6th Crowd-Sourced Bathymetry Working Group (CSBWG6) Meeting

19-21 June 2018,
National Oceanographic and Atmospheric Administration (NOAA) –
National Centers for Environmental Information (NCEI), Boulder, Colorado, USA

(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 participants and thanked all those who had made the trip to attend. She noted it was the 6th meeting and that there were a number of new participants from those who attended the 2nd meeting held in Boulder in 2016. She highlighted the achievement of producing the B-12 document ready for submission to IHO Member States in such a relatively short period, she also noted that there now needs to be a shift of focus onto the new tasks set by IRCC, which were broader in nature and appeared to be more conceptual, which would challenge the group.

1.2 Administrative Arrangements

The Chair provided administrative and domestic information. IHO provided comment and input from Secretariat and the tasks ahead.

1.3 Introductions

All participants – representing Canada, Norway, UK and USA (NOAA-NCEI, NOAA-OCS, CCOM-JHC), the World Ocean Council (WOC), the NF-GEBCO Seabed 2030 Project, ONE Data Technology Co, Dongseo University and Farsounder INC – introduced themselves and gave a short description of their background and current role, see Annex A for list of participants. Apologies were received from Frederico Antonio Saraiva Nogueira (Brazil), Jens Peter Weiss Hartmann (Denmark), Seppo Mäkinen (Finland), Anne-Cathrin Wölfl (Germany), Erik Biscotti and Marta Pratellesi (Italy), Jaya Roperez (Philippines), Leonor Veiga (Portugal), Aron Frank Sørensen (BIMCO), Glenn Wright (GMATEK), Kenneth Himschoot and Andrew Schofield (Sea-ID), and Tim Thornton (TeamSurv) who were unable to attend in person. The following participated remotely: Jens Peter Weiss Hartmann (Denmark), Glenn Wright (GMATEK), Kenneth Himschoot (Sea-ID), Emma Wise (ChartWorld/SevenCs) and Tim Thornton (TeamSurv)

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, CSBWG5, was approved and the subsequent actions were reviewed. Action items from CSBWG5 were presented, it was noted the majority of items were included in the agenda for discussion during the meeting.

1.5 Report to IRCC10

a. The Chair report to IRCC10 and outcomes of IRCC10. She provided a presentation on the outcomes of IRCC10 and reactions to the CSBWG report; IHO provided details of the actions, decisions and recommendations extracted from the IRCC10 meeting report.

b. ToRs and RoPs. The Chair presented the changes to the ToRs approved at IRCC10. Explanations on the changes were provided and the focus for future work was highlighted.

2. Updates on current projects

2.1 Introduction

Chair introduced the session, explaining the importance of keeping informed of projects and initiatives related and relevant to the working of the CSBWG.

The following presentations were provided:

2.2 IHO DCDB – Aaron Rosenberg (NOAA-NCEI)

Presented the work on enhancing the DCDB and provided some background on recent work. He provided an overview of the CSB data pipeline from data provision via Trusted Node to user access of databased data. Future developments were articulated, including streamlining new contributor procedures, wider choice of user delivery format and updating of map viewer. The timescale was questioned. He was also questioned on how it was proposed to handle receipt of S-102 format data and gridded products? It was agreed this needed to be considered. **Action NOAA-NCEI** It was noted that the DCDB page on IHO website, particularly technical comments, could be revised and refreshed in view of the CSB project and noting its use as the window on the DCDB. It was agreed this could be progressed as resources became available. **Action NOAA-NCEI**

NOAA-NCEI presented the DCDB viewer with explanation of various layers. Highlighted proposal to lead cloud based storage of bathymetric point data, additional functionality of geographic file sub-setting and on demand delivery format conversions. It was noted there was a need to engage with IHO Member States through IRCC so that it is not perceived as a North American centric project. Also highlighted that cloud based storage is still in the very early discussion phase. Presented the future vision of the DCDB and the services which will be available.

2.3 Rose Point Navigation – Adam Reed (NOAA-OCS)

Presented an update on the project, providing a recap on the background. He noted the current data contribution from 113 vessels of about 117 million data points and 18 GB of data. Highlighted future upgrading possibilities – metadata capture, capture of vessel type, full anonymous options, include offsets and heading. He explained how contributors remained anonymous by not having data within the Rose Point programme. Much discussion on impacts of offsets and draft settings on final data quality. Noted it's normal to have depth below keel or from waterline. Important to appreciate difference between depth below keel and TX, some systems confuse and thus need to obtain clarity in metadata. Also, help defining process to acquire relevant metadata, as it is suggested to discuss with RosePoint on how they could make the anonymous feature more obvious and to include ship type as well as offsets and heading data. **Action NOAA-NCEI** It was requested that the CCOM-JHC shapefile converter be provided. **Action CCOM-JHC**

