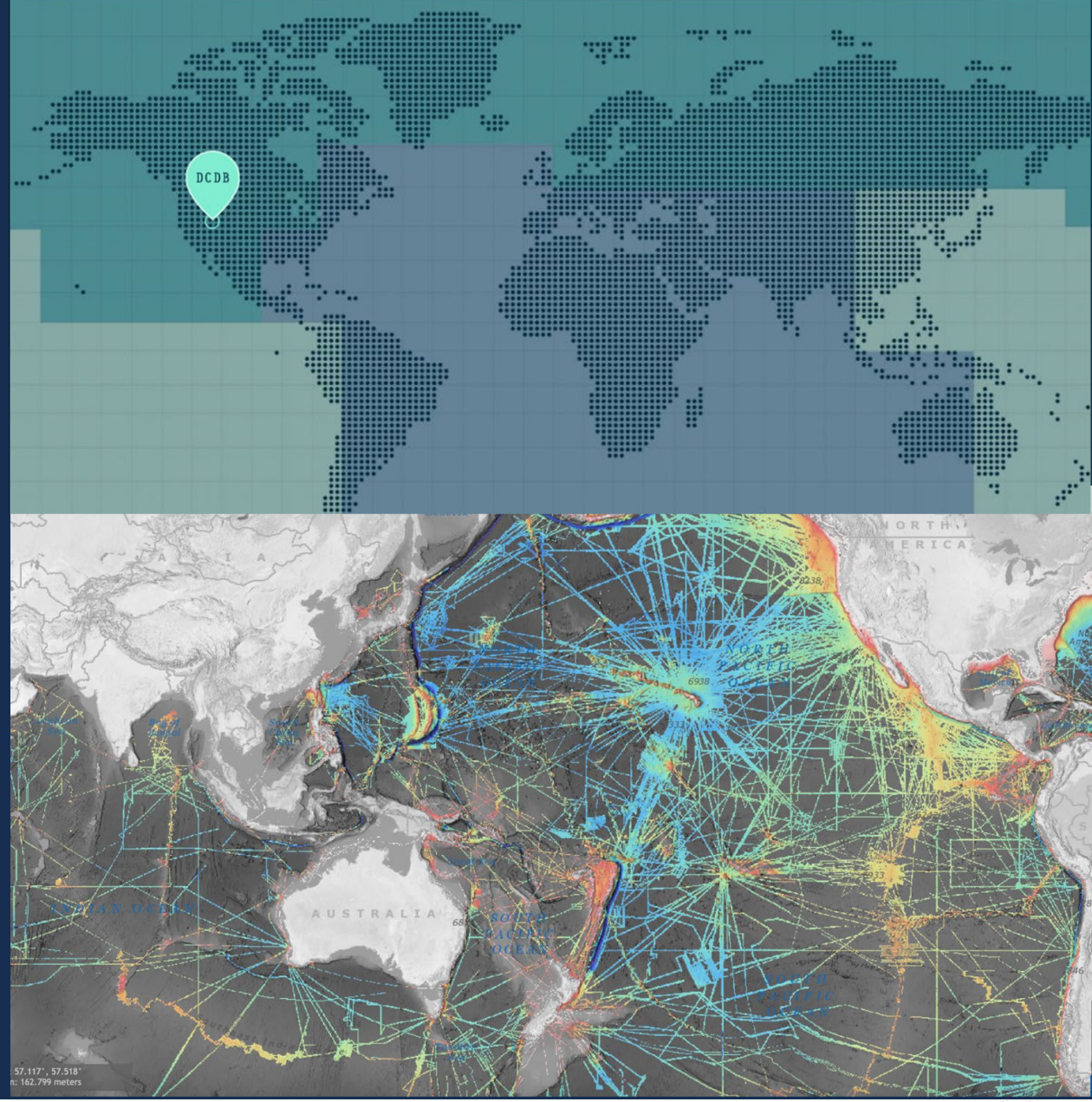
Stewarding Bathymetric Data for the World

