Ocean Affairs and the Law of the Sea

Contribution of the Intergovernmental Oceanographic Commission of UNESCO to the Report of the Secretary-General

DEVELOPMENTS IN THE FIELD OF OCEAN AFFAIRS AND THE LAW OF THE SEA

Pursuant to United Nations General Assembly Resolution 76/72: Oceans and the law of the sea as of 9 December 2021
contribution of the Intergovernmental Oceanographic Commission of UNESCO (IOC) to the report of the Secretary-General.

MAIN DEVELOPMENTS OVER THE PERIOD

- Significant progress has been made in the implementation of the UN Decade of Ocean Science for Sustainable Development. Endorsed Decade Actions now number 43 programmes, 146 projects and 51 contributions. Five Decade Collaborative Centres have been established and will provide essential coordination support to the Decade Coordination Unit housed within IOC-UNESCO. The Decade Advisory Board was established and met twice throughout this period to

directions in ocean data and information management. The IODE network now comprises 93 national data centre. The Ocean Biodiversity Information System (OBIS) now has 99.98 million occurrences of 159,965 species from over 4,000 datasets.

- Against the backdrop of the January 2022 tsunami that affected Tonga and that was responded by the Pacific Tsunami Warning Center, tsunami exercises and drills have continued across coastal communities. The IOC Ocean Decade Tsunami Programme is being developed and has the aim of making 100% of at-risk communities prepared for and resilient to tsunamis by 2030. World Tsunami Awareness Day was celebrated across the world on 5 November 2021.

- Activities on marine spatial planning continued and 2021 saw the completion of the joint IOC-European Commission MSPglobal Initiative. This three-year programme left a strong legacy of knowledge products that will be essential for future actions in MSP and sustainable ocean planning. IOC-UNESCO is one of the leading technical institutions of the Ocean Action 2030 coalition that was borne out of the High-Level Panel for a Sustainable Ocean Economy and that has a goal to increase global capacity and action in sustainable ocean planning.

- Development Strategy has started. The Ocean Teacher Global Academy now regroups 17 regional and specialised training centres and is delivering training contributing to sustainable ocean management. In January 2022, a new toolkit or educational policy makers on ocean literacy was released and the IOC ocean literacy portal was revamped.

UNITED NATIONS DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT (2021–2030)

1. The period from June 2021 to May 2022 represented a period of intense activity for the Ocean Decade. In June 2021 the first results of the first Call for Decade Actions (No. 01/2020) that solicited close to 250 potential Decade contributions were announced, with other announcements following throughout the period as submissions were analysed and endorsement decisions made. To date, 170 Decade Actions have been endorsed through the first Call for Decade Actions. These Actions cover all ten Ocean Decade Challenges and are being implemented by lead partners from over 40 countries.

2. The second Call for Decade Actions No. 02/2021 was launched in October 2021 and closed on 31 January 2022. This Call solicited programmes contributing to Ocean Decade Challenges related to marine pollution, ecosystem management and restoration, and the ocean-climate nexus. It also solicited projects for 25 endorsed Programmes. In addition, funding streams from the AXA Research Fund and the MeerWissen Initiative were integrated into the Call for Decade Actions via a sponsored Call for Decade Actions mechanism. 38 Programme submissions and 134 project submissions from lead partners in 33 countries were received in response to this Call. Approximately 70 additional submissions were received in response to the sponsored elements of the Call. The submissions are currently being reviewed and the first set of endorsement decisions of four new programmes, 38 projects and five new contributions.

3. The third Call for Decade Actions No. 03/2022 was launched on 15 April 2022 and is soliciting programmes contributing to Ocean Decade Challenges related to sustainable blue food and sustainable ocean economy, as well as projects for 16 endorsed Decade programmes. This Call also solicits in-kind or financial contributions to support Decade Actions in Africa and Pacific SIDS.

4. Two meetings of the Interim Decade Advisory Board were held during this period, in September and December 2021. These meetings considered and made recommendations on the endorsement of Decade programmes, as well as providing advice on the conceptual framework for monitoring and evaluation for the Decade and commencing preparation of the second Call for Decade Actions in 2021.

5. The IOC Assembly at its 31st session approved the Terms of Reference for the Decade Advisory Board on the basis of Document IOC-31/3.7.Doc(1), including the selection process of its members. Between 5 July and 22 September 2021 a call for nominations was opened for 15 expert members of the Board. Via this process 243 nominations were put forward either by Member States of IOC-UNESCO, United Nations, United Nations entities, or intergovernmental organizations, as well as self-nominations. A Selection Panel was convened by the IOC Executive Secretary and composed of the IOC Chair and IOC Officers representing the five IOC electoral groups. With the technical support of the Decade Coordination Unit, this Panel was tasked with the selection of the 15 expert members of the Decade Advisory Board. In its evaluation the Panel undertook to ensure that the expert members have sufficient skills, knowledge, influence and impartiality regarding the vision and objectives of the Decade and are able to undertake the work outlined in the terms of reference. Diversity across sectors was a key consideration including a mix of members from the scientific community, the private sector, philanthropy and government. Expert members were also selected with due consideration to expertise, geographic, generational, and gender balance.

