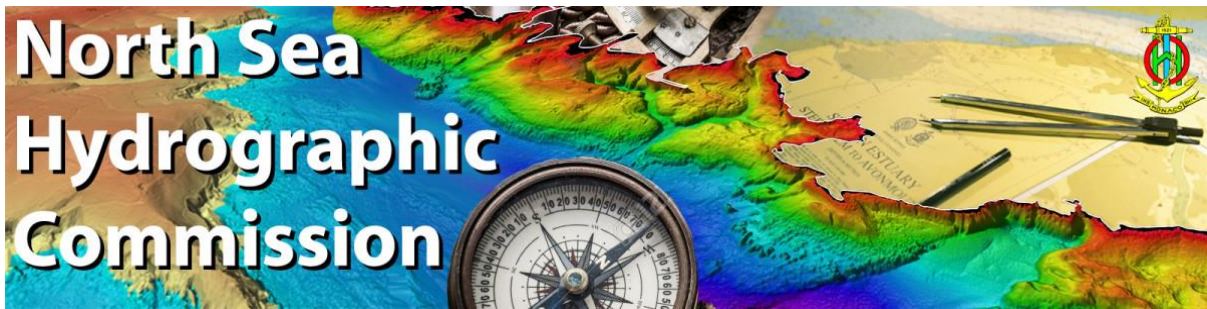


34th NORTH SEA HYDROGRAPHIC COMMISSION MEETING



Meeting Notes final Draft

Attendees:

NSHC

Belgium:	Flemish Hydrography - FH
Denmark:	Danish Geodata Agency
France:	Shom
Germany:	Bundesamt für Seeschifffahrt und Hydrographie - BSH
Iceland:	Icelandic Coast Guard
Ireland:	Irish Maritime Administration and Geological Survey of Ireland - GSI
Netherlands:	Dutch Hydrographic Office - NLHO
Norway:	Norwegian Hydrographic Service
Sweden:	Swedish Maritime Administration
UK:	UKHO and Maritime & Coastguard Agency - MCA

Organisations

IHO
Seabed2030

Companies (for agenda item G only)

iXblue
Kongsberg
Sea ID
SevenCs
Teledyne CARIS
Terratec
XOcean
USA National Geospatial-Intelligence Agency (NGA)
MapLarge (on behalf of NGA)

Apologies

Fugro

Overview

The following notes provide a record of dialogue and discussion during the 34th NSHC meeting, online VTC, on 27 and 28 April 2021. These notes are an effort to capture the

information and sentiments expressed - errors and omissions are the responsibility of the author. Once these notes have been appropriately reviewed they will form the basis of the minutes for the next NSHC session.

Session 1: Tuesday 27th April 2021

A. Administrative / Organizational issues

A.1 Formal Opening – Chair NSHC (NSHC34-List Participants: [List of Participants-v2.0](#))

- The chair opened the meeting by welcoming all participants and Secretary General of the IHO. The chair thanked all Member States for their input during the preparation of the meeting.
- The chair reminded the commission about the statutes and noted the focus on cooperation.
- The SG of the IHO emphasized the importance of the meetings of such as the NSHC. He is glad the meeting can take place – after 3 years - although as an online VTC. He is looking forward to an interesting meeting with the reports of the relevant WGs and several presentations of the industry;
- Rhett Hatcher (UK) introduced himself as head of the UK delegation and informed the group of the upcoming retirement of Andy Hinton and Nigel Sutton and introduced their replacement, Ashley Hawkins and Helen Wojcik, respectively.

Practical arrangements: meeting will be recorded for the purpose of taking minutes only and will not be put online. **A.2 Agenda - Chair NSHC** (NSHC34-A2: [Draft agenda and Timetable-v6.0](#))

- Additional presentation G.6. by NGA (US)/MapLarge
- No proposals to change/add the Agenda: approved as is.

A.3 Report NSH33 - Chair NSHC (NSHC34-A3: [NSHC33 Minutes](#) for approval and NSHC34-A4: [NSHC33 List of Actions](#))

- No comments received: approved minutes of NSHC 33

B. Report of IHO Bodies (part 1)

B.1 IHO - Mathias Jonas (NSHC34-B1.1: [IHO Report](#) and NSHC34-B1.1a: [IHO Report presentation](#))

- Overview of the IHO structure, main activities and productive output;
- 2nd IHO Assembly: Nov. 2020; A3 is planned from 25 till 29 April 2022;
- NSHC is requested to take note of this briefing, and to take action on the items raised in the full report submitted as meeting document NSHC34-B1.1

Comment:

- Chair: the briefing and mentioned report has been noted.

