

# Annual Report 2016

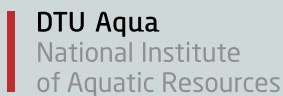
## EUROPEAN MARINE BOARD

*The European Marine Board provides a pan-European platform for its member organizations to develop common priorities, to advance marine research and to bridge the gap between science and policy, in order to meet future marine science and societal challenges and opportunities.*

The European Marine Board was established in 1995 to facilitate enhanced cooperation between European organizations involved in marine science. In 2016, EMB represents 32 member organizations (research funding bodies, research institutes and nationally-based consortia of third-level institutes). Through the EMB, these organizations work together to develop a common European vision on the research priorities and strategies for marine science.

The EMB provides the essential components for transferring knowledge from the scientific community to decision makers, promoting Europe's leadership in marine research and technology. Adopting a strategic role, the EMB provides a unique forum within which marine research policy advice to national agencies and to the European Institutions is developed, with the objective of promoting the establishment of the European Marine Research Area.

[www.marineboard.eu](http://www.marineboard.eu)



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# Highlights 2016

1. **Creation of EMB-IVZW**, 20 January, Brussels (page 10)

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2. **EuroMarine General Assembly**, 27-29 January, Olhao

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3. **WG Citizen Science Kick-Off Meeting**, 18-19 February, Ostend (page 21)

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4. **SCAR-fish Meeting**, 24 February, Brussels

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5. **Vella Meeting**, 2 March, Brussels

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6. **EMBCP Meeting**, 26 April, Sopot (page 30)

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7. **EMB Spring Plenary**, 27-28 April, Sopot (page 16)

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8. **University Consortium Panel Kick-Off Meeting**, 28 April, Sopot (page 29)

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9. **Sea Change General Assembly**, 11-13 May, Athens (page 26)

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10. **ESDP Panel Meeting**, 12 May, Kristineburg (page 28)

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11. **WG Citizen Science 2nd Meeting**, 2-3 June, Galway

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12. **AtlantOS General Assembly**, 28 June – 1 July, Kiel (page 27)

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13. **Vella Meeting with Ocean Experts**, 8 July, Ostend (page 25)

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14. **EOOS European Parliament event**, 8 September, Brussels (page 24)

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15. **Blue Economy Business and Science Forum**, 12-13 September, Hamburg

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16. **EMB Autumn Plenary**, 19-20 October, Glasgow (page 18)

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17. **University Consortium Panel Meeting**, 20 October, Glasgow

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18. **MASTS Annual Science Meeting**, 19-21 October, Glasgow

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19. **Forum Oceano**, 16 November, Porto

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20. **Campus Do Mar Conference**, 17 November, Vila Real

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21. **CommoOCEAN**, 6-7 December, Bruges (page 30)

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22. **EMBCP Meeting**, 8 December, Ostend

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23. **ESDP Panel Meeting**, 20 December, Brussels

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Images from some of these highlight events are shown on the left (page 4) and throughout the report.



# Message from the Chair



2016 was a significant year in the history of the European Marine Board. On 20 January, representatives of eight EMB member organizations gathered in Brussels to found the new EMB IVZW Association. From that point forward, EMB has had its own legal personality for the first time. It also started the countdown to a subsequent separation from the European Science Foundation (ESF), the organization that has hosted EMB since its establishment in 1995. The separation came fully into being on 1 January 2017.

This momentous change in the operational platform of the European Marine Board marks the end of our direct association with the ESF. ESF has been an important partner for more than 20 years and I would like to thank its staff and leadership for their excellent support and cooperation in that time. In particular, I thank Martin Hynes, ESF President, and Jean-Claude Worms, ESF Chief Executive, for the helpful and collaborative

manner in which we have been able to jointly manage an amicable separation. Although we have now separated, both organizations remain committed to promoting science and will continue to cooperate to our mutual benefit. This has been clearly demonstrated as discussions began towards the end of 2016 with the European Space Sciences Committee (ESSC) - which remains part of ESF - to collaborate on a study to determine future research priorities in the exploration of outer solar system icy moon oceans ('Exo-oceans'). The ESSC felt that it was important to bring marine science expertise into the study group and invited EMB to nominate two experts.

The EMB member organizations have high expectations of the biannual plenary meetings and the spring and autumn meetings in 2016 did not disappoint. In spring, the Board met in the picturesque Polish Baltic Sea resort of Sopot, home to the Institute of Oceanology of the Polish Academy of Sciences (IO-PAN). At that meeting the Board approved a new strategic activity for EMB on Advanced Marine Ecosystem Modelling, to get underway in 2017. A decision was also taken to hold the 6<sup>th</sup> EMB Forum on a topic within the broad framework of international ocean governance. The EMB Delegates enjoyed excellent presentations from young IO-PAN researchers (see interviews on page 17 of this report) and a fascinating evening lecture by Jan-Marcin Węśławski on tidal glaciers as refugia for cold water fauna in a warming Arctic. My sincere thanks to EMB Delegate, Sławomir Sagan, IO-PAN Director, Janusz Pempkowiak, and all the staff of IO-PAN for great organizational support making us so welcome.

For the autumn plenary, the EMB was hosted by the Marine Alliance for Science and Technology Scotland (MASTS), at the University of Strathclyde Technology and Innovation Centre in the heart of Glasgow city. The plenary meeting was held alongside the MASTS Annual Science meeting which added greatly to the experience for the EMB members. Delegates were able to visit the various science stands in the exhibition space during coffee breaks. Because the EMB open session was included in the formal agenda of the MASTS meeting, it was, in terms of attendance, the largest open session in the history of the EMB. This meeting also included the first formal general assembly of the new EMB IVZW association. Other Board decisions included approval to proceed with EMB policy papers on long-term impacts of climate change and sea-level rise, and the decommissioning of offshore man-made installations. A new EMB panel bringing together the EMB University Consortiums was also approved by the Board members. Sincere thanks to MASTS colleagues Mark James, David Paterson and Emma Defew for their generous hospitality and helping us to achieve a highly successful meeting.

Looking ahead to 2017, the change in our legal status will provide some extra work for the Secretariat to deal with but, importantly, it will be business as usual for the EMB as the leading European platform for delivery of marine science policy advice. We have a pipeline of new publications including an important position paper on Citizen Science, to be launched at European Maritime Day in Poole, UK. Work will also begin on Navigating the Future V (NFV). The Board has agreed that NFV will be a shorter document than NFIV, focusing on a smaller number of selected topics. It will pose a challenge to the EMB members and experts to make difficult decisions about which topics should be prioritized, but as a strategic platform, that is at the core of our *raison d'être*.

Notably, there is already strong support to re-emphasize the importance of curiosity-driven marine science and ocean exploration, whilst still addressing research priorities in support of maritime policy, innovation and sustainable blue growth. In this context, it is important not to promulgate an oversimplified dichotomy of basic versus applied research. All marine research entails some form of innovation and delivers new knowledge to help us better understand and manage our interactions with the ocean. One topic emerging in EMB discussions in 2016 was the exciting work to investigate the origins of life on earth; specifically, the theory that life on earth began 4 billion years ago around hydrothermal vent systems on the ocean floor. This research reminds us of the fascination with understanding fundamental questions that has attracted so many young people into scientific careers. My thanks to our NIOZ (Royal Netherlands Institute for Sea Research) Delegate, Jan de Leeuw, for bringing this topic to the EMB discussions. 2017 looks to be a very interesting year to be part of EMB.

**Prof. Jan Mees**, EMB Chair

# Executive Director's report



As you will read in the Chair's Statement, 2016 was a year of significant change for the EMB. This was particularly noticeable from the point of view of the Secretariat. The Chair reflects on the momentous change that was implemented with the foundation of a new legal entity in the form of an international not-for-profit association under Belgian law. A significant effort was invested by the Secretariat in 2016 in preparing for the separation from ESF and for life as an independent entity. In addition, there were significant staff changes, to which I will return later.

Despite these operational changes, the strategic work programme continued and there were several highlights in 2016. At a political level, one of the key events of the year was the visit on 8 July of Karmenu Vella, EU Commissioner for Environment, Maritime Affairs and Fisheries, to the EMB offices in Ostend. As a result of detailed planning between the Secretariat, the Cabinet of Commissioner Vella and DG MARE, a meeting was arranged with the Heads of some of the major national marine institutes from among the EMB membership. The Commissioner has expressed an interest to engage more closely with marine research leaders from around Europe and EMB was seen as the most effective channel for strategic science policy advice. The meeting focused primarily on ocean observing needs and priorities. Further details of the meeting and its participants can be found on page 25 of this report.

2016 was an important year for the progress of a key EMB strategic working group activity on marine citizen science. The Working Group met twice with a kick-off meeting in Ostend in February and a second meeting in Galway in June. With strong leadership from Carlos Garcia Soto of IEO Spain (Chair) and Gro van der Meer of IMR, Norway (co-Chair), the group made rapid progress, ably guided by EMB Science Officer, Veronica French. By the end of the year the group had decided that the final publication would be a full position paper (instead of a shorter Future Science Brief) and the paper itself, including several case studies on existing marine citizen science initiatives from across Europe, was at an advanced stage. Further details are provided on page 21 of this report.



Some new strategic activities were also initiated. The Board approved new activities on Advanced Marine Ecosystem Modelling, Decommissioning of Offshore Oil and Gas Installations, and Policy Implications for the Long-term Impacts of Climate Change. The latter two were planned as a Science Commentary and EMB Policy Brief respectively and both were at an advanced stage by the end of 2016 with publication due in early 2017. Significant work was also invested by the Secretariat on progressing the EOOS (European Ocean Observing System) initiative in collaboration with colleagues from EuroGOOS. Key activities included the launch of a broad open stakeholder consultation supported by a consultation document and a high-profile EOOS event in the European Parliament on 8 September (see page 24).

At the spring plenary meeting, the Board also decided that the next EMB Forum, to be held in Autumn 2017, will be in the area of ocean governance. Wider developments in ocean governance provide an incentive for members to ensure that the voice of the EMB community (and marine science generally) should be heard. These include the significant developments taking place at the level of the United Nations: the Sustainable Development Goals including SDG 14 and the ongoing work of the PrepCom towards a new UNCLOS Implementing Agreement on the conservation and use of marine biodiversity in Areas Beyond National Jurisdiction. In addition, Commissioner Vella has set international ocean governance as one of the key priority areas of his term in office and in 2016 the Commission completed a broad stakeholder consultation in this area. The 6<sup>th</sup> Forum will, therefore, be an important event for the EMB and an opportunity for the voice of marine science to influence ongoing ocean governance processes.

2016 also saw the inevitable changes in the Secretariat and it was sad to say farewell to a number of longstanding colleagues and friends. In September, after more than four years of dedicated service to EMB, Dr. Nan-Chin Chu moved back to Brest to take up a new position with the Directorate for International Affairs at Ifremer. In November, Dr. Veronica French also moved on; at the time of writing she has taken up a position as Manager of the Secretariat of the European Citizen Science Association (ECSA). Finally, before the end of the year Karen Donaldson had accepted a new post with the Department of Fisheries and Oceans in her native Canada. While it is never good to lose the kind of dedication, experience and talent that these three excellent staff members brought to EMB over the years, it is at least heartening to see that their experience with EMB has set them up for positive career advancement opportunities. I wish them every good fortune in their new positions and locations. I also have the pleasure to welcome three new members of staff who, following an intensive recruitment programme, had been appointed before the end of the year. I am certain that Science Officers Paula Kellett and Ángel Muñoz Piniella, and Executive and Finance Officer, Joke Coopman, will be excellent additions to the EMB staff and will serve the Board with distinction. I very much look forward to working with these new colleagues in 2017.

