

# CORE DISCOVERIES

The Newsletter for  
US Scientific Ocean Drilling

*Chikyu* Breaks Scientific Drilling Record  
at the Japan Trench pg.3

Today's Ocean Acidification Rate  
May Be Unprecedented pg.5

How Downhole Logging  
Works pg.10



## INSIDE THIS ISSUE

Expedition Updates . . . . .	3
<i>Chikyu Breaks Scientific Drilling Record at the Japan Trench and JOIDES Resolution Targets Climate Records in the North Atlantic</i>	
Education and Diversity News. . . . .	4
<i>"Ship to Shore Science" Kickoff Meeting Generates Ideas for Collaboration and 2012 Minorities in Scientific Ocean Drilling Fellowship Awarded</i>	
Research Highlights . . . . .	5
<i>Today's Ocean Acidification Rate May Be Unprecedented</i>	
Who Is The US Scientific Ocean Drilling Community?. . . . .	6
Community Spotlight . . . . .	7
<i>Jennifer Magnusson</i>	
Letter from the National Science Foundation . . . . .	7
Letter from the USAC Chair . . . . .	8
Drill Bits . . . . .	9
How It Works . . . . .	10
<i>Downhole Logging</i>	
Letter from the U.S. Implementing Organization . . . . .	11
Expedition Schedule . . . . .	12

*On the cover: The JOIDES Resolution sits dockside in Ponta Delgada, São Miguel, Azores. (Photo courtesy of 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 seafloor. 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 (MEXT). Additional program support comes from the European Consortium for Ocean Research Drilling (ECORD), the Australia-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.

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For more information about IODP, visit: [www.iodp.org](http://www.iodp.org)

For more information about USIO and USSSP, visit:  
[www.oceanleadership.org/programs-and-partnerships/](http://www.oceanleadership.org/programs-and-partnerships/)



## UPCOMING EVENTS/MEETINGS/WORKSHOPS

### Building U.S. Strategies for 2013-2023 Scientific Ocean Drilling

April 30 - May 2, 2012  
 Denver, Colorado

<http://iodp-ussp.org/workshop/strategies/>

### Goldschmidt Conference

June 24-29, 2012  
 Montreal, Canada

[www.vmgoldschmidt.org/2012/index.htm](http://www.vmgoldschmidt.org/2012/index.htm)

### U.S. Advisory Committee for Scientific Ocean Drilling

June 25-27, 2012  
 Washington, DC

<http://iodp-ussp.org/committees/usac/>

### International Geological Congress

August 5-10, 2012  
 Brisbane, Australia

[www.34igc.org/](http://www.34igc.org/)

### Asia Oceania Geosciences Society

August 13-17 2012  
 Singapore

[www.asiaoceania.org/aogs2012](http://www.asiaoceania.org/aogs2012)

### Observatories in Scientific Ocean Drilling

September 11-12, 2012  
 Houston, Texas

<http://iodp-ussp.org/workshop/observatories/>

## Upcoming SAS Meetings

### Proposal Evaluation Panel

May 14-15, 2012  
 Edinburgh, United Kingdom

### Science Implementation and Policy Committee

June 19-20, 2012  
 Washington, DC

### Site Characterization Panel

August 7-9, 2012  
 Barcelona, Spain



# EXPEDITION UPDATES

## *Chikyu* Breaks Scientific Drilling Record at the Japan Trench

On April 1, the *Chikyu* set out from Shimizu, Japan on Expedition 343 (Japan Trench Fast Drilling Project). Under the leadership of James J. Mori (Kyoto University) and Frederick Chester (Texas A&M University), the science party includes 28 scientists representing ten different countries.

After a tumultuous first week beset by stormy seas and another week of shipboard preparations, drilling operations began in earnest on April 16. About a week later, on April 24, the team broke the world record for scientific ocean drilling, surpassing the record of 7049.5 meters below the sea surface set in 1978 by DSDP Leg 60 in the Marianas Trench. Two days later the drill advanced to a final depth of 7740 meters below sea surface, crossing the fault zone into the downgoing Pacific plate.

Planned in response to the 2011 Tohoku earthquake and the ensuing tsunami, the expedition seeks to investigate the geophysical signatures left behind by that devastating event. To better understand how the fault slipped more than 50 meters, the scientists will retrieve core samples and make measurements of the residual heat left behind as a result of the movement.

