamental research, there are rich and diverse opportunities for major progress towards the attainment of the mission agencies' operational goals through ocean observations. As NSF moves forward to support new sustained time-series research activities, we will do so in close coordination with the other agencies of the Federal government. NSF is an active player within the National Ocean Partnership Program's planning activities for the development of a U.S. Integrated Ocean Observing System (IOOS). It is clear that the operational goals of IOOS and the research goals of NSF-supported investigators are highly synergistic and there is substantial benefit to considering both research and operational objectives when designing components of the observing system.

This is an exciting time in the ocean sciences - the discipline is rich in new ideas, and the development of new technologies is changing the way we observe the ocean. OCE is responsive to these changes and is willing to implement new ways to enable the community's research.

## FASTLANE PROPOSAL SUBMISSION AND REVIEW SYSTEM UPDATE

As the National Science Foundation mandated deadline of October 1, 2000 for the research community to use FastLane for all major proposal, review, award, and other interactions fast approaches, the Division of Ocean Sciences (OCE) is encouraged by the recent FastLane proposal submission results. In the first six months of fiscal year 2000, OCE received a total of 785 proposals of which 44% (351) were submitted via FastLane. This is a substantial increase over the 19% (254) of proposals submitted electronically in all of fiscal year 1999. Although the ocean sciences community must be commended for making such strides, we still have a long way to go. OCE is still well under the average for the Foundation of 77%.

Some of the difference can be attributed to OCE's recommendation that collaborative proposals not be submitted via FastLane for the February 15, 2000 target date and the concern from the community that color is not printed by NSF.

OCE requires all proposals (including collaborative proposals) for the August 15, 2000 target date to be submitted via FastLane. Collaborative proposals, in which there is simultaneous submission of proposals from different institutions, with each institution requesting a separate award, must be submitted as follows: The lead institution submission will include a cover sheet, project summary, project description, references cited, biographical sketches, budgets and budget justification, current and pending support, and facilities, equipment and other resources for their institution. Non-lead institution submissions will include all of the above for their institution except the project summary, project description, and references cited (Grant Proposal Guide NSF 00-2 Chapter II.D.12.b).

We strongly encourage you to take some time to learn how to use the system before the target date. Should you run into any difficulties, contact numbers for each of the Division's FastLane representative can be found on the FastLane webpage at <https://www.fastlane.nsf.gov>. In addition, the FastLane Helpdesk can be reached by calling 1-(800) 673-6188 or by sending an email to [fastlane@nsf.gov](mailto:fastlane@nsf.gov). The Division of Ocean Sciences Fastlane representative, Kandace Binkley, can be reached at (703) 306-1582 or by sending an email to [ocefl@nsf.gov](mailto:ocefl@nsf.gov).

A number of technical issues have surfaced with the use of FastLane. Here are some hints that may help with future submissions.

### Proposal Preparation System

1. Fonts - One of the major issues for OCE has been the use of Type 3 and computer modern fonts by TeX and LaTeX users. Type 3 fonts can be difficult to read on screen since most systems other than those of TeX and LaTeX users do not have Type 3 fonts, and often they cause printing problems for NSF's proposal printing unit.

NSF recently revised the Hints and Pointers for Creating a PDF file. The new instructions can be found at <http://www.fastlane.nsf.gov/a1/pdfcreat.htm>. The instructions have been broken down by type of operating system and the type and version of software being used to create PDF files. There are also specific instructions for TeX and LaTeX users at <http://www.fastlane.nsf.gov/a1/pdfcreat.htm#DVIPS>. In addition, the Adobe webpage has a paper by Kendall Whitehouse called "Creating quality PDF files from TeX with DVIPS" at <http://www.adobe.com/support/techdocs/543e.htm> which contains a lot of useful information including where to find Type 1 versions of fonts.

2. It is very important that before the proposal is submitted you view/print the entire proposal using the "Print Entire Proposal" button in FastLane. Some problems do not show up when you just view/print one section at a time. If you notice a problem viewing/printing a proposal after submission, please do not submit a second copy of the proposal via FastLane. Contact Kandace Binkley and she will work with you to fix the problem.

### Annual and Final Progress Reports

Please submit all annual and final progress reports via FastLane prior to the deadline.

1. You cannot submit more than one annual report for a reporting period. As you navigate to the annual progress report section, verify that the beginning and end dates in the boxes are for the correct reporting period.

2. Once you have completed your progress report and you press the submit button, the report has not yet been submit-

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## Program News

### Biological Oceanography

**Staff Changes:** Alison Sipe, a 1999 Knauss Sea Grant Fellow at NSF, is continuing to work in the Division of Ocean Sciences (OCE) as a Science Assistant with primary emphasis on serving the Directorate for Geosciences in the NSF-wide Biocomplexity Phase II competition along with Phil Taylor. She will also be working between OCE and the Office of Polar Programs (OPP) to help administrate this year's Life in Extreme Environments (LEExEn) competition. Cynthia Suchman has joined the Biological Oceanography Program (Bio OCE) staff as an Assistant Program Director. A 1999 John Knauss Sea Grant Fellow, Cynthia comes to NSF following a year on Capitol Hill where she worked for the House Committee on Resources, Subcommittee on Fisheries Conservation and Oceans. She completed her Ph.D. at the University of Rhode Island studying the behavior and feeding ecology of zooplankton.

**OEUVRE - Ocean Ecology: Understanding and Vision for REsearch:** The workshop report, compiled by Peter Jumars and Mark Hay, is now available. This document is the product of a community discussion, initiated by Bio OCE, on future areas for research in the ecology of the world's oceans. If you would like a copy, please contact Shannon Hughes at [shughes@nsf.gov](mailto:shughes@nsf.gov) or 703-306-1580.

One of the strong recommendations from OEUVRE was that much greater attention in ocean sciences needs to be placed on understanding the functional significance of biological processes and biological diversity in biogeochemical dynamics. Nowhere is this more necessary than in understanding the inter-related cycling of carbon, nitrogen, phosphorus and silica, and the role of trace elements in the biological processes regulating these cycles. With this in mind, the Bio OCE Program recently initiated a community workshop called EDOCC - Ecological Determinants of Ocean Carbon Cycling - to further the recommendations of OEUVRE. Doug Capone and Ricardo Letelier, along with an excellent organizing committee, have led the EDOCC dialogue to date. This was born out of the recognition that we still do not have a good understanding of the role and importance that marine ecosystems play in atmospheric carbon sequestration and burial. The EDOCC workshop was held in March 2000. More on EDOCC can be seen at <http://picasso.oce.orst.edu/ORSOO/EDOCC/EDOCC.html>. An important part of EDOCC is gathering and incorporating comments on the report from a wide segment of the community via the web page. The EDOCC discussion is now complemented by another community dialogue: OCTET: Ocean Carbon: Transport, Exchanges and Transformations (<http://www.msrb.sunysb.edu/octet/>). Other community discussions may follow deriving from EDOCC or taking on additional issues (e.g., the role and impact on higher trophic level).

Three new LTERs (Long-Term Ecological Research in Land/Ocean Margin Ecosystems) are being established with support from Bio OCE and the LTER Program (headed by Scott Collins, Division of Environmental Biology). All deal with interactions of marine, estuarine, land, and freshwater systems along the coastal margin, and augment the existing coastal LTERs in Plum Island Sound, MA and the Virginia Coastal Reserve. The new sites are: the Santa Barbara Channel and watersheds (PI: Dan Reed, UCSB); the Florida Everglades and Florida Bay (PI: Dan Childers, Florida Int'l U); and the Georgia coastal system around Sapelo Island (PI: Tim Hollibaugh, U of GA). As per "the Madison meeting" ([http://atlantic.evsc.virginia.edu/~bph/LTER\\_LMER/workshop1.html](http://atlantic.evsc.virginia.edu/~bph/LTER_LMER/workshop1.html)) on LTERs in marine systems, the first recommendation has been completed: the Land-Margin Ecosystems Research Program (LMER) is now over and the land/ocean margin LTERs have been established in force. Community discussions continue on the further expansion of LTER into the ocean realm, from the coasts to the open ocean, as recommended at Madison.

In cooperation with NOAA, NSF/OCE/Biological Oceanography is reviewing proposals for the U.S. GLOBEC Northeast Pacific Program in the Coastal Gulf of Alaska. Proposals were due 1 May 2000 ([http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2000\\_register&docid=00-7922-filed](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2000_register&docid=00-7922-filed)). These studies will complement the ongoing and recently initiated projects in the California Current System (see: <http://www-powelllab.biol.berkeley.edu/nep/projs.html>) to round out the eight year program of research (outlined at: <http://www-powelllab.biol.berkeley.edu/nep/index.html>).

