

NORTH INDIAN OCEAN HYDROGRAPHIC COMMISSION

22ST MEETING – YOGYAKARTA, INDONESIA, 13-15 FEBRUARY 2023

Report of the IHO Secretariat

Submitted by: IHO Secretariat

Executive Summary: This paper reports on activities of the IHO Secretariat that may impact the work of the North Indian Ocean Hydrographic Commission.

Status of Membership of the IHO

1. One of the main changes resulting from the entry into force of the revised IHO Convention is that, for States wishing to join the IHO that are already Member States of the United Nations, there is no requirement to seek the approval of existing Member States of the IHO. Since NIOHC21 there has not been any new members and the IHO membership still stands at 98. Unfortunately, Serbia and Syria remain suspended from Member States rights.

2. The non-IHO Member States of the NIOHC region are Jordan, Maldives, Somalia, Sudan and Yemen. Countries who are Member States of the IMO are encouraged to become IHO members and the IHO respectfully repeats its invitation to those non-IHO Member States to accede to the IHO Convention. The IHO Secretariat, in cooperation with the Department of External Relations of the Government of Monaco, stands ready to assist those non-IHO Member States with the application process for membership of the IHO, as recently done towards several non-IHO Member States in other hydrographic regions, and stands ready to pay High Level Visits to those States in the NIOHC region not yet IHO Member States.

3. Recommendations:

3.1 NIOHC is invited to encourage and propose to the IHO Secretariat High Level Visits to those States not yet IHO Member States.

Outcomes of the 6th Meeting of the IHO Council

4. The Council considered the proposed IHO Work Programme and Budget for 2023 and the three-year Work Programme and Budget for the period 2024–2026. It would also identify priorities for the Council over the next three years. The Council endorsed the recommendation by HSSC by which Goal 1 and its Targets in the IHO Strategic Plan should have the highest priority in the 2023–2026 Work Programme. The Council noted the outcome of the 9th session of the IMO NCSR on the revision of MSC.1/Circ.1503/Rev1 – ECDIS Guidance for Good Practice and Revision of MSC.232(82) – ECDIS Performance Standard (IHO CL 31/2022 refers) and took note of the associated commitments made towards the IMO and the IEC in particular (transition period for S-100 ECDIS, to become legal to use after 1 January 2026 and from 1 January 2029, new systems must comply with the new IMO Resolution on ECDIS Performance Standards).

5. C6 noted the recommendations made by HSSC on the automated production of paper charts and confirmed the Decision made at A-2 by which priority is to develop guidelines for the automated production of paper charts meeting S-4 chart minimum content requirements from S-101 ENC data. The Council welcomed the information provided by the Republic of Korea on the S-100 Test-bed Project and agreed that it is a critical component of the Roadmap. The Council invited IHO Member States to participate in this S-100 test-bed project and in addition, to consider whether other criteria should also be considered (expected geographical coverage implementation rate compared to existing S-57 ENCs, distribution and update mechanisms and NPubs coverage, for instance).

6. The Council noted the outcome of the IRCC April 2022 Workshop on the Strategic Performance Indicators, the new TORs of the IBSC and the progress made by IRCC to establish an IHO e-Learning Center. C-6 endorsed the new proposed Capacity Building Strategy, which will be submitted to the 3rd Session of the IHO Assembly for approval, and noted the decrease of Capacity Building fund over the last few years. The Council noted the progress made by IRCC in the development of the methodologies and metrics for SPIs allocated to IRCC and endorsed the proposals (definitions, metrics, action plan...) as reported in IHO CL 23/2022, with particular attention to SPI 1.2.2 - Percentage of navigationally significant areas for which the adequacy of hydrographic knowledge is assessed through the use of appropriate quality indicators (CATZOC) assigned by the Member States.