B.2 IHO Council Activities – Mathias Jonas (NSHC34-B2: not available online)

NSHC is invited to adapt their respective instruments to comply with the recommendations of the IHO Resolution 2/1997 (Establishment of Regional Hydrographic Commissions (RHC) as amended by A-2). **AP 1/2021**;

- The Secretariat invites NSHC members to consider to contribute to a future joint activity of interested parties in the development phase of a revised definition of hydrographic interest;
- The Secretariat invites NSHC members to contribute proactively to the implementation of the strategic developments in future paper chart layout and production. Likewise the Secretariat welcomes any practical experience gained with the parallel production of S-57 and S-101 ENCs including their use for streamlined paper chart production., DK, FR, NO, NL & UK already well involved in supporting actions at Nautical Cartography WG;
- The Secretariat proposes HSSC13 / May 2021 to establish an S-130 Project Team to develop the Product Specification and the authoritative data set based on. WENDWG is crucial to build bridges between data standardization and data production;
- IHO's renewed strategic goals: RHC are asked to experiment the implementation of the Strategic Plan and consider during this process, following gap analysis if appropriate, whether our organization and work programmes are fit for purpose. SWPHC already gave a good example. **AP 2/2021**

Comments

- DK: is not yet a member of the Council as mentioned in SG report;
- SE/HSSC Chair: HSSC13: 3 till 7 May 2021; DQWG: The NL Chair Mr. Broekman is leaving the office. New candidates are welcome. This WG is very important for the future developments of the S-100; NL states that they will keep on working within this WG but cannot provide replacement chair;
- NO: asks for more information on SWPWG; see Agenda Point B.3. later on;

Chair NSHC34 shall initiate the procedure for AP 1/2021 and 2/2021 aiming to have a matured proposal at the NSHC35 next year.

B.3 Strategic Plan Review Working Group (SPRWG) update – FRANCE: Pierre-Yves Dupuy (NSHC34-B3: [SPRWG](#))

- Pierre- Yves Dupuy is Head of the Public services/International relations Directorate of Shom. Takes over the Strategic Plan Review WG update from Bruno Frachon who left Shom in 2019;
- Overview of the SPR 2017-2020 provided;
- Implementation SPR 2021-2026 (approved at A2) consists in 3 Goals and 9 Targets https://iho.int/uploads/user/About%20IHO/Strategic%20Plan/IHOS_P2021_2026_final.pdf
- Strategic Plan Indicators and metrics are a tool for monitoring the achievement of the Targets of the Strategic Plan;
- Informs the NSHC on the work that has been done by the SWPHC (South West Pacific HC) on Decision C4/39, in preparing a gap analysis (Feb. 2021);
- Proposes to develop a common NSHC gap analysis based on each coastal state for each goal and against targets. To define 'Where are we now?', 'What is the gap?' 'What is the role of the NSHC to meet the goals and targets', 'How do we collectively meet the challenges and achieve the goals and targets?'

Comments

- NO, DK, chair: agree on the proposal;
- IHO (Mathias): focuses on the importance of goal 3: ‘Participating actively in international initiatives related to the knowledge and the sustainable use of the Ocean’. What do we need to do and what do we want the Secretariat to do?
- Chair: we shall consider this point in the future gap analysis.
- Chair: Chair will initiate a gap analysis consultation for the NSHC region, using the template that SWPHC Chair has circulated. cf. AP2/2021 – B.2.

B.4 IHO EU Network WG (IENWG) update – GERMANY: Thomas Dehling (NSHC34-B4: [IENWG Report](#) and [IENWG Presentation](#))

- MoU is established between the IHO and the EC: “Provide a framework ensuring a continuing liaison between IHO and EU in the specific areas of common interest.” DG MARE acts as the contact point on the EC side. IENWG from the IHO side. FR is chair;
- NSHC representative: DE, T. Dehling. Meetings are open for any IHO MS to participate. Almost all NSHC MS are participating regularly.
- 3 meetings since last NSHC Conference: 11/2018, 01/202 and 12/2020;
- 4 fields of activity:
 - Implementation of the Open Data Directive: list of high values datasets: possible impact on the economic models of some European HOs. Some suggestions and recommendations were made to harmonize the positions as far as possible;
 - The future of EMODnet: has become a long-term marine data initiative. Currently EMODnetIII Bathymetry started. Several HOs are participating. Next Open Conference and Jamboree: 14 till 18 June 2021 online;
 - Marine/maritime spatial planning (MSP);
 - European Ocean Observing System (EOOS): related to GOOS, EUROGOOS and NOOS: liaisons still not fully understandable.
- Invites the Chair NSHC to note this report and to discuss future perspectives

Comment

- NL: the discussion on the definition of the ‘high values datasets’ is going on. There is not a decision yet upon the integration of ENCs into the List of ‘high values datasets’. There is a ‘High Impact’ and a ‘Low Impact’ option. Low Impact option has only the IENCs and not the regular ENCs. It looks as the Commission has a preference for the Low impact option, meaning that the ENCs will not be integrated on the List of high values datasets. The decision is expected within a few weeks;
-
- Chair: future perspective of the WG and networking should continue;
- DK: agrees on this and emphasizes the importance of the work;
- Chair: notes the report.

B.5 World Wide Electronic Navigational Chart Database (WEND) WG report – UKHO: Jackie Sydenham (NSHC34-B5-Rev.2: [WENDWG Report Rev.2](#) and [WENDWG Report presentation](#))

- The representative for the NSHC WENDWG is Helen Wojcik due to Nigel Sutton’s retirement.

