

# European

# MARINE BOARD

Advancing Seas & Ocean Science

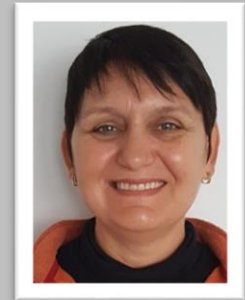
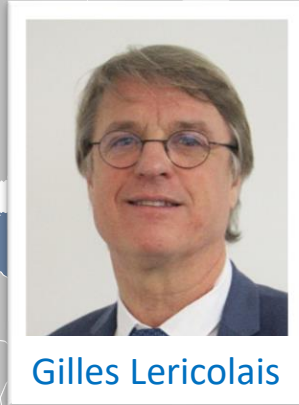
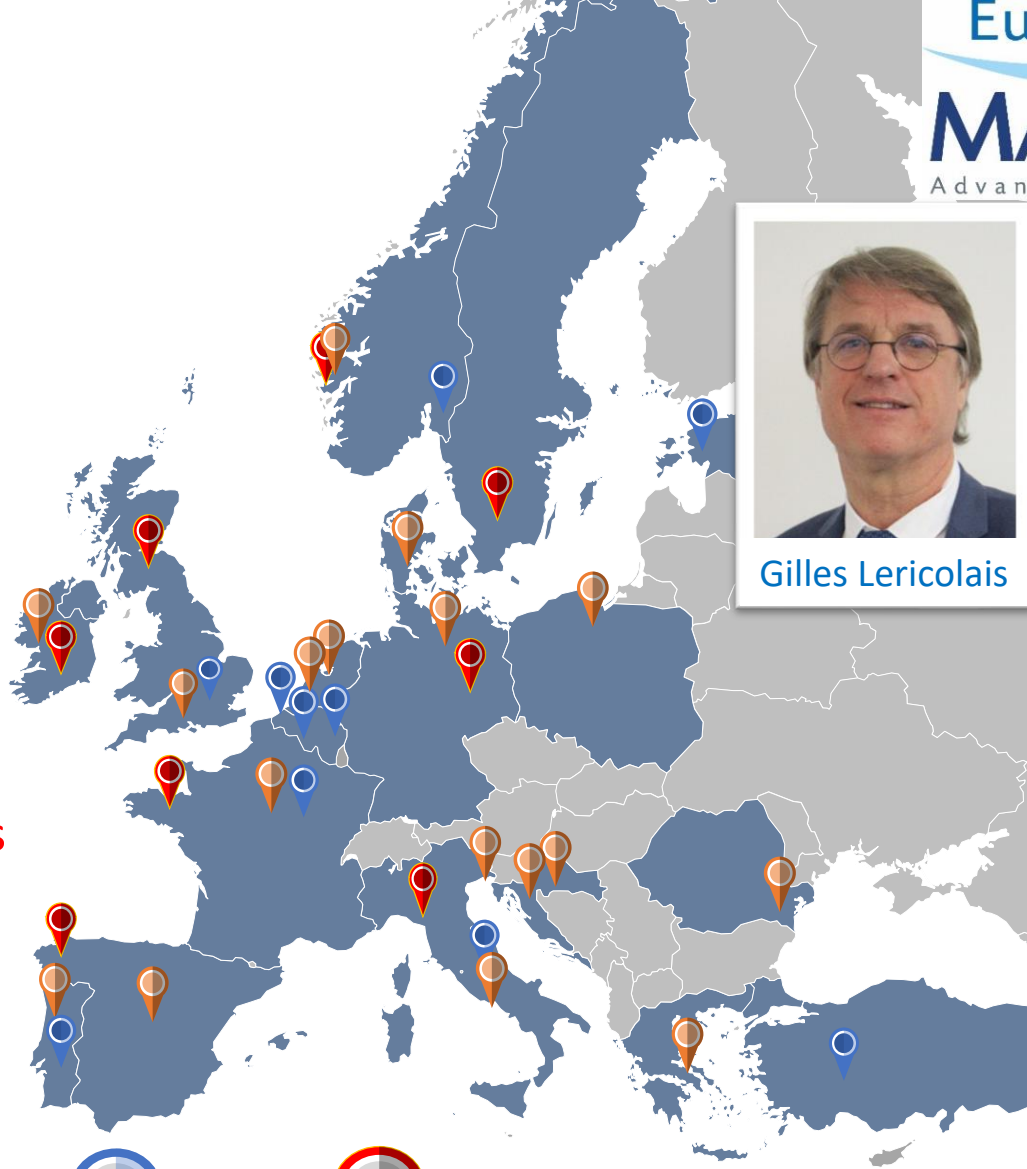
## 25 years of enabling marine science in Europe

Sheila Heymans

12 June 2020

Air Centre - Net Fridays

A unique European partnership of major marine and oceanographic institutes, research funding agencies and national networks of universities



