

A world map with bathymetry data overlaid. The map uses a color scale from light blue (shallow) to dark blue (deep). The Atlantic Ocean is the central focus, with labels for 'NORTH AMERICA', 'SOUTH AMERICA', 'EUROPE', 'AFRICA', 'INDIAN OCEAN', and 'AUSTRALIA'. The title 'Crowdsourced Bathymetry' is centered over the Atlantic in large white font.

# Crowdsourced Bathymetry



**IHO**

International  
Hydrographic  
Organization

The South West Atlantic Hydrographic Commission (SWAtHC) 17

14 - 15 March 2023



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# The IHO Crowdsourced Bathymetry Initiative

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

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





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# The IHO Crowdsourced Bathymetry Initiative

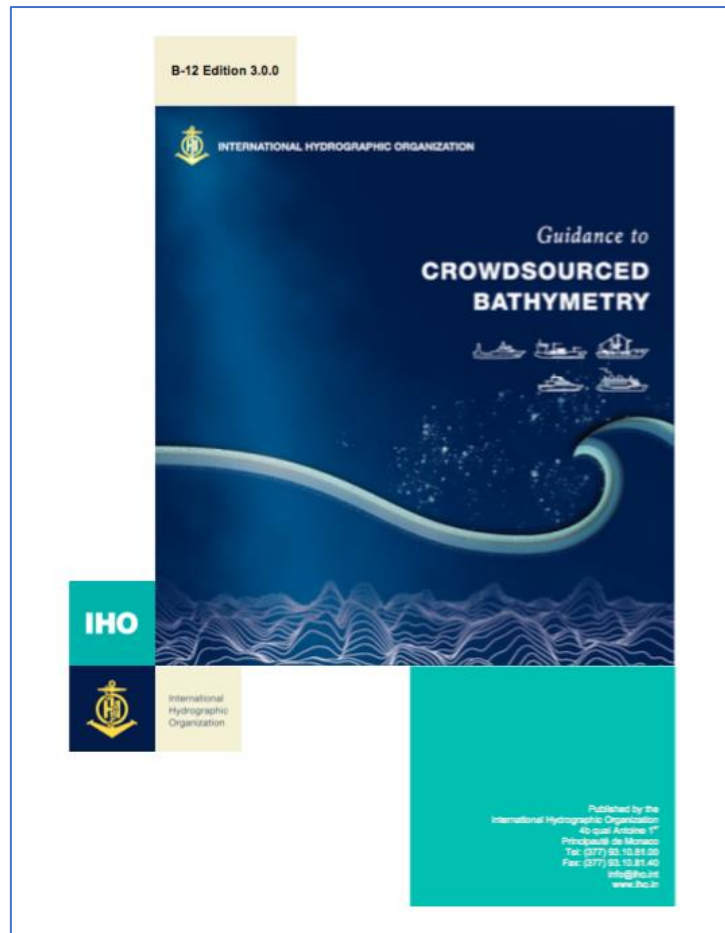
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## **CL 25/2022 requested approval of B-12 IHO Guidance on Crowdsourced Bathymetry Edition 3.0.0**

Updates include: incorporating feedback from operational use and experience, making the document more "equipment agnostic", simplifying the document and making it more accessible to ALL readers (data collectors, providers and users).

**APPROVED!!**

[iho.int/uploads/user/pubs/bathy/B\\_12\\_CSB-Guidance\\_Document-Edition\\_3.0.0\\_Final.pdf](https://iho.int/uploads/user/pubs/bathy/B_12_CSB-Guidance_Document-Edition_3.0.0_Final.pdf)





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# IHO CL 01/2020 & IRCC CL 21/2020

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- All coastal States are requested to indicate their position on the ***provision of CSB data*** from ships within waters subject to their jurisdiction into the public domain
- To date, 33 coastal States (**green**) have replied positively\*





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# **IHO CL 01/2020 & IRCC CL 21/2020**

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All Coastal States...”are requested to indicate their position on the provision of CSB data from ships within waters subject to their national jurisdiction into the public domain as well as highlighting ...any caveats they wish to apply to such provision.”

## **SWAtHC IHO Member States:**

**Argentina, Brazil, Uruguay.**

## **SWAtHC Associate States:**

Paraguay

## **SWAtHC Observer States:**

Bolivia

**The IHO encourages all coastal states to review IRCC CL 1/2020 and, if possible, offer a positive response to IHO Secretariat.**

[https://iho.int/uploads/user/Inter-Regional%20Coordination/IRCC/IRCC\\_Letters/IRCC\\_Letter\\_2020\\_01\\_CSB\\_Activities.pdf](https://iho.int/uploads/user/Inter-Regional%20Coordination/IRCC/IRCC_Letters/IRCC_Letter_2020_01_CSB_Activities.pdf)





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# CL Questionnaire asks:

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- 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?

