



Research Networking Programmes

Science Meeting – Scientific Report

The scientific report (WORD or PDF file - maximum of seven A4 pages) should be submitted online within two months of the event. It will be published on the ESF website.

Proposal Title: *2nd Deep-Water Circulation Congress: The Contourite Log-book*

Application Reference N°: *5473*

1) Summary (up to one page)

We are proud to announce that we were successful in continuing the efforts that have been made by the organisers of the first Deep-Water Circulation Congress: Processes and Products, organised in Baiona, Spain (16-18 June, 2010). After this first period of 4 years, a major milestone in contourite research was passed with the execution of IODP Expedition 339, drilling the Cádiz Contourite Depositional System. Also, this first congress has laid the base for a number of topical publications, renewed collaborations, international partnerships and projects of which the results were presented during this 2nd Deep-Water Circulation Congress in Ghent.

Moreover, during this year, when the Marine Geology journal will celebrate its 50th anniversary, we can celebrate as well the first seminal paper on deep-sea currents, published by Heezen and Hollister in the first volume (2nd issue) of Marine Geology. Since then, a tremendous effort has been realized by numerous marine scientists to be able to better understand the story locked within the contouritic sequences. We are proud to announce that a rather large selection of the papers presented during this congress will be further elaborated for a special “2DWC” issue of Marine Geology.

During the 3 days of the conference, 6 exciting keynote lectures were given, 35 oral and 28 poster presentations, many of which were presented by one of the 20 PhD students and early career scientists, on the total of 95 official conference registrations (of which 6 sponsored by ESF). These presentations were the collaborative effort of 266 international scientists. I am delighted to announce that the organizing committee was able to provide travel grants to a significant number of international participants and that 17 students from 4 geology, or geology-related, master courses in Belgium (Ghent, Leuven, Liège and Brussels) were invited to attend this conference, hoping it could add inspiration to their academic formation.

2) Description of the scientific content of and discussions at the event (up to four pages)



Group photograph of the 2DWC participants

The 2DWC conference was financed, among others, by the FWO, the Research Foundation Flanders, which carries the slogan “opening new horizons”. That is literally and figuratively what the intentions were of this conference. This is why the 2nd Deep-Water Circulation Congress aimed to focus on the “Contourite Log-book”, with the intention to increase our ability to unveil and extract the temporal and lateral variability of palaeoceanographic processes. Through examples and case studies from all corners of the world, and investigating deep into the seafloor, geophysical, geochemical, paleontological and sedimentological data has revealed more insight in the past, present and hopefully future of the deep-water circulation of our planet. Based upon the submitted abstracts, we were able to focus on 4 topical sessions, all preceded by a keynote introduction, and one general introduction to the conference.

The introductory keynote was given – by remote presentation- by Dr. Michele Rebesco (OGS, Italy), entitled “*Contourites and associated sediments controlled by deep-water circulation processes: state of the art and future considerations*”. Here, the present-day state of the art of the topic was given, alongside the currently used diagnostic criteria and classification of contourite system, as well as criticism and points that need to be developed and addressed during the conference. The major “missing link” still remains the identification of responsible hydrographic processes and to extract their variability within the geological record.

Session 1: “*The influence of contourite sedimentation on slope (in)stability*”. This session was co-sponsored by the IGCP-585 E-MARSHAL project. Since contourite deposits may be found for a large part on high latitude margin, especially in the Northern Atlantic Ocean, they play a major role in the stability of continental margins. Especially on high latitudes their lateral and temporal variability may provoke mass movements.



This was highlighted in detail by the keynote provided by – also by remote presentation - Dr. David J.W. Piper (Geological Survey of Canada, Canada): “*Process, time and architecture: lessons from shallow contourites and their failures in the path of the Labrador Current*”. This was also addressed during the following presentation. However, also a lot of attention was paid to the mixing of alongslope and downslope systems. This may test the limits of the diagnostic criteria and is of high importance for a better assessment of the role of contourite deposits in petroleum systems. This also calls for looking back at old – traditional – onshore and offshore sections to reinterpret these classic hydrocarbon system examples with the present-day knowledge. However, on sediment core level, it still remains difficult to distinguish fine-grained turbidite from (hybrid) contourite deposits. One possible way forward may lie in the benthic micropalaeontological assemblages, as indicated during the presentation of M. Rogerson.

