



14th Meeting of the IHO Crowd Sourced Bathymetry Working Group

Report

14 – 17 August 2023

Stavanger, Norway

(Paragraph numbering is the same as the Agenda Item numbering and does not necessarily reflect the order in which matters were discussed)

1. Welcome and opening remarks

1.1. Welcome and opening remarks

The Chair welcomed participants and provided opening remarks. She noted it was the largest meeting to date with approximately 30 participants in person and 30+ on line. She thanked the Norwegian Mapping Authority Hydrographic Service for hosting the meeting and Fugro for sponsoring the icebreaker reception.

1.2. Domestic and administrative arrangements

Evert Flier (EF) welcomed everyone on behalf of the host organisation. He thanked Seabed 2030 and Raymarine for sponsoring the meeting dinner.

The IHO Sec explained the administrative arrangements.

1.3. Introductions, apologies and approval of agenda (read ahead)

Apologies were offered from Paul Holthus (WOC) and the Abubakar Giginya (NHO).

1.4. Approval of CSBWG13 report and review of actions (read ahead)

The CSBWG13 report was tabled and approved. The actions from CSBWG13 were reviewed.

Decision 1. CSBWG13 Report Approved
Decision 2. Actions reviewed and updated



1.5. Chair report to IRCC15 – [Report](#)

The Chair provided an update on the report to IRCC15 and her introduction to the work of the group. She went through the history of the work of the group, noting that it started in 2014. She noted that the original focus was the creation of IHO Publication B-12 but this has now shifted to the future strategy. She noted that to date we have 34 coastal states that have replied positively to the CLs and went through the latest metrics for data holdings – 25GB+ 10 trusted nodes. She noted that the WG is at a junction where the community is scaling, but posed the question as to whether the WG is ready for this? In light of this, a new WP was developed to focus activity on what needs to be done. She went through the resultant changes to the ToRs and the associated work items and the actions requested of IRCC. She noted that all requests were approved apart from the frequency of meetings to be 8 months.

A question was posed as to why CSBWG sits under IRCC and not HSSC. IHO Sec answered that the nature of extensive collaboration means that it was judged to sit better under IRCC and noted that not every WG fits neatly under either, but we get around this when respective publications fall into the approval regime of the respective competent body.

It was suggested that a yearly graphic representing new countries responding to the CL would be useful.

Action 1. Produce a yearly graphic report of new countries that have responded to the CL.

2. CSBWG Work Items – Status Updates

2.1. Submit IHO CSB initiative as a UN Decade Action

EF introduced work item B. He noted that there are four options for having CSB recognised as a CSB activity:

- Programme
- Project
- Activity
- In kind contribution

He noted that the first three follow a call for action with associated deadlines but that the in kind contribution does not

It is not clear what the best fit for the CSB Initiative is. This is because it is not properly defined what the initiative is in terms of project structure and how this relates to the CSBWG and its work plan.



The IHO Sec provided an explanation as to the options for how the CSB initiative could be structured in terms of programmatic work. It was agreed that this should be decided before a decision on how to link it to the Ocean Decade was made.

Action 2. Work Item B team to produce a definition and schematic of IHO the CSB Initiative

2.2. Gather & prioritize HO-specific issues/opportunities regarding national policy/regulations related to CSB

Chair introduced Work Item C - [Report](#)

A brief on the activities conducted related to gathering, prioritizing and responding to HO-specific issues/opportunities regarding national policy/regulations related to CSB. The WG were invited to comment/discuss the reported progress on each of the Work Sub items:

- C1 - Capture issues regarding national policy/regulations/culture affecting the endorsement of CSB
- C2 - Draft proposed rationale to the issuing of a new brief Circular Letter (and Questionnaire) to MS explaining the purpose of IHO CL21/2020 and encouraging a positive response.
- C3 – Request the policy framework(s) or guideline(s) adopted by coastal states who positively responded to IHO CL 21/2020 or IRCC CL 01/2020
- C4 – Educate CSBWG members on International Law of the Seas as it pertains to passage sounding collection

Following a discussion a view was expressed that we are not in a position at this time to draft and issue a new Circular Letter (C2). It was agreed that efforts should be focused on C1 and C3. It was noted that Steve Keating (SK) would be providing a presentation on C4 on Day 3 of the meeting.

