IHO Data Centre for Digital Bathymetry

Report to IRCC15

Tokyo, Japan
12 – 14 June 2023

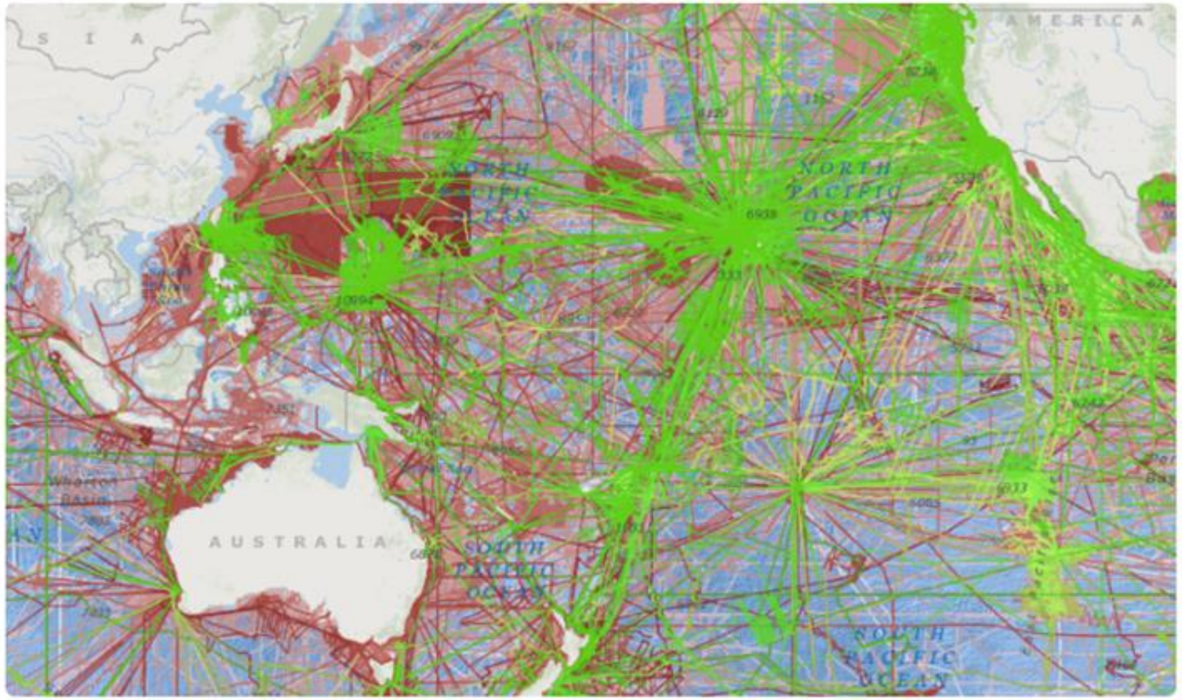
By Jennifer Jencks

Director, IHO DCDB

IHO DCDB Home | Contribute Data | Crowdsourced Bathymetry | CSB Mapping Projects

IHO Data Centre for Digital Bathymetry (DCDB)

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



IHO DCDB Data Viewer highlighting ship tracks and data availability over the Pacific Ocean and neighboring regions

The DCDB archive includes over 30 terabytes of oceanic depth soundings acquired with multibeam and singlebeam sonars by hydrographic, oceanographic and industry vessels during surveys or while on passage.

The DCDB also archives and provides access to data contributed in support of the IHO Crowdsourced Bathymetry (CSB) initiative.

The IHO DCDB Data Viewer shows the global coverage of the DCDB's bathymetric data holdings as well as the spatial extent of data archived at other repositories via web services.

Access Data

IHO International Hydrographic Organization

ngdc.noaa.gov/iho/

International
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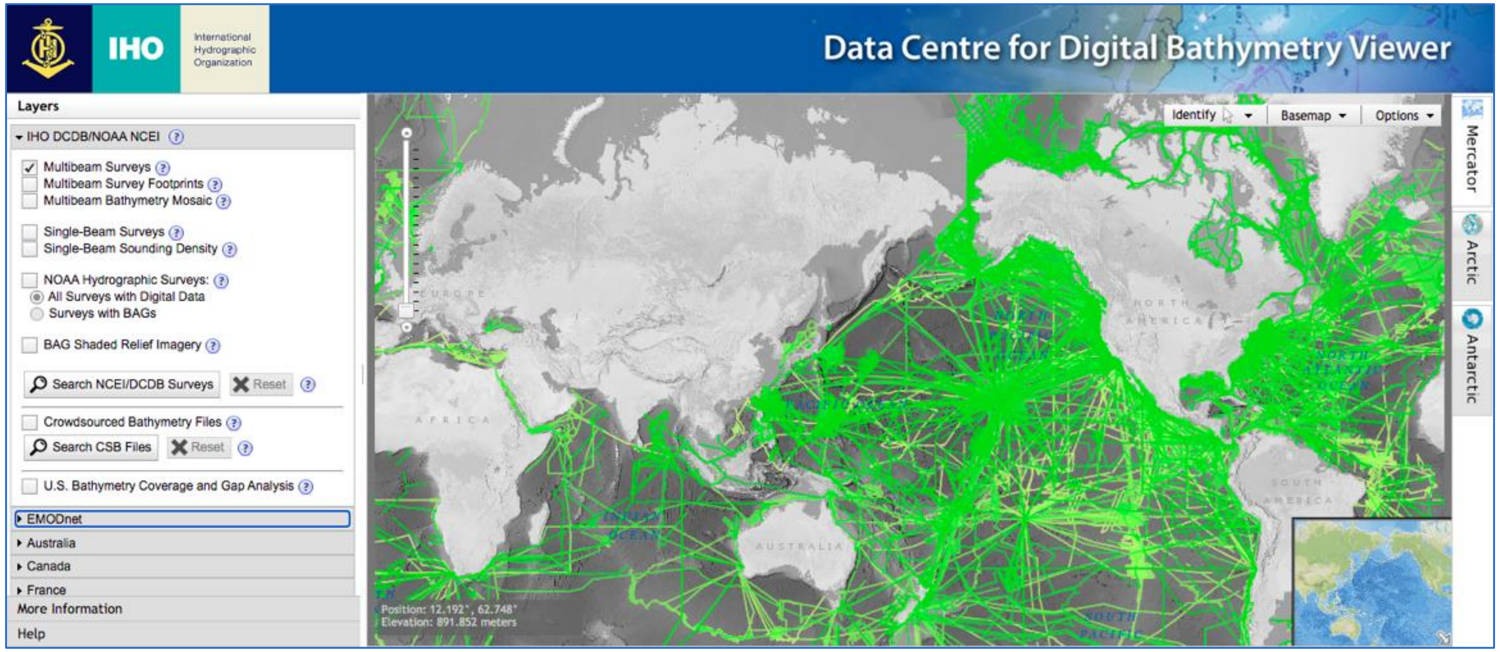
DCDB Data Holdings

Multibeam Bathymetry Data Holdings



Archive includes raw and processed multibeam bathymetry data, survey metadata, and supporting ancillary data and products for some surveys.

