

11th MEETING OF THE IHO INTER-REGIONAL COORDINATION COMMITTEE
IHO-IRCC11
Genoa, Italy, 3-5 June 2019

REPORT

1. Opening Remarks, Introductions and Administrative Arrangements

Docs: IRCC11-01A List of Documents (Secretariat)
IRCC11-01B List of Participants (Secretariat)
IRCC11-01C List of IRCC Members (Secretariat)

The 11th Meeting of the IHO Inter-Regional Coordination Committee (IRCC) took place in Genoa, Italy, hosted by the Navy Hydrographic Institute (IIM) of Italy from 3 to 5 June 2018. The meeting was chaired by Dr 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 meeting was opened by the Vice Chief of Staff of the Italian Navy, Vice Admiral Paolo TREU. He welcomed the participants to Genoa and highlighted the need to strengthen cooperation among hydrographic offices, promote interoperability and coordination among RHCs, maximize blue growth, safeguard sea lines of communication and make sustainable use of the seas.

IHO Secretary-General, Dr Mathias Jonas thanked the host for organizing such important meeting and stressed the importance of service and product provision to support informed decisions and to ensure sustainable use of the oceans, seas and inland waters. Important to turn knowledge to services and allow forecasts for the seas, improve density of bathymetry, improve tide and water level monitoring and provide services for the mesh of data. The IHO has a regional infrastructure to support the global solutions. We need to do together what we cannot do alone, to build the oceans we want. He highlighted the X-Prize won by the GEBCO Alumni Team and awarded in the Oceanographic Museum of Monaco, providing visibility to the GEBCO Seabed 2030 Project. He noted the challenges and opportunities with big data, cloud solutions, remote surveying, Capacity Building (CB), standardization and cooperation matters.

Chair addressed the participants and highlighted a number of matters related to the work of the IRCC and the need for team work to progress all the aspects of the IRCC. He invited the presenters to focus on the achievements, leaving time for the important discussions in order to gain international recognition for hydrography in its entirety. He also acknowledged the evolution of hydrography and nautical cartography.

2. Approval of Agenda

Doc: IRCC11-02 Agenda and Timetable (Secretariat)

Participants were invited to comment on the agenda and timetable in case updates were necessary. Agenda was adopted.

3. Matters arising from Minutes of IRCC10 Meeting

Docs: IRCC11-03A Minutes of IRCC10 (Secretariat)
IRCC11-03B Status of Action List from IRCC10 (Secretariat)
IRCC11-03C IRCC WP 2018-2019 (Secretariat)

Chair invited the meeting to comment and approve of the IRCC10 Minutes. List of Actions from IRCC10 and IRCC WP 2018-2019 were reviewed and updated.

Decision 1: to approve the Minutes of IRCC10 (doc. IRCC11-03A).

4. Review of Terms of Reference and Rules of Procedure

Doc: IRCC11-04 IRCC TOR-ROP (Secretariat)

Participants considered the IRCC Terms of Reference (ToR) and Rules of Procedure (RoP) and the recent changes approved by Member States. The meeting considered that the ToR and RoP are still fit for purpose and that no changes were required.

5. Report by the Secretariat

Doc: IRCC11-05 IHO Secretariat Report (Secretariat)

IHO Director (Secretary of the IRCC) Mustafa Iptes introduced *doc. IRCC11-05* and presented the status of the IHO Membership with Guyana becoming the 90th Member State of the IHO and three Members suspended (Democratic Republic of the Congo, Serbia and Syria). He presented the outcomes of the 2nd Meeting of the IHO Council and the activities in preparation for the 3rd Meeting and for the 2nd Session of the IHO Assembly. Participants were briefed on the challenges and opportunities of the International Hydrographic Review (IHR) and the sad and tragic passing of its Editor since 2013, Mr Ian Halls (Australia). He reported the activities related to the IHO centenary celebrations, the World Hydrography Day and other activities at the IHO Secretariat, highlighting the vision to have 100 Member States before 21 June 2021 which will be centenary of the IHO.

Decision 2: to note the IHO Secretariat report (*doc. IRCC11-05*).

Action 1: RHC Chairs to confirm/update the representatives to the IHR Editorial Board (deadline: August 2019).

6. Regional Hydrographic Commissions (RHCs)

6.1 RHC Reports

Docs: IRCC11-06.1A Nordic HC (NHC Chair)
IRCC11-06.1B North Sea HC (NSHC Chair)
IRCC11-06.1C East Asia HC (EAHC Chair)
IRCC11-06.1D US/Canada HC (USCHC Chair)
IRCC11-06.1E Mediterranean and Black Seas HC (MBSHC Chair)
IRCC11-06.1F Baltic Sea HC (BSHC Chair)
IRCC11-06.1G Eastern Atlantic HC (EAtHC Chair)
IRCC11-06.1H South-East Pacific Regional HC (SEPRHC Chair)
IRCC11-06.1I South-West Pacific HC (SWPRHC Chair)
IRCC11-06.1J Meso American - Caribbean Sea HC (MACHC Chair)
IRCC11-06.1K Southern Africa and Islands HC (SAIHC Chair)
IRCC11-06.1L North Indian Ocean HC (NIOHC Chair)
IRCC11-06.1M ROPME Sea Area HC (RSAHC Chair)
IRCC11-06.1N South West Atlantic HC (SWAtHC Chair)
IRCC11-06.1O Arctic Regional HC (ARHC Chair)

RHC Chairs were invited to summarize their reports and present the key achievements, the challenges faced, and lessons learned in each Region, and the Committee was invited to note the key achievements and discuss how to overcome some of the common challenges faced by the RHCs.

a) Nordic Hydrographic Commission (*doc. IRCC11-06.1A*)

Presented by Mr Jens Peter Hartmann (Denmark). He introduced the report and the new routing system for the Baltic Sea and the strategic workshop to define the future of the Nordic Hydrographic Offices, linking with the SDGs, using PEST analysis (Political, Economic, Social and Technological).

He also informed on the process for licensing for the leisure market by providing S-57 datasets to companies. During the discussions, the meeting considered the possibilities for the RENCs to provide a single shop for companies, the difficulty on getting recreational boaters to use ENC, and the need to ensure the safety of navigation by providing the same data to all mariners.

The meeting also considered the benefits in having an official position of the IHO on the issue of ENC for the leisure market, as companies seek for the position of the IHO, without it national positions may be weakened. Industry could provide the same data existing in the ENC, and the IHO could facilitate the process. SOLAS vessels and recreational boaters using different data could be a potential danger to navigation.

Discussions involved the need to facilitate the use of commercial companies to provide data under a national legal framework and the benefits of making data widely available even if the mariners are not enforced to use them. The meeting took note that OGC is looking into licensing of geospatial data in the broad geospatial environment.

The Committee considered that data quality and consistency are of paramount importance and this can be achieved by the RENCs. Data provided through the RENCs could provide this consistency. This topic was further considered under agenda item 7d.

