Crowdsourced Bathymetry

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The IHO Crowdsourced Bathymetry Initiative

International Hydrographic Organization

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

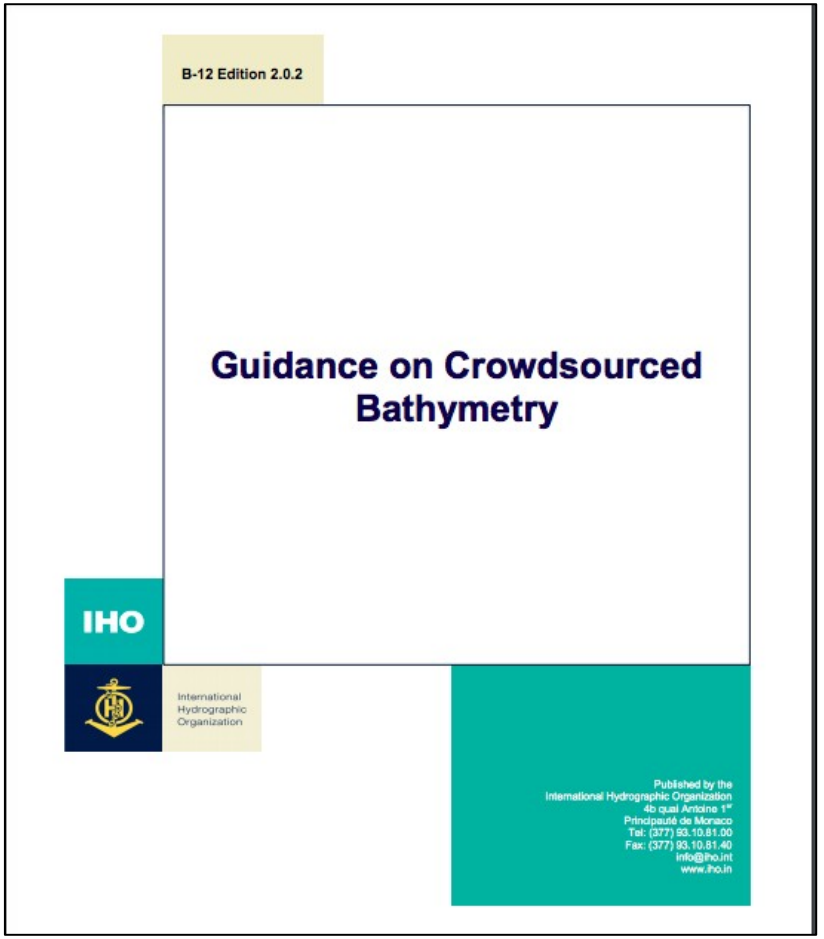
Crowdsourced bathymetry (CSB) is the collection and sharing of depth measurements from vessels, using standard navigation instruments, while engaged in routine maritime operations.

The IHO Crowdsourced Bathymetry Initiative

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.

Edition 2.0.0 was published in 2019.