Action 3. Work Item C team to draft letter to National Hydrographers requesting the policy framework or guidelines adopted by coastal States who positively responded to the 2019/2020 Circular Letters.



2.3. Gather and prioritize HO-specific issues relating to CSB data

Peter Wills (PW) introduced Work Item D - [Report - Presentation](#)

He provided an introduction to the work item, recapping that the team members are representatives of HOs and reported that they had met three times. He went through the objectives identified by the team and reported that it was agreed that the main focus was on data accessibility.

Giuseppe Masetti (GM) provided an analysis of key areas relating to accessibility of data in the DCDB. [Presentation](#).

The presentation included a comprehensive analysis of accessibility issues identified with the DCDB, together with initial responses provided by the DCDB team. It was noted that much of the detail provided in the presentation related to areas of ongoing development and that the analysis would be useful in prioritising future activity. It was also noted that the resource available to undertake this development work is finite so the initial prioritisation work undertaken by the group would be necessary and most useful.

It was also noted the significant contribution from NOAA/DCDB for everything they do.

Decision 3. Work item remains valid. CSBWG agrees with priorities and endorses the proposed way ahead.

Action 4. Work Item leads and DCDB to review initial findings and prioritise remedial/further investigation.

2.4. Support CSB/SB2030 Coordinators in their RHC engagement

Belen Jimenez (BJ) introduced work item E - [Report](#)

The work item, participants and the approach to analysing perceived issues was described. The current status quo and system of RHC representatives was described. It was reported that the group had identified 3 sub tasks:

E-1: Revisit and update the CSB/SB2030 Coordinator role, aiming to clearly define responsibilities and provide guidance to minimize the burden and maximize success.

E-2: Work with Coordinators to develop regional strategies aligned with CSBWG and SB2030 goals, recognizing the need for tailored support in different regions.

E-3: Raise awareness of CSB in the IHO Capacity Building Subcommittee, with a focus on identifying potential capacity-building activities.



It was noted that a priority was to clarify the role of the Coordinators so that it is not so cumbersome to understand how the duties of the role should be discharged. A discussion was had relating to how the network of Coordinators could be supported and whether links to the IHO CSB programme should be strengthened. The idea of a dedicated forum was raised and the Chair reported that IRCC had not supported the creation of a formal group. It was noted that the list of Coordinators on the IHO website should be updated.

Action 5. Update list of CSB/SB2030 RHC Coordinators on IHO website

2.5. Discuss & propose potential software tool support for HOs

Anders Bergström (AB) introduced work item F. [Report](#)

He noted that 5 meetings had been held so far and fruitful discussions had been had. Key Participants have included Anders Bergström (Raymarine), Knut Hartmann (EOMAP), Mathieu Rondeau (CHS), Meredith Payne (ESRI), Idris Salaudeen (7Cs), Emma Wise (ChartWorld), KarenCove (CARIS), Benjamin Barbier (CARIS), Paul Duvoy (University of Alaska).

It was noted that there was a lot of discussion on how CSB data could be used in the ECS/Sub ECDIS market with the general theme of what makes data 'good enough' for it to be of use to mariners. It was noted that there are roughly 70k SOLAS vessels, 30k non-SOLAS and 32 million leisure vessels.

He reported that 9 initial areas/tools where development could be useful had been identified:

1. Tools that make SDB and CSB complement each other in any way
2. Data availability tool even if not shared
3. Quality indicator tool
4. Data filtering for easier sharing
5. Potential to asses' data with official data to better understand your performance and data quality (compare what is being done with GNSS accuracy support already)
6. SDB, CSB no go zones
7. QGIS for building maps (not for navigation use) (CHS to work on open call for this)
8. Tools to support actual creation of official/nonofficial data from quality assessed or big CSB data.



9. A [IHO] tool where stakeholders can provide information that they have data and reason for not sharing or where they would share. EMODNET is one example of this with its about 50 stakeholders and how it really provides valuable information on the data.

