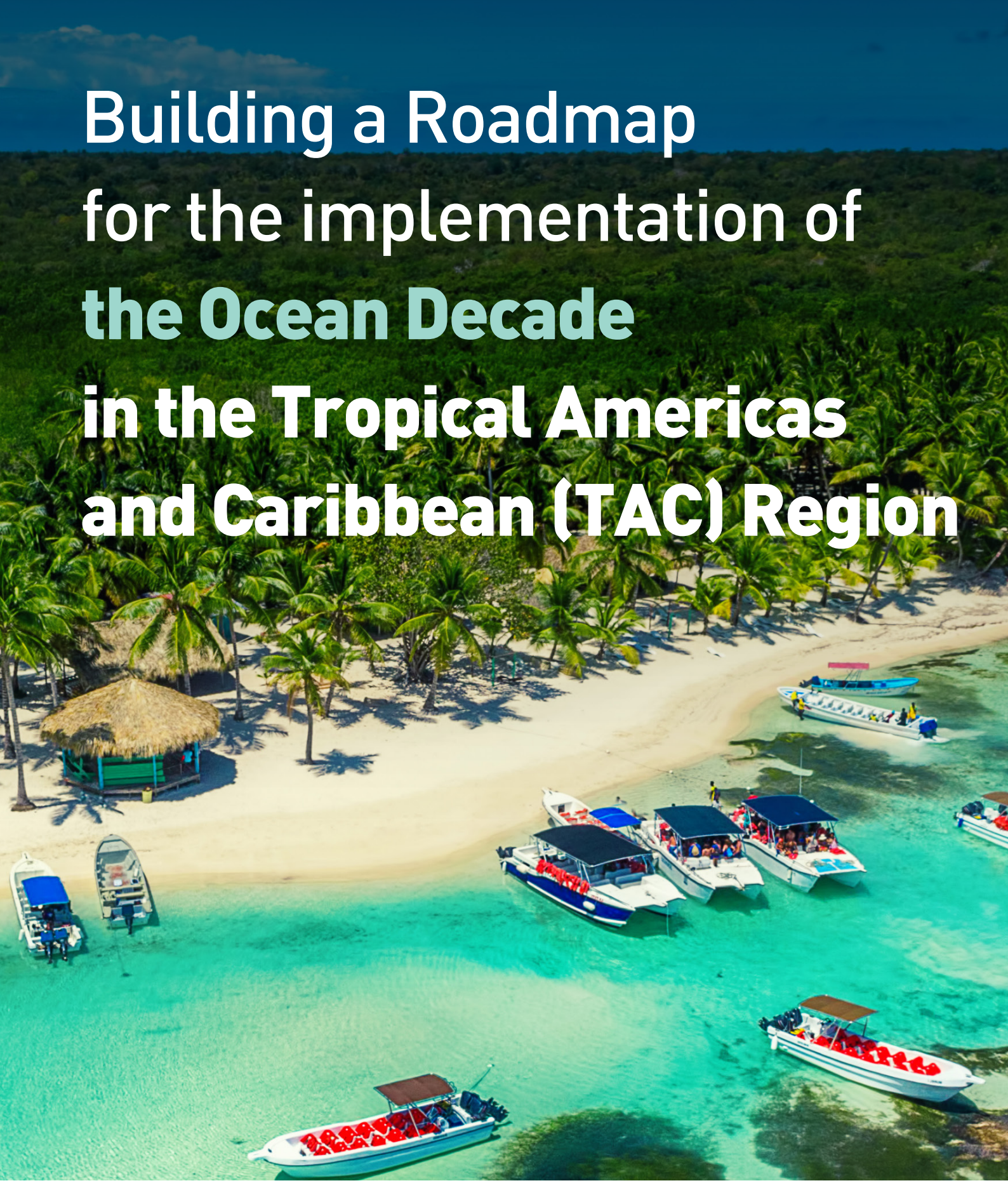
Building a Roadmap for the implementation of the Ocean Decade in the Tropical Americas and Caribbean (TAC) Region



The United Nations
Decade of Ocean Science
For Sustainable Development
2021-2030

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

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(IOC/2024/ODS/59)

Table of contents

1 Summary

Introduction

The primary purpose of the Roadmap for the implementation of the UN Decade of Ocean Science for Sustainable Development 2021-2030 ('Ocean Decade') in the Tropical Americas and the Caribbean (TAC) Region is "to provide a coordinated framework for just, inclusive and impactful action, that meets the strategic ambition of the Ocean Decade Challenges in the TAC region, while recognizing its diversity. This includes identifying and responding to regional priorities, addressing emerging issues, fostering collaboration and use of science and knowledge among partners and stakeholders." It builds on the priorities and recommendations of the Vision 2030 process, as summarised in the Barcelona Statement (2024 Ocean Decade Conference, 10-12 April 2024, Barcelona, Spain).

The Ocean Decade in the Tropical Americas and Caribbean Region

There is a growing number of Ocean Decade Actions led by and implemented in the TAC Region. The region is of great importance regionally and internationally, demonstrated by the dedicated Call for Decade Actions No. 06/2023 which facilitated the development of Decade Actions led by organisations based in the TAC Region through a co-design process.

This Roadmap has been developed through a multiyear preparatory, consultative and co-designed process including TAC Region countries and territories, with a concerted effort to involve Small Island Developing States (SIDS). The actions set out within will be adapted for regional and national implementation. This process has ensured alignment with the Ocean Decade allowing the region to contribute to global objectives and local needs, simultaneously.

TAC Region Priorities

Ten priorities have been identified for the region.

- **Priority 1.** Marine pollution reduction and management from source to sea
- **Priority 2.** Marine and coastal ecosystem-based management, including deep-sea ecosystems and emerging threats
- **Priority 3.** Equitable and resilient small-scale fisheries and aquaculture, and sustainable aquatic food production
- **Priority 4.** Evidence-based Sustainable Ocean Plans (SOPs)
- **Priority 5.** Sustainable and climate-resilient ocean economies with ecosystem and societal co-benefits
- **Priority 6.** Ecosystem-based climate adaptation and mitigation initiatives, and renewable energy technologies
- **Priority 7.** Decision support tools for the resilience of coastal communities
- **Priority 8.** Financial instruments, policies and models to diversify and accelerate investment in ocean science
- **Priority 9.** Social science and ocean literacy research on human-ocean connection
- **Priority 10.** Ocean health and human health

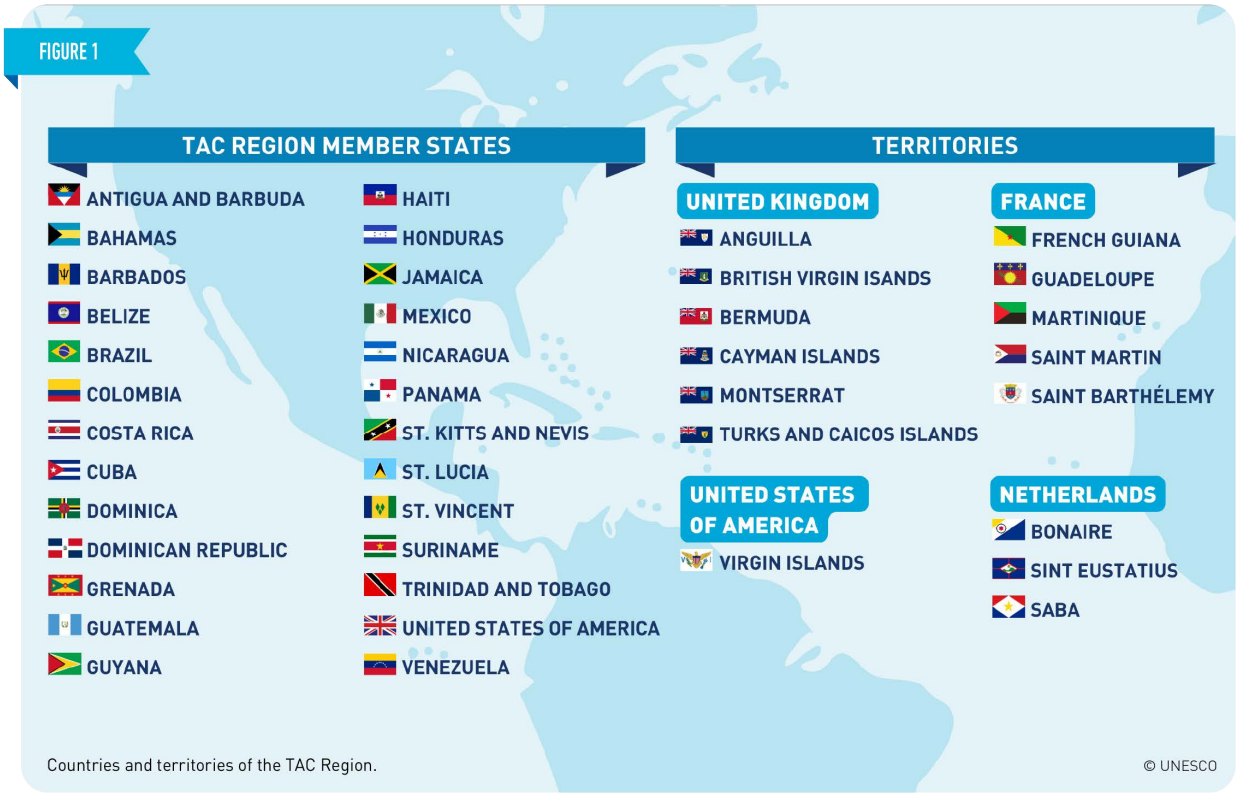
Each priority is presented alongside key knowledge gaps, needs, and issues. Tangible actions to address each priority are also presented.

Implementing the Roadmap

Collaboration, communication and implementation at the national scale are highlighted as vital components of the enabling environment for the TAC Region. The Intergovernmental Oceanographic Commission (IOC) Sub-Commission for the Caribbean and Adjacent Regions ('IOCARIBE') has the overall responsibility for planning and coordinating, jointly with other UN organisations, the Ocean Decade in the Tropical Americas and the Caribbean Region. Together with five other decentralised Ocean Decade coordination structures, they will implement this Roadmap with a particular focus on developing and enforcing policies that support sustainable ocean development and bring benefit to local communities in the TAC Region.

2 The Ocean Decade in the TAC Region

The Tropical Americas and Caribbean (TAC) Region encompasses the Western Tropical Americas (Western Tropical Atlantic and the Caribbean) and the Eastern Tropical Pacific (Figure 1).[1]



Countries and territories of the TAC Region.

The TAC region is regarded as one of the most geopolitically diverse and complex regions in the world due to its geographical location, natural resources and the region's associated environmental challenges. Ocean science capacity and economic development differentiate Continental Coastal countries and the Caribbean Island countries and territories[2] as two distinct regions. However, both are greatly dependent on the ocean and coastal resources.

The Organisation of Eastern Caribbean States (OECS) acknowledges that the ocean and its resources present significant opportunities for economic diversification and wealth generation that can benefit everyone. The ocean's fundamental role in the region's economies and livelihoods highlights the need for enhanced coherence among the social, economic and environmental pillars of sustainable development.[3]

[1] Countries (33): Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Brazil, Colombia, Costa Rica, Cuba, Curacao, Dominica, Dominican Republic, El Salvador, France, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, The Netherlands, Nicaragua, Panama, Saint Kitts and Nevis, St. Lucia, St. Maarten, St. Vincent and the Grenadines, Surinam, Trinidad and Tobago, United Kingdom, United States of America, Venezuela.

[2] Overseas Territories, Départements, Municipalities, Communities: France: French Guiana, Guadeloupe, Martinique (French overseas départements), Saint Barthélemy, Saint Martin (French overseas communities). The Netherlands: Bonaire, Saint Eustatius, Saba (Special Municipalities of the Netherlands), United Kingdom: Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat, Turks and Caicos. United States of America: US Virgin Islands.

[3] OECS. 2020. Eastern Caribbean Regional Ocean Policy. Organisation of Eastern Caribbean States Commission.

BOX 1: SIDS IN THE TAC REGION

While there are many upper-middle-income Caribbean Island countries and territories in the region[4], most are also Small Island Developing States (SIDS), characterised by low resilience and high vulnerability to environmental impacts. These nations and territories are economically reliant on tourism and possess Exclusive Economic Zones (EEZs) that exceed their terrestrial areas. These extensive maritime domains underscore their significant responsibility for the sustainable development of ocean resources. Awareness of the importance of ocean science and economic stability to their environmental stewardship is increasing. The need for science knowledge and capacity development for this region is highlighted in the "SIDS Accelerated Modalities of Action (SAMOA) Pathway" of 2014, and more recently in "The Antigua and Barbuda Agenda for SIDS (ABAS) May 2024 – A Renewed Declaration for Resilient Prosperity". These frameworks emphasise the importance of building capacity in the following areas: i) climate change adaptation and mitigation strategies, including improving understanding of the science of climate change; ii) marine biodiversity conservation, including the establishment and management of Marine Protected Areas, sustainable fisheries management and marine pollution control; iii) ocean governance and the implementation of the United Nations Convention on the Law of the Sea (UNCLOS); iv) disaster risk reduction and resilience, including early warning systems, disaster preparedness, response and recovery, and building resilient coastal communities and infrastructure; v) blue economy, including sustainable resource management, value-added processing, marketing and trade, and sustainable tourism practices; vi) enabling youth economic participation.

The Intergovernmental Oceanographic Commission (IOC) of UNESCO Sub-Commission for the Caribbean and Adjacent Regions ('IOCARIBE') has the overall responsibility for planning and coordinating, jointly with other UN organisations, the UN Decade of Ocean Science for Sustainable Development 2021–2030 ('Ocean Decade') in the Tropical Americas and the Caribbean Region (TAC).

Over the past decade, the ocean's critical role in shaping social, economic and ecological systems has gained significant recognition. Initially receiving limited attention in the context of the Sustainable Development Goal 14 (SDG) on "Life Below Water", it has become a key element in most global agreements and frameworks (Ocean Decade Vision 2030 Outcomes Report).[5] A pivotal element to advance the ocean's critical role has been the series of high-level United Nations Conferences to Support the Implementation of Sustainable Development Goal 14 (The UN Ocean Conferences) – The 2017 UN Ocean Conference co-hosted by Sweden and Fiji in New York, USA, the 2022 UN Ocean Conference co-hosted by Portugal and Kenya in Lisbon, Portugal, and the 2025 UN Ocean Conference which will be co-hosted by France and Costa Rica and take place in Nice, France.

BOX 2: THE OCEAN DECADE ACTION FRAMEWORK

The Ocean Decade Action Framework is the operational framework that guides the design and implementation of actions throughout the Ocean Decade. It comprises three process-based **Objectives** and ten high-level Ocean Decade Challenges for 'the science we need', leading to the seven **Decade Outcomes** that describe 'the ocean we want'. Underlying the Ocean Decade Objectives, Challenges and Outcomes are the Decade Actions – tangible initiatives carried out across the globe to fulfil the Decade vision. Ocean Decade Actions include Programmes, Projects, Activities and other Contributions, and are implemented at different levels.
Within the framework of the Ocean Decade, 'ocean science' encompasses natural and social science disciplines, including interdisciplinary topics; 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 (Figure 2).

