

MARINE DATA

data portal and data viewers

February 23, 2022 || Robin Heß and Karen Albers

Roadmap



1. Introduction
2. Portal
3. Viewer
4. Outlook: Upcoming Features & Earth Data
5. References

1. Introduction



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1. Introduction

Marine Data is a cross-institute portal for finding, visualizing and downloading maritime research data

- We want scientists to be able to work effectively through access to a big amount of data on a centralized entry point
- Decentralized data storage

DAM DEUTSCHE ALLIANZ MEERESFORSCHUNG **HELMHOLTZ** RESEARCH FOR GRAND CHALLENGES

HOME EXPEDITIONS PLATFORMS DATA VIEWER My Data Guide

Search for author, expedition, project, ...

PS126 with Polarstern
2021-05-24 - Bremerhaven
2021-06-27 - Bremerhaven

Air temperature	Water temperature
16.70 °C	16.09 °C

NEAR REAL TIME DATA
Near real time data is presented in hourly averages and no quality control is applied.

MORE INFORMATION

Merian Meteor Sonne Polarstern Alkor Heincke

FEATURED PROJECTS
Explore thematically grouped information

FRONTIERS IN ARCTIC MARINE MONITORING
An ocean observation system designed to enable year-round time series observations with near real-time data in Fram Strait, the main gateway between the Atlantic and Arctic Ocean.

MOSAIC - MULTIDISCIPLINARY DRIFTING OBSERVATORY
The largest-scale Arctic research expedition of all time. German research icebreaker Polarstern spend a year drifting through the Arctic Ocean, trapped in the ice.

DEUTSCHE ALLIANZ MEERESFORSCHUNG
German marine research has a unique research infrastructure, including research vessels and research stations, aircraft, observatories and underwater vehicles.

FIND DATA READ MORE

<https://marine-data.de>

1. Introduction

- **Core Feature:** Search engine for data, platforms and expeditions
- **FAIR:** Findable, Accessible Interoperable, Reusable

The screenshot displays the marine-data.de website interface. At the top, the logos for DAM (Deutsche Allianz Meeresforschung) and HELMHOLTZ (Research for Grand Challenges) are visible, along with navigation links for HOME, EXPEDITIONS, PLATFORMS, DATA, and VIEWER. A search bar is present with the placeholder text "Search for author, expedition, project ...".

The main content area is divided into a left sidebar and a main results pane. The sidebar includes a "Home" button and a "Sensor" section with a "Dashboard" and "Workspace" link. The main results pane features a "MAP" section with a map of the North Atlantic region showing several blue location pins. Below the map are filters for "Temporal Coverage" and "Provider".

The search results list several datasets:

- Tree-ring measurements of Picea shrenkiana (Shrenk's spruce) from sample KYSIPCSH-121 (2007)**
Schweingruber, Fritz Hans; Feiertag, Belinda
<https://doi.org/10.1594/PANGAEA.594100>
- Microbial life at deep sea hydrothermal vents - recent developments and new challenges (2009)**
Imhoff, Johannes F.; Hügler, Michael; Perner, Mirjam; Gärtner, Andrea
- Oxygen and salinity measured on water bottle samples at station TT008_5-CTD29 (2003)**
Murray, James W
<https://doi.org/10.1594/PANGAEA.120713>
- Tree-ring width of Quercus species from historical object sample 6637B/04A, Germany, Bardowick (2012)**
PreEler, Erhard
<https://doi.org/10.1594/PANGAEA.781339>
- Semiochemical experiment data, 2005-2009 - RELU Re-bugging the system: promoting adoption of alternative pest management strategies in field crop systems**
John Pickett, ssor; Bailey, Alastair; A. Pickett, John
- BMP: Monitoring Cruise 92/03 (TF0113, 54.9250 N, 13.5000 E) (IOWDB) (1992)**

Each result includes icons for download, share, and other actions. At the bottom of the page, there are buttons for "FIND DATA" and "READ MORE" for each result.

<https://marine-data.de>

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<https://marine-data.de>

1. Introduction

- **Core Feature:** Search engine for data, platforms and expeditions
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DEUTSCHE ALLIANZ MEERESFORSCHUNG HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

HOME EXPEDITIONS PLATFORMS DATA VIEWER My Data Guest

Search for author, expedition, project ...

Temporal Coverage Platform Device Begin Port End Port Chief Scientist

Platform: Aikor (425), Heincke (638), Maria S. Merian (184), Meteor (514), Polarstern (298), Poseidon (566), Sonne (403)

