附属資料7

United Nations Decade of Ocean Science for Sustainable Development

2021 – 2030

Implementation Plan

DRAFT version 1.0

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Foreword

In 2016, the first World Ocean Assessment of the United Nations stated that humankind is running out of time to start managing the ocean sustainably. In recognition of the urgency of the situation facing the ocean, one question preoccupies ocean actors across the globe: is there a way to reverse the decline in ocean health while continuing to rely on the ocean for our current and future needs, particularly under a changing climate? The proclamation of the **United Nations Decade of Ocean Science for Sustainable Development, 2021–2030** (hereafter, '**the Decade'**) by the United Nations General Assembly in December 2017 provides a once-in-a-lifetime opportunity to positively answer this existentially important question, and sends a clear message that the international community considers ocean science a priority at the beginning of the third millennium.

Ocean science is a broad concept: it encompasses natural and social scientific disciplines, local and indigenous knowledge, the science-policy and science-innovation interfaces, and the technology and infrastructure to carry out research. In its present state, ocean science is largely competent for diagnosing problems; however, its ability to offer solutions of direct relevance to sustainable development requires a massive upgrade. The Decade will trigger a revolution in ocean science. It will create a paradigm shift in the generation of qualitative and quantitative ocean knowledge—including from data poor regions such as the deep ocean, lesser known coastal areas, or the polar regions—to inform the development of solutions that contribute to sustainable development. It will simultaneously catalyse behaviour change that will be required for the successful implementation of these solutions. Guided by the United Nations Convention on the Law of the Sea (UNCLOS), stronger science-based governance frameworks and policies at global and national levels will be developed to create an enabling environment to support sustainable ocean-based economic development. This will be accompanied by significant efforts to continuously strengthen the science-policy and science-innovation interfaces.

In our information-centred, internet-linked society, ocean data, information, and knowledge systems will be supported to evolve to a much higher level of readiness, accessibility, and interoperability. Capacity to generate, understand and use ocean science will be developed across the globe. The scale of such efforts will need to be exponentially greater than anything seen to date. The Decade will support numerous UN entities to fulfil their ocean related mandates in a societally focussed manner. The Decade is a global undertaking, but its activities will be conducted on all scales: from global approaches to regional, national and local actions.

An equally transformational part of the Decade is about us, and our relationship with the ocean. Society at large needs to understand the value of the ocean, and this understanding can be nurtured through enhancement of the ocean literacy of diverse stakeholder groups. Holders of local and traditional knowledge will be essential partners in Decade and will work with the scientific community and other actors to exchange information that complements scientific understanding and illuminates the multitude of cultural values of the ocean.

Equity, inclusiveness, respect, fairness and scientific integrity are core principles of the Decade, and the Decade will systematically identify and dismantle barriers to achieving gender, geographic and generational balance so that no one is left behind. Everyone should be able to benefit from the ocean science, including Small Island Developing States, Least Developed Countries, and Land-locked Developing States.

Merging ocean research with governance and technological innovation and its societal uptake will be a key metamorphosis to be achieved between 2021 and 2030. Its scale will be unprecedented.

Multiple stakeholders are expected to engage and start collaborating outside their traditional communities connecting knowledge generators and users in an iterative process of co-design and co-delivery of ocean science. This will create new groupings of actors from natural, social science and humanities disciplines, business and industry, governments, UN entities, intergovernmental organisations (IGOs), NGOs and civil society, educators, early career ocean professionals, ocean sports and recreation organisations, arts and cultural communities, and local and indigenous knowledge holders. Partnerships and active communication will be at the heart of the success of the Decade.

The Implementation Plan for the Decade is not intended to be a prescriptive document. Rather, it presents a framework for transformational action that will build on existing achievements and galvanise action across geographies, sectors, disciplines, and generations. The Implementation Plan presents a series of high-level *Ocean Decade Challenges* that represent the most pressing and immediate priorities for the Decade and that will evolve over the life of the Decade. It also presents a series of process-focused objectives to organise future actions under the Decade. Undertakings of a scale such as the Decade cannot be rigidly and deterministically governed. The main function of Decade governance structures will be to monitor and evaluate the progress, consolidate useful developments, and facilitate the emergence of new priorities, with an overall goal of delivering science that is useful for sustainability.

I hope you, the reader and a future Decade stakeholder, will support the overall strategic vision and approach of the Decade as described in the Implementation Plan. With your engagement and your support, the impact of the Decade will be much bigger than the sum of the individual components and together we will be able to create the science we need for the ocean we want.

Vladimir Ryabinin
Executive Secretary of the IOC

TABLE OF CONTENTS

page

ANNEXES

1. **GLOSSARY**

List of Figures

List of Tables

List of Boxes

LIST OF ACRONYMS

ECOP	Early Career Ocean Professional
EPG	Executive Planning Group
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection
GOSR	Global Ocean Science Report
IOC	Intergovernmental Oceanographic Commission of UNESCO
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IWG	Informal Working Group
LDC	Least Developed Country
LLDS	Land-locked Developing State
MHEWS	Multi-hazard Early Warning System
OECD	Organisation for Economic Cooperation and Development
OL	Ocean literacy
SDG	Sustainable Development Goal
SIDS	Small Island Developing State
TMT	Transfer of marine technology
UNCLOS	United Nations Convention on the Law of the Sea
UN DOALOS	Division for Ocean Affairs and the Law of the Sea of the Office of Legal Affairs, United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly

Acknowledgements

The Intergovernmental Oceanographic Commission (IOC) of UNESCO gratefully acknowledges the many individual and institutional contributors to the Implementation Plan over the last three years.

The idea of the Decade was borne out of a meeting of IOC Officers and senior Secretariat staff held in early January 2016 in Gilleleje, Denmark. The meeting was chaired by Peter Haugan and supported by the IOC former Executive Secretary Gunnar Kullenberg. The first version of the Decade Roadmap was drafted by the IOC Secretariat with the help of Neville Smith.

The Implementation Plan has its genesis in the discussions of an Interim Planning group that worked in early 2018 and comprised: Sue Barrell (Australian Bureau of Meteorology), Julius Francis (Western Indian Ocean Marine Science Association – WIOMSA), Kristina Gjerde (IUCN), Gabriele Goettsche-Wanli (UN DOALOS and also acting as UN-Oceans focal point), Sieglinde Gruber (European Commission), Craig McLean (NOAA), and Martin Visbeck (GEOMAR), together with staff from the IOC Secretariat.

An Executive Planning Group (EPG) comprising 19 global leaders in ocean science was established in mid-2018, and made significant contributions to the Plan. The EPG members[1] are Francisco Armando Arias-Isaza, Elva Escobar Briones, Karen Evans, Kristina Gjerde, Christa von Hillebrandt-Andrade, Anna Jöborn, Youn-Ho Lee, Suzan Kholeif, Jens Krüger, Atmanand Malayath, Margaret Leinen, Craig McLean, Linwood Pendleton, Fangli Qiao, Ricardo Serrão Santos, Sergey Shapovalov, Dismore Gilbert Siko, Martin Visbeck, and Mitsuo Uematsu. The EPG was chaired by the IOC Executive Secretary, and benefited from wisdom of two IOC Chairpersons, Peter Haugan and Ariel Troisi, and from input and support of the IOC Secretariat. Early Career Ocean Professionals including Harriet Harden-Davies, Alfredo Giron, Evgeniia Kostianaia, Guillermo Ortuño Crespo, and Erin Satterthwaite actively contributed to EPG discussions and the preparation of the Implementation Plan.

Between June 2019 and May 2020, global, thematic, and regional planning meetings convened over 1500 participants from the scientific community, governments, UN entities, NGOs, private sector, and donors across ten ocean basins. These meetings provided important input to the Implementation Plan on scientific priorities and capacity development needs, as well as information on existing and future partnerships to implement Decade Actions. The Governments of Brazil, Canada, Denmark, India, Italy, Japan, Kenya, Norway, Sweden, Republic of Korea and Mexico as well as the Secretariats of the UN Environment Programme (Nairobi Convention, Mediterranean Action Plan, Caribbean Environment Programme), the European Commission, the Ocean Frontier Institute (Canada), the North Pacific Marine Science Organization (PICES), the National Institute of Ocean Technology (NIOT) India, the International Council for the Exploration of the Sea (ICES), the Permanent Commission for the South Pacific (CPPS), the Mediterranean Science Commission (CIESM), the Danish Centre for Marine Research, the Autonomous National University of Mexico (UNAM), the Research Council of Norway, Arctic Frontiers, the Pacific Community (SPC), the UN Global Compact, the Western Indian Ocean Science Association (WIOMSA), Velux Foundations, Foundaçao Grupo Boticario, and the Carlsberg Foundation provided invaluable support to the organization of these workshops.

[1] The affiliation and background of EPG members is provided on the Decade website: https://www.oceandecade.org

In late 2019, over 50 leading ocean institutions provided written submissions to the development of the Decade's scientific priorities, and over 230 written submissions were received in response to the peer review of the zero draft of the Implementation Plan in early 2020.

PART 1

UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT

Part 1 of the Implementation Plan explains the rationale for the Decade, discusses the process required to move from the 'ocean we have' to the 'ocean we want', and describes the desired state of the ocean at the end of the Decade.

1.1. RATIONALE FOR THE DECADE

1. There is increasing recognition and understanding of the reliance of humankind on the vital life-supporting services provided by the ocean. The High-Level Panel on Sustainable Ocean Economy[2] considers the ocean a source of solutions for climate change mitigation and for many dimensions of a sustainable ocean economy including the future of food and energy. The ocean also furnishes unquantifiable aesthetic, cultural and recreational services that are essential to human wellbeing. According to conservative estimates by the OECD, the ocean economy generated $US1.5 trillion in 2010 and has the potential to outperform the growth rate of the global economy both in terms of generated value and employment[3]. It could potentially reach an output of US$3 trillion in 2030, and this development could include contributions from new or less developed services, for example from minerals and marine genetic resources.

Box 1.1: Ocean science in the context of the Decade

In the context of the Decade, the ocean includes the coast to the open sea, and the ocean surface to the deep ocean seabed. 'Ocean science' encompasses natural and social science disciplines, including interdisciplinary approaches; the technology and infrastructure that supports ocean science; the application of ocean science for societal benefit, including knowledge transfer and applications in regions that are lacking science capacity; and the science-policy and science-innovation interfaces. Ocean science embraces and integrates local and indigenous knowledge. Ocean science recognises the central role of the ocean in the earth system, and includes consideration of the land-sea interface and ocean-atmosphere and ocean-cryosphere interactions.

2. The ocean is a complex and dynamic socio-ecological system that is influenced by land-based activities, as well as ocean-atmosphere and ocean-cryosphere interactions. Over 40% of the ocean's surface is strongly affected by multiple drivers, and 66% is experiencing increasing cumulative impacts[4]. Global ocean warming has continued unabated since the 1970s, with a doubling of the rate of warming since the early 1990s and a rise in the

[2] https://www.oceanpanel.org/

[3] OECD (2016). *The Ocean Economy in 2030.* OECD Publishing, Paris.

[4] IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Díaz, J. Settele, E. S. Brondízio E.S., H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. 56 pages.

frequency of marine heatwaves[5]. Exacerbated by ocean acidification and other factors, this warming will lead to large-scale disappearance of corals and other highly productive ecosystems that are a cornerstone of the world's biodiversity, and a source of food and livelihoods for hundreds of millions of people. Deoxygenation resulting from the combined effects of increased nutrient loads and ocean warming is creating 'dead zones' and low oxygen zones throughout the ocean. Harmful algal blooms caused by nutrient pollution are devastating marine biodiversity and generating significant risks for human health. Vast swathes of the ocean exist where very little is known; for example, the enormous surface and volume of the ocean mean that understanding of marine biodiversity and the seabed in areas beyond national jurisdiction is limited, and knowledge of polar regions and the Southern Ocean lags behind that of many other areas of the global ocean.

3. Today, the most pressing goal is to collectively find transformative solutions to the challenges that face the ocean and thus humankind. The solutions will be many and varied, and will differ in their form and scale to best respond to regional, national and local contexts. They may include, amongst others, science based policy and decision-making; management and governance frameworks; and technological innovation. All of these solutions will need to be underpinned by a clear understanding of the barriers to behaviour change: if such barriers are not overcome, then the solutions developed through improved ocean science will be of limited impact. Development of the required transformative solutions will also require better equipped and more sustainably funded science. Target 14.a of SDG 14 Life below Water is to increase scientific knowledge, develop research capacity and transfer marine technology, but national investment in ocean science around the world remains low with an average of 1% of national research budgets attributed to ocean science between 2013 and 2017[6].

4. The only possibility to move from the 'ocean we have' to the 'ocean we want' is to convince governments, decision makers, funders, scientists from natural and social science disciplines including humanities, and the society at large that the world requires a transformational, large-scale, adequately resourced, innovative campaign to mainstream ocean science. This campaign needs to cut across geographies—including across the land-sea interface, and include least developed countries (LDCs), Small Island Developing States (SIDS) and land-locked developing States (LLDSs). It needs to be inter-generational, recognise and redress gender disparities in ocean science, and be of sufficiently long duration to deliver lasting change.

5. In 2016, the Intergovernmental Oceanographic Commission of UNESCO (IOC) initiated a concept for such a campaign and consulted IOC Member States and numerous other interested parties in its development. On 5th December 2017, this preparatory work culminated in the proclamation by the UN General Assembly (UNGA) at its 72nd session of the **UN Decade of Ocean Science for Sustainable Development 2021–2030** (referred to as 'the Decade'). The UNGA called on the IOC to prepare an Implementation Plan for the Decade in consultation with Member States, specialized agencies, funds, programmes and bodies of the United Nations, as well as other intergovernmental organizations, non-governmental organizations and relevant stakeholders. This resulting Implementation Plan, which is the result of a highly inclusive three year preparation process involving thousands of stakeholders, will guide the ambitious endeavour

[5] 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, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)]. In press.

[6] IOC/UNESCO. 2017. Global Ocean Science Report - The current status of ocean science around the world. L. Valdés et al. (eds), Paris, UNESCO Publishing.

represented by the Decade, and will evolve with time reflecting new possibilities, opportunities, and challenges.

6. The Decade will be implemented within the framework of the United Nations Convention on the Law of the Sea (UNCLOS) and it represents an opportunity to build scientific capacity and sustainably use the potential of the ocean to achieve the goals of the 2030 Agenda for Sustainable Development. There are numerous interactions between Sustainable Development Goal (SDG) 14 related to the conservation and sustainable use of the ocean, seas and marine resources, and the achievement of many other SDGs[7] (refer Figure 1.1).

7. There are numerous pathways for the Decade to contribute to the achievement of the 2030 Agenda. For example, under optimistic projections the ocean has the potential to supply up to six times more food than it does today[8] (SDG 2 – Zero hunger). Development and application of renewable energy technologies, actions to maintain and strengthen ocean carbon uptake and low-emission ocean-based transport and food production could reduce greenhouse gas forcing and mitigate the effects of climate change (SDG 7 – Affordable and clean energy; SDG 13 – Climate action). Improved investments in ocean science could redress gender disparity in science, including in developing countries (SDG 5 – Gender equality). New knowledge and tools for coastal nature-based solutions could increase the adaptive capacity of hundreds of millions of the most vulnerable people (SDG 3 – Good health and wellbeing; SDG 10 – Reduced inequalities; SDG 11 – Sustainable Cities and Communities). Support to sustainable ocean based industries will increase employment opportunities across the globe (SDG 1 – No poverty; SDG 8 – Decent work and sustainable economic growth).

