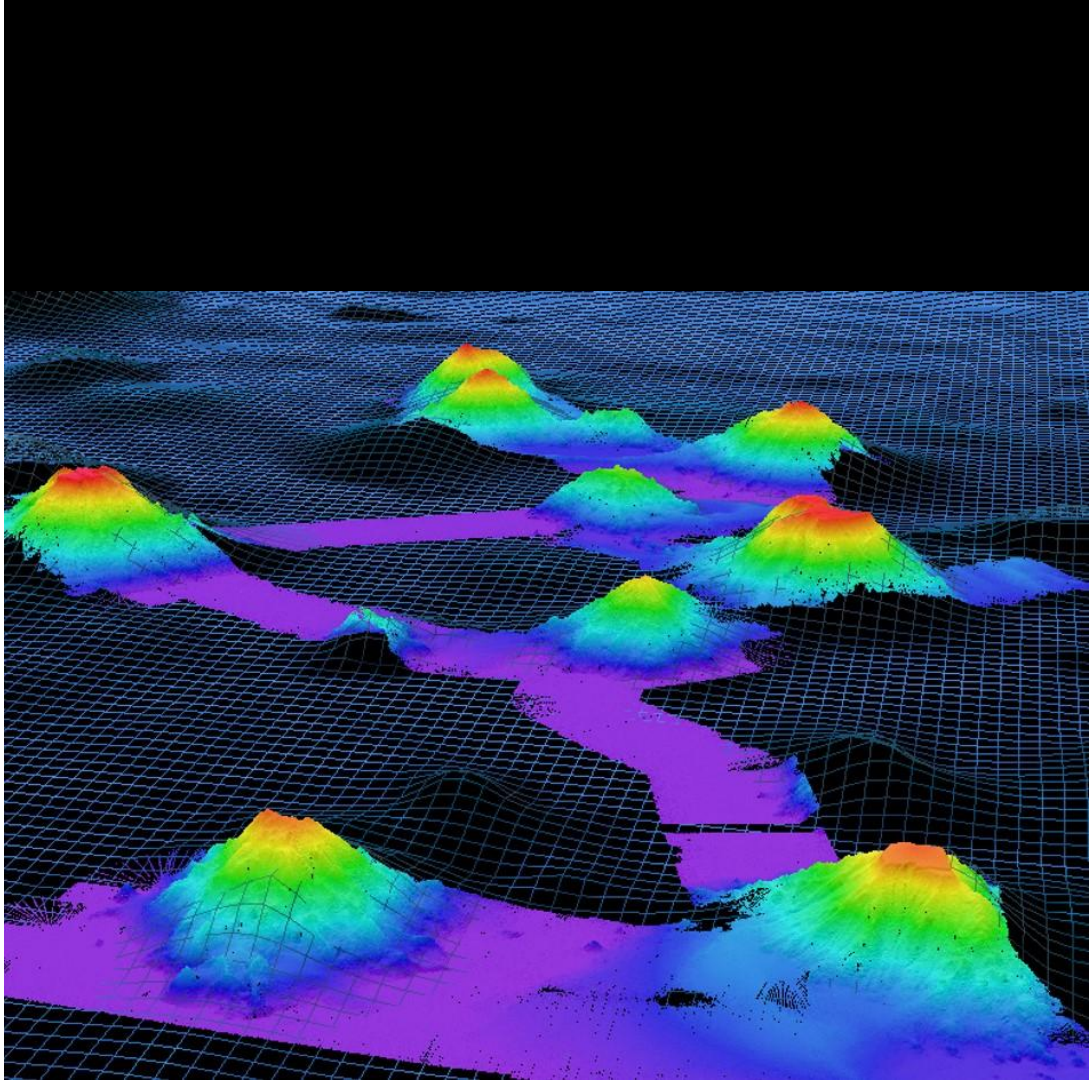
NOAA Ocean Exploration Deepwater Mapping:

How to Find our Data and other Available Resources

Shannon Hoy
September 2024



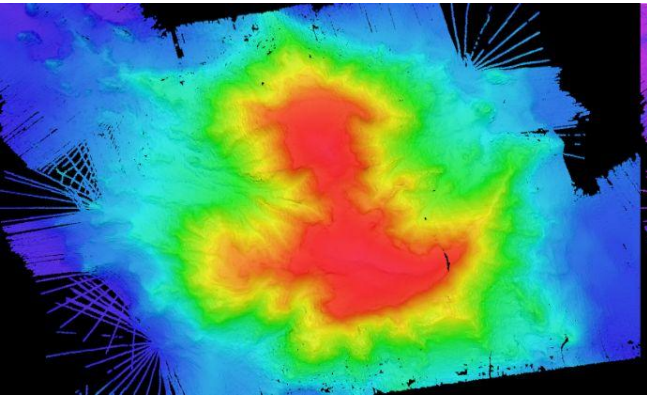
We are heading this way for

Beyond the Blue!