Voluntary Observing Ship (VOS) scheme – provided a brief on involvement and the expansion to include a bathymetry element to the current meteorological and oceanographic observations. CAN noted the involvement and work of Canadian Hydrographic Service (CHS) to contribute. World Ocean Council (WOC) highlighted the need to coordinate the various programmes and to develop a single portal for submission of contributions to make involvement easier and less demanding on ship board personnel. CAN noted the need to target potential data gathering communities to explain the benefits. It was agreed NOAA-OCS should investigate whether there was a need for more regular meetings with the IHO DCDB to move forward the inclusion of bathymetric data gathering in the VOS and whether a small project team was required. **Action NOAA-OCS**

WOC suggests the development of coordination on approaching companies – the upside is the potential for synergies. He described a growing reluctance for companies to get involved because of "too many options/programmes." This could be as simple as a spreadsheet that captures the companies, who's contacting them, what's been requested, etc. NOR suggested the need to list the

programmes and initiatives already commenced and then prioritise for further engagement. It was agreed a list providing an overview of current programmes should be created and maintained to allow better tracking and keep the CSBWG aware of opportunities, particularly in collaboration with similar initiatives. **Action NOR**

There remained a need to keep IHO Member States informed of the proposed changes/enhancements/developments to the DCDB and also when they had been completed, to ensure awkward questions were not asked in more formal gatherings. **Action Chair**

2.4 Sea-ID – Kenneth Himschoot (Sea-ID)/Brian Calder (CCOM-JHC)

Noted a report on discussions with potential contributors on hurdles and reasons for not providing data. It was agreed to provide an update on progress with development and distribution of Mark 3 and Mark 4 loggers. Felt there needs to be a demonstration of data quality of collected data at CSBWG7.

CCOM-JHC provided an update on the trials and data quality generated from the Mark 4 logger, which has the potential to gather high quality high accuracy bathymetry data in vertical as well as horizontal. He noted the results achieved and the next tasks and developments. Calculation of horizontal offsets to be considered in next stage. Chair questioned what was the outreach strategy to market and distribute the loggers. CCOM-JHC indicated that port approaches, harbours and inland water ways were potential targets. He highlighted the AECO project with Norway for expeditionary ships to use the Mark 4 loggers in the Arctic. It was noted that there was a need to obtain buy-in from HOs to encourage further potential users and platforms. TeamSurv noted the cost could be a challenge for the low end potential contributors. Sea-ID highlighted there remains an issue of over requesting of engagement with projects, which is reducing the willingness of organizations to become involved. WOC suggested there needs to be more coordination of requests and engagement; a list of companies with details of who has made contact, what has been requested, etc.; see 2.3 above.

2.5 Swath CSB:

a. GMATEK Inc. – Glenn Wright

Provided a presentation on the gathering and uses of swath bathymetry data from 3D forward-looking sonars. Provided background on development work, considerations for the future and significant items. Additional details on progress at IMO on development of Polar Code 2 was provided. WOC gave details on projects ARICE and EUPOLARNet and work being undertaken in the Arctic area. TeamSurv noted the increased availability of bandwidth in the Arctic area, although will only support single beam echo sounder (SBE) data volumes at present.

b. Farsounder INC – Heath Henley

Gave background on developments and capabilities. Presented methodologies and uses. Identified that customers were going into interesting areas and wanted to use the data for safety of navigation. Displayed examples of data against current survey data and the assessment of the results against current S-44 Orders 1 a/b and Special. Future work includes comparison against MBES. Current main focus is real-time data provision for safety of navigation.

2.6 Seabed 2030 – Satinder Brindra

Provided a background brief on the NF-GEBCO Seabed 2030 project, including the Seabed 2030 promotional video. Highlighted the connection with UN Sustainable Development Goal (SDG) 14 and the need for a full bathymetric picture of the seafloor to make the goal achievable. NOR highlighted the new tool developed by NOAA to indicate what areas meet 100m grid coverage and where coverage is less, which allows targeted effort to areas for most benefit and impact. Need to investigate ways to expand the contributing community and provide due recognition. CCOM-JHC

displayed data from a survey of recreational mariners, which indicated that they would go more than 5nm off route to collect data if they knew where it was required.

2.7 World Ocean Council – Paul Holthus

Provided a presentation on the work and initiatives of WOC SMART Ocean-SMART Industries: Harnessing Ocean Opportunities for Seabed Data Collection. Highlighted all the growing uses of the oceans and the increases in commercial activities. Identified bathymetric data collecting as an easy contribution to SDG 14 under Increasing Ocean Scientific Knowledge. Highlighted the need to prioritise the data collection requirements. Noted important to identify common issues on which to engage with potential partners to encourage buy-in to initiatives. Noted the importance of communication and ability to assist in overcoming obstacles to participation by opening engagement with organizations who can provide clarifications and advice.

2.8 ChartWorld/SevenCs – Emma Wise

Provided an overview on recent activities related to CSB. She described the ENC tool suite for generation of high density bathymetric bENCs to include CBS data for transforming x, y, z data into contoured graphics for display on various platforms in near real time. Expanded on the IHO Secretariat proposal for contributors to provide and receive it back with additional data tided against a global model and for a contour overlay to be created once the data density achieves a predetermined threshold. TeamSurv indicated their interest to assist with the data gathering challenges.

