SAIHC19 CSB Annual Report 2023

To: Members of the IHO Southern African and Islands Hydrographic Commission (SAIHC)

Subject: **ANNUAL REPORT: CROWD-SOURCED BATHYMETRY (CSB) WITHIN THE SOUTHERN AFRICAN AND ISLANDS HYDROGRAPHIC COMMISSION (SAIHC)**

BACKGROUND, INTRODUCTION AND PURPOSE

1. In 2014, the IHO initiated a collaborative project to enable mariners to collect "crowd-sourced bathymetry". The IHO Crowd-Sourced Bathymetry Working Group (CSBWG) was formed and tasked to develop B-12 IHO Guidance on Crowd-sourced Bathymetry that states the IHO's policy towards, and best practices for, the collection and contribution of CSB. IHO Data Centre for Digital Bathymetry (DCDB) built a data pipeline that allows the public to contribute, and discover and download CSB data via a web-based map viewer interface.

The purpose of this document is to provide a short annual report for the Southern African and Islands Hydrographic Commission (SAIHC), as an output identified at SAIHC17. The report focusses the 13th Crowd-Sourced Bathymetry Working Group (CSBWG13) Meeting Report and notable action items for SAIHC, as well as CSB activities within the SAIHC region.

TERMS OF REFERENCE (TORS)/RULES OF PROCEDURE (ROP)

2. SAIHC recognised the importance for all Member States to communicate and collaborate in support of Seabed 2030 activity. Previously there was no dedicated Point of Contact (POC) within SAIHC for this activity, so the SAIHC MSDIWG was assigned as interim coordinator which was incorporated into the TORs. During SAIHC17 however, South Africa was endorsed as the coordinator for Crowd Sourced Bathymetry/Seabed 2030. As such, minor amendments to the TORs for the SAIHC-MSDIWG have been edited (please note the SAIHC-MSDIWG 2022 Annual Report).

CURRENT STATUS OF CSB WITHIN SAIHC

3. **South Africa**. The SA Navy Hydrographic Office (SANHO) reached an agreement to participate in a trial with the IHO and Seabed 2030 by deploying data loggers in RSA waters, for eventual roll-out to SAIHC. The SANHO, in collaboration with the Institute for Maritime Technology (IMT), commenced with the two part trial in 2020. The trial concept is as follows:

a. Part 1: Data Collection: Data collection involves the collection of bathymetry data by means of installing data loggers onboard vessels of opportunity. Seabed 2030 supplied 50 TeamSurv NMEA data loggers to South Africa in 2020. In 2021, a further 50 Yacht Devices Voyage Recorder data loggers was delivered. Once vessel of opportunity partners were identified, IMT conducted technical visits, logger installation, setting to work and initial data processing. The SANHO performs the final checking of rendered data before preserving the data in a central database, where after it is made available to GEBCO/Seabed 2030 community.

b. Part 2: Data Sharing: Data sharing is the collection of existing bathymetry data from various sources. This includes but is not limited to existing survey data in the form of bathymetric datasets and gridded products from the survey, exploration and engineering sectors. As per Seabed 2030 recommendations, low density datasets and gridded products with large grid/bin sizes or polygons of areas surveyed/explored where data exists can also be submitted and shared with the SANHO.

c. Executing The Trial: The task of identifying and introducing the concept to local and regional role-players (Part 1 & 2) is ongoing. A total of 32 stakeholders have been identified and approached, ***of which 4 are new since the previous report***. These included commercial fishing industries, recreational boating (fishing and diving charters), government vessels (SA Navy and research vessels), small scale/subsistence fishing community, private sector and SAIHC Member States. Unfortunately the total vessels fitted with data loggers remains at 5, being the M/V Edinburgh, National Sea Rescue Institute (NSRI) boats, and recreational private boats. The M/V Edinburgh and NSRI boats have submitted data already, with data from the two recreational boats expected by May 2022. However, technical challenges prevented the boats from collecting any data, and rectification steps are ongoing. In terms of Data Sharing (Part 2), 9 ***(of which 1 is new since the previous report)*** stakeholders providing datasets and gridded products to the SANHO, one stakeholder providing polygons of areas surveyed, and 6 stakeholders provided further contact information only. The data was checked, verified, collated, and submitted to GEBCO in February 2022 (Figure 1).

