JOI/USSAC Newsletter

News from the Joint Oceanographic Institutions/U.S. Science Support Program associated with the Integrated Ocean Drilling Program • Fall 2004 • www.joiscience.org

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courtesy of IODP

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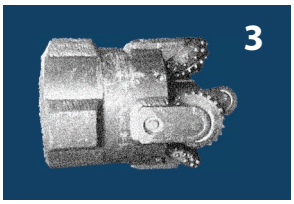
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JOI/USSAC Newsletter

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

Joint Oceanographic Institutions (JOI) is a consortium of U.S. academic institutions which brings to bear the collective capabilities of the individual oceanographic institutions on research planning and management of the ocean sciences. Established as a private, non-profit corporation in 1976, JOI facilitates and fosters the integration of program and facility requirements for the oceanographic community, makes the case for support, and arranges for appropriate management either through individual institutions or by JOI itself. Currently, JOI manages the U.S. Science Support Program (USSSP) which supports U.S. participation in 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.

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

Cover Images
Offshore participants of IODP's Arctic Coring Expedition 302 gather at the North Pole. (Martin Jakobsson, courtesy of IODP)
Drilling pipe. (Bob Burger, JOI)
The *Oden* at work in the Arctic ice on Expedition 302. (A. Krylov, courtesy of IODP)

Drill Bits

IODP-MI Has Moved

On September 30, 2004, IODP Management International (IODP-MI) relocated, and its new contact information is:
IODP-MI
815 Connecticut Avenue, NW, Suite 210
Washington, D.C. 20006
telephone: 202-465-7500

Staff e-mail addresses are available at www.iodp.org.

Gallery of Honor

IODP-MI is seeking your most evocative, retrospective images for a Gallery of Honor in its new Washington office. Wanted are images that vividly portray an "aha" moment: the excitement of bringing core on board, a momentous episode, or a unique experience that illustrates scientific ocean drilling's rich history. All contributions selected for display will identify the donor with a nameplate that includes the date of the expedition and any editorial caption provided with the image. Send your image(s) via e-mail to Nancy Light (nlight@iodp.org) or by post to the new IODP-MI address above. If you would like items to be returned to you, please include a self-addressed envelope.

Ocean Drilling at AGU

Hang out with the ocean drilling crowd at the American Geophysical Union (AGU) Fall Meeting, December 13-17, 2004, in San Francisco! JOI will be hosting an exhibit at booths 312 to 316, and IODP-MI will have a display at booths 320 to 324.

An IODP Town Meeting, organized by IODP-MI, will be held at AGU on Tuesday, December 14. Information on its exact timing and location is coming soon.

Wanted: Intern Candidates

USSSP-IODP is seeking qualified U.S. applicants for a one-year internship, beginning summer 2005, at the JOI office in Washington, DC. The intern position focuses on scientific ocean drilling and specifically provides support to USSSP and IODP. JOI encourages applications from recent college graduates who are interested in learning about science program management before pursuing an advanced degree in the geosciences. Candidates should be prepared to work in a fast paced office environment and handle multiple tasks. Excellent written and verbal communication skills as well as a sense of humor are essential.

For the term appointment, the intern will be a salaried JOI employee with full benefits. Specific start and end dates are negotiable. Applicants should submit a cover letter, resume, and the names of three references to Susan Boa (sboa@joiscience.org) by March 15, 2005. Interested candidates with questions may call Susan at 202-232-3900 x1607. For more information about JOI and the science programs it manages, please visit: www.joiscience.org

New USSSP Staff Member

JOI welcomes Susan Boa as a Senior Program Associate for USSSP. Susan will support a wide range of activities for U.S. efforts in scientific ocean drilling, including meeting coordination and managing the Schlanger Ocean Drilling Fellowship and the Distinguished Lecturer Series.

Formerly, Susan managed the Seafood Choices Alliance, which is housed within SeaWeb, a national ocean conservation organization. Previously, she provided support to a wide range of SeaWeb activities, including coordinating a nationally-syndicated daily radio program *The Ocean Report*, a research initiative for Marine Protected Areas, and specific conservation efforts.

Prior to joining SeaWeb, Susan coordinated Naval Oceanography activities with other federal agencies in the Office of the Oceanographer of the Navy Interagency Policy Division. She also gained international policy experience while a project administrator at the NSF Global Change Research Projects Office. While a NOAA Sea Grant Fellow at the Smithsonian Institution, Susan helped develop the Ocean Planet exhibition. She holds a BS from Hood College and a MS in Biological Oceanography from Florida State University—and remains an avid Seminole fan. In addition to two *Alvin* cruises and one dive, she once spent 30 days on a Russian research vessel with a crew of 70 Russians, ten American men, and three American women, all three of whom were named Susan.

New Interns at JOI

In summer 2004, two new interns arrived at JOI. Andy Baker earned a BA degree from Hobart College (May 2004) with a major in Geoscience and a minor in Environmental Studies. His honors project focused on lake-level change during the Holocene in the Finger Lakes of upstate New York.

Jill VanTongeren holds an honors degree in Geology from the University of Michigan (May 2004). Her undergraduate research included: the organic geochemistry of meteorites, the early Cenozoic paleoclimate of New Zealand and the Southern Ocean, and fieldwork in Antarctica.

Schlanger Ocean Drilling Fellowship

July 2004 Fellowship Awards

Alexandra Turchyn
Harvard University
"Oxygen Isotopes in Marine Sulfate over the Cenozoic"
(DSDP and ODP legs 85, 86, 198, and 199)

Sharon Hoffman
MIT/WHOI
"Pa/Th and Stable Isotopic Records of Deep Water Circulation during the Last Interglacial"
(ODP legs 154, 162, 172, 177, and 202

Application Deadlines:
November 15, 2004 and April 15, 2005
www.usssp-iodp.org/schlanger

IODP Mission-Specific Platforms Set Sail

Dan Evans, ESO Science Manager

By the time you read this article, you will likely have heard that the first mission-specific platform expedition for the Integrated Ocean Drilling Program (IODP) has been successfully completed. Aside from its scientific merits (see page 7), the Arctic Coring Expedition (ACEX) was more than just Expedition 302 in the annals of international scientific ocean drilling, for it was also a significant event in the exploration history of the Arctic and in icebreaking co-operation.

The Russian icebreaker, Sovetskiy Soyuz *(left), and the drilling vessel,* Vidar Viking.

ACEX was the result of several years of planning, although it is only just over one year since the formation of ESO, the ECORD Science Operator. In the world of IODP acronyms, ECORD is itself an acronym standing for the European Council for Ocean Research Drilling. ECORD was formed by several European countries in order to provide a third arm of IODP and to provide mission-specific platforms (MSPs) to IODP (www.ecord.org).

In 2002, ECORD decided to set up an implementing organization, and issued a call for expressions of interest. At this stage the British Geological Survey (BGS), the University of Bremen and the European Petrophysics Consortium (the universities of Leicester, Montpellier, Aachen and Amsterdam) decided to put in a joint bid, led by Ali Skinner of BGS. The bid was successful and the work then started, including getting to grips with the new and evolving IODP structure.

Early meetings in the project included those associated with the EGU/AGU/EGS Nice meeting in April 2003, when the idea of drilling on the Lomonosov Ridge in the Arctic Ocean was already a well-defined concept but seemed quite a long way off. These discussions involved the main proponents of the project, now the Co-Chief Scientists, Kate Moran (University of Rhode Island) and Jan Backman (Stockholm University), and also Ulf Hedman and Anders Karlqvist of the Swedish Polar Research Secretariat (SPRS) who have been key players in ACEX. These individuals had been involved in conceptual planning for the project over several years.

