

THE NIPPON FOUNDATION-GEBCO

SEABED 2030

*GEBCO - Seabed 2030
Project - CSB Activities*

Update

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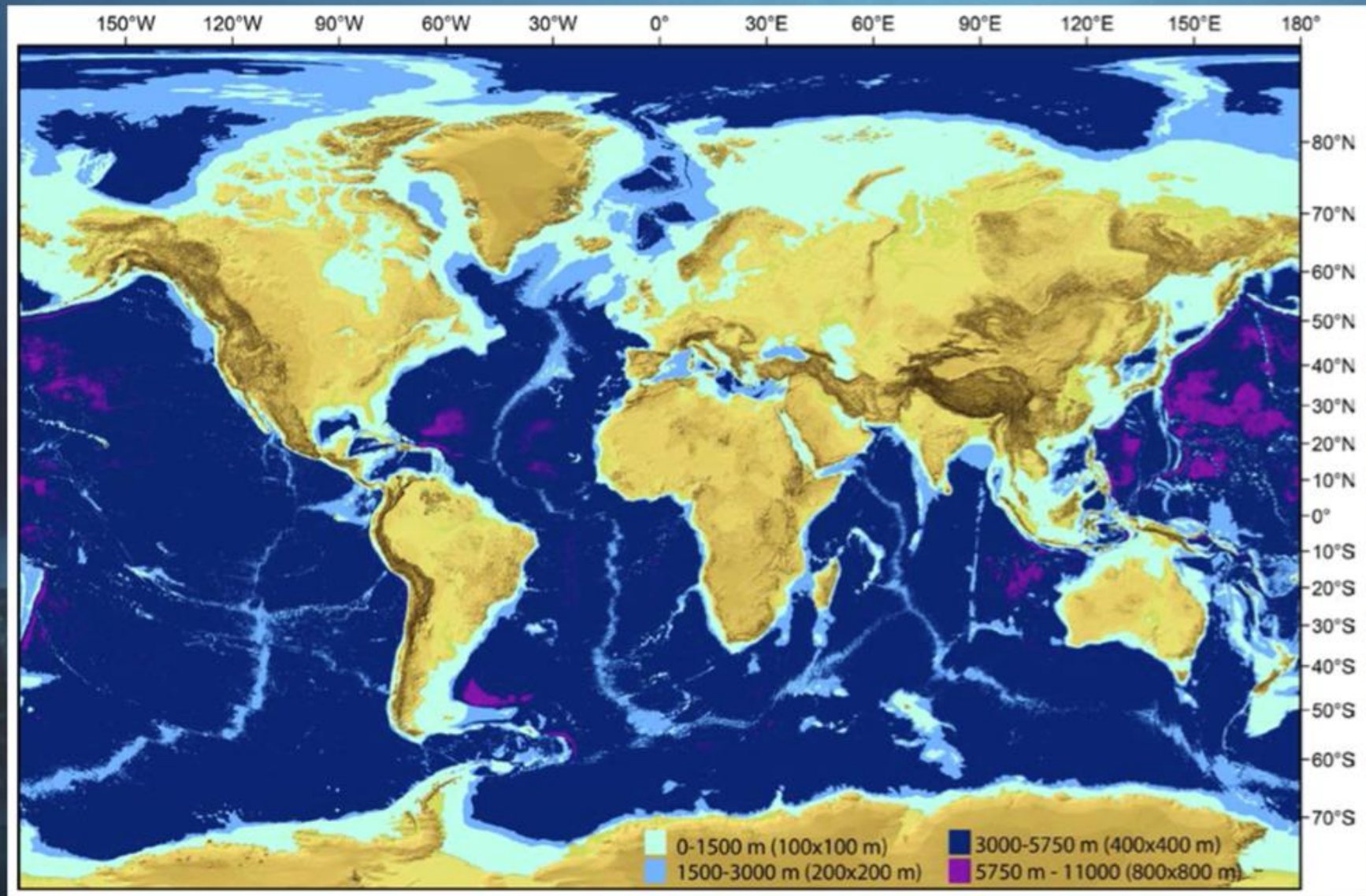


The Nippon Foundation - GEBCO Seabed 2030 Project is a collaborative project to inspire the complete mapping of the world's ocean by 2030, and to compile all bathymetric data into the freely-available GEBCO Ocean Map.

Seabed 2030 aspires to empower the world to make policy decisions, use the ocean sustainably, and undertake scientific research that is informed by a detailed understanding of the global ocean floor.



What does 100% mapped mean?



GEBCO Products

- Global gridded bathymetric data
 - 2014: 30 arc-second grid
 - 2019 - 2021: 15 arc-second grid
- Gazetteer of Undersea Feature Names
- Grid viewing software
- Printable maps
- Web Map Service (WMS)
- IHO-IOC GEBCO Cook Book



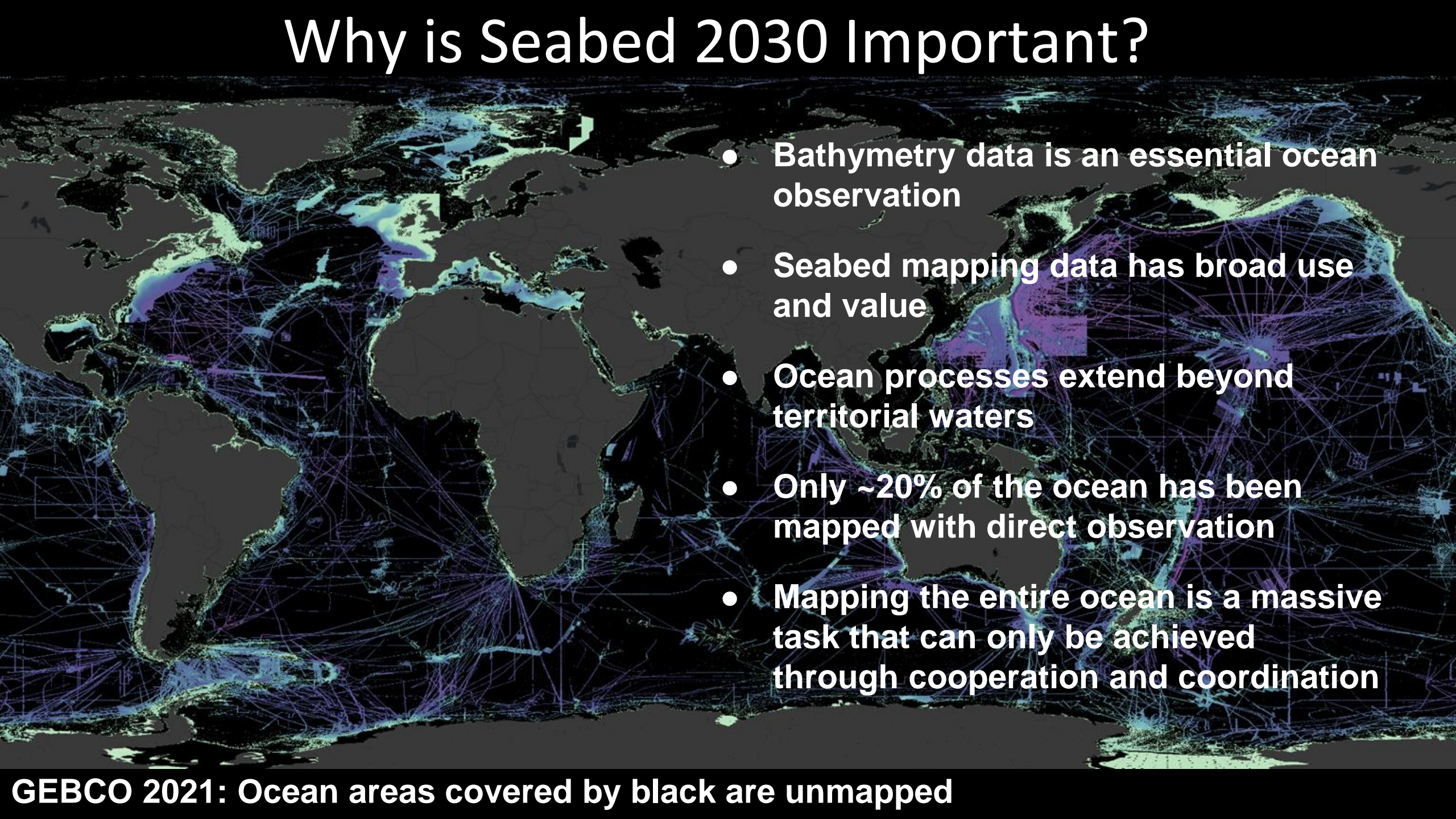
The screenshot shows the GEBCO website homepage. At the top, there is a navigation menu with links for Home, Data & Products, Seabed 2030, Training, News & Media, About, and Contact. Below the navigation is a header section featuring logos for IHO (International Hydrographic Organization), IOC (International Oceanographic Commission), and GEBCO. The main content area includes the GEBCO logo and a statement: "GEBCO aims to provide the most authoritative, publicly available bathymetry data sets for the world's oceans." Below this statement are three buttons: "Download GEBCO's global grid", "Download polar grids", and "Contribute data".