- Meetings: 3/2018;2/2019; 4 and 9/2020; 2/2021;
- Activities:
 - Facilitating a world-wide consistent level of high-quality, updated official S-57 ENCs through integrated services that support chart carriage requirements of SOLAS Chapter V, and the requirements of the IMO Performance Standards for ECDIS;
 - Reviewing options, and recommending actions, that expand the value of the Worldwide ENC Database to all marine data users applying data management principles;
 - Supporting the S-100 based products implementation strategy
- Overlaps in NSHC region: Low level ENC Gaps/Overlaps repeatedly occur along national boundaries. Region D INT Chart Coordinator was aware of overlap issue. INT Chart MS and WENDWG MS had mixed views on how to resolve. Region D INT Chart Coordinator NSHC NSICCWG will update at B.7.
- RENCs – harmonised licences to all vessels including leisure

Comment

- Chair: noted the report;
- No further comments.

C. Marine Spatial Data Infrastructure (MSDI)

C.1 BSNSMSDI-WG – DENMARK: Jens Peter Hartmann (NSHC34-C1-Rev.1: [BSNSMSDI WG Rev.1](#))

- Last meeting: 8/2020;
- EMODNETIII period 2020-2022;
- S-121. Maritime limits and boundaries: regional approach to MSDI; link with HELCOM and DG MARE;
- BS-NSMSDIWG should investigate how the BSHC and NSHC could work with S-122 and if it was possible and desirable to establish a pilot project with the North Sea and Baltic Sea as an S-122 testbed (decision BSHC 25 meeting);
- Investigate the possibilities to establish a joint online meeting between the EU MSP Technical Expert group on data and the BSNSMSDIWG in order to share information and to identify areas of cooperation;
- Follow up the EU project eMSP in order to investigate possibilities for cooperation
- Continue the planning of a MSDI Hackathon but due to lack of resources it should be a small scale MSDI Hackathon with HO data and the possibility to cooperate with relevant university and/or stakeholders should be investigated as the possibility to have an online MSDI Hackathon;
- List of NSHC MSDI contact persons is now available;
- OGC seeks sponsors for a cooperative OGC – IHO Federated Marine SDI Demonstration Pilot demonstrating a multi-country, federated MSDI for land/sea interface use-cases. Responses were due by April 30, 2021.
- The scope of DGA participation in the Pilot:
 - The Baltic Sea/North Sea as an S-100 test bed:
 - testing of various S-100 data sets relevant to MSDI and MSP, especially of S-122;
 - Establishment of demonstration project regarding distribution of relevant S-100 data sets for the Baltic Sea and the North Sea for MSDI and MSP;

- Climate change.
 - Marine data in the Arctic:
 - Establishment of demonstration project regarding. establishment of an Arctic MSDI;
 - Crowd source Bathymetry and the need for standards;
 - Testing of various S-100 data sets relevant to maritime safety and environmental protection;
 - Climate change.
- Asks the NSHC to note the report and approve the draft Workplan;
- Discuss whether the BS-NSMSDIWG also should investigate the possibilities to include the North Sea in the pilot project focusing on S-122 data as a testbed.

Comment

- NO: congratulates the work that have been done and supports the question for investigation of the possibilities to include the North Sea in the pilot project focusing on S-122 data as a testbed
- Chair: supports NO on the including of the North Sea into the pilot project focusing on S-122 data as a testbed: **AP3/2021**;
- Chair: notes the report and approves the Workplan ;
- No further comments.

C.2 Update on EMODnet – FRANCE: Thierry Schmitt (NSHC34-C2: [EMODNet update](#))

T. Schmitt on behalf of the EMODnet Bathy consortium (<https://www.emodnet-bathymetry.eu/>);

- Members of the consortium: HOs, Research Institutes and Small and medium sized enterprises;
- CDI and CPRD catalogues;
- EMODnet Bathymetry DTM ($\pm 100\text{m}$) available; DOI, free of charge, free to use. Available at MSL and LAT;
- HR DTM: > 200 High resolution DTM datasets available (resolution up to the m);
- OGC WMTS service (<https://tiles.emodnet-bathymetry.eu/>). Based upon EMODnet DTM + GEBCO + ViewFinderPanoramas.org (ASTER GDEM, SRTM3, EU-DEM);
- International collaboration: IHO, GEBCO and EMODnet;
- Estimation of coastline at MSL, LAT, HAT;
- EMODnet Bathy 2020-2022: overview of 5 work packages: leaders: Shom, MARIS, TWG, IFREMER, GSGC, Deltares and CNR-ISMAR;
- Overview DTM and HRDTM production agenda.

Comment

- IHO: emphasizes that the work has been done in a proper way and for the engagement in this field.
- Chair: EMODnet is very important. What in the future? After 2022?
- No further comments.

C.3. Introduction to Multiagency MSDI Governance – UKHO, Gerald Wong (NSHC34-C3: [UKHO MSDI Governance Paper for IHO](#))

- Based upon ‘The UN-GGIM IGIF Nine Pathways model’: The IGIF advocated by the UN-GGIM and the World Bank is anchored by the nine strategic pathways covering three main areas of influence – Governance, technology and People.
- The Governance model being developed at UKHO would mitigate the strategic risks in the MSDI field.
- Achieving balance by:
 - Umbrella MSDI Governance includes emerging (behavioural) techniques alongside traditional (compliance) measures.
 - The crucial trait of MSDI Governance advocated by UKHO is ensuring a balance between driving technology exploitation and being driven by technology. The UKHO’s MSDI Development Pathway is a generalised concept that takes into account a given nation’s economic resources.
 - Traditional only MSDI Governance could lead to suboptimal technological solutions, while a technology-only focus could lead to complex (and expensive) partial solutions.

