

THE NIPPON FOUNDATION-GEBCO

# SEABED 2030



International  
Hydrographic  
Organization



Intergovernmental  
Oceanographic  
Commission



United Nations Decade  
of Ocean Science  
for Sustainable Development

## ***Webinar 2: Building the Map***

How do we build the map? How can you access & contribute data?

Webinar Chair:

Mr. Stuart Caie, SWPHC Seabed 2030/CSB Coordinator

Presenters:

Mr. Kevin Mackay, Head Seabed 2030 South and West Pacific Regional Center

Ms. Jaya Roperez, Data Manager, Seabed 2030 South and West Pacific Regional Center

Ms. Jennifer Jencks, Director IHO Data Center for Digital Bathymetry

2022 SWPHC Seabed 2030/CSB Webinar Series: Webinar 2, May 24, 2022

## Today's Agenda

13:00 - 13:15 Welcome & logistics

13:15 - 13:30 Introduction, Recap and Homework Review

13:30 - 13:50 Examples from the Pacific

13:50 - 14:45 How do we build the map?

- How the regional product is being developed
- Data formats and information needed
- How to package/submit data and metadata
- How to access data and the GEBCO product

14:45 - 15:00 Conclusions and Homework for Next Session



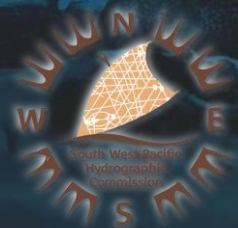


THE NIPPON FOUNDATION-GEBCO

# SEABED 2030

## Introduction, Recap & Homework Review

Mr. Stuart Caie, SWPHC Seabed  
2030/CSB Coordinator



International  
Hydrographic  
Organization



2022 SWPHC Seabed 2030/CSB Webinar Series: Webinar 2, May 24, 2022

# Overview of Webinar Series



## Objectives of this Webinar Series

- Overview & Introduction:
  - Objectives, strategy and motivation of the Nippon Foundation - GEBCO Seabed 2030 Project
- Promote collaboration and coordination
- Review current status of ocean mapping for this region
- Demonstrate online tools that are available
- Engage the community of stakeholders
  - Gather information about existing data, planned mapping efforts
  - Input on needs of stakeholders with respect to tools, workflows, regional mapping priorities
- Develop a roadmap for completing mapping of the region by 2030





## Webinar Schedule

- Webinar 1 - May 10: Where are we now? Introduction and Goals including review of current mapping status in the region
- **Webinar 2 - May 24: How do we build the map? How can you contribute data?**
- Webinar 3 - June 21: Increasing Data Coverage: Crowdsourced Bathymetry and Data Coverage Polygons
- Webinar 4 - July 1: Moving Ahead Together: Summary, Next Steps and Wrap up.



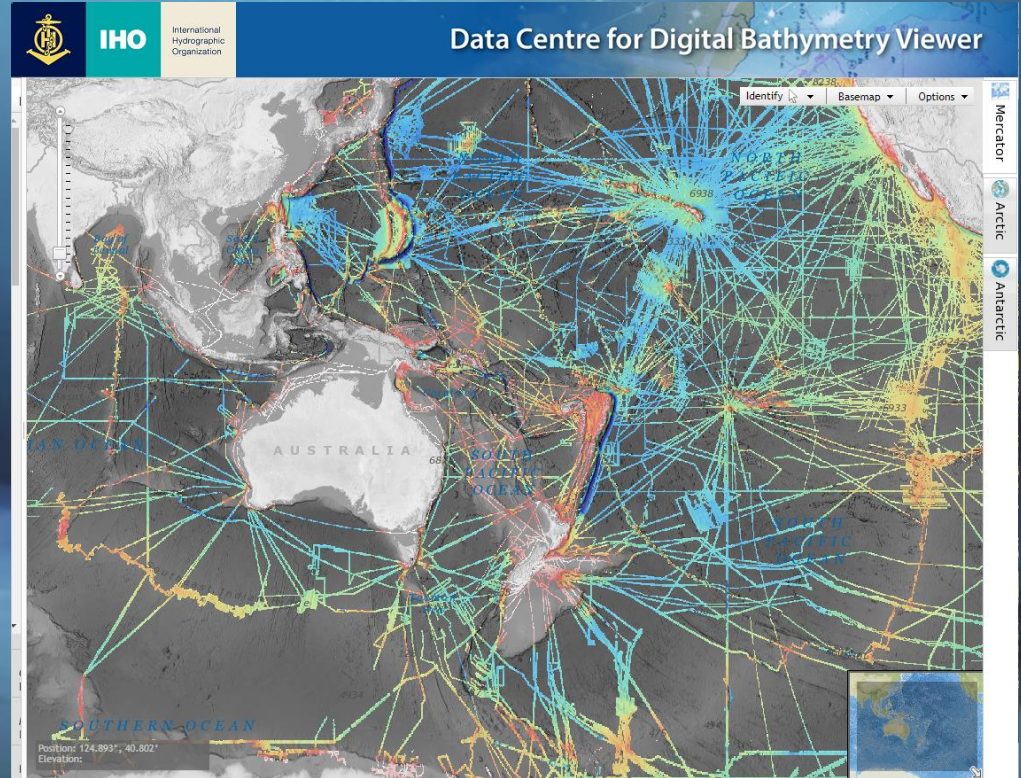
## Goals for today

- Discussion and review of Homework from Webinar 1: Existing data
- Discussion of data compilation
  - How is the regional product built?
  - What metadata is needed and why?
- How to contribute data to Seabed 2030 and the IHO DCDB?
- How to access data from GEBCO and the IHO DCDB?



# Recap Webinar 1: Where are we now?

- Introduction to Seabed 2030 & South and West Pacific Regional Center
- Introduction to IHO Digital Centre for Digital Bathymetry (DCDB)
- Status of mapping in the region





# Discussion & Review of Homework Assignment #1



# Review of Homework #1

- Identify and assemble information about existing datasets that are held by your country (e.g. web services, polygons, etc)
- Identify and assemble information about planned surveys in your area of jurisdiction (e.g. polygons of areas)
- Assemble information about technical challenges that we might be able to help you address.
- Input on strategies for gaining access to non-public data?



# Examples from the Pacific

## Kiribati & Niue







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# Kiribati's support for SB2030

Marine Division, MICT

Tion Uriam

(National Coordinator for Hydrography)



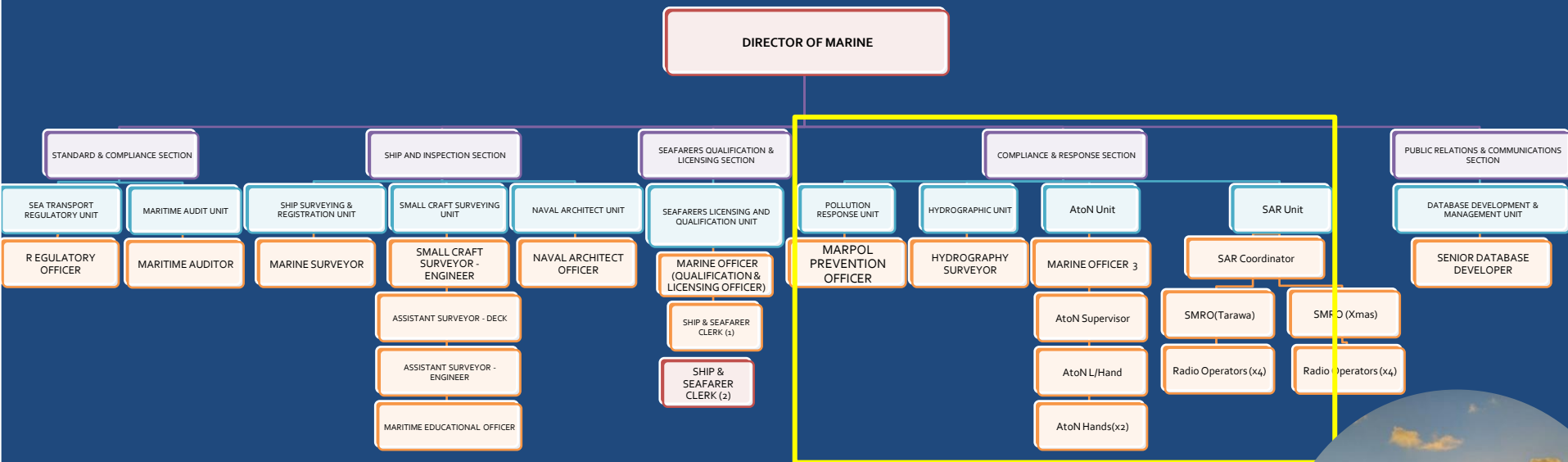
WHERE MARITIME SAFETY &  
ENVIRONMENT  
COMES FIRST



# Org. Chart



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# Obligations

- Government is a party to several conventions
- SOLAS Convention Chapter V, regulations 9 and 4)
  - Production/modernization of nautical charts
  - Provision of hydrographic services
- 2011 IHO Assessment of Nautical Charting in Kiribati
  - reveals that the nautical charts require updating
  - significant adverse impacts on the economy, people and the environment



IHO Capacity Building Programme

The State of  
Hydrography and Nautical Charting  
in  
The Republic of Kiribati



November 2011



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# Policies and Strategic Plans

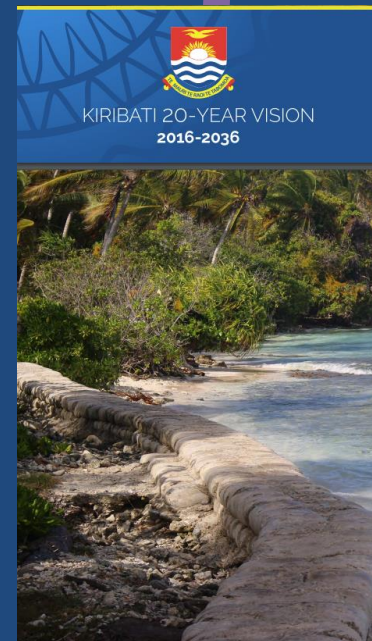


## MSP and KV20

### Pillar 3 – Infrastructure for Development - Improving Connectivity and Accessibility

#### MICT Strategic Plan 2021 – 2024

Objective 2: Strengthen air, sea, and land transportation and infrastructures to meet social demands and complements economic enhancing activities – Upgrading and Publication of all Kiribati Nautical Charts





# Available data



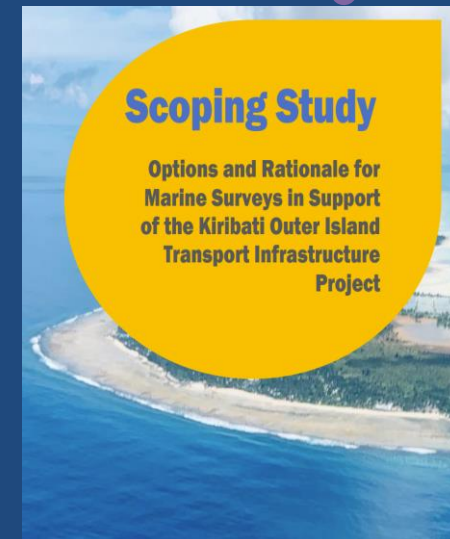
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UK Hydrographic  
Office