Photo courtesy of Katsuyoshi Michibayashi, Shizuoka University

For more see [www.jamstec.go.jp/chikyu/exp343/e/](http://www.jamstec.go.jp/chikyu/exp343/e/)

## *JOIDES Resolution* Targets Climate Records in the North Atlantic

On June 2, the *JOIDES Resolution* will set sail from St. George, Bermuda to begin Expedition 342 (Paleogene Newfoundland Sediment Drifts). Co-chief scientists Richard D. Norris (Scripps Institution of Oceanography, University of California, San Diego) and Paul A. Wilson (National Oceanography Centre, University of Southampton, UK) will lead a team of 32 scientists hailing from 11 different countries.

The expedition will drill several sites southeast of Newfoundland, near the final resting place of the ill-fated *RMS Titanic*. Large sediment drifts here contain detailed records of the Paleogene, when Earth's climate experienced dramatic fluctuations. For example, during the Paleocene-Eocene Thermal Maximum (or PETM, see pg. 5 for more) some 56 million years ago, the Earth was warm enough that nearby Greenland was completely free of ice. However, about 20 million years later, the climate cooled considerably and ice sheets began forming again.

The expedition's main target is a series of less severe warm periods, called hyperthermals, which occurred in the time between these "hothouse" and "icehouse" conditions. Beginning about 5-6 million years after the PETM, these hyperthermals were most likely caused by periodic spikes of atmospheric carbon. The source of these carbon spikes is uncertain, but the sediment records could hold the answer. The science team also hopes to learn more about the onset and evolution of deep-water ocean currents in the North Atlantic, which exert a major influence on global climate both past and present.

For more background see [http://iodp.tamu.edu/scienceops/expeditions/newfoundland\\_sediment\\_drifts.html](http://iodp.tamu.edu/scienceops/expeditions/newfoundland_sediment_drifts.html) and for updates from the expedition follow <http://joidesresolution.org/node/2492>.



## EDUCATION & DIVERSITY NEWS

### “Ship to Shore Science” Kickoff Meeting Generates Ideas for Collaboration



Deep Earth Academy held the project kick-off meeting for “Ship to Shore Science: The *JOIDES Resolution* as a Platform for Education” in Washington, DC February 29 – March 1, 2012. The project is funded by a pathways grant from the National Science Foundation’s Informal Science Education division. The meeting brought together 55 scientists, educators, media experts and other friends of the program to brainstorm ways to achieve creative and ambitious informal science education and outreach goals by leveraging the *JOIDES Resolution*.

The meeting took advantage of an innovative format known as “Open Space.” Within a couple hours of the meeting’s start, the group had raised more than 50 concepts, large and small, and arranged them into an

agenda of 34 working sessions. Over the next two days, the participants self-managed and documented these working sessions, adding and combining a few topics along the way.

On the third day of the meeting, each participant voted to rank and prioritize the ideas, and then formed groups to collaborate on proposal writing. There was tremendous energy and enthusiasm at the meeting, which included a live ship-to-shore session with Virginia Jones, the Education Officer on Expedition 340T (Atlantis Massif), the expedition underway at the time.

Within two weeks following the meeting, the participants submitted 14 proposals – four of which were selected for funding:

- Working with Girl Scouts in New York City
- Creating regional networks to help spread the IODP message
- Creating an e-book to test out new interactive technology
- Creating a stand-alone interactive museum kiosk about the stories we get from cores

All of the ideas, notes and prioritization results are available online at: <https://sites.google.com/site/shiptoshorescience/home>. Follow along to watch how the projects develop!

### 2012 Minorities in Scientific Ocean Drilling Fellowship Awarded

Rocio Caballero-Gill, a Ph.D. student from Brown University, is the U.S. Implementing Organization’s first Minorities in Scientific Ocean Drilling Fellow. Using data from Deep Sea Drilling Project Leg 90 (Site 594) and Ocean Drilling Program Leg 181 (Site 1125), Caballero-Gill will work with Timothy Herbert on a research project titled “Investigating a Potential Mechanism for Sustained Pliocene Warmth Using Micropaleontology and Alkenone Paleothermometry” to answer critical questions in Pliocene climate research.



