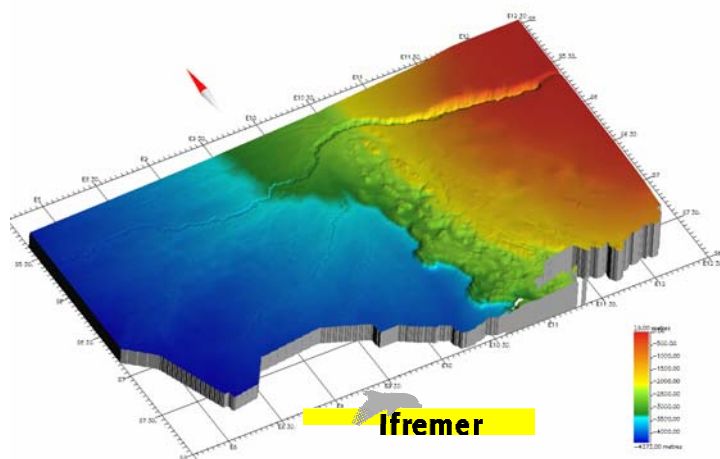


***COMARGE Workshop***

***6 – 7 July 2006***

***Institut Océanographique, Paris***

**- Report -**



Ifremer 3-D bathymetry of the Equatorial West African Margin (Zaiango/Biozaïre project)

**CoML/COMARGE workshop  
Institut Oceanographique  
Paris, 6-7 July 2006**

## **I. Aim**

The workshop hosted by the Institut Océanographique in Paris was the second international workshop organized by COMARGE after the Rio Meeting. The Paris workshop was meant to introduce the objectives of COMARGE to a larger audience of about 40 scientists from almost all countries that had expertise in margin studies in terms of taxonomy and ecology and further discuss those objectives. The general aims were to share interest and agree on a list of major scientific questions in order to plan the future actions in a collaborative way.

The workshop was more specifically intended to:

- Bring together deep-sea scientists from all continents, who had positively answered the call for contribution to COMARGE sent in February 2006 (CoML/COMARGE: Towards a globalization of the project);
- Identify key questions, existing and planned studies, and data available on continental margins worldwide, who could contribute, on a collaborative basis, to the synthesis on benthic diversity patterns and processes aimed by COMARGE;
- Further develop the questions addressed by the project
- And finally propose concrete plans on how to solve those questions within the Census of Marine Life time frame 2006-2010.

The workshop was attended by 36 scientists from 18 countries (cf. List of Participants).

## **II. Programme**

The first day of the workshop was dedicated to oral presentations (cf. list of presentations in annex):

- Lucien Laubier, director of the Institut Océanographique, welcomed the participants and recount a century of Oceanography at the Institut.
- Myriam Sibuet and Robert Carney introduced the COMARGE project (its rationales, its aims, some financial aspects and the use of CoML grant) as well as the objectives of the workshop.
- Lenaick Menot presented the data management plans for COMARGE and partial results of the answer to the call for contribution.
- Philippe Bouchet broadened the perspectives to the inventory of global marine biodiversity: The state of knowledge, the expected unknowns and the actual limits of knowledge.
- 20 talks were presented, two talks taxonomically-focused and 18 talks geographically-focused, covering all margins worldwide, from the North-Eastern Atlantic to the South-Western Pacific and Indian Ocean.

The second day of the workshop was dedicated to discussions. Discussions began in plenary assembly. In the beginning of the afternoon, two working groups were defined. Discussions followed within working groups. Dr Lisa Levin and Dr Robert Carney reported the outcomes of the two groups at the end of the day.

