

STRATEGIC PLAN REVIEW WORKING GROUP (SPRWG) DRAFTING GROUP-1 MEETING Monaco, 30-31 January

Contribution to the IHO Work Programme 2019

Task 1.4.2

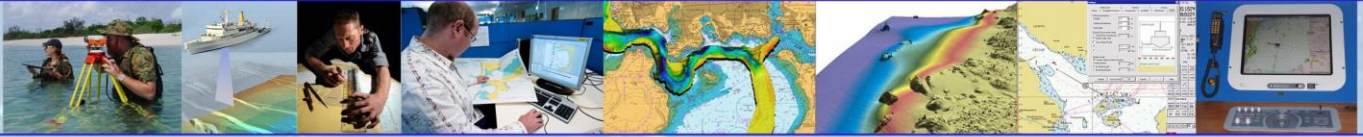
Develop and propose future IHO Work Programme, Budget and Strategic Plan

The 1st Meeting of the Drafting Group of the Strategic Plan Review Working Group (SPRWG) was held in Monaco, from 30 to 31 January with 12 participants from eight Member States. Secretary-General Mathias Jonas and Assistant Director Alberto Costa Neves represented the IHO Secretariat.



Participants at the 1st Meeting of the Drafting Group of the Strategic Plan Review Working Group (SPRWG)

The IHO Council was directed by the 1st Session of the IHO Assembly to conduct a comprehensive review of the IHO Strategic Plan and to provide a draft revised Plan in time for the 2nd Session of the Assembly in 2020. In the current scoping phase the Drafting Group reviewed the current and future strategic context in which the IHO operates, advancing the work done by correspondence.

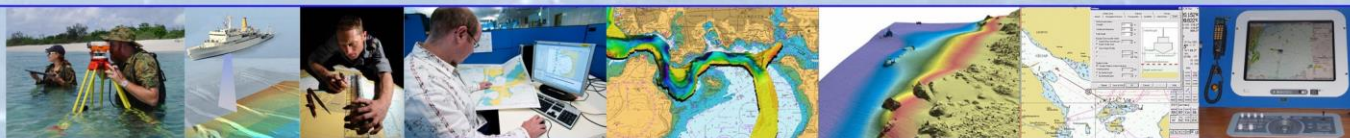


Participants considered the definition of success for the IHO in 2026, identified deficiencies in the existing Plan, and envisioned the appropriate goals, ways and means that could address those deficiencies. The meeting identified criteria for measuring success and for proposing priorities for the IHO, considered the interrelation to other management elements such as budget, work plan and performance indicators.

The meeting considered the international arena and the relationship with the United Nations Sustainable Development Goals and the Shared Guiding Principles for Geospatial Information Management. Cooperation with other international organizations and the existing joint work were also discussed. A modern communication framework was considered as a critical element for the success of the IHO Strategic Plan.

Among other factors considered were the need to develop nautical publications under the S-100 framework, cyber security and data assurance, increase of the bathymetric coverage and knowledge of seafloor shape and enhance capacity building.

The next meeting of the Drafting Group will be carried in conjunction with the upcoming meeting of the Inter-Regional Coordination Committee (IRCC11) in Genoa, Italy, from 3 to 5 June 2019.



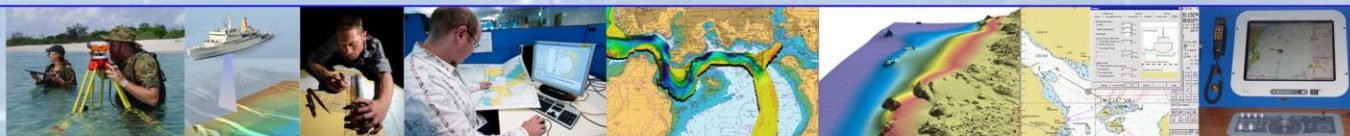
17TH MEETING OF THE DOCUMENT REVIEW WORKING GROUP OF THE IHO SUB-COMMITTEE ON THE WORLD-WIDE NAVIGATIONAL WARNING SERVICE (DRWG17) London, UK, 29-31 January

Contribution to the IHO Work Programme 2019	
Task 3.5.2	WWNWS-SC meetings/DRWG

The Document Review Working Group (DRWG) of the IHO Sub-Committee on the World-Wide Navigational Warning Service (WWNWS-SC), which is continuing its review and maintenance of the WWNWS documentation, met at the Headquarters of the International Maritime Organization (IMO) in London, UK from 29 to 31 January under the chairmanship of Mr Peter Doherty (USA). The meeting was held in the week following the 6th session of the IMO Sub-Committee on Navigation, Communications and Search and Rescue (NCSR 6), to take advantage of the presence of WG Members who had previously attended NCSR 6 (Canada, New Zealand, Norway, USA, IMO, World Meteorological Organization (WMO), International Mobile Satellite Organization (IMSO), Inmarsat, Iridium and IHO). The IHO Secretariat was represented by Assistant Director David Wyatt.

The outcomes of the 6th session of the IMO Sub-Committee on Navigation, Communications, and Search and Rescue (NCSR 6) relevant to the WWNWS-SC were reviewed. These included the work of a number of Correspondence Groups and groups developing equipment guidelines in which WWNWS-SC members should be involved.

As a consequence of the decisions made at the 99th session of the Maritime Safety Committee (MSC 99) and NCSR 6, in particular the recognition of Inmarsat Fleet Safety and the Iridium satellite service as recognised mobile satellite services of the Global Maritime Distress and Safety System (GMDSS), the DRWG completed a comprehensive revision of the International SafetyNET Manual to include details of the Fleet Safety services and the results of the migration from the I3 to the I4 satellite constellations. The draft revisions will be considered by the 11th meeting of the WWNWS-SC (WWNWS11), which will be held from 26 to 30 August 2019 in Halifax, Canada, and subsequently be submitted to the 7th session of the NCSR scheduled 15 to 24 January 2020. The DRWG also generated the draft preliminary interim version of the Iridium satellite services manual, which will support the work undertaken by Iridium during the initial operational assessment phase of their service. The draft manual will be submitted to MSC 101 for approval. Subsequent to gaining initial operational experience, it is planned to undertake a further revision of the Iridium manual at DRWG18, in preparation for submission to the 12th meeting of the WWNWS-SC (WWNWS12) in 2020.

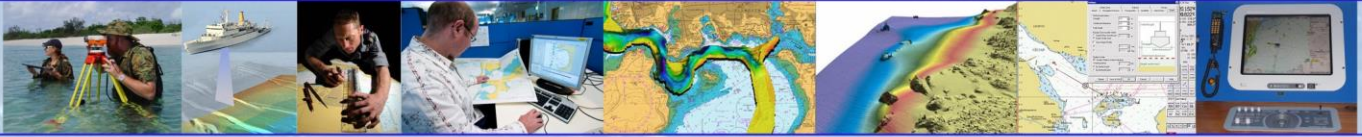


DRWG17 participants at the IMO Headquarters

The DRWG also reviewed the draft agenda for the 11th session of WWNWS-SC in preparation for the meeting in August 2019 and noted the next document due for comprehensive review was the IMO NAVTEX Manual, which will be commenced at DRWG18 in 2020.

All meeting documents are available on the IHO website (https://www.iho.int/mtg_docs/com_wg/CPRNW/CPRNW_Docreview/DRWG17/DRWG17.htm).

The documents, submitted by the DRWG to WWNWS11, will be available on the WWNWS page of the IHO web site. The next DRWG meeting is tentatively planned from 28 to 30 January 2020 at IMO in London.



**6TH SESSION OF THE IMO SUB-COMMITTEE ON NAVIGATION,
COMMUNICATIONS AND SEARCH AND RESCUE (NCSR6)
London, United Kingdom, 16 - 25 January**

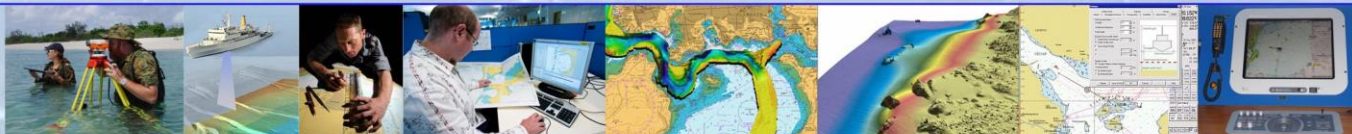
Contribution to the IHO Work Programme 2019	
Task 1.1.8.4	Maintain relationship with the International Maritime Organization (IMO), including Attendance of NCSR-SC meeting

The Sub-Committee on Navigation, Communications and Search and Rescue (NCSR) is a subordinate body of the Maritime Safety Committee (MSC) of the International Maritime Organization (IMO). The 6th session of the Sub-Committee (NCSR 6) was held at the IMO Headquarters in London, United Kingdom from 16 to 25 January 2019. The IHO was represented by Director Abri Kampfner, Assistant Director David Wyatt, Mr Peter Doherty, the Chair of the World-Wide Navigational Warning Service Sub-Committee (WWNWS-SC), and Mr Christopher Janus, Branch Chief, NGA Maritime Watch - NAVAREA IV/XII. Several representatives of Hydrographic Offices also attended the meeting as a member of their national delegation.



IMO NCSR 6 Plenary in session

NCSR 6 approved the draft MSC circular on the Procedure for the submission of documents containing proposals for the establishment of, or amendments to, ship's routing systems or ship reporting systems, in addition two routing measures and three precautionary areas were approved, all of which will be forwarded to the MSC for adoption at its 101st session (MSC 101) in June 2019. The Sub-Committee invited interested parties to verify the modifications to one routing measure and submit comments to MSC 101. The Sub-Committee received reports from the Chair of the IMO NAVTEX Panel and the Chair of the IHO WWNWS-SC reported on the activities of the sub-committee.



With respect to navigation matters, the NCSR 6 approved the draft MSC resolution on amendments to MSC.191(79) on *Performance standards for the presentation of navigation-related information on shipborne navigational displays*, which included an expanded appendix of S-mode Guidelines. The Sub-Committee approved the draft SN.1/Cir.243/Rev.2 on *Guidelines for the presentation of navigation-related symbols, terms and abbreviations*. The NCSR 6 approved the draft MSC circular on *Initial descriptions of Maritime Services in the context of e-navigation*, which included an annex containing all the draft descriptions submitted by coordinating bodies to date. The Sub-Committee approved the draft MSC circular on *Guidance for navigation and communication equipment intended for use on ships operating in polar waters*. All these drafts will be submitted to MSC 101 for the Committee's approval and subsequent adoption.

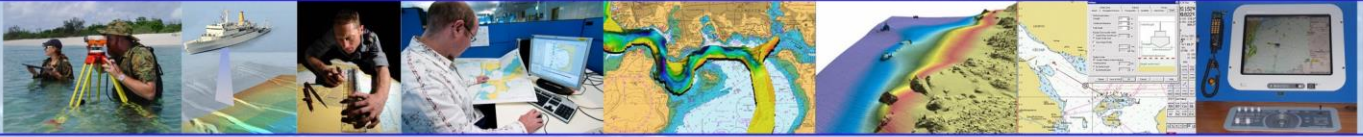
In regard to Communications and Global Maritime Distress and Safety System (GMDSS) matters, the Sub-Committee approved the re-establishment of a Correspondence Group on the modernization of the GMDSS, taking into account the progress on the revision of SOLAS chapters III and IV and on the related and consequential amendments to existing instruments other than SOLAS. The Sub-Committee invited Member States and international organizations to submit proposals to a subsequent session to address the issues related to monitoring of Enhanced Group Call (EGC) messages in a multi-provider environment. The NCSR 6 approved revisions to the SafetyNET Manual related to the recognition of the Fleet Safety service and for these revisions to be issued as interim guidance in a MSC circular. The Sub-Committee approved the proposed amendments to resolutions A.705(17), as amended,



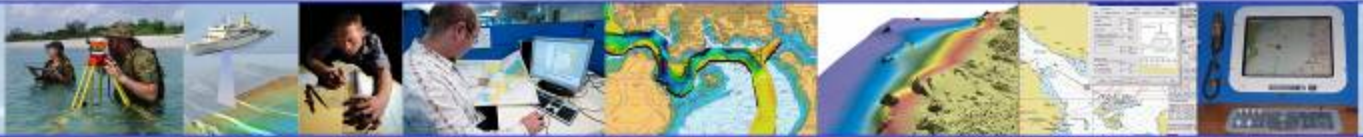
IHO and WMO delegations at IMO NCSR 6

– *Recommendation on promulgation of Maritime Safety Information*,

A.706(17), as amended, – *World-Wide Navigation Warning Service*, and A.1051(27) – *IMO/WMO worldwide met-ocean information and warning service guidance document* – subject to final consideration of some text at MSC 101 before final approval and adoption. The Sub-Committee approved the revised Terms of Reference for the International SafetyNET Coordinating Panel and agreed to the re-naming of the Panel to become the IMO Enhanced Group Call (EGC) Coordinating Panel, in line with the current IMO NAVTEX Coordinating Panel. The NCSR 6 approved the draft revisions the terms of reference for the 15th meeting of the IMO/ITU Experts Group, which is planned to be held at the IMO 8 to 12 July 2019, and the draft IMO position on relevant World Radiocommunication Conference 2019 (WRC-19) agenda items.



Mr Ringo Lakeman, Netherlands, and Mr Nigel Clifford, New Zealand, were re-elected as Chair and Vice-Chair, respectively, of the Sub-Committee for its seventh session (NCSR 7) scheduled to be held at the IMO Headquarters from 15 to 24 January 2020. The full report of NCSR 6 (NCSR 6/23) will be available on the IMODOCS website (<https://webaccounts.imo.org/>) when issued.



**9TH MEETING OF THE WORLDWIDE ENC DATABASE (WEND)
WORKING GROUP (WENDWG)**

Brest, France, 26 – 28 February

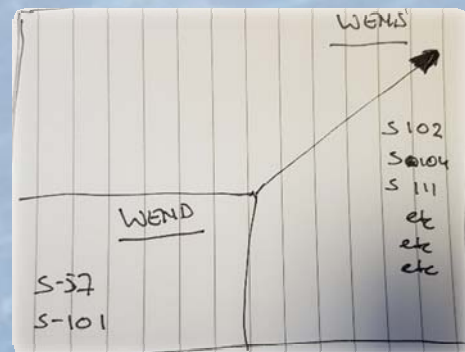
Contribution to the IHO Work Programme 2019	
Task 3.4.1	Organize, prepare and report annual meetings of the WEND Working Group - Foster the implementation of the WEND principles, monitor progress and report to IRCC.

The 9th meeting of the Worldwide ENC Database Working Group (WENDWG) took place in Brest, France, hosted by the Hydrographic and Oceanographic Service of France (Shom), from 26 to 28 February, in conjunction with the 4th joint meeting of the Regional ENC Coordinating Centres (RENC), IC-ENC, PRIMAR and, for the first time, the EA-RECC (Regional ENC Coordination Centre) of the East Asia Hydrographic Commission. The meeting was chaired by Mr Jamie McMichael-Phillips (United Kingdom). Twenty-one delegates from 11 Member States (Brazil, China, Finland, France, Italy, Netherlands, Norway, Republic of Korea, Sweden, United Kingdom and United States) representing 13 Regional Hydrographic Commissions (ARHC, BSHC, EAHC, EAHC, MACHC, MBSHC, NHC, NSHC, RSAHC, SAIHC, SWAtHC, SWPHC and USCHC), the Chairs of the IC-ENC Steering Committee and PRIMAR Advisory Committee and the directors of the RENCs attended the meeting. Director Mustafa Iptes and Assistant Director Yves Guillam (Secretary) represented the IHO Secretariat.

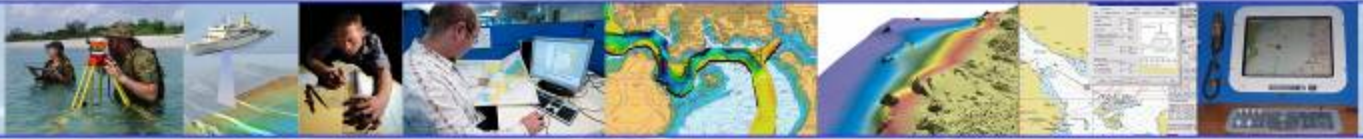
At the opening session of the meeting, Ingenieur general Bruno Frachon, Director General of Shom, welcomed the participants and highlighted the fact that the WENDWG had been a major asset for the last decade for the IHO, when actually entering the digital age with the timely delivery of qualified, updated and consistent ENC for ECDIS. He also stressed the importance of preparing the future.

The Chair reported on the main outcomes of the last IRCC meeting held in Goa, India (June 2018), where the Committee agreed to amend the Terms of Reference of the WENDWG. As a consequence, the WENDWG is now requested to develop options to expand the value of the Worldwide ENC database to all marine data users. In particular, it is tasked to support non-ECDIS maritime community through license management of ENC data as well as the Seabed 2030 Project. Some pragmatic actions were agreed for these purposes, thanks to a joint effort provided by the RENCs with some technical support offered by NOAA/USA.

The IHO Secretariat reported on the decisions and actions from the 2nd meeting of the IHO Council (October



*Conceptual sketch,
“from the WEND to WENS (Worldwide
Electronic Navigation Services)”*



2018) that have an impact on the activities of the WENDWG. Two fruitful workshop sessions were organized to address the different issues raised at the IHO Council. Subsequently, the meeting agreed to submit a proposal at the next IRCC aiming to develop new WEND-like Principles as a possible component of the S-100 Implementation Strategy.

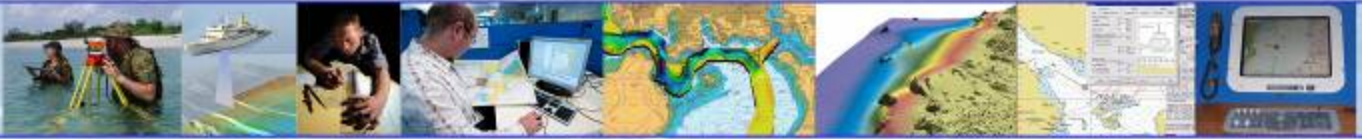
Following the reports provided by the representatives of the RHCs and on a more technical side, several actions were agreed to assess the feasibility of the operational implementation of the IHO Resolution 1/2018 - *Elimination of overlapping ENC data in areas of demonstrable risk to the safety of navigation* -, noting that in some Charting Regions the situation is not improving. The RENCs will try, for instance, to improve their tracking and accounting procedures, in support of ENC Producers and RHCs, while the IHO Secretariat is now preparing the commissioning of the enhanced version of the INTToGIS system (INTToGIS II), which includes an ENC overlap checker function. Thanks to this development supported by KHOA, NOAA for the AIS (Automatic Identification System) traffic density database, NGA for the Worldwide Ports database and the RENCs, the International Charting Coordination Working Groups will soon be able to build their own assessment with regard to ENC Schemes, ENC Coverage and Overlaps and possible important CATZOC inconsistencies. The IHO Secretariat commended the ARHC, BSHC, EAHC and MBSHC Charting Regions Coordinators for their involvement in the experimentation phase of INTToGIS II.

In conclusion of a decision made at the 8th meeting of the IRCC, the meeting welcomed the latest version of the IHO ENC Coverage Catalogue, which is now fully aligned with the ENC Data Flow diagram.

The 10th meeting of the WENDWG is scheduled to be held in Hong Kong, China, in February 2020.



WENDWG-9 participants at Shom, Brest, France



6TH CONFERENCE OF THE EAST ASIA HYDROGRAPHIC COMMISSION STEERING COMMITTEE (EAHC-SC) Bali, Indonesia, 20 -22 February

Contribution to the IHO Work Programme 2019

Task 3.2.1.3	Prepare for and report meetings of the Regional Hydrographic Commissions (RHC) / EAHC
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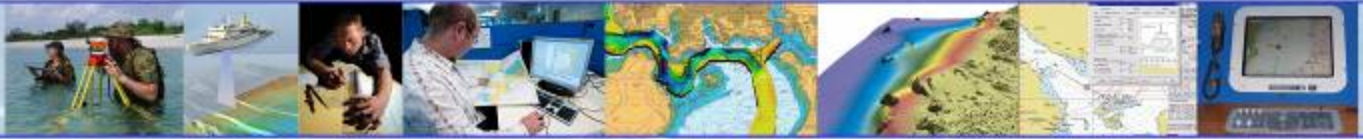
The 6th Conference of the East Asia Regional Hydrographic Commission Steering Committee (EAHC-SC) was held from 20 to 22 February in Bali, Indonesia.



Participants of the 6th Conference of the East Asia Hydrographic Commission Steering Committee in Bali, Indonesia

Fifty seven participants representing nine out of the ten EAHC Members (Brunei Darussalam, China (including Hong Kong), Indonesia, Japan, Malaysia, Republic of Korea, Philippines, Singapore and Thailand) and four observers (Vietnam, Cambodia, United Kingdom and United States of America) participated in the Conference.

The EAHC Conference was chaired by Dr Yukihiro Kato, Chief Hydrographer of Japan, assisted by Mr Shigeru Nakabayashi, from JHOD (Japan Hydrographic and Oceanographic Department). Dr Mathias Jonas, Secretary-General of the IHO, represented the IHO Secretariat. He delivered a report on the relevant issues undertaken since the 2nd IHO Council held in October 2018, under



the three pillars of the IHO Work Programme namely, Corporate Affairs, Hydrographic Services and Standards and Inter-Regional Coordination and Support. In the course of his report he explained the increasing relevance of the IHO contributions to the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM), the Secretariat's proposals on how to support the UN Decade of the Ocean Science for Sustainable Development through collaboration with IOC (Intergovernmental Oceanographic Commission) of UNESCO, the joint Sponsorship of the GEBCO Seabed2030 project and the uptake of Crowd Source Bathymetry as a practical activity. He elaborated further on the recent progression within the S-100 framework and the prospects of S-100 related hydrographic standards application through the Member States following a future implementation plan. He finally provided insight on the renewed IHO GIS services and other Secretariat's IT-improvements. For continuation in the IHO Council operations following the second Assembly in 2020, he emphasized the task of EAHC to consider the nomination of Council members to occupy the two Council seats allocated to the EAHC.

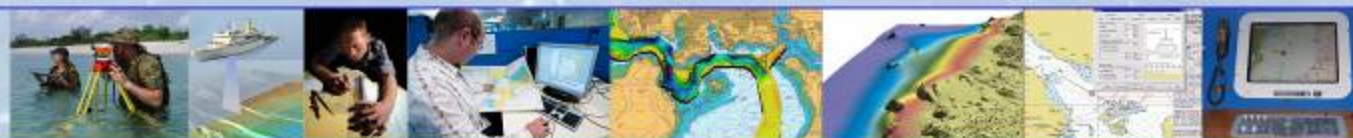


Vice Admiral Wuspo Lukito, Vice Chief of Naval Staff of the Indonesian Navy opens the 2019 EAHC-SC Conference with three strikes of the gong.

Recent achievements in Capacity Building and the implementation phase of the East Asia Regional ENC Coordination Center (EA-RECC), now operational in Hong Kong, were considered by the steering committee in greater detail. Hong Kong, China made a proposal on the EA-RECC governance and future financial arrangements for the distribution of ENCs via EA-RECC. The EAHC agreed on the proposed EA-RECC ToR and RoPs and agreed on further deliberations about technical and financial aspects in the course of the current year. Deliberations how to treat the subject of South China ENCs were also considered.

The Steering Committee was informed on the work of the subordinate Working Groups of the EAHC. Singapore proposed the renaming of the S-100 study group as the S-100 working group and to set a target date for full S-101 transition by 2025 for the East Asian region. In order to prepare best for this significant turnover, a proposal for an S-101 based test bed for the Malacca and Singapore Straits was discussed intensively. Consensus was reached that added value for the test bed users could be gained through combination of a variety of S-100 based products, namely S-102, S-104, S-111, S-112 and S-122.

In the light of the new IHO Convention and the ongoing revision process of IHO Resolution 2/1997 pertaining to the constitution of the Regional Hydrographic Commission, the EAHC decided to establish a Status Amendments Working Group to work out proposals for potential revisions of the EAHC statutes in place to be endorsed by the next EAHC SC in 2020.



An important issue was the consideration of the impressive evolvement of national MSDI activities within the region. The Chair of the EAHC MSDI-WG suggested considering a true regional MSDI approach taking the Baltic Sea and the Arctic region as examples for best practice. The Commission decided on follow-up activities through a comprehensive review of the EAHC-MSDIWG work plan.

These deliberations were followed by the report of the Training, Research and Development Center - Board of Directors - TRDC-BOD. In 2018 the Centre provided courses on the use of GNSS for tide correction for survey and carto production data base system development. The courses on MSI, risk assessment for hydrographic survey and charting management for the safety of navigation have been scheduled in the year of 2019.

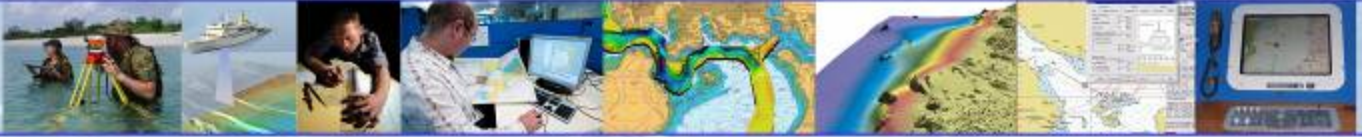
The Steering Committee approved the 2020 capacity building plan including another technical visit to Cambodia and agreed on a review of the 5 year Capacity Building Programme to align better with IHO's and EAHC's strategic goals, to review methods of learning and access to resources, e.g. e-learning, to address user demands for hydrographic and non-hydrographic users. The EAHC Steering Committee agreed to share the basic carto and hydro course syllabi and materials with the RHCs represented at the IHO CBSC.

Japan, as NAVAREA XI Coordinator, reported on recent developments discussed at the last WWNWS-SC meeting in Monaco in August 2018. Japan highlighted that the Operational Manual has to be updated due to new communication providers, namely Iridium, coming into service. Special emphasis was put on the report of the Strategic Team Advance Roadmap (STAR) Task Group. This group is tasked to identify strategic directions for the future targets of EAHC. The Commission agreed to put special emphasis on capacity building, autonomous equipment and MSDI and considered the work of the group as excellent preparatory work for the ongoing IHO Strategic Plan revision process.

United States, as an observer, reported on the availability of updated global geoid model and magnetic field model. The presentation triggered a wider discussion about open data policy, seconded by United Kingdom's observer's presentation on the interrelation of hydrography to the United Nations Sustainable Development Goals (SDG).

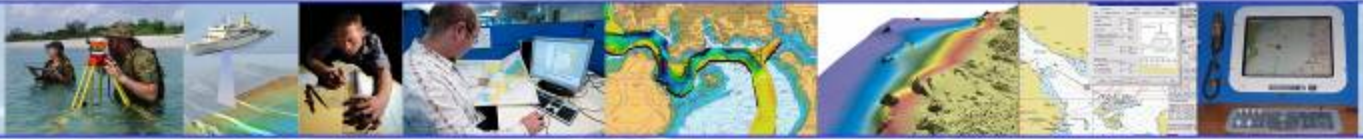
Singapore proposed a resolution to identify appropriate activities within the collaborative framework of the EAHC to respond to the challenge of climate change. Based on the proposal of Singapore, the EAHC-SC agreed to work on a report to address the contribution and support of the Commission in terms of data sharing to support the monitoring and study of climate change and the wider framework of the UN Sustainable Development Goals, namely SDG14. Further work on this topic was put on the EAHC STAR group with a target date for endorsement by EAHC Steering Committee of 31 December 2019.

China reported on the expected completion of the Chinese version of the IHO Hydrographic Dictionary S-32 under the new paradigm. The presentation was supplemented by statements of some of the EAHC-SC members to consider national versions of the dictionary within the years to come.



By means of the individual interventions, numerous participants quoted repeatedly a phrase of the welcome address given by Vice Admiral Wuspo Lukito, Vice Chief of Naval Staff of the Indonesian Navy, to indicate their joint understanding of the EAHC-SC spirit: *Alone you can go fast, together you can go far.*

The next meeting of the East Asian Hydrographic Commission Steering Committee is planned to be held in Tokyo, Japan in the first quarter of 2020.



**8TH MEETING OF THE ROPME SEA AREA
HYDROGRAPHIC COMMISSION
Islamabad, Pakistan, 18-20 February**

Contribution to the IHO Work Programme 2019	
Task 3.2.1.10	Prepare for and report meetings of Regional Organization for the Protection of the Marine Environment (ROPME) Sea Area Hydrographic Commission



The 8th meeting of the ROPME (Regional Organization for the Protection of the Marine Environment) Sea Area Hydrographic Commission (RSAHC) was held in Islamabad, Pakistan, from 18 to 20 February. The meeting was opened by Captain Muhammad Khalid, Hydrographer of Pakistan, in the presence of Vice Admiral Kaleem Shaukad, Vice Chief of Pakistan Naval Staff. Representatives from RSAHC Member States Islamic Republic of Iran, Oman, Pakistan and Saudi Arabia attended the meeting with United Kingdom attending as an Associate Member and observers from a



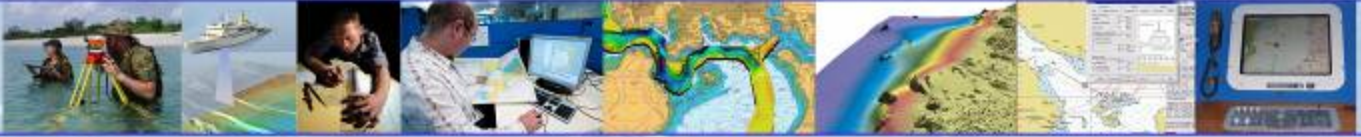
number of organizations, authorities and representatives from industry. Director Mustafa Iptes and Assistant Director David Wyatt represented the IHO Secretariat.



Director Iptes addresses delegates at the Opening Ceremony of RSAHC8

The meeting received national reports from Member and Associate Member States and the IHO Secretariat after which the meeting received reports on the Crowdsourced Bathymetry (CSB) initiative, IHO-IOC GEBCO project, GEBCO Seabed 2030 project and on Worldwide ENC Data Base (WEND) issues. Delegates were encouraged to provide regular updates to the IHO Yearbook (P-5) and IHO publication C-55 - *Status of Hydrographic Surveying and Nautical Charting Worldwide*. Details of regional INT Chart and electronic navigational chart (ENC) coverage were

presented by the regional coordinator (Iran); a number of issues were identified and actions were agreed. The NAVAREA IX Coordinator (Pakistan) provided an up-date on issues relating to the World-Wide Navigational Warning Service (WWNWS) and outcomes from related IMO meetings were reviewed. Director Iptes briefed the Commission on current IHO issues and activities as well as the two Council meetings and the forthcoming second session of the IHO Assembly.



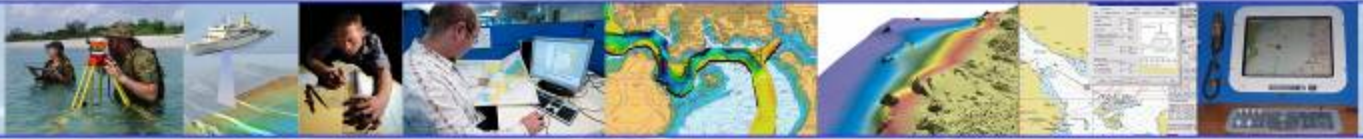
The meeting included presentations from industry representatives that highlighted technologies and training opportunities available to the region. Industry representatives were keen to emphasize their willingness to engage with the RSAHC and its members to assist with the development of hydrographic and cartographic capability within the region. These presentations were followed by a presentation from the regional Capacity Building (CB) Coordinator (Iran). All the presentations generated considerable debate on various issues and regional requirements. A comprehensive list of CB requirements was developed for submission to the IHO Capacity Building Sub Committee (CBSC) that will meet in May in Italy. Presentations were also given on the IHO-IOC GEBCO Project, the Seabed 2030 project and the IHO CSB initiative, all of which supported the request that Member States contribute to the GEBCO programme through the provision of shallow water bathymetric data to the IHO Data Centre for Digital Bathymetry (DCDB).

The participants reviewed the Commission statutes and agreed to an amendment to include a fixed term for the role of Chair with the Vice-Chair automatically taking over as Chair after each meeting. The Islamic Republic of Iran assumed the role of the Chair of the Commission with Oman elected as Vice-Chair. The Commission also confirmed that the Chair (IR of Iran) and Vice-Chair (Oman) would occupy the two seats on the IHO Council allocated to the RSAHC for the period April 2020 to April 2023.

With the objective of increasing participation of member states, the RSAHC decided to have a 2nd Extraordinary meeting of the RSAHC in February 2020 before the 2nd session of the IHO Assembly, which will include a half-day meeting of the INT Chart Coordination Working Group. The venue and dates will be decided later based on hosting proposals from the Member States.



Participants to the RSAHC8 Meeting



7TH MEETING OF THE CROWDSOURCED BATHYMETRY WORKING GROUP

Québec City, Canada 12-14 February

Contribution to the IHO Work Programme 2019	
Task 3.6.4	Develop general guidelines on the use and collection of Crowdsourced Bathymetry (CSB)

The Crowdsourced Bathymetry Working Group (CSBWG) has been tasked by the Inter-Regional Coordination Committee (IRCC) to develop the IHO publication B-12 that provides guidance on the collection and use of Crowdsourced Bathymetry (CSB) and to investigate ways to increase participation in data gathering activities. The document will provide guidelines and advice on various considerations that should be taken into account when collecting CSB data for inclusion in the global bathymetric data set which is maintained in the IHO Data Centre for Digital Bathymetry (DCDB).

The working group held its 7th meeting in Québec City, Canada from 12 to 14 February 2019. The Chair of the CSBWG, Ms Jennifer Jencks (USA, Director of the DCDB), chaired the meeting which was attended by representatives from eight Member States (Canada, Denmark, India, Italy, New Zealand, Norway, UK and USA), and observers and expert contributors from the ONE Data Technology Co, Dongseo University,

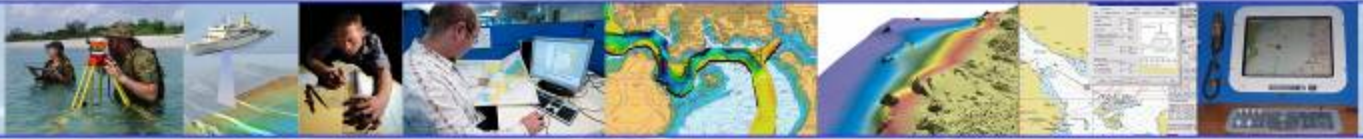


Farsounder INC, Da Gama Maritime Ltd, GMATEK Inc, and Fugro. Assistant Director David Wyatt (Secretary) represented the IHO Secretariat.



The participants of the CSBWG Industry Workshop between sessions

Prior to the meeting, an Industry Workshop was conducted with representatives from CIDCO, Da Gama Maritime, EGS Survey (representing ICPC), ECC, ESRI, FarSounder, Fugro, GMATEK, Hypack, Leeway Marine, Olex, ONE Data Technology, Secunda, SevenCs/ChartWorld and Teledyne CARIS. The representatives were given an overview of the IHO CSB initiative, which was followed by short presentations on current



industry partner projects, examples of CSB data usage by hydrographic offices and habit mapping projects and technology perspectives. AORA/ASMIWG, Sea-ID, NF-GEBCO Seabed 2030 and James Cook University gave presentations by remote link. The Workshop participants then considered how to expand the initiative into the various maritime sectors, what methodologies were appropriate to incentivize data gathering activities, how the data could be made available and what recognition strategies were desirable.

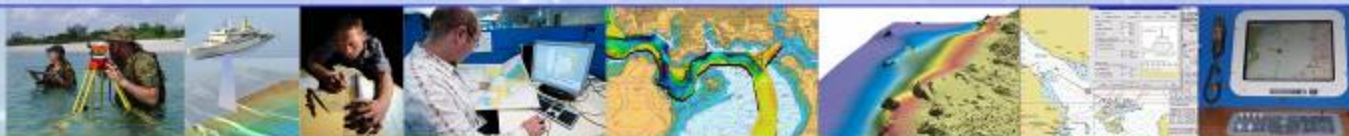
The CSBWG briefly reviewed the final draft version of the B-12 Guidelines which was presented to Member States for adoption via IHO Circular Letter 11/2019. A full explanation was provided on the background to the generation of Edition 2.0.0 within such a short timeframe. The WG decided to start considering ways of obtaining user community feedback and comments at its next meeting, which will allow some operational experience to be gained with the current version.



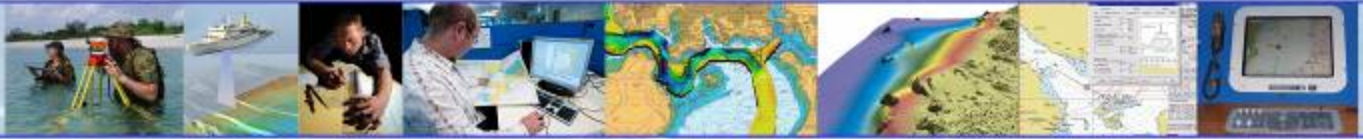
The participants of the 7th meeting of the CSBWG between sessions

The participants also considered the outreach and recognition strategies, which should be developed. The group focused on the Research vessel, Cruise Liner and recreational leisure sectors, including the Super Yacht community, as being the ones most likely to be able to contribute the most needed data. It was agreed that representation at a number of events and meetings was essential to raise awareness and to

progress the five headline topics (need, how, what, incentives and benefits) to increase contributions and participation. It was agreed that leading organizations and companies within each sector could be identified and approached to act as CSB ambassadors. It was proposed that the first three CSB ambassadors should be Carnival on behalf of the cruise industry, Fugro on behalf of the marine survey industry and PGS on behalf of the seismic survey industry. Additionally, it was agreed that closer liaison needed to be established with other IHO bodies as well as the Seabed 2030 project, in particular the Chairs of the Data Quality Working Group (DQWG) and Marine Spatial Data Infrastructure Working Group (MSDIWG) should be invited to future meetings. It was suggested that the Director and Deputy Director of the Seabed 2030 project should be invited to participate and that close harmonization of the outreach activities of both groups should be a priority.



It was agreed that the next meeting of the working group should consider whether the development of a S-100 based Product Specification was desirable, taking into consideration the expert advice available within the IHO Secretariat. It is therefore planned to hold the 8th meeting of the CSBWG at the IHO Secretariat, in Monaco, from 22 to 24 October 2019. In addition, to assist with planning, it was agreed that the 9th meeting would be held in Stavanger, Norway, in June 2020.



**16TH CONFERENCE OF THE SOUTH WEST PACIFIC
HYDROGRAPHIC COMMISSION
AND
TECHNICAL WORKSHOP ON RESPONSE TO DISASTERS
AND DATA DISCOVERY
Niue, 11-15 February**

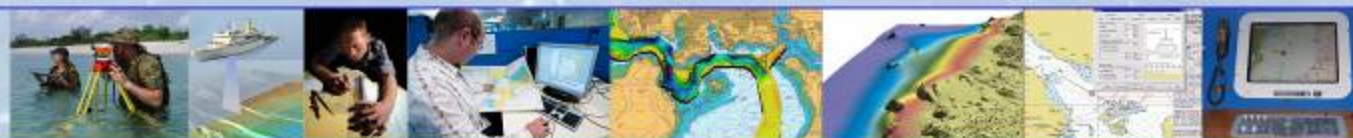
Contribution to the IHO Work Programme 2019	
Task 3.2.1.14	Prepare for and report meetings of the South West Pacific Regional Hydrographic Commission (SWPHC)

16th Conference of the South West Pacific Hydrographic Commission

The 16th Conference of the South West Pacific Hydrographic Commission (SWPHC) was hosted by the Department of Transport and the Department of Justice, Lands and Survey of Niue from 13 to 15 February in the Scenic Matavai Resort. Representatives from all nine Member States of the Commission (Australia, Fiji, France, New Zealand, Papua New Guinea, Tonga, United Kingdom, United States of America and Vanuatu), and from all eight Associate Members (Cook Islands, Indonesia, Kiribati, Nauru, Niue, Palau, Samoa and Solomon Islands) attended the conference. Three Observer States (Marshall Islands, Tokelau and Tuvalu), the Pacific Community (SPC) and six representatives from industry also participated, a total of 55 participants representing all the coastal States in the region. The IHO Secretariat was represented by Director Abri Kampfer and Assistant Director Alberto Costa Neves.



Participants in the 16th Conference of the South West Pacific Hydrographic Commission



The conference was opened by the Hon. Pokotoa Sipeli (Niue's Minister of Infrastructure), and chaired by Commodore Fiona Freeman (Australia). Each of the coastal States provided an update on their activities since the last meeting that took place in Fiji in 2018.

The conference noted the support provided by the five Primary Charting Authorities (PCA) to the Small Islands Developing States (SIDS) and the recent developments in surveys, charting and maritime safety information (MSI). New Zealand informed the participants on the progress with surveys and charting made in-house and abroad through the Pacific Regional Navigation Initiative (PRNI) for five SIDS. Australia reported on the developments in its own waters and on the two supported SIDS. UK described the developments in the five SIDS and its overseas territories, by means of the Commonwealth Marine Economies (CME) Programme. Progress was also noted by the US in support of its overseas territories and three supported SIDS. France reported on the progress in its overseas territories and domains in the region.

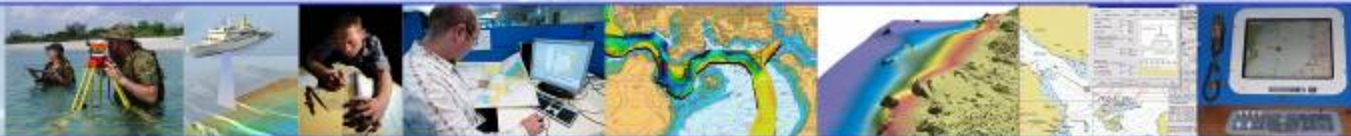
SPC briefed the Commission on the development of its Pacific Safety of Navigation Project and the progress conducting hydrographic and geodetic surveys, implementing Aids to Navigation and supporting data discovery in the region. SPC presented the work of the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and its World-Wide Academy, and informed the meeting on the establishment of the International Maritime Organization's regional representative, stationed at SPC's Fiji office.

The conference assessed the impact of capacity building through regional programs and through the IHO Capacity Building Programme. This continuous support has proved valuable for raising awareness on the importance of hydrography and bringing maturity in all phases of capacity building. The reports from the two NAVAREA Coordinators (Australia and New Zealand) indicated significant improvements in the provision of MSI in the region.

Participants showed renewed interest for progressing their marine spatial data infrastructure (MSDI) due to the significant impact it can bring to the national economy. They received briefings on the status of the GEBCO Seabed 2030 Project and the possibilities for contributing with data, both existing or through new surveys.