The main content area is divided into three columns, each with a title, an image, a description, and a "Read more" button:

- Gridded Bathymetry Data:** Includes a world map showing bathymetric data. Description: "GEBCO's gridded bathymetric data sets are global terrain models for ocean and land. The grids are available to download or access through Web Map Services." Button: "Read more".
- Data & Products:** Includes a map of the Pacific Ocean region. Description: "GEBCO produces and makes available a range of bathymetric data sets and products. This includes a global bathymetric grid, gazetteer of undersea feature names, a Web Map Service and printable maps of ocean bathymetry." Button: "Read more".
- Seabed 2030:** Includes a map of the seabed. Description: "Seabed 2030 is a collaborative project between the Nippon Foundation and GEBCO. It aims to bring together all available bathymetric data to produce the definitive map of the world ocean floor by 2030 and make it available to all." Button: "Read more".

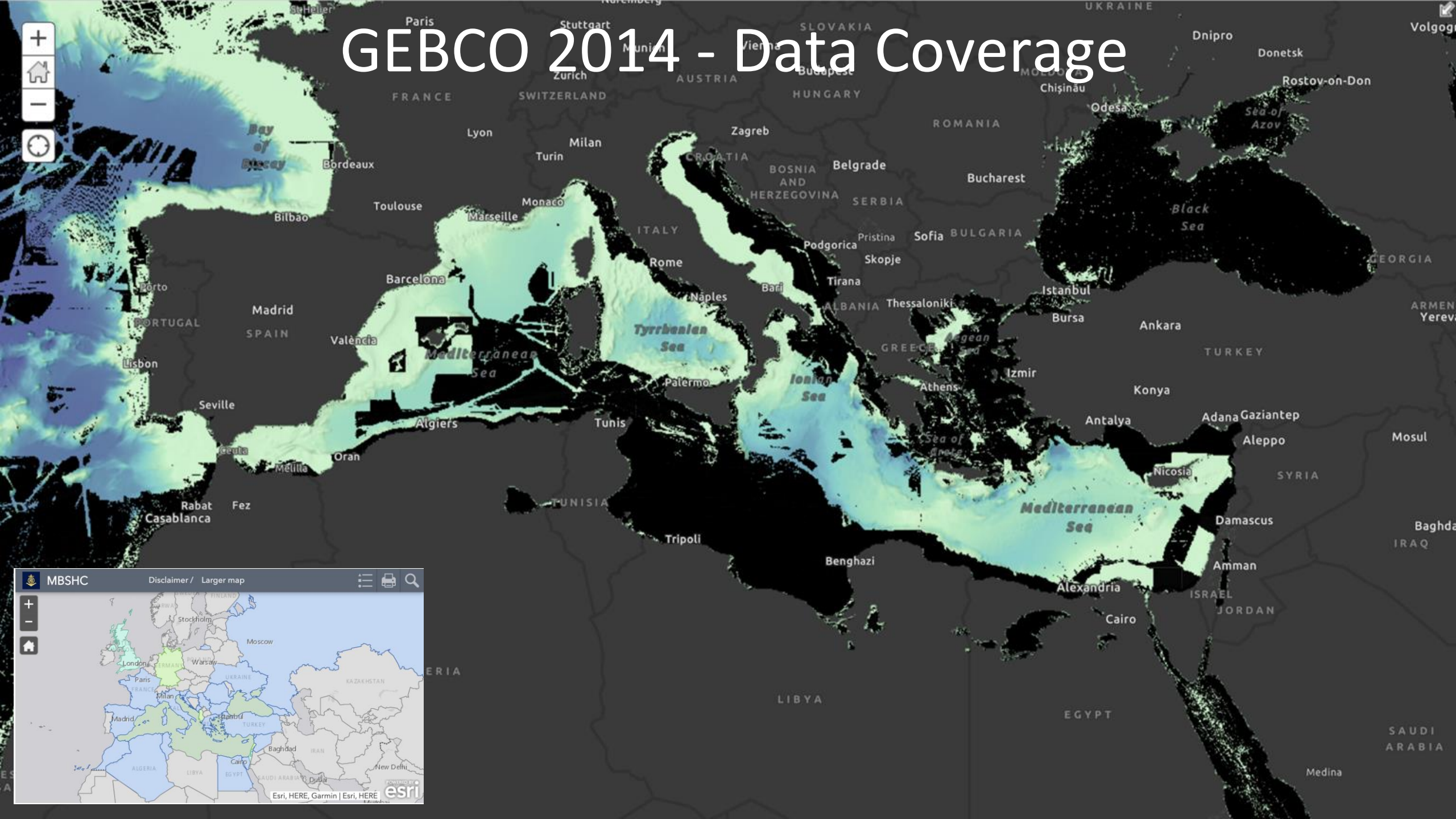
Download the GEBCO grid from: gebco.net or seabed2030.org

Why is Seabed 2030 Important?