Action 2: NHC Chair to share the questionnaires on the Nordic Strategic Plan in the region (done during the meeting).

b) North Sea Hydrographic Commission (*doc. IRCC11-06.1B*)

Presented by Captain Marc van der Donck (Netherlands). He reported on the work of the sub-committees of the NSHC. Tides WG progressed on the Common Reference Surface and the Resurvey WG tasked to include alternative survey means, with categories for surveys, improved evaluation of risk assessments, with big progress in using Satellite Derived Bathymetry (SDB) and Lidar by Members. The quality of the Crowdsourced Bathymetry (CSB) data is also a topic in the region. The ICCWG completed the ENC coverage (except for Greenland), with a reschemed ENC, overlaps and gaps at low risk to navigation. He shared experiences in contouring algorithms, status of populating CATZOCs, resurvey frequency and factors for risk calculation.

c) East Asia Hydrographic Commission (*doc. IRCC11-06.1C*)

Presented by Mr Shigeru Nakabayashi (Japan). He reported the status of recommendations and actions from IRCC10 and the situation of Viet Nam which is still an observer despite becoming an IHO Member State since 2015. He provided information on the celebration of the 50th anniversary of EAHC in 2021 and the establishment of the “Strategic Team Advance Roadmap (STAR) Task Group” led by Japan to develop a Strategic Plan of EAHC including associated key objectives for EAHC to meet future needs, considering also the discussion and progress of the IHO SPRWG. He reported the Capacity Building activities and their impact for the benefit of the region and its Members.

d) US/Canada Hydrographic Commission (*doc. IRCC11-06.1D*)

Presented by Mr David Prince (Canada). He informed the meeting on the rescheming of ENCs, charting of transboundary areas, paper charts generated automatically from ENCs, autonomous surveys in particular in very shallow waters and data contributions to the IHO DCDB and GEBCO with 100m resolution datasets for non-navigation.

The IHO Secretariat raised the observation that the IHO website does not have a brief history of some RHCs. The meeting then agreed on the following action:

Action 3: ARHC, MBSHC and NIOHC Chairs to provide a brief history about their RHCs to be made available in the IHO website (deadline: 30 September 2019).

e) Mediterranean and Black Seas Hydrographic Commission (*doc. IRCC11-06.1E*)

Presented by RAdm Luigi Sinapi (Italy). He reported the active engagement in the IHO-EU network working group (IENWG), benefiting from UN events, projects and tenders. Several Member States from the region took part in European Commission’s flagship maritime projects EMODNET and are active in the revision of EU Directive on Re-use of public sector information.

The meeting was informed that Italy is acting as Marine Spatial Data Infrastructure (MSDI) Ambassador and sent a questionnaire to assess the relative level of MSDI advancement of the national infrastructures. He reported that a significant amount of overlaps still exists at different Usage Bands 1, 2 and 3 and also discrepancies exist between new ENCs and existing INT charts.

He reported the impact of the CB activities and the plans for a submission to IBSC of a regional scheme of individual recognition, to which the IBSC Chair offered support for its development.

f) Baltic Sea Hydrographic Commission (*doc. IRCC11-06.1F*)

Presented by Mr Jens Peter Hartmann (Denmark). He informed the meeting that the region reviewed its Statutes and the progress with the Baltic Sea Bathymetry Database (BSBD), now available in a resolution of minimum 500m grid space, with plans to produce a higher resolution bathymetric model of the Baltic Sea. Several Members are already providing up to 50m resolution.

He briefed on the resurvey monitoring and coordination, using a database and a web-based interface. A GIS tool allows Members to input information regularly and provides effective visual information for decision

makers. The development of a harmonized Chart Datum in the Baltic (BSCD 2000) reference and its implementation plan and the establishment of the Baltic Sea MSI Working Group (BSMSIWG) were noted by the meeting.

He reported on the workshop for processing of bathymetric data linked to density ENC's using the current S-57 and future S-102 gridded data. The meeting considered the use of high-resolution ENC experiences in Australia and New Zealand, their prototypes and models that could benefit other ENC Producers and stakeholders. The meeting was informed that PRIMAR is investigating the development of high-resolution S-102 to complement ENC's and the meeting agreed on the following action:

Action 4: WENDWG to issue a questionnaire to capture the status and plans of users/producers of High Density ENC's and report back to IRCC (deadline: IRCC12).

g) Eastern Atlantic Hydrographic Commission (doc. IRCC11-06.1G)

Presented by Commodore C. E. Okafor (Nigeria). He reported the challenges with the provision of MSI services in the region, despite the efforts of the NAVAREA and CB Coordinators. The meeting considered the poor membership in Central and West Africa (WCA), with only three IHO Member States and 18 Associate Members, with only two Hydrographic Services established in the region.

He reported the need of better communication tools with governments for sustainable funding in the region and the importance of engaging with the IMO, IOC and IALA, in fronts like blue economy, coastal erosion and disaster responses. He informed that a seminar is being joint organized with IALA for risk assessment and safety of navigation, to be held in Morocco in October 2019.

h) South-East Pacific Regional Hydrographic Commission (doc. IRCC11-06.1H)

Presented by LtCdr Natalia Otorola (Colombia). She informed the meeting that despite having only four Members, the region has more than 8500km of coastline, 71 terminals and ports and spread over three NAVAREA. Maritime activities constantly growing in the region and the IHO CB Programme has great impact in the continuous improvement of hydrographic products and services.

The meeting was informed on coordination of the planning and execution of CB activities with the two neighboring regions (MACHC and SWAtHC), the engagement with stakeholders and the cooperation among navies and the efforts of the Members to actively participate in the IHO bodies.

i) South-West Pacific Hydrographic Commission (doc. IRCC11-06.1I)

Presented by Mr Adam Greenland (New Zealand). He reported on the challenges with a vast maritime region and only nine Member States in the region, 12 non-IHO Member States and 11 overseas territories. He informed the meeting on the impact of CB activities in the region, in particular for the establishment of MSI services in the two NAVAREAs (X and XIV) and in coordination with NAVAREA XI.

He informed the meeting on the engagement in disaster response planning and data discovery, in mechanisms to share data and to establish geospatial portals and MSDI in the region. The meeting was also briefed on the engagement of foreign affairs from developed countries and the Asian Development Bank (ADB) in support of developing nations. These engagements have allowed for new surveys to be conducted in island nations and new or updated charts to be produced.

Progresses were reported on Seabed 2030, on the use of hydrographic data for non-navigational purposes, on marine spatial planning and challenges on recruiting and retaining qualified and experienced staff, on handling distances with countries widely spread within region and on resourcing to maintain level of engagement in SWP due to competing national priorities.

Decision 3: to note the continued value and effectiveness of preceding RHC meetings with CB related workshops.

j) Meso American - Caribbean Sea Hydrographic Commission (doc. IRCC11-06.1J)

Presented by Ms Katie Ries (USA). She reported on the challenges in a region with 30 coastal States (15 IHO Member States) and 22 overseas territories and the cooperation with IOCARIBE, COCATRAM and the neighboring RHCs (SEPRHC and SWAtHC), in particular on CB, with a calendar for activities to

maximize access to training opportunities. She also reported progress on the work with Caribbean Marine Atlas and with regional mapping project (IBCCA).

The meeting was briefed on the charting collaboration and the existing 914 ENC's available, including increased large scale ENC coverage of major cruise ship ports. Most of these ENC's can be seen in the MACHC ENC Online chart viewer (<https://www.iho-machc.org/#enconline>). The MACHC ICC is working to provide their extracted bathymetric data from ENC's as a contribution to both Seabed 2030 and the MSDI effort.

She presented the main accomplishments of the region with Guyana becoming a new IHO Member State in 2019, the creation of a MSDI WG, the development of the Disaster Response Strategy and Plan and the bathymetric gap analysis to support future activities in the region. The meeting agreed on the following decision:

- Decision 4:** to note specifically the challenges faced in the MACHC which are common to many RHCs:
- 1) For the newly established MACHC MSDI WG to determine how best to deliver regional MSDI data offerings. There is clearly a regional demand for data layers derived from ENC's for non-navigation purposes, to support activities such as the management of a regional marine protected area network, a regional risk assessment for maritime accidents and maritime disaster response.
 - 2) While contact has been established with the Head of Seabed 2030 Atlantic/ Indian Oceans Regional Data Center, the International Bathymetric Chart for the Caribbean and the MACHC, a challenge is how to increase the regional contributions of existing data and to catalyze collaboration to fill gaps. A gap analysis is being developed for the MACHC as a tool to help generate that momentum.
 - 3) To develop a Disaster Response Plan with the appropriate level of detail, including ideally a GIS-based layer that can most effectively support coordination and communication efforts before and after a maritime disaster event.

k) Southern Africa and Islands Hydrographic Commission (*doc. IRCC11-06.1K*)

Presented by RAdm Tim Lowe (UK). He informed the meeting on the improving attendance at SAIHC meetings by countries and industry, to which the CB Awareness Seminar contributed significantly. He also noted the development of the SAIHC Capacity Building Strategy and the SAIHC ENC Scheme, with the use of risk analysis.

