



**2nd SESSION OF THE ASSEMBLY
Monaco, 21-24 April 2020**

**REPORTS OF THE REGIONAL HYDROGRAPHIC COMMISSIONS AND THE HCA
(IN ALPHABETICAL ORDER)**

1. Arctic Regional Hydrographic Commission	ARHC
2. Baltic Sea Hydrographic Commission	BSHC
3. East Asia Hydrographic Commission	EAHC
4. Eastern Atlantic Hydrographic Commission	EAtHC
5. Meso-American - Caribbean Sea Hydrographic Commission	MACHC
6. Mediterranean and Black Seas Hydrographic Commission	MBSHC
7. Nordic Hydrographic Commission	NHC
8. North Indian Ocean Hydrographic Commission	NIOHC
9. North Sea Hydrographic Commission	NSHC
10. ROPME Sea Area Hydrographic Commission	RSAHC
11. Southern Africa and Islands Hydrographic Commission	SAIHC
12. South East Pacific Regional Hydrographic Commission	SEPRHC
13. South West Atlantic Hydrographic Commission	SWAtHC
14. South West Pacific Hydrographic Commission	SWPHC
15. United States Canada Hydrographic Commission	USCHC
16. Hydrographic Commission on Antarctica	HCA

1. REPORT OF THE ARCTIC REGIONAL HYDROGRAPHIC COMMISSION (ARHC)

1. Chair:

Rear Admiral Shepard M. Smith (USA) from September 19, 2019 to present
Captain Gennady Nepomiluev (Russia) from September 13, 2018, to September 19, 2019
Birte Noer Borrevik (Norway) from August 24, 2017 to September 13, 2018
Pia Højgaard (Denmark) from October 6, 2016 to August 24, 2017

Vice-Chair:

Dr. Geneviève Bécharde (Canada) from September 19, 2019 to present
Rear Admiral Shepard M. Smith (USA) from September 13, 2018 to September 19, 2019
Captain Sergey Travin (Russia) from August 24, 2017 to September 13, 2018
Birte Noer Borrevik (Norway) from October 6, 2016 to August 24, 2017

2. Membership:

Canada
Denmark
Finland (*associate member*)
Iceland (*associate member*)
Italy (*associate member*)
Norway
Russian Federation
United States of America

Observer(s): International Hydrographic Organization (IHO)

3. Meetings:

10th Meeting (ARHC-10)- Anchorage and Nome, Alaska, USA August 10-14, 2020
9th Meeting (ARHC-9) – Murmansk, Russian Federation September 17-19, 2019
8th Meeting (ARHC-8) – Longyearbyen Svalbard, Norway September 11-13, 2018
7th Meeting (ARHC-7) – Ilulissat, Greenland, Denmark August 22-24, 2017

4. Agenda Items:

- a) National Report updates addressing charting, survey, science and technology, personnel and national interagency coordination and policy developments
- b) Progress with new innovative technologies and techniques to acquire hydrographic data, such as autonomous vehicles, crowd sourced Bathymetry, and satellite derived bathymetry
- c) Strategic directions of hydrographic offices and the global hydrographic community. This includes a consideration of the goals, structure, and nature of the ARHC as it enters its second decade of collaboration in the 2020s.
- d) Integration of efforts and interests of the ARHC to the work of the IHO, including feedback into the IHO Work Program and enhancing linkages and synergies to the efforts of other IHO working groups, such as Council, CSBWG, DQWG, MSDIWG, IRCC, HSSC, the IHO-IOC GEBCO and Seabed 2030, and others. A principal topic of considerable interest is the ARHC support and contributions to the GEBCO Seabed 2030 initiative, the crowd sourced bathymetry initiative, and support to the IHO DCDB.

- e) External outreach to the EU, UN, the Arctic Council and others to inform of hydrographic interests and developments bearing on the safe navigation and marine environmental protection in the Arctic. Primary outreach and collaboration to-date has focused on the EU, Arctic Council PAME Working Group, Arctic Shipping Best Practices Information Forum and Portal, the Arctic SDI, the UNGGIM and its marine working group, and others.
- f) Science and stakeholder workshops convened generally the day before each formal opening of the ARHC meeting itself to allow external, local, and generally new audiences to share perspectives (especially local) on development and societal context of maritime transportation in the Arctic.
- g) Internal organization and coordination through working groups set up under the ARHC, primarily the Operations and Technology Working Group, the Arctic Regional Marine Spatial Data Information Working Group, and the Arctic International Charting Coordination Working Group.
- h) Reduction of ENC overlaps
- i) Membership

5. Difficulties encountered and challenges yet to be addressed:

The Arctic region's vastness, remoteness, and emergence as a unique operating environment present a challenge to the ARHC and the hydrographic offices making progress realizing the goals of the IHO to chart the ocean and protect the marine environment. The challenge is being addressed by testing and sharing news of technological solutions and enhancing partnerships to broaden awareness of the challenges that will emerge with increased navigation in the Arctic. Topics such as satellite derived bathymetry, crowd sourced bathymetry, autonomous vessel operations will continue to be important topics of ARHC agenda in the near future

6. Achievements/outputs/conclusions:

- i. An initial regional assessment of the state of hydrographic survey and charting has been completed and updated. See "Arctic Hydrography Adequacy-an Update" (DOC ARHC8-C1a) and the associated interactive Web Map.¹
- ii. Information and experiences with autonomous survey vehicles, satellite derived bathymetry and crowd source bathymetry has been shared and discussed
- iii. External partnerships and communications with key stakeholders is making excellent progress in general. A Memorandum of Understanding with the Arctic Council PAME is expected to be signed by A-2; hydrographic offices have been attending relevant external meetings and for a to share news of the work of the ARHC; and related MSDI initiatives are being synergized (see UNGIM, Arctic SDI, MSDIWG, and ARMSDIWG)
- iv. Overlaps in ENC coverage have largely been resolved and are at the point of low risk.
- v. Stakeholder science workshops were organized by hosting nations at ARHC-7 (Illulisat, Greenland, Denmark) and ARHC-8 (Svalbard, Norway). These one day meetings preceded the formal sessions of the ARHC itself and allowed a critical venue for local scientific, governmental, academic, and community representatives to contribute perspectives regarding hydrographic matters related to community development. Topics such as local pilotage, tourism, arctic research, governance, and public-private partnerships were among

¹ https://iho.int/uploads/user/Inter-Regional%20Coordination/RHC/ARHC/ARHC8/ARHC8-C1a_Arctic_Hydrographic_Adequacy_OTWG.pdf and <https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=2e0f077b8a0147149c8229c9204332d7>

the many important topics highlighted. The additional input provided by Arctic stakeholders informed and contributed to the discussions of the hydrographic offices during the formal regional commission meetings which followed.

7. Actions required of the Assembly:

- a) note the report of the ARHC and
- b) take any other action considered appropriate.

2. REPORT OF THE BALTIC SEA HYDROGRAPHIC COMMISSION (BSHC)

1. Chair:

Mr. Mindaugas Česnauskis (Lithuania) 29.09.2016 - 21.09.2017
 Mr. Thomas Dehling (Germany) 21.09.2017 - 29.08.2018
 Mrs. Pia Dahl Højgaard (Denmark) 29.08.2018 -12.09.2019
 Captain (PLN) Andrzej Kowalski (Poland) 12.09.2019 -13.10.2019
 Captain (PLN) Dariusz Kolator (Poland) from 14.10.2019 - until now

Vice-chair:

Mr. Mathias Jonas (Germany) 29.09.2016 - 24.04.2017
 Mr. Thomas Dehling (Germany) 24.04.2017 - 21.09.2017
 Mrs. Pia Dahl Højgaard (Denmark) 21.09.2017 - 29.08.2018
 Captain (PLN) Andrzej Kowalski (Poland) 29.08.2018 -12.09.2019
 Mr. Patrik Wiberg (Sweden) 12.09.2019 – until now

2. Membership:

Members: Denmark, Estonia, Finland, Germany, Latvia, Poland, Russian Federation, Sweden

Associate Member: Lithuania

3. Meetings:

22 nd Meeting:	Rostock (Germany),	19-21 September 2017
23 rd Meeting:	Aalborg (Denmark),	28-29 August 2018
24 th Meeting:	Gdańsk (Poland),	10-12 September 2019

4. Agenda Items:

IHO-EU Network WG (IENWG)

Sweden acted as a representative of BSHC. BSHC member states have been active in participating in the IHO-EU Network Working Group since its inception in 2012 with substantial co-operation and progress on one of the European Commission's flagship maritime projects European Marine Observation and Data Network (EMODNET) and its coastal mapping project. During the last BSHC Conference concerns were raised on safety of navigation issues if source data is made freely available as well as the need for exchange of information on national implementation of the new PSI directive was requested on a bilateral basis.

Re-survey Monitoring and Coordination

BSHC developed and operates a standing scheme of re-surveys for the region. Schedule and execution of surveys are provided in an updated web based interface maintained and operated by Sweden. Surveys are being regularly co-ordinated between neighbouring countries. The BSHC Re-survey Monitoring Working Group liaises with the respective NSHC Working Group. HELCOM Re-Survey MWG chair just prepared and sent a letter to HELCOM MARITIME with the aim of a possible continuation of the task in HELCOM and inclusion of CAT III areas in the Re-Survey Scheme.

Baltic Sea Bathymetric Database

Sweden operates a cross border bathymetry database and a geo portal (data.bshc.pro) on behalf of the Commission. BSHC Member States are providing gridded mesoresolution depth information. Data density differs between the Member States and has a minimum resolution of

500 m. The website is fairly widely used and the portal is running smoothly. The usage of the portal is almost unchanged from year to year. Most users are from SE and PL.

It is possible to either download data or to use the WMS service provision. The options for the re-use of the data are not fully harmonised and depend from the specific national legal regulations. Sweden plans to release a new version of the grid as far as newer and better data is available from numerous countries.

The BSHC bathymetry database is recognized by GEBCO as a Regional Mapping Project. At the same time BSBD uses the GEBCO dataset for areas where no data has been provided by national HO of the region. BSBD is used in the EMODnet phase 2 model and it is planned to assist in deliveries to EMODnet “High Resolution Seabed Mapping” (phase III).

Harmonized Chart Datum in the Baltic Sea

BSHC developed the Baltic Sea Chart Datum 2000 as a joint height reference. It is based on the European Vertical Reference Frame (EVRF). A first specification of such a harmonized chart datum was completed in 2016. The specification reflects the specific needs of surface navigation and hydrography in addition to EVRF conventions. The Chart Datum WG is monitoring and gives guidance for the implementation of the harmonized chart datum. BSHC members have widely committed to implement it. In some countries implementation has already started.

FAMOS - FASTMOS

Several BSHC Member States (DE, DK, EE, FI, LV, LT, SE) and working groups are involved in the project FAMOS coordinated by Sweden. The project focuses on surveying areas relevant for commercial shipping in the Baltic Sea according to the BSHC-HELCOM re-survey scheme. Furthermore, it serves as a platform for implementing the common Baltic Sea chart datum as proposed by the BSHC Chart Datum Working Group and agreed upon within BSHC. The project receives EU co-financing from the CEF Transport programme. The first phase of the project, FAMOS Freja, was successfully executed from 2014 to 2016. The second phase of the project, FAMOS Odin, was ongoing for the time 2016-2018. The third and last period of FAMOS is aimed to start in 2020. A new project name, FASTMOS 2020-2023, is proposed. The project concept is currently being designed and new stakeholders and potential partners are signing up in the process. So far, four work packages have been defined. The aim is to enable the maritime sector to be a more efficient and sustainable means of transport. Completing HELCOM Re -survey scheme is fundamental for any development in the Baltic Sea.