## Scoping Study

- Several works done in the past – a collection of bathymetric data – not sure who has these
- Data held with SPC
- Provision of SDB data through CME program – these are with us
- NOAA – helped with the ECS submission



[Click here](#)



# Sharing data with SB2030



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## Things to consider:

- Risk – who are we giving this data to; sensitive information
- Return – benefits from sharing our data

## Seek Approval

- Approval from my Director
- Provision of some form of agreement (letter, MOU etc)







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# WAYS FORWARD



- Plans to share more data with SB2030
- Be an active participant

## KAM BATI N RAB'A!

# Examples from the Pacific

Niue



# How is the Regional Map Being Developed?



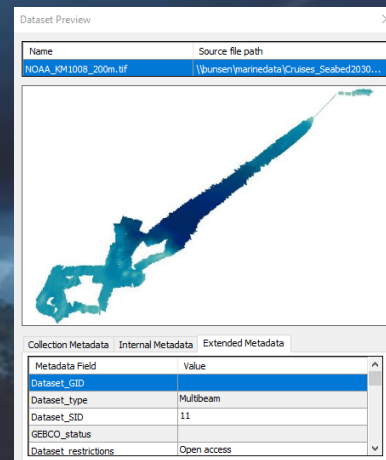
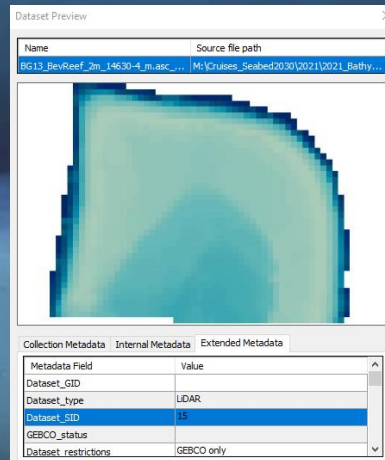
# Regional Data Assembly

Data contribution / mined can be:

- Gridded contributions (DEMs)
  - BAGs, geotiffs, grd
- Isolated depth measurements
  - ENC, singlebeam, CSB, etc
- Raw and/or Processed swath data

Integrate data based on:

- Type Identifier (TID)
- Date of Data Acquisition
- Resolution
- Processing Quality



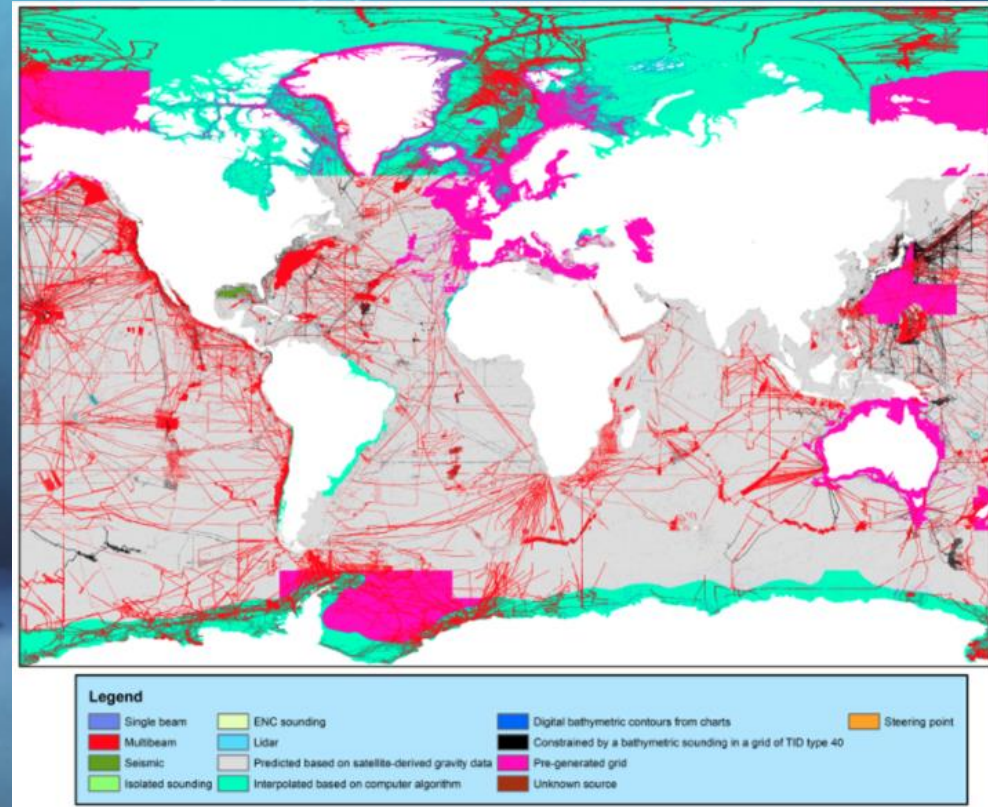






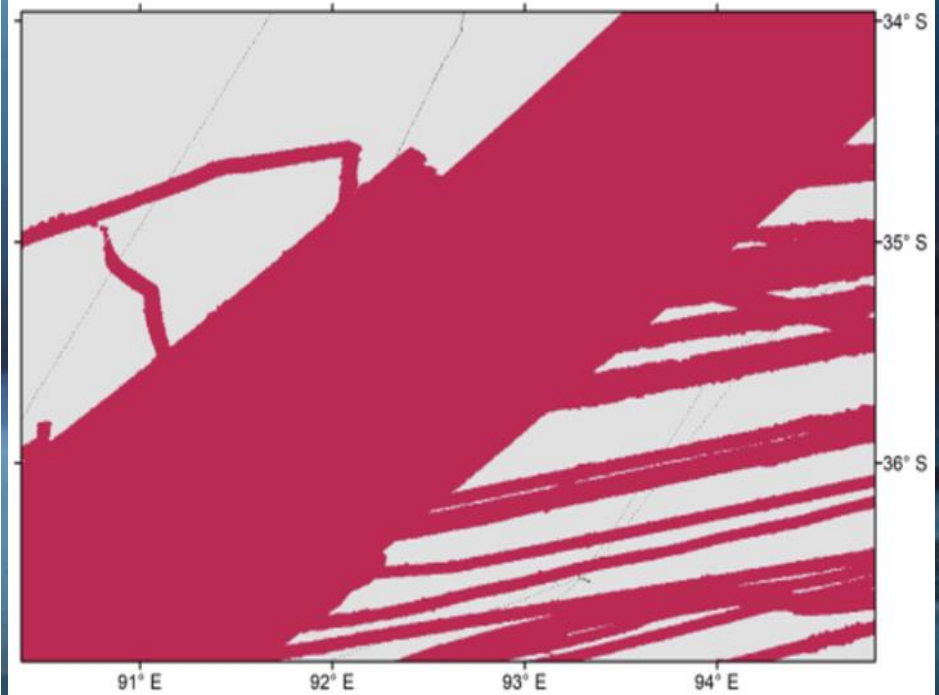
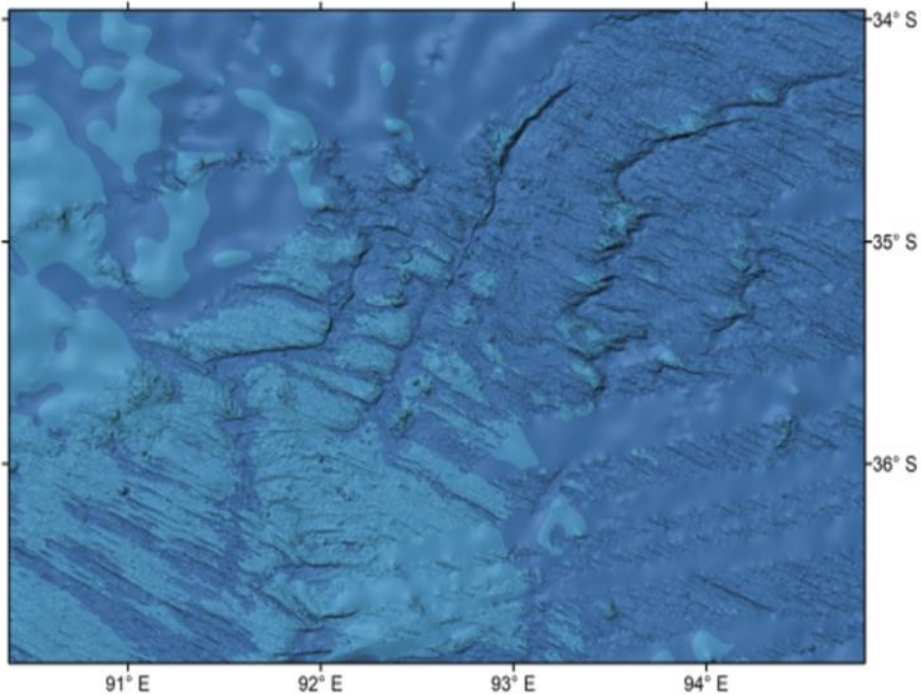
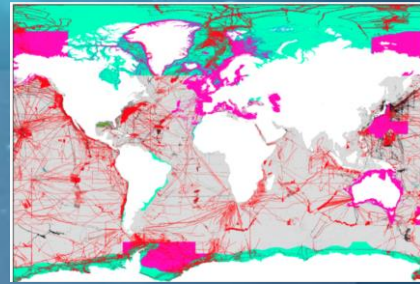
## Type Identifier (TID)

- Companion to grid to explain source type for elevation data
- Distinguishes direct from indirect measurements
- Identifies the kind of data that contributed to each grid node
- Helps prioritize data when combining overlapping observations



## Type Identifier (TID)

- Explains differences in data resolution





## Type Identifier (TID) -

- Helps to distinguish “mapped” from “unmapped”

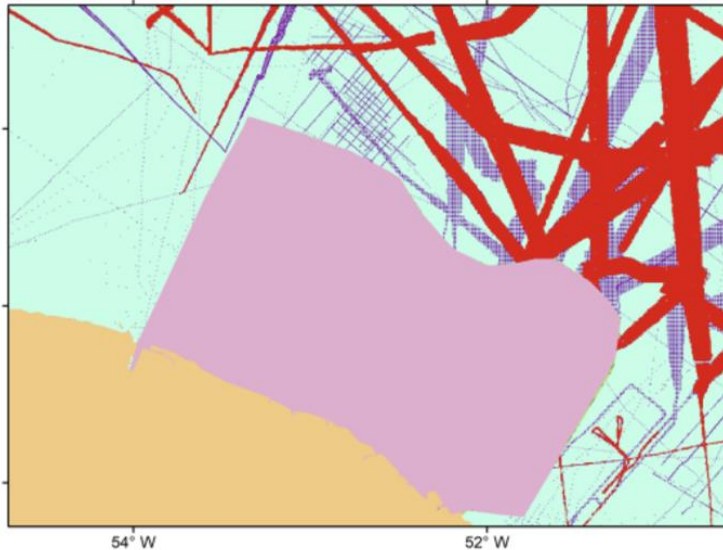
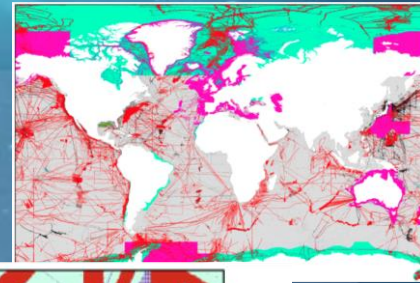


