

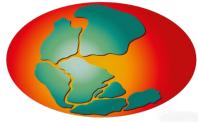


# PANGAEA.

Data Publisher for Earth & Environmental Science

...und dessen Beitrag zu  
nachhaltigem Datenmanagement

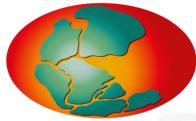
30. Okt. 2025



# Wer ich bin



**Lars Möller**  
Science & Service  
Coordinator



# PANGAEA in aller Kürze

- Informationssystem zur Publikation und Langzeitarchivierung von wissensch. Daten
- vor ± 30 Jahren etabliert
- Gegründet und betrieben:



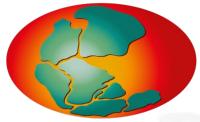
- Akkreditiert:



The screenshot shows the homepage of the PANGAEA Data Publisher. At the top right is a search bar and a 'SEARCH' button. The main header reads 'PANGAEA.' followed by 'Data Publisher for Earth & Environmental Science'. On the left, there's a 'Submit Data' button with a globe icon. Below it is a 'ALL TOPICS' dropdown menu and a search bar. The central part of the page features five large cards with images and titles: 'CHEMISTRY' (7353), 'LITHOSPHERE' (50297), 'BIOLOGICAL CLASSIFICATION' (34336), 'ATMOSPHERE' (31773), and 'PALEONTOLOGY' (25880). Below these are smaller thumbnail images representing other data categories.

Felden, J., Möller, L., Schindler, U. et al. PANGAEA - Data Publisher for Earth & Environmental Science. Sci Data 10, 347 (2023).

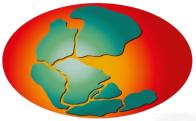
<https://doi.org/10.1038/s41597-023-02269-x>