Session 2: “*The coupling between oceanographic processes and contourite sedimentation*” constitutes one of the most challenging issues for future research; to better tie present-day physical oceanographic processes to contourite deposits, with the aim to better understand past oceanic circulation. Topics were brought forward such as physical oceanography, palaeoceanography on cores and seismics, as well as seismic oceanography. They were introduced by the keynote of Prof. Dr. Anna Wahlin (University of Gothenburg, Sweden): “*The role of physical oceanographic processes in contourite sedimentation and how we can work together*”. This collaboration is indeed needed since both from within oceanographic as geological questions, uncertainties remains. From within physical oceanography, there are still some mathematical unknowns to explain present-day processes. The link with geology may be provided through better modelling and comparing this theoretical base with short- to long-term field observation data. However, this still is costly and requires thorough collaboration. However, the most essential unknown is to find out what effectively gets recorded in the “log-book”? Are these peak, average or extreme current conditions? In case these may be averages, over which time frame do they operate? This will need to be addressed in the future. This may be partially addressed in the newly developing domain of seismic oceanography, although there is controversy in the type of information that is stored within the seismic water column data.

Other points of discussion involved the shift of large-scale circulation processes to small-scale intensification due to the influence of topographical obstacles along the current pathway (shadow features) or by underlying palaeotopography. Additionally, on a geochemical level, the strength of Nd isotopes for bottom water mass fingerprinting is confirmed and its use is most stimulated, however better collaboration with sedimentologists is needed to better constrain the depositional environments.



The topics addressed in the previous session partly overlap with **Session 3**: “*Contourite processes and deep-water ecosystems*”, since the challenges are identical and – moreover - since contourite processes play a vital role in the initiation, maintenance and decay of deep-water ecosystems. Mostly, but not uniquely, this is related to cold-water coral (CWC) reefs and mounds, where both systems seem to influence each other. This session is co-sponsored by FWO-ICA COCARDE II and ESF COCARDE-ERN. The keynote presentation by Prof. Dr. Dierk Hebbeln (University of Bremen, MARUM, Germany) “*Good neighbours in vigorous currents: contourites and cold-water corals*” documented the influence of climate and ocean current variability on the life cycle of cold-water coral reefs along the Northeastern Atlantic margin and the Western Mediterranean Sea.

Besides this, due to the close association of CWC reefs and contourite drifts, CWC geochemistry may be used to provide high-resolution records of water mass changes (which is less easy to extract from sedimentary series). Vice versa, since CWC growth mostly is discontinuous, off-mound contourite deposits may be used to assess CWC growth stages and to document the time series that are absent within the CWC mound.

The final **Session 4**: “*Advances in diagnostic criteria of contourite systems*” focused on the general advances and methods in (seismic) facies characterization of contourite systems, including shallow-water and lake contourites, as well as their economic relevance within hydrocarbon systems. This session started with the keynote presentation of Prof. Dr. Michel Hoffert (Université Louis Pasteur, France): “*Manganese nodules: genesis, distribution and deep-water circulation*”, documenting one of the least accessible, but most intriguing contourite systems. Mn nodules are found in ultra-deep basins and their formation mechanisms are still under debate. However, it is clear that they could not grow without the action of bottom currents. A better knowledge on the detailed circulation pattern of currents on the deep sea floor, may result in a better predictability of the occurrence of these Mn nodule fields. Also, they may help to better assess the possible role of currents in sediment plume distribution during potential exploration activities.

Other topics that dominated the discussion involved the (classic) role of sediment waves as diagnostic feature for bottom currents. They can occur both in alongslope and downslope settings, under a wide variety of sizes and angles with respect to the current. Moreover, they are still susceptible to be interpreted as features of slope stability. More effort needs to be invested in a better characterization of these features and to better document their temporal and spatial evolution with respect to the prevailing oceanographic settings. Finally, also new shallow water contourite systems were presented with the question if we may simply compare them with deep-water systems and upscale all characteristics and processes?

Prior to the closure discussion, a final keynote was presented by Dorrik A.V. Stow (Heriot-Watt University, United Kingdom): “*Contourites in the Gulf of Cádiz: new findings from IODP Expedition 339*”. The importance of IODP339 is essential for the new advances in contourite research. First of all, this is the first time 5 km of sediment were drilled through possibly the best documented contourite depositional system. This will enable to better identify diagnostic criteria that include a better grasp of temporal and spatial variability, framed into a better elaborated sequence stratigraphic model. Secondly, the recovery of several 100 m of contourite sands may trigger more interest from the hydrocarbon industry, allowing to better assess their petroleum potential. It was experienced by all participants that better contacts and dialogue with the petroleum industry should be established. Despite confidentiality, the community would profit enormously from better case studies from actual producing contourite fields, again, for the sake of better developing diagnostic characteristics. In this point of view, also attention should be paid to better document the processes of sediment supply – and their sources in contourite systems.

The closure discussion highlighted all of the above issues, but also brought forward a call for the study of fossil contourites. We are now able to identify contourite systems in the present-day marine realm, but it still remains problematic to identify them in old marine sequences outcropping on land, where the diagnostic tools and research methods are limited and more complex. Basically, starting from the current diagnostic tools, a set of characteristics should be developed to identify the best criteria to study these fossil contourites, and to predict their occurrences. Also, a list should be made (atlas?) where the good outcrops are located for testing these criteria.