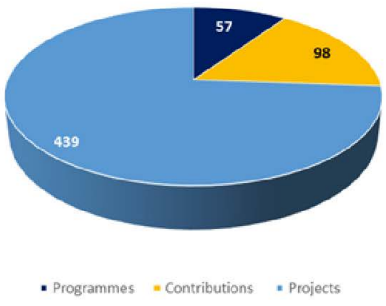
[4] https://blogs.worldbank.org/en/opendata/world-bank-country-classifications-by-income-level-for-2024-2025
[5] UNESCO-IOC (2024). *Ambition, Action, Impact: The Ocean Decade Pathway to 2030. Consolidated Outcomes of the Vision 2030 Process*. UNESCO, Paris. (The Ocean Decade Series, 50).

FIGURE 2

The Ocean Decade Action Framework. © UNESCO

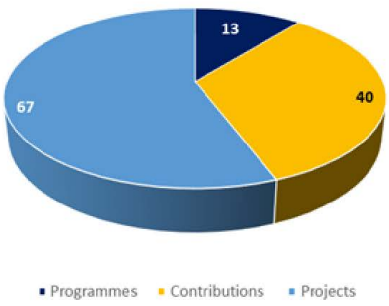
From 2021 to 2024, more than 590 Programmes, Projects and Contributions have been endorsed through Calls for Decade Actions. Following the Call for Decade Actions No. 07/2024 to fill gaps in funding and resources, as well as to incentivise new initiatives in capacity development as part of the Ocean Decade Capacity Development Facility to support Decade Actions, a total of 120 Actions have been endorsed related to the TAC Region, with 108 of them led by TAC Region based organisations (Figures 3, 4, and 5). A list of IOCARIBE Ocean Decade Actions can be found in Annex I.

FIGURE 3

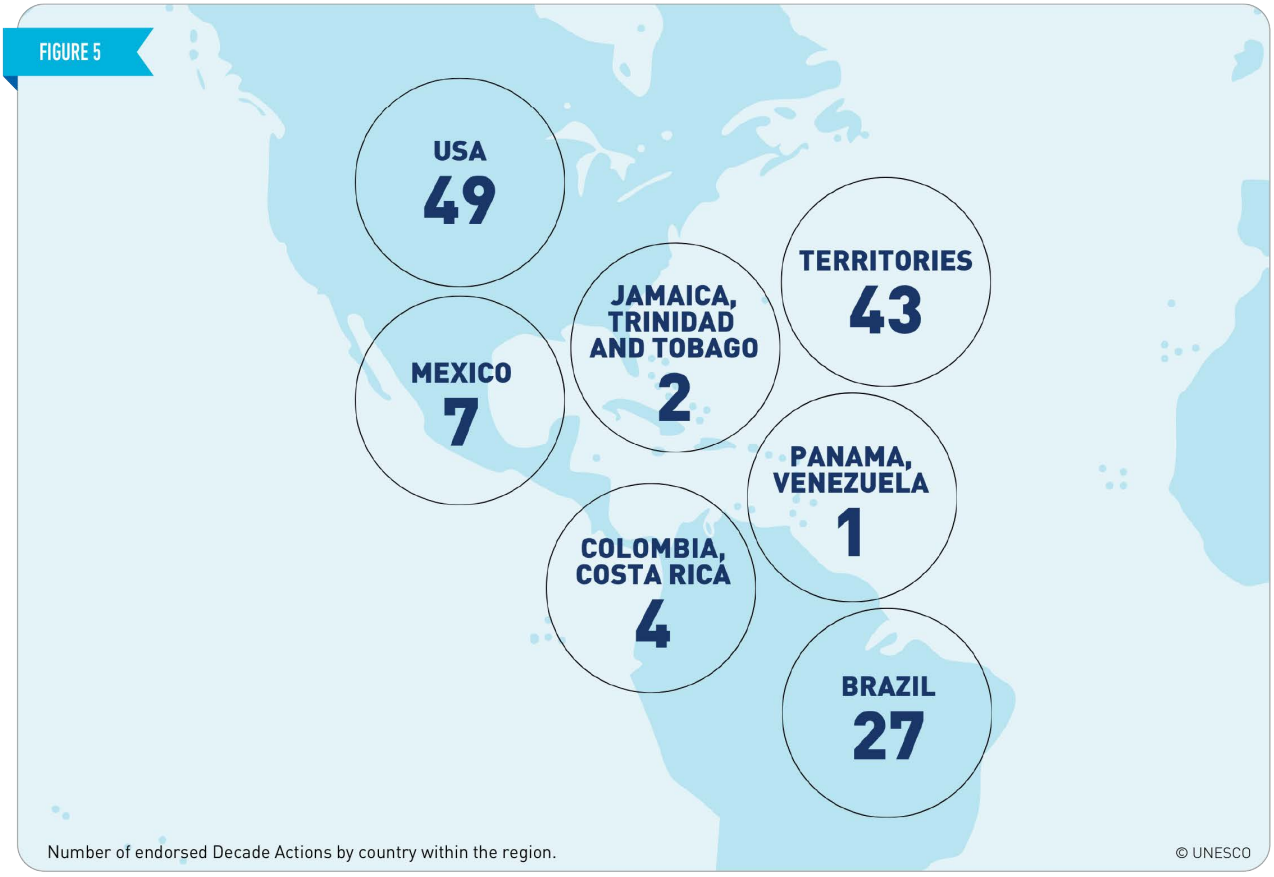


Global endorsed Ocean Decade Actions.

FIGURE 4



Endorsed Decade Actions being implemented or led by organisations in the TAC Region.



Decade coordination structures, such as Decade Coordination Offices (DCOs) and Decade Collaborative Centres (DCCs) provide guidance in co-design and co-implementation of Decade Actions at the regional scale. The network of decentralised structures in the TAC Region is composed of i) the TAC Decade Coordination Office; ii) the TAC Task Force; iii) the National Decade Committees (NDC); iv) the Ocean Decade Focal Points; and v) the TAC Ocean Decade Network. These varied structures are coordinated by IOCARIBE and can be seen in Figure 6.

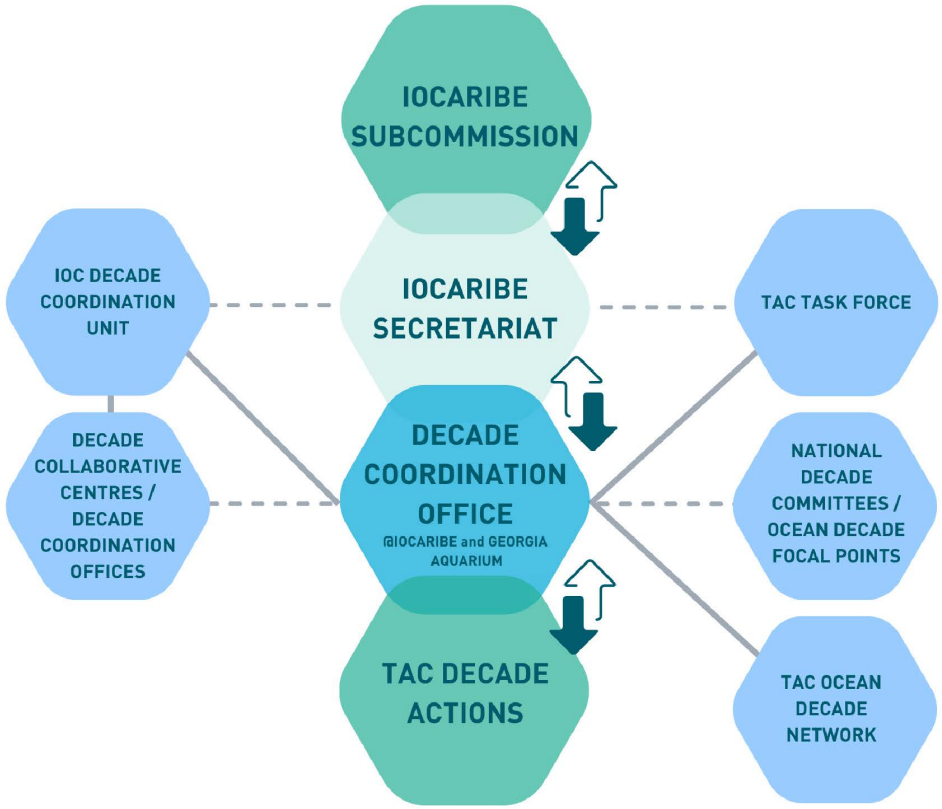
The TAC Decade Coordination Office of IOCARIBE is located at the Georgia Aquarium and i) coordinates and supports endorsed Decade Actions and catalyses new Actions; ii) improves stakeholder facilitation and engagement; iii) increases resource mobilisation and communications, and iv) monitors and reports on activities.

The TAC Task Force is established as a technical advisory body providing strategic advice to the Secretariat and Governing Bodies of the IOCARIBE Sub-Commission. Its role includes:

- Advising on the engagement and outreach strategy of the Decade to help catalyse high-level interest and engagement in the TAC Region among key stakeholders.
- Providing strategic vision, direction and coordination of specific actions.
- Identifying and fulfilling priorities and needs, with special attention to SIDS.
- Facilitating the inclusion of SIDS into co-designed Decade Actions.

The TAC Ocean Decade Network was established to connect organisations that are co-designing or co-implementing a Decade Action and the TAC Task Force with a diverse array of stakeholders, allowing their voices to shape initiatives, fostering interdisciplinary collaboration and building essential partnerships.

FIGURE 6



TAC Region decentralised coordination structures. © UNESCO

The TAC Region National Decade Committees (NDCs) are located in Brazil, Colombia, France, Mexico, The Netherlands, Aruba, Curaçao and Sint-Maarten, United Kingdom and the USA. Many countries and territories in the region lack the capacity to host an NDC. While no DCCs are based in or focus on the TAC Region, this form of structure is particularly important in supporting SIDS engagement with the Ocean Decade in the region.

Vision 2030 in the TAC Region

The Vision 2030 process serves as the operational framework focused on mapping out science, knowledge, capacity, resources or infrastructure needs to fulfil each of the ten Ocean Decade Challenges, as well as strengthening linkages between them. These needs and associated priorities were launched during the 2024 Ocean Decade Conference in April 2024, which emphasised the importance of participation from and recognition of the TAC Region. Of particular importance to capacity building and increasing access to ocean science in this region was the identification of infrastructure including marine pollution monitoring, ocean observations and interoperable ocean data. It also addressed how to enhance the use of adapted, innovative technology to underpin the equitable generation. This would allow access to all nations to observations, data and knowledge across all Ocean Decade Challenges.

3 Purpose of the Ocean Decade TAC Region Roadmap

The primary purpose of the roadmap for the implementation of the Ocean Decade in the TAC Region is "to provide a coordinated framework for just, inclusive and impactful action, that meets the strategic ambition of the Ocean Decade Challenges in the TAC region, while recognizing its diversity. This includes identifying and responding to regional priorities, addressing emerging issues, fostering collaboration and use of science and knowledge among partners and stakeholders."

The co-design process outlined below aimed to lay out key priority actions for the region to shape Ocean Decade Actions, ultimately leading to transformative ocean science solutions and contributing to the collective global effort under the Ocean Decade.

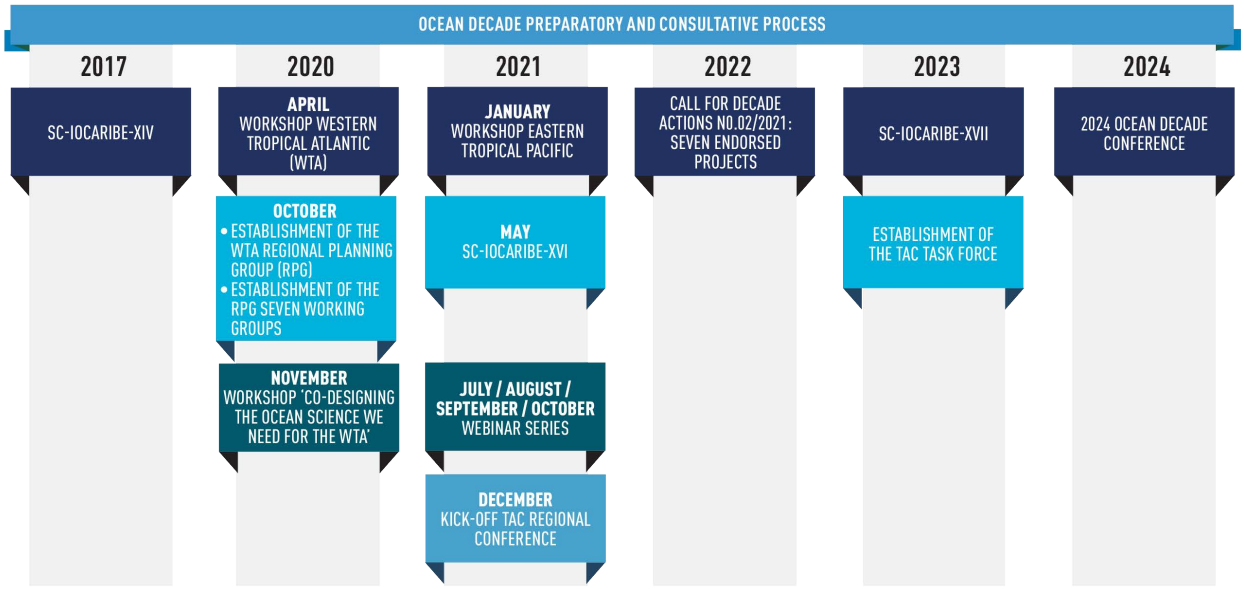
4 Preparing the TAC Region Roadmap

The preparation of this Roadmap was catalysed through co-design and included thousands of contributors. Initiated in 2017 in the TAC Region, the process brought together a diverse range of stakeholders, including scientists, policymakers, programme managers, government officials, United Nations agencies, international and regional organisations, representatives from tourism, oil and gas industry, maritime sector, private enterprises and non-governmental organisations.

The Kick-off TAC Regional Conference (December 2021) focused on fostering regional partnerships for Decade Actions co-designed across a diversity of stakeholder groups. To enhance regional governance, the Conference recommended establishing National Decade Committees for the Ocean Decade to promote local and national collaboration.

Regional priorities were identified and new, expanded stakeholder networks and partnerships were established in alignment with the Decade Outcomes. The process was carried out through a series of workshops and meetings (Figure 7), which served to recognise knowledge gaps, barriers and needs in capacity development.

FIGURE 7



Ocean Decade preparatory and consultative process. Milestones from 2017 to 2024 are included.

5 Defining Priorities for Decade Actions in the TAC Region

The ten regional priorities identified through the participatory co-designed process detailed above are presented here. Increasing the development and implementation of policies that address these regional priorities will contribute to achieving solutions to the broader Ocean Decade Challenges, fostering a more resilient and sustainably managed ocean environment in the TAC region. The full list of priorities can be found in Annex II.

