

# PANGAEA®

**Publishing Network for Geoscientific and Environmental Data**



**Hannes Grobe & Rainer Sieger**

**Alfred-Wegener-Institut**



[www.pangaea.de](http://www.pangaea.de)

**Data Library**

IN

**Open Access**

FOR

**Georeferenced Data**

FROM

**Earth & Environment**





# DFG Recommendations for Good Scientific Practice

## **DFG**

### **Empfehlungen der Kommission "Selbstkontrolle in der Wissenschaft"**

---

Vorschläge zur Sicherung guter wissenschaftlicher Praxis  
Januar 1998

### **Empfehlung 7**

Primärdaten als Grundlagen für Veröffentlichungen sollen auf haltbaren und gesicherten Trägern in der Institution, wo sie entstanden sind, für zehn Jahre aufbewahrt werden.





# OECD Principles and Guidelines for Access to Research Data from Public Funding



2007





Deutsche  
Forschungsgemeinschaft

**DFG**

**Ausschuss für Wissenschaftliche Bibliotheken und  
Informationssysteme**

**Unterausschuss für Informationsmanagement**

**Empfehlungen zur gesicherten Aufbewahrung und Bereitstellung  
digitaler Forschungsprimärdaten**

**Januar 2009**





# HOST INSTITUTIONS



Center for Marine Environmental Sciences, Bremen



Alfred Wegener Institute for Polar and Marine Research, Bremerhaven





# WORLD DATA CENTER SYSTEM OF ICSU





WORLD DATA CENTER FOR MARINE ENVIRONMENTAL SCIENCES

WDC-MARE



## Biogeochemistry, Circulation, and Life of Present and Past Oceans

The WDC is aimed at collecting, scrutinizing, and disseminating data related to Global Change in the fields of environmental oceanography, marine geology, paleoceanography, and marine biology.

WDC-MARE focuses on georeferenced data using the  
information system **PANGAEA**.





Final data report  
for projects

CD/DVD with data and local  
search engine

Description and further  
information in a booklet

Distribution through 270 libraries  
with focus on marine research

# WDC-MARE Reports

0001  
2004



Integrated Data Sets of the DFG Research Project SFB 313

Environmental Change: The Northern North Atlantic  
(Veränderungen der Umwelt: Der nördliche Nordatlantik)

---

Hannes Grobe, Michael Diepenbrock,  
Priska Schäfer, Jörn Thiede & Gerold Wefer

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WORLD DATA CENTER FOR MARINE ENVIRONMENTAL SCIENCES

Alfred Wegener Institute for Polar and Marine Research, Bremerhaven  
MARUM Center for Marine Environmental Sciences, Bremen





# COSTS

Costs for data archiving:  
<1 % of the costs for data acquisition!

## **SYSTEM OPERATION** (AWI/MARUM)

- a) Hardware, software, network,
- b) System and network management, data librarian
- c) Individual data archiving

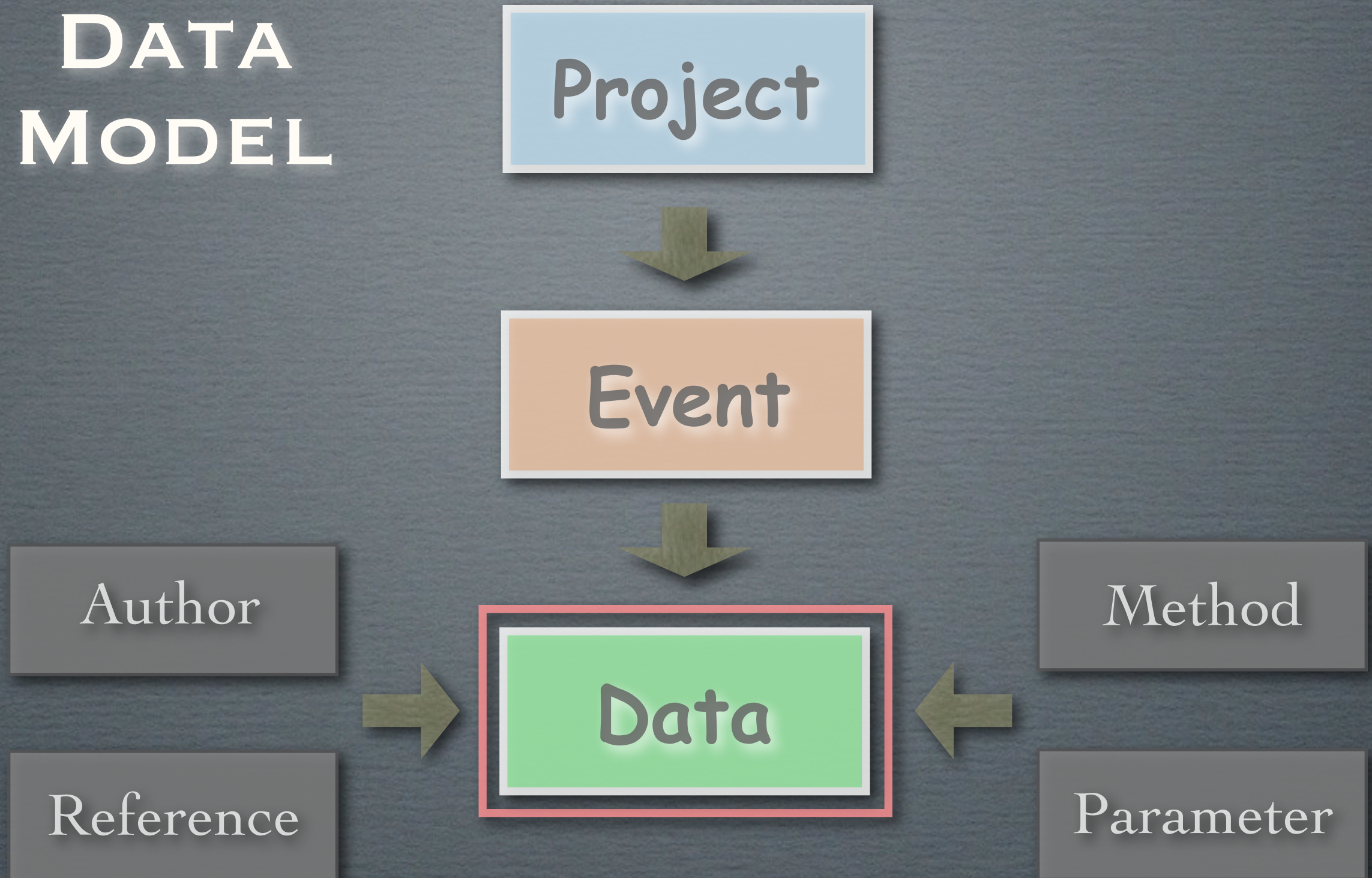
## **DATA ARCHIVING** (Projects)

- a) Data curator
- b) Support by Pangaea group
- c) Data citation with Persistent identifier





# DATA MODEL





# DATA CLASSIFICATION

technical	scientific level	<i>example</i>
numbers	primary (raw)	<i>counts</i>
text	secondary	<i>percentage</i>
objects	tertiary	<i>calculations interpretations</i>



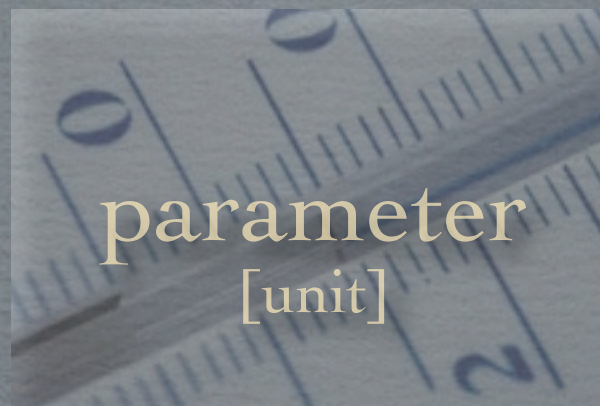


# GEO-CODE & META-DATA

*when ?*



*what ?*

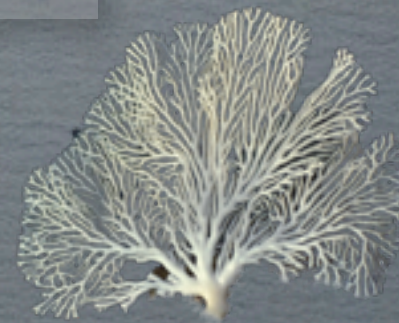


*how ?*



123.456

text

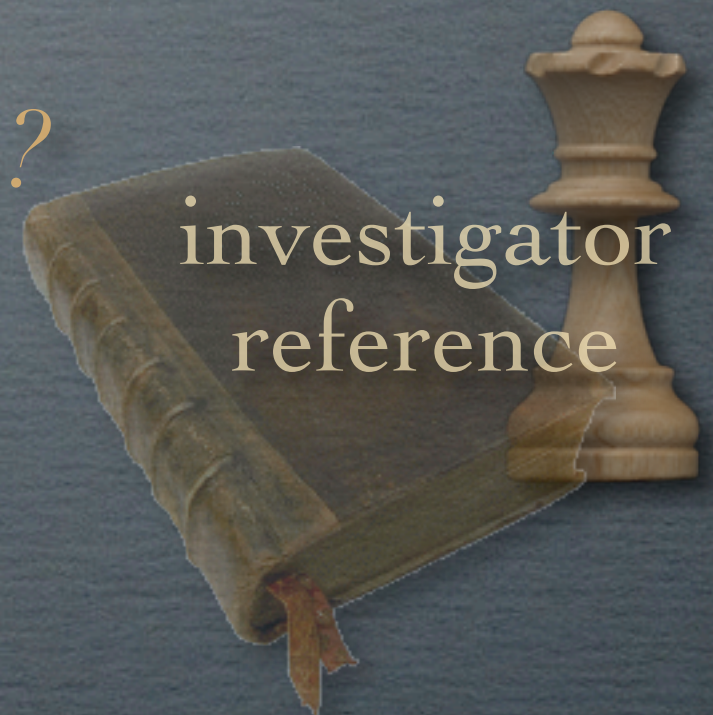


*where ?*



ice, water, air,  
sediment, object...