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



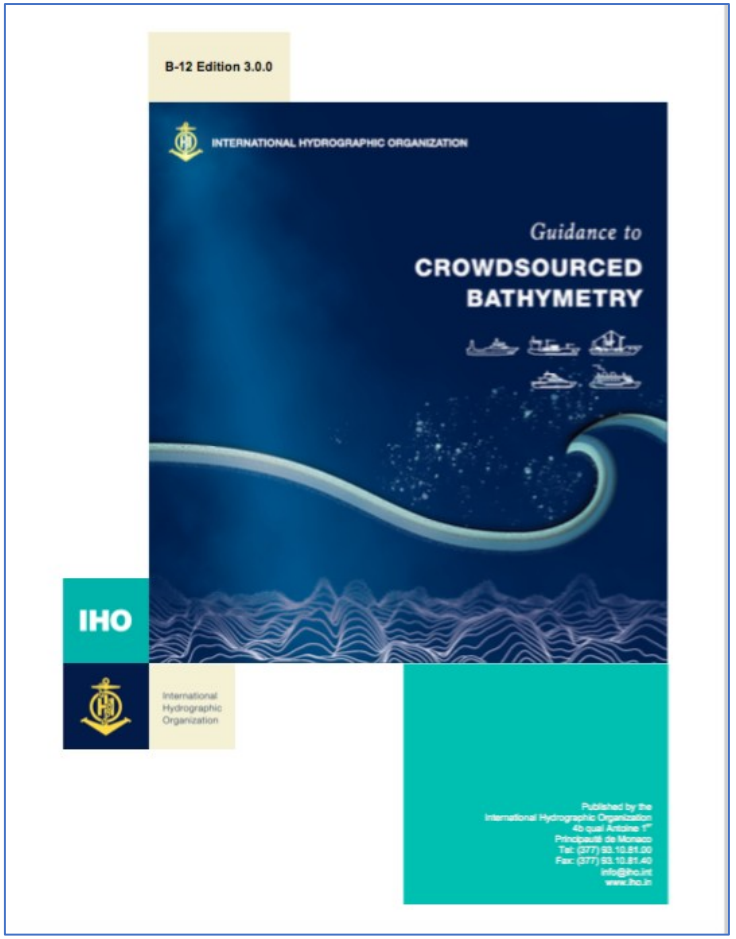
The IHO Crowdsourced Bathymetry Initiative

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

Responses due no later than 01 October 2022.

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).

iho.int/en/draft-publications



IHO CL 01/2020 & IRCC CL 21/2020

- 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, 32 coastal States (green) have replied positively*

IHO Circular Letter 21/2020

International Hydrographic Organization

"...Member 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.

IRCC Circular Letter 1/2020

"...The Chairs of RHCs are requested to encourage associate members, observer States as well as any other coastal State within their region, to indicate their position on the provision of CSB data from ships within their waters of national jurisdiction"

SWAtHC Associate States:

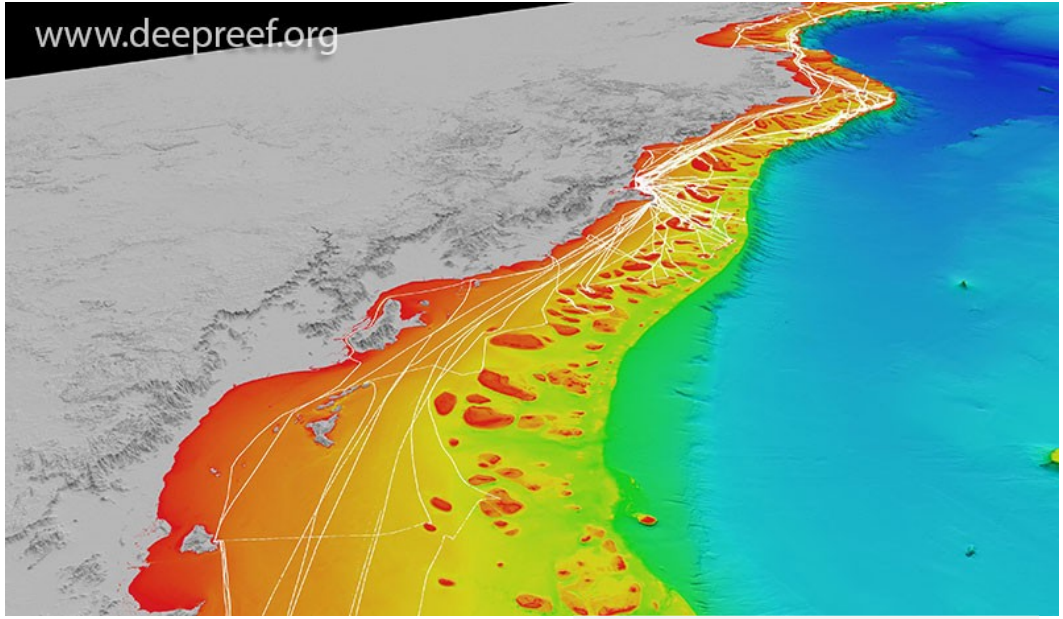
Paraguay y Bolivia

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

The Value of CSB Data

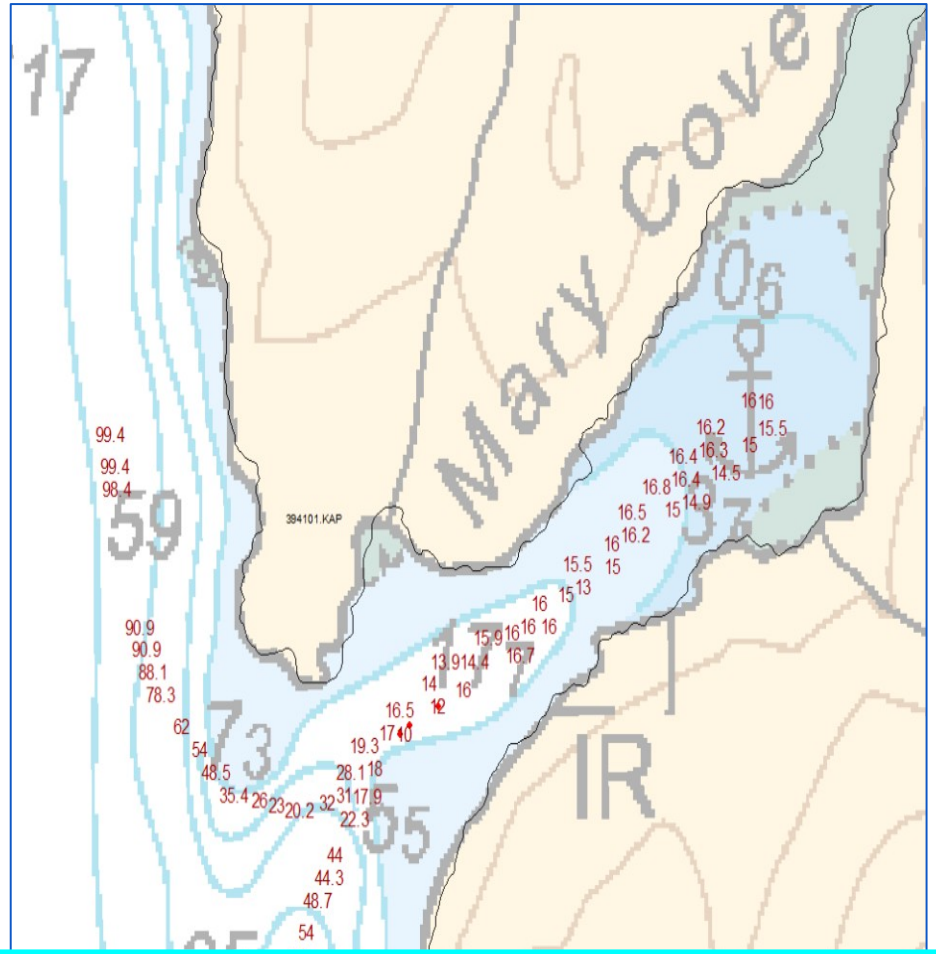
- Data with scientific, commercial & research value at no cost to the public sector
- Fill gaps where data is scarce (eg: Arctic, SIDS)
- Useful along shallow, complex coastlines
- Identify uncharted features
- Assist in verifying charted information
- Confirm whether charts are appropriate for the latest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



