



The Schlanger Ocean Drilling Fellowship Comes of Age

Holly Given, JOI

Remember being eighteen years old and ready to explore the world? The Schlanger Ocean Drilling Fellowship Program, which entered its eighteenth year in 2005, has matured and like a typical young adult is ready for new challenges. The program will continue to promote outstanding graduate student research based upon scientific ocean drilling, but the opportunities it offers its recipients are expanding. The most significant modification will be the introduction of Schlanger “classes” where each year’s awardees travel to Washington, D.C. to meet each other and to learn about the “other side” of science.

The fellowship—which was the U.S. Science Support Program’s (USSSP) first official education and community engagement program—was launched in 1987 as the “JOI/USSAC Ocean Drilling Fellowship.” The program was renamed in 1999 in honor of Dr. Seymour Schlanger, the first Chair of the U.S. Science Advisory Committee (USSAC), who was instrumental in establishing the fellowship.

The original purpose of the fellowship was to encourage talented graduate students to conduct research compatible with the interests of the Ocean Drilling Program (ODP) and to increase graduate student participation on the drill ship. As the need for the latter diminished, the program funded more shore-based proposals to broaden the scope of supported research and to encourage students to tap the treasure trove of existing cores and data. And now, following the advent of the Integrated Ocean Drilling Program (IODP) in 2003, the fellowship will metamorphose into a more comprehensive program that augments the education of promising young scientists beyond the experience they gain in class, in the laboratory, and at sea.

A bright future for the Schlanger Ocean Drilling Fellowship is expected. Its high profile in the science community is due, in part, to the successes of its past recipients. Fellowship research to date has yielded hundreds of articles in scientific journals and publications. Future fellowship recipients are likely to become leaders in U.S. scientific ocean drilling efforts as have a

number of past fellows. For instance, four former fellows have served as members of USSAC, including its current Chair, Gabe Filippelli. Three past fellows have been co-chief scientists on drilling expeditions, seven fellows have been speakers in the USSSP Distinguished Lecturer Series,

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and two have become faculty sponsors of second-generation fellows and even more have mentored applicants. In addition, dozens of fellows have continued their association with scientific ocean drilling by participating on expeditions, serving in the science advisory structure, and by attending and organizing USSSP workshops.

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The *JOI/USAC Newsletter* is issued by the Joint Oceanographic Institutions (JOI) and is available free of charge.

JOI is a consortium of 20 premier oceanographic research institutions that serves the U.S. scientific community through management of large-scale, global research programs in the fields of marine geology and geophysics and oceanography. Known for leadership of U.S. scientific ocean drilling initiatives and growing involvement in ocean observing, JOI has helped facilitate discovery and advance global understanding of the Earth and its oceans through excellence in program management.

JOI manages the U.S. Science Support Program (USSSP) associated with the Integrated Ocean Drilling Program (IODP). Funding for USSSP-IODP is provided through a cooperative agreement between JOI and the National Science Foundation (NSF). The U.S. Science Advisory Committee (USSAC) offers guidance to JOI regarding the needs of the U.S. scientific community.

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For more information about JOI and USSSP, visit: www.joiscience.org.

Drill Bits

IODP and Industry Collaborate

Fifteen IODP scientists and thirteen industry participants from nine companies gathered in Houston in May to discuss how the Integrated Ocean Drilling Program (IODP) and leading industry corporations could assist one another. The meeting resulted in an agreement to form an IODP-Industry Task Force that will be a point of contact between the two entities. The Task Force will complement the newly formed Industry-IODP Science Program Planning Group, a panel within the IODP Science Advisory Structure that provides support to individual industry scientists who plan drilling proposals in collaboration with academic scientists. The potential benefits of collaboration were central to the meeting's dialog, which picks up where industry and the International Working Group left off in IODP's early planning stages.

ECORD Membership Expands

In late April, during the Expedition 307 port call in Dublin, Ireland announced its new membership in the European Consortium for Ocean Research Drilling (ECORD). Ireland's affiliation in the program is through the Geological Survey of Ireland. Belgium also recently joined ECORD through Belgium's National Fund for Scientific Research. Although the membership is provisional for one year, Belgium is expected to become a full member in the near future. And last, but not least, Canada has become a full ECORD member.

New Journal Debuts

The successor to the *JOIDES Journal* is in production. The new journal, called *Scientific Drilling*, is an expanded four-color bound publication. Published by IODP-MI and the International Continental Drilling Program, the journal will cover both marine and continental drilling. An electronic version also

will be available online. Any scientist or scientific institution interested in receiving the printed journal may send a request to journal@iodp-mi-sapporo.org.

Electronic Publications Policy

A set of publication principles representing a new and fully electronic IODP publications policy has been approved. These principles include:

- All scientific specialty papers will be published in open, peer-reviewed literature;
- Expedition reports with site descriptions will be entirely electronic and Web-based with end-user print capability;
- An electronic, Web-based publication series comprising expedition reports, reviewed data reports, reviewed scientific synthesis papers, and a bibliography with open access links (as permitted by journals) to all scientific specialty papers will constitute the prime scientific program publication series.

Electronic Site Survey Data Bank

IODP-MI is forging ahead with plans to turn the IODP Site Survey Data Bank (SSDB) into a fully electronic, Web-based, science information resource. Following an

RFP earlier this year, a team from Scripps Institution of Oceanography, University of California, San Diego, and the San Diego Supercomputer Center was awarded the SSDB management contract. Effective May 4, 2005, the contract will continue for six to nine years and is worth up to \$3.8 million. The data bank will receive, catalog, and store data required to support ocean drilling proposal submission and review processes, as well as to support safe, efficient scientific drilling operations at sea.

"Chikyu" Delivered to JAMSTEC

The *Chikyu*, Japan's state-of-the-art scientific drill ship, is scheduled for delivery to the Japanese Marine Science and Technology Center (JAMSTEC) on July 29—as this newsletter goes to press. A phase of training staff and testing the newly constructed research vessel will begin in August. The vessel will make its first port call later this year and will be ready for international operations by 2007. A new Web page dedicated to the *Chikyu* is available at: www.jamstec.go.jp/chikyu/index.html. The page includes information about the vessel's operations and location, and sections for children teachers, students, and researchers.

Workshop Support Available

USSSP-IODP support is available for workshops to generate fresh ideas for advancing the study of Earth processes and history through scientific ocean drilling.

USSSP-IODP encourages

- broad community involvement
- multidisciplinary approaches
- relevance to IODP's *Initial Science Plan*
- graduate student participation

To discuss ideas, contact

Holly Given,
USSSP Director
e-mail: hgiven@joiscience.org
phone: (202) 232-3900 x1611

Conveners receiving awards must produce a report summarizing the goals and results of the workshop.



Proposal Deadlines: **October 1 and April 1**
For more information: www.ussp-iodp.org/workshops

Educational Resource Survey

Do you teach or exhibit ocean science? Or do you know someone who does? Do you incorporate any scientific ocean drilling research in your teaching? To create a cohesive and useful education plan, Joint Oceanographic Institutions is conducting an inventory of existing classroom (kindergarten to undergraduate level) and museum resources based on scientific ocean drilling discoveries and related processes. Please share what you know by contacting: Leslie Peart (lpeart@joiscience.org) or Matt Niemitz (mniemitz@joiscience.org).

The Schlanger Ocean Drilling Fellowship Comes of Age

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Since the program's inception, 397 applicants from 83 different institutions have been considered for fellowships. The average success rate is approximately 21% with 81 students having received fellowships, including seven who received two-year fellowships and six who received a renewal year upon reapplication. Of the 81 fellows, 51 have sailed aboard *JOIDES Resolution*. The fellows hail from 34 different institutions, with a high number of fellows from the University of California, Santa Cruz (11), Stanford University (6), the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program (6), and Scripps Institution of Oceanography (5).

In 2003, JOI distributed a survey to former and current fellows and the response rate was 73%. The respondents particularly appreciated the flexible manner in which JOI has awarded and managed the funds. For example, the Schlanger program allows awardees to allocate their budget as they

see fit and provides no-cost extensions. The fellows also commended the fellowship review committees. Reviewer feedback helped many students improve their research strategies and proposals. The survey also indicated that although Schlanger fellows enter a variety of fields, nearly two-thirds remain in academia with the majority continuing their involvement in scientific ocean drilling one way or another.