2.9 TeamSurv – Tim Thornton

Provided an update on recent projects and initiatives, including the improvement to their tidal model to be a global model, including in shore gauges and a sound velocity global model. Now have the ability to capture AIS data. Recent work in Channel Island and North Sea and work on SDB, provision of data to EMODNet and looking at motivation on participation and rate of build-up of data. Looking for partner or total takeover to upscale CSB efforts. He was asked how data being passed to EMODnet, noted a monthly packaging transmission. Noted no issues or restrictions on data gathering or availability, due to outputting packaged data rather than individual vessel contributions and for it being published as a composite grid. Provided a brief background on TeamSurv and its activities. Explained how they use other data sources, including Open Sea Map, and how the data quality is assessed. Increasing contributions, build up community with feedback and communication, website areas based on contributors inputs and specialized viewers. CAN asked what was the initial reason that individuals gave for wanting to be involved; filling the data gap, better depth data, show where they have been, etc. CCOM-JHC provided results of survey on incentives to motivate to participate, noted the majority were updated data and increased knowledge. Seabed 2030 asked background of vessels and groups contributing, most appeared to want information for operational uses.

All the presentations generated numerous comments, questions and wide ranging discussions.

3. Review of B-12 – *IHO Guidance on Crowdsourced Bathymetry* – Edition 1.0.0.

Outcomes of final editorial meeting

The outcomes of the final editorial meeting, held in Victoria, Canada, 30 March 2018, were highlighted and the decisions made were discussed. Revisions resulting from the feedback, comments and input received were noted, as well as items to be considered for Edition 2.0.0.

4. Member State Data Gathering Policy

The Chair introduced the task from the IRCC and what was the required outcome. The drafted text generated wide ranging discussion and questions. It was generally agreed to keep the question simple and for those Member States, which did not agree to the activity, the Chair CSBWG and IHO

Secretariat would engage to see where the difficulties lie and what needed to be done for them to allow CSB to be undertaken.

The proposed text for inclusion in the future IHO Circular Letter was:

"Do you support crowdsourced bathymetry data gathering activities, in the form of single track profiles, whilst vessels are undertaking normal passage in your waters of national jurisdiction and for the data to be made openly available?"

It is proposed that the Member States which have indicated their support would be listed on the IHO website. In time it is hoped that numbers will increase until the minority feel sufficiently reassured and confident to join in supporting CSB activities.

5. Maintenance of IHO Publication B-12

The Chair introduced the vision and ideas for what the B-12 Edition 2.0.0 could contain and what format it could be made available. The vice-Chair suggested there was a need to have clarity on what CSB was and how it can be developed. The Chair highlighted that it should not be a re-write of the document, it is an opportunity to update sections, add additional new information and potentially remove sections which were no longer required.

It was suggested more practical guidance targeted at particular communities could be included; it was also noted that more clarity was required on what were the roles, capabilities and services of a Trusted Node. Some HOs would like to have guidance on how to use CSB. It was felt use-case examples would be of more benefit and would allow a much more flexible approach.

WOC noted the need for a comprehensive Outreach strategy, as the document will not gain a wide readership alone. Need to define the target audience and how it is anticipated B-12 may be used. TeamSurv suggested the document could include input from Trusted Nodes directed to their contributors and how they can engage with a particular Trusted Node. DEN ask if there should be guidance for HOs on how to use the data. NOR noted that individual HOs have differing policies, although it was felt it might be too early to develop such guidance, it may be more appropriate to highlight different approaches to progress towards a more harmonized approach.

It was considered that the GEBCO Cookbook might provide an example of how to maintain and manage the B-12 as a web based ePublication as the rate of development and change in technology made a traditional document less appropriate. An initial example will be created and made available for appraisal at CSBWG7 and the formal request would be included in the Chair report as an action for IRCC11 to consider. **Action CCOM-JHC/Chair**

6. Outreach Strategy

The Chair introduced the task required by IRCC to expand the potential contributors and users, including identifying the different motivations for individual and organizational involvement. There was a need to identify the key contributor communities with the capabilities to make the most significant contributions in terms of data quality, which would then assist in convincing HOs of the value of the data. Research/survey ships, cruise liners and the cable/pipe laying community (International Cable Protection Committee (ICPC) were suggested to be the most obvious. NOR highlighted the participation of WOC and Seabed 2030 could be used to leverage their organizational strategies. NOR continued the earlier discussion (captured above in 2.3) for the need for better coordination between the organizations through an inventory of potential contributors to ensure multiple inquiries are not directed. Need to map the contributor communities and potential users. Seabed 2030 suggested developing a single sheet with the main messages, tools, FAQs and measuring results and successes. WOC noted the need to separate the different sectors and develop appropriate strategies and tools for each. NOAA-OCS suggested identifying the CBS benefits to contributors.

CCOM-JHC suggested translation of the B-12 for the data collector was a major element of the communication strategy and that the equipment manufacturers could be leveraged to articulate the message through their customer base and communication methods. TeamSurv fully agreed on using the manufacturer base and including appropriate messages. WOC highlighted the need for SMART leverage and questioned whether the correct companies and business communities are already engaged and suggested methods to identify the gaps in communication and recipients. FarSounder acknowledged industry is likely to be best placed to engage with the mariner community.

