

## **General Problem Definition**

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

**An example of this is the continuing problem of Illegal, Unregulated & 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 & sector-specific agreements & rules complicates or even hampers implementation.**

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

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

Yes

**\* Please explain why!**

Problems relating to the international governance of the ocean pertain to either:

- Achieving agreement on governance of the High Seas, beyond the Exclusive Economic Zone
- The ability of intergovernmental bodies / international organisations coordinating ocean activities in the High Seas / areas beyond National Jurisdiction to enforce rules and regulations, and to develop new rules that cannot be 'vetoed'.
- Gaps in scientific knowledge and technology to underpin sustainable development of the ocean

Nation states already have a large degree of control over the activities that are undertaken within their EEZ. However, beyond the EEZ, governance is minimal. UNCLOS, the UN Convention on the Law of the Sea, defines the rights & responsibilities of nations in their use of the ocean (including the High Seas), establishing guidelines for businesses, the environment, & management of marine natural resources. Legal enforcement & regulation of any activity beyond the EEZ is very difficult, expensive and time consuming. Any amendments to UNCLOS would require ratification by signatory States, and non-States such as the European Union have no formal voice in UNCLOS, and are unlikely ever to be granted one. Most UN Member States have adopted 200 mile EEZs, with up to 350 miles in some special instances.

Within these areas EU Members will be applying the Marine Strategy Framework Directive and various degrees of Marine Spatial Planning, though in the Mediterranean the lack of adoption of the usual 200 mile EEZ does present a great challenge for ocean governance, and an agreed approach by EU Members States would have considerable positive impact – but legally any new convention would have to be applied on a State by State basis, as the EU is not a 'State' under UNCLOS. The EU could have a

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'High Seas Directive' transposed into domestic law by each member state – but it would have no binding power in international courts as only UNCLOS is recognised for Ocean Governance purposes.

A further complication for enforcement is which part of the UN would be responsible? There are already over 20 UN bodies with an ocean remit, such as the International Seabed Authority and Intergovernmental Oceanographic Commission, and in theory some degree of coordination from "UN-Oceans" based in New York, but in practice the UN's visibility in the High Seas is low, and some Member States do not fully support the UN's role in ocean governance. For example, at the high-level Washington 2014 "Our Ocean" Conference the UN system was barely represented.

Unless a 'High Seas Police Force' was established with international funding and membership, all enforcement will need to be carried out by UN Members under some sort of standing mandate with clear rules of engagement. Dealing with rogue states, non-state actors or states who refused to ratify new agreements would be challenging, unless the UN Security Council put its full weight behind any new High Seas convention or amendment to UNCLOS.

Regarding gaps in scientific knowledge and technology – there are still gaps in our knowledge of ecosystem function and interaction, particularly in deep waters where the response of ecosystems to human exploitation such as deep-sea mining is largely unknown. Technology is advancing rapidly with all ocean depths reachable, but spatial/temporal data acquisition is very sparse compared with terrestrial measurements, and the deployment of much 'smarter' technologies in industries such as fisheries would go a long way towards reducing by-catch and unintended environmental damage.

### **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 & 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

**\* If you do not agree, please explain why!**

I agree with the specific definitions of the ocean governance problem

If you do not agree with the above list of problems, please tell us why (max characters: 2000)

**Which specific problems would you add?**

Please list any specific problems contributing to ineffective international ocean governance below (max 2000 characters)

There are significant gaps in how the High Seas are policed. UNCLOS restricts transportation of slaves, piracy & drug trafficking (articles 99, 100-107 & 108 respectively), and in these cases a Signatory State may stop and search suspect ships regardless of the nationality of the offender. Other High Seas activities are almost entirely unregulated by binding statute, e.g. deep-sea mining and fishing.

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Europe's "ecosystems approach" to coordinating policies & evidence for management of human activities in the marine environment could also be applied to international ocean governance. Policies, conventions & organisations have developed in isolation and demonstrate a low success rate in delivering environmental & economic benefits. For example the International Commission for the Conservation of Atlantic Tuna makes science-based recommendations on fishing effort, but lacking 'teeth' is ignored by a significant portion of the fishing community with illegal and unregulated catch of tuna greatly exceeding safe limits. Boats engaged in illegal trade are not insured, rarely comply with international safety and crewing standards, or are not properly registered with any Port State so the ability to control their activity is limited.

