

Starting at the source to save the sea

LOOK UPSTREAM TO ACHIEVE SDG 14



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We rely on healthy oceans

The air we breathe, the food we eat and the climate on which our survival depends are all inextricably linked to ocean health. The ocean supports entire communities and industries, sustains hundreds of millions of jobs, helps drive the modern global economy, and is crucial to poverty alleviation in the most vulnerable regions. The ocean economy contributes more than USD 1.5 trillion each year to the global economy¹. It is also the single largest active carbon and heat sink – absorbing more than 90 percent of excess heat and around 30 percent of anthropogenic CO₂ emissions².

Healthy oceans depend on action on land and along rivers

The health of the ocean and its benefits to society are at risk, largely due to activities taking place far from its shores. There are many factors that have led to a cascade of impacts on terrestrial and freshwater ecosystems extending to coastal zones and the ocean. These factors include the exponential growth of coastal megacities and the intensification of human activities due to population growth, continued urbanization, unsustainable consumption patterns, and changes to diets and lifestyles.

Biodiversity in marine and freshwater ecosystems has declined radically over the past few decades. Protecting ocean health and promoting a sustainable blue economy begins with taking action on land and along waterways.

The demands of agricultural, industrial and urban development, changes in water and sediment flows, nutrient and chemical pollution, marine litter, over-fishing and climate change threaten the ocean and the benefits it brings humanity. Unsustainable demand for marine resources as well as an endless flow of pollution places the livelihoods of more than three billion people at risk, most of whom live in developing countries³. In addition, the ocean's capacity to serve as a crucial carbon sink is diminishing due to acidification, which in turn, intensifies global climate change.

1 OECD (2016); The Ocean Economy in 2030. OECD, Paris

2 IPCC, 2019: Summary for Policymakers. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.- O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, M. Nicolai, A. Okem, J. Petzold, B. Rama, N. Weyer (eds.)]. In press.

3 OECD (2019); OECD work in support of a sustainable ocean. OECD, Paris.

Climate change exerts additional pressure on an already critical situation. Global warming and the subsequent increase of ocean temperatures can mean sea level rise, coral bleaching, loss of breeding grounds, extreme weather events and coastal erosion from changing currents. At the same time, some measures that aim to limit and adapt to climate change impacts on land and along coasts run the risk of causing additional adverse effects on the ocean unless their broader effects are properly understood and addressed. Changes in land and water use patterns for power generation may disturb biota, sediment, and nutrient flows to the ocean. Other climate adaptive measures, such as flood defence infrastructure, may create a different set of problems by limiting the fresh- and saltwater exchanges necessary for productive estuaries and brackish ecosystems.

The state of the ocean and coastal marine environments serves as an indicator of the sustainability of our actions not only at sea, but also on land, along rivers and at the coast. Achieving Sustainable Development Goal (SDG) 14 depends upon action from a range of sectors, with some of these actions occurring far from their point of impact. There is an urgent need for a coherent approach across landscapes and sectors to achieve the targets of SDG 14.

The source-to-sea approach to management links governance, operations, practices and finance across marine, coastal, fresh-water and terrestrial systems and stimulates cooperation between upstream and downstream actors as well as coordination across sectors.

