
Hintergrundstudie

**Ocean as a Global Commons:
International Governance
and the Role of Germany**

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Zur Studie

Hintergrund

Wie können Global Commons besser geschützt und nachhaltiger genutzt werden, insbesondere im Rahmen der Deutschen Nachhaltigkeitsstrategie:

Unter anderem diese Frage bearbeitet die Wissenschaftsplattform Nachhaltigkeit 2030 mit dem Ziel, wissenschaftlich basierte Handlungsempfehlungen für politische Akteure zu entwickeln. Zu diesem Zweck hat sich 2017 über die Plattform die Arbeitsgruppe „Global Commons“ formiert, geleitet von Prof. Martin Visbeck (Co-Vorsitzender der Wissenschaftsplattform) und Prof. Aletta Bonn (Deutsches Zentrum für integrative Biodiversitätsforschung). In diesem Rahmen wurden unter anderem vier Hintergrundstudien zu vier Global-Commons-Bereichen von der Plattform in Auftrag gegeben (Süßwasser, Meere, Wälder, Biodiversität/Böden). Das vorliegende Papier „Oceans as Global Commons: International Governance and the Role of Germany“ ist eine von ihnen. Maßgeblich für die weitere AG-Arbeit ist ein breiter interdisziplinärer Austausch mit der Wissenschaft sowie transdisziplinärer Austausch mit Politik, Wirtschaft und Zivilgesellschaft in mehreren Schritten.

Zitierhinweis

Abhold, K., Hoffmann, H., McGlade, K., Krüger, I., Stelljes, N. (2019): Oceans as Global Commons. International Governance and the Role of Germany. Report to the Science Platform Sustainability 2030. Berlin: Ecologic Institute.

DOI

10.2312/iass.2019.039

Scientific Review Paper

Ocean as a Global Commons:

International Governance and the Role of Germany

For the:

Wissenschaftsplattform Nachhaltigkeit 2030

AG Global Commons

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April 2019



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1 Executive Summary

The world's oceans cover the majority of the Earth's surface and provide essential resources and habitats to sustain our planet's life. Human activities both on land and at sea are placing enormous pressure on our oceans, affecting their wealth of biodiversity and their ability to provide key ecosystem functions and services. We are now coming to grips with the fact that the oceans and their resources are finite and exhaustible. The world's oceans are recognised as a global commons in need of improved governance and management. Despite an existing international legislative framework and multiple initiatives that aim to sustainably use and manage our oceans, action and cooperation from all global states is needed to halt and reverse unsustainable trends before a tipping point is reached.

The UN Agenda 2030 and its Sustainable Development Goal 14 on oceans marks a call for action on this front to address key ocean challenges. Within this framework, Germany promotes and engages in activities that build and expand ocean knowledge, that support the sustainable management of marine resources, and that encourage biodiversity protection. Despite some progress, much is needed to see the achievement of Goal 14. States should become proactive in supporting transformation measures for ocean sustainability. The integration of ocean concerns into existing international legislative frameworks and fora, such as the UNFCCC and FAO, could provide key operational starting points to strengthen the underlying sustainability architecture for ocean governance.

2 Introduction

The United Nations 2030 Agenda for Sustainable Development builds on the Millennium Development Goals and the decisions of the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012. It defines 17 Sustainability Goals (SDGs) for anchoring sustainability as a guiding principle in key areas of life, politics and the economy.

Achieving the SDGs requires intensive global and national cooperation. In particular, Goal 14 'Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development' can only be achieved through international processes that must be anchored by national processes, as oceans as 'common goods' extend beyond national borders. In Germany, the implementation of the 2030 Agenda lies with the Federal Ministry for Economic Cooperation and Development (BMZ) and Federal Minister for the Environment, Nature Conservation, and Nuclear Safety (BMU). The German Council for Sustainable Development is actively involved in the implementation of the goals and the German Sustainability Strategy concretises the 17 goals of the Agenda 2030 for Germany.

The study "Ocean as a Global Commons: International Governance and the Role of Germany" was developed by Ecologic Institute at the request of the Institute for Advanced Sustainability Studies (IASS) as part of the Science Platform Sustainability 2030 (Wissenschaftsplattform Nachhaltigkeit 2030). The aim of the study is to provide an overview of the different governance mechanisms in regard to the Global Commons "Oceans" area. The study addresses the following four research areas:

- Oceans: commons function for global sustainability and key challenges,
- Global oceans governance and the Agenda 2030,
- Contributions "with" and "by" Germany,

- Key transformation processes for strengthening the sustainability architecture.

3 Methodology

The research paper was developed based on a synthesis of relevant current research findings and literature on different governance mechanisms regarding the Global Commons “Oceans” area and Germany’s actions and role within these mechanisms. For the literature review, current research results and scientific publications as well as current national and international political processes were identified through an online search in German and English to respond to the four research areas. References within identified relevant documents allowed to expand the research radius to further documents and findings, utilising a snowball effect to find and collect literature. The literature resulting from the search was categorised according to relevance to the four areas and used for analysis for the respective sections of the report.

4 Ocean as a Global Commons

4.1 Oceans: commons function for global sustainability and key challenges

The world’s oceans can be considered Earth’s remaining frontier, with vast amounts of their blue depths unexplored and unknown to science. What we do know is limited but growing, building on decades of ocean research, all of which have pointed to the critical importance of our global oceans to the Earth’s functioning.

Oceans provide numerous ecosystem services to humans, including regulating our climate, cycling nutrients, providing food and genetic resources, as well as cultural services associated with human health and wellbeing^{1,2,3}. These services benefit coastal and non-coastal communities across the world, economically supporting commercial and small-scale fisheries, pharmaceutical industries, tourism and hospitality industries, as well as mining and energy industries. Many of these ocean-based ecosystem services and their benefits flow across biophysical and national boundaries⁴. For example, fish stocks and marine mammals can traverse along vast expanses of coastlines and even oceans to find feeding grounds or areas to spawn. Furthermore, oceans play a major role in regulating the global climate by providing a critical net transfer of heat from the South to the North Atlantic through the Atlantic meridional overturning circulation (AMOC), also referred to as the Gulf Stream⁵.

Oceans are thus uniquely characterised by their interconnected and fluid nature, linking energy and climate cycles, marine living resources, and human activities as they move through coasts, regional seas, and open oceans. Consequently, human impacts and the effects of global growth fail to be

¹ WOR (2015). “Chapter 2: How the seas serve us”. In: *World Ocean Review 4: Sustainable Use of Our Oceans – Making Ideas Work*. Available at: https://worldoceanreview.com/wp-content/downloads/wor4/WOR4_en_chapter_2.pdf

² UN (1987). “Our Common Future, Chapter 10: Managing The Commons”. In: *Report of the World Commission on Environment and Development: Our Common Future*. Available at: <http://www.un-documents.net/ocf-10.htm#>

³ Liqueste et al. (2013). “Current Status and Future Prospects for the Assessment of Marine and Coastal Ecosystem Services: A Systematic Review”. *PLoS ONE* 8(7): e67737.

⁴ Schröter et al. (2018). “Interregional flows of ecosystem services: Concepts, typology and four cases”. *Ecosystem Services* 31(B), pp. 31-241.

⁵ Atlantic Future (2018). “The Atlantic Ocean – an interconnected biological reality”. Available at: <http://www.atlasoftheatlantic.com/narrative/ocean>

contained within one nation's boundaries; passing through air and water currents between nations, and through complex food chains between species. This fluidity distributes the burdens and benefits of economic and social development to both rich and poor⁶. In this way, our oceans are a unique and common resource that must be managed not just by one, but by all countries in a way that takes full account of their interconnectedness.

Unlike other ecosystems and resources, the world's oceans have a long history of countries both recognising the need for more freedoms (i.e., for shipping lanes and safe passage of vessels) and attempting to extend sovereign rights into marine space (i.e., for fishing rights and access to resources). As far back as the early 1600s, the oceans were recognised as being the property of "no one", under common possession by all⁷.

This thinking was extended in 1982, where the United Nations Convention on the Law of the Sea (UNCLOS) formally declared "the area of the seabed and ocean floor and the subsoil thereof, beyond the limits of national jurisdiction, as well as its resources, are the common heritage of mankind, the exploration and exploitation of which shall be carried out for the benefit of mankind as a whole, irrespective of the geographical location of States"⁸. Through UNCLOS the obligations in regard to marine environmental protection of the oceans as a commons were stated and established for the first time. A few years later in 1987 the concept of "sustainable development" was highlighted in the Brundtland Report "Our Common Future", which also identified the oceans as a global commons. The report also laid the groundwork for events that eventually lead to the adoption of Agenda 2030 and the UN Sustainable Development Goals (SDGs)⁹.

When humans entered the 'Great Acceleration' in the 1950s, economic growth exploded exponentially and improved the wellbeing of millions of people in industrialised nations. This growth, however, collided with Earth's environmental systems, such as the atmosphere, oceans, ice sheets, and waterways, as well as its abundant biodiversity^{10,11}. In today's age, with unprecedented human impact on our planet's natural processes and biodiversity, we have entered what has been coined the 'Anthropocene'^{12,13}. In this new age, many scientists are concerned that we are treating the planet and its nature-based support systems past sustainable levels^{14,15}.

Human Use and Impact on Ocean Resources

⁶ UN (1987).

⁷ Schrijver, N. (2016). "Managing the global commons: common good or common sink?" *Third World Quarterly* 37(7), pp. 1252-1267.

⁸ See UNCLOS (1982), Preface, and Section 2, Articles 136 and 137. Available at:

http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

⁹ Holden et al. (2014). "Sustainable development: *Our Common Future* revisited". *Global Environmental Change* 26, pp. 130-139.

¹⁰ Rockström (2017). "Managing the global commons". UNEP: Our Planet. Available at: <http://web.unep.org/ourplanet/october-2017/articles/managing-global-commons>

¹¹ Nakicenovic et al. (2016). "Global Commons in the Anthropocene: World Development on a Stable and Resilient Planet". IIASA Working Paper. IIASA, Laxenburg, Austria. Available at: https://www.iucn.org/sites/dev/files/global_commons_in_the_anthropocene_iiasa_wp-16-019.pdf

¹² Levin, P.S. and Poe, M.R. (2017). "Preface". In: Levin, P.S. and Poe, M.R. (eds.), *Conservation for the Anthropocene Ocean Interdisciplinary Science in Support of Nature and People*. Academic Press.

¹³ Nakicenovic et al. (2016).

¹⁴ Halpern, B.S. (2017). "Chapter 13 - Addressing Socioecological Tipping Points and Safe Operating Spaces in the Anthropocene". In: Levin, P.S. and Poe, M.R. (eds.), *Conservation for the Anthropocene Ocean Interdisciplinary Science in Support of Nature and People*. Academic Press.

¹⁵ UN (1987).

Human use of ocean systems can cause extreme disruptions to natural processes and shift ecosystems to states beyond their natural ability to recover. With respect to fisheries, for example, this can be through local extinctions of species, fish stock collapse or through overexploitation of particular species. To allow ocean ecosystems to retain their resilience capacities, we must use them sustainably, for example by promoting ecosystem-based harvest of fish stocks or reducing nutrient pollution¹⁶.

To date, we have struggled to sustainably use ocean resources, and have directly impacted oceans through overfishing, nutrient and plastic pollution, introduction of invasive alien species, habitat destruction, among others. Overfishing, in particular, has been a long-term concern related to ocean health, and is an example of the tragedy of the commons. It has been estimated that roughly half of all global fisheries are overfished or have collapsed. Reasons for this are varied, but many argue that data limitations make it difficult to set yield targets that ensure sustainable fisheries. However, even some fish stocks, such as the Atlantic Bluefin tuna, that are data-rich and well monitored are still overfished, highlighting the challenge of translating science into actionable policy¹⁷. In addition, it is difficult to motivate practitioners to adhere and enforce the existing targets and halting unregulated and illegal fishing is a major problem for sustainable exploitation of fish stocks.

