

IHO DATA CENTRE FOR DIGITAL BATHYMETRY REPORT

Submitted by Director IHO DCDB

SUMMARY

Executive Summary: This document provides details of the work of the IHO DCDB, new/significant data contributors, an update on the ongoing development program to enhance the interfaces and data management capabilities of the DCDB as well as a general update on the work being undertaken by the CSBWG.

Action to be taken: See paragraph 7

Related documents: IHO CL23-1990 on Establishment of the DCDB;
2023 MOU between NOAA & the IHO To Cooperate on the Data Centre for Digital Bathymetry;
IHO CSB Guidance Document (B-12) Edition 3.0.0

1. Overview/Introduction

The IHO's Data Centre for Digital Bathymetry, which is hosted by NOAA, was established in 1990 to ensure that an international repository existed that would accept, manage, archive and share, freely and without restrictions, depth data contributed by hydrographic, oceanographic, and other vessels. The DCDB strongly encourages IHO Member States and other organizations to contribute their bathymetric data and metadata in a variety of standard formats and to work with DCDB data managers to determine the best way to get data to the repository. As the official repository for the IHO, the DCDB plays a pivotal role in the success of the IHO Crowdsourced Bathymetry Initiative and GEBCO.

2. **Data Contributors**

In 2023, the DCDB has archived multibeam bathymetry data from ~80 surveys from the following data providers:

- U.S. Academic Research Fleet (ARF): 54 surveys
- NOAA Fleet: 23 surveys
- Canadian Hydrographic Service: 2 surveys
- GEOMAR: 1 survey
- Northwestern Michigan College: 1 survey
- Peru Navy: 1 survey

Over the last year, the DCDB continued to bring in crowdsourced bathymetry data from Rosepoint Navigation System, FarSounder Inc, PGS and MacGregor Germany. New data transfer pipelines were established with M2Ocean, Great Lakes Observing System (GLOS), Orange Force Marine and GEC Aqua Map. Onboarding is underway with The Interdisciplinary Center for Development in Ocean Mapping (CIDCO), DockTech, Seabed 2030, International SeaKeepers, UNH/CCOM, SeaID, COMIT and NOAA.

3. IHO DCDB Enhancements

Improved Map Viewer:

Once the contributed bathymetric data have been archived, they are made discoverable and accessible through the DCDB web map viewer (ncei.noaa.gov/maps/iho_dcdb/).

Improvements and updates to the viewer over the last year include:

- Added DEPARTURE/ARRIVAL PORT for multibeam popup
- CSB legend was updated to demonstrate age of file, rather than provider, within color scale.
- New [CSB vector tile layer](#) created (hosted in ArcGIS Online) which provides a fast-drawing view of the CSB lines.
- Web Services - Updates:
 - Switched to Canada NONNA WMTS
 - Updated to new GEBCO_2023 Basemap & Type Identifier (TID) grid (Bathymetric Coverage Maps).
- Web Services - New:
 - Norway added: MAREANO was moved from under EmodNet to be a standalone.
 - Added IHO Regional Hydrographic Commissions ([RHC](#)) boundaries to DCDB viewer (Options)

CSB-specific Enhancements:

Software developers have focused their effort this last year on finalizing and testing *The Crowdsourced Bathymetry Coastal State Review Application*. The intent of the CSB CSRA is to provide a process for coastal states who have requested pre-approval of CSB data collected within waters of their national jurisdiction before the public distribution from the DCDB.

This application is currently being tested by colleagues at the Danish and Australian Hydrographic Offices. The DCDB plans to have this application in operation by the end of 2023.

Planned DCDB Enhancements:

In response to the growing data demands from the Seabed 2030 project and IHO CSB initiative, the DCDB has focused the last several years on rebuilding its infrastructure and enhancing its interface to provide more streamlined data ingest, archiving, discovery, display and retrieval of global bathymetric data. These new ingest-to-archive data pipelines will allow for improved reliability, greater ease in ingesting new data, greater flexibility in allowed data formats and simplified data delivery. Over the next year, additional enhancements will focus on:

Multibeam Bathymetry:

- Finalizing the migration of the current (outdated, inflexible) database to the new schema to enable a better system for:
 - Versioning of processed swath files
 - Discovery of ancillary files
 - Improved tracking of complex metadata, including multiple source institutions for surveys.
 - Indicating polygons of extent of coverage

Crowdsourced Bathymetry

- Operationalizing the Crowdsourced Bathymetry Coastal State Review Application.
- Improving the granularity and precision of the CSB geographic mask.
 - Will involve masking only the subset of a given submission which intersects with restricted areas.

- o May also include ability to take different actions with the embargoed data depending on the member state's requirements.
- Improve data visualization
 - o Currently experimenting with various ways to improve the display of point data

AutoGrid

The current version of AutoGrid is a web application which accepts the user's area of interest, cell size, and grid format and then asynchronously produces a custom data grid from the multibeam archive. AutoGrid 2.0 will run in the cloud (AWS) and include multibeam and CSB data (with eventual expansion to include singlebeam and possibly lidar).

