

## Baltic Sea expedition offshore phase completed

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*The new IODP*

*Israel joins ECORD*

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*TOP Proposal*



Michael Webb

## Message from the Council Chair

Following much planning and negotiation it is pleasing that the **International Ocean Discovery Program (IODP)** has now finally got underway and the points of agreement that underpin the Memoranda of Understanding between ECORD, the US National Science Foundation (NSF), and the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), are now in place.

Programme renewal activities amongst ECORD's partners are now well advanced and I am pleased to report that the outlook for ECORD is looking very positive. At this time the majority of ECORD partners have already signed the new **ECORD Memorandum of Understanding** and provided details on planned cash contributions over the first 5 years of IODP. Based on the latest financial information, the ECORD Managing Agency is projecting that the overall ECORD budget from current partners will only be around 10-15% down on the annual ECORD budget in the last 5 years of the Integrated Ocean Drilling Program. Given the major financial pressures on ECORD's partners, this relatively modest reduction is a major achievement, not least because it allows for ECORD to meet financial commitments to the NSF (\$7m pa) and JAMSTEC (\$1m pa), whilst still retaining sufficient funds to deliver an enhanced programme of mission-specific platform (MSP) expeditions.

Whilst this is excellent news, it is clear that sustained funding of the IODP will continue to be subject to review by ECORD partners from time to time - most notably, at the mid-way point in 5-years' time - and so ECORD will need to continue to work with the science community to ensure that the strongest possible case can be presented for continued sustained funding. As was recently reported in *Nature*<sup>1</sup>, there are major concerns in the science community about the NSF funding for the *JOIDES Resolution*. ECORD has been working closely with NSF programme managers to develop a strong co-funding package for *JOIDES Resolution* operations in IODP that will be a critical component of the case that will be presented to

the NSF's National Science Board in November when the decision will be made on the US funding for the next 5 years of IODP. The package that has been agreed with partners will, as of October 1, 2013, see a major step change in the level of the co-funding of *JOIDES Resolution's* costs - with around a third of the operations costs in the first year of IODP coming from partners. ECORD remains optimistic that this package, along with the opportunities to provide 'top up' funds via the Complementary Project Proposal mechanism, will allow for the *JOIDES Resolution* to continue to be utilised at current levels during the first 5 years of IODP.

Looking forward it is though clear that external budget pressures, such as the price of marine fuel, will continue to grow and this will present a significant challenge to all of the partners of IODP. Within ECORD, work will continue to secure additional cash contributions from potential new partners, such as Russia and Czech Republic, and from the European Commission, for example via an Integrated Infrastructure Initiative 'I3' in the area of '**Research Infrastructure for Ocean Drilling**'. ECORD will also work with ECORD partners and non-partners to secure in-kind contributions of ship-time to support future MSP operations and thereby reduce the overall cash cost to ECORD of planned MSP operations - the first example of which it is anticipated will be a research ship for the Atlantis Massif expedition in 2015 (*page 5*).

Finally, on behalf of ECORD Council I would like to thank Rodey Batiza (NSF) and Kiyoshi Suyehiro (IODP-MI) for all the excellent work that they have done for many years in support of the Integrated Ocean Drilling Program and wish them both very best wishes in their future careers.

1. *Nature*, 'Drilling hit by budget woes', September, 25, 2013, pp. 469-470.

Michael Webb, Chair of the ECORD Council, until December 31, 2013 - <http://www.ecord.org/c/council.php>

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Gilbert Camoin

## ECORD Managing Agency: New ECORD ventures in the new IODP



Milena Borissova

The **International Ocean Discovery Program** started on October 1, 2013 just as the *JOIDES Resolution* returned from Expedition 346 Asian Monsoon, the *Chikyu* was operating offshore Japan for Expedition 348 Nankai Trough Seismogenic Zone Experiment Stage 3, Plate Boundary Deep Riser, and while the *Greatship Manisha* was implementing the mission-specific platform (MSP) Expedition 347 Baltic Sea Paleoenvironment - reflecting the continuity in scientific ocean drilling that has been the rule over the last decades.

The smooth transition between the Integrated Ocean Drilling Program and the International Ocean Discovery Program has been made possible through the work done during the last two years by the International Working Group + and, more recently, by the new Facility Boards, which have set up the IODP architecture, defined the Terms of Reference of the new advisory panels, and detailed the Procedures and Guidelines for IODP expeditions.

### ECORD membership and new opportunities

With two exceptions, Austria and Spain for which the final decision is still pending, all current ECORD member countries have confirmed their continued participation and defined their level of contribution, allowing ECORD to confirm its major objective to deliver an average of one MSP expedition a year for the International Ocean Discovery Program.

New opportunities for increasing the ECORD budget that will be available for MSP operations will be created through potential external co-funding and in-kind contributions, as well as through the possible expansion of the Consortium. Israel became the 19<sup>th</sup> ECORD member on October 1, 2013 (*pages 31-32*). Discussions have started with Russia following a visit of an ECORD delegation to Saint Petersburg, on June 20 and 21, 2013 (*right*). Furthermore, preliminary contacts have been established with Turkey, Luxemburg and Czech Republic.

### ECORD partnership

The new **Memoranda of Understanding (MoU)** summarising the agreement between ECORD and its partners, the USA (NSF) and their associate members, and Japan (JAMSTEC and MEXT), have been finalised and include a combination of significant co-funding along with berth exchanges to provide access to the *JOIDES Resolution (JR)* and the *Chikyu* for ECORD scientists and access to MSP expeditions for scientists from our partner countries. In addition, ECORD is in the process of creating new opportunities through potential in-kind contributions from our partners to implement MSP expeditions, as well as the opening of the ECORD educational activities to interested IODP partners.

### Collaboration with other science programmes

The ISOLAT (Integrated Southern Ocean Latitudinal Transects) workshop, funded by ECORD in the frame of the MagellanPlus Workshop Series Programme, was held in September 2013 in Cambridge and was a further step in the emerging collaboration between IODP and IMAGES. A large scale, multiple-objective,

multi-site coring proposal is expected to be submitted soon to IODP and could be the basis for a future IODP MSP expedition.

ECORD will set up close collaboration with other science programmes and initiatives in the long term as reflected by the active ECORD participation in the upcoming ICDP (International Continental Drilling Program) and EMSO (European Multidisciplinary Seafloor Observation) science conferences, which will be held in November 2013 in Potsdam, Germany, and Rome, Italy, respectively.

### ECORD and the European Commission (EC)

Following the submission of the **DEISM (Distributed European Infrastructure for Subseafloor Sampling and Monitoring)** proposal by ECORD in October 2012 in response to an EC Public Consultation on Research Infrastructures, a paragraph related to ocean drilling has been included in the new EC Integrated Infrastructure Initiative 2014-2015 document. In coordination with ICDP and EMSO, ECORD intends to submit in 2014 a proposal dealing with the establishment of a unique network designed to initiate technological development and innovation, and to increase and optimise trans-national access to cutting-edge technologies and scientific services to the European science community. In parallel, ECORD is exploring new ways of organising its management and funding, *e.g.* possibly as a **European Research Infrastructure Consortium (ERIC)**.



*The ECORD delegation in St Petersburg: from left to right, Robert Gatliff (ESO), Gilbert Camoin (EMA), Carlota Escutia (ESSAC) and Alan Stevenson (ESO).*

### ECORD contribution to IODP

The drilling proposals that have been submitted on October 1, 2013, at the start of the International Ocean Discovery Program, reflect the strong and permanent intellectual contribution of ECORD to IODP, embracing the four major science themes of the IODP Science Plan for 2013-2023.

The number of **MSP proposals** that are at various development stages has never been so high in the IODP evaluation and operational structures, and their diversity in terms of science topics (climate change, sea-level change, geohazards, hydrogeology, ocean crust) and geographical distribution, with a special focus on the climate evolution of the Arctic and Antarctic regions, demonstrates the great success of the MSP concept.

Only a few days after the start of the International Ocean Discovery Program, the current and forthcoming scientific, operational and networking activities promise a bright future for ECORD.

Finally, since the ESSAC Office will move to Zurich on January 1, 2014 with Gretchen Früh-Green as the new ESSAC Chair, we would like to warmly thank Carlota Escutia and Julia Gutiérrez Pastor for their outstanding services to ESSAC and their great contribution to ECORD's influence in IODP.

*"I like the dreams of the future better than the history of the past."  
(Thomas Jefferson)*

*Gilbert Camoin, EMA Director, and Milena Borissova, EMA Assistant Director - <http://www.ecord.org/ema.html>*

## ECORD Industry Liaison Panel

The extraordinary scientific achievements accomplished by ECORD during the past years, coupled with the renewed financial commitments for the next five years from the majority of European countries, demonstrate the importance and uniqueness of this international multidisciplinary research programme.

In this new phase, several new ambitious scientific research projects that are currently being discussed within the ECORD community, such as coring the under-explored Arctic region or the unknown sub-salt stratigraphy in the Mediterranean, require more than ever a sound mission preparation and access to sophisticated and expensive technology. From this perspective, the ECORD Industry Liaison Panel (ECORD-ILP) activity is aimed at developing a constructive and active dialogue with the industry (*e.g.* oil & gas, mining and marine engineering industry) to identify possible common scientific objectives. Collaboration with industry may be realised in different ways ranging from accessing confidential data in support of the project-planning phase

(*e.g.* well and 3D seismic data) to sharing costs of capital-intensive missions. The panel is therefore an important platform within the ECORD organisation where academia and industry can meet and find mutually beneficial ways for pushing science forward.

The ECORD-ILP held its first annual meeting on May 8-9, 2013 in Geneva. Representatives from Total, ENI, ExxonMobil and BP attended the event along with colleagues from EMA, ESO, ESSAC, CNRS and four other European research institutes. The key results of the meeting are (1) that industry looks at the overall IODP with great interest and can see mutual benefits in joining forces to carry selected projects forwards. Modalities of co-operation and industry contribution (*e.g.* data access, financial) will need to be discussed on a case-by-case basis; (2) early involvement of industry in potentially interesting drilling projects is recommended. This can be achieved via *ad-hoc* events such as the MagellanPlus workshops, which can certainly facilitate to build up a common discussion ground; (3) the ECORD community shall make an effort to

identify, during the early stage of proposal writing, all potential aspects of the project which may be relevant for the industry (*e.g.* common area of investigation). This will establish early contact with individual companies and thus start a fruitful dialogue.

Overall the Geneva meeting was a very good start, which gave a positive boost to the ECORD-ILP activity in the new programme.

*Andrea Moscariello, ECORD-ILP-Chair*  
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### Andrea Moscariello

graduated from the University of Turin (Italy) and received a Ph.D. at the University of Geneva (Switzerland) with his research on lake and glacial sedimentology/chemostratigraphy of Lake Geneva deposits. In 1997 Andrea joined the U.S. Geological Survey in Denver, Colorado to do post-doc research on sedimentary processes in continental rift basins. From 1997 to 2011 he worked as a geoscientist for the oil and gas industry, first at Shell International in UK and the Netherlands and many other places in the world - Middle East, Africa, Asia, USA, South America and the North Sea - and then later as a consultant based in The Hague (NL). From 2000 to 2008 Andrea was Affiliate Lecturer of continental sedimentology at the



University of Cambridge, UK and from 2006 to 2011 he was appointed Assistant Professor at the Technical University of Delft, NL to teach production geology and reservoir modeling. In March 2011, Andrea was appointed Full Professor of Reservoir Geology and Basin Analysis at the University of Geneva where he leads several academia and joint-industry funded projects, specialising in the description and characterisation of hydrocarbon and geothermal reservoirs and reservoir analogues.



Karsten Gohl

## News from the ECORD Facility Board

In the new organisational structure of the freshly launched IODP phase 2013-2023, each IODP member consortium responsible for providing the three platform types, the *JOIDES Resolution*, *Chikyu* and mission-specific platform (MSP) to IODP, has a facility board to help implement drilling expeditions with these platforms. The **ECORD Facility Board (EFB)** is the key planning forum for the MSP expeditions by providing operational and management oversight. The main task of the EFB is to determine the operations schedule for MSPs in order to implement high-priority science proposals forwarded by the Science Evaluation Panel (SEP), based upon science priorities, optimal geographic distribution and costs. Furthermore, the EFB approves the expedition section of the ECORD Annual Plan, which includes policies and decisions on the operations schedule, data management, publications, core curation, and engineering and scientific technical development. Strong links with the *JOIDES Resolution* Facility Board (JRFB) and the *Chikyu* IODP Board (CIB) provide maximum information exchange on decision-making processes and discussion across the boards and other IODP organisations and partners.

The EFB is composed of the **Science Board**, consisting of five scientists from any country funding the IODP, and the **ECORD Executive Bureau**, consisting of members of the ECORD Council, the ECORD Managing Agency (EMA) and the ECORD Science Operator (ESO). The Science Board members are selected to serve on the EFB on three-year staggered rotations, while the Chair serves two years. They are nominated by the Executive Bureau, and their nominations are approved by the Council, based on the recommendations provided by ESSAC following an open nomination process. In addition, liaisons exist with the other facility boards, other funding agencies and IODP organisations. EFB decisions and actions are based on consensus. This mix of members and liaisons may seem large and complex, but it best serves the direct exchange of discussion issues and decision-making processes in line with other IODP entities. It allows procedures and standards to be matched across the three platform providers in IODP, but reserves the possibility of adjusting particular needs and procedures for individual drilling platforms. In particular, for the various platform options of the MSPs, a certain degree of flexibility, while staying as close as possible to the unifying IODP standards and procedures, is an important challenge in the EFB work in order to bring proposed individually designed drilling projects towards successfully planned expeditions.

**What function does the EFB have for scientists submitting MSP proposals?** The EFB receives IODP proposals aimed at MSP operations from the SEP after these proposals have positively passed the SEP review and the external review process. Scheduling of these drilling plans depends on a range of issues, which include the excellence of science, the technical and operational feasibility of a project, the budgetary constraints of ECORD, and regional preferences in some cases (*e.g.* the polar regions). For instance, if the budget does not allow for two high-cost expeditions in two subsequent years, the EFB may decide

on alternating between low-cost and high-cost expeditions from year to year. The EFB may have questions and requests to the proponents regarding their drilling strategies, and the EFB will facilitate communications between the proponents and the ECORD Science Operator (ESO) who will implement the technical and operational part of the expedition.