The IHO Data Centre for Digital Bathymetry

Jennifer Jencks

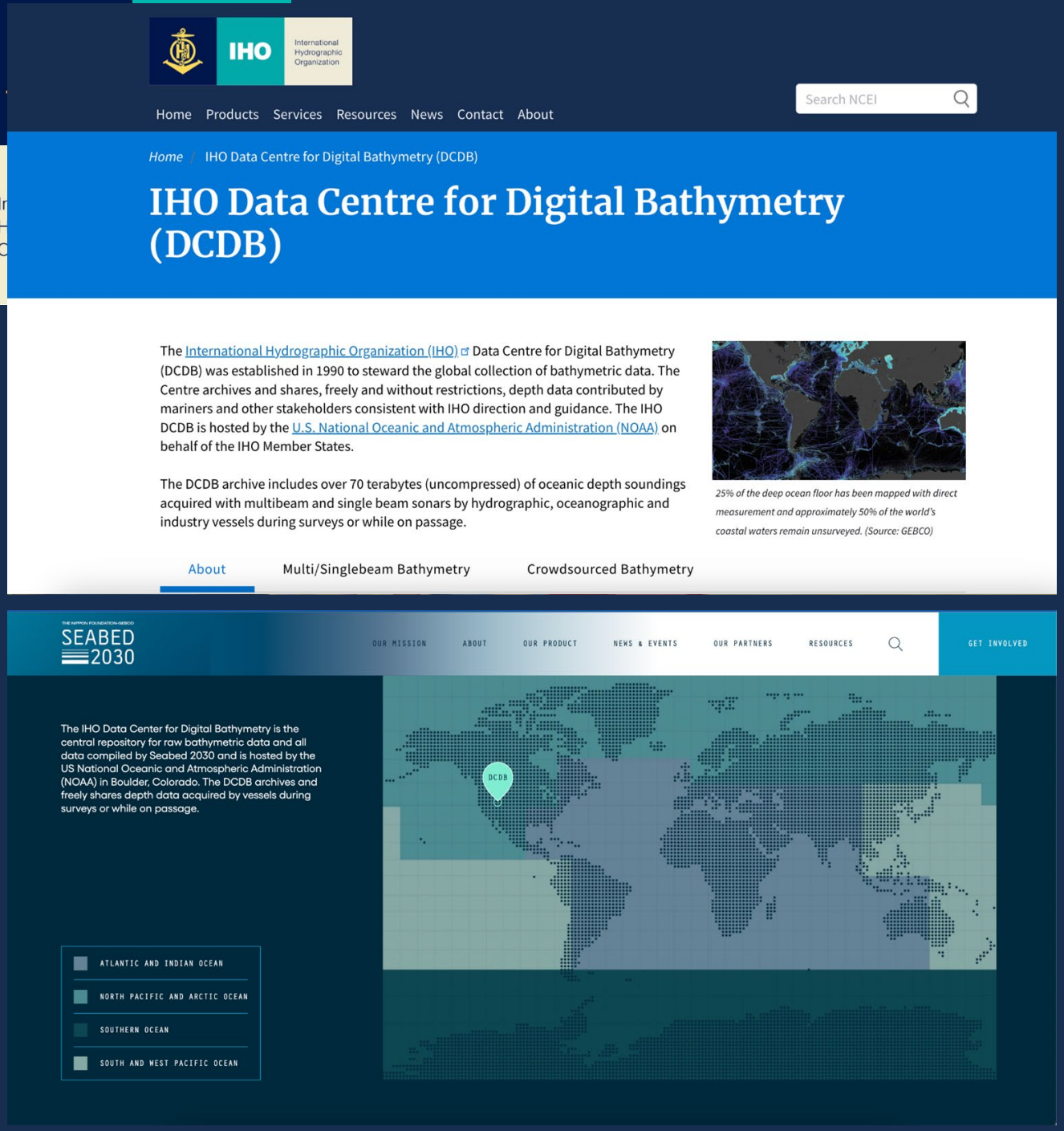
Director, IHO DCDB

jennifer.jencks@noaa.gov



International Hydrographic Organization
Organisation Hydrographique Internationale