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

The Value of CSB Data

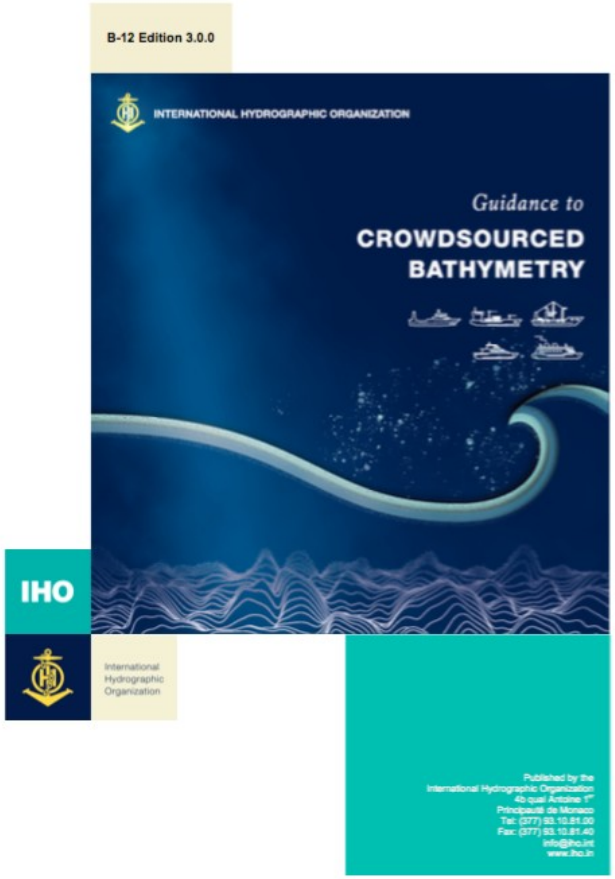
- The Canadian Hydrographic Service has used CSB to update several Inside Passage charts along coastal routes.
- A systematic comparison of charted depths < 10 m yielded improved charted channel depths, data density and improved chart compilation in areas that were surveyed with single beam.
- CSB helped prioritize survey areas for the following survey season
- CSB has initiated the publication of Notices to Mariners.



...but only if vessels collect and contribute depth information while o passage

How to Collect & 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).



CSB Trusted Nodes – Software Companies

International Hydrographic Organization

Rose Point Navigation System

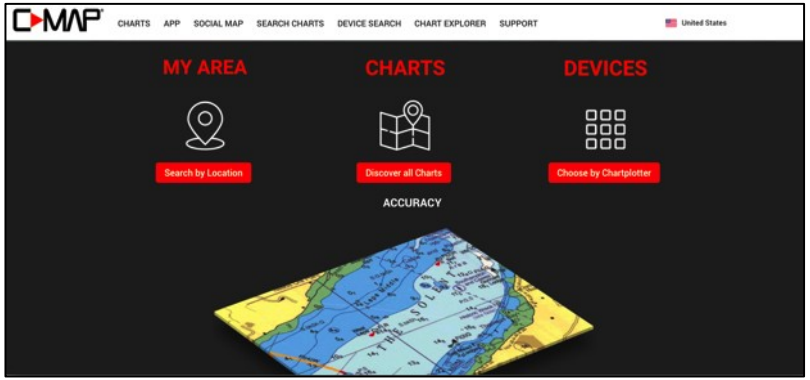
- Mariners can enable their electronic charting system log file to record *position, depth, and time*.
- When a mariner updates their software or chart catalog, data is transmitted to the DCDB

www.pcmaritime.com

www.rosepointnav.com

Navico C-MAP

- Finalized testing of new bathymetric feed b/w DCDB & navigation software company.
- Data contributions to begin this summer.