Finally, my thanks to the EMB Chair, Jan Mees, and to the ExCom and Board members for their continued commitment and support for the work of the Secretariat. The Secretariat is there to serve the Board and without the active commitment of the Chair and the members, the EMB could not reach the level of success it has in 2016 and over the previous years. I am very much looking forward to entering a new phase with EMB as an independent organization with a new team and a bright future in 2017 and beyond.

**Dr. Niall McDonough**, EMB Executive Director

# EMB mission, structure and governance

## MISSION

The European Marine Board (EMB) provides an independent platform for organizations involved in supporting, delivering and using marine research and technology to promote common positions on research priorities and strategies in Europe.

EMB is a unique marine science forum which develops scientific foresight by initiating state-of-the-art analysis and studies and translating them into clear policy recommendations to national agencies and governments as well as to European institutions.

Where the EMB identifies a topic of strategic interest as the basis for a new activity, it applies one of a range of instruments to deliver a tailored impact. Targeted at European and national research programme managers, strategy developers, policymakers and the marine research community, EMB outputs drive future European and national marine research agendas, programmes and supporting strategies and policies.

EMB acts as a science-policy interface, transferring and translating scientific knowledge to policy makers, and channelling policy needs back to the research community.

## STRUCTURE AND GOVERNANCE

The European Marine Board is a pan-European partnership of national organizations which are either research funding organizations, RFOs (e.g. research councils or ministries), research performing organizations, RPOs (e.g. national marine research institutes) or nationally-based consortia of third-level institutes. EMB activities and the operation of its secretariat are funded through annual member contributions and EMB external contracts. At the end of 2016, EMB represented 32 organizations from 18 European countries. A full list of EMB member organizations and delegates is available on the website: [www.marineboard.eu/members](http://www.marineboard.eu/members), and in Annex 1 of this report.

During 2016, EMB embarked on the process of forming its own independent legal entity as an international not-for-profit organisation under Belgian law (IVZW). On 20 January 2016, eight founding members signed the deed in the presence of a Notary Public at a dedicated founding meeting in Brussels, paving the way for the process of separating from the European Science Foundation (ESF) to begin. EMB IVZW will formally become an independent legal entity on 1 January 2017. This move will enable EMB to continue to strive to secure its future as the primary marine science foresight and strategy think-tank in Europe.

## EMB DELEGATES

Representing the major organizations involved in marine research in Europe, the Board's member organization delegates (i) provide a high-level overview of national science policy priorities, (ii) guarantee a multidisciplinary and high-quality scientific expertise for the Board's activities, and (iii) ensure a high-level uptake of the Board's strategic recommendations at national and European levels.

The EMB's mixed membership of RPOs, RFOs, and national university consortia ensures its unique capacity to deliver science policy advice on issues of identified strategic importance and to influence European marine research agendas.

EMB delegates meet twice a year at plenary meetings to share knowledge, to define common priorities, and to agree on activities and outputs. Observers and guests are invited to attend EMB plenary meetings on an ad hoc basis. These include the European Commission (EC), the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO), and other international and European marine science networks.



EMB Spring 2016 Plenary Meeting (27 April, Sopot, Poland)

## EXECUTIVE COMMITTEE

EMB operations are overseen by the Executive Committee (ExCom). The ExCom meets three times per year to follow up on the implementation of the actions agreed by the Board at plenary meetings, make operational and financial decisions and give strategic guidance to the Board and Secretariat.

ExCom members and their mandates as of December 2016:



**Jan Mees – Chair**  
Research Foundation – Flanders  
(FWO), Belgium  
May 2014-May 2017



**Alessandro Crise - vice-Chair**  
National Institute of Oceanography and  
Experimental Geophysics (OGS), Italy  
May 2015-May 2017



**Jan-Stefan Fritz – vice-Chair**  
German Marine Research Institute  
(KDM), Germany  
May 2015-May 2018



**Mark James – vice-Chair**  
Marine Alliance for Science  
and Technology Scotland  
(MASTS), United Kingdom  
May 2015-May 2018



**Gilles Lericolais – vice-Chair**  
French Research Institute for the  
Exploration of the Sea  
(IFREMER), France  
October 2016-October 2018



**Erlend Moksness - vice-Chair**  
Institute of Marine Research  
(IMR), Norway  
May 2014-May 2017



**Tarmo Soomere - vice-Chair**  
Estonian Academy of Sciences,  
Estonia  
May 2015-May 2017



**Niall McDonough - Executive  
Director**  
Head of Marine Board Secretariat  
*ex officio member*



## SECRETARIAT

The strategic and operational decisions and activities proposed by the Board and ExCom are implemented by the Secretariat, based at the EMB offices in Ostend, Belgium. A full list of the current EMB Secretariat team is available on the website: [www.marineboard.eu/about/secretariat](http://www.marineboard.eu/about/secretariat) and in Annex 2 of this report.



**Niall McDonough**  
Executive Director



**Kate Larkin**  
Senior Science Officer



**Nan-Chin Chu**  
Science Officer



**Veronica French**  
Science Officer



**Paula Kellett**  
Science Officer



**Karen Donaldson**  
Scientific Administrator







# Plenary meetings 2016

European Marine Board plenary meetings, held twice a year in spring and autumn, gather EMB member organizations to reflect and agree on topical marine science and technology issues, and propose future strategic actions. During these meetings, EMB delegates also benefit from interactions with invited speakers, guests and observers including from the European Commission and the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO).

## SPRING PLENARY MEETING (27-28 APRIL, SOPOT, POLAND)

The Spring Plenary Meeting was hosted by the Institute of Oceanology of the Polish Academy of Sciences (IO-PAN). The meeting was attended by 22 delegates and 6 invited guests (see participants list in Annex 3).

### Governance

- The 2016 budget was approved.

### Science activities

- The topic of international ocean governance was approved by the Board as the focus for EMB's 6<sup>th</sup> Forum;
- The Board approved the launch of a new EMB Working Group activity on marine ecosystem modelling.

The open session of the meeting welcomed representatives of EMB stakeholders, observers and partners. The programme included:

- Welcome by Prof. Janusz Pempkowiak, Director of IO-PAN
- Presentation of IO-PAN research activity, Ksenia Pazdro, vice-Director of IO-PAN
- CommOCEAN conference, Jan Seys, EMBCP
- Partnership for Observations of the Global Oceans (POGO), Karen Wiltshire, POGO Chair
- EuroMarine and perspectives on marine science from genes to ecosystems, Patrizio Mariani, 2016 Chair of EuroMarine Steering Committee
- EurOcean – adding value to information on marine science and technology, Ned Dwyer, Executive Director, EurOcean

Young researchers from IO-PAN provided flash presentations on their current research, covering the tracking of Harmful Algal Blooms (HAB's) in the Baltic Sea, responses of Arctic benthic biomass to climate change, and the characterization of dissolved organic matter in the European Arctic. Interviews with some of the speakers can be found on the following page.

Spring Plenary Evening Lecture: *Tidal glaciers - refugia for cold water fauna in a warming Arctic* Professor Jan Marcin Węśławski, Department of Ecology, IO-PAN and WG Citizen Science member.





## Marta Konik

PhD student, Remote Sensing Laboratory, IO-PAN



- 1. How did you get into your field of research?** Two important factors influenced the direction of my development: my interest in nature, and the people I've met who have developed my passion and helped me along my way. People, in particular teachers, are extremely important. They might stir up and shape our passions or let them fade away. I was lucky to meet good teachers, really good scientists and tutors. I did not plan my career from the outset, as I have been learning new things and adapting my direction continuously; ultimately I do what I enjoy.
- 2. What's the most exciting thing you've learnt or discovered?** At the beginning of my studies I kept exploring the life in the oceans, which seemed to me to be still rather distant for ordinary people. Phytoplankton and the phenomenon of harmful algae blooms (HABs) interested me the most, because of their incredibly huge impact on ecosystems, along with their influence on our lives and the health threat that they may pose, especially when considering their inconspicuous size.
- 3. What's the biggest challenge facing your field?** It is hard for me to define the biggest one, but the HABs are difficult to identify and investigate due to the high dynamics of evolution in time, combined with high spatial variability. Moreover, the term harmful algal blooms is relatively wide and the HABs around the world are formed by various species, which are composed of many pigments of varying spectral properties. This forces us to focus on local issues in order to solve a global problem.
- 4. Does your research include any European collaboration, and if so, who does it involve?** Development of the methods for remote sensing of HABs would be hard to continue without collaborations. Of course the data acquisition itself is hard to imagine without being a part of a bigger community. Moreover, my colleagues and I have been cooperating with French, Norwegian, Romanian and English partners regarding the interpretation and exploitation of the synergy of satellite information between various sensors in order to investigate HABs as well as regarding the development of some new technical aspects of the satellite data processing.

## Mikolaj Mazurkiewicz

PhD student, Department of Marine Ecology, IO-PAN



- 1. How did you get into your field of research?** In 2010, during my bachelor studies on Biological Oceanography, I went to a presentation about the R/V *Oceania* arctic cruise (vessel operated by IO-PAN). I was so impressed by what I saw that I decided to try to get on board for the next cruise. I became a volunteer in the Department of Marine Ecology in IO-PAN, volunteering once or twice a week. This resulted in a good cooperation with the scientists from this department, especially with Prof. Maria Włodarska-Kowalczyk. One day she proposed that I do research for my Master's thesis under her charge. Of course I agreed immediately. I took part in a few cruises in the Baltic before finally sailing to the Arctic in 2012 and fell in love with this area. Since then I have been on a few more Arctic cruises, including two during polar night. When I finished my Masters, the Professor received a large grant and was looking for a PhD student who would investigate the impact of climate change on the size of arctic bottom fauna. I found it very interesting, applied for this position and was accepted.
- 2. What's the most exciting thing you've learnt or discovered?** Honestly, I must say that my biggest discovery was when I realized how easily and smoothly people can adjust to completely new conditions thousands of kilometres from home. After one or two days without internet connection and mobile phone signal you become completely free and life is much easier. That all the facilities we are surrounded by every day are unnecessary and we can survive without them without any problems.
- 3. What's the biggest challenge facing your field?** As I work in the Norwegian and Arctic seas one of the biggest challenges is logistics. Studies have to be planned way in advance and if something goes wrong during the sampling campaign, the next chance to take samples will likely be the next year. Another challenge is my laboratory work, which mostly comprises of measurements of organisms. It seems trivial but it is very laborious and can test my patience, especially if there are thousands of creatures to analyse.
- 4. Does your research include any European collaboration, and if so, who does it involve?** My research is mostly done as a part of the DWARF project, from the Polish Norwegian Research Program. This study focuses on the Northern seas and involves cooperation with Norwegian partners from the University of Oslo, NINA and Akvaplan-niva. I also had the chance to cooperate with the University of Tromsø (Norway) within the Marine Night project and to carry out a bilateral cooperation with the University of Liège (Belgium), where analysis of carbon content in sediment was performed. Of course wider European cooperation would allow researchers to gain a more complete perspective of the problem studied, covering the whole latitudinal range of European coastal seas.

