5th Crowd-Sourced Bathymetry Working Group (CSBWG4) Meeting

5-6 December 2017,
International Hydrographic Organization, Monaco

(Paragraph numbering is the same as the Agenda Item numbering and does not necessarily reflect the order in which matters were discussed. When more than one participant attended from a State, each is identified by their initials after the three letter country code.)

1.   **Opening**

The vice-Chair, Serge Gosselin, welcomed all the participants and thanked them for making the trip to attend. He noted that the Chair was happily unavailable due to the birth of her first child. He noted there was much work to be completed during the meeting, highlighted the excellent work undertaken by the document editor, Whitney Anderson (Editor).

The Secretary-General (SG), Dr Mathias Jonas, welcomed all and provided an introduction, including some background, which included highlighting International Hydrographic Review Edition 1 Volume 1 from 1923, which included articles similar to the aspirations of CSB and GEBCO; he also noted that this was a transfer to the idea into the digital age. He highlighted there was a technical as well as publicity aspect to the work of the CSBWG and the CSBGD (B-12) working towards data to create a worldwide bathymetric dataset.

The vice-Chair then gave an introductory presentation on behalf of the Chair, in which the anticipated goals for the meeting were articulated and what the expected outcomes for the meeting ought to be. He provided some background of what has been tasked by IRCC and an update on the agreed timeline. The Secretary provided clarity on the process for the different editions. The vice-Chair noted that all the sections were being addressed, Brian Calder had received the comments relevant to his section and he would provide feedback in line with the agreed timeline. Baltic and International Maritime Council (BIMCO) noted that this initiative needed to be sold to the ship owners and crews and there appeared to be a lack of motivation as well the need to minimize the burden on bridge staff; he also asked who the data owner is and to what use is the data being put, assurances need to be provided. Sea-ID noted that these same comments were raised initially; he noted that the previous SG had noted that the IHO would own the data and that the IHO could ask member states whether they would support this activity in their maritime areas of responsibility. SG suggested, following the landside model, it would not be possible or wise to separate the ownership of each piece of data. He noted geo information science was driven worldwide by the USA policy of providing freely available data. He anticipated that in future the only interaction by the bridge staff should be to select (or not) whether he wishes to contribute using an imbedded software, the rest of the process should be as automated as possible and easy for the participant to complete. The Secretary noted that the data was to be placed in an open source database to be used as a potential user desired. BIMCO highlighted having a ship name attached could be an issue; Adam Reed (NOAA-OCS) noted that the minimum required metadata only required x, y, z and date and time, all other fields were voluntary. Numerous questions and comments were passed forward to the breakout sessions.

2.   **Administrative Arrangements**

The Secretary provided domestic and administrative details for the meeting.

3.   **Introductions**

All participants – representing Canada, Denmark, France, Italy, Nigeria, Norway, Portugal, UK and USA (NOAA-NCEI, NOAA-OCS, NGA), BIMCO and Sea-ID – introduced themselves and gave a short description of their background and current role, see Annex A for list of participants. Apologies were received from Seppo Mäkinen (Finland), Brian Calder (NOAA-OCS), Anthony Klemm (NOAA-

OCS), Patrick Keown (NOAA-OCS), Tim Thornton (TeamSurv), Ole Benjamin Hestvik (Olex) who will not participate in the future, Steffe-Hinrich Boie (SevenCs) and Paul Cooper (Caris).

The agenda was adopted, see Annex B, and Annex C for a list of meeting documents.

4.   Previous Meeting report and Action List

The report of CSBWG4 was approved and actions were reviewed, it was noted that the few outstanding actions were included in the agenda for the meeting.

5.   Report to IRCC9

The Chair report to IRCC9 and outcomes of IRCC9 were reviewed. Evert Flier (NOR), who represented the Chair at IRCC9, provided a short brief on the IRCC meeting, he highlighted liability issues as a topic as well as what is the incentive to participate and contribute. He noted that there were a number of similar comments made by Member States (MS), as to those received in response to IHO CL49/2017, which appeared enthusiastic but much more cautious about it taking place within their waters. He noted, as a result of Assembly-1 and Council-1, that the scope of the WG should be expanded and that CSB data has a use, particularly in the future and that HOs need to find a way to use and portray the data. The IRCC9 outcomes were highlighted; the vice-Chair noted that the actions should be considered in the discussions during the meeting.