Comments:

- DK: fully confirm the ‘governance’ need in MSDI. DK is making today 90 datasets from 11 Agencies freely available to the public, illustrating the challenge;
- NO: very interesting presentation. NO has a lot of experience gathered in the last years. The major challenge is to let understand the agencies why they participate. What’s the benefit for them?
- Chair: considering it is a concept it would be useful to get updates as this get implemented by UKHO or others;
- There were further exchanges in the “chat” of existing initiatives within IHO WGs which may be relevant to UKHO team;
- No further comments.

D. Survey and Tidal

- **D.1 Re-survey Working Group Report + Report on the use of Crowd Sourced bathymetry– UK: Phil Payne** (NSHC34-D1: [RWG Report](#) Last meetings: 9/2018; 11/2019; 1/2020 and 9/2020;
- ToR: S-29: North Sea area. Share technical hydrographic instructions;
- Risk Assessment: still going on: focusing on region instead of DSSR only. At the last meeting, further refinements were made to the merging and portrayal of MS polygons.
- C55 Proposal: has been overtaken by the paper submitted by FR and UK to CBSC16 on C-55 and the subsequent setting up of a C55 review group;
- An overview was given on the applicability of Alternative Survey Techniques: LIDAR, SDB, CSB, Autonomous Surveying, Seabed Mobility, Policies on Surveying in and around Offshore Wind Farms;
- Offshore Wind Farms: contact has been established with the North Sea Offshore Wind Energy Forum and the two groups will look to ensure commonality of purpose regarding resurvey activity around windfarms;
- Asks that the NSHC notes the report;

- Asks to endorse the WG plan to limit the risk assessment to a harmonisation and sharing of CATZOC and survey polygons to allow further cross boundary harmonisation of resurvey plans. See also Agenda Item B.10;
- Asks to endorse the ToRs and Standing Agenda;
- Extends invitation for other IHO members to attend RWG future meetings

Comment

- Chair: notes the report;
- DK: DK region stands out (no resurvey). An additional Danish member will join the RWG and make further contributions to this work;
- NL: emphasizes the need of endorsing the ToR and the RA for the harmonisation and sharing of the CATZOC and survey polygons. Harmonisation of polygons across the borders is very important. Asks the question: what is the influence of C-55 on the activities of the RWG?
- Chair: NSHC endorses the WG plan to limit the risk assessment to a harmonisation and sharing of CATZOC and survey polygons to allow further cross boundary harmonisation of resurvey plans and endorses the ToR and Agenda;

Report on the use of Crowd Sourced bathymetry (NSHC34-D1: [RWG Paper on CSB in the North Sea region](#))

CSB: paper 'To investigate how CSB can be used to support resurvey activity in the North Sea Region';

- The paper looks into several aspects:
 - Current use of CSB
 - Considerations in Planning a Resurvey scheme: accuracy of soundings and age of the date are to be considered;
 - Potential use of CSB: charting and monitoring;
 - Benefits of CSB: repetitive measurements, cost (currency and environmental), economic (Blue Economy);
 - Issues with CSB: quality of data; resource, liability, awareness of quality by Mariners;
 - CSB datasets;
 - Current work: several national trials in the North Sea region to assess the accuracy and potential use of CSB in the region.
 - Intelligent Crowd Sourcing;
 - Way ahead: paper outlines the issues and concerns from a technical level as well as the potential consequences and issues that are being considered;
- Asks the NSHC approval for publication;

Comment

- Chair: points out the link with Agenda Point E.1. Crowd Sourced Bathymetry & Seabed 2030 on Wednesday 28 April;
- DK: interesting paper, but have some comments, which will be passed on to Phil. DK has project with Canada which they would be happy to present at NSHC35;
- NL: expresses their respect for the work done. NL shall also forward their comments on the paper. Point of interest is the difference in availability of sounding data in the Southern North Sea and the Central and Northern North Sea. In the latter there is a lack of data in EMODNET. The gap could be filled with CSB data. Should a regional approach be used to benefit from CSB in NSHC region?
- IHO: take into account that B12 'Guidance on CSB' has a global, worldwide focus; not only for the North Sea;

- Article in IHR on CSB: <https://iho.int/en/crowdsourced-bathymetry-working-group-discusses-how-to-increase-available-data>;
- Chair: additional comments by MS on the proposed paper are welcomed: **AP 4/2021**.

D.2 Tidal Working Group Report – BE, Johan Verstraeten (NSHC34-D2: [TWG Report](#))

Tidal working group convened at one occasion early in 2020. Apart from this meeting, there are numerous intermediate contacts by correspondence, mainly on a bilateral basis.

Main action within the group concerned the further development of reference surfaces for GNSS-based surveys. SE, NL and DE proposed newly developed and further iterations of reference surfaces for their area. Focus of these newly developed reference surfaces is also on the further reduction of differences between them at international borders.

The current 1% of local depth acceptable difference has proven to be hard to achieve in shallow areas.

Future challenges include

The preparation of the introduction of S-104 Water level information for surface navigation and S-111 Surface currents.

Providing input for the IHO TWLCWG project on Data archeology

The meeting was then asked to:

- take note of the report
- further charge the tidal working group with
 - monitoring developments in GNSS based surveys;
 - preparing the introduction of S-100 series (S-104 Water level information for surface navigation and S-111 Surface currents);
 - Investigating and further reducing differences between reference surfaces at international borders.