On March 7-8, 2013, the EFB had its **first annual meeting** in Edinburgh. As the new organisation of IODP was not yet fully aligned for the new phase at the time, various recommendations, decisions and actions were discussed and decided on with regard to implementation policies and procedures across IODP, for instance proposal guidelines, measurement policy, sample and data policy, and curation. An example of a recommendation is that interactions between proponents and ESO must be encouraged at an early proposal stage, even before the proposal is forwarded to the EFB. The benefits are that proponents would know the various options to implement their drilling plans, what specific site-survey data will be required depending on various technological options, and that expedition length could be better adapted to scientific needs, resulting in a more affordable expedition. The EFB received the following five MSP proposals from the Proposal Evaluation Panel (now SEP) to be considered for scheduling:

- 548-Full3 Chicxulub Crater (Morgan et al.);
- 581-Full2 Late Pleistocene Coralgall Banks (Droxler et al.);
- 637-Full2 New England Shelf Hydrogeology (Person et al.);
- 716-Full2 Hawaiian Drowned Reefs (Webster et al.);
- 758-Full2 Atlantis Massif (Früh-Green et al.).



(photo D. Smith @ ECORD/IODP)

The EFB decided to schedule proposal **548-Full3 'Chicxulub Crater'** to be drilled with a liftboat or jack-up platform at the end of 2014 at the earliest, and proposal **758-Full2 'Atlantis Massif'** to be drilled in 2015 using a seabed drilling device such as MeBo and/or RockDrill II. The scheduling of both expeditions requires that the budget objectives are met. The next EFB meeting will take place on March 4-6, 2014 in Bremen, when it is expected that an even larger number of proposals will have to be discussed for possible scheduling.

With all three facility boards established, first meetings having been held and a large number of decisions made this year, we are ready to operate and to kick off the new IODP phase. We are looking forward to a promising future of MSP expeditions with our increased variety of drilling operations.

*Karsten Gohl, Chair of the ECORD Facility Board - <http://www.ecord.org/ecord-fb.html>*



David McInroy Sarah Davies

## ECORD News Science Operator



Ursula Röhl Dave Smith

Since the last ECORD Newsletter, ESO have now implemented the offshore phase of the 5<sup>th</sup> and final mission-specific platform (MSP) expedition of the Integrated Ocean Drilling Program. The ESO team and drilling contractors mobilised the *Greatship Manisha* in Falmouth, England in early September (*below right*) and met up with the Science Party in Kiel, Germany on September 12. In the days before the ship arrived in Kiel, the entire offshore Science Party met with other members of the ESO team, including the Expedition Project Managers, in Copenhagen, Denmark to go through the detailed plans for the expedition and discuss roles and responsibilities onboard the ship. A media conference was held in Copenhagen to coincide with the event, which attracted wide interest in the expedition (*see Albert Gerdes's report on page 13*). The team onboard the *Greatship Manisha* have been sending daily progress reports from the ship and informal logbook reports, both of which can be read on the expedition's web page.

The *Greatship Manisha* will return to port at the beginning of November, by which time we will be several weeks into the new phase of ocean drilling, the **International Ocean Discovery Program**. The ECORD Facility Board (EFB), which has been established to determine the operations schedule for MSPs in the new programme (*see EFB Chair, Karsten Gohl's report on page 5*), has already met and decided that the next expeditions to be scheduled are the Chicxulub Crater and Atlantis Massif expeditions. As Karsten reports, the next EFB meeting will take place in March 2014 when we expect a large number of proposals will be added



*The Greatship Manisha during coring operations (BSB-3) in the Baltic Sea (photo D. McInroy © ECORD/IODP).*

to the list for scheduling. In the meantime, ESO will continue to scope the expeditions put forward by the EFB with the aim to implement the expeditions in the next few years.

There have been some staff changes in ESO within the European Petrophysics Consortium (EPC) as reported on *pages 9-10*. Everyone in ESO would like to thank Sally and Louise for their contributions to the team and wish them well in their new careers.

*David McInroy, ESO Science Manager, Sarah Davies, EPC Manager, Ursula Röhl, Curation and Lab Manager and Dave Smith, ESO Operations Manager - <http://www.eso.ecord.org>*

## The Baltic Sea Paleoenvironment Expedition

The 5<sup>th</sup> mission-specific platform expedition of the IODP, **Baltic Sea Paleoenvironment**, set sail from Kiel on September 12, 2013 and is scheduled to end in early November. Using the *Greatship Manisha* equipped with a Geoquip Marine coring rig (*above*), the expedition has recovered cores that will aid the investigation of environmental change in the Baltic region during the last glacial cycle as the Scandinavian Ice Sheet waxed and waned (*map page 7*).

At the time of writing a total of 1198.5 m had been drilled, with 212.2 m of open holing and 1001.5 m of core recovered (average recovery 98.7%). The expedition is currently coring the final borehole of the 7 primary sites and will return to port to demobilise in early November.

After departing Kiel, the expedition visited **Site M0059 (BSB-3) in the Lille Baelt area**. At this site, black mud and greenish-gray clay with weak cm-scale colour lamination was recovered, which down to 20 metres below seafloor (mbsf) displayed benthic foraminifera, diatoms and remains of coastal marine fauna and flora. The sediments in the lowermost part of the sequence are



*The Greatship Manisha gets ready for the Baltic Sea Paleoenvironment Expedition (photo D. Smith © ECORD/IODP).*

silty sands. At 89 mbsf a hard diamicton of sand and stones with little silt was encountered. Tills with this composition are known to have a northeasterly provenance and can be attributed to the main ice advance over the area reaching the Last Glacial Maximum (LGM) at around 23 to 21 kyr BP. It seems likely that the recovered diamicton can be assigned to this ice advance.



*Location map of the Baltic Sea Paleoenvironment Expedition.*

The diamicton presented problems for the coring apparatus, so open holing was conducted down to anticipated Eemian deposits at 160 mbsf, with spot-sampling on the way to confirm the lithology. From the core-catcher material it was concluded that an Eemian sequence is not present at this site. However, further analysis of the logging data suggests that a possible Eemian sequence exists between 145 and 155 mbsf as suggested by an increase in resistivity.

The next site was **M0060 (BSB-1) southeast of Anholt in the Kattegat**. The top 4.5 m of sediment consisted of very well sorted sand with only a few foraminifers, below which silty clay



*First core on deck at BSB-3 (photo A. Kotilainen © ECORD/IODP).*

was recovered. From 18.6 mbsf, mostly stiff Holocene clay was fully recovered, which gradually changed from lighter to darker grey with depth. The lithologies at this site are hard deposits of mixed clay and sand with variable composition, ranging from almost pure sand to silty clay. At several depths the sand layer had apparent overpressure and formation water with suspended sand, which shot up through the drill pipe. The occurrence of shell fragments of marine bivalves, snails and foraminifera, together with the grain-size succession, indicate that the depositional environment changed several times from shallow water to deeper water and then back again to more shallow water. Charcoal fragments were abundant at several horizons. The expedition also recovered 5-10 mm large, thin sheets of amorphous black plant material with fibrous imprints of cellular plant structure and with indications of initial pyritization. A number of such pieces were collected and frozen at  $-80^{\circ}\text{C}$  for later DNA analysis. Such material also constitutes excellent samples for  $^{14}\text{C}$  dating and the possibility to achieve an accurate timescale is very promising. Below 200 mbsf the sediment is increasingly hard and sandy. At about 10 m short of the target drilling depth, further coring was prevented due to a strong artesian flow of formation water that carried large amounts of sand up into and around the drill string and locked the bottom hole assembly, causing the hole to be abandoned.

After a 4-day transit, the expedition arrived at **M0061 (BSB-10) in the Ångermanälven Estuary**. The uppermost part of the

sequence consisted of a greenish clay on top of a black sulphide clay, turning into a weakly varved clay with weak sulphide banding. Some shell fragments and plant remnants were recorded. From 13.3 mbsf the sediment became increasingly rich in silt and was a pure, well sorted silt at 20.7 mbsf. Due to the high water content it was not possible to determine from the material in the core catcher whether the sediment was varved or not. The last cores had been difficult to retrieve as the sediment became more and more sandy. At the end, a hard layer was reached where hammer coring brought back a granite rock of about 5 cm diameter.



*Microbiology sampling at BSB-3 (photo D. Smith © ECORD/IODP).*

Coring operations then moved to site **BSB-11** further up the river. The upper ca. 15 mbsf were pure clay and are expected to be well suited for varve analyses when the cores are split in Bremen during the Onshore Science Party. Below that depth the sediment was coarser-grained, varying between clayey silt and silty sand. Drilling continued down to 35.9 mbsf to make sure that the borehole had penetrated through the clay deposits. Correlations based on magnetic susceptibility records from the different holes at both sites M0061 and M0062 are extremely good.

**Site M0063 (BSB-9) in the Landsort Deep northeast of Gotland** was partly completed before a port call was made at Nynashamn, near Stockholm, Sweden. At a water depth of 437 m, this site is the deepest of Expedition 347 and also the deepest area in the Baltic Sea.

The first piston cores brought back a black gyttja (a lacustrine mud containing abundant organic material) strongly smelling of sulfide and with fine layers that were difficult to distinguish in the surface core due to the strong sulfidization and the very fluid sediment. The gyttja was highly charged with methane gas and developed large bubbles, cracks and voids in the cores. Some sediment was even lost out of the core liner after it was opened on the deck due to a virtual eruption of black gyttja.

The gyttja contained foraminifera, diatoms and pollen grains in varying densities. Below ca. 18 mbsf the sediment changed into a dark greenish gyttja with a small amount of silt. From 30 mbsf, varves were no longer recognisable and below 40 mbsf the sediment was grey, homogenous clay without foraminifera, typical for sediments deposited in the Ancylus Lake. Below 50 mbsf the clay was pale brownish and thinly varved. The varves became more variable and thicker (1-5 cm) in the deep glacial clay sequence below, which had no detectable foraminifera or other microfossils. At 90 mbsf the sediment became slightly coarser and a horizon of clayey sand was found. A tentative estimate based on the visible varve thicknesses points towards a sequence of glacially varved clay that represents ca. 2200 years of varve deposition. This varve deposition took place during the Baltic Ice Lake and Yoldia Sea stages of the Baltic Sea.

A clayey, sandy, and gravelly diamicton was present from 92 to 102 mbsf, below which the sediment was pale brown, well-sorted silt. Coring continued into hard, very well sorted gravel by open-holing with intermittent hammer coring. At 106 mbsf and 116 mbsf hammer coring brought up only a small amount of well sorted gravel with no fine-grained sediment. This probably represents glacio-fluvial gravel resulting from a strong flow of melt water from the ice sheet. Due to the risk of getting stuck in the unstable gravel, Hole M0063A was terminated at a depth of 116 mbsf and logged.

The *Greatship Manisha* completed sites BSB-5 (M0064) and BSB-7 (M0065) in the Bornholm Basin ahead of schedule, allowing time to re-visit sites BSB-3 and BSB-4 in the Lille Baelt area. The expedition is scheduled to finish at Kiel, Germany on



*The Expedition 347 team (Captain Nikhil Kanetkar ©ECORD/IODP).*

November 1 (*above*). The Science Party on-board the platform will assemble again with the entire Onshore Science Party to continue their work on the cores at the MARUM Bremen Core Repository in late January/early February 2014.

*David McInroy, ESO Science Manager, Sarah Davies, EPC Manager, Ursula Röhl, Curation and Lab Manager and Dave Smith, ESO Operations Manager*

**Expedition web page:** <http://www.eso.ecord.org/expeditions/347/347.php>

Expedition logbook: <http://www.eso.ecord.org/expeditions/347/log.php>

Ship reports: <http://www.eso.ecord.org/expeditions/347/daily.php>



## News from the European Petrophysics Consortium

The three universities forming the European Petrophysics Consortium (EPC), Leicester, Montpellier and Aachen, have had a particularly busy few months having been involved in two IODP expeditions, welcoming new members of staff and holding send-offs for long-standing members as they move to new posts in the UK and USA.



*Johanna Lofi, Logging Staff Scientist aboard the JOIDES Resolution Expedition 346 Asian Monsoon (Credit: William Crauford, IODP/TAMU).*

corrections just prior to the arrival of her second child, clear dedication to the job, and those papers are now out!



*Annette (ESO Petrophysicist) and Annick (Petrophysics Staff Scientist) aboard the Greatship Manisha on Expedition 347 Baltic Sea Paleoenvironment (© ECORD/IODP).*

Onto the farewells: **Louise Anderson** and **Sally Morgan** have worked for the group for years and have both moved on to new posts this year. Between them they have sailed on the diverse

range of IODP platforms; the *JOIDES Resolution*, the *Kayd*, the *Greatship Maya* and the *Chikyu*. Back onshore, Louise and Sally have spent many months at the MARUM in Bremen working with our other ESO partners before the main Onshore Science Party (OSP) phase, during the OSP phase and undertaking additional research on IODP cores. The acquisition and interpretation of downhole logging and core petrophysics data are the common threads linking all these activities. Louise and Sally have been key members of the EPC team delivering high-level scientific and technical support to the IODP.



*Louise Anderson (left), Logging Staff Scientist, and logging engineers in the downhole measurements laboratory aboard the JOIDES Resolution during Expedition 336 (credit: William Crauford, IODP).*

Louise's first IODP expedition was sailing on sea-trials on the newly refitted *JOIDES Resolution* in 2009 alongside fellow EPC Research Scientists Annick Fehr and Jenny Inwood, and our colleagues from Lamont, part of the wider Logging Consortium. Since then Louise has participated in expeditions studying a diverse range of topics including paleoclimate records (321), coral reef response to sea-level change (325), the evolution of seamounts (330), and the microbiology of the ocean crust (336) (above). The focus of Louise's work throughout her time as an IODP Research Associate has been the downhole logging. Colleagues around the organisation attest to Louise being an ideal colleague on an offshore expedition as she is cheerful, calm, professional and knowledgeable. These characteristics in combination with her tenaciousness were key in gaining the vital permit to import EPC equipment into Queensland, Australia for Expedition 325. Louise is the only EPC Research Associate to have sailed on expeditions using the *JOIDES Resolution*, a mission-specific platform and the *Chikyu*. In 2012, she sailed as a Logging Scientist in the Science Party for the Japan Trench Fast Drilling Project (J-FAST) supported by NERC (NE/K00123X/1). Her participation on this challenging and exciting expedition led to co-authorship on a *Science* paper. Louise is a

great scientific communicator and, amongst many activities, took part in a 'School of Rock' on the *JR* and introduced live Skype expedition tours to the department in Leicester. IODP's loss is Total E&P's gain, as Louise moves to a post as a Petrophysicist within this oil company based in their Aberdeen offices.