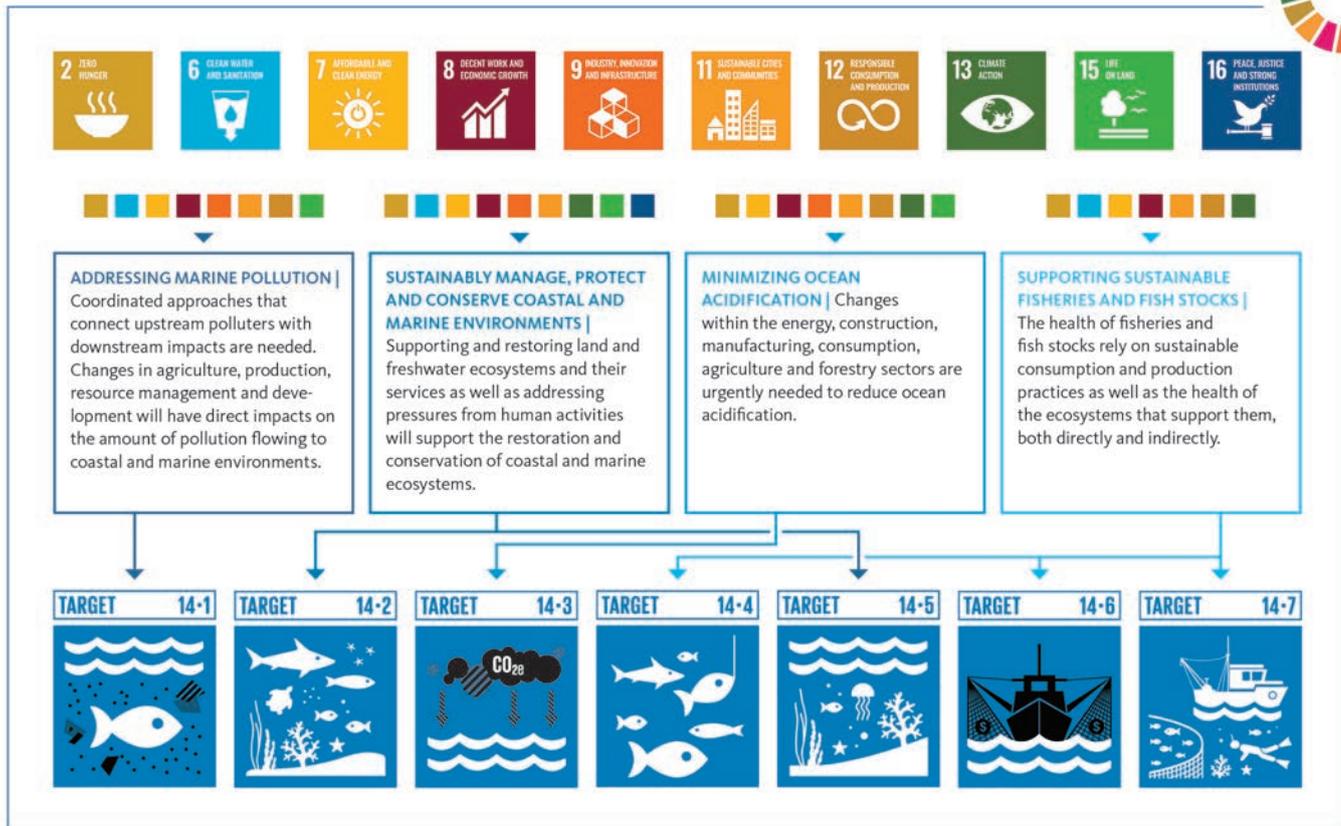
A coordinated agenda for SDG 14

The 2030 Agenda is indivisible in its nature: no SDG can stand on its own. This is especially true for SDG 14 (Life Below Water) as it is both the end recipient of many human activities as well as an enabler for many of the other SDGs.



A COORDINATED AGENDA TO ACHIEVE SDG 14

Achieving SDG 14 calls for a more integrated approach across landscapes, multiple SDGs and the wider 2030 Agenda.



The realization of SDG 14 depends largely on how we work to achieve food security (SDG 2), access to water and sanitation (SDG 6), energy for all (SDG 7), sustainable economic growth (SDG 8), sustainable industrialization (SDG 9), sustainable cities (SDG 11), responsible production and consumption (SDG 12), climate action (SDG 13) and healthy terrestrial ecosystems (SDG 15). The interdependency of these goals and their targets demonstrates the need to balance key societal objectives and ensure that the achievement of one goal does not hinder the advancement of the others.

It is paramount that global development is achieved with a view to minimizing threats to ocean health and productivity. However, the progress towards the SDGs is often measured against sector-specific indicators, ignoring their effects on the attainment of other targets. For example, the current formulation of targets and indicators related to food security (SDG 2) places little emphasis on the downstream impacts of agricultural production on eutrophication and the creation of marine dead zones. The sustainability of industrial processes (SDG 9) and energy production (SDG 7) will be measured in relation to CO2 emissions, but with limited attention to water, sediment, and pollutant flows to the ocean. Targets do not always reflect the interdependencies of the SDGs. However, if this interdependency was taken into account, it would support the mutual achievement of SDG targets and result in multiple benefits across the 2030 Agenda.

Figure 1 illustrates some of the connections between SDG actions and their potential impact on SDG 14 targets.

Fragmentation jeopardizes progress

Fragmented governance impedes efforts to address the heavy burden land-based and upstream activities are putting on the ocean. Organizations and/or agencies responsible for the health of the ocean are often not the decision-makers, managers or regulators of many of the activities that threaten its well-being. While being recipients of a vast array of ocean services (food, leisure, transport, employment, climate regulation, carbon sink), land-based sectors and municipalities often do not account for the potential downstream implications of their activities, nor do they recognize their reliance on the ocean or the vast benefits the ocean gives them. Our societies depend on healthy oceans, yet many of the beneficiaries are located far away from the coastline and are not incentivized to invest or participate in measures that reduce pressure on marine ecosystems.

