7th Crowd-Sourced Bathymetry Working Group (CSBWG7) Meeting

12-14 February 2019,
Hôtel Château Laurier, Québec City, Canada

(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

Chair welcomed all and noted that CSBWG6 was the start of the shift of focus for the WG from the development of B-12 into the next steps. These include the development of outreach and recognition strategies, identifying different uses of CSB data, and liaising with industry, organizations and IHO bodies that are involved with potential uses of CSB data.

1.2 Administrative Arrangements

The vice-Chair provided administrative and domestic information.

1.3 Introductions

All participants – representing Canada (CAN), Denmark (DNK), India (IND), Italy (ITA), New Zealand (NZL), Norway (NOR), UK (GBR) and USA (NOAA-NCEI, NOAA-OCS, NGA, NAVOCEANO, CCOM/JHC-UNH), ONE Data Technology Co, Dongseo University, Farsounder INC, Da Gama Maritime Ltd, GMATEK Inc and Fugro – introduced themselves and gave a short description of their background and current role, see Annex A for list of participants.

Chair asked all to consider the agenda in light of the discussions and work of the Industry Workshop. She stepped through the draft agenda, providing more detail on each topic, and she asked whether the agenda needed adjusting. 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 report of the previous meeting, CSBWG6, was approved and the subsequent actions were reviewed. Action items from CSBWG6 were presented, a number of items were identified as being covered in the agenda.

CCOM/JHC-UNH noted that the shapefile convert had been developed, although further collaboration would be needed to progress to the next stage, access can be obtained via CCOM at https://bitbucket.org/ccomjhc/csb-dcdb/src/master/.

It was agreed that the Seabed 2030 Director and the nearest Regional Data Center lead should participate in future CSBWG meetings. This will raise the awareness of the CSB initiative. Fugro suggested CSBWG could have viewing rights to the Seabed 2030 wiki, IHO was asked to investigate. **Action 1 - IHO**

2. IHO CSB Industry Day Debrief

2.1 Denmark (DNK) suggested that moving forward we needed more participation from product providers (Garmin, Navionics (now owned by Garmin), Wartsila (ex-Transas), etc.) and hardware providers to increase the range of discussion and engagement. Vice-Chair suggested that it should be a WG or

IHO approach, rather than through individual member states. NOR suggested making the initial approach through the IHO Secretary-General (SG) rather than the Chair of the WG. NOR was making approaches to the Research Vessels and government run vessels, he also suggested targeting leading companies via appropriate nationals on behalf of the WG and the IHO. NOR suggested using the Corporate Social Responsibility (CSR) angle for companies.

2.2 Letter being developed by Seabed 2030 for IHO SG and IOC Executive Secretary (ES) signatures to assist engagement with companies. DNK suggested mapping actions and focus against UN Sustainable Development Goals (SDGs) and IOC Decade for Ocean Science. CAN noted that the CSBWG has a focus beyond IHO Member States, unlike other WGs. It was suggested that the website description of the WG should be revised to reflect the current work of the WG. **Action 2 - Chair/IHO**

3. Review of B-12 – *IHO Guidance on Crowdsourced Bathymetry* – Edition 2.0.0.

3.1 IHO briefed on the outcomes of the second meeting of the IHO Council (C-2) and the actions taken to mitigate some of the points raised. It was recommended that 'are' in the new paragraph 3.1 is changed to 'will'. **Action 3 - IHO** It was acknowledged that the WG members should have been informed of the CL and the reasons for the short notice publication before the CL was sent out. It was highlighted that there remains a lack of awareness and knowledge amongst Member States on CSB and the activities of the CSBWG. It was noted that this could be because CSB was outside the normal HOs work and therefore the reports were often ignored. It was noted that for many HOs the handling of CSB was a resource issue, which is a challenge that individual Member States need to address. It was highlighted that the current H Note process had not been superseded and should be actively encouraged. It was noted that HOs will need to address the challenge of providing the best available data in their products to the maritime community. IND noted that if the IMO backed the initiative, it would carry additional weight; he also expressed concerns that more capable ships could be collecting data within third country waters without approval. The group was reminded that the definition of CSB (stated in B-12) and that it did not cover or encourage unrestricted collection of data using survey systems in a systematic manner. It was questioned whether the collection of bathymetry on transit using MBES was covered. It was noted that a caveat of no MBES collection in TS could be included in the CL reply, if desired. IHO suggested that a positive approach should be taken with the focus being on "how" data be obtained for national use. NOR highlighted that the B-12 was an IHO publication, which should be approved within the HO; it was acknowledged that CSB was a new culture, which required a reappraisal of the role of HOs and how they will handle data in the future. It was noted that highlighting examples of uses of CSB on the IHO website would strengthen the case.

