

**Paper for Consideration by
13th ARHC Conference
Nuuk, Greenland, Denmark 5 - 7 September 2023
IHO Secretariat Report**

Submitted by:	Secretariat of the IHO
Executive Summary:	This paper reports on activities of the IHO Secretariat that may impact the work of the Arctic Region Hydrographic Commission.

Status of Membership of the IHO

1. Since ARHC12, no new country has acceded to the IHO Convention and the IHO membership still stands at 98. Unfortunately, Serbia, Syria and Vanuatu remain suspended from Member States rights.

3rd Session of IHO Assembly

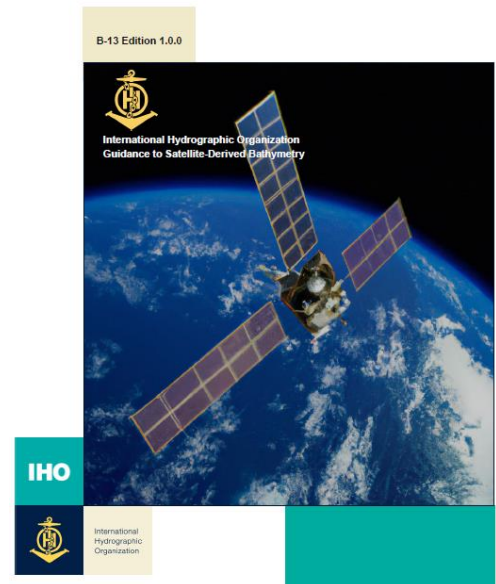
2. The 3rd Session of the Assembly of the International Hydrographic Organization was held at the Grimaldi Forum in Monaco from Tuesday 2 May to Friday 5 May 2023. The session took place as an in-person event which marked the return to the normal practice stipulated in the General Regulations after the conduct of the 2nd Session of the Assembly in 2020 as a remote event due to the limitations induced by the COVID-19 pandemic.
3. The session was attended by just under 300 representatives from 75 of the 98 Member States of the IHO, together with 3 non-Member States. In addition, 28 representatives from observer international, regional or national organizations took part in the discussions. A meeting of the Finance Committee was held prior to the opening of the Assembly on 1 May. Two groups of exhibitions, one illustrating the work of the IHO Member States and another provided by 23 commercial exhibitors, ran from 2 to 5 May.
4. Mrs Pia Dahl Højgaard, the Hydrographer of Denmark, and Mr Adam Greenland, the Hydrographer of New Zealand, were elected as Chair and Vice-Chair of the Assembly, respectively.
5. The Assembly examined 15 proposals and several reports tabled by Member States, subordinate organs and the Secretary-General. It agreed on 35 decisions including the approval of the Work Programme and Budget of the Organization for the next three-year period.
6. An important item on the Agenda of the Assembly was the election of the Secretary-General and a Director for the forthcoming period. The elections took place on Friday 5 May: Dr Mathias Jonas (Germany) was re-elected as the Secretary-General for a three-year term and Dr John Nyberg (USA) was elected as a Director for the period 2023-2029. Both will take up their posts on 1 September 2023.
7. In principle, the Assembly agreed to host its fourth session from 21 to 24 April 2026 in Monaco, subject to confirmation in due course by the Secretary-General, in liaison with the Government of the Principality of Monaco.

Outcomes of the 15th HSSC meeting

8. The 15th meeting of the Hydrographic Services and Standards Committee (HSSC) was held in Helsinki, Finland, from 5 to 9 June 2023, hosted by Traficom, the Finnish Transport and Communications Agency. An embedded Industry Stakeholders' Session was arranged for two half-day sessions themed "S-100 Industry Perspective", which offered an opportunity to IHO Member States to interact with stakeholders regarding the concerns and challenges with S-100 implementation.
9. HSSC reviewed the main decisions from the 3rd Session of the Assembly having a possible impact on HSSC, which was followed in particular by decisions for the establishment of two project teams, the TORs of

which were drafted during an ad hoc session:

- 9.1. The S-100 Infrastructure Centre Establishment Project Team, under HSSC, the outcome of which will be also monitored at Council level;
 - 9.2. The Electronic Chart System Project Team, under the ENCWG, aiming to develop a set of recommendations/issues to be considered by existing IHO bodies, external organisations, and Member States on ECS¹ navigational requirements having an impact on current IHO standards.
10. While the priority of the meeting was to reassert the need for the different WGs to concentrate the efforts and subsequent resources on the critical path and S-100 based product specifications identified for the Phase 1/Route Monitoring in the S-100 Roadmap, HSSC endorsed S-100, Ed. 5.1.0 - IHO Universal Hydrographic Data Model and approved a significant number of new Editions at this meeting, commending the work of the relevant WGs/PTs, and Member States involved in the outstanding developments achieved since HSSC-14. In accordance with the principles stated in IHO Resolution 2/2007, it was reminded that all Editions enumerated as 1.0.0 were for initial implementation, testing and evaluation.



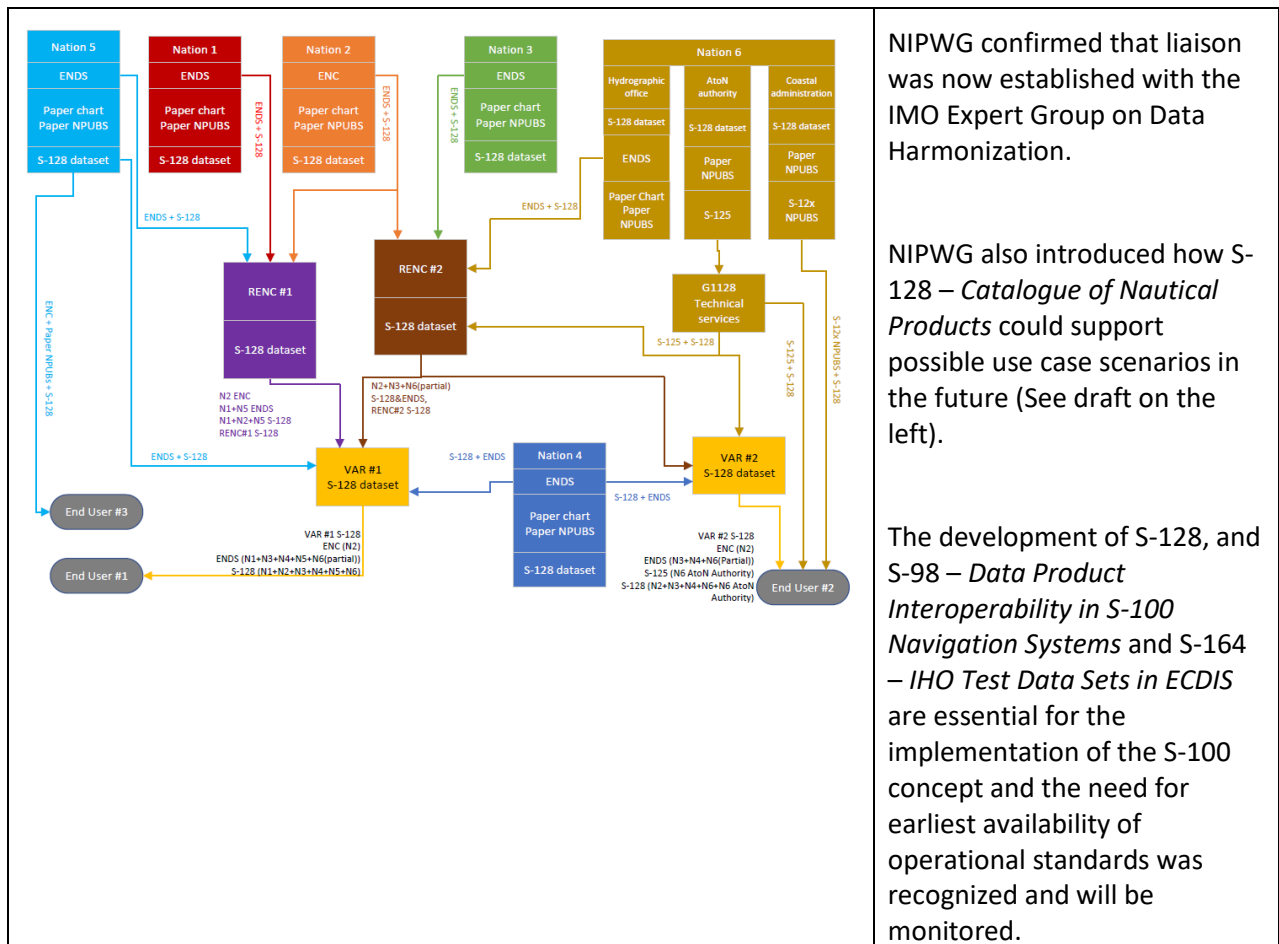
These *Standards* are:

- S-131, Ed. 1.0.0 - *Marine Harbour Infrastructure*;
 - S-164, Ed. 1.0.0 - *IHO Test Data Sets in ECDIS*;
 - S-68, Ed. 1.0.0 - *Guidelines and Recommendations for Hydrographic Offices for the allocation of CATZOC/QoBD Values from Survey Data*;
 - S-124, Ed. 1.0.0 - *Navigational Warnings*;
 - S-130, Ed. 1.0.0 - *Polygonal Demarcations of Global Sea Areas*;
 - B-13, Ed. 1.0.0 - *Guidance to Satellite-Derived Bathymetry*.
11. The publication of S-104, Ed. 1.1.0 - Water Level Information for Surface Navigation and S-111, Ed. 1.2.0 – Surface Currents, expected in June 2023, were also duly noted. The confirmation of the publication in April 2023 of the Ed. 1.1.0 – ENC Product Specification, the cornerstone of the S-100 concept, was also very well received.
12. The HSSC approved the establishment of the S-100 Security Scheme PT under HSSC, mainly to develop the S-100 appointment and termination process for data servers, OEMs and ENDS service providers, and to analyse the current IHO agreements to ensure they are legally binding.
13. In order to avoid that the IHO is obliged to submit a change proposal to an important IMO MSC Circular² through a complicated procedure, HSSC agreed that it was wiser to keep the former title of Publication S-66 - Facts about Electronic Charts and Carriage Requirements, for the Ed. 2.0.0 of a (new) Publication to come, resulting from the merging of the existing Editions of S-66 and S-67 and inclusion of additional information relevant to Mariners and Port State Control authorities.
14. An impact study to be made in accordance with IHO Resolution 2/2007 was requested by the HSSC from the ENCWG prior to the endorsement of a new Edition 4.0.0 of S-64 since there were some concerns raised during the discussions on the possible negative effects of this new Edition on current S-57 ECDIS

1 Sub-ECDIS unregulated market, from leisure boats to large non-SOLAS vessels.

2 IMO MSC.1/Circ.1503/Rev.2 ECDIS – “Guidance for Good Practice”

and the implementation of the S-100 ECDIS from 2026.



15. The HSSC tasked the NCWG to consider the evolution of Section 200 of S-11 Part A for including S-101 Scheming Guidelines, and the incoming WENDWG Chair³ reported that the development of a new Section 300 in S-11 Part A – Guidelines for other S-100 Products – Phase 1/Route Monitoring (Guidelines for the Coordination and Management of the Development of S-100 Data Services in RHCs), was planned to be discussed at IRCC-15 the week after.
16. The representatives of IEC, CIRM, IALA, and ICPC, among others, provided very good updates on matters affecting HSSC. Due to time constraints, presentations from OGC and NATO GMWG Technical Panel were made available on the HSSC-15 webpage for consultation only.
17. With Ed. 1.0.0 of the S-130 Product Specification available for testing and evaluation, there were already some arguments in favour of commencing a Phase 2, with regard to the production of an IHO authoritative data set (who?, single set?...). The objectives, decided by the IHO 2nd Assembly, and the TORs of the Project Team were reminded to the participants.
18. The Maritime Autonomous Surface Ships (MASS) Navigation Project Team delivered to HSSC a very comprehensive report identifying the regional situation with regard to MASS issues and requirements, as well as an S-100 gap analysis. The MASS Project Team was invited to co-operate with the IALA MASS Task Force and the IMO Joint MSC/FAL/LEG Working Group on MASS. For this purposes, the mandate of

³ Germany's representative at HSSC-15: Mr Jens Schröder-Fürstenberg.

the Project Team was extended for one year, prior to the possible establishment of a WG, to be considered in 2024.