ESO will be required to operate MSPs in a wide variety of environments not accessible to the other IODP research ships: the U.S. riserless vessel, currently the *JOIDES Resolution*, and the Japanese riser vessel, *Chikyu*. The drilling locations are chosen through IODP's Science Advisory Structure, and highly ranked proposals that are deemed suitable for MSPs are given to ESO for implementation. The expeditions could therefore be in any part of the world, with a wide range of potential working environments. This first expedition was in the ice-covered waters of the high Arctic, whereas the second will be coring coral reefs around Tahiti. There are also a number of possible locations in different parts of the world for expeditions in the future. Given this range of potential working environments, ESO will in many cases need to bring in appropriate expert advice. For ACEX and its the high-latitude location, the Swedish Polar Research Secretariat was chosen to help plan many aspects of the expedition including contracting icebreakers, helicopters and the ice and fleet management teams.

A particularly critical aspect of the ACEX expedition was ice management. This enabled the drilling vessel to operate with dynamic positioning in open water while being surrounded by moving sea ice that continuously threatened to move the ship off station. Because successful management of the ice was clearly essential to the success of the venture, two polar-class icebreakers, the Swedish vessel *Oden* and the Russian nuclear-powered icebreaker *Sovetskiy Soyuz* were contracted to carry out the task of protecting the drilling vessel.

The *Oden* was the command centre for ice management and control of the whole fleet. The Ice Manager was Arno Keinonen, a marine architect by training who has been involved in ice management in the Beaufort Sea and around Sakhalin. The Fleet Master was Captain Anders Backman who was Master of the *Oden* when she became the first nonnuclear-powered vessel to reach the North Pole unaided in 1991. His experience and standing in the icebreaking community were critical in ensuring the fine co-operation achieved among the three ships, for the fleet was not short of experience as it included a total of seven icebreaker captains! Although not previously tested in the high Arctic, the ice management process proved to be even more effective than had been thought possible, and detailed models were devised to understand the patterns of ice movement. Keinonen was amazed by the ability of the icebreakers and remarked, "The ACEX experience has demonstrated that a fleet of ships of this quality are capable of operation in all but the worst polar ice-pack conditions."

The drilling vessel was the *Vidar Viking*, which normally works as a Baltic icebreaker in winter and as a towing and supply vessel during the summer. Before the expedition it required a lot of modification. In fact, a 2-m diameter moonpool was installed, although this feature is not being retained after the expedition. ESO contracted SeaCore Ltd. to build and install its R100 drilling rig with associated gear, as well as to operate the rig during the expedition. In water depths of up to 1300 m, drilling penetrated nearly 430 m below the seafloor to reach the expedition's scientific target.

> *"The ACEX experience has demonstrated that a fleet of ships of this quality are capable of operation in all but the worst polar ice-pack conditions."*

The *Oden* had been used for polar research projects before ACEX and was the base for the science party, the majority of whom were micropaleontologists able to date the sediments and provide environmental analysis. A range of ephemeral measurements and core logging were also carried out on both the *Oden* and the *Vidar Viking*. Unfortunately only a portion of the science party was able to participate offshore, but all will be present when the cores are split at the University of Bremen core repository under the eagle eye of ESO's Ursula Röhl during November 2004.

The last year of preparation was amazingly interesting, although it is a relief that the offshore data collection is now completed. IODP Expedition 302 was a highly challenging first expedition for ESO and MSPs, but it was very exciting to face this challenge together with the excellent ESO team, its high-quality, dedicated contractors, and such a fine fleet of ships with their excellent officers and crew.

After a month in the Arctic Ocean's ice; roll on Tahiti!

Colin Graham, courtesy of IODP

In the ice: the Sovetskiy Soyuz *and expedition support helicopters.*

U.S. Panel Members in the IODP Science Advisory Structure

SPPOC
Eric Barron, Pennsylvania State University
Peggy Delaney, University of California, Santa Cruz
Susan Humphris, Woods Hole Oceanographic Inst.
Roger Larson, University of Rhode Island
Larry Mayer, University of New Hampshire
Nick Pisias, Oregon State University
David Rea, University of Michigan

SPC**
Keir Becker*, University of Miami, RSMAS
Barbara Bekins, US Geological Survey
Tim Byrne, University of Connecticut
Bob Duncan, Oregon State University
Patricia Fryer, University of Hawaii
Ken Miller, Rutgers, The State University of New Jersey
Terry Quinn, University of South Florida

ESSEP**
Jerry Dickens, Rice University
Katrina Edwards, Woods Hole Oceanographic Inst.
Ben Flower, Univ. of South Florida
Shemin Ge, University of Colorado
Richard Norris, University of California, San Diego
Greg Ravizza, University of Hawaii
Mike Underwood, University of Missouri

ISSEP**
Wolfgang Bach, Woods Hole Oceanographic Inst.
Craig Fulthorpe, University of Texas at Austin
Jeff Gee, Scripps Institution of Oceanography
Julia Morgan, Rice University
Nina Rosenberg, Lawrence Livermore National Lab
Damian Saffer, University of Wyoming
Lori Summa, ExxonMobil

SciMP
Sean Gulick, University of Texas at Austin
Timothy Lyons, University of Missouri, Columbia
Kevin Mandernack, Colorado School of Mines
Clive Neal, University of Notre Dame
Liz Screaton, University of Florida
Geoff Wheat, University of Alaska/MBARI
Roy Wilkins, University of Hawaii at Manoa

EPSP
Robert Bruce, BHP Petroleum
Hans Juvkam-Wold, Texas A&M University
Barry Katz*, ChevronTexaco
Craig Shipp, Shell International E&P
Joel Watkins, Texas A&M University

SSP
Suzanne Carbotte, Columbia University
James Corthay, ExxonMobil Corporation
Earl Doyle, Shell (retired)
Alistair Harding, University of California, San Diego
David Naar, University of South Florida
Davd Twichell, US Geological Survey
Dale Sawyer, Rice University

TAP
Martin Chenevert, University of Texas at Austin
Marvin Gearhart, RBI-Gearhart
Jack Germaine, Massachusetts Inst. of Technology
David Huey, Stress Eng.
Kate Moran*, University of Rhode Island
Frank Schuh, Drilling Tech. Inc.
Howard Shatto, Private Consultant

ILP
George Grabowski, ExxonMobil Exploration
Michael Howell, University of South Florida
Alan Huffman, Fusion Petroleum Technologies Inc.
Garry Karner, Lamont-Doherty Earth Observatory
Martin Perlmutter, ChevronTexaco
Carlos Pirmez, Shell International E&P Inc.
Sven Plasman, Fugro McClelland Marine Geosciences, Inc.

* U.S. co-chair ** effective after the November 16-19, 2004 SSEPs meeting
For more information on the SAS panels, please visit: www.usssp-iodp.org/iodp_committees

Seeking a U.S. Riserless Scientific Ocean Drilling Vessel for Post-FY06 Operations

JOI Alliance/USIO Platform Team

In June 2004, the United States Implementing Organization (USIO) of the Integrated Ocean Drilling Program (IODP) launched the first phase of riserless drilling and coring operations using the R/V *JOIDES Resolution*. Expeditions are currently scheduled through April 2005, and the potential exists for as many as eight additional expeditions, depending on the availability of IODP funding. The plans for future expeditions will evolve over the coming months following the same procedures by which highly ranked drilling proposals are normally scheduled.