Sally was working offshore virtually as soon as she started in post in April 2009 heading to Expedition 313 New Jersey Shallow Shelf as the ESO Petrophysicist to work 12-hour shifts on our then newly acquired Geotek Multi-Sensor Core Logger (MSCL (*below*)). She sailed on the Expedition 325 Great Barrier Reef Environmental Changes in 2010 (*below right*) again with primary responsibility for the MSCL. During her time at Leicester, Sally became our expert for these core measurements and was in



*Sally logs the first cores on the Geotek MSCL on Expedition 313 New Jersey Shallow Shelf (photo D. Smith © ECORD/IODP).*

high demand. She brought her expertise to non-IODP ventures including expeditions using the seabed rock drill with ESO partners, the BGS, on the *RSS James Cook* and, in collaboration, with Geotek, on the *CCGS Amundsen* as part of ArcticNet. Her particular legacies to EPC are her contributions to designing and modifying our MSCL facilities to meet the specific scientific needs of the Expedition 347 Baltic Sea Paleoenvironment Expedition. She proposed and, in conjunction with Geotek, installed a fast-track MSCL into our dedicated offshore Petrophysics Container to enable timely stratigraphic correlation and rapid logging of cores taken for microbiological analysis. With the Baltic expedition still in progress at the time of writing the combination of a fast-track and standard MSCL has provided the data to the great satisfaction of both groups of scientists.

Anticipating the high core volumes from the Baltic (currently over a kilometre and rising), Sally suggested replacing the existing NaI scintillation crystal used in the MSCL-XYZ, to measure natural gamma radiation (NGR), with a BGO crystal to enable us to reduce the measurement time and still produce high-quality data prior to the start of the OSP. Tests were successful and this adaptation will be used for the first time in December 2013. Having worked for Schlumberger Oilfield Services as an Engineer for Logging While Drilling prior to her

PhD, Sally developed her scientific downhole logging expertise as the Logging Staff Scientist, alongside Angela Slagle of Lamont, on Lesser Antilles Volcanoes and Landslides (340). Sally is staying within the IODP and working as a Research Associate with the Borehole Research Group at the Lamont Doherty Earth Observatory, Columbia University,

Louise and Sally have been fundamental in establishing an excellent reputation for developing and executing downhole and core petrophysics programmes within IODP 2003-2013, building on a long history of participation since the late 1980s. I know they will be much missed by all their colleagues within the ECORD Science Operator and across the wider IODP community as well as by EPC staff at Leicester, Montpellier and Aachen. We all wish them well in their new careers.

These are big shoes to fill but new appointee, Annette McGrath, is doing sterling work as an ESO Petrophysicist aboard the *Greatship Manisha* in the Baltic Sea (*page 9*) running the fast-track and standard MSCL. Annette has been working in a part-time capacity for the group and before that was a Project Manager for The National Forest. Elke Hanenkamp has been with the group since July as a maternity leave replacement. Elke joined us from the Natural History Museum in Karlsruhe after a PhD on volcanology based in New Zealand. Elke will be a key member of the pre-onshore team out in Bremen in December and January. Amy Ellis is due to join the group in November. She is currently completing her PhD in experimental rock mechanics at Manchester University and working as an Engineering Geologist.



*Sally is the face of a news article in the Australian Cairns Bulletin during the Onshore Science Party for the Great Barrier Reef Environmental Changes Expedition 325.*

As we move into the next phase of ocean research drilling within the International Ocean Discovery Program, we will be building on the considerable legacy of former members and developing the roles and expertise of new group members to face the mixed and varied challenges that will be coming our way.

*Sarah Davies, EPC Manager - <http://www2.le.ac.uk/departments/geology/research/gbrg/iodp/epc>*



Albert Gerdes



Alan Stevenson

## ECORD Outreach and Education News and Activities



Patricia Maruéjol



Julia Gutiérrez Pastor

### News from the Outreach team

The ECORD Outreach Team have been busy organising three booths at international science conferences, holding two media conferences ([page 13](#)), producing and distributing ECORD materials and opening education calls. The team held the ECORD Outreach and Education Task Force meeting in Paris, France, on October 7-8, 2013, to co-ordinate the programme's outreach and education activities that will take place during this winter and spring of 2014. We were happy to welcome Gretchen Früh-Green who will take over as the new ESSAC Chair on January 1, 2014. We were also pleased to meet up with Catherine Mével ([below](#)) who hosted the meeting at the IPG-Paris, and Rosa Bernal Carrera.



The renewal of IODP kept the team very busy with the preparation of new resources and online information, as well as the organisation of outreach activities related to the Baltic Sea Paleoenvironment Expedition ([pages 6 to 8](#)).

### Reported activities

An important part of our activities is to promote IODP to the scientific community at international conferences, and this was of special importance a few months before the renewal of IODP. The main event was **EGU 2013** (April 7-12, 2013) in Vienna, Austria, at which ECORD and ICDP co-organised a booth ([above right](#)) and a Townhall meeting <http://www.ecord.org/pil/egu13.html>. Live demonstrations of logging operations were organised several times per day to explain logging with a sonic tool, a common tool used by both science programmes. The booth also attracted many scientists from other fields of research and from non-IODP countries (*e.g.* Algeria, Russia, Mexico). The Townhall meeting was again a successful event where the community had the opportunity to meet, share views and hear about the most recent outcomes of IODP expeditions and ICDP projects. Educators were also active at EGU, in particular Jean-Luc Bérengruer (Lycée International de Valbonne, France) and Susan Gebbels (Newcastle University, UK) reporting their experience as Education Officers onboard the *JOIDES Resolution* during the Hess Deep Expedition ([right](#)), and interactions with teachers attending the GIFT Workshop focusing on Geohazards.



From left to right, Maria-José Jurado, Jochem Kuck (ICDP) and Carlota Escutia (ESSAC) discuss in the booth at EGU 2013 (photo T. Wiersberg)



Jean-Luc Bérengruer presents his IODP-ECORD poster at EGU 2013.

For the third successive year, ECORD presented IODP to geochemists attending the **Goldschmidt 2013 Conference** in Florence, Italy from August 25-30. The conference was a major success with almost 4,100 participants. This year we invited ICDP to share the booth with us after many questions were asked about lake and continental drilling at the Goldschmidt 2012 in Montréal. It was also a good opportunity to promote the ECORD - ICDP MagellanPlus Workshop Series Programme as well as the new format of the *Scientific Drilling* journal. More than 50 presentations were about IODP expeditions and the sessions related to IODP science ('Life below the seafloor', 'Alteration at MOR', etc.) drew many visitors to the booth. The next Goldschmidt conference will be held in Sacramento, USA; ECORD will not be involved, but we plan to take part in the Goldschmidt 2015 conference, which will be held in Prague, Czech Republic.

Following the success of the booth at the Polar Petroleum Potential Conference (3P Arctic) in Halifax, Canada in 2011, ECORD again took part as an exhibitor at the **3P Arctic Conference** in Stavanger (Norway), October 15-18. The conference was attended by over 600 delegates and included about 20 sessions with around 160 oral presentations and over 50 posters. The conference covered all aspects of the geology, petroleum geology and geophysics of the Arctic and circum-Arctic sedimentary basins. The ECORD booth (*below*) attracted steady interest throughout the conference, and gave us the opportunity to show the areas where Arctic proposals have been submitted to IODP and to help liaise with scientists and industry working in the region. The next 3P Arctic Conference will be held in St Petersburg, Russia in 2015.



The ECORD Outreach team organised two **international media conferences** (*page 13*) in September in Copenhagen at the start of the Baltic Sea Paleoenvironment Expedition 347, and in Paris in early October to launch the International Ocean Discovery Program.



ECORD printed materials have been widely distributed during the last six months at press conferences, a public event ('Open House') at Saarland University, Germany and also at MagellanPlus workshops and national IODP meetings. The **ODP/IODP core replicas** were extensively used at public events such as 'Oceano y Tiempo' in Salamanca (Spain) (*page 28*) and TU Night at Braunschweig University (Germany). ECORD also received two additional replicas from the IODP-MI office in Tokyo when it closed. These two replicas have been displayed at the Urbino Summer School.

The transition to the new IODP 2013-2023 requires the **ECORD websites** to be renewed with updated information about the new IODP and ECORD entities. We also continue to post and share news, calls and photos on social networks such as twitter and facebook, in particular during the time of the Baltic

Sea Paleoenvironment Expedition. Finally, the ECORD logo has been slightly re-designed (*see cover*) and is available online along with the new IODP logo at <http://www.ecord.org/pi/logos.html>.

### Upcoming Events and Activities

Members of the team will be involved in outreach activities organised at AGU 2013 (December 9-13, 2013) and ECORD materials will be provided to our colleagues for distribution in the IODP booth organised by the Consortium for Ocean Leadership (booth # 111). We will continue the fruitful co-operation with the ICDP outreach team to present joint activities at international science conferences: EGU 2014, April 27-May 2, 2014 and at ISC in Geneva (Switzerland) (*page 29*). The core replicas will be used at the Universidade do Algarve, Portugal, for teaching undergraduate courses and at the International High School in Valbonne, France, for classroom and workshop activities.

### ECORD Education

Two ECORD teachers from Canada were invited to the School of Rock onboard the *JOIDES Resolution* (*page 14*) and ECORD education opportunities were presented during the IODP media conference in Paris and during several interviews with the media (*below*). A call for teachers to sail as Education Officer during the Izu Bonin Mariana Arc Expeditions (March to September 2014) has been issued and distributed to the ECORD community.



*Carlota Escutia is interviewed at the IODP media conference in Paris.*

When the ESSAC office moves to Zurich on January 1, 2014, we will say goodbye to Carlota Escutia. We would like to thank Carlota and Julia for their enthusiasm and dedication to the ECORD Outreach and Education Task Force during the past two years and we look forward to working with Gretchen and Julia who will continue her role as ESSAC Science Co-ordinator for the next two years.

**ECORD Outreach team: Albert Gerdes and Alan Stevenson, ESO, Patricia Maruéjol, EMA, and Julia Gutiérrez-Pastor, ESSAC -**  
<http://www.ecord.org/pi/promo.html>

### Get connected with ECORD



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Find us at ESO outreach and at ESSAC ECORD



<http://www.ecord.org/RSS/ecord-rss.php>

## ECORD - IODP International Media Conferences

The ECORD Outreach Team have organised two international media conferences in recent months. The first event took place in Copenhagen on September 5 at the start of the IODP Baltic Sea Paleoenvironment Expedition. It was organised in co-operation with and held at the Danish International Press Centre in the heart of the city. Valuable assistance was also given by our outreach colleagues at the universities of Aarhus and Södertörn who announced the media conference to journalists in Denmark and Sweden, and helped to make it a success.

### Exploring the Environmental History of the Baltic Basin, Copenhagen, September 5, 2013

Eight journalists from Denmark, Sweden, Finland, Russia, and China attended the media conference (*top right*). Co-chief Scientists Thomas Andr en and Bo Barker J rgensen gave an overview of the opportunities and challenges of the Baltic expedition. Expedition Project Manager Carol Cotterill presented the logistics. The media conference was moderated by Albert Gerdes.

Science communication had been organised before the conference, and on September 5 and the following days media releases were distributed in Denmark, Sweden, Finland, France, and Germany. Several interviews were arranged with radio, print media, and TV stations, mainly involving the Co-chief Scientists.

Taken together the team were pleased with the results of the outreach activities. To date about 50 reports have appeared in major newspapers, news agencies, TV channels, and online portals, mainly in the Scandinavian countries and Germany. One highlight was a two-page article that one of the biggest Danish newspapers, the Aarhus-based *Jyllands Posten*, devoted to the expedition.

Further media activities will be organised during the Onshore Science Party, which will be held in the Bremen IODP Core Repository in January and February 2014.



*Media conference in Copenhagen, Denmark.*

### Discovering our oceans - A new era of Ocean Research Drilling, Paris, October 9, 2013

A second international media conference took place at the headquarters of the French research foundation CNRS in Paris on October 9. The event marked the start of the new era of IODP which began on October 1. Invitations both to French media and Paris-based international correspondents were distributed by ECORD and the press office at CNRS.

Fourteen journalists had registered of whom ten attended the event (*right*). Gilbert Camoin, Director of the ECORD Managing Agency (EMA), welcomed the media representatives, briefly introduced IODP and ECORD, and gave an update of the on-going Baltic Expedition. Keir Becker, Chair of the IODP Forum presented key issues of the new programme and also addressed aspects such as international cooperation and the IODP infrastructure. Carlota

Escutia, ESSAC Chair, informed the participants about opportunities which the new programme offers to early-career scientists. A resumé and outlook by Gilbert Camoin opened the floor for a short Q&A session, followed by single interviews arranged with the press (*see photo page 12*).

Given that, due to the Nobel Prize announcement later that morning, the media conference had to start rather early, the IODP event attracted a good level of media interest. As in Copenhagen, a media release was distributed widely on the day (in both English and French). Thanks to some of our ECORD colleagues the information was also translated into other languages for national media. To date, there have been about 20 articles and other mentions of the new IODP reported in the media. More information on the Paris media event can be found on [www.ecord.org/p/IODP-press\\_conference.html](http://www.ecord.org/p/IODP-press_conference.html)



*IODP media conference at CNRS headquarters in Paris, France (photo A. Stevenson).*

The satisfying response to both press conferences shows the benefit of co-operation with local outreach specialists and especially collaborating with foreign correspondent associations. This successful model will continue to be used for similar events in the future.

