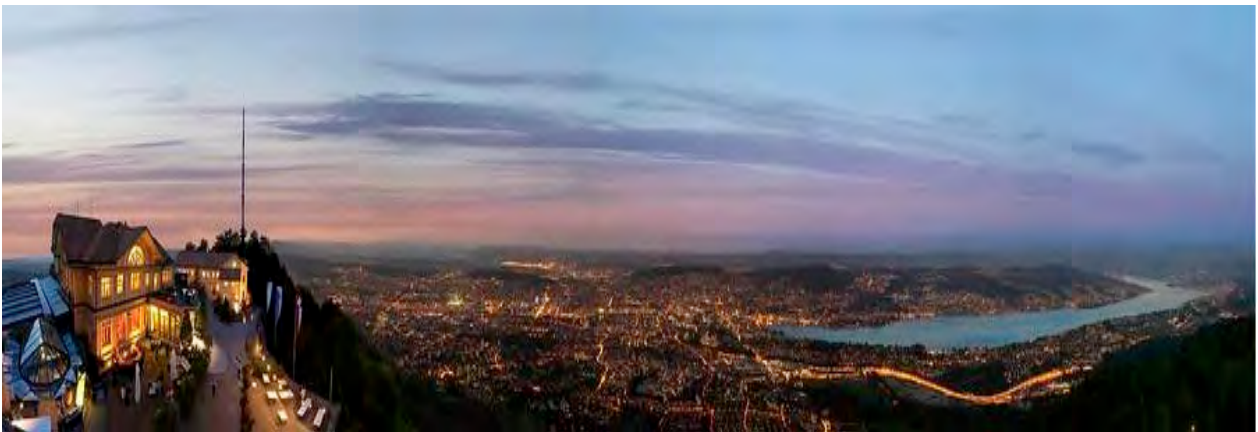


**15<sup>th</sup> Meeting of the  
ECORD Science Support & Advisory Committee  
ESSAC**

26<sup>th</sup> and 27<sup>th</sup> October 2010,  
Hotel Uto Kulm  
Zurich, Switzerland



# **Agenda of the 15<sup>th</sup> ESSAC Meeting**

26<sup>th</sup> and 27<sup>th</sup> October 2010, Zurich, Switzerland

**Monday 25<sup>th</sup> October** : field trip to the Jura Mountains (Leader: Prof. Dr. Helmut Weissert, ETH Zurich)

**Tuesday 26<sup>th</sup> October, 9:00– 18:00 h**

*Coffee break 10:30-11:00 – Lunch break 12:30-13:30 – Coffee break 15:30-16:00*

**1. Introduction**

- 1.1 Call to order, introductions (Stein) (5')
- 1.2 Welcome and meeting logistics (McKenzie) (5')
- 1.3 Discussion and approval of the Agenda (Stein) (5')
- 1.4 Items since the 14<sup>th</sup> ESSAC Meeting/ESSAC Office news (Stein/Lezius) (20')

**2. IODP News**

- 2.1 Lead Agencies, SASEC, ECORD Council and IWG+ (Mével) (20')
- 2.2 New Science Plan: updates (Mével) (10')
- 2.3 Science Steering Evaluation Panel (SSEP) (Stein) (15')
- 2.4 Science Planning Committee (SPC), Operation Task Force (OTF) and Program Member Offices (PMO) (Stein) (45')
- 2.5 Outreach Co-ordination Group (Stevenson) (10')

**3. ECORD News**

- 3.1 EMA - ECORD Council (Mével) (20')
- 3.2 ECORD evaluation committee (Mével) (20')
- 3.2 ESO (Stevenson) (20')
- 3.3 IODP Future Program Naming Workshop (Maruéjol) (10')
- 3.4 EMA-ESO-ESSAC (Maruéjol) (5')
- 3.5 ECORD Publications
  - 3.5.1 ECORD Newsletter #15 (Maruéjol) (5')
- 3.6 ESSAC Office News: information about budget and subcommittee structure (Stein) (10')
- 3.7 ESSAC representatives and National Office reports (ESSAC Delegates) (45')

**4. Nominations and Staffing**

- 4.1 Staffing (Stein) (30')
  - 4.1.1 Updates on expedition staffing: Juan de Fuca (327), CORK (328), South Pacific Gyre (329), Louisville (330), Deep Hot Biosphere (331), Riserless Observatory (332), Inputs Coring & Heat Flow (333), CRISP (334), Superfast (335), Mid-Atlantic Microbiology (336)
  - 4.1.2 Nomination of co-chiefs
- 4.2 SAS panel nominations/changes (Stein) (30')

**5. Breakout sessions**

**ESSAC Subcommittees**

(90')

**17:00** Dr. Adrian Gilli, Geological Institute, ETH-Zürich

*"The Alps, glaciations and human history: The 'Top-of-Zurich' perspective"*

*(short walk with overlook (if weather permits) followed by lecture)*

*pre-dinner apéro*

**19:30** *Special Raclette/Mixed Grill Dinner*

**Wednesday 27<sup>th</sup> October 2009, 9:00– 18:00 h**

*Coffee break 10:30-11:00 – Lunch break 12:30-13:30 – Coffee break 15:30-16:00*

**6. ECORD Highlights**

**6.1 ECORD Highlight (1): Superfast Spreading Rate Crust Program** (Teagle) (45')

**6.2 ECORD Highlight (2): Climate and Societies** (Haug) (45')

**7. Education and outreach**

**7.1 ECORD Summer Schools (Reports)**

7.1.1 Urbino Summer School in Paleoclimatology, (15')  
Urbino, July 2010 (Lourens)

7.1.2 ECORD/IODP Canada Summer School on Ocean and climate changes in (15')  
polar and subpolar environments, Montreal, June/July 2010 (Banerjee)

7.1.3 ECORD Summer School on Dynamics of Past Climate Changes, Bremen, (15')  
September 2010 (Lezius)

**7.2 ECORD Grants and scholarships** (Lezius) (5')

**7.3 Distinguished Lecturer Programme 2010 update** (Lezius) (5')

**7.4 School of Rock 2010 & Expedition 327 outreach activities** (Lezius) (5')

**8. Reports of ESSAC subcommittees and discussion** (60')

**9. Workshop Reports**

**9.1 ESF Magellan Programme: Present and Future** (Erbacher) (20')

**9.2 Joint IODP/ICDP session at the EGU 2011 in Vienna** (Stein) (5')

**10. Review of consensus, motions and actions** (Stein) (15')

**11. Next meetings**

**11.1 ESSAC #16, May 2011, Leuven, Belgium** (Foubert) (10')

**11.2 ESSAC #17/ESSAC #18, October 2011/May 2012** (Monteys, Seidenkrantz) (10')

**12. Any Other Business** (Stein)

## **List of Participants**

### **ESSAC Office**

**Ruediger Stein (Chair)**

**Jeannette Lezius**

ESSAC Delegate Germany

ESSAC Science Coordinator

### **ESSAC Representatives**

**Neil Banerjee**

**Georges Ceulener**

**Carlota Escutia**

**Anneleen Foubert**

**Rachael James**

**Helga Kleiven**

**Lucas Lourens**

**Xavier Monteys**

**Judith McKenzie (meeting host)**

**Werner Piller**

**Marit Solveig Seidenkrantz**

**Ian Snowball**

**Kari Strand**

**Paola Tartarotti**

**Antje Voelker**

ESSAC Delegate Canada

ESSAC Alternate France

ESSAC Delegate Spain

ESSAC Alternate Belgium

ESSAC Delegate UK

ESSAC Alternate Norway

ESSAC Delegate Netherlands

ESSAC Delegate Ireland

ESSAC Delegate Switzerland

ESSAC Delegate Austria

ESSAC Delegate Denmark

ESSAC Delegate Sweden

ESSAC Delegate Finland

ESSAC representative Italy

ESSAC Delegate Portugal

### **Observers/Guests**

**Menchu Comas**

**Jochen Erbacher**

**Gerald Haug**

**Patricia Maruéjol**

**Catherine Mével**

**Alan Stevenson**

**Damon Teagle**

**Helmut Weissert**

IODP-Spain Scientific Committee

ESF Magellan Workshops

ETH Zurich

EMA

EMA

ESO

co-chief Superfast

ESSAC Alternate Switzerland

Apologies

**Serge Berné**

**Bryndís Brandsdóttir**

**Elisabetta Erba**

**Nalan Koc**

**Rudy Swennen**

ESSAC Delegate France

ESSAC Delegate Iceland

ESSAC Delegate Italy

ESSAC Delegate Norway

ESSAC Delegate Belgium

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3. Science Planning Committee (SPC) executive summary
4. Urbino Summer School on Paleoclimatology 2010 Report
5. ECORD Summer School on Dynamics of Past Climate Changes Bremen Report
6. ECORD/IODP-Canada Summer School on Ocean and climate changes in polar and subpolar environments information
7. COST Program Proposal for Workshops on Scientific Drilling (Magellan Plus Workshop Series)

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## ESSAC Terms of References

ACEX	Arctic Coring Expedition (Expedition 302)
APLACON	Alternative Platform Conference (Lisbon, May 2001)
AF	Academy of Finland
BCR	Bremen Core Repository
BGS	British Geological Survey (UK)
BoG	IODP-MI Board of Governors
CDC	Conceptual Design Committee (new riser vessel)
CDEX	Center for Deep Earth EXploration (Japan)
CoNISMa	Consorzio Nazionale Interuniversitario per le Scienze del Mare (Italy)
CDP	Complex Drilling Project
CNR	Consiglio Nazionale delle Ricerche (Italy)
CNRS	Centre National de la Recherche Scientifique (France)
DASTI	Danish Agency for Science, Technology and Innovation
DFG	Deutsche Forschungsgemeinschaft (German Research Foundation)
EC	European Commission
ECORD	European Consortium for Ocean Research Drilling
EDP	Engineering Development Panel
EPC	European Petrophysics Consortium
EMA	ECORD Managing Agency
ERA-Net	European Research Area Network
ESF	European Science Foundation
EPSP	Environmental Protection & Safety Panel
ESO	ECORD Science Operator
ESSAC	ECORD Science Support and Advisory Committee
FWO-Vlaanderen	Fund for Scientific Research-Flanders (Belgium)
FWF	Austrian Science Fund
GRICES	Gabineta de Relacoes Internacionais da Ciencias e do Ensino Superior (Portugal)
GSI	The Geological Survey of Ireland
ICDP	International Continental Scientific Drilling Project
IIS-PPG	Industry IODP Science Program Planning Group
INGV	Istituto Nazionale di Geofisica e Vulcanologia (Italy)
INSU	Institut National des Sciences de l'Univers (France)
IOs	Implementing Organisations
IODP	Integrated Ocean Drilling Program
IODP-MI	IODP Management International, Inc.
ISP	Initial Science Plan for the IODP
JAMSTEC	Japan Marine Science & TEchnology Center
J-DESC	Japanese Earth Drilling Science Consortium
JEODI	Joint European Ocean Drilling Initiative
JOI	Joint Oceanographic Institutions
JR	JOIDES Resolution
LDEO	Lamont Doherty Earth Observatory
MEC	Ministerio de Educacion y Ciencia Y (Spain)
MEXT	Ministry of Education, Culture, Sports, Science & Technology (Japan)
MoU	Memorandum of Understanding
MOST	People's Republic of China Ministry Of Science and Technology

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<b>MSP</b>	<b>Mission-specific platform</b>
<b>NanTroSEIZE</b>	<b>Nankai Trough SEIsmogenic Zone Experiment</b>
<b>NCMR</b>	<b>National Center for Marine Research (Greece)</b>
<b>NERC</b>	<b>Natural Environment Research Council (UK)</b>
<b>NSF</b>	<b>National Science Foundation (USA)</b>
<b>NWO</b>	<b>Netherlands Organisation for Scientific Research</b>
<b>OD21</b>	<b>Ocean Drilling in the 21st Century (Japan)</b>
<b>ODP</b>	<b>Ocean Drilling Program</b>
<b>OEAW</b>	<b>Austrian Academy of Sciences</b>
<b>OGS</b>	<b>Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (Italy)</b>
<b>RANNIS</b>	<b>The Icelandic Centre for Research</b>
<b>SAS</b>	<b>Science Advisory Structure</b>
<b>SASEC</b>	<b>Science Advisory Structure Executive Committee</b>
<b>SciMP</b>	<b>Scientific Measurements Panel</b>
<b>SNF</b>	<b>Swiss National Science Foundation</b>
<b>SODV</b>	<b>Scientific Ocean Drilling Vessel</b>
<b>SPC</b>	<b>Science Planning Committee</b>
<b>SSEP</b>	<b>Science Steering &amp; Evaluation Panel</b>
<b>SSP</b>	<b>Site Survey Panel</b>
<b>STP</b>	<b>Site Technology Panel</b>
<b>TAMU</b>	<b>Texas A &amp; M University</b>
<b>ToR</b>	<b>Terms of Reference</b>
<b>USSAC</b>	<b>United States Science Advisory Committee</b>
<b>USSSP</b>	<b>United States Science Support Program</b>
<b>UVic</b>	<b>University of Victoria (Canada)</b>
<b>VR</b>	<b>Swedish Research Council</b>



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## **1. Introduction**

### **1.1 Letter from the Chair**

Dear ESSAC Delegates, ESSAC alternates, and attendees of the 15th ESSAC Meeting,

since one year, the ESSAC Office is now located at the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven, Germany - already half-time of our office work here at AWI!! As the ESSAC Chair, I can say that all office activities are running very well. Special thanks to Jenny, our very active and well-organized Science Coordinator! What happened since this 14th ESSAC Meeting in Tromsø?

Over the last months, we issued calls for six expeditions: Expedition 331 - Deep Hot Biosphere, Expedition 332 - Riserless Observatory -2, Expedition 333 - Inputs Coring 2 & Heat Flow, all with Chikyu, and Expedition 334 - Costa Rica Seismogenesis Project (CRISP), Expedition 335 - Superfast Crust 4, Expedition 336 - Mid-Atlantic Microbiology, all with JOIDES Resolution. IOs have completed staffing for expeditions 331 and 332, for expeditions 333 and 334 a short-term call had been issued. ESSAC has completed the selection of ECORD scientist for expeditions 335 and 336, and the staffing is in process yet. More information about the scientific objectives, precise dates, and official notification of all these expeditions can be found in the table (below) and on the IODP website at: <http://www.iodp.org/expeditions/>.

Within the Science Advisory Structure (SAS), several changes took place: Neal Watson (UK) has been nominated as new ECORD EDP member, replacing John Thorogood (UK) who rotated off. Peter Clift (UK) is the new ECORD member within STP, replacing Neil Mitchell (UK) who rotated off. Within STP, Georges Gorin (Switzerland) rotated off, Douglas Schmitt (Canada) is now upcoming vice-chair, and Nathalie Vigier (France) is new ECORD member. Hugh Jenkyns (UK) and Gilbert Camoin (France) rotated off the SPC replaced by Heiko Pälike (UK) and Javier Escartin (France). Michael Enachescu (Canada) resigned from EPSP and is replaced by Martin Hovland (Norway). The ECORD Council has already approved these changes.

Deep Earth Academy, teaching initiative of the US Consortium for Ocean Leadership, has just completed the 2010 School of Rock, which took place onboard the JOIDES Resolution during IODP Expedition 328 - Cascadia ACORK. Two teachers from ECORD took part in this event. Further information available on the website of the Consortium for Ocean Leadership: <http://www.oceanleadership.org/education/deep-earth-academy/educators/school-of-rock/2010-school-of-rock/>.

The second phase of the ECORD Distinguished Lecturer Programme 2008-2010 ended. The series has been very successful with a total of 46 talks in 12 ECORD and non-ECORD countries by the 2008-2010 lecturers Peter Clift, Achim Kopf and John Parkes. At its spring meeting, ESSAC elected Kai-Uwe Hinrichs (MARUM, University of Bremen, Germany, "Benthic archaea - the unseen majority with importance to the global carbon cycle revealed by IODP drilling"), Dominique Weis (PCIGR, University of British Columbia, Canada, "What do we know about mantle plumes and what more can we learn by IODP drilling?") and Helmut Weissert (ETH Zurich, Switzerland, "Carbon

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cycle, oceans and climate in the Cretaceous: lessons from Ocean Drilling (DSDP to IODP) and from records on continents”) to be the 2010-2012 ECORD Distinguished Lecturer. Although the deadline for the first call to host a lecture already passed, ECORD still invites colleges, university or non-profit organisations in ALL European countries (and Canada) to apply via electronical mail to [essac.office@awi.de](mailto:essac.office@awi.de). Applications from non-traditional IODP and ECORD audiences within the European Community are especially welcome.

In 2010, three Summer Schools were funded by ECORD: · Ocean and climate changes in polar and subpolar environments, Montréal, Canada (June 27 – July 12) · Dynamics of Past Climate Changes, Bremen, Germany (September 09-24) · The Urbino Summer School in Paleoclimatology-Past Global Change Reconstruction & Modelling Techniques, Urbino, Italy (July 09-29). ECORD provided scholarships to allow young scientists to attend one of the ECORD Summer Schools 2010. Among 44 applicants for ECORD Scholarships, ESSAC decided to fund 15 students from ECORD and Non-ECORD countries with amounts between 500 and 1500 €. ECORD sponsored merit-based awards for outstanding graduate students to conduct research related to the Integrated Ocean Drilling Program. ESSAC received high qualified applications, whereof 5 young researchers have been awarded an ECORD Research Grants of around 2000 € each to cover travel and lab expenses.

Within the ESF Magellan workshop series the workshop “Volcanic basins: scientific, economic and environmental aspects” took place (May 07-10, 2010; Convenor: Nicholas Arndt). A call for future ESF Magellan workshop proposals is open with deadline November 15, 2010: <http://www.esf.org/magellan>.

During the EGU 2011 in Vienna, we will organize a special Interdivision Session dealing with major achievements and perspectives in ocean and continental drilling. Details including deadlines are available on: <http://meetingorganizer.copernicus.org/EGU2011/session/6436>.

Finally, I would like to thank all the ESSAC delegates and the other IODP/ECORD bodies for active cooperation during the last months. As already stated last time, such a constructive and efficient cooperation between all of us is so important for the planning phase of the new post-2013 scientific drilling program. Discussions and input for the future of IODP are needed now!

I warmly thank Judy McKenzie for hosting the 15th ESSAC Meeting in Zurich and for her efforts for the outstanding arrangements made for that meeting.

I wish you a successful and pleasant meeting.

Ruediger (Rudy) Stein

Bremerhaven, October 08, 2010

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## 1.2 Welcome and meeting logistics of the 15<sup>th</sup> ESSAC Meeting in Zurich, Switzerland

### November 03 to 04, 2009

#### **Practical Information**

To reach the Hotel Uto Kulm from Zurich airport, take one of the frequent trains into the Main Train Station (Hauptbahnhof). The way to the airport train station is well marked after you pass through arrivals. From the Main Train Station, take Train S10 from Track 2 to the end station Uetliberg. The train leaves every 30 minutes (or every 20 minutes on Saturday and Sunday) and arrives at the end station in 20 minutes. From the end station, it is a pleasant walk (uphill) to the Hotel Uto Kulm. Consider buying a train ticket from the airport to Uetliberg at the airport. You can check exact connections from the airport to Uetliberg using the timetable given at:

<http://www.utokulm.ch/en/getting-here/>.

For those arriving either on 24 or 25 October, no arrangements have been made for dinner on these evenings. A restaurant and bar are available at the hotel, but you may wish to spend your free evening in one of the local restaurants down in Zurich. Group dinners will be arranged for us at the Hotel Uto Kulm for the evenings of 26 and 27 October. In particular, the Swiss SNF/ECORD hosted social event will be a Special Raclette/Mixed Grill Dinner on 26 October.

For more information about the Hotel Uto Kulm and facilities, please check the following web site <http://www.utokulm.ch/en/home/>.

#### **Hotel's Address:**

Hotel UTO KULM AG  
8143 Uetliberg/Zürich  
T +41 (0)44 457 66 66  
F +41 (0)44 457 66 99  
[info@utokulm.ch](mailto:info@utokulm.ch)

For further assistance regarding administrative and logistical matters, please contact:

#### **Meeting Host**

Judith McKenzie  
Geologisches Institut  
Sonneggstrasse 5  
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### 1.3 Discussion and approval of the Agenda

At the meeting in Zurich, Switzerland, R. Stein will present the current agenda and highlight potential challenges of the meeting and/or changes of the agenda.

### 1.4 Items since the 14<sup>th</sup> ESSAC Meeting and ESSAC Office news

R. Stein will present items since the last ESSAC meeting. The list down-below contains the actions items, which arose since the 14<sup>th</sup> ESSAC meeting in Tromsø, Norway (May 26-28, 2010) and that have been accomplished by the ESSAC Office or other persons in charge (ESSAC delegates, subcommittee members or observers) since then (labelled with “**Done**”).

Action items not fulfilled yet, have been labelled by “**in progress**”.

The full list of action items, consensuses and motions are given in the executive summary (appendix 1).

> **ESSAC Action Item 1005-01:** The ESSAC Office will forward late nominations for South Pacific Gyre Expedition to USIO: 1st priority: Nathalie Dubois (UK), alternates: Cecily Chung (UK), Victoria Rennie (UK).

*done*

> **ESSAC Action Item 1005-02:** The ESSAC Office will contact IODP-MI and ask for status of Co-chief nomination for the Mediterranean Outflow expedition (644).

*done*

> **ESSAC Action Item 1005-04:** The ESSAC Office will contact Gretchen Frueh-Green to ask her if she is willing to stay within the SPC for one more meeting.

*done*

> **ESSAC Action Item 1005-05:** The ESSAC Office will send a letter to all alternates to ask them if they are willing to stay as an alternate. If they will stay in the pool of alternates they have to agree being an “active” alternate, i.e., being informed about the current activities of the specific SAS panel.

*in progress – new SAS structure*

> **ESSAC Action Item 1005-06:** The ESSAC Office will send a letter to those who rotated off during the last month and for those rotating off in the near future, asking them if they are willing to become an alternate for one or two more years.

*in progress – new SAS structure*

> **ESSAC Action Item 1005-07:** ESSAC Office will create a form for a standardized 1-page max CV for applications of scholarships.

*done*

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> **ESSAC Action Item 1005-08:** ESSAC Office will include in future calls for ECORD Research Grants a statement that a detailed budget plan has to be outlined in the application.

*Ok/done*

> **ESSAC Action Item 1005-09:** ESSAC Office will send out a letter to Jean-Luc Berenguer concerning his idea about an “ECORD School of Rock” (Teacher’s Workshop) and provide him guidance and contact to Eve Arnold, Carlo Laj and Consortium of Ocean Leadership.

*done*

> **ESSAC Action Item 1005-10:** ESSAC Office will send out a letter to previous lecturers of the DLP to ask for comments and experiences within this programme. ESSAC will also thank them for their efforts and collaboration.

*done*

> **ESSAC Action Item 1005-11:** ESSAC Office will send out a letter to new lecturers of the DLP with conditions and advices for their contribution to the programme.

*done*

> **ESSAC Action Item 1005-12:** ESSAC Office will send out a Call to host a lecture of the new DLP.

*done*

> **ESSAC Action Item 1005-13:** ESSAC Office will forward the list of possible candidates for the Joint IODP/ICDP Program Planning Group- climates & human evolution to SPC.

*done*

> **ESSAC Action Items:** Calls has been issued for Expedition 332 (deadline July 15, 2010) and Expedition 333 (deadline July 19, 2010). Short-term calls has been issued for Expedition 331 (expertise in sedimentology, physical properties, petrology; deadline July 15) Expedition 333 (expertise in micropaleontology (nannos), organic geochemistry, paleomagnetism; deadline September 28) and Expedition 334 (expertise in micropaleontology (nannos, forams, diatoms), organic geochemistry; October 07). A call with extended deadline has been issued for School of Rock (deadline June 02, 2010). A first call to host a lecture had been issued (deadline September 30) → it is still possible to apply via electronical mail.

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## **2. IODP News**

### **2.1 Lead Agencies, SASEC, ECORD Council and IWG+**

C. Mével will give a summary about the latest news regarding lead agencies and implementing organizations activities.

### **2.2 New Science Plan: updates**

C. Mével will present some updates about the New Science Plan

### **2.3 Science Steering Evaluation Panel – SSEP**

R. Stein will present a summary of the 14<sup>th</sup> SSEP meeting that took place in the “Kochi City Culture Plaza”, Kochi, Japan, from May 18<sup>th</sup> to 20<sup>th</sup>, 2010. The draft minutes (v1) are given in appendix 2.

### **2.4 Science Planning Committee – SPC, Operation Task Force – OTF, and Program Member Offices - PMO**

R. Stein will present a summary of the 16<sup>th</sup> SPC meeting, incl. OTF and PMO meeting that took place in La Jolla, San Diego, CA, USA, from August 30<sup>th</sup> to September 1<sup>st</sup>, 2010. The executive summary (v1.0) is presented in appendix 3.

### **2.5 Outreach Co-ordination Group**

A. Stevenson will give a summary about the meeting of the Outreach Co-ordination Group, held at IODP-Mi office in Tokyo on September 14<sup>th</sup> – 15<sup>th</sup>, 2010.

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### **3. ECORD News**

#### **3.1 EMA - ECORD Council**

C. Mével will give a summary about the latest news regarding EMA and ECORD Council activities.

#### **3.2 ECORD evaluation committee**

C. Mével will give a presentation about the ECORD evaluation.

#### **3.3 ESO**

A. Stevenson will give a summary about the latest news regarding ESO activities

ESO Report by David McInroy (ESO Science Manager) and Alan Stevenson (ESO Outreach Manager):

#### ***Great Barrier Reef Environmental Changes - Expedition #325***

Since the last ESSAC meeting in Tromsø, the Great Barrier Reef Environmental Changes expedition has been carried out at the Bremen Core Repository from 2-16 July 2010. The summary statistics for the expedition are:

Number of sites 29

Number of holes 34

Number of cores 420

Drilled length 759.34 m

Recovered length 225.22 m

Average core recovery 30 %

Duration 55 days

Deepest penetration 46.4 mbsf

Number of holes logged 4

Although the recovery was less than expected (c.f. 57.5% for Expedition 310 Tahiti, which had slightly different lithologies, i.e. higher portion of microbialites), some impressive cores were recovered, including continuous massive coral frameworks characteristic of very high energy and shallow environments (probably <5 m paleowater depth), ideal for sea level reconstruction. The results from the Science Party are positive – important and exciting sections have been recovered. The Expedition 325 Preliminary Report, which includes a preliminary scientific assessment, was published online on 30th August. The 1st Post-expedition Meeting (editorial meeting) is scheduled for 7th-11th December 2011.

#### ***New Jersey Shallow Shelf - Expedition #313***

Expedition 313 is currently 10 months into the moratorium period with the Science Party conducting their post-Expedition research. The Expedition Report editorial meeting was held at TAMU, College Station, Texas 3rd-7th June. Peer-reviewed papers from Expedition 313 are not expected for several months.

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## ***Other***

There are currently 3 MSP proposals at OTF and 2 at SPC. ESO has been directed by ECORD to aim to implement one MSP Expedition before the end of the program. ESO is currently scoping 2 proposals in parallel: Proposal 716 Hawaiian Drowned Reefs and Proposal 548 Chixculub K-T Impact Crater. At their March 2011 Meeting, the SPC will take advice from ESO and decide which of the scheduled MSPs, including any proposals forwarded to OTF at that meeting, should take priority. The feasibility of implementing either Hawaii or Chixculub will depend on platform costs and availability (currently unknown) and permitting (in progress). ESO aim to implement the chosen Expedition in FY2013.

### **3.3 to 3.5 ECORD Outreach Activities**

P. Maruéjol will report on the ECORD outreach activities from June to December 2010 as discussed at the last EMA-ESO-ESSAC (ECORD Outreach) meeting held in Bremerhaven on August 24-25, 2010. The meeting was attended by A. Stevenson and A. Gerdes (ESO), Jenny Lezius and R. Stein (hosts/ESSAC), C. Mével, M. Benchikh and P. Maruéjol (EMA).

#### ***1) New/revised ECORD publications***

ECORD Newsletter #15 - late October 2010, 20-page issue distributed as printed copies and available on-line - HYPERLINK "<http://www.ecord.org/pub/nl.html>".

The 15th issue comprises ECORD information from mid-May to October 2010 with news and updates from the ECORD Council, EMA, ESO, ESSAC and ECORD Outreach, reports on ECORD Summer Schools 2010 and Magellan Series Workshop an meeting, 'A Letter from the Netherlands' (L. Lourens, J. Stuefer and H. Brinkhuis), a presentation of the Kochi Core Centre (L. Gupta) and an article about the Aurora Borealis as a potential "tool" for the new program (B. Wolff-Boenisch).

The next issue - ECORD Newsletter #16 to be released early April 2011 at EGU will be prepared during the next EMA-ESO-ESSAC meeting in Paris and assembled with the following deadlines:

Call for contributions - to be issued early February 2011,

Author's deadline - March 8, 2011.

The following items have been identified:

'A Letter from Switzerland' by J. McKenzie, G. Früh-Green and M. Kern-Lütschg

The future of Magellan Workshop Series,

And possibly, an article on the new science plan to be released on December 2010 (M. Bickle, G. Camoin, H. Pälike and D. Teagle as ECORD participants of the SPWC).

Revised Publications:

The ECORD leaflet and folder are being revised with an update of their contents, in particular new informations about the two last MSP expeditions. The updated Folder is expected to be released at AGU 2010.

#### ***2) Outreach activities:***

A joint DS3F/ECORD information booth presented at EurOcean 2010 on 12-13 September 2010 in Ostend, providing ECORD materials to national events and educational activities held in ECORD member countries:



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Loan of IODP core replicas + ECORD materials (Urbino and ECORD-Canada summer schools, University of Aveiro, Leicester University, BGS Open Day, Lycée International Valbonne),

National flyers (Canada for portcall in Victoria, Ireland for Geoscience 2010 Conference),

ECORD materials at IODP booths organised at national Earth Science meetings (IODP-Portugal at the Portuguese National Geological Congress, IODP-France at the RST in Bordeaux), IODP SAS meeting (EDP in Geneva), and conferences (Deep-water circulation in Pontavedra).