Nutrient and plastic pollution have garnered increasing attention from both research and political agendas. Nutrient pollution, i.e. eutrophication, in marine coastal areas mainly originates from land-based sources in the form of nitrogen (N) and phosphorous (P). Other sources of nutrient pollution can originate from aquaculture and even atmospheric deposition. With increasing nutrient emissions into coastal waters, marine ecosystems experience stress associated with eutrophication and even hypoxia situations that can negatively impact marine and coastal biodiversity¹⁸. Furthermore, plastic production increased dramatically over the past 60 years, and the direct and indirect input of plastic products and particles is a recognised threat to marine environments both coastally and in the open ocean. Plastic pollution has multiple impacts in marine systems, from the transference of invasive species and pathogens, the accumulation of toxins within marine biodiversity, as well as death of marine mammals, reptiles, fish and seabirds due to plastic ingestion or entanglement. In addition, plastic pollution poses challenges and costs to marine industries, especially for tourism¹⁹.

Over the past century, the rapid, postindustrial rise of the human population has seen an increasing number and size of settlements along coastlines. Such urbanisation and development trends along shorelines have had serious implications to coastal habitats and ecosystems resulting in coastal erosion, pollution and habitat modification. Global-scale economic trends can also be seen from shipping and tourism industries, which impact ocean habitats and ecosystems through the transference of invasive alien species, the construction of larger ports and establishment of hotels, restaurants and other tourism-related infrastructure. The latter two can cause serious damage to coastal and marine habitats and ecosystems, either degrading them or destroying them entirely²⁰.

¹⁶ Halpern, B.S. (2017).

¹⁷ Halpern, B.S. (2017).

¹⁸ Glibert et al. (2018). "Changing Land-, Sea-, and Airscapes: Sources of Nutrient Pollution Affecting Habitat Suitability for Harmful Algae". In: Glibert et al. (eds.) *Global Ecology and Oceanography of Harmful Algal Blooms*. Ecological Studies (Analysis and Synthesis), vol 232. Springer, Cham

¹⁹ Avio, C.G., Gorbi, S. and Regoli, F. (2017). "Plastics and microplastics in the oceans: From emerging pollutants to emerged threat". *Marine Environmental Research* 128, pp. 2-11.

²⁰ Levin, P.S. and Poe, M.R. (2017).

Some challenges the world's oceans are facing are indirectly caused by human perturbations to our Earth's natural systems. The most notable of these are caused by climate change, which impact the oceans through ocean warming and sea level rise, ocean acidification and deoxygenation. Since 1971, global oceans have absorbed approximately 93% of the Earth's increase in heat, and average surface temperatures increased by 0.44°C over that time frame. With this influx of added heat, i.e. energy, oceans are thermally expanding, causing sea levels to rise. This absorptive capacity of our oceans is regionally variable, with some oceans regions warming faster than others and some parts of the world experiencing sea level rise at different rates while others may experience decreases in sea levels^{21,22}.

Furthermore, the ocean is absorbing large quantities of atmospheric CO₂, which breaks down in marine waters and causes ocean acidification²³. Increased levels of ocean acidity can influence calcium carbonate shell formation in certain marine animals, including corals, plankton, and shellfish. As many of these organisms are on lower tropic levels, ocean acidification is likely to affect fundamental biological and chemical processes of the sea in coming decades²⁴.

Lastly, global climate change has impacted marine species and their communities by affecting e.g., individuals' physiology, population-level demography, abundance and distributions of species across space and time²⁵. Scientists predict that new species communities are likely to develop due to these changes. In the tropics, species richness is projected to decline, while the warming of colder waters is foreseen to cause a shift in the diversity of local communities by attracting species from lower latitudes. Even though it is not possible to precisely predict the consequences of these changes, it is clear that they will fundamentally affect marine biodiversity and the functioning of many marine ecosystems²⁶.

Cumulative Effects and Tipping Points

In today's oceans, human activities have strong, complex, and interacting and partly cumulative effects that are only beginning to understand (Figure 1). In addition, several activities can even lead to new pressures²⁷. Indeed, such effects are already found within the continental shelf and coastal regions²⁸. The implications of such interactions and accumulations cannot be predicted, and could have serious consequences to the continued provision of key ecosystem functions and ecosystem services²⁹. Pushing marine ecosystems beyond their ability to cope can cause dramatic shifts in the provision of

²¹ Rhein et al. (2013). "Observations: Oceans". In: Stocker et al. (eds.), *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK and New York, NY, USA. pp. 255-316.

²² EEA (2017). "Global and European Sea Level". Available at: <https://www.eea.europa.eu/data-and-maps/indicators/sea-level-rise-5/assessment>

²³ Pinsky, M.L. and Selden, R.L. (2017). "Chapter 2 - Climate Variability, Climate Change, and Conservation in a Dynamic Ocean". In: Levin, P.S. and Poe, M.R. (eds.), *Conservation for the Anthropocene Ocean Interdisciplinary Science in Support of Nature and People*. Academic Press.

²⁴ Rhein et al. (2013).

²⁵ Pinsky, M.L. and Selden, R.L. (2017).

²⁶ Pinsky, M.L. and Selden, R.L. (2017).

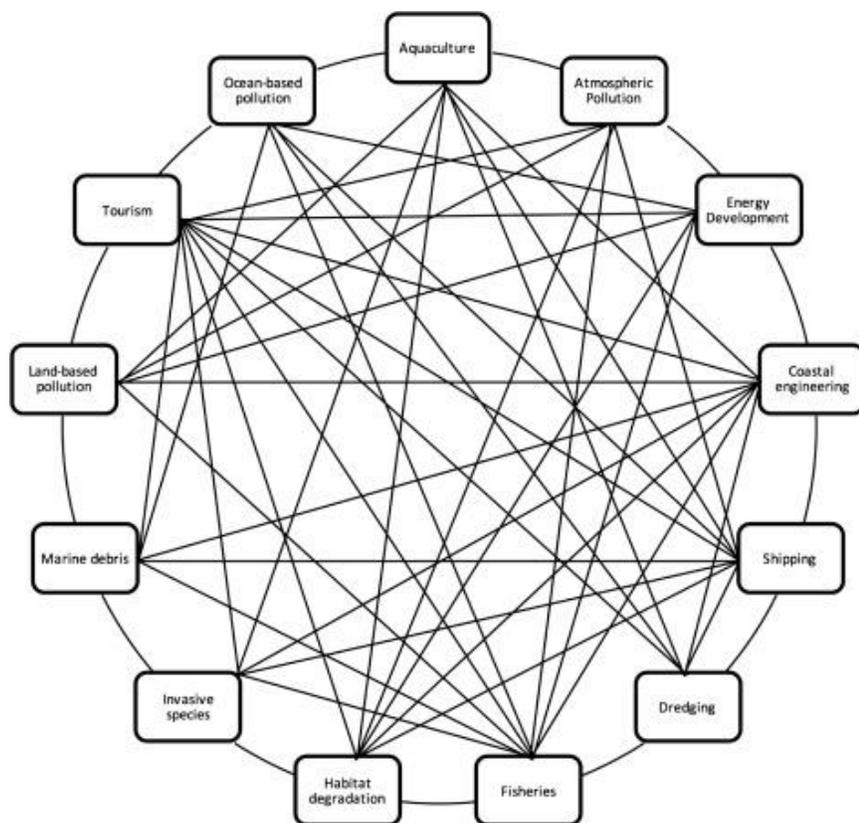
²⁷ Korpinen and Andersen (2016). "A Global Review of Cumulative Pressure and Impact Assessments in Marine Environments". *Frontiers in Marine Science* 3:153.

²⁸ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage". Available at: https://www.wbgu.de/fileadmin/user_upload/wbgu.de/templates/dateien/veroeffentlichungen/hauptgutachten/hg2013/wbgu_hg2013_en.pdf

²⁹ Levin, P.S. and Poe, M.R. (2017).

ecosystem services, such as the loss of food resources, collapse of fish stocks, changes in aesthetics, and loss of habitats due to coastal development. Intensive pressures caused by human activities, and their potential cumulative impacts and interactions, could even lead to regional or global tipping points³⁰. With an increasing global population and demands on marine space and resources, ecosystem tipping points are likely to be reached more quickly and more often³¹.

Figure 1: Interlinkages between human activities in marine environments



Source: Levin and Poe (2017)

Implications for Policy

In this context, science-based decision making will challenge policymakers and managers to consider the multiple activities occurring in our oceans and their wide-ranging environmental, ecological, and social consequences³². To ensure the sustained provision of key ocean resources and services, we will need to identify and operate within a “safe space” for the planet and humanity. This safe space respects resilience of ecosystems and threshold values, taking into consideration human activities and their impacts on biological resources and ecosystem services³³. Ensuring a balance between human use

³⁰ WBGU (2013). “Flagship Report- World in Transition: Governing the Marine Heritage”.

³¹ Halpern, B.S. (2017).

³² Sullivan et al. (2017). “Chapter 1 - Bridging the Science–Policy Interface: Adaptive Solutions in the Anthropocene”. In: Levin, P.S. and Poe, M.R. (eds.), *Conservation for the Anthropocene Ocean Interdisciplinary Science in Support of Nature and People*. Academic Press.

³³ Halpern, B.S. (2017).

of and impact on marine environments promotes sustainable development in line with global political agendas, such as the UN 2030 Agenda for Sustainable Development and its Goal 14 on oceans³⁴.

Agenda 2030 and its Sustainable Development Goal (SDG) 14 elevated the world’s oceans as a key environmental area in need of attention and improved global governance. Within SDG 14, its 7 targets focus on some of the key challenges facing our oceans today, including marine pollution; ocean conservation, restoration and resilience; overfishing and destructive fishing practices, including harmful fisheries subsidies; ocean acidification; and sustainable development and management of ocean activities (see Table 1)³⁵.

Despite SDG 14 and increased attention to oceans, governance of the world’s oceans and their health is largely disjointed and fractured between different levels of management, geographical areas, and between different maritime sectors³⁶. Fragmentation of the ocean is caused by many different factors, such as zoning of the oceans, the limited scope and mandates of regional agreements, and a lack of detail in UNCLOS. Furthermore, the separation of management into different sectors leads to players and institutions that do not interact sufficiently with each other. For example, military activities within the sea have long been managed by naval offices, while fisheries and aquaculture are managed by agriculture and food authorities, and waste disposal at sea by environmental or maritime authorities³⁷.

In the Anthropocene, while private companies increasingly enjoy the many benefits provided by the world’s oceans, public institutions and state governments are the ones held responsible for their governance and protection. Most activities by private companies within the ocean realm require a license or permit provided by the responsible authorities of state governments. Understanding disparities and managing such socio-ecological interactions within adaptive and holistic policies will be necessary as humans continue to turn to the global oceans to meet global resource needs³⁸.

Table 1: Targets and cross-cutting issues of SDG 14

Targets
14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.
14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.
14.3 Minimise and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.
14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum

³⁴ UN SDG Knowledge Platform (2019). “Sustainable Development Goal 14”. Available at: <https://sustainabledevelopment.un.org/sdg14>

³⁵ UN SDG Knowledge Platform (2019). “Sustainable Development Goal 14”.

³⁶ Bernal, P.A. (2015). “State ocean strategies and policies for the open ocean”. In Smith et al. (eds.), *Routledge Handbook of Ocean Resources and Management*. Routledge: New York, New York.

³⁷ WBGU (2013). “Flagship Report- World in Transition: Governing the Marine Heritage”.

³⁸ Halpern, B.S. (2017).

sustainable yield as determined by their biological characteristics.
14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.
14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognising that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation.
14.7 By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.
Cross-cutting issues
14.A Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.
14.B Provide access for small-scale artisanal fishers to marine resources and markets.
14.C Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of The Future We Want.

4.2 Global oceans governance and the Agenda 2030

The sustainable management of ocean ‘global commons’ relies on international cooperation; particularly in areas beyond national jurisdictions, i.e. the High Seas and the Area. This is not only important to maintain our oceans and their resources, but for all nations that rely on its rational management. Therefore, it is essential to establish agreed, equitable, and enforceable rules to govern the rights and duties of nations in respect to the oceans as a global commons, to ensure their ecological integrity against the increasing pressure of demands on its finite resources³⁹.