*Albert Gerdes, ESO Public Relations  
agerdes@marum.de*

## 2013 School of Rock

Exploring ocean cores and the geology of the Pacific Northwest  
Victoria, BC, April 1-9, 2013



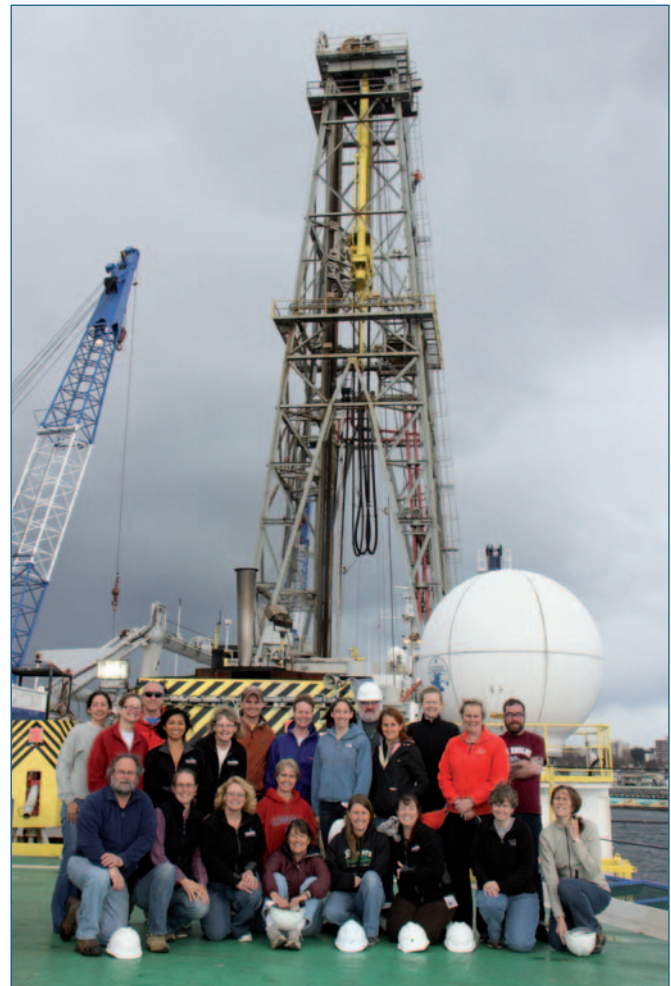
IODP-Canada was pleased to partner with the Consortium for Ocean Leadership to support Canadian participation in the 2013 School of Rock (SOR). The SOR - <http://joidesresolution.org/node/3298> - is the adventure of a lifetime for earth and ocean science educators interested in experiencing scientific drilling research. During this multi-day workshop onboard the incredible 143m *JOIDES Resolution*, educators work with real core material and state-of-the-art lab technology to learn how science reveals clues about earth's history.

After reviewing applications from across Canada, two deserving candidates were selected. Jane Londero is a high-school math and science teacher in Whitehorse, Yukon. Before becoming a teacher she was an exploration geologist and spent ten years working internationally on base-metal and gold projects. Sarah Thornton is a senior laboratory instructor at the University of Victoria, where she teaches mainly the ocean sciences curriculum. Before teaching she worked as a research technician at the University of Alaska studying nutrient chemistry.

The other 17 participants were from all over the United States - Virginia, New York, Ohio, Illinois, Massachusetts, California, Texas, Hawaii, Nebraska and Delaware - with various teaching and science backgrounds. They lived onboard the *JOIDES Resolution* as if they were out at sea, starting with breakfast between 6-6:45 am with the drill crew, technicians and maintenance staff. Sessions started at 7 am, which included tours of the different areas of the ship - the engine room, the bridge, the drill platform or the labs where the core is received, processed, analysed and then studied by the onboard scientists.



The four instructors - Jennifer Collins, Larry Krissek, Dotti Pak and Phil Rumford - provided plenty of background about how the voyages operate, how the drilling process works and how the samples are processed. Jane explains that "having people that had actually participated in some of the cruises, describing the sea and drilling conditions and the camaraderie of the scientists and technicians to get the best samples for the project was invaluable!"



This year's workshop focused on the hydrology and geology of the Pacific Northwest and beyond. Participants were led through lectures and labs working with core from previous voyages, sampling for microfossils, viewing them under the microscopes and producing data that gave them information about climate change over time.

With such a large range in experience and knowledge of earth science, the sessions involved a lot of discussions on how the material can be used to present and integrate the information in the classroom. Jane reveals that "there are many activities that we went through during the school that I will be able to use in my mining and geology classes and can pass on to the other science teachers at my school and community!"

*Diane Hanano (CCOD Scientific Co-ordinator) with a report from Jane Londero*  
[coordinator@mail.iodpcanada.ca](mailto:coordinator@mail.iodpcanada.ca)  
<http://www.iodpcanada.ca/>

## Reports of ECORD Summer Schools

### 10<sup>th</sup> Urbino Summer School in Paleoclimatology, July 10-30, 2013, Urbino, Italy

The Urbino Summer School is held in the small hill town of Urbino, in the Marche region of Italy, which experienced a great cultural flowering in the 15<sup>th</sup> century, attracting artists and scholars from all over Italy and beyond, and influencing cultural developments elsewhere in Europe. I was lucky to get a scholarship from ECORD to take part in this school. It was really helpful for me as my research is closely connected with the investigation of paleoclimate. I work under the project “Rapid environmental changes in the Eurasian Arctic - lessons from the past to the future” at the Thule Institute, University of Oulu, Finland.

During three intensive weeks we attended lectures and seminars at the University of Urbino, which not only provided us with new knowledge but helped refresh our understanding of paleoreconstruction studies, such as paleoclimatology, paleoceanography, climate modeling, cyclostratigraphy and biogeochemical cycling. We also had opportunities to conduct exercises on data analysis and sediment description, working with special programme software for modeling. During the field trip to Gubbio we observed the K-T boundary ([page 16](#)), described outcrops, and finally presented the results of our investigations via short group reports.

This school also included an informal or “bonus” part. From a social point of view the Urbino Summer School provides an opportunity to meet world-famous scientists from different

research areas and countries, and to meet other students or future colleagues. The people involved in the summer school are available at all times during and after the classes, so the students have a great opportunity to discuss and ask questions concerning their research throughout the day.

Besides the lectures a seminar named “Woman in Science” was organised where questions concerning gender policy were discussed in an informal atmosphere.

This year was special for the Urbino Summer School as it was its 10<sup>th</sup> Anniversary and all of the students and instructors were invited to celebrate the event, which also coincided with the annual Cioppino Conference.

I really appreciated all of the lectures, seminars and discussions during this course. I hope it was also a useful and memorable experience for every summer-school student. I look forward to seeing them again at future scientific meetings. I am thankful to the organising committee and excellent instructors for their great work. The Urbino Summer School provides a high level of education and scientific communication, and I would recommend students who are interested in paleoclimatology study to take part.

*Ekaterina Kaparulina, ECORD Scholarship Awardee 2013*  
[ekaterina.kaparulina@oulu.fi](mailto:ekaterina.kaparulina@oulu.fi)



As I started talking to participants from the two previous years, my decision to apply for the 10<sup>th</sup> Urbino Summer School in Paleoclimatology (USSP) was made very quickly. After the application process I successfully became an ECORD Awardee, and was therefore able to participate as a first year PhD student from the “Institute of Geosciences” of the University of Frankfurt (Germany).

As the title implies, the thematic focus of the summer school is paleoclimatology on a broader scale but at a smaller scale comprises geochemistry, paleoceanography and modeling techniques, a mixture of disciplines that come together in climate research. And this is what the philosophy of the Urbino Summer School is all about: to bring together many different people from all over the world, lecturers and students alike, working in different research fields, but still all connected by the universal goal to unravel (paleo-) climatology.

For me and my 57 fellows (mostly PhD students, but also Master students and Post-docs) everything started on July 9 at the icebreaker party, where we all met for the first time. I realised that all these guys from different continents are working on more or less the same topic as I do and that they will be my colleagues for probably the next 30 years.

Within the following three weeks, more than 20 leading international researchers gave insightful lectures, from introductory background topics such as sedimentary and biotic archives, introductions to the key methods like stable-isotope geochemistry and age models, to specific topics like the



different greenhouse and icehouse states, organic geochemistry, cyclostratigraphy, sea-level changes, geochemical modeling and much more. Of course there were some topics that I was familiar with, but they turned out to be very useful reminders, especially in conjunction with the topics that were still unknown to me, such as modeling techniques.

To summarise, the Urbino Summer School in Paleoclimatology was a fantastic experience that is of great professional and personal value and I strongly recommend participation to all young researchers. Lastly, I want to thank the organisation committee, Simone Galeotti, Stephen Schellenberg and Henk Brinkhuis, as well as all the lecturers that made this event so unique. And special thanks to Dan Brinkhuis who created a wonderful movie in celebration of the 10<sup>th</sup> USSP (*see below*).

*Julia Hoffmann, ECORD Scholarship Awardee 2013  
ju.hoffmann@em.uni-frankfurt.de*

### In celebration of the 10<sup>th</sup> USSP Urbino Summer School

Urbino, Italy is the perfect stage for any summer school. Historically it has been a hub where art, science and culture has thrived since the Renaissance, but also today it is a perfect place to get inspired and relax at the same time. Ten years ago, the founding fathers of the USSP (*right*) could not have picked a better place to invite senior paleoclimate specialists to interact in depth with the next generation of climate scientists from all over the world. For me, as a professional filmmaker, it was a remarkable project to work on....no script and not much preparation. It gave me the freedom to tell the story of the 10<sup>th</sup> USSP anniversary as I saw fit to document the relevance and atmosphere of this course. After two weeks of intense filming and interacting I got all the stories and impressions I needed. The result is a ten-minute film about passionate senior scientists who just wanted to share their knowledge with students and vice versa.... they were energised by this young group of eager students. I guess that's what makes the USSP concept so inspirational and enjoyable. It is a place where you can easily develop new friendships and create engaging



multi-disciplinary collaborations that can help to forward the field of paleoclimate science. Next stop for me will be AGU and I am sure I will meet a lot of my new friends from Urbino in San Francisco. Meanwhile enjoy and share this short documentary at <http://www.youtube.com/user/scienceMediaNL>

*Dan Brinkhuis, Science Media NL - [www.sciencemedia.nl](http://www.sciencemedia.nl)*



## ECORD Bremen Summer School on deep-sea sediments: From stratigraphy to age models, September 9-20, 2013, Bremen, Germany

The ECORD Bremen Summer School was an intense workshop focused on the sampling, preparation, curation and study of IODP cores, with a focus on the theoretical and practical conversion from the different indicators into age models.

Thirty PhD, MSc and bachelor students attended the summer school. They came from Austria, Belgium, Chile, Philippines, Finland, France, Gabon, Germany, Greece, Italy, Mexico, the Netherlands, Portugal, Russia, Spain, Turkey, Ukraine, UK and USA. Such a great mixture made the course very exciting, giving enriching exchanges from different cultural points of view. The school teachers were top researchers in each of the subjects taught. The lectures were dynamic, creating an integrative atmosphere where scientific challenges were exposed and discussed. The opportunity to exchange and discuss scientific questions with leading scientists was of great value.

The course consisted of lectures on chemostratigraphy, magnetostratigraphy, biostratigraphy, Milankovitch theory, cyclostratigraphy and probabilistic age modeling. All of the lectures were complemented with new (or developing) software addressing biostratigraphic correlation, developing age models, cyclostratigraphic studies, and probabilistic age modeling. In addition, we had a practical exercise, called the "Virtual Ship" (*below*) simulating the analysis performed offshore on a research vessel and onshore laboratories (*e.g.* core description, analysis of the physical properties of the sediments and biostratigraphy).



Every day after lunch, participants presented their own research to the audience. This allowed us to find out about the striking topics that the young researchers are working on. On the last day we concentrated on learning how to write an IODP proposal. After the lecture we had a discussion during which

fantastic ideas quickly emerged, confirming that many of the discussions during the summer school were fruitful, and also that a collaborative and enthusiastic atmosphere had been created.

We visited the oil museum of Wietze (Lower Saxony), where extraction of crude oil started in the 17<sup>th</sup> century. The oil field of Wietze is considered to be one of the first to drill a borehole for extracting oil in the world. The experience contributed to expanding our perspective of drilling techniques and methodologies onshore.



We thank the organisers of the school: Prof. Dierk Hebbeln, Prof. Michal Kucera, Prof. Heiko Pälike and Dr. Ursula Röhl. We are also very grateful to all the lecturers that took part in the summer school, some of them coming from really far away. We also acknowledge the technicians and staff from MARUM, and also all the students who contributed to such a pleasant stay in Bremen.

As a result of attending such lectures and practical exercises, we have a greater understanding of the study of sediment cores. The multidisciplinary approach to the study of cores covered during the summer school also provides more awareness on the methodological pitfalls and how to solve them. The introduction to new and unreleased computer software gave us new points of view on methodologies and useful tools that will help us with data analyses for our own research. The IODP Virtual Ship training gave us experience of the work carried out during IODP expeditions, in which most of us hope to participate in the near future.

*Luis Valero Montesa, University of Barcelona, and Ariadna Salabarnada Roset, IACT CSIC-University of Granada*



Carlota Escutia Dotti

## News from



Julia Gutiérrez Pastor

A new era of ocean research drilling was launched on October 1, 2013 with the start of the International Ocean Discovery Program “Exploring the Earth under the Sea”. The new IODP provides outstanding opportunities for the community to propose and participate in excellent and societally relevant scientific projects. In the new IODP, the ECORD Facility Board (*see page 5*) will oversee the operations of the mission-specific platform (MSP) operations, including scheduling expeditions, approving programme long-term plans, monitoring the advisory panels, and developing and monitoring policies for data collection, publications and core curation. This operational independence means that ESSAC’s role as the Science Advisory body of ECORD will be even more relevant.