Figure 3A. Area of pre-generated grid shown in pink

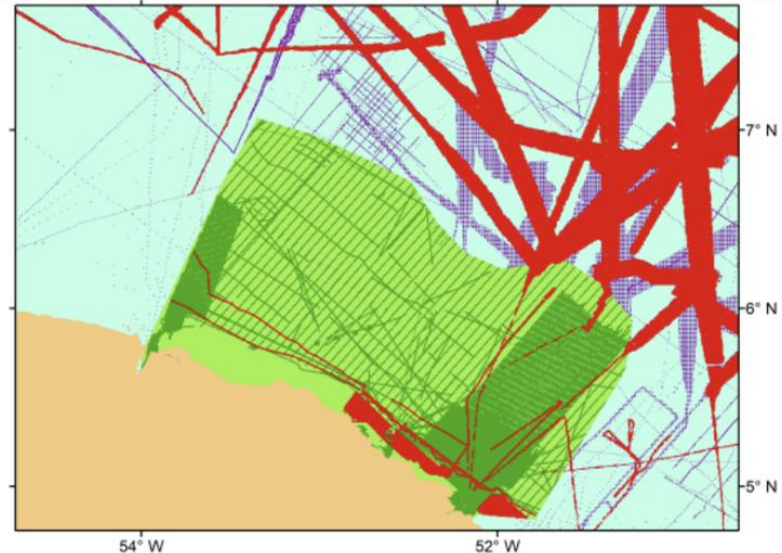
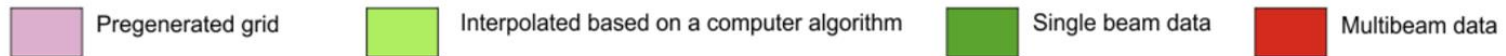
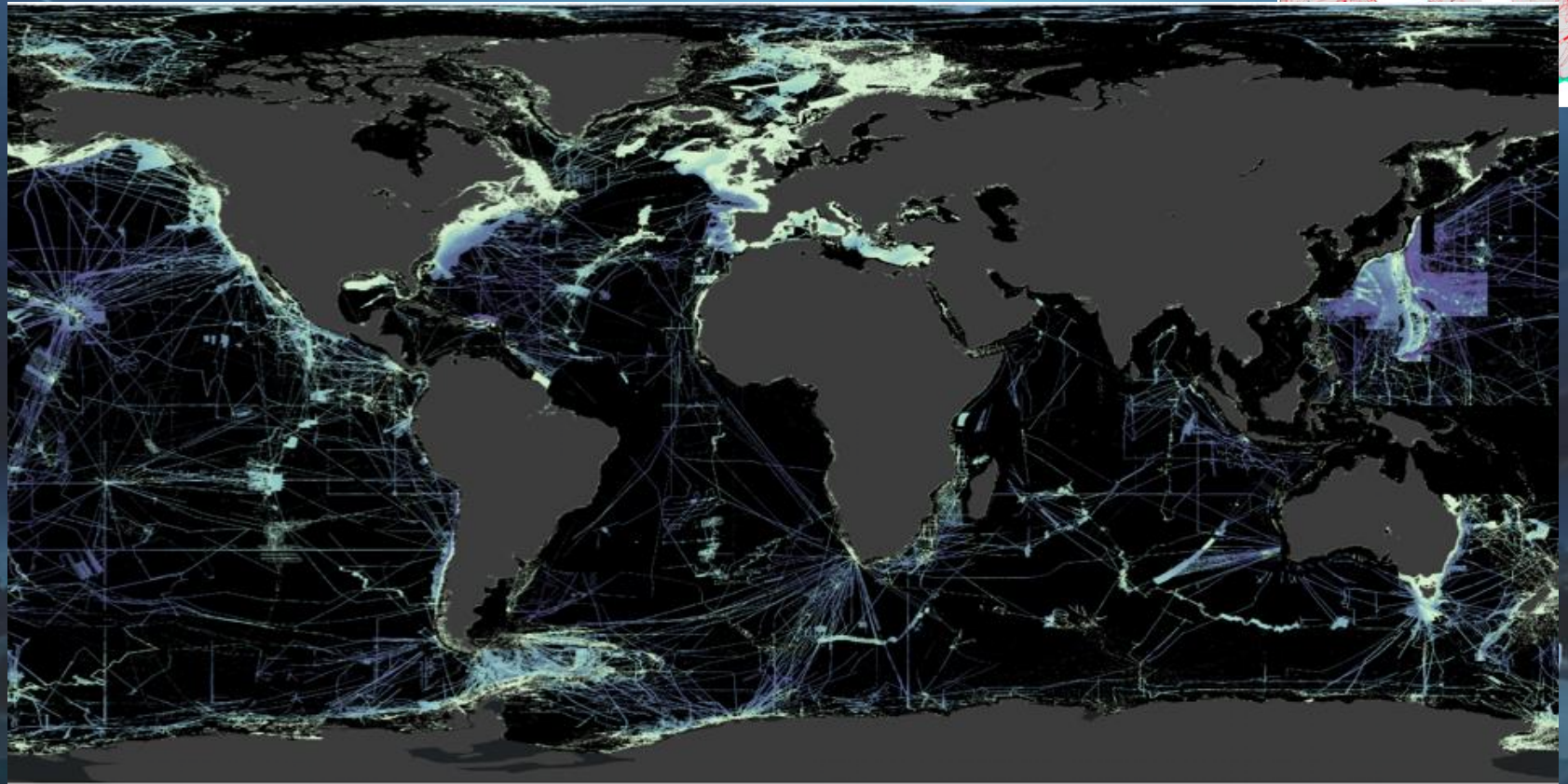


Figure 3B. Source data types used in the pre-generated grid are identified





## Type Identifier (TID) - Visualize “mapped” areas



## Type Identifier (TID)

If a grid is contributed, an accompanying TID grid is important to provide if

- Grid includes large areas that are interpolation
- Grid includes predicted and measured bathymetry



=



+





Questions?



# How to Contribute Data







# Contributing Data



[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](mailto: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



Email address \*

Your email

Your Name \*

Your answer

Your Organization \*

Your answer

Country or Organization who holds these data \*

Your answer



### Data Sharing status \*

- ☐ Open Access - freely available
- ☐ Restricted Access (e.g. can be included in GEBCO products, but not disseminated as provided)
- ☐ Embargoed
- ☐ Other: \_\_\_\_\_

### Region of the World Ocean \*

Check all that apply

- ☐ Arctic Ocean
- ☐ Atlantic Ocean
- ☐ Indian Ocean
- ☐ North Pacific Ocean
- ☐ South and West Pacific Ocean
- ☐ Southern Ocean



Would you like to archive these data with the IHO Data Center for Digital Bathymetry (IHO DCDB)?

The IHO DCDB was established in 1990 to steward the worldwide collection of bathymetric data. The Center archives and shares, freely and without restrictions, depth data contributed by mariners. (More information at: <https://www.ngdc.noaa.gov/iho/>).

☐ Yes

☐ No

☐ Other: \_\_\_\_\_

How can these data be accessed? \*

Please provide a link to the data (e.g. DropBox, GoogleDrive, WeTransfer, FTP etc) or a description of what will be necessary to access these data.

Your answer  
\_\_\_\_\_

Please describe the processing status of the data you would like to contribute. \*

Select all that apply

☐ Raw unprocessed data

☐ Processed data that have been QA/QC'd

☐ Gridded data products

[gebco.net/about\\_us/contributing\\_data/](https://gebco.net/about_us/contributing_data/)





- ☐ Processed data that have been QA/QC'd
- ☐ Gridded data products
- ☐ Other: \_\_\_\_\_

### Additional Comments

Your answer

### Authority to make the data available

- ☐ I confirm that I have the authority to make these data available to GEBCO.

Submit

Clear form

Never submit passwords through Google Forms.

GoogleForms

This form was created inside of Seabed 2030.



## Contributing data for public access

GEBCO encourages the sharing of source bathymetric data within the international community for the benefit of all.

The [International Hydrographic Organization Data Center for Digital Bathymetry](#) (IHO DCDB), manages a worldwide publicly-accessible digital data bank of oceanic soundings on behalf of the Member Countries of the IHO. Archiving data with the IHO DCDB ensures their long term preservation and public availability.

## Contributing data for updating the GEBCO grid only

If source data cannot be made publicly available, data can still be contributed directly to GEBCO through the Seabed 2030 Project (as described in the form above).

The project prefers processed data in the form of multibeam grids, single beam tracks or pre-generated grids (i.e. a data set in gridded form based on a number of source data sets).

If submitting a pre-generated grid, please provide accompanying information describing source data types included in the grid and if areas are based on interpolation (e.g. as a [Type Identifier Grid](#)).

This information will better help us to 'map the gaps'.

## Useful contacts

- Global Center [gdacc@seabed2030.org](mailto:gdacc@seabed2030.org)
- IHO DCDB [bathydata@iho.int](mailto:bathydata@iho.int)
- Seabed 2030 [Regional Centers](#)

[gebco.net/about\\_us/contributing\\_data/](https://gebco.net/about_us/contributing_data/)



## How to Contribute Data to the IHO DCDB

Contact [bathydata@iho.int](mailto:bathydata@iho.int) for more information on contributing data or sharing web services to the IHO DCDB.

Refer to [Submitting Marine Geophysical Data to the IHO DCDB](#) for how to package and submit data.

Governments, organizations, academia, industry and individuals are encouraged to contribute data to the IHO DCDB.

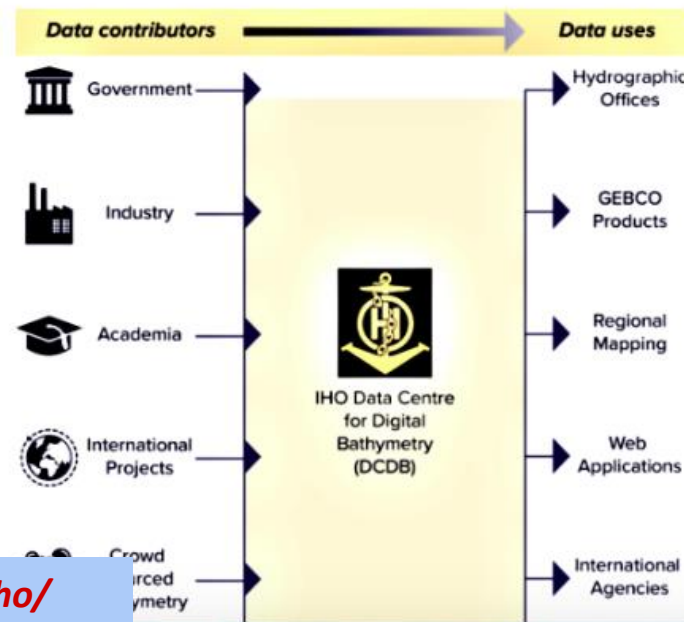
Bathymetric data and metadata can be submitted via File Transfer Protocol (FTP), email, or mail (hard drive) in the formats listed below.