3.2 It was agreed that the WG needs to consider how feedback could be obtained from the maritime user community from their experience of using B-12, after it has been publish and adopted. **Action 4 - ALL** It was felt that it was too soon to consider amendments before the publication had been adopted. This work will commence at the next meeting.

It was agreed to develop a CSB processing section for the B-11 (GEBCO Cookbook) which references back to B-12. **Action 5 – Chair/CAN**

3.3 CCOM/JHC-UNH demonstrated a number of draft B-12 e-publication versions which had been developed, this highlighted the flexibility which could be included, as well as the limitations of each format. It was recommended that this approach should be demonstrated to IRCC11 as an example of how other IHO publications and guidance documents could be presented in the future. **Action 6 - Chair** IHO to provide the final adopted version to CCOM/JHC-UNH for conversion into the WG agreed format. **Action 7 - IHO/CCOM-JHC**

It was agreed that use cases should be highlighted through a section in the B-12 e-publication and also on the IHO DCDB website, using links. Example uses cases to date include: CHS, NOAA, Great Barrier Reef Project, GEBCO Grid and CIDCO. It was also agreed that identified sector ambassadors

could also be highlighted. It was also noted that Seabed 2030, a project into which CSB will be fed, will do the same.

4. Outreach Strategy

4.1 GMATEK provided a presentation on ways to engage the smaller boating community. He suggested approaches that could be taken to increase their participation or the provision of data through an App. in smartphones, which would not require additional equipment and would be low cost. The approach would not require manufacturers' participation and was a passive method. The key was a NMEA to Bluetooth plug-in and industry association sponsorship/support of the initiative. He described the development programme and the possible forward commercialization. CAN suggested that similar apps. already exist, such as Open Seamap. CCOM/JHC-UNH noted that observations from the UNH survey have indicated that the majority of small boaters already have equipment installed, mostly Garmin, and therefore this approach would potentially create a similar organization. CCOM/JHC-UNH noted that the motivation for most was the ability to obtain data; GMATEK indicated that own data would be available and subscription would gain access to all data. GMATEK acknowledged that a partnership with an equipment manufacturer would be necessary. NOR asked how the community engagement would be undertaken. GMATEK noted that the raw data might go to the DCDB, although processed data and derived products would be delivered through the subscription service. GMATEK suggested a path forward could be a new NOAA Small Business Innovation Research (SBIR) programme topic. He suggested the WG submit a "topic description", and, if selected, then multiple bidders could compete to be awarded a contract. NOAA-OCS highlighted and cautioned of a previous initiative with which NOAA was not pleased with the outcome. It was agreed that NOAA-OCS and GMATEK would develop a proposal. **Action 8 - NOAA-OCS/GMATEK**

4.2 The WG revisited the CSB Stakeholder Mind Map that had been generated at CSBWG6 (see Enclosure 1). The purpose of the mind map was to identify primary focus groups for which to develop different business models and approaches. It was agreed upon that a primary contact and/or ambassador should be identified for each group. Chair introduced on which areas to focus and what the anticipated outcomes should be. The focus should be the leads/ambassadors per sector and what the message should be. NOR indicated that a letter from the IHO SG which could be used to highlight the wider initiative. There was a need to identify the industry leaders to influence their respective sector. NOR suggested a list of potential industry leaders could be developed and included in the report to IRCC. DNK highlighted the need to keep within the mandated objectives within of the ToRs, it was noted that the ToRs provided sufficient latitude to authorize this approach. The following groups were discussed in detail:

Primary Contact: The software users

CCOM/JHC-UNH asked Da Gama Maritime what the incentive could be, Da Gama Maritime suggested the presentation of the data and the end user experience were important factors, which would encourage users to select a particular product. IND suggested improved data quality could be an incentive as it would improve the products and end user experience. CCOM/JHC-UNH noted that the main point was asking whether the company would allow their users to participate without impacting their own data flow. It was considered that this could be a strong differential between systems, in addition users could question companies why all data was not included rather than just the data gathered through their particular system. CCOM/JHC-UNH suggested that leveraging users' power and influence on manufactures via press articles in magazines and websites accessed by the user communities. It was suggested that this would benefit the IHO as being seen to take an interest in the small vessel community. It was suggested that both IHO and National Hydrographers should be seen to be supporting the message. Chair asked why people would want to become involved. NGA suggested some form of prize could be considered, he also noted people use systems because they have certain capabilities which are different/better than the competition. Chair noted the manufactures need to develop the capability and the DCDB would provide the detail on how to add the data to the DCDB database.

ITA noted the need to develop a coordinated message and HOs need to be prepared for the increased levels of data provisions; Chair noted the need to develop a 'call for action' message and that use should be made of the Seabed 2030 PR and Outreach capabilities. DNK highlighted the leverage which would gained if CSB data highlighted a feature which had not been included on the published chart.

Suggested Actions:

- User magazines:
    - Spread information on the initiative through magazines and journals (eg: Boating World, Yachting World, Powerboat, etc);
    - Reach out to these magazines and convince them to write the article. WG members, IHO, NOAA could be quoted;
    - If any magazines show interest, consider inviting them to a future WG meeting
- Have presences at relevant Shows
    - MP suggested having a presence at the Genoa Boat Show to highlight the initiatives; **Action 9 - ITA**
    - It was also suggested that the Miami show could be targeted. **Action 10 - NOAA-OCS**
- Chair suggested Open Chart Plotter Navigation (CPN) could be invited to participate in the CSBWG. Chair to reach out. **Action 11 - Chair**
- Could there be a competition? A hackathon?
    - We should remember that companies can inspire users;
    - Seabed 2030 might want to dig in to this;
    - Perhaps have this at the next Hydro Intern;
    - Could simply raise awareness. How to use the data, how to gather the data…

Geophysical

Primary Ambassador: PGS
Who will contact and how: NOR and IHO SG

GBR suggested engaging with other survey companies, such as QPS, Hypack, etc. to follow Fugro.

NOR indicated that he would need to be able to provide additional information and indications at a future meeting. He suggested a letter from IHO SG acknowledging their interest in joining the efforts being made by Fugro and Carnival Cruise Liner to promote and engage with this initiative and be a sector ambassador for IAGC. This letter would applaud/welcome/emphasize the importance/state other examples of other "Industry Leaders".

Suggested Actions:

- It was agreed a draft letter of support could be generated for staffing at the Secretariat; **Action 12 - Chair/NOR/IHO**
- Fugro attending next IAGC conference and anticipates being able to highlight CSB;
- NOR identified a need to engage with Seabed 2030 to highlight these contributors and provide recognition of their involvement as sector ambassadors and data contributions **Action 13 - Chair**

Cruise Ships

Primary Ambassador: Carnival and Macgregor

Noting that Carnival and Macgregor are engaged, there is a need to work closely on how to publicise the initiative and encourage other companies to participate.

Suggested Actions:

- It was proposed that the Miami Show could be used to highlight the progress made over the past year;
- NOR noted that it may be possible to suggest new builds could have a deeper capable SBES (or MBES) installed.

Yachting

Primary Contact: ECDIS and ECS companies

Da Gama Maritime suggested engaging through the Super Yacht Forum at the METS show to engage with owners and captains. It was noted that FarSounder participates and could highlight the initiative. It was suggested that IHO could participate to raise the profile of CSB. It was noted that it was necessary to engage with both owners and captains. An incentive could be to be able to term the vessel as a research vessel. It was noted that the capability needs to be available and ready before generating the community enthusiasm to become involved. It was agreed that the main focus should be through the ECDIS and ECS manufactures.

Suggested Actions:

- Reach out to: SevenCs, Wartsila (ex-Transas); companies that make ECDIS.
- A presentation or relevant social event at the Monaco Yacht Show (September).
- Incentive: "make your boat a research vessel!!"