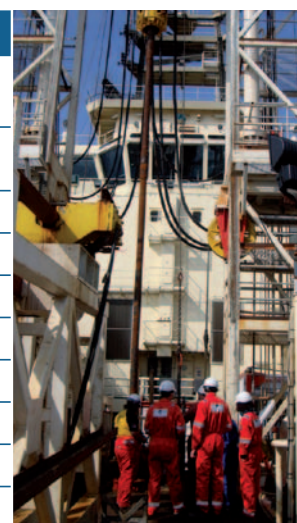
As we write the ESSAC news, there are two ongoing **IODP Expeditions**. The MSP Baltic Sea Paleoenvironment Expedition 347, with Co-chief Scientists Thomas Andrén (Sweden) and Bo Barker Jørgensen (Denmark) is underway with the goal to better understand the paleoenvironmental evolution of the Baltic Sea through the last glacial cycle (*pages 6 to 8*). The *Chikyu* is conducting the Nankai Trough Seismogenic Zone Experiment Stage 3 during Expedition 348. The focus is on “ultra-deep” drilling to ultimately reach the seismogenic zone. Operations include direct core sampling and analysis from the fault on which great earthquakes have repeatedly occurred, to understand the geologic characteristics of the seismogenic zone. The *JOIDES Resolution* Asian Monsoon Expedition 346, which focused on the onset and evolution of millennial-scale variability of Asian monsoons and the possible relation with Himalaya and Tibetan Plateau uplift, ended on September 28.

Preparing for future IODP Expeditions, ESSAC has launched calls for ECORD scientists to participate in the *JOIDES Resolution* Indian Monsoon Rainfall and Bengal Fan Expeditions (deadline for applications are both on January 15, 2014). It is important to note that these expeditions are contingent upon approval for operations of the *JOIDES Resolution* beyond September 30, 2014 and authorisation of funds for these operations by the NSF National Science Board in November 2013. In addition, we issued a call for the IODP Expedition 348 “GeniusPlug” contingency operation. This was a limited call for geochemical, microbiological, and observatory specialists. Regarding the status of other past calls, staffing is ongoing for the three Izu Bonin Mariana (IBM) Expeditions 350, 351 and 352 (IBM-rear arc, IBM arc origins, and IBM forearc, respectively), expected to investigate the genesis of continental crust in the Izu-Bonin-Mariana convergent margin. More information about the scientific objectives and precise dates of all these expeditions can be found in the table below and on the IODP website at <http://www.iodp.org/expeditions>.

The IODP Advisory Panels in the new IODP have been greatly simplified (*page 20*). The **Science Evaluation Panel (SEP)** involves the former Proposal Evaluation Panel (PEP) and Site Characterization Panel (SCP). The mandate of SEP is to evaluate all the proposals submitted to IODP in terms of both scientific excellence and completeness and quality of the site-survey data package. The **Environmental Protection and Safety Panel (EPSP)** reviews all prospective drilling by the IODP drilling platforms and advises on safety requirements and appropriate technology needed to meet these requirements.

## IODP Expedition Drilling Schedule

| Expedition                            | Exp # | Drillship | Dates   | Co-chief Scientists                  |
|---------------------------------------|-------|-----------|---|--------------------------------------|
| Baltic Sea Paleoenvironment           | 347   | MSP       | Offshore: Sept. 12 - early Nov., 2013<br>OSP: late January 2014 | B.B. Jørgensen-T. Andrén             |
| NanTroSEIZE Plate Boundary Deep Riser | 348   | Chikyu    | Sept. 13, 2013 - Jan. 20, 2014                                  | T. Hirose - D. Saffer<br>H. J. Tobin |
| South China Sea                       | 349   | JR        | Jan. 26 - March 30, 2014  | C. F. Li - J. Lin                    |
| Izu Bonin Mariana: Rear Arc           | 350   | JR        | March 30 - May 30, 2014   | Y. Tamura - C. Busby                 |
| Izu Bonin Mariana: Arc Origins        | 351   | JR        | May 30 - July 30, 2014  | R. Arculus - O. Ishizuka             |
| Izu Bonin Mariana: Forearc            | 352   | JR        | July 30 - Sept. 29, 2014  | J. Pearce - M. Reagan                |
| Indian Monsoon Rainfall               | 353   | JR        | Nov. 29, 2014 - Jan. 19, 2015                                   | S. Clemens - tbn                     |
| Bengal Fan                            | 354   | JR        | Jan. 29 - March 31, 2015  | C. France-Lanord - tbn               |
| Arabian Sea Monsoon                   | 355   | JR        | March 31-May 31, 2015   | D. Pandey - tbn                      |
| Indonesian Throughflow                | 356   | JR        | July 31 - Sept. 30, 2015  | tbn                                  |



JR: *JOIDES Resolution*, MSP: mission-specific platform, OSP: Onshore Science Party. Expeditions 353 to 356 are contingent upon approval by the NSF - <http://www.iodp.org/expeditions>. ECORD Co-chief Scientists are marked in blue. The drill rig of the Greatship *Manisha* during Expedition 347: Baltic Sea Paleoenvironment (photo D. Smith ©ECORD/IODP).

The second phase of the **ECORD Distinguished Lecturer Programme (DLP)** will run until June 2014 with three ECORD Distinguished Lecturers presenting exciting ocean drilling discoveries on three main scientific themes of the IODP Science Plan (2013-2023) - <http://www.essac.ecord.org/index.php?mod=education&page=dlp>:

- Claude Hillaire-Marcel, Univ. du Québec à Montréal, Canada "The Arctic Ocean in the Cenozoic climate system";
- Benoit Ildefonse, Université Montpellier, France "Mantle, ocean crust and seawater, what's next in scientific ocean drilling?";
- Roger Urgeles, Institut de Ciéncies del Mar, Barcelona, Spain "Submarine landslides and derived tsunamis, new challenges for the IODP".

A call for a third phase of DLP lecturers will be issued by ESSAC towards the end of 2013.

Within the ECORD educational programmes, two ECORD Summer Schools have taken place in 2013:

- **The Urbino Summer School** in 'Paleoclimatology: Past Global Change and Modeling Techniques'. University of Urbino, Italy, July 10 - 30, 2013 (*pages 15-16*) - <http://www.urbinosp.it>. Dan Brinkhuis (Science MediaNL) produced a short documentary celebrating the 10 years of the Urbino Summer School (*page 16*);
- **ECORD Bremen Summer School 2013** on 'Deep-Sea Sediments: From Stratigraphy to Age Models', University of Bremen, Germany, September 9-20, 2013 (*page 17*) - [http://www.marum.de/en/ECORD\\_Summer\\_School\\_2013.html](http://www.marum.de/en/ECORD_Summer_School_2013.html).

In addition, ESSAC awarded 18 ECORD scholarships for young scientists from ECORD countries or non-ECORD countries to attend one of these two summer schools. Ten of these scholarships were awarded for the Urbino Summer School and eight for the Bremen Summer School.

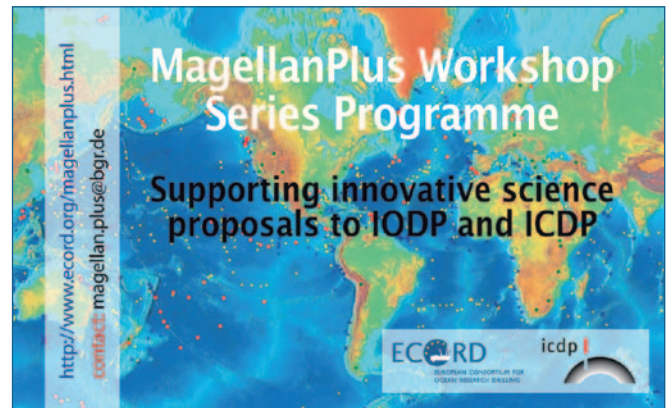
Furthermore, ESSAC has approved two **ECORD-sponsored Summer Schools for 2014**:

- The Urbino Summer School in 'Paleoclimatology: Past Global Change and Modeling Techniques'. University of Urbino, Italy (dates to be determined);
- ECORD Bremen Summer School 2014 on Sub-seafloor Biosphere: Current Advances and Future Challenges. University of Bremen, Germany (September 22 - October 3, 2014).

A new call to host a summer school for 2015 will be issued by ESSAC in December 2013.

As for **ECORD Research Grants**, the increase in the budget for these small and short-term grants, which should cover travel and lab expenses, has resulted in a total of nine grants awarded for 2013. These are merit-based awards for outstanding graduate students to conduct research related to the IODP. The new call for ECORD Grants will be issued in early 2014. Reports of previously awarded grants are posted on the ESSAC webpage - <http://www.essac.ecord.org/index.php?mod=education&page=grants>. A report on work carried out with the support of an ECORD Research Grant by Felix Genske is posted on *page 25*.

The **ECORD/ICDP MagellanPlus Workshop Series Programme** continues to support European and Canadian scientists in developing new and innovative science proposals



for submission to IODP and ICDP - <http://www.ecord.org/magellanplus.html>. Three workshops are scheduled for the winter/spring 2014:

- Deep-sea Record of Mediterranean Messinian Events (DREAM II), January 20-23, 2014, Paris, France;
- Accelerating Neoproterozoic Research through Scientific Drilling, Nottingham, UK, in March 2014;
- BLACKSINK - Drilling in the Black Sea, Bucharest, Romania (dates to be determined).

The next deadline to apply for MagellanPlus Workshop support is **February 1, 2014**.

Upcoming activities also include the EGU 2014 Meeting (April 28 - May 2, 2014) where we will hold the **EuroFORUM 2014**: "Major achievements and future perspectives in scientific ocean and continental drilling". This session aims to summarise and review major scientific achievements in deep-earth sampling and monitoring through ocean and continental drilling with special emphasis on the European contributions to IODP and ICDP. Furthermore, we encourage contributions that outline perspectives and visions for future drilling projects, in particular projects using a multi-platform approach. The deadline for receipt of abstracts is **January 16, 2014**. We look forward to receiving your contributions!

In all, a new decade of scientific ocean drilling awaits the exciting new science proposals and participation by the community. For this, we encourage you to submit drilling and workshop proposals. The ESSAC Office will continue to support the ECORD community in all related ocean drilling activities, including addressing your questions about the new programme, how to get involved, and long-term plans. On January 1, 2014, the ESSAC Office will move from Granada (Spain) to Switzerland with Gretchen Früh-Green as the new ESSAC Chair. Our best wishes and good luck to Gretchen in this new endeavour. The ESSAC Office in Granada continues to thank the dedication and hard work of the Science Co-ordinator, Julia Gutiérrez-Pastor, the active involvement of the ESSAC Delegates, and the ECORD Council, with input from the scientific community.

*Carlota Escutia, ESSAC Chair, and Julia Gutiérrez-Pastor, ESSAC Science Co-ordinator - <http://www.essac.ecord.org>*

## ECORD Representatives in IODP Advisory Panels

| Science Evaluation Panel (SEP)                   |         |                                    |                           |             |                                  |
|--|---------|------------------------------------|---------------------------|-------------|----------------------------------|
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| Jörg Geldmacher                                  | Germany | jgeldmacher@geomar.de              | <b>Site Evaluation</b>    |             |                                  |
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| Environmental Protection and Safety Panel (EPSP) |         |                                    |                           |             |                                  |
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| The United Kingdom       | Bridget Wade<br>b.wade@ucl.ac.uk                  | Anthony Morris<br>amorris@plymouth.ac.uk              |

## Calendar of Workshops and Conferences

|   |   |  |   |
|---|---|--|---|
| <p><b>2013</b></p> <p><b>November 11-14, 2013</b><br/><b>ICDP Conference</b><br/>Imaging the Past to Imagine our Future.<br/>Potsdam, Germany,<br/><a href="http://www.icdp-online.org">www.icdp-online.org</a></p> <p><b>November 11-13, 2013</b><br/><b>Scientific Ocean Drilling Workshop</b><br/>Multidisciplinary Transect Drilling During Transits.<br/>College Station, TX, USA<br/><a href="http://ussp-iodp.org/workshop/transect/">ussp-iodp.org/workshop/transect/</a></p> <p><b>December 9-13, 2013</b><br/><b>AGU Fall meeting 2013</b><br/>San Francisco, CA, USA<br/><a href="http://fallmeeting.agu.org/2013/">fallmeeting.agu.org/2013/</a></p> <p><b>December 11, 2013</b><br/><b>Mini IODP workshop</b><br/>IODP Drilling to Basement in the Aleutian Basin.</p> | <p>San Francisco, CA, USA<br/><a href="http://ussp-iodp.org/workshop/aleutian-basin/">ussp-iodp.org/workshop/aleutian-basin/</a></p> <p>-----</p> <p><b>2014</b></p> <p><b>January 6-8, 2014</b><br/><b>Volcanic and Magmatic Studies Group (VMSG)</b><br/>Edinburgh, UK<br/><a href="http://vmsg.org.uk/vmsg-edinburgh">vmsg.org.uk/vmsg-edinburgh</a></p> <p><b>January 20-23, 2014</b><br/><b>MagellanPlus Workshop</b><br/>Deep-sea Record of Mediterranean Messinian Events (DREAM) II.<br/>Paris, France<br/><a href="mailto:magellan.plus@bgr.de">magellan.plus@bgr.de</a></p> <p><b>February 4-8, 2014</b><br/><b>Paleoceanography of the Brazilian Equatorial Margin (BEM)</b><br/>Sao Paulo, Brazil<br/>Pre-registration until Dec. 7 to <a href="mailto:jovane@usp.br">jovane@usp.br</a></p> | <p><b>April 27-May 2, 2014</b><br/><b>EGU General Assembly 2014</b><br/>Vienna, Austria<br/><a href="http://www.egu2014.eu">www.egu2014.eu</a></p> <p><b>May 19-24, 2014</b><br/><b>Japan Geosciences Union 2014</b><br/>Tokyo (Chiba City), Japan<br/><a href="http://www.jpгу.org/meeting_e/">www.jpгу.org/meeting_e/</a></p> <p><b>May 21-23, 2014</b><br/><b>GAC-MAC Annual Meeting</b><br/>Fredericton, Canada<br/><a href="http://www.unb.ca/conferences/gacmac2014">www.unb.ca/conferences/gacmac2014</a></p> <p><b>May 5-8, 2014</b><br/><b>Ocean Technology Conference 2014</b><br/>Houston, TX, USA<br/><a href="http://www.otcnet.org/2014/">www.otcnet.org/2014/</a></p> <p><b>June 9-13, 2014</b><br/><b>Goldschmidt 2014</b><br/>Sacramento, CA, USA</p> | <p><a href="http://www.goldschmidt.info/2014">www.goldschmidt.info/2014</a></p> <p><b>July 28 - Aug. 1, 2014</b><br/><b>AOGS</b><br/>Sapporo, Japan<br/><a href="http://www.asiaoceania.org">www.asiaoceania.org</a></p> <p><b>August 22-28, 2014</b><br/><b>ISC 2014 Sedimentology</b><br/>Geneva, Switzerland<br/><a href="http://www.sedimentologists.org/meetings/isc">www.sedimentologists.org/meetings/isc</a></p> <p><b>December 15-19, 2014</b><br/><b>AGU Fall Meeting</b><br/>San Francisco, CA, USA<br/><a href="http://meetings.agu.org/">meetings.agu.org/</a></p> <p>-----</p> <p><b>2015</b></p> <p><b>June 9-13, 2015</b><br/><b>Goldschmidt 2015</b><br/>Prague, Czech Republic<br/><a href="http://www.geochemsoc.org/programs/goldschmidtconference">www.geochemsoc.org/programs/goldschmidtconference</a></p> |
|---|---|--|---|