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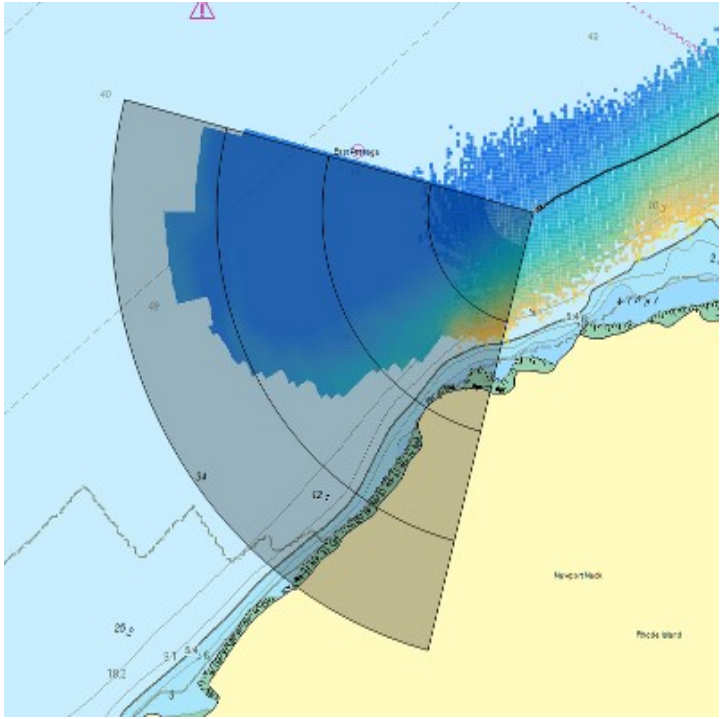
CSB Trusted Nodes – Hardware Companies

FarSounder Inc.

- Designs and manufactures 3D Forward Looking Sonar (3D-FLS) for navigation and obstacle avoidance.
- Customers are given the option to participate in CSB collection and contribution



CSB Trusted Nodes – Cruise Line Industry

Carnival Cruise Line

- Macgregor Germany supplies Carnival Cruise Lines with VDR solutions.
- Voyage Data Recorders (VDR) are a mandated device for effectively all ships on international voyages.
- By default, this device is logging depth sounding data for IMO mandated shipborne single beam devices.
- A bathymetric feed was established between MacGregor and the DCDB

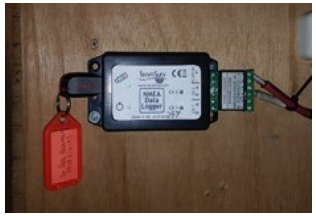
Voyage Data Recorder

CSB Trusted Nodes – Academia/Research

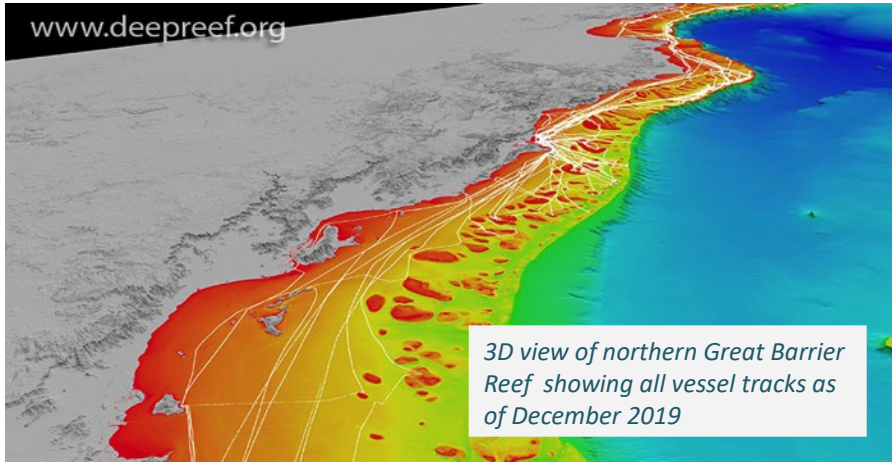
International Hydrographic Organization

James Cook University

- Distributed inexpensive data loggers to ~10 volunteer vessels using their own echo sounder and GPS sensors along the Great Barrier Reef
- Data is at the DCDB
- Awaiting interpretation of Australia's response to IHO CL 21/2020



SmartLog USB data logger



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

CSB Trusted Nodes – Seabed 2030 Project

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:

4. Hand out data loggers to the community
5. Assist local mariners in set up
6. *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).

