



Response to Consultation on International Ocean Governance

First some questions about you

*Where are you from? Belgium

Which profile describes you the best? Non-Governmental Organization

The European Marine Board's public ID number in the Transparency Register is: 571994418695-46

I International Ocean Governance – Context

General Problem Definition

Recent discussions and initiatives conclude that the current framework for international ocean governance is not effective enough in ensuring the sustainable management of oceans and their resources.

An example of this is the continuing problem of Illegal, Unregulated and Unreported (IUU) fishing, or the lack of implementation of relevant rules or ratification of relevant agreements[1] that put sustainable management of fish stocks at risk.

Also, the sheer number of oceans-relevant international institutions and sector-specific agreements and rules complicates or even hampers implementation.

[1] For example, the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing was concluded in 2009, needs 25 ratifications for entry into effect, and currently counts only 12, including the EU. The IMO's Ballast Water Convention was adopted in 2004 and is still not in force.

***Do you agree or disagree with this general problem definition?**

- [Yes](#)
- No

***Please explain why!**

The European Marine Board (EMB) recognizes the issues of ineffective ocean governance identified by the consultation and the need to overcome such barriers to achieve sustainable management of our seas and ocean. In terms of international coordination, the UN General Assembly has a central role in advancing the maritime agenda at global level and the 1982 United Nations Convention on the Law of the Sea (UNCLOS) provides the global framework for ocean governance and international instruments for the regulation of marine activities and for the environmental management and conservation of marine ecosystems.

However, the *ad hoc* development of international marine legislation and the institutions which apply to activities in the oceans and coastal areas means that governance is now complex and fragmented (Rogers *et al.*, 2015¹). There are more than twenty UN organizations with an ocean remit but there is a lack of clarity between their respective mandates, which may hinder implementation and compliance. This is exacerbated by the fact that UNCLOS is still to obtain a fully global membership and while the Intergovernmental Oceanographic Organization (IOC) of UNESCO can provide a vital platform for discussion, it lacks concrete regulatory powers. Likewise, UN-Oceans, an inter-agency mechanism that seeks to enhance the coordination, coherence and effectiveness of competent organizations of the United Nations system, could be the overarching coordinator of all UN activities with respect to ocean issues. However, it also lacks any executive power.

¹ Rogers, A.D., Brierley, A., Croot, P., Cunha, M.R., Danovaro, R., Devey, C., Hoel, A.H., Ruhl, H.A., Sarradin, P-M., Trevisanut, S., van den Hove, S., Vieira, H., Visbeck, M. (2015) Delving Deeper: Critical challenges for 21st century deep-sea research. Larkin, K.E., Donaldson, K. and McDonough, N. (Eds.) Position Paper 22 of the European Marine Board, Ostend, Belgium. 224 pp. ISBN 978-94-920431-1-5. <http://www.marineboard.eu/file/265/download?token=J5hokhHB>

In addition, there could be a greater value across the entire international ocean governance system placed on scientific knowledge that underpins evidence-based decision making and in strengthening the science-policy interface and science advisory process to make such knowledge available.

In terms of governance of areas beyond national jurisdiction (ABNJ), a notable gap is the lack of legal and policy frameworks to regulate access to and utilization of living and non-living deep-sea resources, although it is noted this is under discussion at UN level. There is also no globally-binding legal framework for the establishment of MPAs or marine reserves and no procedure for international monitoring to regulate activities (Olsen *et al.*, 2013)². With respect to biodiversity beyond national jurisdiction, these issues are now being addressed in discussions that are getting underway in 2015 towards the development of an international instrument to the UNCLOS (“Implementing Agreement”) that will address a package of measures including area-based management. It is imperative that a strong science advisory process is incorporated into this process both to ensure that proposals as they develop are based on robust scientific evidence, and to protect the capacity of nations to conduct curiosity-driven marine research in ABNJ.

Illegal, unreported and unregulated fishing (IUU fishing) is also an evident problem that continues to put sustainable management of fisheries at risk. This issue is particularly pertinent for deep-sea fisheries which exhibit some of the most vulnerable stocks in areas in the most remote parts of the world’s oceans that are most challenging to regulate (Rogers *et al.*, 2015). A report from the Global Ocean Commission (2014)³ has recommended greater transparency and eventual phasing out of high seas fisheries subsidies. From a scientific perspective there needs to be a strengthening of the use of social-ecological data and research to provide sound evidence to support important fisheries management issues, ensuring that aquatic food can support the needs of a rapidly growing global population.