Data to evaluate the diversity of the applicants has not been collected from the beginning of the program, but the addition of a demographic form to the fellowship application package will allow this to be tracked in the future. That said, the program appears to have been successful in achieving gender balance. Overall, women represent 43% of the applicant pool and 47% of the awardees. Early in the program, women constituted a lower percentage of both groups, but during the last five years, women have represented 49% of the applicants and 57% of the awardees.

Future of the Fellowship

As funding for the fellowship expanded over the years, adjustments were made to ensure a vibrant, effective, and efficient program. However, the start of IODP provided an ideal time to review the program's structure and to make changes to strengthen it for the future. In January 2005, USSAC recommended that the review and award process be normalized to a single annual cycle. This change allowed the introduction of the concept of a Schlanger "class," where at the conclusion of the fellowship, each year's awardees will participate in a seminar associated with the summer USSAC meeting, which is frequently held in Washington, D.C. Thus, each class of fellows will meet each other, present their research, and gain exposure to JOI, NSF, and USSAC. JOI also hopes to create opportunities for the fellows to meet their congressional representatives. These activities will enrich the fellowship experience and increase stakeholder awareness of the fellowship program.

2005-2006 JOI/USSSP Distinguished Lecturer Series

Dr. Harold J. Tobin

New Mexico Inst. of Mining and Technology

Getting Inside the Plate Boundary: Subduction Zone Megathrusts in IODP

Northern Illinois University
Montclair State University
Central Washington University
Vanderbilt University
Dickinson College
New Mexico State University
Southwestern Oregon Community College

Dr. Kathryn Moran

University of Rhode Island

Arctic Coring Expedition (ACEX): A North Pole Discovery

University of Alaska, Fairbanks
Bryn Mawr College
Stanford University
Five Colleges, Inc.
University of Minnesota, Duluth
Huston-Tillotson College

Dr. Barbara E. John

University of Wyoming

Understanding Slow Spreading Ridges: How Do They Work?

University of Tennessee
University of Maine, Orono
University of Minnesota
Western Washington University
Rice University
Southern Illinois University, Carbondale
University of California, Santa Barbara

Dr. Albert C. Hine

University of South Florida – St. Petersburg

Big Waves, Extreme Aridity, Strange Reefs, and Poisonous Gas All Seen in the Cool-Water Carbonate Sediments of the Great Australian Bight

Hamilton College
Colorado School of Mines
University of Wisconsin, Oshkosh
University of Wisconsin, Eau Claire
University of Arkansas
University of New Mexico
Cornell University

Dr. Gabriel M. Filippelli

Indiana Univ. – Purdue Univ. Indianapolis

A Cure for Global Warming? A Critical Look at Iron Fertilization's Role in Climate Change Using ODP Cores

University of Texas, Dallas
University of Texas, Arlington
Boston University
Kent State University
Albany State University
Keene State College
Bowling Green State University
Savannah State University
Muskingum College
California State University, East Bay

Dr. Theodore C. Moore, Jr.

University of Michigan

The Once and Future Warm Earth: A Paleoclimatological View

Florida International University
Rutgers University
University of South Florida
University of Northern Colorado
Elizabeth City State University
East Carolina University
New Mexico School of Mines and Technology
College of Wooster

For more information, visit www.usssp-iodp.org/education/dls/

Schlanger Ocean Drilling Fellowship

The NSF review panel of JOI's 2003 proposal for a U.S. Science Support Program for IODP acknowledged the value of the Schlanger Fellowship by suggesting an increase in the number of fellows per year. The panel also recognized the importance of fellows presenting their work and interacting with other scientists. Creating a class of fellows and the associated activities represents a significant step in elevating the profile of the program, strengthening its impact, and maximizing engagement with the broader ocean research community. Other existing fellowship programs, such as the Dean John A. Knauss Sea Grant Fellowship also emphasize the connection their students have with the larger ocean community by creating cohesive classes of fellows, bonded by their research and their experience. Such classes become a valued networking and career-building activity that continues to enrich the fellows' experience far beyond the original award period. The revisions to the Schlanger Fellowship are designed in part to do the same thing.

The Fellowship Program offers merit-based awards for outstanding graduate student research related to the Integrated Ocean Drilling Program. The award is \$28,000 per year. Research may be directed toward objectives of specific expeditions or broader themes.



**Application Deadline:
November 15, 2005**

www.usssp-iodp.org/Education/Fellowship/default.html

A more detailed explanation of the new fellowship procedures will appear in September on the JOI website. In general, proposals will be accepted in mid-November to be evaluated at a January USSAC meeting. Any graduate students at U.S. institutions who are interested in the Schlanger Ocean Drilling Fellowship are encouraged to

visit the Web page www.usssp-iodp.org/Education/Fellowship/default.html, or to contact schlanger@joiscience.org.

Holly Given is the Director of the U.S. Science Support Program associated with the Integrated Ocean Drilling Program at Joint Oceanographic Institutions in Washington, DC.

USSSP-IODP Undergraduate Supplements

JOI is pleased to announce these awards for Undergraduate Supplements as part of a pilot project of the U.S. Science Support Program's Education and Community Engagement objective. These \$5K supplements are awarded to traditional JOI sub-awards when Principal Investigators show that an undergraduate student can participate in their project in a meaningful way. JOI's goal is to expose undergraduates to scientific ocean drilling techniques, and expedition-specific goals, without the expenditure of sending them to sea.

Student	Institution	Parent Award	Faculty Sponsor
Lisa Linville & Taylor McKenzie	Western Washington University	PEA/Exp. 301: Effects of Hydrothermal Alteration on the Paleomagnetism of Mid-Ocean Ridge Basalts: Rock Magnetism of Expedition 301 Samples	Bernard Housen
Brendon Quirk, Kristen Mullen, & Michelle Summa	James Madison University	PEA/Exp. 302: Cenozoic Ice-Rafting History of the Arctic Ocean	Kristen St. John
Audrey Wingate	University of Rhode Island	PEA/Exp. 302: Sea Ice Cover of the High Arctic Ocean Via Grain Size and X-ray Analysis of Sediments from the Lomonosov Ridge	Kathryn Moran
Mark Frazer	University of Hawaii	PEA/Exp. 303: High-Resolution Sedimentation Rate History Sites 1305 and 1308, IODP Expedition 303	Roy Wilkens
Emily Grudem	University of Florida	PEA/Exp. 303 Late Pleistocene Stable Isotope and Elemental (Scanning XRF) Stratigraphies of Selected IODP 303 Sites	David Hodell
Jesse Beckles & Melissa Rowland	University of Florida	PEA/Exp. 303: Magnetic Stratigraphy of IODP Expedition 303 Sediments	James Channell
TBD	Oregon State University	Instrument Development Award for Osmotic-Pump-Coupled Growth Chambers for In Situ Microbial Cultures	Martin Fisk
Dave Digioia	Rutgers University	PEA/Exp. 303: Stable Isotope Stratigraphy of IODP Sites 1306 and 1307: The Cornerstone to High-Resolution Paleooceanographic Studies on Eirik Drift	James Wright
Margaret Haack	Ohio State University	PEA/Exp. 303: Pleistocene Records of Ice-Rafting at Orbital and Sub-Orbital Timescales in the North Atlantic Ocean from IODP Expedition 303 Cores	Lawrence Krissek

The Integrated Ocean Drilling Program at Sea

Expeditions 304 and 305 Ocean Core Complex 1 and 2

IODP Expeditions 304 and 305 drilled Atlantis Massif, an “oceanic core complex” on the western flank of the Mid-Atlantic Ridge at 30°N. The program was designed to investigate the processes that control formation of oceanic core complexes and the exposure of ultramafic rocks in very young oceanic lithosphere. To accomplish these objectives, we focused on two sites: one in the lower-crustal or possibly upper-mantle footwall—at and below an exposed detachment fault—and one in the adjacent upper-crustal hanging wall. Attempts to drill the hanging wall failed but drilling at the footwall site was very successful. The main effort was at Hole U1309D, which penetrated to 1415.5 meters below the seafloor with average recovery of 75%. Downhole logging data obtained are generally of high quality.