PRIORITY	KNOWLEDGE GAPS, ISSUES AND NEEDS	ACTIONS
Priority 1. Marine pollution reduction and management from source to sea	• Inadequate data on sources of pollutants and areas of highest concentration or greatest threat to health. • Lack of understanding of pollutants from land-based sources, in fish and seafood, of plastic, and marine litter. • Alignment with international and regional agreements and conventions is needed.[6] • Holistic approach to address both biotic and abiotic factors in terrestrial and marine environments.	*Primary Goal: Identify, quantify and reduce sources of marine pollution comprehensively and systematically* • Establishment of sentinel sites with harmonised methodologies covering pristine to heavily polluted areas. • Enhancement of capacity, including at the institutional level, by bridging North-South data gaps, fostering knowledge exchange and developing technological solutions and best practices.
Priority 2. Marine and coastal ecosystem-based management including deep-sea ecosystems and emerging threats	• Marine and coastal ecosystem health must be addressed due to its tight interlinkages with community wellbeing, economic health, and asset resilience in the TAC Region. • Weak governance over ecosystem health in the region. • There is a cumulative impact of multiple stressors on the regional marine ecosystems. • Lack of knowledge of previously unexplored pelagic and deep-sea ecosystems. • Lack of coverage of Regional Fishery Bodies (RFBs) to oversee management of key species. • The deep-sea often lies within areas beyond national jurisdiction (ABNJ), complicating management efforts.	*Primary Goal: Enhanced ecosystem-based management (EBM)* • Strengthening of scientific capacity and decision-making processes through robust networks for collaboration. • Data-driven marine spatial planning through regionally standardised protocols for remote sensing, and vessel-based data collection, including via fishing boats and ships of opportunity. • Establishment of new Marine Protected Areas (MPAs) and Other Effective area-based Conservation Measures (OECMs) in line with international treaty commitments[7] while considering socio-economic impacts and collaborating across the region.

[6] E.g. Cartagena Convention and its Protocols on Oil Spills and Land-Based Sources of Marine Pollution.
[7] E.g. Kunming-Montreal Global Biodiversity Framework (GBF) Targets, the BBNJ Treaty, and regional instruments such as the Specially Protected Areas and Wildlife (SPAW) Protocol of the Cartagena Convention.

Priority 3. Equitable and resilient small-scale fisheries and aquaculture, and sustainable aquatic food production	• Implementation gaps in fisheries and aquaculture management plans. • These industries are vital for food security and socio-economic success in the region. • Increased monitoring of climate change impacts is needed to support the resilience of these activities.	*Primary Goal: Long-term sustainability via strengthened governance and innovation* • Institutionalised ecosystem approach to fisheries and ecosystem-based management frameworks that consider social and ecological needs. • Blue food technologies supported through entrepreneurial initiatives. • New collaborative networks to bring together fisheries, aquatic food production and diverse sectors, e.g. tourism. • Training programmes to support an upskilled workforce.
Priority 4. Evidence-based Sustainable Ocean Plans (SOPs)	• A traditional siloed approach across sectors and large marine ecosystems[8] creates a barrier to sustainable management. • Lack of coordination to align national and regional priorities, including social, economic, and environmental issues. • Diverse, unique challenges and opportunities within the region which require specific actions to address them.	*Primary Goal: Unified and sustainable approach to ocean management* • Development of complimentary SOPs which are user-driven, mission-oriented, considerate of climate change adaptation, equitably distribute benefits, grounded in science, reach across sectoral and thematic siloes, and incorporate knowledge of Indigenous People and Local Communities.
Priority 5. Sustainable and climate-resilient ocean economy with ecosystem and societal co-benefits	• Risky private capital financing and investments. • Gaps in ocean governance and tenure issues, especially in ABNJ. • Lack of holistic management approaches such as EBM and SOPs to demonstrate reliability in attracting private investment. • Lack of knowledge around distribution and health of marine and coastal habitats. • A need to prioritise investments in capacity development and enhancement and institutional strengthening.	*Primary Goal: Generate knowledge, support innovation and create solutions for equitable and sustainable ocean economy development amidst evolving environmental, social and climate conditions, with a focus on SIDS* • Integrated finance mechanisms to ensure that progress in one sector does not hinder another one and that resources supporting national and local socio-economic priorities are not compromised. • Digital mapping and monitoring to identify critical habitats, track species populations and detect threats like overfishing and pollution. • Detailed capacity and knowledge landscape map and gap analysis of the sustainable ocean economy.

[8] Large Marine Ecosystems (LMEs) in the region - the Gulf of Mexico, the Caribbean, the North Brazil Shelf, the California Current, the Gulf of California and the Pacific Central American Coast.

Priority 6. Ecosystem-based climate adaptation and mitigation initiatives, and renewable energy technologies	• Need to reduce carbon dioxide emissions to address climate change impacts. • Lack of effective monitoring of the region's unique oceanographic and climatic conditions, and of predictive capacity. • Underinformed communities and weak risk reduction policies limiting climate change resilience and adaptation knowledge. • Potential conflicts in implementation of international treaties[9] with stakeholder rights.	*Primary Goal: Implementation of system scale climate mitigation and adaptation approaches[10] underpinned by ecological and biodiversity dynamics* • Conservation and restoration of mangroves, seagrasses and salt marshes as potential carbon sinks. • Deployment of advanced marine renewable technologies. • Enhancement of a tailored Ocean Observing System for the region for accurate and timely data to improve coastal predictions and biodiversity monitoring. • Ocean literacy and awareness opportunities for local communities and policymakers, which promote cross-border cooperation and improved responses to climate-related events.
Priority 7. Decision support tools for resilience of coastal communities	• Uncertainty of vulnerability and risk to coastal communities and marine industries in the face of climate-driven regionally specific challenges.[11] • Underserved areas face a lack of data collection, management, sharing and utilisation. • Long-term, integrated and dynamic approach to adaptation planning is needed. • Lack of resources to support digital innovation.	*Primary Goal: Effective policy and governance frameworks which support equitable coastal adaptation alongside a sustainable ocean* • Development of advanced decision support tools integrated with ecosystem-based disaster risk reduction and nature-based solutions for adaptive governance and management systems. • Creation of a robust digital ecosystem for the region, including building capacity for end users.[12]
Priority 8. Financial instruments, policies and models to diversify and accelerate investment in ocean science	• Lack of comprehensive financial strategy for the Ocean Decade which avoids inter-regional competition for resources. • Overly complex application, access and approval procedures for relevant finance sources. • Need for national implementation of funding models to secure long-term	*Primary Goal: Diversify and accelerate investment in ocean science, including for enhanced digital representation of the ocean and sustainable ocean planning, observing and infrastructure* • Strategy and development of innovative financing models to support sustainable ocean priorities in the TAC Region which can be deployed at the national level through a coordination group ensuring conflict for resources is reduced.

[9] United Nations Framework Convention for Climate Change (UNFCCC), Paris Agreement, and the High Seas Treaty.
[10] Ecosystem-Based Disaster Risk Reduction (Eco-DRR), Ecosystem-Based Adaptation (EBA), and Ecosystem Approach to Fisheries (EAF).
[11] E.g Sargassum influxes, coastal erosion, sea level rise, oil spills, harmful algae blooms and the impacts of natural hazards such as hurricanes and tsunamis.
[12] This approach aligns with the Ocean Decade Data and Information Strategy.

	impact beyond the Ocean Decade. • Few expansive funding models exist for ocean science, therefore climate finance models should be adapted.[13] • Lack of marine natural capital values in mainstream decision making.	• Diversification and strengthening of ocean science funding by supporting existing multilateral climate funds[14] with resources to manage administrative processes. • Development of funding models for SIDS-led small projects which reduce high transaction costs and administrative burdens. • Implementation of innovative financing models[15] for ecosystem-based approaches to support the resilience, restoration and conservation of coastal ecosystems, and provision of technical and capacity assistance to recipients.
Priority 9. Social science and ocean literacy research on human-ocean connection	• Unique sociocultural dynamics and environmental challenges of the region need to be addressed. • Shallow, not always culturally relevant understanding of the ocean's significance. • Lack of ocean literacy curricula in both informal and formal education systems. • Need for greater social acceptance of and engagement in conservation, rehabilitation and adaptation projects. • Knowledge gaps in extent and effectiveness of ocean literacy impacts and ocean related values. • Poorly-funded area of research. • Need to integrate findings into the Global Ocean Observing System to facilitate knowledge exchange.	*Primary Goal: Ensure that all sectors of society in the TAC Region develop stronger connections with the ocean, recognise its vital role in well-being and are motivated to make sustainable decisions that benefit both people and the planet* • Increase of diversity of communications and education tailored to resonate with varied audiences employing local languages, arts, music and culturally relevant narratives to effectively convey the importance of ocean conservation. • Transdisciplinary research exploring the social, cultural and behavioural drivers that influence human-ocean interactions and connections. • Citizen science initiatives which reinforce connections between populations and their environments through low-cost data collection. • Resource mobilisation[16] to map and measure ocean literacy impact.
Priority 10. Ocean health and human health	• Regional vulnerability to pollutants, coastal water contamination, oil spills, harmful algal blooms and accumulation of heavy metals in marine life is significant. • Data gaps in marine pollution in the deep ocean and the	*Primary Goal: Evaluate the long-term impacts of marine pollution, implement effective regulatory measures and ultimately improve both ocean and human health outcomes* • Advancement of scientific knowledge regarding sources and impacts of marine pollution.

[13] E.g. "Antigua and Barbuda Agenda for SIDS (ABAS) – A Renewed Declaration for Resilient Prosperity."
[14] Green Climate Fund, Global Environment Facility and its Special Climate Change Fund, and the Adaptation Fund.
[15] E.g. public-private sector partnerships and capital market instruments, Public-Private Partnerships (PPPs), Blue Bonds, Ocean Impact Investment Funds, Marine Ecosystem Services Credits, Blue Carbon Credits, Environmental Impact Bonds (EIBs), Blue Venture Capital (VC), Sustainable Blue Economy Bonds, Ocean Conservation Insurance, Blue Crowdfunding Platforms.
[16] Funding agencies, philanthropic foundations, the private sector and international organisations.

	ecological and human health risks of emerging pollutants. ● Malnutrition is a significant issue in Latin America and the Caribbean.[17] ● Limited access to nutritious food such as fish due to economic barriers, production challenges and cultural dietary preferences. ● Lack of baseline data and long-term study outputs.	● Increase of understanding of policy and resource mobilisation mechanisms to improve nutritious food access. ● Development of robust water and sediment quality criteria for emerging pollutants, including nanoparticles and rare earth elements. ● Support for sustainable fisheries and aquaculture to enhance the provision of nutrient-rich food with low environmental impact. ● Collaborative public health initiatives[18] which cut across the priorities presented here to address pollutant cumulative, additive and temporal trends in the context of climate change.

[17] "41 million people faced hunger and 28.2% experienced moderate to severe food insecurity in 2023" FAO, IFAD, UNICEF, WFP and WHO (2024). *The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms*. Rome. https://doi.org/10.4060/cd1254en

[18] With Pan American Health Organization (PAHO) and national health and environmental authorities.

6 Implementing the TAC Region Roadmap

The ten regional priorities identified through the participatory co-designed process detailed above are presented here. Increasing the development and implementation of policies that address these regional priorities will contribute to achieving solutions to the broader Ocean Decade Challenges, fostering a more resilient and sustainably managed ocean environment in the TAC region. The full list of priorities can be found in Annex II.

Building an Enabling Environment

Implementing Ocean Decade Actions in the Tropical Americas and Caribbean Region requires several key enablers to be successful. These include:

- Fostering **collaboration and partnerships** among countries, organisations and stakeholders to leverage resources and expertise.
- Strengthening and ensuring access to **ocean observation**, **laboratory infrastructure**, internet and computing resources.
- Sharing **data and information** to promote evidence-based decision-making.
- **Capacity development** through training programmes and educational initiatives to empower local communities and institutions.
- Enhancing and enforcing **policy**, **legislative and institutional frameworks and governance structures** which promote ecosystem-based management.
- Encouraging **innovation and technology transfer**.
- Securing **financial resources**.
- Establishing robust **monitoring and evaluation frameworks**.

Effective communication was recognised as a vital enabler in the TAC Region. Communication plays a key role in raising awareness among the public and stakeholders, supporting ocean health and advancing the broader objectives of the Ocean Decade by fostering a sense of shared responsibility. This, in turn, encourages informed, meaningful and consensus-building engagement from communities and cross-sectoral stakeholders in decision-making, driving transformational change. Clear communication also mobilises support for conservation efforts and advocates for policy changes that promote sustainable ocean management. By facilitating knowledge exchange and sharing best practices, communication enhances collaboration, innovation and capacity. Additionally, it is essential for monitoring and reporting progress, and ensuring transparency and accountability in the dissemination of results and outcomes.

Policy Frameworks as Drivers of Science and Knowledge

The Ocean Decade emphasises solution-oriented science to foster sustainable development, encompassing a comprehensive array of policies, strategies and decisions at local, national, regional and international scales. Through actively engaging with knowledge users and conducting applied science, Decade Actions advance the 2030 Agenda for Sustainable Development.

Through the priorities and associated Decade Actions set out in this Roadmap, the TAC Region will facilitate collaboration and communication channels between scientists and policymakers throughout the research process. The key activities supporting this are:

- Integrating policy relevance into selection criteria into evaluation of research proposals.
- Incentivising policy-relevant research through funding mechanisms, awards and institutional recognition.

- Providing training and workshops for scientists and policymakers on engagement approaches.
- Strengthening consultation processes.
- Early engagement with policymakers at the design phase.
- Ongoing dialogue between all actors to ensure policy objective alignment.
- Effective dissemination of research findings to diverse audiences.

By ensuring that Decade Actions are co-designed to address science and knowledge priorities in the region, this Roadmap strongly responds to policy needs.

Action at the National Level

While the Ocean Decade operates on a global scale, real transformation will ultimately materialise when Decade Actions are translated into action at the national level. National-level engagement is pivotal for realising tangible outcomes across the Decade Actions presented in this Roadmap. As highlighted in the *Building an Enabling Environment* section above, commitments relating to policy and governance are critical for implementing Decade Actions. Enforcement of policies and legal frameworks takes place at the national scale. In the TAC Region, this is especially important due to the proximity of countries and territories and their shared maritime space. Strong political leadership fosters **intersectoral coordination** among government agencies, engages stakeholders in policy development and **advocates** for ocean health on regional and global platforms. **Sustained political will** is essential for overcoming challenges, mobilising resources and achieving meaningful progress towards the goals of the Ocean Decade.

National funding agencies have numerous possibilities to work directly with donors, banks and other financiers to mobilise tangible action and benefits at the local and community levels. This resource mobilisation also allows nations to fulfil their international obligations and support economic development.

Enhanced Collaboration

International cooperation for ocean science in the TAC Region is essential due to the ocean's interconnected nature, the proximity of countries and territories to one another and the global scale of marine challenges. Collaborative research fosters knowledge exchange, facilitates the development of shared solutions to issues like pollution and overfishing and empowers SIDS through capacity development and institutional strengthening. TAC regional and sub-regional collaboration within ocean science generates robust data, informs policy decisions and continues to shape global treaties to achieve "the ocean we want".

Next Steps

The next steps to successfully implement the Ocean Decade Roadmap for the Tropical Americas and the Caribbean will be to create a resource mobilisation and an implementation plan.