Contains over 3,800 surveys spanning 43 years.

58 different data sources.

Total size: ~66 TB uncompressed.

ncei.noaa.gov/maps/iho_dcdb

DCDB Data Holdings ⇒ GEBCO Products

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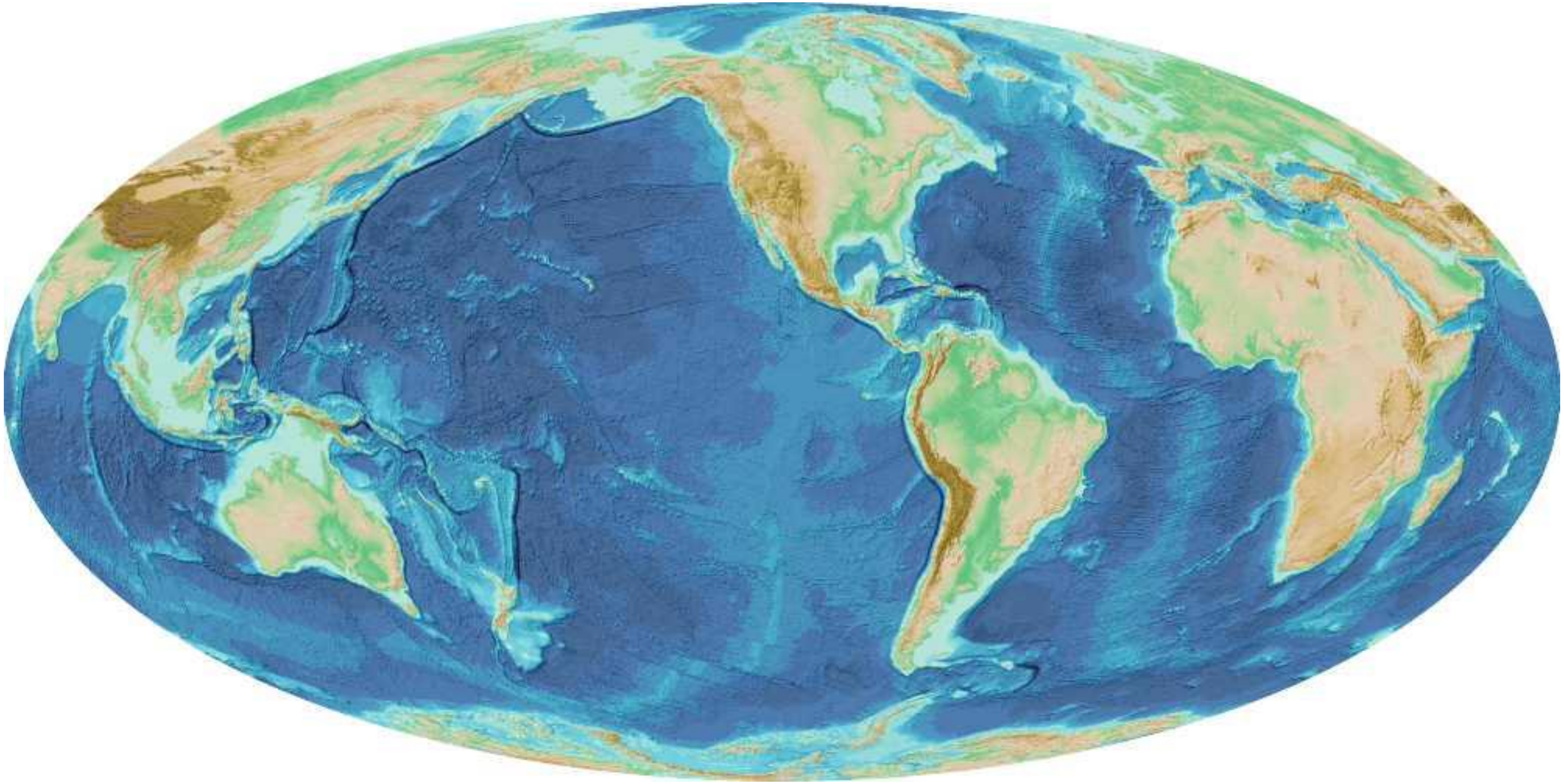