19. All Stakeholders and industry partners present delivered enlightening presentations in relation to HSSC activities, and S-100 in particular. Most of their recommendations and possible key risk mitigation measures were captured in the list of decisions and actions since they are critical to ensure a smooth implementation of the S-100 eco-system. All Member States are invited to consult these presentations on the HSSC-15 webpage (IHO Stakeholders' Open Session in particular) for getting the full picture.
20. HSSC initiated an action for the preparation of the next IHO Strategic Plan: in accordance with Decision A3/08e, the HSSC invited the HSSC Chair Group and its Members to brainstorm in preparation of inputs to the future IHO Strategic Plan 2027-2032. These draft inputs are planned to be considered at the next meeting HSSC-16 in 2024, and then to be submitted to the Council.
21. HSSC re-elected Mr Magnus Wallhagen (Sweden) and Ms Nathalie Leidinger (France) as Chair and Vice-Chair of the HSSC by acclamation.
22. **Recommendation:**
 - 22.1. ARHC members are invited to continue follow and evaluate the possibility to contribute to the work of HSSC and its subordinate Working Groups and Project Teams.

Outcomes of the 15th IRCC meeting

23. The 15th meeting of the Inter-Regional Coordination Committee (IRCC-15) was held in Tokyo, Japan, from 12 to 14 June 2023, hosted by the Japan Coast Guard Hydrographic and Oceanographic Department (JHOD). The meeting was chaired by Mr Thomas Dehling (Germany) and attended by 47 in person participants from 19 Member States. The IHO Secretariat was represented by Director Luigi Sinapi and Assistant Director Leonel Manteigas.
24. IRCC Chair, Mr Thomas Dehling, provided the IRCC report, highlighting the activities since IRCC 14 and the excellent cooperation between IRCC and HSSC and the respective subordinate bodies. A particular focus on the 3rd Session of IHO Assembly's Decisions affecting IRCC was made. In particular, on Decision 20 – *Establish a Project Team under IRCC to explore the establishment of reliable alternative funding for activities related to Capacity Building and GEBCO*. IRCC will be also involved in reviewing the IHO Strategic Plan and the 9 Strategic Performance Indicators (SPI) allocated to IRCC, the figures of which will be provided by the end of each year for updating the IHO Publication P7 - IHO Annual Report.
25. The RHC and HCA Chairs (and those speaking on behalf of those chairs not present at the meeting) focused their reports on the most important regional key achievements, key findings and lessons learned, and then on the proposals to bring to IRCC's attention. The main concerns were related to the need of collaboration and coordination in the implementation of the S-100 Roadmap, the need to increase the Capacity Building activities at regional level, as well as the lack of participation in the RHCs' activities and meetings and data collection in remote locations. RHC Chairs were requested to discuss how HO's can assume a geo-coordinating role to help ensure provision of data on a regional level, and to open the debate on RHCs' future engagement in climate change related activities in reference to the IHO Strategic Goal 3.
26. The Sub-Committee on the World-Wide Navigational Warning Service (WWNWS-SC) Chair informed on the last WWNWS14 meeting, which was also a joint meeting with WMO Worldwide Met-Ocean Information Warning Service, focused on S-124 progress and Iridium SafetyCast Implementation. During the meeting, a Space Activities Working Group and a Task Team on Volcanic Activity were established. He provided feedback on IHO SPI 3.1.1 (target 90%) assigned to WWNWS. Overall, for 2022, the WWNWS assessed Coastal States MSI capacity to be 87%. The SPI is measured yearly, based on the navigational warnings issued and on the MSI support provided by NAVAREAs. WWNWS is working in cooperation with

of digital maritime data for these users. IRCC encouraged RHCs to invite Hydrographic Offices to consider the regulatory environment for non-ECDIS mandated vessels within national, regional and global discussions on this topic. IRCC requested HSSC to direct the NCWG to liaise directly with WWNWS with regards to the future of the paper chart production and the impact on navigational warnings.