Photo courtesy of IODP-USIO



# RESEARCH HIGHLIGHTS

## Today's Ocean Acidification Rate May Be Unprecedented *Few parallels exist in 300-million-year geologic record*

A study\* in *Science*, published on March 2, 2012, finds that human-sourced carbon emissions are causing a high rate of ocean acidification that may be unmatched within the last 300 million years. Such a rapid change is likely to have severe and long-term consequences for shell-forming marine life. The work relies heavily on evidence obtained by scientific ocean drilling and focuses on mass extinctions and other ecological changes, such as major migrations and rapid evolutionary events. It is the most comprehensive study yet to survey the geologic record for evidence of ocean acidification over such a vast time period.

The *Science* study, a review of previous paleoceanographic work, found evidence for several times when natural spikes in atmospheric carbon sent average global temperatures soaring. However, there is only one period in the last 300 million years when the oceans changed even remotely as fast as today: the Paleocene-Eocene Thermal Maximum (PETM), some 56 million years ago.

In a span of a few thousand years, a surge of carbon dioxide doubled atmospheric concentrations, pushing average global temperatures up by about 6 degrees Celsius and dramatically changing the ecological landscape. As a result, as many as half of all species of benthic foraminifera—a group of single-celled organisms that live on the ocean bottom—went extinct. Many surface-dwelling algae and small zooplankton migrated to higher latitudes while new, short-lived species evolved.

Evidence for the PETM event can be seen in seafloor sediments and was first discovered in cores recovered during Ocean Drilling Program (ODP) Leg 113 (Site 690). A particularly famous core obtained on ODP Leg 208 (Site 1262) contains a layer of reddish-brown clay sandwiched between thick deposits of white ooze. These white layers contain the carbonate skeletons of microscopic plankton; the telltale brown layer in between stands as visible evidence that the carbonate shells dissolved under highly acidic conditions.

Improved drilling technology invented by ODP engineers made it possible to gather further geological evidence of climate change during the PETM. Scientists on board ODP Legs 198, 199, 207 and 208 documented an increase in atmospheric carbon dioxide, a rise in temperature, and changes in ocean circulation, stratification and oxygenation.



*The single-celled organism Stensioeina beccariiiformis survived the asteroid impact that killed the dinosaurs 65 million years ago but went extinct nine million years later, when the oceans acidified due to a massive CO<sub>2</sub> release. It ranged across many depths, in all oceans. (Credit: Ellen Thomas, Yale University)*

These physical changes led to ecological changes such as migrations of surface dwellers, the extinction of bottom dwellers and shifts in primary productivity. Additionally, Integrated Ocean Drilling Program (IODP) Expedition 302 (Arctic Coring Expedition) found evidence of unusually severe warming and oxygen depletion in the Arctic Ocean during the PETM.

In the last hundred years, ocean acidification has progressed at least 10 times faster than it did 56 million years ago. The Intergovernmental Panel on Climate Change (IPCC) predicts that average ocean pH may fall to 7.8 by the end of the century, raising the possibility of PETM-like shifts in ocean chemistry.

The Science Plans for both the Integrated Ocean Drilling Program (2003-2013) and the International Ocean Discovery Program (2013-2023) identify paleoclimate research as a leading priority. This summer, Expedition 342 (Paleogene Newfoundland Sediment Drifts) will seek to learn the source of carbon surges that triggered the Paleogene hyperthermals—periodic warm periods that occurred beginning 5-6 million years after the PETM. As a secondary goal, the expedition may learn more about the PETM itself. (See pg. 3 for more.) With clearer insight into the past, the scientific community will be better positioned to understand and predict how life on Earth will respond to the stresses human society is inflicting today.

\*Hönisch et al., 2012. *The Geological Record of Ocean Acidification*. *Science* Vol 335 Pg 1058; March 2, 2012.

This report was adapted from a press release issued by Lamont-Doherty Earth Observatory, with input from study coauthor Ellen Thomas (Yale University).

## WHO IS THE US SCIENTIFIC OCEAN DRILLING COMMUNITY?

by Susan Humphris and Charna Meth

We all have our own ideas about the makeup of the scientific ocean drilling community, but now we have data that document those who are actively involved in the current Integrated Ocean Drilling Program (IODP) and are interested in becoming involved in its successor program. The recent on-line survey conducted to inform the Building U.S. Strategies workshop reveals more than the U.S. community's priorities for the next scientific ocean drilling program – it provides a census of our community. One program brings us together, but the results reveal that our identity is multifaceted.