There are about 300 research proposals and about 170 incubation activity proposals for the Biocomplexity Phase II competition. Bio OCE is serving as the "lead" for the participation of the entire Geosciences Directorate (Ocean, Earth and Atmospheric Sciences). The Biocomplexity initiative involves most of the NSF Directorates and will be administered by a group of program directors from across the NSF Directorates. The proposals are very inter-disciplinary; almost a third of the research proposals and a quarter of the incubation proposals are relevant to the interests of the Geosciences Directorate. Awards should be announced in September.

Last year's Biocomplexity Phase I Competition was very successful for the Ocean Sciences. Of the approximately \$28 million allocated, about half of the funds will support projects of central importance to our understanding of biocomplexity in ocean systems. There are two awards that constitute a tightly linked couplet of projects (for ~ \$7.5 million) on regional to global scale biogeochemistry and ecosystem processes revolving around: iron limited productivity, nitrogen fixation by photosynthetic plankton, the delivery of iron via land-atmosphere connections or land/riverine connections, and the interacting limitations of other essential elements. The titles and PIs of these two awards are:

-Oceanic N<sub>2</sub> fixation and global climate; Tony Michaels (USC), Scott Doney (NCAR), Dave Karl (Hawaii), Ed Boyle (MIT), Dave Siegel (UCSB), Dan Sigman (Princeton), and Ron Siefert (U. MD.)

-Factors affecting, and impact of, diazotrophic microorganisms in the western Equatorial Atlantic Ocean; Ed Carpenter (SUNY), Doug Capone (USC), Jon Zehr (UCSC), Don Olson (Miami), Mercedes Pascual (UMD-COMB), Raleigh Hood (UMD H Pt), and Sanudo-Whitley (SUNY).

The two other ocean-related Biocomplexity awards are:

-Microbial biogeochemistry, biological diversity and environmental complexity in systems from the Chesapeake Bay to the Sargasso Sea; Bess Ward, Pat Glibert, Todd Kana, Jackie Collier, George Jackson, Todd Lane, Mary Voytek; Princeton is the lead institution.

-Microbial and nutrient controls in mangrove ecosystems - both the marine and terrestrial components; Ilka (Candy) Feller, Mandy Joye, Bob Ulanowicz, Carol McKee, Myrna Jacobson, Marilyn Fogel, Marc Frischer, Carol Shearer, Catherine Lovelock, John Cheesman; SERC is the lead institution.

Life in Extreme Environments (LExEn): Bio OCE is serving as the "lead" for the participation of OCE in LExEn this year, while OPP (Polly Penhale, Program Director) is leading this activity. Proposals were due in April and awards will be announced by the end of summer 2000.

Bio OCE continues cooperative support of The U.S. Joint Global Ocean Flux Study, Synthesis and Modeling Program (U.S. JGOFS SMP) with the Chemical Oceanography Program. The main objective of the SMP is to synthesize knowledge gained from U.S. JGOFS and related studies into models that reflect our current understanding of the ocean carbon cycle and its associated uncertainties. In particular, the processes that control carbon partitioning among oceanic reservoirs, and the implications on ocean/atmosphere carbon exchange, are to be emphasized. Current projects and investigators are listed at: <http://www1.who.edu/mzweb/resarea.html> and [http://www1.who.edu/mzweb/smp\\_people.html](http://www1.who.edu/mzweb/smp_people.html).

Research Experiences for Undergraduates (REU) Supplements are routinely supported in Bio OCE. We fund students each year as part of ongoing research projects, usually with one or two students working on an isolated project. We believe, however, that there is the potential to improve the experiences derived from REU supplements; doing more than what can be done with individual undergraduate students written into individual awards or supported by other means. We are encouraging PIs to consider more creative uses of REU supplements.

Bio OCE is encouraging PIs to propose ways in which they and other collaborating scientists supported by OCE might use a number of undergraduates in a sort of research consortium arrangement. We are interested in arrangements that

provide experience with interdisciplinary research in a community setting of PIs, graduate students, post-docs and technicians. In addition, the setting should provide students with diverse research experiences. Consortial arrangements might include mentorship by a number of PIs at a single institution. Alternatively, a consortium might occur in a field operation implemented by PIs/mentors from different institutions. We are looking for creative plans for the use of REU supplements that would not fit well in the context of REU sites, but do more to show undergraduate students the diversity and dynamics of interdisciplinary research in the ocean sciences.

Resubmission of Declined Proposals - Are you feeling overwhelmed by the number of proposals you receive from NSF to review? Do you sometimes imagine that you receive the same proposal over and over again, (apparently) unchanged? When this happens are you tempted to rely on the comments you made in the previous submission rather than carefully re-evaluate the proposal? For many members of the Ocean Sciences Community, "yes" seems to be the answer to all these questions. There has been a long-standing NSF Policy that "A declined proposal may be resubmitted, but only after it has undergone substantial revision." (GPG, NSF 00-2). In the future, PIs will see a new section in the Panel and Program Summary of recommendations, reminding them of this NSF policy. After a second submission, Bio OCE will ask for a letter justifying further resubmissions and explaining how reviewer and panel concerns have been addressed. Our intention is to reduce reviewer fatigue, perhaps improve the quality of the external reviews, and encourage PIs to make needed changes in proposals earlier rather than later.

One final note: Soon Bio OCE will be in need of a rotating program director, so if you know of any good, qualified candidates, please contact the Program.

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## Marine Geology and Geophysics

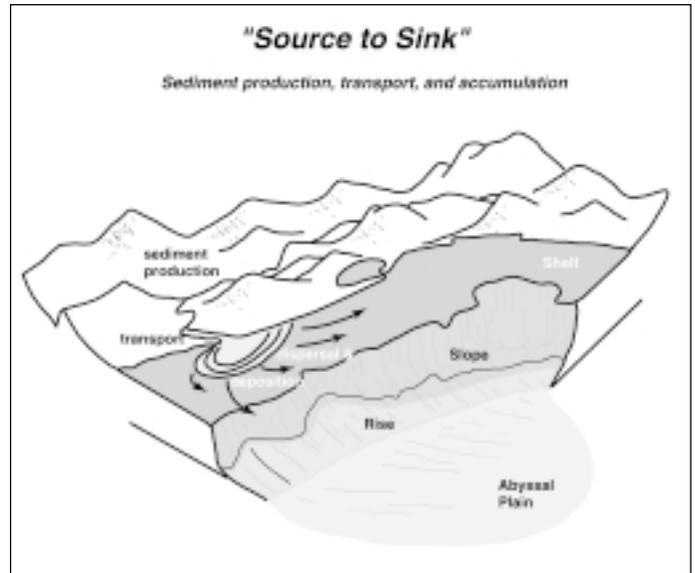
The second competition for funding under the MARGINS Program was held in April 2000. The special Earth and Ocean sciences panel considered 25 proposals that met the program announcement criteria for inclusion in the MARGINS competition. However, these proposals were limited to only two of the four MARGINS initiatives for which detailed science plans are available (the "seismogenic zone" and the "subduction factory"). At the time this newsletter went to press no

decisions had been made as to which of these proposals will be successful.

This winter the MARGINS' community has been actively planning for the two additional initiatives, i.e., "rupturing continental lithosphere", and "sedimentation and stratigraphy" (sed/strat) on the margins. For the latter, the community has chosen to focus on the entire "source-to-sink" system along selected transects. This will allow better understanding of the processes and the fate of the sediments from their origin at the weathering sites in the hinterlands to their sequestration on fluvial flood plains and their remobilization and ultimate sink on the continental shelf, rise and the basin floor. The stated goal of the sed/strat community is to discern the relationships among processes relevant to sediment production, transport, accumulation, and preservation on margins at multiple temporal and spatial scales, from turbulence to tectonics and from sedimentary fabric to sequence stratigraphy and basin analysis. In a late September workshop a set of site-selection criteria were identified by this community to pick self-contained systems that could serve as potential study areas. The criteria identified included the presence of strong forcing signals, active sedimentation spanning all of the source-to-sink environments, and preservation of high-resolution stratigraphic record. The sites also had to be "ready" to be investigated, i.e., existence of broad background information and manageable logistics for research, in addition to having societal relevance. The workshop participants selected seven primary and several allied sites where these criteria were met. During a "town" meeting at the AGU annual meeting in December the sed/strat community further discussed these potential sites, and based on community-wide evaluation via the Internet, narrowed the selection down to two "focus" areas for the source-to-sink studies (Papua New Guinea and New Zealand).