- 
- A world map where the oceans are colored in shades of blue and green, representing mapped seabed areas. The landmasses are black. The map is overlaid with a network of thin, light-colored lines, likely representing data collection routes or survey tracks. The density of these lines is higher in some regions, such as the North Atlantic and the Pacific, and lower in others, such as the Indian Ocean and parts of the Southern Ocean.
- Bathymetry data is an essential ocean observation
 - Seabed mapping data has broad use and value
 - Ocean processes extend beyond territorial waters
 - Only ~20% of the ocean has been mapped with direct observation
 - Mapping the entire ocean is a massive task that can only be achieved through cooperation and coordination

GEBCO 2021: Ocean areas covered by black are unmapped

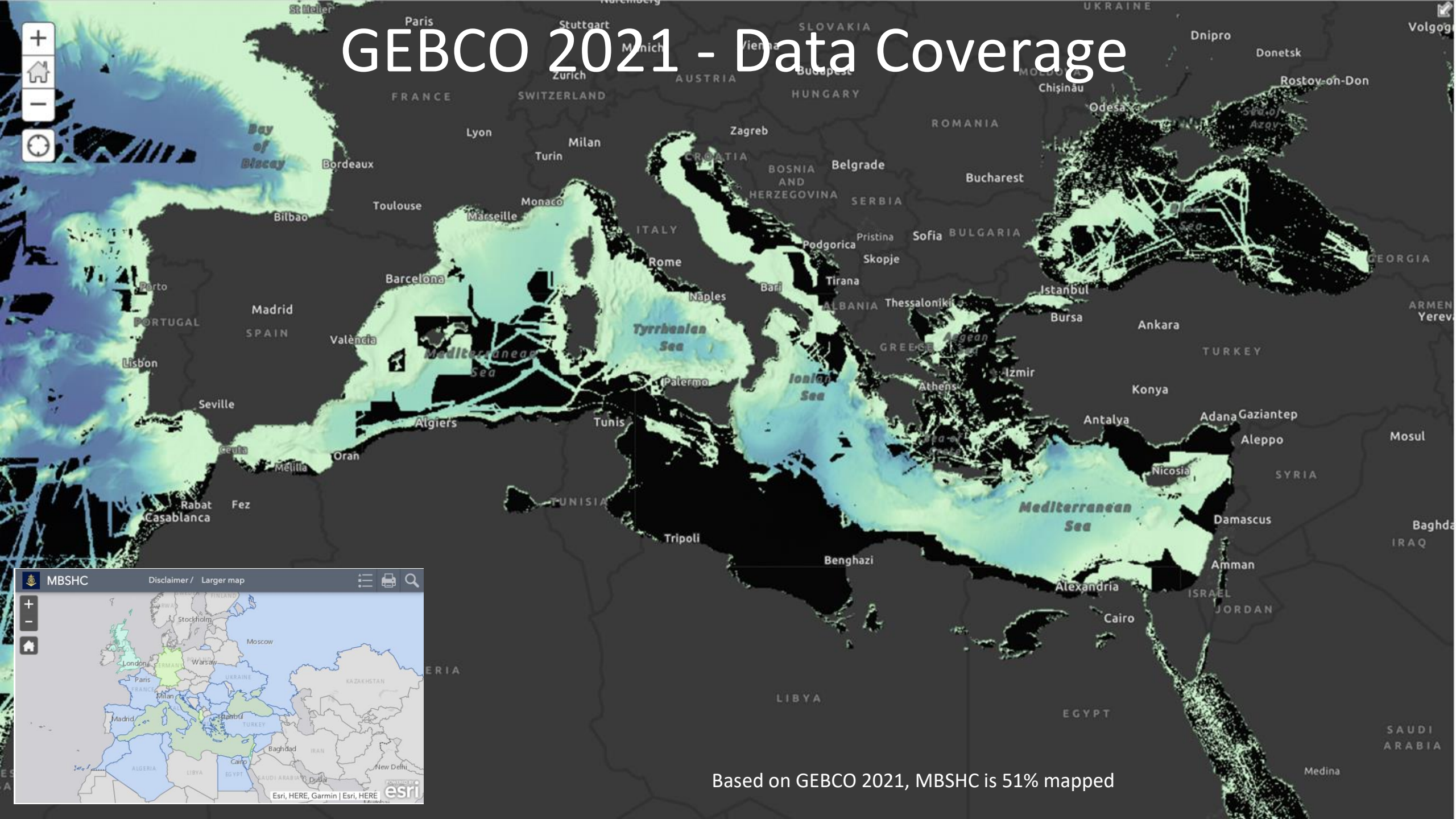
GEBCO 2014 - Data Coverage



MBSHC Disclaimer / Larger map

Esri, HERE, Garmin | Esri, HERE

GEBCO 2021 - Data Coverage



Based on GEBCO 2021, MBSHC is 51% mapped

Mapping the Gaps

- **Ocean Frontier Mapping**

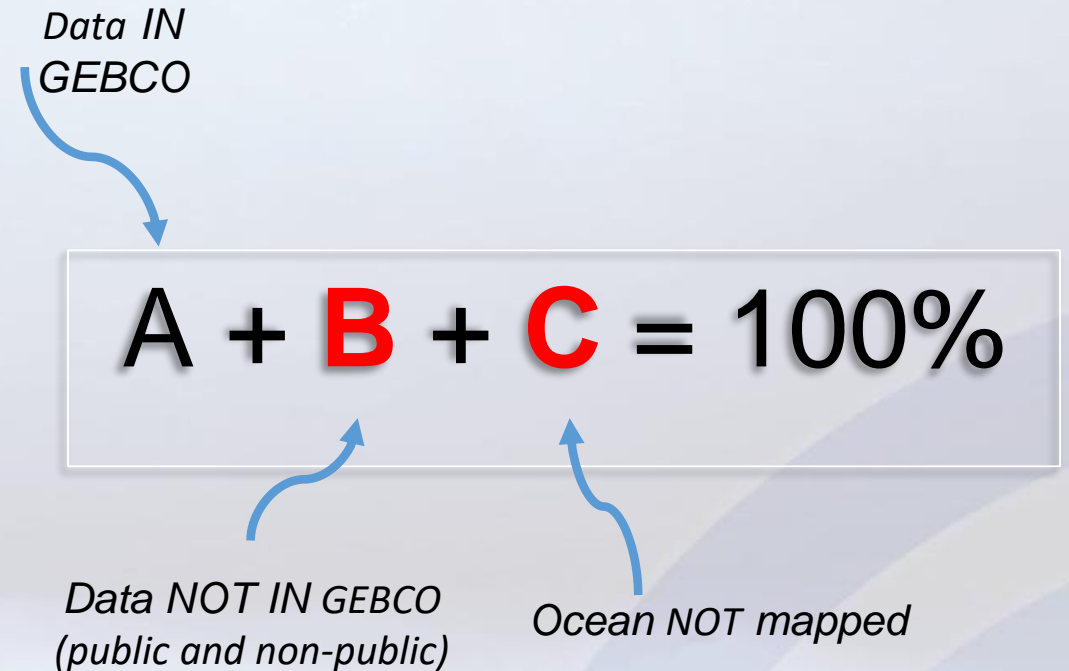
- Use GEBCO grid to inform location of future mapping
- Advocate for greater mapping activity
- Identify funding for mapping expeditions