UN Agenda 2030 and United Nations Convention on the Law of the Sea

In line with this, the UN Agenda 2030 was adopted in 2015, which lays forth a vision for the sustainable, resilient, and more equitable transformation of global development⁴⁰. It contains 17 SDGs and 169 targets covering various topics of global importance, including SDG 14 that aims to conserve and sustainably use the oceans, seas and marine resources. The Agenda builds upon previous efforts relating to global sustainable development of the 2000 UN Millennium Declaration and its eight Millennium Development Goals as well as the 1992 Agenda 21 and its section 2 on *Conservation and*

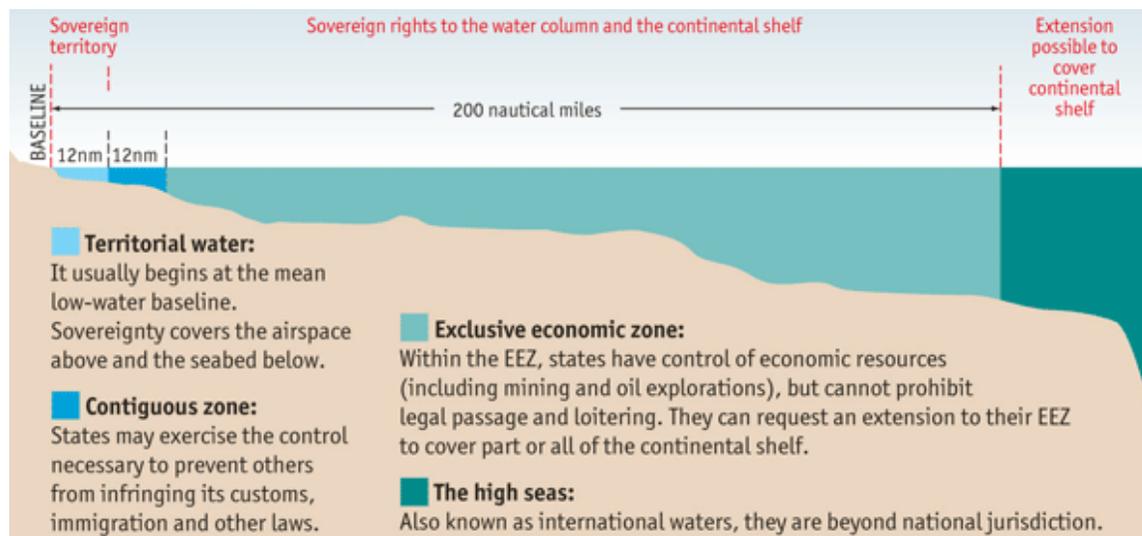
³⁹ UN (1987).

⁴⁰ UN (2015). “Transforming our world: the 2030 Agenda for Sustainable Development”. Available at: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

management of resources for development^{41,42}. At its core, though not explicitly stated, the 2030 Agenda and its environmental goals such as SDG 14 recognise the importance of the global commons and incorporate concerns regarding their ecosystem resilience and overexploitation in the new era of the Anthropocene.

Agenda 2030 and SDG 14 explicitly support and encourage cooperation between nations to further improve and advance ocean governance. For example, SDG 14 and its cross-cutting issue 14.C specifically makes reference to implementing the major international law governing the world’s oceans: the United Nations Convention on the Law of the Sea (UNCLOS), adopted in 1982⁴³. This international agreement establishes geographical boundaries for maritime space and provides a framework for each area’s resources and uses and their respective sovereignty by coastal states (see Figure 2)⁴⁴. Under UNCLOS, coastal states are required to ensure that living resources within their Exclusive Economic Zones (EEZs) are not endangered by overexploitation and calls for regional cooperation regarding their conservation and management strategies, including the exchange of scientific information, the conservation and development of stocks, and the optimum use of highly migratory species⁴⁵.

Figure 2: UNCLOS division of maritime boundaries and sovereign rights



Source: The Economist (2012)

Related to the implementation of UNCLOS, there are various processes ongoing that are important for global ocean governance. This includes the *United Nations Open-ended Informal Consultative Process*

⁴¹ UN (2000). “United Nations Millennium Declaration”. Available at: <http://www.un.org/millennium/declaration/ares552e.pdf>

⁴² UN SDG Knowledge Platform (2019). “Agenda 21”. Available at: <https://sustainabledevelopment.un.org/outcomedocuments/agenda21>

⁴³ UN (1982). “United Nations Convention on the Law of the Sea”. Available at:

http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf

⁴⁴ The Economist (2012). “Maritime disputes: Make law, not war”. Available at: <https://www.economist.com/node/21560849/all-comments>

⁴⁵ UN (1987).

on *Oceans and the Law of the Sea (ICP)*, established in 2002 with the aim to enhance the effectiveness of developments relating to UNCLOS and intergovernmental coordination⁴⁶.

In addition, and of recent importance, is the *Intergovernmental Conference on an international legally binding instrument under UNCLOS on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction*. This process aims to develop a treaty text for an international legally binding instrument under UNCLOS on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction. The conference has started meeting for four sessions (2018 to 2020)⁴⁷.

International Convention for the Prevention of Pollution from Ships

Besides UNCLOS, the main international instrument to regulate marine pollution is the International Convention for the Prevention of Pollution from Ships (MARPOL), adopted by the International Maritime Organization (IMO) in 1973 and amended multiple times throughout the years. MARPOL is the key policy instrument that includes regulations aimed at preventing and minimising pollution from ships, including oil, sewage, garbage, and air pollution⁴⁸. In relation to SDG 14, MARPOL supports target 14.1, which calls for preventing and reducing marine pollution of all kinds. MARPOL, however, does not address land-based sources of pollution, such as nutrients and debris. To date, there is no internationally legally binding instrument or policy that aims to address such sources of pollution. Rather, multiple agreements and calls for action have been put forward focusing on plastic pollution, such as the UN resolutions on marine litter and microplastics, the G20 Action Plan on Marine Litter, and the G7 Ocean Plastics Charter^{49,50,51}. Furthermore, the UN has an *Ad-hoc Expert Working Group on Marine Litter* that is looking at options for an international legal regime on plastics, which met for the first time in 2018⁵².

Convention on Biological Diversity

Related to conservation and protection of biodiversity, exploitation of marine living resources and relevant to multiple SDG 14 targets is the international Convention on Biological Diversity (CBD), which entered into force in 1993. It aims to conserve biological diversity and ensure the sustainable use of its components and the fair and equitable sharing of benefits arising from the utilisation of genetic

⁴⁶ UN SDG Knowledge Platform (2019). "Intergovernmental Processes". Available at: <https://sustainabledevelopment.un.org/topics/oceans/intgovprocesses>

⁴⁷ UN SDG Knowledge Platform (2019). "Intergovernmental Processes".

⁴⁸ IMO (2019). "International Convention for the Prevention of Pollution from Ships (MARPOL)". Available at: [http://www.imo.org/en/about/conventions/listofconventions/pages/international-convention-for-the-prevention-of-pollution-from-ships-\(marpol\).aspx](http://www.imo.org/en/about/conventions/listofconventions/pages/international-convention-for-the-prevention-of-pollution-from-ships-(marpol).aspx)

⁴⁹ UNEP (2016). "United Nations Environment Assembly of the United Nations Environment Programme: Marine plastic litter and microplastics". Available at: http://wedocs.unep.org/bitstream/handle/20.500.11822/11186/K1607228_UNEPEA2_RES11E.pdf?sequence=1&isAllowed=y

⁵⁰ G20 (2017). "G20 Action Plan on Marine Litter". Available at: <https://www.mofa.go.jp/mofaj/files/000272290.pdf>

⁵¹ G7 (2018). "Ocean Plastics Charter". Available at: <https://g7.gc.ca/wp-content/uploads/2018/06/OceanPlasticsCharter.pdf>

⁵² UN (2018). "United Nations Environment Assembly of the United Nations Environment Programme: Report of the first meeting of the ad hoc open-ended expert group on marine litter and microplastics". Available at: <https://www.unenvironment.org/events/un-environment-event/first-meeting-ad-hoc-open-ended-expert-group-marine-litter>

resources⁵³. SDG target 14.5 directly links to the CBD and its Strategic Plan for Biodiversity 2011-2020 Aichi target 11, which calls for the conservation of 10% of coastal and marine areas⁵⁴.

To support the implementation of the CBD, the Conference of the Parties (COP) was established to govern the Convention and meets every other year or as needed. It was at the COP meeting in 1995 that the CBD adopted the Jakarta Mandate on the Conservation and Sustainable Use of Marine and Coastal Biological Diversity. This mandate included a series of ocean-relevant goals related to integrated marine and coastal management, sustainable mariculture, preventing the spread of invasive alien species and a global system of marine and coastal protected areas. In addition, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) and the Subsidiary Body on Implementation (SBI) are the two permanent subsidiary bodies of the CBD to support its implementation, development and effectiveness⁵⁵.

Though not explicitly formed to support the CBD, the *UN Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socio-economic Aspects* was established to strengthen the regular scientific assessment of the state of the marine environment in order to enhance the scientific basis for policy-making. The Regular Process completed its first cycle and is currently in its the second cycle (2016 to 2020). In 2015, it produced the First Global Integrated Marine Assessment (“World Ocean Assessment”). The assessment examined the “scale of human impact on the oceans and the overall value of the oceans to humans; the main threats to the marine environment and human economic and social well-being; the needs for capacity-building and effective approaches to meeting such needs; and the most serious gaps in knowledge and possible ways of filling them”⁵⁶.

UN Fish Stocks Agreement

Specifically regarding fisheries, the 1995 UN Fish Stocks Agreement covers the conservation and management of straddling and highly migratory fish stocks. It requires states to apply a precautionary approach to the management of fish stocks, protect biodiversity in the marine environment, and to take measures to eliminate overfishing, among others. The Agreement also calls for the establishment and operation of sub-regional or regional fisheries management organisations or bodies (RFMOs), which are to establish conservation and management measures on the high seas⁵⁷. This links directly to SDG 14 targets, specifically target 14.4 on effectively regulating fisheries harvest and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices⁵⁸.

The UN Fish Stocks Agreement has undergone three Reviews in 2006, 2010 and 2016, the next of which will not be conducted until after 2020. These Review Conferences provide recommendations to improve the conservation and management of fish stocks⁵⁹. In addition, Informal Consultations of States and Parties happen at more regular intervals and have been held since 2002. These

⁵³ Bernal, P.A. (2015).

⁵⁴ CBD (2019). “Aichi Biodiversity Targets”. Available at: <https://www.cbd.int/sp/targets/>

⁵⁵ Global Youth Biodiversity Network (2016). “CBD in a Nutshell”. Available at: https://www.cbd.int/youth/doc/cbd_in_a_nutshell.pdf

⁵⁶ UN SDG Knowledge Platform (2019). “Intergovernmental Processes”.

⁵⁷ UN (1995). “Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks”. Available at: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N95/274/67/PDF/N9527467.pdf?OpenElement>

⁵⁸ UN SDG Knowledge Platform (2019). “Sustainable Development Goal 14”.

⁵⁹ UN (2016). “Review Conference on Saving World’s Fish Stocks Concludes with Adoption of Robust Draft Outcome”. Available at: <https://www.un.org/press/en/2016/sea2032.doc.htm>

consultations aim to consider specific issues related to the implementation of the Agreement, with a view to sharing experiences, improving understanding and identifying best practices. The recent Informal Consultation took place in May 2018 and focused on the science-policy interface in the context of the Agreement⁶⁰.

Oceans Conference

Lastly, other processes that influence policy and mark important milestones relating to ocean management and Agenda 2030 are key conferences, such as the UN Oceans Conference held in 2017. Hosted by the governments of Fiji and Sweden, and coinciding with World Oceans Day, it was a high-level UN conference to support the implementation of SDG 14. The conference aimed to support the concrete implementation of SDG 14 and urged actors to register voluntary commitments for The Ocean Conference. These commitments are individual or joint initiatives voluntarily undertaken by governments, the United Nations system and other intergovernmental organisations, and other actors that aim to contribute to the implementation of SDG 14⁶¹. In addition, the conference successfully adopted an intergovernmentally agreed declaration in the form of a “Call for Action” to support the implementation of SDG 14⁶².