7. The Council approved the proposed amendment to the S-100 Implementation Roadmap with the updated version 2.0 dated July 2022. Version 3.0 of the Roadmap, to include an additional proposal on the dual fuel Concept for S-100 ECDIS, would appear only after approval by the forthcoming Assembly-3. C6 approved version 1.0 of the Guidelines on the Implementation of the WEND-100 Principles, noting that the efforts on establishing a common global gridding system could not reach consensus and is put on hold. C6 endorsed the Dual Fuel Concept for S-100 ECDIS Executive Summary and the full report, and noted that several Members requested guidance on the best way to prepare the operational implementation phase of S-100 data services within their Regional Hydrographic Commissions.

8. In view of the preparation of the new Council 2023-2025, the IHO CL 43/2022 provides the resultant distribution of the 20 seats on the Council allocated to the RHCs and those States that are eligible to be selected to occupy those seats, whilst the Secretariat will use the table of tonnages (2021-2023) provided in accordance with Finance Regulations of the IHO - Article 6 (a), subject to the addition of any new Member States, to determine the remaining 10 seats to be occupied on the Council.

9. Recommendations:

9.1 NIOHC members are invited to continue on the implementation of the IHO Strategic Plan and support IRCC in identifying measures and values to measure those SPI of regional interest allocated to IRCC, and to consider providing their CATZOC values - through the RENCs - to support the IHO Secretariat in the process of measuring SPI 1.2.2.

9.2 NIOHC members to note the updated version 2.0 of the S-100 Implementation Roadmap, and the version 1.0 of the Guidelines on the Implementation of the WEND-100 Principles, with particular attention to the creation of a new role of S-100 Services Coordinator or the expansion of the role of Regional Chart Coordinator to include S-1xx products.

9.3 NIOHC is invited to declare the identity of the State/s selected to occupy the first 20 seats on the Council that are allocated on a regional basis.

Preparation of the 3rd Session of IHO Assembly

10. The third session of the IHO Assembly (A-3) will take place in the Grimaldi Forum in Monaco from Tuesday 2 May to Friday 5 May 2023. The meeting of the Finance Committee and the meeting of the Heads of Delegations will take place on Monday afternoon, 1 May 2023 at the Grimaldi Forum, as well as a conference on the Empowering Women in Hydrography project. The Opening Ceremony for the Assembly will take place on Tuesday morning, 2 May 2023. At A-3 it is intended to celebrate the 120th Anniversary of the creation of GEBCO, as well as to invite those new Member States that have joined the Organization since the 1st Session of the IHO Assembly to present their flag. An Industry and a Member States exhibition will take place in the same period of A-3 at the Grimaldi Forum in Monaco, and the IHO Member States are invited to consider sending a ship to the Port of

Monaco during A-3. A thematic Session on “*Future challenges for hydrography in the Ocean Decade*” is scheduled on Thursday afternoon, 4 May 2023 and the election of the Secretary-General and one Director is scheduled on Friday morning, 5 May 2023.

11. The Assembly is the principal decision-making organ of the IHO (Article V of the Convention on the IHO), and it is essential that all IHO Member States are represented not only to review the past activities of the Organization, but also to adopt an effective and realistic IHO Work Programme and Budget for the next three years, and then to formulate proposals and adopt appropriate Resolutions. All the details on the preparation and conduct of A-3 are available on <https://iho.int/en/3rd-session-of-the-assembly-2023> where the Assembly Circular Letters (ACLs) are available.

12. **Recommendation:** *NIOHC members are encouraged to register on line their.*

Capacity Building Programme

13. The level of activity of the IHO Capacity Building (CB) Programme was clearly affected by the COVID19 pandemic in 2020 and 2021 showing in 2022 a restart of the activities but having some that needed to carry on to 2023. Expenditure in the IHO 2022 CB Work Programme (CBWP) of the non-earmarked funds will be about 200,000 Euros in 2022 (not all expenses are yet concluded), value that is significantly higher than the 15,627.22 Euros in 2021. Considering the earmarked activities it is expected that the expenditures of the 2022 CBWP will be around 870,000 Euros. Since in 2022 the execution of some CB activities still affected by the COVID-19 pandemic, Decision 9 of the CBSC20 meeting approved that the 2022CBWP funded activities not executed in 2022 can be moved to the 2023CBWP. The budget assigned to 2022 has benefited from the funds attributed by the IHO Secretariat, from the funds not used in CBWP2021 and also from additional funds made available by the Republic of Korea for capacity building activities for the Regional Commissions (the so-called non-earmarked activities). At CBSC20 Inter-sessional meeting, the 2022CBWP activities were prioritized, and at CBSC20 meeting the 2023CBWP was approved being both available at the following link: <https://iho.int/en/capacity-building-and-technical-cooperation>. NIOHC has four funded CB activities in the 2022CBWP. One was executed the:

- 2022/P-35 Seminar on Raising Awareness of Hydrography (from 2021 P-13)

The other three might be carry over to the 2023CBWP:

- 2022/A-02 Technical Visit to Republic of Maldives
- 2022/P-06 Seminar on Raising Awareness of Hydrography
- 2022/P-30 MSI (training on establishment of MSI structure and basic MSI procedure) (FORMER 2020 P-08 and 2021 P-07)

14. The CB finance situation will be more difficult in 2023 with the expected reduction of the non-earmarked funds, so it was recognized that it will be very important to share resources and projects and invest in the remote activities. The CBSC20 meeting discussed the 2023 CBMP (CB Management Plan (CBMP)). Having in consideration the projects with the highest score after the evaluation process and the funding available, the projects to be funded were selected and the 2023CBWP was approved by the Sub-Committee and then uploaded to the Capacity Building and Technical Cooperation webpage on the IHO website. Discussion at CBSC20 highlighted the importance of engagement at the correct levels to build awareness of the importance of Hydrography. This supports the inclusion of Phase 0 into the IHO CB Strategy which focusses on the awareness of the importance to development Hydrographic Governance. Engagement with the correct stakeholders, on a ministerial level, is vital for the successful delivery of Technical and High-Level Technical Visits and the recipients of Technical Visits are reminded that their assistance in identifying these stakeholders is critical.

15. In terms of courses managed at IHO Secretariat level in 2022, 2 candidates were selected for 2022/2023 Master of Science Programme in Hydrographic Science at the University of Southern Mississippi (USA), sponsored by the Republic of Korea, 14 candidates were selected to participate in the 13th and 14th GEOMAC courses in Cartography Cat B (see IHO CL 19/2022) sponsored by Nippon Foundation, and 10 candidates for 2022 Cat B Hydrographic Survey Programme sponsored by the

Republic of Korea were selected (see IHO CL 22/2022). For 2023/2024, the Master of Science Programme in Hydrographic Science at the University of Southern Mississippi (USA), sponsored by the Republic of Korea, was announced with IHO CL 34/2022.

Empowering Women in Hydrography (EWH)

16. The 2nd Session of the IHO Assembly (A-2) approved the adoption of a new work item of Empowering Women in Hydrography (EWH) to the Work Programme of the IHO CBSC (A-2 Decision 35), and tasked the Secretariat to secure funding through allocation of IHO budget resources available and negotiation of suitable cooperation agreements with interested Member States.

17. CANADA and IHO signed an Agreement available at <https://iho.int/en/mou-agreements>. The Agreement secures the funds for the period 2021-2024, and finally describes a series of activities and initiatives which will enable more women to participate equitably in the field of hydrography and to assume more leadership roles within the hydrographic community. The project includes outreach, contact and learning, including internships, at-sea experiences and train-on-the-job activities (see IHO CLs 47/2021, 07/2022, 09/2022 and 14/2022). A specific webpage (<https://iho.int/en/basic-cbcs-ewh>) has been set up under the Capacity Building Sub-Committee (CBSC) for this project. The first year of the EWH project has been completed successfully, with the provision of a workshop on “Gender balance & Empowering Leaders” to draw the attention on the importance of reducing gender imbalance in hydrography and more in general in STEM, the hire of an EWH project Assistant to support the implementation of the project’s activities, 1 internship on Outreach, 3 internships related with the review process of submitted programmes to the International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC), the submission for EWH project to become an UN Ocean Decade Action, and then – as activity offered by the IHO Member States - three opportunities for an at-sea experience on a NOAA hydrographic ship. In order to get a clear picture of the gender distribution within the International Hydrographic Community, following the decision of IRCC (see Decision IRCC14/17), the IHO Secretariat invited the IHO MS with IHO CL 26/2022 to participate in a survey to determine the percentage of female employees in Hydrographic Offices and in leadership roles with the first results of the questionnaire officially published on the IHO website and social media. Also, a Mentorship programme was launched with a call for Mentors and Mentees in the IHO CL 46/2022.