The meeting was briefed on the establishment of the SAIHC MSDI WG and pointed out the need to update the "RHC report to IRCC" template, with the follow up of the IRCC recommendations to RHCs. The meeting agreed the following action:

- Action 5:** IHO Secretariat to update the "RHC report to IRCC" template, to include "IRCC recommendations to RHCs" (deadline: 30 July 2019).

l) North Indian Ocean Hydrographic Commission (*doc. IRCC11-06.1L*)

Presented by RAdm Tim Lowe. He informed the meeting that there are still a number of ENC gaps and overlaps in a region that needs to be addressed and the improving attendance at NIOHC meetings by countries and industry, to which the CB Awareness Seminar contributed significantly. The region progressed the NIOHC Capacity Building Strategy and the discussions on the duration of the tenure of the Chair, statutes under review. The region considered the revision of the IHO Resolution 1/2005 IHO Response to Disasters and recommended establishment of emergency contact numbers that was considered under agenda item 8.

m) ROPME Sea Area Hydrographic Commission (*doc. IRCC11-06.1M*)

In the absence of a representative from the region, the report was introduced by IHO Director Iptes. He reported the lack of engagement of some Members in the region and the poor attendance to the last RSAHC meeting held in Pakistan and also the recently assigned CB Coordinator in the region, from Iran (Islamic Republic of). He noted the positive impact of CB activities in the region, where new surveys were conducted and new and updated charts were produced.

n) South West Atlantic Hydrographic Commission (doc. IRCC11-06.1N)

Presented by Captain Pablo Tabaréz (Uruguay). He highlighted the extension of the maritime area spreading in two NAVAREAs and the huge inland waterways to be surveyed and charted. Bolivia is in the process to become an Associate Member. The other Associate Member, Paraguay, was an IHO Member State from 1967 to 1969. Both are highly dependent on these waterways, also used to reach the Atlantic Ocean. Despite the challenges, there is no significant ENC overlap and the region is actively working to reduce the gaps. The region achieved 77% of the INT scheme and 78% of the ENC scheme. He stressed the importance of CB activities in support of the provision of hydrographic services and to achieve the IHO objectives in the region.

o) Arctic Regional Hydrographic Commission (doc. IRCC11-06.1O)

Presented by RAdm Shep Smith (USA). He reported the engagement with stakeholders and the combination of the meetings with an Open Forum on science topics. He noted the progress in the Arctic MSDI WG (ARMSDIWG), the Arctic SDI and the engagement with GEBCO Seabed 2030, including the use of autonomous survey platforms.

Decision 5: to note all the reports from agenda item 6.1 (docs. IRCC11-06.1A, 06.1B, 06.1C, 06.1D, 06.1E, 06.1F, 06.1G, 06.1H, 06.1I, 06.1J, 06.1K, 06.1L, 06.1M, 06.1N and 06.1O).

6.2 Revision of IHO Resolution 2/1997 Establishment of RHC

Docs: IRCC11-06.2 Draft revised IHO Resolution 2/1997 (IHO Sec., USA)

Chair invited the meeting to review the draft amendments of the IHO Resolution 2/1997 as amended. Minor edits were suggested as removing "Supra-national", making reference to the IHO General Regulation instead of basic documents, correcting WWNWS as a service instead of a system, reinstating "at least" in paragraph 9, removing "expected" from paragraph 5 and changing "ensure" to "enable" in paragraph 18. The following was agreed at the meeting:

Decision 6: to endorse the draft amended IHO Resolution 2/1997 (Annex to doc. IRCC11-06.2).

Action 6: IHO Secretariat to finalize the amended IHO Resolution 2/1997 and publish as Annex to doc. IRCC11-06.2 (deadline: 20 June 2019).

Action 7: IRCC Chair to submit the amended IHO Resolution 2/1997 to C-3 (deadline: 15 July 2019).

7. Reports from IRCC Subordinate Bodies

Docs: IRCC11-07A Hydrographic Commission on Antarctica (HCA Chair)

IRCC11-07B World-Wide Navigational Warning Service Sub-Committee (WWNWS-SC Chair)

IRCC11-07C Capacity Building Sub-Committee (CBSC Chair)

IRCC11-07D1 WEND Working Group (WENDWG Chair)

IRCC11-07D2 WENS Drafting Group Progress Report (WENDWG Vice-Chair)

IRCC11-07E MSDI Working Group (MSDIWG Chair)

IRCC11-07F IHO-EU Network Working Group (IENWG Chair)

IRCC11-07G CSB Working Group (CSBWG Chair)

IRCC11-07H FIG-IHO-ICA IBSC (IBSC Chair)

IRCC11-07I1 IHO-IOC GEBCO Guiding Committee (GGC Chair)

IRCC11-07I2 New Edition 4.2.0 of IHO Publication B-6

IRCC11-07I3 Inclusion of Seabed 2030 in RHC work plans (IHO Council Chair)

IRCC11-07J IHO DCDB Report (IHO DCDB Director)

IRCC11-07K UN-GGIM Shared Guiding Principles for Geospatial Information Management (PPT)

Chairs of the IRCC bodies presented the main achievements, challenges faced, lessons learned and work programs in the IRCC bodies, including the Project Team on the UN-GGIM Shared Guiding Principles for Geospatial Information Management (PPT). The Committee was invited to consider the inputs and to provide guidance of each body's work programme.

a) Hydrographic Commission on Antarctica (doc. IRCC11-07A)

Presented by the IHO Secretary-General, Chair of the HCA, who introduced the report. He noted the recent meetings of the Commission and the work of the Hydrographic Priorities Working Group (HPWG). HCA

agreed that the Region M Coordinator, in liaison with the IHO Secretariat and the RENCs has the responsibility to check and monitor ENC overlaps within the Antarctic region. The commission also agreed on the principles that HCA Members should be encouraged to ensure that bathymetric information contained in their HCA ENCs should be extracted and transmitted to the IHO DCDB.

He highlighted that DCDB coverage in Antarctic waters could be improved through crowdsourced bathymetry and with professional multibeam data contributions from research vessels operating in the area. The Commission agreed that, as a matter of principles, the current primary charting authorities in Antarctica should be encouraged to consider the future production and distribution of S-100 based products for Antarctica, in their areas of charting responsibilities. IAATO agreed to check if the new guidance on crowdsourced bathymetry (IHO Publication B-12) can be implemented technically by exporting data from Voyage Data Recorders.

The meeting was informed that the next meeting of HCA will be held with ATCM XLII and the opportunity to have contribution of its Members to highlight the importance of hydrography and bathymetry for Antarctica as a whole. Some ATCM Member States, through their Hydrographic Services will second the proposal to update the Resolution on Hydrographic Mapping in Antarctic waters. He noted that the ENC coverage is gradually growing but still far from completion and that the availability of reliable survey data remains the major problem. He highlighted that a crowdsource approach in combination with the activities of Seabed 2030 project offers a new chance to acquire substantial bathymetric information of this remote area and provide it for a multitude of uses under the open data policy of the DCDB.

b) World-Wide Navigational Warning Service Sub-Committee (doc. IRCC11-07B)

Presented by Mr Peter Doherty (USA), Chair of the WWNWS-SC. The IRCC11 was informed of the activities of the World-Wide Navigational Warning Service, including NAVAREA and coastal warnings and progress on documentation of WWNWS. The IRCC noted the difficulties in ensuring Maritime Safety Information (MSI) infrastructures in the West and Central Africa region, as informed by the EAtHC Chair. The IRCC urged close liaison between regional CB Coordinators and the WWNWS-SC on the programming of and candidate selection for MSI training. The meeting was also informed on the risk to ensuring MSI training due to the lack of qualified trainers.

