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Annual Report 2023

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IHO

International Hydrographic Organization

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FOREWORD

The third IHO Assembly was undoubtedly the most prestigious IHO event of the year. It marked the first in-person gathering since the 2017 Assembly, signifying a significant shift from virtual meetings that had been necessitated by the pandemic. Despite leveraging modern communication tools in the past three years to advance our extensive work programme, the challenging period following the 2020 virtual Assembly taught us a vital lesson: virtual and hybrid meetings cannot fully replace the value of face-to-face interactions. The gap of six years without in-person discussions at the plenary level was notably long, particularly considering the changes in leadership across various hydrographic services. For many delegations, the Assembly in Monaco was an entirely new experience.

As the principal organ and decision-making body of the IHO, the Assembly is committed to two core principles: democracy through adherence to the Convention's rules and diplomacy in its conduct. It stands as a testament to these pillars of multilateralism in action.

The IHO, built on collaboration, mutual respect, and support, navigates technical solutions in a complex political landscape. This guiding compass steered our approach during the third Assembly. We were highly content with the detailed deliberations and the resulting collective decisions.

The Assembly provided an opportunity for the global hydrographic community to convene, incorporating a thematic session on new horizons in hydrography. The presentations emphasized the relevance of the IHO's aspirations, particularly in digitally representing the complexities of seas and oceans. Notably, the Assembly highlighted the significance of the ocean mapping program under GEBCO, aligning with IHO's strategic goals aimed at leveraging hydrographic data for societal benefit and actively engaging in ocean-related international initiatives.

GEBCO has made considerable progress in terms of coverage and quality but requires new alliances to expedite further development. The "Map the Gaps" Symposium, held during the 2023 GEBCO week in collaboration with various organizations, marked the culmination of major IHO events. This symposium, occurring during GEBCO's 120th year, provided an inspiring platform to foster relationships essential for the continuation of this critical mission.

In 2023, the International Hydrographic Review celebrated its 100th anniversary during the 3rd Session of the IHO Assembly, highlighting its enduring relevance and contributions to the international hydrographic community.

Additionally, 2023 initiated the third triennium of the IHO Council, serving as the apex decision making body of the IHO's working year. The Council session reviewed progress and set the course for technical standardization and capacity building support, building upon the mandates from the third Assembly.

Both the Assembly and Council noted the strategic importance for the IHO to focus on the implementation of the S-100 Universal Hydrographic Data Model in the lead-up to 2026 and beyond, recognizing the IMO’s rapidly approaching acceptance of S-100 compliant ECDIS.

Moreover, 2023 was a year of strengthened collaborations with international organizations, both governmental and non-governmental, locally within Monaco and globally. These partnerships aimed to enhance research, monitoring of marine waters, and contribute to global initiatives for the oceans, encompassing various domains such as oceanic management, early warnings, gender equality in ocean sciences, and exploring the potential impact of enhanced seabed exploration on the ocean economy and beyond.

Lastly, heartfelt gratitude goes to the IHO Secretariat's staff for their continuous and flawless support in managing day-to-day activities and organizing the multitude of events that defined the significant milestones of 2023.

Monaco, 1st March 2024



Luigi Sinapi	Dr Mathias Jonas	Dr John Nyberg
Director	Secretary-General	Director

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INTRODUCTION

The Secretariat is pleased to present the Annual Report of the activities of the Organization for 2023. This report provides an account of the principal activities and achievements of the IHO, the subordinate bodies of the Organization and the Secretariat during the year. The report also describes the cooperation and participation of other international organizations and stakeholders in the execution of the IHO Work Programme.

Work Programme & Strategic Plan

The conduct of the IHO Work Programme was permanently overseen by the Council. As a result of 2nd Assembly's approval of the revised Strategic Plan each item of the Work Programme was associated with the respective goals and targets. Most programmed work items were met. The detailed review of the IHO Work Programme items addressed at Council 6 (2022) resulted in concrete proposals for decisions and actions, which were brought forward to the 3rd Assembly for consideration and subsequent approval. On this sound basis to act, Council 7 (2023) was enabled to approve the Work Programme for the forthcoming year 2024.

Budgetary and financial situation

The Council has permanently overseen the budget and the financial situation by consideration of the respective annual reports of the Secretary-General and the endorsement of annual budget estimates during the inter-Assembly period.

This Report consists of two Parts to address the two principal items as explained above:

Part 1 – General

Part 1 provides short summary reports and observations on the execution of the IHO Work Programme. Part 1 is structured based on the three parts of the Work Programme: Corporate Affairs, Hydrographic Services and Standards and Inter-Regional Coordination and Support. In this way, the Report is also directly related to the technical structure of the Organization which is based on the Secretariat (Corporate Affairs) function and the two principal Committees - the Hydrographic Services and Standards Committee (HSSC) and the Inter-Regional Coordination Committee (IRCC). As far as suitable, Part 1 of the Report follows the same structure and uses the same headings as in the approved Work Programme.

Part 2 – Finance

Part 2 provides the financial statement and accounts for 2023.

A significant part of the operational budget is allocated to travel. This supports the travel expenses of the Secretariat Staff engaged on IHO activities. A list of Secretariat travel in 2023 is shown in **Annex D**.

Performance Monitoring

The third Assembly renewed its task for Council to monitor closely the appropriateness and applicability of the agreed Strategic Performance Indicators. The Assembly had decided not to invest further in the MSDI data portal (Goal 2, Target 2.1). The associated SPI 2.1.1 would be interpreted to mean the number of downloads of the data and information represented in the global thematic layers (Decision A3/8). Under the aegis of the responsible Committee chairs, both HSSC and IRCC reported the 2023 indicator values for endorsement at Council 7 (2023). The annual Status Report on Performance Monitoring available forms **Annex B** to the IHO Annual Report (Publication P-7). This Annex also includes a set of SPI´s for Work Programme 1 *Corporate Affairs* which was endorsed by Council 7 (2023).

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Partie 2 - Finance

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ANNUAL REPORT SUMMARY

Work Programme 1

One of the high points of this past year was undoubtedly the third session of the Assembly of the IHO which convened in May, bringing together 450 participants representing 98 Member States, industry and partners to discuss developments in technical standards and ocean mapping and agree on resolutions to guide future activities. In the context of pursuing the transition to digital data services, the S-100 concept moved closer to becoming a reality as Member States agreed on a strategy for its implementation, which aims to establish S-100 based data services with S-101 Electronic Navigational Charts (ENCs) as the driving force by 2026. After decades of discussions, Member States also approved the resolution recognizing the existence of the "Southern Ocean" around Antarctica and setting its northern geographic limit at 60 degrees latitude South, while duly acknowledging national positions and possible reservations. In light of the now well-established global use of the term "Southern Ocean" by geographers and the scientific community, this resolution aims to solve this long-lasting issue.

Highlighting hydrography's contribution to discussions taking place on the international stage, this year's Assembly included thematic sessions addressing hydrography's role in the Ocean Decade. High level speakers included HSH Prince Albert II of Monaco, Mark Heine, CEO of Fugro, Dr Heike Deggim, Director, Maritime Safety Division, IMO, and Dr Kerri-Ann Jones, Deputy Secretary-General, OECD. An embedded workshop also focused on the benefits of gender balance within organizations and the role of leadership as part of the Empowering Women in Hydrography (EWH) initiative.

During A3, HSH Prince Albert II of Monaco was presented with the 120th GEBCO anniversary world map. The week culminated with the re-election of Dr Mathias Jonas as Secretary General and Dr John Nyberg as Director.

A big focus of the year was the implementation of S-100, which is gaining traction. During A3, Member States approved the fundamental strategic change introduced by the S-100 framework and approved the Dual Fuel Concept for S-100 ECDIS. The WENDWG saw its scope extended to S-100 and has set the development of guidelines for the coordinated implementation of the new S-100 based products and services as a top priority. The assessment and monitoring of the readiness status at national and regional levels for the S-100 implementation has started. Some Regional Hydrographic Commissions (RHCs) nominated an S-100 Coordinator and/or established an S-100 Coordination Sub-Group.

In parallel, the international hydrographic community continued to grow in 2023, as the IHO welcomed the Republic of Cabo Verde as its 99th Member State.

In order to improve productivity and efficiency at the Secretariat, a plan for the full renovation of its digital infrastructure was developed and implementation has already begun.

In addition, the IHO continues its efforts in public relations and outreach. The IHO website had a total of 921,575 views in this calendar year. The LinkedIn page grew to 8,821 followers in December and reached total post impressions of 322,413.

Work Programme 2

The implementation of S-100 is gathering speed. In October, the Council recommended Member States be prepared to meet their expected commitments for the adoption phase of the "operational" Editions of the S-100 Product specifications which are critical for the new S-100 ECDIS.

The 11th ABLOS Conference provided an opportunity for participants to reflect on, and discuss, challenges brought about by the changing legal environment within the Ocean Science and exploration communities. Topics discussed included challenges in defining Arctic continental shelf limits, satellite data in defining hotspot ridge boundaries, and the role of scientific and technological advances in maritime boundary disputes. Sessions also explored gender equality in ocean science institutions, the impact of sea level rise on maritime boundaries, and the use of publicly available datasets for reconnaissance studies.

Finally. thanks to the support provided by the Hydrographic Surveys Working Group and the national best practices shared by some Member States, the long-awaited new publication S-68 – Ed. 1.0.0 – *Guidelines and Recommendations for Hydrographic Offices for the Allocation of CATZOC/QoBD[1] from Survey Data* was issued.

Work programme 3

Initiatives centred around Crowdsourced Bathymetry have continued to grow as does industry participation. In March 2023, the IHO and the Monaco Yacht Club launched their joint endeavour at a dinner conference hosted by the Yacht Club. A series of related events followed including a conference during the Monaco Yacht Show.

2023 was also a special year for GEBCO as it marked the 120th anniversary of the programme. There were a series of events and initiatives throughout the year to celebrate this milestone. This included the release of a 120th Anniversary World Map with the latest data. The map was presented to HSH Prince Albert II at the 3rd Session of the Assembly. In honour of the Monegasque origins of the programme, the GEBCO Map the Gaps Symposium was held at the Oceanographic Museum of Monaco in partnership with the Oceanographic Institute, Prince Albert I of Monaco Foundation and examined ocean exploration from 1903 to the future. It brought together diverse members of the ocean community and included inspirational speakers such as Dr Dawn Wright, Victor Vescovo, and Fabien Cousteau.

With this year seeing a new record number of proposals to name undersea features, members of the GEBCO Sub Committee on Undersea Feature Names (SCUFN) discussed ways to deal with increasingly large numbers of proposals but also how to safeguard data on features in disputed areas. Members agreed to establish a new SCUFN Naming 2030 Sub-Group which aims to develop a numerical data model based on a Geographic Feature Unique Identifier. Under this system, undersea features would be identified by a single, universally recognized alphanumerical code. It will examine solutions adopted by the International Astronomical Union Working Group on Star Names to assess the adaptability of their system for undersea features. SCUFN members also voted “to freeze” the naming of undersea features in the South China Sea.

PART 1

GENERAL

Summary reports and observations on the execution of the IHO Work Programme

MEMBER STATES OF THE INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO)
31 December 2023

Albania (Republic of)	Mexico
Algeria	Monaco
Argentina	Montenegro
Angola (Republic of)	Morocco
Australia	Mozambique
Bahrain	Myanmar
Bangladesh	Netherlands
Belgium	New Zealand
Brazil	Nigeria
Brunei Darussalam	Norway
Bulgaria	Oman
Cameroon	Pakistan
Canada	Papua New Guinea
Chile	Peru
China	Philippines
Colombia	Poland
Croatia	Portugal
Cuba	Qatar
Cyprus	Republic of Kenya
Democratic People's Republic of Korea	Republic of Korea
Democratic Republic of the Congo*	Republic of Cabo Verde
Denmark	Romania
Dominican Republic	Russian Federation
Ecuador	Samoa
Egypt	Saudi Arabia
Estonia	Serbia*
Fiji	Seychelles
Finland	Singapore
France	Slovenia
Georgia	Solomon Islands
Germany	South Africa
Ghana	Spain
Greece	Sri Lanka
Guatemala	Suriname
Guyana	Sweden
Iceland	Syrian Arab Republic*
India	Thailand
Indonesia	Tonga
Iraq (Republic of)	Trinidad and Tobago
Iran (Islamic Republic of)	Tunisia
Ireland	Turkey
Italy	Ukraine
Jamaica	United Arab Emirates
Japan	United Kingdom of Great Britain and Northern Ireland
Kuwait	United States of America
Latvia	Uruguay
Lebanon (Republic of)	Vanuatu (Republic of)
Malaysia	Venezuela (Bolivarian Republic of)
Malta	Viet Nam
Mauritius	

* *Rights of membership suspended*

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IHO SECRETARIAT 2023

MATHIAS JONAS
Secretary General

Dr. Mathias Jonas is the elected Secretary-General of the International Hydrographic Organization (IHO) since 2017. Prior to this appointment he held the posts of Vice President of the Federal Maritime and Hydrographic Agency and National Hydrographer of Germany. Being originally a mariner, Dr Jonas has been involved in integrated navigation matters since the beginning of the nineties. He has continuously contributed to IMO and IHO standardisation activities for navigation equipment, survey and cartography since. As one of the responsibilities of his current post he holds the Chair of the Hydrographic Commission on Antarctica.

LUIGI SINAPI
Director

Luigi Sinapi is the Director Inter Regional Coordination and Support Programme – of the IHO since September 2020. He is Rear Admiral of the Italian Navy and before joining the IHO he was Director of the Italian Hydrographic Institute, Commander of a Frigate and a Destroyer, and participated in NATO security missions in the former Yugoslavia and Kosovo for which he was decorated. He is currently in charge of Capacity Building, Education and Training and GEBCO programmes.

JOHN NYBERG
Director

Dr. John Nyberg was elected as IHO Director Technical Programme in 2023. Prior to his appointment, Dr. Nyberg held several positions with the U.S. National Oceanic & Atmospheric Administration (NOAA) including Deputy Hydrographer and Chief of the Marine Chart Division. John has managed international, interagency, and legislative engagements and teams of 100+ employees to produce and distribute thousands of nautical charting products. He has been working on advancing IHO initiatives for over 20 years.


ISABELLE BELMONTE
ROSA ACOSTA URBINA
CAROLINE FONTANILI
ARESKI MAACHE
JEFF WOOTON
SANDRINE BRUNEL
KAZUFUMI MATSUMOTO
TRACY BOWENS
LEONEL MANTEIGAS
INYOUNG PARK
CHRISTOPHE BUZZI
LORÈNE CHAVAGNAS
SAMUEL HARPER
YONG BAEK
YVES GUILLAM
MATTHIEU PARIS
RÉMY ROQUEFORT
SARAH JONES COUTURE
ISABELLE ROSSI

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WORK PROGRAMME 1
Corporate Affairs

Introduction

IHO Work Programme 1 "Corporate Affairs" covers the provision of the principal organs as well as the other services of the Secretariat of the IHO including the management and fostering of relations with other international organizations. Work Programme 1 is executed primarily by the Secretariat, under the leadership of the Secretary-General assisted by the two Directors.

IHO Council

Representatives of 35 IHO Member States discussed the future of digital data services and other priorities during the meeting of the new IHO Council. Taking place at the Secretariat in Monaco, the 30 countries sitting on Council met for the 1st time with the goal of coordinating the implementation of activities voted on during Assembly in May. The biggest topic of discussion was progress and next steps in the implementation of the Universal Digital Data Model, known as the S-100 framework.

With the transition to digital data systems and the increasing need for up-to date ocean data, implementing the universal data model which can support data both produced by and used by a range of different stakeholders is the priority.

Progress in the various projects related to S-100 was regarded as proof of the international community's commitment to this transition. Having interoperable and machine-readable data will provide a cornucopia of benefits in support of safe navigation, the development of the blue economy, and effective initiatives to measure and address ocean change. Already the Product Specification for the delimitation of sea areas (Polygonal demarcations of global sea areas, S-130 Edition 1.0.0) is ready for initial implementation, testing and evaluation. Council agreed to test the Product Specification in two regions, the Baltic Sea and the Southern Ocean, before the publication of the operational version of the standard and official production of the single IHO authoritative dataset for limits.

Council members also discussed the provision of an MSDI layer for Marine Protected Areas, a concrete example of how these standards could support the wider ocean community and global initiatives under the UN Ocean Decade. A global MSDI layer dedicated to MPAs, limited to the High Sea as a first step, would allow compatible GIS systems to monitor progress in the goal of protecting 30% of the ocean by 2030, which caters to Goal 3 of the IHO Strategic Plan to contribute international initiatives related to the knowledge and sustainable use of the ocean.

Dr Mathias Jonas and Pia Dahl Højgaard

Participants also listened to updates from the IHO-Singapore Innovation and Technology Laboratory, and in particular the project to test whether safe navigation can be supported by displaying dynamic sea level changes on ENCs. The S-100 Implementation Roadmap was updated with a new timeline for standards development into their operational edition 2.0.0 planned to be approved by IHO Member States from November 2024.

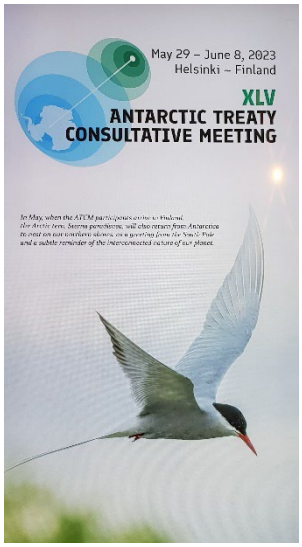
Cooperation with International Organizations

This element covers liaison and cooperation between the IHO and other international organizations. Notable activities during the year are described. The IHO was represented in most cases by the Secretary-General, a Director or an Assistant Director.

Antarctic Treaty Consultative (ATCM)

The ATCM in Helsinki included the first ever full-day session dedicated on climate change. The aim is to share views and best practices and to adopt a declaration where the Antarctica community communicates to the global public its concerns about climate change and how it affects Antarctica.

The Monday 5 June morning session was dedicated to the implementation of the IMO Polar Code, a session chaired by Minister Fausto Lopez Crozet (AR). This session started with an open discussion on the possible contribution of ATCM in the improvement of the Polar Code. The IHO Secretariat used it as a hook for presenting some bullets of the IHO Report introducing the new S-100 data services (inc. S-411, S-412) developed by the IHO (HCA). The IHO Secretariat mentioned for instance that "voyage planning" and safety of navigation are part of the Polar Code. That was strongly supported by Ms Lisa Kelley (IAATO Head of delegation). The key role played by the UK (UKHO) in the HCA (Hydrographic Priority WG, Maritime Shipping Routes maintained, Coordination) was also highlighted to the head of the UK delegation in particular.



The HCA Secretary met Minister Fausto Lopez Crozet in the margins of the plenary session. He was kept informed in advance of the presentation that the IHO Secretariat would mention in his brief the Decision recently made at the 3rd Session of the Assembly on the "Southern Ocean". After the presentation, which included the reservations included in the new Resolution (the cartographic conventional limit (60°S) had no legal, political, environmental, oceanographic effect...), the Minister (AR) thanked the IHO for the efforts on this naming issue and for the IHO report in general. One should note that most of the papers presented at ATCM include "Southern Ocean".

The Chair of the WG2 of ATCM thanked the IHO and informed that ATCM had decided to keep the hydrographic activities in their ATCM MultiYear Strategic Work Plan. They informed the IHO Secretariat representative that they would welcome an IHO Report on an annual basis with some charts depicting the status of survey coverage and S-100 data services planned to be available in the Region.

Comité International Radio Maritime (CIRM)

The Comité International Radio-Maritime's (CIRM) Annual Conference provides an important opportunity for the IHO to engage with members of the marine electronics industry, including many ECDIS and ECS equipment manufacturers, navigation system integrators, ship service providers, and other electronic equipment specialists. Dr John Nyberg represented the IHO at this year's Conference and participated in the S-100 session which featured presentations from Furuno, NAVTOR, PRIMAR, and the UKHO. There were several important interactions from the meeting, including the critical timeline regarding the S-100 development cycle (particularly with phase 1 implementation), the importance of communicating the value of S-100 to the OEM community, and the recognition that IHO participation at such events is both helpful and appreciated. During the S-100 session PRIMAR presented their current work on the testing of S-128 and asked for increased industry participation. CIRM's ECDIS WG met on the last day of the conference where they discussed S-100 and revisions to "CIRMs position on Transition to S-100 ECDIS" document.

John Nyberg and Richard Doherty (CIRM Secretary General)

The Conference proved to be a venue for informative discussion on how ship owners view equipment (and data) upgrades and industry progress on MASS, including opportunities and challenges.

International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA)

- **7th Digital@Sea Asia-Pacific 2023 Conference and Workshop on enhancing the safety of navigation by digital means**

The 7th Digital@Sea Asia-Pacific Conference was held in Seoul, Republic of Korea from 12 to 13 September and was co-organized by the Ministry of Oceans and Fisheries of the Republic of Korea, IALA, and DMA (Danish Maritime Agency). The Conference was followed by a "Workshop on enhancing the safety of navigation by digital means", from 14 to 15 September. The IHO Secretariat was represented by Director Luigi Sinapi, who participated at the 7th Digital@Sea Asia-Pacific Conference, and Assistant Director Leonel Manteigas, who participated at the workshop.

Digital@Sea Asia Pacific Conference and speakers

Under the theme of "The present and the future of the maritime digital industry", the Conference served as a venue to share maritime digital technology and discuss cooperation among Europe, North America, and the Asia-Pacific countries, and was joined by renowned experts, faculties, and stakeholders in the international maritime digital sector to share new policies and cutting-edge technologies and discuss cooperation for the shared goal of maritime digitalization.

The Conference comprised six sessions, including "Growth of the global maritime digital market", "Directions of new maritime digital service", and "Global GHG reduction trends and the role of Maritime Digitalization". Under the session "Directions of new maritime digital service", IHO Director Luigi Sinapi presented on "The Universal Hydrographic Data Model S-100: S-100 and S-200 products development", highlighting on the S-100 developments with a focus on the future IHO and IALA products and services, and the transition from S-57 to S-101, following the inclusion of S-100 as a valid base technology in ECDIS at the IMO MSC 106 meeting in November 2022.

IHO Director Luigi Sinapi presenting at the session "Directions of new maritime digital service"

The "Workshop on Enhancing Safety of Navigation by Digital Means" was organized by the Ministry of Oceans and Fisheries of the Republic of Korea, IALA, IMO and IHO having as objective facilitate the development and implementation of digital services which can enhance maritime safety and marine environment protection in Asia.

The agenda of the workshop comprised eight sessions. On the first session were received welcome addresses from: Mr. Jong-uk Hong, Director of Maritime Affairs and Safety Policy Bureau, Ministry of Oceans and Fisheries, (MOF); Mr. B. Sıtkı Ustaoğlu, Head, Asia and Pacific Section, Technical Cooperation Division, IMO; IHO Assistant Director Leonel Manteigas; and Mr. Omar Eriksson, Deputy Secretary-General IALA.

Participants of the "Workshop on Enhancing Safety of Navigation by Digital Means"

On the second Session dedicated to the "Update from International Organizations", Assistant Director Leonel Manteigas delivered a presentation on the topic "IHO Capacity building contribute to the safety of navigation", providing an overview of the IHO, the focus of the hydrography and its importance for the safety on navigation, the transition from S-57 to the S-100 compliant products and respective benefits, and the importance of the partnership between international organizations for the Capacity Building.

Additionally, there were sessions dedicated to "Sharing Digital Experiences", "Digitalization projects/initiatives worldwide" and "Other Developments" the final session was chaired by IHO Assistant Director Leonel Manteigas. Two important sessions were dedicated to the topic "Digitalization in participating countries" with presentations from Bangladesh, Brunei Darussalam, Cambodia, Malaysia, Indonesia, Philippines, Sri Lanka, Timor-Leste, Viet Nam and Japan.

International Maritime Organization (IMO)

- **IMO TCC73**

The 73rd session of the Technical Cooperation Committee (TCC), the IMO body that considers matters within the scope of the implementation of technical cooperation projects, was held in London from 16 to 19 October 2023. H.E. Mr. Dwight Gardiner (Antigua and Barbuda) and Ms. Anays Berrocal (Panama) were both re-elected for 2024 as Chair and Vice-Chair respectively. Assistant Director Leonel Manteigas represented the IHO.

In his opening remarks, the Secretary-General of IMO, Mr Kitack Lim, welcomed the participants and highlighted the important items in the agenda. The decarbonization of shipping to address climate change and digitalization that offers new and transformative opportunities for shipping and port activities were highlighted as key maritime developments. He announced the launch of the new IMO Technical Cooperation brochure and informed the Committee that in July 2023, IMO adopted the 2023 Strategy on Reduction of Greenhouse Gas Emissions from Ships.

Agenda item 2 - Work of Other Bodies and Organizations, a reminder was presented that the Council had requested the Secretariat to continue to explore mechanisms to support developing countries, in particular Small Island Developing States (SIDS) and Least Developed Countries (LDCs), in participating in the Junior Professional Officers (JPO) and Senior Professional Officers (SPO) programme.

Agenda item 3 -Technical Cooperation Planning and Reporting the Integrated Technical Cooperation Programme (ITCP) implementation during 2022 showed a gradual return to pre-COVID-19 pandemic levels, with 70% of the planned activities delivered both through remote and in-person methods. This comprised 181 activities, including eight advisory and needs assessment missions and 87 training courses. The training had approximately 2,028 participants worldwide in 2022. In addition, 243 fellows completed fellowships at the World Maritime University (WMU), the IMO International Maritime Law Institute (IMLI) and other maritime training institutions. Further, 472 officials attended events aimed at developing and harmonizing regional strategies on maritime technical issues. The participation of women in senior official activities and fellowships was 38%

IMO Secretary-General Mr. Kitack Lim during the opening remarks.

and 57% respectively. The total expenditure on technical cooperation activities in 2022 reached $17.7 million, representing a financial delivery rate of 57%. On the development of e-learning courses the Secretariat is planning to expand its portfolio. The Secretariat was requested to explore ways to measure and evaluate their effectiveness.

On the Integrated Technical Cooperation Programme (ITCP) and Technical Cooperation Fund, the allocation for 2024 and 2025 amounted to $13.4 million, which was 9% lower than the allocation for 2022-2023. The overall allocation would cover 47% of the total ITCP requirement of approximately $28.4 million. In order to mobilize and secure the additional resources required Member States and shipping industry stakeholders were urged to make financial and/or in-kind contributions.

Under the Resource Mobilization and Partnerships item related to the Implementation of the Long-term Resource Mobilization Strategy, progress was reported on mobilizing diverse resources for thematic long-term TC projects since TC 72. To attract more partnerships and financial resources, several marketing materials were produced, including 21 project concept papers and four IMO TC partnership newsletters. In October 2023, there were 128 operational partnership arrangements as compared to the 97 reported to TC 72. Of these, 30 were one-off financial support attracting a total amount of $6,287,642; 85 were financial and in-kind; and 13 were implementing partnership agreements.

Related with the Annex of the Document TC 73/4(b) IHO Assistant Director Manteigas informed the Committee that a Joint Capacity Building coordination meeting is planned for 2024, after the interruption of the meeting schedule caused by the COVID pandemic since the collaboration between IHO, IMO, IALA, IOC, WMO, IMPA, IAEA and FIG are essential to coordinate the CB efforts within the UN concept of “Deliver as one”.

Document TC 73/4(b)/3, submitted by SPC, introduced the Pacific Regional Safety of Navigation Strategy 2023-2027. A call was noted for the Pacific Island Countries and SPC to implement the strategy and report on future meetings of the Pacific Regional Transport Ministers and the technical capacity of SPC to coordinate different projects in the field of maritime safety and safety of navigation. New Zealand acknowledged the work of the Pacific Community and regional partners in developing the Strategy and that Australia and New Zealand supported five regional Maritime Safety Information (MSI) training courses since 2010. The latest was held in last July, hosted by the Fiji Hydrographic Office, with capacity building funding from the International Hydrographic Organisation (IHO). IHO Assistant Director Manteigas informed the Commission that “the IHO recognizes the importance of the work of the Pacific Community and regional partners in developing the Pacific Regional Safety of Navigation Strategy 2023-2027 that aims to provide a regional framework to address five main areas of safety of navigation, which also includes Hydrographic Services. The IHO and its Capacity Building (CB) program is committed to contributing support for the initiatives related to safety of navigation and the hydrographic responsibilities attributed to the States in the SOLAS Convention, in all RHCs. The MSI courses mentioned by New Zealand funded by the IHO Capacity Building

IHO Assistant Director Leonel Manteigas during his interventions.

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programme are examples of this commitment. During this year, along with several other activities included in the IHO 2023 CB Work Programme, two more MSI courses will be supported in two more of the 15 RHCs."

On the Financial contributions to Technical Cooperation, the Committee welcomed several relevant pledges that were announced during TC 73 and expressed its appreciation to all donors and encouraged Member States, intergovernmental organizations, non-governmental organizations and the industry to continue supporting ITCP activities.

On the Capacity-Building Decade 2021-2030 Strategy the publication of the new TC brochure "All Hands on Deck" was noted, which contains the TC Framework that brings together the different strategic elements that guide the future direction of IMO's technical cooperation, including the IMO Strategic Plan, the Capacity-Building Decade 2021-2030 Strategy, the technical cooperation thematic priorities, and the Strategy for resource mobilization for IMO's technical cooperation activities. Annex 1 to document TC 73/6 contains the alignment between the TC Framework and the four work streams of the Strategy that are: WS 1 – Reform and streamline IMO's internal organization for delivery of technical assistance; WS 2 – Support Member States in maritime development; WS 3 – Enhance the Regional Presence Office (RPO) Scheme; and WS 4 – Strengthen the global training and development network. The United Arab Emirates presented a proposal for a comprehensive capacity development strategy and the Secretariat was invited to prepare and share a draft. During the Regional Presence and Coordination session, the delivery of 107 activities implemented by the network of IMO Regional Presence Offices in 2022 was noted, including support to the implementation of IMO's Women in Maritime programme. The Committee expressed its appreciation to the host governments of IMO RPO's, namely Côte d'Ivoire, Ghana, Kenya, the Philippines, and Trinidad and Tobago, as well as the Pacific Community for supporting the establishment of an RPO in Fiji. Progress was also appreciated towards hosting the newly established IMO RPO in Egypt.

On Capacity-Building - Strengthening the Impact of Women in the Maritime Sector, the Committee was updated on the activities delivered through IMO's Women in Maritime Programme in 2022, in particular the celebration of the first International Day for Women in Maritime and the publishing of the IMO-WISTA International Women in Maritime survey report, containing information about the proportion and distribution of women working in the maritime sector. The document containing the draft Global strategy for the IMO Women in Maritime Associations (WIMAs) was also introduced.

In relation with the Global Maritime Training Institutions two documents summarized the main activities undertaken by the World Maritime University (WMU) and the IMO International Maritime Law Institute (IMLI) during 2022 related to governance and management, financial matters, programme enrolments and graduates, academic developments and partnerships, cooperation, research and consultancies, including publications, outreach activities and United Nations-related matters.

Work Programme - it was noted that the information provided in document TC 73/13 (Secretariat) and approved the biennial status report of the TCC for the 2022-2023 biennium and substantive items to be included in the provisional agenda for the period 2024-2027.

Intergovernmental Oceanographic Commission (IOC)

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.

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IHO participating at the 32nd Session of the IOC Assembly.

The morning of 26 June was dedicated to the approval of the IOC Capacity Development Strategy 2023-2030 presented on Friday 23 June, 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.

GEBCO. GGC Chair, Mr Evert Flier presenting the GEBCO Report.

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), which became operational in February 2018 and 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.

IHO Assistant Director Samuel Harper presented the recent developments on the new GEBCO governance.

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.

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*

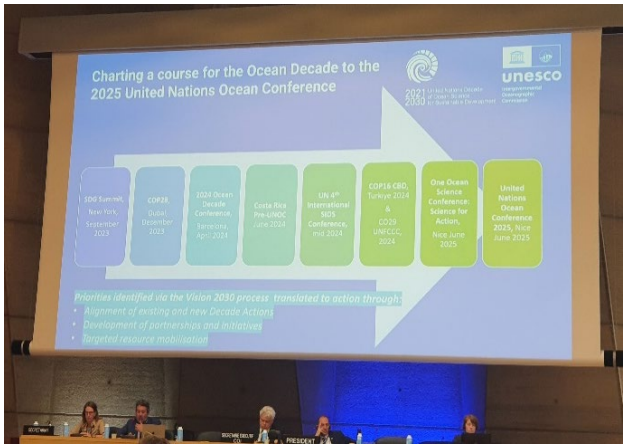
society" and "*Participating actively in international initiatives related to the knowledge and the sustainable use of the Ocean*". In this regard, Hydrography and Oceanography cannot go separate in the future, as they provide, via their applications and the common GEBCO programme, a unifying framework 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

In the evening of 26 June, a reception to celebrate the 120th anniversary of GEBCO was hosted by the IOC-UNESCO and sponsored by FUGRO, in the presence of H.E. Mme Anne-Marie Boisbouvier, Ambassador of Monaco to UNESCO, the IOC-UNESCO delegates, Industry and the Nippon-Foundation GEBCO-Seabed2030 project. The reception was preceded by speeches delivered by the IOC Executive-Secretary, IHO Director, Ambassador of Monaco to UNESCO, GGC Chair, representative of FUGRO and the Seabed2030 Director. It was remarked that the central role of GEBCO in mapping the Ocean, as the last challenge of humankind as a whole, and as a necessity which is driving the agendas of many international organizations and coastal and non-coastal States. The importance of Seabed2030 as an accelerator of GEBCO was highlighted and acknowledged by all the speakers and the participants at the reception, as well as the long-lasting support of the Principality of Monaco to GEBCO since its creation in 1903. The next celebration of the 120th Anniversary of GEBCO will be the GEBCO week and Map the Gaps symposium planned in Monaco in November 2023.

Reception for 120th anniversary of GEBCO hosted by IOC-UNESCO

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. A paper on Ocean Observations in areas of national jurisdiction was presented by the acting Director of GOOS. It was reported to the IOC Assembly that the IHO, through its Crowd Sourced Bathymetry Working Group (CSBWG), is actively investigating solutions to working within these constraints and would be most willing to cooperate with GOOS in the interests of sharing knowledge and experience.



Presentation of the updates on Decade Implementation plan

The last topic on 27 June was the update on the Decade Implementation plan made by the IOC Secretariat. The topic was preceded by a video on the Ocean Decade's main enterprises described by Prof Margaret Leinen of San Diego University, co-chair of the Decade Advisory Board. 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. An overview on the endorsed Decade Actions was provided, highlighting the numbers and the categories so far achieved (48 Programmes / 276 Projects / 84 Contributions), and on the established Ocean Decade Alliance, comprising 10 Patrons, including H.S.H. Prince Albert II of Monaco. An overview on the Foundations Dialogue was also presented, mentioning the meeting held with the growing informal group of more than 30 philanthropic funders in mid-June at the Third Foundations Dialogue held in Monaco on 14 June 2023. Finally, a summary of the Vision for 2030, Mission, Strategic Objectives, Challenges, Outcomes and Priorities of the Decade were presented. The next important steps for the initiative will be the 2024 Ocean Decade Conference in Barcelona, Spain, 10 to 14 April 2024, noting the 2025 United Nations Ocean Conference planned to take place in Nice (France), to align existing and new Decade Actions, develop partnerships and initiatives, to target resource mobilization and then to set up perspectives for the next two years.

Documents and resolutions of the two days of the 32nd Session of the IOC Assembly are available at https://oceanexpert.org/event/3837, as well as the entire documentation of the 32nd Session of the IOC Assembly, including presentations, interventions and statements of the participants (IOC-UNESCO Member States and Observes).

United Nations (UN)

13th United Nations Committee of Experts on Global Geospatial Information Management

The UN-GGIM held its annual meeting of the Committee of Experts on Global Geospatial Information Management in August 2023. The IHO was represented by Dr. John Nyberg who participated in four events during the week, a seminar on standards, an official Working Group meeting on Marine Geospatial Information Management, a Side Event to promote the new IGIF-Hydro, and the Committee of Experts plenary sessions.

Both the WG on Marine Geospatial Information Management meeting and side events were successful, though it should be noted that attendance from IHO Member States was relatively low when compared to previous years. Of special note from the Working Group meeting, Dr. Parry Oei (Singapore) has agreed to chair the WG for one year while the WG looks for permanent co-chairs.

Most importantly, the "United Nations Operational Framework for Integrated Geospatial Information Management Part Two: The Strategic Pathways" was endorsed by the Committee of Experts and both parts one and two of the UNI-GIF-Hydro were adopted as the complete "United Nations Operational Framework for Integrated Geospatial Information Management" (UN-IGIF-Hydro).The document was preceded by a white paper and accepted as an action of the Decade of Ocean Science over the past 5 years. The IHO and its Member States have

participated extensively in the drafting of the UNIGIF-Hydro.

Operational Framework for Integrated Marine Geospatial Information Management (UN-IGIF-Hydro)

The expectation for the UNIGIF-Hydro will be to serve as a reference for countries who wish to implement the UNIGIF's 9 strategic pathways in the marine domain and to help ensure that marine programs are included in the larger geospatial information ecosystem.

During the plenary session of the UN-GGIM, the IHO made interventions in support of the role of standards in geo-information management and the adoption of the UN-IGIF-Hydro respectively.

United Nations Division on Ocean Affairs and Law of the Sea (UN-DOALOS)

The two-day international symposium hosted by the UN Division for Ocean Affairs and the Law of the Sea (DOALOS) in collaboration with the International Oceanographic Commission (IOC) of UNESCO aimed to the strengthening of the ocean science-policy interface. The audience of about 160 participants was comprised of scientific and policy communities at all levels, including States, intergovernmental organizations, and other stakeholders with competence in ocean science-policy relationship. The IHO was represented by the Secretary-General Dr Mathias Jonas.

The expected outcome focused on the general awareness and understanding of the importance of the science-policy interface for ocean governance. Four sessions, with regional focuses on the Pacific, Indian, North and South Atlantic regions, worked to identify regional and global lessons and to set priorities in reinforcing the science-policy interface through capacity development. The regional aspect was highlighted by a specific session addressing science communication and ocean literacy as a key element of the science-policy interface.

Special emphasis was given to the compatibility and synergies between the upcoming third cycle of the Global Ocean Assessment 2023-2025 under the coordination of DOALOS and the framework of the United Nations Decade of Ocean Science for Sustainable Development (2021–2030) coordinated by IOC-UNESCO. One of the main conclusions made was the supplementary character of both processes, i.e. the Global Ocean Assessment to identify gaps in ocean stewardship and the Ocean Decade becoming instrumental in filling these gaps through scientific insight to be brought forward to the political sphere of decision making. One item affecting IHO themes in particular was the translation of data into policy-relevant information and knowledge. The permanent lack of data including bathymetric information was noted among others by representatives from small island states and less developed countries. In the course of this discussion the representative of French company Alcatel Submarine Networks, Mr Jean Aude reaffirmed the commitment of the sea cable industry to proactively contribute to the GEBCO programme through bathymetric data gatherings collected while on transit or on cable laying action which can eventually help to change the situation.

International and Other Observers Organizations

1st African Harbour Masters Committee Seminar

Under the aegis of the Ministry of Equipment and Water of Kingdom of Morocco, the 1st edition of the African Harbour Masters Committee Seminar (1st AHMC Seminar), organized by the AHMC, as the regional committee of the IHMA (International Harbour Masters Association), in partnership with ACOPM (Moroccan Association of Port Officers) and Tangier City Port, was held in Tangier, Morocco from 2 to 3 March 2023, in the Barcelo' Hotel Tangier.

The main theme of the Seminar was "*The crucial role of human factors for a better future for African ports*". The seminar concluded on 3rd

March with the visit to the new Tangier Med Port. Director Luigi Sinapi represented the IHO with the objective to present the tasks and mission of the IHO and the role of Hydrography today, highlighting the new Universal Hydrographic Data Model S-100 and its derived products and services, for improving safety of navigation.

1st edition of African Harbour Masters Committee (AHMC) – Barcelo' Hotel Tangier, Morocco.

During the official opening, the Port Commander and Director of Operations of the Port of Tangier, Mohamed Maghazi, Chairman of the AHMC, emphasised that the seminar is part of the activities of the IHMA and its African regional committee. The seminar aimed at promoting the safe, efficient and environmentally friendly management of maritime operations at port level, noting that the event brings together experts, port officials and port and maritime professionals representing more than 25 countries. Mr Maghazi, also President of ACOPM, said that at a time when 90% of international trade is carried out by sea, ports are proving to be particularly sensitive platforms, in a context that is highly exposed to the challenges of safety, security and environmental protection, not forgetting the challenges of sustainable development and operational and technological intelligence. For his part, IHMA President, Paul O'Regan, indicated that the seminar is an opportunity to present the professional perspectives of port commanders and officers at the international, regional and national levels, emphasising the importance of the human factor in promoting port performance and to maintain connection with International Organizations, such as IHO and IALA, both present at the seminar. For his part, the Director of Ports and Maritime State Property at the Ministry of Equipment and Water, Sanae El Amrani, emphasised the importance of the theme chosen for this event, noting that the resource "Humanity" is at the heart of all development in all sectors, including ports. As for the Director General of the Tangier Med Port Authority (TMPA), Hassan Abkari, he emphasised that the topics that will be discussed during the seminar are of paramount importance for African ports, which are called upon to make a strong commitment to innovation and efficiency, but also to believe, more than ever, in their potential to achieve top performance as world-class ports.

1st edition of AHMC Seminar official opening.

The seminar then developed into the following four thematic panels:

- *1st Panel - Navigation*. The objective of the panel was to share experiences and solutions for improving ship manoeuvring and port operational limits, challenging safety and optimization in ports and knowing more on the future of port approach navigational charts and port authority responsibility.
- *2nd Panel – Maritime Women, oceanography & AtoN*. The objective of this panel was to present on the role of women in the maritime industry, the importance of oceanography and atmospheric impact on safety of navigation, the future of IALA and the importance of aids to navigation in the ports.
- *3rd Panel – Dangerous Cargo*. The objective of the panel was focused on dangerous cargo and hazard studies of ports and terminals, highlighting the importance of management of dangerous cargo in container terminal and the port management programmes.
- 4th Panel – Sustainability and performance. The objective of the panel was to highlight how nowadays the ports are operating in intense international competition in their pursuit of safety, security, efficiency and competitiveness, responding to this pressure by embracing lead-ingedge technologies and digitalization, and moving towards "smart" and optimized solutions.

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1st edition of AHMC Seminar 1st Panel on Navigation - Presentation by IHO Director Luigi Sinapi

IHO Director Luigi Sinapi participated in the 1st Panel on "*Port approach navigational charts and port authority responsibility*", highlighting the implementation of a new and universally recognized way of representing the marine environment: the Universal Hydrographic Data Model S-100. The S-100 development concept allows interoperability with a wide range of marine geo-data and overcomes deficiencies for future digital nautical chart data products. With the approval of the new IMO ECDIS Performance Standards (Resolution MSC. 530(106)) the S-100 ECDIS will be 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 (MSC.530(106).

Given the multitude and diversity of products and services available to mariners in both route monitoring and route planning, one product that will play a key role in the S-100 product landscape is the *S-128 - Catalogue of Nautical Products*. The S-128 service will be an essential part of Port State Control, in order to check that the vessel conforms to carriage requirements.

The role of Ports and Port Authorities in providing end users with the necessary information for everything that complements mooring, unloading, loading and manoeuvring within ports was highlighted. The *S-131 - Marine Harbour Infrastructure* product is designed for end users to know all the services they will need while in port are available and accessible. It will be in line with IMO Resolutions A.893(21) and A.862(20), respectively the "Guidelines for voyage planning" and "Code of practice for the safe loading and unloading bulk carriers" and will improve the information exchange between harbours and hydrographic offices by acting as a neutral repository of harbour information. In developing this product, the ports will play a key role, to provide the bulk of S-131 data.

The AHMC's president closed the seminar highlighting the importance of networking and sharing experiences for a new integrated approach to port management, where the human factor remains an absolute priority in view of the challenges to which the African ports are exposed and the needs of the port community stakeholders.

31stl International Cartographic Conference

The 31st International Cartographic Conference (ICC 2023) was held in Cape Town, South Africa from 13 to 18 August 2023. The event was organised by the South African National Committee for ICA with the theme "SMART CARTOGRAPHY FOR SUSTAINABLE DEVELOPMENT". There were 845 delegates to the ICC, an excellent attendance due in part to representation by 33 African countries and also a concurrent meeting of the Africa Region of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM). There were workshops offered by the SDG Data Alliance where both organizations took part in various aspects of the ICC program, including five interesting keynote presentations. Director Abri Kampfer represented the IHO with

the objective to strengthen the cooperation with the Association that has several objectives in common with the IHO.

The International Cartographic Association (ICA) was established in 1959 to promote the disciplines and professions of Cartography and Geographic Information Science (GISc) in an international context. The IHO has cooperated with the ICA for a long time, notably through the ICA Commission on Oceanic Cartography which was replaced in 1980 with a Commission on Marine Cartography. A Memorandum of Understanding (MoU) between the IHO and the ICA was established in 2003 and revised in 2012 to provide a framework for continuing cooperation between the two organizations.

IHO Director Abri Kampfer addressing the Conference in the

The Opening Ceremony took place on 13 August and ICA President Tim Trainor invited IHO Director Abri Kampfer to address the conference. Director Kampfer thanked the ICA President for the invitation, stressed some common objectives and the long and important collaboration between both organizations, enhancing the Marine Cartography Commission and the fact that both institutions contribute with Members to the FIG/IHO/ICA International Advisory Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC). He commented that the theme of ICC2023, "Smart Cartography for Sustainable Development," is a perfect reflection of the importance of the collaboration between IHO and ICA. Smart cartography can be used to support a wide range of sustainable development initiatives, such as managing marine resources, protecting marine ecosystems, planning and developing coastal communities and responding to climate change, to name but a few. The importance of an all-embracing digital data model for all kind of marine geoinformation based on IHO´s S-100 framework was emphasised as it will allow fully interoperable data streams to feed evolving technology for the benefit of the maritime industry. He mentioned the richness of the Conference programme and congratulated the organizing committee on their efforts to organize such an important event.

The ICC 2023 consisted of the Conference, where numerous scientific papers on cartography-related matters were presented throughout the week in sessions running in parallel and a Cartographic Exhibition, which also included a digital exhibition, where various maps and other cartographic products from ICA member countries were presented with several examples of Nautical Charts.

On 14 August the IHO Director was invited for a meeting with the ICA President, Tim Trainor, the ICA Secretary-General, Thomas Schulz, ICA Vice-President, Andrés Arístengui and the incoming ICA President, Georg Gartner. Several opportunities for improving future collaboration in different areas such as the Capacity Building, Spatial Data Infrastructures, the IBSC and Cartographic Exhibitions were discussed. New membership to the Marine Cartography Commission and an additional two ICA members to the IBSC was highlighted. An interesting discussion on ethics in cartography was held as it was recognized that cartography can deliver a powerful message and influence decision makers. It was agreed that the close professional relationship between IHO and ICA should continue and strengthen where possible.

Organization for Economic Co-operation and Development

The IHO also continued its efforts to raise awareness about the importance of hydrography and ocean mapping. To examine the far-reaching impact of ocean data, the IHO Secretariat started cooperating with the OECD. The two organizations organized a workshop on the Future of Seabed Mapping and its uses in 2045 at the IHO Secretariat in Monaco. The report presenting the outcomes will be presented at the UN Ocean Decade Conference in 2024 and some of the findings will be incorporated into the OECD Ocean Economy in 2045 Report.

National Oceanic and Atmospheric Administration

Another highlight of 2023 was the IHO and the United States' National Oceanic and Atmospheric Administration reaffirming their commitment to make ocean data available to the global community by signing a new Memorandum of Understanding. The MoU ensures the continued hosting by NOAA of the IHO Data Center for Digital Bathymetry (DCDB), an online, open-access database that stores ocean depth data from around the world.

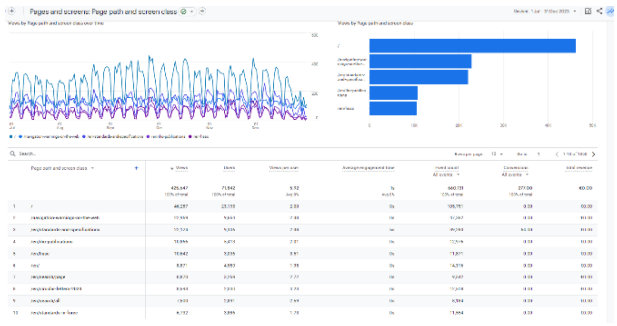
Public Relations and Outreach

Relationships with the Government of Monaco and the diplomatic corps accredited in Monaco

Communications with the Government of Monaco, in particular the Department of External Relations and Cooperation, was regular and productive throughout the reporting period. Thanks to the established collaboration procedures the accession of the Republic of Cabo Verde as 99th Member State was successfully managed.

Promote the IHO through Publicity and public relations initiatives

The outreach of IHO themes is more than ever based on digital provisions. Social media such as linkedIn, facebook and twitter are the relevant communication channels in parallel to the IHO website. Website click rates and page impressions are systematically monitored and impact the selection and placement of themes and documents on the website and social media.



The Secretariat maintained a record of the principle IHO activities in the monthly publication of the International Hydrographic Bulletin composed of the meeting brief reports, as well as providing a quarterly article in the journal *Hydro International*.

John Nyberg, Keynote Address

- Hydrographic Conference – Hydro 2023

The European Hydrographic Conference was held in Genoa, Italy between 7 and 9 November. There were approximately 150 hydrographic professionals, students, industry representatives, and others in attendance.

The conference covered a wide range of topics of interest to hydrographers that included everything from new technology, collaboration and partnership, sustainability in the ocean, ocean exploration and more.

John Nyberg and Mayor of Genoa, Marco Bucci

IHO Director John Nyberg attended for the first half of day one to deliver the keynote address, "Transforming Hydrography: Our Journey Towards 2030" where he highlighted wide range of high level opportunities available to the hydrographic community during this decade. Nyberg introduced the United Nation's 2030 Agenda, the Decade of Ocean Science for Sustainable Development, the IHO DCDB, Seabed 2030, the UN IGIF-Hydro, and IHO progress and opportunities around the IHO S-100 Universal Hydrographic Data Model.

Following the keynote address, Nyberg chaired an hour long "Hydrographer of Tomorrow: Adapting to Technological Advances and Global Challenges" session that became an interactive conference wide discussion on the challenges for both developing and finding the skills needed for modern hydrographic programmes. Following the discussion, it was decided that an

article for the next edition of Hydro International would be written.

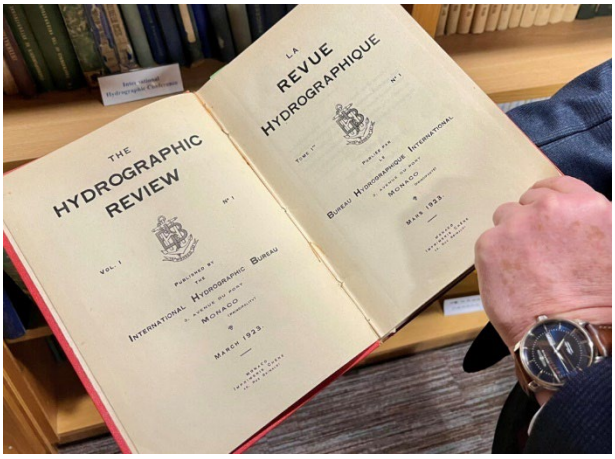
There was a comprehensive exhibition area that included approximately 20 hydrographic sponsors and exhibitors.

World Hydrography Day

The theme of World Hydrography Day (WHD) 2023 was ***"Hydrography - underpinning the digital twin of the ocean"***. The digital twin of the ocean aims to develop a consistent, high-resolution, multi-dimensional and near real-time virtual representation of the ocean that could make ocean knowledge open-access, available to citizens, scientists and policymakers around the world, and will provide a platform for global cooperation. The theme was designed to highlight how hydrography and oceanography could work together for mutual benefit, with hydrography being a building block for the digital twin. National events in connection with World Hydrography Day 2023, as reported by Member States, are available at: *https://iho.int/en/whd-2023-celebrations-around-the-world.*

International Hydrographic Review

The website of the International Hydrographic Review is now fully synchronised with the printable biannual issue. The first issue of the International Hydrographic Review (IHR) in 2023 was a special jubilee edition. Ever since its first issue published in 1923, the IHR has been a prestigious publication of the International Hydrographic Organization (IHO), adapting its focus, content and format through changing times. To commemorate this milestone, this issue is a special jubilee edition. First, it features a new, redesigned and modern layout in which the IHR will be published from now on. As a special tribute to our readers, a printed copy of this jubilee edition will be presented to each delegate attending the 3rd Session of the IHO Assembly. Today, the IHR is a reputable international scientific journal that publishes peer-reviewed articles spanning all facets of hydrography. Additionally, it covers related disciplines, including oceanography, geodesy, remote sensing, geo-information science, geophysics, acoustics, marine technology and navigation. The readership of the IHR is diverse, encompassing academia, industry, organizations and authorities within the international hydrographic community and beyond. The Editor in Chief, Dr Patrick Westfeld strives to publish articles that appeal to this broad audience, providing relevant insights and perspectives for all.



The original exemplar of the very first issue of The Hydrographic Review (Vol.1, Nº1, March 1923), a technical bulletin and predecessor of the IHR

Encourage new membership of the IHO

The Secretariat was in dialogue with another four IMO Member States which indicated interest in joining the IHO. The Secretariats undertook every effort to explain the rights and benefits of their potential IHO membership and looks optimistically forward to welcoming the 100th IHO member in the forthcoming year.

Management of the IHO Secretariat

Human and Material Resources

Based on the decision of the third Assembly (Decision A3/10) the entire Secretariat´s staff is now working under the revised M-7 Staff Regulations Edition 9.0.0 which was set in force by 1 July 2023. The approved revision of IHO´s Staff Regulations was induced by the rearrangements made for the health insurance and retirement system for the local IHO Staff. Based on the experiences made during the COVID pandemic, an element of teleworking was introduced into the general working arrangements.

Investment was made in outdoor furniture to facilitate the better use of the Secretariat´s terrace for receptions and other events associated to the hosting activities. The costs were shared with the International Atomic Energy Agency (IAEA) and the Center Scientific De Monaco (CSM) which both are resident in the same building as the Secretariat and are entitled for

the use of the terrace under the prerogative and the coordination of the IHO Secretariat.

Information and Operations Management

- **IT-Infrastructure of the Secretariat**

As an ongoing requirement for any modern IT infrastructure, hardware and software equipment were under permanent maintenance and modernization. The further digitalization of administrative and production processes at the Secretariat was progressing.

The internal IT personnel continues to rely on a combination of one dedicated member of staff and approximately a third of the time of an Assistant Director, together with assistance and services provided by several service providers under contract terms. An ongoing challenge was the provision of matured hard- and software infrastructure for remote and hybrid meeting formats. Investments were made in video production hardware, i.e. a high-class camera. Other notable investments were the renewal of the internal firewall architecture meeting increased needs for protection against cyber-attacks and a more powerful uninterruptable power supply to maintain undisturbed operation in case of a power failure.

In-kind contributions of Member States hosting applications such as the DCDB (USA), S-100 Registry and the IHO e-learning Center (both hosted by Republic of Korea) are indispensable for the proper functioning of the Secretariat's digital services. During the year it became even more evident that the continued operations of those services require substantial human recourses. The Secretariat´s operational maintenance of the S-100 Registry forming the core digital component of the S-100 framework alone absorbs three third of the time of the appointed staff expert. Digital tools such as the online meeting registration system and the *formstack* system enabling the digital management of Member States responses to Circular Letters performing only thanks to the technical and operational support of project officers from Japan and Republic of Korea.

A notable project has started to reshape the software means used for official documents dispatch and archiving. The desired solution tentatively named "IHO Portal" will also include an overarching meeting registration system. The new system will bring benefit for the Secretariat's staff and the interested public in managing content for working documents retrieval interconnected automatically to the relevant meetings of IHO bodies of work.

- **Maintenance of publications that are not allocated to a specific IHO body**

The Secretariat maintained and issued various publications during the year including P-5 - IHO Yearbook, P-6 Assembly Proceedings, P-7 - IHO Annual Report, S-11 Part B – INTernational Chart Web Catalogue, associated web services and user manuals, and M-3 - IHO Resolutions.

