ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG

HELMHOLTZ
RESEARCH FOR GRAND CHALLENGES

EGU23-9952 Abstract

Sharing is encouraged

THE EARTH DATA PORTAL

for Finding and Exploring Research Content

April 28, 2023 | EGU General Assembly 2023

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NAVIGATION

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Clickable areas are highlighted as blue rectangles.

- Introduction
- Project Context
- Integration
- Interactive Tour
- Data Visualization
- Related Portal
- Technology
- References

INTRODUCTION

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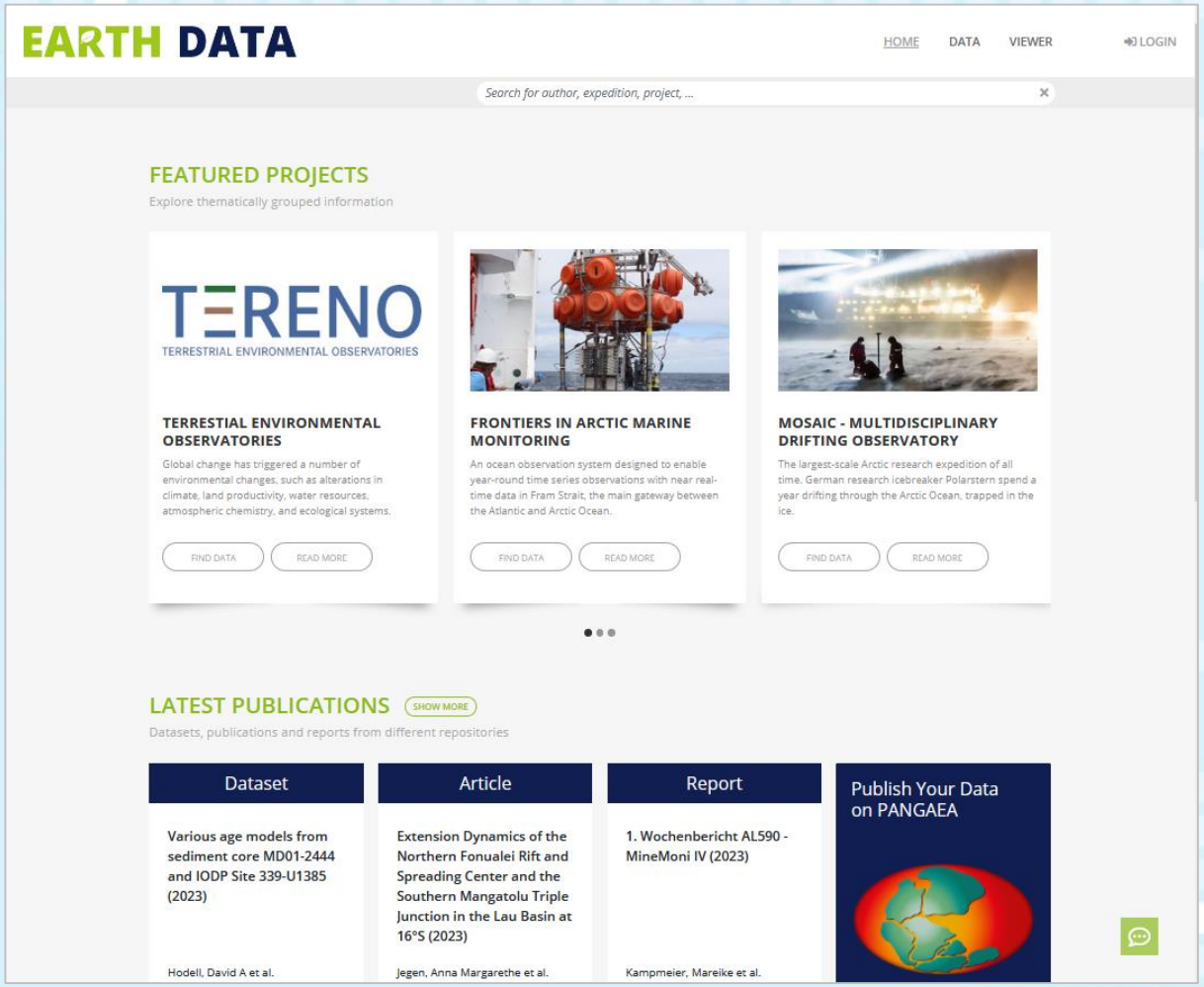
Earth Data is a cross-institute portal for finding, visualizing and downloading earth and environment research data.

The portal aims to enable scientists to work effectively by giving access to re-usable data.

- Centralized entry point
- Decentralized (meta)data



https://earth-data.de

INTRODUCTION

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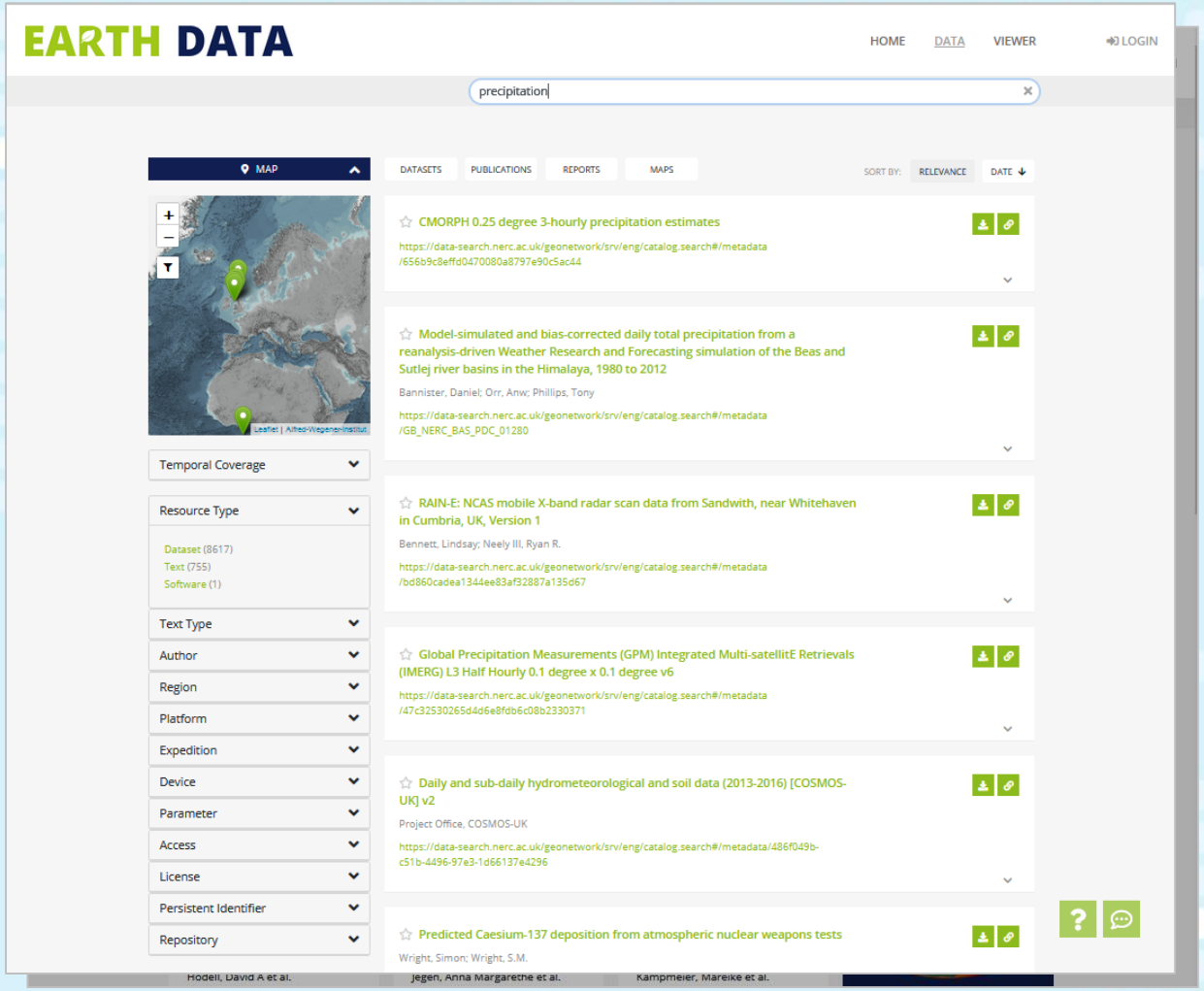
- Centralized entry point
- Decentralized (meta)data
- Free-text search engine



https://earth-data.de/?site=data

INTRODUCTION

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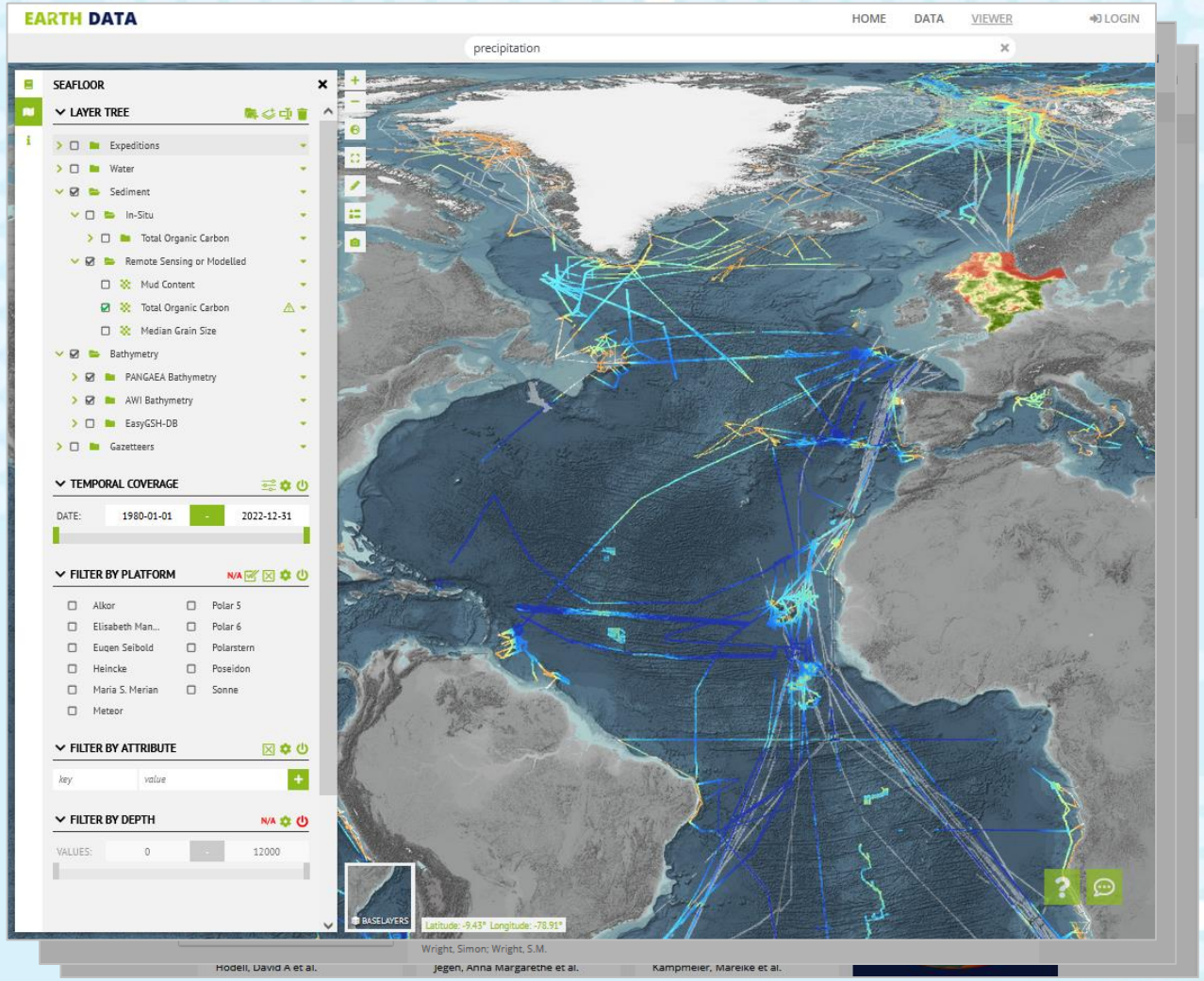
- Centralized entry point
- Decentralized (meta)data
- Free-text search engine
- Thematic map viewers

FAIR: **F**indable, **A**ccessible **I**nteroperable, **R**eusable



https://earth-data.de/?site=viewer

INTRODUCTION

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Earth Data is being actively developed

On a technical level, the portal is in a mature status

Some of the challenges are:

- **Coordination** with our partners to make their data more visible
- **Harmonization** of incoming metadata for a common presentation
- **Showcasing** selected data collections to encourage exploration

PROJECT CONTEXT

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As part of the **German Marine Research Alliance (DAM)** and the **Helmholtz-funded DataHub project**, leading German research centers are working on joint data management concepts, including the **Earth Data** portal.

Development and operation are executed in the computing and data center of the **Alfred Wegener Institute** in collaboration with the partner institutes.

We are also in contact with **NFDI4Earth** for future collaboration and exchange in research data management and portal development.