In total, 433 scientists responded, representing 117 universities, institutions, businesses and government agencies located in 39 states and Washington, DC. A particularly striking statistic is that 44% of the respondents are students or early career researchers who finished their education less than 10 years ago. It is encouraging to see such a large cohort ready and eager to become involved, and it bodes well for the continued vitality of scientific ocean drilling.

Our community is strongly interdisciplinary. Respondents were asked to identify with which of the 2013-2023 Science Plan themes they most closely identified. With 31% selecting more than one theme, it is clear that many in our community now take a truly interdisciplinary approach to their research. In addition, IODP has broadened its reach over the last decade to include a new and growing group of microbiologists interested in using drilling to characterize the subsurface biosphere. An impressive 18% of all respondents selected the Biosphere Frontiers theme; notably, 42% of those respondents self-identify as microbiologists. This demonstrates that there is a strongly interdisciplinary group of researchers poised and ready to make great breakthroughs in our understanding of this largely unknown biological realm.

Our community is both ship-based and shore-based. More than half (51%) of respondents have never sailed on an expedition and 27% are interested in developing synthesis studies on legacy samples and data. The impact of scientific ocean drilling data reach far beyond the confines of one expedition. These data show that some commonly held perceptions of our demographics are not quite accurate, while painting a clear picture of a broad community that is engaged and ready to embrace future research challenges.

Our community is innovative. The IODP research community is thinking beyond just drilling holes, collecting cores and logging downhole data. For example, the Earth in Motion theme builds on technology developed during ODP and IODP to use boreholes to monitor subsurface conditions over long time periods, and to start designing active experiments with the Earth. Our community is also engaged in many other large initiatives that have linkages with ocean drilling. More than 100 respondents are involved in GeoPRISMS, and more than 10% are involved in EarthScope, the International Continental Scientific Drilling Program (ICDP) or InterRidge.

In summary, the scientific ocean drilling community is large, geographically broad and multidisciplinary. It includes many experienced scientists, as well as a strong cohort who will become the next generation of leadership for the program. Many rely on samples and data from scientific ocean drilling to conduct research at the cutting edge of their fields. Ocean drilling is an important scientific tool, and our community is ready to ensure continued access to this capability that is so critical to the success of the U.S. ocean research agenda.





## COMMUNITY SPOTLIGHT



### JENNIFER MAGNUSSON

Jennifer Magnusson—an educator, marine biologist, web developer and graphic designer from the Pacific Northwest—sailed as the Education Officer on Expedition 336 (Mid-Atlantic Microbiology). During two months at sea, she called on all of her skills to share the story of the expedition. Jennifer's job was to translate the exciting science happening on board, as well as the ups and downs as they transpired, for non-technical audiences.

She did this through multiple blogs, regular Facebook and Twitter posts, YouTube videos containing footage produced by the professional videographers on board and nearly 50 Skype video broadcasts. With assistance from the expedition scientists, these video broadcasts generated a lot of excitement and energy. Students loved the opportunity to talk live with “real” scientists doing real science out in the middle of the ocean. And Jennifer loved connecting with them.

“Each and every videoconference was a chance to inspire young minds,” Jennifer said, “and each one inspired me to keep digging deeper and to look at the science from a different direction.”

While all Education Officers on the ship use similar tools, each one brings their own unique perspective and expertise. With her web design and graphics skills, Jennifer was able to utilize the web to great advantage. She even created a set of *JOIDES Resolution* playing cards with multiple uses for educators. As a result of her expedition, Jennifer has made several presentations at international science and education conferences.

“It is such an enriching experience! Even if you think you won't be able to do it for administrative or financial or family reasons, sit down with those involved and brainstorm some solutions. It not only benefits you as an educator, but the classrooms and students you are connected to as well.”

Future opportunities for Education Officers are always posted here: <http://joidesresolution.org/node/453>.

## LETTER FROM THE NSF

Dear Colleagues,

We would like to thank the community for their active participation in the recent survey conducted by Ocean Leadership on Building U.S. Strategies for 2013-2023 Scientific Ocean Drilling. An impressive 433 U.S. scientists participated in the survey, and the results clearly reflect the interdisciplinary nature of IODP. We were particularly impressed by the list of funding sources, not just from other directorates within NSF, but also other government agencies, foundations and organizations. The sheer diversity of funding reveals much about the value and impact of your research.