He highlighted the importance of monitoring the status of MSI in the regions and mentioned the example of the MACHC that can be replicated in other regions. He also mentioned the importance of updating C-55 against the GMDSS Master Plan. Discussions touched upon the possibility to engage the IMO on funding from MSI trainers and the benefits of developing a pilot project for a template with drop-down menus for preparing MSI messages.

Action 8: RHC Chairs to request MSI National Coordinators to review the contents of the relevant Annexes of the GMDSS Master Plan and of section C (MSI) of IHO Publication C-55 – *Status of Hydrographic Surveying and Nautical Charting Worldwide* – to ensure consistency for their national entries (deadline: 30 July 2019).

Recommendations to RHCs:

1. urge the use of the Joint Manual on MSI to ensure correct terminology and formats are used in MSI messages;
2. encourage closer engagement of the National MSI Coordinators of Member States with the relevant NAVAREA Coordinator(s).
3. urge close liaison between regional CB Coordinators and the Chair WWNWS-SC on programming and candidate selection for MSI training.
4. encourage the attendance of Member States and Observers at WWNWS-SC meetings.

c) Capacity Building Sub-Committee (doc. IRCC11-07C)

Presented by Mr Thomas Dehling (Germany), Chair of the CBSC. He reported the update of the 2019 CB Work Programme (CBWP) and approval of the 2020 CB Management Plan and the 2020 CBWP, considering the priorities identified by the Sub-Committee with respect to the IHO CB Strategy, the available resources and potential additional resources. IRCC acknowledged the CBSC's concerns on the restrictions and shortage of funding to meet the needs of capacity building of Member States.

The meeting considered the need to put forward a proposal for a guaranteed minimum level of IHO Capacity Building Fund share in the IHO overall budget, as CB is a core strategic objective of the IHO. The CB fund has been used carefully and according to the IHO CB Strategy and the funds not already allocated to certain earmarked projects are limited to the regular IHO contribution. This contribution is dependent on the financial situation of the IHO budget. That contribution for 2019 is less than expected and the situation in the following years is not clear, putting the success of the CB programme under a considerable risk. The CBSC Chair proposed to investigate the possibility of a formal proposal to ensure a minimum share of the IHO budget to allow for CB in a stable and sustainable way.

The meeting was informed on the execution of the 2018 CBWP (total of 844 517 Euros) from the IHO budget and supplemented by additional financial support from Member States (currently the Nippon Foundation of Japan, and the Republic of Korea) with in-kind support from Member States and from stakeholders.

For the 2019 CBWP, the Republic of Korea (ROK) contributed 543 500 Euros to the Capacity Building Programme to sponsor two students on the Category "A" Master of Science in Hydrographic Science at the University of Southern Mississippi in USA (CL 17/2019 refers) and to sponsor five students on a Category "B" Marine Geospatial Information Program at the Korea Hydrographic and Oceanographic Agency (KHOA), Busan, ROK (CL 27/2019 refers). In addition, some of the short courses in the 2019 CBWP are being supported by the ROK's contribution. Fund provided by the Nippon Foundation (NF) of Japan (194 514 Euros) will be used to sponsor seven students at the Category "B" Marine Cartography and Data Assessment, delivered for the CHART (Cartography, Hydrography and Related Training) Project, at the UKHO, Taunton, UK (CL 22/2019 refers).

The meeting was informed on the establishment of a Project Team on Outreach (PT Outreach) tasked to draft the way ahead for promoting and increasing the visibility of work done and the achievements reached by the IHO CB Programme. Participants discussed the IHO CB Strategy, the need to share training material and upload videos to support CB activities, the example of the IMO that has a resource mobilization officer and WMO with a division for fund raising and project management. The overall understanding is that there is need to add larger projects in addition to and not replacing existing CB activities. The meeting also agreed that the focus on the financial challenges shadowed the great success achieved by the CB Programme.

The IRCC noted the outcome of the C-55 Review Project Team (C55RPT), under the lead of Norway, with a proposal to address the limitations of the current IHO Publication C-55 (Status of Hydrographic Surveying and Nautical Charting Worldwide) and proposal for future development with a two-step approach. A short-term solution is using CATZOC information as an indicator for survey adequacy based on the proposal from France and UK (doc. CBSC16-08.3B). The IRCC considers important to encourage Member States to use CATZOC to generate the input for C-55 in a consistent and harmonized way based on this proposal. A longer-term solution was envisaged in making use of modern MSDI and GIS information. C-55RPT was tasked to propose and define the scope for future work using CATZOC in a GIS environment and the differentiation of uses for the future of C-55, engaging with the DQWG.

Decision 7: to acknowledge the significant effort from CB Coordinators to assess the needs in the region, to invite Member States to identify national and regional projects that may contribute to the CBWP and to coordinate the support for countries in need.

Decision 8: to acknowledge the concerns of the CBSC due to the restrictions and shortage of funding.

Action 9: CBSC to provide the Council via IRCC with information on the minimum resources needed to support a sustainable level of CB activities in accordance with the CB Strategy. Seek guidance from the Council on the way ahead to address the resource shortage and ensure a sustainable flow of resources (deadline: 30 June 2019).

Action 10: IRCC Chair to submit the IHO Council a proposal to seek solution for sustainable funding to the CBWP (deadline: 15 July 2019).

Recommendations to RHCs:

5. to encourage Member States to use CATZOC to generate the input for C-55 in a consistent and harmonized way.

d) WEND Working Group (doc. IRCC11-07D1)

Presented by Mr Jamie McMichael-Phillips (UK), Chair of the WENDWG. He highlighted the progress towards the full implementation of the WEND Principles and the meeting expressed concerns that overlapping ENC's create confusion onboard ships and that IHO community should work to eliminate overlapping data. The IRCC identified the need for a regional engagement to encourage Member States to use CATZOC to generate the input to C-55 (paragraphs 8 and 9) and for this to be effective, there is the need to encode meaningful values of CATZOC in ENC's. Reports were received by the IRCC on the status of populating CATZOC's in ENC's, paper charts generated automatically from ENC's, high resolution ENC's and on possibilities to support and/or regulate the chart production for leisure boats.

The importance of data quality and consistency was considered as well as the need for Member States to distribute their ENC's via the RENC's and to provide their agreement for making CATZOC values available in the additional layers of INTogIS II (Manager Mode, available to MS only). The IRCC noted that work continues by stakeholders to improve coverage and to manage overlaps. The IRCC approved a revision to the WENDWG Terms of Reference that support an implementation strategy for S-100 based products, including S-101 ENC's and also continuity of WENDWG activities. The IRCC noted the early draft of the provision of S-100 services roadmap.

The IRCC was briefed on the improvements to the IHO ENC Catalogue and the contributions from IC-ENC and PRIMAR for ongoing support to ENC producers and user communities. The progress in establishing operations of the EAHC Regional ENC Coordination Centre (RECC) and the work of Republic of Korea and other stakeholders in developing INTogIS Phase II were noted by the Committee.

Decision 9: to note that work continues by stakeholders to improve coverage and to manage overlaps.

Decision 10: to approve draft revision to WENDWG ToRs (as attached) that support an implementation strategy for S-100 based products, including S-101 ENC's.