3) Assessment of the results and impact of the event on the future directions of the field (up to two pages)

The impact of this conference is already very clearly addressed in the previous section. During the discussion, several points were addressed in order to foster advances – or breakthroughs – in contourite research. We hope that this conference will have brought scientists and new partners together, resulting in to new research proposals.

However, a more clear path to continue is the need for more dialogue and discussion on specific topics. In order to better underline the current advances and state-of-the-art, a special issue of the journal *Marine Geology* will be organised, where the extended abstracts will be further elaborated to full papers. Emphasis will be put on multidisciplinary and to increase our ability to unveil and extract the temporal and lateral variability of palaeoceanographic processes. One of the foremost conclusions of the congress was to better involve physical oceanographers to otherwise “standard” contourite studies. The proposed papers for this special issue address these issues, as well as other focus points. Initial screening of the proposed abstracts and content happened prior and during the conference, after which the authors were asked to confirm their interest. We are proud to be able to present 31 titles of possible papers (introductory paper is not included in this number). 27 of these were submitted as an extended abstract to the congress, whereas 2 others proposed a different title and content than presented during the congress. Through this multidisciplinary work, we aspire to address the most important pending issues and set a benchmark for coming generations of studies on contourite depositional systems. This is also the rationale behind the selection of the guest editors, who all represent a different angle of insight into this topic; David Van Rooij (Geophysics), Calvin Campbell (Slope stability), Andres Rueggeberg (Geochemistry) and Anna Wahlin (Physical oceanography).

During the preparation of the congress, and discussed during the closing remarks, the objectives of upcoming meetings were discussed. The key guidelines involved an increase visibility and attendance of physical oceanographers and to attract more industry-related research. Also, we should push to present more 3D seismic data, which will give more insight into seismic geomorphology, thus palaeotopographic reconstructions. Finally, the community is fully aware this is mostly a European-dominated scientific topic and that more scientists should be involved (or attracted) from Africa, Asia (India, Japan) and the Americas. This will also determine to location of these key meetings:

(1) AGU Fall Meeting, 15-19 December 2014, San Francisco, USA

During this meeting, a poster session will be organized entitled “*The palaeoceanographic value of contourite archives*”, under the Palaeoceanography & Palaeoclimatology theme, convened by D. Van Rooij (UGent, B) & B. Romans (Virginia Tech, USA).

(2) XIX INQUA Congress, 27 July – 2 August 2015, Nagoya, Japan

The session “*Revealing palaeoceanographic variability from Contourite Depositional Systems: state-of-the-art and future challenges*” will focus on Quaternary changes, mostly extracted from core or drilling records. The abstract submission was opened from

Early September until 20 December 2014. The session will be convened by D. Van Rooij (UGent, Belgium) & F.J. Jimenez Espejo (JAMSTEC, Japan).

(3) 35th IGC, 27 August– 2 September 2016, Cape Town, South Africa

The International Geological Congress is probably the largest convention of Earth sciences in the world, and is organized every 4 years. In order to guarantee the best possible visibility, both a session as a workshop will be proposed. The session will be held rather broad, dealing with contourite processes and products, whereas the workshop will focus on diagnostic criteria, as a 1-day practical exercise, introduced by a large number of specialists.

(4) 3rd DWC, Spring 2017, Wuhan, China

During the closure session, also the future of this conference series was discussed. Due to the large number of ongoing studies and the very high momentum, it was decided to organize the DWC meetings every 3 years, which will also enable an alternative time frame, avoiding collision with other regular conferences such as IAS, IGC, ...

The next meeting will be held in Wuhan, China in the Spring of 2017, by Prof. Dr. Xinong Xie of the China University of Geosciences. Also the location of the 4th DWC was decided to be in Buenos Aires, Argentina in 2020, to be organised by Dr. Roberto Violante of the Argentina Hydrographic Survey.

For these meetings, the organizing committee should foster to involve sufficient physical oceanography, but also to invite experts in turbidite sedimentology, to better discuss the mixing of both systems. Also more 3D seismics and interpretation of backscatter should be involved. However, in order to really make significant advances, the presentations should be forced to focus on understanding a specific process, or modeling, ground truthing, direct observations... instead of "just presenting a nice set of new seismic profiles". Although the present-day concepts was experienced as very good, the next meeting should be held over a longer period (3-4 days) in order to have better discussions, for example to have a longer and more intense poster presentation workshop.