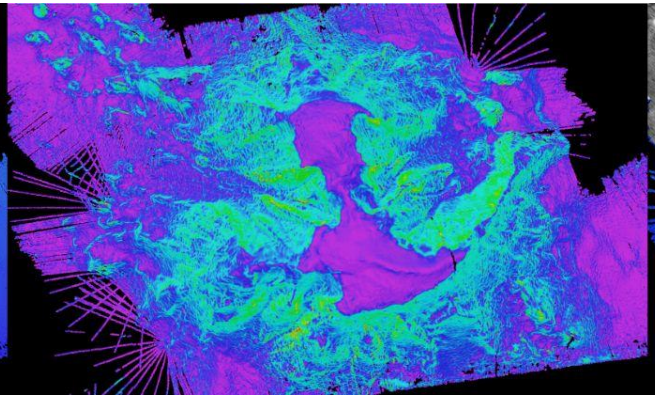
Types of Mapping Data

EM 304 MKII Multibeam Sonar (26 kHz)

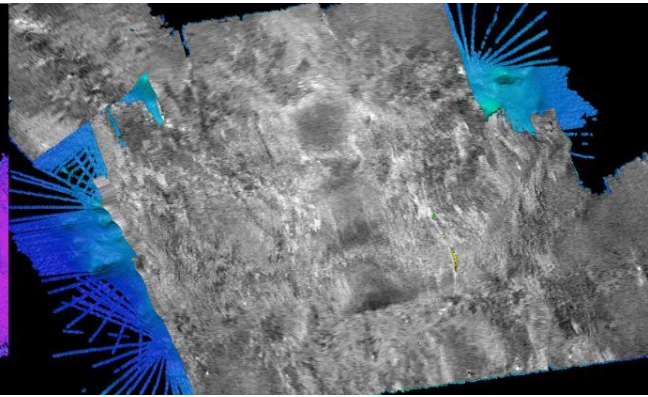
Bathymetry

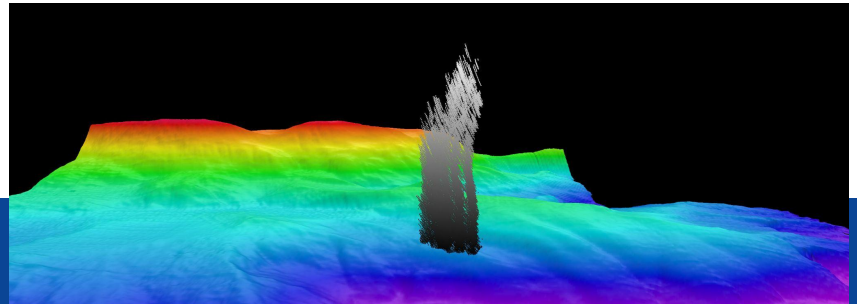


Slope



Seabed Backscatter

