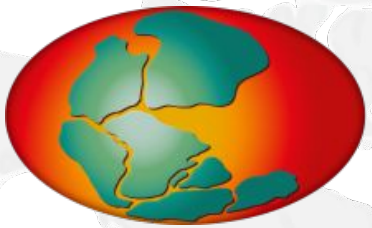

PANGAEA.

Community Workshops

de.NBI

GERMAN NETWORK FOR BIOINFORMATICS INFRASTRUCTURE

Find & retrieve data

08 & 09 May 2025

marum

Zentrum für Marine Umweltwissenschaften

AWI

ALFRED-WEGENER-INSTITUT

HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG

University of Bremen

The workshop team

Dorothee Kottmeier
Terminology Manager & Data Steward
PANGAEA / HMC

Flavia Höring
DAM Project Manager & Data Editor

Dana Ransby
Data Manager & Data Editor

The workshop team

Uwe Schindler
Technical infrastructure, metadata, search

Kathrin Riemann-Campe
DAM Data Editor

Lars Möller
Science & Service Coordinator

Outline Day 1

May 08	Intro & Find data
10:30 am	Welcome & …
10:35 am	Brief introduction to PANGAEA
10:45 am	PANGAEA search challenge
11:30 am	**Break** (10 min)
11:40 am	Search challenge - presentation & discussion
12:00 pm	“Advanced search” presentation
12:20 am	**Questions & Answers** (10 min)

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PANGAEA in a nutshell

PANGAEA in a nutshell

- Information system for long-term archival and publication of scientific data
- Established ± 30 years ago
- Hosted by:

AWI

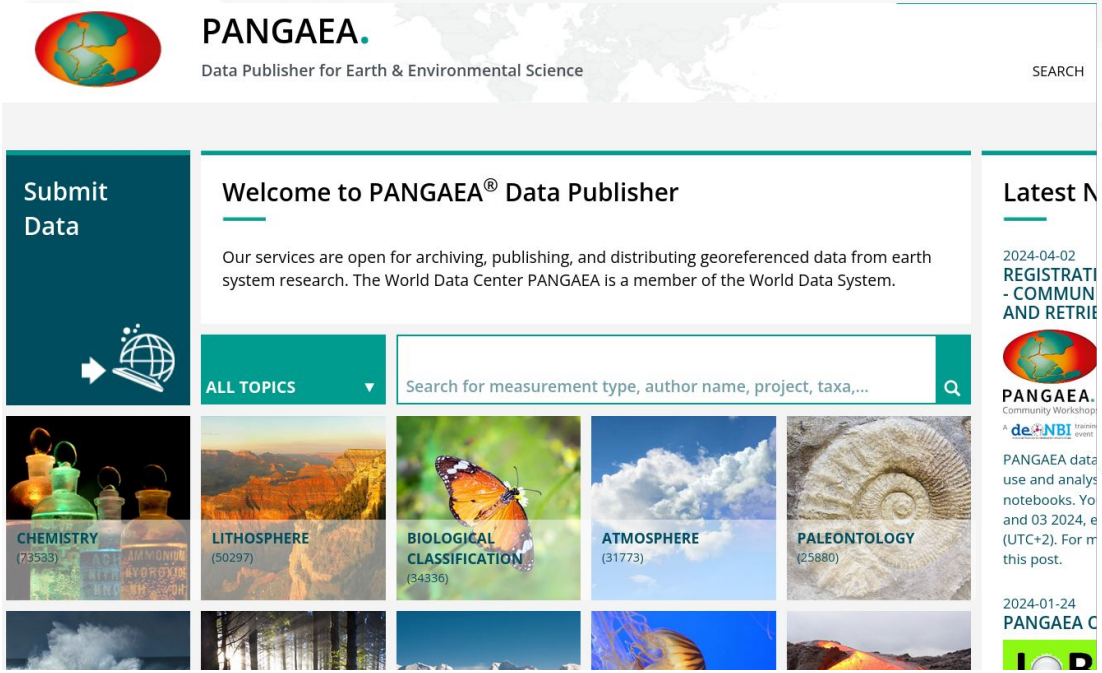
marum Zentrum für Marine Umweltwissenschaften

- Accredited:

WORLD DATA SYSTEM

WMO Information System

CORE TRUST SEAL

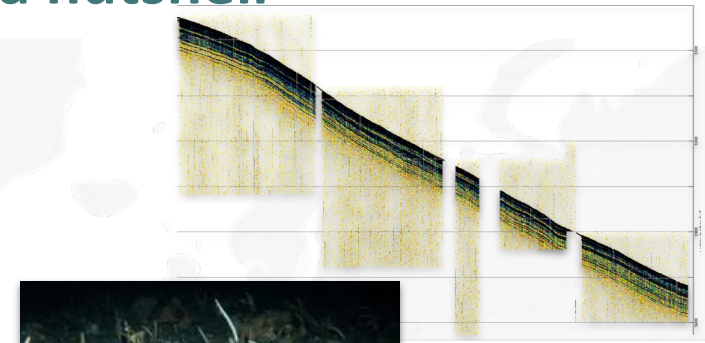


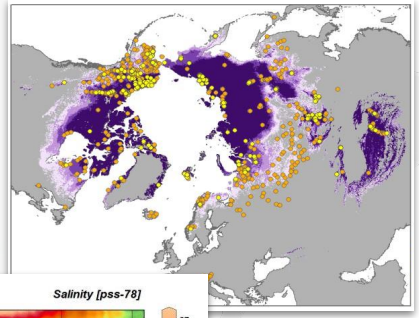
PANGAEA in a nutshell

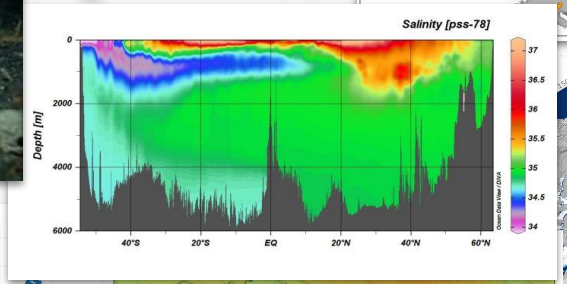
- multidisciplinary data

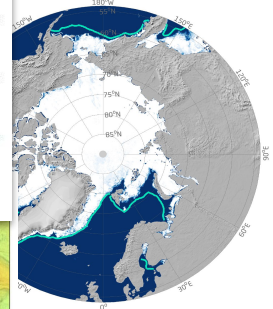
PANGAEA in a nutshell

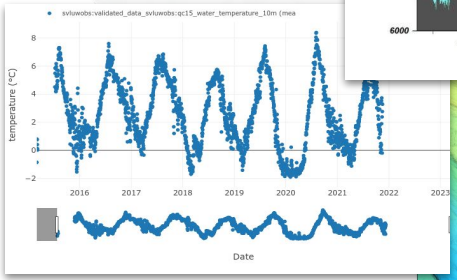
- multidisciplinary data
- heterogeneous data types

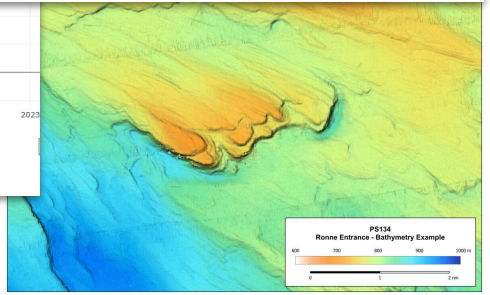






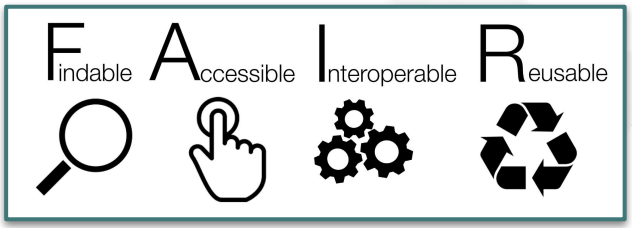


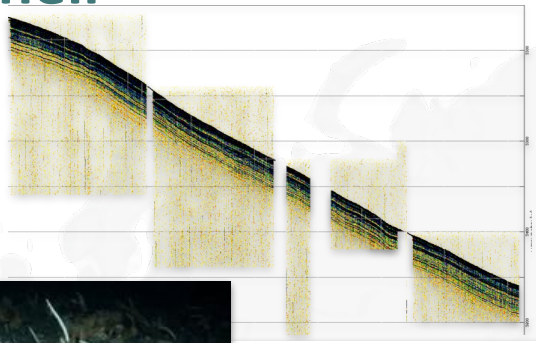


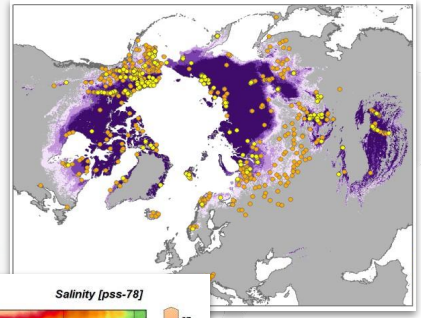


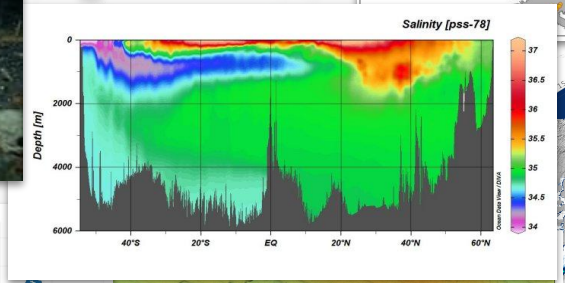
PANGAEA in a nutshell

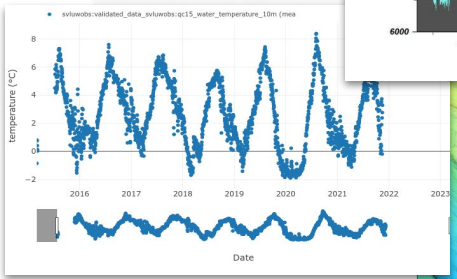
- multidisciplinary data
- heterogeneous data types
- quality controlled via manual review & curation

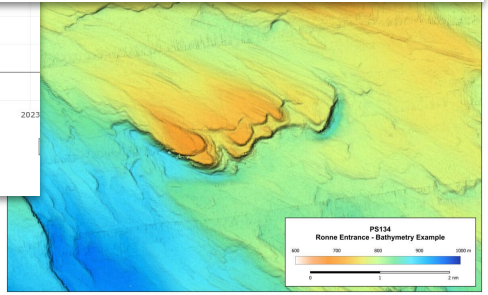


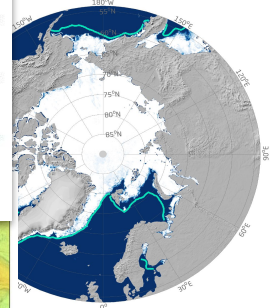






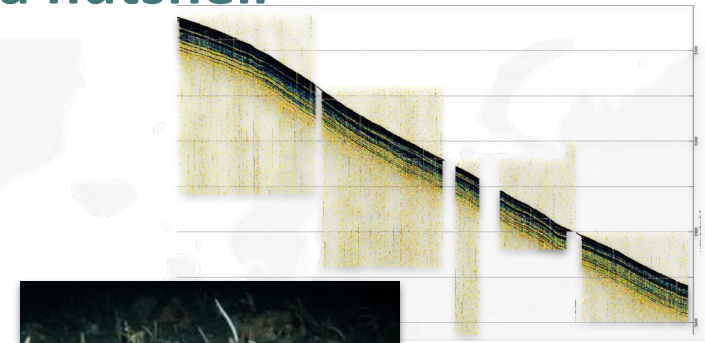


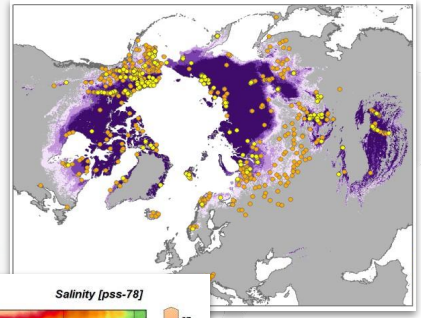


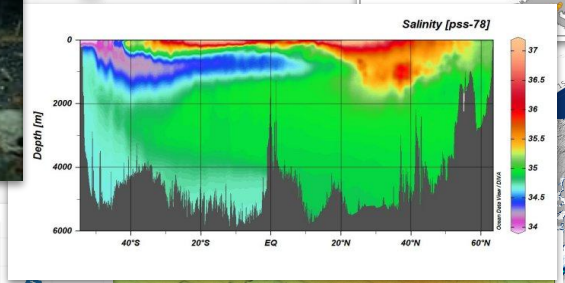


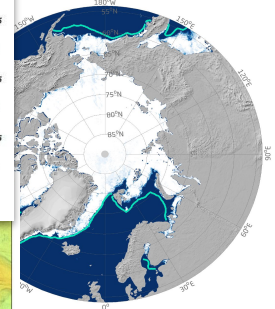
PANGAEA in a nutshell

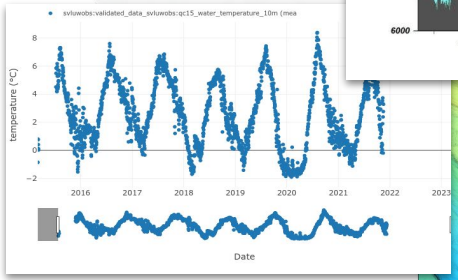
Findable Accessible Interoperable Reusable

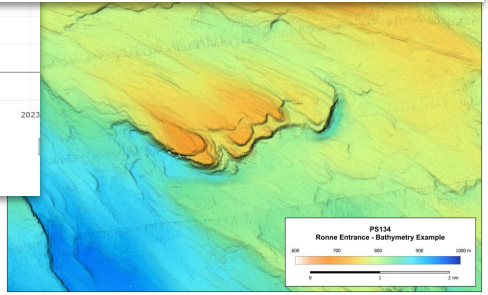












- > 435,000 datasets
- > 33 billion measurements
- > 890 projects
- ~ 10,000 new datasets / year

Who is behind PANGAEA?

- Team consists of …
  - Data editors
  - Scientific project & data managers
  - Software developers
  - Management & Coordination
- …and associated partners

HELMHOLTZ ZENTRUM FÜR UMWELTFORSCHUNG UFZ

GEOMAR Helmholtz Centre for Ocean Research Kiel

NIhK Wilhelmshaven

ZARM

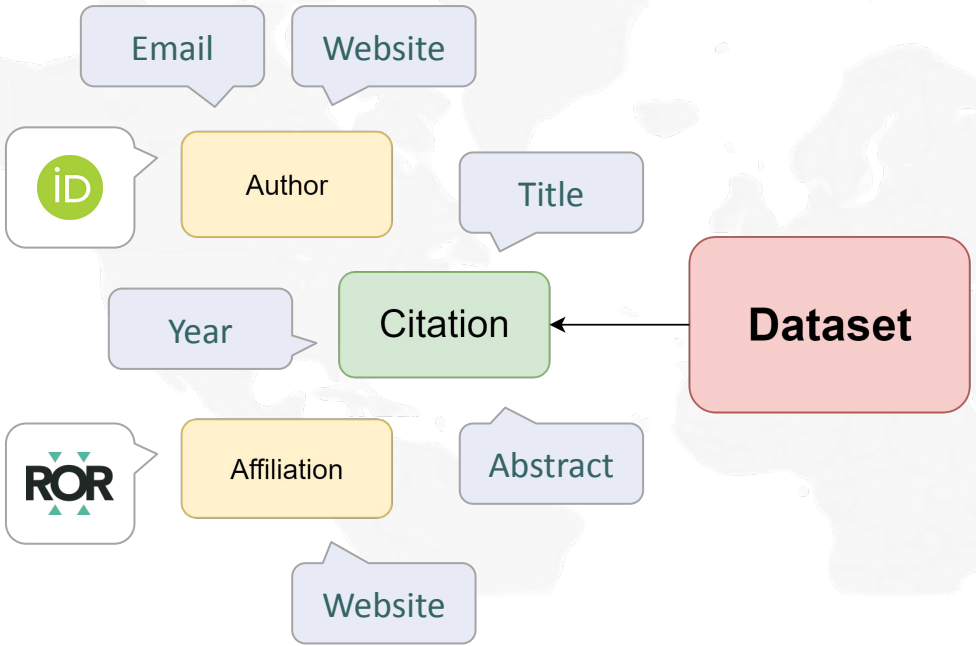
ZMT LEIBNIZ-ZENTRUM für Marine Tropenforschung