8. The Decade will contribute to achieving aspirations contained in global policy frameworks including the UN Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), the Sendai Framework for Disaster Risk Reduction, the Small Island Developing States Accelerated Modalities of Action (SAMOA) Pathway, the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage, the 1972 World Heritage Convention, the Convention on Migratory Species (CMS) and emerging agreements such as a legally binding instrument under UNCLOS on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ). The Decade will strongly contribute to complementary UN initiatives including the UN Decade of Ecosystem Restoration, and the Decade of Action to deliver the SDGs that will both run in parallel to the Decade, as well as the UN Water Action Decade that will end in 2028, and the UN Decade of Action on Nutrition that includes an Action Network on Sustainable Food from the Ocean for Food Security and Nutrition that will end in 2025. Bridging these decades and activities will provide unique opportunities for a holistic approach to ocean science, action and policy.

[7] International Council for Science (ICSU), 2017. A Guide to SDG Interactions: from Science to Implementation [D.J. Griggs, M. Nilsson, A. Stevance, D. McCollum (eds)]. International Council for Science, Paris

[8] Costello, C., L. Cao, S. Gelcich et al. 2019. The Future of Food from the Sea. Washington, DC: World Resources Institute. Available online at www.oceanpanel.org/future-food-sea

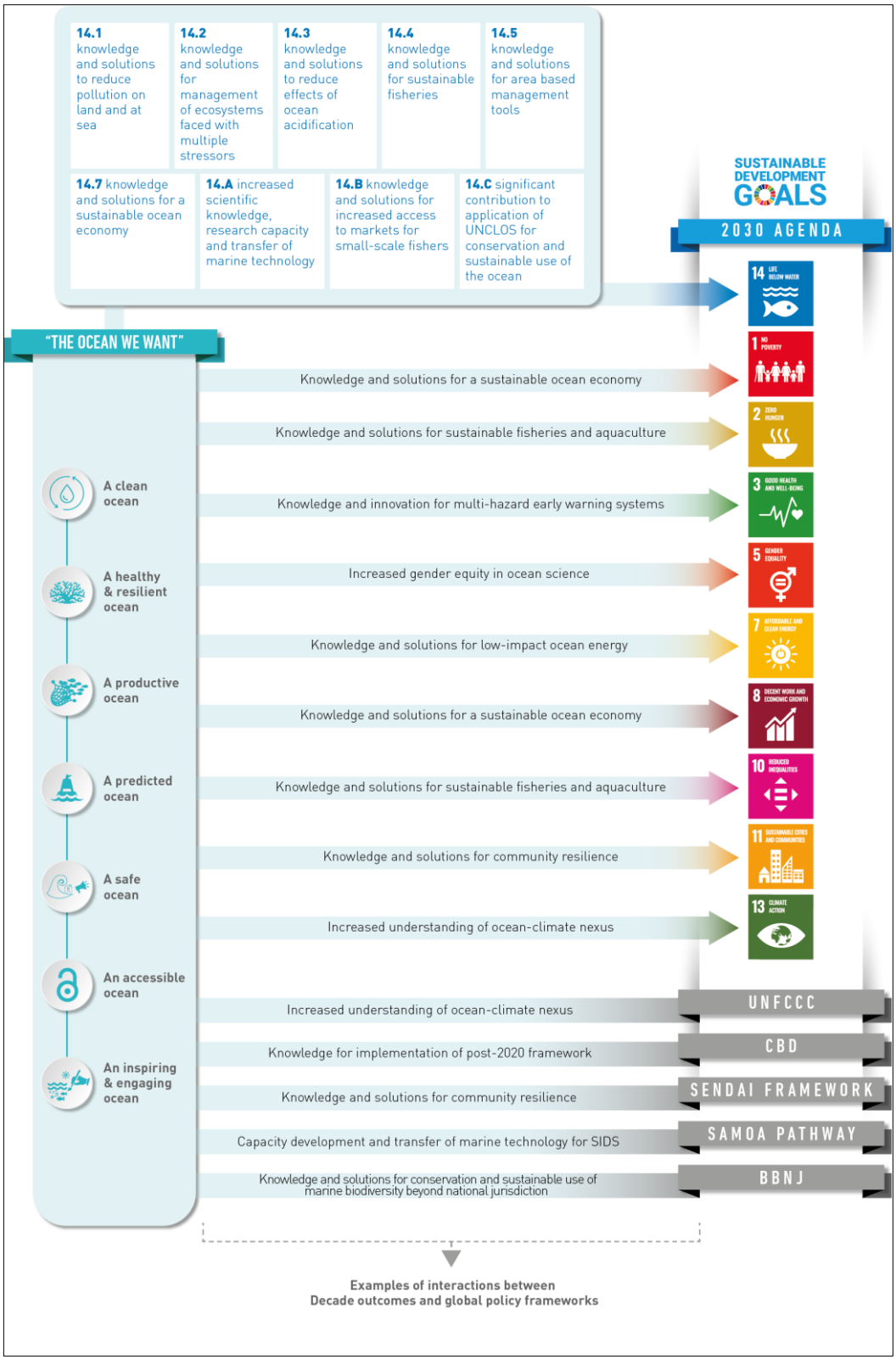


Figure 1.1. Interactions with the 2030 Agenda and the SDGs

9. United Nations entities and intergovernmental organisations including the Food and Agriculture Organization (FAO), the International Hydrographic Organization (IHO), the International Maritime Organization (IMO), the IOC, the International Seabed Authority (ISA), the UN Environment Programme (UNEP), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the United Nations Development Program (UNDP), the United Nations Office for Disaster Risk Reduction (UNDRR), United Nations regional programmes, the World Health Organization (WHO) and the World Meteorological Organization (WMO), will contribute to the success of the Decade by building on existing efforts and increasing collaboration to pursue scientific pathways that fall under the purview of their respective missions.

10. The scope of the work envisaged during the Decade is beyond the capacity of any single nation, any single stakeholder group, or any single scientific discipline. The ocean is offering us an opportunity to work together for the common good in a true spirit of multilateralism and interdisciplinarity. Co-design, engagement, and partnerships will be central to the success of the Decade. The Decade represents a framework to convene a wide range of stakeholders to collectively align their research, investments and initiatives around a set of common challenges, and thus ensure that the result of the collective effort will be exponentially greater than the sum of the parts. The framework provided by the Decade will allow initiatives to grow and flourish at the local, national or regional scales in a form that best responds to specific contexts and priorities.

11. Engaging in the Decade will bring a wide range of benefits. Partners will have the opportunity to join a highly visible, shared, global effort that builds on decades of achievements in ocean science. There will be opportunities to create new collaborations across disciplines, geographies and generations. Opportunities will also be created to access new sources of support or to invest in innovative and audacious ocean science, and to raise the visibility and reach of actions and initiatives.

12. The Decade is everyone's Decade. It is a once in a lifetime opportunity to transform the way ocean science is done and used. The Decade invites all partners to build on existing efforts and combine future action at all scales of engagement to find science driven solutions to improve the state of the ocean and advance the welfare of humanity.

1.2. VISION, MISSION AND OUTCOMES

13. The vision of the UN Decade of Ocean Science for Sustainable Development is:

The science we need for the ocean we want.

14. The mission of the Decade is:

Transformative ocean science solutions for sustainable development, connecting people and our ocean.

15. The Decade will harness, stimulate and empower interdisciplinary ocean research at all levels, in order to support delivery of the information, action and solutions needed to achieve a well-functioning ocean in support of all SDGs of the 2030 Agenda. The Decade will mobilise resources and technological innovation to build capacity, develop scientific knowledge, build and share infrastructure and foster partnerships for a sustainable and healthy ocean. In doing so, the Decade will facilitate a transition from the 'ocean we have' to the 'ocean we want' that supports a sustainable, equitable and healthy future for all (refer Figure 1.2).

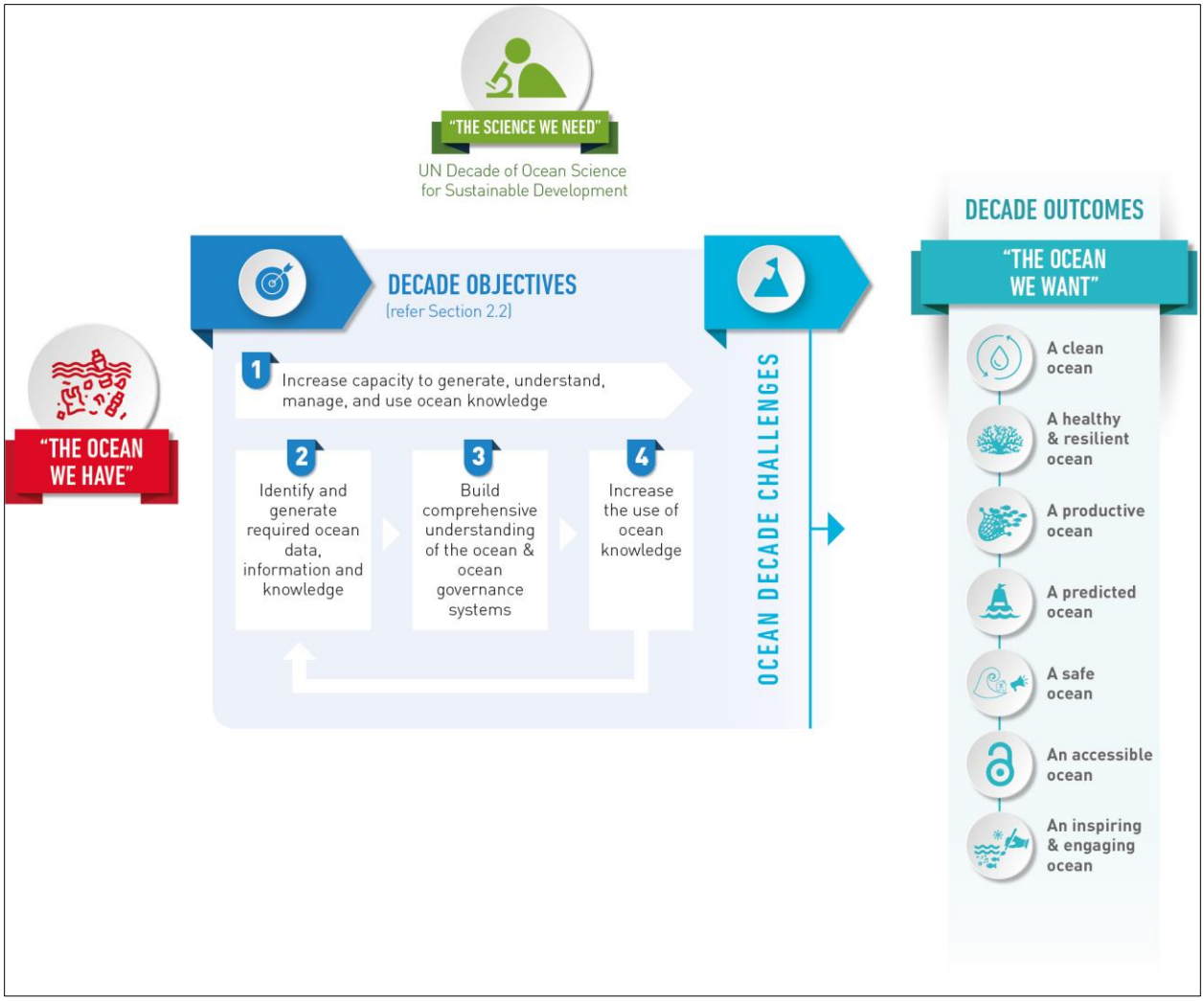


Figure 1.2. Moving from the 'ocean we have' to the 'ocean we want'

16. Achieving the shift to the ocean we want requires a multi-step, iterative process that will embrace innovation, creativity, and leaps in capability. Throughout the Decade, natural and social scientists and ocean stakeholders will work together to co-design and co-deliver, solution-oriented research that spans all aspects of the ocean including human interactions, ocean-atmosphere interactions and the land-sea interface.

17. Existing and new knowledge will underpin the co-development and deployment of relevant and accessible decision support systems, services and tools that will be used by decision-makers, policy developers, innovators, and managers at local, national, regional and global scales. Capacity development, enhancement of ocean literacy and the systematic identification and removal of barriers to full gender, generational, and geographic diversity will be an essential element of each stage of this process.

18. The Decade will **stimulate innovation** and increase **access to existing and new technology** to increase the diversity and scope of ocean exploration, integrate data management systems, and deliver ocean knowledge to guide sustainable pathways. To enhance predictive capability, the Decade will maximise the discovery and use of observations of the ocean, including local knowledge and understanding, and deliver next generation forecasting systems, ocean models and assessment frameworks. It will exchange ocean knowledge with diverse users—including governments, business and industry, UN entities, NGOs, local communities, managers or innovators, through **new data, information and knowledge platforms** that are fit for purpose. These platforms will enable adaptive and science-informed policy responses to global change and hazards thus avoiding ecological or societal tipping points, and ensuring that risks from ocean disasters are reduced. Action will be required at **global, regional, national and local levels** and will need to reflect priorities and needs of stakeholders. The engagement of a **wide variety of stakeholders** from global research institutes to local communities will be essential.

Box 1.2: Transformative Ocean Science

The notion of transformation is central to the Decade. The Decade, both in terms of action and outcomes, needs to move beyond business as usual to a true revolution in ocean science. The different ways in which the transformative nature of the Decade will manifest include the promotion and facilitation of ocean science that:

- uses the 2030 Agenda as a central framework to identify and address the most pressing societal questions related to SDG14 and related SDGs;
- is co-designed and co-delivered in a multi-stakeholder environment to be relevant and responsive across the entire value-chain from knowledge generation, to applications and services to use of science for solutions;
- is solutions-focused and contributes to a wide variety of potential solutions including policy, decision-making, management or governance frameworks, or technology development and innovation;
- where needed, is big, audacious, forward-looking, and spans geographies;
- reaches across disciplines and actively integrates natural and social science disciplines;
- embraces local and indigenous knowledge as a key knowledge source;
- is transformative because of who is doing it or where it is being done, including in both less developed and developed countries;
- strives for generational, gender and geographic diversity in all its manifestations;
- is communicated in forms that is widely understood across society and triggers excitement about the ocean and behaviour change;
- is shared openly and available for re-use.

19. The following seven outcomes describe the ‘ocean we want’ at the end of the Decade. They describe both the desired state of the ocean (Outcomes 1 and 2), and the desired state of society’s use of, and interaction with, the ocean (Outcomes 3 to 7).

- **Outcome 1: A clean ocean where sources of pollution are identified, reduced or removed.** Society generates a vast range of pollutants and contaminants including marine debris, plastic, nutrients, underwater noise, pharmaceutical pollutants and heavy metals. These pollutants and contaminants derive from a wide variety of land and sea based sources, including point and non-point sources. The resulting pollution is unsustainable for the ocean and jeopardises ecosystems, human health, and livelihoods. It will be critical to

generate interdisciplinary and co-produced knowledge on the causes and sources of pollution and its effects on ecosystems and human health. This knowledge will underpin solutions co-designed by multiple stakeholders to eliminate pollution at the source, mitigate harmful activities, remove pollutants from the ocean, and support the transition of society into a circular economy.

- **Outcome 2: A healthy and resilient ocean where marine ecosystems are understood and managed.** Degradation of marine ecosystems is accelerating due to unsustainable activities on land and in the ocean. To sustainably manage, protect or restore marine and coastal ecosystems, knowledge of these ecosystems, and **their** reactions to multiple stressors, needs to be enhanced. This is particularly true where multiple human stressors interact with climate change, including acidification and temperature increase. Such knowledge is critical to developing tools to implement management frameworks that build resilience and avoid ecological tipping points, and thus ensure ecosystem functioning and continued delivery of ecosystem services for the health and wellbeing of society and the planet as a whole.

- **Outcome 3: A productive ocean supporting sustainable food supply and a sustainable ocean economy.** The ocean will be a foundation for future global economic development and human wellbeing, including assuring food security and secure livelihoods for hundreds of millions of the world's poorest people. Knowledge and tools to support the recovery of wild fish stocks, deploy sustainable fisheries practices, and support the sustainable expansion of aquaculture, while protecting essential biodiversity and ecosystems, **will** be essential. The ocean also provides critical goods and services to a wide range of established and emerging industries including extractive industries, energy, tourism, transport and pharmaceutical industries. Each of these sectors has specific needs in terms of increased knowledge, and support to innovation, technological development and decision support tools to minimise risk, avoid lasting harm, and optimise their contribution to the development of a sustainable ocean economy.