[iho.int/uploads/user/Inter-Regional%20Coordination/CSBWG/MISC/B-12\\_2020\\_EN\\_Acceptance\\_of\\_CSB\\_Data\\_in\\_NWJ\\_v3.0.pdf](https://iho.int/uploads/user/Inter-Regional%20Coordination/CSBWG/MISC/B-12_2020_EN_Acceptance_of_CSB_Data_in_NWJ_v3.0.pdf)

Enclosure to IHO CL 21/2020  
IHO File S3/2649

## 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](mailto: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:

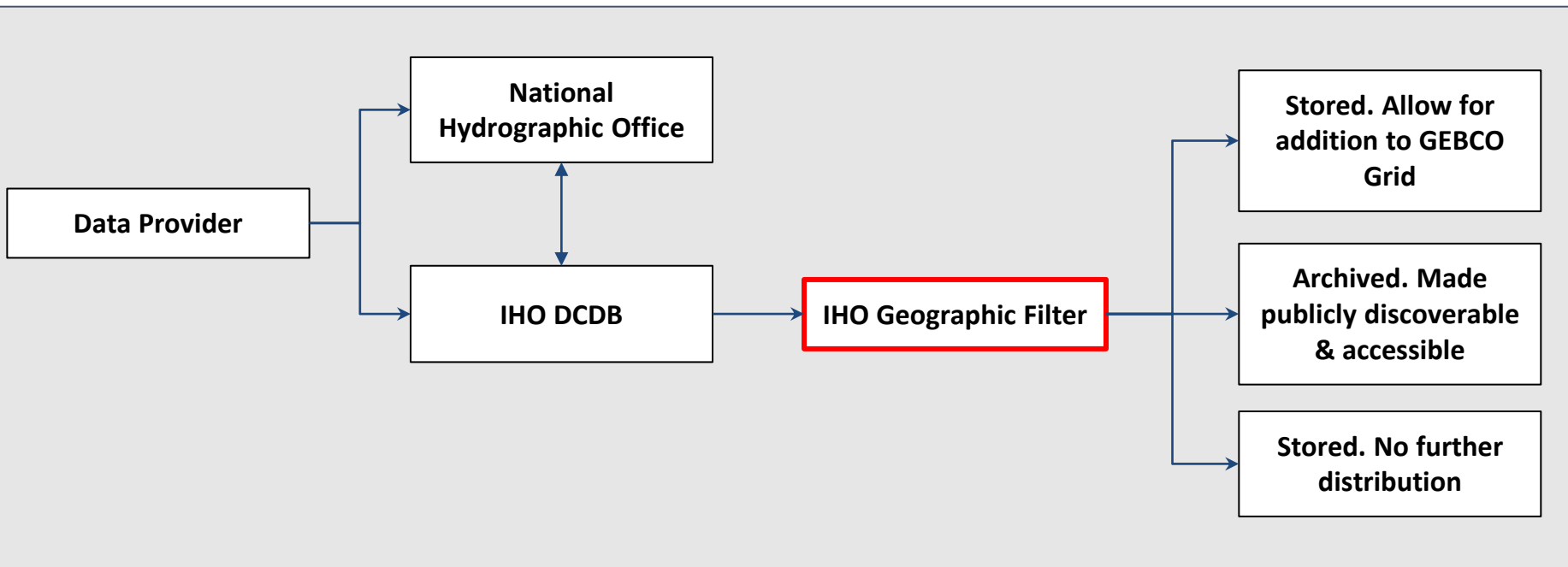


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# Geographic Filter

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In response to feedback provided to the IHO, the IHO Data Centre for Digital Bathymetry (DCDB) implemented (and continues to update) a geographic filter for incoming data to take into account coastal countries' positions on the distribution of CSB collected in their areas of jurisdiction.