# Wer steckt hinter PANGAEA?

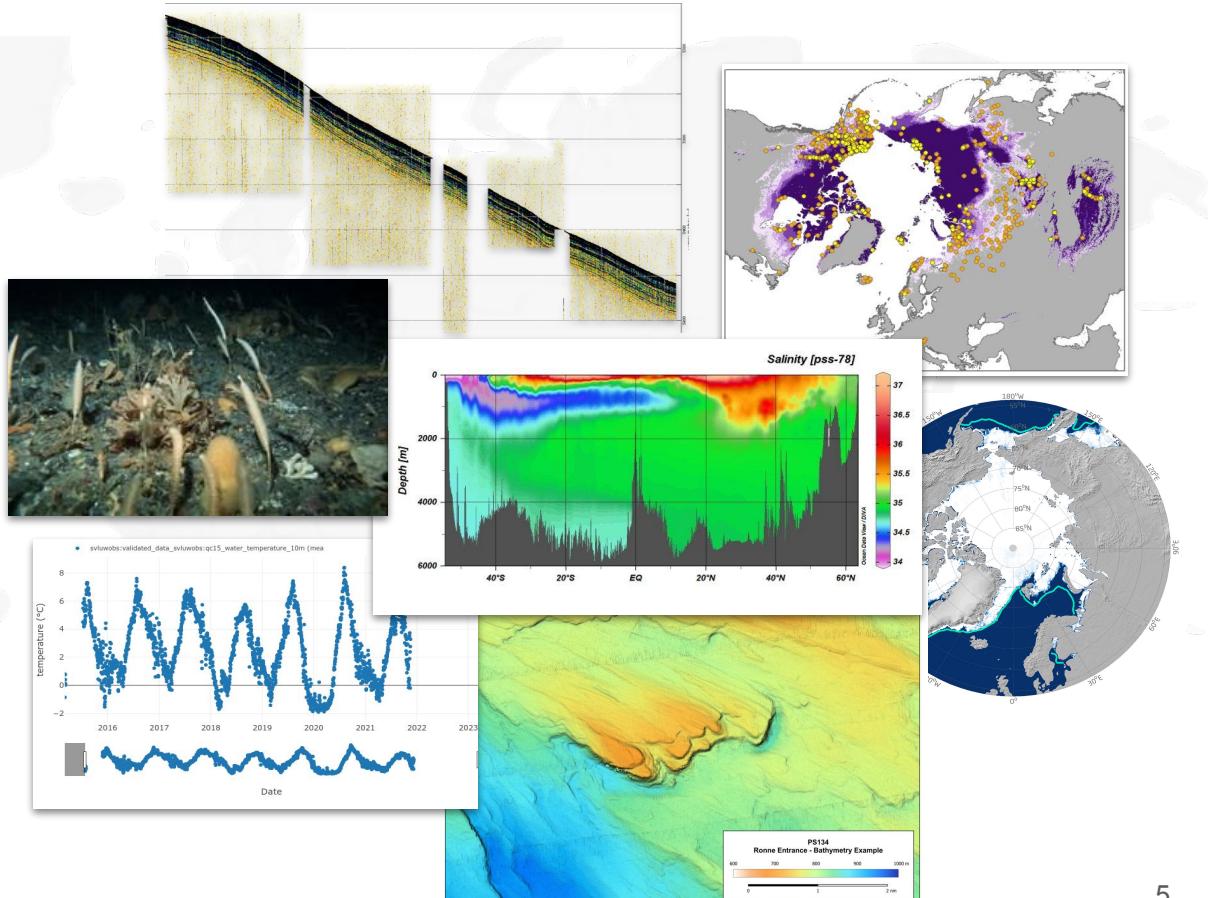
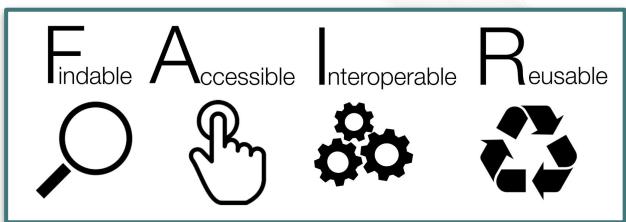
- Team bestehend aus ...
  - DateneditorInnen,
  - Wiss. Projekt- & DatenmanagerInnen,
  - Software Entwicklern,
  - Management & Koordination
- ...und assoziierten Partnern

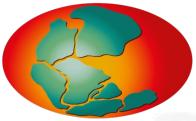




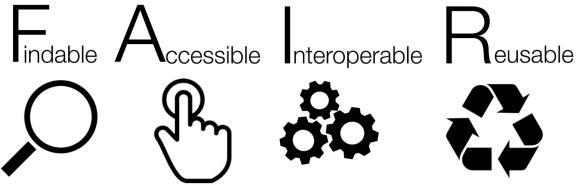
# Datenvielfalt

- multidisziplinäre Daten
- heterogene Datentypen
- Qualitätskontrolliert per Review & Kuration