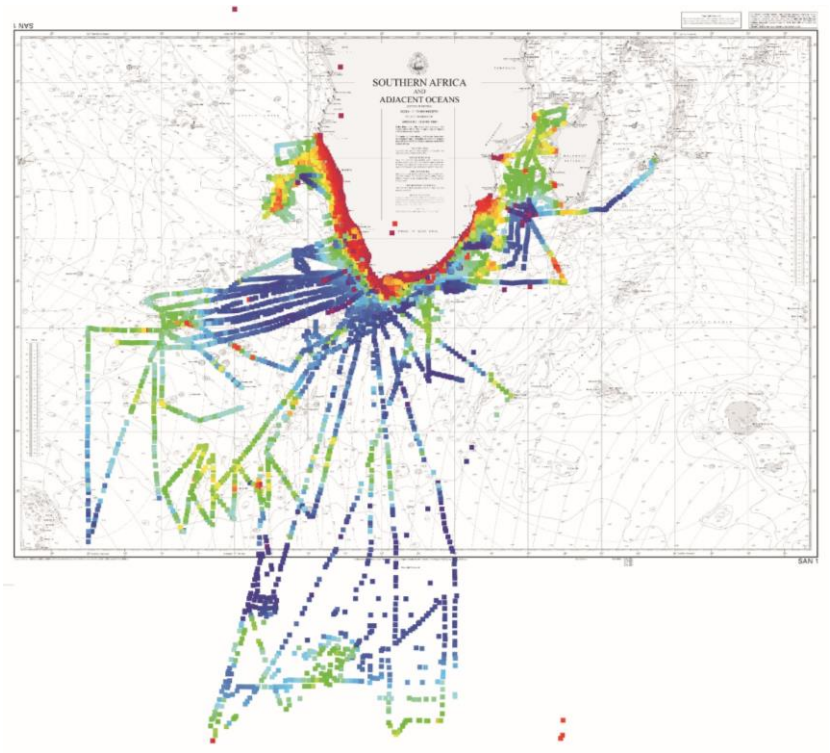

Figure 1.

d. Lessons learnt thus far.

i. Low/tentative responses from commercial fishing and offshore mining industries. This is driven by concerns over commercially sensitive information but they are trying to overcome this by continuing dialogue to show that data will be in safe custody, as well as developing a showcase model to help demonstrate the benefit.

ii. Lengthy decision making processes for participation approval makes it difficult to generate and maintain momentum.

iii. Limited off-the-shelf deployments. Most deployments are performing nearshore operations.

iv. SAIHC MS not committed to CSB yet.

v. Data acquisition and processing: variety of sensors presents variety of data formats, especially with TeamServ loggers. Python open source code adaptable to meet individual data string requirements for processing essential data, but at this point there is no “one code for all” solution.

vi. TeamServ USB reliability: 2/4 TeamServ loggers experienced faulty USB devices, resulting in 2nd M/V Edinburgh deployment data not being recorded. Solution is to replace TeamServ USBs with 16GB commercial off the shelf USB devices.

vii. Data quality: lack of calibration and sensor synchronisation presenting possible quality issues ito SP-44.

4. **Monaco Explorations - Indian Ocean Expedition**. Monaco Explorations conducted an Indian Ocean Expedition (Figure 2) from 03 October to 30 November 2022, with the Objective to

a. advise stakeholders through a holistic scientific approach (sustainability science);

b. share knowledge through an ambitious outreach programme; and

c. mobilize governments by making available information and analyses to support sustainable management of maritime areas.