Baltic Sea International Chart Coordination (BSICC)

The working group processes ENC and paper chart issues fully in parallel and to the same extent. The facilitation of the INT Chart Web Catalogue and continuous updating of S-11 Part B, have become inherent part of the chart publishing process in all member states. Monitoring of Baltic Sea ENC scheme and the identification of potential gaps and overlaps has been added to the standing agenda items of the working group. BSHC member states agreed about the unlimited internal use of the small scale ENC covering the whole Baltic as provided by Germany as the responsible producer.

Finland acted as a representative from BSHC and proposed several changes of geographical names (i.e. “Middle Baltic” to “Central Baltic” and “Central Baltic Sea” to “Baltic Proper”) and to shift the limit between Middle Baltic and South-Eastern Baltic.

There is also the need to refine the limits between charting region D (North Sea) and charting region E (Baltic Sea) to correspond to the limit as laid out in IHO S23. This proposal will also refine the definition of the limits between the sea areas, Skagerrak and Kattegat as well as the definition of the existing limit between charting region D (North Sea) and charting region E (Baltic Sea) in accordance with S-23 by defining coordinates for GIS-purposes. NSHC should be informed about the refined limit.

Marine Spatial Data Infrastructure (MSDI)

MSDI delivers the instruments for the enhanced scope of hydrographic information users. MSDI can create the framework for future provision of this information beyond the classic field of surface navigation. BSHC and NSHC see the importance to deal with these opportunities from a regional approach. The respective WGs in both RHCs have been merged in 2016 to the NSHC and BSHC Baltic Sea North Sea Marine Spatial Data Infrastructure Working Group (BSNSMSDIWG). It will report to both commissions and cooperate with the respective IHO MSDI working groups.

WENDWG

BSHC is regularly represented in the WEND Working Group by Finland. The representative shall report to the Commission, including: review of the progress on the work items of WEND, resolving overlaps, ENC distribution and harmonisation, ENC coverage status. BSHC receives the annual report and gives further guidance to the BSHC WENDWG representative.

BSHC Internet Domain

BSHC developed an internet domain (www.bshc.pro). It is operated by Sweden. The content is under ongoing development. Major facts about the members and activities of the Commission are already presented. URL links provided for GIS applications matching with the scope of the Commission and to IHO web pages.

Capacity Building

Activities in CB are mainly dealt internally within BSHC. CBSC is chaired by Germany and Germany provides the CB Coordinator for the BSHC.

5. Difficulties encountered and challenges yet to be addressed

Russian Federation is a very important member of BSHC, but unfortunately since 2018 has not participated in BSHC conferences and working groups as well.

6. Achievements/outputs/conclusions

The cooperation within the BSHC is very productive. Several projects have led to joint databases and results provided in the web. The outreach of the hydrographic work in the region and beyond has improved even further.

Member states have continued to contribute extensively to the work of the IHO and have been active participants of working groups.

There has been substantial co-operation between commission member states and other European States and the EU on information sharing and shared projects.

Denmark and Poland completed EEZ delimitation process covered Bornholm surroundings for the safety of navigation reason (now more possibilities to cover this area by official hydrographic data).

7. Actions required of the Assembly:

Take note of the Report of the Baltic Sea Hydrographic Commission.

3. EAST ASIA HYDROGRAPHIC COMMISSION (EAHC)

1. Chair

RAdm. Dato' Pahlawan ZAAIM bin HASSAN, Malaysia, until September 2018

Dr. Yukihiro KATO, Japan, since September 2018

Vice Chair

Dr. Arata SENGOKU, Japan, until March 2018

Dr. Yukihiro KATO, Japan, April 2018 - September 2018

RAdm. Harjo SUSMORO, Indonesia, since September 2018

2. Membership

Members: Brunei Darussalam, China, Democratic People's Republic of Korea, Indonesia, Japan, Malaysia, Philippines, Republic of Korea, Singapore, Thailand, Vietnam (provisional)

Observers: Cambodia, Timor Leste, UK, USA, GEBCO Guiding Committee

3. Meetings

- 7th EAHC Training and Research Development Center Board of Directors Meeting
Tokyo, Japan 14-15 August 2017
- 6th EAHC Charting and Hydrography Committee Meeting
Tokyo, Japan 16-18 August 2017
- 8th EAHC Training and Research Development Center Board of Directors Meeting
Xiamen, China 5 March 2018
- 5th EAHC Steering Committee Meeting
Xiamen, China 6-8 March 2018
- 13th EAHC Conference
Putrajaya, Malaysia 18-20 September 2018
- 7th EAHC Charting and Hydrography Committee Meeting
Chiang Mai, Thailand 28-29 November 2018
- 1st EAHC MSDI Working Group Meeting
Chiang Mai, Thailand 29-30 November 2018
- 9th EAHC Training and Research Development Center Board of Directors Meeting
Bali, Indonesia 18-19 February 2019
- 6th EAHC Steering Committee Meeting
Bali, Indonesia 20-22 February 2019
- 10th EAHC Training and Research Development Center Board of Directors Meeting
Singapore 25 June 2019
- 2nd EAHC MSDI Working Group Meeting

Singapore 26 June 2019

- 8th EAHC Charting and Hydrography Committee Meeting
Singapore 27-28 June 2019
- 11th EAHC Training and Research Development Center Board of Directors Meeting
Tokyo, Japan 3-4 February 2020
- 7th EAHC Steering Committee Meeting
Tokyo, Japan 5-7 February 2020

4. Agenda Items

- EAHC Strategy Plan / MSDI-WG Work Plan / Long-Term CB Programme Plan
- EAHC 50th Anniversary Celebrations
- EAHC Member Status
- Report on HSSC / IRCC / IHO Council
- S-100 Works
 - S-100 Testbed Project
 - S-101 Conversion Practice
 - S-100 Implementation Framework
- EA-RECC activities
- Update on East Asia and South China Sea ENCs
- Feedback on CB programs conducted
- Maritime Safety Information
- EAHC-MSDI activities

5. Difficulties encountered and challenges yet to be addressed

- Political Influence

6. Achievements/Outputs/Conclusions

- EAHC Capacity Building Programme:
 - Training in Hydrographic Survey for Disaster Management and Relief, 11-15 September 2017
 - Workshop on LiDAR and Satellite Derived Bathymetry (SDB) 30 January-1 February 2018
 - Training in use GNSS for Tide Correction for Survey, 9-13 July 2018
 - Carto Production Database System Development, 22-26 October 2018
 - Maritime Safety Information Course and Maritime Safety Information Database Workshop, 9-13 September 2019
 - Risk Assessment for Hydrographic Surveys and Charting Management for the Safety of Navigation, 9-13 December 2019
- Technical Visit to Cambodia, 20-22 August 2019

- Approval of the draft ToR/RoP for the Governing Body (Board Of Directors) of the EA-RECC
- Establishment of the EAHC Statutes Review Working Group (EAHC-SRWG).

7. Actions required of the Assembly

- a) The Assembly is invited to note the report of the EAHC

4. REPORT OF THE EASTERN ATLANTIC HYDROGRAPHIC COMMISSION (EAthC)

1. Chair:

Okafor Chukwuemeka Ebenezer (NG): October 2018 till date
 Juan A. Aguilar Cavanillas (SP): October 20, 2016 to October, 2018
 Abdelouahed Dihaji (MA): September 18, 2014 to October 20, 2016
 Bruno Frachon (FR): November 16, 2012 to September 18, 2014
 Agostinho Ramos da Silva (PT): to November 16, 2012

Vice-chair:

15th meeting: Okafor Chukwuemeka Ebenezer (NG)
 14th meeting: Juan A. Aguilar Cavanillas (SP)
 13rd meeting: AbdelouahedDihaji (MA)
 12nd meeting: Bruno Frachon (FR)

2. Membership:

Members: Cameroon, France, Morocco, Nigeria, Portugal, Spain.

Associate members: Benin, Cabo Verde, Congo, Côte d'Ivoire, Guinea, Guinea-Bissau, Mauritania, Senegal, Togo

Observers: Angola, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Gambia, Liberia, Sao Tome and Principe, Sierra Leone, UK, USA.

3. Meetings:

Next meeting: 16th EAthC; 28 September – 2 October 2020 in Lisbon (PT)

15 th meeting:	Lagos (NG),	17 – 19 October 2018
14 th meeting:	Cádiz (SP),	18 - 20 October 2016
13 rd meeting:	Casablanca (MA),	16 – 18 September 2014
12 nd meeting:	Lisbon (PT),	14 – 16 November 2012

4. Agenda Items:

According to the 3-year work plan 2018-2020, execution of the CB activities in the region since the last session of the Assembly has been encouraging thus far. Of particular note was the execution and plans of high-level and technical visits such as the visits to regional training centres to find synergies in support of the CB plans. Most recently, the joint IALA-IHO workshop for capacity-building in hydrography and marine aids to navigation, which geared its efforts towards Risk Assessment, Survey Specifications and AtoN Maintenance was organized between October 21st and 24th 2019 and hosted in Rabat by the Directorate of Ports and Maritime Public Domain with the support of the Hydrography, Oceanography and Cartography Division of the Royal Moroccan Navy. Other CB activities in the future include Technical Visit to Congo and Togo in 2020. Having these seminars and technical visits would prove beneficial to the EAthC where coastal states would be informed of their international obligations, the need for better cooperation within the region and the value of their hydrographic information.

The 15th EAthC meeting considered how the IHO CB Programme can support coastal states to prepare for the International Maritime Organization (IMO) Member State Audit Scheme (IM-SAS) with respect to the provision of hydrographic services. The status and implementation of the regional INT and ENC charting schemes were presented by the regional coordinator for Region G (France) including the process for monitoring and managing charts and the chart

schemes. These schemes were also reviewed by the Regional G International Charting Coordination Working Group (G-ICCWG).

The 9th meeting of the Worldwide ENC Database Working Group (WENDWG) took place in Brest, France, hosted by SHOM, from 26 to 28 February 2019 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. 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. However, concerns were raised in terms of coverage; UB1 and UB2 coverage considered as completed, but persistent gaps over Northwest coast of Africa in Band 3 and still few maritime approaches covered in band 4. There has been very slight improvement in the coverage of ports in the African sub-region (UB5 & UB6).

5. Difficulties encountered and challenges yet to be addressed:

Challenges faced in the EAtHC region are linked to the exploitation of marine resources, risk prevention in highly humanized areas exposed to increasing hazards and maritime delineation issues. Hydrographic services remain globally far behind in most of the Central & Western African coastal states within the EAtHC region. The difficulty involved in getting most Governments in the region to appropriate funds for development and sustainability of Hydrography remains one of the major challenges in the region. Hence, there is need for increased advocacy in this regard until improvement is achieved. Going by the accomplishments of the 3-year work plan 2018-2020, thus far, there has been a number of successful Capacity Building (CB) initiatives in the region, however, there is no commensurate development in hydrographic practice within the region. It would be worthy to note that awareness has increased, including at the highest political level in Nigeria, who developed its MSI facilities and charting capabilities after attending relevant workshop/training facilitated by the IHO. There is still a lot of work that needs to be done as more than 85 percent of countries in the region still depend on third party to fulfill their national obligations and most of them are not yet members of the IHO, though being members of the IMO.