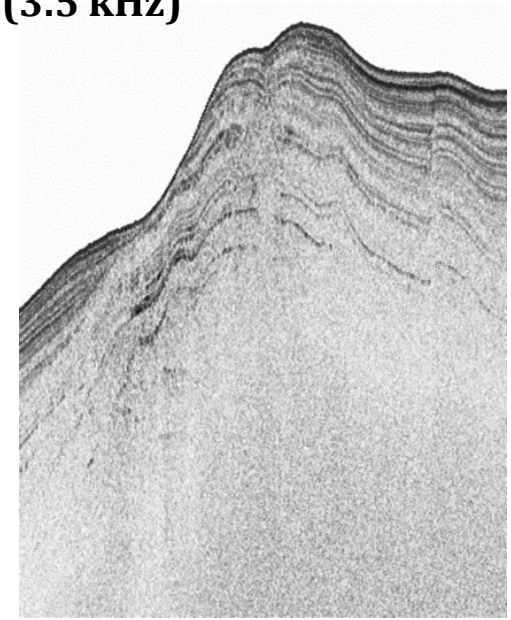




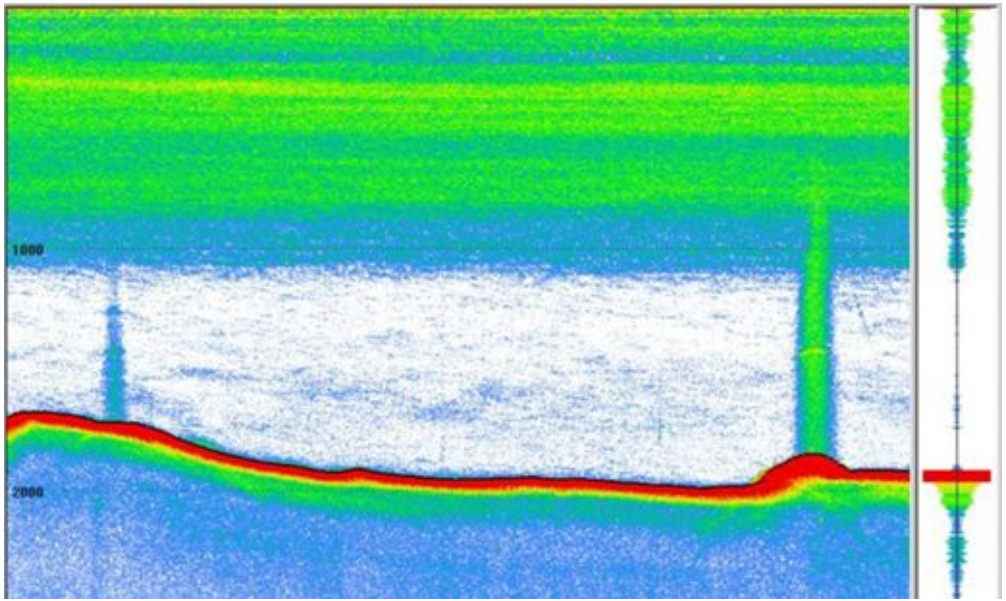
Water Column Backscatter

Types of Data

Knudsen 3260 Subbottom (3.5 kHz)



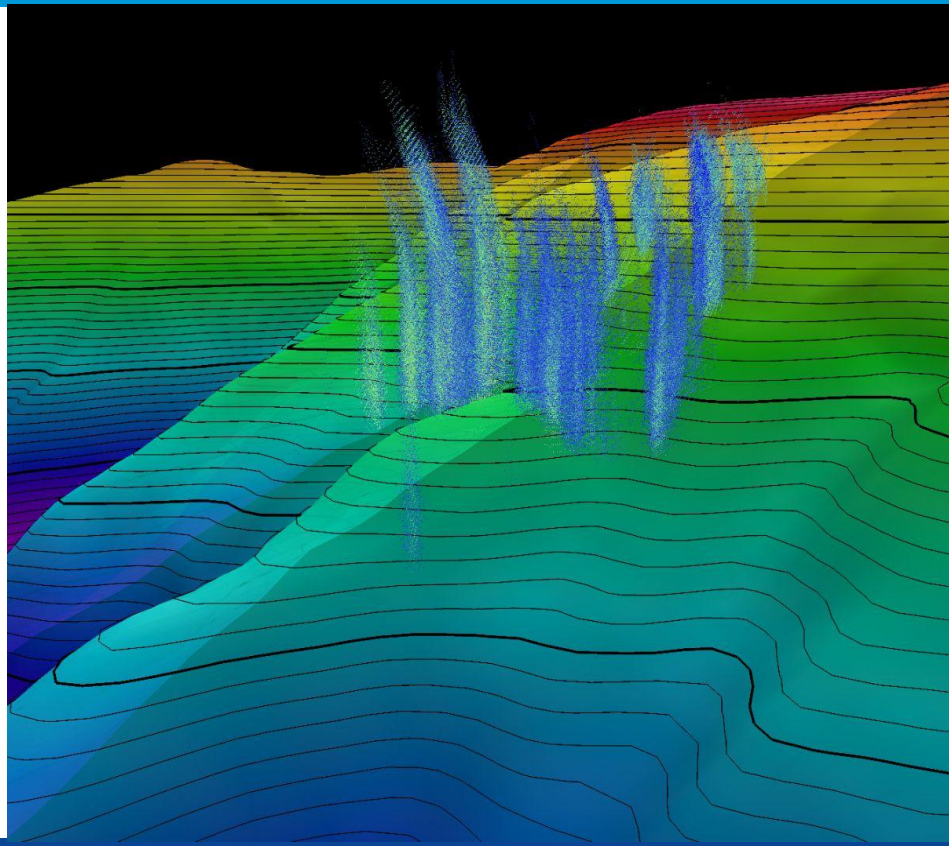
EK Split-Beam (GPT: 18, 120, 200 kHz ; WBT: 38, 70 kHZ)