Paula Kellett Joke Coopman



Britt Alexander Ángel Muñiz



RESEARCH PERFORMING  
INSTITUTES



RESEARCH FUNDING  
ORGANIZATIONS



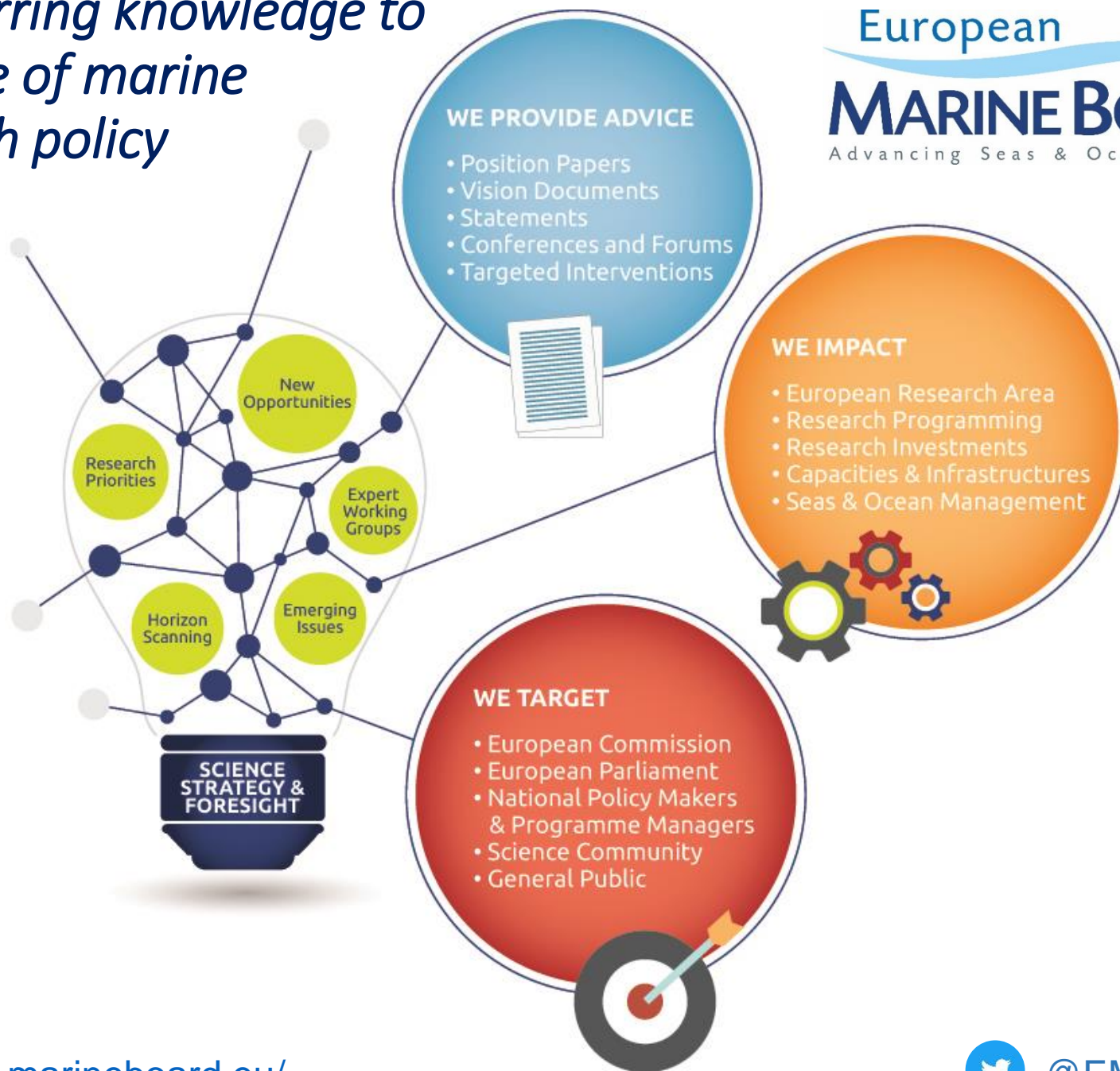
NETWORKS AND  
UNIVERSITY CONSORTIA

35 MEMBERS FROM

18 COUNTRIES



# Transferring knowledge to the core of marine research policy



**1989:** EC (DGRTD) + ESF establish European Committee for Ocean and Polar Sciences

Chair: Gotthilf Hempel

Conference at AWI (Germany)  
12-16 September 1994

Hempel G. 1995. The Ocean and the Poles: Grand Challenges for European Cooperation. Jena, Germany 381pp.



**To identify the 'Grand Challenges' in ocean and polar science:**

1. Operational Forecasting of the oceans and coastal seas
2. Variability of the deep sea floor
3. The Arctic Ocean
4. European Programme on Ice coring in Antarctica
5. Coastal zones
6. Biodiversity

**1995:** ESF sets up the Marine and Polar Sciences Board (EMaPS)

To coordinate specific marine, polar and joint activities.

**Members:** ESF member organizations, major national marine/polar scientific institutions or groups of these.

Whose research is it anyway: New Scientist 30 March 1996

<https://www.newscientist.com/article/mg14920235-800-forum-whose-research-is-it-anyway/>



**1998:** Independent review ->

European Polar Board +

**Marine Board**

**Self-funded non-governmental body**

**Members:** 24 organisations from 16 countries: major national marine science institutes + national funders.

**Secretariat in Strasbourg**



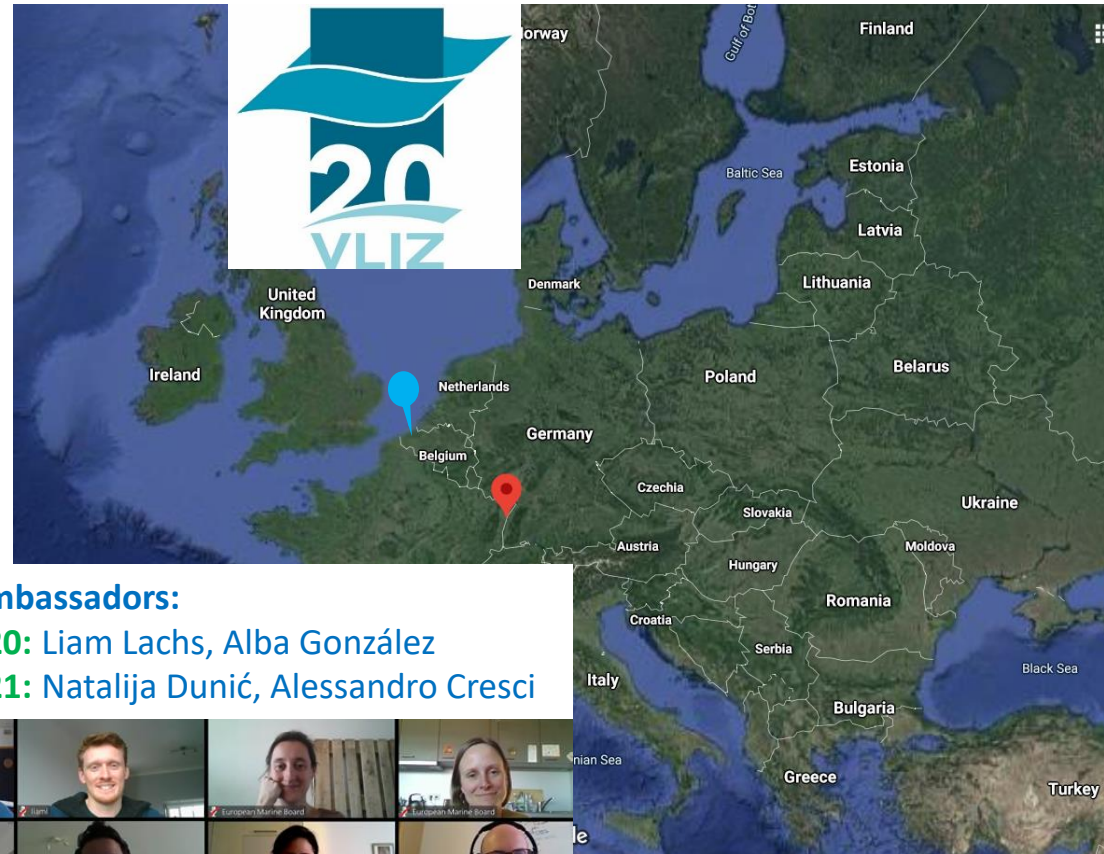
**Executive Secretary – Niamh Connolly**



Executive Secretary/Director –  
**1998-2007: Niamh Connolly**  
**2007-2017: Niall McDonough**  
**2018 → : Sheila Heymans**



**2007: EMB Secretariat moved to Ostend**



**Young Ambassadors:**

**2019-2020: Liam Lachs, Alba González**

**2020-2021: Natalija Dunić, Alessandro Cresci**



**2013:** Marine Board becomes  
**European Marine Board**

Expands members to include  
**national consortia of universities**  
with strong marine focus.

**2016:**  
**European Marine Board ivzw**  
establishes own legal entity

8 Founding members

**2017:** fully independent from ESF



**1989:** European Committee for Ocean and Polar Sciences

Chair: Gotthilf Hempel

Members:

Biology (2)

Research Administration (4)

Physical oceanography (4)

Geology (6)

## Position Paper 1: 1997

Deep-sea coring and drilling in Europe

- Identify drilling capabilities
- Define long-term science strategy for ocean drilling
- Promote European technologies

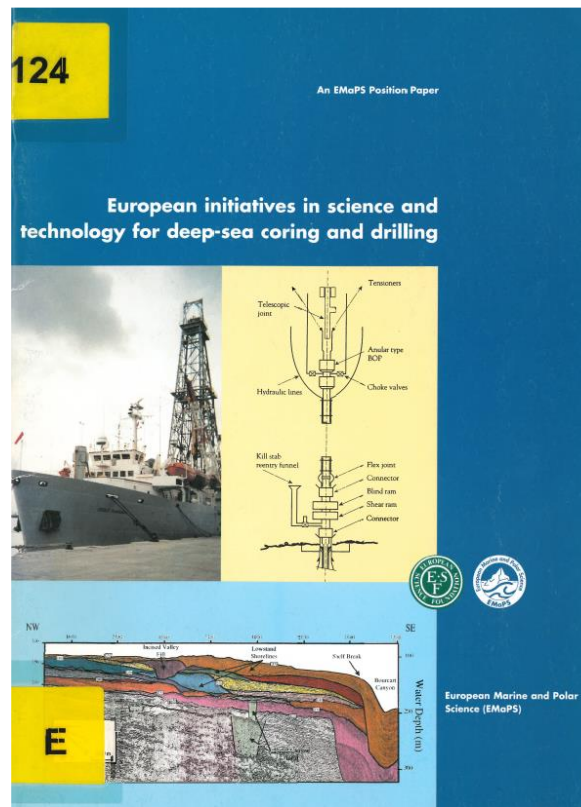
**1995:** Marine and Polar Sciences Board (EMaPS)

Strasbourg: 14-15 October 1996

Southampton: 7-9 November 1996

D'Ozouville et al. 1997. European initiatives in science and technology for deep-sea drilling. ESF Marine Board Position Paper No. 1