DAM DEUTSCHE ALLIANZ MEERESFORSCHUNG

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DataHub
Research Field Earth and Environment

NFDI4Earth

View Member Institutes

INTEGRATION

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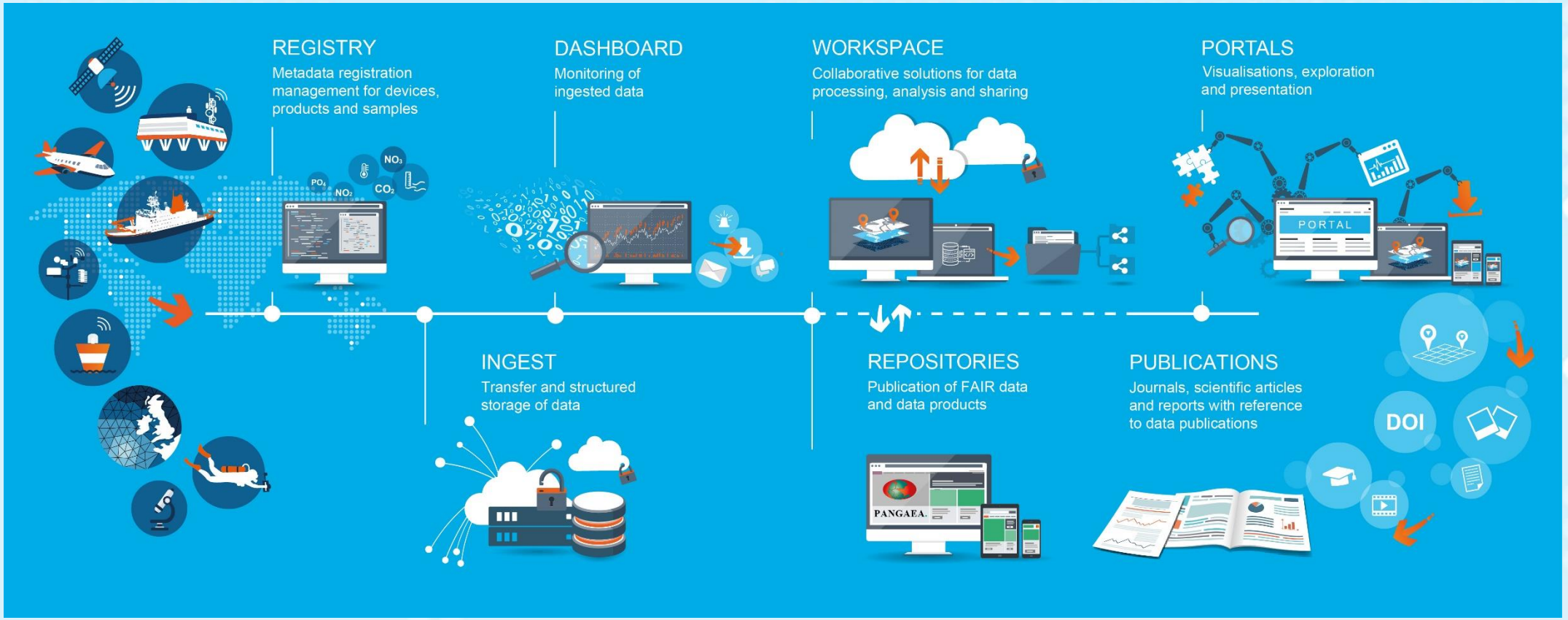
The portal is interconnected with other applications and infrastructures as a part of

O2A: Data flow from Observations to Analysis & Archives



https://o2a-data.de

INTERACTIVE TOUR

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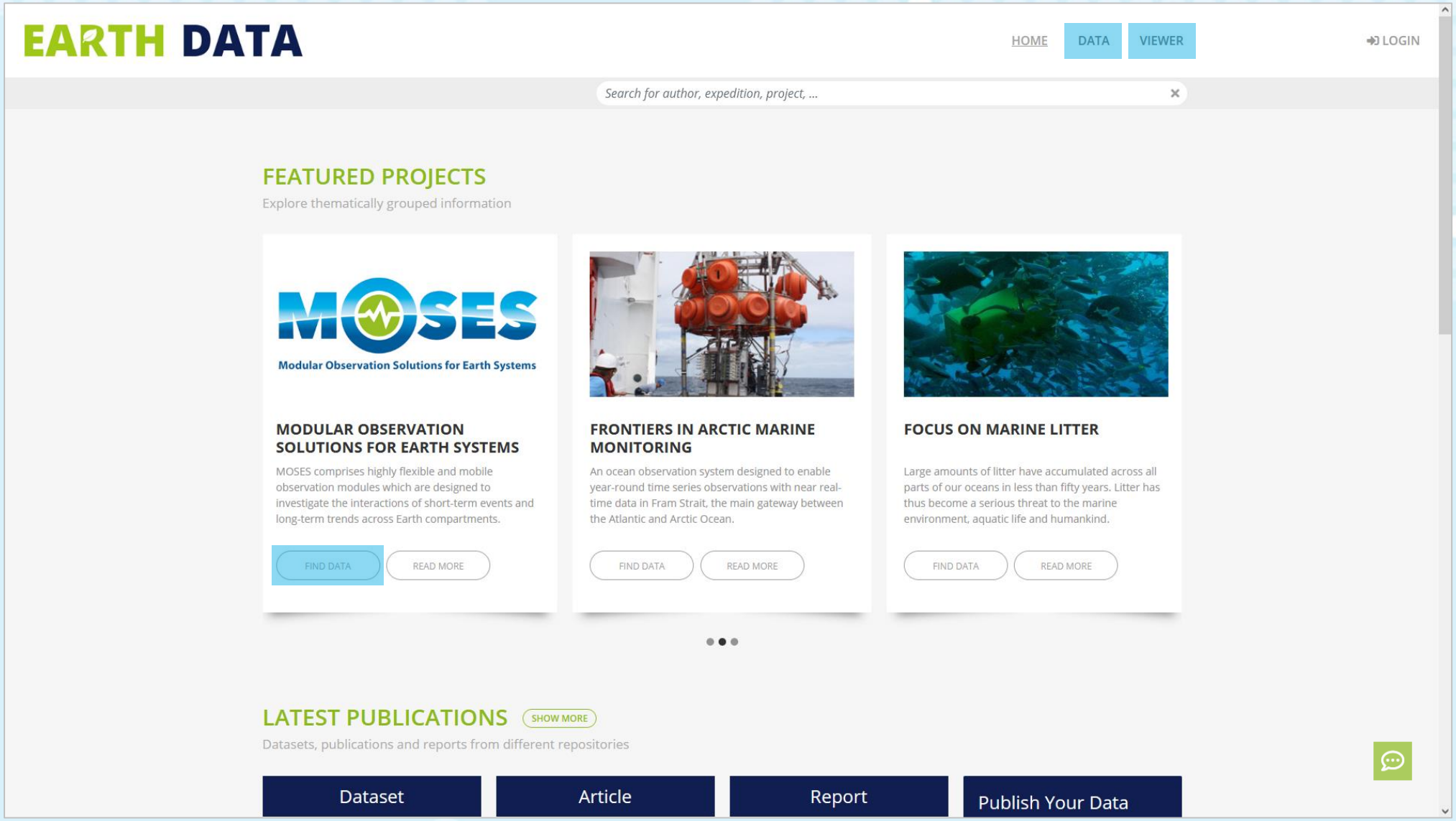

Welcome!
This is a nonlinear tour of the portal UI

https://earth-data.de

Featured Projects
is an overview that allows you to explore data from selected showcase projects.

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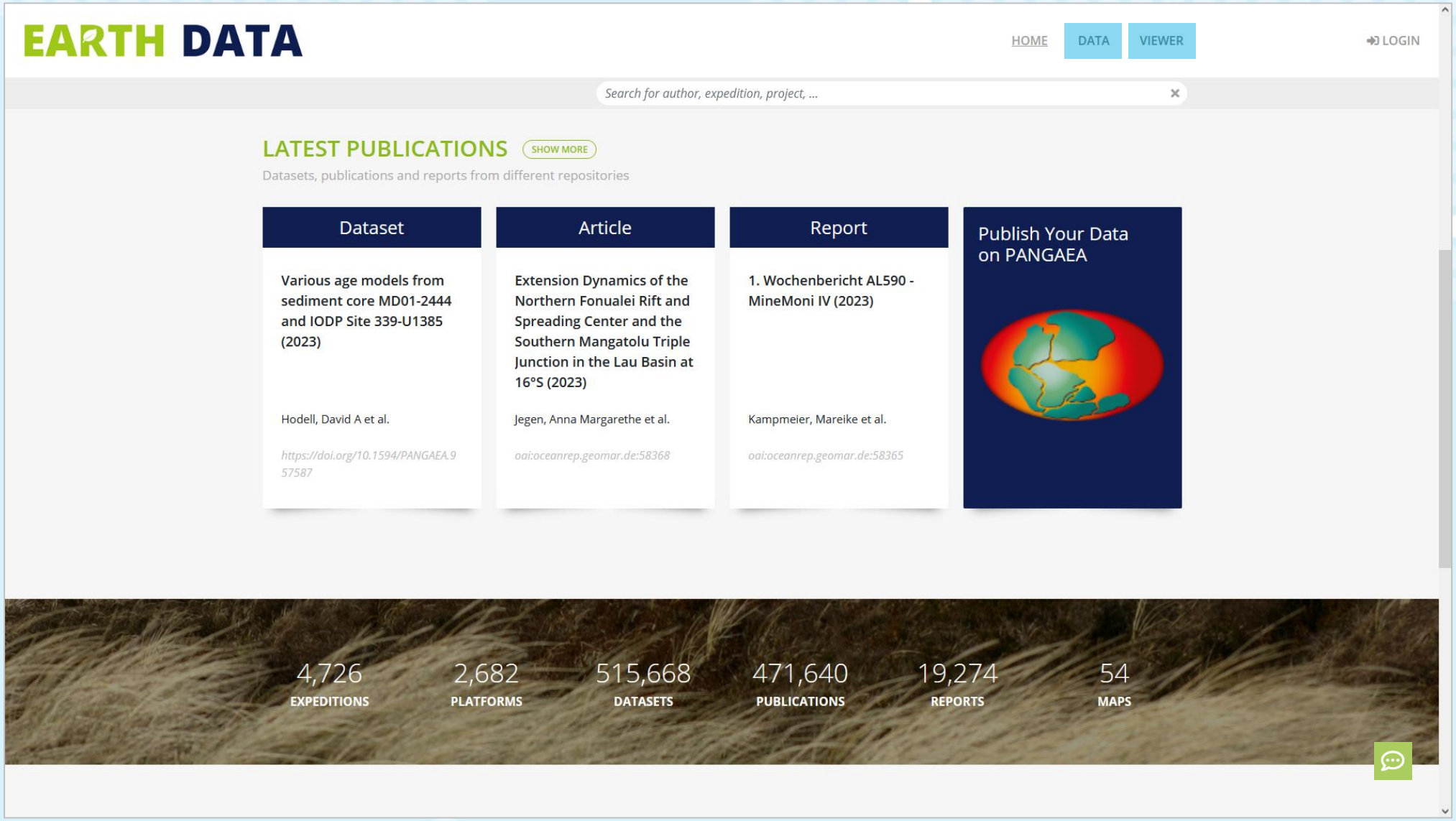

Latest Publications showcases search results with the most recent publication date.

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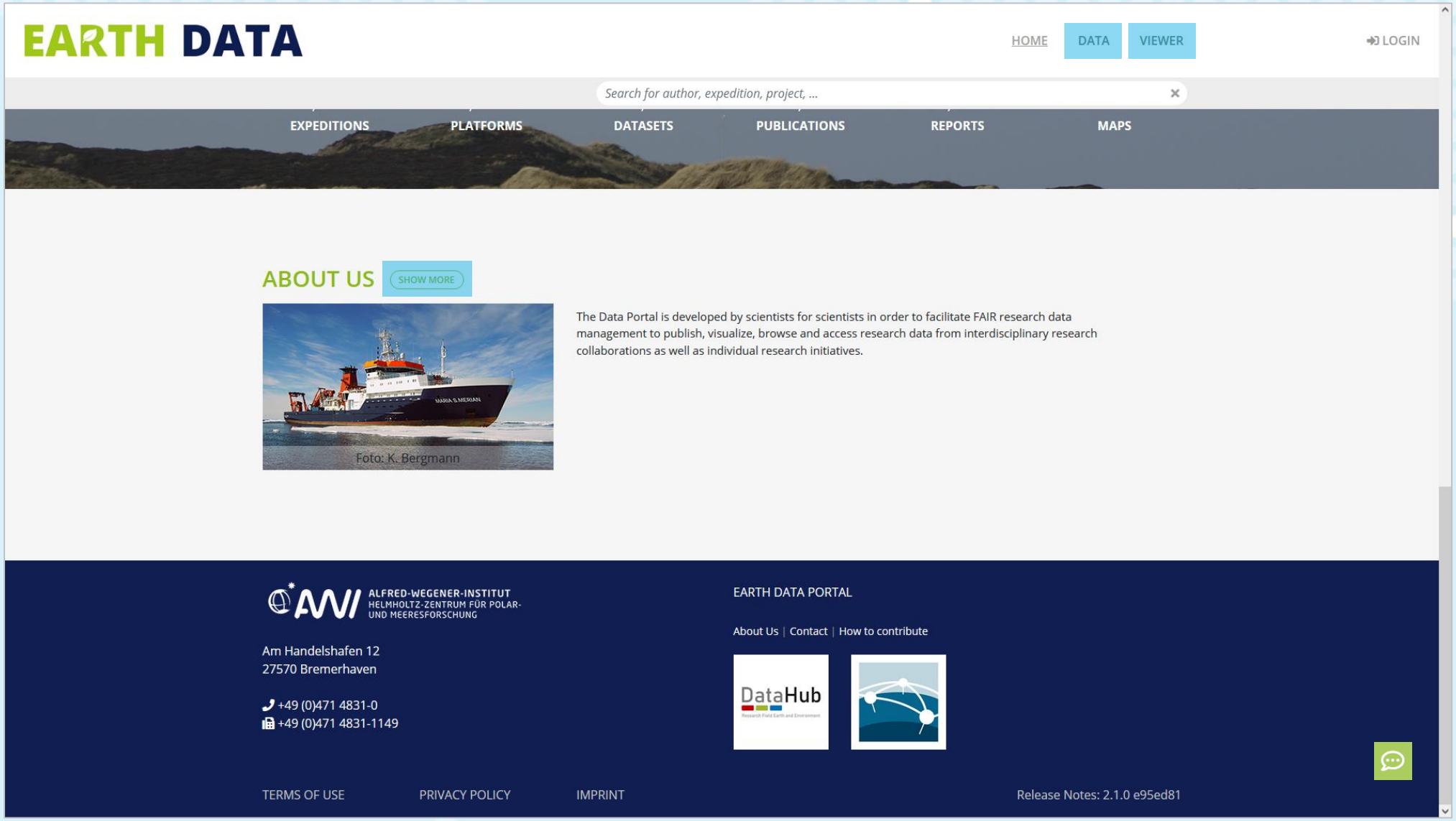

About Us
contains some information about the portal and an overview of participating partner institutes.