6. In addition to the 15 expert members, UN Legal Counsel/DOALOS, which is the Secretariat and focal point of UN-Oceans and the United Nations Convention on the Law of the Sea, will have one permanent seat on the Decade Advisory Board. The IOC Secretariat as coordinator of the Decade will also have a permanent seat on the Board. Three more seats were reserved for UN Agencies. In January 2022, following a process agreed with UN-Oceans that called for Expressions of Interest from UN Agencies for a rotating seat on the Board, the United Nations Environment Programme, World Meteorological Organization and the International Seabed Authority were all confirmed as UN Agency representatives for 2022.

7. The Decade Advisory Board was convened in January 2022 for an initial briefing session and then met in-person for its first operational meeting in March 2022. At this meeting, the Board discussed recommendations related to the endorsement of Decade programmes from Call for Decade Actions No. 02/2021 and discussed a range of strategic issues related to measuring progress of the Decade, resource mobilisation, the role of indigenous and local knowledge in the Decade, and the means of increasing engagement of Small Island Developing States and Least Developed Countries. A set of rules and procedures for the Board is presented in IOC/INF-1414.

8. During this period, Expressions of Interest for 7 Decade Collaborative Centres and 4 Decade Implementing Partners were received (IOC/INF-1413). The Decade Collaborative Centres are currently undergoing review including an independent Feasibility Study as per the process set out in the DCC operational guidelines (IOC/2021/ODS/23 Rev). Two of the four Decade Implementing Partners have been approved and the remaining two applications are being reviewed.

9. As part of its contribution to the Decade (IOC/INF-1418), IOC is leading 13 of these Decade Actions (out of a total of 15 UN-led Decade Actions), and is substantively involved in two other endorsed Decade Actions that are not led by UN partners. In response to Call for Decade Actions No. 02/2021, IOC is substantively involved in 9 submissions. IOC is also proposing to host 3 Decade Coordination Offices; one focused on observations linked to GOOS, one focused on data linked to IODE, and one regional coordination office in WESTPAC. These structures are described in IOC/INF-1418, together with information on resource needs for their operationalisation.

10. Twenty-eight (28) National Decade Committees have been created and six regional taskforces are convening partners in the development and operationalisation of regional Action Plans and programmes. An African regional taskforce is being established to oversee implementation of the Ocean Decade Africa Roadmap. Four thematic Communities of Practice regrouping endorsed Decade Actions are operational, and several others are in the final stages of preparation.

11. Meetings of informal working groups on communications, technology and innovation, and monitoring and evaluation provided valuable input during this period. A Data Coordination Group was established in December 2021 to support development and operationalisation of the data, information and knowledge strategy for the Decade. The Ocean Decade Expert Roster has been established to create a pool of experts to assist the IOC Secretariat with the identification of strategic

targets for Ocean Decade Challenges, in the review of Decade programme submissions, and in regular review processes of the Decade.

12. There were intensive stakeholder engagement and outreach efforts during this period. In-person or hybrid events focusing on different aspects of the Ocean Decade were held at the IUCN World Conservation Congress (Marseille, September 2021), UNFCCC COP 26 (Glasgow, November 2021), and Monaco Ocean Week (Monaco, March 2022). The Ocean Decade had a central role in the One Ocean Summit in Brest, February 2022. The revamped Ocean Decade website was launched in October 2021 and incorporates the Global Stakeholder Forum, an online community platform for exchange and collaboration which has over 4,000 registered users. The GenOcean communications campaign was launched on 4 April 2022 and is the public facing communications campaign of the Decade that aims to incite the general public to take action based on enhanced ocean knowledge.

13. Mobilisation of resources remains a key challenge for the Decade during the transition from the planning phase to the action phase. The Ocean Decade Alliance has grown during this period and now numbers nine Patrons and 15 institutional members. Alliance Sherpas meet regularly and are developing a workplan for the Alliance and prepare for strong visibility of this group during the UN Ocean Conference in Lisbon (June 2022). In addition to the sponsored Calls for Decade Actions included in the Call for Decade Actions No. 02/2021, three sponsored Calls have been developed and launched mobilizing close to USD10 Million.

14. There have been significant efforts to engage philanthropic Foundations during this period, and an in-person meeting of the Foundations Dialogue was held from 1 3 June 2022 in Rabat, Morocco hosted by the Foundation Mohamed VI for the Protection of the Environment. Secondments and loans of staff have been finalized with France and Fugro (a private sector partner) and have

24. In addition to continuing to co-sponsor the Blue Carbon Initiative (BCI) with Conservation International and IUCN, IOC now co-hosts together with Australia the secretariat for the coordination of the International Partnership for Blue Carbon (IPBC). A revised Strategic Plan of the IPBC and website was published and a new engagement strategy drafted.

25. Several Blue Carbon events were organized at COP-26 and the profile of Blue Carbon for

30. In collaboration with the Liege University, IOC organized the 53rd international Colloquium on ocean dynamics, 16 20 May 2022. The scientific steering committee, including IOC staff, helped to outline the programme and to secure additional funding to support participation of keynote speakers and young researchers.

31. The IOC Executive Council at its 51st session agreed to establish a new IOC working group focusing on multiple stressors. A draft scientific summary for policy-makers, introducing the issue of

all stakeholders to benefit from better knowledge, products and services delivery and providing evaluation capability to inform investment. Finally, the *CoastPredict* will innovate the science of observing and predicting the Global Coastal Ocean by enabling systems designed in a global framework to be implemented locally in coastal locations worldwide. Programme brochures have been published and can be found here: *Observing Together*, *CoastPredict*, *Ocean Observing Co-Design*.