Mapping Data Ethos

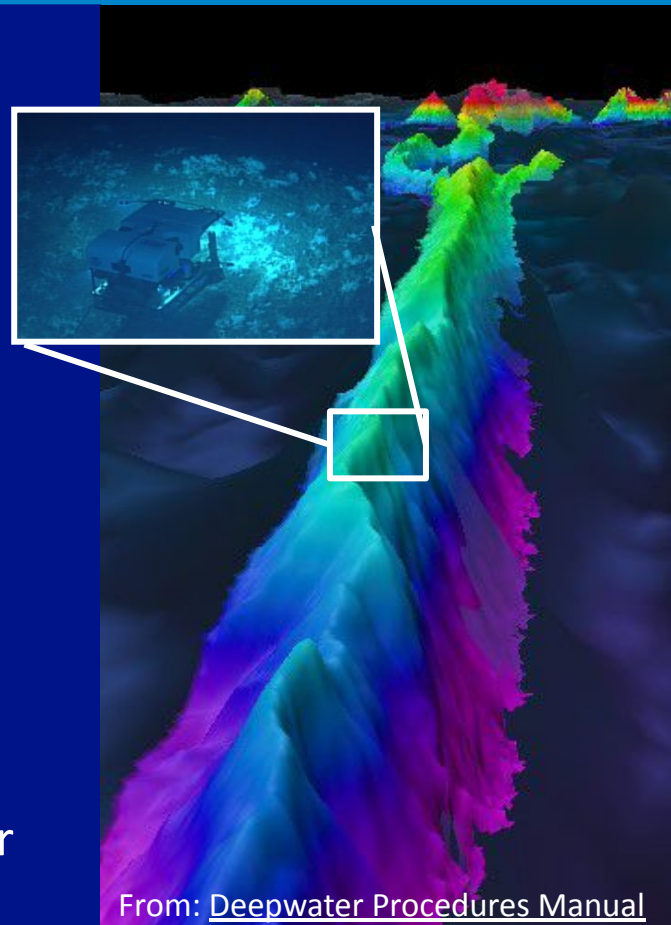
Our primary goal is to provide ocean mapping data that are useful for numerous users with a variety of needs.

We want to ensure that we provide data in formats for mapping super-users who prefer to process their own data, but also data that can be **effectively used** by stakeholders who do not have the **time**, **resources, or expertise** to process ocean mapping data, especially when needed for decision making and follow-up exploration.



Principles of Exploration Mapping

- Always Collect Data
- Systematically Maximize Coverage
- Collect Useful and Quality Data
- Produce Useful Products
- Report Necessary Metadata
- Release Open-Access Data in a Timely Manner