SELECTED FILTERS: vessel X

EXPEDITION	PLATFORM	BEGIN	END				
MSM104/2	Maria S. Merian	2021-12-18 Las Palmas	2022-01-08 Walvis Bay				
M179/1	Meteor	2021-12-13 Emden	2022-01-10 Punta Arenas				
SO287	Sonne	2021-12-11 Las Palmas	2022-01-13 Galiao				
PS127	Polarstern	2021-12-01 Bremerhaven	2022-01-01				
MSM105	Maria S. Merian	2021-11-24 Mindelo	2021-12-10 Mindelo				
M179	Meteor	2021-11-21 Montevideo	2021-12-27 Punta Arenas				
M178	Meteor	2021-11-21 Emden	2021-12-19 Las Palmas				
MSM104	Maria S. Merian	2021-11-18 Emden	2021-12-15 Las Palmas				
HES89	Heincke	2021-11-05 Bremerhaven	2021-11-20 Bremerhaven				
SO286	Sonne	2021-11-05 Emden	2021-12-08 Las Palmas				
HES88	Heincke	2021-10-23 Bremerhaven	2021-11-05 Bremerhaven				
M177	Meteor	2021-10-23 Emden	2021-11-18 Emden				
HES87	Heincke	2021-10-18 Bremerhaven	2021-10-23 Bremerhaven				
HES86	Heincke	2021-10-03 Bremerhaven	2021-10-17 Bremerhaven				
HES85	Heincke	2021-09-23 Bremerhaven	2021-10-02 Bremerhaven				

« 1 2 3 4 5 6 7 8 9 10 11 12 »

Expedition

FIND DATA READ MORE

1. Introduction



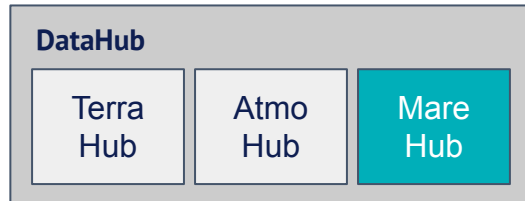
O2A: Data flow from Observations to Archives

1. Introduction

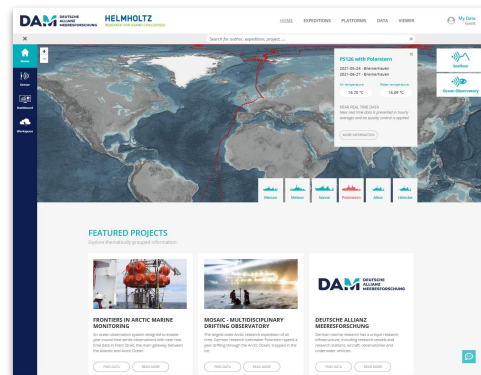
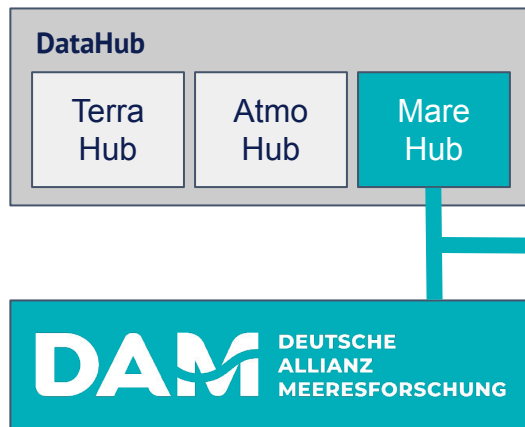


O2A: Data flow from Observations to Archives

1. Introduction



1. Introduction



Marine Data portal with thematic viewers

2. Portal



Sitemap /-structure

Portal

- Home
- Expeditions
- Platforms
- Data
- Viewer

Live Demo

<https://marine-data.de/>

3. Viewer: Data Search

Find data, publications, reports and map-projects in the data search

- Aggregation of decentralized data providers (e.g. PANGAEA, EPIC, Geomar, ...)

The screenshot displays the marine-data.de search interface. At the top, the logos for DAM (Deutsche Allianz Meeresforschung) and Helmholtz (Research for Grand Challenges) are visible, along with navigation links for Home, Expeditions, Platforms, Data, and Viewer. A search bar contains the term 'polarstern'. Below the search bar, a sidebar on the left offers navigation options: Home, Sensor, Dashboard, and Workspace. The main content area features a 'MAP' section with a satellite-style map of the Arctic region, a 'Temporal Coverage' dropdown menu, and a 'Resource Type' dropdown menu listing Datasets (35326), Images (522), and Videos (42). Other filters include Author, Platform, and Expedition. The search results are sorted by 'RELEVANCE' and 'DATE'. The results list includes:

- Ozone sonde profiles during MOSAIC Leg 4-5 (2022)** by von der Gathen, Peter; Maturilli, Marion. DOI: <https://doi.pangaea.de/10.1594/PANGAEA.941294>
- Continuous raw particle number concentration data in 10 sec resolution, measured in the Swiss aerosol container during MOSAIC 2019/2020 (2022)** by Beck, Ivo; Quéléver, Lauriane; Laurila, Tiiu; Jokinen, Tuja; Schmale, Julia. DOI: <https://doi.pangaea.de/10.1594/PANGAEA.941283>
- Whale sightings during POLARSTERN cruise PS123 (2022)** by Burkhardt, Elke. DOI: <https://doi.pangaea.de/10.1594/PANGAEA.941215>
- Eddy kinetic energy in the Arctic Ocean from moored velocity observations (2022)** by von Appen, Wilken-Jon; Baumann, Tili; Janout, Markus A.; Kolbusov, Nikolay; Lenn, Yung-Dienn.