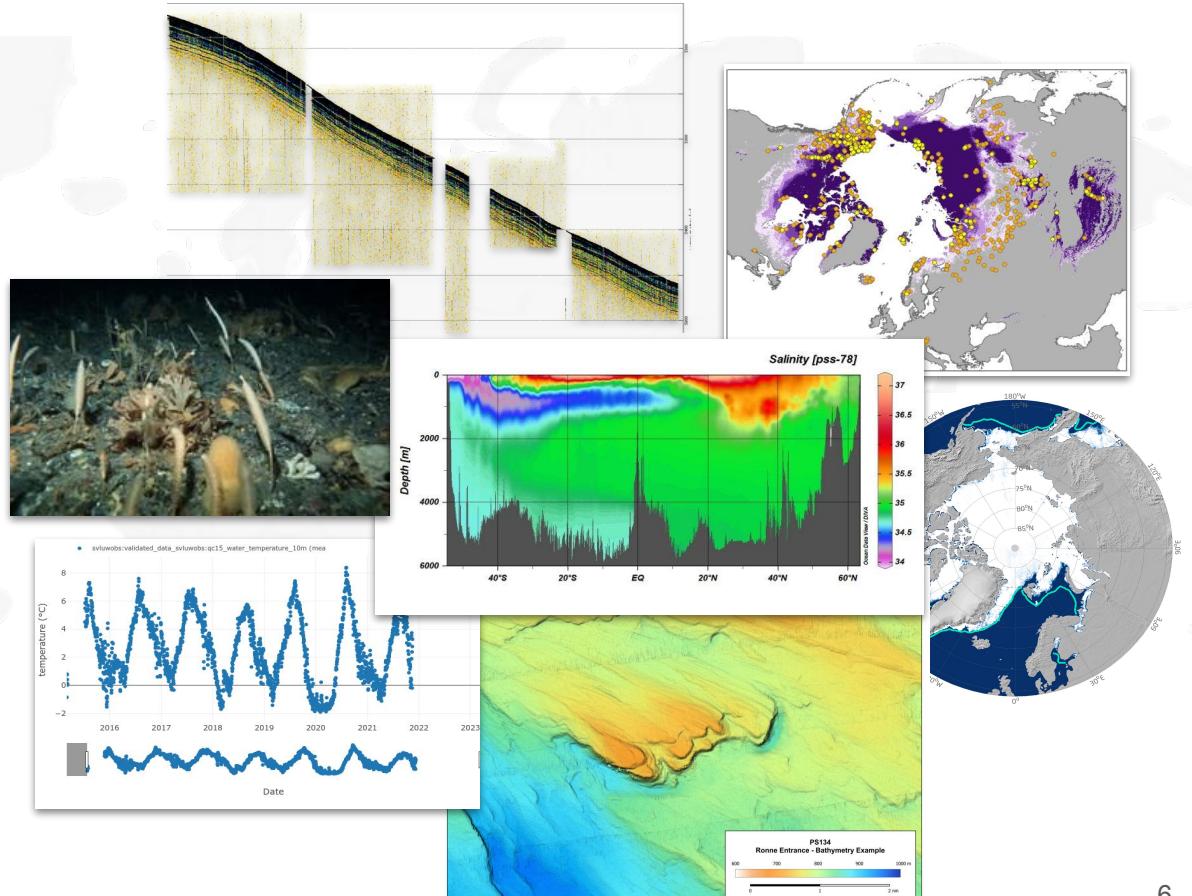


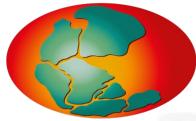


# Datenvielfalt



- $\sim 440.000$  Datensätze
- $> 35 \times 10^9$  Datenpunkte
- $> 930$  Projekte
- $\sim 10.000$  neue Datensätze/a



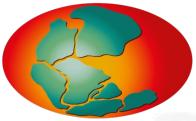


# Nachhaltigkeit aus Sicht von PANGAEA

- Langfristige Archivierung & Verfügbarkeit der Daten & Metadaten
- Verlässliche technische Infrastruktur und Sicherheitskonzepte
- Governance, Finanzierung und Community-Einbindung
- Zertifizierung und externe Evaluation
- Zugänglichkeit und Offenheit
- Interoperabilität & Wiederverwendbarkeit
- Datenqualität (QA und Kuration)



Konformität zu FAIR Prinzipien



# Datenqualität - sichern und erhöhen

- **Zusammenstellung unterstützen**
  - Authors Guides & Dokumentation
  - Themenspezifische Templates
  - Trainings zu Abgabe und Nachnutzung

**PANGAEA Wiki**

This wiki is a dynamic manual and reference for the data library PANGAEA® - Data Publisher for Earth & Environmental Science. <https://www.pangaea.de/>

The PANGAEA Wiki is operated to support PANGAEA data providers and end-users in archiving, publishing and retrieving data. It is a reference & documentation user-guide for any questions and information related to PANGAEA and its operation. For the details of our data processing and publication please refer and cite our most recent PANGAEA publication: Felden, J.; Möller, L.; Schindler, U.; Huber, R.; Schumacher, S.; Koppe, R.; Diepenbroek, M.; Glöckner, FO (2023): PANGAEA - Data Publisher for Earth & Environmental Science. Scientific Data, 10(1), 347, <https://doi.org/10.1038/s41597-023-02269-x>.

