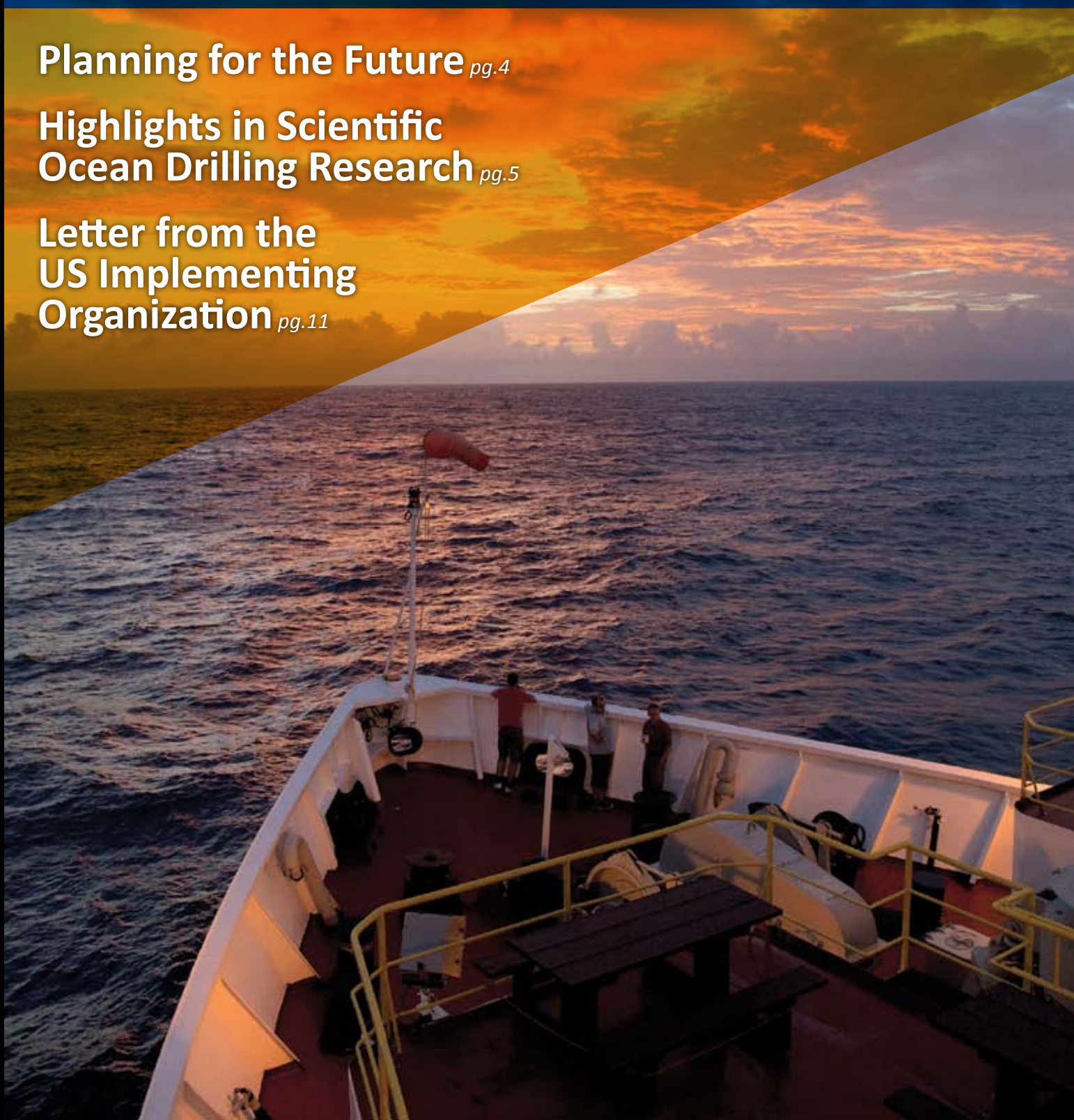
FALL 2010

CORE DISCOVERIES

The Newsletter for US Scientific Ocean Drilling



INSIDE THIS ISSUE

Cover photo courtesy IODP-USIO.

The Integrated Ocean Drilling Program (IODP) is an international research program dedicated to advancing scientific understanding of the Earth through drilling, coring, and monitoring the subseafloor. The U.S. Science Support Program (USSSP) supports the involvement of the U.S. scientific community in IODP and is funded by the National Science Foundation (NSF). The *JOIDES Resolution* is a scientific research vessel managed by the U.S. Implementing Organization of IODP (USIO). Together, Texas A&M University, Lamont-Doherty Earth Observatory of Columbia University, and the Consortium for Ocean Leadership comprise the USIO. IODP is supported by two lead agencies: the U.S. NSF and Japan's Ministry of Education, Culture, Sports, Science, and Technology. Additional program support comes from the European Consortium for Ocean Research Drilling (ECORD), the Australian-New Zealand IODP Consortium (ANZIC), India's Ministry of Earth Sciences, the People's Republic of China (Ministry of Science and Technology), and the Korea Institute of Geoscience and Mineral Resources.