GEBCO 2023 grid = 24.9% of seafloor mapped

DCDB Data Holdings

Multibeam Bathymetry Data Contributions in 2022/23 - **127 NEW surveys**

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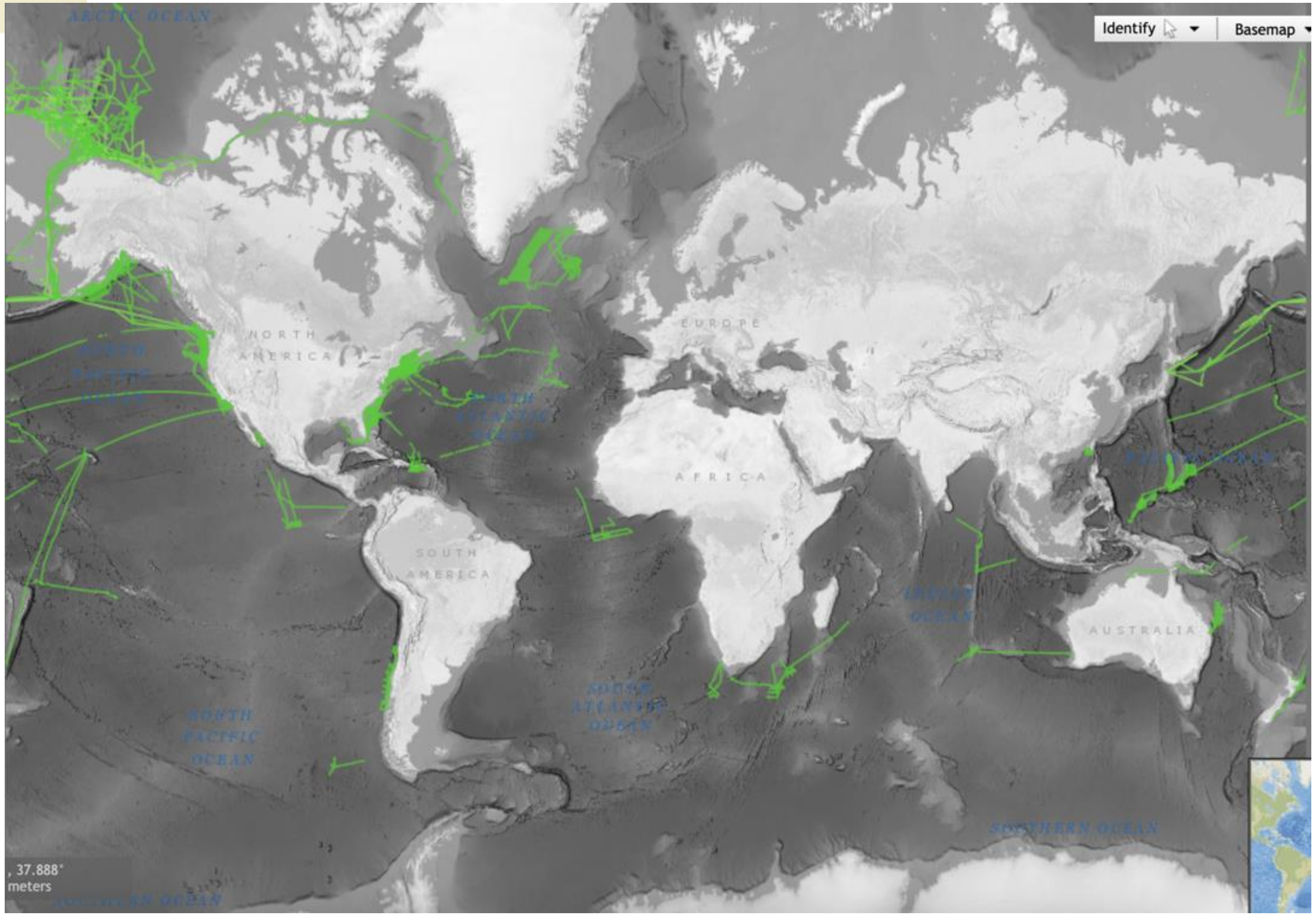