INTERACTIVE TOUR

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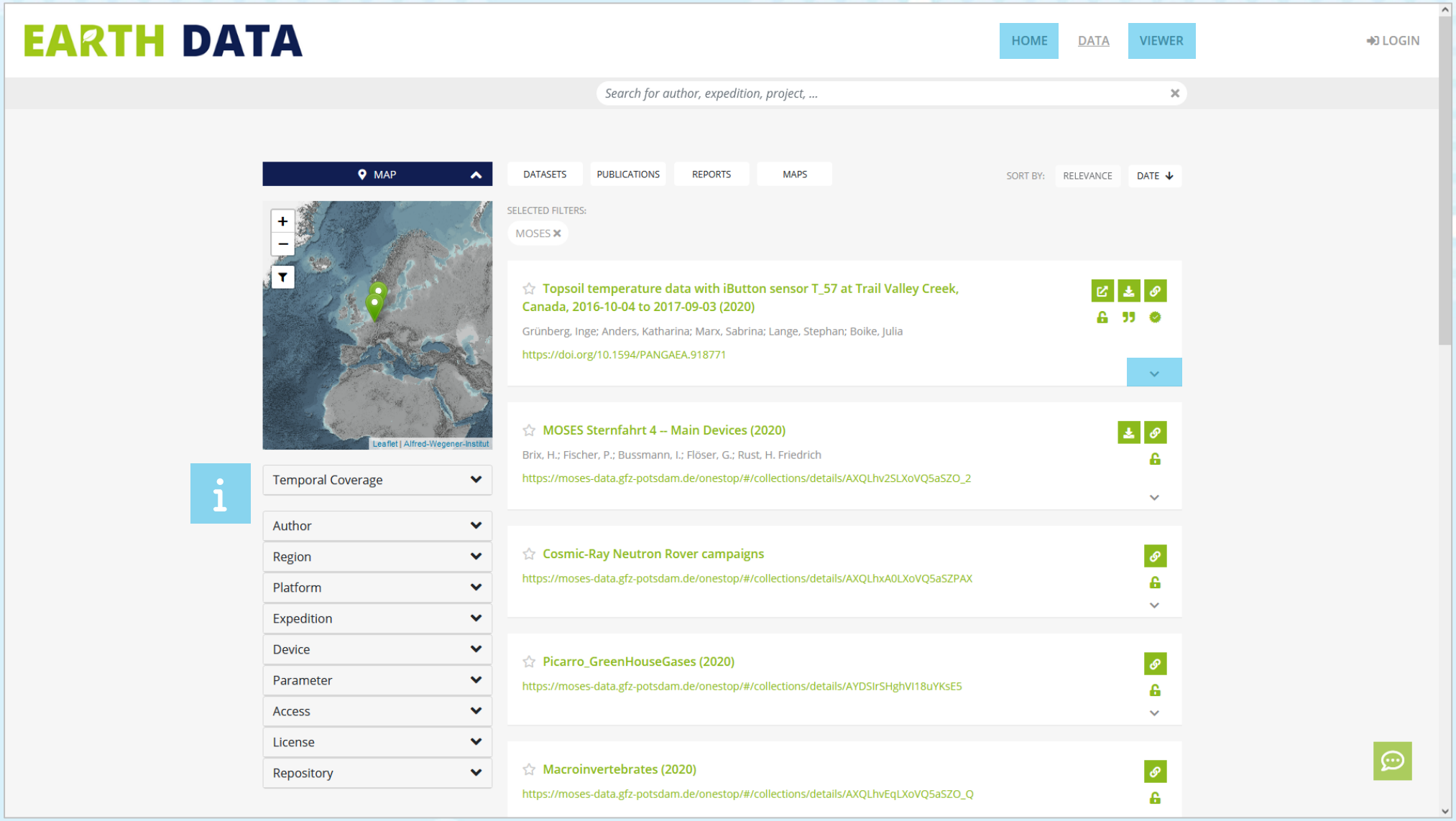

The Data Page is a core feature of the portal and allows you to find data from a variety of sources using free-text search with filters.

Icons in the search results link to related resources or deliver more information about a dataset.

- OPEN ACCESS
- CITABILITY
- LICENSE

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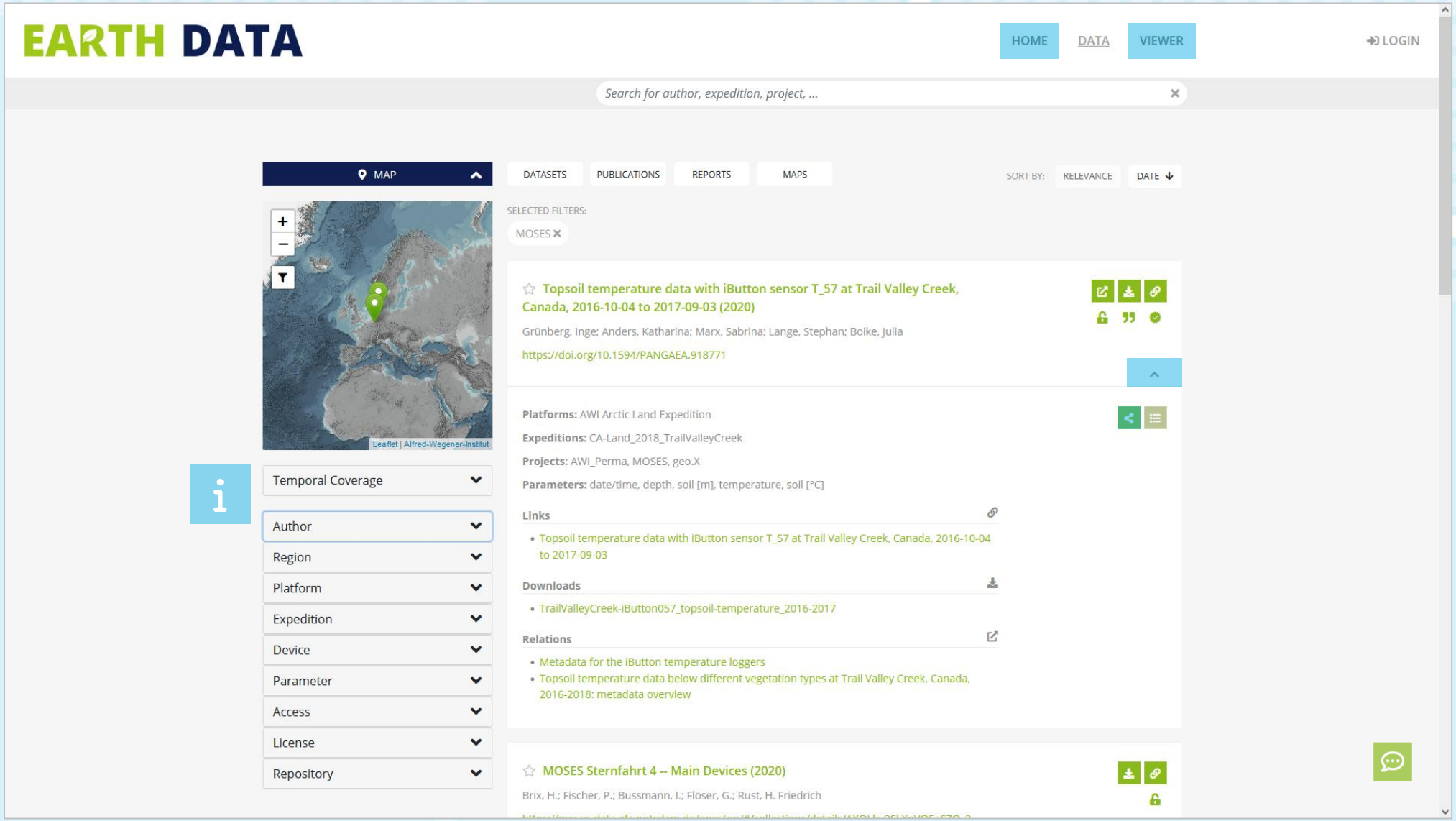

Search results can be opened to view more information.

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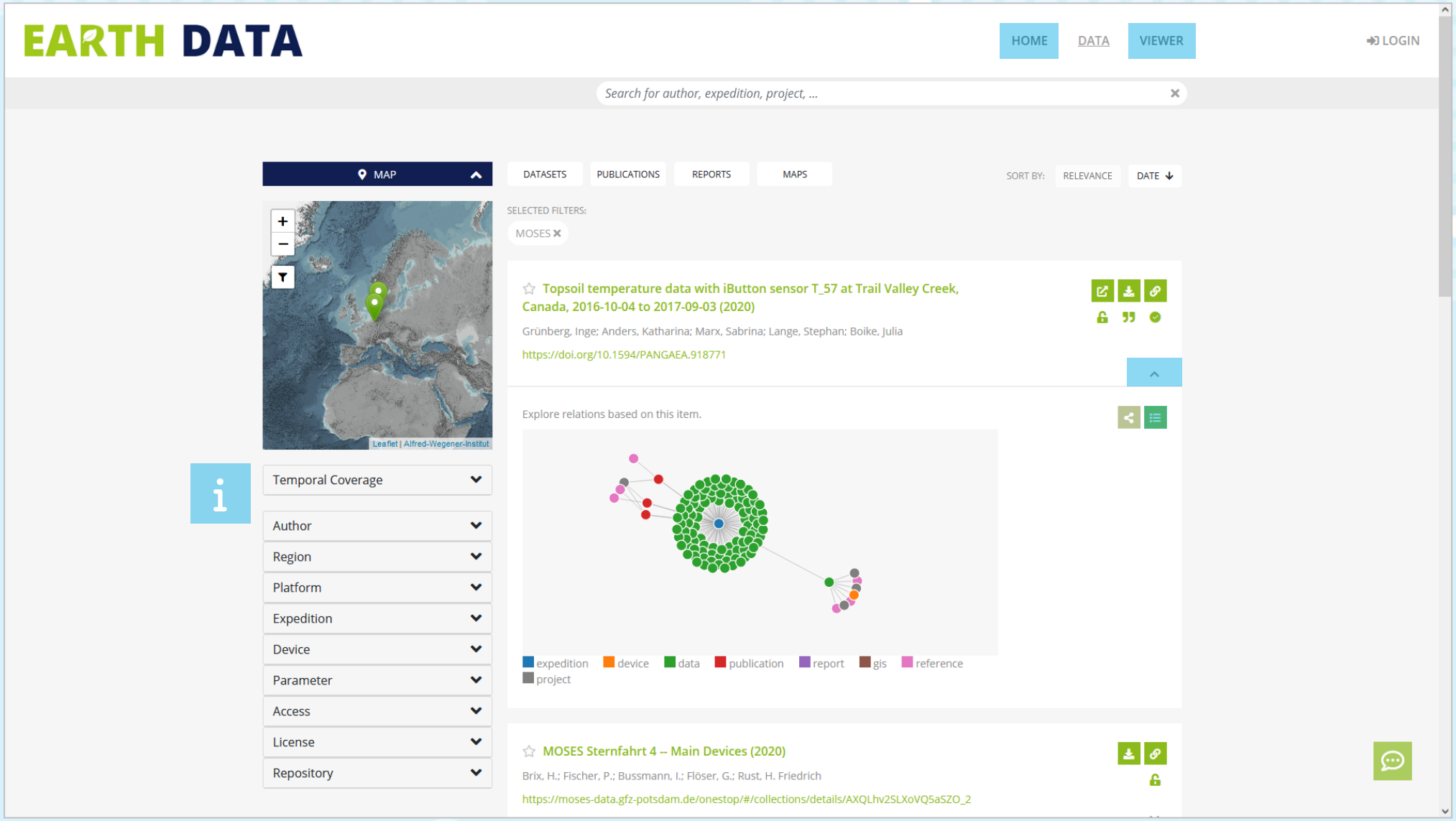

Related items can be explored in a graph visualization.

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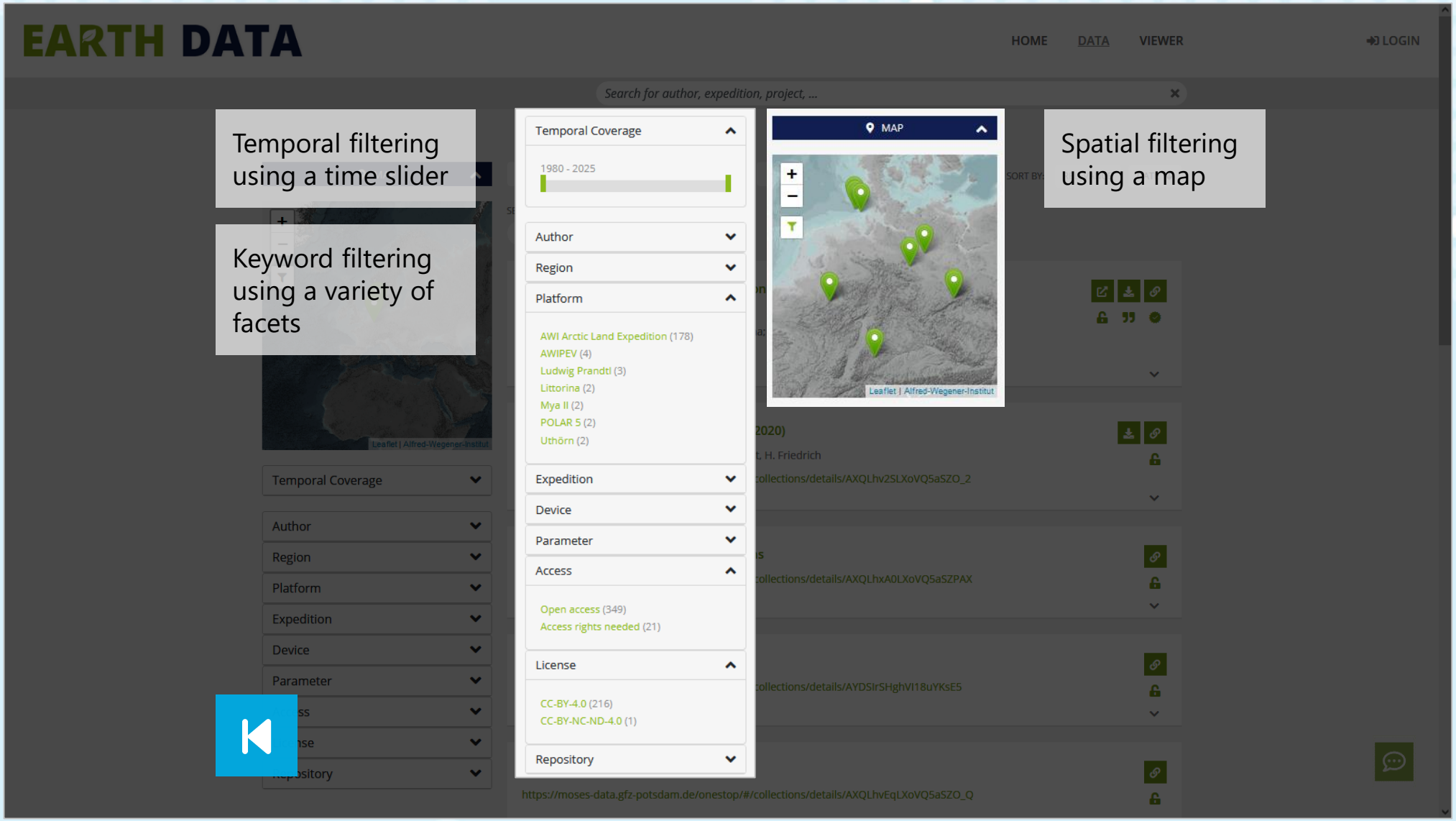