Submarine Cable

Primary Contact: EGS Survey (Chris Dougherty)/IPCC

It was noted that IHO Secretariat was engaged with ICPC and that the ICPC was considering how they could be involved within the security/safety requirements.

Shipping
Primary Contact: IMO

IHO noted that Seabed 2030 was going to present to the 101st session of the Maritime Safety Committee. It was also noted that the IMO SG had raised the issues. DNK noted that it would move the issue forward if HOs started to use the data in ENCs to demonstrate to the regulators that this was improving information available on charts and should be supported by member States, Flag states and shipping industry.

Research

NOR highlighted the draft agreement which contains recommendations between the Marine Research Institute and Norwegian HO. He noted that B-12 did not really address research vessel activities, which needed to be considered and a resolution needs to be found for the issue of collecting data via MBES. Concerns were expressed that MBES operations were not part of B-12. It was suggested that a separate chapter could be developed to cover the use of MBES by research vessels for CSB. It was noted that single transit operations were covered, however repeat offset tracks generated an issue. It was suggested that the CL 11/2019 questionnaire would cover this issue and allow coastal states to place caveats on these types of operations. Vice-Chair and NOR noted that many of the ships, although equipped, are not focused on bathymetric data collection and training needs to be provided to

improve the quality of the data generated. CCOM/JHC-UNH gave an overview of the role of the National Science Foundation (NSF) Multibeam Advisory Committee (MAC) that provides information and training for these exact reasons. MAC resources are available online to the public (http://mac.unols.org). NOR suggested other WG members could review the Norwegian recommendations to help improve the texts and indicate other HO support for the approach taken by Norway. **Action 14 - ALL** DNK noted that Denmark currently obtained a copy of the dataset but the company nor the HO could pass the data to a third party, he suggested that this could be discussed at IRCC to change the approach. NOR suggested that there needs to a harmonized view on how MBES operations and data gathering should be viewed.

4.3 CSB Generic Presentation

It was suggested the presentation had a wider use than just at various meetings, it could be used as a tool within the outreach strategy. The Chair asked for comment and input to improve the presentation. It was noted that the presentation was a resource to which others could add and tailor to match the audience. The WG provided a number of suggestions to improve the content, included a number of additions. **Action 15 - Chair/IHO**

4.4 Synergies with other groups

Chair introduced by noting that these discussions had been on going and with which other IHO bodies the CSBWG should be directly engaging. In addition to the MSDIWG, it was suggested that the DQWG was a body with which a closer relationship should be developed. **Action 16 - Chair** ITA provided details of the discussions held at the recent DQWG on how CATZOC may be developed to enable HOs to assess CSB data for use in nautical charts. It was noted that there was on going work to revise CATZOC descriptions and that S-44 was being revised, which may allow a qualified assessment of CSB data quality by HOs for potential use on their products. It was agreed that the list of Regional Hydrographic Commission meetings should be reviewed to identify at which meetings the CSGWG should be represented. **Action 17 - Chair/vice-Chair/IHO**

It was agreed a significant benefit would be having access to the Seabed 2030 wiki, where the identified list of relevant meetings and potential participants was maintained along with presentations given. IHO was asked to investigate whether read only access could be provided to CSBWG members. **See Action 1 - IHO** It was also suggested that the Director and Deputy Director Seabed 2030 should participate in CSBWG meetings with an agenda item focused on outreach and external engagement strategies. **Action 18 - Chair**

Items 4.7 to 6.x covered under discussion of other agenda items.

7. Close

7.1 It was suggested that the generation of a S-100 based PS could be created. It was agreed this should be a separate agenda item and that CSBWG8 would allow the WG to benefit from the expertise within the Secretariat to explore the topic further. It was suggested that a type of 'bathymetric information overlay' could be developed, although further discussion was required, particularly with respect to visualization in the context of an ECS. It was agreed this should be an agenda item for the next meeting. **Action 19 - Chair/IHO**

7.2 Venue and dates of the 8th CSBWG Meeting

It was agreed that the next meeting of the working group should progress the work in preparing the next edition of B-12 and continuing the expanded tasks directed to the CSBWG by the IRCC. It is therefore planned to hold an eighth meeting of the CSBWG at the IHO in Monaco on 22-24 October 2019. **Action 20 - IHO** NOR confirmed that CSBWG9 would be in Stavanger, Norway, in June2020.