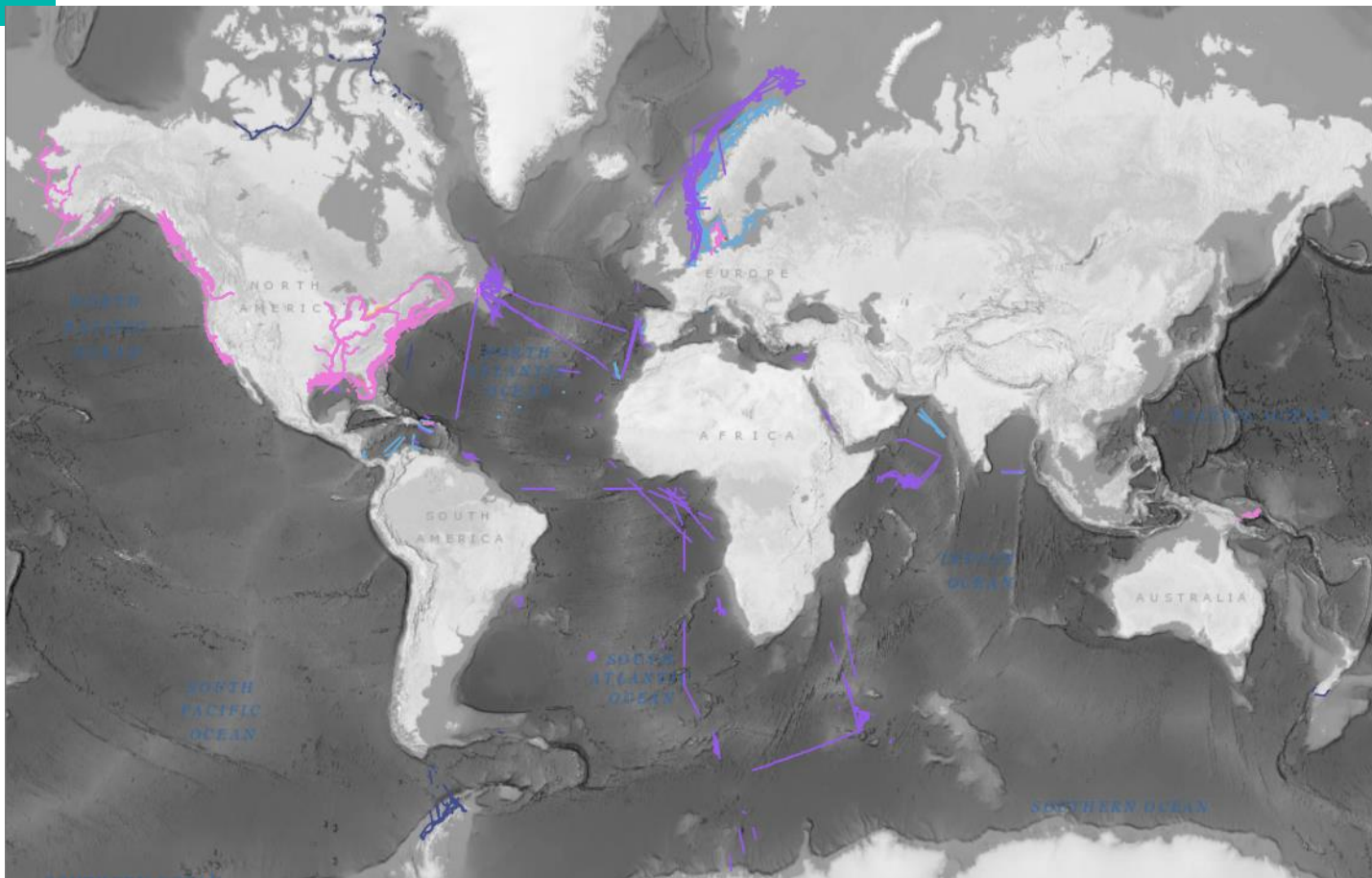




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# CSB Data Holdings

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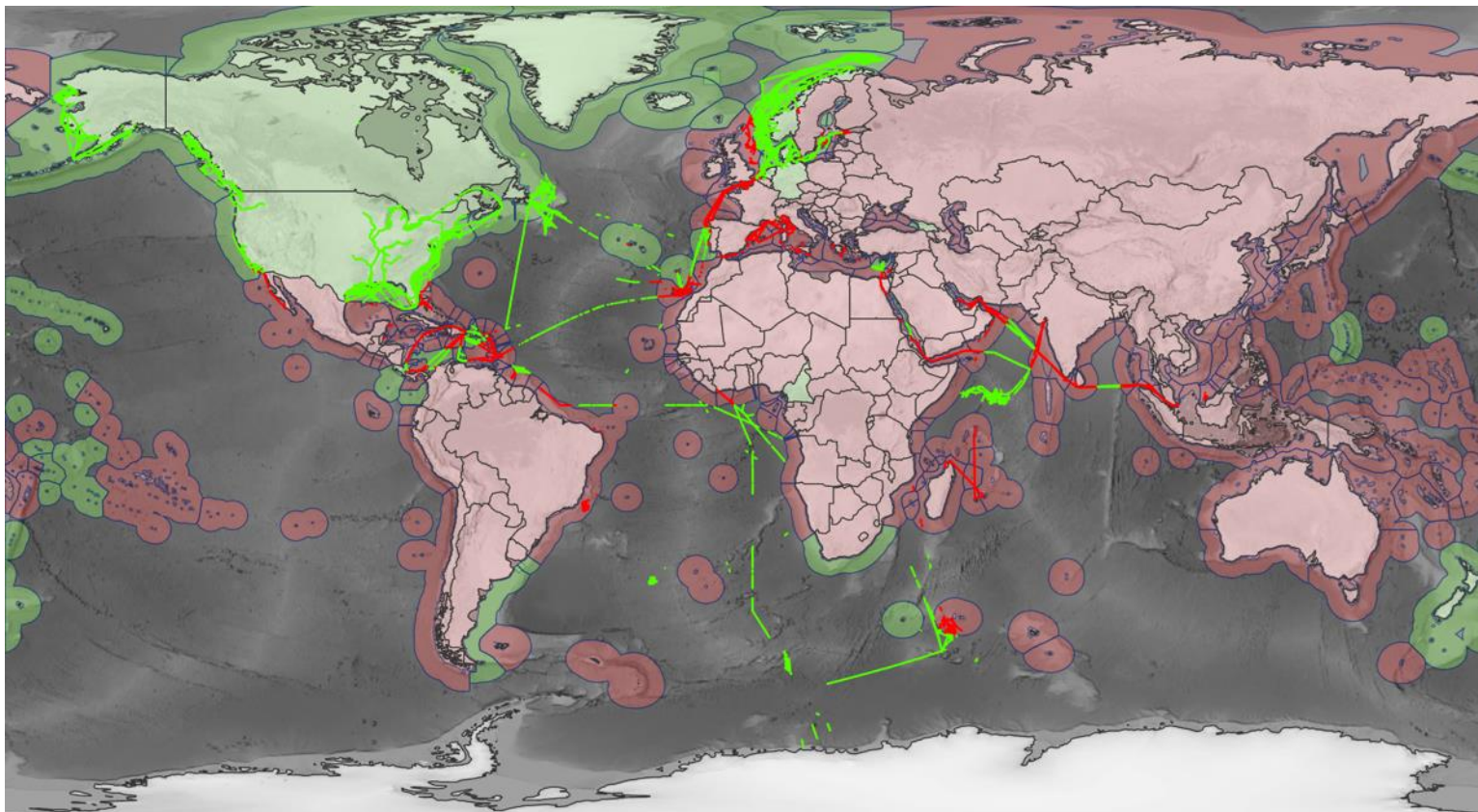
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# CSB Data Holdings

Green = Positive Response

Red = Negative Response, No Response

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Map for illustrative purposes only. (Credit: Marine Regions)



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# Geographic Filter

International Hydrographic Organization

The DCDB is currently working to automate the notification and approval process of data for coastal states who have provided positive responses but request pre-approval of data before the public distribution from DCDB.

Home Manage Username: Chris Slater Log Out

Search Areas [Search CSB Data](#)

Search

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[Search](#) [Clear](#)

Layer Chooser Show

French Exclusive Economic Zone

|            |                                |
|------------|--------------------------------|
| ID         | 296                            |
| GEONAME    | French Exclusive Economic Zone |
| TERRITORY1 | France                         |
| ISO_TER1   | FRA                            |
| SOVEREIGN1 | France                         |
| TERRITORY2 |                                |
| ISO_TER2   |                                |
| SOVEREIGN2 |                                |
| TERRITORY3 |                                |
| ISO_TER3   |                                |
| SOVEREIGN3 |                                |
| ISO_SOV1   | FRA                            |
| ISO_SOV2   |                                |
| ISO_SOV3   |                                |
| EXCLUDE    | manual                         |
| DATA_SET   | EEZ                            |