The WG then "mind mapped" the outreach challenge to identify the various sectors engaged with CSB and some of the communities within each sector. The WG then identified the five high-level headline topics to be communicated as well as draft text to be further developed as the messages to be communicated. Identified high level headline topics should be: Need, What, How, Benefits, Incentives. Seabed 2030 agreed to take these topics and text and develop community-specific messaging/talking points. **Action Seabed 2030**

Headline Topics:

1. What is the need/Why are we doing this
    a. Understanding our oceans better is essential for development and the benefit of humanity…because
        i. the oceans deliver to us 50-60% of our oxygen supply
        ii. food supply
    b. Lack of knowledge – we need you to contribute
    c. We know more about the moon and Mars…
    d. Your data will help create a global common good for the benefit of mankind
    e. Survival of mankind…growing population… (how do we make the ocean more relevant to those that only think of the land?)
    f. …for the improvement of the seafloor model…the base layer is the knowledge of ocean depths and shape

2. Global Benefits:
    a. The seafloor base layer will support many other disciplines.
        i. Better bathy leads to better fish farm locations, better tsunami modellers, etc, - improves overall ocean system knowledge
    b. Saving lives, property and environment (eg: Sri Lanka 2004)
    c. Global common good
    d. Fulfilment of SDG14
    e. Safety of navigation
    f. Better data

3. Benefits/incentives to the data provider:
    a. Better data (eg: I know where to go fishing this weekend)
    b. Safety of navigation
    c. Cost savings
    d. Market development opportunities
    e. Acknowledgement strategy (eg: Good corporate citizenship award)

4. What do we want you to do.
    a. Collect data (collect good! data)
    b. Share your data (make your data publicly available)
    c. Evangelize (encourage/promote others)
    d. Be curious. Talk to us. Engage.

5. How we want you to do it.
    a. Read B-12
    b. Join or become a Trusted Node

c. Turn on collection in your software
d. Ask your software and hardware provider if they have data collection capability

The Chair displayed the mind map generated during the discussions (see enclosure 1).

Seabed 2030 displayed the World Hydrographic Day (WHD) press release on the provision of the Ocean Infinity data from their Indian Ocean work.

7. Recognition Strategy

Covered in Outreach discussions.

8. Potential Uses of CSB

8.1 CHS use

CAN provided a brief presentation on the work undertaken by the CHS on the use of CSB data. Noted a number of charting issues which had been highlighted by the CSB data when compared to the limited charted data. Vice-Chair highlighted the importance of checking all data received for safety of navigation issues and provide the information to the maritime community as protection against future litigation. It was recognized that HOs have finite resources and have limited ability to process and utilize the CSB data; it was suggested that automated processes could be better used to assist in the data management processes. It was noted that CARIS does not read GeoJSON format data at present; Chair requested all to ask CARIS to develop the ability to read this format. **Action All** It was identified there needs to be closer engagement with other relevant IHO WGs (DQWG, NIPWG, NCWG, MSDIWG, HSPT– see IHO website for the WGs ToRs and mandate) and the Open Geospatial Consortium (OGC) Marine Domain WG. TeamSurv highlighted the importance of filtering out the poor quality or anomalous data to assist in the data management load, currently the process is undertaken using HO official data as the comparator. CAN noted that the area and use of the data would dictate the effort required and the assessment on the size of variation would become significant. It was suggested an S-100 base Product Specification (PS) could be developed, it was highlighted that this would be creating a standard and therefore IHO resolution 2/2007, as amended, would apply. IHO recommended a less formal bathymetric information overlay to which contributors could add their own data as well as any other data they wished; it was noted that discussions with ChartWorld/SevenCs had indicated that it could be possible to in-bed a global tidal mode and a contouring algorithm. This would effectively generate 'instant bathymetry' for the contributor. ChartWorld/SevenCs had indicated they could make the resources available under an IHO or Seabed 2030 contract to undertake the development and deliver the product.

8.2 HO perspectives

DEN provided a perspective from the HO, noted that CSB was not in use at present. He felt a best practice guidance for HOs would be of benefit. He noted that old data and data of unknown source is in use but modern CSB has not been included. NOR highlighted the on-going scepticism of HOs towards CSB, which had a negative impact on encouraging contributions. NOR highlighted the ChartWorld/SevenCs initiative of developing an overlay for display with a chart. IHO recommended caution on developing an S-100 based PS, which would take the WG into a standards area requiring to follow strict and time consuming procedures. It was suggested a white paper be developed to highlight use cases from multiple HOs, detailing their individual approach to using CSB; ultimately it was agreed that the initial focus should be directed towards documenting multiple use cases for publishing on the CSB web page to provide examples and experiences to HOs and to highlight the breadth of current uses of CSB data to potential contributors **Action Chair/All** Recommended developing a use case document, which highlights what different approaches are being taken and development of a less formal overlay. DEN suggested AHC could develop a pilot project from the user case perspective. CCOM-JHC suggested an additional section of B-12 could contain use-case information, which could be added to as new methods and approaches appear. It was suggested that,

once adopted, the Chair should approach IRCC for approval for allow B-12 to be a living document similar to B-11. CCOM-JHC to develop a web based version of B-12 for discussion at CSBWG7, this could include a link to a live area where user cases and best practices were highlighted. **Action CCOM-JHC**