18. With Letter IOC/VR/22.377/JB/AC/mb dated 9 September 2022, IOC endorsed the project entitled “No. 62.2 - Empowering Women in Hydrography” as a project forming part of the UN Decade of Ocean Science for Sustainable Development 2021-2030.

IHO e-learning Center

19. Following the improvement made by the e-learning Project Team to advance in the implementation of the center, the IHO e-learning center established at KHOA is now accessible at <https://elearning.iho.int> , or via the IHO website. Member States who have experience in developing and providing e-Learning contents should consider actively sharing contents, resources, and experience with the e-Learning PT. The center now operational and is expected that soon the Guidelines are finalized and the Governance Board defined.

20. Ms Lucy Fieldhouse (UK) is the NIOHC CB Coordinator for planning and implementing the regional CB activities.

21. Recommendations:

21.1 NIOHC members are invited to continue follow and evaluate the possibility to contribute to the CB Programme.

21.2 NIOHC members are invited to participate at the EWH project and provide proposals via the specific webpage (<https://iho.int/en/basic-cb-sc-ewh>) set up under the Capacity Building Sub-Committee (CBSC) for this project.

21.3 NIOHC members are invited to disseminate the call for Mentors and Mentees of the EWH Mentorship Programme (IHO CL 46/2022). Due date 31 Jan 2023, but only 12 responses received to date.

21.4 NIOHC members are invited to provide contributions of online learning material to the Project Team established for the IHO e-Learning Center at KHOA.

Maritime Safety Information Services

22. Work by the International Maritime Organization (IMO) on the modernization of the Communications and Global Maritime Distress and Safety System (GMDSS) continues with the ongoing review and updating of the SOLAS chapters III and IV and on the related and consequential amendments to existing instruments. The consequential changes as a result of the recognition of the Iridium SafetyCast service as a recognised mobile satellite service (RMSS) provider in the GMDSS continue to be implemented. The Iridium SafetyCast service became SOLAS carriage compliant from 1 January 2020. Good progress has been made with implementation with a number of NAVAREAs due to become operational in 2022, with more entering the formal testing phase. However, there is still a number of NAVAREAs that need to commit to implementation before the service can be declared fully operational. Member States are reminded of the resources required and the responsibilities for their national Coordinator to perform their functions as part of the GMDSS. The national Coordinators should have established sources of information relevant to the safety of navigation within national waters, effective communications with the NAVAREA Coordinator and adjacent national Coordinators, if needed, to pass relevant information to all authorities and organization that need to be made aware and access to broadcast systems for transmission to their area of national responsibility.

23. From the last IHO World Wide Navigation Warning Service Subcommittee (WWNWS), it was reported on the approval of the IMO NAVTEX Manual for submission to the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR 9). More work was needed in relation to SPI 3.1.1, as only 62% of Coastal States provided information internally to the NAVAREAs by the end of 2021, compared to the target of 90% (143 Coastal States out of 230). The new version of the Joint IMO/IHO/WMO Manual on MSI was expected in January 2024. Coastal States expressed concern that MSI providers were compelled to bear the burden of all additional costs incurred from implementing Iridium SafetyCast services.

24. Recommendations:

The NIOHC Chair is requested to encourage all NIOHC members to:

24.1 Encourage all information providers (NAV and MET Area Coordinators and RCCs) to complete agreements with all RMSS and commence the necessary testing of the SafetyCast system to progress towards declaring full operational status.

24.2 Establish and maintain effective communications with the relevant NAV and MET Area Coordinators to ensure the timely provision of MSI.