- **Crowdsourced Bathymetry**

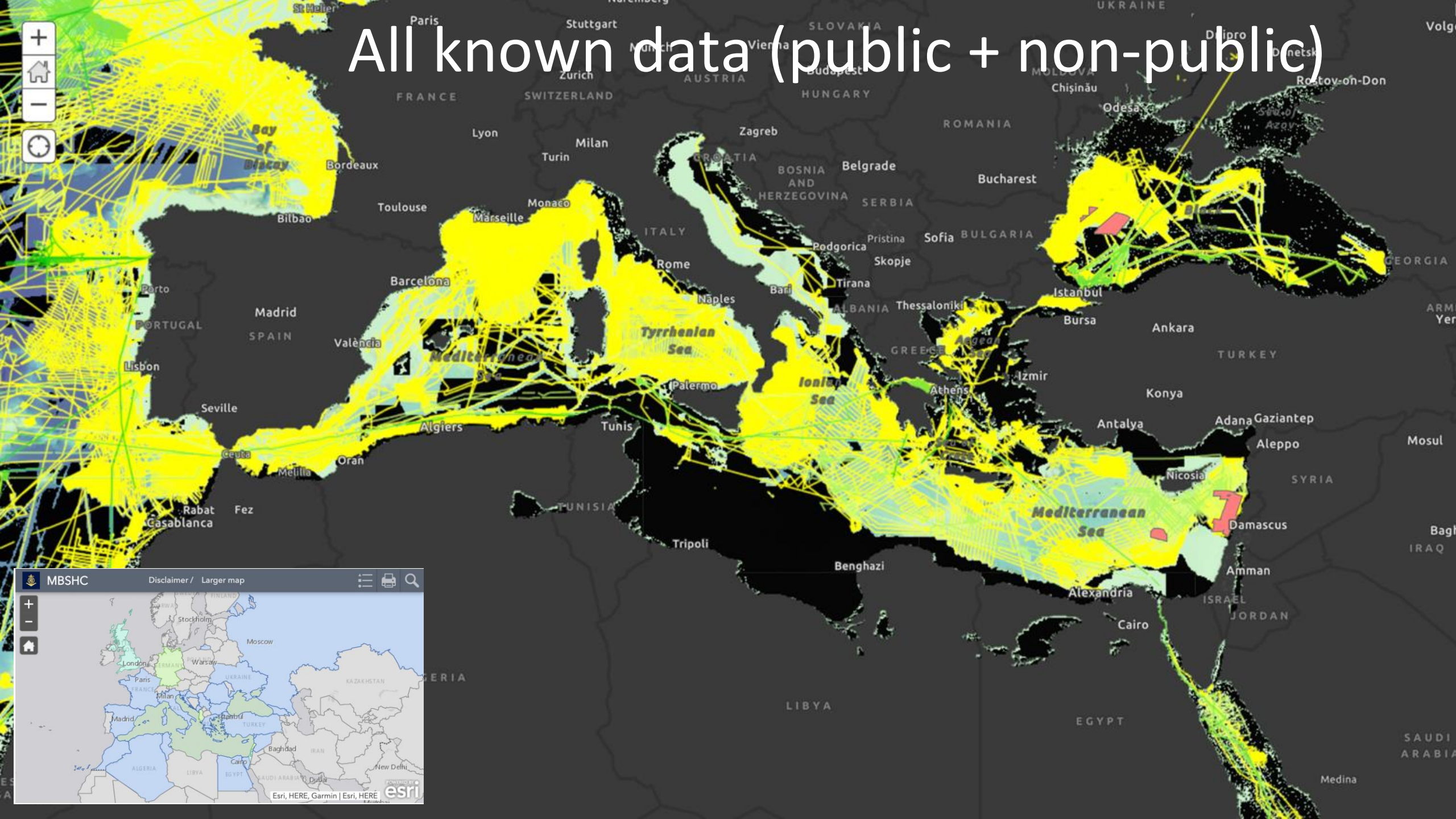
- Promote CSB around the world
- Gain support of/data from contributors at all levels

- **Technology Innovation**

- What can Seabed 2030 do to accelerate update of technology to accelerate rate of bathymetric mapping?



All known data (public + non-public)

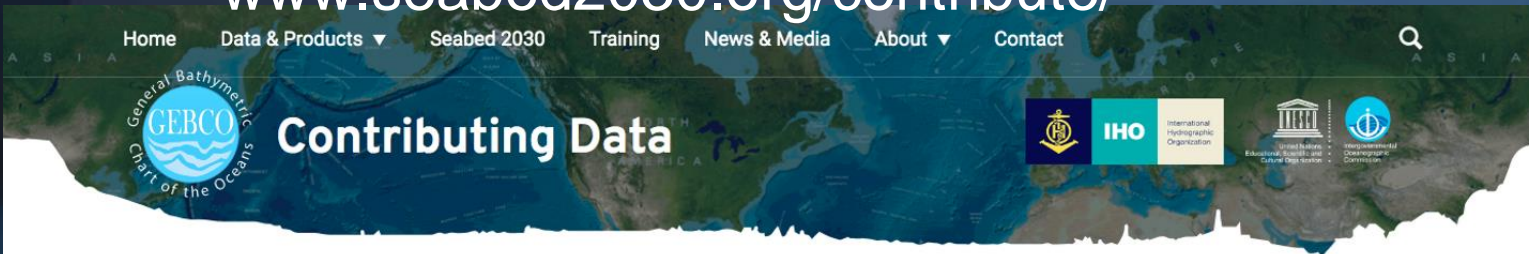


MBSHC Disclaimer / Larger map

Esri, HERE, Garmin | Esri, HERE

Contributing Data

- Bathymetry data in a variety of formats from a variety of devices
- IHO Data Center for Digital Bathymetry offers long-term archiving and access services
- More information available at:
www.seabed2030.org/contribute/



Home » About » Contributing data

How to contribute data

Please use the form below to make contributions of multibeam and/ or single-beam survey data, individual soundings or existing grids to help update our gridded data sets and products. If you have any problems in completing the form, then please email this information to the Global Center (gdacc@seabed2030.org).