6.   Updates on current projects

The following presentations were provided:

a.   IHO DCDB – Aaron Rosenberg (NOAA-NCEI)

Provided an update on DCDB developments, including data receipt and discovery improvements. He highlighted the data flow processes and the data security which had been put in place. He noted that only track lines were created and the metadata extracted. It was noted that there was potential for the data upload to increase dramatically and therefore processes needed to be developed to manage this expansion. He highlighted the next development phases for the DCDB, he noted some limitations existed with the current hardware, which will need to be addressed for additional capabilities to be developed. He provided an insight into what the future aspirations and directions intended by NOAA were for the further development of the DCDB.

He highlighted potential future contributors, which would include the evolution from primarily SBES to MBES to processed datasets and therefore the need to be able to distinguish between raw data and processed data and the different ways of handling and storing the data.

b.   Rose Point Navigation – Adam Reed (NOAA-OCS)

Provided an update on developments of the partnership with DCDB and the new processes created to make data contribution minimal intervention. He highlighted the data format used and the current expansion of the project and therefore the increase in contributors. The cost of the Rose Point Navigation was noted although the upload was free, it was confirmed that the data was provided without restriction into the DCDB. This generated a number of questions, particularly technical clarifications; all Rose Point Navigation supported software versions have the capability without additional cost. BIMCO asked what part of the metadata was automatic and whether there was any return communications after upload. DCDB confirmed there would be confirmation of receipt and acceptance generated when the system was connected to the internet, either directly or via the standalone platform.

c.   EMODNet –Thierry Schmitt (SHOM)

Provided an update on the European Marine Observation and Data Network (EMODNet) initiative and the current developments to improve the resolution of the digital terrain model. He noted the importance of giving credit to the data providers and the work EMODNet had completed to improve their visibility. He explained that the data was held by individual organizations from whom the data could be obtained on request. He highlight initiatives on how to expand the contributors beyond the current European organizations and how to ingest this additional data.

d. Sea-ID – Kenneth Himschoot (Sea-ID)

Provided a presentation on a new development of an initiative to obtain point source data from the navigation systems. He highlighted the collaboration with UNH. He gave some details of the next phase of development to reduce the costs and make the hardware more available, including integrating with Side-scan sonar data and to turn raw data into a bENC layer in collaboration with SevenCs/Chartworld.

e. Mapping the Atlantic seabed – AORA-CSA Workshop – Evert Flier (NMAHS)

Provided a brief on the recent workshop held in Norway in October. He provided background on the initiative which came out of the Galway Statement covering research in the north Atlantic between USA, CAN and EU. Recently a new initiative had been started between the EU, Brazil and South Africa to expand the area to cover the entire Atlantic. He highlighted the various elements of the AORA, which included Ocean Literacy – knowledge of the oceans. He noted that Infomar had the target of completing high resolution coverage of Irish waters by 2026; he also highlighted the Norwegian Mareano initiative. He noted that Geomar are now actively engaging with the initiative to collect data whenever possible. He highlighted the Global Ocean Data initiative (https://www.pgs.com/investor-relations/ir-news-stock-announcements/launch-of-global-ocean-data-initiative2/) of the Norwegian company Petroleum Geo-Services and the extraction of shallow water bathymetry from ENC data, which could be led by the RENCs. He noted that there was a growing awareness and a number of initiatives were overlapping, which would necessitate linking and coordination as a future requirement.

All the presentations generated numerous comments, questions and wide ranging discussions. BIMCO highlighted the Danish development of the Maritime Communications Platform. NMAHS noted the environmentalist issue with sound into the water; he suggested that the scientific community needs to support the initiative with good science and publications of papers. The vice-Chair suggested the Canadian Hydrographic Service (CHS) will seek to provide support from its own organization, the Canadian Department of Fisheries and Oceans, through a literature review and the generation of a report on the topic for the WG and IHO.