24.3 Use and follow the guidance provided in S-53 – Joint IMO/IHO/WMO Manual on Maritime Safety Information – to ensure the necessary facilities and capabilities are provided and maintained for the gathering and communication of MSI within their area of national responsibility.

Crowd-Sourced Bathymetry, GEBCO and Seabed2030

25. Following the last CSBWG12 hybrid meeting held in February 2022 at the IHO, the Crowdsourced Bathymetry Working Group (CSBWG) revised the IHO publication B-12 which provides guidance on the collection and use of Crowdsourced Bathymetry (CSB), and identified ways to facilitate the data gathering activities. The new edition of publication B-12 was endorsed by IRCC. With IHO CL 41/2022 Edition 3.0.0 of B-12 was approved by 37 Member States. Besides, a new Agreement template on the “*Terms of the Provision of Crowdsourced Bathymetry Data*” from the Trusted Nodes to the IHO, was prepared by the CSBWG and will be part of the new edition of B-12 publication. The document represents the way for submitting Crowdsourced bathymetry data for long-term preservation and stewardship, as a joint effort between the Trusted Nodes and the IHO to accurately document the agreement and the expectations between the two entities. The new Agreement was also used to sign a historic Agreement between the IHO and International Seabed Authority (ISA) for “*Submitting marine geophysical data for long-term preservation and stewardship in IHO DCDB archive*”. It is expected that the initial contribution covers the ISA backlog of approximately 15 years of data recording and, going forward, the ISA estimates an annual contribution of approximately 750 GB each year. Future geophysical data collected by ISA contractors will be submitted by ISA to DCDB using the guidelines laid out in such Agreement.

26. The Circular Letters (IHO CL 21/2020 and IRCC CL 1/2020) to request MS to indicate their positions on the provision of CSB data are receiving new positive replies, in addition to the 31 already available at the link: https://iho.int/uploads/user/Inter-Regional%20Coordination/CSBWG/MISC/B-12_2020_FR_Acceptance_of_CSB_Data_in_NWJ_v3.0.pdf thanks also to the continuous engagement of the CSB-GEBCO-Seabed 2030 Regional Coordinators with IHO Member States, to advocate for open data access and CSB activities. In fact, there continues to be concern over the apparent lack of dedicated resources available within national HOs to process data available via DCDB. The importance of liaison with other IHO bodies, as well as appropriate engagement with industry to progress the work items, continues to be a key enabler for the project.

27. Thanks to the support of CSBWG and Nippon Foundation Seabed2030 project, the IHO Secretariat also promoted CSB through three sailing boats: the Sir Ernst and La Louise, who departed from Monaco and France for expeditions to the Antarctica in late 2021/early 2022, and committed to collect data for the IHO DCDB and generally contribute to increase our knowledge of the ocean and the Poles, and the Jancris, who departed from Cape Canaveral for an ocean crossing named “A sail for the blue” in May 2022 and arrived in Monaco on 21 July 2022. In addition to that, the IHO Secretariat with the support of GGC, CSBWG and Nippon Foundation GEBCO-Seabed2030 project, in July 2022 signed a Letter of Cooperation with the Yacht Club of Monaco to engage the world of yachting (yachts and mega yachts) in the CSB.

28. In December 2021, the International Hydrographic Organisation (IHO), the Intergovernmental Oceanographic Commission (IOC) and GEBCO Chair/Vice Chair met to discuss on how much the ocean science and seabed mapping landscape is undergoing significant change, and that the work of GEBCO (including that of the Nippon Foundation GEBCO Seabed 2030 Project) has never been so relevant or visible. It was noted that GEBCO would need to evolve with this changing environment in order to remain relevant, and that its organisational structure has grown in recent years. Therefore, it was decided to review the GEBCO Governance and establish a Project Team accordingly, which has recently started working on the Governance review.

GGC38 also noted that one of the gaps was for a GEBCO Strategic Plan that clearly sets out the connections between the strategic objectives of the parent Organizations, the future direction of GEBCO and the work of the subordinate bodies, initiatives and activities. So that, it was approved also the establishment of a Drafting Team for drafting a GEBCO Strategic Plan in line with the IHO Strategic Plan (2021-2026) and the IOC Medium Term Strategy (2022-2029). The PT presented a

first draft of the GEBCO Strategic Plan at GGC39, which will be approved by next year by the GGC and presented to IRCC15 in June 2023.