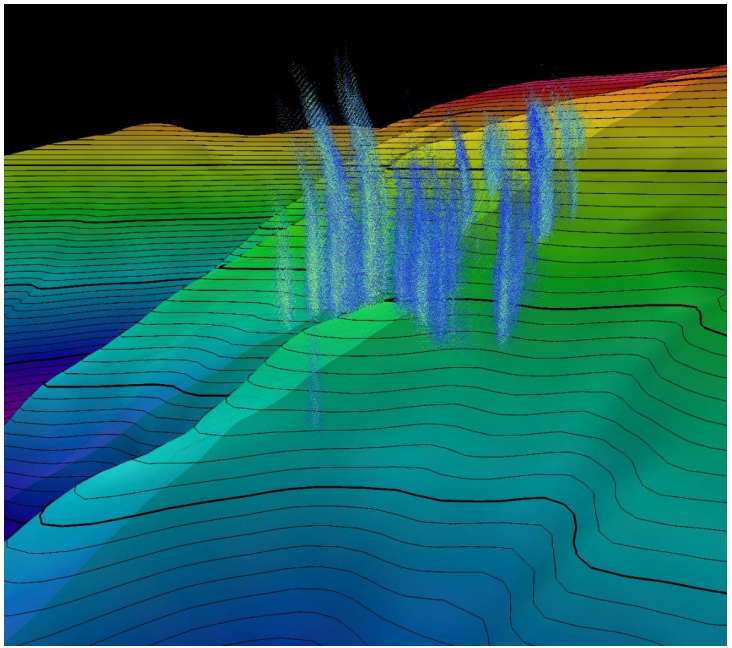


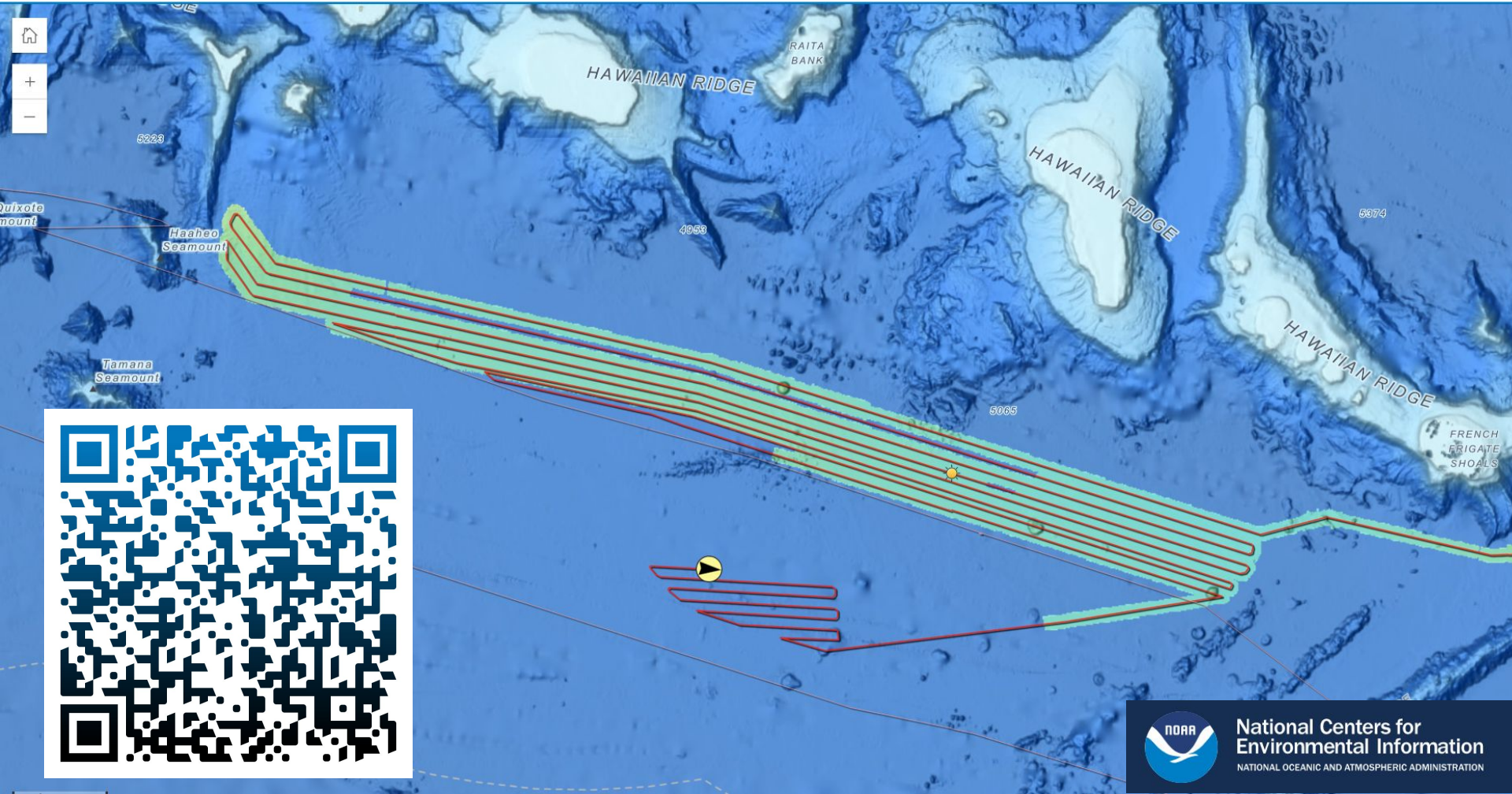
From: Deepwater Procedures Manual

Levels of Data

For each dataset we strive to provide Level 00, 01, 02, and 03 data, along with necessary metadata for our various communities. We also provide both proprietary and non-proprietary formats.