6. Achievements/outputs/conclusions:

There has been remarkable improvement in hydrographic awareness within the region most especially in Gambia, Cote d'Ivoire, Congo, DRC and Guinea which all show increased awareness. On 29 August 2019, vide IHO CL 41/2019, it was announced that the Republic of Ghana has become the 92nd Member State of the International Hydrographic Organization. This shows the increasing efforts of the EAtHC towards the greater involvement of the Coastal States primarily concerned by the development of their hydrographic services. In terms of development of MSI capacity, Ghana, with the assistance of Denmark, established a MSI system, while Nigeria established its MSI Portal and commenced collaboration with France for its broadcast. Liberia has commenced training of an MSI National Coordination and intends to promulgate its MSI via Safety Net in future.

It is worthy to note that Nigeria has attained Phase 3 of CB strategy by producing its first Nautical Chart early 2019. This is an encouraging step as Nigeria and Morocco are demonstrating exemplary hydrographic capacity development as well as awareness. Therefore, both member states should play an increasingly active role for the benefit of West and Central African coastal states, sharing their experience and providing training capacities and training opportunities.

EAtHC appears to have understood the importance of Hydrography, however, more encouragements and collaborative activities need to be intensified so as to maintain the tempo.

7. Actions required by the Assembly:

Note the report of the Eastern Atlantic Hydrographic Commission.

5. REPORT OF THE MESO AMERICAN AND CARIBBEAN SEA HYDROGRAPHIC COMMISSION (MACHC)

1. Chair

Rear Admiral Fernando Alfonso RODRIGUEZ ANGLI	Mexico	until March 2017
Rear Admiral Enrique FLORES MORADO	Mexico	March 2017 to March 2019
Ms. Kathryn Ries	US	March 2019 to present

Vice-Chair

Ms. Katie Ries	US	March 2017 to March 2019
Vice Admiral Antonio Fernando Garcez Faria	Brazil	March 2019 to August 2019
Vice Admiral Marcos Borges Sertã	Brazil	August 2019 to present

2. Membership

Members: Brazil, Colombia, Cuba, Dominican Republic, France, Guatemala, Guyana, Jamaica, Mexico, Netherlands, Suriname, Trinidad and Tobago, United Kingdom, United States of America, Venezuela.

Associate Members: Antigua and Barbuda, Barbados, Belize, Costa Rica, El Salvador, Grenada, Haiti, Honduras, Nicaragua, Panama, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines.

During this reporting period, the Dominican Republic has regained full membership and Guyana has acceded into the IHO and is now a full member of MACHC as well.

3. Meetings

The MACHC has met annually since the close of the 1st Session of the IHO Assembly in 2017, as follows:

18 th Conference	Varadero, Cuba	November 2017
19 th Conference	Cartagena de Indias, Colombia	November 2018
20 th Conference	Santo Domingo, Dominican Republic	December 2019

4. Agenda Items

The main topics dealt with during the reporting period were primarily organized around the following MACHC Committees and Working Groups. Here follows some of their major activities and accomplishments:

a) MACHC International Charting Coordination Working Group (MICC)

- MACHC ENC Online established
- MACHC ENC Boundary limits now include parts of the Amazon River within the MACHC area, which should now be reflected on IHO and other sites depicting RHC boundaries.
- Increasing Availability of ENCs in Region:
 - ENC Cells available in
 - 2017: 842
 - 2018: 914
 - 2019: 933

- Increasing Availability of INT Charts in the region
 - 2018: 49 produced- schemed 33
 - 2019: 51 produced – schemed 33
- Ports Analysis evaluation to identify gaps
 - 2015: -43 Ports lacking large scale coverage
 - 2016: -14 of the 43 have ENC coverage planned
 - 2017/2018: - 29 ports from 43 covered
 - 2018/2019: - anchorage areas were added to list making a total 92 and currently only 32 not covered
- Proposal for a MACHC Regional ENC scheme
 - A MICC sub-working group established 2019 to develop guidance for a way forward.
- S 100 series test beds
 - National Testbeds in progress for S-102 (Bathymetry), S-111 (surface currents), S-122 (marine protected areas)

b) MACHC Capacity Building Committee (CBC)

- Technical Visits to:
 - a. El Salvador – 2017
 - b. Dominican Republic – 2018
 - c. Guatemala - 2019
- Held three Hydrographic Governance Seminars in 2017, 2018 and 2019 for non-IHO member coastal states. The 2018 Seminar generated a Disaster Response Framework adopted by the MACHC. The 2019 Seminar included a half-day training on Introduction to MSDI, using the new IHO MSDI training materials that were well received.
- Held a regional Multibeam Processing Training course in Colombia in 2018, organized by the MACHC with participation of SWAtHC and SEPHC Members' representatives. Held just after the MACHC19 conference, this training had participants from Argentina, Brazil, Republica Dominicana, Ecuador, El Salvador, Guatemala, México, Venezuela, Chile and Colombia. This training was theoretical, with support of industry, and practical on board the "ARC Roncador", a vessel belonging to Hydrographic Service of Colombia.
- Held a regional Maritime Safety Information Training course in Brazil in 2018, organized by SWAtHC but with participation of MACHC Member representatives. Another course took place in the Dominican Republic in 2019, following the MACHC20 Conference. This training had participants from Anguilla, Belize, British Virgin Islands, Cayman Islands, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Honduras, Guatemala, Montserrat, and Turks and Caicos. The MACHC also evaluated the overall regional status of MSI to help better prioritize participation in future training sessions.

- Training on Tides and Water Levels for Spanish Speakers is planned for 2020 in Costa Rica. The broad range of regional co-sponsors include the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS), the Central American Commission for Maritime Transport(COCATRAM) and neighboring RHCs (SEPRHC, SWaHC).
 - Other collaborative regional training opportunities are being actively explored with the IMO, under the UN concept of “Delivering As One” to support the SDG-14, in particular maritime development cooperation activities.
- c) MACHC Marine Spatial Data Infrastructure Working Group (MMSDI WG) - established in 2019)
- Initiated an inventory of national MSDI data holdings
 - Established a website portal to make key data sets (bathymetry, shoreline and maritime boundaries) more accessible for non-navigation uses, such as a regional risk assessment for maritime accidents, management of marine protected areas and disaster response.
 - Contributed some of these datasets to the Caribbean Marine Atlas, an existing regional geospatial data and information platform and encouraged other countries in the region to make their open geospatial information available there, and avoid having to build a duplicative individual MSDI.
 - Increased national bathymetric data contributions to the IHO DCDB and to the Seabed2030 Regional Data Assembly and Coordination Center for the Atlantic and Indian Oceans.
 - Established linkages with the UN-GGIM Working Group on Marine Geospatial Information effort.
- d) Disaster Response
- The 2018 Seminar on Hydrographic Governance prior to the MACHC19 included a workshop on dealing with maritime disasters. It produced a draft Disaster Response Plan Framework that the MACHC has implemented much of on its new bilingual (English/Spanish) MACHC Initiative Website. It provides a centralized place for critical information needed by both countries impacted by an event and those who want to support the response. It includes preparation (national, regional and industry senior and working level emergency points of contact); response (national and industry assets potentially available after an event; template for damage assessment) and communication (summaries of Member State response activities during the 2019 Hurricane Dorian) information.
- e) MACHC Contributions to GEBCO/Seabed 2030
- The MACHC initiated collaboration with the Seabed 2030 Regional Data Assembly and Coordination Center for the Atlantic and Indian Oceans (a representative attended the 20th MACHC meeting) and developed a gap analysis tool. It will be shared with IO-CARIBE and many other regional partners to help focus national efforts to contribute existing data and catalyze new collaborative surveys to fill regional data gaps. Also revitalized the International Bathymetric Chart for the Caribbean Project scheduled for

completion by mid-year 2020. The MACHC appointed a regional Seabed 2030 coordinator provided by Mexico to liaise with the RDACC and work with Member States to increase both traditional and crowdsourced bathymetric data contributions.

f) Industry hydrographic survey support activities

Over the reporting period, the MACHC has seen an unprecedented rise in hydrographic surveying activity, with a number of member states benefitting from the efforts of leading foreign government agencies' funding and contracting of modern, holistic (topographic and bathymetric) hydrographic surveys to IHO Order 1 standards (often enhanced in accuracy and/or resolution by the national contracting authority). These include, but are not limited to, St. Vincent and the Grenadines, Anguilla, Cayman Islands, Belize, Turks and Caicos Islands, St. Martin/St. Maarten and portions of Jamaica and Haiti. They amount to tens of thousands of square kilometers of modern coverage fueling entire new chart editions and providing the baseline for the Blue Economy, disaster mitigation activities, and Seabed2030 contributions, amongst others.

g) Creation of new MACHC Initiative Website

The MACHC Initiative Website complements the IHO MACHC site, which archives all the documents related to MACHC meetings. It is a space where the work of the MACHC is contained and is designed to be a centralized resource for all MACHC members. Some of the key features include:

- Both English and Spanish languages;
- Mobile device friendly;
- Provides up-to-date information related to the work of the Committee, Working Groups and other initiatives as described above.

5. Difficulties encountered and challenges yet to be addressed

- Full ENC coverage not yet achieved and a new regional ENC scheme under development.
- Finding ways to increase alternate sources of funding and partnerships for capacity building, as the demand far outweighs IHO CB funds. The Tides and Water Levels training for Spanish speakers is a good example of the strategic expansion of co-sponsors to leverage new CB resources and create a broader impact across regional stakeholders beyond just the MACHC.
- A related area to be further explored is with donor organizations such as the InterAmerican Development Bank which has funded member states like Jamaica and Haiti to execute IHO-standard hydrographic surveys overseen by a capable NGO (University of the West Indies, Mona). The MACHC will further engage with entities like the IDB to potentially expand these resources for regional hydrographic surveys and related training and education.
- Several non-IHO Member coastal states emphasized the importance of high-level visits in order to increase hydrographic awareness and help accelerate national political and technical processes for them to become IHO members. This will be taken into account as the new MACHC Capacity Building Plan for 2021-23 is developed.

- Increasing the access to and delivery of authoritative data layers from electronic navigational charts to satisfy non-navigation regional demands.
- Increasing the regional contributions of existing data and catalyzing new national and collaborative surveys to fill regional gaps for Seabed 2030.
- Continuing to develop and exercise the MACHC Disaster Response Plan.
- Expanding the potential of Crowd Sourced Bathymetry in Region. Currently three nations out of 28 (10%) have notified IHO of a willingness to participate in the IHO CSB global effort.