The conference noted with satisfaction that there are few ENC overlaps in the region and none with significant navigational risk. The International Charting Coordination Working Group (ICCWG) also reported progress to remediate the existing CATZOCs that are unassessed.

Other relevant agenda items involved data discovery and portals, response to disasters, outcomes of relevant IHO bodies and the need to establish tide gauges, seeking cooperation with existing international and regional projects. The revision of the IHO Resolutions 1/2005 *IHO Response to Disasters* and 2/1997 *Regional Hydrographic Commissions* were also discussed in order to provide input from the region.



Participants in the Workshop on Response to Disasters and Data Discovery preceding the SWPHC16

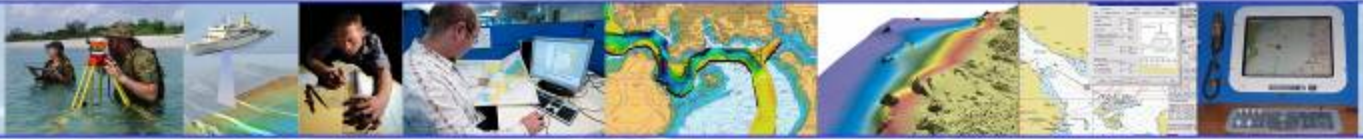
IHO/SWPHC Technical Workshop on Response to Disasters and Data Discovery

The 16th Conference of the Commission was preceded by a technical workshop on *Response to Disasters and Data Discovery*, sponsored by the IHO capacity building fund. The aim of the session on Response to Disasters was to make SIDS in the region aware of the role of the IHO and the SWPHC in the aftermath of a disaster and to understand what procedures are needed to identify appropriate action and support. Another objective was to provide guidance to SIDS to establish national procedures and guidelines.

The session on Data Discovery aimed at providing an overview of discovery tools, search capabilities, use of metadata and data, mechanisms to share data (release agreements, bilateral arrangements) and the establishment of geospatial portals. Fourteen presenters briefed the participants to the workshop. Their presentations are available on the IHO website under the SWPHC page.

Next Meeting

The next meeting is scheduled in Wollongong, Australia, from 10 to 14 February 2020 (subject to confirmation). The Commission re-elected Commodore Fiona Freeman (Australia) as Chair and elected Mr Robson Tari (Vanuatu) as the Vice-Chair.



**14TH MEETING OF THE DATA QUALITY WORKING GROUP (DQWG)
IHO Secretariat, Monaco, 5 – 8 February**

Contribution to the IHO Work Programme 2019

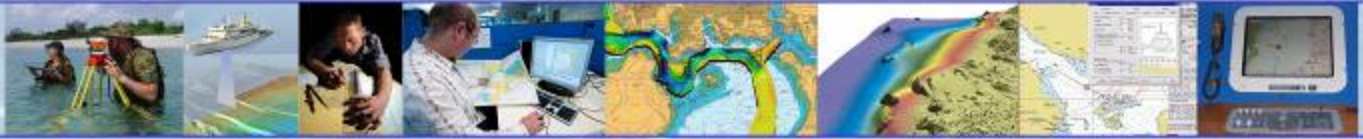
Task 2.1.2.6	Organize, prepare and report meetings of DQWG
Task 2.4.9	Maintain S-67 – Mariners’ Guide to Accuracy of ENC’s

The 14th meeting of the Data Quality Working Group (DQWG) took place at the IHO Secretariat, Monaco, from 5 to 8 February.



Participants in the DQWG-14 meeting, IHO Secretariat, Monaco

Director Abri Kampfer welcomed the participants and gave a short opening address stressing the transversal role of the DQWG in the IHO and the large expectations from Member States to get data quality guidance for harmonizing purposes. The meeting was chaired by Mr Rogier Broekman (Netherlands). Thirteen delegates from 11 Member States (Brazil, Canada, Denmark, Finland, France, Italy, Japan, Netherlands, Norway, United Kingdom and United States) attended the meeting. The Secretary-General of the IHO made an intervention during the meeting, highlighting the increasing interest in data quality in support of marine knowledge, decision



making by mariners and the development of autonomous shipping. The IHO Secretariat was represented by Technical Standards Support Officer Jeff Wootton and Assistant Director Yves Guillam. Assistant Director Alberto Costa Neves attended the meeting as well, mainly as liaison for MSDI, C-55 and Capacity Building/Educational matters, in relation to data quality and data integrity.

Following the review of the Terms of Reference of the DQWG, the meeting agreed to submit an amendment for the approval of the HSSC, aiming to offer the possibility for the DQWG to provide advice related to data quality in all areas and not only limited to Product Specifications managed by the S-100WG.

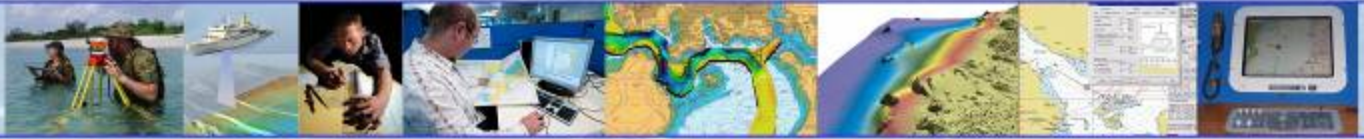
The Chair provided a status report on the harmonization of data quality indicators, describing how IHO Members allocate S-44 values for different types of survey techniques (including crowd sourced bathymetry, satellite derived bathymetry, LIDAR) and translate these to CATZOC values. Examples of generalization (aggregation) issues of current CATZOC values across ENC compilation scales were also discussed, while steadily keeping in mind the key objective that the DQWG is tasked to develop guidance on quality aspects that will help the Member States to allocate meaningful quality values of bathymetric data in future S-101 ENC. To this end, a document will be created describing the conversion of S-57 (M_QUAL/CATZOC) to S-101 (Quality of Bathymetric Data).

The DQWG reviewed all the comments received on its first draft of the Data Quality Checklist for Product Specifications that is planned to become a component of Part C of IHO Publication S-97 – *IHO Guidelines for Creating S-100 Product Specifications*. Graphical examples still need to be included in this Part C.

The Chair reported that the DQWG had received requests to review the data quality components of the S-101, S-102 and S-127 Product Specifications. These were checked against the draft Part C, with feedback to be provided to the responsible Working Groups.

During an interactive workshop, the meeting considered methodologies for the display of quality information. A benchmarking of proposals and current standards was made, for two user modes: route planning and route monitoring. While noting the obstacles of an evolution of the regulations and ECDIS standards in the short term, several findings were identified during the workshop that will help to define a new portrayal concept. When finalized, it will be submitted to the other HSSC Working Groups for testing, and possible implementation in the design of future S-101 ECDIS.

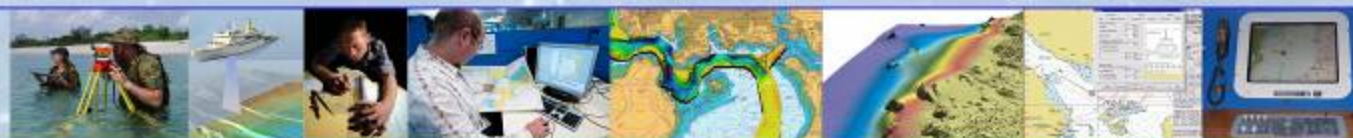




The DQWG reviewed the significant number of comments and concerns received on the draft Publication S-67 - *Mariners' Guide to Accuracy of Depth Information in ENC's* - and agreed to propose a new way forward at the next HSSC meeting.

The next meeting is planned at the IHO Secretariat, Monaco, from 4 to 7 February 2020.

Further information concerning the meeting is available on the IHO web site at www.iho.int > Committees & WG > DQWG > DQWG-14 > Documents.



6TH MEETING OF THE NAUTICAL INFORMATION PROVISION
WORKING GROUP (NIPWG)
AND
IHO DIGITAL NAUTICAL PUBLICATIONS STAKEHOLDERS' FORUM
Rostock, Germany, 28 January -1 February

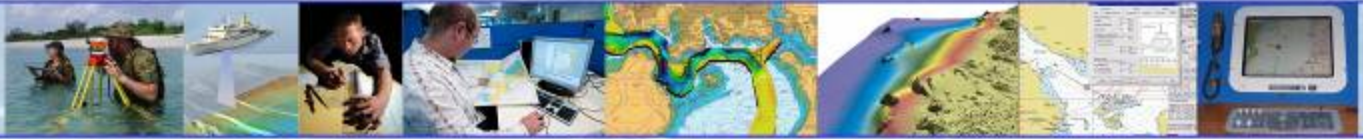
Contribution to the IHO Work Programme 2019	
Task 1.4.4	Conduct biennial IHO stakeholders' forums (Digital Nautical Publications)
Task 2.1.2.5	
Task 2.5.2	
Task 2.8.1	
Task 2.8.3	
	Organize, prepare and report meetings of NIPWG
	Support the development and implementation of Maritime Services
	Maintain S-12, as appropriate - <i>Standardization of List of Lights and Fog Signals</i>
	Maintain S-49, as appropriate - <i>Standardization of Mariners' Routeing Guides</i>



The 6th meeting of the Nautical Information Provision Working Group (NIPWG) took place in Rostock, Germany, hosted by the Federal Maritime and Hydrographic Agency (BSH) from 28 January to 1 February. A stakeholders' forum on nautical digital publications with the theme *Presentation of Nautical Publication Information on future S-100 based ECDIS* took place at the Penta Hotel, Rostock, on 29 January.

Mr Thomas Dehling, National Hydrographer of Germany, welcomed the participants and gave an opening address stressing the importance of NIPWG activities for the evolution of navigational concepts and systems. The meeting was chaired by Mr Jens Schröder-Fürstenberg (Germany). Twenty-seven delegates from 15 Member States (Brazil, Canada, Denmark, Estonia, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Republic of Korea, Spain, United Kingdom and United States) and seven expert contributors (Anthropocene Institute, IEC, KRISO, National Taiwan Ocean Centre, Portolan Sciences, United Navigation, University of New Hampshire) attended the meeting. Nine other stakeholders (Bimco¹, CIRM², Furuno, ICS³, IHMA⁴, Intertanko⁵,

¹ Baltic and International Maritime Council.
² Comité International Radio-Maritime.
³ International Chamber of Shipping.
⁴ International Harbour Masters Association.
⁵ International Association of Independent Tanker Owners.

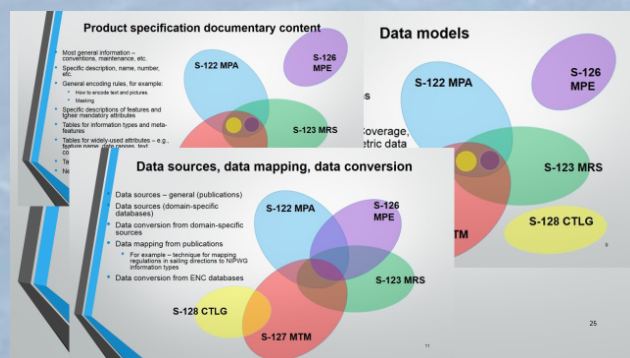


SevenCs, Chartworld, HS-Wismar⁶), participated in the forum, either being physically present or through video teleconference links. The IHO Secretariat was represented by Assistant Director Yves Guillam.

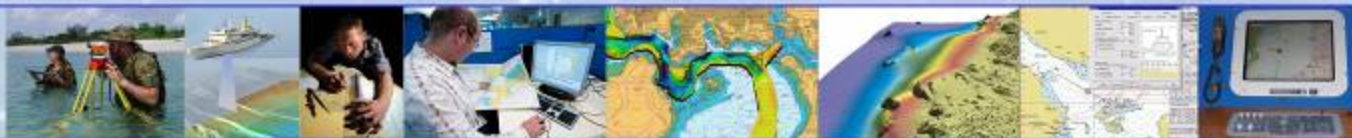
The NIPWG Chair opened the stakeholders' forum introducing the challenges, such as data quantity, data portrayal, data access, data governance and data interoperability, which the working group are facing before being able to move forward and test the initial provision of digital nautical information under the S-100 framework. In response, all the presentations delivered by the stakeholders provided a better understanding on how the provision of S-100 based products should be done and could enable the evolution of navigational concepts (front-of-bridge ECDIS folio versus electronic back-of-bridge folio, overlays, autonomous shipping, etc.). The need for the regulations to evolve in parallel was acknowledged as well as the obstacles faced by the industry if a consistent system "package" (standards, updated nautical products to be used in conjunction with S-101 updated ENC's and data governance and dissemination) was so far not proposed by the IHO.

The meeting reviewed the good progress made on the development of the S-12x product specifications that are under the remit of NIPWG. The support provided by the IHO Special Projects Fund was acknowledged, without which no progress could be done due to the complexity of these products. It was subsequently agreed that it would now be useful to initiate prototyping the implementation of existing S-12x products in a S-100 based environment in order to explore data flows, governance architecture and service delivery mechanism. This bottom-up approach would also be very beneficial to the development of the implementation strategy for the regular and harmonized production and dissemination of S-100 based products. An architectural display of S-100 based products was presented and will be refined for further discussions at HSSC.

While addressing the various complex issues relating to these product specifications whether they are in progress, under development or adopted, questions were raised on the similarities and differences between them and the subsequent need for some wise harmonization process for both the product specifications and data sets. An initial comparison was also made between S-121 and S-122 data sets and encoding concepts. A couple of options were also discussed to ensure alignment and synchronization, without duplication, between products and features contained in S-201 versus S-125 and S-101.



⁶ University of Applied Sciences, Technology, Business and Design.



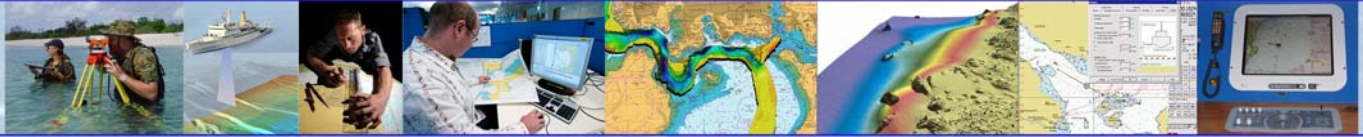
The representative of Canada, also Chair of the S-124 Correspondence Group (Navigational Warnings), gave a status report of the development of the product specification, presented the tests carried out in Canada, both by the Hydrographic Service and the Coast Guard.

The participants were informed on the outcomes of the workshop on the development of the XML structure for Notices to Mariners (NtM) that took place in Genoa, Italy in September 2018. It was agreed that INT-1 symbols should be available in SVG format with a unique identifier and a text description in a symbol registry.

The 7th meeting of the NIPWG is scheduled to be held in Saint-Petersburg, Russian Federation, from 25 to 29 November 2019, and the 8th meeting, in September 2020 in France.



NIPWG-6 participants in Rostock, Germany



19TH CONFERENCE OF THE NORTH INDIAN OCEAN HYDROGRAPHIC COMMISSION

Muscat, Oman, 25-28 March

Contribution to the IHO Work Programme 2019

Task 3.2.1.9

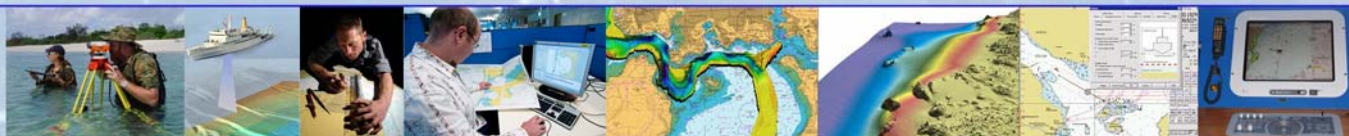
Attendance of the North Indian Ocean Hydrographic Commission Conference

The 19th Conference of the North Indian Ocean Hydrographic Commission (NIOHC) was held in Muscat, Oman, from 26 to 28 March, under the chairmanship of Rear Admiral Tim Lowe, National Hydrographer of the United Kingdom. Participants were welcomed at the opening ceremony by Rear Admiral Abdullah bin Khamis bin Abdullah Al Raisi, Commander of the Royal Navy of Oman.

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 from Australia, France, Mauritius, Oman, Seychelles and USA. The Russian Federation, Somalia and Yemen were represented as Observer States. Representatives of the Intergovernmental Maritime Organization (IMO), International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and several industry stakeholders also attended as invited observers. Director Mustafa Iptes and Assistant Director David Wyatt represented the IHO Secretariat. Following the opening ceremony, Director Iptes called on Rear Admiral bin Abdullah Al Raisi, Commander of the Royal Navy of Oman and was informed that Oman will actively continue to support the IHO activities in the region.



Director Iptes exchanges gifts with Commander of the Royal Navy of Oman.



The NIOHC19 meeting was preceded by a half day seminar on National Obligations for the Provision of Safety of Navigation Services, which was attended, in addition to NIOHC members, associates and observers, by Somalia and Yemen. The INT Chart Coordination Working Group (NICCWG) held a meeting in the afternoon of 25 March after which a report was prepared for the NIOHC19 conference.

The NIOHC received reports from Member States, Associate Member States and the IHO Secretariat as well as summary reports on the second meeting of the IHO Council and last meetings of the IHO Hydrographic Services and Standards Committee and the Inter Regional Coordination Committee. Director Iptes briefed the Commission on current IHO activities and the preparations for the forthcoming Third Council meeting and second session of the IHO Assembly. The meeting also received reports on progress and issues related to the work of the Marine Spatial Data Infrastructures Working Group, relevant activities that had taken place in the International Maritime Organization, including relevant outcomes of the 6th meeting of the IMO Sub-Committee on Navigation, Communications and Search and Rescue (NCSR 6) and an update from the NAVAREA VIII coordinator.

A Capacity Building (CB) plan was developed for submission to the 17th meeting of the IHO Capacity Building Sub-Committee (CBSC17). The Commission established a CB Working Group to help develop future applications for submission to the CBSC, in addition the Commission also established a Working Group to review the NIOHC Statutes and recommend revisions and amendments to the next NIOHC conference in 2020.

The meeting received a number of presentations from industry representatives. These highlighted new technologies and training opportunities available to the region. Industry representatives were keen to emphasize their willingness to engage with the NIOHC and its members to assist with the development of hydrographic and cartographic capabilities within the region.



Participants of the NIOHC19 Conference.



Sri Lanka, 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. The NIOHC elected Indonesia to assume the Vice-Chair position for the next period. Sri Lanka indicated they would host the 20th meeting of the Commission in Colombo, Sri Lanka, with proposed dates being in May 2020. It was agreed to hold an INT Chart Coordination Working Group meeting prior to NIOHC20.



42ND MEETING OF THE UNITED STATES – CANADA HYDROGRAPHIC COMMISSION (USCHC)

Biloxi, Mississippi USA, 18 March

Contribution to the IHO Work Programme 2019

Task 3.2.1.15	Prepare for and report meetings of the Regional Hydrographic Commissions (RHC) / USCHC
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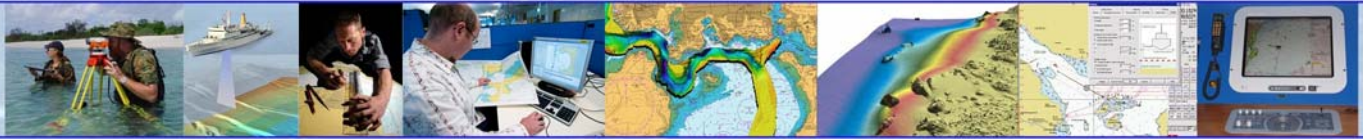
The 42nd meeting of the United States – Canada Hydrographic Commission (USCHC) was held on 18 March in Biloxi, Mississippi, United States of America. USCHC42 took place in conjunction with the US Hydro Conference 2019. The meeting was co-chaired by Director, Office of Coast Survey of the USA, Rear Admiral Shepard Smith and the Hydrographer General of Canada, Ms Geneviève Bechard respectively. Twenty five participants attended the meeting, including representatives from the Canadian Hydrographic Service (CHS) and the Departments of National Defense (DND) and Fisheries and Oceans (DFO), the National Oceanographic and Atmospheric Administration (NOAA), National Geospatial-Intelligence Agency (NGA), US Navy and US Army Corps of Engineers (USACE) and the United Kingdom Hydrographic Office (UKHO) as an observer. Secretary-General Dr Mathias Jonas represented the IHO Secretariat.

The USCHC42 agenda covered a wide range of topics of mutual interest with the Member States' reports and the additional briefs on the activities of the International Hydrographic Organization (IHO), WEND Working Group, Maritime Spatial Data Infrastructure Working Group, Crowdsourced Bathymetry Working Group and IHO/IOC GEBCO Project. Dr Mathias Jonas reported on the IHO Work Programme and the Organization's activities since the second IHO Council held in October 2018.

Some of the topics provoking in-depth discussions included:

- Management of survey and charting activities in border areas and the arctic region;
- Marine Spatial Data Infrastructures (MSDI);
- Crowdsourced bathymetry and the operation of DCDB on behalf of the IHO through NOAA;
- The future of the paper chart; and
- New concepts for the provision of S-100 based data products.

Several technical presentations were also made that were complementary to the discussions, including: joint gridded ENC plans and implications; bathymetric data in the cloud; update of local vertical and horizontal reference datum as well as updates of the global geoid and magnetism models.



The IHO Secretary-General gave a key note address during the opening ceremony of the US Hydro Conference. Under the title “Challenging the norm in Hydrography” he presented his vision of the future developments in all relevant fields of contemporary hydrography such as survey, production of hydrographic products and their future provision. He placed special emphasis on the uptake of unmanned operation of maritime craft and identified hydrographic measurement campaigns as the frontrunner in many aspects of autonomous shipping.

The 43rd USCHC meeting will be held in Québec, Canada in March 2020.



The participants of the USCHC42 meeting.



9TH MEETING OF THE IHO/ROK PROGRAMME MANAGEMENT BOARD (PMB9) Busan, Republic of Korea, 12-13 March

Contribution to the IHO Work Programme 2019

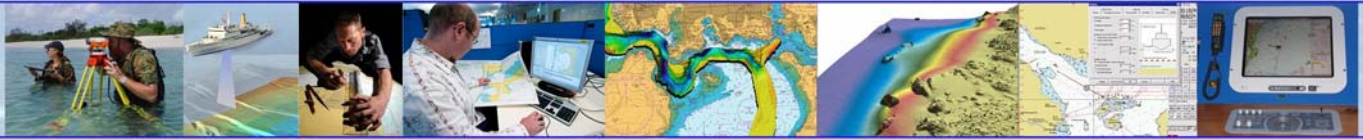
Task 3.3.6	Organize, prepare and report on meetings with other organizations, funding agencies, private sector and academia. Coordinate delivery of Capacity Building activities and investigate new opportunities for CB activities.
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The 9th meeting of the IHO/Republic of Korea (ROK) Programme Management Board (PMB9) was held at the Korea Hydrographic and Oceanographic Agency (KHOA), Busan, Republic of Korea on 12 to 13 March 2019. The meeting comprised of delegates from ROK, the Chair of the CBSC, representatives from the IHO Secretariat and the Hydrographic Sciences Programme Manager of the University of Southern Mississippi (USM). Participants were welcomed by KHOA Director General Mr Yong-seok KANG. Director Mustafa Iptes and Assistant Director Alberto Costa Neves (Secretary) represented the IHO Secretariat.

The PMB was established under the IHO - ROK Memorandum of Understanding (MoU) to identify directions for improving hydrography and nautical cartography worldwide through the capacity building activities funded by the ROK and to manage the IHO-ROK programme of technical cooperation. The meeting agreed on the need to revise the current MoU in order to update and adjust some of its provisions.

The meeting reviewed the progress and achievements of the various training and education activities sponsored by the ROK. The annual financial contribution from the ROK forms a significant part of the Capacity Building (CB) Fund used to support the annual IHO CB Work Programme (CBWP). Since its inception the ROK contribution has supported education programmes in hydrography and cartography, training for trainers' (TFT) courses, seminars and short courses on hydrographic surveys, ENC quality assurance, marine spatial data infrastructures, law of the sea, and tides and water levels, amongst others.

The PMB considered the management aspects of supporting trainees on the Category "A" Hydrography Programme at the USM and the Category "B" Nautical Cartography Programme at the KHOA in order to effectively deliver high level education and training to participants from developing countries. During the meeting the selection board for the 2019-2020 edition of the Category "A" Programme was convened and the candidates from Mexico and Tunisia was selected, subject to final acceptance by the USM. The meeting was informed that the next TFT training on basic hydrography to be delivered in mid-2019, originally limited to the East Asia Hydrographic Commission (EAHC), will be open to all IHO Member States. Circular letters will be issued calling for applications to the Category "B" Cartography Programme and for the TFT.



Participants at PMB9

The meeting was briefed on CB activities being conducted by the EAHC Technical, Research and Development Center (TRDC) and its developments of e-learning to better assist the international hydrographic community. The meeting agreed to boost the development of Maritime Safety Information (MSI) e-learning material in English and French and the implementation of the online training material for Marine Spatial Data Infrastructures (MSDI), developed by Denmark.

The meeting reviewed the status of development of the Capacity Building Management System (CBMS) jointly addressed by KHOA and the IHO Secretariat. The meeting concluded that the CBMS is mature enough to be used operationally for receiving submissions to the CBSC in 2019. The PMB agreed to investigate the possibility of organizing a KHOA Alumni Seminar in 2021, together with the PMB11 meeting.

The 10th meeting of the PMB will take place in Monaco on 3 to 4 March 2020.



10TH MEETING OF THE MARINE SPATIAL DATA INFRASTRUCTURES WORKING GROUP (MSDIWG)

4-5 March, Busan, Republic of Korea

OGC MARINE DOMAIN WORKING GROUP MEETING

6 March, Busan, Republic of Korea

UN-GGIM WORKING GROUP ON MARINE GEOSPATIAL INFORMATION

7-9 March, Busan, Republic of Korea

Contribution to the IHO Work Programme 2019	
Task 3.7.1	Organize, prepare and report annual meetings of the Marine Spatial Data Infrastructures Working Group (MSDIWG).
Task 3.7.4	Coordinate relevant activities with the Open Geospatial Consortium (OGC) Marine Domain Working Group (Marine DWG)
Task 1.1.12.1	Maintain relationship with the United Nations (UN) organizations including the Committee of Experts on Global Geospatial Information Management (UN-GGIM) and the WG on Marine Geospatial Information (WGMGI)

The 10th meeting of the Marine Spatial Data Infrastructures Working Group (MSDIWG) took place in Busan, Republic of Korea, hosted by the Korea Hydrographic and Oceanographic Agency (KHOA), on 4 and 5 March, in conjunction with the OGC Marine Domain Working Group (Marine DWG) meeting on 6 March and with the 1st Meeting of the Working Group on Marine Geospatial Information (WGMGI) of the Committee of Experts on Global Geospatial Information Management (UN-GGIM). The meeting was chaired by Mr Jens Peter Weiss Hartmann (Denmark). Nineteen delegates from 12 Member States (Australia, Brazil, Denmark, Germany, Indonesia, Italy, Netherlands, Norway, Republic of Korea, Singapore, United Kingdom and United States of America) and 15 representatives of observer organizations and industry members attended the meeting, a total of 35 participants. Assistant Director Alberto Costa Neves represented the IHO Secretariat.

The meeting was opened by Mr Yong-seok KANG, Director General of KHOA, welcoming the participants and highlighting the importance of the international cooperation and the relevance of Marine Spatial Data Infrastructures (MSDI) for the sustainable development and use of the oceans, seas and inland waters. The willingness of Republic of Korea to contribute to the international efforts to increase the knowledge of the oceans and their sustainable use was emphasized.



Amendments to the Terms of Reference were proposed by the Chair and endorsed by the meeting, in accordance with decisions of the IRCC10. It proposes an expansion of the remit of the WG to include marine spatial planning (MSP) and common operating picture (COP). The Chair reviewed the relevant outcomes from the Council, IRCC, HSSC, WENDWG and DQWG meetings that affected the work of the WG. The Chair provided an overview on the work of the Strategic Plan Review WG and how it will affect the work of the WG.

Online training material on MSDI developed by Denmark was presented by the Chair, following an action from IRCC10. The material will be made available from the IHO website to serve the IHO Capacity Building Programme. The meeting also considered ways to promote free online material available from industry members and agreed to create a dedicated page in the IHO website.

The meeting agreed with the Open Geospatial Consortium (OGC) to review the paper previously submitted to HSSC on the interoperable aspects of a Discrete Global Grid System (DGGS), to develop a white paper on data integrity assurance and to create a template policy statement. OGC will also develop a Guide of Standards for the Common People, to promote and facilitate the adoption of standards worldwide in all aspects of a MSDI.

Participants reviewed the current status of the IHO Concept Development Study (CDS) on MSDI that is being developed by OGC and funded by the USA/NGA, that will be finalized in April 2019 and presented to IRCC11. The CDS will assess the current state of data management and exchange technologies used in the marine domain. The knowledge gained from the CDS will provide interoperability reference architecture for MSDI and foundation for a potential future pilot project that will in turn advance the state of MSDI to support discoverability, accessibility, and interoperability of marine geospatial data across the globe.

Member States and Expert Contributors presented their latest developments and shared lessons learned related to SDI and MSDI. The role of the MSDI Ambassadors was considered and the meeting took note of the Regional Hydrographic Commissions (RHC) that have made progress at national and regional levels. The meeting received feedback on several Use Cases that are being developed and their importance to promote MSDI.

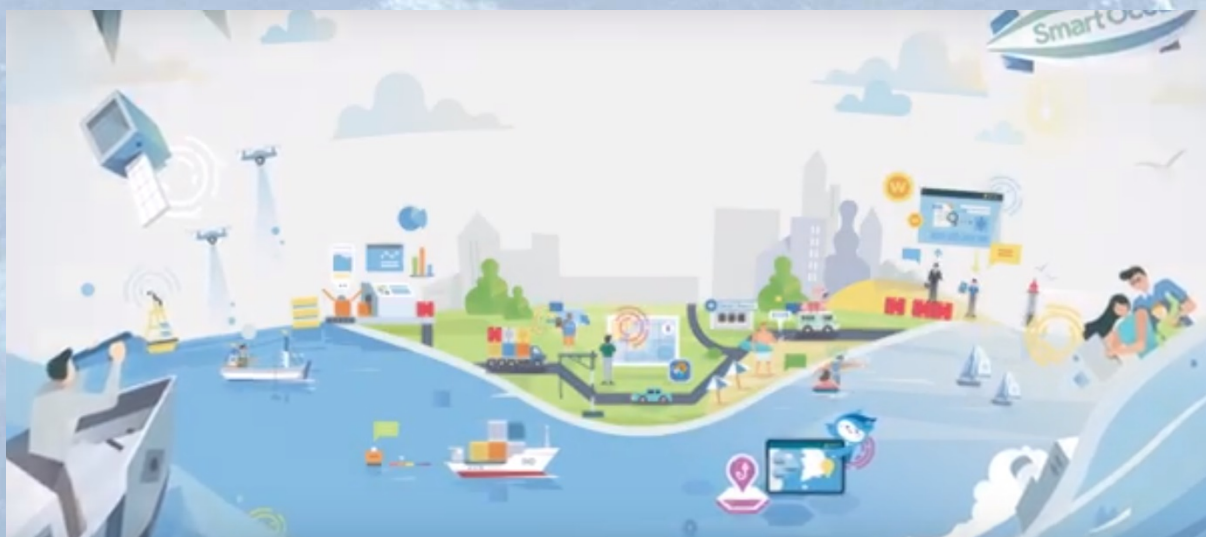
Participants considered how the WG could support the IHO to contribute to the United Nations (UN) Sustainable Development Goals (SDG), in particular those where the impact is more prominent. Attention was also given to the close liaison between the IHO and the UN Committee of Experts on Global Geospatial Information Management (UN-GGIM) and its WG on Marine Geospatial Information (WGMGI). The meeting considered the ongoing work of the IRCC Principles Project Team (PPT) on the UN-GGIM Statement of Shared Guiding Principles for Geospatial Information Management.

The WG considered how to improve communication and to develop an outreach strategy considering the target audience and the means to achieve it. A drafting group was established to develop the first draft of this strategy. The meeting also decided to investigate the possibilities for the development of a new publication on the status of MSDI worldwide from a database



within the IHO Regional and Country Information Systems (RIS/CIS). The Chair was tasked to coordinate, with the UN-GGIM/WGMGI Chair, the preparation of a common questionnaire on the status of MSDI worldwide.

The meeting approved with satisfaction the video on MSDI kindly developed by the Republic of Korea (draft available at www.youtube.com/watch?v=5m15KBhd9v0). The video will be made available on the IHO website in English, French and Spanish). Other topics considered by the meeting were the development of a Training for Trainers Course on MSDI, the use of template for MSDI maturity assessment and the way ahead for improving the IHO Publication C-17 *Spatial Data Infrastructures: "The Marine Dimension" - Guidance for Hydrographic Offices*.

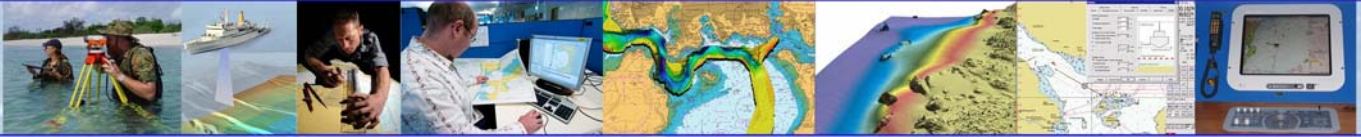


The video to promote MSDI developed by Republic of Korea, available at www.youtube.com/watch?v=5m15KBhd9v0

OGC Marine Domain Working Group

MSDIWG10 was succeeded by a meeting of the OGC Marine Domain Working Group (DWG). The meeting was Co-Chaired by Mr Sebastian Carisio (USA and Vice-Chair of the IHO MSDIWG) and Mr Jonathan Pritchard (UK). The meeting reviewed the outcomes of the OGC Marine Summit, held in Singapore on 27 February and the MSDI Concept Development Study (CDS) and the possible follow on Pilot Project.

The meeting also considered the developments of the S-121 Product Specification on Marine Boundaries and Limits, the advances in the GeoPackage Encoding Standard, the updates of the GEBCO Seabed 2030, matters related to interoperability and discoverability, particularly for scientific data, vertical datum harmonization, management and manipulation of temporal data in the marine domain (bathymetry, point clouds), storage and handling for variable resolution



data, the progress with the DGGs, governance and policy for data sharing, interoperability and implementation of data catalogues, metadata for bathymetry and data security and provenance and authenticity.

UN-GGIM Working Group on Marine Geospatial Information (WGMGI)

MSDIWG10 and OGC Marine DWG were followed by the 1st Meeting of the UN-GGIM WGMGI. The meeting was chaired by Mr John Nyberg (USA), one of the co-chairs of the WG. All Member States participating in the meeting were represented by Hydrographic Offices or by their representatives in an IHO body.

The Chair reported on the progress made with the online meetings and highlighted the importance of the support received from the IHO, in particular of its Secretary-General. Main points emphasized by the Chair included the strong relationship with the UN SDG 14 (Conserve and sustainably use the oceans, seas and marine resources for sustainable development) and the need to improve Communications, the importance to include inland waters and countries with no coastline and the very importance of funding and capacity building.



Participants of the 1st meeting of the UN-GGIM Working Group on Marine Geospatial Information

The WG aimed to address marine geospatial information, including inland water bodies and waterways, focusing on the 2030 Agenda for Sustainable Development, in particular, SDG 14 and to an extent, SDG 6 (Ensure availability and sustainable management of water and sanitation for all). The meeting was attended by 42 expert representatives from Australia, Brazil, Denmark, Germany, Italy, Jamaica, Netherlands, Norway, Republic of Korea, Singapore, United Kingdom, United States of America, IHO, OGC and UN-GGIM Private Sector Network.



The meeting agreed that marine geospatial information must be made available, accessible and discoverable for a multiplicity of purposes within collaborative information systems nationally to deliver reliable, timely and quality information necessary for citizens, organizations and governments to build accountable actions and make informed and evidenced-based policies and decisions.

The 11th meeting of the MSDIWG will be held in Rostock, Germany, in February 2020. There will be a joint technical session with the OGC Marine DWG and an MSDI Open Forum. The UN-GGIM WGMGI recognized the importance of having the next meeting collocated with the MSDIWG and OGC Marine DWG and will investigate the possibility to have the next meeting in Rostock.



4TH S-100 WORKING GROUP (S-100WG), 5TH S-102 PROJECT TEAM MEETINGS AND 1ST IHO GI REGISTRY WORKSHOP Aalborg, Denmark, 26 February - 1 March

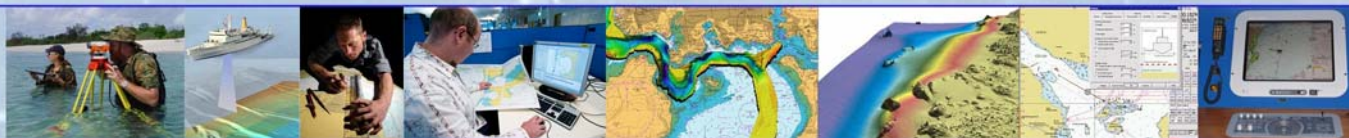
The Danish Geodata Agency hosted the 4th S-100 Working Group, 5th S-102 Project Team meetings and the 1st IHO Registry Workshop in Aalborg, Denmark between 26 February and 1 March 2019. More than 60 participants, representing 22 Member State agencies and 18 expert contributors from industry and academic organizations, attended the meetings. Director Abri Kampfer, Assistant Director Anthony Pharaoh and Technical Standards Support Officer Jeff Wootton represented the IHO Secretariat.

1st IHO Geospatial Information Registry Workshop (25 – 26 February).

The 4th S-100WG meeting was preceded by the 1st IHO Geospatial Information (GI) Registry workshop, which was chaired by the IHO GI Registry Manager, Mr Jeff Wootton (IHO Secretariat). Thirty two delegates from 11 Member States (Canada, China, Denmark, Finland, France, Italy, Norway, Republic of Korea, Romania, Sweden and United States) and eight expert contributors (ESRI, IALA, IC-ENC, IEHG, KRISO, Portolan Sciences, University of New Hampshire and WMO) attended the workshop. Stakeholder participation in the workshop was also provided by representatives of six IHO Working Groups and Project Teams (ENC Working Group, Nautical Information Provision Working Group, S-100 Working Group, S-101 Project Team, S-124 Project Team and S-129 Project Team).

The Chair outlined the main aims of the workshop, which were to provide participants with a common understanding of the IHO GI Registry; and to leverage on the wide range of subject matter expertise of the participants in discussing and improving all aspects of the Registry. An introduction to the structure, roles, interface and content of the IHO GI Registry and its component Registers was provided. This was followed by a briefing on the issues raised and the “lessons learned” in the operation of the IHO GI Registry since it became operational in October 2016, which provided the starting point for discussions for the remainder of the workshop. The structure of a new “Beta” version of the GI Registry, which is under development but partially operational, was demonstrated and discussed.

The standardization of the content of the Registry was discussed in detail, which provided input to an editing session on draft publication S-99 Annex A – Conventions and Guidelines for the Content of the IHO GI Registry. Outcomes from the workshop will also contribute to a review of S-100 Part 2 – Management of Registers and S-99 – Operational Procedures for the Organization and Management of the S-100 Geospatial Information Registry. The workshop concluded with demonstrations of the Feature Catalogue Builder and Portrayal Catalogue Builder tools.



Participants in the 1st IHO Geospatial Information Registry Workshop

5th S-102 Project Team Meeting (25 – 26 February).

Twenty two participants representing Member States, industry organizations and academia participated in the 5th S-102 Bathymetric Surface Project Team meeting which was held at the same venue and time as the Registry Workshop. The meeting was chaired by Mr David BRAZIER (USA – CNMOC).

The primary focus of the meeting was to complete Edition 2.0.0 of the S-102 Bathymetric Surface Product Specification, in time for consideration at the 11th Hydrographic Services and Standards Committee (HSSC11) meeting which will take place in May 2019. Some of the main items that were considered by the meeting included issues relating to horizontal accuracy metadata, revisions to the S-102 grid structure, the suitability of S-102 for navigation and extensions to the HDF5 encoding format. The meeting considered several proposals for corrections, clarifications and extensions to the Product Specification. There were also some informative discussions on data quality constructs (developed by the Data Quality Working Group) and how these could be used to portray uncertainty in navigation systems.

The Chair provided a report on the software application that has been developed to convert grid data from the “Bathymetric Attributed Grid” (BAG) format to the S-102 format. This conversion software will be made available for download from the S-100WG page on the IHO website (<http://www.iho.int>).



Participants in the 5th S-102 (Bathymetric Surface) Project Team Meeting

4th S-100 Work Group Meeting (27 February - 1 March)

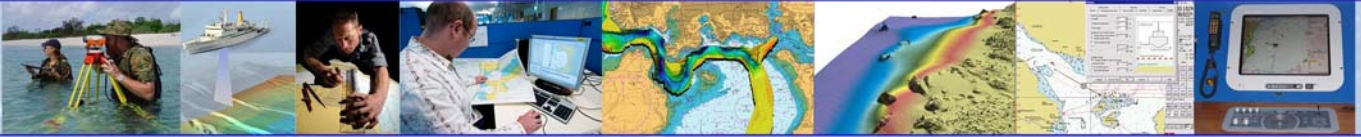
The S-100 Working Group meeting, which was chaired by Ms Julia Powell (USA - NOAA), considered reports on the status of the following product specifications currently under development by IHO subordinate bodies; the S-102 (Bathymetric Surface), the S-121 (Maritime Limits and Boundaries), the S-101 (Electronic Nautical Chart), the S-129 (Under Keel Clearance Management) and the S-124 (Navigational Warnings) Product Specifications.

The meeting discussed several proposals for changes and extensions for inclusion in the next edition of the S-100 Universal Hydrographic data Model. These included proposals to change the naming convention used for exchange set catalogues; to implement changes to the catalogue style sheet file structure; and to provide colour pallet support for the display of symbols. There were also proposals to extend the HDF5 encoding format and to modify the way feature associations are used in the ISO 8211 encoding format.

Denmark provided a presentation on the work that it has been carried out to produce generic S-100 based validation checks. The meeting also reviewed the following two important support documents currently under development; S-97 - Product Specification Development Guidebook; and S-98 - Interoperability Specification for S-100.

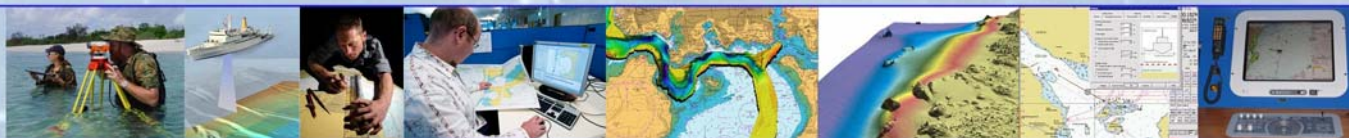
Presentations were provided on the status of the new GI Registry web application; the S-57 to S-101 conversion software application; the Feature Catalogue and Portrayal Catalogue builder applications; the Data Classification and Encoding Guide (DCEG) document generation application; and the S-100 data viewer applications.