<https://marine-data.de/?site=data>

3. Viewer: Data Search

Find data, publications, reports and map-projects in the data search

- Aggregation of decentralized data providers (e.g. PANGAEA, EPIC, Geomar, ...)
- Text based search input

The screenshot displays the marine-data.de search interface. At the top, the logos for DAM (Deutsche Allianz Meeresforschung) and HELMHOLTZ (Research for Grand Challenges) are visible. The navigation menu includes HOME, EXPEDITIONS, PLATFORMS, DATA, and VIEWER. A search bar at the top right contains the text 'polarstern'. Below the search bar, there are tabs for DATASETS, PUBLICATIONS, REPORTS, MAPS, and SAMPLES. A 'MAP' button is also present. The search results are sorted by RELEVANCE and DATE. The results list includes:

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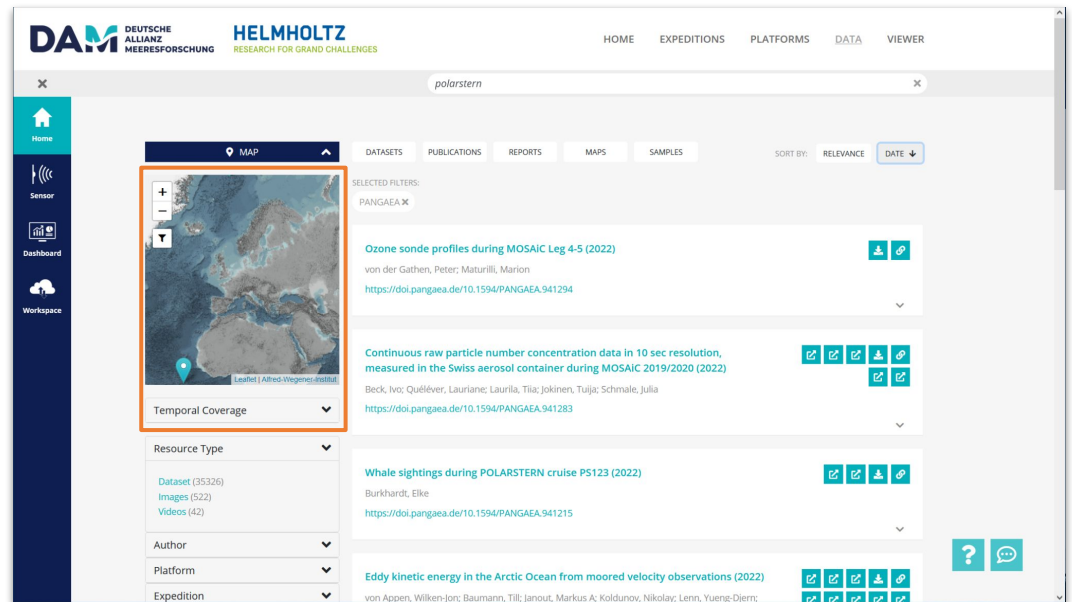
On the left side, there is a sidebar with navigation options: Home, Sensor, Dashboard, and Workspace. Below these, there are filter options for Temporal Coverage, Resource Type (with counts: Datasets (35326), Images (522), Videos (42)), Author, Platform, and Expedition. A map view is also available, showing a satellite image of the Arctic region with a location pin for 'Learhet (Alfred-Wegener-Station)'. A 'SELECTED FILTERS' section shows 'PANGAEA X'.

<https://marine-data.de/?site=data>

3. Viewer: Data Search

Find data, publications, reports and map-projects in the data search

- Aggregation of decentralized data providers (e.g. PANGAEA, EPIC, Geomar, ...)
- Text based search input
- Spatial and temporal filtering



The screenshot displays the marine-data.de search interface. At the top, the logos for DAM (Deutsche Allianz Meeresforschung) and HELMHOLTZ (Research for Grand Challenges) are visible, along with navigation links for HOME, EXPEDITIONS, PLATFORMS, DATA, and VIEWER. A search bar contains the text 'polarstern'. Below the search bar, a sidebar on the left offers navigation options: Home, Sensor, Dashboard, and Workspace. The main content area features a 'MAP' section with a satellite-style map of the Arctic region, where a location is marked with a pin and labeled 'Leahel (Alfred-Wegener-Station)'. To the right of the map, there are filters for 'Temporal Coverage' and 'Resource Type'. The 'Resource Type' filter is expanded, showing 'Dataset (35326)', 'Images (522)', and 'Videos (42)'. The search results are sorted by 'RELEVANCE' and 'DATE'. The results list includes:

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3. Viewer: Data Search

Find data, publications, reports and map-projects in the data search

- Aggregation of decentralized data providers (e.g. PANGAEA, EPIC, Geomar, ...)
- Text based search input
- Spatial and temporal filtering
- Filter by facets (e.g. author, project, expedition, ...)