ncei.noaa.gov/maps/iho_dcdb

U.S. Academic Research Fleet (ARF): 60 surveys

Fugro: 12 surveys

NOAA Fleet: 51 surveys

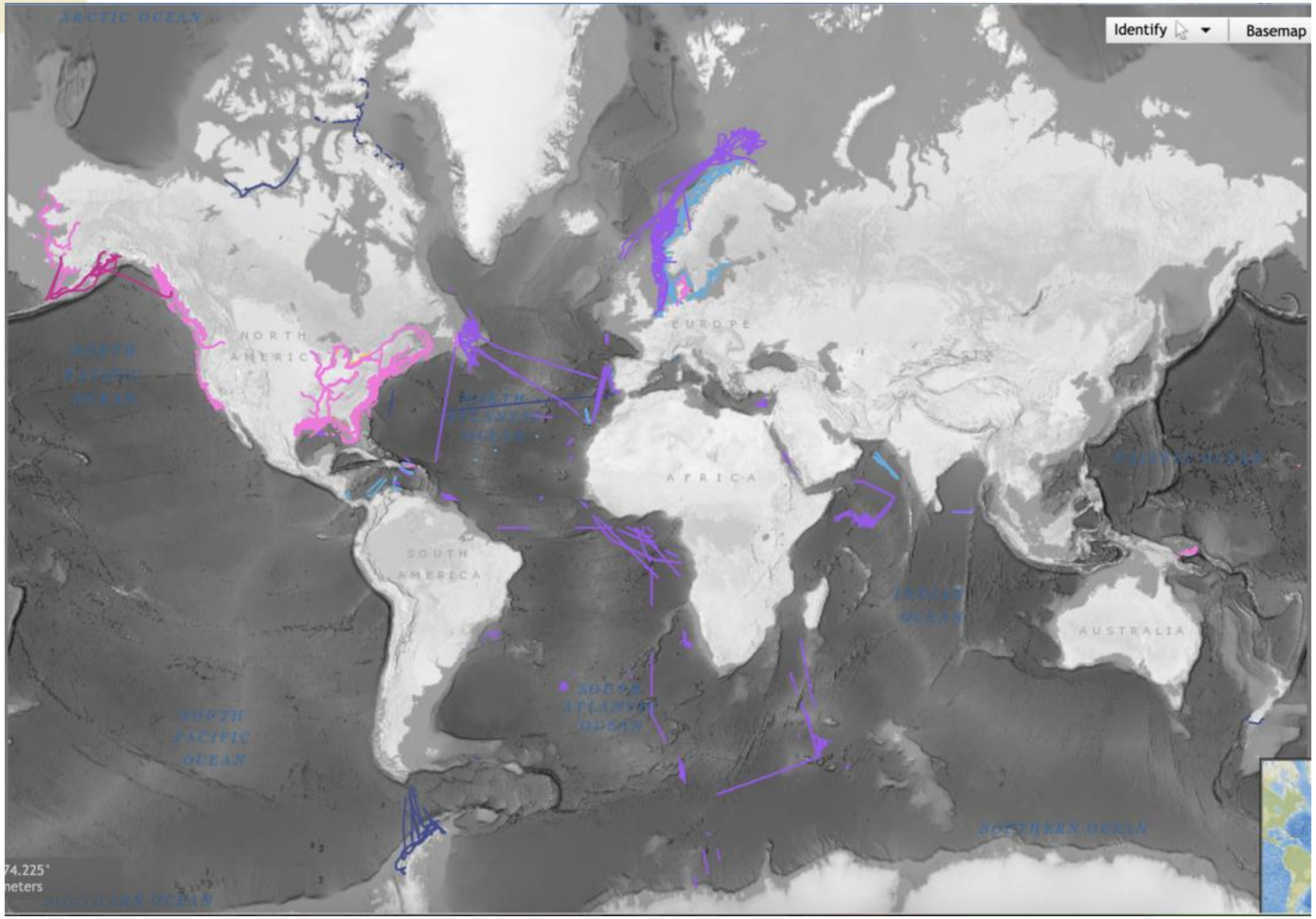
JAMSTEC: 7 surveys

Canadian Hydrographic Service: 2 surveys

DCDB Data Holdings

Crowdsourced Bathymetry

International Hydrographic Organization



ncei.noaa.gov/maps/iho_dcdb

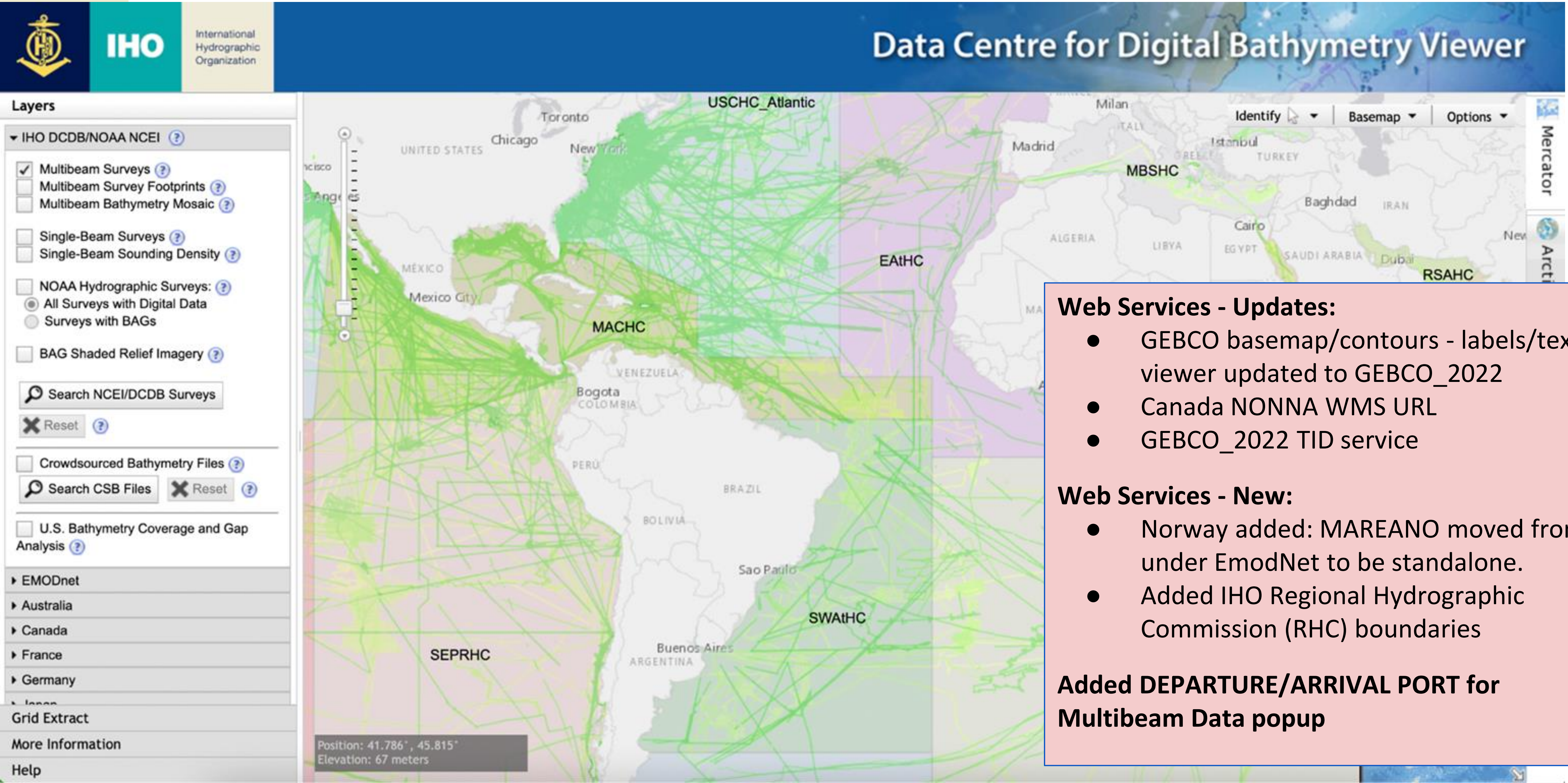
The DCDB continues to bring in CSB data from:
Rosepoint Navigation System, FarSounder Inc, PGS and MacGregor Germany.

New CSB pipelines were finalized with:
M2Ocean, Great Lakes Observing System (GLOS), Orange Force Marine and GEC Aqua Map.

Onboarding in process for:
The Interdisciplinary Center for Development in Ocean Mapping (CIDCO) and Seabed 2030

DCDB Map Viewer

Improvements and updates



Web Services - Updates:

- GEBCO basemap/contours - labels/text in viewer updated to GEBCO_2022
- Canada NONNA WMS URL
- GEBCO_2022 TID service

Web Services - New:

- Norway added: MAREANO moved from under EmodNet to be standalone.
- Added IHO Regional Hydrographic Commission (RHC) boundaries

Added DEPARTURE/ARRIVAL PORT for Multibeam Data popup

DCDB Enhancements

Development of a coastal state pre-approval portal for CSB data.