<http://www.marineboard.eu/>



**1998:** split->

**2020**

Geohazards working group



@EMarineBoard



**1998:** split->

European Polar Board +  
**Marine Board**

**Workshops:** Yerseke (NL)  
16-18 Dec 1997  
22-24 April 1999

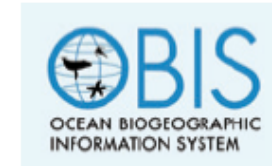
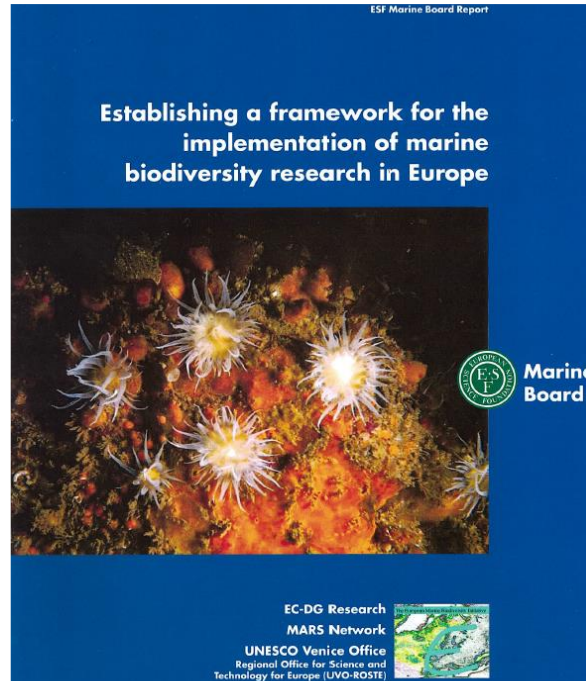
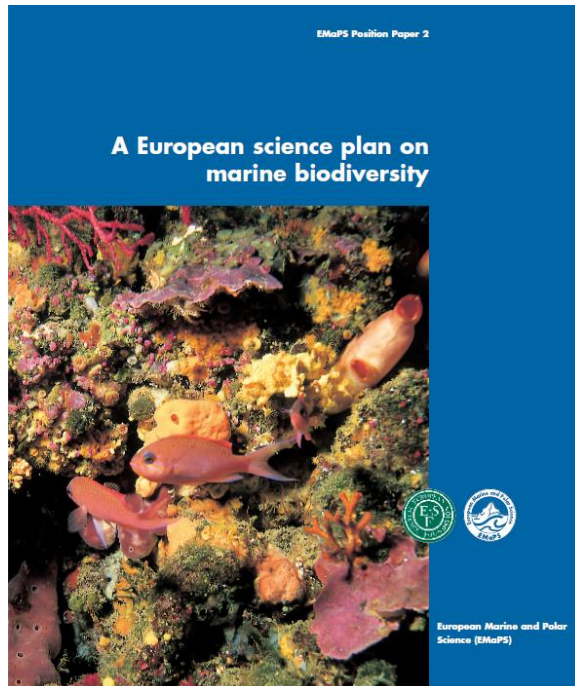
FP6: NoE 2004-8



**Position Paper 2: 1998**  
Heip et al.

Heip and Hummel, **2000**

 *CENSUS OF MARINE LIFE*  
2000-2010



2002: Convention on Biological Diversity – to:

- support approaches to marine management by 2010;
- facilitate establishment of MPAs and networks by 2012;
- maintain productivity and biodiversity of important and vulnerable marine and coastal areas, including ABNJs.

2010: CBD – Aichi Target 11:

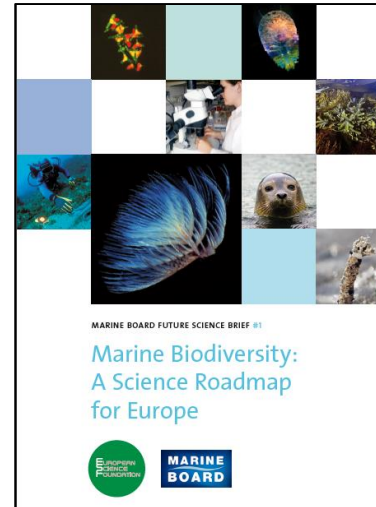
*“by 2020, at least 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved ...systems of protected areas ...”*

2012: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

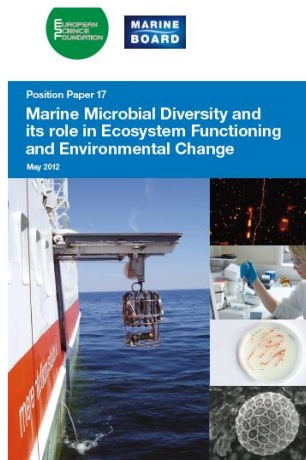


<http://www.marineboard.eu/>

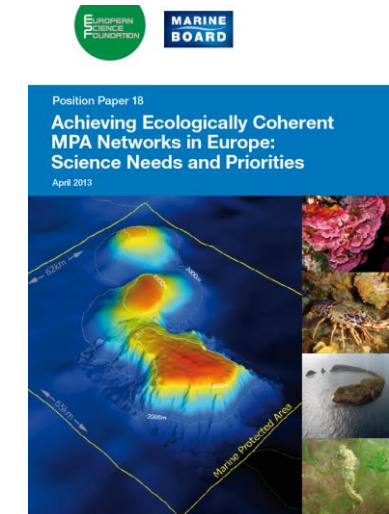
**Future Science Brief: 1**  
Heip & McDonough, 2012



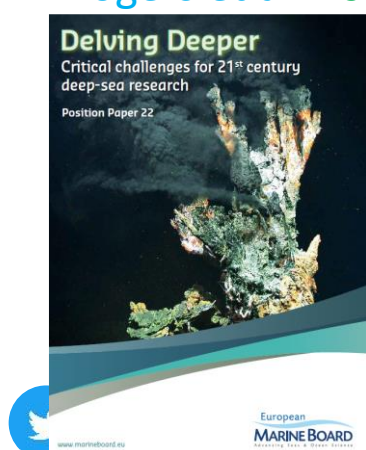
**Position Paper 17:**  
Glöckner et al. 2012



**Position Paper: 18**  
Olsen et al. 2013



**Position Paper 22:**  
Rogers et al. 2015



Heip and McDonough, 2012



nature  
climate change

Letter | Published: 04 March 2019

## Marine heatwaves threaten global biodiversity and the provision of ecosystem services

Dan A. Smale , Thomas Wernberg, Eric C. J. Oliver, Mads Thomsen, Ben P. Harvey, Sandra C. Straub, Michael T. Burrows, Lisa V. Alexander, Jessica A. Benthuyssen, Markus G. Donat, Ming Feng, Alistair J. Hobday, Neil J. Holbrook, Sarah E. Perkins-Kirkpatrick, Hillary A. Scannell, Alex Sen Gupta, Ben L. Payne & Pippa J. Moore

*Nature Climate Change* 9, 306–312(2019) | Cite this article

9494 Accesses | 80 Citations | 1016 Altmetric | Metrics

for Europe



### Recommendations:

- Better understanding of the factors which create, maintain and deplete biodiversity in ecosystems,