ANNEX I

List of United Nations Decade of Ocean Science Endorsed Actions in the Tropical Americas and the Caribbean Region

Table 1. Programmes

NAME OF PROPOSED DECADE PROGRAMME	LEAD INSTITUTION	COUNTRY	CONTACT PERSON	EMAIL ADDRESS	COMMS FOCAL POINT	COMMS FOCAL POINT EMAIL	ECOP FOCAL POINT	ECOP FOCAL POINT EMAIL	COMMS MATERIALS PROVIDED
Ocean Decade Research Programme on the Maritime Acoustic Environment	Interagency Working Group for Ocean Sound and Marine Life	United States	Heather Spence; Juliette Lee; Kannan Sivaprakasam	heather.spence@ee.doe.gov; juliette.lee@boem.gov; Kannan.sivaprakasam@ee.doe.gov	Dr Kyle M. Becker	kyle.becker1@navy.mil	Elizabeth Weidner	eweidner@ccom.unh.edu	NO
The Coral Reef Sentinels: A Mars Shot for Blue Planetary Health	The Smithsonian Institution	Panama	David Kline	klined@si.edu	Kate Hibbs	DavisKH@si.edu	Matthieu Leray	LerayM@si.edu	YES
Ocean Voices: Building transformative pathways to achieve the Decade's outcomes	Nippon Foundation Ocean Nexus Center, EarthLab, University of Washington	United States	Harriet Harden Davies; Gail Sant	harriet.harden-davies@ed.ac.uk; gail.sant@ed.ac.uk;	Ariel Wang; Karin Trudo	arielyw@uw.edu; karino3@uw.edu	Marleen Schutter; Frederique Fardin	m.schutter@cgiar.org; flf25@cam.ac.uk	YES

				ocean.voices@ed.ac.uk					
Marine Life 2030	Marine Biodiversity Observation Network (MBON) & National Oceanographic and Atmospheric Administration (NOAA)	United States	Frank Muller Karger; Gabrielle Canonico	gabrielle.canonico@noaa.gov; carib@usf.edu	Gabrielle Canonico	gabrielle.canonico@noaa.gov	Bárbara Pinheiro; Claudia Barón; Veronica Relano	clobaron@gmail.com; barbara.pinheiro@icbs.ufal.br; v.relano@oceans.ubc.ca	NO
ForeSea - The Ocean Prediction Capacity of the Future	OceanPredict	United Kingdom of Great Britain and Northern Ireland (UK)	Primary: Eric Chassignet, to copy: Kirsten Wilmer-Becker; Stéphanie Cuven; PN Vinayachandran; Fraser Davidson; Marie Drevillon	echassignet@fsu.edu; kirsten.wilmer-becke@metoffice.gov.uk; scuven@mercator-ocean.fr; vinay@iisc.ac.in; fraser.davidson@dfo-mpo.gc.ca; mdrevillon@mercator-ocean.fr	PN Vinayachandran	vinay@iisc.ac.in	Ann Kristin Sperrevik	ann.k.sperrevik@met.no	NO

Challenger 150 - A Decade to Study Deep-Sea Life	DOSI - Deep Ocean Stewardship Initiative (www.dosi-project.org) DOSI is a volunteer, transdisciplinary network of >1800 experts from 92 countries, which seeks to integrate science, technology, policy, law and economics to advise on ecosystem-based management of resource use in the deep ocean and strategies to maintain the integrity of deep-ocean ecosystems within and beyond national jurisdictions	United Kingdom	Dr Kerry Howell; Dr Ana Hilário	kerry.howell@plymouth.ac.uk; ahilario@ua.pt	Kerry Howell; Ana Hilario	info@challenger150.world	Kirsty McQuaid	Kirsty.mcquaid@plymouth.ac.uk	NO

Fisheries Strategies for Changing Oceans and Resilient Ecosystems by 2030	Gulf of Maine Research Institute	United States	Katherine Mills; Claire Enterline	kmills@gmri.org; centerline@gmri.org	Elijah Miller	emiller@gmri.org	Jacob Eurich	jacobeurich@ucsb.edu	YES
Deep Ocean Observing Strategy	Deep Ocean Observing Strategy	United States	Lisa Levin; Patrick Heimbach	llevin@ucsd.edu; heimbach@ices.utexas.edu	Lisa Levin	llevin@ucsd.edu	Leslie Smith	Leslie.Smith@youroceanconsulting.com	YES
Global Ecosystem for Ocean Solutions (GEOS)	Ocean Visions (www.oceanvisions.org) and Future Seas (futureseas2030.org) will serve as points of contact and leads for GEOS	United States	Leonardo Valenzuela Pérez	leonardo@oceanvisions.org	Liliana Bastian	liliana@oceanvisions.org	Erin V. Satterthwaite; Alfredo Giron	esatterthwaite@ucsd.edu; agiron@stanford.edu	NO
Global Ocean Decade Programme for Blue Carbon	The University of St Andrews	United Kingdom of Great Britain and Northern Ireland (UK)	William Austin; George Biddulph	wena@st-andrews.ac.uk; gb216@st-andrews.ac.uk	Professor William Edward Newns AUSTIN	bluecarbon@st-andrews.ac.uk	Alex Houston	bluecarbon@st-andrews.ac.uk	

UN31	The Ocean Decade Tsunami Programme	Intergovernmental Oceanographic Commission, IOC/UNESCO	France	Bernardo Aliaga	b.aliaga@unesco.org				
UN1	Ocean Observing Co-Design - Evolving ocean observing for a sustainable future	The Global Ocean Observing System (GOOS) through lead sponsor IOC/UNESCO	France	Emma Heslop; Ann Christine Zinkann	e.heslop@unesco.org; ann-christine.zinkann@noaa.gov	Ann Zinkann; Emma Heslop	ann-christine.zinkann@noaa.gov; e.heslop@unesco.org	In progress	In progress
UN25	An Ocean Data and Information System supporting the UN Decade of Ocean Science for Sustainable Development	International Oceanographic Data and Information Exchange (IODE) of the Intergovernmental Oceanographic Commission (IOC).	Belgium	Peter Pissierssens	p.pissierssens@unesco.org				

Table 2. Projects

UNIQUE ID	DATE OF ENDORSEMENT	HOST PROGRAMME	NAME OF PROPOSED DECADE PROJECT	LEAD INSTITUTION	COUNTRY	CONTACT PERSON:	EMAIL ADDRESS	ADDITIONAL CONTACTS	ADDITIONAL CONTACT EMAIL ADDRESSES
100.4	March 2024	UN26. Global Environment Monitoring System for the Ocean and Coasts (GEMS Ocean) Programme	Assessing Multiple Stressors in Coastal Ecosystems	Federal University of Technology – Paraná	Brazil	Renata Ruaro	derint-ct@utfpr.edu.br		
101.4	March 2024	UN26. Global Environment Monitoring System for the Ocean and Coasts (GEMS Ocean) Programme	Observatory of Marine Anthropogenic Litter	Universidade Federal do Pará-UFPA	Brazil	Marcus Fernandes	mebf@ufpa.br		
102.4	March 2024	144. CoastPredict - Observing and Predicting the Global Coastal Ocean	Reef-shaped coastlines: effects of climate change	University of São Paulo/Oceanographic Institute	Brazil	Eduardo Siegle	esiegle@usp.br		
119.2	October 2022	Not yet defined	Projeto TransforMAR	Associação Tatauga Dive	Brazil	Alexandre Silva	alexandre@tataugadive.com.br		

18.4	March 2024	11.2. Global Ocean Decade Programme for Blue Carbon	The Observatory of Mangrove and its Maretories	Organização da Sociedade Civil (OSC) Sarambuí	Brazil	Indira Angela Luza Eyzaguirre	indira.eyza@gmail.com		
19.3	May 2023	UN7. Ocean Literacy With All (OLWA)	Ocean Culture: port to port and Water Cycle	ABraVela	Brazil	Sergio Esteves	grandregatta@gmail.com		
42.3	October 2023	UN7. Ocean Literacy With All (OLWA)	Monitoramento Mirim Costeiro	Instituto Monitoramento Mirim Costeiro	Brazil	Caroline Schio	contatoinstitutommc@gmail.com		
42.6	June 2024	90. Sustainability of Marine Ecosystems through global knowledge networks (SmartNet)	INCT Biodiversity of the Blue Amazon (INCT-BAA)	National Science and Technology Institute on Biodiversity of The Blue Amazon	Brazil	Eduardo Secchi; Manuela Bassoi; Beatrice Padovani	edu.secchi@furg.br; manu.bassoi@gmail.com; beatrice.ferreira@ufpe.br	Julyana Pereira Simas	julyana.psimas@gmail.com
46.2	December 2022	64. Empowering Women for the UN Decade of Ocean Science for Sustainable Development	Women in blue: gender equity for ocean	Federal University of São Paulo	Brazil	Leandra R. Gonçalves	goncalves.leandra@unifesp.br		
51.2	June 2022	UN7. Ocean Literacy With All (OLWA)	Maré de Ciência (Tide of Science)	Universidade Federal de São Paulo (UNIFESP)	Brazil	Ronaldo Christofoletti	maredeciencia@gmail.com		
74.5	June 2024	69. Cultural Heritage Framework Programme	Recovering and reusing ghost nets (NETS FOR THE OCEAN)	Marulho	Brazil	Beatriz Mattiuzzo	bia@fazermarulho.com.br		

81.4	March 2024	Not yet defined	Coalizão Paraná pela Década do Oceano	Universidade Federal do Paraná	Brazil	Camila Domit	camila.lec@ufpr.br		
82.4	March 2024	144. CoastPredict - Observing and Predicting the Global Coastal Ocean	Popular Observatory of the Sea - Amazon coast	Instituto de Pesquisas Científicas e Tecnológicas do Estado do Amapá-IEPA	Brazil	Valdenira Santos	valdenirasantos@iepa.ap.gov.br		
83.4	March 2024	176. Global Estuaries Monitoring (GEM) Programme	CONTAMINATION IN MANGROVES OF NORTHEAST BRAZIL	Federal Rural University of Pernambuco	Brazil	Caroline Miranda Biondi	caroline.biondi@ufrpe.br		
84.4	March 2024	Not yet defined	Plastic oceans Monitoring the plastic	University Centre Cesmac	Brazil	Jessé Pavão	jesse.marques@cesmac.edu.br		
85.4	March 2024	Not yet defined	Technologies to extract microplastics from the sea	FEDERAL UNIVERSITY OF CEARA	Brazil	Rilvia Santiago-Aguiar	rilvia@ufc.br		
87.4	March 2024	Not yet defined	Observadores da Natureza para o Desenvolvimento Ambiental das Ilhas Oceânicas	Universidade Federal Fluminense	Brazil	Carlos Eduardo Leite Ferreira	carlosferreira@id.uff.br		
88.4	March 2024	Not yet defined	Recycling on the development of sensor for oceans	Universidade Federal do Espírito Santo	Brazil	Arnaldo Leal Junior	leal-junior.arnaldo@ieee.org		

89.4	March 2024	UN7. Ocean Literacy With All (OLWA)	InterAntar - mediação das ciências polares	Federal University of ABC	Brazil	Silvia Dotta	silvia.dotta@ufabc.edu.br		
9.2	September 2022	9. Global Ocean Corps and Conveyor	Lusophone Hub of the Ocean Decade	University of São Paulo - USP	Brazil	Wânia Duleba	wduleba@usp.br		
9.6	July 2024	UN7. Ocean Literacy With All (OLWA)	AquaRio in the ocean decade	Instituto Museu Aquário Marinho do Rio de Janeiro	Brazil	Rafael Valle	rafael.franco@aquariomarinhodorio.com.br		
91.4	March 2024	UN26. Global Environment Monitoring System for the Ocean and Coasts (GEMS Ocean) Programme	3D sensors for contaminants and marine toxins	Federal University of Santa Catarina	Brazil	Iolanda Cruz Vieira	iolanda.vieira@ufsc.br		
92.4	March 2024	Not yet defined	Hyperspectral sensing of coastal soils	Federal University of Santa Catarina	Brazil	Alexandre ten Caten	ten.caten@ufsc.br		
94.4	March 2024	Not yet defined	Sustainability as solution to marine litter	Federal University of Paraiba - UFPB	Brazil	Amelia Santos	amelia.santos@academico.ufpb.br		
95.4	March 2024	Not yet defined	Sustainable technologies to improve water supply	Universidade Federal do Ceará	Brazil	Ronaldo Ferreira Nascimento	ronaldo@ufc.br		
96.4	March 2024	Not yet defined	Brazilian Tropical Estuaries Monitoring	Universidade Federal do Estado do Rio de Janeiro - UNIRIO	Brazil	Lazaro Laut	lazaro.laut@uniriio.br		

97.4	March 2024	UN7. Ocean Literacy With All (OLWA)	Blue University of the Brazilian coast	Institute of Marine Sciences (LABOMAR). Federal University of Ceará (UFC)	Brazil	Marcelo de Oliveira Soares	marcelosoares@ufc.br		
133.2	September 2022	17. Marine Life 2030	Gain knowledge to respond to multiple stressors	INVEMAR Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andréis	Colombia	Francisco Arias	francisco.arias@invemar.org.co		
138.2	June 2022	144. CoastPredict - Observing and Predicting the Global Coastal Ocean	Integrating Coastal Hazard Warning Systems for TAC	IOCARIBE + ICG	Colombia	IOCARIBE and Christa G. Von Hillebrandt-Andrade	christa.vonh@noaa.gov; l.inniss@unesco.org	IOCARIBE Secretariat	p.wills-velez@unesco.org
20.6	June 2024	172. Global Ecosystem for Ocean Solutions (GEOS)	Colombia Ocean-Climate Innovation Hub (Colombia Ocean Hub)	Laboratorio De Biologia Molecular Marina Biommar	Colombia	Laura Catalina Reyes Vargas	Lc.reyes10@uniandes.edu.co		
7.6	June 2024	4.3. Sustainable Blue Food Futures for People & Planet (BlueFood Futures)	Sustainable Mariculture Network	Universidad Nacional de Colombia sede Caribe	Colombia	Adriana Santos Martinez	asantosma@unal.edu.co		
197	October 2021	63. Fisheries Strategies for Changing Oceans and Resilient Ecosystems by 2030 (FishSCORE 2030)	Costa Rica and Honduras collective action for the implementation of the Voluntary Guidelines for the sustainability of small scale	CoopeSoliDar R.L	Costa Rica	Vivienne Solis Rivera	vsolis@coopesolidar.org		

			fishing in the context of food security and poverty eradication.						
25.4	September 2023	UN31. The Ocean Decade Tsunami Programme	Tsunami & Climatic RR at Protected Areas in CR	SINAMOT Program. National University Costa Rica (UNA)	Costa Rica	Silvia Chacon-Barrantes	sinamot@una.ac.cr		silvia.chacon.barrantes@una.ac.cr
26.5	March 2024	172. Global Ecosystem for Ocean Solutions (GEOS)	Blue Economy Coalition for Ocean Climate Solutions	Mar y Comercio	Costa Rica	Marilyn Valverde	marycomercioazul@gmail.com		
4.4	September 2023	UN2. Observing Together: Meeting Stakeholder Needs and Making Every Observation Count	Red de Tecnologías para el Océano	Colectivo Internacional Pelagos Okeanos	Costa Rica	Sergio Cambronero Solano	info@somospelagos.com		addyef10@gmail.com
44.6	June 2024	26. Ocean Biomolecular Observing Network (OBON)	ATLASea: Atlas of marine genomes (ATLASea)	Centre national de la recherche scientifique (CNRS)	France	Hugues Roest Crollius	hrc@bio.ens.psl.fr		
44.6	June 2024	26. Ocean Biomolecular Observing Network (OBON)	ATLASea: Atlas of marine genomes (ATLASea)	Centre national de la recherche scientifique (CNRS)	France	Hugues Roest Crollius	hrc@bio.ens.psl.fr		
140.2	June 2022	107. The Nippon Foundation-IOCARIBE	MACHC-IOCARIBE	National Land Agency Hydrographic Unit	Jamaica	Diego Billings	diegobillings35@gmail.com;	IOCARIBE Secretariat	p.wills-velez@unesco.org