## AUTUMN PLENARY MEETING (19-20 OCTOBER GLASGOW, UK)

The Autumn Plenary Meeting was hosted by the Marine Alliance for Science and Technology for Scotland (MASTS) in Glasgow, in conjunction with their Annual Science Meeting (ASM). The meeting was attended by 28 EMB delegates and 7 invited guests (see participant list in Annex 3).

### Governance

- Gilles Lericolais (IFREMER) was reinstated as a vice-Chair on the EMB Executive Committee for a further two-year term;
- 11 member organizations were ratified as members of the new EMB IVZW;
- The 2017 budget was approved.

### Science activities

- The Board approved the subgroup of the University Consortium Panel as a new EMB panel;
- The Board approved the draft text for a science commentary on climate change and sea-level rise;
- The Board gave approval to proceed with a policy brief on the issues surrounding the decommissioning of man-made structures;
- The Board approved Professor Lisandro Benedetti-Cecchi (CoNISMa) as the chair for the new EMB working group on Biological Observing in the Ocean (WG BIO OBS).

The open session of the meeting welcomed representatives of EMB stakeholders, observers and partners. The programme included:

- Marine Science – A Tartan Perspective! An overview of marine science in Scotland and future challenges, Mark James, MASTS
- 2020 and Beyond: Can Europe sustain marine ecosystems and drive Blue Growth at a North Atlantic scale?, Prof. Murray Roberts, University of Edinburgh
- Marine Renewables and optimal ecologically sustainable planning for our oceans, Dr. Beth Scott, University of Aberdeen
- Decommissioning of offshore structures, Jan de Leeuw, NIOZ
- H2020 and other activities, Marco Weydert, European Commission, DG RTD
- Blue Growth & Ocean observation, Iain Shepherd, European Commission, DG MARE
- SEACAMS – Reducing the risk for marine renewable industries through collaborative research, David Mills, Bangor University
- Update on UNCLOS PrepCom on BBNJ (Biodiversity Beyond National Jurisdiction), Alans Evans, NERC

At the plenary reception two early stage researchers from MASTS provided flash presentations on their PhD research investigating the effects of anthropogenic noise on the blue mussel (*Mytilus edulis*) and marine spatial planning and innovation in governance. Interviews with the speakers are presented on the following page. EMB delegates, guests and participants of the MASTS Annual Science Meeting joined together for a session of traditional Scottish ceilidh dancing.





## Lucy Greenhill

Research Fellow (Marine Planning and Governance); Scottish Association for Marine Science (SAMS)

- 1. How did you get into your field of research?** I've always been passionate about the environment and motivated to address the need to better manage the consequences of human development on the planet. To contribute, I focus on how governance can evolve to address sustainability in marine resource use, through integration, innovation and transformation. In the past, I worked in international oil spill response, specialising in techniques for incidents in polar regions, followed by a Masters to study marine management more broadly. This led to a valuable 5 years at the Joint Nature Conservation Committee (JNCC), providing statutory advice to UK government departments on offshore activities, particularly emerging marine renewables. I am now back in academia, to take a wider perspective and develop theories and tools to address the complex challenges of governance, to support innovation and to work more effectively across the science/policy interface.
- 2. What's the most exciting thing you've learnt or discovered?** I am fascinated by the evolving thinking around doing 'science' itself, and how relevant this is to innovations in governance. There is growing emphasis on necessary 'co-production' of knowledge, involving a wide range of real-world actors in the framing of problems, generation of solutions and on-going reflection based on collective experience. This recognises the limitations of traditional approaches, the creative potential of wider involvement and enables more rapid application of new ideas. At a practical level, I investigate this in the context of marine spatial planning (MSP), since the multi-actor dialogue in MSP may enable new understanding of challenges to emerge, leading to better governance in addressing conflicts and optimised resource use for the benefit of society.
- 3. What's the biggest challenge facing your field?** Better governance for the oceans relies on increasing integration, co-operation and collaboration. This requires attitudes of openness to new ways of working at an individual and institutional level, which is compromised by current political trajectories, particularly in Europe and within the UK, which risk leading to reduced co-operation and limits our opportunities for making radical shifts towards sustainability. Positive change is possible during such states of flux and political debate, however this relies on strong and co-ordinated action by 'progressive' groups to articulate and promote innovative approaches, and counter regressive attitudes. Scientists have a key role to play, however it requires more 'action-orientated' ways of working which I aim to support in the coming year.
- 4. Does your research include any European collaboration, and if so, who does it involve?** My organisation (SAMS) collaborates extensively with European partners, and I am involved with a number of groups and projects including as North Sea Ambassador for the European Commission Maritime Spatial Planning Assistance Mechanism, AQUASPACE (Horizon 2020) and the ICES Working Group on Marine Planning and Coastal Zone Management. A European approach is essential for creativity in research, co-operation in developing governance for shared marine areas and interconnected systems and to cost-effectively develop and share knowledge across the EU.



## Matt Wale

PhD Student; Department of Biological Sciences, Edinburgh Napier University

- 1. How did you get into your field of research?** I am a marine biologist by training, having pursued this field from an early age. After working for a period after my Bachelor's degree I decided to undertake a Master's degree via research at the University of Bristol, which is where I got introduced to the subject of anthropogenic noise research. My interest for this field grew throughout my Master's and led me to pursue it further into my PhD at Edinburgh Napier University.
- 2. What's the most exciting thing you've learnt or discovered?** As I work in a field that is constantly developing there is always something new and exciting to discover. My personal interests lie in the trade-offs animals make when confronted with stressors in their environment. The most exciting thing I have learnt to date is how invertebrates, previously thought unable to be effected by noise in the environment, are susceptible to this growing pollutant.
- 3. What's the biggest challenge facing your field?** Most previous work in my field has been focussed on the effects of noise on vertebrates, especially marine mammals, which detect noise through sound pressure. Marine invertebrates detect the particle motion of underwater sound. To date this component has been very difficult to measure reliably, and therefore is missing from many studies, preventing accurate assessments of the experienced noise levels.
- 4. Does your research include any European collaboration, and if so, who does it involve?** To date my work has been focussed in Scotland. However, I have plans for future collaborations with researchers across Europe.





# Thematic science policy activities

## CITIZEN SCIENCE

### Advancing Citizen Science for Coastal and Ocean Research

The EMB's Citizen Science working group 'Advancing Citizen Science for Coastal and Ocean Research', has been convened to highlight the potential of Citizen Science to



make significant contributions to marine sciences and to provide new ideas and directions for further development of Marine Citizen Science into the future. The working group comprises 12 members, with Carlos García Soto of the Spanish Institute of Oceanography (IEO) and Gro I. van der Meeren of the Institute of Marine Research (IMR), Norway, holding the positions of WG Chair and co-Chair, respectively.

The working group kick-off meeting took place over 18-19 February, hosted by the EMB Secretariat in Ostend, Belgium. Working group discussions focused on the current opportunities and challenges provided by Marine Citizen Science as well as visions for increasing Marine Citizen Science into the future. The working group held its second meeting on 2-3 June at the National University of Ireland (NUI), Galway. Meeting discussions focused on progressing text contributions, identifying gaps and planning the timeline for a publication on Marine Citizen Science. The publication is expected to be completed in early 2017. Updates from the 1<sup>st</sup> European Citizen Science Association (ECSA) Conference, (19-21 May, Berlin) were also provided. The meeting concluded with the working group engaging in Citizen Science through carrying out a coastal survey in Galway Bay under the supervision of Karin Dubsy; International Coordinator of Coastwatch Europe and working group member.



Members of WG Citizen Science at the National University of Ireland, Galway. Picture features from left to right: Niall McDonough (EMB), Jane Delany (Newcastle University, UK), Angel Duarte (meeting guest, Coastwatch Europe), Christine Domegan (NUIG), Gérald Mannaerts (National Natural History Museum, France), Carlos García Soto (IEO), Gro I. van der Meeren (IMR), Karin Dubsy (Trinity College Dublin, Ireland), Gabriel Gorsky (Pierre-and-Marie-Curie University, France), Julia Busch (University of Oldenburg, Germany), Veronica French (EMB).

# DECOMMISSIONING OF OFFSHORE STRUCTURES

Credit: Siemens AG, Munich/Berlin (www.siemens.com/press/en/index.php)



With an estimated 1357 oil and gas structures in the OSPAR maritime area and over 1800 wind structures in the North Sea, the issue of how to manage these structures as they come to the end of their life is of growing environmental, economic, and social concern. Following a presentation made by EMB delegate Jan de Leeuw (NIOZ) at the Spring Plenary 2016 on the INSITE initiative, EMB was eager to produce something on this topic to raise awareness of the issue and what the science community can do to help resolve the problem. Led by Jan de Leeuw, a draft was presented at the Autumn Plenary 2016 and approved as a new EMB activity, with the outcome of a Policy Brief to be published in early 2017. The publication outlines the ecological questions which still need to be answered and highlights the INSITE Programme as a successful Joint

Industry Project. This project seeks to provide all stakeholders with the independent scientific information needed to better understand the effect of man-made structures on the North Sea and its ecosystems, and hence better inform any future decision-making processes.



## Jan de Leeuw

EMB Delegate (NIOZ) and member of the Independent Science Advisory Board (ISAB) for the INSITE programme

- 1. How did you get involved in decommissioning research?** About three years ago I was asked by Ian Boyd from St Andrews University, UK, to become a member of an Independent Science Advisory Board (ISAB) overseeing research related to the influence of man-made structures such as oil- and gas platforms on the North Sea ecosystem. The research program called INSITE (Influence of man-made Structures in the Ecosystem) aims to perform research which will help stakeholders (governments, oil companies, NGO's) to figure out what the best way of decommissioning is, seen from a scientific point of view. The first phase of this program is financed by 8 oil and gas companies who, however, are not involved with the research itself. At this moment 8 international projects are looking at different aspects of the biodiversity related directly to these platforms and whether or not there is connectivity of specific species between the platforms.
- 2. What's the most exciting thing you've learnt or discovered on this subject?** I didn't know too much about the flora and fauna associated with these platforms acting as hard substrates in the middle of sandy sediments before I became a member of ISAB. It came as a big surprise to discover how diverse these platform communities are. Pictures of the structures of these platforms give you the impression that you are in a tropical environment with all kinds of very colourful anemones, mussels, etc., something like a coral type environment. Now that the project is operating I'm very pleased by the intense cooperation between the different research groups. Such an intense collaboration will yield an extra layer of knowledge from the individual results.
- 3. What's the biggest challenge facing this field?** The biggest challenge within this program is to filter out the impact of hard substrates and their diversity in the North Sea ecosystem realizing that there are many other factors determining the changing North Sea ecosystem, such as results of climate change (higher temperatures, acidification, increasing anoxia), pollution, fisheries, etc.
- 4. Does this research include any European collaboration, and if so, who does it involve? If not, is there a need for a European approach?** This first phase of the INSITE program is meant to gather insight on the major processes determining (changes) of biodiversity and connectivity as well as attempts to develop ecosystem models taking into account these hard substrates and connectivity. The future second and third phase is meant to continuously monitor these processes and to further develop ecosystem models in such a way that we can try to predict what the decommissioning of oil- and gas platforms will mean for the ecosystem richness and diversity, also given the fact that other hard substrates such as wind turbines will be installed. This follow up of phase one research will need much more funding and further collaboration. The European Commission could play a major role in this in the years to come.

