

A world map showing bathymetry (ocean depths) in shades of blue, with landmasses in green and brown. The map is centered on the Atlantic Ocean. Overlaid on the map is the title text.

Crowdsourced Bathymetry initiative and request for DQWG guidance

DQWG 16-02.6A

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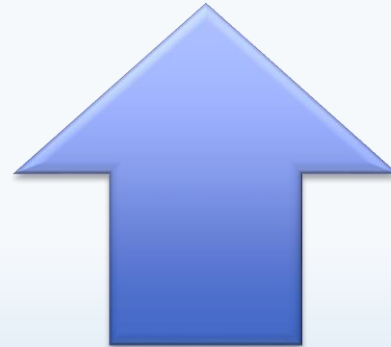
Scope of the presentation



Describe CSB initiative
and the value of CSB
data



Request DQWG guidance
regarding the usage of
CSB data on official
Nautical Charts produced
by HOs



IHO Crowdsourced Bathymetry Initiative

Crowdsourced bathymetry (CSB) is the collection of depth measurements from vessels, using standard navigation instruments, while engaged in routine maritime operations



IHO Crowdsourced Bathymetry Initiative

In 2014, the IHO initiated a collaborative project to enable mariners to collect “crowdsourced bathymetry”.

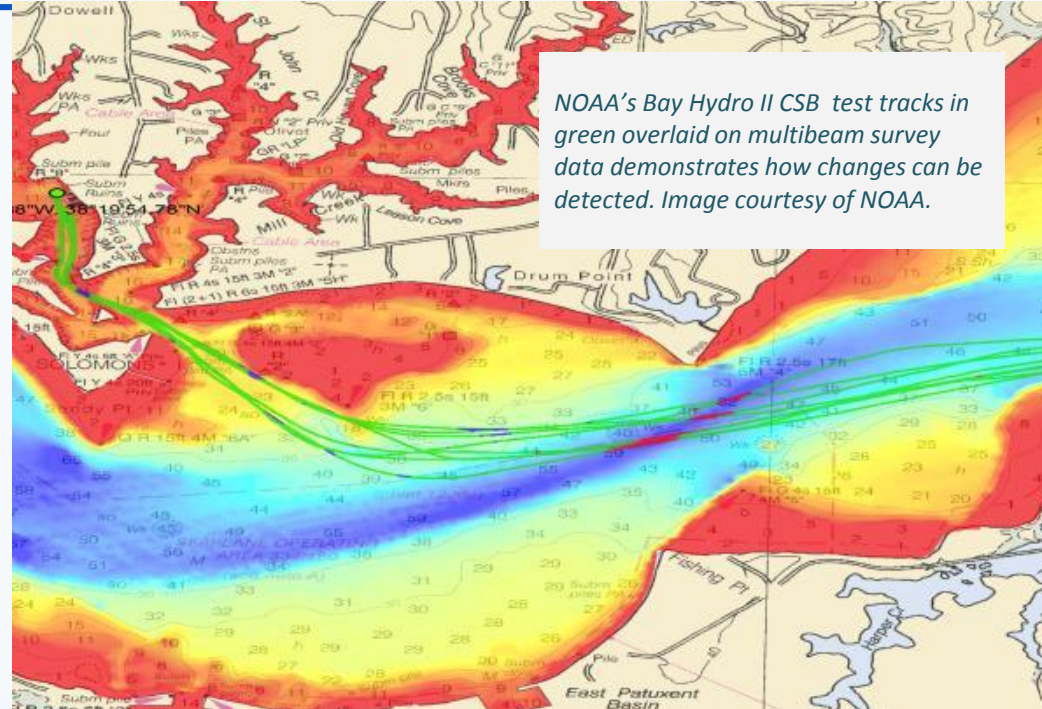
A Working Group was formed and tasked to develop ***B-12 IHO Guidance on Crowdsourced Bathymetry*** that states the IHO’s policy towards, and best practices for, the collection and contribution of CSB.

