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, an update on the ongoing development programme to enhance the interfaces and digital 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: [Insert paragraph number in document where actions are requested]

Related documents: [Insert details of relevant documents or state "None"]

1. IHO DCDB Enhancements

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.

CSB-related Enhancements:

In 2014, the IHO, at its Fifth Extraordinary International Hydrographic Conference, recognized that traditional survey vessels alone should not be relied upon to solve data deficiency issues and agreed there was a need to encourage and support all mariners in an effort to "map the gaps". And so, the IHO initiated an international collaborative project to support and enable mariners and professionally manned vessels to collect crowdsourced bathymetry as part of their "passage sounding"

With the rollout of this collaborative project, the DCDB saw the need to enhance its existing infrastructure to streamline the ingestion of CSB, and to improve the data viewing, data discovery and data download capabilities. The pilot work was accomplished with the help of two collaborative partners: Rosepoint Navigation Systems and SeaID.

Over the last 2 years, the DCDB and NOAA have teamed up with Rosepoint Navigation Systems to provide mariners that use Rosepoint software an option to enable CSB logging. In doing so, a modified electronic charting system log file could record position, depth, and time. The mariner can then choose to remain anonymous or to submit metadata about their vessel and equipment. After the mariners have uploaded their log files to Rosepoint, Rosepoint (serving as what we call a "trusted node" or data aggregator) then posts these files to the DCDB where they are archived and made available to the public through the DCDB web map

viewer. The intent is that these data, like all data submitted to the DCDB, would NOT necessarily be "harmonised" or reviewed but would reside in the DCDB "as is". It would remain up to the users to determine their value and utility for their own purpose.

In this way, the fundamental data that reside in the DCDB serve as the world reference raw bathymetric data set which can be used as the basis for refined and processed products such as the GEBCO bathymetric grids.

Improved Map Viewer:
Once the contributed bathymetric data has been archived, it is made discoverable and accessible through the DCDB web map viewer. Improvements to the viewer over the last year include the addition of the following web services:

- The gridded bathymetric data coverage of Lamont's GMRT (Global Multi-Resolution Topography synthesis) grid
- EMODnet's bathymetric data holdings
- The data collected by the IHO Crowdsourced bathymetry pilot project.

Future Enhancements:
Over the next year, future enhancements will likely include:

- Expanding beyond the pilot project to include more trusted data providers in the CSB project.
- Continue to refine and improve the data upload and download pipelines at the DCDB
- Research the potential implementation of point storage technology to better handle the large volumes of points that are expected to be received.

2. CSB Working Group Update

The Crowdsourced Bathymetry Working Group (CSBWG), chaired by the Director of the IHO DCDB, is tasked by the Inter-Regional Coordination Committee (IRCC) to develop a draft IHO publication on policy for trusted crowdsourced bathymetry (CSB). This CSB Guidance Document will provide guidelines on the collection and assessment of CSB data for inclusion in the global bathymetric data set which is maintained in the IHO Data Centre for Digital Bathymetry (DCDB). A draft of the Guidance Document has been completed and made available via the IHO website to the public.

CSBWG3:
The working group held its third meeting at the offices of the Leibniz Institute for Baltic Sea Research (IOW) in Warnemünde, Germany on 7 and 8 November 2016. The Chair of the CSBWG, Ms Jennifer Jencks (USA, Director of the DCDB), chaired the meeting which was attended by representatives from ten Member States (Canada, Denmark, Finland, France, Germany, India, Italy, Norway, Portugal and USA), and observers and expert contributors from SevenCs and Sea-ID. Secretary General Robert Ward and Assistant Director David Wyatt represented the IHO Secretariat. Mr Serge Gosselin (Canada) was elected as vice-Chair of the Working Group to occupy the previously vacant position.

At the meeting the CSBWG received verbal reports from the coordinators of its Correspondence Groups that had been tasked with drafting specific sections of the IHO CSB Guidance Document. During the meeting the various draft sections of the Guidance Document were developed further. It was agreed that an initial draft version will be circulated to IHO Member States and targeted stakeholders for their comments in preparation for the

presentation of a final draft to the IRCC at its 9th meeting in Paramaribo, Suriname, in June 2017.

CSBWG4:
The working group held its fourth meeting at the Center for Coastal and Ocean Mapping & NOAA/UNH Joint Hydrographic Center University of New Hampshire, Durham, United States on 13 and 14 February 2017. The Chair of the CSBWG, Ms Jennifer Jencks, chaired the meeting, which was attended by representatives from six Member States (Canada, Italy, Nigeria, Norway, Philippines and USA), and observers and expert contributors from GMATEK, Inc./World Maritime University and Sea-ID. Secretary General Robert Ward and Assistant Director David Wyatt represented the IHO Secretariat.