- **Outcome 4: A predicted ocean where society understands and can respond to changing ocean conditions.** The vast volume of the ocean is neither adequately mapped or observed, nor is it fully understood. Exploration and understanding of the changing ocean including its physical, chemical and biological components and interactions with the atmosphere and cryosphere is essential, particularly under a changing climate. Such knowledge is required from the land-sea interface along the world's coasts to the open ocean, and from the surface to the deep ocean seabed. It needs to include past, current and future ocean conditions. More relevant and integrated understanding and ultimately prediction of ocean ecosystems and their responses and interactions will underpin the implementation of ocean management that is dynamic and adaptive to a changing environment and changing uses of the ocean.

- **Outcome 5: A safe ocean where life and livelihoods are protected from ocean-related hazards.** Both geophysical and human induced hazards create devastating, cascading and unsustainable impacts for coastal communities, ecosystems, and economies. The changing frequency and/or intensity of weather- and climate-related hazards is exacerbating these risks. Mechanisms and processes for assessing the risk, mitigating, forecasting and warning of these hazards and formulating adaptive responses are required to reduce short- and **longer**-term risks on land and at sea. Higher density ocean data and improved forecast systems—including those related to sea level, marine weather and climate are needed from near real time through decadal scales. When these

enhancements are linked to education, outreach, and communication, they will empower policy and decision-making and mainstream individual and community resilience.

- **Outcome 6: An accessible ocean with open and equitable access to data, information and technology and innovation.** Inequalities in ocean science capacity and capabilities need to be eradicated through simultaneously improving access to data, knowledge, and technology, and by increasing skills and opportunities to **engage** in data collection, knowledge generation and technological development. Increased dissemination of relevant ocean knowledge to the scientific community, governments, business and industry, and the public through relevant and accessible products will improve management, innovation and decision-making contributing to societal goals of sustainable development.

- **Outcome 7: An inspiring and engaging ocean where society understands and values the ocean in relation to human wellbeing and sustainable development.** In order to incite behaviour change and ensure the effectiveness of solutions developed under the Decade there needs to be a step change in society's relationship with the ocean. This can be achieved through ocean literacy approaches and other public awareness **and** education tools that will build a significantly broader understanding of the economic, social, and cultural values of the ocean and the plurality of roles that it plays to underpin health, wellbeing and sustainable development. This outcome will highlight the ocean as a place of wonder and inspiration, thus also influencing the next generation of scientists, policy makers, government officials, managers and innovators.

PART 2

ACTION FRAMEWORK FOR THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT

Part 2 of the Implementation Plan describes the framework that will guide the design and implementation of Actions throughout the Decade. At the highest level, it presents a series of Ocean Decade Challenges, followed by the objectives of the Decade, and a hierarchy of Decade Actions including the criteria and process for their endorsement. It describes principles to guide data management, capacity development and describes how stakeholders can engage in the Decade.

2.1 OCEAN DECADE CHALLENGES

This section presents a series of high level Ocean Decade Challenges that seek to unite Decade stakeholders around common priorities.

20. The framework that will guide the design and implementation of Actions throughout the Decade comprises several levels (refer Figure 2.1).

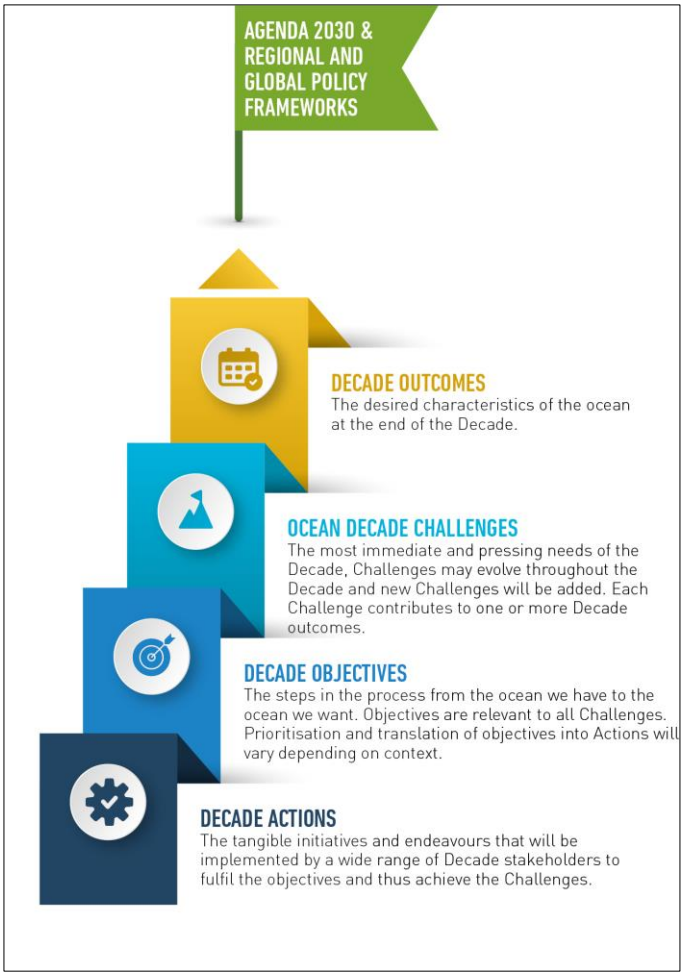


Figure 2.1. Decade Action Framework

21. A series of high-level Ocean Decade Challenges represent the highest level of the Decade Action Framework. They articulate the most immediate and pressing priorities for the Decade and aim to unite Decade partners in collective action, thus ensuring that the whole of the Decade is exponentially greater than the sum of its parts. The Challenges feed directly into the Decade outcomes and thus the Decade's contribution to the 2030 Agenda and complementary global policy frameworks.

22. The Challenges have been designed to represent common global priorities that can be translated into relevant Decade Actions at the global, regional, national and local scales by a wide range of stakeholders. Prioritisation of the Challenges, and the form and scope of related Decade Actions, will be different across the globe depending on local, national and regional contexts; for example to align with priorities contained in national ocean policies, or to focus efforts in areas of particular significance such as marine World Heritage sites or underwater cultural heritage sites.

23. The Challenges have been identified from discussions with stakeholders throughout the preparation phase of the Decade including the regional consultation workshops. The Challenges may evolve and change as issues are resolved, and new Challenges will be added as issues emerge over the course of the Decade. Stakeholders will be involved in the process of revising and updating the Challenges via the engagement and review mechanisms outlined in Sections 2.6 and 3.3.

24. The present set of Ocean Decade Challenges are as follows:

- Ocean Decade Challenge 1. Understand and map land and sea-based sources of **pollutants and contaminants** and their potential impacts on human health and ocean ecosystems, and develop solutions to mitigate or remove them.
- Ocean Decade Challenge 2. Understand the effects of multiple stressors on ocean ecosystems, and develop **solutions to protect, monitor, manage and restore ecosystems and their biodiversity** under changing environmental conditions, including climate.
- Ocean Decade Challenge 3. Generate knowledge, support innovation, and develop solutions to optimise the role of the ocean to contribute to **sustainably feeding the world's population** under changing environmental and social conditions.
- Ocean Decade Challenge 4. Generate knowledge, support innovation, and develop solutions to contribute to **equitable and sustainable development of the ocean economy** under changing environmental and social conditions.
- Ocean Decade Challenge 5. Enhance understanding of the **ocean-climate nexus** and use this **understanding** to generate solutions to mitigate, adapt and build resilience to the effects of climate change, and to improve services including improved predictions and forecasts for weather, climate, and the ocean.
- Ocean Decade Challenge 6. Expand **multi-hazard warning systems** for all biological, geophysical, and weather **and** climate related ocean hazards, and mainstream community preparedness and resilience.
- Ocean Decade Challenge 7. Ensure a sustainable **ocean observing system** that delivers timely data and **information** accessible to all users on the state of the ocean across all ocean basins.
- Ocean Decade Challenge 8. Develop a comprehensive **digital representation of the ocean**, including a dynamic ocean map, through multi-stakeholder collaboration that

provides free and open access to explore, discover, and visualize past, current, and future ocean conditions.

- Ocean Decade Challenge 9. Ensure comprehensive **capacity development and equitable access to data, information, knowledge and technology** across all aspects of ocean science and for all stakeholders regardless of geography, gender, culture, or age.
- Ocean Decade Challenge 10. Ensure that the multiple values of the ocean for human wellbeing, culture, and **sustainable** development are recognised and widely understood, and **identify and overcome barriers to the behaviour change** that is required for a step change in humanity's relationship with the ocean.

2.2 DESIGNING THE SCIENCE WE NEED

This section presents the framework within which Decade Actions will be developed and delivered to contribute to the fulfilment of the Ocean Decade Challenges.

25. A multi-step, iterative process is required to move from the 'ocean we have' to the 'ocean we want'. During the course of Decade, stakeholders need to acquire sufficient capacity to deliver the needed knowledge, and trigger effective action based on that knowledge. The Decade's objectives are process objectives that reflect the four steps shown in Figure 1.2:

- Objective 1. Increase capacity to generate, understand, manage, and use ocean knowledge
- Objective 2. Identify and generate required ocean data, information and knowledge
- Objective 3. Build comprehensive understanding of the ocean and ocean governance systems
- Objective 4. Increase the use of ocean knowledge

26. All of the objectives are relevant to all of the Ocean Decade Challenges and they will be implemented in an iterative manner. Each of the objectives has been broken down into sub-objectives, and their achievement may involve various standards, best practices, agreements, policies and principles. The sub-objectives and challenges are intended to inform the formulation, structuring and clustering of Decade Actions. These sub-objectives will be reviewed and updated regularly throughout the Decade implementation to ensure their ongoing relevance and reflect emerging issues or changes to the Ocean Decade Challenges.

Objective 1: Increase capacity to generate, understand, manage, and use ocean knowledge

27. Capacity to generate, manage, make available and use ocean knowledge cuts across all other objectives of the Decade. A substantial expansion in capacity for filling current gaps in our understanding of the ocean, including future conditions, is needed to facilitate co-design of ocean science and co-production of knowledge, and to co-deliver solutions in support of decision-making, policy, management and innovation. Expanded and equitable access to ocean knowledge, technology and services, in a form that responds to user needs, ensuring quality of data, will complement capacity development efforts. Common understanding of the value of the ocean for human wellbeing and sustainable development is needed to achieve a step change in human behaviour and humanity's relationship with the ocean.

28. Sub-objectives include*:*

- **1.1:** Facilitate equitable and open access to ocean data, information, knowledge and technology for all stakeholder groups across geographies, genders, and generations.
- **1.2:** Implement Findable, Accessible, Interoperable and Re-usable (FAIR) data principles and best practices across ocean data, information and knowledge systems to support the coordination, coherence and harmonisation of ocean knowledge, and coordination amongst data holders and providers.
- **1.3**: Expand capacity development mechanisms across stakeholder groups in the co-design and co-delivery of ocean science that is relevant to society.
- **1.4:** Expand capacity development mechanisms across stakeholder groups in the use, communication and understanding of ocean data, information and knowledge to inform policy, decision-making, management and technological innovation.
- **1.5:** Expand Ocean Literacy mechanisms across geographies, genders and generations to improve dialogue, and increase use and understanding of ocean science to inform public choices and behaviour affecting the ocean; and to facilitate exchange of views and the development of common perspectives on the importance of the ocean for wellbeing and sustainability.

Objective 2: Identify and generate required ocean data, information and knowledge

29. The identification and fulfilment of priority ocean data, information and knowledge gaps needs to build on a transdisciplinary foundation of ocean exploration, observation, and experimentation. This foundation will need to engage multiple stakeholders across natural and social science disciplines and indigenous and local knowledge holders, and span all areas of the ocean from the surface to the deep ocean, and from the coast to the open ocean.

30. Sub-objectives include:

- **2.1:** Expand and integrate research and observation systems and facilitate interdisciplinary and transdisciplinary, multi-stakeholder, collaboration between knowledge generators and users to identify priority gaps in ocean knowledge—including in data poor regions—and to frame efforts in exploration, observations and experimentation.
- **2.2:** Innovate and expand the use of historical ocean knowledge through improved archival, data archaeology and rescue, and repurposing of data.
- **2.3:** Enhance and expand existing ocean observing systems across all ocean basins to deliver information on standardised essential ocean variables including social and economic, geological, physical, chemical, biological, ecological parameters, and observations on human interactions with the ocean.
- **2.4:** Enhance access to existing technology and promote new technology development to increase availability and lower the costs associated with exploration, observations and experimentation.
- **2.5:** Develop mechanisms that support community-led science initiatives and the exchange of local and indigenous knowledge as part of ocean exploration, observations and experimentation efforts.

Objective 3: Build comprehensive understanding of the ocean and ocean governance systems

31. Improved ocean data, information and knowledge generated under Objective 2 is needed to construct a fuller understanding of the ocean and ocean governance both in terms of its component parts, and in terms of its interactions with the other elements of the Earth system and social systems including human interactions. This holistic understanding can then support improved predictions, forecasting and modelling that will generate knowledge for decision-making, policy, management and innovation.

32. Sub-objectives include:

- **3.1:** Generate a comprehensive inventory, mapping, and understanding of the role and function of ocean components including the interaction with the climate system and the land-sea interface and their responses to change and variability.
- **3.2:** Generate a comprehensive understanding of thresholds and tipping points for ocean components, based on a fuller understanding of multiple stressors and their synergistic and cumulative effects.
- **3.3:** Improve existing, and develop new generation ocean models for improved understanding of the past, current and future states of the entire ocean system (including geological, physical, biogeochemical, biological, ecological, social and cultural components) and for improved prediction and forecasting to inform decision-making, policy, management and innovation in the context of human use and climate change.
- **3.4:** Improve forecasts and predictive capability for oceanic hazards or events that affect human safety, wellbeing, and food security.

Objective 4: Increase the use of ocean knowledge

33. The outcomes of the Decade will only be achieved if decision makers, policy makers, innovators and society are served by tools, applications and services that translate data, information and knowledge generated through Objectives 2 and 3 into forms that can be used to assess and mitigate risk, support a sustainable ocean economy, and advance implementation of effective and sustainable management of the ocean.

34. Sub-objectives include:

- **4.1:** Develop interoperable, open access platforms to share data, information and knowledge with stakeholders in a format that is suitable to their needs and which can be used to develop solutions.
- **4.2:** Facilitate knowledge exchange among stakeholders, including science, industry, communities, and decision makers, that supports co-design and co-delivery of solutions to challenges to the ocean including policy, decision-making, management, and technology and innovation.
- **4.3:** Expand and enhance spatial planning processes to support equitable access to coastal and marine resources, protect ecosystem functions and services and provide for sustainable development across regions and scales.
- **4.4:** Expand and enhance inclusive management frameworks that reduce stressors on the ocean, maintain ecosystem functioning, provide for adaptive processes under changing ocean conditions, and incorporate community values and needs.

- **4.5:** Expand and enhance planning tools for building and mainstreaming preparedness and evolutive adaptive responses to multiple stressors and hazards that provide for the protection, restoration and recovery of ecosystems, recognise trade-offs and increase the resilience of coastal communities.
- **4.6**: Facilitate co-designed and co-delivered interdisciplinary actions, including through exchanges with indigenous and local knowledge holders, which generate knowledge and solutions that would foster the science to policy interface leading to a sustained behaviour change in society that will benefit the ocean.

2.3 DECADE ACTION HIERARCHY AND ENDORSEMENT PROCESS

This section presents the different types of Decade Actions, and discusses the criteria and process for endorsement of Actions as part of the Decade.