Seabed 2030 6th Pacific Ocean Mapping Meeting
4 - 6 November 2024

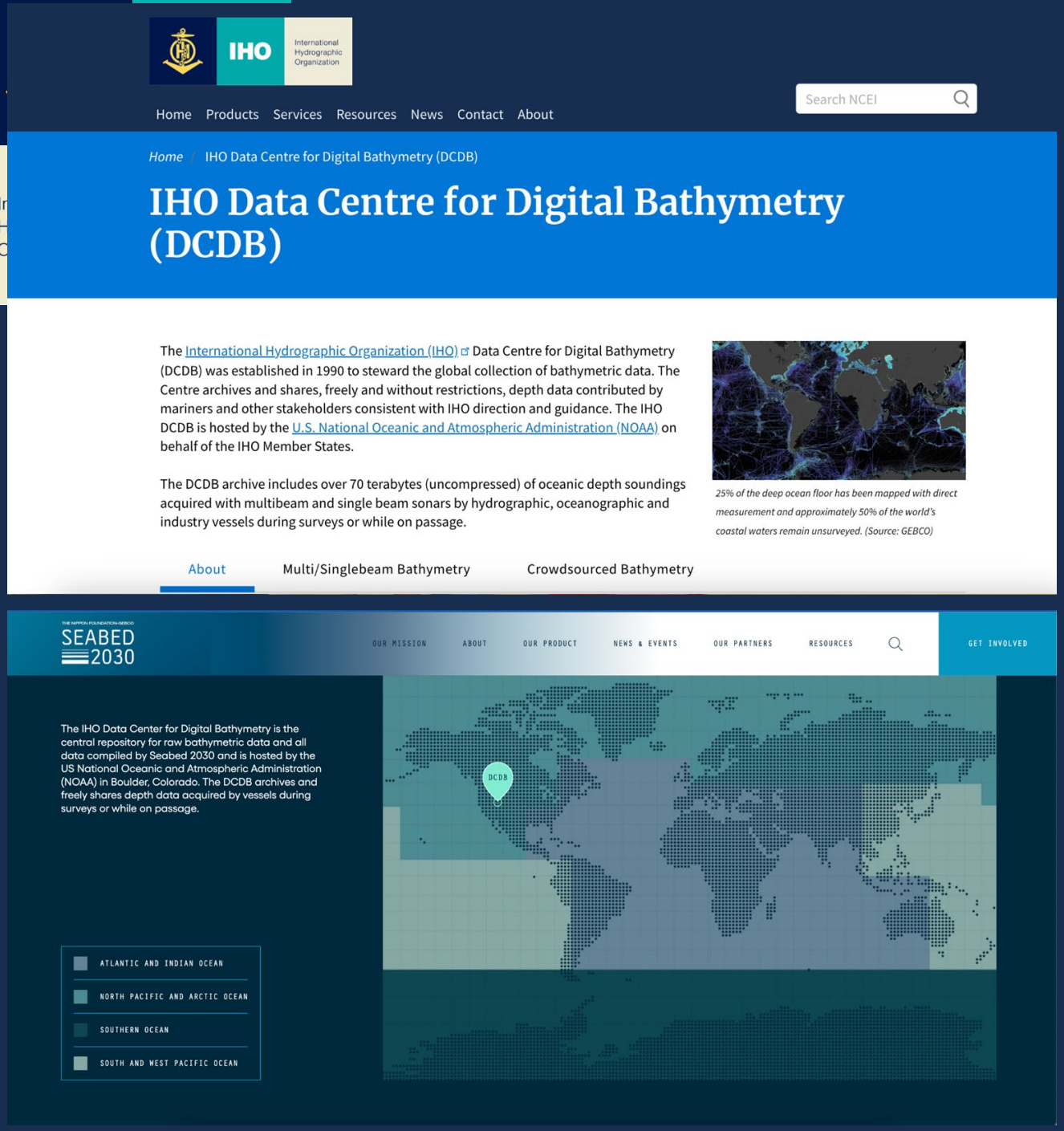


What is Data Stewardship?

The practice of managing an organization's data to ensure it's accessible, usable, secure, and trustworthy.

This responsibility spans every stage of the data lifecycle, from creation through to archive.

informatica.com/resources/articles/what-is-data-stewardship.html#:~:text=%C3%97,an%20advocate%20for%20trusted%20data



Who We Are

- The IHO DCDB was established in 1990 to steward the global collection of bathymetric data
- The DCDB is hosted by NOAA on behalf of IHO Member States
- Long-term archive for GEBCO & Seabed 2030

ncei.noaa.gov/iho-data-centre-digital-bathymetry

What We Steward

- Multibeam - 69 TB
- Singlebeam - 100’s of Millions of points
- NOAA’s Office of Coast Survey (OCS) - 1274 TB
- Coastal Lidar - High resolution shallow water in U.S waters
- Crowdsourced - Millions of points and growing fast!
- Satellite Derived*

