

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 and relevant activities of the AORA.

Action to be taken: See paragraph 7

Related documents: IHO Circular Letter 25/2022: CALL FOR THE APPROVAL OF EDITION 6.1.0 of S-44 - IHO STANDARDS FOR HYDROGRAPHIC SURVEYS AND EDITION 3.0.0 OF B-12 – GUIDANCE FOR CROWDSOURCED BATHYMETRY

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, AORA activities, and GEBCO.

2. **Data Contributors**

In the last year, the DCDB has archived multibeam bathymetry data from 206 surveys and 24 sources. The largest data providers to the DCDB continue to be the U.S. Academic Research Fleet (ARF) with 55 archived in 2022. Additional significant data contributions to the DCDB in 2022 include:

- NOAA - 15 surveys
- Fugro - 28 surveys
- LDEO MGDS - 18 surveys
- Caladan/Five Deeps - 73 surveys

Over the last year, the DCDB continued to bring in crowdsourced bathymetry data from Rosepoint Navigation System, FarSounder Inc, PGS and MacGregor Germany. A new pipeline was established with the Great Lakes Observing System (GLOS) and discussions and data transfer testing are currently underway with Navico C-Map, M2Ocean and Aquamap.

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Once the contributed bathymetric data have been archived, they are made discoverable and accessible through the DCDB web map viewer.

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

- New url: ncei.noaa.gov/maps/iho_dcdb/
- Added DEPARTURE/ARRIVAL PORT for Multibeam Data popup
- Web Services - Updates:
 - GEBCO basemap/contours - labels/text in viewer updated to GEBCO_2022
 - Updated Canada NONNA WMS URL, GEBCO_2022 TID service
 - Added several new and updated AusSeabed compilations layers (Australia).
 - Point to new WMS endpoints for Netherlands Caribbean grids
 - Added new GEBCO_2021 Type Identifier (TID) grid (Bathymetric Coverage Maps).
- Web Services - New:
 - Added IHO Regional Hydrographic Commission (RHC) boundaries
 - Saildrone Multibeam Coverage Polygons
 - Land Information New Zealand (LINZ) bathymetric data layers
 - UKHO Bathymetric Survey Coverage (view only)
 - IFREMER raw Multibeam layer (view only)
 - Alfred Wegener Institute processed multibeam data coverage
 - PANGEA processed and raw bathymetry data and footprints
 - Global Maritime Traffic Density Service
- “Grid Extract” added to the viewer:
 - Grid Extract 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 (GeoTIFF) from either the "Multibeam Mosaic" or "Multibeam Mosaic Hillshade."

CSB-specific Enhancements:

Software developers at the DCDB spent several months in 2021 and 2022 performing a major overhaul of the CSB data ingest-extract-archive pipeline. The work took into account the lessons learnt over the past few years with the intent to provide a better service, improved functionalities and an enhanced user experience. This new infrastructure was deployed in summer, 2022. All CSB files have been reprocessed and a major update to the map viewer now allows for faster drawing of CSB tracklines.

As the CSB initiative grows, the DCDB has also been working to develop beyond its current basic file management capabilities to a continuous point store hosted in the cloud. The CSB data are currently available either through the [NOAA Big Data Program](#) or through the DCDB viewer. Moving to the cloud now allows for CSB data to be stored as a seamless collection of points. The end user can now query this point store to extract just the data of interest and request that a grid be created from the results.

Planned DCDB Enhancements:

Over the next year, additional enhancements will focus on:

- Currently underway:
 - Completion of 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 backscatter and ancillary files
 - Indicating polygons of extent of coverage
 - Deployment of the new multibeam ingest pipeline which will result in improved

automation and flexibility

- Development of a coastal state pre-approval portal for CSB data.
- Complete the update of [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 (eventually singlebeam and possibly lidar).

4. IHO CSB Working Group Update

CSBWG12

The working group held its 12th meeting (virtual), from 7-10 March 2022, hosted by the IHO Secretariat in Monaco. The meeting was led by the Chair and Vice-Chair and attended by over 55 participants. The focus of the meeting, which was hosted by the IHO Secretariat and attended by a few WG members including the Chair, was to further progress the work on finishing the new edition of B-12.

B-12

The primary of the meeting was to gather final consensus on B-12 where possible, identify which issues required further work, dedicate discussions and proposals on those issues, and aim to seek consensus. This was achieved. The CSBWG agreed to put B-12 to the WG for endorsement following final incorporation of the latest edits and suggestions.

Messaging & Outreach

Day 4 provided a small opportunity to discuss IHO Regional Hydrographic Commission (RHC) Seabed 2030/CSB Coordinator and CSB Project updates.

Other Business

It was greatly acknowledged that the one year focus on B-12 had prevented the CSBWG from having substantial discussions on other topics - specifically on the details of the CSB-related work that is ongoing by many of the expert contributors on the WG. It was suggested that intersessional webinars could be organized, dedicated to these and other topics.

B-12 Guidance on Crowdsourced Bathymetry Endorsement

Following CSBWG12, decisions and edits were incorporated into B-12 and sent to the CSBWG for final review and endorsement. The WG was given two weeks to provide endorsement using silent procedure. The CSBWG has endorsed B-12 IHO Guidance on Crowdsourced Bathymetry Edition 3.0.0. In June 2022, the IHO Inter-Regional Coordination Committee (IRCC) also endorsed Edition 3.0.0. IHO Circular Letter 25/2022 was sent to IHO Member States in late June calling for the approval of Edition 3.0.0. Responses were requested by no later than 01 October 2022. Review of those responses are currently underway.

5. DCDB & Seabed 2030 Coordination

The DCDB Director meets monthly with both the Seabed 2030 Director and Development Coordinator. These meetings allow for communication and coordination on several ongoing Seabed 2030-funded CSB activities. Through partnership with and funding by the NF-GEBSCO Seabed 2030 Project, a supply of generic 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. Obviously, due to COVID-19, the speed in which the data loggers were ordered and distributed was greatly impacted and the roll

out of these loggers to the communities is expected to also be severely delayed. However, the programs listed below are progressing:

- 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

6. AORA Activities

Though there has been a several year hiatus of Atlantic Seabed Mapping International Working Group (ASMIWG) meetings, AORA-related activities do continue. They include:

- A framework report for Atlantic Bathymetry and Benthic Mapping submitted for H2020 Mission Atlantic project.
- ASMIWG & Mission Atlantic mapping activity and progress presented to International Seabed Authority UN World Oceans Day conference
- ASMIWG & Mission Atlantic mapping activity and progress presented to European Hydrographic Offices at EU DG MARE event in celebration to 10th anniversary of partnership with IHO on seabed mapping.
- Mission Atlantic report presented alongside Seabed 2030 at the Eurofleets+ workshop on seabed mapping

7. Actions

The GGC is requested to:

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