CCMAR Centro de Ciências do Mar

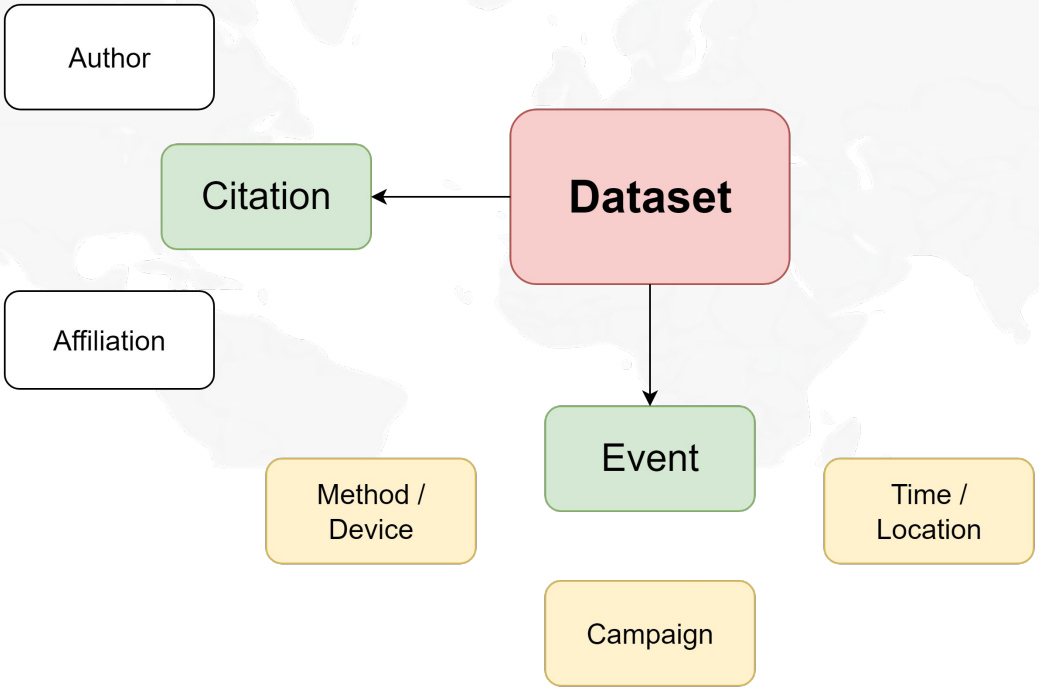
The keys to PANGAEA data

Data model

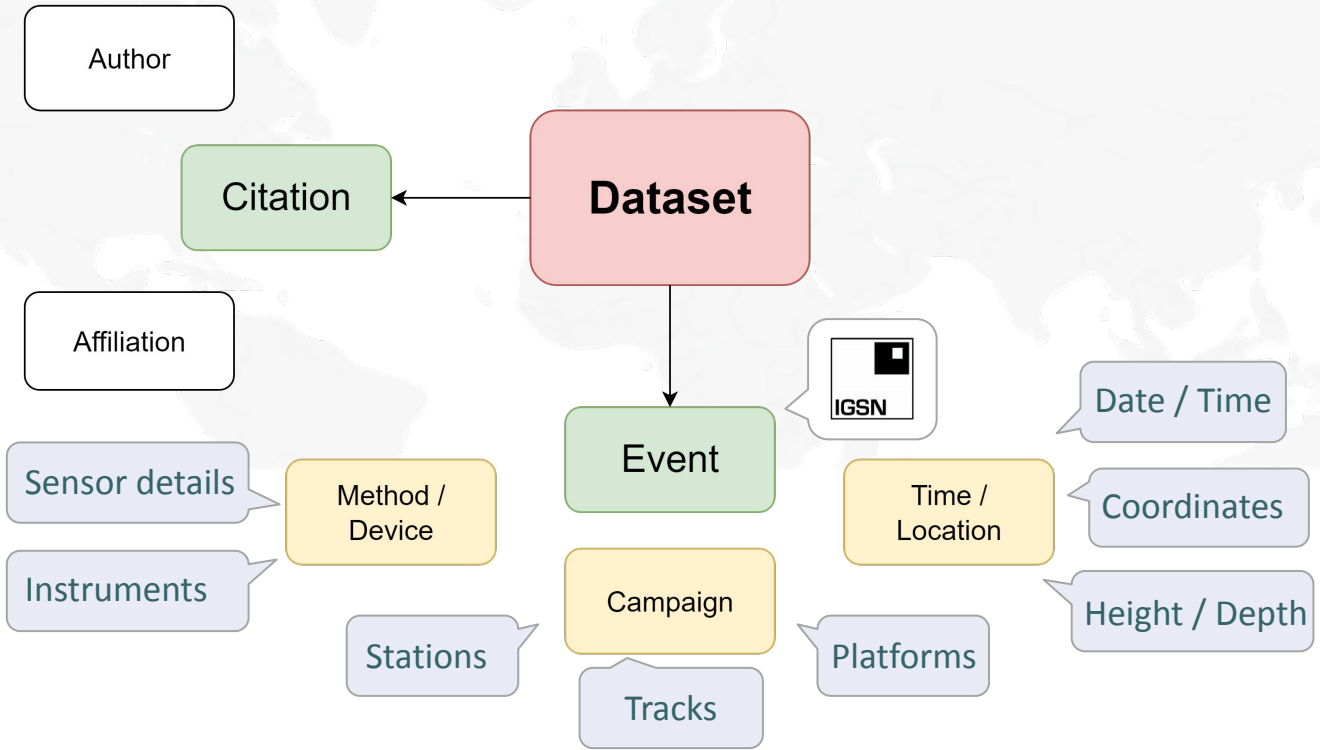
Data model


Email
Website
Author
Title
Year
Citation
Dataset
Affiliation
Abstract
Website

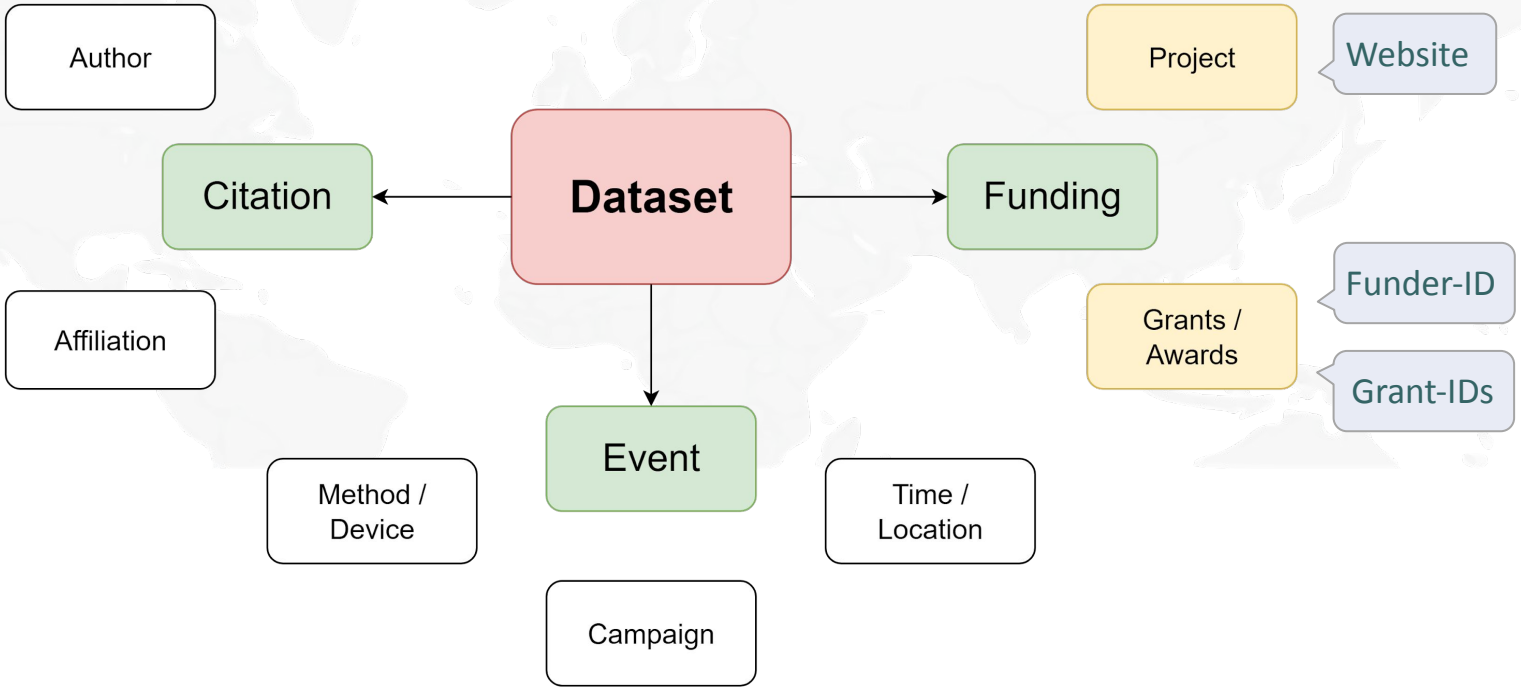
Data model


Author
Citation
Dataset
Affiliation
Event
Method / Device
Time / Location
Campaign

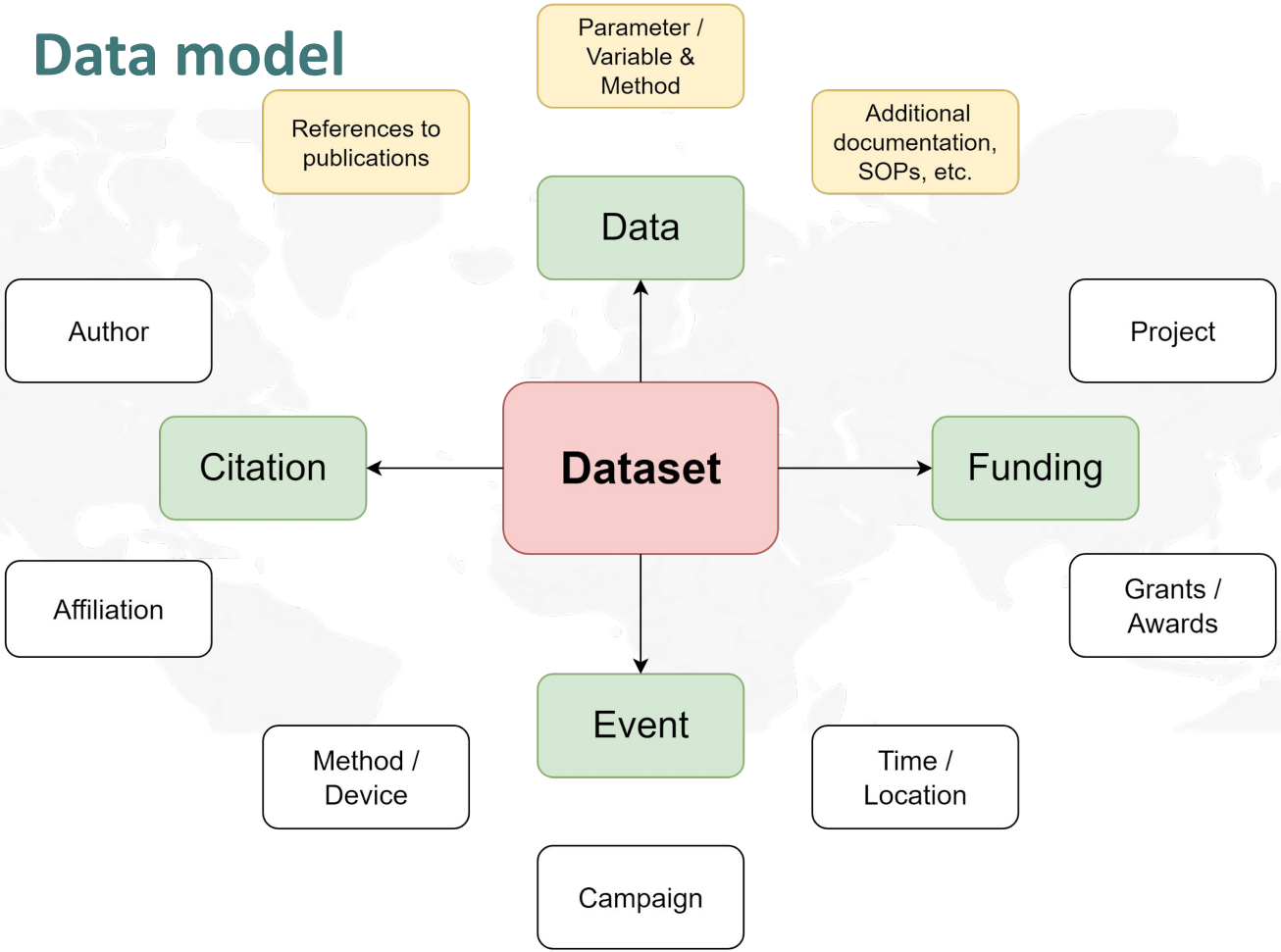
Data model


Author
Citation
Dataset
Affiliation
IGSN
Event
Date / Time
Sensor details
Method / Device
Time / Location
Coordinates
Instruments
Campaign
Height / Depth
Stations
Platforms
Tracks

Data model


Author
Citation
Affiliation
Dataset
Project
Website
Funding
Funder-ID
Grants / Awards
Grant-IDs
Event
Method / Device
Time / Location
Campaign

Data model


Parameter / Variable & Method
References to publications
Additional documentation, SOPs, etc.
Data
Author
Project
Citation
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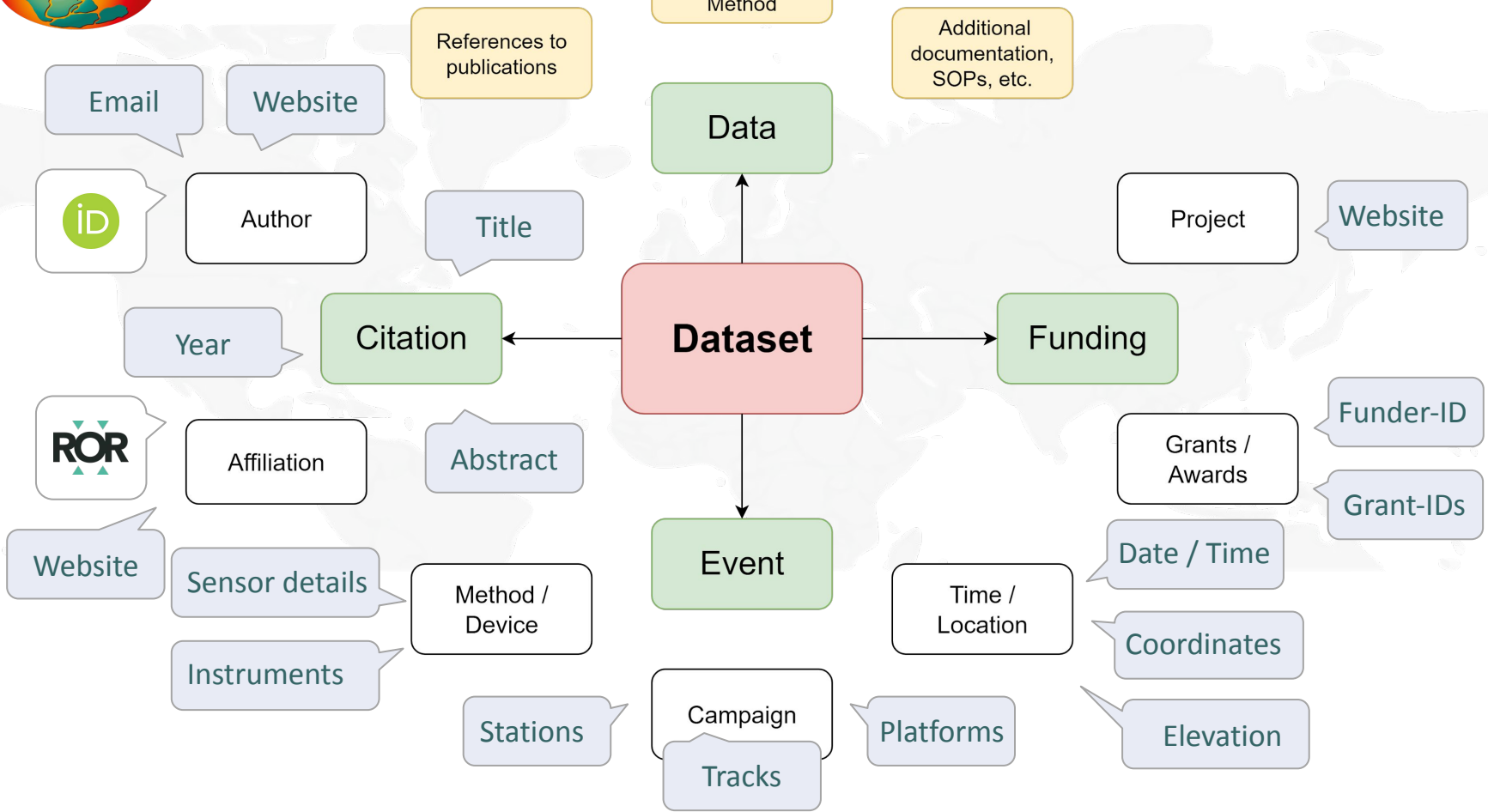
Funding
Affiliation
Grants / Awards
Event
Method / Device
Time / Location
Campaign

Data model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Email
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Citation
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Funding
Affiliation
Abstract
Grants / Awards
Funder-ID
Grant-IDs
Website
Sensor details
Method / Device
Event
Time / Location
Date / Time
Coordinates
Instruments
Stations
Campaign
Platforms
Elevation
Tracks

Landing pages
Basics

Dataset landing pages

Citation

Collection reference

Abstract

References

Dataset landing pages

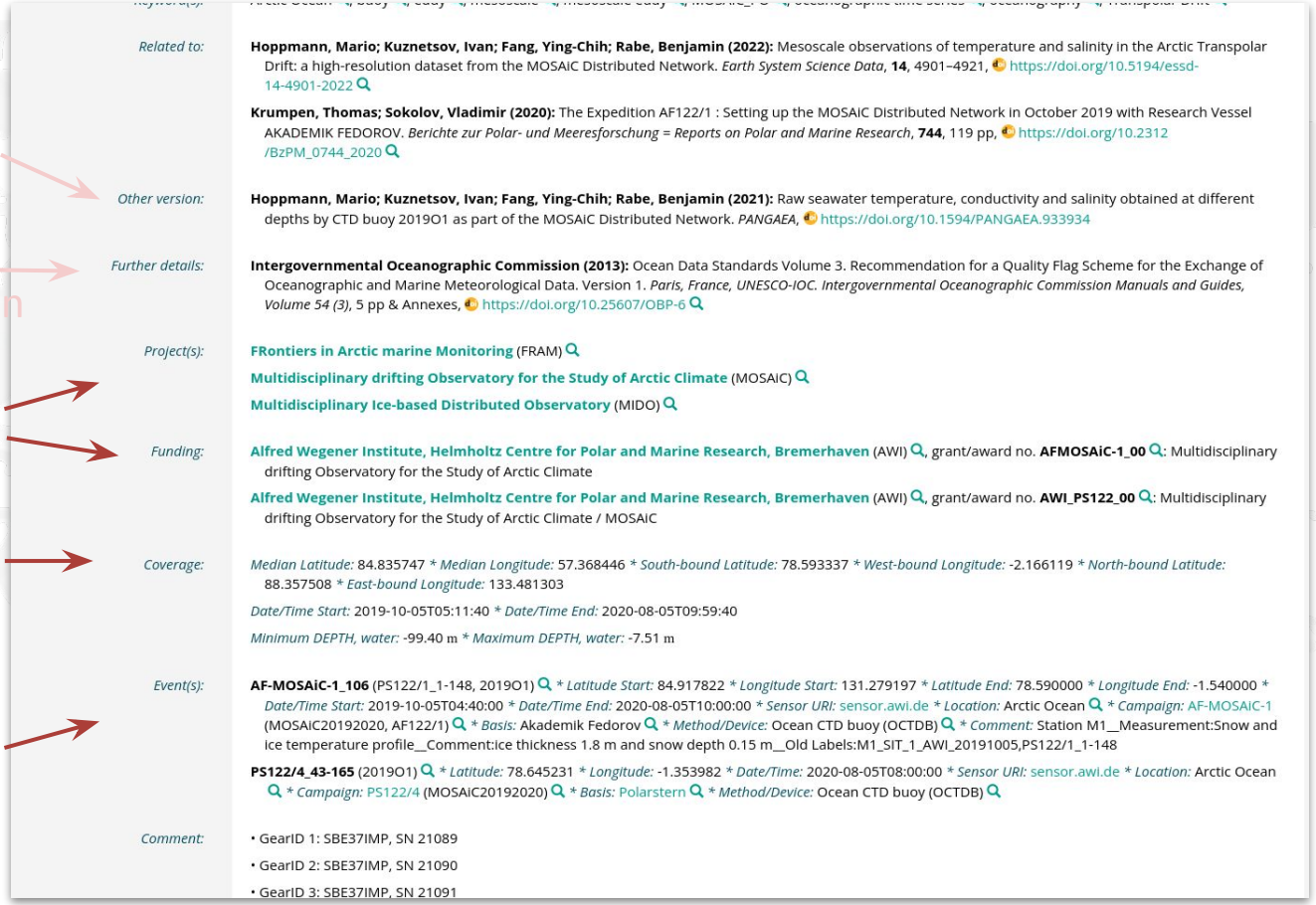
Alternative version

Additional documentation

Funding information

Geospatial & temporal reference

Sampling (event) information



Related to:

Hoppmann, Mario; Kuznetsov, Ivan; Fang, Ying-Chih; Rabe, Benjamin (2022): Mesoscale observations of temperature and salinity in the Arctic Transpolar Drift: a high-resolution dataset from the MOSAiC Distributed Network. *Earth System Science Data*, **14**, 4901–4921, https://doi.org/10.5194/essd-14-4901-2022

Krumpen, Thomas; Sokolov, Vladimir (2020): The Expedition AF122/1 : Setting up the MOSAiC Distributed Network in October 2019 with Research Vessel AKADEMIK FEDOROV. *Berichte zur Polar- und Meeresforschung = Reports on Polar and Marine Research*, **744**, 119 pp, https://doi.org/10.2312/BzPM_0744_2020

Other version:

Hoppmann, Mario; Kuznetsov, Ivan; Fang, Ying-Chih; Rabe, Benjamin (2021): Raw seawater temperature, conductivity and salinity obtained at different depths by CTD buoy 2019O1 as part of the MOSAiC Distributed Network. *PANGAEA*, https://doi.org/10.1594/PANGAEA.933934

Further details:

Intergovernmental Oceanographic Commission (2013): Ocean Data Standards Volume 3. Recommendation for a Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data. Version 1. *Paris, France, UNESCO-IOC. Intergovernmental Oceanographic Commission Manuals and Guides, Volume 54 (3)*, 5 pp & Annexes, https://doi.org/10.25607/OBP-6

Project(s):

FRontiers in Arctic marine Monitoring (FRAM)

Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC)

Multidisciplinary Ice-based Distributed Observatory (MIDO)

Funding:

Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven (AWI), grant/award no. **AFMOSAiC-1_00**: Multidisciplinary drifting Observatory for the Study of Arctic Climate

Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven (AWI), grant/award no. **AWI_PS122_00**: Multidisciplinary drifting Observatory for the Study of Arctic Climate / MOSAiC

Coverage:

Median Latitude: 84.835747 * *Median Longitude:* 57.368446 * *South-bound Latitude:* 78.593337 * *West-bound Longitude:* -2.166119 * *North-bound Latitude:* 88.357508 * *East-bound Longitude:* 133.481303

Date/Time Start: 2019-10-05T05:11:40 * *Date/Time End:* 2020-08-05T09:59:40

Minimum DEPTH, water: -99.40 m * *Maximum DEPTH, water:* -7.51 m

Event(s):

AF-MOSAiC-1_106 (PS122/1_1-148, 2019O1) * *Latitude Start:* 84.917822 * *Longitude Start:* 131.279197 * *Latitude End:* 78.590000 * *Longitude End:* -1.540000 * *Date/Time Start:* 2019-10-05T04:40:00 * *Date/Time End:* 2020-08-05T10:00:00 * *Sensor URI:* sensor.awi.de * *Location:* Arctic Ocean * *Campaign:* AF-MOSAiC-1 (MOSAiC20192020, AF122/1) * *Basis:* Akademik Fedorov * *Method/Device:* Ocean CTD buoy (OCTDB) * *Comment:* Station M1__Measurement:Snow and ice temperature profile__Comment:ice thickness 1.8 m and snow depth 0.15 m__Old Labels:M1_SIT_1_AWI_20191005,PS122/1_1-148

PS122/4_43-165 (2019O1) * *Latitude:* 78.645231 * *Longitude:* -1.353982 * *Date/Time:* 2020-08-05T08:00:00 * *Sensor URI:* sensor.awi.de * *Location:* Arctic Ocean * *Campaign:* PS122/4 (MOSAiC20192020) * *Basis:* Polarstern * *Method/Device:* Ocean CTD buoy (OCTDB)

Comment:

- GearID 1: SBE37IMP, SN 21089
- GearID 2: SBE37IMP, SN 21090
- GearID 3: SBE37IMP, SN 21091

Dataset landing pages

Variables measured

documented changes

Usage rights information

logistical support that made this effort possible. We express our gratitude to all participants of these expeditions, and particularly to the MOSAiC School for their field assistance during the set-up. We appreciate the efforts of Kirstin Schulz, Julia Regnery, Ingo Schuffenhauer, Morven Mullwijk, Sandra Tippenhauer and the entire Leg 4 Team for the recovery of the instruments.

Parameter(s):

#	Name	Short Name	Unit	Principal Investigator	Method/Device	Comment
1	DATE/TIME	Date/Time		Hoppmann, Mario		Geocode
2	LATITUDE	Latitude		Hoppmann, Mario		Geocode
3	LONGITUDE	Longitude		Hoppmann, Mario		Geocode
4	Drift velocity	Drift vel	m/s	Hoppmann, Mario		
5	Submerged	Submerged		Hoppmann, Mario		Boolean (logical)
6	Temperature, air	TTT	°C	Hoppmann, Mario		Surface
7	Gear identification number	Gear ID		Hoppmann, Mario	see description in data-set comment	
8	Conductivity	Cond	mS/cm	Hoppmann, Mario	CTD, SEA-BIRD SBE 37-IMP MicroCAT	
9	Temperature, water	Temp	°C	Hoppmann, Mario	CTD, SEA-BIRD SBE 37-IMP MicroCAT	
10	Pressure, water	Press	dbar	Hoppmann, Mario	CTD, SEA-BIRD SBE 37-IMP MicroCAT	
11	DEPTH, water	Depth water	m	Hoppmann, Mario	calculated from pressure and latitude	Geocode
12	Salinity	Sal		Hoppmann, Mario	PSS-78, salinity scale	
13	Quality flag, conductivity	QF conduct		Hoppmann, Mario	Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data	
14	Quality flag, water temperature	QF water temp		Hoppmann, Mario	Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data	
15	Quality flag, water pressure	QF water press		Hoppmann, Mario	Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data	
16	Quality flag, water depth	QF water depth		Hoppmann, Mario	Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data	
17	Quality flag, salinity	QF sal		Hoppmann, Mario	Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data	
18	Flag, buoy	Flag buoy		Hoppmann, Mario	see comment	Indicator for buoy-transmitted (1) or internally-recorded (0) CTD data

Change history: **2022-10-13T13:17:57** – Quality flags corrected

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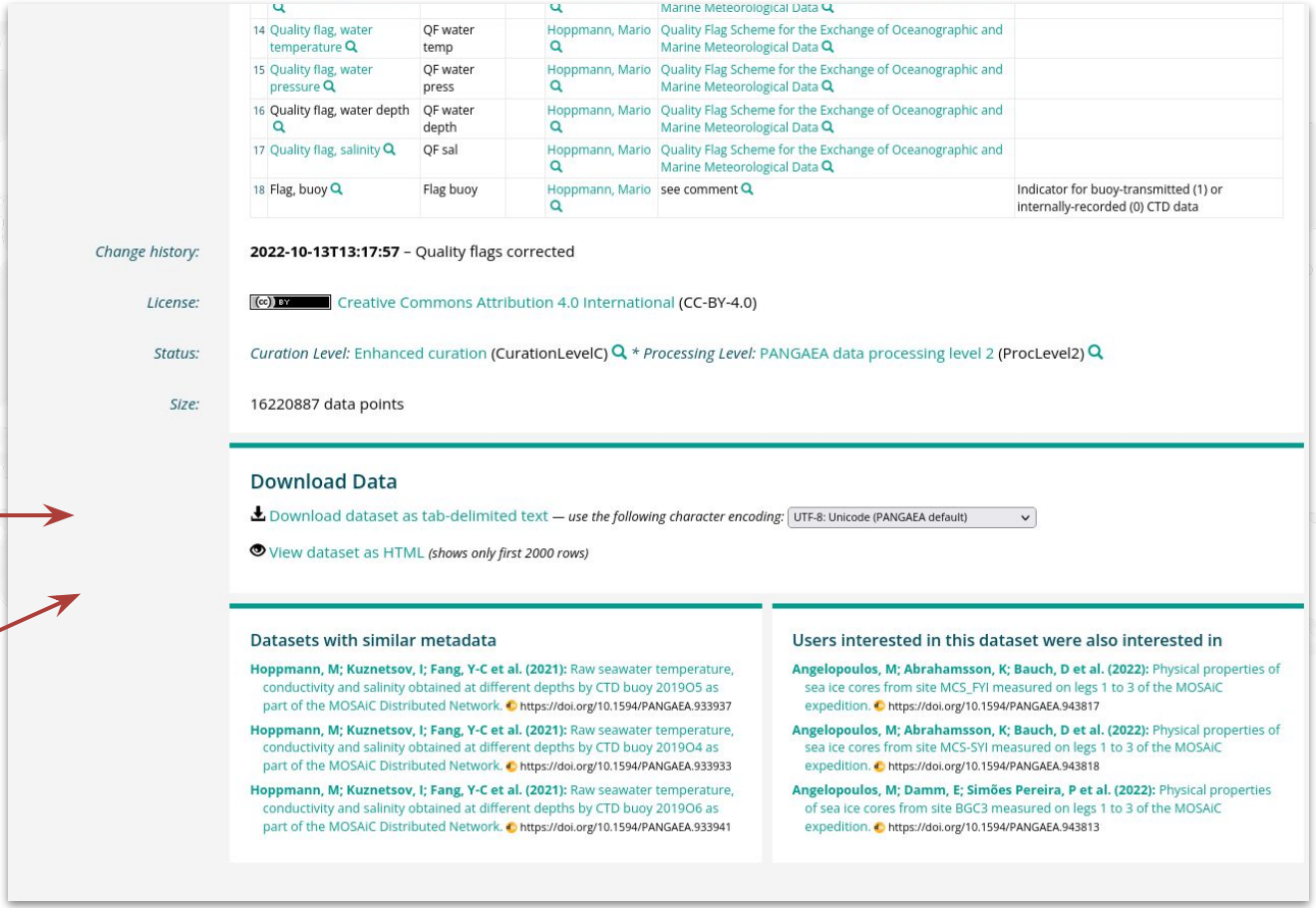
Dataset landing pages

Direct download

Data preview



					Marine Meteorological Data	
14	Quality flag, water temperature	QF water temp		Hoppmann, Mario	Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data	
15	Quality flag, water pressure	QF water press		Hoppmann, Mario	Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data	
16	Quality flag, water depth	QF water depth		Hoppmann, Mario	Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data	
17	Quality flag, salinity	QF sal		Hoppmann, Mario	Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data	
18	Flag, buoy	Flag buoy		Hoppmann, Mario	see comment	Indicator for buoy-transmitted (1) or internally-recorded (0) CTD data

Change history: **2022-10-13T13:17:57** – Quality flags corrected

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Status: *Curation Level:* Enhanced curation (CurationLevelC) * *Processing Level:* PANGAEA data processing level 2 (ProcLevel2)

Size: 16220887 data points

Download Data

Download dataset as tab-delimited text — *use the following character encoding:* UTF-8: Unicode (PANGAEA default)

View dataset as HTML *(shows only first 2000 rows)*

Datasets with similar metadata

Hoppmann, M; Kuznetsov, I; Fang, Y-C et al. (2021): Raw seawater temperature, conductivity and salinity obtained at different depths by CTD buoy 2019O5 as part of the MOSAiC Distributed Network. https://doi.org/10.1594/PANGAEA.933937

Hoppmann, M; Kuznetsov, I; Fang, Y-C et al. (2021): Raw seawater temperature, conductivity and salinity obtained at different depths by CTD buoy 2019O4 as part of the MOSAiC Distributed Network. https://doi.org/10.1594/PANGAEA.933933

Hoppmann, M; Kuznetsov, I; Fang, Y-C et al. (2021): Raw seawater temperature, conductivity and salinity obtained at different depths by CTD buoy 2019O6 as part of the MOSAiC Distributed Network. https://doi.org/10.1594/PANGAEA.933941

Users interested in this dataset were also interested in

Angelopoulos, M; Abrahamsson, K; Bauch, D et al. (2022): Physical properties of sea ice cores from site MCS_FYI measured on legs 1 to 3 of the MOSAiC expedition. https://doi.org/10.1594/PANGAEA.943817

Angelopoulos, M; Abrahamsson, K; Bauch, D et al. (2022): Physical properties of sea ice cores from site MCS-SYI measured on legs 1 to 3 of the MOSAiC expedition. https://doi.org/10.1594/PANGAEA.943818

Angelopoulos, M; Damm, E; Simões Pereira, P et al. (2022): Physical properties of sea ice cores from site BGC3 measured on legs 1 to 3 of the MOSAiC expedition. https://doi.org/10.1594/PANGAEA.943813

Dataset landing pages

		depth			Meteorological Data
17	Quality flag, salinity	QF sal		Hoppmann, Mario	Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data
18	Flag, buoy	Flag buoy		Hoppmann, Mario	see comment

Indicator for buoy-transmitted (1) or internally-recorded (0) CTD data

Change history: **2022-10-13T13:17:57** – Quality flags corrected

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Status: *Curation Level:* Enhanced curation (CurationLevelC) * *Processing Level:* PANGAEA data processing level 2 (ProcLevel2)

Size: 16220887 data points

Data

Download dataset as tab-delimited text — *use the following character encoding:* UTF-8: Unicode (PANGAEA default)

1 Date/Time	2 Latitude	3 Longitude	4 Drift vel [m/s]	5 Submerged	6 TTT [°C]	7 Gear ID	8 Cond [mS/cm]	9 Temp [°C]	10 Press [dbar]	11 Depth water [m]	12 Sal	13 QF conduct	14 QF water temp	15 QF water pres
2019-10-05T05:11:40	84.918326	131.268406	0.08			1						9	9	
2019-10-05T05:11:40	84.918326	131.268406	0.08			2						9	9	
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Dataset landing pages

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PANGAEA data search challenge

Challenge: Biological data

Break out room 1

How do environmental and anthropogenic change affect the biodiversity in Antarctica?

Alfred-Wegener-Institut/
Priska Hunkeler (CC-BY 4.0)

Challenge: Biogeochemical data

Break out room 2

> How can corals be used as geochemical archives of human impact, particularly through marine heat waves, acidification, pollution or eutrophication?

Credit: Hagainativ via Wikimedia

Challenge: Oceanography data

Break out room 3

> In which geographical regions can you find marine litter?
> Do they change for different types of litter?

Credit: Mudasir Zainuddin
via Wikimedia

Challenge: Climate data

Break out room 4

> What was the variability of atmospheric carbon dioxide levels during the last 1 Mio. years, and how does it compare to levels before industrialisation and today?

Image Credit : Dennis Bromage / Barcroft

Search challenge wrap-up & discussion

Please present your groups findings & experiences

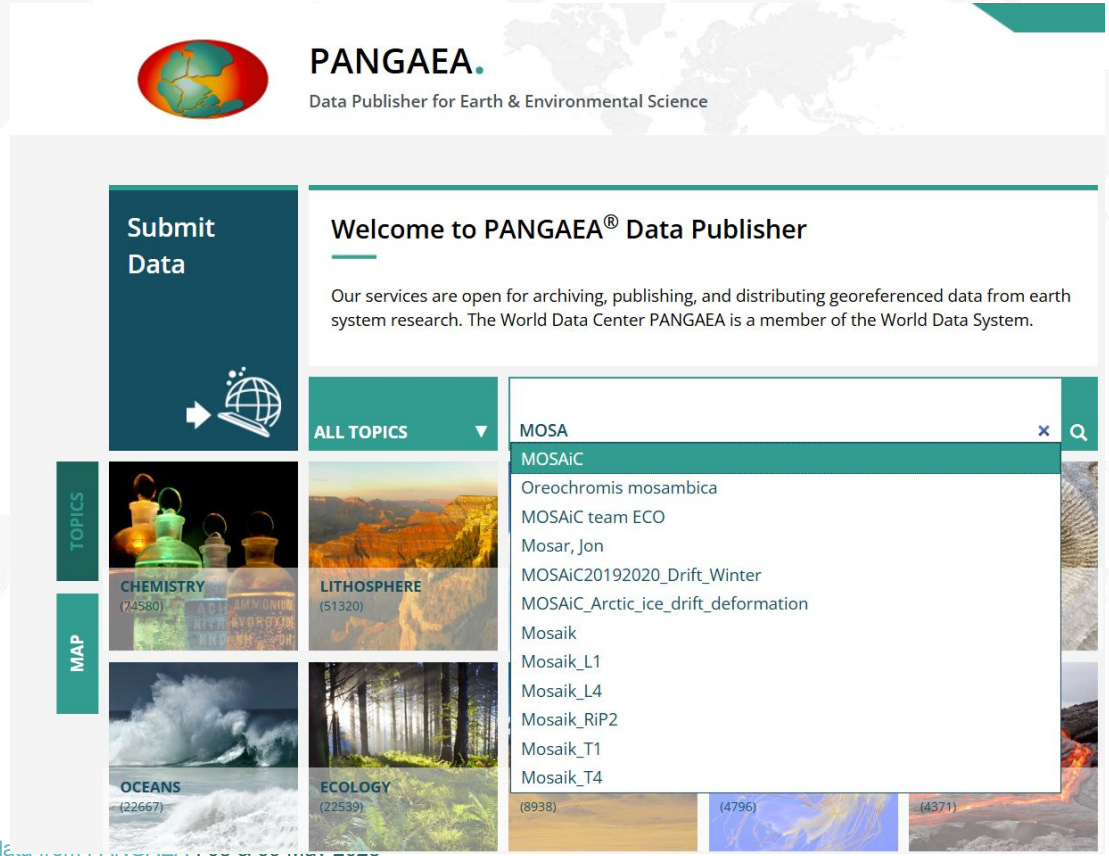
a. What were the outcomes of your challenges briefly
b. What went well concerning the data search?
c. What were your (groups) challenges with searching?
d. Focus on key points / findings / issues / takeaways
e. Anything you missed? What could have helped?