| Trace Id                             | Publish                        | External Id                    | Provider  | Platform  | Instrument | Start Time           | End Time             | File Name  | File Size | Last Updated                |
|--------------------------------------|--------------------------------|--------------------------------|-----------|-----------|------------|----------------------|----------------------|--|-----------|-----------------------------|
| 000033e4-759c-4591-af98-04c29f8b967b | true<br><a href="#">Change</a> | MACGR-9221566-AIDAAURA-oyHjp01 | MacGregor | Anonymous |            | 2020-03-28T03:08:32Z | 2020-03-28T03:10:16Z | 20220322085844674039_9221566-AIDAAURA-oyHjp01.tar.gz | 965       | 2022-03-28T21:17:48.738516Z |
| 000042ca-d435-4d84-ae4-ec04163d4dc2  | true<br><a href="#">Change</a> | MACGR-9221566-AIDAAURA-oyHjp01 | MacGregor | Anonymous |            | 2020-04-29T03:00:32Z | 2020-04-29T03:02:36Z | 20220322083434750180_9221566-AIDAAURA-oyHjp01.tar.gz | 798       | 2022-03-28T15:16:03.354039Z |

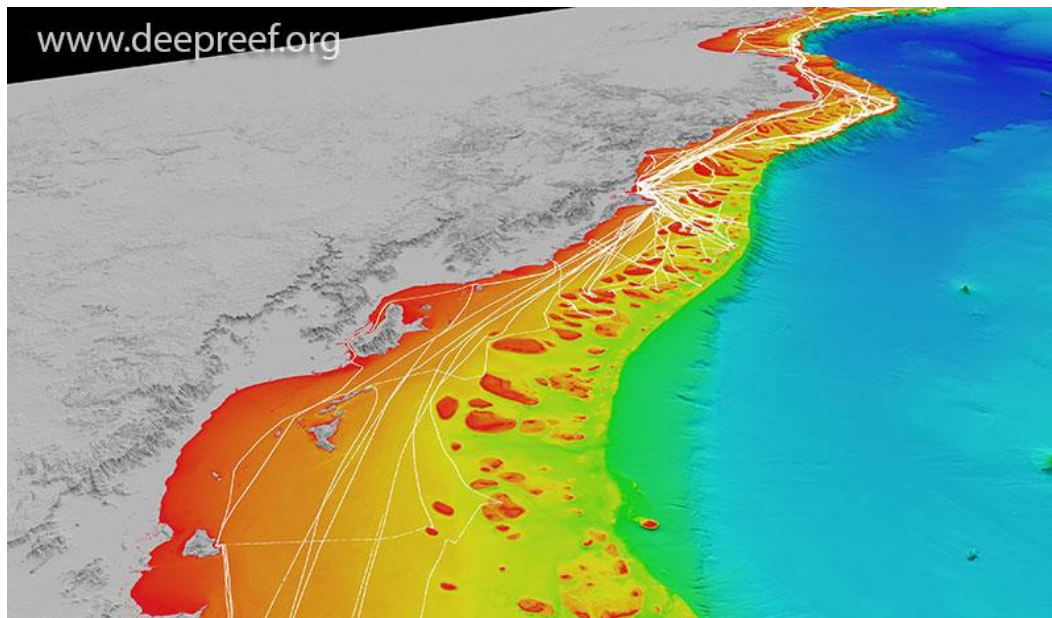