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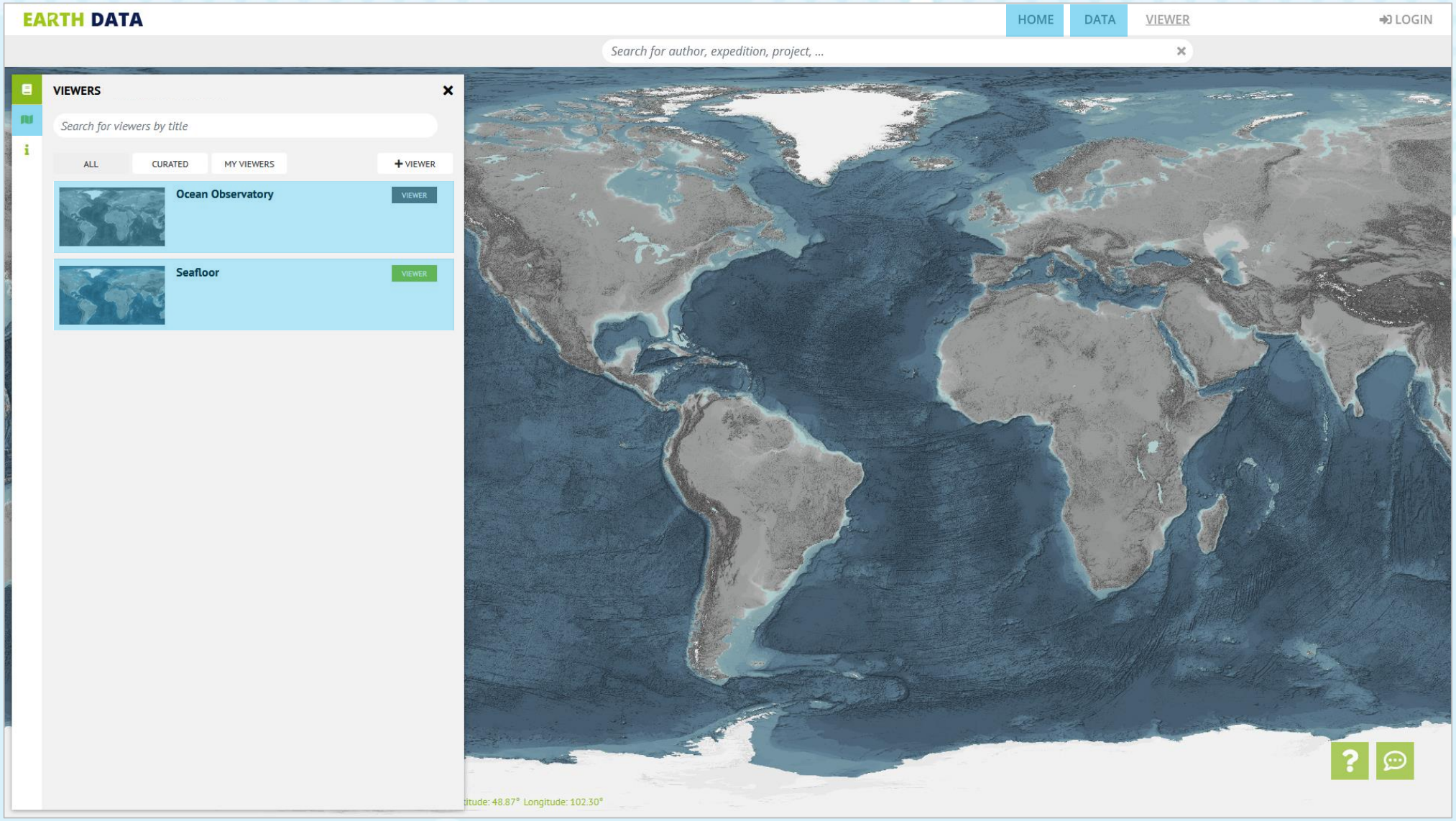

Thematic Viewers allow exploration and visualization of spatial data on a map.

A list of pre-configured viewers can be explored in the future. Currently two viewers with marine research data are available.

Click here to find out more about data products and their visualization:

Data Visualization

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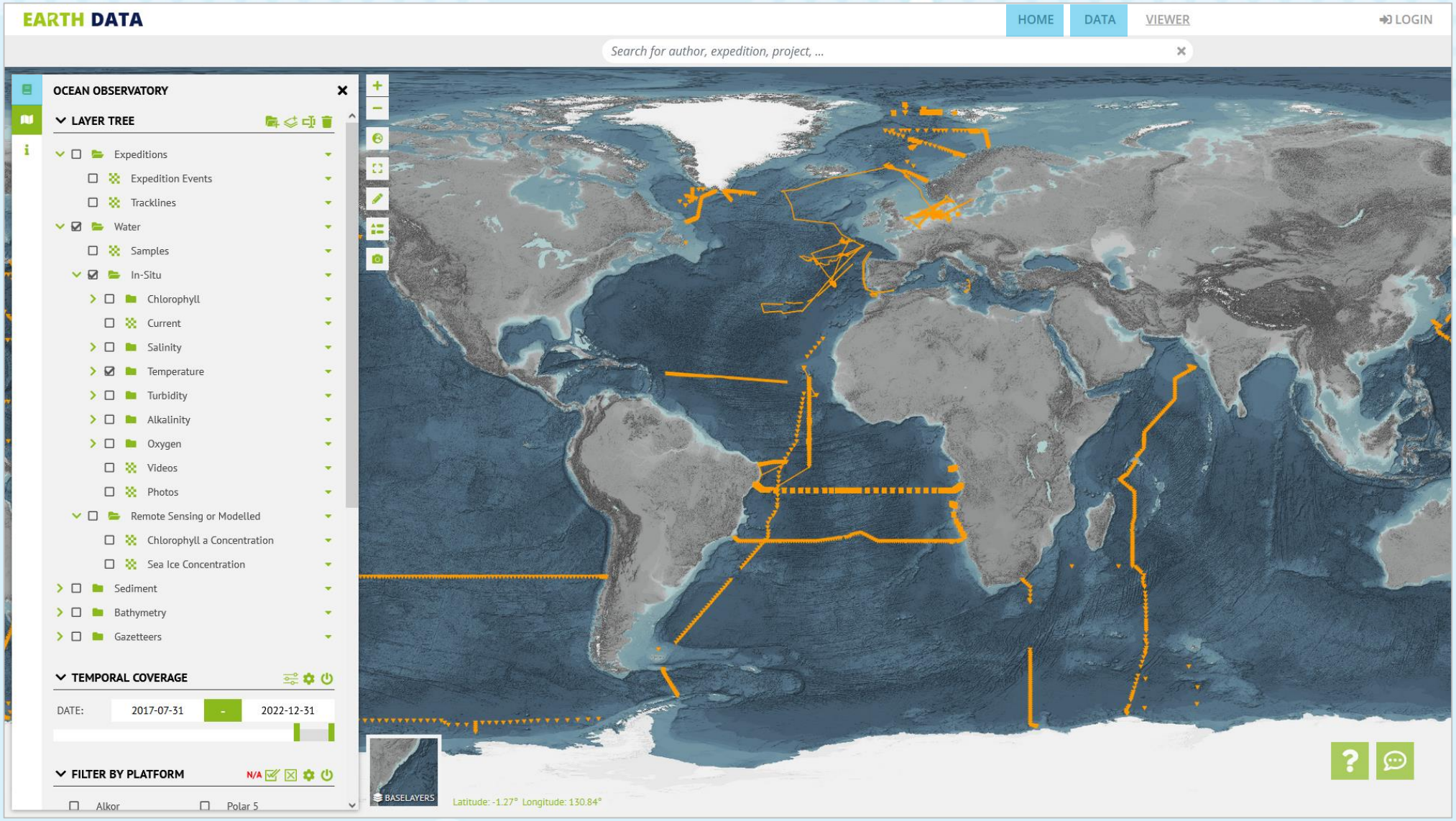

Ocean Observatory
This viewer focuses on oceanographic data and primarily visualizes measurements taken in the water column

Click here to find out more about data products and their visualization:

Data Visualization

Click here to find out more about the related Marine Data portal:

Related Portal

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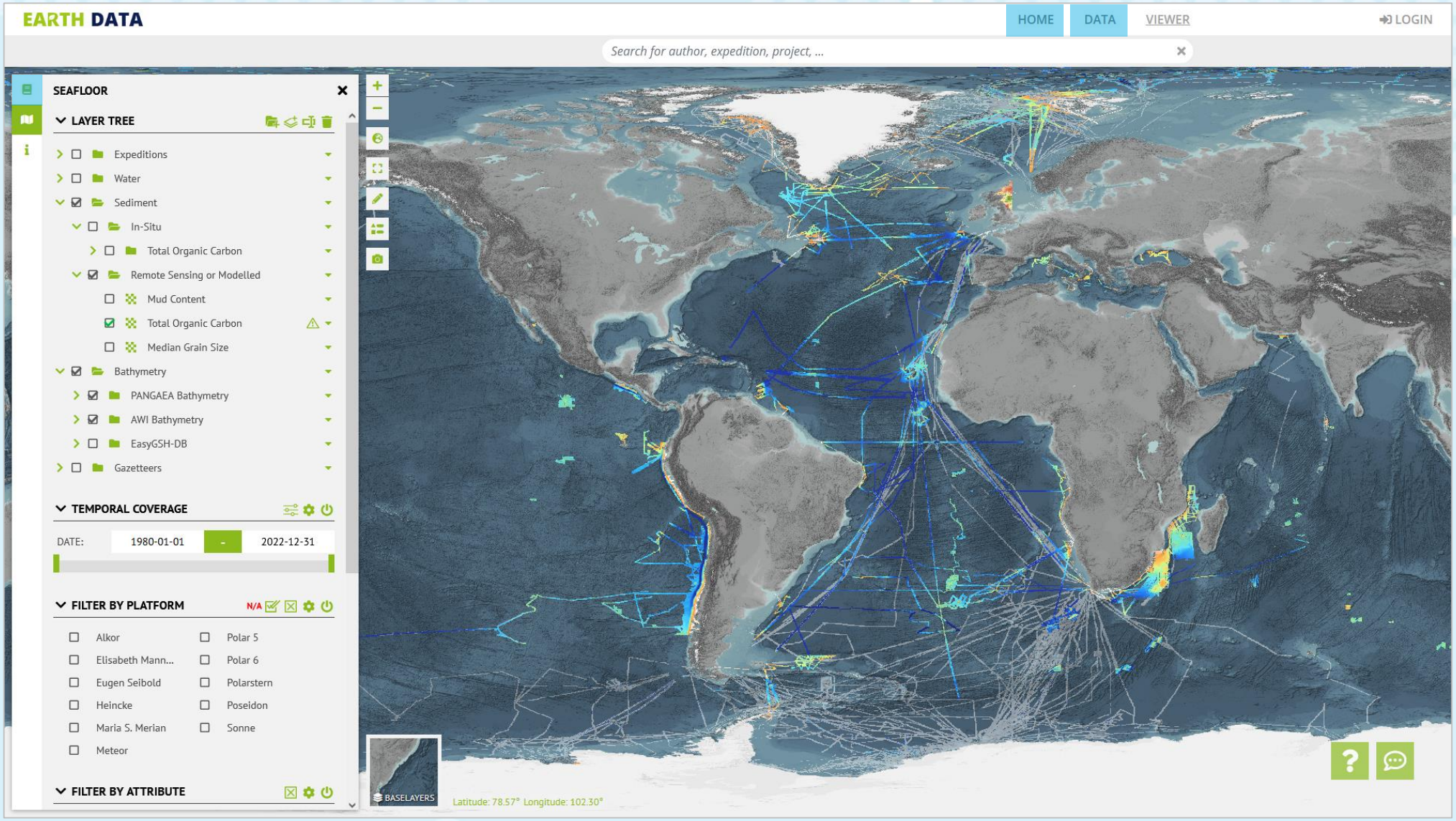

Seafloor
This viewer focuses on sediment and bathymetric data

Click here to find out more about data products and their visualization:

Data Visualization

Click here to find out more about the related Marine Data portal

Related Portal

INTERACTIVE TOUR

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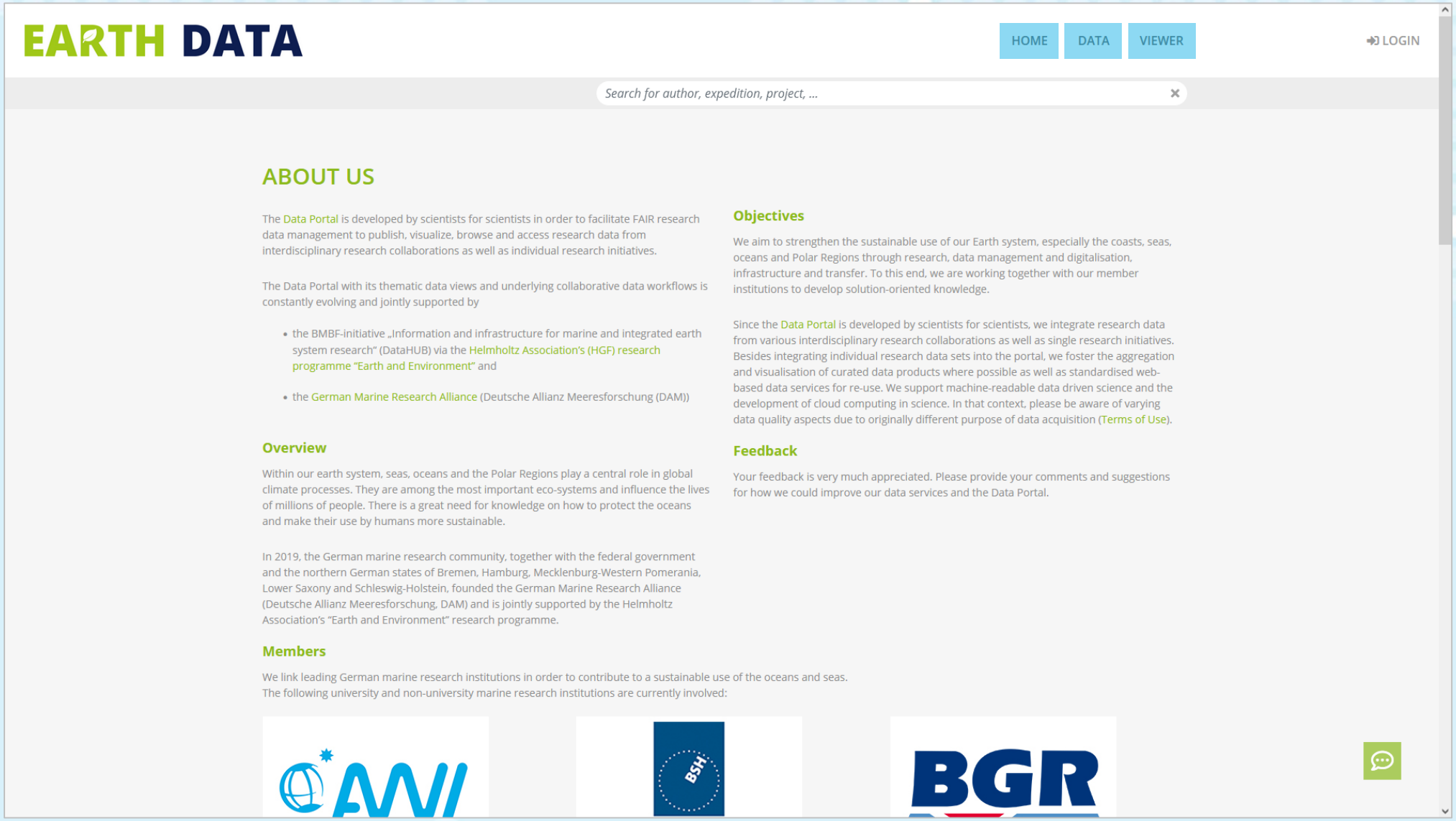

About Us contains some information about the portal and an overview of participating partner institutes.