Advanced search

Kathrin Riemann-Campe

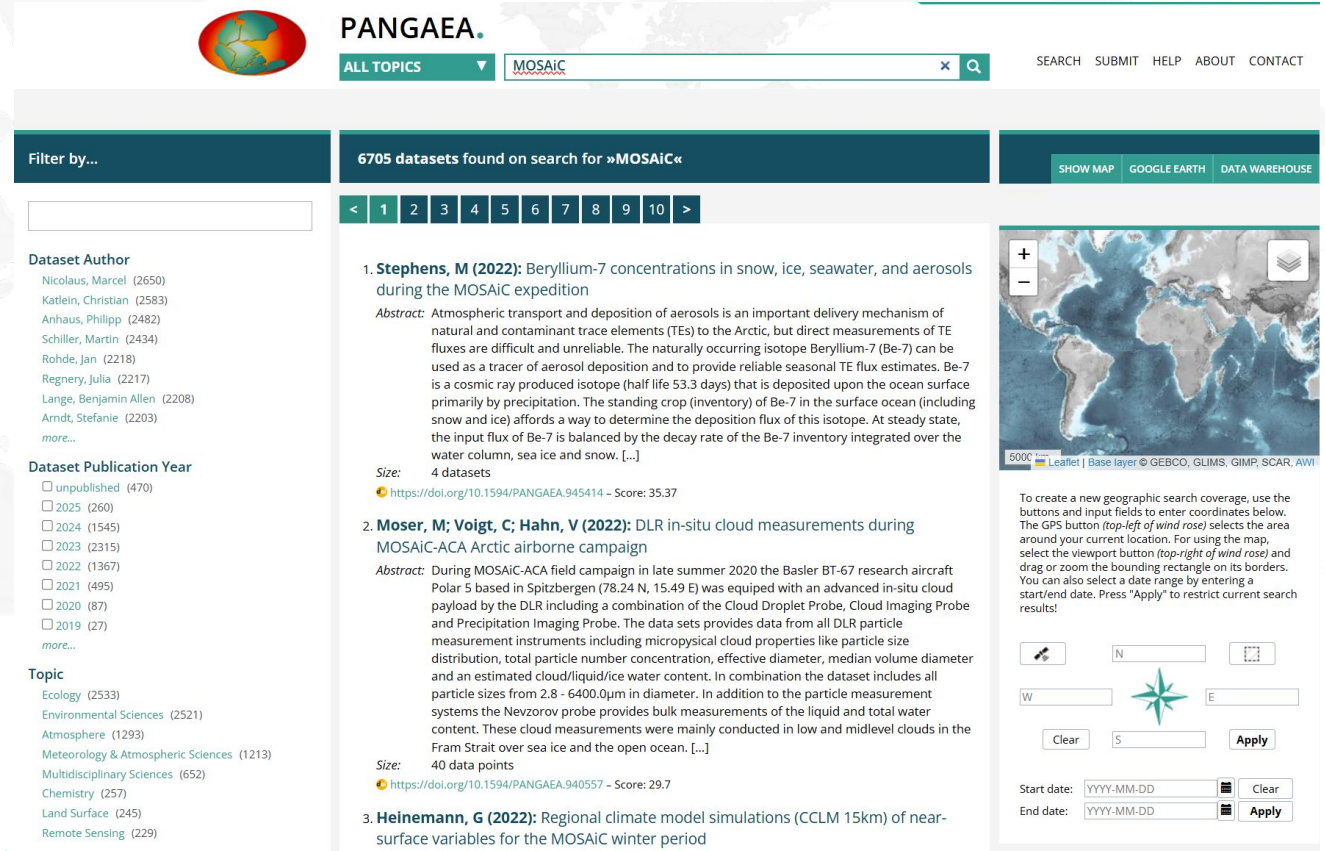
Start with keyword(s)

- start with any keyword in search panel



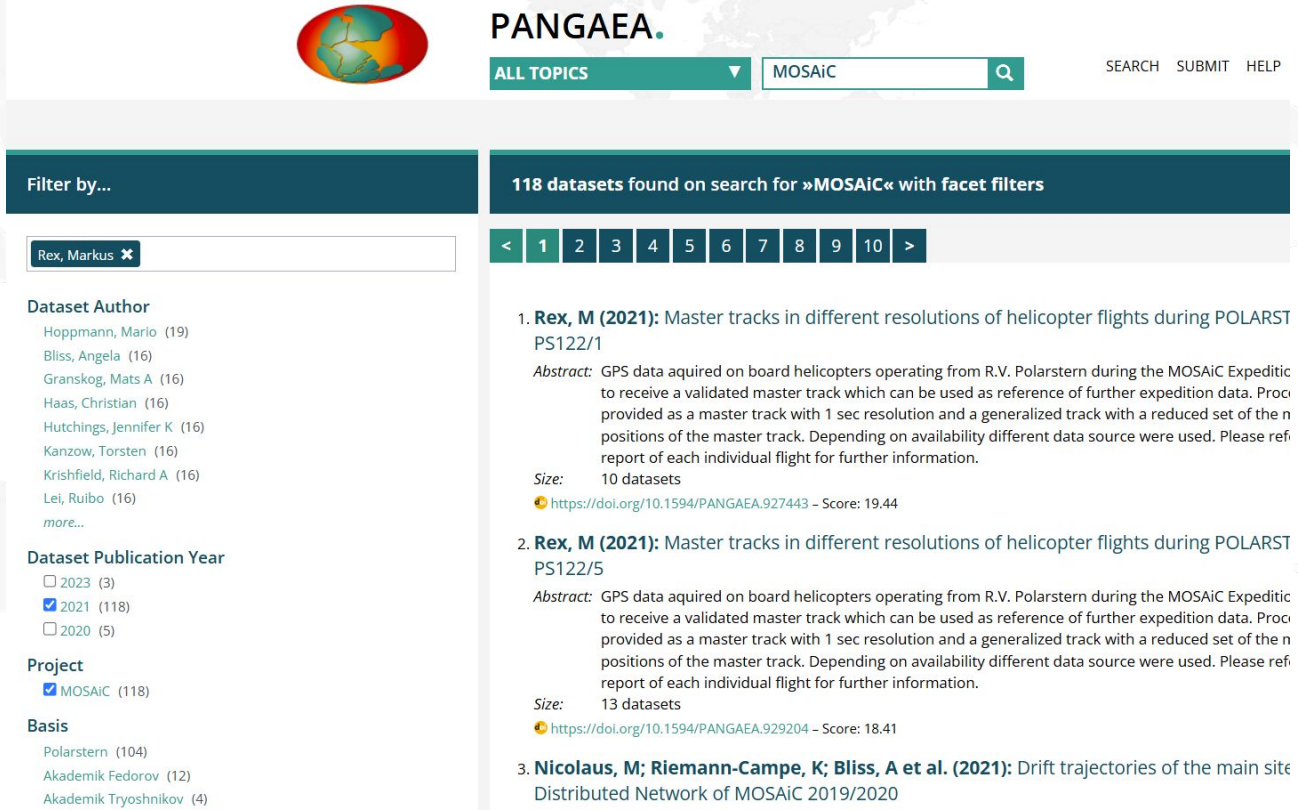
Start with keyword(s)

- start with any keyword in search panel



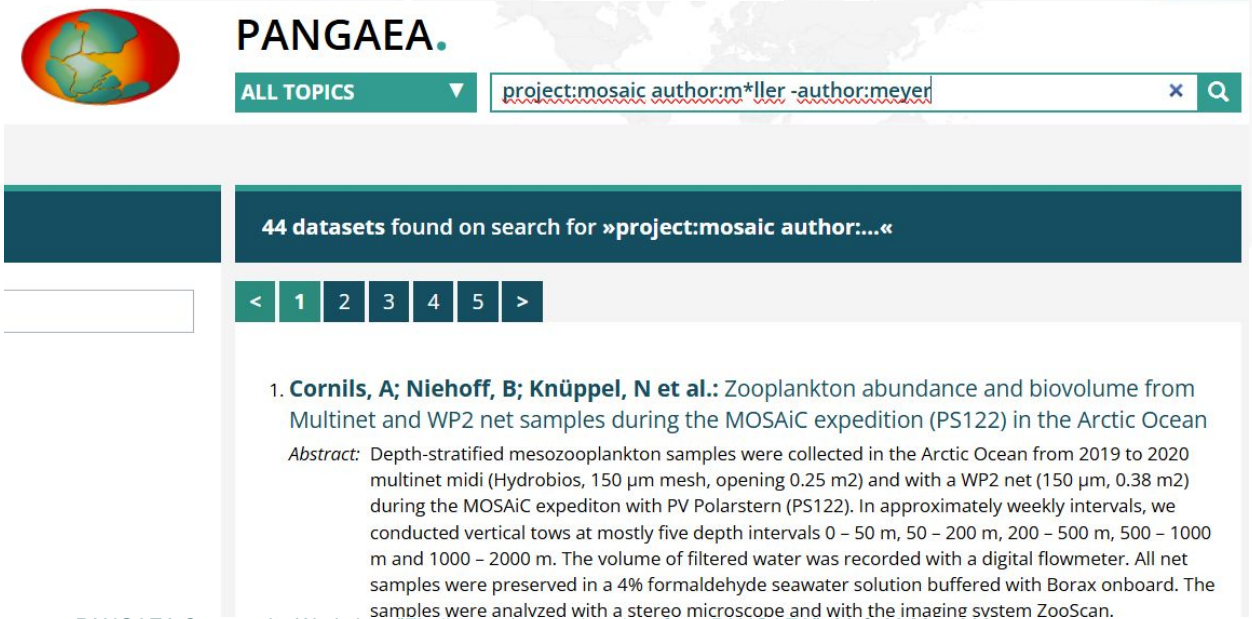
Search via facet filter

- start with any keyword in search panel
- refine with facet filter

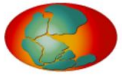


Use specific keywords

- use specific keywords, wildcards (*), exclusions (-), etc.
- Help: PANGAEA Wiki



Where to find the PANGAEA Wiki ?



PANGAEA.

ALL TOPICS ▼ | project:mosaic author:m*ller -author:meyer ×

SEARCH SUBMIT HELP ABOUT CONTACT

Filter by...

Dataset Author
- Lonardi, Michael (19)
- Pilz, Christian (19)
- Siebert, Holger (19)
- Wehner, Birgit (19)
- Granskog, Mats A (15)
- Müller, Oliver (15)
- Gardner, Jessie (13)
- Hoppe, Clara Jule Marie (11)
- more...

Dataset Publication Year
- unpublished (1)
- 2024 (4)
- 2023 (16)
- 2022 (23)

Topic
- Cryosphere (8)
- Chemistry (7)
- Organic Chemistry (7)
- Animalia (3)
- Biological Classification (3)
- Chordata (3)
- Ecology (3)
- Environmental Sciences (3)
- more...

Project
- MOSAiC (44)
- AC3 (21)

44 datasets found on search for »project:mosaic author:...«

SHOW MAP | GOOGLE EARTH | DATA WAREHOUSE

< 1 2 3 4 5 >

1. **Cornils, A; Niehoff, B; Knüppel, N et al.:** Zooplankton abundance and biovolume from Multinet and WP2 net samples during the MOSAiC expedition (PS122) in the Arctic Ocean

Abstract: Depth-stratified mesozooplankton samples were collected in the Arctic Ocean from 2019 to 2020 multinet midi (Hydrobios, 150 µm mesh, opening 0.25 m2) and with a WP2 net (150 µm, 0.38 m2) during the MOSAiC expediton with PV Polarstern (PS122). In approximately weekly intervals, we conducted vertical tows at mostly five depth intervals 0 – 50 m, 50 – 200 m, 200 – 500 m, 500 – 1000 m and 1000 – 2000 m. The volume of filtered water was recorded with a digital flowmeter. All net samples were preserved in a 4% formaldehyde seawater solution buffered with Borax onboard. The samples were analyzed with a stereo microscope and with the imaging system ZooScan.

Size: 1 datasets

https://doi.pangaea.de/10.1594/PANGAEA.980504 – Score: 13.01

2. **Torres-Valdés, S; Rember, R; Heitmann, L et al. (2024):** Dissolved nutrients data from the PS122 MOSAiC Expedition carried out onboard Polarstern during Legs 1 to 3

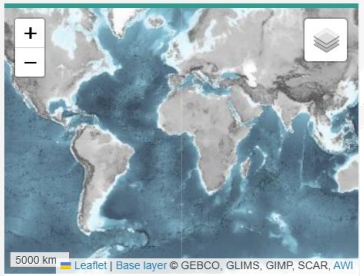
Abstract: Samples for the analysis of dissolved nutrients were collected during the Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC) from the water column, sea ice cores and from special events/locations (e.g., leads, melt ponds, brine, incubation experiments). Samples for dissolved inorganic nutrients (NO3 +NO2 , NO2 , PO4 , Si(OH)4, NH4) were analysed onboard during PS122 legs 1 to 3, with duplicate samples collected from CTD casts for later analysis of total dissolved nitrogen (TDN) and total dissolved phosphorus (TDP). From leg 4, all samples collected were stored frozen at -20°C for later analysis. Analyses of stored samples were carried out at the AWI Nutrient Facility between January and March 2021. Nutrient analyses onboard and on land were carried out using a Seal Analytical AA3 continuous flow autoanalyser, controlled by the AACE software version 7.09. [...]

Size: 25249 data points

https://doi.org/10.1594/PANGAEA.966213 – Score: 11.97

3. **Torres-Valdés, S; Rember, R; Heitmann, L et al. (2024):** Dissolved nutrients data from the PS122 MOSAiC Expedition carried out at the AWI Nutrient Facility

Abstract: Samples for the analysis of dissolved nutrients were collected during the Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC) from the water column, sea ice cores and from



To create a new geographic search coverage, use the buttons and input fields to enter coordinates below. The GPS button *(top-left of wind rose)* selects the area around your current location. For using the map, select the viewport button *(top-right of wind rose)* and drag or zoom the bounding rectangle on its borders. You can also select a date range by entering a start/end date. Press "Apply" to restrict current search results!

N | W | E | S | Clear | Apply

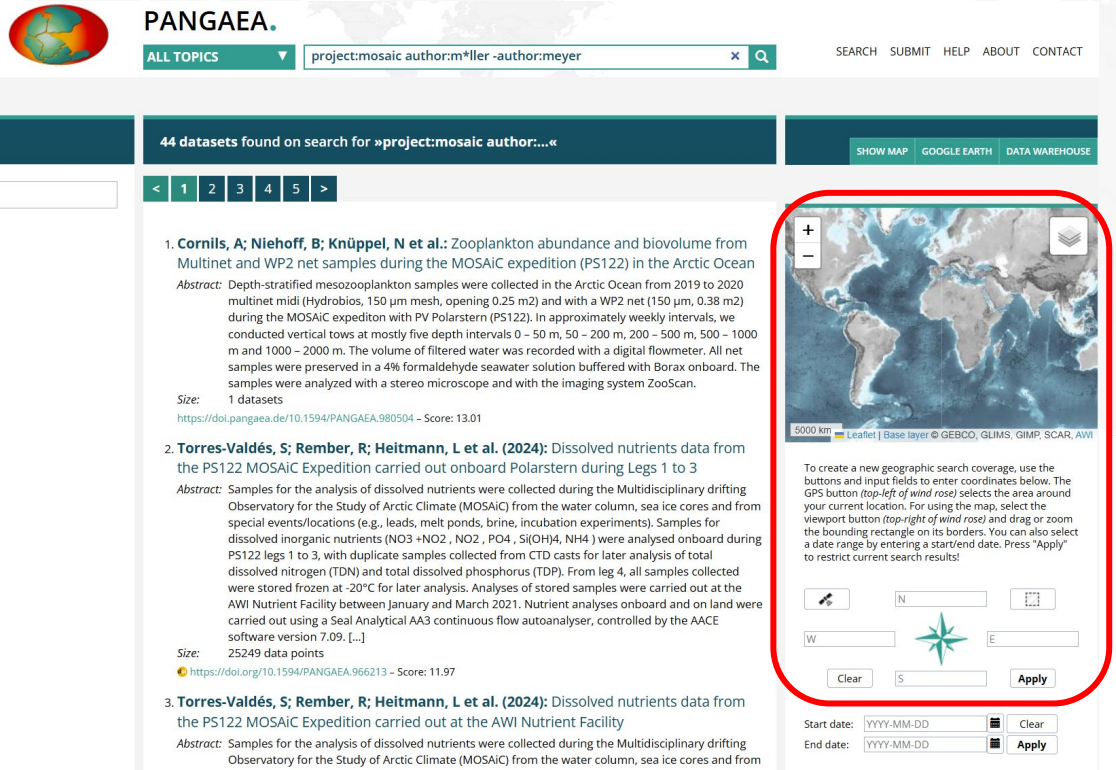
Start date: YYYY-MM-DD Clear

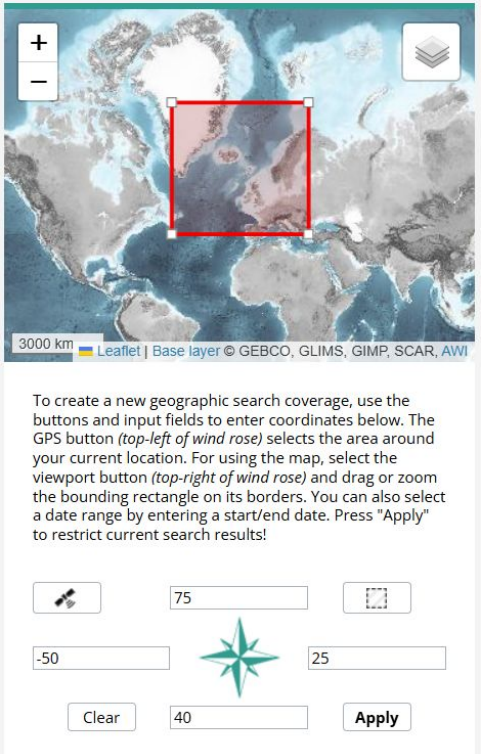
End date: YYYY-MM-DD Apply

PAN

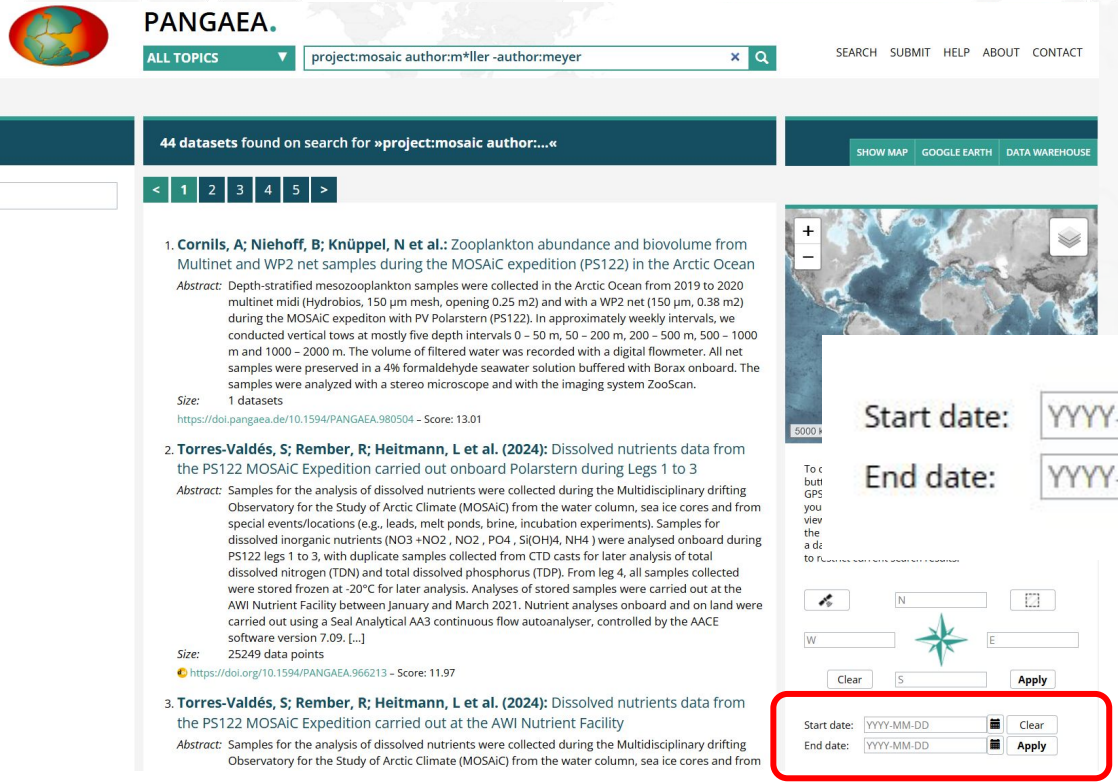
Show results on map

Apply bounding box on map





Select time range of data acquisition



Select and download via Data Warehouse

Kathrin Riemann-Campe ⇦ log in needed

PANGAEA.