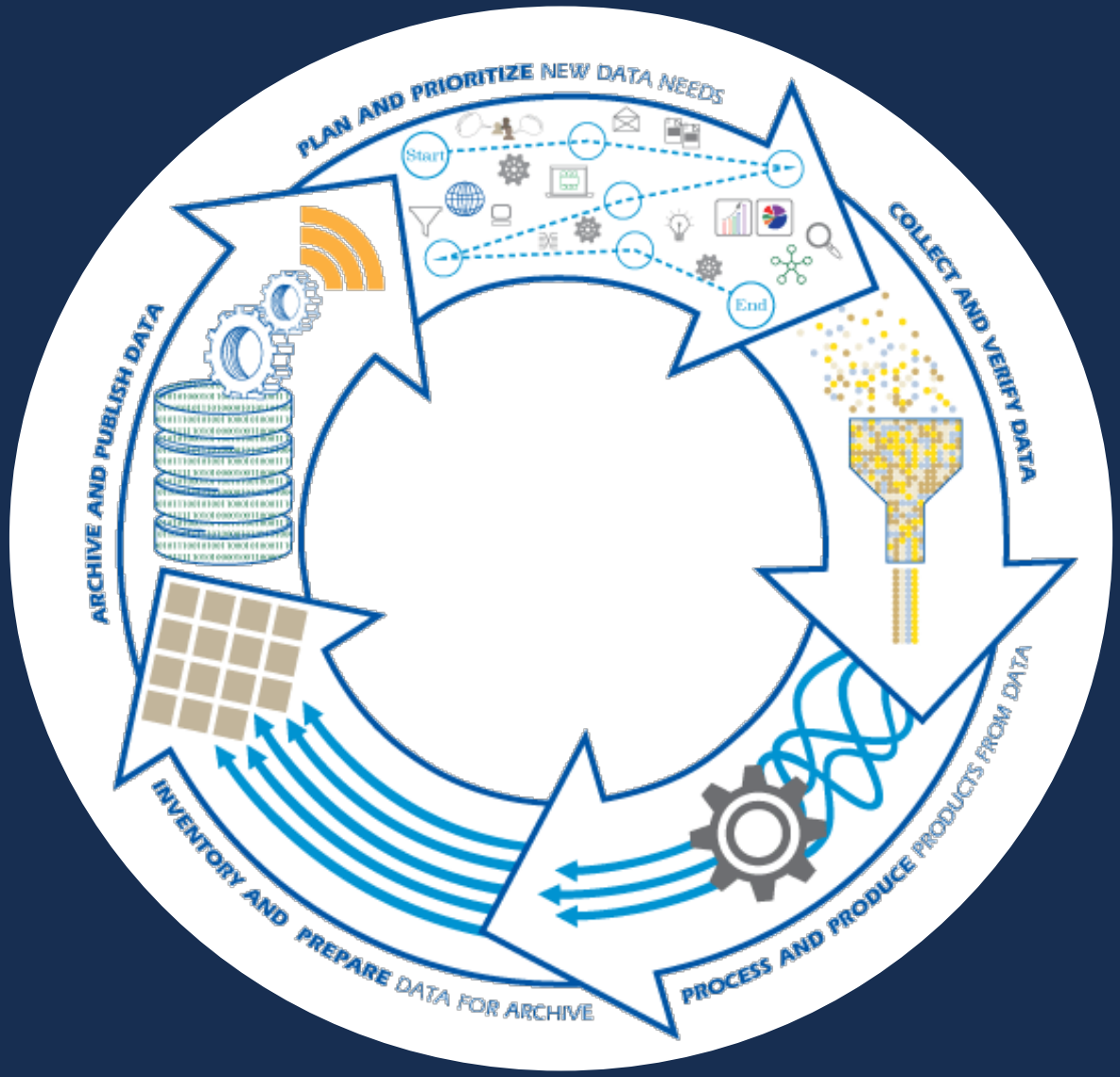
*Planned for the future

Why Steward Data?

Collect Once Use Many Times

The collection of scientific data can be expensive, resource & time intensive and oftentimes data may not be collected again.

Communities of today and tomorrow benefit when they can access and use existing data, enabling inquiries that might otherwise not be possible.



Why Steward Data?

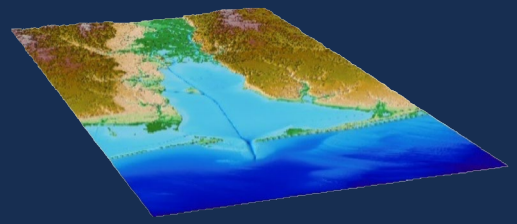
Key Tenet of the Archive

Ensure that the preserved data and information are *independently understandable* to everyone.

In other words, anyone should be able to understand the information without needing assistance from the experts who collected or created it.

Why We Steward

Bathymetry and Global Relief



Coastal Digital Elevation Model (DEM)

Safe navigation

Marine Mammal Management

Quantifying sea level rise impact

Help mitigate coastal hazards and improve community preparedness

National security

More rapid recovery from severe events

Data & Products Become Information that Support Our Communities

How We Steward

Beginning ~ early 2010's, the data stewardship community began thinking about and organizing around the idea of ***data principles***.

Not standards, but ways of thinking about how we go about our work.

FAIR came first, and others, such as **CARE** and **TRUST** followed.