54. GOOS recognised the need to provide support to lift the programmes by investing resources to fund one full-time role divided across the three programmes. Much has been achieved with limited resources to progress the programmes and tangible actions are already underway. The first Ocean Observing Co-Design Workshop will be held in June 2022, which - progress development of co-design processes with the observing and modelling communities, and key user stakeholders. The workshop will also support the development of the first exemplar co-design projects in key user need areas, including carbon budgets, biodiversity for local and global ocean resource management, marine heatwaves and hurricane forecasts.

55. Eleven endorsed ocean observing projects are supported under the Co-Design Programmes, which target key advances across the ocean observing system. The Observing Together Programme has engaged and initiated support for 5 capacity development projects. The CoastPredict Programme has 68 partner organizations contributing to the CoastPredict Steering Committee, and 4 endorsed projects, and 3 core projects submitted, contributing to 6 thematic areas for action in the global coastal ocean. In addition, the University of Bologna (Italy) has submitted a proposal for a Decade Collaborative Centre (DCC) for Coastal Resilience in a Changing Climate. Funded by the regional environmental agency this will support the work of CoastPredict and other Decade Actions under this Decade challenge area.

56. There are now over 121 endorsed Ocean Decade Programmes and Projects, a significant number of which (56%) are directly contributing to meeting the Ocean Decade Challenge 7 related to observations. This speaks both to the urgent need for an expanded ocean observing system to meet pressing societal needs, as foreseen in the GOOS 2030 Strategy, and also to the importance of active coordination across these actions. GOOS and the Ocean Decade Coordination Unit (DCU) have worked together in the last months to develop a proposal for a Decade Coordination Office for Ocean Observations. This will be managed by GOOS to support Challenge 7. It will enhance the collaboration across the actions focused on Challenge 7, and with other coordination and collaboration centres for data, modelling, and coastal resilience. It will also support the transformation of GOOS through integrating new observations into existing infrastructure to strengthen the legacy of the Decade investments and highlighting gaps. It will also work on data flow as a priority across all the ocean observing actions. A proposal for the Decade Coordination Office for Ocean Observing sboration

(IMDOS) and associated Marine Debris EOV, in partnership with key organizations working in this area including GESAMP, UNEP and the satellite community. This may become an action under the Ocean Decade.

GOOS and its co-sponsor WMO

64. The 2021 Extraordinary World Meteorological Congress (October 2021) approved the new WMO Unified Data Policy, which supersedes its older policies relating to the international exchange of meteorological, hydrological and climate data between the 193 Member states and territories of WMO. The approved WMO Unified Data Policy Resolution (Res.1) can be found here. For the first time, ocean data and the GOOS Essential Ocean Variables are called out in this WMO Data Policy, which is a call for action to share ocean data that reaches beyond the global meteorological community. The new policy
Earth system data weather, climate, hydrology, atmospheric composition, cryosphere, ocean and space weather. For the first time, ocean data are explicitly included in the policy, covering *in situ* and remotely-sensed observational data both in and above the ocean and at the sea-surface, from the open ocean to the coast. The ocean data aspects of the policy were developed in collaboration with

shall be exchanged on a free and unrestricted basis. The exchange of all other observed biogeochemical and biological/ecosystems GOOS EOVs and GCOS ECVs is recommended (see article for details). This is supportive in raising the importance of sharing EOV and ECV data in

Headquarters in New York from 6 to 10 June 2022. The IOC Chair, GOOS Co-Chairs, and several members of the GOOS Core Team have been invited to participate as panellists. The Informal Consultative Process was established by the General Assembly in 1999 in order to facilitate its annual review of developments in ocean affairs and the law of the sea. The ocean is at the core of key challenges facing society: food security, overfishing, climate change, extreme events, loss of biodiversity, and poor management of coastal ecosystems, challenges that have the potential to destabilize regions and impoverish billions of people. This is an important opportunity to highlight where coordinated support from member states can have a powerful global impact on meeting these challenges through targeted and impactful development of the sustained Global Ocean Observing System (GOOS), ing

practices more efficiently. Importantly the Ocean Decade endorsed the facilitate building a Community of Practice and take forward a Federated Network of methodological management systems in a co-design exercise with the Ocean InfoHub Project. Best practices are a major tool for training the next generation of ocean researchers.

the start point for discovering sources that are compliant with the ODIS-Architecture that is defined in the Ocean InfoHub project.

82. As invited by IOC-XXX (Decision IOC-XXX/7.2.2: Ocean Data and Information System [ODIS) the fully detailed and costed project proposal for the ODIS has been prepared for submission to IODE-XXVI and IOC-XXXI. The proposal defines the major components of the ODIS digital ecosystem, and clarifies the roles of the ODISCat catalogue of sources, Ocean InfoHub, and Partnership Centre for ODIS within the higher-level ODIS project, and provides a budget forecast to the end 2025. The IOC Ocean Data and Information System (ODIS) will be an e-environment where users can discover data, data products, data services, information, information products and services provided by Member States, projects and other partners associated with IOC. While ODIS will initially focus on "partners associated with IOC" this has been expanded, considering the partnership established under the UN Decade of Ocean Science for Sustainable Development. As such it will become a key contribution to the data chapter of the Ocean Decade implementation plan.