- **Communication between the IHO Secretariat and Member States through Circular Letters**

During the year, the Secretariat published 46 Circular Letters (CLs) in English, French and Spanish and three Finance Circular Letters were published in English and French. In addition, seven Assembly Circular Letters in preparation of the third Assembly and three Council Circular Letters in preparation of the seventh Session of the IHO Council were dispatched.

- **Technical Library of the IHO Secretariat**

The Secretariat's technical library comprises of bound manuscript copies of all significant IHO records, such as Conference Proceedings and Circular Letters, together with an extensive ad hoc collection of reference books and periodicals on various topics related to hydrography and nautical charting. The rare copies of the early publications of the organization before the digital age are now well protected behind lockable glass door added to the some of the bookshelves.

- **Digital Document Archive**

The IHO website offers open access to a repository of official working documents issued by the Secretariat since 2000 or the date of establishment of active IHO bodies after this year.

- **GIS Infrastructure**

As part of the global GIS infrastructure used in the Secretariat (Country Information System, the Catalogue of National Web portals, etc.), INToGIS is the one-stop-shop platform designed by the IHO Secretariat in 2014 to modernize the catalogue of INTernational charts and developed and maintained since 2015 by the Republic of Korea (KHOA). It is operational and widely used since 2016 by Member States,

the Regional Hydrographic Commissions, the Charting Regions Coordinators and the IHO Secretariat, to display and manage, the Web Catalogue of INTernational Charts and ENCs (S-11 Part B). Several additional layers are available (World Port Index, European Waters Traffic Density (EMODnet), CATZOC data, etc.). The 2nd version in force is named INToGIS II**.** Charts and ENCs queries, gap analysis and ENC overlapping functions are available.

The USA provided the final version of a worldwide coverage of traffic density. This version aims to support the work of the Regional Hydrographic Commissions in their assessment of the adequacy of ENC coverage and quality in dense traffic areas, including in Polar Regions.

It was this year then the WENDWG continued the discussion on the subsequent development of INToGIS III, using S-128 standard as far as possible, in order to allow HOs and other users to manage and visualize S-1xx products coverage in the future. This new functionality offered through the IHO GIS toolbox should become a key component of the Roadmap for the S-100 Implementation Decade.

The IHO Secretariat also finalized the efforts for the integration of different web services isolated components in support of SCUFN activities, between different partners and supporting organizations (KHOA, NOAA). Thanks to the integration of IHO SCUFN Digital Archive (the repository of all naming proposals, index maps, reports, 3D maps, etc.) and the renewed SCUFN Operational Web-services, the digital support of the SCUFN process has become now much more efficient, more transparent, more visible, more accessible, more interoperable to all and Member States in particular, but also beyond the borders of the IHO community.

Changes in IHO Secretariat Staff

The Secretariat comprised 18 Members of Staff, supplemented by three officers seconded by Member States and one assistant to work on specific projects otherwise beyond the resources of the Secretariat. The total number of staff remained unchanged compared to the previous year. Thanks to the outsourcing of the translation work two staff positions are currently pending replacement, but the job descriptions will be redefined.

Ms. Dan Costin, Information Technology Officer left for retirement after 13 years' service in October 2023. He was replaced by Mr Matthieu Paris.

Dan Costin (ITO Officer) left for retirement after 13 years' service

The post of the Digital Communication Assistant was occupied by Ms Astrid Alonso until July. She was replaced after by Mr Christophe Buzzi. translation work two staff positions are currently pending replacement, but the job descriptions will be redefined.

Translation Service

Under coordination of the Head Translator, Ms. Isabelle Rossi, translation support is now received from external contractors (Mr David Giraudeau, employed at SHOM and Mr Máximo Rubio, employed at the Spanish Hydrographic Office). The use of modern translation software assists to maintain high quality and expedient translations into both languages.

Secondment of Personnel to the IHO Secretariat

One officer each from the Korea Hydrographic and Oceanographic Agency – Mr Insung Park finished his detachment end of September after three years of outstanding service. He was replaced by Ms Inyoung Park.

Mr Kazufumi Matsumoto of Japan Coast Guard have been posted to the Secretariat throughout the year.

An officer from the Directorate of Hydrography and Navigation of Peru - Captain Javier Fernandez – who was seconded to the Secretariat since January 2022 returned home end of November.

WORK PROGRAMME 2
Hydrographic Services and Standards

Introduction

The IHO Work Programme 2 "Hydrographic Services and Standards" seeks to develop, maintain and extend technical standards, specifications and guidelines to enable the provision of standardised products and services that meet the requirements of mariners and other users of hydrographic information. This Work Programme is under the principal responsibility of the Hydrographic Services and Standards Committee (HSSC).

Technical Programme Coordination

This element monitors technical developments and oversees the development of the IHO technical standards, specifications and publications through the coordination and interaction of the relevant IHO working groups reporting to the HSSC.

Conduct Annual meeting of HSSC

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.

The meeting was chaired by Mr Magnus Wallhagen (SMA[1], Sweden) and attended by 76 registered participants from 28 Member States (Australia, Belgium, Brazil, Canada, China, Croatia, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, India, Indonesia, Iran (Islamic Republic of), Latvia, Netherlands, Norway, Poland, Portugal, Republic of Korea, Romania, Singapore, Spain, Sweden, United Kingdom, and United States of America), four Partner Organizations (CIRM, ICPC[2], IEC, IALA) and three subject matter experts (IC-ENC, PRIMAR, EAHC-RECC). Eleven stakeholders, namely Sperry Marine, SevenCs, Canadian Coast Guard, RENCs, Teledyne Caris, IIC Technologies, Furuno, National Taiwan Ocean University, Esri, and ChartWorld, representing industry, academia, OEM, and chart suppliers, provided their *S-100 Industry Perspective* in two main sessions, the first in person since the pandemic. The IHO Secretariat was represented by Director Abri Kampfer (HSSC Secretary) and Assistant Director Yves Guillam (HSSC Assistant Secretary).

Ms Pipsa Eklund, Director for Maritime and Transport Services at Traficom, and Mr Rainer Mustaniemi, National Hydrographer of Finland, welcomed the participants in Helsinki and highlighted the importance of the development of standards and interoperable services, in particular in the new S-100 operational era coming to reality in less than three years.

The HSSC Chair opened the meeting with a full review of 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:

The S-100 Infrastructure Centre Establishment Project Team, under HSSC, the outcome of which will be also monitored at Council level;

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 ECS[3] navigational

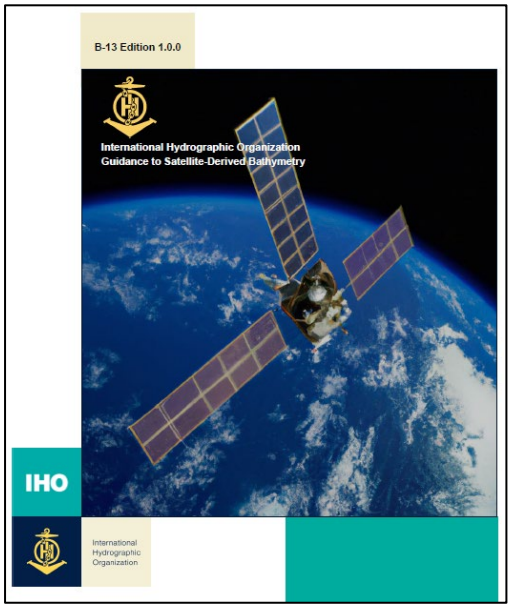
[1] Swedish Maritime Administration.

[2] International Cable Protection Committee

[3] Sub-ECDIS unregulated market, from leisure boats to large non-SOLAS vessels.

requirements having an impact on current IHO standards.

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*.

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.

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.

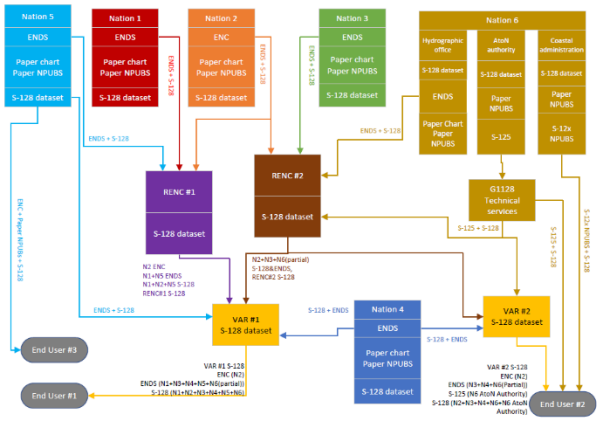
In order to avoid that the IHO is obliged to submit a change proposal to an important IMO MSC Circular[4] through a complicated procedure, HSSC agreed that it was wiser to keep the former title of Publication S-66 - *Facts about Electronic Charts and Carriage Requirements*, for the Ed. 2.0.0 of a (new) 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.

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

NIPWG confirmed that liaison was now established with the IMO Expert Group on Data Harmonization.

[4] IMO MSC.1/Circ.1503/Rev.2 *ECDIS – "Guidance for Good Practice"*

NIPWG also introduced how S-128 – *Catalogue of Nautical Products* could support possible use case scenarios in the future (See draft below).



The development of S-128, and S-98 – *Data Product Interoperability in S-100 Navigation Systems* and S-164 – *IHO Test Data Sets in ECDIS* are essential for the implementation of the S-100 concept and the need for earliest availability of operational standards was recognized and will be monitored.

Following a submission paper from Germany addressing several issues on paper charts carriage requirements (legal aspects, etc.), maintenance, and coverage in the context of a full IMO ECDIS mandatory carriage requirement in the future, drafted in the wake of the announcement by the UKHO of the withdrawal of Admiralty paper charts, planned in 2030 at the earliest, HSSC agreed that the document should be further discussed at IRCC. However, the NCWG was invited to consider the need for a new standard for paper chart corrections (such as the XML format for Notices to Mariners) then to be aligned with S-4, if and when appropriate.

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 Chair[5] 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.

After fruitful discussions on the different options available for the future of the HDWG, the HSSC re-acknowledged the international recognition of the IHO Hydrographic Dictionary and the need to keep it as stand-alone IHO publication with the IHO Geospatial Information Registry (GI Registry) as a basis for maintaining its S-100-related component. HSSC thanked the outgoing Chair for his completion of the review of the IHO Hydrographic Dictionary, welcomed the incoming Chair (former Vice-Chair), and tasked the GI Registry Team and the HDWG incoming Chair to prepare the necessary steps to move the WG to a HD Correspondence Group (HDCG).

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

Participants in HSSC-15

[5] Germany's representative at HSSC-15: Mr Jens Schröder-Fürstenberg.

available on the HSSC-15 webpage for consultation only.

With Ed. 1.0.0 of the S-130 Product Specification available for testing and evaluation, there were already some arguments in favor 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.

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

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.

The Committee welcomed the confirmation from Japan for its offer to host HSSC-16 in Tokyo, in May 2024. The offers by Norway for hosting HSSC-17 in 2025, and Poland for HSSC-18 in 2026 were also welcomed.

HSSC re-elected Mr Magnus Wallhagen (Sweden) and Ms Nathalie Leidinger (France) as Chair and Vice-Chair of the HSSC by acclamation.

At the end of the meeting, the Chair thanked Director Abri Kampfer, HSSC Secretary, for his last 6 years at the helm of HSSC for the IHO Secretariat, as well as Traficom for their seamless support in hosting the meeting.

Hydrographic Data Transfer Standards

This element addresses the developments related to transfer standards for digital hydrographic data, the maintenance of the relevant IHO standards, specifications and publications and the provision of technical advice as appropriate.

Conduct meetings of HSSC Working Groups

8th S-100 WG

The 8th Meeting of S-100 Working Group (S-100WG8) was held in Singapore from 13 to 17 November 2023 as face to face with added live streaming capability. During the week of the S-100WG meeting, there were also breakout sessions for the S-102 and S-129 Project Teams to discuss the development of their respective S-100 Product Specifications.

The S-100WG8 meeting was chaired by Ms Julia Powell (USA), supported by Co-Vice Chairs Ms Elizabeth Hahessy (Denmark) and Ms Iji Kim (Republic of Korea). 42 delegates from 19 IHO Member States (Australia, Brazil, Canada, Denmark, Finland, France, Germany, India, Indonesia, Italy, Japan, Netherlands, Republic of Korea, Singapore, Slovenia, Spain, Sweden, United Kingdom, and USA), 3 External Liaisons (International Electrotechnical Commission (IEC), International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and NATO Geospatial Maritime Working Group (GMWG)), and 27 Expert Contributors were registered for the meeting. The IHO Secretariat was represented by Director John Nyberg, Assistant Director Yong Baek and Technical Standards Support Officer Jeff Wootton.

Plenary session for S-100WG-8

In John Nyberg's welcome address, he highlighted the publication of S-100 Ed.5.1.0 in October 2023 and commended the efforts of S-100 Working Group (WG) for their accomplishments thus far. Additionally, he underscored the importance of preparing the operational versions of S-100 based Product Specifications to achieve Phase 1 of the S-100 Roadmap by 2024. He encouraged active participation from IHO Member States and Expert Contributors to ensure the successful achievement of our goals by 2026, aligning with the revised IMO ECDIS Performance Standards.

The Chair opened the meeting by informing participants that major items to be discussed at the meeting were proposals for corrections and clarifications for inclusion in the next S-100 Edition 5.2.0 and the approval timeline and impact of Edition 5.2.0 of S-100 on S-100 based Product Specifications. It was also noted that Edition 6.0.0 of S-100 would be deferred until after 2026 due to resource constraints and possible impacts on implementers.

During a session addressing matters arising and S-100 Project Team reports, the Working Group approved Edition 1.2.0 of the S-101 Electronic Navigation Chart (ENC) Produce Specification for the Data Product Specification (Main Document) and the Data Classification and Encoding Guide (DCEG). Consequently, the S-101PT will develop the Feature and Portrayal Catalogues for Edition 1.2.0 of S-101,

with plans to publish in early 2024 subsequent to final S-101PT approval of these Catalogues. Additionally, Edition 1.1.0 of S-129, Under Keel Clearance Management (UKCM) Product Specification, was approved during the meeting.

The Working Group discussed the maintenance efficiency of the S-100 Validation component and its correlation to the S-100 based Product Specifications. As a follow-up to the HSSC15 meeting in June 2023, it was agreed to designate the specification number for the S-100 Validation component as S-158. This will be submitted for confirmation by the HSSC at the HSSC16 meeting in May 2024.

During the meeting, 17 change proposals for S-100 were reviewed, and 11 proposals were approved for inclusion in S-100 Edition 5.2.0. A significant modification, suggested in the approved proposals, includes enhancing cyber security for the distribution of S-100 data products by incorporating the latest digital signature algorithm technology. The remaining 6 submitted proposals were rejected due to their introducing substantial changes to S-100 constituting extensions. These rejected proposals will be considered for the next full Edition 6.0.0 of S-100 Ed.6.0.0.

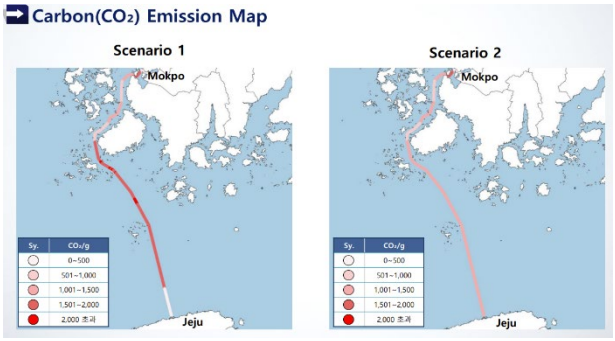
The meeting established a timeline for the approval of S-100 Edition 5.2.0, with the HSSC endorsement targeted for March 2024 and IHO Member State approval anticipated by June 2024. This will allow for S-100 based Product Specifications for Phase 1 implementation to be aligned with S-100 Edition 5.2.0.

The Republic of Korea (ROK) presented a paper discussing the results of an ecological benefits and navigational safety study, which utilized S-100 data through a S-100 simulator. The study focused on optimizing ship route and engine RPM usage, taking into consideration S-100 data products.

Simulation systems for the ecological benefits study in Republic. of Korea.

The study showed a ship's optimal routing plan utilising S-100 data products is able to minimize fuel consumption, which increases operational efficiency and lowers CO2 emission of the vessel.

The S-100WG elected Ms Julia Powell (USA) as Chair, and Ms Elizabeth Hahessy (Denmark) and Mr Benjamin Hell (Sweden) as co Vice-Chairs by acclamation.



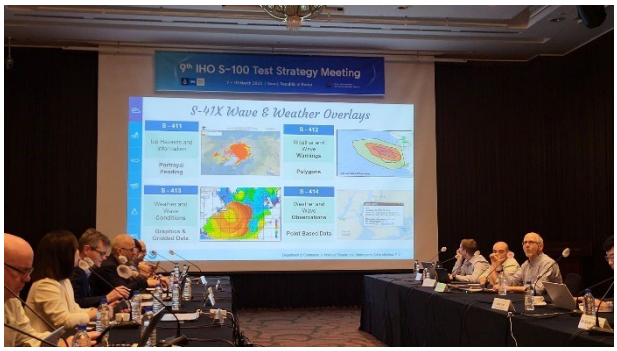
Simulation result for various scenarios are presented

The S-100WG welcomed the offer by Italy to host S-100WG9 in Genoa in November 2024; and an offer from Indonesia to host S-100WG10 in 2025.

S-100WG-8 participants.

9th Meeting of S-100 Test Strategy

The 9th Meeting of S-100 Test Strategy (S-100TSM9) was held in Seoul, Republic of Korea, hosted by Korea Hydrographic and Oceanography Agency (KHOA) from 7 to 10 March 2023 as an in-person meeting. The S-100TSM9 was chaired by Ms Julia Powell (USA), supported by Co-Vice Chairs Ms Elizabeth Hahessy (Denmark) and Ms Iji Kim (Republic of Korea). Thirty participants from seven Member States (Canada, Denmark, Germany, Republic of Korea, Sweden, United Kingdom and USA), and thirteen Expert Contributors attended the meeting. The IHO Secretariat was represented by Director Abri Kampfer and Assistant Director Yong Baek.



Plenary session for S-100TSM-9

Director Abri Kampfer in his welcome address thanked expert contributors for their support with the technical implementation of S-100 and highlighted the S-100 roadmap, especially the operational versions of the phase 1 products in the roadmap, namely S-101 - *ENC*, S-102 - *bathymetric surfaces*, S-104 - *water level information for surface navigation*, S-111 - *surface currents*, S-124 - *navigational warnings* and S-129 - *under keel clearance management,* should meet the timeline of their development.

The objective of the S-100 Test Strategy Meeting was to further develop and align the core important contents needed for the S-100 development to progress towards the usage of S-100 ECDIS from 2026 onwards. The data exchange mechanism has evolved over time, with the continued development of S-100 Part 17, Discovery Metadata for Information Exchange Catalogues.

At the meeting, S-100 change proposals seeking clarification and improvements of S-100 Part 8, Part 10a, Part 14, Part 15 and Part 17 were discussed, in addition to a paper describing the IHO Security Scheme policy to empower the IHO Secretariat to operate as S-100 Edition 5 Scheme Administrator. Moreover, the policy paper defined the requirements of the Scheme Administrator application, developed

by PRIMAR, to support IHO Secretariat in this role.

Additionally, S-164 - *Test data for S-100 and ECDIS Type Approval,* S-98 - *Data Product interoperability in Navigation Systems,* and S-128 - *Catalogue of Nautical Products* were also discussed. Particularly, S-164 is a product specification currently in development towards a first edition and several issues regarding the scenarios that must be covered by the test datasets were resolved. S-98 defines how the data will operate on the S-100 ECDIS and is therefore linked to the development of the test datasets. S-128 is intended to provide the information needed for an ECDIS to govern up-to-datedness of its navigational data holdings and will be a crucial component for S-100 ECDIS to generate the ECDIS Update Status Report. The data model for S-128 is ready to be tested, but the infrastructure from the producer to the on-board systems is currently being debated.

The meeting agreed to submit a draft package of S-100 Edition 5.1.0 and the first edition of S-164 to the S-100WG for approval, and they will take action based on the S-100WG's decision, but the intention is to submit to HSSC for endorsement and approval respectively.

S-100TSM-9 participants

10th S-101 Project Team,

The 10th meeting of the S-101 Project Team (S-101PT10) was held in Brest, France from 13 to 15 June 2023 in a principally in-person format, however allowing remote viewing and attendance for delivery of key Agenda items.

The meeting was chaired by Mr Thomas Richardson (United Kingdom). 22 delegates from 14 Member States (Belgium, Canada, Denmark, Estonia, Finland, France, Netherlands, Norway, Republic of Korea, Spain, Sri Lanka, Sweden, United Kingdom and USA); 1 Non-Member State (Union of the Comoros); 1 External Liaison (International Electrotechnical Commission (IEC)); and 10 Expert Contributors attended the meeting. The IHO Secretariat was represented by Technical Standards Support Officer Jeff Wootton, who acted as Secretary for the meeting; and Assistant Director Yong Baek. S-101PT Vice-Chair Mr Alvaro Sanchez (Australia) and representatives from Germany participated in the meeting remotely; with a further 10 remote observers from IHO Member States and Expert Contributors attending the various sessions.

S-100TSM-10 participants

The meeting commenced with an opening address by the Head of Public Services and Inter-The meeting commenced with an opening ad-dress by the Head of Public Services and International Relations and Directorate-International Charting Co-ordinator for Region G, Captain Pierre-Yves Dupuy, of the Service hydrographique et océanographique de la marine (SHOM). He welcomed participants to Brest, noting its extensive maritime history; and stressed the importance of the work being done by the Project Team in developing the S-101 Product Specification as the fundamental dataset layer to support the realisation of the S-100 Roadmap for the S-100 Implementation Decade (2020-2030).

The S-101PT Chair proceeded to the Agenda for the meeting, stating that the principle outcome of the meeting was to discuss and adjudicate on proposals related to the development of Edition 1.2.0 of the S-101 ENC Product Specification, which will be the final "implementation and testing" version of the Product Specification before publication of the operational release Edition 2.0.0. Update reports were presented from the S-101 Data Classification and Encoding Guide (DCEG), S-101 Portrayal, Data Validation Checks, Dataset Load/Unload and Scales, and Test Dataset Sub-Groups. Substantial progress was reported in all areas of S-101 development, however

S-101PT10 in session

concern was raised that the posts of Sub-Group Leads for the S-101 Data Validation Checks and the Test Dataset Sub-Groups remained vacant, which could potentially be a risk in achieving operational release of S-101 during 2024. Mr Klas Östergren (Sweden) subsequently volunteered to take the Lead for the S-101 Data Validation Checks Sub-Group; and the Chair stated that he will continue to act as the Lead for the Test Dataset Sub-Group until the next S-101PT meeting.

Several proposals for amending or extending S-101 were submitted to the meeting, for inclusion in S-101 Edition 1.2.0. The meeting agreed that, pending the approved changes and further Sub-Group recommendations being applied, final Project Team endorsement of S-101 Edition 1.2.0 would be achieved at the next S-101PT meeting (September 2023). Significant discussion also took place on the steps required, and possible risks, in achieving operational release of S-101 during 2024 in line with the S-100 Roadmap.

Informative progress reports from Member States and Stakeholders on the various S-100 Test Beds were delivered; and the Project Team expressed their appreciation to those involved in testing all aspects of S-101 implementation, with encouraging outcomes and resultant feedback to inform further S-101 development.

At the conclusion of the meeting, Mr Thomas Richardson (United Kingdom) was re-elected as Chair, with Mr Alvaro Sanchez (Australia) re-elected and Mr Klas Östergren (Sweden) elected as Co-Vice Chairs, of the S-101PT.

8th ENCWG and 11th S-101 Project Team

The 8th meeting of the ENC Working Group (ENCWG8) combined with the 11th meeting of the S-101 Project Team (S-101PT11) was held in Lombok, Indonesia from 25 to 29 September 2022 in a hybrid format.

The ENCWG sessions of the meeting were chaired by Mr Thomas Mellor (United Kingdom) and the S-101PT sessions of the meeting were chaired by Mr Thomas Richardson (United Kingdom). 52 delegates from 27 Member States (Argentina, Australia, Brazil, Canada*, Chile, China, Denmark*, Egypt, Finland*, France*, Germany, Greece, India*, Indonesia*, Italy, Japan, Netherlands*, New Zealand*, Norway, Portugal, Republic of Korea*, Slovenia, Spain, Sweden*, United Arab Emirates, United Kingdom* and USA*); 2 External Liaisons (International Electrotechnical Commission (IEC)* and Inland ENC Harmonization Group (IENC)); and 13 Expert Contributors attended the meeting. The IHO Secretariat was represented by Assistant Director Yong Baek, who acted as Secretary for the ENCWG portion of the meeting; and Technical Stand-ards Support Officer Jeff Wootton, who acted as Secretary for the S-101PT portion of the meeting.

The combined meeting commenced with an opening address by the Commander of the Indonesian Navy's Hydro-Oceanographic Centre (Pushidrosal), Vice Admiral TNI Nurhidayat.

The programme for the combined meeting was structured such that the first half of the meeting covered the ENCWG Agenda (days 1 and 2), followed by the S-101PT Agenda (days 3 and 4) and any residual items on day 5.

The ENCWG Chair introduced the major items to be discussed at the ENCWG portion of the meeting which were aligned with the Decisions and Actions from the HSSC15 meeting (June 2023); and new submissions impacting on the IHO Specifications that are under the remit of the ENCWG. This included the requirement to conduct an impact study on the development of a New Edition of S-64 - *IHO Test Data Sets for ECDIS*; progress on the merging of S-66 - *Facts about Electronic Charts and Carriage Requirements* and S-67 - *Mariners' Guide to Accuracy of Depth Information in Electronic Navigational Charts (ENC)* into a single IHO Publication, also aiming to incorporate ENC and ECDIS related information papers; amendments required to S-52 - *Specifications for Chart Content and Display Aspects of ECDIS* and S-64 to cater for requirements in S-100 ECDIS when in dual-fuel mode; and approval of the IHO ECDIS Cyber Security Guideline. The establishment of an ECS Project Team (ECS PT) under the ENCWG by the HSSC was also reported. Additional discussions focused on approval of a New Edition of S-58 - *ENC Validation Checks*; ENC conversion (S-57 to S-101 and S-101 to S-57) and reports on the results of data conversion tests by Member States; and clarifications to S-52 Annex A - *IHO ECDIS Presentation Library*.

During the progress report on the merging of IHO Publications S-66 and S-67 the decision of the HSSC to retain the designation of the merged Publication as S-66 rather than the previously agreed S-67 was reported. The meeting also approved the final draft of the IHO ECDIS Cyber Security Guideline which is to be included in this Publication.

The Working Group agreed to proceed with the development of an S-64 impact study to engage a broader range of stakeholders in assessing the impact of the introduction of a revision of S-64. The Working Group also approved clarifications to S-52 Annex A and S-57 Appendix B-1, Annex A – *Use of the Object Catalogue for ENC* based on proposals submitted to the meeting; and approved the New Edition of S-58 for submission to the HSSC for endorsement.

Reports were presented by the IHO-Singapore Laboratory and the S-57 Sub-Group; and update reports provided on S-62 - *List of IHO Data Producer Codes* and S-63 - *IHO Data Protection Scheme*. Several proposals relating to the S-57 framework and data encoding were discussed. An update report was also submitted by the ENC Conversion Sub-Group, with the publication of Edition 1.1.0 of S-65 Annex B – *S-57 ENC to S-101 Conversion Guidance* by the ENCWG earlier in the year being noted.

At the conclusion of the ENCWG portion of the joint meeting, the ENCWG elected Mr Thomas Mellor (UK) as Chair, and Mr Richard Fowle (Denmark) as Vice-Chair by acclamation.

The S-101PT Chair commenced the S-101PT portion of the meeting, stating that the principle

ENCWG8/S-101PT11 in-person participants

outcome of the meeting was to achieve Project Team approval of the Product Specification Main document and Annex A – *Data Classification and Encoding Guide* (DCEG) for Edition 1.2.0 of S-101 for submission for approval by the S-100WG at S-100WG8 (November 2023). It was confirmed that S-101 Edition 1.2.0 would be the last implementation and testing version of S-101 before the development of the first operational Edition 2.0.0 of the Product Specification, so as to achieve the timeline for S-101 development as outlined in the S-100 Roadmap. Changes to the S-101 Main document and S-101 Annex A were discussed and approved as part of the delivery of the S-101 DCEG Sub-Group report, with further changes to both documents approved for inclusion in Edition 1.2.0 based on proposals submitted to the meeting (S-101PT approval of the changes to be achieved by correspondence prior to submission to S-100WG8).

Revisions to the S-101 Terms of Reference were approved for submission to the S-100WG for endorsement. Update reports were presented from the S-101 Portrayal, Data Validation Checks, Dataset Load/Unload and Scales, and Test Dataset Sub-Groups. Significant progress was reported in all areas of S-101 development, with the development of the S-101 Edition 1.2.0 Feature and Portrayal Catalogues to be commenced on approval of the S-101 Edition 1.2.0 Main document and DCEG by the S-100WG. It is intended to publish S-101 Edition 1.2.0 in the first quarter of 2024.

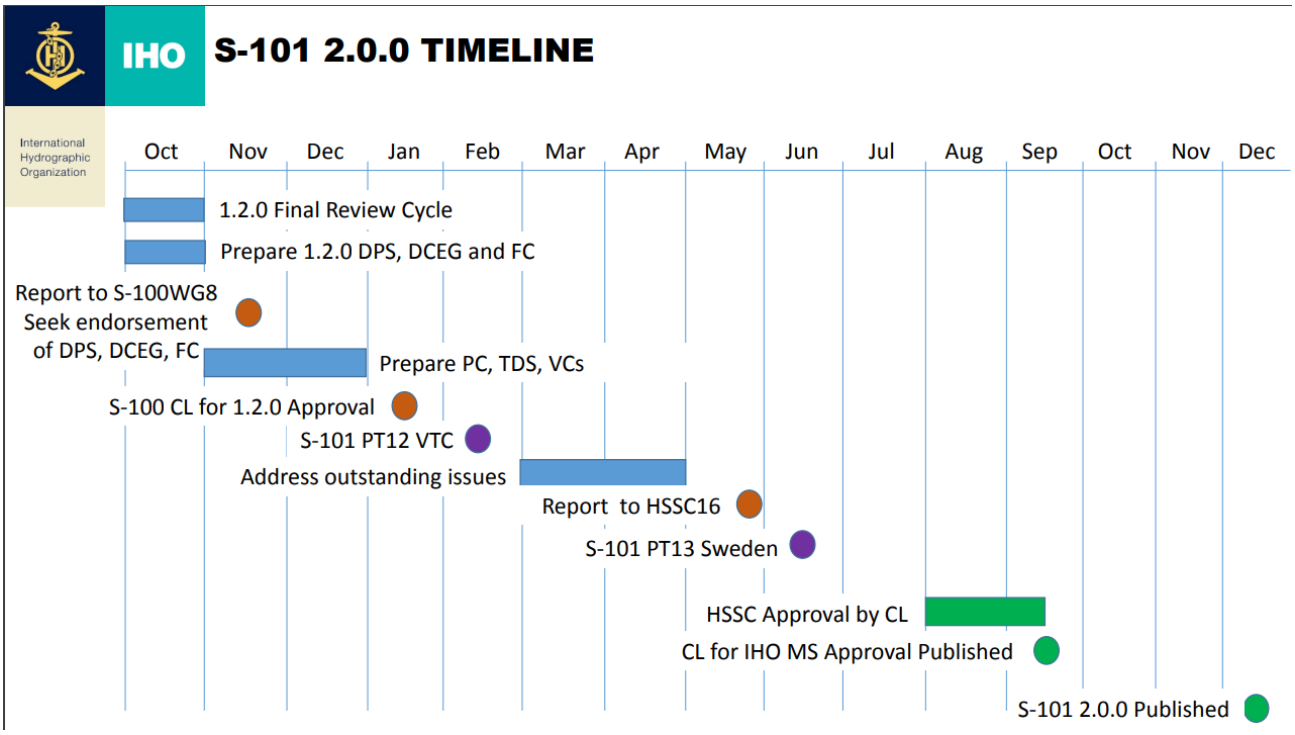
Several proposals for amending or extending S-101 were submitted to the meeting, with decisions as to whether approved changes were to be included in S-101 Edition 1.2.0 or Edition 2.0.0 based principally on testing requirements.

5th S-130 PT

The 5th Meeting of S-130 Project Team (S-130PT5) was arranged by video teleconference (VTC) from 13 to 14 March 2023.

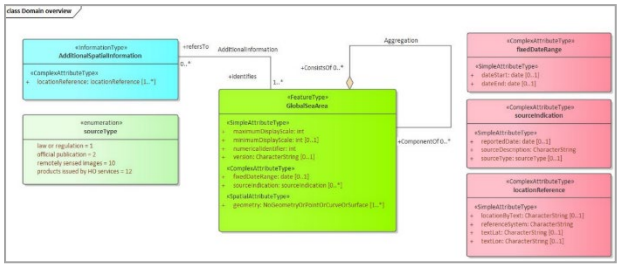
The meeting was chaired by Ms Britt Lonneville (Belgium), supported by Vice Chair Mr Lingzhi Wu (China). Thirty participants from nine Member States (Belgium, China, Democratic People's Republic of Korea, India, Japan, Republic of Korea, Türkiye, United Kingdom and USA), and expert contributors from the industry attended the meeting. The IHO Secretariat was represented by Director Abri Kampfer and Assistant Director Yong Baek.

The meeting reviewed the progress report from the Schema Sub-Group (SSG) leader and the updated application schema. The SSG leader presented the draft definition of the features utilized in the product specification and requested that they be reviewed and approved. The final



S-101 Edition 2.0.0 Development Timeline ranging from Oct 2023 to December 2024

draft definitions will be submitted to S-130PT members in advance of submission to the next HSSC meeting.



S-130 Application Schema discussed during S-130PT5

The meeting reviewed and discussed the initial draft version of the S-130 Product Specification and agreed that the document should be updated to reflect the progress made such as the inclusion of a metadata chapter and a feature catalogue.

The IHO Director Abri Kampfer briefed on the background and intention to designate the IHO as the S-130 dataset producer using IHO S-100 producer code as one single authorized entity. There were differing views from Member States, however it was agreed to move ahead with one single producer and report to the next HSSC for confirmation on the data producer.

S-130PT5 Participants

6th S-130 PT

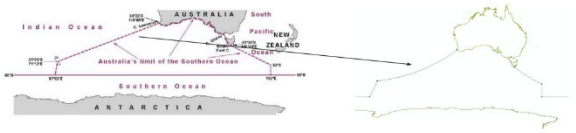
The 6th meeting of the S-130 Project Team (S-130PT6) took place at the IHO secretariat in Monaco from 28 to 29 November 2023 in a hybrid format. The PT meeting, chaired by Mrs Britt Lonneville (Belgium) and supported by Vice Chair Lingzhi Wu (China), included 15 delegates from 10 Member States (Belgium, Brazil, China, Democratic People's Republic of Korea, Greece, Japan*, Republic of Korea*, Türkiye, United Kingdom and USA*). The IHO Secretariat was represented by Secretary General Mathias Jonas and Assistant Director Yong Baek.

The meeting opened with an address by the IHO Secretary General Mathias Jonas, who delivered the decisions from Assembly 3 regarding the postponement of the consideration of the subsequent development of basic guidelines for the allocation and display of attributes of sea areas to be applied to geographic information system, following the publication of Edition 2.0.0 of the S-130PS and the initial release of the authoritative S-130 dataset.

The S-130PT Chair reported on the progress since the last meeting (S-130PT5), highlighting the publication of Edition 1.0.0 of the S-130 PS in April 2023. The chair outlined the following key discussion points for the meeting:

1. Lessons learned and scenarios from S-130 Test Datasets
2. Development of the next iteration version of S-130PS
3. Discussion on the timeline and work plan for S-130PT to achieve Edition 2.0.0
4. Elections of Chair, Vice Chair and Secretary for the next 3 years.

The Chair presented the creation of the Test Datasets in the Southern Ocean and the Baltic Sea. Those datasets, contracted by the IHO, were presented by the Chair and provided three alternative scenarios: Scenario 1 - *Representation of contributing points and construction lines*, Scenario 2 - *Representation of location Reference* and Scenario - 3 *Format of numerical identifiers*.



Exercise S-130 Test Data on the Southern Ocean for different scenarios

The meeting reviewed and discussed three different data model proposals for the S-130PS based on lessons learned from the Test Datasets. The remodelling agreed upon during the meeting will be incorporated into Edition 1.1.0 of the S-130PS, which will be circulated before the next PT meeting. The main Product Specification document, Data Clarification and Encoding Guide (DCEG) and S-130 Feature

Catalogue will also be confirmed at the next PT meeting. To progress the registration of S-130 concepts to the IHO GI registry, the meeting designated IHO Sec (Mr Yong BAEK) as the representative of the S-130PT to propose terms and definitions for the S-130PS.

At the conclusion of the S-130 PT meeting, Mrs Britt Lonneville (Belgium) was re-elected as Chair and Mr Lingzhi Wu (China) as Vice-Chair, both by acclamation.

S-130PT6 participants

Nautical Cartography

This element addresses the developments related to nautical cartography for charts specifications of ENCs and paper nautical charts, the maintenance of the relevant IHO standards, specifications and publications, and the provision of technical advice as appropriate.

Conduct meetings of Nautical Cartography Working Group (NCWG)

9th NCWG

The 9th meeting of the Nautical Cartography Working Group was held in Taunton, UK from November 27 to December 1, 2023 in a fully hybrid format. The meeting was chaired by Mikko Hovi (Finland). The Working Group started day one with a complete review of actions and items of interest arising from HSSC, Council, Assembly and other HSSC Working Groups. Additionally, the group covered general administrative items including updates to their Terms of Reference, Work Plan, and running list of action items.

As is usual practice for the Working Group, it considered a number of proposals and clarifications for chart symbols crossing the full suite of charting products, including paper, S-57, and S-101.

WG Photo.

The Group considered the work of the Baseline Symbology Project Team which presented the work that it has done to present and asked the Group to consider its future direction and leadership. The Project Team noted many of the challenges that it is facing, most notably resources, but was pleased to introduce an agreed colour palette for nautical charts to be considered for addition to S-4. The Working Group intends to present the universal colour palette to the HSSC in 2024. The Baseline Symbology Project Team also presented the work that they have started to crosswalk symbols across all charting products including printed and digital representations and confirmed their charge to coordinate symbols, colours, lines, styles, etc. for implementation in charts of any kind.

The Project Team held a ¼ day session to consider the future of the Team. The meeting resulted in an improved understanding of how to use technology to move the work forward and an increased Team membership.

The Group received presentations from the UKHO on the Electronic Charting System (ECS) Project Team which is considering the segment of the shipping industry that is not required to use ECDIS but is still mandated to use official products. The Group received presentations from the UKHO on the Electronic Charting System (ECS) Project Team which is considering the segment of the shipping industry that is not required to use ECDIS but is still mandated to use official products.

The Working Group considered comments on the future of INT chart schemes from India (NHO), and the Secretariat (John Nyberg) provided a presentation that provided clarification from the Secretariat's perspective. It was agreed that many of the items presented in the paper were being addressed by other IHO Working Groups. The paper was appreciated and was an excellent opportunity to introduce the work being done around the IHO regarding the transition from INT charts to electronic charting.

There were two excellent presentations on ENC to paper chart implementations, one from the USA, NOAA and one from Canada, CHS. Both instances demonstrated the advances that have been made in S-57 paper chart generation. While some challenges still exist, progress in this direction has moved forward rapidly and is now being implemented in some official capacities. The presentations presented an excellent opportunity to discuss the technology behind these systems and challenges that many may have if/when they decide to implement them.

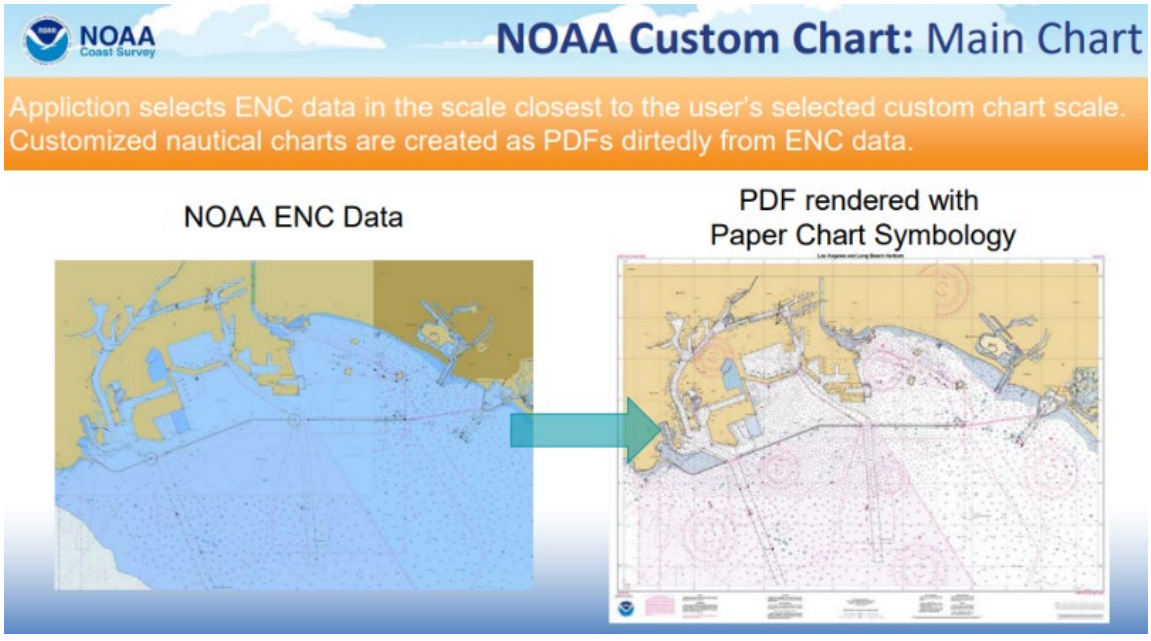
A use case paper on the ENC derived paper chart was presented by the USA (NGA) which discussed some of the challenges that they are facing when trying to meet S-4 guidelines when automating paper charts from ENC. The paper also presented guidelines to consider including updating, scale, printing, chart elements, and other items that they considered as a "must" for them to be considered official charts. The Working Group agreed that the mandate of the Baseline Symbology Project Team was to align S-4 with the automation of paper charts from S-101 ENCs.

The WENDWG Chair presented a paper requesting the NCWG to recognize the WENDWG as the responsible body for authoring S-11 Part A, Section 300 focusing on the provision of S-100 services beyond ENC. The NCWG agreed to the proposal and intends to present the request to HSSC for further approval. Both the NCWG and WENDWG agreed that there needed to be some additional text included in the introduction of S-11 regarding the management of the document to reflect the unusual circumstance of having two WGs share some responsibility for one IHO document.

The Working Group re-elected Mikko Hovi (Finland) and Nick Rodwell (UK) as chair and vice-chair respectively.

Digital Data Protection and Authentication

The IHO Secretariat continued to administer the S-63 scheme for S-57 ENCs. In addition, the S-100 scheme application described in S-100 Part 15 is now available on the IHO website to allow for agreements with the Original Equipment Manufacturers (OEM) and Data Servers for S-100 based data sets in order to implement S-100 data dissemination. Both data protection schemes are administered in panel during the transition period.



NOAA Custom Chart.

P-7

The administrator function involves processing applications and providing technical support and the individual and unique digital certificates and codes that are required to allow ENC/S-100 data servers, OEMs and software developers to encrypt and de-encrypt ENCs as part of the services or equipment that they provide. The S-63 Security Scheme currently includes 70 Data Servers and 415 OEM's.

Data Quality

The 18th meeting of the Data Quality Working Group (DQWG) was held as a remote video-teleconference (VTC) event from the IHO Secretariat, Monaco, from 7 to 9 February. The event was initially planned as a face-to-face meeting, but the Chair was unable to be physically present due to administrative reasons and it was decided at short notice to arrange the meeting as a simple VTC meeting. In the end, seven Members were physically present in Monaco, facilitating the exchanges and discussions on very technical issues in the margins of the meeting sessions.

The meeting was chaired by Mr Lingzhi Wu (China). Twenty-five registered delegates representing 14 Member States (Canada, China, Denmark, Egypt, Finland, France, Germany, India, Italy, Netherlands, Norway, Sweden, United Kingdom and United States), two representatives of the RENCs (IC-ENC[6], PRIMAR), the Chairs of the S-101 Project Team, ENCWG[7], TWCWG[8], MASS PT[9], and HSWG[10], four expert contributors (IEHG[11], Geomod, Portolan Science, and University of New Hampshire) attended the meeting. The IHO Secretariat was represented by Director Abri Kampfer, Technical Standards Support Officer Jeff Wootton and Assistant Directors Yong Baek and Yves Guillam.

Director Abri Kampfer opened the meeting highlighting the importance of the work of the DQWG in support of the other working groups and project teams in the development of the data quality components (including validation checks) of their product specifications. Reporting that the IMO recently approved the IHO proposed amendments to the ECDIS Performance Standards, he also stated that the unique transverse role of the DQWG was even more critical now than before, due to the strategic change in S-100 ECDIS with interacting navigational data layers enabled by the Interoperability Specification S-98. The Chair echoed these statements and noted that the continuation of the DQWG was however at stake since the calls for nominations of office bearers (Vice-Chair, Secretary) had remained unfruitful so far.

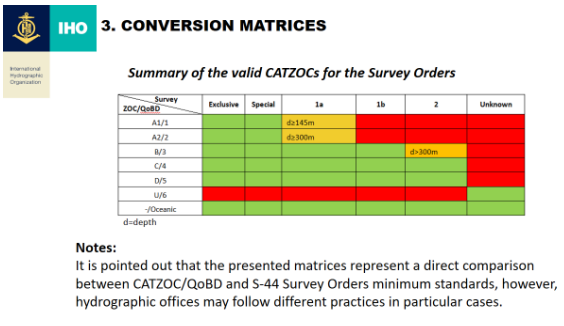
The DQWG addressed a significant number of complex technical topics at the meeting and reported in particular on the outcome of the cross-check review of data quality elements in S-100 based products specifications. The meeting participants commended the TWCWG Chair for his recorded well-structured presentation on the progress made with S-104 and S-111.

Before any involvement of some DQWG members, the DQWG Chair was invited to liaise with the S-100WG Chair on the proposed action plan related to the possible revision of data quality elements in overarching S-100 documents (S-97 Part C, S-100 Part 4c, Appendix D of S-100 Part 11). It was recommended to limit the actions, if any, to those considered critical for the future adoption of Edition 2.0.0 of the S-100 based product specifications for Route Monitoring as endorsed by the Council.

Following up on a decision made by HSSC, the DQWG established a sub-group to consider the proposal from the ENCWG to submit Edition 2.0.0 of S-67 at HSSC-15 for endorsement. This new Edition of S-67 - *Mariners Guide to use of ENC Data in ECDIS*[12] aims to amalgamate into one single publication: S-66 - *Facts about Electronic Charts and Carriage Requirements*, S-67 Edition 1.0.0 - *Mariners' Guide to Accuracy of Depth Information in Electronic Navigational Charts (ENC)*, Basic information for ECDIS users on ECDIS mandate and electronic charts ENC & RNC, ENCWG Information Papers, ENC and ECDIS Cyber Security Guidelines.

[6] Also Chair of the S-101 Project Team.
[7] ENC Standards Maintenance Working Group.
[8] Tides, Water Levels and Currents Working Group (recorded presentation).
[9] Maritime Autonomous Surface Ships (MASS) Navigation Project Team (PT) (recorded presentation).
[10] Hydrographic Surveys Working Group.
[11] Inland ENC Harmonization Group.
[12] Proposed new title at the date of publication of this Bulletin Report.

With a focus on data quality elements, the Chair of the S-101 PT reported on the progress made in the development of the S-101 Product Specification, also monitored by the IHO HSSC ISO 9001 Cell. As part of the discussion and following a strong recommendation from HSSC, the RENCs were invited to provide statistics on the progress made by ENC producers on the encoding of two major S-57 data quality attributes[13], currently optional in S-57 and mandatory in S-101, to facilitate the smooth conversion from S-57 to S-101 data.



IHO

3. CONVERSION MATRICES

Summary of the valid CATZOCs for the Survey Orders

Survey ZOC/QoBD	Exclusive	Special	1a	1b	2	Unknown
A1/1			d≥145m			
A2/2			d≥300m			
B/3					d>300m	
C/4						
D/5						
U/6						
-/Oceanic						

d=depth

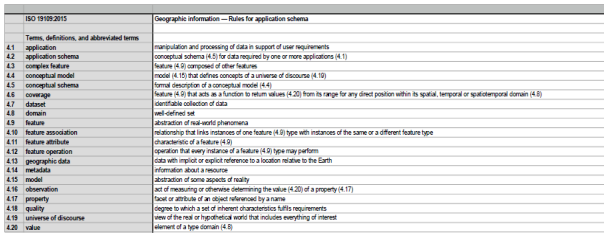
Notes:
It is pointed out that the presented matrices represent a direct comparison between CATZOC/QoBD and S-44 Survey Orders minimum standards, however, hydrographic offices may follow different practices in particular cases.

Coming soon, a long-awaited new IHO Publication: Guidelines and Recommendations for Hydrographic Offices for the Allocation of CATZOC/QoBD from Survey Data

Thanks to the support provided by the HSWG since the last meeting and thanks to the national best practices shared by some Member States , the DQWG endorsed at the meeting the proposed Edition 1.0.0 of a new IHO publication: Guidelines and Recommendations for Hydrographic Offices for the Allocation of CATZOC/QoBD from Survey Data.

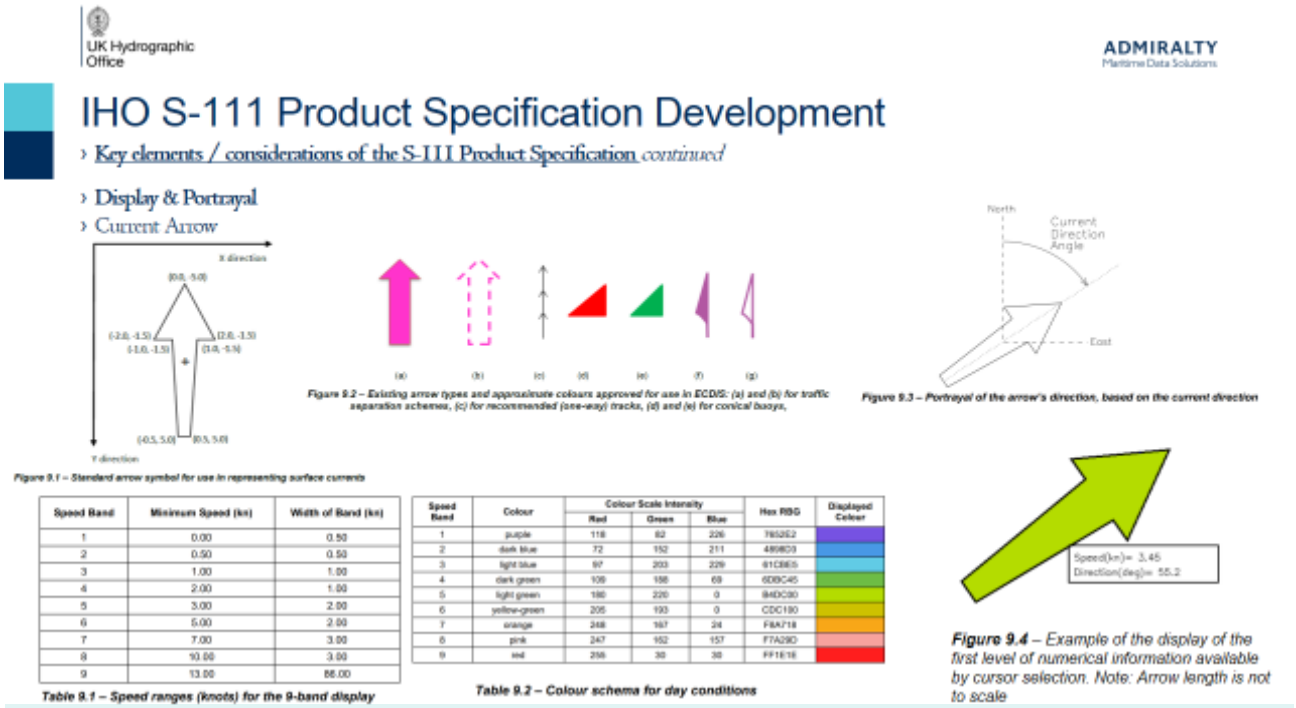
This is a significant achievement from the DQWG which will be submitted to HSSC-15 seeking the agreement of the committee on the publication of Edition 1.0.0 "as is", while acknowledging existing limitations in the document, as well as justified national reservations and some cartographic aspects that need to be addressed in further editions.

The DQWG thanked the Netherlands, and Mr Rogier Broekman in particular, former DQWG Chair, still active in geospatial information, for their very useful "gift" to the DQWG: a comprehensive and very practical dictionary (spreadsheet) of the definitions used in ISO 19xxx geospatial standards.



	ISO 19109:2015	Geographic information — Rules for application schema
	Terms, definitions, and abbreviated terms	
4.1	application	manipulation and processing of data in support of user requirements
4.2	application schema	conceptual schema (4.5) for data required by one or more applications (4.1)
4.3	complex feature	feature (4.9) composed of other features
4.4	conceptual model	model (4.15) that defines concepts of a universe of discourse (4.19)
4.5	conceptual schema	formal description of a conceptual model (4.4)
4.6	coverage	feature (4.9) that acts as a function to return values (4.20) from its range for any direct position within its spatial, temporal or spatiotemporal domain (4.8)
4.7	dataset	identifiable collection of data
4.8	domain	well-defined set
4.9	feature	abstraction of real-world phenomena
4.10	feature association	relationship that links instances of one feature (4.9) type with instances of the same or a different feature type
4.11	feature attribute	characteristic of a feature (4.9)
4.12	feature operation	operation that every instance of a feature (4.9) type may perform
4.13	geographic data	data with implicit or explicit reference to a location relative to the Earth
4.14	metadata	information about a resource
4.15	model	abstraction of some aspects of reality
4.16	observation	act of measuring or otherwise determining the value (4.20) of a property (4.17)
4.17	property	facet or attribute of an object referenced by a name
4.18	quality	degree to which a set of inherent characteristics fulfils requirements
4.19	universe of discourse	view of the real or hypothetical world that includes everything of interest
4.20	value	element of a type domain (4.8)

The ISO 19xxx Dictionary – Example with definition in ISO



UK Hydrographic Office

ADMIRALTY Maritime Data Solutions

IHO S-111 Product Specification Development

› Key elements / considerations of the S-111 Product Specification *continued*

› Display & Portrayal

› Current Arrow

X direction

Y direction

Figure 9.1 – Standard arrow symbol for use in representing surface currents

Figure 9.2 – Existing arrow types and approximate colours approved for use in ECDIS: (a) and (b) for traffic separation schemes, (c) for recommended (one-way) tracks, (d) and (e) for conical buoys,

North

Current Direction Angle

East

Figure 9.3 – Portrayal of the arrow's direction, based on the current direction

Speed Band	Minimum Speed (kn)	Width of Band (kn)
1	0.00	0.50
2	0.50	0.50
3	1.00	1.00
4	2.00	1.00
5	3.00	2.00
6	5.00	2.00
7	7.00	3.00
8	10.00	3.00
9	13.00	86.00

Table 9.1 – Speed ranges (knots) for the 9-band display

Speed Band	Colour	Colour Scale Intensity			Hex RBG	Displayed Colour
		Red	Green	Blue		
1	purple	118	82	226	7652E2	
2	dark blue	72	152	211	4898D3	
3	light blue	97	203	229	61CBE5	
4	dark green	109	158	69	6D9C45	
5	light green	180	220	0	B4DC00	
6	yellow-green	205	193	0	CDC100	
7	orange	248	167	24	F8A718	
8	pink	247	152	157	F7A29D	
9	red	255	30	30	FF1E1E	

Table 9.2 – Colour schema for day conditions

Speed(kn)= 3.45
Direction(deg)= 55.2

***Figure 9.4** – Example of the display of the first level of numerical information available by cursor selection. Note: Arrow length is not to scale*

Report by the TWCWG on S-104 and S-111 product specification development: Why? What? How?, Sources, Keyelements, Display & Portrayal, Testbeds, Data Quality aspects

[13] POSACC and SOUACC.