ALL TOPICS ▼ | mosaic "snow height" ×

SEARCH SUBMIT HELP ABOUT CONTACT

Filter by...

Dataset Author
- Nicolaus, Marcel (105)
- Hoppmann, Mario (102)
- Katlein, Christian (73)
- Tao, Ran (73)
- Belter, Hans Jakob (50)
- Rohde, Jan (49)
- Anhaus, Philipp (27)
- Salganik, Evgenii (16)
- *more...*

Dataset Publication Year
- 2025 (2)
- 2024 (68)
- 2023 (19)
- 2022 (9)
- 2021 (15)
- 2020 (12)

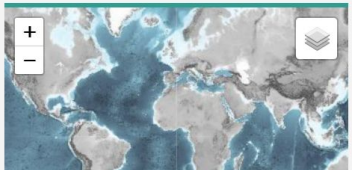
Topic
- Chemistry (5)
- Organic Chemistry (5)
- Cryosphere (3)
- Inorganic Chemistry (3)
- Geosciences, Multidisciplinary (1)
- Lithosphere (1)

Project
- MOSAiC (121)
- AWI_Sealce (93)
- meereisportal.de (93)
- MIDO (14)

125 datasets found on search for »mosaic "snow height"«

< 1 2 3 4 5 6 7 8 9 10 >

SHOW MAP | GOOGLE EARTH | DATA WAREHOUSE



1. **Nicolaus, M; Hoppmann, M; Regnery, J (2021):** Snow height on sea ice, meteorological conditions and drift of sea ice from autonomous measurements from buoy 2020S106, deployed during MOSAiC 2019/20

Abstract: Snow height was measured by the Snow Buoy 2020S106, an autonomous platform, installed on drifting sea ice in the Arctic Ocean during MOSAiC (Leg 5) 2019/20. The resulting time series describes the evolution of snow height as a function of place and time between 26 August 2020 and 26 June 2021 in sample intervals of 1 hour. The Snow Buoy consists of four independent acoustic range finder measurements re
to snow height, geographic pos
temperature were measured. N
into the sea ice. Thus, these me
the original snow-ice interface.
the snow pack around the buoy

Size: 116672 data points

https://doi.org/10.1594/PANGAEA.937174 -

2. **Nicolaus, M; Hoppmann, M; Reg**
conditions and drift of sea ice fro
deployed during MOSAiC 2019/2(

Abstract: Snow height was measured by
drifting sea ice in the Arctic Oce
describes the evolution of snov
and 01 July 2021 in sample inte
range finder measurements re
to snow height, geographic pos
temperature were measured. N
into the sea ice. Thus, these me
the original snow-ice interface.
the snow pack around the buoy

Size: 110176 data points

https://doi.org/10.1594/PANGAEA.937173 – Download – Score: 55.66

Available Parameters and Geocodes

Page 1 of 165 < prev 1 2 3 4 5 6 next >

Score	Parameter/Geocode	
	DATE/TIME	✚
	LATITUDE	✚
	LONGITUDE	✚
	EVENT LABEL	✚
	ELEVATION [m a.s.l.]	✚
	DEPTH, ice/snow [m]	✚
	DEPTH, water [m]	✚
100.0%	Snow height [m]	✚
23.1%	Quality flag, snow height	✚
17.7%	Quality flag, position	✚
15.0%	Temperature, technical [°C]	✚
12.1%	Pressure, atmospheric [hPa]	✚

Configuration

Page 1 of 1 < prev 1 next >

Parameter/Geocode	Method	
DATE/TIME	no average	⇩ 🗑
LATITUDE		⇧⇩ 🗑
LONGITUDE		⇧⇩ 🗑
Snow height [m]	<any>	⇧ 🗑

<any>
Buoy, radiation station
Snow buoy
SnowMicroPen
Tape measure

Outline Day 2

May 09	Download and access data
10:30 am	Intro PANGAEA programmable interfaces
10:50 am	**Questions I**
10:55 am	Introducing pangaear
11:05 am	Introducing pangaeapy
11:20am	**Questions II**
11:25 am	**Break** (10 min)
11:35 am	Pangaeapy practical
12:20 am	**Questions III & Outro** (10 min)

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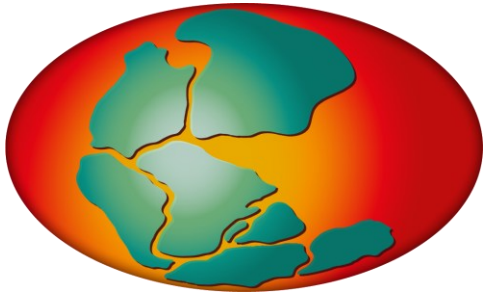
11:35 am	Pangaeapy practical
12:20 am	**Questions III & Outro** (10 min)



PANGAEA Community Workshop 2025

Intro: PANGAEA programmable interfaces

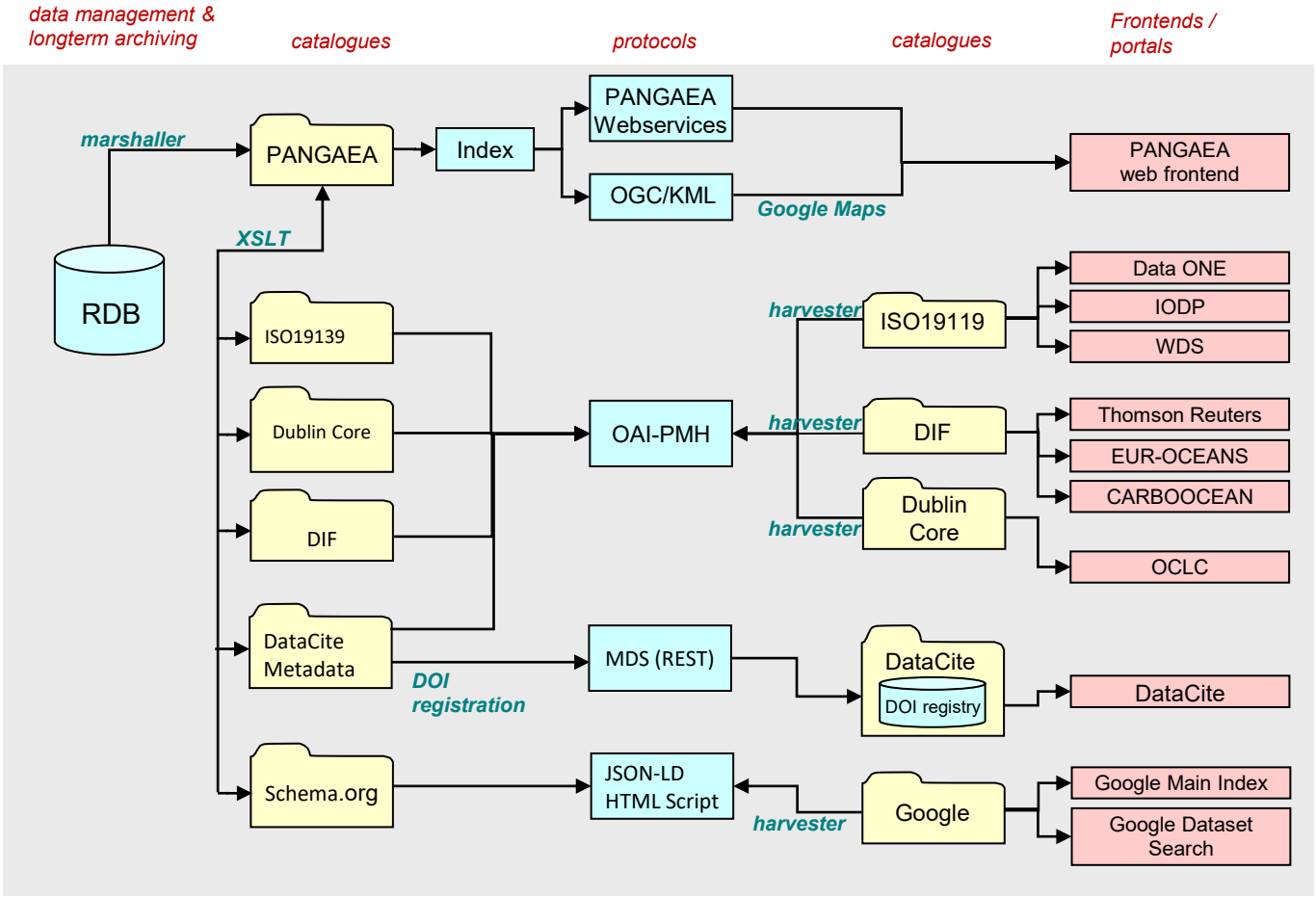
Uwe Schindler

PANGAEA (MARUM, University of Bremen)

Overview

PANGAEA Metadata Dissemination

PANGAEA Metadata Services



Data and Metadata APIs:
Programmatic download!

DOI Link Discovery & Content Negotiation

API to access metadata and data?

There's no PANGAEA API for that!

API to access metadata and data?

There's no PANGAEA API for that!

It's all included in PANGAEA's DOI / dataset landing pages!

*) and many other data centers have the same available thanks to FAIR
**) and also your paper publisher may serve metadata like that

Background

I have a DOI name, **FAIR** / machine usage? **=>**

HTTP Content Negotiation

Download link discovery? **=>**

https://signposting.org/

Background

Newest Work

Content Negotiation by Profile
W3C Working Draft 26 November 2019

https://www.w3.org/TR/dx-prof-conneg/

Download link discovery? =>

https://signposting.org/

Citation:

Capron, Emilie; Govin, Aline; Stone, Emma J; Masson-Delmotte, Valerie; Mulitza, Stefan; Otto-Bliesner, Bette L; Rasmussen, Tine Lander; Sime, Louise C; Waelbroeck, Claire; Wolff, Eric William (2015): Last Interglacial synthesis of high-latitude temperature: temperature anomalies and associated errors for 4 time slices [dataset]. *PANGAEA*, https://doi.org/10.1594/PANGAEA.841672,

Supplement to: Capron, E et al. (2014): Temporal and spatial structure of multi-millennial temperature changes at high latitudes during the Last Interglacial. *Quaternary Science Reviews*, **103**, 116-133, https://doi.org/10.1016/j.quascirev.2014.08.018

Always quote citation above when using data! You can download the citation in several formats below.

RIS Citation | BibTeX Citation | Copy Citation | Facebook | Twitter | Show Map | Google Earth | 1432 | 151 | 80

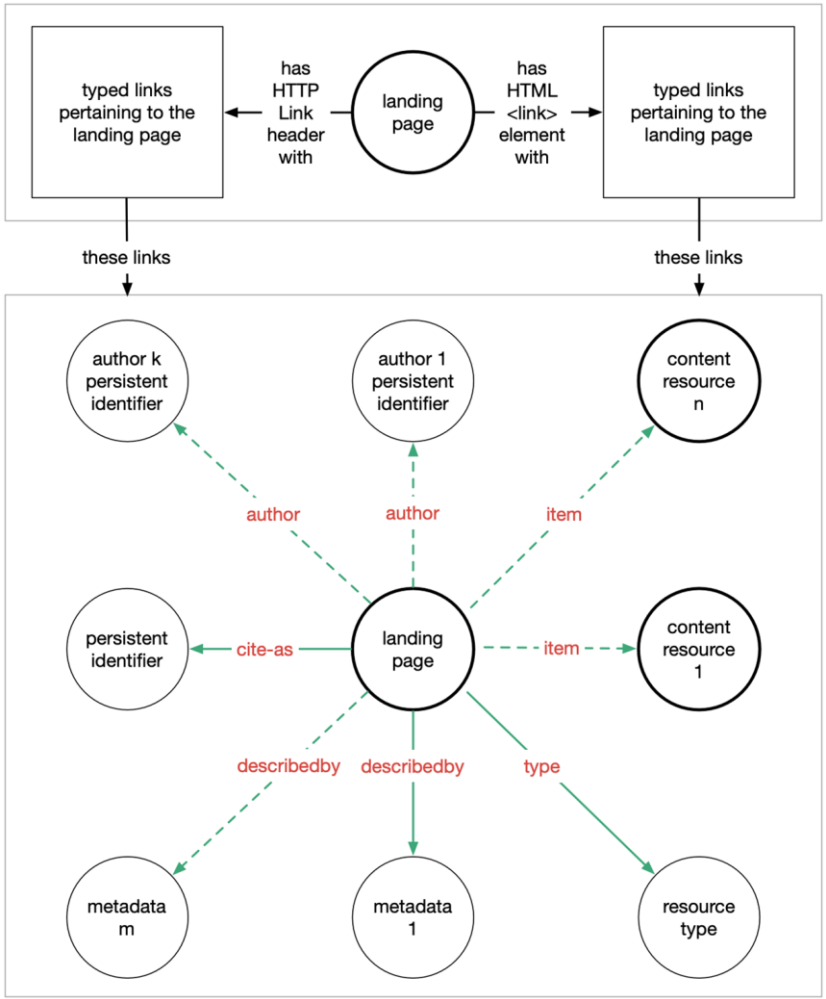
Abstract:

The Last Interglacial (LIG, 129-116 thousand of years BP, ka) represents a test bed for climate model feedbacks in warmer-than-present high latitude regions. However, mainly because aligning different palaeoclimatic archives and from different parts of the world is not trivial, a spatio-temporal picture of LIG temperature changes is difficult to obtain. Here, we have selected 47 polar ice core and sub-polar marine sediment records and developed a strategy to align them onto the recent AICC2012 ice core chronology. We provide the first compilation of high-latitude temperature changes across the LIG associated with a coherent temporal framework built between ice core and marine sediment records. Our new data synthesis highlights non-synchronous maximum temperature changes between the two hemispheres with the Southern Ocean and Antarctica records showing an early warming compared to North Atlantic records. We also observe warmer than present-day conditions that occur for a longer time period in southern high latitudes than in northern high latitudes. Finally, the amplitude of temperature changes at high northern latitudes is larger compared to high southern latitude temperature changes recorded at the onset and the demise of the LIG. We have also compiled four data-based time slices with temperature anomalies (compared to present-day conditions) at 115 ka, 120 ka, 125 ka and 130 ka and quantitatively estimated temperature uncertainties that include relative dating errors. This

Link discovery

HTTP (HEAD) request to landing page of DOI:

Web server tells all “alternate representations” of a resource!



```
$ > curl -LI https://doi.org/10.1594/PANGAEA.841672
HTTP/2 302
date: Thu, 02 May 2024 14:19:46 GMT
[...]
location: https://doi.pangaea.de/10.1594/PANGAEA.841672
[...]

HTTP/2 200
server: nginx/1.25.5
date: Thu, 02 May 2024 14:19:47 GMT
content-type: text/html;charset=utf-8
content-length: 389246
x-powered-by: Jetty(12.0.8)
vary: Origin, Cookie, Authorization, Accept
link: <https://doi.org/10.1594/PANGAEA.841672>;rel="cite-as",
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alt-svc: h3=":443"; ma=2592000
strict-transport-security: max-age=31536000
```