The aim of the group is to explore these 9 ideas further and recommend those that will be further developed back to the group in due course.

Three lightning presentations were given exploring specific issues and tools currently under development:

AB gave a presentation on instances where industry is using 'non-official' data – [Presentation](#).

Idris Salaudeen (IS) gave a presentation on Chartworlds CIO+ Services – [Presentation](#).

Karen Cove (KC) gave a presentation on Caris tools being developed to support SB2030 – [Presentation](#).

2.6. Clarify support identified by current Trusted Nodes needed for current and future Trusted Nodes.

Guillaume Morissette introduced work item G – Report.

One of the key requirements identified was for a definitive list of Trusted Nodes. There was a discussion on how easy it is to identify which trusted node the data has been supplied through into the DCDB. The means of doing this was discussed and the discussion moved onto how can the trusted node community discuss topics of mutual interest.

Commented [S1]: This needs adding to once I have GM's presentation

Action 6. DCDB to provide contact details of Trusted Nodes to work item G lead

2.7. Clarify all aspects of the CSB data cycle and capture known issues, requirements and suggested enhancements.

Brian Calder (BC) introduced the work item H - [Report](#)

He started by identifying all aspects of the CSB data life cycle and noted key considerations:

- Capture processing

Review, recommend and document the data flow of standard processing stages for data capture, including extensions for uncertainty. He noted that the best way to make data processing cheaper/easier is to collect better data in the first place.



- Metadata

Review the current metadata structure for CSB data for completeness, encoding methods, validation mechanism and support for end-user database mapping and recommend modifications.

He noted that in the past we have shown an example of what metadata should look like, but the lack of a controlled vocabulary is problematic.

He recapped a potential solution for validating metadata that he presented at the previous CSBWG meeting and noted the implications for how this would need to be managed and how this would affect B-12 – he noted that it would need to evolve faster than the current IHO approval process would allow.

- Data format extension

Consider potential extensions of the current GeoJSON to include such features as heading, motion time series, and uncertainty estimates.

- Data access

Investigate and consider extensions to the DCDB S3 data store and OGC services, particularly with respect to searchability and metadata access for individual observers, and make suggestions for future development at DCDB.

- Use cases

Establish recommendations for one or more use cases of CSB, and associated guidelines for data products (e.g., interpretation of quality, known problems, required processing, etc.). Collaborate with other task groups preparing specialized products (e.g., for HO use).

The key point made was that whilst there may be use cases that are more of a commercial nature, there may be simple cases such as providing feedback, that are key to the success of the initiative.

- Availability

Promote and contribute to an open source reference implementation of available algorithms for all the processing steps, preferably with a permissive license such as MIT or CC0.

Following this summary, the proposed prioritisation for further work was given as:

1. Data access
2. Metadata
3. Capture Processing
4. Data format Extensions
5. Use Cases



6. Availability

Secondly, BC explained the work that had been undertaken on developing a GeoJSON Metadata Schema - [Report](#).

He made the following recommendations:

- WG is requested to note this information
- WG is requested to consider metadata schema information
- WG is solicited for other prioritization data
- WG is requested to encourage participation in fact-finding, service definition, and use cases, etc.

Decision 4. Record use cases as required for reference

Decision 5. Agree development of metadata schema

Decision 6. Revised prioritisation agreed

2.8. Maintain and update B-12

GM provided an update on work item A.

He explained what work has been done namely speaking to various stakeholders to consider what the evolution of B-12 looks like and also what the maintenance and update schedule will look like. He noted that it incorporated a number of other agenda items, but that the key considerations going forward would be the format of the publication, as well as the use of some kind of common/collaborative work space. Arguments for considering these elements centred on the need to be dynamic with the content of B-12 and avoid unnecessary red tape. IHO Sec re-emphasised the process as it relates to the maintenance of official IHO publications but noted that there were other working groups that were starting to use the IHO GitHub as a common working Platform. It was also noted that the S-102 WG had been using this successfully and it was likely that lessons learnt could be shared. The notion of a full proposal and trial of using this platform is to be developed so that the WG can fully assess the cost v benefit.