35. Decade Actions are the tangible activities that will be carried out across the globe over the next ten years to fulfil the Decade vision. Decade Actions will be carried out by a wide range of proponents including, but not limited to, research institutes, governments, UN entities, intergovernmental organisations, other international and regional organisations, business and industry, philanthropic and corporate foundations, NGOs, educators, community groups, or individuals (e.g. via community led science initiatives).

36. Different levels of Decade Actions will be implemented including **programmes** and their related **projects,** as well as **activities**, and/or **contributions.**

- A Decade programme is global or regional in scale and will contribute to the achievement of one or more of the Ocean Decade Challenges. It is long-term (multi-year), interdisciplinary and multi-national. A programme will consist of component projects, and potentially enabling activities.
- A Decade project is a discrete and focused undertaking that is typically of a shorter duration. It may be regional, national or sub-national and it will typically contribute to an identified Decade programme.
- A Decade activity is a one-off standalone activity (such as an awareness-raising event, a scientific workshop, or a training opportunity). It enables a programme or project or directly contributes to an Ocean Decade Challenge.
- A Decade contribution supports the Decade through provision of a necessary resource (e.g. funding, resource mobilisation, data, or an in-kind contribution, including staff, provision of infrastructure, or equipment). A contribution can support either the implementation of a Decade Action or the coordination functions of the Decade.

37. Decade Actions will be resourced by a diversity of partners including national governments, philanthropic and corporate foundations, multilateral and bilateral funding agencies, business and industry, and individuals (e.g. via crowdfunding). Section 3.2 provides further discussion on financing and resource mobilisation for the Decade.

38. Decade Actions will include both initiatives to generate and use data and knowledge, and initiatives to create a robust enabling environment for ocean science including capacity development, ocean literacy, and data and knowledge management initiatives.

39. The endorsement of Decade Actions will be carried out through the process described below and illustrated in Figure 2.2. This process involves the governance and coordination structures of the Decade including: the Decade Board—a high-level advisory group; the Decade Coordination Unit—the centralised coordination structure; and regional or programmatic decentralised coordination structures. Section 3.1 provides a detailed description of these structures.

40. Calls for Actions for programmes and projects will be launched periodically by the Decade Board and Decade Coordination Unit via an online platform. These Calls will target priority action areas to support the Decade objectives at the global or regional levels, or for priority themes. Proponents can respond to these Calls for Action with ideas for Decade Actions in the form of programmes or projects. Proponents can submit Actions in the form of activities or contributions at any time via the online platform. The Decade Board will review and decide requests for endorsement of Decade programmes, while the Decade Coordination Unit will review and decide requests for endorsement of Decade projects, activities and contributions, taking into account recommendations from relevant decentralised coordination structures.

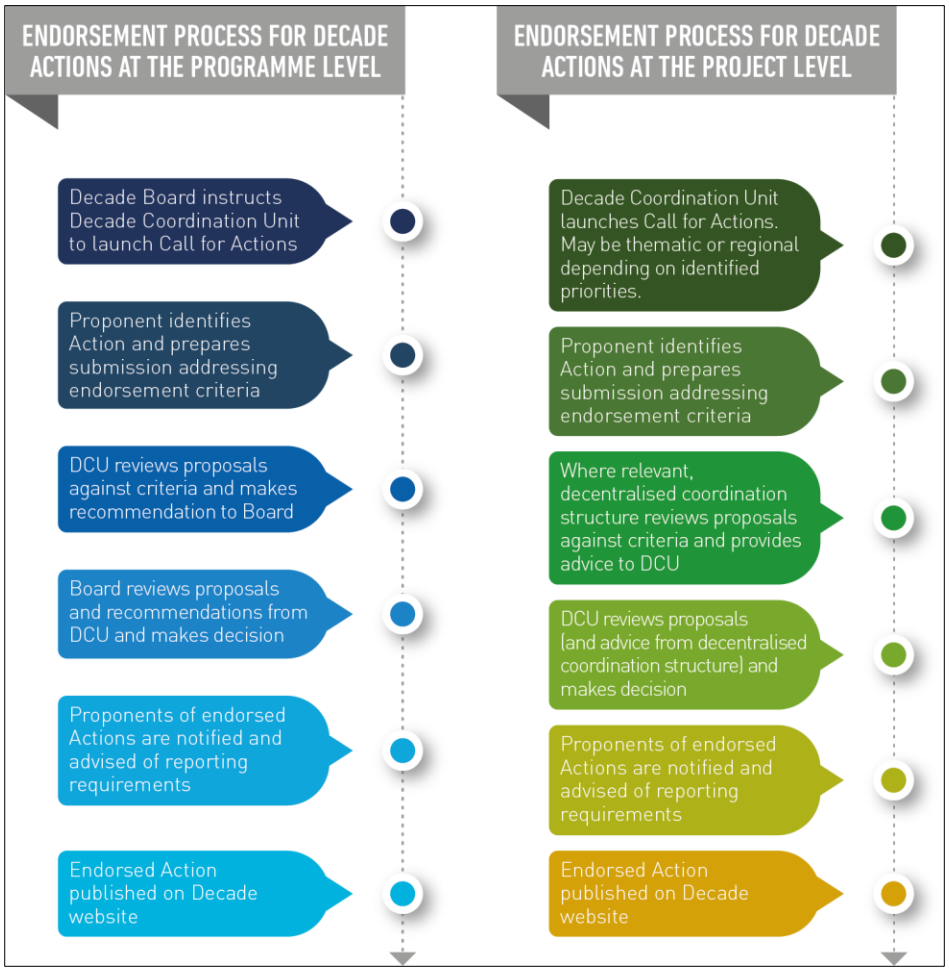


Figure 2.2. Endorsement process for Decade Actions at the programme and projects levels

41. All Actions endorsed under the UN Decade of Ocean Science for Sustainable Development will need to demonstrate how they:

- Contribute to fulfilling the Ocean Decade Challenges and to achieving the Decade objectives and the associated sub-objectives.
- Accelerate the generation or use of knowledge and understanding of the ocean, with a specific focus on knowledge that will contribute to the achievement of the SDGs and complementary policy frameworks and initiatives.
- Are co-designed or co-delivered by knowledge generators and users, and thus facilitate the uptake of science and ocean knowledge for policy, decision-making, management and/or innovation.
- Ensure that all data and resulting knowledge are provided in an open access, shared, discoverable manner and are appropriately deposited in recognized data repositories consistent with the IOC Oceanographic Data Exchange Policy[9] or the relevant UN subordinate body data policy.
- Strengthen existing or create new partnerships across nations and/or between diverse ocean actors, including users of ocean science.
- Contribute toward capacity development, including, but not limited to, beneficiaries in SIDS, LDCs and LLDSs.
- Overcome barriers to diversity and equity, including gender, generational, and geographic diversity.
- Collaborate with and engage local and indigenous knowledge holders.

42. At the time that endorsement is requested, potential Actions can already have secured all of their required financial and in-kind resources, or they can be submitted without having secured the full resources needed for implementation. In this latter case, the Decade Coordination Unit may facilitate connections between proponents of Actions and resource providers (refer Section 3.2).

43. Both ongoing and new initiatives can be considered for endorsement as Decade Actions.

44. Once endorsed, Actions will be reported on the Decade website. Proponents of endorsed Actions will be able to use the Decade logo during the implementation of the Action. Proponents will be required to provide a brief annual report on the implementation of the Action. Endorsement will be valid for the duration of the Action.

2.4 DATA, INFORMATION AND DIGITAL KNOWLEDGE MANAGEMENT

This section describes the data, information and digital knowledge management framework that will be collectively developed throughout the Decade.

45. The digitisation, sharing, and management of data, information and digital knowledge are cornerstones for the Decade's success. In this domain, the Decade's vision is that the ocean community will rally their capacities to collectively co-design and construct a distributed digital

[9] Refer https://www.iode.org/index.php?option=com_content&view=article&id=51:ioc-oceanographic-data-exchange-policy&catid=24&Itemid=100040

system capable of: (i) holistically representing the complex socio-ecological ocean system at global, regional or local scales; and (ii) representing the ocean's role in sustainable development across scales. Stakeholders must be able to access, use, and contribute to this digital ecosystem through multiple interfaces tailored to their needs and capacities.

46. No one system or central infrastructure will be able to implement the vision above; instead, Decade stakeholders will need to contribute to the development of a distributed, robust, and collaborative "digital ecosystem" of interoperating parts, that leverages open, scalable, easily implementable, and responsive digital management frameworks. This distributed system must include resources to support a complete understanding of marine social-ecological systems drawing from historical data, contemporary data (including real-time data streams), and modelled data to help predict future ocean conditions. It must also be constructed to contribute to the identification of knowledge gaps that can then be used to trigger the generation of new knowledge. As it develops, the Decade's digital commons must embrace non-quantifiable forms of knowledge and diverse knowledge paradigms—including indigenous and local knowledge, to contribute to the digitised evidence base. The design and development of the system must overcome existing barriers—including a lack of digitisation capacity, data fragmentation, siloing of data, lack of data sharing, and hidden or underexploited datasets.

47. The contributed components of the Decade's data, information and digital knowledge system must allow exchanges between knowledge generators and users. The system's components need to support scientists, planners, and decision-makers at all levels, as well as businesses, communities, and other stakeholders in accessing and using information products and services tailored to their needs.

48. This ambitious goal will require collective implementation from a diverse—but closely coordinated—community of contributors and users. Much of the required capability to build a coordinated digital ecosystem for the ocean is already available: many actors—from national institutes to small enterprises and research initiatives—have created immense capacity to gather, manage, integrate, analyse, communicate, and act on complex marine data. The main challenge is to enhance efforts to rally, focus, align, and combine capacities across all sectors including the academic, philanthropic, industrial, and governmental sectors.

49. Implementing the Decade's digital framework will be a continuous process, responding to innovation and unforeseen needs while maintaining operational integrity. All co-implementers must leverage and help coordinate existing systems and capacities so that they can act as interoperable components of a global whole. Implementation must build on existing and well-functioning systems and networks of trust, while simultaneously providing an impetus to fill known gaps, and detect new and emerging needs.

50. As local, regional, and global frameworks and initiatives emerge to meet the Decade's digital needs, a set of core features must be borne in mind to ensure alignment with the central vision. The aim is to create and maintain an approachable, robust, and extensible set of common and best practices across scales, sectors, and capacities, including methods that enable:

- Continuous and transparent validation and quality control/assurance of digital products and streams.
- Exposure of stakeholders' data, information, and knowledge in ways that meaningfully contribute to a global commons (both technically and substantively).
- Automated discoverability of data and information within and across independent systems.

- Access to data, while respecting controls where needed.
- Interoperability, from datasets to infrastructure, allowing rapid integration, analysis, and synthesis.
- A modern and scalable digital stewardship culture.

51. Component systems and their guiding frameworks must aim to promote and enable:

- The use of standards, best practices and coordination across shared global frameworks.
- The implementation of, and adherence to, clear and fit-for-purpose data management plans, that are made publicly available when no credible restrictions exist.
- The participation by diverse stakeholders through partnership at multiple levels, including through networks of interoperating platforms, communities of practice, and coordination solutions.
- More rapid and timely sharing of data, thus reducing time and cost from observation to utilisation.
- Targeted capacity sharing and development—matching opportunities and needs to skills and resources—as well as technology transfer across networks to raise global capacity.
- New ways of ensuring data are accessible and useable in the science-policy and science-innovation interfaces co-created by stakeholders.
- The delivery of tailored digital products and services to users across stakeholder groups and geographies, through custom interfaces, dashboards, and other user experience solutions that allow users to tailor information to their geographical or thematic area of interest.
- Reusable, consistent, open, and widely shared data, software, and other relevant code.
- The creation of working groups and advisory boards to drive innovation, protect intellectual property rights, protect sensitive and proprietary information, and ensure equity and justice for data contributors at all levels, including indigenous and local groups and industry, following the FAIR and CARE principles[10].

52. To support the above, the use of linked open data technologies is strongly encouraged to allow components of the Decade's digital ecosystem to project interoperable representations of their internal digital resources onto the web for use and rapid reuse by all stakeholders. Operating in an interlinked digital ecosystem, participants in the Decade's digital ecosystem—in accordance with their capacities—should aim to construct systems that would:

- Embrace a culture of timely, "free and open" access, use, re-use, and redistribution of observational data for the greatest public good, working closely with recognised digital repositories[11].
- Interlink resources that are grounded in peer-reviewed, trustworthy science or transparent, quality-controlled procedures and which deliver content traceable to raw observations, measurements, analyses, or models of the ocean and the earth system, across its socio-environmental dimensions.

[10] https://www.gida-global.org/care

[11] Such repositories should be consistent with the IOC Oceanographic Data Exchange Policy or the relevant UN subordinate body data policy.

- Create new opportunities for the participation of industry and local and indigenous groups in ocean science, accounting for forms of information that may not align with scientific numeration or may require new digital representations of evidence.
- Provide and enable examination of predicted future states of societal systems and their host ecosystems, as well as the impacts they have upon one another.
- Be responsive to users needs through proactive engagement and co-development.
- Be extensible, allowing development of new components to address unforeseen needs that are capable to rapidly interoperate with other components.
- Accelerate the pace of scientific discovery and its rapid application across the ocean value-chain.
- Be capable of being used and contributed to by a wide range of stakeholders, including those in low-technology environments.
- Champion and promote interoperability with external systems, both existing and emerging and from small to multi-national scale.

53. Collective implementation of the Decade's digital ecosystem must also occur at the level of policy. Digital policy is a key part of the bridge between scientific and (inter) governmental policy, allowing these domains to support one another in developing indicators and measurement systems. The measures described above support this effort and are intended to help decision makers more confidently access, understand, and use scientific insight while directing scientific capacities to societal needs and region-specific priorities. While it may be impossible to reach agreement on a single, overarching policy across all partners—many of whom have existing policies, the systems constituting the Decade's digital ecosystem will need to be flexible enough to deal with the various policies, licenses, rules, and restrictions applicable to data and information from a wide variety of sources. The machine-readability of licenses and other policy devices will therefore be a key feature in the growth of a healthy and trustworthy digital ecosystem for the ocean. Indeed, new licensing norms and provenance capacities will be needed to allow open and proprietary data to appropriately cross-inform one another while acknowledging and crediting a network of original sources.

54. In order to translate the principles of the framework described above into tangible outcomes, a working group has been established to develop a strategy on ocean data and information stewardship for the Decade (IWG-SODIS)[12]. This working group is also working with relevant UN entities to explore a joint data and information system under the Decade, and investigating the future scope of scientific data and information stewardship activities of the Decade. Following the completion of these tasks, it is envisaged that a group of subject matter experts will be established to continue providing advice and expertise on scientific data stewardship throughout Decade implementation.

55. Throughout the Decade, Calls for Action for new digital products focusing on the transfer, sharing and use of knowledge will be launched. These products will be developed and deployed as part of the data, information, and digital knowledge management framework by generators and users of knowledge. They will be based around principles of dynamic matchmaking that aim to match supply of and demand for information and knowledge in relation to priority issues. These

[12] https://www.iode.org/index.php?option=com_content&view=article&id=598&Itemid=100017

mechanisms will work at all levels of technical readiness, including technologies adapted to the needs of LDCs, SIDS and LLDSs.

56. All data, information and knowledge management related initiatives will be closely linked to capacity development and transfer of marine technology initiatives that are outlined in the following section. This will ensure that all stakeholders have the skills and access technology needed to generate, interpret and use data, information and knowledge.

2.5 CAPACITY DEVELOPMENT

This section describes the principles, expected outcomes and priority activities for capacity development initiatives undertaken during the Decade.

2.5.1 Capacity Development Framework for the Decade

57. Human capacity to carry out ocean science is unequally distributed across the world, across generations, and across genders. The 2017 *Global Ocean Science Report* (GOSR) highlights the predominance of ocean scientists in developed countries when compared to many SIDS and LDCs. It also reveals a generational bias in many countries towards domination of ocean science by older generations, although many LDCs have a relatively young ocean researcher community. Female scientists comprise on average 38% of the researchers in ocean science, with significant variations across disciplines, levels of seniority, and between countries.