Comment:

- NL: 1% on LAT was proposed as a start of the discussion, but seems to be defined as a new norm. Clarification by the WG is needed.
- DE: agrees with NL. Intersessional feedback on this matter is needed;
- Chair NSCH: **AP8/2021** for TWG: need of a clarification for the use of 1% of LAT as the norm;

B. Report of IHO Bodies (part 2)

B.7 Report of North Sea International Charting Co-ordination Working Group – UK, Andy Hinton (NSHC34-B7: [NSICCWG Report](#))

- The NSICCWG Chair Andy Hinton will oversee the transfer of duties to ensure a seamless transition to Ashley Hawkins.
- Overview of activities:

- Revised management review and monitoring of INT charts: still a few MS who have not yet updated the web catalogue for changes to their INT charts despite reminders. We urge members to do so;
- Amended TOR for NSICCWG were adopted at NSHC33;
- INT Charting:
 - A small amendment to the limits between INT Area D NSHC and Area E: approved by NSICCWG members and ratified by the BSHC.
 - INT Chart Rescheming since 2018: DK/DE and BE;
 - ENC Rescheming since 2018: GE/NL and UK;
 - ENC Overlaps and gaps issue at international borders: IHO guidance of only allowing a 5 metre overlap (IHO Resolution 1/2018 Chapter 2.1.8 - Seamless ENC coverage, S-57, APPENDIX B.1, Annex A): WG: almost unattainable, proposes to define a risk based overlap.

Comment

- Chair:
 - Thanks Andy for the work that he has done and welcomes Ashley as the new representative within NSHC.
 - Approved the minor amendments to the NSICCWG ToR (Annex A);
 - Approved the slight change in border limits between Areas D and E;
 - The status of the INT Chart schemes via IHO INTToGIS and ENC Chart Catalogue links has been noted.
- No further comments.

B.8. Nautical Cartography WG: Future on the paper nautical chart report – round table discussion on Member States HO's perspectives (NSHC34-B8: not available)

- Chair: considering time restraints and non-urgent nature of this agenda item proposed by the chair, it will be postponed till NSHC35 in April 2022, Reykjavik: **AP5/2021**.

B.9 IRCC 11 + 12 – Chair IRCC, Thomas Dehling (NSHC34-B9: [IRCC Report](#) and [IRCC 11 and 12 documents](#))

- Last meetings: IRCC11: 6/2019 and IRCC12: 10/2020;
- Important topics:
 - implementation of the Revised Strategic Plan;
 - Strategic Performance Indicators (SPI): will be monitored by the Council;
 - CBSC is instructed to develop a system of performance indicators to measure, in accordance with the Revised Strategic Plan, the effectiveness and efficiency of CB activities;
 - S-100 Implementation Strategy;
 - new IHO Resolution on WEND100 Principles to the Council for endorsement;
 - establishment of an IHO e-Learning Centre: strong support from Republic of Korea (ROK). IRCC asks MS to share their experience concerning e-learning.

Comment

- Chair: takes note of this report; asks MS to share experience on e-learning: **AP6/2021**.
- DE clarifies that this applies to experience, but especially content would also be highly beneficial.
- No further comments.

B.10 IRCC 11 + 12: overview and progress of AP and REC, NSHC33 – Chair NSHC, Koen Vanstaen
(NSHC34-B10: [IRCC and NSHC33 Action Points](#))

Overview AP IRCC12:

- 2. Review the paper on the Future of paper Charts and provide feedback on it - **AP5/2021**; see item B.8: postponed till NSHC35, April 2022;
- 3. Encourage MS to continue updating C-55 : status of Hydrographic Surveying and Charting Worldwide - **AP7/2021**;
- 4. RHC to implement the IHO Resolution 2/1997 as amended by A-2: see Agenda item B.2 - **AP1/2021**;
- 6. Invite MS who have experience in developing and providing e-Learning contents to share their resources and experiences to the e-Learning PT: see Agenda item B.9 – **AP6/2021**;
- 11. Promote the discussion of any item with relevance to SDI/MSDI/MSP and to take appropriate actions: see Agenda item C - **AP3/2021**;
- 12. Consider CSB and Seabed 2030 initiatives be permanently added as an agenda item at future RHC meetings: done
- 13. Encourage MS to support the CSB initiative with positive actions, such as requiring all research vessels to collect bathymetric data for later uploading, when on passage or when it does not interfere with other research activities : see Agenda item D.1 : **DONE** (doc on CSB, P. Payne);
- 14. Support the modification of the current “RHC Seabed 2030 Coordinator” to a joint “RHC CSB/Seabed 2030 Coordinator” and provide the identification of the Coordinators - **AP9/2021**;
- 16. Encourage MS to release datasets or subsets into the public domain via the IHO DCDB: **CONTINUOUS**;
- 17. Encourage MS to promote the vital need to map the entire seabed and 19. to make existing seabed mapping data available for use by Seabed 2030 in the GEBCO Grid: see outcome Agenda Item E.1. – **AP10/2021**;
- 20. RHC to participate at regional level in those actions of the UN Ocean Decade matching with IHO’s new strategic targets (IRCC12-08C): **CONTINUOUS**.