- **Raw sonar data:** MGD77T or the original manufacturer's format
- **Processed data:** gsf, BAG, NetCDF, tiff, xyz, sd, asc, etc.
- **Metadata:** XML or text

Other formats and products will be considered on a case-by-case basis.

Learn more about contributing [crowdsourced bathymetry](#).

IHO Member States are invited to provide sounding data extracted from their Electronic Navigational Charts (ENC). Only soundings from ENC cells in navigational purpose bands 2 and 3 are requested. For more information, please refer to [IHO Circular Letter 11/2016](#).



# IHO DCDB Resources

**Data management guidelines and metadata templates** to encourage data collectors into becoming data providers.

Guidelines cover:

- Acceptable data file formats



International Hydrographic Organization  
Organisation Hydrographique Internationale

## Submitting Marine Geophysical Data to NOAA's National Centers for Environmental Information & the co-located IHO Data Center for Digital Bathymetry

### Introduction

This document describes procedures to prepare multibeam bathymetric data, subbottom profiler data, water column sonar data, and supplemental data sets for submission to NOAA's National Centers for Environmental Information (NCEI) and the co-located International Hydrographic Organization (IHO) Data Center for Digital Bathymetry (DCDB).

### File Formats

#### 1. Multibeam Bathymetry

##### General Information:

The multibeam bathymetry database at NCEI/IHO DCDB primarily maintains raw (as collected) data files in the instrument's vendor specific format (e.g., .all, .s7k, .xse). However, any other supplemental data (sound speed profiles, tides, vessel offsets, cruise reports, etc.) and/or processed versions of the multibeam data are also accepted. In all submissions, the data files and cruise/survey should be well documented using metadata.

##### MB Data File Formats:

NCEI can accept bathymetric data from most of the commercial multibeam sonars and acquisition systems. The multibeam bathymetry data management pipeline at NCEI relies heavily on the open source software suite, [MB-System](#). Data formats supported by the software are listed on their [website](#). Data submitted in unsupported formats will still be accepted but will not be discoverable through the web services provided at NCEI (e.g., [Bathymetric Data Viewer](#)). These data can only be accessed from the archive upon request to [mb.info@noaa.gov](mailto:mb.info@noaa.gov).

Processed data (if submitted) need to be delivered in an MB-System processed format or other non-proprietary format. The majority of processed data in the multibeam bathymetry database are processed MB-System, XYZ, or GSF format.

If your data are not in one of the supported formats, email [mb.info@noaa.gov](mailto:mb.info@noaa.gov) to discuss the options available at NCEI for your data.



# IHO DCDB Resources

**Data management guidelines and metadata templates** to encourage data collectors into becoming data providers.

Guidelines cover:

- Metadata

## Metadata:

Proper metadata are very important for documenting the history of the data and providing insight into the means of long-term preservation. Please include any metadata that have already been created for each cruise/dataset. NCEI uses and prefers ISO standard metadata, but accepts all other standards. If you are not familiar with metadata, NCEI has developed a metadata primer available here: <http://www.ncddc.noaa.gov/metadata-standards/>. Example ISO standard metadata records for dataset level (multibeam, singlebeam/subbottom, water column), collection/cruise level, and multibeam file level are provided with this document.

If cruise level metadata have not been created, the minimum requested metadata fields and examples are listed in the following table. An Excel spreadsheet to easily populate this information for the data submission can be requested from [mb.info@noaa.gov](mailto:mb.info@noaa.gov).

Organisation Hydrographique Internationale

Information Field	Example	Comments
SURVEY_NAME	NF1309	Typically "ship ID, year, cruise number"
SHIP_NAME	Nancy Foster	
CHIEF_SCIENTIST	John Smith	"None" for transits
CHIEF_SCI_ORGANIZATION	USGS	"None" for transits
DEPARTURE_PORT	San Juan, Puerto Rico	City, State for US ports. City, Country for international ports
ARRIVAL_PORT	Charleston, SC	City, State for US ports. City, Country for international ports
START_TIME	30-SEP-13	date only. "DD-MMM-YY"
END_TIME	01-OCT-13	date only. "DD-MMM-YY"
NAV1	DGPS (or GPS)	Equipment used in determining data positioning
INSTRUMENT	Reson 7125	Sonar instrument used in data collection
HORIZONTAL_DATUM	WGS84	If projected data, which projection zone
VERTICAL_DATUM	MLLW	not required for transit
SHIP_OWNER	NOAA	
PROJECT_NAME	Corals in the Florida Keys	Specified project name or "Transit"
SOURCE	NOAA	Source organization of data being provided
ABSTRACT	Text summary	Brief narrative summary of the resource contents. Abstract narrative should include information on general content and features; dataset application: GIS, CAD, image, database; geographic coverage: county/city name; time period of content: begin and end date or single date; and special data characteristics or limitations.
PURPOSE	Text summary	Summary of the intentions for which the dataset was developed. Purpose includes objectives for creating the dataset and what the dataset is to support.
PROPRIETARY	yes/no	Pertains to temporary data access restrictions.
COMMENTS	Proprietary hold until Oct 1, 2014	General comments regarding the cruise or dataset, if any
PROCESSING_STEPS	Text summary	Paragraph describing processing performed on data, if any
DOI	doi:10.7289/V56T0JNC	If a DOI is not provided, NCEI will create one upon request.
OUTSIDE_LINK	<a href="http://www.....">http://www.....</a>	Web link to additional information regarding cruise, project, or funding

# IHO DCDB Resources

**Data management guidelines and metadata templates** to encourage data collectors into becoming data providers.

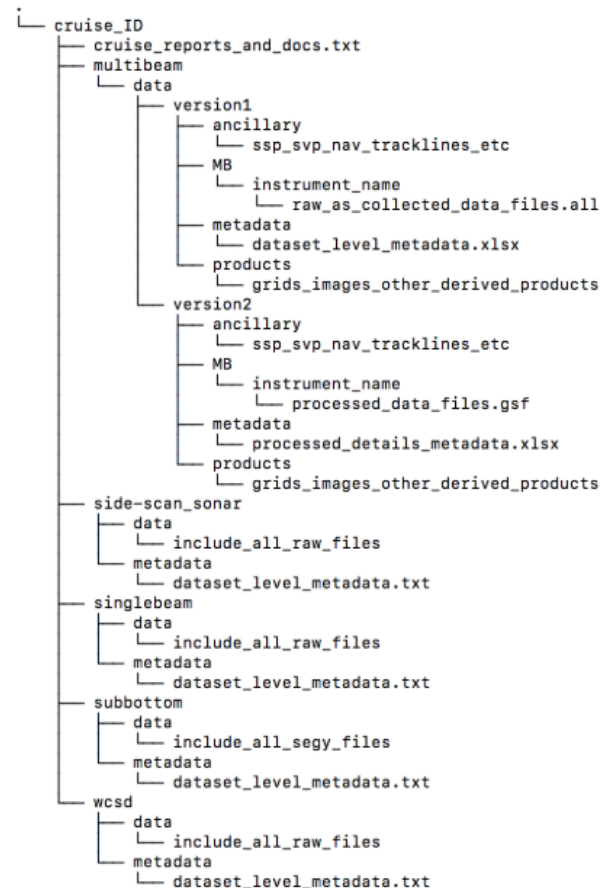
Guidelines cover:

- Requested file directory structure

## Data File Structure:

The data may be delivered in one archived file (e.g., tar or zip) in a well-defined directory structure. Please include an MD5 checksum with the delivery so NCEI can verify the integrity of the files and the completeness of the data transfer. For questions regarding MD5 checksums, contact [mb.info@noaa.gov](mailto:mb.info@noaa.gov).

A preferred data structure would be the following:



# IHO DCDB Resources

## *One tool to pack it all...*

- Stand-alone packager for cruise-based data.
- Simple user interface with pulldown menus and controlled vocabularies
- Generates cruise-level and series level metadata files
- Creates consistent data packages

## *Cruise Data Packager (CruisePack)*

NCEI CruisePack v.1-1-20

Package People / Organizations Cruise Information **Datasets**

+ Add Additional Dataset

Multibeam Bathymetry	Kongsberg EM122	Public Release Date	2019-Aug-26	X
Path to Data Files		/data/MB/EM122	Select Directory	<input checked="" type="radio"/> Raw <input type="radio"/> Processed <input type="radio"/> Products
Add Data Comment				
Multibeam Bathymetry	Kongsberg EM710	Public Release Date	2019-Aug-26	X
Path to Data Files		/data/MB/EM710	Select Directory	<input type="radio"/> Raw <input type="radio"/> Processed <input type="radio"/> Products
Add Data Comment				
Sub Bottom	Knudsen CHIRP 3200	Public Release Date	2019-Aug-26	X
Path to Data Files		/data/CHIRP3200	Select Directory	<input checked="" type="radio"/> Raw <input type="radio"/> Processed <input type="radio"/> Products
Add Data Comment				

Hide Records Clear Form Stop Packaging Save For Later Package Data



Questions regarding contributing data?





# How to Access Raw and Processed Bathymetric Data





## 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.



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](#)



## Layers

## ▼ IHO DCDB/NOAA NCEI (?)

- ☒ Multibeam Surveys ?
- ☐ Multibeam Survey Footprints ?
- ☐ Multibeam Bathymetry Mosaic ?
- 
- ☐ Single-Beam Surveys ?
- ☐ Single-Beam Sounding Density ?
- 
- ☐ NOAA Hydrographic Surveys: ?
  - ☒ All Surveys with Digital Data
  - ☐ Surveys with BAGs
- 
- ☐ BAG Shaded Relief Imagery ?