58. Capacity development is an essential tenet of the Decade. It has the ultimate aim of achieving evenly distributed capacity across the globe, across generations, and across genders and thus reversing asymmetry in knowledge, skills and access to technology. The combined impact of capacity development efforts under the Decade must be exponentially greater than the sum of past and current individual efforts to enable and scale up action in all sectors of society and thus accelerate a fundamental shift in the way the ocean is perceived and managed. This increase will result both from an increased volume of efforts, but also from enhanced coordination and focus of efforts.

59. Importantly, capacity development efforts must focus not only on capacity to do the science, but also on capacity to influence the design of the science, to understand the science, and to use the science to develop solutions for sustainable development. In this sense, the targets of capacity development as part of the Decade include not only scientists, but also the users of knowledge such as governments, policy-makers, managers or innovators.

60. As all parts of the ocean are interconnected, the improved scientific knowledge and capacity to understand, observe and manage the ocean needs to be available equitably to all countries. The challenges and potential barriers to effective capacity development include fragmentation and a lack of coordination of efforts, and insufficient investments by donors or lack of interest by governments. The vast scale of ocean science can exacerbate these challenges.

61. To meet the challenge presented by the Decade, capacity development carried out as part of the Decade needs to:

- Be an integral part of each Decade Action. In this sense, the endorsement criteria of actions under the Decade include a consideration of contributions toward capacity development, including in SIDS, LDCs and LLDSs.

- Be needs driven with investment in tools that can match the demand for capacity development to different opportunities.
- Be developed to respond to regional and national priorities and respect cultural and geographical diversity, for example in terms of language, technology adopted, and methods of learning.
- Privilege long-term partnerships that build on existing resources and networks, and avoid ad-hoc, short-term efforts that are not part of a coordinated approach.
- Include a focus on mechanisms to accelerate the use of knowledge for societal wellbeing.
- Target both scientists and users of science including managers (for example protected area managers or fisheries managers), policy makers, decision makers or innovators.
- Address all facets of ocean science, i.e. all relevant natural and social science disciplines including a focus on interdisciplinary approaches, the infrastructure and technology that supports ocean science, the application of science for societal benefit, and the science-policy and science-innovation interfaces.
- Recognise and engage local and indigenous knowledge holders as both beneficiaries and providers of capacity development.
- Build on and strengthen existing national and regional networks and resources.
- Identify and overcome barriers to gender, geographical, and generational balance.

62. The strategic framework to guide capacity development efforts throughout the Decade is documented in Table 2.1 and reflects the key elements of a wide range of approaches across the UN system.

Outcome	Priority Activities
1. Human resources developed at individual and institutional levels	• Academic and higher education opportunities including through online and distance learning • Continuous professional development • Sharing of knowledge and expertise / community building • Training, including training of trainers • Integration of ocean science in curricula in primary and secondary schools including information on ocean science careers • Actively improving gender, generational and geographic diversity
2. Access to technology and physical infrastructure established or improved	• Facilitating access to technology and infrastructure (e.g. research facilities, instruments, research vessels, high power computing, digital telecommunications) • Developing skills to lead and participate in technology and infrastructure development
3. Global, regional, and sub-regional mechanisms strengthened	• Identifying specific national and regional capacity development needs

Outcome	Priority Activities
	• Strengthening existing national and regional resources and networks for capacity development • Supporting regional and sub-regional organisations to be leaders in, and amplifiers of, capacity development
4. Development of ocean research policies in support of sustainable development promoted	• Supporting identification of ocean research priorities • Supporting development of national marine science management procedures and national policies
5. Awareness and understanding increased, and exchanges facilitated on role and values of ocean	● Ocean literacy (refer below for more detail) ● Public information and communication (refer Section 2.6 for more detail)
6. Sustained, long-term resource mobilisation reinforced	● Mobilising in-kind and financial support for capacity development initiatives as part of the Decade (refer Section 3.2 for more detail)

Table 2.1. Strategic framework for capacity development initiatives during the Decade

63. As specific capacity development initiatives are defined for the Decade, reference will also be made to the strategies and frameworks of other competent international organisations.

64. Decade capacity development efforts will focus on, but will not be limited to LDCs, SIDS and LLDSs. Specific approaches for these beneficiaries will be required including the use of low-bandwidth / low-technology tools in areas where access to digital telecommunications is limited. The resource needs for SIDS, LDCs and LLDSs to participate in capacity development efforts will need to be addressed as part of resource mobilisation efforts.

65. Partnership and cooperation will be essential pillars of all capacity development during the Decade. Collaboration between United Nations entities, research organizations, NGOs, private sector, national development cooperation agencies and others, that leverage partner capabilities, expertise, platforms, data, best practice methods, or joint funding opportunities, will lead to optimal efficiencies, effectiveness and impact of capacity development initiatives.

66. Advances in capacity throughout the Decade will be measured so that the impact of the Decade can be tracked, and broad trends including gaps in action can be identified and rectified. In addition to collection of data from individual Decade Actions (refer Section 3.3), the GOSR will provide a tool to measure global trends in ocean science capacity. The second edition of the GOSR, the GOSR 2020 will provide the baseline information against which to assess progress in the development of capacity in the area of ocean science over the course of the UN Decade.

2.5.2 Ocean Literacy

67. Ocean Literacy contributes to capacity development and is defined as the understanding of human influence on the ocean and the ocean's influence on people. Ocean Literacy initiatives

aim to increase awareness on the state of the ocean, provide tools for exchange of knowledge and perspectives on the values of the ocean, and provide approaches that can transform ocean knowledge into actions to promote ocean sustainability. Ocean Literacy as a concept and approach is radically evolving from being a tool applied in formal education and training contexts, to a tool and an approach for society as a whole. A broad range of stakeholders can lead and benefit from Ocean Literacy.

68. The vision for Ocean Literacy during the Decade will be to enable and scale up action in all sectors of society regarding ocean sustainability in order to accelerate a fundamental shift in the way our ocean is valued, understood, and managed. Throughout the Decade, Ocean Literacy will play a key role in promoting sound public marine policy, fostering more responsible citizenry, encouraging more ocean aware corporate practices, and stimulating young people to start a career in the sustainable ocean economy, in ocean science, marine policy, or ocean conservation and management.

69. During the Decade, Ocean Literacy activities will focus on four priority areas: mainstreaming Ocean Literacy in policy formulation; formal education; corporate action; and community engagement. A range of priority Ocean Literacy initiatives have been identified for the Decade that are relevant at the global, national and sub-national levels, and it is expected that these will be transformed into endorsed Decade Actions by stakeholders around the world. Ocean Literacy efforts during the Decade will also support governments and other stakeholders to develop the skills and tools needed to effectively implement activities that are the most relevant in their particular context. This will include the development of National Ocean Literacy Strategies; developing collaborations, partnerships and networks; showcasing and endorsing Ocean Literacy efforts; and increasing research, monitoring and evaluation of the impacts of Ocean Literacy.

2.6 HOW TO ENGAGE IN THE DECADE

This section provides information on the different engagement structures and mechanisms for the Decade.

70. The Decade is everyone's Decade and inclusivity across geographies, generations, genders and disciplines will be essential. The Decade will be implemented for and by a diverse range of ocean stakeholders, whose active and sustained engagement will determine its success. Engagement in the Decade will take many forms that will evolve as the Decade rolls out. The overall goals of engagement include catalysing: (i) co-design and co-delivery of ocean science; (ii) sharing of knowledge in formats that will be proactively adopted and used, for example in policy, decision-making or innovation for sustainable development; and (iii) innovative multi-actor, multi- and interdisciplinary partnerships.

71. Key stakeholder groups of the Decade are described below and others will be identified during implementation. The boundaries between these groups are fluid; for example, an individual could be a private sector scientist, who is a holder of local and indigenous knowledge. This fluidity emphasises the need for a flexible and broad approach to engagement with multiple entry points for multiple interests.

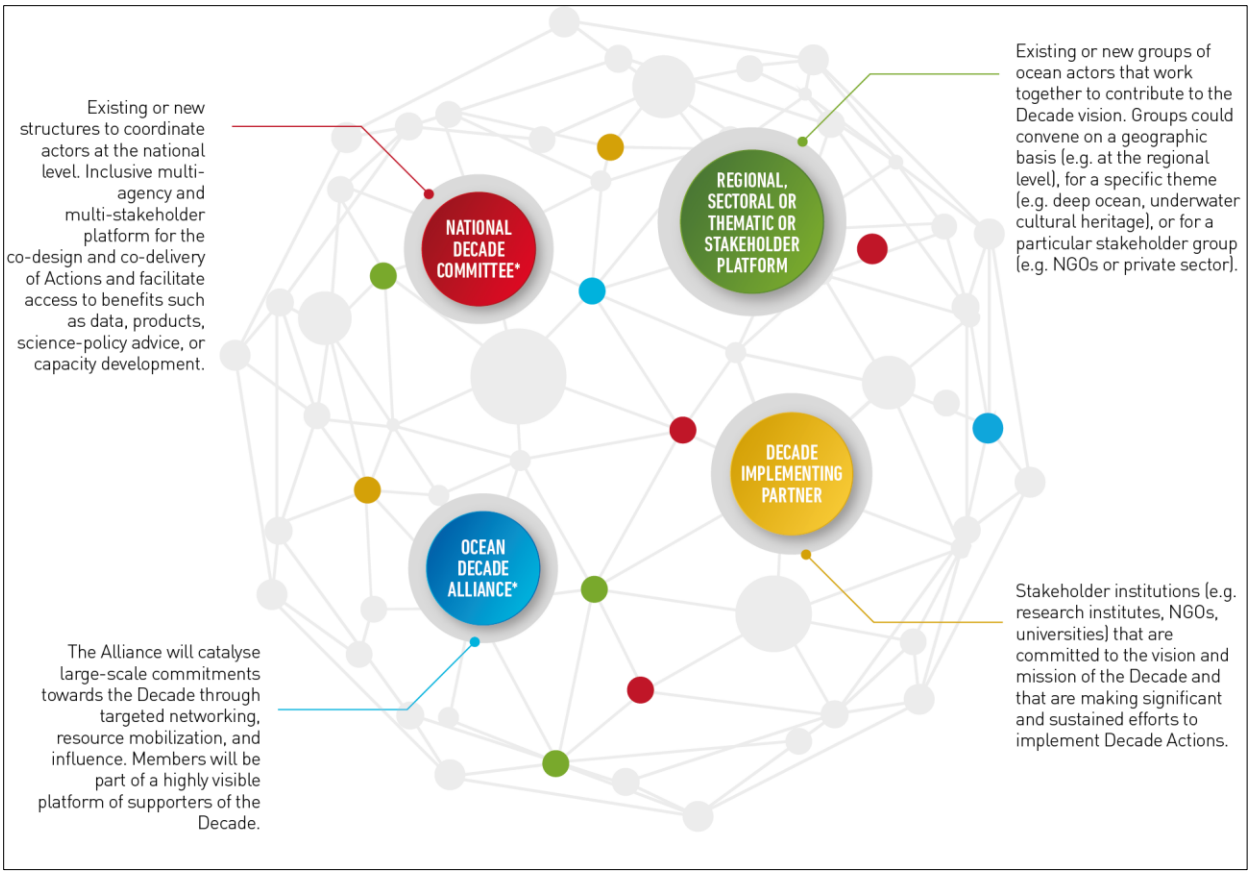
- Scientists, research institutions and universities will benefit from opportunities provided by the Decade for increased collaboration with a diverse range of partners for inter- and trans-disciplinary co-design and co-delivery of ocean science, increased recognition of the contribution of ocean science to sustainable development, and access to resources to support their work.

- Local and indigenous knowledge holders will make a particularly important contribution to the Decade by providing access to information that complements scientific knowledge. They can benefit from increased access to partnerships with scientists in areas of common interest. Tailored engagement strategies will be developed for this group in the early stages of Decade implementation to take account of regional and local cultural contexts, and to identify support needs to ensure active and meaningful engagement.
- Early Career Ocean Professionals (ECOPs) are a significant focus of the Decade. ECOPs can make crucial contributions to the Decade by actively participating in Decade Actions and governance and coordination structures, acting as Decade ambassadors, and continuing the Decade's legacy post-2030. They will benefit from professional development and networking opportunities catalysed through the Decade, and opportunities to join and lead scientific collaborations and partnerships.
- UN entities and intergovernmental organisations (IGOs) are essential actors at numerous points throughout the ocean science value-chain from co-design to co-delivery, to use of generated knowledge, and the provision of resources. Engagement in the Decade will support these partners to fill their respective mandates. Major contributions in the form of Decade Actions and provision of resources are expected and will be welcomed from UN entities and IGOs throughout the Decade.
- National governments will continue to be essential funders of ocean science—both as Member States of UN entities and via national science funding agencies, and will benefit from the Decade through increased interaction with ocean scientists, innovators and other actors in the co-design and co-delivery of science, services and technology relevant to policy, management and decision-making.
- Sub-national governments are at the interface between local communities and policy development, management and decision-making related to sustainable development. This group is an essential part of the user community that will contribute to and benefit from increased interaction with scientists to co-design and co-deliver relevant knowledge and services.
- Local coastal communities are an essential stakeholder of the Decade. They hold essential ocean knowledge, are most vulnerable to changing conditions, and will be the beneficiaries of the Decade outcomes. Their engagement is key at all stages of Decade actions.
- Business and private sector stakeholders, including emerging maritime industries and ocean information service providers, are primary commercial users of the ocean and can contribute significantly to the Decade in terms of resources and partnerships, and as a driver of technological innovation to enhance ocean science. Benefits to the private sector include enhanced scientific knowledge that can contribute to reducing business risks and creating opportunities for sustainable economic development.
- Technology and innovation hubs**,** including those in emerging and developing countries, regroup businesses and individuals that can identify, develop, pilot and test new and emerging technologies to improve the way in which ocean science is done, and the way in which it is used to contribute to sustainable development. These hubs are often more nimble and less risk adverse than more traditional business and industry stakeholders, and have a key role to play in advocating for and co-designing and co-delivering audacious ocean science.
- Professional societies are an excellent mechanism to engage and reach large numbers of individuals with a potential interest in the Decade including the scientific community or business and industry.

- Philanthropic foundations and science funding agencies will play a role in the Decade through provision of resources, as well as outreach, advocacy and development of an enabling environment to catalyse broad support for Decade priorities. The Decade will provide these organisations with a common set of priorities to assist resource allocation decisions, and increased opportunities for engagement with a broad range of ocean actors.
- NGOs and civil society are a diverse group that can play a multitude of roles in the Decade ranging from generation of science, to advocacy with governments and policy makers, and education and outreach with local communities. Benefits to NGOs and civil society from engagement in the Decade are also wide and varied ranging from increased access to resources and innovative partnerships, and improved access to data and knowledge.
- Aquarium, zoo, and museum operators are ideal platforms for communicating the importance of the ocean and its role in sustainable development to the millions of visitors that they receive each year. The Decade will work with this group to develop innovative and targeted communications campaigns as part of outreach and ocean literacy activities.
- Children, youth, school students and educators are an essential target group for the Decade, which aims to increase the attractiveness of ocean related careers for the next generation. Youth are the next generation of ocean scientists and decision makers, and increasingly play a role in influencing public opinion on issues of global concern. Ocean literacy initiatives will be a key mechanism to target this group.
- The general public—including poor and marginalised communities—will be targeted through the communications and ocean literacy activities that are adapted to cultural, linguistic and geographical contexts, including access to technology. The general public will contribute to the Decade potentially via crowdfunding and community led science initiatives. Communities worldwide will benefit from improved management of coastal resources and a healthier ocean.

72. Targeted engagement strategies will be developed for key stakeholder groups to guide specific initiatives throughout the Decade.