Overview AP NSHC33:

- 2/2018 : Bathymetry Contours Workshop to share knowledge and experiences of Contouring algorithms Germany 34th NSHC: Workshop on ‘Bathymetric data processing for nautical products’ was organized by in Hamburg Bundesamt für Seeschifffahrt und Hydrographie (BSH) from 9 till 11 April 2019: **DONE**;
- 1/2018 Crowd sourced data RWG to investigate how crowd sourced bathymetry can support the work of the NSHC RWG 34th NSHC: Paper RWG: **DONE**;
- 6/2016 B.5: Vertical reference (LAT) comparison: Continue to investigate and reduce the differences between the LAT along boundaries in accordance with the action items of TWG WP 18/1. Publication of those differences is paused until the outcomes of the investigations are available: **OPEN until the Tidal WG closes this AP**;
- 3/2010 (Concl. 89): NSHC decided to task the NSHC resurvey WG with
 - to complete the overview where applicable: available on nshc.pro (2 versions: cartography based on CATZOC and RWG standardised 5 resurvey intervals)
 - to publish the scheme on the internet: available on nshc.pro

- to propose a way forward to harmonize the presentations of the resurvey schemes and of C55: Harmonization of resurvey schemes/intervals is done. Input was provided for the C55.
- to include conclusion 28 “Resurveying of critical areas” in their work program: **DONE;**
- 6/2014 (Concl. 112) Risk assessment : undertake a risk assessment analysis for the North Sea area, including the Dover Strait: close, as the work that was defined in first stage have been **DONE;**
- 8/2014 (Concl. 115) Contact person for the MSDI WG Each Member State to inform the Chair/Vice-Chair of the IHO MSDIWG of a national contact person for MSDI matters: List of NSHC MSDI contact persons is available: **DONE.**

Comment

- DE:
 - IRCC12/6: e-learning: not only experience but also sharing material is very important;
 - NSHC33 – 2/2018: Bathymetric Workshop on Contouring algorithms in DE was very productive. AP can be closed.
- No further comments.

B.11 NSHC Structure Operation – Chair, Koen Vanstaen (no relevant doc.)

- 2 issues were resolved concerning the organisation of future conferences:
 - Combination of hosting and chairing the NSHC meetings: The long-standing habit of having meetings hosted and chaired by different participating organizations is not the most effective way at the present time. NO mentioned recent positive experience from same country hosting and chairing the Arctic Hydrographic Commission.
 - The need to have intermediate meetings in order to respond more effective to issues arising at other levels.

Recent experience with organizing of and participating in VTC has shown it is a very effective way of handling business.

The duration of 2 years for the chair remains unchanged.

The accepted proposal for the organization of the upcoming NSHC:

- 2022 – physical meeting – IS hosts and chairs
- 2023 – VTC – SE chairs
- 2024 – physical meeting – SE hosts and chairs

Session 2: Wednesday 28th April

E. General Developments

E.1. Crowd Sourced Bathymetry & Seabed 2030 – GERMANY , Thomas Dehling and SEABED2030, Jamie McMichael-Phillips and Martin Jakobsson

(NSHC34-E1: [CSB and Seabed 2030](#) and [Seabed 2030 presentation](#))

Crowd Sourced Bathymetry:

- NSHC involvement: T. Dehling announced he would step down as NSHC coordinator for CSB/Seabed2030. DE took the initiative to propose Patrick Westfeld (DE) as new coordinator of NSHC at the CSB/Seabed2030 WG. Patrick is an active member of this WG since 2020.

Comments

- Thomas was thanked for his involvement and work for the CSB/Seabed2030 WG;
- Chair: agreement to appoint Patrick as the new NSHC coordinator.

Seabed2030

- The organization was described and the regional data centers and global center.
- At this moment, significant efforts go to making the inventory of datasets not yet released to Seabed2030.
- Apart from this in large remote areas input from CSB is considered the only practical way to reach the intended 100% coverage.
- Seabed2030 identified the requirement for acceleration projects in several areas.
- At his moment there is significant progress from the 6% coverage at the start of the project to the 19-20%, most of which is from the new availability of existing data.
- The remainder of the current dataset is contributed by data derived from satellite altimetry.
- The ongoing Seabed2030 survey was mentioned. NSHC Member States were all requested to reply.

Seabed2030 organization in the NSHC area (Martin Jakobsson)

- NSHC is involved in 2 Seabed2030 areas : North Pacific/ Arctic Ocean and Atlantic/Indian Ocean;
- Coverage requirements are set to a depth dependent footprint based on 2°x2°MB beam angles. This results in a relatively coarse grid, in order to reduce concerns regarding safety/security/military issues as well as for proprietary Industry data.

