

8th Crowd-Sourced Bathymetry Working Group (CSBWG8) Meeting

23-25 October 2019,
IHO Secretariat, 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

1.1 Welcome

Vice-Chair welcomed all and highlighted the absence of the Chair. It was noted that while the awareness of Crowdsourced Bathymetry (CSB) was increasing, more still needed to be done to raise its profile. He commented on the need to increase the participation, and asked all to consider what sort of applications CSB could be applied other than safety of navigation.

Secretary provided a welcome and introduction to all participants.

The Vice-Chair identified the opening words from the IHO Secretariat were most definitely a ‘call to action’. CCOM-JHC/UNH highlighted the discussions at the Vision to Action (V2A) technical session in London. Fugro noted the expansion beyond Seabed 2030 was an issue for the UN to address as well.

1.2 Administrative Arrangements

The Secretary provided administrative and domestic information.

1.3 Introductions

All participants introduced themselves and provided brief details on their background. Apologies were received from Jennifer Jencks (NOAA-NCEI/Director IHO DCDB/Chair CSBWG), Thierry Schmitt (France), Renny Thomas (India), Andy Talbot (UKHO), Daewon Park (ONE Data Technology Co. Ltd) and Heath Henley (Farsounder INC). The Vice-Chair noted the new faces was an indication of the health and growing interest in the initiative amongst IHO Member States and Industry partners, see Annex A for list of participants.

The agenda was approved with the addition of an additional presentation from the Chair of DQWG and discussion on the outcomes of the IHO Council 3 meeting. The agenda was adopted, see Annex B, and Annex C for a list of meeting documents.

1.4 Previous Meeting report and Action List

The Secretary went through the list of actions from CSBWG7. It was noted that the need to harmonize and engage with the recently announced Seabed 2030 initiative was vital to avoid duplication of effort and conflicting messages, the new Director Seabed 2030 should be invited to CSBWG9. The refurbishment of the IHO Reception and Entrance was highlighted and the opportunity to include displays on CSB.

The Vice-Chair briefed on the state of the investigation into manmade noise in the water column and impacts, he noted that there was little real science study on its impact and the results were inconclusive; he noted that there were other IHO bodies which were also investigating these issues and therefore he suggested there was a need for a coordinated approach. He noted that scientists from the

Department of fisheries and oceans (DFO) from Canada will start a project in 2020; CCOM-JHC/UNH noted the results of studies being undertaken, funded by NOAA, and offered that the results could be made available. It was noted that the impacts varied depending on the species. NOR noted the Antarctic treaty consultative meeting (ATCM) had discussions on this topic, it was noted that the frequency of the equipment commonly used in CSB was not a problem.

It was noted that a number of the outstanding items would be covered under other agenda items.

1.5 IRCC11 Outcomes

The Vice-Chair went through the CSBWG report to IRCC11, the Secretary highlighted the decisions and recommendations for the CSBWG to address. The positive list was displayed and the revised questionnaire was proposed as a potential solution to increasing the number of coastal states on the list. ITA noted that, despite providing a positive response, it was not on the list. She also noted the seminar and regional meetings at which CSB had been discussed and promoted, particularly within the Mediterranean region, she highlighted the message given by the Hydrographer of Italy of needing to share data and the need for CSB ambassadors. DNK recommended that the approach made to Hydrographic Offices (HOs) needed to be carefully considered to ensure that they took supporting action. NOR noted the need to engage with the Regional Hydrographic Commissions (RHCs) in an active manner and by making them responsible for some results and reporting progress, there was a need for them to take ownership of the completeness of coverage within their region. NOR noted the outcome of the recent IHO Council meeting and the inclusion of a progress report against the IHO Strategic Plan, which needs to be approved by the IHO Assembly in April. NOR suggested that each RHC should have a CSB coordinator to focus regional efforts.

No amendments to the ToRs were considered necessary, see Annex D.

2. Current IHO CSB-related Projects

2.1 DCDB Developments

The Chair, via remote connection, provided an update on the developments of the IHO Data Centre for Digital Bathymetry (DCDB) and the website, and asked for feedback to develop it further. **Action 1 – All** The Secretary highlighted the feedback received from Brazil when trying to contribute the supporting bathymetry from featuring naming proposals to the Sub-Committee on Undersea Feature Names (SCUFN) in accordance with the revised guidelines.

She then provided an update on the RosePoint Navigation project and the current data flow through the Trusted Node process. She explained the various elements of the data flow pipeline. She highlighted the amount of data provided from a single Trusted Node. She noted the work with new “trusted nodes”: FarSounder, Macgregor, James Cook University and CIDCO in preparation to allowing the data to be added. However the current list of positive coastal states remain a block on further progress. The next steps were explained and some proposed partner projects to increase the rate of development were articulated, in particular cloud/point store work with ESRI.

She explained the Seabed 2030 funded CSB projects to develop the concept in a similar manner to the James Cook University Great Barrier Reef (GBR) project. She noted that the UKHO and Hydro SAN had displayed a desire to become involved to increase the data gathering effort in remote and uncharted areas for which they have responsibility. She explained the current state of progress.

CCOM-JHC/UNH provided a brief on its investigation into various data loggers and their performance in different conditions for different uses with different sensors connected. He described the results obtained from each logger from trials collecting data on the UNH survey vessel. This generated a number of comments and questions.

The Chair noted that there was a need to re-engage with UKHO and HydroSAN to provide the test results and allow them to progress on their projects. Da Gama proposed spreading distribution of loggers rather than concentrating into a few limited areas. It was expressed that the participants appeared to prefer to have limited spread to match the ground support and where they needed to focus the data gathering effort. It was also noted that the density of data was a fact as the systems were of a variable capacity and quality and therefore it would be easier to assess the quality of the data with data concentrated into a limited coverage area. NLD/Chair DQWG highlighted the need to know how the data was logged and under what circumstances.

2.2 Interdisciplinary Center for Development in Oceans Mapping (CIDCO)

CIDCO provided a brief on their activities on the CSB project in Northern Canada in support of local community development. Team Surv highlighted the importance of community engagement. CIDCO noted it was important to find a reason for local communities to want to collect the data. The presentation generated a number of questions and comments.

2.3 FarSounder

FarSounder provided an update on their developments and activities. He provided a brief description of the systems available for use in CSB. He described the activities in remote areas and the provision of data to the DCDB.

2.4 James Cook University

James Cook University (JCU) provided an update on progress with the Great Barrier Reef (GBR) data gathering project and activities as a Trusted Node. He noted some of the technical challenges which needed to be overcome during the fitting of loggers. He highlighted the coverage achieved and the pleasing quality of the data being provided from the various vessels. He noted the resources needed to initiate and sustain the project. He highlighted the broad spectrum of motivation articulated by the masters and captains on why they were participating, and the importance of providing feedback to the vessels on how their data was being used and to the funding agencies to demonstrate the impact on their contributions. He noted the development of the AUS Seabed Hub, which should assist in highlighting the development of the CSB position within the country. The Secretary noted the inconsistency between the JCU activities and the verbal positive comments from the Government was not the current message being given by the Australian Hydrographic Office (AHO), it was requested that the AHO be approached to make a positive reply to the IHO Secretariat. It was noted that engagement with the AUS Seabed project would allow the GBR example to be repeated in other areas of the country. The presentation generated numerous comments and questions.