To subscribe to *Core Discoveries*, contact:
IODPcommunications@oceanleadership.org; 202-232-3900

For more information about IODP, visit: *www.iodp.org*

For more information about the USIO and USSSP, visit:
www.oceanleadership.org/programs-and-partnerships/

UPCOMING EVENTS/ MEETINGS/WORKSHOPS

IODP Primer: An Introduction to the Ocean Drilling Programs

Sunday, December 12, 2010
1:00 – 5:00 pm;
Please check USSSP website for location
San Francisco, California

www.oceanleadership.org/programs-and-partnerships/usssp/

IODP Town Hall

Tuesday, December 14, 2010
5:30 – 7:30 pm; Hilton San Francisco Union Square
San Francisco, California

www.iodp.org/

IODP Union Session at AGU

Thursday, December 16, 2010
All day; Session U42A, Room MS-104 and
MS-Poster Hall (Moscone South)
Moscone Convention Center
San Francisco, California

www.agu.org/meetings/fm10

AAAS Annual Meeting

February 18-21, 2011
Washington Convention Center, Washington, DC

www.aaas.org

Workshop on Geological Carbon Capture and Storage in Mafic and Ultramafic Rocks

January 8-10, 2011
Sultan Qaboos University, Muscat, Oman

http://ccs-oman2011.org/

Upcoming SAS Meetings

Science Advisory Structure Executive Committee (SASEC)

January 18-19, 2011
Miami, Florida

Site Survey Panel (SSP)

February 2-4, 2011
Tokyo, Japan

Scientific Technology Panel (STP)

February 13-16, 2011
Auckland, New Zealand

EXPEDITION UPDATES

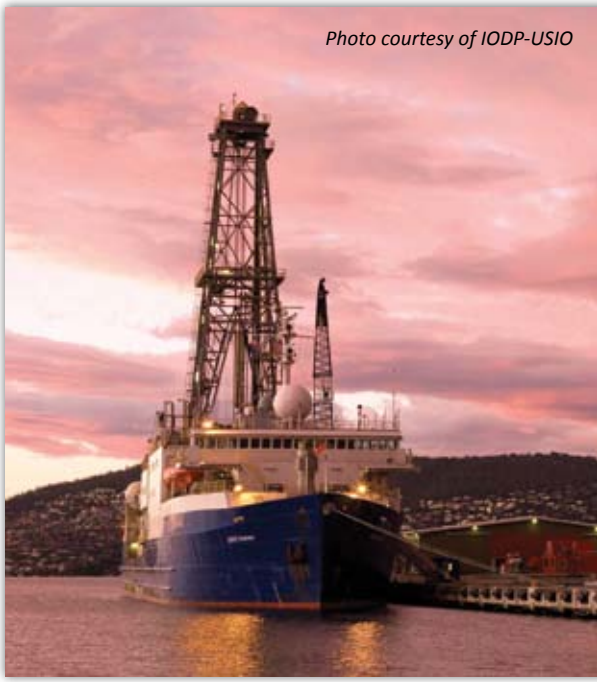


Photo courtesy of IODP-USIO

Wandering Hotspots

Are hotspots stationary? In mid-December, the *JOIDES Resolution* will leave Auckland, New Zealand to test this tenant of science at the Louisville Seamount Trail.

The Louisville Seamount Trail – along with the well-known Hawaiian-Emperor Seamount Trail – has been a keystone in deciphering the motion of the Pacific plate because it is assumed that the seamounts are fed by a fixed deep-mantle plume. ODP Leg 197, however, discovered that the Hawaiian hotspot is not stationary as once thought; instead it has migrated southward over millions of years.

IODP Expedition 330 Louisville Seamount Trail will test whether the Louisville hotspot has also moved and if it moved coherently with the Hawaii hotspot. The results will either verify or change ideas about hotspot volcanism and models for plate and plume motion. These data, in turn, will provide valuable information about the Earth's convection regime and allow for a crucial calibration of current mantle flow models and global plate circuit reconstructions.

The Louisville Seamount Trail Expedition will target four Louisville seamounts that have ages similar to those sampled during Leg 197. By analyzing lava flows using paleomagnetic, $^{40}Ar/^{39}Ar$ geochronological, and geochemical techniques, the expedition will be able to directly compare paleolatitude estimates and geochemical signatures between seamounts in the two longest-lived hotspot systems in the Pacific. To follow the expedition online, visit: *http://iodp.tamu.edu/scienceops/expeditions/louisville_seamounts.html*.