- 4) **Annexes 4a) and 4b): Programme of the meeting and full list of speakers and participants**

Annex 4a: Programme of the meeting

	Day 0	Day 1	Day 2	Day 3	
	9 September	10 September	11 September	12 September	
08h00		Registration & Poster setup			08h30
09h00		Opening session	Keynote 3: A. Wahlin	Keynote 5: M. Hoffert	09h30
10h00		Keynote 1: M. Rebesco	Session 2: (Palae)oceanography	Session 4: Diagnostic features	
11h00		Coffee	Coffee + posters	Coffee + posters	11h30
		Poster presentations	Session 2: (Palae)oceanography	Session 4: Diagnostic features	12h30
		Lunch	Lunch	Lunch	
14h00		Keynote 2: D.J.W. Piper	Keynote 4: D. Hebbeln	Keynote 6: D.A.V. Stow	
15h00		Session 1: Slope instability	Session 3: Deep-water ecosystems	Closure session	
16h00		Coffee + posters	Coffee + posters		16h30
		Session 1: Slope instability	Session 4: Diagnostic features		17h30
18h00	Ice Breaker City Hall				
19h00		Conference Dinner Cruise River Lys	Social Event Filliers Distillery		
21h00					
23h00					

1800-1900: Ice Breaker reception at the Ghent City Hall

10 September 2014 (Day 1)

0800-0900 Registration and poster setup

0900-1000 Official opening session

- Prof. Dr. Freddy Mortier, Deputy Vice-Chancellor Ghent University
- Prof. Dr. Herwig Dejonghe, Dean of the Faculty of Sciences, Ghent University
- Prof. Dr. Jan Mees, Director VLIZ-Flanders Marine Institute
- Dr. Lucien Halleux, G-Tec N.V.
- Dr. Patrick Roose, Royal Belgian Institute of Natural Sciences, O.D. Nature
- Prof. Dr. David Van Rooij, 2DWC Chairman, Ghent University

1000-1100 Keynote presentation Michele Rebesco (OGS, Italy, through video conferencing): *“Contourites and associated sediments controlled by deep-water circulation processes: state of the art and future considerations”*

1100-1130 Coffee break

1130-1230 Short Oral Poster presentations

1230-1400 Lunch break

1400-1500 Keynote presentation David J.W. Piper (Geological Survey of Canada, Canada, through video conferencing): *“Process, time and architecture: lessons from shallow contourites and their failures in the path of the Labrador Current”*

1500-1600 **Session 1: *The influence of contourite sedimentation on slope (in)stability (IGCP 585)***

Session chair: Calvin Campbell (Geological Survey of Canada)

1500-1515: Xinong Xie, Hui Chen, Yuhong Xie, Zhenfeng Wang, Yongchao Lu and Jianye Ren: *Spatial distribution of deepwater depositional systems and relationship with bottom currents on the northwestern lower slope of the Northwest Sub-Basin, South China Sea*

1515-1530: Elda Miramontes, Antonio Cattaneo, Gwenael Jouet, Sebastien Garziglia, Estelle Thereau, Arnaud Gaillot, Angelique Roubi and Mickael Rovere: *The Pianosa Contourite Depositional System (Corsica Trough, North Tyrrhenian Sea): stratigraphic evolution and possible role in slope instability*

1530-1545: Roberto A. Violante, F. Javier Hernández-Molina, I. Pastor Costa and Tilmann Schwenk: *Different styles in configuration of the contouritic drifts in the northern sector of the Argentine Continental Margin: implications in slope stability and geohazard*

1545-1600: Adam Creaser and F. Javier Hernández-Molina: *Along- and down-slope process interactions in proximal channel-levee systems: Implications for hydrocarbon exploration*

1600-1630 Coffee break + poster presentations Session 1

1) Gemma Ercilla, Carmen Juan, Belén Alonso, Ferran Estrada, David Casas, Marga García, F. Javier Hernández-Molina, J. Tomás Vázquez, Estefanía Llave, Desirée Palomino, Marcel-lí Farran, Christian Gorini, Elia d’Acremont, Bouchta El Moumni Abdellah Ammar and the CONTOURIBER and MONTERA Teams: *Water mass footprints in uneven turbidite system development in the Alboran Sea*

- 2) Marga García, Belén Alonso, J. Tomás Vázquez, Gemma Ercilla, Desirée Palomino, Ferran Estrada, M^aCarmen Fernández Puga, Nieves López Gonzalez and Cristina Roque: *Morphological characterization of contourite and mass-wasting recent processes at the Guadalquivir Bank Margin uplift, Gulf of Cadiz*
- 3) Kainan Mao, Stanislas Delivet, David Van Rooij and Xinong Xie: *Bottom currents influenced deep-water canyons in the northern of Baiyun Sag slope, South China Sea*
- 4) Eleonora Martorelli, Alessandro Bosman, Daniele Casalbore, Francesco L. Chiocci, Federico Falcini, Pierpaolo Falco, Giannetta Fusco, Eleonora Morelli and Martina Pierdomenico: *High-resolution seismic stratigraphy, multibeam bathymetry of the Capo Vaticano region (Tyrrhenian Sea) coupled with oceanographic data: interplay between alongslope bottom currents and downslope processes*