Though SDG 14 and its targets cover both coastal areas and the high seas, only the latter is regarded as truly commons while the former is managed at an individual state level. Regardless, pollution, fish stocks, invasive species and other effects of economic development do not recognise legal boundaries. In fact, it is this lack of physical boundaries that means that global oceans require particular attention and sound management of land-based and sea-based activities combined.

Due to the dependency of the global socio-ecological systems on oceans, good governance and management of other environmental resources directly impact the health and provision of ocean-based ecosystem functions and services. In this way, the achievement of SDG 14 is inherently linked to the achievement and progress of other SDGs, particularly related to SDG 15 on terrestrial ecosystems, SDG 13 on climate, and SDG 6 on freshwater management⁶³. In general, global sustainability challenges are closely interlinked, yet often managed and studied separately. However, further efforts are needed to not only improve and apply systems integration but also translate scientific findings into actionable policy, with supportive and effective frameworks and processes⁶⁴.

4.3 Contributions “with” and “by” Germany

National Actions “By” Germany

⁶⁰ UN (2019). “The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks: Informal Consultations of States Parties”. Available at:

https://www.un.org/depts/los/convention_agreements/fish_stocks_agreement_states_parties.htm

⁶¹ UN (2019). “The Oceans Conference”. Available at: <https://oceanconference.un.org/>

⁶² UN (2017). “Our ocean, our future: call for action”. Available at:

http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/71/312&Lang=E

⁶³ Schmidt et al. (2017). “SDG 14: Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development”. In International Council for Science, *A Guide to SDG Interactions: From Science to Implementation*. Available at:

<https://council.science/cms/2017/05/SDGs-Guide-to-Interactions.pdf>

⁶⁴ Liu et al. (2015). “Systems integration for global sustainability”. *Science* 347(6225).

Overall, Germany maintains a number of activities that support the achievement of SDG 14. Its national legislation is strongly linked to commitments under EU Directives, such as the Water Framework Directive (WFD), the Common Fisheries Policy (CFP) and the Marine Strategy Framework Directive (MSFD). Furthermore, it is a contracting party to regional sea conventions on the Baltic Sea (Helsinki Convention, HELCOM) and the North-east Atlantic (OSPAR Convention). All of these initiatives take the ‘common nature’ of the oceans into account. In line with European Directives, Germany collaborates with neighbouring member states to protect transboundary ecosystems. In addition, Germany supports national fora and events that mainly aim to raise public awareness for marine topics and to support exchange between policy, science and the general public.

Although the objectives of the 2030 Agenda are formulated and addressed globally, they are mainly implemented at national level. The German Sustainable Development Strategy was adopted by the cabinet in January 2017 and is the policy instrument that implements the 2030 Agenda in Germany⁶⁵. To support its national implementation, Germany has developed two indicators for SDG 14. These indicators are marginally linked to the larger set of indicators developed by the UN to support action on its targets. However, these indicators tend to lack detail, especially regarding specific limits for certain pollutants or target levels for governance.

Within Germany, the indicators and targets listed below are in line with and addressed by current German legislation covering the management of marine space and resources, water quality and biodiversity protection. Most of these national legislations and regulations are based on commitments at the European or international level. For example, targets of indicator 1 are in line with Germany’s management targets under the Ordinance on the Protection of Surface Waters (2016), which has been based on definitions under the WFD⁶⁶. Furthermore, target of indicator 2 is in line with regulations of fisheries under the CFP as well as SDG 14 target 14.4^{67,68}.

Indicator 1: Nitrogen input into Baltic and North Sea via German inflows
Target: to limit the riverine input of nitrogen to be below 2.8 mg N/l for the North Sea and below 2.6 mg N/l for the Baltic Sea.
Indicator 2: Share of sustainably fished fish stocks in the North and Baltic Sea
Target: to sustainably manage fish stocks used for economic purposes in line with the Maximum Sustainable Yield (MSY) approach by 2020.

⁶⁵ OECD (2018). “Policy Coherence for Sustainable Development 2018: *Towards Sustainable and Resilient Societies*”. Available at: https://www.oecd-ilibrary.org/development/policy-coherence-for-sustainable-development-2018_9789264301061-en

⁶⁶ Federal Statistical Office of Germany (2016). “Sustainable development in Germany: Indicator report 2016”. Available at: https://www.destatis.de/EN/Publications/Specialized/EnvironmentalEconomicAccounting/Sustainability/Indicators2016.pdf?__blob=publicationFile

⁶⁷ Federal Statistical Office of Germany (2016).

⁶⁸ UN SDG Knowledge Platform (2019). “Sustainable Development Goal 14”.

Within the European Union the management of the oceans, and in particular the different European marine regions, is considered to be an issue that has to be addressed by acting together rather than nationally. An example is the CFP, which has primarily been implemented to manage fish stocks on the EU level. Although fish stocks are being exploited economically through commercial fisheries and can represent an important local source of employment and human wellbeing in coastal regions and beyond, they are themselves not bound to a fixed location and can migrate across national waters⁶⁹.

In addition to the CFP and WFD, Germany is bound to the MSFD. The MSFD goes beyond the CFP or WFD by not only focussing on one pressure or activity, but rather considering biological elements (species, habitats and their communities) and aspects of pressures on the marine environment (biological, physical, substances, litter and energy) under one directive^{70,71}. It aims to achieve good environmental status of all European seas by 2020⁷². The MSFD has a very strong regional focus, encouraging neighbouring member states in the different European marine regions to collaborate and streamline activities to protect the marine environment and reduce pressures. The regional approach is based on the 'commons' idea that each marine region has its particularities and dominant pressures, which should be addressed nationally and collectively by several states⁷³. Furthermore, the achievement of good environmental status is considered to be a 'common' benefit to all countries within a marine region, because aspects such as water quality and healthy ecosystems are not limited to national waters.

As Germany is a member of the EU, all European Directives must be transposed to national law. However, many of these key Directives require transboundary and international cooperation for their implementation. This is the case for the CFP, WFD and the MSFD mentioned above. Under its obligation of implementing the MSFD Germany has assessed the environmental state of its national waters of Baltic and North Sea, developed monitoring programmes to continuously assess the state, and developed programmes of measures to reduce land and sea-based pressures⁷⁴. In addition, Germany actively contributes to meetings with neighbouring member states under the MSFD process.

Case Study: Germany in the European Union

The regional approach to MSFD implementation is closely linked to the UN Environment Regional Seas Convention processes in the Baltic (HELCOM) and North Sea (OSPAR). The UN Regional Seas Programme promotes the cooperation between neighbouring coastal states to address such regional issues and pressures collectively⁷⁵. Germany is a contracting party to HELCOM and OSPAR, which are examples that have been successful in developing regional action plans for various pressures and

⁶⁹ European Commission (2015). "The Common Fisheries Policy (CFP)". Available at: https://ec.europa.eu/fisheries/cfp_en

⁷⁰ European Commission (2017). "Our Oceans, Seas and Coasts". Available at: http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm

⁷¹ European Commission (2017). "Commission Decision (EU) 2017/848". Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017D0848&from=EN>

⁷² European Commission (2017). "Our Oceans, Seas and Coasts".

⁷³ European Parliament (2008). "Directive 2008/58/EC – Marine Strategy Framework Directive". Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0056>

⁷⁴ Bund-Länder Messprogramm Meeresumwelt (2011). "Die MSRL - eine Chance für die Europäischen Meere". Available at: <https://www.meeresschutz.info/msrl.html>

⁷⁵ UNEP (2013). "Regional Seas Conventions and Action Plans: A Framework for Regional Coordination and Cooperation to Protect Shared Marine and Coastal Resources. Factsheet".

activities. In its capacity, Germany supports and chairs working groups under the conventions and attends regular meetings^{76,77}. However, success of these programmes and their commitments, due to their voluntary nature, is based on the willingness and ability of its member states to act. Nevertheless, some have also made efforts towards interregional collaboration and support, such as the cooperation between OSPAR and the West and Central African Region (WACAF; Abidjan Convention)⁷⁸.

Events to Raise Public Awareness

In addition to political engagements of Germany and the implementation of marine policy, the government also aims to raise awareness for ocean topics nationally through events and conferences. Annually, the Federal Maritime and Hydrographic Agency (BSH) in cooperation with the Federal Environment Agency (UBA) and the Federal Agency for Nature Conservation (BfN) organise a Marine Environment Symposium⁷⁹. This Symposium took place in 2018 for the 28th time. At the annual symposiums, current important topics relevant to the marine environment are discussed. At the 2018 Symposium, for example, topics included shipping and the environment, marine litter, offshore energy and seabirds, and sustainable aquaculture, among others.

Case Study: Germany's National Efforts on Marine Litter

Germany has made increasing efforts to address the issue of marine litter in recent years, which can be highlighted in two examples:

(1) In 2016 the Federal Ministry for the Environment established the '*Round Table of Marine Litter*' (*Runder Tisch Meeresmüll*) to coordinate and support implementation of national measures for the reduction of marine litter. The Round Table includes about 130 experts from fisheries, shipping, plastics industry, wastewater and waste management, cosmetics, retail trade, science, education, tourism, environmental associations, state, federal and communal authorities and politicians, as well as artists. Participants discuss proposals for measures and develop specific implementation steps.

(2) Germany's Federal Ministry for Education and Research (BMBF) supports since 2017 a research focus initiative called '*Plastics in the Environment – Sources, Sinks, Solutions*'. The project is interdisciplinary and aims to provide a better understanding of the environmental impacts of plastic waste from river basins getting into the oceans. One aspect of the project covers a comprehensive scientific assessment of the problem of plastic waste, which aims to fill in existing knowledge gaps. Moreover, solutions for reducing plastic emissions into the environment are identified and implemented. The project, which will run until 2021, examines the entire value chain of plastics, from production and use to disposal, to identify opportunities for improvement and options for action.

International Actions "With" Germany

⁷⁶ BfN (2018). "Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) (1992)". Available at: <https://www.bfn.de/en/activities/international-nature-conservation/international-agreements-and-programmes/steckbriefe-meeresnaturschutz/ospar.html>

⁷⁷ BfN (2018). "Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention) (1992)". Available at: <https://www.bfn.de/en/activities/international-nature-conservation/international-agreements-and-programmes/steckbriefe-meeresnaturschutz/helsinki-convention.html>

⁷⁸ OSPAR (2019). "Abidjan Convention". Available at: <https://www.ospar.org/about/international-cooperation/abidjan-convention>

⁷⁹ BMU (2018). „Meeresumwelt-Symposium 2018 Veranstaltungswebsite“. Available at: <https://www.bmu.de/veranstaltung/meeresumwelt-symposium-2018/>

In addition to actions within its national marine waters, Germany also supports activities beyond its national jurisdiction to support the sustainable management of marine resources, encourage biodiversity protection and improve scientific knowledge about marine issues. Several of these actions take place within the frame of Voluntary Agreements made at the UN Ocean Conference in 2017. Moreover, the Federal Ministry for Economic Cooperation and Development (BMZ) supports international development and cooperation work.

Germany's activities also encompass involvement in Arctic and Antarctic marine environmental management and conservation actions and support of activities to reduce marine litter. Even though most of the supported projects are not affecting national marine waters, Germany gives political and financial backing to the conservation, regulation and scientific research of the oceans.

Furthermore, Germany has also committed itself to various international conventions and processes, such as UNCLOS, the IMO Ballast Water Convention, the CBD, the UN Fish Stock Agreement⁸⁰ and MARPOL. These agreements apply within German national waters and contribute to the achievement of SDG 14. At the same time, Germany is active within these agreements and therefore supports aims and targets under these agreements in marine waters beyond its national waters.