## Reports of Workshops

### Deep Biosphere Research in the IODP

Beth Orcutt<sup>1</sup>, Heath Mills<sup>2</sup> and Jan Amend<sup>3</sup>

The past decade of the Integrated Ocean Drilling Program (IODP) fostered a significant increase in deep biosphere investigations in the marine sedimentary and crustal environments, and scientists are well poised to continue this momentum into the next phase of IODP. In the final months of the recent phase of IODP, twenty-four deep biosphere scientists from around the world (China-2, EU-5, Japan-6, USA-11) gathered together in Florence, Italy (*right*) in association with the Goldschmidt 2013 conference, to discuss new deep biosphere discoveries and make recommendations for continuing deep biosphere research in the next phase of IODP. The goals of this workshop were to evaluate recent findings in a global context, to synthesise available biogeochemical data, to foster thermodynamic and metabolic activity modeling, to identify regional targets for future targeted sampling and dedicated expeditions, to foster collaborations, and to highlight the accomplishments of deep biosphere research within IODP.



Continued on page 26

## MagellanPlus Workshop Reports

### :: Advancing our Understanding of Cretaceous Ocean Dynamics by Scientific Drilling April 15-17, 2013, London (UK)

Convenors: T.J. Bralower, P. Bown, E. Erba, H. Jenkyns, M. Leckie and S. Robinson

Understanding the response of Earth's climate and ocean system to elevated levels of atmospheric CO<sub>2</sub> is a key theme for the next phase of scientific ocean drilling. Marine environmental conditions during the middle Cretaceous (Barremian through Turonian; ~130-88 Ma) provide insights into the possible state of future oceans influenced by globally increasing temperature and major changes in ocean chemistry. This preview includes ocean dynamics driven by reduced thermal gradients and episodic ocean acidification together with hypoxia, anoxia and euxinia (including Oceanic Anoxic Events, OAEs). High profile and novel research has demonstrated that the middle Cretaceous oceans record the 'end-member' conditions of

an ocean-atmosphere system forced by rapid and extreme climate change. Studying the environmental conditions of the Cretaceous provides complementary, yet contrasting, views of greenhouse climates compared to the much better-studied Paleogene. However, although considerable progress in our understanding of Cretaceous oceans was derived during the early stages of ocean drilling (*right*), especially the DSDP, further advances are severely limited by a lack of material to which new proxies and techniques can be applied. With few

oceanic records from the high latitudes, particularly in the Northern Hemisphere, and the Pacific Ocean, and spot coring of many 'classic' Cretaceous sites drilled during the DSDP, the limitations of the archive are both geographic and stratigraphic in scope.

In order to address the deficiencies in our understanding of Cretaceous climate and ocean dynamics, new drilling projects, both on land and at sea, are required. With support from IODP-MI, USSSP, Magellan+ and UK-IODP, a workshop was held at University College London in April 2013, with the specific goal of instigating new drilling projects designed to further our understanding of Cretaceous ocean circulation and climate, acidification and deoxygenation, and the impact of these conditions on life at the surface of the ocean and at depth.

The workshop was size limited to encourage dynamic and focused discussions in breakout groups that led, over three days, to preliminary

drafts of drilling proposal summaries. The workshop was attended by 47 participants (including 22 from ECORD countries), including representatives from the modelling, geochemical, geophysical and palaeontological communities and ranging from PhD students just embarking on IODP careers to senior professors, with memories of life aboard *GLOMAR Challenger*! In order to allow the maximum time for discussion, presentations were limited to introductory talks by the convenors covering the major themes, overviews of the IODP proposal and site-survey requirements (vital to ensure attendees were aware of the requirements of the IODP proposal process and that, by highlighting such critical issues now, future delays in the progression

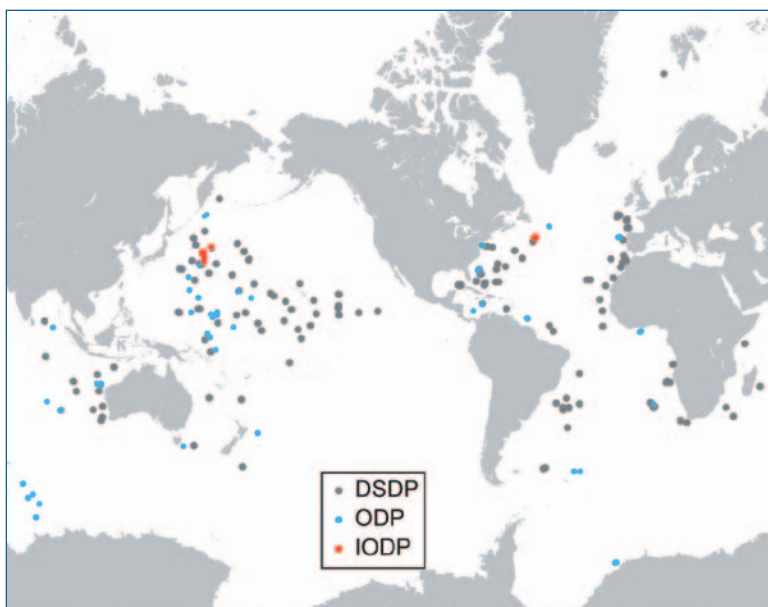
of the proposals might be avoided), and poster presentations by attendees.

Prior to the workshop, invited participants completed a questionnaire describing their areas of scientific interest and where they would like to drill. On the basis of this information, four breakout groups of approximately equal size were organised along geographical lines - Arctic, North and South Atlantic, Southern Ocean, Indian and Pacific Ocean. These groups met to discuss science questions pertinent to their area, and, from the beginning of the second day, potential

drilling targets. By the plenary session on the third day, each group had identified key objectives and had drafted documents describing the aims, justification, and drilling strategies for their region. Within these documents, detailed descriptions of specific target areas were given, which range from re-drilling of areas explored by the DSDP to new drilling in places for which seismic data have only recently become available. Furthermore, the projects outlined during the workshop require a range of platforms both for onshore and offshore drilling.

We hope that the information drafted in London will form the basis of many pre-proposals that will be submitted in Autumn 2013 and Spring 2014 to the Science Evaluation Panel and that eventually these will lead to exciting new opportunities to reveal the secrets of the Cretaceous world.

*The workshop was funded by the ECORD MagellanPlus Workshop Series, Programme, UK- IODP, USSSP and IODP-MI.*



*Map showing sites that recovered Cretaceous-age sediments during DSDP, ODP and IODP drilling*

## :: Deep-sea Record of Mediterranean Messinian events (DREAM) - May 5-8 2013 Brisighella (Italy)

Convenors: A. Camerlenghi, G. deLange, R. Flecker, D. Garcia-Castellanos, C. Hübscher, W. Krijgsman, J. Lofi, S. Lugli, S., V. Manzi, T. McGenity, G. Panieri, M. Rabineau, M. Roveri and J.F. Sierro

About 6 million years ago the Mediterranean Sea was transformed into a giant saline basin, one of the largest in the Earth's history and surely the youngest. This event, commonly referred to as the Messinian salinity crisis (MSC), changed the chemistry of the global ocean and had a permanent impact on both the terrestrial and marine ecosystems of a huge area surrounding the Mediterranean region. The first fascinating and successful MSC scenario proposed following DSDP Leg XIII in 1970 envisaged an almost desiccated deep Mediterranean basin with a dramatic ~1,500 m drop of sea level, the incision of deep canyons by rivers extending across dried-up continental margins, and a final catastrophic flooding event when the connections between the Mediterranean Sea and the Atlantic were re-established in the early Pliocene (5.33 Ma).

The purpose of this workshop was to gather three generations of scientists - 37 scientists and 13 students/young post-docs (*below*) in order to identify locations for multiple-site drilling (including riser drilling) in the Mediterranean Sea that would allow us to solve the several open questions that still exist concerning the causes, processes, timing and consequence at local and planetary scale of the Messinian salinity crisis. Participants included the founders of the Mediterranean desiccation theory, M.B. Cita, W.B.F. Ryan, K. Hsu, along with N. Eguchi and J. Kuroda, representing the operator of the *Chikyu* and the Japanese scientific community respectively.

The programme was fulfilled in a friendly informal atmosphere, though dominated by intense constructive discussion. After the first

day of presentations by invited speakers on key scientific aspects of the MSC, the second was dedicated to the review of our existing knowledge, primarily from seismic data sets at a regional level in light of the identification of realistic drilling targets. The last day of the workshop was devoted to the organisation of future activities.

The outcome of the workshop was the willingness to proceed with the submission to IODP of a Multi-phase Drilling Project including several drilling proposals addressing specific drilling objectives, all linked to the driving objectives of the MSC drilling. Several proposal ideas emerged to support the Multi-phase Drilling Project concept: Salt tectonics and fluids, Deep stratigraphic and crustal drilling in the Gulf of Lion (deriving from the GOLD drilling project), Deep stratigraphic and crustal drilling in the Ionian Sea, Deep Biosphere, Sapropels, and the Red Sea.

In order to focus future actions to specific objectives it was decided to establish thematic working groups initially formed by DREAM Workshop participants and to be expanded later by including additional experts according to the DREAM MSC initiative and the 6 potential complementary drilling proposals. A list of future actions was approved, including a proposal of a second MagellanPlus Workshop (DREAM II) focussing on the pre-proposal writing, and a COST Action for long-term scientific networking (pre-proposal submitted).

Contact: [acamerlenghi@ogs.trieste.it](mailto:acamerlenghi@ogs.trieste.it)



*DREAM Workshop participants (indoor, because of rain throughout the time of the workshop): 1 Dirk Simon, 2 Alastair Fraser, 3 Marina Rabineau, 4 Gert DeLange, 5 Stefano Lugli, 6 Axel Ehrhardt, 7 Luc Lourens, 8 Marco Taviani, 9 Patrick Grunert, 10 Daniel Garcia-Castellanos, 11 Estelle Leroux, 12 Junichiro Kuroda, 13 Andrea Argnani, 14 Vinicio Manzi, 15 Francisco Javier Sierro, 16 Jean Pierre Suc, 17 Judith McKenzie, 18 Dave Hoddell, 19 Wout Krijgsman, 20 Christian Gorini, 21 Werner Hieke, 22 Bill Ryan, 23 Maria Bianca Cita, 24 Giovanni Aloisi, 25 Abdulaziz Al-Balushi, 26 Fabiano Gamberi, 27 Ken Hsu, 28 Marco Roveri, 29 Terry McGenity, 30 Giuliana Panieri, 31 Riccardo Geletti, 32 Simone Ziegenbalg, 33 Marlies van der Schee, 34 Anna Del Ben, 35 Christian Hübscher, 37 Johanna Lofi, 38 Marcello Natalicchio, 39 Nobu Eguchi, 40 Roger Urgeles, 41 Rachel Flecker, 42 Hayley Allen, 43 Chiara Sauli, 44 Angelo Camerlenghi, 45 Romain Pellen, 46 Diana Ochoa Lozano, 47 Oliver Driussi, 48 Alejandra Lago Cameselle, 49 Arianna Mocnik, 50 Stefano Marabini.*

## Highlights of IODP Proposal #778 Tanzania Offshore Paleoclimate (TOP)

Bridget Wade<sup>1</sup> and Paul N. Pearson<sup>2</sup>

Significant climate perturbations took place during the Cenozoic as the Earth shifted from a greenhouse to an icehouse state, but the history of tropical climate change and the role of declining atmospheric carbon dioxide content ( $pCO_2$ ) is surprisingly poorly known because of a lack of high quality records. The expanded, clay-rich sediments offshore Tanzania are unique in that they possess exceptionally preserved and abundant calcareous microfossils (Figure 1) and organic biomarkers, and are thus ideal for quantitative detailed reconstructions of tropical ocean and terrestrial temperatures,  $pCO_2$ , productivity and hydrology utilising inorganic and organic proxies. The recovery of expanded sedimentary successions rich in microfossils will provide important data on the evolutionary responses to critical climate changes.

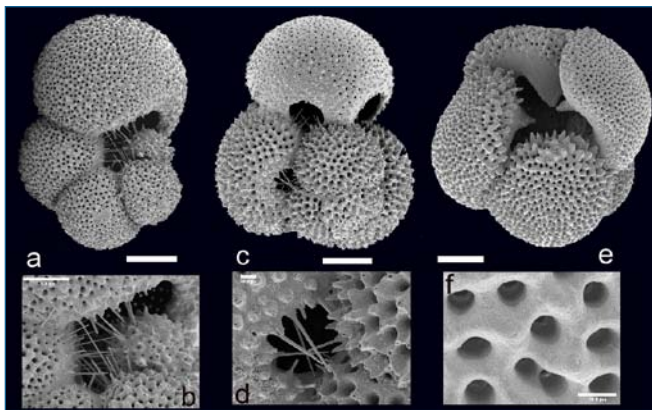


Figure 1: Scanning electron microscope (SEM) images of extremely well-preserved Pliocene planktonic foraminifera recovered from offshore Tanzania during site-survey work in 2009 (GLOW station 22). Specimens are free of overgrowth and infilling, with spines observed in the umbilicus. Scale bars a, c, e = 100 microns; b = 50 microns; d, f = 10 microns. Uniquely, such exquisite preservation characterises the entire Cenozoic of the Tanzania margin.