### III. Assembly discussions

Assembly discussions were intended first at refining the questions that COMARGE had identified within the steering committee and will address within the next four years, taking into account new contributions. Each participant had the opportunity to state their own priority questions. All questions were listed and later summarized into seven topics:

1. Landscape-scale questions = definition of habitats
2. Habitat heterogeneity in relation to regional diversity = quantifying the diversity in each habitat
3. Basin scale/ Sea scale / Global scale comparisons (Sulu Sea versus Mediterranean Sea; Gulf of Mexico, Sea of Japan, Mediterranean Sea, Antarctic, Arctic; Passive versus active margins, inclusive of trenches?; Island versus continental slopes).
4. Large-scale gradients in relation to community structure and zonation: Latitude, bathymetry, North-South versus East-West gradients.
5. Small-scale heterogeneities.
6. Biogeography.
7. Anthropogenic impacts on margin diversity.

In the early afternoon, the assembly discussed the ways to develop each of these topics, considering that some approaches are more specifically addressed by a good knowledge in taxonomy and some other more by ecological studies, taking into account the community structure and the environmental factors. Therefore, a dichotomy was highlighted between questions that do require comparing species lists and taxonomically accurate data at large spatial scales, mainly within topics 4 and 6 and questions which may be addressed at a local scale and/or by the analysis of diversity indices rather than accurately named species lists (topics 1, 2, 3, 5 and 7). The assembly was divided into two groups in order to further discuss and develop these two sets of topics.

### IV. Working group discussions

#### ***A. Report of Working Group on Large-Scale Patterns - Prepared by R.S. Carney***

##### **1. Purpose of Working Group**

The Group consisted of workshop participants especially interested in distribution patterns on large circum-basin and global scales. These patterns include distribution of taxa and of community diversity; both require a high degree of taxonomic information. Consistent with CoML objectives, these patterns are now poorly known but are knowable when data are adequate. Consistent with COMARGE objectives, these patterns address questions ranging from alpha to epsilon diversity. Working Group II identified a series of questions, identified critical steps in answering those questions, and identified a course of action, with specific participants volunteering to move the themes forward.

##### **2. Questions Identified**

A total of 11 questions were proposed by the Working Group. All can be considered subcomponents of two main questions posed by COMARGE. An important distinction between the two main questions is that the first is a taxa-specific question that examines large-scale distributions taxon by taxon. The second is a community-specific question that examines species diversity of communities over large geographic areas.

2.1. What are the depth ranges of species and communities of species over large segments of continental margin, and can these observed patterns be used to develop predictive models based on faunal control by non-biological habitat factors?

Subcomponents

2.1.1. For what taxa and what margin regions are there sufficient high-quality data for species for meaningful comparison across many studies?

2.1.2. What are the primary causes of depth zonation with respect to depth, topography, productivity, water mass, latitudinal processes, and interaction among processes?

2.2. Is a maximum in alpha and beta diversity a consistent feature along large segments of the margin ecosystem at mid-lower slope depth, and if so can these observed patterns be used to develop predictive models based on faunal control by non-biological habitat factor?

2.2.1. For what margin communities and regions are there sufficient high-quality data for meaningful comparison of diversity estimates across many studies?

2.2.2. How does geography of diversity change along margins when scales from alpha to epsilon are considered?

2.2.3. What are the primary causes of community diversity patterns on margins with respect to depth, topography, productivity, water mass, latitudinal processes, and interaction among processes?

### 3. Approach to Answering Questions

Answering both questions first requires identification of suitable data.

The group quickly agreed that both the taxa-specific and community-specific question can only be answered using very high quality archived data. The taxa-specific question requires correct and consistent identification to species over large areas from many studies. The community-specific question requires similarity of methods across many studies and consistent identification within each study.

Data can be sought either by taxa or by region of the margin. It was concluded that of major margin species only foraminifera data may now be suitable for analysis. Therefore, data should first be identified by region and then by taxon within region.

#### 3.1. Identify Geographic Data on Margin Species

A preliminary consideration of data availability (see attached) suggests that the most easily accomplished large-scale, taxa-specific syntheses may be:

The Atlantic as far as 30 degrees south including Gulf of Mexico and Mediterranean.  
The Pacific as far as 30 degrees north.