We are looking forward to seeing you at the next stage in the process, the Building U.S. Strategies workshop in Denver. The workshop is focused on defining U.S. science priorities for the post-2013 IODP. It seems clear from the meeting planning, discussions and survey results that the priorities will reflect the unique perspective of the U.S. community while aligning well with the international priorities described in the 2013-2023 Science Plan.

Immediately after the Building U.S. Strategies workshop, the National Science Board (NSB) will consider an information item for renewal of the IODP post-2013 at its meeting May 2-4. This discussion follows months of successful internal NSF vetting of the measure. The NSB will then consider an action item for renewal at its July meeting. We look forward to the NSB approval, despite significant budget challenges in 2013 and beyond.

Sincerely,

**The NSF Team**

(Rodey Batiza, Jamie Allan, Thomas Janeczek, Jim Beard, and Leonard Pace)



## LETTER FROM THE USAC CHAIR



Dear Colleagues,

The response to the recent online survey of the U.S. ocean drilling community was exceptional. You participated en masse, resulting in 433 responses from 117 research institutions (see page 6). Unmistakably, the survey results show that we are an active group of interdisciplinary researchers from across all age categories.

The survey was the first step in setting priorities for implementing the post-2013 scientific ocean drilling program. The second step will happen at the Building U.S. Strategies workshop, which will take place in Denver April 30 – May 2.

Prioritization is a necessary step in the operations of large-scale research programs such as IODP. While the goal is not to create an *a priori* expedition list, we simply cannot drill everything on our (long) wish list. We must be willing to make hard choices to efficiently and effectively operate the program.

At the Denver workshop, meeting participants will use the insights you provided via the online survey to target areas of the 2013-2023 Science Plan where the community can make progress on both short-term and longer timeframes, and then consider the resources needed to achieve those goals. Given that the *JOIDES Resolution* is expected to start the new IODP program in the Western Pacific or Indian Ocean, we need to think hard about which of the challenges presented in the science plan can be accomplished in or near those regions. We also need to consider the state of readiness of active drilling proposals, which regions might be next, and which workshops or technologic improvements are necessary now in order to serve long-term goals.

Although many might see this as a painful exercise, community priorities provide a very strong voice for the program, especially in times of tough competition for government funding. We must be ready to show that our objectives are not only scientifically and/or societally relevant, but also achievable.

All the best,

**Anthony Koppers**

Chair, U.S. Advisory Committee  
for Scientific Ocean Drilling

## USAC MEMBERS

**Anthony Koppers (Chair)**

Oregon State University

**Gary Acton**

University of California, Davis

**Ivano Aiello**

Moss Landing Marine Laboratories

**Gail Christeson**

University of Texas at Austin

**Gerald Dickens**

Rice University

**John Jaeger**

University of Florida

**Jon Lewis**

Indiana University of Pennsylvania

**Heath Mills**

Texas A&M University

**J. Casey Moore**

University of California, Santa Cruz

**Craig Moyer**

Western Washington University

**Yair Rosenthal**

Rutgers University

**Anja Schleicher**

University of Michigan



Photo courtesy of IODP-USIO



# DRILL BITS

## Portugal Gets a Double Dose of *JOIDES Resolution* Port Calls

The *JOIDES Resolution* recently made two port calls in Portuguese territory.

On November 16, 2011, the ship arrived in Ponta Delgada, on the island of São Miguel, Azores, at the close of Expedition 336 (Mid-Atlantic Ridge Microbiology). Nearly 270 students, teachers, scientists, dignitaries and reporters toured the ship.

Two months later, on January 16, 2012, the *JOIDES Resolution* visited Lisbon at the close of Expedition 339 (Mediterranean Outflow). Onshore events included a science presentation for VIPs (including a former President of Portugal, the Portuguese Secretary of State for Science and several members of Portuguese Parliament) and a press briefing for about 30 local and regional journalists. In two full days of ship tours, the staff of the *JOIDES Resolution* welcomed nearly 600 students, scientists and dignitaries on board.

