

Chapter 1 Introduction

Lead Authors:

Albert Fischer and Sarah Grimes , Intergovernmental Oceanographic Commission of UNESCO, Paris, France

Chapter Citation:

Fischer, A.and S. Grimes. (2016). Chapter 1: Introduction. In UNESCO IOC and UNEP (2016). The Open Ocean: Status and Trends.United Nations Environment Programme, Nairobi, pp. 1-7.





Introduction



The TWAP

The Transboundary Waters Assessment Programme (TWAP) was established to assess – for the first time - the state of the global transboundary waters system. It aimed to guide the Global Environment Facility (GEF) to identify priority areas for intervention in the management of shared water systems. The results should also help governments in managing their shared water bodies. The project has been carried out using a scientifically credible methodology for a global assessment of transboundary water systems (groundwater, lakes/reservoirs, river basins, Large Marine Ecosystems (LMEs), and open ocean areas). It has also catalysed partnerships and established arrangements for conducting the global assessment. The assessment methodology has allowed the monitoring of evolving trends in these water systems, and the identification of the impacts of GEF International Waters programmes and those of other agencies and actors.

For the Open Ocean component, the assessment methodology was developed to decipher the complex interaction of the natural system with human systems, speaking to a high level policy and decision making audience, and pointing to environmental problems related to the ‘open ocean’. For the purpose of this assessment, ‘open ocean’ was defined to include areas beyond national jurisdiction. However, also acknowledging that the open ocean is connected to and has direct impacts on areas within national jurisdiction, the assessment covers a global scope. (see Glossary Box 1 for an explanation). Whilst focused on the open ocean, the assessment maintained a high level of scientific credibility, making the best use of sometimes very sparse data about the open ocean, and identifying uncertainties driven from gaps in knowledge and in data.

The open ocean as global commons

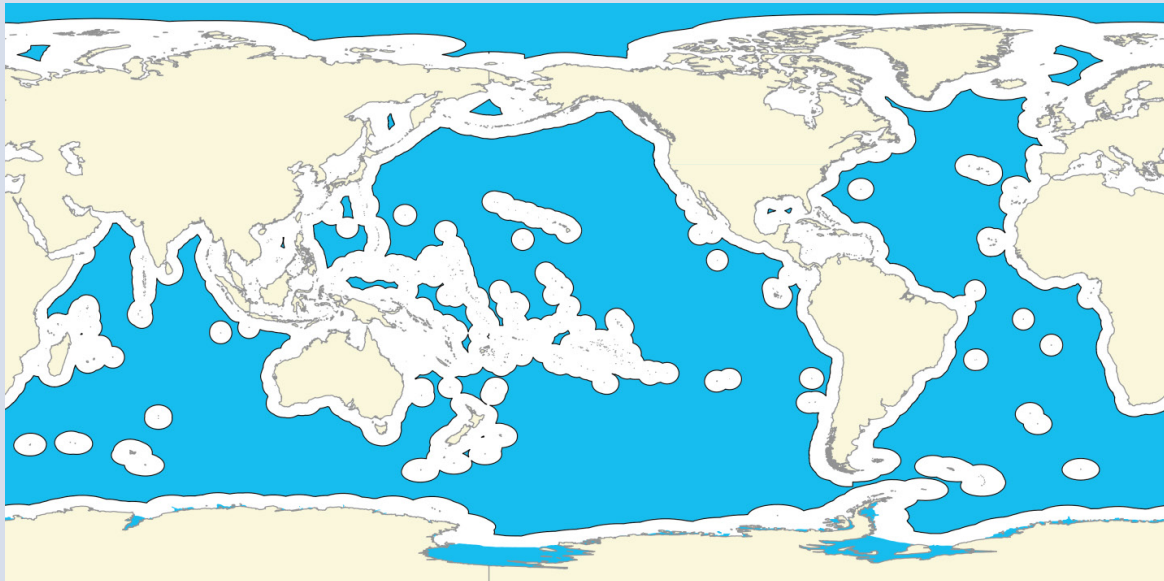
The open ocean is the largest area of global commons, vital to life on the planet, and under the legal jurisdiction of no one nation but the common stewardship of all. About half of the entire surface of our planet is open ocean in areas beyond national jurisdiction (Figure 1.1).