7. **Review of Progress**

The vice-Chair introduced the comments received in response to IHO CL 49/2017. He asked for general comments prior to breaking out into review groups for each chapter. Secretary raised concerns that some comments appeared to be leaning towards a crowdsourced hydrography guidance document, rather than the initial purpose. NMAHS suggested general responses should be provided with the revised version as an outcome of the comments; CHS suggested a general feedback should be provided and that there appears to be a publicity gap on the purpose for the document and its use. To ensure a follow-up and a response to the originator of comments, it was agreed that any comments received would be answered by mentioning either: a. Relevant but need further time to develop and include in version 2.0.0; b. Comments which were relevant and to be included in version 1.0.0; and c. Comments which should not be included supported by a short rational.

It was agreed the following focus breakout groups should be: data contribution/data collection/sensors, metadata, uncertainty and liability.

A status update was provided to indicate progress on the assessment of comments.

FRA provided observations on Uncertainty.

NOAA-OCS + NOAA-NCEI provided observations on Data contribution, Data collection, Sensors and Metadata.

The vice-Chair provided observation on Legal Considerations.

8.   Breakout Sessions

The participants reviewed the discussions and progress achieved during the breakout sessions. Each Chapter lead provided a short synopsis for inclusion in the meeting report.

Data Contribution (NOAA-NCEI) – One of the major themes of discussion in the chapter 1 breakout was methods for giving clarity to the concept of a trusted node. The breakout group supported an annex document which describes the current trusted nodes to give examples for potential contributors. The second major theme of discussion was the B-12 position on individual contributions. The document currently pushes individual contributions into the future tense. This raises the question, is this because the DCDB is not prepared for individual contributors, or do we want to enforce that all contributors go through a node to abstract away technical questions and receive the benefits of aggregation? NOAA-NCEI was tasked with determining the status of the individual contributor model. **Action NOAA-NCEI** Another theme present throughout the chapter was certain member states insisting that all data traffic flowed through trusted nodes. The group felt this was a way to control the data from their waters and an attempt to limit the scope of CSB. The group agreed with comments that section 1.4.2 felt out of place as currently written. The proposed solution is to change the title to "Accessing contributed CSB data" and adding text which gives more context to the topic's ties to contribution.

Data Collection and Sensors (NOAA-NCEI) – The breakout group found numerous comments in chapter two to pertain to content outside of the scope of the document such as 'locking' (encryption?) of data before it reaches the DCDB, sound velocity corrections and data processing during ingest. There was agreement with comments regarding additional general guidance for data transfer and statements were added to stress that logging and transmitting should be as simple and automated as possible to encourage CSB data flow and that transfer is encouraged to be done through shore offices if use of at-sea communications are unavailable or financially unreasonable. A recommendation that appeared in multiple chapter 2 comments was the collection of additional information to supplement XYZT; e.g., CMG or heading. The group agreed that this is valid and potentially beneficial; however, the DCDB is not prepared for additional data fields and this topic would be best addressed in future versions of the B-12 along with the previously discussed sound velocity topics. Lastly, the group agreed with comments on technical inconsistencies in the text; e.g. NMEA string formatting and clarifying that USB means a storage device, which will be addressed with updated examples.

Metadata (NOAA-OCS) –

Uncertainty (SHOM) – Globally, while reviewing the uncertainty chapter, it appears that there is a misunderstanding between raw and processed data (integration of lever arms, consideration of Sound Velocity (SV)) up to the point that some comments are requesting minimal quality. It was decided that, as we are considering only raw data, we do not want to filter out data provisions, however it stresses out the need of valuable metadata for the trusted node or the data user to assess the data (we should refer more to the metadata section). Another element of

discussion was the use of the table indicating the targeted accuracy of sub-components of the acquisition system. We believe that this table should be removed because it might worry contributors on both the way of assessing this accuracy for their system and also, more importantly, worry them if they are far from reaching this values. Finally, some minor corrections related to figure numbering will have to be done.