In parallel to this first operational phase, the USIO—managed by the JOI Alliance—is working to acquire, convert, and commission a riserless Scientific Ocean Drilling Vessel (SODV) with significantly enhanced capabilities as initially defined by the USSAC Conceptual Design Committee (CDC) report (March 2000).

The CDC report provides a first-order assessment of the U.S. scientific community's requirements for a riserless SODV (see: www.joialliance.org/mrefc/planning/default.html). It recommends upgrades that include improving the core recovery, quality, and continuity of stratigraphic sections recovered from all environments. Based on the recommendations presented in the CDC report and the results of subsequent planning efforts, the JOI Alliance is defining specific requirements and enhanced capabilities to be incorporated into the design of the new U.S. SODV.

The first step in the search for the new vessel was to conduct a Market Survey, which assessed the state-of-the-art technology in derrick, substructure, and drilling equipment. The second step was an Invitation to Tender (ITT), which obtained accurate, first-order information from potential vessel contractors. Both of these steps were initiated in December 2003 and responses were returned by April 2004. The responses to the Market Survey and ITT were used to assess the potential availability of suitable drilling platforms and related equipment, and to prepare a request for proposals (RFP). The RFP was subsequently released in October 2004 as part of the process to acquire and convert a U.S. riserless SODV for IODP operations beyond FY06.

Concurrently, the JOI Alliance prepared and submitted a Project Execution Plan (PEP) to NSF that describes a strategy for acquiring, converting, and commissioning a SODV, in keeping with the Major Research Equipment and Facilities Construction (MREFC) guidelines issued by NSF (see: www.joialliance.org/mrefc/planning/default.html). To assist with these planning efforts, JOI recently hired Stuart Williams as the SODV Project Director to oversee and direct the vessel conversion process as part of an integrated JOI Alliance strategy.

To involve the scientific community, the JOI Alliance has created a riserless SODV Briefing Book that presents a vision for the U.S. platform that encompasses the vessel's drilling and coring capabilities, onboard scientific research capabilities, and issues of habitability (see: www.joialliance.org/mrefc/briefing_book). Currently, the JOI Alliance is seeking guidance and comments from the international scientific community to ensure that the design requirements that were developed for the U.S. SODV meet the expectations and long-term needs of the community.

"Your responses to this questionnaire will help guide the engineering design process that will be initiated in early 2005."

The concepts that are presented in the U.S. SODV Briefing Book will evolve into functional engineering designs that define the on-board science capabilities and habitability and will be used to establish the framework for the vessel conversion. Specifically, the individual chapters of the Briefing Book describe the scientific requirements, the functional requirements for the design of science facilities, and the living and recreational requirements proposed for the vessel. Additional chapters in the Briefing Book describing the vessel's conceptual operational and drilling capabilities will be available at the end of October 2004. An online questionnaire is being used to solicit the community's views regarding the ideas and priorities presented in the Briefing Book. Your responses to this questionnaire will help guide the engineering

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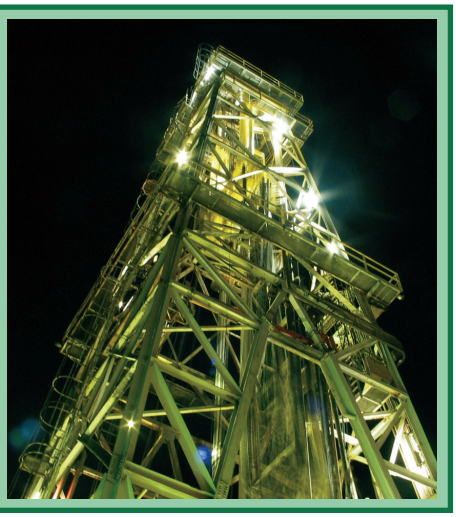
Your Input Is Needed

The JOI Alliance seeks your input regarding the design requirements for the U.S. riserless Scientific Ocean Drilling Vessel to be used after FY06 operations.

A **Briefing Book** presenting a vision encompassing the vessel's drilling and coring capabilities, onboard research capabilities, and issues of habitability is available at: **www.joialliance.org/mrefc/briefing_book**.

An online questionnaire for your feedback accompanies the Briefing Book.

Deadline for Comment: January 31, 2005



On Top of the World with Expedition 302

Kate Moran and Jan Backman

Scientists were literally on top of the world when IODP's Arctic Coring Expedition (ACEX) 302 recovered sediment cores this past summer (August 7 to September 14, 2004) from the Lomonosov Ridge—a mere 250 km from the North Pole. The expedition marked the first successful drilling in the central Arctic Ocean. In spite of the challenges, the expedition achieved its primary scientific objective, which was to recover a sediment record for the Arctic Ocean basin and to sample basement rocks.

The expedition's greatest logistical hurdle was maintaining the drillship *Vidar Viking's* position long enough to collect core. Heavy sea-ice cover in the region moves upwards of 0.3 knots with the Transpolar Drift and also responds locally to wind, tides, and currents. With some luck, but mostly the careful choreography of the protecting icebreakers *Sovetskiy Soyuz* and *Oden*, the *Vidar Viking* managed to keep station for periods greater than eight days in waters more than 90% covered by multi-year ice.

"These sediments reveal that during the PETM [about 55 Ma] the Arctic was subtropical."

The planning and logistics for orchestrating this epic venture are discussed further on page 4 of this newsletter, and additional information is available at: www.ecord.org/acex/acex.html.

As a result of the logistical accomplishments, ACEX drilling reached 430 m beneath the seafloor in water depths of approximately 1300 m. Cores were collected from four boreholes and wireline geophysical logs were successfully run in one borehole.

During the expedition, Co-Chief Scientists—Jan Backman, Stockholm University and Kate Moran, University of Rhode Island—led a small international team of scientists with expertise in micropaleontology, stratigraphy, petro-and geophysics, chemistry, microbiology and sedimentology.

John Farrell, courtesy of IODP

Core on deck aboard the Vidar Viking.

However, additional onshore scientists will conduct a majority of the core description and post-expedition analyses this fall at the IODP repository in Bremen, Germany.

SeaCore, Ltd. and British Geological Survey (BGS) personnel collected core using a custom-built drilling rig for the *Vidar Viking* and tools provided by the BGS. During the drilling process, core catcher samples were transferred to the *Oden* for preliminary micropaleontological and sedimentological analysis. Prior to being sealed in plastic liners, cores were analyzed for physical properties using the nondestructive multisensor track method. In addition, pore water was extracted and microbiology samples were taken from selected intervals.

The expedition's drilling target, Lomonosov Ridge, spans the Arctic from Greenland to Siberia and was hypothesized to be a sliver of continental crust that separated from the Eurasian Plate approximately 50 Ma. As the ridge migrated northward and subsided, continuous marine sedimentation (as suggested by seismic data) recorded the paleoceanographic history of the Arctic Ocean. The elevation of the ridge above the surrounding abyssal plains (~3 km) ensure that ridge-crest sediments are pelagic and free of turbidites.