9. Close

9.1 Any other business

a. Review of relevant IHO Resolutions

The relevant resolutions were displayed. The Chair requested comments and input by 24 August. **Action All**

b. ONE Data Technology provided a brief on their activities on a crowdsourcing based High Density Depth Data service platform. It was suggested the activities described were those of a Trusted Node, which was acknowledged. Noted that vessels were contracted to gather data. NOR asked what the intended output from the project was, was it to up-scale into a more open process contributing to the overarching objectives of the CSB initiative? Requested clarification on how to contribute raw data to the IHO DCDB. **Action NOAA-NCEI** He highlighted there were restrictions on gathering high density data but CSB data was accepted. Found that provision of better data and knowledge of the seafloor topography was motivation for fishing vessels to participate in the project.

c. Vice-Chair highlighted the need to ensure a harmonized message and consistent terminology be used moving forward. He asked with whom it was intended to work, he highlighted the potential different communities from the survey/research vessels, professionally used vessels on targeted tasks (tugs, CG vessels, etc.) and open source vessels (leisure craft, fishing vessels, etc). It was highlighted that the distinction between CSB and Volunteer Geographic Information (VGI), which includes systematic data gathering for another purpose than other than bathymetric data gathering. NOR suggested to list the possible relevant different types of VGI. The CSB definition captured in B-12 was highlighted and the reasons for keeping it to the neutral and uncomplicated wording to allow the maximum number of IHO MS to facilitate the activity. CAN supported the current wording.

9.2 Venue and dates of the 7th CSBWG Meeting

It was agreed that the next meeting of the working group should progress the work in preparing Edition 2.0.0 and the expanded tasks to be undertaken by the CSBWG. It is therefore planned to hold a seventh meeting of the CSBWG in Québec City, Canada on 12-14 February 2019. **Action IHO/CAN** NOR suggested it appropriate to consider future meetings and it was agreed that CSBWG8 would be held in Monaco in late November/early December 2019 and CSBWG9 would be in Stavanger, Norway, in mid-2020.

9.3 Election of Chair and vice-Chair

The current chair, Ms Jennifer Jencks (USA), and vice-Chair, Mr Serge Gosselin (Canada), were unanimously re-elected for the period 2018-2020.

9.4 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 CSBWG7 webpage and all those who have actions to complete should keep the Chair and the Secretary informed of any progress. **Action ALL**

It was agreed that the IHO would circulate a draft meeting report to all attendees by 29 June. **Action IHO**

Attendees were requested to provide any comments by 13 July. **Action ALL**

It was intended the final meeting report would be published by 27 July 2018. **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 April 2019. **Action Chair**

The Chair requested IHO to generate a draft Agenda for CSBWG7 and include it as Annex F to the report. The draft Agenda may require further amendment following intersessional progress.

9.5 DEN suggested Maritime WG of the UN-GGIM could be a group with whom to engage. CCOM-JHC suggested the OEMs (Garmin, RosePoint, ChartWorld/SevenCs, etc) could be involved via an industry/stakeholder day/half-day at the end of the meeting. NOR suggested CSB should be a standing agenda item on RHC meetings. Chair, vice-Chair and IHO to develop a generic presentation for use at RHC meetings. **Action Chair, vice-Chair, IHO** CAN suggested providing more clarification on the roles and requirements of a Trusted Node and how contributors can be provided with examples of real world examples of data contributions.