2.5 TeamSurv

Team Surv provided a presentation updating on the activities and developments of projects and studies in which it is involved in various parts of Europe. He noted the lack of funding had restricted activities, although it had allowed a focus on hardware and software development. Details of the new developed smartphone APP were provided. It was noted the OpenSeaMap was to include track data released under the Open Data Licence, it was highlighted that the IHO could utilize the data as well if desired.

2.6 Navigating off the grid

Captain Christoph Schaefer, MY Gene Machine, provided a presentation on his experiences of navigating in remote areas, the hazards encountered, sharing data and the lack and poor quality of data available on published charts in these areas. He provided numerous examples on the use of non-official data sources, including Google and Apple Maps, to supplement the official navigational charts. The use of drones was highlighted as an additional tool. He highlighted the challenge of the results of

climate change, which is opening up new previously unsurveyed areas, in addition to the current issue of the many unsurveyed areas. He explained the use of the Wide Angle Sonar Seafloor Profiler (WASSP) multibeam system for surveying remote areas from the main vessel as well as the tender using a wireless link to the main vessel and then displaying the data as an overlay on the electronic chart system. He indicated the potential use of autonomous surface vessels with the WASSP on board to protect the tender in areas where drones cannot provide good images. He noted the data was of value to the scientific community, particularly on a smaller scale in areas for repeat observations. The presentation generated numerous questions and comments. He indicated the potential to repeat the approach for SOLAS vessels, particularly cruise ships visiting remote locations. It was highlighted that there needed to be engagement with WASSP and that they should be invited to the next meeting.

Action 2 – NOR/MY Gene Machine He noted there was a need to clarify to whom and to where the data should be sent for future use.

2.7 FLIR Maritime

FLIR Maritime provided a presentation on their activities, systems, data quality assessment, data usage and future developments. He demonstrated some data comparison examples from various data types of the same areas. He noted the company was willing to share their database with the IHO. He identified a need to encourage HOs to use CSB data in their products to make the activities commercially viable. He noted that the current reporting process needed to be updated to allow a more rapid exchange. He suggested that a short summary guide of B-12 should be created to communicate the idea for the wider public participation, who he felt would not read the entire B-12.

Action 3 – Chair He identified a number of other areas, which could be addressed, to ease the participation and increase the standardization. He emphasises the safety and environmental factors should be the main driver for increasing the amount and availability of data. NOR identified the bullet points which should be the focus of the CSBWG efforts. The presentations generated a number of questions and comments.

2.8 Electronic Chart Centre

Electronic Chart Centre (EEC) provided a presentation on the activities of the ECC. He provided background on the company and its relationship with the PRIMAR Regional ENC Coordinating Centre (RENC). He provided details on ideas to improve and increase the data available for use by GEBCO and to expand CSB data. He suggested some ideas on improvements for the DCDB on non-data coverage and route import for planning and adjustment, survey quality by creating a methodology to select the best data, the ability to download parts of surveys and tracks, download only those parts of surveys which are already in the public domain taking account of current national regulations, online accessibility of data, automated ENC comparison to identify variations, automated survey comparison to identify differences between overlapping survey data and Trusted Node uncertainty calculation support to generate information on received data and add to metadata. He identified the potential, over time, to generate individual surveyor/vessel uncertainty estimates. He highlighted some errors and issues which needed to be addressed by the DCDB. It was noted that adding external programmes and software to the NOAA-NCEI was a challenge, however this should not stop development. It was agreed that these ideas and proposals were what the Director DCDB wished to achieve but could not due to resource limitations. It was agreed that the ideas were a positive advance and EEC was encouraged to engage with the Director DCDB to investigate how it could be progressed.

Action 4 – ECC/Chair NOR noted that ECC was a commercial operation and would need to be considered how these developments would be resourced. CCOM-JHC/UNH suggested that there were too many barriers to setting up a Trusted Node and that if some of their functions could be developed by ECC as web services, the results could be accessed via the DCDB, or Trusted Nodes.

3. Member State data gathering policy

3.1 Review of replies to IHO CL 11/2019

The Secretary provided details on the IHO CLs issued to seek approval for B-12 and the follow-up CL announcing its approval and adoption.

3.2 Review of positive list

The Secretary provided details of the IHO CL issued seeking individual coastal state position on CSB. He explained the rationale for publishing the positive list. He also displayed actions from the 16th HCA meeting, which were of relevance to the CSBWG. These generated a number of comments and questions. NLD/Chair DQWG asked how you control airborne data collecting.

3.3 DCDB development

The Chair, via remote connection, provided details on the DCDB position and how to mask data collected in restricted areas. She highlighted the challenges for handling the data, particularly as the DCDB handles file data rather than point data, which results in the entire file being suppressed. NLD/Chair DQWG noted that if the CSBWG can demonstrate the positive aspects of CSB, what coastal states will gain and the safety of navigation perspectives, then wide acceptance will follow. NOR noted that it was a long term initiative, which will be overcome by technology and social attitudes. He noted that the majority of states supported the UN Sustainable Development Goals (SDGs) and the need for greater ocean knowledge whilst placing limitations on CSB data collection. DCDB and Sea-ID agreed to work on maintaining the database of polygons where Member States have caveats on handling data so that a single shape file of limits is used. **Action 5 – DCDB/Sea-ID**

4. Review of B-12

4.1 Proposed clarifications for B-12 Edition 2.0.3

The Secretary introduced two proposed clarifications for B-12 for consideration by the CSBWG, see document CSBWG8/4/1/2. It was agreed that HOs would need to accept and check the data, as the alternative would be to ignore or lose the data. ITA indicated that they would accept the data and have to find the resources to do so. NOR suggested that HOs need to reassess their approach to additional data provided in an ad hoc manner. The proposal generated a number of comments. It was noted that this could create a challenge for data gathering on transit which crossed a number of zones of coastal states and therefore could require additional effort by the data gatherer, which could make new participants less keen to participate. It was agreed that the two proposed paragraphs be included in B-12 as a clarification to the current text and version 2.0.3 be published. IHO Member States would be notified under a Circular Letter, which would also highlight new coastal states added to the positive list. **Action 6 – IHO** DNK noted that current national legislation of coastal states would need to be reviewed to reflect current technologies and practices as many were far behind what was actually happening in their waters and the activities being undertaken by the maritime community, together with the Open Data resulting from the worldwide web.

4.2 e-Publication format

CCOM-JHC/UNH provided a demonstration of a potential e-publication formats for B-12, highlighting the benefits and limitations of the various formats. It was agreed that this should be demonstrated at IRCC12 for approval as the future format of the publication and as a potential format for other IHO publications. **Action 7 – Chair**

5. Potential uses of CSB by Hydrographic Offices

5.1 Use case examples

CAN provided a presentation of examples of CSB uses by HOs for chart assessment and updating. He presented examples of National Oceanic and Atmospheric Administration (NOAA) and CHS uses and how CSB had influenced national survey and chart scheme planning. The Vice-Chair suggested a more innovative approach needed to be taken with potential uses for CSB beyond charting. GBR described some of their activities and studies of using CSB for marine archaeology, renewable energy, coastal zone management and engagement with academia. He volunteered to provide further details at the next meeting. **Action 8 – GBR** NLD/Chair DQWG described how CSB could be used to help monitor sea level rise.