The 2019 IPCC Report on the ocean and cryosphere specifically highlights fragmented governance systems as a key challenge to addressing climate-related changes and risks. Governance is organized to respond to societal needs, around segments of the natural systems (e.g. river basins or coastal areas), along administration units (e.g. national and municipal borders and exclusive economic zones), separated by sectors (e.g., energy production or agriculture), and they fit temporal scales much shorter than those of hydrogeomorphic and climate changes. This creates challenges when balancing the diverse and often conflicting development objectives, stakeholder priorities and institutional arrangements that span social, economic and natural borders and timescales.

Financial systems, on the other hand, follow economic borders, often focusing on a specific sector or social geography, thereby limiting the assessment of risks and benefits that could incentivize upstream measures that deliver downstream benefits. Despite the multitude of ecological, economic and social benefits that different parts of society receive from oceans, there are limited incentives for countries or municipalities to invest in measures that may primarily benefit ecosystems beyond their borders without financial mechanisms to bridge actions and benefits.

This sectoral fragmentation also plays out in the data available and the research conducted that could inform the costs and benefits of addressing linkages across land, freshwater, coastal and marine systems. Without this, it is difficult to demonstrate the upstream benefits of a healthy ocean to the extent that trade-offs will be appropriately considered when making upstream investments.

SUPPORT FOR THE SOURCE-TO-SEA APPROACH

The need for a source-to-sea approach has been highlighted in funding strategies of the Global Environment Facility (GEF) and the Swedish International Development Cooperation Agency (Sida); in operational strategies of UN Environment, UNDP Water and Ocean Governance Programme and the Swedish Agency for Marine and Water Management (SwAM); and in ministerial declarations/outcome documents from World Water Forum and the 2018 Dushanbe High-Level International Conference on the International Decade For Action "Water for Sustainable Development, 2018-2028". The German Federal Ministry for Economic Cooperation and Development (BMZ) and SwAM have funded implementation of the source-to-sea approach in countries including Viet Nam, Ethiopia, South Africa, Russia, China and Sweden.

As seen with the issue of climate change, the demise of the ocean is a result of cumulative impacts: no one activity or actor is responsible. The absence of a cohesive approach to achieving the 2030 Agenda and lack of political commitment to work together on these issues is stalling progress on SDG 14. An approach that focuses on the interdependencies of the SDGs and brings attention to their interlinkages is needed.

Such source-to-sea management should be:

HOLISTIC | addressing upstream and downstream linkages across issues, stakeholders, desired outcomes, costs and benefits

COLLABORATIVE | building upon existing institutions, established methods and ongoing processes

PRIORITIZING | targeting and addressing the issues that hold the greatest potential for generating positive impacts for the system

PARTICIPATORY | engaging upstream and downstream stakeholders from different sectors and raising awareness about the impact of human activities

CONTEXT DEPENDENT | derived from, and responsive to, the local context

RESULT ORIENTED | targeting intermediate outcomes that contribute to overall improved economic, social and environmental status

ADAPTIVE | learning-by-doing through pragmatic implementation, monitoring, evaluation and adaptive management

What does coordinated management look like?

Ocean health is critically dependent on society's ability to minimize the negative effects of human activities while mitigating and adapting to the effects of climate change together with making efforts to meet the needs of a growing and more prosperous population. This can only be done by harmonizing social, economic and environmental priorities within the system as a whole. Sustaining green and blue economic growth requires governance and management processes that also balance and protect development priorities from their source all the way to the sea.

The source-to-sea approach to management links governance, operations, practices and finance across marine, coastal, freshwater and terrestrial systems and stimulates cooperation between upstream and downstream actors as well as coordination across sectors^{4,5}. The strength of this approach is its ability to ensure outcomes of mutual benefit from source to sea by homing in on priorities that span traditional land-freshwater-marine boundaries. These linkages are highlighted by drawing focus to six flows: water, pollutants, biota, materials, sediments, and ecosystem services (see box) as well as designing courses of action that improve overall system health by reducing flows detrimental to the source-to-sea system and enhancing flows that maintain ecosystem functions and services.