A lack of top-level leadership hinders coordination of activities. Within the UN system only UN-Oceans, an advisory body to the UN General Assembly based in New York, covers the full ocean policy spectrum from fisheries to seabed mining & energy, but this has led to confusion over which of its member UN agencies provide practical leadership on a given issue. As an advisory and coordination body UN-Oceans has little real-world executive ability to deliver better ocean governance.

It could be argued that to really gain traction the Ocean needs a seat on the UN as a Virtual State – a truly radical solution that could be championed at EU level.

International organisations engaged with ocean policy and governance remain uncoordinated, often know little about each other, and would benefit from strong leadership. That leadership should come from the UN. Only UN Member States have the ability to enforce better ocean governance in the High Seas and only a few with strong pro-environmental stewardship attitudes are interested in extending jurisdiction outside their EEZ. *(1969 characters)*

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

1. Gaps in ocean governance – there is no valid mechanism for areas outside the EEZ
2. The need to properly coordinate the existing mechanisms, ideally via the UN by offering executive powers to UN-Oceans or one (or more) of its member bodies such as the Intergovernmental Oceanographic Commission, International Seabed Authority or FAO.
3. Inability to enforce/police activities on the High Seas
4. Lack of fundamental underpinning scientific knowledge.

Please list one item which you consider the single most important specific problem (max 250 characters).

The lack of a single, adequately-resourced, executive agency, answerable to the UN Secretary General, able to coordinate and enforce high seas ocean governance for the benefit of all humankind, receiving scientific advice from the Intergovernmental Oceanographic Commission and others. *(247)*

## **The existing international Ocean Governance Framework**

***The existing international Ocean Governance Framework is composed of many institutions, rules, processes, agreements & arrangements.***

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*Some institutions operate at a global level[1], others at regional[2], national[3] or sub-national level. Some have a general mandate relating to the oceans[4], the competence of others is limited to certain sectors[5] or issues[6]. Some agreements create legally binding obligations to the parties of that convention[7], others are non-binding[8].*

*The existing international Ocean Governance Framework is often not effective for the reason that agreed rules & policies are not ratified[9], complied with or implemented or due to an overlap or a lack of coordination between existing institutions & processes.*

*For example, lack of transparency or coherence of rules & differences in standards between regions, or the absence of rules in other areas can be an obstacle for operators, either because they distort the market at the global level, or due to the absence of rules which favours those who work on the basis of lower & environmentally more harmful standards. This in turn discourages innovation & technological progress & potentially harms high-quality operators including those from the EU. This may be even more of an issue when considering that many highly innovative companies are SMEs.*

*Another gap is the management of marine resources by area. Whereas there are a large number of fisheries management organisations covering a significant proportion of the world's oceans, these organisations only cover fisheries management issues. Regional Seas Conventions deal with the environmental issues in their own geographical areas – which are often different from those covered by e.g. fisheries organisations. There is no 100% coverage of the world's oceans by these organisations, & whilst they cooperate in a number of cases[10], such cooperation is neither systematic, nor comprehensive.*

*Even though discussions on the launch of negotiations for an implementing agreement on biodiversity in areas beyond national jurisdiction are far advanced in the UN, in its absence, there are no rules or mechanisms for cross-cutting area-based management of human uses, or Maritime Spatial Planning, in international waters.*

*The set of international organisations dealing (in some cases partially or indirectly[11]) with oceans & their governance is broad, but there is no overarching body at UN level with the mandate to coordinate their action in the context of oceans, leading to potential conflicts or overlaps[12].*

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*[1] E.g. Convention on Biodiversity (CBD), International Maritime Organisation (IMO), International Labour Organisation (ILO), etc.*

*[2] E.g., Regional Fisheries bodies including Regional Fisheries Management Organisations (RFMOs), Regional Seas Programmes or Conventions (RSCs)*

*[3] Maritime Administrations, Ministries of Transport, Ministries of Environment in individual countries*

*[4] E.g. International Maritime Organisations*

*[5] E.g. Regional Fisheries Management Organisations, International Seabed Authority*