5.2 Data Quality

The Chair of the DQWG provided two presentations on ‘Data Quality Combining S-101 and S-102 and Definitions of depth’, and ‘Using data quality for safe navigation’, he particularly requested feedback. He noted that currently only the depth data is taken into account, whereas there was a need to consider uncertainty in the calculation. NOR highlighted that S-4 noted the rationale for using CSB by HOs. DNK suggested that a white paper could be created on guidelines on how CSB could be used by HOs, which could be endorsed by IHO Member States. It was noted that focusing on using CSB for charting, rather than simply building a complete picture of the seafloor, had the potential of tying CSB into definitions under UNCLOS; however it was noted that there was a need to overcome HO reluctance to use the data where appropriate and a real need to provide guidance to HOs to assist in overcoming these views. **Action 9 – Chair/Vice-Chair/NOR** CCOM-JHC/UNH noted the challenge of measuring the uncertainty. The Chair of the DQWG drew attention to two DQWG documents of relevance:

DQWG reference documents: national methodologies from survey to CATZOC values.

DQWG letters for 2019: S-67 Mariners Guide to accuracy of depth information in ENCs

5.3 Development of S-100 base Product Specification

DNK/Chair MSDIWG introduced the concept of developing an S-100 based Product Specification (PS) to allow CSB datasets to be used in various applications and uses. He suggested that coastal zone management was a particular area which could benefit and it could assist in MSDI. He suggested that some HOs were concerned on taking on the issue of data quality. He suggested it could be similar to S-102. The IHO provided detail and background on S-102 and associated datasets. He suggested that it could be more than was required, noting the coding format detail in B-12. He suggested that the model would need to be expanded and the current point geometry was significantly limited compared to S-102 data geometry. He suggested that CSB was more suited to the service delivery domain. He cautioned against making the effort of developing a PS and that energy could be directed into developing the service aspects, looking at a PS later. CCOM-JHC/UNH suggested that S-102 was not necessarily efficient for sparse datasets. NLD/Chair DQWG noted that the benefit was that it would be harmonized with other data being used in an ECDIS, a significant disadvantage was that the process needed to follow the set approach for S-100. DNK/Chair MSDIWG suggested that the MSDIWG needed a method for using and manipulating CSB to support the various uses to which it potentially could be put. The Vice-Chair noted that the original goal remains of making CSB data available in an easy accessible format; NLD/Chair DQWG suggested that CSB data needs to be made available to the crowd in an easily usable format, which was probably some form of web browser application, although this may not be compatible for use by vessels. Da Gama noted that the user needed to be clear that the data was unofficial. It was agreed not to progress this proposal at this stage.

5.4 GEBCO/Seabed 2030 update

Fugro provided an update on GEBCO and Seabed 2030 project developments, which were relevant to CSBWG. He highlighted the broad opportunities to progress the initiatives and leverage the UN SDGs and UN Decade for Ocean Science for Sustainable Development. He noted the importance of

coordination and collaboration between CSBWG and the various Seabed 2030 project programmes to ensure harmonization and that conflicting messages are avoided. It was agreed that the new Director of the Seabed 2030 project should be a participant in the CSBWG meetings to ensure synchronization.

Action 10 – Chair It was noted that the two main challenges were increasing participation and removing national legal limitations to CSB. It was noted that benefit examples were needed to improve the positive view of CSB. Sea-ID noted that a wiki had been developed to collect presentations and articles as well as images to promote the benefits of CSB, he asked that all CSBWG participants contribute. **Action 11 – All** Sea-ID agreed to provide details of the Wiki to allow all to access and make use of the content. **Action 12 – Sea-ID** NOR suggested closer engagement with World Ocean Council (WOC) and to use their network to encourage industry to be involved. The Vice-Chair suggested that the Chair CSBWG and Director Seabed 2030 undertake regular conversations and engagement. **Action 13 – Chair.** Fugro suggested CSBWG engage with GEBCO to ensure a collaborative approach to avoid duplication. **Action 14 – Chair**

5.5 Next steps for Outreach

The Chair, via remote connection, provided an introduction to the Outreach Strategy, she provided an update on activities and what developments had been achieved. She highlighted the successes achieved with individual sectors. NOR provided an update on engagement with Petroleum Geo-Services (PGS), Norway, and the ATCM. He noted that the two main companies which held the largest amounts of embargoed data were involved closely with the CSBWG and Seabed 2030, he noted that both companies were actively engaging with the owners of the data to allow release of the data or a subset. DNK/Chair MSDIWG suggested that coastal states may need to look at the way they give permissions for the release of data covering their waters. It was suggested that subsets could be released as an alternative to the current blanket ‘No’, which appears to be the default position of many coastal states. The list of RHCs at which presentations had been given was highlighted, she suggested that it should be a standing agenda item. The IHO highlighted that the recently approved revision to resolution 2/1997, as amended, detailed the permanent agenda items, which did include CSB and GEBCO; he noted that the Inter-Regional Coordination Committee (IRCC) and a number of RHCs were engaged and contributing. The Chair suggested that the CSBWG should look to ensure there was representation at all RHCs. **Action 15 – All** It was agreed that a list of RHC meetings should be included as an annex to the final meeting report, see Annex E. **Action 16 – IHO** NOR highlighted that the IHO Council 3 meeting had included the reporting of percentage coverage within each region, this had been included in the Strategic Plan, he noted that reporting would increase engagement and potentially release additional datasets. NOR suggested that CSB ambassadors be identified for each RHC to promote and lead regional activities. It was proposed that members of the CSBWG could fulfil this role for those RHCs covered by the participants. **Action 17 – Chair/IHO** DNK/Chair MSDIWG suggested that particular topics for discussion could be developed for presentation and requesting input from RHC member states and actions for the RHCs, which could increase their activity. It was requested whether engagement with World Meteorological Organization (WMO) for expanding VOS activity had been considered; the Chair noted that progress had stopped due to personnel changes, although initial responses from WMO was positive. The IHO indicated that the template for the national reports to RHC meeting was being updated to include aspects of CSB and support to GEBCO, he suggested that a list of topics for inclusion could be developed and submitted to the Secretariat. **Action 18 – Chair**

The Secretary-General (SG) provided a short brief on recent activities including the Seabed 2030 ‘Vision to Action’ event and the Our Oceans Conference. He particularly noted the commitment of the International Seabed Authority (ISA) for contractors to provide bathymetric data for inclusion in the GEBCO Grid. He reported positively on the discussions and outcomes of the Our Oceans Conference. He suggested using the highlighted national support at the Conference as a lever to gain support for CSB. It was suggested letters could be sent to HOs to gain support in light of the position taken in associated UN initiatives. **Action 19 – IHO**

6. Outreach Strategy

6.1 Review of Outreach actions

The Vice-Chair displayed a number of headline ideas and topics for consideration within Outreach:

- Marketing;
- Targeting leaders/ambassadors;
- Meeting formally with leaders/ambassadors;
- Targeting areas for CSB done by leaders/ambassadors;
- Getting consistent message – presentation;
- Getting consistent message internally – GEBCO/Seabed 2030/UN Decade/CSBWG; and
- Creating event to highlight/discuss to create momentum to expand participation in CSB.

The Vice-Chair highlighted the task identified by the Chair on the actions and ways to increase the data contributions and incentives to increase participations. Fugro noted the high profile of CSB within the messages generated by GEBCO and Seabed 2030. NOR noted that the regions not represented within the CSBWG needed to be approached via the IRCC and encouraged to become engaged. **Action 20 – Chair**

6.2 Review of Mind Map

It was decided to split into small groups to consider the various aspects of Outreach and how to develop a coordinated strategy. All groups would consider the three main topics:

- Actions to increase contributions;
- Key messages; and
- Review mind map and consider renaming.