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 Value of CSB Data

- Data with scientific, commercial & research value at **no cost** to the public sector
- Fill gaps where data is scarce (eg: Arctic)
- Useful along shallow, complex coastlines
- Identify uncharted features
- Assist in verifying charted information
- Confirm whether charts are appropriate for the latest traffic patterns.



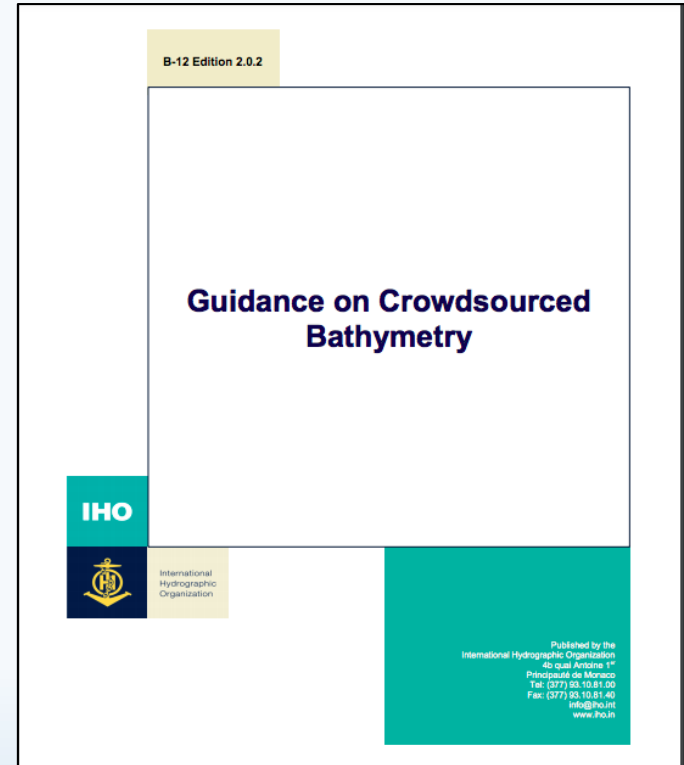
...but only if vessels collect and donate depth information while on passage



“CALL FOR APPROVAL OF EDITION 2.0.0 OF IHO PUBLICATION B-12”

35 Member States approved the
adoption of B-12 out of 38 replies.

iho.int/uploads/user/pubs/bathy/B_12_Ed2.0.3_2020.pdf



IHO CL 11/2019 Annex B

“ACCEPTANCE OF CROWDSOURCED BATHYMETRY ACTIVITIES IN NATIONAL WATERS OF JURISDICTION”

- 15 IHO MS replied “positive”
 - CL 47/2019 provides a summary analysis of positive responses ==>
- The DCDB now filters out CSB data collected from the waters of all coastal countries not included on the positive list.
- The lack of initial replies showed that the CL ask was not clear.



ACCEPTANCE OF CROWDSOURCED BATHYMETRY ACTIVITIES IN NATIONAL WATERS OF JURISDICTION

1. Based on the comments received to the questionnaire in Annex B to IHO CL 11/2019, the following table is published as the Positive List to guide potential data gathering activities undertaken by the wider maritime community in waters of national jurisdiction:

Member State	Area	Specific actions required
Argentina	EEZ only	Provide copy of dataset to Hydrographic Office
Brazil	EEZ only	Provide copy of dataset to Hydrographic Office
Canada	All waters – no multibeam activity without prior permission	Inform Hydrographic Office of new dataset
Cyprus	All waters	Provide copy of dataset to Hydrographic Office
Denmark	All waters – no multibeam activity without prior permission	Inform Hydrographic Office of any variance with published chart
Georgia	All waters	Provide copy of dataset to Hydrographic Office
Germany	All waters	Inform Hydrographic Office of new dataset
Monaco	All waters	Provide copy of dataset to Hydrographic Office
Netherlands	All waters - Detailed bathymetric surveys of wreck sites around Bonaire, Curaçao, Saba, Sint Eustatius and Sint Maarten falls under UNCLOS definition of scientific research and thus requires prior permission; resultant data cannot be published until authorised	Inform Hydrographic Office of new dataset
New Zealand	All waters	Inform Hydrographic Office of new dataset
Norway	All waters – no multibeam activity without prior permission	Inform Hydrographic Office of new dataset
Philippines	Shipping routes and transit passages only	None
South Africa	EEZ only	Provide copy of dataset to Hydrographic Office
Sweden	EEZ only	Inform Hydrographic Office of new dataset
USA	All waters	None