Photo courtesy of JAMSTEC

Hot Water in Okinawa Trough

Recently, the *Chikyu* ventured into new territory as she collected samples from the Iheya North Hydrothermal Field of the Okinawa Trough. This expedition marked the first time *Chikyu* has worked for IODP on an expedition outside of the multi-year NanTroSEIZE Project, and only the second microbiology-focused expedition of scientific ocean drilling.

IODP Expedition 331 Deep Hot Biosphere set sail from Shimizu, Japan in early September with microbiologist Ken Taka (JAMSTEC) and geochemist Mike Mottl (University of Hawaii) serving as co-chiefs. As they arrived at the first site, the science party was eager to begin collecting and analyzing samples to understand the role of the subsurface biosphere in hydrothermal systems, the mechanisms of microbial methane generation, and the mechanisms of gas transport in seafloor sediments.

As operations got underway, the crew and science party immediately encountered unexpected conditions. Hotter-than-predicted hydrothermal waters began melting the plastic core liners and many of the cores that were retrieved contained copious amounts of hydrogen sulfide. The Deep Hot Biosphere expedition was quickly living up to its name.

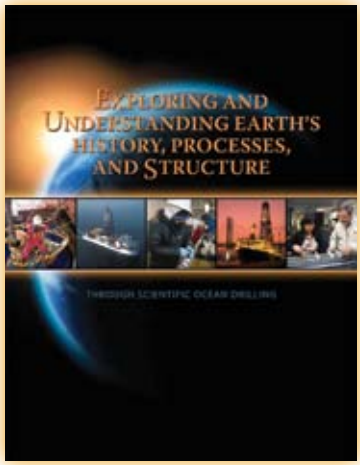
The ingenuity of the crew and science party overcame the initial, and scientifically interesting, obstacles. Aluminum liner was brought onboard and the lateral variability of this complex hydrothermal system was further investigated. The expedition was successful in directly sampling the hydrothermally-active mounds, obtaining samples to characterize the microbial communities, and installing casing for future observatories. Initial results will be published in the Preliminary Report early in 2011.

Planning for the Future of Scientific Ocean Drilling

by Susan Humphris, Woods Hole Oceanographic Institution

Planning efforts for the future of scientific ocean drilling are rapidly gaining momentum as the science plan for a new program takes shape. In the spring of 2010, a team was formed to work closely with the U.S. Advisory Committee for Scientific Ocean Drilling (USAC) to engage the U.S. scientific community in supporting a new scientific ocean drilling program. The team is led by myself and includes Peter deMenocal (Lamont-Doherty Earth Observatory), Katrina Edwards (University Southern California), and Demian Saffer (Pennsylvania State University). In 2011, Andy Fisher (University of California, Santa Cruz) will replace Katrina who will have extensive time at sea. Our role is to develop resources and opportunities for the scientific community (including ourselves) to communicate, engage, and educate our peers, university and college senior administrators, and community and national leaders about the importance of maintaining a vibrant scientific ocean drilling program to address exciting and urgent scientific questions. To that end, we have been working hard over the summer to set up events, develop materials, and coordinate with USAC on presentations for the next year.

Accomplishments Brochure



We have worked with Ellen Kappel (Geo Prose) to develop an 8-page brochure that captures some of the major accomplishments of scientific ocean drilling. Titled "Exploring and Understanding Earth's History, Processes and Structure," this colorful publication is written for a general audience, and will ultimately be a companion to a similar brochure that will describe the new science plan. Copies of the new brochure are available through the Consortium for Ocean Leadership and will be distributed at the AGU Fall meeting, so please take a few copies and give them to senior administrators at your institutions. An electronic copy can be downloaded here: *www.oceanleadership.org/programs-and-partnerships/usssp/*.

AGU Union Session

We are convening a Union Session at AGU – "Frontiers in Scientific Ocean Drilling: Recent Discoveries and Future Opportunities" – to bring attention to the novel results from recent drilling that have substantially advanced our knowledge of earth and life systems in recent years, and to highlight new techniques, including riser-based drilling, high-latitude drilling, and the establishment of hydrological, biological, and geodynamic borehole observatories. We have one oral session that includes four invited speakers, as well as a poster session. We hope that this session will be of broad interest across earth, ocean, atmospheric, and life sciences and we look forward to seeing you there.

USSSP Workshop for Early Career Scientists

With a new scientific ocean drilling program comes the opportunity to energize a new generation of scientists. We have received funding through the U.S. Science Support Program (USSSP) to conduct a workshop to engage early career scientists in future scientific ocean drilling. To be held in College Station, Texas from March 30 to April 1, 2011, the workshop will include group discussions to share ideas for new projects and experiments that fit within the new science plan; sessions on how to submit proposals, apply to participate in an expedition; become an active member of the drilling community; and a tour of the core repository. Information on how to apply will be posted in *EOS* and will be available at the IODP booths at AGU. Please tell your graduate students, post-docs, and early career colleagues about this opportunity; we look forward to their participation!