Search NCEI/DCDB Surveys

- ☐ Crowdsourced Bathymetry Files [?](#)

[?](#)

☐ U.S. Bathymetry Coverage and Gap Analysis [?](#)

► EMODnet

► Australia

► Canada

► France

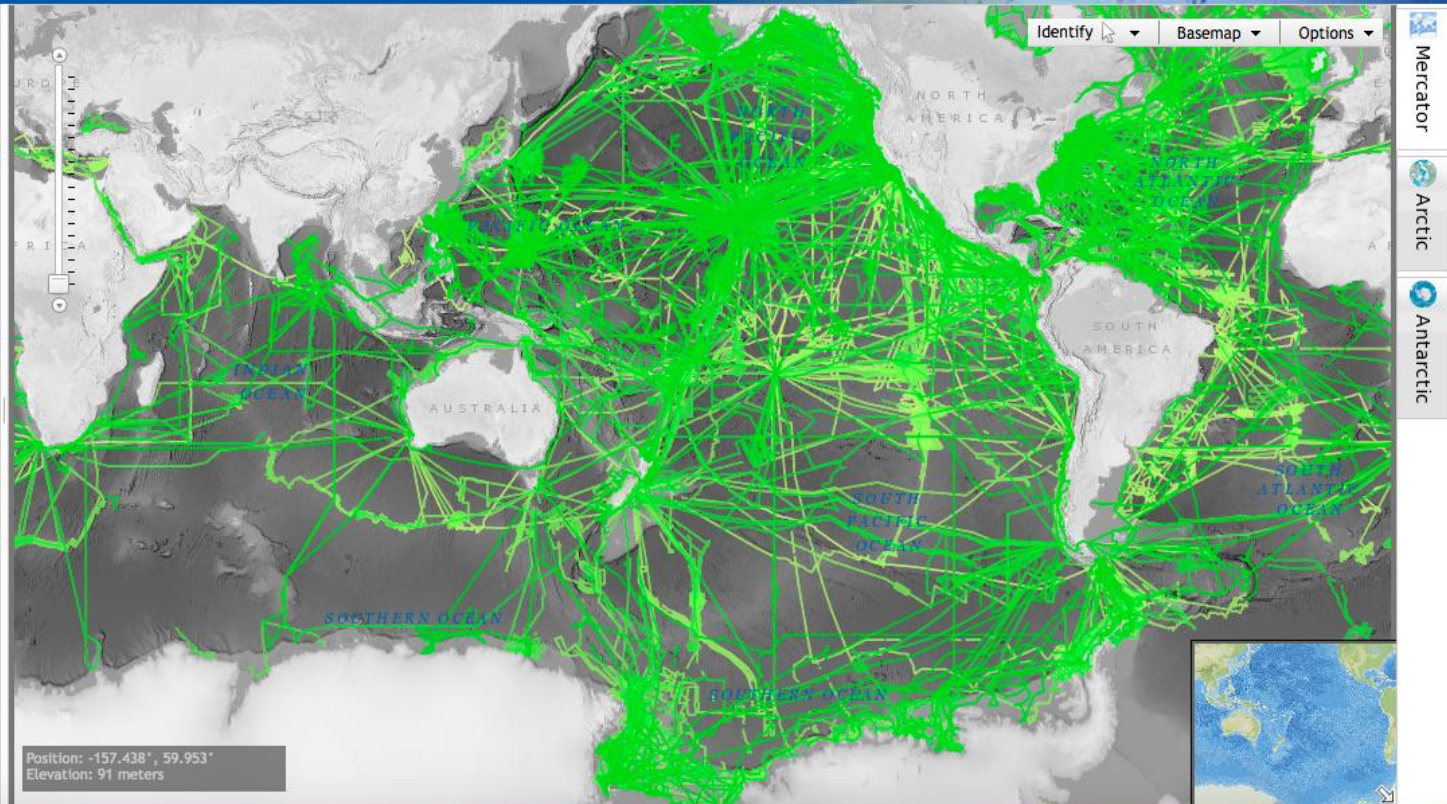
► Germany

▶ .lanan

Grid Extract

### More Information

Help





## Layers

### ▼ IHO DCDB/NOAA NCEI ?

- ☐ Multibeam Surveys ?
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- ☐ Multibeam Bathymetry Mosaic ?

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  - ☒ All Surveys with Digital Data
  - ☐ Surveys with BAGs

- ☐ BAG Shaded Relief Imagery ?

?

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?

- ☐ U.S. Bathymetry Coverage and Gap Analysis ?

### ► EMODnet

### ► Australia

### ► Canada

### ► France

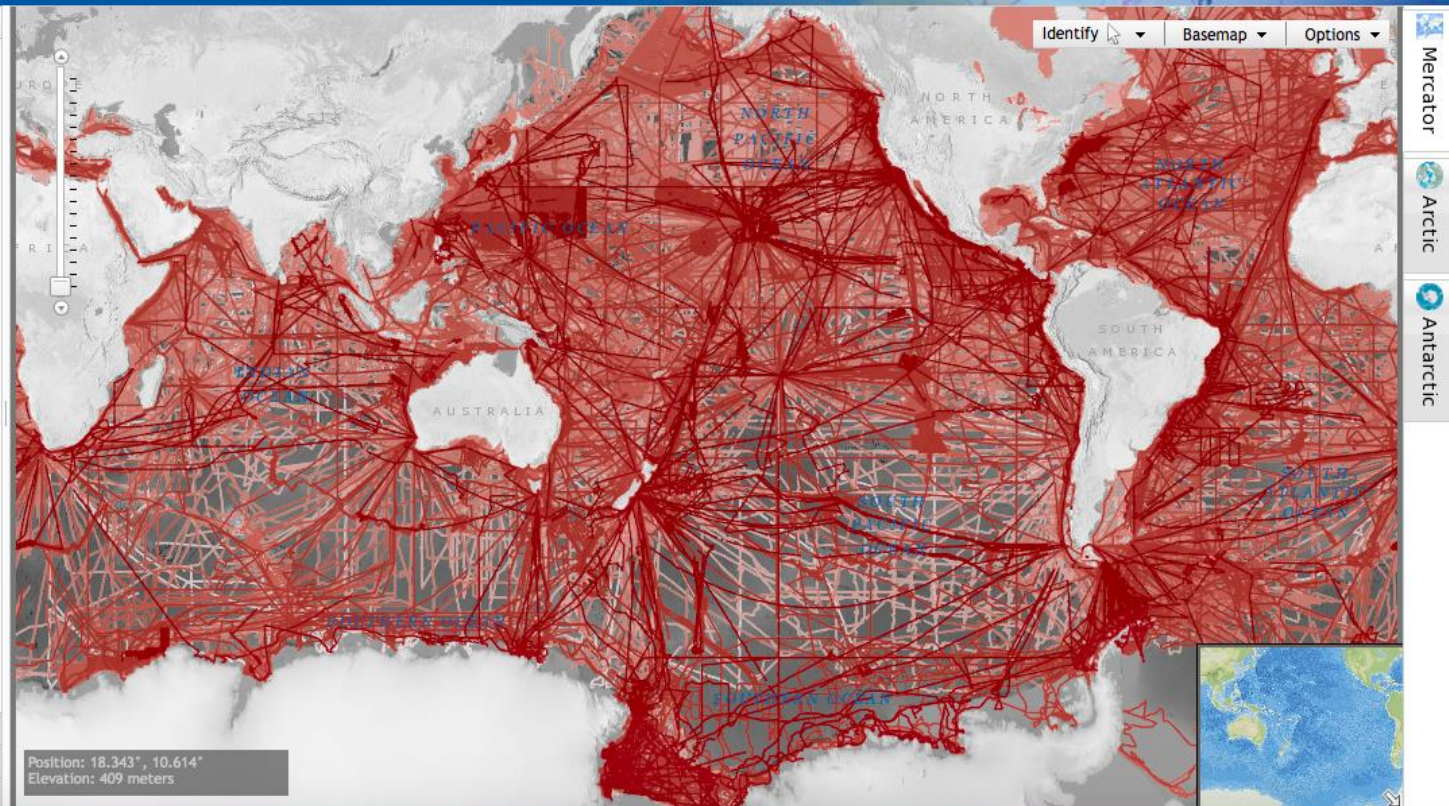
### ► Germany

### ► Japan

### Grid Extract

### More Information

### Help







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# Data Centre for Digital Bathymetry Viewer

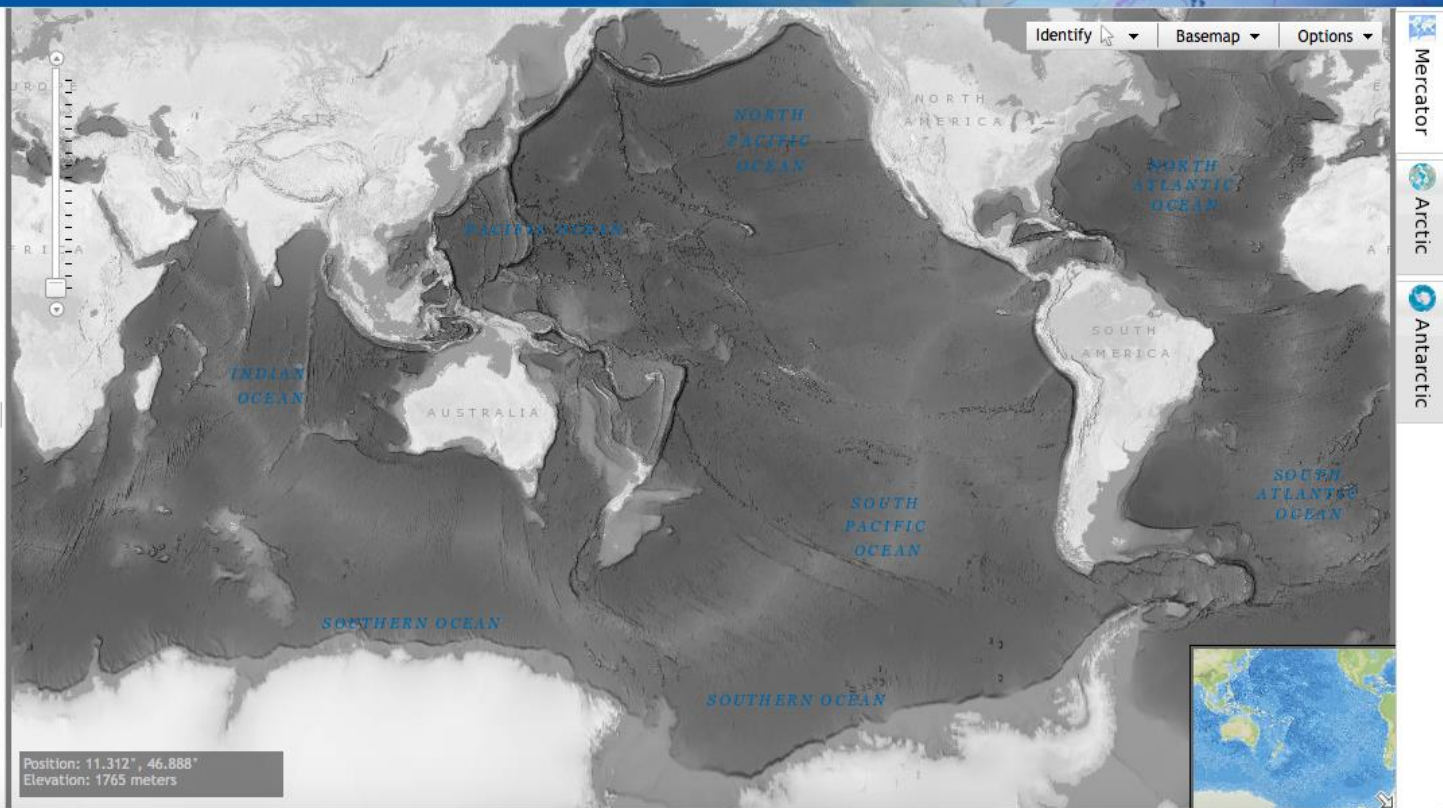
## Layers

- ▶ IHO DCDB/NOAA NCEI ?
- ▶ EMODnet
- ▶ Australia
- ▶ Canada
- ▶ France
- ▶ Germany
- ▶ Japan
- ▶ Netherlands
- ▶ New Zealand
- ▶ United Kingdom
- ▶ Other Data Sources
- ▶ Known Non-Public Data ?
- ▶ Bathymetric Coverage Maps

Grid Extract

More Information

Help



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*Organisation Hydrographique Internationale*



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# Data Centre for Digital Bathymetry Viewer

## Layers

### IHO DCDB/NOAA NCEI ?

- ☒ Multibeam Surveys ?
- ☒ Multibeam Survey Footprints ?
- ☐ Multibeam Bathymetry Mosaic ?
- ☐ Single-Beam Surveys ?
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- ☐ NOAA Hydrographic Surveys: ?
  - ☒ All Surveys with Digital Data
  - ☐ Surveys with BAGs

- ☐ BAG Shaded Relief Imagery ?