### ***3) Involvement to IODP Outreach activities:***

Naming the post-2013 program:

The project was led by Sarah Saunders (Director of communications at Consortium for ocean Leadership) who organised brainstorming workshops through USA, Europe, Japan and on-board the JR, and an internet survey (108 responses) from late June to early September 2010. "The goal for the naming project is to create a name that is meaningful, evocative, and memorable for a wide audience – a name that provides a solid communications platform for scientific ocean drilling well into the 21st century."

ECORD took the opportunity of holding the European workshop in Bremen, one day before the ECORD outreach meeting in Bremerhaven, and invited three ECORD scientists Achim Kopf, Marianne Conin and Xavier Monteys.

Draft names were submitted to the Name Selection Committee on early October with the resulting recommendations:

the post-2013 program name should resonate well with taxpayers/general public and media identified as the key target audiences

a tagline will be used in conjunction with the name to better explain what the program do and why it matters.

Annual meeting of the IODP Outreach Task Force at IODP-MI headquarters in Tokyo, 13-14 September, (see Agenda 2.5),

Elaboration of the Outreach section to be included in the new science plan.

### ***4) Future activities***

ECORD Calendar 2011

Participation to the IODP booth at AGU Fall 2010,

Joint ECORD/IODP/ICDP booth and townhall meeting at EGU 2011 set up at the next EMA-ESO-ESSAC meeting, early February in Paris

## **3.6 ESSAC Office News**

R. Stein will present facts about the FY11 Budget and the ESSAC Subcommittee structure.

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### 3.7 ESSAC representatives and National Office reports

Each ESSAC delegates will give a short summary about the latest national activities regarding IODP and ECORD issues. The current ESSAC delegates and alternates are given in the table down below:

#### ESSAC Delegates and Alternates

<b>Austria</b>	Werner E. Piller <a href="mailto:werner.piller@uni-graz.at">werner.piller@uni-graz.at</a>	Michael Wagreich <a href="mailto:michael.wagreich@univie.ac.at">michael.wagreich@univie.ac.at</a>
<b>Belgium</b>	Rudy Swennen <a href="mailto:rudy.swennen@geo.kuleuven.ac.be">rudy.swennen@geo.kuleuven.ac.be</a>	Anneleen Foubert <a href="mailto:Anneleen.Foubert@ees.kuleuven.be">Anneleen.Foubert@ees.kuleuven.be</a>
<b>Canada</b>	Neil Banerjee <a href="mailto:neil.banerjee@uwo.ca">neil.banerjee@uwo.ca</a>	Ulrich G. Wortmann <a href="mailto:uli.wortmann@utoronto.ca">uli.wortmann@utoronto.ca</a>
<b>Denmark</b>	Marit-Solveig Seidenkrantz <a href="mailto:mss@geo.au.dk">mss@geo.au.dk</a>	Paul Cornils Knutz <a href="mailto:pkn@geus.dk">pkn@geus.dk</a>
<b>Finland</b>	Kari Strand <a href="mailto:kari.strand@oulu.fi">kari.strand@oulu.fi</a>	Annakaisa Korja <a href="mailto:annakaisa.korja@helsinki.fi">annakaisa.korja@helsinki.fi</a>
<b>France</b>	Serge Berne <a href="mailto:serge.berne@univ-perp.fr">serge.berne@univ-perp.fr</a>	Georges Ceulener <a href="mailto:ceulener@ntp.obs-mip.fr">ceulener@ntp.obs-mip.fr</a>
<b>Germany (Chair)</b>	Ruediger Stein <a href="mailto:Ruediger.Stein@awi.de">Ruediger.Stein@awi.de</a>	Jochen Erbacher <a href="mailto:j.erbacher@bgr.de">j.erbacher@bgr.de</a>
<b>Iceland</b>	Bryndís Brandsdóttir <a href="mailto:bryndis@raunvis.hi.is">bryndis@raunvis.hi.is</a>	Gudrún Helgadóttir <a href="mailto:gudrun@hafro.is">gudrun@hafro.is</a>
<b>Ireland</b>	Xavier Monteys <a href="mailto:Xavier.Monteys@gsi.ie">Xavier.Monteys@gsi.ie</a>	David Hardy <a href="mailto:david.hardy@gsi.ie">david.hardy@gsi.ie</a>
<b>Italy</b>	Elisabetta Erba <a href="mailto:elisabetta.erba@unimi.it">elisabetta.erba@unimi.it</a>	Leonardo Sagnotti <a href="mailto:leonardo.sagnotti@ingv.it">leonardo.sagnotti@ingv.it</a>
<b>The Netherlands</b>	Lucas Lourens <a href="mailto:llourens@geo.uu.nl">llourens@geo.uu.nl</a>	Stefan Schouten <a href="mailto:schouten@nioz.nl">schouten@nioz.nl</a>
<b>Norway</b>	Nalan Koç <a href="mailto:Nalan.Koc@npolar.no">Nalan.Koc@npolar.no</a>	Helga F. Kleiven <a href="mailto:kikki@uib.no">kikki@uib.no</a>
<b>Portugal</b>	Antje Voelker <a href="mailto:antje.voelker@ineti.pt">antje.voelker@ineti.pt</a>	Luiz F. Menezes Pinheiro <a href="mailto:Imp@geo.ua.pt">Imp@geo.ua.pt</a>
<b>Spain (vice-chair)</b>	Carlota Escutia Dotti <a href="mailto:cescutia@ugr.es">cescutia@ugr.es</a>	César Ranero <a href="mailto:cranero@icm.csic.es">cranero@icm.csic.es</a>
<b>Sweden</b>	Ian Snowball <a href="mailto:Ian.Snowball@geol.lu.se">Ian.Snowball@geol.lu.se</a>	Eve Arnold <a href="mailto:eve.arnold@geo.su.se">eve.arnold@geo.su.se</a>
<b>Switzerland</b>	Judith McKenzie <a href="mailto:judy.mckenzie@erdw.ethz.ch">judy.mckenzie@erdw.ethz.ch</a>	Helmut Weissert <a href="mailto:helmut.weissert@erdw.ethz.ch">helmut.weissert@erdw.ethz.ch</a>
<b>U.K.</b>	Rachael H. James <a href="mailto:R.H.James@noc.soton.ac.uk">R.H.James@noc.soton.ac.uk</a>	Ros Rickaby <a href="mailto:Rosalind.Rickaby@earth.ox.ac.uk">Rosalind.Rickaby@earth.ox.ac.uk</a>

## 4. Nominations and Staffing

### 4.1 Staffing

R. Stein will summarize on expedition staffing.

#### 4.1.1 Updates on expedition staffing :

#### #331 Deep Hot Biosphere

Okinawa Deep Hot Biosphere (Expedition 331)					
STARS	Candidate		C	Expertise	
<b>Priority list (final)</b>					
2,81	Bowden	Stephen	UK	Organic Geochemist Petroleum Geologist Sedimentologist	Lecturer
2,38	Breuker	Anja	D	Microbiologist	PhDstudent
2,31	Eckert	Sebastian	D	Inorganic Geochemist	PhDstudent
2,29	Guilbaud	Romain	UK	Inorganic Geochemist	PhDstudent
2,63	Hollis	Steven Phi	UK	Petrology/Geochemistry	PhDstudent
2,13	Birrien	Jean Louis	F	Microbiology	Engineer
<b>To be invited as well if expertise needed for Expedition 331</b>					
3,00	Southam*	Gordon	CND	Paleontologist (Nannofossil) Microbiologist Paleontologist (Phytoplankt	Professor
<b>Reserve list</b>					
2,13	Sauer	Patrick	D	Microbiologist	PhDstudent
2,00	Pansegrau	Moritz	D	Inorganic Geochemist Sedimentologist	PhDstudent
1,29	Cruz	Ines	P	Petrology	PhDstudent
invited and declined					
applicants invited and accepted					

#### #332 NanTroSEIZE Stage 2: Riserless Observatory and

#### #333 NanTroSEIZE Stage 2: Subduction Inputs 2 and Heat Flow

NanTroSEIZE (Expedition 332) Observatory					
STARS	Candidate		C	Expertise	
	Kopf	Achim	D	Co-chief	Prof
	Hammerschmidt	Sebastian	D	Sedimentologist	grad Student
<b>NanTroSEIZE (Expedition 333) - Inputs Coring and Heat Flow</b>					
STARS	Candidate		C	Expertise	
<b>Priority list of ECORD nominations</b>					
	Henry	Pierre	F	Co-chief (invited and accepted)	
3,00	Alves	Tiago	UK	Sedimentology, seismic interpretation, physical properties	lecturer, post-doc
2,89	Laberg	Jan Sverre	N	Sedimentologist	Post-Doctoral Researcher
2,89	Strasser	Michael	D	Physical Properties Specialist Sedimentologist Stratigraphic Correlator	Post-Doctoral Researcher
2,78	Marcaillou	Boris	F	Geophysicist Physical Properties Specialist	Associate Professor
2,44	Fehr	Annick	D	Geophysicist Logging Scientist Physical Properties Specialist	PhD student
2,11	Serié	Chritsophe	UK	Geophysicist Petroleum Geologist Sedimentologist Stratigraphic Correlator	PhD student
2,00	Garçon	Marion	F	Inorganic Geochemist	PhD student
<b>List of alternates</b>					
2,22	Casas	David	ES	Physical Properties Specialist Sedimentologist	Post-Doctoral Researcher
1,56	Reusch	Anna	D	Physical Properties Specialist Sedimentologist	MSc student
1,33	Bartsch	Carolin	D		MSc student
invited					
Exp 333: Short call for additional organic geochemist, nannofossil specialist (Ongoing evaluation)					

### #334 Costa Rica Seismogenesis Project (CRISP)

CRISP_A (Expedition 334)				
STARS	Candidate		C	Expertise
<b>First-Priority list</b>				
	Vanucci	Paola	I	Co-chief
3,00	Barckhausen	Udo	D	Geophysicist Logging Scientist Physical Properties Specialist Downhole Measurements
2,86	Kutterolf	Steffen	D	Inorganic Geochemist Petrologist Sedimentologist Stratigraphic Correlator
2,63	Marcaillou	Boris	F	Geophysicist Physical Properties Specialist
2,50	Conin	Marianne	F	Geophysicist Hydrologist Logging Scientist Physical Properties Specialist
2,38	Heuret	Arnaud	F	Geophysicist Structural Geologist
1,88	McCay	Gillian	UK	
1,71	Behnsen	Julia	UK	Petrology, Geochemistry, Structural geology, Physical Properties
<b>Alternates</b>				
2,71	Meschede	Martin	D	Sedimentologist Structural Geologist
2,00	Pape	Thomas	D	Organic Geochemist Sedimentologist
2,00	Pinero	Elena	D	Inorganic Geochemist
2,00	Stipp	Michael	D	Petrologist Metamorphic Petrologist Structural Geologist
1,71	Aden-Arroyo	Ivonne	D	
1,57	Völker	David	D	Geophysicist Physical Properties Specialist Sedimentologist
1,00	Albarracín	Silvia	ES	Geophysicist Sedimentologist Stratigraphic Correlator Structural Geologist
invited so far				
Exp 334: Short call for additional organic geochemist, nannofossil specialist (Ongoing evaluation)				

### #335 Superfast Spreading Crust 4

Superfast (Expedition 335)				
STARS	Candidate		C	Expertise
<b>First-priority list</b>				
	Ildefonse	Benoit	F	Co-chief
	Teagle	Damon	UK	Co-chief
3,00	Banerjee	Neil	CND	Inorganic Geochemist Petrologist Metamorphic Petrologist
3,00	Godard	Marguerite	F	Inorganic Geochemist Petrologist
3,00	Koepke	Juergen	D	Petrologist
2,83	MacLeod	Christopher	UK	Structural Geologist Downhole Measurements
2,79	France	Lyderic	F	Petrologist Metamorphic Petrologist Structural Geologist
2,79	Lissenberg	Johan	UK	Petrologist
<b>Alternates</b>				
2,75	Williams	Helen	UK	Inorganic Geochemist
2,67	Morris	Anthony	UK	Paleomag
2,50	Strauss	Harald	D	Inorganic Geochemist
2,43	Harris	Michelle	UK	Inorganic Geochemist Petrologist Metamorphic Petrologist
2,33	McCaig	Andrew	UK	
2,08	Salisbury	Matthew	CND	
2,00	Abily	Benedicte	F	Petrologist Structural Geologist
1,92	Pressling	Nicola	UK	Geophysicist Paleomagnetist Structural Geologist
1,83	Morgan	Sally	UK	Logging Scientist Metamorphic Petrologist Physical Properties Specialist
1,83	von der Handt	Anette	D	petrologist/geochemist
1,67	Faak	Kathrin	D	Inorganic Geochemist Petrologist
1,50	Hoefig	Tobias	D	Petrologist Metamorphic Petrologist
1,50	Violay	Marie	F	Logging Scientist Physical Properties Specialist
1,17	Debret	Baptiste	F	
invited				
should be invited as No. 9 and No. 10, if additional berths available (still under discussion)				
invited for Louisville				



## #336 Mid-Atlantic Ridge Microbiology

Mid-Atlantic Microbiology (Expedition 336)					
STARS	Candidate		C	Expertise	
First-Priority list					
	Bach	Wolfgang	D	Co-chief (invited and accepted)	
2,85	Rouxel	Olivier	F	Petrologist Metamorphic Petrologist Inorganic Geochemist	Associate Scientist
2,71	Aloisi	Giovanni	F	Sedimentologist Inorganic Geochemist	Researcher
	Schmidt-Schie	Friederike	D	Geophysicist Logging Scientist Physical Properties Specialist	PhD student
2,21	Leth Jørgensen	Steffen	N	Microbiologist	PhD student
2,00	Kaasalainen	Hanna	ICE	Inorganic Geochemist	PhD student
1,67	Pasini	Valerio	F	Microbiologist Geophysicist Petrologist Structural Geologist	PhD student
1,57	Rennie	Victoria	UK	Inorganic Geochemist	PhD student
Alternates					
3,00	Danovaro	Roberto	I	Biologist Microbiologist	Full Professor, Director Dept.
2,57	Orcutt	Beth	DK	Microbiologist Inorganic Geochemist Organic Geochemist	postdoc
2,67	Luna	Gian Marco	I	Biologist Microbiologist	post-doc researcher
2,43	Breuker	Anja	D	Geomicrobiology	Scientific employee
2,17	Scholz	Florian	D	Inorganic Geochemist	Postdoctoral researcher
1,80	Engelhardt	Tim	D	Microbiologist	PhD student
1,25	Adhikari	Rishi Ram	D	Microbiologist Inorganic Geochemist Organic Geochemist	PhD Student
1,17	Tangherlini	Michael	I	Biologist Microbiologist	PhD Student
invited so far		invited but declined			
Further comments:					
- Within the priority list, Rouxel (F), Aloisi (F) and Leth Jørgensen (N) are a "must" from our side due to the extremely negative quota of France and Norway.					
- Kaasalainen is included in the priority list due to her expertise, but also because this is the first application we ever got from Iceland					
- Pasini and Rennie, although a worse star ranking than others from the list of alternates, are in the priority list due to the very negative quota of France and UK					
- Luna is a potential candidate but because of the very positive quota of Italy not in the priority list.					
( If expertise needed and not given by other potential ECORD candidates, he may be invited)					
- Orcutt, Breuker, and Engelhardt are already invited for other expeditions, and they have accepted the invitations					
- Danovaro applied as shore-based scientist					

### 4.1.2 Nominations of co-chiefs

The following list of ECORD nominations for possible co-chiefs has been requested by IODP-MI.

Number	Short title	Nominee
745-CPP	Shimokita Coal Bed Biosphere	Antje Boetius
745-CPP	Shimokita Coal Bed Biosphere	Kai-Uwe Hinrichs
745-CPP	Shimokita Coal Bed Biosphere	Matthias Zabel
644-Full2	Mediterranean Outflow	Fatima Abrantes
644-Full2	Mediterranean Outflow	Dorrik Stow
644-Full2	Mediterranean Outflow	Javier Hernandez-Molina
644-Full2	Mediterranean Outflow	Thierry Mulder
644-Full2	Mediterranean Outflow	Jacques Deverchere
644-Full2	Mediterranean Outflow	Catherine Kissel
681-Full2	Lesser Antilles Volcanic Landslide	Steve Sparks
681-Full2	Lesser Antilles Volcanic Landslide	Anne Le Frien
681-Full2	Lesser Antilles Volcanic Landslide	Geroges Boudon
681-Full2	Lesser Antilles Volcanic Landslide	Christine Deplus
681-Full2	Lesser Antilles Volcanic Landslide	Martin Palmer

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## **4.2 Updates on SAS panel nominations**

R. Stein will summarize updates on SAS panel nominations. The ECORD Council has already approved the following changes:

### **4.2.1 EDP**

Neal Watson (UK) has been nominated as new ECORD EDP member, replacing John Thorogood (UK) who rotated off.

### **4.2.2 STP**

Peter Clift (UK) is the new ECORD member within STP, replacing Neil Mitchell (UK) who rotated off.

### **4.2.3 STP**

Georges Gorin (Switzerland) rotated off, Douglas Schmitt (Canada) is now upcoming vice-chair, and Nathalie Vigier (France) is new ECORD member.

### **4.2.4 SPC**

Hugh Jenkyns (UK) and Gilbert Camoin (France) rotate off, Heiko Pälke (UK) and Javier Escartin (France) will replace them.

### **4.2.5 EPSP**

Michael Enachescu (Canada) resigned; he is replaced by Martin Hovland (Norway).

## **5. Breakout Sessions**

## **6. ESSAC highlights**

### **6.1 Superfast Spreading Rate Crust Program**

D. Teagel will give a report about the Superfast Spreading Rate Crust Program.

### **6.2 Climate and Societies**

G. Haug will give a presentation about “Climate and Societies”.

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## **7. Education and outreach**

### **7.1 ECORD Summer Schools (Reports)**

#### **7.1.1 Urbino Summer School in Paleoclimatology, Urbino 2010**

L. Lourens will give a short report about the Urbino Summer School in Paleoclimatology. A report of the USSP 2010 is provided in appendix 4. Webpage: <http://www.urbinosp.it/>

#### **7.1.2 ECORD/IODP-Canada Summer School on Ocean and climate changes in polar and subpolar environments, Montréal, Canada**

N. Banerjee will give a short report about the ECORD/IODP-Canada Summer School. Information materiel of the Canadian Summer School is provided in appendix 6. Webpage: [http://www.iodpcanada.ca/news\\_items/an-iodp-canada-summer-school-in-2010](http://www.iodpcanada.ca/news_items/an-iodp-canada-summer-school-in-2010)

#### **7.1.3 ECORD Summer School on Dynamics of Past Climate Changes, Bremen, Germany**

J. Lezius will give a short report about the ECORD Summer School on Dynamics of Past Climate Changes. A report of the Bremen Summer School is provided in appendix 5. Webpage: [http://www.glomar.uni-bremen.de/ECORD\\_Summer\\_School\\_2010.html](http://www.glomar.uni-bremen.de/ECORD_Summer_School_2010.html).

### **7.2 ECORD Grants and Scholarships**

J. Lezius will present updates about the ECORD Grants and Scholarships.

### **7.3 Distinguished Lecturer Programme 2010-2012**

J. Lezius will present updates of the new DLP. Lecturers 2010-2012 are:

"Deep Biosphere and Subseafloor Ocean" theme: Kai-Uwe Hinrichs, MARUM, University of Bremen, D; "Benthic archaea - the unseen majority with importance to the global carbon cycle revealed by IODP drilling"

"Solid Earth Cycles and Geodynamic" theme: Dominique Weiss, PCIGR, University of British Columbia, CDN; "What do we know about mantle plumes and what more can we learn by IODP drilling?"

"Environmental Change, Processes and Effects" theme: Helmut Weissert, ETH Zurich, CH; "Carbon cycle, oceans and climate in the Cretaceous: lessons from Ocean Drilling (DSDP to IODP) and from records on continents"

### **7.4 School of Rock 2010 and Expedition 327**

J. Lezius will present some information about the School of Rock 2010 and outreach activities of expedition 327.

## **8. Reports of ESSAC subcommittees and discussion**

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## 9. Workshops, communication and vision

### 9.1 ESF Magellan Programme: Present and Future

J. Erbacher will present a report about the ESF Magellan Programme. The COST Program Proposal for workshops on Scientific Drilling (Magellan Plus Workshop Series) is provided in appendix 7.

### 9.2. Joint IODP/ICDP session at the EGU 2011 in Vienna

R. Stein will give an outlook about the joint IODP/ICDP session at the EGU 2011 in Vienna.



CL4.17/SSP1.2

#### **Major achievements and perspectives in scientific ocean and continental drilling**

Convener: Ruediger Stein

Co-Conveners: Ulrich Harms, Ursula Roehl

Since 1968, scientific ocean drilling is recovering unique global geological records preserved in marine sedimentary deposits and basement rocks. These records obtained within the Deep Sea Drilling Project (DSDP), the Ocean Drilling Program (ODP), and the Integrated Ocean Drilling Program (IODP) have been key for major advances in our understanding of our planet, including palaeoclimate, palaeoceanography, deep biosphere and crustal dynamics and tectonic processes. Global continental efforts are coordinated within the International Continental Scientific Drilling Program (ICDP). Funding and support for research projects is provided to tackle challenging geoscientific themes of socio-economic relevance such as paleoclimate, earthquakes and volcanism, or unconventional energy resources.

The principal goals of this session are to summarize and review major scientific achievements in ocean and continental drilling with special emphasis on the European contributions to IODP and ICDP. Furthermore, perspectives and visions for drilling projects using a multi-platform approach will be tackled.

(Web-Info: <http://meetingorganizer.copernicus.org/EGU2011/session/6436>)

## 10. Review of consensus, motions and actions

## 11. Next meetings

A. Foubert will present Leuven as location for the next ESSAC#16 meeting.

Two propositions have been made for next meeting locations: X. Monteys will present Dublin as possible location for the ESSAC#17 meeting. M-S. Seidenkrantz will present Denmark as possible location for the ESSAC#18 meeting.

## 12. Any other Business



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## **Appendix 1**

Executive summary of the 14<sup>th</sup> ESSAC meeting

**LIST OF CONSENSI, MOTIONS AND ACTIONS**  
**14<sup>TH</sup> ESSAC MEETING**  
**Tromsø, May 26-28, 2010**

**1. INTRODUCTION**

**1.3 Discussion and approval of the Agenda**

<b>ESSAC Consensus 1005-01:</b> ESSAC approves the Agenda of its 14 <sup>th</sup> meeting on May 26-28, 2010 at the Sommarøy Hotel, Tromsø, Norway.
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**4. ELECTION OF NEW VICE-CHAIR**

<b>ESSAC Motion 1005-01:</b> ESSAC nominates Carlota Escutia Dotti (Spain) as incoming vice-chair; term will start on October 01, 2010.
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*Camoin moved; Abrantes seconded; 15 of 16 in favor; 1 abstained (Escutia)*

**5. NOMINATIONS AND STAFFING**

**5.1 Updates in expedition staffing**

<b>ESSAC Consensus 1005-02:</b> ESSAC approves the late nominations for South Pacific Gyre Expedition: 1 <sup>st</sup> priority: Nathalie Dubois (UK), alternates: Cecily Chung (UK), Victoria Rennie (UK).
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> **ESSAC Action Item 1005-01:** The ESSAC Office will forward late nominations for South Pacific Gyre Expedition to USIO: 1<sup>st</sup> priority: Nathalie Dubois (UK), alternates: Cecily Chung (UK), Victoria Rennie (UK).

<b>ESSAC Consensus 1005-03:</b> ESSAC will nominate as potential co-chiefs for Okinawa Deep Biosphere Expedition: Kai-Uwe Hinrichs (D) and Christophe Monnin (F).
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> **ESSAC Action Item 1005-02:** The ESSAC Office will contact IODP-MI and ask for status of Co-chief nomination for the Mediterranean Outflow expedition (644).

ESSAC approves the following status concerning deactivation/re-submission of proposals for the new program:

<b>ESSAC Consensus 1005-04:</b> In preparation for the new program, ESSAC recommends that proponents of active IODP proposals should be invited to submit a new version of their proposal to the new program. The new proposal should take into consideration the new science plan and the recent scientific achievements of IODP in the relevant field.
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**5.2 Updates on SAS panel nominations**

> **ESSAC Action Item 1005-03:** The ESSAC Office will contact all current SAS alternates and ask them whether they would like to stay in the pool of alternates or not.

<b>ESSAC Consensus 1005-05:</b> ESSAC approves that Gretchen Frueh-Green should stay in SPC for one more meeting.
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> **ESSAC Action Item 1005-04:** The ESSAC Office will contact Gretchen Frueh-Green to ask her if she is willing to stay within the SPC for one more meeting.

> **ESSAC Action Item 1005-05:** The ESSAC Office will send a letter to all alternates to ask them if they are willing to stay as an alternate. If they will stay in the pool of alternates they have to agree being an “active” alternate, i.e., being informed about the current activities of the specific SAS panel.

> **ESSAC Action Item 1005-06:** The ESSAC Office will send a letter to those who rotated off during the last month and for those rotating off in the near future, asking them if they are willing to become an alternate for one or two more years.

**ESSAC Consensus 1005-06:** From applications for future calls for SAS panel membership ESSAC may select highly ranked (but not selected for panel membership) candidates as alternates for the specific panel.

**ESSAC Consensus 1005-07:** ESSAC approves that the membership as alternates in SAS panels is limited to a maximum of three years. After that time span, alternates will rotate off automatically.

**ESSAC Consensus 1005-08:** ESSAC approves that the names of SAS alternates will not be published on the ESSAC website

## 8. EDUCATION AND OUTREACH

### 8.2 ECORD Scholarships and Research Grants 2010

**ESSAC Consensus 1005-09:** ESSAC selected the 13 best ranked applications to be supported by an ECORD scholarship for participating in the Summer Schools in Urbino/Italy (11), Montreal/Canada (1), and Bremen/Germany (1). Awarded applicants are from UK (5), Germany (4), Canada (2), France (1), and Norway (1). In addition, one application from a non-ECORD European country (Poland) was selected for a scholarship.

**ESSAC Consensus 1005-10:** ESSAC selected the 5 best ranked applications to be awarded by an ECORD research grant. Awarded applicants are from Germany (2), France (1), Canada (1), and Portugal (1).

> **ESSAC Action Item 1005-07:** ESSAC Office will create a form for a standardized 1-page max CV for applications of scholarships.

> **ESSAC Action Item 1005-08:** ESSAC Office will include in future calls for ECORD Research Grants a statement that a detailed budget plan has to be outlined in the application.

### 8.3 ECORD Summer Schools 2011

**ESSAC Consensus 1005-11:** ESSAC approves the voting results that the Urbino Summer School 2011 in “Paleoclimatology” and the ECORD Bremen Summer School 2011 on “Subseafloor Fluid Flow and Gas Hydrates” will get granted and supported by 10 k€ each.

### 8.5 ECORD Teachers Workshop

> **ESSAC Action Item 1005-09:** ESSAC Office will send out a letter to Jean-Luc Berenguer concerning his idea about an “ECORD School of Rock” (Teacher’s Workshop) and provide him guidance and contact to Eve Arnold, Carlo Laj and Consortium of Ocean Leadership.

## 8.6 ECORD Distinguished Lecturer Programme

> **ESSAC Action Item 1005-10:** ESSAC Office will send out a letter to previous lecturers of the DLP to ask for comments and experiences within this programme. ESSAC will also thank them for their efforts and collaboration.

**ESSAC Consensus 1005-12:** ESSAC nominates the following scientists as 2010-2012 ECORD Distinguished Lecturers:

Theme 1 Solid Earth Cycles and Geodynamics: Dominique Weis, University of British Columbia, Vancouver, Canada - "What do we know about mantle plumes and what more can we learn by IODP drilling?"

Theme 2 Deep Biosphere and the Subseafloor Ocean: Kai-Uwe Hinrichs, Marum/University of Bremen, Germany - "Benthic archaea - the unseen majority with importance to the global carbon cycle"

Theme 3 Environmental Change, Processes and Effects: Helmut Weissert, ETH Zurich, Switzerland - "Carbonates, carbon cycle and climate: multiple greenhouse pulses in the Cretaceous"

> **ESSAC Action Item 1005-11:** ESSAC Office will send out a letter to new lecturers of the DLP with conditions and advices for their contribution to the programme.

> **ESSAC Action Item 1005-12:** ESSAC Office will send out a Call to host a lecture of the new DLP.

**ESSAC Consensus 1005-13:** ESSAC approves the request form for the institutes hosting future lectures of DLP.

## 9. WORKSHOPS, COMMUNICATION AND VISION

**ESSAC Consensus 1005-14:** ESSAC listed possible candidates for the Joint IODP/ICDP Program Planning Group- climates & human evolution (to be forwarded to SPC):

Dave Hodell, Stefan Mulitza, Mark Masslen, Lucas Laurens, Jaap S Sinninghe Damste, Lydie Dupont, Mauro Cremaschi

> **ESSAC Action Item 1005-13:** ESSAC Office will forward the list of possible candidates for the Joint IODP/ICDP Program Planning Group- climates & human evolution to SPC.

## 12. ANY OTHER BUSINESS

**ESSAC Consensus 1005-15:** ESSAC thanks Gilbert Camoin (former ESSAC Chair), Fatima Abrantes, and Menchu Comas for their dedicated and highly effective service within ESSAC.