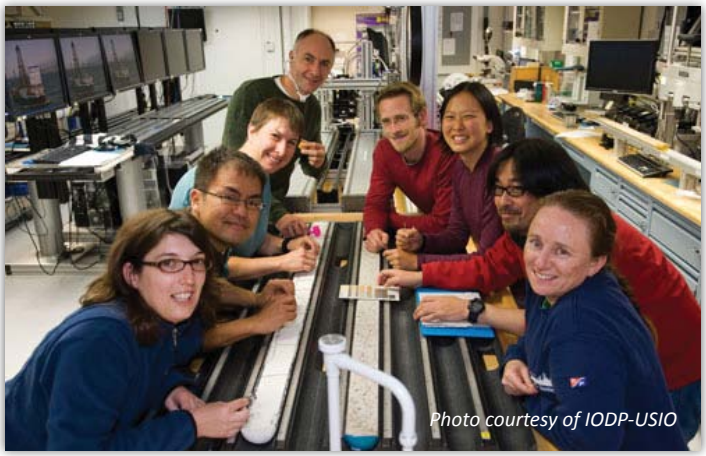


Photo courtesy of IODP-USIO

We will keep you updated on our activities over the next year, and welcome your help, input, and ideas on how to spread the word and galvanize the scientific community towards ensuring the future of scientific ocean drilling beyond 2013!

RESEARCH HIGHLIGHTS

Documenting and Forecasting Sea Level Change

By Gregory Mountain, Rutgers University

Understanding the history, cause, and impact of sea-level change is a compelling goal of Earth system research. Encroaching shorelines clearly show that sea level is rising, most likely as a result of expanding ocean water and melting glaciers in a warming world. This rise is roughly 3 mm/yr, a rate which has nearly doubled in the last 100 years, and will continue to accelerate for decades even if we are able to hold the release of greenhouse gases at present levels. The geologic record shows that global sea level has fluctuated by over 100 m at rates as high as 3 m per century: preparing for the future relies on learning from the past.

Scientific ocean drilling plays a valuable role in documenting past sea-level rise and forecasting its impact. Three strategies employ marine sediments for this purpose: 1) measuring fluctuations in oxygen isotopes preserved in marine fossils as a proxy for ice volume change; 2) directly establishing sea-level height by drilling Pleistocene corals that once lived within a few meters of sea level; and 3) backstripping continental margin sediments that contain successions of nearshore facies. Each approach was outlined in 1987 by the 2nd Conference on Scientific Ocean Drilling and has since been further refined.

Photo courtesy of ECORD

Accumulating a continuous and reliable oxygen isotopic record has been an ongoing goal of scientific ocean drilling and has had much success; equal success in drilling into corals and shallow continental margins has been thwarted by many challenges. Early efforts onboard the *JOIDES Resolution* (ODP Legs 143, 144, and 194 for corals, and Legs 150, 166, 174A, and 182 for facies successions) encountered low core recovery, hole instability, and/or difficult station keeping. Recently, IODP has leveraged improvements to the *JOIDES Resolution* and the use of mission-specific platforms to make significant advances towards documenting sea-level history in these systems.

Corals as 'fossil dipsticks' recording the last 20 ka of sea-level fluctuation have been successfully recovered offshore Tahiti (IODP Expedition 310) and Australia (IODP Expedition 325). Both were made possible by operating from dynamically-positioned platforms equipped for coring variably cemented corals. Results from Tahiti added detail to millenial-scale variations known from other studies and Expedition 325 (completed this past summer) will provide new perspectives on sea-level rise rates in the decades ahead. Furthermore, these records will help identify otherwise unknowable links between climate, sea level, and oceanographic parameters that are essential to understanding the global system.

IODP Expeditions 313 and 317 were completed within the last year and results are still developing. At 35 m water depths off the coast of New Jersey, Expedition 313 drilled from a jack-up, self-propelled barge in the shallowest water attempted in the history of scientific ocean drilling. Expedition 317 used the refurbished *JOIDES Resolution* to work in 84 m water depth off New Zealand's South Island. Both expeditions were aimed at ground-truthing facies patterns and sea-level fluctuations predicted by stratal architecture determined by high-resolution seismic data. Although recovering a sea-level curve from thick sediment packages like these will require backing out the imprint of lithospheric subsidence, isostatic and flexural loading, sediment supply and compaction, the requisite high core recovery, good geochronology, and high-quality core-log-seismic correlation have been met.

Ultimately, IODP provides the technology necessary to drill the best locations for understanding sea level fluctuation. Stay tuned for emerging results as we improve our understanding of the effects of sea-level change on the Earth system, sharpen measurements of the rates and magnitudes of past changes, and provide forecasts of impacts in the future.