Our proposed drill sites are also sufficiently close to the African continent to connect marine records with terrestrial vegetation and hydrology changes to hominin evolution.

TOP drill sites were selected after a dedicated seismic survey cruise in which outcropping reflectors on the seafloor were cored to constrain the age succession. Deep reflectors were correlated from offshore to onshore where the Cretaceous and Paleogene crop out and have been intensively sampled by a scientific coring programme over the past decade (e.g. Nicholas et al., 2006). The drill sites are shared between relatively inshore locations, where we expect to recover a thick clay-rich succession, and more offshore locations on the Davie Ridge (Figure 2).

TOP offshore drilling is formally linked to an ongoing proposal to the International Continental Scientific Drilling Program

(ICDP) entitled Tanzania Onshore Palaeoclimate Integrated Coring (TOPIC). That effort will core the Paleogene and possibly Upper Cretaceous where it is most accessible onshore. The two proposals share most of the same scientific aims and will be closely coordinated with one another.

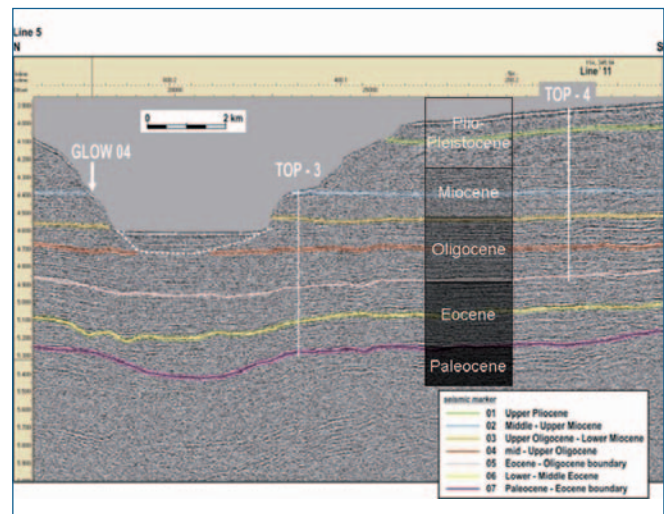


Figure 2: The northern Davie Ridge and Tanzania Channel with interpreted seismics. GLOW 4 = box core; upper Miocene. TOP-3 and TOP-4 target Miocene to Paleocene and Pleistocene to Eocene sediments, respectively.

The drilling will significantly advance the fields of paleoclimate, paleoceanography, plankton evolution, paleoanthropology and regional tectonics. It is expected that IODP drilling offshore Tanzania will transform our understanding of the mechanisms of climate change for the last ~56 million years and will help define variations in tropical and meridional temperatures and evolutionary history in relation to  $pCO_2$  through greenhouse and icehouse climate regimes. These records hold vital information to address transitional climate change, the mechanisms by which extreme climates develop and terminate, and forcing and feedback mechanisms in the ocean-atmosphere system, thus contributing to key scientific objectives of the IODP Science Plan for 2013-2023.

**IODP Proposal #778 Proponents:** B. Wade, C. Nicholas, P. Pearson, D. Kroon, P. Bown, D. Kent, A. Sluijs, R. Pancost, J. Firth, T. Westerhold, P. deMenocal, B. Huber and J. Singano.

<sup>1</sup> University College London - [b.wade@ucl.ac.uk](mailto:b.wade@ucl.ac.uk)

<sup>2</sup> Cardiff University

### Reference

- Nicholas et al. (2006). *J. African Earth Sciences*, 45, 431-466



## Report of ECORD Research Grants

### The petrology and geochemistry of lavas from the western Azores oceanic plateau

Felix Genske<sup>1</sup>

This ECORD-funded project addresses the evolution of the westernmost part of the Azores oceanic plateau (Figure 1), which is located in the central North Atlantic, either side of the Mid-Atlantic Ridge (MAR). Almost all published studies have focused on the eastern Azores islands and the MAR basalts, and only more recently lavas from the western Azores islands have been included to further reconcile the nature of this plateau (Genske et al., 2012; Larrea et al., 2012). This is important because the chemical composition of these lavas holds important information in terms of plume-ridge interaction, or, more generally, constraints as to whether the western plateau is related to the same mantle plume that is believed to be the source of the islands east of the ridge.

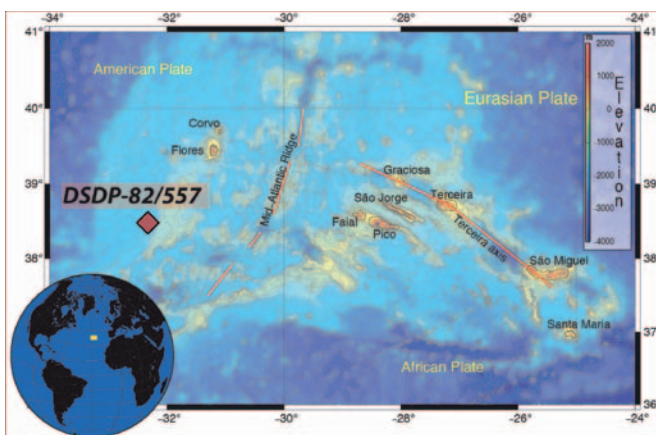


Figure 1: Bathymetric map showing the location of drill hole DSDP-82/557 on the Azores platform. Map generated using GMT.

The data obtained during this project span major and trace elements as well as radiogenic isotope compositions of strontium, neodymium and hafnium that were measured on drilled basalt cores on DSDP82-557, plus cores from a subsided island west of Flores (Ryall et al., 1983) and just off the western Azores plateau (DSDP82-556). Whereas all of the on-plateau submarine basalts are similar in composition to lavas from the western Azores islands (França et al., 2006; Genske et al., 2012; Larrea et al., 2012), the drilled basalts from hole 556 resemble normal MORB crust (Figure 2 - new data are highlighted in red). The actual data will be included and presented in a paper, which is in preparation and will be submitted in 2013.

The preliminary findings from this study confirm the results from onboard major and trace element measurements (Bougault et al., 1985). However, the high-field strength elements, namely Nb, Ta, Zr and Hf, reveal distinct systematics across the entire Azores platform, which require new interpretations regarding the mantle composition and melting dynamics in the Azores region.

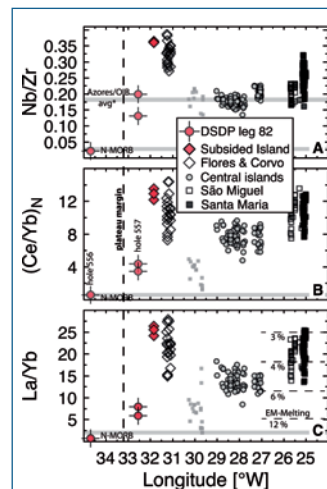


Figure 2: Plots of A) Nb/Zr, B) primitive mantle normalised (Ce/Yb)<sub>N</sub> and C) La/Yb, ratios versus longitude [°W] across the Azores archipelago. The ratios of Nb/Zr (and Ta/Hf, not shown) reveal an asymmetry with highest values and largest variation ascribed to Flores and Corvo lavas. Compositional ranges for typical N-MORB and normal OIB are shown for comparison (Arevalo and McDonough, 2010, and Willbold and Stracke, 2006 respectively).

In line with the radiogenic isotopes we conclude that the local depleted MORB mantle plays an important role for the generation of magmas that erupted during the formation of the Azores oceanic plateau.

From bathymetric constraints, together with chemical differences between drill holes DSDP82-556 and 557, we also conclude that the western boundary of the chemically enriched plateau strikes roughly north-south at longitude -33 degrees W.

The major elements were analysed via XRF at the GeoZentrum Nordbayern/ Germany; all other data were obtained at the Geochemical Analysis Unit (GAU) at Macquarie University, Sydney. The trace elements were determined via solution quadrupole ICP-MS, Sr and Nd isotopes were measured on a Tritium TIMS and the Hf isotopes were analysed on a Nu MC-ICP-MS.

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*Continued from page 21*

Several recent IODP expeditions have focused on testing specific deep biosphere hypotheses, including Expedition 329 South Pacific Gyre (*right*), Expedition 331 Deep Hot Biosphere, Expedition 336 Mid-Atlantic Ridge Microbiology, Expedition 337 Deep Coalbed Biosphere off Shimokita, and the currently-underway Expedition 347 Baltic Sea Paleoenvironment operated by ECORD. Deep biosphere scientists have also been engaged in several other expeditions, as part of the broader scientific goal of the programme. Since the discovery of the deep biosphere through research conducted in the Ocean Drilling Program (ODP), ongoing efforts to assess the size of the deep biosphere suggest that marine sediments harbour a microbial biomass on par with the biomass of the oceans (Kallmeyer et al. 2012). Slowly-metabolising populations continue to exist in extremely carbon-poor sediments deposited tens of millions of years ago (Røy et al. 2012). Advances in analytical capacity have allowed for single cell activity to be determined in deep sediment microorganisms (Morono et al. 2011), for genomes to be constructed from individual cells from sediments (Lloyd et al. 2013), and for analysis of the actively expressed functions used by microbes in the subsurface (Orsi et al. 2013), allowing a better understanding of the metabolic capability of uncultivated species. Direct coupling of stable isotopic signatures of microbial activity with gene expression has also demonstrated active microbial populations in subsurface oceanic crust (Lever et al. 2013). These studies highlight some of the many recent advances in deep biosphere research.

The future of sub-surface biosphere exploration is strong, given a wealth of active early-career researchers and the prominence of research objectives within the new IODP ten-year science plan. During the IODP Deep Biosphere Research workshop, the participants recognised the immediate importance of standardising routine contamination testing of core material, sampling core material at regular intervals for archival storage, and immediately performing cell counts during shipboard operations. The proper collecting, processing and preserving of core material using biologically sensitive techniques was seen as essential to ensure adequate access to samples by both the shipboard and shore-based scientists. Scientists on-board Expedition 347 Baltic Sea Paleoenvironment are currently testing out new microbiological sampling techniques that may be integrated across platforms, enabling new discoveries into the future.

*The authors would like to acknowledge all of the participants in the IODP-MI sponsored workshop for contributing to the ideas expressed in this review.*

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*Tim Engelhardt, microbiologist at the University of Oldenburg, Germany, takes samples in the microbiology lab onboard the JR during Expedition 329 (photo John Beck, IODP/TAMU).*

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## News from ECORD Member countries

### Sweden

**Swedish Membership.** Following negotiations with ECORD, the Swedish Research Council (VR) will contribute 528,000 USD/year to ECORD for membership of IODP for the next five years (2013-2018). In 2017 the VR will decide on its participation for the remaining period. We have the ambition to be an active partner in scientific drilling and aim to engage a wider Swedish community to utilise scientific drilling in their research.

**Expedition 347 Baltic Sea Paleoenvironment.** At the time of writing the first drill cores were being recovered by the technical and scientific crew onboard the *Greatship Manisha* (above). Daily reports provided by Carol Cotterill



*Thomas Andrén (left), Expedition 347 Co-chief Scientist, about to get his hands on and taste (literally) late-glacial clay recovered on the Greatship Manisha. Thomas is being served by Alex Wuelbers (ESO Curator) (photo C. Cotterill © ECORD/IODP).*

(ESO Expedition Project Manager) and less formal communications from the Swedish Co-chief Scientist (Thomas Andrén) indicate that the expedition was proceeding according to schedule, with exceptional core recovery. The

Swedish Quaternary community is eagerly waiting to learn about the recovered cores.

#### Meetings and organisation.

The 32<sup>nd</sup> Nordic Geological Winter Meeting, which will be held in Lund on January 8-10, 2014, will include a session dedicated to (scientific) drilling in the Nordic countries with convenors Henning Lorenz and Ian Snowball.

To increase synergy between Swedish Earth scientists involved in drilling programmes such as IODP and ICDP, a Swedish Scientific Drilling Program has been established - [www.ssdp.se](http://www.ssdp.se).

*Ian Snowball, ESSAC Delegate, and Magnus Friberg, ECORD Council Delegate*  
<http://www.ssdp.se>

### Canada

**Canadian portcall of the JOIDES Resolution.** The Consortium for Ocean Leadership and IODP-Canada were pleased to offer several public tours of the scientific drilling vessel *JOIDES Resolution* (*JR*). The ship was docked at Ogden Point in Victoria, BC, for a maintenance period before embarking on IODP Expeditions 341S to the Cascadia margin and 341 to the Gulf of Alaska.

A total of 5 tours, each lasting about 75 minutes, were held on May 9 and 10, 2013. Tours were led by three knowledgeable guides: Earl Davis (Natural Resources Canada), Kathy

Gillis and Sarah Thornton (University of Victoria) (right)

The tours started near the derrick on the "catwalk," where the 9m cores are first received after being brought up from the seafloor. Participants were given an introduction to IODP and ECORD, and an overview of the *JR*'s impressive drilling and logging capabilities. The groups then viewed many of the scientific areas, including the petrophysics lab, core lab, microscopy/paleontology lab, and chemistry/microbiology lab. Participants also got a feel for what life onboard is like through visits to the galley, gym and lounge/movie room. The tours



finished with a stop at the ship's bridge.

Over 50 people had the unique opportunity to tour this remarkable 143m long ship. Participants included many students, researchers, faculty and staff from local universities and various levels of government.

All participants went home with a bag full of IODP/ECORD/CCOD publications and giveaways.

*Diane Hanano, CCOD Scientific Co-ordinator*  
[coordinator@mail.iodp.canada.ca](mailto:coordinator@mail.iodp.canada.ca)  
<http://www.iodpcanada.ca>

## Spain

IODP-ICDP Spain has launched a new website - <http://www.iodp-icdp.es/> - with news and opportunities for scientists to participate in IODP and ICDP. You can navigate the site in English or Spanish and access beautiful pictures, audiovisual material and links to other ECORD and IODP sites.