*[6] E.g. Convention on Biological Diversity*

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**[7] E.g. International Commission for the Conservation of Atlantic Tunas**

**[8] E.g. Sargasso Sea Convention**

**[9] E.g. PSMA agreement – see above**

**[10] E.g. MoU between OSPAR & NEAFC**

**[11] E.g. World Bank, World Trade Organisation**

**[12] This is notably the case for environmental agreements or bodies (MEAs) vs. sectoral bodies**

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

To close the gaps in existing ocean governance frameworks a mechanism is needed to enable the high seas to be managed in a manner that enables the stewardship of a clean, healthy, safe and biologically productive ocean whilst maintaining freedom of navigation for commerce and defence. This need not necessarily involve the establishment of a new institution, but could be achieved by strengthening an existing UN body to add ocean environmental stewardship and enforcement to its remit. For example UN-Oceans could be turned into an Executive Agency of the UN General Assembly, able to seek advice from, and task member bodies as required, to get the job done, or sub-contract work to Member States. It would need a substantial budget – the ocean covers a vast area.

Existing legal frameworks will need to be amended. UNCLOS provides the legal basis for High Seas governance, but the current version has little focus on the environmental protection of the high seas, instead focussing on the sea as a resource without regard to sustainability or ecological impacts of human activities. Future ocean governance must include the emerging range of human activities on the High Seas, especially as commercial companies move towards fully-fledged sea-bed mining activities. Future ocean uses may include activities such as open-ocean ranching, deployment of ocean thermal energy systems, even floating cities in the High Seas – any new instrument needs to be far-sighted and flexible.

Intergovernmental programmes will need to be interfaced with national marine policies & vice versa. This would enable member states to improve their engagement in intergovernmental platforms & facilitate the faster ratification of international laws. For example, a new EU Ship Recycling Regulation (1257/2013) entered into force for all European member states on 30 December 2013, with the objective to reduce the negative impacts linked to the recycling of EU-flagged ships. It brings into force an early implementation of the requirements of the IMO 2009 Hong Kong Convention for the Safe & Environmentally Sound Recycling of Ships (currently awaiting full ratification), & therefore contributing to its global entry into force.

There also needs to be greater transparency & communication between regions to facilitate improved cooperation in matters of ocean governance. From a science policy perspective within the EU improving communication would help with the implementation of European Marine Policies such as the Marine Strategy Framework Directive. Also improving communication between high-level policy organisations, member states & other relevant parties would be beneficial in improving the general understanding of how timescales priorities can be aligned.

(2335)

**\*What would you want to change?**

The global ocean requires an Integrated Marine and Maritime Policy, as per Europe's integrated policy [http://www.europarl.europa.eu/atyourservice/en/displayFtu.html?ftuld=FTU\\_5.3.8.html](http://www.europarl.europa.eu/atyourservice/en/displayFtu.html?ftuld=FTU_5.3.8.html) or the UK's Marine Policy Statement <https://www.gov.uk/government/publications/uk-marine-policy-statement>. Any Ocean Policy can only be delivered via the United Nations, via UN Member States and Bodies.

As the EU is not a UN Member State it is unable to change international law pertaining to use of the High Seas, but can request Member States to adopt a consistent approach to High Seas governance, building on lessons learned with the Integrated Marine and Maritime Policy, Marine Strategy Framework Directive and associated monitoring programmes, plus national legislation such as the UK's Marine and Coastal Access Act (2009). Note that the EU's failure to deliver sustainable fisheries prior to the 2013 Common Fisheries Policy Reform damages Europe's credibility in the eyes of the wider International community regarding ocean governance – fisheries MUST be included in any integrated marine management system for the High Seas, not treated as an isolated industry.

Within the UN family "UN-Oceans" has a wide-ranging ocean remit and could play the pivotal role in coordination of existing international & UN ocean-focussed bodies. However, in it's current form UN-Oceans has no executive power to implement a coordinating strategy. This would be one area that could be changed to improve overall international ocean governance.

Within UN-Oceans the Intergovernmental Oceanographic Commission (IOC), International Seabed Authority & International Maritime Organisation (IMO) are examples of existing bodies that can be enhanced under UN mandate to deliver better ocean governance. They are servants of their Member States, ensuring that the democratic process is applied to some extent in their decision-making Assemblies and Councils. Whilst this does mean that it can take several years for policies to deliver tangible results, the mechanisms are robust, ratified at government level, and long-lasting.