83. The Ocean InfoHub (OIH) Project (https://oceaninfohub.org/) is a three-year project, funded by the Government of Flanders, Kingdom of Belgium. The aim of the project is to support the initial development of the Ocean Data and Information System architecture (ODIS-Arch), as well as develop communities of practice (information systems and their end users) in three pilot regions: Africa; the Latin America and Caribbean region; and the Pacific Island Developing states. Thus, it aims to improve access to global ocean information, data and knowledge products for management and sustainable development. The project will not be establishing a new database, but will be supporting discovery and interoperability of existing information systems. The OIH Project commenced in April 2020 with the recruitment of a project manager and a number of national and

November 2021 (88 participants, 18 Member States). Several other online working sessions where organised including Working Group 2; Task Team Scientific Tsunami Hazard Assessment Makran Subduction Zone; IGCP 740 West Makran Paleo-tsunami Investigation; First Workshop for West Makran Paleo-tsunami Investigation; IOWAVE20 Task Team, and Intersessional Meeting of the Subregional Working Group for the North West Indian Ocean (WG-NWIO). Moreover, IOTWMS organised two regional Media training workshops on Standard Operating Procedures (SOP) for Tsunami Early Warning and Emergency Response in the North-West Indian Ocean (NWIO) region (7 9 September and 26 28 October 2021).

87. In the NEAMTWS region the 17th Session of the ICG for the Tsunami Early Warning and Mitigation System in the NEAMS (online) was held on 24 26 November 2021 (78 participants, 16 Member States). Several other online working sessions where organised including of the Task Team on Operations and the Steering Committee.

88. ICG/CARIBE-EWS-XVI was convened as an in presential meeting on 7 10 June 2022, hosted by the Government of Aruba, Kingdom of Netherlands, with the option of online participation for specific agenda items (Cf. ICG/CARIBE-EWS-XVI/3)

89. In the Pacific Ocean, the Twenty-ninth Session of the PTWS ICG (ICG/PTWS-XXIX, online) was organised on 1 8 December 2021 (116 participants, 27 Member States). Additional online meetings of the

Tsunami Events

94. The Hunga-Tonga Hunga-Tongatapu, Tonga began erupting at 4:07 UTC on 15 January 2022 based on Himawari-8 satellite images, with a massive explosive eruption at 04:14 UTC from seismic data. The eruption triggered

107. The IOC Tsunami Unit will be the official holder of the documentation supporting the Tsunami Ready recognition. The Tsunami Ready Recognition Programme web site (www.tsunamiready.org) serves as the public information site providing information on the Programme and recognized Tsunami Ready communities. The Tsunami Ready Recognition Programme web viewer (https://tsunamireadyviewer.ioc-tsunami.org) provides up-to-date metadata information on recognized communities, and those seeking recognition. The Tsunami Ready Recognition Programme is implemented by Member States. Each Member State is responsible for administering its national programme. Its National Tsunami Ready Board (NTRB) and Tsunami Ready Local Committee (TRLC) provide guidance to the community during the recognition process. The NTRB is responsible for reviewing and approving the Tsunami Ready Application. In the case of small countries and territories, the recognition may be made at the national/territorial level. In this case, a Regional Tsunami Ready Board (RTRB) would be responsible for reviewing and approving recognition. The IOC Manual and Guides 74, *Standard Guidelines for the Tsunami Ready Recognition Programme* (2022) serves as the primary implementing reference. The publication also includes information on the resources needed, tools, references, and videos, as well as training materials. The users of the Tsunami Ready Guidelines are local authorities of coastal communities at risk of tsunami impact, as well as representatives of Emergency Management Agencies or Disaster Management Offices and Disaster Risk Management experts working with coastal communities facing risk of tsunami impact.

Targeted capacity development and technical assistance

108. Human and national capacity to deal with tsunamis are still unevenly spread among nations. Since its start the Tsunami programme has contained a strong capacity development component. The aim of these activities is to enable Member States to understand the risk and know ways in which they can mitigate the hazard, provide warning to people in a timely manner, and be able to carry out awareness and preparedness activities to sustain knowledge and ability-to-respond across generations.

109. In the backdrop of the pandemic and under the coordination of the IOC-UNESCO Tsunami Unit in close collaboration with Tsunami Information Centres (CTIC, ITIC, IOTIC, NEAMTIC), the International Tsunami Information Center (2 reW(t)511( )-39(h)-11(a)-BT/F1 TJETQq0.00000887 0 591 0 0 1

Support for enabling research and policy development

117. Ongoing improvements of tsunami warning systems and mitigation efforts contribute to sustain the system, reduce costs and uncertainty, and maintain public trust.

118.

126. A new GlobalHAB initiative is addressing the mass occurrences of the macro algae Sargassum in both West Africa and the Caribbean. A sub-committee is established with an initial focus to join a GESAMP Task Team on Sargassum in organizing an Open Science Meeting (OSM) on Sargassum. This will involve the GESAMP technical secretaries of the sponsoring agencies that have indicated an interest in this topic (IOC, UN Environment, FAO, UNDP, WMO, IAEA). The results of the OSM will be published as a white paper or in a peer-reviewed journal and will form the basis

COVID-19, the event, initially planned to be held in Mexico, will instead be conducted as an on-line stakeholder consultation.