The first MARGINS "theoretical and educational" institute with the theme of "rheology and deformation" was held in January and attended by about 100 participants (including 16 non-US scientists). The agenda included state-of-the-science lectures from authorities on subjects that ranged from fault behavior to velocity fields, extension and strain partitioning, finite element modeling, lab studies of friction and rheology of brittle faults, role of fluids and more. The institute was considered an unqualified success by those in attendance. The theoretical institutes will play an important role in the educational component of the program – ca. 50% of the attendees were students and post-docs.

The theoretical institute was followed by a workshop on the theme of "rupture of continental lithosphere" with the main objective of choosing the two "focus" sites for this theme. The group identified several essential and desirable attributes for the sites to be chosen, with additional logistical requirements. Five sites were discussed, which were narrowed down to two "focus" sites (the Gulf of California-Salton Sea system and the Northern Red Sea) that represent "end member" situ-



*The MARGINS effort encapsulates several conceptual innovations, which includes the recognition of margins as entities extending from sediment source to sediment sink.  
Image from the MARGINS Report, unpublished.*

ations (non-cratonic vs. cratonic). A document outlining the science plan for this theme will be forthcoming. Results of these workshops and other information about upcoming meetings are also posted on the MARGINS homepage that is regularly updated ([www.soest.hawaii.edu/margins/](http://www.soest.hawaii.edu/margins/)).

A second MARGINS theoretical institute on the theme of "inside the subduction factory" is planned for August 20-25, 2000 and will be held in Eugene, Oregon. It will bring together petrologists, seismologists, geochemists and geodynamicists to address primary problems in the operation of the subduction factory. The sed/strat community is also planning to hold a theoretical institute of their own later this year to educate the community about the chosen "focus" sites, to organize the broad design of a coordinated program, and to produce a detailed science plan (please consult the MARGINS web site for additional information about how to apply for attendance at this and other institutes).

The RIDGE Program is having an active year with several workshops, six of which are planned for the rest of the year. The symposium on results of the MELT II experiment, held at Brown University in March, was a striking demonstration of the multidisciplinary synergies that have developed around the MELT Program. The results of some of the planned workshops will be used in developing the science plan for the new RIDGE Program. We certainly hope that the community members will either attend one or more of these workshops or provide input to the RIDGE steering committee. A draft of the RIDGE 2000 Report is posted on the RIDGE homepage ([ridge.oce.orst.edu](http://ridge.oce.orst.edu)) and the community is encouraged to comment.

The MG&G Program participates in the interdivisional Earth System History (ESH) activity, a component of the US Global Change Research Program. The emphasis of ESH is the study of past climate changes and their effect upon the oceans, cryosphere and continental systems. Funds for the ESH program are contributed by NSF's Earth, Ocean and Atmospheric Science Divisions, the Arctic Section of the Office of Polar Programs, and the Paleoclimate Program of NOAA. ESH received proposals for over 150 different projects for the spring 2000 review cycle. Proposals within the marine system, including coral studies, totaled about 50, an increase of 40% over the previous year. At the time of writing of this report, the review process was still underway. Thematically, in the last few years ESH has seen the emphasis shift to high-resolution studies, with a focus on rapid change events. There is also a strong component to develop or improve geochemical tools to serve as proxies of productivity, sea surface temperature, and deep water sources and flow paths. The MG&G Program contributes about \$2.7M annually to the ESH activity.

**Staff changes:** At the end of 1999, Connie Sancetta left NSF to enjoy an early retirement, although we promptly invited her back as an "expert" on a part-time basis to help us with the next cycle of ESH proposals. Recently, Dick Poore, a paleoceanographer with the USGS, has joined us on an inter-agency loan and will replace Connie as the lead for the ESH program in OCE. Rodey Batiza, a marine petrologist and currently professor at Hawaii Institute of Geophysics, has also accepted our offer to join the MG&G Program starting this fall.

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## Oceanographic Technology and Interdisciplinary Coordination (OTIC)

### Technology Development:

The overall objective of the OTIC Technology Development Program is to support efforts to develop new tools and capabilities for conducting ocean science research. And as discussed elsewhere in this newsletter, attention is becoming increasingly focused on sustained, time-series observations to address appropriate time and space scales of ocean processes. High priorities for the Program are two areas requiring new and improved capabilities: systems for making sustained observations for ocean research, and long-term chemical and biological sensors.

In January 2000, the Ocean Studies Board (OSB) conducted a workshop to examine the scientific merit of, technical requirements for, and overall feasibility of establishing the infrastructure needed to implement a system of seafloor ob-

servatories. The workshop was attended by about 75 ocean scientists from all disciplines and their input contributed to an OSB study to assess the extent to which observatories will address future requirements for conducting multidisciplinary ocean research, and to gauge the level of support for such programs within ocean sciences and the broader scientific community. Considerable enthusiasm was generated at the workshop, and we are looking forward to the publication of the workshop report later this summer.

The matter of improved biological and chemical sensors for long-term, sustained deployments is still an issue. The OTIC Program supports the development of innovative new sensors that address ocean science research requirements. The Program would also be receptive to funding a community workshop along the lines of the MARCHEM Workshop in 1993. A feature of that Workshop was participation by several commercial instrument manufacturers and several analytical chemists. Their cross-fertilization with the ocean science people resulted in some fresh thinking about sensor design and several successful prototypes resulted.

### Coastal Ocean Processes (CoOP) Program:

During January 2000, the CoOP office moved to Skidaway Institute of Oceanography and is now headed by Richard Jahnke. The OTIC Program would like to thank Mike Roman at the University of Maryland Center for Environmental Science for his extraordinary efforts and skilled leadership of CoOP for nearly seven years. The new CoOP web page can be found at <http://starbuck.skiio.peachnet.edu/coop/>.

A new CoOP research initiative was recently started for Wind-Driven Transport Processes in the NE Pacific. Two major efforts are now underway, one of which is headed by Jack Barth at Oregon State University entitled "Coastal Ocean Advances in Shelf Transport (COAST). The second project is headed by John Largier at Scripps Institution of Oceanography with collaborators at San Francisco State University and University of California - Davis and Santa Cruz. This project is entitled "The Role of Wind-driven Transport in Shelf Productivity."

The two major projects in CoOP's Great Lakes initiative, KITES and EEGLE are in their third year and final field season. They have two years to go for data processing and analysis. Links to these projects' web sites are on the CoOP web page.

And CoOP has recently published a new report entitled "Transport and Transformation Processes over Continental Shelves with Substantial Freshwater Inflows." This is the Report from the CoOP Buoyancy-Driven Transport Processes Workshop held in October 1998. The CoOP Science Steering Committee has recommended that buoyancy-driven transport be a topic for the next major process study. A Program Announcement is anticipated in FY 2002. Copies of the Report are available through the CoOP Office.

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about how the Program will be staffed in 2001 and beyond.

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## Chemical Oceanography

The number of proposals submitted to the two regular annual Chemical Oceanography (CO) Panels has continued to climb since 1995, when the typical number per panel was 47 to 50. Since that time, the number has risen to an average of about 63 per panel, due in large measure to the decline in support for marine chemical research in other Federal agencies as well as to the rapid rise in research interest in several areas of marine biogeochemistry — especially iron, nitrogen biogeochemistry, coastal groundwater chemistry, and the ocean carbon cycle. The NSF Biological Oceanography, Atmospheric Chemistry, and Hydrology Programs have been actively involved with us in the review and funding of projects in these areas.

The dramatic increase in demand for support for marine biogeochemical research has naturally involved a marked increase in the past two years in the number of multi-investigator, interdisciplinary proposals submitted to the “core” Program. Such projects are *ipso animo* more complex and more expensive than other one or two-investigator projects. To increase the likelihood that we will be prepared to handle them when the peer review process identifies a compelling project, we began almost three years ago to restructure our system for financing CO research projects. The new strategy, in brief, involves a shift toward funding the great majority of smaller research projects “up front” and funding larger projects one year at a time. To minimize stress on the marine chemistry research community, especially investigators in soft-money positions, we have made the transition toward funding as many proposals as possible “up front” gradually. The transition is almost complete, so that now the program looks forward to reviewing a healthy mix of both medium-sized 10-investigator proposals and smaller single investigator activities. We invite your comments on this!