## THE TICKING TIME BOMB OF CLIMATE CHANGE AND SEA LEVEL RISE

The threats of climate change have been well documented, with reports of record temperatures, a thawing Arctic with younger and thinner Arctic sea ice, and the risk of large calving events as rifts in major Antarctic ice shelves grow. The Intergovernmental Panel on Climate Change (IPCC) was created to provide policymakers with regular



Credit: Shutterstock

assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. In its 5<sup>th</sup> Assessment Report, the IPCC used four different Representative Concentration Pathway (RCP) scenarios to create time-dependent projections of atmospheric greenhouse gas concentrations. However, there are limitations to this method as the projections arbitrarily use the year 2100 as the end point, giving a falsely reassuring impression that the effects beyond 2100 are of lesser importance and that it may be

possible to reverse the effects through later emissions reductions. This issue was raised in a seminal paper published in *Nature Climate Change* by Clark et al. (2016)<sup>1</sup>, which argues that to properly consider the consequences of rising CO<sub>2</sub> levels, scientists need to look forward, not just to the end of this century, but to the next tens to hundreds of thousands of years.

The EMB member organizations agreed that this was an extremely important article that shed light on the insufficient attention by policymakers on the longer term (millennial) impacts of climate change and sea-level rise, and that EMB could add value to the scientific paper by summarizing its key messages in a short, hard-hitting science commentary. The commentary, entitled *'The ticking time bomb of climate change and sea-level rise: Why human actions in the next 10 years can profoundly influence the next 10,000'* will be published in early 2017.

### EMB contribution to EC IPCC SROCC nomination

The EMB Secretariat has been closely following the progress of the International Panel on Climate Change (IPCC) special report on Climate Change and Oceans and the Cryosphere (SROCC), which will integrate information and perspectives across the domains of all three working groups of the IPCC. Both the Directorate-General for Research & Innovation (DG RTD) and the Directorate-General for Maritime Affairs and Fisheries (DG MARE) of the European Commission were very interested in its development and directly requested EMB's advice on ocean and climate change research and a list of experts in response to EC nominations to the Scoping Meeting of SROCC. For the latter, the Secretariat issued a call for experts through delegates in July 2016 and a total of 11 experts were submitted to DG MARE to form part of the EU expert list to be in turn submitted to the IPCC.

<sup>1</sup> Peter U. Clark, Jeremy D. Shakun, Shaun A. Marcott, Alan C. Mix, Michael Eby, Scott Kulp, Anders Levermann, Glenn A. Milne, Patrik L. Pfister, Benjamin D. Santer, Daniel P. Schrag, Susan Solomon, Thomas F. Stocker, Benjamin H. Strauss, Andrew J. Weaver, Ricarda Winkelmann, David Archer, Edouard Bard, Aaron Goldner, Kurt Lambeck, Raymond T. Pierrehumbert and Gian-Kasper Plattner (2016). Consequences of twenty-first century policy for multi-millennial climate and sea-level change. Perspective article in *Nature Climate Change* 6: 360-369. DOI:10.1038/nclimate2923.



## OCEAN OBSERVING



There is a growing recognition of the need to build a comprehensive, end-to-end European Ocean Observing System (EOOS) to coordinate the currently fragmented and complex ocean observing capacity across Europe. This concept was first formally endorsed at the EuroOCEAN 2010 conference where the resulting Ostend Declaration called for policymakers to “Support the development of a truly integrated and sustainable

funded European Ocean Observing System to establish Europe’s global leading role.” EMB has identified Ocean Observing as a strategic area and has developed a number of publications and initiatives to further this area.

### EOOS Parliament event and consultation

EMB has been working closely with EuroGOOS to promote the development and implementation of the European Ocean Observing System (EOOS) concept. A European Parliament event, hosted by MEP Ricardo Serrão Santos, took place on 8 September 2016, to present on EOOS progress. The event brought European policy and decision makers together with the ocean observing community, to engage in a direct dialogue and discussions on needs and ambitions for a strong and integrated European ocean observing capacity.

“Investing in ocean observations is an investment in the future of our planet.”

*Vladimir Ryabinin,  
IOC-UNESCO, EOOS EP Event*

EMB Executive Director, Niall McDonough, presented a draft consultation document entitled ‘Towards an end-to-end, integrated and sustained ocean observing system for Europe’. The consultation document provides further information on why there is a need for such a framework and sets out a definition and vision for EOOS. The document also formed the basis for an open stakeholder consultation that was launched on 12 December 2016 to collect views of the European ocean observing community and wider stakeholders and will be critical to inform any decision-making about a future EOOS.



Speakers at the EOOS Parliament Event. Left: Bernhard Friess (DG MARE), Ricardo Serrão Santos (MEP, Portugal), Vladimir Ryabinin (IOC-UNESCO). Right: from left to right: Jan-Stefan Fritz (KDM), Joaquin Tintore (SOCIB, Spain), Martin Visbeck (GEOMAR), Amanda Bates (NOC), Bernhard Friess (DG MARE), Ricardo Serrão Santos (MEP, Portugal), Vladimir Ryabinin (IOC-UNESCO), Glenn Nolan (EuroGOOS), Niall McDonough (EMB)

### Commissioner Vella meeting with ocean experts

On 8 July 2016, Karmenu Vella, EU Commissioner for Environment, Maritime Affairs and Fisheries, visited the EMB offices in Ostend to meet with EMB Directors to discuss opportunities and challenges for ocean observation and seabed mapping in Europe. To prepare for the discussions, DG MARE requested that EMB conduct a consultation among its members on the societal benefits, critical gaps, investment needs and potential funding sources for ocean observing and seabed mapping in Europe. Responses provided by the EMB member organizations were collated into a single document and discussed initially at a meeting of EMB Directors which took place on 7 July, to ensure key messages that represented the EMB membership could be presented to Commissioner Vella.

The meeting with Commissioner Vella on 8 July was a great success, with all participants agreeing that there needs to be a scaling up in coordination and effort in coastal and ocean observing and mapping, in the widest sense, at European level. The Commission expressed its interest in putting early practical support and funding in place to guide this process, with suggestions including a study on the economic and societal benefits of ocean observing and seabed mapping. The Commission will also consider ways of establishing an Ocean Observing/Mapping Forum, the results of which could be presented at the Our Ocean Conference which will take place in Malta on 5-7 October 2017.



Participants of the meeting between Commissioner Vella and EMB Directors, Ostend, 8 July 2016. Picture features from left to right, top row: Veronica French (EMB), Marco Weydert (DG RTD), András Inotai (Commissioner's team), Eduardo Balguerías Guerra (IEO), Janusz Pempkowiak (IO-PAN), Peter Heffernan (Marine Institute), François Jacq (IFREMER), Bernhard Friess (DG MARE), Iain Shepherd (DG MARE), Karen Donaldson (EMB). Bottom Row: Henk Brinkhuis (NIOZ), Alessandro Crise (OGS), Niall McDonough (EMB), Karen Wiltshire (AWI), Karmenu Vella (Commissioner Environment, Maritime Affairs and Fisheries), Jan Mees (FWO, EMB Chair), Mark James (MASTS), Peter Pissierssens (IOC-UNESCO).

# European projects

Sea Change is an EU Horizon 2020-funded project (Blue Growth Call 2013-2014) on the topic of Ocean Literacy. The overarching goal of Sea Change is to raise European citizens' awareness of the intrinsic links between the ocean and human health, and to empower the general public, as Ocean Literate citizens, to take direct and sustainable action towards a healthy ocean and seas, healthy communities and ultimately a healthy planet. Coordinated by the Marine Biological Association, UK, the project consortium comprises 17 European and international organizations. To meet its objectives, the Sea Change partnership is designing Ocean Literacy related activities and materials focused on education, community, and governance actors, and directly targeted at citizens.



After one year of activity, the Sea Change project held its first General Assembly meeting on 11–13 May 2016 in Athens where the partnership discussed progress to date and future plans together with the Sea Change International Advisory Group. EMB holds



a place on the Sea Change steering group and leads one of the nine project work packages. During 2016, EMB completed all deliverables associated with the EMB-led work package, which focused on reviewing aspects of Ocean Literacy and providing communication materials to be used throughout the project. One of the key deliverables completed during 2016 was an animation and an accompanying set of factsheets. These explore the

links between human health and the ocean by highlighting five areas in which the ocean can and does impact on our health and wellbeing, and provides suggestions of 'ocean-friendly' actions that can be taken in each area. The five areas addressed were: climate regulation, food, pollution, medicine, and the blue gym effect. The purpose of these resources is to raise awareness that the marine environment, its structure and processes have a major bearing on current and future human health and wellbeing and that we all share the responsibility of looking after the ocean.

During 2016, the EMB also contributed to a review of science-policy interfaces in international and European marine policy and has carried out consultations with policy actors as part of a marine governance work package. As part of the consultations, EMB were responsible for conducting interviews with two high-level policymakers, and for each interview a summary report was produced, based on the recordings, and a fuzzy cognitive map was produced. In addition, EMB provided written reflections on the process involved in carrying out this task.



The EMB deliverables are available on the Sea Change project website at [www.seachangeproject.eu](http://www.seachangeproject.eu).



# AtlantOS

EMB are partners in the EU Horizon 2020 AtlantOS project (Optimizing and Enhancing the Integrated Atlantic Ocean Observing System). During 2016 EMB attended the second AtlantOS general assembly in Kiel, Germany, where over 160 scientists from Europe, North America, South America, and Africa met to discuss the ongoing activities within each Work Package. The main component of EMB work in AtlantOS begins in 2017.



Further information on AtlantOS and EMB's role in conducting a foresight review on ocean observation governance in the context of the European Ocean Observing System (Task 10.6, WP10) is available on the AtlantOS project website at: [www.atlantos-h2020.eu](http://www.atlantos-h2020.eu)



AtlantOS project partners attending the second Annual Meeting (28-30 June, Kiel)

# EMB panels

## EUROPEAN SCIENTIFIC DIVING PANEL

Since 2008, the European Marine Board's European Scientific Diving Panel (ESDP) has acted as a European operational platform to advance underwater scientific excellence and to promote and implement a practical support framework for scientific diving related activities.



During 2016, the ESDP was reviewed as part of EMB's periodic panel review that takes place every 4 years. It was agreed that since its establishment, ESDP had already achieved advanced progress through production of consultation documents and guidelines. The Review Committee concluded that it was timely for the EMB to phase out its support for the ESDP by the Spring Plenary in 2017.