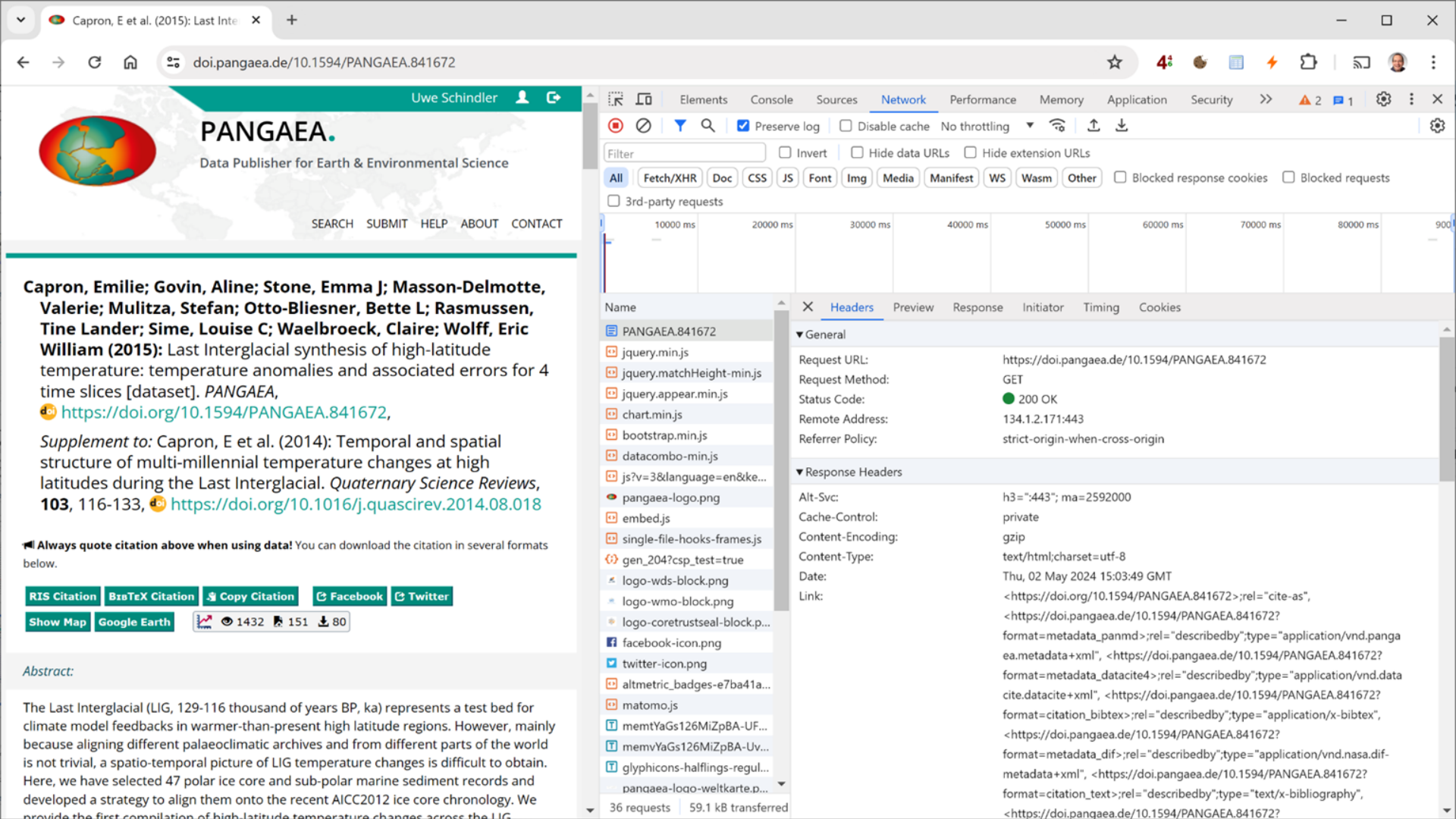
Capron, E et al. (2015): Last Inte
doi.pangaea.de/10.1594/PANGAEA.841672
Uwe Schindler
PANGAEA.
Data Publisher for Earth & Environmental Science
SEARCH SUBMIT HELP ABOUT CONTACT
Capron, Emilie; Govin, Aline; Stone, Emma J; Masson-Delmotte, Valerie; Mulitza, Stefan; Otto-Bliesner, Bette L; Rasmussen, Tine Lander; Sime, Louise C; Waelbroeck, Claire; Wolff, Eric William (2015): Last Interglacial synthesis of high-latitude temperature: temperature anomalies and associated errors for 4 time slices [dataset]. PANGAEA, https://doi.org/10.1594/PANGAEA.841672,
Supplement to: Capron, E et al. (2014): Temporal and spatial structure of multi-millennial temperature changes at high latitudes during the Last Interglacial. Quaternary Science Reviews, 103, 116-133, https://doi.org/10.1016/j.quascirev.2014.08.018
Always quote citation above when using data! You can download the citation in several formats below.
RIS Citation
BibTeX Citation
Copy Citation
Facebook
Twitter
Show Map
Google Earth
1432 151 80
Abstract:
The Last Interglacial (LIG, 129-116 thousand of years BP, ka) represents a test bed for climate model feedbacks in warmer-than-present high latitude regions. However, mainly because aligning different palaeoclimatic archives and from different parts of the world is not trivial, a spatio-temporal picture of LIG temperature changes is difficult to obtain. Here, we have selected 47 polar ice core and sub-polar marine sediment records and developed a strategy to align them onto the recent AICC2012 ice core chronology. We
Elements Console Sources Network Performance Memory Application Security
Preserve log Disable cache No throttling
Filter Invert Hide data URLs Hide extension URLs
All Fetch/XHR Doc CSS JS Font Img Media Manifest WS Wasm Other Blocked response cookies Blocked requests
3rd-party requests
10000 ms 20000 ms 30000 ms 40000 ms 50000 ms 60000 ms 70000 ms 80000 ms
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PANGAEA.841672
jquery.min.js
jquery.matchHeight-min.js
jquery.appear.min.js
chart.min.js
bootstrap.min.js
datacombo-min.js
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pangaea-logo.png
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single-file-hooks-frames.js
gen_204?csp_test=true
logo-wds-block.png
logo-wmo-block.png
logo-coretrustseal-block.p...
facebook-icon.png
twitter-icon.png
altmetric_badges-e7ba41a...
matomo.js
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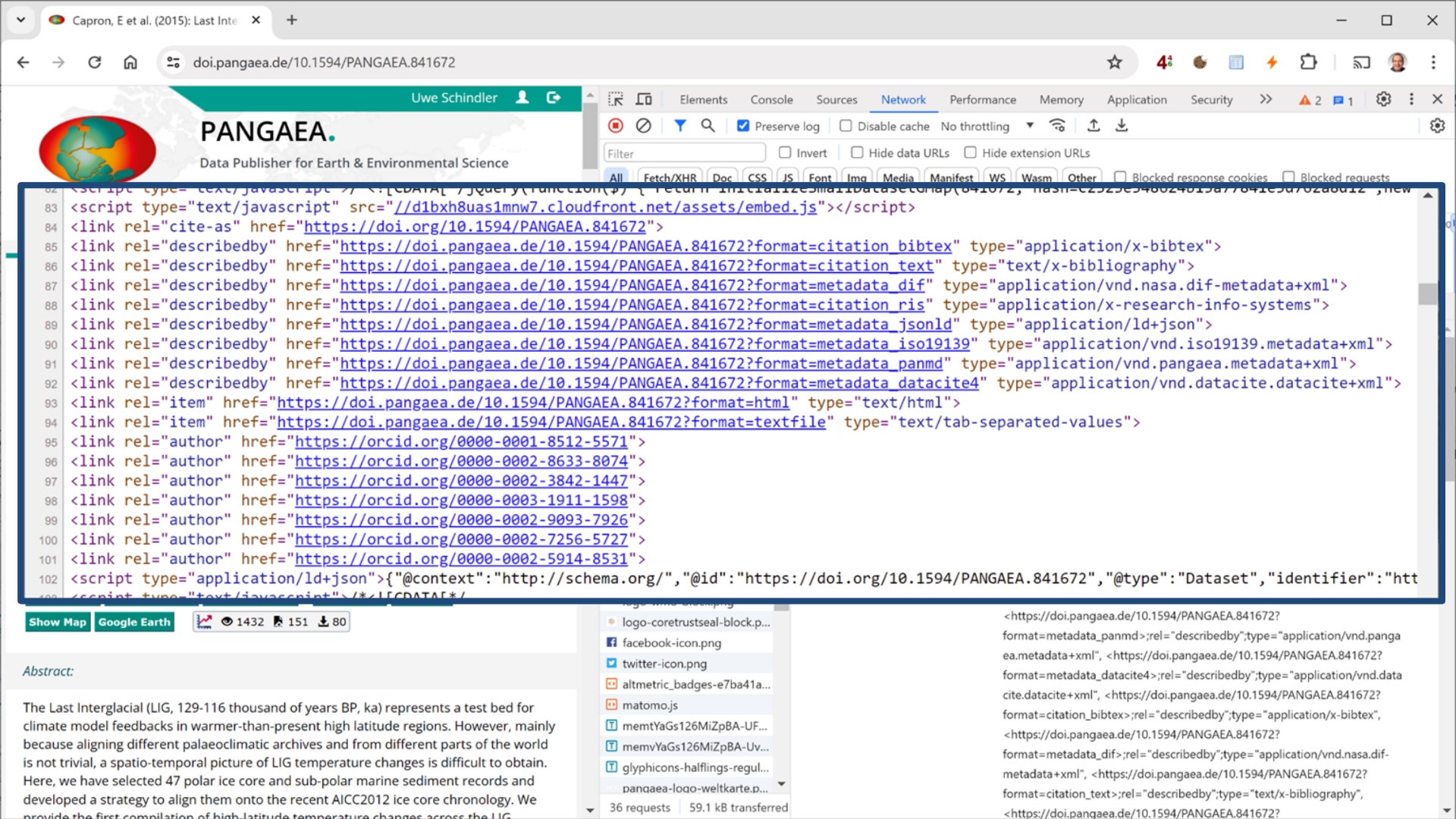
memvYaGs126MiZpBA-Uv...
glyphicons-halflings-regul...
pangaea-logo-weltkarte.p...
36 requests 59.1 kB transferred
Headers Preview Response Initiator Timing Cookies
General
Request URL: https://doi.pangaea.de/10.1594/PANGAEA.841672
Request Method: GET
Status Code: 200 OK
Remote Address: 134.1.2.171:443
Referrer Policy: strict-origin-when-cross-origin
Response Headers
Alt-Svc: h3=":443"; ma=2592000
Cache-Control: private
Content-Encoding: gzip
Content-Type: text/html;charset=utf-8
Date: Thu, 02 May 2024 15:03:49 GMT
Link: <https://doi.org/10.1594/PANGAEA.841672>;rel="cite-as", <https://doi.pangaea.de/10.1594/PANGAEA.841672?format=metadata_panmd>;rel="describedby";type="application/vnd.pangaea.metadata+xml", <https://doi.pangaea.de/10.1594/PANGAEA.841672?format=metadata_datacite4>;rel="describedby";type="application/vnd.datacite.datacite+xml", <https://doi.pangaea.de/10.1594/PANGAEA.841672?format=citation_bibtex>;rel="describedby";type="application/x-bibtex", <https://doi.pangaea.de/10.1594/PANGAEA.841672?format=metadata_dif>;rel="describedby";type="application/vnd.nasa.dif-metadata+xml", <https://doi.pangaea.de/10.1594/PANGAEA.841672?format=citation_text>;rel="describedby";type="text/x-bibliography", <https://doi.pangaea.de/10.1594/PANGAEA.841672>


Capron, E et al. (2015): Last Inte
doi.pangaea.de/10.1594/PANGAEA.841672
Uwe Schindler
PANGAEA.
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Elements
Console
Sources
Network
Performance
Memory
Application
Security
Preserve log
Disable cache
No throttling
Filter
Invert
Hide data URLs
Hide extension URLs
All
Fetch/XHR
Doc
CSS
JS
Font
Img
Media
Manifest
WS
Wasm
Other
Blocked response cookies
Blocked requests
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<link rel="author" href="https://orcid.org/0000-0001-8512-5571">
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<script type="application/ld+json">{"@context":"http://schema.org/","@id":"https://doi.org/10.1594/PANGAEA.841672","@type":"Dataset","identifier":"htt
Show Map
Google Earth
1432
151
80
Abstract:
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logo-coretrustseal-block.p...
facebook-icon.png
twitter-icon.png
altmetric_badges-e7ba41a...
matomo.js
memtYaGs126MiZpBA-UF...
memvYaGs126MiZpBA-Uv...
glyphicons-halflings-regul...
pangaea-logo-weltkarte.p...
36 requests
59.1 kB transferred
<https://doi.pangaea.de/10.1594/PANGAEA.841672?format=metadata_panmd>;rel="describedby";type="application/vnd.pangaea.metadata+xml", <https://doi.pangaea.de/10.1594/PANGAEA.841672?format=metadata_datacite4>;rel="describedby";type="application/vnd.datacite.datacite+xml", <https://doi.pangaea.de/10.1594/PANGAEA.841672?format=citation_bibtex>;rel="describedby";type="application/x-bibtex", <https://doi.pangaea.de/10.1594/PANGAEA.841672?format=metadata_dif>;rel="describedby";type="application/vnd.nasa.dif-metadata+xml", <https://doi.pangaea.de/10.1594/PANGAEA.841672?format=citation_text>;rel="describedby";type="text/x-bibliography", <https://doi.pangaea.de/10.1594/PANGAEA.841672?

Data Download

- Use one of the provided “**link**” relations to download!

- Query the DOI directly with *YOUR* most liked content type: **Content Negotiation**

Download tab data file!

```
$ > curl -OJLf 'https://doi.pangaea.de/10.1594/PANGAEA.841672?format=textfile'
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 43533    0 43533    0     0   110k      0 --:--:-- --:--:-- --:--:--  110k
curl: Saved to filename 'Capron_2014.tab'

$ >
```

Download tab data file!

```
$ > curl -OJLf -H'Accept: text/tab-separated-values'
  https://doi.org/10.1594/PANGAEA.841672
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   187  100   187    0     0    573      0 --:--:-- --:--:-- --:--:--   573
100   111    0   111    0     0    119      0 --:--:-- --:--:-- --:--:--   119
100 43533    0 43533    0     0  33130      0 --:--:--  0:00:01 --:--:--  166k
curl: Saved to filename 'Capron_2014.tab'

$ >
```

Download tab data file!

```
$ > curl -OJLf -H'Accept: application/x-download' https://doi.org/10.1594/PANGAEA.841672
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   187  100   187    0     0    573      0 --:--:-- --:--:-- --:--:--   573
100   111    0   111    0     0    119      0 --:--:-- --:--:-- --:--:--   119
100 43533    0 43533    0     0  33130      0 --:--:--  0:00:01 --:--:--  166k
curl: Saved to filename 'Capron_2014.tab'

$ >
```

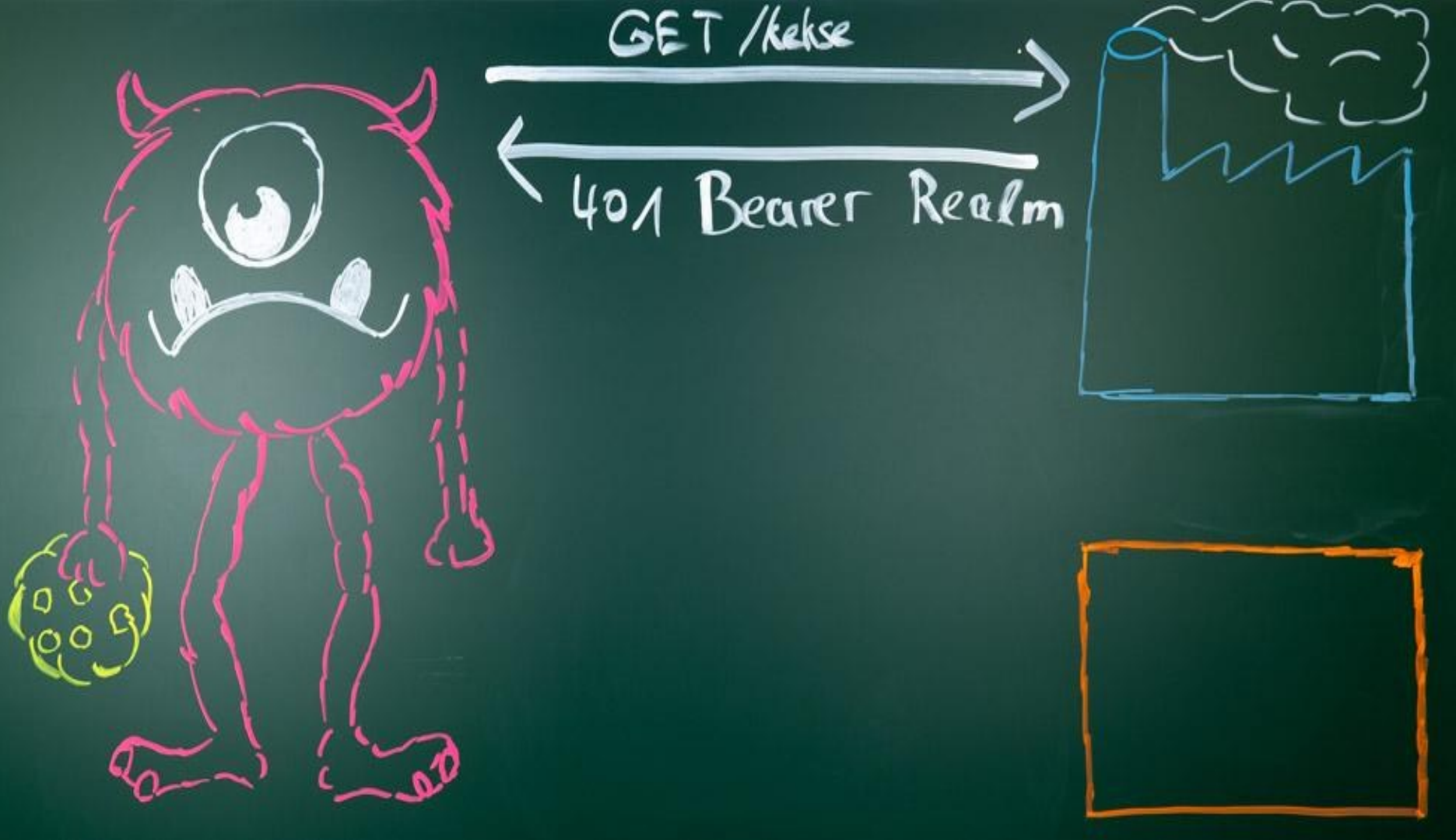
Let's get metadata in ISO 19139 / 19115 format!

```
$ > curl -L -H'Accept: application/vnd.iso19139.metadata+xml' https://doi.org/10.1594/PANGAEA.841672
<?xml version="1.0" encoding="UTF-8"?><!--*** Generated from internal PANGAEA metadata schema by iso19139.xslt ***--><MD_Metadata
   xsi:schemaLocation="http://www.isotc211.org/2005/gmd http://www.isotc211.org/2005/gmd/gmd.xsd" id="de.pangaea.dataset841672"
   xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:gmd="http://www.isotc211.org/2005/gmd" xmlns:gco="http://www.isotc211.org/2005/gco"
   xmlns:gml="http://www.opengis.net/gml" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://www.isotc211.org/2005/gmd">
<fileIdentifier>
<gco:CharacterString>de.pangaea.dataset841672</gco:CharacterString>
</fileIdentifier>
<language>
<LanguageCode codeList="http://www.isotc211.org/2005/resources/Codelist/ML_gmxCodelists.xml#LanguageCode" codeListValue="eng">eng</LanguageCode>
</language>
<hierarchyLevel>
<MD_ScopeCode codeList="http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#MD_ScopeCode"
   codeListValue="dataset">dataset</MD_ScopeCode>
</hierarchyLevel>
<contact>
<CI_ResponsibleParty>
<organisationName>
<gco:CharacterString>PANGAEA</gco:CharacterString>
</organisationName>
<contactInfo>
<CI_Contact>
```

How about access restricted datasets?

Following “cookie monster” illustrations by Till Born *(predic8: Microservices, APIs & Integration):*
https://www.predic8.de/bearer-token-autorisierung-api-security.htm

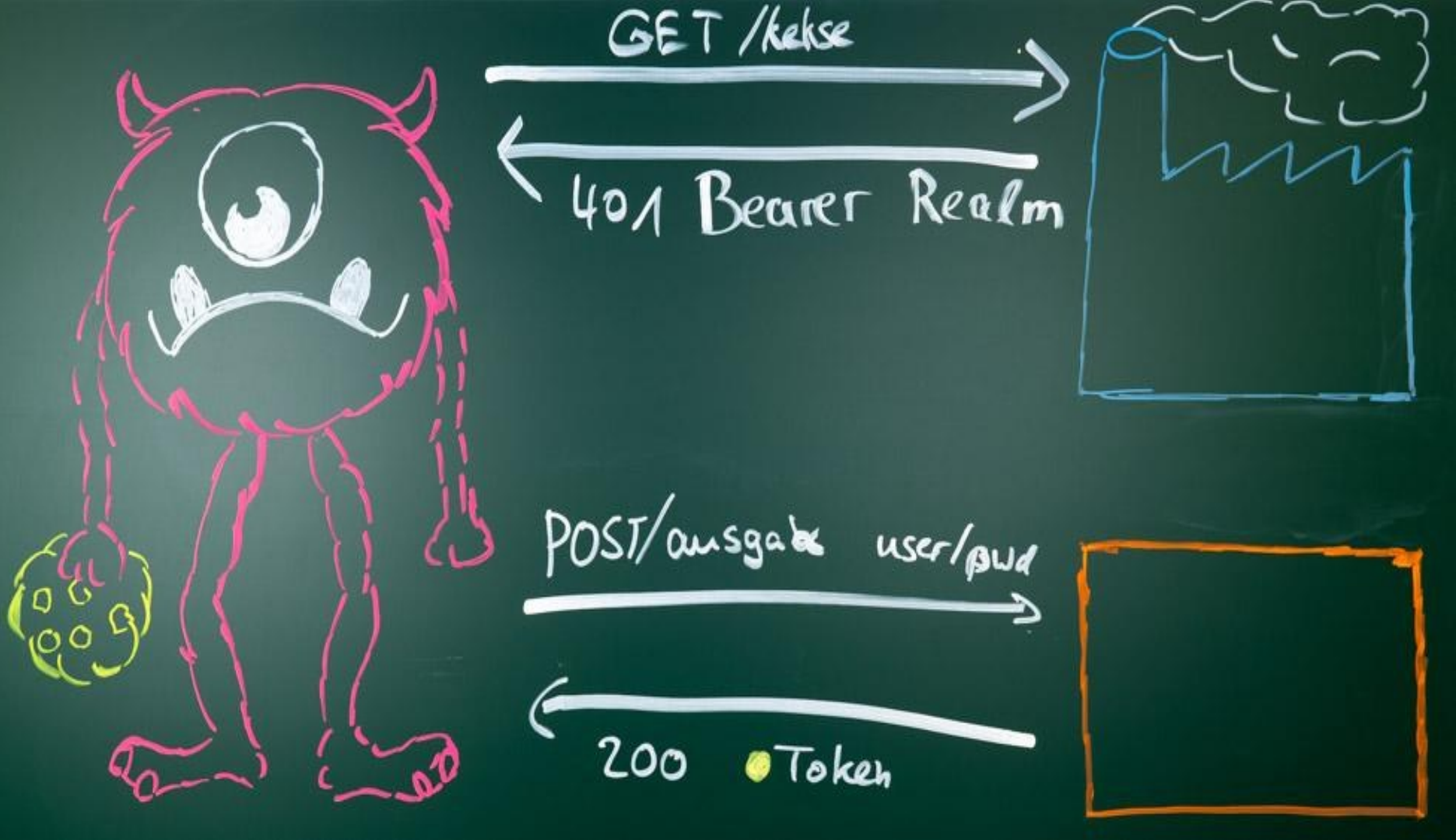

GET /kekse


GET /kekse
401 Bearer Realm

GET /kekse

401 Bearer Realm

POST/ausgabe user/pwd


GET /kekse
401 Bearer Realm
POST/ausgabe user/pwd
200 Token


GET /kekse
401 Bearer Realm
GET /kekse
Authorization: Bearer Token
POST/ausgabe user/pwd
200 Token