The Korea Hydrographic and Oceanographic Agency (KHOA) and the USA Space and Naval Warfare Systems Command (SPAWAR) organization provided comprehensive presentations on projects to test the use of S-100 data within prototype navigations systems. These test systems load and portray datasets based on the S-101 ENC, S-102 Bathymetric Surface, S-111 Surface Currents, S-122 Marine Protected Areas, S-123 Radio Signals and S-127 Marine Traffic Management Product Specifications.



Participants of the 4th S-100 Working Group Meeting

The next S-100WG meeting is scheduled to take place in February or March 2020. Venue and dates still to be confirmed.



13TH MEETING OF THE SOUTH WEST ATLANTIC HYDROGRAPHIC COMMISSION (SWATHC)

Buenos Aires, 25 and 26 April

Contribution to the IHO Work Programme 2019

Task 3.2.1.13	Prepare for and report meetings of the South West Atlantic Hydrographic Commission (SWAtHC)
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The 13th meeting of the South West Atlantic Hydrographic Commission (SWAtHC) was hosted by the *Servicio de Hidrografía Naval (SHN)* (the Argentinian Hydrographic Service), on 25 and 26 April in Buenos Aires. Twenty delegates attended the meeting, chaired by Captain Pablo Tabarez (Uruguay). All three IHO Member States of the Commission, Argentina, Brazil and Uruguay, were represented together with the Associate Member, Paraguay and the Observer State Bolivia. Three industry stakeholders (Teledyne CARIS, Kongsberg and IIC Technologies) participated in the meeting as Observers. The IHO Secretariat was represented by Director Mustafa Iptes and Assistant Director Alberto Costa Neves.

The meeting considered measures to raise the hydrographic awareness of Paraguay and Bolivia on the importance of becoming IHO Member States and the benefits of hydrography as part of the national infrastructure. Both are already Members of the IMO and parties to the SOLAS Convention and Paraguay was an IHO Member from 1967 to 1969.

Argentina reported on the progress of hydrographic surveys and the new charts and new editions in paper and electronic charts for both the coastal and inland waters. A new chart scheme for the Parana River was established. The meeting was informed on the contribution to the national spatial data infrastructure and to the national research system. Progress was reported in the International Bathymetric Chart of the Southern Ocean (IBCSO) and in the national water level framework. An MSI trainer was nominated during the meeting to support the provision of training in the region.

Brazil informed the meeting on the recent hydrographic surveys in coastal and inland waters, including the contribution to the delimitation of the extension of the continental shelf project. The incorporation of a new survey vessel was announced to the meeting. The branch of the Paraguay-Parana Waterway under Brazilian responsibility was 100% covered by inland ENC's (1 840km). Brazil announced the new tools to use social media for promulgation of information and the current prediction system for ports. Brazil further informed the meeting that one student from Bolivia and one from Angola are currently enrolled at the Category "A" Hydrographic Programme on a scholarship support.

Uruguay reported progress in surveys in coastal areas and in inland waters. New charts and new editions were issued since the last meeting. Transition from offset to print-on-demand continues



and now accounts for 2/3 of the total production. The participation in water level monitoring and other environmental projects were reported to the meeting.

Paraguay reported on the actions taken since the 2014 IHO Technical Visit and received indications of support from Member States to sustain progress. Paraguay has the third largest river fleet in the world. Bolivia reported numerous hydrographic surveys in its nearly 2 900 rivers and water bodies, including a survey in three reservoirs at 5 200 m altitude. Bolivia informed the meeting on the preparation of a cartographic plan, the ongoing project of a hydrographic act and the support of capacity building from neighbouring countries in the region. A strong interest in joining the IHO was manifested during the meeting.

The meeting considered the way ahead for cooperation and capacity building, the close cooperation with the Intergovernmental Committee of the Paraguay-Parana Waterway, the contribution to the GEBCO Seabed 2030 project, the developments of inland ENC's in cooperation with the Inland ENC Harmonization Group (IEHG) and the coordination of Member States to participate in all bodies of the IHO.

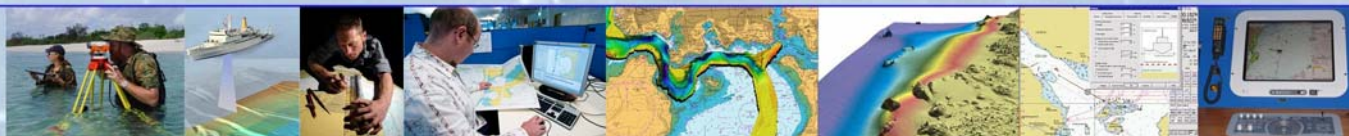
Participants celebrated the fact that there are no significant overlaps in the region and that work is in progress to eliminate the existing ones. A gap between Brazil and Uruguay ENC's was recently identified and eliminated, in accordance with the IHO Resolutions and WEND Principles. Additionally, all ENC's have their CATZOC's assessed, an indication of the good work and cooperation that exists in the region. The region developed its ENC scheme that was presented to the WENDWG9 meeting and will be input to the INT2GIS II system.

Receptions were held on the Brazilian Oceanographic Vessel *Antares* that had called in the port of Buenos Aires and at the Corvette Uruguay, a maritime museum of the Argentinean Navy.

The next Conference will take place on 5 and 6 March 2020 in Brazil, the exact date to be confirmed.



Participants of the SWAtHC13 meeting.



63RD MEETING OF THE NORDIC HYDROGRAPHIC COMMISSION Helsinki, Finland, 10 to 11 April

Contribution to the IHO Work Programme 2019

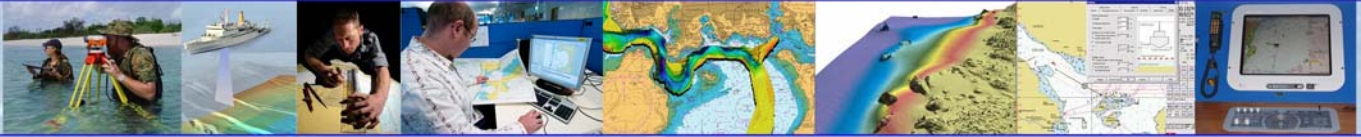
Task 3.2.1.7	Prepare for and report meetings of the Regional Hydrographic Commissions (RHC) / NHC
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The 63rd Meeting of the Nordic Hydrographic Commission (NHC) was held in Helsinki, Finland, under the chairmanship of Rainer Mustaniemi, National Hydrographer of Finland. Representatives from all NHC Member States, namely Sweden, Denmark, Finland, Iceland and Norway attended the meeting. The IHO Secretariat was represented by Director Abri Kampfer.

The NHC63 agenda covered a wide range of topics of mutual interest with the Member States' reports and the additional briefs on the activities of the International Hydrographic Organization (IHO), Inter-regional Coordination Committee, WEND Working Group, Maritime Spatial Data Infrastructure Working Group, Crowd-Sourced Bathymetry Working Group and IHO/IOC GEBCO Project. Director Kampfer briefed the Commission on current IHO activities and the preparations for the forthcoming 3rd Council meeting and second session of the IHO Assembly. Feedback was received on the activities of the IHO-European Union Network Working Group (IENWG). The two Regional ENC Coordinating Centres, Primar and IC-ENC, reported on their activities

Some of the topics provoking in-depth discussions included:

- Report from the Nordic Strategic Workshop;
- Crowdsourced bathymetry data policies
- New concepts for the provision of S-100 based data products;
- The ADAPT project in Sweden in optimizing seagoing public transport in an archipelagic environment.



The participants of the NHC63 meeting.

Feedback was provided by the two NHC expert groups, the Nordic Surveys Expert Group (NSEG) and the Nordic Chart Production Expert Group (NCPEG). Experience was also shared on national projects and organisational restructuring of national hydrographic services.

An Open Session was convened as a post meeting event and two industry presentations were delivered “Introduction to Fugro’s Rapid Airborne Multibeam Mapping System (RAMMS)” and “Shallow Area Hydrographic Survey Project in the Baltic Sea Using a Combination of MBES and Bathymetric LiDAR”. Both presentations were well received and generated some discussion.

On completion of the meeting Iceland assumed the responsibility as Chair and Vice-Chair in accordance with the precepts of the NHC Statutes. The 64th NHC meeting will be held in Iceland in March 2020.



MONACO EXHIBITION ON "HISTORICAL NAUTICAL CHARTS AND MEDITERRANEAN"

Monaco Yacht Club, Monaco, 1-14 April

Contribution to the IHO Work Programme 2019

Task 1.3.1	Promote the IHO through publicity and public relations initiatives.
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The years 2019 and 2021 are important in the history of the International Hydrographic Organization (IHO). The year 2019 will mark the centenary of the 1st International Hydrographic Conference, which was held in London in 1919 and the year 2021 will be the centenary of the establishment of the International Hydrographic Bureau (IHB) in Monaco as precursor of the modern IHO. The IHO Secretariat has undertaken the centenary celebrations of the International Hydrographic Organization as important milestones of the IHO. In this regard, it has been planned to organize exhibitions, symposiums, outreach events and similar activities over the next three years..

As the first event under the IHO Centenary Celebrations, the Secretariat of the IHO organized an Exhibition on "Historical Nautical Charts and Mediterranean" from 1 to 14 April 2019 which was held at the Monaco Yacht Club. The Curator of the exhibition was Mr Ali Riza Isipek (Turkey).



Opening Ceremony of Monaco Exhibition honoured by HSH Prince Albert II of Monaco.

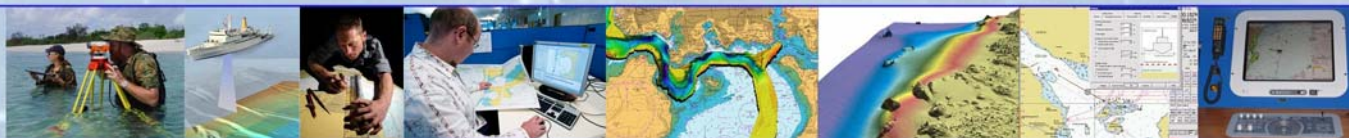
The exhibition, presenting a stunning collection of historic sea charts, ship models and other artefacts, was opened by HSH Prince Albert II of Monaco on 1 April 2019 and appreciated by numerous distinguished guests. The exhibition also attracted numerous local and international visitors, exposing them to the historic art of nautical charting during the two weeks.



Visitors had thus the opportunity to learn about famous cartographers, the maritime world of the Mediterranean, types of old ships, historic navigation methods, old nautical charts from different countries and tools used for navigation. This immense heritage was displayed by means of oil paintings, wooden ship models, tiles (maps and miniatures on ceramic), portolans (world's first nautical charts), flags, navigational tools and informative roll-up banners. A section dedicated to Prince Albert I of Monaco was also displayed at the exhibition.



HSH Prince Albert II of Monaco and the IHO Secretary-General Dr Mathias Jonas during the Inauguration Tour of the Exhibition.



17TH MEETING OF THE IHO CAPACITY BUILDING SUB-COMMITTEE (CBSC17)

29 - 31 May, Genoa, Italy

Contribution to the IHO Work Programme 2019	
Task 3.3.1	Organize, prepare and report annual meetings of the Capacity Building Sub-Committee (CBSC)

The 17th meeting of the IHO Capacity Building Sub-Committee (CBSC17) was held in Genoa, Italy, from 29 to 31 May, hosted by the Italian Hydrographic Institute. The meeting was chaired by Mr Thomas Dehling (Germany) and attended by 29 participants representing 14 Regional Hydrographic Commissions (RHCs) and 20 Member States. The South West Atlantic Hydrographic Commission (SWAtHC) was not represented. The welcome address was provided by RAdm Luigi Sinapi, National Hydrographer of Italy. The IHO Secretariat was represented by Director Mustafa Iptes, Assistant Director Alberto Costa Neves (CBSC Secretary) and Sandrine Brunel (CB Assistant).

The Sub-Committee considered that the IHO Capacity Building Strategy still proves to be very efficient and the implementation of the CB Procedures is very helpful in the execution of the CB Work Programme (CBWP). The meeting also agreed to prepare an input paper to the IHO Strategic Plan Review Working Group (SPRWG) in order to contribute to its development before submission to the next meeting of the IHO Council (C-3). CB is a crucial tool supporting all the targets envisioned in the draft IHO Strategic Plan.

Participants considered that Capacity Building is also key for the development of hydrographic services in developing countries that otherwise couldn't achieve the targets envisioned in the draft IHO Strategic Plan. In order to provide this support, regular and sustainable resources from Member States, stakeholders and the CB Fund is critical. The meeting considered ways to increase resources, including those contributions beyond the CB Fund and agreed that in order to attract donor organizations there is a need to take part in comprehensive projects with other international and regional organizations. In this regard the meeting was informed on the IHO-IMO-WMO-IOC-IALA-IAEA-FIG-IMPA Joint CB Group's initiative to organize a joint project to support Bangladesh, under the leadership of the IMO, under the UN "Delivering as One".

The meeting acknowledged the generous financial contributions of the Republic of Korea and of the Nippon Foundation of Japan, that has a major impact in the CBWP. These contributions jointly creates a number of opportunities for developing Member States in education programmes in Hydrography (Categories "A" and "B") and in Nautical Cartography (Category "B") that have been contributing to the increase in survey and charting worldwide. The contribution from Member States and Industry that provide in-kind support (provision of facilities, trainers, advice, etc.) was also acknowledged.



The draft CB Procedure 9 on Technical Visits was considered and approved by the Sub-Committee. The drafting group was tasked to create a template for the follow-on Implementation Visits to be considered at the next meeting. The meeting was also briefed by the C-55 Review Project Team (C-55RPT) on the limitations and recommendations for the use of CATZOC derived information to update the IHO Publication C-55 as a short-term solution. This will allow the input to be consistent and in a harmonized way. A longer-term solution was envisioned as part of modern MSDI and GIS environments. C-55RPT was tasked to define the scope for future work using a GIS approach.

Participants acknowledged the progress in the IHO Secretariat with the IT-based CB Management System (CBMS), essential to support the work of the CB Coordinators in the RHCs. The system is being developed with the generous and intensive support from ROK in cooperation with the IHO Secretariat. The submissions to CBSC18 will be made online using the CBMS that will also contain the database for recording trainees, trainers, consultants, events and other elements for an efficient CB management. It is also envisioned to provide the figures for the CB-related performance indicators.

Reports received from the RHCs and from the IHO Secretariat showed progress in several areas with Guyana becoming the 90th Member State of the IHO, the development of new IBSC recognized programmes at both Category "A" and "B", the positive impact of the Maritime Safety Information (MSI) courses coordinated between the CBSC and the WWNWS-SC, the improved coordination with regional organizations and the impact of aid-programmes from foreign affairs of several Member States. The meeting acknowledged the assignment of a CB Coordinator in the RSAHC.

National and regional reports were received from the New Zealand Pacific Region Navigation Initiative (PRNI), the Risk Assessment Project in the Greater Caribbean Region (GCR), the United Kingdom Commonwealth Marine Economies (CME) Programme, the EAHC Training, Research and Development Center (TRDC), the Mexico FOCAHIMECA Project, the CB activities provided by Italy, the Japan International Cooperation Agency (JICA) training course and the training opportunities in Industry.

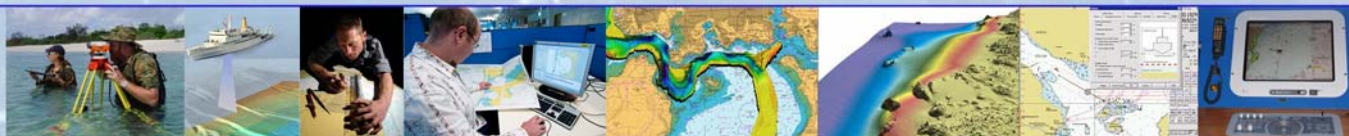


Participants of the 17th meeting of CBSC



The meeting updated and adjusted the 2019 CB Work Programme, considered the priorities identified by the Sub-Committee, the available and potential additional resources and approved the 2020 CB Management Plan and the 2020 CBWP.

The next meeting of the CBSC is planned to be held in Gdansk, Poland, from 27 to 29 May 2020, hosted by the Hydrographic Office of the Polish Navy. Following meetings will be held in Monaco (2021), Ecuador (2022, to be confirmed) and Japan (2023, to be confirmed). The CBSC meeting in 2021 will be held in conjunction with a two-day CB Stakeholders' Seminar.



VISIT OF DELEGATION OF VIET NAM TO THE IHO SECRETARIAT

Monaco, 16 May

A delegation from Viet Nam led by Rear Admiral Pham Manh Hung, Vice Chairman and Director General of Viet Nam Hydrographic Office (VHO) visited the IHO Secretariat on 16 May, and was received by IHO Director Mustafa Iptes, accompanied by Assistant Directors Alberto Costa Neves and Yves Guillam.

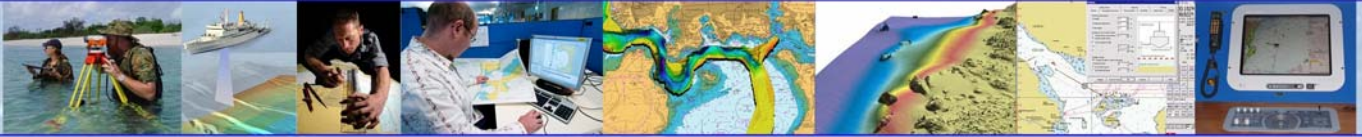


Viet Nam became a Member State of the IHO in 2015 and the visit aimed at familiarizing the VHO Staff with the overall IHO work programme, improving the ties between the VHO and the IHO Secretariat and identifying opportunities for Viet Nam to contribute to the work and objectives of the IHO.

The visit included a thorough presentation of the IHO, highlighting the various opportunities for the active engagement of Viet Nam, including corporate affairs, technical work, cooperation with other Member States and participation in Capacity Building.

During the visit the Hydrographer of Viet Nam highlighted the interest of his country in pursuing a fast development in Hydrography and Nautical Cartography to support safety of navigation and economic development in the more than 3,000 islands and 3,200 km of coastline. He also briefed the IHO Secretariat on the current status of surveying and charting and the bilateral agreements with France, India, Norway and United Kingdom.

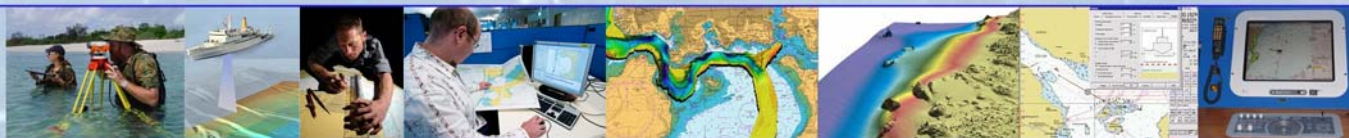
It was reported that Viet Nam is aiming to become a more active Member by hosting IHO meetings and Capacity Building activities. By developing the country's Marine Spatial Data



Infrastructure, it will improve the quality of the national chart portfolio and the national economic infrastructure. Viet Nam, as a Member of the IHO, also expressed their desire to become a full Member of the East Asia Hydrographic Commission (EAHC).



Rear Admiral Pham Manh Hung and IHO Director Mustafa Iptes during the Visit of Viet Nam del



1ST GLOBAL PLANNING MEETING OF THE UNITED NATIONS DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT Copenhagen – Denmark, 13 - 15 May

Contribution to the IHO Work Programme 2019	
Task 1.1.9	Maintain relationship with the Intergovernmental Oceanographic Commission (IOC) of UNESCO

The 1st Global Planning Meeting ended after three days of lively discussions with over 200 participants from science, academia, policy, communication and private sector organisations brainstorming on how to achieve the six key Decade outcomes by 2030: a clean ocean, a healthy and resilient ocean, a safe ocean, a sustainable and productive ocean, a predicted ocean and a transparent and accessible ocean. Dr Mathias Jonas, Secretary-General of the IHO, represented the IHO Secretariat.

Human and society questions were at the fore and core of debates: What kind of science and infrastructures are needed to understand and inform decision makers and citizens alike about the present and future changes in the ocean? How can we align on-going research investments in order to produce major breakthroughs such as a global map of the seafloor or a deep-sea observing system? How can science define pathways for ocean sustainability, providing solutions to feed a growing world population without harm to marine biodiversity?

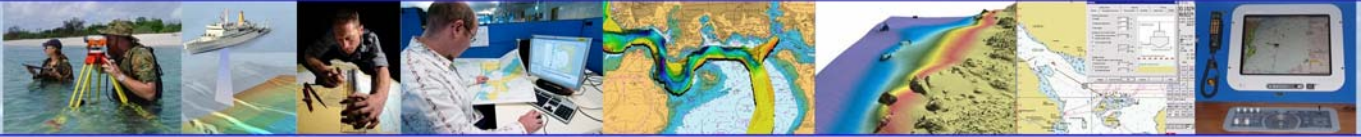
“The Decade takes on a critical role in critical times, as we are facing challenges our species has never faced before. As we know so little, we need this Decade to fill the gaps in scientific knowledge to enhance ocean health. But it must do so within a precautionary approach applied with vigor” said Peter Thomson, UN Secretary-General’s Special Envoy for the Ocean, opening the meeting at the Assembly Hall of Denmark’s National Museum.

By video message, H.S.H. Prince Albert II of Monaco urged all to go further in the transformation of society. He insisted that we must act urgently to provide solutions to society’s major current challenges, responding to the climate change and biodiversity crisis and plastic pollution.

Peter Haugan, Chair of the Intergovernmental Oceanographic Commission (IOC) of UNESCO expressed the Decade is a once in a lifetime opportunity, that it needs to be about the people, leaving no one behind, and enabling individuals to make a difference. He highlighted the need for an ambitious top-down and bottom-up movement to meet the Sustainable Development Goals.

Vladimir Ryabinin, Executive Secretary of IOC called on young professionals and social scientists to work together in an interdisciplinary effort. It should be an ambitious, team work undertaking across all sectors.

Dr Mathias Jonas, Secretary-General of IHO, underpinned the vital importance of the digital mapping of the oceans presenting seabed topography as the basic information. He explained the GEBCO concept and the interrelation to the Seabed 2030 project. For data contributions



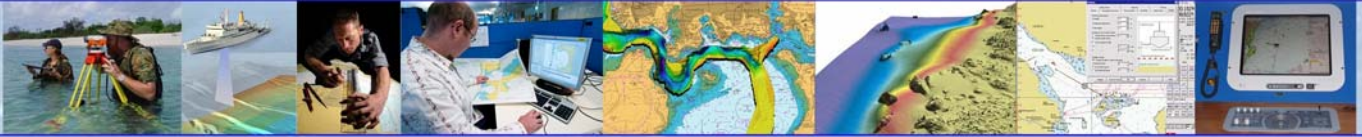
gathered by commercial surveys he coined the term “digital philanthropy”. He went on to advertise for IHO’s S-100 approach to be potentially applicable to all sorts of marine information including chemistry and biology of the oceans resulting in interoperable datasets to form “the digital aquarium”.



Official group picture of the 1st Global Planning Meeting of the UN Decade of Ocean Science for Sustainable Development © Leif Bolding

In order to succeed, participants concluded that the Decade needs to promote ocean literacy across the world to anchor mind-sets around the fundamental relationship humanity has with the ocean. The Decade needs to be inclusive, participative, and interdisciplinary. It will require a powerful marketing and communication strategy, advancing stakeholder partnerships across different disciplines.

Capacity development and technology transfer are required to smaller economies who are in need of ocean science, such as the Small Island Developing States. The importance of traditional knowledge should be emphasized, because the current way of life is destructive. Ultimately, the Decade needs to start a global movement and should change the current ‘domination’ narrative over the ocean and turn it into something positive. In the end, as summed up by Margaret Leinen, Director of the SCRIPPS Institution of Oceanography, “it is about what can we do together that we cannot do separately” as no single nation can deliver on its own the science we need for the ocean we want.



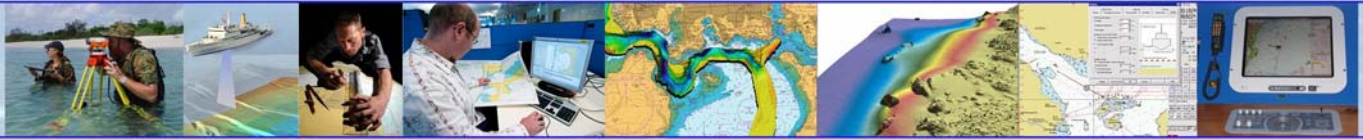
The next months of planning will include regional workshops to identify further priorities and identify existing initiatives, experts and potential partnerships. The first regional workshop covering the Pacific Community is set to take place in Nouméa, New Caledonia (23-25 July 2019), and a second workshop in Tokyo, Japan (31 July – 2 August 2019) will consult stakeholders in the North Pacific region. Many more workshops and consultations are planned from August 2019 to the first quarter of 2020, covering every ocean basin, including the Polar Regions and marginal seas.

The 2nd Global Planning Meeting scheduled for May 2020 will then integrate knowledge and regional priorities into a global implementation plan that will include a science plan, a communication strategy as well as a resources mobilisation plan to be presented to the various Decade partners at a kick-off meeting in Germany during the first quarter of 2021.



Live stream: #OceanDecade First Global Planning Meeting (Monday, 13th May 2019)

Dr Mathias Jonas, Secretary-General IHO explains the role of hydrography in relation to the Ocean Decade



11TH MEETING OF THE HYDROGRAPHIC SERVICES AND STANDARDS COMMITTEE (HSSC-II)

Cape Town - South Africa, 6-9 May

Contribution to the IHO Work Programme 2019

Task 2.1.1	Organize, prepare, and report annual meetings of HSSC
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The 11th meeting of the Hydrographic Services and Standards Committee (HSSC) took place in Cape Town, South Africa from 6 to 9 May 2019. The meeting was hosted by the South African Navy Hydrographic Office (SANHO). The HSSC Chair, RAdm Luigi Sinapi (Italy) opened the meeting and invited Captain Theo Stokes, National Hydrographer of South Africa to provide the opening address. After welcoming delegates to the Mother City in all eleven official languages spoken in South Africa, Captain Stokes emphasized South Africa’s commitment to providing standards based on hydrographic products and services. He reported on the new rejuvenation programme being undertaken by the SANHO which will include the acquisition of a new hydrographic survey vessel, 3 organic survey motor boats and major upgrades to the production and training facilities within SANHO.

Sixty-three participants representing twenty-four IHO Member States and eleven stakeholder organizations participated in the meeting. The IHO Secretariat was represented by Director Abri Kampfer, Assistant Directors Yves Guillam and Anthony Pharaoh.



The participants of the 11th Hydrographic Services and Standards Meeting.

Following the resignation of the HSSC Vice-Chair, Mr. Michael Prince (Australia), the Committee elected Mr. Magnus Wallhagen (Sweden) as his replacement. The HSSC Chair congratulated Mr Wallhagen and expressed his appreciation to Mr. Prince for the significant contribution he had made during his term in office.



The Chair of the Strategic Plan Review Working Group (SPRWG) of the IHO Council, Ingénieur général Bruno Frachon (France), reported on the draft Revised IHO Strategic Plan currently under development and the links to be established with the IHO Work Programme of the HSSC through Performance Indicators. Subsequent suggestions were made by the HSSC Chair. The meeting also discussed the format and content of a showcase presentation on S-100 based products and test bed systems to be presented at the 3rd session of the IHO Council.

Reports were provided by the Chairs of the HSSC Working Groups and Project Teams. The S-100WG Chair reported on new documents under development which include a guidebook for product specification developers (S-97), the “Interoperability Specification” for S-100 based navigation systems (S-98) and a proposal to implement an “S-100 Technical Readiness Levels” concept for controlling and monitoring the development of S-100 based products. Reports were also provided on the status of the S-101, S-102, S-121 and S-129 Product Specifications. PRIMAR reported on their implementation of the S-100 based security system for the distribution of S-102 and other product data.

The Chair of the ENCWG reported on the S-58 test datasets (available on Github), progress with developing guidance on producing high density bathymetric ENC's and extensions to the S-63 (IHO Data Protection Scheme) required to address cyber security concerns.

The NIPWG Chair reported on the product specifications that have recently been completed, and those still under development. He reported on the outcomes of the joint IMO/IHO Harmonization Group on Data Modelling (HGDM) meeting (IMO, London – October 2018) and the discussions on the IMO e-Navigation Maritime Service descriptions that fall under the IHO responsibility.

The NCWG Chair reported on the status of IHO publications under its remit, and highlighted issues and options reported in a paper entitled “Future of the Paper Chart”. A survey is proposed to Member States and its outcome will be incorporated into the final version of the report on the future of the paper chart.

The Chair of the DQWG reported on the new data quality indicators under development and highlighted a data quality “decision tree” that is intended to provide guidance on achieving a harmonized implementation of quality parameters for hydrographic data under the S-100 framework. The DQWG was also commended for the development of a new conditional visualization methodology of quality of bathymetric data which now needs to be experimented.

Canada reported on an “S-100 cloud distribution pilot project” which has demonstrated the ability to store S-102 data on a cloud repository, combine it with S-57 data and make it available for use as a web services.

Following a proposal made by the USA, the meeting had fruitful discussions on the possible implementation of MARPOL regulations into a new S-100 based product, still to be developed. A two-step process was agreed to speed up the service to mariners, firstly a revision of the S-57 catalogue of objects and then to consider at a later stage, whether it is appropriate to move forward with a new S-100 based products covering IMO-type regulations.



Reports were also provided on the activities of the Hydrographic Survey Project Team (HSPT), the Tides - Water Level and Current Working Group (TWCWG), the Hydrographic Dictionary Working Group (HDWG) and Advisory Board on Law of the Sea (ABLOS) activities. The HDWG provided a demonstration of the prototype online hydrographic dictionary applications which includes English, French, Spanish and Chinese terms and definitions.

alarm	In ECDIS a device or system which alerts by audible means, or audible and visual means, a condition requiring attention.
جرس إنذار	في نظام عرض الخرائط الإلكترونية (أكسس) هو جهاز أو نظام تحذيري مسموع أو مسموع ومرئي، حالة تمتدعي الإنتباه.
all other information	In ECDIS used to describe information additional to the STANDARD DISPLAY. Also called "ON-DEMAND INFORMATION".
جميع المعلومات الأخرى	في نظام عرض الخرائط الإلكترونية (أكسس) تستعمل لوصف معلومات إضافية إلى تلك المعلومات القياسية المعروضة، وأيضا يدعى «معلومات الأخرى».

ARABIC LANGUAGE FOR HYDROGRAPHIC DICTIONARY (IHO)

PROPOSED BY:
Khalid AL-SAYED
IHO MEMBER STATE

ARABIC NATIONAL HYDROGRAPHIC SERVICE

معلومات الأخرى: المعلومات الإضافية إلى تلك المعلومات القياسية المعروضة، وأيضا يدعى «معلومات الأخرى».

英汉海道测量词典

ENGLISH-CHINESE MARITIME HYDROGRAPHIC DICTIONARY

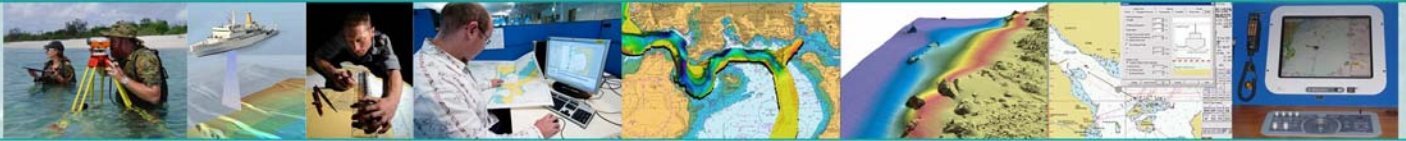
中国航海出版社 编

Towards a multilingual IHO Hydrographic Dictionary using unique reference number for definitions

All reports and presentations given by the Working Groups are planned to be used in preparation of a strategic paper covering the S-100 Implementation Strategy aiming to provide some guidance to Member States on their transition plans to prepare the future production of S-100 based products.

Presentation on the activities of the following relevant external liaison organizations were provided by the International Maritime Organization (IMO), Comité International Radio-Maritime (CIRM), International Organization for Standardization (ISO/TC211), International Association of Light house Authorities (IALA), Open Geospatial Consortium (OGC), International Cable Protection Committee (ICPC) and Defense Geospatial Information Working Group (DGIWG). There were information papers presented on the phase II of the INTtoGIS project, the NOAA surface currents reporting facility and increases in the shifting of the magnetic north pole.

The 12th HSSC meeting will take place in Bristol, United Kingdom from 11-15 May 2020.



30th Session of the Assembly of the Intergovernmental Oceanographic Commission (IOC)
Paris, France, 26 June-4 July

Contribution to the IHO Work Programme 2019	
Task 1.1.9.1	Maintain relationship with the Intergovernmental Oceanographic Commission (IOC) of UNESCO, including attendance of Assembly

The Assembly is the highest governing body of the Intergovernmental Oceanographic Commission (IOC) of UNESCO. The functions of the Assembly are to consider matters related to managing the regional subsidiary bodies and their programmes, overseeing the ocean research programmes, the ocean observing systems and data management, the regional tsunami warning systems, the coordination of warning and mitigation systems for ocean hazards, the capacity building programme and strategy, sustainable development and governance, administration and management of the IOC and governance of the IHO-IOC GEBCO Project in cooperation with the IHO.

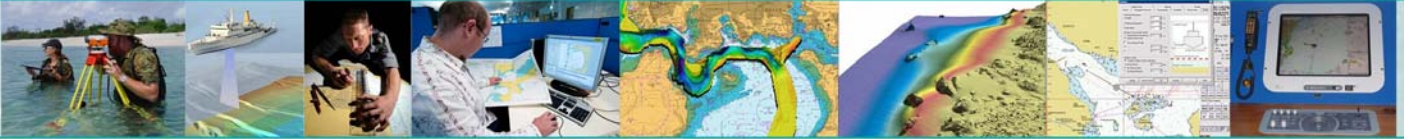


Intergovernmental Oceanographic Commission

The 30th session of the IOC Assembly was held at the UNESCO Headquarters in Paris, France from 26 June to 4 July, preceded by the 52nd Session of the IOC Executive Council held on 25 June. Ocean Science Day was also celebrated by special panel sessions on 27 June. The delegations included representatives of the Hydrographic Offices of the following IHO Member States: Argentina, Brazil, Chile, Colombia, France, Germany, Peru, Portugal, Republic of Korea, Russian Federation, Singapore, Sweden, Thailand, Turkey, USA and Viet Nam. Director Mustafa Iptes and Assistant Director David Wyatt represented the IHO. The Assembly was opened by the Deputy Director-General of UNESCO, Mr Qu Xing, on behalf of the Director-General, Ms Audrey Azoulay, and Dr Vladimir Ryabinin, the Executive Secretary of the IOC.



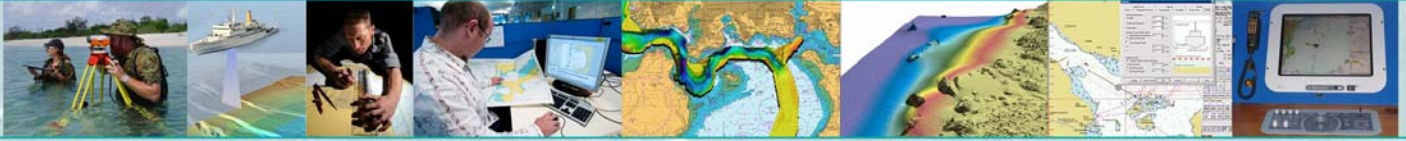
30th IOC Assembly in plenary session



General

The Assembly received reports from the Executive Secretary, on the activities of the IOC regional subsidiary bodies – *the sub-commissions for the Western Pacific, the Caribbean and adjacent regions, and Africa and adjacent island States* - the status of the IOC global ocean science report, the world climate research programme and the 2nd International Indian Ocean expedition. Introducing the discussions on the UN Decade of Ocean Science for Sustainable Development (the Decade), the Executive Secretary highlighted that there were less than two years to work with Members States, the UN, all partners and stakeholders to develop an implementation plan. He noted that this was a once-in-a-life-time opportunity for all to achieve a breakthrough in the capacity of oceanography to serve people and the planet. The Executive Secretary identified as the main challenge for the Commission's small Secretariat the dual tasks of raising, not only extra budgetary resources necessary to maintain its core operational programmes, but also significant additional resources to lead and coordinate the Decade preparation phase. He noted a new approach to fund-raising and outreach, based on highlighting the societal benefits of the IOC's work and demonstrating the return on investment in ocean science and observation were being developed. The Executive Secretary highlighted that the Global Planning Meeting in Copenhagen last May represented a first step in bringing together experts and stakeholders to discuss and identify the science questions to be addressed during the Decade. He introduced the six societal outcomes of the Decade, the expected science breakthroughs, the research and development priority areas as well as the four potential pillars of the Decade (a georeferenced Atlas, observations and data system, the science-policy interface and societal applications). He stressed the need for technological innovations as well as an economic valuation of the ocean to drive the development of transformative partnerships under the Decade.

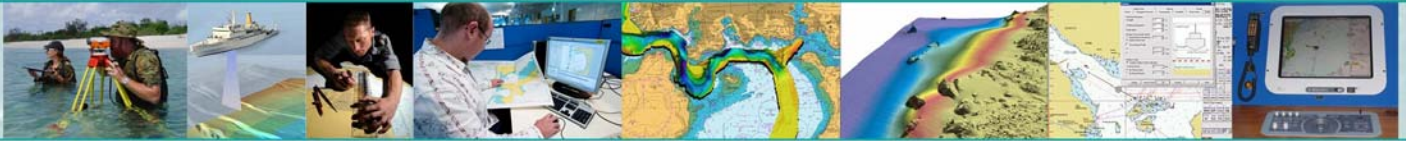
The Assembly identified that the IOC has a critical role to play in the development of UN Sustainable Development Goal (SDG) 14 indicators. In the context of biodiversity beyond national jurisdiction (BBNJ), the Commission's contribution on capacity development and transfer of marine technology was noted as particularly important. The Assembly stressed the need for more operational services and exchange of data, with a particular focus on real-time data exchange. The Assembly welcomed the continuation of the 2nd International Indian Ocean Expedition (IIOE-2) until 2025 as an important contribution to the first half of the Decade. The potential role of Maritime Spatial Planning in addressing many issues related to economic development of coastal nations was highlighted. The Assembly discussed the UN world ocean assessment and the progress with the Global Ocean Observing System (GOOS), the Global Climate Observing System and the restructuring of the World Meteorological Organization (WMO), which will result in the establishment of a Joint WMO-IOC Collaborative Board to which the new WMO-IOC Joint technical committee for oceanography and meteorology (JCOM) will report. Two GOOS-related projects - the European Commission (EC) Horizon 2020 funded AtlantOS project and the Tropical Pacific Observing System in 2020 (TPOS 2020) project – were highlighted. It was noted that the AtlantOS has contributed to the development of a vision for an All-Atlantic Ocean Observing System as a contribution to GOOS, and is seeking to develop mechanisms to engage with Member State agencies and organizations around the Atlantic Basin.



Two resolutions adopted by the 18th World Meteorological Congress, which impact across citizen science and observation activities, were highlighted. The first resolution reaffirmed the importance of marine meteorological observations, including those in Exclusive Economic Zones (EEZs), used operationally by WMO Members to provide services in support of safety of navigation and the protection of life and property in coastal and offshore areas; it also clarifies the legal regime under which the Voluntary Operating Ship Scheme and surface observing platforms operate. The second resolution noted the 20-year history of work by the IOC to develop a cooperative framework regarding the sharing of ocean data in EEZs, recognizing that WMO's operational forecast models and services increasingly rely on sustained global data streams of subsurface observations, and decided to identify the requirements for subsurface ocean variables to improve the quality of these forecasts and services, working closely with IOC in order to explore mechanisms that make the highest-impact subsurface ocean data freely available, and build the capacity of all WMO Members to use the resulting forecast systems and services. It was also noted work by the JCOMM Observations Coordination Group and GOOS that surveyed ocean observing networks on the impediments they faced in taking observations within EEZs in full compliance with the provisions of UNCLOS (The United Nations Convention on the Law of the Sea).

The Assembly also discussed the regional tsunami warning and mitigation systems – *the Pacific (PTWS)*, *the Indian Ocean (IOTWMS)* and *the North-Eastern Atlantic, the Mediterranean and connected seas (NEAMTWS)* – the tsunami and other coastal hazards warning system for the *Caribbean and adjacent regions (CARIBEEWS)* as well as the global coordination of warning and mitigation systems for ocean hazards and harmful algal blooms. During the presentation of the reports and subsequent discussions covering the Tsunami and Other Hazards Warning System Working Group (TOWS-WG), the IHO was highlighted as one of the significant partner organizations, particularly with respect to the transmission of warning information. The adoption of the TOWS-WG report and recommendations, means that the World-Wide Navigational Warning Service Sub-Committee (WWNWS-SC) and the TOWS-WG can move forward on the implementation of the operational processes for the dissemination of tsunami warnings and structured messages via the International Maritime Organization/IHO WWNWS. The Chair of the IHO-IOC GEBCO Guiding Committee (GGC) highlighted the importance of comprehensive bathymetric datasets to model tsunami impacts and the speed of propagation of the energy wave.

The Assembly received a briefing on the proposed development of the IOC Ocean Data and Information System (ODIS), that will be a framework in which existing ocean data and information systems, products and services will be promoted and where connections between these systems will be promoted and possibly developed by relevant stakeholders. It was noted that the International Oceanographic Data and Information Exchange (IODE) will work with existing stakeholders, linked and not linked to the IOC, to improve the accessibility and interoperability of existing data and information, and to contribute to the development of a global ocean data and information system, leveraging established solutions where possible. The IOC ODIS will target scientists, government agencies/policy-makers, IOC global and regional programmes, IODE National Oceanographic Data Centres, Associate Data Units, Associate Information Units, UN agencies, IGOSs, and Industrial and commercial enterprises. The Assembly stressed the need to develop ODIS with involvement



from the widest possible range of stakeholders, ensuring active participation from IOC Member States but also from other UN agencies, NGOs, national and regional programmes and projects, as well as the private sector.

Ocean Bathymetry and Capacity Building

The Assembly considered the biennial report of the Chair of the GGC and expressed its support for the increased IOC engagement in the work of GEBCO activities. The Chair of the GGC highlighted the various activities undertaken in the recent biennium, in particular highlighting the commencement, in February 2018, of the operational phase of the Nippon Foundation-GEBCO Seabed 2030 project and the progress achieved to increase the global bathymetric coverage. He noted that more details had been provided in the Seabed 2030 side event the previous day. The proposed revisions, as amended by IRCC11, to the Guiding Committee terms of reference and rules of procedure were endorsed. During the GEBCO discussions the IHO representative noted that the wide spread verbal support needs to be supported by real actions to gather bathymetry and make data available. He also urged all IOC Member States, that owned or operated research vessels, to ensure that their vessels were collecting and storing bathymetric data whenever they were at sea and that the data was provided to the IHO Data Center for Digital Bathymetry so as to be freely and openly available to all who may wish to make use of it, sentiments reiterated by the Executive Secretary of the IOC.