Post meeting note: Due to a major Seabed 2030 event at the Royal Society in London on 22 October, dates for CSBWG8 are now 23-25 October.

7.3 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 CSBWG8 webpage and all those who have actions to complete should keep the Chair and the Secretary informed of any progress. **Action 21 - ALL**

It was agreed that the IHO would circulate a draft meeting report to all attendees by 22 February. **Action IHO**

Attendees were requested to provide any comments by 8 March. **Action ALL**

It was intended the final meeting report would be published by 16 March. **Action IHO**

The IHO and the Chair would prepare the final report to IRCC11 using the format required by IRCC. It was noted the report to IRCC11 needs to be submitted towards the end of April2019. **Action Chair**

The Chair requested IHO to generate a draft Agenda for CSBWG8 and include it as Annex F to the report. The draft Agenda may require further amendment following intersessional progress.

7.4 The Chair asked for comments on the direction the WG was taking and the tasks which were being addressed.

8. Closing remarks

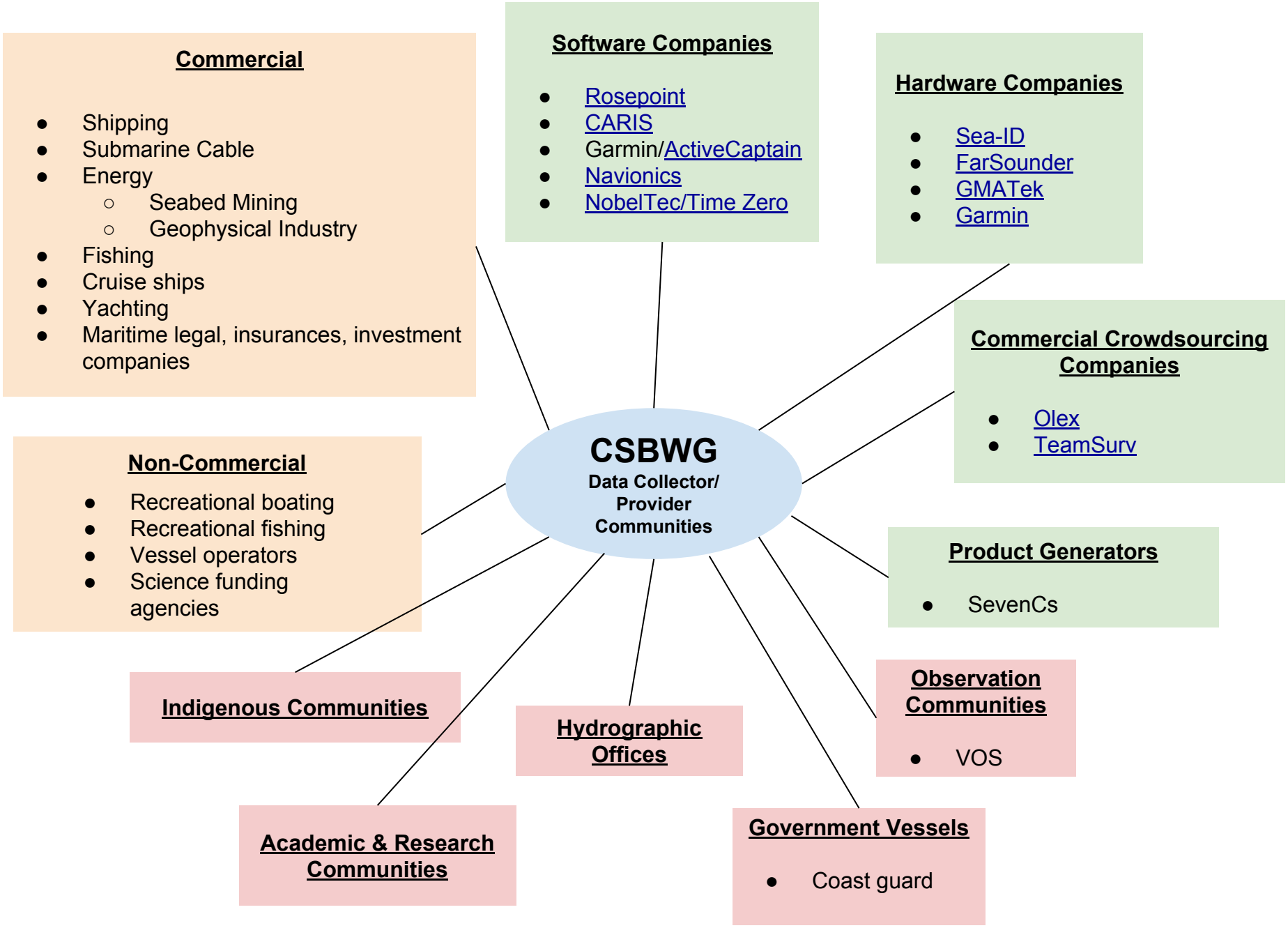
Chair thanked all the participants for their input and efforts and he highlighted how much had been achieved on developing the B-12 to the position of being presented to the Member States in such a short time. She highlighted the positive feedback from the IRCC participants. She encouraged all to maintain their engagement and progress the tasks and work during the intersessional period. She particularly thanked CHS for hosting the meeting.