31. The IRCC re-elected Mr Thomas Dehling as IRCC Chair and elected Dr Jennifer Jenks as IRCC Vice-Chair for the next 3 years by unanimity.

32. Recommendation:

- 32.1. ARHC members are invited to continue follow and evaluate the possibility to contribute to the work of IRCC and its subordinate Working Groups and Project Teams.

Hydrographic Commission on Antarctica

33. HCA reported to A-3. Particular focus was given to HCA's approach for S-100 governance and production strategies adapted to the specifics of the polar region.
34. The Assembly approved the proposed IHO Resolution on the recognition of the Southern Ocean and took note of the consequences on the limits of some global sea areas as a result of recognition of the Southern Ocean. The Assembly endorsed the fact that this new Resolution is without prejudice to or limitation of the views of the IHO, any other international body or any IHO Member State regarding the subject matter addressed.
35. Interrelated to the subjects of both ARHC and HCA, the Secretariat was reporting to ATCM45 in Helsinki, Finland in June 2023. A separate report on the outcome will be given under Agenda item E1.

36. Recommendation:

- 36.1. Take note of HCA's approach for S-100 governance and production strategies adapted to the specifics of the polar region. It is the view of the Secretariat that a similar concerted regional approach for Arctic waters to establish coordinated regional S-100 based data services is ARHCs most relevant task for the years ahead. The development and formal approval of a strategy addressing these issues is recommended.

Outcome of 46th meeting of the FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC)

37. IBSC is a joint Board of the International Federation of Surveyors (FIG), the International Hydrographic Organization (IHO) and the International Cartographic Association (ICA).
38. The 46th meeting of the IBSC was held in the Hydrographic and Oceanographic Department, Japan Coast Guard (JHOD) in Tokyo, Japan, from 15 to 26 May 2023. It was chaired by Capt (R) Nickolas Roscher (Brazil, IHO) and attended by ten Members of the Board (one Member attended some sessions by VTC), a future Member and one intern. IHO Assistant Director Leonel Manteigas (IBSC Secretary) represented the IHO Secretariat.
39. During the meeting the Board assessed 11 submissions for recognition of nine hydrographic and two cartographic programmes received from 10 Countries. Four of the programmes received were new. Of the 11 submissions, one was "Recognized", seven "Could be recognized" receiving conditions to meet and three were "Not recognized". However, in the effort to allow more programs to be recognized, in addition to the seven submissions with conditions to be recognized, the Board offered to one non-recognized submission the possibility to submit a new version intersessionally.
40. The Board discussed the need to update the Standards and create a new standard related with Marine

Spatial Data Professionals. In the course of the discussion the need to liaise with other stakeholders and in particular with the IHO MSDIWG to make an informed decision on the way to proceed further on this subject at the next intersessional meeting.

41. Due to the need to work in the process to revise the Standards and debate the possibility to develop a new Standard after the inputs received from the identified stakeholders, to establish the changes on the Guidelines to allow the recognition of Subjects and conclude the revision of eight intersessional submissions, it was decided to plan an intersessional workshop on the week of 30 October to 3 November 2023 in London or Athens.

Preparation of the forthcoming 7th Meeting of the IHO Council (C-7)

42. The agenda of C-7 consists of the regular operational items, i.e. the Work Programme and the Budget for 2024 and the tasks received from the third Assembly. Two submissions of Secretariat aim to address two of these tasks, namely

- 42.1. Further digitalization of Secretariat's operation
- 42.2. Implementation of a new global MSDI layer dedicated to Marine Protected Areas (MPA)

43. Recommendation

- 43.1. ARHC Members (being Council Members) are advised to study the two submissions to be prepared for the expected deliberations.