Examination of diversity patterns does not require the same high level of taxonomic certainty. When similar methods were employed, comparisons among all ocean basins are possible.

### 3.2. Identify Taxonomic Focus

Only a limited number of taxa are presently suitable for large-scale syntheses by means of traditional morphological taxonomy. The confidence with which results across many separate studies can be used is highly dependant on the experts used and the ease of identification of the species. In general the larger fauna (megafauna) are best known.

These megafauna groups include:

- Fishes
- Decapod crustaceans
- Echinoderms
- Cnidarians
- Molluscs

Macrofauna and meiofauna, however, remain a very important component of margin diversity. Thecate foraminifera are a group that can be used for large-scale syntheses. Smaller crustaceans, polychaetes, and nematodes may be used with caution.

## **4. A Proposed Workshop on Large-Scale Margin Patterns**

The group agreed that a workshop should be held within the following year with the purpose of carrying out preliminary analysis of actual datasets with an emphasis on the Atlantic synthesis of taxa-specific distributions. That workshop will also identify data gaps and most effective taxonomic focus. The workshop should be carried out at a national museum with large holdings of margin species and readily accessible data bases.

Leaders to develop such a workshop are:

- Dr. Gary Poore
- Dr. Andy Gooday
- Dr. Ann Vanreusel

Further development of the community-specific question about diversity maxima will require coordination with Working Group-I (Landscape patterns and processes). Participants in Working Group –II felt such a diversity workshop should include participation of deep-sea diversity specialists such as Dr Mike Rex and diversity theorists. These experts were not represented.

## **5. Attachment**

Quick assessment of data availability from margins of Global Ocean

### Atlantic

Arctic - Hausgarden site nematodes copepods, polychaete(?) 1000-5000k

NE Atlantic – Numerous data sets on numerous taxa full slope depth.

NW Atlantic – Fewer than NE, but still numerous data sets on numerous taxa full slope depth.

Mediterranean – Fewer deep studies than Atlantic but greatly increasing data along European coast, mostly upper slope. Region of special interest due to age and warm water.

Gulf of Mexico and Caribbean – extensive data from Gulf of Mexico, many taxa and full slope depth. Only limited data from Caribbean.

West Africa – Increasing data Nigeria/Angola from oil studies, British Museum maintains a West African database. Good foraminifera distribution studies.

Eastern South America – Increasing data Brazil coast 700-2000m, polychaetes, molluscs, demersal fishes, and echinoderms.

#### Pacific Ocean

Western South America – Limited data sets, isopods, decapods, nematodes, shelf to trench.

Western Central America – Limited data sets, Polychaetes by Allan Hancock Foundation.

Western North America – Many data sets, Scripps studies, San Francisco dredging studies, MBARI sampling, studies off Oregon and Washington. Many taxa, 200 to 4000m depth range.

North East Pacific – Less data, fisheries related surveys off Alaska.

North West Pacific – Many data sets Russian studies, many taxa, shelf to trench depths.

Sea of Japan – Many data sets Russian and other studies, many taxa. Depths not known.

Of special interest due to similarities with Gulf of Mexico.

China/Taiwan - fish, decapod crustaceans, polychaetes.

Polynesia – Limited data set, exploration ongoing.

Philippines - Limited data set, exploration ongoing.

Australia/New Zealand – Good data sets, strong coordination between field sampling and museum study.

#### Indian Ocean

Indian/Pakistan – Limited data sets, Pakistan margin study forams, macro mega

Oman Margin – Limited data sets, John Gage, NOC campaign

East Africa – Limited data sets (Nematoda A. Mumtumb W Ind Ocean) 200-2000m , Dutch Indian Ocean Program (?), Historical cruises (in literature)

South Africa – Limited data sets, fish, echinoderm, polychaetes (J. Day). Natal Museum

Antarctic Margin – Good data sets, must be coordinated with ANDEEP.