K. Casey, P. Lemieux, and N. Ritchey
NOAA/NESDIS/NCEI
NESDIS Data Management Working Group
May 2022

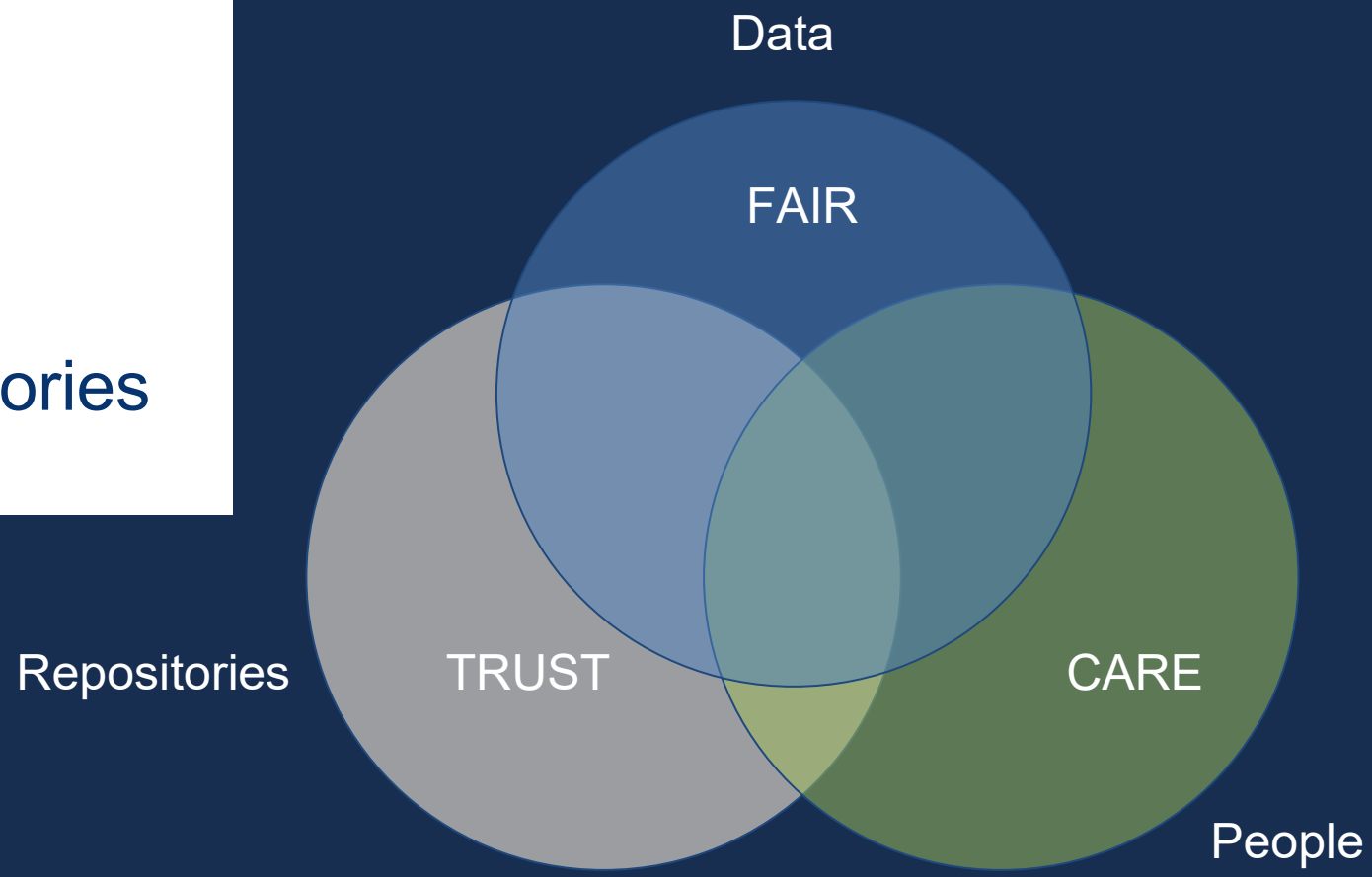
For context:

FAIR is about the data

CARE is about people and communities

TRUST is about the data repositories

How We Steward



K. Casey, P. Lemieux, and N. Ritchey
NOAA/NESDIS/NCEI
NESDIS Data Management Working Group
May 2022

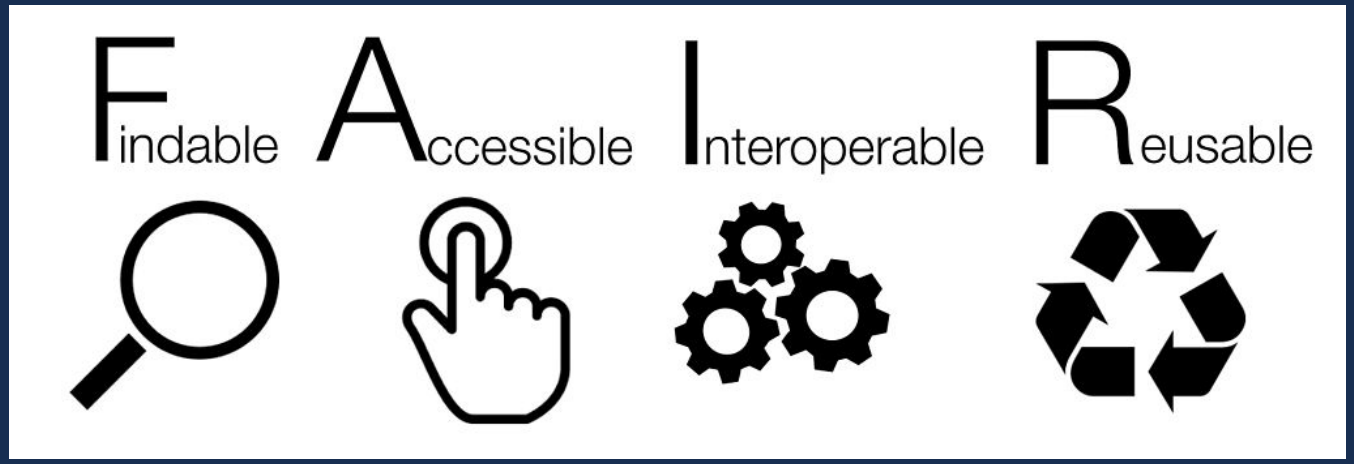
Modified from Margaret O'Brien's Venn diagram view: (https://zenodo.org/record/5644249#.YmwJYvPML5Z)

How these principles play out at the DCDB

FAIR - *is about the data*

The DCDB recognizes that the public value of data and products is maximized by:

- The development of common standards (data and metadata) and the encouragement of their use.
- Facilitating discovery and access