		GEBCO Seabed 2030 Project	Seabed 2030 Project				diego.billings@nla.gov.jm		
6.6	June 2024	172. Global Ecosystem for Ocean Solutions (GEOS)	Engineering Resilient Caribbean Coastlines (ENRICO)	Smith Warner International	Jamaica	David Smith	david@smithwarner.com		
10	October 2021	Not yet defined	Manejo Costero Integrado como Medida de Adaptación al Cambio Climático Integrated Coastal Management as an Adaptation to Climate Change Measure	Instituto de Ciencias del Mar y Limnología UNAM	Mexico	Vivianne Solis Weiss	solisw@cmarl.unam.mx		
37	October 2021	UN1. Ocean Observing Co-Design-Evolving Ocean observing for a sustainable future	Ocean Monitoring and Prediction Network for the Sustainable Development of the Gulf of Mexico and the Caribbean	Consorcio de Investigación del Golfo de México (CIGOM) is a network of Mexican research and higher education centers and University Institutes: CICESE, CINVESTAV-Mérida, Escuela Nacional de Educación Superior-UNAM Mérida, UABC-Instituto de Investigaciones Oceanológicas, CIDESI, UNAM-Centro Ciencias	Mexico	Dr. Juan Carlos Herguera	herguera@cicese.mx		

				de la Atmósfera, UNAM-Instituto de Ciencias del Mar y Limnología, UNAM-Instituto de Biotecnología, Universidad Autónoma del Carmen UNACAR, Instituto Nacional de Ecología y Cambio Climático (INECC), Facultad Ingeniería Universidad de Antioquia Colombia					
119	October 2021	Not yet defined	Resilience of the ecosystems, fisheries and marine-based economy under a persistent anomalous warm and low-productivity regime in the Gulf of California	Instituto de Ciencias del Mar y Limnología, Universidad Nacional Autónoma de México	Mexico	Dr. Carlos Jorge Robinson-Mendoza, Director	robmen@unam.mx		
136.2	June 2022	189. Joint Exploration of the Twilight Zone Ocean Network (JETZON)	Enhancing capacity development in the TAC Region	Universidad Nacional Autónoma de México (UNAM)	Mexico	Elva Escobar	escobri@cmarl.unam.mx	IOCARIBE Secretariat	p.wills-velez@unesco.org
137.2	October 2022	Not yet defined	Ocean Literacy in the TAC Region	Universidad Nacional Autónoma de México (UNAM)	Mexico	Elva Escobar	escobri@cmarl.unam.mx		p.wills-velez@unesco.org

31.5	June 2024	UN7. Ocean Literacy With All (OLWA)	The Mantaverse	Pelagios Kakunjá	Mexico	Jane Vinesky	janevinesky@gmail.com		
34.3	May 2023	12. Ocean Decade Research Programme on the Maritime Acoustic Environment (OD-MAE)	Ocean World of Sound: MesoAmerican Reef	Ocean World of Sound	Mexico	Raymundo Santisteban	ray.santisteban.avila@gmail.com; ray@the-stills.com		
28.5	March 2024	UN5. Ocean Best Practices for the Decade	Surfside Science	Metabolic Foundation	Netherlands (Kingdom of the)	Christie Mettes	christie@metabolic.nl		
41.6	June 2024	172. Global Ecosystem for Ocean Solutions (GEOS)	3D Purpose Built Reefs for Marine Restoration (Coast3D Reefs)	Coastruction	Netherlands (Kingdom of the)	Nadia Fani	info@coastruction.com		
28.4	May 2023	16. Ocean Voices: Building transformative pathways to achieve the Decade's outcomes	SIDS Ocean Science Policy Network - Pilot Project	University of the West Indies - St. Augustine Campus	Trinidad and Tobago	Nellie Catzim	ncatzim@gmail.com		
134.2	September 2022	17. Marine Life 2030	TAC Pollutants Observatory	IVIC Instituto Venezolano de Investigaciones Cientificas	Venezuela	Soraya Silva	soraya.j.silva@gmail.com	p.wills-velez@unesco.org	

135.2	September 2022	28. ForeSea - The Ocean Prediction Capacity of the Future	TAC Ocean Observing and Forecasting System	University of the Virgin Islands	United States of America (USA)	Douglas Wilson	doug@coastaloceanobs.com; Doug.Wilson@uvi.edu	p.wills-velez@unesco.org	
14.3	May 2023	UN2. Observing Together: Meeting Stakeholder Needs and Making Every Observation Count	Benefits of Ocean Observing Catalog	U.S. Integrated Ocean Observing System (IOOS) Program Office, National Ocean Service, National Oceanic and Atmospheric Administration	United States of America (USA)	Ralph Rayner	ralph.rayner@noaa.gov		
39	October 2021	16. Ocean Voices: Building transformative pathways to achieve the Decade's outcomes	The Ripple Effect: Capacity Sharing for the Ocean	The New England Aquarium (through its global Marine Conservation Action Fund (MCAF) Program)	United States of America (USA)	Elizabeth Stephenson	estephenson@neaq.org		
112	October 2021	44. The Coral Reef Sentinels: A Mars Shot for Blue Planetary Health.	Coral Reef Restoration Engaging Local Stakeholders Using Novel Biomimicking IntelliReefs	IntelliReefs (https://www.intellireefs.com/about-us-pdf)	United States of America (USA)	Melody Brenna, CEO & Co-Founder	melody@reeflifefoundation.org		
112.2	September 2022	17. Marine Life 2030	Submersible Technology to Advance Reef Science	2DegreesC	United States of America (USA)	Neil van Niekerk	n.vanniekerk@2degreesc.org		

117.2	September 2022	UN5. Ocean Best Practices for the Decade	Advocating for humane capture fisheries to support ocean and fisheries sustainability	Aquatic Life Institute	United States of America (USA)	Christine Xu	christine@ali.fish		
12.6	July 2024	4.3. Sustainable Blue Food Futures for People & Planet (BlueFood Futures)	F3 Future of Fish Feed	Anthropocene Institute	United States of America (USA)	Barbara Page; Ford Brodeur	f3fishfreefeed@gmail.com; ford@anthinst.org		
121.2	June 2022	189. Joint Exploration of the Twilight Zone Ocean Network (JETZON)	Ocean Twilight Zone Project	Woods Hole Oceanographic Institution	United States of America (USA)	Heidi Sosik	hsosik@whoi.edu		
142.2	June 2022	Not yet defined	NOAA Harmful Algal Bloom Forecasting	NOAA National Centers for Coastal Ocean Science	United States of America (USA)	Kaytee Pokryzwinski-Boyd	kaytee.boyd@noaa.gov		
2.2	June 2022	Not yet defined	Science Without Borders®: Conserving the Tropics	Khaled Bin Sultan Living Oceans Foundation (KSLOF)	United States of America (USA)	Elizabeth Thompson	thompson@livingoceansfoundation.org		
25.2	June 2022	Not yet defined	Crustal Ocean Biosphere Research Accelerator	Bigelow Laboratory for Ocean Sciences	United States of America (USA)	Beth Orcutt	cobra@bigelow.org		
27.4	May 2023	Not applicable	MERMAID Coral Reef Data Platform	Wildlife Conservation Society	United States of America (USA)	Emily Darling	edarling@wcs.org		

34.2	June 2022	57. Challenger 150 - A Decade to Study Deep-Sea Life	Deep-Ocean Genomes Program	Woods Hole Oceanographic Institution	United States of America (USA)	Timothy Shank	tshank@whoi.edu		
65.2	June 2022	17. Marine Life 2030	The Cozumel Coral Conservatory	Living Sea Sculpture	United States of America (USA)	Colleen Flanigan	misssnailpail@gmail.com		
98.2	October 2022	219. Ocean Acidification Research for Sustainability (OARS)	Enhancing Accessibility of OA Reference Materials	NOAA	United States of America (USA)	Madyson Miller	madyson.miller@noaa.gov		
58.5	January 2024	144. CoastPredict - Observing and Predicting the Global Coastal Ocean	Coastal Observation Lab in a Box	University of Edinburgh	United Kingdom of Great Britain and Northern Ireland (UK)	Greg Cowie	glcowie@ed.ac.uk		
Project		UN10	OceanTeacher Global Academy: Building Capacity and Accelerated Technology Transfer for the Ocean Decade	UNESCO/IOC Project Office for IODE	Belgium	Ms Claudia Delgado/Mr Greg Reed	ioc.training@unesco.org		

Table 3. Contributions

UNIQUE ID	DATE OF ENDORSEMENT	NAME OF PROPOSED DECADE PROGRAMME	LEAD INSTITUTION	COUNTRY	CONTACT PERSON	EMAIL ADDRESS	COMMS FOCAL POINT	COMMS FOCAL POINT EMAIL	ECOP FOCAL POINT	ECOP FOCAL POINT EMAIL	COMMS MATERIALS PROVIDED
1	June 2021	IOGP Environmental Genomics Joint Industry Programme	The International Association of Oil and Gas Producers (IOGP)	United Kingdom	Harvey Johnstone, Environment Director	hj@iogp.org	Dr Michael Marnane	michaelmarnane@chevron.com	TBC	TBC	YES
27	June 2021	The NASA Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission: Advanced satellite measurements of the sea and sky	NASA Goddard Space Flight Center	United States	Drs. Laura Lorenzoni and Jeremy Werdell	jeremy.werdell@nasa.gov	Ms. Sara Blumberg	sara.e.blumberg@nasa.gov	Dr Aimee Neeley	aimee.neeley@nasa.gov	YES
30	June 2021	Marine.Science	Bertarelli Foundation	United Kingdom	Damian Jensen	Damian.Jensen@waypointcapital.net	Heather Koldeway	Heather.Koldeway@zsl.org	Heather Koldeway	Heather.Koldeway@zsl.org	

33	June 2021	NASA Sea Level Change Science Team	NASA	United States	Nadya Vinogradova Shiffer	nadya@nasa.gov	Nadya Vinogradova Shiffer	nadya@nasa.gov	Dr Benjamin Hamlington	benjamin.d.hamlington@jpl.nasa.gov	
42	June 2021	IOGP Sound and Marine Life (SML) Joint Industry Programme (JIP)	The International Association of Oil and Gas Producers (IOGP)	United Kingdom	Harvey Johnstone	hj@iogp.org	Felicite Robertson	fr@iogp.org	TBC	TBC	YES
50	June 2021	MPAs as sentinel sites for ocean conservation, science and literacy	US National Oceanic and Atmospheric Administration	United States	Gonzalo Cid	Gonzalo.Cid@noaa.gov	Dr. Gonzalo Cid	Gonzalo.Cid@noaa.gov	Madyson Miller	Madyson.Miller@noaa.gov	
51	June 2021	NOAA Coastal Aquaculture Siting and Sustainability Program	US National Oceanic and Atmospheric Administration	United States	James Morris, PhD, Program Lead, Coastal Aquaculture Siting and Sustainability (CASS), Marine Spatial Ecology Division, NOAA/NCCOS	james.morris@noaa.gov					
59	June 2021	The Ocean Decade Image Bank and Toolkits	The Ocean Agency	United States	Richard Vevers	richard@theoceanagency.org	Richard Vevers	richard@theoceanagency.org			

116	June 2021	A Transformative Decade for the Global Ocean Acidification Observing System	National Oceanic and Atmospheric Administration	United States	Madyson Miller	madyson.miller@noaa.gov	Meredith Kurz, Program Analyst, Office of International Activities, NOAA Office of Oceanic and Atmospheric Research	meredith.kurz@noaa.gov	Dr Kerri Dobson	kerri.dobson@noaa.gov	
121	June 2021	Committee on Earth Observation Satellites - Coastal Observations, Applications, Services, and Tools (CEOS COAST)	National Oceanic and Atmospheric Administration (NOAA), National Environmental Satellite Data and Information Service (NESDIS), Center for Satellite Applications and Research (STAR)	United States	Paul M. DiGiacomo	paul.digiacomo@noaa.gov	Paul M. DiGiacomo	paul.digiacomo@noaa.gov	Merrie Beth Neely, GST Contractor for NOAA	merrie.neely@noaa.go	
122	June 2021	The World Ocean Database Programme (WODP): Openly discoverable, accessible, adaptable,	National Oceanic and Atmospheric Administration (NOAA)	United States	Hernan Garcia	Hernan.Garcia@noaa.gov	Hernan Garcia	Hernan.Garcia@noaa.gov	TBD	TBD	

		and comprehensive digital global profile oceanographic data of known quality									
124	June 2021	Integrating Coastal Wetlands Data into Greenhouse Gas (GHG) Inventories for Developing Countries: A New International Blue Carbon Initiative	United States Department of State and United States National Oceanic and Atmospheric Adminstriation	United States	Daniel Kandy	kandydd@state.gov	Monica Allen	Monica.Allen@noaa.gov	Alec Shaub	alec.shaub@noaa.gov	
133	June 2021	Promote Seabed 2030 and Ocean Mapping	US National Oceanic and Atmospheric Administration	United States	Trisha Bergmann	trisha.bergmann@noaa.gov	Alexis Maxwell	Alexis.Maxwell@noaa.org	Lauren Talbert	Lauren.Talbert@noaa.org	
135	June 2021	NSF Coastlines and People	U.S. National Science Foundation	United States	Stacy Aguilera-Peterson	saguiler@nsf.gov; ademery@nsf.gov; csuchman@nsf.gov;	National Science Foundation Coastlines and People Working Group; nsfcope@nsf.gov	nsfcope@nsf.gov; media@nsf.gov	Neha Pankow	npankow@nsf.gov	YES

						jmcmanus@nsf.gov	- For media inquiries, email NSF Public Affairs at media@nsf.gov				
140	June 2021	International Ocean Discovery Program	U.S. National Science Foundation	United States	Stacy Aguilera-Peterson	saguiler@nsf.gov; ademery@nsf.gov; csuchman@nsf.gov; jmcmanus@nsf.gov	Charna Meth, Executive Director of the IODP Science Support Office ; cmeth@ucsd.edu or IODP "Contact us" page: https://www.iodp.org/program-organization/science-support-office For NSF media inquiries, email NSF Public Affairs at media@nsf.gov	cmeth@ucsd.edu; media@nsf.gov	Samantha Bova	sbova@sdsu.edu	YES
142	June 2021	Global Ocean Biogeochemistry Array (GO-BGC Array)	U.S. National Science Foundation	United States	Stacy Aguilera-Peterson	saguiler@nsf.gov; ademery@nsf.gov; csuchman@nsf.gov; jmcmanus@nsf.gov	GO-BGC Team; info@go-bgc.org - For media inquiries, email NSF Public Affairs at media@nsf.gov	info@go-bgc.org; media@nsf.gov	Yui Takeshita	yui@mbari.org	YES