LETTER FROM THE USAC CHAIR

Dear Colleagues,

I was recently asked to speak about scientific ocean drilling at the 2011 American Association for the Advancement of Science (AAAS) meeting. The theme of the meeting is Science Without Borders, and the symposium is entitled International Territory: Science at Sea, Science in Space, and Science at the Poles. The invitation led me to realize that I had taken the international aspect of scientific ocean drilling for granted. From my first cruise as a graduate student (ODP Leg 146) to my most recent (IODP Expedition 316), I have worked as a member of an international science team. In my experience, I've realized that over the course of an eight-week expedition, the boundary between nightshift and dayshift becomes more important than borders between nations.

Although the focus of the AAAS session is international collaborations, scientific ocean drilling bridges several "borders" – those between land and sea, between disciplines, and between new and experienced scientists. The science brings together top names in the field with graduate students. The differences of experience disappear as you are having breakfast in the galley or working around the core table. Galley and core discussions also bring together disciplines that would otherwise rarely interact.

As the current phase of drilling gathers momentum, IODP continues to dissolve boundaries. We are now successfully drilling in shallower waters, drilling deeper below the seafloor, and extending the range of piston coring beyond what was previously possible. At the August 2010 Science Planning Committee meeting, representatives from new member nations such as China, India, and Korea provided encouraging news on their growing ocean science communities.

Now is a critical time to consider the value that scientific ocean drilling has provided to your research and to the broader community. At the upcoming AGU Fall Meeting, please attend the IODP Town Hall and the Union session "Frontiers in Scientific Ocean Drilling," which will highlight program accomplishments and opportunities. Then, take it a step farther and assure that the recent accomplishments and future potential of ocean drilling are visible to your colleagues, institutions, funding agencies, and general public.

Best regards,

Liz Screaton
U.S. Advisory Committee
for Scientific Ocean Drilling

USAC MEMBERS

Liz Screaton (Chair)
University of Florida

Gary Acton
University of California, Davis

Beth Christensen
Adelphi University

Anthony Koppers
Oregon State University

Jon Lewis
Indiana University of Pennsylvania

Mitch Lyle
Texas A&M University

Craig Moyer
Western Washington University

Stephen Pekar
Queens College

Susanne Straub
Columbia University

Heath Mills
Texas A&M University

J. Casey Moore
University of California, Santa Cruz

Gerald Dickens
Rice University

Photo courtesy of IODP-USIO

DRILL BITS

Welcome New USAC Members

Ocean Leadership would like to welcome Gerald Dickens (Rice University), Heath Mills (Texas A&M University), and J. Casey Moore (University of California, Santa Cruz) to the U.S. Advisory Committee for Scientific Ocean Drilling (USAC). USAC is the national advisory committee for U.S. participation in IODP. It is established through the U.S. Science Support Program and represents the broad community in formulating scientific and policy recommendations. The ocean drilling community thanks new and continuing members for their time and commitment to the program!

Mohole Workshops

Mohole workshop participants

Drilling an ultra-deep hole through the crust to the Mohorovičić discontinuity (the Moho) and into the uppermost mantle is a long-standing ambition of scientific ocean drilling, and remains essential to answering fundamental questions about the dynamics of the Earth and global elemental cycles. The scientific community recently held two workshops to plan for the Mohole project, which is a major objective in the new science plan. The first workshop was held in June in Kanazawa, Japan, and the second was held Washington, D.C., in September. The workshops initiated a roadmap for project implementation and technology development and identified several potential sites in Pacific fast-spreading crust to focus geophysical site survey efforts over the next few years. This project will require the concerted efforts of the international scientific and engineering communities who share aspirations in direct exploration of the deep interior of the Earth.

Apply to the Marine Geoscience Leadership Symposium

As global headlines focus on climate change, ocean acidification, and tsunamis, marine geoscientists stand well positioned to serve the needs of society while pushing the frontiers of scientific research. To solve these challenges and forge the necessary links between science and society, marine geoscientists must reach beyond their individual laboratories, form interdisciplinary collaborations, and communicate their discoveries to the public and to policy makers. The Marine Geoscience Leadership Symposium introduces these skills to early career marine geoscientists. Meeting April 18-22, 2011 in Washington, D.C., participants will engage in small group discussions, participate in proposal workshops, and meet with funding agencies, media representatives, and policy makers. The symposium will provide leadership and communications training and begin the process of forming interdisciplinary research collaborations.

Applicants may be from any subfield of marine geology or geophysics and must have completed their Ph.D. between December 1, 2007 and December 31, 2010. Selected participants will receive full participation support. The deadline to apply is December 31, 2010. For more information, visit *www.oceanleadership.org/mgls*.