## ***B. Report of Working Group on Landscape Patterns and Processes and Anthropogenic Impact – Prepared by L.A. Levin and L. Menot***

### **1. Landscape-scale classification**

Leader: **Alan Hughes**

Co-leader: Erwan Le Guillou, Anthony Grehan

#### Purpose

The purpose of a landscape-scale classification is to define and map habitats on continental margins, including the border of the shelf, in order to:

- a) Quantify and compare habitat heterogeneity on continental margins
- b) Refer to a common framework for habitat description

The experience gained by the Interreef project (shelf) in Australia and the Afen project on western Shetland margin as well as a similar topic discussed by the ICES WG on Deep-Water Ecology could be instructive. Common denominators may be sought between different classification schemes. The originality of the approach is to create biological criteria, different from geological mapping.

#### Contributions

- Passive margins: West of Shetland (Alan Hughes), Porcupine Seabight (Alan Hughes, Bhavani), Armorican margin (Erwan Le Guillou), Gulf of Cadix (Marina da Cunha), Gulf of Mexico (Elva Escobar, Gilbert Rowe), Angolan margin (Myriam Sibuet), South-East Australia (Allan Williams, via Thomas Schlacher).
- Active margins: Sagami Bay (Hiroshi Kitazato), Chile margin (Javier Sellanes).

#### Schedule and outcome

A workshop on this theme should be organized during the first semester of 2007. The outcome of the workshop could provide a basis for a publication about classification of habitats on continental margins.

### **2. Habitat heterogeneity in relation to regional diversity**

#### **a) Purpose**

The aim of this theme is to assess the effects of habitat heterogeneities on the biodiversity of benthic communities at several spatial scales. A set of habitats of interested or “hotspots” on continental margins has been listed; it includes: cold seeps, canyons and fans, oxygen minimum zones, deep corals, slides, wood and whale falls, small scale heterogeneities (mainly biogenic: mudballs, burrows) A leader as well as interested participants have been identified for each of those hotspots. A list of questions, common for all hotspots, has been drawn up.

## b) Questions

### Patterns

- Are hotspots more or less species rich than surrounding environments?
- What is the species overlap between hotspots and background assemblages?
- What is the change in community structure along a gradient induced by the hotspot?
- Are there transition systems that have higher diversity than pure systems?
- Are there differences at higher taxonomic levels between hotspots and background margin?
- What is the degree of endemism related to hotspots versus geographic location?
- Are there basin-scale patterns within hotspots habitats?
- Do similar habitats in different basins have similar patterns of biodiversity?
- What contributions do hotspots make to margin biodiversity?

### Processes

- Are there sites of adaptive radiation?
- How does the hotspot modify the physical and chemical environment on margins (hotspot as ecosystem engineers)?
- What is the dynamic of hotspot communities relative to the margin fauna (e.g. growth rates, biomass and production)?
- Is there an environmental proxy for the hotspot?

## c) Contributions

### Cold Seeps

- Who - **Lisa Levin (leader)**, Craig Smith, Myriam Sibuet, Bob Carney, Marina da Cunha, Javier Sellanes, Ann Vanreusel, Karine Olu, Hiroshi Kitazato
- Where - San Clemente, Equatorial African Margin (meio, macrofauna), Pacific NW (ER/ Hydrate Ridge) (macrofauna), Campeche Basin, Haakon Mosby (meiofauna), Chile margin? (macro, meiofauna), New Zealand?
- Data gap: Gulf of Mexico, comparison of seep vs margin not easy

### Canyons (and fans)

- Who – **Thomas Schlacher (leader)**, Craig Smith, Marina da Cunha, Andy Gooday, Joan Cartes, Gilbert Rowe, Antonio Dell'Anno, David Billett, Elva Escobar, Vetter
- Where - Southern California, Portuguese margin, Mediterranean Sea (Var canyon, Lacaze-Duthiers and Cap Cruces Canyons), Gulf of Mexico (Mississippi Canyon, Campeche Canyon, De Soto Canyon, Aliminos), Hawaiian Canyons, Tasmania and W. Australia, NZ Kaikouri.