73. In recognition of the diversity of stakeholders and the wide range of potential types of engagement, the Decade does not promote a prescriptive, top-down framework for stakeholder engagement. Rather, the Decade will promote a stakeholder ecosystem that builds on existing stakeholder groups and platforms, and that will develop and evolve organically over the next ten years and beyond. To provide a broad outline for this ecosystem, different types of voluntary stakeholder engagement networks have been identified as illustrated in Figure 2.3.



**Refer Sections 3.1 and 3.2 respectively for further discussion of the National Coordination Committees and the Ocean Decade Alliance.*

Figure 2.3: Decade voluntary stakeholder engagement networks

74. These voluntary stakeholder networks will be self-organised and self-coordinating and will determine their own processes for membership and participation. They can be global in nature, or focused on a specific region, country or local community. The Decade Coordination Unit will provide high-level guidance on the roles and membership of the stakeholder networks, including diversity considerations. The Decade Coordination Unit will also play a connection service between networks with fewer resources and capacity, and partners who may be able to provide resources, mentorship, or in-kind support.

75. While benefits related to collaboration and partnerships will result from participation in stakeholder networks, individuals or institutions do not need to be a member of a voluntary network to propose an Action for endorsement under the Decade or to contribute resources to the Decade. Similarly, participation in one or more of these networks does not avoid the need to follow the endorsement processes for a proposed Action under the Decade.

76. There is no limit to the number of ways that an individual or an institution can participate in the different stakeholder networks. For example, an individual scientist may be part of an ECOP stakeholder platform, a collaborator in a Decade Action, and a member of a National Coordination Committee. Stakeholder networks will be self-funded and can register to become recognised Decade partners via a simple online interface. Once recognised they will be able to use the Decade logo in communications and awareness raising materials. All recognised networks will

provide simple annual reports on their activities and achievements for inclusion in Decade annual reporting.

77. A **Global Stakeholder Forum** will provide a convening mechanism for all stakeholder engagement networks. This Forum will have both virtual and physical elements. The Forum will include an online interactive platform for all Decade Implementing Partners, Stakeholder Platforms, National Decade Committees, Alliance members and proponents of Decade Actions. It will allow members to post collaboration ideas and opportunities, invite membership or participation according to their defined processes, hold virtual meetings or webinars to share knowledge and collaborate, and use visibility and communications tools to raise awareness regarding their activities.

78. The virtual platform of the Forum will also act as an interface between stakeholders, the Decade Coordination Unit and the Decade Board. Based on the results of biennial scientific prioritisation exercises and in advance of Calls for Action, the Decade Coordination Unit and decentralised coordination structures will use the Forum to stimulate discussion, generate ideas, and virtually convene interested parties for co-design and collaboration around priority scientific issues. They will actively work to connect stakeholders that are looking for collaboration opportunities, and will share examples of successful co-design and co-delivery activities to inspire action in others. Throughout the implementation phase, they will use the Forum to develop and communicate specific initiatives to support co-design and collaboration initiatives including technical working groups, co-design workshops, or training initiatives for co-design approaches. Members of the Global Stakeholder Forum will be able to engage with the Decade Board via the virtual platform, for example in response to requests for inputs to Decade review processes, or calls for nominations for experts in working groups or sub-committees.

79. Members of the Global Stakeholder Forum will meet through a virtual and in-person **Decade global and regional conference series** that will be organised to convene stakeholders, share information on progress towards the Decade vision, and catalyse new initiatives and partnerships. Sessions within the conferences will be dedicated to the development of co-design collaborations, training on co-design approaches, and the showcasing of successful past initiatives. Starting in 2021, international in-person conferences will take place at least every three years, typically in conjunction with other major events within the ocean community. Regional in-person events will also commence in 2021 and will subsequently be organised as the opportunity arises in conjunction with major regional meetings. Regional and international virtual conferences and events will be organised more regularly throughout the Decade as one-off events or as part of other meetings. Governments, regional organisations, universities and other actors will be asked to express interest in hosting these in-person and virtual conferences with the aim of ensuring diversity in the location of the events throughout the Decade. Decade decentralised coordination structures will also play a key role in supporting the convening of these meetings.

2.6.1 Communicating the Decade

80. Communication of the Decade and its achievements will be key to engaging stakeholders, catalysing actions and mobilising resources. The Decade Coordination Unit will coordinate communication activities, and will encourage Decade stakeholders at all levels and in all locations to become advocates of the Decade who will, in turn inspire action for the Decade. A detailed Decade communications strategy will provide a framework for this communication and will itself evolve throughout the Decade. Communications will aim to enhance global understanding of the importance of a healthy global ocean to underpin a healthy society and a sustainable global economy, and to provide mechanisms to communicate and exchange on the importance of the

ecological, physical, social, economic and cultural characteristics of the ocean. This will in turn generate excitement around the global ocean as an adventurous and largely unexplored frontier. The strategy will establish principles and messaging that are tailored to the local and regional contexts of different stakeholders, including cultural, technological and linguistic specificities. Finally, the communications strategy will provide information on what the Decade will achieve; why they should get involved; and how they can provide their support. The strategy will use the following key messages in its outreach to stakeholders:

- The ocean is a place of wonder and one of the last unexplored frontiers on the planet.
- The ocean harbours resources that are essential to human livelihoods and economies, but they need to be used sustainably.
- Humans need a healthy ocean, but the ocean is in trouble.
- The ocean is a key ally in the fight against climate change and is vital to the production of food and to human health.
- The safety of coastal communities and ocean users can be substantially improved by improved prediction, forecasting and warning of ocean hazards.
- Our understanding of the ocean and its contribution to sustainability depends on our capacity to conduct and use effective, global ocean science to make real, transformative change.
- In order to achieve SDG 14 and many other SDGs we need greater ambition, stronger partnerships and more investment in innovative, science-based solutions.
- The Decade provides a once-in-a-lifetime opportunity to transform the way we use global ocean science to generate solutions to the most critical problems facing the planet.
- The success of the Decade will depend on political leadership, public support, and collective action at a global level.

81. The Decade communications strategy will invite all stakeholders to become part of **"Generation Ocean"** (or **"GenO"**) to deliver the Decade vision. The GenO brand will provide a clear call to action for everyone who wants to become part of the Decade's efforts to understand the ocean and to take the actions needed to protect it for present and future generations. The vision is that “Generation Ocean” will convene all living and future generations to build a new kind of society by 2030, one in which all of humanity will use the best available science and knowledge to deliver the ocean we need for the future we want. The inclusive nature of the brand will be highlighted as it is developed across digital and print media, and takes the shape of a full communications campaign with key messages and means of communication that are tailored to different regions and countries to ensure that no one is left behind in the dissemination of the messages.

82. The campaign will feature testimonials of citizens of all ages and walks of live about how they interact with the ocean. It will spotlight local and regional champions for the Decade—including local celebrities or civil society leaders—who can translate the global messages of the Decade to the local and regional context and thus inspire action amongst communities around the world.

PART 3

IMPLEMENTATION OF THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT

Part 3 describes the implementation of the Decade. It presents the governance and coordination framework of the Decade, the mechanisms for financing of Decade Actions and coordination costs, and the framework to measure progress and adaptively manage the Decade.

3.1 GOVERNANCE AND COORDINATION FRAMEWORK

This section describes: (i) the intergovernmental process required to guide and report on the progress of the Decade implementation; (ii) the mechanism to provide high-level, strategic oversight of the Decade; and (iii) the role and functions of various implementing and coordinating entities.

83. Achieving the ambition of the Decade and delivering transformative ocean science through a high-level strategic framework requires coordination at multiple scales and a lean decision-making process. Decade actions contributing to the Decade's vision will be undertaken by national, subnational and local governments and a wide range of stakeholders including research institutes, UN entities, intergovernmental organisations, business and industry, philanthropic and corporate foundations, NGOs, educators, community groups, or individuals. Therefore, governance and coordination arrangements for the Decade need to be flexible, agile, facilitate collaboration across groups of actors, and optimise the use of existing structures wherever possible.

84. The purpose of the Decade governance and coordination framework is to:

- Provide an enabling environment for the Decade's implementation through enhanced dialogue, partnership, and financing.
- Empower others to engage, plan, and implement Decade actions through a robust and coordinated science-based framework, in a spirit of co-design and co-delivery.
- Coordinate and promote the Decade globally and in all regions, leaving no one behind.
- Facilitate sharing of knowledge, tools and lessons learned.
- Report on the progress of the Decade, including regional and national commitments under one common global umbrella, thereby underscoring its contribution to the SDGs.

85. To respond to this complexity, the Decade governance and coordination framework is built on a set of centralised and decentralised structures that are described in the following sections.

3.1.1 Governance Framework

UN General Assembly & IOC/UNESCO Governing Bodies

86. The Decade is a UN-wide initiative endorsed by the UN General Assembly (UNGA). The 2017 UNGA Resolution (A/RES/72/73) invites *inter alia* the Secretary-General to inform the UNGA on the implementation of the Decade, based on information to be provided by the IOC. The governance framework for the Decade takes into consideration the relevant provisions of

UNCLOS which sets out the rights, obligations and responsibilities of various States and competent international organisations with respect to marine scientific research.

87. The governing bodies of the IOC will provide intergovernmental oversight of the Decade and consider regular reports prior to their review by the UNGA. The Decade Board, which is described below, is an advisory body that will report to the governing bodies via existing processes, i.e. the regular meetings of the IOC Assembly and Executive Council. The IOC governing bodies will report to UNESCO and the UNGA via existing processes.

Decade Board

88. The Board of the Decade will be responsible for the high-level, strategic oversight of the Decade throughout the implementation phase. It will lead the process to set the strategic agenda, provide recommendations on the endorsement of programmes and Decade Collaborative Centres, and review the consolidated performance of Decade Actions. Board members will also contribute to the assessment of resource requirements for Decade Actions and raise awareness about the Decade, including with potential resource providers.

89. The Board will comprise up to 20 members including representatives of UN entities and a balance of experts from relevant scientific disciplines, as well as from stakeholders from socio-economic and policy sectors. Open calls for nominations will be used to identify candidates for the Board. Expertise, geographic, generational, and gender balance will be taken into account in the selection of members. Membership will be on a rotational basis with members to serve two-year terms that are renewable for a second mandate, with processes—to ensure staggered turnover of Board members. The Chair of the IOC will chair the Board. The Board will establish task groups and/or invite external experts as needed to address specific issues or tasks.

Engagement and coordination across the UN System

90. UN-Oceans, the UN system wide inter-agency coordination mechanism focusing on ocean and coastal issues[13], and its members are invited by the UNGA resolution 74/19 to collaborate with IOC on the Decade. New forms of cooperation and, potentially, stronger formal links between the Decade Coordination Unit and UN organizations will be explored based on the understanding that ocean science represents a cross-cutting theme that underpins the mandates of several UN entities. Collaboration across UN entities will be promoted through the dedicated UN-Oceans Decade contact group established in 2019 (i.e. during the 19th Meeting of UN-Oceans). Several bilateral cooperation agreements that exist amongst entities focusing on science-policy aspects, technical, scientific and capacity development cooperation will be leveraged. Regional implementation will also be an important focus of the coordination amongst UN structures and programmes. The Decade coordination structures described below will proactively seek partnerships and synergies with UN and non-UN regional intergovernmental organizations, to guide the development of regionally driven science-based applications.

91. To facilitate the required level of engagement, United Nations Legal Counsel / DOALOS (as the focal point of UN-Oceans) will be represented on the Decade Board. Four other seats on the Decade Board will be reserved for UN entities based on their contribution to the Decade. UN entities will be invited to report their respective contributions to the Decade through the annual UN

[13] www.unoceans.org

Secretary-General's report on the ocean, as well as the anticipated biennial 'State of the Decade' report (refer Section 3.3).

92. Figure 3.1 illustrates the elements of the governance and coordination framework for the implementation phase of the Decade.

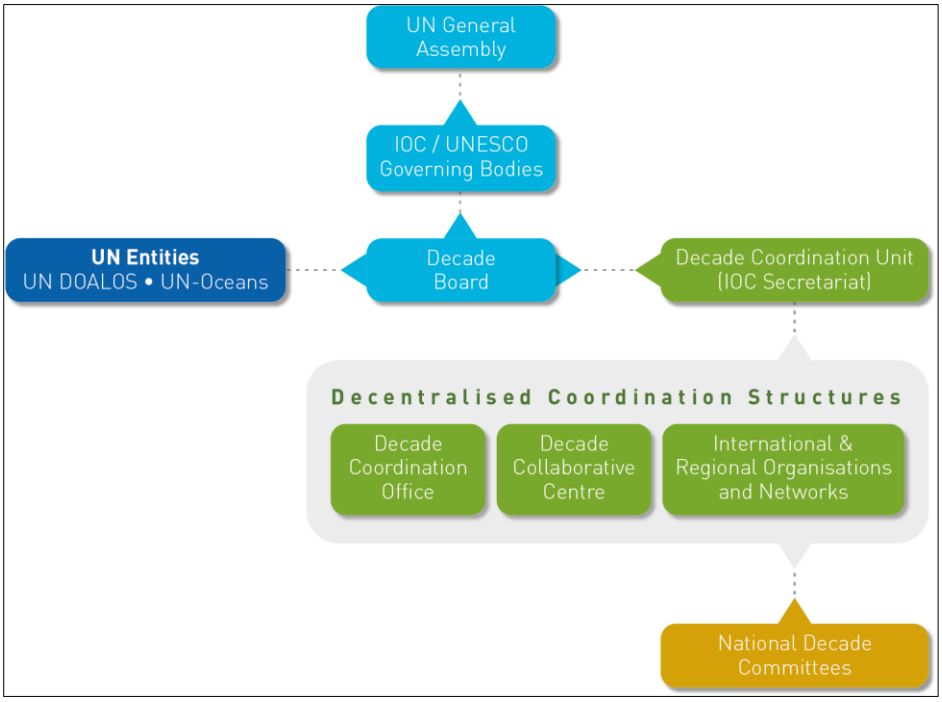


Figure 3.1: Governance and coordination framework for the Decade

3.1.2 Coordination Framework

Decade Coordination Unit

93. The Decade Coordination Unit will be located within the IOC Secretariat in UNESCO Headquarters. Its three main functions are to act as the: (i) primary coordination office for the implementation of Decade Actions; (ii) Secretariat for the Decade Board; and (iii) Secretariat for the Ocean Decade Alliance. The Coordination Unit will work in close collaboration with the Secretariats of other UN entities and may include seconded staff from UN entities and programmes to ensure a well-coordinated inter-agency approach. In addition, a more decentralized approach may be explored by appointing personnel within UN entity Secretariats to support the coordinating functions of the Decade.

94. The Unit will develop biennial action plans and resource needs assessments to inform Calls for Action and facilitate connections between resource providers and proponents of Actions; coordinate and consolidate information from the decentralised structures to facilitate monitoring and reporting; coordinate communications and outreach including targeted engagement with funding and resource providers; endorse Decade projects, activities and contributions; and provide Secretariat support to the Board and the Ocean Decade Alliance (refer Section 3.2). In terms of the Alliance, the Decade Coordination Unit will perform the following tasks:

- Promote the development of the Alliance membership by proactively seeking engagement of high-level supporters.
- Facilitate the process of membership of the Alliance in accordance with the eligibility criteria, and when relevant, conduct due diligence process for membership of companies and private entities in line with UNESCO/UN rules.
- Identify and communicate resource needs for priority areas of the Decade and assisting in linking needs to potential resource providers.
- Keep track of financial commitments provided by Alliance members, through the annual Decade reporting process.
- Facilitate the convening of Alliance events and related outreach/communication activities.

95. The Decade Coordination Unit will also facilitate liaison between the Decade stakeholder engagement structures and the Decade Board via the Global Stakeholder Forum as discussed in Section 2.6.

96. The Decade Coordination Unit will work with UN entities, programmes and conventions to ensure high visibility and representation of the Decade in UN conferences, events and forums, such as the Regular Process for Global Reporting and Assessment of the State of the Marine Environment including Socioeconomic Aspects. The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) may be activated at the request of UN entities to address relevant priorities identified during the Decade.