?

- ☐ Crowdsourced Bathymetry Files ?

?

- ☐ U.S. Bathymetry Coverage and Gap Analysis ?

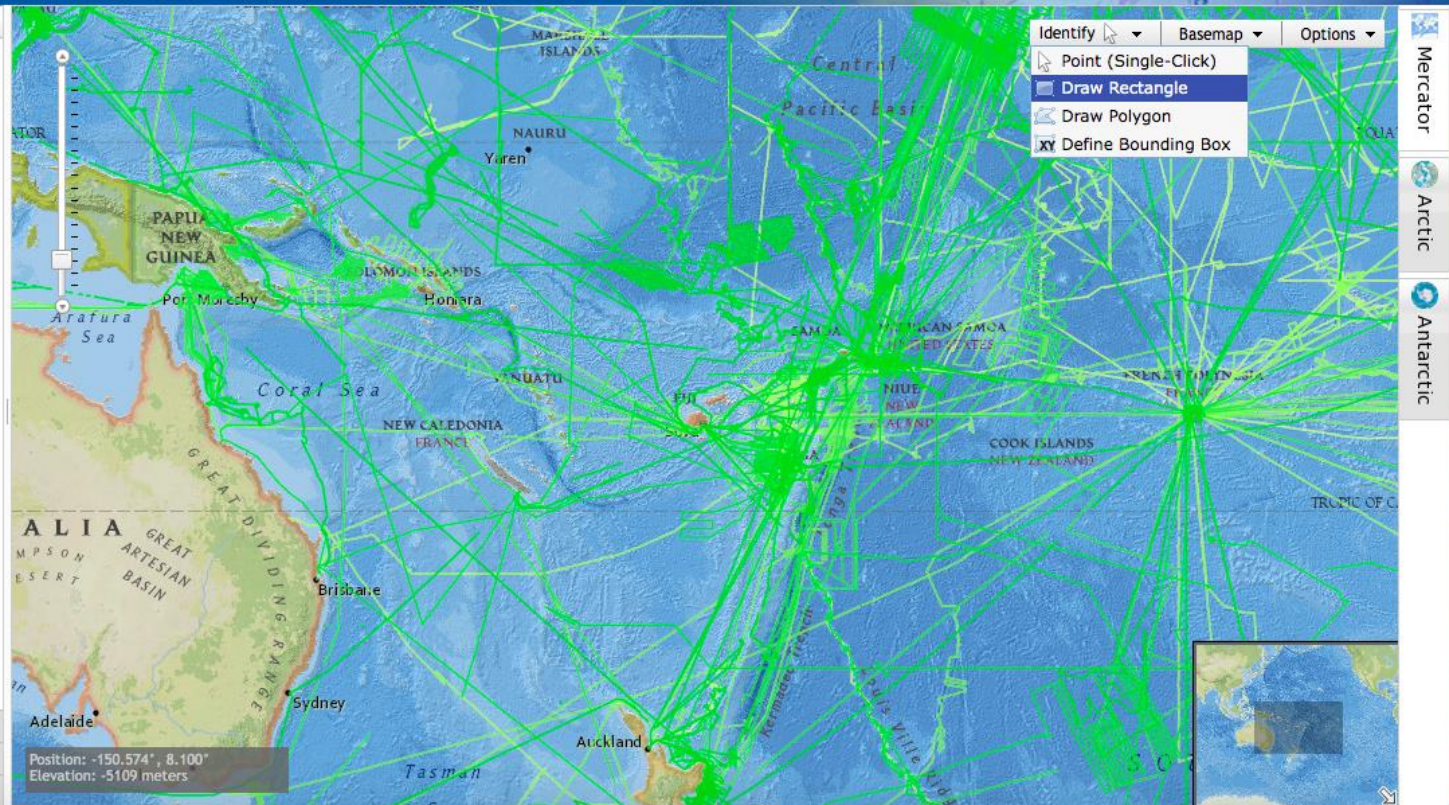
### EMODnet

- ▶ Australia
- ▶ Canada
- ▶ France
- ▶ Germany
- ▶ Japan

Grid Extract

More Information

Help



International Hydrographic Organization  
*Organisation Hydrographique Internationale*



## Layers

### ▼ IHO DCDB/NOAA NCEI ?

- ☒ Multibeam Surveys ?
- ☐ Multibeam Survey Footprints ?
- ☐ Multibeam Bathymetry Mosaic ?
- ☐ Single-Beam Surveys ?
- ☐ Single-Beam Sounding Density ?
- ☐ NOAA Hydrographic Surveys: ?
  - ☒ All Surveys with Digital Data
  - ☐ Surveys with BAGs

### ☐ BAG Shaded Relief Imagery ?

?

### ☐ Crowdsourced Bathymetry Files ?

?

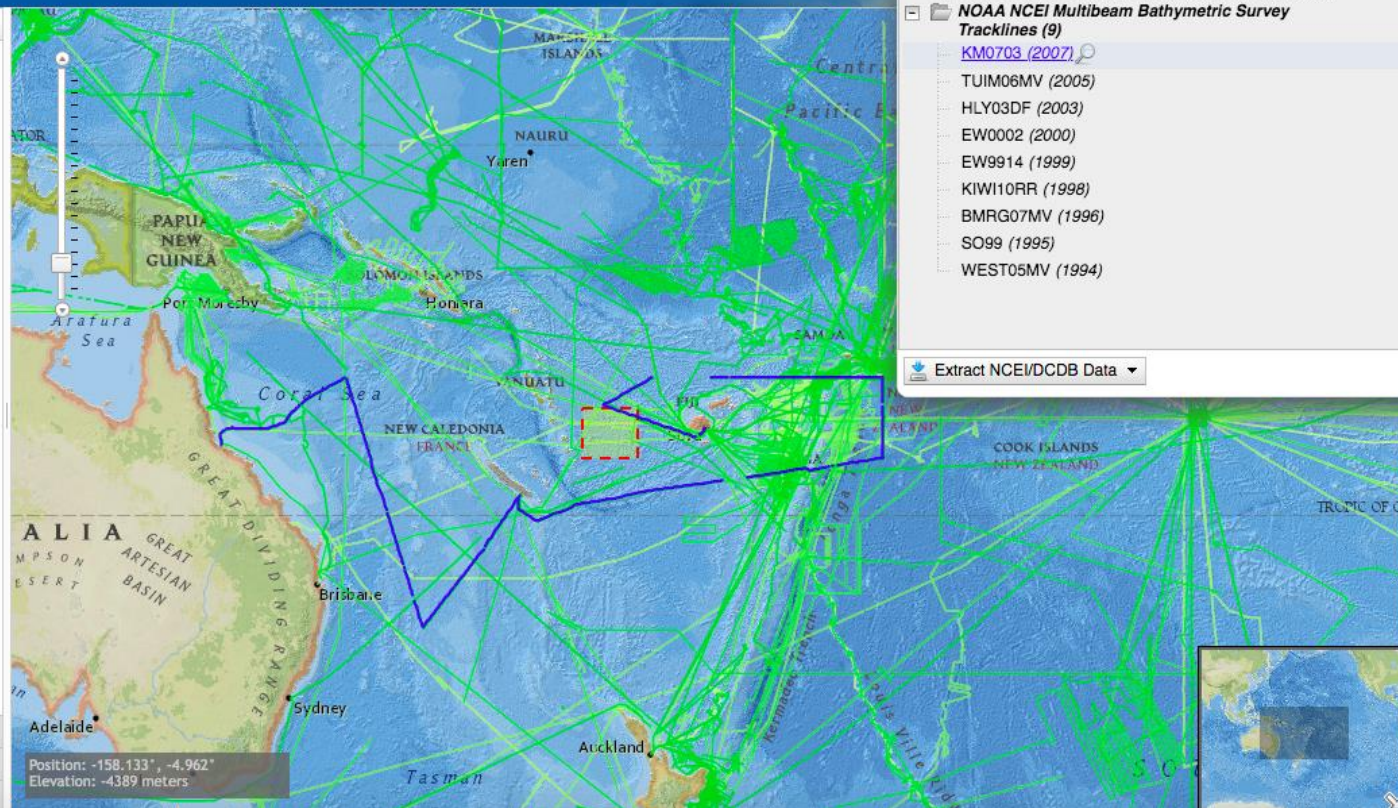
### ☐ U.S. Bathymetry Coverage and Gap Analysis ?

#### ► EMODnet

- Australia
- Canada
- France
- Germany
- Japan
- Grid Extract

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## Identified Features (9)

Note: WMS layers (EMODnet, AusSeabed, MAREANO) are only available using a point (single-click) to identify.