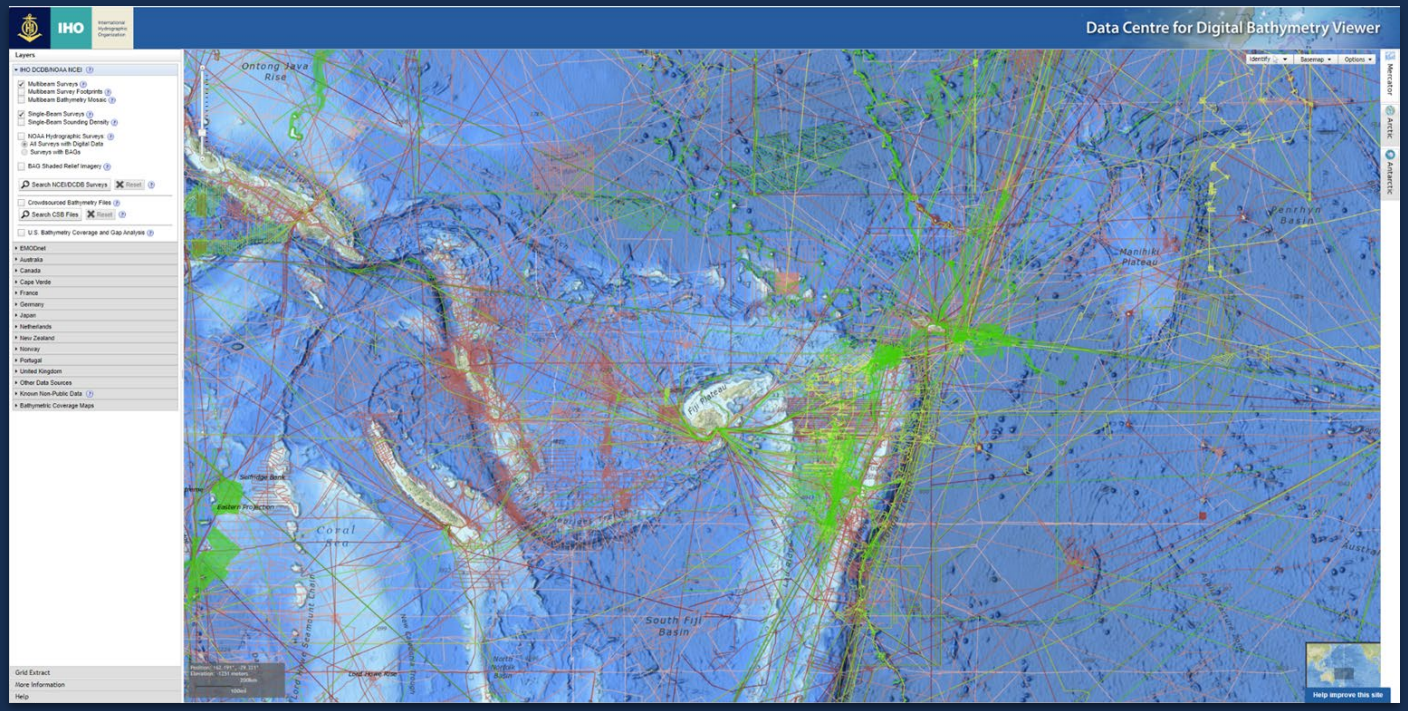
How these principles play out at the DCDB

FAIR - *is about the data*

- Data and metadata sharing is the foundation of our efforts
- **Use case-driven** interfaces, formats and products that meet common needs that are key
- Development and encouragement of a global community of practice

Open Access Data ≠ Accessible Data

Online data is not enough! We must do better.



DCDB Data Viewer: Tracklines of Singlebeam (red) and Multibeam (green) data near Fiji

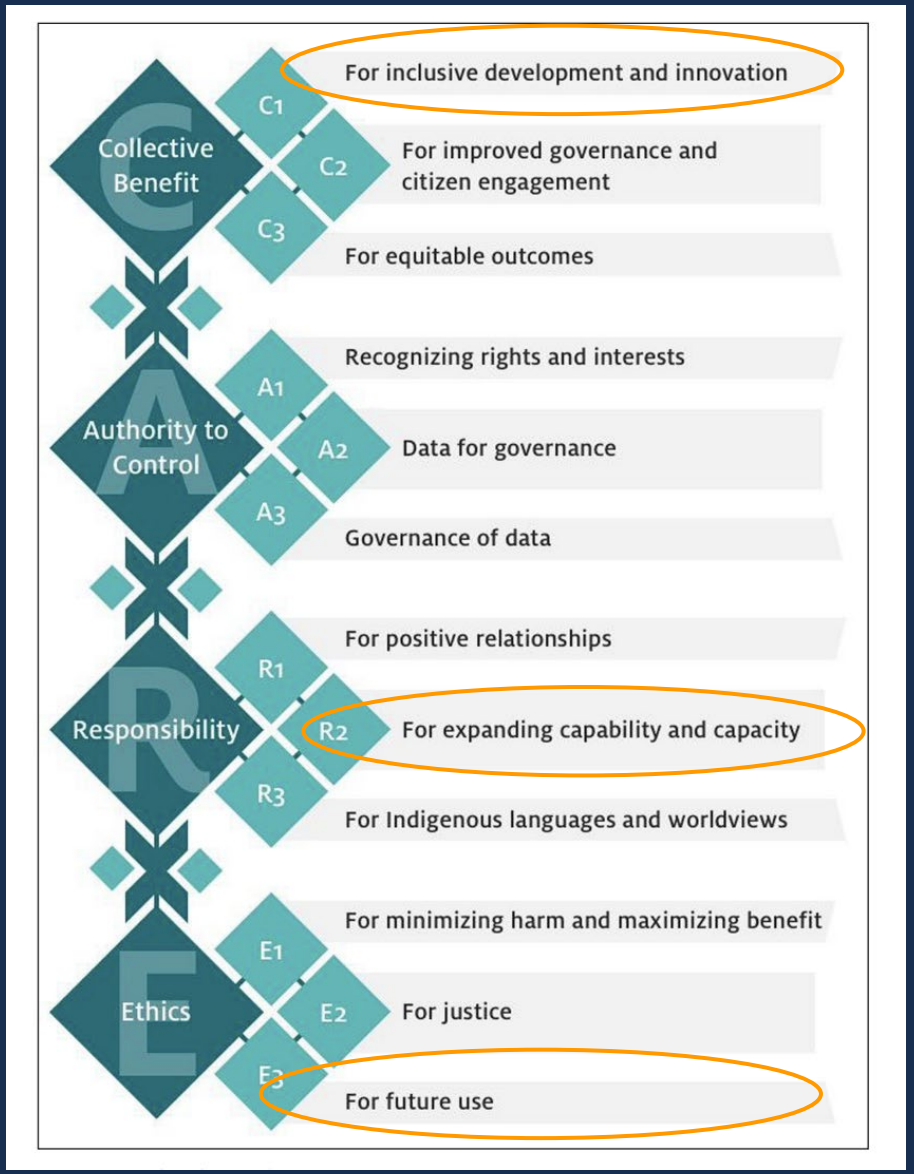
How these principles play out at the DCDB