Center for Dark Energy Biosphere Investigations

NSF has funded the Center for Dark Energy Biosphere Investigations (C-DEBI), a science and technology center focused on the deep biosphere. C-DEBI is a multi-institutional center that will establish the framework needed for transformative experimental and exploratory research on the subseafloor biosphere. Their first major science objective is to coordinate and integrate the science associated with upcoming microbiology-focused IODP expeditions (including IODP Expedition 329 South Pacific Gyre Microbiology and IODP Expedition 336 Mid-Atlantic Ridge Microbiology) by establishing a new model for conducting internationally coordinated collaborative research in the deep subseafloor biosphere. C-DEBI will also focus on education via a coordinated program across primary, secondary, and higher education programs, and for C-DEBI scientific participants to learn how to be more effective in communicating scientific and technical results to a broader audience. To participate in C-DEBI activities, please visit: *www.darkenergybiosphere.org/*.

EDUCATION & DIVERSITY NEWS

A New Model for Outreach on the *JOIDES Resolution*

During each IODP expedition onboard the *JOIDES Resolution*, Deep Earth Academy selects one Education Officer to join the expedition. This person is responsible for communicating the expedition's science to students and teachers across the globe using regular blog posts and ship-to-shore videoconferences.

Knowing that coring and observatory installations during IODP Expedition 327 Juan de Fuca Ridge-Flank Hydrogeology would require a smaller science party than usual, expedition co-chief scientist Andy Fisher (University of California, Santa Cruz) invited Deep Earth Academy and the U.S. IODP communications department to expand expedition education activities with a previously untested model. Rather than staffing the expedition with only one Education Officer, a total of six *Outreach* Officers from the U.S. and France joined the expedition. Participants included a late-career high school physics teacher, a computer graphics graduate student, an undergraduate engineering student from a historically black university, an artist, and two middle and high school Earth and life science teachers (*http://joidesresolution.org/node/1154*). This diversity created a dynamic, productive, and challenging group.

After discussing inquiry-based teaching methods and investigating Earth science concepts to gain a basic understanding of the scientific objectives of the expedition, the outreach team worked on individual projects that benefited their personal and professional goals and the ocean drilling community. More than 70 new products were developed, including hands-on and computer-based Earth science classroom activities and demonstrations, robotics, a computer animation, and pieces of fine art. These items will be made available to scientists, teachers, and learning audiences over the coming year. The outreach group also facilitated 17 interactive videoconferences to research vessels, schools, and museums around the world and contributed to two websites, Facebook, YouTube, and audio recordings for COSEE NOW's Ocean Gazing podcasts (*http://coseenow.net/podcast/2010/08/joides2/*).

Deep Earth Academy now has a new model for immersive, expedition-based teacher education programs and will present results from this expedition in the Education section of the AGU Fall Meeting.

Photo courtesy of IODP-USIO

COMMUNITY SPOTLIGHT

KEIR BECKER


Photo courtesy of ODP

When we first sat down with Keir Becker, a hydrogeologist at the University of Miami, he immediately suggested in his usual soft-spoken manner that we interview someone else. "Wouldn't someone younger be better?" he modestly asked.

Becker is a pioneer of active subseafloor experimentation and instrumentation and a strong advocate of the science enabled by ocean drilling. He has sailed on 18 ocean drilling program expeditions, more than any other scientist, and has volunteered for numerous panels and committees. Reflecting on his experiences, Becker says he enjoys the hands-on work of installing instruments the most. "I'm not really there for the cores," he says.

Becker fondly remembers the day he descended in the Alvin to collect data from the first CORK, which was installed on ODP Leg 139. The observatory itself was an experiment and at the time, he was simply excited that the instrumentation worked. He did not expect that in situ observatories would be a focus of future drilling programs.

Today, Becker sees a similar revolution in deep biosphere research as the field shifts from exploratory science to active experimentation and hypothesis-driven research. Most recently, he participated in IODP Expedition 327 Juan de Fuca Ridge-Flank Hydrogeology. He will next sail on IODP Expedition 336 Mid-Atlantic Microbiology and wonders hopefully if there will be a twentieth opportunity to sail before he retires.

When on land, Becker continues to serve the community and chair committees. He also briefs decision makers, such as the National Research Council and members of the U.S. Congress, on the scientific successes of the program. When asked about this work and the future of IODP, he replies humbly, "I'm only one of a couple hundred U.S. scientists helping to prepare for the next program."

LETTER FROM THE NSF

Dear Colleagues,

The National Science Foundation has been working closely with our international partners, the implementing organizations, IODP Management International, and the science community to plan for the post-2013 scientific ocean drilling program. We are attending community workshops and meetings, reading the new science plan, and discussing future structures, partnerships, and collaborations.

The science community has done a remarkable job over the past two years in planning for the next program. There were numerous disciplinary and national meetings around the world, the INVEST Conference that attracted nearly 600 participants, and the completion of the first draft of the next science plan. At the same time, the International Working Group Plus (IWG+; *www.iodp.org/International-Working-Group-Plus/*) has been focusing on the international agreements and organization of the future program.