Action 7. To develop a full proposal of using the IHO GitHub platform, including the proposed rules for management of content and approval processes.

2.9. Develop a recognition & incentive strategy plan

David Millar (DM) introduced work item I – [Report](#).

He started by clarifying what was in and out of scope of the work item as far as the group had considered:



In Scope - Develop a recognition & incentive strategy by compiling a list with short summaries of potential incentives and recognitions that would motivate individuals / organizations to participate in CSB.

Not in Scope - Implementation of the recognition & incentive strategy.

He recapped the approach that the group had taken to the task:

1. Initial virtual kick-off meeting on 19 April 2023
2. Progress work via e-mail communications and shared documents
3. Use Google Drive to host shared documents
4. Consider NLA International-Seabed 2030 "Seabed 2030 Economic Impact Sectors Document" and IHO CSBWG 2-page flyers to develop list of various target sectors
5. Develop lists of recognition and incentives by sector which included:
 - a. Commercial data collectors / survey companies
 - b. Commercial maritime support vessels
 - c. Commercial shipping
 - d. Commercial cruise ships
 - e. Commercial fishing and aquaculture
 - f. Mega Yachts / Super Yachts / Trawler Yachts
 - g. Recreational boaters
 - h. Government
 - i. Philanthropic ocean science
 - j. Commercial Trusted Nodes – Software
 - k. Commercial Trusted Nodes – Hardware
 - l. Non-Commercial Trusted Nodes

Based upon this sectoral analysis, the following incentives were considered:

- Corporate / Community Citizenship / Ocean Stewardship
- Brand Awareness
- Tax Incentives
- Business Opportunities
- Operational Improvement
- Customer / Stakeholder Engagement
- Education / Outreach
- Goodwill
- Public Recognition of Contributions
- It's Fun! (gamify)
- Give Data / Get Data
- Supports hydrography
- Supports ocean science
- SDG14 & Ocean Decade
- Marketing
- Product testing



- Fundraising opportunities
- Mandates
- Cost incentives
- Planning and coordinating future mapping

Based upon this analysis the following recognitions were considered:

- MOUs / partnerships for ESG
- Logo placement and acknowledgement
- Valuation of contribution (tax)
- Promote participation / philanthropy
- Rewards (certificates, plaques, flags)
- Awards
- Maps showing coverage
- Naming of underwater features

The group then considered and discussed the proposed recognition/incentives by sector and discussed the following next steps:

- Incorporate CSBWG feedback on work to date
- Validate with sector representatives?
- Finalise strategy by developing short summary descriptions for each incentive/recognition

Action 8. CSBWG members with access to sector leads/contacts to provide them to the Work item J lead.

2.10. **Develop a communication plan in coordination and collaboration with related efforts (SB2030, GEBCO, etc) - Report**

Tim Kearns (TK) introduced work item J – [Report](#).

He reported that a draft communication plan had been produced and went through the key elements of such a plan. He suggested that in order to properly implement such a plan, a budget would be required.

Following a discussion it was noted that a priority for the group should be to work with the other work item teams to understand what their communication needs are. By extension, it was agreed that shaping the message is the most important thing so that a consistent message can be provided by everyone. It was also noted that these messages need to be adapted to fit specific audiences.

2.10.1. **Update on the MtG Symposium**

TK provided an update on preparations for Map The Gaps 2023 noting that the theme was “Ocean exploration from 1903 to the future”. He noted that registration



was on the light side so encouraged all to promote the event through their networks.

It was noted that the second of the two days would be focused on CSB and that this would be a great opportunity to showcase the work of the community.

Action 9. WI I lead to engage with other WI leads to consolidate requirements for outreach and engagement so that messaging requirements can be understood.

2.10.2 COMIT Outreach Plan

SG gave an overview of the outreach plan for the COMIT CSB initiative - [Report](#)

She explained that this was a University of Southern Florida led Pilot project 'Crowd the Bay' focused in Tampa Bay. It is a regional CSB project focused on a large potential crowd of more than 1 million registered vessels. She went through the need for CSB in Tampa Bay – lots of poorly charted shallow areas. She also referenced the low lying nature as one of the key drivers for the project.