Decentralised Coordination Structures

97. The governance framework includes different types of decentralised coordination structures at the programmatic or regional level as described below.

98. ***Decade Coordination Offices*** may be hosted by UN Member States and will require the establishment of a Seat Agreement with the host Member State and the provision of financial resources by the host Member State through IOC/UNESCO or other UN frameworks[14]. These Offices will act as 'decentralised' Decade Coordination Units, being organically attached to the central Decade Coordinating Unit (i.e. tasked by and reporting to the central Unit), and will be responsible for a regional portfolio of Decade Actions and/or specific thematic initiatives (e.g. observations, Ocean Literacy, ocean mapping, capacity development etc.). Decade Coordination Offices may also be located in existing UN Offices. The main functions of Decade Coordination Offices include, but are not limited to:

(i) Coordinate, monitor and report on specific Decade programmes or regional portfolios of actions.

(ii) Review requests for endorsement of Decade projects, activities and contributions falling under their mandate and provide recommendations to the Decade Coordination Unit.

[14] Individual UN Bodies and Conventions have their own procedures to establish decentralised structures that will need to be adhered to.

(iii) Organize and participate in Decade implementation review meetings and other relevant meetings and discussions linked to the Decade implementation.

(iv) Promote cooperation with relevant IOC programmes, related projects, other relevant UN entities and stakeholder groups in order to advance the implementation of the Decade.

(v) Raise awareness and visibility of the Decade amongst diverse stakeholder groups.

(vi) Seek partnerships and potential voluntary commitments to strengthen implementation and impact of the Decade.

99. Initial guidance for the establishment of IOC/UNESCO-based Decade Coordination Offices is provided through IOC Circular Letter 2785 of 2019.

100. ***Decade Collaborative Centres*** will be hosted by one or more countries or an international organization engaged in Decade activities but will not require the establishment of a dedicated IOC/UNESCO office. These Centres will be legally separate from the IOC and operated under the complete responsibility of the establishing entity(ies). They will catalyse Decade Actions at the regional or thematic level by providing technical, logistical, and financial support for: (i) scientific coordination and planning; (ii) the identification of collaboration opportunities; (iii) awareness raising and stakeholder engagement; and (iv) technical and scientific capacities to support Decade Actions.

101. These Centres will also assist the Decade Coordination Unit and Offices to track the implementation of endorsed Decade Actions in their respective domain, thus contributing to the overall monitoring and evaluation effort. Collaborative Centres may transmit and recommend to the Decade Coordination Offices/Unit, the endorsement of potential Decade Actions. Proposals for the establishment of Decade Collaborative Centres will need to be reviewed by the Decade Board based on a proposal demonstrating international expertise and capacities. Once approved, the Decade Coordination Unit will establish a partnership agreement with the hosting institution to frame the collaboration. More detailed operational guidelines will be developed for Decade Collaborative Centres prior to the start of the Decade.

102. ***International and regional organizations and networks*** with a focus on marine research, ocean management, or scientific cooperation will also be leveraged to facilitate the coordination of the Decade, particularly in areas not well covered by the other elements of the Decade coordination framework. Several of these organisations were engaged actively during the planning phase, acting as Decade 'conveners' for planning workshops in specific ocean basins or for specific themes; engaging stakeholders; and identifying regional and thematic science and capacity development priorities. The role of these organisations as active promoters of the Decade and conveners of stakeholders at the regional level will be enhanced, for example through recognition as Decade Collaborative Centres. Specific partnership agreements will be formalised with the Decade Coordination Unit on a case-by-case basis.

National Decade Committees

103. Given the scope and breadth of the Decade, national coordination of Decade activities will in many cases be essential. The creation of National Decade Committees will be encouraged to facilitate national contributions to the Decade, engage national stakeholders, and enhance their access to Decade benefits such as data, forecasts, science-based decision support tools, or

capacity development opportunities. Ideally, these National Decade Committees should be multi-agency and multi-stakeholder platforms, involving the political and scientific institutions and actors concerned by the ocean and its management. Existing or to-be-established IOC national coordinating mechanisms may provide the basis for performing such functions. The role of National Decade Committees could include:

- Act as an information conduit from the Decade structure to the national science and sustainable development community to promote awareness and interests.
- Provide national inputs for the formulation of Decade Actions including the facilitation of co-design initiatives across groups of stakeholders and/or nations.
- Facilitate the planning and implementation of national priorities and activities.
- Ensure that outputs of activities implemented under the Decade are available to the community.
- Take a lead role on issues of outreach, education and communication at a national level.
- Encourage and facilitate the provision of necessary national funds and logistical support for the implementation of activities contributing to the Decade.
- Encourage voluntary national contributions to the costs of international coordination.
- Assist the Decade coordination structures in planning, implementation and delivery of activities at the national level.
- Facilitate hosting of regional or international meetings related to the Decade.

3.2 RESOURCE MOBILISATION

This section describes the different financing mechanisms that exist for the Decade for coordination and Action costs.

3.2.1 How will Decade Actions be resourced?

104. Currently, resources for ocean science come from several main sources. National governments are key sources of financing for ocean science; however, on average only 1% of national research budgets support ocean science[15]. Philanthropic and corporate foundations are also important sources of financing for ocean science and can play complementary roles in awareness raising, education. Finally, business and industry are key players particularly in terms of in-kind resource provision or investment in research and innovation, although complexities can exist, for example in relation to data sharing, given the commercial mandate of these partners.

105. If the ambitions of the Decade are to be realised, funding for ocean science from existing donors—including those mentioned above, will need to increase significantly. In addition, new sources of funding or support will need to be nurtured including emerging financing models such as blue bonds or ocean business impact investments, public-private partnerships, multilateral or bilateral development banks, and innovative in-kind contributions. There will also need to be increased engagement with funding and resource providers who may not directly support ocean science but who support initiatives or activities inextricably linked to, or reliant upon, ocean science. This includes funders who traditionally focus on social sciences, or who are more strongly focused on supporting users in the ocean science value-chain. Successful engagement of this

[15] Data for the period 2013—2017 taken from GOSR 2020 in preparation.

latter group will require exchange and dialogue on the broad nature of ocean science and the foundational role that ocean science plays in many other sectors and domains of activity.

106. A wide range of existing and new partners will fund Decade Actions and the resource base for the Decade will need to be broad and flexible. No single agency or actor will manage all Decade resources. The Decade itself is not a funding mechanism and the Decade is not structured to collect contributions from partners that would be amassed in a common pool of financial resources. The Decade's approach will be to continue existing engagement efforts to encourage partners to align their funding and support strategies with identified Decade priorities.

107. To mobilise resources at a level that meets its ambition, the Decade needs to present a clear and robust value proposition to attract funding and resource partners and generate excitement to become part of the ocean science revolution throughout the Decade and beyond. The value proposition for funding and resource providers is that they will be part of a global, highly visible and long-term collective effort that will allow them to create greater impact than if they were working alone. It will allow them to collaborate and establish new partnerships both with fellow funders and resource providers, and with new recipients of funding and resources. The Decade allows them to join this common effort while maintaining a focus on their own geographical or thematic priorities, and continuing to adopt their own processes and procedures for the identification and administration of their support.

108. The value proposition for proponents of Decade Actions in terms of funding and resource provision is structured around three elements. Firstly, in many cases, proponents of Decade Actions will take the lead in securing their own resources: in these cases, the endorsement of an initiative as a Decade Actions will increase its attractiveness to funders and resource providers that are supportive of the Decade. Secondly there will be funding and support opportunities that are exclusively available to Decade Actions and for which the Decade Coordination Unit will play a coordination role between priority needs and the commitments of funding and resource partners via the Ocean Decade Alliance and the Global Stakeholder Forum. Finally, through planned engagement efforts and outreach to funders and resource providers, the Decade aims to raise awareness and understanding of the need for an increased volume of funding for ocean science globally as well as changes in the structure of that funding, including the need for longer-term funding.

109. Both financial support and in-kind support will be mobilised for the Decade. Support will be required for the implementation of programmes, projects and activities under the decade ("**Action costs**"). The volume of Action costs mobilised through the Decade will only be limited by the scope and ambition of the Decade itself.

110. Support will also be needed for recurrent, operational activities including the functioning of the Decade Coordination Unit, the costs of regular meetings and review processes, and other related operational costs ("**coordination costs**"). Ensuring adequate resources for coordination costs will be essential to the success of the Decade. Specific resource mobilisation efforts will target partners with a predisposition to provide this type of support. The volume of resourcing needed for coordination costs will be disproportionately skewed to the start-up phase. Post-start up, the coordination costs should be relatively predictable thus allowing medium- to long-term resource mobilization planning. Resources will be mobilized to support the coordination and administration functions of the Decade Coordination Unit: this cost will be in the order of US$1.5-2 million per year. The coordination costs associated with decentralised coordination structures will depend on the type of structure (i.e. coordination office or collaborative centre), the role and location, and whether it is an existing or new structure.

111. Biennial resource needs assessments will be prepared by the Decade Coordination Unit and will include information on coordination and Action costs. Information on secured resources and resource gaps will be used to match needs with available resources.

112. The focus of resource mobilisation will be on catalysing new and additional resources and support for ocean science. To track this effort, all support—financial or in-kind, will be tracked using common metrics regardless of mobilisation mechanisms and compared to baseline data. This will ensure that there is robust and consolidated information on the resources invested in the Decade and will allow the impact of the Decade to be analysed and communicated.

3.2.2 Mechanisms for Mobilising Resources

113. Figure 3.2 and the following text describe the different ways in which a partner can contribute financial or in-kind resources to the Decade to support Actions or coordination costs. All resource providers—regardless of the mechanism adopted and the volume of their contribution—will be recognised for their support to the Decade either through the Ocean Decade Alliance or on a regularly updated 'honour roll' of contributions to the Decade that will be included on the website.

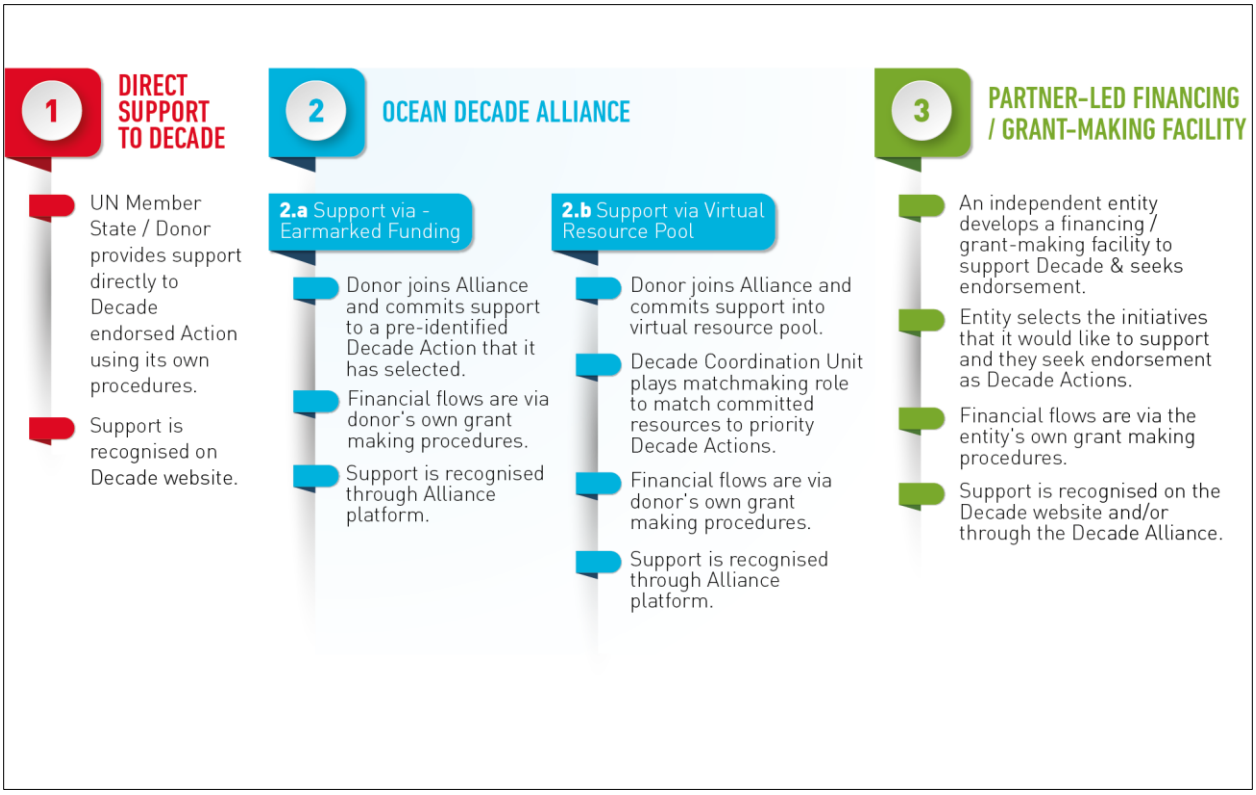


Figure 3.2. Financing mechanisms for the Decade

Mechanism 1: Direct support for Decade Actions and Coordination Costs

114. Under this mechanism, donors will use their existing processes to provide direct support to Decade Actions and coordination costs. Much of this support is likely to come in the form of Member State government funding via UN entities. Nationally funded research projects or nationally determined voluntary contributions such as research cruises, research and sustained

measurement networks, technical training, or data systems will also be essential forms of support. Multilateral or regional funders or philanthropic foundations could also fund Actions and will be important partners throughout the Decade.

115. The mechanisms for direct support to coordination costs are likely to vary depending on the level of the governance structure. At the level of the Decade Coordination Unit, the predominant form of funding is expected to be through direct financial and in-kind support for operations (e.g. through the secondment or loan of staff). Such support will be in the form of extra budgetary resources from Member States or external financial partners. Further in-kind resources at the central level could include hosting and organization of scientific meetings or workshops (e.g. stakeholder conferences or Decade Board meetings), communications or outreach campaigns, technical assistance or consultancy projects, or support for participation in global events linked to the Decade.

116. At the decentralised level, hosting of a Decade Coordination Office or Decade Collaborative Centre by a Member State will be one of the major mechanisms to provide in-kind support. Contributions from Member States may also include extension of existing support mechanisms to cover relevant Decade administration and coordination functions, or secondment and loan of staff to support Decade Coordination Offices or Decade Collaborative Centres.

Mechanism 2: Support via Ocean Decade Alliance

117. The Ocean Decade Alliance will be a key component of the resource mobilisation efforts for the Decade, focusing on significant voluntary resource commitments. The Alliance is not a funding or grant making facility; rather, it is an engagement platform to connect large-scale resource providers with proponents of Decade Actions. The Alliance would provide a mechanism to organize members' commitments and resources via a 'virtual resource pool' into which members of the Alliance could commit in-kind or financial resources to implement priority Decade Actions. Alliance members would include governments, industry, civil society, scientific institutions, philanthropic organizations, and United Nations entities. The following criteria will guide decisions on Alliance membership:

(i) demonstrated sustained commitment to supporting ocean science through research, capacity development, innovation and technological development, and/or communications and awareness raising;

(ii) demonstrated willingness to act as a high-level ambassador for the Decade and to lead by example thus motivating action in other stakeholders;

(iii) significant financial or in-kind support to Decade Actions; and

(iv) commitment to UN goals and ethical principles. Membership of the Alliance would initially be for a period of three years that would be renewable based on the continuing commitments. Different levels of membership will be available depending on the scale of resources committed to the Alliance.

118. There are two options for support through the Alliance. Under the first option, members of the Alliance earmark their commitments to Actions or coordination costs that they have pre-identified as wishing to support. Under the second option, Alliance members would commit resources to a 'virtual resource pool' and the Decade Coordination Unit would assist in linking commitments to proponents of Decade Actions that need resources. In both cases, financing would be directly from the Alliance member to the proponent of the Decade Action.