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# The Value of CSB Data

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



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

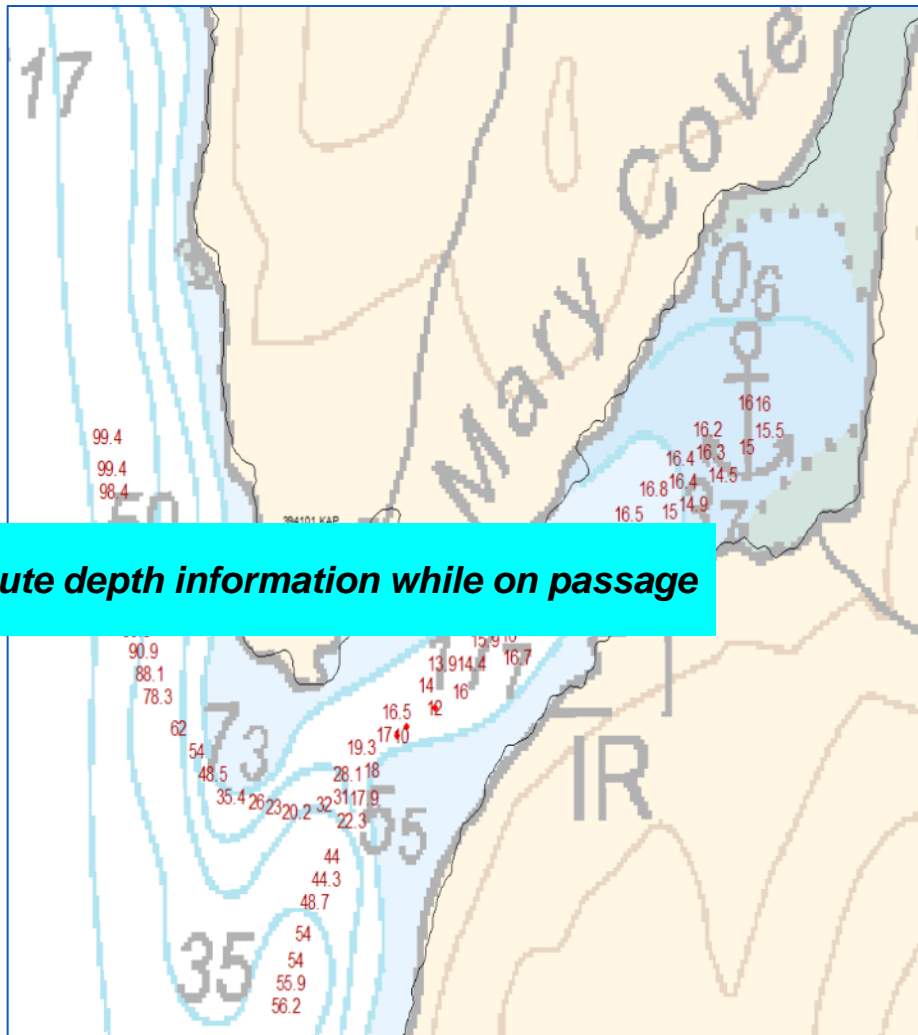


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# The Value of CSB Data

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Hydrographic  
Organization

- The Canadian Hydrographic Service has used CSB to update several Inside Passage charts along coastal routes.
- A system of CSB data collection for depths < 10 m **...but only if vessels collect and contribute depth information while on passage** depths, compilation in areas that were surveyed with single beam.
- CSB helped prioritize survey areas for the following survey season
- CSB has initiated the publication of Notices to Mariners.





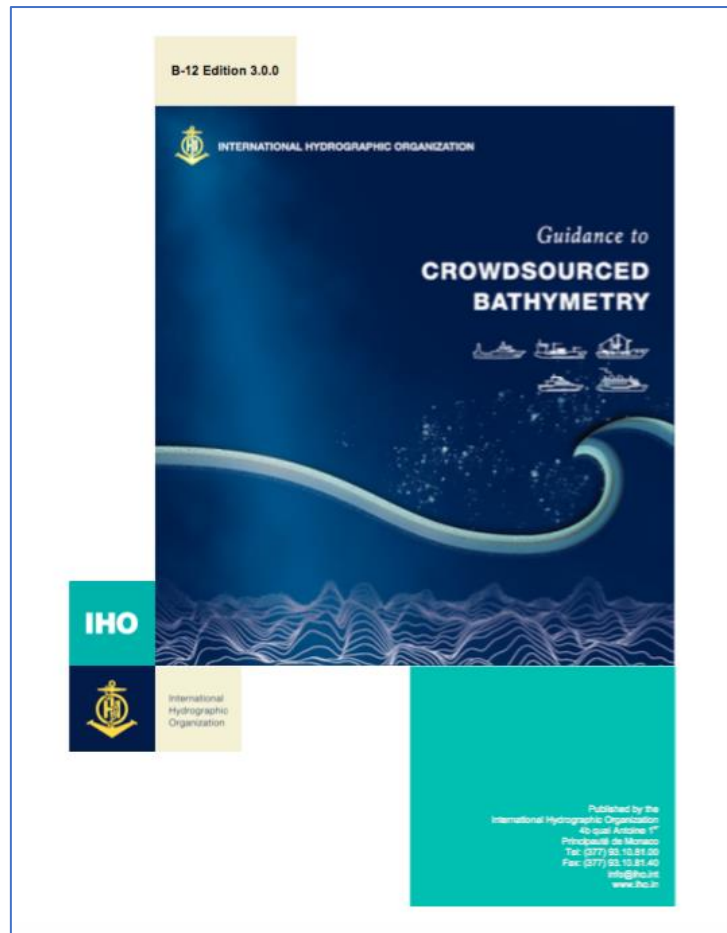


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# How to Collect & Contribute CSB Data

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- 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).