P-7

To be or not to be physically present in Monaco at the DQWG-18 meeting? that is the question.Well, who can do more, can do less!

Nautical Publications

This element addresses the developments related to the preparation of nautical publications, the maintenance of the relevant IHO standards, specifications and publications, and the provision of technical advice as appropriate.

Conduct meetings of Nautical Information Provision Working Group (NIPWG)

10th NIPWG VTC

The 10th meeting of the Nautical Information Provision Working Group (NIPWG) was held at the IHO Secretariat, Monaco, from 12 to 15 September 2023.

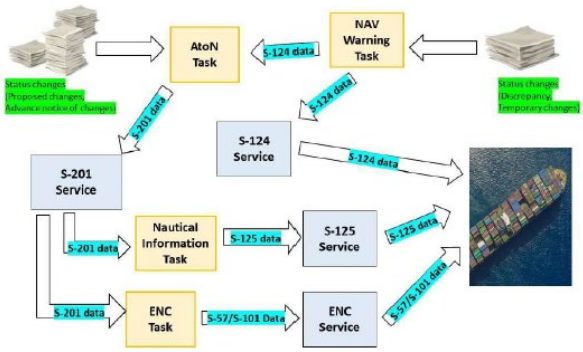
The meeting was chaired by Mr Eivind Mong (Canada), supported by Mr James Weston, Secretary (United Kingdom). Thirty-eight delegates from 15 Member States (Australia, Canada, China , Denmark, Finland, France, Germany, India, Italy, Norway, Poland, Republic of Korea, Sweden, United Kingdom and United States of America) and twelve expert contributors representing various stakeholders (EGDH, IHMA, ICS, IEC, Portolan Sciences, Furuno, Teledyne Geospatial, Anthropocene Institute, IIC Technologies Inc, PRIMAR, SevenCs, and Bureau Veritas Marine&Offshore) . The IHO Secretariat was represented by IHO Director Dr John Nyberg, Technical Standards Support Officer (TSSO) Jeff Wootton , Project Officer Insung Park and Assistant Director Yves Guillam.

Dr Mathias Jonas, Secretary-General of the IHO welcomed the participants, making several comparisons across the centuries between the first textual navigation data services available through the portolans, followed by charts, then the first handheld cellular phone, and therefore stressing the key role for NIPWG in the S-100 era to tackle multiple concepts and technologies together in support of mariners' requirements and beyond. The NIPWG Chair opened the meeting, providing a clear statement on the objectives and priorities given by the HSSC, such as S-128 development since it is the only the S-100 based product under NIPWG listed in Phase 1 / Route Monitoring of the S-100 Roadmap. The List of those Decisions and Actions from HSSC-15 tasking NIPWG was also reviewed.

Following an update on S-101 modelling provided by TSSO, the participants acknowledged that a robust mechanism to assess the impact of changes in the S-101 model on S-12x product specifications - in the remit of NIPWG - was not well established yet. However, the Working Group made progress during the week, as demonstrated by a Member (US) who agreed to become the representative of NIPWG in the Registry Domain Control Body for better coordination.

Several quite complex technical and policy issues were addressed during the meeting. One of which was about the MRN concept. The MRN was proposed as a possible way to identify official versus unofficial data in conjunction with producer codes, but the Group decided to design use cases prior to any implementation phase. As a side-consequence for S-98, the meeting agreed to include an interoperability identifier into the registry, as a concept.

The updates provided by the different Task Groups (TGs) on the development of their product specifications (S-122, S-123, S-125, S-128, S-131…) were promising. This offered the opportunity to identify the need to extend the principle of drafting "Operational Interaction Diagrams" (such as the one aside for S-125) to other nautical publications.



Generic AtoN information flow

Source: 20th IALA Conference

For S-123, the proposed changes to the product specification Ed. 1.0.0 by the TG were agreed in principles but need to be shared within NIPWG before a next edition is submitted for approval. At the same time, Bureau Veritas suggested S-123 as an S-100 based product adequate candidate to map the connectivity coverage for remote operations which is becoming so important for navigation of autonomous platforms in particular but may include additional uses. This was received positively and the introduction of new object types in S-123 to meet this requirement is to be considered.

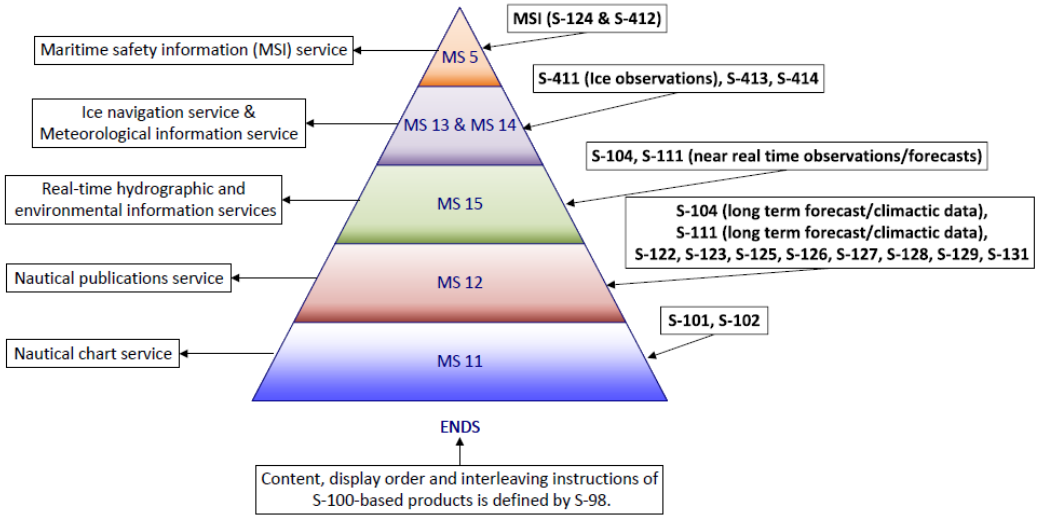
For S-128, the TG was requested to create and distribute a detailed timeline of the development roadmap from November 2023 to August 2024, to ensure a robust testing phase when the tool for generating CATALOG files is ready and documented. The Secretariat also invited the TG to make a clear distinction between the S-128 product specification development and the development of INToGIS III. Dedicated monthly VTC meetings are now planned to finalize the product specification, prepare and monitor the testing phase, and work on distribution issues and use cases. As a reminder, the Chair referenced the S-128 use case possible scenarios, presented at HSSC-15[14].

The Chair also reminded the Group of the requirement for an impact study of S-128 before submission of Ed. 2.0.0 for approval, and Denmark agreed to lead this task. This impact study should cover the association with the IMO Maritime Services.

On this matter, in preparation of the NIPWG report to HSSC, the Chair and Vice-Chair provided an update on the S-100 System Architecture in relation to IMO's Maritime Services.

Some refinements are still needed since the description of Maritime Services is very limited in general (IMO MSC.1/Circ.1610 refers) and the association with SOLAS/V Regulations not clearly depicted yet.

With no other nomination received by the Secretariat for the positions of Chair and Vice-Chair, Mr Eivind Mong (Canada)[15] and Mr Stefan



Electronic navigational data service (ENDS) means a special-purpose database compiled from nautical chart and nautical publication data, standardized as to content, structure and format, issued for use with ECDIS by or on the authority of a government, authorized hydrographic office or other relevant government institution, and conforming to IHO standards; and, which is designed to meet the requirement of marine navigation and the nautical charts and nautical publications carriage requirements in SOLAS regulations V/19 and V/27. The navigational base layer of ENDS is the electronic navigational chart (ENC). (MSC.530(106))

[14] See HSSC-15 IHO Secretariat's Bulletin Report.

[15] Due to administrative reasons, commitment confirmed for one year only.

Engström (Finland) were re-elected by acclamation.

In his conclusion, the Chair shared NIPWG Members' recognition of the strong support received from subject matter experts of industry since the last meeting.

NIPWG-10 Participants

Tides and Water Levels

This element addresses developments related to tidal and water level observation, analysis and prediction and other related information including vertical and horizontal datums, the maintenance of the relevant IHO standards, specifications and publications, and the provision of technical advice as appropriate.

Conduct meetings of the Tides, Water Level and Currents Working Group (TWCWG)

7th TWCWG

The Tides, Water Level and Currents Working Group (TWCWG) has been tasked by the IHO Hydrographic Services and Standards Committee (HSSC) to monitor and develop the use of tidal, water level and current information as well as to advise on tidal, water level and current observation, analysis and prediction.

Due to challenges with the original scheduling of an in person meeting, the 7th meeting of the Tides, Water Level and Currents Working Group (TWCWG7) originally planned to be held in South Africa, was held as a virtual meeting from 22 Feb – 2 March under the chairmanship of Mr Chris Jones. The meeting was attended by 64 delegates from 23 IHO Member States and observers from, the Secretariat of the Intergovernmental Oceanographic Commission of UNESCO (IOC), ER Systems, PRIMAR, Portolan Services, GEOMOD and the University of South Florida. Assistant Director Sam Harper represented the IHO Secretariat.

Some of the participants at the TWCWG7 meeting

The Chair provided an update on the interaction and discussions which had taken place with other IHO subordinate bodies, in particular NIPWG, DQWG, HSWG, CSBWG and S-100WG.

A significant amount of TWCWG7 was devoted to reviewing the finalised versions of the S-100 based Product Specifications for which the group is responsible – S-104 (Water Level Information for Surface Navigation) and S-111 (Surface Currents).

S104 & S-111

Aside from specific updates to S-104 and S-111, the group observed that both product specifications had been fully alligned with S-100 Ed 5.0.0. In addition the following issues had been addressed:

- Specified data type size for HDF5 attributes.
- Harmonized enumeration for types of data
- Additional guidance for production
- Requirements for compliance with S-98 (Interoperability)
- Guidance for "cell scheming"
- Rules for dataset and support file names (allowed characters, length)
- Annex F describing product specific validation checks ("informative" in this edition).
- Temporary removal of screen captures in Annex E.
- Updated references
- Minor editorial corrections throughout

It was noted that both Product Specifications had been submitted to the GI Registry for copy-editing and subsequent formal release. In terms of future development, it was agreed that the focus would now be on working towards Ed 2.0.0. Additional Member States volunteered to join the Project Team groups to as-sist the development. It was noted that to reach this milestone, fully operational test datasets would be required. The proposed time-line for publication of Editions 2.0.0 is likely to be Q3/Q4 of 2024.editing and subsequent formal release. In terms of future development, it was agreed that the focus would now be on working towards Ed 2.0.0. Additional Member States volunteered to join the Project Team groups to assist the development. It was noted that to reach this milestone, fully operational test datasets would be required. The proposed timeline for publication of Editions 2.0.0 is likely to be Q3/Q4 of 2024.

Survey/Questionnaire on Member State Readiness for S-104 and S-111

KHOA presented the results of their survey designed to assess the current state of 'readiness levels' of Member States in terms of their production plans for S-104 & S-111 outputs. The reported that useful information gained on setting a 'priority order' of datatype (i.e.real-time, forecast, predicted…..). Responses from 16 Member States were received and the results showed a variety of vertical datums, numerical models and grid sizes were in use. Those Member States who are currently outputting data, provide Forecast, Predicted and Real-time datatypes. Those Member States who are not currently outputting data do have plans to do so in the future. They also noted that PRIMAR training modules are available as a development aid.

HSWG/TWCWG collaboration to improve tidal observation uncertainty standards within the relevant sections of S-44

The Chair of the HSWG joined the meeting to present the issue of tidal observation uncertainty within S-44. He noted that S-44 currently holds very limited information about "tidal observation uncertainties". He explained that Edition 6.1.0 only refers to observation/measurement uncertainties for 'Water Flow Direction' and 'Water Flow Speed'. It was noted that there is the potential to re-define the existing criteria, and add new criteria for Water Levels. In response, a TWCWG task team was established to investigate further in time for the next Edition of S-44.

Hydrographic Dictionary

This element addresses the development, maintenance and extension of IHO Publication S-32 - *Hydrographic Dictionary* in English, French and Spanish, and the provision of technical advice as appropriate.

Maintain and extend the IHO Hydrographic Dictionary in English, French and Spanish

The Hydrographic Dictionary Working Group is presently in a state of transition, moving from a Working Group to a Correspondance Group, in accordance with HSSC 15/68. The Group is presently rewriting its terms of reference, but continues work on the harmonisation of the reference dictionary database with the IHO GI Registry. All terms have been included into the GI Registry and work continues on the classification of terms into designated categories to reduce the maintenance tasks to those that are relevant to hydrography and cartography with other terms being taken from other specialisations. At the HSSC meeting held in June 2023, the Committee agreed on the need to keep the IHO Hydrographic Dictionary as stand-alone IHO publication, with the GI Registry as a basis for maintaining its S-100-related component.

ABLOS

This element addresses the developments related to the hydrographic aspects of the United Nations Convention on the Law of the Sea (UNCLOS), the maintenance of the relevant IHO publications, and the provision of technical advice as appropriate.

Organize and prepare the Advisory Board on the Technical Aspects of the Law of the Sea (ABLOS) annual business meeting

30th ABLOS Business Meeting

The Advisory Board on the Law of the Sea (ABLOS) is a joint board of the International Hydrographic Organization (IHO) and the International Association of Geodesy (IAG) with the objective to provide information and advice on technical aspects of the Law of the Sea.

The ABLOS held its 30th Business Meeting (BM) on the 10 and 13 October 2023 at the IHO Secretariat, Monaco. The three sessions were led by the ABLOS Chair, Dr Juan Carlos BÁEZ SOTO (IAG – Chile) and Vice Chair, Fiona BLOOR (IHO – UK). The sessions were attended by all the ABLOS members and IHO and IAG appointed observers from Australia, Brazil, Chile, Denmark, France, India, the Republic of Korea, Sweden and the United Kingdom. The IHO Secretariat was represented by Assistant Director Sam Harper, ABLOS Secretary.

The meeting focused on several key topics; discussions were held on the progress of various working groups, technical and legal issues, and updates on the TALOS project. The meeting also featured discussions on future activities, planning for upcoming events, ongoing projects and plans for future initiatives.

A key topic for discussion was the future of the ABLOS, its role and relevance of its work; it was noted that beyond the traditional technical advice provided by the group, the changing legal environment within the Ocean Science and exploration communities meant the question over what the future role for ABLOS had never been so relevant. Notwithstanding this, it was agreed that the TALOS manual would remain core to ABLOS, but that dedicated work should be undertaken to ensure that the target audience and the nature of te guidance contained within is fit for purpose.

The participants reflected on the publication of C-51 – *A Manual on Technical Aspects the United Nations Convention on the Law of the Sea - 1982* – Edition 6.0.0. It was noted that whilst some progress had been made towards the draft text for Ed.7.0.0 it was agreed that it would be developed in time for BM31 and onward submission to HSSC16 in 2024 under the leadership of John Ells, Chair of the Editorial Board.

11th ABLOS Conference

The 11th ABLOS Conference, held at the IHO Secretariat in Monaco on October 11-12, 2023, covered various themes in ocean geosciences. Keynote speakers discussed gender equality in ocean science and governance, and technical sessions addressed the delineation of continental shelf limits under Article 76. Topics included challenges in defining Arctic continental shelf limits, satellite data in defining hotspot ridge boundaries, and the role of scientific and technological advances in maritime boundary disputes. Sessions also explored gender equality in ocean science institutions, the impact of sea level rise on maritime boundaries, and the use of publicly available datasets for reconnaissance studies. The conference concluded with a session on challenges in defining rules, standards, and guidelines in the face of environmental and technical changes, emphasizing international responsibilities and the intersection of submarine cables and marine scientific research.

Participants of the ABLOS BM30 and 11th ABLOS Conference

Hydrographic Surveys Working Group (HSWG)

5th HSWG

The Hydrographic Surveys Working Group (HSWG) has been tasked by the IHO Hydrographic Services and Standards Committee (HSSC) to act as the focal point for hydrographic surveying industry engagement with the IHO and maintain and promote the use of IHO publications S-44 *Standards for Hydrographic Surveys* and C-13 *Manual on Hydrography.*

The 5th meeting of the Hydrographic Surveys Working Group (HSWG5) was Pushidrosal on the island of Lombok, Indonesia from 2nd to 5th October 2023, under the chairmanship of Mr David Parker (UK). The meeting was attended by 20 delegates from 10 IHO Member States (Finland, France, Germany, India, Indonesia, Italy, Portugal, Sweden, UK and USA) and a range Expert Contributors from industry and academia. The IHO Secretariat were represented by Assistant Director Sam Harper.

Introducing the meeting, the Chair summarized the intentions for HSWG5. The main focus of HSWG5 was progressing the work on updating

C-13, The Manual on Hydrography, with a particular focus on ensuring that the project team had clarity on the purpose and target audience of the revised publication. He noted that it was also his intent to review the S-44 update process and discuss the key elements of S-44 which would be the focus of the next revision.

S-44. Following a recap of the process leading to approval of S-44 Ed.6.1.0, the update process was reviewed and agreed to be every 2 years. The key areas that would be the focus of the next revision were agreed to be Backscatter, Seafloor Coverage and Uncertainty. It was noted that Backscatter would be an entirely new addition to S-44 and that external expertise would likely need to be sought. The plan to have these revisions ready for December 2024 for onward submission to HSSC17 was agreed.

C-13. Ian Davies (UK) led the Project Team through the results of the questionnaire that had been prepared to gauge the interest, scope and intended audience of a revised C-13 publication. Previously it had been envisioned that C-13 should be a companion guide to the S-5 and S-8 syllabi. However, in exploring the mechanics of maintaining a publication that kept up to date or at least consistent with S5 and S8 some significant challenges were identified. After much discussion it was agreed that the content of S-5 and S8 would be a starting point for the new edition of C-13, however it would be a standalone reference publication that seeks to provide the latest thinking with regards to Hydrographic Sciences.

Other Matters. Noting the inter-linkages with other IHO bodies, presentations and discussion on key issues were had relating to the Data Quality Working Group, the Hydrographic Dictionary Working Group, the Tides, Water Levels and Currents Working Group, the S-100 Working Group, The GEBCO Technical Sub-Committee on Ocean Mapping and the Crowdsourced Bathymetry Working Group. It was noted that the HSWG would need to be proactive in reaching out to these groups to provide support and a number of associated actions were assigned. Of particular note was the growing need for HSWG representation within the working groups that are responsible for various S-10x Product Specifications. It was noted that in many cases, language, terminology and the general approach to discussing and describing issues relating to measurement uncertainty is inconsistent across many of these groups and that there is a role for the HSWG to assist as the subject matter experts.

Election of the Chair, Vice Chair and Secretary. Both the Chair and Vice Chair completed their first 2 year terms at HSWG5. Both were willing to stand again and in the absence of any other nominees, were voted in by acclamation.

The secretary also indicated his desire to remain in post which was supported by the members of the working group.

Some of the participants at the HSWG5 meeting.

Technical outreach, advice and guidance in relation to IHO Standards, specifications and guidance

125th OGC Meeting

The 125th Member Meeting of Open Geospatial Consortium (OGC) was held in Frascati, Italy from 20 to 24 February 2023. The meeting was sponsored by the European Space Agency (ESA). The overarching theme of the meeting week was “Space and Geospatial”. More than 200 people attended the OGC Member Meeting in person, with more than 100 virtual. Attendees included key standards leaders and regional experts from industry, academia and government. The IHO Secretariat was represented by Assistant Director Yong BAEK at the Marine Domain Working Group session on 20 February 2023.

The kick-off began with welcome remarks by Dr Rune Floberghagen, Head of Science, Applications and Climate Department in the Directorate for Earth Observation Programmes, ESA, with a focus on the use of and contribution to OGC Standards and an overview of European Space Agency (ESA) programmes.

A half-day special session for OGC Marine community was held to discuss “Connecting Land and Sea.” The meeting focused on past, present and future work related to the global marine domain and the multi-year IHO-OGC Federated Marine SDI (FMSDI) Initiative. Part I of the session focused on both the work of the OGC Marine Domain working group and progress to data on past work on FMSDI and planned future work. Part II was the demonstrations of results from The Federated MSDI Pilot (FMSDI) and Phase III (Arctic) under a scenario of a vessel in distress in Western Alaska, just south of the Arctic Circle and a review if the Engineering report for approval.

The Federated Marine Spatial Data Infrastructure (FMSDI) Pilot is an OGC Innovation Program initiative with the objective to enhance Marine Spatial Data Infrastructure (MSDIs), to understand MSDI maturity better and demonstrate the power of FAIR (Findable, Accessible, Interoperable, Reusable) data in the context of the marine environment.

The pilot will lead to four main outcomes.

Demonstration – A practical technology demonstration from global community experts showcasing federated Marine SDI for selected Land/Sea use cases. Possible examples include use cases for the Arctic, European Coastal Regions, and Southeast Asian region. The demonstration will show how using OGC, IHO, and other open standards enable the community’s ability to find, obtain, use, share, interoperate, and reuse data.

Impact on OGC Standards – Lessons learned, gaps, and the need for changes to the OGC Standards Baseline will be summarized in an Engineering Report that will inform the OGC Standards Programme.

Marine Domain Working Group in session

Impact on IHO Standards – Practical testing of relevant S-100-based IHO standards will accelerate the process for the adoption and implementation of IHO standards. The resulting Engineering Report will help inform the work of the IHO HSSC Working Group and will provide inputs to enhance the framework and its component standards.

Development of the Marine Spatial Data Infrastructure (MSDI) Maturity Model – Providing a roadmap for MSDI development.

OGC’s Federated Marine Spatial Data Infrastructure Pilot continues to be successful and will add new phases of work with additional sponsors and expansion of topics. The Marine DWG is coordinating closely with the International Hydrographic Organization (IHO) and United Nations Working Group on Marine Geospatial Information to develop a partnership to test against real work-use cases in this pilot and other projects.

WORK PROGRAMME 3
Inter-Regional Coordination and Support

Introduction

The IHO Work Programme 3 "Inter-Regional Coordination and Support" seeks to establish, coordinate and enhance cooperation in hydrographic activities on a regional basis, and between regions, especially on matters associated with the coordination of global surveying, nautical charting and ocean mapping, dissemination of maritime safety information (MSI) and capacity building (CB), including education and training. IHO Work Programme 3 is implemented under the principal responsibility of the Inter-Regional Coordination Committee (IRCC).

Inter-Regional Coordination Committee (IRCC)

The IRCC promotes and coordinates those activities that might benefit from a regional approach. The principal objective of the IRCC is to establish, coordinate and enhance cooperation in hydrographic activities among States on a regional basis, and between regions; establish cooperation to enhance the delivery of capacity building programmes; monitor the work of relevant IHO Inter-Organizational Bodies engaged in activities that require inter-regional cooperation and coordination; promote cooperation between pertinent regional organizations; and review and implement the IHO Capacity Building Strategy, promoting capacity building initiatives.

Conduct annual meetings of IRCC

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.

Dr Masayuki Fujita, Chief Hydrographer of Japan, provided a welcome speech in which he expressed the honour of hosting this important event. He remarked that Hydrography supports the foundation data and information for the implementation of our respective mission and vision, and support cooperation and partnership with stakeholders. The importance of IRCC is further growing in promoting regional cooperation and safe navigation, and advancing regional hydrographic services. He enhanced the important items in the agenda of this meeting after the 3rd Session of the IHO Assembly.

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.

On behalf of the IHO Member States and IHO Secretariat, Director Luigi Sinapi delivered the IHO Secretariat Report, expressing gratitude to the JHOD for hosting such an important IHO meeting and the preceding IBSC46 and CBSC21 meetings. He highlighted that the IRCC represents, within the world's Hydrographic Community and together with the IHO Assembly, the only other real opportunity to discuss the regional realities, issues and initiatives of common interest in the fields of Hydrography, Nautical Cartography, Capacity Building, Ocean Mapping and many others, identifying the best and most appropriate

approach to be applied at regional and global levels. In the IHO Secretariat's report he highlighted the outcomes of the 3rd Session of the IHO Assembly, the initial information on the incoming 7th IHO Council and the most important achievements in IHO outreach and new IHO projects.

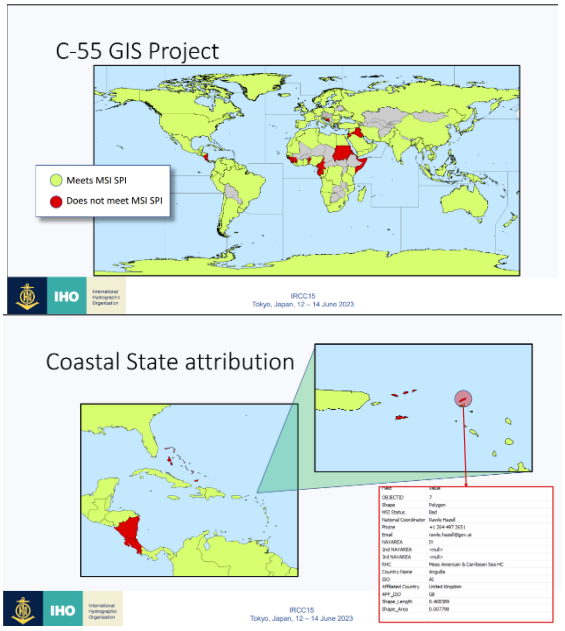
Participants at IRCC15

The HSSC Vice-Chair presented the progress on the S-100 Implementation Roadmap and on the S-100 product specifications. HSSC is focused on the "Phase 1 - Navigational Route Monitoring Mode" Product Specifications to be operational by October/November 2024. IHO will report to IMO NCSR the progress of Product Specifications against the S-100 implementation roadmap, as well as expected coverage of S-100 products once they start to become available. HSSC approved Ed. 1.0.0 of S-68 – Guidelines and recommendations for hydrographic offices for the allocation of CATZOC/QOBD (Quality of Bathymetry Data) values from survey data for initial implementation, testing and evaluation, and Ed 1.0.0 of B-13 - Guidance to Satellite Derived Bathymetry. HSSC tasked NCWG to work on S-11 Part A, Section 200, to incorporate S-101 Scheming Guidelines. HSSC discussed the paper provided by Germany on the effects of amended paper chart production practice, similarly discussed at IMO MSC 107, and tasked NCWG to make an impact study and develop a standard for NtM (XML) if appropriate. HSSC approved ToRs for the establishment of the S-100 Infrastructure Centre Establishment Project Team (ICE PT) under HSSC (following Decision A3/14). An ISO Cell was set up after HSSC13 to experiment with the application of ISO 9001 in the development of S-101 Product Specifications. On this, HSSC invited IRCC to consider mirroring such an ISO Cell on S-101 via the RHCs. HSSC endorsed the proposal from the UK for the IHO to consider the creation of a new award, more inclusive than the Medal of Prince Albert 1st, recognising once a year a champion of hydrography across HSSC and IRCC (WGs, SCs and PTs). IRCC also supported the proposal to consider the creation of a new award, to be presented to C-7.

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. Good progress in the inter-regional cooperation and successful partnership with industry and international stakeholders, especially in the field of Capacity Building and the implementation of new technology, were noted and discussed. 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.

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 CBSC on a C-55 GIS project, considering the States having MSI capacity and meeting the MSI SPI, and those not having such capacity and not meeting the MSI SPI. The presented demo on the C-55 GIS project will be evaluated to be incorporated into the INToGIS III. On Iridium SafetyCast Implementation, WWNWS agreed that the use of all IMO RMSSs should be mandatory, showing those NAVAREAs already fully implementing the Iridium SafetyCast system, as well as those still in trial and those that have not yet implemented the system. Two courses on MSI were

conducted in 2022. S-124, Edition 1.0.0 is ready for submission for approval. NCSR10 approved the joint IMO/IHO/WMO Manual on Maritime Safety Information.



C-55 GIS project presented by WWNWS

The Capacity Building Sub-Committee (CBSC) Chair presented the CB Work Programme (CBWP), the significant impact of the COVID-19 pandemic on the CB activities, the new projects launched lately (e-Learning Center and EWH), Proposal 3.5 to the 3rd Assembly and the C-55 improvements. The Chair highlighted the generous financial external contribution to Capacity Building coming from the Republic of Korea, Japan through the Nippon Foundation and Canada, and the related initiatives/projects funded with those contributions. The CB funds situation available for 2023 and 2024 was also presented, highlighting once again the core strategic role of Capacity Building in Hydrography. With reference to the e-Learning center, the Project Team completed the Guidelines with the proposed composition of the Steering Committee. The CBSC endorsed the Guidelines and IRCC approved them, asking the IHO Secretariat to inform, via an IHO CL, that the e-Learning center is fully operational and call for the establishment of the Steering Committee, in line with the indications provided in the Guidelines. On C-55, the PT progressed on the new edition of the IHO C-55 publication, highlighting that the C-55 PT developed a solution for survey status in countries based on CATZOC provided via the RENCS directly to the IHO Secretariat. For non-navigational purposes, data from Seabed2030 can support annual regional and global reporting including Areas Beyond National Jurisdiction (ABNJ). CBSC welcomed Proposal 3.5 to the 3rd Assembly, requesting that CBSC is involved, but highlighting that the task-force should consist of members with the appropriate skills. Finally, a way-ahead for the EWH project was presented by Canada on behalf of the IHO Secretariat, IRCC, CBSC and Canada, proposing how the project could evolve into a programme and the possible ways to support, financially and in-kind, the programme. The way-ahead will be reported from IRCC Chair to Council at C-7 for decisions. The IHO Secretariat was finally asked to issue a questionnaire on gender balance via Circular Letter every 3 years.

The Worldwide ENC Database Working Group (WENDWG) Chair reported on achievements of the WENDWG in the last few years, focusing on the transition from pure S-57 focus to S-100 world. The WG completed a WEND-100 Product and Service Matrix using the UN-Integrated Geospatial Information Framework pathway principles to assist RHCs and MS, through the application of basic UN-GGIM check-list and good practices applied to S-100 Products and Services. This approach is aimed at identifying the key issues and critical paths to be considered for healthy product lifecycle, noting that not all future S-100 based products services can or will be provided by every Hydrographic Office. Responses to the Matrix were received from 8 of the RHCs resulting in an average total score of 45.85. The WG considered the WEND-100 Principles and S-1xx Implementation Guidelines to be in “maintenance mode” and included them as part of the regular agenda to consider updates as S-100 Products and Services mature. WENDWG Chair thanked KHOA for leading the INToGIS III development, noting its importance for sharing S-100 product coverage into the future, encouraging submission of S-128 datasets for use in INToGIS, and thanked NGA for the updates on NGA World Port Index and Global Maritime Traffic Density Service. On the regional S-100 coordinator’s role, some RHCs requested more guidance on what the role entails, An amendment to include Section 300 in S-11 Part A to describe the Coordinator responsibilities was considered. Some progress was made on measuring the SPI 1.3.1 via a first run of the WEND IGIF Products and Services Matrix that has been completed.

The Marine Spatial Data Infrastructures Working Group (MSDIWG) Chair reported on the progress on the IHO Strategic Plan Target 2.1 - Build a portal to support and promote regional and international cooperation in marine spatial data infrastructures - and, Target 2.3 - Apply UN shared guiding principles for geospatial information management - , S-100 framework, the Digital Twins (DT), and the FAIR principles and UN-GGIM IGIF-Hydro) from a MSDI perspective. On DITTO (Digital Twins of The Ocean), MSDIs are evolving from a data infrastructure to a knowledge infrastructure and enabling and benefiting from DT would be one of the many ways MSDIs would drive marine knowledge. The MSDI Chair mentioned the importance of the RHC MSDI Ambassadors to promote MSDI and help MS prepare national reports with respect to MSDI status. The MSDIWG embarked on an update of the C-17 publication. The updates were deemed significant enough to entail an Edition 3.0.0. with the two most notable, a cookbook for HOs on not only establishing MSDIs but also advancing existing MSDIs and addressing all levels of MSDI maturity - leaving no one behind. This gives newly established MSDIs a chance to keep abreast of future trends and to adopt the latest advances in technologies, standards and practices; and secondly an "IGIF-aligned MSDI implementation", explaining the bridge between the MSDI 4 pillars to the UN-GGIM IGIF 9 strategic pathways. The updated publication will also provide information how HOs can apply these frameworks such that MSDIs can be integrated with the larger geospatial ecosystem, in line with the IHO Strategic Goals 2021 - 2026, to address many of the environmental challenges, climate change and sustainable development, and increase safety and efficiency of port-to-port navigation with integrated marine spatial data. IRCC approved the MSDIWG Terms of Reference version 2.0, and endorsed C-17 Ed. 3.0.0, requesting the IHO Secretariat, in accordance with Resolution 2/2007 as amended, to issue a Circular Letter seeking for the approval of the IHO MS. Finally and in accordance with A-3 Decision 8 point c), IRCC tasked MSDI to not invest into another portal, but to focus on the existing global thematic layers already available on the INToGIS and, if new potential global thematic layers are identified in addition to those potential ones listed into the PRO 1.2 approved by A-3, they should be brought to the attention of IRCC for the approval by the Council.

European Maritime Day – 24-25 May 2023, Brest (France)

The IHO-EU Network Working Group (**IENWG)** reported on the MoU signed in 2012 by the European Commission and the IHO, which ensures a continuing liaison in areas of common interest. The 10th anniversary meeting of the EC and IHO in 2022 valued the contributions of the EU HOs and outlined prospects. The latest IENWG13 meeting was organised on the occasion of the annual European Maritime Days (EMD) of the European Commission DG MARE and focused on global issues concerning the blue economy, the marine environment, the maritime security and ways of moving forward. IENWG and DG MARE discussed new opportunities for collaboration, covering also EU policies of interest for the IHO, projects and strategy. Information on some EU projects (EU study on marine data collection coherence, re-use of environment public data applied to marine knowledge, Inspire - European Spatial Data Infrastructure for the purposes of EU environmental policies and Maritime Spatial Planning was provided and shared, highlighting the interoperability with data and IHO standards. The EU countries' contribution to GEBCO interoperability between EMODnet, the IHO DCDB and the IHO and IOC GEBCO was also discussed. Finally, a discussion on the review of the strategy and the way-forward for the IENWG took place at the IENWG13, highlighting Maritime policies in order to continue to monitor and influence the EU policies, the development of the S-100 hydrographic products and services, in order to promote them across the European Commission (to make good use of for the purposes of blue economy, marine safety, climate change, protection of marine areas and biodiversity), the IHO Capacity Building programme, in order to promote the development of programmes for the hydrographic capacity in the EU, and outside EU in particular for safe sea lines with East Asia and Africa, in connection with IRCC initiatives to extend CB funds, and finally the data collection, in order to develop common

acquisition campaigns of bathymetric data in the EU maritime basins. The involvement of the IHO secretariat was recognized as an asset for the promotion of activities at high level in the EU Commission.

The FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) Chair reported that at the IBSC45 meeting in 2022, 13 submissions were received with only 3 initially recognized, but after the intersessional review all 13 were recognized. At this year´s IBSC46 11 submissions were received. 1 submission was recognized and for the remaining 10, whilst 3 submissions were not recognized, the Board offered 8 inter-sessional revisions. The Board decided to develop a pathway to recognize Subjects of the S-5 Standards S5A & S5B in addition to the recognition of full programmes. IBSC worked on the review of the IBSC Standards and maintenance of IBSC Publications. Ms Cecilia Cortina (Mexico), currently attending the University of New Hampshire - Nippon Foundation/ GEBCO programme alumna, joined the Meeting as an intern supported by Nippon Foundation/GEBCO within the EWH project. The Board discussed the need to update the Standards and potentially create a new standard for Marine Spatial Data Professionals. During the discussion the need to liaise with other stakeholders, in particular the IHO MSDIWG, to make an informed decision on the way forward on this subject was considered necessary. IBSC also agreed that the increasing number of inadequate submissions cause additional workload to the Board, and a second annual inter-sessional meeting is required in 2023 to finalize reviews of the inadequate submissions, but mainly to progress on the revision of the standards and the recognition of Subjects. The future engagement of IBSC with the IHO e-Learning Center was also discussed. IRCC tasked the IBSC in liaison with the IHO Secretariat to organize an online workshop to provide clarifications on the submissions to the Board.

The Crowdsourced Bathymetry Working Group (CSBWG) Chair reported 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, workshopping 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.

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.

The IRCC Vice-Chair presented on the Proposal 3.5 - Establish an ad-hoc Project Team under IRCC to explore the establishment of reliable alternative funding for activities related to Capacity Building and GEBCO (see A-3 Decision 20). The PT composition was discussed, as well as the team's timeline and objectives. The possible available opportunities such as an ENC surcharge, voluntary contributions and approaches to Development Banks were presented, with aim to provide additional Capacity Building opportunities and Standards development. With reference to UNGGIM, the important tool for engaging with the Development Banks via the IGIF-Hydro was also discussed. IRCC established a scoping Team under the leadership of Dr John Nyberg to investigate potential additional sources of funding and the Team's objectives for the following presentation to C-7.

A paper from Germany on "Effects of amended paper chart production practice" was presented to IRCC (the same paper was presented by Germany to HSSC at HSSC15 meeting). The IRCC acknowledged the work being done at the HSSC in supporting Safety of Navigation for non-ECDIS mandated vessels (small commercial, fishing, leisure, etc) to allow for the transition from paper nautical charts via the provision 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.

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.

Conduct Regional Hydrographic Commission meetings (RHC)

Arctic Regional Hydrographic Commission (ARHC)

The 13th Conference of the Arctic Regional Hydrographic Commission (ARHC) was held in Nuuk, Greenland, Denmark, from 5 -8 September 2023.

Nineteen participants representing four ARHC Members (Canada, Denmark, Norway, and the USA and four Associate Members (Finland, Iceland, Italy and United Kingdom) participated in the Conference.

The ARHC Conference was chaired by Ms Pia Dahl Højgaard, National Hydrographer of Denmark. The IHO Secretariat was represented remotely by Secretary-General Dr Mathias Jonas who reported on the recent Secretariat`s activities affecting the Arctic Region.

The Secretary-General informed the ARHC Members of the strategic issues that will be on the agenda of the upcoming 7th meeting of the IHO Council. His presentation placed special emphasis on the parallel activities of the Hydrographic Commission on Antarctica in view of a coordinated approach for the implementation of future regional S-100 based data services. Dr Jonas highlighted the overarching importance of the UN-GGIM Committee of Experts decision to adopt of the Operational Framework for Integrated Marine Geospatial Information Management UN-IGIF-Hydro (Part One & Two). The UN-IGIF-Hydro aims to ensure the inclusion of the marine domain in the larger geospatial information ecosystem and is intended to be used by both developing and established geospatial programs which wish to implement the UN-IGIF Strategic Pathways in the marine domain. The UN-IGIF-Hydro framework recognizes hydrography and ocean mapping as important contributors to other geospatial domains.

All participants reported on their national activities in the Arctic region since the last Conference. Motivated by a paper "Navigating to a Greener Future" presented by United Kingdom, the Committee started a discussion on the greening of hydrographic operations and the possible impact of hydrographic data to climate-related research. ARHC noted the Arctic Risk Assessment Report submitted by its Operations and Technology Working Group (OTWG), and requested the report to be updated to include Southern Greenland in its geographic scope.

Of special note, all ARHC members expressed their willingness to share the underlying data of the Arctic Risk Assessment.

ARHC confirmed Evert Flier (Norway) as ARHC representative to WENDWG and task him to coordinate the regional answers on the implementation of the S-100 roadmap.

At the end of the meeting, Ms Birte Noer Borrevik, National Hydrographer of Norway, was elected as the new Chair of the ARHC.

All available documents of the meeting are posted on the ARHC page of the IHO website.

ARHC13 participants

Baltic Sea Hydrographic Commission (BSHC)

The 28th Conference of the Baltic Sea Hydrographic Commission (BSHC27) was held in Helsinki, Fin- land, kindly hosted by the Finnish Transport and Communication Agency, from 19 to 21 September, under the Chairmanship of Mr Rainer Mustaniemi (Finland). A total of twenty 24 attendees from seven of the eight full members of the Commission (Denmark, Estonia, Finland, Germany, Latvia, Poland, and Sweden) and associate member Lithuania were represented at the Conference. The United King- dom and USA attended as Observers. The IHO Secretariat was represented by Secretary-General Dr Mathias Jonas.

The Chair of the BSHC Mr. Rainer Mustaniemi (FIN) opened the 28th Baltic Sea Hydrographic Commis- sion Meeting and welcomed the participants. The Chair highlighted the importance of the meeting due to ongoing projects and especially plans for cooperation in S-100 implementation in the region.

IHO Secretary General, Dr Mathias Jonas presented the report of the IHO Secretariat, with emphasis on the importance of S-100 change and that the Baltic Sea is the laboratory to S-100 implementation. He pointed out that plenty of work has been done also between meetings and several BSHC member states represented in IHO Working Groups. "If we can make it here, we can make it everywhere", the Secretary General quoted Frank Sinatra.

Red cells mark up the areas of Estonia's national waters now covered with S-102 Version2.2 datasets

Participants of the 28th BSHC Conference

Mr. Magnus Wallhagen, Sweden informed about the outcomes of the 6th meeting of the IHO Council, held in Monaco on 18-20 October 2022 and the highlights of the forthcoming Council 7 agenda.

All Members present provided National Reports informing on projects and developments of interest since the last Conference. Specific items to note with relation to the S-100 roadmap were Estonia's announcement of the provision of S-102 version 2.2 datasets for test purposes and Finland's collabo- ration with national Meteorological Institute for S-104, S-111, S-411, S-412 provision. Lithuania re- ported on the ongoing process to obtain approval to become an IHO Member State.

The Re-Survey Monitoring Working Group (MWG Chair) Mrs. Maarit Mikkelsen, Finland presented the MWG report and gave an overview of the re-survey status of the region.

Mr. Magnus Wallhagen, Sweden presented the issue on the finalization of the global dataset for polygonal demarcation of marine limit (S-130) and the need of it to be tested. The Commission agreed to forward the existing Baltic Sea Limits vertices to IHO Secretariat for S-130 experimental testing purposes.

The Chair of the BSHC Strategic Correspondence Group (SCG) Mr. Magnus Wallhagen informed the Commission about the work in the Strategic Cor- respondence Group (BS- SCG). The follow-up dis- cussion resulted in the conclusion that BSHC does not need a separate Stra- tegic Plan and should in- stead implement the over- arching IHO Strategic Plan according to the regional specifics. The SCG was therefore declared as closed.

Ms Pia Højgaard (Denmark) on behalf of the Baltic Sea North Sea Marine Spatial Data Infrastructure Working Group BS-NSMSDIWG Chair presented the report from the BS-NSMSDIWG. The WG has been in dormant state, waiting for the BSHC decision. Denmark proposed to close the BSMSDIWG since MSDI developement is largely regulated by EU regulations which seven out of eight BSHC Member States are subject to. This justification was supported by Latvia. US commended BSHC and stated that the excisting of IHO MSDI WG has been greatly as a result of BS-NS MSDI WG and acknowledges their important work. The Commission finally agreed to close the BSMSDIWG and inform the NSHC Chair accordingly. It was the understanding of the participants that this decision leads to the close of the Baltic Sea part of the BS-NSMSDIWG part too.

The IRCC Chair Mr. Thomas Dehling (Germany) presented the work of the IRCC since the previous BSHC Conference, focusing on the IRCC's recommendations to the Regional Hydrographic Commissions (RHC). The Commission went into intense debate on items related to the future regional coordination of S-100 based data service provisions which was interrelated to the reported WEND activities. Items were S-100 Implementation and coordination, the WEND-100 Product Matrix IGIF, to be updated annually, WEND-100 Principles and S-1xx Implementation Guidelines, S-101 ENC Scheming Guidelines, INToGIS III and S-128. The WEND 100 IGIF matrix as a useful means to assess the situation and future progress was confirmed Ms. Annika Kindeberg (Sweden), as BSHC's representative, presented the highlights of the work done in the IHO-EU network (IENWG), with focus on several EU projects related ongoing (EU projects presented to EU). The resulting discussion highlighted the current lack on strategic direction in the Working Group, taking note at the same time however, that Belgium, France and the Netherlands undertake a significant amount of intercessional work. The IHO Secretariat´s representative elaborated on the added value to IHO to liaise with a regional political entity as the EU is.

Mr. Magnus Wallhagen (Sweden) on behalf of the Baltic Sea Bathymetric Database Working Group (BSBDWG) Chair (Mr. Hans Öiås) presented the report on the current status of the BSDB and future plans for the WG. After an intense debate the Commission decided to close down the BSBD database and the service provided via the BSHC website, respectively. A

temporary solution will be available at the BSHC website until September 2024. This de- cision was made under the assumption that the con- tent of the BSBD database has now be- come an inherent part of the EMODNET ba- thymetry services and the duplication of ser- vice through provision of a specific BSHC ser- vice would no longer be re- quired.

Mr. Magnus Wallhagen (Sweden) presented the report on the forthcoming Baltic Sea e-Nav project.

This project includes partner organizations from x BSHC Members and is funded by EU to an amount of five million Euro. The project is aiming to and can be regarded as the most im- portant regional testbed to implement Phase 1 S-100 based data service in support of new S- 100 compliant ECDIS applications. It is ex- pected that the project will gain valuable best practice experiences to be shared with and possibly adopted by other regional approaches within the network of the Regional Hydro- graphic Commissions..

At the end of the meeting Mr Olavi Heinlo (Estonia) was elected as the Chair of the BSHC and Mr Janis Krastins (Latvia) as the Vice-Chair

East Asia Hydrographic Commission (EAHC)

The 9th meeting of the Steering Committee of the East Asia Hydrographic Commission (EAHC) was held was in Yogyakarta, Indone- sia, as a hybrid meeting from 15 to 17 Febru- ary, under the chairmanship of Vice Admiral Nurhidayat, National Hydrographer of Indone- sia. Representatives from Brunei Darussalam, China, Indonesia, Japan, Republic of Korea (RoK), Malaysia, Philippines, Singapore and Thailand were represented at the meeting. Vi- etnam, United Kingdom and United States of America were represented as Observer States. Several industry stakeholders also attended as invited observers. Director Abri Kampfer repre- sented the IHO Secretariat.

Director Kampfer briefed the Commission on current IHO activities and the preparations for the forthcoming third session of the IHO As- sembly. Particular emphasis was placed on the outcomes of the 6th Council meeting noting the focus on S-100 Implementation. Director Kampfer reminded on the adoption by IMO of the new ECDIS Performance Standard which includes S-100. S-100 is now a reality and to deliver on the expectations of the maritime world will have an impact on individual Member States and also on the Regional Hydrographic Commissions. He stressed the requirement to have discussions on the needs of each MS and what can be done in the region to assist those that may need assistance. A plan of action is required to be in a position to provide S-101 ENCs and related S-100 product coverage for the region by 01 January 2026 when the S-100 ECDIS will become legal to be used for primary navigation.

The Member States present delivered their re- spective national reports and addressed the full range of activities covered by the duties of hy- drographic offices in the region. Special em- phasis was given to capacity building and the uptake of S-101 ENC production in the years to come. Discussions for regional coordination for this new production line is underway.

The outcomes of the EAHC Training and Re- search Development Center Board of Directors (TRDC-BOD) meeting that preceded the 9th SC Meeting was discussed. The current TRDC- BOD Chair announced his retirement, and it was agreed for Indonesia to be the new TRDC- BOD Chair. The Outgoing TRDC-BOD Chair advised that the incoming TRDC-BOD Chair, and EAHC Capacity Building Coordinator posi- tion should be handled by different member states. The selection of the new Vice-Chair and coordinator of EAHC Capacity Building will be determined at the next TRDC-BOD meeting. TRDC BOD agreed to deliver S-100 training for the member states to implement S-100. China will conduct a capacity building on Hydrogra- phy for Disaster Mitigation and Humanitarian Support (P-11) during the year with exact dates to be confirmed later.

The meeting considered the report of the Stra- tegic Team Advance Roadmap (STAR) Task Group. This group is tasked to identify strategic

directions for the future targets of EAHC. The STAR coordinator was tasked to reconsider all projects, and working groups under EAHC as to where in the structure the projects and the WG would sit and a working group was established with Japan as lead with Singapore, Malaysia, Indonesia, China, and Thailand participating.

Discussions on a Regional Framework for Disaster Risk Management and Mitigation concluded that it was essential, however, Members noted the need to take into consideration that it may overlap with other agencies' responsibilities. Each member state needs to examine which aspect they can support the framework and report back at the next meeting. Further items of note were the reports reflecting the work of the EAHC subordinate Working Groups, for example in MSDI. The MSDI WG had difficulties to meet in person, but it was confirmed that the next meeting of the MSDI WG will be held in Hanoi, Vietnam,12 - 14 September 2023 Supported by NAVAL COMMAND of Vietnam.

The East Asia Regional Electronic Navigational Charts Coordination Centre (EA-RECC) reported on their activities since the last SC meeting. EA-RECC participated in the 12th WENDWG Meeting in 2022, the 12th HSSC Meeting in 2022 and in the PRIMAR Technical Experts Working Group Meeting in 2022. Capacity building was conducted for new staff and an initial study of conversion of S-57 ENC to S-101 ENC with commercial software and KHOA S-100 Viewer was undertaken. The head of the EA RENC renewed the offer to collaborate with all members of the region in ENC distribution and informed that efforts will be made to establish a Board of Directors and to confirm the financial arrangements.

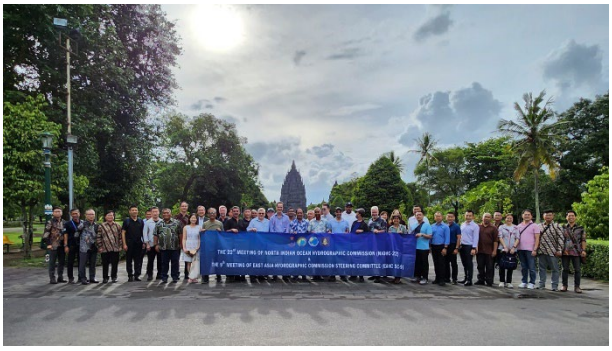
Malaysia reported on the revision of the EAHC Statutes with recommendations to address issues identified with regards to Locality **(**Article I.1 – Sea areas), Nature of the Commission **(**Article I.1 - Technical) Admission of Membership. (Article II.2 – Admission decision), Timeframe of the Next Session Conference. (Article III.2 – Time for informing the Conference) and Unanimity **(**Article VII.1 – Vote for the Conference & Article X.4 – Vote for Statutes Amendments). The member states present agreed to the amendments of the Article I.1 (both region K and keep ocean and seas name), Article II.2, Article III.2. (with the 3 months notification), the recommendation for Article VII.1, Article X.4. The EAHC Secretariat will circulate the amendments to all member states for endorsement. There was no objection from MS to include associate members into EAHC Statutes.

The meeting received a presentation from an industry representative highlighting new technologies. A presentation on the IHO Crowdsourced Bathymetry (CSB) initiative provided feedback on the current status of participation and new developments. The meeting was informed that the DCDB began working on an automated notification and approval system for data collected in the areas of jurisdiction of coastal states that provided positive responses but also requested in their caveats the right to pre-approve the data before it is publicly distributed through the DCDB. The vision here is that the DCDB would provide login credentials to an HO, allowing them to log into the system and accept or reject the public release of data within their waters. The EAHC members were invited to participate in the CSBWG to stay informed of the new technology, the progress of ongoing projects and new projects. Participation will allow for obtaining clarification on concerns about CSB data collection or sharing.

The IHO CSB initiative is also working directly with the Seabed 2030 Project. SB2030 intends to not only accelerate CSB activity around the world, but to also serve as a Trusted Node to help in the setup of data collection and data assembly. A presentation on Seabed 2030 re-enforced this message and the EAHC members were requested to share bathymetry data with Seabed 2030 to complete the GEBCO map. The GEBCO 2022 grid stands at 23.4 % of the world's seafloor mapped.

Participants of the 9th meeting of the Steering Committee of the East Asia Hydrographic Commission (EAHC)

The meeting confirmed that Indonesia and Thailand will occupy the two Council seats allocated to the EAHC for the period 2023 to 2026.



Historic first-time joint excursion for NIOHC and EAHC delegates.

Meso American - Caribbean Sea Hydrographic Commission

The 24th Meeting of the Meso American & Caribbean Sea Hydrographic Commission (MACHC24) was held at the Torarica Resort in Paramaribo, Suriname from 12 to 15 December 2023, with 82 participants, 57 in person and 35 online. 14 Member States, 6 Associate Members, one Observer State, 8 observer organizations and 10 industry members were represented. Director Luigi Sinapi and Assistant Director Leonel Pereira Manteigas represented the IHO Secretariat.

Pre-plenary Working Group meetings took place on 12 December 2023, including MACHC Marine Spatial Data Infrastructure Working Group (MMSDIWG), MACHC Seabed 2030 (SB2030), MACHC Maritime Safety Information Working Group (MSIWG), MACHC Capacity Building Committee (CBC) and MACHC International Coordinating Charting Working Group (MICC).

The Opening Ceremony took place on 12 December afternoon at the Maritime Authority of Suriname. At the ceremony, the Director of the Maritime authority of Suriname, the Presi-dent of the Maritime Association of Suriname, the MACHC Chair, the IHO Director and the Ministry of Transports Communications and Tourism of Suriname delivered their speech-es, highlighting the importance of MACHC meetings for safety of navigation and the con-servation and sustainable use of the oceans and maritime resources at national, regional and international levels.

The MACHC24 plenary started on 13 December with welcoming remarks from the MACHC Chair RAdm Angus ESSENHIGH (UK), who expressed his gratitude to the host organization, thanked all participants as well as the ones attending by VTC and the representatives of the industry. In line with IHO Resolution 2/1997, the new Statutes of MACHC and the opportunity to annex the list of the ongoing actions to them were discussed.

Participants at Paramaribo (Suriname).

Spain informed the audience about the intention to intensify the cooperation with the Members of the Region, and mentioned the hydrographic courses sponsored by the Spanish Government in favour of the Spanish speaking countries. The Netherlands presented the European Marine Observation and Data Network (EMODnet) project and the plan to extend to the Caribbean area the use of the respective portal containing bathymetric data and metadata. The bathymetry DTM available free of charge and then the collaboration with the IHO DCDB and GEBCO were mentioned.

IALA Membership signing of Dominican Republic, witnessed by IHO Director Luigi Sinapi and RAdm Angus ESSENHIGH (UK) MACHC Chair

The IALA representative presented a video about the history of IALA, with the focus on training and capacity building, providing some examples of collaboration projects with several Coastal States of the Region, describing the IALA Academy founded in 2012, which provides

courses on AtoN and VTS via also distance learning systems.

IHO Director Sinapi provided an overview on the IHO most important activities and challenges, highlighting on the results of the High-Level Technical Visits (HLTVs) to the Dominican Republic and Jamaica. The success of the HLTVs was possible thanks to the outstanding organization provided by the local authorities and the delivery of clear and straightforward messages to local Governments on the importance of Hydrography for the sustainable development of both Countries. The representative of the Dominican Republic and Jamaica enhanced the importance of the HLTVs and informed the MACHC the respective Governments will approve measures to support the respective hydrographic sectors.

HLTVs to Dominican Republic and Jamaica

The Netherlands, as one of the two MACHC members having a seat at the IHO Council, highlighted on the outcomes of the 7th meeting of the Council, with a particular focus on the most important decisions. The USA presented on the revision of the IHO Strategic Plan (SP) and the establishment of a Correspondence Group to prepare the IHO Strategic Plan 2027-2032. The Correspondence Group chaired by the Council Vice-Chair is expected to present to 8th Council in October 2024 a final draft on the process of revision of the IHO SP. It was recommended to the MACHC members to strive for a major involvement in the implementation of the IHO SP.