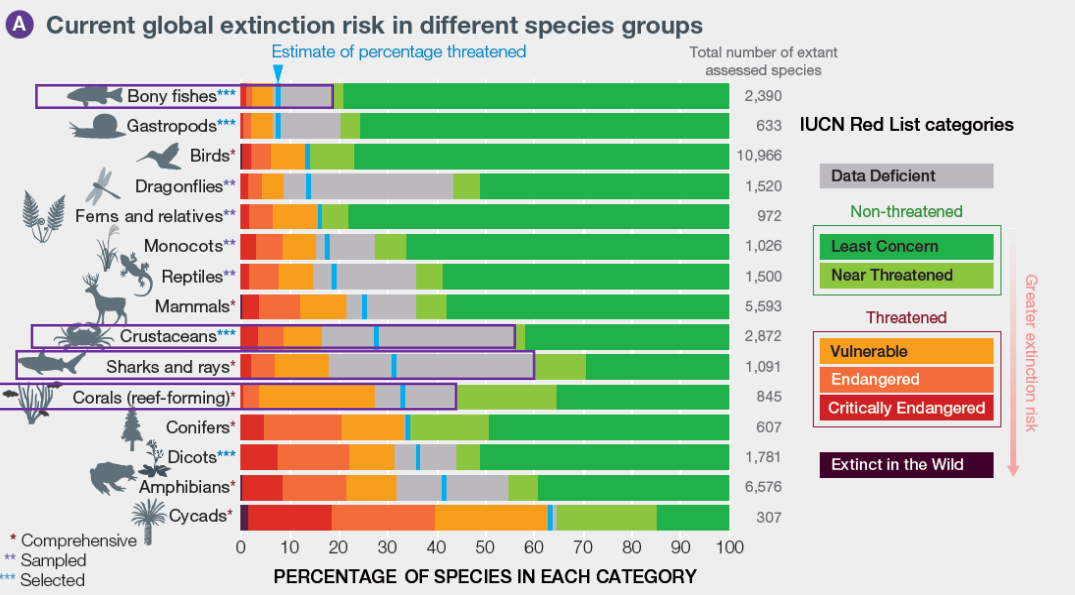
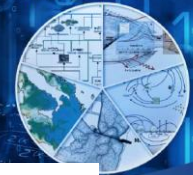


### IPBES Global Assessment Report

FSB 4: 2018

Future Science Brief N° 4 October 2018

Enhancing Europe's Capability in Marine Ecosystem Modelling for Societal Benefit



• ...



**1995:**  
Grand challenges  
Hempel et al.



**2000:** Hamburg  
**EuroOCEAN conference**  
Boissonnas & d'Ozouville



**2004-2009:** FP6: Facilitating  
Cooperation between  
National Marine Research  
Programmes in Europe

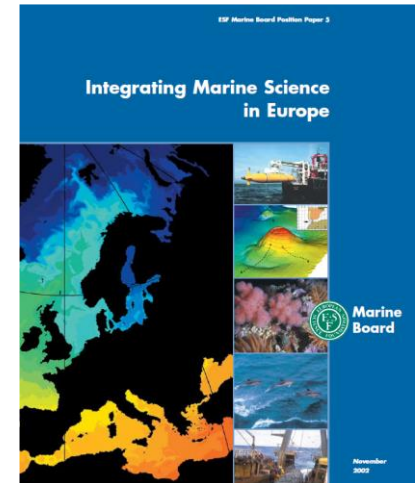


**2010-2014:**



**Position Paper 3: 2001**  
**Navigating the Future 1**  
Towards a marine  
European Research Area.

**Position Paper 5: 2002**



**Position Paper 11: 2007**  
Response to green papers.

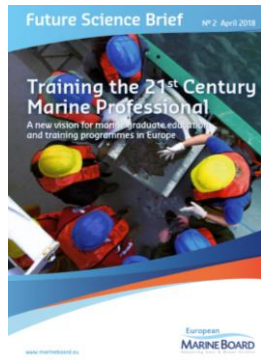




THE ATLANTIC:  
OUR SHARED RESOURCE  
MAKING THE VISION REALITY

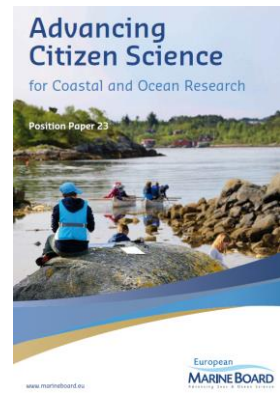


**FSB 2: 2018**



- Recommendations for **strengthening Human Capacity Building**, in particular by facilitating the completion of PhD fellowships ...
- **Enhance public awareness** towards marine and maritime scientific and policy issues in Europe....

**PP 23: 2017**



**Partnerships?  
Mission?**



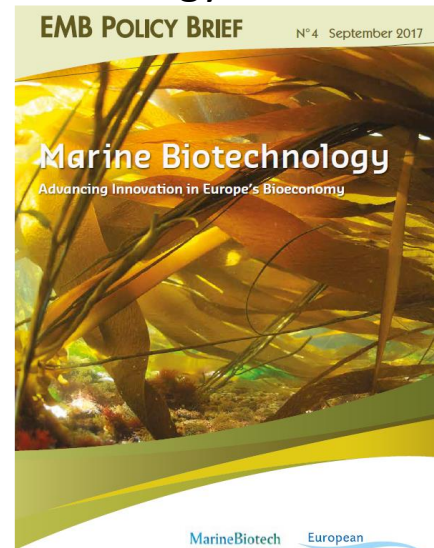
Review of Ocean Literacy in European Maritime Policy

**Position Paper 4: 2001**  
Feasibility Study Report.

**Position Paper 15: 2010**  
Querellou et al.

**3rd EMB Forum: 2012**  
New Technologies for  
a Blue Future

**Policy Brief 4: 2017**  
EMB & Marine  
Biotechnology ERANET  
(FP7 funded)  
... strategy to 2030



..outline R&D priorities  
in marine biotechnology  
to strategically refocus  
Europe's extensive but  
dispersed infrastructure  
... This initiative could  
benefit from catalytic  
and directed funding  
from EU's FP6.



**Vision:** by 2020 –  
European marine  
biotechnology sector  
be organised,  
integrated, globally  
competitive



..highlight innovation  
hotspots for the  
European marine  
sector, showcase  
emerging  
technologies  
for growth, novel  
applications for  
human well-being  
and tools for next  
generation marine  
knowledge

<http://www.marineboard.eu/>

## 3rd EMB Forum: 2012 New Technologies for a Blue Future

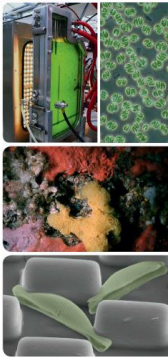


3<sup>RD</sup> EUROPEAN MARINE BOARD FORUM  
New Technologies for a Blue Future  
18 April 2012, Brussels, Belgium

### PROCEEDINGS

"We are entering a new era of engineering –  
imagineering... Rapid advancements in areas  
like fibre optic cables are offering the reality of  
unlimited power and constant telepresence  
in the oceans... these technologies and the  
knowledge they produce are going to vastly  
enhance the planet we live on and the future  
planets we will explore."

-John Oelony, University of Washington, USA

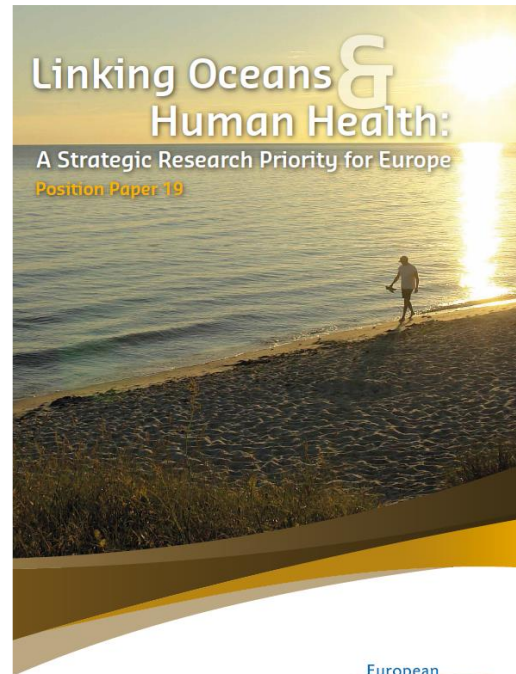


[www.marineboard.eu](http://www.marineboard.eu)

.. novel applications  
for human well-  
being and tools for  
next generation  
marine knowledge ...

**Technology .. driving bio-inspired breakthroughs...** some of the latest  
bio-based polymers with multiple applications for marine and maritime  
sectors ...