Crowd-Sourced Bathymetry and GEBCO

44. The Crowdsourced Bathymetry Working Group (CSBWG) Chair reported to IRCC15 on the last meeting and on the achievements of CSBWG and DCDB. Following the publication of B-12 Ed 3.0.0, CSBWG13 focused on a critical review of the group's operating mandate, as set out in the ToRs and RoPs. The new version of CSBWG ToR was approved by IRCC. CSB has reached a level of maturity and is picking up momentum rapidly, assisting in a change in the way many Member States view CSB. CSB is working on designing a work plan and determining their direction forward, reviewing the evidence, work-shopping a strategy and agreeing with the outcome. An important point is to investigate and promote ways to increase data contributions and incentives to take active part in the CSB initiative, also investigating ways to foster and facilitate data providers, increase data contributors and identify incentives on how and why mariners should become involved. A CSB Pointstore Dashboard is under development and the DCDB is formatted into a database schema and will then go through a data ingest pipeline to get archived and published. DCDB will continue to support the GEBCO Gazetteer and KHOA Beta-Gazetteer interoperation, developing a modern user interface. DCDB reported on SPIs 3.2.1 and 3.2.2 in a way that allows better understanding on the evolution on the amount of data and number of contributors to DCDB who are not Hydrographic Offices. Nearly 30 surveys from the ARHC region were added to the DCDB database since June 2022. For the next reports, DCDB would cooperate with RHCs to produce annual regional breakdowns of data holdings as part of SPI reporting. The MoU signed between IHO and NOAA to reaffirm NOAA's relationship and commitment to Ocean data was also mentioned. IRCC tasked the CSBWG in liaison with the IHO Secretariat to organize an online workshop on the benefit of Crowdsourced Bathymetry and how to expand data contribution to DCDB.
45. The GEBCO Guiding Committee Chair reported on the organization of the next GEBCO meetings in 2023 (Principality of Monaco) and 2024 (Fiji). A new IHO appointed GGC member joined GGC in 2022 for a mandate of 5 years. GGC has been working on the celebrations of GEBCO 120th years of ocean discovery, a new GEBCO strategy, a GEBCO Code of Conduct, a GEBCO Governance review, including the GEBCO organigramme with all the relations codified and the next steps for the approval of the new GEBCO governance. The high activity and intense cooperation with Seabed2030 was highlighted. A new GEBCO

Sub-Committee on Education and Training was established. The main activities of the 5 GEBCO Sub-Committees were presented, with focus on outreach, including the presentation of the new 2023 GEBCO map during the IHO Assembly in May 2023 in the presence of H.S.H. Prince Albert II. IRCC endorsed the GEBCO Code of Conduct.

46. Recommendations:

ARHC members are invited to:

- 46.1. 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.
- 46.2. Make data freely available for inclusion in the DCDB and the widest possible use, in accordance with IHO Resolution 1/2017.
- 46.3. Reply to the IHO CL 25/2022 for the adoption of Edition 3.0.0 of B-12 – Guidance on Crowd-Sourced Bathymetry.
- 46.4. Review national legislation to remove barriers restricting CSB activities within their waters.

Outcome of the 32nd Session of IOC UNESCO Assembly

47. The 32nd Session of the IOC UNESCO Assembly was held in Paris from 21 to 30 June 2023, at the UNESCO headquarters. The IHO Secretariat participated at the Assembly as Observer, and was represented by Director Luigi Sinapi and Assistant Director Samuel Harper. The Chair of the GEBCO Guiding Committee (GGC) Evert Flier (Norway) also attended the IOC Assembly. The participation of the IHO Secretariat and the GGC was limited to the days 26 and 27 June 2023, mainly dedicated to GEBCO and the UN Ocean Decade.
48. The morning of 26 June was dedicated to the approval of the IOC Capacity Development Strategy 2023-2030, for the discussion on the revision of the IOC Oceanographic Data Exchange (IODE) policy, the State of Ocean Report (StOR) 2022 and an update on the IOC/SDG 14 indicators, for which the IOC custodianship role was confirmed.
49. The afternoon of 26 June was mainly dedicated to GEBCO. GGC Chair, Mr Evert Flier presented the GEBCO Report, which covers the GEBCO activities for the period 2021 to 2023, with attention to the GEBCO Sub-Committees achievements over the last two years. He also highlighted a continuing and growing interest in the health and status of the oceans by many governments, international and philanthropic organizations and more generally by the public. The current heightened awareness and global focus on the ocean and related topics are resulting from a number of high profile initiatives, such as the United Nations 2030 Agenda for Sustainable Development Goals, the Paris Agreement under the UN Framework Convention on Climate Change, the Sendai Framework for Disaster Risk Reduction 2015-2030, the UN Decade of Ocean Science for Sustainable Development (2021-2030) and most recently, the historic new Agreement on Marine Biodiversity of Areas Beyond National Jurisdiction (BBNJ), which have all highlighted the lack of comprehensive global bathymetric coverage, which is recognized as a fundamental element to achieve the goals of these initiatives. The Nippon Foundation-GEBCO Seabed 2030 Project (Seabed 2030), is now a UN Decade endorsed project, has been at the forefront of this focus. Seabed 2030 has created a global movement to search out new datasets to be added to the currently available bathymetry with the IHO DCDB being identified as the preferred raw data store.
50. IHO Assistant Director Samuel Harper presented the recent developments on the new GEBCO governance, which should be submitted for approval at the next GGC40 meeting in November 2023.
51. Finally, IHO Director Luigi Sinapi addressed the audience on how the seafloor knowledge has become one of the primary strategic objectives of both the GEBCO parent organizations, IHO and IOC, as well as the