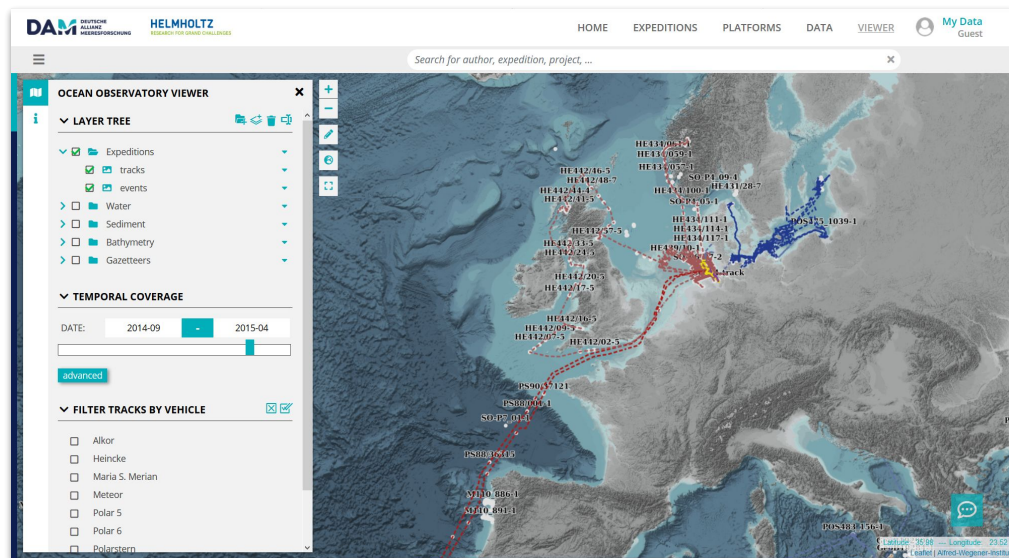
The screenshot displays the search interface of the marine-data.de website. The search term 'polarstern' is entered in the search bar. The results are filtered by 'PANGAEA'. The interface includes a sidebar with navigation options (Home, Sensor, Dashboard, Workspace) and a main content area with a map, a list of search results, and a filter panel. The filter panel shows 'Resource Type' with options for Dataset (35326), Images (522), and Videos (42). The search results list includes 'Ozone sonde profiles during MOSAIC Leg 4-5 (2022)', 'Continuous raw particle number concentration data in 10 sec resolution, measured in the Swiss aerosol container during MOSAIC 2019/2020 (2022)', 'Whale sightings during POLARSTERN cruise PS123 (2022)', and 'Eddy kinetic energy in the Arctic Ocean from moored velocity observations (2022)'. Each result includes the author, a DOI link, and icons for sharing and downloading.

<https://marine-data.de/?site=data>

3. Viewer

Marine Data includes map-based viewers to explore and find data

- Uses established OGC interfaces (e.g. WMS, WFS)
- Data products are hosted in the O2A Spatial Data Infrastructure (SDI)



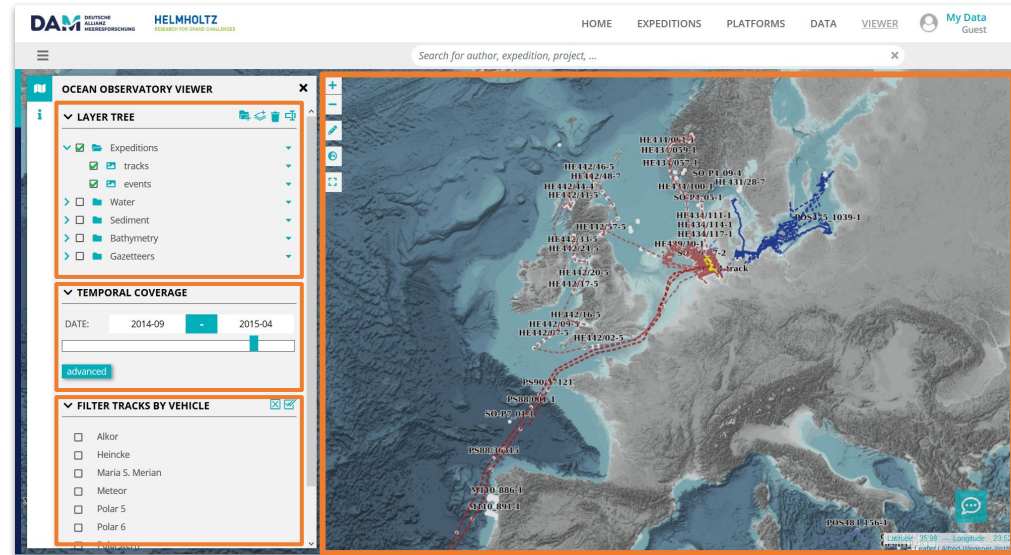
Live Demo

<https://marine-data.de/?site=viewer>

3. Viewer

Marine Data includes map-based viewers to explore and find data

- Uses established OGC interfaces (e.g. WMS, WFS)
- Data products are hosted in the O2A Spatial Data Infrastructure (SDI)
- Built as a modular and reusable open-source framework