## **Appendix 2**

Draft Minutes of 14<sup>th</sup> SSEP-meeting (cf. 2.3 SSEP)

**14<sup>th</sup> Meeting of the  
*Science Steering and Evaluation Panel*  
May 18-21<sup>st</sup>, 2010  
The ‘Kochi City Culture Plaza’ Cul-port  
Kochi, Japan**

**Draft Minutes (v1)**

**1. Joint Session, Introduction**

**1.1. Call to Order and brief introduction to the meeting (SSEP co-chair Iryu)**

Science Steering and Evaluation Panel (SSEP) co-chair Iryu welcomed participants, thanked local host Inagaki, and briefly reviewed the meeting agenda and described how the meeting would be organized. Furthermore, Iryu announced that the meeting would take three days, with required reviews for 13 drilling proposals (and one discussion of a complimentary project proposal (CPP)), and that it will include a discussion/evaluation of SSEP protocols.

**1.2. Self-introduction of panel members, liaisons, and guests**

The attendees briefly introduced themselves and explained their function during the meeting. **Meeting attendees are included in Appendix 1.** Among the guests are US Science Support Program (USSSP) invited students Hintz, McKoy and Navarette, guided and introduced by Vivian Whitney.

**1.3. Welcome and meeting logistics (host Inagaki)**

Local host SSEP member Inagaki welcomed delegates and briefly explained logistics. The SSEP thanked him for organizing the meeting and for guiding a much appreciated field trip on May 17<sup>th</sup>.

**1.4. Approval of present 14<sup>th</sup> SSEP meeting agenda (Iryu)**

**SSEP Consensus 1005-1:** The SSEP approves the revised agenda of their 14<sup>th</sup> meeting, May 18-21, 2010 in Kochi, Japan.

The agenda for the 14<sup>th</sup> meeting of SSEP is provided as **Appendix 2.**

**1.5. Approval of last (13<sup>th</sup>) SSEP meeting minutes (Iryu)**

Iryu asked for approval of the most recent 13<sup>th</sup> SSEP meeting in Melbourne, Australia (November 2009). Iryu asked for a consensus to approve the minutes ‘as is’, and all members agreed.

**SSEP Consensus 1005-2:** The SSEP approves the minutes of their 13<sup>th</sup> SSEP meeting on May 16-18<sup>th</sup> 2009, Melbourne, Australia.

**1.7 IODP-MI Report (H. Kawamura)**

Hiroshi Kawamura (Science Support, Integrated Ocean Drilling Program, Management International, Inc. (IODP-MI)) reported on activities at IODP-MI. He

provided information about the IODP organizational structure and gave an overview of the current Science Advisory Structure (SAS) meeting schedule. He then provided proposal submission statistics. For this SSEP meeting, IODP-MI received 14 proposals (3 deep biosphere, 5 environment, 6 solid Earth). As of May 2010, 105 proposals were active in the system. For the current SSEP meeting there are 7 full proposals, 2 pre-proposals, 4 ancillary project letters (APLs), as well as one CPP proposal. Following an extensive review of all proposal statistics, Kawamura explained the potential outcomes and recommendations for each proposal type for the current meeting. He mentioned that Barry Zelt was no longer with IODP-MI, listed the current IODP-MI vacancies, and then concluded with a reminder of the current SSEP member rotation schedule.

## **1.7. Science Advisory Structure Panel Reports**

### **1.7.1. Site Survey Panel Report (K. Kawamura)**

Kiichiro Kawamura (Site Survey Panel (SSP) liaison) explained the role of the SSP and reported the outcomes of the most recent January 2010 SSP meeting in Oakland, New Zealand. Kawamura provided updates on those proposals that the SSP panel evaluated during the meeting (14 full proposals, 4APLs, and 3 pre-proposals)

### **1.7.2. United States Implementing Organization Report (Zarikian)**

Carlos Zarikian (Texas A&M University) reported on *JOIDES Resolution (JR)* expeditions and the new schedule. He briefly reviewed the accomplishments of the Canterbury and Wilkes Land expeditions; both were very successful. Sampling parties organized for the Bering Sea expedition were equally successful, and more are now scheduled for later expeditions. New expeditions (e.g., Juan de Fuca, Cascadia, South Pacific Gyre Microbiology, Louisville Seamounts, Superfast/CRISP, Mid-Atlantic Microbiology) are scheduled to begin in July 2010. Furthermore, Zarikian provided an update on Lamont-Doherty Earth Observatory (LDEO) status and outreach activities for recent expeditions, including the successful video reports created during Wilkes Land and many video conferences to and from the ship with schools and museums. He finished by announcing that the *JR* has been undergoing significant maintenance including re-arrangement of the core lab.

### **1.7.3. Center for Deep Earth Exploration Report (Nielsen)**

Simon Nielsen (Center for Deep Earth Exploration (CDEX)) provided an update on the current CDEX and *Chikyu* status. Activities of CDEX in 2009-2010 included two training missions, a drydock phase for the ship, outreach activities, and the planning of IODP expeditions for Stage 3 of the Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) Complex Drilling Project. Stage 3 will begin during the second half of 2010, with drilling of the top hole (installation of conductor pipe and drilling to 800 meters below the seafloor to set casing) for the NanTroSEIZE deep riser site, as well as installation of observatories at several NanTroSEIZE sites.

#### **1.7.4. Kochi Core Center Report (Gupta)**

Lallan Gupta (Kochi Core Center (KCC)) reviewed the status of the KCC. Ultramodern facilities are available for the sampling scientists and most of the currently available reefer space is filled.

#### **1.7.5. ECORD Science Operator Report (Davis)**

Davis reported on recent activities by the European Consortium for Ocean Drilling Research (ECORD) Science Operator (ESO). She reviewed the accomplishments of Expedition 313 (New Jersey Shallow Shelf) and 325 (Great Barrier Reef Environmental Changes). She reviewed the outreach activities, symposia, workshops and meetings (including the European Geosciences Union (EGU) meeting), and announced the forthcoming ECORD-sponsored summer schools. Brinkhuis added that as of this year, besides ECORD grants (for students from European countries), National Science Foundation (NSF) grants are available for US students.

#### **1.7.6. Engineering Development Panel Report (Ussler)**

Bill Ussler (Engineering Development Panel (EDP) liaison) reviewed the role of EDP and updated the SSEP on EDP activities. He summarized current technological issues, including continuous core recovery high latitude coring activities. He then reviewed engineering and technical issues for upcoming proposals, which include the Simple Cabled Instrument for Measuring Parameters In-Situ (SCIMPI) and non-magnetic core barrels.

## **2. Reviewing Process**

### **2.1 Introduction**

The SSEP co-chair Iryu reviewed the SSEP terms of reference, and explained again the conflict of interest (COI) rules that had been circulated prior to the meeting. Iryu reviewed the star grouping system and reminded the panel that if an EDP and/or Scientific Technology Panel (STP) review was requested, a detailed justification would need to be added to the review.

### **2.1 Breakout Sessions**

A total of 13 proposals were reviewed during this phase of the meeting (the CPP is discussed later). Panel members were divided into two breakout sessions for detailed discussions of the proposals: Breakout Group 1: *Solid Earth* (chaired by M. Torres) and Breakout Group 2: *Paleoenvironment and Microbiology* (chaired by F. Iryu and H. Brinkhuis ).

The conflict of interest rules and confidentiality requirements were respected during the entire review procedure (breakout sessions, general sessions, and grouping). The table below lists the conflicted SSEP members, liaisons, and guests who left the room during the review of the relevant proposals.

Proposals to be reviewed:



<b>Proposal</b>	<b>Short title</b>	<b>Lead proponent</b>	<b>Conflict of Int.</b>
737-Full2	North Sea Cenozoic Climate Change	Donders	
<del>745-CPP</del>	<del>Shimokita Coal Bed Biosphere</del>	<del>Inagaki</del>	Inagaki, Hinrichs
748-Full2	Nice Airport Landslide	Stegmann	Cattaneo
751-Full	West Antarctic Ice Sheet Climate	Bart	
754-Full2	Norwegian Sea Silica Diagenesis	Davies	
758-Full2	Atlantis Massif Seafloor Processes	Früh-Green	
765-Pre	Arctic Slope Stability	Winkemmann	
766-APL	Essaouira Seamount Hotspot	Geldmacher	
767-Pre	Tore Seamount Paleoenvironment	Lebreiro	
768-APL	Gulf of Mexico Paleoclimatology	Flower	
769-APL	Costa Rica Crustal Architecture	Tominaga	
770-Full	Kanto Asperity Project: Observatories	Kobayashi	
771-Full	Iberian Margin Paleoclimate 2	Hodell	Hodell
772-APL	North Atlantic Crustal Architecture	Tominaga	

### Watchdog assignments

#### Watchdog assignments (ver. 10):

#### Breakout Group 1: Earth • Chair: Torres •

<b>Proposal</b>	<b>Lead WD</b>	<b>WD #2</b>	<b>WD #3</b>	<b>WD #4</b>	<b>WD #5</b>
748-Full2	Carlut,	Ikehara,	McHugh	Vrolijk	Michibayashi
754-Full2	Marsaglia	Smirnov	Koepke	Suzuki	Yamamoto
766-APL	MacLennan	Ishizuka	Smirnov	Morishita	Moulin
758-Full2	Schulte	Hinrichs	Inagaki	Marsaglia	Suzuki
769-APL	Ishiwatari	Ishizuka	MacLennan	Morishita	Harris
770-Full	Smirnov	Harris	Michibayashi	Carlut	Cattaneo
772-APL	Moulin	MacLennan	Morishita	Koepke	Ishiwatari

#### Breakout Group 2: Paleoenvironment and Microbiology • Co-chairs: Iryu and Brinkhuis •

<b>Proposal</b>	<b>Lead WD</b>	<b>WD #2</b>	<b>WD #3</b>	<b>WD #4</b>	<b>WD #5</b>
737-Full2	Rosenthal	Hodell	Ikehara	Cattaneo	Su, Xin
751-Full	Hodell	Sato	Carlut	Lee	Pahnke
758-Full2	Schulte	Hinrichs	Inagaki	Marsaglia	Suzuki
765-Pre	Hornbach	Michibayashi	Harris	McHugh	Vrolijk
767-Pre	Sato	Su, Xin	Gallagher	Inagaki	Lee
768-APL	Gallagher	Yamamoto	Pahnke	Rosenthal	Hodell
771-Full	Pahnke	McHugh	Lee	Su, Xin	Hinrichs

### 3. Joint Session, Proposal Dispositions

The course of action regarding each of the 13 SSEP proposals reviewed during the Kochi meeting was achieved by consensus of the full panel. The specific dispositions for each proposal were as follows:

Number	Short Title	Contact Proponent	Disposition
737-Full2	North Sea Climate Change	Donders	Revise full
748-Full2	Nice Airport Landslide	Stegmann	Forward to SPC 3 with three stars
751-Full	West Antarctic Ice Sheet Climate	Bart	Revise full
754-Full2	Norwegian Sea Silica Diagenesis	Davies	Revise full
758-Full2	Atlantis Massif Seafloor Processes	Früh-Green	External review
765-Pre	Arctic Slope Stability	Winkelmann	Deactivate
766-APL	Essaouira Seamount Hotspot	Geldmacher	Revise APL
767-Pre	Tore Seamount Paleoenvironment	Lebreiro	Deactivate
768-APL	Gulf of Mexico Paleoclimatology	Flower	Revise APL
769-APL	Costa Rica Crustal Architecture	Tominaga	Revise APL
770-Full	Kanto Asperity Project: Observatories	Kobayashi	Revise full
771-Full	Iberian Margin Paleoclimate 2	Hodell	Revise full
772-APL	North Atlantic Crustal Architecture	Tominaga	Revise APL
745 CPP	Shimokita Coal Bed Biosphere	Inagaki	Forward to SPC

The summary dispositions were as follows:

Pre-Proposal: request Pre2 Proposal	=	0
Pre-Proposal: request Full Proposal	=	0
Full Proposal: forward to SPC	=	1 (Grouping: 3*)
Full Proposal: send for External Review	=	1
APL: request revision	=	4
APL: forward to SPC	=	0
CPP: forward to SPC	=	1
Full Proposal: request revision	=	5
Full Proposal: request new submission/deactivate	=	0
Pre Proposal: request new submission/deactivate	=	2
APL: request new submission/deactivate	=	0

A qualitative grouping was assigned to those proposals forwarded to the Science Planning Committee (SPC) using the 5-star scale grouping. Grouping was obtained by consensus of the full panel, after evaluation against the individual grouping criteria.

#### **4. Discussion and evaluation of SSEP protocols and proposal review process**

Torres introduced issues to be discussed regarding the functioning of SSEP and provided several recommendations on the behalf of all co-chairs. These included: (1) obligatory former lead watchdog (WD) to contact the new WD to maintain solid historical perspective of a proposal, (2) early proposal history information to be provided by IODP-MI, (3) establish a protocol or guidelines for SSEP WD assignments, and (4) have proactive panel members aiding in recognition of potential problems with proposed WD assignments. Discussion led to several additional suggestions, including: (1) have better reviewer-proponent contact through lead WD (Hodell), (2) **have proponents provide high-resolution figure files during submission of a proposal for use in Power Point presentations during the SSEP meeting**, and (3) have proponents provide a detailed rebuttal letter when a revised version of their proposal is submitted (Hinrichs). The latter was re-formulated as a motion, seconded by Schulte, and accepted by consensus.

**SSEP Motion 1005-3:** The SSEP requests that proponents co-submit a detailed rebuttal document together with any revised version of a proposal.

Marsaglia moved, Schulte seconded, 31 in favor, 0 opposed, 0 abstained

A brief overview of current (non-stipulated) proceedings regarding watchdog assignment was provided by co-chair Brinkhuis. Vrolijk reiterated that while WDs have been assigned to a given proposal, the entire panel is also responsible. The earlier suggested recommendations were further discussed and this led to a motion by Marsaglia to ask the co-chairs to prepare a document with SSEP guidelines for the next meeting, seconded by Schulte. This motion was accepted by consensus.

**SSEP Motion 1005-4:** The SSEP panel asks the co-chairs to prepare a draft version of guidelines regarding WD assignment and associated SSEP procedures to be ready for discussion at the next meeting of SSEP.

Marsaglia moved, Schulte seconded, 31 in favor, 0 opposed, 0 abstained

It was remarked that such guidelines would be useful also for other SAS panels that include WDs (Ishiwatari). Other issues were subsequently raised by SSEP panel members including the notion that the breakout groups should be as many as possible, allowing expertise of panel members to be maximized (Hinrichs). Alternatively, it was suggested that a single general session would perhaps be preferable. There was general consensus that SSEP must be flexible in this regard, seeking to optimize proposal review and nurturing. It was also remarked that there should be time dedicated to write and compose the SSEP reviews during any SSEP meeting (Torres). Other discussed issues included: (1) WD-proponent contacts prior to a panel meeting, discouraging such procedures (Torres) and (2) the idea of having proponents presenting proposals (Hinrichs), which was deemed problematic because of logistical, financial, and objectivity reasons. It was

also decided to maintain the current ‘COI rules’. There was a brief discussion regarding handling of deactivation versus resubmission of the same or similar proposals, before turning to issues regarding a lack of a mechanism to appeal and a code of conduct within SAS (bodies). At this stage, SPC chair Fillipelli commented on these, and related issues, including cases where proponents approached SPC in attempts to overrule SSEP decisions. He stated that: (1) SPC only would comment on the system rather than individual cases, (2) that there was indeed a lack of an appeal mechanism, (3) SPC sticks to their mandate, including only handling proposals after SSEP has forwarded them to SPC, and (4) such cases should be regarded as ‘incidents’ providing no basis for structural changes. Furthermore, it was noted that ‘complaints about SSEP’ sent to SPC were not forwarded to SSEP panel members. Following discussion among various panel members led to the idea that a proponent’s issues with SSEP decisions and recommendations should be directed towards SSEP alone. It led to a motion asking SPC to formulate a possible appeal process by Vrolijk, seconded by Schulte. This motion was approved by consensus.

**SSEP Motion 1005-5:** The SSEP asks SPC to provide stipulations regarding an appeal process regarding issues concerning SSEP decisions for proponents of proposals, to be discussed and produced during the next meeting of SPC.

Marsaglia moved, Schulte seconded, 31 in favor, 0 opposed, 0 abstained

## **5. Evaluation of Complimentary Project Proposal procedures and experiences (Vrolijk)**

CPPs are a relatively new SPC invention, and the concept was implemented for the first time with Proposal 745-CPP. WDs were assigned swiftly and were found very responsive and dedicated. There was overall commitment to uphold the principles of SSEP. The use of the ‘message board’ was a reasonable success, but needs to be further developed. Global time zones posed a challenge. The process succeeded because everyone practiced the assumption of good intent. Things that are recommended for improvement include: (1) designation of an IODP-MI point contact, (2) greater recognition of the flexibility required for interpretation of IODP-MI rules, (3) more explicit note to WDs that they are on the verge of being involved in time-sensitive work, and (4) involvement of the remainder of the SSEP members – finding a mechanism to quickly reach consensus online. Co-chairs again thanked everyone involved.

## **6. Upcoming SSEP meetings**

The 15<sup>th</sup> SSEP meeting will be in Portland, OregonUSA; tentative dates are 7<sup>th</sup> to 10<sup>th</sup> November 2010. The subsequent meeting in May 2011 will be held at either Cambridge (Hodell) or Bremen (Hinrichs).

## **7. Resolutions for outgoing SSEP members**

Resolutions were given for outgoing SSEP members, viz: Hinrichs (by H. Brinkhuis), Ishiwatari (by Michibayashi), Marsaglia (by McHugh), Schulte (by Harris), and Vrolijk

(by Hornbach).

## **8. Conclusion**

The co-chairs Yasafumi Iryu, Marta Torres, and Henk Brinkhuis thanked all of the panel members for their dedication and hard work, and again thanked Fumio Inagaki for hosting the meeting. Watchdogs submitted drafts of proposal reviews to the IODP-MI science coordinators (Hiroshi Kawamura and Denise Kulhanek) before the meeting ended.

## APPENDIX 1: SSEP Meeting Attendees

Name	E-mail	Affiliation	
Brinkhuis, Hendrik*	H.Brinkhuis@uu.nl	SSEP	co-chair
Carlut, Julie	jcarlut@geologie.ens.fr	SSEP	
Cattaneo, Antonio <sup>a</sup>	Antonio.Cattaneo@ifremer.fr	SSEP	alternate for Berné, Serge
Gallagher, Stephen	sjgall@unimelb.edu.au	SSEP	host
Harris, Robert	rharris@coas.oregonstate.edu	SSEP	
Hinrichs, Kai-Uwe	khinrichs@uni-bremen.de	SSEP	
Hodell, David**	dhod07@esc.cam.ac.uk	SSEP	new member
Hornbach, Matthew	matth@utig.ig.utexas.edu	SSEP	
Ikehara, Ken	k-ikehara@aist.go.jp	SSEP	
Inagaki, Fumio	inagaki@jamstec.go.jp	SSEP	
Iryu Yasufumi*	iryu.yasufumi@a.mbox.nagoya-u.ac.jp	SSEP	co-chair
Ishiwatari, Akira	geoishw@cneas.tohoku.ac.jp	SSEP	
Ishizuka, Osamu**	o-ishizuka@aist.go.jp	SSEP	new member
Koepke, Jürgen**	koepke@mineralogie.uni-hannover.de	SSEP	new member
Lee, Kyung Eun	kyung@hhu.ac.kr	SSEP	
MacLennan, John	jcm1004@cam.ac.uk	SSEP	
Marsaglia, Kathleen	kathie.marsaglia@csun.edu	SSEP	
McHugh, Cecilia	cmchugh@qc.cuny.edu	SSEP	
Michibayashi, Katsuyuki	sekmich@ipc.shizuoka.ac.jp	SSEP	
Morishita, Tomoaki**	moripta@kenroku.kanazawa-u.ac.jp	SSEP	new member alternate for Daniele Brunelli
Moulin, Maryline <sup>b</sup>	mmoulin@fc.ul.pt	SSEP	
Pahnke, Katharina	kpahnke@hawaii.edu	SSEP	
Rosenthal, Yair	rosentha@marine.rutgers.edu	SSEP	
Sato, Tokiyuki	toki@keigo.mine.akita-u.ac.jp	SSEP	
Schulte, Mitch	schultemd@missouri.edu	SSEP	
Smirnov, Aleksey	asmirnov@mtu.edu	SSEP	
Su, Xin**	xsu@cugb.edu.cn	SSEP	new member
Suzuki, Yohey	yohey-suzuki@aist.go.jp	SSEP	
Torres, Marta*	mtorres@coas.oregonstate.edu	SSEP	co-chair
Vrolijk, Peter	peter.vrolijk@exxonmobil.com	SSEP	
Yamamoto, Masanobu**	myama@ees.hokudai.ac.jp	SSEP	new member
<i>Observers</i>			
Anderson, Louise	lma9@le.ac.uk	USIO	
Davies, Sarah	sjd27@leicester.ac.uk	ESO	
Filippelli, Gabe	gfilippe@iupui.edu	SPC	
Guerin, Gilles	guerin@ldeo.columbia.edu	USIO	

Kawamura, Hiroshi	science@iodp-mi-sapporo.org	IODP-MI
Kawamura, Kiichiro	kichiro@fgi.or.jp	SSP
Kawamura, Yoshi	ykawamura@iodp.org	IODP-MI
Kubo, Yusuke	kuboy@jamstec.go.jp	CDEX
Kulhanek, Denise	science@iodp-mi-sapporo.org	IODP-MI
Nielsen, Simon	simon.n@jamstec.go.jp	CDEX
Powell, Emily	EPowell@oceanleadership.org	COL
Slagle, Angela	aslagle@ldeo.columbia.edu	ESO
Ussler, Bill	methane@mbari.org	EDP
Yang, Ting	tyang@tongji.edu.cn	Observer
Zarikian, Carlos	zarikian@iodp.tamu.edu	USIO

*MSPHD program observers*

Whitney, Vivian	
Hintz, Amanda	MSPHD program
McKoy, Kendra	MSPHD program
Navarrete, Jessica	
Urbina	MSPHD program

\*SSEP co-chair

\*\*new members

<sup>a</sup>alternate for Serge Berné

<sup>b</sup>alternate for Daniele Brunelli

## APPENDIX 2: MEETING AGENDA

### 14<sup>th</sup> Meeting of the Science Steering and Evaluation Panel

Kochi City Culture-Plaza Cul-Port, Kochi, Japan

May 18-21<sup>st</sup>, 2010

*Meeting Agenda*

#### Monday May 17, 2010 (Optional)

10:00 to 17:30 Visit on-land accretionary complexes, Shimanto Belt, Muroto Peninsula

18:00 Sponsored ice breaker

#### Tuesday, May 18, 2010 08:30-17:00

##### *Joint Session, Reports*

- Introduction of attendees to SSEP (Iryu)
- Introduction of students sent by USSSP to SSEP (???)
- Opening Remarks by Host (Inagaki)
- Approval of the agenda (Iryu)
- Approval of minutes from Melbourne, Australia November, 2009 (Iryu)
- Introduction to the meeting (Iryu)
- IODP-MI report (H. Kawamura)
- SSP report (K. Kawamura)
- USIO report (Zarikian)

----- Coffee break ----

- CDEX report (Toczko?)
- ESO report (Davis?)
- EDP report (Ussler)

----- Lunch break ----

##### *Joint Session, Meeting overview*

- Reviewing process and breakout sessions (Iryu)

##### *Breakout sessions*

- Proposal review

Proposals to be reviewed:

Proposal	Short title	Lead proponent	Conflict of Int.
737-Full2	North Sea Cenozoic Climate Change	Donders	
<del>745-CPP</del>	<del>Shimokita Coal Bed Biosphere</del>	<del>Inagaki</del>	Inagaki, Hinrichs
748-Full2	Nice Airport Landslide	Stegmann	Cattaneo
751-Full	West Antarctic Ice Sheet Climate	Bart	
754-Full2	Norwegian Sea Silica Diagenesis	Davies	
758-Full2	Atlantis Massif Seafloor Processes	Früh-Green	
765-Pre	Arctic Slope Stability	Winkemmann	
766-APL	Essaouira Seamount Hotspot	Geldmacher	
767-Pre	Tore Seamount Paleoenvironment	Lebreiro	



768-APL	Gulf of Mexico Paleoclimatology	Flower	
769-APL	Costa Rica Crustal Architecture	Tominaga	
770-Full	Kanto Asperity Project: Observatories	Kobayashi	
771-Full	Iberian Margin Paleoclimate 2	Hodell	Hodell
772-APL	North Atlantic Crustal Architecture	Tominaga	

**Watchdog assignments (ver. 10):**

**Breakout Group 1: Earth • Chair: Torres •**

Proposal	Lead WD	WD #2	WD #3	WD #4	WD #5
748-Full2	Carlut,	Ikehara,	McHugh	Vrolijk	Michibayashi
754-Full2	Marsaglia	Smirnov	Koepke	Suzuki	Yamamoto
766-APL	MacLennan	Ishizuka	Smirnov	Morishita	Moulin
758-Full2	Schulte	Hinrichs	Inagaki	Marsaglia	Suzuki
769-APL	Ishiwatari	Ishizuka	MacLennan	Morishita	Harris
770-Full	Smirnov	Harris	Michibayashi	Carlut	Cattaneo
772-APL	Moulin	MacLennan	Morishita	Koepke	Ishiwatari

**Breakout Group 2: Paleoenvironment and Microbiology• Co-chairs: Iryu and Brinkhuis •**

Proposal	Lead WD	WD #2	WD #3	WD #4	WD #5
737-Full2	Rosenthal	Hodell	Ikehara	Cattaneo	Su, Xin
751-Full	Hodell	Sato	Carlut	Lee	Pahnke
758-Full2	Schulte	Hinrichs	Inagaki	Marsaglia	Suzuki
765-Pre	Hornbach	Michibayashi	Harris	McHugh	Vrolijk
767-Pre	Sato	Su, Xin	Gallagher	Inagaki	Lee
768-APL	Gallagher	Yamamoto	Pahnke	Rosenthal	Hodell
771-Full	Pahnke	McHugh	Lee	Su, Xin	Hinrichs

**Wednesday, May 19, 2010 08:30-17:00**

**Breakout sessions**

- Proposal review cont.
- 

**Joint SSEP session**

**SPC report (Filippelli)**

- Proposal Review

**Thursday, May 20, 2010 08:30-16:00**

**Joint SSEP session**

- Proposal Review
- Discussions and recommendations to SPC
- Discussion and evaluation of SSEP protocols and proposal review process, recommendations to SAS evaluating committees
- Announcements on upcoming SSEP Meetings Nov 2010 (USA), May 2011 (Europe?)

- Resolutions for outgoing SSEP: Hinrichs, Ishiwatari, Marsaglia, Rosenthal, Schulte, Vrolijk
- Conclusions

***16:00 Optional visit to the KCC*** : After the meeting, take a bus to Kochi Core Sampling Research Center (KCC), and tour the Core repository and laboratory. Barbecue dinner party at KCC (pay your own).

## **Appendix 3**

Executive Summary (v1.0) of 16<sup>th</sup> SPC meeting (cf. 2.4 SPC)

## **IODP Science Planning Committee**

**16<sup>th</sup> Meeting, 30 August – 1 September 2010**

**San Diego, CA, USA**

### **EXECUTIVE SUMMARY (V.1.0)**

#### **1. Introduction**

##### **1.3. Approve SPC meeting agenda – highlight action items**

**SPC Consensus 1008-01:** The SPC approves the revised agenda of its sixteenth meeting on 30 August 2010- 1 September 2010 in San Diego, CA, USA.

##### **1.4. Approve last SPC meeting minutes**

**SPC Consensus 1008-02:** The SPC approves the minutes of its fifteenth meeting on 23–26 March 2010 in Sydney, Australia.

#### **7. SAS panel reports**

##### **7.1. SSEP**

**SPC Consensus 1008-03:** The SPC recognizes the spirit of SSEP consensus statement 1005-5, but, given the upcoming changes in science advisory structure, declines the statement at this time.

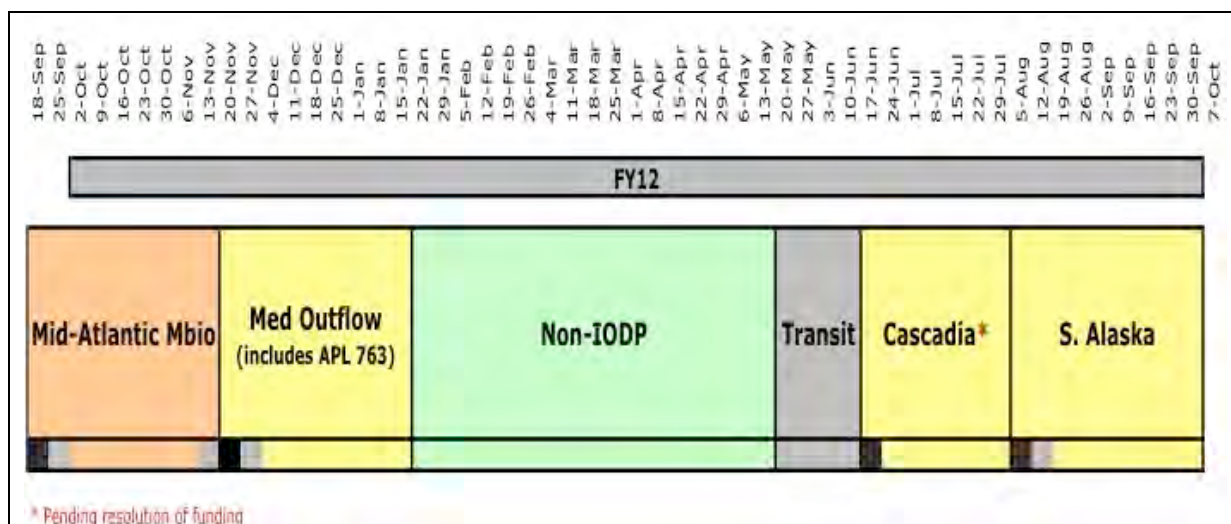
##### **7.5. EDP**

**SPC Consensus 1008-04:** The SPC endorses all consensus statements forwarded to it by the Engineering Development Panel (EDP) (EDP Consensus Statements 1007-04, -05, -06, -07, -08, -09, -10 and -23) for this meeting.