Summary – **Empower UN-Oceans or a component body/bodies to deliver reformed international governance, informed by impartial expert science advice from the Intergovernmental Oceanographic Commission and other UN bodies.**

(1993)

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

Protection for marine biodiversity and the marine environment in areas beyond national jurisdiction is the key gap in current frameworks. This must include fisheries on the High Seas – where an unacceptable portion of the catch is illegal and unreported. To enable protection there must be adequate monitoring and enforcement. To roll out an equivalent of the EU's Marine Strategy Framework Directive with accompanying Good Environmental Status indicators on a global basis, with no sector (such as fisheries) excluded, would deliver a healthy ocean capable of sustainable levels of exploitation for food, minerals and other resources.

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This would require a new governing body, or enhanced powers to existing UN bodies, including policing and enforcement powers.

Governance of seabed mining will need to rapidly evolve as this has not yet occurred on an industrial scale, and the impacts on deep ocean ecosystems are very poorly understood or quantified.

### ***How would they benefit?***

A comprehensive marine management agency should deliver a sustainably-exploited ocean that enabled wild ecosystems to continue to flourish, so that the ocean continues to deliver ecosystem benefits such as climate regulation, waste recycling, and oxygen production on a global scale. Coverage would be sea surface to deep sea floor so that mining operations in international waters are monitored too.

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

From a fisheries perspective over-exploited shared seas such as the Mediterranean that have small EEZs (only 12 miles rather than the usual 200 miles) would be the top priority. However securing agreement from non-EU states for an EU-imposed management system would be very difficult, whereas securing agreement from a more neutral UN agency might be easier to achieve. An international agreement along the lines of the Marine Strategy Framework Directive that included ecosystem-based fisheries regulation would transform the health and biodiversity of shared seas.

Developing nations would strongly benefit from improved organisation of international marine governance, particularly to protect themselves from over-exploitation of their offshore resources by major powers, including EU-registered fishing interests. Within the Caribbean EU member states such as the UK, France and Netherlands have responsibilities for overseas territories who would benefit strongly from implementation of the same systems used in Europe to provide enhanced ocean governance.

The High Seas would benefit from filling-in gaps in institutional frameworks, and more effective organisation – particularly in fisheries regulation and enforcement, and in the future by actions to ensure that deep sea mining is regulated to a high standard, based on improved scientific understanding of deep ocean ecosystems.

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### ***How would they benefit?***

The EU could work at a high level within its regional seas to with both EU & non-EU states to improve relations & attitudes towards environmental protection of the marine environment regionally, ultimately improving the output of the Marine Strategy Framework Directive. Furthermore careful coordination by the EU between European & non-European countries sharing regional seas, could ultimately facilitate improved governance of the high seas through shared visions for ocean management & protection.



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Efforts from the EU within the seas of developing nations could help to improve communication & exchange of information within the Caribbean would facilitate access to the region for marine science research purposes. It would also improve knowledge exchange between Europe & these countries, especially in terms of environmental protection & management, as well as disaster planning & relief.

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### **\*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?**

Many sectors of the economy could benefit from more effective international ocean governance. Improving environmental management & protection in EEZ will benefit the ecosystem services & improve fisheries, which are a large part of many coastal state economies. Improved environmental management will also benefit the tourism industry, energy industry & offshore mining industry. The latter would also benefit from improved coordination in the high seas beyond EEZ's, protecting benthic communities, which are critical for carbon cycling & deep-sea ecosystem survival. Fisheries would also benefit from high seas management especially with regards to protection of migratory routes & spawning grounds.

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### **How would they benefit?**

Effective regulation reduces risk for investors, shareholders, insurers and governments. It also improves human health and safety, and reduces the risk of accidents and hazardous events. Shareholder value is enhanced for companies that work according to sound, science-based policies. Fisheries industries would benefit by from improved environmental protection because fish stocks would be managed & not overfished. Wild stock levels in certain areas of the ocean would be able to recover & be available for more productive fishing in the future, bringing more money into the sector. Similarly if migratory routes and spawning grounds were protected species would have greater proliferation & survival from juvenile to adult life stages.