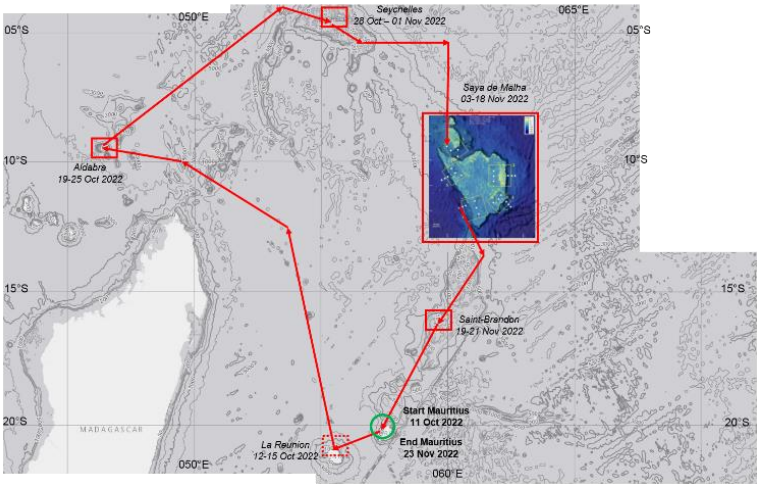

Figure 2.

The SANHO supported the expedition by assisting with the planning for the collection of bathymetric data as regional Seabed 2030 coordinator, in liaison with the Atlantic and Indian Oceans Regional Center. Passage soundings were collected from the S.A. Agulhas II (deep sea single beam echo sounder) throughout the expedition, and the SANHO is in the final stages of verifying the processed data iot submit the data to GEBCO/Seabed 2030 (Figure 3).

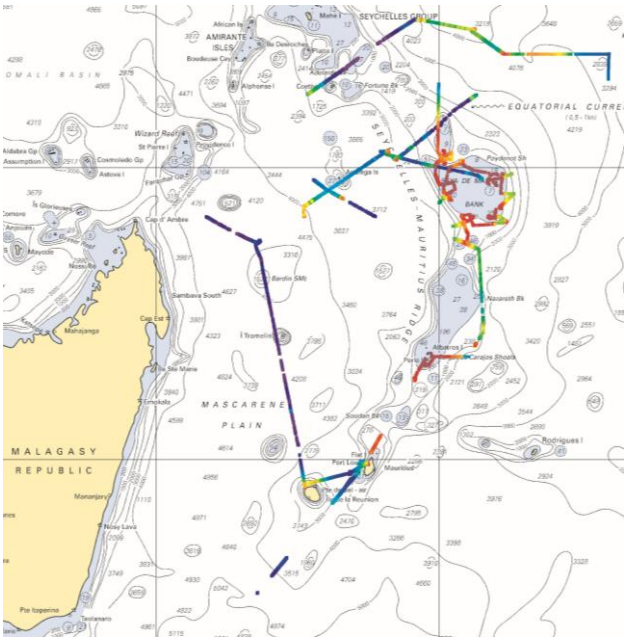

Figure 3.

CURRENT STATUS OF IMPLEMENTATION WITHIN SAIHC

5. Members States are encouraged to report CSB implementation as part of their national report and updates to be shared with the SAIHC CSB Coordinator.

IHO CSB ACTIVITIES

6. The IHO-CSBWG13 met in person on 9 – 12 January 2023. Key points to note from IHO-CSBWG13 as follows (full report to be noted and available on the IHO website):

a. Chair Report to IRCC14. The Chair went through the presentation made to IRCC14 and noted the actions that were requested of them. She highlighted the key component being the request for endorsement of B-12 Ed 3.0.0 ahead of submission to Member States (MS) for approval.

b. UN Decade of Ocean Science for Sustainable Development Calls for Action. The IHO Sec gave an update on the 4th call for action from the UN Decade of Ocean Science for Sustainable Development. He noted that the CSB initiative could be a good fit but that the deadline for submissions was the 31st January. He noted that this could be a significant piece of work as the work of the CSBWG is not programmatic in nature, so this structure would have to be developed before the proposal could be written. He suggested that this idea be parked until the strategy sessions had been completed as it may arise as an outcome of these deliberations.