6.3 Alignment with GEBCO/Seabed 2030

Fugro highlighted a press release from the Our Oceans Conference highlighting that the US announced NOAA is prepared to spend \$1 billion over the next decade to lead the broader US effort to explore, map and characterize the global ocean floor, including the US continental shelf, in support of Seabed 2030, which aims to facilitate the complete mapping of the global ocean floor by 2030.

Fugro then provided details on the GEBCO and Seabed 2030 communications activities, including the establishment of the new GEBCO Sub-Committee on Communications, Outreach and Public Engagement (SCOPE), and related events. He highlighted the recent outcomes and products, which included updating the core message, a rack card, conference exhibition material, attending the OceanObs'19 conference and getting "Seafloor" added to the OceanObs'19 Conference declaration statement, engagement with WOC and AORA, numerous articles, participated in the 1st UN Decade of Ocean Science for Sustainable Development Global Planning meeting and the Shell Ocean Discovery XPrize awards. He provided a number of suggestions and recommendations for consideration by the CSBWG.

The Vice-Chair and ITA suggested there was a vital need for all the key programme and initiative leads to directly engage to ensure a coordinated approach is achieved. The Secretary noted that that all relevant organizations were directly involved with IHO and IOC programmes:

GEBCO project – IOC and IHO
Seabed 2030 project – Director
CSBWG – IHO

UN Decade – IOC

It was suggested that an agenda item should be included in the forthcoming GGC36 meeting to commence the coordination process. **Action 21 – IHO/Fugro**

6.4 Development of Outreach Strategies

The breakout groups provided a brief on their discussions and outcomes:

Group One:

- Actions:
 - Require member states to give updates on status of response to CL 11/19 at regional meetings;
 - Write guidance on trusted node concept (CSBWG);
 - Review “pain points” for contributors (CSBWG?).
- Message:
 - Explain CSB to member states that responded “no” or have not responded;
 - Include definition and examples;
 - Update ppt with feedback;
 - Include mind map in ppt;
 - Communicate trusted node method in ppt.
- Mind map:
 - WASSP (hardware);
 - New items:
 - IIC (training/consulting);
 - IHO working groups - add groups;
 - Warsash (training mariners).

The SG suggested that reporting on the status of responses to IHO CL 11/2019 could be added to the IHO report to RHCs. NOR suggested that the process should be a standing item and states should be asked at what level of resolution they were prepared to release data for their waters and how they would facilitate contributing to the CSB initiative.

It was highlighted that there was a requirement to articulate the roles and responsibilities of a Trusted Node and to clarify the process to become one. It was noted that this was an action from previous meetings and needed to be completed. **Action 22 – Chair/Sea-ID**

Group Two:

- Actions to Increase Contributions (Who / How):
 - Current Sector Focus;
 - Submarine Cable;
 - Request opportunity to speak at ICPC Plenary Meeting in spring 2020;
 - Coordinate with GEBCO / Seabed 2030 on who to lead;
 - Provide update to ASN and Subcom on outcome of Seabed 2030 symposium and this meeting;
 - See what support or information is required prior to annual meeting.
 - Geophysical
 - Request opportunity to speak at IAGC Annual Meeting in 2020;
 - Coordinate with GEBCO / Seabed 2030 on who to lead;
 - Include PGS if possible;

- See what support or information is required prior to annual meeting.
 - Cruise Ships
 - Request opportunity to speak at CLIA Annual Meeting in 2020;
 - Coordinate with GEBCO / Seabed 2030 on who to lead;
 - Include PGS if possible;
 - Provide update to CLIA on outcome of Seabed 2030 symposium and this meeting;
 - See what support or information is required prior to annual meeting.
 - New Sector Focus
 - Recreational Boating / Recreational Fishing and Software / Hardware Companies;
 - Top down and bottom up approach;
 - Engage boating and fishing community via clubs, marinas, magazines, associations;
 - Utilize flyers, advertisements and social media;
 - Engage a professional marketing organization on strategy;
 - Emphasize importance of bathymetry to ocean sustainability and ocean uses that they can appreciate;
 - Create a demand for their suppliers to support CSB;
 - Establish a partnership with FLIR Systems;
 - Go back to other suppliers, Garmin in particular, and show disconnect between their sustainability initiatives and lack of support for CSB;
 - Leverage UN Ocean Decade and sustainability in communication;
 - Coordinate with GEBCO / Seabed 2030 on who to lead.
- Key Message (Who / How):
 - How
 - Utilize and leverage the UN brand and the promotion of the UN Ocean Decade;
 - Focus on Sustainability showing the importance of bathymetry and CSB to key aspects of societal health, safety and prosperity;
 - Create expansion of bathy use cases;
 - Show where bathy fits into the circle of life;
 - Emphasize that we live on a finite planet / ocean supports the air we breath;
 - Use social media platforms of types and at all levels;
 - Connect with civil society, youth and professionals;
 - Coordinate with GEBCO / Seabed 2030 and UN Ocean Decade.
 - Who?
 - Find and utilize celebrity spokespeople who are passionate about the ocean and ocean health;
 - Utilize members of this group, IHO, IOC, GEBCO to utilize social media platforms;
 - Develop and share social media messages and strategy.
- Review Mind Map
 - Only suggestion is add NGOs as a sector or maybe it is already there.

Group Three

- Action to increase contribution: who / how
 - Solidify existing relationships

- identified contributors with: NO + USA;
 - contact other industry players in same branch : ‘how about you’?
 - have unified (seabed 2030 – GEBCO + UN ocean decade) /clear message from (David M.);
 - include: what’s in it for me? + what do we need to do?
 - We have to have a plan for feedback that’s timely (highest motivation factor).
- Provide recommendation how to provide timely feedback implementation / example;
 - open source?
 - validation services for country constraints;
 - getting IHO MS on board (regionally);
 - seabed 2030 coordinator/RHC;
 - IHO SPI on seabed 2030 compliance;
 - Address HO’s whose government want to contribute but responded negative or not to IHO CL.
- CSWWG interaction plan based on responses to IHO CL 11/2019
- Key messages:
 - Message to industry
 - Sustainable oceans;
 - Ocean stewardship / CORPORATE RESPONSIBILITY;
 - IMPROVING ocean health;
 - Seabed knowledge is baseline knowledge;
 - Ocean currents;
 - Glaciers;
 - Ecosystems;
 - Biodiversity;
 - Climate;
 - Food;
 - Sea transport;
 - Be part of this global initiative of the big blue family on this blue planet.
 - What would it take for you to contribute?
 - Users / clients of: Garmin, Ray Marine, Navico, Johnson Outdoor + boat magazines.

It was agreed that current engagements with commercial companies needed to be nurtured and maintained to ensure data is delivered and continues to be delivered. It was also noted that use of experiences and motivations of current lead contributors should be used to communicate to other potential contributors. CCOM-JHC/UNH suggested providing guidance on how to progress and the future actions needed to achieve the desired outcomes with a realistic time plan, these could be tailored to individual companies. It was agreed that the national reports to RHC could include positive coastal states and actions to encourage participation. It was noted that graphics could be provided to RHCs to indicate in which waters data had been received and the variance between the DCDB and BODC generated GEBCO_Grid. **Action 23 – IHO/Chair**

It was suggested that a video could be created to highlight successful use cases. **Action 24 - IHO**

It was agreed that prioritization of the ideas was needed.

7. **Recognition Strategy**

7.1 Incentives

The SG suggested that contributors could receive a physical graphic of the area which had been contributed. The SG demonstrated the CCOM-JHC/UNH BathyGlobe application.