Click here to find out more about the projects context:

Project Context

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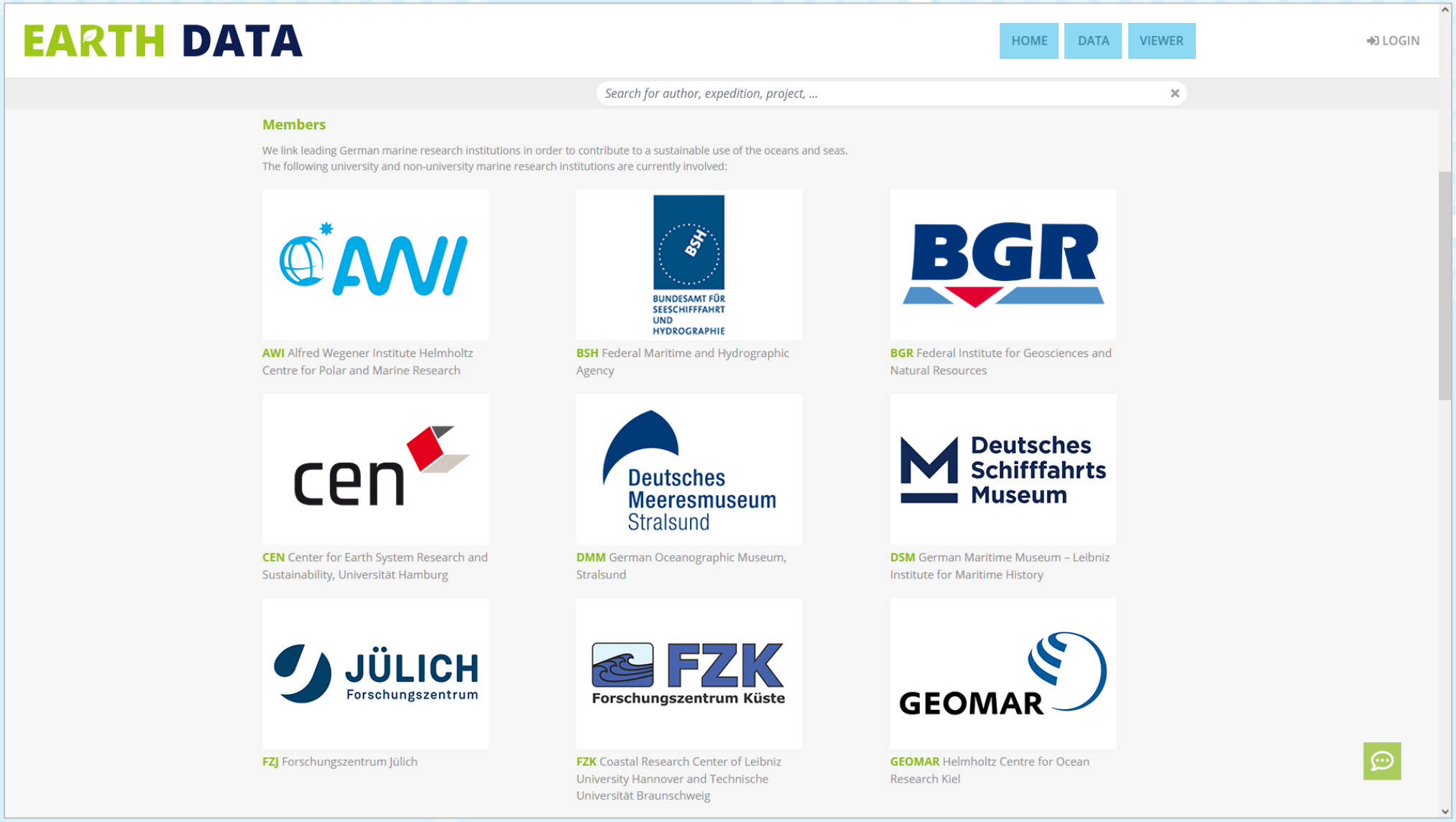

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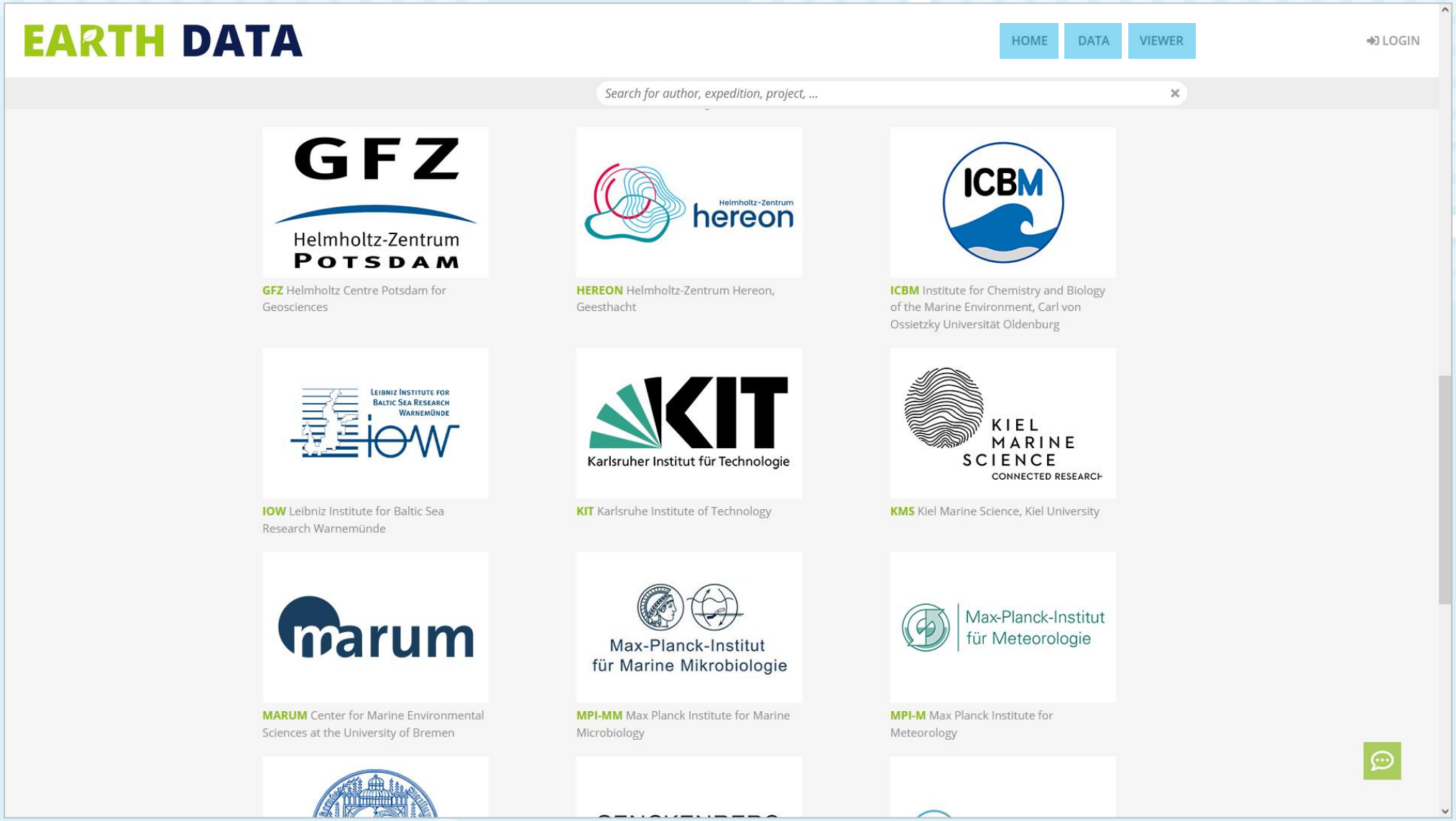

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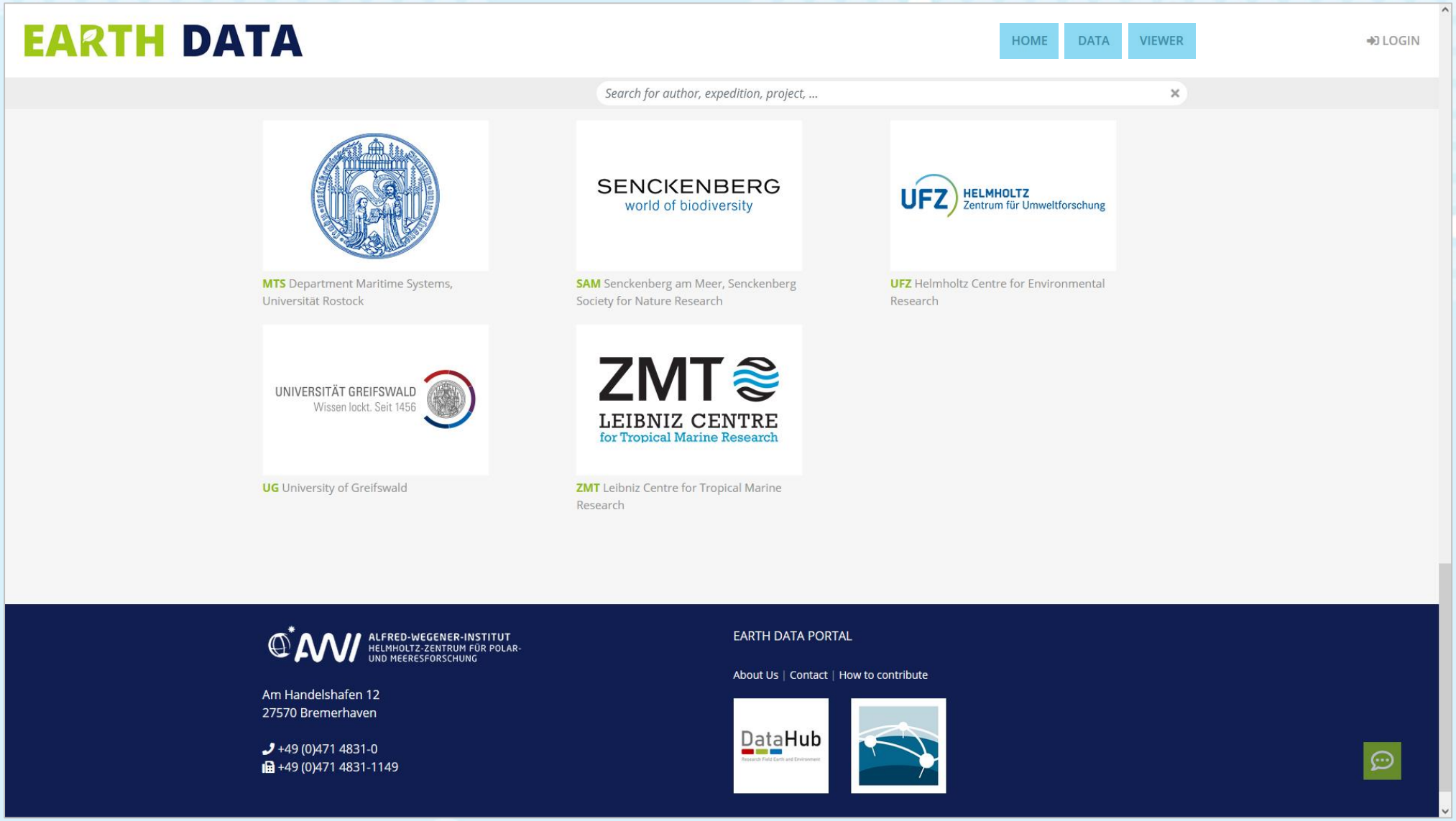

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DATA VISUALIZATION

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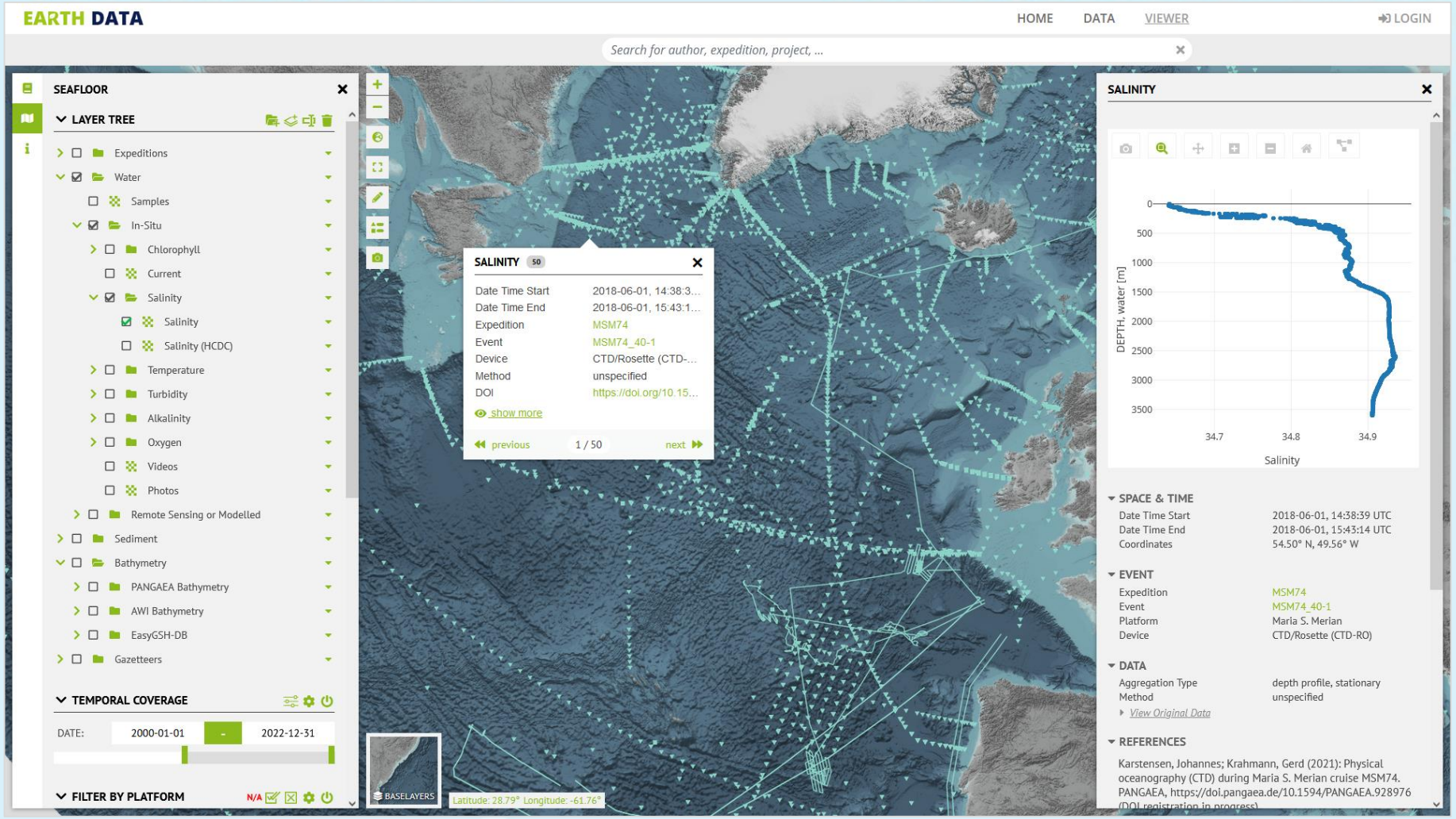
Water Column | **Bathymetry** | **Remote Sensing** | **Videos & Images** | **Information**



Here you can explore an excerpt of the data products provided in the projects context.