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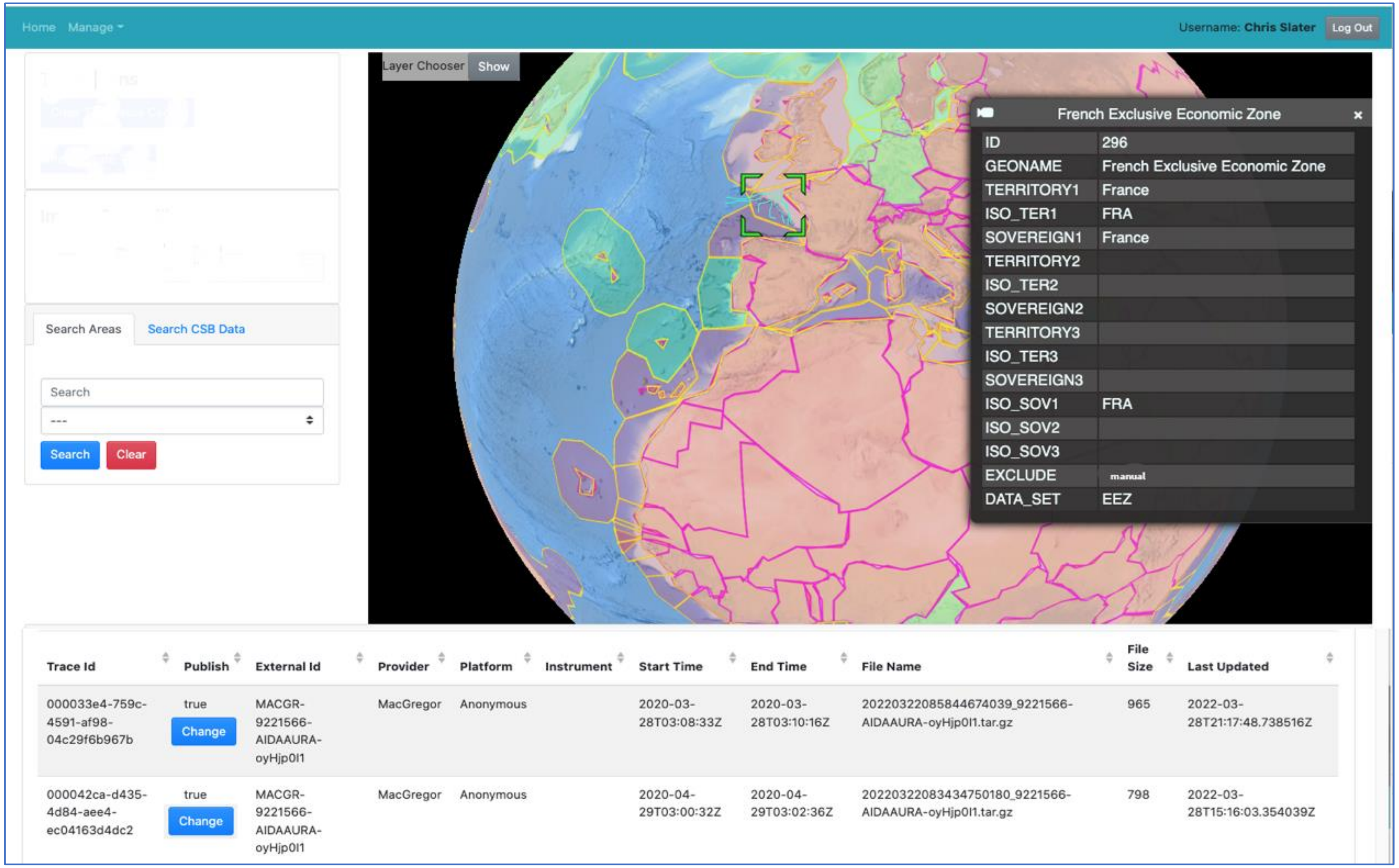
Testing underway for a notification and approval process of data for coastal states who have agreed to allow public access to CSB data collected within waters of their national jurisdiction, but requested pre-approval of data before the public distribution from DCDB.



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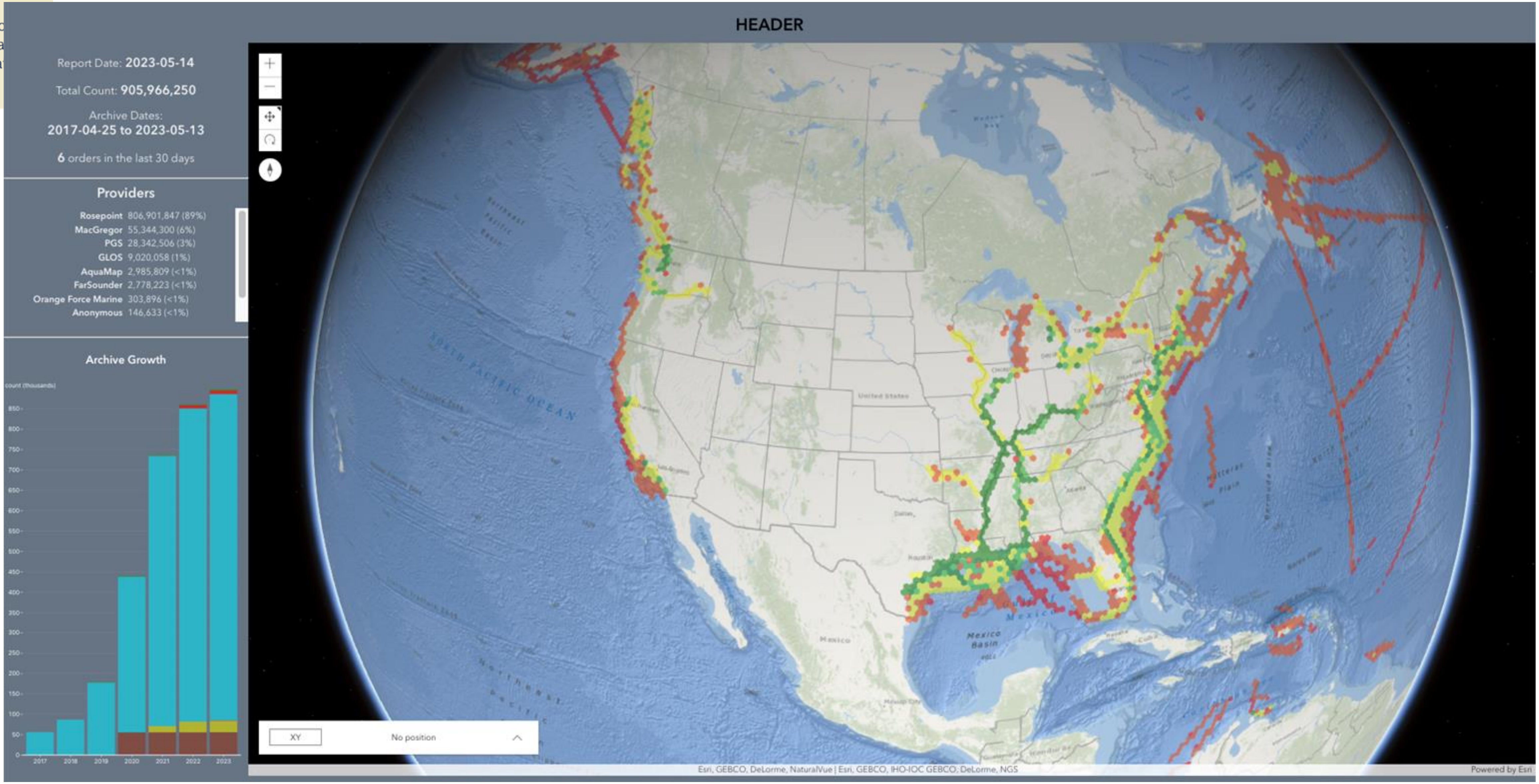
DCDB Enhancements