Legal Considerations (vice-Chair) – briefed the WG on the proposed changes, which included removal of use of the term 'Legal', renaming the chapter to be 'Additional Considerations' and making the contents shorter and more positive, highlighting that the CSB is a continuation of previous activities undertaken by mariners. FRA suggested that a form of crediting contributors should be considered. The issue of further use of the data, particularly for commercial use, generated considerable discussion. BIMCO and Sea-ID raised significant concerns over commercial non-navigational use, NOR highlighted the reasons for data collection for improvement of navigational safety and knowledge of the oceans and seas. NOAA-OCS suggested that there needs to be a check whether the restrictions can be included in the DCDB data. **Action NOAA-NCEI** The IHO needs to check whether current website statements cover the data in the DCDB. **Action IHO** SG highlighted that all bathymetry in Europe, in accordance with the INSPIRE directive, is freely available, although derived products (such as charts) were restricted, and that CSB is designed to increase knowledge of the oceans and seas for all users community. The vice-Chair noted that no consensus could be achieved, hence he suggested that the free availability of data should be maintained and further work should continue. Sea-ID and BIMCO would undertake further discussions and obtain further comment and clarifications from their communities. **Action Sea-ID/BIMCO**

NOAA-OCS provided a brief on the discussions on documenting Trusted Nodes. It was agreed in the future a list of Trusted Nodes and contact details would be published in the IHO website along with a list of IHO member States who support CSB in their waters. CHS agreed to provide appropriate description for inclusion in B-12. **Action CHS** The vice-Chair suggested details on what are the expected features of a Trusted Node in terms of knowledge, capabilities and services should be included; initial comments should be included in Edition 1.0.0 with further expanded details developed for Edition 2.0.0. **Action Editor/Sea-ID**

9. Review of B-12 development timeline and future milestones

Editor highlighted the major comments received in response to IHO CL49/2017 to ensure section leads had considered the issues. Each chapter lead provided updated comments and details on proposed actions for the document. The Editor requested 'Track Change' versions be forwarded. **Action Chapter Leads** It was suggested the Chapter Leads, Editor, Chair and vice-Chair should meet prior to the submission of Edition 1.0.0. to IRCC10. This could happened via a single day meeting after CHC on 30 March in Victoria, B.-C., Canada. Editor to circulate revision version for WG comments to prepare final version. **Action Editor**

10. Environmental considerations

The vice-Chair agreed for CHS to undertake a literature review to assess and provide the latest updated information covering impact of human induced sound into the water column on marine ecological living community. The objectives is to obtain information on potential impacts to counter any environmental issues which may be raised. Editor suggested confining the research to literature on SBES use. **Action vice-Chair**

11. Review of ToRs and RoPs

The WG considered the expansion of the scope of the tasks to be undertaken beyond the creation of the B-12 publication. NOR provided some background, which resulted from discussions at the IHO Assembly-1 and Council-1, he noted that IRCC had been tasked to consider the issue. DNK highlighted the need to provide some guidance to HOs on how to use and portray CSB and that there were other groups (MSDIWG, OGC, UN-GGIM) with which the WG should interact. The vice-Chair noted that there remained a task on

encouraging contributors to become involved as well some education of HOs, he highlighted the issue of answering why should vessels contribute and why they need to see some results for their efforts.

NOAA-OCS suggested a need to look at how feedback could be provided. NOR highlighted the need to increase the incentives for people to contribute and also how the education process can be undertaken to clarify to the IHO Member State (MS) community and HOs the reason for CSB and its continuation; he identified collaboration with Marine Spatial Data Infrastructure Working Group (MSDIWG), Data Quality Working Group (DQWG) and Project Team on Standards for Hydrographic Surveys (HSPT) as significant areas to be considered. Sea-ID noted that IHO could generate appropriate standards for industry to follow. SG noted DQWG is tasked to look at quality across all IHO activities; he noted he would urge the Comité International Radio-Maritime (CIRM) to encourage ECDIS manufacturers to include some logging software in future new systems and he provided ideas on some possible awards. Sea-ID noted that advertising and outreach needs to be better addressed. Director Iptes (DCoord) noted that completion of Edition 1.0.0 would be a success, which needs to be highlighted and advertised through IHO, their MS and the broader mariner community. NOR highlighted Ocean Literacy and how it could be linked to CSB.

The Secretary suggested generating standards and guidance for the portrayal and use of CSB data, noting that the bENC layers being provided through Chartworld/SevenCs could benefit from harmonized guidance for other developers towards a common method and approach.