10. Closing remarks

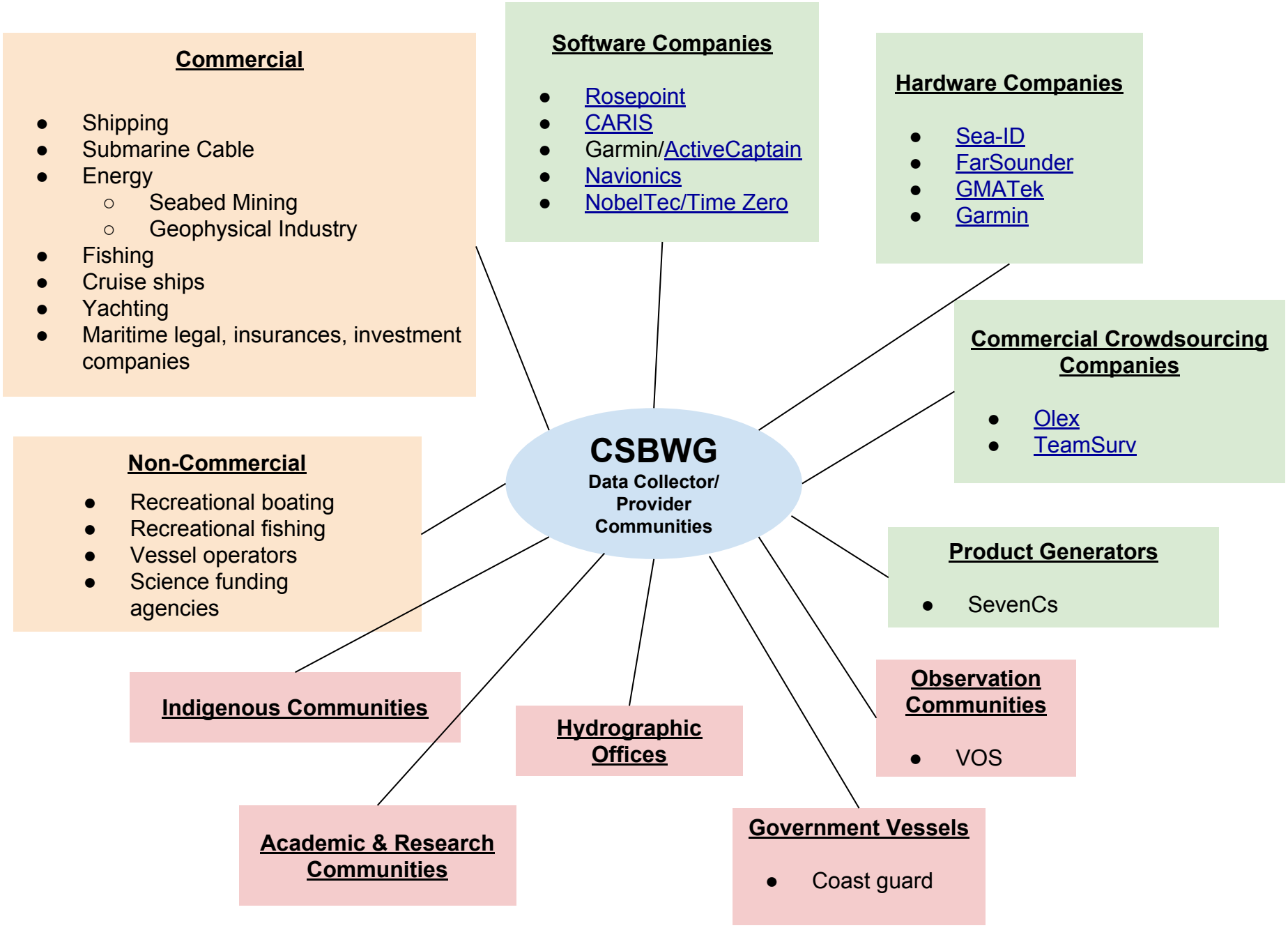
Chair thanked all the participants for their input and efforts and highlighted how much had been achieved on developing the B-12 to the position of being presented to the Member States in such a short time. She highlighted the positive feedback from the IRCC participants. She encouraged all to maintain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

The following Enclosure is attached:

1. Outreach strategy mind map.

The following Annexes are attached:

A. CSBWG6 – List of Participants.
B. CSBWG6 – Agenda
C. CSBWG6 – List of Documents
D. CSBWG6 – List of Actions
E. CSBWG6 – ToRs and RoPs
F. CSBWG6 – Draft Agenda for CSBWG7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CARIS
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Navionics
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Hardware Companies
Sea-ID
FarSounder
GMATek
Garmin
Commercial Crowdsourcing Companies
Olex
TeamSurv
Non-Commercial
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 CSBWG6

Member State	Organization	Name	E-mail
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Remote participants:

Jens Peter Weiss Hartmann (Denmark), Glenn Wright (GMATEK), Kenneth Himschoot (Sea-ID), Emma Wise (ChartWorld/SevenCs) and Tim Thornton (TeamSurv)

6th MEETING OF THE IHO CROWDSOURCED BATHYMETRY WORKING GROUP
IHO-CSBWG6
NCEI-NOAA, Boulder, Colorado, USA, 19-21 June 2018
Remote Access: Refer to last page
All times are Boulder, CO (USA Mountain Time)

DRAFT AGENDA AND TIMETABLE

Time	DAY ONE OF CSBWG6 – Tuesday 19 June	Action
0800	**Coffee**	
0830	1. **Welcome** .1 Welcome and opening remarks .2 Domestic and administrative arrangements .3 Introduction of participants, apologies and approval of agenda .4 Approval CSBWG5 Report and Review of Actions .5 Chair report to IRCC10 a. Outcomes and actions from IRCC10 b. Revision to ToRs and RoPs	 Chair Chair Secretary Secretary Chair
1000	**Health Break**	
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 Rosenberg Reed Himschoot/ Calder Wright Henley
1145	**Group photograph**	Chair
1200	**Lunch Break**	
1330	**2. Updates of Current Projects (continued)** .6 Seabed 2030 .7 World Ocean Council .8 ChartWorld/SevenCs .9 Other?	 Bindra Holthus Moggert-Kägeler
1430	**3. Review the CSB Guidance Document 1.0.0 (B-12)** .1 Outcomes of final editorial meeting; incorporation of additional feedback comments and input, if any, and further development for preparation of Edition 2.0.0	 Chair
1500	**Health Break as needed**	
1530	**4. Member State Data Gathering Policy** *"Request IHO Member States state their policy on data gathering restrictions within their maritime areas of jurisdiction to enable CSB activities to be undertaken"*	Chair