The initial offshore expedition results—based on only 3% of the material recovered—indicate that the upper 160 m of core captured a continuous paleoceanographic record of the past ~14 my. The sediments include sand, interpreted as ice-rafted debris, and occasional, small pebbles, suggesting that ice-covered conditions in the Arctic Ocean extended throughout the interval. Details of the ice cover's extent, timing and dominance during this time period will be revealed with further study.

Cores from greater depths indicate that sometime in the late Eocene to early Oligocene (~ 34 Ma), sedimentation on the ridge was interrupted. This may represent either a hiatus in sediment deposition or a large erosional event that removed sediment. Sediments from the late Eocene are black, organic-rich and siliceous indicating a depositional environment dominated by ice-free, warmer surface ocean waters. An interval recovered around the early to middle Eocene boundary contains an abundance of *Azolla* spp., suggesting that a fresh-water setting dominated the region at that time.

Although predictions estimated the base of the sediment column at 50 Ma, ACEX drilling revealed that the latest Paleocene to earliest Eocene interval boundary (~ 55 Ma), well known as the "Paleocene Eocene Thermal Maximum" or PETM, was recovered. These sediments reveal that during the PETM, the Arctic was subtropical with warm surface-ocean temperatures. ACEX also penetrated the basement rocks confirming the hypothesis that the Lomonosov Ridge crust is of continental origin and Cretaceous in age.

More detailed results will be available after the full science party opens the cores in November 2004. At this time, members of the offshore science party and the onshore science party will assemble to complete these analyses. The latest results will then

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On Top of the World

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be presented at the December 2004 American Geophysical Union meeting in San Francisco.

The Arctic Ocean is the last major basin to be reached by scientific ocean drilling. The success of ACEX demonstrates that core recovery in the high Arctic is possible, opening the door to future expeditions in the region. It is now only a matter of time before the evolution and geological mysteries of the *mare incognitum* are revealed.

Acknowledgements

The authors thank the IODP ECORD Science Operator; Swedish Polar Research Secretariat; captains and crews of the *Oden*, *Sovetskiy Soyuz*, and *Vidar Viking*; Eriksson Response; SeaCore Ltd; Stockholm University; and Bremen University.

Authors

Kate Moran, University of Rhode Island
Jan Backman, Stockholm University
The ACEX 302 scientific party

Seeking a U.S. Riserless SODV

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design process that will be initiated in early 2005.

The U.S. SODV Briefing Book is one of several approaches being used to inform and engage the international scientific community regarding the planning process and

"By participating in the online survey, you and other scientists can ensure that your expectations for the new vessel are met or exceeded."

status of the U.S. SODV project. By completing the online questionnaire, you and other scientists can ensure that your expectations for the new vessel are met or exceeded. IODP-MI will participate in this process by synthesizing the community's input and providing a summary of these comments in a report to NSF.

The extent to which these expectations are realized will be constrained by the amount, timing, and availability of funding provided through the NSF MREFC account, among other factors. The input received from the community will help to set realistic priorities for the decisions that will be made by the JOI Alliance during the SODV engineering design phase in early 2005. Therefore, it is critical that you and others in the science community respond to the questionnaire prior to February 2005.

The JOI Alliance looks forward to receiving your feedback and comments about any of the concepts, specifications, or priorities presented in the U.S. SODV Briefing Book. We strongly encourage you to participate in this important process that will ultimately lead to the commissioning of a U.S. SODV and the continued riserless drilling operations in IODP beyond October 2006.

Distinguished Lecturer Series 2004-2005

Dr. Jerry McManus
Woods Hole Oceanographic Institution

"Pleistocene Climate Instability: Oceans, Ice and Insolation"

College of Charleston
University of La Verne
Winona State University
The University of Akron
Southwestern Oregon Community College
University of South Dakota
University of San Diego

Dr. Ellen Thomas
Wesleyan University

"Greenhouse Gas Emissions, Environment and Biota: The Earth 55 Million Years Ago"

Michigan Technological University
Jacksonville University
Eckerd College
Central State University
Bryn Mawr College
Converse College
La Salle University

Dr. Marta Torres
Oregon State University

"Methane-Ice in Marine Sediments: Where, How and Why We Study These Deposits"

Colorado School of Mines
University of Georgia
Louisiana State University
Grand Valley State University
University of St. Thomas
New Mexico Highlands University

Dr. Kyger C. Lohmann
University of Michigan

"Unraveling the Archive of Climate Change from the Marine Record: Integration of Isotopic and Elemental Proxies in Molluscan Carbonates"

University of Miami
University of Nebraska, Lincoln
SUNY-Binghamton
University of California, Davis
Columbus State University
Millersville University
Boise State University

Dr. Kevin Brown
Scripps Institution of Oceanography

"What Causes Transience in Fluid Flow in Subduction Zones and in Other Oceanic Margin Environments?"

University of Missouri, Columbia
East Carolina University
South Dakota School of Mines
Central Washington University
Lawrence University
Syracuse University

Dr. R. Mark Leckie
University of Massachusetts at Amherst

"Linking Tectonics, Climate Change, and Biotic Evolution: The Oceanic Anoxic Events of the Mid-Cretaceous (~120-90 Ma)"

Iowa State University
University of Illinois at Chicago
Indiana University- Purdue University Indianapolis
Eastern Kentucky University
Maine Maritime Academy
University of North Dakota

Expedition Information

Expedition 301 Juan de Fuca

IODP Expedition 301 was part of a multi-disciplinary program to evaluate the formation-scale hydrogeologic properties of oceanic crust; determine fluid pathway distribution within an active hydrothermal system; establish links among fluid circulation, alteration, and microbiological processes; and determine relations between seismic and hydrologic anisotropy.

Tetsuro Urabe, Geoff Wheat, Keir Becker, Andy Fisher and a CORK with three osmotic samplers.

During the expedition, an existing borehole observatory was replaced in Hole 1026B, which penetrates the upper oceanic crust on the eastern flank of the Juan de Fuca Ridge. One kilometer away, at Site 1301, two new observatories were established, penetrating 318 m into basement. The science party also sampled sediments, basalt, fluids, and microbial materials; collected wireline logs; and conducted hydrogeologic tests in the two new basement holes.

The first multi-dimensional, cross-hole experiments in the oceanic crust—including linked hydrologic, microbiological, seismic, and tracer components—are planned for a future drilling expedition. Following drillship operations, multi-year tests will be initiated. This new network of subseafloor observatories will reveal a much larger volume of the crustal aquifer system than has been tested previously. By monitoring, sampling, and testing within multiple depth intervals, we can evaluate the extent to which oceanic crust is connected vertically and horizontally; the influence of these connections on fluid, solute, heat, and microbiological processes; and the importance of scaling on hydrologic properties.