Supporting Voluntary Commitments Projects for the UN Ocean Actions

Germany is actively engaged in many projects (see below) dedicated to SDG 14 and has shown efforts in line with Voluntary Commitments made at the UN SDG Oceans Conference in 2017⁸¹. A table listing all projects and providing a summary can be found in the appendix (Table 2). The focus of these projects can be summarised into three different categories:

- Projects and activities supporting the protection of biodiversity: The projects differ from the focus on one specific habitat or region (i.e., *Save Our Mangroves Now!* and *Marine Protected Area in the Weddell-Sea, Antarctica*) and the provision of financial support with focus on different places around the world (i.e., *Fostering the conservation and sustainable use of marine Biological Diversity through the International Climate Initiative (IKI)* and the *Blue Action Fund*).
- Projects and activities supporting ocean governance, regulation and dialogue: The projects range from one overarching ocean governance project fostering regional dialogue (i.e., *Partnership for Regional Ocean Governance: International Forum for Advancing Regional Ocean Governance*), to targeted projects that aim to regulate specific activities and reduce their pressures (i.e., *support of environmental regulatory measures for Deep Sea Mining*, *Innovative management solutions for minimizing emissions of hazardous substances from urban areas in the Baltic Sea Region*, *Implementation of Ten-point Plan of Action for Marine Conservation and Sustainable Fisheries of German Development Cooperation*, *Reducing air pollution from vessels serving the German Federal Administration*).

⁸⁰ UN (2018). "Chronological lists of ratifications of, accessions and successions to the Convention and related Agreements." Available at: http://www.un.org/depts/los/reference_files/chronological_lists_of_ratifications.htm#Agreement%20for%20the%20implementation%20of%20the%20provisions%20of%20the%20Convention%20relating%20to%20the%20conservation%20and%20management%20of%20straddling%20fish%20stocks%20and%20highly%20migratory%20fish

⁸¹ UN (2018). "Voluntary Commitments". Available at: <https://oceanconference.un.org/commitments/>

- Projects and activities supporting scientific research and monitoring: One supported project focuses primarily on scientific research (*Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAIC)*), while another supports the identification of research gaps in marine science (*Scoping Process: Blue Ocean*). A third project is implemented to support monitoring in line with MARPOL (*Installation of a German air monitoring network to support MARPOL Annex-VI compliance monitoring*).

BMZ Conservation Agenda

The Federal Ministry for Economic Cooperation and Development (BMZ) states that more than two-thirds of the German development cooperation partner countries are island or coastal states. In order to preserve coastal habitats for future generations and to be able to use them sustainably, the BMZ will further increase its involvement in marine protection and management of coastal economies. It developed a 10-Point Action Plan on Marine Conservation and Sustainable Fisheries, which aims to⁸²:

- Create more and better managed marine reserves
- Promote sustainable artisanal fisheries and aquaculture
- Promote sustainable and socially responsible processing and marketing of fish
- Support partner countries in the fight against illegal, unreported and unregulated fishing
- Build strategic partnerships with business
- Assisting partner countries in reducing marine pollution
- Develop strategies to deal with possible irreversible damage to marine ecosystems
- Support coastal regions in adapting to climate change
- Expand early warning systems for the consequences of climate change
- Support country and cross-thematic cooperation

Activities in the Arctic and Antarctica

As seen in some of the above mentioned initiatives, Germany is actively involved in marine conservation activities in the Arctic and Antarctic^{83,84}. As Germany does not have national waters within the Arctic region, it cannot be a member of the Arctic Council, the central intergovernmental forum to protect the arctic environment and develop the region sustainably⁸⁵. However, Germany has been granted observer status within the council, through which it is invited to meetings and supports the work of working groups and it may, if granted permission, propose projects and make statements at council meetings⁸⁶. The German Foreign office stated that the Federal Government is aiming to make

⁸² BMZ (2018). „Meere schützen und nachhaltig nutzen“. Available at:

<http://www.bmz.de/de/themen/biodiversitaet/arbeitsfelder/meeresschutz/index.html>

⁸³ UBA (2016). „Konzepte und Maßnahmen zum Schutz der Arktis“. Available at:

<https://www.umweltbundesamt.de/themen/nachhaltigkeit-strategien-internationales/arktis/umweltschutz-in-der-arktis/konzepte-massnahmen-schutz-der-arktis>

⁸⁴ Die Bundesregierung (2017). „Besserer Schutz für die Antarktis“. Available at:

<https://www.bundesregierung.de/Content/DE/Artikel/2017/01/2017-01-18-besserer-schutz-antarktis.html>

⁸⁵ Arctic Council (2018). “The Arctic Council: A backgrounder”. Available at: <https://arctic-council.org/index.php/en/about-us/member-states/33-about-us>

⁸⁶ UBA (2014). „Arktischer Rat“. Available at: <https://www.umweltbundesamt.de/themen/nachhaltigkeit-strategien-internationales/arktis/rechtlicher-institutioneller-rahmen-der-arktis/arktischer-rat>

the Arctic a central topic of German politics, in order to preserve Arctic biodiversity, but also in regard to economic opportunities⁸⁷.

Regarding the Antarctic, Germany has signed the Antarctic Treaty and is consequently bound to the Environmental Protocol of the Antarctic, which sets environmental standards for the Antarctic region and thus regulates all activities that may have a negative impact on the environment of the Antarctic. This is implemented in Germany by the Environmental Protection Protocol Implementation Act (AUG). It provides that all activities in the Antarctic organised in or departing from the territory of the Federal Republic of Germany are subject to an authorisation requirement for which an Environmental Impact Assessment (EIA) has to be carried out and assessed by the German Federal Environment Office.

Case Study: Germany's International Efforts on Marine Litter

Germany has supported international activities for the reduction of marine litter in recent years. In 2013, the German Federal Environment Agency (UBA) organised on behalf of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) the *International Conference on Prevention and Management of Marine Litter in European Seas*. The European Commission DG Environment was a co-organiser. UBA stated as one of the reasons for the organisation of this conference was Germany's strong engagement in this topic, e.g. as co-lead of the EC-Technical Working Group "Marine Litter" and within the corresponding regional work under OSPAR. In addition, the Federal Government's final report on the G7 presidency in 2015 included a separate chapter on protecting the marine environment and in particular the commitment for an action plan against marine litter⁸⁸.

International Actions "Through" Germany

Contrary to the activities and initiatives described above, Germany is also conducting activities that conflict with ocean conservation and sustainability objectives. Below, four examples for these types of activities that negatively affect the oceans and their biodiversity were selected based on their level of impact and relevance in current discussions. The activities relate to seafood consumption and processing, climate change, plastic pollution and marine cruise ship tourism. Each of these activities show that even though environmental regulations and conservation efforts exist, activities supported as part of economic and sectoral growth can be in conflict with environmental objectives.

Fish Consumption and Industry

Germans consumed an average of 13.5kg of fish in 2014⁸⁹. However, more than half of fish consumed in Germany is imported and not caught in German waters⁹⁰. According to the UN Food and Agriculture Organization (FAO), imports of fisheries products in 2014 amounted to USD 5.9 billion⁹¹. This is due to the high demand for fish in Germany, but also due to the unhealthy state of fish stocks in the German

⁸⁷ Auswärtiges Amt (2013). „Leitlinien deutscher Arktispolitik“. Available at: https://www.bmel.de/SharedDocs/Downloads/Landwirtschaft/EU-Fischereipolitik-Meeresschutz/Leitlinien-Arktispolitik.pdf?__blob=publicationFile

⁸⁸ Die Bundesregierung (2015). „G7-Präsidentschaft 2015“. Available at: https://www.bundesgesundheitsministerium.de/fileadmin/Dateien/3_Downloads/G/G7/2016-g7-abschlussbericht.pdf

⁸⁹ New Economics Foundation (2018). "Fish dependence day 2018 update". Available at: https://neweconomics.org/uploads/files/NEF_FISH-DEPENDENCE-18_DIGITAL.pdf

⁹⁰ New Economics Foundation (2018). "Fish dependence day 2018 update".

⁹¹ FAO (2012). "Fishery and Aquaculture Country Profiles: Germany". Available at: <http://www.fao.org/fishery/facp/DEU/en>

North and Baltic Seas. Most stocks are not fished at their maximum sustainable yield, and can therefore not be fished to their full potential^{92,93}.

The 'Fish Dependence Day' sets the day for a given country from when its national consumption of fish originates from imports and not fishing activities within national waters. It is annually calculated by NGOs to demonstrate that countries are not self-sufficient when it comes to fisheries and rely majorly on fishing grounds in other parts of the world. Simply put, the earlier the calculated day, the higher total demand for imports and therefore more pressure on external fish stocks. In 2018, Germany's Fish Dependence Day was on the 4th of May^{94,95}. After that day, Germany's fish consumption can be seen as not self-sufficient and reliant on imported fish. With more than half of the fish product imports coming from countries outside of the EU, the import often originates from developing countries. This often leads to the loss of a locally profitable and important source of protein in the exporting country⁹⁶.

Climate Change

Climate change negatively affects the global oceans in various ways. Ocean acidification caused by an increase of CO₂ absorption, in addition to an increase in water temperatures and sea level rise will negatively impact marine life as well as humans. Germany is directly contributing to global warming through its continuous emissions of greenhouse gases⁹⁷. Even though Germany is a contracting party of the Paris Climate Agreement and agreed to decrease its CO₂ emissions by 40% by 2020, the Federal Ministry for Environment stated in June 2018 that this target will not be achieved. Instead, reductions will reach 32% by 2020⁹⁸. By not adhering to its commitment, Germany does not contribute sufficiently to actions that combat climate change, which in turn strengthens the risk of negative climate change impacts on the oceans.

Plastic Pollution

About 446,000 tonnes of plastics are being emitted into the environment in Germany annually. Due to limits in scientific methods it is currently not possible to estimate precisely how much of this amount is entering German marine waters. However, studies in German rivers (such as the Rhine) have shown high concentrations of microplastic in some locations. These particles are likely to enter the sea eventually⁹⁹. Other estimates indicate that annually 20,000 tonnes of marine litter enter the North Sea overall and Germany contributes to this contamination¹⁰⁰. As long as this contamination is still taking

⁹² BfN (2013). "Impacts on commercial species". Available at: <https://www.bfn.de/en/activities/marine-nature-conservation/pressures-on-the-marine-environment/fisheries-and-fish-stocks/impacts-on-commercial-species.html>

⁹³ BfN (2013). "German fisheries in the North Sea and Baltic Sea". Available at: <https://www.bfn.de/en/activities/marine-nature-conservation/pressures-on-the-marine-environment/fisheries-and-fish-stocks/german-fisheries-in-the-north-sea-and-baltic-sea.html>

⁹⁴ New Economics Foundation (2018). "Fish dependence day 2018 update".

⁹⁵ New Economics Foundation (2018). "Fish Dependence Day 2018 – The reliance of the EU on fish from elsewhere". Available at: <https://neweconomics.org/uploads/images/2018/05/FDD-2018-summary.pdf>

⁹⁶ New Economics Foundation (2018). "Fish dependence day 2018 update".

⁹⁷ UBA (2013). „Klimawandel der Meere“. Available at: <https://www.umweltbundesamt.de/themen/wasser/gewaesser/meere/nutzung-belastungen/klimawandel-der-meere#textpart-1>

⁹⁸ BMU (2017). „Klimaschutzbericht 2017“. Available at:

https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/klimaschutzbericht_2017_aktionsprogramm_bf.pdf

⁹⁹ Fraunhofer Institut (2018). „Kunststoffe in der Umwelt: Mikro- und Makroplastik“. Available at:

<https://www.umsicht.fraunhofer.de/content/dam/umsicht/de/dokumente/publikationen/2018/kunststoffe-id-umwelt-konsortialstudie-mikroplastik.pdf>

¹⁰⁰ NABU (2018). „Plastik Müll und seine Folgen“. Available at: <https://www.nabu.de/natur-und-landschaft/meere/muellkippe-meer/muellkippe-meer.html>

place, Germany contributes to the overall accumulation of plastics in the oceans. Due to their small size, microlitter are prone to dispersing into the wider ocean and eventually affecting biodiversity outside of German waters.

Marine cruise tourism

Over the last decade, cruise ship tourism has become increasingly popular among Germans. In 2017, over 2.18 million German passengers travelled on board of ocean cruise ships. Compared with other EU member states, numbers of cruise ship passengers from Germany are the highest. The most popular destinations for cruises by German passengers are the Mediterranean and northern waters (North Atlantic)¹⁰¹. Even though cruise ships are required to meet MARPOL regulations regarding pollution and waste, they are known to cause various pressures on the marine environment and have been compared to ‘floating cities’, producing large amounts of waste (i.e., waste water, solid waste and air pollution) and impacting coastal regions and ports in a very concentrated manner^{102,103,104}. Through increasing numbers of German tourist on cruise ships, the environmental impact of German citizens on the oceans is increasing in areas outside of Germany’s national waters.