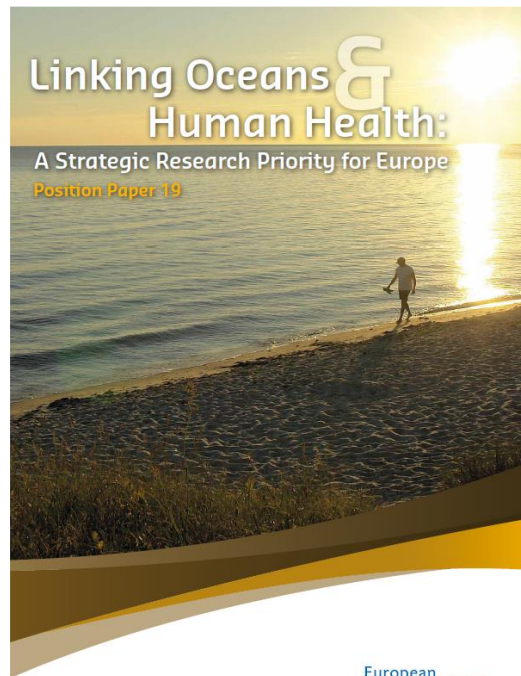
... access to the deep-sea and innovative molecular techniques, such as  
molecular studies of sponges ... noted as driving new opportunities for  
bio-prospecting, leading ...applications of marine biological resources.



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

**Position Paper 19: Moore et al. 2013.**  
Linking Oceans & Human Health: A  
strategic Research Priority for Europe

**Position Paper 19: Moore et al. 2013.** Linking Oceans & Human Health: A strategic Research Priority for Europe



www.marineboard.eu

H2020: 2017-2020



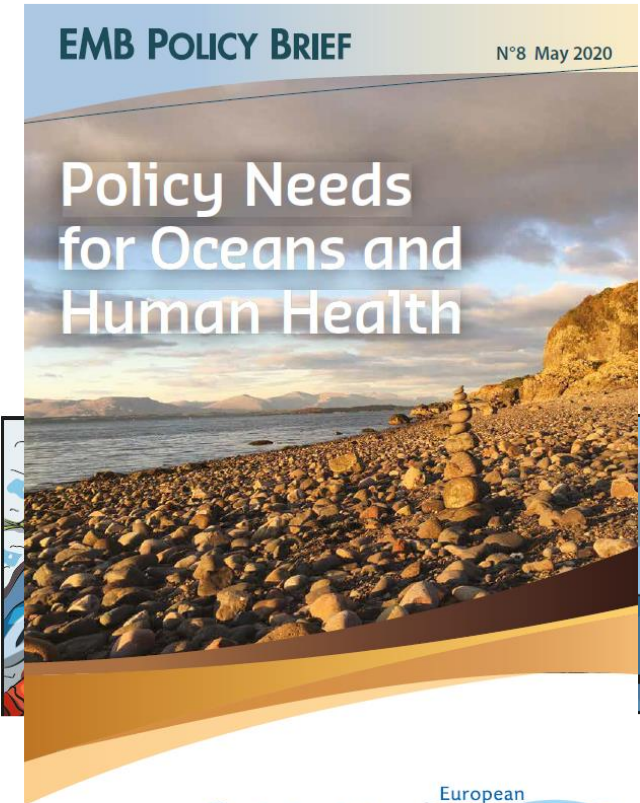
**Seas, Oceans & Public Health in Europe**

Linking oceans and health research

Coordinator: Lora Fleming U of Exeter  
€2 million Euros; 8 partners (academia, SMEs, government)



**Policy Brief No 8: 2020**



SOPHIE webinar:

<http://www.marineboard.eu/> <https://www.youtube.com/watch?v=M7drxxnbHrY>



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## Position Paper 6: 2003 Navigating the Future 2

ESF Marine Board Position Paper 6

### Navigating the Future –II– Summary of Integrating Marine Science in Europe



“Europe needs to move towards sound and **true governance** of its oceans and seas, integrating all components for a **comprehensive and responsible management** of its marine assets”

## Position Paper 8: 2006 Navigating the Future 3



Position Paper 8

### Navigating the Future - III

November 2006

Galway statement & Green paper on Maritime Policy, ...the need for **regional marine resource management** ..A forum of marine **scientists, policy makers, representatives from industry, coastal stakeholders** convened regularly to ensure **effective communication and synergy** between sectors.”

## Position Paper 11: 2007 Response to green papers...

EU Green paper on maritime policy ... should be supported by excellent scientific research...



Position Paper 11  
Response to the European Commission's Green Papers:  
(i) *Towards a future Maritime Policy for the Union: A European vision for the oceans and seas*  
(ii) *The European Research Area: New Perspectives*  
November 2007



## Vision Document 2: Da Rocha et al. 2010



Marine Renewable Energy requirements:

- An European policy on Marine Renewable Energy;
- A governance framework relying on sound research and based on:
  - The development and consolidation of enabling policies ...;
  - The alignment of competing policy objectives;
  - ...



## Position Paper 20: 2013 Navigating the Future 4



**13 thematic chapters -> science policy briefing documents:**

- ...
- Safe and sustainable use of marine and coastal space
- Sustainable harvest of food from the sea
- Linking oceans and human health
- ...
- An integrated and sustained European Ocean Observing System
- Effective European marine science-policy interfaces
- ...

**2016-2018:** Meetings with DG MARE Commissioner Vella



**2019-2021:**



<https://webgate.ec.europa.eu/maritimeforum/en/frontpage/1469>





# Observation value chain: Observations to Management

## EMB Panel on EMODNET

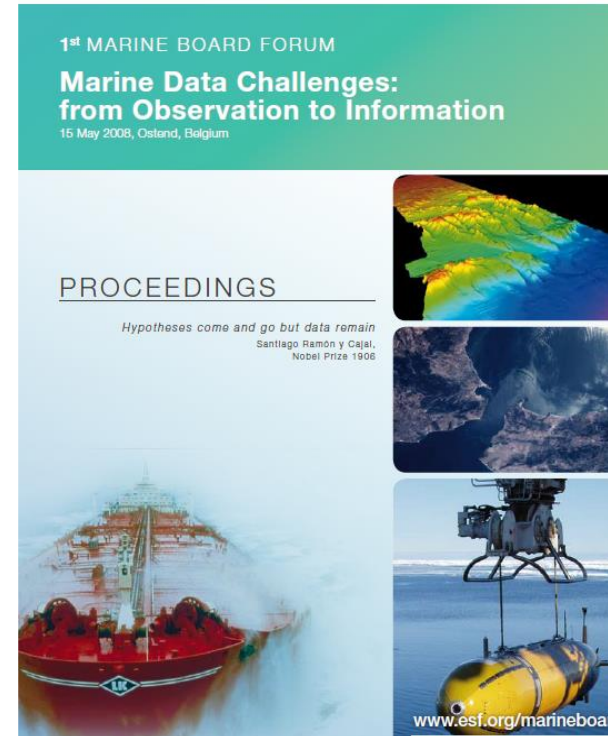
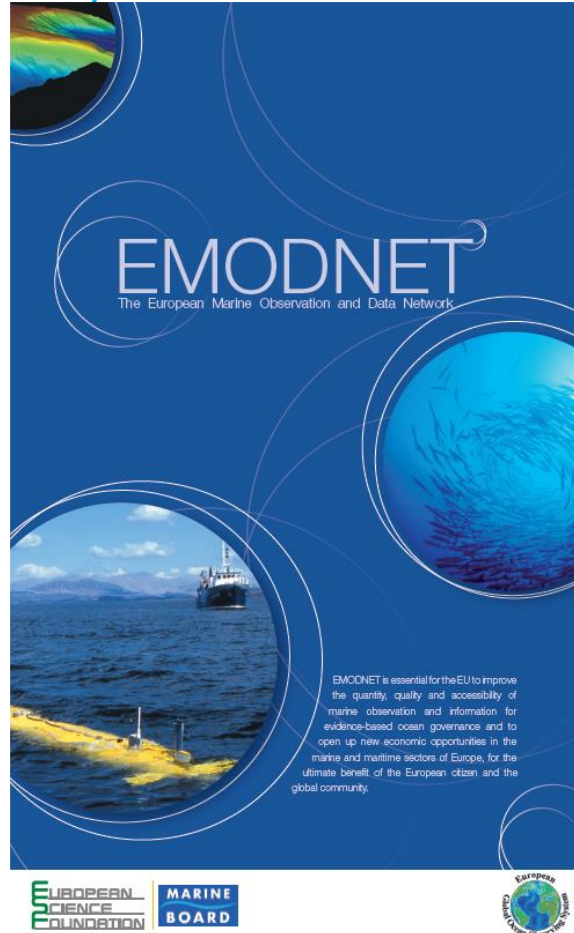
**EurOCEAN: 2008**

Aberdeen

**EMODNET: 2008**

Ryder et al.