4 Granit, J., Liss Lymer, B., Olsen, S., Tengberg, A., Nömmann, S., & Clausen, T. J. (2017). A conceptual framework for governing and managing key flows in a source-to-sea continuum. *Water Policy*, 19(4), 673–691.

5 Mathews, R. E., Tengberg, A., Sjödin, J., & Liss-Lymer, B. (2019). Implementing the source-to-sea approach: A guide for practitioners. SIWI, Stockholm.

Applying a source-to-sea approach to management is central to tackling the development aspirations defined in the 2030 Agenda at a system scale. The approach balances upstream and downstream demands and provides an avenue for coordination of the SDGs.

In applying a source-to-sea approach to management, it is important to answer questions such as:

- To what extent are coasts and the ocean impacted by alterations in water, pollutants, biota, sediments, materials and ecosystem services? What are the sources of those alterations and how do we quantify these? What impacts are inland communities facing as a result of downstream impacts?
- Which stakeholders is it critical to engage? What behaviours or practices must change to reduce harmful impacts and what needs to be in place to support these changes? What are the risks of inaction?
- What are the governance arrangements in the source-to-sea system? Who has the mandate and influence over what? Where are there gaps, conflicts, overlaps?
- What are the priority actions that will improve the source-to-sea system? How can such actions be financed?
- What are suitable indicators to monitor progress?

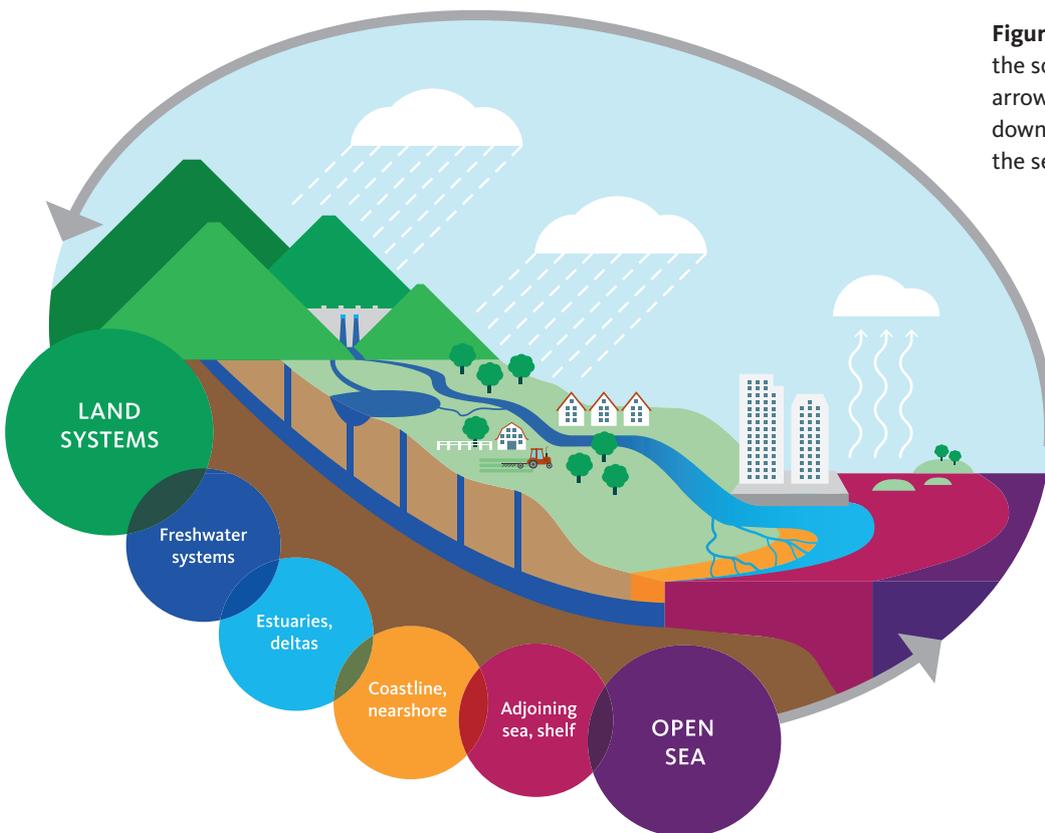


Figure 2. Segments comprising the source-to-sea system, arrows indicate the upstream-downstream linkages between the segments.

Figure 3. Source-to-sea key flows of water, biota, sediment, pollutants and materials combine to condition the ecosystem services that the source-to-sea system provides.