Editor suggested engaging with Universities. NOAA-OCS noted that consideration needs to be given to the contributors of MBES and processed gridded data as well as other types of data, such as Side-scan data.

The vice-Chair asked what are the top three priority items for IRCC to consider tasking the WG? NOR suggested first priority must be how to increase and facilitate contributions to CSB then how to incentivise. Sea-ID suggested creating a legal framework. FRA suggested providing guidance to Trusted Nodes. NOAA-OCS recommended stating the goal and then increase users of the data and then add additional technologies.

It was agreed first priority was increase contributions, second was increase users and third was to consider different technologies and resultant data. SG suggested industry should create technical solutions, then uses and then increase contributions.

Secretary highlighted the objectives in the ToRs, to which proposed amendments should be made. It was agreed the current list of tasks should be reduced down to 'maintain B-12 and propose amendments as appropriate'.

It was agreed the objectives should be:

> Increase data contribution and incentives on how and why to become involved;
> Identify potential uses of CSB by HOs and how it can be portrayed, with concrete and useful examples;
> Provide guidance on data quality and standards for CSB;
> Maintain B-12 and propose amendments as appropriate; and
> Liaise with other IHO bodies involved with and potential uses of CSB data, such as GGC, MSDIWG, DQWG and HSPT.

The Secretary was requested to draft a revised preamble and revised objectives to be circulated with the draft meeting report and list of actions. **Action Secretary**

12.   Any other business

Web layout/marketing/outreach/education

The vice-Chair encouraged all to circulate presentations, papers and articles about CSB prepare by them and the MS they are representing to help generate a common approach to advertising CSB and nurture the momentum from the publication of the Guidance Document ver.1.0.0. **Action All**

Participation incentives

DCoord highlighted potential events and meetings at which CBS would be highlighted. The vice-Chair noted that there were a number of events at which all could highlight CSB contribution and its benefits. **Action All** Sea-ID asked whether a CSB display could be included in the IHO entrance; SG noted that it would be part of the review being undertaken by the Secretariat. **Action IHO**

13.   Venue and dates of the 6th CSBWG Meeting

In addition to the editorial meeting in Victoria, B.-C., Canada 30 March 2018, it was agreed that a further meeting of the working group would be necessary to progress the work in preparing Edition 2.0.0 and to review the outcomes of IRCC10 with respect to Council-1 instructions. It is therefore planned to hold a sixth meeting of the CSBWG in Boulder, Colorado, USA,19-21 June 2018. **Action IHO**

14.   Action Items

A draft list of Action Items from the meeting was generated. All Action Items are marked in this report and are collated together at Annex D. An updated list of the Action Items will be maintained on the CSBWG6 webpage and all those who have actions to complete should keep the Chair and the Secretary informed of any progress. **Action ALL**

It was agreed that the IHO would circulate a draft meeting report to all attendees by 12 December. **Action IHO**

Attendees were requested to provide any comments by 22 December. **Action ALL**

It was intended the final meeting report would be published by 12 January 2018. **Action IHO**

The IHO and the Chair would prepare the final report to IRCC10 using the format required by IRCC. It was noted the report to IRCC10 needs to be submitted by 30 April 2018. **Action Chair**

The Chair requested IHO to generate a draft Agenda for CSBWG6 and include it as Annex F to the report. The draft Agenda may require further amendment following intersessional progress.

15.   Closing remarks

The vice-Chair thanked all the participants for their contributions and efforts and he highlighted how much had been achieved on developing the B-12. He thanked the Editor for her efforts and good work to coordinate the comments and feedback to generate the review document. The SG thanked the participants for their enthusiasm and productive focus to create measureable output. He encouraged all to maintain the focus to achieve the goal of presenting the final document to IRCC10 and Council-2.

The following Annexes are attached:

A.   CSBWG5 – List of Participants.
B.   CSBWG5 – Agenda
C.   CSBWG5 – List of Documents
D.   CSBWG5 – List of Actions
E.   CSBWG5 – Draft revised ToRs and RoPs
F.   CSBWG5 – Draft Agenda for CSBWG6