Decision 11: to note that time has come to start applying the different steps identified in the Resolution 1/2018 to be in a more robust position to evaluate its effectiveness in the near future.

Decision 12: to approve the proposed updated WENDWG 2019-20 Work Programme as given at Annex A of doc. IRCC11-07D1 and the continuity of WENDWG activities (WENDWG ToRs Art. 4.4 refers).

Decision 13: to note that work is underway to improve data which in turn will improve ENC coverage assessments for port areas.

Decision 14: to commend IHO Secretariat and all other stakeholders for delivery and improvements to the IHO ENC Catalogue.

Decision 15: to commend IC-ENC and PRIMAR for their ongoing support to the ENC producer and user communities.

Decision 16: to commend EAHC RECC for its progress in establishing its operations.

Decision 17: to commend KHOA and other stakeholders for their hard work in developing INTogIS Phase II.

Recommendations to RHCs:

6. to make their own RHC risk assessment of navigational risk for ENC overlaps and to take action to manage these as required.

7. to reinforce to Members States the fact that the one-year "clock" to resolve overlaps should begin once the overlapping issues, starting with the potential highest risk cases, have been reported to ENC producers (Resolution 1/2018 – IHO CL 19/2018 refers).

8. Encourage ENC producers to make available all ENC data (including exclusive data) to every RENC to facilitate quality control (overlapping checks, risk assessment etc.).

9. Continue timely provision to WENDWG of status reports on ENC coverage, availability and overlaps.

10. Encourage ENC producers to provide their agreement, to their RENC, for making CATZOC values available in the additional layers of INTogIS II (Manager Mode only, available to MS only).

Mr John Nyberg (USA), Vice Chair of the WENDWG and the Chair of the WENS (Worldwide Electronic Navigation Services) Drafting Group introduced his Progress Report (doc. IRCC11-07D2), following instructions from the Council (C2/30 refers) to investigate the applicability of the WEND-like Principles to the production and dissemination of S-101 ENC's and the first generation of S-100 based products and to report back at C-3. The drafting group was tasked to re-write the WEND principles to include the full suite of navigation services to be offered through the S-100 suite of product specifications. The IRCC instructed the drafting group to reference the S-100 Roadmap for the Provision of S-100 Services once it is complete and to keep the scope of the WENS to include services that are related to navigation and MSDI. The new principles will follow the original intents outlined in the WEND Principles including data availability anywhere in the world, distribution through compatible and coordinated networks, standardization, authority of service, capacity building and data protection.

Discussions included whether to narrow scope of WENS to only include product specifications that are mandatory for carriage, the linkage to the e-Navigation implementation strategy, the S-100 services that may be in this scope for WENS, the potential contribution from MSDI in these principles, the need to coordinate the distribution of hydrographic services with meteorological services (weather, waves, wind, ice), in order not to duplicate work and to keep focus on safety of navigation.

Decision 18: IRCC is the appropriate body for directing the development of the Worldwide Electronic Navigation Services (WENS).

Decision 19: to continue the work for the development of WENS Principles.

e) MSDI Working Group (doc. IRCC11-07E)

Presented by Mr Jens Peter Hartmann, Chair of the MSDIWG. He reported 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, with a joint report in preparation. The meeting 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 IRCC was informed on the development of training material for MSDI, funded by Denmark which is intended to be publicly available. IRCC also considered and approved the amendments to ToRs and RoPs of the MSDIWG.

Decision 20: to take note of the MSDI Concept Development Study (MSDI-CDS).

Decision 21: to approve the amended ToR and RoP (Annex C) adding in Para 1. Add " as far as marine data is involved" and deleting Para 3.15.

Decision 22: to acknowledge and support the work of the IHO Project Team on the implementation of the UN- GGIM Shared Guiding Principles for Geospatial Information within the IHO.

Update of UN-GGIM-MGIWG Chair on the status of the WG.

The co-Chair of the UN-GGIM Working Group on Marine Geospatial Information (WGMGI) updated the IRCC11 on its programme of work and the relationship with the IHO MSDIWG. The WG had its first meeting in Busan, ROK (7 - 9 March 2019), currently with 25 members, including three from private industry, preceded by the MSDIWG10 meeting.

The co-Chair outlined progress on a situational use case focusing on the value of marine geospatial information required to set up a wind farm. The WG intends to collect preliminary answers to the use case questions in time to present initial results to the UNGGIM Committee of Experts in August 2019. He also mentioned the work that the OGC is doing to prepare a Guide for Marine Geospatial Information for the Common Person.

He outlined the importance of the UNGGIM meeting of the Committee of Experts in August 2019 - New York City. The WG will sponsor three side events during the August meeting, a WG Progress Report, a Use Case presentation, and an Arctic SDI themed session. The meeting was informed on the work being done by the UN-GGIM and the World Bank regarding the Implementation Guide for the UN Geospatial Information Framework.

f) IHO-EU Network Working Group (doc. IRCC11-07F)

Presented by IGA Bruno Frachon (France). He reported the outcomes of the last meeting, held back to back with the EOOS Conference. The meeting expressed concerns for interoperability and the re-use of scientific data, the promotion of B-12 on CSB, the status of the EMODNet-Bathymetry project, led by the Chair of GEBCO/TSCOM and the increase in resolution on coastal areas.

The meeting was informed on the EU Directive on Public Sector Information, the new concept of High Value Dataset and the potential impact on resources of EU national Hydrographic Offices. He presented the IENWG Work Programme for IRCC consideration.

Decision 23: to approve the IENWG Work Programme (Annex of doc. IRCC11-07F).

g) CSB Working Group (doc. IRCC11-07G)

Presented by Ms Jennifer Jencks (USA), Chair of the CSBWG. She reported progress in Crowdsourced Bathymetry (CSB) activities, the edition 2.0.2 of 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).

The meeting noted the importance of increased awareness and information as well as stakeholder engagement/involvement in order to help to overcome a degree of skepticism on the CSB concept within parts of the IHO community and some sections of the marine domain on potential, although untested, legal issues and concerns on commercial exploitation of data. Participants considered that CSB is a grey area under the UNCLOS and that the IHO should be more active in having a positive definition.

The meeting was informed on the approval of the IHO Publication B-12 on CSB and that a CL will be issued to provide notice and feedback. Participants considered that CSB is a real and existing activity and how to make good use by Hydrographic Offices and by the wider hydrographic community. A suggestion was presented that multibeam manufacturers could add a functionality to collect data while in transit in order to allow the research vessels to automatically acquire data while in transit without having an operator.

Recommendations to RHCs:

11. Encourage Member States to release datasets or subsets into the public domain via the IHO DCDB;
12. Encourage Member States to state their policy on data gathering restrictions within their maritime areas of jurisdiction, as requested in IHO CL 11/2019, to enable CSB activities to be undertaken;
13. Encourage Member States to support the CSB initiative with positive actions, such as requiring all research vessels collect bathymetric data for late uploading, when on passage or when it does not interfere with other research activities;
14. Encourage Member States to support a scaled trial of CSB data collection as a follow on to earlier pilot programmes.

Decision 24: to reappoint the CSBWG to continue its work under the existing ToRs.

USA presented a feedback on the engagement with Rose Points and SeaIQ for improving the collection of CSB data that has proved beneficial for the work of the hydrographic service.

h) FIG-IHO-ICA IBSC (doc. IRCC11-07H)

Presented by Mr Adam Greenland. He informed the meeting that sixteen course submissions were reviewed by the IBSC at its 42th meeting held in Hawaii, USA in March/April 2019 against the new Standards (IHO Publications S-8A and S-8B Standards of Competence for Category "A" and Category "B" Nautical Cartographers and IHO Publication S-5A and S-5B Standards of Competence for Category "A" and Category "B" Hydrographic Surveyors. From these submissions, 11 were recognized, three were considered for intersessional review and two were not recognized.