127. The comprehensive undertaking to develop the first Global HAB Status Report (GHSR) based on data compiled in the Harmful Algal Information system (HAIS) is now completed. HAIS is composed of IOC/HAEDAT, OBIS and the literature with the collaboration of IAEA, ICES, and PICES and with the financial support of the Government of Flanders (Kingdom of Belgium). HAIS thus provides the basis for the Global HAB Status Report. The GHSR consist of the HAIS Data Portal; a special issue of the *Elsevier journal Harmful Algae* with regional reviews and partly open access (published February 2021); a paper in *Nature Communications* (released 8 June 2021); and an IOC Synthesis and Scientific Summary for Policy Makers (IOC/INF-1399 released 8 June 2021). This first-ever global statistical analysis examined ~9,500 HABs events over 33 years and found that the harm caused by HABs rises in step with growth of the aquaculture industry and marine exploitation and calls for more research on linkages. Conducted over seven years by 109 scientists in 35 countries, the study found that reported HAB events have increased in some regions and decreased or held steady in others. A widely-stated view that HABs are on the rise throughout the world, perhaps due to climate change, could not be confirmed based on the available data.

128. The comprehensive IOC website on Harmful Algae was completely rejuvenated and relaunched February 2022 (https://hab.ioc-unesco.org/).

129. The Chairs of all Task Teams under the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms (IPHAB) met on 26 27 April in Denmark to define their contributions to address the UN Ocean Decade challenges and to draft initiatives to be submitted for endorsement as Decade activities.

130. Through the IOC Science and Communication Centre on Harmful Algae the longstanding opportunities for capacity enhancement in monitoring of HABs continue with several annual courses. Concluding examinations give the trainees certification in identification of HAB causative species. All courses are run within the IOC OceanTeacher platform and include a combination of preparatory e-learning, hands-on practical courses and an examination. All courses throughout 2021 were given on-line due to the COVID-19 situation, but the hands on training is resuming second half 2022. The IOC Centre collaborates with the Marine Institute (Ireland) and the University of Las Palmas de Gran Canaria (Spain) in operating the International Phytoplankton Inter-calibration (IPI) which is working with more than 100 participants from more than 50 laboratories. IPI is also established within the OceanTeacher platform and is accredited under ISO17043.

Marine invasive species

131. One million species are on the verge of extinction and the introduction of non-indigenous species (NIS) to new environments is listed as one of the five key drivers impacting biodiversity, according to the recent IPBES global assessment. SIDS are particularly vulnerable to such a risk, which also creates a real biosecurity risk for human health and the sustainability of livelihoods. It is

larger) marine structures linked to the unfolding and fast-growing blue economy, are the main vectors for the introduction and spread of NIS in the marine environment. The IOC has a number of activities addressing marine invasive species.

132. During 2021, the Flanders-funded Pacific islands Marine bioinvasions Alert Network (PacMAN) project, which is developing a national invasive species monitoring system as well as an

early-warning decision-support tool for Pacific SIDS, has developed strong relationships across the marine stakeholder community in Fiji. An operational arrangement between the Biosecurity Authority of Fiji (BAF) and the PacMAN project gives the project access to quantitative Polymerase Chain Reaction (qPCR) facilities at BAF and strengthens collaboration on marine biosecurity in Fiji. Continuing support from Fiji Ports Corporation enabled the identification of sampling sites at the Suva harbour focusing on the high-risk areas in terms of incoming international vessels, as well as access and use of port infrastructure for sampling. Together with the international scientific experts the PacMAN monitoring plan was drafted including a port baseline survey, a list of high-risk marine invasive species, and a sampling plan for routine monitoring. The monitoring plan was accepted by the full advisory board, chaired by the Ministry of Fisheries and Forests of Fiji. With the strong backing of the local community and scientific expertise, sampling was initiated in November 2021, and the first samples for metabarcoding and voucher specimens have been collected.

133. IOC cosponsors with ICES and IMO a Working Group on Ballast and Other Ship Vectors (https://www.ices.dk/community/groups/Pages/WGBOSV.aspx), which provides scientific support to the development of international measures aimed at reducing the risk of transporting non-native species via shipping activities. The Group met on-line in 2021 and will in 2022 meet on-line 2 4 May 2022 with Okko Outinen (Finland) as Chair.

134. Some Member States have recently taken steps to address the role of biofouling in the transfer of NIS and are at different stages in the development of national legislation and requirements to manage biofouling across maritime sectors. The IMO Secretariat, partnering with the Global Environment Facility (GEF) and the United Nations Development Programme (UNDP), have also stepped up their efforts to meet the challenge of biofouling. A new project was launched in January 2019, the GEF-UNDP-IMO GloFouling Partnerships, to develop suitable tools and provide capacity building on biofouling management in twelve developing countries and SIDS. IOC has joined the three agencies to provide scientific guidance and coordinate efforts to implement projects elements addressing non-ship pathways. Within this multi-year project IOC is currently developing best practices guidelines for management of biofouling in the aquaculture; offshore oil and gas ocean energy; offshore structures; ocean instrumentation; dredging and costal infrastructure sectors.

135. Under the leadership of the IOC, GESAMP has established a Working Group on Biofouling Management (WG44) with the overall objective to build a broader understanding on introduction and spread of NIS via biofouling across all maritime industries. The Working Group will provide a global overview of the impact of biofouling across all maritime industries and structures and support the initial information requirements of the GloFouling Partnerships for understanding the role of biofouling in the transfer of NIS. The Working Group comprises experts (members) from various disciplines and sectors which are related to impact and management of biofouling and worked be e-mail correspondence throughout 2021 to deliver a first draft of their global overview.