The igneous sequence recovered at Hole U1309D was dominantly three crustal rock types: basalt (~3%), inter-layered gabbro (91%), and ultramafics (~5%). The gabbroic rocks have compositions among the most primitive sampled along the Mid-Atlantic Ridge. The olivine-rich troctolites,



Excellent recovery from Hole U1309D keeps technical staff and rig floor crew smiling as core is transferred to the catwalk during Expedition 304.

making up most of the ultramafic rocks, may be primitive cumulates. Overall, the section is moderately altered and little deformed. Alteration mineral assemblages record cooling that ranged from magmatic to zeolite facies conditions. The main alteration product is a greenschist facies; extensive amphibolite facies alteration and deformation are generally lacking, and areas of high-strain ductile shear are spatially restricted to narrow zones.

Shipboard paleomagnetic measurements generally indicate little deviation ($\leq 20^\circ$) of the inclination direction from the expected orientation at the site. The occurrence of depth intervals with distinct and variable inclination—together with the absence

of a thick, high-temperature, ductile deformation zone at the top of the footwall—is difficult to reconcile with a single, deep-rooted, convex normal detachment fault, as is often drawn in cross-sections of oceanic core complexes. Instead, most deformation appears to have occurred at low temperature within a brittle regime with strain localized in narrow intervals concentrated in the upper few hundred meters of the hole.

Our findings are inconsistent with the pre-drilling hypothesis that the footwall was composed mainly of an uplifted mantle section where serpentinization was responsible for lower densities and high-seismic-velocity gradients in the upper few hundred meters of the dome below the seafloor. The known exposures of serpentinized peridotite on the south wall of Atlantis Massif, together with prior seismic indications that at least portions of the dome contain rocks with velocities suggestive of fresh peridotite (olivine-rich) and the documented downhole variability at Site U1309, all indicate significant lateral heterogeneity within the footwall.

- Donna Blackman, Scripps Institution of Oceanography, and Barbara John, University of Wyoming, Expedition 304 Co-Chiefs

Expedition 306 North Atlantic Climate 2

Expedition 306 followed Expedition 303 as part of a two-cruise study aiming to understand climate-ocean interactions of the North Atlantic over the past several million years. Although a variety of proxies for changes in climate, ice-sheet size, ocean circulation, and environment exist, the chronologies for these proxies are insufficiently precise to understand fully the relationships among the changes. In particular, what factors control—versus those that merely respond to—rapid climate change? The thick sedimentary sections cored during the two cruises are located in regions known to be sensitive to changes in ice-sheet size and ocean circulation. These sediments were deposited at rates high enough to provide proxies and establish

chronologies on a millennial timescale using a combination of geomagnetic paleointensity, stable isotope, and detrital layer stratigraphies.

Expedition 306 recovered over 2.3 km of core from three thick sedimentary sections at Sites U1312 (a reoccupation of DSDP Site 608, ~600 km NNE of the Azores), U1313 (a reoccupation of DSDP Site 607, ~400 km WNW of the Azores), and U1314 (on the Gardar Drift). The success of the coring program did not come easy; the first few weeks of Expedition 306 were notable mainly for the poor weather conditions and associated rough seas, resulting in the loss of 10 days of operations. Fortunately, like the climate, the weather changes. The improved conditions



Expedition 306 sedimentologists (Helen Evans, University of Florida; Shelley Judge, Ohio State University; and Patrizia Ferretti, University of Cambridge) examine a Site U1313 core with striking color variations that correspond to glacial/interglacial intervals.

during the cruise’s last four weeks allowed us to complete the coring program and to transit to the Vøring Plateau to install a CORK at Site U1315 (a reoccupation of ODP Site 642).

Expedition 306 (continued)

The CORK consists of a 150-m-long thermistor string, which sits within the cased hole, and salinity and temperature sensors, which sit within an elevated reentry cone. The data, which will be retrieved in about five years, will provide a temperature-depth profile that will be used to reconstruct bottom-water temperatures over the past century. Drilling, casing, and installation of the CORK proceeded ahead of schedule, which left just enough time at the end of the cruise for Hole 642E to be logged with a suite of tools, which included borehole temperature measurements that were gathered as the first tool string was lowered slowly.

Highlights of the expedition include the successful installation of the CORK and the recovery of three complete stratigraphic sections with clear paleoclimate signals. Site U1313 provides an excellent example of the latter. At this site, the mainly nannofossil-rich sediments contain alternations in the terrigenous component, mainly in the form of clay content, that give rise to clear variations in the sediment color, with darker sediments being associated with glacial intervals and lighter sediments with interglacial intervals. The striking pattern of the variations in the lightness of the sediment mimics variations in global benthic oxygen isotope stacks. These same variations are notable in most physical properties measured on the core and

by downhole logging, as well as in the geochemical variations of the sediments. As with global benthic isotope stacks, the color, physical properties, and geochemical records indicate a pattern consistent with the onset of northern hemisphere glaciation shortly after 3 Ma, with subsequent alternations that have a dominant 41-k.y. cyclicity up to about 900 ka, after which the 100-k.y. cyclicity becomes dominant. These alternations and the good paleomagnetic recording properties of the sediments are ideal for producing well-dated climate proxies that can be used to examine phase relationships among temperature records, ice-sheet instability, and changes in deepwater circulation over the past 5 m.y.

- Gary Acton, University of California-Davis,
Expedition 306 Science Party

Expedition 310 Tahiti Sea Level

The second Mission Specific Platform expedition of IODP, Tahiti Sea Level, is currently scheduled for the September to October 2005 timeframe. For background information on the science and topics related to the expedition, visit a new Web page: www.rcom-bremen.de/English/Tahiti_Expedition_2005.html.

Monterey Expedition Postponed

An expedition to install two cased boreholes in Monterey Bay has been indefinitely postponed due to difficulty in resolving permitting issues. One of the intended boreholes was to be configured for developing new tools and techniques, and the second was to be for deploying and testing downhole seismometers. The operational days allocated to the Monterey Program were redistributed between the Cascadia (Expedition 311) and Superfast Spreading Crust Programs. The latter is now known as Expedition 312 instead of 313 to fill the gap left by the Monterey Program. The long-term implications for the Monterey Program continue to be considered by the IODP Operations Task Force (OTF), and the program may be rescheduled in FY07 or IODP's next phase.

U.S. Participants on IODP Expeditions

Expedition 307: Porcupine Carbonate Mounds

Trevor Williams	Lamont-Doherty Earth Obs.	Staff Scientist
Miriam Andres	RSMAS, University of Miami	Sedimentologist
Emily Browning	Univ. of Massachusetts	Nanno. Paleontologist
Tracy Frank	Univ. of Nebraska, Lincoln	Inorganic Geochemist
Jamshid Gharib	University of Hawaii	Inorganic Geochemist
Jay Gregg	Oklahoma State University	Sedimentologist
Ivana Novosel	Rice University	Sedimentologist
Vladimir Samarkin	University of Georgia	Microbiologist
Arthur Spivack	University of Rhode Island	Microbiologist/Geochem

Expedition 308: Gulf of Mexico Hydrology

Peter Flemings	Pennsylvania State University	Co-Chief Scientist
Cédric John	Texas A&M University	Proj. Man./Staff Scientist
Gerardo Iturino	Lamont-Doherty Earth Obs.	Logging Staff Scientist
Brandon Dugan	Rice University	Logging Scientist
William Gilhooly	University of Virginia	Inorganic Geochemist
Hui Long	Pennsylvania State University	Phys. Props./Downhole
J. Casey Moore	U. California, Santa Cruz	Sediment./Structural
Carlos Pirmez	Shell Intl. Ex. & Production	Sedimentologist
Derek Sawyer	Pennsylvania State University	Sedimentologist
Anatoliy Shumnyk	Florida State University	Nanno. Paleontologist

Expedition 309: Superfast Spreading I

Neil Banerjee	Texas A&M University	Proj. Man./Staff Scientist
Sedelia Durand	Florida International Univ.	Igneous Petrologist
Yongjun Gao	University of Houston	Ig. Petrol./Geochemist
Lisa Gilbert	Williams Col./Mystic Seaport	Physical Properties
E. Herrero-Bervera	University of Hawaii	Paleomagnetist
Haroldo Lledo	Binghamton University	Inorganic Geochemist
Douglas Wilson	U. California, Santa Barbara	Geophysicist