Live Demo

<https://marine-data.de/?site=viewer>

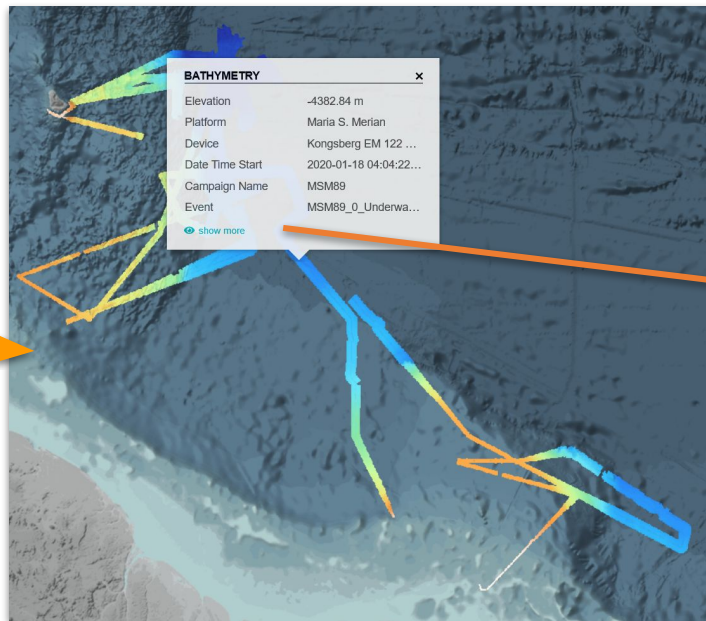
3. Viewer: Data Products

▼ LAYER TREE

- Expeditions
- Water
 - Samples
 - In-Situ
 - Remote Sensing or Modelled
- Sediment
 - In-Situ
 - Remote Sensing or Modelled
- Bathymetry**
- Gazetteers

The Layer Tree contains an overview of project-relevant data products that were implemented in collaboration with the MareHub/DAM working groups

Selecting a layer displays it on the map



Clicking on the data opens a popup with measurement-specific metadata—including a reference to the source

PANGAEA MULTIBEAM RAW DATA BATHYMETRY (0... X)

SOURCE & DOWNLOAD

Source (DOI) <https://doi.org/10.1594/PAN...>
PANGAEA Dataset ID 923066

FILE INFO

File Suffix .all
MBIO MB-System Data Format 58

REFERENCES

Citation Karstensen, Johannes; Lavik...
License CC-BY 4.0
Access Rights unrestricted

MEASUREMENT INFO

Platform Maria S. Merian
Platform Type (NERC L06 SeaVc research vessel)
Method (NERC L05 SeaDataNet multi-beam echosounders)
Device (NERC L22 SeaVoX Devic Kongsberg EM 122 multibea...
Sensor URN void
Ancillary SVP Available no
Date Time Start 2020-01-18 04:04:22.095 UTC
Date Time End 2020-02-19 18:30:39.077 UTC
Elevation (Minimum) -6477.00 m
Elevation (Maximum) -42.00 m
Elevation -4382.84 m

CAMPAIGN & PROJECT INFO

Campaign Name MSM89
Campaign Optimal Name EURECAA
Cruise Report (DOI) <https://doi.org/10.2312/cr...>
Campaign Start 2020-01-17 00:00:00 UTC
Campaign Start Location Bridgetown
Campaign End 2020-02-20 00:00:00 UTC
Campaign End Location Bridgetown
Expedition Program <https://www.idf.uni-hambur...>
BSH ID 2020086
Project Label DAM
Project Name Underway Research Data
Project URI <https://www.allianz-meeres...>

PANGAEA STATUS

PANGAEA Curation Level Enhanced curation

PANGAEA EVENT INFO

Event Name MSM89_0_Underway-9
Depth Type ELEVATION_Bathymetric

3. Viewer: Videos & Images

You can explore video and image data (e.g. OFOS) and directly play it in the viewer

FEATURE

Event Name	PS101_242
Platform	Polarstern
Date Time Start	2016-10-17T03:10:30Z
Device	TV_MUC

[show more](#)

VIDEO IMAGES

SPACE & TIME

Date Time Start	2016-10-17 03:10:30 ...
Marine Zone	seafloor
DEPTH, water	855 m

EVENT

Event	PS101_242
Expedition	PS101
Platform	Polarstern
Device	TV_MUC

MEDIA CONTAINER

Name	2016-10-17T031030_...
Format	QuickTime / MOV
Duration	00:31:55.903
File Size	985.806 MB

VIDEO CODEC

Video Codec Name	h264
------------------	------

FEATURE

ID	10508
Date Time	2016-01-21T18:40:30Z
Event ID	41443806
Event Name	PS96/061-1
Elevation	469

[show more](#)

[previous](#) 4/13 [next](#)

OFOS 1 DIGITAL CAMERA

SPACE & TIME

Date Time	2016-01-21 18:40:30 UTC
Coordinates	76.10° S, 30.31° W
Elevation	469 m

EVENT

Event	PS96/061-1
Event ID	41443858
Expedition	PS96
Expedition Alias	ANT-XXXI/2 FROSN

SOURCE

Name	PS96_061-1_links-to-photo...
Doi	https://doi.org/10.1594/PANGAEA611194
URN	https://nfs.gangaea.de/image/...
URL	http://nfs.gangaea.de/image/...