SOURCE-TO-SEA LINKAGES FOR OCEAN HEALTH

Source-to-sea systems are connected through flows of water, sediment, biota, pollutants and materials which impact the functioning of ecosystems and the services they provide. Alterations in these flows can diminish valuable ecosystem services. Some examples of how these flows affect the achievement of SDG 14 are:



KEY SOURCE-TO-SEA FLOWS	EXAMPLE IMPACTS TO THE SOURCE-TO-SEA SYSTEM	RELATED SDG 14 TARGETS
WATER	Changes in land use, coupled with climate change, can contribute to decreased overall water availability and drought as well as increased flood risk or flood severity downstream. Changes in water flows, whether caused directly or indirectly by climate change, can exacerbate water quality issues. While dam and reservoir construction is an important measure to manage water flows, mitigate water scarcity and produce low-carbon electricity, the flows of some rivers are so highly diverted by dams and weirs that little water reaches the sea, robbing coastal ecosystems of the water, sediment and nutrients they need.	14.1, 14.2, 14.3, 14.4, 14.7
SEDIMENT	Almost a third of global sediment flows are trapped in dams and reservoirs upstream ⁷ and without the required flow of sediments from rivers, deltas and coastlines face greater risk of erosion, particularly in the face of sea-level rise. In addition, increased sediment loads as a result of activities that cause soil degradation and increased erosion risk in the catchment smother coral reefs and seagrass beds downstream.	14.2, 14.4, 14.7
BIOTA	Ecosystem connectivity is crucial to biodiversity and for maintaining healthy stocks of the species that move between different habitats as part of their life cycle. Anadromous and catadromous fish serve as important sources of protein and income for many vulnerable populations but have been severely affected in several regions as their migratory pathways are blocked by dams and other impediments.	14.2, 14.4, 14.5, 14.7
POLLUTANTS	While there have been successes in controlling the leakage of pollution from land to sea, trends are mostly negative. Wastewater treatment, agricultural runoff and plastic waste pose challenges in most regions and the resulting pollution limits the resilience of coastal and marine ecosystems and their ability to perform valuable ecosystem services like carbon sequestration. Pollutant leakage further reduces the quality of marine protein and threatens biodiversity.	14.1, 14.2, 14.3, 14.4, 14.7
MATERIALS	Construction of infrastructure and other development activities modify river channels and coastlines through, for example, dredging, clearing rocks and land reclamation. This can have major implications for water and sediment flows through disconnecting floodplains, reducing aquifer recharge, altering salinity regimes and increasing erosion. Wildlife and plant populations may decrease or disappear entirely due to habitat destruction.	14.2, 14.3, 14.4, 14.7

6 Charles J. Vörösmarty, Dork Sahagian, Anthropogenic Disturbance of the Terrestrial Water Cycle, *BioScience*, Volume 50, Issue 9, September 2000, Pages 753–765, [https://doi.org/10.1641/0006-3568\(2000\)050\[0753:ADOTTW\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2000)050[0753:ADOTTW]2.0.CO;2)

Call to action – Start at the source to save the sea

We are facing unprecedented challenges due to the decline in ocean health. This calls for new approaches and strengthened partnerships that engage actors and sectors located upstream of coastal and marine areas. Addressing these challenges cannot wait. Our shared future depends on all levels of government and decision-makers pulling together to drive meaningful change and uniting policy and action for coordinated management in order to restore and maintain the health of the ocean.

The lead up to the UN Ocean Conference, Convention on Biological Diversity COP 15 and the UNFCCC COP 26, as well as other upcoming events, present a unique opportunity to galvanize commitment and strengthen actions to support ocean health. Immediate action from local to global scales is required.

We call upon the international community to join forces and take bold steps to achieve SDG 14 through the following actions:

COMMIT | Mobilize commitments from leaders in government, business, financial institutions, academia and civil society to advance coordinated management from source to sea. Rally support for the development of legal instruments, strategies and action plans to catalyze source-to-sea action at global, regional and national levels.

FINANCE | Incentivize management practices that link land-based activities with impacts on coasts and ocean. Call for collaboration from international financial institutions and governments to stimulate cross-sectoral coordination and upstream-downstream cooperation through financial and regulatory tools.

PARTNER | Build and reinforce multi-stakeholder partnerships at all levels to strengthen commitment and advance knowledge. Accelerate action for development on land and along rivers to safeguard healthy marine and coastal ecosystems and protect livelihoods.