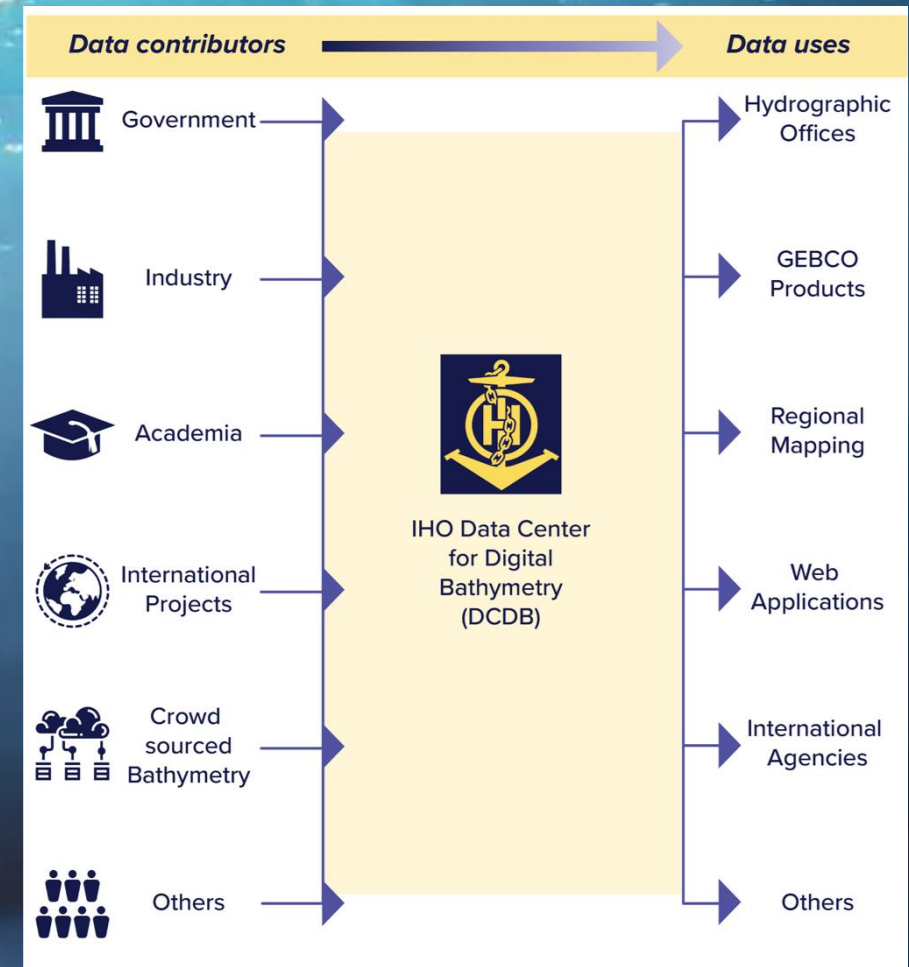
GEBCO Data Contribution Form

GEBCO's aim is to provide the most authoritative, publicly-available bathymetry of the world's oceans. It operates under the joint auspices of the International

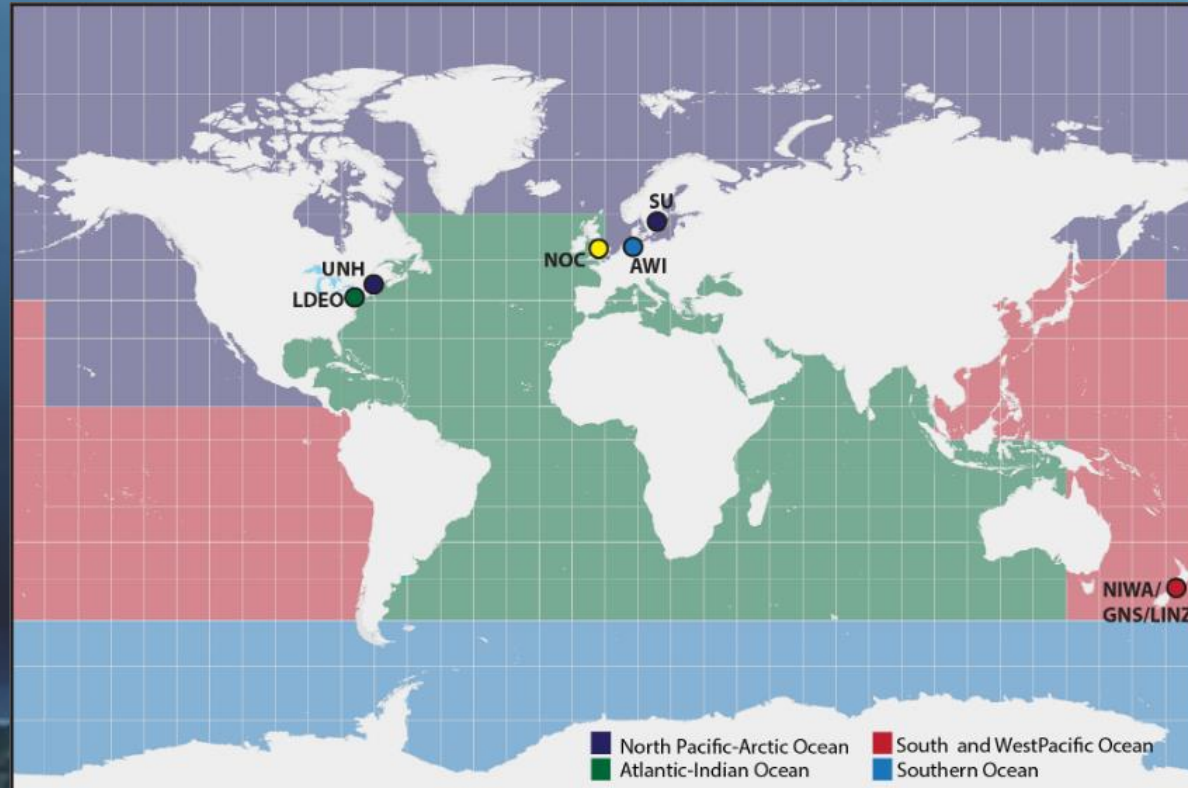
Jump to

- > [Our data contributors](#)
- > [Join the Crowdsourced Bathymetry initiative](#)

Share this



Seabed 2030 Regional Center for the Atlantic and Indian Oceans



Contact us: atlantic-indian@seabed2030.org



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



The IHO Crowdsourced Bathymetry Initiative

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

A Working Group was 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.

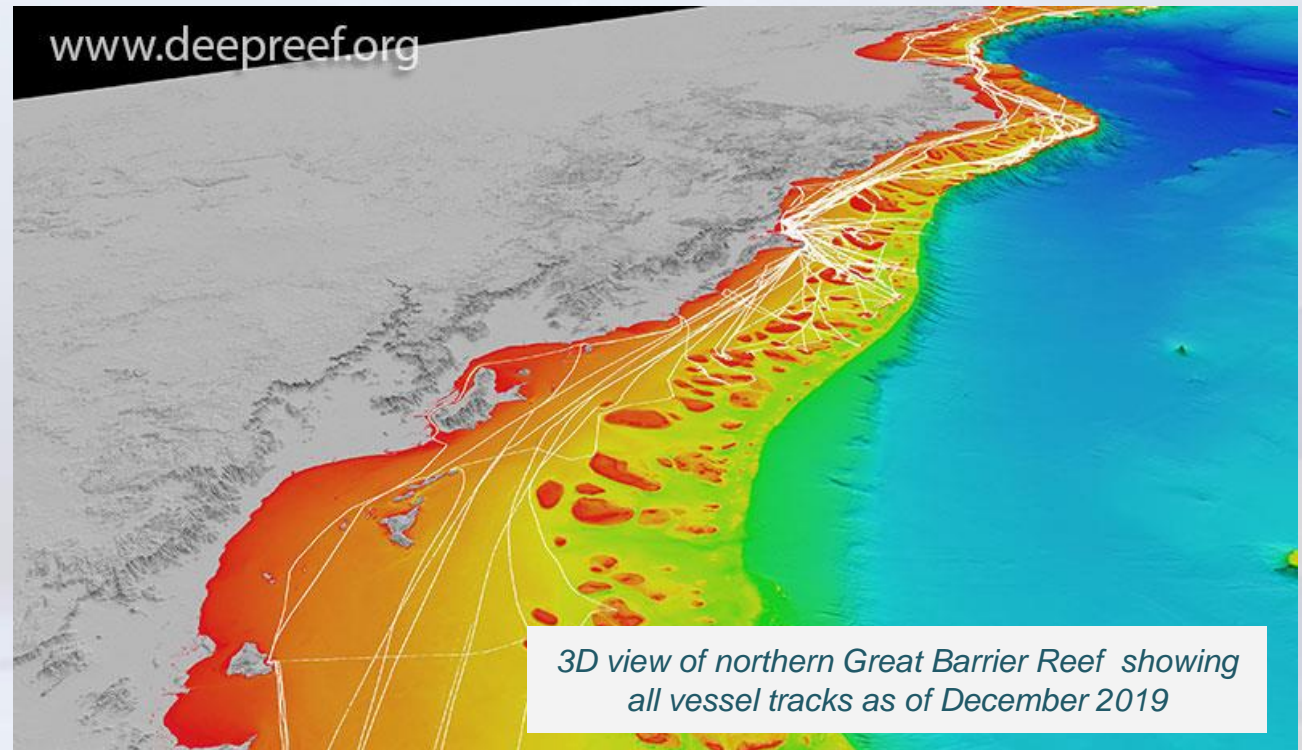
iho.int/uploads/user/pubs/bathy/B_12_Ed2.0.3_2020.pdf