*who ?*





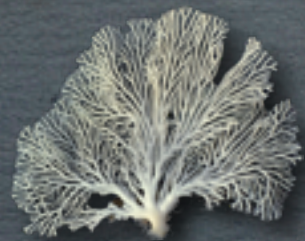
# Georeferenced Data & Files

Data  
table

Value	Latitude	Longitude	3.Spatial dim	Date/Time	Age (kyr)
0.555	-67.6421	18.7659	0.3	2004-03-04	
23.7	-67.6421	18.7659			5.7
123.456	-67.6421	18.7659	112.45		1230
...	...				

Example doi:10.1594/PANGAEA.407415

Binary  
object



123.456  
text  
file

...

Latitude	Longitude	3.Spatial dim	Date/Time	Link
-67.6421	18.7659	0.3	2004-03-04	hs.pangaea.de/para/ ps69/12345678...

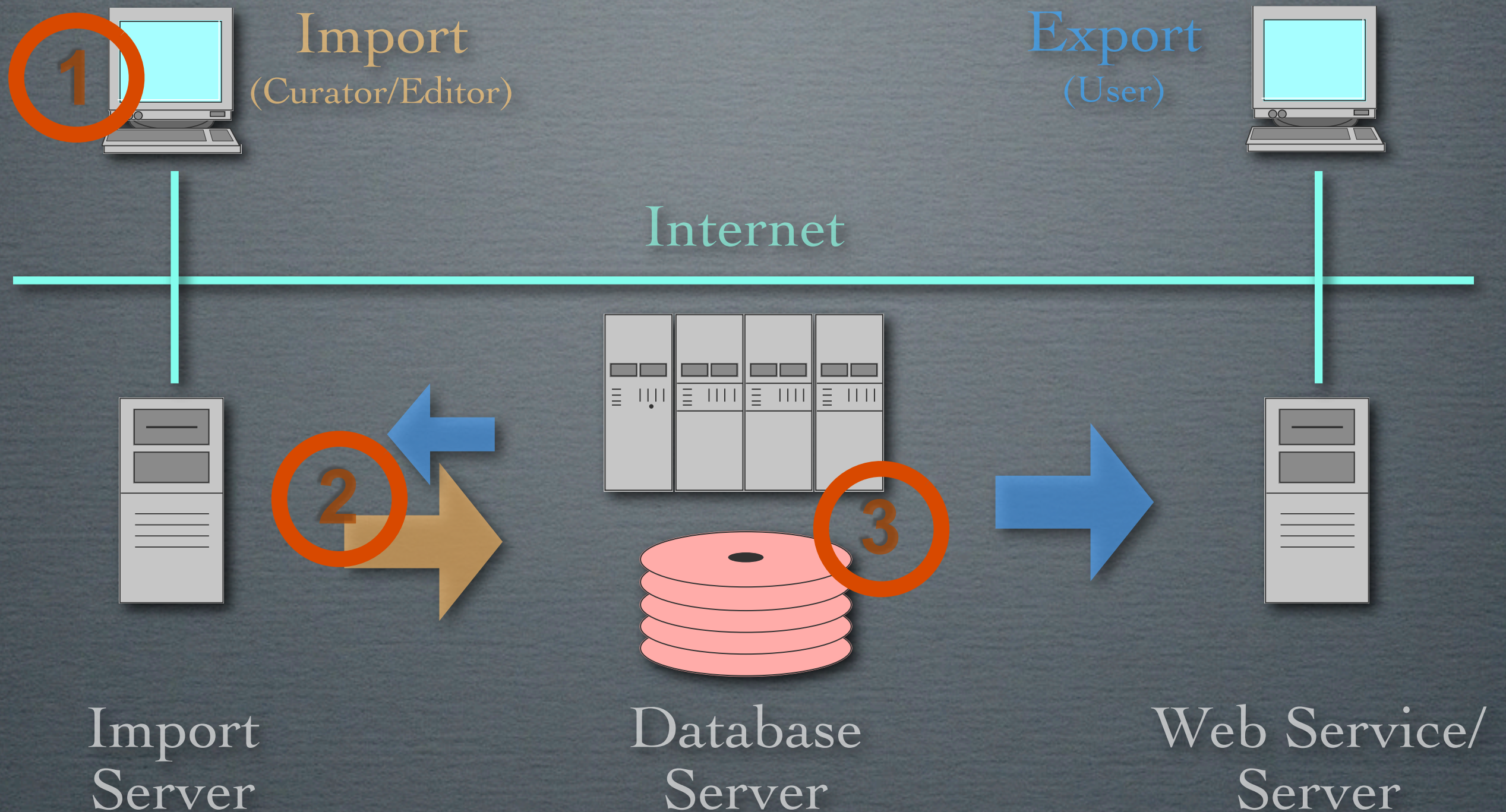
Example doi:10.1594/PANGAEA.596353





# Client-server system

three-tiered architecture





# Data Access

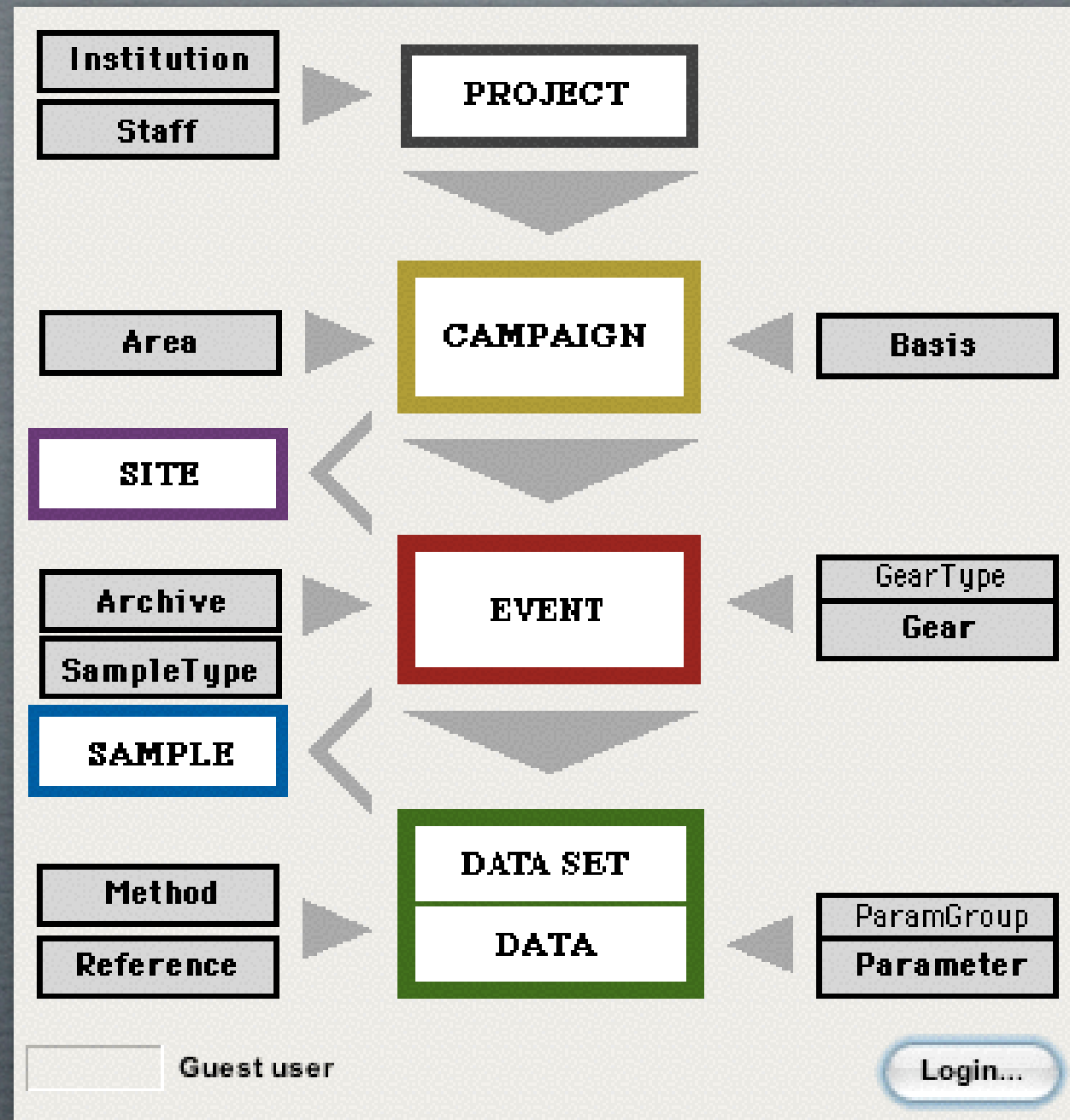
- Search engine
- ART (Advanced Retrieval Tool) > curators only
- DDI (Direct Download Interface) > dynamic queries
- PanCore > Metadata search
- DOI (Digital Object Identifier) > persistent link
- Web service > exchange with portals (ISO, DC, XML)
- Data-Warehouse > retrieval & compilation





# ART

## Advanced Retrieval Tool



*Did you read  
the manual ?*





# Search engine



Search for:

Search

[Show map](#)

[Help](#)

[Info](#)

[Software](#)

[Advanced search](#)