- **Level 00 -** Raw unprocessed data in the sensor's native format (e.g., .kmall)
- **Level 01 -** Processed point files (e.g., .gsf) that support regridding of the dataset.
- **Level 02 -** Products in multiple formats that are used throughout the community (e.g., .tif, .xyz, .sd, and .grd).
- **Level 03 -** Web mapping services to enhance discoverability and accessibility (e.g., Data Atlas and AGOL Services)
- **Ancillary Data** - All metadata useful for interpretation of the data (e.g., Data Reports, Calibration Reports, Acquisition and Processing Logs, Weather Logs, BISTs, Telnets, and PU Parameters).





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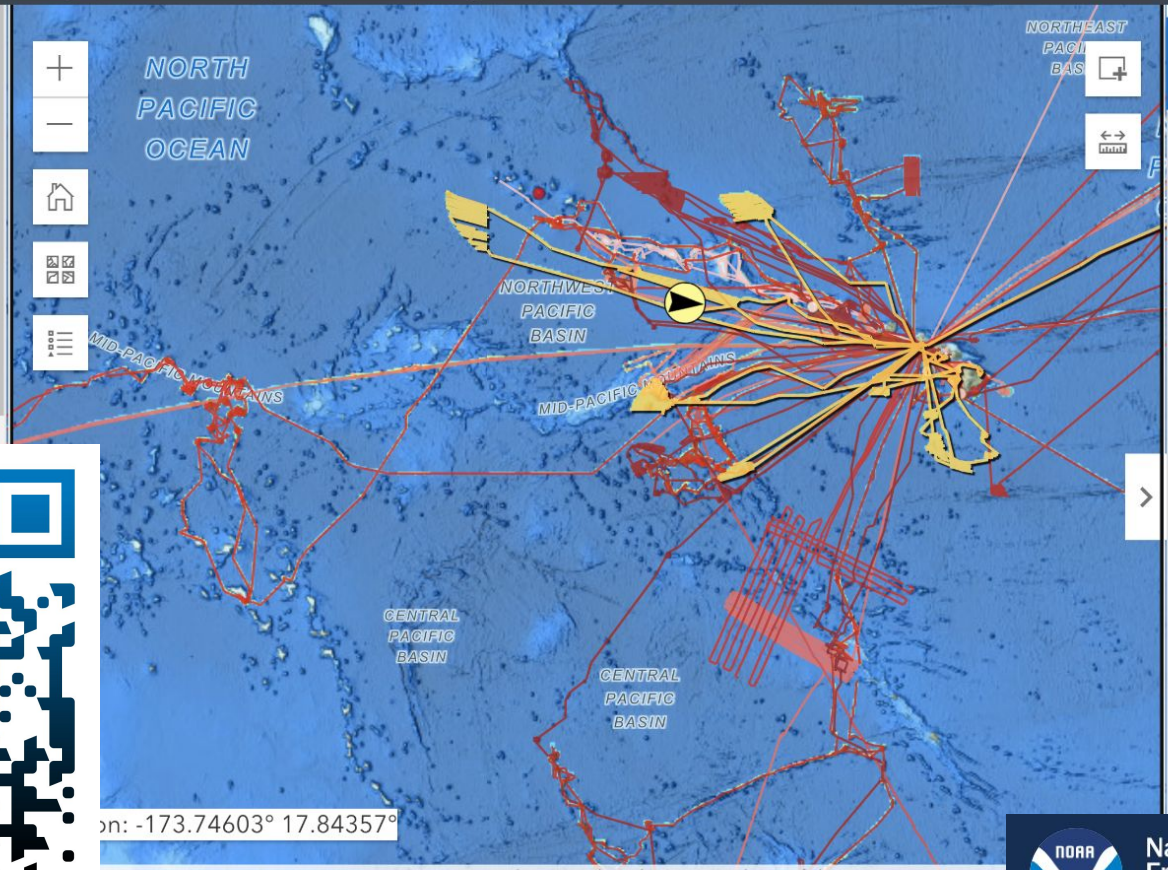
NOAA Ocean Exploration Data Atlas