The IHO Data Center for Digital Bathymetry built a data pipeline to allow the public to contribute and access CSB data.



The Value of Crowdsourced Bathymetry Data

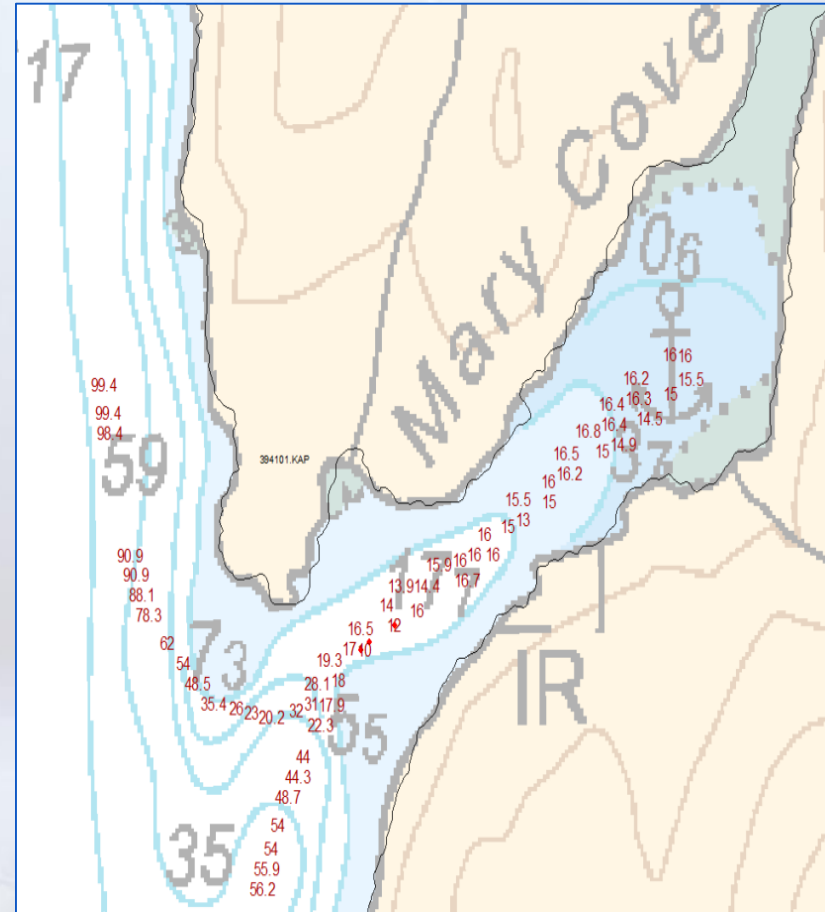
- Data with scientific, commercial & research value at no cost to the public sector
- Fill gaps where data is scarce (eg: Arctic, SIDS)
- Useful along shallow, complex coastlines
- Identify uncharted features
- Assist in verifying charted information
- Confirm whether charts are appropriate for the latest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



...but only if vessels collect depth information while on passage!

The Value of Crowdsourced Bathymetry Data

- CHS 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.



*CSB revealed some chart compilation problems.
Don't use the chart to figure out how much anchor chain you need!*



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 national jurisdiction into the public domain
- To date, 30 coastal states (green) have replied positively** (**Cyprus, Georgia, Italy, Monaco, Romania, USA**)
- A geographic filter was implemented to reflect current coastal state positions.



[*iho.int/uploads/user/circular_letters/eng_2020/CL21_2020_EN_v1.pdf](https://iho.int/uploads/user/circular_letters/eng_2020/CL21_2020_EN_v1.pdf)

[**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)



CL 21/2020 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?

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 - 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:

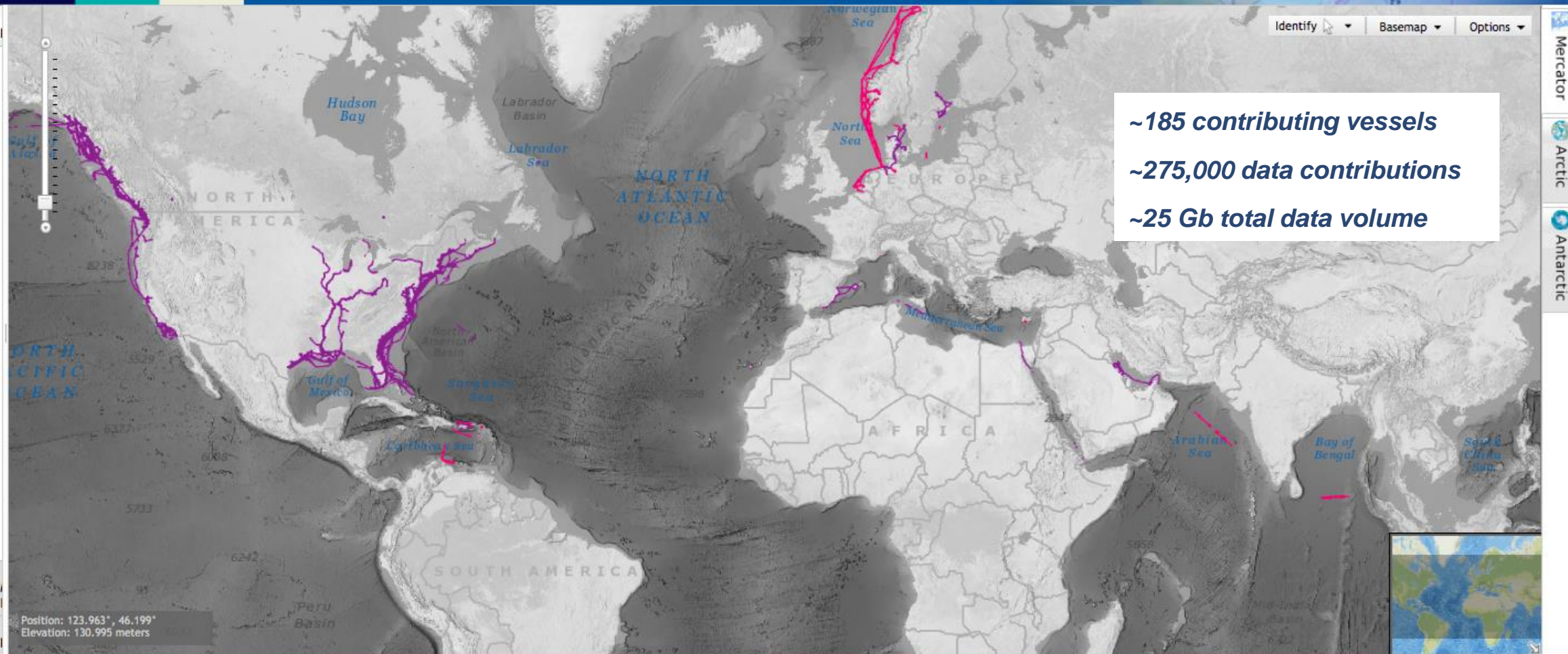




IHO

International
Hydrographic
Organization

Data Centre for Digital Bathymetry Viewer



~185 contributing vessels
~275,000 data contributions
~25 Gb total data volume

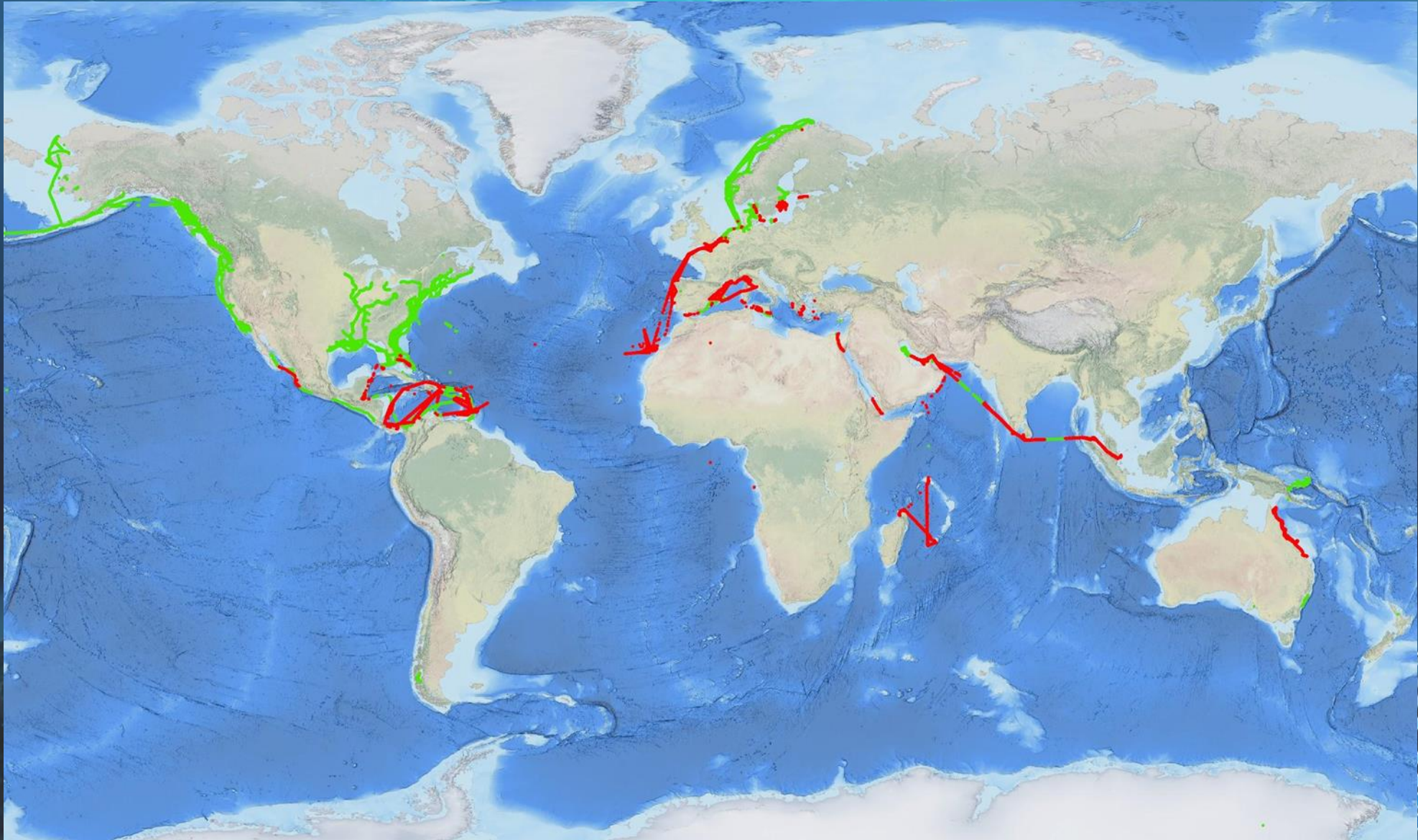


IHO

International
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Data Centre for Digital Bathymetry Viewer





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.

Current CSB Trusted Nodes

Rose Point Navigation System

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

MacGregor/Carnival Cruise Line

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

FarSounder

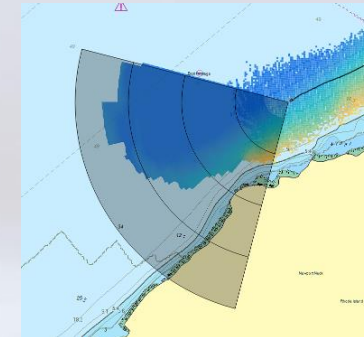
- Manufactures 3D Forward Looking Sonar; some clients have agreed to ALSO collect/contribute CSB

Petroleum Geo-Services (PGS)

- Recently established a new bathymetric feed b/w DCDB & PGS seismic vessels



www.rosepointnav.com



In Process CSB Trusted Nodes

James Cook University

- Data submitted to the DCDB; Awaiting Australia's response to IHO CL

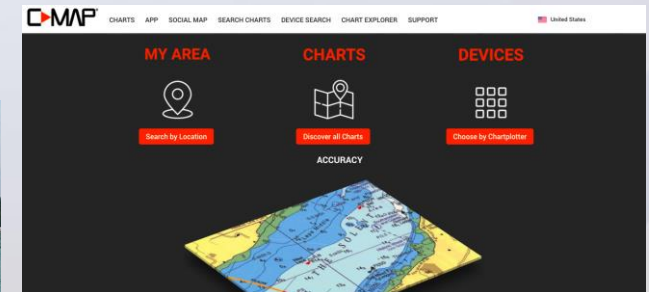


SmartLog USB data logger



Navico C-MAP

- Recently established a new bathymetric feed b/w DCDB & navigation software company



Great Lakes Observing System

- Awaiting test submissions, initial checks complete



M2Ocean

- Finalizing metadata content and testing data submissions with data collected by Hydroballs (small autonomous bathymetric buoys)



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 and GEBCO.



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



Seabed 2030-funded CSB Field Trials

- **Greenland Institute of Natural Resources**
 - Phase 1: aim to engage approximately 50 vessels of various sizes- 30 data loggers deployed so far.
- **South African Navy Hydrographic Office (SANHO) and Institute of Maritime Technology (IMT)**
 - 100 data loggers deployed to SANHO/IMT.
 - Planning of trials: identification of stakeholders, establish relationships, feasibility studies, regular communication via various channels.
- **Palau Bureau of Marine Transportation**
 - 100 data loggers received (NMEA0183 and NMEA2000)
 - Coordinating with South & West Pacific Seabed 2030 Data Center
 - Will receive support from U.S. Navy for logger installation and setup in 2022.