3. Viewer: Additional Services

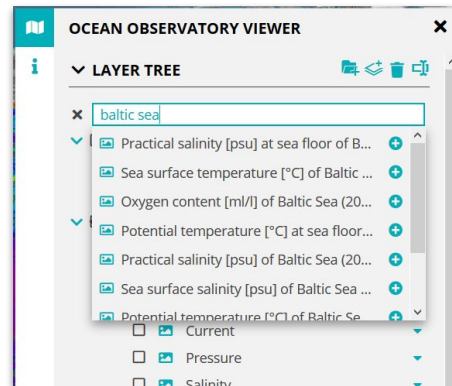
There are multiple ways to load additional data into the viewer

Service Catalog

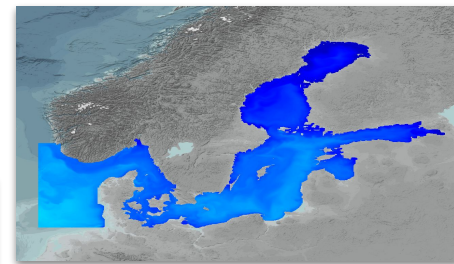
- Minimal user interface
- REST-API to allow harvesting and integration into external portals and viewers
- **Under Development:**
API and UI might change, CSW support is planned

Externally Hosted Services

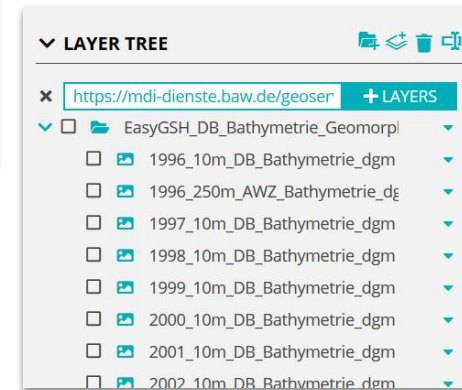
- Existing WMS and WFS can be added using the URL
- Service and layer metadata gets parsed and added to the Layer Tree



Service Catalog



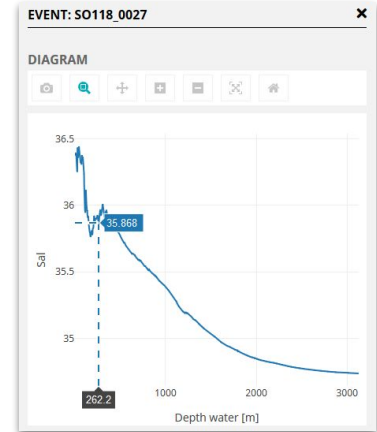
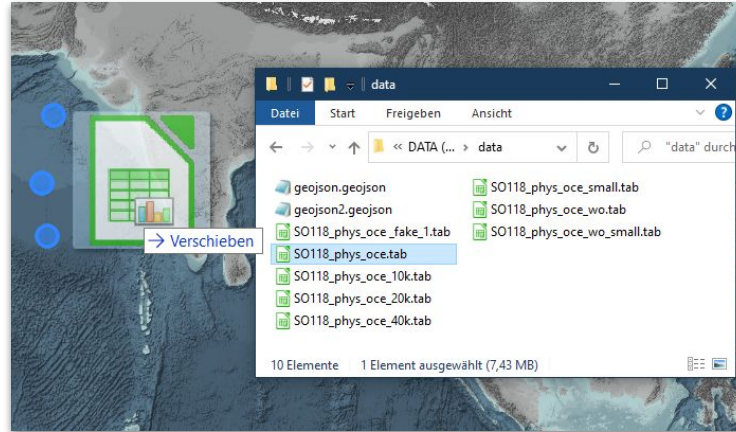
e.g. model data hosted at
GEOMAR



External Services

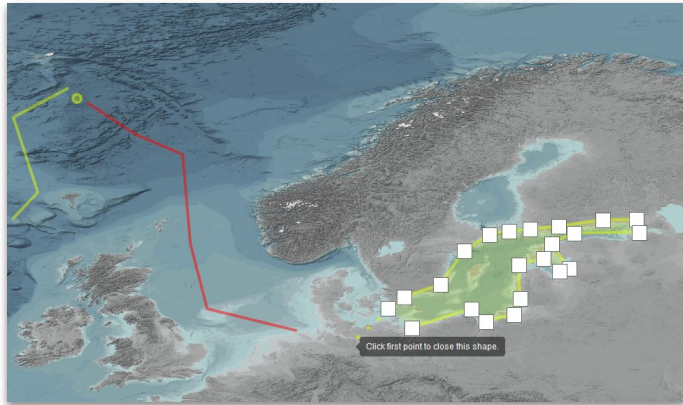
3. Viewer: Drag & Drop

- Drag & drop of local ***.geojson** and ***.csv/*.tab** files
- Currently only for depth profiles
- Supports PANGAEA ***.tab** format
- Includes simple graph visualizations