At the VIP presentation in Lisbon, the European Consortium for Ocean Research Drilling (ECORD) recognized five scientists for their long-term contributions to scientific ocean drilling. Jamie Austin (University of Texas at Austin) received accolades for more than three decades of leadership and seminal contributions to the Deep Sea Drilling Project (DSDP), the Ocean Drilling Program (ODP) and the Integrated Ocean Drilling Program (IODP).



Photo courtesy of IODP-USIO

## Publication Services Offers ISO Disc Images Of Expedition Proceedings

Integrated Ocean Drilling Program (IODP) Publication Services now offers the ability to download ISO disc images from the IODP publications website. In practical terms, users can pop a blank DVD into their computer and download or burn a replica of the Expedition Reports portion of any IODP Proceedings volume. This will result in a disc with the same content as those mailed to the participants of each expedition and to libraries around the world. To access the disc images, please see <http://iodp.tamu.edu/publications/proceedings.html>.

## *JOIDES Resolution* Featured At Brazos Valley Museum In Bryan, Texas

The Brazos Valley Museum of Natural History in Bryan, Texas, partnered with the Integrated Ocean Drilling Program to present the temporary exhibit "Getting to the Core: the *JOIDES Resolution*," which was on display February 2 through April 28, 2012. The exhibit took visitors "out to sea" through a combination of graphics, ship photographs artifacts, cores, drill bits, a 3D model of the ship and videos. The exhibit also featured the artwork of Dinah Bowman, who sailed on Expedition 327 (Juan de Fuca Hydrogeology) as resident artist. For more information, please see <http://brazosvalleymuseum.org/exhibits/getting-core-joides-resolution>.

**BRAZOS VALLEY  
MUSEUM**  
of Natural  
History





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. 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.

## Downhole logging

Cores of seafloor sediment and rock can reveal much about the geologic history of our planet. However, recovered cores are often incomplete, and some samples undergo dramatic physical and chemical changes when lifted from the pressurized depths. To fill in these gaps and further complement the data found in cores, marine scientists rely on a process known as downhole logging.

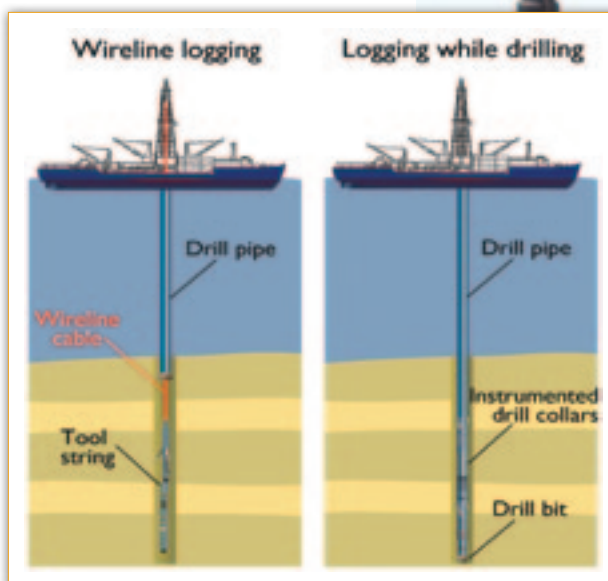
Downhole logging measures physical, chemical and structural properties within drilled geological formations. Logging tools are either lowered into the borehole on a cable after drilling (wireline logging) or placed just behind the drill bit in instrumented drill collars (logging while drilling).

The tools employ nuclear, electromagnetic and acoustic sources and sensors to measure properties such as natural radioactivity, density, electrical resistivity and sonic velocity. The wireline cable provides real-time communication between the tools and the surface; logging-while-drilling tools typically record data in resident memory devices that technicians can access when the tool returns to the ship.

Logging tools rapidly collect data that are continuous with depth and measure *in situ* properties. They can reveal much about a formation’s stratigraphy, lithology and mineralogy. When core recovery is incomplete, the depth of sampled cores can be uncertain; logs provide a continuous record of properties at various depths within a formation. Where there is preferential recovery of a certain rock type (for example, massive basalt pillows can be recovered more easily than fractured breccia) the logs can help construct a more accurate stratigraphy.

Logging tools acquire data at original temperature and pressure conditions, which is particularly useful when studying materials whose properties change when samples are brought to the surface. For example, downhole logs can measure the characteristic properties of methane gas hydrates, which are unstable and dissociate in recovered core samples.