GET /kekse

401 Bearer Realm

GET /kekse

Authorization: Bearer Token

200 Ok

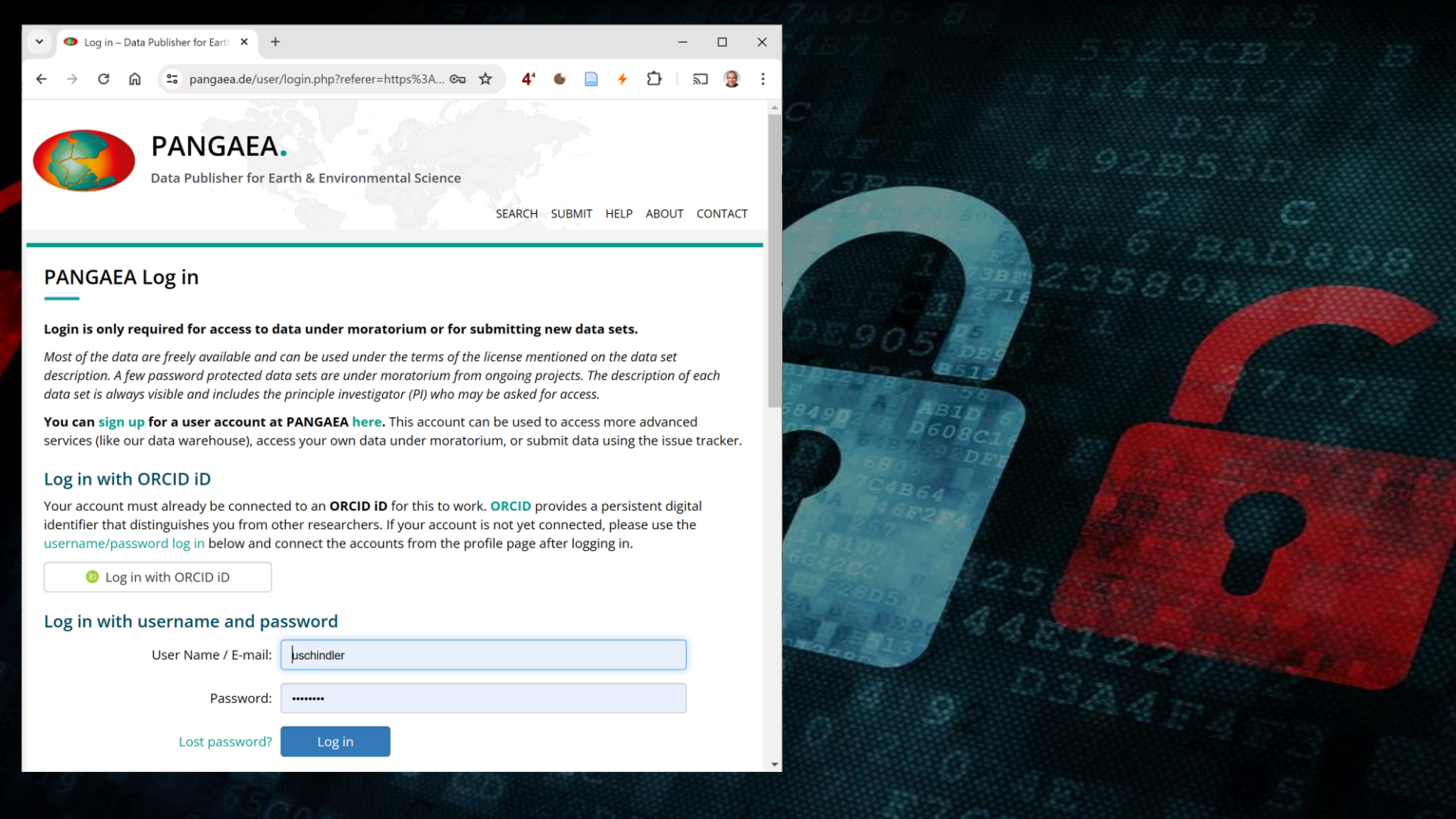
POST/validate

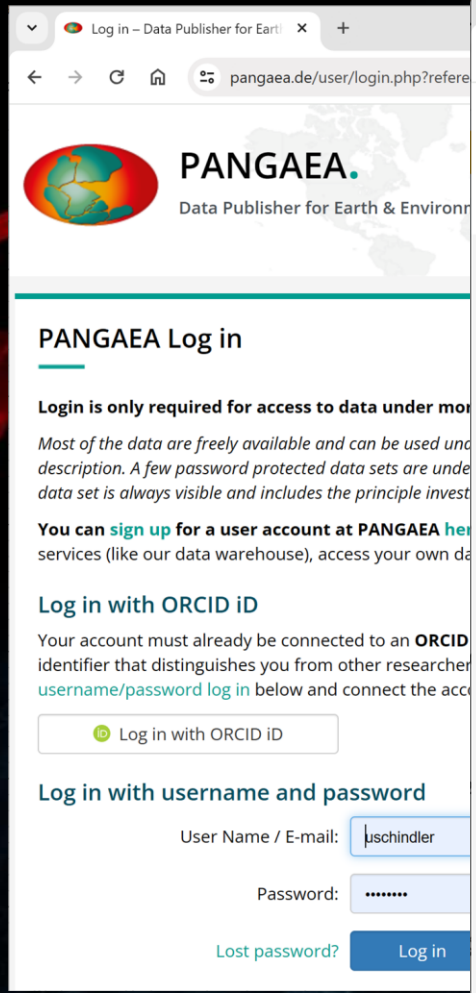
Token

20
Ok

POST/ausgabe user/pwd

200 Token


Log in – Data Publisher for Earth
pangaea.de/user/login.php?referer=https%3A...
PANGAEA.
Data Publisher for Earth & Environmental Science
SEARCH SUBMIT HELP ABOUT CONTACT
PANGAEA Log in
Login is only required for access to data under moratorium or for submitting new data sets.
Most of the data are freely available and can be used under the terms of the license mentioned on the data set description. A few password protected data sets are under moratorium from ongoing projects. The description of each data set is always visible and includes the principle investigator (PI) who may be asked for access.
You can sign up for a user account at PANGAEA here. This account can be used to access more advanced services (like our data warehouse), access your own data under moratorium, or submit data using the issue tracker.
Log in with ORCID iD
Your account must already be connected to an ORCID iD for this to work. ORCID provides a persistent digital identifier that distinguishes you from other researchers. If your account is not yet connected, please use the username/password log in below and connect the accounts from the profile page after logging in.
Log in with ORCID iD
Log in with username and password
User Name / E-mail:
uschindler
Password:
Lost password?
Log in


Log in – Data Publisher for Earth
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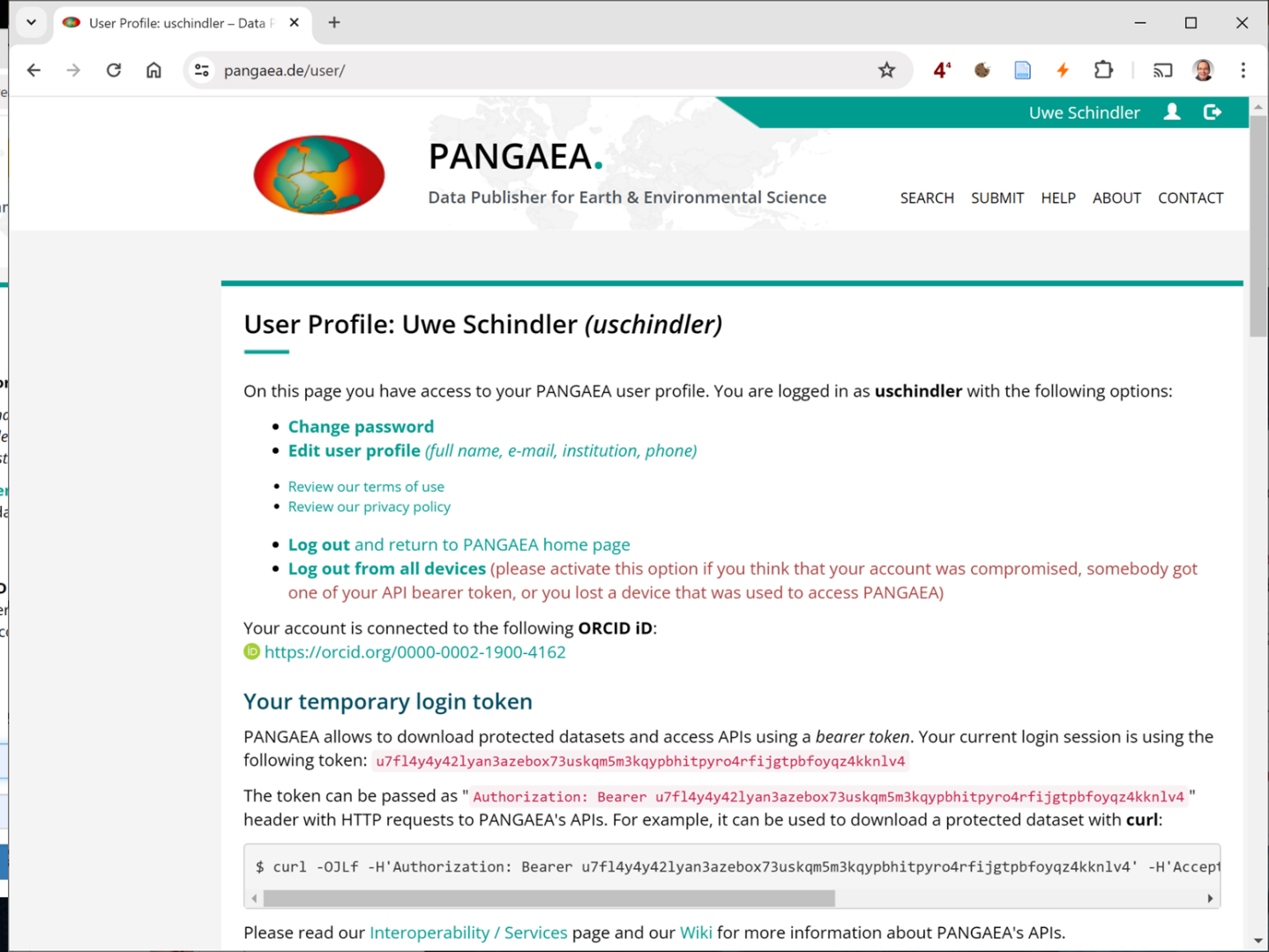
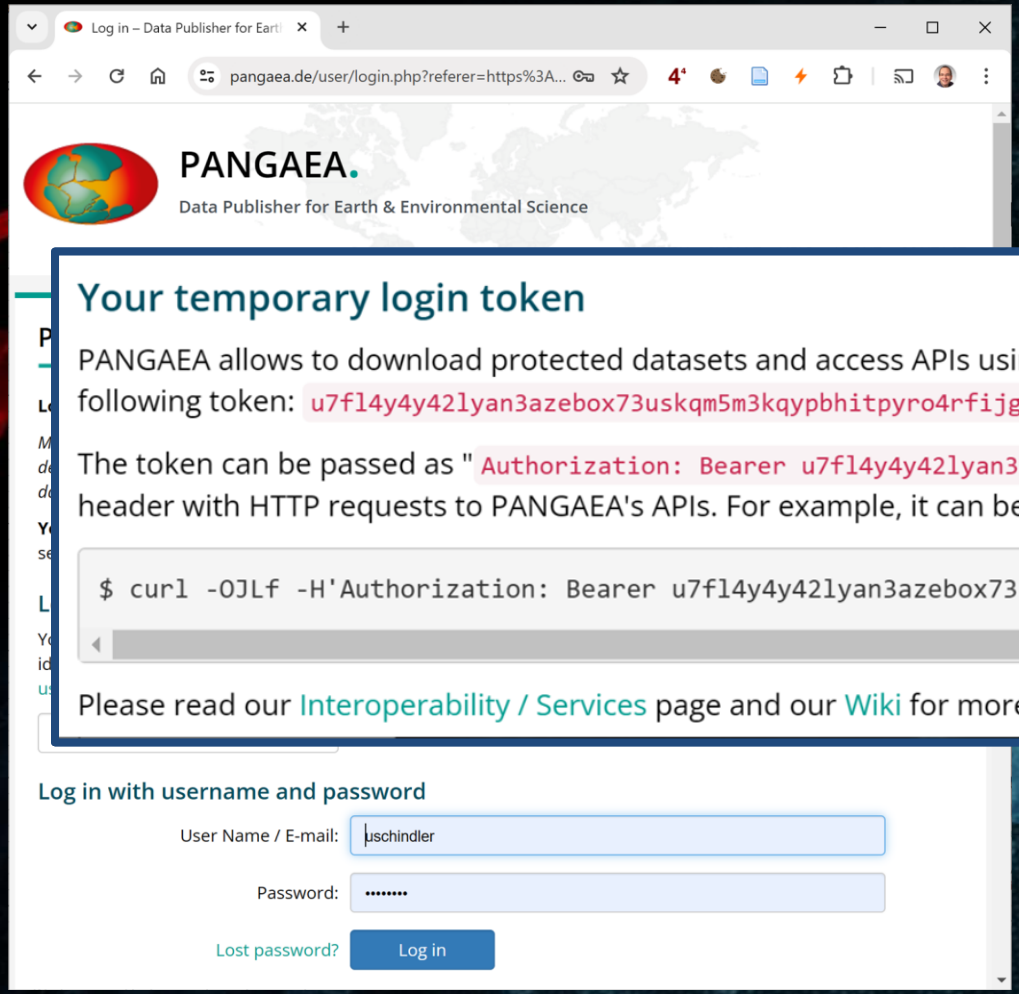
PANGAEA.
Data Publisher for Earth & Environr
PANGAEA Log in
Login is only required for access to data under mor
Most of the data are freely available and can be used unc
description. A few password protected data sets are unde
data set is always visible and includes the principle invest
You can sign up for a user account at PANGAEA her
services (like our data warehouse), access your own da
Log in with ORCID iD
Your account must already be connected to an ORCID
identifier that distinguishes you from other researcher
username/password log in below and connect the acc
Log in with ORCID iD
Log in with username and password
User Name / E-mail:
uschindler
Password:
Lost password?
Log in


User Profile: uschindler – Data
pangaea.de/user/
Uwe Schindler
PANGAEA.
Data Publisher for Earth & Environmental Science
SEARCH
SUBMIT
HELP
ABOUT
CONTACT
User Profile: Uwe Schindler (uschindler)
On this page you have access to your PANGAEA user profile. You are logged in as uschindler with the following options:
Change password
Edit user profile (full name, e-mail, institution, phone)
Review our terms of use
Review our privacy policy
Log out and return to PANGAEA home page
Log out from all devices (please activate this option if you think that your account was compromised, somebody got one of your API bearer token, or you lost a device that was used to access PANGAEA)
Your account is connected to the following ORCID iD:
https://orcid.org/0000-0002-1900-4162
Your temporary login token
PANGAEA allows to download protected datasets and access APIs using a bearer token. Your current login session is using the following token: u7fl4y4y42lyan3azebox73uskqm5m3kqypbhitpyro4rfijgtpbfoyqz4kknlv4
The token can be passed as " Authorization: Bearer u7fl4y4y42lyan3azebox73uskqm5m3kqypbhitpyro4rfijgtpbfoyqz4kknlv4 " header with HTTP requests to PANGAEA's APIs. For example, it can be used to download a protected dataset with curl:
$ curl -OJLf -H'Authorization: Bearer u7fl4y4y42lyan3azebox73uskqm5m3kqypbhitpyro4rfijgtpbfoyqz4kknlv4' -H'Accept
Please read our Interoperability / Services page and our Wiki for more information about PANGAEA's APIs.


Log in – Data Publisher for Earth
pangaea.de/user/login.php?referer=https%3A...
PANGAEA.
Data Publisher for Earth & Environmental Science
Your temporary login token
PANGAEA allows to download protected datasets and access APIs using a bearer token. Your current login session is using the following token: u7fl4y4y42lyan3azebox73uskqm5m3kqypbhitpyro4rfijgtpbfoyqz4kknlv4
The token can be passed as "Authorization: Bearer u7fl4y4y42lyan3azebox73uskqm5m3kqypbhitpyro4rfijgtpbfoyqz4kknlv4" header with HTTP requests to PANGAEA's APIs. For example, it can be used to download a protected dataset with curl:
$ curl -OJLf -H'Authorization: Bearer u7fl4y4y42lyan3azebox73uskqm5m3kqypbhitpyro4rfijgtpbfoyqz4kknlv4' -H'Accept
Please read our Interoperability / Services page and our Wiki for more information about PANGAEA's APIs.
Log in with username and password
User Name / E-mail:
uschindler
Password:
Lost password?
Log in

How about finding out what datasets exist in the system?

PANGAEA Search

Caution!

- There is *(at moment)* **no official** and **documented** API of PANGAEA Search
- Official **Search REST API** will come **in near future**

Currently, clients “**pangaeapy**” and “**pangaear**” have support for using an internal, undocumented API

Alternatives

DataCite Search API:
https://support.datacite.org/docs/api

- Searches larger inventory
- Returns DOI from any datacenter
- Summary metadata is returned
- Data access with…..

Alternatives

DataCite Search API:
https://support.datacite.org/docs/api

- Searches larger inventory
- Returns DOI from any datacenter
- Summary metadata is returned
- Data access with….. **Content Negotiation!** 

Feedback?

Thank You!

pangaear: open source package

- R package **developed and maintained by rOpenSci**
- Data retrieval interface for PANGAEA
- Download and documentation on GitHub and CRAN:
  - https://github.com/ropensci/pangaear
  - https://CRAN.R-project.org/package=pangaear

Scott Chamberlain, Kara Woo, Andrew MacDonald, Naupaka Zimmerman and Gavin Simpson (2021). pangaear: Client for the 'Pangaea' Database. R package version 1.1.0. https://CRAN.R-project.org/package=pangaear

Why pangaear?