# DDI

## Direct Download Interface

Define individual queries on any table  
by using ART

---

Save query and configuration

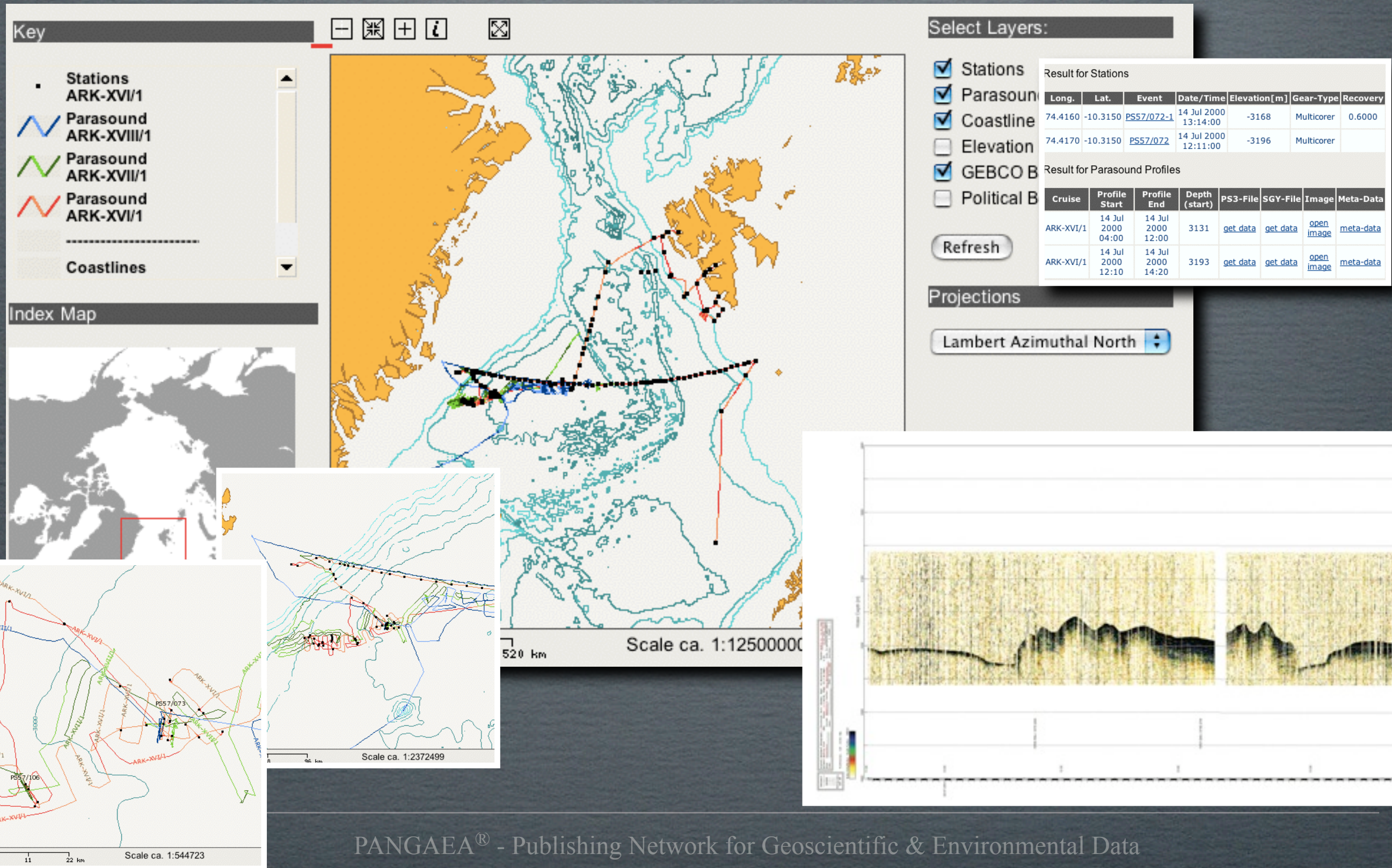
---

Add query to a new data set description  
or link it on a web page





# Pangaea Internet Mapper PIM

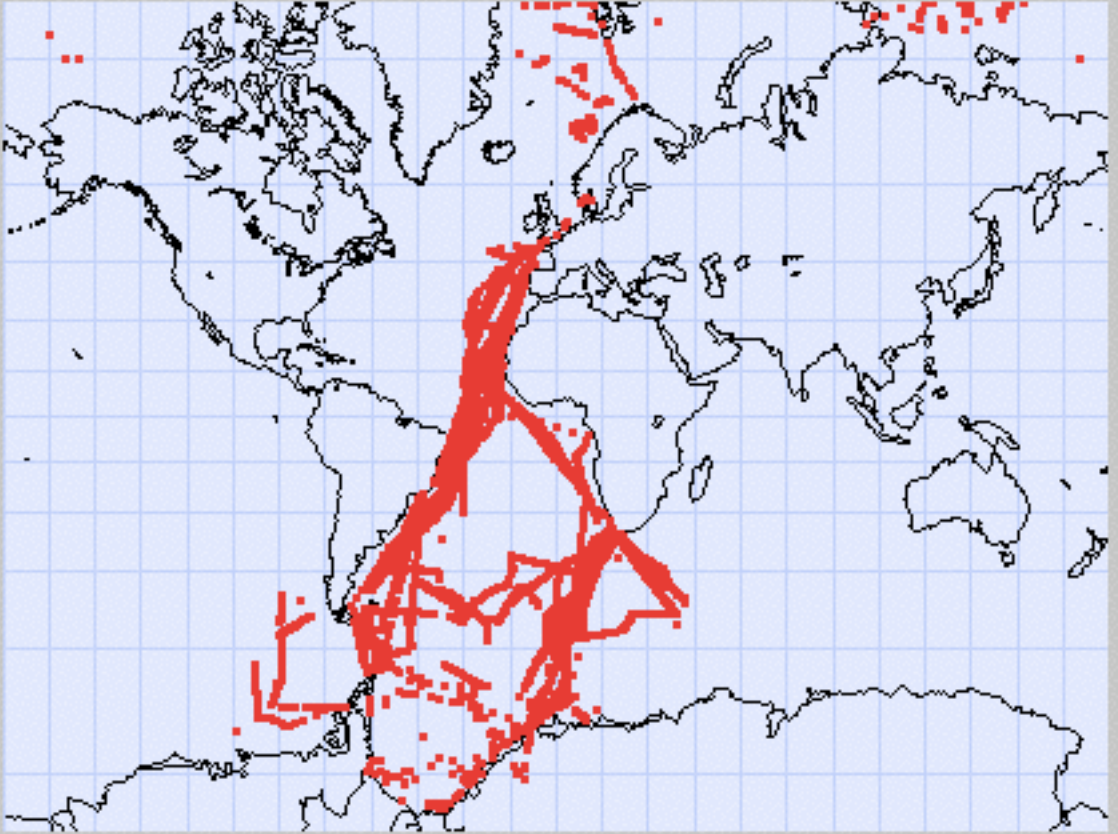





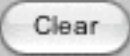


# PanCore

Retrieval | Result config | Result







Core/Sample:

Cruise:

Ship:

Project:

Gear type:

Elevation from:

to:





# Persistent link/DOI

## IMAGES Cores

- [Images I:1995](#)
- [Images II:1996](#)
- [Images III:1997](#)
- [Images IV:1998](#)
- [Images V:1999](#)
- [Images VI:2000](#)
- [Images VII:2001](#)
- [Images VIII/IX:2002](#)
- [Images X/XI:2003](#)

Core	Latitude (dec °)	Longitude (dec °)	Waterdepth (m)	Corelength (m)
<a href="#">MD95-2001</a>	46.8	-8.67	3788	22.37
<a href="#">MD95-2002</a>	47.45	-8.53	2174	29.99
<a href="#">MD95-2003</a>	55.18	-14.76	2365	26.93
<a href="#">MD95-2004</a>	55.47	-14.68	2177	28.485
<a href="#">MD95-2005</a>	57.03	-10.06	2130	22.02
<a href="#">MD95-2006</a>	57.03	-10.06	2122	30.22
<a href="#">MD95-2007</a>	57.52	-8.39	158	19.35
<a href="#">MD95-2008</a>	62.74	-3.99	1016	21.5



## CRP Cape Roberts Project

Home

CRP-1

Sample list  
Core box images  
Data

CRP-2

CRP-3

### Studies from the Cape Roberts Project, Ross Sea, Antarctica

Hambrey, M; Wise, S; Barret, P; Davey, F; Ehrmann, W; Smellie, J; Villa, G & Woolfe, K (eds) (1998): Studies from the Cape Roberts Project, Ross Sea, Antarctica; Scientific Report of CRP-1. Terra Antarctica, 5(3)  
Links at the end of each reference will download data as tab delimited text files.

Armienti, P; Messiga, B & Vannucci, R (1998) Sand provenance from major and trace element analyses of bulk rock and sand grains. 589-599 p  
Tab.1 (Major and trace elements on whole rock sample)  
Tab.2,3,4 (Major and trace elements of pyroxene, feldspar and glasses)

Yuretich, R; Melles, M; Sarata, B & Grobe, H (1999) Clay minerals in the sediments of Lake Baikal: a useful climate proxy. Journal of Sedimentary Research, (69(3)), 588-596 p  
[Core BDP93-2 sedimentology](#)