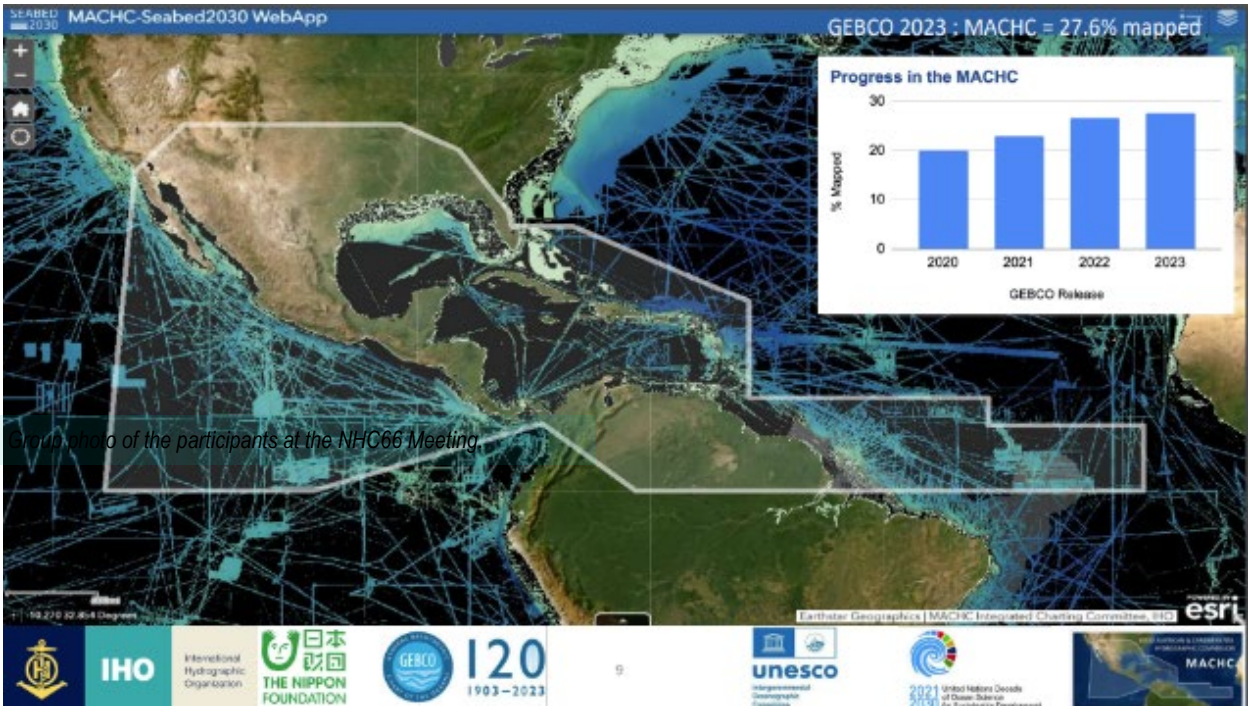
PRIMAR illustrated its ENCs distribution scheme and the Portal with 17 training modules on S-100 and S-101, available for free to all IHO Member States. IC-ENC provided an overview of the respective organization and governance. The validation service and the good cooperation with PRIMAR were highlighted, and the Learning Management System (LMS) established in 2021 for the IC-ENC members was presented.

Due to the large number of Members and Associated Members, the National Reports were presented into three different groups. In the end, each group provided a report on the main topics discussed. The importance of the HLVs and technical visits, the implementation of MSP/MSDI, the need of survey platforms, equipment and training, the importance of the conversion from S-57 to S-101 ENCs and the S-100 roadmap were highlighted as common aspects to the majority of the MACHC members. Venezuela raised the issue related to the restrictions to have access to the software for cartographic production due to the embargo.

The MACHC MSDI Chair reported that the website was updated. The link with EMODnet was described and the intention to continue with the incorporation of the UN-GGIM principles and to have a workshop with the UN-GGIM were presented. Mr Andy Dippolito from USA was elected Chair of the MMSDIWG. The MACHC International Charting Coordination (MICC) Chair reported on the status of the regional ENCs available. INT Chart coverage for the region had no update. The need to nominate an S-100 regional coordinator and create a regional S-100 working group entirely virtual were discussed. It was also remembered that the WENDWG CL01/2023. Finally, it was noted that implementing a scheme for S-100 based products would prevent overlaps. The MSIWG Chair highlighted on the IHO MSI Strategic Performance Indicator - SPI 3.1.1 with a target of 90% of Coastal States capable to provide MSI by 2026 and reported that in 2023 at NAVAREA IV/XI there was an increase in the MSI received to 94%. The CARIBE WAVE system aiming to make 100% of coastal communities at risk of tsunamis prepared and resilient by 2030 was described. Mr. Timothy “Ed” Stacy from USA was elected Chair of MSIWG.

The Capacity Building (CB) Coordinator presented the main achievements of the CBSC21 Intersessional and CBSC21 meetings, enhancing the activities completed by the Empowering Women in Hydrography (EWH) project and the opportunities onboard NOAA ships. Venezuela reported that 40% of the personnel working in Hydrography, Cartography and Aids of Navigation are women. An update on the C-55 Project Team was provided along with the progress made in the IHO e-Learning Center. The CB activities to be proposed for 2025 and the 2024-2026 Workplan were also presented.

makers. The participation of Industry was large and much appreciated by the participants. The representatives of Industry presented on the two recognized programmes S-5B and S-8B, satellite derived bathymetry, transatlantic collaboration to address Hurricane Disaster Risk Management and the Scenarios for Storm Surge Risk Mapping, integration of Satellite and Marine Based Hydrographic Survey methods in the MACHC Region, LiDAR, tools for S-100 migration and production, automated Paper Charts, the latest developments on echosounders and Maritime Technical Services available for the Caribbean region.



Group photo of the participants at the NHC66 Meeting.

Seafloor coverage in the MACHC region.

The Seabed 2030 and CSB Coordinator reported on the importance of Seabed 2030 and the Regional activities, as well as the data types received and the formats for the ingestion into the DCDB. In the Region, the seafloor coverage stands at 27,6%. On CrowdSourced Bathymetry, the Cruisepack was presented as a data packaging and metadata gathering software tool NCEI has developed to simplify data submission preparation for cruise-based data.

The Caribbean Community Climate Change Centre presented on a LiDAR project for climate change adaptation. The Centre obtained a grant from the Caribbean Development Bank (CDB) to survey all 19 borrowing Member Countries. The objective of the project is to contribute to mitigate the effects of climate change providing information to decision

The United Kingdom presented an update on the paper chart production and the IHO ECS Project Team, which was created to identify and prioritize ECS navigation requirements, analyse their impacts on current IHO hydrographic standards and develop a set of recommendations/issues. Some MACHC members expressed concerns of what this will mean in terms of workload for the respective HOs.

Nordic Hydrographic Commission (NHC)

The 66th Meeting of the Northern Hydrographic Commission (NHC66), was held from 21 to 22 March 2023 in Aalborg, Denmark.

The meeting was chaired by Ms Pia Dahl Højgaard, National Hydrographer of Denmark.

P-7

Twelve delegates from five Member States (Denmark, Finland, Iceland, Norway, and Sweden) participated in the meeting. The IHO Secretariat was represented by Secretary-General Dr Mathias Jonas.

Group photo of the participants at the NHC66 Meeting.

The meeting commenced with welcome words by Pia Dahl Højgaard, National Hydrographer of Denmark. The meeting proceeded with the approval of the agenda and the matters arising from the previous NHC65 Meeting and the respective list of actions.

Secretary-General Dr Jonas reported on the general arrangements of the IHO and the preparations of the forthcoming 3rd IHO Assembly affecting the work of the Commission. He reminded on the main goals of the IHO Strategic Plan and S-100 Roadmap, the task to the Member States to proceed with their implementation and the coordinating role of the respective Regional Hydrographic Commission.

Member States provided their detailed national reports. All countries reported on the notable increase in ENC sales. A lively discussion arose about the share of the world fleet of ships on international voyages carrying ECDIS. According to the figures received from RENCs this number accounts for approximately 35000 vessels in comparison to a total number of approximately 120000 vessels from the smallest (< 500 GT) to largest size forming the global fleet. This insight triggered considerations about the ongoing need for provision of paper charts and effective ways to produce them. (< 500 GT) to largest size forming the global fleet. This insight triggered considerations about the ongoing need for provision of paper charts and effective ways to produce them.

All members reported on their respective activities in view of the implementation of the S-100 road map and approved this issue as a future standing NHC Agenda item. Norway highlighted that it has already started with S-102 production, focusing on selected ports and harbours, narrow passages, etc. The production of S-102 has been achieved by utilizing existing production steps, with an additional product output. Production processes for some of the other S-100 products, e.g. S-101, S-104 and

S-131, must be solved utilizing existing production line and toolsets, and possibly optimized, upgraded and improved, but still managed as one production line. This will better utilize and maintain needs, competence, optimize production resource demands and automate the parallel product outputs from the same process. Some S-100 products are new products and will as such require a new process to be established. This includes an efficient and secure data flow from miscellaneous data owners outside the hydrographic domain to products.

In order to coordinate these transition processes regionally, it was agreed to continue with the support of the Nautical Chart Production Experts Group (NCPEG) under revised Terms of Reference that supports the engagement with new standards and the future of paper charts for instance, or matters on compilation of hydrographic and other chart data (bathymetric, terrain, fairways, AtoNs, etc.). The working group is formed by technical experts with marine data and cartographic background. The Commission also confirmed the ongoing existence of the Nautical Survey Experts Group (NSEG) under the Terms of Reference in place with a focus on the automation of post-processing of survey data, mainly data cleaning.

The Commission received reports on recent activities of the relevant IHO subordinate bodies such as WENDWG and GEBCO Guiding Committee. In the GEBCO context, Denmark reported about its national project aiming to establish a Trusted Crowd-Sourced Bathymetry Framework, named GAVIAN.

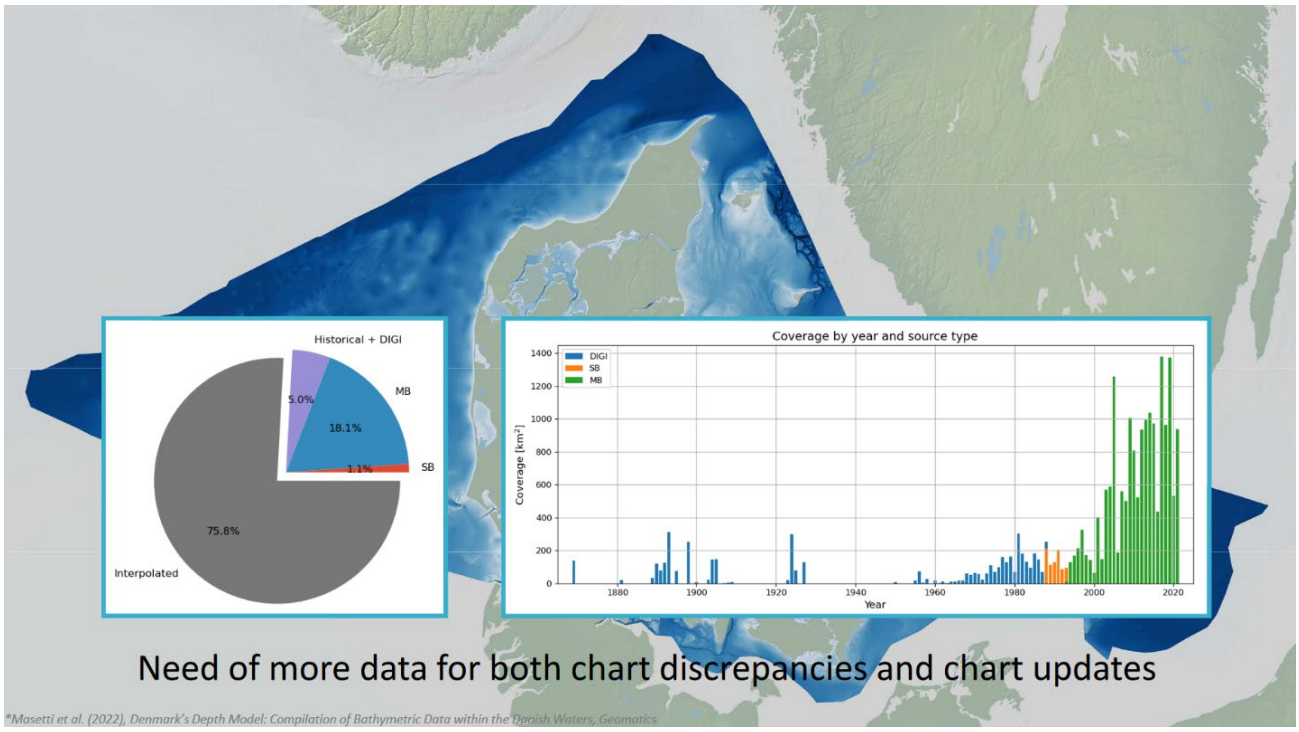


Illustration on the coverage of Danish national waters with single beam, multi beam and interpolated depth information.

At the end of the meeting Magnus Wallhagen (Sweden) took over the role of Chair from Pia Dahl Højgaard (Denmark).

North Indian Ocean Hydrographic Commission

The 22nd Conference of the North Indian Ocean Hydrographic Commission (NIOHC) was held in Yogyakarta, Indonesia, as a hybrid meeting from 13 to 15 February, under the chairmanship of Vice Admiral Nurhidayat, National Hydrographer of Indonesia. NIOHC Member State representatives from Bangladesh, Egypt, India, Indonesia, Myanmar, Pakistan, Saudi Arabia, Sri Lanka, Thailand and the United Kingdom (UK) attended the meeting together with representatives of Associate Members Australia, France, Oman and USA. Several industry stakeholders also attended as invited observers. Director Abri Kampfer represented the IHO Secretariat.

Director Kampfer briefed the Commission on current IHO activities and the preparations for the forthcoming third session of the IHO Assembly. Particular emphasis was placed on the outcomes of the 6th Council meeting noting the focus on S-100 Implementation. Director Kampfer reminded on the adoption by IMO of the new ECDIS Performance Standard which includes S-100. S-100 is now a reality and to deliver on the expectations of the maritime world will have an impact on individual Member States and also on the Regional Hydrographic Commissions. He stressed the need to have discussions on the requirements of each MS and what can be done in the region to assist those that may need assistance. A plan of action is required to be in a position to provide S-101 ENCs and related S-100 product coverage for the region by 01 January 2026 when the S-100 ECDIS will become legal to be used for primary navigation.

The NIOHC received reports from Member States and Associate Member States. The meeting also received reports on progress and issues related to the work of the Marine Spatial Data Infrastructures Working Group, and reports from the NAVAREA VIII and NAVAREA IX coordinators.

IC-ENC reported on the development of Production Support, Validation, Distribution & Revenue Management services for S-101, which includes a conversion readiness service(S-57 to S-101), S-102-Bathymetric Surface Product, S-104-Water Level Information for Surface Navigation, S-111-Surface Currents and S-122-Marine Protected Areas. As part of IC-ENC's S-57 Validation Service, new checks have been added to give advice to Members on action to take in order to make conversion to S-101 more efficient. Value added Resellers (VARs) have been appointed to use ENC data to support the safe navigation of non ECDIS

vessels. This is a new service in which over half of IC-ENC Members participate.

The NIOHC CB Coordinator provided feedback on the outcomes of the 20th CBSC meeting, activities achieved during 2022, activities and opportunities for 2023 and endorsed activities for 2024. The Commission was informed of the *Empowering Women in Hydrography* project and invited to participate. Activities to date included a Webinar held 7 March 2022, Internship at the IHO Secretariat, Monaco (EWH Outreach), 3 internships with the IBSC and three opportunities for at-Sea experience with NOAA. Activities are also underway for the development of a Mentoring scheme.

The INT Chart Coordination Working Group (NICCWG) report was briefly discussed. A presentation from Indonesia on national plans for S-100 implementation generated good discussions on regional coordination and agreement was reached that the ICCWG should widen its scope of activities. S-100 training courses already available should be undertaken and regional focus should be on a first priority to gain experience on conversion from S-57 to S-101.

The meeting received a number of presentations from industry representatives highlighting new technologies. Industry representatives were keen to emphasise their willingness to engage with the NIOHC and its members to assist with the development of hydrographic and cartographic capabilities within the region. A presentation on the use of Satellite Derived Bathymetry (SDB) and achieved accuracies was well received and the potential for wider use in the region was recognized.

Participants of the NIOHC22 Conference.

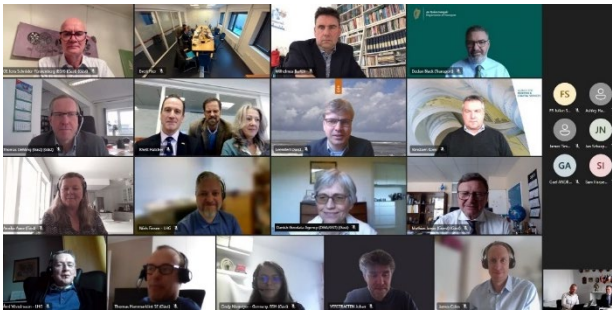
Discussions on considerations for the 7th Council meeting identified S-100 Implementation as the most important topic and acceptance that the outcomes of the third session of the Assembly will provide additional topics for the focus of the Council for the next three years. The meeting confirmed that India will occupy the single Council seat allocated to the NIOHC for the period 2023 to 2026.

It was further agreed that Thailand, the current Vice-Chair of the NIOHC, will assume the Chair of the NIOHC within the next four months in accordance with the Statutes of the Commission. Bangladesh was nominated as Vice-Chair.

North Sea Hydrographic Commission (NSHC)

The 36th Meeting of the North Sea Hydrographic Commission (NSHC36), was held from 29 to 30 March 2023 as VTC. The virtual format was in application of the decision made at NSHC34 to oscillate between virtual and in person meetings.

The meeting was chaired by Mr Magnus Wallhagen, National Hydrographer of Sweden. Thirty delegates from ten Member States (Belgium, Denmark, France, Germany, Iceland, Ireland, Netherland, Norway, Sweden, and United Kingdom) participated in the meeting. The IHO Secretariat was represented by Secretary-General Dr Mathias Jonas.



Some the participants at the NSHC36 Meeting.

The meeting commenced with welcome words by Mr Magnus Wallhagen, National Hydrographer of Sweden and NSHC Chair. He pointed out that since last year's Conference, in particular work around S-100 had progressed at the IHO and at the national Hydrographic Offices. This provided the NSHC with a good starting point for implementing the new products in the North Sea area. Regional coordination of S-100 implementation is therefore an important agenda item for the Commission. Another important action was to revise the NSHC statutes in order to incorporate adjustments necessary due to the applying IHO Resolution. The meeting proceeded with the approval of the agenda which has been ordered according to the IHO work programme structure and the matters

arising from the previous NSHC35 Meeting and the respective list of actions.

Secretary-General Mathias Jonas reported on the general arrangements of the IHO and the preparations of the forthcoming 3rd IHO Assembly affecting the work of the Commission. He reminded on the main goals of the IHO Strategic Plan and S-100 Roadmap, the task to the Member States to proceed with their implementation and the coordinating role of the respective Regional Hydrographic Commission.

The HSSC Chair, *Mr Magnus Wallhagen* (SE), presented the progress in the HSSC working groups, also as an introduction to the next agenda item, which dealt with S-100 implementation within the NSHC. Related to S-100, the HSSC Chair stressed the importance of IHO's implementation commitment towards IMO, leading to the HSSC and Council recommendation that S-100 implementation should be assigned the highest priority in the 2023–2026 Work Programme. This requires Member States to achieve substantial coverage with S-101 ENCs by 2026.

Mr Koen Vanstaen (BE), presented the results of the S-100 questionnaire survey, as well as recommendations for S-100 implementation coordination within the NSHC. *Mr Vanstaen* pointed out that especially the second recommendation, on timing, needed further discussion.

The Commission's Member States shared the common opinion that a coordinated implementation of S-100 would yield the highest added value for the end users, and thereby will strongly contribute to market adoption of S-100 within the shipping industry. The Secretary General pointed out that even if there will be few S-100 compatible ECDIS installed in 2026, stimulating the industry to invest into S-100 equipment needs to be "fuelled" by data with good coverage and added value.

The Commission by-and-large acknowledged the concrete recommendations from Belgium as how to distribute the responsibility for S-100 implementation coordination among the existing NSHC working groups. However, coordination of S-128 was not considered to be as relevant and will mostly be carried out by the RENCs. The Commission also identified the potential problem in several countries that Navigational Warnings are not under the responsibility of the national Hydrographic Office, which may complicate S-124 implementation coordination.

With regard to the timeline of S-100 implementation, as well as planned product coverage, the Commission concluded that both aspects should be dealt with so that added value for the end users is maximised as early as possible, e.g. by focusing on the most important geographic coverage in terms of vessel navigation and a synchronized launch of different products in the same region as a complete S-100 stack of interoperable services.

The Commission also acknowledged that S-100 coordination is a new task and may require different skills and competence from the Member State representatives in the involved working groups. Based on these discussions, the Commission agreed to task the NSICCWG with overall S-100 implementation coordination in general, including the critical standards framework as applicable, as well as S-101 and S-102 implementation coordination specifically.

The Commission received reports on recent activities of the relevant NSHC subordinate bodies such as the Resurvey Working Group, Tidal Working Group, the North Sea MSI Working Group, North Sea INT Chart Coordination Working Group and the Baltic Sea North Sea Marine Spatial Data Infrastructure Working Group. For the latter one conclusion, expressed by several Member States, was that the relevance of MSDI for Hydrographic Offices has diminished significantly since the group was established many years ago. At that time, many Hydrographic Offices did not naturally consider spatial data, MSDI and data use beyond navigation – such as for Marine Spatial Planning, but this has been changed with the S-100 paradigm shift. Furthermore, structures for dealing with these questions nationally and internationally have been established, for example with the implementation of the EU INSPIRE Directive. That paradigm shift was partly enabled by the MSDI working groups. Now, regional S-100 coordination can fill much of the remaining regional aspects of these groups' previous role and the limited resources should be focused on where they produce the greatest benefits.

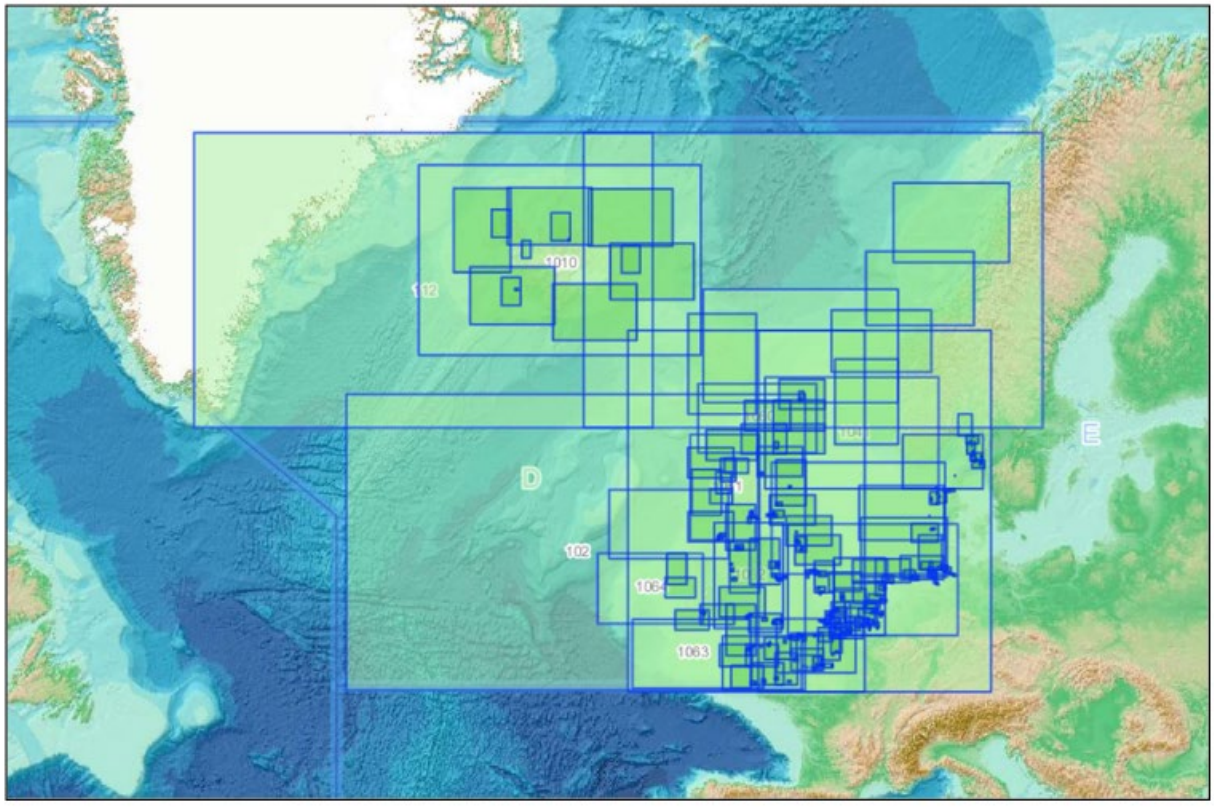
On the other side, the concern was raised that while the IHO-EU Networking Working Group (IENWG) can address policy questions related to MSDI, a forum for exchanging operative views on e.g. INSPIRE and EMODnet is also

needed. Consequently, maybe the BS-NSMSDIWG could be developed into a truly European MSDI working group.

The Chair concluded that this discussion could not have been prepared before the meeting and suggested to make the BS-NSMSDIWG dormant during the coming year, in order to take a final decision on either starting up again or finally close the group at the next Conference.

matrix to the WENDWG in the future on behalf of the NSHC, and whether this should be dealt with by the NSICCWG (tasked with overall regional S-100 coordination) or the WENDWG Representative. The conclusion was that WENDWG Representative to continue submitting the IGIF matrix for NSHC to WENDWG.

The Commission finalized the Conference with the pending discussion of the revision of the statutes. Amendments to the NSHC Statutes



REGION D INT CHART PANELS BY USAGE

Overview	17	General	12
Coastal	63 (including plans)	Approach	70 (including plans)
Harbour	239 (including plans)	Berthing	17 (including plans)
Total	**418 (including plans)**		

Illustration on the regional coverage with INT charts.

Member States provided detailed reports on national initiatives which are of potential interest for the region such as France´s national digital platform for nautical information using S-124, a project to modernize nautical charting based on a unified cartographic source and UK´s views on the Future of Digital Charting.

The Commission received reports on recent activities of the relevant IHO subordinate bodies such as WENDWG and GEBCO Guiding Committee. The Commission discussed the responsibility for the submission of the IGIF

had been proposed by the Chair (SE) and the Vice Chair (UK). The Chair explained the proposed changes, which are partly based on structural changes within the IHO, decided at the 2nd Assembly, since the last amendment in 2016. Furthermore, the draft also implements a gender-neutral language, changes to how NSHC Conferences shall be organised, and minor editorial revisions. The Commission discussed the topic and generally appreciated the revisions. Some Member States noted remaining minor editorial issues and proposed another review and approval process by correspondence,

followed by a formal signing procedure at the next Conference.

Southern Africa and Islands Hydrographic Commission (SAIHC)

The19th Meeting of the Southern African and Islands Hydrographic Committee (SAIHC19) was held from 29 to 31 August 2023 in Mauritius as a hybrid event and seminar on awareness of hydrography was held on 28th August 2023 prior to the SAIHC19 plenary meeting.

The meeting was chaired by Peter Sparkes, National Hydrographer of the UK. A total of 67 participants from eleven IHO Member States (Angola, France, India, Kenya, Mauritius, Mozambique, Norway, Portugal, South Africa, United Kingdom and United States), NGIO and industry experts attended the meeting. The IHO Secretariat was represented by Assistant Director Yong BAEK.

The meeting was opened by Mr Mohammad Salim Ferhat Joomun, Senior Chief Executive of the Ministry of Housing and Land Use Planning, Republic of Mauritius. Commander Ankush Sachdeva, Officer-in-Charge of Mauritius Hydrographic Service, extended a warm welcome to all participants and expressed gratitude to the attendees for their significant presence. He underscored the importance of a conference such as SAIHC as an opportune moment for the region to reestablish connections and engage in discussions on the topics of mutual interest, with the aim of working together to achieve common goals.

SAIHC, as one of the Regional Hydrographic Commissions, plays an important role in implementing the International Hydrographic Organization's (IHO) work programme and strategic plans in the Western Indian Ocean Region. The aim of SAIHC is to assess and assist in sustainable development of the Member States of the region towards coordinated hydrographic activities, meet the objectives of IHO, address the obligations under Safety of Life at Sea, United Nations Conventions on laws of the Sea and focus on capacity building. IHO Assistant Director Yong BAEK welcomed all attendees at the conference. He emphasized the critical significance of the capacity building in ensuring the achievement of our goals and also provided insights into the digital trends that the IHO community should be prepared for, along with the challenges that the Regional Hydrographic Commission should prioritize in the coming years.

Opening remarks at the SAIHC19 Meeting.

The Commission discussed the progress of SAIHC statutes review, noting that the 2022 version of the statutes had been circulated on 21 June 2023, to allow members to provide comments or propose amendments. Since no comments or suggestions were received from members, the 2022 version of SAIHC statutes was approved during the meeting.

Assistant Director Yong BAEK provided an overview of the IHO report, which encompassed the Assembly 3 report held in Monaco from the 2nd to the 5th May 2023. The key highlights from the IHO report include:

IHO Work Programme and Budget for 2023 approved and the three-year Work Programme and Budget 2024-2026 endorsed :

- New ECDIS performance standards introducing S-100 approved by IMO
- New IHO Resolution on S-100
- Dual Fuel Concept for S-100 ECDIS
- IHO 3rd Assembly Decisions
- Status of P-5 and C-55 on SAIHC region.

Group photo at the SAIHC19 Meeting.

The Commission addressed the challenges and preparations related to S-100 products, with a particular focus on the S-100 implementation roadmap. The UK expressed that they are aiming to generate full S-100 capability by 2026, however they realize this will be a challenge. France emphasized its commitment to prioritize the production of S-100 products, with a particular emphasis on S-124. It was agreed that the UK and France would collaborate to create a table detailing the data sets being produced by Member States.

Member States submitted comprehensive reports on their national activities, including updates on INT charts and ENC productions, capacity building programmes, and preparation of S-100 since the last SAIHC18 meeting. Furthermore, during the presentation of the regional MSDIWG the responsibility of developing Terms of Reference (TOR), with due consideration for gender-inclusive language and support for S-100.

Commander Theunissen, South Africa introduced the SAIHC Disaster Response Framework, which was developed during the SAIHC18 meeting. He requested members to review the framework and asked all MSs to provide their contact details. The Commission agreed to establish a SAIHC social media aimed at facilitating smoother communication and information sharing among members, including the hydrographic society.

The meeting elected Rear Admiral Angus Essenhigh (UK) as the Chair and Mr. Mohummad Shamad Ayoob Saab (Mauritius) as the Vice Chair.

South-East Pacific Regional Hydrographic Commission (SEPRHC)

The 15th meeting of the South-East Pacific Regional Hydrographic Commission (SEPRHC15) was held in Valparaiso, Chile, from 27 to 29 November 2023, hosted by the *Servicio Hidrografico y Oceanografico de la Armada* (SHOA) of Chile. The meeting was chaired by Rear Admiral Arturo Oxley Lizana (Chile) Director of SHOA, and attended by 18 registered participants. All IHO Member States of the Commission (Chile, Colombia, Ecuador and Peru) were represented, as well as the Observer State, Spain. The meeting was also attended by the Vice Chair of the IHO Capacity Building Sub-Committee (CBSC), representatives of the Industry (Teledyne Caris) and NIWA for the aspects related to the Nippon Foundation GEBCO-Seabed2030 project. The IHO Secretariat was represented by Director Luigi Sinapi.

Participants at SEPRHC15.

Buque Rompehielo "Almirante Viel" - Chile and Buque ARC "Simon Bolivar" – Colombia.

The SEPRHC15 meeting was preceded by an Icebreaker offered by SHOA in its facilities. The SEPRHC15 meeting was opened by the Chair, Rear Admiral Arturo Oxley Lizana (Chile), who welcomed the participants, thanked Peru for its period of chairmanship from 2020 to 2023, recalled that the difficulties linked to the COVID-19 pandemic are now behind us, as well as that the coordination and leadership of the Hydrographic Offices allow the SEPRHC members to face and brilliantly overcome in the South-East Pacific Region, the challenges linked to the implementation of the new standard S-100 and the development of related products. The transferring Chair - Rear Admiral Carlos Guerrero Malpartida (Peru) took stock of the situation of the last three years of the Peruvian chairmanship, recalling that the implementation of the S-100 represents the priority in the region. After that, the handover took place - in the presence of the Director of the IHO - between the transferring Chair - Rear Admiral Carlos Guerrero Malpartida (Peru) and the accepting Chair - Rear Admiral Arturo Oxley Lizana (Chile).

The IHO Director highlighted the decisions of the 3rd Session of the IHO Assembly and the 7th meeting of the IHO Council of greatest interest for the region and the actions requested from the SEPRHC in the immediate future, with particular attention to the appointment of key figures within the Regional Hydrographic Commissions, including the representative at the WENDWG, the S-100 Regional Coordinator, the regional coordinator for aspects related to CrowdSourced Bathymetry, GEBCO and Seabed 2030, the active participation at the *Project Team on Fund Generation of IHO Project Initiatives* under the IRCC, as well as the importance of regional coordination within the MSDI for the implementation of the UNGGIM principles regarding the management of geospatial data.

The national reports highlighted some specific aspects of the SEPRHC, including a state-of-the-art polar hydro-oceanographic capability, thanks to a substantial renewal of the hydro-oceanographic fleet in the SEPRHC countries, a unique warning capability for Tsunami and response to extreme events such as tsunamis and earthquakes, which is expressed through products (e.g. tsunami inundation maps) and services for the population and cooperation within the region, characterized by a wave and tide gauge network present along the entire Central and South American Pacific coast, as well as the presence of nationwide maritime geospatial data infrastructures. Finally, a visit was organised to the SHOA operations room, connected to Chile's SNAM (Sistema Nacional de Alarma Maremotos).

The CBSC Vice Chair gave a presentation on the IHO's Capacity Building programme and new initiatives underway at the international level, such as the new IHO e-Learning Centre installed at the KHOA, the Empowering Women in Hydrography (EWH) project, and the A-3 and C-7 decisions on Capacity Building. SEPRHC's Regional Capacity Building

Coordinator outlined the Region's three-year plan, pointing out that for the next few years until the S-100 comes into effect, the required activities will focus on training for S-101 and S-102. Finally, the Chair of the SEPRHC made a proposal on behalf of the Region - to be formalized through a Circular Letter for the approval of the four Member States - to support the IHO Capacity Building Programme, both regionally and internationally, through an increase in the cost of a single ENC cell and the sharing of the increased revenue from the sale of ENCs between the Region (SEPRHC) and the IHO Capacity Building Programme in favour of all IHO Member States, according to percentages to be established. This initiative will also be brought to the attention of the Region's Member RENC (IC-ENC) for consideration by the IC-ENC Steering Committee.

Expedition in international waters proposed by Colombia to contribute to the GEBCO and Seabed2030 programme on behalf of SEPRHC

Following the decisions resulting from the last HSSC, IRCC, Council and Assembly meetings, SEPRHC decided to appoint Ecuador as the Region's representative to the WENDWG and to provide a response to *WENDWG CL 01/2023 - Readiness Status of RHCs for the provision of S-1xx datasets by 2026 per Charting Region*. SEPRHC also appointed Peru as Regional S-100 Coordinator, in line with the WEND100 principles. Chile, in its capacity as SEPRHC Chair, was appointed as the CSB/GEBCO/Seabed2030 Regional Coordinator, and finally, at the proposal of Colombia, it was approved to contribute - on behalf of SEPRHC - to the GEBCO programme and the Nippon Foundation GEBCO-Seabed2030 project through an expedition with the Colombian polar vessel ARC *Simon Bolivar* in international waters of the Pacific along the entire South American coast to Antarctica, sending data to the DCDB. A presentation by NIWA's representative on GEBCO, Seabed2030 and Crowdsourced Bathymetry, as well as by the representative of Teledyne Caris on the latest developments in tools and software for the migration to the S-100 standard, completed the SEPRHC15 meeting. Finally, the SEPRHC approved the new Statutes in line with IHO Resolution 2/1997, deciding to reduce the period of meetings from three years to eighteen months.

South-West Atlantic Hydrographic Commission (SWAtHC)

The 17th meeting of the South-West Atlantic Hydrographic Commission (SWAtHC-17) was held in virtual format from 14 to 15 March 2023. The meeting was chaired by Commodore Valentín Alejandro Sanz Rodriguez (Argentina) and attended by 39 registered participants. All IHO Member States of the Commission (Argentina, Brazil and Uruguay) were represented, as well as the Associate Member State, Paraguay and the Observer State, Bolivia. In addition, Spain and Portugal participated at the meeting as invited States. The IHO Secretariat was represented by Director Luigi Sinapi and Assistant Director Leonel Manteigas.

Some participants at SWAtHC17.

The SWAtHC-17 meeting was opened by the Chair, Commodore Valentín Alejandro Sanz Rodriguez (Argentina), who welcomed the participants, highlighting the good participation from all the States of the SWAtHC (Members, Associate and Observer) and the invited States (Spain and Portugal).

IHO Director Luigi Sinapi expressed his gratitude to Argentina for chairing the meeting, mentioning that the SWAtHC-17 meeting represents a unique opportunity before the all-important appointment of the 3rd Session of the IHO Assembly planned in May 2023.

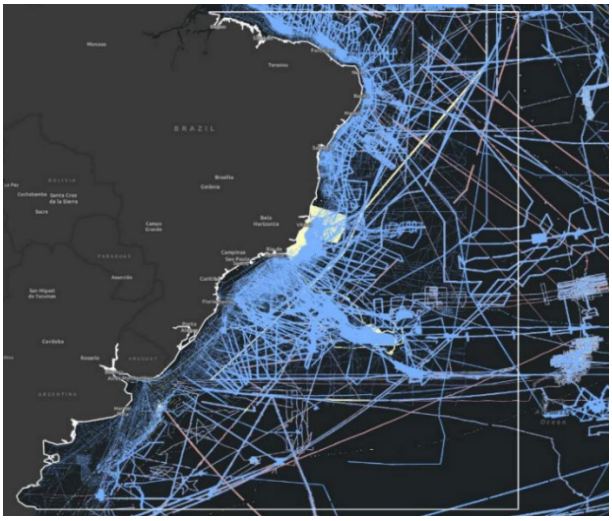
The results of the meeting could serve the SWAtHC's Chair to refine and better calibrate positions of the Regional Commission to be brought to the Assembly, as an example of strong internal cohesion and joint vision on very important issues, first and foremost the S-100 Implementation Roadmap. Director Sinapi

provided also the IHO Secretariat Report, mentioning the most important achievements in IHO outreach, the new IHO projects and how the preparations of the 3rd Session of the IHO Assembly are proceeding. With reference to the Assembly, the Commission will soon formalize Brazil as its representative to the next IHO Council 2023-2025, in accordance with the IHO CL 43Rev1/2022.

The meeting proceeded with the update on the outcomes of the 6th Council, the Capacity Building activities carried out and planned in the Regional Commission and the last meeting of WWNWS subcommittee. With reference to Capacity Building, the focus was on the planning for the years 2023 and 2024 and the results of the activities conducted in 2022, with particular reference to the high-level visit and the technical visit to Bolivia, carried out respectively by the IHO Secretariat and the SWAtHC Chair. From the visits, the Plurinational State of Bolivia confirmed that it has a well-developed Hydrographic Service ready to officially join the IHO. In this regard, Bolivia's representative confirmed that it has initiated all internal steps for formal membership of the IHO. With reference to the WWNWS, the Chair of the SWAtHC expressed the Commission's reservations about the mandatory use of the new satellite communication system recognised by IMO for the provision of GMDSS services, highlighting not only problems related to the costs of the new system, but also to possible errors in the transmission of MSI information.

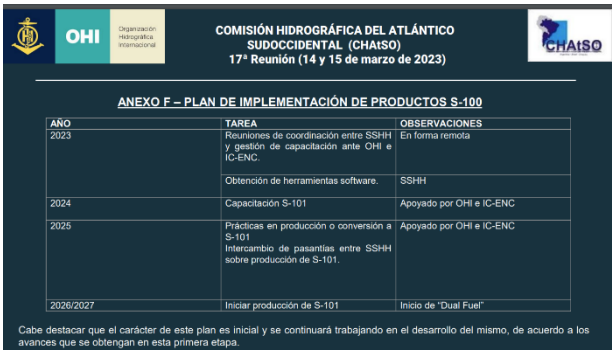
The national Reports of the five SWAtHC States present (Brazil, Argentina, Uruguay, Paraguay and Bolivia) and the invited States (Spain and Portugal), highlighted the excellent collaboration and mutual support in the hydrographic and cartographic sectors within the Region, the very high level of attention to South America's inland waters and the necessary lines of communication required to improve the ports and their operation.

During the meeting an update on the activities of GEBCO, Crowd Source Bathymetry (CSB) and Seabed2030 was provided by the CSB/GEBCO/Seabed2030 Regional coordinator, highlighting that the coastal States of the Region actively contribute to the GEBCO programme, through the regular submission of existing bathymetric data in national databases and new data from hydrographic campaigns.



SWAtHC's GEBCO 2022 plus newly contributed data.

Following the recommendations of the Worldwide ENC Database Working Group (WENDWG), the Planning Committee of SWAtHC (a Committee established during the second meeting of the Commission in 2008 and composed of one representative of each SWAtHC Member's Hydrographic Office) assumed the role of S-1xx Coordinator and will report to the next WENDWG about the implementation of S-100 Products implementation Roadmap at regional level. The need to generate a regional implementation plan for the S-100 products was raised with the premise of RHC's members giving support to each other. The Committee developed a questionnaire to assess the main strengths and weaknesses of the HOs, in order to develop the respective national implementation plan. The questionnaire was based on three main axis: existence of implementation plans at the HO's level, technological needs and training needs. According to the answers provided by the HOs, it was concluded that none of the SWAtHC's HOs have an agency-wide implementation plan for S100 products, 66% of the HOs will start working with S-102 in the short term, 66% of the HOs have already tested the transformation from S-57 to S-101 products, and 100% of the HOs estimate the probable year of implementation of S-101 (generate S-57 and S-101 products) from 2026/2027, considering that one of the main obstacles is not having specialised personnel. In order to find solutions to the latter, an initial regional Implementation Plan was approved by the Commission to start production of the S-101 in the period 2026/2027.



COMISIÓN HIDROGRÁFICA DEL ATLÁNTICO SUDOCCIDENTAL (CHAtSO)
17ª Reunión (14 y 15 de marzo de 2023)

ANEXO F – PLAN DE IMPLEMENTACIÓN DE PRODUCTOS S-100

AÑO	TAREA	OBSERVACIONES
2023	Reuniones de coordinación entre SSHH y gestión de capacitación ante OHI e IC-ENC.	En forma remota
	Obtención de herramientas software.	SSHH
2024	Capacitación S-101	Apoyado por OHI e IC-ENC
2025	Prácticas en producción o conversión a S-101 Intercambio de pasantías entre SSHH sobre producción de S-101.	Apoyado por OHI e IC-ENC
2026/2027	Iniciar producción de S-101	Inicio de "Dual Fuel"

Cabe destacar que el carácter de este plan es inicial y se continuará trabajando en el desarrollo del mismo, de acuerdo a los avances que se obtengan en esta primera etapa.

Initial regional S-100 implementation plan.

The Commission agreed that Brazil will assume the chair of the SWAtHC at the end of April 2023, in accordance with the Commission's statutes.

South West Pacific Hydrographic Commission

The 20th meeting of the South West Pacific Hydrographic Commission (SWPHC), was held in Wellington, New Zealand, from 23 to 25 February 2023. The Meeting was attended by 77 participants. Representatives from Australia, Fiji, France, New Zealand, Papua New Guinea, Samoa, Solomon Islands, Tonga, United Kingdom and United States attended the meeting. Cook Islands, Kiribati Marshall Islands, Niue, Palau and Tuvalu were represented as Associate Members. Several observer organizations and industry delegates were also present. Assistant Director Leonel Manteigas represented the IHO Secretariat. The Meeting was preceded by a one-day VTC pre-meeting and a two-day Workshop on Hydrographic Governance.

Participants in the 20th SWPHC Meeting.

The pre-Meeting: on the 14 February 2023 was opened by the SWPHC Chair Mr Adam Greenland (New Zealand) with a "Te reo Māori" (formal greeting). IHO Director Abri Kampfer and Assistant Director (AD) Leonel Manteigas represented the IHO Secretariat. The pre-Meeting received several presentations in anticipation of the 20th SWPHC meeting, starting with an overview and examples of cyber risks in the maritime domain by Lt Cdr Nelson McMillan (UK).

Ms Kathrine Kelm from the World Bank (WB) presented on building partnerships and understanding how the World Bank works. Mr Andy Coote of ConsultingWhere spoke about the UNGGIM Integrated Geospatial Information Framework (IGIF-H) use case from the Philippines with integrated land and marine management. Dr John Nyberg (US) spoke on the supplement to the IGIF, the IGIF-Hydro, to be endorsed later in the year.

Mr Julien Simon (FR) presented a summary of the IHO Strategic Plan SPI's allocated to HSSC, the progress of the development of S-100 components and gave an overview of the objectives and work of the European Network led by the IHO/EU cooperation. Mr Greenland (NZ) presented a summary of the IRCC14 meeting and the workshop on the Strategic Plan. He also shared the SWPHC paper on raising awareness of hydrography and open data, submitted to IRCC14.

Mr Leonel Manteigas (IHO) presented the Universal Hydrographic Data Model S-100: Benefits of the S-100 Related Products. Mr Stuart Shepard (NAVAREA X Coordinator) and Mr David Wilson presented (NAVAREA XIV coordinator) presented the respective reports on GDMSS, MSI and NAVAREA Coordination. Mrs Hilary Thompson (AU), Chair of the SWPHC Work Plan & Priorities WG presented an overview of the activities to empower women in hydrography in the South-West Pacific, including the Women in Hydrography Network.

Mr Nicolas Pion (PG) presented an overview of the Hydrographic Leaders Programme and what the session on Challenges Faced by Pacific Island Nations on the meeting agenda will entail. Mrs Hilary Thompson (AU) gave an overview of the Pacific Regional Maritime Transport Officials meeting held in November 2022, where a paper on the IHO Strategic Plan and the SWPHC Work Plan was presented. Mr Stuart Caie (NZ) presented on behalf of the SWPHC CB Coordinator an overview of the gap analysis requested and on the intent of the planned CB workshop.

The Meeting was opened on 22 February by the SWPHC Chair, Mr Adam Greenland (LINZ) who welcomed participants to this first in-

person meeting for three years and reminded participants to invest in the meeting to make it count for their region. The Minister for Land Information, Hon Damien O'Connor, addressed the Commission via video address, congratulating the commission and encouraging collaboration and partnerships for the lasting benefits of the region. Mr Leonel Manteigas (IHO Secretariat) thanked the dignitaries and extended his personal greetings and those of the IHO Secretariat to those attending the SWPHC meeting and encouraged the commission to take note of key activities of regional and international significance to the hydrographic and maritime community, such as the implementation of S-100 Roadmap; the IHO renewed commitment to the UN Decade of Oceans; the hydrographic Capacity Building programme and the IHO/Nippon Foundation Seabed 2030 project. He closed by wishing all participants a successful and fruitful meeting, in anticipation of the 3rd IHO Assembly in May 2023. The meeting proceeded with the matters arising from the previous SWPHC19 Meeting and the respective list of actions.

IHO AD Leonel Manteigas provided an overview of the SWPHC membership, reported on the outcomes of the 6th Meeting of the Council and the recommendations that the SWPHC support the IRCC in identifying measures and values to measure those SPIs of regional interest allocated to IRCC. He reported on the preparation for the 3rd IHO Assembly and encouraged recent Member states to present their flag, informing that the Assembly is in-person only and Member states are encouraged to register on-line. Following further discussion, a decision was made to support a representation to the IHO to allow on-line participation to enable a more inclusive and broader participation.

The States presented their respective National Reports with the presentations focused on the main achievements since the last meeting, the main challenges and/or obstructions and any other matters of interest. From the National reports it was possible to notice the difference among the Members of the region with regards to the respective hydrographic capacities.

Mr Salesh Kumar gave an overview of SPC (Pacific Community) and the respective activities, including the Maritime Integrated Programme, focusing on the Pacific Safety of Navigation project which supports governance, capacity building and infrastructure throughout the region. He reported on the LiDAR capture in Tonga and Vanuatu, a Pacific Data Hub and tides mobile app and training in tides among others. IALA (Mr Omar Frits Eriksson) summarized the respective work, promoted membership and encourage locally produced aids to navigation to use their standards. He invited the coastal states to engage with IALA to help meeting international obligations for maritime safety, including receiving education. The IMO representative, Mr Bekir Sitki Ustaoglu, noted that both IMO and the SWPHC are strongly engaged in delivering a programme of technical assistance to support developing countries to strengthen the institutional, legal, managerial and technical capacity to meet their international obligations. IMO is establishing a Regional Presence Office (RPO) in Fiji and he highlighted the implementation of the IMO's Capacity Building Decade, particularly for Small Island Developing States.

The meeting reviewed the SWPHC Work Plan & Priorities with the respective Working Group Chairs informing on the activities achieved during this first year of the 3-year plan. Of note is achieving the target of two seats on the IHO Council; the successful delivery of the Hydrographic Leaders Program; the presentation on cyber security delivered during the 1-day VTC Pre-Meeting; the sharing of S-100 experiences through two workshops; the development of a data value proposition and the delivery of a Seabed 2030 webinar series.

The meeting received an introduction to the Hydrographic Leaders Programme (HLP) session, its objectives, the breadth of the program, the participants and the topic for discussion, "Challenges Faced by Island Nations". Then the meeting divided into groups to discuss questions posed by the Hydrographic Leaders Programme cohort. On the Empowering Women in Hydrography (EWH) project Mrs Thompson provided an overview and introduced the SWPHC Empowering Woman in Hydrography Pacific Network with 55 women. The network has met twice online and was starting to connect with others and has identified what they want from the network and what they can give.

The session "Safety of Navigation: Delivering as one" that presented on the collaborative networks was chaired by Leonel Manteigas (IHO). The CB International Partners comprise joint meetings of IHO, IMO, WMO, IOC, IALA, IAEA, FIG and IMPA which have been disrupted by COVID over the past two years. He invited Mrs

Thompson (AU) to provide an overview of the Pacific Regional Transport Officials Meeting held in November 2022 and papers presented and also invited Mr Ustaoglu (IMO) to comment on the collaborative work of the IMO. He noted the challenges with working together due to COVID and re-iterated the IMO's commitment to collaborating with the IHO and other CB International Partners on capacity building activities in the region. Mr Manteigas finished his presentation with a request to the Commission to consider how the IHO, IMO and IALA can support the region and the Member states, recognising the issues and challenges faced, such as climate change and sea-level rise.

Following the overview of IGIF at the Pre-Meeting, Ms Kathrine Kelm (World Bank) presented on 'Building Partnerships: Understanding the World Bank' and informed that the World Bank has developed templates and tools to assist countries implementing the IGIF. These are open and available on the World Bank Open Learning Campus website. Mr Andrew Coote presented on a case study from the Philippines and the integration of land and marine management. Mr Tion Uriam (KI) presented on Kiribati's experience with implementing the IGIF, investigating how hydrography would support their government's strategic plan and vision across other sectors besides the ocean.

GEBCO Programme overview of the collaborative nature and its community makeup was given by Mr Sam Harper (GEBCO Secretary). Ms Belen Jimenez (SaWPaC Data Manager) presented an overview of Seabed 2030 and the SaWPaC region. Globally, coverage is currently 24.5%, with the SaWPaC region at 25.6% and 15% for the SWPHC region. Ms Jimenez encouraged the Coastal states of the Commission to support Seabed 2030 by providing data and reminded the meeting of the importance of using data loggers for crowdsourced bathymetry. Ms Jennifer Jencks (IHO DCDB Director and Chair of CSBWG) provided an update on activities, including how to contribute data and how to access the viewer for data that the Centre holds. Mr Hayes Moses (PW) provided an overview of Palau's experience with installing data loggers, provided by Seabed 2030. Of the 100 loggers provided, approximately 50 were installed with the support of NGA before Covid-19 restrictions started.

Industry / Expert Contributors presentations were received from EOMAP, Woolpert/AAM, Fugro, IIC Technologies, Ocean Infinity, JICA and P&O Cruises.

Mr Robert Cario (AU), Chair of SWPHC International Charting Coordination Working Group (ICCWG), gave an overview of the progress of the WG and informed that SWPHC will extend the role of the Charting Regional Coordinator for the implementation of the S-100 Implementation Roadmap. Two S-100 Workshops were held to coordinate the efforts on the implementation of S-100, promote the cooperation and exchange of experiences and identify CB requirements. New INT charts and ENCs have been published by SHOM and Australia. Australia have withdrawn 13 charts of the 1.5 million scale series and New Zealand has made a submission to withdraw four 1.5 million scale charts this year.

SWPHC MSDIWG Chair Ms Helen Phillips (UK) gave an update on the progress of the WG, informing that there has been increased participation, more regular meetings and workshops. Work was undertaken to align the MSDIWG work with the SWPHC Work Plan on open data policies and make presentations on promoting open data. The WG created a data sharing value proposition, "Why should we share data?", which aligns to the UN Sustainable Development Goals and would support conversations with Ministers and Governments.

The meeting discussed the National Impacts of S-100 with Mr John Lowell (US) reminding that the obligation to SOLAS is to arrange for the collection of hydrographic data; nations do not need to do everything themselves since SOLAS is flexible on how nations fulfil their responsibilities. Whatever the S-100 Product Specification, Governance is key in producing the product or arranging for it to be produced. Regional Hydrographic Commissions can help but nations need to understand their view of geospatial data, establish a data policy as needed, know the data providers, establish a National Coordination Committee and coordinate work with the Primary Charting Authority when applicable.

The report from a 2-Day Capacity Building (CB) workshop on Hydrographic Governance was provided by Mr Matt Borbash (US), SWPHC CB Coordinator, with an overview of activities undertaken. Over 30 participants took part in the workshop focusing on three goals, National Interest and Prioritisation of Hydrography, National Institutional Arrangement for Hydrography

and External Coordination and Partnership on Hydrography. The Chair thanked the IHO and Australia for funding delegates to attend the CB workshop, which also enables participation in the Commission meeting. This model works very well and it is wished to see it continue. An overview of the CBSC20 and the VTC intersessional meeting outcomes and approved the 3-year CB work plan were also provided.

During the discussion on the Work Plan & Priorities for 2023-2026 it was asked whether there is a desire to run the Hydrographic Leaders Programme again. Mr Manteigas (IHO Secretariat) asked whether the Programme could be shared outside the region and there was general agreement for that to happen. The UK mentioned there was positive interest from other RHCs and recommended it in other RHC that the UK are involved. New Zealand confirmed that there has been a lot of interest for a Cohort 2 from within the region and would likely form part of the next Work Plan. An overview of the amendments to the draft SWP Disaster Response Framework document was provided.

The Chair reviewed the Draft Agenda of the 3rd Session of the IHO Assembly, noting registration closes 20 March 2023 and that there is a separate registration for the EWH event. He encouraged new Members to attend the Assembly to present their nations flag. In relation with the World Hydrographic Day 2023 members were encouraged to consider how the Commission could produce something collaboratively regarding the meaning of digital twin of the ocean, particularly for the region. Mr Jasbir Randhawa (AU) talked about the articles published in the latest volume of the International Hydrographic Review from the region, including a reminder about an online survey sent out. He commented that the IHR is celebrating its centenary this year so there will be some special articles.

Fiji and New Zealand were designated as the SWPHC Members to the IHO Council and Mr Borbash (US) was re-elected as Capacity Building Coordinator. Australia was elected as Chair and Fiji as Vice-Chair of the SWPHC for the next 3 years.

USA-and Canada Hydrographic Commission (USCHC)

The 46th Meeting of the US/Canada Hydrographic Commission (USCHC45), was held from 16 to 17 March 2023 in Mobile, Alabama, USA. USCHC46 took place in conjunction with the US Hydro Conference 2023. The meeting was chaired by John Nyberg, Office of Coast Survey of the USA, in representation of the co-Chair, Rear Admiral Benjamin Evans, NOAA Director, who could not attend because of personal reasons. Twenty-three participants attended the meeting in person and six others attended virtually, including representatives from the Canadian Hydrographic Service (CHS), the Royal Canadian Navy, the National Oceanographic and Atmospheric Administration (NOAA), National Geospatial-Intelligence Agency (NGA), US Naval Meteorology and Oceanography Command (CNMOC) and the United Kingdom Hydrographic Office (UKHO) as observers. IHO Secretary-General, Dr Mathias Jonas represented the IHO Secretariat.