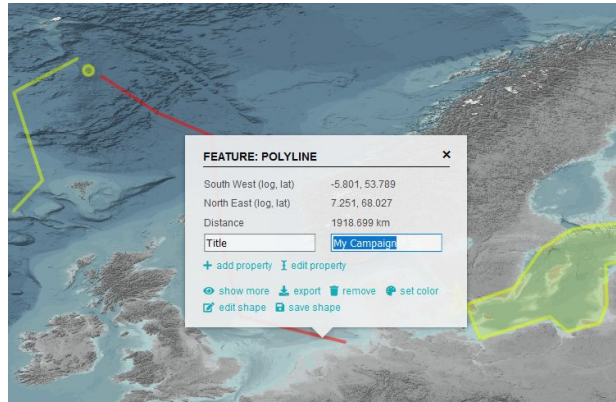


3. Viewer: Drag & Drop

The drawing tool allows drawing custom geometries in the viewer



Drawing directly on the map



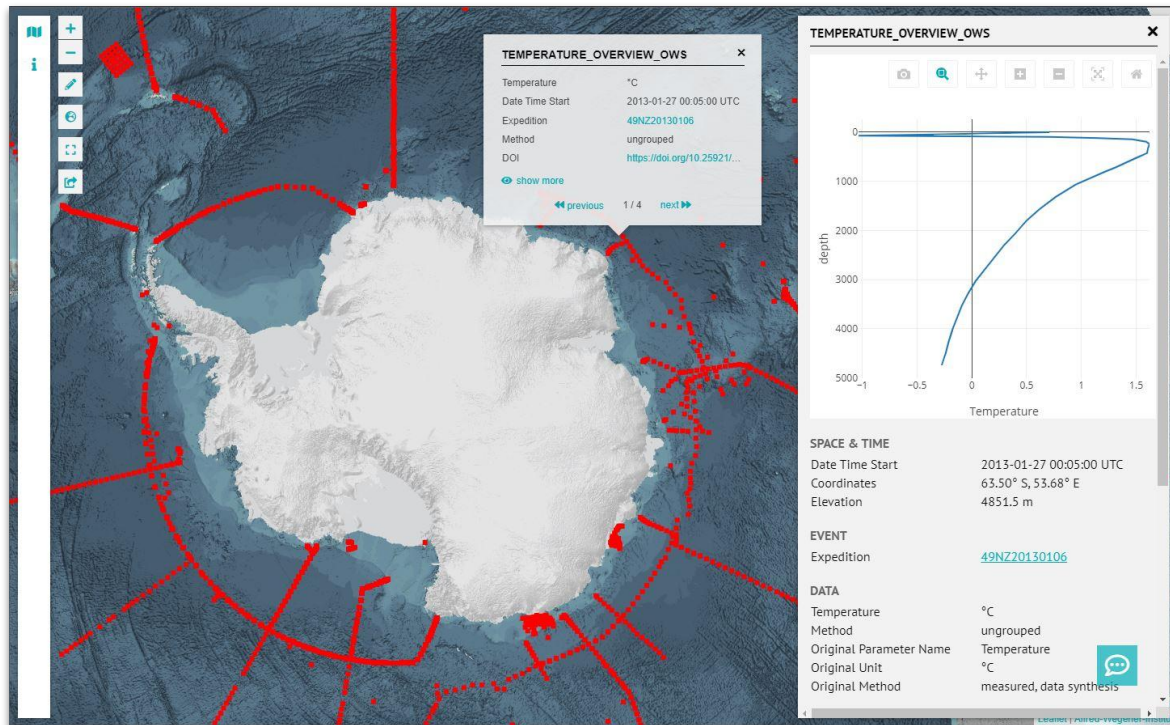
Adding annotations and exporting geometries

Planned Feature:
Cut out data and add it to a “shopping cart”

4. Outlook: Upcoming Features

Quick Visualization of oceanographic data in the viewers

- Aggregated data sources (e.g. PANGAEA, GLODAP, COSYNA, ...)
- Depth Profiles
- Time Plots



4. Outlook: Upcoming Features

User accounts with federated login on Marine Data

MY DATA

You can add interesting datasets to this list as favorites for later viewing. On the search [results page](#), click the ★-icon next to an item's title.

Currently, your favorites are stored in your browser. In the future you can login, save your favorites and download them.

All favourites

- Favourite Expeditions** (2016-05-25 Bridgetown - 2016-06-28 Ponta Delgada)
 - M127 with Meteor
 - Favourite Expeditions X
- My Datasets**
- My Viewers**
- Research Vessels** (2019-08-10 Bremerhaven - 2019-09-13 Tromsø)
 - PS121 with Polarstern
 - Favourite Expeditions X

[Add a new group](#)

[Download List](#)

Bookmark datasets, platforms, expeditions and viewers in your account and sort them into groups

OCEAN OBSERVATORY VIEWER

LAYER TREE

- Expeditions
 - tracks
 - events
 - My Layers

TEMPORAL COVERAGE

DATE: 2009-09

FILTER TRACKS BY VEHICLE

- Alkor
- Heincke
- Maria S. Merian
- Meteor
- Polar 5
- Polar 6
- Polarstern
- Poseidon
- Sonne