# PANGAEA® – standard interfaces for metadata

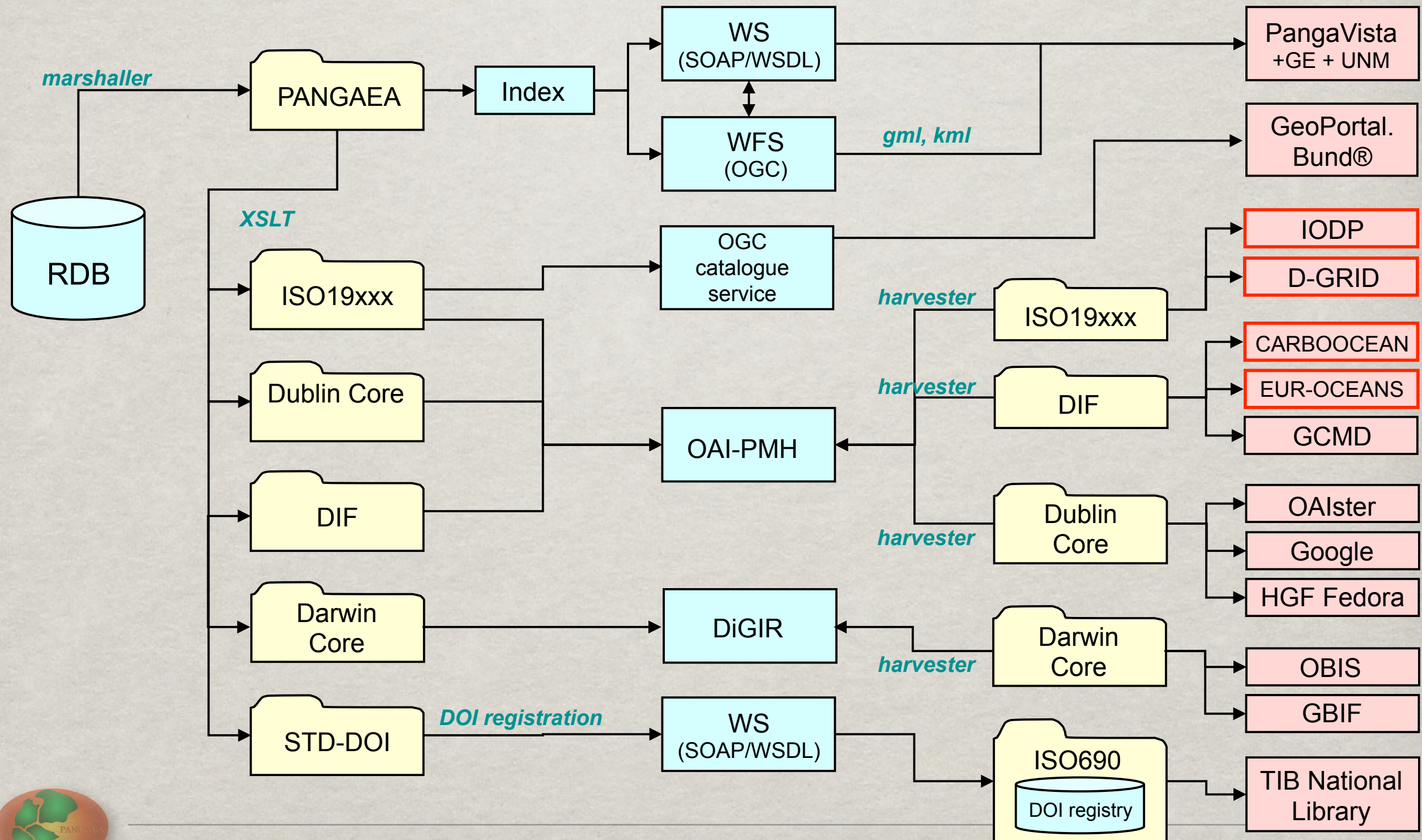
*data management & longterm archiving*

*catalogues*

*protocols*

*catalogues*

*Frontends / portals*





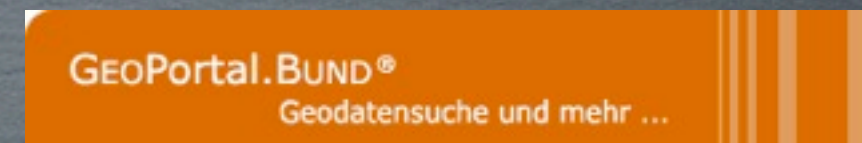
# Web services



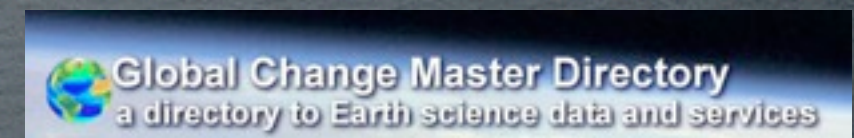
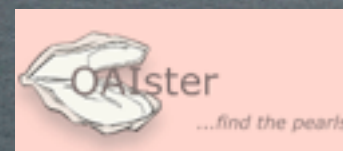
## Search Engines



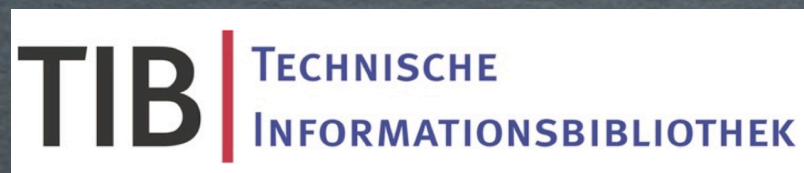
## Meta Systems



## Projects



## Portals



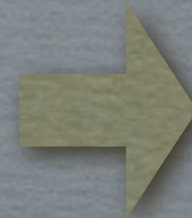
## Library Catalogs



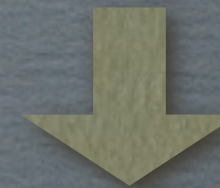


# LOCAL DATA MINING

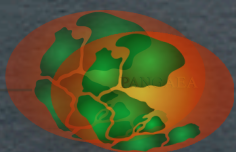
Search for:  
  
[Show map](#)  [Help](#)



**Data warehouse**



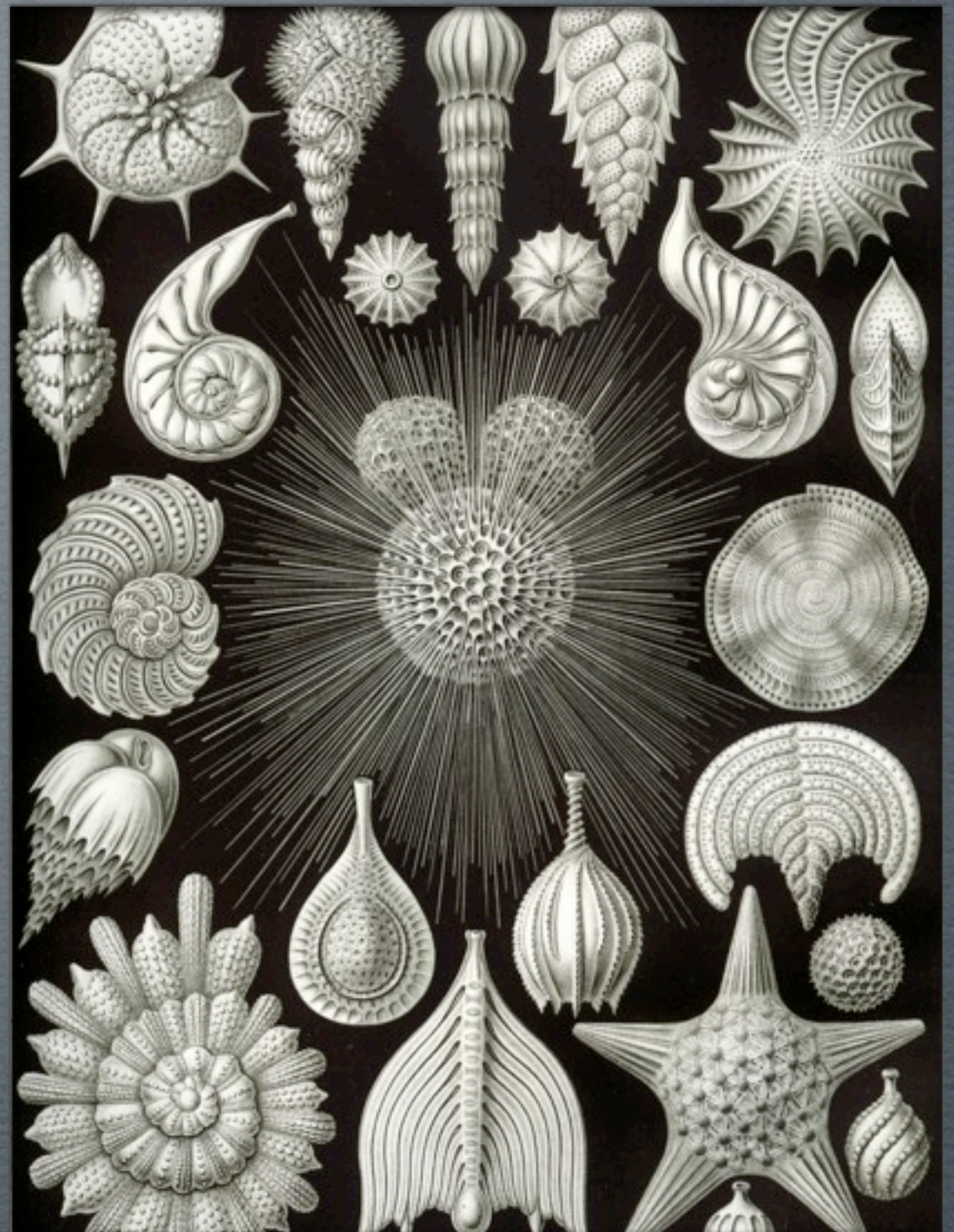
GIS (shape, ODV, PanMap)  
Plots (PanPlot, Tilia, Excel)  
Statistic (StatView, TimeSlice)  
Models (individual text format)  
... to be extended