**1st MB Forum: 2008**



*..support the importance of long-term data series to ensure adequate baselines to facilitate assessment, modelling and forecasting. Initiatives such as the proposed **EMODNET** and the EU Atlas of the Seas will provide significant contributions to addressing these needs.*

**EU Commissioner Joe Borg**

<http://www.marineboard.eu/>



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## 2nd MB Forum: 2010



2<sup>ND</sup> MARINE BOARD FORUM

**Towards a European Network of Marine  
Observatories for Monitoring and Research**  
16 September 2010, Brussels, Belgium

### PROCEEDINGS

*"A Long-term, stable and integrated  
network of strategic marine observatories...  
providing consistent in situ data from the seas  
and oceans... as a driver for smart, sustainable  
and inclusive growth in Europe..."*

Extract from 2<sup>nd</sup> Marine Board Forum Vision Statement



Driving science and technology frontiers  
for observing our changing oceans:  
From discovery and exploration in the  
19<sup>th</sup> Century to new frontiers in ocean  
observation in the 21<sup>st</sup> Century

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

Vision: *" A long-term, stable and integrated network of strategic marine observatories, installed and operated through multi-national cooperation and support, providing consistent in situ data from the seas and oceans in support of the EU Integrated Maritime Policy ..."*

**Calls for A European strategy on the development of an integrated network of marine observatories:**

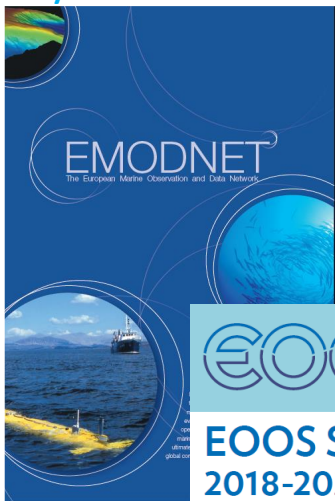
**..Innovative and long-term funding mechanisms** combining EU and Member and Associated State funding streams **to support development** of a full network and its continued operation;

...

Use of **advanced e-infrastructure framework** to gather and make available **consistent and quality- controlled datasets** from distributed observing systems.

## EMODNET: 2008

Ryder et al.



## 2014:

EMODnet financed by the EU DG MARE European Maritime and Fisheries Fund.

EOOS (European Ocean Observation System) to align, integrate and promote Europe's ocean observing capacity.



EOOS Strategy  
2018-2022

OCTOBER 2018



Implementation  
2018-2022

OCTOBER 2018



www.eoo

## FSB 3: 2018

## FSB 6: 2020

### EU International Ocean Governance Forum

Dedicated to oceans and the seas worldwide, the International Ocean Governance (IOG) Forum will support the follow-up to the EU's International Ocean Governance Agenda for the future of our oceans.



#IOG  
#OceanEU

EU-Ocean-Governance-Forum@ec.europa.eu





# Observation value chain: Remote sensing

**Workshops:** Brussels  
24 May 2006,  
31 Aug 2006,  
30 Nov 2006

**Position Paper 12: 2008**  
Robinson et al.

FP7 MyOcean (2009-12),  
FP7 MyOcean2 (2012-14)



Position Paper 12  
**Remote Sensing of Shelf Sea  
Ecosystems**  
*State of the Art and Perspectives*  
February 2008



Wider uptake of satellite ocean colour data requires that users are given **easy, unrestricted and free access** to the processed data products, using **on-line web-based** scene selection according to user-specified criteria.



**EMODnet**



## Project information

### MERSEA

Grant agreement ID: 502885

Start date: 1 April 2004  
End date: 30 September 2008

Funded under:  
FP6-AEROSPACE

Overall budget:  
€ 24 320 809



EU contribution  
€ 13 997 699

Coordinated by:  
INSTITUT FRANCAIS DE RECHERCHE POUR  
L'EXPLOITATION DE LA MER  
France

FR, BE, CA, CY, DE, DK, ES, FI,  
GR, IE, IT, NL, NO, TR, UK

# Observation value chain: Research Fleets

**1999-2005:** European  
Research Vessel Operators -  
ERVO Panel



**Position Paper 10: 2007**

Binot et al.



Position Paper 10  
**European Ocean Research Fleets**  
March 2007

Towards a Common Strategy and Enhanced Use



**Workshops:**  
Bergen & Barcelona 2018,  
Galway 2019  
**Position Paper 25: 2019**  
Nieuwejaar et al.

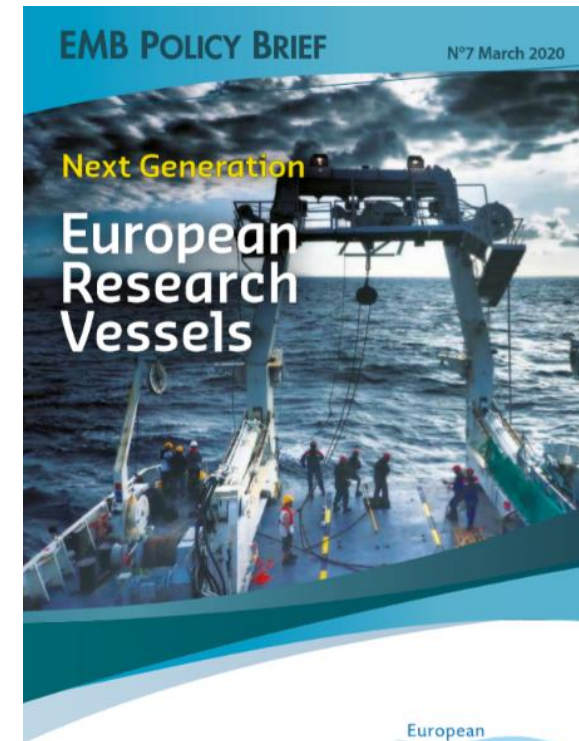


www.marineboard.eu



**Policy Brief 7: 2020**

...European RV fleet ageing  
and should continue to be  
modernized and renewed...



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## Workshops:

Nice (2003)  
London (2003)  
Galway (2004)

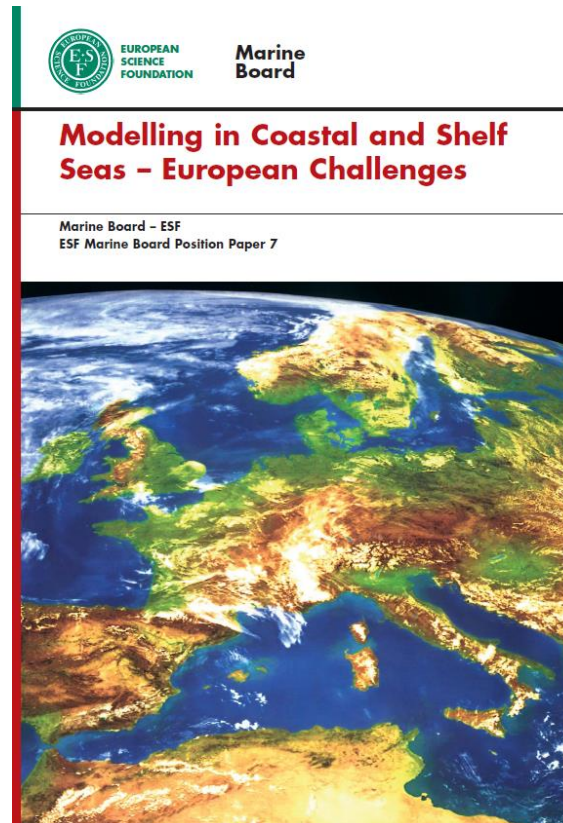
## Hydrodynamic modelling:

... need for a wide range of models with different characteristics to provide genuine ensemble envelopes and cater for a range of environments...