Specific Problem Definition: what causes the overall problem?

The causes of ineffective international ocean governance could be explained by:

- Gaps in the existing international ocean governance framework
- Inefficient use and implementation of the existing international ocean governance framework, or insufficient coordination among its components
- A lack of knowledge about the oceans

*Do you agree with the list of specific problems?

- [Yes](#)
- No

*If you do not agree, please explain why!

EMB agree with the list of specific problems (see below for additional comments on specific problems)

²Olsen EM, Johnson D, Weaver P, Goñi R, Ribeiro MC, Rabaut M, Macpherson E, Pelletier D, Fonseca L, Katsanevakis S, Zaharia T (2013). Achieving Ecologically Coherent MPA Networks in Europe: Science Needs and Priorities. Marine Board Position Paper 18. Larkin, KE and McDonough N (Eds.). European Marine Board, Ostend, Belgium. <http://www.marineboard.eu/file/23/download?token=hUK5AcVY>

³Global Ocean Commission (2014). From Decline to Recovery: A Rescue Package for the Ocean http://www.globaloceancommission.org/wp-content/uploads/GOC_Summary_23.6.FINAL_ENG_.pdf.

***Which specific problems would you add?**

Despite the considerable support by European and national funders for marine science, there remains a chronic deficit of knowledge about the oceans. This represents a barrier to achieving effective and holistic governance of our seas and global ocean. This is perhaps particularly the case for the deep-sea – that part of the ocean below 200m water depth - which covers about 65% of the earth's surface and provides 95% of its biosphere. And yet, there is an increasing demand for such knowledge with increasing commercial interest to access ocean resources in deeper waters beyond the continental shelf. What is clear is that technology development and commercial interest is moving at a pace that outstrips the ocean governance discussions and the generation of new knowledge through scientific research. If commercial activities are to proceed, it is imperative that we develop a much greater knowledge and understanding of our seas and ocean (Rogers *et al.*, 2015⁴).

Knowledge derived from scientific research is one of the key pillars for evidence-based ocean stewardship and governance. A recent example is a research study that published '*A Scientific Basis for Regulating Deep-Sea Fishing by Depth*⁵', providing much-needed evidence for the ongoing policy debate on a potential EU ban on deep sea to bottom trawling below 600 metres. In the first assessment for the Marine Strategy Framework Directive, task group reports noted gaps in deep sea knowledge across many member states e.g. for Descriptors 3, 8, 9 and 10 (Rogers *et al.*, 2015).

There is also a need to build more effective science-policy interfaces to stimulate greater interaction between decision makers and the marine scientific community and wider stakeholders, and channel knowledge through effective science advisory processes.

***If you were to rank the list of specific problems by priority, which one would come first?**

Ocean governance is inextricably linked to ocean science and an interdisciplinary, cross-sectoral holistic approach is vital. It is, therefore, not possible or appropriate to rank specific problems by priority. Marine scientific knowledge is a central pillar to the knowledge base underpinning environmental and wider decision making regarding our seas and ocean. A forward looking strategy to ocean governance with innovative governance models and coordinating mechanisms is much needed. For instance, the UN-Oceans interagency has set out a collaborative mechanism for communicating ocean and coastal issues within the UN system. However, there remains insufficient coordination and overlap of mandates for many agencies and more could be done to stimulate exchange with the wider marine stakeholders. Robust and effective science advisory processes are also vital to channel the right knowledge at the right time to enable evidence-based decision making and maximize enforcement and compliance. Europe is a global leader in many areas of marine scientific research (e.g. see deep-sea publications analysis, Rogers *et al.*, 2015) and the EU has the competence to strengthen this through research and education programmes.

