SAIHC20 CSB Annual Report 2024

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 on the 15th Crowd-Sourced Bathymetry Working Group (CSBWG15) 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.

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, ***this has remained unchanged since the previous report due to capacity constraints***. Stakeholders 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 no data from the two recreational boats. 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 0 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).

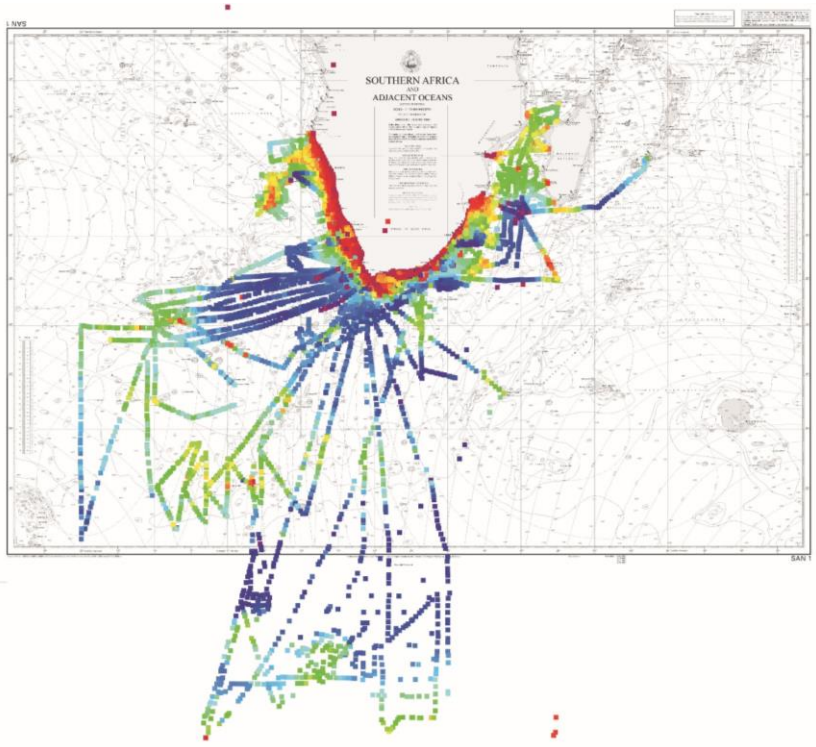

Figure 1.

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.

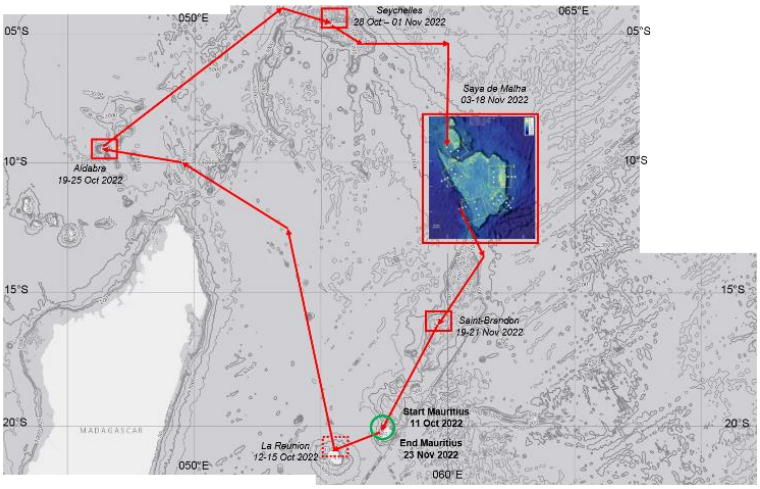

Figure 2.

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 verifying the data iot submit the data to GEBCO/Seabed 2030 (Figure 3).

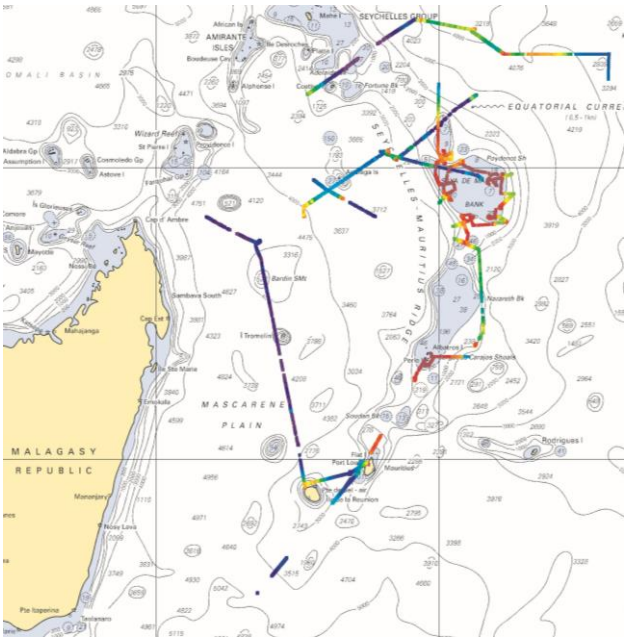

Figure 3.