### OMZ

- Who- **Javier Sellanes (leader)**, Lisa Levin, Andy Gooday, Baban Ingole, Craig Smith, Hiroshi Kitazato, Gordon Paterson, Elva Escobar
- Where - Mazatlan margin, off Goa (meio and Macrofauna), Central and North Chile margin, Oman, Pakistan, Peru margin, Southern California basins, CA/OR margin

### Deep Corals

- Who - **Karine Olu (leader)**, Debora Pires, Anthony Grehan, Marina da Cunha, Tina Molodotsova, Ann Vanreusel, Erwan Le Guilloux and contact: Alex Rogers, Amy Baco, Andre Freiwald
- Where - Brazil?, Angola margin, NE Atlantic, West of Shetland , Gulf of Cadiz, Mediterranean Sea
- Collaboration – Possible interaction with CenSeam (Seamounts)

### Slides (slumps, turbidity currents, mass wasting)



- Who – **Andy Gooday (Leader)**, Gilbert Rowe, Elva Escobar, Antonio Dell’Anno
- Where - Gulf of Mexico, Monterey Canyon, US East Coast and Africa, Mediterranean Sea

### **Wood and whale falls**

- Who - **Craig Smith (leader)**, Bertrand Richer des Forges, Sarah Samadi, Philippe Bouchet, Hiroshi Kitazato
- Where - Sagami Bay, California margin, Philippines

### **Small Scale heterogeneities**

- Who – **Michael Klages (leader)**, Erwan Le Guilloux, David Thistle, Alan Hughes, Gordon Paterson, Craig Smith, Marina da Cunha, Thomas Schlacher, Myriam Sibuet, Lisa Levin
- Where – Hausgarten, Hebble, San Diego Trough

#### **d) Approach to Answering Questions**

There is a need for each habitat-group to identify what can effectively be compared and, according to data available, which questions can effectively be addressed. This first step can be achieved via email.

One or several workshops have to be planned, most probably in 2008.

### **3. Anthropogenic impacts on margins**

#### **a) Purpose**

The exploitation of mineral and living resources increases on continental margins. The purpose of this theme is to identify the types of anthropogenic impacts on continental margins, to map their occurrence and intensities and finally to provide an assessment of their impacts, including their unique effects on continental margins.

#### **b) Who**

**Baban Ingole (leader)**, Paulo Costa, Anthony Grehan, David Thistle, Bhavani Narayanaswamy, Gilbert Rowe, Alan Hughes, Bob Carney, Craig Smith, Erwan Le Guilloux, Elva Escobar, Lenaick Menot

#### **c) Approach to Answering Questions**

A provisional list of potentially deleterious human intrusions on continental margins includes: trawling, hydrocarbon extraction (added substrate, impact of artificial drilling mud, oil spill), CO<sub>2</sub> sequestration, heavy metal loading, waste disposal/heavy metal loading, nutrient enrichment, sediment and pollutant supply to canyons, global warming.

Due to time constraints, the discussion ended prematurely. Only the characterization of trawling intensity and effects was discussed. It was suggested to look for data sets for fisheries, endangered species, map trawling intensity on the slope of different regions (Javier Sellanes can obtain Chile margin trawling maps) and map Marine Protected Areas in deep water on margins.

## V. Workshop conclusions

The workshop allowed i) defining four themes that should be addressed by COMARGE in the future, ii) planning actions for years 2006-2008 in order to progress on each of these themes and iii) identifying leaders for each action.