**PANGAEA IN BRIEF**

- About
- Terms of use
- Privacy Policy
- Support/Contact
- Team
- Become a Front-office partner institution
- Data Rescue

**DATA SUBMISSION**

For information on how data submissions to PANGAEA work, what to do and how to prepare your data, please read our [Authors Guides](#) before submitting.

If models were involved in the generation of your data, please read "Model data and PANGAEA" first.

Support the data publication with our generic and research field specific "[Best practice manuals and templates](#)" that help to provide important meta-

**DATA SEARCH**

- PANGAEA Search (also explained in one of our videos!)
- PANGAEA XML schema



## Authors Guides

These guides provide following information about data.

- 1 I. Mission and Scope
  - 2 II. Editorial Criteria
    - 2.1 General Information
    - 2.1.1 Data
    - 2.1.2 Data
    - 2.1.3 Usage
  - 2.2 The editor
  - 2.3 Costs
- 3 III. Guidelines for Submission
    - 3.1 Preparation
      - 3.1.1 Accuracy
      - 3.1.2 Completeness
      - 3.1.3 Consistency
      - 3.1.4 Clarity
      - 3.1.5 Relevance
      - 3.1.6 Accuracy
      - 3.1.7 Clarity
      - 3.1.8 Completeness
      - 3.1.9 Consistency
      - 3.1.10 Relevance
    - 3.2 Requirements
      - 3.2.1 Metadata
      - 3.2.2 How to submit
      - 3.2.3 How to update
    - 3.3 Additional Information

General field observation studies from earth and environmental sciences

We recommend the following template for authors wishing to submit data for studies that do not fall within the more specific research areas listed below.

[Generic spreadsheet template for field observation data \(xlsx-file including detailed instructions\)](#)

[Generic text-file template for field observation data \(zipped tab separated text files\). Please see instruction file 0\\_README.md first!](#)

## Guidelines and templates for specific research domains

### Biological data

### Chemical data

### Geological data

### Geophysical data

- Multibeam echosounder data (incl. SVP, MBES water column data) & Side-scan sonar data & bathymetry model data ([Bathymetry](#))
- Sediment echosounder data (e.g. Atlas Parasound P70 echosounder data) ([Sediment\\_echosounder](#))

### Meteorological data

### Eddy-Covariance-Measurement Systems

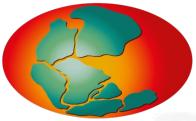
### Oceanography data

- ADCP Underway Data
- Bio-optical Sensors Underway Data
- CTD Data
- CTD Underway Data
- Ferrybox Underway Data
- TSG Underway Data