1630-1715 **Session 1: *The influence of contourite sedimentation on slope (in)stability (IGCP 585)***

Session chair: Calvin Campbell (Geological Survey of Canada)

1630-1645: Katrien Heirman, Tove Nielsen and Antoon Kuijpers: *Down, across and along: sediment deposition and erosion on the glaciated southeast Greenland margin*

1645-1700: Giacomo Dalla Valle, Fabio Trincardi and Fabiano Gamberi: *Slope instability along a contourite-dominated margin in the Mediterranean Sea*

1700-1715: Mike Rogerson and Stuart Fielding: *Micropalaeontological Discrimination of Contourite and Turbidite Depositional Systems*

1800-2300 Conference dinner cruise

11 September 2014 (Day 2)

0830-0930 Keynote presentation Anna Wahlin (University of Gothenburg, Sweden):
“The role of physical oceanographic processes in contourite sedimentation and how we can work together”

0930-1100 **Session 2: *Coupling between oceanographic processes and contourite sedimentation***

Session chair: Andres Rüggeberg (Ghent University – University of Fribourg)

- 0930-0945: Pere Puig, Albert Palanques, Jacobo Martín, Marta Ribó and Jorge Guillén: *Benthic storms in the north-western Mediterranean continental rise caused by deep dense water formation*
- 0945-1000: Antje H.L. Voelker, Francisco J. Jimenez-Espejo, Andre Bahr, Gary D. Acton, Andreia Rebotim, Emilia Salgueiro, Ursula Röhl and Carlota Escutia: *Mediterranean Outflow Water changes in the Gulf of Cadiz during the Mid-Pleistocene Transition – The role of insolation*
- 1000-1015: Antoon Kuijpers and Tove Nielsen: *High-energy contourite settings related to North Atlantic Deep Water flow*
- 1015-1030: Till J.J. Hanebuth, Antonia L. Hofmann, Antje Lenhart, Ludvig A. Löwemark, Tilmann Schwenk and Wenyan Zhang: *Short-term sediment dynamics on a contourite body (off NW Iberia), Part I: Rapid changes of bottom-flow intensity during the past 50ka deduced from a sediment-core transect*
- 1030-1045: Wenyan Zhang and Till J.J. Hanebuth: *Short-term sediment dynamics on a contourite body (off NW Iberia), Part II: The impact of hydrographic fronts as deduced from numerical modelling*
- 1045-1100: Gabriele Uenzelmann-Neben and Antje Müller-Michaelis: *High-resolution structure of the upper Western Boundary Undercurrent core shaping the Eirik Drift*
- 1100-1130 Coffee break + poster presentations Session 2
- 5) Carmen Juan, Gemma Ercilla, F. Javier Hernández-Molina, Ferran Estrada, Belén Alonso, David Casas, Marga García, Marcel-Í Farran, Estefanía Llave, Desirée Palomino, J. Tomás Vázquez, Teresa Medialdea, Christian Gorini, Elia D’Acremont, Bouchta El Moumni, Abdellah Ammar and the CONTOURIBER, MONTERA and MOWER Teams: *(Paleo)circulation models in the Alboran seas during the Pliocene and Quaternary*
- 6) Belén Alonso, Nieves López-González, Graziela Bozzano, David Casas, Gemma Ercilla, Carmen Juan, Ferran Estrada, Marga Garcia, J. Tomás Vázquez, Isabel Cacho, Desirée Palomino, Elia d’Acremont, Bouchta El Moumni, MONTERA and MOWER Teams: *Djibouti Ville Drift: Sedimentation and record of bottom-current fluctuations during the Pleistocene and Holocene*
- 7) Samuel Toucanne, Gwenael Jouet, Emmanuelle Ducassou, Maria-Angela Bassetti, Bernard Dennielou, Charlie Morelle Angue Minto'o, Marjolaine Lahmi, Nicolas Touyet, Karine Charlier, Gilles Lericolais and Thierry Mulder: *A 130,000-year record of Levantine Intermediate Water flow variability in the Corsica Trough, western Mediterranean Sea*