#### **12. OTF Report: IODP expedition scheduling II**

##### **12.2. SPC discussion and approval**

**SPC Consensus 1008-05:** The SPC approves FY11 JR schedule as presented by OTF chair Hans Christian Larsen.



**SPC Consensus 1008-06:** The SPC approves FY12 Chikyū schedule as suggested by NanTroSEIZE Project Management Team (PMT) as Plan (5x5x5) TD around 5200 m.

Year	PMT Plan (5x5x5) TD around 5200m	Plan A+ (5x5x10) TD 7000m	Plan A' (5x5x7) TD 6200m	Plan A'' (5x5x5) TD 6200m
2010	20days20" csg @ 850m	20days20" csg @ 850m	20days20" csg @ 850m	20days20" csg @ 850m
2011	116days(3.9mth) 16" csg @2100m (as deep as possible) (LWD, No Core) 13-3/8" @3300m (as deep as possible) (LWD, Core 100m, Wireline logging, VSP)	116days(3.9mth) 16" csg @2100m (as deep as possible) (LWD, No Core) 13-3/8" @3300m (as deep as possible) (LWD, Core 100m, Wireline logging, VSP)	116days(3.9mth) 16" csg @2100m (as deep as possible) (LWD, No Core) 13-3/8" @3300m (as deep as possible) (LWD, Core 100m, Wireline logging, VSP)	116days(3.9mth) 16" csg @2100m (as deep as possible) (LWD, No Core) 13-3/8" @3300m (as deep as possible) (LWD, Core 100m, Wireline logging, VSP)
2012	99days(3.3mth) 11-3/4" @4700m Core 100m Wireline logging.	99days(3.3mth) 11-3/4" @4700m Core 100m Wireline logging.	99days(3.3mth) 11-3/4" @4700m Core 100m Wireline logging.	99days(3.3mth) 11-3/4" @4700m Core 100m Wireline logging.
2013	94days(3.1mth) Drill 8-1/2"(LWD) to confirm Mega-splay fault. Sidetrack 8-1/2" hole and Core 200m (minimum). Wireline Logging. No need to set 9-5/8" csg.	298days(9.8mth) Drill 8-1/2"(LWD) to confirm fault ST 8-1/2" hole and Core 200m Continue drlg to 6000m. U-ream & set 9-5/8" csg. Drill 8-1/2"(LWD) below Plate Sidetrack and drill to 6900m. Core from 6900m to 7000m Wireline logging. Plug back & Suspend	205days(6.8mth) Drill 8-1/2"(LWD) to confirm fault ST 8-1/2" hole and Core 200m (minimum). Continue drlg to 6100m. Core from 6100m to 6200m. Wireline Log U/ream and set 9-5/8" csg @6000m Plug back & Suspend	150days(5mth) Drill 8-1/2"(LWD) to confirm fault ST 8-1/2" hole and Core 200m (minimum). Continue drlg to 6100m. Core from 6100m to 6200m. Wireline Logging Plug back & Suspend
TTL	329 days (11mth)	533days(17.8 mth)	440 days(14.7mth)	385days(12.8mth)

\* "Year" in the figure above represents Japanese Fiscal Year starting 1 April and ending March 31.

**SPC Motion 1008-07:** The SPC recommends IODP Proposal 681-Full2 Lesser Antilles Volcanic Landslide as the preferred contingency for Proposal 553-Full2 Cascadia Margin Hydrate for FY 12 JR schedule, should the costs of the CORKs make the Cascadia Margin Hydrate expedition fiscally untenable.

Van der Pluijm moved, Murray seconded

14 in favor (*Blackman, Feary, Kakegawa, Maekawa, Murray, Ohkouchi, Peterson, Stein,*

*Takada, Tokunaga, van der Pluijm, Yamazaki, Filippelli, Kasahara*); 3 opposed (*Frueh-Green, John, Umino*), 0 abstained, 3 non-voting (*Li, Cheong, Singhvi*)

**SPC Consensus 1008-08:** The SPC continues to recognize the high merit of recovering a high-resolution North Atlantic climate reference section off the Iberian margin as the prime objective of Proposal 763-APL. SPC also acknowledges Site Survey Panel (SSP) concerns that the deeper sequence at the location of proposed site PORT-1A contains evidence of mass transport deposits (MTDs) that will affect the APL objective of obtaining a continuous, undisturbed sedimentary section. In response to the recommendation by SSP that the drilling location for 763-APL be shifted to avoid MTDs, and with the concurrence of the lead proponent, SPC approves the relocation of the 763-APL drillsite to the location of SHACK-04A, one of a series of sites contained in Proposal 771-Full from the same proponent group. SSP has rated the site survey status of SHACK-04A as “1Aa” and SPC agrees that the scientific objectives of this APL can be more than adequately addressed at the new location. SPC reiterates its support for a fourth APC hole to 150 mbsf in order to ensure recovery of a complete sequence and to provide sufficient sediment for what is likely to be very high sample demand.

## 17. Proposal handling during transition II

**SPC Consensus 1008-09:** SPC asks SSEP to analyze proposals within their pool in November 2010, and determine following;

1. Which have the highest scientific potential
2. Which APLs align with FY2012 drilling schedule and draft FY2013 shiptrack

**SPC Consensus 1008-10:** SPC will consider OTF and SPC proposals at March 2011 for transferring to the new SAS

**SPC Consensus 1008-11:** At the March 2011 SPC meeting, SPC will consider the prioritization of proposals from SSEP when SPC decides which proposals to transfer to the new SAS

**SPC Consensus 1008-12:** SPC will work with IODP-MI in the March-August 2011 timeline to individually advise proponents of all proposals as to the status of their proposal

## 19. Approval of new SAS chair and vice-chair

### 19.1. STP chair and vice-chair

**SPC Consensus 1008-13:** The SPC appoints Saneatsu Saito and Douglas Schmitt as chair and vice-chair of the Scientific Technology Panel (STP) respectively, effective immediately.

### 19.2. SSP chair and vice-chair

**SPC Consensus 1008-14:** The SPC appoints Gilles Lericolais and David Mallinson as chair and vice-chair of the Site Survey Panel (SSP) respectively, effective immediately.

## 20. Other business

**SPC Consensus -15:** The SPC greatly thanks to Ohkuochi's deep knowledge of the program, specially for paleo-climate aspect of carbon in black shale from the mantle origin. He is always so cool. He acted as nice interpreter of Japanese. He explained the culture of Japanese and the status of Japanese government in the relation to scientific view point, and why Chikyu' operation has not been so easy. His comments were critical in SPC decision making. Thank you Ohkuochi and we will miss your enthusiastic contributions.

**SPC Consensus 1008-16:** The SPC thanks Hugh Jenkyns for his service on SPC. He is recognized for his careful evaluation and presentations of proposals and his insight on scientific issues related to stratigraphy, climate and tectonics.

**SPC Consensus 1008-17:** The SPC thanks David Fiery for his service, commitment and enthusiasm as a member of the panel. A New Zealander with Australian pedigree serving as a US representative demonstrates how serious we take national interests. Capitalizing on a long experience in ocean drilling, Dave complemented regular member duties with informative get-togethers for new and returning US members, and encouraged informal meetings with a range of stakeholders in support of the program's current and future goals. Dave demonstrated a firm commitment to diversity in research targets and a keen sense of likely success. Importantly, he served the IODP with an ever-present smile and healthy sense of humor that often served us well.  
Thank you, Dave.

**SPC Consensus 1008-18:** The SPC thanks Gilbert Camoin for his dedicated and highly effective service within SPC. His deep knowledge in all aspects of paleoclimate/paleoceanography, especially those related to sea-level change, played always a crucial role in SPC decision making. The SPC will miss his experience, enthusiastic contributions, and humor, and wishes Gilbert every success in his future activities – inside and outside of IODP.

**SPC Consensus 1008-19:** The SPC thanks Donna Blackman, the University of California San Diego, and Ocean Leadership for hosting the 16<sup>th</sup> IODP Science Planning Committee Meeting, held at Scripps Institution of Oceanography. The meeting venue was incredible, enhanced by the exceptional weather, making it even more difficult to remain in the beautiful Forum, and not on the beach. The SPC thanks Neil Driscoll for a tremendous beach walk/field excursion through the Eocene fan system exposed in cliffs north of Scripps. Finally, the SPC thanks ICP10 for the opening night reception.

## **Appendix 4**

Urbino Summer School on Paleoclimatology 2010 Report



# THE 2010 URBINO SUMMER SCHOOL IN PALEOCLIMATOLOGY



**REPORT TO ECORD**

# THE 2010 URBINO SUMMER SCHOOL IN PALEOCLIMATOLOGY (USSP)

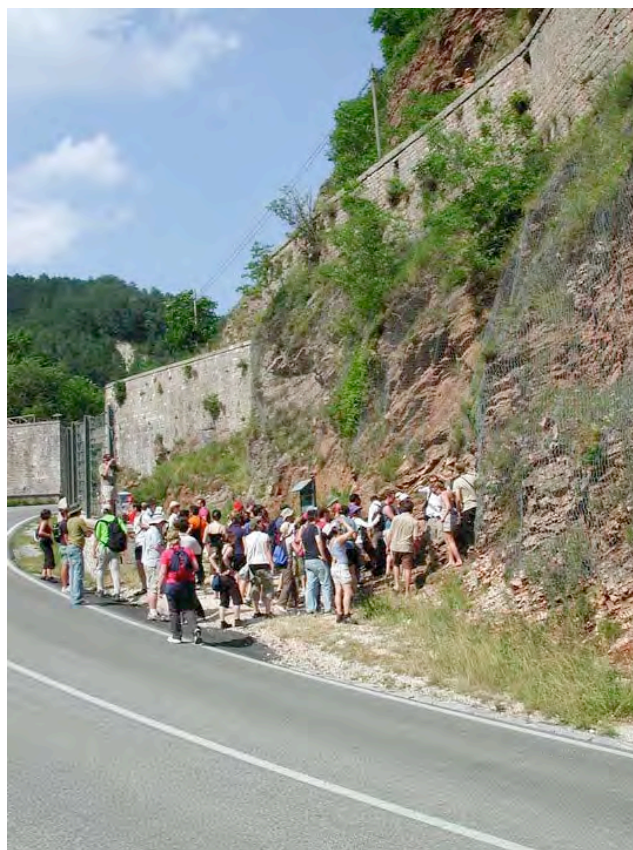
To promote the integration of field data and modeling results in the next generation of paleoclimatologists, the USSP Consortium and teacher pool (Table 1a, b) organized the **7th Urbino Summer School in Paleoclimatology between July 10-29, 2010, in Urbino, Italy**. The USSP brought together ~45 world experts in climatology and climate modeling, paleontology, palaeoceanography, palaeoclimatology, and geochemistry, to lecture and mentor ~60 typically first-year graduate students more than 15 nations (Table 2). This brief report summarizes the 7<sup>th</sup> USSP in terms of structure and impact, support and financing, and ongoing planning for its next offering.

## ***USSP 2010 Structure and Impact***

The USSP 2010 provided an integrated student-centered program comprised of (1) integrated overarching plenary topical lectures by internationally recognized scientists; (2) student-centered data-rich exercises, field investigations, and presentations on field data and related *ad hoc* modeling results; (3) Parallel sessions providing groups of participants with a more focused coverage of selected topics within paleoclimatology (4) a field excursion to the classic Cretaceous and Cenozoic sections around Gubbio, and (5) intensive

discussions of specific palaeoclimate and IODP related topics in small student working groups facilitated by dedicated

instructors. The 2010 program structure included, as usual, a first week almost exclusively centered on IODP/JOI elements, mainly including elements of the ‘*School of Rock*’ by Mark Leckie (UMass. Amherst, USA).



USSP 2010 group visiting the classical Cretaceous/Tertiary boundary outcrop at Bottaccione during the field work.

The 2010 program structure included, as usual, a first week almost exclusively centered on IODP/JOI elements, mainly including elements of the '*School of Rock*' by Mark Leckie



The class in the calssroom...

(UMass. Amherst, USA). This allowed to develop several student-centered investigations within the broader structure of a "virtual IODP leg" and comparison of oceanic sequences with the local succession counterparts. The USSP 2010 schedule is presented in Table 3. In addition, USSP 2010 programme included a 1 day workshop (Transient Changes in Past Warm Climates on July 23, 2010) where many

instructors gave informal presentations on their latest, often unpublished, field and modeling results, providing students with an excellent opportunity to experience the cutting edge of scientific progress. Student 2010 course evaluations assessed USSP 2010 as extremely positive.

*USSP Support and Financing* – As in past years, the Faculty of Sciences & Technologies of Urbino University hosted USSP 2010, providing a large hall for lectures, labs, smaller rooms for student working groups and parallel sessions, and wireless computer and library access to support student-centered investigations. Student tuition was set at an economical 650 euro, due in large part to generous sponsorship by (1) the Italian Ministry for Environment , (2) the Netherlands Darwin Center for Biogeosciences (3), the European



Former EGU Outstanding Young Scientists awardees Appy Sluijs and Luke Skinner holding the Cioppino 2010 workshop abstract book.

Consortium for Ocean Research Drilling (ECORD), (4) the European Geophysical Union (EGU; sponsoring

teaching by '*EGU outstanding young scientist*'-awardees), (5) the United States National

Science Foundation (NSF), (6) the LPP Foundation, Utrecht, and (7) the universities of Urbino and Utrecht. Additional generous support from these, and smaller sponsors including ACE-SCAR and IMAGES allowed USSP to offer more than 20 student fellowships. **The collective support of these institutions is gratefully acknowledged.** Please note that all institutional support and student tuition is exclusively used to fund travel and lodging for the USSP instructors, who freely donate their valuable time and effort to organize and produce the USSP program.

The partnership with

The partnership with the Darwin Center for Geobiology is of great relevance for the Urbino Summer School in Paleoclimatology, not only because of the continual financial support but also –and even more importantly – for the great contribution in terms of teaching forces and inputting of new ideas in the program. This resulted in the inclusion in the course of additional concepts and components that have a great relevance for the programme and the participants.

*USSP 2011 Ongoing Planning* – For our 2011 offering, we have received, and gratefully acknowledge the financial support from ECORD. We are currently seeking additional financial sponsorship, notably from non-European IODP sources, to reduce tuition levels, increase student enrollment, and maintain our low instructor-to-student ratio.

With compliments,

obo USSP Consortium: Henk Brinkhuis & Simone Galeotti, directors USSP

**Table 1a.** *Members of the (core) USSP Consortium. This Consortium was established in November 2005 to support and give continuity to the USSP programme.*

<b>Member</b>	<b>Institution</b>	<b>Country</b>
Henk Brinkhuis (Lead Organizer)	Utrecht University	Netherlands
Ken Caldeira	Stanford University	USA
Rob DeConto	University of Massachusetts	USA
Gerald R. Dickens	Rice University	USA
Simone Galeotti (Lead Organizer)	Urbino University	Italy
Matthew Huber	Purdue University	USA
Lee Kump	Penn State University	USA
Mark Leckie	University of Massachusetts	USA
Mark Pagani	Yale University	USA
Paul Pearson	University of Cardiff	UK
Isabella Premoli-Silva	Milano University	Italy
Isabella Raffi	Chieti University	Italy
Eelco Rohling	University of Southampton	UK
Stephen Schellenberg	San Diego State University	USA
Ellen Thomas	Yale University	USA
James C. Zachos	University of California, Santa Cruz	USA

**Table 1b.** Members of the USSP teacher pool and their academic institution. USSP lecturers are recognized scholars in paleoclimatology, and related disciplines, and frequently contribute to the field through publications in peer-reviewed journals (e.g., *Science*, *Nature*, *Geology*, *Paleoceanography*, etc.). Nearly all teach university courses and mentor student research from the undergraduate and graduate level.

USSP Teacher Pool (2009-2010)		
David Beerling	University of Sheffield	UK
James Bendle	Glasgow University	UK
Jelle Bijma	AWI Bremerhaven	Germany
Steve Bohaty	Southampton University	UK
Gabriel Bowen	Purdue University	USA
<i>Henk Brinkhuis (director)</i>	Utrecht University	The Netherlands
Ken Caldeira	Stanford University	USA
Anthony Cohen	UK Open University	UK
Thomas Cronin	USGS National Center	USA
Robert DeConto	University of Massachusetts	USA
Peter DeMenocal	Lamont-Doherty	USA
Gerald R. Dickens	Rice University	USA
Henk Dijkstra	IMAU Utrecht	The Netherlands
<i>Simone Galeotti (director)</i>	Urbino University	Italy
Darren Grocke	Durham University	UK
Niki Gruber	ETH Zurich	Switzerland
Gerold Haug	ETH Zurich	Switzerland
Anna von der Heydt	IMAU Utrecht	The Netherlands
Chris Hollis	GNS	New Zealand
Jorijntje Henderiks	Uppsala University	Sweden
Matthew Huber	Purdue University	USA
Kirk Johnson	Denver NHM	USA
Paul Koch	University of California Santa Cruz	USA
Lee Kump	Penn State University	USA
Luca Lanci	Urbino University	Italy
Mark Leckie	University of Massachusetts	USA
Lucas Lourens	Utrecht University	The Netherlands
Dick Kroon	Edinburgh University	UK
Jack Middelburg	Utrecht University	The Netherlands
Ulysses Ninnemann	Bergen University	Norway
Mark Pagani	Yale University	USA
Heiko Pälike	University of Southampton	UK
Rich Pancost	Bristol University	UK
Paul Pearson	University of Cardiff	UK
Isabella Premoli-Silva	Milano University	Italy
Isabella Raffi	Chieti University	Italy
Gert-Jan Reichert	Utrecht University	The Netherlands
Maureen Raymo	Columbia University	USA
Andy Ridgwell	Bristol University	UK
Eelco Rohling	University of Southampton	UK
Yair Rosenthal	Rutgers University	USA
Francesca Sangiorgi	Utrecht University	The Netherlands
Stephen Schellenberg	San Diego State University	USA
Caroline Slomp	Utrecht University	The Netherlands
Appy Sluijs	Utrecht University	The Netherlands
Luke Skinner	Cambridge University	The Netherlands
Jan Smit	Vrije Universiteit Amsterdam	The Netherlands
Howard Spero	University of California Davis	USA
Catherine Stickley	Norwegian Polar Institute	Norway
Paolo Stocchi	TU Delft	The Netherlands

Neil Tabor	Perdue University	USA
Debbie Thomas	Texas A&M University	USA
Ellen Thomas	Yale University	USA
Paul Valdes	Bristol University	UK
Bert Vermeersen	TU Delft	The Netherlands
Bridget Wade	Leeds University	UK
Johan Weijers	Utrecht University	The Netherlands
Scott Wing	Smithsonian Inst. Washington DC	USA
Roderik van de Wal	IMAU Utrecht	The Netherlands
Jim Zachos	University of California, Santa Cruz	USA
Richard Zeebe	University of Hawaii at Manoa	USA
Patrizia Ziveri	UAB Barcelona	Spain

**Table 2.** Participants to USSP2010 and their nationality. USSP received more than 90 applications this year and was able to accept 52 participants, several of them receiving a scholarship from different institutions.

	<b>Surname</b>	<b>Name</b>	<b>Nationality</b>		<b>Surname</b>	<b>Name</b>	<b>Nationality</b>
1	Allen	Kat	USA	27	Mjell	Tor Lien	Norwegian
2	Balsinha	Maria Joao	Portuguese	28	Myhre	Sarah	USA
3	Bell	Dave	UK	29	O'Dea	Sarah	UK
4	Berke	Melissa	German	30	Olde	Kate	UK
5	Bloxsom	Pete	UK	31	Penman	Don	USA
6	Bonnet	Sophie	French	32	Poigner	Harald	German
7	Bosmans	Joyce	Dutch	33	Pope	James	UK
8	Buckles	Laura	Dutch	34	Ruvalcaba	Itzel	Dutch
9	Buzan	Jonathan	USA	35	Sagoo	Navjit	UK
10	Cicek	Aydin	Turkish	36	Schuler	Lisa	German
11	Cogez	Antoine	French	37	Setoyama	Eiichi	Japanese
12	Consoloni	Ilaria	Italian	38	Sghibartz	Cristina	UK
13	Delle	Rose Marco	Italian	39	Stepanek	Christian	German
14	Erb	Michael	German	40	Stewart	Joe	UK
15	Fer	Istem	Turkish	41	Toney	Jaime L.	USA
16	Gao	Shuang	Chinese	42	Topper	Robin	Dutch
17	Gasson	Ed	UK	43	Vanhove	Daan	Belgian
18	Goldner	Aaron	USA	44	Vasiliev	Iuliana	Dutch
19	Goudeau	Marie-Louise	French	45	Vellekoop	Johan	Dutch
20	Grogan	Danielle	USA	46	Vetter	Lael	USA
21	Hesse	Tilman	German	47	Vinje	Galaasen Eirik	Norwegian
22	Ivanovic	Ruza	UK	48	Wang	Tingting	Chinese
23	Jansson	Ida	Canadian	49	Warnock	Jon	USA
24	Jantz	Nele	German	50	Winnick	Matt	USA
25	Kanner	Lisa	USA	51	Xu	Xu	Chinese
26	Koutsodendris	Andreas	Greek	52	Yau	Audrey	USA



## **Appendix 5**

ECORD Summer School on Dynamics of Past Climate Changes Bremen Report

## Report

### ECORD Summer School on “Geodynamics of Mid-Ocean Ridges”

September 13-24, 2010, MARUM - University of Bremen, Germany



#### 1 Aims

The major goal was to bring PhD students and young Postdocs in touch with IODP at an early stage of their career, inform them about the actual research within this international scientific program, and to prepare them for future participations in IODP expeditions. Such training will be achieved by taking the summer school participants on a “virtual ship” where they get familiarized with a wide spectrum of state-of-the-art analytical technologies and core description methods according to the high standards on IODP expeditions. Therefore the course was equally balanced, with half the time dedicated to lectures and discussions and the other half to laboratory exercises.

#### 2 Location and Organisation

The ECORD Summer School on “Dynamics of Past Climate Changes” 2010 was held September 13-24, 2010 at the MARUM – Center for Marine Environmental Sciences, Bremen University, Germany. It has been organized by Prof. Dierk Hebbeln, Director of the Bremen International Graduate School for Marine Sciences „Global Change in the Marine Realm“ (GLOMAR), by Prof. Dr. Michael Schulz, head of the Geosystem Modelling at the University of Bremen, and by Dr. Ursula Röhl, head of the IODP Bremen Core Repository (BCR). GLOMAR, MARUM and BCR jointly offered the unique training possibilities used for this summer school by providing laboratory facilities and by providing a seminar room equipped with 20 laptops (internet access, MatLab etc.).

### 3 The Topic

There is particular public and political focus on the role of anthropogenic greenhouse gases as a driver for the observed warming trend in global climate. IODP findings within paleoclimate research have gained strong societal interest and were recently recognized by the Intergovernmental Panel on Climate Change as an important contributor to understand processes of climate change. Correspondingly, the topic covered here is highly relevant in terms of assessing: (1) how and why rapid major changes in climate and sea-level have happened in the past; (2) critical parameters and thresholds in Earth systems affecting climate change; and (3) what extremes might be possible for our planet and their implications for future climate change.

### 4 Programme

The two-week course combined lectures and interactive discussions on mid-ocean ridges with practical exercises, with the latter mainly using the facilities of the BCR. The scientific lectures and exercises have been confined mostly to the first week, whereas the "virtual ship" related practicals took part during the second week. During the weekend in the middle of the summer school an excursion was offered.

In the first week the program (see attachment) focused on lectures by and discussions with leading paleoceanographers and paleoclimatologists. The latter included climate modelers, physical oceanographers, and researchers working on polar ice cores as well as lake records. The lectures and discussions, given and guided by leading scientists from the field (see below), have been grouped in the following sub-themes:

1. *Climate response to orbital forcing*
2. *Millennial-scale climate variability*
3. *Linkages between climate and tectonics*
4. *Sea-level changes*
5. *Paleoproductivity, carbon burial through time, high CO<sub>2</sub> worlds*

The weekend between the first and the second week gave the participants the possibility to join a field trip to the *Late Quaternary landscapes in the vicinity of Bremen* on Saturday, and to explore the city of Bremen at the free Sunday. The second week of the summer school took advantage of the unique facilities of the Bremen IODP core repository and labs and aimed at introducing PhD students and young Postdocs



to a full range of IODP related topics from general introduction to the program to compiling of IODP proposals and to get an insight into "shipboard" methodologies applied on the drilling vessels. The focus was on group-based practicals focusing on standard shipboard methodologies such as core description, physical properties, stratigraphy, borehole logging, etc..

Lecturer:

Name	Institute/University
Karl-Heinz Baumann	MARUM / University of Bremen
Torsten Bickert	MARUM / University of Bremen
Sarah Davies	University of Leicester (UK)
André Droxler	Rice University (USA)
Gerhard Fischer	MARUM / University of Bremen
Thomas Fredrichs	MARUM / University of Bremen
Walter Hale	MARUM / University of Bremen
William Hay	University of Colorado (USA)
Dierk Hebbeln	GLOMAR / University of Bremen
Dave Hodell	University of Cambridge (UK)
Holger Kuhlmann	MARUM / University of Bremen
Ken Miller	Rutgers University (USA)
Alan Mix	Oregon State University (USA)
Mahyar Mohtadi	MARUM / University of Bremen
Matthias Prange	MARUM / University of Bremen
Ulla Röhl	MARUM / University of Bremen
Luzie Schnieders	MARUM / University of Bremen
Michael Schulz	MARUM / University of Bremen
Luke Skinner	University of Cambridge (UK)
Stefan Steinke	MARUM / University of Bremen
Thomas Westerhold	MARUM / University of Bremen

## 5 Participants

A total of 28 PhD students and young post-docs from several European countries and Canada participated in the ECORD Summer School.

Name	Institute/University	Country
Nicolas Barbarin	Université Aix-Marseille III	France
Evgenia Bazhenova	Alfred-Wegener-Institute, Bremerhaven	Germany
Rachel Brackenridge	Heriot-Watt University, Edinburgh	United Kingdom
Wenwen Chen	MARUM / University of Bremen	Germany
Patrick Grunert	University of Graz	Austria
Annette Hahn	University of Bremen	Germany
Helen Hamaekers	KU Leuven	Belgium
Sze Ling Ho	Alfred-Wegener-Institute, Bremerhaven	Germany
Enqing Huang	MARUM / University of Bremen	Germany
Franziska Kersten	Alfred-Wegener-Institute, Bremerhaven	Germany
Anna Kloss	MARUM / University of Bremen	Germany
Max Lars	Alfred-Wegener-Institute, Bremerhaven	Germany
Edith Maier	Alfred-Wegener-Institute, Bremerhaven	Germany
Sandra Mateus	Marine Geology Unit (UGM), LNEG, Alfragide - Lisbon	Portugal
Lelia Matos	Marine Geology Unit (UGM), LNEG, Alfragide - Lisbon	Portugal
Marie Meheust	Alfred-Wegener-Institute, Bremerhaven	Germany
Chloé Pretet	University of Geneva	Switzerland
Andreia Rebotim	Marine Geology Unit (UGM), LNEG, Alfragide - Lisbon	Portugal

Name	Institute/University	Country
Kira Rehfeld	PIK Potsdam / Humboldt University Berlin	Germany
Jian Ren	Alfred-Wegener-Institute, Bremerhaven	Germany
Jan-Rainer Riethdorf	IFM-GEOMAR, Kiel	Germany
Sarah Romahn	Alfred-Wegener-Institute, Bremerhaven	Germany
Angeliki Sampatakaki	University of the Aegean, Mytilene	Greece
Celia Neto dos Santos	Marine Geology Unit (UGM), LNEG, Alfragide - Lisbon	Portugal
Natalia Sudarchikova	Max-Planck-Institute for Meteorology, Hamburg	Germany
Huadong Liu	MARUM / University of Bremen	Germany
Xiao Zhang	MARUM / University of Bremen	Germany
Rike Zimmermann	MARUM / University of Bremen	Germany

Within the summer school, the participants were given the opportunity to present their own projects in 15-minutes talks. Ms **Rachel Brackenridge** (Heriot-Watt University, Edinburgh), Mr **Patrick Grunert** (University of Graz), Mr **Enqing Huang** (MARUM / University of Bremen), Ms **Chloé Pretet** (University of Geneva), and Ms **Kira Rehfeld** (PIK Potsdam / Humboldt University Berlin) received awards for best oral presentations.

## 6 Feedbacks

During the summer school and especially at its end we received overwhelming positive feedbacks from the participants, especially with respect to the very dedicated lecturers.

## 7 Outlook and ECORD Summer School 2011

It is planned to address the three major topics of the IODP Initial Science Plan in a recurring three year cycle, thereby exploiting the unique facilities in Bremen where about 50 scientists work on the whole width of IODP-related topics. After the first full cycle comprising an "Earth History" topic in 2007 (*ECORD Summer School on Paleooceanography*), a "Deep Biosphere" topic in 2008 (*ECORD Summer School on the Deep Subseafloor Biosphere*), and a "Solid Earth Cycles and Geodynamics" topic in 2009 (*ECORD Summer School on the Geodynamics of Mid-Ocean Ridges*), this year's summer school on *Dynamics of Past Climate Changes* was again an "Earth History" topic and, thus, started the second cycle. In the next year, we will continue this cycle with the ***ECORD Summer School on the Subseafloor Fluid Flow and Gas Hydrates*** which is preliminary scheduled to take place in Bremen from September 12-23, 2011.