# DATA WAREHOUSE

< *Globigerina bulloides* >





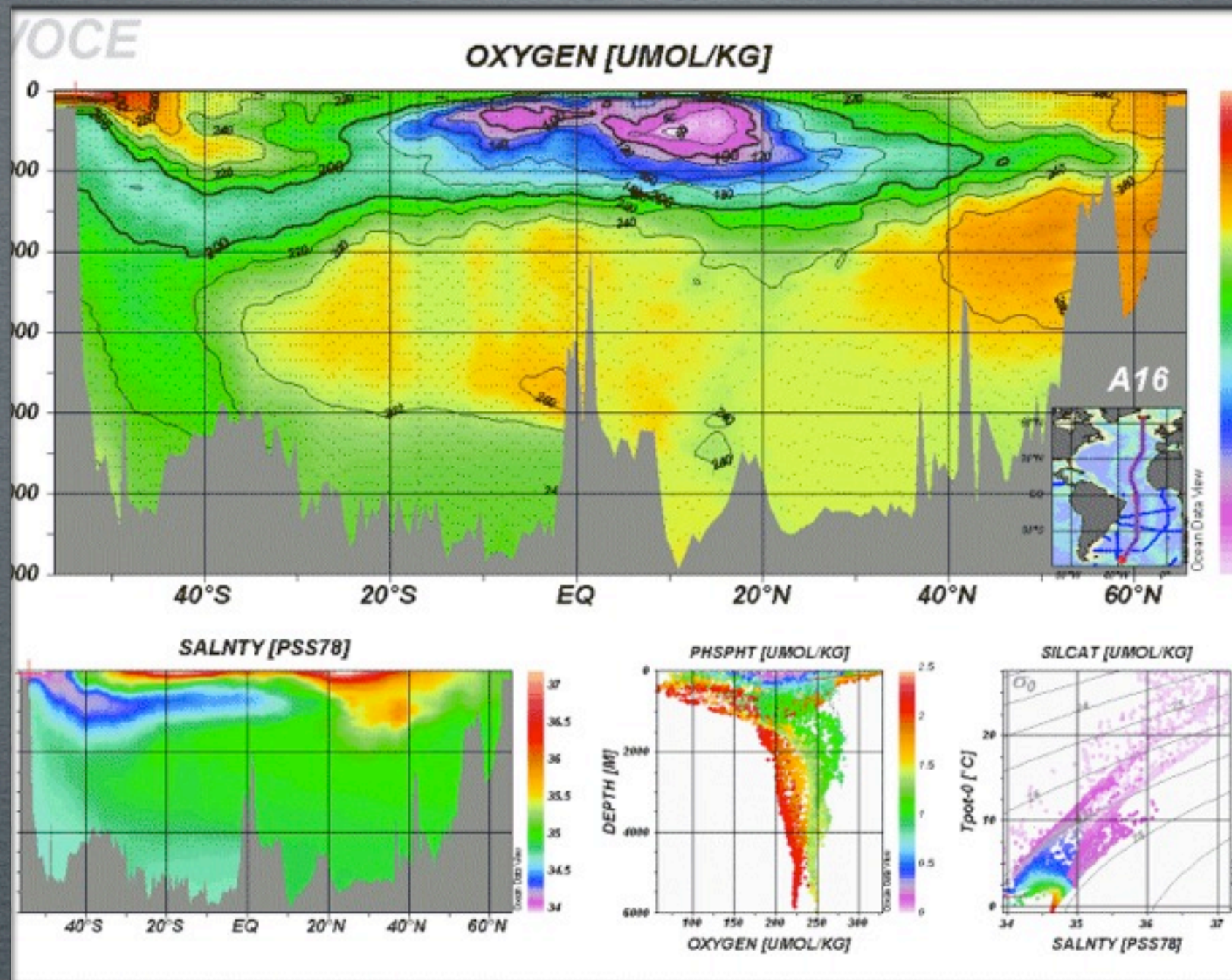
# DATA WAREHOUSE

*< Temperatur >*





# Ocean Data View (ODV)





# MAJOR PROJECTS

<u>International</u>	<u>EU</u>	<u>National</u>
BSRN	OMARC	rcom
JGOFS	CarboOcean	SIRRO
WOCE	EurOceans	HISTRA
EPICA	HERMES	ARCOD
IODP	EPOCA	DFG/BMBF

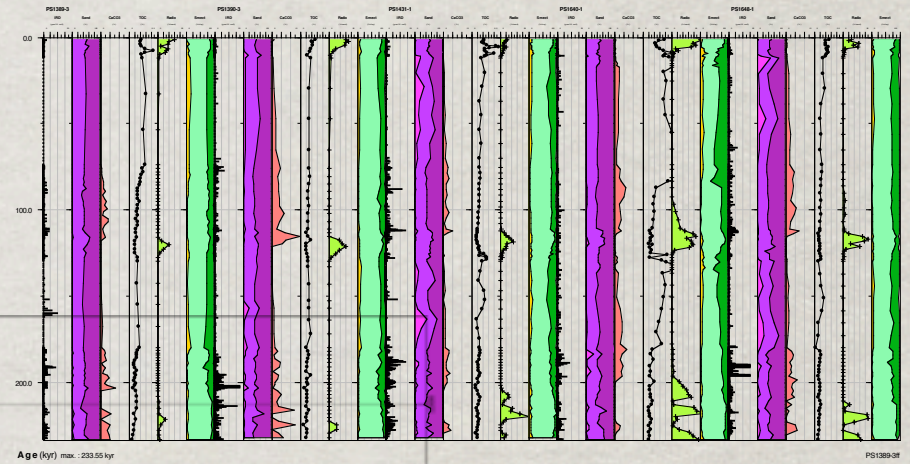
<http://www.pangaea.de/projects/>



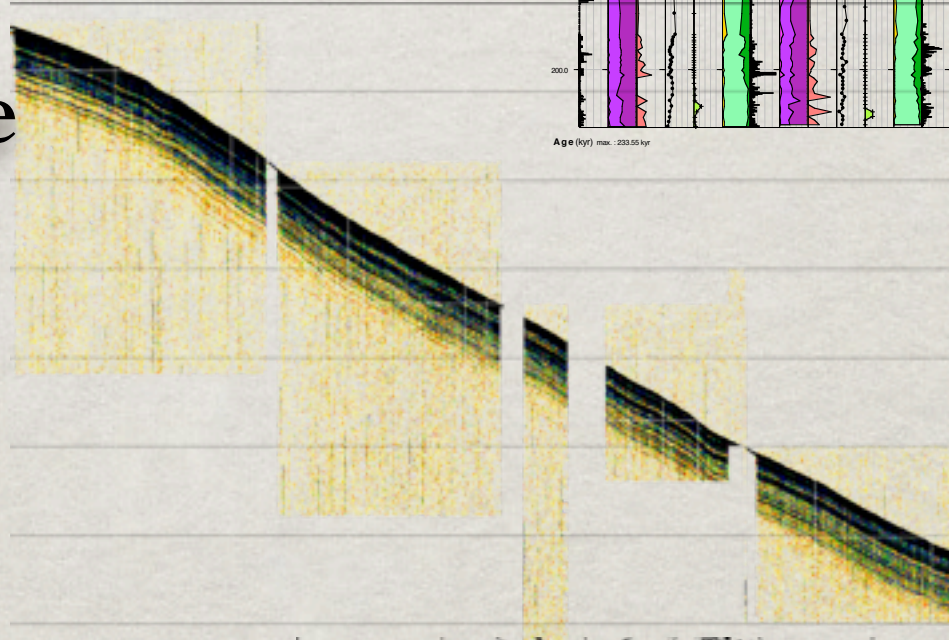


# Examples from Geoscientific Research

◆ Sediment profile



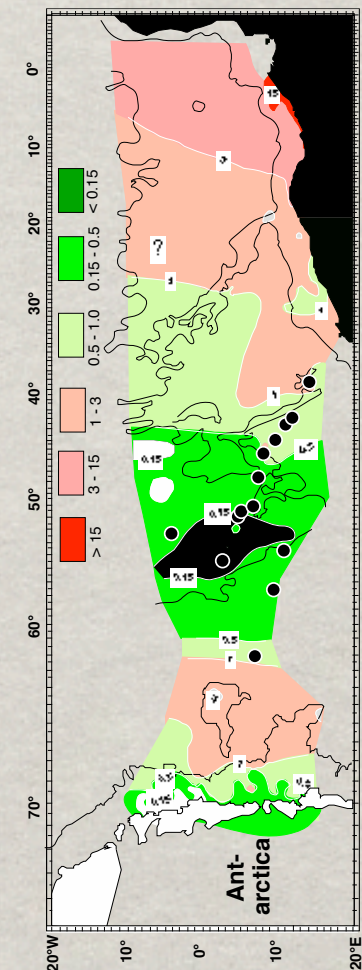
◆ Seismic profile



◆ Mineral distribution



◆ Geological map



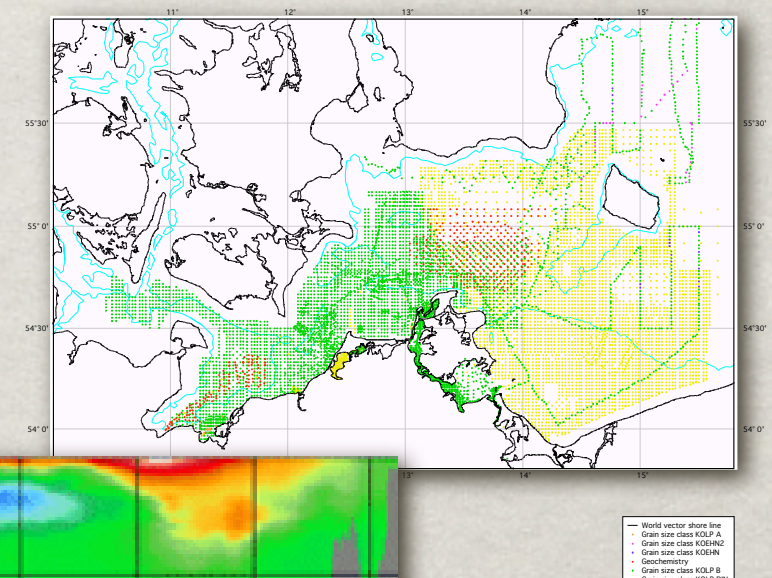


# Examples from Environmental Research

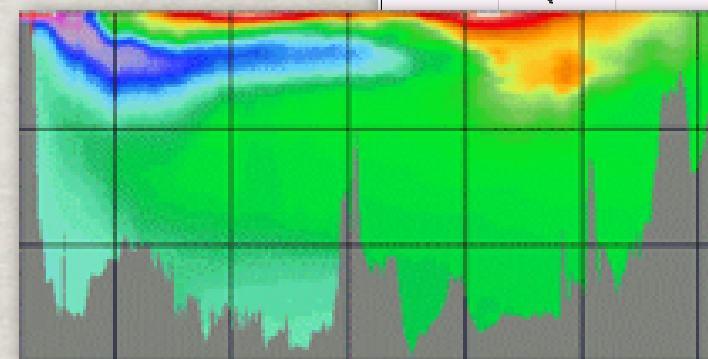
◆ Images



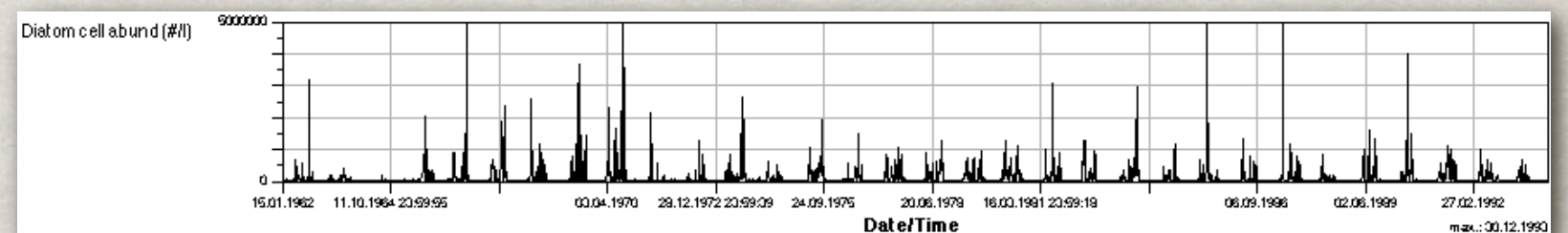
◆ Distributed samples



◆ Hydrographic profiles



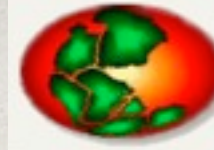
◆ Times Series





# JGOFS

JOINT GLOBAL OCEAN FLUX STUDIES



PANGAEA

Please quote reference and citation when using data!