Two ESDP Panel meetings took place during 2016, where the discussion focused on updating the ESDP Consultation Document, which outlines the competencies to become a certified (Advanced) European Scientific Diver (ESD/AESD), and the future of ESDP as an independent entity. During the December meeting, ESDP welcomed new Chair Jean-Pierre Feral (CNRS), who represents the French National Committee for Scientific Diving, and new associate membership from Bulgaria (IBER).



Members of ESDP at the meeting in Sweden, 12 May 2016. Picture features from left to right: Maria Asplund (Sven Lovén Centre, Sweden), Alain Norro (RBINS, Belgium), Jean-Pierre Feral (CNRS), Mats Walday (NIVA, Norway), Maria Salomidi (HCMR), Dimitar Berov (IBER, Bulgaria), Massimo Ponti (UBO, Italy), Martin Sayer (SAMS, ESDP Chair), Jouni Leinikki (FSDSA, Finland), Karen Donaldson (EMB), Eva Turicchia (UBO, Italy).



## UNIVERSITY CONSORTIUM PANEL

Due to the growing membership within EMB of Higher Education Institution (HEIs) consortia, the University Consortium Panel (UCP) was created to explore areas of mutual interest with regards to both research and education in the broadest sense. Some of the initial key objectives of the Panel include: establishing a forum within which HEI consortia that exist or are in development can meet, identifying and sharing best practice with respect to the governance and operation of these consortia, identifying and sharing opportunities for HEI consortia to collaborate across the EU or internationally, actively seeking to secure resources and funding to support graduate student and specifically PhD student training, promoting each other's consortia both nationally and internationally, and identifying where the respective resources and networks that exist within these consortia can add value to existing and future EMB activities.

After a kick-off meeting at the Spring 2016 plenary meeting, the UCP became an official EMB panel at the Autumn 2016 plenary meeting with 6 members. The UCP meets twice a year following each plenary meeting.



Members of UCP at the meeting in Glasgow, 20 October. Picture features from left to right, top row: Niall McDonough (EMB), Artūras Razinkovas-Baziukas (Klaipeda University), Lisandro Benedetti-Cecchi (CoNISMa), Yves-Marie Paulet (Marine Universities of France), Jeremy Gault (IMUC) Bottom row: Lois Calder (MASTS), Mark James (MASTS; UCP Chair), Karen Donaldson (EMB), Dominique Simon (Marine Universities of France).

## EUROPEAN MARINE BOARD COMMUNICATION PANEL

The European Marine Board Communications Panel (EMBCP) provides a pan-European platform for marine science communicators to promote European Marine Board activities, to synergize outreach activities and to advocate Ocean Literacy.



During 2016, the EMBCP was reviewed as part of EMB's periodic panel review that takes place every 4 years. Considering the strategic importance to EMB of marine science communication, the Review Committee recommended that the EMBCP be invited to become a permanent EMB panel, dependent on the panel fulfilling a number of conditions, one of which is putting in place a steering committee to assist the Chair and share responsibility for progressing the Panel's work. The EMBCP also welcomed two new members during 2016, from the Marine Universities

of France, France, and the National Oceanography Centre (NOC), UK.

A major activity of the EMBCP throughout 2016 was the organization of CommOCEAN 2016, the 2<sup>nd</sup> International Marine Science Communication Conference. The 1<sup>st</sup> International Marine Science Communication Conference, was launched by EMBCP and organized in the first instance by its Portuguese partners (CIIMAR, Ciencia Viva) in Porto in 2014. Co-organized by the EMBCP, together with EMB, the IODE Project Office for IOC-UNESCO and the Flanders Marine Institute (VLIZ), Belgium, CommOCEAN 2016 took place on 6-7 December 2016 in Bruges, Belgium. Targeting marine scientists and communicators, the programme promoted the exchange of good practice in modern ocean science communication, dissemination and outreach, as well as learning about current marine science research. The conference programme comprised four major sessions: the fundamentals of science communication/ reaching out to the public, optimizing impact, social media and graphics, and thinking out of the box, new formats and creativity.

Further information on CommOCEAN 2016 is available on the conference website at [www.commocean.org](http://www.commocean.org)



Members of EMBCP at the meeting in Poland, 26 April 2016. Picture features from left to right, top row: Jan Marcin Węśławski (IO-PAN), Ferdinando Boero (CoNISMa), Lucy Calvert (NOC), Sigrid Maebe (RBINS, Belgium), Joana Saiote (CIIMAR), Dominique Simon (Marine Universities of France), Marco Faimali (ISMAR-CNR, Italy). Middle row: Joanna Piwowarczyk (IO-PAN), Andreas Villwock (GEOMAR, Germany), Thomas Isaak (IFREMER), Line Reeh (DTU Aqua), Veronica French (EMB), Lisa Fitzpatrick (Marine Institute). Bottom row: Jan Seys (VLIZ, Belgium; EMBCP Chair).





# Communication and outreach

The European Marine Board uses a variety of channels to reach its stakeholders, including disseminating publications at conferences, media campaigns for EMB events, and online outlets including a twitter feed and website.

In 2016, the European Marine Board twitter account gained 870 new followers, more than doubling the total number to 1813. The account had 6796 profile visits, with a monthly average of 566. The twitter feed is used to announce and promote EMB activities, as well as highlight updates from the marine science community. Two EMB activities that were particularly successfully promoted through Twitter were Sea Change and its respective deliverables, and the CommOCEAN conference.

The twitter feed was also successfully used to communicate with other networks and individual stakeholders. The feed allowed EMB to instantly update member organizations and stakeholders on the events the Secretariat were attending.

The website is regularly updated with information on the expert working groups, EMB strategic areas, and the EU projects that EMB is involved in. All of EMB's publications are also available to download from the website free of charge.

In 2016, the website was visited almost 79,500 times, with over 49,000 unique visitors from over 100 countries. The top three documents downloaded were the Ocean Climate Nexus statement, the Marine Board Special Report on Climate Change and Marine Ecosystem Research (CLAMER), and position paper 22 'Delving Deeper: Critical challenges for 21<sup>st</sup> century deep-sea research' with 2,800 downloads combined.

Twitter: 1813 followers





# Finances

The EMB annual budget is based on income from member organization contributions and external contracts, e.g. EU framework projects. The Flemish Government of Belgium provides an in-kind contribution to the EMB Secretariat through the provision of office space, running costs and equipment at the InnovOcean site in Ostend, as well as the employment cost of one Secretariat staff member. Member organizations also provide in-kind contribution through support for participation of national experts in EMB activities, i.e. travel and subsistence to attend meetings.

Up until the end of 2016, the European Science Foundation (ESF) provided the legal entity to EMB, this included the operation service support on financial matters. Due to the separation from ESF starting in 2016, EMB IVZW had started its own bookkeeping at the end of 2016. The figures provided below represent an aggregation of the ESF and the EMB IVZW accounts in order to give a representative overview of the 2016 income and expenditure.

| <b>AVAILABLE FUNDS 2016 – ESF + EMB IVZW</b>   | <b>EUR</b>     |
|--|----------------|
| <b>Member Contributions<sup>1</sup></b>  | 384.000        |
| <b>FP drawdown on employment costs (estimate)</b><br>Staff time related to the external projects | 62.804         |
| <b>Total available funds 2016</b>  | <b>446.804</b> |

| <b>EXPENDITURE 2016 – ESF + EMB IVZW</b>                   | <b>EUR</b>     |
|--|----------------|
| <b>Secretariat employment costs</b>                        | 277.247        |
| <b>Meeting costs</b><br>Staff travel and meeting logistics | 20.306         |
| <b>Publication and dissemination</b>                       | 6.480          |
| <b>Running expenses</b>                                    | 17.267         |
| <b>Business consultancy and separation costs</b>           | 37.882         |
| <b>ESF overhead costs</b>                                  | 31.120         |
| <b>Total</b>   | <b>390.302</b> |

|                                       |                |
|---------------------------------------|----------------|
| <b>Total Balance 2016<sup>2</sup></b> | <b>+56.502</b> |
|---------------------------------------|----------------|

<sup>1</sup> This number does not include the MASTS Membership contribution for 2016 (17.000 EUR) which was paid in full in 2015.

<sup>2</sup> Any further carry over from ESF to EMB IVZW cannot be calculated at the moment as ESF is currently in the process of finalizing the EMB transfer accounts.

# Annexes

# ANNEX 1:

## Marine Board member organizations, delegates and alternates

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### BELGIUM

Belgian Science Policy Office (BELSPO)  
*David Cox*

Fonds National de la Recherche Scientifique (FNRS)  
National Fund for Scientific Research  
*Jean-Marie Beckers*

Fonds voor Wetenschappelijk Onderzoek -  
Vlaanderen (FWO)  
The Research Foundation - Flanders  
*Jan Mees (Chair)*  
*Tina Mertens*

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### CROATIA

Institut za oceanografiju i ribarstvo (IZOR)  
Institute of Oceanography and Fisheries  
*Ivica Vilibic*

Institut Ruđer Bošković (IRB)  
Ruđer Bošković Institute  
*Robert Precali*

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### DENMARK

Institut for Akvatiske Ressourcer (DTU Aqua)  
National Institute for Aquatic Resources  
*Fritz Köster*  
*Kirsten Thomsen*

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### ESTONIA

Eesti Teaduste Akadeemia  
Estonian Academy of Sciences  
*Tarmo Soomere (vice-Chair)*

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### FRANCE

Centre National de la Recherche Scientifique  
(CNRS)  
National Centre for Scientific Research  
*Jean-Marie Flaud*

Institut Français de Recherche pour l'Exploitation  
de la Mer (IFREMER)  
French Research Institute for Exploitation of the Sea  
*Gilles Lericolais (vice-Chair)*

Universités Marines  
Marine Universities of France  
*Yves-Marie Paulet*  
*Jean-Alain Pocard*  
*Dominique Simon*

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### GERMANY

Konsortium Deutsche Meeresforschung (KDM)  
German Marine Research Institute  
*Jan-Stefan Fritz (vice-Chair)*  
*Rolf Peinert*

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### GREECE

Ελληνικό Κέντρο Θαλάσσιων Ερευνών (HCMR)  
Hellenic Centre for Marine Research  
*Vasilios Lykousis*

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### IRELAND

Marine Institute  
*Fiona Grant*  
*Michael Gillooly*

Irish Marine Universities Consortium  
*Jeremy Gault*  
*Anthony Grehan*  
*Colin Brown*

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### ITALY

Consiglio Nazionale delle Ricerche (CNR)  
National Research Council  
*Enrico Brugnoli*

Istituto Nazionale di Oceanografia e di Geofisica  
Sperimentale (OGS)  
National Institute of Oceanography and Experimental  
Geophysics  
*Alessandro Crise (vice-Chair)*

Consorzio Nazionale Interuniversitario per le  
Scienze del Mare (CoNISMa)  
National Inter-University Consortium for Marine  
Sciences  
*Ferdinando Boero*

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### LITHUANIA

Klaipeda University  
*Artūras Razinkovas-Baziokas*

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### THE NETHERLANDS

Nederlandse Organisatie voor Wetenschappelijk  
Onderzoek (NWO)  
Netherlands Organisation for Scientific Research  
*Josef F. Stuefer*