**Attachment: Overview on the Summer Schools programme**

Monday Sep. 13	Tuesday Sep. 14	Wednesday Sep. 15	Thursday Sep. 16	Friday Sep. 17
<b>Welcome &amp; Introduction</b>	Wrap-up of the previous day by participants	Wrap-up of the previous day by participants	Wrap-up of the previous day by participants	Wrap-up of the previous day by participants
<b>Climate response to orbital forcing</b>	<b>Millennial-scale climate variability</b>	<b>Linkages between climate and tectonics</b>	<b>Sea-level changes</b>	<b>Paleoproductivity, carbon burial, high CO<sub>2</sub> worlds</b>
Introduction to key proxies – in ocean sediments, ice cores (Hodell)	The record of rapid change (Hodell)	Tectonics and Climate (Hay)	Eustacy (Miller)	Carbon cycle and ocean productivity: an introduction (Hay)
Introduction to orbital climate analysis (Mix)	Practical: Exploring hysteresis behaviour (Skinner/Schulz)	<i>-continued -</i>	Carbonate sequences (Droxler)	From high to low CO <sub>2</sub> worlds (Hay)
Presentations by participants	Presentations by participants	Presentations by participants	Presentations by participants	Presentations by participants
Simple timeseries models (Mix)	Modelling glacial millennial-scale climate variability (Skinner/Schulz)	Global ocean circulation near the Eocene-Oligocene boundary (Prange)	Siliciclastic sequences (Miller)	A short-term perturbation of the carbon cycle: The PETM (Bickert)
Orbital Changes, Mid Pleistocene Transition and longer (Hodell)	Millennial-scale variability during interglacials (Skinner, Hodell, Schulz)	Tropical ocean gateway closures and Neogene climate cooling (Prange)	Coral Reefs and Deglaciations (Droxler); Future sea level (Miller)	Oceanic anoxia - principles and examples from history (Fischer)
<b>Ice Breaker</b>				

**Saturday, Sep.18**

Field trip: Late Quaternary landscapes in the vicinity of Bremen (Hebbeln)

**Sunday, Sep. 19**

Free time to explore Bremen

Monday Sep. 20	Tuesday Sep. 21	Wednesday Sep. 22	Thursday Sep. 23	Friday Sep. 24
<b>Introduction to IODP and ECORD (Röhl, Hale)</b>	Lab turn #1	Lab turn #3	Lab turn #5	<b>How to write an IODP proposal (Röhl)</b>
Introduction Core curation BCR – Bremen Core Repository				
Presentations by participants	Lab turn #2	Introduction to Virtual Ship Lab turns #4-#6	Lab turn #6	Wrap-up, Awards, & farewell
Introduction to Virtual Ship Lab turns #1-#3		Lab turn #4	Downhole Logging (Davies)	
	Presentations by participants		Farewell get-together	

**Lab turns (Three groups of 9-10 students rotate for three practicals)**

<b>Turn #1 - #3:</b> Core description (Mohtadi, Steinke) Physical properties (Kuhlmann) XRF Core scanning (Röhl)	<b>Turn #4 - #6:</b> Core splicing (Westerhold) Integrated stratigraphy (Fredrichs, Baumann) Pore waters (Schnieders)
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## **Appendix 6**

ECORD/IODP-Canada Summer School on Ocean and climate changes in polar and subpolar environments information



Montreal, July 23th, 2010

## Re: IODP/ECORD - Canada 2010 Summer School: A great success

The IODP/ECORD Summer School "Ocean and climate changes in polar and sub-polar environments" organized from June 27th to July 12th by ECORD/IODP-Canada was a great success. Nineteen students and postdoctoral fellows from Canada, France, Germany, UK, Serbia, Portugal and USA participated in a two-week intensive training in marine geology and paleoceanography. The participants had sailing and sampling experience on board the R/V Coriolis II in the St. Lawrence Estuary and Saguenay Fjord; they acquired theoretical and practical knowledge on cutting-edge techniques for sampling and analyzing geological and geophysical data. Courses, lectures, practical exercises and laboratory visits were offered at UQAR, INRS-ETE and UQAM, in addition to field trips in Gaspesia and St. Lawrence Lowlands giving students an extensive scientific portrait of paleoceanography and paleo-climatology in polar and sub-polar environments.



*Caption: Students sampling sediments in a box core on the R/V Coriolis II. Photo by H. Gaonac'h*

This summer school was possible thanks to the participation of an impressive group of scientists. More than a dozen researchers from ECORD countries and actively involved in IODP activities presented the most recent state-of-the-art theory and practice in high latitude geophysics, geochemistry, paleontology, geomorphology, oceanography, sedimentology, sea-ice modeling, gas hydrates: Hans Asnong H. (UQAM, Canada), Gilles Bellefleur (GSC-Ottawa, Canada), Xavier Crosta (Bordeaux I, France), Anne de Vernal (UQAM, Canada), Mathieu Duchesne (GSC-Québec, Canada), Frédérique Eynaud (Bordeaux I, France), Pierre Francus (INRS-ETE, Canada), Martin Frank (IFM-GEOMAR, Germany), Yves Gélinas (Concordia, Canada), Joël Guiot (CNRS, France), Claude Hillaire-Marcel (UQAM, Canada), Patrick Lajeunesse (Laval, Canada), Jean-François Lemieux (New York, USA), Guillaume Massé G. (CNRS, France), Matt O'Regan (Cardiff, UK), Joseph Ortiz (Kent State, USA), Frank Rack (Nebraska-Lincoln, USA), Taoufik Radi (UQAM, Canada), André Rochon (UQAR, Canada), Ruediger Stein (AWI, Germany), Guillaume St-Onge (UQAR, Canada), Bjorn Sundby (UQAR).

IODP-Canada is grateful to the many institutions which sponsored this summer school: the GEOTOP Research Center, the *Institut des sciences de la mer de Rimouski* (ISMER), the *Institut national de la recherche scientifique - Centre - Eau Terre Environnement* (INRS-ETE), the Université du Québec à Montréal (UQAM), the Canadian Consortium for Ocean Drilling (CCOD), the European Consortium for Ocean Research Drilling (ECORD) and the MobilUQ program of the *Université du Québec*.

For more details on the 2010 IODP/ECORD-Canada Summer School, please contact the IODP-Canada office.



*Caption: The participants during a field trip at the Parc national du Bic. Photo by H. Gaonac'h*

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# **R/V Coriolis II Expedition 2010-03**



**Part of the Integrated Ocean Drilling Program (IODP) – Summer school in Marine Geology and Paleoceanography**

**Location: Quebec, Canada**

**Date: June 28 to June 30, 2010**

**Leg A: Rimouski to Saguenay Fjord to Tadoussac**

**Leg B: Tadoussac to Rimouski**

**Senior Scientists: Guillaume St-Onge and Anne de Vernal**

*Report by scientific staff of R/V Coriolis II Expedition: Final Draft July 12, 2010*

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## 1. Acknowledgements

The participation and training of the scientific staff during the June 2010 expedition to the Gulf of St. Lawrence, Quebec was possible thanks to the financial support from the Université du Québec (MobilUQ grant) as well as from ECORD (European Consortium for Ocean Research Drilling) and IODP (Integrated Ocean Drilling Program)-Canada. The scientific staff is grateful to Anne de Vernal (GEOTOP, UQAM) and Guillaume St-Onge (GEOTOP, ISMER-UQAR) for their supervision and support during the mission. We also thank the crew of the research vessel Coriolis II for exemplary operation of the ship and aiding in the collection of sediment and water-column samples, and geophysical data.

## 2. Context

The mission on board the R/V Coriolis II was part of the *Integrated Ocean Drilling Program* (IODP) - Canada summer school in June 2010. This course took place on the state-of-the-art research vessel R/V Coriolis II in the Saguenay Fjord and the St. Lawrence Estuary from June 28 to June 30<sup>th</sup>, 2010. The mission was separated into two legs: Leg A - Rimouski into the Saguenay Fjord and then back to Tadoussac, and leg B - Tadoussac to Rimouski, allowing for the training of a total of 20 students and young researchers.

Paleoclimatology and paleoceanography attempt to deeply understand extremely important issues about global change, in particular regarding rapid climate fluctuations, sea ice cover, sea level variations, natural hazards, bioproductivity, and the sequestration of CO<sub>2</sub>. Indeed, due to the large variability in response to anthropogenic forcing, model-based climatic projections are primarily extrapolations of data series. To test and evaluate predictive models, it is thus necessary to study extreme events from "archive" proxies of past climates accessible from marine and lacustrine sediments.

The analysis of these data is often very difficult and requires multidisciplinary approaches. It starts with preliminary studies based on the establishment of bathymetric seismic profiles to precisely determine seafloor or lake bottom topography, and thus the best coring or drilling sites. This is followed by expeditions to collect sample materials. While such marine programs are necessary for the success of marine and paleoceanography research, they are also crucial for the training of students since they give the young researchers some basic background and more advanced concept learning and hands-on experience at sea as opposed to only classroom study. This type of event also gives opportunities for new collaborations and interactions between students and professors.

## 3. Objectives

The main objective of this short expedition was to allow the summer school students to acquire theoretical and practical knowledge in marine geology and in the paleoceanography of polar and sub-polar environments. Other objectives include improving understanding of the preparation of marine expeditions, and increasing familiarization with various basic and cutting edge techniques for the sampling and analysis of geological and seismic bathymetric data.

Marine geology is a field science in which learning from marine expeditions is a very important part. It is a multidisciplinary science where numerous research projects involve

theoretical and technical contributions from geophysics, geochemistry and micropaleontology. Such training also implies knowledge of basic sailing and safety and security principles. In this short mission, students acquire training as well as develop interactions and new collaborations with participants from various backgrounds and between the University of Quebec universities (UQAM, UQAR) as well as with universities from other parts of Canada, Europe, and elsewhere. During the mission, the students have the opportunity to learn cutting edge techniques such as geophysical seismic methods (with an echosounder and side scan sonar), and also basic coring (box coring, gravity coring, grab sampling, and piston coring), as well as sampling (of water, plankton, etc.) and monitoring of the water column properties of temperature, salinity, and turbidity (using a CTD device).

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Blue rows, Leg A; Green rows, Leg B; White rows, Legs A and B

**Leg A:** *Back row, Left-Right:* Stefan Markovic, Laurence Nuttin, Jenny Maccali; *Second row, L-R:* Guillaume St-Onge, Romina Gehrmann, Paul Beckwith; *Front row, L-R:* Gilles Desmules, Anne de Vernal, Mathieu Dellinger, Sophie Retailleau, Alex Matveev, Thais Lamana, Audrey Limoges.



**Leg B:** *Back row, Left-Right:* David Carozza, Guillaume St-Onge, Eugenia Bazhenova, Delphine Fernandez-Bruyère, Marc-André Cormier, Mathieu Chevalier, Elizabeth Farmer, Cristina Ventura; *Front row, L-R:* Anne de Vernal, Ayoki Oluwaseyi Idowu, Anthony Novak.



## 5. Summary of Accomplishments and Activities

>12 hours of seismic reflection data

>2 hours of recorded seismic reflection data

Survey and detection of shipwreck *Empress of Ireland* with side-scan sonar

6 CTD profiles

2 Piston cores (plus trigger weight cores)

4 Box cores

1 Plankton tow

1 Grab van Veen core

1 Gravity Core

Table 5.1 Summary table of activities during Coriolis II 2010-03.

### Coriolis II, 2010-03 activities

Date	Time of day	Location	Activity	Site	Notes
			Team A embark on		
28	Dinner time	Rimouski	Leg A		
28	Evening	Rimouski	Steam		
	Evening	Rimouski	Echo sounding		no recording
					Pump not working -
28	Evening	St-Lawrence estuary	CTD		cancellation
			Grab Van Veen		
28	Evening	St-Lawrence estuary	core	COR1003-01	
28	Evening	St-Lawrence estuary	Plankton tow	COR1003-01	
28	Evening	St-Lawrence estuary	Steam		
				<i>Wreck of the</i>	
28	Evening	St-Lawrence estuary	Side scan sonar	<i>Empress of</i>	
28	Evening	St-Lawrence estuary	Steam		
28	Evening	St-Lawrence estuary	CTD	COR1003-02	
28	Night	St-Lawrence estuary	Steam		
29	Morning	Saguenay Fjord	Piston core +		Piston stopped by
29	Day	Saguenay Fjord	Trigger weight	COR1003-03	sand layer
29	Day	Saguenay Fjord	Box core	COR1003-03	3 sub-samples
29	Day	Saguenay Fjord	CTD		
29	Day	Saguenay Fjord	Steam		
29	Day	Baie des Ha! Ha!	Box core	COR1003-04	2 sub-samples
29	Day	Baie des Ha! Ha!	Gravity core		Half full
29	Day	Baie des Ha! Ha!	CTD		
29	Day	Baie des Ha! Ha!	Steam		
			Teams change,		
			Team B embark on		
29	Dinner time	Tadoussac	Leg B		
29	Evening	Tadoussac	Steam		
					Echo sounder,
29	Evening	St-Lawrence estuary	Seismic survey		no recording
29	Evening	Upwelling zone	CTD	COR1003-05	

## Coriolis II, 2010-03 activities

Date	Time of day	Location	Activity	Site	Notes
29	Evening	Escoumins area	CTD	COR1003-06	Stopped working on the way up (~250m)
29	Night	St-Lawrence estuary	Steam		
30	Morning	Betsiamites area	Seismic survey		Sparker and Echo sounder, recorded
			Piston core +		
30	Day	Betsiamites area	Trigger weight	COR1003-07	TWC almost empty
30	Day	Betsiamites area	Box core	COR1003-07	3 sub-samples
30	Day	Betsiamites area	CTD	COR1003-07	Test, 60m
30	Day	St-Lawrence estuary	Steam		
30	Day	Laurentian Channel, Pointe au père	CTD	COR1003-08	Stopped working on the way down (~180m), cancelled
30	Day	Laurentian Channel, Pointe au père	Box core	COR1003-09	At an angle, 2 sub-samples
30	Day	St-Lawrence estuary	Steam		
30	Day	Rimouski	Team B disembarks		

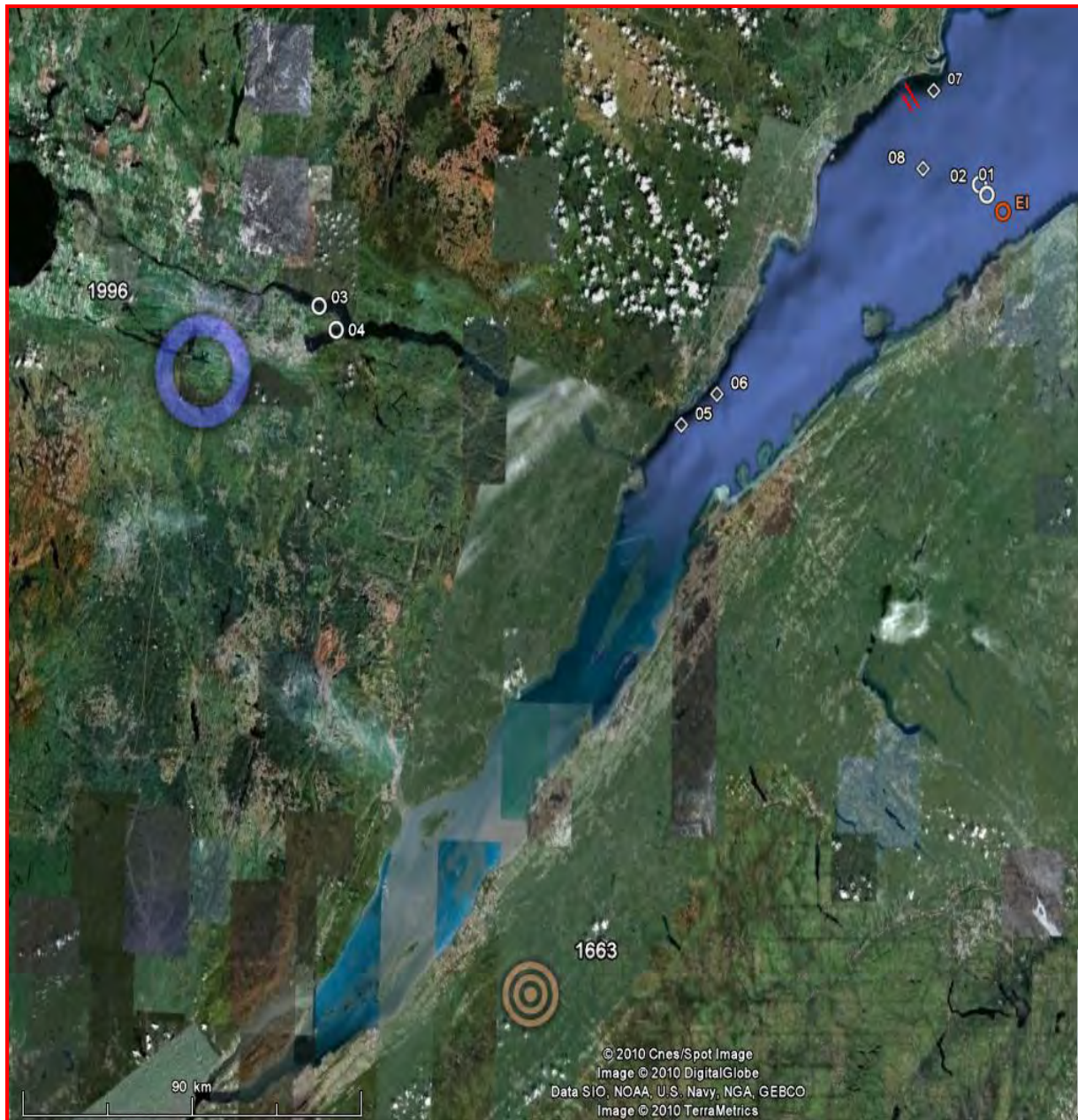
*Yellow and green are associated with group A, Leg A*

*Blue and pink are associated with group B, Leg B*

## 6. Daily Narrative

The daily narrative is a detailed edited dialogue of the daily activities that occurred during the mission. All times are stated in ship time (EST). Figure 6.1 illustrates the location of the sites. These sites are found in: 1) the Saguenay Fjord (Figure 6.2) where high sediment accumulation rates give the opportunity to collect records of environmental variations of the last decades/centuries (e.g., Leduc et al., 2001; St-Onge and Hillaire-Marcel, 2001), and 2) in the St. Lawrence Estuary. In the latter case, visits included sites offshore Betsiamites (Figure 6.3), where large landslides have been observed during the Holocene (Cauchon-Voyer et al., 2008), as well as one site in the Laurentian Channel (Figure 6.3) where more than 400 m of sediments have been deposited during the Quaternary (e.g., Duchesne et al., 2010; St-Onge et al., 2008; Thibodeau et al., 2006).



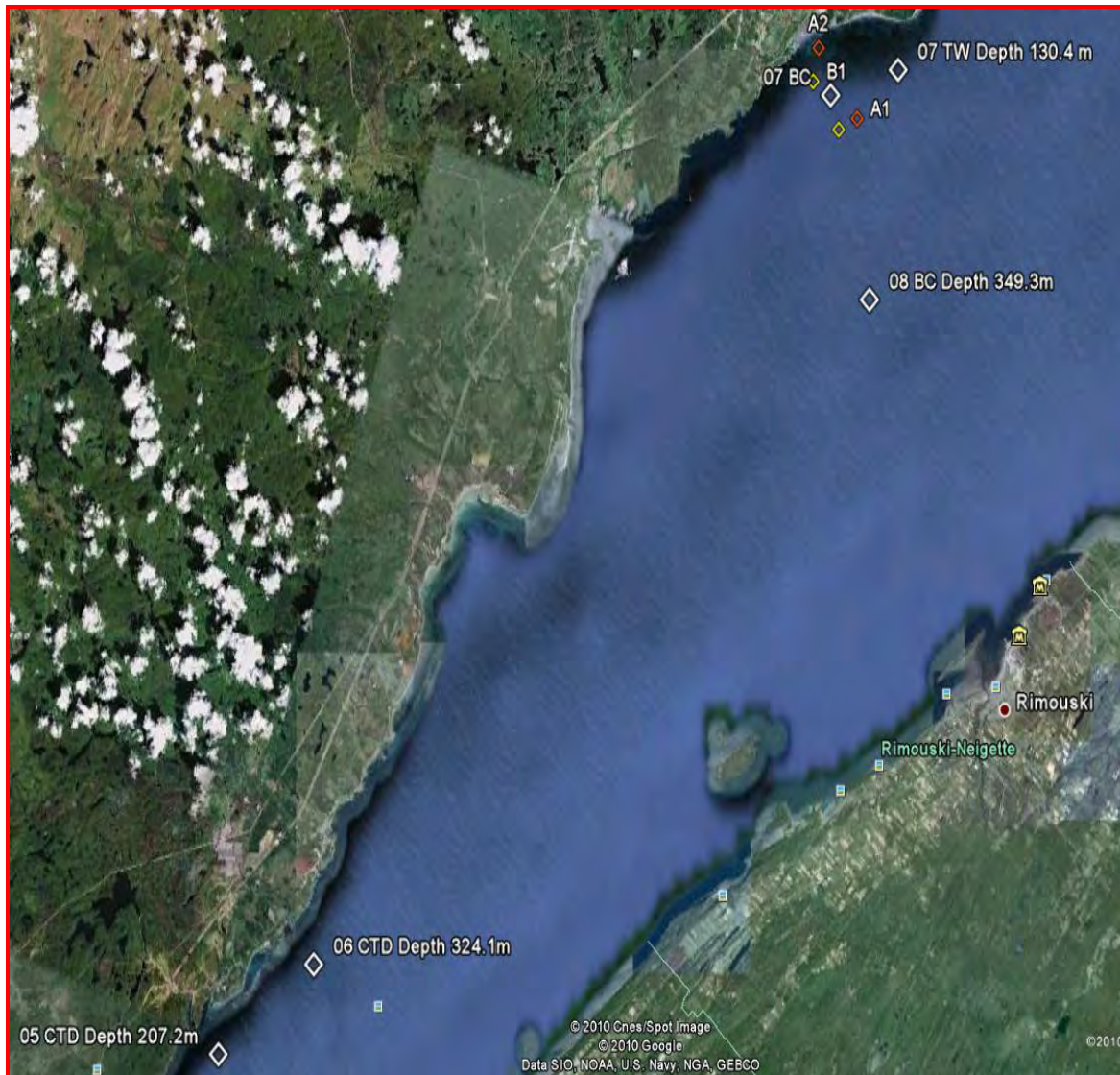


**Figure 6.1:** All station locations in Quebec. The main river is the St. Lawrence and the channel to the left is the Saguenay Fjord. The blue circle represents the location of the Saguenay flood in 1996. The yellow circle represents the approximate epicenter of the 1663 magnitude 7 earthquake. Leg A sites are circles while Leg B sites are diamonds. Red site EI is the Empress of Ireland wreck site, and the red lines indicate the submarine canyon survey location.





**Figure 6.2:** Station locations in the Saguenay Fjord during Leg A. Details are given indicating the work performed at each site and the depth of each site (BC = Box Core, GC = Gravity Core, and PC = Piston Core). The channel to the upper left is the Northern Channel and the one to the lower left is the Baie des Ha! Ha!



**Figure 6.3:** Station locations in the St. Lawrence Estuary during Leg B. The red and yellow diamonds represent the lines over which the Sparker was used. TW indicates the plankton tow location. Rimouski (the starting and ending point of the mission) is located on the lower right of the map. The white areas over land to the NW are cloud formations.

## **LEG A**

### **June 28, 2010, Rimouski**

The scientific staff of group A embarked upon the Coriolis II at 5.00 PM and received security/safety information at 5.30 PM. The ship departed for the Laurentian Channel at 6.00 PM.

#### **Station 01**

7.10 PM – CTD (48°7N; 29°5W).

No measurements were recorded due to technical difficulties with the pump (lack of pump suction)

7.20 PM – CTD cancelled.

7.37 PM – Grab van Veen core sampler was deployed successfully (48°40.686 N; 66°29.582W; water depth 336 m). Two surface samples were labelled COR1003-01-GRAB; a part of the Grab sediments was sieved at 250 µm mesh size and the shell residues were collected in a plastic bag labelled COR1003-01 > 250 µm.

8.11 PM – Plankton tow with 20µm mesh deployed at up to 200 m depth (48°40.700N; 68°29.500W; 336 m). Tow continued until 8.21 PM. Parts of the sample were preserved in a solution consisting of 30% ethanol, 70% Rose Bengal, with 1.5 g of sodium bicarbonate, and labelled COR1003-01 0-200m > 20µm.

8.30 PM – Began cruising towards the location of the wreck of the *Empress of Ireland*.

9.00 PM – Side scan sonar deployed (48°37.94N; 68°24.85W; 78 m).

A 60 m spaced searching grid pattern near the wreck site was sailed (called “mowing the lawn”) and scanned in order to find the resting place of the *Empress of Ireland*. After a few minutes, because of the limited time available, the Captain decided to go directly to the commemorative buoy located near the ship. Wreck successfully detected and imaged with side scan sonar; images saved.

#### **Station 02**

10.17 PM – CTD deployed successfully (48°39.500N; 68°25.927W; 165 m).

Device recovered at 10.30 PM. Data stored in file CL01.cnv.

10.45 PM – End of operations. Ship begins steaming overnight to Fjord. Scientific staff sleeps with some interruptions due to choppy sailing conditions and lack of sea acclimatization.

### **June 29, 2010, Saguenay Fjord**

3.50 AM – Entered Fjord. Sea conditions calmer in protected Fjord offering steadier sleeping conditions.

6.00 AM – Beginning of day.

The ships crew start to prepare the piston core for deployment. The scientific staff awoke bright and early with a hearty breakfast and a burning desire to begin the day's work.

### **Station 03**

9.22 AM – Piston coring begins (48°24.761N; 70°49.757W; 86 m).

The 9 m piston core was triggered at 9.35 AM (48°24.763N; 70°49.338W), and when recovered was divided into 3 sections and labelled COR1003-03-PC.

- Section A-B length: 152 cm

- Section B-C length: 155 cm

- Section C-D length: 17 cm

Success was moderate with a total length of  $152 + 155 + 17 = 324$  cm (3.24 meters out of a potential for 9 meters). A sand layer (higher resistance to core penetration than sediment layers) prevented the progression of the piston core further into the sediment. The Trigger Weight Core was labelled COR1003-03-TWC, A-B: 135 cm.

11.00 AM - The piston core samples were uncapped due to gas accumulation and subsequent pressure; small holes were then drilled into the caps to prevent reoccurrence of accumulation.

10.51 AM – Box coring (48°24.744N; 70°49.866W; 60 m)

Three sub-samplings of the box core were successfully taken (known as push cores) and labelled COR1003-03-BC.

- A: 52 cm (no compaction during sampling)

- B: 52 cm (compaction of 3 cm)

- C: 50 cm (irregular compaction between 0 and 4 cm due to surface slope gradient)

A forth sub-sampling failed with 100% compaction due to striking a large likely glacially rafted circular rock. The surface of the sediment (top few mm of sediment at water-sediment interface) was sampled with a spoon and labelled COR1003-03 BC box surface. A subsample of Push Core A was treated with Rose Bengal and alcohol in a tube and labelled COR1003-03 Floc-Rose Bengal. The push core labelled COR1003-03-BC-A with a length of 52 cm was extruded in the onboard laboratory into 1-cm “hamburger” sized sections with the plywood/jack core-processing device; these samples were all bagged and labelled. The samples from the upper 15 cm of COR1003-03-BC-A were stained with Rose Bengal solution (living material takes up stain, dead material does not).

11.23 AM – CTD deployed (48°24.75N; 70°49.85W)

Data stored in file SAG03.cnv.

11.30 AM – Began cruising towards the Baie des Ha! Ha!

### **Station 04**



12.45 PM – Box coring performed (48°21.973N; 70°46.014W; 163 m).

Two sub-samples (i.e. push cores) were taken from the box core and labelled COR1003-04-BC.

COR1003-04-BC-A: length 55 cm (zero compaction)

COR1003-04-BC-B: length 56 cm (zero compaction)

The surface (few millimetres) was sampled with a spoon and labelled COR1003-04 BC box surface. A part was mixed with Rose Bengal and alcohol in a tube and labelled COR1003-04-FLOC.

1.45 PM – Gravity coring (48°22,000N; 70°45,959W; 163 m)

Although the entire surface of the core appeared to penetrate the sea floor completely, only 1.70 m (of the total 3 m length) was recovered and the surface was not flat. This loss may have been due to leaching. Due to the loss and possible leaching, the core was sampled to a length of 1.50 m.

1.31 PM – CTD successfully deployed (48°22.00N; 70°45.99W; 163 m)

Data stored in file SAG04.cnv.

6.00 PM – Arrival in Tadoussac

Change of the scientific team with ship anchored in Tadoussac Bay. Due to lack of available docking space Team A was ferried to shore and Team B to the ship via the ships zodiac. Part of ferrying was performed in foggy and rainy conditions.

## **LEG B**

### **June 29, 2010, Tadoussac**

6:00 PM - The scientific staff comprising group B embarked upon the Coriolis II at approximately 7.30 PM from anchor in Tadoussac Bay and received security/safety information. The ship sailed for the Laurentian Channel.

#### **Station 05**

8.45 PM - CTD (48°11.850 N, 069°32.530 W)

The CTD was deployed and lowered to a depth of 207.2 m. During recovery, there was some cable trouble so measurements were not successful.

#### **Station 06**

9.30 PM - CTD (48°15.555 N, 069°25.101 W; 324.1 m) (Bon Désir area, Laurentian channel)

The connection was lost during retrieval and no data was retrieved.

### **June 30, 2010, Betsiamites**

7.30 AM- Sparker deployed (48°49.915 N 068°42.556 W; 154.9 m) (Betsiamites area, Laurentian channel)

Steaming speed was ~ 2.3 knots. The weather was sunny with some clouds and winds were calm.

9.30 AM- End of the Sparker operation (48°50.49 N, 068°44.831 W).

### **Station 07**

11.00 AM – Piston coring (48°51.891 N, 068°39.29 W; 131 m)

The piston core was deployed. The trigger weight core was not full. Sediments were placed in a plastic bag. The Piston Core (COR1003-07-PC) was cut into 4 sections: labeled AB, BC, CD, and DE.

1.30 PM – Box coring (48°50.855 N, 068°44.644 W, in Laurentian channel)

The weather was rainy. Three samples were collected and labeled COR1003-07-BC; A, B and C, respectively. There was no compaction in Core A. Cores B and C had compaction of 4 and 5 cm, respectively. The surface of the sediment was sampled with a spoon.