ASSESSMENT & INFORMATION FOR POLICY

Sustainable Development Goals (SDG)

136. In the context of the 2030 Agenda for Sustainable Development, several targets of SDG 14 are directly relevant to the work of IOC, particularly in the areas of marine pollution, ocean acidification, ecosystem-based management, as well as marine research capacity and transfer of marine technology. IOC is identified as the UN custodian by the Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs) for SDG indicators 14.3.1 (ocean acidification) and 14.a.1 (scientific

Hosted in Ostend, this new portal helps Member States, NODCs, other organizations and individual scientists to submit ocean acidification data. IOC HQ and IODE further develop a user-friendly GOSR data portal, which allows open access to all GOSR2020 data, and in particular the 14.a.1 information. In February 2020 and February 2021 IOC reported to the IAEG on both indicators. Several activities were undertaken to advance the methodology of indicators for targets 14.3 and 14.a, as well as in relation to target 14.1 on marine pollution (Nutrients).

138. Concern over the impacts of altered nutrient inputs, N, P and Si, to coastal waters led the UN

on eutrophication: *By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution*. UN Environment is the custodian agency for Indicator 14.1.1, and the IOC is responsible to develop ICEP as the indicator. To implement ICEP, it is required to develop a component on a dissolved silica model and evaluate the effectiveness of ICEP in predicting coastal impacts at the global scale. To promote and increase the understanding of the potential of ICEP as indicator, the IOC in 2019 produced an animation for YouTube: https://youtu.be/qW2nV2bsyCs. The detailed plan of work has been elaborated by the IOC N-CIRP Group of Experts in 2017. The work will require funding for two postdoctoral scholars and an expert workshop to validate models and will extra-budgetary funding. Identifying funding proved a hard challenge but was solved late 2021 as a combination of funds from UNEP via a UN to UN agreement as well as Norwegian (NORAD) funding. The work is now initiated and will be completed second quarter 2023.

World Ocean Assessment

139. IOC continues to provide scientific and technical support to the World Ocean Assessment (WOA) process established under the UNGA. A third cycle of assessment (2021 2025) was initiated under the UN Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects. In accordance with the programme of work for the third cycle, one of the outputs of the third cycle will be the production of one or more assessments of the marine environment, including socioeconomic aspects. In addition, the Regular Process will provide support for other ocean-related intergovernmental processes which may include a series of policy briefs for policymakers tailored to each process. In this context, a dedicated brief highlighting synergies between the Regular Process and the Ocean Decade will be produced.

140. IOC will also contribute to the

Alliance and provide a space for the announcement of high-level commitments to the Decade agenda.

152. The IOC Executive Secretary took part in the Expert Group Meeting on SDG 14 in preparation for HLPF 2022, on 10 11 May 2022 organised by UN DESA. The objective of this meeting was to take stock of progress towards achieving SDG 14, and to assess: what has changed since the SDG was last reviewed in 2017, including in relation to the COVID-19 pandemic; progress and next steps

seventeen UN Decade Action Incubators a region specific enabling mechanism for fostering partnerships and nurturing new ideas into concrete Decade Actions. Over 1,500 participants joined these Incubators and a launch event for the UN Decade endorsed COASTAL-SOS project, which covers a variety of ocean priority issues in the region, including the most important marine biodiversity and ocean ecosystem health such as coral reefs and conservation of marine mammals and sea turtles; multiple stressors such as climate change, marine heatwaves, ocean plastic pollution and harmful algal blooms; coastal inundation and erosion; the most interactive areas between the ocean and human activities such as the Asian Marginal Seas and the largest ocean circulation system in the Pacific Kuroshio; and the new development and application of tools and ocean technology such as remote sensing, ocean forecasting and service system, and marine spatial planning.

WESTPAC has been mobilizing actions from various stakeholders, and developing potential proposals for Decade Actions. Building on the tangible results of the Decade Action Incubators, the Sub-Commission has developed and submitted, in January 2022, four proposals for registration as
he strongest ocean current in the Western Pacific: the 2nd Cooperative Study of Kuroshio and Adjacent Regions

Pacific -

As is the case for WESTPAC, the prolonged pandemic also presents an opportunity to demonstrate its value in taking adaptive approach to programme implementation. Considering the varying COVID-19 development and preventive measures in different countries, WESTPAC intensifies its effort in developing and implementing country-specific activities to serve the needs of IOC Member States in the region for ocean sustainability.

WESTPAC continues to support IOC Member States in the region preparing for and responding to ocean acidification. To further enhance capacity of Member States for ocean acidification monitoring and analysis, and eventually achieve the SDG 14.3, WESTPAC conducts, in October

Decade Roadmap plan for Africa and the partnerships, co-design and co-delivery processes required for the development of the Ocean Decade Actions to deliver the Science We Need for the Ocean We Want in Africa.

IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE)

166. IOCARIBE has the overall responsibility for formulation of policy, principles and strategy, and for planning and coordination of the UN Decade of Ocean Science for Sustainable Development 2021 2030 in the Tropical Americas and the Caribbean Region (TAC). As a result of the planning process for the Ocean Decade that started early 2018, a Regional Planning Group (RPG) for the UN Ocean Decade was established in 2020 to advance and coordinate strategic partnerships and actions for the Tropical Americas and Caribbean Region (TAC) engagement in the Ocean Decade. The WTA RPG established 7 Working Groups to promote multi-disciplinary, inclusive co-design and implementation partnerships to achieve each of the 6 initial Societal Outcomes and one specific for Capacity Development, recognizing the efforts of the Working Groups and strategy for advancing the Ocean Decade in the Tropical Americas and the Caribbean Region. The seventh societal outcome, an Inspiring and G1E-11(.)5( )-198(Th)8(e)-11( )-198(se)-11(ve)11(n)-11(t)5(h)-11( )-198(so)-11(ci)17

IOC Regional Committee for the Central Indian Ocean (IOCINDIO)

172. Following Decision A-31/3.5.6. of the IOC Assembly, the Executive Secretary issued the Circular Letter, 2872 inviting Member States to nominate their representatives to the open-ended intersessional Working Group on the Status of the IOC Regional Committee for the Central Indian Ocean (IOCINDIO). Together with the Circular Letter, draft Terms of Reference for the Working Group were also submitted. The invitation stressed the importance of gender balance in the nominations of Member States Representatives. While IOC Member States bordering the Indian Ocean are directly concerned, all IOC Member were invited to participate in and contribute to the Working Group. Thus, with the view to ensure the widest participation possible, the Circular Letter was sent not only to the Official National Coordinating Bodies for liaison with the IOC, but also to Permanent Delegates, Observer Missions to UNESCO of IOC Member States, the Chair of IOC, Vice-Chairs, Chairs of IOCAFRICA, IOCINDIO, and WESTPAC and the National Commissions for UNESCO of IOC Member States. Both the IOC Secretariat and the IOCINDIO Chairs followed up with reminders to Member States. As a result, 23 Member States responded and nominated Representatives. The IOCAFRICA and WESTPAC Chairs were also invited and effectively attended the Working Group meetings as well as the past officers of the IOCINDIO. The Regional Coordination Operations Centre (RCOC) based in Seychelles also nominated a Representative as an observer.

173. The first meeting, which was held 28 February 2022 online, adopted the Terms of Reference

that IOCINDIO will participate and contribute to the IOCAFRICA kick off Conference of the UN Decade of Ocean Sciences for Sustainable Development in Egypt, 10 12 May 2022.

178. The IOCINDIO Chair informed Member States at the first meeting of the IOCINDIO Open ended Intersessional Working Group that Bangladesh is willing to organize the kick-off meeting of the UN Decade of Ocean Science for Sustainable Development for the Indian Ocean, likely in the last quarter of 2022.

CAPACITY DEVELOPMENT

179. (CD) activities. With the dedicated pool of resources bolstered by new funding from NORAD, the Secretariat could better focus its efforts, including a better coordination of CD tasks of the Decade Coordination Unit. In 2021, these activities focused on: (i) Priority Africa (ocean acidification and harmful algae, development of a database on training opportunities); (ii) tsunami ready communities in the Caribbean region; (iii) improved access to and sharing of ocean data and information in the Indian Ocean and Pacific region; (iv) development of video tutorials related to the Ocean Biodiversity Information System (OBIS); (v) development of the Index for Coastal Eutrophication Potential (ICEP) as the Indicator for Sustainable Development Goal 14.1.1 on Eutrophication (in cooperation with UNEP); and (vi) support to strengthen the coordination of IOC capacity development efforts.

180. Three more nodes of the Ocean InfoHub will be supported, in partnership with National

focal points and 10 CD focal points. Full results were made available online at the survey website https://surveys.ioc-cd.org.

186. The IOC Assembly (IOC Decision A-31/3.5.3) extended the current IOC CD Strategy to July 2023 and revised the terms of reference of the GE-CD to allow a continuation of the work on the revision of the IOC Capacity Development Strategy. At the third meeting of the Group of Experts, a Working Group on the revision of the IOC CD Strategy was established and tasked to work on the new IOC Capacity Development Strategy for 2023 2030 and present a proposal to the IOC Assembly at its 32nd session in June 2023.

Ocean Literacy

192. Recognizing that sustainable development cannot be achieved without ocean literate societies, the launch of the UN Decade of Ocean Science for Sustainable Development (2021 2030) is further accelerating the global reach of Ocean Literacy, as it has been designated a Decade Action

UN Environment Programme Finance Initiative, as well as the work done on Sustainable Ocean Economy by OECD. In addition to the short videos on ocean literacy, two live webinars on ocean data & risk management and Blue Finance (with a focus on insurance and blue bonds) took place in March 2022 with 450 participants. On 6 April 2022 a Peer Learning Session on SDG 14 was co-organized with UNEP on Ocean Literacy and Blue Economy in the context of the UNECE Forum on Sustainable Development).

202. In accordance to IOC Assembly Decision A-31/3.5.4, IOC Circular Letter, 2887 was sent to Member States to seek proposals for nominations of members of the Ocean Literacy Group of Experts.

Assessing the impacts of the COVID-19 pandemic on ocean science

203. The *Global Ocean Science Report* measures, in a systematic manner, investments in ocean science (human resources, infrastructure such as research vessels and laboratories) as a proportion of national R&D envelopes. Trends in scientific production, including through international scientific collaborations, and in the transfer of research findings to the application sectors (via patents and their licensing) are also measured by the GOSR. It is important to assess the impacts of the COVID-19 pandemic on such strategic investments in relation to the 2030 Agenda. The next full edition of the GOSR, expected to be published in 2025, will allow to measure the possible impact of the global pandemic on ocean science in the long-term, including *inter alia* employment, diversity in ocean science, core funding, additional investments, conferences, observations and publications.