role of the Ocean increasingly understood and recognized in our society and in the global Earth system. For the IHO, Ocean knowledge – and GEBCO – is central to the strategic Goals 2 and 3 of the IHO Strategic Plan, respectively for “Increasing the use of hydrographic data for the benefit of society” and “Participating actively in international initiatives related to the knowledge and the sustainable use of the Ocean”. In this regard, Hydrography and Oceanography cannot go separate in the future, as they provide, via their applications and the common GEBCO programme, a unifying framework for scientists and stakeholders from diverse sectors to develop the scientific knowledge and the partnerships needed to accelerate and harness advances in ocean science. In his intervention, the DOALOS representative pointed out the United Nations Resolution 77/248, which at paragraphs 313 and 314 welcomes the work of GEBCO under IHO and IOC and, particularly, the progress made under the Seabed2030 project towards mapping the 100% of the ocean floor by 2030, encourage Member States to consider contributing to mechanisms that allow for the widest possible availability of all bathymetric data.



Presentations on GEBCO delivered to the IOC Assembly – 26 June 2023

52. During the session of 27 June, discussions were focused on the Global Ocean Observing System (GOOS) and how the integrated system can support a wide range of applications, including GEBCO, through a network of regional and national alliances. On the GOOS’ future, the Society requires a step-change in ocean observation to climate adaptation, coastal forecasting and management and then support governments in managing net-zero.
53. The last topic on 27 June was the update on the Decade Implementation plan made by the IOC Secretariat. Seabed2030 and DITTO (Digital Twins of The Oceans) were explicitly mentioned as examples for reaching the objectives of the Decade of Oceans. The Decade Coordination Office established under the IOC Secretariat presented the Decade evolution and key achievements over the last 12 months, highlighting the key challenges and the remaining gaps identified in 2022.

54. Recommendations:

- 54.1. ARHC members are invited to take note of the established fields of collaboration between IOC and IHO in view of the ambitions of the Ocean Decade. Identification of additional themes for collaboration is welcomed.

IHO GIS and Databases

55. Work has continued on the IHO internal systems. Especially, two components are to be mentioned:
- IHO Country Information system, and
 - IHO Online Form system.
56. 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 ARHC 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.

57. 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, five WebGIS applications have been available to the public in this new environment.

58. Recommendation

58.1. Countries in the ARHC 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

59. The IHO Secretariat is continuing its outreach efforts online. IHO's online presence is growing slowly but surely, and we now have 8041 followers on LinkedIn.

60. International Hydrographic Review (IHR)

60.1. 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.

60.2. Papers for consideration for publication in the IHR should be forwarded directly to the editor Dr Patrick Westfeld (Germany) (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.

60.3. The Review was celebrating its 100th Anniversary by means of a specific edition to address the relevance and the changing focus of this oldest IHO publication. The printed version was sponsored by Germany/BSH.

61. Actions Requested of ARHC:

- a) Note this report
 - b) Consider the recommendations proposed in this report
 - d) Consider submitting papers for publication in the International Hydrographic Review
 - e) Take any other actions as considered appropriate.
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