CARE - *is about people and communities*

The DCDB strives to provide information and tools on data stewardship, discovery and access

Seek to understand technical barriers and develop solutions:

- Unclear what to share (eg: formats)
- Lack of tools and/or workflows
- Data transfer mechanisms



How these principles play out at the DCDB

CARE - *is about people and communities*

Pacific Ocean Mapping Workshop: Access and use of open data and tools

Seabed 2030 5th Pacific Ocean Mapping Meeting - Lima, Peru

Seabed 2030 6th Pacific Ocean Mapping Meeting - Nadi, Fiji

How these principles play out at the DCDB

TRUST - *is about the data repositories*

	Guidance for Repositories
Transparency	To be transparent about specific repository services and data holdings that are verifiable by publicly accessible evidence.
Responsibility	To be responsible for ensuring the authenticity and integrity of data holdings and for the reliability and persistence of its service.
User Focus	To ensure that the data management norms and expectations of target user communities are met.
Sustainability	To sustain services and preserve data holdings for the long-term.
Technology	To provide infrastructure and capabilities to support secure, persistent, and reliable services.

The TRUST Principles for Digital Repositories, Lin et al. (2020)

How these principles play out at the DCDB

TRUST - *is about the data repositories*

The DCDB is hosted by NOAA's National Centers for Environmental Information, who provide the infrastructure, services, guidance, etc

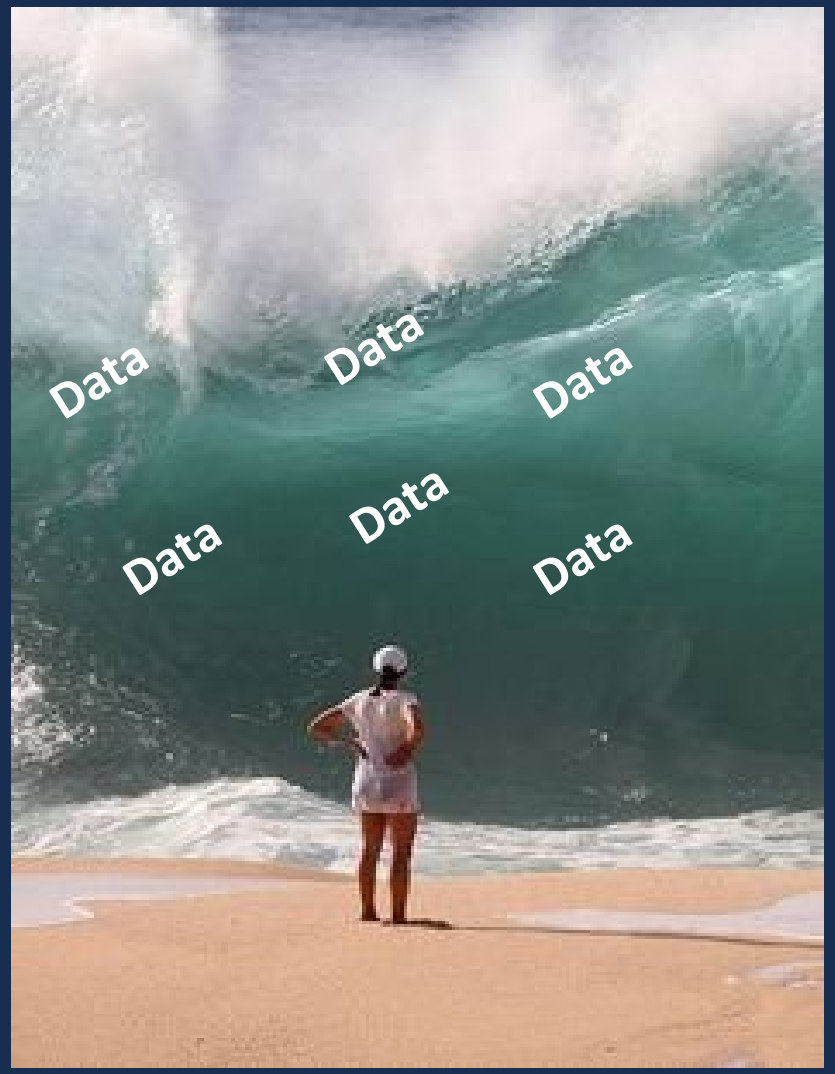
National Oceanic & Atmospheric Administration - Boulder, Colorado