Currently, the twenty-four member countries involved in IODP have pledged to be members of the post-2013 program, with new members welcome at any time. The program will involve all three major platforms (*Chikyu*, *JOIDES Resolution*, and mission specific platforms) and we anticipate no interruption in drilling activities. A streamlined, simplified, and more efficient science advisory structure will be implemented in 2011.

The next steps involve preparing the proposal package – which will include the new science plan and National Research Council report on past accomplishments and future promise of scientific ocean drilling – for the NSF National Science Board (NSB; *http://nsf.gov/nsb/*). The NSB will ultimately decide whether the new program is approved for funding. The NSF Director, the Assistant Director for GEO Directorate, and the Division Director of the Ocean Sciences Division will also have a voice in the decision of whether or not to support this new program. An important consideration for them will be how strongly the science community supports a new program.

Approval of the post-2013 program is by no means a sure thing and will require strong arguments on the importance of the science and its impacts on the nation. We look forward to continuing to work with you in the planning effort and welcome your comments.

Sincerely,

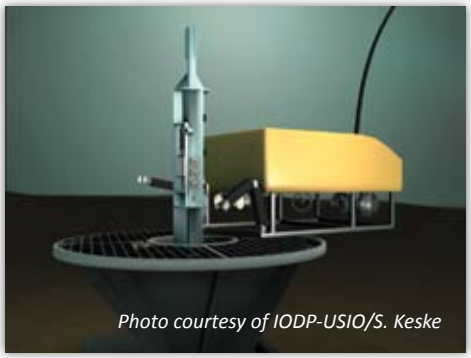
Rodey Batiza
National Science Foundation

HOW IT WORKS

From the rig floors of the drilling platforms to the desks of member offices worldwide, IODP is a dynamic yet complicated program. This section is designed to explain the "ins and outs" of different aspects of IODP and in each issue, we will select one or two topics to highlight – we invite you to test your IODP knowledge and to learn something new about the program.

CORKing the Seafloor

Recent expeditions on the *JOIDES Resolution* and the *Chikyu* have installed several "CORK" observatories in the seafloor. A CORK, or Circulation Obviation Retrofit Kit, is a device that is lowered into an open borehole to collect long term measurements, such as fluid pressure and temperature, and samples to be used for geochemistry and microbiology studies. CORKS are designed to collect data and samples at one or more depth intervals within a borehole. Once installed, a CORK can last for up to a decade.



Still from CORK animation.

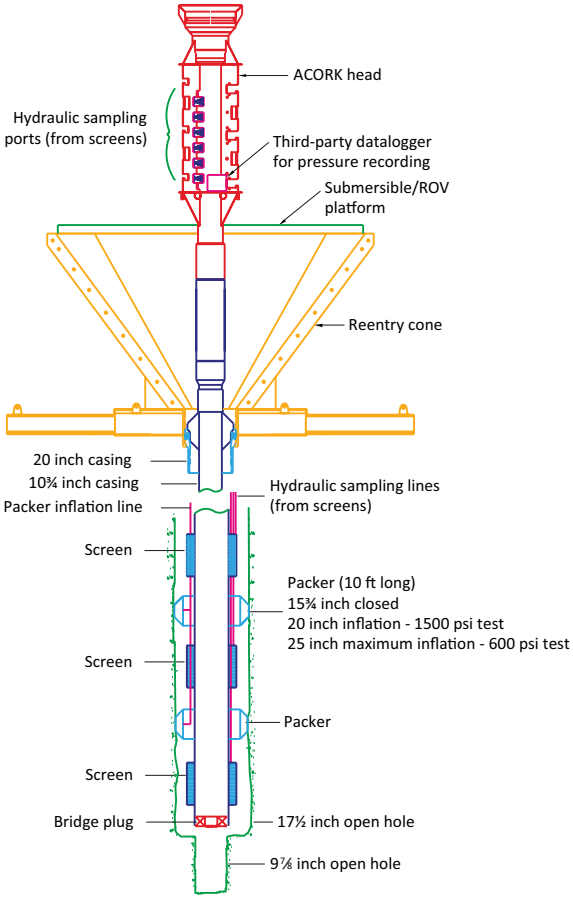
A fundamental feature of all CORKs is that they are designed to isolate the sea from the seafloor by employing rugged fluid seals to prevent seawater from flowing into the borehole and borehole water from flowing up into the ocean. The fluid seal minimizes contamination and provides for discrete sampling from different intervals.

Numerous intervals of isolation can be created by sealing the borehole at different depths using a device called a "packer," which expands tightly against the borehole wall. For instance, if fluid measurements and samples are desired from a specific fault zone within the borehole, seals can be placed above and below the fault with an arrangement called a "straddle packer." Once isolated, the fault interval can be pressurized, depressurized, purged for sampling, and monitored continuously. Data and samples from each isolated interval are delivered to the wellhead at the seafloor via tubes, pipes, or wires that are connected to sensors, pumps, or simple fluid screens in each interval. These data are ultimately collected or downloaded at the wellhead by submersible or ROV.