- Andy Fisher, Expedition 301 Co-Chief

U.S. IODP Expedition Participants

Expedition 303: North Atlantic Climate 1

James Channell (Co-Chief), University of Florida
John Damuth, University of Texas at Arlington
Samuel Henderson, Rutgers, The State Univ. of NJ
David Hodell, University of Florida
Lawrence Krissek, Ohio State University
Stephen Obrochta, Duke University
Joseph Stoner, University of Colorado, Boulder
Roy Wilkens, University of Hawaii, Manoa
James Wright, Rutgers, The State Univ. of NJ
USIO Staff Scientist: Mitchell Malone
USIO Logging Staff Scientist: Stuart Robinson

Exedition 304: Oceanic Core Complex 1

Barbara John (Co-Chief), University of Wyoming
Donna Blackman, Scripps Inst. of Oceanography
Allison Charney, University of Connecticut
David Christie, Oregon State University
Bryce Frost, University of Wyoming
Jeff Gee, Scripps Inst. of Oceanography
Craig Grimes, University of Wyoming
Nicholas Hayman, Duke University
James Gregory Hirth, WHOI
USIO Staff Scientist: Jay Miller

Expedition 305: Oceanic Core Complex 2

Donna Blackman (Co-Chief), Scripps Inst. of Ocean.
James Beard, VA Museum of Natural History
Patricia Fryer, University of Hawaii
Amber Harris, University of Rhode Island
Kevin Johnson, University of Hawaii
Garry Karner, Lamont-Doherty Earth Observatory
Olivia Mason, Oregon State University
Martin Rosner, WHOI
Xixi Zhao, University of California, Santa Cruz
USIO Staff Scientist: Jay Miller

IODP Operations Schedule

for more information: www.iodp.org/expeditions

Expedition Name	Port of Origin	Dates	Description
303: North Atlantic Climate 1	Bermuda	Sept. 22 - Nov. 14, 2004	Investigate late Neogene-Quaternary stratigraphic records of millennial-scale environmental variability, and document the details of geomagnetic field behavior.
304: Ocean Core Complex 1	Ponta Delgada	Nov. 14, 2004 - Jan. 7, 2005	Drill two sites on the Mid-Atlantic Ridge to document the conditions under which ocean core complexes develop and characterize the nature of the alteration from within oceanic periodite.
305: Ocean Core Complex 2	Ponta Delgada	Jan. 7 - Feb. 27, 2005	
306: North Atlantic Climate 2	Ponta Delgada	Feb. 27 - April 22, 2005	Continuation of North Atlantic Climate 1. Also, install a borehole observatory in ODP Hole 642E to investigate bottom-water temperature histories.
Tahiti MSP Expedition	Tahiti	June - Aug. 2005	Drill a tectonically inactive reef setting to establish a record of the last deglacial sea-level rise and identify short-term paleoclimatic/paleoceanographic changes following the Last Glacial Maximum.

JOI's Education Coordinator: A Life-Long Learner

Leslie Peart, JOI

Welcome Aboard

Leslie Peart became JOI's Education Coordinator in August 2004, adding another twist to her diverse career as a science teacher and a marine educator. In her most recent position, as the Director of Interpretive and Guest Services at Chicago's Shedd Aquarium, she directed thirty staff in developing and implementing a wide array of daily learning activities for the aquarium's 2.1 million yearly guests.

"JOI's research contributions offer a compelling medium for science educators and learners at all ages and levels of understanding. We will, through thoughtful design, be able to excite the nation and its classrooms through programs as lively as the oceans!"

You may contact Leslie at: lpeart@joiscience.org or 202-787-1603. To learn about USSSP-supported education activities, visit: www.usssp-iodp.org/Education/default.html.

I love science and I love the field of education, the logical next step for science. Both fields require planning, imagination, creativity and careful analysis. When the two become one as science education, the analysis shifts from the products of empirical data to audience characteristics, learning styles and the delivery of appropriate messages. In fact, while somewhat intuitive, connecting audience, activity and message requires a fairly scientific approach. As scientists, it simply isn't good enough to put our results on the shelf. If we really want to add life to our research, we must share our facts and figures with everyone we can, from kindergarten to graduate-level classrooms, to the public and policy makers.

I would describe myself as a life-long learner. I've always been a student, an educator, or both. My first childhood memories include specific exhibits at the art museum and animals at the zoo. Then, as I was entering first grade in Toledo, Ohio, my father interviewed for a position in Corpus Christi, Texas. I remember his description of the city: "Everything's right across the street from the beach;" and so it was.

The water was warm, the sand was hot, gulls were a constant, and so was Corpus Christi Bay. Shell collecting, 100-foot beach seines, sunburns, and digging for ghost crabs were the mainstays of our expeditions to Padre Island. We also went by ferry to the dolphin show at the University of Texas, Port Aransas, where we sat on weathered bleachers by the water. I remember being chosen to come forward and say, "Hello everybody, my name is Leslie," for a dolphin to imitate. These activities influenced me, what experiences launched your career? As science educators, we strive not only to impart theory, law and fact, but also to create memorable learning opportunities that promote our field and encourage new scientists.

When I was twelve, Dad bought a Sunfish sailboat, then a bigger family boat, and sailing soon became as important as school. Fortunately, the first accredited secondary course in marine science in Texas was available at my school, allowing my hobbies and academic interests to merge. After high school, I tried to attend Southwestern University but couldn't stand being away from my beloved "city by the sea." Corpus Christi State beckoned me home and that's where I completed a BS and MS in biology. I could teach sailing and take field-oriented classes that provided academic excuses to spend time on the waters and beaches of South Texas and northern Mexico.

I loved hard science and fieldwork, but soon discovered my real joy was sharing science. Friends and professors encouraged me to try classroom teaching. My first position was one abandoned midterm at a small high school in a low-income neighborhood. It required an emergency composite certification that qualified me for any secondary science offered in Texas public schools (mostly chemistry, marine and environmental sciences).

With experience teaching eight secondary science courses at two distinctly different schools, I landed my first job in the public aquarium field at the Texas State Aquarium. There we produced *Wonders Under the Sea*, a live marine science television series designed for K-12 audiences that was also carried in prime time by 80 public television stations. I developed more than 150 math and science activities to accompany the series and organized about 20 pre-service and in-service teacher workshops each year in Texas and Mexico.

From semiarid, subtropical South Texas, I moved to the rainforests of subarctic Alaska to head the first education department at the Alaska SeaLife Center. This vital research and public education venue was funded in part by *Exxon Valdez* oil spill restitution monies and affiliated with the University of Alaska at Fairbanks. Our focus was featuring and interpreting North Pacific marine mammal, seabird and fisheries research conducted within the habitats on display. My next move was to Chicago, where the Shedd Aquarium offered me the perfect "personal laboratory" for developing exhibit-based learning activities for a variety of audiences.

As you might guess, I believe learning should be active, lively and pleasurable. Science education can and should draw upon many disciplines—like our work at JOI. Science and its methods beg to be shared. It's fun for me to interpret hard science for nonscientific audiences. It's that light bulb experience and it's quite invigorating. I get the biggest kick out of doing my part to foster science literacy.

And yes, I did plenty of sailing on the waters of Resurrection Bay and Lake Michigan. Science education should always involve seagoing experiences...

Reconstructing Seawater Strontium Concentrations Using Marine Barite

Kristen Averyt
Stanford University

Faculty Adviser
Adina Paytan

Changes in atmospheric CO_2 on time scales >1 m.y. relate to chemical weathering of rocks, hydrothermal activity, and partitioning of carbon among different reservoirs. Determining how these processes influence the carbon cycle is key to understanding climate change. Precise and continuous records of seawater Sr concentrations ($[Sr]_{SW}$) and Sr isotopic composition ($[^{87}Sr/^{86}Sr]_{SW}$) may constrain their relative variations. The $[Sr]_{SW}$ and $[^{87}Sr/^{86}Sr]_{SW}$ respond to the relative rates of input and removal to and from—and the chemical signature of—Sr sources and sinks (i.e., carbonate and sulfate sedimentation, weathering of carbonates versus silicates, hydrothermal activity). Although $[^{87}Sr/^{86}Sr]_{SW}$ is well-known, there are few reliable records of $[Sr]_{SW}$. Existing $[Sr]_{SW}$ data sets, based on Sr/Ca ratios from carbonates, are complicated by the unknown history of seawater Ca, the susceptibility of biogenic carbonates to diagenesis, "vital effects," and species-dependent distribution coefficients. A record of $[Sr]_{SW}$ from another authigenic phase (independent of Ca variations) would circumvent these issues.