A systems approach is needed, capable of integrating marine modules and linking these into holistic simulators (geological, socio-economic etc.).

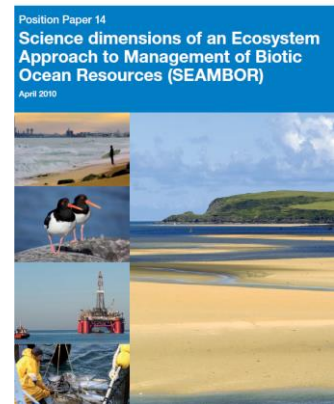
Position Paper 7: 2005  
Prandle et al.

Workshop: Plymouth 2017  
Future Science Brief 4: 2018  
Heymans et al.



**Position Paper 14: 2010**

Rice et al.  
Ecosystems...

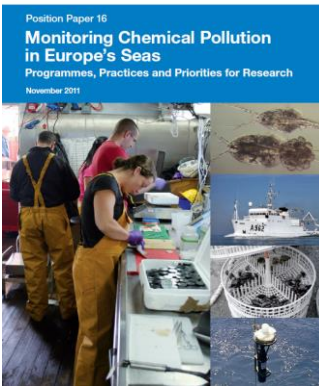


... calls for more, and better managed data!

**Position Paper 16:**

Roose et al. 2011

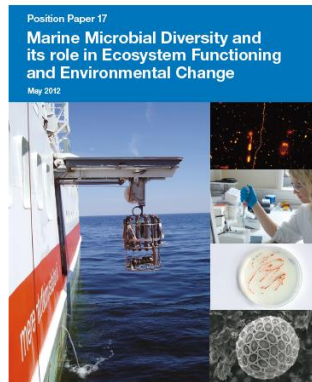
Chemical pollution...



**Position Paper 17:**

Glöckner et al. 2012

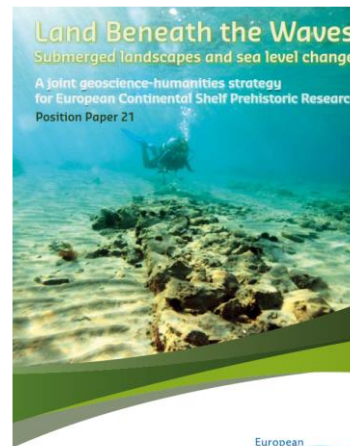
Microbial diversity...



**Position Paper 21:**

Flemming et al. 2014

Archaeology ...



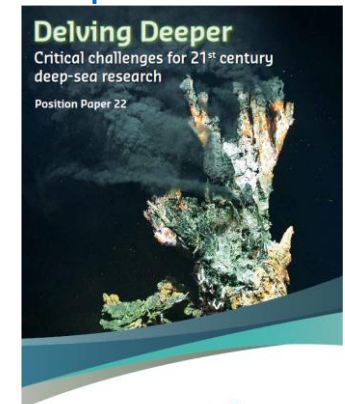
www.marineboard.eu



**Position Paper 22:**

Rogers et al. 2015

Deep-sea...



www.marineboard.eu



## Position Paper 14: 2010

Rice et al.



Position Paper 14  
**Science dimensions of an Ecosystem  
Approach to Management of Biotic  
Ocean Resources (SEAMBOR)**

April 2010



## Workshops:

EMB+NSF (USA): London, 2004

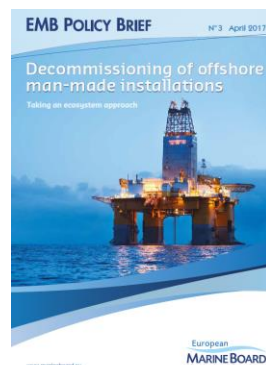
EMB WG: Oxford, 2005



## Critical Science priorities:

1. Develop **integrated policy evaluation tools** to improve decision-making ...;
2. Improve knowledge of **how ecological support systems** (food webs, physical-biological coupling) are **linked to provision of goods & services**;
3. Assess **consequences of ecosystem changes** for economies /societies, and investigate and develop mitigation and/or adaptation options;
4. Evaluate the **advantages and limitations of alternative ecosystem conservation policies, ...**;
5. ...
6. Take measures to **improve data management** and inter-operability of data.

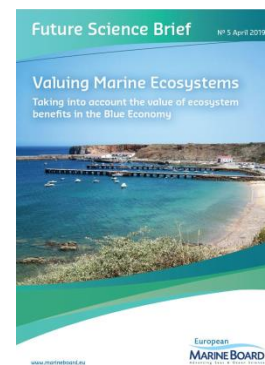
## PB 3: 2017



## FSB 4: 2018



## FSB 5: 2019





# Human Impacts: Climate change


## Position Paper 9: 2007 Philippart et al.



## Special Report: 2011 Heip et al. [www.clamer.eu](http://www.clamer.eu)



## 5th EMB Forum: 2015 The critical role of ocean science in responding to climate change



**THE OCEAN CLIMATE NEXUS**

THE CRITICAL ROLE OF OCEAN SCIENCE IN RESPONDING TO CLIMATE CHANGE

**A call from the ocean research community**

On 30 November 2015 the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21) will get underway in Paris. COP21 represents a momentous opportunity for governments to make serious commitments to address climate change and its implications for humankind and the health of our planet. The role of the ocean in the climate system must be an integral part of these discussions. The earth's climate and the ocean are fundamentally linked in ways we still do not fully understand. The ocean plays a key role as a climate regulator and in buffering the damaging effects of climate change. But the human activities that cause climate change, predominantly greenhouse gas emissions, are also affecting the health of the ocean, making it increasingly warmer and causing ocean acidification. We are damaging the very system that is fundamental to our wellbeing.

Ocean scientists are at the front line in the quest for knowledge to understand the role of the ocean in the earth and climate systems, and the implications of changing oceans for our environment and wellbeing. Hence, ocean research must be at the heart of our global response to climate change. For this reason, the ocean science communities of Europe and the North America, through the combined voices of the European Marine Board and the Consortium for Ocean Leadership, are issuing this joint call for action.

**To the COP21:**

We call on the Parties to the United Nations Framework Convention on Climate Change to:

- Recognize the fundamental role of the ocean in the climate system in reaching a post-2020 climate agreement;
- Deliver a strong agreement with ambitious mitigation targets to reduce harmful greenhouse gas emissions and curb damage to the ocean and its ecosystems;
- Understand and promote the role of ocean and climate research as a fundamental tool in the societal response to climate change and provide impetus to improve the knowledge base for climate action.

**To Research Funders:**

Our research communities stand ready to work across borders and disciplines towards a greater understanding of the ocean-climate nexus, and to communicate scientific knowledge to support ocean stewardship and measures to understand, mitigate and adapt to global change.

We call on the funders of research to support major and, where necessary, long-term ocean-climate research and observation programmes with a level of investment that matches the gravity of the impacts of a changing ocean and the importance of the ecosystem services it provides. To achieve the scale of research required, international collaboration will be essential.

In this short statement, we summarize the role of the ocean in the earth and climate systems. We set out some of the key challenges for unravelling the links between ocean and climate and the most important research priorities that can help provide answers and support an evidence-based societal response to climate change.

## Science Commentary 1: 2013 Haugan et al.



### Getting ready for an ice-free Arctic

A major increase in our capacity to observe and study the Arctic Ocean ecosystem is urgently required before the region is transformed by rapid environmental change and commercial exploitation.

## Science Commentary 2: 2017 Clark et al. 2016

Science Commentary – April 2017



### 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

## Statement to COP21: 2015 Schulz et al.



@EMarineBoard

## Workshops:

EMB+NSF (USA): London, 2004

EMB WG: Oxford, 2005

## Position Paper 13: 2008

Boyd et al.