At the fourth meeting, the CSBWG received verbal reports from the coordinators of its correspondence groups that had been tasked with drafting specific sections of the Guidance Document. During the meeting the various draft sections of the document were developed further. An initial draft version of the Guidance Document has been made available to targeted stakeholders for comment prior to the presentation of a first draft to the IRCC at its 9th meeting in Paramaribo, Suriname, in June 2017. Subject to the agreement of the IRCC, this will be followed by a formal public consultation period leading to the submission of a final proposed text to the 10th meeting of the IRCC (IRCC10) in 2018, consideration by the IHO Council at its 2nd meeting and subsequent adoption by the IHO Member States towards the end of 2018.

CSBWG5:
The fifth meeting of the CSBWG is scheduled for December 2017 at the IHO in Monaco where the goal will be finalize the CSB Guiding Document (or B-12) - as it is now formally draft "IHO Publication B-12 – IHO Guidance on Crowdsourced Bathymetry". A final version will need to be ready and available by early 2018 so it can be submitted to IRCC10 and subsequently to Council2 prior to circulation to IHO Member States for formal adoption as B-12 Edition 1.0.0. Specific goals and outcomes for the meeting include:

1. Review B-12, including all external comments received. Chapter leads and editor to reconcile them against current content and advise on suitability for inclusion.

2. Discuss future B-12 formats and access aiming to ease the document's use and relevance among the maritime community. This might include a simple-to-navigate web document and/or a one to two page executive summary document that could direct the reader to the appropriate section of B-12 for the necessary details.

3. AORA Activities

The Atlantic Seabed Mapping International Working Group (ASMIWG) is one of three working groups focused on implementing the Galway Statement on Atlantic Ocean Cooperation, signed by the European Union, Canada, and the United States in May 2013. The intent of the Galway Statement is to foster cooperation and increase knowledge of the Atlantic Ocean through improved coordination and collaboration in ocean observation efforts.

A subset of the working group was tasked to develop a cohesive seabed mapping strategy for the Atlantic Ocean. The aim of the study was to develop a reproducible process for identifying and evaluating potential target areas within the North Atlantic that represent

suitable sites for future bathymetric surveys. The sites were selected by applying a GIS-based suitability analysis that included specific user group-based parameters of the marine environment. Furthermore, information regarding current data coverage were gathered to take into account in the selection process. The results reveal the suitability of sites within the North Atlantic based on the selected criteria. Three potential target sites should be seen as flexible suggestions for future mapping initiatives rather than a rigid, defined set of areas. This methodology can be adjusted to other areas of interest and can include a variety of parameters based on stakeholder interest. Further, this work only included accessible and displayable information about multibeam data coverage and would certainly benefit from more easily available and discoverable data sets or at least from location information.

This work has been submitted to The Journal of Ocean Technology for the upcoming winter issue, JOT: Mapping the Deep.

ASMIWG7:
The working group held its seventh meeting at the Center for Coastal and Ocean Mapping & NOAA/UNH Joint Hydrographic Center University of New Hampshire, Durham, United States on 15 and 16 February 2017.

4th Meeting of the Galway Statement Implementation Committee:
The fourth Galway Statement Implementation Committee meeting was hosted by the U.S. Department of State, Washington D.C., United States on 6 and 7 April 2017 and attended by the tri-partite co-chairs from the U.S., EU, and Canada. The ASMIWG chair provided a summary overview of the activities of the ASMIWG and deliverables to date. The IHO DCDB Director gave a presentation on the process for Selection of Pilot Areas for Seabed Mapping in the North Atlantic with associated options and estimated costs. In principle the co-chairs were highly supportive of the proposed pilot. With further evolution of the proposal the pilot could be well situated for consideration under future funding programs (e.g. Horizon 2020, DFO's Partnership Fund, etc.)

ASMIWG8:
The working group held its eighth meeting at the Bedford Institute of Oceanography (BIO) located in Halifax, Nova Scotia, Canada on 10 and 11 October 2017.

4. Miscellaneous

Notable New Data Contributor to DCDB:
Fugro Marine GeoServices has been in conversation with the IHO DCDB for the last year regarding the establishment of a data pipeline. Over the last three years, Fugro has acquired 800GB of bathy and water column data during vessel transits that have asked be archived and made available to the public. DCDB data managers have been evaluating the initial data delivery to identify metadata gaps and offer suggestions for improved data packaging (eg: file naming/folder structure) that will allow Fugro to provide a more complete product. This will ultimately allow Fugro to identify a workflow and delivery method that will promote consistency across their entire fleet.

5. Actions
The GGC is requested to note the contents of this report and take action as deemed necessary.