146	June 2021	GEOTRACES	U.S. National Science Foundation	United States	Elena Masferrer	elena.masferrer-dodas@univ-tlse3.fr	GEOTRACES International Project Office, Elena Masferrer Dodas, Executive Officer; ipo@geotraces.org - For media inquiries, email NSF Public Affairs at media@nsf.gov	ipo@geotraces.org; media@nsf.gov	Laura Whitmore, Post-Doctoral Researcher, College of Fisheries and Ocean Sciences, University of Alaska Fairbanks	lmwhitmore@alaska.edu	YES
166	June 2021	France's Priority Research Program "Ocean of solutions"	IFREMER - Institut français de recherche pour l'exploitation de la mer CNRS - Centre national de la recherche scientifique	France	François HOULLIER, CEO Ifremer	francois.houllier@Ifremer.fr	Emmanuelle Platzgummer	emmanuelle.platzgummer@ifremer.fr	Celine Degremont	Celine.degremont@ifremer.fr	
188	June 2021	Esprit de Velox	Association Esprit de Velox	France	François FREY	francoisf@espritdevelox.org	Chloé Le Cam	chloelc@espritdevelox.org	Chloé Le Cam	chloelc@espritdevelox.org	Yes

204	June 2021	Multinational Image Classification Assessing Coastal Habitats	National Oceanographic and Atmospheric Administration, Southeast Fisheries Science Center	United States	Matthew W. Johnson	matthew.johnson@noaa.gov	Keeley Belva	keeley.belva@noaa.gov	Jennifer Leo	Jennifer.leo@noaa.gov	
226	June 2021	AGU's Mentoring365: UN Decade of Ocean Sciences	American Geophysical Union	United States	Janice Lachance, Executive Vice President, Strategic Leadership and Global Outreach	jlachance@agu.org	Mark Shimamoto	mshimamoto@agu.org	Tyler-Rae Chung	tylerrae.chung@gmail.com	
239	June 2021	Ocean Sciences Meeting 2022-2030	American Geophysical Union	United States	Heather Nalley	hnalley@agu.org	Victoria Forlini, Director	vforlini@agu.org			
507	December 2021	Polar Pod Expedition	Ocean Polaire	France	Jean-Louis ETIENNE	jle@jeanlouisetienne.com; info@jeanlouisetienne.com	Elsa Pény Etienne	elsa@jeanlouisetienne.com			
4.2	June 2021	Center: Chemical Currencies of a Microbial Planet	Woods Hole Oceanographic Institution	United States of America (USA)	Elizabeth Kujawinski, Laura Gray	ekujawinski@whoi.edu; laura.gray@whoi.edu	Dr. Laura Gray	laura.gray@whoi.edu	Mr. Matthew S. Schechter	mschechter@uchicago.edu	

27.2	June 2022	Inundation Signatures on Rocky Coastlines	Williams College	United States of America (USA)	Ronadh Cox	rcox@williams.edu	Prof. Rónadh Cox	rcox@williams.edu	Dr. Annie Lau	annie.lau@uq.edu.au	
28.2	June 2022	Global Fund for Coral Reefs	United Nations Multi-Partner Trust Fund Office	United States of America (USA)	Nicole Trudeau	nicole.trudeau@undp.org			Nicole Trudeau	nicole.trudeau@undp.org	
148.2	June 2022	Sea Grant International	NOAA	United States of America (USA)	Madyson Miller	madyson.miller@noaa.gov	Meredith Kurz	meredith.kurz@noaa.gov	Mr Sean Mahaffey	sean.mahaffey@noaa.gov	
150.2	June 2022	National Sea Grant College Program	NOAA Sea Grant	United States of America (USA)	Rebecca Briggs	rebecca.briggs@noaa.gov	Amara Davis	amara.davis@noaa.gov	Amanda Lawrence	amanda.lawrence@noaa.gov	
58.2	September 2022	Leveraging Our Networks for the Ocean Decade	Sustainable Ocean Alliance	United States of America (USA)	Emily Tewes	emily@soalliance.org	Sabrina Skelly	sabrina@soalliance.org	Emily Tewes	emily@soalliance.org	
141.2	October 2022	IGIF-Hydro	United Nations Working Group on Marine Geospatial Information (UNWG-MGI), UN Committee of	United States of America (USA)	Chee Hai Teo	teo@un.org			Ms. Pearlyn Pang	pearlyn_pang@mpa.gov.sg; ggim@un.org	

			Experts on Global Geospatial Information Management (UN-GGIM)								
516	December 2022	Royal Society Ocean Science Policy Programme	The Royal Society	United Kingdom of Great Britain and Northern Ireland (UK)	Georgia Park	georgia.park@royalsociety.org					
523	June 2023	Peace Boat US - Youth for the SDGs Program	Peace Boat US	United States of America (USA)	Emilie McGlone	emilie@peaceboat-us.org	Emilie McGlone	emilie@peaceboat-us.org	Molly Rosaaen	oceans.peaceboat@gmail.com	
79.4	October 2023	Unpath'd Waters	Historic England	United Kingdom of Great Britain and Northern Ireland (UK)	Barney Sloane	Barney.Sloane@HistoricEngland.org.uk	Anthony Firth	Antony.Firth@HistoricEngland.org.uk	Heidi Hellinger-Bauer	heidi.hellinger-bauer@allianz.com	
144.2	October 2023	US Tsunami Contributions to IOC Tsunami Pt 1	NOAA	United States of America (USA)	Mike Angove	michael.angove@noaa.gov	Liz Tirpak	liz.tirpak@noaa.gov			

145.2	October 2023	US Tsunami Contributions to IOC Tsunami Pt 2	NOAA	United States of America (USA)	Laura Kong	laura.kong@noaa.gov	Liz Tirpak	liz.tirpak@noaa.gov			
17.5	January 2024	ICRI Plan of Action 2021 - 2024	International Coral Reef Initiative	United Kingdom of Great Britain and Northern Ireland (UK)	Francis Staub	fstaub@icriforum.org	Thomas Dallison	Thomas.dallison@icriforum.org	Margaux Monfared	Margaux.monfared@icriforum.org	
59.5	March 2024	EuroMarine Outlook on International Ocean Programs	EuroMarine - European Marine Research Network	France	Emma Bello; Josep Lluís Pelegrí	director@euromarinenetwork.eu; pelegri@icm.csic.es	Josep Lluis Pelegrí	pelegri@icm.csic.es	Inês Gregório; Nerea Piñeiro Juncal	oyster@euromarinenetwork.eu	
534	March 2024	Mediterranean Green Shipping Centre of Excellence	World Ocean Council	France	Lisa Simone de Grunt	lisa.degrunt@oceancouncil.org	Lisa Simone de Grunt	lisa.degrunt@oceancouncil.org	Lisa Simone de Grunt	lisa.degrunt@oceancouncil.org	
536	March 2024	Ocean Community Empowerment and Nature Grants	Department for Environment, Food, and Rural Affairs	United Kingdom of Great Britain and Northern Ireland (UK)	Victoria Bendall	ocean@defra.gov.uk	Clare Gorman	clgo@niras.com	Yolanda Sanchez Alvarez	yoal@niras.com	

540	Jul-24	Pan-Arctic Distributed Biological Observatory	University of Maryland Center for Environmental Science, Solomons, Chesapeake Biological Laboratory, Solomons, Maryland USA	United States of America (USA)	Jacqueline Grebmeier	jgrebmei@umces.edu					

ANNEX II

Defining the TAC Priorities

Table 1. Tropical Americas and Caribbean (TAC) Region Priorities

BARCELONA STATEMENT PRIORITIES	PRIORITY FOR THE REGION?
1. **Marine pollution reduction and management across the land-sea continuum including emerging pollutants** **Understand global distribution** and human health and ecosystem impacts of **marine pollution** across the land-sea continuum, including the identification of priority pollutants and consideration of emerging and unregulated pollutants.	• Identify, quantify and reduce sources of marine pollution. • Land-based sources of marine pollution. • Pollutants in fish & seafood. • Plastic pollution and marine litter. • Definition of a set of key pollutants. • Harmonization of methods. • Establishment of representative and sustainable long-term monitoring sites. These sentinel sites should adopt harmonized methodologies and be strategically located in representative areas to form a comprehensive monitoring network that can monitor the global extent of marine pollution, encompassing its wide regional variability (Cooper et al., 2023), from the most pristine to the heavily polluted areas • Develop a transboundary, multidisciplinary approach for a regional pollution observatory. • **Develop a Programme for the TAC region to respond to Conventions and Protocols.** • It is crucial to establish baseline databases and conduct long-term studies that enable the continuous monitoring of ocean health and the impacts of marine pollution. • Oil Spills: Enhancing the Region-Wide Information System for Oil Spills. **First priority** is to address data gaps related to the sources and impacts of priority pollutants (e.g., pollutants found in high concentrations, or with high toxicity, or with known adverse effects on biota or human health) and the most contaminated areas. To evaluate temporal trends and evaluate the effectiveness of control and remediation actions, it is necessary to implement representative sentinel sites in the region for long-term studies.

	Second priority is to compile these data into standardized and interoperable regional and global databases, based on common best practices for data collection and management, that are freely available and accessible, facilitating the sharing and comparing of information and supporting better decision-making. **Third priority** should be capacity development to help bridge the data gap between the Global North and the Global South, fostering the development and sharing of knowledge and technological solutions to mitigate marine pollution. **Partnerships and Resources**: IOC-UNESCO (IOCARIBE) and the UNEP Regional Seas Programme (Caribbean Environment Programme (CEP) could play a facilitative role in maintaining continuous communication among diverse stakeholders and promoting the application of collected data and information. Integration, synergies and interdependencies with other Challenges reducing, preventing, and mitigating marine pollution requires a holistic approach to ocean management which considers the full range of complex interrelationships between biotic and abiotic systems across the land-ocean continuum.
2. Marine and coastal ecosystem-based management including deep-sea ecosystems and emerging threats Enhance and scale-up marine and coastal ecosystem-based management approaches, including a focus on better understanding of and solutions for multiple stressors. Better understand deep-sea ecosystems, including vulnerability to climate change and new or emerging economic activities.	• The CLME Transboundary Diagnostic Analyses TDAs identified weak governance as a root cause of the failure to sustain provision of goods and services from marine ecosystems in the Wider Caribbean. • Protect, conserve and restore ocean ecosystems to improve the resilience of regional communities that depend on them. • Map and protect marine ecosystems, taking into account the effects of climate change. • Nature-based solutions, including ecosystem restoration. • Promote National Biodiversity Strategy and Action Plan (NBSAP) or equivalent efforts. • Promote solutions for multiple stressors. • Networks and open data hubs for better science communication, coordination and collaboration. • Improved remote ocean observation systems and use of data from ships and fishing vessels using data-sharing apps. • Diversify marine spatial planning focus from coastal areas to include deep ocean and more ocean-climate interactions. • Promote Marine Protected Areas (MPA); Marine Management Areas (MMA); Other Effective area-based Conservation Measures (OECMs) management that considers Ecosystem Approach to Fisheries (EAF).

	• Mapping of marine environment and resources particularly in the deep-sea ecosystem (FAO Nansen Vessel). • Data collection and assessment of marine resources. • Biodiversity Conservation: Understanding the distribution and health of marine ecosystems and species is crucial for biodiversity conservation. • Digital mapping and monitoring can help identify critical habitats, track species populations, and detect threats like overfishing and pollution. • IOCARIBE will prioritise strengthening the scientific capacity of Member States for ocean management at both national and transboundary levels. This approach will involve implementing the Strategic Action Programme for the Sustainable Management of the Shared Living Marine Resources of the Caribbean and North Brazil Shelf Large Marine Ecosystems (CLME+ SAP)." while also supporting the establishment and operation of a Coordination Mechanism and sustainable financing plan for ocean governance. These efforts aim to elevate the region's scientific expertise and facilitate coordinated, sustainable management of marine resources. • Enhancing scientific understanding of ocean ecosystems and their health indicators is crucial for ecosystem-based management (EBM). This is essential for a sustainable ocean economy and effective governance in the region. Improved coordination among key stakeholders is needed.
3. Equitable and resilient small-scale fisheries and aquaculture, and sustainable aquatic food production Encourage sustainable, resilient, and equitable small-scale fisheries (SSF) and aquaculture (SSA) and facilitate sustainable management of industrial fisheries. Strengthen sustainable aquatic food production and innovation for new	Human health and well-being: Sustainable blue foods are excellent sources of essential nutrients, contributing to overall human health and well-being, and can ease pressure on land-based agriculture (World Health Organization, 2019). Embracing Indigenous stewardship of marine resources has shown to be successful in preserving biodiversity, which also supports food security, human rights, and sovereignty of indigenous peoples around the world (FAO, 2021). • Institutionalisation of social-ecological system, EAF, EBM, ICM, MSP and similar inter- and trans-disciplinary approaches, particularly to SIDS problem-solving and opportunity creation. • Reduce or eliminate implementation gaps in fisheries and aquaculture integrated management plans with climate adaptation. • Use inter-sectoral linkages with SSF and SSA (e.g. to tourism) to incentivise and help capitalise innovation and entrepreneurship especially in SMMEs.

frontiers with a focus on developing countries and strengthened public-private partnerships.	• Develop new blue food labour and technology through revision of school and vocational science and technology curricula including adult learning and citizen science. • Sustainable Use of Marine Living Resources. • Aquatic foods a valuable resource for food and nutrition security. • Monitor environmental and climate change impacts, including ocean acidification. • Area based fisheries and biodiversity management and MSP.
4. Evidence-based Sustainable Ocean Plans (SOP) Underpin evidence-based Sustainable Ocean Plans (SOPs) at the national level and in relevant transboundary areas.	Promote the development of national sustainable ocean plans, and in the transboundary areas of the Gulf of Mexico LME, the Caribbean and North Brazil Shelf The main challenge is to harmonise and integrate plans and strategies that are developed by sector (silo approach) into a coherent national sustainable ocean plan. The TAC region could capitalise on the Regional / Sub-regional and National Ocean Plans, National Ocean Strategies, national incentives to the Maritime industry, Oil and Gas and ,renewable Energies, Fisheries National Plans, Tourism, Marine Spatial Planning, and Integrated Coastal Management. It is critical that governments develop integrated Sustainable Ocean Plans (Hanson et al., 2020) and related strategies that clearly place the restoration, protection, and sustainable management of the ocean's natural assets as a priority.
5. Sustainable and climate resilient ocean economy with ecosystem and societal co-benefits Encourage sustainable and climate resilient ocean economy projects, prioritising those that integrate	To define the content of this Priority for the TAC Region it is recommended to consider also the ABAS Action Plan, as well as the financial instruments / models as recommended in **Priority 8** below. • As mentioned in Priority 4, it is essential to promote sustainable and climate resilient projects that integrate environmental conservation, restoration and adaptation, especially in SIDS. • A strong enabling environment is needed to derisk private capital financing and investments and support this transition. Most notably the **gaps in current ocean governance and lack of clarity** around tenure are considered to create a high-risk environment to financiers. For example, governance tools might include the