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-CSBWG15 met over the period 4-6 April 2024 in Monaco and the event could also be attended online. Key points to note from IHO-CSBWG15 as follows (full report to be noted and available on the IHO website):

a. Opening Remarks by Chair. In highlighting key elements, the Chair introduced the new document, CSB 101, and mentioned it is open for feedback and recommendations from the team. The Chair reminded the group that they have agreed to meet in person once a year and conduct one video teleconference (VTC) intersession. It was noted that the current ToRs on the website need to be updated to reflect the new work plan.

b. IHO Website. Technical work is being done to update the URL and add it to the "about" drop-down on the IHO site. Current URL: https://iho.int/en/crowdsourced-bathymetry

c. IHO DCBD. The following were key elements from the report on DCDB activity:

   i. Data can now be accessed via API.Data can be reviewed prior to publication if required as per CL response.

   ii. The Autogrid application currently provides grids based on Multibeam data, with work in progress to include CSB data.

   iii. The next generation of the map viewer is also under development.

   iv. Member states were encouraged to give feedback on the above to the CSBWG (see full report).

d. Maintain and Update B-12. Having reviewed B-12 Ed. 3.0.0, it was noted that there are elements that are already out of date. It was indicated that a change is needed to the way B-12 (as a formal IHO Publication) is maintained/updated and the governance that covers this process. It was suggested that a far more agile approach was required and that a committee of experts spanning HOs, Industry and academia should be formed with a view to rapidly innovate. Members of the CSBWG who represent MS should investigate who could participate in such a group.

e. Submit IHO CSB Initiative as a UN Decade Action. At CSBWG14, the IHO Sec had been tasked to develop a proposal for the new structure of the CSB Initiative for consideration at CSWG15, noting that this is a precursor to considering how the CSB initiative could be formally aligned with the UN Decade. Options were presented and Option 2 was the preferred option. Option 1 would define the entirety of the CSBWG work plan as the CSB Initiative, whereas Option 2 would have a distinct CSB Initiative Work item (through which participants in the initiative would have access to the output of all of the work of the CSBWG). Following approval of the CSB Initiative structure by IRCC16, this will be investigated and brought back to the CSBWG for consideration.

f. Gather and Prioritise HO-specific Issues / Opportunities regarding National Policy / Regulations Related to CSB. Key discussion points centred around the amount of data that is currently filtered out in the DCDB due to lack of permissions given by MS for data release in waters under national jurisdiction, and the interpretation of the MSR provisions within UNCLOS.

g. Gather and Prioritise HO-specific Issues. Key takeaways were as follows (see full report for details):

   i. API access and data review processes have been improved.

   ii. Industry and technical engagements are ongoing to enhance tools and data usability.

   iii. Emphasis on quality assurance and data rescue efforts to maximize the use of available data.

   iv. Development of analytical tools and dashboards for better transparency and decision-making support.

h. Support CSB/SB2030 Coordinators in their RHC Engagement. The CSB/ SB 2030 Coordinator role and responsibilities update is complete. The need for tailored support in different regions is recognised and it is planned to raise awareness of CSB in the IHO Capacity Building Subcommittee, focussing on capacity building initiatives. MS to note the full report for details.

i. Discuss & Propose Potential Software Tool Support for HOs. B-12 had been reviewed to identify areas where software solutions could help with participation or implementation of CSB within HOs. MS to note the full report for details.

j. Clarify Support Identified by Current Trusted Nodes needed for Current and Future Trusted Nodes. Tools were starting to be published under open libraries that can be integrated into hydrographers tools. There is a focus on the creation and publication of an open-source uncertainty model and maintaining a free portal to showcase CSB partners and projects. There was acknowledgment of the work with indigenous communities, noting that data from First Nations can be politically sensitive. The importance of lowering barriers to entry by making more open-source software available, making it easier to deploy TN solutions without needing to understand the specifics of B-12 was emphasised. The importance of having drafts reviewed by the WG was highlighted as was ensuring that SB2030/IHO/GEBCO have copies to share with new TNs.

k. Clarify all aspects of the CSB Data Cycle and capture Known Issues, Requirements and Suggested Enhancements. A prioritized list of the CSB life cycle, highlighting the challenges posed by the current pace of development compared to the IHO approval process was presented and various tools currently being developed, including filters, processing tools, and correcting tools were discussed. Such tools could enable interested parties to develop custom CSB ingest pipelines, tailored to their specific needs. A workshop alongside CSBWG16 will be organised to explore how to work with various tools.

l. Develop a Communication Plan in Coordination and Collaboration with Related Efforts (SB2030, GEBCO, etc). The WG were requested to provide input, brainstorming outreach and communication materials that could be improved, identifying any products or infrastructure they could leverage, and sharing

information about any upcoming products or efforts. Upcoming work included further development and refinement of the Communications and Outreach Strategy.

m. Develop a Recognition and Incentive Strategy Plan. Two questionnaires have been circulated via the "gebco_folk" distribution list and an IHO LinkedIn post. Everyone is encouraged to be responsive to the questionnaires and distribute them widely as lack of responses is a significant risk. Results will be summarised and analysed at the next meeting.

n. Seabed2030 and CSB Update. SB2030 global centre acts as a Trusted Node (TN) for data collected by CSB. They have implemented CCOM's code, which documents and inputs metadata, and creates geojson files with some quality control information.

o. CSBWG/Seabed 2030/SO-SI collaboration. Development of a shipping focused 2 page flyer by World Ocean Council is an area of collaboration with the CSBWG.

p. Data Quality Working Group Update. MS to note the proposal for improving CATZOC Values in the Report.

q. Date and Venue of Next Meeting. The next CSWG16 meeting will be held in Wellington, New Zealand 24 – 28 March 2025.

TRAINING AND CAPACITY BUILDING REQUIREMENTS AND OPPORTUNITIES

7. There is nothing new to report from a training perspective since SAIHC19. 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. 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 CSBWG15.

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

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 CSB Coordinator.