## I. Mission and Scope

The information contained in this document

<https://wiki.pangaea.de/>



# Datenqualität - sichern und erhöhen

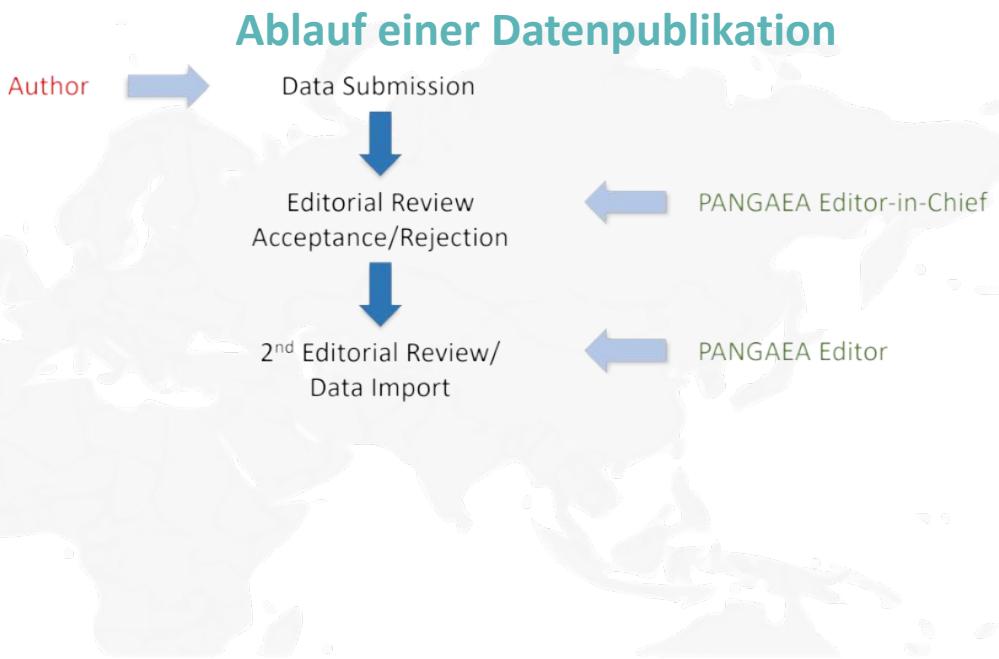
- Zusammenstellung unterstützen
  - Authors Guides & Dokumentation
  - Themenspezifische Templates
  - Trainings zu Abgabe und Nutzung
- Erfassen von Kontextinformationen

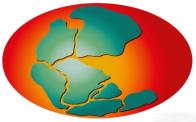
The screenshot shows the PANGAEA Data Publisher for Earth & Environmental Science website. At the top, there's a navigation bar with links for SEARCH, SUBMIT, HELP, ABOUT, and CONTACT. Below the navigation is a horizontal progress bar with five steps: 1 Basics, 2 References, 3 Projects and Grants, 4 Upload, and 5 Submit. The main area is titled 'Basic Information'. It contains fields for 'Title\*' (My great data), 'Authors\*' (Möller, Lars, lars.moeller@pa, with a remove button), 'Keywords' (diatom; ice core; Antarctica; south westerly wind;), and 'Abstract/Describe your Data\*' (This data was retrieved long time ago and almost got forgotten in my drawer. But now I decided to share it with the world.). There are three identical repeating footnotes at the bottom: 'decided to share it with the world.', 'decided to share it with the world.', and 'decided to share it with the world.'. At the very bottom right, there's a link to 'Read our data submission guidelines.'



# Datenqualität - sichern und erhöhen

- Zusammenstellung unterstützen
  - Authors Guides & Dokumentation
  - Themenspezifische Templates
  - Trainings zu Abgabe und Nutzung
- Erfassen ess. Kontextinformationen
- **Zweistufiges Review-Verfahren**
  - Initiale “formelle” Prüfung
  - Späterer vertiefter Review durch FachexpertInnen





# Datenqualität - sichern und erhöhen

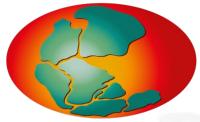
... von Metadaten

- Abgabe vollständig?
- Abstract aussagekräftig?
- Kontext der Erhebung klar?
  - Georeferenz
  - Methode
  - Datum & Uhrzeit
- Information zu Messmethodik?
- Kontext der Studie?

Initialer formeller Review...

... und Daten

- Dateien in akzeptierten Formaten
- ... und Inhalte zugänglich?
- Daten strukturell kompatibel?
- Parameternamen eindeutig interpretierbar?
- Einheiten gegeben?
- Offensichtliche Inkonsistenzen vorhanden?



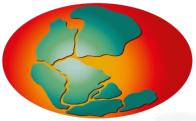
# Datenqualität - sichern und erhöhen

## Vertiefter inhaltlicher Review

- Angaben & Daten konsistent?
- Methodik und Resultate plausibel und nachvollziehbar?