Improving the quality of bathing waters & beach areas would also improve the appeal of a region in terms of tourism. A major economic driver in many coastal regions is tourism.

The energy industry would benefit from improved ocean governance/coordination & would improve its public image if efforts were made to more comprehensively coordinate & regulate environmental protection legislation for offshore energy & mineral exploration. Furthermore if the energy & science communities more effectively linked up & shared knowledge duplication would be reduced & resources for monitoring the marine environment could be used more effectively/strategically.

### **\*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. Taking the Mediterranean as an example, coordination between African & European countries is key to appropriate management of the sea's ecosystems. Without comprehensive management by nations from both continents ecosystems will become unsustainable as the Mediterranean's environment becomes increasingly uninhabitable for most life apart



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from jellyfish. This scenario would result in a decrease in the attractiveness of the region for tourism, ultimately impacting the economy of the area. Similarly negative impacts will be seen within the fisheries communities again with resulting economic detrimental consequences.

Similar coordination between the EU & non-EU states around the Arctic may also have value in the longer term. However, since the EU does not have a member state bordering the Arctic Circle, & most of the Arctic Ocean is EEZ of the USA, Russia, Norway, Denmark & Canada the influence that the EU can exert in the Arctic is likely to be minimal.

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### **\*Which principles or objectives should guide potential action?**

When an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if some cause & effect relationships are not fully established scientifically. This is the precautionary principle & should be the primary mechanism guiding potential action. The precautionary principle is based on the need for strong, sound scientific evidence & as such this should mean that scientific knowledge is integrated into any international ocean governance discussions or newly developed frameworks. This is especially important for developing governance around environmental protection issues.

When looking at environmental protection an ecosystems approach needs to be taken looking at the whole picture & all species interactions, including humans, rather than developing species or activity specific policies in isolation of one another.

In the UK the Marine Policy Statement, jointly developed between the devolved administrations sets out the vision for clean, healthy, safe, productive & biologically diverse oceans & seas. Within the EU, the Marine Strategy Framework Directive sets out to achieve Good Environmental Status of EU waters. This is another principle, which should also guide any potential action.

At a European level the Blue Growth strategy balancing sustainable development of the marine & maritime economy with protection of the environment is another good strategy, which should guide future actions.

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### **How would you go about measuring progress in this area?**

The only way to measure if progress is being made with international environmental protection is to have Marine Strategy Framework Directive (MSFD) type descriptors of the status of the marine environment. The MSFD has 11 descriptors (1: Biological diversity, 2: Non-indigenous species, 3: Fish/shellfish, 4: Marine food webs, 5: Eutrophication, 6: Sea floor integrity, 7: Hydrographical conditions, 8: Contaminants, 9: Contaminants in fish & seafood, 10: Marine litter, 11: Underwater noise) which each EU member state has taken & set targets & programmes of measures to monitor & achieve good environmental status. Progress towards the achievement of Good Environmental Status (set as a target within each of these descriptors) will be measured periodically & an iterative process of reassessing the targets & monitoring programmes will be put into place. Were environmental protection governance to be put into place in the high seas, this would likely be the best system to measure progress. How you agree upon targets for each descriptor will be difficult because of the

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lack of scientific baseline, & the number of countries with conflicting priorities who would also want a say in the decision.

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### **Lack of knowledge**

*Innovative technological capabilities (e.g. in marine biotechnology or renewable energies) alongside more traditional economic activities need a much better understanding of seas & oceans to sustainably realise their economic potential. At the same time, seas & oceans around us are changing, also due to pressure from human activities, including climate change, ocean acidification & fishing, & the overall health of the marine environment is a growing concern.*

*In some cases, we may not understand the oceans sufficiently to take appropriate decisions[1], or gaps in surveillance systems or assets & capabilities for example can be a major obstacle to the development & application of rules to manage activities or even correctly enforce Marine Protected Areas. Lack of knowledge about positive or negative impacts of activities[2] may lead to suboptimal results or even missing growth opportunities provided by making use of ecosystems as economic service providers as is the case for tourism.*