8. **Close**

8.1. Election of Vice-Chair

The Vice-Chair advised that he would be retiring at the end of the month and therefore there was a vacancy for the Vice-Chair position. Marta Pratellesi (Italy) was nominated and unanimously elected as Vice-Chair. **Action 25 – IHO**

8.2. Next meeting

NOR offered to host the next meeting in Stavanger, Norway, during the week commencing 29 June. It was suggested that a second industry/stakeholder event could be considered, the Chair supported the idea. NOR suggested including science, government and other stakeholders. It was agreed that 29 June to 2 July were the best dates with the stakeholder event on the second day. **Action 26 – NOR/IHO**

8.3. Review of list of actions

The Secretary went through the list of actions, he noted that those which had been missed could be added when the draft report and draft list was circulated for comment. The Vice-Chair requested that participants identify which actions they could progress and indicate as such in the draft list of actions. **Action 27 – All** 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 F. An updated list of the Action Items will be maintained on the CSBWG8 webpage and all those who have actions to complete should keep the Chair and the Secretary informed of any progress. **Action 28 – All**

8.4. Outstanding issues

The Vice-Chair suggested the Chair DQWG be a permanent member of the CSBWG. **Action 29 – Chair**

8.5. Closing

The Chair, via remote connection, provided a thank-you presentation for the departing vice-Chair. The SG provided brief summing up remarks, noting that the IHO was established with the recognition there were political differences which the Organization should strive to overcome. The Vice-Chair wished all safe journeys home.

The following Annexes are attached:

- A. CSBWG8 – List of Participants.
- B. CSBWG8 – Agenda
- C. CSBWG8 – List of Documents
- D. CSBWG8 – ToRs and RoPs
- E. CSBWG8 – List of RHC meetings
- F. CSBWG8 – List of Actions
- G. CSBWG8 – Draft Agenda for CSBWG9

IHO Crowd-Sourced Bathymetry Working Group (CSBWG)
List of Participants CSBWG8

| Member State | Organization | Name | E-mail |
|--------------------|---|--------------------------------------|-----------------------------------|
| Canada | Canadian Hydrographic Service (CHS) | Serge Gosselin (vice-Chair) | Serge.Gosselin@dfo-mpo.gc.ca |
| Canada | Canadian Hydrographic Service (CHS) | Peter Wills | Peter.Wills@dfo-mpo.gc.ca |
| Denmark | Danish Geodata Agency (DGA) | Jens Peter Hartmann | jepha@gst.dk |
| India | Indian National Hydrographic Office (NHO) | Renny Thomas | inho@navy.gov.in |
| Italy | Istituto Idrografico della Marina (IIM) | Marta Pratellesi | marta.pratellesi@marina.difesa.it |
| Japan | Hydrographic and Oceanographic Department, Japan Coast Guard (JHOD) | Haruka Ogawa | ico@jodc.go.jp |
| Japan | Hydrographic and Oceanographic Department, Japan Coast Guard (JHOD) | Kentaro Kaneda | ico@jodc.go.jp |
| Netherlands | Netherlands Hydrographic Office/Chair DQWG | Rogier Broekman | r.broekman.01@mindef.nl |
| Norway | Norwegian Mapping Authority Hydrographic Service | Evert Flier | evert.flier@kartverket.no |
| UK | UKHO | Andrew Talbot | andrew.talbot@ukho.gov.uk |
| USA | CCOM/JHC, UNH | Brian Calder | brc@ccom.unh.edu |
| USA | NavOceano | Raymond Sawyer | Raymond.sawyer@navy.mil |
| USA | NGA | Deborah Peterson | Deborah.L.Peterson@nga.mil |
| IHO | IHO Secretariat | David Wyatt (Secretary) | adso@iho.int |
| IHO | IHO Secretary-General | Mathias Jonas | mathias.jonas@iho.int |
| Expert Contributor | Fugro | David Millar | dmillar@fugro.com |
| Expert Contributor | Da Gama Maritime Limited | Steve Monk | steve@dgmaritime.com |
| Expert Contributor | FLIR Systems AB | Andres Bergström | anders.bergstrom@flir.com |
| Expert Contributor | SevenCs/ChatWorld | Emma Wise | emma.wise@chartworld.com |

| | | | |
|--------------------|--------|-------------------|--------------------|
| Expert Contributor | Sea-ID | Kenneth Himschoot | kenneth@sea-id.org |
|--------------------|--------|-------------------|--------------------|

Remote presenters:

Jennifer Jencks (**Chair**) – NOAA-NCEI/Director IHO DCDB

Heath Henley – Farsounder INC.

Tim Thorton – TeamSurv

Robin Beaman – James Cook University

Julien Desrochers – CIDCO

Apologies:

Daewon Park – ONE Data Technology Co., Ltd

8th MEETING OF THE IHO CROWDSOURCED BATHYMETRY WORKING GROUP
IHO-CSBWG8
IHO, Monaco 23-25 October 2019

AGENDA AND TIMETABLE

| Time | DAY ONE OF CSBWG8 – Wednesday 23 October | Action |
|-------------|--|--|
| 1400 | 1. Welcome .1 Welcome and opening remarks .2 Domestic and administrative arrangements .3 Introduction of participants, apologies and approval of agenda .4 Approval CSBWG7 Report and Review of Actions .5 Chair report to IRCC11 a. Outcomes and actions from IRCC11 b. Review of ToRs and RoPs | Chair/SG Secretary Secretary Secretary Chair |
| 1515 | Group photograph | Secretary |
| 1530 | Coffee | |
| 1600 | 2. Review the CSB Guidance Document 2.0.2 (B-12) .1 Consideration of feedback comments, input and proposed actions on Edition 3.0.0 | Chair |
| 1630 | 3. Member State Data Gathering Policy .1 Review of Member States replies to IHO CL 11/2019 with respect to data collection policy for each coastal state. .2 Development of a list of coastal states who support the collection of CSB within their waters of national jurisdiction published on the IHO website, including caveats; how to increase participation level. .3 IHO DCDB development of a geographic mask that filters incoming data based on MS responses. | Chair |
| 1730 | END OF DAY ONE | |
| 1800 | Reception – Terrace/Chart room | IHO |
| Time | DAY TWO OF CSBWG8 – Thursday 24 October | Action |
| 0830 | 4. Updates of Current IHO CSB-related Projects (<i>Remote participation under investigation for this agenda item only</i>) .1 Introduction; .2 IHO DCDB development • Current known Trusted Nodes • Seabed 2030-funded pilot projects .3 CIDCO .4 FarSounder .5 James Cook U. | Chair Chair Desrochers Henley Beaman |
| 1000 | Coffee | |
| 1030 | 5. Updates of Current IHO CSB-related Projects .6 Others 6. Outreach Strategy .1 Review of Outreach-related actions .2 Update on CSB Outreach activities: to focused sectors, shows attended, industry engagement, etc. | Chair Chair/Flier |
| 1230 | Lunch Break | |
| 1400 | 6. Outreach Strategy Discussion on concrete actions and ways to increase data contributions and incentives on how and why mariners should become involved. .3 Review Mind Map of CSB Stakeholder Sectors a. What new sectors should we target? What do they want and what do they need? Identify ambassador. Develop approach to each. .4 Discussion of outreach and education strategies in line with GEBCO and Seabed 2030-Project activities, synergies and harmonization of approach and material? | Chair |
| 1530 | Coffee | |
| 1600 | 6. Outreach Strategy (continued) | Chair |
| 1700 | END OF DAY TWO | |