## New: Underwater Noise (May 2020)

**Chair:** Frank Thomsen, DHI, Denmark

**Co-Chair:** Sonia Mendes, JNCC, UK

## Future Science Brief

- **Update** Position Paper 13
- Broaden scope to **all marine organisms**,
- Raise awareness of the **current knowledge and research gaps**,
- **Highlight the conflicts** that exist relative to underwater noise.



<http://www.marineboard.eu/>

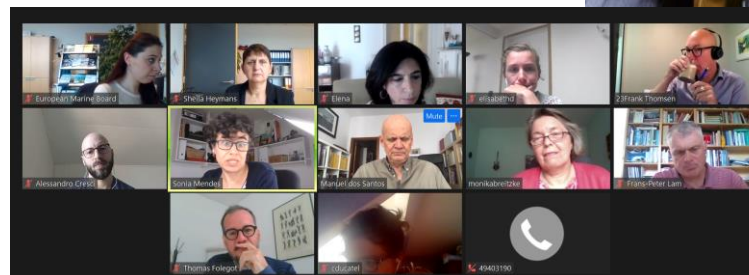
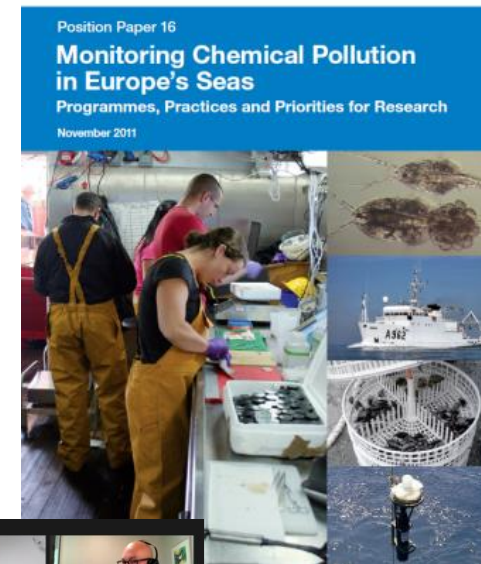
## Workshops:

Brussels & Ostend 2008

Brussels & Oslo 2009

## Position Paper 16:

Roose et al. 2011



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**6th EMB Forum: 2017**  
Implementing UN 2030  
Agenda

**Position Paper 24: 2019**  
**Navigating the Future V**  
**EurOCEAN2019**

**Policy Brief 6: 2019**

European  
**MARINE BOARD**  
Advancing Seas & Ocean Science

6<sup>TH</sup> EUROPEAN MARINE BOARD FORUM  
**IMPLEMENTING THE UN 2030 AGENDA**  
What role for marine science?  
6 December 2017, Brussels, Belgium

PROCEEDINGS

*"We need science to help the Ocean so that it can support the UN 2030 Agenda."*  
Peter Haugen, University of Bergen, Norway

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

Navigating the  
**Future V**  
Position Paper 24

**Marine Science for a Sustainable Future**

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European  
**MARINE BOARD**  
Advancing Seas & Ocean Science

**EMB POLICY BRIEF** N°6 October 2019

Navigating the  
**Future V**

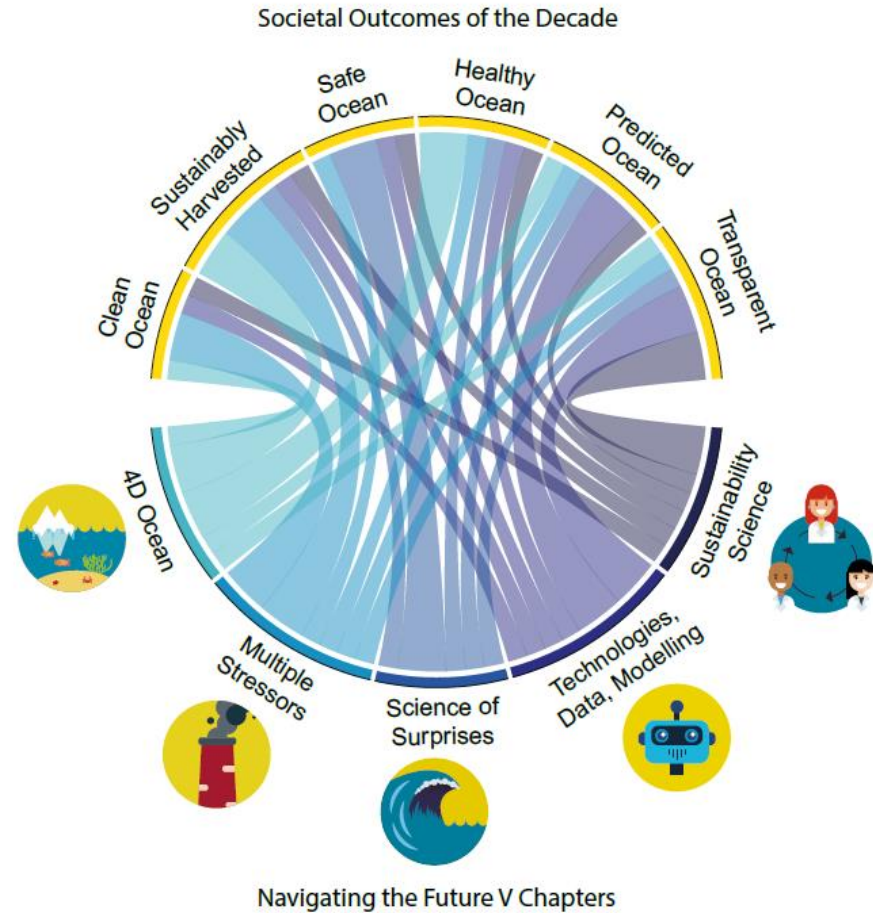
**Recommendations for the Ocean Decade**

European  
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Advancing Seas & Ocean Science  
[www.marineboard.eu](http://www.marineboard.eu)

# NFV Recommendations for the Ocean Decade:

## Key scientific questions:

- **4-Dimensional Ocean** (3D plus time);
- **Impacts of multiple** and cumulative human **stressors**;
- How to predict **extreme events**, natural hazards & climate;
- Advances in **ocean technologies**, modelling & Artificial Intelligence; and
- Foster **sustainability science**.



# From 1995 to the future...

## Hempel 1995: 'Grand Challenges'

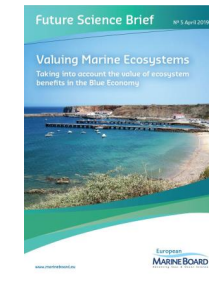
Coastal zones ... **new EMB working group on Coastal Resilience**

...

Operational Forecasting of the oceans and coastal seas



**PP14 Ecosystem approach:** Develop **integrated policy evaluation tools** to improve decision-making ...linked to the provision of goods and services which benefit humans;



**PP21 Marine Archeology:** Expand **predictive modelling** for areas where direct observation is difficult and as an effective tool to **facilitate MSP**



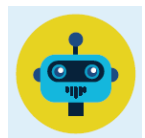
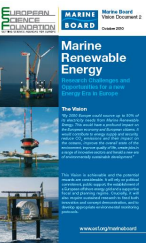
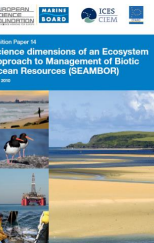
European  
MSP Platform

**Vision 2: Renewable energy:** Position **MSP** at the core of the sustainable development of MRE in Europe

**PP24 Navigating the Future V: Virtual Ocean ...**



**EU call – strengthening our knowledge in support of the European Green Deal**  
**Topic 3: A transparent and accessible ocean – Towards a digital twin of the ocean!**





# From 1995 to the future...



**European Research Area:** Enhance public awareness towards marine and maritime scientific and policy issues in Europe....



**PP21 Marine Archeology:** Communicate scientific results to the public through outreach activities

... **EMB Communication Panel** working on a **FSB on Marine Science Communication in Europe: a way forward**



**EU Mission: Healthy Oceans, Seas, Coasts and Inland waters**

**PP22 Deep Sea:** Promote cross-disciplinary research and collaboration

**PP24 Navigating the Future V:** Foster sustainability science

**2021-2030: UN Decade of Ocean Science for Sustainable Development**