Comments:

- NO (Evert Flier) commented further on this as chair of the CSB/Seabed2030 guiding committee;
- Commitment on behalf of NSHC member states is required on 2 fields **AP10/2021**:
 - Data sharing / National policies
 - Financing of mapping expeditions

- Financing: inconsistency between the Top Level Administrative commitments made at the UN level and the actual data availability/Sharing commitment.
- Coverage at this moment can be improved by:
 - A policy of letting research vessels contribute depth measurements whilst undertaking other tasks (NO);
 - Contributions by offshore industries, with Fugro currently being a major contributor already. Agreements have almost been reached with other companies.
 - Current status of Seabed2030 shows gaps that sometimes can be covered by involving private partners. E.g. by route variations of the ferry between Stavanger and Aberdeen.
 - National efforts are required to identify and fulfill these possibilities for improved coverage.
- NL (Leendert Dorst) mentioned the difference of coverage between the Southern part of the North Sea and the Central and Northern part with the two latter parts showing partial coverage.
- Many NSHC member states have survey authority in large overseas territories and can therefore have an impact beyond NSHC region.
- Seabed 2030 clarified requirement for
 - cleaned grid data
 - no requirement for precompiled grids or interpolated data
 - where national requirements pose restrictions on availability of MB grids, downgraded grids are acceptable.
- UK (Rhett Hatcher): UKHO as a hydrographic office fully supports the Seabed2030 effort. However, restrictions on data availability imposed by other departments apply: UK defense and security policies, policies on available budgets and policies determined by overseas territories.
- FR (Pierre-Yves Dupuy): Different policies apply for French Waters and for overseas territories where the data availability policy for territorial waters is determined per country.
- NO (Evert Flier) concluded the discussion with the mention that progress will be monitored.
- Chair thanked presenters and encouraged Member States to make data available and encourage their national stakeholders to release data.

E.2 Updates on the development of Autonomous Surface Navigation. Identification of collaboration opportunities – UKHO, Mark Casey (NSHC34-E2: [UKHO Autonomous Vessel Navigation Paper](#))

- Currently industry mainly focusses on smaller vessels with various degrees of autonomy as defined by IMO.
- A big issue is the current lack of regulations, with only practical guidelines available.
- At IMO level, a scoping study is going on. One of the main challenges is the requirement for a different chart product, with the currently available focus largely on viewing and interpretation by a human eye. Methods for input from radio signals and integration of contextual information differs from conventional charts.

- S-57 lacks the extensibility that is needed to support autonomous navigation. S-100 data sets will be required but innovation is still much needed to support machine interpretation
- Ongoing initiatives were mentioned :
- Thales tests near Plymouth. UKHO provides high resolution chart and survey data and tidal data through an API.
- Polaris Consulting uses Ants-On-Deck technology for route calculations based on high resolution grid bathymetry and tidal data.
- UK has established test sites: MCA MARLAB near Portland, SMARTSound autonomous vessel testing area near Plymouth.
- Admiralty launched an autonomous navigation Challenge. BMT came out as winner.
- PhD's on position determination are currently going on :
 - Marine celestial navigation for autonomous vessels
 - Coastline feature detection and interpretation
- A project to develop a digital twin of Plymouth Sound developed by Thales and OSC also supports autonomous navigation.
- In the field of large autonomous vessels the “Mayflower 400” vessel and project stands out as a first Atlantic crossing project.
- Other projects with large autonomous vessels are under development in US and SG.

Comment:

- SE (Magnus Wallhagen) as HSSC chair mentioned there are proposals on autonomous navigation on their HSSC13 agenda. These include S-100 developments focused on machine readability. They also have a link to the DQWG efforts.
- Chair: notes the considerable and diverse efforts in this field. Chair of DQWG is vacant at this moment. MS are invited to submit candidates for this task. Special attention is required to set up specific regulations.

E.3 S-100 Implementation Strategy: update from Netherlands and round table discussion on progress at Member States HOs – Netherlands, Marc v.d. Donck (NSHC34-E3: [S-100 implementation strategy](#))

- S-100 implementation strategy is taking place along the roadmap endorsed at IHO Assembly A.2
- The critical part of the S-100 time path depends largely on the development of IMO ECDIS Standards. At this moment, it seems that other S-100 Series will be ready before S-101.
- Considering the limited time available Netherlands proposes to have a fuller discussion at NSHC35, based on preparatory work undertaken before such meeting.

Comment:

- IHO / Mathias: commented on this as liaison between the IHO secretariat and IMO: implementation of S-100 in ECDIS is on track.
- Chair: proposes to consult members states plans with regards to S-100 at same time as gap analysis discussed earlier.

E. 4 IC-ENC S-102 WG: plans and progress – Chair IC-ENC SC, Marc v.d. Donck (NSHC34-E4: [IC-ENC S-102 WG](#))

- IC-ENC set up a work plan for 2021-2023 based on a selection S-100 that are in-scope for IC-ENC.
- Other products involved in the workplan
 - HD-ENC
 - Non-ECDIS Service launched
 - Learning management system

Comment:

- NO: added information to this on behalf of Primar. S-100 developments are operational. Training courses were organized with participants of both Primar and IC-ENC member states.
- Chair: noted the workplan and welcomed the combined efforts by Primar and IC-ENC.

F. General Developments - NORWAY, Evert Flier (NSHC34-F: [Regional Developments](#))

F.1 New Hydrographic Infrastructure

- Nautilus Project provides one common integrated solution for all steps from data processing to dissemination
- The system is likely to be based on combination of existing products and bespoke developments

F.2 Marine Base Maps in Norway

- This is a demonstration project executed by the Norwegian Hydrographic Service, the Norwegian Geological Survey and the Marine Research Institute of Norway.. Three pilot areas were defined.
- It intends to supplement the existing Mareano project, which has an offshore focus.