	.1 How do we clarify data collection policy from each Member State? .2 Consider drafting a letter for the IHO to issue to MS requesting whether they have a national policy on passage sounding and, if so, what is it? .3 Goal: a list of coastal states who support the collection of CSB within their waters of national jurisdiction published on the IHO website.	
1700	**END OF DAY ONE**	
TBD	Dinner	
Time	**DAY TWO OF CSBWG6 – Wednesday 20 June**	**Action**
0830	**5. Maintain the IHO publication B-12** Discussion on the vision of B-12 Edition 2.0.0 and how feedback will be incorporated. Topics include: .1 Who is the audience? Is there a need for sub-documents? .2 Will this become a web-hosted document? What would that look like? .3 Potential additions/new material to include	Chair
1000	**Health Break**	
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 .2 Who are our main data collectors? Our data users? a. Determine approach to each	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	**Health Break**	
1530	**7. Recognition Strategy** .1 Discuss an IHO and National HO Recognition strategy for data collectors	Chair/ Secretary
1700	**END OF DAY TWO**	
Time	**DAY THREE OF CSBWG6 – Thursday 21 June**	**Action**
0830	**8. Identify Potential Uses of CSB: Hydrographic Offices** .1 Canadian Hydrographic Survey Use Case .2 CSB from a HO perspective; how can HO's use CSB? a. The implication for HO with relation to CSB b. The possibility of establishing a CSB S-100 product specification S-1xx. c. The legal aspect of CSB from a national perspective d. Producing a CSB White Paper	Wills Hartmann
1000	**Health Break**	
1030	**9. Close** .1 Any other business a. Relevant IHO Resolutions – input/feedback to GEBCO TSCOM	Chair Secretary

	.2 Date and venue of next meeting - CSBWG7 - and intercessional activities. .3 Election of chair and vice-chair (postponed from CSBWG5) .4 Review of Action List for CSBWG6 and draft agenda for CSBWG7. .5 Discussion on outstanding issues and post-meeting expectations **10. Closing remarks by Chair.**	Chair Secretary Secretary Chair
1230	**END OF THE MEETING**	Chair

REMOTE ACCESS
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USA Toll Free Number : 1-866-xxx
Participant Passcode: xxx

CSBWG6 - List of Documents

Document No	Document Title
CSBWG6-Invitation Letter	Letter of Invitation v2.0
CSBWG6-Annex B	Registration Form
CSBWG6-Annex B	Registration Form (Word Version)
CSBWG6-Annex D	Logistic Information
CSBWG6-Annex C	Foreign Visitors Form v2.0
CSBWG6-Document Template	Document Template (Word version)
CSBWG6-1.3-Agenda	CSBWG6 Draft Agenda v8.0
CSBWG6-1.3-Agenda	CSBWG6 Draft Annotated Agenda v1.0
CSBWG6-1.4-Action List	List of Actions - CSBWG5 - updated 11 May 2018
CSBWG6-1.5a	Chair report to IRCC10
CSBWG6-1.5a	IRCC10 outcomes - Draft
CSBWG6-1.5b	Draft ToRs and RoPs (Clean)
CSBWG6-1.5b	Draft TorS and RoPs (Track Change)
CSBWG6-3.1	B-12 (*IHO Guidance on Crowdsourced Bathymetry*) Draft Edition 1.0.0 (Clean)
CSBWG6-3.1	B-12 (*IHO Guidance on Crowdsourced Bathymetry*) Draft Edition 1.0.0 (Track Change)
CSBWG6-9.1a	IHO Resolutions
CSBWG6-9.4	Proposed draft agenda for CSBWG7 v1.0
CSBWG6-INF.1	Hydro International article
CSBWG6-Presentations	Presentations.zip
CSBWG6-Participants	CSBWG6 List of Participants

LIST OF ACTIONS – Updated 9 August 2018

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	IHO
CSBWG5				
5	B-12	CSBWG7	Provide status report on development of ability for individual data contributions	NOAA-NCEI
5	B-12	CSBWG7	Check whether restrictions on downloading data from DCDB can be put in place	NOAA-NCEI
5	B-12	CSBWG7	Check whether current website statement covers data in the DCDB	IHO
5	Environmental issues	CSBWG7	Report on literature review covering impact of SBES use with respect to impact of human induced sound into the water column	Vice-Chair
CSBWG6				
2.2	Presentations - DCDB	CSBWG7	Investigate how to handle S-102 format and gridded datasets for inclusion in the DCDB	NOAA-NCEI
2.2	Presentations - DCDB	CSBWG7	Progress further updating of the IHO DCDB homepage	NOAA-NCEI
2.3	Presentations - RosePoint	CSBWG7	discuss with RosePoint on how to make the anonymous feature more obvious and to include ship type as well as offsets and heading data	NOSS-NCEI
2.3	Presentations - RosePoint	CSBWG7	Provide shapefile converter	CCOM-JHC
2.3	Presentations - RosePoint	CSBWG7	Investigate need for more regular meetings to move forward the inclusion of bathymetric data gathering within the VOS scheme	NOAA-OCS