29. With IHO CL 10/2022 – and with an IOC CL within the IOC community as well – the IHO advised Member States that nominations are being sought for the 19th course of the IHO-IOC-Nippon Foundation/GEBCO Training Program leading to a Graduate Certificate in Ocean Bathymetry at the University of New Hampshire (UNH), USA. The 19th course began in late August 2022 and students will undertake an intensive 12-month period of lectures, practical laboratory and on-the-water projects, secondments to relevant laboratories and cruises on research or survey ships. The course represents a strong investment in future generations of ocean scientists and hydrographers. In order to liaise with this successful existing program and to identify and connect with other ocean mapping programs, at GGC38 it was decided to establish a new Sub-Committee on Education and Training (SCET), now operational.

30. Nippon Foundation GEBCO-Seabed 2030 project was endorsed as an Action of UN Decade of Ocean Science for Sustainable Development. The complex network of this project was explained along with the data ingestion in the system and mapping coverage that now stands at 23.4% (June 2022). The project is focused on mapping the gaps with three different initiatives: the Ocean Frontier Mapping, Crowd Sourced Bathymetry and Technology Innovation. It is necessary to promote the need to map the entire seabed and to encourage organizations to make their data available.

31. Seabed 2030 signed many Memorandum of Understanding in recognition of the organizations' work to advance the understanding of ocean bathymetry, and to complement the goals of the United Nations Decade of Ocean Science for Sustainable Development. Data contributions increased from the previous year and, in addition to the regional programmes in support of IHO's Crowdsourced Bathymetry (CSB) initiative, it is seeing increasing interest across a diverse community of owners and operators of super yachts and small vessels who wish to help gather new depth information. To support the harvesting of this bathymetry, it was established a Trusted Node at the Global Center and, with the invaluable assistance of DCDB and others from IHO's CSB Working Group, have been developing data handling routines. Also, a CSB Technical Advisor is operating remotely to provide basic on-call support for logger installation.

32. New global survey calls for greater coordination of seabed mapping activities were launched in London, 15 October 2021 to give a major boost to efforts to map the entire seafloor by the end of the decade. The survey aimed to develop a more consolidated global view of seabed mapping needs in order to move towards an agreed list of strategically important priority areas for further action. It also achieved its secondary aim of finding new data that could immediately feed into the emerging global map. Seabed2030 project looks forward to forming new partnerships and strengthening existing ones, as working collaboratively can greatly help fill in the gaps, as in the case of FUGRO, that in 2021 delivered to Seabed 2030 more than 2 million km² of high-resolution in-transit bathymetry data, collected by Fugro vessels, which a data coverage roughly equivalent to the size of Mexico, and many other contributors. It was continued to coordinate Satellite Derived Bathymetry in data sparse areas. Seabed2030 was recently involved in the NIWA-Nippon Foundation "Tonga Eruption Site Mapping Project" (TESMaP) after the eruption of the Hunga Tonga volcano.

33. **Recommendations:**

NIOHC members are invited to:

33.1 *Consider the impacts of the increasing global societal and United Nations (UN) driven need to complete the picture of the seafloor as well as the potential benefits to individual coastal States.*

33.2 *Make data freely available for inclusion in the DCDB and the widest possible use, in accordance with IHO Resolution 1/2017.*

33.3 Consider to review national legislation to remove barriers restricting CSB activities within their waters.

IHO and United Nations Decade of Oceans for Sustainable Development

34. The IHO Secretariat attended the 2nd UN Oceans Conference in Lisbon, 27th June – 1st July 2022 with the principle aim to ensure that seabed mapping and hydrography were appropriately represented and that the IHO's leadership in these domains was duly recognised. The IHO led one side event on Seabed Mapping and Marine Data for Multifunctional Spatial Planning and provided closing remarks for the SB2030 side event, ensuring that the role of hydrography was properly represented and that due credit was attributed to the activities in which we are engaged. It is clear that the essential role that bathymetry plays in underpinning ocean science and related activities is becoming a mainstream concept, and consequentially other stakeholders (often with a more visible presence, larger network but less expertise/authority) are developing their own activities, initiatives and solutions that have the potential to encroach on, or duplicate IHO activity.