*The marine knowledge base is already being strengthened at international & EU level. Major efforts are being undertaken in projects funded by the EU's Framework programmes for research, joint programming, international & national programmes. This includes for example, the mapping & assessment of ecosystems & their services, the work under the Convention on Biological Diversity on ecologically & or biologically significant marine areas, the initiative on "The Economics of Ecosystems & Biodiversity", the UN World Ocean Assessment, potential forthcoming work by the Intergovernmental Platform on Biodiversity & Ecosystem Services. The Commission's "Marine Knowledge 2020" initiative quantified the benefits of sharing knowledge & data across national & sectoral boundaries[3]. Marine research cooperation is high on the agenda in some areas (e.g. North Atlantic).*

*While much research is taking place to obtain more data & information about our seas, a lot of it is still in its early stages, carried out in piecemeal fashion, limited in time or scope or simply not shared enough. A good example is the collection of data in the context of environmental assessment for specific projects which is often done multiple times for different projects, leading to duplication, or held by individual organisations & not made available to others who might benefit from the same data.*

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*[1] We only learned recently about the real importance of plankton as oxygen generator  
<http://www.reuters.com/article/2015/05/22/us-science-plankton-idUSKBN0062G120150522>*

*[2] Fixed sea structures providing habitats*

*[3] Commission staff working document Marine Knowledge 2020: roadmap Accompanying the document Communication from the Commission on Innovation in the Blue Economy realising the potential of our seas & oceans for jobs & growth  
<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0149&from=EN>*

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

Mapping of the sea floor & demarcation of international marine boundaries benefit from improved maritime knowledge. Scientifically we have the capacity to map the sea floor to a very high resolution by undertaking bathymetric surveys from ships and autonomous underwater vehicles. However this is a timely process & needs investment in scientific capabilities & expertise. If such investment were made then there would be tangible benefits, including, better understanding of the sea bed topography including the location of sea mounts where key fish species are known to exist would assist in the development of sustainable fishing practices, enabling sustainable yields to be landed for many years into the future.

Furthermore understanding where seabed resources lie (energy & minerals), & their relation to sensitive habitats & ecosystems would allow sustainable exploitation of these resources. Improved understanding of the extent of continental shelf extents will facilitate the resolution of territorial claims in certain politically tense regions of the ocean (e.g. the Arctic).

Finally understanding of the bathymetry & geology of the sea floor in regions, which are prone to natural disasters such as hurricanes or tsunamis (due to geological movement of fault lines) will enable improved disaster resilience. This may be through improved preparedness (knowing where a tsunami may occur & the possible direction of travel/impact to land), or improved knowledge of shipping lanes & access to coastal regions for vessels offering humanitarian relief after a natural disaster.

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

Aside from the bathymetric mapping of the seas & oceans, as discussed above, another obvious gap is in our ability to make seasonal to decadal predictions about weather & climate. Better understanding of this seasonal to decadal variability would allow for improved prediction of hurricanes, drought & flood events on a global scale, which in turn would facilitate better disaster preparedness. Similarly improved understanding of sea level rise & storm surges on a global scale & its prediction into the future would also allow governments to better plan the development of infrastructure in coastal regions.

Knowledge of aquaculture is also another key gap in the marine knowledge base. Currently much of the research undertaken on aquaculture is in the coastal regions, but not much is understood or known about aquaculture on a much larger scale in the high seas. Scaling up aquaculture may be key to future food provisioning with a globally expanding population. As such knowledge is needed about where to undertake such as scaling up exercise.

Understanding of the ecology, geography & geology of the deep-sea bed is also a critical gap in our knowledge base. Improving scientific understanding in this area is vital before any regions of the deep sea are exploited for their mineral resources. Without knowing the make up of the seabed, environmental protection measures, mitigating against any industrial activity cannot be put into place.

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

Scientists gather a lot of information about the seas & oceans. However because knowledge exchange with communities outside of academia is typically only considered towards the end of a project when the results have been identified, the success of transferring any new knowledge is often poor. A way to improve this is to integrate knowledge exchange into science programmes from the outset, working with stakeholders outside of the research community to ensure that knowledge products are tailored to their needs & that the stakeholders understand the implications of the research. Such knowledge exchange must happen throughout the project life cycle & not just at the end of a project. Furthermore collaborative working with partners outside of academia can be encouraged if knowledge exchange is built into research programmes & collaborative co-design of projects & programmes is undertaken. This is especially relevant for collaborations between industry & academia.