Koninklijk Nederlands Instituut voor Onderzoek  
der Zee  
Royal Netherlands Institute for Sea Research (NIOZ)  
*Jan de Leeuw*  
*Henk Brinkhuis*

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## NORWAY

Havforskningsinstituttet  
Institute of Marine Research (IMR)  
*Erlend Moksness (vice-Chair)*  
*Tore Nepstad*

Norges forskningsrad  
Research Council of Norway (RCN)  
*Lars Horn*

Universitetet i Bergen (UiB)  
Marine Strategic Board | University of Bergen  
*Kikki Flesche Kleiven*

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## POLAND

Instytut Oceanologii Polskiej Akademii Nauk  
(IO-PAN)  
Institute of Oceanology of the Polish Academy of  
Sciences  
*Slawomir Sagan*

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## PORTUGAL

Centro de Investigação Marinha e Ambiental  
(CIMAR)  
Centre of Marine and Environmental Research  
*Vitor Vasconcelos*

Fundação para a Ciência e a Tecnologia (FCT)  
Foundation for Science and Technology  
*Mario Ruivo*

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## ROMANIA

Institutul National de Cercetare - Dezvoltare  
Marina "Grigore Antipa"  
National Institute for Marine Research and  
Development "Grigore Antipa"  
*Vasile Patrascu*

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## SPAIN

Instituto Espanol de Oceanografia (IEO)  
Spanish Institute of Oceanography  
*Carlos Garcia Soto*

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## TURKEY

Türkiye Bilimsel ve Teknik Arastirma Kurumu  
(TUBITAK)  
Scientific and Technological Research Council of  
Turkey  
*Leyla Tolun*

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## UNITED KINGDOM

Marine Alliance for Science and Technology  
Scotland (MASTS)  
*Mark James (vice Chair)*  
*David Paterson*

National Oceanography Centre (NOC)  
*Edward Hill*

Natural Environment Research Council (NERC)  
*Stephen Hill*  
*Mike Webb*



## ANNEX 2: Secretariat

### **Permanent team:**

Niall McDonough, Executive Director

Kate Larkin, Senior Science Officer

Nan-Chin Chu, Science Officer (until 16 September 2016)

Veronica French, Science Officer (until 30 November 2016)

Paula Kellett, Science Officer (from 21 November 2016)

Karen Donaldson, Scientific Administrator

## ANNEX 3: Participants of EMB plenary meetings 2016

### Spring 2016 Plenary Meeting, 27-28 April 2016, Sopot, Poland

#### EMB DELEGATES

| Representative                     | Member Organization   |
|------------------------------------|---|
| <b>JAN MEES</b> – CHAIR            | Research Foundation – Flanders (FWO), Belgium                               |
| <b>FERDINANDO BOERO</b>            | National Inter-University Consortium for Marine Sciences (CoNISMa), Italy   |
| <b>LUCY CALVERT</b>                | National Oceanography Centre (NOC), UK                                      |
| <b>ALESSANDRO CRISE</b>            | National Institute of Oceanography and Experimental Geophysics (OGS), Italy |
| <b>ALEXANDRA DROSSOU-BERENDES</b>  | Helmholtz Association of National Research Centres (GEOMAR), Germany        |
| <b>JAN DE LEEUW</b>                | Royal Netherlands Institute for Sea Research (NIOZ), Netherlands            |
| <b>JEAN-MARIE FLAUD</b>            | National Center for Scientific Research (CNRS), France                      |
| <b>CARLOS GARCÍA SOTO</b>          | Spanish Institute of Oceanography (IEO), Spain                              |
| <b>FIONA GRANT</b>                 | Marine Institute (MI), Ireland  |
| <b>JEREMY GAULT</b>                | Irish Marine Universities Consortium (IMUC), Ireland                        |
| <b>LARS HORN</b>                   | Research Council of Norway (RCN), Norway                                    |
| <b>MARK JAMES</b>                  | The Marine Alliance for Science and Technology for Scotland (MASTS), UK     |
| <b>KIKKI KLEIVEN</b>               | University of Bergen (UIB), Norway  |
| <b>GILLES LERICOLAIS</b>           | French Research Institute for Exploitation of the Sea (Ifremer)             |
| <b>PATRIZIO MARIANI</b>            | National Institute of Aquatic Resources (DTU Aqua), Denmark                 |
| <b>ERLEND MOKSNESS</b>             | Institute of Marine Research (IMR), Norway                                  |
| <b>ROBERT PRECALI</b>              | Rudjer Bošković Institute (IRB), Croatia                                    |
| <b>ARTŪRAS RAZINKOVAS-BAZUIKAS</b> | Klaipeda University, Lithuania  |
| <b>MARIO RUIVO</b>                 | Foundation for Science and Technology (FCT), Portugal                       |
| <b>SLAWOMIR SAGAN</b>              | Institute of Oceanology of the Polish Academy of Sciences (IO-PAN), Poland  |
| <b>TARMO SOOMERE</b>               | Estonian Academy of Sciences, Estonia                                       |
| <b>IVICA VILIBIC</b>               | Institute of Oceanography and Fisheries (IZOR), Croatia                     |

## OBSERVERS, SPEAKERS AND GUESTS

| Representative    | Organization   |
|-------------------|--|
| ALAN DEIDUN       | University of Malta, Malta   |
| NED DWYER         | EurOcean   |
| PATRIZIO MARIANI  | EuroMarine   |
| KSENIA PAZDRO     | Institute of Oceanology of the Polish Academy of Sciences (IO-PAN), Poland |
| JANUSZ PEMPKOWIAK | Institute of Oceanology of the Polish Academy of Sciences (IO-PAN), Poland |
| JAN SEYS          | Flanders Marine Institute (VLIZ), Belgium (EMBCP CHAIR)                    |
| KAREN WILTSHIRE   | Partnership for Observation of the Global Oceans (POGO)                    |

## EMB SECRETARIAT

| NAME            |                        |
|-----------------|------------------------|
| NIALL MCDONOUGH | EMB Executive Director |
| NAN-CHIN CHU    | EMB Secretariat        |
| KAREN DONALDSON | EMB Secretariat        |
| VERONICA FRENCH | EMB Secretariat        |

## Autumn 2016 Plenary Meeting, 19-20 October 2016, Glasgow, UK

### EMB DELEGATES

| Representative                     | Member Organization   |
|------------------------------------|---|
| <b>JAN MEES</b> – CHAIR            | Research Foundation – Flanders (FWO), Belgium                               |
| <b>LISANDRO BENEDETTI-CECCHI</b>   | National Inter-University Consortium for Marine Sciences (CoNISMa), Italy   |
| <b>FERDINANDO BOERO</b>            | National Inter-University Consortium for Marine Sciences (CoNISMa), Italy   |
| <b>ALAN EVANS</b>                  | Natural Environment Research Council (NERC), UK                             |
| <b>JAN DE LEEUW</b>                | Royal Netherlands Institute for Sea Research (NIOZ), Netherlands            |
| <b>JAN-STEFAN FRITZ</b>            | German Marine Research Consortium (KDM), Germany                            |
| <b>CARLOS GARCÍA SOTO</b>          | Spanish Institute of Oceanography (IEO), Spain                              |
| <b>JEREMY GAULT</b>                | Irish Marine Universities Consortium (IMUC), Ireland                        |
| <b>FIONA GRANT</b>                 | Marine Institute (MI), Ireland  |
| <b>ANTHONY GREHAN</b>              | Irish Marine Universities Consortium (IMUC), Ireland                        |
| <b>ED HILL</b>                     | National Oceanography Centre (NOC), UK                                      |
| <b>LARS HORN</b>                   | Research Council of Norway (RCN), Norway                                    |
| <b>MARK JAMES</b>                  | The Marine Alliance for Science and Technology for Scotland (MASTS), UK     |
| <b>KIKKI KLEIVEN</b>               | University of Bergen (UIB), Norway  |
| <b>GILLES LERICOLAIS</b>           | French Research Institute for Exploitation of the Sea (Ifremer)             |
| <b>MÁRCIA MARQUES</b>              | Foundation for Science and Technology (FCT), Portugal                       |
| <b>ERLEND MOKSNESS</b>             | Institute of Marine Research (IMR), Norway                                  |
| <b>DAVID PATERSON</b>              | The Marine Alliance for Science and Technology for Scotland (MASTS), UK     |
| <b>YVES-MARIE PAULET</b>           | Universités Marines (UM), France  |
| <b>ROBERT PRECALI</b>              | Ruđer Bošković Institute (IRB), Croatia                                     |
| <b>ARTŪRAS RAZINKOVAS-BAZIUKAS</b> | Klaipeda University, Lithuania  |
| <b>SLAWOMIR SAGAN</b>              | Institute of Oceanology of the Polish Academy of Sciences (IO-PAN), Poland  |
| <b>DOMINIQUE SIMON</b>             | Marine University of France, France   |
| <b>COSIMO SOLIDORO</b>             | National Institute of Oceanography and Experimental Geophysics (OGS), Italy |
| <b>TARMO SOOMERE</b>               | Estonian Academy of Sciences, Estonia                                       |
| <b>ELENA STOICA</b>                | National Institute for Marine Research and Development (RMRI), Romania      |
| <b>LEYLA TOLUN</b>                 | Scientific and Technological Research Council of Turkey (TUBITAK), Turkey   |
| <b>IVICA VILIBIC</b>               | Institute of Oceanography and Fisheries (IZOR), Croatia                     |



## OBSERVERS, SPEAKERS AND GUESTS

| <b>Representative</b> | <b>Organization</b>                           |
|-----------------------|---|
| <b>LISA ALMESJÖ</b>   | The Swedish Research Council (Formas), Sweden |
| <b>DAVID MILLS</b>    | University of Bangor, UK                      |
| <b>IAIN SHEPHERD</b>  | DG MARE                                       |
| <b>MARCO WEYDERT</b>  | Marine Resources Unit, DG RTD                 |
| <b>JACKY WOOD</b>     | JPI Oceans                                    |
| <b>MURRAY ROBERTS</b> | University of Edinburgh                       |
| <b>BETH SCOTT</b>     | University of Aberdeen                        |

## EMB SECRETARIAT

### NAME

|                        |                        |
|------------------------|------------------------|
| <b>NIALL MCDONOUGH</b> | EMB Executive Director |
| <b>KAREN DONALDSON</b> | EMB Secretariat        |
| <b>VERONICA FRENCH</b> | EMB Secretariat        |

## ANNEX 4: Working group members 2016

### Working Group Citizen Science

#### Working Group Members:

- Carlos García Soto, Spanish Institute of Oceanography (IEO), Spain – WG Chair
- Gro I. van der Meeren, Institute of Marine Research (IMR), Norway – WG co-Chair
- Oliver Zielinski, University of Oldenburg, Germany
- Jan Marcin Węśławski, Institute of Oceanology of the Polish Academy of Sciences (IO-PAN), Poland
- Karin Dubsy, Trinity College Dublin, Ireland
- Gérald Mannaerts, National Natural History Museum, France
- Jan Seys, Flanders Marine Institute (VLIZ), Belgium
- Christine Domegan, National University of Ireland, Galway, Ireland
- Karen von Juterzenka, University of Kiel, Germany
- Jane Delany, Newcastle University, UK
- Gabriel Gorsky, Pierre-and-Marie-Curie University, France
- Francesca Malfatti, National Institute of Oceanography and Experimental Geophysics (OGS), Italy