Measurements from various parameters in the water column can be explored in the viewer and visualized in a graph.

Extensive metadata including a reference to the source is linked in every point.

DATA VISUALIZATION

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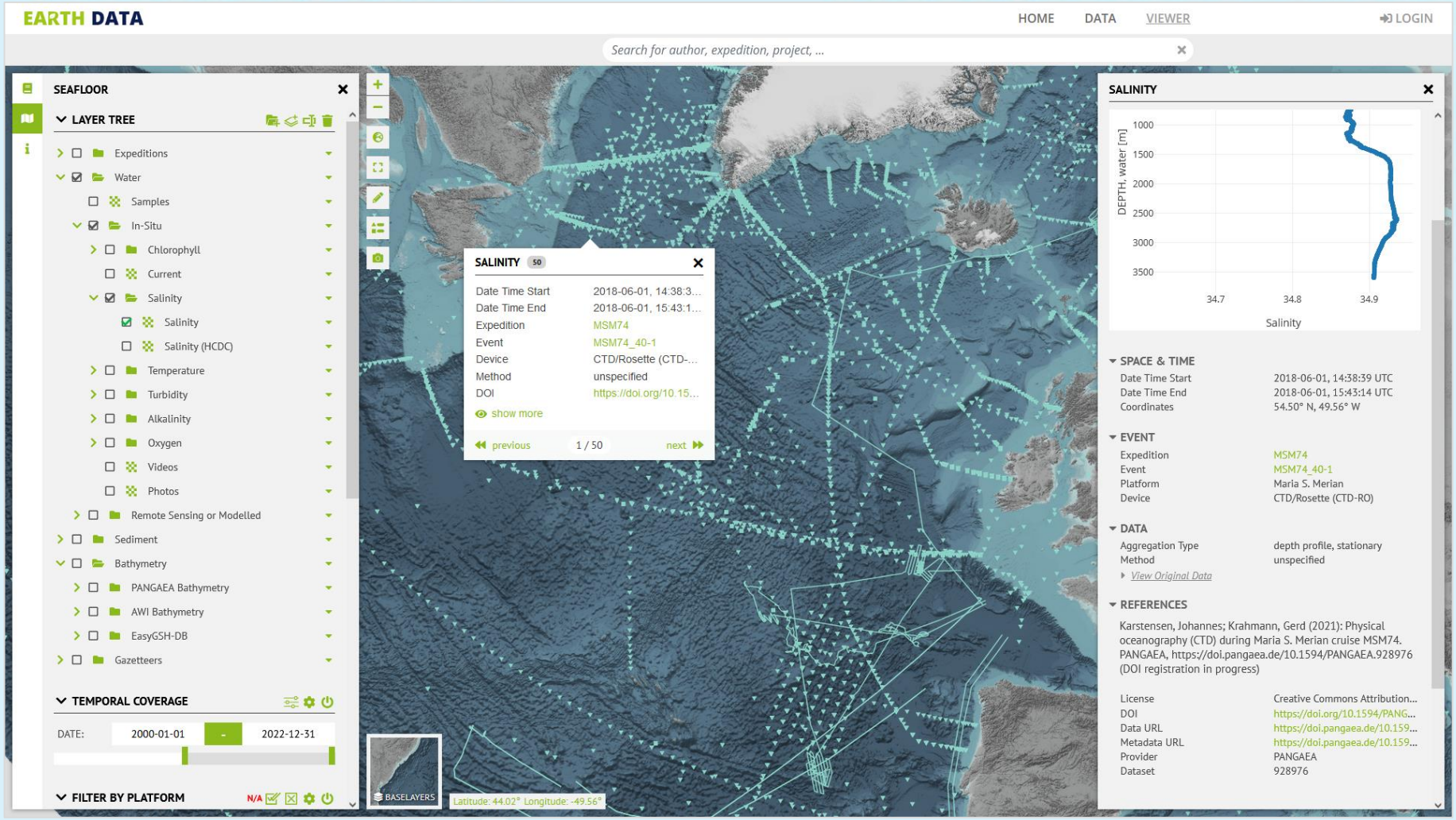

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Water Column | **Bathymetry** | **Remote Sensing** | **Videos & Images** | **Information**

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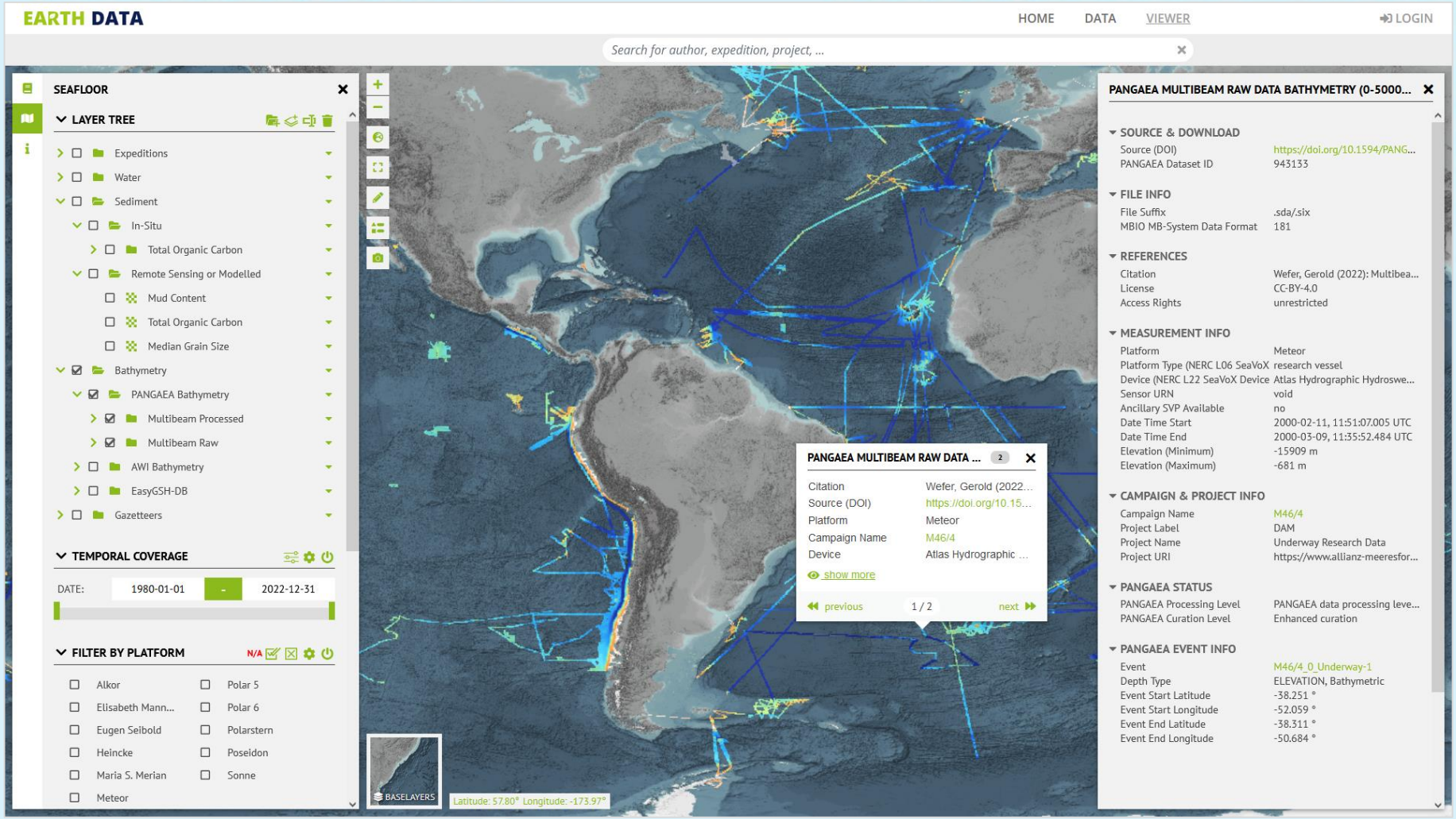
Bathymetric measurements with extensive metadata can be visualized as a colored raster on the map.



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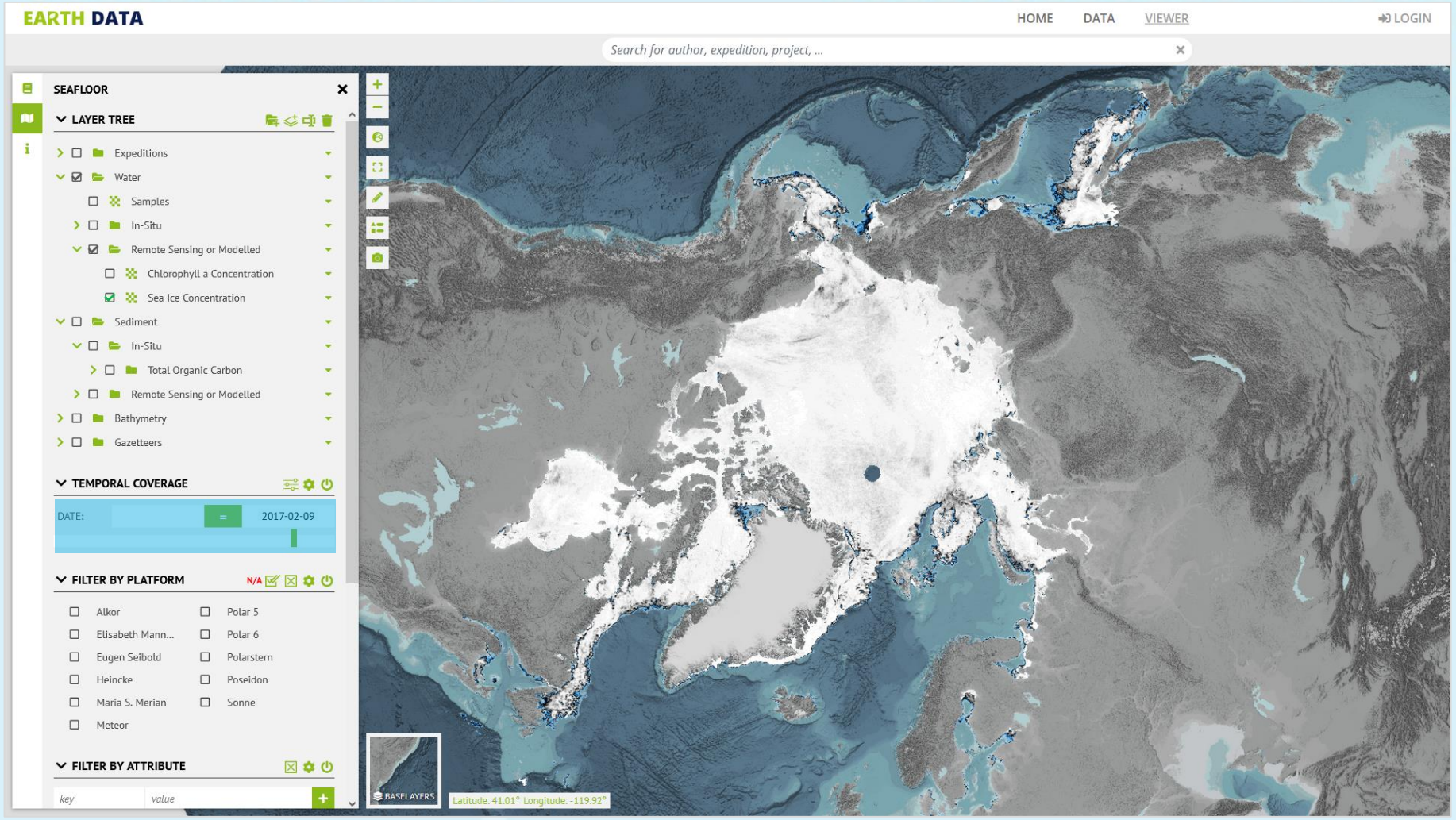

Here you can explore an excerpt of the data products provided in the projects context.

Remote sensing data like sea ice concentration can be visualized as a raster on the map. The viewer allows switching to polar projections to propertly display data in the polar regions.

This dataset can also be filtered by time using a slider

DATA VISUALIZATION

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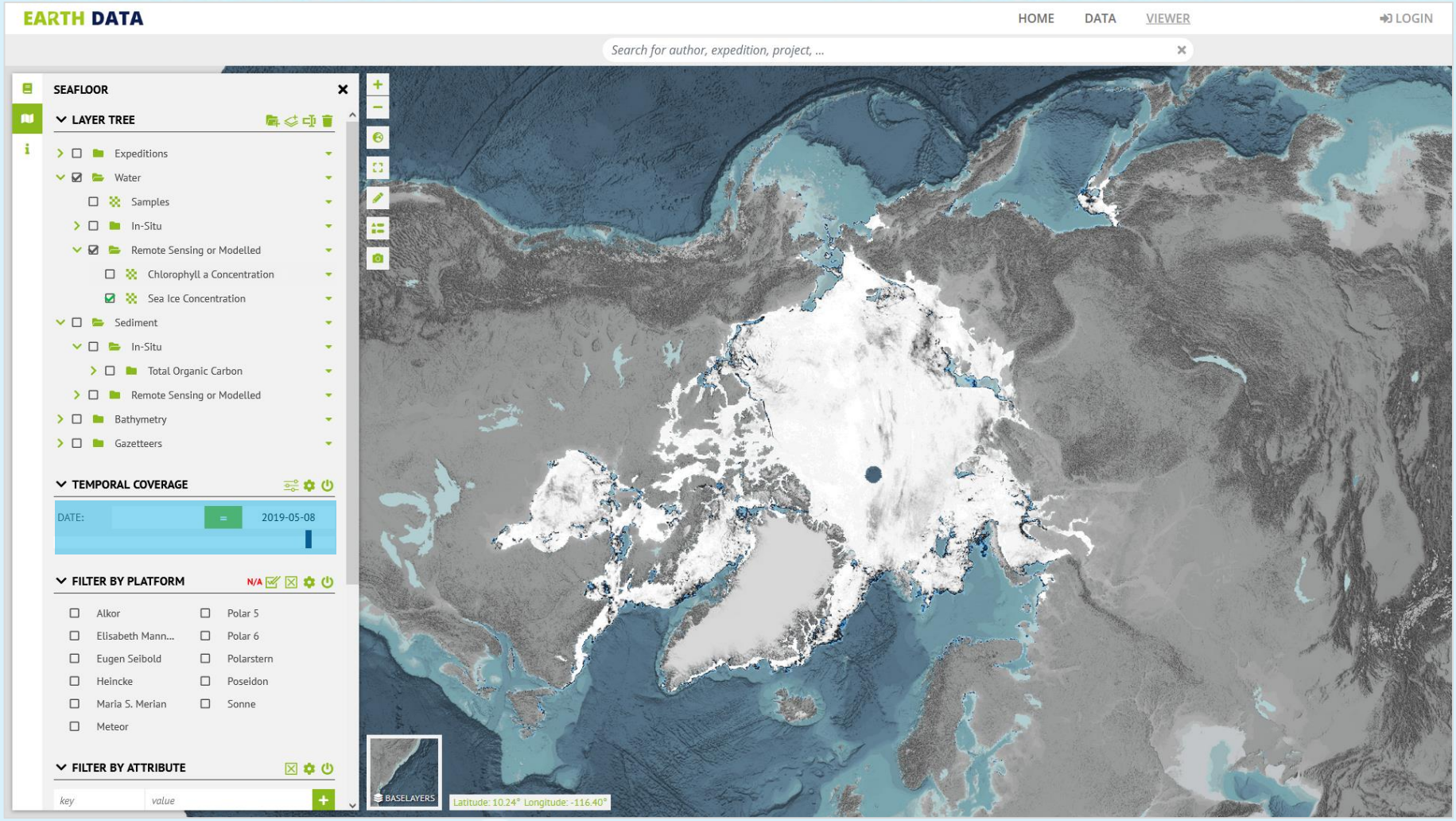
Water Column | **Bathymetry** | **Remote Sensing** | **Videos & Images** | **Information**