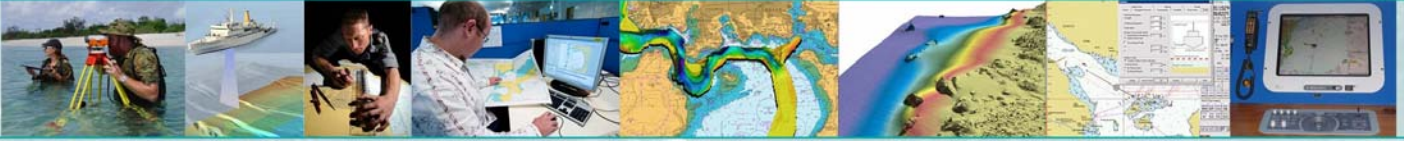
The Assembly discussed the IOC Capacity Development Strategy, including its regional programmes and proposals for the IOC Capacity Development Fund. The IOC Ocean Literacy activities, including contributions to the Ocean Literacy in 2018-2021 Action Plan, which had been undertaken in the last intersessional period, were highlighted including progress on global and regional cooperation.

Side Event and Discussion Panel on the Nippon Foundation - GEBCO Seabed 2030 Project

A side event and discussion panel on the Nippon Foundation – GEBCO Seabed 2030 project was held during the lunch time break of the Assembly on 2 July, moderated by Mr Shin Tani, GEBCO Guiding Committee Chair. Assistant Director David Wyatt, representing the IHO, was invited as a panellist. During the introductions to the discussions he stressed the long association of the IHO with the GEBCO Project and its governance. He highlighted the importance of completing the picture of the ocean floor to support the numerous UN initiatives, which needed a comprehensive bathymetric dataset to achieve their goals.



The panel participants at the Seabed 2030 side event

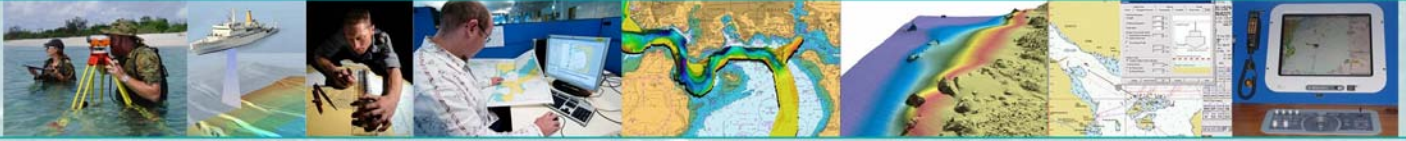


Office Bearers

The Assembly elected Mr Ariel Hernán Troisi of Argentina as new President of the IOC for 2019 to 2020.

Next Sessions

The next session of the IOC Assembly (Assembly-31) is scheduled from 14-25 June 2021 with the 53rd and 54th Executive Councils to be held 29 June-3 July 2020 and 13 June 2021 respectively. All documents of the 30th session of the IOC Assembly will be available from the IOC of UNESCO website. It was also highlighted that the Ocean Conference was programmed 2-6 June 2020.



69th Session of the IMO Technical Cooperation Committee London, United Kingdom, 25-27 June

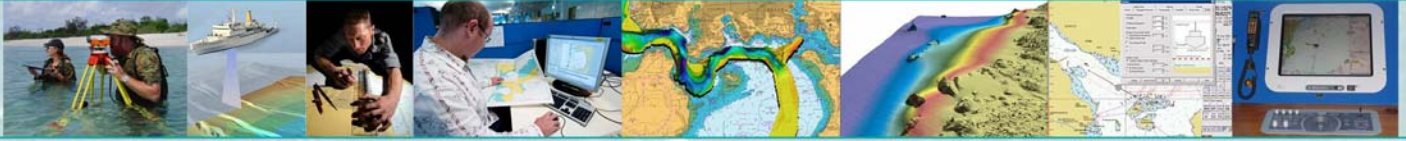
Contribution to the IHO Work Programme 2019	
Task 1.1.8.5	Maintain relationship with the International Maritime Organization (IMO), including attendance of Technical Cooperation meetings

The Technical Cooperation Committee (TC) is the IMO body that considers matters within the scope of the implementation of technical cooperation projects for which the IMO acts as the executing or cooperating agency and any other matters related to the IMO's activities in the field of technical cooperation. The 69th session of the TC (TC 69) was held at the IMO Headquarters in London, UK, from 25 to 27 June 2019. Mr. Zulkurnain Ayub (Malaysia) chaired the meeting. Assistant Director Alberto Costa Neves represented the IHO.

In his opening remarks, the Secretary-General of IMO, Mr Kitack Lim, highlighted this year's World Maritime theme, "Empowering women in the maritime community", in line with SDG 5 (*Achieve gender equality and empower all women and girls*), to highlight the important contribution of women all over the world to the maritime sector. IMO, through its "Women in Maritime" Programme, conducted under the auspices of the Technical Cooperation Division, has worked over the past 31 years to enhance the contribution of women as key maritime stakeholders. He stressed the role of the IMO's Integrated Technical Cooperation Programme (ITCP) to help all Member States to develop and formulate innovative policies and strategies to respond to the needs of countries to achieve the SDGs.



Chair, Mr. Zulkurnain Ayub (Malaysia), addressing the meeting.



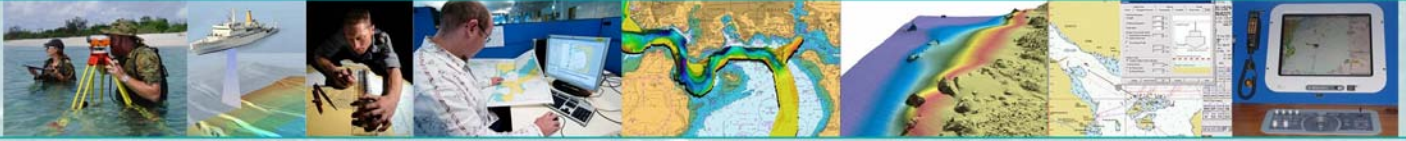
The meeting considered the ITCP delivery during 2018 and approved the ITCP for the biennium 2020-2021 and the TC Fund allocation of circa 14.6 million US dollars to support the programme's core activities. The TC Fund receives contributions from Member States and donor agencies. The Committee endorsed the long-term resource mobilization strategy to support Capacity Building and maritime development projects. The 2020-2021 ITCP envisions regional workshops and training courses for safety of navigation in West Central Africa, Asia, Pacific Islands, Eastern Europe, Latin America and Caribbean and Arab States/Mediterranean region, which will involve the IHO and IALA.

The Committee considered the implementation of the 2030 Agenda for Sustainable Development, especially SDGs 5 and 14, and the strengthening partnerships with the World Maritime University (WMU), International Maritime Law Institute (IMLI) and other global maritime training institutions. It also approved the new and improved Country Maritime Profile module, which has the potential to provide knowledge in support of the IMO-IHO-IALA joint needs assessment visits to coastal States.

The meeting took note of the first joint needs assessment mission in Sudan by the IMO, IHO and IALA, conducted on matters related to hydrography, hydrographic surveys, nautical charts, ships' routing and aids to navigation. The collaboration between the three organizations, which is expected to be sustained, was aimed at enhancing and supporting safety of navigation. Also noted was the participation of the IMO regional presence in IHO and IALA related activities under the UN "Delivering as One" and the contribution from the IHO to the capacity building activities in the Asia-Pacific region.

The Committee noted the status of implementation of the global technical cooperation programme of the IMO Member State Audit Scheme (IMSAS). The IHO representative made an intervention to indicate that, with respect to the implementation of relevant aspects of SOLAS Chapter V, the IHO stands ready to contribute to the Corrective Action Plans (CAP) following IMSAS visits and to the preparation of auditors and audit visits.

Countries in the Caribbean Sea reported on the Regional Senior Maritime Administrators (SMA)' Workshop held on 28 February and 1 March 2019 in Jamaica. Among other matters, the Jamaica SMA Resolution 2019 invited Caribbean States to consider inviting the IHO to assist in the establishment of a national framework for hydrographic services in order to meet the mandatory obligations of SOLAS Chapter V - Regulation 9, researching the feasibility of the establishment of a regional hydrographic office, and becoming members of the IHO and of the Meso America - Caribbean Sea Hydrographic Commission (MACHC). The SMA Workshop became an annual event which includes Hydrography as a permanent agenda item.

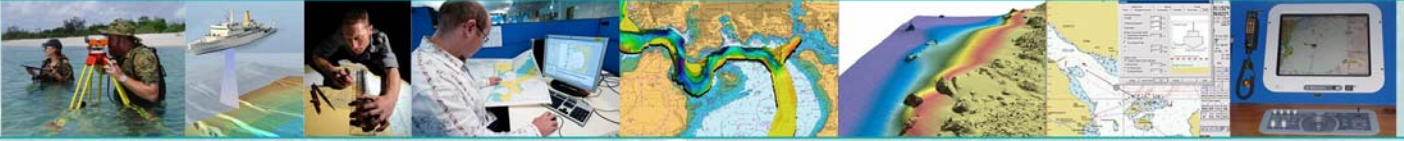


Prime Minister of Malta, the Honorable Dr Joseph Muscat and IMO Secretary-General, Mr Kitack Lim with IMLI's Faculty and Alumni during the 30th anniversary celebration session.

Side activities included a session to celebrate IMLI's 30th anniversary, with the participation of the Prime Minister of Malta, the Honorable Dr Joseph Muscat, a ceremony where Malaysia handed financial contributions to WMU and IMLI, with the participation of the Minister of Transport of Malaysia and the launching of the Secretary-General Emeritus Koji Sekimizu's PhD Fellowship on Maritime Governance at WMU. During the meeting other Members announced donations to the TC Fund. The meeting held a small session of appreciation to Mr Juvenal Shiundu, Acting Director of the Technical Cooperation Division, who will retire after more than 22 years of sterling service to the IMO.

During the meeting the IHO representative had numerous fruitful informal discussions with the IMO Secretariat Staff and with delegates. The cooperation between the IMO and the IHO for developing and eventually sharing their respective country maritime profiles was discussed and will be further considered. Coordination was progressed with the Executive Director of the *Comisión Centroamericana de Transporte Marítimo* (COCATRAM) on the implementation of joint capacity building activities in the Meso America and Caribbean Sea region. A joint needs assessment visit to Iraq was discussed and is under consideration by IMO, IHO and IALA.

The TC elected Mr Laurent Parenté, Vanuatu, as Chair and Mrs Mandana Mansoorian, Iran (Islamic Republic of), as Vice-Chair of the Committee for 2020. The next session of the TC (TC 70) is tentatively scheduled from 15 to 17 June 2020.



MONACOLOGY

2019

The 2019 edition of Monacology took place from 11 to 14 June 2019 below the International Hydrographic Organization's Headquarters. Monacology is an annual event that aims to raise children's awareness about the environment and sustainable development.

The underlying theme of *Monacology 2019* was "*Monaco, my sustainable town*". In accordance with the theme the IHO presented a chart of the "Marine protected area from Toulon to Orbetello", courtesy of the French Hydrographic Office (SHOM), showing the protected area for marine mammals, subject to an agreement between Italy, Monaco and France.

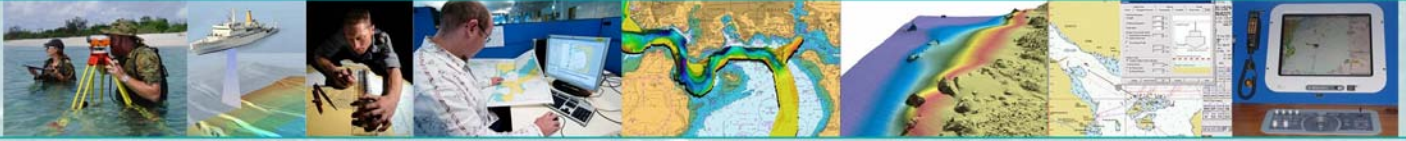


IHO stand at the Monacology 2019

With inquisitive eyes, the children were curious to learn the name of "their" sea and with great attentiveness and precision (like a true cartographer, editor's note) they reproduced the chart with the coastline and protected areas.

Learning to read and grasp the geography of our Blue Planet is allowing our youngsters to address the question of hydrography and marine science and to create awareness of their importance.

In this instance all the participating youngsters from local schools, were able to produce their own chart which they could take home or back to school.



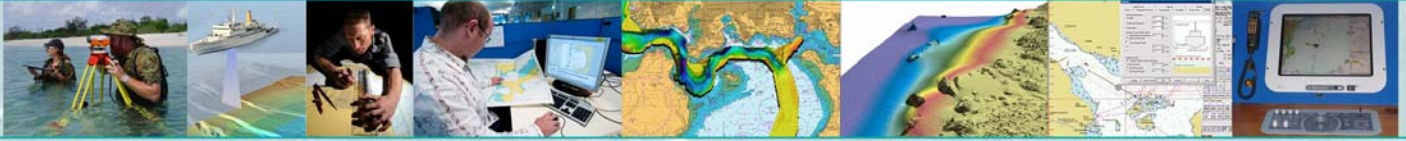
A young hydrographer and the struggle for a chart puzzle

Each budding hydrographer was given an IHO badge “Junior Hydrographer” in recognition of their efforts.

The IHO stand was honored by the visit of HSH Prince Albert II of Monaco, on Wednesday 13 June. He was welcomed by Secretary-General Dr Mathias Jonas who presented the IHO Stand which focused on creating awareness for the new generation on the importance of hydrography for sustainable development of seas and oceans especially the Mediterranean which is their playground.



HSH Prince Albert II of Monaco on the IHO stand with IHO Secretary-General Dr Mathias Jonas



101st Session of the IMO Maritime Safety Committee London, United Kingdom, 5-14 June

Contribution to the IHO Work Programme 2019	
Task 1.1.8.3	Maintain relationship with the International Maritime Organization (IMO), including Attendance of MSC meeting

The Maritime Safety Committee (MSC) is the highest technical body of the International Maritime Organization (IMO). The functions of the MSC are to consider matters related to aids to navigation, construction and equipment of vessels, rules for the prevention of collisions, handling of dangerous cargoes, maritime safety procedures, hydrographic information, salvage and rescue and any other issues directly affecting maritime safety. The 101st session of the MSC (MSC 101) was held at the IMO Headquarters in London,

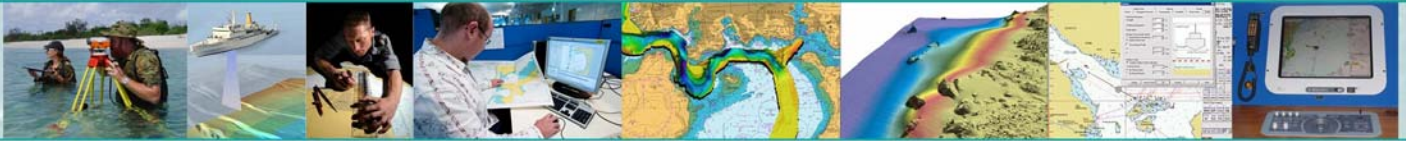


IMO MSC 101 in plenary session

UK, from 5 to 14 June 2019. Director Abri

Kampfer and Assistant Director David Wyatt represented the IHO. In addressing the agenda of the session in his opening statement, the Secretary-General of IMO, Mr Kitack Lim, highlighted completing the high-level review of IMO instruments and performing an overarching analysis to ensure that MASS operations are addressed in the most efficient manner in future, keeping in mind the need to maintain or, if possible, enhance safe navigation and operations. With regard to piracy and armed robbery against ships, 223 incidents occurred worldwide in 2018 as compared to 204 incidents reported in 2017; so far in 2019, incidents in West and Central African waters have accounted for about half of all reported incidents. He highlighted that Sub-Committee on Navigation, Communications and Search and Rescue (NCSR)-6 had produced many draft circulars and resolutions for approval and adoption; of special importance were the instruments related to the provision of maritime safety information through Inmarsat Fleet Safety and Iridium Safety Cast. He noted it was imperative that the guidance material needed to implement those new services was made available as soon as possible.

Dr Graham Allen, acting Director of the Nippon Foundation (NF)-GEBCO Seabed 2030 project, gave a presentation during one of the post plenary events, which was supported by an information document submitted to the MSC 101. He provided background to GEBCO and the Seabed 2030 project as well as highlighting the progress achieved by the Seabed 2030 to date and the next steps to increase the current global bathymetric coverage. He highlighted the recent success of the NF-GEBCO Alumni team in winning the Shell Ocean Discovery XPrize competition. He concluded with the actions that maritime administrations



could take to support the project and thus contribute to achieving the goals of UN Sustainable Development Goal (SDG) 14 and the UN Decade of Ocean Science for Sustainable Development.

Maritime Autonomous Surface Ships (MASS)

The Committee noted the progress of the regulatory scoping exercise. The MSC encouraged IMO Member States to contribute to the first step of the regulatory scoping exercise and invited Member States to submit the results of the first step to the intersessional Working Group. The Committee approved the terms of reference for the intersessional Working Group and approved the draft interim guidelines for MASS trials and the associated MSC circular (MSC.1/Circ.1604). A number of IMO Member States highlighted the need to have prior permission from coastal state for vessels in level 3 and 4 of autonomy to operate in their waters.

Polar Code for non-SOLAS Ships

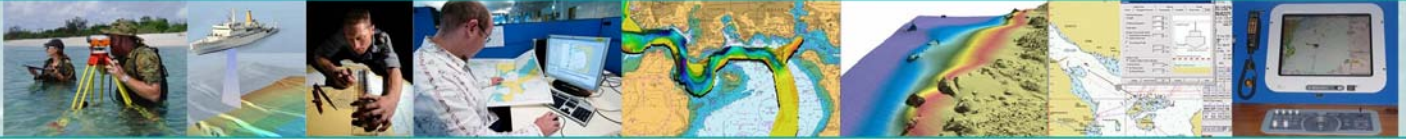
In considering safety measures for non-SOLAS ships operating in Polar waters, the Committee approved the draft Assembly resolution urging the implementation of recommendatory measures for non-SOLAS ships operating in polar waters as well supporting measures aimed at reducing operational risks. The MSC agreed to task NSCR 7 to consider further on making the application of chapter 9 and 11 of the Polar Code mandatory for non-SOLAS ships, whilst considering the consequences and feasibility of applying these chapters before commencing the development of amendments to mandatory instruments.

Hydrography, Navigation and Charting

The traffic separation schemes and routing measures approved at NSCR 6 were adopted. The MSC approved the MSC Circular (MSC.1/Circ.1609) on *Guidelines for the standardization of user interface design for navigation equipment, S-Mode*. The Committee also adopted the resolution MSC.466(101) on *Amendments to the Performance standards for the presentation of navigation-related information on shipborne navigational displays* and approved SN.1/Circ.243/Rev.2 on *Guidelines for the presentation of navigation related symbols, terms and abbreviations*. Directions given by all three documents will affect the design of ECDIS user interface from 2024 onwards. The Committee adopted resolution MSC.467(101) on *Guidance on the definition and harmonization of the format and structure of Maritime Services in the context of e-navigation* and approved MSC.1/Circ.1610 on *Initial descriptions of Maritime Services in the context of e-navigation*.



Acting Director Seabed 2030 Project, Dr Graham Allen, addressing a post plenary session at MSC 101



Maritime Safety Information

The Committee approved MSC.1/Circ.1364/Rev.1/Corr.1 on *Amendments to the Revised International SafetyNET Manual* and MSC.1/Circ.1611 on *Interim guidance on technical requirements for Fleet Safety*. The MSC adopted, with modifications submitted by IMSO, resolution MSC.468(101) on *Amendments to Promulgation of Maritime Safety Information* (resolution A.705(17), as amended); the Committee also adopted resolutions MSC.469(101) on *Amendments to World-Wide Navigational Warning Service* (resolution A.706(17), as amended) and MSC.470(101) on *Amendments to IMO/WMO Worldwide Met-Ocean Information and Warning Service – Guidance Document* (resolution 1051(27)). The MSC agreed to circulate the interim Iridium SafetyCast service manual by means of an MSC circular until such time as the full and mature document is finalized, consequently the Committee approved MSC.1/Circ.1613 on *Interim Iridium SafetyCast service manual*.

Maritime Security

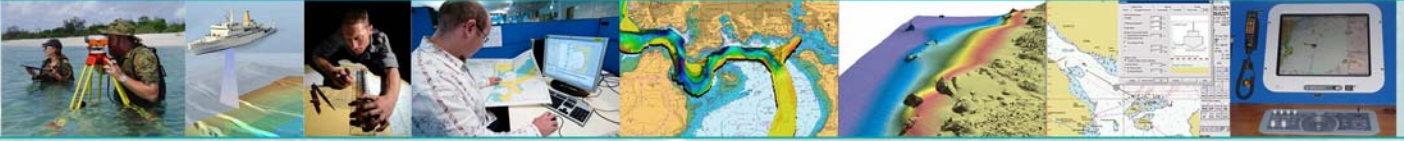
The Committee agreed that aspects of cyber risk management, including physical security aspects of cyber security, should be addressed in Ship Security Plans under the International Ship and Port Facility Security (ISPS) Code. The MSC also confirmed that resolution MSC.428(98) on *Maritime cyber risk management in Safety Management Systems (SMS)* sets out the Organization's requirements for Administrations to ensure cyber risks were appropriately addressed in existing SMS, verified by an endorsed Document of Compliance and Safety Management Certificate, and that in the Ship Security Plan, reference should be made to cyber risk management procedures found in the SMS.

Piracy and Armed Robbery

The Committee requested Member States to continue to report incidents of piracy and armed robbery to the Secretariat using the reporting form in MSC.1/Circ.1333/Rev.1 on *Recommendations to Governments for preventing and suppressing piracy and armed robbery against ships*. Member States were also reminded to provide and keep updated the information related to their National Point(s) of Contact for communication of information on piracy and armed robbery in the Contact Points module of the Global Integrated Shipping Information System (GISIS). The MSC noted the decision by the industry group related to the review and revision of the High Risk Area (HRA) to amend the geographic boundaries and to reduce the area for piracy in the Indian Ocean, so as to better reflect the threat of piracy in the region whilst retaining the primary objective to ensure the safety and security of seafarers.

Unsafe Mixed Migration

The MSC received reports on progress made with the Global Compact for Safe, Orderly and Regular Migration and the Global Compact on Responsibility-sharing for Refugees. The MSC received a number of reports from member States directly involved in operations, particularly those involved in the central Mediterranean Sea, and the efforts being undertaken to better facilitate multilateral cooperation and seek solutions to common problems by sharing expertise and best practices. The Committee noted that since the launch of the Inter-agency platform for information-sharing on migrant smuggling by in GISIS,



only seven incidents had been reported. Member States were encouraged to provide and update the information included in the appendix to MSC.1/Circ.896/Rev.2 on *Interim measures for combating unsafe practices associated with the trafficking, smuggling or transport of migrants by sea*.

Ship Voluntary Observing Scheme

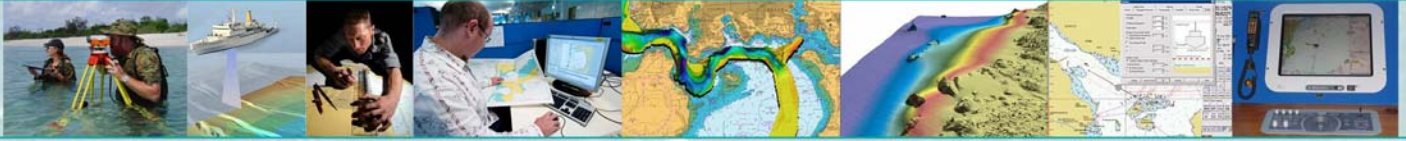
During the discussions on the ship voluntary observing scheme (VOS), the World Meteorological Organization made a strong intervention supporting the current mode of operation. The IHO made an intervention in support of the position of the WMO, highlighting the negative impact on IHO initiatives, such as Crowdsourced Bathymetry and GEBCO, if the proposed amendments were adopted and approved. There was considerable support from Member States and other organizations for the position of the WMO and the future of the VOS in its current form. Some Member States questioned the assertion that VOS activities did not come under the UNCLOS restrictions with respect to scientific research.

Office Bearers

The MSC unanimously re-elected Mr Bradley Groves, Australia, as Chair and Mr Juan Carlos Cubisino, Argentina, as Vice-Chair of the Committee for 2020.

Next Sessions

The next session of the MSC is scheduled from 13 to 22 May 2020 (MSC102).



21st Conference of the Mediterranean and Black Seas Hydrographic Commission

Cádiz, Spain, 11-13 June

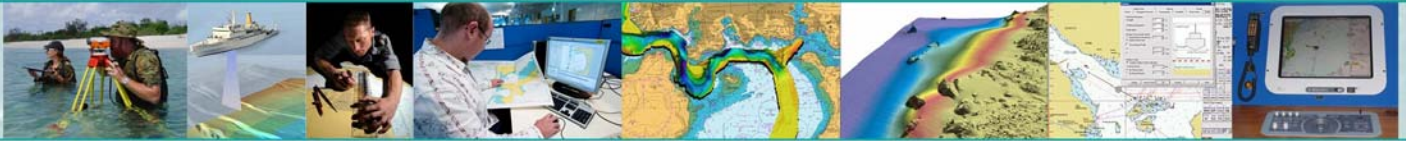
Contribution to the IHO Work Programme 2019

Task 3.2.1.6	Prepare for and report meetings of the Regional Hydrographic Commission: MBSHC
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The 21st Conference of the Mediterranean and Black Seas Hydrographic Commission (MBSHC) was held in Cádiz, Spain from 11 to 13 June, hosted by the Instituto Hidrográfico de la Marina (IHM), the Spanish Hydrographic Office. The Conference was chaired by Rear-Admiral Luigi Sinapi, Director of the Italian Hydrographic Service (IIM). A total of 47 representatives from 18 Member States of the MBSHC (Algeria, Bulgaria, Croatia, Cyprus, Egypt, France, Georgia, Greece, Italy, Malta, Montenegro, Morocco, Romania, Russian Federation, Slovenia, Spain, Turkey and Ukraine) and two Associate Member States (United Kingdom and United States of America) participated in the Conference. Albania, the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the Intergovernmental Oceanographic Commission (IOC) of UNESCO, the Mediterranean Science Commission (CIESM), IC-ENC and PRIMAR, as the two Regional ENC Coordinating Centres (RENC), were represented as observers. Seven stakeholders from industry participated as invited expert contributors. The IHO Secretariat was represented by Director Mustafa Iptes, Assistant Director Yves Guillam and Spanish Translator Mary Paz Muro. A total of sixty-seven participants attended the Conference.



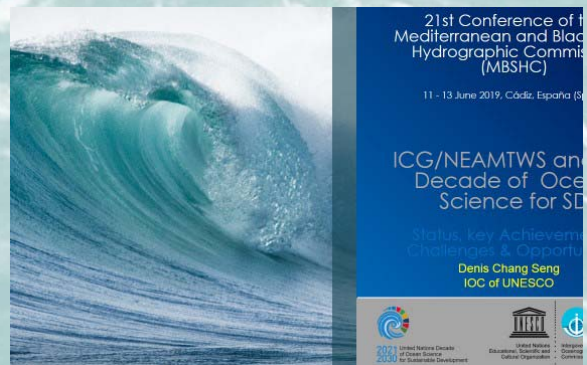
Participants of the 21st Conference of the MBSHC.



The Conference was opened by Vice-Admiral Juan Luis Sobrino Pérez-Crespo, Commander of the Maritime Action in Spain, who highlighted the importance of hydrography not only in support of safety of navigation but also as a geospatial data foundation for the planning and management of maritime affairs.

The MBSHC received about 20 national reports from Member States. Some of them, like the one from Croatia, were supported by very efficient presentations as they provided not only highlights but also conclusions, strategic priorities and high priority topics suggested for discussion at the Conference. Director Iptes reported on the IHO corporate matters and the work programme in general and on the main outcome of the last IRCC meeting (IRCC-11). The Members were informed on the programme and the main deadlines for the preparation of the 2nd session of the Assembly, which include the selection process of the Council Members. They were also invited to use the new online formstack service as far as possible to update their entries (C-55, P-5) and respond to IHO Circular Letters. Members were also invited to provide their input to update the MBSHC Statutes in accordance with the final amendments to the IHO Resolution 2/1997 that were endorsed at IRCC-11.

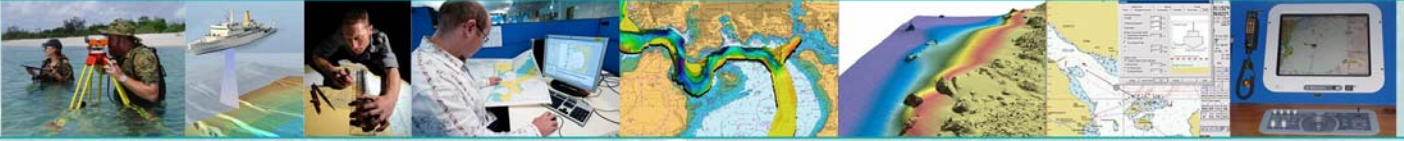
All the presentations made either by observers or industry participants and stakeholders were very educative, in particular for those who participated in the Conference for the first time. The IOC representative provided a clear status report of the tsunami warning systems in the region and the current challenges and gaps faced by the coastal States of the Mediterranean Sea. The NAVAREA Coordinator was invited to participate in the NEAMWave 20 exercise.



The endorsement of the IALA Risk Management Toolbox by the IMO through the SN.1/Circ.296 was noted as well as the capacity building opportunities for the development and the maintenance of Aids to Navigation (AtoN) provided by IALA.

The MBSHC Chair, reporting also as HSSC Chair, provided a clear picture of the technical developments made under the S-100 framework as well as on the implementation strategy of S-100 based products, which is under preparation for being reviewed at the next Council meeting. It was noted that very few MBSHC Member States had actually started to get involved in S-100 based products developments. What should be done to get prepared in the near future is a general expectation implicitly raised by the MBSHC Members.

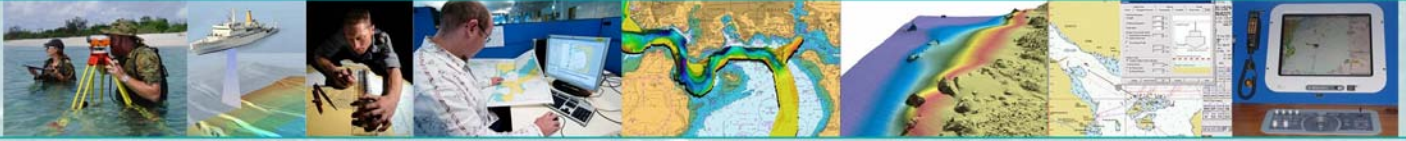
One of the remaining and core activities of the Commission is the establishment of agreed ENC and INT chart schemes. The MBSHC was firstly informed that a survey on the *Future of the Nautical Paper Chart*, prepared by the Nautical Cartography Working Group and endorsed by HSSC, was about to be launched (IHO CL 29/2019 refers). The preliminary



report attached to this survey shows implicitly that from now, priority had to be given to ENC schemes. Noting this warning and notwithstanding the difficulties to reach consensus in the design of these schemes, some proposals were made by the Region F Chart Coordinator (France) to move forward. In application of the IHO Resolution 1/2018 on overlapping ENC cells, the MBSHC noted the risk assessment reports provided by interested parties and the associated political statements. At the end of the Conference, Shom (France) resigned from the role of Chart Coordinator and was commended for its commitment and achievements for more than 40 years as Region F Chart Coordinator. The Chart Coordinator role was taken over by the IIM (Italy).

A report on Maritime Safety Information (MSI) activities in NAVAREA III was presented by Spain and reviewed by the Commission. The recent activities of the Working Group for the Safety of Navigation in the Black and Azov Seas (BASWG) were also presented by the Chair of BASWG (Turkey).

At the end of the Conference, Captain (Dir) José Daniel Gonzalez-Aller Lacalle took over as Chair of the MBSHC and the Commission welcomed the offer made by Slovenia to host the 22nd Conference of the MBSHC in 2021.



11th Meeting of the IHO Inter-Regional Coordination Committee (IRCC11)

Genoa, Italy, 3-5 June

Contribution to the IHO Work Programme 2019

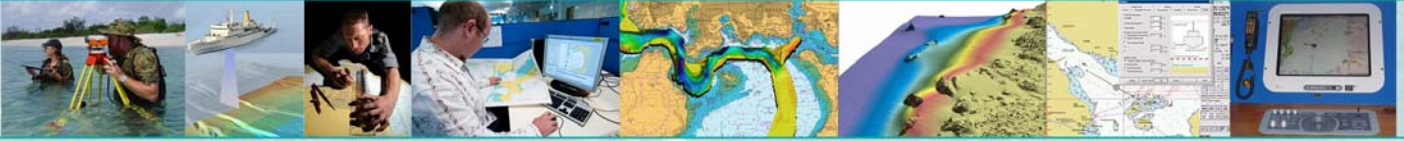
Task 3.1.1	Organize, prepare and report annual meetings of the Inter-Regional Coordination Committee (IRCC)
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The 11th meeting of the IHO Inter-Regional Coordination Committee (IRCC11) was held in Genoa, Italy, from 3 to 5 June, hosted by the Italian Hydrographic Institute. The meeting was chaired by Mr Parry Oei (Singapore) and attended by 47 participants from 23 Member States and two observing Organizations. All but one of the Regional Hydrographic Commissions (RHCs) and all subordinate bodies of IRCC were represented. The ROPME Sea Area Hydrographic Commission (RSAHC) was not represented. The opening address was delivered by the Deputy Chief of the Italian Navy, Vice Admiral Paolo TREU. The IHO Secretariat was represented by Secretary-General, Dr Mathias Jonas (HCA Chair), Director Mustafa Iptes (IRCC Secretary) and Assistant Director Alberto Costa Neves (IRCC Assistant Secretary).

The IRCC reviewed the reports and activities of the RHCs and of its subordinate bodies. It also received reports and input from other IHO bodies and from external stakeholders. The meeting was informed of the difficulties in ensuring Maritime Safety Information (MSI) infrastructures in the West and Central Africa region, where there are only three Member States and 18 Associate Members, with only two hydrographic services in place. The Committee urged close liaison between regional CB Coordinators and the WWNWS-SC on the programming of and candidate selection for MSI training.

Participants acknowledged the significant effort of CB Coordinators to assess the needs in the regions, to identify national and regional projects that may contribute to the Capacity Building Work Plan (CBWP) and to coordinate the support for countries in need. The IRCC acknowledged the concerns of the Capacity Building Sub-Committee (CBSC) due to the lack of funding to cover all projects identified within the CBWP. The Committee recognized the work done by the IBSC in the delivery of Edition 2.1.0 of the companion document *Guidelines for the Implementation of the Standards of Competence for Hydrographic Surveyors and Nautical Cartographers* (May 2019). The meeting acknowledged the generous financial support from the Republic of Korea and the Nippon Foundation of Japan and the in-kind support from Member States and industry stakeholders.

The meeting identified the need for a regional engagement to encourage Member States to use CATZOC to generate the input to C-55 (*Status of Hydrographic Surveying and Nautical Charting Worldwide*) in a consistent and harmonized way. For this to be effective, there is the need to encode meaningful values of CATZOC in ENCs. Reports were received on the status of populating CATZOCs in ENCs, paper charts generated automatically from ENCs,



high resolution ENC and on possibilities to support and/or regulate the chart production for leisure boats.

The importance of data quality and consistency was considered and the Committee invited RHCs to encourage Member States to distribute their ENCs via the RENCs and to provide their agreement for making CATZOC values available in the additional layers of INTOGIS II (Manager Mode, available to MS only). Participants noted that work continues by stakeholders to improve coverage and to manage overlaps and the Committee approved a revision to the WENDWG Terms of Reference that support an implementation strategy for S-100 based products, including S-101 ENCs. Participants noted the early draft of the provision of S-100 services roadmap. These developments will eventually lead to the establishment of a global coordination of navigation services principles in cooperation with IMO and IALA.

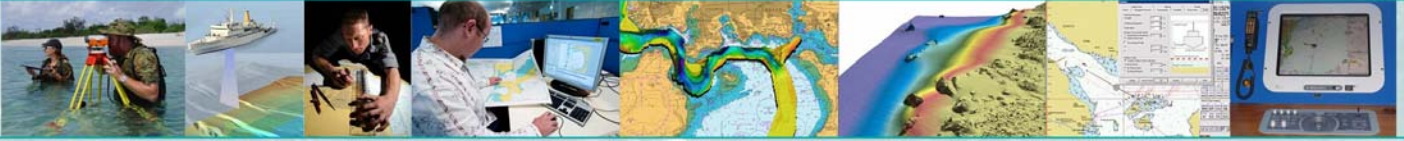
The meeting noted the improvements to the IHO ENC Catalogue and commended IC-ENC and PRIMAR for the ongoing support to ENC producers and user communities and the EAHC Regional ENC Coordination Centre (RECC) for its progress in establishing its operations. It also commended Republic of Korea and other stakeholders for their hard work in developing INTOGIS Phase II.

Progress was reported on surveying aspects, with the developments on the vertical Common Reference Surfaces, risk assessments and resurvey plans, Satellite Derived-Bathymetry (SDB), depth contouring algorithms, autonomous surveys with emphasis to very shallow waters and on new hydrographic vessels reported in Fiji, Morocco and Nigeria. Progress was noted in Crowdsourced Bathymetry (CSB), the new IHO Publication B-12 (*Guidance on Crowdsourced Bathymetry*) and the need for RHCs to engage and encourage Member States to release datasets or subsets into the public domain via the IHO Data Center for Digital Bathymetry (DCDB). Reports were received on increased data contributions to the DCDB and for GEBCO, highlighting the positive impact of GEBCO Seabed 2030 Project.

The Committee endorsed the draft amended IHO Resolutions 2/1997 *Establishment of Regional Hydrographic Commissions* and 1/2005 *IHO Response to Disasters*. MapAction, a humanitarian mapping charity, presented its work and the potential synergies in responding to disasters by working with the IHO and with RHCs. Disaster response plans are under development in some RHCs and experiences were shared during the meeting.



Participants of the 11th meeting of IRCC



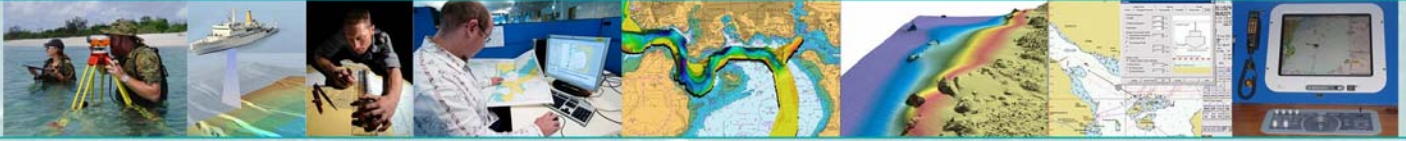
The meeting reviewed the progress on global Marine Spatial Data Infrastructure (MSDI) activities and the outcome of the MSDI Concept Development Study jointly conducted by the Open Geospatial Consortium (OGC) and the IHO, funded by USA-NGA. A joint report is under preparation. It also acknowledged the work of the IHO Project Team on the implementation of the UN- GGIM Shared Guiding Principles for Geospatial Information within the IHO. The co-Chair of the UN-GGIM Working Group on Marine Geospatial Information (WGMGI) updated the meeting on its programme of work. Participants were informed on the development of training material for MSDI, funded by Denmark that will be publicly available soon.

The IRCC endorsed the amendments to the IHO Publication B-6 (*Standardization of Undersea Feature Names*) and the amendments to the IHO Resolution 2/2007 *Principles and Procedures for making changes to IHO Technical Standards and Specifications* as amended. The meeting was informed on the progress made by the Strategic Plan Review Working Group (SPRWG) and on the possible impact on the implementation of the IRCC work programme.

The Committee was informed of the tragic passing of Mr Ian Halls (Australia), editor of the International Hydrographic Review (IHR) from 2013 to 2019 and acknowledged his excellent work. IHO Assistant Director Alberto Costa Neves was appointed as acting Editor for the November 2019 Edition of the Review. RHC Chairs were invited to search proactively for articles on good science and/or research level for publication in the Review and to support their representatives in the IHR Editorial Board. Developments in the infrastructure of the IHO Secretariat were reported, including on the IHO GIS, databases, online registration system and on-line form system and how they impact the RHCs and the Member States' activities.

The International Cable Protection Committee (ICPC) reported its activities and the Committee noted the growing threat to submarine cable infrastructure from uncoordinated deep seabed mining activity and the need to chart cables to full ocean depth in these areas, recognizing the need for ICPC members to provide as-laid cable data in a timely manner. It also noted the dialogue of ICPC with OGC with respect to commissioning an Interoperability Experiment and future Pilot project with the objective to develop a S-4xx submarine cable product specification.

The next meeting of the IRCC is planned to be held in Gdansk, Poland, from 1 to 3 June 2020, hosted by the Hydrographic Office of the Polish Navy. Following meetings will be held in Monaco (2021), Ecuador (2022, to be confirmed) and Japan (2023, to be confirmed). The IRCC meeting in 2021 will follow the CBSC18, a two-day CB Stakeholders' Seminar and the celebration of the World Hydrography Day of the Centenary.



The 25th Assembly of the International Seabed Authority (ISA) Kingston, Jamaica, 22 - 26 July

Contribution to the IHO Work Programme 2019	
Task 1.1.14	Maintain relationship with the International Seabed Authority (ISA)

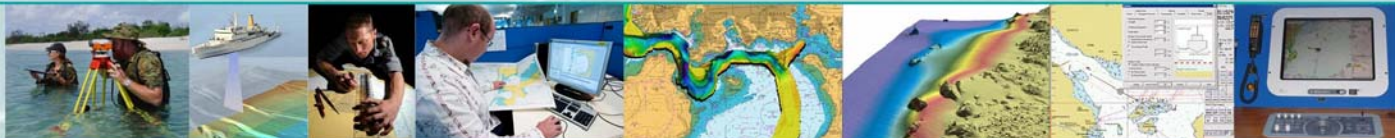
The 25th Assembly of the International Seabed Authority (ISA) was held at ISA Headquarters from 22 to 26 July in Kingston, Jamaica. The IHO was represented by the IHO Secretary-General, Dr Mathias Jonas.