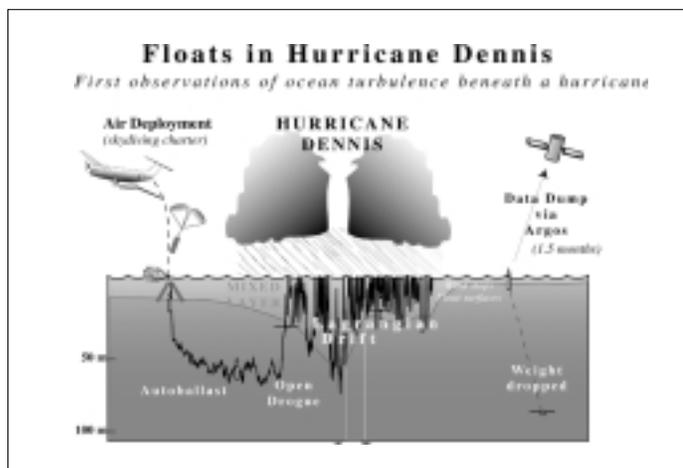
Staff changes: Dave Kadko ended his one-year tour as a rotator in the Program in January and has returned to his day job at RSMAS. Meanwhile, Simone Metz has quickly come up-to-speed as Associate Program Director and has had a big impact on our day-to-day operations, especially in interacting with the community. We expect to have another rotator in place to fill the third program officer position in early summer; when arrangements have been formalized, we will announce who that is. Stay tuned! In that regard, if you are interested in serving the marine chemistry community by doing a two-year rotation as a Program Officer in the CO Program, please contact us. We are already beginning to think

## Physical Oceanography

The Physical Oceanography (PO) Program received proposals spanning a broad range of ocean science topics for consideration by the November 1999 and May 2000 panels. At the time of writing, the May 2000 panel has not yet met. Proposals submitted to the November panel and subsequently funded include projects dealing with air-sea interaction, estuarine dynamics, the analysis of data collected during four major open-ocean process studies, projects based on analysis of remotely sensed and float data, several different observational experiments, laboratory work, large and small-scale numerical modeling, and geophysical fluid dynamics. As is unfortunately always the case, a number of promising proposals had to be declined for lack of funds. The funds available in FY 2000 are roughly the same as in FY 1999.

One of the pleasures of being a Program Manager is reading about new research results, only a short time after they are obtained, in the annual reports that PIs submit. FastLane provides a flexible way of including text, graphics and even copies of preprints in one's report and references to a PI's web site offer yet another way of including information. As we were writing this article, we received a report from Eric D'Asaro at the University of Washington's Applied Physics Laboratory and School of Oceanography. During the last hurricane season, with funding from a Small Grants for Exploratory Research (SGER) award, he successfully deployed some of his Lagrangian floats ahead of an approaching hurricane (see figure on page 9). The result was new information on the subsurface mixing that occurs along a hurricane track and on the way in which this generates the low sea-surface temperature anomalies that are frequently seen as a hurricane passes over the ocean in low, subtropical latitudes. It is hoped that a better quantitative understanding of this process will lead to improved forecasts of hurricane intensities and trajectories. For more details, as well as a movie of what happens when one throws an instrument out of a perfectly good airplane, please see Dr. D'Asaro's web site at <http://poseidon.apl.washington.edu/~dasaro/DENNIS/Text.html>.

A sign of the continuing health of our field is that a significant number of proposals received in 1999 involved new investigators as PIs or co-PIs. These have proven to be competitive with proposals from more experienced investigators and the proportion of funded proposals involving new PIs is similar to the proportion of new PIs amongst submitting PIs. As well as new investigator proposals funded through the core research program, three new PIs in physical oceanography



Float (water) transits upper layer in 10 minutes 10cm/s vertical velocity. Mixes ocean to 30-60m depth. Brings up cold water > 3°C cooling. Cooler water inhibited Hurricane growth. Image by E. D'Asaro, University of Washington.

received CAREER awards. The Program would like to congratulate Carl Friedrichs (VIMS), Sarah Gille (UC Irvine) and Arnoldo Valle-Levinson (Old Dominion University) on their success in the CAREER program with proposals that combine exciting research ideas and innovative teaching. Dr. Friedrichs, in interdisciplinary work co-funded with the Marine Geology and Geophysics Program, proposes to study flow and sediment transport in estuaries; Dr. Gille will use a combination of float data and numerical modeling in a study of the role of the Southern Ocean; Dr. Valle-Levinson will study estuary/ocean exchange processes. The educational aspects of the proposals include the involvement of high school students, teachers and undergraduates in both making *in situ* observations and learning some elements of data analysis, a novel computational analysis laboratory, interdisciplinary teaching, and a program of team research projects in which high school and undergraduate students are mentored by graduate students and faculty members.

#### CLIVAR News:

The past six months have been a very active period for CLIVAR in the United States. Investigators from the University of Colorado (Webster), University of Washington (Houze) and the University of Hawaii (Lukas, Firing and Hacker) with collaborators from NOAA and CSIRO successfully completed a pilot study called JASMINE (Joint Air Sea Monsoon Interaction Experiment) on the Intraseasonal Oscillations of the Asian-Australian Monsoon. The research was funded jointly by the Physical Oceanography and Climate Dynamics Programs at NSF and NOAA's Office of Global Programs. For more information on the experiment and its preliminary results, please visit: <http://paos.colorado.edu/~jasmine/>.

Another Air-Sea Interaction experiment in the cold tongue InterTropical Convergence Zone of the Eastern Equatorial Pacific called EPIC (Eastern Pacific Investigations of Cli-

mate) is planned for 2001 and proposals are under review.

Two scientific workshops took place in October and December 1999 to develop the U.S. implementation plans for the Pacific and Atlantic sectors, respectively. We anticipate spinning up these two experiments next year.

Dr. David Legler ([legler@usclivar.org](mailto:legler@usclivar.org)) has been selected as the Director of the newly established U.S. CLIVAR Project Office and has started in that position at the end of February 2000. David comes from Florida State University with research expertise on large-scale air-sea interactions. The U.S. CLIVAR office is collocated with the U.S. GCRP offices in Washington, DC. Information about the U.S. CLIVAR program can be found at the following web site: <http://www.usclivar.org/index.html>.

#### WOCE News:

The AIMS phase of WOCE is continuing with synthesis of the Pacific, Deep Basin Experiment, the tracer data sets (He/Tr and CFC's) and the production of Atlases for the Pacific and Southern Oceans. The US WOCE Office is working hard with the WOCE PI's and various data centers to ensure that the release of the WOCE data set on CD-ROMs, scheduled for the Summer/Fall of 2000, is as complete as possible. Drs. Dale Haidvogel and Carl Wunsch will run a WOCE Young Investigator Workshop at NCAR this Summer. The goal of the Workshop is to provide hands-on training to investigators new to WOCE in analysis techniques and modeling tools that could be used to analyze and synthesize the rich WOCE data sets.

Staff changes: We are very pleased to announce that Dr. William J. Wiseman, Jr. joined the Physical Oceanography Program as an IPA (rotator) from Louisiana State University at the beginning of the year. Bill brings with him a broad range of expertise in coastal and estuarine processes. Many of you will have met him or become reacquainted with him at the recent Ocean Sciences Meeting in San Antonio. Since graduating from Johns Hopkins University under Don Pritchard and spending two years at the University of New Hampshire, Bill has been at LSU's Coastal Studies Institute for the past 28 years. Much of this time has been spent in interdisciplinary, descriptive coastal and estuarine physical oceanography, involving interactions with both biological oceanographers and marine geologists. During the first decade of his research, Bill was involved in extensive coastal process work in the Arctic (North Slope of Alaska and Svalbard). This included studies of coastal circulation, beach processes with and without ice interactions, bluff retreat, and coastal meteorology. The next ten years were spent in a variety of activities world-wide. These included studies of circulation across reefs and within reefal lagoons on St. Croix, circulation and sediment transport processes at the mouth of the Huang He, turbidity currents in Canadian fjords, and coastal circulation along the Louisiana coast. The past decade has been spent studying coastal and estuarine processes (circulation, sediment transport, hypoxia) along the Louisiana coast

(continued on page 12)