Group photo of the participants at the USCHC46 Meeting.

The meeting commenced with welcome words from the Chair and opening remarks of the co-Chair Dr. Geneviève Béchard, Hydrographer of Canada and the IHO Secretary-General. The meeting proceeded with the approval of the agenda and the matters arising from the previous USCHC45 Meeting and the respective list of actions.

National Reports were presented in sequence from Canada and US, followed by reports of the IHO Secretariat and UKHO. According to the two national reports, notable progress was made in the definition and rework of ENCs in gridded schemes. Both reports highlighted the

efficient cross boundary coordination to solve cartographic issues resulting from the new schemes. As an item of note, US reported on the ongoing cancellation of national paper charts. The last NOAA paper chart will be cancelled on 5 December 2024. In order to feed the ongoing customers' needs on printed products, NOAA Custom Chart v. 2.0 was released in February 2023 and a Certified Printed Electronic Navigational Chart (CPENC) development process is well underway. Canada seconded to this item that a national contract was initiated to assess Paper Chart 2.0 products against IHO S-4 standards. The meeting continued with the reports of the respective national representatives in various IHO related activities, namely updates on the WENDWG deliberations with interrelations to the IGIF product matrix status update and GEBCO/Seabed2030.

The Commission continued with a broad discussion on how to contribute nationally and regionally to the IHO Strategic Goals, the implementation of the S-100 roadmap and the regional measurement of the related SPIs. Cooperation was agreed to develop joint methods for the assessment of SPI which fall under Strategic Goal Number 1. In reference to Goal 2 and 3 both Commission Members highlighted their activities in support of the Ocean Decade and the linkages to the work of UN-GGIM, including the collaboration with OGC. Canada alluded also to the human side of the transformation of all aspects in the conduct of hydrography. Both Commission members reported about the respective national contributions to the "Empowering Women in Hydrography" project.

Before closing the meeting, John Nyberg handed over to Dr Geneviève Béchard as host of the forthcoming meeting. The next meeting is scheduled for May 2024 in St. Johns, Newfoundland, Canada.

Panellists discussing aspects of "The hydrographer of the future".

Dr Mathias Jonas took the opportunity of the preceding US Hydro to address the Conference as Key Note Speaker under the title "Drivers, Solutions and Enabler for a productive and healthy ocean". He also attended two panel discussions – one assigned to data centricity as fundamental concept in modern hydrography and the other on the professional profile of "the hydrographer of the future".

The Human Side of Digital Transformation

- Transformation Chapter 1: Workforce and Workplace
- Hydrographer of the Future Project – Envisioning the CHS Hydrographer of the Future.
  - International workshop (support from international Advisory Board)
  - Engaging CHS Staff in April
- Culture Review – understanding our current and desired culture
  - Supports cultural shifts
  - Measuring progress annually
- Building Human Resources and Training plans with the aim of shaping the workforce we will need in the future.

P-7

Conduct meetings of IRCC subordinate Working Groups

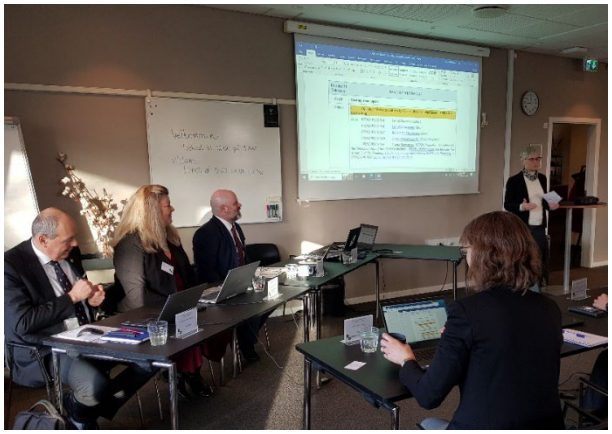
WEND Working Group

The 13th meeting of the Worldwide ENC Database Working Group (WENDWG), was held from 21 to 23 February 2023 in Aalborg, Denmark, hosted by the Danish Geodata Agency (DGA).

The meeting was chaired by Dr John Nyberg (United States of America), seconded by Ms Annika Kindeberg-Axne, Vice Chair (Sweden). Thirty delegates from 17 Member States (Australia, Brazil, Canada, China, Croatia, Denmark, Finland, France, Germany[16], Italy, Japan, Norway, Republic of Korea, Spain, Sweden, United Kingdom and United States[17])[18] representing 8+1 Regional Hydrographic Commissions (ARHC, BSHC, EAHC, EAtHC, NSHC, SWAtHC, SWPHC, USCHC and the HCA), the director and manager of the RENCs (IC-ENC, PRIMAR, and the EAHC-RECC) attended the meeting. Director Luigi Sinapi and Assistant Director Yves Guillam (Secretary) represented the IHO Secretariat.

WENDWG13 participants.

In their opening speeches, Ms Pia Dahl Højgaard, Director General of DGA and IHO Director Luigi Sinapi highlighted the increasing importance of the WENDWG in the new S-100 era as well as the need to raise awareness of the RHCs in the development of a harmonized coordination in support of the S-100 Implementation Roadmap.



Opening address by the Director General of DGA

The Chair provided a short report on the most important accomplishments of the WENDWG since 2019, despite the pandemic.

Reviewing the objectives and the agenda of the meeting, all participants, and representatives of the RHCs in particular, were briefed on the urgent need to accelerate the preparation of the S-100 coordination process in their regions, due to the very short time left before 2026, the year when the S-100 ECDIS becomes a reality for the International Maritime Community.

The meeting was structured to facilitate open discussions on three major topics:

The S-100 coordination in place at national and regional levels and subsequently the readiness status[19] of the RHCs in the light of their preliminary assessment based on the use of version 1.0 of the WEND100-IGIF[20] matrix distributed in August 2022, once the principles were approved at IRCC-14;

The variety of options adopted by ENC Producers for the definition of S-101 ENCs Scheming Principles;

Considerations on the operational service implications of S-128 – *Catalogue of Nautical Products*.

On the first item, the WENDWG noted that only a few RHCs had provided a report on the S-100 implementation approach in their region. Thanks to those RHCs who did provide a status report[21], the S-100 Coordination process (national and regional levels) was assessed. However, some RHCs have started to

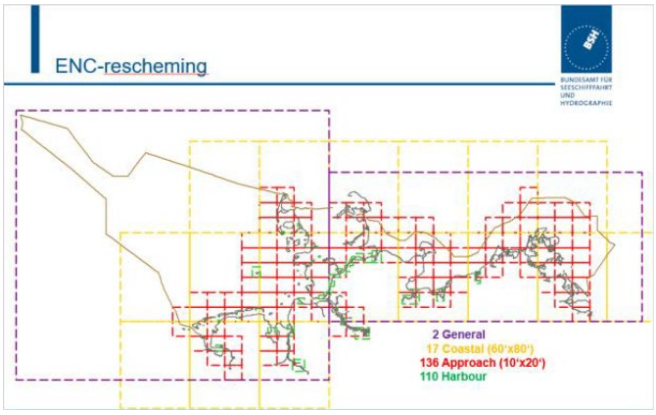
[16] Including the Chair of the IRCC.
[17] Including the Chair of the S-100WG.
[18] Apologies received from Greece, India, and South Africa.
[19] One of the Strategic Performance Indicator (SPI 1.3.1).
[20] Integrated Geospatial Information Framework (IGIF): https://ggim.un.org/IGIF/
[21] BSHC, USCHC, EAtHC, HCA, SAIHC, SWAtHC, MBSHC, EAHC, NSHC, MACHC, SWPHC, ARHC.

establish S-100 Coordination Working Groups and their TORs are planned, in a first phase, to be published on the WENDWG webpage > WENDWG Repository for sharing the best existing practices. In a second phase, the

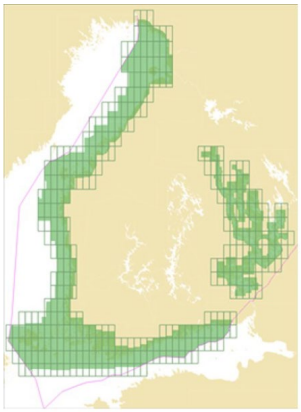
WENDWG will submit a new work item to the IRCC for approval (HSSC informed) on the development of a new Section 300[22] to the existing Publication S-11 Part A, the title of which could be: *Guidelines for the Coordination and Management of the Development of S-100 Data Services in RHCs*.

Since it was agreed that the IHO must establish the adequate environment and procedures to be in a position to report in the next couple of years to the IMO on the situation around the world for the predicted coverage, from 2026 to 2029, of S-101 ENCs and the other top priority S-100 products for Route Monitoring, the Chair of the IRCC was invited to consider the possibility to provide an update on the current heterogeneous situation with regard to S-100 between Member States and RHCs at the 3rd Session of the Assembly in May and at IRCC-15 in June.

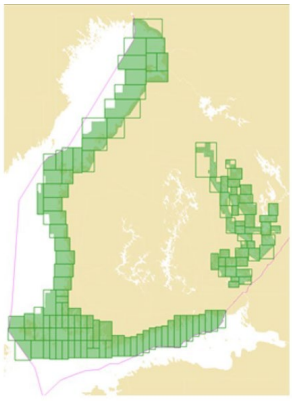
Despite difficulties in understanding the WEND100-IGIF matrix for some RHCs and Member States, this tool was proven to be very useful to get an estimate of the readiness level (SPI 1.3.1 of the Strategic Plan refers). With the lessons learned from the first round since August 2022, additional guidelines to fill[23] the matrix and especially use it at RHC level, need to be developed in 2023.



Germany: regular grid in progress.

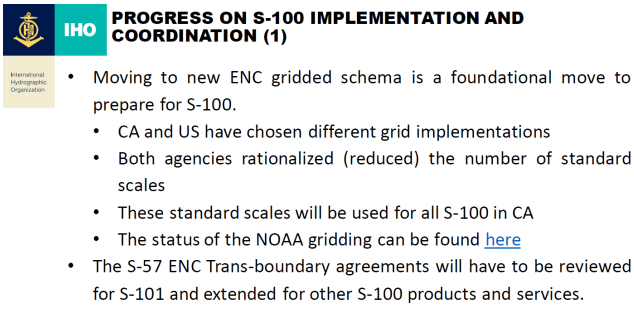


Regular 15'x15' grid, (335 cells)

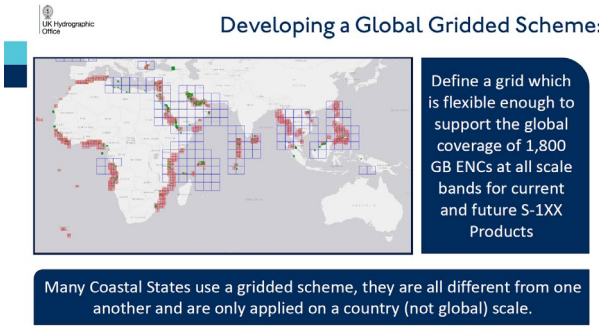


Existing approach ENC -scheme (131 cells)

Finland: a rectangular grid but not regular, for production efficiency, no real benefit to change, suggests freedom for HOs to choose.



US-Canada: good progress but still some important trans-boundary and harmonization issues to be fixed.



United Kingdom: a global gridded scheme for data improvement and scale harmonization.

Different opinions and strategies on the benefits of gridded scheme, depending on national situations, geographic specificities, etc….to be monitored by the WENDWG

[22] *S-11 Part A, Current Edition 3.1.0: Section 100 Guidance for the Preparation and Maintenance of International (INT) Chart Schemes, Section 200 Guidance for the Preparation and Maintenance of ENC Schemes.*

[23] *Which is not an end in itself!*

On the second item, it has become clear from now on that there will be no global common grid for S-101 ENCs and other S-100 products as such. Fruitful opposite experiences were shared at the meeting on this matter and it is now obvious that Member States will develop their own approach, their own grid, hoping that the end result will be seamless and harmonized for end-users…which remains to be demonstrated!

On the third item, it is now duly acknowledged by the WENDWG that INToGIS III (still under development by KHOA) is to become a one-stop-shop IHO useful tool for Member States and the RHCs for planning and scheming S-100 data services, then for the IHO Secretariat to report to the IMO. It was also well understood that the support to be performed by the RENCs on behalf of their Members for producing their S-128 datasets will be a critical component of the S-100 eco-system. Very enlightening considerations on the operational use of S-128 and to clarify the vision on how S-128 will be utilized by stakeholders (data producers, RENCs, End-user service providers, Port State Control) were shared by the S-100WG Chair, also on behalf of NIPWG. They cover a wide-range of strategic questions[24], including communication and education.

Noting the support offered by the RENCs, the WENDWG agreed on the way forward for a joint NIPWG/S-100WG concept paper on the operational use of S-128, starting with a use case#1 focused on SOLAS Navigation and Route Monitoring, in accordance with the WEND-100 Implementation Guidelines.

Throughout the meeting, all discussions were also used by the representative of the US (NGA) to capture the extended functions of the WENDWG. Significant amendments to the TORs and ROPs of the WENDWG (main drivers: scope extension to S-100, S-100 implementation and RHC coordination, amended version of the ECDIS Performance Standard and gender-neutrality) are planned to be submitted to the IRCC for approval in June 2023.

The WENDWG welcomed the offer made by the US to host the WENDWG-14 meeting (20-22 February 2024)[25] and invited the Chair to consider an open session for industry in 2024 (with a theme to be defined). Australia and Hong-Kong China volunteered to host in 2025 and 2026 respectively.

At the end of the meeting, Mr Jens Schröder-Fürstenberg (BSH, DE) was elected as Chair by secret ballot, and Mr Jason Scholey (UKHO, UK) as Vice Chair by acclamation, with 1 July 2023 as the date of effect for the two positions[26]. The WENDWG thanked the outgoing Chair and Vice Chair, for their remarkable commitments and achievements since 2019/2020.

Increase participation by non-Member States

One of the important strategic goals of the IHO is to increase the participation of non-Member States in IHO activities. The CB Technical Visits and High-level Visits are an important instrument to continue the campaign to raise the awareness to developing Countries, Member and non-Member States of the IHO. From the 12 CB Technical Visits and High-level Visits planned for 2023 only 5 were executed with three Technical Visits to Mauritania, Madagascar, and Belize as well as two High-level Visits to Jamaica and Cambodia. The accession of Cabo Verde to the IHO Convention as new IHO Member State in November 2023 brought the IHO Membership to 99 Member States, unfortunately two Member States remain suspended.

Capacity Building Management

The IHO Capacity Building programme is a strategic objective of the organization that considers the hydrographic maturity of coastal States and provides targeted training, technical assistance and awareness-raising seminars and workshops aimed at improving the status of hydrographic surveying and nautical charting and the delivery of maritime safety information in regions, particularly for developing countries.

The IHO Capacity Building programme is funded from the IHO budget and is supplemented by

[24] See Doc. WENDWG13-06.2A.

[25] Dates and location to be confirmed, back-up IHO Secretariat.

[26] After the 3rd Session of the Assembly and IRCC-15.

additional financial support from Member States (currently the Nippon Foundation of Japan, Republic of Korea and Canada with funds for the Empowering Woman in Hydrography project) with in-kind support from Member States and from industry. Particular attention has been focused on the e-Learning, in order to optimize the limited funds available and also allow increase in the participation to the educational and training programmes from the Member States. In that regard, the 2nd IHO Assembly approved the proposal from the Republic of Korea to establish an IHO e-Learning Center that after a period of tests was established by the Capacity Building Sub-Committee. The e-Learning Center Steering Committee was created and now is working to get more contents to the Center that is operating with the technical and financial support from Republic of Korea.

The level of activity of the IHO Capacity Building (CB) Programme was clearly affected by the COVID 19 pandemic in 2020 and 2021 and started to show a restart of the activities in 2022 that continued in 2023, but some activities still need to be carry on to 2024 in accordance with Decision CBSC21/10, however CBSC already decided that no more non executed activities will be carried over to the 2025 CBWP (Decision CBSC21/14). From the 415,354 euros of non-earmarked funds available the expenditures of the IHO 2023 CB Work Programme (CBWP) totalized 122,171 Euros which represents 29% of execution. The non-earmarked budget assigned to 2023 has benefited from the funds attributed by the IHO Secretariat, from the funds not used in CBWP2022 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). Considering all the funds, the earmarked and the non-earmarked, the 2023 CBWP had a total budget of 1,347,9311 euros.

One Director, one Assistant Director, one CB Assistant and some other members of the staff were directly engaged in supporting the CB programme.

Capacity Building Sub-Committee (CBSC)

The 21st meeting of the Capacity Building Sub-Committee (CBSC) was held in Tokyo, Japan, from 7 to 9 June 2023, hosted by the Japan Coast Guard Hydrographic and Oceanographic Department (JHOD). The meeting was chaired by Mr Evert Flier (Norway) and attended by 21 participants in person from 10 Member States. The IHO Secretariat was represented by Director Luigi Sinapi and Assistant Director Leonel Manteigas.

Dr Masayuki Fujita, Director of JHOD, welcomed the participants and expressed gratitude for the participants' support and highlighted the importance of Capacity Building in the International Hydrographic Community, expressing the wish that the meeting could provide an important contribution to the safety of navigation. He also mentioned that Japan has a long history of cooperation through the Nippon Foundation and the hydrographic course Cat B provided by JICA (Japanese International Cooperation Agency) attracting many foreign students. Director Luigi Sinapi thanked JHOD for hosting the meeting, highlighting that the meeting represents a unique opportunity after the 3rd Session of the IHO Assembly, to start a new three-year cycle until the next IHO Assembly of 2026, in which to implement the new Revised Capacity Building Strategy recently approved and adopted by A-3, to actively contribute to search for new forms of funding through the creation of a Project Team to be activated by the IRCC, and to intensify the cooperation within and between the Regional Hydrographic Commissions to search for new forms of support for the IHO capacity building programme.

Participants at CBSC21.

The Sub-Committee recognized that also in 2023 the CB Fund received the regular contribution from the IHO budget and donations made by governments, other international organizations, funding agencies, public or private institutions and associations or private individuals in support of IHO Capacity Building initiatives, particularly from the Republic of Korea, Nippon Foundation, Japan and Canada. In 2023, ROK assured an additional contribution

of 40K€ for the non-earmarked activities of the CBWP2024.

The CB Fund does not include the in-kind contribution or support from MSs or organizations that can be among others on the provision of facilities, trainers, other personnel, advice, etc. The CB programme depends on these contributions as this additional support helps to build wider capacity building in hydrography. To improve the visibility of the contribution from MS outside the CB Fund and to harmonize the efforts even better, MS were requested to inform CBSC on their other relevant CB activities that are self-funded. CB Coordinators were requested to inform on the activities delivered remotely that can be attended by participants of other regions so that they can be included in the IHO CB Calendar.

The CBSC 2023Work Plan was updated during the CBSC21 Inter-sessional Meeting. It is expected that several activities will not be completed due to the aftermath of the COVID-19 pandemic and the number of activities that have been carried over from previous workplans. The CB Coordinators will seek delivery of CB activities by alternative methods where possible to assist in their completion. It was agreed that funded activities from the 2023 plan that are not completed will be carried over into CB 2024WP. Those not funded will be cancelled. It was also agreed that funded activities in the 2024WP that are not completed will not be carried over into the 2025WP as was previously the case prior to COVID-19.

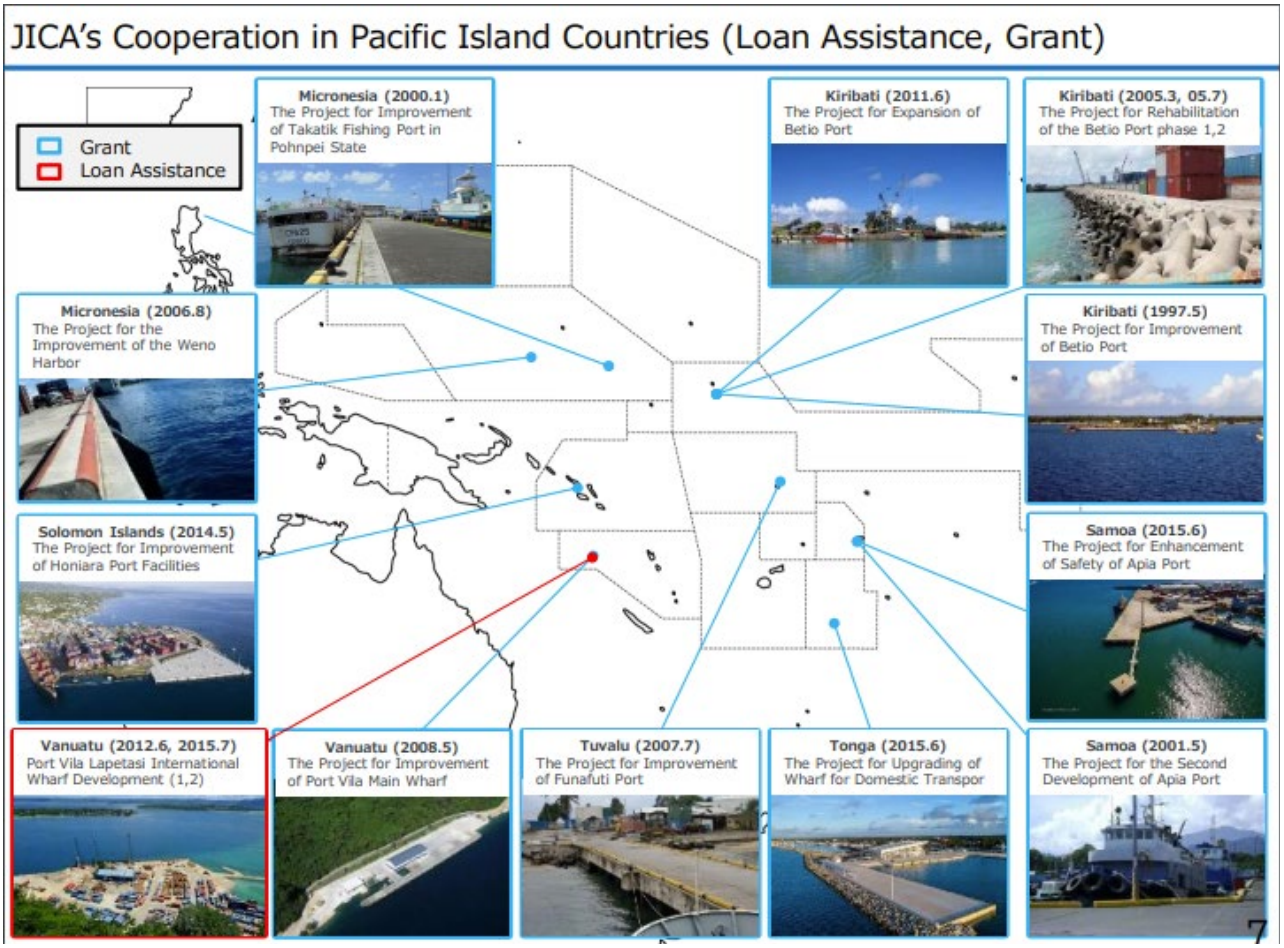
The submissions from the RHCs were prioritized based on Procedure 4 and adjusted according to Procedure 11 at CBSC21. Funding of all submissions would require funds of 603,610 € whilst the funds allocated to the CB 2024WP currently stand at 126,890 €.

Amongst the major projects currently under the IHO CB programme are the funding of students from IHO Member States for the Category "A" Hydrographic Survey Program at USM, the alumni Seminar and the Category "B" Nautical Cartography Program held at KHOA, Busan, ROK. Japan continues to provide its important contribution through the Nippon Foundation (NF) by funding CB training projects. Replacing the former NF-IHO CHART project, the new MoU between NF and IHO implemented the Nippon Foundation-IHO Geospatial Marine Analysis and Cartography (GEOMAC) Project. This project was renewed for a further three years starting in 2023. The next GEOMAC course will start in July and end in December of 2023. For October 2023 it is also planned for an alumnae seminar to be organized in London.

The Empowering Women in Hydrography (EWH) work item, that aims to contribute to more women participate equitably in the field of hydrography and assume leadership roles within the hydrographic community, was presented and discussed. The project has entered the final year of the 3-year work-plan and will see the continuation of the mentoring programme and a secondment to IC-ENC. Dependent upon available funding it is hoped that this project will become a long-term programme supported by the IHO Members States. It was agreed that EWH will for now be a standing agenda item at CBSC. Following on from IHO CL26/2022, baseline information has been collected for percentage of female employees and percentage of females in leadership roles in MS Hydrographic Offices. It was agreed to repeat this survey every three years to monitor the status and progress of gender balance.

The IHO eLearning Center was discussed as the Project Team have completed their work. The Project Team Chair presented the Guidelines for the e-Learning Center that were endorsed by CBSC, and proposed the composition of the Steering Committee (SC) as follows, IHO Director, CBSC Chair, Secretary (from CBSC), 1 member of IBSC and 6 other members. A Center Support Team will be provided by the Republic of Korea to maintain the system. The continued support from the ROK was greatly appreciated, as it ensures that IHO Members and Non-Members will be able to access important learning opportunities. Once the SC is established, the IHO e-Learning Center will go live officially and it will be announced via IHO Circular Letter.

The C-55 Project Team (PT) reported to CBSC21 on the progress of improving C-55, with particular attention to MSI, as WWNWS has developed a geospatial solution for the status of MSI reporting by Coastal States on their website. This solution can function for C-55 reporting on MSI, to the Status of Hydrographic Surveying – Safety of Navigation, as the previous C-55 PT developed a solution for survey status in countries based on CATZOC provided via the RENCS directly to the IHO Secretariat, and then to the Status of Hydrographic Surveying for non-navigational purposes. In this regard,



JICA cooperation and activities

data from Seabed2030 can support annual regional and global reporting, including Areas Beyond National Jurisdiction (ABNJ). In the future, it is expected that C-55 reporting will be based on a GIS solution, using a data format aligned with S-100 development.

CBSC welcomed proposal 3.5 to the 3rd Session of IHO Assembly (Establishment of a Taskforce to explore the potential merits, structures, and options for alternate fund generation to support Capacity Building and other IHO initiatives), identified the need for the taskforce to be resourced by relevant specialists (for example proposal writing skills), discussed the potential for funding generation through a modest increase of ENC wholesale price where member states will maintain price setting responsibility, and finally expressed the intention to be represented on the task force.

Finally, JICA presented their work and informed on the procedure to apply for relevant JICA funded courses. CBSC Secretary reported on the work undertaken by the internship of a Student of the University of Tokyo at the IHO Secretariat. He sent out a survey to all recipients of IHO CB funded activities in the last decade to evaluate impact of the courses on their career, organisation, and country. The results confirmed the importance of CB activities for Member States. The CBSC encouraged that this assessment be conducted tri-annually.

Meetings with other organizations, funding agencies, private sector and academia

The 13th Coordination Meeting of the IHO-ROK Programme Management Board (PMB13)

The 13th Coordination Meeting of Programme Management Board (PMB13) for the IHO-Republic of Korea (ROK) Programme of Technical Cooperation was held in person, after three years of video conference due to the pandemic, at the Asti Hotel, Busan, Republic of Korea from 7 to 9 February 2023 in accordance with the Memorandum of Understanding between the ROK and the IHO on Support for the IHO Capacity Building Programme.

The PMB13 was preceded by the High Level Meeting with the Ministry of Foreign Affairs

(MOFA) in Seoul, ROK on 6 February 2023. The IHO Secretariat was represented by Director Luigi SINAPI and the MOFA by Director General for International Legal Affairs, Mr RHEE Zha Hyoung. Discussions focused on IHO Capacity Building, the development of the Universal Hydrographic Data Model S-100 and those sectors where the ROK is actively participating, providing various professional opportunities and online systems. MOFA reaffirmed continuing support for the benefit of the international hydrographic community.

Meeting with the Director General for International Legal Affairs, Ministry of Foreign Affairs, Republic of Korea : Mr RHEE Zha Hyoung

The PMB13 examined 13 applications for the Category "A" Master of Science course in Hydrographic Science at the University of Southern Mississippi (USM) recognized by the IBSC (FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers).The Selection Panel, comprising representatives from the ROK, the IHO Secretariat, the USM and the Chair of Capacity Building Sub-Committee as an observer, selected a candidate from Romania and Türkiye each to enrol in the 2023-2024 session.

Since 2013, the number of graduated students from the Category "A" Programme totals 21, including those from the 2022-2023 academic year, from 13 IHO Member States (Bahrain, Bangladesh, Estonia, Guatemala, Jamaica, Malaysia, Mauritius, Mexico, Nigeria, Philippines, Romania, Thailand and Tunisia). In order to share the active contributions of alumni to the national, regional and international hydrographic communities after graduation and to celebrate the successful 10th anniversary of the programme, it was decided to organize an Alumni Workshop from 12 to 14 September 2023 in Busan, ROK.

IHO Director SINAPI (PMB13 chair), representatives from the ROK, the IHO Secretariat, the USM and the Chair of Capacity Building Sub-Committee

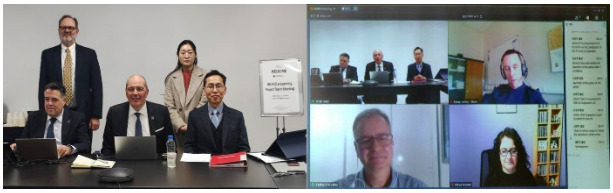
PMB13 also approved the budget allocation for the programmes in 2023 including the Category "B" Nautical Cartography Programme for 9 students to attend the course, to be held at the Korea Hydrographic and Oceanographic Agency (KHOA) in Busan, ROK from 19 June to 3 November 2023. In order to reduce the challenges associated with the tight timeline for the entire process to be completed in a year, it was decided that for future Category "B" Programmes the IHO Circular Letter calling for candidates should be initiated before the PMB meeting. This is however dependent on the confirmation from the ROK to the IHO Secretariat of the availability of the relevant funds.

The PMB13 was associated with the visit to KHOA on 8 February 2023, which provided PMB13 participants with a better understanding of the current status of hydrography and oceanography in the Republic of Korea such as the S-100 Testbed in connection with the vessel simulator, Oceanographic observation and forecast system and Ocean Satellite Center. In particular, the Ocean Broadcast Studio showed the potentiality of extended application of hydrography and oceanography in our daily life.

Visit to Korea Hydrographic and Oceanographic Agency and meeting with Director General.

During the visit, the PMB13 delegates were welcomed by the Director General LEE Cheoljo of KHOA. Both the IHO Secretariat and the ROK highlighted that close mutual cooperation is essential, not only for the development of hydrographic capabilities in Member States, but also for the marine environment and active participation in the U.N. Decade of Ocean Science for Sustainable Development.

After in-depth discussions between the IHO Secretariat and the ROK during the PMB13 meeting on the recently installed IHO e-Learning Center, the PMB13 reached a substantial compromise just before the 9th meeting of IHO e-Learning Project Team (ELPT9) on 9 February 2023. The ROK informed the IHO Secretariat and the ELPT about the decision to support (with human resources and financially) the IHO e-learning Center, the establishment of which is completed and the guidelines will be presented for approval at the next CBSC and IRCC meetings to be held in June 2023. Immediately after the meetings, the IHO Secretariat will announce by means of an IHO CL that the IHO e-learning Center is fully operational and encourage Member States to provide further training materials to the Center. The outcome of the preparatory meeting was subsequently reported to the ELPT9 and welcomed by the PT Chair and all the participants.



Visit to Korea Hydrographic and Oceanographic Agency and meeting with Director General.

Follow-up of CB activities and initiatives

The IHO Secretariat, on behalf of the CBSC, continuously monitored CB activities and initiatives. One Director and one Assistant Director were engaged in this work. Additionally, the Secretary-General, both Directors and the Assistant Directors continuously monitored CB activities undertaken in the RHC areas for which they provide an overview and advisory function.

Capacity Building Assessment

Technical and Advisory Visits

Execution of the technical and advisory visits executed in 2023 are summarized in the following table:

N°	Activity	RHC/Org.	Implementation
A-01	Technical visit to Mauritania	EAtHC	Led by SHOM 16-20 January 2023
A-03	Technical Visit to Madagascar	SAIHC	Led by SHOM 12-22 February 2023
A-09	Technical Visit to Belize (former 2022 A-05)	MACHC	Led by UK Date 5-9 June 2023
A-12	High Level Technical Visit to Dominican Republic (former 2021 A-06 and 2022 A-13)	MACHC	Led by IHO Date 23-24 November 2023
A-13	High Level Technical Visit to Jamaica (former 2021 A-07 and 2022 A-14)	MACHC	Led by IHO Date 5-7 December 2023

Capacity Building Provision

Raise awareness on the importance of hydrography

The IHO Secretariat continued to work on a schedule of visits to improve global awareness

of hydrography, engage external stakeholders such as the United Nations, UN-GGIM, IMO, IALA, the European Commission, funding agencies, academia and industry in general. Unfortunately, some of the planned courses, workshops and seminars are still being carried to 2024. This included visits to high level authorities in several countries, participation in RHC meetings, participation in various seminars and conferences.

Revise M-2 – The Need for National Hydrographic Services

The IHO Publication M-2 was updated in 2018 as Edition 3.0.7, and is being updated with the accession of the new Member States.

Technical workshops, seminars, short courses

Execution of the seminars, workshops and short courses planned for 2023 are summarized in the following table:

Nº	Events	RHC	Implementation
P-32	Technical Workshop on Hydrographic Governance (former 2021 P-07 & former 2022-P29)	SWPHC	Led by Linz, Wellington, New Zealand 20-21 February 2023
P-36	Raising Hydrographic Awareness (for SAIHC Associate and Non-Members) (former 2022-P10)	SAIHC	Led by UKHO, Pointe aux Piments, Mauritius 28-31 August 2023
P-37	Hydrography for Disaster Mitigation and Humanitarian Support (former 2022-P11)	EAHC	Led by China MSA, Hybrid Format Dates 12-15 September 2023
P-38	MSI Regional Workshop (former 2021 P-06 and 2022 P-28)	SWPHC	Led by SWPHC, Nadi, Fiji 25-27 July 2023
P-39	MSI (training on establishment of MSI structure and basic MSI procedure) (former 2020 P-08, 2021 P-07 and 2022 P-30)	NIOHC	Led by UKHO, Oman Dates 23-25 October 2023
P-40	MSI Course (former 2020 P-37 with updated costing and from 2021 P-09 and 2022 P-31)	SAIHC	Led by UKHO, Oman Dates 23-25 October 2023
P-44	Tides Workshop for Spanish Speakers (former 2020 P11, 2021 P-33 and 2022 P-45)	MACHC	Led by NOAA (IOC and IMO), Costa Rica Dates 13-17 November 2023

Coordination of Global Surveying and Charting

Publication C-55: Status of Hydrographic Surveying and Nautical Charting Worldwide

During the report period the Secretariat received more updates and confirmations to the entries in C-55.

The following table lists the countries for which updates to existing C-55 entries were received in 2023

IHO Member States	Non IHO Member States
Argentina	Antigua and Barbuda
Brazil	Bahamas
Denmark	Barbados
Dominican Republic	Belize
Finland	Comoros
France	Dominica
Guyana	Grenada
Jamaica	Lithuania
Mauritius	Madagascar
Pakistan	Panama
Poland	Saint Kitts & Nevis
Singapore	Saint Lucia
Slovenia	Saint Vincent & the Grenadines
Sri Lanka	
Suriname	
Sweden	
Trinidad and Tobago	
United Kingdom of Great Britain and Northern Ireland	
Uruguay	

Maritime Safety Information

Conduct Meetings of the World-Wide Navigational Warning Service Sub-Committtee (WWNWS SC)

The International Hydrographic Organization (IHO) World-Wide Navigational Warning Service Sub-Committee (WWNWS) was held on 4 - 8 September 2023 at the IHO Secretariat, Monaco. Representatives from the International Maritime Organization (IMO), International Mobile Satellite Organization (IMSO) and Satellite Communication companies attended as well. The meeting was led by Mr. Christopher JANUS (Chair WWNWS, United States) and Mr Trond SKI (Vice-Chair WWNWS, Norway). The IHO Secretariat was represented by Assistant Director Sam Harper.

The Sub-Committee received Maritime Safety Information (MSI) self-assessment reports from 19 NAVAREAs, the Baltic Sea Sub-Area and a national report from China. Significant progress has been made with the implementation of the Iridium SafteyCast System, with only 2 NAVAREAs yet to have started the process. It was noted that a key outcome of MSC105 was that the use of all Recognised Mobile Satellite Services (RMSS) is now mandatory. The IMO made it clear that if any member state was experiencing issues with the implementation of SafetyCast, regardless of the nature of the issue, they should contact the IMO to discuss what support could be provided.

The IMO provided a summary of the key outcomes from MSC106 and MSC107, the 18th Meeting of the IMO/ITU Experts Group on Maritime Radio Communication Matters and

the NCSR10. Key items discussed included Recognition of the BeiDou Message Service System (BDMSS) for use in the GMDSS, developments in GMDSS services including guidelines on maritime safety information and amendments to the revised ECDIS performance standards (resolution MSC.232(82)) to facilitate a standardized digital exchange of ships' route plans. The issue of the completeness of information in the IMO Global Integrated Shipping Information System (GISIS) as a key component of the GMDSS Master Plan was discussed. Delegates were reminded that it was an IMO Member State (MS) decision to consolidate information digitally, and the GISIS was the implementation of this decision.

The outcomes from the 21st meeting of the Document Review Working Group were discussed. The final draft of the revised joint IMO/IHO/WMO manual on Maritime Safety Information was a significant focus of the meeting ahead of its planned submission to NCSR10 in 2023. The Sub-Committee approved the draft text and onward submission.

Briefings on the activities of the IMO NAVTEX and the IMO Enhanced Group Call (EGC) Coordinating panels were provided by their respective chairs as well as developments in the provision of mobile satellite GMDSS services from Inmarsat and Iridium.

The IMO EGC Coordinating Panel Chair provided a comprehensive presentation report on the activities of the Panel, including details of the report to NCSR 10. Key items included, authorization and registration of contingency arrangements between METAREA and/or NAVAREA Coordinators, revocation of SafetyNET Certificates, implementation of Iridium SafetyCast Service, coastal warning areas broadcast, contractual agreements with RMSS providers.

Inmarsat and Iridium gave updates on their respective systems and future planned developments. Both reiterated their offer of assistance and highlighted various training solutions that are available.

Reports from the Capacity Building and MSI training course held in Colombia, Fiji, and Cabo Verde were discussed as well as a review the processes for reporting the status of MSI provision at Regional Hydrographic Commission meetings. France gave an impressive demonstration of the e-learning material that have been developed and are now available through their dedicated portal.

The second day of the meeting was dedicated to a work shop on the S-124 Product Specification on Navigational Warnings, led by the Chair of the S-124 Project Team. He noted provided an update on the proposed schedule to complete Ed.2.0.0, and provided insight into the various challenges and work items that would need to be tackled. A number of task teams were established to move this work forward. The size and complexity of the task was acknowledged by all and that the need for up skilling in a number of areas would be required to ensure the broader S-100 Implementation deadlines were not missed.

When finalized the report of WWNWS14 will be posted in the IHO website, where all the meeting documents are already available (www.iho.int > Committees & WG > WWNWS-SC > WWNWS13).

Members of the WWNWS15 Meeting.

Ocean Mapping Programme

The 2023 GEBCO Annual Meetings were held between the 6 – 10 November and included the Annual Sub-Committee Meetings (6 Nov), The Map the Gaps Seminar (7-8 Nov) and the 40th GEBCO Guiding Committee Meeting (9-10 Nov). The Subcommittee Meetings were hosted at the IHO Secretariat whilst the Map the Gaps Seminar was hosted by the Oceanographic Museum of Monaco.

The IHO Secretariat was represented at the annual meetings by Director Luigi Sinapi, Assistant Director Sam Harper (Secretary) and Public Relations and Communications Officer Sarah Jones-Couture.

GEBCO Subcommittee Meetings

SCUFN. The 36th meeting of the IHO-IOC GEBCO Sub-Committee on Undersea Feature Names (SCUFN) was hosted by the Australian Hydrographic Office (AHO) in Wollongong, Australia, from 6 to 10 November 2023.

The meeting, chaired by Dr Yasuhiko Ohara[27] [IHO representative] from the Japan Hydrographic and Oceanographic Department (JHOD, Japan), was attended by 45 participants, which consisted of the 12 SCUFN members, plus representatives of nine Member States[28] (Australia, Canada[29], China, Greece, Indonesia, Japan, Malaysia, Philippines, the Republic of Korea and Viet Nam) and subject matter experts (Marine Regions, NOAA (USA), ACUF[30] (USA), KHOA and KOSBI[31] (ROK), Geoscience Australia and BGS[32]). Assistant Director Yves Guillam (SCUFN Secretary) represented the IHO Secretariat.

Ms Hilary Thompson, Executive Director of the AHO, in her welcome and opening address, introduced the HydroScheme Industry Partnership Programme (HIPP) led by the AHO. She also reminded the HMS *Challenger* Expedition held from 1872 to 1876, the objectives of which were to explore the physical, chemical, and biological characteristics of the deep sea and its potential for humankind. She concluded her speech with the interesting history of the naming of Australia. A special traditional indigenous "smoking ceremony" in music (*didgeridoo*) was arranged by members of the Illawarra Aboriginal Corporation, to welcome the participants on their "Dharawal"/ Wollongong country.

Participants in SCUFN-36 – Opening Ceremony.

The Chair opened the meeting noting that SCUFN had another significant challenge to face this year with about 450 naming proposals[33], a record in the history of SCUFN. Despite the procedure in force through the pre-review by SCUFN Members of the naming proposals, thanks to the SCUFN Operational Web Services (operated by KHOA), and the preloading by the Secretariat of all naming proposals on the GEBCO Gazetteer[34], there was a huge risk to be obliged to defer a significant number of proposals. To prevent SCUFN from facing this situation again in the near future, the Secretary suggested to cap the number of naming proposals per organization/country (25 max.) and per year for SCUFN meetings in total (250 max.). This new rule "25/250" was adopted unanimously with immediate effect after SCUFN-36. Proposed amendments to the ROPs will be prepared accordingly and submitted to the GGC[35].

Good progress was made on some important corporate matters, such as:

"*The Repository of Typical Cases*", a knowledge-database[36] on decision-making process in SCUFN which is now clearly established as a living document complementary to B-6…;

…as well as "*The Cookbook for Generic Terms*", a much more comprehensive catalogue of all

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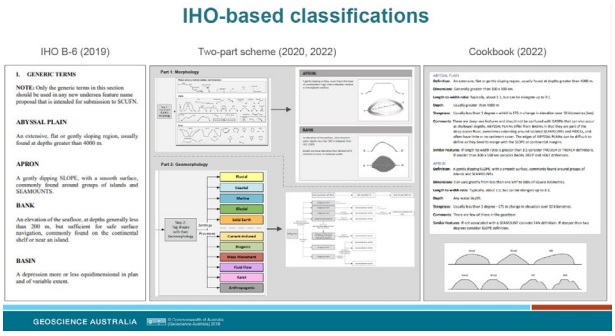
[27] *Vice-Chair, Acting Chair since SCUFN-35.2 in December 2022.*
[28] *India and Sri Lanka were registered but no present.*
[29] *Ms Anna Hendi, Chair of the SCUFN UFN Project Team, participated on VTC for the agenda item on the Automated Detection of Features.*
[30] *Advisory Committee on Undersea Features.*
[31] *Korea Seabed Information.*
[32] *British Geological Survey.*
[33] *Including revisions and fast-track.*
[34] *Task handled by contract to display the naming proposals in context, available to SCUFN Members only in EDIT mode.*
[35] *GEBCO Guiding Committee.*
[36] *This document (leading: SCUFN Member Roberta Ivaldi) is planned to become a key component of the development of Artificial Intelligence tools in support of SCUFN activities in the future.*

morphologic definitions of undersea features that will benefit soon from the views of other subject matter experts (Geoscience Australia, BGS, et al.) already involved in the development of a *Two-Part Seabed Geomorphology Mapping Scheme for Multidisciplinary Applications*.

SCUFN agreed that an inter-comparison of these definitions was essential to ensure consistency in the future, as B-6 is not self-sufficient as such, while recognizing that it is the only authoritative international Guidelines available to proposers so far.

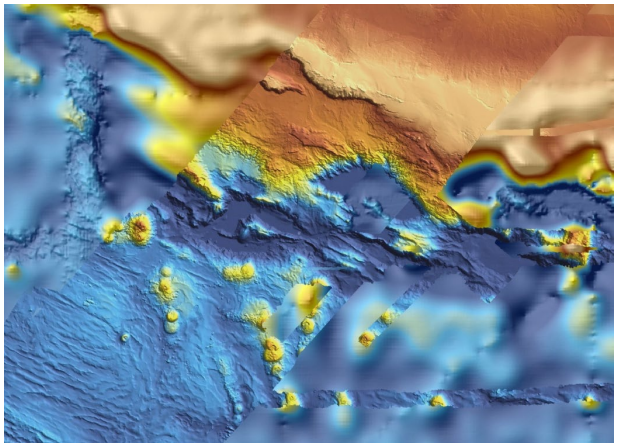


Very useful updates were also provided by the supporting organizations (NOAA, KHOA) and the subject matter experts from ACUF, Marine Regions, Seabed 2030[37], and the UN GEGN[38].

At the start of the sessions devoted to the review of naming proposals, some Member States (Philippines and Malaysia, then followed by Viet Nam and China) made important statements, similar in content to those made in 2022[13], raising their concerns on the location of the naming proposals in the South China Sea (SCS).

Despite all the efforts made at SCUFN-35 to move forward[39], Observers requested this time "to freeze" the SCS for undersea features naming. A question[40], drafted by the Secretary, was then put to a vote in application of SCUFN ROP 2.10 (political sensitivity). The outcome of this vote is that the SCS has become a "no-go area" for undersea feature naming.

This decision saved a significant amount of time since out of 450 naming proposals, a total number of 284 proposals located in the SCS



(China (78+5+21), Malaysia (11), Philippines (21+14+43) and Viet Nam (91)), were not considered at all! As a consequence, all 166 remaining proposals were reviewed, and most of them were approved with very few comments, thanks to the continuing improvement of the quality of proposals over the years. Very few proposals were kept pending or were not accepted. As a reaction to the issues faced by SCUFN (SCS frozen, increasing number of proposals, dual naming proposal for same features, absence of mutual consultation, automated detection, robustness of detection algorithms with better definitions of generic terms, etc.), the Secretary shared his opinion that time had come to start thinking on the future of SCUFN. The establishment of a SCUFN Naming 2030[41] SubGroup was decided. This SubGroup will be in charge of the preparation of the future of SCUFN through the development of a new designator model, based on Geographic Feature Unique Identifier, and accepting multilingual attributes for the same feature. The Secretary also recommended this SubGroup to explore the solutions adopted by the International Astronomic Union Working Group on Star Names. This option, if retained in the future, might support the last technological development and the increase knowledge of the seabed, for naming features more efficiently and more consistently. There is still a long way to go… but the SCUFN Undersea Feature James Webb-Space-Telescope-like endeavour was effectively launched in Wollongong this year! As stated by SCUFN Member Mike

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[37] *SCUFN Member Mackay.*

[38] *United Nations Group of Experts on Geographical Names (SCUFN Member Trent Palmer).*

[39] *SCUFN-35 Summary Report and Bulletin Report refer.*

[40] *"In application of ROP 2.10, do SCUFN Members consider that all proposals located in the SCS should be frozen until a joint proposal on the way forward is made to SCUFN by all interested parties? » (Vote by secret ballot: 7(yes) to 5(no).*

[41] *In relation to the Ocean Decade 2030 Project on the Detection of Undersea Features presented by Ms Anna Hendi (CHS, Chair of the UFN PT).*

Coffin: “Should SCUFN get prepared to name the millions of Abyssal Hills that cover the most of the oceanic crust in the future?” …*That is the question*.

At the end of the meeting, SCUFN Members elected Dr Yasuhiko Ohara [IHO] for the position of Chair, and First Admiral Dr Najhan MD Said [IHO], for the position of Vice-Chair.

The Chair and Secretary thanked Australia for their excellent support and the efficient arrangements provided during the week. SCUFN also welcomed the offer from the Republic of Korea (KIGAM, KHOA) for their proposal to host the next meeting in Jeju, Republic of Korea, from 24 to 28 June 2024.

TSCOM. The TSCOM Chair presented the annual report of activity and associated work plan and associated budget lines. Key activity was summarised as the release of the 2023 version of the GEBCO grid, liason with Seabed 2030 (visit of Chair TSCOM to the South and West Pacific Regional Mapping Community Meeting in Lima, Peru), continued work within the Opportunistic Mapping Resource WG, continued feasibility study to use Deep Argo groundings as calibration for the GEBCO grid and the update to the IOC-IHO GEBCO Cookbook. Of particular note was the collaboration with DCDB and Seabed 2030 Atlantic and Indian Ocean data centre to deliver a series of Webinars and an in person Workshop.

SCRUM. The SCRUM Chair presented the annual report of activity and associated work plan and associated budget lines. The Chair of SCRUM drew attention to the dedicated Youtube channel and requested guidance on how to proceed. It was agreed that advice should be sought from SCOPE.

SCOPE. The SCOPE Vice Chair presented the annual report of activity and associated work plan and associated budget lines. A lengthy discussion was had surrounding what constituted an official GEBCO product vice a derived product from the GEBCO dataset, as well as the associated level of approval that was required. It was made very clear that any product that carried the GEBCO and Parent organisation Logos constituted an official GEBCO product, and therefore need to go through a robust approval process in order to mitigate the risk of any errors, mistakes or inconsistencies that could offend international partners. It was noted that no such process exists and that one should be created.

SCET, The SCET Chair presented the annual report of activity and associated work plan and associated budget lines. Due to a number of personnel challenges, SCET was reported to be very much in the initiation phase but it was indicated that work was expected to be reinvigorated in early 2024.

Map the Gaps Seminar. The Map the Gaps Symposium 2023, held at the Oceanographic Museum of Monaco, featured a diverse agenda spanning two days. Special presentations were delivered by Victor Viscovo on his experience with the Five Deeps project, Dr Dawn Wright, Chief Scientist of ESRI and Fabian Cousteau on the future of sub-marine habitation. The pleanary included various sessions focusing on ocean exploration, technology spotlights, ocean mapping programs, and special topics related the novel uses and need for seabed data. The event also covered critical perspectives in ocean policy and citizen science. Notable sessions included discussions on new explorers and technologies, fleets of explorers and spotlights on innovation. The symposium concluded with closing remarks from IHO Director Luigi Sinapi, highlighting the progress and future directions in hydrographic research and mapping.

GEBCO Guiding Committee (GGC). The 40th meeting of the GEBCO Guiding Committee (GGC40) was held in Hybrid format with 50+ participants including Guiding Committee Members, representatives of Sub-committees, Observers and industry experts. The meeting focused on various aspects of ocean mapping and related activities. Key points included the review of action items from GGC39, updates from IHO and IOC, financial reports, and reports and work plans from Sub-committees. Significant discussions revolved around governance reviews, strategic planning, and progress briefs on Seabed 2030 Project activities. The meeting also addressed the future of the GEBCO Symposium, funding procedures, and membership.

Seabed 2030. The Seabed 2030 project continues to act as an accelerator for data identification and ingestion into the GEBCO Grid. Good progress has been made with the release of the 2023 GEBCO grid representing improved total coverage of 24.9%. The Seabed 2030 Project is organised into five discrete work packages which are listed below:

- Work Package 1 – Data
- Work Package 2 – Process Improvements
- Work Package 3 – Innovation
- Work Package 4 – Mapping Activities
- Work Package 5 – Management

The Nippon Foundation – GEBCO Training Programme. It was noted that GEBCO had a relationship with the Nippon Foundation since 2014 which represented more that 35 million dollars' worth of investment. During this time they have supported 120 students from 50 different countries.

In 2023, it was reported that 150+ valid applications for 7 spaces had been received which went to show how popular and in demand the course is. It was noted that that this would be something that SCET should consider in terms of what the appetite may be for a range of learning offerings.

In reflecting on the value and importance of the contribution the Nippon Foundation has made the seabed mapping community, the range of activities and dispersion of the NF-GEBCO Alumni, was duly noted.

Conduct meetings of the Crowdsourced Bathymetry Working Group (CSBWG)

CSBWG13

The working group held its 13th meeting (hybrid), from 10-12 January 2023, hosted by the National Oceanic and Atmospheric Administration in Denver, Colorado, USA. The meeting was led by the Chair and Vice-Chair and attended by ~50 participants (25 in person, ~30 virtual). IHO Assistant Director Sam Harper (Secretary) represented the IHO Secretariat.

In person participants at the CSBWG13 meeting.

Following the publication of B-12 Ed. 3.0.0 (which has been the major focus of the CSBWG for the last three years), CSBWG13 focused on a critical review of the groups operating mandate, as set out in the ToRs and RoPs. To achieve this, the CSBWG undertook a number of strategic planning sessions to take stock of the current status quo, review what has worked well and what has not, identify barriers to scaling CSB and build an evidence base to inform future decision making. In doing so, the CSBWG were able to explore potential solutions to overcome these barriers and identify ten high level priority work areas which were used as the basis to develop a new Work Plan. In turn, this work plan was cross referenced with the WGs existing ToRs and an updated version will be prepared for IRCC15 approval. The 10 key priority areas identified were:

1.Maintain the IHO publication B-12 through periodic reviews and updates identified by Member States;

2.Engage with HOs and IHO Member States on matters relating to CSB uses, including but not limited to Nautical Cartography;

3.Monitor Member State and Regional Hydrographic Commission progress regarding development of best practices and CSB initiatives and incorporate into B-12 as appropriate;

4.Investigate ways to foster and facilitate data providers (i.e.: Trusted Nodes), increase data contributions and identify incentives on how and why mariners should become involved;

5.Investigate and promote greater end use of CSB data in and outside the hydrographic community;

6.Provide guidance on data quality and standards for CSB in liaison with appropriate IHO Working Groups;

7.Liaise with other relevant IHO and allied bodies involved with CSB data to improve coordination and promote its use and development;

8.Liaise closely with the IHO Data Centre for Digital Bathymetry (DCDB) as it continues to develop technology to collect, display and distribute CSB data to the public;

9.Encourage and support all aspects of the CSB data life cycle from acquisition through archival to discovery and distribution, emphasizing automation and efficiency whenever possible; and

10.Encourage and expand scholarly discourse regarding the benefits of CSB to support U.N. Decade on Ocean Science and GEBCO

objectives by encouraging contributions to scientific, legal, and policy literature.

CSBWG continues to enjoy strong industry participation and this is reflected in the membership of the group. CSBWG13 received sixteen reports on a diverse range CSB related projects from a mixture of industry, academia, member states and civil society. CSBWG13 also discussed a number of outreach events planned for 2023. In late 2022, the IHO signed a cooperation agreement with the *Yacht Club de Monaco* (YCM) to work together to promote CSB within the yachting industry. In March 2023, the implementation of this agreement will be launched at a joint dinner conference hosted by the YCM. This will be the first of a series of events showcasing CSB within this community.

CSBWG14 also considered that Since IRCC14, the number of positive MS respondents to CL21/2020 has risen to 34 with the addition France and Australia. Whilst momentum seems to be growing, there is still the need to consider how to work within the MSR constraints of UNLCLOS within waters under national jurisdiction.

CSBWG14

The working group held its 14th meeting (hybrid), from 14-16 August 2023, hosted by the Norwegian Mapping Authority, Stavanger, Norway. The meeting was led by the Chair and Vice-Chair and attended by ~65 participants (30 in person, ~35 virtual). IHO Assistant Director Sam Harper (Secretary) represented the IHO Secretariat.

In person participants at the CSBWG14 meeting.

The Chair provided an update on the report to IRCC15 and her introduction to the work of the group. The history of the work of the group was discussed, noting that it started in 2014 and that the original focus was the creation of IHO Publication B-12, which has now shifted to the future strategy. I was noted that to date 34 coastal states that have replied positively to the CLs and that DCDB CSB data holdings equate to approximately 25GB + 10 trusted nodes. She noted that the WG is at a crossed roads where the community is scaling but posed the question as to whether the WG ready for this. In light of this, the new Work Plan was developed at CSBWG13 to focus activity on what needs to be done. The resultant changes to the ToRs and RoPs and the associated work items had been posed to IRCC. She noted that all requests were approved apart from the frequency of meetings to be 8 months.