## Prozessierung & Kuration

- Verknüpfen, standardisieren



# Datenqualität - sichern und erhöhen

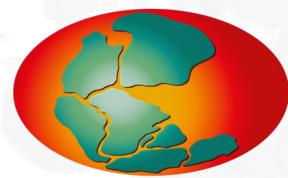
Querverbindungen herstellen

**ROR**

**ORCID**  
stands for  
Open Researcher and Contributor ID



Institutionen



Publikationen

**ENA**  
European Nucleotide Archive

Sequenzen

**WORMS**  
World Register of Marine Species

Organismen



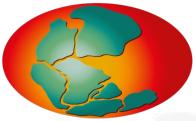
Proben



Forschende



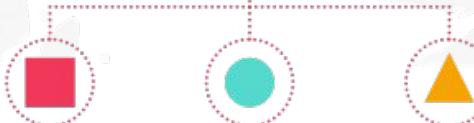
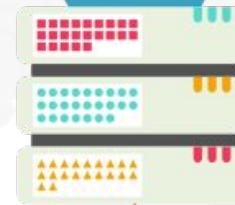
Projekte



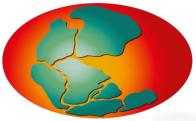
# Datenqualität - sichern und erhöhen

## Harmonisieren & Standardisieren

- Messgrößen,
- Einheiten,
- Dimensionen und Formate,
- Terme (Messgrößen, Einheiten, Spezies, Methoden...)  
→ semantisch eindeutige Annotation von Begriffen



adapted from freePik



# Editorielle Aufwertung

## Einheitlich Struktur geben (tabellarische Daten)

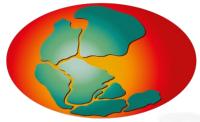
- Jeder Messpunkt hat ein Event
- Jedes Event (u.a.):
  - Label
  - Geocodes (Koordinaten & Höhe/Tiefe)
  - Date/Time
  - Methode
- Jede Messgröße:
  - Einheit / Dimension
  - Eindeutige Bezeichnung (+ Link zu international rel. Terminologie)
  - PI
  - i.d.R. Methode (SOP, Instrumente) und
  - Matrix (Wasser, Sediment, Luft, Eis etc.)

Event(s):

**6-TOW-001GGC** (RNDB-1GGC) [Q](#) \* *Latitude: 51.156160 \* Longitude: 167.656160 \* Elevation: -2393.0 m \**  
*Recovery: 1.36 m \* Location: Pacific* [Q](#) \* Campaign: **6-TOW** [Q](#) \* Basis: Thomas Washington [Q](#) \* Method/  
Device: Giant gravity corer (GGC) [Q](#)

**6-TOW-002GGC** (RNDB-2GGC) [Q](#) \* *Latitude: 51.122500 \* Longitude: 167.789160 \* Elevation: -2507.0 m \**  
*Recovery: 1.50 m \* Location: Pacific* [Q](#) \* Campaign: **6-TOW** [Q](#) \* Basis: Thomas Washington [Q](#) \* Method/  
Device: Giant gravity corer (GGC) [Q](#)

**6-TOW-003GGC** (RNDB-3GGC) [Q](#) \* *Latitude: 51.106660 \* Longitude: 167.829000 \* Elevation: -2610.0 m \**  
*Recovery: 1.81 m \* Location: Pacific* [Q](#) \* Campaign: **6-TOW** [Q](#) \* Basis: Thomas Washington [Q](#) \* Method/  
Device: Giant gravity corer (GGC) [Q](#)



# Datenqualität - sichern und erhöhen

## Vertiefter inhaltlicher Review

- Angaben & Daten konsistent?
- Resultate und Methodik plausibel und nachvollziehbar?