For additional expedition information:
www.iodp.org

IODP Operations Schedule

for more information: www.iodp.org

Expedition Name	Port of Origin	Dates
308: Gulf of Mexico Hydrogeology	Mobile	May 31 - July 8, 2005
309: Superfast Spreading Crust 2	Christobal	July 8 - Aug. 28, 2005
310: Tahiti Sea Level	TBD	Fall 2005
311: Cascadia Margin Gas Hydrates	Balboa	Aug. 28 - Oct. 29, 2005
312: Superfast Spreading Crust 3	Victoria	Oct. 29 - Dec. 29, 2005
Demobilization will occur in Galveston, Texas	Christobal	Dec. 29 - Jan. 31, 2006

The Southern Ocean: Three Decades of Scientific Drilling Synthesized

Gabe Filippelli, Indiana University~
Purdue University Indianapolis

Among the most notable achievements of scientific ocean drilling are its concerted efforts in the Southern Ocean—the frigid and very biologically productive ocean basin surrounding Antarctica. Drilling at dozens of sites in the region’s deep waters and on the Antarctic margin has recovered material for analysis by hundreds of scientists. The exciting results of this research have revealed the dynamic nature of ice-sheet development and ice/margin interactions through time, and have elucidated the Southern Ocean’s role as a critical component in both the development and persistence of Antarctic glaciation. As a sensitive mixing pool of global water masses, a locus of high biological sedimentation, and a source of high-resolution records of climate forcing and response, it is one of the most important oceanographic regions in the world. In addition, this research has significantly increased our understanding of the Cenozoic to decadal-scale processes impacting oceanography and climatology of the Southern Ocean and Antarctica. It is now time to mine the rich results from several decades of scientific drilling and to thus provide a scientific framework for future expeditions in this region.

To this end, 26 researchers from five countries attended a synthesis workshop at the University of Colorado, Boulder in January 2005. The workshop, funded by the U.S. Science Support Program associated with the IODP, focused on Southern Ocean Paleooceanography and Paleoclimatology. It was convened by Detlef Warnke (California State University, Hayward), Tom Marchitto

The workshop agenda book, including presentation abstracts, can be accessed at www.geology.iupui.edu/research/biogeochemlab/index.htm.

(University of Colorado, Boulder), Jose Abel Flores (University of Salamanca, Spain), and Gabe Filippelli (Indiana University-Purdue University Indianapolis).

The workshop began with plenary presentations on critical aspects of the Southern Ocean’s evolution, including the Cenozoic context for its development (Peter Barker); geomorphology and ice dynamics in Antarctica (Carlota Escutia); ice-sediment dynamics from continents to



the sea, from the Last Glacial Maximum to the present (Kathy Licht); its Pleistocene sedimentation patterns (Bernard Diekmann); Pleistocene variability of its surface and implications for climate development (Rainer Gersonde); its paleoecological history (Jose Abel Flores); and its nutrient dynamics and limitation (Jennifer Latimer). Poster sessions followed, and vibrant discussions were ongoing—in breakout groups, in plenary sessions, and during social events. The underlying themes of the discussions focused on identifying what we know and don’t know about several critical processes on various timescales—including ice-sheet development, tectonics, ecosystem dynamics, biogeochemical responses, and Southern Ocean thermal structure.

One fantastic product of the workshop was the synergy of top-notch researchers

enjoying premiere science in a retreat-type atmosphere. Quite a few “Why don’t we know that yet?” moments punctuated the workshop, but this was not unexpected because scientists sometimes see the unknowns more clearly than the known facts. The workshop’s final outcome will be a set of synthesis papers—published as a special issue in a journal—focused on the following broad themes:

- Steps in climate evolution in the Southern Ocean during the Neogene;
- Bio- magneto- radio-chronology in the Southern Ocean;
- Development of Antarctic glaciation, Southern Ocean circulation and productivity during the Cenozoic;
- Comparative integration of Antarctic proximal events with Southern Ocean proxies; and
- Antarctic margin history.

This collection of papers will serve as a guide to both new and experienced researchers, and will provide a framework for planning future expeditions to this beautiful, cold, and oh-so-critical part of our Earth.

Now that the dust has settled, what seemed like a good idea before the workshop (i.e., holding a synthesis workshop on a regional



or topical theme) seems essential—in my mind at least—for a number of fields related to scientific drilling. Although the push to recover more material from critical places may rightfully drive much science, synthesizing the physical and intellectual archive from decades of scientific drilling is also an important activity that should be encouraged and funded as a priority mission of the Integrated Ocean Drilling Program.

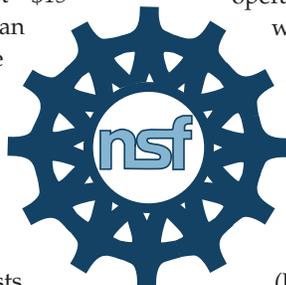
Workshop participants were Peter Barker (UK), Wolf Berger (Scripps Institution of Oceanography), Andrea Caburlotto (OGS, Italy), Bernard Diekmann (AWI Potsdam), Carlota Escutia (University of Granada), Gabe Filippelli (Indiana University~Purdue University Indianapolis), Jose Flores (University of Salamanca, Spain), Rainer Gersonde (AWI Bremerhaven), David Harwood (University of Nebraska), Dave Hodell (University of Florida), Kelly Kryc (Joint Oceanographic Institutions), Jennifer Latimer (University of Michigan), Kathy Licht (Indiana University~Purdue University Indianapolis), Tom Marchitto (University of Colorado, Boulder), Ellen Martin (University of Florida), Peter Molnar (University of Colorado, Boulder), Simon Nielson (University of Florida), Suzanne O’Connell (Wesleyan University), Harunur Rashid (Massachusetts Institute of Technology), Christina Riesselman (Stanford University), Howie Scher (University of Florida), Reed Scherer (University of Northern Illinois), Amelia Shevenall (University of Washington), Peter Schultheiss (GeoTek Ltd., UK), Lora Teitler (California State University, Hayward), Detlef Warnke (California State University, Hayward).

Activity and Opportunity

News from the National Science Foundation

Rodey Batiza and Jamie Allan
Program Directors, NSF/ODP

The National Science Foundation's (NSF) budget for 2005—about 2% less than its 2004 budget—included the first ~\$15 million for a Scientific Ocean Drilling Vessel (SODV) to serve the Integrated Ocean Drilling Program (IODP). The total cost of vessel conversion is expected to be about \$115 million, with \$58 million requested in the 2006 NSF budget, which, in total, requests a 2.4% increase over 2005.



The selection process for the SODV is ongoing with a decision expected by the end of the summer. The vessel—with its enhanced drilling capabilities, improved scientific capacity, and greater habitability—is expected to begin IODP drilling sometime in FY07. John Walter has joined the NSF/ODP program and will be responsible for SODV activity. Previously employed by the National Oceanographic and Atmospheric Administration, John has broad experience in marine engineering and shipyard conversions, repair, and operations. He also has a strong background in vessel acquisition, procurement, and contracting.

On another front, IODP Management International (IODP-MI) has in place

contracts with Japan's Advanced Earth Science and Technology Organization (AESTO) for their Sapporo office and with Joint Oceanographic Institutions (JOI) and the British Geological Survey (BGS) for operations. There is also a contract with the Bremen Core Repository, and a contract for a Site Survey Data Bank with Scripps Institution of Oceanography. A Memorandum of Understanding (MOU) with the Japanese Marine Science and Technology Center (JAMSTEC) for the *Chikyu's* operation is in place, and a contract should be signed in the coming year.

Year 2 of the U.S. Science Support Program for IODP (USSSP-IODP) began in March 2005, with a new program plan. A notable highlight is a robust and diverse education program headed by Leslie Peart, Director of Education at JOI.

Larry Clark has been appointed Division Director of the Ocean Sciences Division (OCE) of NSF for one year. Candidates for the new Division Director are being considered. Carolyn Ruppel will extend her stay as a "rotator" in the NSF/ODP Program through June 2006, and potential candidates to succeed her are encouraged to learn more about the position. Dylan Sullivan, a Truman Fellow, arrived at NSF

on June 6, 2005. He is at NSF this summer and will spend the remainder of the year at JOI working on education activities.

And last, but not least, the new NSF seismic survey vessel, the R/V *Marcus Langseth*, is undergoing a shipyard conversion and is expected to be complete in June 2006. Design work is also currently underway for a new deep submersible to replace the long serving DSV *Alvin*.

Expedition Objective Research Funding Available

NSF/ODP has increased its support for U.S. participants on IODP drilling expeditions.