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# Current CSB Trusted Nodes

## Rose Point Navigation System

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



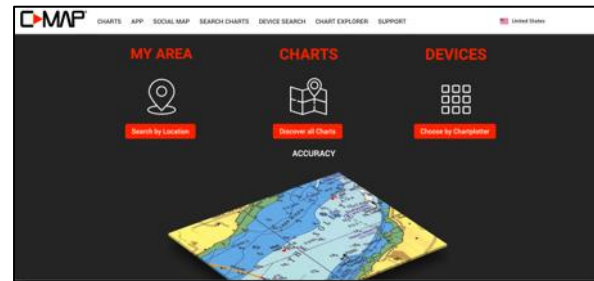
[www.rosepointnav.com](http://www.rosepointnav.com)



Voyage  
Data  
Recorder

## Navico C-MAP

- New CSB feed b/w DCDB & navigation software company.



## MacGregor/Carnival Cruise Line

- Data provided by Voyage Data Recorders (VDR)

## Petroleum Geo-Services (PGS)

- Data feed from PGS vessels to the DCDB



## M2Ocean

- Testing data submissions with data collected by Hydroballs (small autonomous bathymetric buoys)



## James Cook University

- Distributed data loggers to volunteer vessels along the Great Barrier Reef



SmartLog USB  
data logger





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# CSB Trusted Nodes – Seabed 2030 Project

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## Objective:

1. Facilitate field trials that will accelerate CSB activity
2. Collect data in data scarce areas
3. Grow excitement about the CSB initiative!

## 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. Provide a copy of these data to Seabed 2030 for inclusion into the DCDB and the GEBCO grid



**Support includes provision of data loggers (NMEA0183 and NMEA2000) and installation support (where needed).**



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# CSB Trusted Nodes – Seabed 2030-funded CSB Programs

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## Greenland Institute of Natural Resources

- Phase 1: aim to engage approximately 50 vessels of various sizes- 30 data loggers deployed so far.

## The Institute For Maritime Technology & The South African Navy HO

- 100 data loggers deployed to SANHO/IMT.
- Planning of trials: identification of stakeholders, establish relationships, feasibility studies, regular communication via various channels.

## Bureau of Marine Transportation - Palau

- 100 data loggers received (NMEA0183 and NMEA2000)
- Coordinating with South & West Pacific Seabed 2030 Data Center
- Currently receiving support from U.S. Navy for logger installation and setup.



*“Sea Lab 1”, IMT – trial deployment (Credit: CDR Christoff Theunissen)*



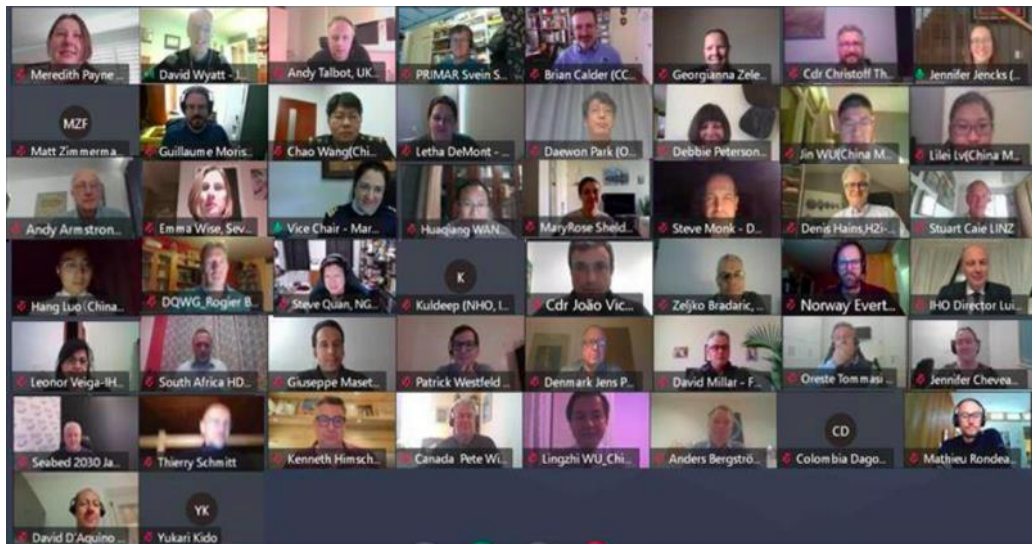


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# IHO CSB Working Group

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- **Meetings:** 13 meetings, 1 industry workshop
- **Chair:** Jennifer Jencks, USA; **Vice Chair:** Peter Wills, Canada
- **Representatives from 18 Member States:** Canada, China, Denmark, France, Germany, India, Italy, Lebanon, Mexico, Netherlands, New Zealand, Norway, Portugal, South Africa, Sweden, UK, **Uruguay**, USA
- **IHO Secretariat:** IHO Assistant Director Sam Harper, IHO Director Luigi Sinapi