The IRCC 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 Committee was informed on the initiatives to support submitting institutions to improve the quality of submissions and agreed on the following:

Decision 25: to acknowledge the work done by the Board in the delivery of the new companion document *Guidelines for the Implementation of the Standards of Competence for Hydrographic Surveyors and Nautical Cartographers* Ed. 2.1.0 (May 2019).

Decision 26: to approve the IBSC Proposed Work Plan – Q2 2019 to Q2 2020 (Annex B of doc. IRCC11-07H).

Decision 27: to note the amendments to the Rules of Procedure (RoP) of the IBSC.

Recommendations to RHCs:

15. Encourage Member States and submitting institutions to engage with the IHO Secretariat early on in the process of preparing submissions for programme recognition. Encourage Member States and submitting institutions to consult the Guidelines and the white paper (IHR-Nov-2017 - Article on "Maintaining the Standards of Competence for Hydrographic Surveyors and Nautical Cartographers") in the process of preparing submissions for programme recognition

i) IHO-IOC GEBCO Guiding Committee (GGC) (doc. IRCC11-07I1 and IRCC11-07I2)

Presented by Mr Shin Tani (Japan), Chair of the GGC. He informed the meeting on the development of the GEBCO activities in particular the progress on Seabed 2030 Project and introduced the GEBCO Work Plan and proposed amendments to the Terms of Reference (ToR) of the GEBCO Guiding Committee. The meeting was informed on the new edition 4.0.2 of IHO Publication B-6 (Standardization of undersea features names, CL 34/2019 refers) to make the supporting bathymetric data available to the IHO DCDB as part of a submission. The IRCC noted that the new GEBCO grid was released in March 2019, which contained significantly more data, particularly in the Arctic and Antarctic regions, where the coverage has increased to approximately 15%. The IRCC was informed on the creation of the new Sub-Committee on Communications, Outreach and Public Engagement (SCOPE) by the GGC.

He informed the meeting on the Seabed 2030 under the IHO-IOC GEBCO framework with the focused goal of producing the definitive, high-resolution bathymetric map of the entire World Ocean by the year 2030. Initiated at the Forum for Future Ocean Floor Mapping by Mr Sasakawa, Chairman of the Nippon Foundation, in Monaco in June 2016, the Nippon Foundation-GEBCO Seabed 2030 project commenced its operational phase at the beginning of February 2018. The project stood up the four regional centers (North Pacific-Arctic Oceans, South and West Pacific Ocean, Atlantic-Indian Oceans, and Southern Ocean) and the Global Center based at the British Oceanographic Data Centre (BODC) of the National Oceanographic Centre (NOC) in the United Kingdom (UK).

The Committee noted that a number of regional meetings have been held with a focus on data discovery, making data publicly available and gap assessment. A reappraisal analysis of the data coverage of the GEBCO 15 arc-second grid, based on current technology variable resolution bands, indicates that about 6% of the current GEBCO grid has been completed. He informed the meeting that the selection process for a permanent Director of Seabed 2030 has been completed and the final contract negotiations are underway.

Recommendations to RHCs:

16. Continue to organize contribution of bathymetric data in shallower coastal areas from their member states to DCDB in order to support the production of higher resolution gridded data products of GEBCO.

17. Invite and communicate with GEBCO members to their meetings as appropriate;

Decision 28: to endorse the work programme of the GGC and proposed amendment to the GGC ToRs (Annex E of doc. IRCC11-07I1), removing "a maximum of" before "additional term" in Para 2.1.

Decision 29: to endorse the amendments to the IHO Publication B-6 (ref. doc. IRCC11-07I2).

Action 11: IHO Secretariat to issue a CL seeking Member States' approval for the draft amendments of the IHO Publication B-6 (deadline: 30 July 2019).

New Zealand expressed concerns about the addition of Antarctic naming principles in the new draft edition as New Zealand would want to use Māori language names. The Committee considered that New Zealand can use Maori names for the features in the Antarctic region, if SCUFN agrees that these Maori names are in fact relevant to the Antarctic region. New Zealand stated that it does not endorse the amendments to the proposed new edition 4.2.0 of the IHO Publication B-6 Standardization of Undersea Feature Names.

Inclusion of Seabed 2030 in RHC work plans (doc. IRCC11-07I3)

IHO Council Chair introduced doc. IRCC11-07I3 suggesting the inclusion of Seabed 2030 in RHC work plans. The meeting considered it relevant and agreed on the following:

Action 12: RHC Chairs to consider the tasks listed as duties for the Regional Seabed Coordinator/Mechanism (doc. IRCC11-07I3) and to include Seabed 2030 in RHC work plans and reports to IRCC (deadline: IRCC12).

j) IHO DCDB Report (doc. IRCC11-07J)

Presented by Ms Jennifer Jencks, Director of the DCDB. She highlighted that the DCDB archives and shares, freely and without restrictions, depth data contributed by mariners and reported that as a result of the NOAA Data Center restructuring and consolidation in 2015, the IHO DCDB is now hosted and maintained by the National Centers for Environmental Information (NCEI), which means that the previous agreement with NOAA is out of date and needs to be revised to reflect the current structure.

The meeting was informed on the efforts to allow the IHO DCDB to receive contributions from CSB, the status of datasets, the tools available to the public and the services offered. She introduced the draft CL which will be issued to promote the activities of the IHO DCDB. The following was agreed by the Committee:

Recommendations to RHCs:

18. Encourage Member State and stakeholders to support by contributing bathymetric data to the DCDB, regardless of origin.

Decision 30: to note the draft CL on DCDB Activities which is provided in the Annex of doc IRCC11-07J.

Decision 31: to note the reports under agenda item 7 (docs. IRCC11-07A, 07B, 07C, 07D1, 07D2, 07D3, 07E, 07F, 07G, 07H, 07I1, 07I2, 07I3 and 07J).

8. Outcomes of the 2st Meeting of the IHO Council (C-2)

Docs: IRCC11-08A List of Decisions and Actions of C-2 (Secretariat)
IRCC11-08B Draft Revised IHO Resolution 2/2007(Secretariat)
IRCC11-08C1 Draft Revised IHO Resolution 1/2005 (EAHC)
IRCC11-08C2 MapAction Global Activities on Disaster Management (MapAction Chair)
IRCC11-08D Draft Revised IHO Strategic Plan (SPRWG Chair)
IRCC11-08E Roadmap for the provision of S-100 services (IHO Council Chair)

The Council Chair provided a brief summary on the C-2 discussions. The Committee considered the outcomes of the 2nd Meeting of the IHO Council, including the decisions and actions related to the IRCC activities, as well as revision of IHO Resolution 2/2007 (Action C2/13 refers). The meeting also considered the progress on Draft Revised IHO Resolution 1/2005 and the assessment on the possible implementation of the strategic targets and performance indicators of the draft revised IHO Strategic Plan (Action C2/40 refers).

a) Decisions and Actions of C-2 (doc. IRCC11-08A)

Secretary introduced the report. The meeting considered the impact and the future elements to be considered by the Council and the follow up work of the Assembly. There was consensus to focus on key aspects of RHCs and avoid lengthy reports in order to allow the Assembly to function properly.

Action 13: RHC Chairs to provide reports to A-2 to the IHO Secretariat in accordance with the Action C-2/53 (deadline: 15 November 2019).

b) Proposed amendments to IHO Resolution 2/2007 Principles and Procedures for Making Changes to IHO Technical Standards and Specifications (doc. IRCC11-08B)

The meeting was informed on the status of revision of the IHO Resolution 2/2007 as amended (Annex A to IHO CL 32/2019 refers) and the way it is structured. A main body describes the updated revised review cycle for working groups and project teams for the development phase of Product Specifications and Standards and two Appendixes lists the Standards that have to be maintained in conformance with the IHO Resolution 2/2007 as amended. A third Appendix provides guidance for conducting stakeholders impact

study (see Action C2/12). Substantial editorial changes were proposed to align the Resolution with HSSC and IRCC new TORs and ROPs (IHO CL 02/2019 refers).