While most of the human population of the planet may feel remote from the open ocean - it influences lives in profound ways. The ocean holds 97 percent of all the water on Earth, most of it in the open rather than coastal ocean. Open ocean dynamics play a key role in regulating and modulating the Earth system and hydrological cycle. The ocean has absorbed about one quarter of human emissions of greenhouse gases and prevented stronger warming of the planet, but as a consequence they are acidifying, with future potential impacts on marine ecosystems. The ocean provides some key ecosystem services to the human population - they produce the majority of oxygen through ocean primary productivity, hold the major part of the planet’s biodiversity, and while the significant fraction of fish catch is in LMEs / coastal waters, the open ocean provides a source of food and economic gain from fish and a habitat to highly mobile species, as well as the transport of nutrients into coastal waters. More than 90 per cent of goods in international trade are transported by sea, and the Global Ocean Observing System (GOOS) estimates the value of marine activities globally (including open ocean and coastal areas) to be about 5 per cent of global GDP.¹

¹ <http://ioc-goos.org/spm>

Defining the 'Open Ocean'

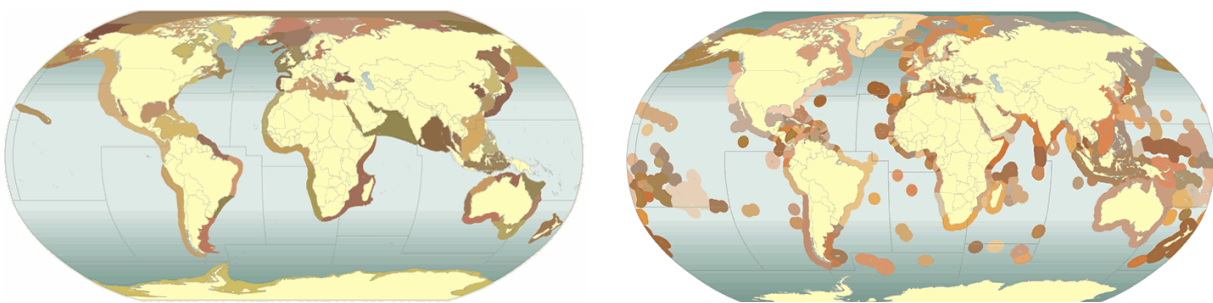
The 'open ocean' is the largest areas of global commons, vital to life on the planet, and under the legal jurisdiction of no single nation but the common stewardship of all in 'areas beyond national jurisdiction' (ABNJ). The area equates to marine waters beyond exclusive economic zones (EEZs). By international convention, the open ocean is the largest transboundary space covering about half of the surface of planet Earth. Ocean 'areas within national jurisdiction' (AWNJ) cover a further 20%. The 'high seas' is an international legal term used by the UN Convention on the Law of the Sea (UNCLOS) which refers to the area of the ocean not included in the EEZ, territorial sea or internal water of any State. Essentially, this is the same as the 'open ocean' and the term is often inter-changed.