How these principles play out at the DCDB

TRUST - *is about the data repositories*

Improving our technology and infrastructure for the present and the future. Infrastructure that 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
- ***Be climate and weather ready***

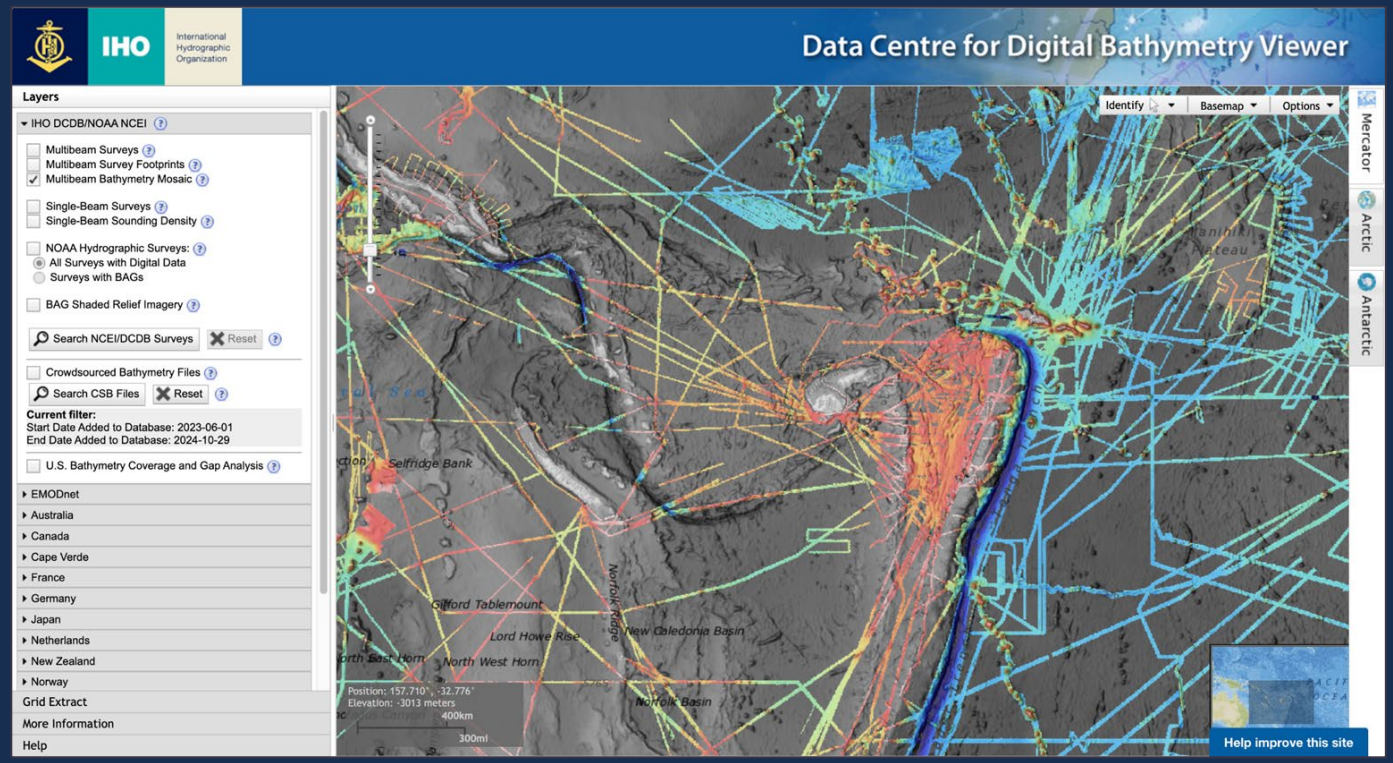


In closing,

Stewarding community-collected data is a privilege, not a right.

By stewarding data in alignment with FAIR, CARE, and TRUST principles, the DCDB strives to enhance its usability and, ultimately, its value.

By working together, we can make data accessible to the widest possible community—both now and for future generations.



IHO

International Hydrographic Organization

Vinaka, Thank you!

ncei.noaa.gov/iho-data-centre-digital-bathymetry

jennifer.jencks@noaa.gov