⁴ Rogers, A.D., Brierley, A., Croot, P., Cunha, M.R., Danovaro, R., Devey, C., Hoel, A.H., Ruhl, H.A., Sarradin, P-M., Trevisanut, S., van den Hove, S., Vieira, H., Visbeck, M. (2015) Delving Deeper: Critical challenges for 21st century deep-sea research. Larkin, K.E., Donaldson, K. and McDonough, N. (Eds.) Position Paper 22 of the European Marine Board, Ostend, Belgium. 224 pp. ISBN 978-94-920431-1-5. <http://www.marineboard.eu/file/265/download?token=J5hokhHB>

⁵ Clarke, J., Milligan, R.J., Bailey, D.M., Neat, F.C. (2015) A Scientific Basis for Regulating Deep-Sea Fishing by Depth. Current Biology. <http://dx.doi.org/10.1016/j.cub.2015.07.070>

<http://eu.savethehighseas.org/ground-breaking-research-confirms-case-for-the-eu-to-close-the-deep-sea-to-bottom-trawling-below-600-metres/>

The existing international Ocean Governance Framework

*What is missing to close the gaps in the existing ocean governance framework (e.g. new institutions, new rules, new agreements, new arrangements)?

There is a need to link intergovernmental programmes and initiatives more closely with national marine policies and vice versa to ensure best practices are shared, and environmental protection and sustainable management is effective not only within areas of national sovereignty but also in ABNJ. There also needs to be greater transparency and communication between regions to facilitate improved cooperation in matters of ocean governance. Europe can show a leadership role here through the Marine Strategy Framework Directive and building on existing regional cooperation mechanisms.

*What would you want to change?

The UN-Oceans interagency has a wide-ranging ocean remit within the UN system and could play a pivotal role in the coordination of the existing international and UN Ocean focused organizations/bodies. However, in its current form UN-Oceans has no clear mandate or executive power to implement any coordinating strategy. This would be one area that could be changed to improve overall international ocean governance. In addition, the importance of individual nations in driving international ocean governance should not be overlooked.

The EU can also play a leadership role in establishing a truly integrated and science-driven World Ocean Assessment. Specifically, the EU could support a review of the strengths and weaknesses of the current World Oceans Assessment, and that the lessons learned are used to promote the establishment of a long-term effort to understand the current and future state of the ocean.

*Which areas or issues of international ocean governance are inadequately covered and could benefit the most from filling gaps in the current framework or from more efficient organisation of the international ocean governance framework?

Europe needs a forward-looking strategy for ocean governance, not only for areas within state sovereignty but also as a best practice for developing international regulations for areas beyond national jurisdiction (ABNJ). This can build upon the successes of Europe's progressive approach to ecosystem-based management through the integrated maritime policy and specifically the marine strategy framework directive (MSFD). However, more could be done to establish measures for achieving good environmental status in ABNJ and developing a robust and agreed legal basis to regulate the access to and utilization of resources from ABNJ, whether from the water column (the "High Seas") or the seabed and subsoil ("The Area"). These policy goals and governance discussions are severely hampered by a knowledge deficit of the deep sea (Rogers *et al.*, 2015)⁶.

Environmental protection measures could also be enhanced. Currently there are very few standards set to protect the international marine environment beyond EEZs. This will be a great challenge to improve as there is no one authority governing the waters beyond EEZs and the UNCLOS has critical limitations in this regard.

Some areas of ocean governance requiring more comprehensive legal and policy frameworks include developing a common strategy and an integrated, long-term platform for European monitoring of human impacts and climate change in coastal areas. In addition, a more integrated and knowledge-based global deep-ocean policy is required

⁶ Rogers, A.D., Brierley, A., Croot, P., Cunha, M.R., Danovaro, R., Devey, C., Hoel, A.H., Ruhl, H.A., Sarradin, P-M., Trevisanut, S., van den Hove, S., Vieira, H., Visbeck, M. (2015) Delving Deeper: Critical challenges for 21st century deep-sea research. Larkin, K.E., Donaldson, K. and McDonough, N. (Eds.) Position Paper 22 of the European Marine Board, Ostend, Belgium. 224 pp. ISBN 978-94-920431-1-5. <http://www.marineboard.eu/file/265/download?token=J5hokhHB>

and the EU could use its competence in RTD policy to promote this.

Europe could also set out to address national and European-level governance issues that act as a bottleneck to blue growth, especially with reference to integrated maritime spatial planning (Rogers *et al.*, 2015). For instance, the EU Directive for establishing a framework for maritime spatial planning (2014)⁷ does not deal with ABNJ or deep-sea environments. This will become increasingly important, thanks to the growing commercial interest to move into deeper waters. There is a great need for proactive marine spatial planning, especially at this early stage before too much development has occurred. This requires strong scientific knowledge, both to help determine the optimum locations for the different activities and to ensure an accurate baseline on which long term monitoring and environmental impact assessments can be based. It also requires an understanding of marine ecosystem goods and services and their environmental, economic and social value.