### NOAA NCEI Multibeam Bathymetric Survey Tracklines (9)

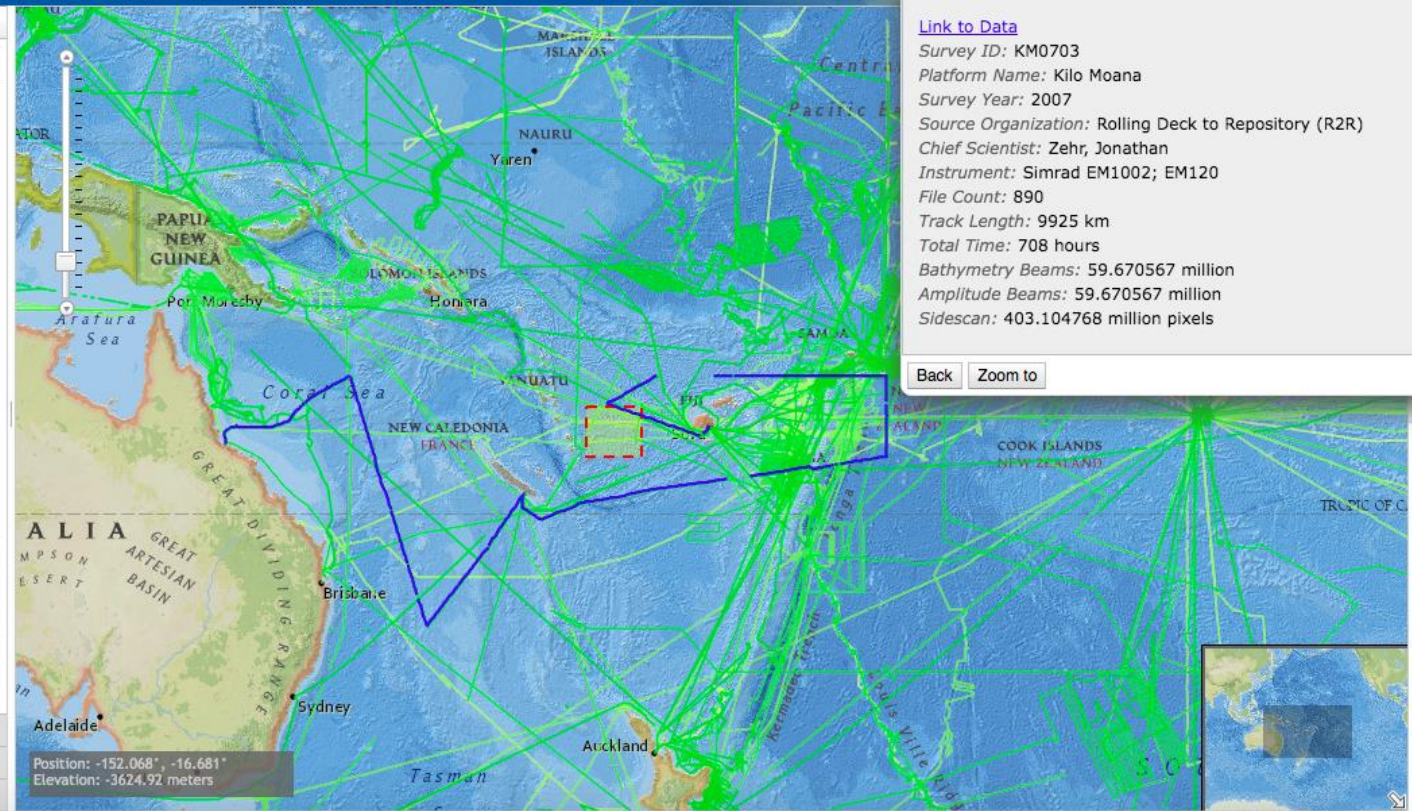
- [KM0703 \(2007\)](#)
- [TUIM06MV \(2005\)](#)
- [HLY03DF \(2003\)](#)
- [EW0002 \(2000\)](#)
- [EW9914 \(1999\)](#)
- [KIWI10RR \(1998\)](#)
- [BMRG07MV \(1996\)](#)
- [SO99 \(1995\)](#)
- [WEST05MV \(1994\)](#)

▼



## Layers

- ▼ IHO DCDB/NOAA NCEI ?
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  - ☐ Single-Beam Sounding Density ?
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    - ☒ All Surveys with Digital Data
    - ☐ Surveys with BAGs
  - ☐ BAG Shaded Relief Imagery ?
- Search NCEI/DCDB Surveys ☒ Reset ?
- ☐ Crowdsourced Bathymetry Files ?
- Search CSB Files ☒ Reset ?
- ☐ U.S. Bathymetry Coverage and Gap Analysis ?
- EMODnet
- Australia
- Canada
- France
- Germany
- Japan
- Grid Extract
- More Information
- Help



Attributes: KM0703 (2007)

**Multibeam Bathymetric Survey: KM0703**

[Link to Data](#)

Survey ID: KM0703  
 Platform Name: Kilo Moana  
 Survey Year: 2007  
 Source Organization: Rolling Deck to Repository (R2R)  
 Chief Scientist: Zehr, Jonathan  
 Instrument: Simrad EM1002; EM120  
 File Count: 890  
 Track Length: 9925 km  
 Total Time: 708 hours  
 Bathymetry Beams: 59.670567 million  
 Amplitude Beams: 59.670567 million  
 Sidescan: 403.104768 million pixels

Back Zoom to

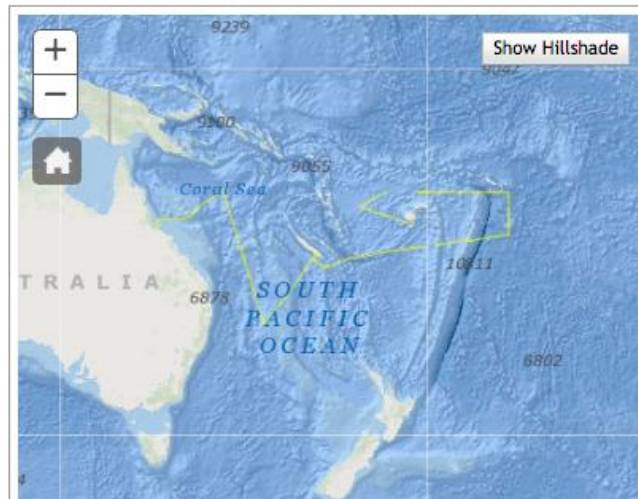


# Multibeam Report for KM0703

Ship Name: Kilo Moana  
Chief Scientist: Zehr, Jonathan  
University of California, Santa Cruz  
Source Organization: UNOLS R2R  
Start Date: 2007-03-14  
End Date: 2007-04-18

## View ISO Metadata

[Download / Request All Files](#)



Visit the full NCEI [Bathymetry Viewer](#)

[\[Expand All\]](#) [\[Collapse All\]](#)

## Multibeam Bathymetry

### Cruise Details

Project: Diazotrophs in the Open Ocean  
Instrument: Simrad EM1002 and EM120

### Data Quality

Number of Files: 898  
Number of Records: 393659

BATHYMETRY DATA	Quantity	Percentage
Number of Beams	59670567	100%
Number of Good Beams	51882976	86.95%

# Multibeam Report

## KM0703

Ship Name: Kilo Moana  
Chief Scientist: Zehr, Jonathan  
University of California, Santa Barbara  
Source Organization: UNOLS R2R  
Start Date: 2007-03-14  
End Date: 2007-04-18

### View ISO Metadata

[Download / Request All Files](#)

### Multibeam Bathymetry

#### Cruise Details

Project: Diazotrophs in the Open Ocean  
Instrument: Simrad EM1002 and EM120

#### Data Quality

Number of Files: 898  
Number of Records: 393659

#### BATHYMETRY

Number of Beams

Number of Good Beams

### File Information

#### Full Resolution Bathymetry as collected (raw): 897

Files	File Size	Description
<a href="#">em1002-073-221945-0001.mb56.gz</a>	20.00MB	Simrad multibeam vendor format
<a href="#">em1002-073-223445-0002.mb56.gz</a>	19.82MB	Simrad multibeam vendor format
<a href="#">em1002-073-224945-0003.mb56.gz</a>	17.50MB	Simrad multibeam vendor format
<a href="#">em1002-073-230446-0004.mb56.gz</a>	15.43MB	Simrad multibeam vendor format
<a href="#">em1002-073-231946-0005.mb56.gz</a>	14.93MB	Simrad multibeam vendor format
<a href="#">em1002-073-233446-0006.mb56.gz</a>	14.72MB	Simrad multibeam vendor format
<a href="#">em1002-073-234946-0007.mb56.gz</a>	14.50MB	Simrad multibeam vendor format
<a href="#">em1002-074-000446-0008.mb56.gz</a>	13.84MB	Simrad multibeam vendor format
<a href="#">em1002-074-001946-0009.mb56.gz</a>	13.02MB	Simrad multibeam vendor format
<a href="#">em1002-074-003447-0010.mb56.gz</a>	12.73MB	Simrad multibeam vendor format
<a href="#">em1002-074-004947-0011.mb56.gz</a>	12.28MB	Simrad multibeam vendor format
<a href="#">em1002-074-010447-0012.mb56.gz</a>	11.84MB	Simrad multibeam vendor format
<a href="#">em1002-074-011947-0013.mb56.gz</a>	11.73MB	Simrad multibeam vendor format
<a href="#">em1002-074-013447-0014.mb56.gz</a>	11.27MB	Simrad multibeam vendor format
<a href="#">em1002-074-014947-0015.mb56.gz</a>	10.58MB	Simrad multibeam vendor format
<a href="#">em1002-074-020446-0016.mb56.gz</a>	10.24MB	Simrad multibeam vendor format
<a href="#">em1002-074-021946-0017.mb56.gz</a>	9.84MB	Simrad multibeam vendor format
<a href="#">em1002-074-023446-0018.mb56.gz</a>	9.66MB	Simrad multibeam vendor format
<a href="#">em1002-074-024946-0019.mb56.gz</a>	9.74MB	Simrad multibeam vendor format
<a href="#">em1002-074-030446-0020.mb56.gz</a>	9.55MB	Simrad multibeam vendor format
<a href="#">em1002-074-031946-0021.mb56.gz</a>	9.49MB	Simrad multibeam vendor format
<a href="#">em1002-074-033447-0022.mb56.gz</a>	9.66MB	Simrad multibeam vendor format
<a href="#">em1002-074-034947-0023.mb56.gz</a>	9.43MB	Simrad multibeam vendor format
<a href="#">em1002-074-040447-0024.mb56.gz</a>	8.37MB	Simrad multibeam vendor format
<a href="#">em1002-074-041947-0025.mb56.gz</a>	8.38MB	Simrad multibeam vendor format
<a href="#">em1002-074-043447-0026.mb56.gz</a>	5.17MB	Simrad multibeam vendor format

51882976

86.95%

# Multibeam Report KM0703

Ship Name: Kilo Moana  
Chief Scientist: Zehr, Jonathan  
University of California, Santa Barbara  
Source Organization: UNOLS R2R  
Start Date: 2007-03-14  
End Date: 2007-04-18

## View ISO Metadata

[Download / Request All Files](#)

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Request Summary

Multibeam Surveys 1



HELP

## Data Request Summary:

### Multibeam Surveys



Files: 897  
Compressed Size: 3.2 GB

### Request Data:

Email

Submit Request

Number of Beams

Number of Good Beams

51882976

86.95%

## File Information

## Full Resolution Bathymetry as collected (raw): 897

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<a href="#">em1002-073-221945-0001.mb56.gz</a>	20.00MB	Simrad multibeam vendor format
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<a href="#">em1002-073-234946-0007.mb56.gz</a>	14.50MB	Simrad multibeam vendor format

- Data requested through the DCDB map viewer are delivered as a single, compressed file which must be uncompressed.
- This can be accomplished using any unpackaging software or freeware such as 7zip.
- Once the data package is uncompressed, the individual raw and processed bathymetry files must be unzipped as well.
- Some files may include a MB-System ship code extension (e.g. .mb56) which also must be removed in order to be accessible for use.





## Layers

### IHO DCDB/NOAA NCEI ?

- ☒ Multibeam Surveys ?
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?

☐ Crowdsourced Bathymetry Files ?

?

☐ U.S. Bathymetry Coverage and Gap Analysis ?