The following Enclosure is attached:

1. CSBWG6 Outreach strategy mindmap.

The following Annexes are attached:

A. CSBWG7 – List of Participants.
B. CSBWG7 – Agenda
C. CSBWG7 – List of Documents
D. CSBWG7 – List of Actions
E. CSBWG7 – ToRs and RoPs
F. CSBWG7 – Draft Agenda for CSBWG8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Commercial Crowdsourcing Companies
Olex
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Recreational boating
Recreational fishing
Vessel operators
Science funding agencies
CSBWG
Data Collector/ Provider Communities
Product Generators
SevenCs
Indigenous Communities
Hydrographic Offices
Observation Communities
VOS
Academic & Research Communities
Government Vessels
Coast guard

IHO Crowd-Sourced Bathymetry Working Group (CSBWG)
List of Participants CSBWG7

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7th MEETING OF THE IHO CROWDSOURCED BATHYMETRY WORKING GROUP
IHO-CSBWG7
Québec City, Canada 12-14 February 2019

DRAFT AGENDA AND TIMETABLE

All Day	**DAY ONE OF IHO CSB INDUSTRY DAY – Tuesday 11 February**	See separate programme
Morning	**DAY TWO OF IHO CSB INDUSTRY DAY – Wednesday 12 February**	
1200	**Lunch Break**	
Afternoon	**DAY ONE OF CSBWG7 – Wednesday 12 February**	**Action**
1330	**1. Welcome** .1 Welcome and opening remarks .2 Domestic and administrative arrangements .3 Introduction of participants, apologies and approval of agenda .4 Approval CSBWG6 Report and Review of Actions	 Chair Host Secretary Secretary
1500	**Health Break**	
1530	**2. IHO CSB Industry Day Debrief** .1 Lessons learned/outcomes/proposals/actions/challenges .2 Next steps and milestones	Chair
1700	**END OF DAY ONE**	
TBD	Dinner	
Time	**DAY TWO OF CSBWG7 – Thursday 14 February**	**Action**
0830	**3. Updates on CSB Guidance Document 2.0.0 (B-12)** .1 IHO Council 2 outcomes, CL and B-12 edits to address concerns raised .2 Discussion on how future feedback will be incorporated in to B-12 .3 Discussion on development (and/or need) of a web-hosted document	 tbc
1000	**Health Break**	
1030	**4. Outreach Strategy** 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. .3 Review draft generic presentation. Discuss need for senior officer briefing notes and skeleton press input.	Chair
1200	**Lunch Break**	
1300	**5. Recognition Strategy** Is recognition strategy for data collectors required, if yes, what form should it take?	Chair
	6. 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 .3 Producing a CSB White Paper, who is the target audience? Next steps.	
1500	**Health Break**	