Credit: Karl Zinglensen



"Sea Lab 1", IMT – trial deployment (Credit: Cdr Christoff Theunissen)



IHO CSB Working Group

- 11 meetings; 1 Industry workshop
- Chair (Jennifer Jencks, USA) & Vice-Chair (Pete Wills, CA)
- Active Member State Participation:
 - Canada, China, **Croatia**, Denmark, **France**, Germany, India, **Italy**, **Lebanon**, Mexico, Netherlands, New Zealand, Norway, Portugal, South Africa, Sweden, UK, Uruguay, **USA**
- 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 WOC
- IHO: Assistant Director Sam Harper



CSBWG 9: 30 Jun-02 Jul 2020



CSBWG 10: 30 Mar -01 Apr 2021

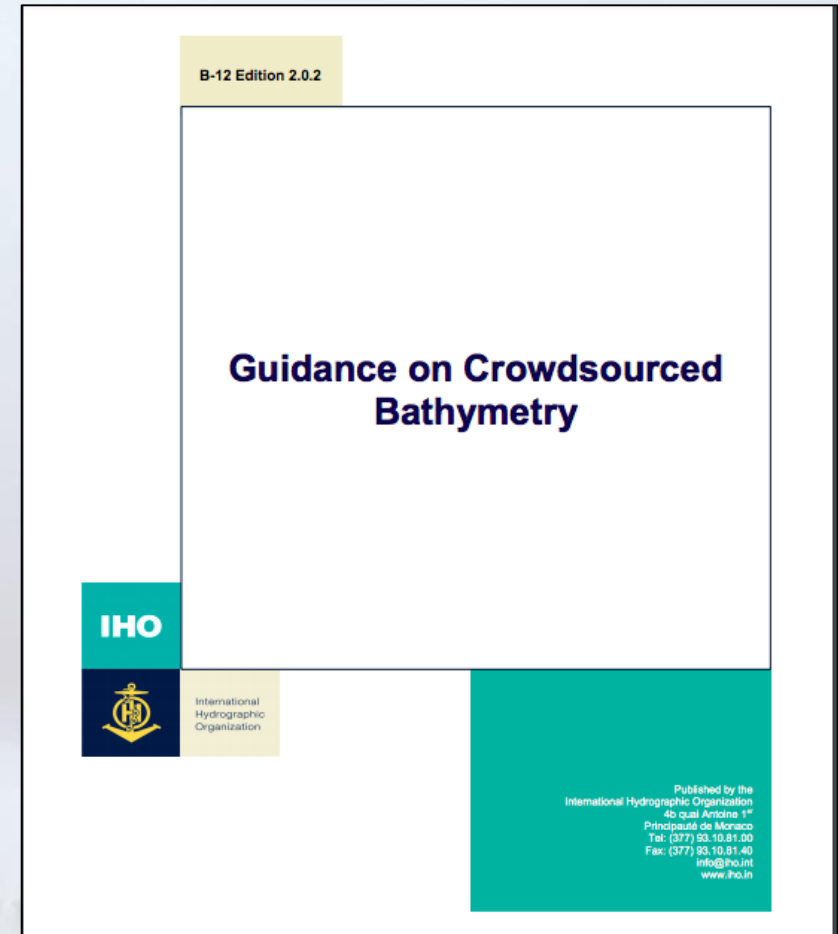


IHO CSB Working Group 12

CSBWG12 held virtually 7-10 March 2022.

FOCUS: To finalize the review and update of IHO Publication B-12: CSB Guidance Document.

B-12 has now been in circulation for over 2 years and, apart from including feedback from operational use and experience, there is a strong desire to make the document more "equipment agnostic" with the intent of soliciting data from ALL sources, not just single beam echo sounders.

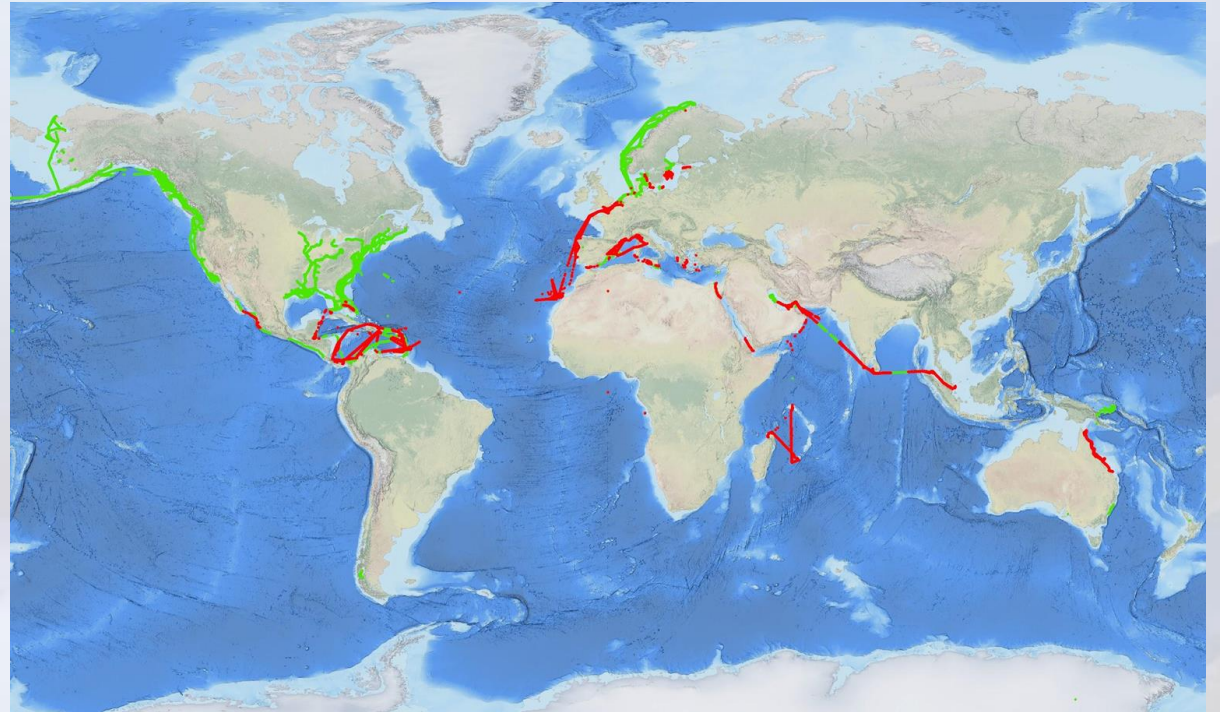


iho.int/uploads/user/pubs/bathy/B_12_Ed2.0.3_2020.pdf



How can HOs become more involved in CSB?

- Offer a positive response to the IHO or IRCC Circular Letters
- Consider joining and/or attending the CSBWG - it is open to all!
- Encourage local participation in CSB collection and sharing.
- Volunteer to become the next Seabed 2030-funded CSB Program!



Thank you.