35. As consequence of the engagement of the IHO Secretariat in the UN initiative, the following are the items for further consideration of IHO:

- Whilst different observing systems collect various different data, the Global Ocean Observing System (GOOS) steering committee has identified a number of Essential Ocean Variables (EOVs) in order to prioritise investment through the Ocean Decade. In discussion with key stakeholders, it was suggested that depth could be added to the list of EOVs, with the IHO and IOC as leads under the auspices of GEBCO.
- Following the Global Ocean Alliance - an international movement to protect 30% of the world's land mass (land and ocean) by 2030s -, SP-122 – Marine Protected Areas could have a key role to play in supporting the sustainable use of such areas, as well as providing a global standard for the measurement of progress towards the target.
- In 2016, the Organisation for Economic Co-operation and Development published the seminal report entitled 'The Ocean Economy in 2030'. For the first time, this report explored the growth prospects for the ocean economy, its capacity for future employment creation and innovation, and its role in addressing global challenges. Further, it examined the risks and uncertainties surrounding the future development of ocean industries and the innovations and actions required in science and technology to support their progress. One area that was not explicitly described was the role of seabed mapping data and hydrography in underpinning blue growth and sustainable development. In 2023, the OECD will begin work on the revision of this report entitled 'the Ocean Economy in 2045'. Given the importance placed upon seabed mapping at the conference, the IHO has been asked to consider being the key point of contact for a dedicated section relating to seabed mapping and hydrography.

36. **Recommendation:** *NIOHC is invited to take note of the engagement of the IHO Secretariat in the UN initiative and the items for further consideration.*

IHO GIS and Databases

37. Work has continued on the IHO internal systems. Especially, two components are to be mentioned:

- IHO Country Information system, and
- IHO Online Form system.

38. The IHO Country Information system has been progressively upgraded to include administrative information and facilitate the maintenance of the IHO publications such as Yearbook (P-5) and Status of Hydrographic Surveying and Charting Worldwide (C-55) posted on the IHO website. The IHO Online Form system has been used since March 2019 and has been widely accepted by the Member States for the Circular Letter responses and the updating of P-5 and C-55 (CL20/2019 and CL03/2020 refers). Countries in the *NIOHC* Region are invited to review their entry in the publications on an annual basis and provide the IHO Secretariat with the appropriate updates through the IHO Online

Form system. The status of the data in the IHO Country Information Database concerning the *NIOHC* Member States, including those provided for C-55 is as follows:

Country	P-5 –Yearbook Last update received	C-55 Last update received
Bangladesh	November 2021	March 2019
Egypt	September 2019	July 2021
India	November 2021	February 2019
Indonesia	June 2022	March 2019
Myanmar	September 2019	March 2019
Pakistan	July 2021	July 2021
Saudi Arabia	June 2022	June 2019
Sri Lanka	January 2020	March 2019
Thailand	November 2022	March 2021
United Kingdom	July 2022	August 2022

39. An Esri-based GIS solution has been implemented for the efficient visualization of geospatial data stored in the Country Information System. This Cloud-based service has enabled access to various layers and functions through the IHO website such as the IHO ENC Catalogue. Currently, six WebGIS applications have been available to the public in this new environment (ENC Coverage Catalogue, IHO Web Catalogue of INT Charts and ENC Schemes, IHO Member States Map, FIG-IHO-ICA IBSC Recognized Programmes and Schemes, GEOMAC project and the Map regarding National Marine Spatial Data Information (MSDI) Portals).