# Program Managers of the Division

Division

## Oceanographic Centers and Facilities Section

### Ocean Drilling Program



*Bruce Malfait, Program Director*



*J. Paul Dauphin, Assoc. Program Director*



*Jamie Allan, Assoc. Program Director*

### Biological Oceanography Program



*Phillip Taylor, Program Director*



*David Garrison, Assoc. Program Director*

### Ship Operations Program



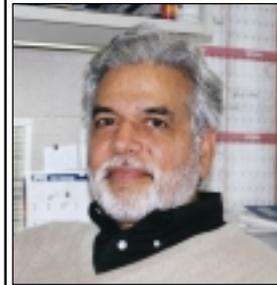
*Emma Dieter, Program Director*

### Ocean. Facilities Program

VACANT

*Program Director*

### Marine Geology and Geophysics Program



*Bilal Haq, Program Director*



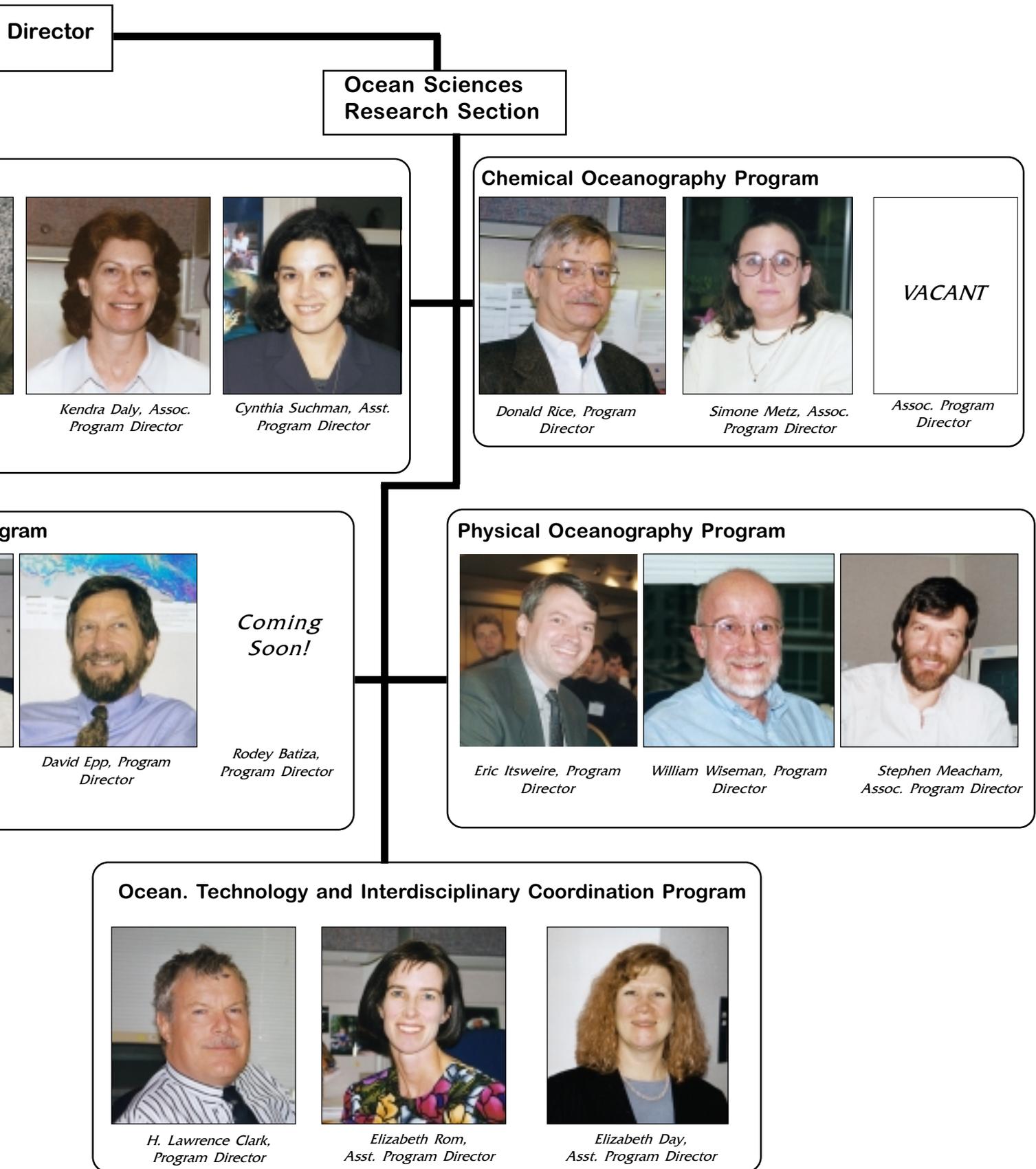
*Richard Poore, Assoc. Program Director*

### Ocean. Instrumentation and Tech. Program



*Alexander Shor, Program Director*

# Division of Ocean Sciences



with occasional forays to other Gulf of Mexico environments (Mobile Bay, Florida Bay, west Florida shelf). Bill has also recently completed an extensive comparison of observational data from the Louisiana shelf with POM output from the same region. Bill and his LSU colleagues have just begun a slope project involving the deployment of their institute's first deep water (2400 m) mooring. Since this involves a significant portion of their institute's equipment resources, they are all anxious to see how much comes back.

Finally, we wish to congratulate Dick Lambert on receiving the 1999 Ocean Sciences award at the AGU/ASLO Ocean Sciences meeting in San Antonio. It couldn't have gone to a more deserving and nicer person.

Eric Itsweire (eitsweir@nsf.gov)  
 Steve Meacham (smeacham@nsf.gov)  
 Bill Wiseman (wwiseman@nsf.gov)

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## Ocean Drilling Program

It's spring, a time of change, transition, and renewal, all appropriate to describe what ODP is experiencing. It's also time for another issue of the OCE newsletter, and another opportunity to update you on happenings in the Drilling Program. First, the *JOIDES Resolution* is out of dry-dock, after undergoing major refit, all spiffed up and sparkling, sporting a fresh coat of blue paint on the hull and cranes, it looks very different. A number of refurbishments and enhancements were accomplished, designed to maintain and improve a safe working environment on the vessel, as well as upgrading drilling capabilities. Included among the enhancements is an Active Heave Compensation system installed to more efficiently de-couple the ship's heave from the drill string. This should result in enhanced core quality and longer bit life, as well as greater control when landing equipment on the bottom or in the hole. After some initial problems with damage to the servomotor that drives the system, and some adjustments to the software which operates the controller, things appear to be working as they are intended. The core handling and description area was renovated for greater efficiency of core flow and analysis. This will be given its first real test with the high core recovery anticipated on the present leg (Leg 189). Installation of a permanent microbiology laboratory was started and is still in the process of being completed. A new floor was added to the lab stack, which sports a new down-hole measurement laboratory, a new conference room for the scientific party, and a core-loading platform. The overall dry-dock activities have resulted in a much more capable *JOIDES Resolution* with extended water depth capabilities, improved operational efficiency, and the capability now to routinely conduct microbiology and gas hydrate research.

Another milestone was recently reached in the planning for the post 2003 Integrated Ocean Drilling Program (IODP), intended to replace ODP. NSF took delivery of the Conceptual Design Report for the non-riser drilling vessel intended for the new program. This stems from the numerous planning documents, prepared by the scientific ocean drilling community, which have identified a wide range of important scientific objectives for a follow-on program post-2003 to the present Ocean Drilling Program. To meet all of these objectives the scientific community has consistently emphasized that both riser (well-control) and non-riser drilling capabilities will be required. Japan's Science and Technology Agency is building a large (ca. 210 m, 50,000 ton) riser/well-control vessel meant to address some of these requirements. The scientific drilling community has repeatedly argued that any future program would also require a non-riser vessel, similar to the present *JOIDES Resolution*, with enhanced capabilities. NSF has indicated that it would seek the necessary resources to bring such a vessel to a future program. This vessel would constitute a major capital asset of the future IODP. To accomplish this, the operational and scientific capabilities of this drilling vessel need to be carefully identified. As the first step to this process, NSF tasked the U.S. Science Advisory Committee (USSAC) for ocean drilling to assist with this process. In response to this request USSAC formed the Conceptual Design Committee (CDC) for the non-riser vessel, chaired by Dr. Peggy Delaney.

The charge to the CDC was as follows:

- 1) Formulate the conceptual design characteristics of a single, non-riser drilling vessel, optimally configured to address the widest possible range of non-riser scientific drilling objectives identified by various planning documents. This vessel should be capable of operating globally, to the extent possible in a maximum range of water depths (shallow to deep), and have endurance characteristics similar to the present *JOIDES Resolution*. The vessel's drilling limitations should be addressed and alternative drilling capabilities identified.
- 2) Identify the optimal configuration of on-board scientific measurement capabilities, i.e. geophysical, geotechnical, and scientific laboratory facilities required to achieve the scientific objectives of the program.
- 3) Provide a feasibility survey of existing and planned drilling vessels having the potential for conversion or modification to meet operational and scientific requirements.
- 4) Prepare a detailed report specifying the operational and scientific characteristics of this non-riser drilling vessel and the science objectives that it will be expected to address.

Funding permitting, it is NSF's intent to begin the selection process for the non-riser vessel and operator in January of 2002, and make an award for vessel acquisition/modification/conversion by October 2003. Conversion would occur in fiscal year 2004, and the vessel would, hopefully, be available to commence international drilling operations no later than early fiscal year 2005. The detailed report is available on the follow-

ing web site: <http://www.joi-odp.org/USSSP/cdc/cdcreportfinal.pdf>. We would like to encourage anyone with comments to submit them to the IODP Planning Subcommittee which is compiling comments on the CDC report. Details for doing this can be found on the web site.