FILTERS | LAYER LIST

Minimum Year: 1999
Maximum Y…: 2024

Expedition Names

Platform Names



485 Expeditions Displayed

RES
FILT

2024
EX2404
Okeanos Explorer (EX2404): Be
the Blue: Papahānaumokuākea
Mapping 2

SHOW ON MAP

2024
EX2403
Okeanos Explorer (EX2403): Be
the Blue: Papahānaumokuākea
Mapping 1

SHOW ON MAP

2024
EX2402
Okeanos Explorer (EX2402): Be

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NOAA Ocean Exploration Data Management

NCEI works with NOAA Ocean Exploration to ensure that ocean exploration data collections are available to the public, and align with FAIR (Findable, Accessible, Interoperable, Reusable) principles through careful stewardship of vital sonar, oceanographic, imagery, video, and collected specimen information. These collections contribute greatly to scientific understanding of the world's ocean.

The NOAA Ocean Exploration Data Management Team at NCEI performs cutting-edge end-to-end data management for NOAA Ocean Exploration-sponsored missions, partnerships, and projects, including expeditions aboard NOAA Ship *Okeanos Explorer*.

These efforts enable rapid and easy data access, facilitate efficient and effective long-term data preservation, and inspire further ocean exploration and research.

Data Access | Video Data Management | Resources

NOAA Ocean Exploration Data Products and Services

Interactive maps, access portals, and other tools for accessing data collected, developed, and funded by NOAA Ocean Exploration.

NOAA Ocean Exploration Data Atlas (New Version)

The new NOAA Ocean Exploration Data Atlas uses the latest GIS technologies to provide access to a continuously updated archive of data, information, and products. The map includes search filters for expedition location, collection year, vessel name, platform type, and open text. Expeditions are displayed on a map and organized by year and location. Ship and ROV tracklines and data points include access to expedition websites, data, and publications. To provide feedback on this new map viewer, please email OER.info.mgmt@noaa.gov .

Launch New Atlas

Okeanos Explorer Expeditions

This site lists and describes NOAA Ship *Okeanos Explorer* expeditions, and provides direct access to corresponding data and products.

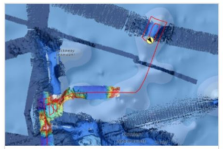
Access Data

NOAA Ocean Exploration Funded Expeditions

This site lists and describes some of the expeditions funded by NOAA Ocean Exploration through its Notice of Funding Opportunity, and provides direct access to corresponding data and products.

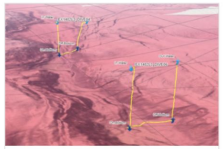
Access Data

Featured group content

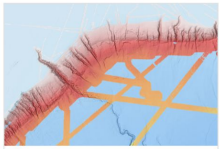


Okeanos Explorer Live Opera…
Web Map
Created: Oct 17, 2019
Updated: Nov 4, 2024
View count: 572,213
ncei_oer_noaa

NOAA Ocean Exploration Da…
Web Mapping Application
Created: Jun 13, 2017
Updated: Jan 30, 2023
View count: 722
ncei_oer_noaa



ROV Dive Tracks 3D Scene
Web Scene
Created: Apr 20, 2020
Updated: Jan 30, 2023
View count: 15,165
ncei_oer_noaa



Okeanos Explorer Bathymetri…
Imagery Layer
Created: Apr 4, 2016
Updated: Jan 30, 2023
View count: 426,814
ncei_oer_noaa

Okeanos Explorer Bathymetri…
Feature Layer
Created: Aug 21, 2019
ncei_oer_noaa

ROV Dive Locations - Okeano…
Feature Layer
Created: May 8, 2020
ncei_oer_noaa

ROV Dive Tracks - Okeanos E…
Feature Layer
Created: May 8, 2020
Updated: Feb 2, 2024
View count: 50,703
ncei_oer_noaa

ROV Samples - ROV Deep Di…
Feature Layer
Created: May 27, 2021
Updated: Jun 25, 2024
View count: 47,863
ncei_oer_noaa

up content

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NOAA OER Deepwater Exploration Mapping Procedures Manual

Download the current version of the NOAA OER Deepwater Exploration Mapping Procedures Manual (pdf, 2.1 MB).