6. Achievements/Outputs/Conclusions

- There are relatively few gaps in regional charting coverage, the MICC operates effectively.
- A regional study on the risk associated with maritime accidents is progressing well, in large part fueled by the navigation data layers provided by the MACHC MS.
- Success achieved in finding new regional co-sponsors for capacity building training, as mentioned above for the Tides and Water Levels training for Spanish speakers. This needs to be built upon and expanded since IHO CB funds are shrinking in relation to the increasing demand. New partnerships with other potential donor organizations such as the IDB need to be explored.
- Some countries in the region have national training offerings that could be better leveraged to support CB and an inventory of those opportunities has been developed for this purpose. This inventory also reflects training available from other regional organization partners, including numerous valuable industry offerings for education and training beyond the confines of proprietary products and services.
- Engagement with the IMO is increasing, with planned IHO and MACHC Member State involvement with the First Caribbean Regional Knowledge Partnership Workshop on Maritime Technical Cooperation Activities, to be held in Kingston, Jamaica from 20 to 24 January 2020 and the Senior Maritime Administrators meeting to be held in St. Lucia in 5-6 March 2020.
- The new MACHC MSDI WG (established in November 2018) has made great progress. Among others, the inventory of where/how to find key data layers from MACHC MS is well received and expanding. A new partnership with the Caribbean Marine Atlas is underway, which is an existing MSDI platform for the region that can host open marine spatial data sets for interested MS who then do not have to build this capacity individually. More MACHC members are engaged in the Working Group on Marine Geospatial Information of the UN-Global Geospatial Information Management program.
- Guyana became a new (90th) Member State of the IHO as of 18 April 2019 and officially became a member of the MACHC in December 2019. All coastal states of South America are now IHO Members!
- The Disaster Response Framework deployed on the new MACHC Initiative Website, was successfully utilized in the response to the impacts of Hurricane Dorian on the Bahamas.

- The International Bathymetric Chart of the Caribbean (IBCCA) is re-invigorated, and expected to be completed by March 2020, a major deliverable for Seabed2030.
- The MACHC partnered with the Seabed 2030 Regional Data Assembly and Coordination Center (RDACC) for the Atlantic and Indian Oceans to develop a gap analysis tool to help focus national efforts to contribute existing data and organize new collaborative surveys. Tool to be shared with IOCARIBE and other partners to generate the momentum to fill regional data gaps. Established a Seabed2030 regional coordinator from Mexico to liaise with the RDACC to increase traditional and crowd sourced bathymetry contributions.
- A new MACHC Initiative Website was created to focus major work efforts and have a centralized place for related documents (complements the IHO MACHC site).

7. Actions required of the Assembly

- The Assembly is invited to note this report and consider options to increase the shrinking IHO CB-fund from both internal and external funding sources.

6. REPORT OF THE MEDITERRANEAN AND BLACK SEAS HYDROGRAPHIC COMMISSION (MBSHC)

1. Chair

J. Daniel GONZALEZ-ALLER LACALLE (Spain)

Vice-chair

Vacant

2. Membership:

Members: Algeria, Bulgaria, Croatia, Cyprus, Egypt, France, Georgia, Greece, Italy, Malta, Monaco, Montenegro, Morocco, Romania, Russian Federation, Serbia, Slovenia, Spain, Syria, Tunisia, Turkey, Ukraine.

Associate members: Israel, Palestinian Authority, UK, USA.

Observers: Albania, CIESM, Germany, Lebanon, IC-ENC, IOC, PRIMAR.

3. Meetings

20 th meeting:	Herceg Novi (Montenegro),	4 – 6 June 2017
21 th meeting:	Cádiz (Spain),	11 – 13 June 2019

4. Agenda Items

- MBSHC member states are active in participating to the IHO-EU network working group (IENWG). Greece is the MBSHC focal point for the IENWG and has provided an updated list of maritime related events, projects and tenders of interest for the MBSHC, as requested. Several MBSHC Member States 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.
- Italy, acting as Chair and ambassador of MBSHC at the MSDIWG, sent to MSs a questionnaire with the intention of conducting a study on the relative level of advancement of countries of the MBSHC in the development of their own MSDI.
- Turkey represents the MBSHC at the CB Sub-Committee and is in charge of updating the MBSHC 3 year CB work plan. CB activities since June 2018:
 - Port & Shallow Water Survey Course (Sept 2018): 6 participants;
 - MSI Training (Sept 2018): 8 participants;
 - Technical Visit to Georgia (Oct 2018).
 - Technical Visit to Lebanon (May 2019).

5. Difficulties encountered and challenges yet to be addressed

- The main difficulties faced by the MBSHC are in the coordination of the INT chart schemes and ENC coverage. Despite a consolidated small scale INT scheme and a growing large scale coverage, midscale schemes development have been slowed down by several long-lasting issues.
- As for the Regional ENC coverage, a significant amount of overlapping still exists at different Usage Band (1, 2 and 3). Since last MBSHC-20 conference, some progresses have been made, most notable is the Cancellation of IT100360, and clipping of UK and Italian

cells for Tunisian data. Moreover, bilateral discussions between concerned MSs are ongoing in order to achieve tangible solutions.

- The MBSHC and the ICCWG of region F are playing a strong part in the setting up of an adequate INT scheme in order to meet the needs of international shipping, as well as in the promotion of INT standards, with most national maps produced in the region now conforming to the S-4 standard. Despite a consolidated small scale INT scheme and a growing large scale coverage, midscale schemes development have been slowed down by several long-lasting issues.
- With the issuing of the IHO Resolution 1/2018, for the elimination of overlapping ENC data in areas of demonstrable risk to the safety of navigation, this tool has started to be implemented in the Region.
- Discrepancies between new ENCs and existing INT charts are raising new difficulties regarding consistency of nautical information provided by different producers.
- Reduced resources have restricted members ability to participate in IHO meetings.
- Further the safety of navigation in the NAVAREA III area by means of improved capacity and coordination.

6. Achievements/outputs/conclusions:

- The enlargement of the MBSHC membership is beneficial. Albania has been asked to consider signing the MBSHC Statutes, to become an Associate Member States.
- MBSHC is developing liaison with States bordering the Caspian Sea.
- The coordinating role of IENWG to present several national HOs of Europe in a joint consortium body has proved successful for winning contracts.
- Bilateral discussion is a prerequisite for the solution of ENC overlapping issues and, very often, is the only pragmatic way forward.
- It would be beneficial to establish a common set of criteria on which an individual recognition scheme should be based on, to be applied to the whole.
- Mediterranean and Black Sea Region, “to monitor and assess individuals at regular intervals and to register them in a formal system so that an individual may gain professional certification or individual recognition at a defined level of competency which may include Category A and Category B” (Chapter 6 of the “Guidelines for the implementation of the standards of competence for hydrographic surveyors and nautical cartographers” - ed. March 2017). MBSHC CL 1/2018 (24/01/2018) has been issued in order to seek MS’s point of view on this regard. Only Cyprus, Malta and Tunisia replied.
- Italy, as Chair and ambassador of MBSHC at the MSDIWG, sent out a MBSHC CL 4/2018 (03/05/2018) in order to seek information from MBSHC MS about their MSDI implementation at a national level. The information provided will be used to extract and synthesize the MSDI implementation process at a regional level.
- Italy attended the MGIWG (UNGGIM) as required by A-1, C-1 and IRCC-9. The MBSHC Region has been represented in the highest world forum on Marine Geospatial matters.
- Capacity building plays a key role in the Region and the enlargement, not only of the MBSHC, but also of the number of IHO Member States is beneficial. Bulgaria has become an IHO Member State, and joined MBSHC in 2018. Albania has been asked to consider signing the MBSHC Statutes, to become an Associate Member State. Lebanon, having a strong support from Italy in establishing a National Hydrographic Service, is also considering the possibility to join the IHO.

- The MBSHC is developing liaison with States bordering the Caspian Sea: MBSHC Chair attended the BASWG14 meeting in Romania in May 2018.
- The coordinating role of IENWG to present several national European HOs in a joint consortium body has proved successful for winning contracts (e.g. EMODNET Bathymetry HRSM): Greece, as the MBSHC focal point for the IENWG, provided an updated list of maritime related events, projects and tenders of interest for the MBSHC (see MBSHC CL 06/2018).
- Since the June 2018, progress has been made in the Region F concerning the solution of some ENC overlaps. Effective tools for detecting these overlaps put in place by the RENCs and the implementation of the recent IHO resolution 1/2018 will help to raise awareness among ENC producers about these overlaps and MS in solving them.
- Italy attended the MGIWG (UN-GGIM) as required by A-1, C-1 and IRCC-9. The MBSHC Region has been represented in the highest world forum on Marine Geospatial matters.

7. Actions required by the Assembly:

- a) Note the report of the MBSHC.
- b) Take any other action considered appropriate.

7. REPORT OF THE NORDIC HYDROGRAPHIC COMMISSION (NHC)

1. Chair

Mr. Patrik Wiberg (Sweden) from March 2017
 Mr. Rainer Mustaniemi (Finland) from April 2018
 Mr. Georg Lárusson (Iceland) from April 2019

Vice-Chair

Mrs. Annika Kindeberg (Sweden) from March 2017
 Mr. Jarmo Mäkinen (Finland) from April 2018
 Mr. Árni Þór Vesteinsson (Iceland) from April 2019

2. Membership

Members: Denmark, Finland, Iceland, Norway, Sweden

3. Meetings

The Commission has met annually since 1st Session of the IHO Assembly, (24-28 April 2017) in accordance with the NHC Statutes:

62 nd Meeting:	Arkö-island near Norrköping, Sweden	10-12 April 2018
63 rd Meeting:	Helsinki, Finland,	9-11 April 2019

NHC MS met in March 2019 and held a Nordic Strategic Workshop.

4. Agenda Items:

The main subjects dealt with during the reporting period were the following:

- Report status and plans of nautical publication
- Review of NHC Statutes
- Experiences with Green laser bathymetry survey
- Crowdsourced bathymetry WG and Seabed 2030 project.
- National data policies on CB and general data policy for HO's
- New systems for Chart Production and Bathymetric Data Management
- ENCs for leisure markets. RENC operations
- ENC Symbology Catalogue – INT1 for ECDIS
- E-navigation - Smart Marine Fairway
- Cost Benefit Analysis of Increased Production and Improved Availability of Marine Geospatial Data - TopoBathy
- Future role of Nordic HO's - IHO Strategy review. Outcome of the Nordic Strategic Workshop in March 2019
- NHC Expert Groups - Nordic Nautical Publication Working Group (NNPWG)
- Nordic Survey Expert Group (NSEG)
- DQWG actions.

5. Difficulties encountered and challenges yet to be addressed:

-

6. Achievements / Conclusions:

- Nordic HOs to coordinate discussion of the issue of S-102. Proposed to have a Nordic Contact list (including S-102 contact points).
- NHC Statutes revised by adding to Article 3, Objectives of the NHC: “d) To cooperate in the case of crisis and disasters affecting one or several Members“
- Name of the Nordic Hydrographic Technical WG changed to Nordic Survey Expert Group (NSEG). Next meeting to discuss role and scope of the group. Report to NHC for approval.
- Nordic Chart Production Expert Group (NCPEG) to include the issue of harmonizing future S-100 products in the ToR. Chair to amend ToR to include future S-100 products and have agreement with all MS.
- NHC MS to establish CATZOC policies and provide information to DQWG
- Save time on presentations of national reports by giving time only for comments or questions related reports.
- The Nordic Strategic workshop in March 2019 decided to further study for coming customer needs by sending a questionnaire to the stakeholders. Norway will host the next NHC Strategic workshop in February/March 2020.

7. Actions required by the Assembly:

- The Assembly is invited to note the report.

8. REPORT OF THE NORTH INDIAN OCEAN HYDROGRAPHIC COMMISSION (NIOHC)

1. Chair

Rear Admiral Sisira Jayakody – Sri Lanka

Vice-Chair

Rear Admiral Harjo Susmoro – Indonesia

2. Membership

Members: Bangladesh, Egypt, India, Indonesia, Myanmar, Pakistan, Saudi Arabia, Sri Lanka, Thailand, United Kingdom.