c. B-12 review. The Chair noted that this was an action item from CSBWG12. The IHO Sec advised that there would have to be a clear rationale for releasing another CL on essentially the same topic, as the previous CL was still in force and could be referred to as required. There was a suggestion that a new CL should be sent because of the new version of B-12 and the change of CC0 license to DCDB. IHO Sec advised that if the group wished to go down this route the a request would have to be made to IRCC, but that he expected that the new addition of B-12 would not be enough of a justification and that the update to the licensing of data in DCDB was outside of the scope of the CSBWG. If a new CL is not advised, GM asked IHO DCDB to evaluate the handling of data licensing before B-12 3.0 and inform the WG in future meetings.

d. Strategy Session: Review of where we are today. Chair introduced the plan for the strategic planning. She introduced the session and explained the aim was to first take stock of where we are today and to have a baseline so that we are in a position to develop our plan going forwards. The chair went through the key tasks contained within the ToRs which are:

   i. Maintain the IHO publication B-12 – IHO Guidelines on Crowdsourced Bathymetry – through periodic reviews and updates identified by Member States;

   ii. Monitor Member State and Regional progress regarding development of best practices and CSB initiatives and incorporate into B-12 as appropriate;

   iii. Investigate and [highlight / promote] ways to increase data contributions and incentives on how and why mariners should become involved.

iv. Define potential uses of CSB for Hydrographic offices (HOs) with examples and useful land equivalents;

v. Provide guidance on data quality and standards for CSB in liaison with appropriate IHO Working Groups;

vi. Liaise with other relevant IHO subordinate bodies involved with CSB data to promote its use and development; and

vii. 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.

It was noted that there is no CSB definition in S-32. This is important to explain that this is not just data collection, rather its onward use for any purpose for which it is useful. It was noted that much has changed and that the ToRs may need to be updated following the strategic plan development. It was noted that the existing definition of CSB was necessarily narrow so that it didn't alienate some stakeholders. Having said this, there was acknowledgement that this could change over time, but care has to be taken not to lose the support of these groups. It was also noted that the key tasks don't obviously recognise the role of industry or the end users and that it would be useful to have wording that speaks to data collection currently broader or more sophisticated than our current definition.

e. Strategy Session: What has worked and what has not worked (yet). The Chair led the group through an exercise to identify what has worked well ito CSB and what has not, and the following results were captured and are to be noted:

Worked Well:

i. B12 developed;

ii. DCDB pipelines, initial trusted nodes, B-12;

iii. A consistent applied effort to include all relevant stake holders (HOs, industry, academia, etc);

iv. Establishment of CSB Coordinators for RHCs; CSB is a standing item on RHC annual reports/agendas;

v. Circular letters about acceptance of CSB raised the subject;

vi. Success in demonstrating how a successful project can be done (eg: Rob Beaman);

vii. It has been demonstrated that data collected can be done inexpensively (ie: WIBL);

viii. VTCs involved many more contributions to B12 - more transparent & inclusive.

What has not worked (yet):

i. The sensitivity of how CSB is regarded has put limitations on how it is defined;

ii. National positions have been applied globally;

iii. 7 years in and still struggling to get the word and the number of vessels to grow in data gathering;

iv. Providing a proof of concept show other HO's how to put CSB on the chart;

v. Getting CSB through HO validations processes;

vi. A best practices still doesn't exist;

vii. Covid effects;

viii. Inclusion of MBES and other valid sources of bathymetric data;

ix. Expanding beyond the single branch leader (eg: Fugro, PGS, Carnival);

x. Many coastal states still believe this data is proprietary;

xi. The answer to the question, "how can i participate in CSB gathering/contributing", is still too difficult to answer;

xii. Have not been able to tell the story what this data will actually be used for;

xiii. Providing feedback (including data) to contributors describing positive impact;

xiv. Not defined answer to "why is CSB important";

xv. Cooperation needs to improve between CSBWG, GEBCO, SB2030;

xvi. Buy in is one thing, once loggers have been installed, the interest and/or technical know-how is not always continuous;

xvii. Continuous feedback support and interest is often not maintained;

xviii. Do we need to revisit whether to use the phrase 'citizen science' more widely as well as 'CSB' to promote? Would people find this more relatable?