I investigated marine barite's ($BaSO_4$) potential as a reliable source for determining $[Sr]_{SW}$. Compared with carbonate, marine barite is relatively insoluble; it is inorganically precipitated (i.e., no "vital" effects), and it is less prone to diagenetic alteration in oxic sediments. Naturally occurring marine barite contains trace quantities of strontium (1% to 5%), and Sr substitutes for Ba in the barite chemical structure. Assuming that substitution occurs in proportion to $[Sr]_{SW}$, the $[Sr/Ba]_{barite}$ will reflect the Sr concentration of contemporaneous seawater, independent of seawater Ba content. (Barite precipitates only under conditions of super-saturation.)

The major goals of my Schlanger Fellowship were: 1) to evaluate the utility of $[Sr/Ba]_{barite}$ as a paleo-$[Sr]_{SW}$ proxy, and 2) to construct a Cenozoic record of changes in the $[Sr/Ba]_{barite}$. A high-throughput analytical method was developed (Averyt et al., 2003) and initially applied to Holocene core-top samples from various ocean basins (Averyt and Paytan, 2003) and to an equatorial Pacific core (TTN013-pc72) representing the last million years of Earth's history. The results (Figure 1) indicate high-frequency changes in $[Sr/Ba]_{barite}$ corresponding to fluctuations in sea level, possibly due to glacial/interglacial changes in aragonite/calcite deposition. Sea-level low stands (glacial intervals) would expose Sr-rich carbonates precipitated on continental shelves (during interglacials) to chemical and physical weathering, which would result in recrystallization of aragonite (Schlanger, 1988). This process releases a significant quantity of Sr to seawater because the concentration of Sr in aragonite is three to six times greater than in calcite. Since 90% of Sr from aragonite can be released in < 100 k.y. (Stoll and Schrag, 1998), this implies that the $[Sr/Ba]_{barite}$ is responding to changes in $[Sr]_{SW}$.

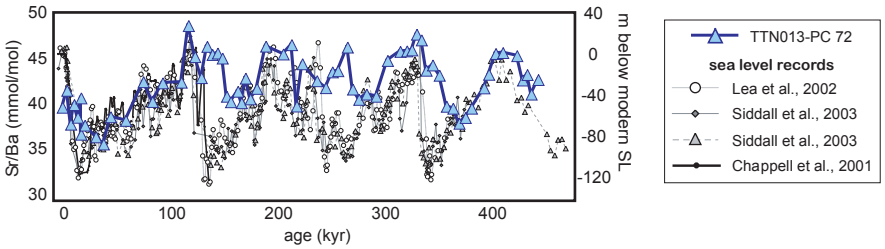


Figure 1. Glacial-interglacial variations in the Sr/Ba ratio of marine barite are coherent with changes in sea level. Aragonite/calcite transitions associated with sea-level fluctuations may affect seawater Sr, and thus the Sr/Ba ratio of marine barite.

The Cenozoic $[Sr/Ba]_{barite}$ curve (Figure 2) includes data from 12 different DSDP and ODP sites. Although most data vary within a natural range (Averyt and Paytan, 2003), the $[Sr/Ba]_{barite}$ from different ocean basins for the same time period appear inconsistent. This is evident in the Eocene and Oligocene, where $[Sr/Ba]_{barite}$ measurements from Pacific sediments differ significantly compared to those from the only Atlantic site—DSDP Site 366. This suggests a regional effect on the $[Sr/Ba]_{barite}$, or that post-depositional processes are affecting the Sr content of marine barite. Some of the scatter may result from high-frequency variation in $[Sr/Ba]_{barite}$, as observed in the glacial/interglacial record (Figure 1), that is not captured by the sampling resolution used in these cores (~ 0.5 m.y.). Additional high-resolution sampling may be necessary to adequately resolve reliable records of $[Sr/Ba]_{barite}$ and $[Sr]_{SW}$ through time.

References

Averyt, K., et al., *Geochem. Geophys. Geosys.*, *4*:1039, 2003.

Averyt, K. and Paytan, A., *Geochem. Geophys. Geosys.*, *4*:1043, 2003.

Stoll, H. and Schrag, D., *Geochim. Cosmo. Acta*, *62*:1107-1118, 1998.

Schlanger, S., In: *Physical and Chemical Weathering in Geochemical Cycles*, NATO ASI Series, A. Lerman and M. Meybeck [eds.], 323-340, 1988.

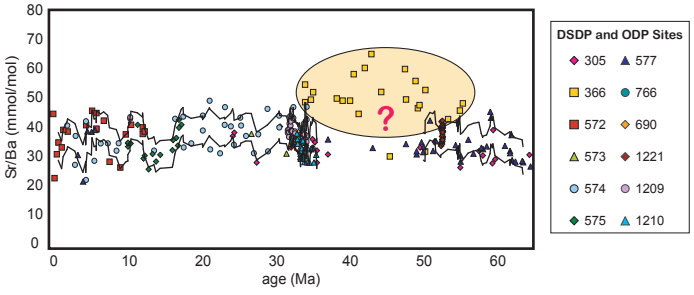


Figure 2. Cenozoic variations in the Sr/Ba ratio of marine barite were determined using core-top sediments. There is a possible discrepancy among data from different ocean basins (shaded area).

Linking the Ocean Observing Initiative and the Integrated Ocean Drilling Program

Andy Fisher and Kevin Brown

A full workshop report is available at:
www.usssp-iodp.org/science_support/workshops/past_workshops.html

Sixty-five international researchers, educators, and administrators gathered July 17-18, 2003, in Seattle, WA, to discuss how best to link the Integrated Ocean Drilling Program (IODP) and the Ocean Observing Initiative (OOI). Because the IODP and OOI share many goals and challenges, numerous possibilities exist for mutual benefit and building upon each other's achievements. This natural partnership began when IODP's predecessor—the Ocean Drilling Program (ODP)—successfully established long-term subseafloor observatories to monitor conditions surrounding boreholes, providing a cornerstone for the OOI.

During ODP, 18 long-term, sealed-borehole observatory systems (CORKs) were deployed in settings ranging from ridge crest to mid-plate to active margin. Data and samples acquired by these systems have helped document remarkable seafloor processes including: transient fluid flow events, pressure responses to seismic events tens of kilometers from observatory sites, and the existence of unusual microfauna within remote crustal reservoirs. Nine other reentry holes have hosted, or are intended to host, short-term or long-term seismometers, and additional holes for observatories will be drilled in IODP.

Within the U.S., the emerging OOI will have three principal elements: 1) a regional cabled observatory network, 2) relocatable deep-sea observatories, and 3) a network of coastal observatories. Cooperative scientific and technical developments for OOI are being planned through a series of meetings and workshops. This past year, the Ocean Research Interactive Observatory Networks (ORION) project was formed, in part to guide OOI's development, including creation of an initial science plan and models for optimizing design and use. The OOI is progressing rapidly in developing and deploying technology with initial funding from the National Science Foundation (NSF), the Keck Foundation, and other sources. Recently, OOI was awarded support from NSF's Division of Ocean Sciences to plan the design and the implementation of oceanographic observatory systems with a target deployment window of 2006-2010.