Associate Members: Australia, France, Oman, Mauritius, Seychelles, USA.

Observers: Malaysia, Russian Federation, Sudan

3. Meetings:

17th Meeting:	Cairo, Egypt	17 - 20 July 2017
18th Meeting:	Goa, India	09 - 12 April 2018
19th Meeting:	Muscat, Oman	25 - 28 March 2019

4. Agenda Items:

17th Meeting – Principal Agenda Items

- Indonesia was invited to become full member of NIOHC.
- Agreed to include details of observer international organizations to the NIOHC page of IHO website.
- India volunteered to nominate representative for the vacant position of IHR editorial Board.
- It was agreed to make updates to C55 and P5 by MS at least once a year.
- MS were encouraged to review local legislations in order to make available CSB publicly.
- MS were invited to consider nomination of MSDI ambassador.

18th Meeting – Principal Agenda Items

- Indonesia became full member of NIOHC
- Called for nominations of international bodies as observers.
- Investigate ways to encourage engagement with Jordan, Maldives and Sudan to progress towards their becoming members of NIOHC and IHO
- Nomination of Captain P. Pawsey, IN as NIOHC representative to IHR editorial board.
- Consider provision of shallow water data to the IHO DCDB for use in the GEBCO.
- Review published data and provide updates to C55 and P5 at least once per year.
- Improve provision of navigational warning information from national coordinators to NAVAREA VIII and NAVAREA IX Coordinators.

- Cross check C-55 and GMDSS Master Plan Annex 7 and 8 entries to ensure harmonization of information.
- Provide details of tide gauges and currents meters for inclusion in the Inventory of National Tide Gauges and Current Meters on the TWCWG page of the IHO website.

19th Meeting – Principal Agenda Items

- UK volunteered to be the NIOHC MSDI representative.
- Review published data and provide updates to C55 and P5 at least once per year.
- Improve provision of navigational warning information from national coordinators to NAVAREA VIII and NAVAREA IX Coordinators.
- Cross check C-55 and GMDSS Master Plan Annex 7 and 8 entries to ensure harmonization of information.
- Provide details of tide gauges and currents meters for inclusion in the Inventory of National Tide Gauges and Current Meters on the TWCWG page of the IHO website.
- MS were requested to investigate and articulate the challenges and dissemination of data to the mariner in the non-regulated SOLAS market and report at NIOHC 20.
- India- To raise S58 checks issue at the next ENC WG.
- It was agreed to arrange a dedicated agenda time on S100 development and product/service delivery by next NIOHC meeting.
- It was agreed to form a CB subcommittee for NIOHC to better inform capacity building activity within the NIOHC region by next NIOHC meeting.
- CB Coordinator/India- develop a paper to present to Council/IRCC/CBSC reflecting concerns regarding allocation of IHO Capacity Building resource/funds by June 2019.
- Establishment of Statutes WG with 6 MS to look into chair period & wider aspects of NIOHC statutes. The WG required to report its findings at the next NIOHC meeting.

5. Difficulties encountered and challenges yet to be addressed:

Difficulties encountered: other than meeting the pace of changing technological advancements in the industry, majority of MS are progressing on their hydrographic and charting activities in the region in complying with SOLAS.

Challenges: There have been significant challenges which were broadly discussed in consecutive meetings and are listed below:

- Poor attendance by MS at IHO WG meetings.
- Provision of survey data and reports of changes that may affect safety of navigation in national waters by coastal states to INT Chart producer nations.
- Timely provision of MSI to NAVAREA VIII coordinator by regional national coordinators.
- To meet varying Capacity Building requirements within the region and to prioritize them.
- Review national legislations in order to seek possibilities to publicly available CSB, tide and current information.

6. Achievements/outputs/conclusions:

- Conduct of CB programme on MSI in Fish Hook SA and Goa India.

- Provision of training and support towards building capacities of regional Hydrographic Offices besides IHO CB initiatives in the region.
- Establishment of Statutes WG
- Establishment of CBWG for NIOHC
- UK was assigned NIOHC MSDI ambassador
- NICCWG achievements include significant reduction in ENC overlaps and the approval of 9 INT charts from Bangladesh.

It can be concluded that all the three meetings were well attended by MS and engaged with fruitful discussions towards improving hydrographic and nautical cartographic affairs in the region.

7. Actions required of the Assembly:

- a) note the report of the North Indian Ocean Hydrographic Commission to the 2nd Assembly of IHO.
- b) take any other action considered appropriate.

9. REPORT OF THE NORTH SEA HYDROGRAPHIC COMMISSION (NSHC)

1. Chair

Declan Black (IE): June 23, 2016 until 28 March 2018.
 Virginie Debuck (BE): June 23, 2016 until 28 March, 2018.
 Koen Vanstaen (BE): from 7 October, 2019 until present.

Vice-chair

Virginie Debuck (BE): June 23, 2016 until 28 March, 2018.
 Hilmar Helgason (IS): March 28, 2018 until 1 November 2019.
 Árni Þór Vésteinsson (IS) from 1 November 2019 until Present.

2. Membership

Belgium, Denmark, France, Germany, Iceland, Ireland, Netherlands, Norway, Sweden, United Kingdom.

3. Meetings

33 th meeting:	Ostend (B),	27-28 March 2018.
34 th meeting:	Reykjavík (IS),	26-27 March 2019 (after submission of this report).

Plus several meetings of the Tidal and Resurvey Working Groups.

4. Agenda Items

Task numbers refer to work programme for 2018-2020 (A.1/WP1/02, approved by decision 23 of the 1st Session of the IHO Assembly).

IHO Work Programme 1 – Corporate Affairs

Element 1.1 Co-operation with International Organisations and participation in relevant meetings.

Task 1.1.4 Maintain relationship with European Union Initiatives (such as INSPIRE and EMODNET)

NSHC member states have been active in participating in the IHO-EU network working group since its inception in 2012 with substantial cooperation and progress on the European Commission's flagship maritime project European Marine Observation and Data Network (EMODNET) and its coastal mapping project. Extensive NSHC member state bathymetric data is now available and regularly updated through the EMODnet portal.

The NSHC member states have also been active in the area of maritime spatial planning and the importance of data from Hydrographic Offices to underpin these plans and support development of the blue economy.

Task 1.1.8. Relationship with IMO

NSHC HO representatives are involved in IMO meetings, in particular the "Maritime Safety Committee" and the "Navigation, Communications and Search and Rescue Subcommittee" and their working groups.

These are particularly important to HO's in the area of ENAV, ECDIS, Maritime Safety information and ships routing.

IHO Work Programme 2 – Hydrographic Services and Standards

Task 2.3 S-100 Framework

The members of the NSHC provided recommendations and suggestions in the discussions on S-100 in the IHO S-100WG.

Task 2.5 Support the implementation of e-navigation and Marine Spatial Data Infrastructures (MSDI)

The members of the NSHC contribute to the related WGs.

IHO Work Programme 3 –Inter Regional Coordination and Support

Element 3.1 Programme Coordination

Tides and water Levels

The NSHC Tidal Working Group (TWG) continues to work with the IHO Tides, Surface Currents and Water Levels working group (TWCWG). Both Working Groups continue to work to combine existing national models in order to develop a common reference surface for tidal reduction to Chart Datum in the North Sea (AP6/2016 B.5 33NSHC). The NSHC Tidal Working Group made progress in comparing differences between surfaces of different NSHC members states. Differences were observed but further investigation is needed to understand the source of these differences. Initiatives to create a common LAT surface by the EU's EMODnet initiative were noted but at this stage considered inadequate for navigation purposes.

Chart contours

A workshop to share knowledge and experiences of Contouring algorithms (AP2/2018 33NSHC) has been organised by Germany in April 2019.

Surface Currents

The Netherlands provides representation at both the NSHC Tidal Working Group (TWG) and the IHO Tides, Surface Currents and Water Levels Working Group (TWCWG). The Netherlands keeps the NSHC TWG group aware of the progress being made specifically in the global 'Surface Current' arena.

Resurvey Group

The resurvey Working Group (RWG) has met annually during the reporting period. Work continued to publish NSHC member state resurvey strategies and plans on the NSHC website. The possibility of creating a North Sea Risk Assessment was discounted as each NSHC Member State had its own strategy based on the physics of its part of the North Sea, the particularities of usage and its own capacities. It was therefore decided in the first instance to limit any work to the Dover Strait area.

The RWG considered the role of crowd sourced bathymetry as a monitoring tool but concluded that further work is needed by the group on this topic.

At its last two meetings the RWG also considered the role of autonomous vehicles, noting the progress that has been made by Member States since the last NSHC meeting.

Task 3.1.1 The Belgian Chair of the NSHC has reported to the annual meeting IRCC11 in Genoa in June 2019.

Task 3.2.1. The Belgian and the future Icelandic Chair of the NSHC are preparing the meeting of the North Sea Hydrographic Commission in Reykjavik, 26 and 27 March 2020.

The NSHC has maintained its place on the internet under www.nshc.pro to raise the profile of our work in the region and inform the public of the work that the commission undertakes.

Task 3.1.18 There has been a high level of industry participation in NSHC meetings during the open session of the meetings which appears to be very beneficial to member states and industry participants.

Element 3.3 Capacity Building Management

Task 3.3.1 There are no real capacity building initiatives currently carried out within the NSHC. However a number of the NSHC members are involved in capacity building activities, the CBSC is chaired by Germany and a number of member states HO's participate, NSHC is represented by Norway.

Element 3.4 Coordination of Global Surveying and Charting Coverage

Task 3.4.1. The United Kingdom provides NSHC representation at the World-Wide Electronic Navigational Chart Database (WEND) Working Group. In addition, the UK provides the Chair of the WEND Working Group.

North Sea International Charting Co-ordination WG (NSICCWG) started in 2017. NSHC approved draft Terms of Reference of the WG.

Element 3.6 Ocean Mapping Programme

Task 3.6.3. *Encourage the contribution of bathymetric data for the IHO DCDB.*

Bathymetric data for the NSHC area are contributed via EMODnet.

Element 3.7 Marine special Data Infrastructures

Task 3.9.1 The MSDI working group is now a merged group between NSHC and BSHC (BSNSMSDIWG) and will report to both commissions. There has been sharing of experience and expertise between members that have more developed systems in place with members that are in the process of deciding how to constitute MSDI and how best to utilise the available data that HO's have available to contribute to or indeed underpin decision making.

5. Difficulties encountered and challenges yet to be addressed

The high cost of carrying out surveys and the limits on national budgets during the period continue to be a limiting factor on survey activity.

6. Achievements/outputs/conclusions

Member states have continued to contribute extensively to the work of the IHO and have been active participants of working groups.

There has been substantial cooperation between commission member states and other European States and the EU on information sharing and shared projects.

There has been continued progress and cooperation on achieving an up to date bathymetric data set for the North Sea and resurvey strategies.

There had been considerable sharing of experiences in new technologies (autonomous vehicles), MSDI and raising the profile of HO's and the data that they acquire and hold.

There is progress on the establishment of vertical reference frames, including national chart datums, with ongoing efforts to understand the differences at national boundaries and how to reduce these to an acceptable level.

7. Actions required by the Assembly

Adoption of the report of the North Sea Hydrographic Commission.