ACT | Mainstream source-to-sea system thinking in governance and management frameworks to strengthen coordination between actors. Address linkages between terrestrial, freshwater, coastal and marine systems in the design and implementation of actions in cities, industries and landscapes, along rivers and coasts, and at sea.

ENGAGE | Move towards sustainable consumption and production by encouraging consumers and businesses to transition away from the take-make-waste economy and adopt behaviours and practices that contribute to the long-term health of ecosystems in the source-to-sea continuum.

RECOMMENDATIONS FOR UN OCEAN CONFERENCE POLITICAL DECLARATION

The conference declaration will set the agenda for ocean action for the next three years and beyond. We call on ocean leaders to stress the importance of land- and freshwater-based linkages and highlight the threats from land-based sources within this text with specific reference to:



PARAGRAPH 3 | Similar to the indivisible nature of the 2030 Agenda, linkages to land and freshwater ecosystems must be highlighted as integral to achieving SDG 14 with a holistic view from source to sea taken to address ocean health.

We underline the interlinkages [between land, freshwater and marine ecosystems] and synergies between Goal 14 and the other Goals of the 2030 Agenda, which is integrated and indivisible in its nature.

PARAGRAPH 4 | In respect to the four targets that mature in 2020 and the urgent action needed to address them, we call for the explicit mention and inclusion of nutrient pollution, which is a key contributor to coastal waters, resulting in eutrophication and dead zones.

Plastic [and nutrient] pollution continues to enter the ocean at an alarming rate, a third of fish stocks are now overexploited, and half of all living coral has been lost.

PARAGRAPH 10 | Land-based impacts on coastal and marine ecosystems span far beyond marine pollution. As such, we call to include strengthening coordinated governance and management from source to sea to avoid adverse impacts on marine and coastal ecosystems from land-based activities and resulting impacts from changes to water, sediment and pollutant flows.

10.a: *Informing integrated ocean management, planning and decision-making [From source to sea], through improving our understanding of the impact of cumulative human activities on the ocean and anticipating the impacts of planned activities and minimize their negative effects.*

10.c: *Reducing [all kind of] marine pollution [from source to sea,] including marine plastic litter and nutrient pollution, contributing to comprehensive life-cycle approaches that include improved waste management and developing new, biodegradable materials that can reduce additional marine plastic litter, [and nature-based solutions that prevent nutrients, chemicals and other pollutants from reaching the ocean.]*

PARAGRAPH 11 | This paragraph must call for the need to enhance knowledge and capacity on science-based, nature-based and innovative governance that strengthens coordination between sectors and addresses the linkages between land, river basins, coasts and the ocean.

11.c: *Establish effective partnerships, including multi-stakeholder, public-private, cross-sectoral and interdisciplinary partnerships [from source to sea], including by incentivizing the sharing of good practices, giving visibility to well-performing partnerships and creating space for meaningful interaction and networking,*

PARAGRAPH 12 | bis [alt 10.c.bis]: The regional and action-oriented approach of the declaration should be strengthened and regional measures incentivized to address the sources of known problems for which solutions exist. This is also a key climate adaptation measure to build resilience against climate change and address SDG 13.1.

12.ter [alt 10.c.ter]: *We commit to develop joint regional commitments to address the most pressing environmental problems related to 14.1 and 14.4 in each sea region by [2022] and as appropriate, initiate a dialogue with existing financing funds and donors.*

PARAGRAPH 13 | Recognizing the need for strong political will, we call for coordinated action to support the achievement of SDG14 from the highest levels and throughout the United Nations System.

We request the Secretary-General to continue his efforts to support the implementation of Goal 14 in the context of the implementation of the 2030 Agenda, in particular by enhancing inter-agency coordination and coherence throughout the United Nations system on ocean issues, taking into consideration the work of UN-Oceans, [including by enhancing linkages to land-based issues affecting the health of the ocean.]

About the Action Platform for Source-to-Sea Management (S2S Platform)

The Action Platform for Source-to-Sea Management (S2S Platform) was launched in 2014 as a multi-stakeholder initiative to exchange and generate knowledge, and support joint action for improved management of land, water, coastal and marine linkages. The S2S Platform has been successful in developing a shared knowledge base and in securing adoption of the source-to-sea approach in policies, strategies and funding mechanisms. Membership is open to all stakeholders that are committed to improving coherence and coordination in land, water and coastal management.

The S2S Platform Secretariat is hosted and coordinated by Stockholm International Water Institute (SIWI). For more information about the S2S Platform, visit www.siw.org/source-to-sea.

Mediterranean Coast Photo: Yves de Soye