1530	**7. Close** .1 Any other business .2 Date and venue of next meeting – CSBWG8 - and intercessional activities. .3 Review of Action List for CSBWG7 and draft agenda for CSBWG8. .4 Discussion on outstanding issues and post-meeting expectations **8. Closing remarks by Chair.**	 Chair Chair/IHO Secretary Chair Chair
1700	**END OF THE MEETING**	Chair

CSBWG7 - List of Documents

Document No	Document Title
CSBWG7-Invitation Letter	Letter of Invitation v1.0
CSBWG7-Annex B	Registration Form (pdf Version)
CSBWG7-Annex B	Registration Form (Word Version)
CSBWG7-Annex C	Logistic Information
CSBWG7-Document Template	Document Template (Word version)
CSBWG7-1.3-Agenda	CSBWG7 Draft Agenda v2.0
CSBWG7-1.3-Agenda	CSBWG7 Draft Annotated Agenda v1.0
CSBWG7-1.4-Action List	List of Actions - CSBWG6 - updated 4 October 2018
CSBWG7-1.5	IRCC10 Relevant Outcomes
CSBWG7-3.1	B-12 (*IHO Guidance on Crowdsourced Bathymetry*) Draft Edition 2.0.0 (Clean)
CSBWG7-4	CSBWG6 Discussion Points
CSBWG7-4.3	Draft generic CSB presentation v2.0
CSBWG7-7.1	ToRs and RoPs
CSBWG7-7.3	Proposed draft agenda for CSBWG8 v1.0
CSBWG7-Presentations	Presentations.zip
CSBWG7-Workshop Presentations	Workshop Presentations.zip
CSBWG7-Participants	CSBWG7 List of Participants

LIST OF ACTIONS – Updated 15 March 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
	-	AOB	On going	Develop display on CSB for IHO entrance – major IHO refurbishment commencing in mid-2019, includes main entrance and reception areas	IHO
CSBWG5					
	5	Environmental issues	~~CSBWG7~~ CSBWG8	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
CSBWG6					
	2.2	Presentations - DCDB	~~CSBWG7~~ CSBWG8	Investigate how to handle S-102 format and gridded datasets for inclusion in the DCDB – on going, when new data manager in place will be explored further, update at next meeting	NOAA-NCEI
	2.2	Presentations - DCDB	~~CSBWG7~~ CSBWG8	Progress further updating of the IHO DCDB homepage – ongoing, priority to be raised and included as part of the outreach strategy	NOAA-NCEI
	2.3	Presentations - RosePoint	~~CSBWG7~~ CSBWG8	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, update at next meeting	NOSS-NCEI
	2.3	Presentations - RosePoint	~~CSBWG7~~ CSBWG8	Investigate need for more regular meetings to move forward the inclusion of bathymetric data gathering within the VOS scheme – on going,	NOAA-OCS