COR1003-07-BC B was extruded into 1-cm sections on board. The samples from the upper 15 cm of COR1003-07-BC-A were collected and placed in tubes of 50 cl and stained with Rose Bengal solution. All of the 1-cm sections were collected in plastic bags and labeled.

### **Station 08**

3.13 PM - CTD (48°42.564 N, 068°41.574 W, 351 m, *Point au Père*, Laurentian Channel)

At a depth of 190 m there was a connection problem with the CTD and no data was collected.

### **Station 09**

1.00 PM – Box coring (48°42.585 N, 068°41.585 W, 349.3 m; Laurentian channel)

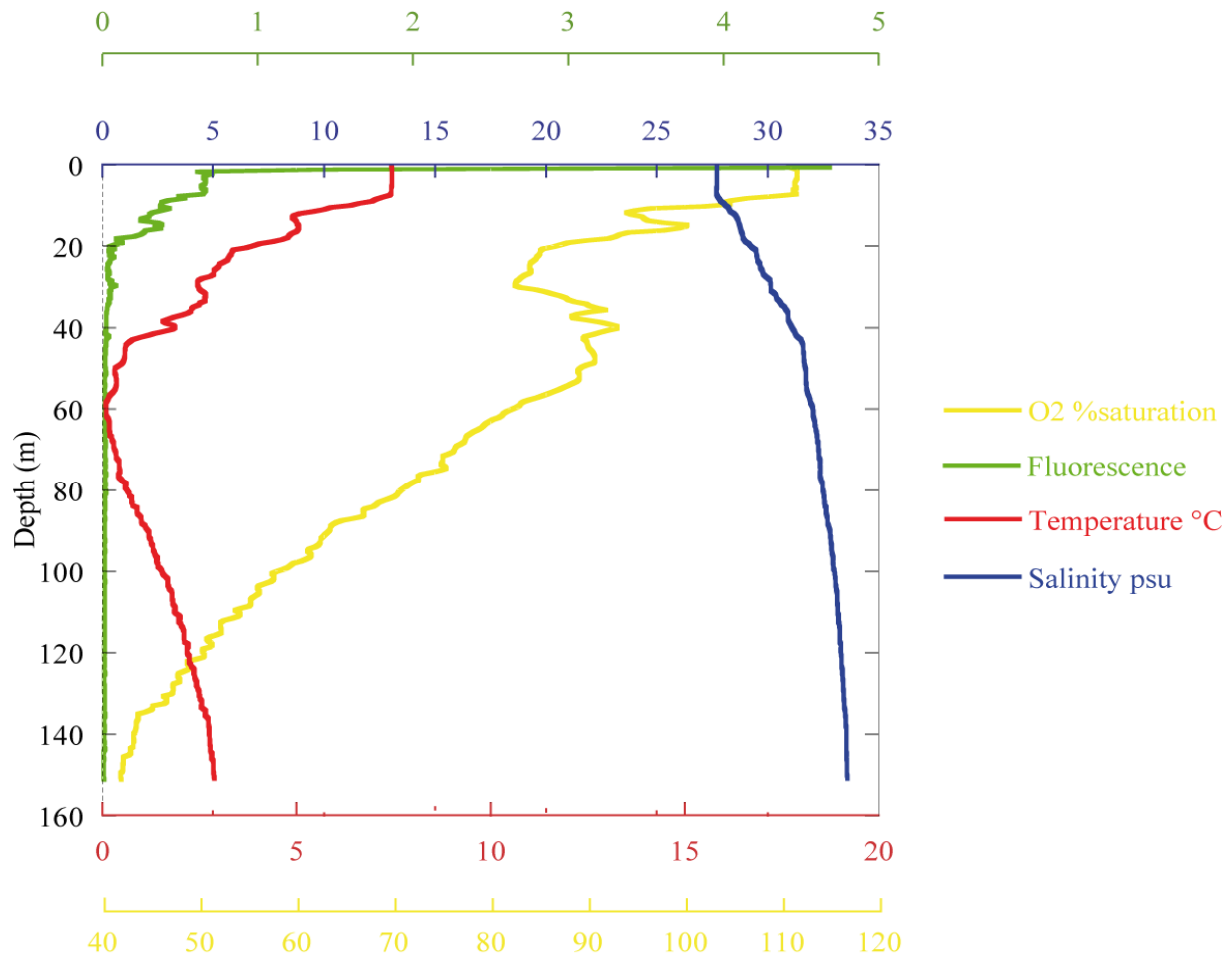
Two cores were collected and labeled A and B. Core A was inclined and had a compaction of about 4 cm. Core B had a compaction of about 3 cm. The upper part of the sediment from the box core was collected with a spoon in order to calibrate the proxies. COR1003-07 BC was cut into two transverse sections and described. Group B disembarked at 7.00 PM at Rimouski.

## **7. Equipment and Procedures**

### **7.1 Temperature - salinity - turbidity measurements in the water column**

Physical properties of the water column were measured with an Applied Microsystems CTD Plus v2 attached to the ship with a wire line. The CTD was calibrated for water depths from zero to 4000 m (4000 dbars). The error in depth with this calibration is  $\pm 2$  m.

The parameters measured with the CTD include conductivity (salinity), temperature, sound velocity, fluorescence, density and pressure, which are used to calculate water depth after correction for latitude. These measurements allow the structure of the water column to be determined and the identification of the main water masses to be sampled with plankton tows and water pumping (see below). Salinity and temperature profiles are illustrated in the resulting section and the raw data tables are also available.



*Fig. 7.1 Results of CTD measurements at station COR1003-02.*

CTD record (Fig. 7.1) at station COR1003-02 shows a mixed zone in the top 6-7 m surface layer characterized by stable variables. From this point down to 60 m steady decreases in temperature and increases in salinity are observed. Below 60 m slight increases in temperature are observed. Fluorescence values indicate biological activity in the uppermost 20 m which is also supported by the sharply reduced oxygen content down to a depth of 30m. A peak in the oxygen distribution characterizes the interval between 30 and 40 m. Below that the oxygen concentration decreases steadily down to the sea floor.

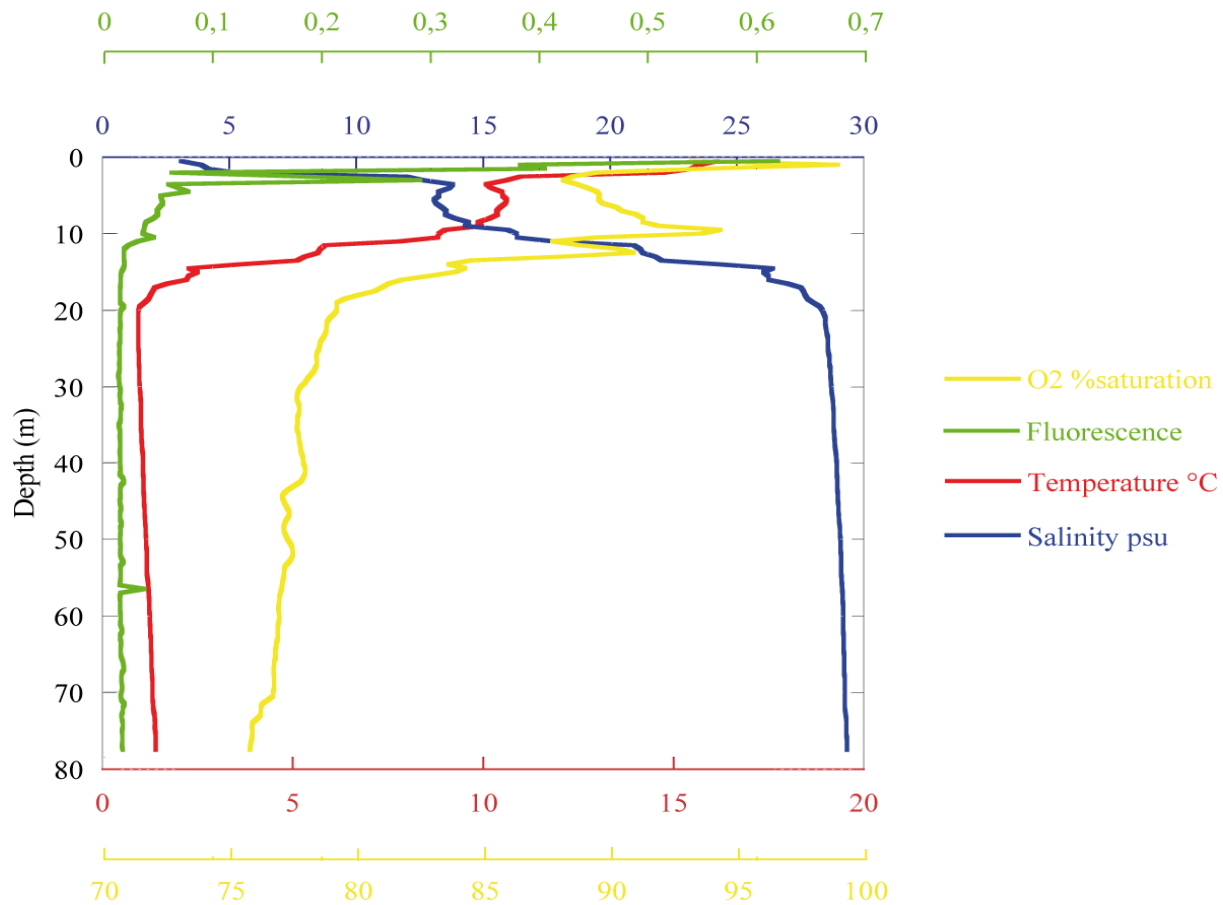


Fig. 7.2 Results of CTD measurements at station COR1003-03.

The CTD profile taken in the station COR1003-03 reveals a salinity increase with depth (Fig. 7.2). The surface salinity (blue line) is about 3 PSU at the surface and around 14 PSU after a few meters (3 or 4 meters) and then it is quite stable around 14 PSU until 10 meters. From 10 meters deep to 20 meters deep, a gradient of more than 16 PSU is visible. The salinity becomes stable at 28 PSU, after 20 meters. The temperature (red line) begins at 16°C and decreases during all the profile. The first main gradient is around 5°C in a few meters (4 meters). Then the temperature is quite stable until about 10 meters. A second gradient of almost 10°C in 10 meters followed by a stabilization around 2°C is seen. The fluorescence (red line) sharply decreases from 0.6 to 0.05 during the first meters of the water column. Then, the decrease is smoother until it stabilized around 0.1. The O<sub>2</sub> saturation (yellow line) decreases with one main peak at 10 meters depth. From the surface to the first 2 meters, O<sub>2</sub> saturation quickly decreases by 10% from the surface to a few meters (2 meters), then it increases by around 5 % during 10 meters. After 10 meters deep, O<sub>2</sub> saturation decreases from 95% to 75%. According to the strong gradients of salinity and temperature, two lines of constant density (called pycnoclines) can be identified: the first one, at the estuary surface, is very thin (around 3-4 meters), the second one begins at 10 meters deep to 18 m deep.



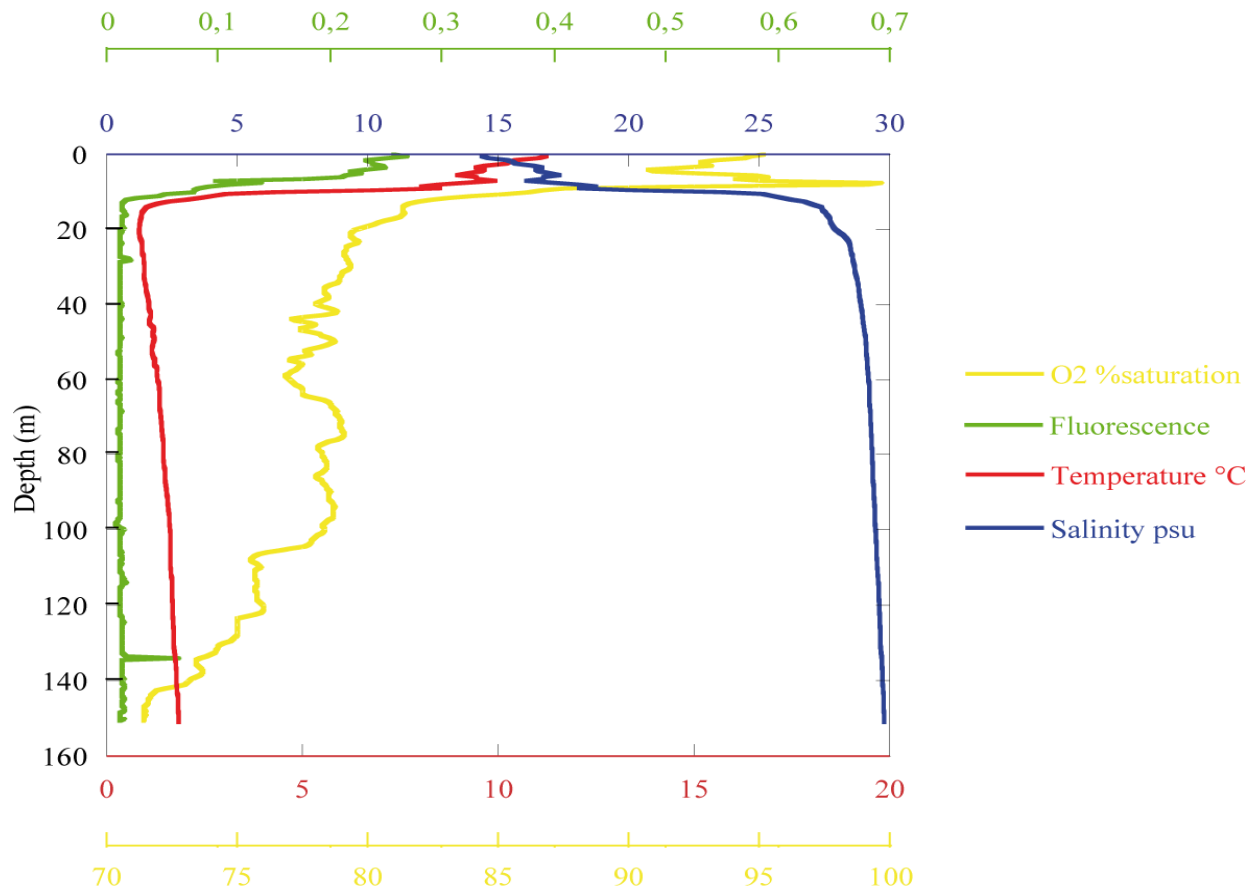


Fig. 7.3 Results of CTD measurements at station COR1003-04.

Results of CTD measurements for COR1003-04 are plotted in Fig. 7.3. A pycnocline can be observed at a depth of approximately 10 to 15 m. The water column above corresponds to the surface layer. This layer is highly influenced by continental freshwater runoff. Temperature is dependent on weather conditions and in our measurements is sharply decreasing with depth from 11 °C immediately at the surface. Salinity is low at the surface (14‰) and steadily increases with depth. At the depth of approximately 10 m it increases sharply indicating a transition to the more saline water below. Below the pycnocline is the cold intermediate layer with a temperature of 1-2 °C. Mixing between the two layers is limited to non-existent. Therefore, significant differences in biological activity and oxygen saturation are observed. The fluorescence curve shows that the highest activity of photosynthetic organisms is in the first 10 m, peaking at the surface and dropping down sharply until it essentially reaches 0 at about 15 m. The activity of organisms (photosynthesis, respiration and organic matter decomposition) forms a reversed curve of oxygen saturation peaking at about 10 m i.e. at the start of the pycnocline transitional zone. The peak in oxygen saturation corresponds to the decrease in fluorescence and temperature and it may be related to both biological factors and physical factors. Decreases in fluorescence indicate low activity/presence of photosynthetic organisms, and we can also assume that respiration at this depth reaches a minimum. Also, the water at the depth of 10 m has the highest potential to dissolve oxygen due to the temperature minimum for surface zone.

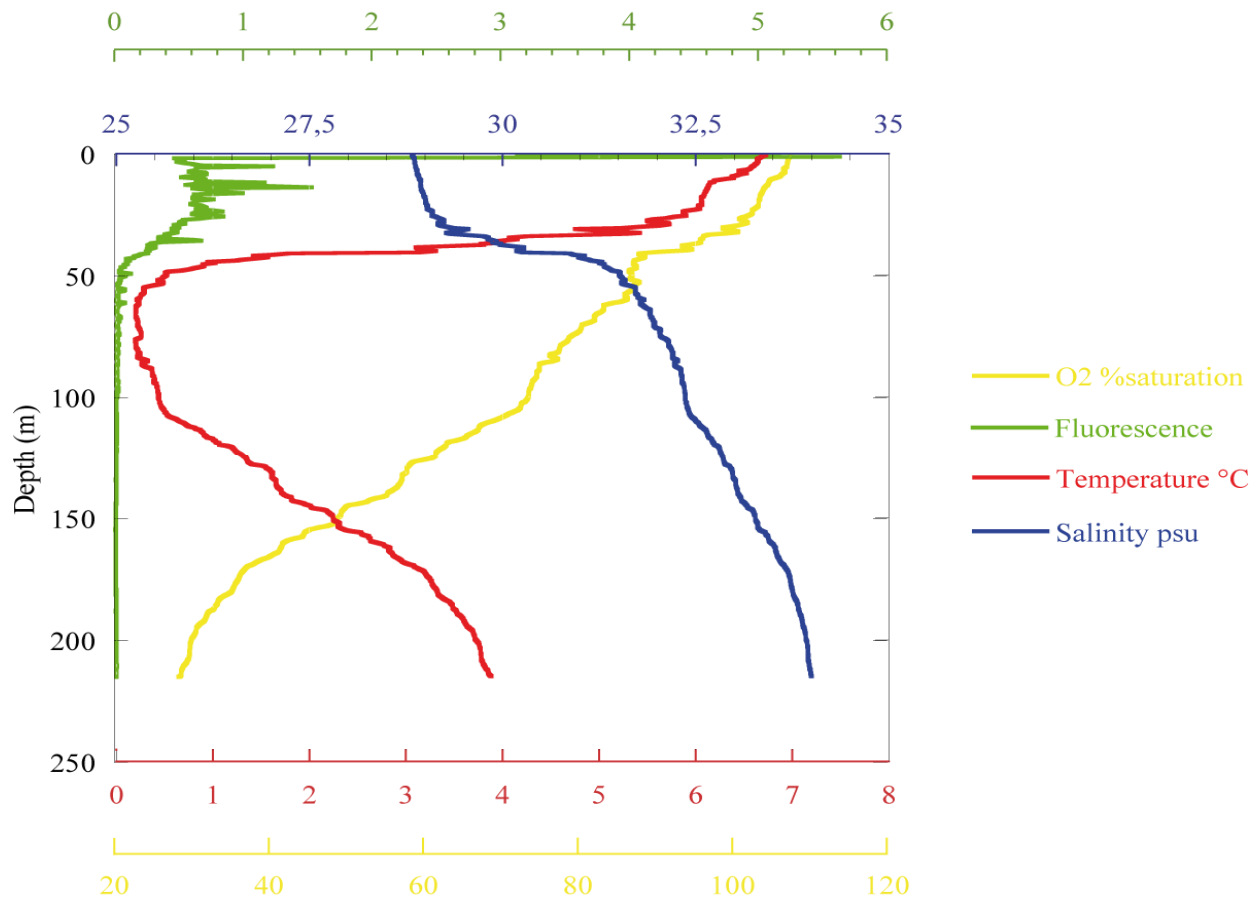
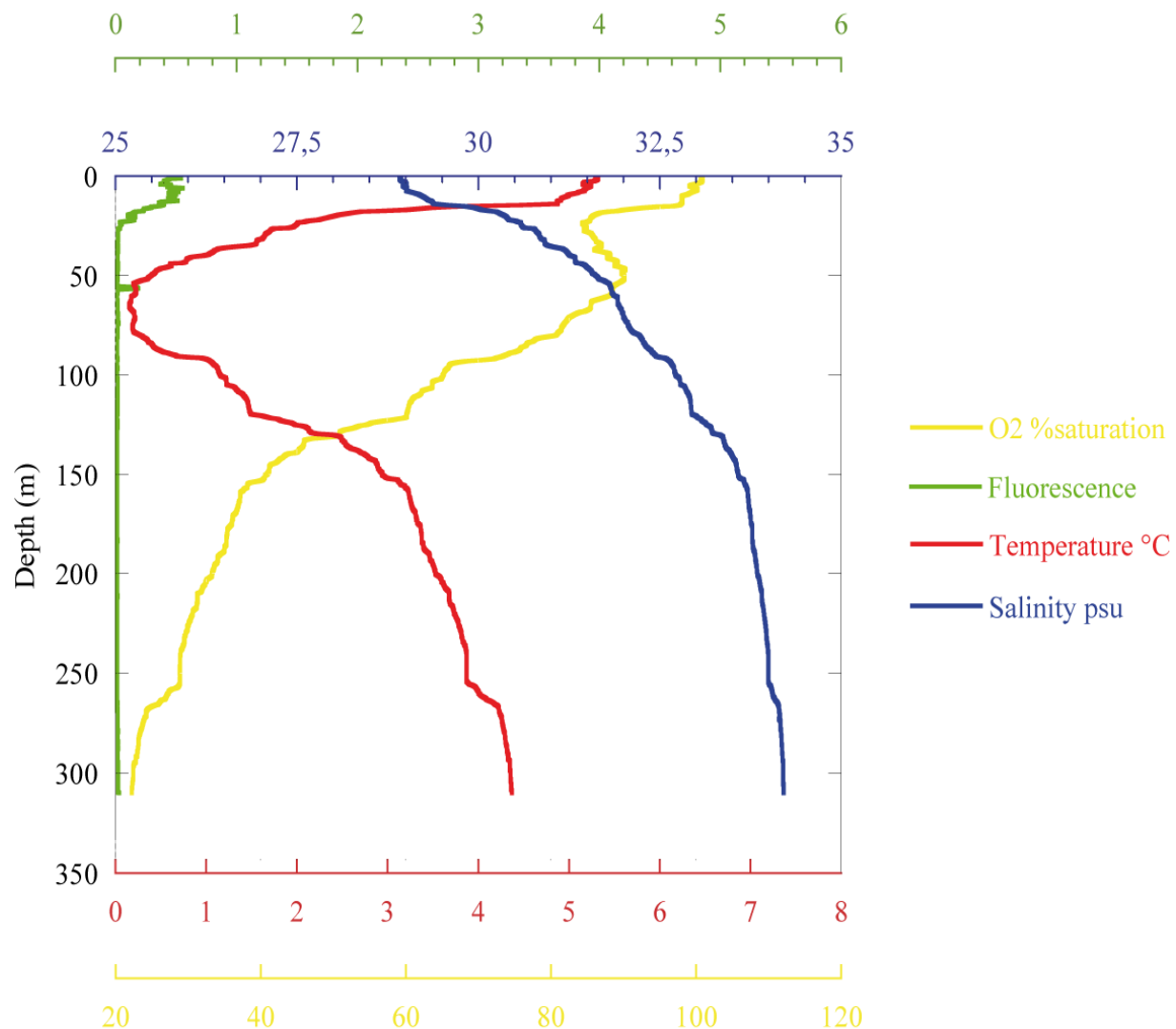


Fig. 7.4 Results of CTD measurements at station COR1003-05.

Figure 7.4 shows results of CTD measurements for station COR1003-05. The water column is stratified. The upper surface layer is separated from the intermediate water by the well pronounced thermocline and pycnocline at the depth zone between 35 and 45 m. The temperature minimum is located between 50 m and 100 m.

The values of fluorescence are highest in the upper surface layer, decreasing to 0 at the depth of about 50 m. In the upper surface layer oxygen saturation is the highest and slowly decreases with depth. The boundary layer between surface and intermediate waters is marked by a stronger decrease in oxygen saturation. In general distribution of oxygen in the upper zone correlates well with fluorescence values. Below boundary zone oxygen content decreases steadily and reaches ~30% at the bottom indicating bottom water hypoxia.



*Fig. 7.5 Results of CTD measurements at station COR1003-06.*

The CTD record for COR1003-06 (Fig. 7.5) shows a presence of thermocline and pycnocline at about 20 m. Temperature minimum is located between 50 and 70 m, and increases afterwards indicating a reversed thermocline. Below the pycnocline salinity increases steadily until it reaches a stable value at 200-250 m.

Fluorescence values indicate biological activity in the uppermost 25 m. Oxygen content decreases sharply at the pycnocline/thermocline transition zone. Below the transition zone oxygen concentration increases until it reaches peak level at the depth of 50m corresponding to the temperature minimum. After that it decreases steadily reaching hypoxia values at the depth of more than 250 m.

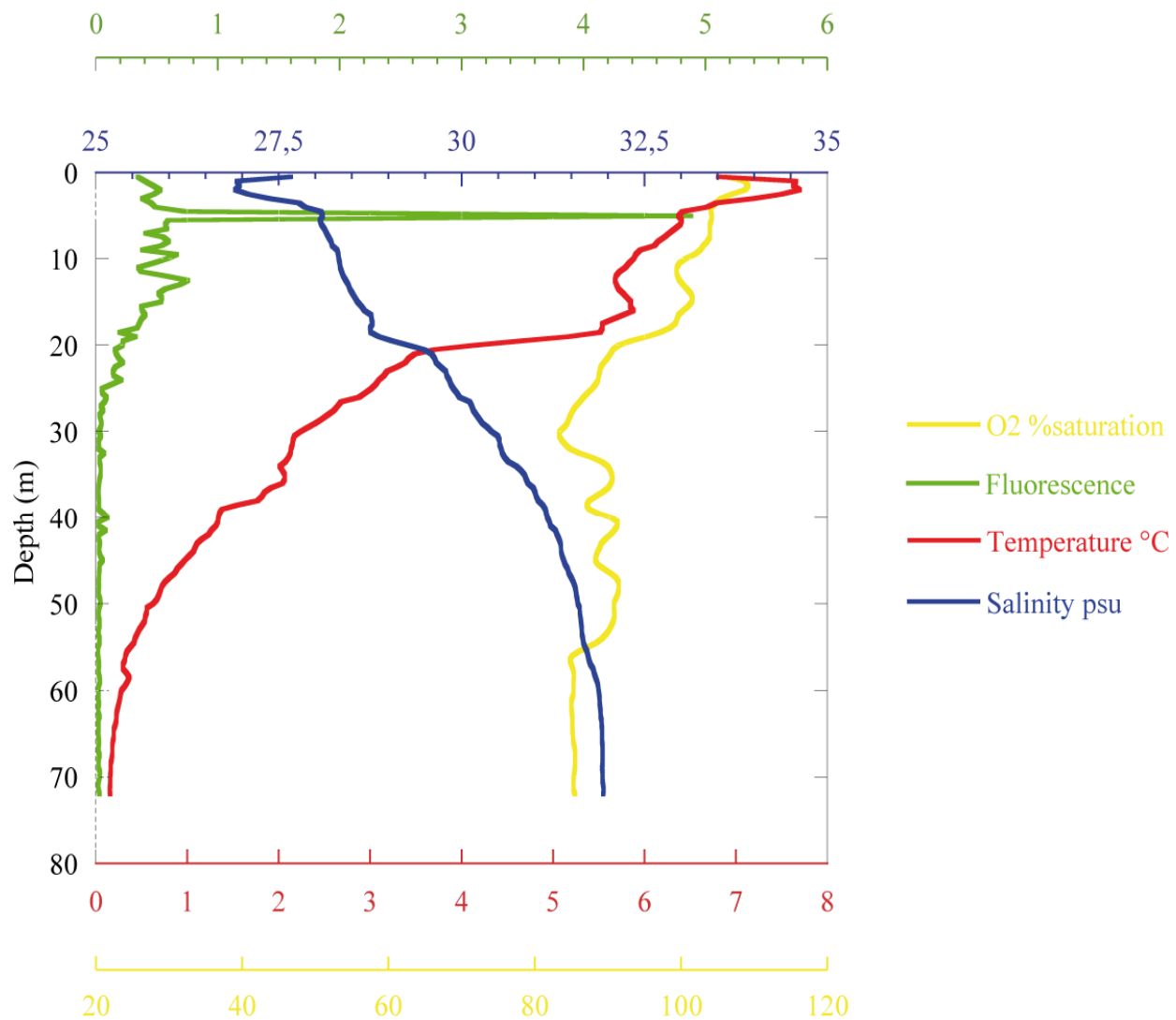


Fig. 7.6 Results of CTD measurements at station COR1003-07.

The results of CTD measurements at COR1003-07 from the Saguenay fjord are presented in Fig.7.6. The temperature profile shows a steady decrease from the peak value of 7°C at the surface to ~0°C at the depth of 70 m, indicating the presence of a sharply pronounced thermocline between surface water and intermediate cold water at the depth of ~20 m. The temperature minimum corresponds to the depth between 50 and 80 m. Lower in the column a gradual transition between the intermediate layer and bottom waters is observed.

Salinity increased from 27 at the surface to 32 at the depth of 70 m. In the salinity profile the pycnocline between the surface layer and intermediate waters is observed at the depth of ~20 m. The transition between intermediate water and bottom water is gradual. The fluorescence curve indicates that biological activity is highest in the upper 25 m. The sharp spike in fluorescence near 5 m is likely an equipment artifact and is not thought to be correct.

## 7.2 Plankton tows

On June 28, 2010 at 8:11 PM, positioned at station 01 (48 40.686 N 68 24.582 W) inside the Laurentian channel, a vertical plankton tow (with 20  $\mu\text{m}$  mesh size) was lowered to 200 m and subsequently lifted towards the surface (48 40.705 N 68 29.488 W). The plankton mesh is shown just before launch in the Figure.



The plankton tow was recovered at 8:21 PM. After washing the plankton net to concentrate samples in a bucket, the sampled plankton were transferred to a single plastic container that was labelled, COR1003-01 0-200m >20 $\mu\text{m}$ .