On another note, major changes are taking shape with respect to the management of ODP at Joint Oceanographic Institutions, (JOI) Inc., the prime contractor for management and operations of the program. On February 22, Dr. Kate Moran departed the position of Director of Ocean Drilling Programs at JOI. Although Kate's tenure as Director was brief she managed to develop a strong rapport with the ODP science community and a reputation for strong and energetic management. The ODP science community has expressed numerous concerns about the timing and process of Kate's departure to JOI's Board of Governors (BOG). The Board met in Washington on 9 March to consider these concerns, as well as other issues related to the management of ODP at JOI. The Board established a management oversight subcommittee to represent the BOG in assisting and advising the President and ODP Director at JOI on matters relating to the management of the ODP contract. Dr. Robert Detrick (former chair of JOIDES EXCOM) will chair this committee. One task of the committee is advising the President on recommendations for possible changes in JOI's management structure. We will report in future columns the recommendations of this committee as they affect management of the ODP.

Effective 1 March, Dr. John Farrell, Associate Director of Ocean Drilling Programs at JOI since 1997, was appointed Acting Director until a search can be completed for a permanent Director. John has extensive experience with the Program's management and operations and is respected in the ODP community for his commitment to the success of the Program. We are working closely with John to ensure effective short-term management of operations and planning. Advertisements for a permanent director have appeared in major international publications and we look forward to seeing a strong list of candidates to lead the management of the Program.

Staff changes: On a final note, we will be losing Jamie Allan as the visiting scientist by late this summer. Jamie has accepted the Department Chairmanship in geology at Appalachian State University in Boone, NC. After 2 1/2 years at NSF, we will miss his boundless enthusiasm and commitment to serving the community. We wish him all the best in his new position. A vacancy announcement for his position appears elsewhere in this newsletter. If you're interested in participating in the fun and excitement of developing new research and drilling programs, give us a call.

Bruce Malfait ([bmalfait@nsf.gov](mailto:bmalfait@nsf.gov))  
Paul Dauphin ([jdauphin@nsf.gov](mailto:jdauphin@nsf.gov))  
Jamie Allan ([jallan@nsf.gov](mailto:jallan@nsf.gov))

## Education

A workshop designed to explore the feasibility of establishing a national Center for Ocean Science Education Excellence (COSEE) is being funded by NSF's Division of Ocean Sciences (OCE) and Division of Undergraduate Education (DUE). This workshop is charged with determining the needs of ocean sciences education in the United States (informal education, K-12 education, undergraduate, and graduate education). This needs assessment will include reviewing the manner by which ocean sciences research results are made available for education. The identified needs will be prioritized and strategies addressing these needs will be recommended to NSF.

This effort is being chaired by Dr. Sharon Walker of the University of Southern Mississippi and Dr. Dean McManus of the University of Washington and a seven person steering committee (Ms. Paula Keener-Chavis, Charleston, SC Math and Science Hub; Dr. Benjamin Cuker, Hampton University; Ms. Patricia Goodnight, Washington, D.C. Public Schools; Dr. Susan Humphris, Woods Hole Oceanographic Institution; Ms. Lee Larkin, Virginia Institute of Marine Sciences/Virginia Sea Grant Program; Dr. Donald Reed, San Jose State University; Ms. Veronique Robigou, University of Washington; and Dr. Jerry Schubel, New England Aquarium). We anticipate approximately 75 participants from the ocean sciences community will attend. The participants will include both scientists who are primarily researchers and educators who represent informal, precollege, undergraduate, and graduate education.

The COSEE Workshop will be conducted May 23-26, 2000 at the University of Southern Mississippi (USM) Gulf Park Campus Conference Center in Long Beach, Mississippi. A formal report produced as a result of the Workshop will be submitted to NSF in Fall 2000 and will be made available to the community. This Workshop offers our community an unequalled opportunity to discuss and recommend enhancements in ocean sciences education in this country.

Other recent Education events include the National Ocean Sciences Bowl (NOSB), organized by the Consortium for Oceanographic Research and Education (CORE). Supported in part by OCE, this academic competition is for high school students and focuses on ocean-related topics. In April, the NOSB Finals were held outside of Baltimore, MD at the Maritime Institute of Technology and Graduate Studies. Lexington High School, Boston, MA won the competition, while State College High School, State College, PA placed second, Cranston High School West, Cranston, RI came in third, and Chapman High School, Inman, SC placed fourth. These teams were rewarded with trips to marine-related research and education sites, and other educational materials. Congratulations to all of the teams and coaches for a great competition!

Elizabeth Day ([eday@nsf.gov](mailto:eday@nsf.gov))  
Lisa Rom ([erom@nsf.gov](mailto:erom@nsf.gov))

## OCE Profile - Aliceann Phelps

*By Shannon Hughes*

In its 50 years of evolution, NSF has gained a reputation for excellence in carrying out its mission. In large part, NSF's successes can be attributed to its outstanding staff. Aliceann Phelps duly represents the outstanding service NSF staff continues to provide.

NSF first hired Aliceann in 1980, amidst government-wide staffing crises such as hiring freezes. The Division of International Programs (INT) seized Aliceann, anxious to hire a qualified secretary before such restrictions were imposed. Her duties in this position included typing speeches and reports for the Director and the White House Science Office.

After a Division reorganization two years later, Aliceann moved to the Western Europe Program, quickly learning the intricacies of NSF proposal and award processing as a Program Assistant. INT benefited greatly from her tireless efforts, and promoted her to Section Secretary in 1984. Her mastery of NSF policies and practices was evident in her training of many INT Program Assistants and careful review of their proposal jackets.

In 1985, Aliceann continued her upward climb on the administrative ladder by accepting the position of Division Secretary of INT. During this time, she attended the College of Notre Dame of Maryland for a business administration degree. By 1986, Aliceann was back working in the proposal and awards operations as INT's Center Manager. Two years later, she tackled the additional duties of Program Specialist, being only the second NSF staff member to bear this title. Akin to a 'Junior' Program Manager, Aliceann focused her attention on preparing program reports, selecting proposal reviewers, managing panels, and composing guidelines for the U.S./India Exchange Program, which enabled linkages between collaborating American and Indian scientists. Aliceann traveled to New Delhi, India, to meet with her Indian counterparts. While in India, she spoke about NSF at a seminar being held at the Indian Institute of Technology.

After 12 years, INT reluctantly bid Aliceann fare-



well when she joined the ranks of the Division of Ocean Sciences (OCE) in 1992. Dr. M. Grant Gross, former Division Director, hired Aliceann as the OCE Administrative Officer.

Today, Aliceann continues to serve as the Division's 'holy grail' of NSF policy and regulation information, and a queue often forms outside her office door. In addition to directly supervising support staff, Aliceann administers all of the Division's personnel actions, and oversees its daily operations.

Aliceann also monitors spending for staff travel, training, supplies, and software. Since OCE is one of the largest Divisions at NSF, Aliceann has the daunting responsibility of certifying funds for (and ensuring reimbursement of) not only staff travel, but also travel for hundreds of panelists, experts, and visiting scientists each year. She remains the OCE travel expert, and is consulted frequently for logistical guidance.

Aliceann continues to enjoy strong familial ties in Baltimore, her birthplace, where her home rests aside her parents and siblings. Her daughter, Sunny, nears completion of a BS degree from the University of Maryland. Aliceann's talent for organizing functions keeps her active in several community clubs, and she enjoys golf.

Aliceann has been OCE's Administrative Officer and Management and Program Analyst for eight years. She has served under two Division Directors, and continues to assist and guide more than 40 Division staff members, as well as the ocean science research community.

## Proposal Target Dates/Deadlines

### Programs

### Target Dates/Deadlines

#### **Ocean Sciences Research Section (OSRS)**

Unsolicited Proposals for Biological Oceanography, Chemical Oceanography, Physical Oceanography, Marine Geology & Geophysics, and Instrumentation Development. Proposals for field programs that require the use of University -National Oceanographic Laboratory Systems (UNOLS) ships in the following calendar year (2002) must be submitted by February 15, 2001, target date.