environmental conservation with socio-economic benefits for local communities. **Challenge 4**: Develop a Sustainable and Equitable Ocean Economy: Generate knowledge, support innovation and develop solutions for equitable and sustainable development of the ocean economy under changing environmental, social and climate conditions	use of incentives and disincentives to encourage best practice, as well as a clear governance framework for the High Seas as a result of the new BBNJ treaty (Thiele 2022). ● This way development plans can promote integrated financing so that one sector does not impede progress in another and does not erode the resource base on which national and local social and economic priorities depend. Having strong plans in place - and the use of integrated ecosystem-based spatial management tools - as well as effective capture of and access to reliable data - would send a clear and positive signal to private sector financiers (de Sanctis et al., 2022). ● Policy Makers and Decision Makers: It is recommended to policy makers at national and international levels that by 2030, comprehensive policies and governance frameworks such as **sustainable ocean plans** are implemented, promoting sustainable management of ocean resources, and ensuring equitable access and benefits distribution among all stakeholders, particularly marginalised and indigenous communities. ● **Biodiversity Conservation**: Understanding the distribution and health of marine ecosystems and species is crucial for biodiversity conservation. Digital mapping and monitoring can help identify critical habitats, track species populations, and detect threats like overfishing and pollution. To prioritise [investments in capacity development], a capacity and knowledge landscape map and gap analysis of the sustainable ocean economy should be undertaken. This is a necessary step to ensure that initiatives to increase capacity and knowledge are doing so in a measurable way and that they underscore equity, innovative solutions, and sustainability.
6. **Climate mitigation and impacts of eventual marine carbon dioxide removal initiatives** i) Rapidly scale up climate mitigation including through marine renewable energy and management of coastal ecosystems. ii) Allow timely understanding of the technical, ecological, and social	● Ocean-climate solutions > Blue carbon focused on mitigation and carbon sequestration. ● Decade part of the climate action. ● Basic Ocean Observing System for the region. ● Coastal predictions. ● Biodiversity-based solutions for mitigation. ● The success of **Priority 6 / Challenge 5** is intricately linked to the outcomes of Challenges 1 to 4, which focus on understanding climate-ocean interactions, controlling marine pollution, conserving biodiversity, and ensuring sustainable food production. Success will include fulfilment of critical science and knowledge gaps with respect to climate adaptation and mitigation. Both approaches need to be addressed in parallel. Key

feasibility, potential impacts of proposed marine carbon dioxide removal initiatives and contribute to future policy and regulation development. **Challenge 5**: Providing Solutions to mitigate, adapt and build resilience to the effects of climate change. Enhance understanding of the ocean-climate nexus and generate knowledge and solutions to mitigate, adapt and build resilience to the effects of climate change across all geographies and at all scales, and to improve services including predictions for the ocean, climate and weather.	mitigation approaches include the development of marine renewable energies, reduction in marine pollution, the development of blue carbon, and marine carbon dioxide removal. Adaptation approaches include increased ocean literacy/awareness; co-designed governance and co-operation; Improved risk reduction policies; and improved predictive capability of ocean, climate and weather forecasts. High level agreements that have already, or will likely soon commit TAC countries to several obligations related to the ocean-climate nexus and ocean solutions include: ● UNFCCC and Paris Agreement. ● The Kunming-Montreal Global Biodiversity Framework (GBF). ● The Agreement on Marine Biodiversity of Areas beyond National Jurisdiction (BBNJ Agreement) or High Seas Treaty. ● The resolution at the UN Environment Assembly (UNEA-5) to End Plastic Pollution and forge an international legally binding agreement by 2024. ● Cartagena Convention. ● 2030 Agenda for Sustainable Development. These regulations and frameworks may introduce conflicts between the various rights and stakeholders and those undertaking the regulation.
7. Decision support tools for resilience of coastal communities Underpin adaptive governance and management systems and decision support tools for the *assessment of vulnerability and risk to coastal communities and marine industries*.	● Nature-based solutions ● Sargassum ● Integrated coastal hazard early warning systems (flooding, inundation, hurricanes, tsunamis ● Sargassum ● Coastal water quality ● Oil spills ● Harmful algae blooms ● Coastal erosion

	Capacity Development and Enhancement and Resource Sharing: In line with the Decade's Data and Information Strategy, resources will need to be mobilised not only for the development of the digital ecosystem backbone and end user services but also for capacity development in data management, sharing, and utilisation among all stakeholders, especially those in underserved regions. **Outcome 4:** Sustainable Policy and Governance Implementation Increased development and implementation of policy and governance frameworks that support sustainable ocean management and address the UN Ocean Decade Challenges at hand.
8. **Financial instruments, policies and models to diversify and accelerate investment in ocean Science** Develop economic models, policies, and innovative financial instruments to diversify and accelerate investment in ocean science, including for enhanced digital representation of the ocean and sustained and sustainable ocean observing and infrastructure.	• Harmonising ocean governance might facilitate more international cooperation **Outcome 4:** Sustainable Policy and Governance Implementation Increased development and implementation of policy and governance frameworks that support sustainable ocean management and address the UN Ocean Decade Challenges at hand. As mentioned, the real transformation will take place and last beyond the Decade, once Decade Actions are implemented at national level. For that, **national commitment and participation are essential**, and any financial and resource mobilisation model should be built up incorporating the obligations and facilities / advantages that countries have at their disposal. **To achieve this priority and to facilitate access to financial and other resources for implementing Decade Actions, firstly it is necessary for the Ocean Decade (led by the DCU) to decide on a Resource Mobilisation Strategy and Plan.** When developing such a strategy and plan, the Ocean Decade could capitalise on the models used for climate financing. As well, in formulating the strategy and plan in **the Tropical Americas and the Caribbean (TAC) Region**, the TAC Task Force might use as an example, in addition to initially proposed initiatives or options, the "Antigua and Barbuda Agenda for SIDS (ABAS) – a Renewed Declaration for Resilient Prosperity." Of course, ABAS is focusing on SIDS, but the financing and resource mobilisation models still are very much valid also for any other country. There are a series of recommendations provided in ABAS that are important discussing when proposing economic models, policies, and innovative instruments to diversify and accelerate investment in ocean science:

i) *"by strengthening, mobilising and providing financial resources to existing multilateral climate funds, such the Green Climate Fund, Global Environment Facility and its Special Climate Change Fund, and the Adaptation Fund. This requires harmonising, as appropriate, and simplifying the application requirements, as well as access and approval procedures for climate financing instruments, especially for SIDS."*

ii) and *"to support ocean-based action to conserve and sustainably use the ocean and its resources by **exploring, developing and promoting innovative financing solutions** to drive the transformation to sustainable ocean-based economies, and the scaling up of nature-based solutions, ecosystem-based approaches to support the resilience, restoration and conservation of coastal ecosystems, including through **public-private sector partnerships** and **capital market instruments**, provide technical assistance to **enhance the bankability and feasibility of projects**, as well as mainstream the values of marine natural capital into decision-making and address barriers to accessing financing, recognizing that further support is needed from developed countries, especially regarding capacity development, financing and technology transfer."*

Traditionally, the financial models used for investing in Ocean Science include:

- Government Funding
- Philanthropic Donations
- Academic Research Grants
- Corporate Sponsorship and Corporate Social Responsibility (CSR)
- International Development Aid
- Venture Capital for Marine Technology Startups
- Private Equity in Marine Infrastructure
- Bank Loans and Project Finance. Multilateral Development Banks
- Grants from International Organizations
- Academic Endowments and Foundations
- International Conventions and Agreements

Among possible innovative financial instruments to accelerate and diversify investment in ocean sciences are:

	• Public-Private Partnerships (PPPs) • Blue Bonds • Ocean Impact Investment Funds • Marine Ecosystem Services Credits • Blue Carbon Credits • Environmental Impact Bonds (EIBs) • Blue Venture Capital (VC) • Sustainable Blue Economy Bonds • Ocean Conservation Insurance • Blue Crowdfunding Platforms
9. Social science and ocean literacy research on human-ocean connection **Inform knowledge drawn from transdisciplinary social science** and ocean literacy research on human-ocean connection, behaviour change, and cultural engagement that can be integrated into Ocean Decade digital infrastructure and used to map and measure the impact of ocean literacy initiatives.	• Education • Ocean literacy for policy makers and industry sector In order to implement this priority in the TAC Region, it is important to recognise different barriers, enablers, and motivators to pro-ocean behaviour. The Working Group 10 identified four key "drivers" that "users" can influence to restore society's relationship with the ocean: (1) Multiple Knowledge Systems, (2) Communications, (3) Education, and (4) Cultural Connections. "Drivers" are key factors that have a major influence on a desired outcome; and "users" are individuals/groups actively engaged in generating the motivation, capabilities, and opportunities to support pro-ocean behaviour. It is also recommended to the Decade Coordinating Unit, funding agencies, philanthropic foundations, private sector entities, and international organisations that by June 2025 there is targeted resource mobilisation and a dedicated Decade call for transdisciplinary social science research on society-ocean connections, behaviour change, and policy change linked to ocean literacy drivers (communications, education, cultural connections). This collective research will directly inform the creation of a human-ocean connection / human-ocean values data set to be integrated into the Global Ocean Observing System (GOOS) platform and digital ocean infrastructure.

	It should be also a culture shift in the way that science is formulated, practiced, and communicated. There is an implicit understanding in the ocean community that ocean threats are an outcome of human behaviour. Shifts in science and the ocean community ensure that all sectors of society have strengthened connections with the ocean; understand the vital role the ocean plays in human and planetary well-being; and have increased motivation, capability, and opportunity to make decisions and behave in ways that ensure a healthy ocean.
10. Ocean health and human health Increase engagement with the health sector and better understand connections between ocean health and human health.	• Sargassum • Coastal water quality • Oil spills • Harmful algae blooms • Marine mammals consumption of heavy metals (mercury in fish) • Microplastic • Chemical pollution (use of pesticides and fertilizers) • Seafood quality • Water quality To identify and understand connections between ocean health and human health it is essential advancing in **Priority 1.** ● Scientific knowledge of the sources and impacts of marine pollution on the marine environment remains limited. ● For deep ocean areas, in particular, our understanding of marine pollution is almost non-existent. ● Knowledge of marine pollution is primarily focused on coastal marine areas in developed countries typically addresses a limited number of pollutants, such as POPs, trace elements like mercury, and nutrients. ● A lack of water and sediment quality criteria for substances of emerging concern (e.g., nanoparticles, rare earth elements) impedes the assessment of their ecological and human health risks. ● Limited information is available regarding the additive and cumulative effects of different pollutants as well as their impacts in the context of climate change.

	• A lack of harmonization of methods for studying marine pollution and marked variations in the availability of quality assurance and quality control information for these types of data among different types of pollutants is compounding our knowledge. • Limited knowledge of baseline concentrations of pollutants and a paucity of long-term studies further hampers our ability to assess temporal trends, differentiate between natural and human-induced stressors, evaluate the long-term impacts of pollution, and assess the effectiveness of regulatory measures. **In achieving this Priority in the TAC Region**, it is necessary to prioritise engaging and working on human health and ocean health connections with the Pan American Health Organization (PAHO), and National Health and Authorities / Agencies.

Table 2. Defining the TAC Region Priorities

BARCELONA STATEMENT PRIORITIES	PRIORITY FOR THE REGION?	EXISTING SCIENCE TO BRING TO THE DECADE?	EXISTING DECADE ACTION TO BRING TO THE TAC REGION?	NEW INITIATIVE NEEDED?	WP
1. **Marine pollution reduction and management across the land-sea continuum including emerging pollutants** **Understand global distribution** and human health and ecosystem impacts of **marine pollution** across the land-sea continuum, including the identification of priority pollutants and consideration of emerging and unregulated pollutants.	• Land-based sources of marine pollution • Pollutants in fish & seafood • Harmonization of methods • Plastic pollution and marine litter • Definition of a key pollutants set • Establishment of representative and sustainable long-term monitoring sites • Develop a Programme for the TAC region • It is crucial to establish baseline databases and conduct long-term studies that enable	• LBS Protocol • Cartagena Convention • REMARCO project • ACE facility (CBF) • Basil Convention GEF ISLANDS (BCRC-Caribbean) • LBS RAC CIMAB Cuba • LBS RAC IMA Trinidad & Tobago • RAC Curacao • GPA Protection from LB Activities • MARPOL Convention	• Healthy rivers, healthy ocean Decade Action • The Coral Reef Sentinels: A Mars Shot for Blue Planetary Health • Ocean Monitoring and Prediction Network for the Sustainable Development of the Gulf of Mexico and	• Light pollution Decade Action	Challenge 1 Refer 2 *Challenge 5 p. 11 Policies and to Cartagena Convention & Others International vs pollution. Refer 2 Challenge 1 p. 7 (3); 9(5); 11 (7); Sustainable Policy and Governance Implementation. P. 16*

	the continuous monitoring of ocean health and the impacts of marine pollution	Pollution from Ships • London Convention Dumping wastes at sea • Minamata Convention on Mercury • Stockholm Convention on POPs	the Caribbean • TAC Pollutants Observatory • Beyond One Ocean Health • IOGP Environmental Genomics Joint Industry Programme (C) • Values of the Ocean - a 10 area Decade Programme for protection and sustainable use of the ocean (C) • 98 Flourishing Oceans - Plastics and		

			Human Health (C) • 121 CEOS COAST (C) • 135 NSF Coastlines and People (C) • Global Ocean Biogeochemistry Array (GO-BGC Array) (C) • GEOTRACES (C) • France's Priority Research Program "Ocean of solutions" (C) • Global plastic ingestion bioindicators (P)		

			• Coastal Pollution Toolbox • Preventing ocean plastic in rivers (C) • Monitoramen t o Mirim Costeiro (P) • Automated Debris Imaging System of ocean plastic (P) • Nutrient Pollution – Global Action Network (PG) • Contaminatio n in Mangroves of Northeast Brazil (P) • Plastic oceans Monitoring the plastic (P)		

			• Technologies to extract microplastics from the sea (P) • Sustainability as Solutions to Marine Litter (P) • Global Ocean Corps and Conveyor (PG) • Connecting communities to Atlantic Ocean observing (P) • TAC Pollutants Observatory (P) • 1 IOGP Environmental Genomics Joint Industry		

			Programme (C) • 27 The NASA Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission (C) • 51 NOAA Coastal Aquaculture Siting and Sustainability Program (C) • 59 The Ocean Decade Image Bank and Toolkits (C) • 99 Global Fishing Index (C) • 124 Integrating Coastal Wetlands Data into		

			Greenhouse Gas (GHG) Inventories for Developing Countries: A New International Blue Carbon Initiative (C) ● 166 France's Priority Research Program "Ocean of solutions" (C) ● 204 Multinational Image Classification Assessing Coastal Habitats (C)		
2. **Marine and coastal ecosystem-based management including deep-sea ecosystems and emerging threats**	● Nature-based solutions, including ecosystem restoration	● CCS > Ti Whale An Nou ● WWF UNEP > Blue corridors	● The Coral Reef Sentinels: A Mars Shot for	Yes, as current hubs, portals and networks not effectively linking data and information	Challenge 2; Challenge 4 (ocean health / human health)

Encourage sustainable, resilient, and equitable small-scale fisheries (SSF) and aquaculture (SSA) and facilitate sustainable management of industrial fisheries. Strengthen sustainable aquatic food production and innovation for new frontiers with a focus on developing countries and strengthened public-private partnerships.	• Promote National Biodiversity Strategy and Action Plan (NBSAP) or equivalent efforts • Promote solutions for multiple stressors • Networks and open data hubs for better science communication, coordination and collaboration • Improved remote ocean observation systems and use of data from ships and fishing vessels using data-sharing apps • Diversify marine spatial planning focus from coastal areas to include deep ocean and more ocean-climate interactions	• TNC > blue carbon • TNC > coral reef restoration • Mangroves • Birds • Sargassum • Seagrass • Turtle habitats • University of West Indies > deep sea • Sand dunes (Mexico DUNAS) • PROCARIBE+ • Key Biodiversity Areas (KBAs) as marine conservation priorities • OECS-ESD > Regional Environmental Information ecosystem (REIS) • UWI Centre of Excellence for Blue Economy & Oceanography (COBE) > regional capacity development	Blue Planetary Health (PG) • Global Ecosystem for Ocean Solutions (GEOS) (PG) • Seabed Mining & Resilience To EXperimental impact • 168 Reef Recovery 2030 (C) • 28.2 Global Fund for Coral Reefs (C) • Downscaling Climate and Ocean Change to Services (C) • Global Ocean Corps and Conveyor (PG) • CoastPredict (PG) • Resilience of the ecosystems, fisheries and marine-based	to real-world use case of evidence-based or influenced EBM decision-making	