4.4 Key transformation processes for strengthening the sustainability architecture

As seen above and in the previous sections, the health and sustainable use of ocean resources are on the global agenda and world politicians are taking note. From increasing commitments within international frameworks to individual contributions and action plans, countries and their governments are recognising the need to address the key issues threatening our global oceans. The agreement on a sustainable development goal for the oceans (SDG 14) marks one of the most important milestones in global ocean governance since the groundbreaking adoption of UNCLOS in 1982. The inclusion of SDG14 in the 2030 Agenda marks the significance of global ocean resources and governance to world’s nations; coastal and landlocked alike. The complex interactions between oceans and other socio-ecological systems mean that the achievement of SDG 14 and its seven targets is inherently tied to progress towards the other SDGs. On this basis, oceans require: (1) effective global management regimes that respect the nature of oceans as a global commons; (2) forms of regional management to address the characteristics of regional seas as host to shared resources; and (3) effective national actions based on international cooperation to address the major land-based threats to the oceans¹⁰⁵. But how do can this architecture for ocean governance be strengthened and where necessary transformed? And what role can Germany play?

Change and transformation can come through many ways, but large-scale shifts take time and generally start small. Change agents support this process; these are individuals or small groups from all sectors and parts of society that stimulate transition initially as marginalised protagonists but gradually

¹⁰¹ Deutscher Reiseverband e.V. (2017). „Der deutsche Reisemarkt – Zahlen und Fakten 2017“. Available at: https://www.driv.de/securedl/106/0/0/1547551725/bb70f113881491a6e6268c7bcf4ce4afc9230e45/fileadmin/user_upload/Fachbereich_e/Statistik_und_Marktforschung/Fakten_und_Zahlen/18-07-06_DRV_ZahlenFakten-2017-Sommerausgabe.pdf

¹⁰² Carić and Mackelworth (2014). “Cruise tourism environmental impacts - The perspective from the Adriatic Sea”. *Ocean & Coastal Management* 102, pp. 350-363.

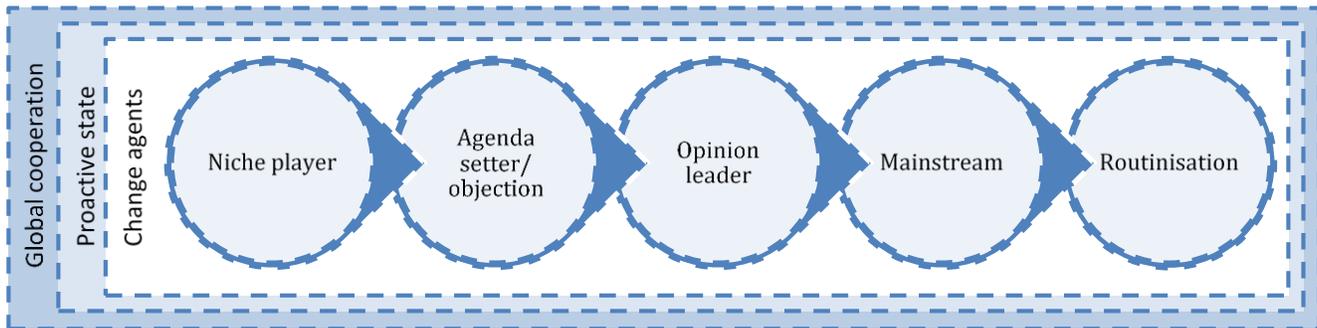
¹⁰³ Congressional Research Service (2008). “Cruise Ship Pollution: Background, Laws and Regulations, and Key Issues”. Available at: https://www.everycrsreport.com/files/20080701_RL32450_c543e0a75c6ebb6d4cd70bb26891f5b186b79362.pdf

¹⁰⁴ NABU (2018). “Kreuzschiffahrt: Auf dem falschen Dampfer”. Available at: <https://www.nabu.de/umwelt-und-ressourcen/verkehr/schiffahrt/kreuzschiffahrt/index.html>

¹⁰⁵ UN (1987).

build momentum and increase the impact of an innovation until it becomes established as a new social routine (see Figure 3)¹⁰⁶. These agents need to be supported or facilitated by proactive states to ensure progress towards transformation change. Germany tends to have a lower number of change agents who concern themselves specifically with marine and maritime topics, a trend which also holds true for corporate-responsibility activities engaged in by companies¹⁰⁷.

Figure 3: Transformation action levels towards a new social routine



Source: adapted from WBGU (2011)

Social Contract for the Oceans

The 2011 report “World in Transition: A Social Contract for Sustainability” from the German government’s Scientific Advisory Council on Global Change recognises the unsustainable trends currently dominating social, political and economic systems. The report proposes a symbolic agreement to initiate a “Great Transformation” towards a low-carbon, sustainable society¹⁰⁸. Under this new social contract, individuals and civil society groups, governments and the international community, business and science pledge to take on shared responsibility for protecting natural life-support systems through agreements on the conservation of the global commons¹⁰⁹. In 2013, a subsequent report was released, which called for a ‘Blue Revolution’ and social contract for the seas that should “lay the foundation for developing a new regulatory framework to underpin sustainable interaction with the oceans”¹¹⁰.

The existing ocean governance framework is already advanced, especially with the establishment of UNCLOS; however, the effectiveness of this framework has been criticised by both the scientific and political community, primarily due to its irresolute implementation and inability to deter misconduct through sanctions.

To develop this framework and address its shortcomings, the proposed social contract argues to¹¹¹:

¹⁰⁶ WBGU (2011). “Factsheet no. 1/2011: A Social Contract for Sustainability”. Available at: https://www.wbgu.de/fileadmin/user_upload/wbgu.de/templates/dateien/veroeffentlichungen/factsheets/fs2011-fs1/wbgu_fs1_2011_en.pdf

¹⁰⁷ WBGU (2013). “Flagship Report- World in Transition: Governing the Marine Heritage”.

¹⁰⁸ WBGU (2011). “Flagship Report- World in Transition: A Social Contract for Sustainability”. Available at: https://www.wbgu.de/fileadmin/user_upload/wbgu.de/templates/dateien/veroeffentlichungen/hauptgutachten/jg2011/wbgu_jg2011_en.pdf

¹⁰⁹ WBGU (2011). “Factsheet no. 1/2011: A Social Contract for Sustainability”.

¹¹⁰ WBGU (2013). “Flagship Report- World in Transition: Governing the Marine Heritage”.

¹¹¹ WBGU (2013). “Flagship Report- World in Transition: Governing the Marine Heritage”.

- Strengthen the knowledge and action base of ocean governance
- Create the necessary conditions for sustainable, long-term management rather than short-term profit
- Develop strategies for sustainable ocean governance
- Improve accession to and implementation of UNCLOS and advance the UN Fish Stocks Agreement and RFMOs
- Support an implementing agreement on biological diversity on the high seas
- Strengthen and extend regional ocean governance while improving dovetailing between regions
- Strengthen and expand private governance through ecolabels and sustainability standards
- Boost international financing and create investment incentives for conservation and the sustainable use of the seas
- Considerably expand marine protected areas and set up marine spatial planning
- Promote the harmonisation of existing liability regimes

Within this contract, Germany would have a social obligation to ensure as an individual country to uphold ocean sustainability as well as support other countries in pursuing sustainable actions as well. Indeed, this obligation goes hand in hand with previous international commitments Germany has agreed to, including Agenda 2030 SDGs, the CBD's Aichi Targets and targets set forth in the Paris Climate Agreement, among others. Germany and other states must become proactive and enabling, working towards establishing and regulating transformation measures within international law in a multilevel system. Furthermore, states must promote innovations necessary for transformation, mobilise key actors and remove barriers. This proactive approach for states, at its core, requires states to set sustainability standards and enforce them both within its own borders as well as with other states through a form of self-policing via flagging violations^{112,113}.

Though suggested to develop and improve the existing system, these recommendations should also be supported via actions to integrate ocean concerns into other existing legal frameworks and regimes. Efforts on this front would attempt to bridge existing gaps between political and organisational silos and reflect better the complex relationships oceans have with other systems¹¹⁴. For example, to address key threats facing the ocean (e.g., climate change, nutrient pollution from agriculture, and plastic pollution, and overfishing), ocean concerns should be represented and lobbied within existing international frameworks and fora. Such actions can be the operational starting points to address a greater transition towards ocean sustainability and holistic international environmental governance in line with Agenda 2030.

Integration of Oceans into International Legal Frameworks and Political Fora

Climate Change

¹¹² WBGU (2011). "Flagship Report- World in Transition: A Social Contract for Sustainability".

¹¹³ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹¹⁴ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

Perhaps the most pressing indirect threat to the global oceans is anthropogenic climate change. Rising sea surface temperatures, sea level rise, changes in seasonal sea ice, changes in ocean thermal structure and currents, changes in the frequency and severity of hurricanes and typhoons, ocean acidification, and oceanic dead zones can all be traced back to the driving force of climate change¹¹⁵. Though the science has supported this connection for many years, both global ocean governance and climate change regimes have been slow to act to create joined-up programming.

The Intergovernmental Panel on Climate Change (IPCC) is currently producing a special report on oceans, climate change, and the cryosphere expected in 2019¹¹⁶. It is hoped that this may have the effect of bringing stronger arguments to policy makers as to date, few ocean governance efforts explicitly tackle the effects of climate change, and mostly within a siloed and jurisdictionally fragmented way^{117,118}.

The key body to engage with on the topic of climate change and oceans is the UN Framework Convention on Climate Change (UNFCCC) and its annual Conference of the Parties (COP)¹¹⁹. Some scientists argue that the goals of the UNFCCC inherently include oceans, as mitigating the effects of climate change on marine systems beyond their natural capacity to adapt, safeguarding ocean food provision and promoting blue growth fall within the scope of the Convention. Moreover, Article 4 of the Convention requires parties to protect their carbon sinks and reservoirs, which explicitly include marine and coastal ecosystems¹²⁰. Moves to include oceans within the climate regime materialised at the COP21, which saw the adoption of the 2015 Paris Climate Agreement and its inclusion of the word “oceans” in its text, thus implicitly acknowledging the link between the two systems¹²¹. In addition, the COP23 hosted an Oceans Action Day, launched the Oceans Pathway initiative, and collected signatures to the Because the Ocean Declaration¹²². The recent COP24 contributed to this momentum by hosting another Oceans Action Day and the presentation of the Assessing Progress on Ocean and Climate Action: 2018 A Report of the Roadmap to Oceans and Climate Action (ROCA) Initiative¹²³.

For Germany and the EU, supportive actions to further integrate ocean perspectives into international climate discussions could be to use diplomatic channels to support the signing of the Ocean Declaration, which especially calls for an ocean action plan under a dedicated working group of the UNFCCC¹²⁴. In addition, Germany could support transdisciplinary research for the development of

¹¹⁵ Allison, E.H. and Bassett, H.R. (2015). “Climate change in the oceans: Human impacts and responses”. *Science*, 350(6262), pp. 778-782.

¹¹⁶ IPCC (n.d.). “Special Report on the Ocean and Cryosphere in a Changing Climate”. Available at:

https://www.ipcc.ch/site/assets/uploads/2018/04/Decision_Outline_SR_Oceans.pdf

¹¹⁷ Diamond, J., Doremus, H. and Long, R. (2018). “Foreword: Oceans and Climate Change: Calling for Holistic Conversation”. *Ecology Law Quarterly* 45(1), pp. 1-8.

¹¹⁸ Allison, E.H. and Bassett, H.R. (2015).

¹¹⁹ Oral, N. (2018). “Ocean Acidification: Falling Between the Legal Cracks of UNCLOS and the UNFCCC”. *Ecology Law Quarterly* 45(1), pp. 9-30.

¹²⁰ WBGU (2013). “Flagship Report- World in Transition: Governing the Marine Heritage”.