2.3	Presentations - RosePoint	CSBWG7	Investigate the creation of a list of current programmes to allow better tracking of related activities, to allow CSBWG to be aware of opportunities for collaboration	NOR
2.3	Presentations - RosePoint	CSBWG7	Include details of DCDB developments in report to IRCC	Chair
5	Maintenance of B-12	CSBWG7	Develop and provide draft of e-Publication version of B-12 for consideration	CCOM-JHC
5	Maintenance of B-12	CSBWG7	Propose to IRCC11 that B-12 becomes a web based e-Publication with continuous update cycle	Chair
6	Outreach Strategy	CSBWG7	Take identified topics and text and develop community-specific messaging/talking points	Seabed 2030
8.1	Potential Uses of CSB – CHS use	CSBWG7	Encourage CARIS to allow GeoJSON format data to be read	All
8.2	HO perspectives	CSBWG7	Document use cases to assist HOs on how to use CSB	All/Chair
8.2	HO perspectives	CSBWG7	Develop web base ePublication version of B-12 with links to user cases and information on best practice	CCOM-JHC
9.1a	IHO Resolutions	24 Aug	Provide amendments and changes to Chair	All
9.1b	Presentation – ONE Data Technology	CSBWG7	Provide details on how to contribute data to the DCDB	NOAA-NCEI
9.2	CSBWG7	17 Aug	Circulate an initial letter of invitation	IHO/CAN
9.4	Action List	CSBWG7	Keep Chair and IHO informed of progress with allocated actions	All
~~9.4~~	~~CSBWG6 Draft Report~~	~~29 Jun~~ Complete	~~Draft to be circulated for comment~~	~~IHO~~
~~9.4~~	~~CSBWG6 Draft Report~~	~~13 Jul~~ Complete	~~All to provide comments on draft report and draft ToRs to IHO~~	~~All~~
~~9.4~~	~~CSBWG6 Final Report~~	~~27 Jul~~ Complete	~~Publish final report~~	~~IHO~~
9.4	Report to IRCC11	5 Apr	Provide outline draft to Chair	IHO
9.4	Report to IRCC11	26 Apr	Submit report to IRCC11	Chair
9.5	AOB	CSBWG7	Develop generic CSB presentation	Chair/ vice-Chair/IHO

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.

7th MEETING OF THE IHO CROWDSOURCED BATHYMETRY WORKING GROUP
IHO-CSBWG7
Québec City, Canada 12-14 February 2019
Remote Access: Refer to last page

DRAFT AGENDA AND TIMETABLE

Time	DAY ONE OF CSBWG7 – Tuesday 11 February	Action
0800	**Coffee**	
0830	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
1000	**Health Break**	
1030	**2. Updates of Current Projects** .1 Introduction; .2 IHO DCDB development .3 NOAA/Rosepoint .4 SeaID .5 Swath CSB a.	 Chair Rosenberg Reed Himschoot
1200	**Lunch Break**	
1330	**2. Updates of Current Projects (continued)** .6 Seabed 2030 .7 Other?	 Bindra
1430	**3. Review the CSB Guidance Document 2.0.0 (B-12)** .1 Development of Edition 2.0.0	 Chair
1500	**Health Break as needed**	
1530	**4. Member State Data Gathering Policy** *"Request IHO Member States state their policy on data gathering restrictions within their maritime areas of jurisdiction to enable CSB activities to be undertaken"* .1 How do we clarify data collection policy from each Member State? Results of IHO CL ??/2018 on adoption of B-12 .2 Goal: a list of coastal states who support the collection of CSB within their waters of national jurisdiction published on the IHO website.	Chair
1700	**END OF DAY ONE**	
TBD	Dinner	
Time	**DAY TWO OF CSBWG7 – Wednesday 13 February**	**Action**
0830	**5. Maintain the IHO publication B-12** Discussion on the vision of B-12 Edition 2.0.0 and how feedback will be incorporated. Topics include: .1 Who is the audience? Is there a need for sub-documents? .2 Review on progress on development of a web-hosted document? .3 Potential additions/new material to include	Chair
1000	**Health Break**	

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 .2 Who are our main data collectors? Our data users? a. Determine approach to each	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	**Health Break**	
1530	**7. Recognition Strategy** .1 Is recognition strategy for data collectors required, if yes, what form should it take?	Chair
1700	**END OF DAY TWO**	
Time	**DAY THREE OF CSBWG7 – Thursday 14 February**	**Action**
0830	**8. Identify Potential Uses of CSB: Hydrographic Offices** .1 CSB from a HO perspective; how can HO's use CSB? a. The implication for HO with relation to CSB b. Producing a CSB White Paper	
1000	**Health Break**	
1030	**9. Close** .1 Any other business a. .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 **10. Closing remarks by Chair.**	Chair Chair Secretary Chair
1230	**END OF THE MEETING**	Chair

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