Aug. 15 and Feb. 15

#### **OSRS Inter-Agency and Special Initiatives**

Climate Variability and Predictability (CLIVAR)  
Ridge Inter-Disciplinary Global Experiments (RIDGE)  
WOCE, Analysis, Interpretation, Modeling, and Synthesis (AIMS)  
Joint Global Ocean Flux Study (JGOFS)/Synthesis and Modeling  
Nanoscale Science and Engineering (NSE)

Aug. 15 & Feb. 15  
Aug. 15 & Feb. 15  
Aug. 15 & Feb. 15  
Fall 2000 (tentative)  
Oct. 10, 2000 (tentative)

#### **Oceanographic Centers & Facilities Section**

Ocean Drilling Program  
Oceanographic Instrumentation  
Shipboard Scientific Support Equipment  
Ship Operations  
Oceanographic Technical Services

Aug. 15 & Feb. 15  
Sept. 15  
Sept. 1  
Oct. 1  
Oct. 15

#### **Other NSF programs of interest to ocean scientists**

CAREER (Faculty Early Career Development Program), Geosciences Directorate: July 27, 2000  
Research Experiences for Undergraduates (REU) Program, NSF 96-102 Sept. 15, 2000 (deadline)  
(Contact Research Program Regarding REU Supplements)

### NEW GEO WEB SITE

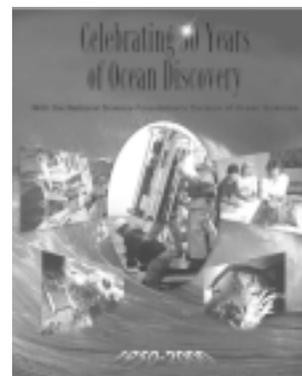
The Directorate for Geosciences has a new web site located at:  
<http://www.geo.nsf.gov>

Also, the Division of Ocean Sciences has a new site:  
<http://www.geo.nsf.gov/oce>

Some url addresses have changed, so please update your bookmarks!

### Free Posters

As a way of celebrating 50 years of ocean discovery at NSF, we have produced a poster of oceanographers at work with an accompanying educational piece. If you or an educator you know would like a poster please contact Elana Khanna at (703) 306-1580 or [ekhanna@nsf.gov](mailto:ekhanna@nsf.gov).



*(continued from page 3)*

ted. The next screen that appears has a check box certifying that the information is correct. This must be checked before the system will allow the report to be submitted.

### Notifications and Requests

1. As described in the Grant Proposal Guide (NSF 00-2), to submit supplemental funding requests via FastLane, PIs should select the "Other" Request Option in the Notifications and Requests section of FastLane, provide the requested information, and then forward it to their Sponsored Projects Office (or equivalent) upon completion. Upon review and concurrence, the authorized organizational official will then submit the request to NSF for approval. A paper copy of the NSF Form 1030 (Summary Proposal Budget Form) signed by both the PI and Authorized Organizational Representative should be forwarded to NSF and postmarked within five working days following submission of the supplemental funding request. Please do not submit a supplemental funding request as a proposal in the Proposal Preparation Section of FastLane.

### Sites of Interest

OCE <http://www.geo.nsf.gov/oce/>  
 ODP <http://www-odp.tamu.edu/>  
 ODP <http://www.oceandrilling.org>  
 JOI <http://www.joi-odp.org>  
 UNOLS <http://www.unols.org>  
 RIDGE <http://ridge.oce.orst.edu/>  
 JOIDES <http://www.who.edu/joides>  
 ECOHAB <http://www.redtide.who.edu/hab/>  
 LExEn <http://www.nsf.gov/home/crssprgm/lexen>  
 LTER <http://lternet.edu/>  
 LMER <http://www.mbl.edu/html/ECOSYSTEMS/lmer/lmer.html>  
 GLOBEC <http://cbl.umces.edu/fogarty/usglobec>  
 MARGINS <http://www.soest.hawaii.edu/margins>  
 JGOFS <http://www1.who.edu/jgofs.html>  
 CLIVAR <http://www.clivar.ucar.edu/hp.html>  
 WOCE <http://www-ocean.tamu.edu/WOCE/uswoce.html>  
 CoOP <http://starbuck.skiio.peachnet.edu/coop/>  
 DEOS <http://vertigo.rsmas.miami.edu/deos.html>  
 NNI <http://www.nsf.gov/home/crssprgm/nano/>

## Vacancies in the Division of Ocean Sciences

### Program Manager, Marine Facilities Manager AD-340-3/4; Ship Operations Program

Responsibilities involve review of proposals from the academic fleet operators for support of operations to implement seagoing research, negotiation of budgets, and management of ongoing grants, cooperative and interagency agreements. Other important duties include oversight of the annual scheduling process on behalf of NSF and other agencies to optimize cost of operations in relation to science days achieved, coordination of a regular ship safety inspection program, and analysis and comparison of costs and relationships in context of an overall program of ship upgrading, conversion, and construction for the academic Fleet.

Applicants for the AD-3 level position must have four or more years of managerial, successful research and/or research administration experience pertinent to the position; plus a Ph.D. or equivalent experience in marine sciences, maritime field or in a closely related field. Those interested in the AD-4 level position must have six or more years of managerial, successful research and/or research administration experience pertinent to the position; plus a Ph.D. or equivalent experience in marine sciences, maritime field or in a closely related field.

Applicants with a broad understanding of the current status of the United States coastal and ocean academic scientific community and its interrelationship with NSF, other Federal agencies, and international planning efforts are desirable. Previous involvement with research in ship operations is advantageous, but is not required. For more information please go to: <http://www.nsf.gov/cgi-bin/getpub?vex0048>.

### Associate Program Director, Geologist AD-340-3; Ocean Drilling Program

The Associate Program Director has primary responsibilities which involve proposal evaluation, project development and support, program planning and budgeting, and related administrative duties. Applicants for this position must have a Ph.D. or equivalent experience in marine geology or geophysics or a related disciplinary field. In addition four or more year of successful research, research administration and/or managerial experience beyond the Ph.D., pertinent to the position.

A broad understanding of the current status of the relevant U.S. academic scientific community and its relationship with NSF, other federal agencies, and international planning efforts are desirable. Previous involvement with ocean drilling would be an advantage, but is not required. For more information please go to: <http://www.nsf.gov/cgi-bin/getpub?vex0049>.

## Other Noteworthy News...

### New Assistant Director for Geosciences

On January 10, 2000, Dr. Margaret Leinen was appointed Assistant Director for Geosciences. In addition to her responsibilities as the Assistant Director for Geosciences, Dr. Leinen will be responsible for coordinating environmental science, engineering, and education programs within NSF, and for cooperation and collaborations on environmental issues between NSF and other Federal agencies.

Prior to coming to NSF, Dr. Leinen was Dean of the Graduate School of Oceanography and Vice Provost for Marine and Environmental Programs at the University of Rhode Island. She was also interim Dean, College of the Environment and Life Sciences. Dr. Leinen spent her entire academic career at the University of Rhode Island, considered one of the country's top institutions for marine studies. During her tenure, she spearheaded the University's efforts to build a cohesive interdisciplinary marine and environmental focus.

Dr. Leinen is a well-known researcher in paleoceanography and paleoclimatology. Her work focuses on the history of biogenic sedimentation in the oceans and its relationship to global biogeochemical cycles, and the history of eolian sedimentation in the oceans and its relationship to climate.

She is a past president of The Oceanography Society. She served on the Board of Governors of the Joint Oceanographic Institutions and on the National Oceanographic Partnership Program's Ocean Research Advisory Panel. Dr. Leinen also

served as Vice Chair of the International Geosphere-Biosphere Program and on the Board on Global Change of the National Research Council/National Academy of Sciences.



Dr. Leinen received her B.S. degree (1969) in geology from the University of Illinois; M.S. (1975) in geological oceanography from Oregon State University; and Ph.D.

(1980) in oceanography from the University of Rhode Island.

### GEO Diversity Program to be Developed

The Directorate for Geosciences is undertaking an initiative to broaden participation in the geosciences by traditionally underrepresented groups including women, minorities and persons with disabilities. Plans for this diversity program will be developed over the summer and fall with a program announcement expected around the first of the year. Further information will be provided on the GEO web site ([www.geo.nsf.gov](http://www.geo.nsf.gov)) at a later date.

### 50 Years of Ocean Discovery

*50 Years of Ocean Discovery, National Science Foundation 1950-2000* is now available in hard copy form. This book covers the 1998 Symposium on Fifty Years of Ocean Discovery that highlighted the achievements of ocean sciences and the individuals who made the advances over the past 50 years. If you would like a copy please contact Shannon Hughes at the Division of Ocean Sciences at (703) 306-1580 or [shughes@nsf.gov](mailto:shughes@nsf.gov). We have a limited supply, but additional books may be purchased through the National Research Council.

### All Four Disciplinary Workshop Reports Now Available

All four disciplinary workshop reports are now available in hard copy form. The four reports are as follows: FUMAGES (Future of Marine Geology and Geophysics), FOCUS (Future of Chemical Oceanography), APROPOS (Advancements in Physical Oceanography), and OUEVRE (Future of Biological Oceanography). If you would like a hard copy of any or all of these please call the Division of Ocean Sciences at (703) 306-1580 and ask for Shannon Hughes.

## CAREER Program

The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers NSF's most prestigious awards for new faculty. The CAREER program recognizes and enables the early career development activities of those faculty members who are most likely to become the academic leaders of the 21<sup>st</sup> century. CAREER awardees are selected on the basis of a career development plan that integrates research and education activities.