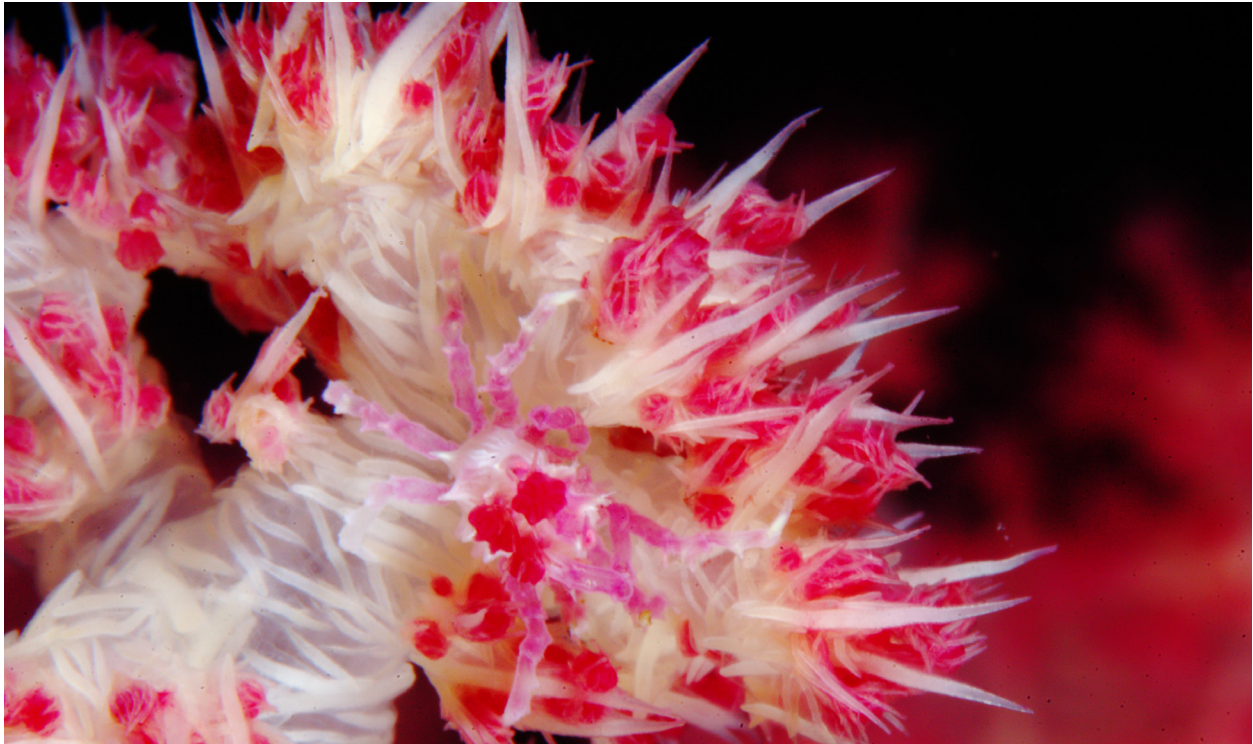
The Open Ocean (or 'area beyond national jurisdiction') is blue. The white areas depict exclusive economic zones (EEZs) (or 'area within national jurisdiction').

The legal framework governing the uses of the ocean and its resources is defined by the UN Convention on the Law of the Sea (UNCLOS), which entered into force in 1994. It defines internal waters; territorial seas; rights of Coastal States in EEZs over natural resources, certain economic activities, marine scientific research and environmental protection; and rights of coastal States on their continental shelf (limited to the seabed) for exploration and exploitation. Areas beyond the internal waters and EEZs are the high seas, where all states enjoy freedoms of navigation, over-flight, scientific research and fishing.

Figure 1.1. Large Marine Ecosystem areas (left) and Exclusive Economic Zones (EEZs, right). About 50 per cent of the surface of the earth is legally beyond national jurisdiction, the open ocean is the largest transboundary space on the planet.



Source: Sea Around Us project



For the purposes of TWAP, the open ocean is defined as the ocean area beyond the defined LME areas² (Figure 1.1). However the open ocean assessment has taken a global approach, complementary to the LME fixed assessment unit approach. While this definition of open ocean is similar to the high seas of UNCLOS, there is a notable addition of many island EEZs in the large ocean basins, particularly in the tropical Pacific. Conditions in the open ocean have impacts on the natural system and particularly on human systems beyond this strict geographic zone, and in assessing the vulnerability and impact of environmental problems associated with the open ocean, the methodology and scope was global.