Development of a “CSB Pointstore Dashboard”



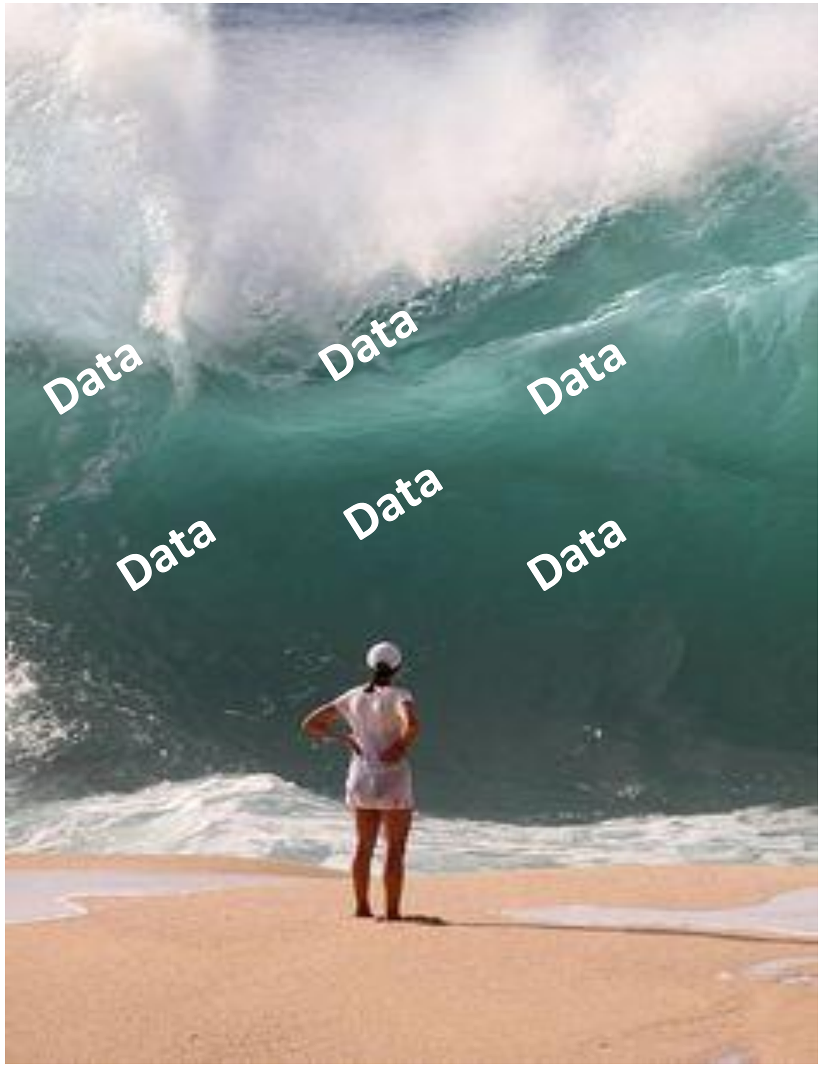
DCDB Enhancements

Preparing for the Wave of Data

Data submitted to the DCDB is formatted into our **database schema**, and then goes through our **data ingest pipeline** to get archived and published to the DCDB Data Viewer.

We are redesigning both the schema and pipeline! Our new ingest infrastructure will:

- Increase automation
- Improve efficiency
- Provide error handling & notification
- Have greater flexibility for evolving bathymetric technology
- Better handle complex datasets and large volumes of data
- Be cloud ready