The importance of nations should also not be overlooked in achieving legal enforcement and compliance and further coordinating mechanisms could be developed at regional sub-regional levels.

The European contribution to international ocean governance could be made stronger with official observer status on all UN bodies with ocean remits and official coordination and collaboration within the EU to ensure a coherent and single voice is represented at the international level.

How would they benefit?

Europe could potentially play an important leadership role in developing improved environmental protection standards and establishing GES measures in ABNJ. This could feed into developments for legislation for sustainable management of the marine environment providing a good base for long-term investments and job creation (e.g. blue growth).

*Which geographic areas could benefit the most from more effective organisation or from filling of gaps in the institutional framework?

The global ocean transcends national and regulatory boundaries and all geographical areas are set to benefit from enhanced international ocean governance. Europe could also benefit from both strengthening internal European ocean governance frameworks and further coordinating the EU voice at international ocean governance fora.

How would they benefit?

A global approach is required to achieve effective ocean governance in ABNJ and this would benefit all nations, promoting sustainable management practices and improving the environmental protection, management and economic outputs of the global blue economy.

Europe could benefit from further formalizing the EU coordination mechanisms to UN organizations and developing a robust and inclusive approach to coordination of ocean governance issues across Europe to ensure that the EU “speaks with a single voice or at least delivers a consistent message, if it is to enhance its influence in key multilateral fora.” (EC COM(2009)536)⁸. European contributions to international science-policy initiatives such as IPBES and to UN bodies with ocean competencies such as ISA should also be strengthened.

Europe could also benefit greatly from more coordinated ocean governance at European level. There is a

⁷ Directive 2014/89/EU: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32014L0089>

⁸ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52009DC0536>

complex distribution of competence between the EU and Member States. The Marine Strategy Framework Directive is proving an important mechanism for holistic governance a regional approach is crucial, especially challenging for regions such as the Mediterranean and Black Sea where there are a high number of EU & non-EU coastal states. Promoting exchange between all regional competent agencies, e.g. Regional Sea Commissions and Regional Fisheries Management Organizations and wider stakeholders will promote the sharing of data, the co-production of new knowledge and cooperation on the conservation and sustainable use of marine biological diversity. An existing example is the Memorandum of Understanding between OSPAR and the NEAFC to address ocean governance in the Northeast Atlantic (Rogers *et al.*, 2015)⁹. This could ultimately facilitate improved governance of the high seas through shared visions for ocean management & environmental protection. This can be further enhanced by international marine research e.g. within the seas of developing nations to improve knowledge exchange and best practice.

***Which sectors of the economy could benefit the most from a more effective international ocean governance framework or from filling gaps in the existing set-up?**

Recognizing and valuing marine scientific knowledge in international ocean governance frameworks and the decision making process will reduce uncertainty, enabling more informed decision making for assessing baselines and setting targets e.g. for good environmental status, fishing quotas and environmental standards. This will benefit a range of marine and maritime sectors including established industries such as fisheries and the energy and tourism sectors, to developing sectors such as marine biotechnology and deep-sea mining industries. In addition, strengthening European ocean governance frameworks and raising environmental standards could be a competitive advantage to driving blue growth sectors in Europe and in turn attracting international students and workers to Europe.

How would they benefit?

More effective international ocean governance frameworks and science advisory processes in decision making will improve environmental protection and establish good environmental status of our seas and ocean (Larkin *et al.*, 2014¹⁰). This in turn will drive ecosystem goods and services including a wealth of monetary and non-monetary benefits. These include improving the quality of bathing waters and beaches driving coastal tourism, and related benefits to human health regarding reduced pollution resulting in safer seafood consumption and mental health benefits from human interaction with the sea. Effective environmental protection and regulation of fish stocks would also result in a sustainable supply of fish. Many industry sectors would also benefit from clear and evidence based regulation, reducing the risks for investors e.g. in technology development which requires substantial investment.