Principles guiding the global partnership for the environment and development are encapsulated in the Rio Declaration of the 1992 Earth Summit (the United Nations' Conference on Environment and Development), and they are worth noting in the context of the open oceans. These principles include:

- putting human beings at the centre of concerns for sustainable development,
- the responsibility of states not to cause damage to the environment of areas beyond their national jurisdiction,
- the equitable meeting of the needs of present and future generations should be a goal of development,
- that states shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystems,
- environmental issues are best handled with the participation of all concerned citizens, at the relevant level,
- the precautionary approach shall be widely applied.³

Under UNCLOS, all states are obliged to adopt, or cooperate with other states in adopting measures to manage and conserve living marine resources. Highly migratory species of fish and marine mammals are accorded special protection. States are bound to prevent and control marine pollution and are liable for damage caused by violation of their international obligations to combat such pollution.

² Sea Around Us Programme

³ Full text of the Rio declaration: <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>

There are a variety of governance arrangements for the open ocean in addition to UNCLOS, detailed in Section 3, which are generally thematic: for managing fisheries, climate change, or ocean-based pollution. They are based on State consensus and cooperation, and generally have weak or no enforcement mechanisms. The TWAP Open Ocean Assessment has evaluated governance arrangements related to open ocean environmental problems as a basis to understand where potential interventions are required to manage these. In some cases, interventions point to areas of management and governance that are not directly related to the open ocean, because of geographic links between human systems, other natural systems, and open ocean systems. In the context of GEF these may not fall under the International Waters focal area, but might cut across other GEF focal areas.

Previous and ongoing assessment efforts and lessons learned

TWAP is not the only assessment focused on the open ocean or international waters. In conducting the assessment, it has been important to learn from previous efforts, and align with ongoing ones, for example with the World Ocean Assessment, to maximize the synergies between efforts and improve their chances of being sustained by local and international involvement.

Previous Global approaches

The Global International Waters Assessment (GIWA) published in 2006 was a previous effort by GEF and implemented by UNEP to assess international freshwater and coastal ocean systems in a holistic and globally comparable manner, but it did not address the open ocean. Four major concerns were addressed: freshwater shortage, pollution, overfishing, and habitat modification, along with the overarching concern of global change. In 66 sub-regions, building on strong local involvement, GIWA assessed the concerns above, and proposed policy options. Whilst GIWA built local ownership from a strong bottom-up approach, it was hampered by a lack in many cases of social scientists and policy expert involvement, and limited stakeholder involvement. The GIWA approach to assessment will not be repeated by GEF. GIWA provided an interesting background to the TWAP Open Ocean Assessment Methodology, in emphasizing the importance of social science and policy in assessing management options for environmental problems, and in pointing out the geographic areas of current and future water stress - since rainfall and drought are controlled mainly by open ocean processes.

The UN General Assembly is currently implementing the *Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socio-Economic Aspects (Regular Process, or otherwise known as the 'World Ocean Assessment')*. In its start-up phase, a group of experts led by UNESCO-IOC and the United Nations Environment Programme (UNEP) conducted an Assessment of Assessments that identified best practices for an influential assessment, published in 2009. TWAP had a different main client (GEF) from the Regular Process (the Member States of the UN), and therefore had a different scope and objectives. Nevertheless, the TWAP Open Ocean and LME Assessments have maintained communication with the Regular Process and hope to contribute relevant results to it in future rounds.