NSF encourages Expedition Objective Research (EOR) proposals to address the scientific objectives of specific drilling expeditions. Resulting EOR grants may begin in the period between the Co-Chief Scientists' approval of the expedition sampling plan and the end of the sample moratorium period.

EOR Proposal Deadlines:

August 15, 2005
February 15, 2006

For questions and/or additional information, please contact:

Carolyn Ruppel (cruppel@nsf.gov) or
Rodey Batiza (rbatiza@nsf.gov)

www.geo.nsf.gov/oce/programs/drilling.htm

JOI and NSF Host Truman Fellow

This coming year, as part of the Truman Fellows Program, the National Science Foundation (NSF) and JOI are jointly hosting a Truman Scholar—Dylan Sullivan. The Harry S. Truman Scholarship (www.truman.gov) is an award for undergraduates pursuing careers in public service, and the Truman Fellows Program allows 20 of these scholars who have recently graduated to gain employment experience through a yearlong program in Washington, DC.

Dylan, who received a BA in Environmental Geology this past spring from the Uni-

versity of Missouri, is already familiar with scientific ocean drilling from his studies. Mentored by Cheryl Kelley, he conducted undergraduate research on carbon fractionation in Gulf of Mexico sediments as a paleo-environmental proxy. Also, guided by Mike Underwood, he determined the median velocity of Missouri River floodwaters using grain-size distributions and sediment transport equations.

While at the Division of Ocean Sciences (OCE) for three months this summer, Dylan will develop a Broader Impacts database by

surveying ocean science research proposals submitted to NSF for the types of outreach activities proposed to meet NSF's Broader Impacts Criterion (Criterion 2). The goal of his project is to help NSF assess the impact of Criterion 2 on ocean research activities. The product will be a document with summary statistics for OCE, to be used for articles prepared for publication in the ocean science literature. Dylan will then spend nine months at JOI where he will work with Holly Given, Leslie Peart, and Susan Boa on USSSP outreach and community engagement activities.

Experiencing Science and Diversity Worldwide

Amy Castner, JOI

Attracting and retaining the participation of a diverse cross-section of the population has been a long-standing challenge for the geosciences community. Although we have made positive strides in increasing the involvement of women, participation levels by people of color remains unacceptably low. To encourage more young scientists of color to become future leaders in the geosciences community, Joint Oceanographic Institutions (JOI) has been developing partnerships and activities designed to provide horizon-building experiences for graduate and undergraduate minority students interested in the marine and geosciences.

A New HBCU Fellowship

Quinn Conyers is the first student awarded the JOI Alliance's new Historically Black Colleges and Universities (HBCU) Fellowship. Quinn, who recently graduated from West Chester University with a bachelor's degree in communications studies, will work at JOI with Susan Boa, Director of Communications and Development, on a wide range of media and outreach activities, including port calls. She will arrive at JOI in late August and work part-time during the 2005-2006 academic year, while also attending classes in the Mass Communications and Media Studies master's program at Howard University.

Oceans of Opportunity

The National Science Foundation (NSF) has awarded funding to Savannah State University, Georgia State University and JOI for its *Oceans of Opportunity* program. This education and outreach program is geared to sustain the involvement of African American students (kindergarten through graduate school in the Savannah and Atlanta areas) in the marine geosciences. The program—anticipated to begin this fall—combines an academic geoscience focus with active research, peer-to-peer mentoring, and continuing opportunities for engaging with marine geosciences material as students advance through the academic levels. In this way, the program will strive to develop self-sustaining academic and research pipelines in marine geosciences at all levels of education for the two



MS PHD'S Program students who attended a SSEP meeting learned firsthand about IODP's proposal evaluation process. The participants (left to right) were Leonard Pace (graduate student, Fisheries Science, Virginia Institute of Marine Science), Aisha Johnson (undergraduate, chemistry, U Houston), Jose Tirado (graduate student, Environmental Science, Universidad Metropolitana - Puerto Rico), Ismael Nieves (graduate student, Environmental Engineering, U Connecticut), and Raymon Sherrell (undergraduate, Marine Science, U South Carolina).

geographic regions. The research pipeline aims to produce cutting-edge results while improving students' investigative skills and confidence through active participation in marine geosciences research. The academic pipeline will broaden student exposure to the discipline by focusing on hands-on teaching methods and using sediment cores from key intervals in Earth history which demonstrate important geologic processes.

To launch the program, JOI has awarded Savannah State University a lecture from USSSP's Distinguished Lecturer Series. JOI will also contribute core samples and models related to the program's educational goals. Other program partners include: Johnson High School (Savannah), which is developing a marine and environmental science career track; the newly established Marine Science Academy at Thunderbolt Elementary (Savannah); and the Oatland Island Education Center (Savannah).

JOI and the MS PHD'S Program

JOI has become an institutional partner with the *Minorities Striving and Pursuing Higher Degrees of Success in the Earth System Sciences* (MS PHD'S) Program, a professional development program for minority graduate and undergraduate students. The program is jointly funded by NSF and the National Aeronautics and Space Administration (NASA) and housed at the University of South Florida. JOI's contribution to the program provides students an entrée into the international and inherently diverse world of global science and science program management. Since joining the program in 2005, JOI has provided horizon-building experiences for seven MS PHD'S students.

In May 2005, five students, accompanied by the MS PHD'S Program Director (Dr. Ashanti Pyrtle, University of South Florida) and myself attended a meeting of IODP's Science Steering and Evaluation Panel in Shanghai, China. The students (pictured) were paired with "meeting mentors," who introduced them to panel members, provided context and answered questions about the proposals or discussion, and debriefed what the students observed and learned each day. The mentors were Jerry Dickens, Rice University; Shemin Ge, University of Colorado; Gerry Iturrino, Lamont-Doherty Earth Observatory; Richard Norris, Scripps Institution of Oceanography; and Greg Ravizza, University of Hawaii.

In June 2005, JOI supported the attendance of two MS PHD'S students at the USSSP-funded Bering Strait Workshop held in Fairbanks, AK. They were Dana Brown, a geosciences graduate of Georgia State University and Maria Vélez-Quiñones, an undergraduate in biology at the Universidad Metropolitana in Puerto Rico. Dr. Holly Given, JOI, was their meeting mentor.

To learn more about JOI's diversity activities, please contact Amy Castner (202-232-3900 x1613, acastner@joiscience.org). Web site information is on the way.



A Day on Capitol Hill

“Congressional Visits Day” annually brings a range of experts to Washington, DC to raise visibility and support for science, engineering, and technology. The tenth Congressional Visits Day, held May 10-11, 2005, was organized by a network of nearly 50 professional, scientific, and engineering societies; higher education associations; institutions of higher learning; and trade associations. For more information, visit: www.aas.org/policy/cvd/. This year, two USSAC members—Harold Tobin and Will Sager—visited several congressional offices to talk about scientific ocean drilling. Contact Susan Boa (sboa@joiscience.org) if you are interested in participating in the future as a representative of scientific ocean drilling.



Dropping into an Episode of “The West Wing”

Harold Tobin, New Mexico Institute of Mining and Technology

I traveled to Washington, DC for an action-packed visit as part of the 2005 Congressional Visits Day. I met with key staff members of the New Mexico delegation on behalf of IODP in general, and, in particular, to request support for funding the new riserless vessel. New Mexico has a long history of congressional support for science—but not so long a history of involvement with scientific ocean drilling.

My visit began as Steve Traver, aide to NM Representative Steven Pearce, whisked JOI staff and me from the House to the Senate office buildings via a labyrinthine route that included the Capitol’s underground train and the Capitol rotunda, all the while peppering us with rapid-fire questions about ocean drilling and plans for the new vessel. We felt like we had dropped into an episode of *The West Wing*. After a very interesting and productive meeting with Mr. Traver and a member of Senator Domenici’s staff, we headed to Senator Bingaman’s office. We were awaiting our meeting when the alarms went off, and the Senate, House, all office buildings, and the White House were evacuated without warning! Soon we found ourselves milling about the lawn near Union Station with various senators and thousands of staffers, all fumbling with their BlackBerries and cell phones. It turned out that a two-seater Cessna plane had flown near the White House and was nearly shot down. The crisis soon over, we were able to conclude our day of meetings.