IHO CL 21/2020 & IRCC CL 01/2020

- All Coastal States are now requested to indicate their position on the ***provision of CSB data*** from ships within waters subject to their national jurisdiction into the public domain
- To date, 30 coastal states (green) have replied positively
- The geographic filter will be updated in 2021 to reflect updated coastal state positions.



iho.int/uploads/user/circular_letters/eng_2020/CL21_2020_EN_v1.pdf

iho.int/uploads/user/Inter-Regional%20Coordination/IRCC/IRCC_Letters/IRCC_Letter_2020_01_CSB_Activities.pdf



CL Questionnaire asks:

- Do you support or object to the CSB data provision for depth measurements from the internal waters, territorial sea, or EEZ of your country?
- Do you wish to be informed when such information is received by the IHO DCDB?
- Do you wish to review such information before its ingestion into the IHO DCDB?
- Do you wish for the opportunity to put caveats on the further dissemination of such data?



CROWDSOURCED BATHYMETRY DATA PROVISION – COASTAL STATE POSITION FOR WATERS SUBJECT TO THEIR NATIONAL JURISDICTION

TEMPLATE FORM

(to be returned to the IHO Secretariat **no later than 4 September 2020**)

E-mail: cl-ic@iho.int - Fax: +377 93 10 81 40)

IHO clarification on Crowdsourced Bathymetry Activity

For the purpose of this Circular Letter, the following terms have the specified meanings:

Bathymetry is the determination of ocean, coastal, and inland water depths. The general configuration of sea floor as determined by profile analysis of depth data.

Crowdsourcing is a process by which people and/or groups voluntarily submit observations, data, or information to accomplish a task or goal.

Crowdsourced bathymetry is defined by the IHO as the collection of depth measurements from vessels, using standard navigation instruments, while engaged in routine maritime operations. Crowdsourced bathymetry data provision is the transmission to the IHO Data Centre for Digital Bathymetry for ingestion, aggregation, categorization, and public dissemination of depth measurements made by vessels, using standard navigation instruments, while engaged in routine maritime operations.

IHO Data Centre for Digital Bathymetry (DCDB) was established in 1990 to steward the worldwide repository of bathymetric data. The Centre archives and shares, freely and without restrictions, depth data contributed by mariners. The IHO DCDB is an IHO resource that is hosted by the U.S. National Oceanic and Atmospheric Administration (NOAA) on behalf of IHO Member States.

Internal Waters, Territorial Sea, and Exclusive Economic Zone have the same meanings as are given those terms under the 1982 UN Convention on the Law of the Sea.

Questions:

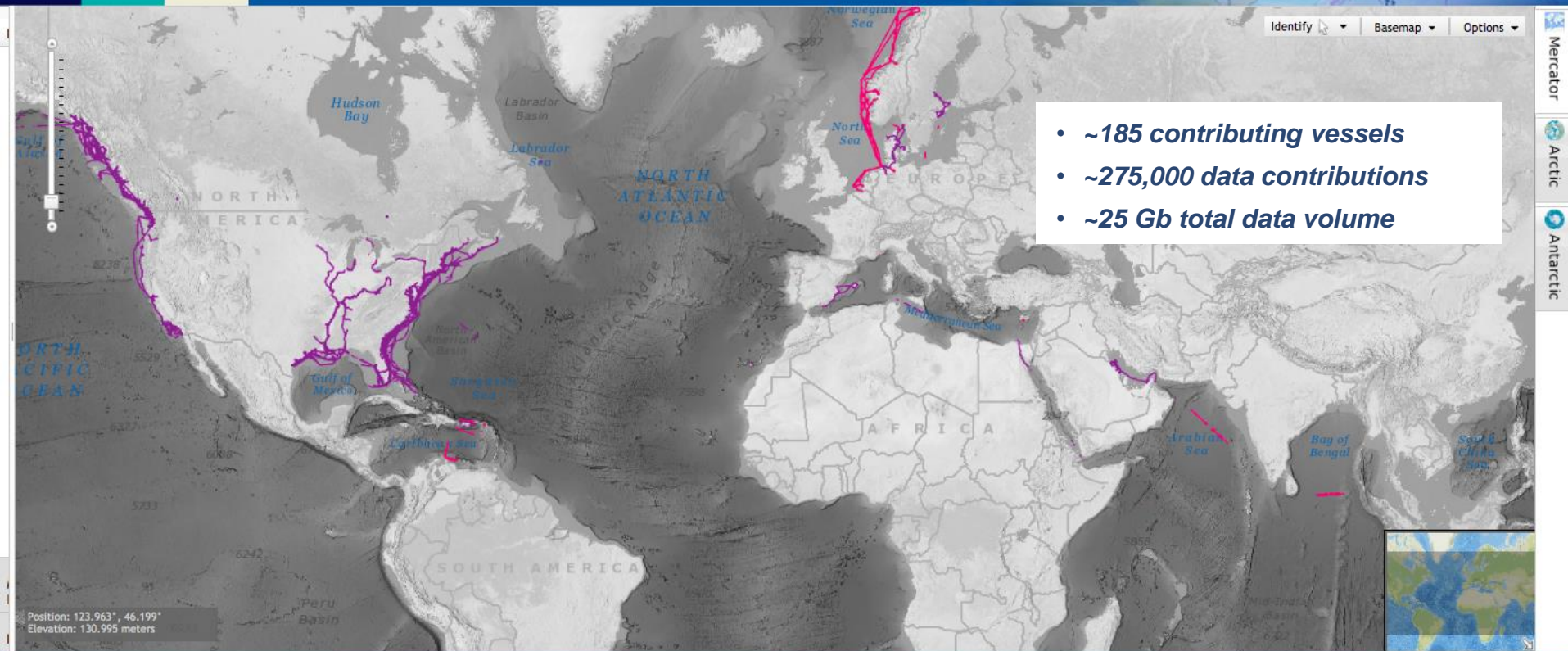
- 1) Do you support or object to the crowdsourced bathymetry data provision for depth measurements from the internal waters of your country?

SUPPORT ☐

OBJECT ☐

CAVEAT:

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IHO

International
Hydrographic
Organization

Data Centre for Digital Bathymetry Viewer

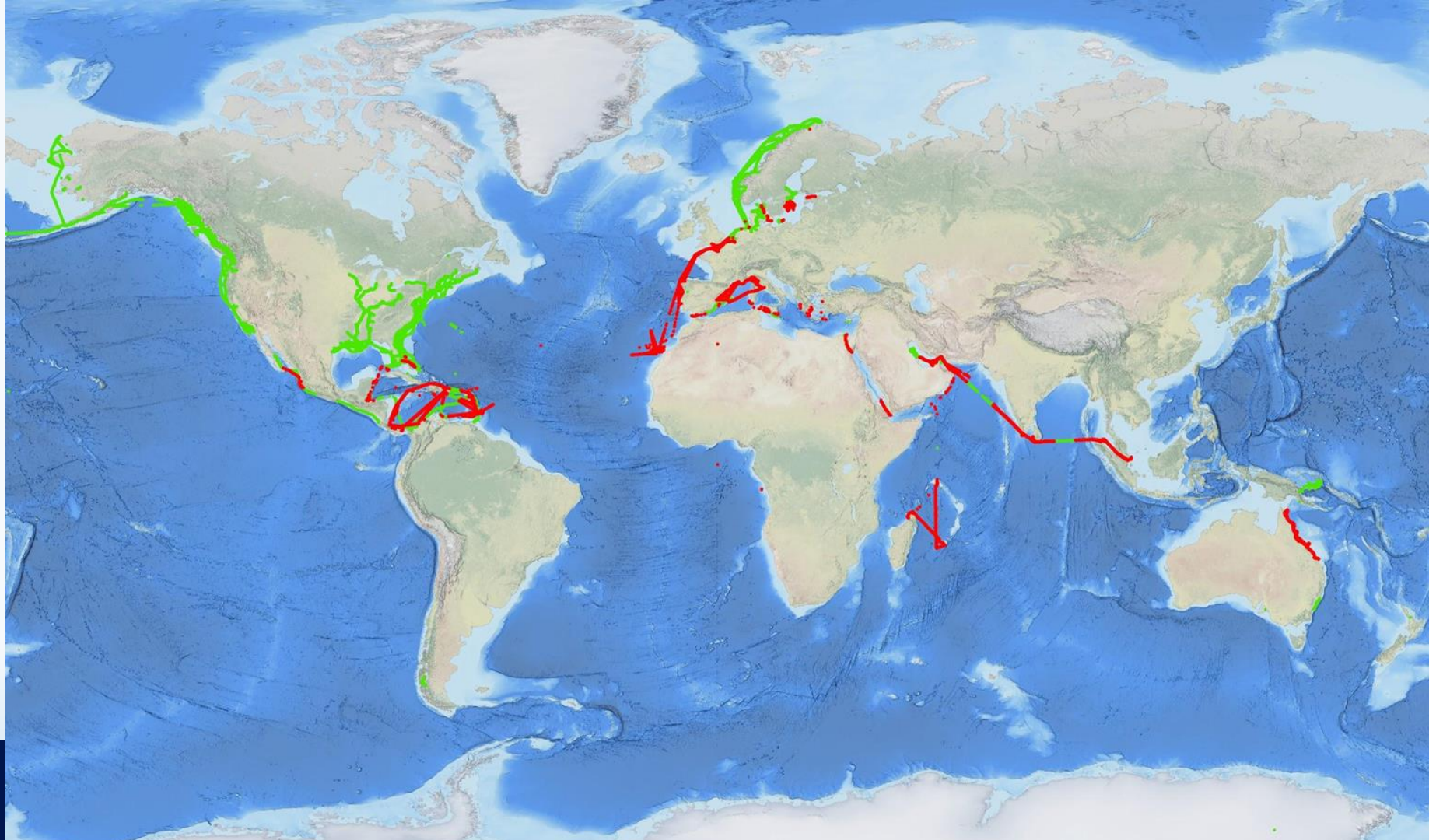


International Hydrographic Organization
Organisation Hydrographique Internationale

Data Quality Working Group – 16

9-10 February 2021

11



How to Contribute CSB Data

- The DCDB accepts CSB contributions through a network of "**Trusted Nodes**"
 - Eg: organizations, companies or universities serving as data liaisons between mariners (data collectors) and the DCDB.
 - Trusted Nodes may supply data logging equipment, provide technical support to vessels, download data from data loggers, and be responsible for data transfer directly to the DCDB.
- CSB data must be provided in either CSV or GeoJSON, and capture the minimum required information (XYZ, timestamp).

Those interested in contributing data or becoming a Trusted Node should contact the DCDB at bathydata@iho.int.



CSB Trusted Nodes - *Current*

Rose Point Navigation System

- Mariners can enable their electronic charting system log file to record position, depth, and time.



www.pcmaritime.com



www.rosepointnav.com

MacGregor/Carnival Cruise Line

- Data provided by Voyage Data Recorders (VDR) logging depth sounding data for IMO mandated shipborne single beam devices.