Workshop Goals and Structure

The primary purpose of the IODP-OOI Workshop was to provide scientific rationale to underpin a broad range of scientific, technical, and educational programs involving ocean drilling and observatories. Specific workshop goals were to:

1. Articulate and codify common IODP and OOI goals to prepare for a community-wide OOI (ORION) meeting in January 2004;
2. Identify experiments and technologies necessary to achieve critical objectives common to IODP and OOI;
3. Establish dialog among scientists, technologists, and educators interested the programs; and
4. Engage new audiences to participate in IODP and/or OOI.

During the workshop, participants split into four thematic working groups: 1) Earth structure, evolution, and earthquake dynamics; 2) lithospheric dynamics geodetics, heat and fluid transport; 3) microbiology, geochemistry and paleoceanography; and 4) hydrates, slope stability, and sediment transport. The groups focused on fundamental questions to be addressed through joint IODP and OOI efforts, and on the observations, sampling, and analyses necessary for major advances in science. Participants interested in education and outreach circulated among the working groups, then met separately to draft recommendations.

Following thematic discussions and a plenary session, workshop participants reorganized into three technical working groups: 1) pre/post-survey, emplacement, and servicing; 2) sensors, data storage, and retrieval; and 3) sampling and incubation. These groups focused on the technology (available, developmental, and "gleam-in-the-eye") essential to accomplish the goals of linked IODP and OOI projects. The final workshop session developed recommendations regarding the future of IODP and OOI planning, priorities, and operations. Details of the discussions and recommendations are available in a complete workshop report (www.usssp-iodp.org/science_support/workshops/past_workshops.html). A brief list of recommendations follow.

Workshop Recommendations

1. Take advantage of common IODP and OOI opportunities;
2. Internationalize the OOI (ORION);
3. Develop fully integrated education and outreach programs;
4. Coordinate access to boreholes and other facilities;
5. Recognize and plan for asset (platform, survey) needs;
6. Accelerate development of essential sensors, samplers, connectors/interfaces and related technology;
7. Continue developing improved drilling, casing, and completion technologies;
8. Reconsider nature of "event response;"
9. Integrate use of models, site surveys, seafloor, and subseafloor observatories to develop and test hypotheses;
10. Support training a new generation of scientists, engineers, and educators;
11. Don't be afraid to think big, or to make incremental progress.

Acknowledgements

USSSP and NEPTUNE supported this workshop. The workshop participants gratefully acknowledge the guidance and support of our NSF colleagues. Without their vision and determination we could only dream of exciting discoveries.

Authors

Andy Fisher, University of California, Santa Cruz
Kevin Brown, Scripps Institution of Oceanography

Workshop News

NanTroSEIZE Mini-Workshop

With USSSP-IODP support, nine scientists from the U.S. and Japan met with seismic industry and NSF representatives on June 24, 2004, at Rice University to discuss a three-dimensional (3D) seismic survey design for the Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE). NanTroSEIZE proposes to examine seismogenesis across a plate boundary interface using both riser and riserless drilling in the Nankai Trough off southwestern Japan (http://ees.nmt.edu/NanTroSEIZE/). The goal of the mini-workshop was to determine the seismic surveying needs for the project and to solicit input from industry experts on preliminary survey acquisition design to meet surveying needs and to minimize acquisition costs. The industry representatives were from three seismic acquisition companies that can operate in the NanTroSEIZE study area: Petroleum Geo-Services Co., Veritas, and WesternGeco.

The NanTroSEIZE setting has multiple requirements for seismic imaging including: shallow (< 1 km subseafloor) and deep (> 6 km subseafloor) targets, complex structures, and seafloor multiples. Despite the challenges, the industry representatives were optimistic that high-quality images could be acquired with industry-standard 3D acquisition techniques. However, the deep targets will require wide coverage to achieve proper aperture, and complex structures and shallow targets will require narrow line spacing to achieve proper 3D sampling for high-quality images. Within the constraints of the estimated parameters, there are no inexpensive surveying options. While the proposed survey designs maximize acquisition efficiency, their initial cost estimates range between $4 million and $8 million for acquisition with approximately $1 million more needed for mobilization/demobilization and $0.5 million needed for processing.

The results of the mini-workshop are being used to seek funds—from both U.S. and Japanese sources—to conduct the 3D seismic acquisition, processing, and scientific interpretation and analysis in support of the NanTroSEIZE drilling program.

Southern Ocean Workshop to Synthesize Drilling Results

During the last three decades, ten DSDP/ODP legs in the Southern Ocean have yielded some of scientific ocean drilling's most exciting results in paleoceanography and paleoclimatology. The Southern Ocean, which is a sensitive mixing pool of global water masses, is a critical component in the development and persistence of Antarctic glaciation. The region is also a locus of high biological sedimentation and a repository of high-resolution records of climate forcing and response.

The primary goal of the workshop is to synthesize the rich results from this important oceanographic region, to identify remaining questions about the biogeochemical history of the Southern Ocean, and to develop a scientific framework for future ocean drilling.

The workshop will focus on the biogeochemical history of the Southern Ocean since the Pleistocene, including:

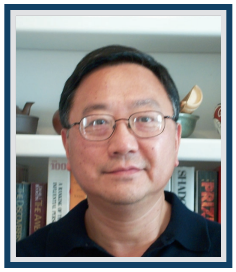
- its thermal structure and evolution,
- its role as a biogeochemical sink,
- the role of limiting nutrients,
- its productivity, and
- the role of climate.

The workshop will be held January 21-23, 2005, in Boulder, Colorado. USSSP-IODP is providing funding for the meeting, which is being convened by Detlef Warnke, Gabe Filippelli, Jose-Abel Flores, and Tom Marchitto. Although the workshop application deadline has passed and participation is limited, questions may be directed to Gabe Filippelli (gfilippe@iupui.edu).

A workshop proceedings document with manuscripts from participants will be published, likely as a Geological Society of America Monograph.

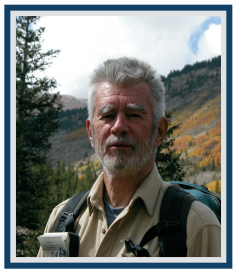
USSAC Welcomes New Members

Jen-hwa Chen



Jen-hwa Chen is currently the team leader responsible for deepwater mooring and riser technologies at the Chevron-Texaco Energy Technology Company in Houston, Texas. In 1981, Jen-hwa received his PhD in civil engineering at the University of California, Berkeley, where he specialized in geotechnical and earthquake engineering. Early in his career, he studied the engineering properties of marine sediments worldwide. His subsequent assignments have included developing an earthquake instrumentation system for offshore platforms, designing and constructing offshore production platforms, and studying the potential impact of seabed natural gas hydrates on deepwater exploration and production activities. Jen-hwa is a registered professional engineer in California and a member of the American Society of Civil Engineers. He has been chairman of the geotechnical resource group of the American Petroleum Institute and a co-convener of the Foundation Panel of the International Organization for Standards (ISO) for developing international standards for offshore production platforms.