40. **Recommendation.** *Countries in the NIOHC Region are invited to review their entry in the IHO Yearbook and C-55 and to provide the IHO Secretariat with the appropriate updates or to report no change (CL 20/2019 refers).*

IHO Outreach

41. There was continued increase in reach of IHO digital communications. In 2022, the IHO website had a total of 863,322 page views. The LinkedIn page had 6525 followers in January 2023, and totaled 245,573 post impressions in 2022. The post with the most views was the one on Tsunami Awareness Day in November which had 9173 views. The upwards trend continued on Facebook with a post on the ship Sir Ernst leaving for Antarctica with data loggers getting 8,2K impressions in January 2022. On Twitter, June 2022 had the biggest reach with the tweets around participation in the UN Ocean conference and WHD leading to 13.3 K tweet impressions. However this is down compared to the record of 22.9K in June 2021.

42. There were also several actions to raise awareness about the IHO's work and the importance of hydrography to a broader audience. The Secretariat continued communicating on social media and participated in regional and global initiatives for the ocean. Together with several Member States and partners, it organized a side-event at the UN Ocean Conference in Lisbon and participated in the Seabed 2030 side-event outside the venue. This ensured hydrography was discussed at this global gathering, which was timely as many international organizations and participants mentioned the importance of mapping the ocean.

World Hydrography Day

43. As announced with IHO CL 01/2022, the theme for WHD 2022 was as follows:

“Hydrography - contributing to the United Nations Ocean Decade”

The theme was designed to highlight the relevant contribution of hydrography as a discipline of applied sciences to the United Nations Decade of Ocean Science for Sustainable Development (2021–2030). The IHO Member States are encouraged to provide any kind of material (documents, presentations, videos, etc.) celebrating the WHD in their countries.

44. As announced with IHO CL 01/2023, the theme for WHD 2023 is as follows:

“Hydrography - underpinning the digital twin of the ocean”

The digital twin of the ocean aims to develop a consistent, high-resolution, multidimensional and near real-time virtual representation of the ocean that could make ocean knowledge open-access, available to citizens, scientists and policy makers around the world, and provide a platform for global cooperation. In terms of international standards, the S-100 Universal Hydrographic Data Model will provide the ocean science community with an operational set of standardized products and services within a unique and globally recognized framework. The theme is designed to highlight how hydrography and oceanography could work together for mutual benefit, with hydrography being a building block for the digital twin. The suggested theme offers the opportunity to emphasize the competencies of hydrographers in the gathering and management of marine data, in order to assist in eliminating the barrier posed by the use of differing formats in the ocean domain. The Secretariat would also welcome any comments and suggestions aimed at improving the impact and the organization of annual WHD celebrations.

International Hydrographic Review (IHR)

45. Twice a year, the IHR provides an opportunity for Member States to publicize technical and other achievements in their region. An editorial board comprising a representative from each region has been established. As it was announced through IHO CL 03/2022, since 5 January 2022 the IHR has a new editor Dr Patrick Westfeld from Germany.

46. Papers for consideration for publication in the IHR should be forwarded directly to the editor (ihreview@iho.int, copy to ihr.editor@iho.int.com). The deadlines are:

- end of January for the May Edition
- end of July for the November Edition.

47. In order to modernize the image of the International Hydrographic Review, its website (<https://ihr.iho.int/>) was completely revamped. It now includes a new section with articles and notes, allowing readers to view and share individual articles more easily. The IHO Secretariat has also worked with the University of New Brunswick (UNB), Canada, in a project to develop a digital repository of the complete library of the IHR. As a result, volumes from the entire collections are available online at: <https://journals.lib.unb.ca/index.php/ihr>. In order to increase visibility of the publication, some articles are shared on social media. On LinkedIn for example, the article “Using multibeam bathymetry & sonar imagery to locate shipwrecks in Cartagena de Indias, Colombia” had 6228 impressions.

48. This year, the Review will celebrate its 100th Anniversary.

49. **Actions Requested of NIOHC:**

- a) Note this report.
- b) Consider the recommendations proposed in this report.
- c) Review entries related to IHO C-55 and P-5 (Yearbook) at least annually.
- d) Consider submitting papers for publication in the International Hydrographic Review.
- e) Take any other actions as considered appropriate.