With the above in mind, the focus of the CSBWG14 meeting was on monitoring and updating progress against the new work plan. In addition, updates on wider CSB developments were provided by participants. Highlights included:

Submission of IHO CSB Initiative as a UN Decade Action. The various different categories of Ocean Decade activity were discussed. It was noted that it was not immediately obvious which category was the most relevant for the CSB initiative and that the man reason for this is that the initiative itself was not properly defined in terms of its shape and structure. It was agreed that this would be the first step in delivering this work item and a proposal would be submitted to CSBWG15 for consideration.

Gather and prioritize HO-specific issues relating to CSB. A brief was given on the activities conducted concerning the gathering, prioritizing and responding to HO-specific issues/opportunities regarding national policy/regulations related to CSB. The following key items were identified for further work:

- Capture issues regarding national policy/regulations/culture affecting the endorsement of CSB
- Draft proposed rationale to the issuing of a new brief Circular Letter (and Questionnaire) to MS explaining the purpose of IHO CL21/2020 and encouraging a positive response.
- Request the policy framework(s) or guidelines(s) adopted by coastal states who positively responded to IHO CL 21/2020 or IRCC CL 01/2020
- Educate CSBWG members on International Law of the Seas as it pertains to passage sounding collection.
- Support CSB/SB2030 Coordinators in their RHC engagement. The work of

the CSB regional coordinators had been reviewed and critically appraised. The group reported that three areas for improvement had been identified and that these would form the focus of the work item going forward:

- Revisit and update the CSB/SB2030 Coordinator role, aiming to clearly define responsibilities and provide guidance to minimize the burden and maximize success.
- Work with Coordinators to develop regional strategies aligned with CSBWG and SB2030 goals, recognizing the need for tailored support in different regions.
- Raise awareness of CSB in the IHO Capacity Building Subcommittee, with a focus on identifying potential capacity-building activities.

It was noted that the need to clarify the role of the coordinators was a priority so that it is clearer how the duties of the role should be discharged. A discussion was had relating to how the network of coordinators could be supported and whether links to the IHO CB programme should be strengthened. The idea of a dedicated forum was raised but the Chair reported that IRCC had not supported the creation of a formal group.

Develop a recognition & incentive strategy plan. The group working on this item gave a brief on the analysis undertaken to identify both the stakeholders that may need to be incentivised to take part in the CSB, and the nature of those incentives that would appeal to the various types of data providers. Future work would include validating these initial findings with sector representatives before finalising a reward a recognition strategy for presentation at CSBWG15.

Stakeholder outreach activities and events for 2023. Key events for CSB engagement for the remainder of 2023 included the Monaco Yacht Show conference, COMIT, Seakeapers Round Table at the Monaco Yacht Show, Map the Gaps Symposium, Hydro Conference 2023 and Lakebed 2030.

Maintain IHO bathymetric publications

B-4 - Information concerning recent bathymetric data

The IHO DCDB is a recognized international repository for all deep ocean bathymetric data (greater than 100 m) collected by hydrographic, oceanographic and other vessels. It has also received significant contributions of crowdsourced bathymetric data. These data can be viewed from:
https://maps.ngdc.noaa.gov/viewers/csb/ and
http://maps.ngdc.noaa.gov/viewers/bathymetry/.

The DCDB data are publically available and used for the production of improved and more comprehensive bathymetric maps and grids, particularly in support of the GEBCO Ocean Mapping Programme. Significant work has been undertaken to improve the searching, viewing and accessibility of the DCDB data, further work is planned to enhance the viewer functions as well as data discovery and accessibility. The DCDB has also developed an application, which automatically masks data received in waters for which permission to make publicly available has not been provided; this masked data is sorted separately and remains inaccessible until such time as permission to release it has been received.

The DCDB has continued working with the private sector to provide a facility for mariners to log bathymetry (position, depth, and time) data using their Electronic Chart Systems, and forward this data to DCDB. Crowdsourced Bathymetry can be provided in GeoJSON format, amongst others.

B-6 - Standardization of undersea feature names

Edition 4.2.0 of Publication B-6 on the Standardization of Undersea Feature Names entered into force in October 2019. This publication provides guidelines for naming features, a naming proposal form and a list of generic terms with definitions with significant clarifications and improvements compared to the previous Edition that was issued in 2013. The work continues within SCUFN to improve the geometric parameters of some specific features (Seamount versus Ridge for instance) but nothing is mature enough to move to another Edition of B-6 yet.

"The Cookbook for Generic Terms" is a much more comprehensive catalogue of all morphologic definitions of undersea features, compared to B-6, that will benefit soon from the views of other subject matter experts (Geoscience Australia, BGS, et al.) already involved in the development of a Two-Part Seabed Geomorphology Mapping Scheme for Multidisciplinary Applications.

SCUFN agreed that an inter-comparison of these definitions of generic terms was essential to ensure consistency in the future, as B-6 is not self-sufficient as such, while recognizing that it is the only authoritative international guidelines available to proposers at present.

The SCUFN Secretary set up a new Repository dedicated webpage in the IHO SCUFN website to collect all complementary information to Publication B-6. With lessons learned from further experimentations in naming proposals reviews, the final objective is for SCUFN to prepare new amendments for more robust generic terms definitions in B-6, to be published in a new Edition 4.3.0 when appropriate.

B-8 - GEBCO Gazetteer of Undersea Feature Names

The database of the on-line GEBCO Gazetteer of Undersea Feature Names, developed by the IHO DCDB (co-located at one of the US National Centers for Environmental Information (NCEI), NOAA), is maintained by the IHO Secretariat through contract support to the former SCUFN Secretary. SCUFN commended NOAA, KHOA, and their software developing teams for the excellent work madesince the last meeting in 2022. A very comprehensive status report was provided. SCUFN noted that continued improvements and enhancements of the Gazetteer will remain incremental, and that an annual funding of 50K/year had been secured and will be used to:

- Perform annual maintenance and upgrades (when necessary)

- Implement a limited number of requested enhancements

- Progress the development of the GEBCO Gazetteer and KHOA Beta-Gazetteer integration.

Mr Chris Slater, Lead Software Engineer (NOAA) recommended that:

- SCUFN Members test Gazetteer v5 and notify the IHO DCDB of any issues;

- SCUFN members provide support and feedback when needed during development of the

GEBCO Gazetteer and KHOA OWS integration;

- KHOA OWS developers continue to test the Gazetteer v5 test environment and let GEBCO

Gazetteer developers know of any issues, changes, or questions;

- SCUFN Members let GEBCO Gazetteer developers know when an upgrade to Gazetteer v5 is appropriate.

B-9 - GEBCO Digital Atlas

IHO publication B-9 - *GEBCO Digital Atlas* (GDA) was previously a two-volume DVD and CDROM set which contained: the GEBCO global bathymetric grid at 30 arc-second intervals; the GEBCO One Minute Grid global bathymetric grid, a global set of digital bathymetric contours and coastlines, the GEBCO gazetteer of undersea feature names and a software interface for viewing and accessing the data sets. However, the modern incarnation of the Digital Atlas is a series of digital datasets and products that are available for download from the GEBCO website. As a consequence, it was anticipated that Publication B-9 would be cancelled, however on further investigation it was agreed that the B-9 designation should somehow be attributed to a Digital Object Identifier. This work is ongoing and is due to be reported to GGC41.

B-11 - GEBCO Cook Book

The *GEBCO Cook Book* (IHO publication B-11) is a technical reference manual that has been developed to assist and encourage participation in the development of bathymetric grids. It is an important GEBCO reference document that is used by academic institutions and hydrographic organizations. The Cook Book covers a wide range of topics such as data gathering, data cleaning, examples of gridding, and provides an overview of different software applications used for producing bathymetric grids.

In February 2022, the GEBCO Cookbook Editorial Board (EB) was established, operating under the guidance of the Technical Subcommittee on Ocean Mapping (TSCOM). The Cookbook comprises 56 chapter sections, of which seven have been recently updated. The

EB initially attempted to migrate the Cookbook to Adobe InDesign but encountered complications in review and publication processes. After consulting with TSCOM, it was decided to transition the Cookbook to a dynamic wiki reference page hosted by the IHO. Looking ahead to 2024, the focus will be on gathering requirements and determining a timeline for the creation of the Cookbook wiki reference page through the IHO and the migration of only the updated chapter sections.

Contribute to outreach and education about ocean mapping

GEBCO continues to promote the importance of bathymetric data to the international community. The annual GEBCO 'Map the Gaps' symposium continues to be the flagship activity with increasing participation at each event. In 2023 this was held at the Oceanographic Museum of Monaco and formed the final showcase event for the 120th Anniversary of GEBCO.

Marine Spatial Data Infrastructures

This element addresses the developments related to the hydrographic component of Spatial Data Infrastructures (SDI), the maintenance of the relevant IHO publications, and the provision of technical advice as appropriate. Thirty-three representatives from 36 Member States and thirteen Expert Contributors participated in this activity during the period of this report. The IRCC strongly encouraged RHCs to promote MSDI and to explore the potential of the MSDIs.

Conduct meetings of the Marine Spatial Data Infrastructures Working Group (MSDIWG)

The 14th meeting of the Marine Spatial Data Infrastructures Working Group of the International Hydrographic Organization (MSDIWG14) took place in-person from 30 January to 3 February 2023 at Genoa, Italy organized by the Italian Hydrographic Office (IIM). The MSDIWG14 meeting was held back-to-back with the OGC Marine Domain Working Group and UN-GGIM Working Group on Marine Geospatial Information. The meeting was chaired by Ms Pearlyn Pang (Singapore) and attended by 31 delegates from 19 Member States (Australia, Canada, Croatia, Denmark, Germany, India, Iran, Italy, Japan, Netherlands, Nigeria, Oman, Portugal, Republic of Korea, Romania, Singapore, Slovenia, United Kingdom and United States) and 8 representatives of NGIO and industry attended the meeting. IHO Director Luigi Sinapi, Assistant Directors Leonel Manteigas and Yong Baek represented the IHO Secretariat.

Participants of the MSDIWG14.

The meeting was opened by Rear Admiral Massimiliano Nannini (Director of the IIM), Mr Marco Bucci (Mayor of Genova) and Ms Elisabetta Trovatore (Deputy Director of the Department for Environmental and Civil Protection of Liguria Region) that welcomed the participants to Genoa. IHO Director Luigi Sinapi enhanced the challenges that the MSDIWG will face during the meeting.

Being a joint meeting Ms Pearlyn Pang (Chair of MSDIWG and Co-Chair of UN-GGIM WG-MGI), Dr John Nyberg (Co-Chair of UN-GGIM WG-MGI) and Mr Rafael Ponce (Co-Chair of OGC Marine DWG) thanked Italy for hosting the meeting and highlighted the importance to have joint IHO MSDIWG, UN-GGIM WG-MGI and OGC Marine DWG meetings.

A change to the MSDIWG Terms of Reference was approved in order to include the maintenance of IHO publication C-17 – Spatial Data Infrastructures "The Marine Dimension". The Chair resumed the objectives for this meeting and went through the actions from C-6, IRCC14 and HSSC14 relevant to the MSDIWG.

On the discussion about the MSDI Portal it was concluded that the proposal will be discussed at the 3rd session of the Assembly.

The meeting received the national reports on the status of MSDI and Maritime Spatial Plans (MSP) from Australia, Croatia, Iran, Italy, Japan, Lebanon, Norway, Republic of Korea, Spain, Singapore and United Kingdom. In

relation with the regions, regional reports were presented from the Baltic Sea and North Sea Hydrographic Commissions, the Mediterranean and Black Seas Hydrographic Commission, Arctic Hydrographic Commission, the Eastern Atlantic Hydrographic Commission and the South-West Pacific Hydrographic Commission.

On the item "S-100 from MSDI Perspective" the attendees were informed that S-100 edition 5.0.0 was published enhancing for the MSDI aspects the operationalization, the interoperability, the data protection/authentication mechanisms and the revisions on the metadata sections. The meeting agreed on using the IHO Lab to explore these topics and maybe consider to develop some guidance for them. It was suggested to come back at the next meetings with some ideas on this topic.

In relation with the WEND-100 Principles, the current version is initially intended for S-101, but in the future other S-1xx products could be aligned to it. This version encourages data availability, data distribution through compatible and coordinated networks, standardization, authority of service and data protection. It also addresses the avoidance of service duplication, coordinated data management, quality management, and assistance and training. In this version Capacity Building is explicitly noted. The WEND-100 Matrix that includes an MSDI column was built around the IGIF pathways and was sent to the Regional Hydrographic Commissions (RHCs), which were encouraged to use the matrix.

OGC informed that it is working on FAIR+ principles which in addition to the Findable, Accessible, Interoperable, Re-usable also include traceability, licensure and connectedness. The future version of C-17 will include some basic information on FAIR+. It was requested to OGC that the FAIR+ principles be included in an eventual FAIR (+) principles checklist.

The meeting discussed the Spatial Data Quality and Integrity, where the 7 Quality Management Principles were presented enhancing that the fundamental concept of the quality is the degree to which an inherent characteristic of an object fulfils the requirements. The quality can be applied to all pathways of the IGIF. The seven Quality Management Principles available on the ISO website, which is a part of ISO 9001, were presented for a following inclusion in the future version of C-17.

On data quality, the debate was focused on safety of navigation, as the traditional purpose of the hydrographic data. For an increase in the use of hydrographic data, the data quality is essential since it allows the users to compare and select the data that suits the purpose. Quality is a question of the degree on how the data comply with the requirements, and data quality elements are the completeness, logical consistency, positional accuracy, temporal accuracy, thematic accuracy and usability.

Table 1: Summary of ISO 9001 7 Quality Management Principles from MSDI Perspective

QUALITY MANAGEMENT PRINCIPLES (QMPs)	MSDI PERSPECTIVE
QMP 1 – Customer focus	All possible **users** are MSDI customers
QMP 2 – Leadership	MSDI needs a **strategic vision**, aligning policies, processes and data
QMP 3 – Engagement of people	Focusing people enables a **people centric** and not only data centric MSDI
QMP 4 – Process approach	MSDI data management **workflow** is composed of several individual trusted processes
QMP 5 – Improvement	MSDI is a long-term **change of view** and not an objective to achieve or a web portal
QMP 6 – Evidence-based decision making	MSDI **links** data and information to policy and governance
QMP 7 – Relationship management	Networking enables MSDI **shared knowledge**

MSDIWG14 discussed how MSDI and Hydrographic Offices (HO) can be part of Maritime Digital Twins (DT) of the future, as data producers, providers (enablers) and users (beneficiaries). MSDI and HO may not necessarily be creators of DT, but can be enablers of DT. In preparing MSDI to be "DT-ready" and provide "DT-ready" data, APIs and services, HO can consider first the data required for the domain-based DT. S-100 and OGC API can provide a good baseline for many of the required datasets (for example S-102, S-104 and S-111 for depth, tidal, water level and currents), with good temporal support. Nevertheless, where HO may not be data producers or owners of required (near) real-time data, collaboration and interfacing with data providers would be required, and this is where tapping in on an established MSDI network, governance structure and system infrastructure would be beneficial.

MSDIWG14 encouraged members to join DITTO (https://ditto-oceandecade.org), an Ocean Decade Action, where best practices and common understanding on digital twins of various marine domains are discussed. The MSDIWG14 agreed to look further into how MSDI can be "DT-ready", the challenges and opportunities for innovation.

The OGC APIs for MSDI were discussed at the OGC Meeting but was explained at

MSDIWG14 that the APIs provide a robust means for data transport and access by end users and have several advantages. S-100 offers web-friendly GML encoding but stops short of formalized API structures for S-100 (General Feature Model GFM) data. There are additional challenges for API implementations such as, Metadata approach and methodologies, S-100 specific structures, e.g. topology, gridded data, multiple vertical datums, quality, portrayal (if required), highly interconnected datasets with a rich relationship structure and different "aggregation" mechanisms. There is a first draft of S-100 GFM data expressed in a JSON encoding. This needs to be expanded to metadata and collections and better harmonized to OGC API features, also to gridded and coverage data. Intelligent querying and selective access need to be considered. Transformation of content and methods for aggregation, together with common OGC API Records metadata would enhance this greatly and OGC would like to contribute to such efforts in the future.

The MSDIWG decided in 2020 to revise IHO C-17 Spatial Data Infrastructures. The Marine Dimension is to provide guidance for Hydrographic Offices on establishing MSDI to make relevant the IHO C-17 with the latest information and trends, namely the IHO Strategic Plan 2021 - 2026, IHO-OGC MSDI Concept Development Study, ongoing Federated MSDI pilot projects, reference materials from the Body of Knowledge, FAIR+ Principles, S-100 and the UN-GGIM documents including the Integrated Geospatial Information Management Framework for the water domain (IGIF-Hydro) Parts 1 and 2. A C-17 drafting team consisting of about 23 MSDI members worked on the updates that were deemed significant enough to entail an Edition 3.0.

A presentation was received on the Global Ocean Observing System (GOOS) that sets a broad framework across a range of scientific disciplines and the regional alliances that are tasked with turning that overall approach into actual observations and systems. The GOOS data portal is a mix of data and "only" metadata layers. GOOS collaborates with EMODnet being easy to pick up a point and then download the data. One of the weaknesses of the international data aggregation efforts is in transparency about what data each portal holds. The schema.org Cluster helps to improve search and discovery.

Singapore informed on the Roadmap for Implementing Marine Science Data Standards and that they started the categorization of the Marine science datasets in different levels through standardization. They have a three phase approach with the categorization, the interdisciplinary integration of international standards and the implementation of Marine Science Data Standards as the authoritative source. The several advantages of standardization were summarized as well as the outcomes of the implementation.

Lebanon presented a national update on crowdsourced bathymetry (CSB) policy informing that CSBWG updated publication B-12. To date, just 32 coastal States have replied positively to the provision of CSB data from ships within waters subject to their jurisdiction into the public domain. The process to have the authorization it is normally complex and not dependent on the HO. Some potential use-cases of crowdsourced bathymetry with a MSDI perspective were provided and how the MSDIWG would envision using CSB and the collaboration with the CSBWG.

MSDIW14 also discussed the review of the available e-learning training materials, concluding on the need for an update to the materials which presently focus on high-level MSDI 4 pillars. For instance, by including technical data and systems management training and incorporating the alignment of the MSDI 4 pillars with the UN-GGIM IGIF nine strategic pathways.

The MSDIWG Work Plan was revised and updated and the list of actions resulting from the MSDIWG14 were presented and discussed.

The MSDIWG conducted elections for the position of Chair and Vice-Chair and Ms Pearlyn PANG (Singapore) was elected as Chair and Ms Caitlin JOHNSON (USA) as Vice-Chair by unanimity.

Work and Meetings of FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC)

The FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) Chair reported that at the IBSC45 meeting in 2022, 13 submissions were received with only 3 initially recognized, but after the intersessional review all 13 were recognized.

At this year´s IBSC46 11 submissions were received. 1 submission was recognized and for the remaining 10, whilst 3 submissions were not recognized, the Board offered 8 inter-sessional revisions. The Board decided to develop a pathway to recognize Subjects of the S-5 Standards S5A & S5B in addition to the recognition of full programmes. IBSC worked on the review of the IBSC Standards and maintenance of IBSC Publications. Ms Cecilia Cortina (Mexico), currently attending the University of New Hampshire - Nippon Foundation/ GEBCO programme alumna, joined the Meeting as an intern supported by Nippon Foundation/GEBCO within the EWH project. The Board discussed the need to update the Standards and potentially create a new standard for Marine Spatial Data Professionals. During the discussion the need to liaise with other stakeholders, in particular the IHO MSDIWG, to make an informed decision on the way forward on this subject was considered necessary. IBSC also agreed that the increasing number of inadequate submissions cause additional workload to the Board, and a second annual inter-sessional meeting is required in 2023 to finalize reviews of the inadequate submissions, but mainly to progress on the revision of the standards and the recognition of Subjects. The future engagement of IBSC with the IHO e-Learning Center was also discussed. IRCC tasked the IBSC in liaison with the IHO Secretariat to organize an online workshop to provide clarifications on the submissions to the Board.

IHO-EU Network Working Group (IENWG)

The IHO-EU Network Working Group (IENWG) reported on the MoU signed in 2012 by the European Commission and the IHO, which ensures a continuing liaison in areas of common interest. The 10th anniversary meeting of the EC and IHO in 2022 valued the contributions of the EU HOs and outlined prospects. The latest IENWG13 meeting was organised on the occasion of the annual European Maritime Days (EMD) of the European Commission DG MARE and focused on global issues concerning the blue economy, the marine environment, the maritime security and ways of moving forward. IENWG and DG MARE discussed new opportunities for collaboration, covering also EU policies of interest for the IHO, projects and strategy. Information on some EU projects (EU study on marine data collection coherence, re-use of environment public data applied to marine knowledge, Inspire - European Spatial Data Infrastructure for the purposes of EU environmental policies and Maritime Spatial Planning was provided and shared, highlighting the interoperability with data and IHO standards. The EU countries' contribution to GEBCO interoperability between EMODnet, the IHO DCDB and the IHO and IOC GEBCO was also discussed. Finally, a discussion on the review of the strategy and the way-forward for the IENWG took place at the IENWG13, highlighting Maritime policies in order to continue to monitor and influence the EU policies, the development of the S-100

European Maritime Day – 24-25 May 2023, Brest (France).

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hydrographic products and services, in order to promote them across the European Commission (to make good use of for the purposes of blue economy, marine safety, climate change, protection of marine areas and biodiversity), the IHO Capacity Building programme, in order to promote the development of programmes for the hydrographic capacity in the EU, and outside EU in particular for safe sea lines with East Asia and Africa, in connection with IRCC initiatives to extend CB funds, and finally the data collection, in order to develop common acquisition campaigns of bathymetric data in the EU maritime basins. The involvement of the IHO secretariat was recognized as an asset for the promotion of activities at high level in the EU Commission.

Liaison Visit to the 15th Course of the IHO-Nippon Foundation GEOMAC Project, United Kingdom Hydrographic Office, Taunton, UK

IHO Director Luigi Sinapi, Assistant Director Leonel Manteigas and Project Officer Kazufumi Matsumoto visited the United Kingdom Hydrographic Office (UKHO) on 21 September 2023 to meet and brief the seven trainees attending the 15th course of the IHO - Nippon Foundation GEOMAC (Geospatial Marine Analysis and Cartography) project. The project, funded by the Nippon Foundation of Japan, provides training in marine cartography and data assessment, which is recognized by the FIG-IHO-ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) as Cartography Category "B" programme. The course is delivered by the UKHO and is composed of eight modules and final project, each module varying from one to three weeks in length. The 15th course ran from 17 July 2023 to 15 December 2023 and was attended by trainees from IHO Member States, namely Chile, Ecuador, Indonesia, Jamaica, Kenya, Romania and Uruguay.

The Team from the IHO Secretariat discussed various topics with the trainees. In response, the trainees described their experiences and thanked the Nippon Foundation, UKHO and IHO for the opportunity to develop their knowledge and expertise in the field of nautical cartography and other relevant fields. Director Sinapi delivered a presentation highlighting the roles of IHO, importance of hydrography, the recent relevant topics for the Organization and capacity building activities. Assistant Director Manteigas delivered a presentation on the objectives, activities and partnerships of the IHO Capacity Building. The impact of the CHART/GEOMAC project was also described and presented in detail by Project Officer Matsumoto. The trainees were encouraged to keep in touch with each other and to maintain the alumni network and relationships after returning to their home countries.

The trainers and trainees of the 15th GEOMAC Course with the IHO visiting Team.

To strengthen the IHO-Nippon Foundation Alumni network, encourage the cooperation among the fellows, improve the global friendship and allow an assessment of the impact of these relevant courses in the global capacity, an Alumni Seminar is also planned for every three years.

The IHO-Nippon Foundation Alumni Seminar - London, UK

The IHO-Nippon Foundation Alumni Seminar was held in London, UK from 25 to 27 October, organized by the IHO and supported by the Nippon Foundation (NF) of Japan, with generous support from the United Kingdom Hydrographic Office (UKHO). The Nippon Foundation has funded selected international trainees to attend courses in nautical cartography at the United Kingdom Hydrographic Office (UKHO) for the last fifteen years. Since 2014, the training has been conducted under the auspices of a Memorandum of Understanding (MoU) signed between the IHO and NF, known as the IHO-NF GEOMAC (Geospatial Marine Analysis and Cartography) Project (formerly, the IHO-NF CHART (Cartography, Hydrography and Related Training) Project). The programme, delivered for the GEOMAC Project, in “Marine Cartography and Data Assessment” is

recognized at the Category "B" level by the FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) in accordance with the Standards of Competence for Nautical Cartographers, IHO Publication S-8B.

The objectives of the Alumni Seminar were to strengthen the IHO-NF Alumni network, to encourage cooperation between the fellows, to improve the global friendship and to obtain feedback from the alumni. Of the total 92 fellows, 48 alumni from 32 countries (Argentina, Bangladesh, Bulgaria, Colombia, Croatia, Denmark, Dominican Republic, Ecuador, Estonia, Fiji, Georgia, Guyana, Indonesia, Latvia, Lebanon, Malaysia, Malta, Mexico, Nigeria, Oman, Peru, Philippines, Poland, Romania, Spain, Sri Lanka, Suriname, Thailand, Trinidad and Tobago, Uruguay, Venezuela and Viet Nam) attended the seminar.

Participants of the IHO-NF Alumni Seminar.

Mr. Mitsuyuki Unno (Executive Director of the Nippon Foundation), Mr. Yu Nakahiro representative of the Nippon Foundation), RAdm Angus Essenhigh (UKHO), Ms. Lucy Fieldhouse (UKHO), Mr. Jeremy Kitcher (UKHO), Mr. Marcus Haddy (UKHO), Dr. Diane Dumashie (FIG), Mr. Gordon Johnston (IBSC), Mr. Adam Greenland (IBSC), Mr. Jamie McMichael-Phillips (The Nippon Foundation-GEBCO Seabed 2030), Mr. Steve Hall (The Nippon Foundation-GEBCO Seabed 2030), RAdm Mustafa Iptes (retied IHO) and Mr. Jeffery Bryant (retired UKHO) also attended the Seminar as invited guests. The IHO Secretariat was represented by Director Luigi Sinapi, Assistant Director Leonel Manteigas and Mr. Kazufumi Matsumoto (Project Officer seconded to the IHO Secretariat by Japan).

On the first day, the Seminar was opened by Assistant Director Leonel Manteigas. The key-note speeches were delivered by Mr. Mitsuyuki Unno (Executive Director of the Nippon Foundation), RAdm Angus Essenhigh (UK National Hydrographer), RAdm Luigi Sinapi (IHO Director) and Dr. Diane Dumashie (FIG President).

(from left to right) Mr. Mitsuyuki Unno - RAdm Angus Essenhigh - RAdm Luigi Sinapi - Dr. Diane Dumashie.

Presentations given by RAdm (ret.) Mustafa Iptes (Former IHO Director) and Mr. Jeffery Bryant (Former UKHO Coordinator) informed the participants about the background and history of the IHO-NF cooperation from each perspective, and the presentation by Mr. Yu Nakahiro (the representative of the Nippon Foundation) introduced the Nippon Foundation, its organization, the respective primary source of funding and the major initiatives to the Human Capacity Building at a Global Scale.

(from left to right) RAdm (ret.) Mustafa Iptes - Mr. Jeffery Bryant - Mr. Yu Nakahiro.

Dr. Diane Dumashie (FIG President) presented on People, Planet & Partnership Working Tackling the Global Challenges, providing an overview of the FIG, its trends and objectives for tackling the global challenges of the future according to FIG. Mr. Gordon Johnston and Mr. Adam Greenland (IBSC Members) provided an overview of the IBSC, the standards and the recognized programmes, the challenges and what they do. Mr. Jamie McMichael-Phillips (Nippon Foundation-GEBCO Seabed 2030) provided an overview and update of the Nippon Foundation-GEBCO Seabed 2030 Project with the beginning of GEBCO and Nippon Foundation-GEBCO Seabed 2030 Project as well as the Ocean Decade challenges and also updated the figures on evolution of the GEBCO Map, which is 24.9%.

Mr. Leonel Manteigas provided an overview of the IHO Capacity Building Work Programme and Strategy, the importance of GEOMAC Project and new Capacity Building initiatives with the figures related with the alumni. Ms. Lucy

Fieldhouse (UKHO) had an administrative overview of the GEOMAC Project such as the annual schedule and logistic arrangements. Also, Mr. Jeremy Kitcher (UKHO) presented the academic overview of the GEOMAC Project such as online pre-learning, new modules of collaboration modules led by Ocean wise and Seabed 2030 and the Digital Twins module. Mr. Kazufumi Matsumoto conducted a questionnaire regarding alumni' careers and follow-up thoughts of the course before the seminar and summarized the results. One of the alumni, Ms. Clarizza Mae Biong, made a presentation on the Workshop on Nautical Charting Fundamentals and S-57 Data Capture - NAMRIA Experience and another alumnae, Lizardo Caro, presented a project of Drift Buoy Developed to Emulate Oil Spills.

Group work (presentation).

On the second day, group work was conducted by the alumni. The alumni were divided into eight groups, each with alumni from different countries. Each group discussed one of four marine-related topics, sharing their experiences and made short presentations.

Group work (discussion).

In the last session, Mr. Leonel Manteigas introduced examples of alumni achievements in relation to the impact of the GEOMAC Project and summarized the seminar. Finally, the seminar was concluded by RAdm Luigi Sinapi with a speech dedicated to the way ahead and the closing remarks.

On the third day, the alumni participated in a social tour of the Cutty Sark ship, the National Maritime Museum and the Royal Observatory in Greenwich, which are deeply related to hydrography and nautical cartography and contributed to their cultural development.

Participants of IHO-NF Alumni Seminar (in front of the Royal Observatory).

The Seminar was an opportunity to assess the retention of the alumni as more than 90% of them are still working in their hydrographic services or related government sector. The NF so far has funded 99 people from 51 countries through the IHO Capacity Building Programme.

Presentations and speeches provided at the Seminar will be available on the IHO web site at: https://iho.int/iho-nf-geomac-project

The Nippon Foundation-GEBCO Alumni Conference 2023

The Nippon Foundation-GEBCO Alumni Conference was held in Tokyo, from 31 July – 3 August 2023.

Participants of the Nippon Foundation – GEBCO Alumni Conference 2023.

The organizers of The Nippon Foundation-GEBCO Alumni Conference 2023 extended a warm welcome to the attendees in Tokyo, emphasizing the significance of the event and the progress made in ocean mapping. The welcome addresses were provided by Yohei SASAKAWA Chairman, The Nippon Foundation and Evert FLIER, Chair of the GEBCO Guiding Committee. They highlighted that GEBCO celebrates 120 years of ocean discovery which represented a milestone worth commemorating

and highlighted the dramatic changes in the scientific, political, and media landscape surrounding ocean mapping since their 100-year celebration. Particular note was made of the increased attention from politicians and the public due to global initiatives like the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, and the new UN High Seas Treaty. Further, GEBCO, once a niche and little-noticed activity, has now become an integral part of the UN Decade of Ocean Science, underscoring the need for a comprehensive map of the ocean seabed for sustainable ocean management.

The welcome addresses conveyed gratitude to the organizing committee for their dedication in planning and organizing the event. It was again emphasized that while precise maps have been created for Earth's terrestrial landscape, and even for extra-terrestrial bodies like the Moon and Mars, the ocean remains largely unexplored. This reality belies the ocean's fundamental importance for our survival and the planet's identity as the "Blue planet".

The Conference saw a range of ocean experts brought together to tackle head on the challenges associated with ocean mapping, explore the latest innovations in technology and identify projects and initiatives that could be taken forward by the Alumni in the future. The conference Keynote addresses were provided by Rachael DEMPSEY, Deputy Assistant Administrator, NOAA, Professor Ronan LONG, Director, WMU-Sasakawa Global Ocean Institute, and Professor Larry MAYER, Director, CCOM/JHC, UNH. A summary video of the conference is available here.

IHO Assistant Director Sam HARPER joined Jamie MCMICHAEL-PHILLIPS (Director NF-GEBCO Seabed 2030 Project), David MILLAR (Government Accounts Director, Fugro) and Nicole YAMASE (Science Advisor, Blue Prosperity Micronesia) to form the first panel discussion on the “Needs of the Ocean Economy”.

Further panel discussions were held focusing on “Technology - latest autonomous and remote marine technology” (ROVs, robots, AUVs, crowdsourcing bathymetry, etc.), “Sustainable Development” (Climate Change Impacts, Mapping in Polar Regions, Renewable Energy) and “Marine Education/Capacity Building for the Next Generation”.

Visit to the University of Southern Mississippi (USM) facilities and the Graduation Ceremony of the Category "A" Master of Science in Hydrographic Science at the University of Southern Mississippi, USA, 31 July – 2 Aug 2023.

The Graduation Ceremony of the Category "A" Master of Science in Hydrographic Science and Category "B" Bachelor of Science in Marine Science (Hydrography) was held at the University of Southern Mississippi (USM), USA on 1 August 2023. One student from Guatemala graduated from the Category "A" Master of Science in Hydrographic Science Programme under the IHO-Republic of Korea (ROK) Programme of Technical Cooperation.

Participants at the graduation ceremony at USM.

The ceremony was hosted by Dr Leila Hamden, Associate Vice President Research, Coastal operations of the USM, and moderated by Prof Stephan Howden, Director Hydrographic Science Research Center of the USM. Fifteen students graduated from the Master of Science in Hydrographic Science this year, including one supported by the IHO-ROK Programme and two by the U.S. Navy. Three students graduated from the Bachelor of Science in Marine Science. Two representatives from sponsoring countries (Mr Sangkil Lee, Counsellor of ROK Embassy in the U.S. and Dr Joe Calantoni, Technical Director, U.S. Navy Naval Meteorology and Oceanography Command) attended the ceremony. The IHO Secretariat was represented by Director Luigi Sinapi.

Since 2000, the USM has been organizing the Category "A" Master of Science course in Hydrographic Science, recognized by the IBSC (FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers). The IHO-ROK Technical Cooperation Programme under the Memorandum of Understanding between the IHO and ROK commenced with supporting

students to attend the course from 2013 to contribute to the IHO Capacity Building Programme.

The number of successful graduate students from the programme totals 21, including one from the 2022-2023 academic year, from 13 IHO Member States (Bahrain, Bangladesh, Estonia, Guatemala, Jamaica, Malaysia, Mauritius, Mexico, Nigeria, Philippines, Romania, Thailand and Tunisia). The Korea Hydrographic and Oceanographic Agency (KHOA), in collaboration with the International Hydrographic Organization, has planned a workshop in September 2023 in Busan (Republic of Korea) for the international students of the IHO-ROK Program of Technical Cooperation to celebrate the anniversary of the first 10 years since the signing of that agreement between the Republic of Korea and the IHO that started the IHO-ROK Program of Technical Cooperation.

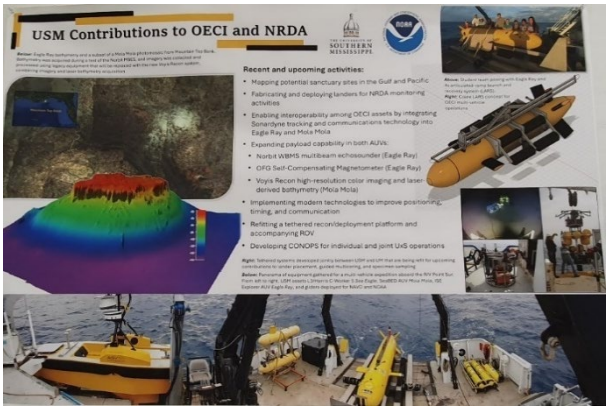
Dr Leila Hamden, Associate Vice President Research, Coastal operations of the USM congratulated the graduates and introduced the programme while underlining the increasing demand for competent and highly qualified hydrographers in many fields such as government agencies and industry. IHO Director Luigi Sinapi thanked the USM and the Republic of Korea for this successful program since the 2013-14 academic year, highlighting that the program is a reference in the hydrographic training at international level, capable not only of keeping up with the times, but also and above all, of responding to the ever-increasing demands for training and work coming from the civil and military world, in line with the need to respect the marine environment and those challenges that the humanity is facing in the field of Climate Change and a wise and respectful exploitation of the Ocean. Counsellor Mr Lee from the ROK Embassy to the USA echoed the significance of collaboration of the three organizations behind the Category A programme at the USM and pledged continued support for the Capacity Building programme on behalf of the Director General of KHOA. Dr Calantoni, Technical Director U.S. Navy Naval Meteorology and Oceanography Command presented the “Hydrographer of the Navy Education Award” to Mr Peter Irewole Komolafe (Nigeria), as Mr Komolafe had shown outstanding performance during the 2022-23 academic year.

The ceremony was preceded (31 July) and followed (2 August) by a visit to the USM facilities distributed between the Port of Gulfport, the USM Gulf Park Campus and the Stennis Space Center in Mississippi. Prof Leonardo Macelloni, Associate Director Hydrographic Science Research Center and Mr Marco D’Emidio, Senior Research Scientist, illustrated the functions of new Marine Research Center (MRC) in the Port of Gulfport, the new programme to release

Highlights of the Ceremony.

P-7

the certificates on Uncrewed Maritime Systems (UMS) performed at USM Gulf Park Campus, and then the oceanographic support facility at the Stennis Space Center. The visit concluded with an informal meeting with representatives of the U.S. Navy Naval Meteorology and Oceanography Command (CNMOC) to illustrate the ongoing and future development cooperation between the USM and CNMOC in the field of education and training in Hydrography.



Programme on Uncrewed Maritime Systems (UMS) at the USM Gulf Park Campus.

"IHO-ROK Cat. Alumni Workshop" – Busan, Republic of Korea, 12-September 2023

The 1st IHO-ROK Cat. A Alumni Workshop was held at the Paradise Hotel, Busan, Republic of Korea from 12 to 14 September 2023 in accordance with the Memorandum of Understanding between the ROK and the IHO on support for the IHO Capacity Building programme. The Workshop was hosted by the Korean Hydrographic and Oceanographic Agency (KHOA) of the Republic of Korea. 12 Alumni from 9 IHO Member States (Bangladesh, Estonia, Guatemala, Malaysia, Mauritius, Mexico, Nigeria, Philippines, Thailand), Prof. Stephan Howden, Director Hydrographic Science Research Center of the University of Southern Mississippi (USM) and Mr. Alberto Costa Neves, former Coordinator Category "A" Master of Science course in Hydrographic Science at the USM, participated at the Workshop. The IHO Secretariat was represented by Director Luigi Sinapi and Assistant Director Leonel Manteigas.

Director General KHOA Mr Cheoljo Lee opened the Workshop, welcoming the participants and thanking the IHO, the USM and the Alumni for their presence. He highlighted the importance of the cooperation between the

Director General KHOA Lee and IHO Director Sinapi delivering their keynote speech.

institutions involved in the management of the Category "A" Master of Science course in Hydrographic Science at the USM. He underlined that the Workshop represents an outstanding example of how much the IHO and the ROK invest in education and training, supporting the international hydrographic community.

IHO Director Luigi Sinapi thanked the Republic of Korea and KHOA for the continuous and unique support to the International Hydrographic Community and the IHO Capacity Building programme, and for the outstanding organization of the Workshop. He affirmed that the IHO-ROK Program of Technical Cooperation is referenced in the hydrographic training at the international level, capable not only of keeping up with the times, but also and above all of responding to the ever-increasing demands for training and work coming from the civil and military world, in line with the need to respect the marine environment and those challenges that the humanity is facing in the field of Climate Change and a wise and respectful use of the Ocean.

Participants at the IHO-ROK Cat. A Alumni workshop.

Following the opening ceremony, the 1st day of the Workshop featured a series of presentations on the "KHOA and its main activities in the hydrographic and oceanographic fields", with a special focus on capacity building activities, the "IHO Capacity Building Strategy and Programme", and the "IHO-ROK Hydrographic Science Capacity Building at the Joint International Applied Science Programme (JIHASP) at the University of Southern Mississippi". Following this, Mr. Costa Neves introduced the 12 Alumni present at the Workshop, inviting them to report on their educational and work experiences during the Master's programme at USM and at the national Hydrographic Services where they work. This session was a special gathering, as it allowed to discuss the different experiences in the fields of Hydrography and Nautical Cartography at national, regional and international level by young Hydrographers coming from all over the world.

Participants at the Workshop inside and outside the Paradise hotel in Busan (ROK).

The morning of the 2nd day of the Workshop focused on technical presentations about the "Mauritius Hydrographic Service", the "National Hydrographic Office challenges and future directions", the surveys using "Photogrammetry and LIDAR techniques and the comparison of the data obtained", the "S-100 application status and plan in hydro and maritime safety domain in Korea" and finally the "Importance of MSDI". The presentations fuelled a constructive discussion among those present, highlighting the differences in approaches and views of representatives of Hydrographic Services.

The afternoon and evening of the 2nd day of the Workshop and the entire 3rd day were dedicated to visiting the cultural attractions in and around Busan and the banquet offered by the KHOA. These moments represented a unique opportunity for the students to consolidate interpersonal relationships in the spirit of the most genuine international cooperation.

Alumni on cultural visits to Busan and the banquet offered by the KHOA.

The 1st IHO-ROK Cat. A Alumni Workshop marked the anniversary of 10 years of an international unparalleled worldwide experience in the field of hydrographic training, as well as represented a symbolic but extremely important moment for the Alumni to establish a network and confirm once again the validity of a story of success, counting already in total 23 Alumni from 14 IHO Member States.

High level technical visit to Santo Domingo, DOMINICAN REPUBLIC

Following the planned IHO CBWP 2023 High Level Technical Visit to the Dominican Republic, and the invitation of the *Hydrographic and Oceanographic Service of the Armada*, the IHO paid a High Level Technical Visit to the Dominican Republic on 23 and 24 November. The role of Hydrography in the sustainable development of the oceans and the new challenges for the IHO and Hydrographic Offices in the United Nations Decade of Sciences for Sustainable Development (2021-2030), the importance of Hydrographic Services at national, regional and international levels, and their role in the sustainable development of national economies, with reference to the Hydrographic and Oceanographic Service of the Dominican Republic were discussed. The IHO Secretariat was represented by Director Luigi Sinapi, accompanied by Ms Lucy Fieldhouse, Vice Chair of the IHO Capacity Building Sub-Committee (CBSC).

Some articles published in the days before the HLTV.

This was the first high-level visit conducted by a member of the IHO Directing Committee, and it was preceded by a strong media campaign in the national media and via social media to highlight its importance and uniqueness. The visit enabled the IHO delegation to learn more about the status of hydrography within the country, as well as to highlight the benefits of hydrography on sustainable development for a country whose economy is so closely linked to the Ocean.

Visits to the Commander General of the Armada, Minister of Defense, President of Senate

During the visit, the IHO delegation met with the highest military, administrative, maritime, legislative and executive officials of the Dominican Republic, including the Commander General of the Armada Vice Admiral Agustín Alberto Morillo Rodríguez, the Minister of Defence Lieutenant General Carlos Luciano Díaz Morfa, the Minister of the Presidency of the Republic Mr José Ignacio Paliza, the Executive Director of the Dominican Port Authority Mr Jean Luis Rodríguez, the President of the Senate of the Republic Hon. Ricardo de los Santos and the President of the Chamber of Deputies Hon. Alfredo Pacheco, together with the Senators and Deputies Chairmen of the Senate and Chamber Committees concerned with sea-related issues, and finally the Constitutional President of the Dominican Republic Mr Luis Rodolfo Abinader Corona as the highest State Official. His Excellency Stefano Queirolo Palmas, Ambassador of Italy to the Dominican Republic, also participated in some meetings, at the invitation of the Dominican authorities. The visit concluded with an interview with Director Sinapi by radio station Z-101, and a lecture by Director Sinapi to the officers of the Armada and representatives of the Dominican Government.

All the interlocutors recognised the importance of hydrography as a foundational tool to guarantee the safety of navigation and the sustainable development of the country in a period of strong maritime expansion that sees the Dominican Republic committed to becoming the first tourist and commercial hub in the Caribbean. Furthermore, it was fully recognized that the consolidation and growth of the country's hydrographic capabilities cannot disregard urgent investments in training and equipment, as well as the full participation of its national Hydrographic Office in IHO activities and programmes at the international and regional levels, the latter through the Meso-American and Caribbean Regional Hydrographic Commission (MACHC).

Meeting with the Constitutional President of the Dominican Republic Mr Luis Rodolfo Abinader Corona.

At the end of the individual meetings with the above-mentioned authorities, the commitment of the national Hydrographic Service at Ministry of Defence level was confirmed, as well as the full willingness to financially support the development of the country's hydrographic capabilities, to approve new legislative instruments to consolidate the role of the Hydrographic Office at a national level, and finally - on the part of the Constitutional President of the Dominican Republic - to urgently initiate a plan to strengthen the equipment necessary to carry out hydrographic surveys through new funding.

Interview with radio station Z-101.

During the Dominican radio Z-101 interview (cfr.https://youtu.be/I9zXYOT-VQs4?si=KV4MT_qx2dejyT4P), Director Sinapi detailed the importance and the benefits for the Dominican Republic to be one of the 99 IHO Member States, and the role and the duties of a Hydrographic Office in ensuring safety of navigation. Referring to the Dominican Republic's extended Economic Exclusive Zone (EEZ), over which it has the full right to exploit potential resources on and in the seabed, Director Sinapi highlighted the importance of hydrography in supporting economic growth to the audience which included high level hydrographic personnel serving in the Hydrographic Office, many of whom were certified by institutions that are recognized hydrographic and cartographic courses.

Finally, Director Sinapi provided a lecture entitled "HYDROGRAPHY: SUPPORTING SUSTAINABLE DEVELOPMENT AT NATIONAL, REGIONAL AND GLOBAL LEVELS" to the officers of the Armada and representatives of the Government of the Dominican Republic. That was a unique moment to illustrate the strategic objectives and future challenges of the IHO and their impact at international, regional and national levels, as well as answering numerous questions regarding Hydrography and its positive impact on the sustainable development of the country and the protection of the marine environment.

The conference was followed by local press coverage, including "*La Republica*", one of the country's most widely read periodicals, which summarised the results and value of the Visit, reporting that the IHO Director recalled that the Hydrographic Offices are the main support for sustainable development of the countries, considering the direct relationship that exists between the safety of navigation and the distribution of trade relations with the outside world. Furthermore, it is essential for the States to allocate economic funds to the investment of hydrographic surveys, through a strategy focused on consolidating human capital: this will have a positive impact on all productive activities related to the sea and maritime services that constitute, in an island country like the Dominican Republic, the sustainable development of the Country.


Listín Diario

LA REPÚBLICA

Gobierno Política Congreso Educación Ciud

RD necesita actualizar rutas de navegación por sus mares

La Armada de la República Dominicana (ARD) realizó ayer una conferencia en la Base Naval 27 de Febrero sobre el "Papel de la Hidrografía en el Desarrollo Sostenible de los Océanos".

"La Republica" - Article on the Conference held on 24th November 2023 at the Naval Base of the Armada of the Dominican Republic

Conference to the Armada officers and Dominican Government representatives.

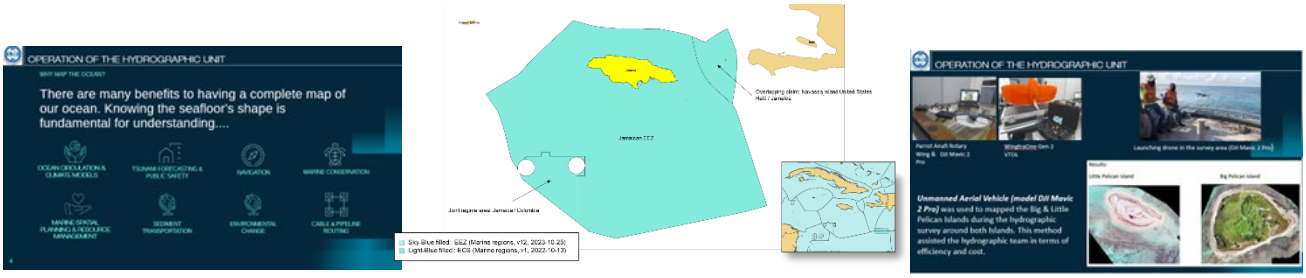
High level technical visit to Kingston,JAMAICA

Following the planned IHO CBWP 2023 High Level Technical Visit to Jamaica, and the invitation of the *National Land Agency (NLA)*, the IHO paid a High-Level Technical Visit to Jamaica from 5 to 7 December. The importance and the objectives of the IHO Capacity Building programme, the role of Hydrography in supporting sustainable development at national, regional and global level, with reference to the NLA and its Survey and Mapping Division, and the digital transformation and wider use of data with specific reference to the development of the Universal Hydrographic Data Model S-100 and the derived products and services, the Marine Spatial Data Infrastructure (MSDI) and the importance of the implementation of the UNGGIM principles and the Integrated Geospatial Information Framework (IGIF) at national and regional levels, were discussed. The IHO Secretariat was represented by Director Luigi Sinapi, accompanied by Ms Lucy Fieldhouse, Vice Chair of the IHO Capacity Building Sub-Committee (CBSC).

HLTV Agenda – IHO delegation and NLA CEO (left) and Group photo of participants (right).

The first two days of the visit were attended by representatives of the National Land Agency (NLA) as the executive agency of the Government of Jamaica in charge of conducting hydrographic activities, the National Hydrographic Committee (NHC) as a cabinet advisory council in the Ministry of Foreign Affairs and Foreign Trade acting as the national coordinator for hydrography and maritime spatial data within the Government of Jamaica, the Jamaica Defence Force Coast Guard, the Maritime Authority of Jamaica, which administer the registration of ships, regulate the certification of seafarers and the safety of shipping with regard to the construction of ships and navigation, the University of Technology of Jamaica as an institution committed to the development of teaching in Hydrography, and then the Advisor/Consultant of the Minister of Economic Growth and Job Creation upon which the NLA depends. The day of 7 December was entirely dedicated to courtesy visits by the IHO delegation to the above-mentioned institutions, including the Ministry of Economic Growth and Job Creation and the Ministry of Foreign Affairs and Foreign Trade

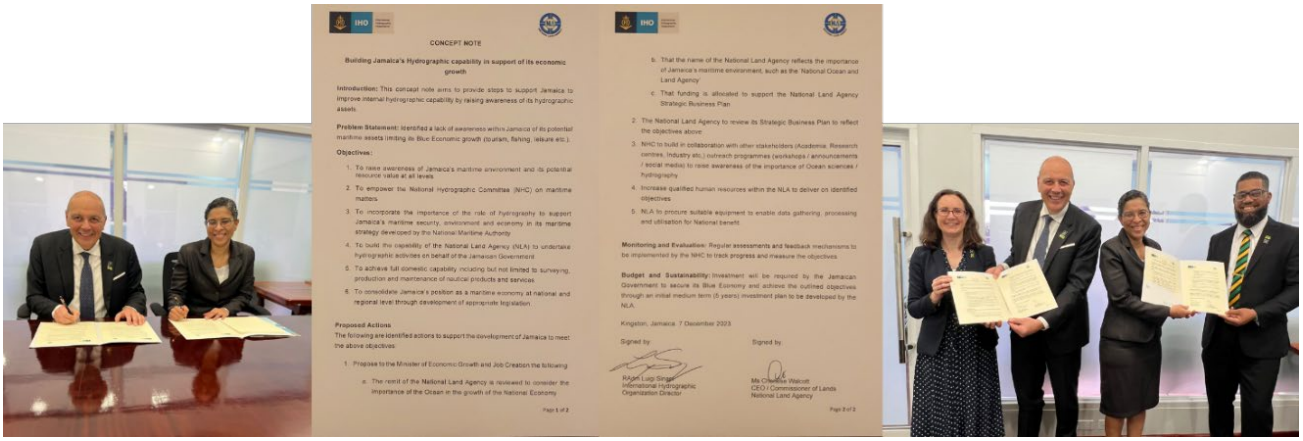
The main topics discussed during the first two days of the Visit were the sustainable use of the Ocean, the safety of navigation, and the need to improve the capabilities of the NLA Survey and Mapping Division which serves as the National Hydrographic Office. Particular attention was paid to the organization of Jamaica's hydrographic activities, with reference to the capacities present at the national level against the potential resources and the extension of the waters under national jurisdiction up to the outer limit of the EEZ declared by Jamaica, equivalent to twenty-five times its land area, and to the benefits that a developed Hydrographic Office with the necessary human, technical and financial resources can ensure for the economic development and Blue Growth of the country. In this regard, the overview of the national hydrographic capacity and organizational structure was completed by the presentations of the NLA and NHC representatives. It was deemed essential to improve the national hydrographic capability through a specific strategy that invests financial and human resources in consolidating and strengthening the National Hydrographic Office, making it increasingly autonomous in its capacity to carry out and improve hydrographic surveys and produce nautical documentation (nautical cartography and aids to navigation). This will have a positive impact on all productive activities related to the sea and maritime services that



Jamaican's EEZ – Hydrography and Blue Economy.

are critical to the sustainable economic development of the country.

At the proposal of the IHO Director, a *"Concept Note - Building Jamaica's Hydrographic capability in support of its economic growth"* was prepared and signed by the IHO Director Luigi Sinapi and the NLA CEO Ms Cheriese Walcott to the attention of the relevant Ministries of the "Economic Growth and Job Creation" and "Foreign Affairs and Foreign Trade".


CONCEPT NOTE

Building Jamaica's Hydrographic capability in support of its economic growth

Introduction: This concept note aims to provide steps to support Jamaica to improve internal hydrographic capability by raising awareness of its hydrographic assets.

Problem Statement: Identified a lack of awareness within Jamaica of its potential maritime assets (Hitting its Blue Economic growth (tourism, fishing, leisure etc.).

Objectives:

1. To raise awareness of Jamaica's maritime environment and its potential resource value at all levels
2. To empower the National Hydrographic Committee (NHC) on maritime matters
3. To incorporate the importance of the role of hydrography to support Jamaica's maritime security, environment and economy in its maritime strategy developed by the National Maritime Authority
4. To build the capability of the National Land Agency (NLA) to undertake hydrographic activities on behalf of the Jamaican Government
5. To achieve full domestic capability including but not limited to surveying, production and maintenance of nautical products and services
6. To consolidate Jamaica's position as a maritime economy at national and regional level through development of appropriate legislation

Proposed Actions

The following are identified actions to support the development of Jamaica to meet the above objectives:

1. Propose to the Minister of Economic Growth and Job Creation the following:
   a. The remit of the National Land Agency is reviewed to consider the importance of the Ocean in the growth of the National Economy
   b. That the name of the National Land Agency reflects the importance of Jamaica's maritime environment, such as the National Ocean and Land Agency
   c. That funding is allocated to support the National Land Agency Strategic Business Plan
2. The National Land Agency to review its Strategic Business Plan to reflect the objectives above
3. NHC to build in collaboration with other stakeholders (Academia, Research centres, Industry etc.) outreach programmes (workshops / announcements / social media) to raise awareness of the importance of Ocean sciences / hydrography
4. Increase qualified human resources within the NLA to deliver on identified objectives
5. NLA to procure suitable equipment to enable data gathering, processing and utilisation for National benefit

Monitoring and Evaluation: Regular assessments and feedback mechanisms to be implemented by the NHC to track progress and measure the objectives

Budget and Sustainability: Investment will be required by the Jamaican Government to secure its Blue Economy and achieve the outlined objectives through an initial medium term (5 years) investment plan to be developed by the NLA

Kingston, Jamaica 7 December 2023

Signed by:

Signed by:

Rear Luigi Sinapi
International Hydrographic Organization Director

Ms Cheriese Walcott
CEO / Commissioner of Lands
National Land Agency

IHO Director and NLA CEO sign the "Concept Note - Building Jamaica's Hydrographic capability in support of its economic growth.