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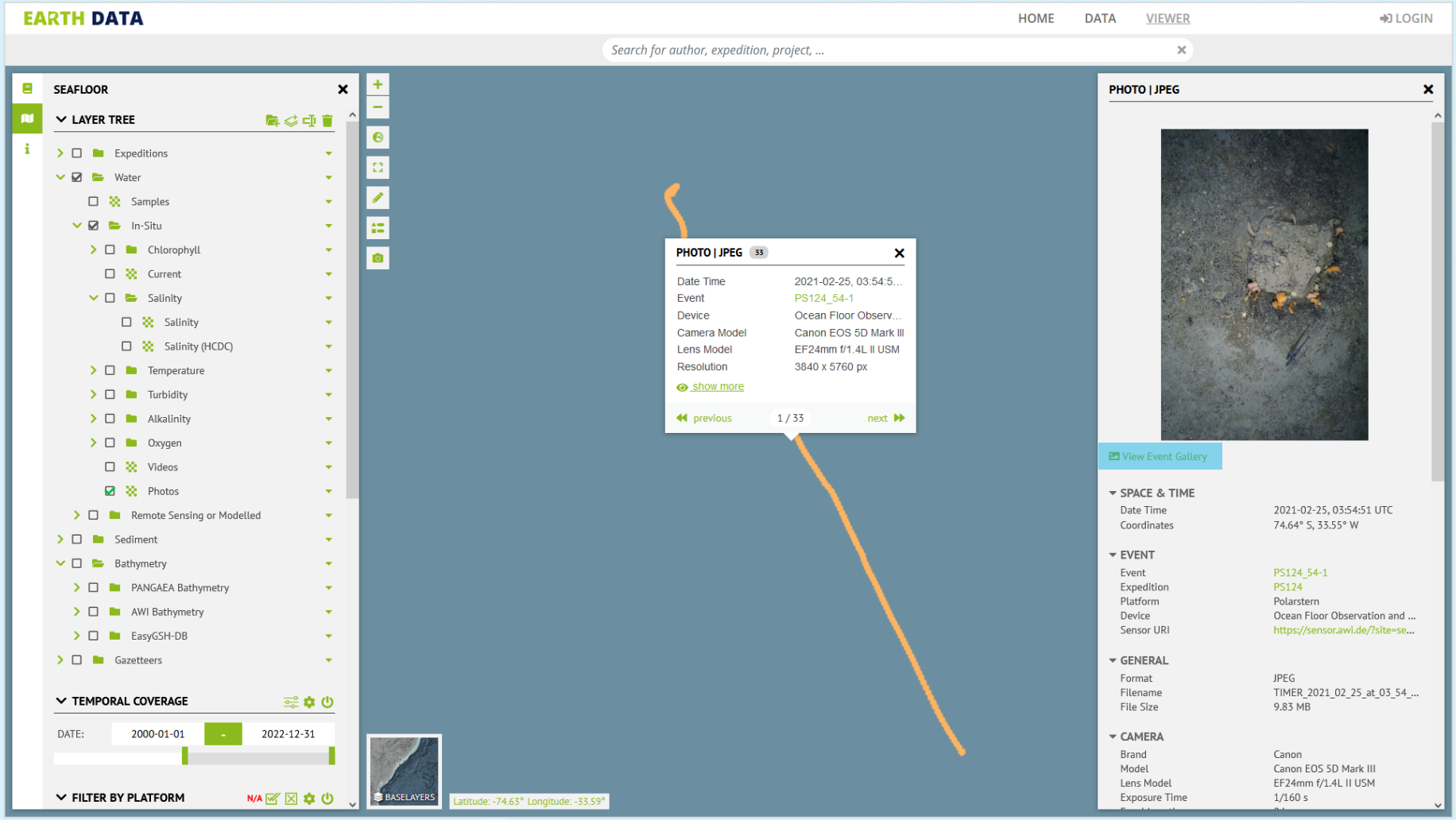
Water Column | Bathymetry | Remote Sensing | **Videos & Images** | Information



Here you can explore an excerpt of the data products provided in the projects context.

Videos & images from the seafloor are visualized as points on the map. When clicking on a point you can view the image or video with extensive metadata.

Media datasets can also be viewed as a gallery.

DATA VISUALIZATION

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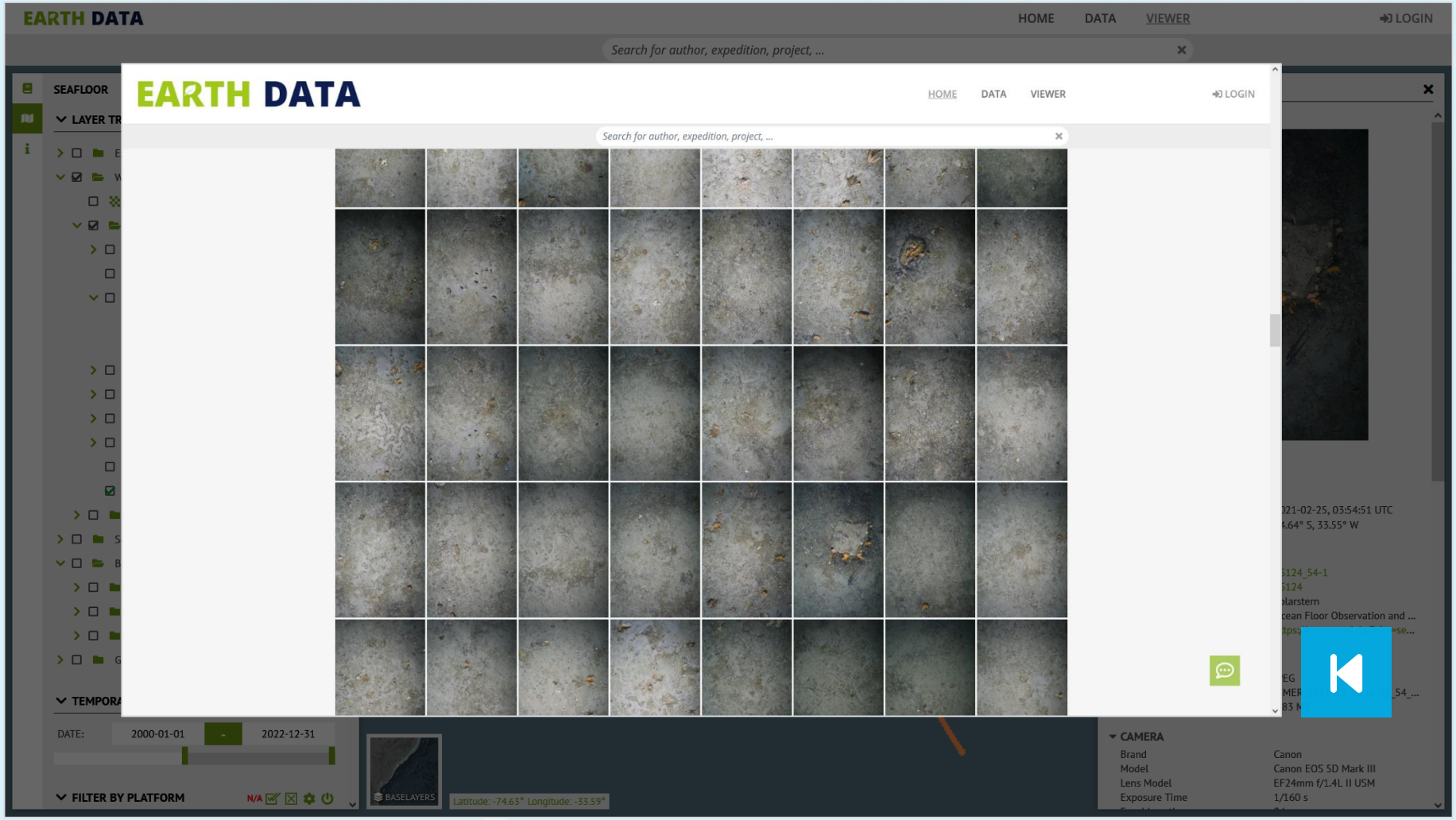
Water Column | Bathymetry | Remote Sensing | Videos & Images | Information



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DATA VISUALIZATION

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Visual Exploration Framework

The viewer uses an internally developed open source framework for visualization based on established open source libraries like leaflet for maps and plotly.js for diagrams.

Open Git Repository

Spatial Data Infrastructure

Data products are compiled from mixed sources and provided using OGC standard interfaces like WMS & WFS in collaboration with scientific working groups.

Related EGU Poster [EGU23-17052]:
A flexible yet sustainable Spatial Data Infrastructure for the Integration of Distributed Research Data

Poster Abstract

RELATED PORTAL

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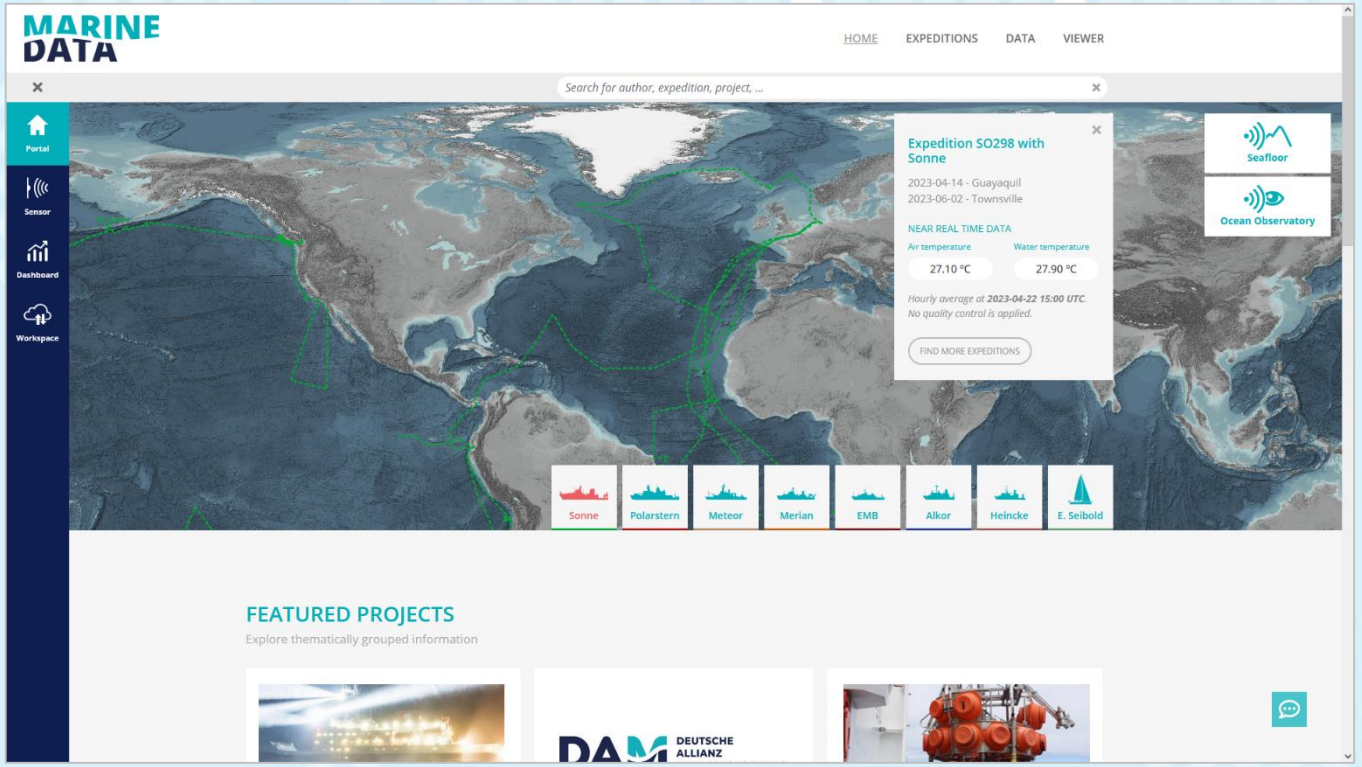
Earth Data has a sibling portal with a focus on marine research

Marine Data uses the same technology stack but different content is being displayed.