- 8) F. Javier Hernández-Molina, Dorrik A.V. Stow, Carlos A. Alvarez-Zarikian, Gary Acton, André Bahr, Barbara Balestra, Emmanuelle Ducassou, Roger Flood, José-Abel Flores, Satoshi Furota, Patrick Grunert, David Hodell, Francisco Jimenez-Espejo, Jin Kyoung Kim, Lawrence Krissek, Junichiro Kuroda, Baohua Li, Estefania Llave, Johanna Lofi, Lucas Lourens, Madeline Miller, Futoshi Nanayama, Naohisa Nishida, Carl Richter, Cristina Roque, Hélder Pereira, Maria Fernanda Sanchez Goñi, Francisco J. Sierro, Arun Deo Singh, Craig Sloss, Yasuhiro Takashimizu, Alexandrina Tzanova, Antje Voelker, Trevor Williams and Chuang Xuan: *Onset of Mediterranean Outflow into the North Atlantic*
- 9) F. Javier Hernández-Molina, Estefania Llave, Benedict Preu, Gemma Ercilla, A. Fontan, M. Bruno, Nuno Serra, J.J. Gomis, Rachel Brackenridge, F.J. Sierro, Dorrik A.V. Stow, Marga García, Carmen Juan, Nicolas Sandoval and Alvaro Arnaiz: *Contourite processes associated with the Mediterranean Outflow Water after its exit from the Gibraltar Strait: Global and conceptual implications*
- 10) F. Javier Hernández-Molina, Anna Wåhlin, M. Bruno, Gemma Ercilla, Estefania Llave, Nuno Serra, G. Roson, Pere Puig, Michele Rebesco, David Van Rooij, David Roque, César González-Pola, Francisco Sánchez, Maria Gómez, Benedict Preu, Rachel Brackenridge, Carmen Juan and Dorrik A.V. Stow: *Oceanographic processes and products around the Iberia continental margin: a new multi-disciplinary approach?*
- 11) Estefania Llave, F. Javier Hernández-Molina, Gemma Ercilla, Christina Roque, David Van Rooij, Marga García, Rachel Brackenridge, Carmen Juan, Anxo Mena, Gloria Jané, Dorrik A.V. Stow: *Deep water circulation around the Iberian continental margin: state of art and future implications*
- 12) Dries Van den Eynde, Matthias Baeye, Michael Fettweis, Frederic Francken, Lieven Naudts and Vera Van Lancker: *Sediment plume monitoring in the Clarion-Clipperton Zone*
- 13) Quentin Dubois-Dauphin, Christophe Colin, Hiske Fink, Dierk Hebbeln, David Van Rooij and Norbert Frank: *Nd isotopic composition of present and Holocene water masses from the Gulf of Cadiz and the Alboran Sea*
- 14) Andres Rüggeberg, Sascha Flögel, Jacek Raddatz and Christian Dullo: *Seawater density reconstruction of intermediate waters along the European continental margin*

1130-1230 **Session 2: Coupling between oceanographic processes and contourite sedimentation**

Session chair: Andres Rüggeberg (Ghent University – University of Fribourg)

- 1130-1145: Lara F. Pérez, F. Javier Hernández-Molina, Federico D. Esteban, Alejandro Tassone, R. Violante, Alberto R. Piola, Andrés Maldonado and Emanuele Lodolo: *Contourite Terraces in the Middle-Slope of the Northern Scotia Sea and Southern Atlantic Ocean: Palaeoceanographic Implications*
- 1145-1200: D. Calvin Campbell: *Comparison of large contourite drifts in the western North Atlantic*
- 1200-1215: Volkhard Spiess: *The Impact of the Agulhas Current System on Sedimentary Systems at the Southeast African Margin - Shallow, Mid- and Deep-Water Contourite Formation*
- 1215-1230: Quentin Dubois-Dauphin, Christophe Colin, Lucile Bonneau, Jean-Carlos Montero-Serrano, Dominique Blamart, David Van Rooij and Norbert Frank: *Millennial-scale influence of southern intermediate component water into the North-east Atlantic during the last 40 kyr*
- 1230-1400 Lunch break
- 1400-1500 Keynote presentation Dierk Hebbeln (University of Bremen, MARUM, Germany): "Good neighbours in vigorous currents: contourites and cold-water corals"
- 1500-1600 **Session 3: Contourite processes and deep-water ecosystems**
Session chair: Jean-Pierre Henriët (Ghent University)
- 1500-1515: David Van Rooij, Thomas Vandorpe, Stanislas Delivet, Dierk Hebbeln, Claudia Wienberg, Ines M. Martins and the Belgica COMIC, MD194 Gateway and MSM36 MoccoMebo shipboard scientific parties: *Buried cold-water coral mound provinces and contourite drifts along the Eastern Atlantic margin: controls, interactions and connectivity*
- 1515-1530: Veerle A.I. Huvenne, Lissette Victorero Gonzales, Dominique Blamart, Edwige Pons-Branchu, Mark N. Mavrogordato, Douglas G. Masson, Claudio Lo Iacono and Russell B. Wynn: *The Darwin Mounds, N Rockall Trough: how the dynamics of a sandy contourite influenced cold-water coral growth*
- 1530-1545: Ludivine Chabaud, Elsa Tournadour, Emmanuelle Ducassou, Thierry Mulder, John Reijmer, Gilles Conesa and Jacques Giraudeau: *The modern carbonate contourite drift of the Little Bahama Bank: a geophysical, sedimentological and biostratigraphic study*
- 1545-1600: Hiske G. Fink, Claudia Wienberg, Ricardo De Pol-Holz and Dierk Hebbeln: *Development of Mediterranean cold-water coral ecosystems since the late glacial*