The Concept Note aims to provide steps to support Jamaica for the improvement of internal hydrographic capability by raising awareness of its hydrographic assets, through the achievement in the medium term (five years) of specific objectives such as: to raise awareness of Jamaica's maritime environment and its potential resource value at all levels, to empower the National Hydrographic Committee on maritime matters, to incorporate the importance of the role of hydrography to support Jamaica's maritime security, environment and economy in its maritime strategy developed by the National Maritime Authority, to build capability of the NLA to undertake hydrographic activities on behalf of the Jamaican Government, to achieve full domestic capability including but not limited to surveying, production and maintenance of nautical products and services, and then to consolidate Jamaica's position as a maritime economy at national and regional level through development of appropriate legislation. To reach the mentioned objectives, the Note proposes to review the remit of the NLA in order to consider the importance of the Ocean in the growth of the National Economy, to re-name the NLA to reflect the importance of Jamaica's maritime environment, such as the *"National Ocean and Land Agency – NOLA"*, to allocate funds to support the NLA Strategic Business Plan and review it in order to reflect the objectives, to raise awareness of the importance of Ocean sciences / hydrography via outreach programmes, and then to increase qualified human resources within the NLA to deliver on identified objectives and to procure suitable equipment to enable data gathering, processing and utilisation for national benefit.

During the courtesy visits of 7 December, the IHO delegation was received by Mrs Arlene Williams, Permanent Secretary of the Minister of Economic Growth and Job Creation, to whom the Concept Note was handed over. She appreciated the work done during the two-day meeting with key stakeholders in Jamaica's marine and maritime fields, recognising the need to invest in the country's hydrographic sector, and mandating the Ministry's staff to put in place the roadmap set out in the Concept Note and present the first results at the meeting with the Minister of Economic Growth and Job Creation scheduled for January 2024. Hon. Alando Terralonge, State Minister of the Ministry of Foreign Affairs and Foreign Trade welcomed the IHO delegation, commending the work of the International Hydrographic Organization for assuring a healthier and more protected ocean, as the main source of life and wellbeing for the planet. He also appreciated the efforts made by the IHO delegation and NLA, as a clear example of fruitful cooperation at international and national level, recognizing the tangible link between a well-developed and autonomous national hydrographic capability and the sustainable and economic growth of the Country.

IHO Director and Minister of State of the Ministry of Foreign Affairs and Foreign Trade (left) and the Permanent Secretary of the Minister of Economic Growth and Job Creation (right).

Courtesy visits to the Defence Force Coast Guard, Maritime Authority of Jamaica and then Port Authority of Jamaica concluded the HLTV, with the common hope that the Hydrographic Office of Jamaica can continue on the path it has embarked upon and increase its active participation at the regional level within the MACHC and at the international level within the framework of ongoing initiatives in the fields of ocean mapping, digital transformation and wider use of data.

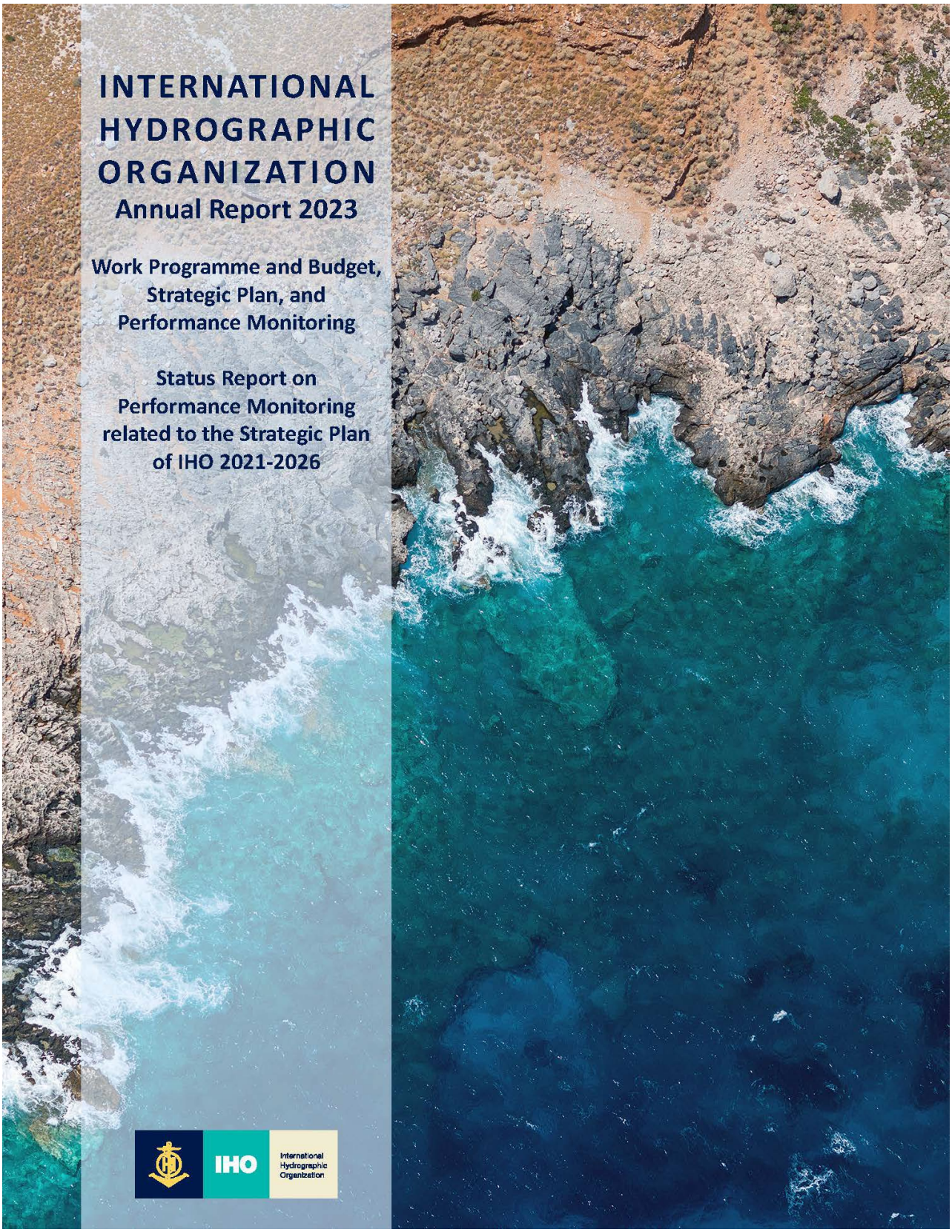
New and Revised IHO Publications

The following new IHO publications or revised editions were issued during 2023 and are available from the IHO website.

DATE	ANNOUNCED VIA CL	TITLE
12/10/2023	CL33/2023	Adoption of edition 3.0.0 of IHO Publication C-17- Spatial Data Infrastructures "The Marine Dimension" - Guidance for Hydrographic Offices.
31/10/2023	CL36/2023	Adoption of Edition 5.1.0 of IHO Publication S-100 – Universal Hydrographic Data Model.

NB: The following publications are continuously updated:

- B-8 - Gazetteer of Geographical Names of Undersea Features
- C-55 - Status of Hydrographic Surveying and Nautical Charting Worldwide
- P-5 - IHO Yearbook
- S-32 - Hydrographic Dictionary
- S-62 - List of Data Producer Codes


INTERNATIONAL HYDROGRAPHIC ORGANIZATION
Annual Report 2023
Work Programme and Budget, Strategic Plan, and Performance Monitoring
Status Report on Performance Monitoring related to the Strategic Plan of IHO 2021-2026
IHO
International Hydrographic Organization

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Background

The IHO Strategic Plan 2021 – 2026 comprises four sections:

I **Preamble** – introduction to the IHO, its vision, mission, and objects. The wording is drawn from the Convention on the IHO.

II **Challenges** – overview of the strategic context within which the IHO and Member States operate now and will operate in the near future and how this may impact activities.

III **Goals** – targets for 2026 and Strategic Performance Indicators.

IV **Implementation Framework** – briefly outlines how the plan is enacted and how progress with respect to the plan is reviewed and monitored.

To face the challenges described under section II, the plan is structured through three overarching goals, focusing the exercise of its mission during this period. Under the three goals, the Organization has identified targets to be reached by 2026.

The Strategic Plan is design to focus on three most relevant goals to be addressed in the two trienniums but is not a comprehensive description of the full scope of IHO activities, which is fully covered in its Work Programme. The Assembly endorsed the alignment of the 2024 and three-year IHO Work Programme 2024-2026 with the Strategic Plan, while keeping the current structure of the Work Programme to facilitate the operational work and implementation by the Secretariat.

GOAL 1 Evolving the hydrographic support for safety and efficiency of maritime navigation, undergoing profound transformation.

On-going transformation in navigation, such as e-navigation, autonomous shipping, reduction of emissions, lead to profound evolution of hydrographic services, in a context of high demands for digital data.

Targets supporting Goal 1

- Deliver standards for hydrographic data and specifications of hydrographic products; support their regular production; and coordinate regional and global services for their provision.
- Develop standards, specifications and guidelines in the areas of data assurance, including cyber security and data quality assessment.
- Use capacity building and training to develop and increase the ability of Member States to support safety and efficiency of maritime navigation.

Strategic Performance Indicators validating the targets supporting Goal 1

SP 1.1.1 Percentage of Member States having operationalized production and distribution of hydrographic data products and services based on IHO Universal Hydrographic Data Model (S-100), under an implementation framework of coordination and agreed timelines.

SP 1.1.2 Number of hydrographic data products and services based on Universal Hydrographic Data Model that cater for the new requirements: autonomous shipping, reduction of emissions.

SP 1.2.1 Percentage of hydrographic data products and services based on S-100 model that are covered by IHO standards, specifications and guidelines on cyber security.

SP 1.2.2 Percentage of navigationally significant areas (e.g. charted traffic separation schemes, anchorages, channels) for which the adequacy of the hydrographic knowledge is assessed through the use of appropriate quality indicators.

SP 1.3.1 Ability and capability of Member States to meet the requirements and delivery phases of the S100 implementation plan.

Strategic Performance Indicators for Goal 1

Work Programme Tasks related to SPI 1.1.1 and 1.1.2

1.1 Co-operation with International Organizations and participation in relevant meetings
1.4 Work Programme & Budget, Strategic Plan and Performance Monitoring
2.1 Programme Coordination
2.2 Foundational Nautical Cartography Framework
2.3 S-100 Framework
2.4 S-57 Framework
2.5 Support the implementation of e-navigation and Marine Spatial Data Infrastructures (MSDI)
3.4 Coordination of Global Surveying and Charting Coverage
3.5 Maritime Safety Information

SPI 1.1.1	Metrics	Member States distribute at least one product based on S-100.						
	Year	2021	2022	2023	2024	2025	2026	60%[2]
		0%	0%	0%	-	-	-	60%[2]

SPI 1.1.2	Metrics	Product Specifications should be operational (e.g. Edition 2.0.0 approved by Member States.)						
	Year	2021	2022	2023	2024	2025	2026	10[3]
		0	0	0	-	-	-	10[3]

Work Programme Tasks related to SPI 1.2.1 and 1.2.2

1.1 Co-operation with International Organizations and participation in relevant meetings
1.4 Work Programme & Budget, Strategic Plan and Performance Monitoring
2.1 Programme Coordination
2.2 Foundational Nautical Cartography Framework
2.3 S-100 Framework
2.4 S-57 Framework
2.5 Support the implementation of e-navigation and Marine Spatial Data Infrastructures (MSDI)
2.6 Hydrographic Surveying
2.8 Other technical standards, specifications, guidelines and tools
3.4 Coordination of Global Surveying and Charting Coverage
3.5 Maritime Safety Information

SPI 1.2.1	Metrics	10 Product Specifications (same as in SPI 1.1.2) includes cyber security and data quality assessment.						
	Year	2021	2022	2023	2024	2025	2026	10[4]
		0	0	0	-	-	-	10[4]

SPI 1.2.2	Metrics	Navigationally significant areas: areas covered by ENCs in Usage Bands 5 to 3. Indicator: % data coverage in ENCs, where CATZOC value is other than U (Unassessed) and Unavailable.						
	Year	2021	2022	2023	2024	2025	2026	100%
	A-USCHC		83.3%	87,3%	-	-	-	
	B-MACHC		96.1%	97,7%	-	-	-	
	C1-SWAtHC		99.4%	99,4%	-	-	-	
	C2-SEPRHC		86.9%	87,4%	-	-	-	
	D-NSHC		99.5%	99,9%	-	-	-	
	E-BSHC		92.8%	91,3%	-	-	-	
	F-MBSHC		88.6%	89,8%	-	-	-	
	G-EAtHC		80.0%	79,4%	-	-	-	
	H-SAIHC		93.3%	93,3%	-	-	-	

[2]Based on 64 of 94 IHO Member States produce S-57 ENCs
[3]They are: S-101, S-102, S-104, S-111, S-122, S-124, S-127, S-128, S-129, S-131
[4]They are: S-101, S-102, S-104, S-111, S-122, S-124, S-127, S-128, S-129, S-131

Work Programme Tasks related to SPI 1.2.1 and 1.2.2

	I-RSAHC	68.2%	67,4%	-	-	-
	J-NIOHC	68.3%	63,1%	-	-	-
	K-EAHC	51.4%	54,6%	-	-	-
	L-SWPHC	98.5%	98,8%	-	-	-
	M-HCA	79.0%	81,4%	-	-	-
	N-ARCH	18.0%	16,4%	-	-	-

Work Programme Tasks related to SPI 1.3.1

1.4 Work Programme & Budget, Strategic Plan and Performance Monitoring

3.2 Regional Hydrographic Commissions and the HCA

3.3 Capacity Building

SPI 1.3.1[1]	Metrics	Ability and capability of Member States to meet the requirements and delivery phases of the S100 implementation plan. Target 50%.						
	Year	2021	2022[1]	2023[2]	2024	2025	2026	50%
		-	Yes	53%	-	-	-	-

[1]The SPI measures the ability and capability to meet the requirements, not the production itself.

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GOAL 2 Increasing the use of hydrographic data for the benefit of society.

The ever-growing applications of marine data entails that IHO takes a more prominent role in cultivating the use of hydrographic data through cooperative and collaborative efforts and identifying the need for collecting more data.

Targets supporting Goal 2

- Build a portal to support and promote regional and international cooperation in marine spatial data infrastructures (MSDI).
- Promote new tools and methods to accelerate and increase coverage, consistency, quality of surveys in poorly surveyed areas.
- Apply UN shared guiding principles for geospatial information management in order to ensure interoperability and extended use of hydrographic data in combination with other marine-related data.

Strategic Performance Indicators validating the targets supporting Goal 2

SP 2.1.1 Number of hits downloading data/information from the portal.

SP 2.2.1 Percentage of adequately surveyed area per coastal state.

SP 2.2.2 Number of new applications of the new version of Standards for Hydrographic Surveys (S-44).

SP 2.3.1 Number of HOs reporting success applying the principles in their national contexts.

Strategic Performance Indicators for Goal 2

Work Programme Tasks related to SPI 2.1.1

1.4 Work Programme & Budget, Strategic Plan and Performance Monitoring
3.3 Capacity Building
3.7 Marine Spatial Data Infrastructures

SPI 2.1.1	Metrics	Portal in design phase, download counting technology to be implemented.					
	Year	2021	2022	2023	2024	2025	2026
		Number of hits downloading data/information from the portal					
		-	461	456	-	-	-

Work Programme Tasks related to SPI 2.2.1 and 2.2.2

1.4 Work Programme & Budget, Strategic Plan and Performance Monitoring
2.6 Hydrographic Surveying
2.8 Other technical standards, specifications, guidelines and tools
3.2 Regional Hydrographic Commissions and the HCA
3.3 Capacity Building
3.4 Coordination of Global Surveying and Charting Coverage
3.6 Ocean Mapping Programme
3.8 International Standards for Hydrographic Surveyors and Nautical Cartographers

SPI 2.2.1	Metrics	Technology to generate percentage figures from C-55 under discussion.					
	Year	2021	2022	2023	2024	2025	2026
		Percentage of adequately surveyed area per coastal state					
		Number of Coastal States within the percentage band of adequate surveyed areas (C55)					
	0%<= area< 25%, depth <200m		69	70	-	-	-
	0%<= area< 25%, depth >200m		82	81	-	-	-
	25%<= area< 50%, depth <200m		25	25	-	-	-
	25%<= area< 50%, depth >200m		20	20	-	-	-
	50%<= area< 75%, depth <200m		20	23	-	-	-

Work Programme Tasks related to SPI 2.2.1 and 2.2.2

	50%<= area< 75%, depth >200m	17	18	-	-	-	
	75%<= area< =100%, depth <200m	34	31	-	-	-	
	75%<= area< =100%, depth >200m	21	20	-	-	-	
		Number of RHCs within the percentage band of area mapped (GEBCO)					
	0%<= area< 25%, depth <200m	18	-	-	-	-	
	0%<= area< 25%, depth >200m	12	-	-	-	-	
	25%<= area< 50%, depth <200m	1	-	-	-	-	
	25%<= area< 50%, depth >200m	7	-	-	-	-	
	50%<= area< 75%, depth <200m	0	-	-	-	-	
	50%<= area< 75%, depth >200m	0	-	-	-	-	
	75%<= area< =100%, depth <200m	0	-	-	-	-	
	75%<= area< =100%, depth >200m	0	-	-	-	-	
SPI 2.2.2	Metrics	Number of downloads of S-44. New applications/survey methods/platforms used as a result of S-44 Edition 6.0.0.					
	Year	2021	2022	2023	2024	2025	2026
	Downloads/Applications	59/0	312/0	1312/0	-	-	-

Work Programme Tasks related to SPI 2.3.1

1.1 Cooperation with International Organizations and participation in relevant meeting

1.4 Work Programme & Budget, Strategic Plan and Performance Monitoring

3.7 Marine Spatial Data Infrastructures

SPI 2.3.1	Metrics	Extension of P-5 required.					
	Year	2021	2022	2023	2024	2025	2026
		Number of HOs reporting success applying the UN shared guiding principles for geospatial information management in order to ensure in their national contexts. % of Yes/Full (from 34 Member States)					
	Representation		72%	72%	-	-	-
	Governance		81%	81%	-	-	-
	Compliance		94%	94%	-	-	-

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GOAL 3 Participating actively in international initiatives related to the knowledge and the sustainable use of the Ocean.

IHO's ambition is to be an effective and recognized contributor to the major Ocean related challenges identified by the international community.

Targets supporting Goal 3

- Collaborate with other bodies who deliver capacity building and training to improve effectiveness of capacity building activities and programmes.
- Improve knowledge of the world's seafloors.
- Implement a comprehensive IHO digital communication strategy in order to enhance its visibility and accessibility to its work.

Strategic Performance Indicators validating the targets supporting Goal 3

SP 3.1.1 Percentage of Coastal States that are able to provide marine safety information (MSI) according to the joint IMO/IHO/WMO manual on MSI.

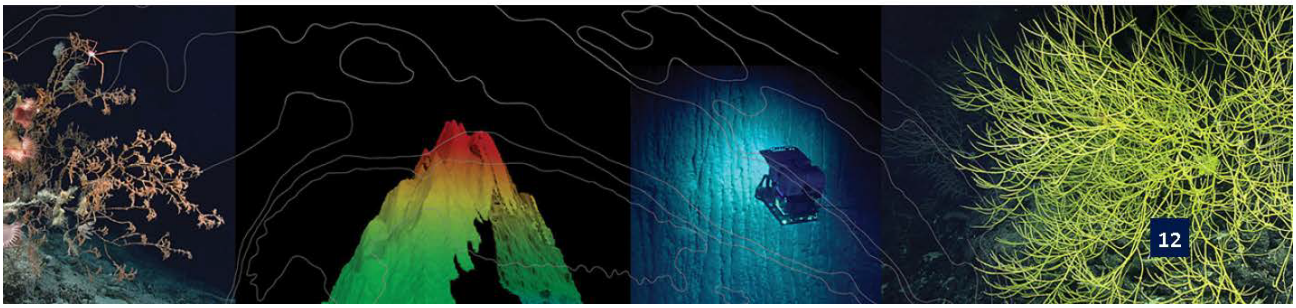
SP 3.2.1 Amount of data received per year by the IHO Data Centre for Digital Bathymetry (DCDB).

SP 3.2.2 Number of contributors to DCDB who are not hydrographic offices.

SP 3.2.3 Percentage of total sea area that is Seabed 2030 compliant for ingestion into the GEBCO dataset and services.

SP 3.3.1 Number of visits, likes, re-postings, etc. associated to the IHO social media sites.

SP 3.3.2 Volume downloaded from the IHO website and Geographical Information System (GIS).



Strategic Performance Indicators for Goal 3

Work Programme Tasks related to Secretariat's activities addressing Goal 3

1.3 Co-operation with International Organizations and participation in relevant meetings
3.6 Public Relations and Outreach
1.4 Work Programme & Budget, Strategic Plan and Performance Monitoring

Metrics	Notable activities undertaken under the IHO Work Programme 1 in four categories.					
Year	2021	2022	2023	2024	2025	2026
Global outreach	13	15	15	-	-	-
Regional outreach	4	4	4	-	-	-
Stakeholder's specific outreach	15	25	21	-	-	-
Consultations	2	2	6	-	-	-

Work Programme Tasks related to SPI 3.1.1

1.1 Co-operation with International Organizations and participation in relevant meetings
1.4 Work Programme & Budget, Strategic Plan and Performance Monitoring
3.1 Programme Coordination
3.2 Regional Hydrographic Commissions and the HCA
3.3 Capacity Building
3.6 Ocean Mapping Programme
3.7 Marine Spatial Data Infrastructures

SPI 3.1.1	Metrics	Percentage of Coastal States that are capable to provide marine safety information (MSI) according to the joint IMO/IHO/WMO manual on MSI [WWNWS and CBSC tasked to develop a collaborative approach how to measure and count.]						
	Year	2021	2022	2023	2024	2025	2026	90%
			62%	87%	-	-	-	

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Work Programme Tasks related to SPI 3.2.1, 3.2.2, and 3.2.3

1.1 Co-operation with International Organizations and participation in relevant meetings
1.4 Work Programme & Budget, Strategic Plan and Performance Monitoring
3.1 Programme Coordination
3.2 Regional Hydrographic Commissions and the HCA
3.6 Ocean Mapping Programme

SPI 3.2.1	Metrics	Amount of data received per year by the IHO Data Centre for Digital Bathymetry (DCDB tasked to start measurement.)					
	Year	2021	2022	2023	2024	2025	2026
	Datasets/Surveys		375	180	-	-	-
SPI 3.2.2	Metrics	Number of contributors to DCDB who are not hydrographic offices (DCDB tasked to measure.)					
	Year	2021	2022	2023	2024	2025	2026
			4	3	-	-	-
SPI 3.2.3	Metrics	Percentage of total sea area that is Seabed 2030 compliant for ingestion into the GEBCO dataset and services [DCDB tasked to start measurement in collaboration with BOC (UK).]					
	Year	2021	2022	2023	2024	2025	2026
			23,4%	24,9%	-	-	-

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Work Programme Tasks related to SPI 3.3.1 and SPI 3.3.2

1.2 Information Management
1.3 Public Relations and Outreach
1.4 Work Programme & Budget, Strategic Plan and Performance Monitoring
3.3 Capacity Building
3.4 Coordination of Global Surveying and Charting Coverage
3.6 Ocean Mapping Program

SPI 3.3.1	Metrics	Followers/Views on LinkedIn, Facebook and Twitter					
Year		2021	2022	2023	2024	2025	2026
in		4263/177,600	6525/245,573	8821/322,413	-	-	-
f		673/ 2049	954/2711	1267/27,680	-	-	-
X		566/77,200	973/58200	1175/62,100	-	-	-

SPI 3.3.2	Metrics	Volume downloaded from the IHO website and Geographical Information System (GIS)					
Year		2021	2022	2023	2024	2025	2026
IHO website views		380,946	863,322	921,575	-	-	-
User groups identified		5	-	-	-	-	-
Volume downloaded from GIS		-	-	-	-	-	-

List of IHO Secretariat Travel (2023)

DATE	NAME	MEETING	DESTINATION	COUNTRY
JANUARY				
30	SINAPI	MSDIWG14, OGC-MWG and UN GGIM WG MGI	Genoa	ITALY
30 - 03	MANTEIGAS	MSDIWG14, OGC-MWG and UN GGIM WG MGI	Genoa	ITALY
30 - 03	BAEK	MSDIWG14, OGC-MWG and UN GGIM WG MGI	Genoa	ITALY
FEBRUARY				
07 10	SINAPI	PMB 13	Busan	KOREA
07 10	MANTEIGAS	PMB 13	Busan	KOREA
13 15	KAMPFER	EAHC SC0	Yogyakarta	INDONESIA
15 17	KAMPFER	EAHC SC9	Yogyakarta	INDONESIA
20 21	BAEK	OGC125	Frascati	ITALY
20 23	SINAPI	WENDWG 13	Aalborg	DENMARK
20 23	GUILLAM	WENDWG 13	Aalborg	DENMARK
20 24	HARPER	WMO SC	Geneva	SWITZERLAND
20 24	MANTEIGAS	SWPHC20 and CB Workshop	Wellington	NEW ZEALAND
MARCH				
01 03	SINAPI	AFRICAN HARBOUR MASTERS Ct	Tangier	MOROCCO
06 10	KAMPFER	S100 TSM 9	Seoul	KOREA
06 10	BAEK	S100 TSM 9	Seoul	KOREA
08 12	HOJGAARD	ASSEMBLY CHAIR Prep	To Monaco	MONACO
14 17	JONAS	USCHC	Mobile	UNITED STATES AME-RICA
13 16	KAMPFER	TECH Mtg	Busan	KOREA
13 16	BAEK	TECH Mtg	Busan	KOREA
21 22	JONAS	NHC66	Aalborg	DENMARK
31	KAMPFER	150 ANNIVERSARY IIM	Genoa	ITALY
MAY				
10 19	HARPER	IMO NCSR 10	London	UNITED KING-DOM
15 26	MANTEIGAS	IBSC 46	Tokyo	JAPAN
JUNE				
04 09	HARPER	IMO MSC107	London	UNITED KING-DOM
04 09	KAMPFER	HSSC15	Helsinki	FINLAND
04 09	GUILLAM	HSSC15	Helsinki	FINLAND
07 09	SINAPI	CBSC 21	Tokyo	JAPAN
07 09	MANTEIGAS	CBSC 21	Tokyo	JAPAN
12 14	SINAPI	IRCC 15	Tokyo	JAPAN
12 14	MANTEIGAS	IRCC 15	Tokyo	JAPAN
13 15	BAEK	S101 PT 10	Brest	FRANCE
13 15	WOOTTON	S101 PT 10	Brest	FRANCE
26 27	SINAPI	IOC ASSEMBLY	Paris	FRANCE
26 27	HARPER	IOC ASSEMBLY	Paris	FRANCE
27 28	JONAS	FRAUNHOFER IPM IPM Curators Board meeting	Fribourg	GERMANY

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JULY				
05 06	MANTEIGAS	CPLP Seminar	Lisbon	PORTUGAL
18 20	SINAPI	IC-ENC Steering Committee 24	Taunton	UNITED KINGDOM
AUGUST				
01 03	HARPER	NIPPON FOUNDATION Alumni Conference	Tokyo	JAPAN
01 04	SINAPI	IHO-ROK-USM Graduation ceremony	Mississippi	USA
14 18	KAMPFER	ICC	Cape Town	SOUTH AFRICA
15 18	HARPER	CSBWG 14	Stavanger	NORWAY
28 01	BAEK	SAIHC 19	Pointe aux Piments	MAURITIUS
SEPTEMBER				
12 14	SINAPI	KHOA Alumni Seminar & Digital Sea Conf	Busan	KOREA
12 14	MANTEIGAS	KHOA Alumni Seminar & Digital Sea Conf	Busan	KOREA
19 20	BAEK	IEC TC 80	London	UNITED KINGDOM
19 21	JONAS	BSHC 28	Helsinki	FINLAND
21	SINAPI	GEOMAC	Taunton	UNITED KINGDOM
21	MATSUMOTO	GEOMAC	Taunton	UNITED KINGDOM
21	MANTEIGAS	GEOMAC	Taunton	UNITED KINGDOM
25 29	WOOTTON	ENCWG8/S-101PT11	Lombok	INDONESIA
25 29	BAEK	ENCWG8/S-101PT11	Lombok	INDONESIA
OCTOBER				
02 05	HARPER	HSWD 5	Lombok	INDONESIA
04 05	NYBERG	CIRM	Izmir	TÜRKIYE
16 19	MANTEIGAS	IMO TC 73	London	UNITED KINGDOM
24 27	SINAPI	NF GEOMAC Alumni Seminar	London	UNITED KINGDOM
24 27	MATSUMOTO	NF GEOMAC Alumni Seminar	London	UNITED KINGDOM
24 27	MANTEIGAS	NF GEOMAC Alumni Seminar	London	UNITED KINGDOM
30 03	MANTEIGAS	IBSC Intersessional	London	UNITED KINGDOM
NOVEMBER				
05 09	GUILLAM	SCUFN 36	Wollongong	AUSTRALIA
07 10	NYBERG	PRIMAR PAC 30	Tirana	ALBANIA
13 17	NYBERG	S100 WG 8	Singapore	SINGAPORE
13 17	BAEK	S100 WG 8	Singapore	SINGAPORE
13 17	WOOTTON	S100 WG 8	Singapore	SINGAPORE
23 24	SINAPI	HLV to Dominican Republic	Santo Domingo	DOMINICAN REPUBLIC
26 29	SINAPI	SEPRHC 15	Valparaiso	CHILE
27 01	NYBERG	NCWG 9	Taunton	UNITED KINGDOM
DECEMBER				
04 08	SINAPI	HLV to Jamaica	Kingston	JAMAICA
11 15	SINAPI	MACHC 24	Paramaribo	SURINAME
11 15	MANTEIGAS	MACHC 24	Paramaribo	SURINAME
12 13	JONAS	DOALOS/IOC UNESCO Int Symp on UN Regular Process in strengthening the ocean science policy interface	Paris	FRANCE

Responsibilities of the Secretary-General and Directors in 2023

Dr. Mathias JONAS – Secretary-General

- Relations with EU, the United Nations including IMO,ISA and WMO, international bodies concerned with hydrographic matters in polar regions, Non-Member States of the IHO, and other relevant organizations and bodies as appropriate;
- Matters concerning IHO Membership, Host Government Affairs;
- Public Relations;
- Finance and Budget;
- Strategic Plan, Work Plan;
- Programme Performance Reporting;
- IHO Council;
- Administration of the IHO Secretariat, Information Technology;
- Personnel Administration of the IHO Secretariat, Staff Regulations;

and the following Regional Hydrographic Commissions:

- Arctic Regional Hydrographic Commission;
- East Asia Hydrographic Commission;
- Nordic Hydrographic Commission;
- North Sea Hydrographic Commission;
- US Canada Hydrographic Commission.

and the following Commission as Chair:

- Hydrographic Commission on Antarctica.

Abri KAMPFER – Director (Technical Programme) – Until 31 August 2023

& John NYBERG – From 1 September 2023

- HSSC and subordinate bodies;
- Relations with ABLOS, IALA, ICA, IEC, ISO, and other relevant organizations, concerning the HSCC programme;
- Technical Support services;
- Stakeholder Liaison;

and the following Regional Hydrographic Commissions:

- Baltic Sea Hydrographic Commission;
- Eastern Atlantic Hydrographic Commission;
- North Indian Ocean Hydrographic Commission;
- Southern African and Islands Hydrographic Commission;
- South-West Pacific Hydrographic Commission.

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- IRCC, and its subordinate bodies, including IBSC and GEBCO;
- Relations with FIG, GEO, IOC, the academic sector (education and training), and other relevant organizations, concerning the IRCC programme;
- Capacity Building, Training, Education and Technical Co-operation, including CB Work Programme, CB Fund and budget;
- IHO Publications;
- International Hydrographic Review;
- IHO Assembly ;
- Annual Report;

and the following Regional Hydrographic Commissions:

- Mediterranean and Black Seas Hydrographic Commission;
- Meso American - Caribbean Sea Hydrographic Commission;
- South-East Pacific Regional Hydrographic Commission;
- ROPME Sea Area Hydrographic Commission;
- South West Atlantic Hydrographic Commission.

Responsibilities of the Staff of the IHO Secretariat in 2023

Managerial Staff

Mr L. MANTEIGAS	(Portugal)	ADCC	Cooperation and Capacity Building
Mr Y. GUILLAM	(France)	ADCS	Charting and Services
Mr. Y. BAEK	(South Korea)	ADDT	Digital Technology
Mr S. HARPER	(United Kingdom)	ADSO	Surveying and Operations

Translators

Ms I. ROSSI	HFrTr	Head French Translator

Technical, Administrative and Service Staff

Ms A. ALONSO (Until June 2023)	DCA	Digital Communication Assistant
Mr C. BUZZI (From September 2023)	DCA	Digital Communication Assistant
Ms I. BELMONTE	DPA	Web and Digital Publications Assistant
Ms S. BRUNEL	FAO	Finance/Administration Officer
Ms T. BOWEN	EWH/OCA	EWH/Outreach & Communication Assistant
Ms L. CHAVAGNAS	OA	Office Assistant
Mr D. COSTIN (Until August 2023)	ITO	Information Technology Officer
Mr. M. PARIS (From October 2023)	ITO	Information Technology Officer
Ms C. FONTANILI	ESO	Executive Support Officer
Ms. S. JONES-COUTURE	PRCO	Public Relations & Communication Officer
Mr A. MAACHE	BSA	Bureau Support Assistant
Mr. R. ROQUEFORT	GSA	GIS Services and Graphic Arts Assistant
Mr J. WOOTTON	TSSO	Technical Standards Support Officer

Associate Professional Officers

Mr. I. PARK (Until September 2023)	(Republic of Korea)	Standards Support
Ms I. PARK (From September 2023)	(Republic of Korea)	Standards Support
Mr. K. MATSUMOTO	(Japan)	GIS and IT Support
Mr. J. FERNANDEZ (Until December 2023)	(Perù)	Council Managing Assistant

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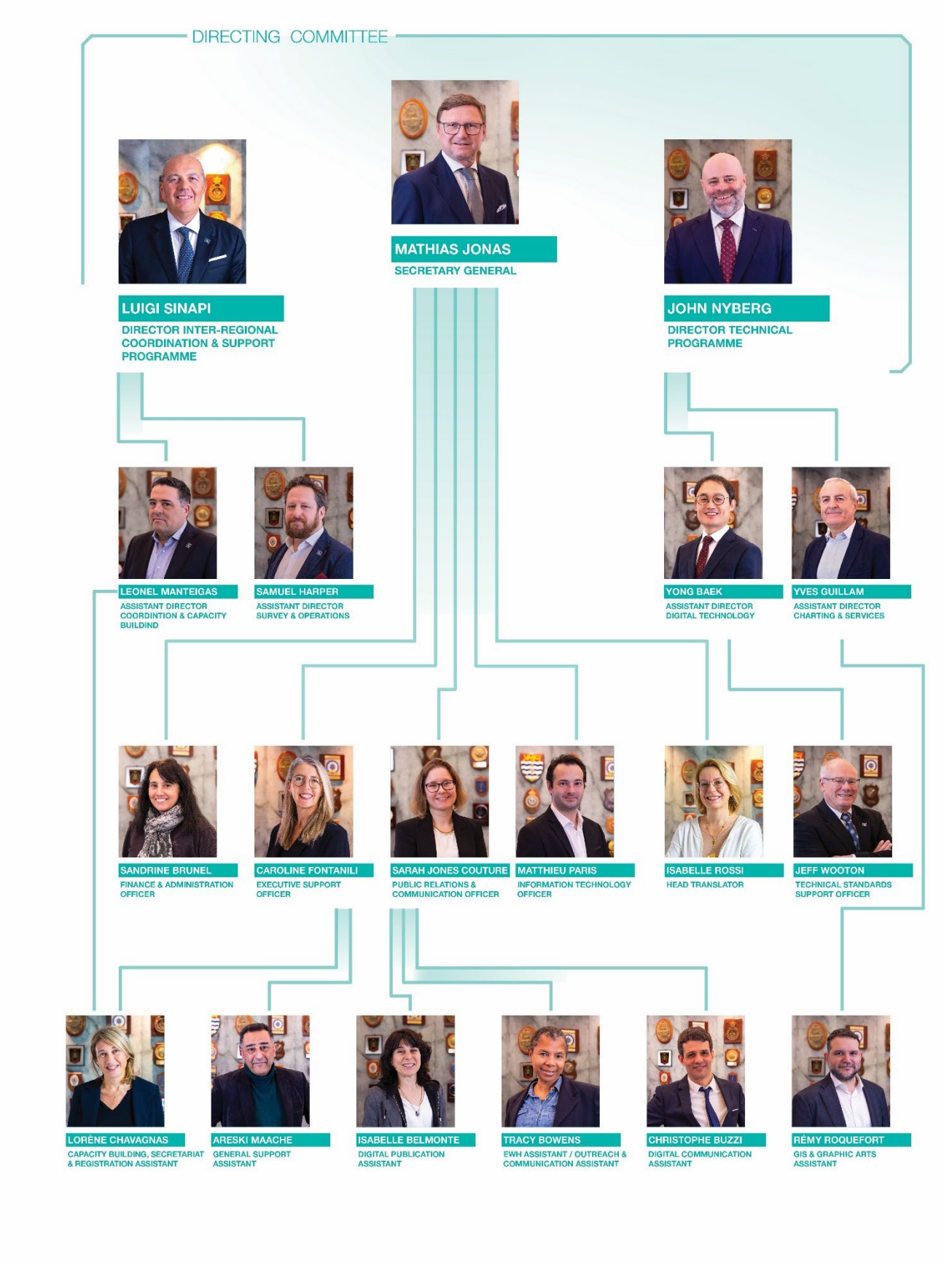
IHO Secretariat in 2023



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List of acronyms

A

ABLOS	Advisory Board on the Law of the Sea
AIS	Automatic Identification System
ARHC	Arctic Regional Hydrographic Commission
ATCM	Antarctic Treaty Consultative Meeting

B

BASWG	Black and Azov Seas Working Group
BSHC	Baltic Sea Hydrographic Commission

C

CB	Capacity Building
CBSC	Capacity Building Sub-Committee
CBWP	Capacity Building Work Programme
CHART	Cartography, Hydrography and Related Training (Project)
CIRM	Comité International Radio-Maritime
CL	Circular Letter
COMNAP	Council of Managers of National Antarctic Programs
CSB	Crowdsourced Bathymetry

D

DCDB	Data Centre for Digital Bathymetry
DG Mare	Directorate-General for Maritime Affairs and Fisheries
DHN	*Diretoria de Hidrografia e Navegação*
DQWG	Data Quality Working Group

E

EAHC	East Asia Hydrographic Commission
EAtHC	Eastern Atlantic Hydrographic Commission
EC	European Commission
ECDIS	Electronic Chart Display and Information System
EIHC	Extraordinary International Hydrographic Conference
EMODnet	European Marine Observation and Data Network
ENC	Electronic Navigational Chart
EU	European Union

F

FIG	International Federation of Surveyors

G

GEBCO	General Bathymetric Chart of the Oceans
GGC	GEBCO Guiding Committee
GIS	Geographic Information System

H

HE	His Excellency
HO	Hydrographic Office

HSH	His Serene Highness
HSSC	Hydrographic Services and Standards Committee

I

IAEA	International Atomic Energy Agency
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IAPH	International Association of Ports and Harbours
IBCSO	International Bathymetric Chart of the Southern Ocean
IBSC	International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers
ICA	International Cartographic Association
ICCWG	International Charting Coordination Working Group
IEC	International Electrotechnical Commission
IC-ENC	International Centre for Electronic Navigational Charts
IENWG	IHO-EU Network Working Group
IHB	International Hydrographic Bureau
IHC	International Hydrographic Conference
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IMPA	International Maritime Pilots' Association
IMSO	International Mobile Satellite Organization
INT	International
IOC	Intergovernmental Oceanographic Commission
IRCC	Inter-Regional Coordination Committee
ISA	International Seabed Authority
ISO	International Organization for Standardization
IT	Information Technology

J

JCOMM	Joint Technical Commission for Oceanography and Marine Meteorology
JHOD	Japan Hydrographic and Oceanographic Department

K

KHOA	Korea Hydrographic and Oceanographic Agency

L

M

MACHC	Meso American - Caribbean Sea Hydrographic Commission
MBSHC	Mediterranean and Black Seas Hydrographic Commission
MEIP	Maritime Economic Infrastructure Programme
METAREA	METeorogical Area
MoU	Memorandum of Understanding
MOWCA	Maritime Organization for West and Central Africa
MS	Member State
MSC	Maritime Safety Committee
MSDI	Marine Spatial Data Infrastructure
MSDIWG	Marine Spatial Data Infrastructures Working Group
MSI	Maritime Safety Information
MSP	Maritime Service Portfolio
MSP	Marine Spatial Planning

N

NATO	North Atlantic Treaty Organization
NAVAREA	NAVigational Area
NAVTEX	NAVigational TEXt Messages
NCEI	National Centers for Environmental Information
NCSR	IMO Sub-Committee on Navigation, Communications and Search and Rescue
NCWG	Nautical Cartography Working Group
NGA	National Geospatial-Intelligence Agency
NGIO	Non-Governmental International Organization
NHC	Nordic Hydrographic Commission
NIOHC	North Indian Ocean Hydrographic Commission
NIPWG	Nautical Information Provision Working Group
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NSHC	North Sea Hydrographic Commission

O

OGC	Open Geospatial Consortium

P

PI	Performance Indicator
PMB	Project Management Board

Q

R

RENC	Regional ENC Coordinating Centre
RHC	Regional Hydrographic Commission
ROK	Republic of Korea
RoP	Rules of Procedure
ROPME	Regional Organization for the Protection of the Marine Environment
RSAHC	ROPME Sea Area Hydrographic Commission

S

SAIHC	Southern African and Islands Hydrographic Commission
SCRUM	Sub-Committee on Regional Undersea Mapping
SCUFN	Sub-Committee on Undersea Feature Names
SDI	Spatial Data Infrastructures
SEPRHC	South East Pacific Regional Hydrographic Commission
SHOM	*Service hydrographique et océanographique de la marine*
SOLAS	International Convention for the Safety of Life at Sea
SPI	Strategic Performance Indicator
SWAtHC	South West Atlantic Hydrographic Commission
SWPHC	South West Pacific Hydrographic Commission

T

TALOS	Technical Aspects of the UN Convention on the Law of the Sea
TC	Technical Committee
ToR	Terms of Reference
TSCOM	Technical Sub-Committee on Ocean Mapping
TWCWG	Tides, Water Level and Currents Working Group

U

UAE	United Arab Emirates
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
UN	United Nations Organization
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN-GGIM	United Nations Committee of Experts on Global Geospatial Information Management
UNH	University of New Hampshire
USA	United States of America
USCHC	USA-Canada Hydrographic Commission

V

W

WEND	Worldwide ENC Database
WG	Working Group
WMO	World Meteorological Organization
WP	Work Programme
WPI	Working-level Performance Indicator
WWNWS	World Wide Navigational Warning Service
WWNWS-SC	WWNWS Sub-Committee

X

Y

Z

PART 2

FINANCE

Financial statements and accounts for 2023

FOREWORD TO THE FINANCE REPORT FOR 2023

Amended by Secretary-General´s recommendations on the use of the accrued surplus in the 2023 budget for 2024.

Introduction

1. This part of the Annual Report 2023 presents the statements of the finances and accounts of the IHO for the 2023 fiscal year in accordance with the Financial Regulations of the IHO.

Result for the fiscal year 2023

2. The 2023 audit of the IHO`s accounts has been undertaken by an external auditor, CABINET TARAMAZZO. The appointment of CABINET TARAMAZZO was approved ex post facto in accordance with Article 19 (b) of the IHO Financial Regulations at the meeting of the IHO Finance Committee prior to the third IHO Assembly on 1st May 2023. The Audit Report is annexed to Part II of this Annual Report.

3. The audited financial statements present a positive balance for 2023 of 215,221.97 Euro (see Table 9 (English) and 10 (French)). The effective budget surplus for 2023 is available for investment in 2024. This result comprises the budget loss of 253,000 Euro from the budget implementation, balanced by an underspend of 10,000 Euro in capital expenditure, 279,000 Euro of operating costs, and the inclusion of the amount paid for depreciable assets of 19,000 Euro.

Budget implementation

4. The implementation of the 2023 budget was substantially impacted by the ongoing increase in inflation, which effectively increased all running costs, including salaries, travel, health insurance and pension insurance. It should be noted that the moderate budget loss of 253,000 Euro resulting from the conservative budget implementation is caused mainly due to the non-payment of contributions from Member States and a reserve provision for bad debts of 133,000 Euro was made. The provision for bad debts has not been compensated by additional income from arrears paid and/or new Members States' contributions. Recruitment to replace retired staff members was again suspended and the Secretariat is understaffed by 10% which is equal to two vacant posts against the nominal head count.

Supplementary remarks on budget issues

In-kind contributions from the Government of the Principality of Monaco

5. According to the official agreement between the IHO and the Government of the Principality of Monaco concerning the headquarters of the Organization, the Principality, in addition to the normal owner's responsibilities, assumed the responsibility for expenses for the rental cost, electricity and water supply which amounted to a total annual cost of 54,693 Euro. It should be noted that the Principality does not charge the IHO for these expenses for the headquarters premises.

Outstanding financial contributions from some Member States

6. When assessing the positive balance sheet, it should be noted that several Member States failed to pay their annual financial contributions in the fiscal year 2023. At the end of the year, 28 Member States had not paid their annual contributions in full. This amounted to 487,000 Euro, which is, in effect, income for 2023 yet to be received and represents 13.92% of the total value of the expected Member States' contributions. The 13.92% unpaid receivables of 2023 are as substantial as the 14.18% debts for 2022 and deviate heavily from 8.44% debts for the 5-year average! When these debts are cleared, they will be reflected in the relevant yearly accounts as extraordinary income. The Secretariat undertakes every effort to remind Member States of their obligations to pay and is in contact with the local Bank to facilitate payments. It must be explicitly stated, however, that a missed clearance of these debts will leave the IHO Secretariat operations in a critical situation and will definitely affect its future performance.

IHO Funds

Assembly Fund

7. The 3rd Session of the Assembly was held in a hired conference centre, the Grimaldi Forum, since the Auditorium Rainier III was unavailable to be proposed by the Principality of Monaco due to an aftermath of the pandemic. Since the regular annual contribution to the Assembly Fund did not cover the cost of this Assembly, an additional provision out of the 2022 surplus to an amount of 101,000 Euro was required.

8. At the end of 2023, 203,172 Euro was available in the Assembly Fund for the planning and execution of the subsequent IHO Assemblies. The availability of the Auditorium Rainier III for subsequent Assemblies is uncertain, and the impact of ongoing inflation pressure on Assembly expenses is difficult to forecast, hence an increase in the Assembly Fund is required. This need is addressed under the Secretary-General's recommendation on the use of the 2023 surplus in 2024.

9. The costs for the annual Council are allocated separately from this Fund in the operational budget to an annual amount of 15,000 Euro for 2021 to 2023.

Special Projects Fund

10. At the end of the year 2023, the positive balance of the Special Projects Fund was 169,021 Euro. In 2023 expenses for special projects were associated mainly to Work Programme 2 and amounted to 128,414 Euro in total.

11. The 3rd Session of the Assembly agreed to focus strategically on Goal 1 as a priority which entails increased consultancy work in the development and testing of IHO's range of S-100 digital standards. This in turn calls for funding out of the Special Project Fund. This need is addressed under the Secretary-General's recommendation on the use of the 2023 surplus for 2024.

Capacity Building Fund

12. In 2023 the activities to build hydrographic capacity as planned in the annual Work Programme 3 were moderate only, due to the aftermath of the COVID-19 pandemic and the subsequent postponement of some of the earmarked CB activities (i.e. Cat A and Cat B courses). The Secretariat received 598,550 Euro from the Republic of Korea, and 409,493 Euro from Japan. The Secretariat received 60,452.12 Euro from Canada and 20,000 Euro from Norway to support Empowering Women in Hydrography (EWH) Project. The total expenditure was 1,599,716 Euro (EWH included), and the balance at the end of 2023 is 1,137,613 Euro.

IBCS Fund

13. The IBSC Fund was established in 2010. At the request of the Fédération Internationale des Géomètres (FIG) Secretariat, which had administered the Fund on behalf of the IBSC since its establishment, the IHO Secretariat, as secretary of the IBSC, took over the role of treasurer of the Fund in 2015. The Fund holds the income generated by the IBSC through its fees structure and supports the normal operations of the IBSC that is jointly operated and governed by the IHO, the FIG and the International Cartographic Association (ICA). The balance of the fund on 1 January 2023 was 66,072 Euro. An amount of 28,260 Euro was received in fees from institutions seeking recognition by IBSC and 46,569 Euro was spent on travel expenses for the Board members to attend meetings. Thanks to a top up of 10,000 Euro from the 2022 surplus, the Fund is in a healthy financial situation, with a positive balance at the end of 2023 of 47,764 Euro.

GEBCO Fund

14. Based on a proposal of the Nippon Foundation and the GEBCO Guiding Committee, the IHO and the IOC as parent organizations of GEBCO agreed on a joint project named SEABED2030, aiming to increase the detail of global knowledge of the seabed topography of the seas and oceans. Within the framework of the project, the IHO Secretariat accepted the administration of the project fund as donated by the Nippon Foundation. In 2023 the Secretariat received 2,910,344 Euro for the administration of the seventh year of the SEABED2030 project from the Nippon Foundation. At the end of 2023, a balance of 1,504,709 Euro remained in the SEABED2030 account. In 2023, 3,124,897 Euro were spent for reimbursement of salaries, operational costs, and travel expenses of the operational phase. The amount of 7,650 Euro was spent for the SCUFN Gazetteer. The amount of 1,739,505 Euro remains for payment of the forthcoming activities of global and regional data centres forming the infrastructural part of the project.

Internal Retirement Fund and Pension Plan

15. The Internal Retirement Fund (IRF) supports the IHO's long-established independent retirement plan (pension scheme) for several retired members of the Secretariat staff. The pensions of nine retired members of staff are covered by the IRF. The IRF is purposely maintained in low-risk investment accounts. The investment sum required at the end of 2023 to meet the estimated liabilities of the IRF over its lifetime, increased by 272,311 Euro to 2,292,662 Euro. The engagement increased with the life expectancy of retirees in compliance with the insurance codes the IHO is aligned with.

Renovation and Enhancement Fund

16. The Renovation and Enhancement Fund is intended to cover any major expenses required for the renovation and upkeep of the IHO headquarters' infrastructure and premises. An allocation to this fund is normally made annually from the operating budget, as approved by Member States through the Council, which has not been the case in 2023. At the end of the year 2023, the positive balance of the Renovation and Enhancement Fund was 41,148 Euro. To meet the emerging risks in terms of cyber security, a major overhaul of the client/server architecture of the Secretariat's internal IT infrastructure is required in 2024. This undeniable need for investment is addressed under the Secretary-General's recommendation on the use of the 2023 surplus in 2024.

Relocation Fund

17. Following the arrival of the newly elected Director (the outgoing Director returning to South Africa and the incoming arriving from United States of America) the Relocation Fund closed with a negative balance of -16,531 Euro. To meet all anticipated expenditure of the relocation of internationally recruited members of staff upon their joining or leaving the IHO Secretariat over the next years, an extraordinary deposit to the Relocation Fund will be required. This need is addressed under the Secretary-General's recommendation on the use of the 2023 surplus in 2024.

Recommendation of the Secretary-General for the allocation of the 2023 budget surplus in 2024

18. As reported in the audited financial statements, the effective budget surplus for 2023 is 215,222 Euro. This surplus is to be managed in accordance with IHO Resolution 1/2014 as amended through deposits in favor of existing IHO Funds.

19. As a lesson learned from the conduct of the 3rd Session of the IHO Assembly at the Grimaldi Forum (as explained in detail in Part 1 of this Annual Report under Work Programme I) the Secretariat expects substantial additional costs for the conduct of the subsequent Assembly sessions. The extra cost estimate amounts to approximately 100,000 Euro per Assembly. It is therefore recommended to allocate a substantial part i.e. 50,000 Euro of the effective 2023 budget surplus for 2024 to the Assembly Fund to build up reserves. This measure will safeguard the health of the Fund to cover the expected expenses for the fourth session of the IHO Assembly in 2026, which will hopefully be held at the Auditorium Rainier III at no cost for the venue as it has been the previous practice for IHO Conferences and Assembly in the past. If this were the case, further provisions to the Assembly Fund could be reduced in favor of other important investments.

20. As highlighted under paragraph 11, the 3rd Session of the Assembly agreed to focus strategically on Goal 1 as a priority which entails increased consultancy work in the development and testing of IHO's range of S-100 digital standards. This in turn calls for funding out of the Special Project Fund. To address this need it is proposed that the Special Projects Fund shall receive 15,000 Euro out of the effective 2023 budget surplus for 2024.

21. The 3rd Session of the Assembly decided in favor of the continuation of the Empowering Women in Hydrography project as part of the Capacity Building Work Programme (WP3). It has turned out that additional human recourses at the Secretariat are indispensable for the coordination of the various activities of IHO Member States and the Secretariat to support this theme. To address this need it is proposed that the Capacity Building Fund shall receive 40,000 Euro out of the effective 2023 budget surplus for 2024 to partly cover the costs of an EWH project employee. This amount will be amended by earmarked donations from IHO Member States to cover the costs of a full-time employment planned to start mid of 2024 and terminating after the 4th Session of the Assembly in 2026.

22. In compliance with its work programme as approved by the 3rd Assembly, the International Board on Standards of Competence IBSC is currently undertaking a major review of the full range of syllabi known as Cat A and Cat B education and training for hydrographers and cartographers. IBSC is also taking steps to create a completely new course for maritime geodata professionals. To cover the extra expenses resulting from this increased activity, it is proposed that the IBCS Fund shall receive 10,000 Euro out of the effective 2023 budget surplus for 2024.

23. As mentioned under paragraph 16, the Secretariat is called to take action to meet the emerging risks in terms of cyber security through a major overhaul of the client server architecture of the Secretariat's internal IT infrastructure. This investment should be covered out of the Renovation and Enhancement Fund which shall receive therefore 40,000 Euro of the effective 2023 budget surplus for 2024.

24. As explained under paragraph 17, the Relocation Fund closed with a negative balance of -16,531 Euro. To meet all anticipated expenditure of the relocation of internationally recruited members of staff upon their joining or leaving the IHO Secretariat over the next years an extraordinary deposit of 60,000 Euro is proposed for the Relocation Fund out of the effective 2023 budget surplus for 2024.

Proposed allocation of the 2023 surplus to IHO Funds

25. Proposal. The Secretary-General proposes that the budget surplus for 2023 of 215,000 Euro be distributed as follows:

a. **50,000 Euro** to the Assembly Fund,

b. **15,000 Euro** to the Special Project Fund,

c. **40,000 Euro** to the Capacity Building Fund,

d. **10,000 Euro** to the IBSC Fund,

e. **40,000 Euro** to the Renovation and Enhancement Fund,

f. **60,000 Euro** to the Relocation Fund.

Conclusion

26. The Secretariat, ever mindful of the difficulty in forecasting the income of the Organization due to none or late payment of financial contributions by Member States and other factors, continues to take a conservative approach to the budget and finances of the Organization. The impossibility of forecasting how inflation will develop over the years to come adds extra challenges to the budgetary maintenance of the Secretariat's operations. A modest increase of Member States contributions of 3% from 2024 was approved by the 3rd Assembly to maintain good financial health and to enable the return to the nominal headcount to support the Secretariat´s ability to meet all its current obligations. Timely payment of all Member States' contributions remains critically important.