Map showing expedition tracks with labels: HE 312/864-2, HE 312/865-1, HE 312/866-1, HE 312/867-1, HE 312/868-1, HE 312/869-1, HE 312/870-1, HE 312/871-1, HE 312/872-1, HE 312/873-1, HE 312/874-1, HE 312/875-1, HE 312/876-1, HE 312/877-1, HE 312/878-1, HE 312/879-1, HE 312/880-1, HE 312/881-1, HE 312/882-1, HE 312/883-1, HE 312/884-1, HE 312/885-1, HE 312/886-1, HE 312/887-1, HE 312/888-1, HE 312/889-1, HE 312/890-1, HE 312/891-1, HE 312/892-1, HE 312/893-1, HE 312/894-1, HE 312/895-1, HE 312/896-1, HE 312/897-1, HE 312/898-1, HE 312/899-1, HE 312/900-1, HE 312/901-1, HE 312/902-1, HE 312/903-1, HE 312/904-1, HE 312/905-1, HE 312/906-1, HE 312/907-1, HE 312/908-1, HE 312/909-1, HE 312/910-1, HE 312/911-1, HE 312/912-1, HE 312/913-1, HE 312/914-1, HE 312/915-1, HE 312/916-1, HE 312/917-1, HE 312/918-1, HE 312/919-1, HE 312/920-1, HE 312/921-1, HE 312/922-1, HE 312/923-1, HE 312/924-1, HE 312/925-1, HE 312/926-1, HE 312/927-1, HE 312/928-1, HE 312/929-1, HE 312/930-1, HE 312/931-1, HE 312/932-1, HE 312/933-1, HE 312/934-1, HE 312/935-1, HE 312/936-1, HE 312/937-1, HE 312/938-1, HE 312/939-1, HE 312/940-1, HE 312/941-1, HE 312/942-1, HE 312/943-1, HE 312/944-1, HE 312/945-1, HE 312/946-1, HE 312/947-1, HE 312/948-1, HE 312/949-1, HE 312/950-1, HE 312/951-1, HE 312/952-1, HE 312/953-1, HE 312/954-1, HE 312/955-1, HE 312/956-1, HE 312/957-1, HE 312/958-1, HE 312/959-1, HE 312/960-1, HE 312/961-1, HE 312/962-1, HE 312/963-1, HE 312/964-1, HE 312/965-1, HE 312/966-1, HE 312/967-1, HE 312/968-1, HE 312/969-1, HE 312/970-1, HE 312/971-1, HE 312/972-1, HE 312/973-1, HE 312/974-1, HE 312/975-1, HE 312/976-1, HE 312/977-1, HE 312/978-1, HE 312/979-1, HE 312/980-1, HE 312/981-1, HE 312/982-1, HE 312/983-1, HE 312/984-1, HE 312/985-1, HE 312/986-1, HE 312/987-1, HE 312/988-1, HE 312/989-1, HE 312/990-1, HE 312/991-1, HE 312/992-1, HE 312/993-1, HE 312/994-1, HE 312/995-1, HE 312/996-1, HE 312/997-1, HE 312/998-1, HE 312/999-1, HE 312/1000-1

Latitude 53.54 — Longitude 1.59
Leaflet | OpenStreetMap contributors

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4. Outlook: Earth Data



A broader **Earth Data** portal is being developed based on Marine Data technology

Not limited to maritime research
data from MareHub and DAM

Also visualize terrestrial and
atmospheric data

The domain **earth-data.de** is already registered - currently redirects to Marine Data

4. Outlook: Earth Data

EARTH DATA

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The largest-scale Arctic research expedition of all time. German research icebreaker Polarstern spend a year drifting through the Arctic Ocean, trapped in the ice.



Modular Observation Solutions for Earth Systems

MODULAR OBSERVATION SOLUTIONS FOR EARTH SYSTEMS

MOSES comprises highly flexible and mobile observation modules which are designed to investigate the interactions of short-term events and long-term trends across Earth...



TERRESTRIAL ENVIRONMENTAL OBSERVATORIES

TERRESTRIAL ENVIRONMENTAL OBSERVATORIES

Global change has triggered a number of environmental changes, such as alterations in climate, land productivity, water resources, atmospheric chemistry, and ecological systems.



5. References



O2A: Data flow from Observations to Archives

<https://spaces.awi.de/x/A4BMBg>

Documentation for the Portal

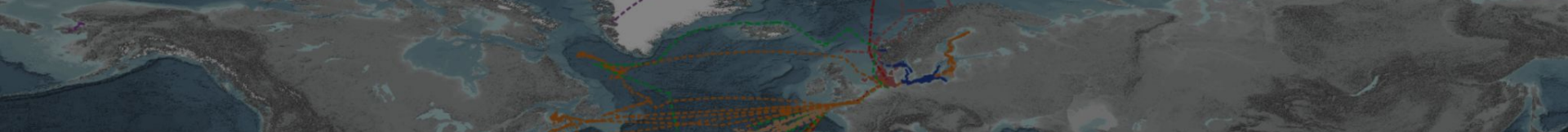
<https://spaces.awi.de/x/kllpEg>

Marine Data: Portal

<https://marine-data.de>

Marine Data: Viewer

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Thank you for your attention!

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04:04:55) (1988)

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