***Where is the greatest added value for the EU to address this specific problem?**

The greatest value for the EU would be to address the issue of international ocean governance in its regional seas, with a focus on the interactions between EU & non-EU member states to develop comprehensive and sustainable management plans, which currently are particularly challenging for the Mediterranean Sea and Black Sea.

Europe is already providing leadership in ecosystem based ocean and coastal management through the Marine Strategy Framework Directive and this, together with European leadership in some areas of marine science (e.g.

⁹ Rogers, A.D., Brierley, A., Croot, P., Cunha, M.R., Danovaro, R., Devey, C., Hoel, A.H., Ruhl, H.A., Sarradin, P-M., Trevisanut, S., van den Hove, S., Vieira, H., Visbeck, M. (2015) Delving Deeper: Critical challenges for 21st century deep-sea research. Larkin, K.E., Donaldson, K. and McDonough, N. (Eds.) Position Paper 22 of the European Marine Board, Ostend, Belgium. 224 pp. ISBN 978-94-920431-1-5. <http://www.marineboard.eu/file/265/download?token=J5hokhHB>

¹⁰ Larkin, K., Wouters, N., McDonough, N., Fernandez, M., Diez, R., Carvalho, T., Garriga, M., Costa, C., Hoepffner, N., Le Moigne, M., LeComte, J-P., Wawrzynski, W., Kellerman, A., Murphy, D., Ni Cheallachain, C., Bergh, Ø., Nedreaas, K. (2014). Proposal and Recommendations for a Science-Policy Interface (SPI) to support MSFD Implementation. FP7 STAGES Deliverable D4.2: http://www.stagesproject.eu/images/STAGES/deliverables/STAGES_D4.2.pdf

deep-sea publications, see Rogers *et al.*, 2015)¹¹ should be appropriately communicated to the international ocean governance discussions.

Europe could also develop a more comprehensive and strategic ocean research policy with key pillars of fundamental research, societal-challenge based and innovation oriented research. Such projects should be inter- and trans-disciplinary taking into account the need for holistic governance combining knowledge of scientific, legal, economic and social aspects.

More effective coordination of ocean governance at European and international levels would also strongly stimulate the interest of the public at large which is not only beneficial in terms of education but also in terms of ocean literacy and awareness, ultimately leading to increasing the value and political influence of the oceans at national through to international levels.

*Which principles or objectives should guide potential action?

A key objective should be the newly approved Sustainable Development Goal 14, to conserve and sustainably use the oceans, seas and marine resources. A key objective within this is to establish good environmental status of our global ocean and balance sustainable management and blue growth. In ABNJ, the overarching principle should be the “common heritage of mankind”. Whilst the precautionary principle should continue to apply, enhanced science advisory processes would ensure that marine scientific knowledge is made available and integrated into ocean governance discussions and when developing new frameworks and regulations.

How would you go about measuring progress in this area?

An international framework for achieving good environmental status would enable descriptors, indicators and targets to be set against which to measure progress, e.g. measure changes in the rate of loss of biodiversity, the detection and management of vulnerable marine ecosystems and the restoration of adequate population levels of threatened species. In Europe, a coordinated foresight and science advisory process could add to the regular assessments conducted through the MSFD (Larkin *et al.*, 2014)¹².

¹¹ Rogers, A.D., Brierley, A., Croot, P., Cunha, M.R., Danovaro, R., Devey, C., Hoel, A.H., Ruhl, H.A., Sarradin, P-M., Trevisanut, S., van den Hove, S., Vieira, H., Visbeck, M. (2015) Delving Deeper: Critical challenges for 21st century deep-sea research. Larkin, K.E., Donaldson, K. and McDonough, N. (Eds.) Position Paper 22 of the European Marine Board, Ostend, Belgium. 224 pp. ISBN 978-94-920431-1-5. <http://www.marineboard.eu/file/265/download?token=J5hokhHB>

¹² Larkin, K., Wouters, N., McDonough, N., Fernandez, M., Diez, R., Carvalho, T., Garriga, M., Costa, C., Hoepffner, N., Le Moigne, M., LeComte, J-P., Wawrzynski, W., Kellerman, A., Murphy, D., Ni Cheallachain, C., Bergh, Ø., Nedreaas, K. (2014). Proposal and Recommendations for a Science-Policy Interface (SPI) to support MSFD Implementation. FP7 STAGES Deliverable D4.2: http://www.stagesproject.eu/images/STAGES/deliverables/STAGES_D4.2.pdf

Lack of knowledge

*Which areas of international ocean governance could benefit the most from better availability of maritime knowledge?