1600-1630 Coffee break + poster presentations Session 3

- 15) Inês Martins, João Vitorino, Thomas Vandorpe and David Van Rooij: *A Physical Oceanography contribution to understand the processes affecting El Arraiche Mud Volcano field (NW Moroccan Margin)*
- 16) Loubna Terhzaz, Naima Hamoumi, Lotfi El Mostapha, David Van Rooij, Silvia Spezzaferri, Agostina Vertino and Jean-Pierre Henriët: *Preliminary results of a sedimentological study of carbonate mounds and cold-water corals from Brittlestar Ridge I and Cabliers site*
- 17) Claudio Lo Iacono, Lissette Victorero Gonzalez, Veerle A.I. Huvenne, David Van Rooij, Eulàlia Gràcia, Cesar Ranero and the GATEWAYS Cruise Party: *Morphology and shallow stratigraphy of the West Melilla and Cabliers CWC Mounds (Alborán Sea). Preliminary insights from the GATEWAYS MD194 Cruise*
- 18) Tim Collart, Kerry Howell, Heather Stewart, Jean-François Bourillet, Estefania Llave, Dominique Blamart and David Van Rooij: *Using cold-water coral mini-mounds as analogue for giant mound growth: assessment of environmental drivers and anthropogenic impact*
- 19) Desirée Palomino, Juan-Tomás Vázquez, José Luis Rueda, Luis Miguel Fernández-Salas, Nieves López-González and Víctor Díaz-del-Río: *Seabed morphology and bottom water masses related to benthic habitats at the Cristóbal Colón diapir (NW of the Guadalquivir ridge, Gulf of Cádiz)*
- 20) Cecilia Laprida, Graziella Bozzano, Ricardo Garberoglio and Roberto A. Violante: *Late Cenozoic fossil cold-water coral concentrations and mounds on the Argentine continental margin, Southwest South Atlantic*

1630-1730 **Session 4: Advances in diagnostic criteria of contourite systems**

Session chair: Roberto Violante (Argentine Hydrographic Survey)

1630-1645: Stanislas Delivet, David Van Rooij, Bram Van Eetvelt and Xavier Monteys: *Seismic geomorphological reconstructions at Goban Spur: Implications for Plio-Pleistocene MOW bottom current variability*

1645-1700: Marta Ribó, Pere Puig, David Van Rooij, Araceli Muñoz and Roger Urgeles: *Large sediment waves on the Gulf of Valencia continental margin (NW Mediterranean): internal structure and evolution*

1700-1715: Dmitry Borisov, Ivar Murdmaa, Elena Ivanova and Oleg Levchenko: *Giant Mudwaves in the NW Argentine Basin (South Atlantic)*

1715-1730: Graziella Bozzano, Roberto A. Violante and José Luis Cavallotto: *Clean and well sorted sands in the deep Argentine Basin (SW Atlantic): the role of the Antarctic Bottom Water*

1800-2100 Visit of the Filliers distillery

12 September 2014 (Day 3)

0830-0930 Keynote presentation Michel Hoffert (Université Louis Pasteur, France):
“Manganese nodules: genesis, distribution and deep-water circulation”

0930-1100 **Session 4: *Advances in diagnostic criteria of contourite systems***

Session chair: Roberto Violante (Argentine Hydrographic Survey)

0930-0945: Till J.J. Hanebuth, Michele Rebesco, M. Grave, A. Özmaral, Renata G. Lucchi and the CORIBAR Team: *The Kveithola Drift (western Barents Sea): Preliminary results from the CORIBAR Cruise*

0945-1000: Oleg Levchenko, Victoria Putans and Dmitry Borisov: *Contourites in the Middle Caspian Sea?*

1000-1015: Hui Chen, Xinong Xie, Ye qiang Shu, Dongxiao Wang, David Van Rooij, Thomas Vandorpe, Kainan Mao and Ming Su: *Deep-water depositional characteristics and relationship with bottom currents at the intersection of Xi'sha Trough and Northwest Sub-Basin, South China Sea*