¹²¹ UN (2015). “Paris Agreement”. Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf

¹²² Mead, L. (2017). “Ocean Pathway Launched at COP 23”. IISD, International Institute for Sustainable Development. Available at: <http://sdg.iisd.org/news/ocean-pathway-launched-at-cop-23/>

¹²³ IISD Reporting Services (2018). “Oceans Action Day at COP 24”. IISD, International Institute for Sustainable Development. Available at: <http://enb.iisd.org/climate/cop24/oceans-action-day/>

¹²⁴ UNFCCC (2016). “Second Because the Ocean Declaration”. COP22, Marrakech, Morocco. Available at: https://oceans.taraexpeditions.org/wp-content/uploads/2016/11/BTO-2-FINAL_14Nov.pdf

guiding principles to suggest how ocean governance might be linked with existing regimes at the national and regional levels¹²⁵.

Nutrient Pollution from Agriculture

Intensive agriculture and the over-application of fertilisers or mishandling of animal waste can negatively affect aquatic biomes through nutrient pollution. The anthropogenic use of reactive nitrogen is expected to increase to approximately 267 Mt N per year by 2050. Furthermore, marine inputs of phosphorus have risen to an estimated 9 Mt per year today¹²⁶. In excess, this pollution can make its way to the coast, causing eutrophication and even hypoxia events with negative impacts on marine and coastal habitats and species¹²⁷.

To address nutrient pollution from agriculture, the easiest way is to target the source. However, to date, there are no political international agreements or organisations that govern agricultural practices. Rather, efforts can be made to broaden discussions on sustainable agriculture to include an ocean perspective within key international meetings, conferences and workshops targeting development of agricultural policy and strategies. This can provide dual opportunities to not only reiterate issues of nutrient pollution but also promote food security through the sustainable development of aquaculture and innovative methods to closing nutrient cycles¹²⁸.

Operational starting points could begin with the FAO, which acts as an agency leading international efforts to defeat hunger as well as a forum for world nations to meet, discuss and share ideas. One of its goals is to improve the productivity and sustainability of agriculture, forestry and fisheries¹²⁹. Other related fora include the Global Forum on Agricultural Research (GFAR), the Consultative Group on International Agricultural Research (CGIAR), the Global Conference on Agricultural Research for Development (GCARD), the Global Alliance for Climate-Smart Agriculture (GACSA), as well as programmes aimed at financing such as the International Fund for Agricultural Development (IFAD) and the Global Agriculture & Food Security Program (GAFSP).

In Germany, efforts can include better representation of ocean concerns at side events of the Global Forum for Food and Agriculture (GFFA), an international conference held in Berlin focusing on key questions regarding the future of the global agri-food industry¹³⁰. At a larger scale, Germany and the EU could also use their influence to improve the regional integration of fisheries governance and marine conservation within the framework of the FAO, especially with regard to the prevention of nutrient loading¹³¹.

Plastics Pollution

¹²⁵ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹²⁶ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹²⁷ Glibert et al. (2018).

¹²⁸ Smith, B. (2015). "Ecological redemption: Ocean farming in the ear of climate change." 35th Annual E.F. Schumacher Lectures, October 2015, Hudson, NY. Available at: <https://centerforneweconomics.org/publications/ecological-redemption-ocean-farming-in-the-era-of-climate-change/>

¹²⁹ FAO (2019). "Make agriculture, forestry and fisheries more productive and sustainable". Available at: <http://www.fao.org/about/what-we-do/so2/hu/>

¹³⁰ GFFA (2019). "What is the GFFA?" Available at: <https://www.gffa-berlin.de/en/uber-das-gffa/>

¹³¹ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

Plastic pollution and accumulation within the oceans is one of the key challenges that need to be addressed to support the achievement of SDG 14. The production of plastic has increased since 1950 more than a hundredfold and represents today more than 280 million tonnes a year. About 8 million tonnes enter the oceans each year and come mainly from land-based sources^{132,133,134}. Estimations foresee that around 1 to 2.4 million tonnes of plastic waste enter the ocean annually from rivers, whereas the main 20 polluting rivers are mostly located in Asia and responsible for 67% of the riverine inputs¹³⁵. Currently 100 million tonnes of plastics (in the shape of macro- and microplastics) are estimated to circulate within the oceans¹³⁶.

Over the last decade, awareness of the plastic issue has both risen within the political and public context, which led to a momentum in the global fight against plastic pollution in 2018. Within that year, the UN Environment Programme (UNEP) made plastics pollution the main topic of World Environment Day 2018. Furthermore, it launched, together with the European Commission, a UNEP Global Plastics Platform, which shall represent a forum for exchange and showcase of initiatives, but shall also support countries in making commitments to reduce global plastic pollution. So far, numerous countries have banned single use plastic bags (e.g., Chile, Peru, Nigeria), or even single use plastic overall (e.g., India by 2022)^{137,138}. In 2018, the G7 also committed to an Ocean Plastics Charter, which aims “to move toward a more resource-efficient and sustainable approach to the management of plastics”¹³⁹. In the previous year, the G20 agreed to an Action Plan on Marine Litter “to take action to prevent and reduce marine litter of all kinds, including from single-use plastics and microplastics”¹⁴⁰.

The EU itself took a strong action against plastic pollution in 2018 by adopting a Europe-wide strategy on Plastics, to pave the way for a more circular economy and the protection of the environment from plastics pollution. The Plastics Strategy aims for all plastic packaging on the EU market to be recyclable by 2030, to reduce the consumption of single-use plastics and to reduced and the intentional use of microplastics. In addition, it calls for an improved product design, production and recycling system to reduce plastic litter production¹⁴¹. Moreover, the Strategy also targets plastic littering from sea-based sources, aiming to reduce the loss or abandonment of fishing gear at sea from fisheries and aquaculture. A separate legislative initiative on single use plastics was also put forward by the EU in

¹³² UNEP (2017). “Dimensions of Pollution – Marine”. Available at: <http://web.unep.org/environmentassembly/marine>

¹³³ Andrady (2011). “Microplastics in the marine environment”. *Marine Pollution Bulletin* 62, 1596–1605.

¹³⁴ Cole et al. (2011). “Microplastics as contaminants in the marine environment: A review”. *Marine Pollution Bulletin* 62, 2588–2597.

¹³⁵ Lebreton et al. (2017). “River plastic emissions to the world’s oceans”. *Nature Communications* 8, Article number: 15611.

¹³⁶ UNEP (2011). “Plastic Debris in the Ocean”.

¹³⁷ UN Environment (2018). “Press release - Nations commit to fight plastic pollution together during the UN General Assembly”.

¹³⁸ Simon et al. (2018). “No More Plastics in the Ocean. Gaps in Global Plastic Governance and Options for a Legally Binding Agreement to Eliminate Marine Plastic Pollution”. Draft report for WWF to support discussions at the Ad Hoc Open-ended Expert Group on Marine Litter and Microplastics. Available at:

https://www.ecologic.eu/sites/files/publication/2018/simon_knoblach_et_al_2018_no_more_plastics_in_the_oceans_global_treaty.pdf

¹³⁹ G7 (2018). “Ocean plastics Charter”.

¹⁴⁰ G20 (2017). “G20 Action Plan on Marine Litter”.

¹⁴¹ European Commission (2018). “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A European Strategy for Plastics in a Circular Economy. COM(2018) 28 final”. Available at: <http://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy.pdf>

May 2018, including bans of plastic materials in certain products¹⁴². To combat waste from ships, the EU made a legislative proposal in January 2018 for improved port reception facilities¹⁴³.

Germany could support global actions against plastic pollution within the above mentioned fora by providing scientific and technical knowledge, which it has gained through its national initiatives. The offering of capacity building regarding plastic recycling, in particular to less developed countries could provide important support and trigger change. For example, public-private partnerships and voluntary agreements are seen as good alternatives or first steps before introducing strict bans, to give consumers time to adjust their behaviour and allow time for the development of more affordable and eco-friendly alternatives to enter the market¹⁴⁴. Moreover, to reduce plastic pollution in the North and Baltic Seas, Germany's efforts under the Regional Seas Conventions OSPAR and HELCOM will be essential to support the implementation of their Marine Litter Action Plans^{145,146}. Furthermore, in relation to combating plastic pollution from fisheries and shipping, Germany can engage in discussions at fora such as the FAO and MARPOL.

Overfishing and Unsustainable Fishing

Clearly important to SDG 14, fisheries management is a key issue determining current and future sustainable use of the oceans. 4.5 billion people depend on seafood for 15% of their animal protein intake worldwide¹⁴⁷; however, fish stocks in many places of the world, including some EU fish stocks, are overfished. If not managed sustainably, fish stocks will be overexploited over a longer term and the common resource will be lost¹⁴⁸. This would certainly be felt by Germany, which is largely dependent on fisheries imports to address its national demand in fish consumption.

The UN Fish Stocks Agreement, the FAO Code of Conduct for Responsible Fisheries, the goals of the Rio follow-up process and the decisions of the CBD represent useful 'soft laws' for sustainable fisheries management. Nevertheless, these regulations and agreements are poorly implemented in practice and have not reversed the overall trend of declining fish stocks globally¹⁴⁹. Nevertheless, there is a growing recognition for the need to pursue sustainable fisheries management, especially following an ecosystem-based approach. This approach incorporates the precautionary principle and management is developed and implemented in line with scientific recommendations of catch limits, and potential spatial and temporal fishing bans¹⁵⁰.

¹⁴² European Commission (2018). "Proposal for a Directive of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment. COM(2018) 340 final". Available at: http://ec.europa.eu/environment/circular-economy/pdf/single-use_plastics_proposal.pdf

¹⁴³ European Commission (2018). "Proposal for a Directive of the European Parliament and of the Council on port reception facilities for the delivery of waste from ships, repealing Directive 2000/59/EC and amending Directive 2009/16/EC and Directive 2010/65/EU. COM(2018) 33 final. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:571a59f5-fac7-11e7-b8f5-01aa75ed71a1.0002.02/DOC_1&format=PDF

¹⁴⁴ UNEP (2018). "Single Use Plastics – A Roadmap for Sustainability". Available at: http://wedocs.unep.org/bitstream/handle/20.500.11822/25496/singleUsePlastic_sustainability.pdf?sequence=1&isAllowed=y

¹⁴⁵ HELCOM (2015). "Regional Action Plan for Marine Litter in the Baltic Sea". Available at:

<http://www.helcom.fi/Lists/Publications/Regional%20Action%20Plan%20for%20Marine%20Litter.pdf>

¹⁴⁶ OSPAR (2014). "Regional Action Plan (RAP) for Marine Litter". Available at: http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/pdf/atlantic_mlrap_brochure.pdf

¹⁴⁷ Béné et al. (2015). "Feeding 9 billion by 2050 – Putting fish back on the menu". *Food Security*, 7(2), pp. 261-274.

¹⁴⁸ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹⁴⁹ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹⁵⁰ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

Within the EU context, Germany could support the development of the CFP into a sustainable direction and in particular advocate for the ban of wasteful and destructive fishing techniques (i.e., those that produce high levels of by-catch and harm seabed habitats). Beyond the EU, Germany could increase its efforts to address overfishing and unsustainable fishing practices within meetings and working groups of key fora, such as the Committee on Fisheries (COFI), a subsidiary body of the FAO. Other important fora would be Regional Fishery Bodies (RFBs) and RFMOs of areas in which Germany fishes as well as the Advisory Committee on Fishery Research (ACFR) and the Global Partnership for Climate, Fisheries and Aquaculture (PaCFA). To strengthen regional ocean governance, Germany and the EU should encourage the development of regional agreements for all marine regions, to cover as much of the global ocean as possible. Furthermore, their development policy can support the agreement of ambitious protocols and action plans within the UNEP Regional Seas Programme, in addition to help implement and enforce their creation of appropriate organisational capacity¹⁵¹.

Regarding imports of seafood from outside the EU, Germany should take into account developments and impacts in the exporting states (primarily Norway, Poland, China, Denmark, the Netherlands and the United States)¹⁵². Through active capacity building with less industrialised nations (e.g., through the GIZ) fisheries science, sustainable fisheries techniques, management options, and monitoring could be promoted further. In particular, the support and promotion of monitoring techniques are crucial in order to address illegal, unreported and unregulated fisheries outside of German waters¹⁵³. At the national level, the promotion and support of eco-labels that indicate sustainably sourced fish could raise public awareness and change consumer behaviour^{154,155}.