Peter Molnar



Peter Molnar was lucky to become a geophysicist during the heyday of plate tectonics. Shortly after completing graduate work at Columbia University, he focused on large-scale continental tectonics. This work involved the study of large mountain ranges; not just their deep structure and surface tectonics, but also their beauty. Eventually, he became frustrated because for virtually every high terrain on earth, an eminent geologist had asserted that the terrain abruptly rose in late Pliocene or Quaternary time. This led first to an inquiry into the simultaneity of the alleged rise of mountains with the emergence of hominids. Soon his pursuits took a more serious vein and expanded to include how to quantify paleoaltimetry, how climate change affects erosion rates, how large-scale tectonics affects climate, and—eventually—what causes climate change in general, which then led him to the Ocean Drilling Program. Rather appropriately, Peter conducts his research from the University of Colorado, Boulder, at the foot of the Rockies.

Ana Christina Ravelo

Christina Ravelo is an Associate Professor at the University of California, Santa Cruz. As a paleoceanographer and paleoclimatologist, she is interested in past tropical and subtropical oceans and climates, and their role in global climate change over the last 5 m.y. She also investigates sources and mechanisms of high-frequency climate variability using statistical analyses of high-resolution records of climate change. Her work employs micropaleonotological and geochemical indicators of past oceanographic conditions. Following undergraduate studies at Stanford University, Christina received a MS and PhD in Geological Sciences from Columbia University. She has served on several ODP advisory panels and has participated as a shipboard scientist on Leg 138 (East Equatorial Pacific) and Leg 167 (California Margin), as well as a shore-based scientist on five other ODP expeditions. In her spare time, Christina enjoys cooking, reading, attending cultural events, and spending time with her husband and three children.

Lisa Robbins

Lisa Robbins has directed the U.S. Geological Survey (USGS) Center for Coastal and Watershed Studies located in St. Petersburg, Florida, since 1999. She is also on the Florida Board of Directors for the Florida Integrated Science Center (FISC), which oversees the St. Petersburg, Tampa, and Virgin Islands offices of the USGS. Previously, Lisa was a Professor at the University of South Florida, Tampa after receiving her PhD in 1987 from the University of Miami's RSMAS. Her research has focused on molecular paleontology and microbially induced mineralization and links to carbon dioxide cycling. Her fieldwork has taken her on cruises in the Bahamas, Florida Bay, and Australia. Lisa has served on the JOIDES Deep Biosphere Program Planning Group and currently serves on the Board of Directors for the Museum of Science and Industry and the Athena Society, both in Tampa. When not attending to science, she spends her time sailing with her husband, Charlie Evans, and three daughters.

William Sager

Will Sager is a professor in the Oceanography and Geology and Geophysics departments at Texas A&M University. He has taught at TAMU for 21 years and holds the Jane and R. Ken Williams '45 Chair in Ocean Drilling Science, Technology, and Education. Will has sailed on 38 major research cruises including IODP Expedition 301 and five ODP legs—two as Co-Chief scientist (Legs 143 and 191). Will received his MS and PhD degrees in geology and geophysics from the University of Hawaii in 1979 and 1983, respectively. He has published 78 peer-reviewed scientific articles and mentored 18 MS and PhD students. His research interests include marine geophysics, paleomagnetism, plate tectonics, gravity and magnetic field interpretation, and the geomagnetic polarity reversal time scale. If Will actually had any free time, he might use it to play the ukulele, paint landscapes in acrylic, or look at the stars through his telescope—but usually he follows his son, Gabriel, to baseball practice and other activities.

A Season for Thanks

A Letter from the Chair

Following IODP's first expeditions, we are seeing the true promise of the "I" in IODP. The integration of varied technical approaches coincides with increased internationalization. The transition from ODP to IODP hasn't been seamless. But it happened, and here we stand at the threshold of new discoveries.

Who can we thank for making IODP real? First and foremost you, the scientific community. You have steadfastly pursued your goals and contributed generously of your time—be it describing the 10,000th mud sample; developing a site's biostratigraphy; serving on committees; or letting your students, universities, and policy makers know how much we learn from this endeavor. I must also acknowledge other key players in successfully launching IODP.

The National Science Foundation (NSF) stood up for us, the U.S. scientists, in a truly unprecedented way. Behind the scenes they drove this effort with a passion and a realism in a period of uncertain budgets. The JOI Office also worked long hours to develop the successful U.S. Science Support Program proposal. By advocating for U.S. scientists and also pushing for greater inclusiveness, outreach, and innovative funding mechanisms, JOI is helping us develop a more creative program with broader societal impact and great promise for continued funding in the future.

I want to thank the previous USSAC Chairs for their direction, passion, and creativity. Peggy Delaney steered the program through the tumultuous early transition to IODP with her excellent organization and articulation. Most recently, Warren Prell piloted USSAC through the actual IODP initiation phase with a variety of successful initiatives. By establishing sub-committees with chairs and named alternates for SAS committees, Warren has made USSAC more effective, responsive, accountable, and busier with lots of work.

Speaking of work: ours as an effective scientific community has only just begun. This effort begins with participation in science advisory panels. USSAC was thrilled by the number of people who volunteered to serve this past July. Unfortunately, many excellent people could not be placed due to expertise balances and institutional conflicts. If you were one, please understand that we value your interest and urge you to volunteer again next year.

Along with our exciting science, we must cultivate a new crop of ocean science leaders and participate in outreach and education activities to create an ocean-science literate society. We must also work to enhance diversity in the program and to explore partnerships with scientists from other disciplines and with non-traditional funding sources. Through these efforts, we can show the public and policy makers the wisdom of investing in scientific ocean drilling.

A final word—I have been immersed in the alphabet soup of ocean drilling acronyms since 1990. My acronym ability is partly due to the experience I have had at IUPUI, the acronym for Indiana University ~ Purdue University Indianapolis. Yes, this is a real university, with 29,000 students, more than 1500 faculty, and the largest external research support in the state. Yes, it is on one urban campus but offers degrees from Indiana University and Purdue University, both public institutions. Yes, it has the longest abbreviation of any university in the country. Yes, I know it is really strange.

With that aside (phew), USSAC is here to represent you and advise JOI on how best to enable your ideas. We are at your service, so please let us know your dreams.

Sincerely,

Gabriel Filippelli, USSAC Chair

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*USSAC Executive Committee

JOI/USSAC Newsletter

Joint Oceanographic Institutions
1201 New York Avenue, NW, Suite 400
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News from the National Science Foundation

A few items from the Division of Ocean Sciences (OCE) and the Ocean Drilling Program (ODP):

1) The National Science Foundation (NSF) has examined its FY2005 budget obligations and has determined that it is able to support an additional four months of Platform Operations Costs (POCs) for the *JOIDES Resolution* in FY2005. This will extend operations from April 23, 2005 until September 30, 2005. The target supplemental budgets for these activities are $10 million in POCs and $2 million in Science Operating Costs. Additional USSSP funds to support the expeditions will be provided as needed.

2) We are also pleased to announce that Dr. Carolyn Ruppel has agreed to extend her position with the NSF/ODP program for a second year. Carolyn's assignment with NSF as Associate Program Director for Ocean Drilling is under the Intergovernmental Personnel Act (IPA).

Rodey Batiza and Jamie Allan
Program Directors, NSF/ODP

Expedition Objective Research Funding Available

NSF/ODP has increased its support for U.S. participants in 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:
February 15, 2005
August 15, 2005

For questions and/or additional information, please contact:
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Rodey Batiza (rbatiza@nsf.gov)

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