IOC Sub-Commission for Africa and the Adjacent Island States (IOCAFRICA)

204. Capacity development continues to be a main area of focus, with three Regional Training Centres for the new phase of the Ocean Teacher Academy programme designated at the University of Ghana (Accra, Ghana), the Eduardo Mondlane University (Maputo, Mozambique) and the Kenya Marine and Fisheries Research Institute (Mombasa, Kenya). Training courses were organized on the following topics: Biological Observations in the Indian Ocean-from Microbes to Megafauna (online from 8-12 November 2021, conducted by INCOIS, India and DFFE, South Africa and attended by 70 students, 28 of them from Africa); Modelling for Ocean Forecasting and Process Studies (online 6 10 December 2021 conducted by INCOIS and ITCOOcean from India and attended by 78 students, 25 of them from Africa); Fundamentals of Ocean Mapping (hosted online by KMFRI from 28 November to 17 December 2021, and attended by 18 trainees all from Africa).

205. Bolstered by support from NORAD, the development of the regional node for the Ocean Information Hub has progressed well, with two online stakeholders meetings held in June 2020 and June 2021. Within the framework of this initiative IOCAFRICA has collected information on Marine policies and legislations, Ocean observations platforms, and marine related projects, experts and institutions which will be used to develop and update databases to be linked to the information hub. The development of a regional portal on training opportunities was completed and is now available at htt( )] TJo d 11 61(11 61(11 61(8( )-39(1(n)-11(g)t)5(i)-4(o)1-11(e)-11( )-85(r)15(e)-11()17(n)-11(i)17(n)-11(g

2021 with UNEP and IOCARIBE; Tsunami Awareness (online with UNDRR, 5 November 2020); Ocean Related Hazards in the Gulf of Guinea (online October 2021, with NIOMR, Nigeria), Ocean Observations in Africa (online 8 June 2021, with University Félix Houphouët-Boigny, Cô
Underwater Cultural Heritage (Windhoek, Namibia and online with the UNESCO Culture sector). The Global symposium on Mapping the Gaps (online 30 November

214. The OceanTeacher Global Academy Center at INVEMAR (Colombia) continued to provide training and capacity development activities to LAC countries and 239 experts were trained during the period July-December 2021. INVEMAR has been establishing partnerships with international and UN organizations to carry out training, seminars, workshops and courses, including the IAEA partnership for ocean acidification workshops.

215. The IODE Ocean InfoHub LAC component is being developed and in the last two quarters of 2021 has significantly advanced with its development building up on the CHM-TMT designed by INVEMAR and in the Caribbean Marine Atlas experience.

216. ODINCARSA counts with 10 NODCs, 7 ADUs (5 OBIS) and 1 AIU, and they carry their activities individually. ODINCARSA is actively participating in the development of the LAC OIH. OIH held 7 coordination meetings through 2021 and hosted one webinar. The region has 3 RTCs and 1 STC of OTGA. In 2021, 13 training courses were delivered with a total of 490 participants. Closer coordination with the TAC UN Decade Regional Planning Group may result in increasing activities and benefits for the region.

217. The Caribbean Marine Atlas (CMA) continues to develop as an online digital platform that stores and provides access to geospatial information (and related documents) on the "Marine Environment and Human Societies in the Wider Caribbean Region". Its two primary objectives are: (i) to support regional-level Integrated Ocean Governance; and (ii) to support Integrated Coastal Zone Management (ICZM) in IOCARIBE Member States.

218. The IOCARIBE-GOOS Steering Group has been re-organized and it is taking the lead to develop a framework for an observing system and for facilitating joint ocean observing missions among IOCARIBE Member States to measure variables related to severe weather forecasting and

wide Investments for sustainable Blue socio- . The new PPG aims to build on the results from the CLME (2009 2014) and CLME+ (2015 2021) Projects, and to give continuity to the implementation of a 10-year regional SAP. IOC of UNESCO / IOCARIBE participate in this new proposal. GEF Grant 17.2 million with ca. 59% for the MSP and Blue Economy component. IOCARIBE should closely follow up this initiative and consolidate its participation by establishing a UN2UN contractual arrangement and lead the MSP and Blue Economy component.

223. Also, in the GEF-supported Proj
Biologically Significant Area-
Implementation Partner.

IOC Sub-Commission for the Western Pacific (WESTPAC)

224. The Sub-Commission endeavours to accelerate transformations in capacity development through the integration of training and research, enhancement of endogenous capabilities and ownership of Member States, and the established mutual assistance and cooperation in the region. As a result of the prolonged pandemic, WESTPAC continued its adapted capacity development modality with a focus on tailored trainings at local/national levels.

225. The Sub-Commission continued to fulfil its voluntary commitment to the UN Ocean Conference, the IOC Capacity Development Strategy (2015 2023), and the UN Ocean Decade -

for the Promotion of Science, conducted a hybrid training on Jellyfish Identification, 17 18 March 2022.

IOC Regional Committee for the Central Indian Ocean (IOCINDIO

235. The activities of the first UNESCO cross-sectorial category 2 Centre (Iceland), namely the International Centre for Capacity Development: Sustainable Use of Natural Resources and Societal Change (GRO)
ained, despite COVID-19 and synergies with other IOC activities continue to be explored.