The visit was timed for the beginning of mark-up of appropriations bills, and the staffers I met were directly responsible for that effort—the make-or-break part of the

budgetary process. The NM delegation occupies key positions for appropriations, especially Senator Domenici. I was impressed with how focused and well informed these legislative assistants were about the National Science Foundation’s Major Research Equipment and Facilities

Construction (MREFC) program and the new scientific ocean drilling vessel. All expressed enthusiastic support for the program. I left with the strong impression that the visit was genuinely worthwhile, not to mention more exciting than I had bargained for.

An Experiment We Need to Repeat

Will Sager, Texas A&M University

Congressional Visits Day seemed like a good idea—visit your senators and congressmen and tell them what a great project IODP is. The message is an easy sell. The President’s budget contains \$57 million to fund the conversion of a drilling ship, which is like a Hubble telescope for marine geoscientists, allowing us to see far back into time.

However, when I visited the Capitol, accompanied by JOI staff, we experienced the reality. That is, on any given day there are dozens of people waiting to see a given congressperson—wanting increased funding for their pet project. On our day, we rubbed elbows with people promoting more research for Amyotrophic Lateral Sclerosis, also known as Lou Gehrig’s Disease. This was a bit intimidating because scientific ocean drilling isn’t curing anybody of anything yet—at least not directly.

We visited the offices of Texas legislators Senator Kay Bailey Hutchison, Senator John Cornyn, Congressman Chet Edwards and Congressman John Culberson. That’s when I found out that you don’t actually meet with your congressperson, who is surrounded by staffers and far too busy to meet directly

with constituents. During our visit, staffers were in a flail about a report on military base closures. Much more important, come Election Day, than science.

The staffers also have a busy schedule and oftentimes little background in science. We were the second group of scientists for one young staffer whose eyes glazed over soon into our visit. On the other end of the spectrum, another staffer in my congressman’s office was very attentive and responsive. In summary, I can’t tell whether these meetings will have any effect, but I believe that trying to have an influence is better than not trying. One thing that I heard several times is that you have to develop a relationship. This suggests repeating the experiment—maybe several times.

On top of it all, there’s the excitement of visiting Washington, DC. You may have heard of the incident back in May when a small plane entered DC airspace and they evacuated the Capitol and surrounding buildings. That happened the day I was there. Imagine thousands of people going through security to get back inside all of those buildings. That was us!

North Atlantic Salinity Variations Linked to Circulation Changes During the Last Glacial Cycle

Changes in the density of sub-polar waters, which are governed by both temperature and salinity, are linked to abrupt climate change through their influence on meridional overturning circulation (MOC) in the North Atlantic Ocean (Boyle, 2000). Today, most of the North Atlantic's subtropical gyre water circulates through the Caribbean Sea before it is transported to the sub-polar regions of the North Atlantic via the Gulf Stream. Net evaporation exceeds precipitation in the Caribbean, resulting in the advection of warm, salty waters to the North Atlantic. As these waters flow northward and cool, the resulting cold, salty waters sink and promote MOC.

The goal of my Schlanger Fellowship was to investigate the link between North Atlantic surface salinity (SS) and MOC variability over the last glacial cycle. By combining Mg/Ca paleothermometry with $\delta^{18}\text{O}_{\text{calcite}}$ ($\delta^{18}\text{O}_{\text{c}}$) measurements on the planktonic foraminifera *Globigerinoides ruber* from Hole ODP 999A in the Caribbean (12°45'N, 78°44'W; 2,827 m; 4 cm/ka sed. rate), I reconstructed the salinity proxy $\delta^{18}\text{O}_{\text{seawater}}$



Matthew Schmidt

University of
California, Davis
Faculty Advisor:
Howard Spero

($\delta^{18}\text{O}_{\text{sw}}$) (Schmidt et al., 2004). Foraminiferal $\delta^{18}\text{O}_{\text{c}}$ is controlled by temperature and $\delta^{18}\text{O}_{\text{sw}}$ so $\delta^{18}\text{O}_{\text{sw}}$ can be computed if temperature is determined independently. The $^{18}\text{O}/^{16}\text{O}$ ratio of seawater covaries linearly with SS, making it possible to estimate changes in past salinity from $\delta^{18}\text{O}_{\text{sw}}$ reconstructions.

Results show that Caribbean $\delta^{18}\text{O}_{\text{sw}}$ variability since 136 ka (Schmidt et al., 2004) exceeds estimates of $\delta^{18}\text{O}_{\text{sw}}$ change due to the growth of continental ice sheets (Waelbroeck et al., 2002) (Fig. 1A,B). By removing the influence of ice volume (Waelbroeck et al., 2002) and subtracting the modern local surface $\delta^{18}\text{O}_{\text{sw}}$ value of 0.8‰, I calculate the ice-volume free, regional change in $\delta^{18}\text{O}_{\text{sw}}$ reported as $\Delta\delta^{18}\text{O}_{\text{IVF-SW}}$ (Fig. 1C). Positive values indicate elevated SS due to the excess removal of H_2^{16}O through evaporation. In ODP Hole 999A, $\Delta\delta^{18}\text{O}_{\text{IVF-SW}}$ was

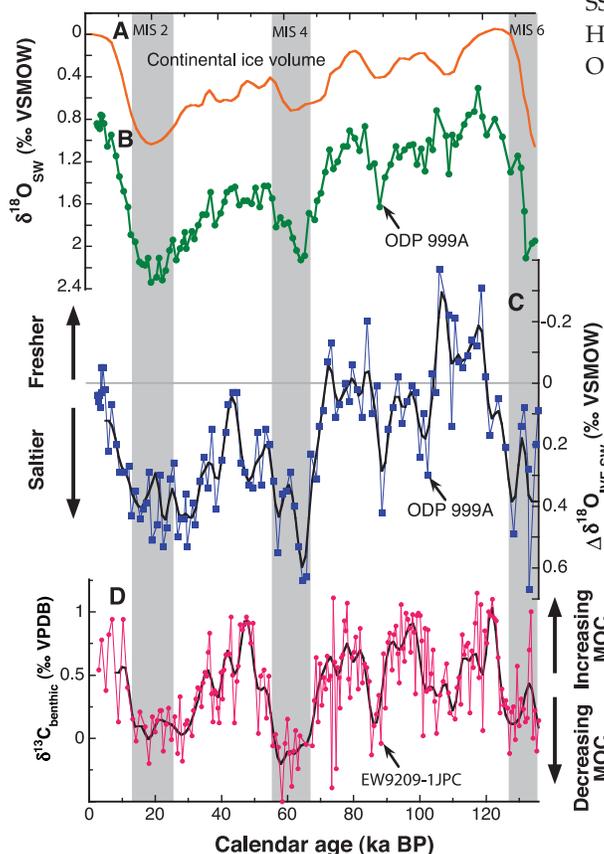


Figure 1. A) Changes in global $\delta^{18}\text{O}_{\text{sw}}$ due to continental ice volume variability since 136 ka (Waelbroeck et al., 2002). B) Caribbean $\delta^{18}\text{O}_{\text{sw}}$ calculated from Mg/Ca-derived SSTs and $\delta^{18}\text{O}_{\text{c}}$ based on the planktonic foraminifera *G. ruber* (white) from ODP Hole 999A (Schmidt et al., 2004). Note that the amplitude of the calculated $\delta^{18}\text{O}_{\text{sw}}$ change in the Caribbean is considerably greater than the global $\delta^{18}\text{O}_{\text{sw}}$ change due to ice volume alone. C) The $\Delta\delta^{18}\text{O}_{\text{IVF-SW}}$ record for ODP Hole 999A, calculated by subtracting global $\delta^{18}\text{O}_{\text{sw}}$ change due to continental ice volume (Waelbroeck et al., 2002) and the modern local $\delta^{18}\text{O}_{\text{sw}}$ value of 0.8‰, represents regional hydrologic changes in the Caribbean during the last glacial cycle. The bold line is a low pass filter running through the raw data (fine line). Shaded bars indicate glacial periods MIS 2, 4, and 6. D) The benthic $\delta^{13}\text{C}$ record (bold line is low pass filter) from Ceara Rise core EW9209-1JPC (5°N, 43°W; 4,056 m) indicates times of reduced MOC (lower $\delta^{13}\text{C}$) (Curry and Oppo, 1997).

more positive than modern seawater by $\sim 0.5\text{‰}$ during cold glacial intervals, Marine Isotope Stage (MIS) 2, 4 and 6. In contrast, warm MIS 3 and 5 $\delta^{18}\text{O}_{\text{sw}}$ values are indistinguishable from the modern $\delta^{18}\text{O}_{\text{sw}}$ value in this region (e.g., $\Delta\delta^{18}\text{O}_{\text{IVF-SW}} \approx 0$). Assuming the freshwater $\delta^{18}\text{O}$ end member in the tropical Atlantic did not change significantly during the Last Glacial Maximum (Jouzel et al., 2000), the modern western Caribbean $\delta^{18}\text{O}_{\text{sw}}$: SS relationship, $\delta^{18}\text{O}_{\text{sw}} = 0.22 \cdot \text{SS} - 6.95$ (Watanabe et al., 2001), suggests that Caribbean salinities were 2.3 to 2.7 PSU higher than modern.