[Data](#) [Software](#) [Info](#) [Links](#)

[PangaVista](#) | [ART](#) | [Projects](#) | [Institutes](#) | [PanCore](#)

You are not logged in ([LOG IN](#))

Search for:

project:jgofs

[Show map](#)

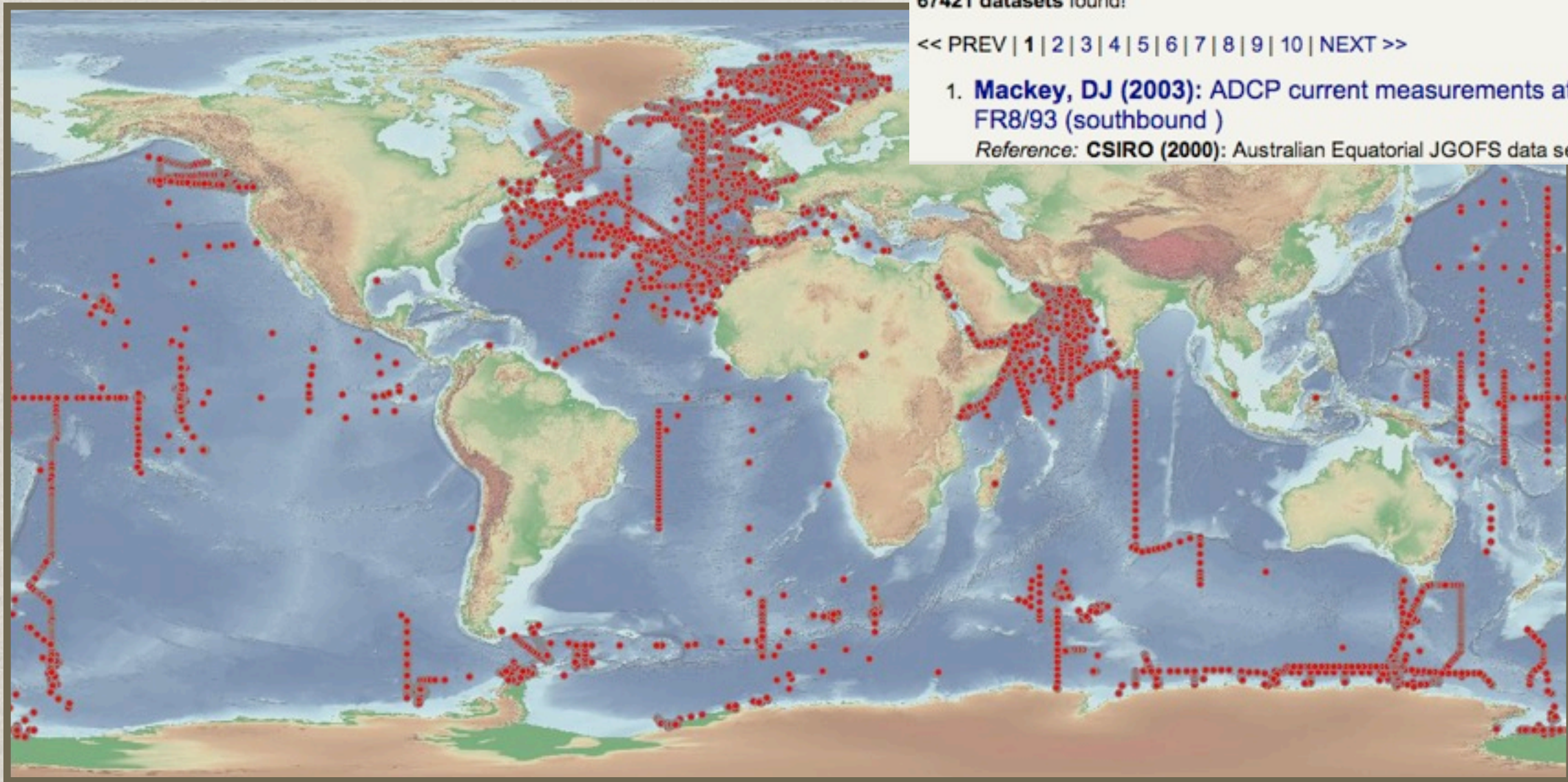
[Help](#)

67421 datasets found!

<< [PREV](#) | [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [NEXT](#) >>

1. **Mackey, DJ (2003):** ADCP current measurements at cruise FR8/93 (southbound)

Reference: **CSIRO (2000):** Australian Equatorial JGOFS data set,





# Sea-bed photos



Search for:  
sea-bed

189 datasets found!

<< PREV | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | NEXT >>

- Gutt, J (2004): Sea-bed photographs (benthos) from the Weddell Sea along ROV profile PS48/281 (©AWI, Gutt 1998)**  
Reference: **Raguá-Gil, JM; Gutt, J; Clarke, A et al. (2004):** Antarctic shallow-water mega-epibenthos: shaped by circumpolar dispersion or local conditions?, *Marine Biology*  
**Gutt, J; Arntz, WE; Balguerías, E et al. (2003):** Diverse approaches to questions of diversity: German contributions to benthos studies around South American and Antarctica, *Gayana*  
**Gutt, J; Piepenburg, D (2003):** Scale-dependent impacts of catastrophic disturbances by grounding icebergs on the diversity of Antarctic benthos, *Marine Ecology Progress Series*  
(and more)  
Size: unknown  
doi:10.1594/PANGAEA.198886 - Score: 80% - Similar datasets
- Gutt, J (2004): Sea-bed photographs (benthos) from the Weddell Sea along ROV profile PS48/238 (©AWI, Gutt 1998)**  
Reference: **Gutt, J; Arntz, WE; Balguerías, E et al. (2003):** Diverse approaches to questions of diversity: German contributions to benthos studies around South American and Antarctica, *Gayana*  
**Gutt, J (2001):** High latitude antarctic benthos: a coevolution of nature conservation and ecosystem research?, *Ocean and Polar Research*  
**Gutt, J (2001):** On the direct impact of ice on marine benthic communities, a review, *Polar Biology*  
(and more)  
Size: unknown  
doi:10.1594/PANGAEA.198885 - Score: 80% - Similar datasets
- Gutt, J (2004): Sea-bed photographs (benthos) from the Weddell Sea along ROV profile PS48/219 (©AWI, Gutt 1998)**  
Reference: **Gutt, J; Arntz, WE; Balguerías, E et al. (2003):** Diverse approaches to questions of diversity: German contributions to benthos studies around South American and Antarctica, *Gayana*  
**Gutt, J; Piepenburg, D (2003):** Scale-dependent impacts of catastrophic disturbances by grounding icebergs on the diversity of Antarctic benthos, *Marine Ecology Progress Series*  
**Gutt, J; Starmans, A (2001):** Quantification of iceberg impact and benthic recolonisation patterns in the Weddell Sea (Antarctica), *Polar Biology*  
(and more)  
Size: unknown  
doi:10.1594/PANGAEA.198884 - Score: 80% - Similar datasets
- Gutt, J (2004): Sea-bed photographs (benthos) from the Weddell Sea along ROV profile PS48/213 (©AWI, Gutt 1998)**