4. IHO CSB Working Group Update

In the last year, the number of positive IHO Member State respondents to CL21/2020 has risen to 34 with the addition of France, Australia and Palau. While momentum seems to be growing, there is still the need to consider how to work within the MSR constraints of UNLCLOS within waters under national jurisdiction.

CSBWG13

The working group held its 13th meeting (hybrid), from 10-12 January 2023, hosted by NOAA in Boulder, Colorado, U.S.A. The meeting was led by the Chair and Vice-Chair and attended by ~50 participants (25 in person, ~30 virtual). IHO Assistant Director Sam Harper (Secretary) represented the IHO Secretariat.

Following the publication of B-12 Ed. 3.0.0 (which has been the major focus of the CSBWG for the last three years), CSBWG13 focused on a critical review of the group's operating mandate, as set out in the ToRs and RoPs. To achieve this, the CSBWG undertook a number of strategic planning sessions to take stock of the current status quo, review what has worked well and what has not, identify barriers to scaling CSB and build an evidence base to inform future decision making. In doing so, the CSBWG were able to explore potential solutions to overcome these barriers and identify ten high level priority work areas which were used as the basis to develop a new Work Plan. In turn, this work plan was cross referenced with the WGs existing ToRs and an updated version was presented to the IHO IRCC for approval - which was obtained.

New work items include:

- A. Maintain and update IHO CSB Guidance Document (B-12)
- B. Submit IHO CSB initiative as a UN Decade Action
- C. Gather, prioritize and respond to HO-specific issues/opportunities regarding national policy/regulations related to CSB
- D. Gather and prioritize HO-specific issues relating to CSB data, including but not limited to Nautical Cartography
- E. Support CSB/SB2030 Coordinators in their RHC engagement
- F. Discuss and propose potential software tool support for HOs
- G. Clarify support identified by current Trusted Nodes needed for current and future Trusted Nodes.
- H. Clarify all aspects of the CSB data cycle and capture known issues, requirements and suggested enhancements.
- I. Develop a communication plan in coordination and collaboration with related efforts (SB2030, GEBCO, etc)
- J. Develop a recognition & incentive strategy plan

CSBWG14

The working group held its 14th meeting (hybrid), from 16-18 August, hosted by the Norwegian Mapping Authority in Stavanger, Norway. The meeting was led by the Chair and Vice-Chair and attended by ~50 participants (30 in person, ~20 virtual). IHO Assistant Director Sam Harper (Secretary) represented the IHO Secretariat. Following the approval of an updated ToR, the group officially shifted their focus to outreach and engagement of hydrographic offices and to better supporting non-professional mariners in collecting and contributing CSB data. Eleven sub-groups provided updates on their progress in the last eight months.

The CSBWG continues to enjoy strong industry participation and this is reflected in the membership of the group.

5. DCDB & Seabed 2030 Coordination

The DCDB Director meets monthly with the Seabed 2030 Director and Administrator. These meetings allow for communication and coordination on several ongoing Seabed 2030-funded CSB activities. Through partnership with and funding by the NF-GEBCO Seabed 2030 Project, data loggers have been purchased and distributed to numerous CSB projects. The intent is for this to be a great way to (1) collect data in underserved areas, (2) grow excitement about the CSB initiative, (3) develop a repeatable regional CSB mapping project strategy. The programs listed below continue to progress and are described in more detail in the Seabed 2030 report:

- The Institute for Marine Technology & the South African Navy Hydrographic Office
- Greenland Institute of Natural Resources
- Palau Bureau of Marine Transportation
- Tall Ship Pelican of London
- Lisa Blair Sails the World
- Several NIWA-led activities offshore New Zealand
- International SeaKeepers Society*

*Seakeepers is currently working with the Seabed 2030 Global Center and the DCDB to become a formal Trusted Node (trusted data provider).

6. Any Other Items of Note

During the 2023 IHO Assembly, Secretary General Dr. Mathias Jonas announced the signing of a Memorandum of Understanding with the United States' National Oceanic and Atmospheric Administration (NOAA). With the signing of this MoU, both parties reaffirmed their commitment to the international community through this key element of the global data infrastructure.

Dr. Rick Spinrad, NOAA Administrator and Under Secretary of Commerce for Oceans and Atmosphere, and IHO Secretary General Dr. Mathias Jonas signed the MoU. During the IHO Assembly, the signing of the MoU was recognized by Dr. Jonas and Rear Admiral Benjamin Evans, U.S. National Hydrographer and Director of NOAA's Office of Coast Survey.

7. Actions

The GGC is requested to:

- a. **Note** the contents of this report;
- b. **Take** any other action deemed appropriate.