The ISA Secretary-General, Mr Michael Lodge gave his annual report on the activities of the Authority and the financial situation. Based on the Strategic Plan as approved by the previous Assembly in 2018, the Secretary-General presented a high level action plan which links precise activities to the overall nine strategic directions of the Authority and associates key performance indicators to each activity. Strategic direction number 4 “Promote and encourage marine scientific research in the Area” addresses the need to establish strategic alliances and partnership with relevant organizations, inter alia the IHO, to share data and information in an open and transparent manner, avoid the duplication of efforts and benefit from synergies, for example, by aligning with the United Nations Decade of Ocean Science for Sustainable Development.

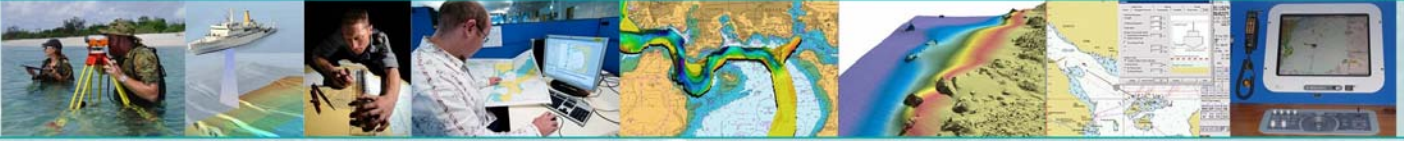
In this context the IHO Secretary-General discussed intensively how ISA’s new repository of data related to the deep seabed and associated water column named *DeepData* and IHO’s DCDB / GEBCO infrastructure can take mutual benefit from each other. Numerous conversations were held with ISA contractors with the same intention to inform them about Seabed 2030 and the options to contribute bathymetric information to the GEBCO digital Ocean Map.

Among numerous considerations, the Assembly authorized the ISA Secretary-General to sign a Memorandum of Understanding between the ISA and the State Oceanic Administration of China concerning the establishment of a joint training and research centre situated in Qingdao, China. The governance will be conducted by a steering committee equally manned by the ISA Secretariat and the Chinese partners.

The Assembly devoted a full day’s agenda to celebrate the 25th Anniversary of the Authority to highlight the progress made within this period. So far 29 contractors belonging to 22 countries have been endorsed to explore their claims consisting of about 1% of the global sea floor to be prepared for regular exploitations as soon as the universal mining code and the associated arrangements are adopted by the ISA Member States within the years to come. Regular exploitation is expected to start around the middle of the next decade.



Cadets of the Jamaican Navy presenting the flags of the ISA Member States – among them the flag of Monaco.



15th Session of the IMO/ITU Experts Group London, United Kingdom, 8-12 July

Contribution to the IHO Work Programme 2019	
Task 1.1.8.4	Attendance of IMO-ITU EG 15 meeting



The International Telecommunication Union (ITU) is a specialized agency of the United Nations (UN) which is responsible for issues that concern information and communication technologies, including aeronautical and maritime navigation. The Experts Group (EG) established jointly by the International Maritime Organization

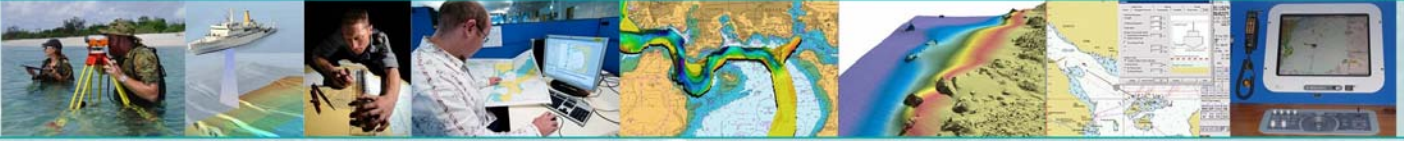


(IMO) and the ITU consists of representatives active in the IMO and the ITU in relation to maritime communications. The function of the IMO/ITU EG is to advise on the development of future requirements for maritime radiocommunications taking into account the operational needs as defined by the IMO and the regulatory needs as defined by the ITU. The 15th session of the IMO/ITU EG (IMO/ITU EG15) was held at the IMO Headquarters in London, United Kingdom, from 8 to 12 July under the chairmanship of Mr Christian Rissone (France). Assistant Director David Wyatt represented the IHO.

The Group addressed a number of topics of direct interest to IHO Member States resulting from discussions at the 101st session of the IMO Maritime Safety Committee (MSC 101), 6th session of the IMO Sub-committee on Navigation, Communications, and Search and Rescue (NCSR 6) and in preparation for the ITU World Radiocommunication Conference 2019 (WRC-19).



15th session of the IMO-ITU EG



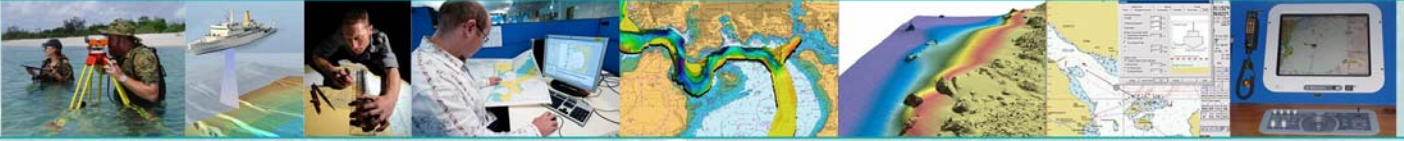
After considering the outcomes of NCSR 6 and MSC 101, the participants focused on further developing the IMO position on the WRC-19 agenda items relating to maritime services. The Group noted that World Administrative Radio Conference Recommendation 316 (Rev. MOB-87) 7) "Use of Ship Earth Stations within Harbours and Other Waters Under National Jurisdiction" had been reviewed already by European Conference of Postal and Telecommunications Administrations (CEPT), taking into account the outcome of NCSR 6, with a view to submission to WRC-19.

The Group expressed concerns over the increasing L-Band interference between terrestrial mobile communications and the spectrum in use for satellite communications, including the GMDSS, and potentially future operation of maritime autonomous surface ships (MASS). The Group considered a document from the IMO Secretariat containing a liaison statement from ECC CEPT referring to the availability of the ECC Report 299 "Measures to address potential blocking of MES operating in bands adjacent to 1 518 MHz (including 15251559 MHz) at sea ports and airports". The Group considered also a document from the IMO Secretariat containing a liaison statement from International Civil Aviation Organization (ICAO) on adjacent band compatibility studies of IMT-Advanced systems in the mobile service in the band below 1 518 MHz with respect to MSS systems operating in 1 518 - 1 559 MHz. During the discussion, a number of delegations shared the concerns expressed in the liaison statement by ICAO with regard to the possibility of harmful interference to L-band satellite communication receivers from IMT user-equipment transmissions. After consideration, the Group invited NCSR 7 and ITU-R WP 5B to note the discussion and comments provided in the meeting report and to take action, as appropriate.

The majority of the meeting was then spent on developing the related draft revisions of SOLAS Chapters III and IV and the related and consequential amendments to other existing instruments. A comprehensive review was conducted with numerous amendments and revisions proposed, including the revision and development of a number of definitions for terms. After consideration, the Group agreed that no amendment to the current definition of "International NAVTEX service" in SOLAS was required and that the IHO World-Wide Navigational Warning Service Sub-Committee (WWNWS-SC) Document Review Working Group could be invited to review the IMO NAVTEX Manual with the aim of developing appropriate text to articulate the current operational procedures in use and the availability of NAVTEX for the transmission of messages on behalf of Search and Rescue (SAR) authorities in relation to SAR operations and incidents, including guidance on the appropriate type and content of these messages. The Group invited the ICAO/IMO Joint Working Group (JWG) on SAR to provide further views and advice on this matter.

The Group concurred with the conclusion of the Correspondence Group (CG) that definitions for "distress alert" and "operational communications" were not required. The Group invited the CG to consider whether definitions for "International EGC service" and "NAVTEX" were necessary, taking into account the information provided by the United Kingdom. All these definitions will be developed further by the CG for submission to NCSR 7.

The Group considered the proposed amendments to regulation IV/5.2 and agreed with the recommendation of the CG that Contracting Governments should provide the Organization with notice prior to the withdrawal of any radiocommunication service. However, the Group



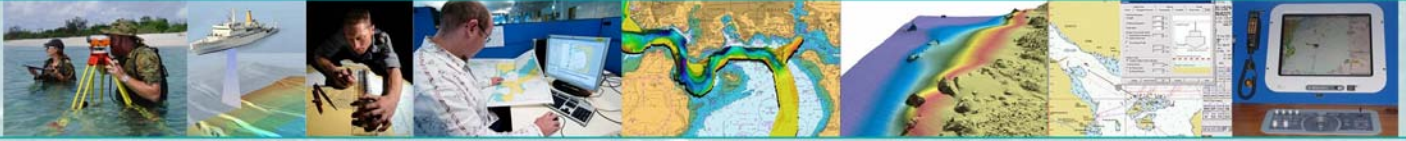
could not agree if the requirement should include a period for prior notification or not, and, if so, what period. The Group noted that if a prior notification would be required, then an appropriate mechanism should be implemented in the GISIS module on "Master Plan of shore-based facilities for the GMDSS" to accommodate this requirement. The Group, therefore, agreed to a draft revision of regulation IV/5.2 with a view to further consideration by NCSR 7.

The Group further developed the revisions to numerous related documents, which included resolution MSC.191(79) - *Performance Standards for the presentation of navigation-related information on shipborne navigational displays*, resolution A.801(19) as amended by MSC.199(80) - *Provision of radio services for the Global Maritime Distress and Safety System (GMDSS)*, resolution A.707(17) - *Charges for Distress, Urgency and Safety Messages through the Inmarsat System*, resolution MSC.306(87) - *Revised performance standards for Enhanced Group Call (EGC) equipment*, resolution MSC.68(68), Annex 3 - *Performance Standards for MF/HF Radio Installations Capable of Voice Communication, Narrow Band Direct Printing and Digital Selective Calling*, resolution A.803(19) - *Recommendation on Performance Standards for Shipborne VHF Radio Installations Capable of Voice Communication and Digital Selective Calling*, resolution A.702(17) - *Radio maintenance guidelines for the Global Maritime Distress and Safety System (GMDSS) related to sea areas A3 and A4*, MSC/Circ.803 - *Participation of non-SOLAS ships in the Global Maritime Distress and Safety System (GMDSS)*, and COMSAR/Circ.32 - *Harmonization of GMDSS requirements for radio installations on board SOLAS ships*, all of which impact on the work of a number of IHO committees, sub-committees and working groups. It is intended that the draft revisions will be submitted to NCSR 7 for further consideration.

The Group briefly discussed a preliminary revision of resolution A.707(17) on *Charges for distress, urgency and safety messages through the Inmarsat system*. The IHO was in agreement with the USA, UK and Inmarsat that a cost sharing model was the most appropriate vehicle so as to spread the increased costs of additional recognized mobile satellite service providers amongst all IMO member states. It was felt that making MSI messages free would have negative consequences on message content and brevity, which would eventually degrade the service provided to the maritime community. The International Mobile Satellite Organization (IMSO) supported the free provision of MSI messages. No consensus was achieved and it was agreed by the Group that interested parties should be encouraged to submit proposals to NCSR 7.

The meeting report and associated documents will be available in the NCSR section of the IMODOCS website in due course.

The next session of the IMO/ITU EG (IMO/ITU EG16) is scheduled from 6 to 10 July 2020 at the IMO Headquarters.



16th Conference of the IHO Hydrographic Commission on Antarctica (HCA) and HCA Seminar at the XLII Antarctic Treaty Consultative Meeting Prague, Czech Republic, 3-5 July

Contribution to the IHO Work Programme 2019	
Tasks	Maintain relationship with the Antarctic Treaty Consultative Meeting (ATCM)
§ 1.1.2	
§3.2.2	Organize, prepare for and report meetings of Hydrographic Commission on Antarctica (HCA)

The 16th Conference of the IHO Hydrographic Commission on Antarctica took place at the Grandior Hotel in Prague, Czech Republic from 3 to 5 July, for the first time in a landlocked State taking the opportunity of conducting an HCA Seminar at the XLII Antarctic Treaty Consultative Meeting (ATCM), raising the awareness of ATCM delegates on the importance of hydrography. Since the Czech Republic is not an IHO Member, the Secretariat had the organizing role for the event.

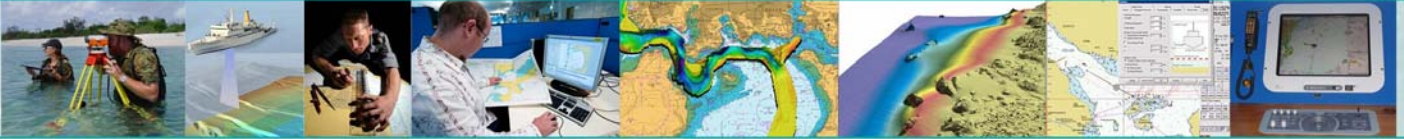


XLII Antarctic Treaty Consultative Meeting
Prague • Czech Republic • 2019

The Conference was chaired by Dr Mathias Jonas, Secretary-General of the IHO, supported by Assistant Director Yves Guillam, HCA Secretary and Ms Caroline Fontanili (IHO Secretariat). Sixteen delegates from 10 Member States (Australia, Chile, Colombia, Germany, Italy, Norway, Republic of Korea, Spain, United Kingdom, USA) and one subject matter expert (GEBCO IBCSO Chair), attended the meeting. Apologies were received from several countries who were unable to attend but provided their national reports.



Participants of the 16th Conference of the IHO Hydrographic Commission on Antarctica



The HCA reviewed progress since its 15th Conference, held in 2018, and received reports from the IHO Member States present. Reports received from Member States not present were delivered by the Secretariat. The reports remarkably demonstrated that numerous HCA members are strengthening their engagement for the Antarctic in terms of new ship's capacity for survey and research, facility infrastructure improvements and investment in new carrier technology such as Autonomous Surface Vessels.

The Chair delivered the Secretariat's Report. He explained the association of the Commission to the relevant IHO bodies, namely IRCC, the IHO Council and the IHO Assembly and provided information on the preparations of the centenary celebrations of the international cooperation in hydrography with the peak event of the 100th anniversary of the IHO in 2021.

The Chair informed HCA members that Turkey is currently in discussion with the IHO regarding membership to the HCA. Turkey has been surveying in Antarctica and has offered to share data with the HCA Hydrographic Priorities Working Group (HPWG) and chart producing countries.

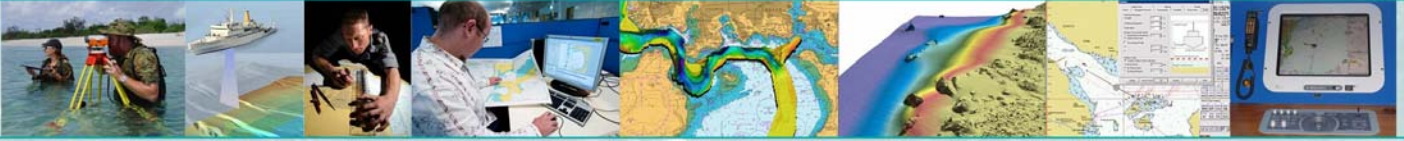
Mr Andy Willett (UKHO), Chair of the HCA Hydrographic Priorities Working Group (HPWG), noted the solid progress in the review of paper chart and ENC schemes for Region M along with the review of maritime shipping routes (MSR) and updating of the survey priorities list. There is currently a proposal to add one new MSR to support new INT charts aligned with IAATO ship statistics. The HPWG Chair noted the use of IAATO real time AIS to monitor vessel locations and deficiencies in navigational coverage.



As it was his last meeting, Mr Andy Willett was commended for his outstanding contribution in HCA activities.

The HCA Secretariat discussed the INTOGIS Phase II Project. Upgrades will include Polar Regions (Arctic and Antarctic) with ENC scheme management procedures (S-11 Part A, Ed 3.1.0 refers), CATZOC values and additional AIS traffic density. The HCA Secretariat also informed the participants on the transition in progress for the HCA GIS, from the current quite confidential situation to Quantarctica (<https://quantarctica.npolar.no/>) in which the HCA GIS datasets will be getting the status of "Quantarctica Friendly Dataset" and therefore will be discovered and used by a much wider audience.

The Conference occurred in conjunction with the XLII Antarctic Treaty Consultative Meeting where the IHO was invited to present a seminar on the status and impact of hydrography in Antarctic waters. In the HCA Conference, priority was therefore given to the final preparation of this seminar.

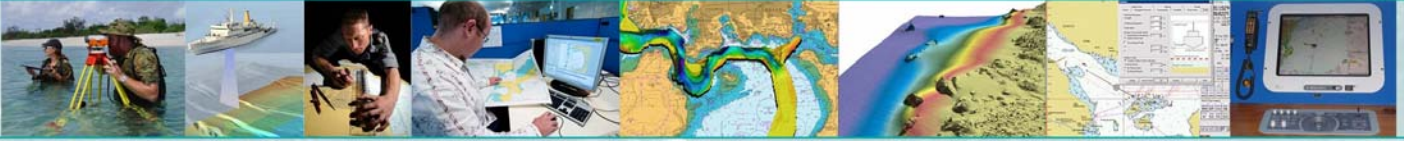


The Secretary-General of the IHO and the National Hydrographers of Chile and the United Kingdom presented papers on international collaboration, safety of navigation and crowd sourced bathymetry. They were strongly supported by some delegations such as Australia, Italy, Norway, Spain and the United States of America. A new Resolution on hydrography initially proposed by Norway and co-sponsored by Italy, New Zealand and the United States, was adopted. This event also enabled re-engagement with COMNAP and SCAR. One of the lessons learnt from ATCM was the lack of communication within nations to engage and even raise the awareness of IHO activities.

Noting the 2nd Session of the IHO Assembly in April 2020, the Chair proposed that the 17th Conference of the IHO Hydrographic Commission on Antarctica be held in 2021. Location is planned to be Monaco, but it was noted that ATCM XLIV 2021 is expected to take place in Paris. The Secretariat will investigate with Shom (France) whether it will be possible to host the HCA Conference back-to-back with the ATCM XLIV.



HCA Seminar at ATCM XLII



11TH MEETING OF THE IHO WORLD-WIDE NAVIGATIONAL WARNING SERVICE SUB-COMMITTEE

Halifax, Canada, 26 - 30 August

Contribution to the IHO Work Programme 2019

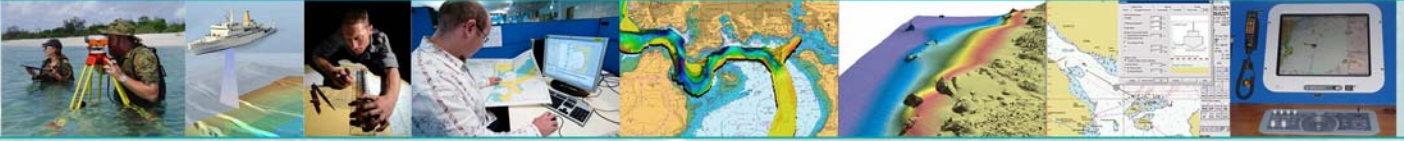
Task 3.5.1

Attendance of WWMWS-SC meeting

The 11th meeting of the World-Wide Navigational Warning Service (WWNWS) Sub-Committee (WWNWS11) was hosted by the Canadian Coast Guard and held in Halifax, Nova Scotia, Canada, from 26 to 30 August under the chairmanship of Mr Peter Doherty of the United States of America. Ms Julie Gascon, Director General Canadian Coast Guard Operations, welcomed the meeting which was attended by 46 delegates from 19 IHO Member States, the Secretariat of the International Maritime Organization (IMO), the Secretariat of the World Meteorological Organization (WMO), the Secretariat of the International Mobile Satellite Organization (IMSO), the Chairs of IMO NAVTEX and International SafetyNET Coordinating Panels, Inmarsat, Iridium, Security of Navigation, Stabilisation, Advice and Training (inc AWNIS) (SONSAT) and the IHO Secretariat. The delegates included representatives of 18 NAVAREA Coordinators, one Sub-Area Coordinator and three National Coordinators. The IHO Secretariat was represented by Assistant Director David Wyatt. It was noted that 2019 was the 45th anniversary of the establishment of the Committee for the Provision of Radio Navigational Warnings (CPRNW), the former name for the WWNWS, and the 20th anniversary of the operational establishment of the Global Maritime Distress and Safety System (GMDSS).



Participants at the 11th meeting of the IHO World-Wide Navigational Warning Service Sub-Committee in Halifax, Canada



The Sub-Committee received Maritime Safety Information (MSI) self-assessment reports from all 21 NAVAREAs, the Baltic Sea Sub-Area and a national report from China, as well as reports from the Secretariats of the IMO, WMO and IMSO. The outcomes from the 17th meeting of the Document Review Working Group (29-31 January 2019) were discussed; in particular the proposed editorial amendments to the Inmarsat SafetyNET Services manual.

The delegates received briefings on the outcomes of recent International Maritime Organization (IMO) meetings, including the 100th and 101st sessions of the Maritime Safety Committee, the 6th session of the Sub-Committee on Navigation, Communications and Search and Rescue and the 15th session of the IMO-International Telecommunication Union (ITU) Expert Group. Up-dates on the activities of the IMO NAVTEX Coordinating and the International SafetyNET panels were provided by their respective chairs as well as developments in the provision of mobile satellite GMDSS services from Inmarsat and Iridium. The meeting also received a progress report on the development of the S-124 Product

Specification on Navigational Warnings from the Chair of the S-124 Correspondence Group. He also provided an update brief on the outcomes of the two day workshop, which had been conducted 27-29 August, in parallel to the WWNWS11. Significant progress had been achieved, which would be reported to the S-100WG, and it was agreed to change the S-124CG into a S-124 Project Team, to facilitate opportunities to hold more regular face-to-face meetings.

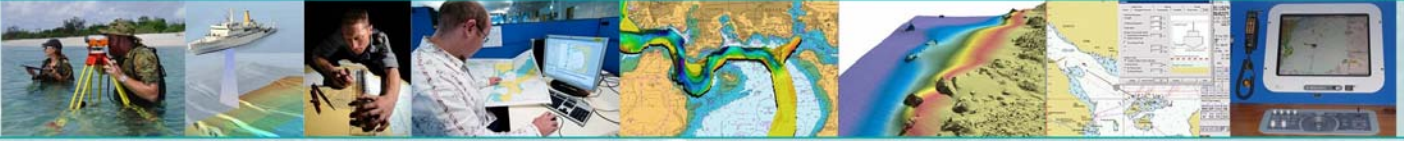
The sessions considered progress reports on the delivery of MSI training courses, and discussed the processes for reporting the status of MSI provision at Regional Hydrographic Commission meetings and methods for identifying to the Capacity Building Sub-Committee the regions and coastal States most in need of training and assistance.

The Maritime Safety Administration (MSA) of China offered to host the next meeting WWNWS12 during the last week of August or the first week of September 2020. It was agreed to investigate this proposal with a view to a final decision before the end of 2019; details will be published on the WWNWS-SC page of the IHO website when available.

When finalized the report of WWNWS11 will be posted in the IHO website, where all the meeting documents are already available (www.iho.int > Committees & WG > WWNWS-SC > WWNWS11)



WWNWS-SC Chair, Mr Peter Doherty, cutting the anniversary cake during a break in plenary sessions of WWNWS11



9TH MEETING OF THE MARITIME LIMITS AND BOUNDARIES PROJECT TEAM (S-121PT)

IHO Secretariat – Monaco, 19-23 August

Contribution to the IHO Work Programme 2019

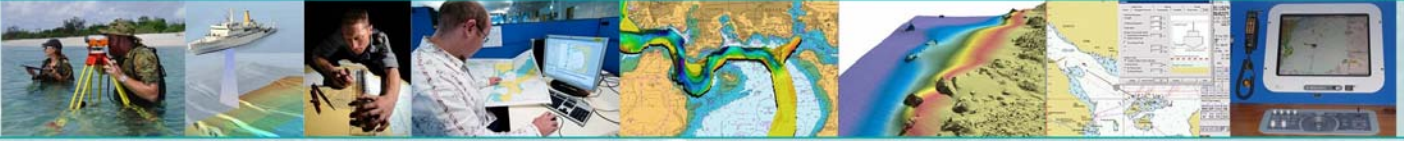
Task 2.3.4	Develop and maintain S-10x Product Specifications
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The Maritime Limits and Boundaries Project Team (S-121PT) held their 9th meeting at the IHO Secretariat, (Monaco) from 19 to 23 August 2019. Fourteen Member State representatives from Australia, Canada, China, Korea (Rep of) and the United Kingdom (UK) attended the meeting. Industry members from IIC Technologies and Cooley also attended the meeting. Members from Canada, France, USA and the United Nations - Division of the Oceans and Law of the Sea (UN-DOALOS) also participated in the meeting via online teleconference link. The meeting was opened by Director Mustafa Iptes, and Assistant Director Anthony Pharaoh represented the IHO Secretariat during the meeting.

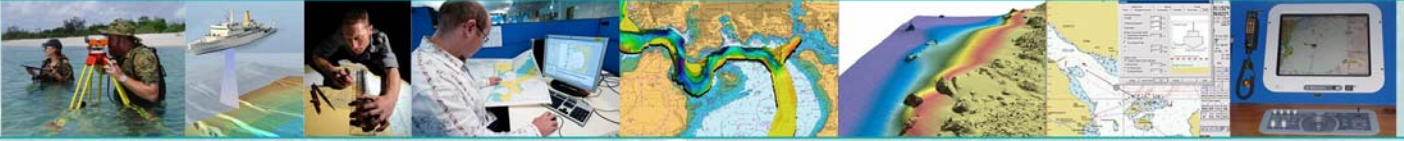
The primary objective of the meeting was to review feedback provided on the draft Edition 1.0.0 S-121 Product Specification documents. The meeting considered 435 comments received from Member States, the S-100 Working Group, industry and the IHO Secretariat. More than three hundred and sixty of the comments were, either accepted for inclusion in the current edition, or for inclusion in a future edition.



The participants of the 9th S-121 Project Team Meeting.



A presentation was provided on a pilot project to test the S-121 Product Specification. The project will be undertaken by the Open Geospatial Consortium (OGC). Its main objectives will be to test the implementation of the S-121 data model and to highlight any geospatial interoperability issues. It is the intention to publish S-121 Edition 1.0.0 for evaluation and testing. It was decided that the date and venue of the next meeting will be determined after the specification have been tested and sufficient feedback have been received.



9TH SESSION OF THE UN COMMITTEE OF EXPERTS ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT (UN-GGIM)

7 - 9 August 2019, New York, USA

Contribution to the IHO Work Programme 2019	
Task 1.1.12	Maintain relationship with United Nations (UN) organizations based in New York, including:
Task 1.1.12.1	- the UN Committee of Experts on Global Geospatial Information Management (UN-GGIM) and WG on Marine Geospatial Information



The 9th Session of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) took place at the UN Headquarters in New York, USA from 7 to 9 August.

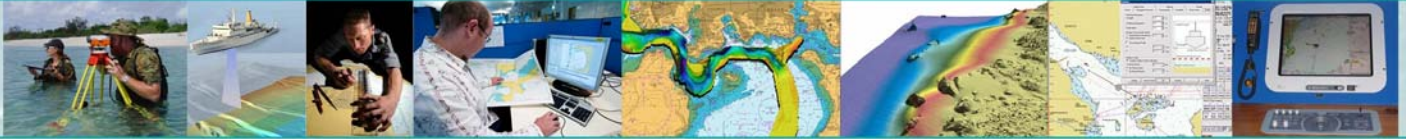
The principal purpose of the UN-GGIM is to play a leading role in setting the agenda for the development of global geospatial information management and to promote the use of geospatial information in addressing key global challenges, particularly taking into account the role of geospatial data in monitoring and achieving the Sustainable Development goals agreed under the UN 2030 Agenda for Sustainable Development. The UN-GGIM reports to the UN Assembly via the UN Economic and Social Council (ECOSOC).

Overall 424 participants attended the UN-GGIM, 301 of them representing 94 UN Member States and 123 representing 70 observing organisations – amongst them IHO, represented by the Secretary-General of the IHO, Dr Mathias Jonas.

Of special relevance for the IHO work programme was the report given under Agenda Item 10 *Marine geospatial information* by the Working Group on Marine Geospatial Information and Agenda Item 15.

The Working Group on Marine Geospatial Information under the leadership of John Nyberg (USA), established by UN-GGIM 7 in 2017, reported to the Committee of Experts for the second time. The Committee welcomed the report of the Working Group on Marine





Geospatial Information, and noted its progress, including the initiation of a use-case exercise on data availability and interoperability. The Chair highlighted that the group has utilized the Integrated Geospatial Information Framework as mechanism for articulating and demonstrating national leadership in marine geospatial information and that its nine strategic pathways are the appropriate means towards implementing integrated marine geospatial information systems in a way that will deliver a vision for sustainable social, economic and environmental development. He insisted that marine geospatial information must be made available, accessible and discoverable for a multiplicity of purposes. The Committee invited the Working Group to consider the variety of marine data sources that may be available, and in this regard, consider capacity development activities to strengthen marine geospatial information capabilities in developing countries and Small island developing states.

The Delegates noted the updated work plan for the biennium 2019 -2020 and requested that the Group consider engaging with the United Nations Decade of Ocean Science for Sustainable Development and related international initiatives, including the Seabed 2030 project. In the course of the discussion it became a specific item of note that the participation of IHO and OGC representatives has strengthened the WGs commitment to promoting geospatial standards, including the IHO S-100 suite of standards, and looks forward to the preparation of a practical guide for the use of geospatial standards in marine data. The Committee requested the Working Group to consider extending the use-case exercise to a broader audience beyond the group members as to enable better understanding of the challenges and issues to address, including to provide real world examples of the benefits of and need for readily available and accessible marine geospatial information. Finally, encouragement was given for a broader geographic participation from Member States in the WG, including from Africa and Small Islands Developing States.

The report on the *Implementation and adoption of standards for the global geospatial information community* (Agenda Item 10), was brought to the attention of the Committee by the Secretary-General IHO. He assured the Committee that many diverse and collaborative standards development and implementation activities carried out by the three standards development organizations in the global geospatial information management community. The Delegates expressed their appreciation to the three collaborating standards development organizations, the Open Geospatial

Consortium (OGC), the Technical Committee 211 of the International Organization of Standardization (ISO) and the International Hydrographic Organization (IHO) for the continuing support and valuable work. The ongoing contribution in the development of guidance and recommended actions for the standards pathway for the implementation Guide of the Integrated Geospatial Information Framework was welcomed as well. The

Tweets by @UNGGIM

UN-GGIM Retweeted

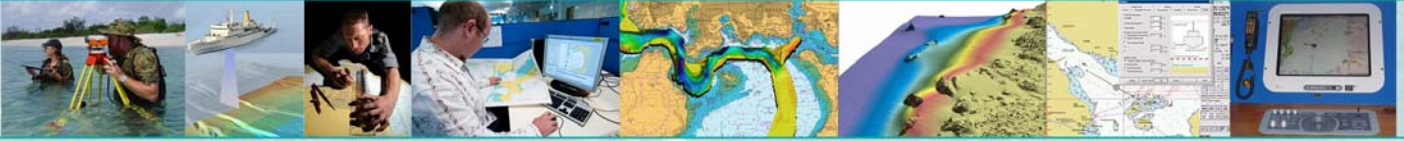


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Dr Mathias Jonas, Secretary General of the International Hydrographic Organisation, details the critical nature of open international standards and the work of the IHO, @isostandards, and @opengeospatial



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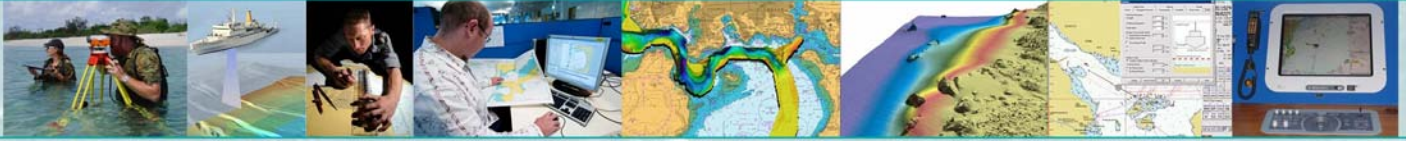
Committee requested the standards development organizations to continue to liaise and work with Member States with technical standards development and adoption, and keep the Committee informed of their ongoing work regarding the use of geospatial standards in supporting the implementation of national geospatial data and systems, the Integrated Geospatial Information Framework and the measurement and monitoring of the SDGs, and encouraged the regional committees, thematic networks and working groups of UN-GGIM to continue to improve knowledge, raise awareness about and engage in the development and promotion of internationally agreed and open geospatial standards.

The Group of the three Standard Developing Organizations agreed to continue the strong liaison on all levels to support the UN-GGIM process further.

The next Session of the Committee is planned at the UN Headquarters, New York, from 5th August to 7th August 2020.



IHO Secretary-General Dr Mathias Jonas, Agneta Engberg Chair ISO/TC211, Mark Reichardt, OGC, Chris Body ISO/TC211 Australia.



32ND MEETING OF THE IHO-IOC GEBCO SUB-COMMITTEE ON UNDERSEA FEATURE NAMES (SCUFN)

Kuala Lumpur, Malaysia, 5 – 9 August

Contribution to the IHO Work Programme 2019

Task 3.6.1	Organize, prepare and report annual meetings of ... associated bodies including...SCUFN
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The 32nd meeting of the IHO-IOC GEBCO Sub-Committee on Undersea Feature Names (SCUFN) was hosted by the Royal Malaysian Navy and Petronas in Kuala Lumpur, Malaysia, from 5 to 9 August 2019.

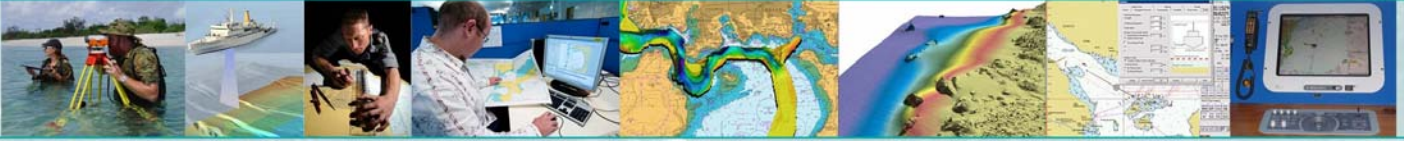
The meeting, chaired by Dr Hyun-Chul Han (IOC representative) from the Korean Institute of Geoscience and Mineral Resources (KIGAM – ROK), was attended by 28 registered participants, which consisted of eleven of the 12 SCUFN members (six IOC and five IHO representatives) and 17 observers, including Mr Shin Tani, Chair of the GEBCO Guiding Committee (GGC), Mr Tetsushi Komatsu (IOC Secretariat), Marine Regions and representatives of China, India, Japan, Malaysia, Philippines, ROK and Russian Federation. Representatives of NOAA (USA) and KHOA (ROK) in charge of the integration of SCUFN operational web services and GEBCO Gazetteer were also present. Assistant Director Yves Guillam (SCUFN Secretary) represented the IHO Secretariat.

The meeting was opened by Senator Liew Chin Tong, Deputy Minister of Defence (Malaysia). Senator Tong was joined by Vice Admiral Datuk Khairul Anuar bin Yahya, Deputy Chief of Royal Malaysian Navy, Rear Admiral Hanafiah bin Hassan, Chief Hydrographer of Malaysia and Ms Zuhaidah Binti Zulkifli, Senior General Manager, Governance and Strategic Relationships, Malaysia Petroleum Management (MPM), PETRONAS. Senator Tong stressed the importance of the work of SCUFN and called for multilateralism in order to achieve progress amidst a setting of disputes and escalating interest in maritime issues, especially in Southeast Asia region. A specially-prepared montage video¹ was shown as part of the event and mementos were presented to the SCUFN Members.



The Sub-Committee considered proposals for 187 undersea feature names, submitted by various bodies and supporting organizations from Argentina (2), Ascension - St Helena (1),

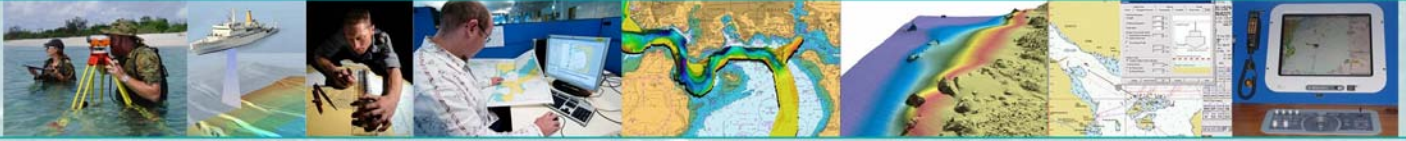
¹ <https://drive.google.com/file/d/1P738YljT3s9bXqScSKWTuxFiHoysrd7y/view>



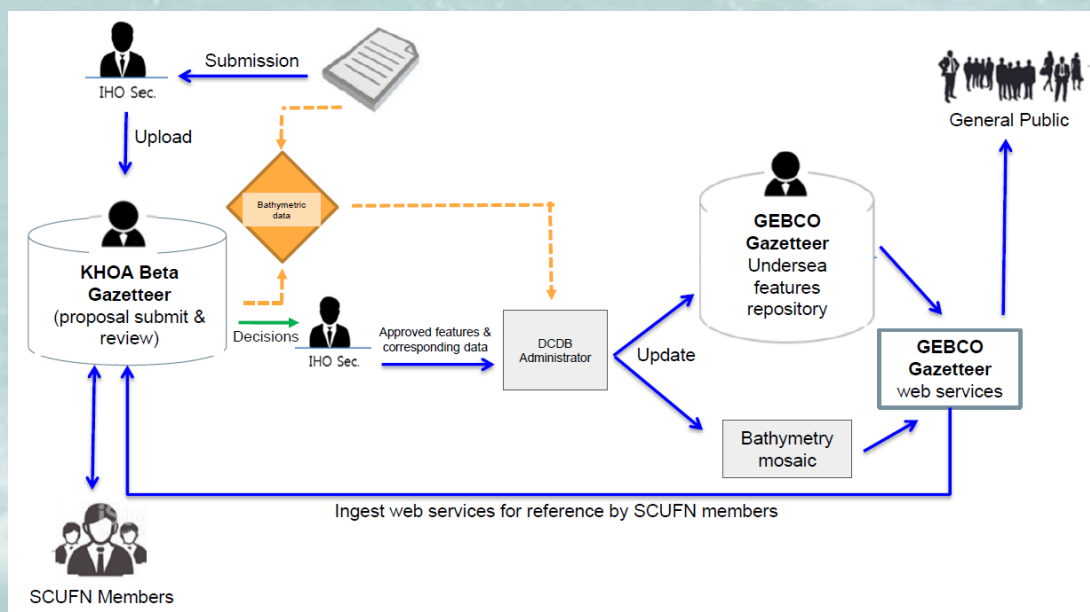
Brazil (15), China (35), Germany (1), Japan (52), Japan together with USA (9), Malaysia (2), Philippines (37), Republic of Korea (3), Republic of Palau (11), New Zealand (18) and USA (1).



Thanks to the increasing quality of submissions, a large number of the names proposed to the Sub-Committee were accepted in a very efficient and speedy manner, under the Chairmanship of Dr Han who made the best of the outcome of the pre-review made by SCUFN members through the scfn.ops-webservices.kr assessment interface. SCUFN thanked the NOAA representative for the major enhancements made recently in the GEBCO



Gazetteer as well as KHOA representatives for the development of the integration of different SCUFN web services. The general principles of this integration, depicted in the diagram below, were agreed and the full integration aiming to avoid duplication and make the whole process much more efficient, is expected within two years.



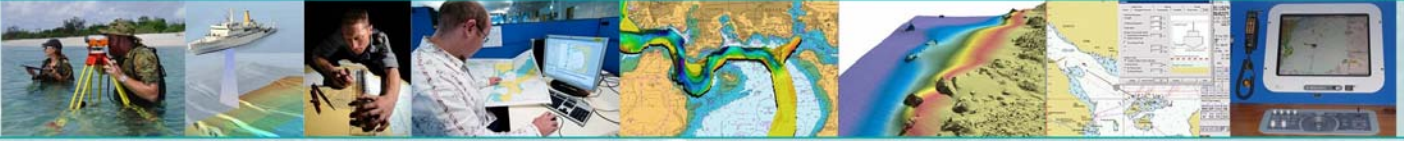
In addition to the analysis of naming proposals, the Sub-Committee considered several “corporate” issues, including:

- The first comments received through the voting procedure by the IHO Member States for the adoption of the new edition 4.2.0 of B-6 that includes pragmatic suggestions on the release of associated bathymetric data to the IHO Data Center for Digital Bathymetry (DCDB);
- The importance of multilateral consultations between proposers prior to SCUFN meetings when the feature may be located in areas of mutual interests, such as the South China Sea, otherwise some coastal States will never be in a position to make naming proposals if these cases are systematically categorized as being “politically sensitive” in accordance with SCUFN Rules of Procedures 2.10.

SCUFN noted the statements made by some coastal States by which they wish to be kept informed of the proposals located in their areas of jurisdiction.

SCUFN also agreed on the need to pursue the development of a general strategy and possible guidelines defining the optimal horizontal resolution between undersea features that are eligible for naming. Several objectives need to be considered for this task:

- the consequences of the development of GIS tools (by Canada for instance) able to discover features automatically, as long as the generic term definitions become more

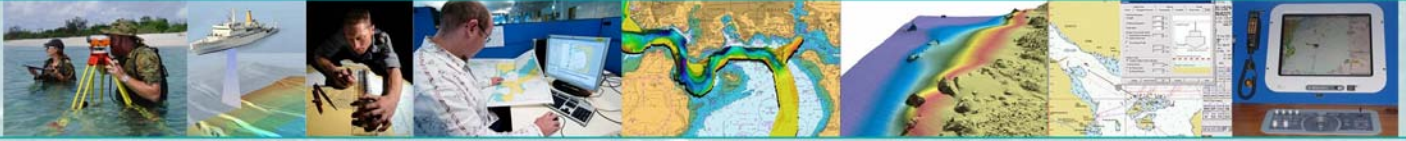


geometrically robust, a task which is in the scope of the Undersea Feature Names Project Team and the Generic Term Sub-Group;

- clutter reduction;
- the categorization minor features that can be now unveiled by new sensors technologies.

The GGC will be requested to provide some guidance on this matter as it could impact the SCUFN Terms of Reference.

At the end of the meeting, the Sub-Committee welcomed the offer made by Argentina to host the next meeting in November 2020 in Buenos Aires.



7TH S-100 TEST STRATEGY MEETING (S-100 TSM7) IHO Secretariat, Monaco, 23 – 26 September

Contribution to the IHO Work Programme 2019	
Task 2.1.2.3	Organize, prepare and report meetings of HSSC working groups (S-100 Test Strategy Meeting).