- ✔ Direct data queries and retrieval via R
- ✔ Enables automated workflows and data mining
- ✔ Reproducible workflow and record of data retrieval
- ✔ Easier bulk download of data
- ✔ Metadata search and analysis

Credit: Gregor Cesnar

Getting started

Install *pangaear* in your environment

```
install.packages('pangaear')
```

Import packages

```
library(pangaear)
```

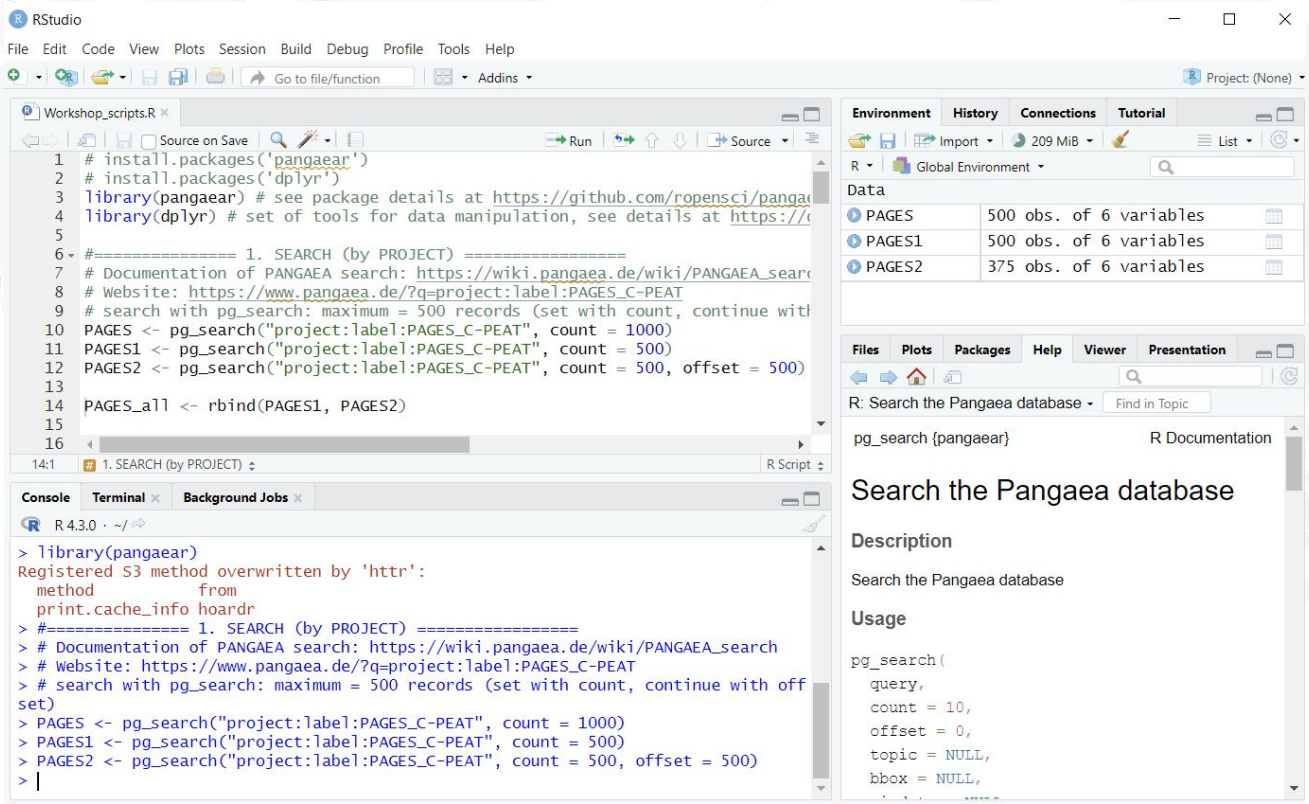
Two essential commands

Function	Description
`pg_search`	Search the Pangaea database (arguments: e.g. count, offset)
`pg_data`	Download data from Pangaea

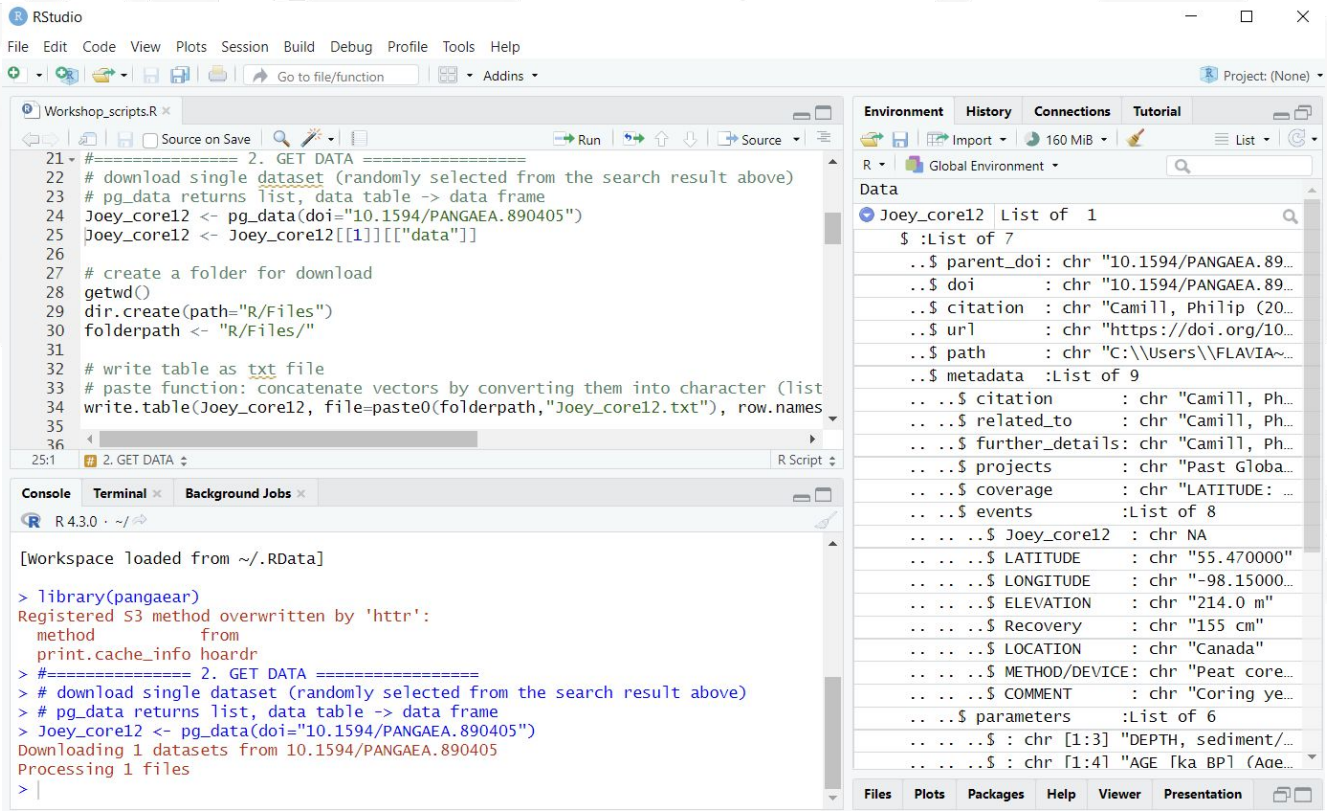
… and others …

pg_search

This mirrors the query via the PANGAEA website



pg_data


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Workshop_scripts.R
21 #=============== 2. GET DATA ================
22 # download single dataset (randomly selected from the search result above)
23 # pg_data returns list, data table -> data frame
24 Joey_core12 <- pg_data(doi="10.1594/PANGAEA.890405")
25 Joey_core12 <- Joey_core12[[1]][["data"]]
27 # create a folder for download
28 getwd()
29 dir.create(path="R/Files")
30 folderpath <- "R/Files/"
32 # write table as txt file
33 # paste function: concatenate vectors by converting them into character (list
34 write.table(Joey_core12, file=paste0(folderpath,"Joey_core12.txt"), row.names
Console Terminal Background Jobs
R 4.3.0 · ~/
[Workspace loaded from ~/.RData]
> library(pangaear)
Registered S3 method overwritten by 'httr':
method from
print.cache_info hoardr
> #=============== 2. GET DATA ================
> # download single dataset (randomly selected from the search result above)
> # pg_data returns list, data table -> data frame
> Joey_core12 <- pg_data(doi="10.1594/PANGAEA.890405")
Downloading 1 datasets from 10.1594/PANGAEA.890405
Processing 1 files
Environment History Connections Tutorial
Global Environment
Data
Joey_core12 List of 1
$:List of 7
..$ parent_doi: chr "10.1594/PANGAEA.89...
..$ doi : chr "10.1594/PANGAEA.89...
..$ citation : chr "Camill, Philip (20...
..$ url : chr "https://doi.org/10...
..$ path : chr "C:\\Users\\FLAVIA~...
..$ metadata :List of 9
.. ..$ citation : chr "Camill, Ph...
.. ..$ related_to : chr "Camill, Ph...
.. ..$ further_details: chr "Camill, Ph...
.. ..$ projects : chr "Past Globa...
.. ..$ coverage : chr "LATITUDE: ...
.. ..$ events :List of 8
.. .. ..$ Joey_core12 : chr NA
.. .. ..$ LATITUDE : chr "55.470000"
.. .. ..$ LONGITUDE : chr "-98.15000...
.. .. ..$ ELEVATION : chr "214.0 m"
.. .. ..$ Recovery : chr "155 cm"
.. .. ..$ LOCATION : chr "Canada"
.. .. ..$ METHOD/DEVICE: chr "Peat core...
.. .. ..$ COMMENT : chr "Coring ye...
.. ..$ parameters :List of 6
.. .. ..$: chr [1:3] "DEPTH, sediment/...
Files Plots Packages Help Viewer Presentation

Example R-scripts

https://github.com/pangaea-data-publisher/community-workshop-material

- Search datasets (by Project or by unique semantic URI from WoRMS database)

```
# Search for species 'Arenicola marina' using its unique semantic URI, see WoRMS database https://www.marinespecies.org/aphia.php?p=taxdetails&id=129868
res2 <- pg_search(query = 'urn:lsid:marinespecies.org:taxname:129868', count = 100)
```

- Filter search results and get multiple datasets
- Download multiple binary files (e.g., images, netCDF format, etc.)

Introduction to pangaeapy

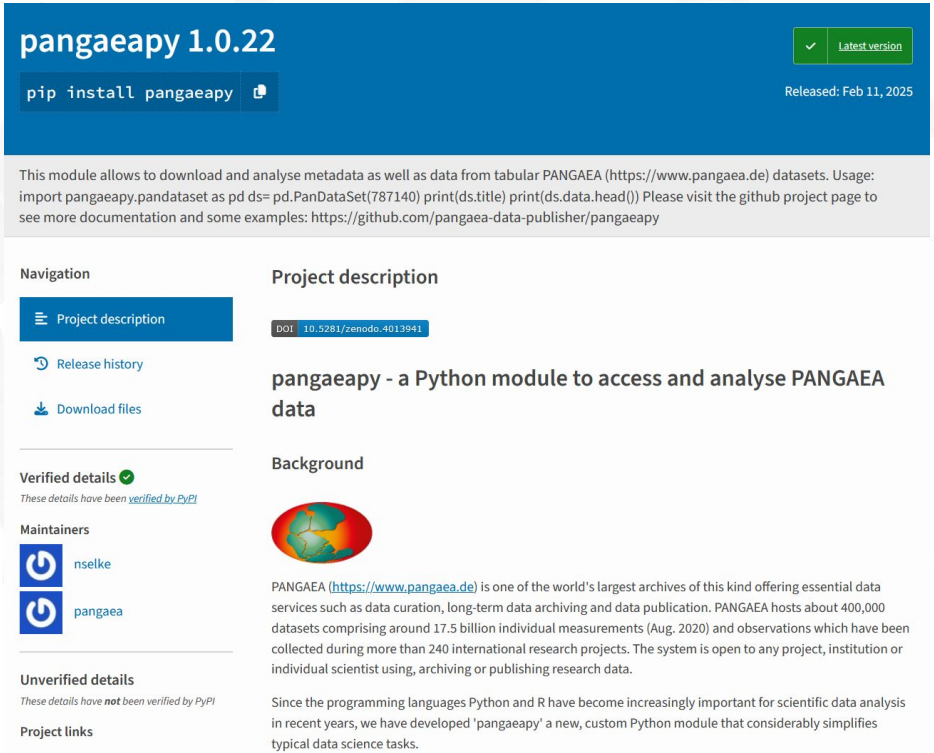
pangaeapy: open source package

1. Developed and maintained by PANGAEA staff

2. But anyone can contribute, see

https://pypi.org/project/pangaeapy/

3. Report issues on GitHub



Robert Huber, Egor Gordeev, Markus Stocker, Aarthi Balamurugan, & Uwe Schindler (2020). pangaeapy - a Python module to access and analyse PANGAEA data. Zenodo. http://doi.org/10.5281/zenodo.4013940.

Why pangaeapy?

- ✔ Direct data queries and retrieval via Python
- ✔ Easier bulk download of data
- ✔ **Metadata search and analysis**
- ✔ Enables automated workflows and data mining
- ✔ Reproducible workflow and record of data retrieval

Credit: Gregor Cesnar

Getting started

Install *pangaeapy* in your environment

```
pip install pangaeapy
```

Import packages

```
import pangaeapy as pan
```

or

```
from pangaeapy.panquery import PanQuery
from pangaeapy.pandataset import PanDataSet
```

Two essential commands

Function	Attributes
`pan.PanQuery('search term')`	totalcount, result

Example:
```
query = pan.PanQuery("Triticum")
query.result
```

	URI	score	html
0	doi:10.1594/PANGAEA.896784	20.516336	<a href="https://doi...
1	doi:10.1594/PANGAEA.886727	18.917538	<a href="https://doi...
2	doi:10.1594/PANGAEA.925261	18.777039	<a href="https://doi...
3	doi:10.1594/PANGAEA.886725	18.592678	<a href="https://doi...

Two essential commands

Function	Attributes
`pan.PanDataSet('PANGAEA ID')`	data, id, uri, doi, title, abstract, year, authors, citation, parameters, events, min-/maxtimeextent, children, etc.

Example:
```
ds = PanDataSet("doi:10.1594/PANGAEA.923033")
ds.data
```

	Event	ID	Project	Access no gen	Access no gen_2	Campaign	Date/Time
0	HUD16/19_010	WB-00001	PRJNA613976	insdc:SRR11365522	NaN	Hudson2016-019	2016-07-20 16:30:12
1	HUD16/19_010	WB-00005	PRJNA613976	insdc:SRR11365520	NaN	Hudson2016-019	2016-07-20 16:30:12
2	HUD16/19_010	WB-00007	PRJNA613976	insdc:SRR11365519	NaN	Hudson2016-019	2016-07-20 16:30:12

For our practice today

1. We`ll work in JupyterNotebook via Colab

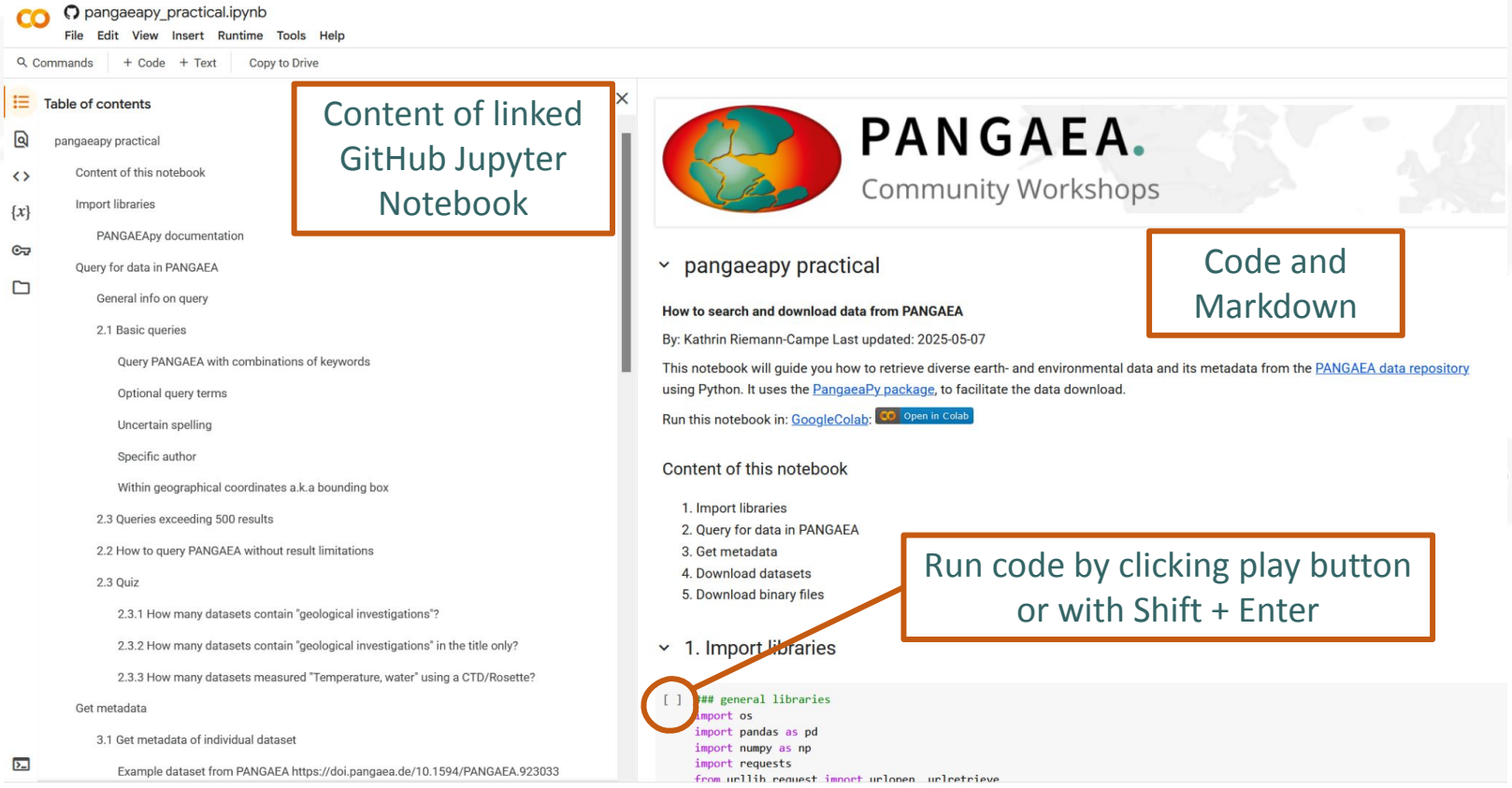
2. Go to PANGAEA`s community workshop GitHub repository

3. Navigate to Python/PANGAEApy_practical

4. Scroll down and click on “Open in Colab”

Working in Jupyter notebooks

NOTE: You cannot save files but download/sync to GoogleDrive



PANGAEApy practical

Kathrin Riemann-Campe

please go to community workshop page on github
https://github.com/pangaea-data-publisher/community-workshop-material/tree/master/Python/PANGAEApy_practical

Thank you!

Interested in the next event?

Enroll to our training mailing list
(https://lists.pangaea.de/listinfo/training)

or scan the QR-code to the right…

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