The meeting considered that the amendments to the Resolution 2/2007 as amended will facilitate the working groups and project teams work in developing S-100 based products, speeding up the development phase. They will also enable IHO to maintain a high level of control on changes to standards and specifications. The meeting considered that the authority of the two main Committees of the IHO (HSSC and IRCC) is preserved and consolidated.

The Committee was informed that Resolution 2/2007 was firstly endorsed by the HSSC11 and consequently submitted to the IRCC11 for endorsement before seeking approval by Member States. A report on the outcome of the approval phase is planned to be given at C-3.

Decision 32: to endorse the amendments to the IHO Resolution 2/2007 (Annex to doc. IRCC11-08B, as amended during the meeting).

c) Proposed amendments to IHO Resolution 1/2005 IHO Response to Disasters (doc. IRCC11-08C1)

Presented by Mr Hiroaki SAITO (Japan). He introduced the paper and informed the meeting that Assembly Decision A-1/19 that tasked the IRCC to review and redraft IHO Resolution 1/2005 *IHO Response to Disasters* as amended, taking into consideration PRO-3 and related comments and submit a draft revision to the Council. The IRCC considered and endorsed the draft amendments to IHO Resolutions 1/2005 *IHO Response to Disasters* as submitted by doc. IRCC11-08C1.

Decision 33: to endorse the amendments to the IHO Resolution 1/2005 (Annex to doc. IRCC11-08C1).

d) Presentation of MapAction activities with respect to response to disasters (doc. IRCC11-08C2)

Presented by Mr Nigel Press, Chair of the MapAction. He introduced the work of MapAction in humanitarian response to disasters in order to seek the views of IRCC for possible ways of cooperating when responding to disasters. MapAction is a humanitarian mapping charity that works through skilled GIS volunteers in the immediate aftermath of a disaster. The skill and experience is recognized as crucial in helping the UN and other charities and agencies to target and coordinate the delivery of humanitarian aid. Since 2002, MapAction has responded on the ground to more than 90 emergencies and many more remotely. The charity leads the way in the relief effort, from the field and the information is provided free to all users.

Participants considered the potential for cooperation and identified synergies with MapAction, in particular in some regions like Africa, the Caribbean Sea and the South West Pacific. MapAction received a suggestion to contact hydrographic societies seeking support for its working, in particular in identifying volunteers. The meeting agreed on the following:

Action 14: IHO Secretariat to investigate the common interests and possibility of an agreement with MapAction in the area of cooperation/collaboration when responding to disaster management (deadline: IRCC12).

Recommendations to RHCs:

19. Consider inviting MapAction to the RHC meetings.

e) Draft Revised IHO Strategic Plan (doc. IRCC11-08D)

Presented by IGA Bruno Frachon, Chair of the Strategic Plan Review Working Group (SPRWG). He briefed the IRCC11 on the progress made by the Strategic Plan Review Working Group and on the possible impact on the implementation of the IHO work programme. Participants of the IRCC11 considered the targets of the draft SP and scope of the Performance Indicators. IRCC Members were invited to provide feedback on the draft Strategic Plan and on the implementation of the IHO work programme.

Action 15: IRCC Members to provide feedback on the draft Strategic Plan and on the implementation of the IHO work programme to the SPRWG Chair, via e-mail bruno.frachon@shom.fr (deadline: 24 June 2019).

f) Roadmap for the provision of S-100 services (IRCC11-08D)

Presented by RAdm Shep Smith, Chair of the IHO Council. He introduced the paper and reported on the work done by the Council, HSSC and IRCC Chairs and the Secretary-General to draft an implementation strategy/roadmap for a transition plan aiming to the regular and harmonized production and dissemination of S-100 based products for further discussion at A-2 and for the preparation of the 2021-2023 IHO Work Programme.

He informed the meeting that the high-level requirements are for coastal States to provide hydrographic services applies to new forms of hydrographic information envisioned to be provided by S-100 services. He highlighted that the IHO and its associated/partner organizations such as RHCs and RENCs are well positioned to coordinate the development, provision, and distribution of these services to promote broad coverage and to "deliver as one".

The meeting was briefed on the challenges for the transition from S-57 to S-101 and the development of S-100 based services. He stressed that the IHO will need to develop Capacity Building activities to share best practices and technology for provision of non-chart services. The Committee agreed on the following:

Decision 34: note the early draft of the provision of S-100 services roadmap and recommend taking into account the engagement with IMO.

Action 16: RHC Chairs to invite Members to make comments and suggestions to the Secretary of the S-100 services roadmap drafting group (Council Chair, RAdm Smith, shep.smith@noaa.gov) (deadline: 24 June 2019).

Decision 35: to note the reports and presentations under agenda item 8 (docs. IRCC11-08A, 08B, 08C1, 08C2, 08D and 08E).

9. Inputs from Member States and other bodies affecting IRCC

Docs: IRCC11-09A Input from HSSC11 (HSSC Chair)

IRCC11-09B Cancelled

IRCC11-09C The Status Report of IHR and Proposals for Improvement (Secretariat)

a) HSSC Report (doc. IRCC11-09A)

Presented by RAdm Luigi Sinapi, Chair of the HSSC. He reported on the developments that affects the IRCC. He introduced the key HSSC priorities at operational and strategic level as the proposed amendments to the IHO Resolution 2/2007 as amended *Principles and Procedures for Making Changes to IHO Technical Standards and Specifications* (doc. IRCC1-08B), the revised IHO Strategic Plan 2021-2026, the S-100 Implementation Strategy and the future of Paper charts. At the technical level, priorities are on the demonstration showcase of S-100 based products, the development of the S-1xx Product Specifications and operationalization of S-1xx framework and the development of the IHO Publication S-32 *Hydrographic Dictionary*.

Some participants expressed concerns that small Hydrographic Services may not be ready to move into all the proposals from HSSC, in particular on the future of the paper charts. Participants considered that there may be necessary to establish an IHO policy and to support these Hydrographic Services into this policy. Additionally, changes in paper charts (S-4) will need the engagement of the IMO with a change in the regulatory framework. Questions were raised on how the IHO will monitor the requirements of the users regarding to paper charts and how the assessment of the future requirements will be.

The Committee considered that CB will be key to achieve the goals to be established by the IHO in order not to leave the last man behind. The meeting agreed on the following:

Decision 36: to note the HSSC Chair Report (doc. IRCC11-09A).

Action 17: IRCC Chair to coordinate with HSSC Chair to draft "S-100 Implementation Strategy" (deadline: 15 July 2019).

Action 18: WWNWS-SC to contribute to update the IMO document "Initial Description of Maritime Services in the context of e-Navigation" (deadline: IRCC12).

Recommendations to RHCs:

20. Encourage Members to support the production S-100 showcase and S-100 products test bed platform.

21. Encourage Members to contribute to S-122 and S-123 data set.
22. Encourage Members to participate in Product Specification development.
23. Encourage Members to encode meaningful values of CATZOC.
24. Encourage Members to support developments to the IHO Hydrographic Dictionary.

b) The Status Report of IHR and Proposals for Improvement (doc. IRCC11-09C)

Presented by IHO Assistant Director Alberto Costa Neves (Assistant Secretary of the IRCC). He introduced the report on the status report on the International Hydrographic Review (IHR) and the IRCC considered the importance of the RHC Chairs to ensure a qualified IHR Editorial Board Member represents their RHC. The IRCC acknowledged the excellent work done by the late Mr Ian Halls as the Editor of the International Hydrographic Review from 2013 to 2019. Assistant Director Alberto Costa Neves was assigned as the Acting Editor of the Review until a replacement for Mr Halls is found. The meeting agreed on the following:

Decision 37: to note the report on the International Hydrographic Review (doc. IRCC11-09C).