She introduced the Pilot Program Roadmap, indicating the three phases:

- 1 Foundations and relationships
- 2 Outreach and Expansion
- 3 Regional – Scale demonstration

She noted that Phase 1 was complete and explained that the later phases are underway. She went through the priorities of the programme:

- Develop outreach and support materials
- Evaluate logger performance and change detection
- Generate Buy-in
- Collect additional data especially met data

She gave a run down on the technology that is being used ranging from the WIBLE and other digital solutions. Finally she touched on the range of partners: IHO, GCOOS, Seakeepers, NOAA, CCOM etc.

The value of the resources being developed was noted as well as the concept of having a centralised CSB initiative website that could link to local initiatives/projects such as this.

3. Websites

IHO Sec gave an update on the IHO CSB website and explained the concept of the hub and spokes approach which should mirror the structure of the initiative to be developed under work item B.

GM gave an update on the CIDCO led CSB portal. It was noted that as both elements evolve, care should be taken to avoid overlap. Further, it was agreed that the



expectation was that some of the existing detail on the CIDCO hosted website would naturally migrate to the centralised CSB web page in due course.

Action 10. Include a useful resources tab on the CSBWG page which would include a link to the CIDCO hosted page as a stop gap.

4. Discussion on CSB and how it fits in to the International Law of the Sea – Report

Steven Keating provided a presentation on his analysis of how CSB fits within the international legal framework - [Report](#)

The group noted the insights and the recommendations for consideration when next undertaking an update to the definition of CSB within B-12.

It was noted that this presentation would be a really useful resource both to explain to potential data providers the limitation of their liability, but also to aid coastal states in considering their formal position with regard to CSB.

5. Stakeholder Outreach

5.1. Other upcoming events

The group noted the following upcoming events:

- Monaco Yacht Show
- COMIT
- Seakeepers round table at MYS
- MtGs
- Hydro 2030
- Lakebed 2030

5.2. Stand-alone Stakeholder Event

The Chair raised the issue of an industry day and cited the reasons why this was not possible to do this time. Following a discussion it was suggested that the Sustainable Ocean Summit may provide an opportunity to 'piggy-back' on an existing industry event.

Action 11. Investigate feasibility of holding a future industry event alongside other relevant events such as the Sustainable Ocean Summit, UN Decade Conference



6. Closing proceedings

In closing the meeting, the Chair explained next steps. It was noted that the meeting had largely consisted of briefs on individual work items and that it was now up to all participants to feed back to Work Item leads on the detail discussed.

Action 12. Provide work item leads with feedback on reports as required

6.1. AOB

Hans Oias (HO) provided a short brief on Sweden's considerations with regard to access to data in the DCDB - [Report](#)

The following discussion raised a number of policy issues that needed to be clarified. HO requested permission to draft a brief report clearly capturing Sweden's concerns, considerations and requests – to be submitted to the IHO Sec. The IHO Sec will then undertake to investigate and report back to CSBWG15.

Action 13. Following submission of Sweden's brief, a full report to be provided to CSBWG15 following due consideration and consultation with IHO and DCDB

6.2. Date and venue of next meeting(s)

Lebanon offered to host CSBWG15. This offer was accepted and noted that March 2024 would be the target date, with exact arrangements to be confirmed.

6.3. Review of Actions for CSBWG14 and draft agenda for CSBWG15

IHO Sec led the review of the actions.

6.4. Discussion on outstanding issues and post-meeting expectations

In discussing next steps, it was agreed that in order to maintain momentum, an intersessional meeting would be arranged for mid-December 2023 where work item leads would have the opportunity to update their respective entries into the CSBWG work plan.

Action 14. WI leads to review timescales and deliverables in CSBWG Workplan

6.5. Closing remarks by Chair

The Chair closed the meeting, thanking Norway for hosting the group, and paying particular note of the generous sponsorships throughout the week – Fugro (opening reception) and SB2030 and Raymarine (group meal).