doi:10.1594/PANGAEA.319877

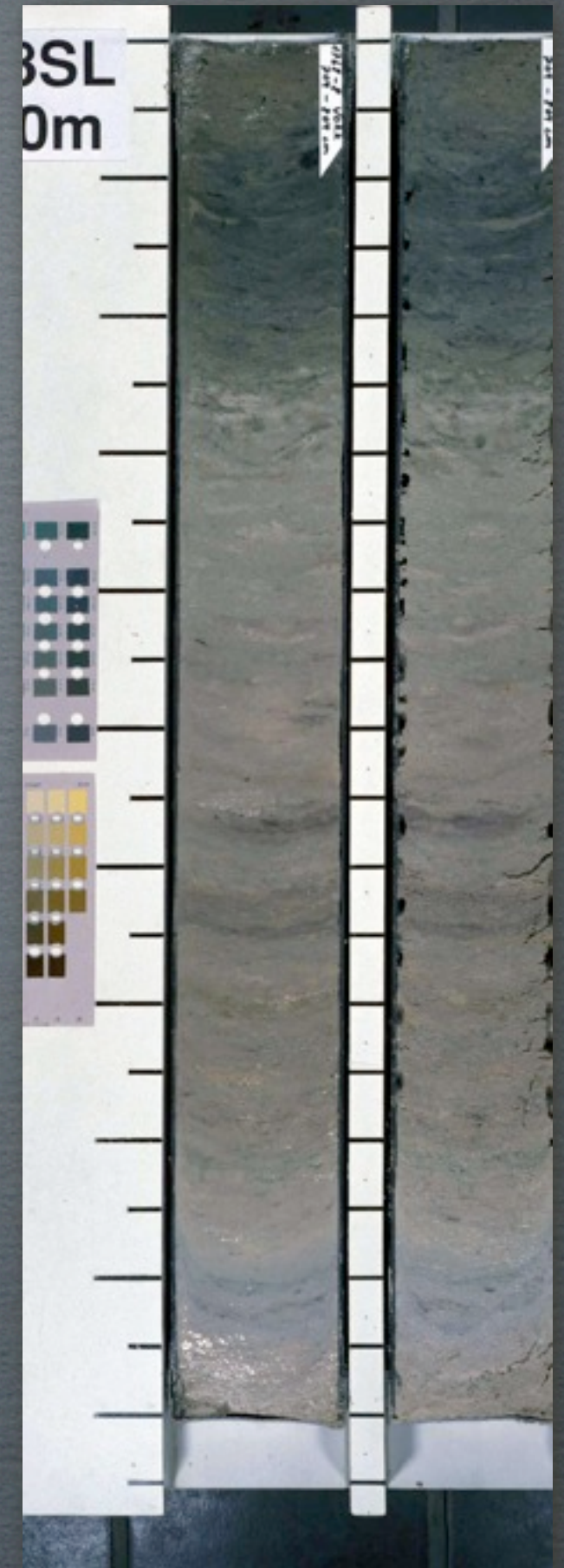
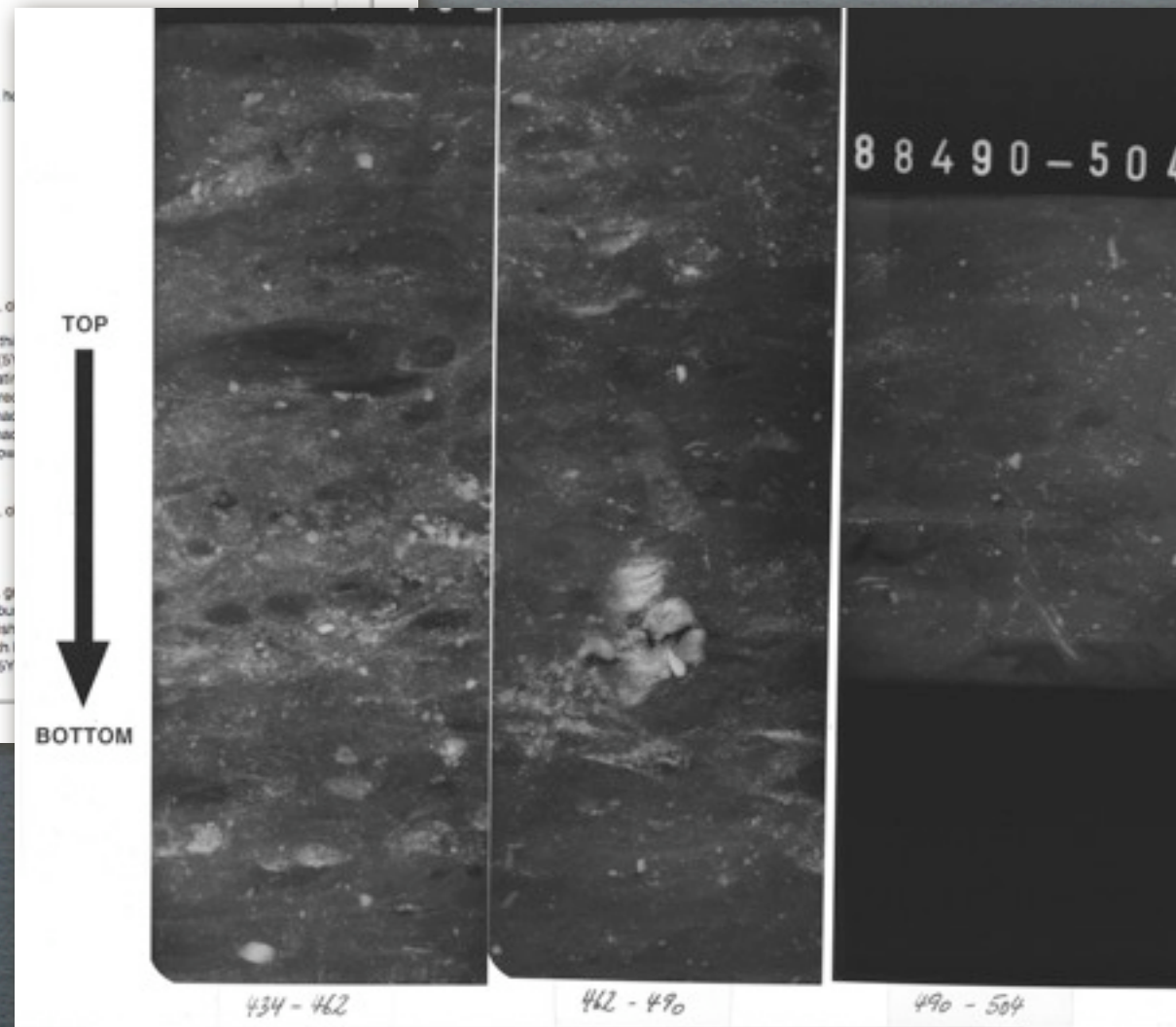




PS1768-8 (SL) North of SW Indian Ridge ANT VIII/3  
 Recovery: 8.96 m 52° 35.6' S, 4° 28.5' E Water depth: 3270 m

Lithology	Struct.	Colour	Description	Age
10YR 7/3			0-35 cm: diatomaceous ooze, very pale brown (0-13 cm), light yellowish brown (13-35 cm)	
10YR 6/4			35-62 cm: diatomaceous ooze, very pale brown (35-53 cm), pale brown (53-62 cm)	
10YR 7/3			62-70 cm: diatomaceous ooze, very pale brown, two light gray layers (62-64 cm and 66-68 cm)	
10YR 6/3			70-94 cm: diatomaceous ooze, very pale brown, darker spots	1
10YR 7/4			94-139 cm: diatomaceous ooze, light yellowish brown (94-96 cm), dark brown (96-99 cm), pale yellow (99-139 cm)	
2.5Y 7/4			106-170 cm: partly core deformation	
5Y 5/3			139-230 cm: diatomaceous mud, homogeneous, olive	
5Y 4/2			230-240 cm: diatomaceous mud, h	
5Y 5/3			240-440 cm: diatomaceous mud, occur throughout, 290-306 cm: some thin black (S) 350-375 cm: alternating scattered diatomial 386-387 cm: diatomial 395 cm: large burrow	
5Y 4/2			440-453 cm: diatomaceous mud, o	
5Y 4/2			453-466 cm: diatomaceous mud, g 453-456 cm: some bu 474-478 cm: yellowish 480-483 cm: ash-rich 485-486 cm: olive (5Y	
2.5Y 5/0				
5Y 5/3				