Typically, cold periods in the North Atlantic are associated with reduced MOC. Benthic foraminiferal $\delta^{13}\text{C}$ oscillations from the western tropical Atlantic reflect the relative strength of North Atlantic MOC (high $\delta^{13}\text{C}$) and Antarctic Bottom Water (low $\delta^{13}\text{C}$) production. Compared with the benthic $\delta^{13}\text{C}$ record from a western tropical Atlantic core (Curry and Oppo, 1997) (Fig. 1D), $\Delta\delta^{18}\text{O}_{\text{IVF-SW}}$ values from Hole ODP 999A show positive salinity anomalies when MOC was reduced. The increased glacial salinities calculated in Hole ODP 999A are also consistent with modelling studies that suggest a southward shift in the Intertropical Convergence Zone (ITCZ) during periods of reduced MOC (Vellinga and Wood, 2002). A more southerly ITCZ results in a drier western tropical Atlantic, suggesting the tropical hydrologic cycle played a direct role in elevating glacial Caribbean salinity and possibly the salinity of the entire North Atlantic subtropical gyre. Furthermore, the accumulation of salt in the glacial North Atlantic gyre may act as a density amplifier for MOC initiation at transitions into interglacials, offsetting the negative density effects of rising temperatures and melting ice at glacial termination events.

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The USSSP/IODP Internship

One Continuous Learning Experience

Andy Baker, Baker Sand Inc.

My undergraduate professors at Hobart College often said that you will continue to learn long after finishing college. I just assumed that it was disclaimer in case they forgot to teach us something in class. Little did I realize then that they were right.



My USSSP/IODP Internship at JOI has been one continuous learning experience. I have travelled as far south as Tierra del Fuego, Argentina (for shipboard experience on a seismic cruise with Jamie Austin, University of Texas, Austin, and his Swiss counterparts), as far west as Hawaii (to help at a USSAC meeting), as far east as Ireland (to participate as a downhole tools/thin section technician on Expedition 307) and as far north as North Dakota (in January...I made the arrangements while I was in Hawaii—what was I thinking?) and almost everywhere in between.

A handful of my trips, such as to North Dakota, were to record talks that were part of the JOI/USSSP Distinguished Lecturer Series for webcasts on the JOI Web site. Several other trips were to help staff exhibit booths at conferences. I particularly enjoyed the school visits and the National Science Teachers Association meetings because I could truly be an ambassador of the scientific ocean drilling program, sharing its wonders and excitement.

All of my learning experiences, however, whether while on travel or in the office have had a reoccurring theme: the market for international and multidisciplinary collaboration is increasing. It was once possible to take the spotlight for discoveries or inventions; household names such as Henry Ford, Ben Franklin, Albert Einstein and Jacques Cousteau made the unthinkable a reality. True, they had worked with others in their accomplishments, but they were the ones given the credit. And now the world is shifting from the "U.S. team of scientists" did this and the "group from Stanford" did that, to "the international science party" accomplished this.

The world, more than ever, is becoming a smaller place. I experienced firsthand how the drilling program, through the U.S. community, is capitalizing on opportunities to broaden the pool of possibilities, from new education initiatives to raising awareness with engineers and scientists in different fields. The sum of these opportunities—and international cooperation—will measure the success of IODP in the future.

Following his internship, Andy is expanding his career opportunities by joining the family business, Baker Sand Inc. of Burbank, Ohio, a medium-size mining operation supplying the aggregate industry.

The "Perks" of Being an Intern at JOI

Jill VanTongeren, Columbia University

The only perks that the typical Washington, DC intern knows are those of the office "perk"-ulator. The USSSP/IODP Intern, however, is not your typical intern. In the JOI office, interns don't have to make coffee, although they may be prone to drinking a lot of it. The JOI intern doesn't have to spend the day licking envelopes, the mail machine has a button for that. At JOI, interns don't even have to attend formal receptions, unless the JOI Board of Governors is in town, of course. As a USSSP/IODP Intern at JOI for a year, I certainly have had my share of coffee, mass mailings, and receptions, but one thing is sure, I have done so much more.

"Oh! The places you'll go!" goes the Seuss graduation adage heard on almost every campus each May. But a year ago, while sitting in the University of Michigan "Big House," I would never have known what an understatement that would come to be. During my internship with JOI, I was able to attend the fall meeting of American Geophysical Union in San Francisco; audio record Distinguished Lecturer Series presentations in Missouri, Minnesota, and Pennsylvania; exhibit at a National Science Teachers Association conference

in Virginia, and participate in a research expedition in Tierra del Fuego, Argentina.

But it's not just the traveling that sets the USSSP/IODP Intern apart from the rest; it is also the things learned while working closely with the JOI staff day in and day out. I have, of course, learned the ins and outs of scientific ocean drilling, and I have tried my best to navigate my way through acronyms and work breakdown structures. However, the two greatest things I will take with me on the road ahead are a fascination for ocean research and the philosophy of science program management. This year, I watched both the communication and education programs at JOI significantly evolve and develop. I have learned to ask fundamental questions and have a goal to which I can work. I have learned to manage my time and communicate effectively with colleagues and the public. I have also learned the value of these endeavors and the need for them in all aspects of life and work. I will take this philosophy and these lessons with me as I enter a PhD program in geochemistry at Lamont-Doherty Earth Observatory of Columbia University this fall. I am looking forward to starting my graduate work, but I will surely miss the pretzels in the copy room.



JOI Welcomes the 2005/2006 USSSP/IODP Interns

Alyssa Edwards

MA, Global Environmental Policy, American University
BA, Marine Biology, Univ. of California Santa Cruz

Nancy Felix

BA, Environmental Systems/Environmental Policy, University of California San Diego

Next Application Deadline: March 2006

Gus: A Legend in His Own Time

Andrea Johnson, JOI

Like a supermodel, Gus uses one name and has a California tan. Unlike a supermodel, Gus is known for his leadership and creativity rather than his svelte figure. Scientific ocean drilling programs have come and gone, but Ted “Gus” Gustafson has endured—serving as a marine technician/lab officer since Leg 1 of the Deep Sea Drilling Project (DSDP) and continuing today. His red beard, sandals and barrel-chested physique have been a familiar and welcome sight on 100 cruises to date (41 DSDP, 56 ODP, and 3 IODP). Steadfast, dependable, and dedicated to the success of each expedition, Gus is often the first person on the dock and the last to leave.

While growing up in San Diego County, Gus played football and was always in the water, surfing or diving recreationally. Naturally handy, he further developed his mechanical skills at Ryan Aircraft and other shops. Roger Larson, then at Scripps Institution of Oceanography, and now at the University of Rhode Island, takes credit for recruiting Gus when he needed a marine technician. To help Roger, Tom Chase, who taught at Palomar Junior College, asked for volunteers from his night course in oceanography. One of them was Gus, whose day job at the time was working in a sheet metal shop at the Marine Corps Camp Pendleton. Roger put Gus in charge of the airgun, asking him to figure out how it worked. Never the weakling, Gus once carried the airgun housing—which others could barely lift—three blocks uphill to a marine engine shop. Following the cruise, Roger told Gus about DSDP, and Gus sailed as the airgun tech when the program was launched in August of 1968. So the legend began...