119. Detailed operational guidelines will be developed for the Alliance prior to the start of the Decade.

Mechanism 3: Partner-led Financing / Grant Making Facility

120. Under this mechanism, an independent entity with its own grant making capacity (e.g. a philanthropic foundation, an NGO or a government entity) will express the desire to mobilise resources to support Decade Actions and offers to act as a hub for mobilising financial contributions from other donors. Individual proposed Actions considered for funding by the entity under the financing and grant-making facility are submitted by the proponent of the Action to the Decade Coordination Unit or Decade Board for endorsement (depending on the scale of the Action). Such a facility may focus on a specific theme, geography or type of Action (e.g. provision of support to LDC, SIDS or LLDS partners), or may have a broader mandate.

3.2.3 Responsibilities for Resource Mobilisation

121. The mobilization of resources for the Decade will take a variety of forms and all actors need to be advocates for identifying and securing support. Specific roles of Decade governance and coordination entities in relation to resource mobilisation are summarised in Table 3.1.

Decade Board	• Define and recommend strategies for resource mobilisation. • Raise high-level awareness of the Decade including with funding partners and resource providers.
Decade Coordination Unit	• Develop Biennial Resource Needs Assessment to identify upcoming priorities and funding needs to inform Calls for Action and facilitate connections between funders and resource providers, and proponents of Decade Actions. • Track financial and in-kind support and report on additional investment generated by the Decade. • Continue to build structured and targeted engagement with traditional and non-traditional funding and resource providers.
Decentralised Coordination Structures and National Decade Committees	• Facilitate and coordinate national, regional and programmatic contributions to Decade Actions and coordination costs.

Table 3.1: Roles in resource mobilisation throughout the Decade

122. Importantly, the value propositions for both funders and those seeking funding and support are inextricably linked to the value of the Decade brand. Ensuring the rigour and visibility of this brand will be one of the key responsibilities of Decade Board and Decade Coordination Unit via engagement and communications efforts that are described throughout the Implementation Plan.

3.3 MEASURING PROGRESS

This section outlines the key elements of the framework to track Decade impact and progress and describes the process to transform this framework into a detailed monitoring and

evaluation strategy for the Decade. It also describes the major review processes embedded in the Decade.

123. The Decade will unfold in a dynamic political, ecological, social and cultural landscape. To remain relevant, the Decade will incorporate mechanisms to allow rapid identification of, and response to, change. A robust monitoring and reporting framework will feed information into a structured process of regular reviews to underpin adaptive management of the Decade (refer Figure 3.3). Regular monitoring and evaluation of Decade progress and impacts will also be important to provide stakeholders with information on the benefits generated by the Decade and thus to inspire action and engagement.

124. The detailed monitoring and evaluation framework for the Decade will be developed during the initial stages of Decade implementation and will be presented to the Decade Board for endorsement. It will contain monitoring and evaluation actions at two levels as described below.

(i) Impact level monitoring and evaluation: In order to fully measure the impact of the Decade, measurement of ocean science success needs to move beyond peer-reviewed publications as the primary measure of performance and focus on the benefits and impacts created through the uptake and use of science. The monitoring and evaluation framework for the Decade will include indicators that measure contributions to global policy frameworks and the progress against Decade outcomes and objectives. It will also include indicators to evaluate progress in the development of a robust enabling environment for ocean science for example through enhanced systems for tracking progress in scientific and technical capacity and ocean literacy. Wherever possible, indicators selected for the Decade will align with indicators already developed for other global policy frameworks such as the 2030 Agenda or the post-2030 global biodiversity framework.

(ii) Operational level monitoring and evaluation: Operational indicators will collect information on the number and type of Decade Actions including information on their geographic location, their alignment with Decade outcomes and objectives, and the diversity of key stakeholders engaged in the Actions. Information on the reach of engagement, communications and outreach activities will also be collected. Information on annual spending of Decade Actions, secured and unsecured resources, and data on the commitments made through the Alliance will be collected to track investments.

125. At each level of analysis, indicators and methodologies will be defined, and a baseline value determined where relevant. Development of certain indicators or methodologies may themselves be the subject of research under the Decade: for example, tools to measure uptake of science for policy, decision-making or innovation; behaviour change triggered by increased understanding of ocean science; or approaches to integrate indigenous and local perspectives into the evaluation of the Decade's impact.

126. As part of the monitoring and evaluation system, proponents of endorsed Decade Actions will be required to report annually on a streamlined series of indicators via online templates that will facilitate reporting and allow for disaggregation of data. Reporting requirements and processes will be kept simple and light to avoid an excessive administrative burden. Decentralised coordination structures will have the responsibility to collect data for indicators for projects and activities included within their remit. The Decade Coordination Unit will collate information on indicators from the decentralised coordination structures and will prepare an Annual Progress Report for validation by the Decade Board that analyses these indicators.

127. Data and information developed via the implementation of the monitoring and evaluation framework will benefit from, and contribute to, regular evaluation and reporting processes within the UN system including the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects (the World Ocean Assessment) and the *Global Ocean Science Report*.

128. The monitoring and evaluation framework will define the methodologies to measure progress of indicators, as well as a further description of responsibilities and required resources.

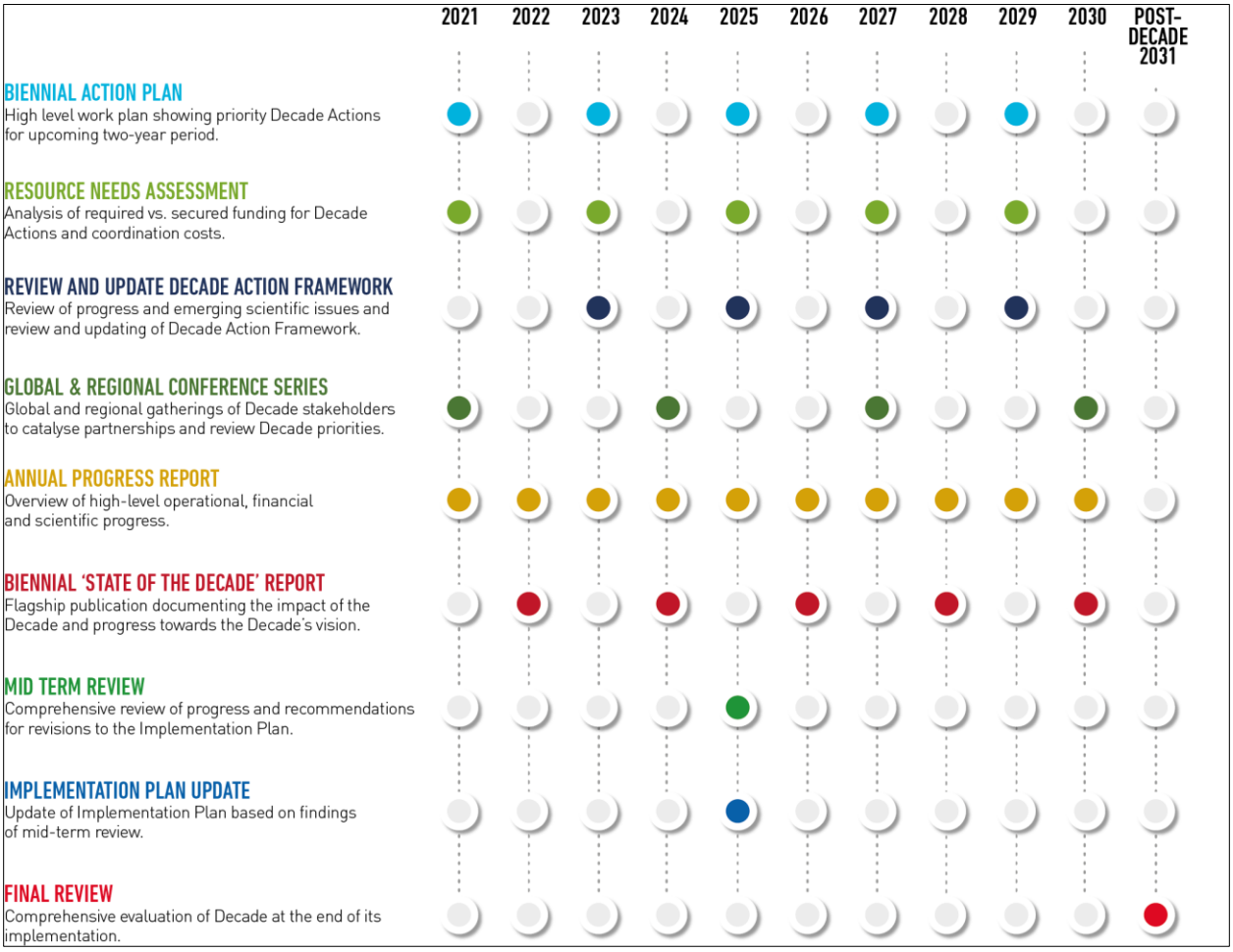


Figure 3.3. Decade review processes

ANNEX 1

GLOSSARY

The following glossary provides definitions in the context of the Decade for a number of common terms used throughout the Implementation Plan.

Action	The tangible activities that will be carried out across the globe over the next ten years to fulfil the Decade vision.
Activity	A Decade Action is a one-off standalone activity (such as an awareness-raising event, a scientific workshop, or a training opportunity). It enables a programme or project or directly contributes to an Ocean Decade Challenge.
Contribution	Supports the Decade through provision of a necessary resource (e.g. funding, resource mobilisation, data, or an in-kind contribution, including staff, provision of infrastructure, or equipment). A contribution can support either the implementation of a Decade Action or the coordination functions of the Decade
Data	A set of values, symbols, or signs (recorded on any type of medium) that represent one or more properties of an entity. For example, the numbers generated by a sensor, values derived from a model or analysis, text entered into a survey, or the raw text of a document.
Decade Board	An advisory body that will provide high-level, strategic oversight of the Decade throughout the implementation phase
Decade Collaborative Centre	Centre hosted by one or more countries or an international organization engaged in Decade activities that will catalyse Decade Actions at the regional or thematic level by providing technical, logistical, and financial support for: (i) scientific coordination and planning; (ii) the identification of collaboration opportunities; (iii) awareness raising and stakeholder engagement; and (iv) technical and scientific capacities to support Decade Collaborative centres will be legally separate from the IOC and operated under the complete responsibility of the establishing entity(ies).
Decade Coordination Office	Offices hosted by UN Member States and requiring the establishment of a Seat Agreement with the host Member State and the provision of financial resources by the host Member State through IOC/UNESCO or other UN frameworks. Offices will act as 'decentralised' Decade Coordination Units, being organically attached to the central Decade Coordinating Unit, and will be responsible for a regional portfolio of Decade Actions and/or specific thematic initiatives
Decade Coordination Unit	Central coordination unit for the implementation of the Decade that will be housed within the IOC Secretariat.
Decade Implementing Partner	Stakeholder institutions (e.g. research institutes, NGOs, universities) that are committed to the vision and mission of the Decade and that are making significant and sustained efforts to implement Decade Actions.
Decade Stakeholder Platform	Existing or new groups of ocean actors that work together to contribute to the Decade vision. Groups could convene on a

	geographic basis (e.g. at the regional level), for a specific theme (e.g. deep ocean, underwater cultural heritage), or for a particular stakeholder group (e.g. NGOs or private sector).
Decentralised coordination structure	Decade Coordination Offices and/or Decade Collaborative Centres.
Digital knowledge	Knowledge, which has been encoded in a machine-readable and -actionable form.
Enabling environment	A set of inter-related elements of the legal, political, financial, socio-cultural and institutional environment that provide transparency, stability and long-term security to facilitate the Decade implementation.
Global Stakeholder Forum	A convening mechanism for all Decade stakeholder engagement networks. The Forum will have both virtual and physical elements.
Indigenous and local knowledge	Refers to the understandings, skills and philosophies developed by societies with long histories of interaction with their natural surroundings. For rural and indigenous peoples, local knowledge informs decision-making about fundamental aspects of day-to-day life. This knowledge is integral to a cultural complex that also encompasses language, systems of classification, resource use practices, social interactions, ritual and spirituality[16].
Information	Products derived from data that lead to a greater understanding of an entity. For example, (i) the interpretation of a range of data from an array of conductivity sensors across the Arctic Ocean that informs us about that ocean's salinity range or (ii) the narrative text of a report on harmful algal blooms that informs the reader on the timing of these blooms.
Interdisciplinary	An approach involving stakeholders from two or more distinct scientific disciplines or stakeholder groups that integrates different knowledge and methods using a synthesis of approaches. Under interdisciplinary approaches, boundaries between disciplines and groups start to break down with the recognition that each discipline can affect the output of the other.
Knowledge	An abstract representation (i.e. a mental model) of an entity which: (i) is constructed from a substantial collection of information; (ii) grants its bearer reliable familiarity with that entity; and (iii) can be used to reason and take action about that entity. For example, an expert with knowledge about the salinity range of the Arctic Ocean (constructed from large amounts of information on the topic) would be able to reason that a salinity value of 43% is a likely error, rather than a real measurement.
National Decade Committee	Existing or new structures that coordinate actors at the national level. Committees are inclusive multi- agency and multi-stakeholder platform for the co-design and co-delivery of Actions and facilitate access to benefits such as data, products, science-policy advice, or capacity development.
Objective	Process objectives that describe the steps in the science value-chain that are needed to meet the Ocean Decade Challenges and thus contribute to achieving the Decade Outcomes.

[16] https://en.unesco.org/links

Ocean Decade Alliance	Resource mobilisation mechanism focused on voluntary, large-scale commitments from governments, UN entities, private sector, foundations or other Decade supporters.
Ocean Decade Challenge	Most pressing and immediate priorities of the Decade. Used to unite stakeholders around common action. May evolve throughout the Decade. Achievement of the challenges will contribute to fulfillment of the outcomes.
Ocean science	Encompasses natural and social science disciplines, including interdisciplinary approaches; the technology and infrastructure that supports ocean science; the application of ocean science for societal benefit, including knowledge transfer and applications in regions that are lacking science capacity; and the science-policy and science-innovation interfaces. Ocean science embraces and integrates local and indigenous knowledge. It recognizes the central role of the ocean in the earth system, and includes consideration of the land-sea interface and ocean-atmosphere and ocean-cryosphere interactions.
Outcome	Describes the 'ocean we want' at the end of the Decade. Outcomes describe both the desired state of the ocean, and the desired state of society's use of, and interaction with, the ocean.
Programme	A Decade Action that is global or regional in scale and will contribute to the achievement of one or more of the Ocean Decade Challenges. It is long-term (multi-year), interdisciplinary and multi-national. A programme will consist of component projects, and potentially enabling activities.
Project	A Decade Action is a discrete and focused undertaking that is typically of a shorter duration. It may be regional, national or sub-national and it will typically contribute to an identified Decade programme.
Proponent	An individual or institution who proposes and implements a Decade Action.
Science-innovation interface	Process which encompasses relations between scientists, stakeholders, and actors in innovation and technological development, and which allow for exchanges, co-design and joint construction of knowledge with the aim of enriching innovation and the development , and deployment of technological solutions.
Science-policy interface	Process which encompasses relations between scientists and other actors in the policy process, and which allows for exchanges, co-evolution, and joint construction of knowledge with the aim of enriching decision-making[17].
Transdisciplinary	Stakeholders from different disciplines or different groups work together to create new solutions and innovations that integrate and move beyond discipline-specific approaches to address a common problem. Transdisciplinarity occurs when two or more discipline perspectives are combined to form a new holistic approach with the expectation that the outcome will be completely different from an addition of the parts.

[17] van den Hove, Sybille. (2007). A rationale for science–policy interface. Futures. 39. 807-826. 10.1016/j.futures.2006.12.004.

UN entity	United Nations agencies, funds, and programmes.
UN-Oceans	Inter-agency coordination mechanism with 29 members that seeks to enhance the coordination, coherence and effectiveness of competent organisations of the United Nations system and the International Seabed Authority working on ocean and coastal related issues.