Themes	Actions	Leaders
A: Large scale biodiversity patterns and processes	1) To identify suitable data, taxonomically and geographically 2) To organize a workshop on Large-Scale Margin Patterns, preliminary analysis of actual datasets	Dr Gary Poore Dr Andy Gooday Dr Ann Vanreusel
B: Landscape-scale classification, habitat mapping	To organize a workshop on this theme in early 2007	Dr Alan Hughes Erwan Le Guilloux Dr Anthony Grehan
C: Habitat heterogeneity in relation to regional diversity	1) For each habitat, identify data available for comparisons 2) To plan analysis workshop(s) for 2008	Dr Lisa Levin, Dr Thomas Schlacher, Dr Karine Olu, Dr Javier Sellanes, Dr Andy Gooday, Dr Craig Smith, Dr Michael Klages
D: Anthropogenic impacts on margins	1) To look for information/data available on impact intensities and effects 2) To map impact intensities for selected kind of human activities 3) To map Marine Protected Areas on continental margins	Dr Baban Ingole

All participants are welcomed to provide basic information regarding their current research activities relevant to continental margins: papers, cruises, proposals, to be shared via the COMARGE website.

## Presentations

Myriam Sibuet & Robert Carney - *Presentation of COMARGE*

Lénaïck Menot - *COMARGE data management plans*

Philippe Bouchet - *Inventorying the marine biodiversity of the world*

Andy Gooday - *Foraminifera on continental margins*

Ann Vanreusel - *Meiofauna on continental margins*

Mickael Klages - *Benthic species distribution at a 1000 to 5000 m water depth transect in the Fram Strait - spatio-temporal patterns at a sensitive gateway between the North Atlantic and Arctic Ocean under Global Change*

Bhavani E Narayanaswamy & Alan Hughes - *The temperate North East Atlantic*

Antonio Dell'Anno - *Biodiversity patterns in the deep Mediterranean Sea*

Myriam Sibuet - *The African Equatorial margin: Contribution of the Biozaire project to the CoML/COMARGE project*

Helena Passeri Lavrado - *Brazilian continental margin research: a recent history*

Paulo Sumida – *SE-S Brazilian margin*

Debora Pires - *Corals from the Brazilian Continental Margin*

Paulo Costa - *Community structure of demersal fishes from eastern Brazilian continental slope*

Elva Escobar - *The Gulf of Mexico*

Craig Smith - *Continental margins off southern California*

Javier Sellanes - *The Chilean margin: overview of past and present benthic studies, and perspectives*

Bertrand Richer de Forges - *20 years of exploration of the tropical margins in South Pacific*

Gary Poore - *Exploring and characterizing marine benthic ecosystems of the South West region of Australia*

Philippe Bouchet - *Exploration of the Philippines Deep Sea*

Tina Molodtsova - *Russian research on the North-West Pacific Ocean margins*

Lisa Levin - *The Arabian Sea*

Baban Ingole - *Benthic communities of the Continental Margins and its vulnerability to the increased anthropogenic activities: Indian Ocean*