Science-based knowledge, expertise and skills are the enablers for all economic activities in the seas and oceans. To promote greater transparency and open data access and appropriate governance of deep-sea resources, we need to ensure adequate representation of scientific expertise contributing to developing legal and policy frameworks addressing deep-sea resources (notably preparation of a new Implementing Agreement under the United Nations Convention on the Law of the Sea (UNCLOS) and development of ISA regulatory framework for seabed mining). Such scientific knowledge is essential to assess baselines, monitor impact of human and wider impacts on the marine environment, and develop ecosystem restoration protocols (Rogers *et al.*, 2015¹³). Some further examples of areas of international ocean governance that could benefit from better availability of marine scientific knowledge include (but are not exclusively):

- Refining the content of Environmental Impact Assessment (EIA) procedures related to deep-sea mining projects, contributing to the wider ISA frameworks for regulation of exploitation activities. This requires fundamental knowledge of the marine ecosystem and knowledge of the drivers pressures and impacts;
- Sustainable exploitation of marine resources. This requires interdisciplinary knowledge of the geological, biological, chemical and physical characteristics of the seafloor and surrounding environment. For seafloor resources, such knowledge will greatly enhance mapping of the sea floor and demarcation of international marine boundaries to allow further understanding on where seabed resources lie (e.g. energy, minerals, biological resources) and their relation to sensitive habitats and ecosystems. Knowledge on the holistic ecosystem is also vital to assess the resilience of fish stocks, particularly deep-water species and to inform decisions on quotas;
- Improving resilience to natural disasters requires marine knowledge of the seafloor, reducing risk and uncertainty.

*Where do you see the most obvious gaps in knowledge about our seas and oceans?

There are considerable knowledge deficits which can hinder sustainable ocean development and ecosystem based management. This is particularly pertinent in the deep ocean, below 200m depth, which forms the world's largest connected biome. There is a critical lack of knowledge of biodiversity, ecosystem functioning, connectivity and resilience for the whole deep sea. Enhanced knowledge of the deep sea and the wider marine environment is vital to establish baselines, inform environmental impact assessments and strategic environmental management plans, and monitor the long-term impact of human activity (Rogers *et al.*, 2015).

Gaps in knowledge also exist across a number of key societal challenges, e.g. in the areas of ocean-climate interaction, human health, food security (e.g. aquaculture), energy and safe and sustainable use of marine space and a clear need for further research to support evidence-based decision-making on managing human activities (EMB, 2013¹⁴).

¹³ Rogers, A.D., Brierley, A., Croot, P., Cunha, M.R., Danovaro, R., Devey, C., Hoel, A.H., Ruhl, H.A., Sarradin, P.-M., Trevisanut, S., van den Hove, S., Vieira, H., Visbeck, M. (2015) Delving Deeper: Critical challenges for 21st century deep-sea research. Larkin, K.E., Donaldson, K. and McDonough, N. (Eds.) Position Paper 22 of the European Marine Board, Ostend, Belgium. 224 pp. ISBN 978-94-920431-1-5. <http://www.marineboard.eu/file/265/download?token=J5hokhHB>

¹⁴ European Marine Board (2013). Navigating the Future IV. Position Paper 20 of the European Marine Board, Ostend, Belgium. <http://www.marineboard.eu/file/18/download?token=QescBTo6>

Specifically, other identified areas of gaps in knowledge include:

- Coastal management, whether to preserve biodiversity, to restore the state of the environment, prevent and mitigate risks to promote governance and integrated management;
- Lack of data on bathymetry, seabed and habitat mapping;
- A better understanding of the role of the ocean in major biogeochemical cycles, particularly the carbon cycle;
- Better anticipation of vulnerability to climate change in particular, the impact of human activities and pollution of all origins including continental, and an assessment of the effectiveness of management tools and measures such as the protection of marine areas for example;
- Ability to make seasonal to decadal predictions about weather & climate;
- Agreed and robust mechanisms, currently lacking, to place monetary and non-monetary value systems on marine ecosystem goods and services, ultimately allowing them to be taken account of in marine management decision making.