Yours sincerely,

Dr Mathias JONAS Secretary-General

International Hydrographic Organization

Organisation Hydrographique Internationale

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Tables

Table 1

International Hydrographic Organization - *Organisation Hydrographique Internationale*

Comparative Balance Sheet - *Bilans comparés*

as of 31 December 2023 - *au 31 décembre 2023*

(expressed in thousands of Euros - *exprimé en milliers d'Euros*)

	See notes	2023		2022	
***Immobilisations* - Fixed assets**					
Valeur nette des immobilisations - Net Tangible assets	4		74		57
***Actif circulant* - Curent assets**					
Débiteurs - Debtors	5	854		602	
Trésorerie disponible					
Cash at bank and in hand :	10	8,678		9,623	
		9,532		10,224	
Créditeurs - montants à moins d'1 an					
Creditors - amounts falling due within 1 year	6	-3,183		-2,672	
***Fonds de roulement* - Working capital**			6,350		7,552
Engagements pour les retraites	7	3,633		3,687	
Pension commitments		-3,633		-3,687	
			0		0
Actif net - Net assets			6,424		7,609
***Réserves* - Reserves**					
Capitaux permanents de l'OHI - Accumulated surplus			2,818		3,099
Autres réserves - Other reserves	8+9		3,808		4,827
			6,626		7,926

Table 2

International Hydrographic Organization - *Organisation Hydrographique Internationale*

Comparative Global Income and Expenditure - *Charges et revenus comparés*

as of 31 December 2023 - *au 31 décembre 2023*

(expressed in thousands of Euros - *exprimé en milliers d'Euros*)

	2023	2022
Revenus - Income	3,622	3,798
Charges opérationnelles - Operating costs	-3,084	-3,046
***Résultat opérationnel* - Operating result**	**538**	**752**
Intérêts reçus - Interest received	94	31
Equipement de bureau - Office equipment	-26	-36
Charges financières - Financial costs	-283	-259
Dotations aux fonds dédiés - Transfer to dedicated funds	-108	-388
***Résultat annuel* - Result for the year**	**215**	**101**

Etat d'évolution du financement permanent

Statement of changes in permanent funding

	Capitaux permanents de l'OHI Net members funds	*Réserve de réévaluation* Revaluation Reserve	*Autres réserves* Other reserves (note 9)	Total
***Montants au 1er Janvier 2023* - Available on 1 January 2023**	2,892		4,827	7,719
Résultat de l'année - Result for the year	215		-	215
***Evolution des fonds dédiés* - Evolution of dedicated funds:**				
- *Dépensé à partir des fonds dédiés* - Spent from dedicated funds			-1,019	-1,019
- *Fonds de retraite interne* - Internal Retirement Fund			-	
- *Fonds pour le déménagement des directeurs* - Relocation Fund			-	
- *Fonds pour les conférences* - Conference Fund			-	
- *Fonds pour le Renforcement des Capacités* - CB Fund			-	
- *Fonds pour les Projets spéciaux* - Special Projects Fund				
***Mouvements dans l'année* - Movements in the year (provisions) :**				
- *Variation provision du FRI* - Changes in IRF requirements	-272		-	-272
- *Dotation du fonds de réserve d'urgence* - Allocation to Emergency Res Fund	-16		-	-16
- *Réserves à distribuer* - Reserves to be distributed				
***Montants au 31 Décembre 2023* - Available at 31 December 2023**	**2,818**		**3,808**	**6,626**

Table 3

International Hydrographic Organization - *Organisation Hydrographique Internationale*
Profit and Loss Statement - *Compte d'exploitation*
as of 31 December 2023 - *au 31 décembre 2023*
(expressed in thousands of Euros - *exprimé en milliers d'Euros*)

		2023	***2021***
Revenus **- Income**			
Contributions des Etats Membres - Contributions from Member States		3,485	3485
Imposition interne - Internal tax		182	185
Revenus et dépenses exceptionnelles - Exceptional income and expenditure		-45	129
		3,622	3798
Revenus financiers **- Interest received**			
Intérêts des placements - bank interest		94	31
Charges opérationnelles **- Operating costs**			
Charges de personnel - Personnel costs	2,597		2613
Déplacements - Long Distance Travel	209		220
Entretien des locaux et équipements - Maintenance of premises and equipment	105		95
Postes et télécommunications - Postage and telephone	25		21
Consultants - Consultancy	74		38
Support administratif pour le Conseil - Administrative support for the Cour	12		9
Autres publications - Other publications			1
Revue H.I - I.H Review	10		10
Autres coûts opérationnels - Other operating costs	26		20
Fournitures de bureau - Office stationery	7		9
Relations publiques - Public relations	20		19
Charges diverses - Miscelleanous			
		-3,084	-3046
Matériel de bureau **- Office equipment**			
Amortissement des immobilisations - Depreciation	11		17
Autres achats - Other purchases	14		19
		-26	-36
Charges financières **- Financial costs**			
Créances douteuses - Bad debts	133		44
Provision congés payés - Provision leave days			-36
Provision retraites externes - Provision external retirement	150		250
		-283	-259
Dotations aux fonds dédiés **- Allocation to dedicated funds**		-108	-388
Résultat net annuel **- Result for the year**		**215**	**101**

Table 4

International Hydrographic Organization - *Organisation Hydrographique Internationale*

Cash Flow Statement - *Etat de flux financiers*

as of 31 December 2023- *au 31 décembre 2023*

(expressed in thousands of Euros - *exprimé en milliers d'Euros*)

		2023		***2022***
***Cash Flow opérationnel* - from operating activities**				
Résultat opérationnel de l'année - Result for the year		215		101
***Ajustements pour* - Adjustments for :**				
Dépréciation des immobilisations - Depreciation	11		17	
Cession d'immobilisations - Sale of fixed assets				
Provision du FRI - IRF provision				
Variation des réserves - Change in reserves				
Intérêts bancaires - Bank interest	-94		-31	
Charges financières - Financial expenditure				
Résultat avant variation du fonds de roulement		-82		-14
Result before working capital changes		133		86
Variation des débiteurs - Change in accounts receivable	-253		-372	
Variation des créditeurs - Change in accounts payable	-511		588	
		-764		216
Flux financier opérationnel - Operating cash flow		-631		302
Intérêts réglés - Interest paid	0		0	
Ajustement du Fonds de retraite - Retirement fund adjustment	69		-285	
		69		-285
Flux financier opérationnel net - Net cash from operating activities		-562		17
Flux financier des investissements				
Cash flow from investing activities				
Achats d'immobilisations - Purchase of fixed assets	-29		-6	
Cessions d'immobilisations - Sale of fixed assets	0		0	
Intérêts reçus - Interest received	94		31	
Flux net des opérations d'investissement				
Net cash movement from investment activities		65		26
***Total des flux financiers* - Total cash flows**		-497		42
Disponibilités au 1er janvier de l'année				
Cash at 1st January of the year		9,791		9749
Disponibilités au 31 décembre de l'année				
Cash at 31st December of the year	Euros	9,294	Euros	9791

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Table 5

International Hydrographic Organization - *Organisation Hydrographique Internationale*
Budget Implementation Summary - *Compte rendu de l'exécution budgétaire*
as of 31 December 2023 - *au 31 décembre 2023*
(expressed in thousands of Euros - *exprimé en milliers d'Euros*)

	2023		
	Budget	Actual - *Réel*	Variance
***Revenus* - Income**			
Contributions des Etats Membres - Contributions from Members State	3,429	3,485	-56
Imposition interne - Internal tax	220	182	38
Intérêts bancaires - Bank interest	35	94	-59
	3,684	3,761	-77
***Charges opérationnelles* - Operating costs**			
Charges de personnel - Personnel costs	2,869	2,597	272
Déplacements - Long Distance Travel	250	209	41
Entretien - Maintenance	109	105	5
Postes et télécommunications - Postage and telephone	32	25	7
Consultants - Consultancy	40	74	-34
Support administratif pour le Conseil - Administrative support for the Council	15	12	3
Autres publications - Other publications	1		1
Revue HI - I.H Review	10	10	
Autres coûts opérationnels - Other operating costs	8	26	-18
Fournitures de bureau - Office stationery	8	7	1
Relations publiques - Public relations	20	20	
Charges diverses - Miscellaneous	1		1
	3,363	3,084	279
***Dépenses d'investissement* - Capital expenditure**			
Amortissement - Depreciation	15	11	4
Autres achats - Other purchases	21	14	7
	36	26	10
***Autres Dépenses d'investissement (>762€)* - Other Capital expenditure (over 762€)**			
Achat d'équipement informatique - Purchase of IT equipement	20	1	19
Achat de mobilier - Purchase of furniture	5	4	1
	25	6	19
***Charges financières* - Financial costs**			
Provision clients douteux - Provision for bad debts		133	-133
Provision congés payés - Provision for leave days			
Provision retraites externes - Provision external retirement	150	150	
	110	362	-253

Table 6

International Hydrographic Organization - *Organisation Hydrographique Internationale*

Overdue Contributions - *Contributions échues*

as of 31 December 2023 - *au 31 décembre 2023*

(expressed in thousands of Euros - *exprimé en milliers d'Euros*)

		2023	2022	2021	2020	*Total*
Angola	Angola	8	8			***16***
Argentina	Argentine	28				***28***
Bahrein	Bahrein	16	16			***32***
Bangladesh	Bangladesh	28				***28***
Bulgaria	Bulgarie	12				***12***
Cameroon	Cameroun	16				***16***
Cuba	Cuba	8	8			***16***
Dem.Rep. Of Congo	Rep.Dem. Du Congo	12	8	4		***24***
Dominican Rep.	Rep.Dominicaine	4				***4***
D.P.R of Korea	Rép. Dém de Corée	20	20			***40***
Fiji	Fidji	8				***8***
Guyana	Guyane	12	12			***24***
Iraq	Irak	8	8	4		***20***
Iran	Iran	76				***76***
Jamaica	Jamaique	12				***12***
Kenya	Kenya	8				***8***
Kuweit	Koweit	40				***40***
Lebanon	Liban	12	12			***24***
Malta	Malte		109			***109***
Myanmar	Myanmar	20				***20***
Pakistan	Pakistan	20	20			***40***
Papua New Guinea	Papua Nvle Guinée	12				***12***
Qatar	Quatar	28	28			***56***
Russia	Russie	3				***3***
Seychelles	Seychelles	12				***12***
Sri Lanka	Sri Lanka	16	16			***32***
Tonga	Tonga	8	8			***16***
Ukraine	Ukraine	24				***24***
Uruguay	Uruguay	16				***16***
		487	***273***	***8***	***0***	***768***

Suspended IHO Member States		Outstanding Contributions	Payment	Balance
Etats Membres de l'OHI suspendus		*Contributions arriérées*	*Paiement*	*Solde*
Serbia - *Serbie*		24.0		***24.0***
Syrian Arab Republic- *Rép. arabe syrienne*		60.0		***60.0***
		84.0	***0.0***	***84.0***

P-7

International Hydrographic Organization - *Organisation Hydrographique Internationale*

Creditors - *Créditeurs*

as of 31 December 2023 - *au 31 décembre 2023*

(expressed in thousands of Euros - *exprimé en milliers d'Euros*)

Contributions reçues d'avance	***Reçues en 2023 pour les prochaines contributions***	***Reçues en 2022 pour les prochaines contributions***
Contributions received in advance	Received in 2023 for future contributions	Received in 2022 for future contributions
Australia - *Australie*	0	32
Belgium - *Belgique*	58	56
Brazil - *Brésil*	45	44
Bruneï	20	0
Canada	0	40
Chile - *Chili*	3	3
Cyprus - *Chypre*	111	101
Finland - *Finlande*	0	32
France - *France*	62	60
Ireland - *Irlande*	16	0
Latvia - *Lettonie*	16	16
Mauritius	12	0
Mexico - *Mexique*	48	48
Morocco - *Maroc*	0	20
Netherlands - *Pays-Bas*	65	0
New Zealand - *Nouvelle-Zélande*	16	0
Oman - *Oman*	0	8
Poland - *Pologne*	12	12
Portugal - *Portugal*	93	85
Singapore - *Singapour*	0	109
South Africa - *Afrique du Sud*	20	20
Sweden - *Suède*	41	40
Thailand - *Thaïlande*	45	0
United Kingdom - *Royaume Uni*	111	0
	794	726

Créditeurs et charges à payer - Creditors and accruals

Plan de pensions - Pensions plan payments	49	91
Charges à payer - Accruals	694	646
Autres créditeurs - Other		7
	742	117

Table 8

International Hydrographic Organization
Organisation Hydrographique Internationale

Notes to the Financial Statements - *Notes relatives aux Etats Financiers*

as of 31 December 2023 - *au 31 décembre 2023*
(expressed in thousands of Euros - *exprimé en milliers d'Euros*)

1- Principes Comptables – *Accounting Policies*

(a) Principes comptables de base – *Basis of accounting*

Les états financiers sont préparés conformément aux principes comptables de l'Organisation Hydrographique Internationale qui ne sont pas substantiellement différents des principes comptables généralement reconnus en Principauté de Monaco sauf pour certains points, par exemple :

- La Provision pour assurer les pensions au personnel IFR et aux retraités : conformément aux principes comptables de l'Organisation Hydrographique Internationale, la provision est intégralement comptabilisée au moyen d'un compte de capitaux propres tandis que, selon les principes comptables généralement reconnus en Principauté de Monaco, cette provision et sa variation annuelle devraient être comptabilisées au moyen de comptes de pertes et profits ;
- Quelques différences mineures de présentation.

The financial statements are prepared in accordance with the International Hydrographic Organization accounting principles which are not substantially different from the generally accepted accounting principles in Principality of Monaco except for some matters, for example :

- *Provision to ensure pensions to IFR staff and retirees : in accordance with the Internal Hydrographic Organization accounting principles, the provision is fully recorded through an equity account whereas under the generally accepted accounting principles in Principality of Monaco, this provision and its annual variation should be recorded through profit and loss accounts.*
- *Some minor presentation differences.*

(b) Revenus – *Income*

Les revenus proviennent essentiellement des contributions des Etats Membres de l'OHI.
Income principally represents contributions receivable from Member States.

(c) Contributions échues – *Overdue contributions*

Conformément à l'article 16 du règlement financier, les droits et prérogatives d'un Etat Membre peuvent se trouver suspendus lorsque ces contributions sont échues depuis au moins 2 années.
La décision 24(e) de la première session de l'Assemblée de l'OHI a supprimé l'article 13 du règlement financier concernant les intérêts de retard.
A compter de 2013, une provision complémentaire pour créances douteuses est instituée, afin de refléter les incertitudes géopolitiques de certains Etats Membres.
In accordance with Article 16 of the Financial Regulations, Member States can be suspended when contributions are in arrears by at least two years.
Decision 24e of the first session of the IHO Assembly deleted article 13 of the financial regulations regarding interest on late payment.
From 2013, an additional provision for bad debts has been made, in order to reflect geopolitical uncertainties of some of the Member States.

(d) **Amortissement des Immobilisations – *Depreciation of tangible assets***

Il est pratiqué un amortissement sur toutes les immobilisations (d'un prix unitaire supérieur à 762 Euros) à hauteur de la valeur totale de l'immobilisation sur sa probable durée d'utilisation selon les taux suivants :

- Mobilier 20 % du coût par année (sur 5 années)
- Equipement informatique 33.33% du coût par année (sur 3 années)

Provision is made for depreciation of all tangible assets (over 762 Euros in value per article) at rates calculated to write off the cost or valuation over its expected useful life as follows:

- *Furniture 20% per annum on cost (5years)*
- *IT Equipment 33.33 % per annum on cost (3 years)*

(e) **Transactions en devises – *Foreign Currencies***

En cours d'année, les transactions libellées en devises sont converties en Euros au taux de change en vigueur à la date de la transaction.

En fin d'année, les dettes et disponibilités libellées en devises sont converties en Euros au taux de change à la date d'établissement du bilan. Les pertes et gains de change sont enregistrés dans le compte de résultat.

During the year, transactions denominated in foreign currencies were converted into Euros at the rate of exchange ruling at the date of the transaction.

At the end of the year, current assets and liabilities denominated in foreign currencies were converted at the rate of exchange ruling at the balance sheet date.

Profit and losses on exchange are dealt with in the profit and loss account.

(f) **Fonds de Retraite interne – *Internal retirement Fund***

L'OHI gère un fonds de pension dénommé Fonds de Retraite Interne (FRI).

Neuf retraités sont concernés par ce fonds.

La totalité des avoirs destinés à couvrir les engagements de ce fonds font l'objet de comptes bancaires spécifiques sous forme de comptes de dépôt à terme.

L'Organisation retient l'intégralité de l'engagement déterminé sur la base de l'estimation d'une étude actuarielle (voir note 7). Depuis 2005, les pensions sont réglées à partir des avoirs du FRI, au lieu d'être réglées depuis le budget de l'OHI, comme ce fut le cas de 2000 à 2004.

The Organization operates a benefit pension scheme know as the Internal Retirement Fund (IRF).

Nine retirees are covered by this fund.

A proportion of the assets held to meet the pension liability are held in designated bank accounts and investments. The Organization makes full provision for the estimated liability based on actuarial valuation (see note 7). From 2005, pensions have been paid form dedicated IRF accounts as opposed to payment from the IHO budget as in previous years (from 2000 to 2004).

(g) **Provision pour retraites externes – *Provision for external retirement***

L'OHI a l'obligation d'assurer à ses membres du personnel recrutés localement un pension de retraite au moins équivalente à la CAR.

Un nouveau contrat a été souscrit depuis Janvier 2022 auprès d'une compagnie d'assurance, GAN VIE, qui assure une pension au moins équivalente à celle versée par la CAR, à la condition que le capital nécessaire au paiement de cette provision soit versé intégralement au GAN au moment du départ à la retraite du salarié.

Cette obligation est calculée et ajustée tous les ans et s'élève à fin 2023 à 2M€ pour les 35 prochaines années.

The IHO has an obligation towards its staff members locally recruited to ensure a retirement pension at least equivalent to the one served by the CAR.
A new contract has been established with another insurance company, GAN VIE, with effect 1st January 2022 which ensures a payment of a pension equivalent CAR on the condition that the capital needed for the payment of this pension is totally paid by the IHO on retirement of the Staff Member. This engagement is calculated and adjusted every year, and is estimated to be 2M€ at the end of 2023 to be spread over the next 35 years.

(h) **Réserve de Trésorerie opérationnelle et Fonds de réserve d'urgence**
Operating Cash Reserve and Emergency Reserve Fund

L'article 17 du règlement financier indique que le Secrétariat disposera à la fin de chaque année d'une réserve de trésorerie opérationnelle, dont le montant sera d'au moins 3/12ème du budget opérationnel annuel.
L'article 18 du règlement financier indique que le montant du fonds de réserve ne sera pas inférieur à 1/12ème du budget opérationnel annuel (voir note 10).
Article 17 of the Financial Regulations indicates that the Secretariat will have at its disposal by the end of each year an amount of operating cash reserve, which will correspond to at least 3/12th of the annual operating budget.
According to Article 18 of the Financial Regulations the Emergency Reserve Fund shall not be less than 1/12th of the annual operating budget (see note 10).

(i) **Evolution ou changement de procédures internes**
Evolution or changes of internal procedures

A compter de 2007, et en accord avec le commissaire aux comptes, les procédures internes ont évolué dans 2 domaines :

- Pour l'amortissement des immobilisations, le Secrétariat retient maintenant la date d'acquisition de l'immobilisation au lieu de commencer à constater l'amortissement à partir du début de l'année suivante ;
- Les dotations aux fonds dédiés (Conférences, déménagement des directeurs, projets spéciaux, fonds pour le renforcement des capacités, fonds de rénovation et d'amélioration et fonds pour la GEBCO) sont dotées à partir du budget.

From 2007, and in agreement with the independent auditor, internal procedures have been developed in 2 areas :

- *Regarding the depreciation of fixed assets, the Secretariat now depreciates these assets from the date of acquisition of the assets, as opposed to starting the depreciation the year following that date ;*
- *Allocations to dedicated funds (Conference Fund, Relocation Fund, Special Project Fund, Capacity Building Fund, Renovation and Enhancement Fund é GEBCO Fund) are included in the budget.*

Table 8

2- Information relative au personnel – *Employee Information*

	2023	2022
Charges de personnel - *Personnel costs :*		
Secrétaire général et directeurs - *Secretary general and directors*	554	523
Salaires du personnel - *Salaries to Staff Members*	1,261	1,318
Cotisations aux régimes de retraite - *Payment to retirement funds*	372	381
Primes d'assurance - *Medical insurance costs*	343	324
Allocations au personnel - *Allowances*	23	38
Autres charges de personnel - *Other staff expenses*		3
Personnel temporaire - *Temporary staff*	45	25
Formation - *Training*		1
	2,597	2,613
L'effectif moyen annuel se décompose comme suit :		
The average number of employees during the year was made up as follows :		
Secrétaire général et directeurs - *Secretary general and directors*	3	3
Assistant Director and Finance officer	5	5
Personnel Permanent- *Permanent Member of Staff*	12	12
	20	20

3- Imposition du Résultat – *Taxation*

Selon l'accord conclu entre l'OHI et le Gouvernement de la Principauté de Monaco, les résultats de l'activité de l'Organisation sont exempts d'imposition.
According to the agreement between the IHO and the Government of the Principality of Monaco, the Organization is exempt from direct taxation.

4- Immobilisations – *Tangible Fixed Assets*

	Mobilier & Instruments Furniture & Instruments	*Biblio-thèque* Library	Total
Valeurs d'acquisition - *Cost*			
Au 1er janvier de l'année - *At 1 January 2023*	338	37	375
Solde des mouvements de l'année -*Net change during the year* *	29	0	29
Au 31 décembre de l'année - *At 31 December 2023*	367	37	404
* Achats moins mises au rebut - *Purchases less scrapping of equipment*			
Amortissements - *Depreciation*			
Au 1er janvier de l'année - *At 1 January 2023*	-318	0	-318
Amortissements de l'année - *Depreciation for the year*	-11	0	-11
	-330	0	-330
Valeur nette - *Net book value*			
Au 31 décembre de l'année n-1 - *At 31 December of previous year*	20	37	57
Au 31 décembre de l'année n - *At 31 December of current year*	37	37	74

Table 8

5- Débiteurs – *Debtors*

	2023	2022
Contributions restant dues (nettes de provision) *Overdue contributions less provision*	629	505
TVA récupérable - *VAT recoverable*	94	44
Avances au personnel et charges constatées d'avance *Prepayments and Staff advances*	131	52
	854	601

6- Créditeurs – *Creditors*

	2023	2022
Contributions reçues en avance - *Prepaid contributions*	794	727
Garantie au FRI - *Guaranty to the IRF*	1,646	1,343
Créditeurs et charges à payer - *Creditors and accruals*	742	602
	3,183	2,672

7- Engagement pour la Retraite – *Pension Commitments*

	2023	2022
- Dépôts à terme du FRI - *IRF Bank deposits*	1,744	1,978
- Disponibilités banque SG - *SG Bank deposits*	243	366
	1,987	2,344
- Garantie du Secrétariat - *Secretariat Guaranty*	1,646	1,343
- Estimation de l'engagement de retraite du personnel *Estimated net liabilities for existing and former Staff Members*	3,633	3,687

8- Fonds dédiés (pour des operations ultérieures) *Dedicated funds for future operations*

	2023	2022
- Fonds pour les conférences - *Conference Fund*	203	274
- Fonds de déménagement - *Relocation Fund*	-17	47
- Fonds de rénovation et d'amélioration – *Renovation and Enhancement Fund*	41	62
- Fonds pour le renforcement des capacités - *Capacity Building Fund*	1,138	1,669
- Fonds pour les projets spéciaux - *Special Projects Fund*	169	292
- Fonds pour la GEBCO - *GEBCO Fund*	1,740	1,949
- Fonds de la bibliothèque de présentation - *Presentation Library Fund*	60	59
- Fonds pour la conférence ABLOS - *ABLOS Conference Fund*	11	11
- Fonds IBSC - *IBSC Fund*	48	66

Table 8

9- Réserves – *Reserves*

	2023	2022
- Fonds de réserve d'urgence - *Emergency Reserve Fund*	314	298
- Réserves à distribuer - *Reserves to be distributed*	100	100
	3,808	4,827

10- Réserve de trésorerie en fin d'année – *End of Year Cash Reserve*

Le montant de trésorerie de fin d'année est un indicateur très utile pour illustrer la solvabilité de l'Organisation, et sa capacité à poursuivre ses opérations durant les 3 mois de l'année suivante (13 semaines).
Un mois supplémentaire se trouve requis pour le fonds de Réserve d'urgence, ce qui signifie un total de 17 semaines.
The end of year cash reserve is a very useful indicator of the liquidity of the Organization, and its ability to continue operations in the new year. It should be sufficient for 3 months operations (13 weeks).
In addition, a further 1 month is required for the Emergency Reserve Fund, this means a total of 17 weeks.

	2023		2022
Trésorerie de l'OHI - *IHO Cash balances*	8,678		9,623
(dont positions financières en devises - voir note 11 - *including foreign exchange holdings - see note 11)*			
Moins - *Less*			
- Contributions de l'année suivante - *Contributions received in advance*	-794		-727
- Valeur des fonds dédiés - *Dedicated funds*	-3,492		-4,420
	4,481		4,476
- Garantie en faveur du FRI - *Guaranty to the IRF*	-1,646		-1,343
- Trésorerie disponible - ***Net available Cash***	2,846	*	3,132
* 39 semaines de fonctionnement	*39 weeks of operations*		

Total du budget de l'année suivante (2024) - *Total Budget for 2024*	3,768 *(hors fonds dédiés)*
- Besoin financiers totaux (Art.17 & 18) = 17 semaines	
Total IHO financial requirements (Art.17 & 18) = 17 weeks	
Art. 17 Réserve de trésorerie opérationnelle (3 mois) :	-942
Art. 17 Operating Cash Reserve (3 months)	
Art. 18 Fonds de réserve d'urgence (1 mois) :	-314
Art. 18 Emergency Reserve Fund (1 month)	
Excédent de trésorerie disponible	1,590
Cash surplus	

Table 8

11- Positions financières en devises – *Foreign Exchange Holdings*

Les disponibilités financières comportent des positions en devises étrangères.
Pour information, la valeur en milliers d'Euros de ces positions en devises en fin d'année sont :
The Cash balance include financial availabilities held in foreign currencies.
For information, the value in thousands of Euros of foreign currencies held at the end of each year was :

	2023	2022
○ Positions en USD - *USD holdings*	1,560	1,298

Ces positions en devises sont sujettes à revalorisation, en fonction de la variation des taux de change, et génère des pertes ou gains de change.
These holdings are liable to re-valuation, according to exchange rates fluctuations.

12- Engagements de caution – *Guarantee commitments*

Personne concernée :
Monsieur Kasufumi MATSUMOTO, détaché du service des gardes-côtes japonais auprès de l'OHI, en qualité de locataire de son domicile.
Objet : Caution solidaire du locataire portant sur paiement du loyer mensuel de 1 300 €
Durée duu bail : 3 ans (17/03/2021 – 13/03/2024)

Person concerned :
Mr Kasufumi MATSUMOTO, seconded by the Japan Coast Guard to the IHO, as Lessee of his apartment.
Subject : Surety on the tenant's monthly rent payment of 1 300 €
Length : Length of lease = 3 years (17/03/2021 – 17/03/2024)

FINANCIAL STATEMENTS

ETATS FINANCIERS

Table 9

BALANCE SHEET

(expressed in Euros)

ASSETS		12/31/2023	12/31/2022
I. CASH AT BANK AND IN HAND			
IHO - Bank current accounts		2,519,686.08	2,327,969.58
IHO - Bank deposit accounts		6,156,954.04	7,293,942.63
Petty cash		1,506.95	663.29
		8,678,147.07	**9,622,575.50**
II. VARIOUS DEBTORS			
Purchases made in advance		4,834.16	3,050.79
Outstanding bills		200.00	2,000.00
Advance to staff		208.33	22,599.99
Claim for refunding of VAT		94,115.99	44,351.22
Interest from Deposit to be received		126,051.74	24,539.47
		225,410.22	**96,541.47**
III. OUTSTANDING CONTRIBUTIONS			
Contributions for the year		485,044.51	486,147.94
Contributions for previous years		281,702.40	64,389.12
Contributions for suspended MS		84,271.68	84,271.68
Provision for doubtful contributions		-222,086.19	-129,526.99
Interest remaining due on contributions		0.00	0.00
		628,932.40	**505,281.75**
IV. INTERNAL RETIREMENT FUNDS ASSETS			
Retirement cash invested (IRF)		1,744,829.12	1,978,460.86
Retirement cash invested (External Pension Plans)		242,916.93	365,949.62
		1,987,746.05	**2,344,410.48**
V. FURNITURE AND EQUIPMENT		367,009.23	338,488.14
Depreciation of assets		-329,644.42	-318,184.85
VI. LIBRARY		36,663.99	36,663.99
		74,028.80	**56,967.28**
		11,594,264.53	**12,625,776.48**

LIABILITIES		12/31/2023	12/31/2022
I. PROVISION FOR THE PENSIONS			
Provision to ensure pensions to IRF staff and retirees		2,292,662.16	2,020,351.00
Provision for external retirement			
II. VARIOUS CREDITORS			
Value of External Pension Plans		291,825.17	365,936.12
A.M.R.R Supplementary Retirement Scheme		0.00	0.00
Accruals (outstanding bills, telex, telephone)		693,572.38	594,104.86
Travel claims & wages		0.00	2,398.38
Various creditors		0.00	0.00
Deposits received for Conference (stands)		0.00	5,210.00
		985,397.55	**967,649.36**
III. CONTRIBUTIONS RECEIVED IN ADVANCE			
Received in advance or in excess		**794,220.79**	**727,197.60**
IV. CAPITAL			
Emergency Reserve fund		314,008.00	297,825.00
Reserves to be distributed		100,000.00	100,000.00
Staff Retirement fund (IRF)		1,098,219.84	1,301,507.32
Conference Fund		203,171.85	269,838.65
Relocation Fund		-16,530.47	47,129.35
Renovation and Enhancement Fund		41,148.25	61,507.92
Capacity Building Fund		1,137,612.84	1,663,834.18
Special Projects Fund		169,021.16	292,436.00
GEBCO fund		1,739,505.27	1,948,881.78
Presentation Library Fund		59,562.15	59,062.15
ABLOS Conference fund		10,734.70	10,747.86
IBSC Fund		47,763.87	66,072.13
		4,904,217.46	**6,118,842.34**
Net yearly operating profit		215,221.97	100,697.41
Net Members Fund		2,402,544.61	2,691,038.77
		2,617,766.58	**2,791,736.18**
		7,521,984.04	**8,910,578.52**
		11,594,264.53	**12,625,776.48**

Table 10

BILAN

(exprimé en Euros)

ACTIF	31/12/2023	31/12/2022	PASSIF	31/12/2023	31/12/2022
I. TRESORERIE DISPONIBLE			**I. PROVISION POUR LES PENSIONS DU PERSONNEL**		
OHI - Comptes courants bancaires	2,519,686.08	2,327,969.58	. Provision pour couvir les pensions du personnel	2,292,662.16	2,020,351.00
OHI - Comptes de dépôt & placement monétaire	6,156,954.04	7,293,942.63	(retraités et actifs relevant du FRI)		
Espèces en caisse	1,506.95	663.29	Provision pour retraites externes		
	8,678,147.07	**9,622,575.50**	**II. CREDITEURS DIVERS**		
II. DEBITEURS DIVERS			Plans de pensions externes	291,825.17	365,936.12
Prestations effectuées d'avance	4,834.16	3,050.79	Retraite complémentaire A.M.R.R	0.00	0.00
Factures non encaissées	200.00	2,000.00	Charges à payer (factures, télécommnucations, etc..)	693,572.38	594,104.86
Avances au personnel	208.33	22,599.99	Salaires et notes de frais	0.00	2,398.38
Demande de remboursement de TVA	94,115.99	44,351.22	Créditeurs divers	0.00	0.00
Intérêts sur placements à recevoir	126,051.74	24,539.47	Montants reçus pour la prochaine Conférence (stands)	0.00	5,210.00
	225,410.22	**96,541.47**		**985,397.55**	**967,649.36**
III. CONTRIBUTIONS			**III. CONTRIBUTIONS RECUES EN AVANCE**		
Contributions pour l'année en cours	485,044.51	486,147.94	Reçues en avance ou en excédent	**794,220.79**	**727,197.60**
Contributions échues (années précédentes)	281,702.40	64,389.12	**IV. CAPITAUX PERMANENTS**		
Contributions (Etats membres suspendus)	84,271.68	84,271.68	Fonds de réserve d'urgence	314,008.00	297,825.00
Provision pour contributions	-222,086.19	-129,526.99	Réserves à distribuer	100,000.00	100,000.00
Intérêts restant dus sur contributions échues	0.00	0.00	Fond de Retraite Interne (FRI)	1,098,219.84	1,301,507.32
	628,932.40	**505,281.75**	Fonds pour les conférences	203,171.85	269,838.65
			Fonds pour le déménagement des directeurs	-16,530.47	47,129.35
IV. TRESORERIE DES FONDS DE RETRAITE			Fonds de rénovation et d'amélioration	41,148.25	61,507.92
			Fonds pour le renforcement des capacités	1,137,612.84	1,663,834.18
Trésorerie disponible (FRI)	1,744,829.12	1,978,460.86	Fonds pour les projets spéciaux	169,021.16	292,436.00
			Fonds pour la GEBCO	1,739,505.27	1,948,881.78
Trésorerie placée (Plans externes)	**242,916.93**	365,949.62	Fonds de la bibliothèque de présentation	59,562.15	59,062.15
			Fonds pour la conférence ABLOS	10,734.70	10,747.86
	1,987,746.05	**2,344,410.48**	Fonds IBSC	47,763.87	66,072.13
				4,904,217.46	**6,118,842.34**
V. MOBILIER & EQUIPEMENTS	367,009.23	338,488.14			
Amortissement des immobilisations	-329,644.42	-318,184.85			
			Résultat opérationnel net de l'année en cours	215,221.97	100,697.41
VI. BIBLIOTHEQUE	36,663.99	36,663.99	Capitaux nets permanents	2,402,544.61	2,691,038.77
				2,617,766.58	**2,791,736.18**
	74,028.80	**56,967.28**			
				7,521,984.04	**8,910,578.52**
	11,594,264.53	**12,625,776.48**		**11,594,264.53**	**12,625,776.47**

International Hydrographic Organization - *Organisation Hydrographique Internationale*

Profit and Loss Statement - *Compte d'exploitation*

as of 31 December 2023 - *au 31 décembre 2023*

(expressed in Euros - *exprimé en Euros*)

		2023		2022
***Revenus* - Income**				
Contributions des Etats Membres - Contributions from Member States		3,485,061.12		3,485,061.80
Imposition interne - Internal tax		181,793.65		184,933.59
Revenus et dépenses exceptionnelles - Exceptional income and expenditure		-44,522.78		128,503.90
		3,622,331.99		3,798,499.29
***Revenus financiers* - Interest received**				
Intérêts des placements - bank interest		93,845.14		31,033.35
		93,845.14		31,033.35
***Charges opérationnelles* - Operating costs**				
Charges de personnel - Personnel costs	2,597,294.37		2,613,456.41	
Déplacements - Long Distance Travel	208,903.02		219,960.46	
Entretien des locaux et équipements - Maintenance of premises and equipment	104,558.67		95,214.91	
Postes et télécommunications - Postage and telephone	25,193.40		21,094.11	
Consultants - Consultancy	74,214.44		37,787.99	
Support administratif pour le Conseil - Administrative support for the Cc	11,653.81		8,513.73	
Autres publications - Other publications	250.00		726.86	
Revue hydrographique internationale - I.H Review	10,000.00		10,000.00	
Autres coûts opérationnels - Other operating costs	25,707.76		20,293.26	
Fournitures de bureau - Office stationery	6,651.98		9,263.95	
Relations publiques - Public relations	19,894.56		9,976.59	
Charges diverses - Miscelleanous	22.99		153.00	
		-3,084,345.00		-3,046,441.27
***Matériel de bureau* - Office equipment**				
Amortissement des immobilisations - Depreciation	11,459.57		16,704.35	
Autres achats - Other purchases	14,148.03		18,968.29	
		-25,607.60		-35,672.64
***Charges financières* - Financial costs**				
Créances douteuses - Bad debts	132,802.56		44,267.52	
Provision congés payés - Provision leave days	0.00		-35,747.00	
Provision retraites externes - Provision external retirement	150,000.00		250,000.00	
		-282,802.56		258,520.52
***Dotations aux fonds dédiés* - Allocation to dedicated funds**		-108,200.00		-388,200.00
***Résultat net annuel* - Result for the year**		**215,221.97**		**100,697.41**

International Hydrographic Organization
Organisation Hydrographique Internationale

Notes to the Financial Statements - *Notes relatives aux Etats Financiers*

as of 31 December 2023 - *au 31 décembre 2023*
(expressed in thousands of Euros - *exprimé en milliers d'Euros*)

1- Principes Comptables – *Accounting Policies*

Les états financiers sont préparés conformément aux principes comptables de l'Organisation Hydrographique Internationale qui ne sont pas substantiellement différents des principes comptables généralement reconnus en Principauté de Monaco sauf pour certains points, par exemple :

- La Provision pour assurer les pensions au personnel IFR et aux retraités : conformément aux principes comptables de l'Organisation Hydrographique Internationale, la provision est intégralement comptabilisée au moyen d'un compte de capitaux propres tandis que, selon les principes comptables généralement reconnus en Principauté de Monaco, cette provision et sa variation annuelle devraient être comptabilisées au moyen de comptes de pertes et profits ;
- Quelques différences mineures de présentation.

The financial statements are prepared in accordance with the International Hydrographic Organization accounting principles which are not substantially different from the generally accepted accounting principles in Principality of Monaco except for some matters, for example :

- *Provision to ensure pensions to IFR staff and retirees : in accordance with the Internal Hydrographic Organization accounting principles, the provision is fully recorded through an equity account whereas under the generally accepted accounting principles in Principality of Monaco, this provision and its annual variation should be recorded through profit and loss accounts.*
- *Some minor presentation differences.*

2- Présentation de l'OHI – *Presentation of the IHO*

L'organisation Hydrographique Internationale (OHI) est une organisation intergouvernementale consultative et technique, qui a été créée en 1921 en vue de soutenir la sécurité de la navigation et la protection du milieu marin. L'OHI jouit du statut d'observateur auprès de l'Organisation des Nations Unis et elle est reconnue comme étant l'autorité compétente en matière d'hydrographie et de cartographie marine.
Le Secrétariat de l'OHI est basé à Monaco et dirigé par un Secrétaire général et assisté de deux directeurs. Le Secrétariat général et les deux directeurs sont élus par les Etats Membres de l'OHI lors des sessions ordinaires de l'Assemblée.

The International Hydrographic Organization (IHO) is an intergovernmental consultative and technical organization that was established in 1921 to support safety of navigation and the protection of the marine environment. The IHO enjoys observer status at the United Nations (UN) and is recognized as the competent international authority regarding hydrography and nautical charting.
The Secretariat of the IHO is based in Monaco and is headed by a Secretary General assisted by two Directors. They are elected by the IHO Member States at ordinary sessions of the Assembly.

3- Information relative au personnel – *Employee Information*

Les membres du personnel sont régis par le règlement du personnel, qui énonce les devoirs et obligations, les conditions de service et les droits fondamentaux des membres du personnel du Secrétariat de l'OHI.
Members of Staff of the IHO are ruled by the Staff Regulations, which set out the duties and obligations, the conditions of service and the basic rights of the Members of staff of the IHO.

L'effectif moyen annuel se décompose comme suit :
The average number of employees during the year was made up as follows :

Secrétaire général et directeurs - Secretary general and directors	3
Assistant Director and Finance officer	5
Personnel Permanent – *Permanent Member of Staff*	12
	20

4- Contributions reçues d'avance – *Contributions received in advance*

A partir du mois de Juillet de l'année en cours, les lettres de demandes de contributions pour l'année suivante sont envoyées aux Etats Membres. Les paiements reçus sont comptabilisés dans le compte 4873 « Contributions reçues d'avance ». Le revenu de contribution est comptabilisé au 1er janvier de l'exercice concerné.
As of July of the current year, letters for the contributions for the following year are sent to Member States. Payments of these contributions are accounted for in the account 4873 "Contributions received in advance". Income from these contributions is accounted for on the 1st January of the following year.

5- Fonds dédiés (pour des operations ultérieures) – *Dedicated funds for future operations*

Fonds pour l'Assemblée – *Assembly Fund*

Le fonds pour les Conférences permet la couverture des dépenses de l'Assemblée hydrographique internationale.
The Conference Fund allow the expenses linked to the International Hydrographic Assembly to be met.

Montant du fonds au 1er Janvier 2023 – *Amount of fund on 1st January 2023*	274,333.63 €
Dotation budgétaire pour 2023 – *Budget Allocation 2023*	20,000.00 €
Affectation Résultat (A3) – *Decision Resultat A3*	100,697.41 €
Dépenses – *Expenditure*	- 246,753.19 €
Montant du fonds au 31/12/2023 – *Amount of fund on 31/12/2023*	203,171.85 €

Fonds de rénovation et d'amélioration – *Renovation and Enhancement Fund*

Le fonds de rénovation est maintenu pour couvrir toute dépense importante de modification ou de rénovation des locaux, dont le financement ne serait pas assuré par le Gouvernement de la Principauté de Monaco.
The renovation fund is maintened in order to meet any major expenses incurred for modification or renovation purposes of the building, in relation to those expenses not covered by the Government of the Principality of Monaco.

Montant du fonds au 1er Janvier 2023 – *Amount of fund on 1st January 2023*	61,507.92 €
Dotation budgétaire pour 2023 – *Budget Allocation 2023*	
Dépenses – *Expenditure*	- 20,359.67 €
Montant du fonds au 31/12/2023 – *Amount of fund on 31/12/2023*	41,148.25 €

Fonds pour le déménagement des directeurs- *Relocation FUND*

Ce fonds est destiné à couvrir les dépenses de déménagement des membres du personnel recrutés sur le plan international.

This fund is intended to cover the removal and relocation expenses for the internationally recruited members of staff.

Montant du fonds au 1er Janvier 2023 – *Amount of fund on 1st January 2023*	47,129.35 €
Dotation budgétaire pour 2023 – *Budget Allocation 2023*	
Dépenses – *Expenditure*	- 63,659.82 €
Montant du fonds au 31/12/2023 – *Amount of fund on 31/12/2023*	- 16,530.47 €

Fonds pour les conférences ABLOS – *ABLOS CONFERENCE FUND*

Le fonds ABLOS couvre les dépenses d'une conférence qui se tient tous les 2 ans.

The ABLOS Fund supports the operational costs for the ABLOS conference which is held every other year.

Montant du fonds au 1er Janvier 2023 – *Amount of fund on 1st January 2023*	10,747.86 €
Dotation budgétaire pour 2023 – *Budget Allocation 2023*	5,940.00 €
Dépenses – *Expenditure*	- 5,953.16 €
Montant du fonds au 31/12/2023 – *Amount of fund on 31/12/2023*	10,734.70 €

Fonds pour la Carte Générale Bathymétrique des Océans – *GEBCO FUND*

Ce fonds a été crée en 2002 pour couvrir les activités liées à la GEBCO (recettes et dépenses), et inclut les subventions reçues chaque année du Gouvernement de la Principauté de Monaco et d'autres bienfaiteurs.

This fund was created in 2002 to support approved GEBCO project activities and includes the subventions received every year from the Government of the Principality of Monaco and any other supporting benefactors.

Montant du fonds au 1er Janvier 2023 – *Amount of fund on 1st January 2023*	1,948,881.78 €
Revenus – *Income :*	
Dotation budgétaire pour 2023 – *Budget Allocation 2023*	18,200.00 €
Subvention reçue du Gvt. de Monaco – *Subvention from the Gvt. Of Monaco*	8,300.00 €
Transfert de la Nippon Foundation – *Transfer from Nippon Foundation*	2,910,344.83 €
Dépenses – *Expenses :*	
SCUFN Gazetter – SCRUM	- 7,650.00 €
SEABED 2030	-3,124,897.53 €
GEBCO	- 13,673.81 €
Montant du fonds au 31/12/2023 – *Amount of fund on 31/12/2023*	1,739,505.27 €

Fonds pour la bibliothèque de présentation – *PRESENTATION LIBRARY FUND*

Ce fonds est dédié à l'évolution d'une publication spécifique (Annexe A à la publication S-52-bibliothèque de présentation de l'OHI pour les ECDIS). Lors de sa 6ème réunion, le comité des normes et services hydrographiques ont approuvé la continuation de ce fonds et a recommandé qu'il soit utilisé pour financer le développement ultérieur de la composante présentation de la nouvelle génération de normes basée sur la S-100.

This fund is dedicated to the maintenance of a specific publication (S-52 Annex A-IHO Presentation Library for ECDIS). During its 6th meeting, the Hydrographic Services and Standards Committee endorsed the continuation of the fund and recommended that the fund be used to support further development of the portrayal component of the new S-100 based generation of standards.

Montant du fonds au 1er Janvier 2023 – *Amount of fund on 1st January 2023*	59,062.15 €
Revenus – *Income :*	
Ventes de la publication "Bibliothèque de présentation »	500.00 €
Sales of the Publication « Presentation Library"	
Montant du fonds au 31/12/2023 – *Amount of fund on 31/12/2023*	59,562.15 €

Fonds de réserve d'urgence – *EMERGENCY RESERVE FUND*

Conformément à la lettre LCCF 6/2003 approuvée, le montant du fonds de réserve d'urgence ne devra pas être inférieur à 1/12ème du budget opérationnel annuel.

As announced in FCCL 6/2003, the amount of the Emergency Reserve Fund shall not be less than 1/12th of the annual operating budget.

Montant du fonds au 1er Janvier 2023 – *Amount of fund on 1st January 2023*	297,825.00 €
Allocation complémentaire pour satisfaire les dispositions de l'article 18 du règlement financier	
Additionnal allowance to meet Financial Regulations Art.18 requirements	16,183.00 €
Montant du fonds au 31/12/2023 – *Amount of fund on 31/12/2023*	314,008.00 €

Fonds de retraite interne (FRI) – *INTERNAL RETIREMENT FUND (IRF)*

L'OHI gère un fonds de pension dénommé Fonds de retraite interne (FRI). Actuellement, neuf retraités sont concernés par ce fonds.

La totalité des avoirs destinés à couvrir les engagements de ce fonds font l'objet de comptes bancaires spécifiques sous forme de comptes de dépôt à terme.

L'Organisation retient l'intégralité de l'engagement déterminé sur la base de l'estimation triennale d'une étude actuarielle.

A partir de 2016, une provision complémentaire, réévaluée tous les ans, est incluse dans le budget annuel, afin de couvrir les engagements supplémentaires générés par la possibilité pour les membres du personnel de choisir une pension basée sur la CAR, conformément à l'article 9.6 du Règlement du personnel édition 8.0.0.

The Organization operates a benefit pension scheme known as the Internal Retirement Fund (IRF). Nire retirees are covered by this fund.

A proportion of the assets held to meet the pension liability are held in designated bank accounts and investments.

The Organization makes full provision for the estimated liability bases on triennial actuarial valuation. From 2016, a provision has been included in the annual budget, to be adjusted every year, to cover the additional liabilities of the Staff Members electing to draw a pension equivalent to the CAR, in accordance with article 9.6 of the Staff Regulations edition 8.0.0.

Montant de la dette sociale au 01/01/2023	3,692,778.48 €	
Amount of social liability on 01/01/2023		
Dotation Budgétaire 2023 – *Budget allocation 2023*	150,000.00 €	
Intérêts perçus par le fonds (D/A) – *Interests received from deposit acc.*	29,290.65 €	
Pensions réglées par le fonds (FRI)-*Pensions paid from IRF*	- 232,548.13 €	
		3,639,491.00 €
Variation annuelle de la dette sociale du FRI		
Variation of IRF liability during the year	272,311.16 €	
Solde du compte FRI au 31/12/2023 – *Balance of IRF on 31/12/2023*	2,020,351.00 €	
Provision pour les pensions au 31/12/2023		
Provision for the pensions on 31/12/2023	2,292,662.16 €	
Montant de la dette sociale du FRI au 31/12/2023		
Amount of IRF social liability on 31/12/2023		3,911,802.16 €

Provision pour retraite externe - *PROVISION FOR EXTERNAL RETIREMENT*

L'OHI a l'obligation d'assurer à ses membres du personnel recrutés localement une pension de retraite au moins équivalente à la CAR. A cet effet, un contrat avait été souscrit auprès d'une compagnie d'assurance, Neuflize Vie. En février 2021, Neuflize Vie a décidé d'annuler ce contrat.
Un nouveau contrat a été souscrit à partir de janvier 2022 auprès d'une autre compagnie d'assurance, GAN VIE, qui assure une pension au moins équivalente à celle versée par la CAR, à la condition que le capital nécessaire au paiement de cette pension soit versé intégralement à GAN au moment du départ à la retraite du salarié.
Cet engagement est calculé et ajusté tous les ans. La valeur actualisée de ces engagements, calculée par la compagnie d'assurance GAN, s'élève au 31 décembre 2023 à 3M€. Le capital au terme estimé et basé sur l'équivalence CAR s'élève quant à lui à 4,9M€
Les fonds versés jusqu'au 31 décembre 2023 sont de 1,3 M€ générant ainsi une provision globale estimée au terme de 1,9M€.
Au 31/12/2023, la provision cumulée comptabilisée s'élève à 543K€.

The IHO has an obligation towards its staff members locally recruted to ensure a retirement pension at least equivalent to the one served by the CAR. To this effect, a contract had been established with an insurance company, Neuflize Vie. In February 2021, Neuflize Vie decided to cancel this contract.
A new contract has been established with another insurance company, GAN VIE, with effect 1st January 2022 which ensures a payment of a pension equivalent CAR on the condition that the capital needed for the payment of this pension is totally paid by the IHO on retirement of the Staff Member.
This engagement is calculated and ajusted every year. The current value of this engagement by the end of 2023 is estimated by the insurance company GAN to be 3M€. The estimate capital at maturity, based on CAR equivalence, amounts to 4,9M€.
The funds already disbursed by december 31, 2023 amount to 1,3M€ generating an estimated total provision at maturity of 1,9M€.
At 31/12/2023, the cumulative provision already recognized amounted to 543K€.

Fonds pour le renforcement des capacités - *CAPACITY BUILDING FUND (CBF)*

La lettre circulaire 87/2004 définit le CBF comme un soutien visant à aider les pays en voie de développement à établir des capacités humaines et institutionnelles en vue du développement efficace des capacités en levés hydrographiques et en cartographie marine nécessaires.
Circular Letter 87/2004 defines the CBF as a support to assist developing countries in building human and institutional capacities for the effective development of hydrographic surveying and nautical charting capabilities needed.

Montant du fonds au 1er Janvier 2023 – *Amount of fund on 1st January 2023*	1,663,834.18 €
Revenus – *Income :*	
Dotation budgétaire de l'OHI – *IHO Budget Allocation*	65,000.00 €
Soutien reçu de la République de Corée– *Support from the Republic of Korea*	598,549.89 €
Soutien reçu du Japon – *Support from Japan*	409,493.00 €
Soutien reçu du Canada – *Support from Canada*	75,440.46 €
Dépenses – *Expenses :*	
Activités financées par la Rep. de Corée- *Activities supported by the Rep.of Korea*	-711,226.58€
Activités financées par le Japon - *Activities supported by Japan*	-661,447.52€
Activités financées par le Canada - *Activities supported by Canada*	-100,629.74€
Activités financées par le fonds de l'OHI- *Activities supported by IHO*	-126,412.51€
Montant du fonds au 31/12/2023 – *Amount of fund on 31/12/2023*	1,137,612.84 €

Fonds pour les projets spéciaux - *SPECIAL PROJECTS FUND*

Le Fonds pour les projets spéciaux a été établi en 2012 pour couvrir différents projets spéciaux, comme la maintenance ou l'établissement de normes, l'édition ou la mise à jour de publications complexes, diverses traductions, et des besoins particuliers identifiés par les comités et groupes de travail de l'Organisation. Ce fond couvre en particulier le développement de la nouvelle génération de normes basées sur la S-100.
The Special Projects Fund was established in 2012 to cover various special projects, such as the maintenance or drafting of standards, the editing or updating of complex publications, translations, and particular requirements identified by the Committees and other bodies of the Organization. This fund supports in particular the development of the new generation of S-100 based standards.

Montant du fonds au 1er Janvier 2023 – *Amount of fund on 1st January 2023*	292,436.00 €
Dotation budgétaire de l'OHI – *IHO Budget Allocation*	5,000.00 €
Dépenses – *Expenditure*	-128,414.84 €
Montant du fonds au 31/12/2023 – *Amount of fund on 31/12/2023*	169,021.16 €

FONDS IBSC - *IBSC FUND*

Le Fonds sert à couvrir les dépenses opérationnelles authorisées du Comité.
A partir de 2015, l'OHI en tant que secrétaire de l'IBSC, a repris le rôle de trésorier du Fonds.
The purpose of the Fund is to support the approved operational expenses of the IBSC.
From 2015, the IHO as secretary of the IBSC, took over the role of treasurer of the Fund.

Montant du fonds au 1er Janvier 2023 – *Amount of fund on 1st January 2023*	66,072.13 €
Honoraires facturés aux institutions souhaitant obtenir l'homologation IBSC *Fees levied on institutions seeking recognition by IBSC*	28,260.88 €
Frais de voyages – *Travel Expenses*	-46,569.14 €
Montant du fonds au 31/12/2023 – *Amount of fund on 31/12/2023*	47,763.87 €

Les fonds ABLOS, GEBCO et IBSC sont tous gérés par le biais des comptes bancaires consolidés de l'OHI.
The ABLOS, GEBCO and IBSC funds are all operated as part of the consolidated IHO bank accounts

INDEPENDENT AUDITOR'S REPORT

PASCALE TARAMAZZO

EXPERT - COMPTABLE

MEMBRE DE L'ORDRE DES EXPERTS COMPTABLES DE LA PRINCIPAUTE DE MONACO

Independent auditor's report

International Hydrographic Organization
4, Quai Antoine I'
98000 Monaco
MONACO

As auditor appointed by the IHO Assembly decision on 02/05/2023, for the financial years 2023-2025, we present our annual report on financial year 2023.

Report on the audit of the financial statements

Our opinion
In our opinion, International Hydrographic Organization's financial statements present fairly, in all material respects, the balance sheet of the Organization as at December 31, 2023, and its profit and loss statement for the year then ended in accordance with the accounting principles selected and disclosed by the Organization as set out in the notes to the financial statements, under the following limitation :
Some specific funds are subject to an annual request for reimbursement of the unspent amount paid in and estimated in dollars. The exchange dollar/euro is not recognized in the result figure, in the absence of agreement to cover it, and remains in the fund's account. In the absence of determination of these successive exchange's differences, whose origin relates to previous year, we are not able to assess their impact.

What we have audited
International Hydrographic Organization's financial statements are comprised of:

- The balance sheet as at December 31, 2023 ;
- The profit and loss statement for the years then ended ;
- The notes to the financial statements.

Basis for opinion
We conducted our audit in accordance with International Standards on Auditing (ISAs).
Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of our report.
We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion except the limitation above

Independence
We are independent of the Organization in accordance with the International Ethics Standards Board for Accountants' Code of Ethics for Professional Accountants (IESBA Code). We have fulfilled our other ethical responsibilities in accordance with the IESBA Code.

Basis of accounting and restriction on distribution and use
We draw attention to Note 1"Accounting policies" to the financial statements, which describes the basis of accounting. The financial statements are prepared for the Organization's member states. As a result, the financial statements may not be suitable for another purpose. Our report is intended solely for the Organization's member states and should not be distributed to or used by parties other than the Organization's member states. Our opinion is not modified in respect of this matter.

Other information

The Secretary General is responsible for the other information. The annual Report 2023 - Part 2- Finances constitutes the other information for the year ended December 31, 2023. It includes the financial statements referred to here above and our auditor's report thereon as well as the Profit and Loss Statement as of 31 December 2023.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon except for the financial statements subject to our auditor's report.

In connection with our audit of the financial statements, our responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the financial statements.

Responsibilities of the Secretary General and those in charge of governance for **the financial statements**

The Secretary General is responsible for the preparation and fair presentation of the financial statements in accordance with the accounting principles selected and disclosed by the Organization as set out in the notes to the financial statements, and for such internal control as Secretary General determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, Secretary General is responsible for assessing the Organization's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless Secretary General either intends to liquidate the Organization or to cease operations, or has no realistic alternative but to do so.

Those in charge of governance are responsible for overseeing the Organization's financial reporting process.

Auditor's responsibilities for the audit of the financial statements

Our objective are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report the includes our opinion. Reasonable assurance in a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs will always detect a material misstatement when it exists.
Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, the could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.
As part of an audit in accordance with ISAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of intern control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Organization's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by Secretary General.

- Conclude on the appropriateness of Secretary General's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Organization's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Organization to cease to continue as a going concern.

- Evaluate the overall presentations, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Date: 03/04/2024

Pascale TARAMAZZO
Le Commissaire aux comptes