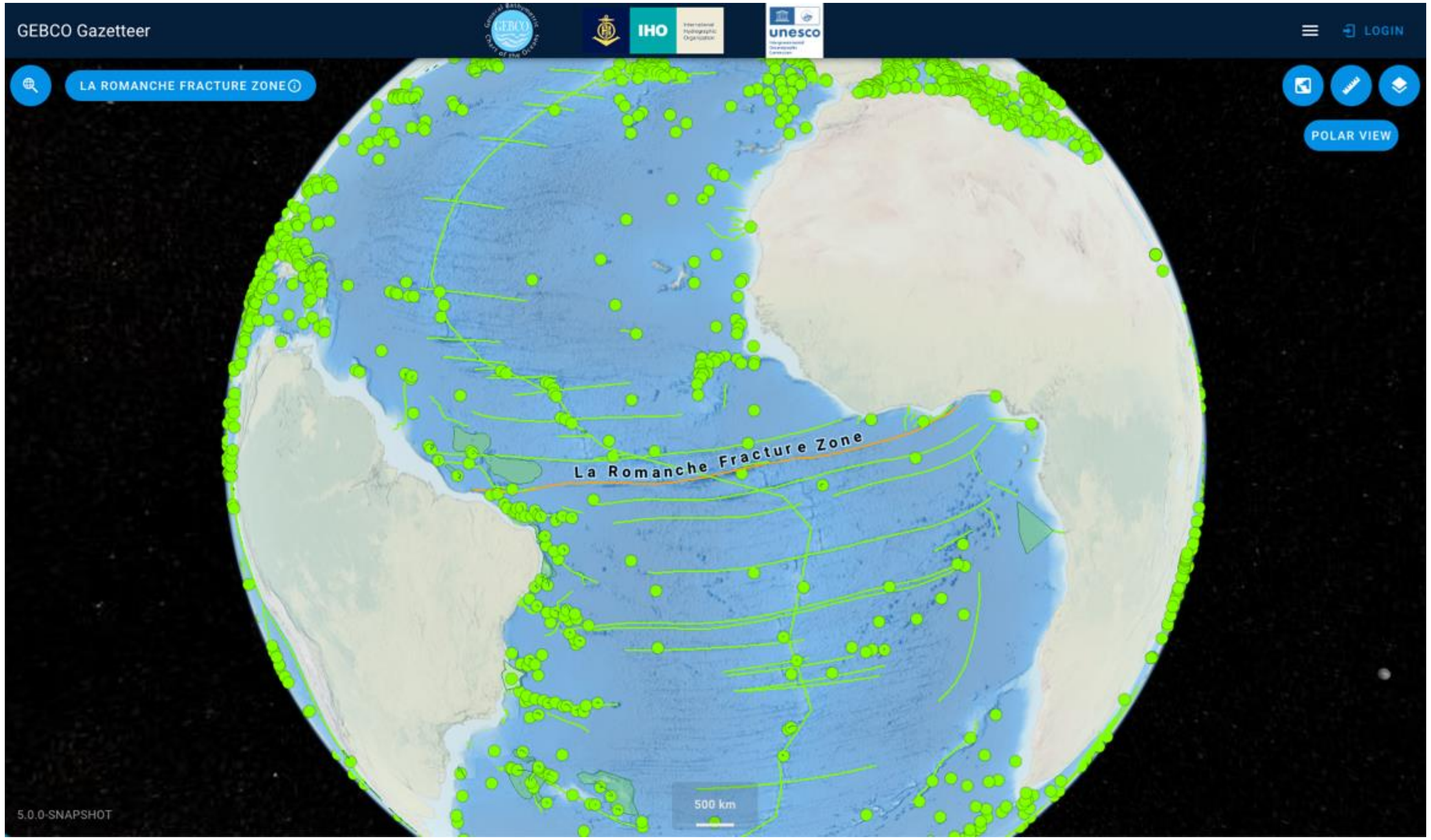
GEBCO Gazetteer

A web tool that allows the public to search for, view, and download information on more than 3800 undersea features.

Goals for 2023 work include:

- Continue to support the GEBCO Gazetteer and KHOA Beta-Gazetteer interoperation (Gazetteer v5.0.0)
- Update the API, fixing reported bugs and adding requested enhancements
- In-depth testing
- ***Developing a modern user interface with Vue.js and Google Material Design***

ngdc.noaa.gov/gazetteer



Progress on IRCC Actions - IHO Annual Report

Action 15

DCDB to investigate how to report on SPIs 3.2.1 and 3.2.2. in a way that allows the perception on the evolution on the amount of data and number of contributors to DCDB who are not hydrographic offices.

- SPI 3.2.1: Amount of data received per year by the IHO Data Centre for Digital Bathymetry (DCDB).
- SPI 3.2.2: Number of contributors to DCDB who are not hydrographic offices.

Figures reported to the Secretariat in January 2023, to populate the part of 2022 IHO Annual Report dedicated to the IHO Strategic Plan 2021-2026.

SINGLEBEAM BATHYMETRY

1. In 2022, a total of 177 datasets/surveys were contributed to the DCDB's singlebeam data holdings.
2. Of those 177 datasets/surveys, 10 were contributed by hydrographic offices.
3. HO contributions currently make up 17% of the DCDB's singlebeam data holdings.

MULTIBEAM BATHYMETRY

1. In 2022, a total of 198 datasets/surveys were contributed to the DCDB's multibeam data holdings.
2. Of those 198 datasets/surveys, 0 were contributed by hydrographic offices.
3. HO contributions currently make up 0% of the DCDB's multibeam data holdings.

CROWDSOURCED BATHYMETRY

1. In 2022, four new data providers began contributing data to the DCDB's CSB data holdings.
2. Of those four new data providers, 0 were hydrographic offices.
3. HOs currently make up 0% of the DCDB's CSB data providers.

Progress on IRCC Actions - <u>ARHC Report to IRCC</u>

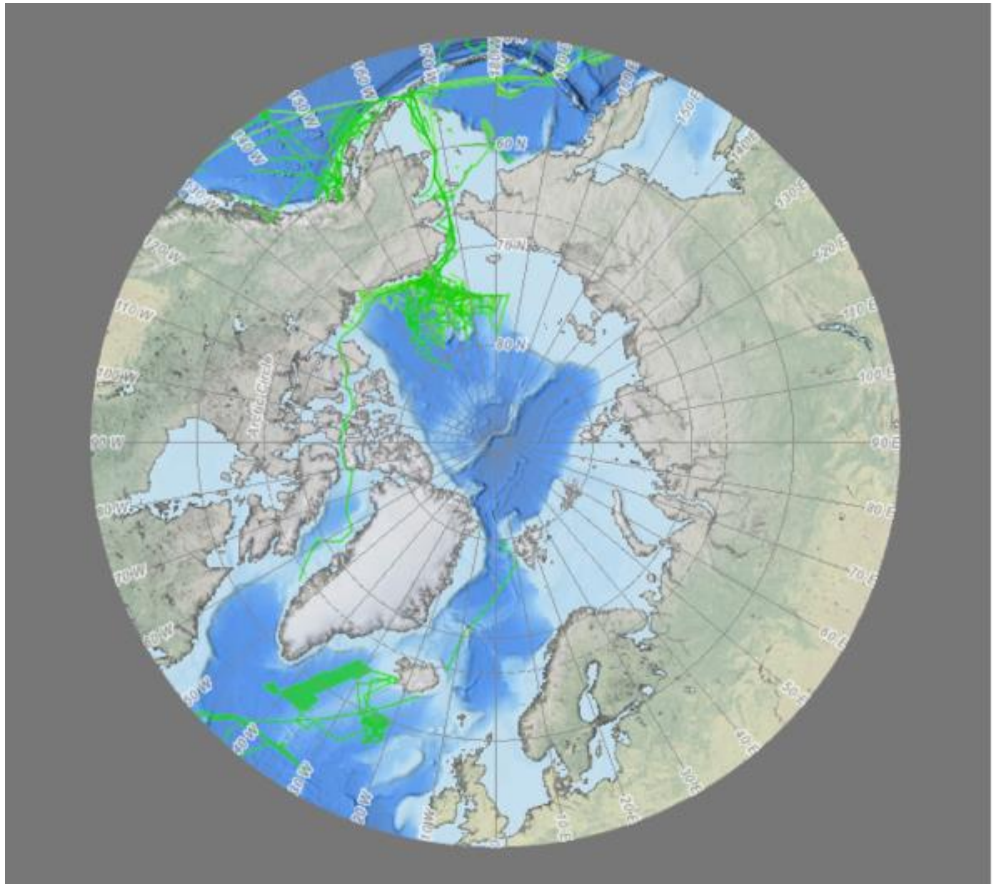
Action 15

DCDB to investigate how to report on SPIs 3.2.1 and 3.2.2. in a way that allows the perception on the evolution on the amount of data and number of contributors to DCDB who are not hydrographic offices.