Deploying a CORK requires careful long-term planning, engineering, and fabrication many months in advance of an expedition. During deployment, the CORK is assembled into a long "string" which includes everything required for the borehole experiments. The string is then lowered into the borehole via the drill string and is rigidly seated into the reentry system on the seafloor. Once installed, the CORK cannot be adjusted. The CORK can remain seated in the borehole for many years acquiring digital data and samples.

During the past year of operations, three CORKS were installed in the seafloor of the northeast Pacific during IODP Expedition 327 Juan de Fuca Ridge Flank Hydrogeology and IODP Expedition 328 Cascadia ACORK. To watch an animation of a CORK, visit *www.youtube.com/watch?v=iNzNGR5fQnI*.

ACORK Configuration
(from Graber et al., 2002)



LETTER FROM THE USIO

Dear Colleagues,

The *JOIDES Resolution* has been back in operations for almost two years now. It seems like only yesterday we were leaving Singapore and embarking on a new phase of ocean drilling. We have completed nine expeditions and the tenth is underway – all have been incredibly successful, adding to our knowledge of how our planet works. Thanks and congratulations to everyone who helped make this a reality!

Even with Singapore behind us, we continue to make improvements to the *JOIDES Resolution*. From April 13 to July 5, 2010, the *JOIDES Resolution* docked in Victoria, Canada for a maintenance period. Maintenance activities included projects in Engineering and Operations (including inspection and preventative maintenance on pipe, improvements to weight on bit monitoring, and the Rig Instrumentation System); IT infrastructure (including upgrading workstations and instrument hosts where possible, upgrading servers, services, and databases, updates to wireless services); IT development (including improvements to web services, upgrades to more than 100 applications and services, upgrades and training on internet services); and Lab infrastructure (remodeling labs for improved coreflow and service, floor repair, stores organization, analytical gas line reconfiguration, core description station remodel, redesign and reconfiguration of the section half multi sensor logger to improve performance and reduce footprint, refinishing laboratory countertops, and rewiring analytical systems for additional safety, durability, and reduced maintenance). The USIO also initiated a review of the shipboard laboratory systems. The Laboratory System Review Team, composed of external experts from the scientific ocean drilling community, met onboard the *JOIDES Resolution* from June 27-29, 2010 to conduct an evaluation of the ship's science laboratory systems and data handling capabilities.

It is our intention to make the Laboratory System Review an annual occurrence. We are listening to what you have to say about the *JOIDES Resolution* and its laboratories and believe in the importance of an external team to help us set priorities for the near- and long-term so that we can improve our science laboratory systems and data handling capabilities, and ultimately, USIO's operational effectiveness. Let me know what you think about how the USIO is doing – I value and welcome your opinion.

Best regards,

David Divins
USIO/Consortium for Ocean Leadership

IODP Expedition Schedule

Expedition	#	Port of Origin	Dates
JOIDES Resolution			
South Pacific Gyre Microbiology	329	Papeete, Tahiti	9 Oct. - 13 Dec. 2010
Louisville Seamount Trail	330	Auckland, New Zealand	13 Dec. 2010 - 12 Feb. 2011
Transit		Auckland, New Zealand	12 Feb. - 15 Mar. 2011
Costa Rica Seismogenesis Project (CRISP)	334	Puntarenas, Costa Rica	15 Mar. - 13 Apr. 2011
Superfast Spreading Rate Crust 4	335	Puntarenas, Costa Rica	13 Apr. - 4 June 2011
Mid-Atlantic Ridge Microbiology	336	Bridgetown, Barbados	17 Sept. - 20 Nov. 2011
Mediterranean Outflow	339	Ponta Delgada, Azores	20 Nov. - 20 Jan. 2012
Cascadia Margin Gas Hydrates 2*	TBD	Victoria, Canada	June - July 2012
South Alaska Margin	TBD	Victoria, Canada	Aug. - Sept. 2012
Chikyu			
NanTroSEIZE Stage 2: Riserless Observatory 2	332	Shingu, Japan	25 Oct. - 12 Dec. 2010**
NanTroSEIZE Stage 2: Inputs Coring 2 and Heat Flow	333	Shingu, Japan	13 Dec. 2010 - 10 Jan. 2011**
Shimokita Coalbed Biosphere Expedition	337	Hachinohe, Japan	15 Mar. - 21 May, 2011**
NanTroSEIZE Plate Boundary Deep Riser 2	338	TBD	10 Aug., 2011 - 10 Jan., 2012**

**Contingent on funding for CORKs*

***dates subject to change*

CONSORTIUM FOR
Ocean Leadership
1201 New York Avenue, NW, 4th Floor
Washington, DC 20005