https://marine-data.de

RELATED PORTAL

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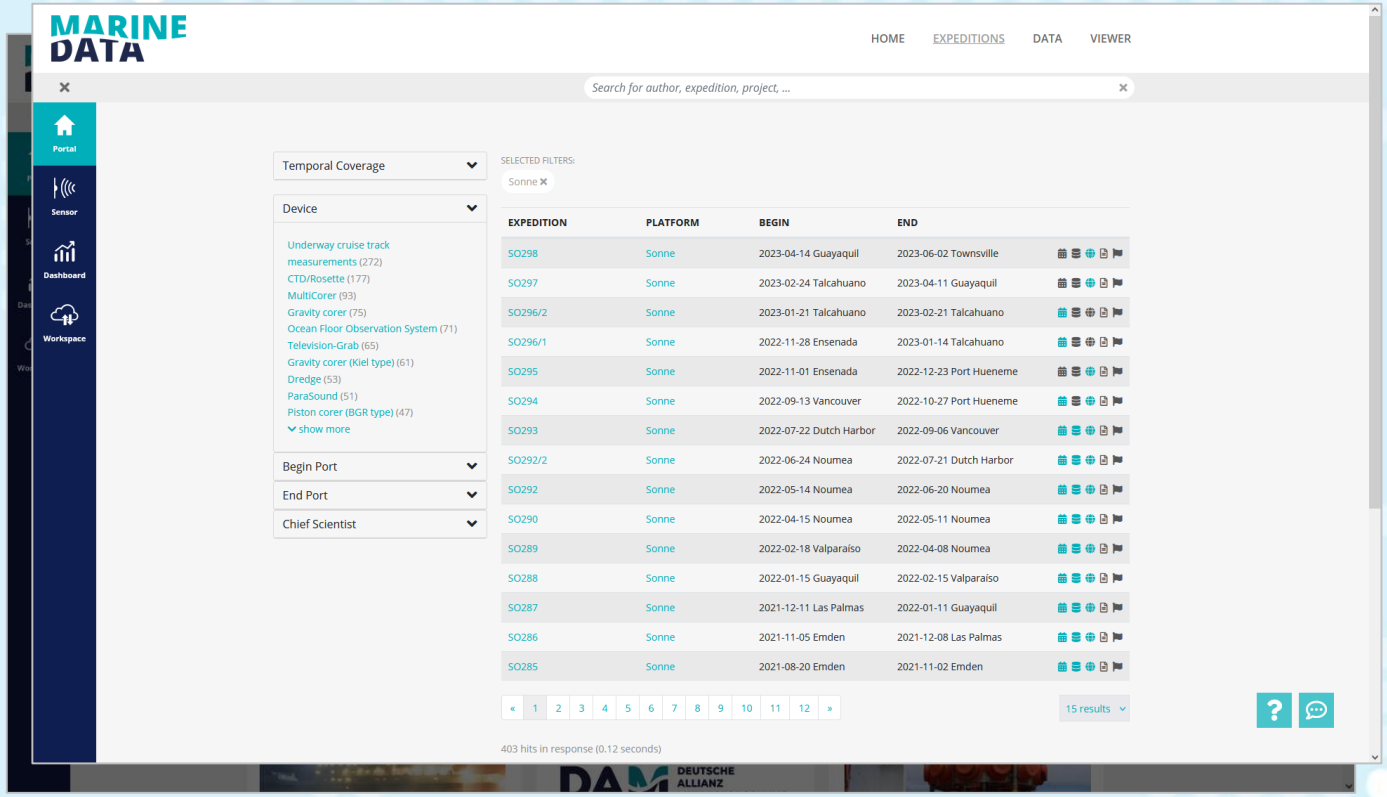
Search for research expeditions



https://marine-data.de/?site=expeditions

RELATED PORTAL

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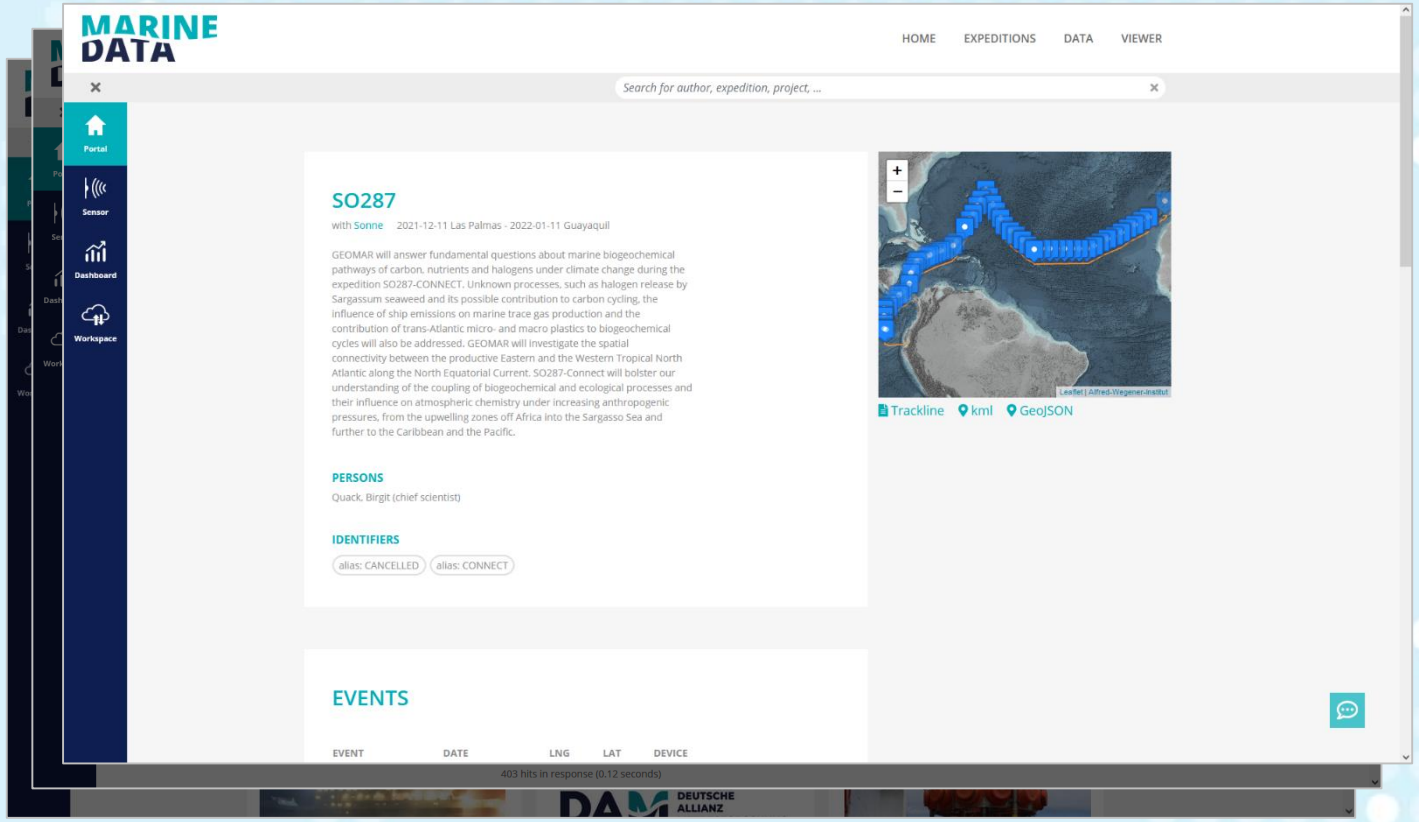
Earth Data has a sibling portal with a focus on marine research

Marine Data uses the same technology stack but different content is being displayed.

- Search for research expeditions
- Read expedition metadata



https://marine-data.de/?site=expedition&expedition=SO287

RELATED PORTAL

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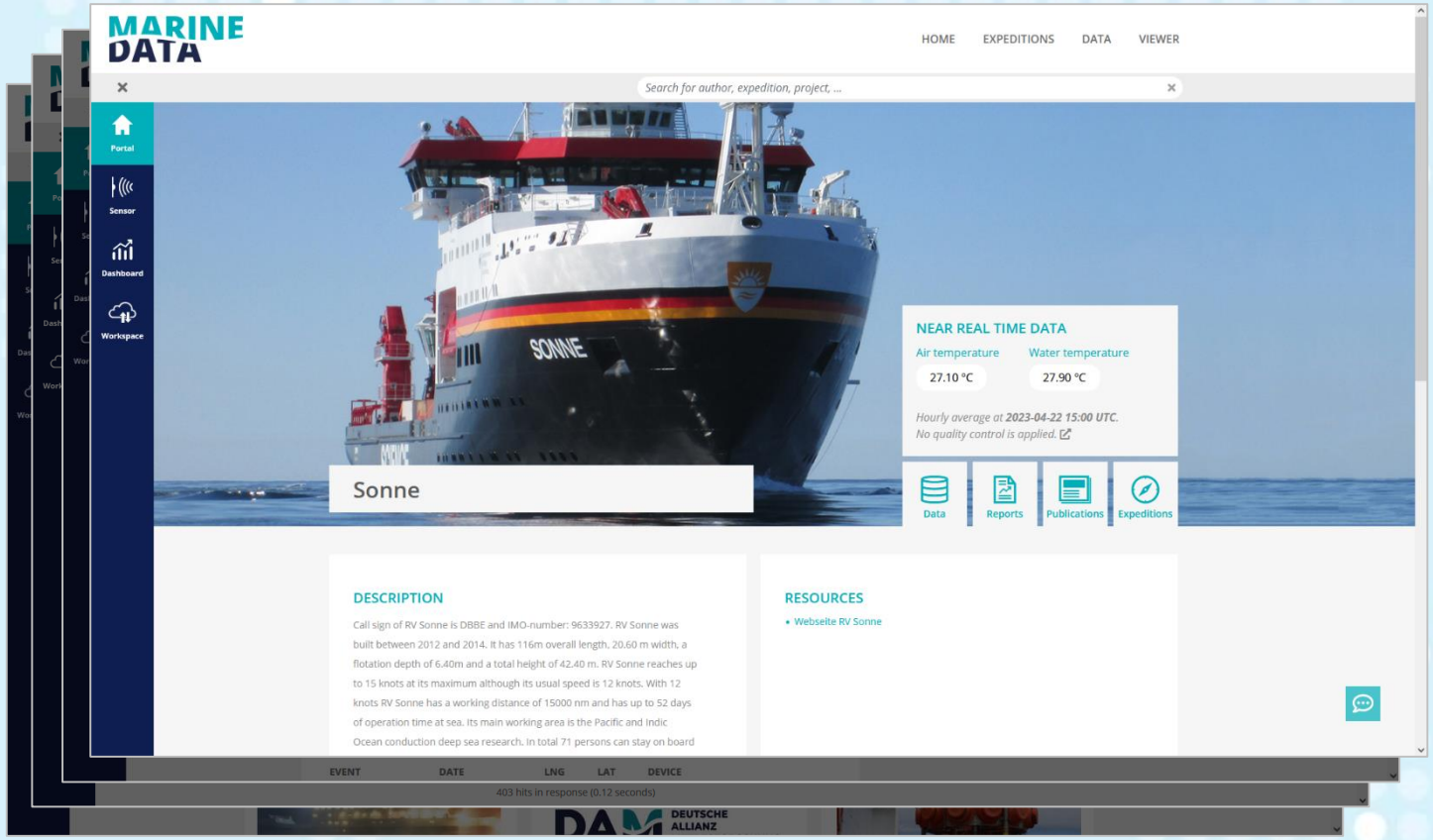
Earth Data has a sibling portal with a focus on marine research

Marine Data uses the same technology stack but different content is being displayed.

- Search for research expeditions
- Read expedition metadata
- Find out more about related research platforms



https://marine-data.de/?site=platform&platform=Sonne

TECHNOLOGY

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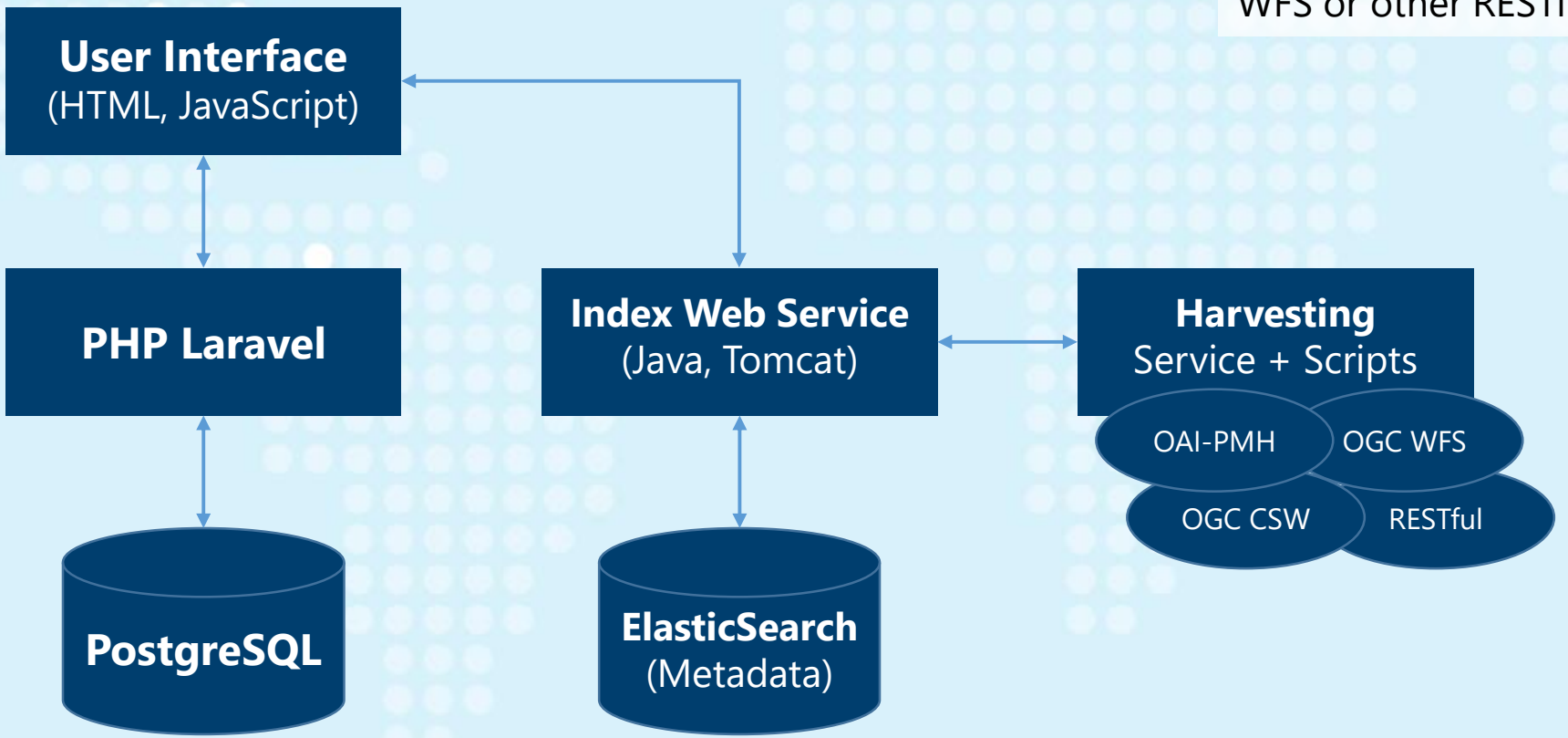
The following diagram is an abstract representation of the portal architecture

Search Metadata Harvesting
Search results in the free-text search are harvested from mixed sources using standard interfaces like OAI-PMH, OGC CSW, OGC WFS or other RESTful APIs



REFERENCES

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Portals

- https://earth-data.de
- https://marine-data.de

Observations to Analysis & Archives

- https://o2a-data.de

Visual Exploration Framework

- https://gitlab.awi.de/software-engineering/de.awi.visualexplorer

Project Partners

- https://www.allianz-meeresforschung.de
- https://www.helmholtz.de/en/research/research-fields/earth-and-environment/
- https://datahub.erde-und-umwelt.de/en/
- https://www.nfdi4earth.de

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