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International Hydrographic Organization

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CITIZEN SOURCED DATA

HELP REVEAL THE DEEP AND SHARE YOUR DATA

CROWDSOURCED DEPTH INFORMATION

Commercially and privately owned vessels are being asked to help increase our knowledge of the ocean and coastal regions by sharing depth measurements from navigation instruments while out at sea. Known as Crowdsourced Bathymetry (CSB), this information can help identify uncharted features, assist in verifying charted information with appropriate category zones of confidence, and help confirm that existing charts are appropriate for the latest traffic patterns.

HYDROGRAPHIC OFFICES have always used data collected from non-survey vessels, historically referred to as passage sounding data. The IHO CSB Initiative is encouraging volunteer observers who operate vessels-of-opportunity using modern technology to collect data in areas where surveys are poor, inadequate, non-existent or where the seafloor is changeable and hydrographic assets may not be readily available. The intent is for these data to be provided to the entire marine geospatial community, through the IHO Data Centre for Digital Bathymetry (IHO DCDB), and incorporated into the publicly available GEBCO global grid.

All types of bathymetric data archived at the IHO DCDB, which has been a source for HOs for decades, are available to the public without restrictions. Although CSB data is of variable quality, it can still be of use to HOs. Each office will have to make their own determination: to use the data directly, to assist with survey planning, to find inconsistencies in products, to monitor mobile seabed areas, etc.

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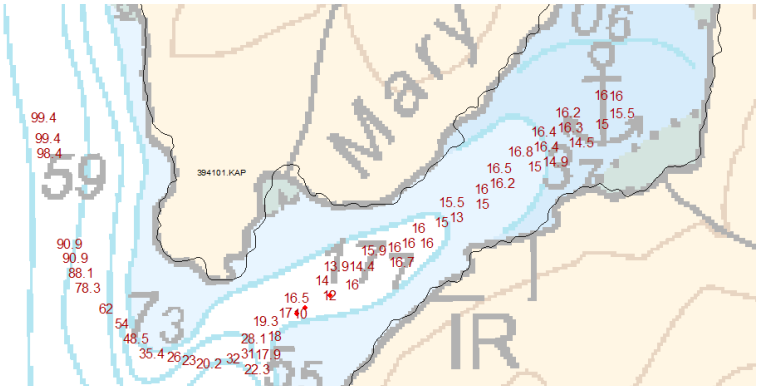
WORKING WITH CSB DATA

CSB data will not replace systematic survey data. The accuracy of most CSB data for charting use would be considered as Catzoc C & D, as well as being quantifiable in the new edition of S-44. Most CSB data will be low accuracy, but if it can be described by standards then it is possible for it to be considered appropriately alongside more accurate data. CSB does have the potential to generate large volumes of data, but is just one of the many new types of data that HOs must learn to process. New approaches to managing and cleaning data, such as automated tools and artificial intelligence, will need to be developed and adopted to make the most of CSB data. Once data volumes start to increase, it is anticipated that co-located (ie: repeated) data will allow increased confidence in the data and expand potential uses.

WHY SHOULD HYDROGRAPHIC OFFICES HELP AND HOW?

Crowdsourced bathymetry contributes to safe navigation in areas of high change, sparse coverage and helps focus limited survey and charting resources. All bathymetric data, including CSB, is crucial in supporting global efforts such as the Nippon Foundation-GEBCO Seabed 2030 Project, which in turn supports UN Decade of Ocean Science for Sustainable Development goals. It is therefore important for HOs to support and promote CSB initiatives both globally and within national waters, championing CSB within their government.

In line with the objectives of IHO resolution 1/2017 to improve the availability of bathymetric data worldwide, the IHO is encouraging HOs to respond positively to IHO CL 21/2020, IRCC CL 1/2020 and to join the IHO CSB Working Group **(contact: bathydata@iho.int)**. Approximately a third of IHO Member States are already supporting the public release of CSB data collected within their waters. The IHO document detailing member states positions can be found here: **https://iho.int/en/csbwg**



The Canadian Hydrographic Service (CHS) has used CSB to update several Inside Passage charts along the coastal routes stretching from Seattle, Washington, to Juneau, Alaska. A systematic comparison of charted depths less than 10 m yielded improved charted channel depths, data density and improved chart compilation in areas that were surveyed with singlebeam. CSB helped prioritize survey areas for the following survey season and initiated the publication of Notices to Mariners.

BECOME A 'TRUSTED NODE'

The IHO DCDB accepts CSB data contributions through organizations, companies or universities that serve as data aggregators and / or liaisons between mariners (data collectors) and the DCDB. These "trusted nodes" help the CSB effort in a variety of ways ranging from providing technical support, downloading data from data loggers, aggregating collected data, and facilitating data transfer directly to the IHO DCDB.
A hydrographic office would be a natural "trusted node", in a position to select what data to contribute to the IHO DCDB while maintaining its independence and direct contact with its maritime community.
The IHO CSB Working Group has input from the maritime community and it is clear that mariners are interested in obtaining as much data as possible on products as quickly as possible and CSB data should play a part in this. Companies are currently developing ways of collecting and displaying CSB data on ECDIS. Only by embracing the IHO CSB Initiative will HOs get the most from this important source of data. Additional information can be found in the IHO B12 Guidance on CSB document:
iho.int/en/bathymetric-publications.

NOAA's Bay Hydro II crowdsourced bathymetry test tracks in green overlaid on multibeam survey data demonstrates how changes can be detected.

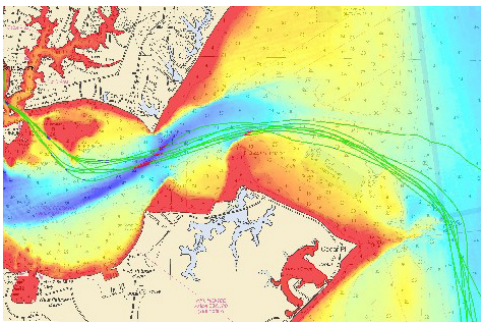
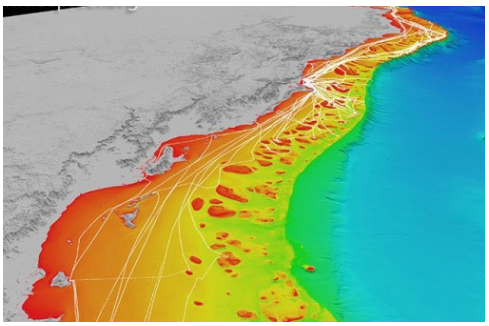


Image courtesy of NOAA

3D view of northern Great Barrier Reef showing all vessel tracks as of December 2019.



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1921–2021

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