## Participants

Name	Institute - Address	Country	Email
Bouchet, Philippe	Museum National d'Histoire Naturelle, 55 rue Buffon, 75005 Paris	France	<a href="mailto:pbouchet@mnhn.fr">pbouchet@mnhn.fr</a>
Carney, Robert	Louisiana State University, Baton Rouge	USA	<a href="mailto:rcarne1@lsu.edu">rcarne1@lsu.edu</a>
Cardenas, Paco	University of Bergen - Institute of Biology, Høyteknologisenteret, Thormøhlensgate, 55 - 5020 Bergen	Norway	<a href="mailto:cardenas_paco@yahoo.fr">cardenas_paco@yahoo.fr</a>
Cartes, Joan	Centre Mediterrani d'Investigacions Marines i ambientals, CSIC, Pg. Maritim de la Barceloneta 37-49, E-08003, Barcelona	Spain	<a href="mailto:icartes@icm.csic.es">icartes@icm.csic.es</a>
Chan, Tin-Yam	Institute of Marine Biology, National Taiwan Ocean University, Keelung	Taiwan	<a href="mailto:tychan@mail.ntou.edu.tw">tychan@mail.ntou.edu.tw</a>
Costa, Paulo	Laboratório de Dinâmica de Populações, Universidade do Rio de Janeiro (UNI-RIO), Av. Pasteur, 458. Urca - Rio de Janeiro- 22290-240	Brazil	<a href="mailto:pauloascosta@uol.com.br">pauloascosta@uol.com.br</a>
da Cunha, Maria	Departamento de Biologia, Universidade de Aveiro, P-3810-193 Aveiro	Portugal	<a href="mailto:mcunha@bio.ua.pt">mcunha@bio.ua.pt</a>
Dell'Anno, Antonio	Department of Marine Science, Polytechnic University of Marche, Via Breccia Bianche, 60131 Ancona	Italy	<a href="mailto:a.dellanno@univpm.it">a.dellanno@univpm.it</a>
Desbruyeres, Daniel	DEEP/LEP, Ifremer, Brest, Technopole Brest-Iroise, 29280 Plouzane	France	<a href="mailto:Daniel.Desbruyeres@ifremer.fr">Daniel.Desbruyeres@ifremer.fr</a>
Escobar, Elva	Unidad Academica en Sistemas Oceanograficos y Costeros, Instituto de Ciencias del Mar y Limnologia, UNAM, A.P. 70-305, Mexico D.F. 04510	Mexico	<a href="mailto:escobri@mar.icmyl.unam.mx">escobri@mar.icmyl.unam.mx</a>

Name	Institute - Address	Country	Email
Fisher, Charles	The Pennsylvania State University University Park, PA 16802	USA	<a href="mailto:cfisher@psu.edu">cfisher@psu.edu</a>
Gooday, Andrew	National Oceanography Centre, Empress Dock, European Way, Southampton, SO14 3ZH	UK	<a href="mailto:ang@noc.soton.ac.uk">ang@noc.soton.ac.uk</a>
Grehan, Anthony	Zoology Department, Martin Ryan Science Institute, University College, Galway	Ireland	<a href="mailto:anthony.grehan@nuigalway.ie">anthony.grehan@nuigalway.ie</a>
Hughes, Alan	National Oceanography Centre, Empress Dock, European Way, Southampton, SO14 3ZH	UK	<a href="mailto:iyh@noc.soton.ac.uk">iyh@noc.soton.ac.uk</a>
Ingole, Baban	National Institute of Oceanography, Dona Paula - 403 004, Goa	India	<a href="mailto:baban@darya.nio.org">baban@darya.nio.org</a>
Kitazato, Hiroshi	Institute for Research on Earth Evolution, Japan Agency for Marine-Earth Science and Technology, 2-15 Natsushimacho, Yokosuka 237-0061	Japan	<a href="mailto:kitazato@jamstec.go.jp">kitazato@jamstec.go.jp</a>
Klages, Michael	Alfred-Wegener-Institut fuer Polar-und Meeresforschung, Postfach 12 01 61, 27515 Bremerhaven	Germany	<a href="mailto:mklages@awi-bremerhaven.de">mklages@awi-bremerhaven.de</a>
Lavrado, Helena Passeri	Marine Biology Department, UFRJ - Federal University of Rio de Janeiro	Brazil	<a href="mailto:hpasseri@biologia.ufrj.br">hpasseri@biologia.ufrj.br</a>
Le Guilloux, Erwan	DEEP/LEP, Ifremer, Brest, Technopole Brest-Iroise, 29280 Plouzane	France	<a href="mailto:Erwan.Le.Guilloux@ifremer.fr">Erwan.Le.Guilloux@ifremer.fr</a>
Levin, Lisa	Scripps Institution of Oceanography, La Jolla, CA	USA	<a href="mailto:llevin@ucsd.edu">llevin@ucsd.edu</a>
Menot, Lenaick	Institut Océanographique, Paris & Ifremer, Brest	France	<a href="mailto:lenaick.menot@ifremer.fr">lenaick.menot@ifremer.fr</a>
Molodtsova, Tina	P.P.Shirshov Institute of Oceanology RAS, 36 Nakhimovsky prospect, Moscow 117218	Russia	<a href="mailto:tina@ocean.ru">tina@ocean.ru</a>