F.3 Standardization of port data

- Nautical publication that offers an improved digital service. The aim is to reduce the amount of work needed for port calls, as it was found out that each port call requires many e-mails.
- The project involves the ports as data owners, with NOHO having a roll as “harvester of data”. One of the aims is to stimulate data acquisition on the ports own terrain.
- S-102 data is made available to Norwegian pilots.
- S-121 Nautical publications are also required but still to-do.
- Part of the project concerns creation of digital twins created from mobile mapping and providing port infrastructure information.

F.4. Launch of Norwegian Bathymetric Data Base Portal – NORWAY, Evert Flier

- The portal contains elevation data: topographic as well as bathymetric data.
- It allows for visualization of metadata (e.g. type of survey, ...)
- For data grids <50m a special application procedure is required.

Comments

Chair: thanked NO for the overview and updates of the ongoing projects.

G. Industrial developments (NSHC34-G: [Industry presentations](#))

G.1. Over-the-horizon USV Hydrographic Surveying – XOcean, Duncan Mallace

- Operational use of “uncrewed surface vessels” with an autonomy of roughly 22 days
- The vessels used require a support vessel only for deployment/recovery and for crossing TSS.
- Successful surveys were executed for MCA Civil Hydrography Program/UK, CHS/CA and industry.
- During surveys data is recorded for MB (Bathymetry Backscatter and water column data) and Side scan sonar at a data rate of 2TB/4days.
- Satellite links are used for data transfer.

G.2. Integrating innovative technologies in Hydrography – FUGRO, Marco Filippone

Apologies for not attending were received.

G.3. From Vision to production: incorporating new technology and techniques into your CARIS workflow to prepare for the dynamic future of hydrographic products and services – CARIS, T. Buxton

- New developments within the CARIS suite of software were introduced :
 - New ping-to-chart workflow
 - New sonar noise classification with AI based filtering to reduce effort required for manual cleaning
 - Developments in process automation workflows
 - S-100 developments
 - Demonstration of a CHS (CA) – CARIS – Primar project for the development of an e-navigation surface near Vancouver (CA)

G.4. Autonomous hydrographic survey solutions with a focus on the iXblue solution, iXblue, David Vincentelli

- USV Drix is their product for remote hydrography. It has a five days autonomy.
- It is a versatile platform where the equipment installed in the gondola determines functionality;
- Results from a concept of operation qualification with Shom were presented:
 - At sea state 5 good quality data could still be recorded. Exclusive order was achieved in 30 m water depth.
 - Tests at different speeds were performed at the “Carré Renard” reference area near Brest. Results showed an excellent match with the Shom reference surface
- Shom experienced the reduction of the cleaning effort from the convention 24h of cleaning per 24h of survey to 6h of cleaning per 24h of survey to be the most impressive feature

- Products under developments include a larger Full Ocean Drix and a shallow water version with a 1 m reduced drop keel and gondola.

G.5. Airborne lidar bathymetry with the CZMIL SuperNova – Terratec, Charles de Jongh

- Terratec introduced their new and improved bathymetric lidar sensors manufactured by Teledyne Optech.
- Measurements can be made up to 3 times visible water depth, depending on turbidity and bottom reflectivity.
- The new equipment was demonstrated in the Stavanger area. The combination of sensors consisted of a Bathymetric lidar sensor, RGB camera and hyperspectral camera. Depth information was gathered in the 0 to 20 m depth range, and some places up to 30m.

G.6. Global Maritime Traffic Density Service (GMTDS) – NGA/MapLarge, Alex Shernoff

This project aims at making global maps of maritime AIS data.

It provides monthly global overviews on a 1 km grid representing the number of hours of AIS occupation per month. It is available as a web service using OGC/WMS.

The data is based on the EMODNet AIS density methodology.

Purposes are identification of data gaps for charting/surveying routes. It can also be used as a tool for Marine Spatial Planning and for monitoring greenhouse gas emissions.

Comments on all the presentations:

- Chair: thanked the representatives of the industry for their valuable contribution and requested for the presentations to be shared with the conference documents on the IHO website.
- NO: asked whether autonomous surveys can compete with conventional surveys when bidding for tenders. XOcean and iXBlue explained their approaches: :
 - XOcean: Explained they won competitive windfarm surveys but also UK MCA contract.
 - iXBlue : Have worked with Shom. Work with local survey companies to deliver surveys outside France.
- 7Cs (Emma): Enquired about map overlays with the NGA product : NGA does not yet have a map overlay. There is no directionality applied on data for route monitoring.
- MCA: can share experience from XOcean work on their CHP.

H. Closing Activities – CHAIR (no relevant doc.)

H.1 AOB

- None

H.2 Introduction new Chair

Chair: Iceland will chair NSHC from end of this meeting to the 2022 Reykjavík meeting. Sweden will then take over as Chair after the 2022 meeting to host a VTC meeting in 2023 followed by a physical meeting in 2024.

H.3 Next meeting

- Iceland: proposal: Reykjavik, 5 and 6 April 2022.

H.4 Closing Remarks

- Chair: Offers thanks to all participants for their co-operation, contributions and for the papers submitted. The tight time schedule and the VTC format which has qualities as well as challenges;
- He also thanked his team in the background for secretariat, the planning of the agenda and preparing minutes of the meeting.
- He notes that it was a pleasure to chair the event and hear the good work taking place across the region.
- Closing proceedings of NSHC 34.