IODP-ICDP Spain organised a workshop during the **International Symposium "The Scotia Arc"** held



in Granada, Spain from May 14 to 16, and led by Javier Hernandez-Molina. New IODP drilling proposals in the Arc of Scotia were discussed. IODP presentations were provided by Carlota Escutia, Javier Hernández-Molina and Michael Weber.

Several interviews on national television and radio were given by Carlota Escutia based on the studies



José Abel Flores presents the exhibition *Oceano y Tiempo (Ocean and Time)* at the University of Salamanca. A drill bit from the JOIDES Resolution is seen in the foreground (photo DiCYT).

published in *Nature Geoscience* on July 21, 2013. These studies reveal that the East Antarctic Ice Sheet was very dynamic between 5-3 million years ago, contrary to the belief that it was very stable. This new finding has major implications for the contribution of the East Antarctic Ice Sheet to sea-level change

**Ocean and Time, "History of a Science"** was a scientific exhibit organised by José Abel Flores from

Salamanca University in collaboration with IODP-ICDP Spain (from June 1 to September 29, 2013). The main topics were ocean history, navigation evolution and their influence on humans based on findings from fossil records and marine sediments.

*Mayte Pedrosa, IODP-ICDP Spain Science Co-ordinator*  
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<http://www.iodp-icdp.es/>

## Ireland

The year 2000 saw Ireland, through the Geological Survey of Ireland (GSI), becoming a member of the Ocean Drilling Program (ODP). The Irish involvement was renewed in 2005 by joining the **Integrated Ocean Drilling Program (IODP)** through membership to ECORD. The drillship *JOIDES Resolution* visited Dublin as part of Expedition 307 exploring the Modern Carbonate Mounds in the Porcupine Seabight, the first ODP/IODP expedition to take place entirely in Irish waters. This phase of the programme concludes this year after many expeditions and a significant contribution from Irish-based scientists.

The Irish voyage in this truly international synergy to explore and study the composition and structure of the Earth's sub-seafloor now continues with the launch of the new programme, the International Ocean Discovery Program: *Exploring the Earth under the Sea*.

The Irish national mapping programme, **INFOMAR** - [www.infomar.ie](http://www.infomar.ie) - celebrated its annual seminar this October in the town of Limerick, SW Ireland. The seminar was an excellent opportunity to attract Irish-based researchers into the discovery of the deep oceans secrets.

*Xavier Monteys, ESSAC Delegate, and Koen Verbruggen, ECORD Council Delegate.*



The JOIDES Resolution in Dublin port, readying for IODP Expedition 307 (photo Integrated Ocean Drilling Program).

## Finland

I am Aarno "Ale" Kotilainen, the new ESSAC delegate from Finland. I am a marine geologist and currently employed as a research professor in charge of the "Marine Geology and Global Change" research programme at the Geological Survey of Finland (GTK). I am also teaching marine geology at the University of Helsinki. My research is focusing on marine sedimentation, palaeoclimatology and palaeoceanography. My first contact with the ocean drilling programme was in the early 1990s when I participated in ODP Leg 145, North Pacific Ocean. At present, I belong to the offshore and onshore science party of IODP Expedition 347: Baltic Sea Paleoenvironment.

To get an IODP drilling vessel into the Baltic Sea has been the dream of Baltic Sea geologists for a long time. The

Baltic Sea Paleoenvironment Expedition has special importance for Finland as it is the first expedition into our "home waters" during our membership in IODP.

It is also the first expedition in which Finnish geologists have been involved in its initiation and planning. The expedition will not only increase our knowledge of the evolution of the Baltic Sea basin and its ecosystem, but will also provide excellent opportunities to strengthen circum-Baltic co-operation and to work with top-level scientists around the world. It will also focus the attention of the global geoscientific community on the geological evolution of the Baltic Sea region.

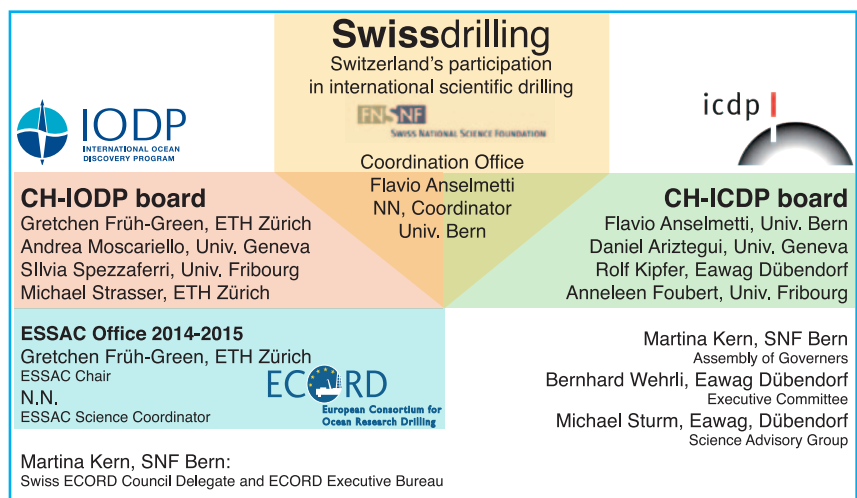
*Aarno Kotilainen, ESSAC Delegate, <http://iodpfinland oulu.fi/>*



*The Finnish offshore-onshore party Outi Hyttinen (University of Helsinki) and Aarno Kotilainen (GTK) onboard the Greatship Manisha during IODP Expedition 347 (© ECORD/IODP).*

## Switzerland

The **Swissdrilling community** has successfully renewed its participation in scientific drilling for the upcoming three years, supported by the Swiss National Science Foundation (SNSF). A new organisational structure has been formed (*right*), with the aim to foster cooperation between the marine (IODP) and the continental (ICDP) scientific communities. A **Swissdrilling Coordination Office** in Bern will be in charge of maintaining the **swissdrilling.ch** website, organising an annual Swissdrilling Conference, managing travel expenses for IODP-ICDP related activities, and maintaining exchange of ongoing drilling information (through website and mailing) and contact to SNSF. Two IODP and ICDP boards will be responsible for informing the community of upcoming opportunities and actively promoting Swiss participation in IODP and ICDP proposals and future expeditions or projects. The two boards will also be responsible for compiling activity



updates for annual SNSF reports and providing research perspectives for future membership proposals.

As the new IODP starts, **Judith McKenzie** will step down as alternate Swiss delegate to ESSAC, and thus wind down a long career of leading Swiss participation in ocean drilling that began with the start of ODP in 1983. The Swissdrilling community

would like to sincerely thank Judy for her tremendous efforts, her constant enthusiasm and her leadership. With the new structure and new participants, we hope to keep the momentum that Judy's many years of involvement has brought to Swissdrilling and to IODP/ECORD in particular.

*Gretchen Früh-Green, ESSAC Vice-Chair - <http://www.swissiodp.ethz.ch>*

## United Kingdom

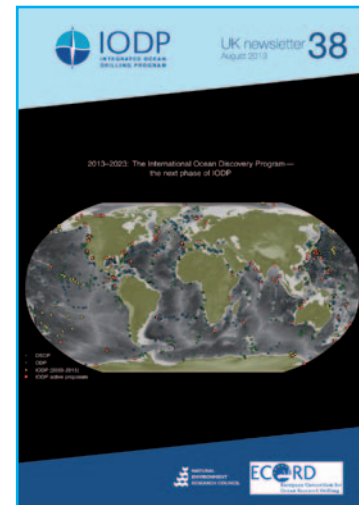
An important UK development over the last six months was the successful renewal of the domestic IODP programme, **UK-IODP**, which supports UK scientists participating in IODP-related science. Commensurate with the renewal of the international programme, the next phase of UK-IODP began on October 1, and will run through to September 2018, at which time the programme will be reviewed.

An important element of the new programme will be the '**Moratorium Awards**', which provide post-cruise funding for UK-based scientists participating in IODP expeditions. The funding level is dependent on career stage: PhD students - £25,000; Post-doctoral researchers - £50,000; Tenured scientists - £25,000. This increase in post-cruise funding will ensure that scientists can take full advantage of the research opportunities afforded by participation in IODP.

UK-IODP is supporting an upcoming (November 18-19) conference on '**Micropalaeontology and the IODP: Past, Present and Future Applications**' hosted by the **Micropalaeontological Society (TMS)** - <http://www.tmsoc.org/agm2013.htm>. We have also funded five 'Rapid Response Grants' over the last six months, supporting preliminary analysis on topics ranging from reconstructing North-East palaeoceanography through the Pliocene and Pleistocene, to assessing isotopic alteration of the oceanic crust at Hess Deep.

We have recently published our own **UK-IODP newsletter** (*right*) which includes a number of expedition and scientific highlights over the past year, workshop reports, and IODP news - <http://www.bgs.ac.uk/iodp/newsletters.html>.

Finally, we welcome **Damon Teagle** of the University of Southampton as the new Chair of the UK-IODP Program Advisory Group, and thank



the outgoing Chair, **Mike Bickle** of Cambridge University, for his over 10 years of insightful contribution and service.

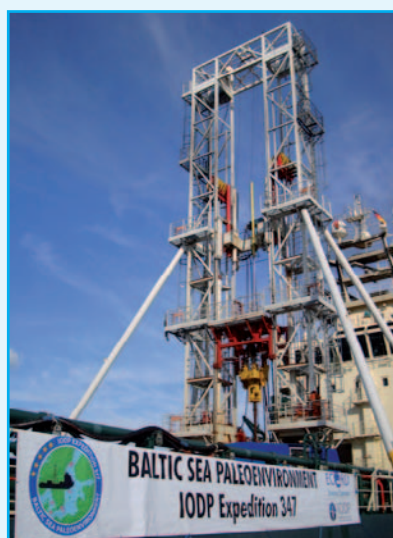
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*UK-IODP -Funding Agency:* <http://www.nerc.ac.uk/research/programmes/ukiodp/>

## Poland

The Polish Geological Institute - National Research Institute (PGI -NRI) is keeping track of the course of the **IODP Baltic Sea Paleoenvironment Expedition** with interest. Our specialist in the field of palynology, Wojciech Granoszewski, is a member of the science party, and is preparing for the Onshore Science Party in Bremen.

An initiative to create a new COST Action supporting the Baltic Sea Paleoenvironment Expedition is in progress. The proposed COST Action has the working name "Baltic



*The Greatship Manisha, drillship of the Baltic Sea Paleoenvironment Expedition (photo D. Smith © ECORD/IODP).*

Sea Paleoenvironment during the Last Glacial Cycle". The PGI - NRI has a leading role in this project gathering institutions from Poland, Sweden, Lithuania, Estonia, Finland, Denmark, Germany, Latvia and Norway. The first attempt to obtain funding failed and a second proposal was submitted on September 24, 2013, which has passed the first general verification. Full evaluation of the proposal and invitation to submit a full application will be announced on November 22, 2013.

*Szymon Uścińowicz, ESSAC Delegate, Piotr Przedzdiecki, ESSAC Alternate and Jerzy Nawrocki, ECORD Council Delegate.*

## Israel

### ECORD membership.

Israel is joining ECORD for the upcoming three years, within the framework of the Mediterranean Sea Research Center of Israel (MERCi). MERCi is a consortium of six universities and two governmental research institutes, headed by the University of Haifa. MERCi aims at addressing an unprecedented array of scientific,

technological, security and environmental challenges related to offshore research in the Eastern Mediterranean.

### ECORD delegates.

The Israeli delegate for the ECORD Council is **Prof. Zvi Ben-Avraham**, (*above left*) Head of MERCi and the Founding Director of the Leon H. Charney School of Marine Sciences at the University of Haifa. Zvi is also the Director of the Minerva Dead Sea



Research Center at Tel Aviv University.

The Israeli delegate for ESSAC is **Dr. Nicolas Waldmann** (*above right*) from the Dr. Moses Strauss Department of Marine Geosciences at



the Leon H. Charney School of Marine Sciences, University of Haifa.

*Nicolas Waldmann, ESSAC Delegate - [nwaldmann@univ.haifa.ac.il](mailto:nwaldmann@univ.haifa.ac.il)*

## Norway

### Norwegian participation in the International Ocean Discovery Program is renewed.

The Research Council of Norway (RCN), through the board of science division, have renewed Norway's membership of the IODP for a five-year period until September 30, 2018. Norway's financial contribution is at the same level as the previous programme, 1.1 million USD per year.

The prioritisation of Arctic exploration, climate change, geohazards and natural resources research themes in the new programme align with Norwegian research priorities. The opportunity to use mission-specific platforms, with smaller equipment and rigs than the drillships, allows more flexibility for studies in a wider range of environments that are of interest to Norwegian IODP researchers. The RCN therefore expect

renewed and increased participation from Norwegian geoscientists in the new IODP collaboration. Norwegian membership after September 30, 2018, will be evaluated in light of our engagement in the programme during the 5-year period that started on October 1.

### Norwegian delegates to the ECORD Science Support and Advisory Committee.

The RCN have nominated Helga (Kikki) Kleiven (*above*) from the University of Bergen as the Norwegian ESSAC delegate and Katrine Husum from the University of Tromsø as the Norwegian alternate. Both are researchers in the fields of marine geology and paleoceanography, and both have contributed and participated actively in ODP/IODP



*From right to left, K. Kleiven (Norway), M. Chen (Taiwan) and R. Herrera (Peru) onboard the JOIDES Resolution during ODP Leg 202 (photo ODP).*

collaboration over many years, and on several cruises.

We look forward to boldly drill where no man or woman has ever drilled before!

*Øyvind Pettersen, (Council Delegate), Kikki Kleiven (ESSAC Delegate) and Katrine Husum (ESSAC Alternate)*



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Thanks to all authors and contributors who helped us to prepare this issue. *The cover photograph shows the derrick and drill rig of the Greatship Manisha lit up during night-time operations of the Baltic Sea Paleoenvironment Expedition (photo C. Cotterill © ECORD/IODP).*