CSB Trusted Nodes – Seabed 2030-funded CSB Programs

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)

IHO CSB Working Group

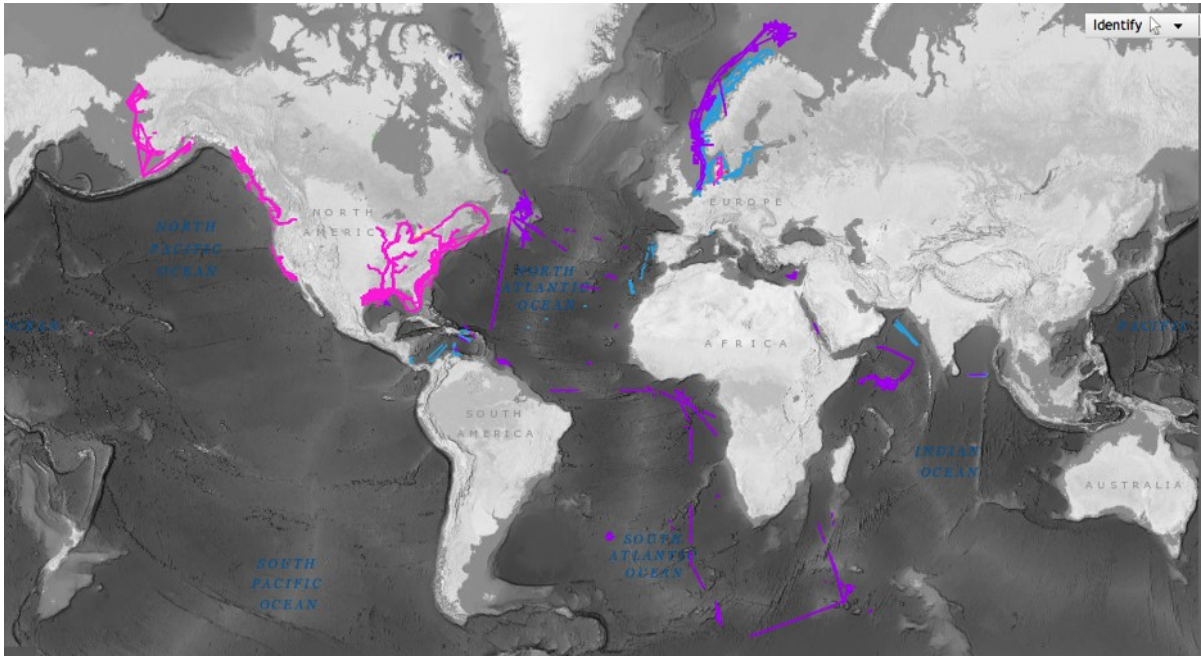
International Hydrographic Organization

- **Meetings:** 12 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, 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, Sea-ID, SevenCs/ChartWorld, TeamSurv, Teledyne CARIS, World Maritime University, and World Ocean Council

How can your HO become involved?

- Offer a positive response to the IHO or IRCC Circular Letters.
- Consider joining and/or attending the CSBWG - it is open to all!
- Talk about it!!



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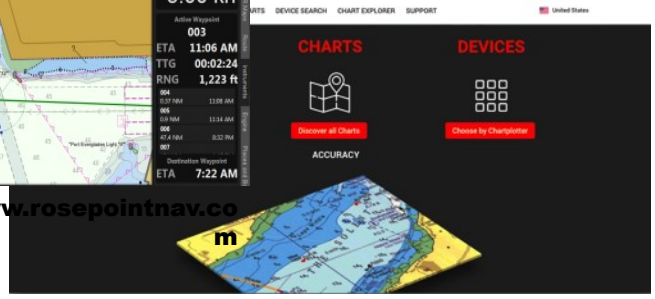
How can your HO become involved?

- 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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