| Time | DAY THREE OF CSBWG8 – Friday 25 October | Action |
|------|--|--|
| 0830 | 6. Outreach Strategy (continued) .5 Development of generic presentation, senior officer briefing notes and skeleton press input. 7. Recognition Strategy Defining the incentives level within a CSB recognition strategy for collector | Chair Chair |
| 1000 | Coffee | |
| 1030 | 8. Identify Potential Uses of CSB: Hydrographic Offices (continued) .1 CSB from a HO perspective; how can/do HOs' use CSB? Identify examples. .2 The implications for HOs with relation to CSB, data handling/QC/QA; perspectives of other IHO bodies (DQWG, NCWG, MSDIWG). • How data can be assessed and evaluated, based on ISO19157 standard | Chair/ Secretary Broekman |
| 1230 | Lunch Break | |
| 1400 | 8. Identify Potential Uses of CSB: Hydrographic Offices (continued) • Development of an S-100 based Product Specification for CSB data and portrayal. .3 GEBCO/Seabed 2030 uses. .4 Producing a CSB White Paper, who is the target audience? Next steps. | |
| 1530 | Coffee | |
| 1600 | 9. Close .1 Any other business a Vice-chair election .2 Date and venue of next meeting – CSBWG9 - and intercessional activities. .3 Review of Action List for CSBWG8 and draft agenda for CSBWG9. .4 Discussion on outstanding issues and post-meeting expectations .5 Closing remarks by Chair. | Chair Secretary Chair Secretary Secretary Chair |
| 1700 | END OF THE MEETING | Chair |

CSBWG8 - List of Documents

| Document No | Document Title |
|--------------------------|--|
| CSBWG8-Invitation Letter | Letter of Invitation v1.0 |
| CSBWG8-Annex B | Registration Form (pdf Version) |
| CSBWG8-Annex B | Registration Form (Word Version) |
| CSBWG8-Annex C | Logistic Information |
| CSBWG8-Annex D | Hotel details |
| CSBWG8-Document Template | Document Template (Word version) |
| CSBWG8-1.1 | IHO Introduction |
| CSBWG8-1.3-Agenda | CSBWG8 Draft Agenda v7.0 |
| CSBWG8-1.4-Action List | List of Actions - CSBWG7 - updated 16 October 2019 |
| CSBWG8-1.5 | Report to IRCC11 |
| CSBWG8-1.5 | Report to IRCC11 presentation |
| CSBWG8-1.5a | IRCC11 Relevant Outcomes |
| CSBWG8-1.5b | ToRs and RoPs |
| CSBWG8-3.1.1 | IHO CL 11/2019 |
| CSBWG8-3.1.2 | IHO CL 28/2019 |
| CSBWG8-3.2.1 | IHO CL 47/2019 |
| CSBWG8-3.2.2 | Outcomes of HCA16 |
| CSBWG8-4.1.1 | B-12 (IHO Guidance on Crowdsourced Bathymetry) Edition 2.0.2 |
| CSBWG8-4.1.2 | B-12 clarifications |
| CSBWG8-6.1 | Regional Hydrographic Commission meetings |
| CSBWG8-8.3 | Proposed draft agenda for CSBWG9 v1.0 |
| CSBWG8-Presentations | Presentations.zip |
| CSBWG8-Participants | CSBWG8 List of Participants |

CROWD-SOURCED BATHYMETRY WORKING GROUP (CSBWG)

Terms of Reference

Ref. 7th IRCC Meeting (Mexico City, June 2015)
10th IRCC Meeting (Goa, June 2018)

1. Preamble

The 5th Extraordinary International Hydrographic Conference (EIHC-5) considered Proposal 4 on Crowdsourced Bathymetry (CSB) and decided by Decision 8 to task the IRCC to establish a Working Group (WG) to prepare a new IHO publication on policy for trusted crowd-sourced bathymetry, taking into account EIHC-5 Proposal 4 and the comments made during the Conference. At the first session of the IHO Assembly and the first meeting of the IHO Council, it was agreed that the scope and tasks of the CSBWG should be considered by the IRCC with a view to expanding the role of the CSBWG beyond that of maintaining IHO publication B-12 - *IHO Guidelines for Crowdsourced Bathymetry* – to include consideration on the potential uses and portrayal of CSB, guidance on data quality and standards, and incentives to increase data contribution by mariners. The IRCC tasked the CSBWG to take into account the programmes already being progressed by other IHO bodies, such as the GEBCO Seabed 2030 and standards development by DQWG and HSPT, and to liaise with these bodies to ensure a harmonized approach and results.

2. Objectives

- a. Maintain the IHO publication B-12 – *IHO Guidelines on Crowdsourced Bathymetry* – through periodic reviews and updates identified by Member States;
- b. Monitor Member State and Regional progress regarding development of best practices and CSB initiatives and incorporate into B-12 as appropriate;
- c. Investigate and [highlight / promote] ways to increase data contributions and incentives on how and why mariners should become involved.
- d. Define potential uses of CSB for Hydrographic offices (HOs) with examples and useful land equivalents;
- e. Provide guidance on data quality and standards for CSB in liaison with appropriate IHO Working Groups;
- f. Liaise with other relevant IHO subordinate bodies involved with CSB data to promote its use and development; and
- g. Liaise closely with the IHO Data Centre for Digital Bathymetry (DCDB) as it continues to develop technology to collect and distribute CSB to the public.

3. Authority

- a. The WG is a subsidiary of the Inter Regional Coordination Committee (IRCC) and its work is subject to IRCC approval.

4. Composition and Chairmanship

- a. The WG shall comprise representatives of IHO Member States, invited Expert Contributors, including members of IHO-IOC Technical Sub Committee on Ocean mapping (TSCOM) and Observers from accredited NGIOs and a representative of the IHO Secretariat.
- b. Member States, invited Expert Contributors and Observers may indicate their willingness to participate at any time. A membership list shall be maintained, posted on the IHO website and confirmed annually.

- c. Invited Expert Contributor membership is open to entities and organizations that can provide a relevant and constructive contribution to the work of the WG.
- d. The Chair and Vice Chair shall be a representative of a Member State. The election of the Chair and Vice-Chair should be decided at the first meeting following each ordinary session of the Assembly and, in such case, shall be determined by vote of the Member States present and voting.
- e. If a secretary is required it should normally be drawn from a member of the WG.
- f. If the Chair is unable to carry out the duties of the office, the Vice-Chair shall assume the Chair with the same powers and duties.
- g. Invited Expert Contributors shall seek approval [of membership / for attendance] from the Chair.
- h. Invited Expert Contributor membership may be withdrawn in the event that a majority of the MS represented in the WG agree that an Expert Contributor's continued participation is irrelevant or unconstructive to the work of the WG.
- i. All members shall inform the Chair in advance of their intention to attend meetings of the WG.
- j. In the event that a large number of Invited Expert Contributor members seek to attend a meeting, the Chair may restrict attendance by inviting the Invited Expert Contributors to act through one or more collective representatives.