1015-1030: Luisa Palamenghi, Hanno Keil, Stephan Steinke, Tim Freudenthal, Mahyar Mohtadi and Volkhard Spiess: *Interaction between South China Sea deep circulation and the northwestern Pearl River Mouth Basin*

1030-1045: Federico Falcini, Eleonora Martorelli, Ettore Salusti and Francesco L. Chiocci: *Diagnostic analysis of contourite drifts and contour currents around small-scale topographic features: some examples from the Italian Seas (Mediterranean Sea)*

1045-1100: Thomas Vandorpe, David Van Rooij, Henk De Haas and Inês Martins: *Obstacle-related contourite drifts in the El Araiche Mud Volcano field, Southern Gulf of Cadiz*

1100-1130 Coffee break + poster presentations Session 4

- 21) Shunshe Luo, Youbin He, Qiqi Lv, Mingli Xi and Yuanquan Zhou: *Trace Element Characteristics and Sedimentary Environmental Significance of the Lower Ordovician Contourites in Northern Hunan, China*
- 22) J. Tomás Vázquez, Desirée Palomino, M. Carmen Fernández-Puga, Luis-Miguel Fernández-Salas, Eugenio Fraile-Nuez, Teresa Medialdea, Olga Sánchez-Guillamón, Luis Somoza and the SUBVENT team: *Seafloor geomorphology of the Passage of Lanzarote (West Africa Margin): Influences of the oceanographic processes*
- 23) Cédric Tallobre, Pierre Giresse, Lies Loncke, Germain Bayon, Maria-Angela Bassetti, Mirjam Randla, Roseline Buscail, Xavier Durrieu de Madron, François Bourrin, Stéphane Kunesch, Christine Sotin, Berné Serge and Vanhaesebroucke Marc: *New findings of contourite-related structures and their implications on oceanographic and sedimentary conditions on the Demerara Plateau (French Guiana and Surinam)*
- 24) Thomas Vandorpe, David Van Rooij, Susana Lebreiro, Belen Alonso, Anxo Mena, Veerle Cnudde and F. Javier Hernandez-Molina: *CT-images of contourite cores: An onset to processing and data interpretation*
- 25) Maarten Van Daele, Willem Vandoorne, Sébastien Bertrand, Niels Tanghe, Inka Meyer, Jasper Moernaut, Roberto Urrutia and Marc De Batist: *Sediment drifts in Lago Castor (Chilean Patagonia) reflect changes in the strength of the Southern Hemisphere Westerly winds since the Last Glacial Maximum*
- 26) Arnaud Beckers, Aurélia Hubert-Ferrari, Christian Beck and Marc De Batist: *Evidence for Holocene bottom-currents erosion in the Western Gulf of Corinth, Greece*
- 27) Vera Van Lancker, Dries Van den Eynde, Lies De Mol, Guy De Tré, Daan Van Britsom, Robin De Mol, Tine Missiaen, Vasileios Hademenos, Denise Maljers, Jan Stafleu and Sytze van Heteren: *Geological resource management of the future: Drilling down the possibilities*
- 28) Lieven Naudts, David Cox, Patrick Roose and Frank Monteny: *RV Belgica II: The new Belgian research vessel to replace the existing RV A962 Belgica*

1130-1230 **Session 4: Advances in diagnostic criteria of contourite systems**

Session chair: Roberto Violante (Argentine Hydrographic Survey)

- 1130-1145: Ivar Murdmaa, Dmitry Borisov, Elena Ivanova, Oleg Levchenko, Olga Dmitrenko and Emelyan Emelyanov: *The Ioffe Calcareous Contourite Drift, Western South Atlantic*

- 1145-1200: Jens Gruetzner and Gabriele Uenzelmann-Neben: *Contourites at the eastern Agulhas Ridge and Cape Rise seamount shaped by Southern Ocean derived water masses*
- 1200-1215: Xiaoxia Huang, Wilfried Jokat and Karsten Gohl: *Bottom currents-controlled sedimentary archives in the southeast Weddell Sea*
- 1215-1230: Gabriele Uenzelmann-Neben and Karsten Gohl: *Early Miocene glaciation in the Amundsen Sea, Southern Pacific: A study of the distribution of sedimentary sequences*
- 1230-1400 Lunch break
- 1400-1500 Keynote presentation Dorrik A.V. Stow (Heriot-Watt University, United Kingdom): “*Contourites in the Gulf of Cádiz: new findings from IODP Expedition 339*”
- 1500-1600 Discussion and closure session

Annex 4b: Full list of speakers and participants

Of the 95 participants, 4 participants and 2 speakers have been funded by ESF ERN COCARDE, indicated by ^{ESF}Name.

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^{ESF}Dierk Hebbeln, MARUM - University of Bremen, Bremen, Germany

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