Voyage Data Recorder



CSB Trusted Nodes - *In-process*

James Cook University (Australia)

- Distributed inexpensive data loggers to ~100 volunteer vessels using their own echo sounder and GPS sensors along the Great Barrier Reef
- Data is at the DCDB
- Awaiting Australia's response to IHO CL 21/2020



SmartLog USB data logger



Petroleum Geo-Services (PGS)

- Just established a bathymetric feed from PGS vessels to the DCDB



Seabed 2030-funded CSB Field Trials

Objective:

1. Facilitate field trials that will accelerate CSB activity
2. Collect data in data scarce areas
3. Grow excitement about the CSB initiative
4. Develop a repeatable regional CSB mapping project strategy

In return, a potential program must guarantee the provision of staff to:

1. Hand out data loggers to the community
2. Assist local mariners in set up
3. Act as a data assembly center
4. Provide a copy of these data to the IHO DCDB to be used in the GEBCO grid



Seabed 2030-funded CSB Field Trials

The Institute For Maritime Technology & The South African Navy Hydrographic Office

- 200 data loggers have finally arrived (supply chain delays due to sourcing components post COVID)
- Testing to begin soon
- Data receipt expected in mid 2021

Bureau of Marine Transportation - Palau

- Recent arrival of 100 loggers

Provision of data loggers

- NMEA0183 and NMEA2000
- Installation support (where needed)



IHO CSB Working Group

- **9 meetings; 1 Industry workshop**
- Chair (Jennifer Jencks, USA) and Vice-Chair (Marta Pratellesi, Italy)
- **Representatives from 14 Member States:**
 - Canada, Croatia, Italy, Nigeria, **Norway**, Philippines, Denmark, Finland, France, Germany, India, Netherlands, Portugal, **UK**, & USA
- **Observers and expert contributors:**
 - CCOM-JHC, ChartWorld/SevenC's, CIDCO, Da Gamma Maritime Ltd, Dongseo U, ECC AS, ESRI, FarSounder, FLIR Systems AB, Fugro, GMATEK, Inc., James Cook U, JAMSTEC, Navico/C-Map, ONE Data Tech Co., Olex, PYA, Seabed 2030, TeamSurv, Teledyne CARIS, Sea-ID, World Maritime University, and World Ocean Council
- **IHO:** Assistant Director David Wyatt



CSBWG2: 10-11 Jan 2016
Boulder, Colorado, USA



CWBWG8: 23-25 Oct 2019
Monaco

CSBWG10 to be held virtually 30 March - 01 April 2021

CSB/Seabed 2030 Coordinator

The CSBWG submitted a paper to IRCC 12 requesting:

“Support for the modification of the current “RHC Seabed 2030 Coordinator” to a joint “RHC CSB/Seabed 2030 Coordinator.”

This figure would serve as a ***member of the IHO CSBWG and as the point of contact to the relevant Seabed 2030 regional centers*** and be charged with leading the discussion of the future tasks for RHCs that will be formalized with the new IHO Strategic Plan.