While coring allows us to physically retrieve samples from the depths, logging allows us to “see” the rock and sediment that remains behind. Together, both techniques reveal a more complete picture than either can on its own.







## LETTER FROM THE USIO

Dear Colleagues,

The team that disseminates Integrated Ocean Drilling Program (IODP) research findings has embarked on an exciting project: evaluating which trends and best practices from the scholarly publishing industry should be implemented during the next phase of scientific ocean drilling. As part of this effort, the U.S. Implementing Organization (USIO) will be reaching out to the IODP community to learn how readers are using the current publications—and what new capabilities they consider important to include in future drilling program publications.

The USIO Publication Services staff at Texas A&M University produces IODP's scientific publications, including the *Proceedings of the Integrated Ocean Drilling Program*. Publication Services provides editing, graphics and production services to all three IODP implementing organizations—in the United States, Europe and Japan. The team also provides publication support services on board the *JOIDES Resolution*, on board the *Chikyu* in cooperation with the Center for Deep Earth Exploration (CDEX) and Marine Works Japan (MWJ) and at onshore science party meetings in Bremen, Germany, for IODP Mission-Specific Platform expeditions.

Today's IODP scientific publications evolved from the publications produced during the Ocean Drilling Program and the earlier Deep Sea Drilling Project. The biggest change between these legacy drilling programs and IODP has been the elimination of printed volumes in favor of electronic publication formats. It will continue to be a priority to keep publication costs as low as possible. Advances in web design and the latest international web standards will make it possible to improve functionality and make publications more user-friendly.

Publication Services is researching how best to leverage these and other technological advancements. Prioritizing improvements—particularly those related to content—



**Angie Miller**



**Brad Clement**

requires feedback from the scientific community. For example, is it a high priority to be able to download published figures as PowerPoint slides, to export references to standard bibliographic software, or to link directly to data sets stored in program databases via web queries? The answers to these and other questions will help determine the direction of publication redesign efforts for the post-2013 International Ocean Discovery Program.

To that end, the IODP Scientific Technology Panel has recommended that Publication Services undertake a broad survey of the scientific community. The goal is to define how the community uses program publications and what minimum publication requirements should be set for the next-generation drilling program. The USIO is developing an online survey to be launched later this year; stay tuned for a call for participation via the Ocean Leadership list serve. We strongly encourage your participation and feedback.

Best regards,

**Angie Miller**  
Publication Services Manager,  
USIO/Texas A&M University

**Brad Clement**  
Director of Science Services,  
USIO/Texas A&M University



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INDICIA

**FSC INFO**

## IODP Expedition Schedule

Expedition	#	Port of Origin	Dates
<b>JOIDES Resolution</b>			
Paleogene Newfoundland Sediment Drifts	342	St. George, Bermuda	2 June – 1 Aug. 2012
Tie-Up			1 Aug. – 23 Oct. 2012
Costa Rica Seismogenesis Project A Stage 2 (CRISP-A2)	344	Balboa, Panama	23 Oct. – 11 Dec. 2012
Hess Deep Plutonic Crust	345	Puntarenas, Costa Rica	11 Dec. 2012 – 10 Feb. 2013
Tie-Up			10 Feb. – 29 May 2013
Southern Alaska Margin Tectonics, Climate & Sedimentation	341	Victoria, Canada	29 May – 29 July 2013
Transit	346T		29 July – 20 Aug. 2013
Asian Monsoon	346	Hakodate, Japan	20 Aug. – 28 Sept. 2013
<b>Chikyu</b>			
Japan Trench Fast Drilling Project	343	Shimizu, Japan	1 April – 21 May 2012
Deep Coalbed Biosphere off Shimokita	337	Hachinohe, Japan	6 July – 15 Sept. 2012
NanTroSEIZE Plate Boundary Deep Riser - 2	338	Shingu, Japan	19 Sept. 2012 – 31 Jan. 2013
<b>Mission-Specific Platforms</b>			
Baltic Sea Paleoenvironment	347	TBD	TBD (Spring/Summer 2013)

Expedition dates, ports of origin, etc. are subject to change.

Please see <http://iodp.tamu.edu/scienceops/> and <http://www.iodp.org/expeditions/> for the most up-to-date ship operations schedules.