10. ROPME SEA AREA HYDROGRAPHIC COMMISSION (RSAHC)

1. Chair

Captain Muhammad KHALID: Pakistan, Feb. 2017 – Feb. 2019
Alireza KHOJASTEH: IR of Iran, since Feb. 2019

Vice Chair

Alireza KHOJASTEH: IR of Iran, Feb. 2017 – Feb. 2019
Hamdan Al YAHMADI: Oman, since Feb. 2019

2. Membership

Members: Bahrain, IR of Iran, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia, United Arab Emirates.

Associate Members: France, Iraq, United Kingdom, United States of America.

Observers: Regional Organization for the Protection of the Marine Environment (ROPME), Middle East Navigation Service (MENAS), International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), Arabian Maritime and Navigation Aids Services LLC (AMNAS)

3. Meetings

7th RSAHC Conference	Muscat , Oman	20 - 22 Feb. 2017
8th RSAHC Conference	Islamabad, Pakistan	18 - 20 Feb. 2019

4. Agenda Items

Main activities of RSAHC are the progress in developing the INT chart schemes, ENC production, MSI, inter-state co-operation under the capacity-building program, and other activities and issues as decided by the Commission, including National Reports, Review of Status of Hydrographic Surveying and Nautical Charting in the RSAHC (IHO Publication C-55). However, this Commission tends to work according to a standing agenda with modifications for new issues as they arise.

The agenda for RSAHC8 Meeting includes:

1. Review of action items from the previous meetings (RSAHC 7).
2. Report by IHO Secretariat.
3. National reports (major items and highlights only) by members and associate members.
4. Review of Status of Hydrographic Surveying and Nautical Charting in the RSAHC (IHO Publication C-55).
5. Report by INT Chart Co-ordinator (IR of Iran).
6. Report by ENC Regional Co-ordinator (IR of Iran) – Progress on the implementation of ENC coverage and other issues.
7. Promulgation of Navigational Warnings with NAVAREA IX area, MSI in NAVAREA IX and the implementation of GMDSS. (Pakistan)
8. Capacity-building status and report by Capacity-building Coordinator (IR of Iran).
9. Relevant International organizations' Report, including GEBCO, CSB, etc.

10. Presentations by Industrial Partners (ixblue, SevenCs, Leica GeoSystems).

5. Difficulties encountered and challenges yet to be addressed

- a) The recent reduction of Capacity-building funds will cause the states in this region encounter reduced CB activities, which are urgently required in order to promote the skills of the hydrographers in the region to the level of other RHCs. It must be kept in mind that since the last RSAHC Meeting, where Mr. Jeff Bryant resigned from his position as RSAHC Capacity-Building Coordinator, there has been no representative to act as the CB Coordinator for RSAHC Region. The result was not being able to take advantage of our suggested CB programs for the year 2018.
- b) While most communication in the region is conducted through correspondence such as emails, there are still have numerous problems in the way of robust, safe and permanent communication between Member States to allow better cooperation within the region. As IHO has been informed, it has been observed in the past few years that Member States of RSAHC have limited participation in regional hydrographic activities.
- c) Certain overlaps in ENC cells between Iran and UK, Iran and Oman, as well as between Pakistan (Region I) and India (Region J).
- d) Following the introduction of new standards such as S-100 series and their implementation in a near future, all the Member States in Region I will need proper trainings to prepare accordingly.

6. Achievements/Outputs/Conclusions

- a) IR of Iran has been selected as CB Coordinator of the RSAHC Region in 2019.
- b) A joint technical visit of Iran has been arranged by IHO and IALA for the second half of 2020. This visit will have positive feedbacks and contribution to capacity-building efforts within the region.
- c) A merger between RSAHC and NIOHC could strengthen the regional activities and engagement, since the regions are adjacent and a few states (i.e. Pakistan and Saudi Arabia) are already members of both RHCs. In the year 2019, there was a joint MSI CB training, and for the year 2020, there will be another joint training course under the CB program.
- d) Since the previous Commission Meeting (RSAHC 7) in February 2017, we have better ENC coverage in the region, which in turn means better coverage of un-surveyed areas in RSAHC region.
- e) Iraq is the only state in the region that is not member to IHO. Hence, the IHO and all Member States of RSAHC region are encouraging Iraq to become a full member of the IHO.
- f) The RSAHC ICCWG has successfully maintained the INT Chart Catalogue for Region I.
- g) There has been a high level of industry participation in RSAHC meetings with ample opportunities to share experiences and contribute to discussions.

7. Actions required of the Assembly

The Assembly is invited to note the report of the RSAHC.

11. REPORT OF THE SOUTHERN AFRICAN AND ISLANDS HYDROGRAPHIC COMMISSION (SAIHC)

1. Chair

Captain Theo Stokes: South Africa, until September 2017 (unable to attend 14th SAIHC Conference)

Rear Admiral Tim LOWE CBE, United Kingdom, since September 2017

Vice Chair

Rear Admiral Tim LOWE CBE: United Kingdom, until September 2017

Captain Theo Stokes: South Africa, September 2017 - September 2019

TBN: Mauritius, since September 2019

2. Membership

Members: France, Mauritius, Mozambique, Norway, Republic of South Africa, Seychelles and United Kingdom

Associate Members: Angola, Comoros, India, Kenya, Madagascar, Malawi, Namibia, Portugal and Tanzania.

Observers: Brazil and United States of America

3. Meetings

14th SAIHC Conference	La Réunion	6 - 8 September 2017
15th SAIHC Conference	Seychelles	27 - 30 August 2018
16th SAIHC Conference	Cape Town, South Africa	2 - 5 September 2019

4. Agenda Items

a) The SAIHC Conferences tend to work to a standing agenda with modifications for new issues as they arise. The principal agenda items dealt with during the above-mentioned meetings are:

- Feedback from other IHO Bodies affecting SAIHC
 - IRCC - Actions and Recommendations on RHCs interwoven into the agenda and actively discussed throughout
 - CBSC
 - IHO Secretariat (IHO Secretariat), including P-5, C-55, and reports from the latest IHO Council, IRCC, WENDWG, HSSC, and MSDIWG
- SAIHC Activities in the light of IHO Work programme
 - ICCWG - INT chart scheme for Region H
 - MSI - NAVAREA VII Self-Assessment
 - Bilateral and Regional Cooperation Agreements, Projects and Regional Capacity Building Management Plan. CBSC Technical Visits and Regional Projects.
 - Presentation of National Reports: Hydrographic surveying, nautical charting, nautical publications and information status

- Procedures in response to Marine Disasters
- Marine / Hydrographic Spatial Data Infrastructure
- Marine Spatial Planning / Blue Economy
- GEBCO / Seabed 2030

5. Difficulties encountered and challenges yet to be addressed

- a) The recently reduced IHO Capacity Building funding is a real concern for the level of CB activity in a region where SAIHC Conferences and associated Seminars are key elements of building capability. Technical visits remain the only effective measure to determine progress, gauge capacity building requirements and interact with decision makers on the importance of hydrography.
- b) The provision of survey data and reports of changes that may affect safety of navigation in national waters by Coastal States to INT Chart producer nations remains problematic and these requirements are constantly communicated.
- c) The effective exchange of information is difficult to achieve, and communication must improve to allow for better execution of the SAIHC Capacity Building Strategy. Limited Capacity Building options are available as the majority of Coastal States must still achieve Phase 1 of Hydrographic development.
- d) The proposals for implementation of S-101 and other S-10X services and changes to the RNW satellite service provision are areas of concern for developing and smaller Hydrographic Offices within the SAIHC region.

6. Achievements/Outputs/Conclusions

- a) Statutes have been amended to allow wider membership, as Associate Membership, for those nations that contribute by their activities to hydrography in the region and also have special interest within the region, enabling India to become an Associate Member to SAIHC in 2017, with active participation in subsequent meetings.
- b) Good progress is being made with the aspirations of nations to attain IHO Membership, with Seychelles becoming the 88th IHO Member and full Member to SAIHC in 2018.
- c) The IHO Capacity Building funded Raising Awareness of Hydrography Seminar preceding the 15th and 16th SAIHC Conferences has proven particularly successful in increasing the awareness of the importance of this element of science to an expanding level of attendance at SAIHC Conferences (approximately 20% increase over the intersessional period) and also for successfully demonstrating “Delivering as one” with IHO, IMO, and IALA, which has added value to discussions and contributed positively to capacity building efforts within the region.
- d) SAIHC has recognised the importance of communication in dealing with Marine Disasters and is developing a SAIHC Marine Disaster Response Framework to build on the SAIHC Response to Marine Disasters emergency contact details.
- e) Establishment of the SAIHC MSDIWG in 2018 and the designation of a regional Seabed 2030 Coordinator for SAIHC.
- f) The SAIHC ICCWG has successfully maintained the INT Chart Catalogue for Region H and progress has been made to create a similar ENC catalogue.
- g) There has been a high level of industry participation in SAIHC meetings with ample opportunities to share experiences and contribute to discussions.

h) Greater inclusion and awareness of Regional Actors and initiatives in RHC meetings and activities is seen as a very positive development.

7. Actions required of the Assembly

a) The Assembly is invited to note the report of the SAIHC.

12. REPORT OF THE SOUTH-EAST PACIFIC REGIONAL HYDROGRAPHIC COMMISSION (SEPRHC)

1. Chair

Vice Admiral Paulo GUEVARA VIANNY: Colombia, until May 2017

Vice Admiral Mario German RODRIGUEZ VIERA: Colombia, March 2017 to Nov 2018

Vice Admiral Juan Manuel SOLTAU OSPINA: Colombia, Nov 28 2018 to present

2. Membership

Members: Chile, Colombia, Ecuador and Peru

Observer Member: Panama

3. Meetings

The SEPRHC has met every three years since of the 1st Session of the IHO Assembly in 2017, as follows:

13 th Conference	Cartagena de India's, Colombia	September 2017
14 th Conference	Valparaiso Chile	March and April 2020

4. Agenda Items

The main topics dealt with during the reporting period were primarily organized around the following SEPRHC Committee and Working Groups. Here follows some of their major activities and accomplishments:

a) SEPRHC International and national Charting N° ENC's Produced

- Chile. 293 Cells
- Peru. 132 Cells
- Ecuador 76 Cells
- Colombia 16 Cells

Colombia and Ecuador are working in the solve the overlapping between their cells according WEND principles

b) SEPRHC Capacity Building Committee (CBC) held:

- Technical Visits to:
 - a. Colombia visit to Panama – 2018
- P21. Workshop on LIDAR technology and methodology for shallow waters and coastline hydrographic surveys in Ecuador. With participation of MACHC and SWAtHC members. October 2018
- Seminar on Hydrographic to raise awareness for Hydrographers 21 and 22 August 2017 before XIII SEPRHC meeting in Cartagena.
- Held training in Data Base in Peru. With participation of SWAtHC members. 2017

- Held training Undersea feature names in Colombia. With participation of MACHC and SWAtHC members. 2017

c) SEPRHC without Capacity Building

- Training in Hydrographic Cat A and Cat B. Every year in all MS
- IALA seminar in Colombia 2019
- IALA Training in Ecuador 2018
- IALA Training in Colombia 2018
- Antarctic Expedition on board BAP Carrasco 2018 and 2019

d) Disaster Response

The SEPRHC members have a governmental internal organization charged of disasters. The Hydrographic service are part of this organization

e) SEPRHC Contributions to Seabed 2030

The SEPRHC members initiated collaboration with the Seabed 2030 according internal protocols

f) Creation of new SEPRHC Initiative Website

On going

5. Difficulties encountered and challenges yet to be addressed

- Pending to resolve the overlapping in frontier cells.
- Write paper to RHI
- Workshops required:
 1. S-100
 2. MSI
 3. MSDI Implementation
 4. ENC Productions and QA
 5. Law of the sea
 6. Tsunami inundations hydrographic actions
 7. Antarctic Charts
 8. Bathymetry with RTK
 9. Operation and interpretation of data collected with sub-Bottom profiler
 10. Operation and interpretation of data collected with Magnetometer
 11. Operation and interpretation of data collected with Piston Core and Heat Flow

6. Achievements/Outputs/Conclusions

- There is safe navigation in SEPRHC area. The charting coverage is excellent
- The cooperation between navies is permanent.
- Peru continued offering the BAP Carrasco as research platform
- The MS SEPRHC are development Capacity building with itself resources, especially in Cat A and B hydrographic program
- The area is cover by three NAVAREAs.