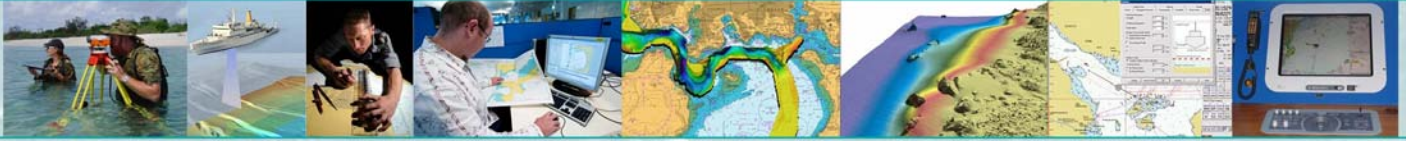
The S-100 Working Group’s 7th Test Strategy meeting took place at the IHO Secretariat in Monaco from 23 to 26 September 2019. Fifteen Member State representatives from Australia, Canada, Finland, France, Germany, Netherlands, Norway, Korea (Rep of) and the USA attended the meeting. Nine representatives from the following industry and academic organizations attended; Esri, Electronic Chart Centre (ECC), Korea Research Institute of Ships and Ocean (KRISO), Korea Maritime and Ocean University (KMOU), IIC-Technologies, International Centre for ENCs (IC-ENC), Portolan Sciences, SevenCs, Teledyne Caris and WR Systems.

The meeting was chaired by Julia Powell (USA). IHO Director Abri Kampfer, Assistant Directors Anthony Pharaoh and Alberto Costa Neves and Technical Standards Support Officer (TSSO), Jeff Wootton, represented the IHO Secretariat and provided logistical support.

The IHO Secretary-General, Dr Mathias Jonas, opened the meeting and reminded delegates of the importance of the work being undertaken by the S-100WG. He highlighted the challenge of bringing all the elements of S-100 data products together for use by data providers, service providers and end users.



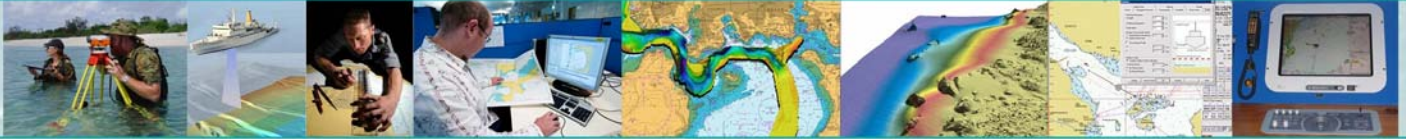
The participants of the 7th S-100 Test Strategy Meeting.



The primary goal of the meeting was to carry out a review of draft S-98¹ publication and to discuss issues relating to the extensions to the S-100 Framework Standard and the implementation of data products in Electronic Chart Display and Information System (ECDIS). The meeting considered issues relating to the architectural display of S-100 related products in ECDIS and how best to achieve harmonized portrayal. There were discussions on the development of an exchange catalogue for multiple products and KHOA provided a report on their sea trial project to test the use of S-100 datasets in a prototype S-100 ECDIS. Other important issues discussed included the need for a code-list register, the implementation of a bathymetric data quality model, carriage requirements for S-100 based ECDIS and data security and authentication for the distribution of S-100 products. A number of proposals for extensions to the S-100 framework standard were also considered.

The next TSM meeting is scheduled to take place at the IHO Secretariat in September or October 2020.

¹ S-98 Specification for Data Product Interoperability in S-100 Navigation Systems



**24TH CONFERENCE OF THE
BALTIC SEA HYDROGRAPHIC COMMISSION
Gdańsk, Poland, 11-12 September**

Contribution to the IHO Work Programme 2019	
Task 3.2.1.6	Prepare for and report meetings of the Regional Hydrographic Commission: BSHC

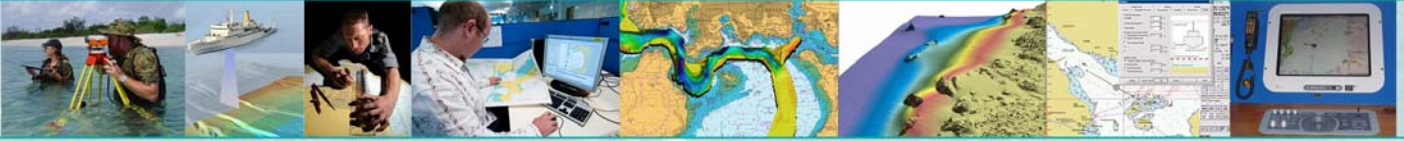
The 24th Conference of the Baltic Sea Hydrographic Commission (BSHC24) was held in Gdańsk, Poland, from 11 to 12 September, under the Chairmanship of Ms Pia Dahl Højgaard, (Denmark). Seven out of eight full members of the Commission (Denmark, Estonia, Finland, Germany, Latvia, Poland, and Sweden) and associate member Lithuania were represented at the Conference. The delegation of the Russian Federation did not participate. The United Kingdom and the United States of America were also represented at the Conference as Observers. The IHO Secretariat was represented by Secretary-General Dr Mathias Jonas.

BSHC24 covered a wide range of regional topics including developments in each of the Member States, the latest status of hydrographic surveying and nautical charting including INT Charts, ENC production and BSHC cooperative projects. The members of the BSHC reported on their national hydrographic, cartographic and Maritime Safety Information activities since the 23rd meeting. They also presented new developments with regard to surveying, chart production and maritime traffic management.

The Commission considered the outcome of the 11th meetings of the Hydrographic Services and Standards Committee and the Inter-Regional Coordination Committee (IRCC) including the 9th meeting of World Wide ENC Database Working Group (WEND-WG).

Secretary-General Dr Jonas reported on the IHO Work Programme and the Organization's activities during the previous year and shared his impressions about the considerations of the 11th Meeting of the Inter-Regional Coordination Committee (IRCC11). He also provided the Commission with general information on topics to be discussed at the upcoming 3rd meeting of the IHO Council (C-3) in October in Monaco, highlighting the fact the five (Denmark, Finland, Germany, Sweden, Russian Federation) of the nine BSHC members will be present at the Council. He also reported about the ongoing preparations of the 2nd Assembly in April 2020 and the triennium to celebrate the hundred years of existence of the IHO.

The Commission reviewed on-going regional initiatives in particular the activities of the Monitoring Re-survey Working Group (MWG), Baltic Sea Bathymetric Database Working Group (BSBDWG), joint North Sea and Baltic Sea Marine Spatial Data Information Working Group (NS-BSMSDIWG), Baltic Sea International Charting Coordination Working Group



(BSICCWG), the Chart Datum Working Group (CDWG) and the new installed Maritime Safety Information Working Group (MSIWG).

Sweden reported about the IHO-EU network working group activities. The report confirmed the general rise of awareness of the role and the duties of Hydrographic Offices and the overarching collaborative arrangements of the IHO on affected EU bodies. The common interest lays with the EMODNET portal theme to present high quality bathymetry as open data. There is an ongoing discussion within the EU whether to adopt navigational chart products to the range of the revision of the EU Directive of Public Sector Information (PSI).

The Commission considered concerted activities for an area-wide gravity measurement campaign featuring improved geoid computations under the auspices of the Chart Datum Working Group (CDWG). Additional measurement needs were identified for Swedish, Polish and Estonian waters.

The Commission renewed its commitment to the continued maintenance of the BSHC internet portal hosted by Sweden including the provision of a gridded bathymetry model for the whole Baltic. The current model still faces good public perception by a significant number of visitors and downloads. The member states reaffirmed these activities as their regional contribution to the Seabed 2030 project.

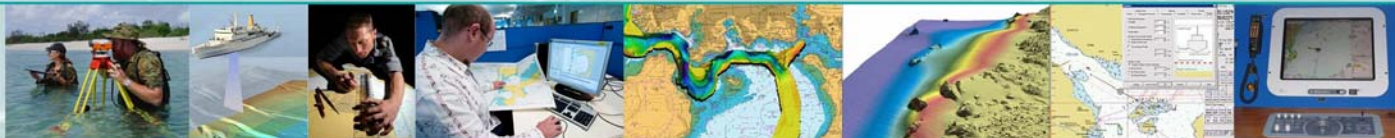
Sweden informed about its intentions to apply for EU funding for a FAMOS follow-up project named FASTMOS. This project will be designed to demonstrate the collaborative application of several S-100 based products in the area of the Sound, the Great Belt, the Kadettrenden, Irbe and the Quark. Sweden invited BSHC members with regional association to these areas to join the project application phase.

Germany proposed to set up a BSHC Marine Data Portal as future testbed for S-100 based data services. BSHC welcomed the proposal, encouraged the partners to outline future cooperation on this subject and suggested to synchronize with the drafting phase with the FASTMOS project.

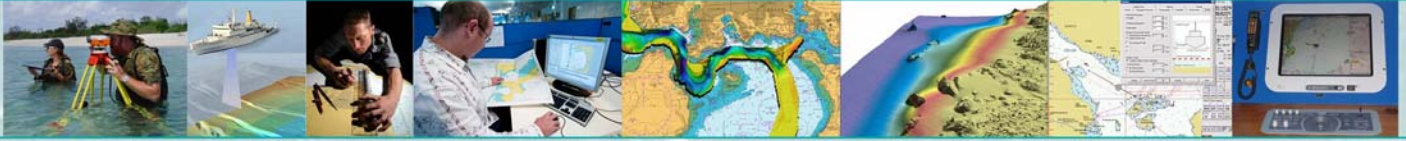
BSHC also discussed the development of the S-100 implementation Decade in Baltic Sea Area but agreed to postpone steps to be taken after the discussion at Council and Assembly level.



Participants of the 24th BSHC Conference in Gdańsk, Poland



At the end of the meeting, Captain (PLN) Andrzej Kowalski, (Poland) was elected as the new Chair of the BSHC. It was agreed that the next meeting of the BSHC will be hosted in Stockholm by Sweden from 23 to 24 September 2020. All available documents of the meeting are posted on the BSHC page of the IHO website as well as under the BSHC web site (www.bshhc.pro)



LIAISON VISIT TO THE 11TH COURSE OF THE IHO-NIPPON FOUNDATION CHART PROJECT

United Kingdom Hydrographic Office, Taunton, UK, 11 September

Contribution to the IHO Work Programme 2019	
CBWP P-03	Attendance of CHART Liaison visit

Director Mustafa Iptes and Mr Naohiko Nagasaka (Project Officer seconded to the IHO Secretariat from Japan) visited the United Kingdom Hydrographic Office (UKHO) on 11 September to meet and brief the trainees attending the 11th course of the IHO - Nippon Foundation CHART (Cartography, Hydrography and Related Training) Project. The project, funded by the Nippon Foundation of Japan, provides training in marine cartography and data assessment, which is recognized at the Category B level by the FIG-IHO-ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers. The course is hosted by the UKHO and is composed of five modules, each module varying from two to five weeks in length. The 11th course started on 2 September 2019 and will end on 13 December. It is attended by students from Bangladesh, Ecuador, Estonia, Nigeria, South Africa, Thailand and Trinidad and Tobago.

The Team of the IHO Secretariat discussed various topics with the students. In response, the students 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. Director Iptes delivered a presentation highlighting the areas of influence and the value of hydrography and the responsibilities of Governments in relation to the provision of hydrographic data, information, products and services. The impact of the CHART project was also described and presented in detail by Mr. Nagasaka. The students were encouraged to keep in touch with each other and to maintain an alumni relationship after they return to their home countries.



The trainers and trainees of the 11th CHART Course with the IHO Visiting Team.



12TH JOINT IHO/IMO/WMO/IOC/IALA/IAEA/FIG/IMPA CAPACITY BUILDING COORDINATION MEETING

London, UK, 10 to 11 September

Contribution to the IHO Work Programme 2019

Task 3.3.6	Organize, prepare and report on meetings with other organizations, funding agencies, private sector and academia
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The 12th Joint IHO/IMO/WMO/IOC/IALA/IAEA/FIG/IMPA Capacity Building (CB) Coordination Meeting was held on 10 and 11 September 2019, at the headquarters of the International Maritime Organization (IMO) in London, United Kingdom. The annual meeting brought together eight representatives from the IHO, IMO, WMO, IALA and IMPA. The IOC representative provided a briefing via videoconference. The IAEA and FIG were not represented at the meeting. The IHO was represented by Director Mustafa Iptes (first day) and Assistant Director Alberto Costa Neves, Capacity Building Sub-Committee (CBSC) Secretary.

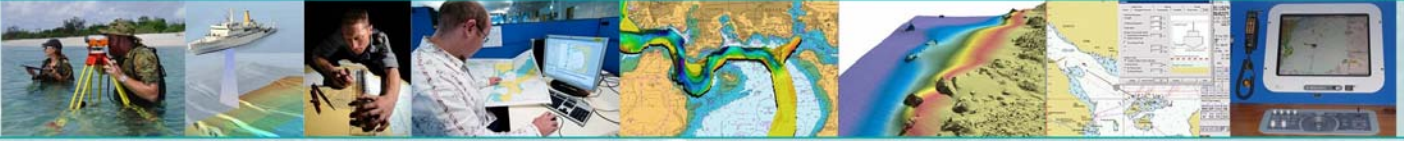
The objective of the meeting is to coordinate the efforts of international organizations for building and developing capacity in the maritime and marine communities. The meeting participants share resources in line with the United Nation concept of "Delivering as One" for effective, efficient, coherent and better performing presence in developing countries. The coordinated international presence has the benefit of creating conditions for enhanced communication and cooperation within the countries and their national infrastructure.



Joint IHO/IMO/WMO/IOC/IALA/IAEA/FIG/IMPA Capacity Building Coordination Meeting

Participants reviewed the joint activities conducted in the intersessional period, in particular the seminars for raising awareness of relevant topics preceding the regular conferences of Regional Hydrographic Commissions (RHCs), namely the EAtHC, MACHC, NIOHC, SAIHC and SWPHC, the technical visit to Angola and the CB workshop held during the e-Navigation Underway Asia-Pacific. Future joint activities for technical visits and raising awareness seminars were considered, starting with a joint IMO-IHO-IALA-IMPA needs assessment visit to Iraq.

The meeting shared achievements, challenges and lessons learned with the implementation of the respective CB or Capacity Development (CD) strategies, the management of



calendars, course catalogues and portals. The meeting also considered ways to collectively improve e-learning, having as example the IOC Ocean Teacher Global Academy (OTGA) hosting IHO courses on Tides and Water Level and on Maritime Safety Information (MSI), both being implemented.

The strategy to deal with funding agencies was considered during the meeting, and the promotion of joint projects. The existing development of a joint project to support inland water transportation in Bangladesh is progressing with meetings being held by the IMO with funding agencies. The same model will be considered to support other countries. The meeting agreed to prepare a concept paper for building maritime and marine capacity in the Caribbean for climate-resilient and sustainable development. This concept will be presented to donors for implementation, as a response to, among others, the reports of the High-Level Symposium and the Regional Senior Maritime Administrators' Workshop in the Caribbean.

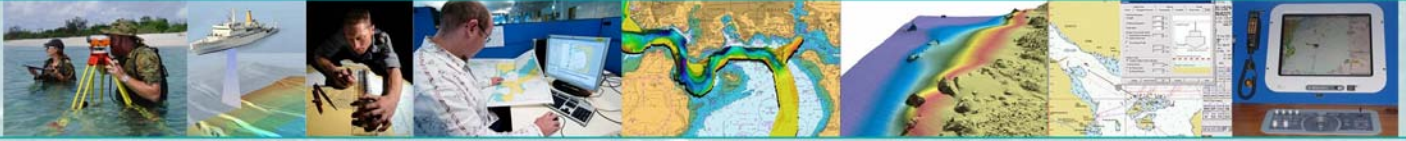
Participants were encouraged to promote and engage with the Working Group on Marine Geospatial Information (WGMGI), established under the United Nations Committee of Experts in Global Geospatial Information Management (UN-GGIM), with the development of an implementation plan for the United Nations Decade of Ocean Science for Sustainable Development (2021-2030) and with the Nippon Foundation-GEBCO Seabed 2030.

The development of a joint input to the IMO Member States Audit Scheme (IMSAS) was considered. The aim is to improve the assessment of the status of Safety of Navigation (SOLAS Chapter V) in a holistic way. IHO reported on its experience in offering support to IMO Member States in their preparation for IMSAS on aspects related to hydrography, nautical charting and MSI.

The meeting considered the impact of alumni from World Maritime University (WMU) and from the International Maritime Law Institute (IMLI) and how they are enabling progress in several aspects in the maritime sector in their countries and in their regions, a long-term return of investment. The impact of the Nippon Foundation's initiatives to support alumni was also noted with appreciation.

The IHO invited the participants to the CB Stakeholders' Seminar that will take place in Monaco on 17 and 18 June 2021, following the CBSC19, and to take part in the Centenary Anniversary of the IHO.

The next Joint CB Coordination Meeting will take place in August 2020 in Monaco, hosted by the IHO Secretariat.



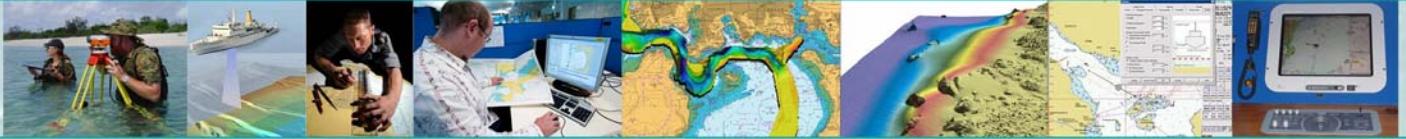
**16TH CONFERENCE OF THE SOUTHERN AFRICAN AND ISLANDS
HYDROGRAPHIC COMMISSION (SAIHC) AND SEMINAR FOR
RAISING HYDROGRAPHIC AWARENESS
Cape Town South Africa, 3 to 5 September**

Contribution to the IHO Work Programme 2019	
Task 3.2.1.11	Attendance of SAIHC – Southern African and Islands Hydrographic Commission

The 16th Conference of the Southern African and Islands Hydrographic Commission (SAIHC) was held from 3 to 5 September 2019 in Cape Town, South Africa. The following SAIHC Member States attended the Conference; France, Mozambique, Mauritius, Norway, South Africa and the United Kingdom. Namibia, Portugal, India, Tanzania, Comoros, Madagascar, Malawi and Kenya attended as Associate Members. Only one Member State, Seychelles, and one Associate Member State, Angola, were unable to attend the Conference. Delegates from the International Maritime Organisation (IMO), International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), Southern and East African and Islands Regional Group for Safety of Navigation and Marine Environment Protection (SEAIGNEP) and industry stakeholder participants from Kongsberg Maritime, AML Oceanographic, Chartwise, Unique Hydra, Teledyne Caris, UnderWater Surveys, Navico, iXBlue and Fugro participated in the Conference as observers. Director Abri Kampfer represented the IHO Secretariat.

The Conference was hosted by the South African Navy Hydrographic Office (SANHO). The SAIHC Chair, Rear Admiral Tim Lowe (UK) opened the Conference and invited Captain Theo Stokes, National Hydrographer of South Africa to provide the opening address. Each of the coastal States present provided an update on their activities since the last Conference that took place in Seychelles in August 2018 and although there is some progress on coordination of hydrographic activities in some countries with the establishment of National Hydrographic Committees, meetings are infrequent. The capacity building needs of the region remains vast and bi-lateral agreements and regional capacity building efforts should be considered in addition to the IHO capacity building programme. South Africa presented on the progress of the creation of an online MSI course that may be very fruitful to improve MSI awareness and create much needed capacity within the coastal States in the region.

The 16th Conference included a meeting of the SAIHC International Charting Coordination Working Group (ICCWG) during which the status of INT chart and ENC production in the region was discussed and decisions were made on finalising the SAIHC ENC Schema and resolving current ENC overlaps. A presentation on the current and future functionalities of the IHO INTogIS II was well received.

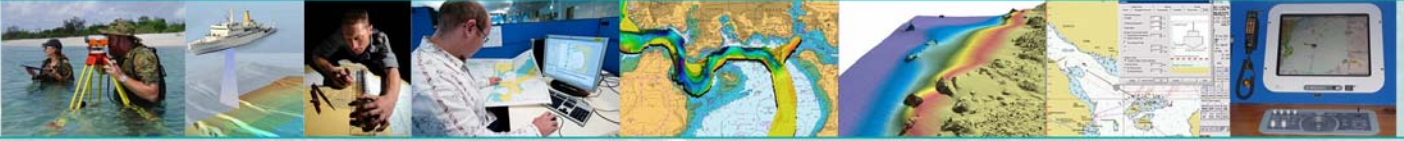


There were presentations and discussions on Marine Spatial Data initiatives and the Conference received feedback from the newly established SAIHC MSDIWG, led by UK, and it was emphasised that the group could play an important role in the discovery of regional data portals and assist in unlocking the “Blue Economy” of the region. An excellent presentation by Ms Lauren Williams from the Department of Environmental Affairs on the South African Marine Spatial Planning and National Oceans and Coastal Information Management System provided a good example of a national Maritime Spatial Planning effort and the potential benefits that can be achieved. GEBCO activities, presented by Evert Flier (Norway) included information on the GEBCO–Nippon Foundation Seabed 2030 Project and feedback on the IHO Crowdsourc Bathymetry WG. Coastal States were reminded of the importance of responding to the questionnaire attached to IHO CL 11/2019 to indicate support for crowdsourc activity within their waters of national jurisdiction, including any caveats, as this will guide future crowdsourc activities within the region.



Participants of the 16th SAIHC Conference

The IHO Capacity Building Programme for the region was discussed and the need to refine the SAIHC Capacity Building Strategy was identified. Other topics discussed during the meeting included; feedback on outcomes from the IHO Council, HSSC, IRCC, WEND WG, MSDI WG and C-55 information. Procedures for dealing with marine disasters were discussed and a presentation by Mozambique on lessons learnt from dealing with the effects of the destructive cyclones Idai and Kenneth that struck Mozambique and neighbouring countries prompted an action to develop a Disaster Response Framework for the SAIHC Region. A report on Maritime Safety Information (MSI) activities in NAVAREA VII was presented by South Africa and reviewed by the Commission. Feedback was also provided by India on NAVAREA VIII activities. It was quite evident that few countries in the region communicate with their NAVAREA Coordinator and more effort are required for the submission of maritime safety information for NAVAREAS VII and VIII. All coastal States in



the region were urged to nominate participants for the upcoming MSI Training Course, but care should be taken that the nominees will be utilised in a MSI role on completion of their training. Presentations were also provided by each of the industry participants. All the presentations made either by observers or industry participants and stakeholders were very educative, in particular for those who participated in the Conference for the first time.

IHO/SAIHC Seminar for Raising Awareness of Hydrography

The 16th meeting of the Commission was preceded by a seminar for Raising Hydrographic Awareness sponsored by the IHO capacity building fund and delivered by representatives from the IHO Secretariat, IMO, IALA and the UK. The seminar was intended to provide the representatives of the SAIHC with information to assist in the development and strengthening of hydrographic capacity to meet their international obligations under SOLAS and to support economic growth and protection of the marine environment.

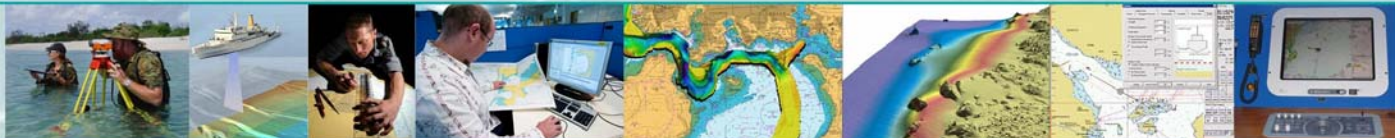


Participants of the SAIHC Seminar for Raising Hydrographic Awareness

Next Conference

The next Conference is scheduled in Mauritius from 7 to 10 September 2020. The Commission re-elected Rear Admiral Tim Lowe (UK) as its Chair and Mauritius was elected as Vice-Chair, subject to confirmation.

All papers and presentations for the Seminar and the Conference are available on the SAIHC16 document page on the IHO website (<http://www.iho.int>).



LATE REPORT

4TH S-101 ENC PROJECT TEAM (S-10IPT) MEETING IHO Secretariat, Monaco, 13-14 June

Contribution to the IHO Work Programme 2019	
Task 2.3.4	Develop and maintain S-10x Product Specifications

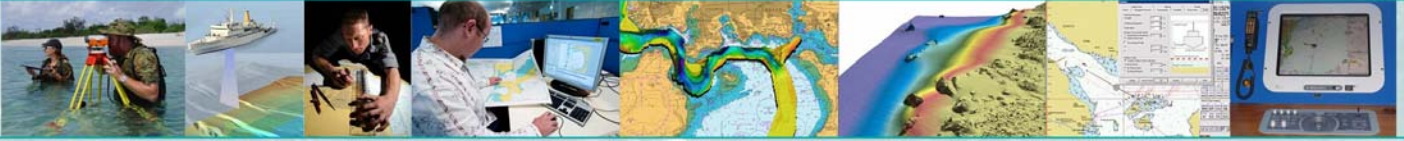
The S-101 Electronic Navigational Chart Project Team (S-101 ENC PT) held its 4th meeting at the IHO Secretariat, in Monaco from 13 to 14 June 2019. Twenty eight Member State representatives from Australia, Brazil, China, Denmark, Estonia, Finland, France, Germany, Italy, Norway, Korea (Rep of), the United Kingdom (UK) and the USA attended the meeting. Ten members from seven industry and academic organizations also attended the meeting. The meeting was chaired by Al Armstrong (USA). Director Abri Kampfer, Assistant Director Anthony Pharaoh and Technical Standards Support Officer Jeff Wootton represented the IHO Secretariat.



The participants of the 4th S-101 Project Team Meeting.

Following the publication of the Edition 1.0.0 of the S-101 ENC Product Specification in December 2018 for evaluation and testing, a few inconsistencies in the S-101 feature catalogue were reported and discussed during the meeting. These will be resolved in the next minor edition of the feature catalogue. A report was provided on the development of the S-101 portrayal catalogue and its associated conditional procedure framework. This work includes the development of conditional rules for triggering both portrayal and alert / indicator events within an ECDIS.

Denmark reported on their activities to develop a framework for documenting validation rules for S-100 based products. Denmark have also developed a preliminary list of validation checks for S-101 ENC data.



The IHO Registry Manager reported on the current status of the GI Registry, and the outcomes of the Registry workshop which took place during the 4th S-100WG meeting in Aalborg, Denmark from 27 Feb to 1 March 2019. KHOA² provided update reports of the Feature Catalogue and Portrayal Catalogue builder applications that are currently being tested. These applications work in tandem with the GI Registry.

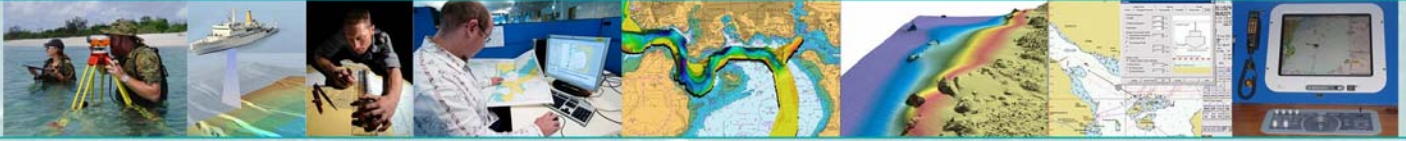
IIC-Technologies presented the results of an S-57 ENC to S-101 ENC data conversion study. One of the main objectives of the study was to look at how S-57 data can be “optimised” in order to facilitate data conversion. The free S-57 to S-101 ENC converter produced by Esri was used for the data conversion.

The Chair of the DQWG reported on a proposed mechanism to automatically compute the equivalent of CATZOC for use in S-101. The process requires that the underlying survey data is adequately attributed.

A report on the new data security scheme that will be used for the distribution of S-100 products was provided by Primar. Other items discussed included; quality of horizontal measurement, additional portrayal issues and reports on test bed projects.

The next meeting is scheduled to take place in conjunction with the next ENCWG meeting. The date and venue of both meetings is yet to be finalized.

² Korea Hydrographic and Oceanographic Agency



NEW HYDROGRAPHER OF UNITED KINGDOM

Rear Admiral Peter James Sparkes

Born and educated in Liverpool, UK, Peter Sparkes joined the Royal Navy as a graduate entrant Surface Warfare officer in 1990.

His initial appointments in Her Majesty's Ships YORK, EDINBURGH, GLOUCESTER,

SOUTHAMPTON, and MONMOUTH, included service in the Arabian Gulf (Operation SOUTHERN WATCH), the Adriatic (Operation SHARPGUARD), and in the North and Western Atlantic (Anti-submarine, counter-narcotic, and disaster relief operations). He qualified as a Principal Warfare Officer in 1998, specialising in Communications and Electronic Warfare. Thereafter, he was promoted to the rank of Lieutenant Commander and served as the Operations Officer of the amphibious flagship HMS FEARLESS in the Mediterranean and Black Sea. Peter Sparkes was then selected to be the Executive Officer and second in command of the frigate HMS NORFOLK, deploying on Operation TELIC / IRAQI FREEDOM in 2003.



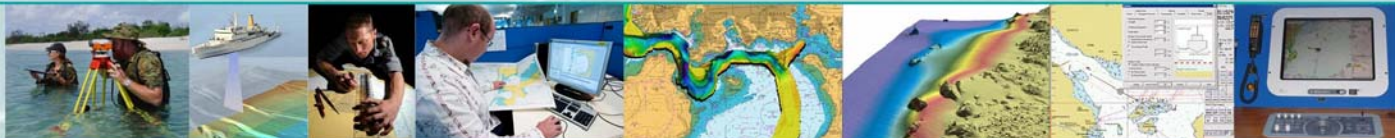
As a Commander, he commanded the frigate HMS CUMBERLAND on a notably successful counter-piracy deployment to the Gulf of Aden in 2008. Upon promotion to Captain in 2010, Peter Sparkes was charged with the generation of the UK's replacement Ice Patrol Ship, HMS PROTECTOR. He subsequently commanded the Royal Navy's ice-breaker on two fascinating austral summer deployments to Antarctica. As a Commodore (1*), he had the privilege of commanding the 44 units (aircraft carriers, destroyers, frigates, mine-hunters, patrol vessels, and the UK maritime explosive ordnance disposal teams) of the Portsmouth Flotilla. An assignment which included overseeing the acceptance into service and force generation of the QUEEN ELIZABETH Class aircraft carriers.

Ashore, Peter Sparkes has served in Ministry of Defence acquisition appointments, with a remit of defining Joint information warfare and maritime situational awareness capabilities. This included the development and introduction into Royal Navy service of the Warship Electronic Charting Display Information System (WECDIS). Within Navy Command he specialised in personnel management and had responsibility for, and oversight of, all Royal Navy and Royal Marine officer and other rank career management below the rank of Captain / Colonel. As a Captain he was the Permanent Joint Headquarters (PJHQ) J5 lead for operational planning in Africa and the South Atlantic. Latterly, he was privileged to serve in Washington DC as the UK Chief of Defence Staff's Liaison Officer to the US Joint Chiefs of Staff (2018 – 2019). He was promoted to Rear Admiral and appointed as the National Hydrographer on 28 October 2019.

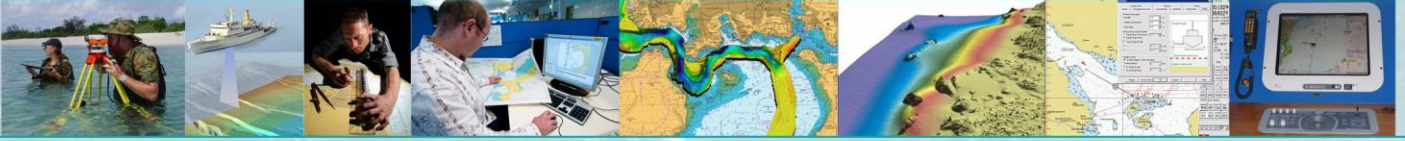
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Peter's wife, Karen, is a teacher. Their son is a Royal Navy medical officer. Rear Admiral Sparkes is a graduate of the Higher Command and Staff Course and the US Capstone Course. He is a Younger Brother of Trinity House, a Freeman of the City of London, and an Honorary Liveryman. Peter enjoys a variety of outdoor pursuits, cooking curries, and he is an avid supporter of Liverpool football club.



IHO-NIPPON FOUNDATION ALUMNI SEMINAR - 2019

Singapore, 29-31 October

Contribution to the IHO Work Programme 2019

Task 3.3.9
2019 CBWP P-
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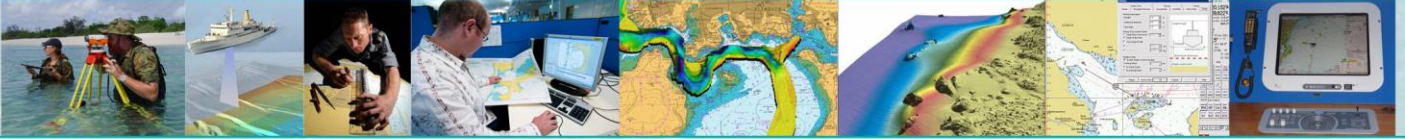
Plan, administer and implement Capacity Building activities, including seminars

The IHO-Nippon Foundation Alumni Seminar was held in Singapore from 29 to 31 October, organized by the IHO and supported by the Nippon Foundation (NF) of Japan. The Nippon Foundation has funded selected international trainees to attend the courses in nautical cartography at the United Kingdom Hydrographic Office (UKHO) for the last eleven 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 CHART (Cartography, Hydrography and Related Training) Project. The course in "Marine Cartography and Data Assessment" delivered for the CHART Project is recognized at the Category "B" level by the 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-8.



Participants of the IHO-NF Alumni Seminar

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 of 84 fellows, 39 alumni from 29 countries (Algeria, Brunei Darussalam, Bulgaria, Colombia, Croatia, Ecuador, Estonia, Fiji, Georgia, Indonesia,



Japan, Latvia, Malaysia, Malta, Mozambique, Oman, Poland, Romania, Singapore, Solomon Islands, Spain, Sri Lanka, Suriname, Thailand, Trinidad and Tobago, Ukraine, Uruguay, Venezuela and Viet Nam) attended the seminar.

Mr. Mitsuyuki Unno (Executive Director of the Nippon Foundation), Ms. Mao Hasebe (representative of the Nippon Foundation), Ms. Lucy Fieldhouse (UKHO), Mr. Christopher Booth (UKHO), Mr. Jeff Bryant (retired UKHO), Mr. Adam Greenland (former Chair of the IBSC) and Mr. Shigeru Nakabayashi (Japan Hydrographic and Oceanographic Department) also attended the Seminar as invited guests. The IHO Secretariat was represented by Director Mustafa Iptes, Assistant Director Alberto Costa Neves and Mr. Naohiko Nagasaka (Project Officer seconded to the IHO Secretariat by Japan).

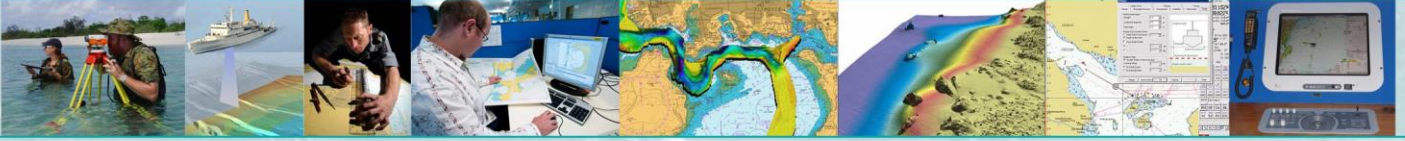
The Seminar was opened by Director Iptes and the welcome speech delivered by Mr. THAI LOW Ying-Huang (Chief Hydrographer of Singapore). The keynote speeches were delivered by Mr. Mitsuyuki Unno (Executive Director of the Nippon Foundation), Mr. Jeff Bryant (Former Course Coordinator, retired UKHO) and Mr. Adam Greenland (Hydrographer of New Zealand and former Chair of the IBSC). Four Members of the IBSC also attended the opening of the Seminar.

Presentations given by the representatives of NF, IHO and UKHO informed the participants about the background of the IHO-NF cooperation, the impact analysis of the CHART Project and a glimpse in the future of the profession of the Cartographers. The fellows shared their experiences and the lessons learned during and after the training programme, their professional progress since their training, and their expectations for future developments in their hydrographic services.

The presentations from the fellows and the impact analysis showed the progress of the world nautical cartography derived from the CHART project in the eleven years since its inception. Most of the fellows shared their experience to lead charting activity with system implementation and work flow innovation. Countries that have alumni of the CHART project have shown significant increase in their chart coverage compared to non-alumni countries, as shown in the IHO publication C-55 *Status of Hydrographic Surveying and Nautical Charting Worldwide*.

The Seminar also shed light in various aspects on the work of cartographers. The keynote speech delivered by Mr. Unno triggered the discussion about the future of nautical cartography with the rapid change in technology and automation. His speech paved the way for the fellows to consider their profession more critically and beyond their routine tasks. The IBSC Members present had the opportunity to see evidence of the success of the IBSC recognition framework through the achievements of the alumni.

The Seminar was an opportunity to assess the retention of the alumni as 98% of them are still working in their hydrographic services or related government sector and 60% are the lead cartographers. The NF has so far funded 64 people from 39 countries through the IHO



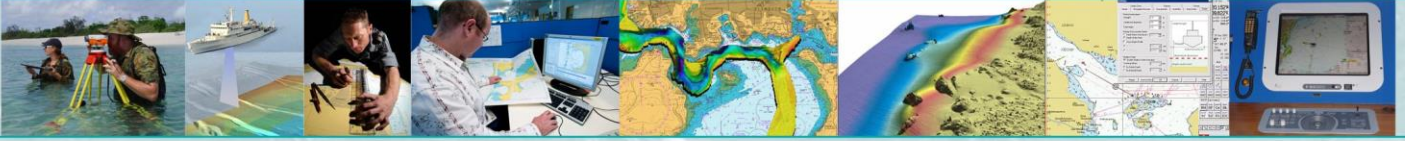
Capacity Building Programme. This group is enlarged with another 20 alumni that attended the same courses, funded from other sources, leading to 84 alumni from 45 countries at the service of nautical cartography worldwide.

Presentations and speeches provided at the Seminar will be available on the IHO web site at:

www.iho.int/cb → Special contributions from external donors



Nautical Cartographers at the service of nautical cartography worldwide



16TH PRIMAR TECHNICAL EXPERTS WORKING GROUP (TEWG) MEETING

Stavanger, Norway, 29-30 October

Contribution to the IHO Work Programme 2019	
Task 2.1.5	Monitor the development of related international standards, specifications and guidance

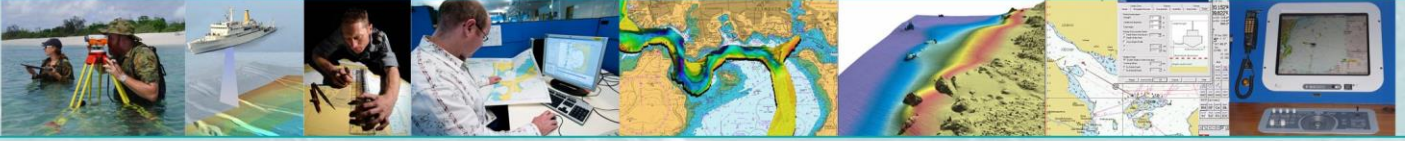
The 16th PRIMAR Technical Experts Working Group (TEWG) meeting took place in Stavanger, Norway from 29 to 30 October 2019. Twenty Member State representatives from Croatia, Finland, Estonia, France, Latvia, Norway, Poland, Sweden, Russian Federation and Vietnam attended the meeting. Seventeen representatives from non-Member States, RENC organizations, industry and academia also attended the meeting. The IHO Secretariat was represented by Assistant Director Anthony Pharaoh.



The participants of the 16th PRIMAR Technical Experts Working Group Meeting.

The main topics and the major outcomes from the 26th PRIMAR Advisory Committee (PAC) meeting (Stavanger, 2-3 October 2019) were presented.

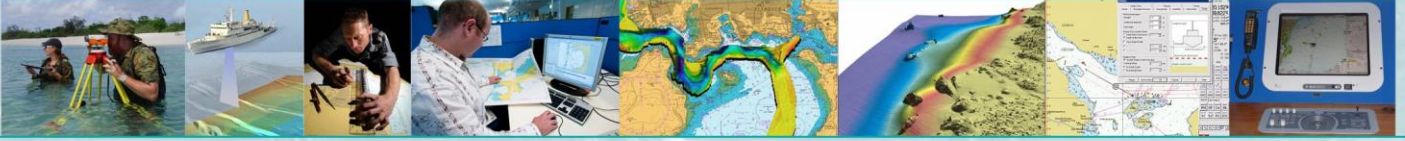
The meeting discussed the important work being undertaken to improve RENC cooperation and to identify ENC overlaps issues, and the need to harmonize ENC licensing models. It was reported that there are currently 16000 ENC's in the PRIMAR catalogue and new data from Albania and China has been released since the last TEWG meeting. The possible distribution of digital publications was discussed and an investigation to determine what types of information should be included in these publications, has been carried out. Several



S-58 ENC validation tests were discussed and presentations on the SevenCs Analyser and Navico dKart Inspector applications were provided.

A presentation on the status of the S-101 project was provided. This reported on the progress with implementing the S-100 data protection scheme and plans for distributing S-100 based products. Industry members from SevenCs and Navico provided presentations on their S-57 to S-101 ENC converters and their plans to implement applications that will produce and consume S-100 based data. A presentation on an S-102 demonstrator project was provided. The project is intended to test how to distribute and use S-102 bathymetric data in an operational environment. Members were invited to contribute S-102 test data for the project.

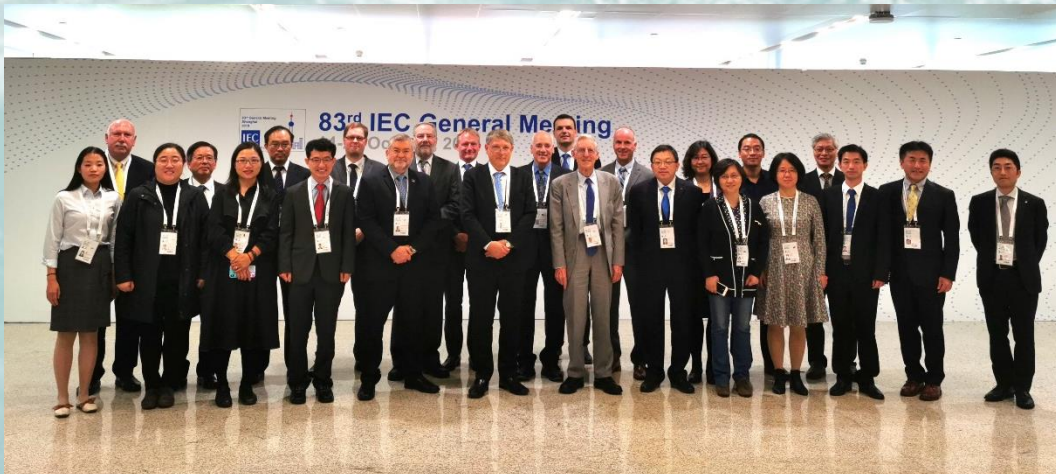
The next meeting of PRIMAR TEWG is expected to be held in March/April 2021.