Name	Institute - Address	Country	Email
Narayanaswamy, Bhavani	Scottish Association for Marine Science, Dunstaffnage Marine Laboratory, Oban, Argyll PA37 1QA	UK	<a href="mailto:Bhavani.Narayanaswamy@sams.ac.uk">Bhavani.Narayanaswamy@sams.ac.uk</a>
Olu, Karine	DEEP/LEP, Ifremer, Brest, Technopole Brest-Iroise, 29280 Plouzane	France	<a href="mailto:Karine.olu@ifremer.fr">Karine.olu@ifremer.fr</a>
Paterson, Gordon	Department of Zoology, The Natural History Museum, London SW7 5BD	UK	<a href="mailto:gjip@nhm.ac.uk">gjip@nhm.ac.uk</a>
Pires, Debora	Museu Nacional/Universidade Federal do Rio de Janeiro, Departamento de Invertebrados, Quinta da Boa Vista, São Cristóvão, 20940-040 - Rio de Janeiro	Brazil	<a href="mailto:dopires@openlink.com.br">dopires@openlink.com.br</a>
Poore, Gary	Museum Victoria, GPO Box 666E, Melbourne	Australia	<a href="mailto:gpoore@museum.vic.gov.au">gpoore@museum.vic.gov.au</a>
Quiroga, Eduardo	Centro de Investigación en Ecosistemas de la Patagonia	Chile	<a href="mailto:eduardo.quiroga@ciep.cl">eduardo.quiroga@ciep.cl</a>
Richer De Forges, Bertrand	Institut de Recherche pour le Développement, B.P. A5, 98848 Noumea Cedex - Nouvelle Calédonie	France	<a href="mailto:bertrand.richer-de-forges@noumea.ird.nc">bertrand.richer-de-forges@noumea.ird.nc</a>
Sibuet, Myriam	Institut Océanographique, Paris	France	<a href="mailto:Myriam.Sibuet@wanadoo.fr">Myriam.Sibuet@wanadoo.fr</a>
Samadi, Sarah	Museum National d'Histoire Naturelle, 55 rue Buffon, 75005 Paris	France	<a href="mailto:sarah@mnhn.fr">sarah@mnhn.fr</a>
Schlacher, Thomas	University of the Sunshine Coast, Queensland	Australia	<a href="mailto:tschlach@usc.edu.au">tschlach@usc.edu.au</a>
Sellanes, Javier	Universidad Católica del Norte, Facultad de Ciencias del Mar, Larrondo 1281, Coquimbo	Chile	<a href="mailto:jsellane@udec.cl">jsellane@udec.cl</a>
Rowe, Gilbert	TAMUG, Galveston	USA	<a href="mailto:roweg@tamug.edu">roweg@tamug.edu</a>
Smith, Craig	Department of Oceanography, University of Hawaii at Manoa, 1000 Pope Road, Honolulu, HI 96822	USA	<a href="mailto:craigsmi@hawaii.edu">craigsmi@hawaii.edu</a>

Name	Institute - Address	Country	Email
Sumida, Paulo	Laboratorio de Dinamica Bentina, Instituto Oceanografico / Universidade de Sao Paulo, Praca do Oceanografico, 191CEP 05508-120 Sao Paulo-SP	Brazil	<a href="mailto:psumida@io.usp.br">psumida@io.usp.br</a>
Thistle, David	Department of Oceanography, Florida State University, Tallahassee, FL 32306-4320	USA	<a href="mailto:thistle@ocean.fsu.edu">thistle@ocean.fsu.edu</a>
Vanreusel, Ann	Marine Biology Section, Ghent University, Ledeganckstraat 35, B-9000 Ghent	Belgium	<a href="mailto:ann.vanreusel@rug.ac.be">ann.vanreusel@rug.ac.be</a>