Author

Data Submission

PANGAEA Editor-in-Chief

Editorial Review  
Acceptance/Rejection

PANGAEA Editor

2<sup>nd</sup> Editorial Review/  
Data Import

PANGAEA Editor

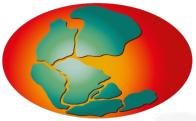
Dataset Proof

Author

Corrections

## Prozessierung & Kuration

- Verknüpfen, standardisieren
- Rückfragen und Korrekturschleifen
- Finale Begutachtung durch Autoren



# Nachhaltig publiziert

## Vertiefter inhaltlicher Review

- Angaben & Daten konsistent?
- Resultate und Methodik plausibel und nachvollziehbar?

Author



Data Submission



Editorial Review  
Acceptance/Rejection



PANGAEA Editor-in-Chief

2<sup>nd</sup> Editorial Review/  
Data Import



Dataset Proof

Corrections



PANGAEA Editor

Publication  
(DOI & Citation)



PANGAEA Editor



PANGAEA

## Prozessierung & Kuration

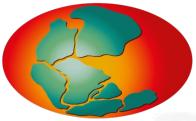
- Prozessieren
- Rückfragen und Korrekturschleifen
- Finale Begutachtung durch Autoren

Author



## Publikation

- qualitativ hochwertig, verlässlich, nachhaltig



# Nachhaltig publiziert

- Zitierfähig (volles wissens. Zitat)
  - Eindeutig referenzierbar (via DOI)
- FAIR!
  - auffindbar und zugänglich,
  - Interoperabel und nachnutzbar,
  - ... für Mensch und Maschine
- Hohe Reichweite & Sichtbarkeit
- Garantiert langfristig verfügbar

**Nederbragt, Alexandra J (2023):**  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  of Cibicidoides wuellerstorfi and related species and carbonate chemistry of ambient sea water [dataset]. PANGAEA, doi: <https://doi.org/10.1594/PANGAEA.960367>

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

Published: 2023-09-01 · DOI registered: 2023-09-01

RIS Citation

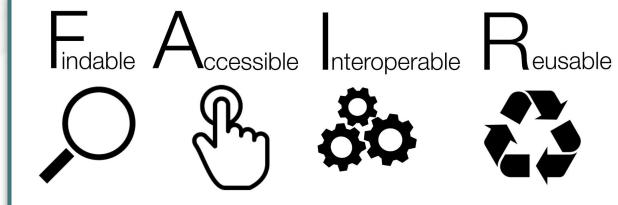
BIBTEX Citation

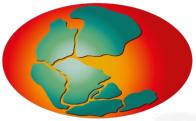
Copy Citation

Share

Show Map

Google Earth





## Zusammengefasst

- Nachhaltigkeit und Qualität ist unser Anspruch
- PANGAEA's Beitrag dazu:
  - Genaue Evaluation von u.a. Vollständigkeit & Plausibilität
  - Anreicherung von Metadaten
  - verbessern Reproduzierbarkeit
  - Standard- und Harmonisierung
  - Referenzier- & Zitierbarkeit
  - sorgen für Sichtbarkeit
  - FAIR und nachhaltig

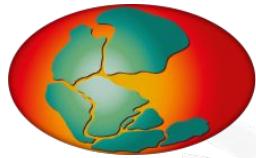
# Vielen Dank!

HEY, LOOK, WE HAVE A BUNCH OF DATA! I'M GONNA ANALYZE IT.

NO, YOU FOOL! THAT WILL ONLY CREATE MORE DATA!



<https://xkcd.com/2582>



# PANGAEA.

Community Workshops

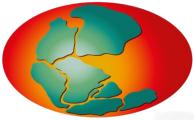
Nächste Ausgabe: “FAIR data publications with PANGAEA”

Wann: 13. & 14. November '25, 10:30 - 12:30 UHR

Wo: <https://events.hifis.net/e/CWS2511>

Allgemein interessiert an PANGAEA Trainings?

→ [https://ogy.de/PANGAEA\\_training\\_mails](https://ogy.de/PANGAEA_training_mails)



**Vielen Dank!  
Gibt es Fragen?**