This year's CAREER Competition (NSF 00-89) was announced in late April and has some major revisions from last year's announcement (NSF 99-110). For questions about changes to the Program, please contact Elizabeth Day at [eday@nsf.gov](mailto:eday@nsf.gov). Below are the highlights of the major changes in the solicitation:

- Revised deadline dates for this year's Competition (the Deadline for the Geosciences Directorate is July 27, 2000, other Directorates will have different deadlines);
  - Eligibility criteria: PI's first doctorate must be earned after October 1, 1992; the PI must be untenured at time of submission and employed in their first tenure track position after October 1, 1996;
  - The minimum award size is \$250,000 in total and the duration of the award is 5 years;
  - PECASE will now be an honorary award having no monetary stipend; and
  - The option for industry matching funds supplements has been removed.
- Please check the CAREER web site <http://www.nsf.gov/home/crssprgm/career/> for more information.

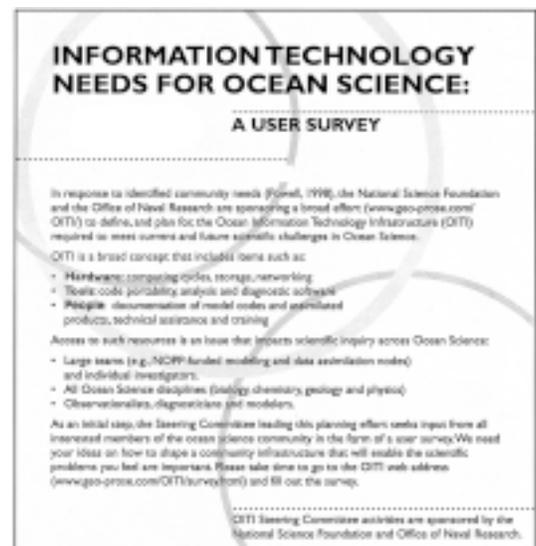
## Ocean Information Technology Infrastructure (OITI)

On behalf of OCE and the National Ocean Partnership Program (NOPP), the Physical Oceanography Program is very involved with the Office of Naval Research in a planning effort aimed at assessing the community need for Ocean Information Technology Infrastructure (OITI) resources. A call for new Information Technology Infrastructure (ITI) resources was put forward at community meetings and summarized in set of workshop reports (Nowlin 1997a,b; Powell, 1998). These workshops identified a number of computationally intensive scientific questions that would benefit by being tackled by well-funded, multi-investigator groups (data assimilation and modeling "nodes") - and supported by enhanced computational resources (a "hub"). Several such nodes have been established and are funded through NOPP (see <http://core.cast.msstate.edu/NOPPpg1.html>).

In addition to these groups, a growing number of ocean scientists, including those who analyze large datasets and those who model a wide range of ocean processes, have found their work hampered by a lack of computer power, portability tools, data storage, network connectivity, and tools to remotely access data over a network. The demand for such resources is increasing more rapidly than the present rate of supply of new resources. This translates into a need for new ITI resources across all ocean science disciplines (including physical, biogeochemical, ecological, coastal, climate and geophysical fluid dynamics).

The OITI Steering Committee has been charged with identifying (a) the science questions that can only be answered with enhanced ITI resources, and (b) what ITI resources are needed, estimates their cost, and providing advice on how such resources should be organized to provide the greatest community access. The membership of the Steering Committee was chosen to include ocean scientists with multidisciplinary interests and people who are cognizant of the interplay between modeling and observations. The Steering Committee is seeking out the best ideas on needs and methods of implementation from the broad community, including existing NOPP teams, other modeling and analysis groups, and individual scientists, through a user survey described in the accompanying panel. Ocean scientists are encouraged to download the survey from the web site, <http://www.geo-prose.com/oiti/>, and return it by email to the address listed on the survey page.

The members of the OITI Technical Steering Committee are: Andrew Bennett, OSU/FNMOC, [bennett@fnmoc.navy.mil](mailto:bennett@fnmoc.navy.mil); Rainer Bleck, LANL, [bleck@lanl.gov](mailto:bleck@lanl.gov); Peter Cornillon, URI, [pete@uri.gso.uri.edu](mailto:pete@uri.gso.uri.edu); Dale Haidvogel, Rutgers, [dale@ahab.rutgers.edu](mailto:dale@ahab.rutgers.edu); Ed Harrison, PMEL, [harrison@pmel.noaa.gov](mailto:harrison@pmel.noaa.gov); Cathy Lascara, ODU, [lascara@ccpo.odu.edu](mailto:lascara@ccpo.odu.edu); Dennis McGillicuddy, WHOI, [dmcgillicuddy@whoi.edu](mailto:dmcgillicuddy@whoi.edu); Thomas Powell, UC Berkeley, [zackp@socrates.berkeley.edu](mailto:zackp@socrates.berkeley.edu); Eric Skyllingstad, OSU, [skylling@oce.orst.edu](mailto:skylling@oce.orst.edu); Detlef Stammer, UCSD/SIO, [dstammer@ucsd.edu](mailto:dstammer@ucsd.edu); and Alan Wallcraft, NRL, [wallcraf@ajax.nrlssc.navy.mil](mailto:wallcraf@ajax.nrlssc.navy.mil).



## Staff Changes

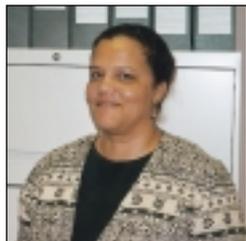
We have had numerous Staff Changes in the last several months. Don Heinrichs, Oceanographic Centers and Facilities Section Head, retired after 25 years of service to NSF. He plans to travel more and spend time with his family. However, occasionally we still have the luck of running into him in the office! Michael Reeve, former Ocean Sciences Research Section (OSRS) Head, has filled Don's position and OCE is in the process of interviewing candidates for the OSRS Head position.

Another long-timer, Connie Sancetta, also officially retired at the end of 1999. She is still running the Earth System History (ESH) Program for this year and is in the office a couple of times a week. Apparently no one has told her the meaning of retirement (thank goodness!)

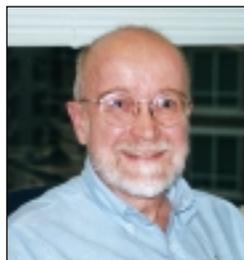
Dave Kadko, an Associate Program Director for Chemical Oceanography has left NSF to return to his research at the University of Miami, RSMAS in the Marine and Atmospheric Chemistry Department.

Both Alison Sipe and Elizabeth Day, 1999 Knauss Sea Grant Fellows, have extended their time here at NSF. Alison is now a Science Assistant for the Biological Oceanography Program and Elizabeth is an Assistant Program Director for our Education Programs.

We have also had several new additions to the Division.



We have a new Office Automation Clerk, Elana Khanna, who helps in the day to day tasks of running the Division. She has previously worked at The Nature Conservancy and The National Park Trust. She has a fourteen year old daughter and an active extended family.



William Wiseman has come on board as Physical Oceanography's new Program Director. Bill has been at Louisiana State University's Coastal Studies Institute for the past 28 years. Much of this time has been spent in interdisciplinary, descriptive coastal and estuarine physical oceanography, involving interactions with both biological oceanographers and marine geologists.



Cynthia Suchman has joined the Biological Oceanography Program staff as an Assistant Program Manager. A 1999 John Knauss Sea Grant Fellow, Cynthia comes to NSF following a year on Capitol Hill where she worked for the House Committee on Resources, Subcommittee on Fisheries Conservation and Oceans. She completed her Ph.D. at the University of Rhode Island, studying the behavior and feeding ecology of zooplankton.



Simone Metz, coming from the Florida Institute of Technology, joined the Chemical Oceanography Program as an Associate Director back in October of 1999. Simone's research has focused on understanding the chemical and mineralogical influences on the trace metal concentrations of high temperature fluids from vent sites on the southern Juan de Fuca Ridge and the TAG Hydrothermal Field, Mid-Atlantic Ridge, 26°N.



Richard Poore is the new Associate Program Director for the Marine Geology and Geophysics Program. He is here on a one year renewable inter-agency agreement. Dick is from the U.S. Geological Survey and his research interests are paleoceanography, paleoclimatology, and biostratigraphy.



Rachel Pressley is our new student-hire, helping with various tasks around the office. Rachel is a freshman at the University of Maryland, College Park and is studying economics.



*Don Heinrichs enjoys his Retirement Party's held in December 1999 at NSF.*

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Grantees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

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

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Relay Service (FRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation regarding NSF programs, employment, or general information. TDD may be accessed at (703) 306-0090 or through FRS on 1-800-877-8339.

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The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

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