Rose of Bengal solution was mixed with formaldehyde and the sample. The Rose of Bengal comprises 30% ethanol, 1.5 g of Rose of Bengal powder, and 1.5 g of sodium bicarbonate ( $\text{NaHCO}_3$ ). The Rose of Bengal stains proteins associated with the cytoplasm pink, making possible the identification of living organisms (living organisms turn pink while dead ones do not). The ethanol eliminates the activity of the living organisms (i.e. kills them), while the  $\text{NaHCO}_3$  avoids unwanted biogenic carbonate dissolution (for example of foraminifera). Formaldehyde was added in the mixture in order to preserve the specimens. Samples were then observed at home port (at UQAR in Rimouski) under the microscope, revealing high densities of diatoms.

## 7.3 Coring Operations

Coring sites were selected based on previously published sites and new seismic surveys conducted during the cruise. Sites in the Saguenay Fjord and the Bay de Ha! Ha! were exceptionally favorable for coring, with very deep and relatively soft sediments with low compaction due to high sedimentation rates.

### 7.3.1 Piston Coring

The piston coring system used can obtain a core sample with an inner diameter (ID) of 99.2 mm and an outer diameter (OD) of 106 mm. Barrel length is 305 cm and the system is typically rigged to a maximum of 5 barrels. During this cruise the system was rigged with three barrels (total core length possible is about 9 m). The core head is 3 m long, 0.6 m in diameter and weighs approximately 1350 kg. Each barrel has an ID of 10.8 cm, a 9.5 mm wall thickness, and exterior couplings secured by setscrews. The liner was a CAB plastic in 305 cm lengths. A split piston with two O-rings and variable orifice size was used and a standard core catcher was used at all coring sites. The trip arm supported a 10.8 cm diameter gravity core with a single 2.14 m long 10" diameter barrel with a 135 kg head. The corer was lowered into the ocean via a 3/4" diameter reinforced wire cable wound with a Pengo model winch. The corer was operated using a handling system that includes a rotating core-head cradle, outboard support brackets, a monorail transport system, a lifting winch and a processing half-height sea-going container. Each recovered core was broken down at the barrel joints and moved to a processing half-height container, where each 305 cm long section of liner was extruded from the barrel and cut into two separate cylindrical halves that were then labelled.

Piston coring was successful at all attempted sites. All core damage and coring performance is summarized in the appendix.

#### Leg A:

29 June 2010, 9:21 AM (48°24.75' N 70°49.766' W; 88 m). No sample in the core catchers. The TWC penetrated fully (mud visible on the outside); the PC penetrated 6 m.

Section C-D: length 0-17 cm

Section B-C: length 17-172 cm      gas bubbles can be observed and are expanding

Section A-B: length 172-324 cm      gas bubbles are expanding (gas released, end cap re-taped at 11:30)

Leg B: 30 June 2010 11:00 AM (48°51.891' N 68°39.29'; 131 m) 0.9 knots

### 7.3.2 Box Coring

#### 29/06/2010- Station 03 (48°24.737' N 70°49.863' W)

At 10:51 AM positioned at station 03 inside the Saguenay Fjord (48°24.737' N 70°49.863' W) the box core was lowered to the fjord floor, reaching 88 m of depth. The bottom sediment was sampled and brought back to the boat deck at 11:10 AM. Once the box-core was opened, the sediment surface was carefully sampled with a steel spoon and transferred to a plastic container (100 ml) for further micropaleontological analysis. Moreover, three (3) PVC transparent

tubes (labelled as COR-10-03-03-BP-A, B and C) of approximately 50 cm in length were individually inserted inside the box core. In order to preserve the sediment original physical configuration (e.g. sediment compaction amount) an air pump was utilized to perform suction on the air inside the tube above the sediment while the tube was being inserted. Tube A (52 cm long) was successfully inserted with no apparent compaction. The second trial was compacted completely due to an obstruction in the box core (namely a glacially rafted rock that Beckwith bulls-eyed with the push core) and was not stored. Push tube B (52 cm) was reported to be compressed about 2 cm. The top part of tubes A and B were capped respectively, first with foam and then with a plastic cover. The cover was taped to hold it in place on the core end. After the push cores were inserted, the steel box was released from the base and pulled upwards (with special handles and one person on each side lifting) and the “box-like sampled sediment” remained relatively intact. It was possible to observe a sharp transition in the sediment coloration with depth (from brown to black). A characteristic greyish layer approximately 13 cm thick was identified as the 1996 Saguenay flood event (can be seen in the following image). The sediment around the tubes was carefully washed away from the ship back into the fjord waters. In this manner, the tubes were recovered without perturbation. Individually, a spatula was positioned on the bottom part of each tube to avoid sediment escape. Thus, one by one, the tubes were turned upside-down and their bottom ends were capped and labelled as previously described.





Photo of COR1003-03-BC and Audrey's boots. The grey layer (13 cm thick) has been identified by Guillaume as resulting from the 1996 Saguenay flooding event. Thus the brown layer (thickness of roughly half the Push Core tube length of 52 cm) or 26 cm thick in the upper half of the diagram was deposited in the 14 years subsequent to 1996; indicating a large sedimentation rate of nearly 2 cm/year.





Guillaume in photo showing push core COR1003-03-BC being removed from the box core and sealed shut with plastic caps.

**29/06/2010- Station 04 (48°21.9 N 70°48.1 W)**

At 12:25 PM positioned at station 04 inside the Baie des Ha!Ha! (48°21.9 N 70°48.1 W) the box-core was launched to the bay floor, reaching 163 m of depth. The bottom sediment was sampled and brought back to the boat deck at 12:32 PM. Once the box-core was opened, the same procedure performed at station 03 was repeated at station 04. At this station only two (2) tubes were sampled and no sediment compaction was observed.

**30/06/2010- Station 07 (48°50.855 N 068°44.644 W)**

At 1:30 PM positioned at station 07 inside the Laurentian channel (48°21.9 N 70°48.1 W) the Box-Core was lowered to the sea floor, reaching 131 m in depth. The bottom sediment was sampled and brought back to the boat deck at 12:50 PM. Once the box-core was opened, the same procedure performed at station 03 and 04 was repeated at station 07. At this station, sediment compaction occurred for tubes B and C with compaction levels of 4 cm and 5 cm, respectively.

**30/06/2010- Station 09 (48°42.585 N 068°41. 585 W)**

At 15:00 positioned at station 09 inside the Laurentian channel (48°21.9 N 70°48.1 W) the box-core was dropped down to the sea floor, reaching 349.3 meters of depth. The bottom sediment was sampled and brought back to the boat deck at approximately 15:20. Once the box-core was opened, the same procedure performed at station 03, 04, 07 were repeated at station 09. At this station only two (2) tubes were sampled. Compaction occurred (4 cm) only for tube A.

### 7.3.3 Grab Sampler

#### 28/06/2010 – Station 01 (48° 40.686 N 68°24.582 W)

At 19:37 positioned at station 01 inside the Laurentian channel (48° 40.686 N 68°24.582 W) the grab sampler (Van-Veen) (see figure below) was launched to sea floor, reaching 336 meters of depth. The sea floor sediment was sampled and brought back to the boat deck at 19:44. Once the grab sampler was opened the top surface part of the sediment was sampled with a stainless steel soup sized spoon wrapped firmly with *Parafilm*, to avoid metal contamination. The sampled sediment had a characteristic brownish color. The latter may represent the sediment anoxic layer; accordingly it may be suitable for observing benthic organisms. The sampled sediment was transferred to two plastic containers (100 ml) that were labelled as COR-10-03-01-GS. A sub-sample (10 ml of sediment) was collected from the container and immediately transferred to a plastic sample tube (centrifuge-like) containing 20 ml of Rose of Bengal solution. As mentioned previously, this solution was made up of Ethanol 30%, 1.5 g of Rose of Bengal powder and 1.5 g of Sodium bicarbonate ( $\text{NaHCO}_3$ ). The Rose of Bengal stains pink proteins associated with the cytoplasm, making possible the identification of living organisms and Ethanol eliminates activity of living organisms (e.g. bacteria), while  $\text{NaHCO}_3$  avoids biogenic carbonate (e.g. Foraminifera tests) dissolution. The remaining sediment sampled by the Van-Veen was sieved through a 250 micrometers pore size sieve. Present in the sample were living bivalves, annelids and ophiroids. The bivalve was sampled for possible future isotopic analysis. Additionally, it was possible to identify broken mussels shells. The remaining sediment was returned to the sea.



Grab Sampler recovering COR1003-01-GS.

### **7.3.4 Gravity Coring**

The gravity core device used was a 6 m long steel tube with a diameter of about 10 cm. On the top a two-ton weight is attached and is responsible for driving the core into the sediment. A core catcher at the business end keeps sediments inside the device as it is extracted from the sediment. Three transparent PVC tubes are inserted into the corer. The core was then lowered a few meters above the sea floor. Then it is released and accelerates due to gravity, increasing in speed in order to penetrate the sediments to the desired depth.

## **7.4 Onboard core processing and sub-sampling**

### **7.4.1 Core description**

#### **COR-10-03-03-BC-A**

This core tube was processed in the laboratory on board. An artisanal device constructed specifically for core sub-sampling was used to cut the sediment core present inside tube B. The tube was placed on the vertical position inside the device, where a jack was located on the bottom. Between the jack and the bottom of the core there was a wood block that allowed the jack's propulsion to push the sediment upwards. Between the wood block and the bottom of the core, there was a plastic disk with the same diameter as the core tube, to avoid contact between the wood and the core while the sediment was being pushed. Each time the sediment was pushed upwards samples were collected. The sampling method was designed to collect samples at 1 cm intervals. To assure that the collected sample was one (1) cm high a one (1) cm PVC ring was placed on the top of the core. Therefore each time the sediment was pushed upwards it filled the ring to its top. With nylon line the bottom of each one (1) cm thick sample was sliced through and the sample was placed inside a zip-lock. Also, it is important to mention that the first 15 samples of the sediment core were sub-sampled. From each sub-sample, approximately 10 cm<sup>3</sup> were removed and placed inside centrifuge-like tubes containing 20 ml of rose of Bengal solution. The sub-samples will be further analysed for possible living organisms.

#### **COR-10-03-07-BC-B**

The same sub-sampling procedure performed on Leg A was repeated on Leg B.

### **Visual core description (VCD)**

#### **LEG A**

#### **COR-10-03-03-BC (B)**

This push core was cut vertically with an artisanally mounted band saw. One of the halves was examined to record a visual description while the other was kept as an archive. The core's surface was homogenized with a metal spatula. Thus, on a core-logging sheet the core's length, colour, structures, granularity, with personal additional comments and a simple sketch of its features were manually recorded. Core's length was obtained with a tape measure. The colour was described by its name (e.g. brown) using a standardized Munsell color-code chart. Observable

structures (e.g. signs of bioturbation, lamination) were recorded as well. The granulometry was determined based on visual sediment compaction and texture. Rolling the sediment between two fingers or even applying it to the tongue observed rudimentary granularity.

## **LEG B**

The same sub-sampling procedure performed on Leg A was repeated on Leg B.

### **7.4.2 Sediment sampling**

Fifteen cores (2 Piston, 2 Trigger Weight, 11 Push, 1 Gravity core) and one Grab sample were collected. All cores were processed according to standard Geological Survey of Canada (GSC) Atlantic core procedures (refer to GSC Open File #1044). All cores were identified alphabetically by section at the time of dismantling individual 3 m core sections from the bottom to top, commencing with the bottom-most core section and proceeding to the uppermost section containing sediment. Each 3 m length of liner was halved, using a modified pipe cutter. The sediment in the liner was cut using a wire saw and the section ends were capped to minimize sediment surface disturbance. Top and bottom core caps were labeled with the cruise and station number, and section label. The base of the core is designated with the letter A and the top of the base section is designated as B. The base section is AB. Each section was brought into the onboard core-processing lab and stored horizontally on the benches. Each core, starting with the base section AB, was processed using the following procedure. The core liner was labeled with an up arrow, cruise number, station number, section label and the top and base of the section were labeled with the appropriate letter. End caps were removed if the sediment was not too fluid, and the section length was recorded.

The sealed core sections were stored upright in the refrigerated reefer container and maintained at 4°C. All core cutters and catchers were measured, labeled, placed in split liners, waxed and stored upright in buckets in the refrigerated container. All extruded core sections due to sediment expansion or core processing methods were likewise labeled and stored. All samples and sub-samples were catalogued and their location information within the container was recorded in an excel spreadsheet.

All station location information, core section lengths, extruded pieces and cutter/catcher lengths, sediment description and core performance information have been documented on deck sheets and then input into the expedition database (ED). The ED database has been backed up and will be verified before downloading into the main ORACLE sample database.

Several cm<sup>3</sup> of sediments collected during Leg A and B were then sampled at various intervals and for various purposes. All the discrete samples were collected using 1-cm thick slices (0-1 cm). The sampling scheme is explained below.

### **7.4.3 Sediment and data archiving**

The materials obtained on the cruise will all be archived at the GEOTOP-UQAM for future study and analysis.

## **7.5 Seismic reflection and acoustic systems**

### 7.5.1 Echo Sounder

The Edgetech X-star sub-bottom profiler uses a chirp signal with two frequency bandwidths (2-10 kHz and 2-5 kHz) for high-resolution shallow sub-bottom profiling. The frequency is linearly ramped upwards from the lower to the higher frequency to ensure a high signal-to-noise ratio and a high spatial resolution. A lower frequency enables a deeper penetration depth through the seafloor sediments (since the acoustic impedance is lower), conversely the higher frequencies provide greater resolution for the upper sediment layers. The sub-bottom profile is converted from the measured two-way-travel time(s) to depth (m) with a typical mean water velocity for the estuary. There is a trade-off between penetration depth of the seafloor and spatial resolution.

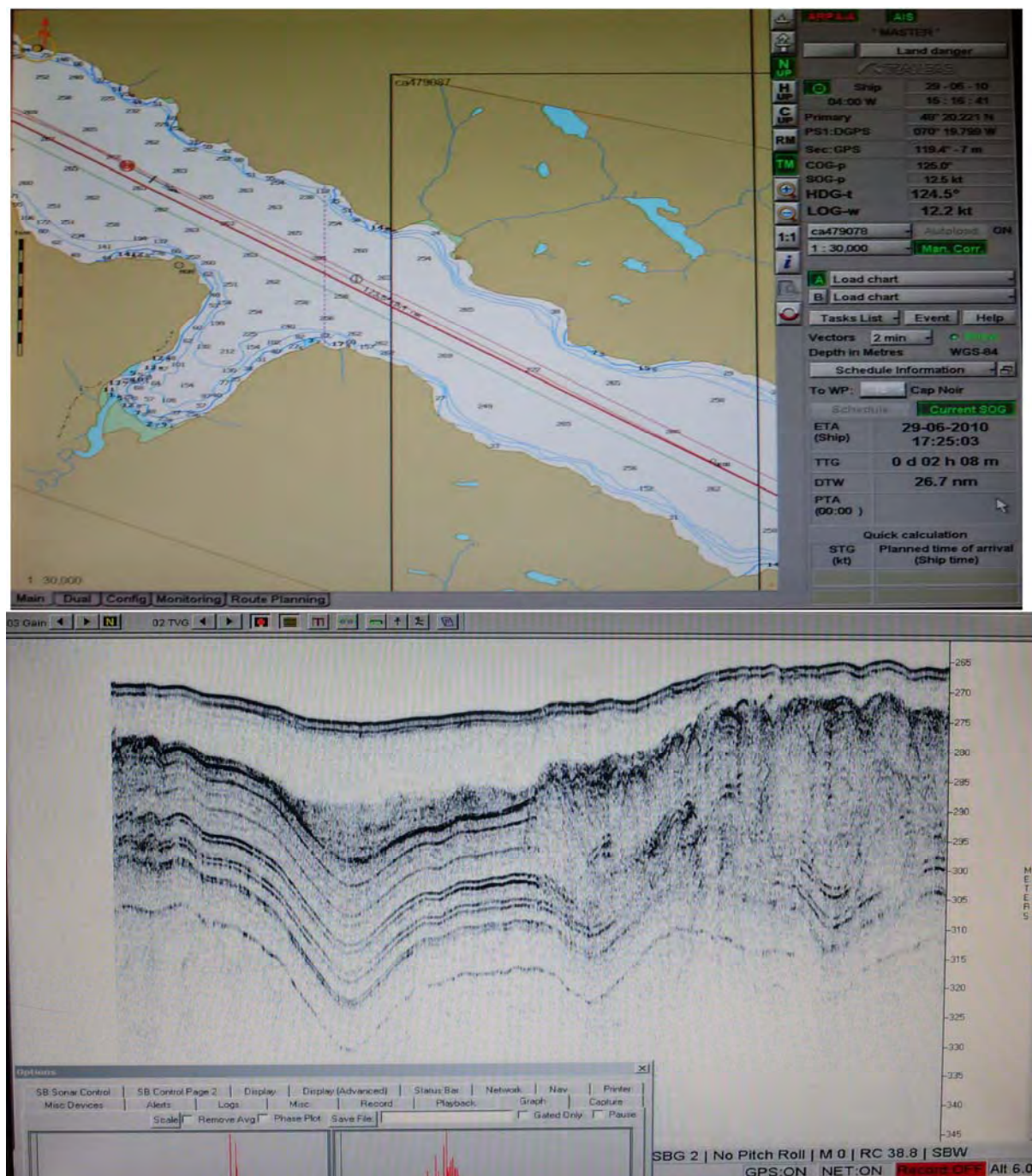


*Edgetech X-Star Chirp Profiler that was positioned on board. The device is mounted over the steel hull plates in the center of the ship down in the engine room. The sound emitted passes directly through the bottom of the ship and downward through the water column to then penetrate the seafloor.*

Details: Pulse type – FM (frequency modulated); Pulse length: 5 - 40 ms; Acoustic power: 212 dB; Resolution: 4 – 50 cm; Beam width: 10 – 30 degree; Pulse Interval: 1.2 s<sup>-1</sup>; Penetration depth: 1.5 - 15 m (sand), 5 - 20 m (clay); Filter: pulse compression filter.

The chirped signal is reflected at sediment boundaries where there is a change in density and seismic velocity (called acoustic impedance contrast). The difference in the physical parameters can be caused by sedimentation of different grain sizes (e.g. sand, clay, silt), by annually varying sedimentation rates (e.g. different biogenic inclusions during winter and summer time), or *in-situ* changes in the chemical content (e.g. biodegradation, gas production).





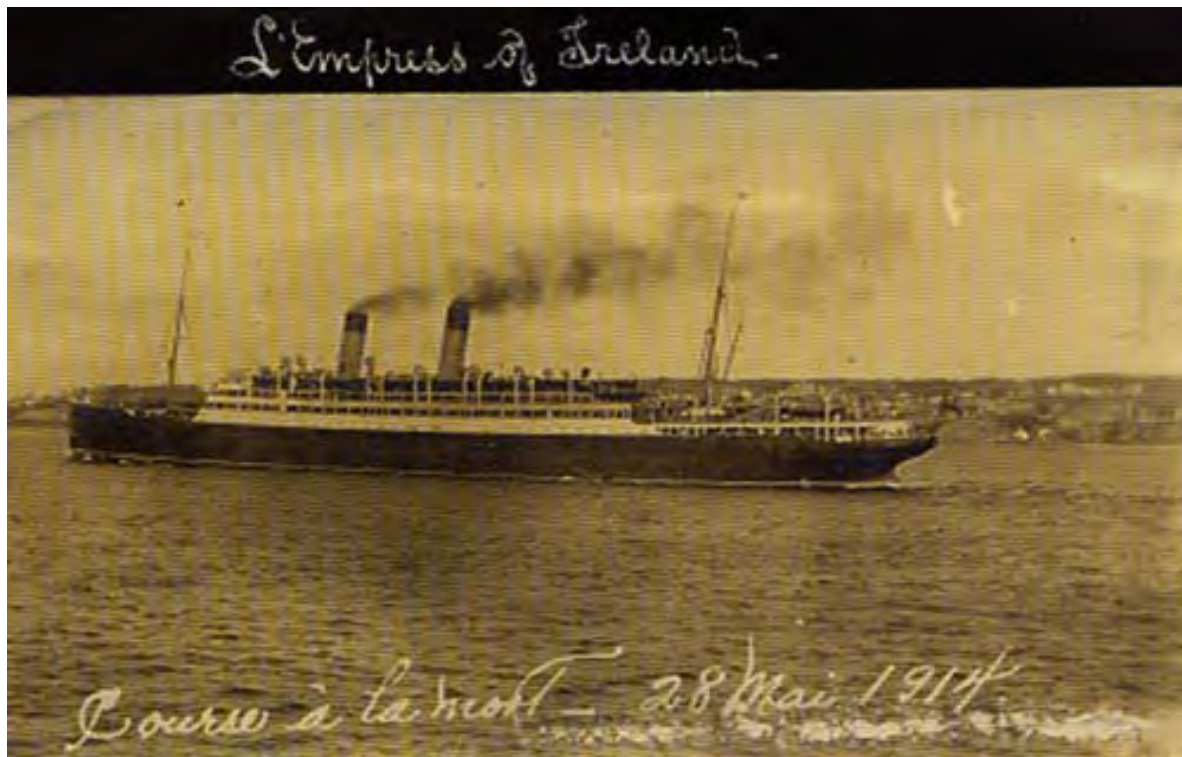
Upper section shows the ship location (controlled by captain, not the science crew) as a red dot in the NW section along with the navigational details (29 June, 2010, 15:16, 48° 20.221, 70° 19.799, depth 266 m). The lower section shows the seismic scan clearly indicating layered folded sediment, a low compaction upper layer, and a turbidite disturbance of the layering (details in text).

We made an observation on the echo sounding profile of a transparent layer a few meters below the seafloor (~ 5-15 m thick). It can be interpreted as the rapid accumulation (with subsequent low compaction) of homogeneous slide sediments possibly triggered by the 1663

earthquake that showed no internal lamination. Underneath we observe parallel reflections of undisturbed sedimentation filling a depression in the seafloor; they are quite different from the neighboring sedimentation. On the right, the sedimentation has been broken up by a sudden single event debris flow creating what is known as a turbidite. Its surface diffracts the seismic energy (as can be seen as hyperbolas in the profile). This causes local blanking areas and only a few internal reflections can be observed.

### 7.5.2 Klein 3000 side scan sonar

Side scan sonar is a system that can rapidly and accurately image large areas of the sea floor. This is very useful for many applications, including the creation of marine bathymetric charts, detection and identification of underwater objects, and surveying for archaeological purposes. In Leg A of the mission we sailed a grid pattern while using the side-scan sonar to locate the wreck of the Empress of Ireland.



Empress of Ireland leaving Québec City hours before colliding in fog with a cargo ship. The ship sank in 14 minutes with 1012 lives lost.

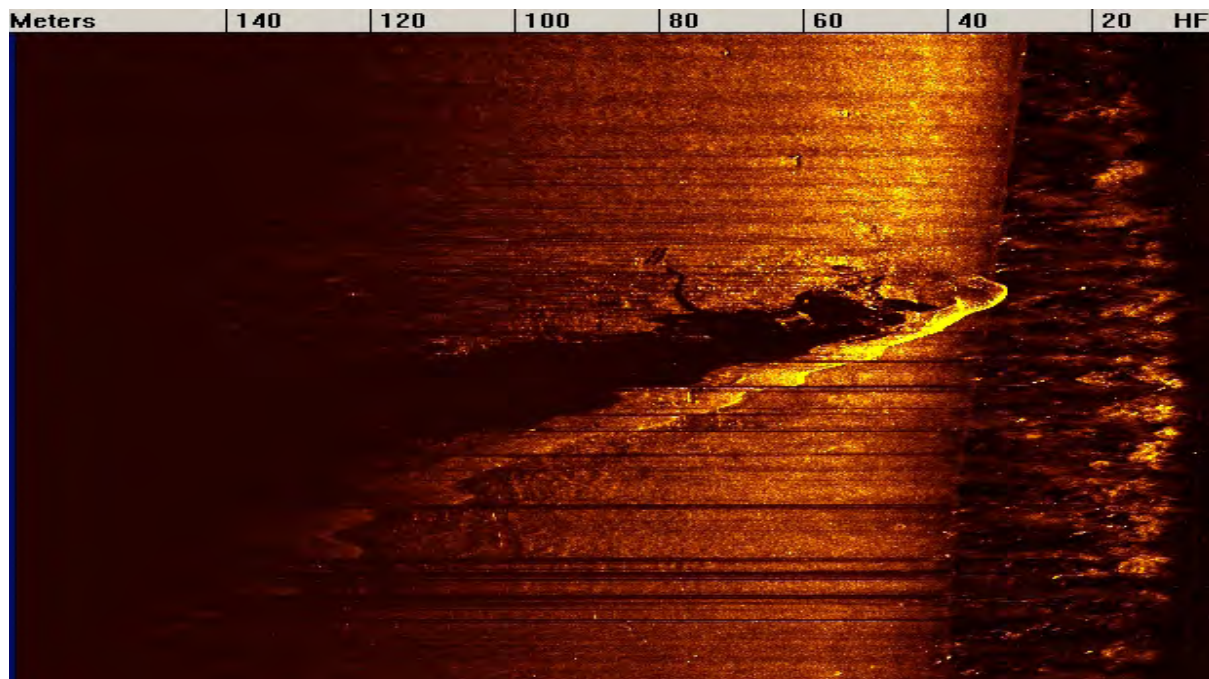
The side scan sonar device operation uses emission of a series of fan-shaped sound pulses down toward the seafloor across a wide angle perpendicular to the path of the sensor through the water. The portion of the device that is placed in the water and towed behind the boat is like a yellow fish with a stabilization fin; a black area on the side towards the front is the port sonar transducer; there is an identical transducer on the starboard side also.

The sensor was towed several hundred meters behind the ship from a cable such that it operated stably at a depth of roughly 10 m. It is important that the device is deep enough and in



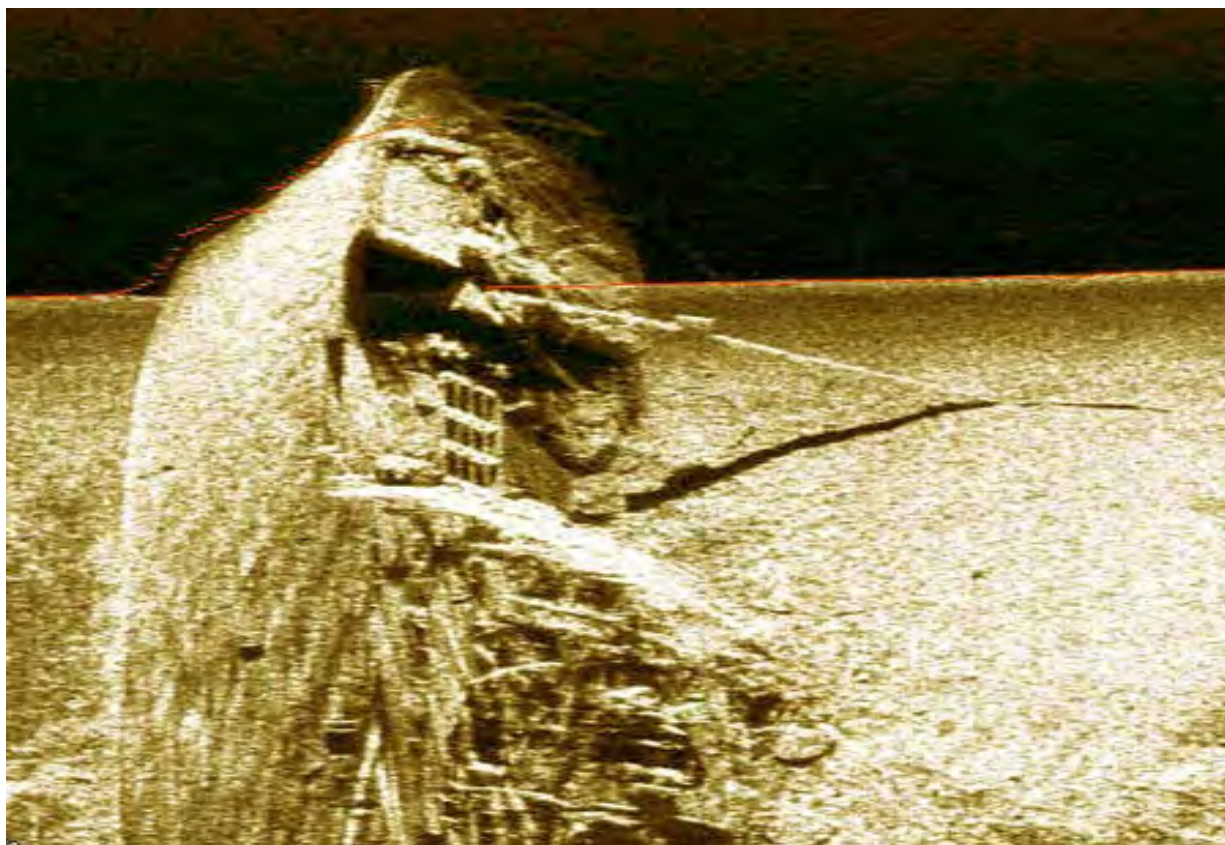
clear water, not disturbed by the turbulent cavitations from the ship propulsion system. The intensity of the sound wave reflections from the seafloor of this fan-shaped beam are recorded in a series of cross-track slices. These slices are then stitched together along the direction of motion forming an image of the sea bottom within the swath (coverage width) of the beam. The sound wave frequency used in the side-scan sonar was either 150 or 500 kHz; the higher frequency results in better resolution with less range. As a result, when the water depth was 100 – 400 m we operated the device at 150 kHz. When the water depth was shallower (40 – 100 m) the device was operated at 500 kHz.

In our search for the wreck of the Empress of Ireland, we initiated a grid search enclosing the estimated location of the ship. A frequency of 150 kHz was chosen with a swath width on either side of the ship of approximately 200 m. The grid pattern was chosen such that our sonar search overlapped from one line to the adjacent search line. This allows a mosaic bottom pattern to be generated when all the data from the sweeps are combined. Due to time constraints we were not able to complete the entire grid so we terminated the grid and went directly to the known coordinates of the wreck to obtain some images. The following figure shows a side scan sonar image of the wreck; which sits upright at an angle at an approximate depth of 40 m.