7. Actions required of the Assembly

The Assembly is invited to note this report

13. REPORT OF THE SOUTH WEST ATLANTIC HYDROGRAPHIC COMMISSION (SWAtHC)

1. Chair

Captain Gustavo MUSSO: Uruguay, since March 2017 until January 2018

Captain Pablo TABAREZ: Uruguay, since January 2018 until 20 April 2020

Commodore Valentin Alejandro SANZ RODRIGUEZ: Argentina, since 21 April 2020

Vice Chair

Commodore Valentin Alejandro SANZ RODRIGUEZ: Argentina, since March 2017 until 20 April 2020

Vice-Admiral Marcos Borges SERTÃ: Brazil, since 21 April 2020

2. Membership

Members: Argentina, Brazil, Uruguay

Associate Members: Paraguay

Observers : Bolivia

3. Meetings

12th SWAtHC Conference	Montevideo, Uruguay	5 - 6 April 2018
13th SWAtHC Conference	Buenos Aires, Argentina	25 - 26 April 2019
14th SWAtHC Conference	Niteroi, Brazil	9 - 10 March 2020

4. Agenda Items

a) The SWAtHC Conferences tend to work with a permanent agenda with amendments for the new issues as they arise. The main topics in the agenda, transacted during the before-mentioned meetings, are:

- i. NAVAREA V and VI Contingency Plan is signed between the Argentine and the Brazilian Hydrographic Services
- ii. Revision and update of SWAtHC Statute.
- iii. Creation and progress of the Regional IC-ENC Coordinating Centre
- iv. Current situation of Chart INT2010: pending approval.
- v. Commission Representation at the IHO Council.
- vi. Presentation of national and IHO Secretariat reports.
- vii. Submission of reports drafted by Working Groups and Committees:
 - Planning Committee.
 - CBSC – WENDWG - IEGH – IRCC – S100WG.
 - GEBCO / Seabed 2030 Progress.
- viii. Update of IHO C-55 and P-5 Publications.
- ix. Signature and ratification of the membership application to the Commission submitted by the Plurinational State of Bolivia.

x. SWAtHC Capacity Building Coordination, Trainings and workshops:

- **2017**

a. Bathymetry workshop using RTK technology (DHN) – P 16. The course provided the opportunity to the regional hydrographic community to learn issues related to bathymetry using RTK and RTG positioning technology, contributing to improve the consistency and quality of ENC and paper nautical chart.

b. Digital Photogrammetry with satellite images (SHN) – P 22. , which addressed the advantages of the innumerable free options of images processing software which are offered worldwide for images treatment and improving interpretation in coastal areas.

c. Data Management Workshop, administration of digital data obtained during the different campaigns (SOHMA) - P-27. Also in 2017, in order to provide the opportunity to the regional hydrographic community to discuss issues like data acquisition and qualifying, metadata profile, data and metadata storage/database, and database uses/queries, giving the participants an understanding of spatial data infrastructures (SDI) for the provision of basic geospatial data.

- **2018**

a. Workshop on Maritime Safety Information - MSI (DHN), and conducted by instructors from US National Geospatial-Intelligence Agency (NGA) with the participation of 18 representatives from Brazil (6), Argentina (2), Uruguay, Paraguay, Bolivia, Colombia, El Salvador, Guyana, Venezuela, Ecuador, Peru and Liberia. The course provided the opportunity for representatives of regional hydrographic communities to gain insight into the importance of the MSI and how to act to report certain events preventing a significant impact on the safety of navigation in coastal region.

b. Practical workshop on surveys carrying out at ports and at shallow waters (SHN), and was performed by specialized personnel from Teledyne CARIS and attended by 31 representatives from Argentina, Brazil, Uruguay and Venezuela

c. International Workshop on Methodology for Bathymetric surveys with LIDAR sensors in Shallow Waters, held in the city of Guayaquil, Ecuador at the invitation of SEPRHC, attended by two Officials, one from DHN and another from SOHMA.

d. Multihaz Processing Workshop, in the city of Cartagena de Indias, Colombia, at the invitation of MACHC, attended by one Official from the SHN.

5. Difficulties encountered and challenges yet to be addressed

a) Difficulties:

- i. The main difficulty encountered is the lack of qualified personnel available versus the increase of workload.
- ii. Shortage of Spanish speaking trainers.

b) Challenges:

- i. The main challenge yet to be addressed is the implementation of S-100.
- ii. In order to be more eligible to receive support from IHO Capacity Building Funds, SWAtHC will propose training courses in conjunction with the neighboring RHCs.
- iii. Carrying out and broadening of trainings and workshops within or beyond the scope of the CBSC.

6. Achievements/Outputs/Conclusions

a) SWAtHC is committed to carrying forward hydrographic and cartographic activities and cooperate in capacity building in straight alignment with IHO objectives and goals and to coordinate charts and ENC's production, harmonize boundaries and data and stimulate participation of all regional countries. The high level of harmonization, quantity of training performed and inexistence of overlaps in ENC's is a good indicator of the success of SWAtHC member's efforts.

b) The full members has approved the request of "The Servicio Nacional De Hidrografia Naval" from Bolivia, and start the procedure of adhesion to become as an Associate Member of SWAtHC. That Service should address this to its national authorities

7. Actions required of the Assembly

a) The Assembly is invited to note the report of the SWAtHC

14. REPORT OF THE SOUTH WEST PACIFIC HYDROGRAPHIC COMMISSION (SWPHC)

1. Chair

Commodore Brett Brace (Australia): until December 2017
Commodore Fiona Freeman (Australia): December 2017 onwards

Vice-Chair:

Captain Hunprey Tawake (Fiji): until Feb 2019
Mr Robson Tari (Vanuatu): Feb 2019 onwards

2. Membership

Members: Australia, Fiji, France, New Zealand, Papua New Guinea, Samoa, Solomon Islands, Tonga, United Kingdom, United States of America, Vanuatu

Associate Members: Cook Islands, Indonesia, Kiribati, Nauru, Niue, Palau,

Observers: New Caledonia, Tokelau, Tuvalu

Observer Organizations: IALA, IMO, GEBCO, Pacific Community (SPC)

3. Meetings

SWPHC15	Nadi, Fiji	(21-22 Feb 2018)
SWPHC16	Niue	(13-15 Feb 2019)
SWPHC17	planned to be held in Wollongong, Australia	(12-14 Feb 2020)

The Commission has met twice since the 1st Session of the IHO Assembly, with all Member States attending the meetings. The third meeting will be held in February 2020, i.e. before the 2nd Session of the IHO Assembly. The meetings were preceded with Capacity Building (CB) workshops. Most non-Member States in the region also attended the SWPHC meetings and workshops. An 'Industry Session' formed part of the meeting agenda and valuable input to CB initiatives was provided by industry representatives who were invited as 'Expert Contributors'.

4. Agenda Items

The main agenda items dealt with since the 1st Session of the IHO Assembly pertained to the following:

- (i) Exchange of information through reports on hydrographic surveying and charting activities in the region
- (ii) Capacity Building – particularly increasing Government awareness of hydrographic responsibilities among the Pacific Island countries (PICs), followed by training of personnel in hydrography.

4.1 Capacity Building (CB) activities

The following CB activities were carried out in the region:

4.1.1 *Technical and Advisory Visits*

(i) Technical Implementation Visit to Niue (Jun 2019) – led by LINZ

Follow-up of the Technical Assessment and Advice Visit carried out in 2016 to ensure that Niue fulfils its SOLAS V obligations, by providing support to implement the recommendations of the technical visit.

(ii) Technical Assessment & Advice Visit to Palau and Marshall Islands (Aug 2019) – led by the IHO

The technical visit provided an opportunity to build Palau and Marshall Islands awareness and understanding of their hydrographic responsibilities as per SOLAS V.

4.1.2 *Technical Workshops and Short Courses*

(i) Technical Workshop on Implementing Hydrographic Governance (Feb 2018) – Led by LINZ; Presenters from AUS, NZ, UKHO, IHO, IALA and SPC

The workshop aimed to assist Pacific Island Countries (PICs) in development and strengthening of hydrographic capacity to meet their international obligations under SOLAS and to support economic growth and protection of the marine environment. A total of 29 participants from the PCAs, PICs, IHO, IALA and SPC attended the workshop.

(ii) Technical Workshop on Disaster Response Planning and Data Discovery (Feb 2019)

Led by LINZ; Presenters from AUS, Fiji, France, New Zealand, Samoa, United Kingdom, United States of America, IHO and SPC. Attended by 50 participants from the PCAs, PICs, IHO and SPC.

The aim of the session on Disaster Response Planning was to make the PICs aware of the role and the SWPHC in the aftermath of a disaster and to understand the procedures needed to identify appropriate action and support. In addition, it provided guidance to the PICs 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 establishment of geospatial portals.

(iii) MSI Regional Workshop (Aug 2018) – Led by New Zealand.

The workshop was held in Wellington, New Zealand with instructors provided by Australia (NAVAREA X), Fiji (MSAF) and New Zealand (NAVAREA XIV). The course provided MSI training to participants from 13 SWPHC Coastal States.

(iv) MBES Training Course (Feb 2019) – Led by UKHO

This activity was carried out by UKHO in Suva, Fiji and involved a bathymetric survey and training course using the R2Sonic equipment.

4.2 SWPHC International Charting Coordination Working Group

The regional International Charting Coordination Working Group (SWPHC ICCWG) comprises Producer Nations (Australia, France, New Zealand, UK and USA) who publish Paper Charts and ENC's in the region. It is chaired by Australia, the INT Chart Co-ordinator for Region 'L', and the main responsibility is the coordination of nautical charting in the region, ensuring the paper chart INT series is comprehensive and current, and the ENC coverage is appropriate. The focus is on paper charts at 1:500,000 and smaller and ENC Nav Purpose 1 and 2 coverage.

The Producer Nations maintain good working relationships with the Hydrographic Offices / National maritime jurisdictions and/or Governments of the countries they chart.

5. Difficulties encountered and challenges

The main challenges and/or obstructions faced in the region are:

- Recruiting and retaining qualified and experienced staff
- Distance – countries widely spread within region
- Resourcing to maintain level of engagement in SWP – competing national HO priorities

6. Achievements / Conclusions

The SWPHC members recognise the value of hydrographic data for the development of the region, and the need to establish a regional hydrographic data gathering capability. There has been considerable progress on hydrographic activities.