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

In order to improve coordination in maritime research an overarching coordination body is needed to bring, scientists, policymakers & industry representatives together to share ideas & knowledge. In the UK this is undertaken through the Marine Science Coordination Committee (MSCC), a platform bringing together many marine & maritime representatives across all of the devolved administrations to share ideas & align work streams, ensuring that science is fed into policy & policy is developed in conjunction with science.

A mechanism similar to the MSCC could be scaled up to a European level to improve the coordination of research, policy & industry communities. This is already being undertaken to some extent within the EU by organisations such as the Joint Programming Initiative, (JPI) Oceans & the European Marine Board. JPI Oceans is a coordinating & integrating strategic platform providing a long-term integrated approach to marine & maritime research & technology development in Europe. The EMB develops common positions on research priorities & strategies for European marine science, facilitating enhanced cooperation between stakeholders involved in supporting, delivering & using marine research & technology. As such the roles of the EMB & JPI organisations could be strengthened to ensure a holistic coordination of all science policy matters across the EU.

There is also a role for global-scale UN bodies such as the Intergovernmental Oceanographic Commission to facilitate coordination in marine research between EU & non-EU member states. The IOC it is a key platform, which promotes international cooperation, coordinates observation & monitoring through the Global Ocean Observing System, leads global efforts to establish tsunami-warning systems, & promotes the equitable participation of member states. However there is room for improvement in the functioning of IOC, ensuring that it remains policy relevant, maintains a focussed portfolio of programmes & improves working relations with industry & non-academic partners.

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

This question has been largely answered in the previous responses to other questions in this consultation. However in summary the main economic activities, which could benefit from better availability of maritime knowledge includes; fisheries, aquaculture, seabed mining, marine energy industry (including both offshore oil & gas exploration & renewables). Similarly the main sectoral policies which could benefit includes; disaster preparedness & relief operations, coastal planning & defence, territorial demarcation claims, environmental protection, governance of the high seas.

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### **How would you go about measuring progress in this area?**

Measuring progress in this area is difficult as there will not be clear outcomes for many of the improvements in the coordination of international governance & making marine knowledge more readily available. However, it would be anticipated that there would be more interdisciplinary research programmes undertaken, & resulting reports & programme outputs. Furthermore an emergence of improved & strengthened marine coordination systems at EU level would also be observed. Such coordination systems would be run by groups of experts with marine science & policy knowledge who could expertly bring together the academic, industry & policy communities.

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***Thank you very much for replying to the survey!***

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***Anything to add? Please enter your comments in the box below.***

For more information on the European Marine Board, please visit <http://www.marineboard.eu/>.

For more information on the JPI Oceans Initiative please visit <http://www.jpi-oceans.eu/about>

For more information about the IOC please visit [www.unesco-ioc.org](http://www.unesco-ioc.org). The UK recently published a policy brief, jointly with the UK National Commission for UNESCO entitled "An evaluation of the Intergovernmental Oceanographic Commission's role in global marine science & oceanography". This

## *National Oceanography Centre (UK) response to EU Ocean governance consultation*

provides an overview of the current functioning of the IOC & how it could be improved in the future in order to stay current & relevant to modern societies needs. The policy brief can be accessed from <http://www.unesco.org.uk/publication/an-evaluation-of-the-intergovernmental-oceanographic-commissions-role-in-global-marine-science-and-oceanography/>.

Mr Stephen Hall (National Oceanography Centre, UK) is the current chair of IOC Group 1 countries (including Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Malta, Monaco, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom of Great Britain & Northern Ireland, United States of America) & vice chair of IOC. This role enables Steve to gain a broad understanding of the needs & issues with different countries in respect to their ocean science needs & outputs.

For more information about the Marine Science Coordination Committee visit [www.gov.uk/government/groups/marine-science-co-ordination-committee](http://www.gov.uk/government/groups/marine-science-co-ordination-committee).

For more information about the Knowledge Exchange activities in EU funded projects please visit the COLUMBUS web site at <http://www.columbusproject.eu/>.