IRCC14/**Recommendation 12: RHC to encourage Member States to release datasets or subsets into the public domain via the IHO DCDB.**

Ongoing. Nearly 30 surveys from the ARHC region were added to the DCDB database since June 2022. Data contributors include: U.S. Academic Fleet (10), Caladan Oceanic LLC (1), National Oceanic and Atmospheric Administration (1), U.S. Coast Guard (8), Japan Agency for Marine-Earth Science and Technology (6).

Figure 1: Multibeam bathymetry data added to the IHO DCDB database between June 2022-present.



Progress on IRCC Actions - ARHC Report to IRCC

Action 15

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IRCC14/Recommendation 13: RHC to encourage Member States to support the CSB initiative with positive actions…

Ongoing. New data continues to be recorded in the region by Petroleum Geo-Services (PGS) and users of Rosepoint's Coastal Explorer software. These data, when collected within the waters of Canada, Denmark, Norway, U.S., Finland, Iceland and Italy, are able to be made publicly discoverable after the DCDB addresses the caveats captured in IHO CL 21/2020.

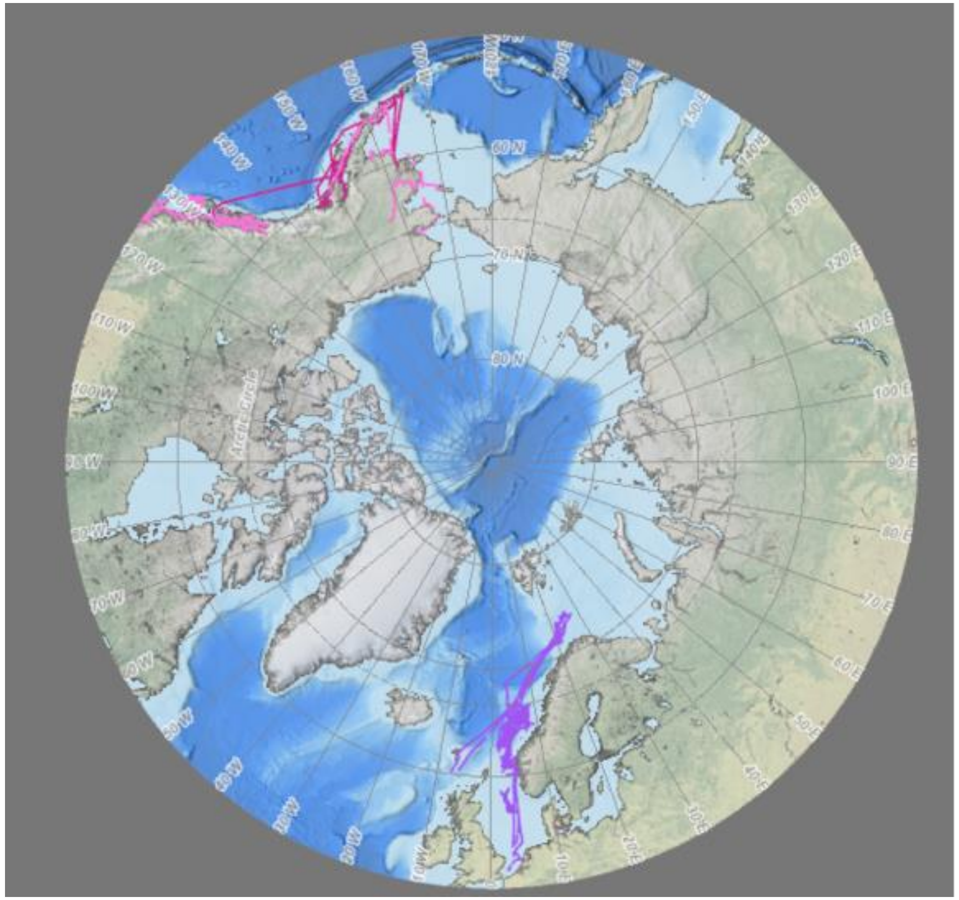

Figure 2: Crowdsourced bathymetry data added to the IHO DCDB database between June 2022-present.

Any Other Items of Note

SPI Reporting

Last year, this report stated the intent of the DCDB in future years would be to produce regional breakdowns of data holdings using RHC limits as part of SPI reporting.

This was not accomplished in 2022 but will be a priority in 2023 and 2024.

Any Other Items of Note

Memorandum of Understanding Signed

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- May 2023: A Memorandum of Understanding was signed to reaffirm NOAA's relationship with the IHO as the host of the IHO DCDB

- During the IHO Assembly, the signing of the MoU was recognized by Dr. Mathias Jonas and Rear Admiral Benjamin Evans

iho.int/en/iho-and-noaa-reaffirm-their-commitment-to-ocean-data-with-a-new-mou

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Conclusions and Recommended Actions

It is highlighted that the DCDB is an IHO Member States' resource that requires additional data to increase the coverage and move towards a comprehensive global bathymetric dataset.

Therefore IHO Member States and stakeholders are ***invited to contribute and encourage the provision of bathymetric data regardless of its origin or reason for gathering.***

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Actions Requested of IRCC

a) Note the contents of this report;

b) Encourage Member State and stakeholder bathymetric data contributions to the DCDB, regardless of origin;

c) Encourage RHC Chairs to collaborate with the DCDB on developing and highlighting annual regional breakdowns of data holdings as part of SPI reporting.

d) Take any other action it considers appropriate.