***How could knowledge about our seas and oceans be better shared among scientists and users (business, policy-makers...)?**

The open data sharing policies of the European Union set out clear guidelines and best practice approaches for making environmental data available for producing products and services for end users from policy makers to industry sectors. Knowledge exchange between the marine research and wider stakeholder community should be ongoing throughout a project lifetime to ensure knowledge is better shared and in the right formats for users.

Whilst open sharing of data is already a pre-requisite of funding for many publicly funded marine scientific research projects, e.g. European Framework Programmes, the same is not the case for industry. Regulations should be produced that require industry and wider stakeholders to share data, particularly when this is no longer commercially sensitive. For instance, in some cases a change to the data policy in existing legal contracts to release data after a certain embargo period would greatly enhance the sharing of data by the industrial sector.

Support for centralized data portals such as EMODnet and Copernicus Marine Environment Monitoring Service (CMEMS) is also crucial together with communicating the benefits and added value to stakeholders to drive the user base and encourage data input by all stakeholders.

***What could be done to improve coordination in maritime research?**

The UN-Oceans interagency mandate could be enhanced to be a fully comprehensive coordinating mechanism for ocean and coastal related issues within the UN but with an outward look to engage the wider maritime research community, e.g. through science advisory processes.

A truly integrated World Ocean Assessment that is robust and both science-based and science-driven would galvanize the international marine and maritime research community. A pilot activity could be supported by the EU to assess the existing mechanisms and consider future scope. In addition, large-scale international marine scientific projects would stimulate international coordination, capacity building and data sharing, particularly if there was a common goal. One example is to conduct an international “Geological Survey of the Oceans”, analogous to the decade-long programme Census of Marine Life, but with a focus on the seabed and its energy and mineral resources, building on existing frameworks such as the Galway Statement on Atlantic Cooperation.

At European level, JPI Oceans is a coordinating and integrating strategic platform providing a long-term integrated approach to marine and maritime research and technology development in Europe. The European Marine Board (EMB) develops common positions on research priorities and strategies for European marine science, facilitating

enhanced cooperation between stakeholders involved in supporting, delivering and using marine research and technology. The roles of the European Marine Board and JPI Oceans could be strengthened to ensure a holistic coordination of all marine science policy matters across the EU.

The science advisory process for maritime research should also be strengthened including effective fora through which scientists can contribute to the ocean governance debate.

The EU and third country partners could also enhance participation in large-scale international research programmes going beyond national jurisdictions and deep-sea research, as recommended in the EU strategy for Marine and Marine Research (COM(2008) 534 final)¹⁵. This would enhance best practice sharing of environmental protection and management issues particularly for developing countries.

***Which economic activities and sectoral policies could benefit the most from better availability of maritime knowledge?**

Better availability of maritime knowledge will drive forward a number of European policies and Directives e.g. MSFD, Blue Growth Strategy and support the development of blue growth sectors and wider marine and maritime economic activities. It is important to state that not only economic activities would benefit and the greatest benefit would be to underpin sustainable management of our seas and ocean, balancing blue growth with environmental protection.

How would you go about measuring progress in this area?

The reports, publications and impact of scientific outputs from collaborative projects and international initiatives could be assessed together with the amount of data being shared by the marine scientific and wider stakeholder community through open access data portals e.g. EMODnet. A mechanism for assessing this and a forum for debate would be important so that activities could be periodically assessed and improvements proposed and implemented accordingly.

Personal details

The European Marine Board (EMB) 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 challenges and opportunities.

The European Marine Board (EMB) was established in 1995 to facilitate enhanced cooperation between European marine science organizations towards the development of a common vision on the research priorities and strategies for marine science in Europe. Members are either major national marine or oceanographic institutes, research funding agencies, or national consortia of universities with a strong marine research focus. In 2015, the Marine Board represents 36 Member Organizations from 19 countries. The Board provides the essential components for transferring knowledge for leadership in marine research in Europe. Adopting a strategic role, the Marine Board serves its member organizations by providing a forum within which marine research policy advice to national agencies and to the European Commission is developed, with the objective of promoting the establishment of the European *marine* Research Area.

For more information on the European Marine Board and to download publications, please visit <http://www.marineboard.eu/> or contact the EMB Secretariat at info@marineboard.eu

¹⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0534:FIN:EN:PDF>