xix. Many MS look to their PCA for guidance/assistance. Focus has not been directed to the PCA.

f. Strategy Session: 5 Perceived barriers to CSB. Vice Chair introduced the session as to identifying perceived barriers to scaling CSB. This was an interactive session where participants were invited to brainstorm potential barriers. Following this exercise, 6 recurring themes were identified and discussed at length (please note full report for details):

i. National Policy/Lack of Government Support;

ii. Lack of HO resources/Low priority;

iii. Lack of a standard support system for Trusted Nodes;

iv. Technology: complex data cycle;

v. Communications;

vi. Unclear/Lack of rewards/Incentives.

g. Strategy Session: Analysis – Where should we go and why? Expected/Desired outputs. The Chair recapped the strategy sessions that was had so far and in light of the direction of travel, proposed an adjusted approach to completing this work from the plan indicated in the agenda. It was proposed that in one final session, the barriers, associated solutions and activities be reviewed to provide high level priorities for CSBWG which could then be used to define a new work plan. This list of high level priorities would then be compared against the existing ToRs to explore whether any changes would be required. This approach was agreed by the group. The Chair led the group through a prioritisation exercise which resulted in the following High Level Priorities:

i. Submit IHO CSB initiative as a UN Decade Action;

ii. Gather and prioritize HO-specific issues/opportunities regarding national policy/ regulations related to CSB;

iii. Gather and prioritize HO-specific issues relating to CSB data, including but not limited to Nautical Cartography;

iv. Support CSB/SB2030 Coordinators in their RHC engagement;

v. Discuss and propose potential software tool support for HOs;

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

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

viii. Develop a communication plan in coordination and collaboration with related efforts (SB2030, GEBCO, etc);

ix. Develop a recognition & incentive strategy plan;

x. Maintain and update B-12

h. Closing and notable action items for Member States. Encourage Member States to support the CSB initiative with positive actions, such as requiring all research vessels to collect bathymetric data for late uploading, when on passage or when it does not interfere with other research activities. CSB/Seabed 2030 RHC Coordinators provided updates and thoughts on CSB related activity in their RHCs, and the CSBWG13 report is to be noted for details.

i. IHO website: Check IHO website for documents and information.

ii. Circulate presentations, articles and papers on CSB to ensure consistent harmonized message is provided at events to advertise CSB, and identify opportunities to highlight CSB and its uses.

iii. Renew efforts to engage with administrations to try and achieve some level of data provision.

iv. Provide feedback on DCDB developments to allow further development and to highlight areas that could be improved to enhance the user experience.

v. Encourage all RHC Chairs to bring the IRCC CL 1/2020 to the attention of all coastal states within their respective RHC.

TRAINING AND CAPACITY BUILDING REQUIREMENTS AND OPPORTUNITIES

7. There is nothing new to report from a training perspective since SAIHC18. Please provide your training and capacity building requirements relating to CSB, either within the national report update, or through the SAIHC CSB Coordinator at hydrosan@iafrica.com

RELATED MSDI ACTIVITIES AND SUCCESSES

8. Nothing to report.

FUTURE INITIATIVES

9. Other than the Monaco Explorations expedition already noted, no other activities have been identified. Please provide your future CSB initiatives and requirements relating to CSB, either within the national report update, or directly through the SAIHC CSB Coordinator at hydrosan@iafrica.com

ACTIONS AND NEXT STEPS FOR SAIHC19

10. SAIHC19 is invited to:

    a. Note this annual CSB report.

    b. Consider and update the SAIHC CSB Coordinator on any CSB activity in the SAIHC region.

    c. Note the action items on all Member States from CSBWG13.

    d. Offer a positive response to the IHO or IRCC Circular Letters

    e. States not part of the CSBWG to consider joining and/or attending the CSBWG.

    f. Report the state of regional and national ocean mapping efforts to the SAIHC SCB Coordinator.