The Open Ocean Methodology also took note of some other global assessment initiatives with some relevance:

- The UN Global Ocean Observing System (GOOS, a joint project with the UNESCO-IOC, World Meteorological Organization (WMO), UNEP, and the International Council for Science (ICSU)) has been developing and working with partners to publicize indicators of open ocean variability and change, and is developing further information on the impacts related to these indicators. Its multilateral network of ocean observations is key for monitoring change in the ocean. While originally developed as a climate observing system, the open ocean extent of GOOS has now expanded into biological and biogeochemical variables, and is working with additional partners to expand to sustained observations of these into 'ecosystem Essential Ocean Variables' (eEOVs). Indeed, the GOOS Biology aspect has been set up, under the guide of *A Framework for Ocean Observing (2012)*, during the course of the Open Ocean Assessment.

The IOC's International Oceanographic Data and Information Exchange (IODE) programme coordinates the management of open ocean data, including the Ocean Biogeographical Information System (OBIS), a key output of the decade-long Census of Marine Life which ended in 2010.

- One of the most extensive scientific assessment efforts that include the open ocean is thematic: the one performed by the Intergovernmental Panel on Climate Change (IPCC). It was based on the assessment of peer-reviewed published scientific articles, and included the open ocean in assessing the role of the ocean in changing climate, and the vulnerabilities to and impacts of the changing climate on natural marine systems.
- The UNEP Global Environmental Outlook (GEO) is a consultative, participatory, capacity-building process for global assessment and reporting on the state of the environment, trends and future outlooks. It aims to facilitate the interaction between science and policy. The Conceptual Framework of GEO is consistent with the one proposed for the TWAP Open Ocean and LME Assessments.

Regional approaches

The European Union's Marine Strategy Framework Directive (MSFD) adopted in 2008 aims to achieve good environmental status of the EU's marine waters by 2020. It requires each EU Member State to conduct a detailed assessment of the state of the marine environment based on definitions of 'good environmental status' and to establish targets and monitoring programmes. The descriptors of 'good environmental status' are now being developed through scientific advice, and are focused on biodiversity, non-indigenous species, healthy fish stocks, marine food webs, human-induced eutrophication, sea-floor integrity relating to ecosystems, hydrographic conditions, pollution, contaminants in seafood, marine litter, and underwater noise. The assessment will include open ocean portions of the northeast Atlantic Ocean, and the descriptors and methodology are relevant to both the Open Ocean and the LME Components of TWAP.



Some regional and national efforts of note:

- Cooperation Across the Atlantic for Marine Governance Integration was a project to rationalize indicators in the coastal zones and open ocean across the Atlantic, and had links to other ocean health index projects.
- The US Government's National Oceanic and Atmospheric Administration (NOAA) is developing Integrated Ecosystem Assessments⁴ for marine ecosystems with indicators to track ecosystem health.
- The OSPAR Quality Status Report 2010⁵ provides a thematic assessment of the level of human threats and ecosystem health in the Northeast Atlantic.

Development of the TWAP Open Ocean Assessment

The UNESCO-IOC coordinated the development of the TWAP Open Ocean Assessment with wide consultation from 2010, including with GEF. The methodology was finalised in July 2012 (UNESCO-IOC 2012, <http://www.geftwap.org/publications/methodologies-for-the-gef-transboundary-assessment-programme-1/volume-6>). The approval of the Project Document in December 2012 paved the way for the Open Ocean Assessment, which was carried out from April 2013 until December 2015. This Technical Report presents the results of the work, and is supplemented by the '*OneSharedOcean.org*' web portal, which provides access to the underlying data and interactive graphics. The key results in relation to policy guidance have been summarised into the *Open Ocean Summary for Policy Makers – Status and Trends (2015)*.

4 <http://www.st.nmfs.noaa.gov/st7/iea/>

5 <http://qsr2010.ospar.org/>

References:

UNESCO 2012 A Framework for Ocean Observing. By the Task Team for an Integrated Framework for Sustained Ocean Observing, IOC/INF-1284, doi: 10.5270/OceanObs09-FOO

UNESCO-IOC 2015 'OneSharedOcean.org' web portal

UNESCO-IOC 2015 Open Ocean Summary for Policy Makers – Status and Trends, UNEP

2012 Summary for the World Ocean Assessment