**2019 PLENARY MEETING OF THE INTERNATIONAL
ELECTROTECHNICAL COMMISSION (IEC)
TECHNICAL COMMITTEE 80 (IEC/TC 80)
Shanghai, China, 24 to 25 October**

Contribution to the IHO Work Programme 2019	
Task 1.1.7	Maintain relationship with the International Electrotechnical Commission (IEC), including IEC Technical Committee 80

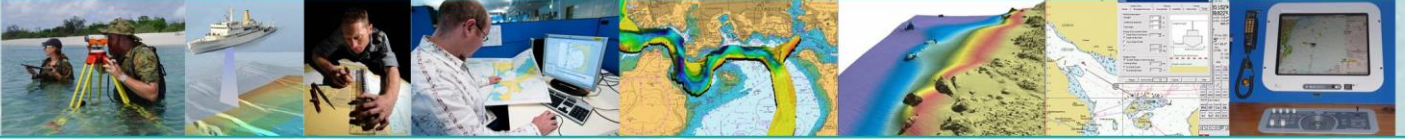
The 2019 Plenary meeting of the International Electrotechnical Commission (IEC) - Technical Committee 80 (IEC/TC80) meeting was hosted by Standardization Administration of China (SAC). The National GNSS Engineering Centre of China and the Wuhan University provided organizational and logistics support for the meeting, which took place in Shanghai, China from 24 to 25 October 2019.



Participants of the 2019 IEC/TC80 Plenary Meeting

IEC/TC80 meets in plenary session every two years to review the main achievements during the intersessional period and agree on future work plans of its working groups, project teams and maintenance teams. The plenary meeting brought together 25 participants, including representatives of national committees and observers from international organizations. Director Abri Kampfer represented the IHO Secretariat. The meeting was chaired by Mr Hannu Peiponen from Finland.

IEC/TC80 prepare standards for maritime navigation and radiocommunication equipment and systems making use of electrotechnical, electronic, electroacoustic, electro-optical and

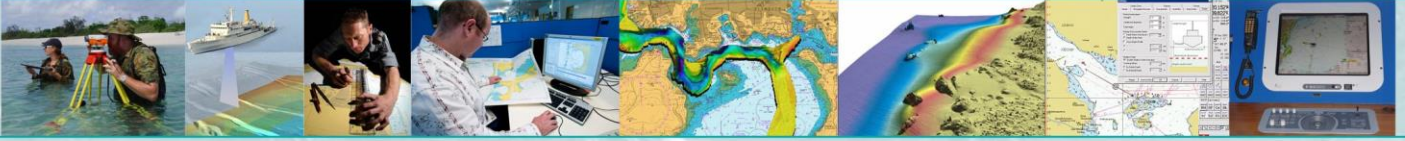


data processing techniques. TC80 standards are widely used by Administrations for type approval of equipment which is a regulatory requirement under the IMO International Convention for the Safety of Life at Sea (SOLAS). The International Hydrographic Organization (IHO) is a Liaison member of IEC/TC80 and participates in its standards development and maintenance Working Groups.

The representative of the IEC Central Office, Mr Christophe Boyer, provided an overview of the processes for the development and maintenance of international standards. He highlighted the recent amendments to the relevant ISO/IEC Directives and explained the use of the IEC expert management system and associated web tools.

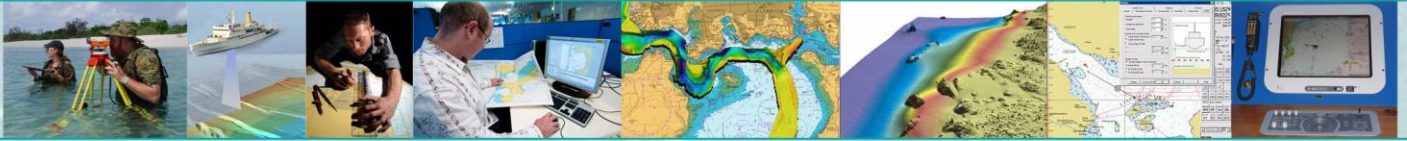
The ten subordinate bodies active during the 2017-2019 intersessional period (four working groups, two project teams and four maintenance teams) reported on their work in relation with the development and maintenance of standards. Of particular interest was the work of WG17 that is developing an S-100 based Route Plan (S-421) product specification. This work was approved as IEC 63173, Part 1 in 2017 and the target publication date of this work has been extended to 2023. IEC 63173, Part 2 is 'Secure online transfer of S-100 based products applied on S-421 Route Plan', which specifies the communication method of the S-100 Product Specifications including Route Plan. The scope is to provide the end-to-end communication for end users including data protection, data authentication and digital signature. The target publication date of this work is June 2022.

In TC80 the MT7 is responsible to maintain the IEC 61174 test standard for ECDIS. This standard is based on IMO resolution MSC 232(82) and related IHO ECDIS standards S-52, S-57, S-63 and S-64. The current 4th edition of IEC 61174 was published in Aug 2015. The IHO Liaison Report to TC80 Plenary provided an update of IHO S-100 developments including the status of current published product specifications. S-101 PS will be technically



ready for regular production of S-101 ENC by end of 2022 and the plenary was informed that the IHO Council endorsed an implementation strategy that will make provision for simultaneous delivery of S-57 and S-101 ENC by 2024. The Plenary concluded that there are ample reasons to consider a revision of IEC 61174 and considering the timelines, such work will have to commence by October 2020. Views of national IEC members will be obtained to reach a final decision.

The Plenary concluded its work with a review of the TC80 Strategic Business Plan. The next TC80 plenary meeting is scheduled for 2021, venue still to be confirmed.



6TH OUR OCEANS CONFERENCE Oslo, Norway, 23-24 October

Contribution to the IHO Work Programme 2019

1.1.15

Maintain relationships with other international and observer organizations when their agendas have relevance to the programme of the IHO



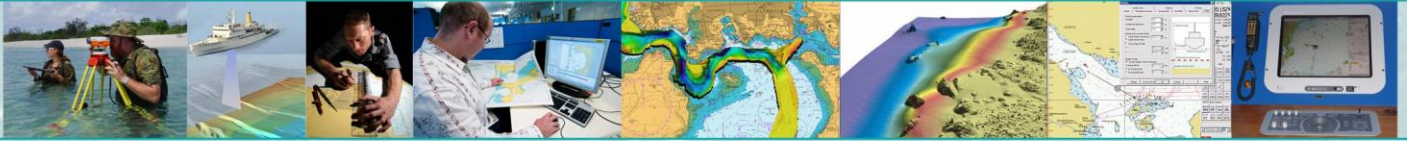
The Our Ocean conference series started in 2014 in New York, USA aiming to build partnerships between government, industry, science and civil society, putting knowledge, technology and finance into action to meet the challenges facing the ocean and enable production and sustainable use to go hand in hand so that the ocean can continue to provide for the needs of future generations.

The Our Ocean 2019 was held in Oslo from 23 to 24 October and hosted by the Government of Norway. The IHO Secretariat was represented by Secretary-General Dr Mathias Jonas. The agenda was specifically highlighting the importance of knowledge as the basis of our actions and policies to ensure protection of our ocean, responsible management of marine resources and sustainable future economic growth. The conference brought together leaders from governments, businesses, civil society and research institutions to share their experience, identify solutions and commit to action for a clean, healthy and productive ocean.

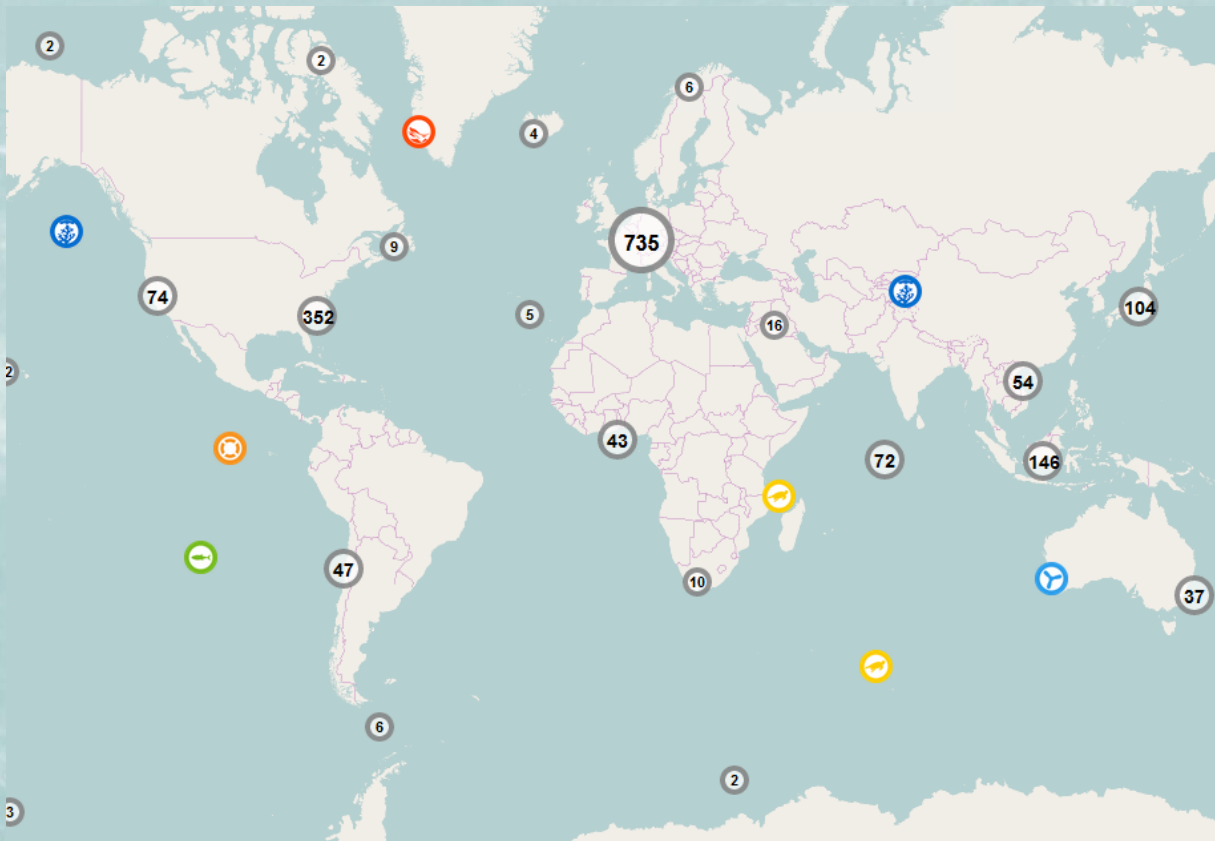


Lise Kingo, CEO and Executive Director of the United Nations Global Compact, which is the world's largest corporate sustainability initiative with more than 13,500 signatories from 170 countries, presented the five tipping points for a healthy and productive ocean – each one with direct or indirect relation to hydrography.

At the core of the Our Ocean conferences are voluntary commitments for significant and meaningful actions towards a clean, healthy and productive ocean. Previous conferences have resulted in nearly one thousand commitments. Governments, organisations and businesses are encouraged to announce new and far-reaching actions for

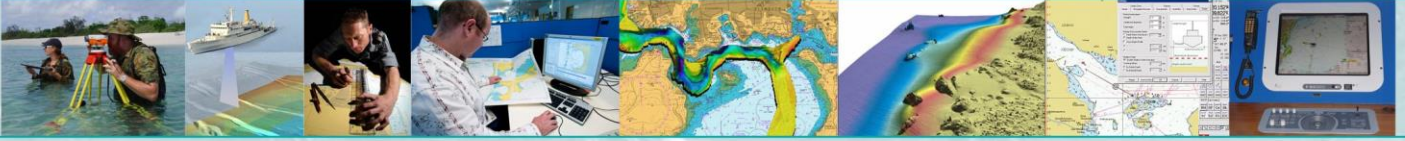


the best of our ocean at this year's conference. Commitments should have significant impact, be measurable and have a clear timeframe. As one of the 1600 commitments made, the IHO Secretary-General gave a commitment for the provision of a global bathymetric grid (GEBCO Grid) and a mechanism for standardized data products for the broadest range of maritime knowledge (S-100).



Global map of commitments made during the 6th Our Ocean Conference.

The next Our Ocean Conference is planned to be held at the Island of Palau in October 2020.



8TH MEETING OF THE CROWDSOURCED BATHYMETRY WORKING GROUP

IHO Secretariat, Monaco 23-25 October

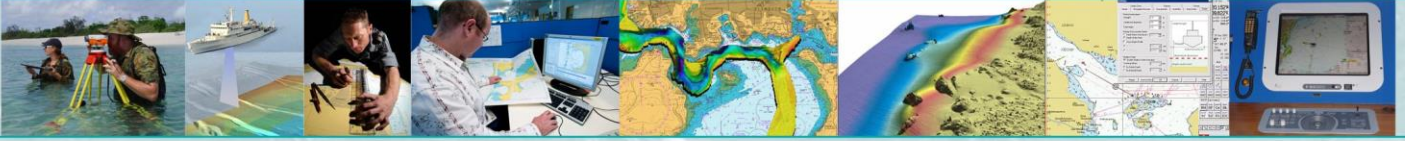
Contribution to the IHO Work Programme 2019	
Task 3.6.4	Develop general guidelines on the use and collection of Crowdsourced Bathymetry (CSB)

The Crowdsourced Bathymetry Working Group (CSBWG) has been tasked by the Inter-Regional Coordination Committee (IRCC) to develop the IHO publication B-12 that provides guidance on the collection and use of Crowdsourced Bathymetry (CSB) and to investigate ways to increase participation in data gathering activities. IHO Publication B-12, Edition 2.0.2 - *Guidance on Crowdsourced Bathymetry*, provides guidelines and advice on various considerations that should be taken into account when collecting CSB data for inclusion in the global bathymetric data set which is maintained in the IHO Data Centre for Digital Bathymetry (DCDB).



The participants of the 8th meeting of the CSBWG between sessions

The working group held its 8th meeting at the IHO Secretariat, Monaco from 23 to 25 October 2019. In the absence of the Chair of the CSBWG, Ms Jennifer Jencks (USA, Director of the DCDB), the Vice-Chair, Mr Serge Gosselin (Canada), chaired the meeting which was attended by representatives from eight Member States (Canada, Denmark, Italy, Japan, Netherlands, Norway, UK and USA) and observers and expert contributors from Fugro, Da



Gama Maritime Ltd, FLIR Systems AB, SevenCs/ChartWorld, ECC AS, MY Gene Machine and Sea-ID. Assistant Director David Wyatt (Secretary) represented the IHO Secretariat.

Whilst reviewing the actions from its previous meeting, the working group received a brief update on research into manmade noise in the water column and its impacts. In light of the inconclusive information, it was agreed that a coordinated approach should be taken with other IHO bodies which were also investigating the issue. The working group received a number of presentations from participants updating on current CSB related projects as well as a number provided remotely from working group members in Australia and Canada.

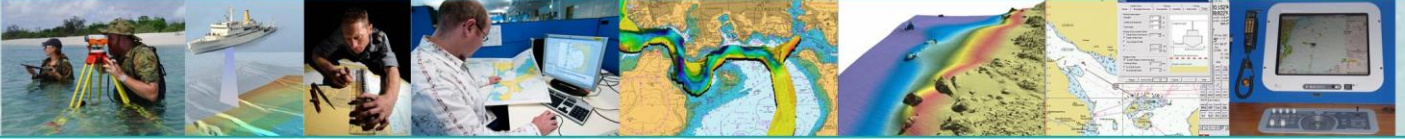
The replies to the various IHO Circular Letters on CSB published during 2019 and the States on the positive list published on the IHO website were discussed. It was agreed that more engagement through Regional Hydrographic Commissions was required to articulate the increasing global societal and United Nations (UN) driven need to complete the picture of the seafloor as well as the potential benefits to individual coastal states. Two proposed clarifications to B-12 – *IHO Guidance on Crowdsourced Bathymetry* – were approved.

The participants discussed current use case examples by a number of Hydrographic Offices (HOs), after which the Chair of the Data Quality Working Group (DQWG) provided two comprehensive presentations on 'Data Quality Combining S-101 and S-102 and Definitions of depth' and 'Using data quality for safe navigation', which highlighted aspects in support of CSB and could overcome a number of HO's concerns to use the data or encourage its collection.

The participants received a comprehensive update on the IHO-IOC GEBCO and Seabed 2030 project activities. In particular on the discussions and outcomes from the 'Vision to Action' event in London, which highlighted the vital need for close coordination and cooperation between the CSBWG, the GEBCO Project and the new Director of the Seabed 2030 project to ensure harmonization of communication and activities. The Secretary-General provided a brief report on the Our Oceans Conference held in Norway recently where he highlighted the positive reception of Seabed 2030 and CSB by the UN and senior government representatives, which needs to be reflected in actions.



The 8th meeting of the CSBWG in plenary session

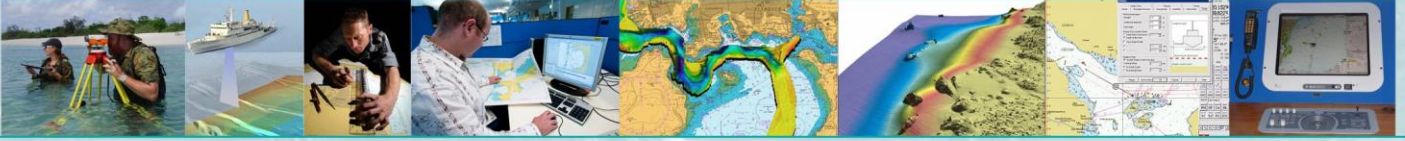


The participants devoted considerable time to the outreach and recognition strategies, which needed to be developed to increase data contributions and incentives to increase participation. The participants were given a brief on the GEBCO and Seabed 2030 communication activities. The attendance at the OceanObs'19 conference and getting "Seafloor" added to the OceanObs'19 Conference declaration statement were highlighted as significant advances. The participation in the 1st UN Decade of Ocean Science for Sustainable Development Global Planning meeting was noted. A number of suggestions and recommendations for consideration by the CSBWG were provided.

During breakout sessions the participants considered three headline topics: actions to increase contributions; key messages; and a review of the mind map developed at CSBWG6. It was agreed that current engagements with commercial companies needed to be nurtured and maintained to ensure data is delivered and continues to be delivered. It was also noted that use of experiences and motivations of current lead contributors should be used to communicate to other potential contributors. It was also recognised that the IHO Secretariat report and the national reports to RHCs provided the opportunity to highlight positive coastal states and actions to encourage participation. It was agreed that the Director of the Seabed 2030 project should be invited to participate in future CSBWG meetings and that close harmonization of the outreach activities of both groups should be a priority.

The Vice-Chair, Mr Serge Gosselin, notified the WG of his pending retirement from the Canadian Hydrographic Service and Ms Marta Pratellesi (Italy) was unanimously elected as the new Vice-Chair.

It is planned to hold the 9th meeting of the CSBWG in Stavanger, Norway, 29 June to 2 July 2020, which will include a one day stakeholder workshop. In addition it was agreed that CSBWG10 should be programmed for early 2021 with CSBWG11 in autumn 2021 and CSBWG12 in mid-summer 2022. Exact dates and locations were not discussed.



**10TH IALA AIDS TO NAVIGATION REQUIREMENTS AND
MANAGEMENT COMMITTEE (ARM) MEETING
AND
3RD IHO-IALA COORDINATION MEETING
IALA Headquarters, Saint-Germain-en-Laye, France, 14 - 18 October**

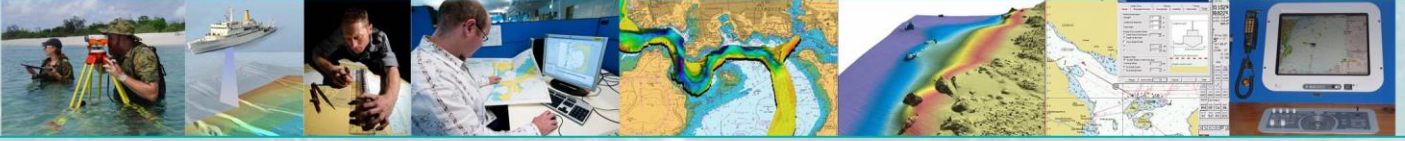
Contribution to the IHO Work Programme 2019	
Task 1.1.6	Annual IALA-IHO Secretariat Liaison Meeting

Under the framework of the Cooperation Agreement between the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and the IHO, a coordination meeting was held at the IALA Headquarters in Saint-Germain-en-Laye, France on 16 October 2019 in conjunction with the 10th IALA Aids to Navigation Requirements and Management (ARM) meeting (14 to 18 October).



Participant of the 10th IALA ARM Meeting

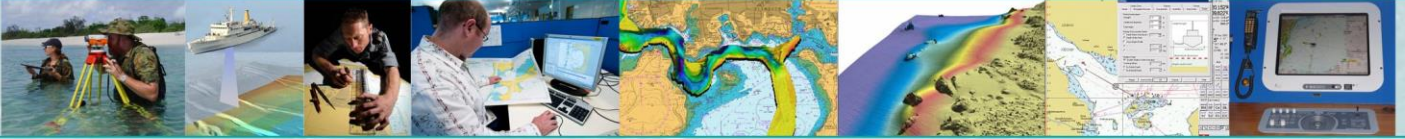
The IHO/IALA coordination meeting was attended by five IALA members and Assistant Director Anthony Pharaoh represented the IHO Secretariat. Update reports were provided on the standards development activities of both organizations. Since the last meeting, the IHO has published a new edition of the S-100 framework standard and five new product specifications. IALA has completed a product specification for Aids to Navigation Information (AtoN) (S-201) which will be released as Edition 1.0.0 for testing and evaluation. IALA has also made significant progress with their Maritime Resource Name (MRN) specification. This provides a naming scheme that can be used to uniquely identify any maritime resource on a global scale.



Other items discussed during the meeting included; charting requirements for new combinations of fixed and flashing lights, the status of inclusion of Aids to Navigation concepts (terms and definitions) in the IHO Registry and recent extensions to the Maritime Resource Name specification.

During the main IALA ARM plenary meeting, reports were provided on relevant items from recent IMO Council, Maritime Safety Committee (MSC) and Sub-Committee on Navigation, Communications and Search and Rescue (NCSR) meetings. Presentations were provided on the status of the *Integrated Maritime Autonomous Transport*, and the *Smart Navigation* projects. A presentation was also provided on the impact of AtoN distribution during North China Sea freeze-up. Progress was made on the development of various work items under the Navigational Requirements, Information Services and Portrayal and Risk Management Working Groups, during the course of the week.

The next IALA ARM meeting is scheduled to take place from 27 April to 1 May 2020, in Buenos Aires, Argentina.



**10TH CONFERENCE AND 26TH BUSINESS MEETING OF THE ADVISORY BOARD
ON THE TECHNICAL ASPECTS OF THE LAW OF THE SEA
Monaco, 7-10 October**

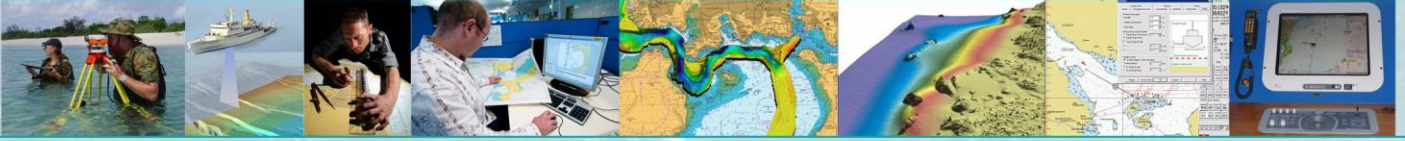
Contribution to the IHO Work Programme 2019	
Task 2.1.2.8	Attendance of ABLOS BM meeting and biennial Conference

The Advisory Board on the Technical Aspects of the Law of the Sea (ABLOS) is a joint board of the International Hydrographic Organization (IHO) and the International Association of Geodesy (IAG). The ABLOS comprises four representatives from IHO Member States and four representatives from the IAG. The United Nations Division for Ocean Affairs and Law of the Sea (UN-DOALOS) and the Secretariat of the IHO provide one ex-officio member each. The ABLOS is charged with providing advice, guidance and, where applicable, offering expert interpretation of the hydrographic, geodetic and marine geo-scientific aspects of the Law of the Sea to the parent Organizations, their Member States or to other organizations on request. It also reviews State practice and jurisprudence on Law of the Sea matters which are relevant to the work of the Board to enable it to provide expert advice when needed. The ABLOS also studies, promotes and encourages the development of appropriate techniques in the application of the technical provisions contained within the UN Convention on the Law of the Sea (UNCLOS). IHO publication C-51-*Manual on the Technical Aspects of the United Nations Convention on the Law of the Sea* is maintained by the ABLOS.

The 26th Business Meeting of ABLOS was held at the IHO Secretariat in Monaco on 7 and 10 October 2019. The 10th ABLOS Conference, titled '*Opportunities and Challenges in the Governance of the Planet Ocean*' took place from 8 to 9 October 2019 and also was held at the IHO Secretariat.

26th Business Meeting of ABLOS

The ABLOS members and observers from Australia, Brazil, Chile, Denmark, France, Republic of Korea the United Kingdom (UK) and United States were present; the appointed observers from Sweden (IAG) and India (IHO) sent apologies; representatives from Qatar and Japan also attended both events. The Chair, Professor Niels Andersen (IAG – Denmark), welcomed all Board members and observers to the business meeting.



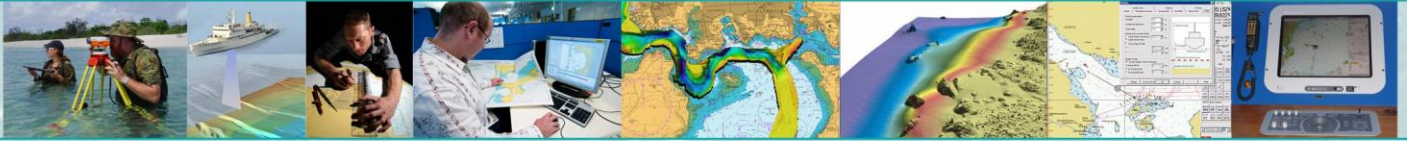
ABLOS Members gathered for ABLOS BM26 in Monaco

The first session of the business meeting completed final preparations for the 10th ABLOS Conference.

ABLOS members and observers discussed notable topics from the various conferences, seminars and workshops that they had attended and undertaken since the previous business meeting. The meeting also discussed the ABLOS capacity building training course, the revision of the material and its ownership and a small group was established to lead this work.

During the 2nd session of the Business Meeting the Terms of Reference and Rules of Procedure for the ABLOS and the Conference Fund Guidelines were reviewed and a number of editorial amendments were identified. The ABLOS noted that two IHO appointed members and one AIG appointed member were due to end their terms in 2021. All were requested to advise whether they would be available for re-nomination by their respective host organizations or whether they were aware of suitable candidates to fill the forthcoming vacancies.

The final actions to complete Edition 6.0.0 of the TALOS Manual - C-51 – *Manual on Technical Aspects of the United Nations Convention on the Law of the Sea - 1982* – were agreed, noting the action placed on the ABLOS by HSSC11. In addition the French and Chilean members of the ABLOS provided progress reports on the French and Spanish translations of Edition 6.0.0. It was also agreed to start a holistic review of the C-51 in preparation for an Edition 7.0.0.



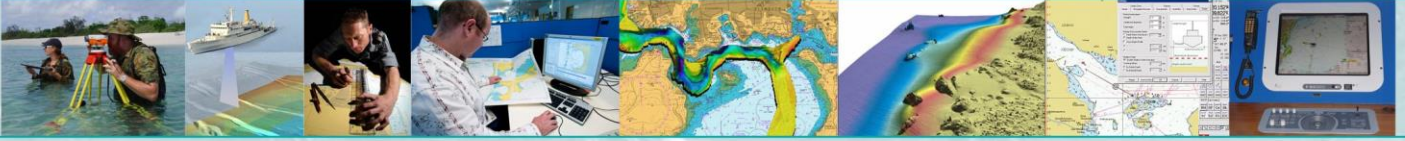
The ABLOS also identified the main resultant output and action from the 10th Conference and the ABLOS agreed to investigate the legal status of Crowdsourced Bathymetry (CSB) with respect to UNCLOS. It was hoped that opinion papers could be developed for publication and supporting presentations made at appropriate events to help clarify the status of CSB and potentially gain wider national acceptance for the activity.

The focus of the regional seminar in Brazil, which will be held immediately following the next Business Meeting, was discussed and agreed. The meeting then considered the theme, title and keynote speaker for the next Conference, the 11th ABLOS Conference, which will be held in Monaco in 2021. It was agreed that there was a need to maintain the momentum generated at the 10th Conference and therefore dates, the title and keynote speaker needed to be advertised at least 18 months ahead of the proposed dates. A Conference organizing committee was formed to undertake these tasks.

On completion of the ABLOS Conference, Mrs Izabel King-Jeck (IHO-Brazil) assumed the role of Chair and Dr Juan-Carlos Báez (IAG – Chile) was elected as Vice-Chair.

10th ABLOS Conference

The 10th ABLOS Conference was attended by 70 delegates and 25 different States were represented, (Australia, Belgium, Brazil, Canada, Chile, China, Denmark, Faeroes Islands, France, Germany, Indonesia, Japan, Kuwait, Netherlands, New Zealand, Norway, Oman, Portugal, Qatar, Republic of Korea, Saudi Arabia, South Africa, Sweden, United Kingdom and USA). The Conference included 20 presentations covering a wide variety of topics and issues in relation with the theme “*Opportunities and Challenges in the Governance of the Planet Ocean*”. IHO Secretary-General, Dr Mathias Jonas, welcomed the delegates on behalf of the IHO. The opening key note address was given by Professor Ronán Long, Director of World Maritime University-Sasakawa Global Ocean Institute. The general theme of the conference was the growing recognition that the oceans are crucial to global sustainability and play a key equilibrating role in global climate as the primary sink for excess heat and carbon present in the global climate system and represent a vital repository and supporter of global biological diversity. Noting coastal and ocean areas are the drivers for the global economy, especially through sea-borne trade as well as via a rising ‘Blue Economy’ around the world, and play a crucial and increasingly important role in global food security. These areas are therefore of critical importance across scales, from the global to the regional, national and sub-national coastal community levels. Acknowledging that the oceans are also increasingly under threat, notably as a result of enhanced competition for coastal and marine resources, and intense and diverse uses of coastal and marine spaces, threatening their sustainability. All too frequently this competition leads to friction and tension among marine users and incompatible spatial and temporal overlaps between uses of ocean space. The impacts of climate change on the oceans further compound these issues. Governing our ‘Planet Ocean’ therefore represents a vital and pressing opportunity and



challenge. The conference provided an opportunity to reflect on, principally, legal and technical aspects relating to a range of these themes. The presentations on various aspects of the Law of the Sea generated numerous questions and comments in plenary and much discussion in the margins during the breaks.



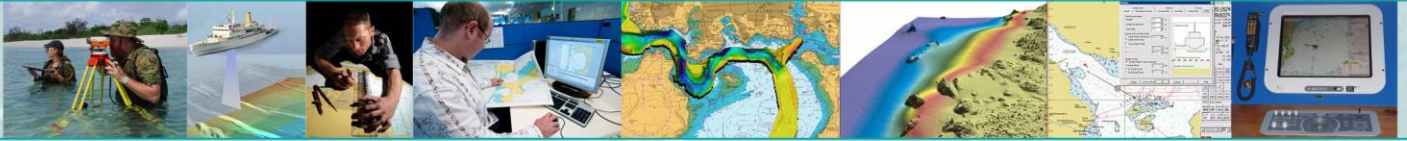
Participants at the 10th ABLOS Conference

Date of Next Meetings

The next Business Meeting (BM27) and Seminar will be held in Niterói, Brazil, 6 to 9 October 2020 and the 28th Business Meeting and the 11th ABLOS Conference will be held in Monaco and is planned for the period 4 to 7 October 2021. Details will be available from the IHO website as the planning progresses.

Availability of Documents

The documents considered by the business meeting and the presentations given at the Conference will be available from the ABLOS section of the IHO website (IHO → Committees and Working Groups → HSSC → ABLOS).



NEW HYDROGRAPHER OF KOREA



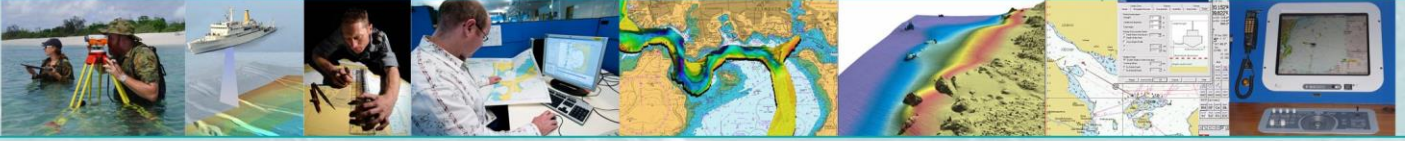
Dr. HONG Lae Hyung

Academic Background

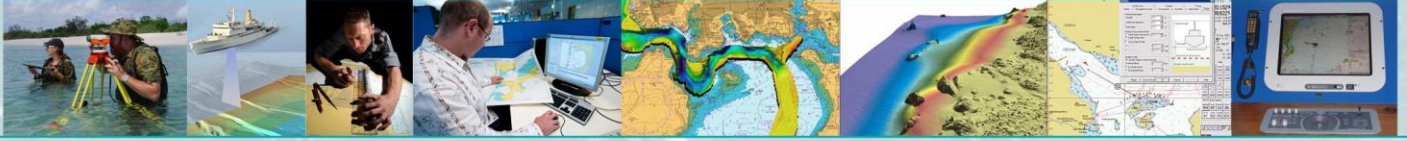
- 2010 PhD Logistics and Operations Management, Cardiff University, UK
- 1996 MSc Public Administration, Seoul National University, ROK
- 1994 BSc Public Administration, Korea University, ROK

Professional Career

- | | |
|-----------------------|---|
| Sep. 2019 – Present | Director General, Korea Hydrographic and Oceanographic Agency, Ministry of Oceans and Fisheries (MOF) |
| Jan. 2018 – Sep. 2019 | Director, Audit and Inspection Division, MOF |
| Aug. 2016 – Dec. 2017 | Director, Port Management Division, Shipping and Logistics Bureau, MOF |
| Aug. 2013 – Aug. 2016 | Seconded Officer, Organisation for Economic Co-operation and Development (OECD) |
| Jul. 2012 – Jul. 2013 | Director, Navigational Safety Information Division, Maritime Affairs and Safety Policy Bureau, Logistics and Port Office, Ministry of Land, Transport and Maritime Affairs (MLTM) |
| Mar. 2011 – Oct. 2011 | Director, International Cooperation Division, Policy Planning Bureau, Planning and Coordination Office, MLTM |



- Jun. 2010 – Mar. 2011 Director, Marine Territory Development Division, Marine Policy Bureau, MLTM
- Jun. 2008 – Jun. 2010 Head, Compensation Policy Team, Hebei Spirit Incident Compensation Bureau, MLTM
- April 1995 Appointed as a Civil Servant



31ST ASSEMBLY OF THE INTERNATIONAL MARITIME ORGANIZATION
IMO Headquarters, London, UK, 25 November to 05 December

Contribution to the IHO Work Programme 2019	
Task 1.1.8.1	Maintain relationship with the International Maritime Organization (IMO)

The biannual Assembly is the main organ of the International Maritime Organization (IMO). It regularly addresses a wide range of administrative and contentious operative issues. The 31st IMO Assembly was held from 25 November to 05 December at the IMO Headquarters in London, United Kingdom and was attended by over a thousand participants representing the vast majority of the overall 174 member states and numerous observers. The IHO was represented by the Secretary-General, Dr Mathias Jonas for the first four days.

The core elements of each Assembly are the regular reports of the subordinate committees such as:

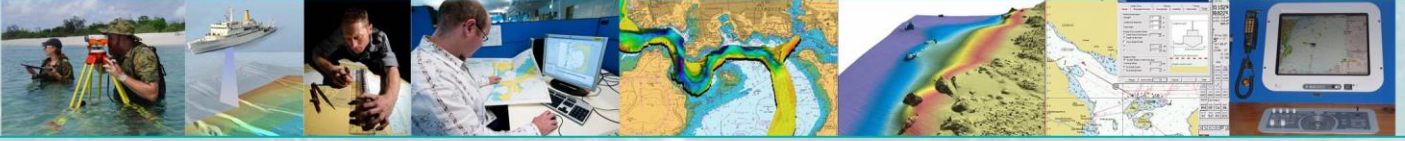
- Maritime Safety Committee
- Legal Committee
- Marine Environment Protection Committee
- Technical Cooperation Committee
- Facilitation Committee

Before the respective committee chairs reported, the re-elected IMO Secretary-General Kitack Lim addressed the delegation by a thorough report on the Secretariat’s performance, including budgetary issues. After his report, many Member States provided their respective national statements. The majority of these statements identified IMO’s response to climate change as the most relevant item placed on the Organization’s agenda for the forthcoming years. Proposed measures to be taken in support are new regulations to extend the use of low sulphur fuels and the accelerated development of a legal framework of Maritime Autonomous Surface Ships (MASS).

The Secretary-General Lim further reported on the ongoing reform of the IMO Council. It is planned to extend the term of the Council from two to four years and to increase the overall number of Council seats from 40 to 52. Among others, the Council reform addresses the subject of terms and conditions of media attendance at meetings of IMO committees and their subsidiary bodies. The regulations



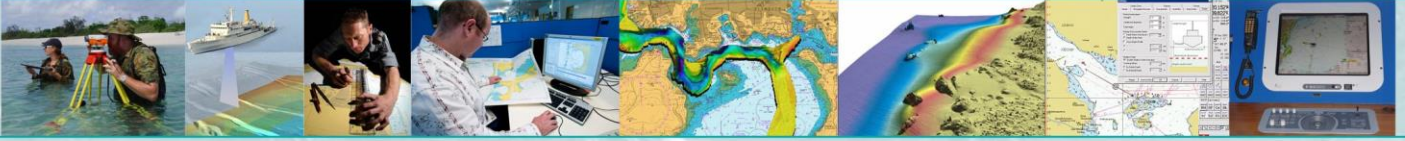
IHO Secretary-General, Dr Mathias Jonas and IMO Secretary-General Kitack Lim at the Reception at the German Embassy in London in company with the German Delegation led by Dr Norbert Salomon (3rd from left)



to be put in place insist on accurate, factual reporting and fair comment, including on social media.

The IHO Secretary-General took the opportunity to approach several IMO Member States to advertise for IHO membership and discussed ways to deepen the collaboration between IMO and IHO on the fields of technical standardization – namely the extension of the S-100 framework to harbour data.

Next IMO Assembly is scheduled to be held in November 2021 in London, UK.



7TH MEETING OF THE NAUTICAL INFORMATION PROVISION WORKING GROUP (NIPWG)

Tallinn, Estonia, 25 - 29 November

Contribution to the IHO Work Programme 2019	
Task 2.1.2.5	Organize, prepare and report meetings of NIPWG
Task 2.5.2	Support the development and implementation of Maritime Services
Task 2.8.1	Maintain S-12, as appropriate - <i>Standardization of List of Lights and Fog Signals</i>
Task 2.8.3	Maintain S-49, as appropriate - <i>Standardization of Mariners' Routeing Guides</i>

The 7th meeting of the Nautical Information Provision Working Group (NIPWG) took place in Tallinn, Estonia, hosted by the Estonian Maritime Administration (EMA) from 25 to 29 November.

Ms Kaidi Katus, Head of Aids to Navigation and Hydrography Division and Deputy Director General of EMA, welcomed the participants and gave an opening address emphasising the importance of NIPWG activities in the development of some of the key components of the S-100 Implementation Strategy. The meeting was chaired by Mr Jens Schröder-Fürstenberg (Germany), supported by Mr Thomas Loeper, Secretary (USA). Twenty-five delegates from 14 Member States (Canada, Denmark, Estonia, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Republic of Korea, Spain, United Kingdom and United States) and seven expert contributors (Anthropocene Institute, Furuno/IEC, ICS¹, IHMA², KRISO³, National Taiwan Ocean Centre and University of New Hampshire) attended the meeting. The IHO Secretariat was represented by Assistant Director Yves Guillam.

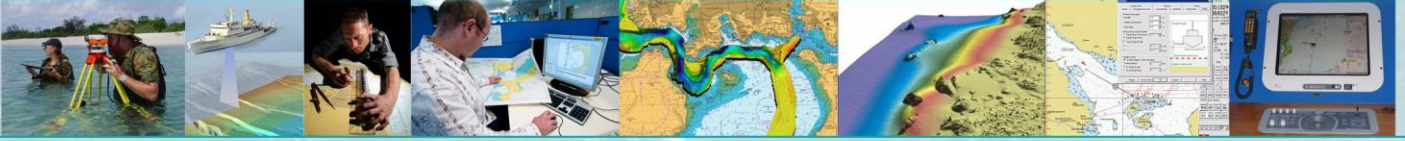
The meeting was opened with an important clarification on the functional terminology - *route monitoring* or *route planning* – the only one to be used when addressing the use of future digital nautical publication products in an ECDIS environment and issues related to the architecture of navigation systems. These terms match with the IMO definitions in use.

The Secretariat reported on the outcome of the 3rd meeting of the Council in relation to NIPWG activities. The participants were in particular informed that following the Council's endorsement of a draft S-100 Implementation Strategy, engagement with the IMO will be starting soon with a

¹ International Chamber of Shipping.

² International Harbour Masters Association.

³ Korea Research Institute of Ships and Ocean Engineering.