- **Observers and expert contributors:** CCOM-JHC, CIDCO, CIRES, Da Gamma Maritime Ltd, Dongseo U, Dock Tech, ECC AS, ESRI, FarSounder, FLIR Systems AB, Fugro, GMATEK, Inc., H2i, James Cook U, JAMSTEC, Navico/C-Map, ONE Data Tech Co., Olex, Orange Force Marine, PYA, Seabed 2030, Sea-ID, SevenCs/ChartWorld, TeamSurv, Teledyne CARIS, World Maritime University, and World Ocean Council

**CSBWG14 Meeting: August 2023, Stavanger, Norway**



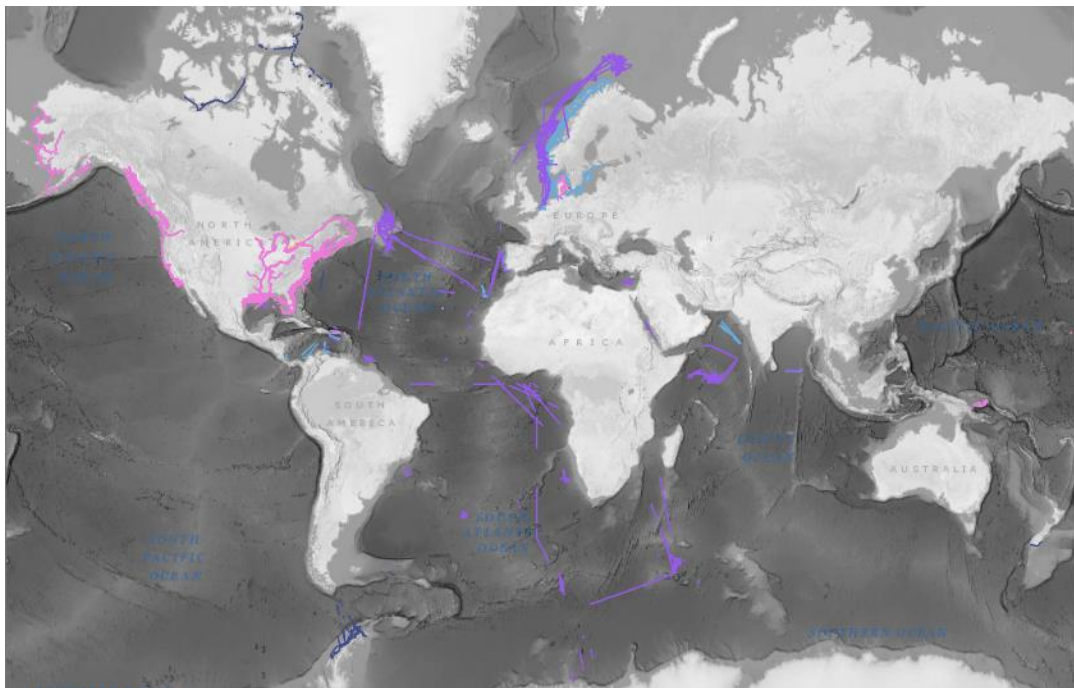


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# How can your HO become involved?

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- Offer a positive response to the IHO or IRCC Circular Letters.
- **Volunteer to become the next CSB/SB2030 Coordinator!**
- Consider joining and/or attending the CSBWG - it is open to all!
- Discuss CSB data at this meeting







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# How can your HO become involved?

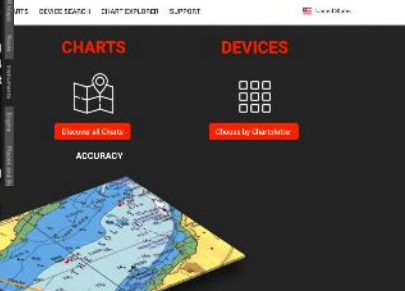
- Determine local interest in participating.
- Determine how your community can become involved. Options include:
  - Utilizing participating navigation software systems (eg: Rosepoint, Navico-CMAP)
  - Utilizing VDRs for larger seagoing vessels
  - Installation of data loggers (NMEA0183 or 2000)
    - Consider identifying funding opportunities for logger purchases and distributions
    - Requesting support from Seabed 2030



SmartLog USB data logger



www.rosepointnav.com





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Thank you.

Jennifer Jencks

Chair, IHO CSB Working Group

*[jennifer.jencks@noaa.gov](mailto:jennifer.jencks@noaa.gov)*