► EMODnet

► Australia

► Canada

► France

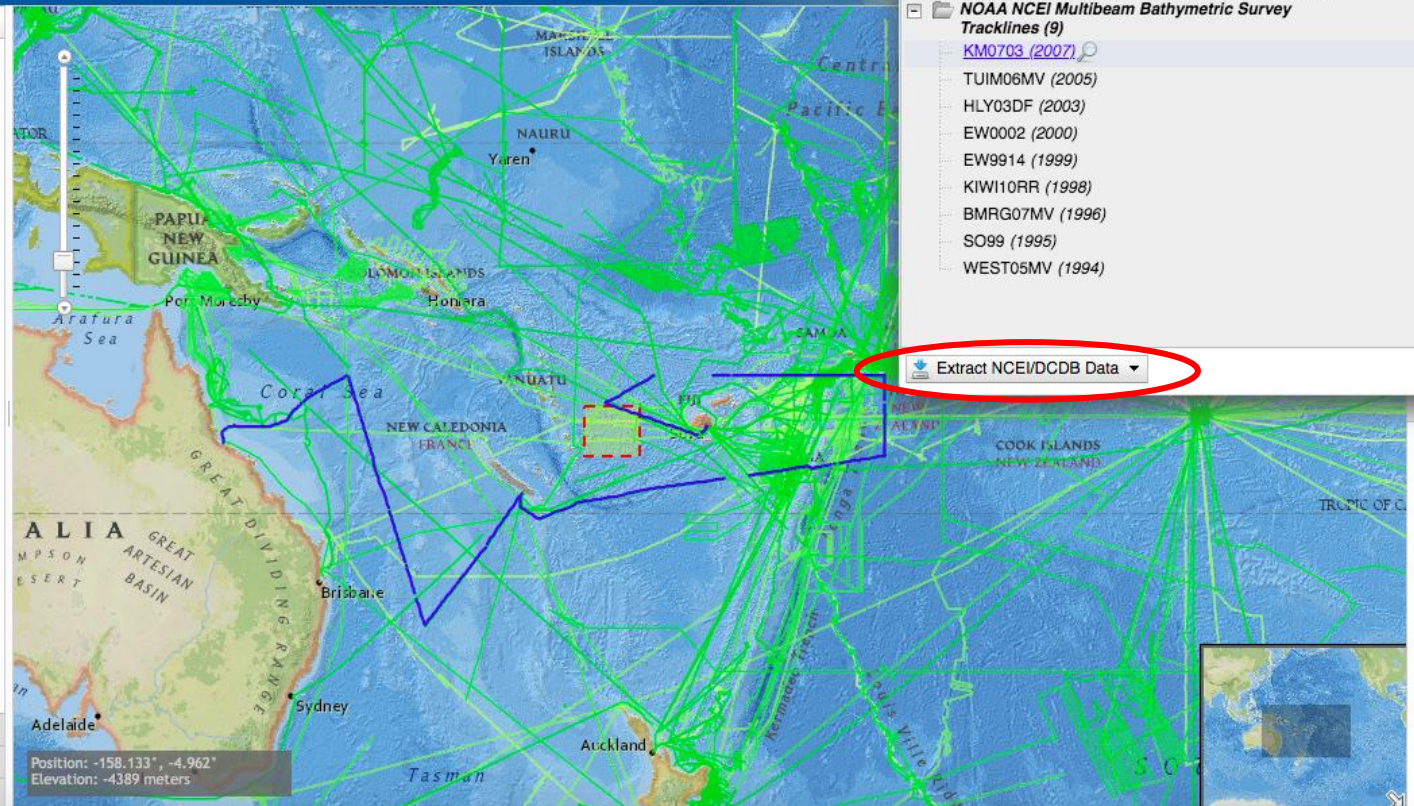
► Germany

► Japan

Grid Extract

More Information

Help



## Identified Features (9)

Note: WMS layers (EMODnet, AusSeabed, MAREANO) are only available using a point (single-click) to identify.

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- [TUIM06MV \(2005\)](#)
- [HLY03DF \(2003\)](#)
- [EW0002 \(2000\)](#)
- [EW9914 \(1999\)](#)
- [KIWI10RR \(1998\)](#)
- [BMRG07MV \(1996\)](#)
- [SO99 \(1995\)](#)
- [WEST05MV \(1994\)](#)

▼

## Search Criteria

Cruise IDs : BMRG07MV, EW000...

Start Year : Not specified

End Year : Present

Platforms : All

Top : -16.9335

Left : 170.4024

Bottom : -20.0174

Right : 174.0059



## Survey &amp; File Statistics

Filesize (approximate)

148.6 MB

Files

448

File Data Types

Bathymetry

Metadata

Images

Supporting

[→ Request Summary](#)

Data Available	Cruise ID	Year	Platform (Ship)	Instrument	<input checked="" type="checkbox"/>
➤	BMRG07MV	1996	Melville	SeaBeam 2000	<input checked="" type="checkbox"/>
➤	EW0002	2000	Maurice Ewing	Atlas Hydrosweep DS	<input checked="" type="checkbox"/>
➤	EW9914	1999	Maurice Ewing	Atlas Hydrosweep DS	<input checked="" type="checkbox"/>
➤	HLY03DF	2003	Healy	SeaBeam 2112	<input checked="" type="checkbox"/>
➤	KIWI10RR	1998	Roger Revelle	SeaBeam 2100	<input checked="" type="checkbox"/>
➤	KM0703	2007	Kilo Moana	Simrad EM1002; EM120	<input checked="" type="checkbox"/>
➤	SO99	1995	Sonne	Atlas Hydrosweep DS	<input checked="" type="checkbox"/>
➤	TUIM06MV	2005	Melville	SeaBeam 2000	<input checked="" type="checkbox"/>
➤	WEST05MV	1994	Melville	SeaBeam 2000	<input checked="" type="checkbox"/>

## Search Criteria

Cruise IDs : BMRG07MV, EW000...

Start Year : Not specified

End Year : Present

Platforms : All

Top : -16.9335

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Right : 174.0059



## Survey &amp; File Statistics

Filesize (approximate)

148.6 MB

Files

448

File Data Types

Bathymetry

Metadata

Images

Supporting

[→ Request Summary](#)

## Data Availab



Request Summary

Multibeam Surveys 9



? HELP

## Data Request Summary:

Multibeam Surveys



Files: 448

Compressed Size: 148.6 MB

## Request Data:

Email

[Submit Request](#)



# We're here to help!

---

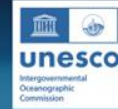
- Our data delivery systems are not without limitations. System failures occur.
- The DCDB is working towards improved data discovery and delivery mechanisms that will increase our delivery capacity and reduce system failures.
- ***If you are experiencing issues with data deliveries, please reach out to us and we will get you the data you need!!***





# How to access the GEBCO product





# The Nippon Foundation-GEBCO Seabed 2030 Project

100% of the ocean floor mapped by 2030

[Download GEBCO's global grid](#)[Download polar grids](#)[Contribute data](#)

Download the GEBCO grid from: [gebco.net](http://gebco.net) or [seabed2030.org](http://seabed2030.org)



Home » Data & Products » Gridded Bathymetry Data

## Global ocean & land terrain models

GEBCO's gridded bathymetric data set, the GEBCO\_2020 grid, is a global terrain model for ocean and land at 15 arc-second intervals. It is accompanied by a Type Identifier (TID) Grid that gives information on the types of source data that the GEBCO\_2020 Grid is based.

- [Download global coverage grids](#)
- [Download data for user-defined areas](#)

More [information](#) about the grid, its terms of use and attribution.

## Download global coverage grids

The GEBCO\_2020 Grid and TID Grid can be download as global files in netCDF format or a set of 8 tiles (each with an area of 90° x 90°), giving global coverage, in Esri ASCII raster and data GeoTiff formats. The data filea are included in a zip file along with the data set documentation.

<b>GEBCO_2020 Grid</b>	<a href="#">netCDF</a> (4 Gbytes, 7.5 Gbytes uncompressed)	<a href="#">Data GeoTiff</a> (4 Gbytes, 8 Gbytes uncompressed)	<a href="#">Esri ASCII raster</a> (5 Gbytes, 20 Gbytes uncompressed)
<b>GEBCO_2020 TID Grid</b>	<a href="#">netCDF</a> 90 Mbytes, 4 Gbytes uncompressed)	<a href="#">Data GeoTiff</a> (96 Mbytes, 7 Gbytes uncompressed)	<a href="#">Esri ASCII raster</a> (108 Mbytes, 9.5 Gbytes uncompressed)

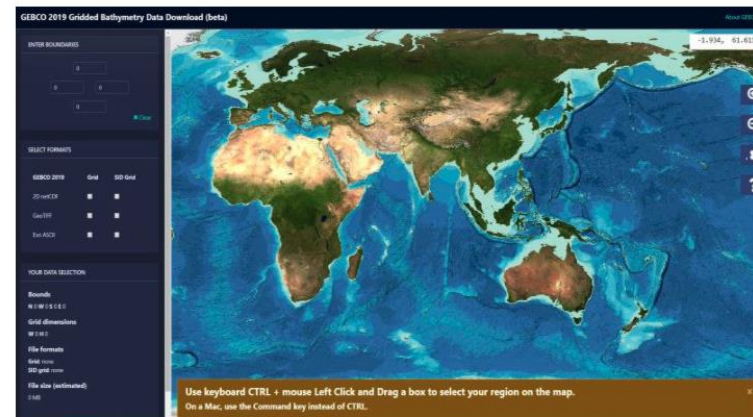
### Jump to

- > [Seabed 2030](#)
- > [Contribute data](#)
- > [IBCAO\\_v4](#)
- > [GEBCO Web Services](#)
- > [Printable maps](#)
- > [Historical GEBCO data](#)
- > [Imagery](#)
- > [Undersea feature names](#)
- > [Historical GEBCO charts](#)
- > [IHO-IOC GEBCO Cookbook](#)
- > [History of GEBCO bathymetry](#)

Share this

## Download data for user-defined areas

Use our [application](#) to select and download data in netCDF, Esri ASCII raster and data GeoTiff formats.





Questions regarding data access?



# Summary & Conclusions

- How is the GEBCO product assembled for the SWPHC Region
- How to contribute data
- How to access data



## Homework #2

- Does data exist that can be contributed?  
[gebco.net/about us/contributing data/](http://gebco.net/about_us/contributing_data/)
- Do you have upcoming surveys that you can share information about?
  - Assemble information about upcoming surveys and data acquisition opportunities (bounding box, polygons, shapefiles, coordinates)
  - Send to Seabed 2030 Coordinator
- Do you have technical challenges that we might be able to help you address?





## Homework #2 Cont...

- Download data from your region from GEBCO and DCDB and provide feedback on the quality and extent of data.
- What challenges or issues did you have downloading and/or viewing the data?
- Sign up for the Seabed 2030 Newsletter!  
**<http://bit.ly/Seabed2030-subscribe>**
- Send Questions/Comments to Seabed 2030 Coordinator:  
**[scaie@linz.govt.nz](mailto:scaie@linz.govt.nz)**



## Next Webinars in this Series

- Webinar 3 - June 21: Increasing Data Coverage: Crowdsourced Bathymetry and Data Coverage Polygons
- Webinar 4 - July 1: Moving Ahead Together: Summary, Next Steps and Wrap up.



Photo!





# Thank you!

Join us 21 June for Webinar 3:

Increasing Data Coverage: Crowdsourced Bathymetry and  
Data Coverage Polygons