Gus found his niche aboard the DSDP vessel, *Glomar Challenger*, where he soon became a laboratory officer and initiated the “Ragged Ass Rangers”—to describe his motley crew of technicians. Motivated by the adventure and thrill of scientific discovery, he thrived on making things work and fabricating parts that

hadn’t previously existed. For example, the Leg 184 science party had trouble getting sample tubes in and out of the core, so Gus manufactured a helpful tool in the machine shop. A well respected and a competent individual, whose burly appearance belies his generosity and kind heart, Gus inherently understood the “big picture” science goals of the program and thus excelled at shipboard teamwork and compromise—among technicians, scientists, and crew.

Before the Ocean Drilling Program (ODP) was launched in 1985, Gus spent six months overseeing the construction and fitting of the *JOIDES Resolution’s* labstack. He was also integral in setting up and running the shipboard labs. A born facilitator and intimidator, he has been a behind-the-scenes mentor to many, always teaching: how the ship and its inhabitants work as a unit, the secrets of each vessel’s remote corners, and the history of scientific ocean drilling.

A natural leader who knew how to get the best out of his staff, Gus became a seagoing tech without management duties in Texas when ODP began so he could maintain his home in Carlsbad, California. A true sailor who doesn’t object to a bit of rum, he doesn’t focus on his many months at sea. Instead, Gus revels in the special opportunities for family time that six months ashore afford him—camping along Baja, fishing and abalone diving in the Pacific, skeet shooting,

and spending time with his two sons and grandchildren. According to his wife, Violet “After being married for forty years, you sometimes forget the man standing at the kitchen sink doing dishes really is a legend in his own time. I have done the 100 cruises with him but only from my land yacht. He has always been my rock.”

Like a steady hand on the tiller, Gus’s leadership and competence shine in crises. He never shies from being front and center when times are tough. For instance, no one who sailed on ODP Leg 163 can ever forget Gus’s bravery and essential role in the brigade that repaired a blown out window on the bridge of the *JOIDES Resolution* during the “perfect storm” that trounced the ship off Greenland. On the foredeck in howling wind and rain, with the roar of waves threatening another lick, Gus and others sealed a breached window to prevent water from reaching the vessel’s navigational and communication equipment.

Adept at just about anything, Gus has many shipboard lairs. In the thin section lab, his finesse makes many a picky petrologist happy. In the downhole tools lab, he keeps custom-made water samplers and temperature measuring tools operating. In the machine shop, he oversees the fabrication of custom hardware. And on the fantail, he extends the life of the seismic hardware he assembled years ago. In summary, his quiet and professional background support has been an anchor in scientific ocean drilling.

Despite of a recent knee replacement, Gus is still at sea as an important player in the Integrated Ocean Drilling Program. In the words of Frank Rack, JOI, who Gus mentored as a technician, staff scientist, and scientist, “Gus has seen it, done it, fixed it, and reinvented it...all a few times.”

Thanks Gus. Here’s a hearty “Tech Salute” from friends and shipmates!

Gus firmly believes that “sea stories should stay at sea” so most tales about Gus will remain untold.

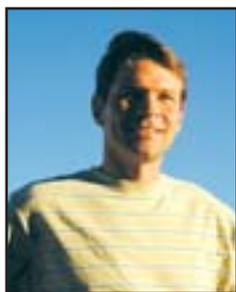


Gus (from top left) with airgun on the fantail, holding a swallow, with underway seismic, and as a “Ragged Ass Ranger.” (Photos courtesy of John Farrell, URI)

Integration in IODP

A Letter from the Chair

Although easily mistaken for International, the "I" in IODP stands for "Integrated." The word's key definition—as intended by the program's founders—is "a combination of parts or objects that work together well." The parts combined extend beyond IODP's membership and funding. Integration is also a key component of the program's science development and review processes, science operation and multiplatform drilling, as well as its role in launching larger and more complex research programs like the Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE).



drilling platforms, and those in the management structure of IODP. To address this shortcoming, Manik Talwani, President of IODP Management International, invited relevant individuals to attend a Management Forum Retreat in May 2005. The retreat was set in Frascati, Italy and excellently planned and conducted by ESSAC Science Coordinator, Valentina Zampetti, and ESSAC Chair, Jeroen Kenter. The goal of the retreat was to bring forward ideas to maximize integration among IODP's components and to open dialog among various organizations.

Was the program integrated at its outset in 2003? Well...although the infrastructure for integration was certainly in place, those of us on the ground struggled with many things including how to make IODP visible and compelling to society. To elaborate, as I write, I—along with hundreds of millions of people worldwide—am eagerly awaiting the collision of a satellite into a comet about 80 million miles away. In comparison, the IODP Web site isn't being shut down by excessive hits regarding the Gulf of Mexico expedition tens of miles off the U.S. coast, which will certainly yield more real science than a comet crash.

So how do we integrate? Communication, understanding, and coordination are relatively obvious ingredients. Many meetings of various entities within IODP have been pursuing this goal, and I find from the U.S. national office perspective that we are beginning to understand how to integrate activities with our international partners on topics ranging from expedition staffing to outreach and media relations. In addition, IODP's Science Planning Committee (SPC) and Science Planning and Policy Oversight Committee (SPPOC) have been trying to encourage communication and develop management systems that maximize input while minimizing inefficiency.

In spite of these efforts, something has been missing—open communication among the organizations representing the national offices, the operators of the scientific

The result of the retreat? Complete success on many levels. Numerous issues and similar ideas were shared by representatives of different management organizations. One idea is to expand on the *Initial Science Plan* by developing and implementing "Missions" which target key scientific topics. From the initial planning stage, these Missions—led by Mission Teams representing a range of scientific interests—would involve the science operators, to allow for early advice on technical issues like site placement and surveys, and outreach and education specialists for greater public awareness of IODP's efforts.

This particular effort to enhance integration in IODP was timely, but our real work has only just begun. I fear that an organization overly focused on individual proposals and expeditions, vetted through and planned by a system largely adopted from ODP, will not fare well in a 21st century world that demands more bang from scientific bucks. As USSAC Chair, I encourage developing a modified structure that continues to include proposal-driven bottom-up science while also proactively driving missions that are clearly relevant scientifically, but not solely the products of bottom-up science. Let's make a program so compelling that high traffic crashes our IODP Web site someday!

Cheers,

Gabe Filippelli, USSAC Chair

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News from the JOI Education Department

Education Web Page Launched

A new Web page, www.joilearning.org, has been established to serve as a clearinghouse for information on all JOI education activities and materials. Although some educational opportunities are linked to specific programs within JOI, the new Web address will allow educators direct access.

"Core on Deck" at NSTA

Three "technicians" and an interactive laboratory exhibit—featuring a K/T boundary core model, microscopes, and seafloor samples for on-the-spot examination—made a splash at the 2005 annual meeting of the National Science Teachers Association (NSTA). The conference, held in Dallas, Texas from March 30 to April 3, attracted approximately 12,000 science educators nationwide, especially from Texas.

Garbed in shipboard coveralls, JOI staff members (Leslie Peart, Matt Niemitz and Andy Baker) introduced over 1500 booth visitors to JOI/IODP education activities and gave away thousands of outreach items including posters, DVDs, and classroom materials. They also scanned barcodes on the nametags of about one-in-three or one-in-four visitors, a representative cross

Dressed for success at the National Science Teachers Association annual conference. In coveralls: Andy Baker, JOI Intern; Leslie Peart, JOI Education Director; and Matt Niemitz, Education Program Assistant. In hats: Texas swing band, "Riders in the Sky."



section of those who spent time at the booth. In this manner, demographic information for over 500 conference participants who visited the booth was collected. The names were entered into a listserve and a follow-up letter was e-mailed, inviting these educators to bookmark the JOI Web site, to comment on what was memorable about the booth/approach, and to send pictures of their classes undertaking *Measure for Measure*, a new classroom activity involving scale measurement calculations based upon the *JOIDES Resolution*.

JOI staff also demonstrated *Measure for Measure* on March 30 with teacher participants at a Science Share-a-thon that targeted an audience seeking experiential

learning activities. The first 130 teachers that completed some portion of the activity were given a take-home package of resources that included—for the very first time—subseafloor samples of sediment and peridotite. The event was hosted by the NSTA Informal Science Education Committee and the Texas Informal Science Education Association, and was sponsored by the Discovery Channel.

In addition, on April 2, JOI participated in Earth and Space Science Resource Day by sponsoring a scientific lecture by Dr. Mark Leckie, University of Massachusetts, Amherst. Slides and audio from the lecture are available at www.joilearning.org.