5. Procedures

- a. The WG should work primarily by correspondence.
- b. The WG should meet at least annually, whenever possible in conjunction with another related conference or meeting. The WG meetings should not normally occur later than nine weeks before a meeting of the IRCC. The Chair or any appointed member, as considered necessary, with the agreement of the simple majority of all members of the WG, can call extraordinary meetings.
- c. The WG should seek advice and input from relevant HSSC WGs as required.
- d. Decisions should generally be made by consensus. If voting is required on issues or to endorse proposals presented to the WG, only IHO Member States may cast a vote. Votes at meetings shall be on the basis of one vote per MS represented at the meeting. Votes by correspondence shall be on the basis of one vote per MS represented in the WG. In all cases of voting, a majority shall be determined based on the number of Member States casting a vote.

| Commission | 2019 | | | 2020 | | | 2021 | | |
|-----------------------------|-----------------------------------|------------------|-----------|--------------------------|-----------------|-----------|---------------|------|-----------|
| | Location | Date | Attending | Location | Date | Attending | Location | Date | Attending |
| Arctic | <i>Murmansk, Russia</i> | <i>17-19 Sep</i> | | Anchorage & Nome, Alaska | 10-14 Aug | | | | |
| Baltic Sea | <i>Gdańsk, Poland</i> | <i>10-12 Sep</i> | | Stockholm, Sweden | 23-24 Sep | | | | |
| East Asia | - | - | | Tokyo, Japan | 5-7 Feb | | | | |
| East Atlantic | - | - | | Lisbon, Portugal | 28 Sep-2 Oct | | - | - | |
| Meso American and Caribbean | Santo Domingo, Dominican Republic | 2-6 Dec | | | | | | | |
| Mediterranean and Black Sea | <i>Cádiz, Spain</i> | <i>18-20 Jun</i> | | - | - | - | tbc, Slovenia | tbc | |
| Nordic | <i>Helsinki, Finland</i> | <i>9-11 Apr</i> | No | Reykjavik, Iceland | 30-31 Mar | No | | | |
| North Indian Ocean | <i>Muscat, Oman</i> | <i>25-28 Mar</i> | Yes | Colombo, Sri Lanka | 18-22 May (tbc) | Yes | | | |
| North Sea | - | - | - | Reykjavik, Iceland | 26-27 Mar | | - | - | |
| ROPME Sea Area | <i>Islamabad, Pakistan</i> | <i>18-20 Feb</i> | Yes | - | - | - | | | |
| South Africa and Islands | <i>Cape Town, South Africa</i> | <i>2-5 Sep</i> | | Mauritius | 7-10 Sep | | | | |
| South East Pacific | - | - | | Valparaiso, Chile | 30 Mar-3 Apr | - | - | - | |
| South West Atlantic | <i>Buenos Aires, Argentina</i> | <i>25-26 Apr</i> | | Brazil | 5-6 Mar | | | | |
| South West Pacific | <i>Alofi, Niue</i> | <i>13-15 Feb</i> | | Wollongong, Australia | 12-14 Feb | | | | |
| USA and Canada | <i>Biloxi, Mississippi, USA</i> | <i>19-22 Mar</i> | No | Québec, Canada | 24 Feb | No | | | |
| Antarctica | <i>Prague, Czech Republic</i> | <i>3-5 Jul</i> | | - | - | | Monaco/Paris | tbc | |

Meetings in italics have already taken place.

LIST OF ACTIONS – Updated 3 December 2019

| No. | Agenda Item | Subject | Status/Date | Comments | Action |
|--------|-------------|---------------------------|--|--|---------------------------------|
| | - | IHO website | On going | Check IHO website for documents and information | All |
| | - | AOB | On going | Circulate presentations, articles and papers on CSB to ensure consistent harmonized message is provided at events to advertise CSB | All |
| | - | AOB | On going | Identify opportunities to highlight CSB and its uses | All |
| CSBWG5 | | | | | |
| | 5 | Environmental issues | CSBWG7 CSBWG8 CSBWG9 | Report on literature review covering impact of SBES use with respect to impact of human induced sound into the water column – on going, further work to be undertaken through separate contract, to be harmonized with ARHC investigations; update at next meeting | Vice-Chair/ NOR |
| CSBWG6 | | | | | |
| | 2.2 | Presentations - DCDB | CSBWG7 CSBWG8 CSBWG9 | Investigate how to handle S-102 format and gridded datasets for inclusion in the DCDB – on going, under investigation by new data manager, update at next meeting | NOAA-NCEI |
| | 2.2 | Presentations - DCDB | CSBWG7 CSBWG8 CSBWG9 | Progress further updating of the IHO DCDB homepage – ongoing, priority to be raised and included as part of the outreach strategy, progress update at next meeting | NOAA-NCEI |
| | 2.3 | Presentations - RosePoint | CSBWG7 CSBWG8 CSBWG9 | discuss with RosePoint on how to make the anonymous feature more obvious and to include ship type as well as offsets and heading data – on going, hindered by lack of focal point at NOAA NOS, update at next meeting | NOSS-NCEI |
| | 2.3 | Presentations - RosePoint | CSBWG7 CSBWG8 CSBWG9 | Investigate need for more regular meetings to move forward the inclusion of bathymetric data gathering within the VOS scheme – lack of NOAA | NOAA-OCS |

| | | | | | |
|--------|-----|--------------------------|------------------|---|----------------------|
| | | | | NOS-VOS lead has stalled project, update on future at next meeting | |
| CSBWG7 | | | | | |
| 4 | 3.2 | B-12 | CSBWG8 CSBWG9 | Consider methods to capture user community feedback gained from use of the publication | All |
| 11 | 4.2 | Outreach Strategy | CSBWG8 CSBWG9 | Investigate interest for Open CPN to attend next meeting On going, update at next meeting | Chair |
| 14 | 4.2 | Outreach Strategy | CSBWG8 | Review Norwegian recommendations to help improve texts and indicate other HO support for the approach taken by Norway | ALL |
| CSBWG8 | | | | | |
| 1 | 2.1 | DCDB Developments | 29 Nov | Provide feedback on revised DBDC website and viewer to Chair | All |
| 2 | 2.6 | CSB related projects | CSBWG9 | Invite WASSP to attend meeting | NOR/My Gene Machine |
| 3 | 2.7 | Presentations | CSBWG9 | Draft short summary guide to B-12 for wider public use | Chair |
| 4 | 2.8 | CSB related projects | CSBWG9 | Engage with DCDB on how to progress ideas and suggestions | ECC/Chair |
| 5 | 3.3 | Data Gathering Policy | CSBWG9 | Maintain database of polygons on handling data to allow single shape file to be used | DCDB/Sea-ID |
| 6 | 4.1 | B-12 | 13 Dec | Insert endorsed clarifications into B-12 and publish as Edition 2.0.3, notify Member States by IHO CL | IHO |
| 7 | 4.2 | B-12 | IRCC12 | Demonstrate e-publications format versions for endorsement and potential example for other IHO publications | Chair |
| 8 | 5.1 | CSB Use cases | CSBWG9 | Provide examples and details of UKHO use cases for CSB | GBR |
| 9 | 5.2 | DQWG | CSBWG9 | Draft guidance document for HOs on uses of CSB | Chair/Vice-Chair/NOR |
| 10 | 5.4 | GEBCO/Seabed 2030 update | CSBWG9 | Invite Director Seabed 2030 project to participate in meetings | Chair |
| 11 | 5.4 | GEBCO/Seabed 2030 update | On going | Provide presentations, articles and images for inclusion the CSB wiki | All |