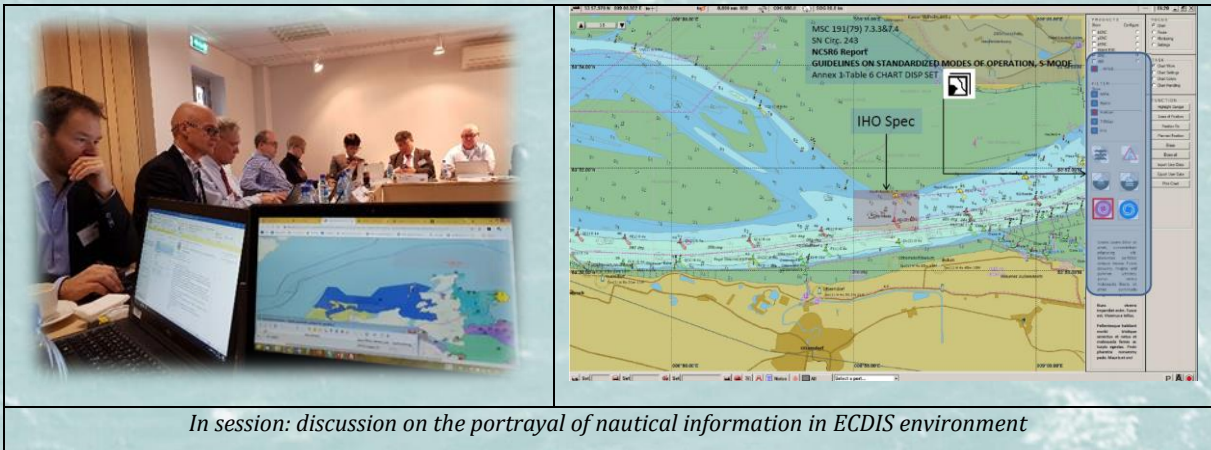
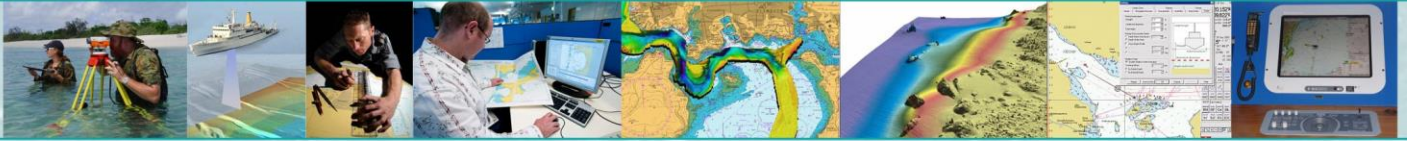


submission paper to NCSR7⁴ which presents a roadmap of the introduction of the next generation of S-101 Electronic Navigational Charts (ENC) and introduces the resulting implications for existing and new ECDIS installations. Attention was drawn on the fact that the timeline is set to achieve synchronization of the implementation of S-101 ENC compatibility with the application of MSC.1/Circ.1593 - *Interim Guidelines for the Harmonized Display of Navigation Information Received via Communications Equipment* - coming into force on 1 January 2024 for new ECDIS equipment by OEMs.

As part of the national projects presented during the meeting, the working group noted the good progress made on the development of the Norwegian Pilot Guide, which has led to a certain level of harmonization of harbour infrastructure data in cooperation with port authorities. The potential reuse of this concept for the provision of nautical information in non-SOLAS environment was noted as well as the possible benefit for the S-100 Implementation Strategy, if data models could be derived from S-12x Product Specifications. In the presence of the representative of IHMA, the meeting agreed that the assessment of needed information to produce a potential product specification on Marine Harbour Infrastructure, including *services* to be established by the HOs to collect data from harbour authorities, was now required. A convincing presentation by the representative of UNH also confirmed the need to move forward in the development of the S-126 - *Marine Physical Environment* data modelling. The intention to initiate or resume the relevant Product Specification development will be submitted for approval to HSSC.

In the context of the S-100 Implementation Roadmap, the meeting acknowledged the increasing importance of the development of the S-128 Product Specification - *Catalogue of Nautical Publication* as a possible driver to provide end-users with the up-to-dateness of the products to be used and to be recognized during Port State control inspections in the future. A set of subsequent actions was decided, some of which with a possible impact on the "WENS" concept. This development was reported by the representative of KRISO for KHOA. The KHOA's project for portrayal harmonization, which is so critical for S-12x based products used in ECDIS environment, led to the decision to have a one-day workshop at the next meeting to assess use-cases and lessons learned provided by Member States. Portrayal issues were also discussed for S-124 - *Navigational Warnings*, and on S-122 - *Marine Protected Areas*. It was noted that some nations have started to produce test datasets in support of some provision and portrayal experimentations.

⁴ IMO Sub-Committee on Navigation, Communications and Search and Rescue (NCSR 7) – Reference: IHO CL 54/2019.



In session: discussion on the portrayal of nautical information in ECDIS environment

Representative of the USA reported on the final steps of the revision of S-49 - *Standardization of Mariners' Routing Guides* that will be submitted as Edition 2.1.0 to HSSC for endorsement in application of the recently amended IHO Resolution 2/2007. In this context, the meeting also considered briefly the possible implications of the discontinuity, within a five years' time frame, of the production of paper charts by the US.

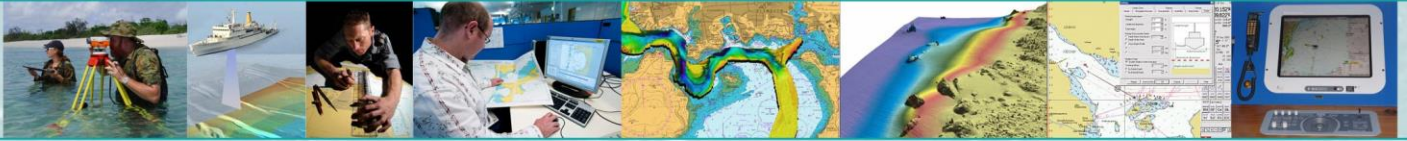
Mr David Lewald (US Coast Guard) informed the participants on the outcome of the recent IALA technical meetings. The working group noted with appreciation the IALA's initiative aiming to develop S-125 - *Marine Navigational Services* for the IHO, as well as the existence and ongoing development of the Marine Resource Name Management Guideline by IALA.

At the end of the meeting, Mr Stefan Engström (Finland) was elected as Vice-Chair of NIPWG.

The 8th meeting of the NIPWG is scheduled to be held in Brest, France, from 21 to 25 September 2020.



NIPWG-7 participants in Tallinn, Estonia



IHO-IOC GEBCO (GENERAL BATHYMETRIC CHART OF THE OCEANS) PROJECT
ANNUAL MEETINGS

Portsmouth, New Hampshire, USA, 4 – 8 November

Contribution to the IHO Work Programme 2018	
Task 3.6.1	Attendance of GEBCO Guiding Committee (GGC) and associated bodies including TSCOM, SCRUM and GEBCO symposium



A series of meetings related to the IHO-IOC GEBCO (General Bathymetric Chart of the Oceans) project were hosted by the Center for Coastal and Ocean Mapping-Joint Hydrographic Center/University of New Hampshire (CCOM-JHC/UNH) in Portsmouth, NH, USA, from 4 to 8 November 2019:



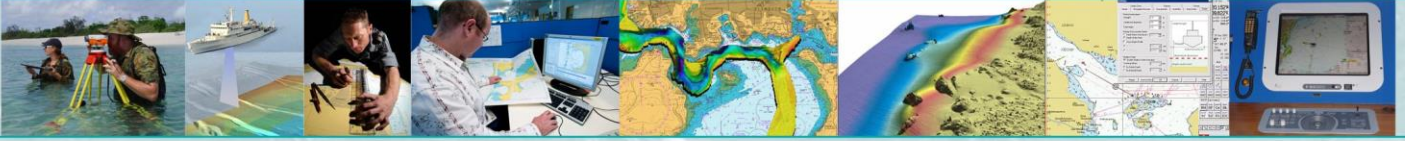
- 4 and 5 November: Joint meetings of the Technical Sub-Committee on Ocean Mapping (TSCOM), the Sub-Committee on Regional Undersea Mapping (SCRUM) and the Sub-Committee on Communications, Outreach and Public Engagement (SCOPE);
- 6 November: GEBCO Symposium; and
- 7 and 8 November: 36th Meeting of the GEBCO Guiding Committee (GGC).

The IHO Secretariat was represented at the joint TSCOM, SCRUM and OWG meeting by Assistant Director David Wyatt and joined by Director Mustafa Iptes for the GEBCO Symposium and the meeting of the GGC.

TSCOM, SCRUM and SCOPE

The joint meeting of TSCOM-SCRUM-SCOPE was co-chaired by Ms Caitlyn Raines (USA), Vice-Chair of TSCOM, Dr Vicki Ferrini (USA), Chair of SCRUM, and Professor Hyo Hyun Sung (ROK), Chair of SCOPE.

The initial sessions covered a number of topics relevant to TSCOM and SCRUM, including an update brief by the Director of the IHO Data Centre for Digital Bathymetry (DCDB) and the Chair Crowdsourced Bathymetry Working Group (CSBWG), which highlighted recent developments, current projects and future considerations. A comprehensive brief on the Seabed 2030 structure and the activities of the Regional Data Centers were received. A number of new applications were demonstrated, including the Arctic App and the Meso-American and Caribbean Sea Hydrographic Commission (MACHC) Discovery App, both of which greatly assist in gaining a better knowledge of data availability within the applicable region.



TSCOM, SCRUM and OWG in plenary session

A detailed brief on the B-11 – *GEBCO Cookbook* – was provided and a number of new chapter titles were identified as well as those existing chapters which needed to be updated. Details of the generation of the GEBCO 2019 Grid were given, in which the new data was highlighted, and the current development state for the 2020 Grid was provided.

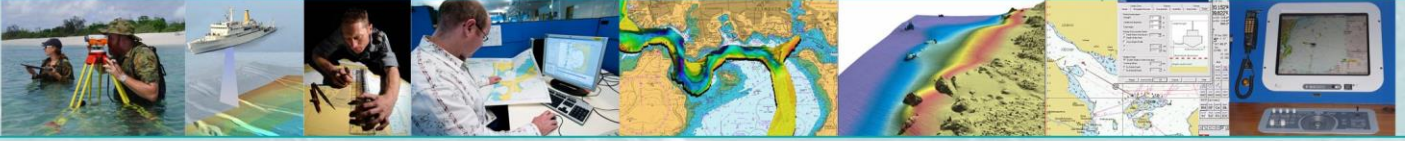
Professor Hyo Hyun Sung, Chair SCOPE, presented a detailed update on activities, the proposed GEBCO communications, outreach and capacity building strategies and suggested activities to increase the public engagement with GEBCO and the subordinate Seabed 2030 project. The updating and improvements to the GEBCO and Seabed 2030 websites were noted and the proposal to generate a new world map version from the 2020 Grid was considered.

As a result of the increased interest in ocean mapping and the significant increase in participation at the Sub-Committee meetings and the symposium, it was proposed that a restructuring of the GEBCO week could be considered by the GGC to allow more time to review the various activities and generate more measured future work plans and funding applications.

The Vice-Chair of SCRUM, Pauline Weatherall, advised the Chair of her desire to step down, and as a result Aileen Bohan (Ireland) was elected as Vice-Chair of SCRUM for the period 2019 to 2022.

GEBCO Symposium

For the twelfth consecutive year, the GEBCO project organized a symposium on the theme of 'Map the Gaps'. The symposium was opened by Kevin Hope, Deputy Director Source Operations at the National Geospatial Agency (NGA) of the USA. The symposium, which included digital poster sessions and contributions from a broad spectrum of institutions involved in all aspects of ocean mapping, featured 16 presentations and two panel sessions on a diverse range of topics. The associated presentations will be available from the GEBCO web site at: (<https://www.gebco.net/about-us/gebco-symposium/>).



Kevin Hope, Deputy Director Source Operations, NGA, opening the GEBCO Symposium

GEBCO Guiding Committee

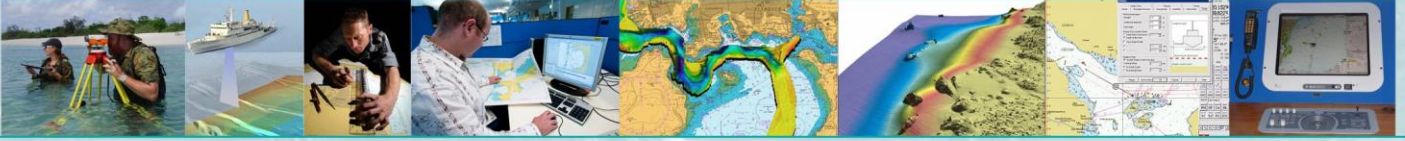
All of the IHO appointed representatives on the GEBCO Guiding Committee were present. Representatives of Australia, Bangladesh, Brazil, Canada, Ecuador, France, Germany, Guam, India, Indonesia, Ireland, Israel, Italy, Japan, Mexico, New Zealand, Nigeria, Peru, Philippines, South Africa, Republic of Korea, Saudi Arabia, United Kingdom, USA, IOC, IHO and representatives from various government departments and academic institutions attended the meeting as observers with a number of industry stakeholders attending as expert contributors.

The Chair, Mr Shin Tani (IHO - Japan), introduced the agenda and programme. The GGC received brief reports from its Sub-Committees and endorsed the work which they had undertaken. The GGC also received reports from key personnel performing functions on behalf of GEBCO as well as reports from its parent bodies, IHO and IOC, on activities since the previous meeting.



GEBCO Guiding Committee meeting at GGC36

The Chair of the Sub-Committee on Undersea Feature Names (SCUFN) reported on an automatic discovery process for undersea features. He noted that this year was the first year that supporting data had been provided to the DCDB by states proposing feature names. He requested guidance on how the SCUFN should consider feature name proposals that were not visible on a $\geq 1:1\,000\,000$ scale map. After detailed consideration, the GGC agreed that the use of the variable depth resolution approach with a provision for Polar Regions should be employed, which would align with the future GEBCO grid product.



The revised harmonized Terms of Reference (ToRs) of all the sub-committees were reviewed and approved along with the ToRs of the Sub-Committee on Communications, Outreach and Public Engagement (SCOPE).

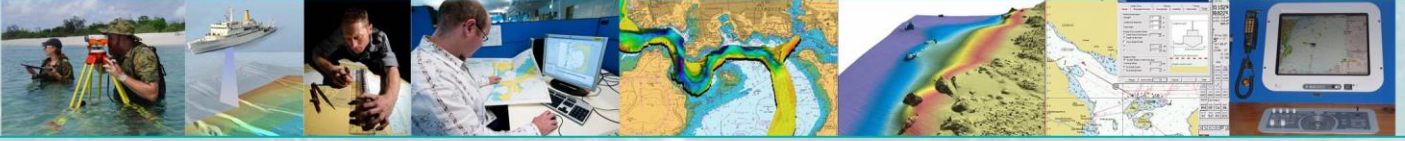
The GGC considered outreach and ways to raise the profile of the GEBCO project among the different stakeholder and user communities, including the IHO and the IOC Member States, the maritime and scientific community and the general public. The GGC reviewed the draft communications strategy and approved SCOPE to commence work in line with the proposed strategy. The GGC devoted considerable time on discussions on the Seabed 2030 Project. The acting Seabed 2030 Project Director provided a comprehensive presentation on the activities of the Seabed 2030 Project Team and the Regional Centers. The GGC reviewed a proposed Seabed 2030 Funding Strategy, as well as reviewing the Year 2 Seabed 2030 Project report and the proposed Year 3 Project Work Plan and both were endorsed after inclusion of some amendments and recommendations. He highlighted the recent appointment of the Director, Mr Jamie McMichael-Philips, who will take up his post on 1 December.

The GGC also reviewed its current financial situation in relation to proposed planned projects. The Committee addressed the budget submissions from its subordinate bodies and approved revised allocations to ensure a suitable contingency balance was maintained for 2020 to cover emergent items. The draft consolidated GEBCO Work Plan and budget will be reported to the 12th meeting of the IHO Inter-Regional Coordination Committee (IRCC) and the 53rd meeting of the IOC Executive Council, for consideration and endorsement of the parent organizations.

The GGC reviewed the state of membership and it was noted that one IOC appointed member had not attended for a second meeting. It was agreed that the Chair would investigate the membership statuses in collaboration with the IOC Secretariat.

All meeting documents and reports will be available from the IHO website (IHO → Committees and Working Groups → IRCC → GEBCO).

The next GEBCO annual meetings are planned to take place in November 2020 in France. Due to the increased number of sub-committees and the expansion of tasks, it was proposed that for the 2020 meetings the GGC should meet the week after the sub-committees and the symposium. Additionally it was agreed that for 2021 onwards the GGC should meet for 3 days in the northern spring period with the sub-committees and symposium taking place over 5 days in the northern autumn period, it was further agreed that initially the GGC meetings should rotate between the IOC and IHO Secretariats.



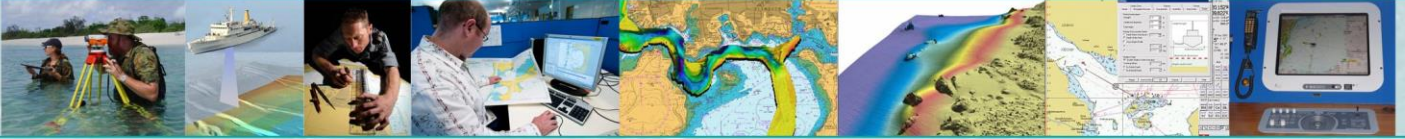
**5TH MEETING OF THE NAUTICAL CARTOGRAPHY
WORKING GROUP (NCWG)
AND 2ND WORKSHOP FOR REGIONAL
INT CHART/ENC COORDINATORS
Stockholm, Sweden, 4–9 November**

Contribution to the IHO Work Programme 2019	
Task 2.1.2.4	Organize, prepare and report meetings of NCWG

Hosted by the Hydrographic Office of the Swedish Maritime Administration, the 5th meeting of the Nautical Cartography Working Group (NCWG-5) took place in Stockholm, Sweden, from 5 to 8 November. The meeting was chaired by Mr Mikko Hovi (Finland), supported by Mr James Timmins, Secretary (United Kingdom). Thirty-four delegates from 21 Member States (Australia, Brazil, Canada, Denmark, Estonia, Finland, France, Germany, India, Indonesia, Italy, Japan, Latvia, Netherlands, Norway, Republic of Korea, Romania, Spain, Sweden, United Kingdom and USA), two Expert Contributors (Esri, Teledyne-Caris), Dr Lysandros Tsoulos, representing the FIG/IHO/ICA International Board of Competence for Nautical Cartographers and the ICA Commission on Marine Cartography participated in the meeting. The IHO Secretariat was represented by Assistant Director Yves Guillam, who also facilitated a workshop for Regional INT Chart/ENC Coordinators on 4 November, preceding the NCWG-5 meeting.

Mr Magnus Wallhagen (Sweden) welcomed the participants on behalf of Mr Patrik Wiberg, Director of the Swedish Hydrographic Office. In his opening address, he highlighted the challenges the Swedish Hydrographic Office's cartographers face every day due to Sweden's archipelago environment. In his position as Vice-Chair of the HSSC, he also stressed the most important issues raised by the HSSC and the Council, which included the requirement for the NCWG to develop at this meeting, as a matter of priority, the recommendations on the Future of the Paper Chart. He emphasized in particular the issues faced by Hydrographic Offices for the allocation of resources in the sustainable maintenance and production of traditional charts (paper and ENCs) and the investments needed for preparing the future with S-100 based products.

Following a proposal from India in support of the IHO Resolution 1/2005 as amended – *IHO response to disasters* – the working group noted that amendments to this Resolution were currently submitted for approval at the next Session of the Assembly and was of the opinion that the provision of emergency contact details was likely to be more appropriate in Nautical Publications than printed on or included in nautical charts. In a proposal from Australia justifying the need for a new type of chart designed with the main purpose of serving as back-up to electronic navigation that can be easily produced from officially (and richer) published ENC data, the working group noted that “two” standards would certainly create some confusion to the mariners. It was also agreed that the associated proposed Australian amendment to the IMO

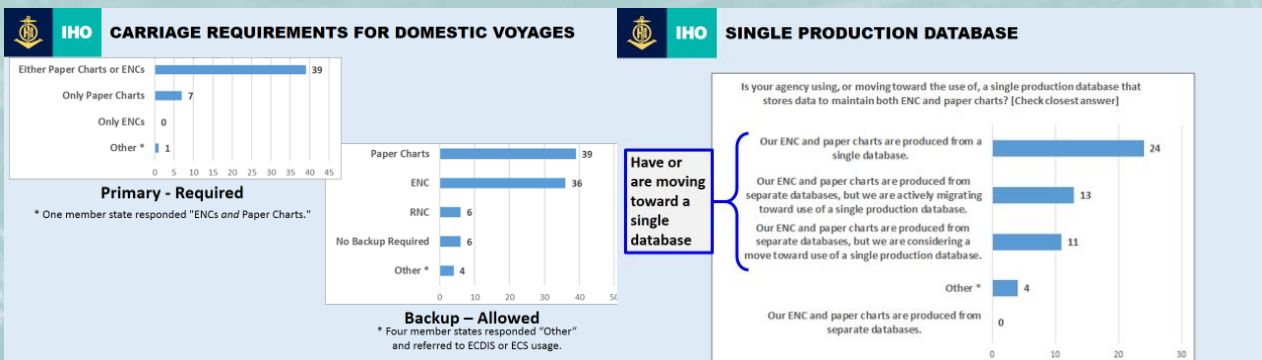


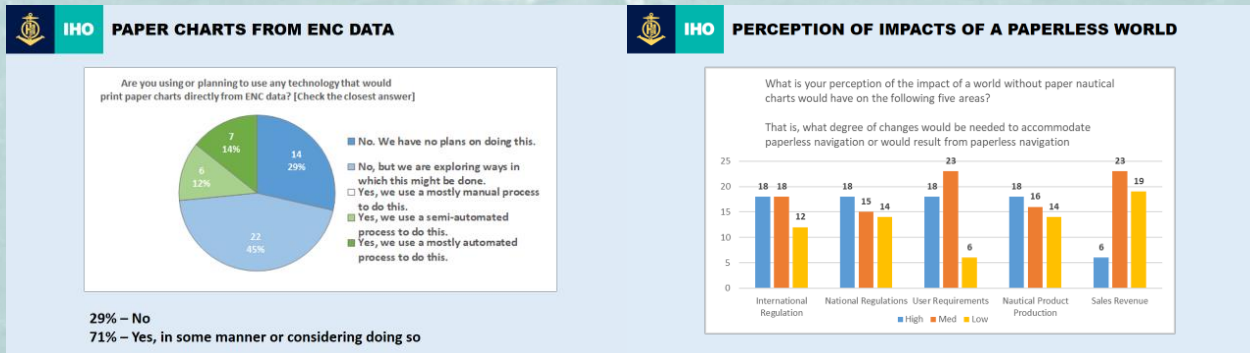
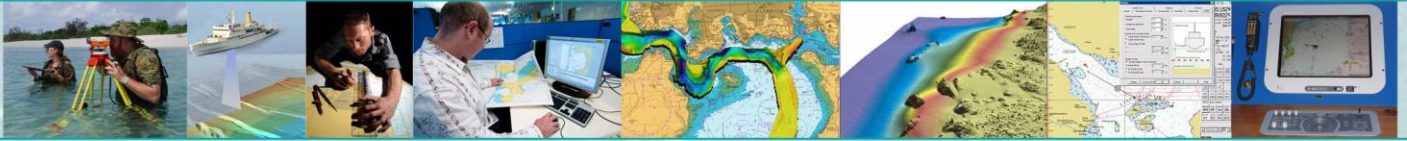
definition of what constitutes a back-up paper chart was not helpful on the matter. The US representative presented the outcome of their experimentation on the automated production of paper charts from an ENC chart database, supported by Esri who stressed the current limitation factors in the IHO standards for automation.



NCWG-5 participants

The Chair (US) of the Sub-Working Group on the Future of the Paper Chart (FNPC) provided a summary report on the outcome of the survey on the Future of Nautical Paper Charts to which 52 Member States responded.





FNPC Survey Excerpt

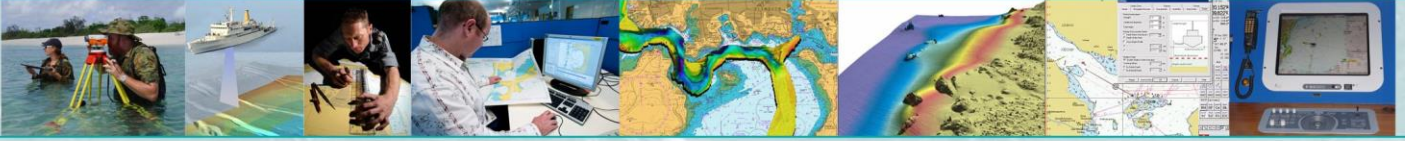
Discussions on the outcome of this survey led to the preparation of three draft challenging and composite recommendations that will be finalized, together with the report on the FNPC, for submission to HSSC. It was noted that due to the deadline for submission to HSSC (mid-March 2020), the report will be available prior to the 2nd Session of the Assembly. As a consequence and by anticipation, the NCWG also drafted some amendments to its Terms of Reference in order to propose a better alignment of its activities with the IHO Work Programme and priorities, such as the S-100 Implementation Decade.

The working group noted the concept for the visualization of the quality of bathymetric data for safe navigation presented on behalf of the Chair of the DQWG, which was questioned mainly due to portrayal issues illustrated by some “counter-examples” provided by Finland. In response to an action from HSSC-11, the meeting welcomed the offer made by the UK to take over the role of custodian for the maintenance of INT-1 – *Symbols, Abbreviations and Terms used on Charts*. This topic was complemented by several suggestions from industry and representatives of the ROK in favour of the development of a *.svg IHO library of symbols to be made available in the IHO Geospatial Registry.

Following the workshop for Regional INT Chart/ENC Coordinators, that included some brainstorming about the future role of Regional Chart Coordinators, it was generally agreed that the INT Charts schemes are not a priority anymore. The IHO Secretariat provided an update on the preparation of the commissioning and timelines of the INTtoGIS II⁵ web services (S-11 Part B, web catalogue of ENCs and INT charts, new layers in the Manager mode such as AIS data, CATZOC, Ports database, enhanced user interface, layers with different patterns and transparency cursors...).

At the end of the meeting, the working group welcomed the offer made by Spain to host the 6th meeting of the NCWG in Cádiz in November 2020.

⁵ A project that is supported by KHOA.



IMO EXPERTS GROUP ON DATA HARMONIZING (EGDH)

IMO Headquarters, London, UK, 04 - 08 November

Contribution to the IHO Work Programme 2019

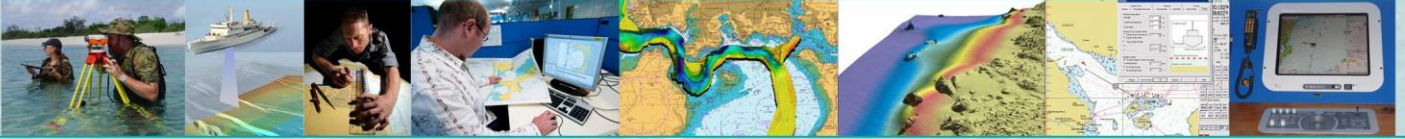
Task 2.1.5.1	Attendance of IMO Experts Group on Data Harmonizing (EGDH) meeting
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The 1st session of the IMO Experts Group on Data Harmonization (EGDH-1) meeting took place from 04 to 08 November 2019 at the IMO Headquarters in London, United Kingdom, under the chairmanship of Mr Mikael Renz (Sweden).

EGDH-1 was attended by representatives from the following Member States: Denmark, France, Germany, Ghana, Liberia, Marshall Islands, Netherlands, Norway, Singapore and Ukraine. The meeting was also attended by delegates from the United Nations Economic Commission for Europe (UNECE), World Customs Organization (WCO), European Commission (EC), International Chamber of Shipping (ICS), International Organization for Standardization (ISO), International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), International Radio Maritime Committee (CIRM), Baltic and International Maritime Council (BIMCO), International Association of Classification Societies (IACS), Oil Companies International Marine Forum (OCIMF), International Transport Workers' Federation (ITF) and International Port Community Systems Association (IPCSA). Director Abri Kampfner represented the IHO Secretariat.



EGDH-1 in session

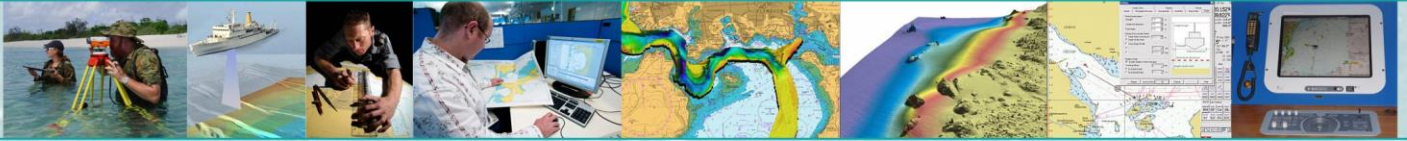


Director Kampfer provided a report on the status on the S-100 framework Standard and highlighted the changes and extensions included in S-100 Edition 4.0.0. The report also included an update on the status of the suite of S-100 based product specifications currently under development by various bodies and the IHO GI Registry operated by the IHO Secretariat. The meeting acknowledged the potential for developing common work in the future between the IMO FAL Committee, and the competent bodies of IALA and IHO on S-127 – Marine Traffic Management. IHO and IALA informed the Group of the possibilities to use MRN as unique identifier not only for objects but also for reports and publications, and IALA invited IMO to become a Domain Manager. The meeting noted the IHO website (<http://s100.iho.int/S100/>) which was a visual representation of the scope of the S-100.

Since the EGDH was meeting for the first time, an introduction to the IMO Compendium was made to ensure that the meeting had the same understanding at the starting point of the discussions. The IMO data set, the IMO Reference Data Model and the Annexes of the IMO Compendium (FAL.5-Circ.41) were introduced by the Organizations that had collaborated to create them. It was recalled that phase 1 of the revision of the IMO Compendium was completed by FAL 43, with data elements included in the FAL Convention, security and waste messages. The first meeting of the EGDH was the starting point of phase 2 to extend the IMO Compendium to other data elements related to the information normally exchanged between ship and shore. During the discussions, the Group amended the definitions of data elements, the code list of data elements and added new business rules to data elements.

Inputs to the IMO Reference Data Model on port logistic operational data and real time data that will allow easy implementation of the IMO Just-In-Time Concept were discussed. The need for enhanced communication between the terminal and the port was also identified. The meeting identified clear links and overlaps with some Maritime Services in the context of e-navigation with organizations conducting ongoing work. The EGDH concluded that the IMO Compendium was a way to bridge the gap between different standards and was not meant to create new standards or change existing standards or conventions. The aim was to facilitate electronic messaging. The meeting agreed in principle the need to align the work of the EGDH with the work of NCSR Sub-committee on e-navigation.

After some consideration, the meeting prepared the terms of reference for the two next meetings of the EGDH that will take place in 2020. These terms of reference were drafted as generic as possible to be used at the two meetings. EGDH 2 had been tentatively scheduled to take place from 27 April to 1 May 2020 and the EGDH 3 from 26 to 30 October 2020.



**49TH MEETING OF THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION – TECHNICAL COMMITTEE 211 (ISO/TC 211)
Tokyo, Omiya, Japan, 3 to 7 December**

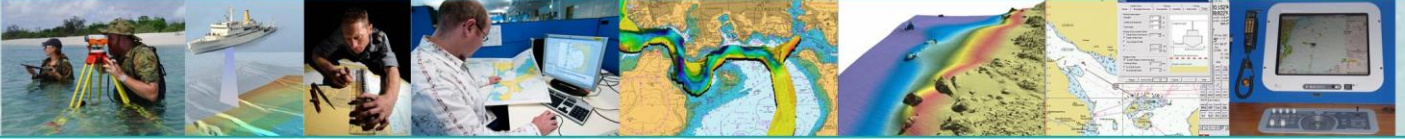
Contribution to the IHO Work Programme 2019	
Task 1.1.10	Attendance of the ISO/TC211 Meeting

The 49th meeting of the International Organization for Standardization (ISO) - Technical Committee 211 (ISO/TC211) was hosted by the Japanese Industrial Standards Committee (JISC). The meeting took place at the Omiya Sonic City building in Tokyo, Japan, from 3 to 7 December 2019.

The ISO/TC211 deals with the development of standards and specifications for the geospatial domain. The International Hydrographic Organization (IHO) is a Class A liaison member of ISO/TC211 and participates in its standards development and maintenance Working Groups. The 19100 series of standards and specifications produced by the ISO/TC211 have been used for the development of the IHO S-100 Universal Hydrographic Data Model and dependant Product Specifications. Twenty three “Permanent” and 5 “Liaison” member organizations attended the meetings. Assistant Director Anthony Pharaoh represented the IHO Secretariat at the Working Group and Plenary meetings.



Participants of the 49th ISO/TC211 Plenary Meeting



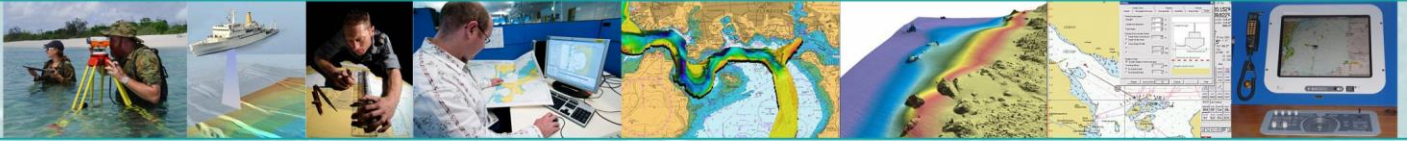
The ISO/TC211 has published and maintains 75 standards (including updates) and a further 25 standards are currently under development. The standards development activities are carried out under the six working groups. The ISO/TC211 maintains the following resources that can be used for accessing and using models and schemas defined in the 19100 series standards; ontology representations of the standards (available at <https://def.isotc211.org>); harmonized UML models (available at <http://iso.sparxcloud.com/index.php>); XML schema repository (available at <http://schemas.isotc211.org>); and a multi-lingual glossary of terms. ISOTC211 has also established a “Geodetic Registry” which includes coordinate reference systems and transformations. The online registry application can be accessed from (<https://geodetic.isotc211.org/>).

In addition to the working group meetings, a meeting was held on the activities being undertaken by the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM). The meeting included discussions on the contribution that “Standards Development Organization’s” (SDO’s), such as the IHO, the ISO/TC211 and the Open Geospatial Consortium (OGC), are making to the development of an Integrated Geospatial Information Framework (IGIF). The meeting noted the importance of this initiative and encouraged SDO’s participation to the 6th High Level Forum (HLF) UN-GGIM meeting which will take place in Windsor, United Kingdom, from 20 to 22 April 2020.

A report on the current state of the IHO’s standards development activities was presented, highlighting the publication of the first edition of the S-121 Maritime Limits and Boundaries Product Specification, which has been produced on behalf of the United Nations Division for Ocean Affairs and the Law of the Sea (UN-DOALOS). Reports were also provided by the representatives from the OGC and the Defence Geospatial Information Working Group (DGIWG), which resulted in discussions on required updates to the 19100 standards under the remit of WG6.

During a half-day “Standards in Action” seminar, presentations were provided on the implementation of the TC211 standards and specifications. These included the following topics; “The introduction of geographic information and statistical standards for surveying data quality”, “The Korean address assignment scheme of AOT (Address of things)”, “Data standardization activity for urban revitalization in Japan”, “Calibration and Validation of Airborne Multispectral Imaging Sensors” and “The entire Global Space 3D Grids and Application for Low Altitude Airspace Management”.

The 50th working group and plenary meeting is scheduled to take place from 8 to 12 June 2020 in Helsinki, Finland.



**20TH CONFERENCE OF THE MESO AMERICAN - CARIBBEAN SEA
HYDROGRAPHIC COMMISSION (MACHC)
AND
SEMINAR ON HYDROGRAPHIC GOVERNANCE AND MARINE
SPATIAL DATA INFRASTRUCTURE (MSDI)
Santo Domingo, Dominican Republic, 2-6 December**

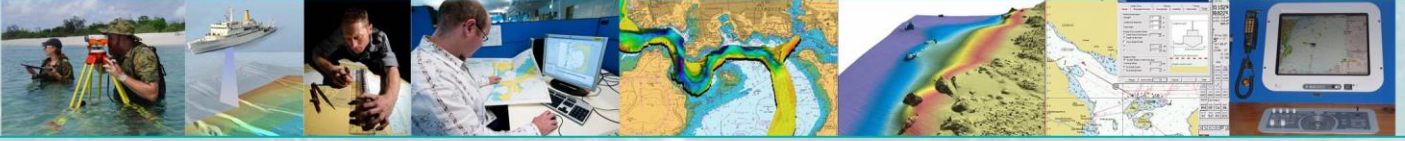
Contribution to the IHO Work Programme 2019	
Task 3.2.1.5	Prepare for and report meetings of the Meso American – Caribbean Sea Regional Hydrographic Commission (MACHC)

The 20th Conference of the Meso American - Caribbean Sea Hydrographic Commission (MACHC) was held in Santo Domingo, Dominican Republic, from 2 to 6 December, with 92 participants representing 14 Member States, eight Associate Members, one observer State, five overseas territories, eight observer organizations and 11 industry members. Director Mustafa Iptes and Assistant Director Alberto Costa Neves represented the IHO Secretariat.



Participants to the 20th Meeting of the Meso American – Caribbean Sea Hydrographic Commission

The Conference was hosted by the Dominican Republic Navy Hydrographic Service and held in Santo Domingo. It was chaired by Mrs Kathryn Ries (United States) and opened by Vice Admiral Miguel Enrique Peña Acosta, Vice Minister of Defence, and by Vice Admiral Emilio



Recio Segura, Head of the Dominican Republic Navy. Around 120 people attended the opening ceremony.

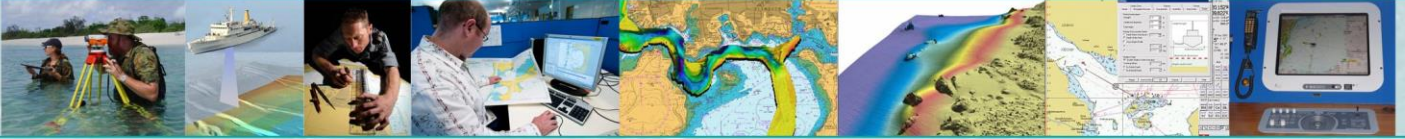
During the meeting, Guyana signed the Statutes of the MACHC as a full Member following its accession to the Convention on the IHO on May 2019.

The Commission was informed on the work, and the impact, of the IHO and its main bodies. Focus was given on the preparation for the 2nd Session of the IHO Assembly and on the alignment of the work of the three bodies of the MACHC: the International Chart Coordination Working Group (MICC), the Marine Spatial Data Infrastructure Working Group (MMSDIWG) and the Capacity Building Committee (CBC). MACHC Members selected the two representatives to the Council for the period 2020-2022 (Brazil and Netherlands).



Mr Rene Duesbury (Guyana) signs the Statutes of the MACHC as a full Member in the presence of the Chair, Mrs Kathryn Ries (USA) and Director Mustafa Iptes

Breakout groups were formed to consider the achievements, challenges, plans and capacity building needs. Recommendations were incorporated to the regional plans of the Commission. Coastal States in the region provided updated information on the status of hydrographic surveys, nautical charting and safety of navigation as well as on the contact information in hydrographic offices. The analysis of the reports allowed the MACHC to take important decisions regarding the coordination of the efforts in the region during the intersessional period.



Industry members provided insightful presentations on trends and perspectives in Latin America, technological developments, quality assurance, S-100 tools, autonomous surveys, data management and standards of competence. Their contribution to the work of the Commission and of the coastal states was well appreciated.

Presence of international and regional organizations provided for inputs and shared experiences that allow better coordination of efforts within the region, in areas of capacity building, ocean mapping, safety of navigation, response to disasters, support to sustainable development, access to funding, data management, environmental monitoring and risk assessment. The University of the West Indies (Jamaica) reported on the status of its work on Economic Assessment of Risks in Maritime Navigation across the Greater Caribbean Region and on the Global Statistical Analysis of Marine Incidents.

Participants updated the national details of the MACHC Response to Disasters Framework and were introduced to the relevant part of the MACHC website (www.iho-machc.org) designed to support the region when responding to disasters. Feedback of the responses to Hurricane Dorian that hit the region in August 2019 was presented by France, UK and the NGO MapAction, while Industry members covered technological developments that support responses to disasters.

The meeting was introduced to the concept plan jointly drafted by the IHO/IALA Capacity Building Initiative aimed at building maritime and marine capacity in the Caribbean for climate resilience and sustainable development. This concept plan will be further considered by the IHO-IMO-WMO-IOC-IALA-IAEA-FIG-IMPA Joint Capacity Building (CB) Group to seek funding from donor agencies. Participants agreed on the update of the three-year CB Plan and the needs of the coastal States for the coming years.

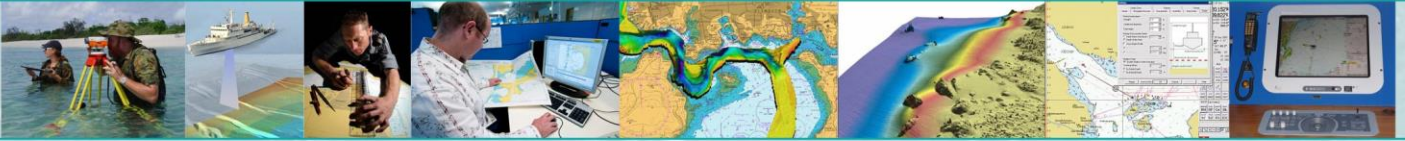
The meeting was informed on the progress done by the MICC and of the progress in ENC coverage in the region reaching 933 ENCs, from 914 available in 2018. The region continued working to cover large scale ENC gaps identified by Cruise Ship Ports Gap Analysis and to solve six identified overlaps. There is progress in the INT Charts with 51 produced and 33 schemed.

The Conference noted the progress done following the creation of the MMSDIWG, through the engagement of stakeholders on use cases. A survey on coastal States' inventory allow the WG to identify data holders that are listed in the MACHC website. Status reports were received from the UN-GGIM Working Group on Marine Geospatial Information (WGMGI) Co-Chair, from GEBCO and its Seabed 2030 project and from the Caribbean Marine Atlas (CMA). Industry participants provided insightful contribution related to SDI and data management.

Next Meeting

The next MACHC meeting will be held in the United States of America, from 30 November to 4 December 2020 (exact venue to be decided).

IHO Capacity Building Seminar on Hydrographic Governance and Introduction to Marine Spatial Data Infrastructure (MSDI)



An IHO Capacity Building Seminar on Hydrographic Governance and Introduction to Marine Spatial Data Infrastructure (MSDI) was held on 2 and 3 December, preceding the Conference. The seminar received the contribution from IHO Member States and Secretariat, International Maritime Organization (IMO), International Association of Aids to Navigation and Lighthouse Authorities (IALA) and from several industry stakeholders. 65 participants of the MACHC20 also attended the Seminar and received relevant information and actively contributed to key aspects of governance both at national and at regional levels, including the development of MSDI.



Participants to the Seminar on Hydrographic Governance and Marine Spatial Data Infrastructure (MSDI)