Decision 38: to acknowledge the excellent work done by the late Mr Ian Halls as the Editor of the International Hydrographic Review (IHR).

Recommendations:

25. RHC Chairs to ensure a qualified IHR Editorial Board Member represents the RHC.

26. RHC Chairs to include an item agenda in their meetings to consider the support to the IHR Editorial Board.

10. Data gathering and Management, Maximizing the use of Hydrographic Data

Docs: IRCC11-10A Update on Data Gathering and Management, Maximizing the use of Hydrographic Data (Secretariat)

Secretary introduced the report and highlighted that the IHO is committed to the collection and management of global reference bathymetry data sets. He highlighted the important roles and activities of the IHO Data Center for Digital Bathymetry (DCDB) and GEBCO (General Bathymetric Chart of the Oceans) project on data gathering activities. GEBCO's aim is to provide the most authoritative publicly-available bathymetry of the world's oceans. GEBCO products include global gridded bathymetric data sets, a global set of digital bathymetric contours and a reference manual on how to build bathymetric grids. The continuing improvement of these products relies on close collaboration with regional mapping programmes.

He provided a general update on data gathering and management, crowdsourced bathymetry, satellite derived bathymetry and maximizing the use of hydrographic data. The meeting was informed on the active participation of the Secretary-General at the 8th Session of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) at the UN Headquarters in New York, USA in August 2018. The Committee reviewed the progress being made by its working groups (WG) on global fundamental geospatial data themes. Several items on the agenda of UN-GGIM8 were of direct relevance to IHO Member States, particularly in relation to the contribution of hydrographic data and services to national and regional spatial data infrastructures.

The Committee received report on the participation of IHO Director Mustafa Iptes at the 5th Edition of Our Ocean Conference (OOC2018) hosted by the Government of Indonesia in Bali, Indonesia in October 2018. The theme of the Our Ocean Conference was: "Our Ocean, Our Legacy". The conference was combined with an exhibition illustrating contributions to ocean related activities from coastal States, International Organizations, non-governmental organizations and industry. High level representatives including Presidents, Vice-Presidents, Prime Ministers and Ministers from over 100 countries and approximately 3000 participants attended the conference. Director Iptes, on behalf of the IHO and IOC of UNESCO, made a Floor Announcement at the OOC2018 on the importance of Seabed 2030 Project.

Decision 39: to note the report on Update on Data Gathering and Management, Maximizing the use of Hydrographic Data (doc. IRCC11-10A).

11. Developments on the Infrastructure of the IHO Secretariat

Doc: IRCC11-11 Infrastructure of the IHO Secretariat (Secretariat)

IHO Assistant Director Alberto Costa Neves introduced the report, providing status report on the developments on the IHO Geographical Information System (GIS) and its supporting databases, the IHO Online Registration System, the IHO Online Form System and how they impact the work of RHCs and the Member States' activities. These developments support data and inputs, enable data visualization, data fusion and analysis, provide GIS data layers for RHCs and Member States, enable publication and website updates (P-5, C-55, etc.).

He reported the upgrade of the databases to include additional information including the date of signature of the SOLAS Convention, when applicable, existence of a Nominated Hydrographic Authority, existence of an MSI Capability, hydrographic capability, status of CATZOCs, identification of the Primary Charting Authority, roster of trainees, trainers and consultants, among others.

Other developments include the replacement of the IHO document system to allow direct access for Member States, the ongoing upgrade and update of the IHO website, the upgrade of the INTtoGIS and the development of the IHO Capacity Building Management System. The progress in the IHO Secretariat infrastructure has received strong support from Japan, Peru and Republic of Korea, directly and/or via their seconded officers.

12. Other information papers

Doc: IRCC11-12 Report of the ICPC Activities

Reported by Mr Graham Evans, Vice Chair of the ICPC, who presented the activities of the International Cable Protection Committee (ICPC) and 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. He also reported 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 meeting agreed on the following:

Decision 40: to note this ICPC report (doc. IRCC11-11).

Decision 41: to note the growing threat to submarine cable infrastructure from uncoordinated deep seabed mining activity and the need to accurately chart as-laid cables to full ocean depth in these areas, recognizing that to carry this out ICPC members need to provide as-laid cable data in a timely manner.

Decision 42: to note dialogue of ICPC with OGC with respect to commissioning an Interoperability Experiment and future Pilot project the objective of which is to develop an S-4xx submarine cable product specification.

13. Next IRCC Meetings (Venue and Date)

The Chair invited the participants to consider dates and venue for IRCC12, IRCC13 and IRCC14. Participants were invited to offer to host IRCC15. The meeting considered several possibilities and agreed on the following:

Decision 43: to hold the next meetings of the IRCC in the following venues and dates:

IRCC12: 1-3 June 2020 - Gdansk, Poland (post-meeting note: changed to 8-10 June 2020)

IRCC13: 22-24 June 2021 - Monaco

IRCC14: May/June 2022 - Ecuador (TBC)

IRCC15: May/June 2023 - Japan (TBC)

14. Any other business

Docs: IRCC11-14 Use of Cloud Services (Canada)

Presented by Mr Douglas Brunt (Canada). He provided the background on the use of cloud services at the Canadian Hydrographic Service (CHS) by presenting two videos on CHS Bathymetry in Teledyne Caris Cloud in PRIMAR Viewer, combined with ENC's and on CHS Bathymetry in Teledyne Caris Cloud in

Kongsberg S-102 Demonstrator. The presentations generated a vivid discussion on the potential use of technologies supporting the work of Hydrographic Services.

15. IRCC Administration (Draft Report from the IRCC to the C-3)

Secretary introduced the highlights of the first draft of IRCC report and proposals to the 3rd Council Meeting. The Committee endorsed its key priorities for 2020 which are *Capacity Building Provision, transition from WEND to WENS concept, Crowd-sourced Bathymetry, Project Seabed 2030, and Marine Spatial Data Infrastructures (MSDI)*.

16. Review of the Actions and Decisions

Docs: IRCC11-16A Draft List of Actions from IRCC11 (Secretariat)
IRCC11-16B Draft List of Decisions from IRCC11 (Secretariat)
IRCC11-16C Draft List of Recommendations to RHCs (Secretariat)

Assistant Secretary presented the draft lists of actions, decisions and recommendations agreed during the meeting in docs. IRCC11-16A, IRCC11-16B and IRCC11-16C that were drafted during the meeting. Final List of Actions, List of Decisions and List of Recommendations to RHCs are in Annexes A, B and C to this report.

Decision 44: to approve the draft List of Actions, Decisions and Recommendations to RHCs as discussed during the meeting (doc. IRCC11-16A, B and C).

17. IRCC Work Programme Management

Docs: IRCC11-17A IHO Work Programme for 2018-2020 (Secretariat)
IRCC11-17B Draft IRCC Work Programme (Secretariat)

Assistant Secretary presented the draft IRCC Work Programme for 2019-2020 (doc. IRCC11-17B) considering the impact of the IHO Work Programme for 2018-2020. Doc. IRCC11-17B was drafted during the meeting. Final IRCC Work Programme 2019-2020 is in Annex D to this report.

Decision 45: to approve the draft IRCC Work Programme as discussed during the meeting (doc. IRCC11-17B).

18. Closure

Chair ends the meeting.

ANNEXES:

Annex A: List of Actions

Annex B: List of Decisions

Annex C: List of Recommendations

Annex D: IRCC Work Programme for 2019-2020