| | | | | | |
|----|-----|------------------------------|-------------------------------|---|----------------|
| 12 | 5.4 | GEBCO/Seabed 2030 update | CSBWG9 | Provide details of Wiki to allow access for CSBWG to use content | Sea-ID |
| 13 | 5.4 | GEBCO/Seabed 2030 update | On going | Establish and maintain dialogue between CSBWG and Seabed 2030 Director | Chair |
| 14 | 5.4 | GEBCO/Seabed 2030 update | On-going | Engage with GEBCO to ensure a collaborative approach to avoid duplication | Chair |
| 15 | 5.5 | HO engagement and data usage | CSBWG9 | Investigate attendance and participation in RHC meetings | All |
| 16 | 5.5 | HO engagement and data usage | 29 Nov | Include list of RHC meetings as an annex to final meeting report | IHO |
| 17 | 5.5 | HO engagement and data usage | CSBWG9 | Identify feasibility to have CSB Regional Coordinators of each RHC to promote CSB and lead regional activities | Chair/IHO |
| 18 | 5.5 | HO engagement and data usage | CSBWG9 | Develop a list of topics for inclusion in national reports to RHCs and submitted to the Secretariat | Chair |
| 19 | - | Secretary-General brief | CSBWG9 | Generate tailored letters to coastal states highlighting the inconsistency between their support at Our Ocean Conference and position regards CSB | IHO |
| 20 | 6.1 | Outreach Strategy | IRCC12 | Encourage via IRCC regions not represented in CSBWG to participate | Chair |
| 21 | 6.3 | Outreach | GGC36 | Propose agenda item for GGC36 on coordination between related initiatives to establish coordination and harmonization | IHO/Fugro |
| 22 | 6.4 | Outreach | CSBWG9 | Develop brief description on roles and responsibilities of a Trusted Node for inclusion in B-12 | Chair/Sea-ID |
| 23 | 6.4 | Outreach | On going | Generate graphics to show where data has been contributed and which states are in the positive list | IHO/Chair |
| 24 | 6.4 | Outreach | CSBWG9 | Generate a video highlighting successful use cases | IHO |
| 25 | 8.1 | Election | 29 Nov Complete | Update CSBWG page | IHO |
| 26 | 8.2 | CSBWG9 | 6 Dec | Circulate an initial letter of invitation | IHO/NOR |

| | | | | | |
|----|-----|--------------------------------|-------------------------------|---|----------------|
| 27 | 8.3 | List of Actions | 15 Nov | Participants identify which actions they could progress and indicate as such in the draft list of actions | All |
| 28 | 8.3 | List of Actions | CSBWG9 | Keep Chair and IHO informed of progress with allocated actions | All |
| 29 | 8.4 | Closing discussions | CSBWG9 | Invite Chair DQWG to be permanent participant of CSBWG | Chair |
| 30 | - | CSBWG8 Draft Report | 1 Nov Complete | Draft to be circulated for comment | IHO |
| 31 | - | CSBWG8 Draft Report | 15 Nov Complete | All to provide comments on draft report | All |
| 32 | - | CSBWG8 Final Report | 29 Nov Complete | Publish final report | IHO |
| 33 | - | Report to IRCC12 | 3 Apr | Provide outline draft to Chair | IHO |
| 34 | - | Report to IRCC12 | 24 Apr | Submit report to IRCC12 | Chair |

9th MEETING OF THE IHO CROWDSOURCED BATHYMETRY WORKING GROUP
IHO-CSBWG9
Stavanger, Norway 29 June – 2 July 2020

DRAFT AGENDA AND TIMETABLE

| Time | DAY ONE OF CSBWG9 – Monday 29 June | Action |
|-------------|--|---|
| 1400 | 1. Welcome .1 Welcome and opening remarks .2 Domestic and administrative arrangements .3 Introduction of participants, apologies and approval of agenda .4 Approval CSBWG8 Report and Review of Actions .5 Chair report to IRCC12 a. Outcomes and actions from IRCC12, including e-publication demonstrator b. Review of ToRs and RoPs | Chair/NOR NOR Secretary Secretary Chair |
| 1515 | Group photograph | NOR |
| 1530 | Coffee | |
| 1600 | 2. Updates of Current Projects .1 Introduction; .2 IHO DCDB development .3 NOAA/Rosepoint .4 Swath CSB a. GMATEK b. FarSounder | Chair Chair Wright Henley |
| 1730 | END OF DAY ONE | |
| 1800 | Reception (tbc) – | NOR |
| Time | DAY TWO OF CSBWG9 – Tuesday 30 June | Action |
| 0830 | 2. Updates of Current Projects (continued) .5 Seabed 2030 .6 ChartWorld/SevenCs .7 Other? | |
| 0930 | 3. Review the CSB Guidance Document 2.0.2 (B-12) .1 Incorporation of feedback comments and input, if any, and further development for preparation of future Edition 3.0.0 | Chair |
| 1000 | Coffee | |
| 1030 | 4. Member State Data Gathering Policy .1 Review of Member States replies to IHO CL 11/2019 with respect to data collection policy for each coastal state? .2 Development of a list of coastal states who support the collection of CSB within their waters of national jurisdiction published on the IHO website, including caveats; how to increase participation level? | Chair |
| 1230 | Lunch Break | |
| 1400 | 5. Recognition Strategy .1 Is recognition strategy for data collectors required, if yes, what form should it take? | Chair |
| 1530 | Coffee | |
| 1600 | 6. Outreach Strategy | Chair |

| | | |
|-------------|--|--|
| | Investigate and highlight ways to increase data contributions and incentives on how and why mariners should become involved. .1 Discussion of outreach and education strategies in line with GEBCO and Seabed 2030 Project activities, synergies and harmonization of approach and material? .2 Who are our main data collectors? Our data users/customers? What do they want and what do they need? Further develop approach to each. a. Review draft generic presentation. Discuss need for senior officer briefing notes and skeleton press input. b. Feedback on outreach activities – shows attended, industry engagement | |
| 1700 | END OF DAY TWO | |
| Time | DAY THREE OF CSBWG9 – Wednesday 1 July | Action |
| | Industry/Stakeholder Seminar | Chair/NOR |
| Time | DAY FOUR OF CSBWG9 – Thursday 2 July | Action |
| 0830 | 6. Outreach Strategy (continued) Continue discussion of outreach and education strategies. Development of generic presentation, senior officer briefing notes and skeleton press input. | Chair |
| 1000 | Coffee | |
| 1030 | 7. Identify Potential Uses of CSB: Hydrographic Offices .1 CSB from a HO perspective; how can/do HOs' use CSB? Examples. .2 The implications for HOs with relation to CSB, data handling/QC/QA; perspectives of other IHO bodies (DQWG, NCWG, MSDIWG). .3 Producing a CSB White Paper, who is the target audience? Next steps. .4 GEBCO uses and engagement. .5 Development of a S-100 based Product Specification for CSB data and portrayal. | Chair/ Secretary |
| 1230 | Lunch Break | |
| 1400 | 7. Identify Potential Uses of CSB: Hydrographic Offices (continued) .1 CSB from a HO perspective; how can/do HOs' use CSB? Examples. .2 The implications for HOs with relation to CSB, data handling/QC/QA; perspectives of other IHO bodies (DQWG, NCWG, MSDIWG). .3 Producing a CSB White Paper, who is the target audience? Next steps. .4 GEBCO uses and engagement. .5 Development of a S-100 based Product Specification for CSB data and portrayal. | |
| 1530 | Coffee | |
| 1600 | 8. Close .1 Any other business a. . .2 Election of Chair and vice-Chair. .3 Date and venue of next meeting – CSBWG10 - and intercessional activities. .4 Review of Action List for CSBWG9 and draft agenda for CSBWG10. .5 Discussion on outstanding issues and post-meeting expectations 9. Closing remarks by Chair. | Chair Secretary Chair Secretary Secretary Chair |
| 1700 | END OF THE MEETING | Chair |