#### EMB Secretariat Support:

Science Officer: Veronica French

Manager: Niall McDonough

## ANNEX 5: Panel members 2016

### European Marine Board Communications Panel (EMBCP)

#### Panel Members:

- Jan Seys, Flanders Marine Institute (VLIZ), Belgium - Panel Chair
- Ferdinando Boero, National Inter-University Consortium for Marine Sciences (CoNISMa), Italy
- Jan Boon, Royal Netherlands Institute for Sea Research (NIOZ), The Netherlands
- Anne Ditlefsen, Research Council of Norway (RCN), Norway
- Marco Faimali, National Research Council, Institute of Marine Sciences (ISMAR-CNR), Italy
- Géraldine Fauville, University of Gothenburg, Sweden
- Lisa Fitzpatrick, Marine Institute, Ireland
- Anouck Hubert, European Institute for Marine Studies (IUEM), France
- Thomas Isaak, French Research Institute for Exploitation of the Sea (IFREMER), France
- Sigrid Maebe, Royal Belgian Institute of Natural Sciences (RBINS), Belgium
- Kjartan Mæstad, Institute of Marine Research (IMR), Norway
- Lucy Calvert, National Oceanography Centre (NOC), United Kingdom
- Martha Papathanassiou, Hellenic Centre for Marine Research (HCMR), Greece
- Francesca Petrera, National Institute of Oceanography and Experimental Geophysics (OGS), Italy
- Joanna Piwowarczyk, Institute of Oceanology of the Polish Academy of Sciences (IO-PAN), Poland
- Line Reeh, National Institute of Aquatic Resources (DTU Aqua), Denmark
- Ralf Roechert, Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI), Germany
- Joana Saiote, Centre of Marine and Environmental Research (CIIMAR), Portugal
- Andreas Villwock, Helmholtz Association of National Research Centres (GEOMAR), Germany

#### EMB Secretariat Support:

Veronica French and Karen Donaldson

## European Scientific Diving Panel (ESDP)

### Panel Members:

- Martin Sayer, National Environment Research Council (NERC), United Kingdom - Panel Chair
- Jean-Pierre Feral, National Centre for Scientific Research (CNRS), France
- Philipp Fisher, Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI), Germany
- Giorgio Caramanna, Italian Association of Scientific Divers (AIOSS), Italy
- Jouni Leinikki, Finnish Scientific Diving Steering Association, Finland
- Maria Asplund, Sven Loven Center for Marine Research, Sweden
- Alain Norro, Management Unit of the North Sea Mathematical Models (MUMM) - Royal Belgian Institute of Natural Sciences (RBINS), Belgium
- Pedro Neves, APorMC - Portuguese Scientific Diving Association, Portugal
- Iliia Krastev, Bulgarian National Association of Underwater Activity and Institute of Oceanology, Bulgaria (Associate Member)

### EMB Secretariat Support:

Karen Donaldson

## University Consortiums Panel (UCP)

### Panel Members:

- Mark James, Marine Alliance for Science and Technology for Scotland (MASTS), United Kingdom - Panel Chair
- Yves-Marie Paulet, Marine Universities of France, France
- Dominique Simon, Marine Universities of France, France
- Lisandro Benedetti-Cecchi, National Inter-University Consortium for Marine Sciences (CoNISMa), Italy
- Ferdinando Boero, National Inter-University Consortium for Marine Sciences (CoNISMa), Italy
- Kikki Kleiven, University of Bergen (UIB), Norway
- Artūras Razinkovas-Baziukas, Klaipeda University, Lithuania
- Jeremy Gault, Irish Marine Universities Consortium (IMUC), Ireland
- Anthony Grehan, Irish Marine Universities Consortium (IMUC), Ireland

### EMB Secretariat Support:

Karen Donaldson and Niall McDonough



## ANNEX 6: Meetings and events organized in 2016 (including jointly)

| Date          | Event and Venue  |
|---------------|--|
| 20/01/2016    | EMB Panel Review, Brussels   |
| 20/01/2016    | Establishment of EMB-IVZW, Brussels  |
| 21/01/2016    | EMB ExCom, Brussels  |
| 18-19/02/2016 | EMB WG Citizen Science Kick off Meeting, Ostend  |
| 25-26/04/2016 | EMBCP Meeting, Sopot   |
| 26/04/2016    | EMB ExCom, Sopot   |
| 27-28/04/2016 | EMB Plenary Meeting, Sopot   |
| 28/04/2016    | EMB UCP Kick-off Meeting, Sopot  |
| 12/05/2016    | 16 <sup>th</sup> ESDP Panel Meeting, Kristineburg  |
| 02-03/06/2016 | EMB WG Citizen Science 2 <sup>nd</sup> Meeting, Galway   |
| 09/06/2016    | Meeting with DG RTD, Director of Bioeconomy, John Bell, and Head of Marine Resources Unit, Sigi Gruber, Brussels |
| 09/06/2016    | Meeting with JPI Oceans, Brussels  |
| 28-29/06/2016 | Meeting of new consortium bidding for Horizon 2020 funds on Oceans and Human Health (SOPHIE proposal), Ostend    |
| 07/07/2016    | Meeting of EMB Directors, Ostend   |
| 08/07/2016    | Meeting with Commissioner Vella, Ostend  |
| 15/09/2016    | EOOS Steering Group Meeting, Brussels  |
| 18/10/2016    | EMB ExCom, Glasgow   |
| 19-20/10/2016 | EMB Plenary Meeting, Glasgow   |
| 06-07/12/2016 | CommOCEAN Conference, Bruges   |
| 08/12/2016    | EMBCP Meeting, Ostend  |
| 20/12/2016    | 17 <sup>th</sup> ESDP Panel Meeting, Brussels  |

## ANNEX 7:

### Presentations to meetings by EMB Secretariat, ExCom and WG members in 2016

| Date          | Event and Venue  | Speaker(s)      |
|---------------|--|-----------------|
| 27-29/01/2016 | EuroMarine General Assembly, Olhao   | Niall McDonough |
| 24/02/2016    | SCAR-fish Meeting, Brussels  | Niall McDonough |
| 02/03/2016    | Meeting of Commissioner Vella with Ocean Research Directors + Networks, Brussels | Niall McDonough |
| 25-26/04/2016 | EMBCP Meeting, Sopot   | Veronica French |
| 08/09/2016    | EOOS European Parliament Event, Brussels   | Niall McDonough |
| 12-13/09/2016 | 70 Years of World Ocean Research, Moscow   | Jan Mees        |
| 12-13/09/2016 | Blue Economy Business and Science Forum, Hamburg                                 | Niall McDonough |
| 16/11/2016    | Fórum Oceano Business2Sea, Porto   | Niall McDonough |
| 17/11/2016    | Campus Do Mar International Science Conference, Vila Real                        | Niall McDonough |
| 01/12/2016    | Marine Universities of France General Assembly, Paris                            | Niall McDonough |
| 06-07/12/2016 | CommOCEAN Conference, Bruges   | Niall McDonough |
| 08/12/2016    | EMBCP Meeting, Ostend  | Karen Donaldson |
| 20/12/2016    | ESDP Panel Meeting, Brussels   | Karen Donaldson |

## ANNEX 8: Member contributions 2016

| EMB Member  | Country     | Contribution<br>2016 / € |
|---|-------------|--------------------------|
| National Centre for Scientific Research, CNRS                           | France      | 17.000                   |
| French Research Institute for Exploitation of the Sea, IFREMER          | France      | 17.000                   |
| Marine Universities of France   | France      | 17.000                   |
| German Marine Research Consortium, KDM                                  | Germany     | 17.000                   |
| Helmholtz Association of National Research Centres (GEOMAR)             | Germany     | 17.000                   |
| National Research Council, CNR  | Italy       | 17.000                   |
| National Institute of Oceanography and Experimental Geophysics, OGS     | Italy       | 17.000                   |
| National Inter-University Consortium for Marine Sciences, CoNISMa       | Italy       | 17.000                   |
| Natural Environment Research Council, NERC (+ NOC)                      | UK          | 34.000                   |
| Marine Alliance of Science and Technology Scotland, MASTS*              | UK          | 17.000                   |
| National Fund for Scientific Research, FNRS                             | Belgium     | 12.000                   |
| The Research Foundation - Flanders, FWO                                 | Belgium     | 12.000                   |
| Belgian Science Policy Office, BELSPO                                   | Belgium     | 12.000                   |
| National Institute for Aquatic Resources, DTU Aqua                      | Denmark     | 12.000                   |
| Marine Institute  | Ireland     | 12.000                   |
| Irish Marine Universities Consortium, IMUC                              | Ireland     | 12.000                   |
| Netherlands Organisation for Scientific Research, NWO                   | Netherlands | 12.000                   |
| Royal Netherlands Institute for Sea Research, NIOZ                      | Netherlands | 12.000                   |
| University of Bergen, UiB   | Norway      | 12.000                   |
| Research Council of Norway, RCN (+IMR)                                  | Norway      | 24.000                   |
| Spanish Institute of Oceanography, IEO                                  | Spain       | 12.000                   |
| Estonian Academy of Sciences  | Estonia     | 8.000                    |
| Hellenic Centre for Marine Research, HCMR                               | Greece      | 8.000                    |
| Klaipeda University   | Lithuania   | 8.000                    |
| Institute of Oceanology of the Polish Academy of Sciences, IO-PAN       | Poland      | 8.000                    |
| Foundation for Science and Technology, FCT                              | Portugal    | 8.000                    |
| Centre of Marine and Environmental Research, CIIMAR                     | Portugal    | 8.000                    |
| National Institute for Marine Research and Development "Grigore Antipa" | Romania     | 8.000                    |
| Scientific and Technological Research Council of Turkey, TUBITAK        | Turkey      | 8.000                    |
| Institute of Oceanography and Fisheries, IZOR                           | Croatia     | 3.000                    |
| Ruđer Bošković Institute, IRB   | Croatia     | 3.000                    |
| <b>Total Call for Contributions 2016</b>                                |             | <b>€ 401.000</b>         |

\* MASTS Membership contributions for 2016 and 2017 were fully paid in 2015

## ANNEX 9:

### Full list of EMB publications

#### PUBLICATIONS IN 2016:

- McDonough, N., Donaldson, K., Chu, N.C., French, V. & Larkin, K. **European Marine Board Annual Report 2015**. European Marine Board, Ostend, Belgium. 2016. ISBN: 978-94-920432-5-2, 58pp
- Legat, A., French, V., & McDonough, N. (2016). **An economic perspective on oceans and human health**. Journal of Marine Biological Association of the United Kingdom, Special Issue: Oceans and Human Health, **96** (1), 13-17. doi:10.1017/S0025315415001319
- McDonough, N. **Climate Change: Ignore the ocean at your peril**. Adjacent Government. February 1 2016. Available at: <http://www.adjacentopenaccess.org/lg-edition-009/climate-change-ignore-ocean-peril/24112/>
- European Marine Board and EuroGOOS. **EOOS: Towards an end-to-end, integrated and sustained ocean observing system for Europe**. EOOS Consultation Document, Brussels, Belgium. 2016.
- **A United Front in Ocean Observation**, Marine Technology News, October 3 2016, N. McDonough, Contributing Author. Available at: <http://www.marinetechologynews.com/news/united-front-ocean-observation-539385>