Australia conducted surveys in Papua New Guinea, expanding the AusENC service to include the full portfolio of published ENC covering Australian, Papua New Guinea and Solomon Islands waters. The AHO has developed a survey planning risk assessment tool based on the methodology developed by LINZ.

Fiji made remarkable progress, with new surveys conducted and charts published. Significant work was carried out in collaboration with the Korean Hydrographic and Oceanographic Authority. The Peoples Republic of China donated a new survey vessel, and sea trials and training were carried out. The provision of Fiji's National MSI Coordinator as an instructor for the MSI Workshop is a direct response to IHO's goal to build capacity by appointing MSI trainers from the region. Fiji has offered to provide training opportunities on board its survey vessel for PICs personnel.

France carried out various survey work in the SW Pacific in support of maritime surveillance, commercial and cruise activities. Three new INT charts were produced and full coverage of New Caledonia waters was achieved in 2018. It has a rapid response hydrographic team available in the region which is available to provide hydrographic support in case of an emergency (marine disaster).

New Zealand progressed with surveys and charting in the region through the NZ Aid programme 'Pacific Regional Navigation Initiative (PRNI)'. A hydrographic risk assessment for Samoa and a traffic analysis for Tokelau were carried out in 2017. Full ENC coverage of NZ waters was achieved and 32 ENCs for the PICTs released. As part of the PRNI hydrographic surveys comprising SDB, ALB and MBES were carried out in the Cook Islands, Niue, Samoa, Tokelau and Tonga. The data will be used to update existing charts and produce new charts, replacing charts in fathoms on undetermined datums. The chart numbers will include the nations two-digit country code replacing the NZ chart number.

In Papua New Guinea the hydrographic work in 30 coastal areas (under the Asian Development Bank Maritime Waterways & Safety Project) has been completed. It involved surveys using ALB and MBES. In August 2018 PNG commenced promulgating coastal warnings via weekly email using templates as per the S-53 format. Rebranding of the 78 PNG charts produced by Australia commenced in 2019 and is expected to be completed by mid-2020.

Samoa has established a National Hydrographic Committee and signed a Bilateral Arrangement on Hydrography with LINZ (New Zealand). Samoa became an IHO Member State in 2019.

Solomon Islands in collaboration with its PCA (Australia) has produced the Solomon Islands National Tide Tables consisting of tidal information for about 40 ports. Solomon Islands became an IHO Member State in 2019.

Tonga has signed a Bilateral Arrangement on Hydrography with LINZ. In June 2019 a member of His Majesty's Armed Forces completed the Category A Hydrographic Surveyor recognised programme at University of Southern Mississippi, with plans to revive the hydrographic capability of the Tongan Navy.

United Kingdom carried out considerable work as part of its Commonwealth Marine Economies (CME) Programme for providing surveys, charting and capacity building in the region. It included survey of critical areas in approaches to Nuku'alofa (Tonga); geodetic survey and installation of tide gauges (Tuvalu), SDB survey of entire island chain (Tuvalu), and digitisation of national charts into S-57 format data (Fiji).

United States of America continues to maintain 6 ENC cells for covering the waters surrounding the Palau Islands.

Cook Islands has established the National Hydrographic Office and recruited an MSI officer. It intends to join the IHO and is pursuing the matter with the relevant national government authority.

Indonesia, an IHO MS from the neighbouring East Asia Hydrographic Commission, became an Associate Member of SWPHC to facilitate the harmonization of ENCs and to coordinate hydrographic surveys, capacity building activities, data sharing and exchange expertise.

Kiribati has appointed a National Coordinator for MSI and recruited a Hydrographic Surveyor. Plans are underway to establish Hydrographic Services.

Marshall Islands attended an IHO funded 3-day MSI workshop (August 2018) for the first time. It also participated in the SWPHC16 Meeting and Technical Workshop (Feb 2019).

Nauru received a Technical Visit (AtoN) and Safety of Navigation Workshop by SPC.

Niue has committed to establishing 40% of its EEZ as a Marine Protected Area (MPA). It is developing the Marine Spatial Management Plan (MSMP) and the compliance strategy and legal analysis to give effect to the MSMP and MPA.

Maritime Safety Information (MSI) The region is covered by NAVAREA X (Coordinator – Australia) and NAVAREA XIV (Coordinator New Zealand). NAVAREA XIV coordinator instigated 6 monthly communications with National MSI Coordinators and individual assessment of MSI from each National Coordinator. Receipt of MSI from National Coordinators increased due to improved communications and IHO CB funded MSI training. WWNWS-SC have made a recommendation to establish regional subject matter experts for three regions – North & South America, Europe & Africa and Asia & Pacific. NAVAREA XIV Coordinator is proposed to be the regional training representative.

SWPHC, in collaboration with other international, regional and bi-lateral partners, is committed to carrying forward hydrographic, nautical cartographic and capacity building activities in close alignment with IHO objectives and goals.

The strategy of preceding SWPHC meetings with a CB workshop has proved very beneficial. Attendance at the workshops and meetings is about 40-50 persons, with majority being from the PICs. All participants were extremely active and contributed to collective and own knowledge of hydrography.

Regular communications between NAVAREA and National Coordinators and continued, targeted MSI training is key to improving the flow of MSI

7. Actions required of the Assembly

- Note the report of the SWPHC
- Note the continued value and effectiveness of preceding SWPHC meetings with CB related workshops

15 REPORT OF THE UNITED STATES – CANADA HYDROGRAPHIC COMMISSION (USCHC)

1. Chair:

- vii. Satellite-derived bathymetry (SDB).
- viii. GEBCO Seabed 2030 and ways the USCHC can contribute to it.
- ix. Paper charts derived automatically from an ENC (aka Paper Chart 2.0)
- x. S-102, S-104, and S-111 products and services developments.
- xi. New survey technologies and methods, e.g. autonomous surveying vehicles (ASVs).
- xii. The role of the hydrographic offices regarding data provision and support of IMO in the context of marine autonomous surface shipping (MASS).

5. Difficulties encountered and challenges yet to be addressed:

- i. The implementation of new ENC grid-based schemes is ongoing.
- ii. The seamless delivery of S-100 products and services in the transboundary areas needs more work. In part this will be a test of the WENS principles.
- iii. The USCHC is still determining the best way to contribute to the GEBCO Seabed 2030 project.

6. Achievements/outputs/conclusions:

- i. Staff exchanges. Three CHS employees were deployed on NOAA surveys in 2019. Reciprocal deployments are planned for the future.
- ii. Information and experiences with autonomous survey vehicles was shared.
- iii. The re-establishment of a committee (now called the Hydrographic Geospatial Products and Services Committee (HGPSC)) to address trans-boundary issues such as the implementation of a new ENC grid-based scheme.
- iv. Under the USCHC, arrangements for surveying within the territorial waters of the other nation were made and executed. The data was also shared.
- v. New shipping routes for the Great Lakes were cooperatively identified and the affected ENCs updated.
- vi. Overlaps in ENC coverage have been resolved. Ongoing collaboration keeps this problem to a minimum.
- vii. Work towards an adequate paper chart from an ENC has made significant progress.
- viii. A summary of the history of USCHC was drafted, approved, and submitted to the IHO for the USCHC website.
- ix. The UNGGIM Shared Guiding Principles were adopted.
- x. Updates to C-55 and P-5 have been delivered.
- xi. USA and Canada have remained active on IHO committees and working groups.

The US and CA are moving in the same direction in many areas and there continues to be excellent opportunities for cooperation and collaboration.

7. Actions required of the Assembly:

- a) note the report of the
- b) take any other action considered appropriate.

16. REPORT OF THE IHO HYDROGRAPHIC COMMISSION ON ANTARCTICA (HCA)

1. Chair:

Dr Mathias JONAS, Secretary-General of the IHO

Vice-Chair:

Mr John HAUMANN, United States, until May 2018
Mr Patrick DORR, United States, since June 2018

Secretary:

Mr Yves GUILLAM, IHO Secretariat

2. Membership:

Members: Argentina, Australia, Brazil, Chile, China, Colombia, Ecuador, France, Germany, Greece, India, Italy, Japan, Korea (Rep. of), New Zealand, Norway, Peru, Russian Federation, South Africa, Spain, United Kingdom, United States, Uruguay, Venezuela

Observer Organizations: Antarctic Treaty Secretariat (ATS), Council of Managers of National Antarctic Programmes (COMNAP), IALA, International Association of Antarctic Tour Operators (IAATO), Scientific Committee on Antarctic Research (SCAR), International Maritime Organization (IMO), Intergovernmental Oceanographic Commission (IOC), General Bathymetric Chart of the Oceans (GEBCO), International Bathymetric Chart of the Southern Ocean (IBCSO)

3. Meetings:

HCA Extraordinary Meeting	Monaco	25 April 2017 (side event at A-1)
HCA15	Niteroi, Brazil	26–28 June 2018
HCA16	Prague, Czech Republic	3-5 July 2019

4. Agenda Items:

The following notable topics have been discussed at the meetings:

- a. Data collection, crowd-sourced bathymetry, data recovery, support to Seabed 2030, anthropogenic noise reduction.
- b. Survey priorities, monitoring of new maritime shipping routes, ENC and INT chart scheming, improvement of data exchange procedures for chart maintenance.
- c. Outreach: engagement with ATCM, COMNAP, SCAR, co-operation with IAATO, IBCSO.
- d. IHO HCA GIS for Antarctica and other Antarctica geospatial portals (Quantarctica).
- e. New Polar vessels.

5. Difficulties encountered and challenges yet to be addressed:

Nothing significant to report except in some cases a lack of communication within nations to engage and even raise the awareness of IHO activities that go much beyond surveys for nautical charting.

6. Achievements/outputs/conclusions:

- a. Thanks to the work of the Hydrographic Priorities Working Group (Chaired by Andy Willett, UK, until July 2019, by Mr Lee Truscott, UK, since July 2019, Region M Charting Coordinator as well), chart schemes are well maintained and meet user requirements.
- b. Since A-1, much better exchange of information and awareness of the activities and research campaigns between HCA Members. Peru, Colombia have made offers to participate in their campaigns.
- c. HCA has now a partnership with Quantarctica. HCA GIS datasets have got the status of Quantarctica Friendly Datasets, thanks to the involvement of Mr Naohiko Nagasaka (Seconded Project Officer, Japan) improving the visibility of IHO data and fields of responsibility to a much wider audience.
- d. At the XLII Antarctic Treaty Consultative Meeting, the IHO was invited to present a seminar on the status and impact of hydrography in Antarctic waters. 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. A new ATCM Resolution² initially proposed by Norway and co-sponsored by Italy, New Zealand and the United States, was adopted and is to be added to the Statutes of the HCA. Another positive outcome of this seminar was the revitalisation of liaison between HCA Secretariat and COMNAP, IAATO, SCAR and the Executive Secretary of the Antarctic Treaty.

7. Actions required of the Assembly:

- a) note the report of the HCA.
- b) commend the Member States (Argentina, Australia, Chile, Colombia, France, Italy, New Zealand, Norway, Peru, Spain, Russian Federation, UK and US) the delegations of whom provided strong support at the Seminar during ATCM XLII, which led to the adoption of a new strategic ATCM Resolution¹ on hydrography.
- c) encourage Member States to share data collected in Antarctic Waters with the IHO DCDB in application of this ATCM Resolution.

² ATCM Resolution 6 (2019) - *Hydrographic Mapping of Antarctic Waters*