With less than 20% of our world ocean's seafloor mapped to modern standards, seafloor mapping is a national and international priority. As emphasized by the U.S. National Strategy for Mapping, Exploring, and Characterizing the United States Exclusive Economic Zone and Seabed 2030, the monumental task of mapping the seafloor requires a collective, coordinated, and collaborative approach.

For more than 10 years, the NOAA Office of Ocean Exploration and Research (OER) has been conducting exploratory mapping operations throughout U.S. waters and in other parts of the world's ocean aboard NOAA Ship *Okeanos Explorer*. Based on this experience, OER produced a manual that describes the office's approach to deepwater ocean exploration acoustic mapping.

The comprehensive manual describes methodologies for data acquisition, processing, reporting, and archiving for ship-based exploratory ocean mapping operations deeper than 200 meters (656 feet). In the context of the U.S. national strategy and Seabed 2030, OER is sharing this manual as a contribution to broader efforts to develop standard ocean mapping protocols and to serve as a guide for other interested public and private entities conducting deepwater mapping and exploration.

Principles of Exploration

The manual also details the principles of exploration that underlie OER's mapping operations. These principles are:

Always collect data — Data are continuously collected anytime the ship is underway, including during transits and when operating in areas that have been previously mapped. If an area already has high-quality bathymetric coverage, collection of other data types, such as repeat bathymetry for temporal comparison, strategic sub-bottom profiling, or targeted water column backscatter, may be prioritized.

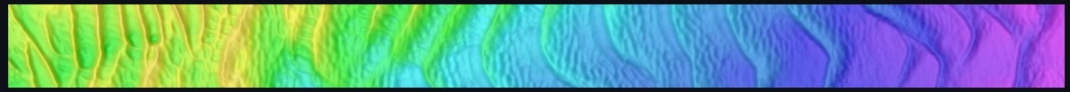
Systematically maximize coverage — Operations are strategically designed to maximize the collective coverage of acoustic data. This entails prioritizing areas where data have not been previously collected and building on existing data, including edge-matching transit data where practical. This requires consulting publicly available bathymetric data.

Collect useful and quality data — Data of the highest achievable quality are collected to be useful across multiple applications by performing annual calibrations, applying correctors for deepwater environments (such as sound speed), maximizing sounding density, and minimizing interference. OER ensures that there are always trained watchstanders operating the systems during all cruises, including transits, to consistently collect, organize, and document high-quality data.

Produce useful products — Secondary products are provided in multiple standardized formats, with a focus on those that can be used with nonproprietary software.

Home

kjerram edited this page 3 weeks ago · 109 revisions



The **Ocean Mapping Community Wiki** is a collaborative space to share multibeam, split-beam, and sub-bottom expertise from the global ocean mapping community.

Resources, best practices, and 'lessons learned' are welcome with the aim of improving data quality for all. Please consider contributing in your area of interest or joining the public discussions and troubleshooting forums.

This effort is hosted by the Multibeam Advisory Committee (MAC) and partners from academia, government, and industry.

Announcements

Check out the Community Announcements and Awareness section for non-commercial news from around the ocean mapping community.

Contributing

We hope you'll add your expertise to the conversation and provide feedback.

See the Contribution Guidelines to see who is contributing and how we are moderating the site content.

Recently updated

1. Make a test plan with the MAC Test Site Database and share your sites with the world (EK cals too!)
2. Check out the Multibeam Survey Planning Template to help science parties define their mapping goals
3. Help out your navigators with the ECDIS Converter for survey line plans
4. Share non-commercial news under the Community Announcements and Awareness section
5. Concatenate files in the File Trimmer (e.g., for patch test processing)
6. The Swath Coverage Plotter now tracks changes in multibeam settings and offsets

Ocean Mapping Community Wiki

We would love to hear from you!

Are there any other products we can provide to help with your workflow?

Stop by the NOAA Ocean Exploration Booth!

LIVE OPERATIONS MAP

DATA ATLAS

DATA MANAGEMENT

DEEPWATER PROCEDURES MANUAL

OMC WIKI

Questions?

oceanexplorer.noaa.gov

OCEAN EXPLORATION

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OER.info.mgmt@noaa.gov