	• Marine Protected Areas (MPA); Marine Management Areas (MMA); Other Effective area-based Conservation Measures (OECMs) management that considers Ecosystem Approach to Fisheries (EAF) • Mapping of marine environment and resources particularly in the deep-sea ecosystem (FAO Nansen Vessel) • Data collection and assessment of marine resources • Biodiversity Conservation: Understanding the distribution and health of marine	• UWI Global Institute for Climate Smart and Resilient Development (GICSRD) > to enhance networking and access to [open] data • CRFM Sargassum project • Fragments of Hope coral restoration	economy under a persistent anomalous warm and low-productivity regime in the Gulf of California • Submersible Technology to Advance Reef Science • Ocean Twilight Zone Project (P) • Connecting communities to Atlantic Ocean observing (P) • Enhancing capacity development in the TAC Region • NOAA Harmful Algal Bloom Forecasting (P) • Science Without Borders®: Conserving the Tropics (P)		

	ecosystems and species is crucial for biodiversity conservation • Digital mapping and monitoring can help identify critical habitats, track species populations, and detect threats like overfishing and pollution		• Hope for Reefs (P) • Chemistry, Observation, Ecology of Submarine Seeps (P) • Deep-Ocean Genomes Program • WCO Biomolecular Observing Network (P) • 43.2 Image analysis by citizens for ocean's life study (P) • 1 IOGP Environmental Genomics Joint Industry Programme (C) • 27 The NASA Plankton, Aerosol, Cloud, ocean Ecosystem		

			(PACE) mission (C) • 34 Marine Science (C) • 42 IOGP Sound and Marine Life (SML) Joint Industry Programme (JIP) (C) • 50 IOGP Sound and Marine Life (SML) Joint Industry Programme (JIP) (C) • 51 NOAA Coastal Aquaculture Siting and Sustainability Program (C) • 59 The Ocean Decade Image Bank and Toolkits (C) • 86 Values of the Ocean a 10 area Decade Programme for		

			protection and sustainable use of the ocean (C) • 98 Flourishing Oceans - Plastics and Human Health (C) • 116 A Transformative Decade for the Global Ocean Acidification Observing System (C) • 121 CEOS COAST (C) • 124 Integrating Coastal Wetlands Data into Greenhouse Gas (GHG) Inventories for Developing Countries: A New International Blue Carbon Initiative (C)		

			• 140 International Ocean Discovery Program (C) • 202 Monaco Explorations (C) • 65.2 The Cozumel Coral Conservatory (P) • 92.2 Better Biomolecular Ocean Practices (P)		
3. **Equitable and resilient small-scale fisheries and aquaculture, and sustainable aquatic food production**	• Institutionalisation of social-ecological system, EAF, EBM, ICM and similar inter- and trans-disciplinary approaches to SIDS problem-solving and opportunity creation • Reduce or eliminate implementation gaps in fisheries and aquaculture integrated management plans with climate adaptation • Use inter-sectoral linkages with SSF and	• UWI-CERMES > capacity building and outreach, EAF, EBM, blue justice, climate and gender matters. • CRFM > fisheries value chain analysis and development; reform of governance and science-policy; implement CCCFP • CANARI > inclusion of civil society, blue	• Resilience of the ecosystems, fisheries and marine-based economy under a persistent anomalous warm and low-productivity regime in the Gulf of California (P) • Costa Rica and Honduras collective action for the	• More and better use of existing initiatives • Standardized method and resources to study ocean acidification in the Caribbean region • Monitor climate change impacts on marine resources • Aquaculture/ mari-culture development in the Caribbean to	Challenge 3, Challenge 4 Blue economy, Challenge 6 (Climate impact on fisheries p. 35), Challenge 7 (Observing system) Challenge 8 p. 47) Challenge 9 p. 26) *Refer 2 Challenge Targeted science priorities p. 17 19*

	SSA (e.g. to tourism) to incentivise and help capitalise innovation and entrepreneurship especially in SMMEs • Develop new blue food labour and technology through revision of school and vocational science and technology curricula including adult learning and citizen science • Sustainable Use of Marine Living Resources • Aquatic foods a valuable resource for food and nutrition security • Monitor environmental and climate change impacts, including ocean acidification • Area based fisheries and biodiversity management and MSP	SMME capacity and gender equality • CNFO > leadership institute, fisherfolk mobilisation for blue food revolution, more policy engagement • FAO-WECAFC set up new or improve working groups on Small Scale Fisheries (SSF) and Small Scale Aquaculture (SSA) topics, implementation of the SSF Guidelines • PROCARIBE+ and other GEF-funded projects > learning-by-doing and data management for Ecosystem Approach to Fisheries (EAF). • CRFM scientific reports/ publications/	implementation of the Voluntary Guidelines for the sustainability of small-scale fishing in the context of food security and poverty eradication. • NOAA Harmful Algal Bloom Forecasting (P) • Science Without Borders®: Conserving the Tropics • Hope for Reefs (P) • Beyond One Ocean Health (P) • 27 The NASA Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission (C) • 51 NOAA Coastal Aquaculture	increase the consumption of fish in the region • Awareness of the nutritional value of fish for pregnant mother and children	

		working group reports • CRFM/BE:CLME+ project • FAO/WECAFC working group reports/activities	Siting and Sustainability Program (C) • 59 The Ocean Decade Image Bank and Toolkits (C) • 86 Values of the Ocean a 10 area Decade Programme for protection and sustainable use of the ocean (C) • 99 Global Fishing Index (C) • 116 A Transformative Decade for the Global Ocean Acidification Observing System (C) • 122 The World Ocean Database Programme (WODP) (C) • 92.2 Better Biomolecular		

			Ocean Practices (P)		
4. Evidence-based Sustainable Ocean Plans SOP **Underpin evidence-based** Sustainable Ocean Plans (SOPs) at the national level and in relevant transboundary areas.	• Promoting the development of national sustainable ocean plans, and in the transboundary areas of the Gulf of Mexico LME, the Caribbean and North Brazil Shelf	• PROCARIBE+ • SOP • MSP • National Ocean Strategies and Plans •	• Global SOP • 59 The Ocean Decade Image Bank and Toolkits (C) • 65 Establishing Turkey's Marine Environment Strategy (C) (Reference)		
5. Sustainable and climate resilient ocean economy with ecosystem and societal co-benefits **Encourage sustainable and climate resilient** *ocean economy* projects, prioritising those that integrate environmental conservation with socio-economic benefits for local communities.	• Promote sustainable and climate resilient projects that integrate environmental conservation, restoration and adaptation, especially in SIDS	• CBF CAR Bluefin • Blue green enterprises program (CANARI) • Key Biodiversity Areas (KBAs) as marine conservation priorities • MPA • MSP	• Integrated Coastal Management as an Adaptation to Climate Change Measure (P) • SEA'TIES (P) • A regional coupled atmosphere-ocean model (P) • Deep-Ocean Genomes Program		

			• Beyond One Ocean Health (P) • 27 The NASA Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission (C) • 50 IOGP Sound and Marine Life (SML) Joint Industry Programme (JIP) (C) • 51 NOAA Coastal Aquaculture Siting and Sustainability Program (C) • 86 Values of the Ocean a 10 area Decade Programme for protection and sustainable use of the ocean (C) • 99 Global Fishing Index (C)		

			• 124 Integrating Coastal Wetlands Data into Greenhouse Gas (GHG) Inventories for Developing Countries: A New International Blue Carbon Initiative (C) • 135 NSF Coastlines and People (C) • 140 International Ocean Discovery Program (C) • 168 Reef Recovery 2030 (C) • 92.2 Better Biomolecular Ocean Practices (P)		
6. Climate mitigation and impacts of eventual marine carbon dioxide removal initiatives	• Ocean-climate solutions Blue carbon focused on		• Global Ecosystem for Ocean Solutions (GEOS)		

Rapidly scale up climate mitigation including through marine renewable energy and management of coastal ecosystems. **Allow timely understanding of the technical**, ecological, and social feasibility, potential impacts of proposed marine carbon dioxide removal initiatives and contribute to future policy and regulation development.	mitigation and carbon sequestration • Decade part of the climate action • Basic Ocean Observing System for the region • Coastal predictions • Biodiversity-based solutions for mitigation		• Marine carbon sinks in decarbonisation pathways • Integrated Coastal Management as an Adaptation to Climate Change Measure • SEA'TIES (P) • A regional coupled atmosphere-ocean model (P) • Connecting communities to Atlantic Ocean observing (P) • MACHC-IOCARIBE Seabed 2030 Project (P) • 43.2 Image analysis by citizens for ocean's life study • 34 Marine.Science (C) • 42 IOGP Sound and Marine Life (SML) Joint		

			Industry Programme (JIP) (C) • 50 IOGP Sound and Marine Life (SML) Joint Industry Programme (JIP) (C) • 59 The Ocean Decade Image Bank and Toolkits (C) • 86 Values of the Ocean a 10 area Decade Programme for protection and sustainable use of the ocean (C) • 121 CEOS COAST (C) • 122 The World Ocean Database Programme (WODP) (C) • 124 Integrating Coastal Wetlands Data into		

			Greenhouse Gas (GHG) Inventories for Developing Countries: A New International Blue Carbon Initiative (C) • 133 Promote Seabed 2030 and Ocean Mapping (C) • 135 NSF Coastlines and People (C) • º140 International Ocean Discovery Program (C) • 166 France's Priority Research Program "Ocean of solutions" (C) • 168 Reef Recovery 2030 (C)		
7. Decision support tools for resilience of coastal communities **Underpin adaptive governance and management systems** and decision support tools for the assessment of	• Sargassum • Integrated coastal hazard early warning systems • Sargassum	• Sargassum • Modelling • Forecasting • Climate Modelling and Predictions.	• iCHEWS (P) • CoastPredict (PG) • Tsunami Programme (PG) • SEA'TIES (P)	• Robust EWS • Integrated coastal hazard early warning systems • Natural capital assessments and	

vulnerability and risk to coastal communities and marine industries.	• Coastal water quality • Oil spills • Harmful algae blooms • Coastal erosion • Nature-based solutions	Including Regional Climate Models (RCMs) • Sea Level Rise Projections • Coastal and Marine Ecosystem Monitoring • Storm Surge and Flood Modelling • Erosion and Sediment Transport Studies • Socio-Economic Impact Assessments • Marine Spatial Planning and Management Tools • Integrated Coastal Area Management (ICAM	• A regional coupled atmosphere-ocean model (P) • Connecting communities to Atlantic Ocean observing (P) • TAC Ocean Observing and Forecasting System • MACHC-IOCARIBE Seabed 2030 Project (P) • NOAA Harmful Algal Bloom Forecasting (P) • 1 IOGP Environmental Genomics Joint Industry Programme (C) • 3 3NASA Sea Level Change Science Team (C) • 50 IOGP Sound and Marine Life (SML) Joint Industry	ecosystem valuations	

		• Early Warning Systems, including Community-Based Preparedness Programmes • Policy and Governance Frameworks, especially National and Local Policies: Regulations and strategies to enhance resilience	Programme (JIP) (C) • 51 NOAA Coastal Aquaculture Siting and Sustainability Program (C) • 59 The Ocean Decade Image Bank and Toolkits (C) • 86 Values of the Ocean a 10 area Decade Programme for protection and sustainable use of the ocean (C) • 116 A Transformative Decade for the Global Ocean Acidification Observing System (C) • 121 CEOS COAST (C) • 122 The World Ocean Database		

			Programme (WODP) (C) • 124 Integrating Coastal Wetlands Data into Greenhouse Gas (GHG) Inventories for Developing Countries: A New International Blue Carbon Initiative (C) • 133 Promote Seabed 2030 and Ocean Mapping (C) • 135 NSF Coastlines and People (C) • 166 France's Priority Research Program "Ocean of solutions" (C) • 188 Esprit de Velox (C)		
8. **Financial instruments, policies and models to diversify and accelerate investment in ocean Science**	• Harmonizing ocean governance > more international cooperation	• CBF CAR Bluefin	• 50 The Ocean Decade Image Bank and Toolkits (C)		

Develop economic models, policies, and innovative financial instruments to diversify and accelerate investment in ocean science, including for enhanced digital representation of the ocean and sustained and sustainable ocean observing and infrastructure.	• Increase visibility of blue economy and the value of ocean goods and services for sustainable development as pivotal element in international cooperation	• Public-Private Partnerships (PPP) • Blue Bonds. Like the World Bank's Sustainable Ocean Fund (ProBlue) • Ocean Impact Fees. Fees levied on industries that benefit from the ocean, such as shipping, fishing, and coastal development. Funds are directed towards ocean research and monitoring • Ocean Crowdfunding	• 86 Values of the Ocean a 10 area Decade Programme for protection and sustainable use of the ocean (C) • 135 NSF Coastlines and People (C) •		
9. Social science and ocean literacy research on human-ocean connection	• Education	• Ocean Literacy for Caribbean	• Ocean Literacy With All (PG)		

Inform knowledge drawn from transdisciplinary social science and ocean literacy research on human-ocean connection, behaviour change, and cultural engagement that can be integrated into Ocean Decade digital infrastructure and used to map and measure the impact of ocean literacy initiatives.	• Ocean literacy for policy makers and industry sector	SIDS - The ocean and me	• Ocean Literacy in the TAC Region (P) • Projeto TransforMAR (P) • WCO Biomolecular Observing Network (P) • 51.2 Maré de Ciência (Tide of Science • 50 IOGP Sound and Marine Life (SML) Joint Industry Programme (JIP) (C) • 50 The Ocean Decade Image Bank and Toolkits (C) • 190 Universeum Ocean Science Lab (C) • Universeum Ocean Science Lab • 202 Monaco Explorations (C) • 226 AGU's Mentoring365: UN		

			Decade of Ocean Sciences (C) • 250 Piping Hot x UN Decade of Ocean Science for Sustainable Development (C) • 500 Ocean Literacy Toolkit for Governments (C) • 58.2 Leveraging Our Networks for the Ocean Decade (P)		
10. Ocean health and human health	• Sargassum • Coastal water quality • Oil spills • Harmful algae blooms • Marine mammals consumption of heavy metals (mercury in fish) • Microplastic • Chemical pollution (use of pesticides and fertilizers)		• Science Without Borders®: Conserving the Tropics (P) • Beyond One Ocean Health (P) • 27 The NASA Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission (C) • 50 The Ocean Decade Image	• Biological chemical early warning	

	• Food quality		Bank and Toolkits (C) • 86 Values of the Ocean a 10 area Decade Programme for protection and sustainable use of the ocean (C) • 86 Values of the Ocean a 10 area Decade Programme for protection and sustainable use of the ocean (C) • 98 Flourishing Oceans - Plastics and Human Health (C) • 204 Multinational Image Classification Assessing Coastal Habitats (C)		

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