#### POSITION PAPERS:

- Rogers A.D. *et al.* (2015) **Delving Deeper: Critical challenges for 21<sup>st</sup> century deep-sea research**. European Marine Board Position Paper 22. Larkin, KE, Donaldson K, McDonough, N (Eds). European Marine Board, Ostend, Belgium, 2014.  
Coordinating author: Alex D. Rogers; Contributing authors: Andy Brierley, Peter Croot, Marina Cunha, Roberto Danovaro, Colin Devey, Alf Haakon Hoel, Henry Ruhl, Pierre-Marie Sarradin, Seline Trevisnaut, Helena Viera, Martin Visbeck
- Flemming N.C. *et al.* (2014) **Land beneath the waves: State of the art, key opportunities and recommendations to advance the European Continental Shelf Prehistoric Research**. European Marine Board Position Paper 21. McDonough N, Chu, NC (Eds). European Marine Board, Ostend, Belgium, 2014.  
Coordinating author: Nicholas C. Flemming; Contributing authors: M. Namık Çağatay, Francesco Latino Chiocci, Nena Galanidou, Gilles Lericolais, Hauke Jöns, Tine Missiaen, Fionnarr Moore, Alar Rosentau, Dimitris Sakellariou, Birgitte Skar, Alan Stevenson, and Henk Weerts.
- European Marine Board (2013). **Navigating the Future IV**. Position Paper 20 of the European Marine Board, Ostend, Belgium. ISBN: 9789082093100
- Moore M., *et al.* (2013). **Linking Oceans and Human Health: A Strategic Research Priority for Europe**. Position Paper 19. McDonough N., Evrard M., Calewaert JB., French V. (Eds). European Marine Board, Ostend, Belgium. 2013. Contributing authors: Michael N. Moore, Craig Baker-Austin, Michael H. Depledge, Iora Fleming, Philipp Hess, David Lees, Paul Leonard, Lise Madsen, Richard Owen, Hans Pirlet, Mathew White, Vitor Vasconcelos, Nicholas Boase, Nicholas Osborne, Aldo Viarengo
- Olsen E. M., *et al.* (2013). **Achieving Ecologically Coherent MPA Networks in Europe: Science Needs and Priorities**. Marine Board Position Paper 18. Larkin, K. E. and McDonough N. (Eds.). European Marine Board, Ostend, Belgium. ISBN 978-9-079528-19-6. 84pp.  
Contributing authors: Luciano Fonseca, Raquel Goñi, David Johnson, Stelios Katsanevakis, Enrique Macpherson, Esben Moland Olsen, Dominique Pelletier, Marijn Rabaut, Marta Chantal Ribeiro, Phil Weaver, Tania Zaharia
- Haugan, P. (2013). **Getting ready for an ice-free Arctic**. McDonough, N. & Larkin, K. E. (Eds.) Marine Board Science Commentary 1, European Marine Board, Ostend, Belgium.
- Heip, C., & McDonough, N. (2012). **Marine Biodiversity: A Science Roadmap for Europe**. Marine Board Future Science Brief 1, European Marine Board, Ostend, Belgium. ISBN: 978-2-918428-75-6.

- Glöckner, F, O. *et al.* (2012). **Marine Microbial Diversity and its role in Ecosystem Functioning and Environmental Change. Marine Board Position Paper 17.** McDonough N., Calewaert J-B. (Eds.). Marine Board-ESF, Ostend, Belgium.  
Contributing authors: Lucas J. Stal, Ruth-Anne Sandaa, Josep Maria Gasol, Fergal O’Gara, Francisco Hernandez, Matthias M. Labrenz, Elena Stoica, Marta Varela Rozados, Adriano Bordalo, Paraskevi Pitta.
- Roose, P. *et al.* (2011). **Monitoring chemical pollution in Europe’s Seas - programmes, practices and priorities for research.** McDonough N., Calewaert J-B. (Eds.). Marine Board-ESF, Ostend, Belgium.  
Contributing authors: Joan Albaigés, Maria João Bebianno, Kees Camphuysen, Margot Cronin, Jan de Leeuw, Geir Wing Gabrielsen, Thomas Hutchinson, Ketil Hylland, Colin Janssen, Bo Jansson, Bjørn Munro Jenssen, Patrick Roose, Detlef Schulz-Bull, Piotr Szefer.
- Querellou J. *et al.* (2010). **Marine Biotechnology: A Vision and New Strategy for Europe. Marine Board Position Paper 15.** McDonough N., Calewaert J-B. (Eds.). Marine Board-ESF, Ostend, Belgium. ISBN 978-2-918428-26-8, 94pp.  
Contributing authors: Torger Borresen, Catherine Boyen, Alan Dobson, Manfred Hofle, Adrianna Ianora, Marcel Jaspars, Anake Kijjoo, Jan Olafsen, Joel Querellou, George Rigos, Rene Wijffels. Special contributions: Chantal Compere, Michel Magot, Jeanine Olsen, Philippe Potin, Filip Volckaert.
- Rice J. *et al.* (2010). **Science Dimensions of an Ecosystem Approach to Management of Biotic Ocean Resources, SEAMBOR. Marine Board Position Paper 14.** McDonough N., Carbonnière A. (Eds). Marine Board-ESF, Ostend, Belgium. ISBN 978-2-918428-10-7, 90pp.  
Contributing authors: Maria de Fátima Borges, Anthony Grehan, Andrew Kenny, Harald Loeng, Francesc Maynou, Jake Rice, Ricardo Serrão Santos, Hein Rune, Skjoldal, Olivier Thébaud, Vassiliki Vassilopoulou, Filip Volckaert. External contributions: Olivier Curtil, Harold Levrel.
- Boyd I. *et al.* (2008). **The Effects of Anthropogenic Sounds on Marine Mammals. Marine Board Position Paper 13.** Connolly N., Calewaert J-B. (Eds). Marine Board-ESF, Ostend, Belgium. ISBN 2-912049-85-7, 94pp.  
Coordinating authors: Ian Boyd, Bob Brownell, Doug Cato, Chris Clark, Dan Costa, Peter Evans, Jason Gedamke, Roger Gentry, Bob Gisiner, Jonathan Gordon, Paul Jepson, Patrick Miller, Luke Rendell, Mark Tasker, Peter Tyack, Erin Vos, Hal Whitehead, Doug Wartzok, Walter Zimmer.
- Robinson I.S. *et al.* (2008). **Remote Sensing of Shelf Sea Ecosystems. Marine Board Position Paper 12.** Connolly N., Walter N., Calewaert J-B. (Eds). Marine Board-ESF, Strasbourg, France. ISBN 2-912049-77-6, 62pp.  
Contributing authors: David Antoine, Mirosław Darecki, Patrick Gorringe, Lasse Petterson, Ian S. Robinson, Kevin Ruddick, Rosalia Santoleri, Herbert Siegel, Patrick Vincent, Marcel R. Wernand, Guy Westbrook, Giuseppe Zibordi.
- Connolly N. *et al.* (Eds) (2007). **Marine Board Responses to the European Commission’s Green Papers: (i) Towards a future Maritime Policy for the Union: A European vision for the oceans and seas and (ii) The European Research Area: New Perspectives EC’s Green Papers on: Maritime Policy, and the ERA. Marine Board Position Paper 11.** Marine Board-ESF, Strasbourg, France. ISBN 2-912049-73-3, 46pp.  
Developed from existing Marine Board-ESF publications and discussions with Marine Board Delegates and Executive Committee.
- Binot J. *et al.* (2007). **European Ocean Research Fleets – Towards a Common Strategy and Enhanced Use. Marine Board Position Paper 10.** Connolly N., Carbonnière A. (Eds). Marine Board-ESF, Strasbourg, France. ISBN 2-912049-62-8, 62pp.  
Contributing authors: Jacques Binot, Juanjo Da obeita, Thomas Muller, Per Wilhelm Nieuwejaar, Marieke J. Rietveld, Paul Stone. Special contributions: Massimiliano di Bitteto, John Breslin, Klaus von Broeckel, Joao Coimbra, Dimitris Georgopoulos, Mick Gillooly, Hannu Gronvall, Jan Piechura, Frans Veenstra.
- Philippart C.J.M. *et al.* (2007). **Impacts of Climate Change on the European Marine and Coastal Environment – Ecosystems Approach. Marine Board Position Paper 9.** Connolly N., Walter N. (Eds). Marine Board-ESF, Strasbourg, France. ISBN 2-912049-63-6, 84pp.  
Contributing authors: Ricardo Anadón, Roberto Danovaro, Joachim W. Dippner, Kenneth F. Drinkwater, Stephen J. Hawkins, Geoffrey O’Sullivan, Temel Oguz, Catharina J.M. Philippart, Philip C. Reid.



- Minster J-F., Connolly N. *et al.* (Eds) (2006). **Navigating the Future III. Marine Board Position Paper 8.** Marine Board-ESF, Strasbourg, France. ISBN 2-912049-59-8, 69pp.  
Contributing editors: Aurélien Carbonnière, Niamh Connolly, Jan de Leeuw, Maud Evrard, Jan Mees, Jean-François Minster, Kostas Nittis, Geoffrey O’Sullivan, Nicolas Walter.
- Prandle D. *et al.* (2005). **Modelling in Coastal and Shelf Seas – European Challenges. Marine Board Position Paper 7.** Connolly N., Walter N. (Eds). Marine Board-ESF, Strasbourg, France. 30pp.  
Contributing authors: João Gomes Ferreira, Wolfgang Fennel, Michael Hartnett, Peter Herman, Michiel Knaapen, Hans Los, Morten Pejrup, Thomas Pohlmann, David Prandle, Roger Proctor, Yann-Hervé de Roeck, Karline Soetaert, Takvor Soukissian, Tapani Stipa, Georg Umgieser, Waldemar Walczowski.
- Mantoura F., Boissonnas J., d’Ozouville L., Connolly N. (2003). **Navigating the Future II - Summary of Integrating Marine Science in Europe. Marine Board Position Paper 6.** Minster J-F. *et al.* (Eds). Marine Board-ESF, Strasbourg, France. 24pp.  
Editors: John Marks, Jean-François Minster, Mario Ruivo, Silvana Vallerga; Other Contributors: Avan Antia, Laura Castellucci, Juanjo Dañobeitia, Jens Degett, Bob Dickson, Graham Edgar, Paul Galvin, David Griffith, Gwyn Griffiths, Harlyn Halvorson, Carlo Heip, Jean-Pierre Henriët, Catherine Jeandel, Frank Lamy, Jacques Legrand, Han Lindeboom, Karin Lochte, Jens Meincke, Geoffrey O’Sullivan, Nadia Pinarði, Gérard Riou, Douglas Wallace, Gerold Wefer, John Woods.
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