				further testing to be undertaken and updated at next meeting	
	9.1b	Presentation – ONE Data Technology	~~CSBWG7~~ CSBWG8	Provide details on how to contribute data to the DCDB – on going	NOAA-NCEI
CSBWG7					
~~1~~	~~1.4~~	~~Review of List of Action2~~	~~16 Mar~~ Complete	~~Investigate gaining read access for CSBWG to Seabed 2030 wiki~~	~~IHO~~
2	1.3	Agenda	CSBWG8	Revise the CSBWG webpage objectives to reflect the revised ToRs	Chair/IHO
~~3~~	~~3.1~~	~~B-12~~	~~5 April~~ Complete	~~Amend new paragraph 3.1 to read 'will' rather than 'are' in reference to the proposed list of supporting Member States~~	~~IHO~~
4	3.2	B-12	CSBWG8	Consider methods to capture user community feedback gained from use of the publication	All
5	3.2	B-12	CSBWG8	Develop CSB processing section for B-11	Chair/CAN
6	3.3	B-12	IRCC11	Demonstrate e-publication version as an example for other IHO publications	Chair
7	3.3	B-12	IRCC11	Provide final adopted version for conversion to agreed format	IHO/CCOM-JHC
8	4.1	Outreach Strategy	7 June	Develop proposal for NOAA SBIR	NOAA-OCS/GMATEK
9	4.2	Outreach Strategy	31 May	Investigate presence at Genoa Charter Yacht Show to promote CSB	ITA
10	4.2	Outreach Strategy	29 Mar	Investigate presence at Miami Seatrade Cruise Global and Miami Boat Show to promote CSB	NOAA-OCS
11	4.2	Outreach Strategy	CSBWG8	Investigate interest for Open CPN to attend next meeting	Chair
~~12~~	~~4.2~~	~~Outreach Strategy~~	~~29 Mar~~ Complete	~~Draft letter, for signature by SG IHO, to support ongoing engagement with PGS and generate draft generic letter, for SG IHO signature, acknowledging companies interest in joining the efforts made by other sector leaders to promote the CSB initiative within their sector~~	~~Chair/NOR/IHO~~
13	4.2	Outreach Strategy	CSBWG8	Engage with Seabed 2030 to highlight contributions and provide recognition of involvement	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
~~15~~	~~4.3~~	~~CSB Presentation~~	RSAHC8 Complete	~~Update presentation contents to reflect feedback from WG and make it available via the CSBWG page on the IHO website~~	~~Chair/IHO~~
16	4.4	Outreach Strategy	CSBWG8	Invite Chair DQWG for next meeting	Chair
17	4.4	Outreach Strategy	CSBWG8	Review list of RHC meetings for CSB representation	Chair/vice-Chair/IHO
18	4.4	Outreach Strategy	CSBWG8	Invite Seabed 2030 Director and deputy Director to next meeting with aim of having a period focused on outreach strategies and external engagement	Chair
19	7.1	AOB	CSBWG8	Include S-100 topic in agenda for next meeting	Chair/IHO
20	7.2	CSBWG8	26 April	Circulate an initial letter of invitation	IHO
21	7.3	Action List	CSBWG8	Keep Chair and IHO informed of progress with allocated actions	All
	7.3	CSBWG7 Draft Report	22 Feb	Draft to be circulated for comment	IHO
	7.3	CSBWG7 Draft Report	8 Mar	All to provide comments on draft report	All
	7.3	CSBWG7 Final Report	16 Mar	Publish final report	IHO
	7.3	Report to IRCC11	5 Apr	Provide outline draft to Chair	IHO
	7.3	Report to IRCC11	26 Apr	Submit report to IRCC11	Chair

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.

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

DRAFT AGENDA AND TIMETABLE

Time	DAY ONE OF CSBWG8 – Wednesday 23 October	Action
0830	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, including e-publication demonsrator b. Review of ToRs and RoPs	 Chair/SG Secretary Secretary Secretary Chair
1000	**Coffee**	
1030	**2. Updates of Current Projects** .1 Introduction; .2 IHO DCDB development .3 NOAA/Rosepoint .4 SeaID .5 Swath CSB a. GMATEK b. FarSounder	 Chair Chair Himschoot Wright Henley
1145	**Group photograph**	Secretary
1200	**Lunch Break**	
1330	**2. Updates of Current Projects (continued)** .6 Seabed 2030 .7 ChartWorld/SevenCs .8 Other?	
1430	**3. Review the CSB Guidance Document 2.0.0 (B-12)** .1 Incorporation of feedback comments and input, if any, and further development for preparation of future Edition 3.0.0	 Chair
1500	**Coffee**	
1530	**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
1700	**END OF DAY ONE**	
TBD	Dinner/Social event	Secretary
Time	**DAY TWO OF CSBWG8 – Thursday 24 October**	**Action**
0830	**5. Recognition Strategy** .1 Is recognition strategy for data collectors required, if yes, what form should it take?	Chair
1000	**Coffee**	

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1030	**6. Outreach Strategy** 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	Chair
1200	**Lunch Break**	
1330	**6. Outreach Strategy (continued)** Continue discussion of outreach and education strategies. Development of generic presentation, senior officer briefing notes and skeleton press input.	Chair
1500	**Coffee**	
1530	**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
1700	**END OF DAY TWO**	
Time	**DAY THREE OF CSBWG8 – Friday 25 October**	**Action**
0830	**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.	
1000	**Coffee**	
1030	**8. Close** .1 Any other business a. . .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 **9. Closing remarks by Chair.**	Chair Secretary Chair Secretary Secretary Chair
1230	**END OF THE MEETING**	Chair

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