# Sediment core documentation

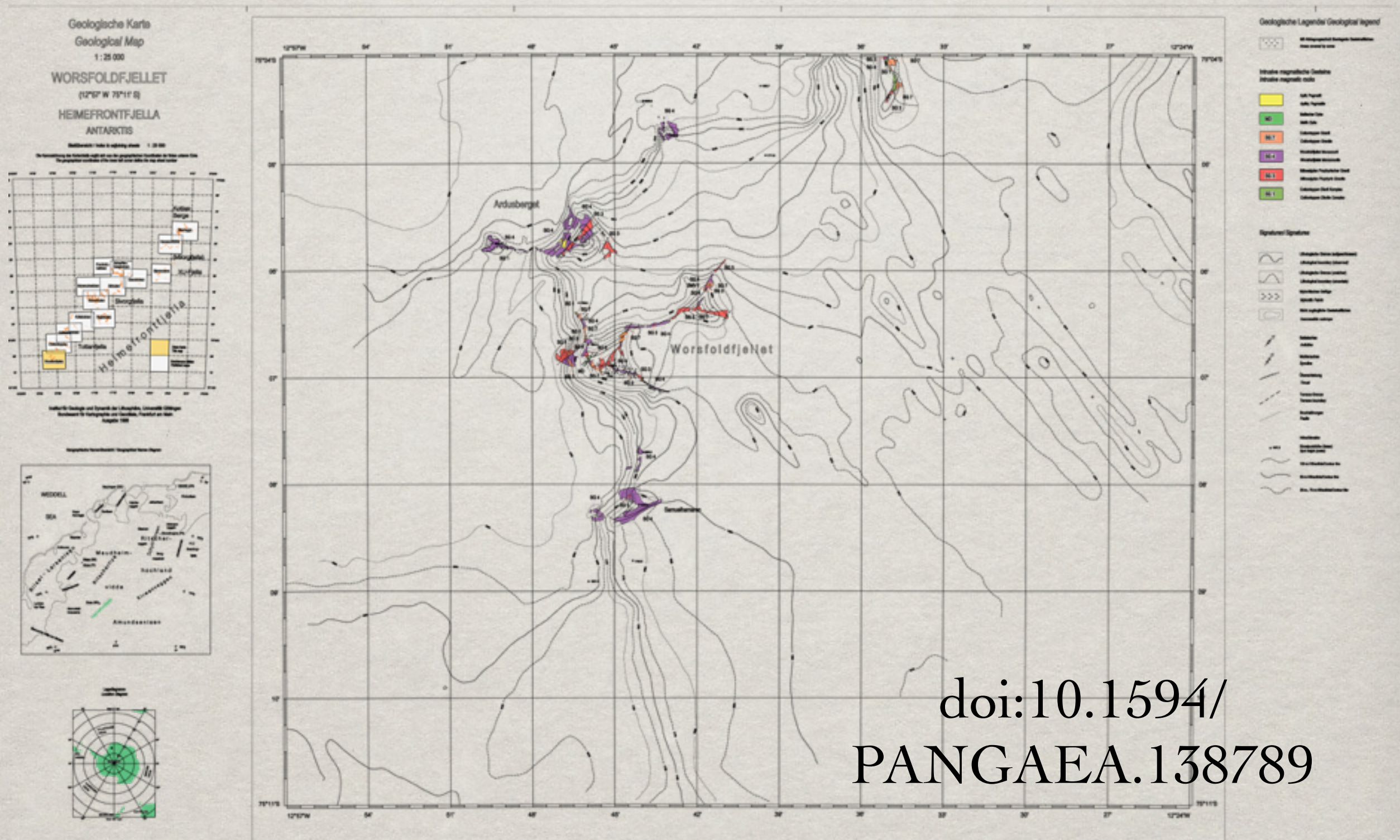


doi:10.1594/PANGAEA.108079





# Worsfoldfjellet



doi:10.1594/  
PANGAEA.138789

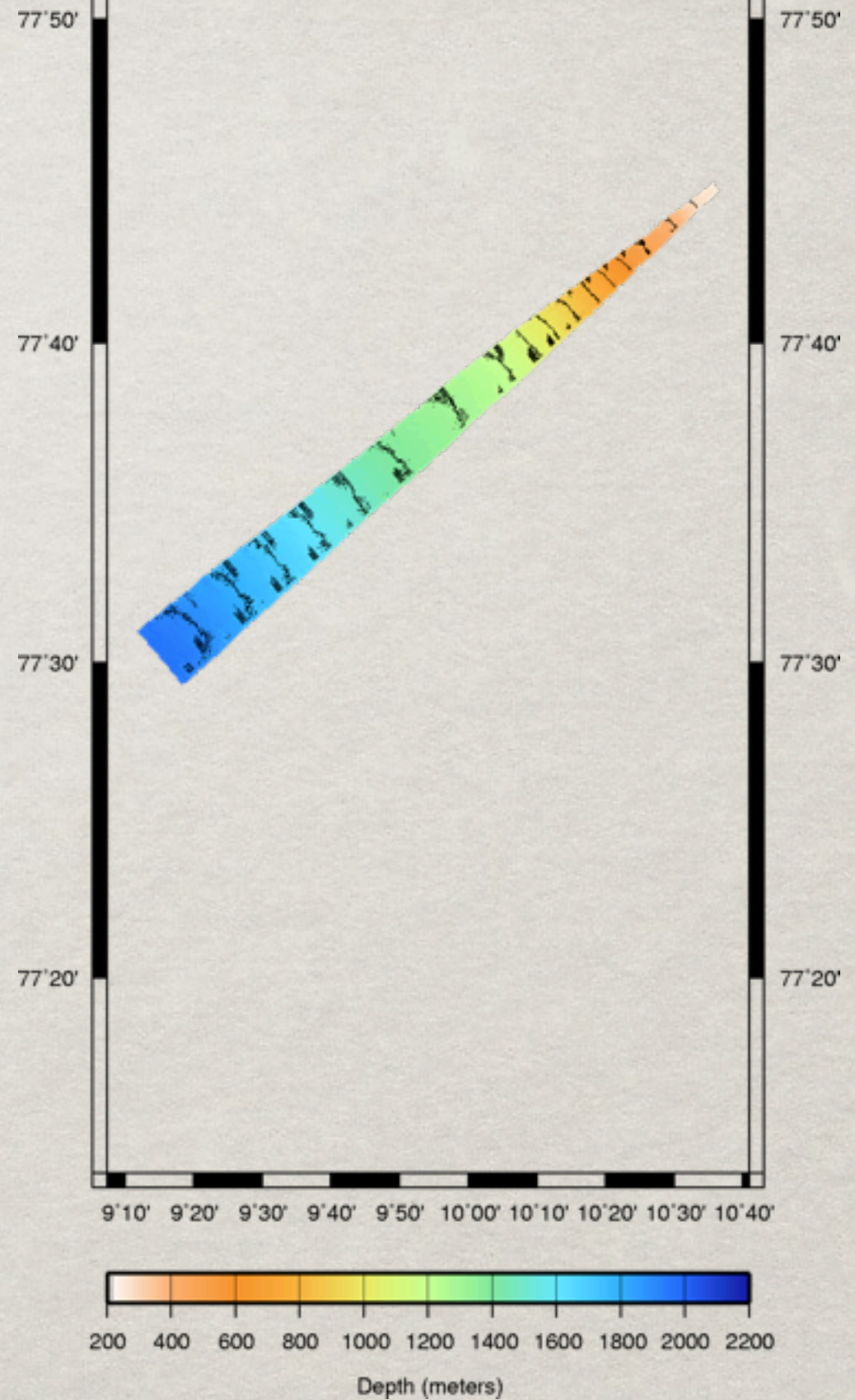


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# Swath sonar bathymetry



[doi:10.1594/PANGAEA.351142](https://doi.org/10.1594/PANGAEA.351142)





# Digital Object Identifier



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results list < previous

**Computers & Geosciences**  
Volume 28, Issue 10, December 2002, Pages 1201-1210

DOI: 10.1016/S0098-3004(02)00039-0

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## PANGAEA—an information system for environmental sciences

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<sup>b</sup> Alfred Wegener Institute for Polar and Marine Research, Bremerhaven 27515, Germany  
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### Abstract

PANGAEA is an information system for processing, long-term storage, and publication of georeferenced data related to earth science fields.





International  
 Foundation



Registration Agency  
for scientific primary data

**TIB** | TECHNISCHE  
INFORMATIONSBIBLIOTHEK



Data library  
PANGAEA



Data center B  
WDC



Data center C  
GFZ



Data center  
xyz...



10.1594/PANGAEA.119754





# WORKFLOW IN DATA PUBLISHING

- 🌐 Provision of data (PI)
- 🌐 Import to PANGAEA (curator)
- 🌐 Proof-Read (PI)
- ↕
- 🌐 Corrections (curator/editor)
- 🌐 Peer review (reviewer ?)
- 🌐 Publication with DOI & citation

**Editorial**

**Review**





# ESSD

EARTH  
SYSTEM  
SCIENCE  
DATA

Earth System Science Data  
The Data Publishing Journal

**Earth System Science Data (ESSD)**  
Chief Editors: David Carlson & Hans Pfeiffenberger

Open Access – Public Peer-Review & Interactive Public Discussion –  
Copyright under a Creative Commons License

Included in the [Directory of Open Access Journals \(DOAJ\)](#), [Bodleian Library \(UK\)](#), [Deutsche Bibliothek \(D\)](#) and [Library of Congress \(USA\)](#). Long-term e-archived in [Portico](#).

**Aims and Scope**

Earth System Science Data (ESSD) is an international, interdisciplinary journal for the publication of articles on original research data(sets), further reuse of high (reference) quality data of benefit to Earth System Science. Editors encourage submissions on original data or data collections of sufficient quality and potential impact to contribute to these aims.

The journal maintains sections for regular length articles, brief communications (e.g., on additions to datasets) and commentary, as well as review articles and "Special Issues".

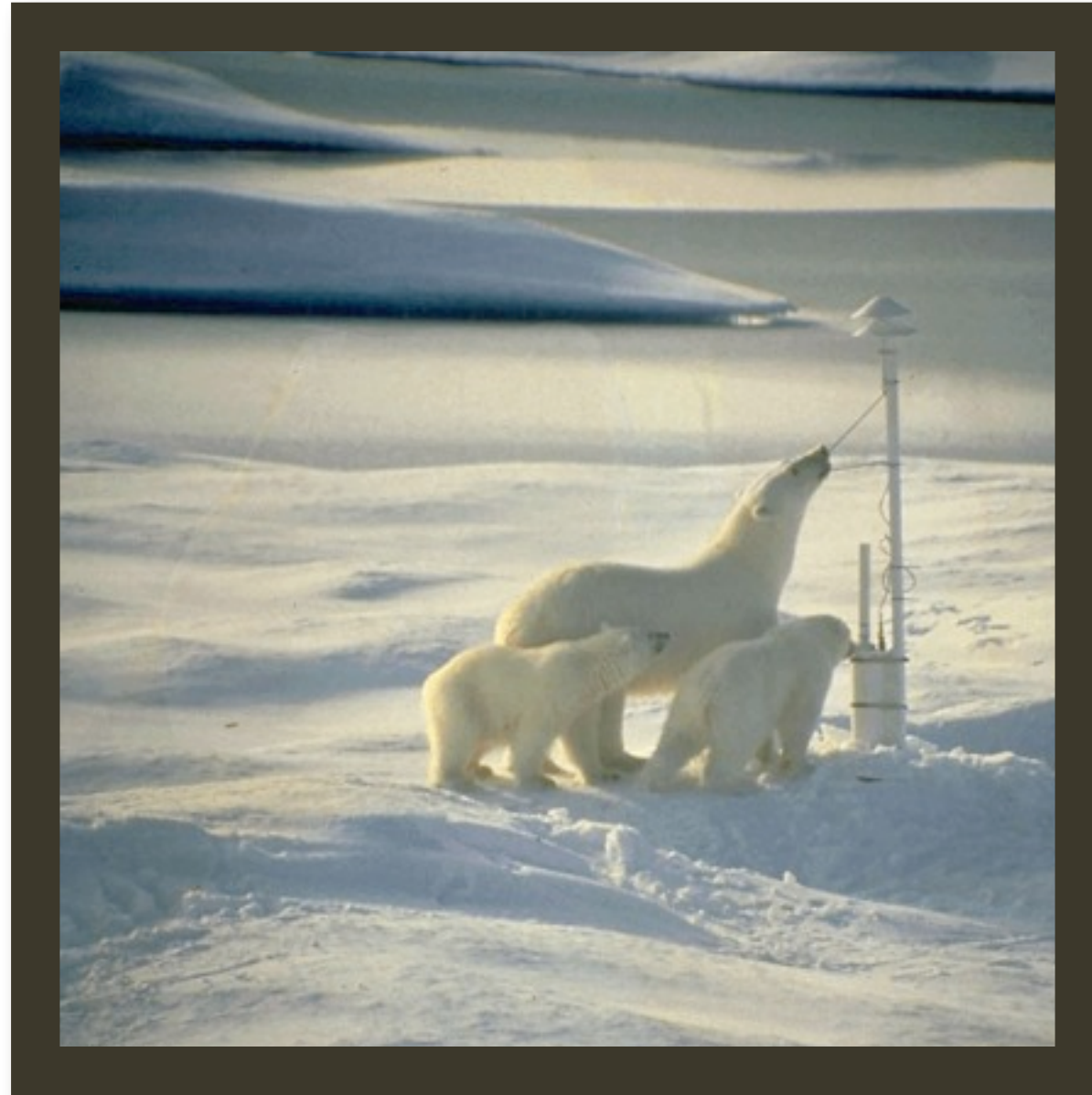
Articles in the data section may pertain to the planning, instrument development, execution of experiments or collection of data. Any interpretation of data outside the scope of regular articles. Articles on methods describe methods, statistical and other methods employed, e.g. to filter, normalize or transform data to primary, published data, as well as nontrivial instrumental or operational methods. Any comparison to other methods is out of scope for regular articles.

Review articles may compare methods or relative merits of datasets.





# no data found ?



might not be the problem of the database ...





## Contact

*info@pangaea.de*

This presentation is available at  
[hdl:10013/epic.31845.d001](https://hdl.handle.net/10013/epic.31845.d001)