*Side scan sonar image of the Empress of Ireland from Leg A mission.*





*High-resolution Canadian Navy side scan sonar image of Empress of Ireland.*

## 7.6 Navigation

The ship navigation was via a GPS system model Furuno GP-31 GPS. There were also radars mounted on the superstructure with collision avoidance systems and weather monitoring systems. The Captain's navigation system located on the bridge of the ship was imaged onto a computer screen in the on-board laboratory allowing the exact ship position to be determined while operating the frequency chirped seismic system or side scan sonar system.

## 7.7 References

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## **8.0 Summary**


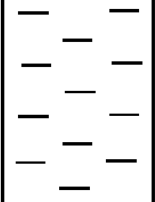

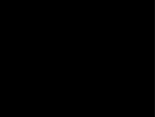






The R/V Coriolis II expedition 201003 (3<sup>rd</sup> mission of 2010) studied the sediments and oceanography of the St Lawrence Estuary and Saguenay Fjord system. Geophysical methods identified seabed topography and underlying sediments and located potential sites for coring. A number of cores were taken for future analysis but brief studies highlighted sediments relating to flood deposits as well as landslides associated with regional earthquake activity (e.g. 1663). Initial micropalaeontological studies revealed the dominance of silicate sediments with colonies of central diatoms, occasional pollen grains but few benthic foraminifera. The Empress of Ireland shipwreck was successfully located and surveyed. CTD surveys identified the main water masses of the region and low oxygen levels were found in the bottom waters throughout the study area with hypoxic conditions exceeding 30% occurring at depth in the St Lawrence Estuary area.

## **9.0 Appendix**

Following are two examples of visual core descriptions and color analysis. Also in the appendix is an overall summary of all the core samples that were obtained on the mission. These materials are being kept in the GEOTOP, UQAM archives and are under the direction of Senior Scientists: Guillaume St-Onge and Anne de Vernal. Please contact them for research access to the core materials.

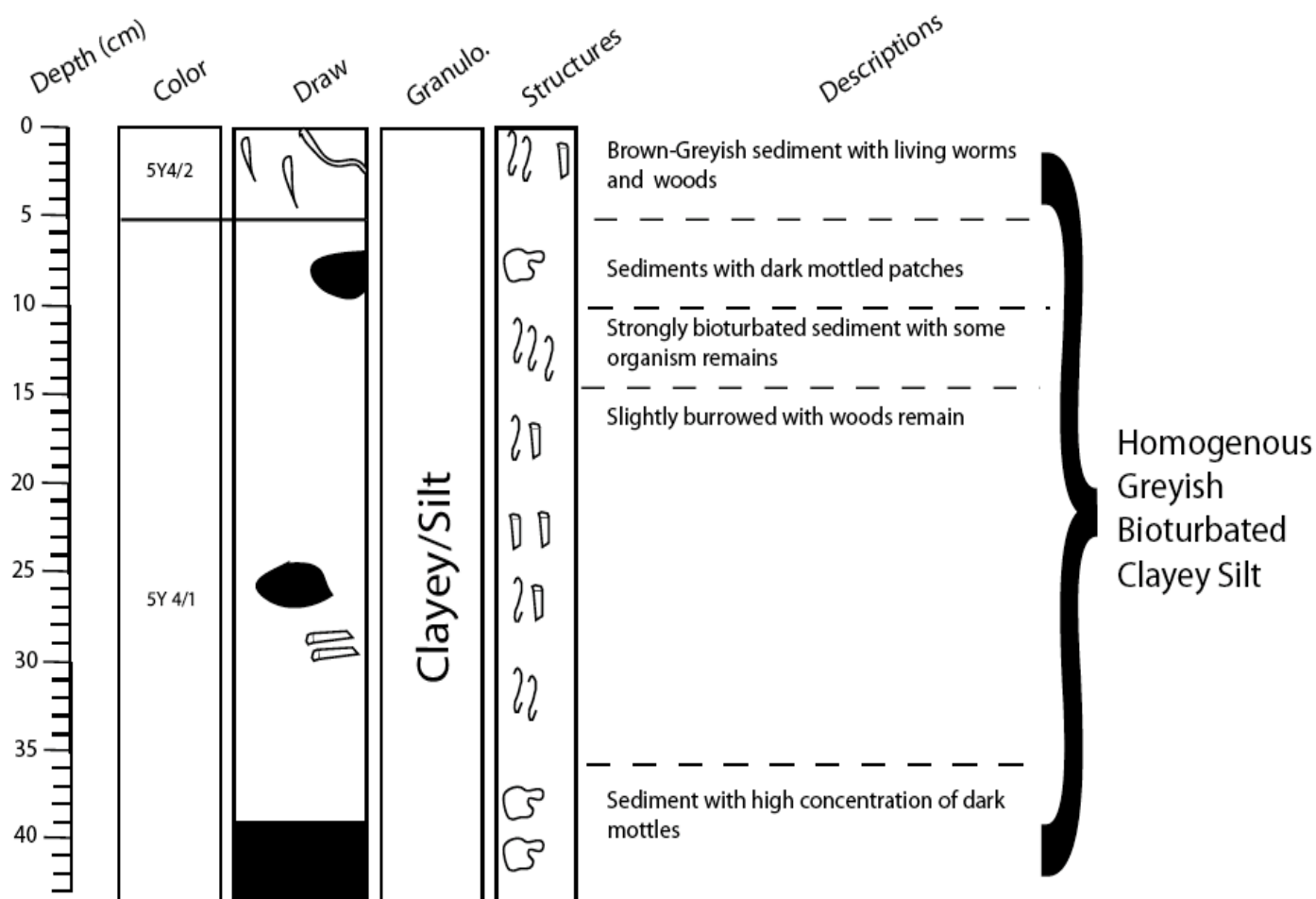
Core : COR1003-03 BC (B) 0 - 50 cm  
 Observers : Thaïs - Alex - Romina - Stefan

Date : 29/06/10

Depth (cm)	Color	Draw	Granulo.	Descriptions
0	7.5YR 4/2		Clay	Brown grayish oxic layer with minor gray striations.
5	7.5YR 4/0 + 7.5YR 4/2			Grey brownish layer with living worm (Annelidae). There are some brown "tube like" shape patches.
10				
15	7.5YR 4/0		Clay	Large gray layer, with clay sized sediment particules. This coloring may repressed sub-oxic threshold of the present core. This layer represents the 1996 flow disaster. Many black colored laminations.
20				
25	10YR 7/1			Grey sediments with no signes of bioturbation. There is a small depression, possibly due to gas intrusions.
30	7.5YR 2/0		Clay/Silt	From this layer of sediment exhale a peculiar strong smell characteristics of organic matter of this degradation. This black layer has some thin gray striations.
35	10YR 4/1			Gray silt clay sediment.
37	7.5YR 3/0			Black thin layer.
38	10YR 7/1		Clay/Silt	Dark gray thin layer.
40	7.5YR 2/0			Large layer of black silty sediment.
43	10YR 7/1			Dark gray sediment.
45	7.5YR 2/0		Silt	Black silty sediment.
50				End of the core.

Core : COR1003-07 BC (B) 0 - 43.8 cm  
 Observers : Oluwaseyi Idowu

Date : 30/06/10



Summary of Samples obtained on Mission June 28 – June 30, 2010, Quebec, Canada  
 Ste. Lawrence Estuary, Saguenay Fjord

LEG A			LEG B		
Samples	Notes	Sampling Methodology	Samples	Notes	Sampling Methodology
Station 01			Station 07		
COR1003-01 A.	0-3 mm	Grab Van Veen	COR1003-07 TW Section AB	Length: 29 cm	Trigger Weight Core
COR1003-01 B.	0-3 mm	Grab Van Veen	COR1003-07 PC Section AB	Length: 153 cm	Piston Core
COR1003-01 >250µm	Blend	Grab Van Veen	COR1003-07 PC Section BC	Length: 151 cm	Piston Core

COR1003-01 Rose Bengual	0-3 mm + Rose Bengual	Grab Van Veen	COR1003-07 PC Section CD	Length: 150 cm	Piston Core
COR1003-01 (Mélangé)	Blend	Grab Van Veen	COR1003-07 PC Section DE	Length: 80 cm	Piston Core
COR1003-01 >20µm		Plankton tow	COR1003-07 BC	Floc	Box-Core
Station 03			COR 1003-07 BC core A	Length: 44 cm	Box-Core
COR1003-03 Floc	Rose Bengual	Box-Core	COR 1003-07 BC core B 0-1 cm		Box-Core
COR1003-03 Floc		Box-Core	COR 1003-07 BC core B 1-2 cm		Box-Core
COR1003-03 BC core A 0-1 cm		Box-Core	COR 1003-07 BC core B 2-3 cm		Box-Core
COR1003-03 BC core A 1-2 cm		Box-Core	COR 1003-07 BC core B 3-4 cm		Box-Core
COR1003-03 BC core A 2-3 cm		Box-Core	COR 1003-07 BC core B 4-5 cm		Box-Core
COR1003-03 BC core A 3-4 cm		Box-Core	COR 1003-07 BC core B 5-6 cm		Box-Core
COR1003-03 BC core A 4-5 cm		Box-Core	COR 1003-07 BC core B 6-7 cm		Box-Core
COR1003-03 BC core A 5-6 cm		Box-Core	COR 1003-07 BC core B 7-8 cm		Box-Core
COR1003-03 BC core A 6-7 cm		Box-Core	COR 1003-07 BC core B 8-9 cm		Box-Core
COR1003-03 BC core A 7-8 cm		Box-Core	COR 1003-07 BC core B 9- 10 cm		Box-Core
COR1003-03 BC core A 8-9 cm		Box-Core	COR 1003-07 BC core B 10- 11 cm		Box-Core
COR1003-03 BC core A 9-10 cm		Box-Core	COR 1003-07 BC core B 11- 12 cm		Box-Core
COR1003-03 BC core A 10-11 cm		Box-Core	COR 1003-07 BC core B 12- 13 cm		Box-Core
COR1003-03 BC core A 11-12 cm		Box-Core	COR 1003-07 BC core B 13- 14 cm		Box-Core
COR1003-03 BC core A 12-13 cm		Box-Core	COR 1003-07 BC core B 14- 15 cm		Box-Core
COR1003-03 BC core A 13-14 cm		Box-Core	COR 1003-07 BC core B 15- 16 cm		Box-Core
COR1003-03 BC core A 14-15 cm		Box-Core	COR 1003-07 BC core B 16- 17 cm		Box-Core
COR1003-03 BC core A 15-16 cm		Box-Core	COR 1003-07 BC core B 17- 18 cm		Box-Core
COR1003-03 BC core A 16-17 cm		Box-Core	COR 1003-07 BC core B 18- 19 cm		Box-Core

COR1003-03 BC core A 17-18 cm		Box-Core	COR 1003-07 BC core B 19-20 cm		Box-Core
COR1003-03 BC core A 18-19 cm		Box-Core	COR 1003-07 BC core B 20-21 cm		Box-Core
COR1003-03 BC core A 19-20 cm		Box-Core	COR 1003-07 BC core B 21-22 cm		Box-Core
COR1003-03 BC core A 10-11 cm		Box-Core	COR 1003-07 BC core B 22-23 cm		Box-Core
COR1003-03 BC core A 11-12 cm		Box-Core	COR 1003-07 BC core B 23-24 cm		Box-Core
COR1003-03 BC core A 12-13 cm		Box-Core	COR 1003-07 BC core B 24-25 cm		Box-Core
COR1003-03 BC core A 13-14 cm		Box-Core	COR 1003-07 BC core B 25-26 cm		Box-Core
COR1003-03 BC core A 14-15 cm		Box-Core	COR 1003-07 BC core B 26-27 cm		Box-Core
COR1003-03 BC core A 15-16 cm		Box-Core	COR 1003-07 BC core B 27-28 cm		Box-Core
COR1003-03 BC core A 16-17 cm		Box-Core	COR 1003-07 BC core B 28-29 cm		Box-Core
COR1003-03 BC core A 17-18 cm		Box-Core	COR 1003-07 BC core B 29-30 cm		Box-Core
COR1003-03 BC core A 18-19 cm		Box-Core	COR 1003-07 BC core B 30-31 cm		Box-Core
COR1003-03 BC core A 19-20 cm		Box-Core	COR 1003-07 BC core B 31-32 cm		Box-Core
COR1003-03 BC core A 20-21cm		Box-Core	COR 1003-07 BC core B 32-33 cm		Box-Core
COR1003-03 BC core A 21-22 cm		Box-Core	COR 1003-07 BC core B 33-34 cm		Box-Core
COR1003-03 BC core A 22-23 cm		Box-Core	COR 1003-07 BC core B 34-35 cm		Box-Core
COR1003-03 BC core A 23-24 cm		Box-Core	COR 1003-07 BC core B 35-36 cm		Box-Core
COR1003-03 BC core A 24-25 cm		Box-Core	COR 1003-07 BC core B 36-37 cm		Box-Core
COR1003-03 BC core A 25-26 cm		Box-Core	COR 1003-07 BC core B 37-38 cm		Box-Core
COR1003-03 BC core A 26-27 cm		Box-Core	COR 1003-07 BC core B 38-39 cm		Box-Core
COR1003-03 BC core A 27-28 cm		Box-Core	COR 1003-07 BC core B 39-40 cm		Box-Core
COR1003-03 BC core A 28-29 cm		Box-Core	COR 1003-07 BC core B 40-41 cm		Box-Core

COR1003-03 BC core A 29-30 cm		Box-Core	COR 1003-07 BC core B 41-42 cm		Box-Core
COR1003-03 BC core A 30-31 cm		Box-Core	COR 1003-07 BC core B 42-43 cm		Box-Core
COR1003-03 BC core A 31-32 cm		Box-Core	COR 1003-07 BC core B 0-1 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 32-33 cm		Box-Core	COR 1003-07 BC core B 1-2 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 33-34 cm		Box-Core	COR 1003-07 BC core B 2-3 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 34-35 cm		Box-Core	COR 1003-07 BC core B 3-4 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 35-36 cm		Box-Core	COR 1003-07 BC core B 4-5 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 36-37 cm		Box-Core	COR 1003-07 BC core B 5-6 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 37-38 cm		Box-Core	COR 1003-07 BC core B 6-7 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 38-39 cm		Box-Core	COR 1003-07 BC core B 7-8 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 39-40 cm		Box-Core	COR 1003-07 BC core B 8-9 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 40-41 cm		Box-Core	COR 1003-07 BC core B 9-10 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 41-42 cm		Box-Core	COR 1003-07 BC core B 10-11 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 42-43 cm		Box-Core	COR 1003-07 BC core B 11-12 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 43-44 cm		Box-Core	COR 1003-07 BC core B 12-13 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 44-45 cm		Box-Core	COR 1003-07 BC core B 13-14 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 0-1 cm	Rose Bengual	Box-Core	COR 1003-07 BC core B 14-15 cm	Rose Bengual	Box-Core
COR1003-03 BC core A 1-2 cm	Rose Bengual	Box-Core	COR 1003-07 BC core C	Length: 43,8 cm	Box-Core
COR1003-03 BC core A 2-3 cm	Rose Bengual	Box-Core	Station 09		
COR1003-03 BC core A 3-4 cm	Rose Bengual	Box-Core	COR1003-09 BC	Floc	Box-Core
COR1003-03 BC core A 4-5 cm	Rose Bengual	Box-Core	COR1003-09 BC core A	Length: 52 cm	Box-Core
COR1003-03 BC core A 5-6 cm	Rose Bengual	Box-Core	COR1003-09 BC core B	Length: 55 cm	Box-Core
COR1003-03 BC core A 6-7 cm	Rose Bengual	Box-Core			
COR1003-03 BC core A 7-8 cm	Rose Bengual	Box-Core			
COR1003-03 BC core A 8-9 cm	Rose Bengual	Box-Core			

COR1003-03 BC core A 9-10 cm	Rose Bengual	Box-Core	
COR1003-03 BC core A 10-11 cm	Rose Bengual	Box-Core	
COR1003-03 BC core A 11-12 cm	Rose Bengual	Box-Core	
COR1003-03 BC core A 12-13 cm	Rose Bengual	Box-Core	
COR1003-03 BC core A 13-14 cm	Rose Bengual	Box-Core	
COR1003-03 BC core A 14-15 cm	Rose Bengual	Box-Core	
COR1003-03 BC core B	Length: 52 cm	Box-Core	
COR1003-03 BC core C	Length: 50 cm	Box-Core	
COR1003-03-TWC Section AB	Length: 135 cm	Trigger Weight Core	
COR1003-03 PC Section AB	Length: 152 cm	Piston Core	
COR1003-03 PC Section BC	Length: 155 cm	Piston Core	
COR1003-03 PC Section CD	Length: 17 cm	Piston Core	
Station 04			
COR1003-04 BC core A	Length: 55 cm	Box Core	
COR1003-04 BC core B	Length: 56 cm	Box Core	
COR1003-04 BC	Surface Floc	Box Core	
COR1003-04 GC	Length: 154 cm	Gravity Core	
COR1003-04 GC Core Catcher		Gravity Core	



## 2010 ECORD/IODP-Canada Summer School evaluation Form

*Totally disagree = 1*

*Rather disagree = 2*

*Rather agree = 3*

*Totally agree = 4*

	Score	Comments
<b>Overall conditions</b>		
The programme of the Summer School met my expectations	3.47	
The accommodation met my expectations	3.53	
The meals met my expectations	3.58	
The field programme met my expectations	3.58	
The general support during the Summer School met my expectations	3.47	
<b>Participants and groups</b>		
I felt comfortable amongst the group of participants	3.79	
I was not disturbed by the different backgrounds and levels of participants	3.63	On the contrary, it was a great experience
There were enough opportunities for exchange of ideas with others	3.68	
I was well prepared for this meeting based on information provided	2.89	Documentation received only 2 days before the beginning of the summer school
The group contributed to my learning progress	3.58	
<b>Lectures</b>		
The degree of difficulty met my expectations	3.37	Yes, in general
The documentation provided was adequate	3.26	Yes, but should have been provided earlier
The various topics covered by the lectures were relevant	3.53	Very interdisciplinary and interesting
The lecturers were well prepared	3.26	Some were too long
The amount of lectures was appropriate	3.22	Yes, but too much condensed in the last days
There was enough time for questions and discussion	3.42	
<b>Ship time</b>		
The preparation before to embark was sufficient	3.28	More time and information
The various monitoring sampling activities were relevant	3.78	
The amount of information provided was appropriate	3.61	
There was enough time for interactivity and discussion	3.63	
The number of time spent at sea was adequate	2.95	More time at sea would be good
<b>Field trips</b>		
The selected locations were interesting	3.47	
The documentation and explanations were adequate	3.16	More explanation
The various time dedicated to each excursion was sufficient	3.47	
The number of "field activities" was adequate	3.42	

## General questions

The best time of the year for the Summer School would have been

May → 3

**June → 9**

**July → 11**

August → 2

The duration of the Summer School (16 day) was

Too short → 1/19

**Adequate → 16/19**

Too long → 2/19

Would the Summer School have been attractive and affordable for you without scholarship ?

YES or NO;

YES for (very) attractive, mostly NO (n=13) for affordable

Do you think that the “all inclusive” package (course programme, field trips, lodging and most meals) is a good formula ?

**YES → 19/19**

NO

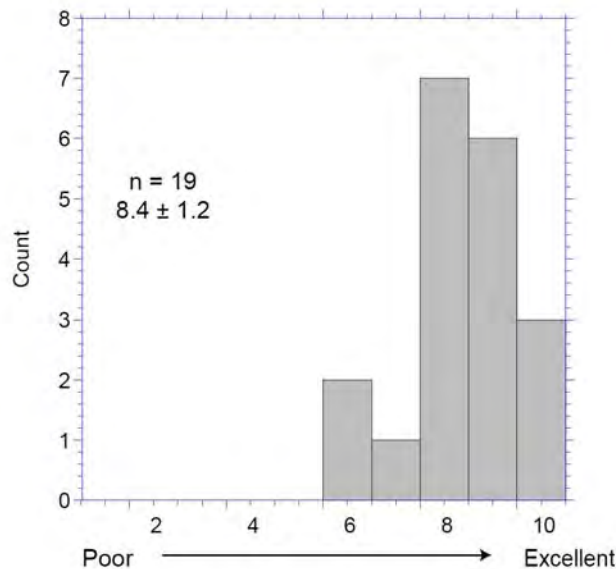
Would you recommend the Summer School to colleagues in your home country?

**YES → 17.5/19**

NO → 1.5/19

## Overall evaluation

On a scale from 1 (poor) to 10 (excellent) I would rate the Summer School:



## General comments

In general, the group was very content with the summer school. The interdisciplinarity of the lecture topics, the field trips and the ship time were much appreciated. The weak points are as follows:

- The balance of lectures, lab works and exercises can be improved, especially in week 2.
- More preparation for the cruise (and lectures before) would help.
- Documentation should have been provided earlier.

## **Appendix 7**

COST Program Proposal for Workshops on Scientific Drilling (Magellan Plus Workshop Series)

**Proposer Details**

**Title:** Prof.

**Gender:** M

**Forename:** Lucas

**ESR:** NO

**Family Name:** Lourens

**Resubmission:** NO

**Year of Birth:** 1966

**Email:** llourens@geo.uu.nl

**Institution:** Faculty of Geosciences, Utrecht University

**Position** Head of the Paleoclimatology group

**Contact Address :** Budapestlaan 4<br>  
Utrecht 3584 CD  
Netherlands

**Scientific Content**

**Title**

COST Program Proposal for Workshops on Scientific Drilling (Magellan Plus Workshop Series)

**Abstract:**

The importance of marine and continental drilling to investigate key questions concerning the major System Earth themes Climate, Environmental, and Ocean Change, Evolution of Life and the Planet, Deep Earth Processes, and Geohazards has long been recognized across Europe. The European track record of scientific drilling science confirms the presence of a large and broad dedicated science community, which substantially and actively participates in ongoing campaigns through a.o. memberships of the Integrated Ocean Drilling Program (IODP) and the International Continental Scientific Drilling Program (ICDP). To secure, however, the European leadership in scientific drilling, it is required that future scientific objectives are outstanding. The Magellan Plus Workshop Series provides an enabling programme for co-ordinated workshops to stimulate and nurture high-quality and innovative European scientific drilling initiatives and proposals that conduct excellent and societal relevant science.

**Key Words:**

Scientific drilling, Continental and Marine drilling, Magellan Plus Workshop Series, IODP, ICDP, IMAGES, EUROMARC, ESSAC, ECORD, Climate, Environmental and Ocean Change, Evolution of Life and the Planet, Deep Earth Processes, Geohazards

**Preferred COST Domain:**

Earth System Science and Environmental Management

**Text of proposal:**

## BACKGROUND, PROBLEMS

Scientific drilling and coring supports a large and influential scientific community in Europe as testified by, for example, the huge impact of the previous operations by the Deep Sea Drilling Program (DSDP), Ocean Drilling Programs (ODP), the current Integrated Ocean Drilling Program (IODP), IMAGES, the International Continental Scientific Drilling Program (ICDP) and other associated EU-supported programmes, such as EUROMARC. Within these programs, European researchers have played a leading role in establishing these programmes and in determining the scientific targets. Important discoveries and scientific advances comprise, e.g., the operation of plate tectonics and the accretion of the oceanic lithosphere, novel insight into physico-chemical causes of earthquakes and volcanic eruptions, the existence of a deep biosphere and the presence of frozen methane (gas hydrates), past extreme and rapid climate variations and perturbations, the mechanisms of ocean biogeochemical cycles, consequences of meteorite impacts on the environment and the discovery of large igneous provinces associated with continental break-up at volcanic margins.

For the maximum realization of the full potential of pan-European drilling-related science, it is imperative that European researchers can lead the planning and execution of identified and promising programmes. In 2006, the ESF Magellan Workshop Series was launched to nurture and coordinate in particular innovative marine scientific drilling proposals by European scientist to strengthen the role of Europe within the international marine drilling community. The Magellan programme has funded to date 18 workshops, which has allowed a total of 356 scientists to jointly develop novel ideas, plan meanwhile 15 drilling proposals, and increase their impact within the international community of geosciences. Besides, the Magellan programme funded nineteen mainly young scientists to participate in international conferences and workshops with a clear focus on marine geo-scientific drilling. In addition a call published in 2008 to advertise the attraction, fascination and social relevance of research related to drilling to graduate students and young post docs, led to co-funding of the Urbino Summer School. The Magellan Workshop Series has been widely acknowledged as a powerful and substantial instrument for a coordinated and political planning in the future of Europe in scientific drilling, but will end on July 31 2011.

A new programme, the Magellan Plus Workshop Series, is hence needed to implement and expand the success of the ending Magellan programme, through both the integration of continental and marine drilling and coring as well as the incorporation of East European countries to meet future challenges in Earth, Life and Environmental sciences and to support the leading role of European scientists in developing new and innovative research initiatives. In anticipation of this need the Magellan programme has launched a final open call for the submission of workshop proposals that integrate marine and continental drilling strategies to address critical scientific questions related to the major System Earth themes:

- Climate, Environmental and Ocean Change
- Evolution of Life and the Planet
- Deep Earth Processes
- Geohazards

## BENEFITS

Scientific drilling is crucial to progress in the Earth, Life and Environmental sciences, and of highly societal relevance. It (1) provides the pivotal data critical for the evaluation of models, which predict future global change, (2) gives access to the deep biosphere comprising bacteria living below the ocean floor and deeply

buried in rocks, (3) allows new tools to investigate the dynamics of continental margins and sea-floor spreading, (4) permits the study of the genesis and recycling of the Earth's interior through time, and (5) provides the means to study geological risks through volcanoes and seismogenic zones, where earthquakes and landslides are initiated.

## OBJECTIVES, DELIVERABLES AND EXPECTED SCIENTIFIC IMPACT

To provide an enabling program for coordinated workshops that will stimulate and nurture high quality and innovative science initiatives and proposals to maintain the European frontier role in international marine and continental research drilling and coring, we propose the establishment of a COST Magellan Plus Workshop Series Programme to:

- Efficiently provide funds for 3-4 scientific drilling workshops per year
- Stimulate collaboration in scientific drilling proposals at a broad European level
- Promote coordination of the pan-European research drilling community

Workshop proposals to the COST Magellan Plus Workshop Series Program must support high-quality, new and innovative science. It is envisaged that a minimum of three and a maximum of four workshops will be organized each year with a six to seven months lead time between proposal submission and the actual workshop. Proposals will be reviewed, and proponents notified, within two months following the submission deadline. Two calls are envisioned with deadlines on January 1st and July 1st. The proposals should include complete and realistic scripts for the workshop, thus enabling the execution of the workshop within four to five months following the selection. It will be anticipated that the workshop proposals will have a significant component of European leadership. The average workshop period and size are set between 2-4 days and 20-35 participants respectively and the location within the area of the European partners of the ESF-COST Program. In addition, the locality should be close to a convenient air and/or train hub and have relatively low cost facilities. The average cost of a workshop is estimated to vary around 20 k€, thereby bringing a total of three-four workshops at 60-80 k€ per year. The participation of young scientists will be particularly encouraged. International experts of the relevant disciplines will be invited to these workshops to provide scientific input to the workshop themes and warrant international collaboration.

## SCIENTIFIC PROGRAMME AND INNOVATION

Workshop proposals to the COST Magellan Plus Workshop Series Programme must broadly follow the major System Earth themes: Climate, Environmental and Ocean Change, Evolution of Life and the Planet, Deep Earth Processes, and Geohazards, as outlined for instance by the new Science Plan of the next phase of IODP and the major goals of ICDP. They should ensure European leadership in the effective exploitation of research opportunities by the planning and execution of marine and continental drilling and coring expeditions, thereby taking into account a mission specific drilling strategy, the societal relevance of the investigations, and a broad European network. Emphasis will be on the impact and effect of large-scale Earth System processes, such as earth quakes, volcanic eruptions, tsunamis, climate and biological changes on the European and Global environments. These processes have been well recognized but still require a reliable prediction.

## ORGANISATION

The programme will ensure that member states obtain the maximum benefit from their investment and meet their mission requirements. Oversight of the ESF COST Magellan Plus Workshop Series Programme will be under the purview of the Scientific Steering Committee (SSC), which includes the programme's annual

budget, the process of coordination, collaboration and development of workshop themes in line with the programme goals. Smaller Executive Steering Committees (ESC, including the Chair of the program and three to four additional members of the SSC) will be formed when dealing with the review process and overview of the workshop planning of selected proposals. The additional ESC members will rotate on an annual or bi-annual schedule. The ESC will report annually to the SSC and meet at least twice per year (annual costs meetings: 10 k€) following submission deadlines and around scheduled workshops. To facilitate fast communication among participants and to provide secretarial support (annual costs secretarial support: 15 k€), a part-time assistant to the Programme Coordinator is requested. Further tasks will be the organization of SSC and ESC meetings, workshops and conferences.

In order to maximize the synergy and optimal integration of future activities between the COST Magellan Plus Workshop Series Programme and the European participation in ICDP and IODP, through the European Consortium of Ocean Drilling (ECORD) and the ECORD Science Support and Advisory Committee (ESSAC), observers are invited to join the Steering Committee meetings. In addition, ESF sets up a programme homepage on its website and the Scientific Steering Committee will link it to amongst others the ECORD and ICDP websites in order to communicate with the science community. Communication activities will include a regular newsletter, published proceedings of workshops and potentially study reports.

Funding agencies from 16 European countries (Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Italy, The Netherlands, Norway, Portugal, Republic of Ireland, Spain, Sweden, Switzerland, and the United Kingdom) and Canada co-operate as a single consortium (ECORD) in IODP, while 15 European countries are member (Austria, Czech Republic, Finland, France, Germany, Iceland, Italy, Norway, Poland, Spain, Sweden, Switzerland) or interested (The Netherlands, Republic of Ireland, United Kingdom, Denmark) in ICDP. Representative scientists from these IODP and ICDP member countries have given their full support to this COST Magellan Plus Workshop Series Program.

**Participants interested in network:**

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