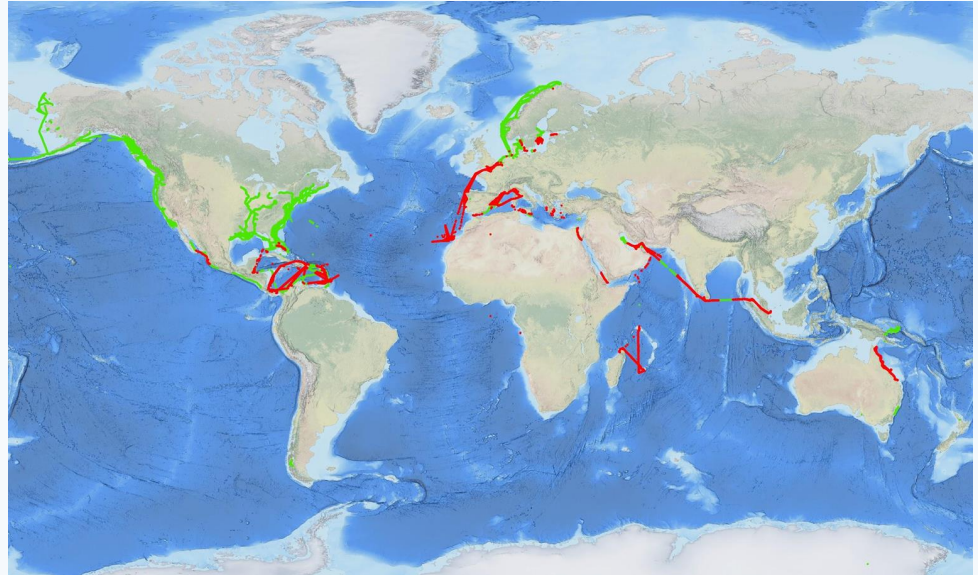
IRCC12-08A.2:

iho.int/uploads/user/Inter-Regional%20Coordination/IRCC/IRCC12/IRCC12-08A.2_Paper_RHC_and_CSB_FINAL.pdf



How can HOs become involved?

- Offer a positive response to the IHO or IRCC Circular Letters
- Select a CSB/SB2030 Coordinator to represent RHC on the CSBWG
- Consider joining and/or attending the CSBWG - it is open to all!
- Volunteer to become the next Seabed 2030-funded CSB Program!
- **USE CSB DATA THROUGH A PROPER QUALITY ASSESSMENT**



Request for guidance from DQWG

Direct link between DQWG and CSBWG since 2019 thanks to the ToR amendment

Take away...

«Good data quality does not mean that the quality of data has to be good. It means that the end user is well informed in how the quality of data is»

By Rogier B.

This statement is about a SPECIFIC RESPONSABILITY of HOs and it was endorsed by HSSC and IRCC



Outcomes of CSBWG 9 (June 2020)

- a **white paper** could be created on **guidelines on how CSB could be used by HOs**, which could be endorsed by IHO Member States. It was noted that focusing on using CSB for charting, rather than simply building a complete picture of the seafloor, had the potential of tying CSB into definitions under UNCLOS; however it was noted that there was a need to overcome HO reluctance to use the data where appropriate and a real need to provide guidance to HOs to assist in overcoming these view” (see CSBWG9 minutes).
- Moreover, the following action was agreed upon, **“Request DQWG investigate data quality parameters and indicators for use by HOs and provide further guidance” (action 28).**



HOs scenario

- Overcome the HOs reluctance
- HOs cautious approach
- Not «adequate» data no matter the source
- Lack of resources for data processing and quality assessment



Main questions

- Which data does HOs have in their official products?
- Is quality correctly assessed?
- Is CSB better than nothing?
- How to attribute the correct CATZOC?
- Historical data are can be considered as CSB data?



Analysis/Discussion 1/2

- There are approximately 60,000 SOLAS vessels and 130,000 private yachts collecting depth data on a daily basis. This data can have added value to the official products of an HO, especially in remote areas of depth < 100 m.
- New S-44 “International Hydrographic Organization Standards for Hydrographic Surveys, Ed. 2020” considers CSB data as hydrographic data at the disposal of the hydrographer and the cartographer.



Analysis/Discussion 2/2

1. MSs are/are not currently using CSB in their paper or digital charts
 - If yes (1), CATZOC attribution to CSB data
 - If not (1), why MSs are not using CSB
2. MSs using CSB with a “signalling” function (data to be compared with existing data)
3. MSs considering “historical data” as CSB data.



Actions required by DQWG

A DQWG white paper on CSB data usage by MSs could provide useful advice for HOs about the possibility to use **CSB as a resource**.

- Note this paper
- Support CSB initiative through the draft of a **white paper** for HOs usage of CSB data, providing advice and best practices





Thank you

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