The Role of Science in the Global Transition

After decades of scientific study and advancement, oceans scientists have supported the launch of the oceans onto the global political agenda. This progress highlights the key role of science and research within the transformation towards a low-carbon sustainable society as well as sustainable stewardship of the oceans. Research can promote transformation by generating sustainable innovations and supporting their dissemination.

To achieve this, further trans- and interdisciplinary research is necessary to examine the complex interlinkages the ocean has to other systems¹⁵⁶. This includes research on the role of the oceans within the Earth's system, cumulative impacts of human activity and the effects on human societies, as well as methods to integrate ocean legal frameworks into use and conservation regimes. With additional information, science and research can support decision-making through the development of visions for

¹⁵¹ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹⁵² Centenera (2014). "Directorate-General For Internal Policies. Policy Department B: Structural and Cohesion Policies. Fisheries in Germany: in-depth analysis". Available at: http://www.europarl.europa.eu/RegData/etudes/note/join/2014/514010/IPOL-PECH_NT%282014%29514010_EN.pdf

¹⁵³ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹⁵⁴ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹⁵⁵ FAO (2011). "Private Standards and Certification in Fisheries and Aquaculture. Current Practice and Emerging Issues". Available at: <http://www.fao.org/docrep/013/i1948e/i1948e.pdf>

¹⁵⁶ Barange, et al. (2016). "The evolving and increasing need for climate change research on the oceans". *ICES Journal of Marine Science*, 73(5), pp. 1267-1271.

a sustainable stewardship of the seas, the suggestion of specific possibilities for sustainable ocean use, as well as help draft political strategies¹⁵⁷.

Above all, data will be essential to carry out and conduct such research. As ocean data availability is often limited or have barriers to access, this can pose a hurdle for ocean transformation visions¹⁵⁸. Consequently, Germany should take a strong stance to lobby in European and international bodies for more reliable data collection¹⁵⁹. It has been argued that marine conservation in Europe have shifted fishing pressures to weakly regulated fishing grounds and aquaculture in West Africa. Ergo, fishing restrictions in one region increase fishing pressure in another, which adds to provisioning service burdens and undermines the livelihoods of fishing communities and biological sustainability¹⁶⁰. But how and to what extent do interregional ecosystem service flows support or undermine existing marine conservation and sustainability targets¹⁶¹? Without proper datasets, questions such as these may be impossible to answer.

5 Conclusion

The global oceans are changing. What once seemed impossible, humans are now faced with rising threats to our blue planet that undermine its ability to sustain life on Earth. The seemingly inexhaustibility of our seas has been challenged with humanity's ever-growing population and appetite for more resources. Action on all fronts is needed to halt and reverse these unsustainable trends before a tipping point is reached. As an area of the global commons, this requires dedicated and concrete cooperation from all global states, coastal and landlocked alike. To date, the UN Agenda 2030 and its Sustainable Development Goal 14 on oceans have marked a turning point on the handling of our oceans and their future. With its seven targets, SDG 14 sets the standard for political action on key ocean challenges and cross-cutting issues. Germany, in its capacity, has stepped up to promote and actively engage in the sustainable use and conservation of global ocean resources, both within its national borders, the EU and beyond. Others have also showed their commitment on this front. Nevertheless, progress towards this goal has been uneven and there is still much more to be done. Without progress in joint action and implementation at the international level, especially regarding sustainable ocean governance, the achievement of SDG 14 may never be realised. As stated in the seminal Brundtland report, "Sustainable development, if not survival itself, depends on significant advances in the management of the oceans"¹⁶².

¹⁵⁷ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹⁵⁸ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹⁵⁹ WBGU (2013). "Flagship Report- World in Transition: Governing the Marine Heritage".

¹⁶⁰ Pascual et al. (2017). "Off-stage ecosystem service burdens: A blind spot for global sustainability". *Environmental Research Letters* 12, 075001.

¹⁶¹ Schröter et al. (2018).

¹⁶² UN (1987).

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7 Appendix

Table 2 Ocean actions supported by the German government for the achievement of SDG14 as Voluntary Commitments made at the UN SDG Oceans Conference in 2017¹⁶³

Ocean action	Actors	Details
Save Our Mangroves Now!	<i>German Federal Ministry for Economic Cooperation and Development (BMZ), IUCN, WWF Germany, WWF US</i>	Aims to support the target of the Global Mangrove Alliance (GMA) to increase the global area of mangrove habitat by 20% until 2030 through conservation. It wants to create a variety of partnerships and cooperation with other mangrove organisations, initiatives and countries and provides a platform for knowledge sharing and the exchange of experience in order to encourage collaborations and to foster synergies.
Partnership for Regional Ocean Governance: International Forum for Advancing Regional Ocean Governance	<i>Partnership for Regional Ocean Governance (PROG) through IASS, IDDRI, TMG-Think Tank for Sustainability, UN Environment</i>	Aims to strengthen regional cooperation for the protection and sustainable development of the oceans. It supports the development of a conceptual approach for effective cross-sectoral governance for the protection and sustainable use of the oceans, and regional exchanges of “good-practice” examples. It supports existing structures and the dialogue with State actors, civil society, and science, in addition to interested representatives of regional and international organisations.
Support of the research project: Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAIC)	<i>German Federal Ministry of Education and Research BMBF, Alfred-Wegener-Institut</i>	A year-round expedition into the central Arctic exploring the Arctic climate system to enhance understanding of the regional and global consequences of Arctic climate change and sea-ice loss. Results shall provide stakeholders and decision-makers with improved knowledge for adapting to climate change and develop target oriented mitigation strategies.
Support of environmental regulatory measures for Deep Sea Mining: Project	<i>German Federal Ministry of Education and Research BMBF, Joint Programming Initiative (JPI): Healthy and Productive Seas and Oceans</i>	The JPI Oceans Pilot Action assesses the ecological impacts that could arise from commercial mining activities in the deep-sea. Germany supports the project and in particular the development of guidelines and standards for deep sea exploitation.
Scoping Process: Blue Ocean	<i>German Federal Ministry of Education and Research BMBF, German Marine Research Konsortium</i>	This action is part of the BMBF Research Programme MARE:N and aims to identify pressing gaps and targets in marine research, that will then be supported through tailor-made measures of funding. A budget of €400 Mio. is allocated for the Research Programme MARE:N

¹⁶³ Text taken from UN (2018). “Voluntary Commitments”. Available at: <https://oceanconference.un.org/commitments/>

		over a period of ten years.
Innovative management solutions for minimizing emissions of hazardous substances from urban areas in the Baltic Sea Region	<i>Germany: BEF-DE, Institute of applied Ecology (municipalities in Hamburg and Lubeck)¹⁶⁴</i>	The project wants to increase the efficiency of water management for decreased discharges of hazardous substances to the Baltic Sea and the regional waters based on enhanced capacity of public and private actors. It aims to show options of how municipalities and WWTPs can reduce emissions of priority hazardous substances.
Fostering the conservation and sustainable use of marine Biological Diversity through the International Climate Initiative (IKI)	<i>Supported by Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), Governments, Civil society organisations, IGOs and NGOs in the beneficiary countries</i>	The BMUB supports the protection of coastal and marine areas in partner countries through a range of bilateral, regional as well as global projects that target effective and sustainable management and long-term funding. The projects mainly focus on marine protected areas, the support for sustainable artisanal fisheries and certification, combating of illegal fishing, reduction of pollution and the protection of coastal population from the consequences of climate change.
Implementation of Ten-point Plan of Action for Marine Conservation and Sustainable Fisheries of German Development Cooperation	<i>Supported by Federal Ministry for Economic Cooperation and Development (BMZ)</i>	The Plan of Action supports ten key activities linked to supporting marine policy development in partner countries. The aim is to promote new and innovative projects and partnerships. The aim is to help to implement key international policy goals and instruments such as the Code of Conduct for Responsible Fisheries of the Food and Agriculture Organization (FAO), the Convention on Biological Diversity, the goals of the Framework Convention on Climate Change such as adaptation to climate change, and the Action Plan to Combat Marine Litter agreed under the German G7 Presidency.
Blue Action Fund	<i>Blue Action Fund, German Federal Ministry for Economic Cooperation and Development (BMZ), KfW Development Bank</i>	The fund provides funding for the activities of national and international non-governmental organizations in their efforts to help conserve marine and coastal ecosystems. The focus lies on biodiversity protection through MPAs and improved MPA management and sustainable marine resource use (i.e., fishery, aquaculture and in tourism). The Fund will support actions in Africa, Latin America, Asia and Pacific region.
Reducing air pollution from vessels serving the	<i>Federal Ministry of Transport and Digital Infrastructure (BMVI), Federal Maritime and</i>	Support of the objective of the IMO to prevent pollution from ships including the ongoing efforts to minimise airborne emission from

¹⁶⁴ Other partners are Sweden: City of Stockholm and Vsters, University of Agricultural Sciences, Finland: Turku Univ, TUKES, Estonia: Prnu, BEF-EE, Latvia: Riga, BEF-LV, Lithuania: Silale, Kaunas, Klaipeda Regional Environment Department, BEF-LT, Poland: Gdansk Univ, Gdansk City, Gdansk Water, Belarus: Vilejka and Iviye and Ecopartnership

<p>German Federal Administration</p>	<p><i>Hydrographic Agency (BSH), Federal Waterways Engineering and Research Institute (BAW)</i></p>	<p>ships. The use of high-quality fuel is one possible way to further minimise air pollution from ships. As a pilot project the replacement building of the survey, wreck-search and research vessel ATAIR that is operated by the Federal Maritime and Hydrographic Agency (BSH) is equipped with LNG-propulsion. The new ATAIR will be able to operate 10 days using Liquefied Natural Gas (LNG) only; which is the usual duration of a survey cruise. Burning LNG causes less noxious emissions compared to marine gas oil or even heavy fuel oil. After the ATAIR it is planned to equip two more German survey vessels with LNG propulsion. The intention of the German Federal Government is to lead by example in reducing air pollution from ships.</p>
<p>Installation of a German air monitoring network to support MARPOL Annex-VI compliance monitoring</p>	<p><i>Supported by German Government</i></p>	<p>The German Federal Ministry of Transport and Digital Infrastructure (BMVI) decided to establish a German air monitoring network to support MARPOL Annex-VI compliance monitoring. This monitoring network will consist of up to six fixed measurement sites close to the main shipping lanes of sea-going vessels (e.g. Elbe, Bremerhaven, Kiel, Warnemünde), as well as one mobile station on board a research vessel. According to the MARPOL Annex VI sea going vessels are forced to burn only fuel with a reduced sulphur content or to use exhaust gas treatment systems achieving the same amount of emission reduction.</p>
<p>Marine Protected Area in the Weddell-Sea, Antarctica</p>	<p><i>Supported by German Federal Ministry of Food and Agriculture (BMEL)</i></p>	<p>The proposal for a marine protected area (MPA) in the Weddell Sea (Atlantic part of the southern Ocean) was developed by Germany and was submitted by the European Union to the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). CCAMLR members have to approve this proposal unanimously.</p>

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Impressum

Herausgeber

Lenkungsreis Wissenschaftsplattform Nachhaltigkeit 2030

Geschäftsstelle Wissenschaftsplattform Nachhaltigkeit 2030

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Über die wpn2030

Die Plattform

Die Wissenschaftsplattform Nachhaltigkeit 2030 ist ein zentraler Ort der Wissenschaft, an dem sie drängende Fragen der Nachhaltigkeitspolitik reflektiert und diskutiert – im Austausch mit Politik, Wirtschaft und Gesellschaft. Wissen für Nachhaltigkeit wird dort zusammengetragen und weitergetragen, insbesondere im Hinblick auf die Umsetzung der Deutschen Nachhaltigkeitsstrategie. Die Plattform arbeitet unabhängig und ist systematisch eingebunden in den offiziellen politischen Steuerungs-, Dialog und Umsetzungsprozess der Agenda 2030. Träger der Plattform sind SDSN Germany, DKN Future Earth und das IASS Potsdam

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Gefördert durch



Bundesministerium
für Bildung
und Forschung



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Forschung für Nachhaltige
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BMBF