



PANGAEA

Publishing Network
for Geoscientific & Environmental Data

Uwe Schindler – NOKIS Workshop 2006

Motivation

- ❑ Open Access to scientific results
- ❑ Safeguarding 'Good Scientific Practice'
- ❑ Added value through integration
- ❑ Overview on 'what exists'
- ❑ Persistent identification and availability
- ❑ Reporting to funding organization
- ❑ Personal record
- ❑ BackUp

**Libraries preserve
the knowledge
of mankind!**



Challenges

- ☑ Long-term **operation**
 - hardware, software, bup, network
- ☑ Simple and flexible **data model**
 - extendable and ajustable to evolving science
- ☑ Scientific and technical **standards**
 - for science and web integration
- ☑ Scalable **access**
 - depending on different user needs
- ☑ **User** driven and controlled
 - to avoid a technical end in itself



EU- Recommendations

The Colour of Ocean Data

Symposium on Oceanographic Data and Information Management, Brussels, 2002

- ◆ Peer review of datasets and standards
- ◆ Coordination and cooperation between stakeholders and data center
- ◆ Comprehensive portals that do not lead to metadata nonsense, but directly to data and information



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.



www.pangaea.de

www.pangea.de

Public library for georeferenced data

Basic research on earth & environment

Normalized data model

Open parameter list

Internet clients for download

Web services and networking



Operating Institutions



Center for Marine Environmental Sciences, Bremen



Alfred Wegener Institute for Polar and Marine Research
Bremerhaven



Organisation & Responsibilities



data model
middleware
clients
web services



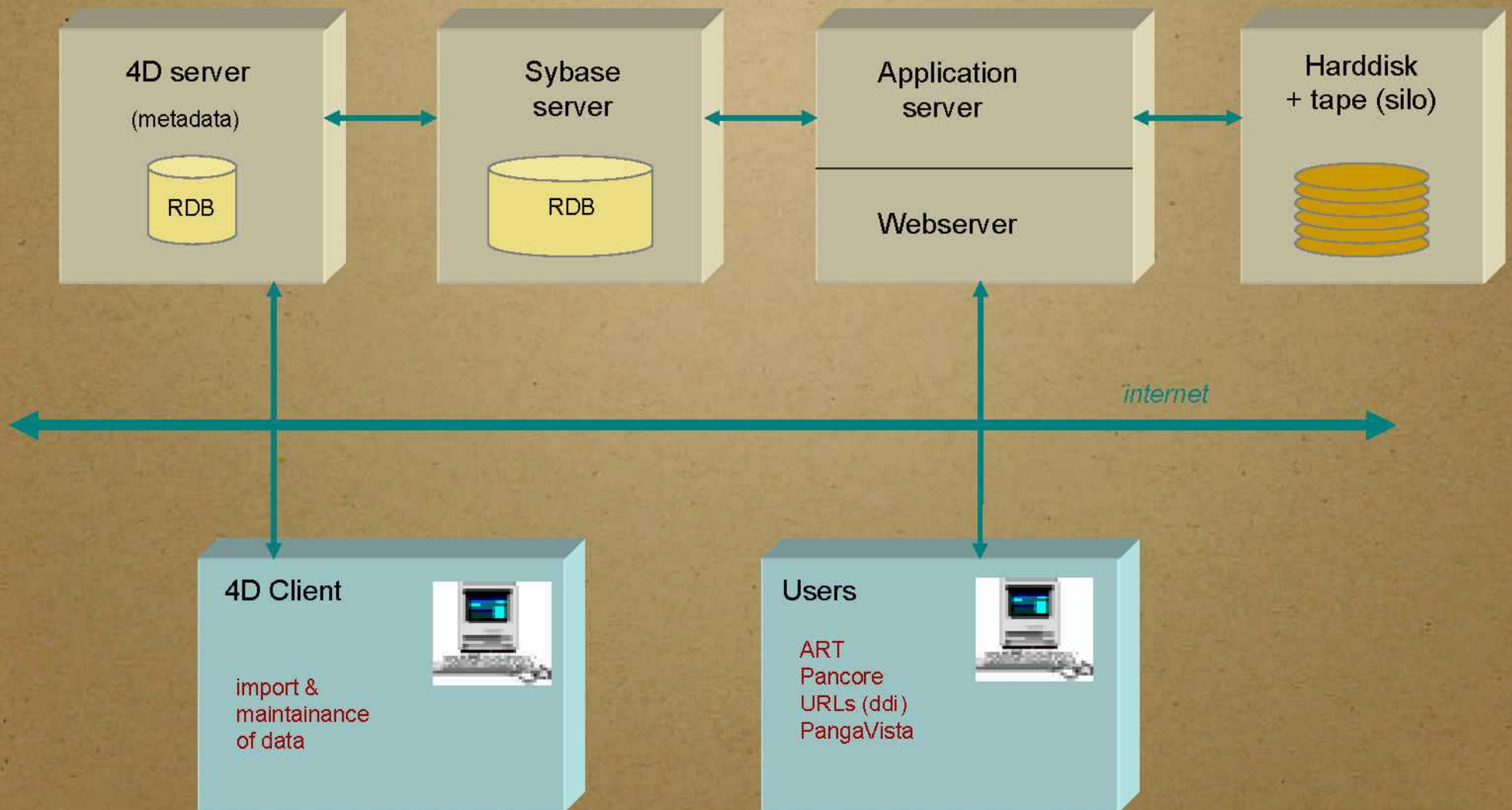
data management
archiving &
publishing



hardware
software
parameter
librarian

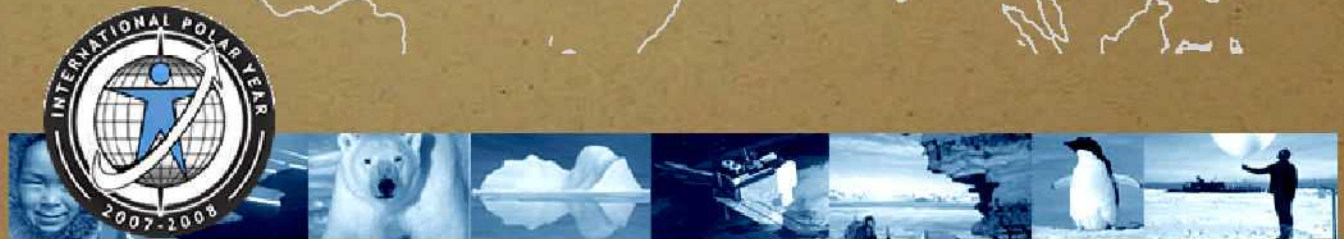


PANGAEA - Technical Infrastructure



World Data Center System of ICSU

established during the International Geophysical Year 1957/58



Examples from Geoscientific Research

- ◆ Sediment profile

[doi:10.1594/PANGAEA.51508](https://doi.org/10.1594/PANGAEA.51508)

- ◆ Seismic profile

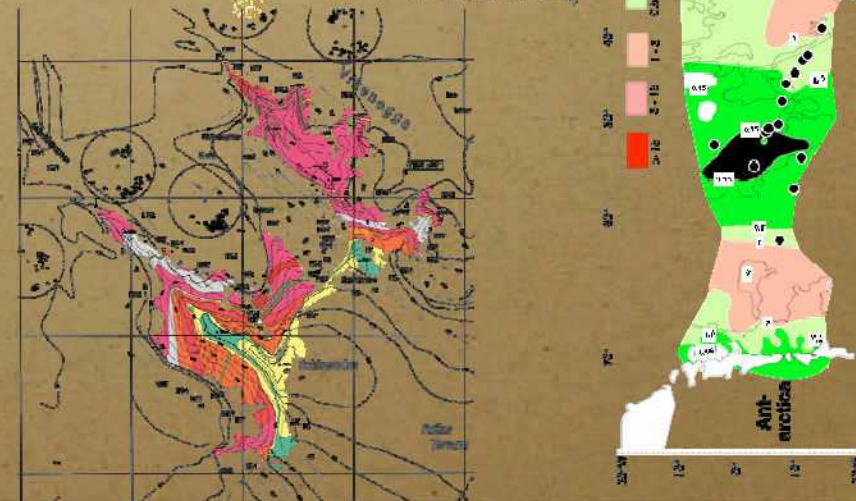
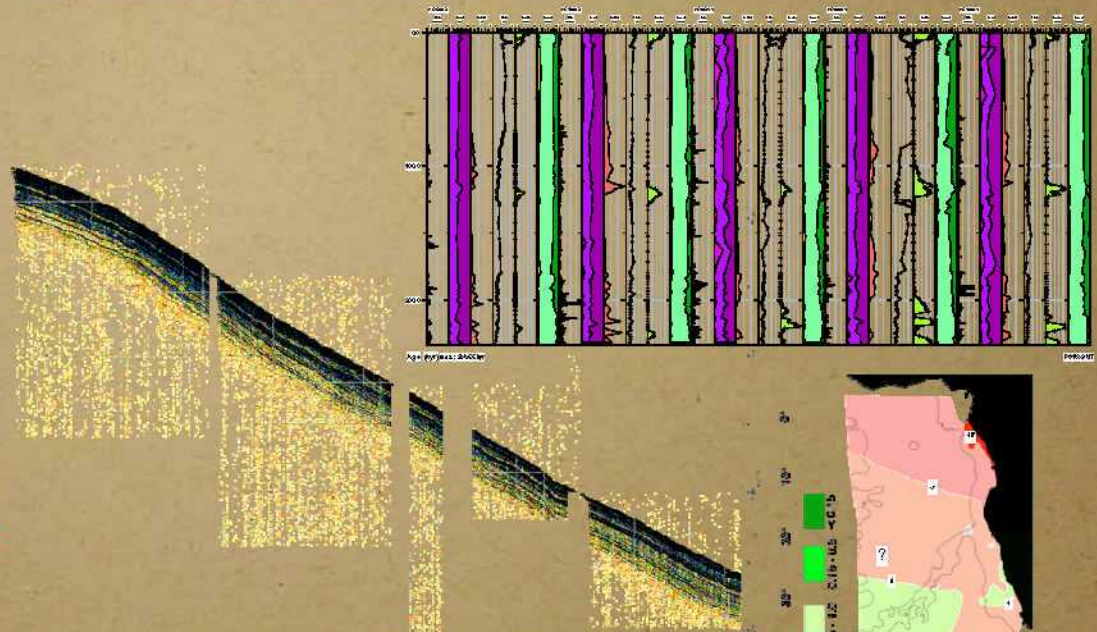
[doi:10.1594/PANGAEA.119223](https://doi.org/10.1594/PANGAEA.119223)

- ◆ Mineral distribution

[doi:10.1594/PANGAEA.55955](https://doi.org/10.1594/PANGAEA.55955)

- ◆ Geological map

[doi:10.1594/PANGAEA.138788](https://doi.org/10.1594/PANGAEA.138788)



Examples from Environmental Research

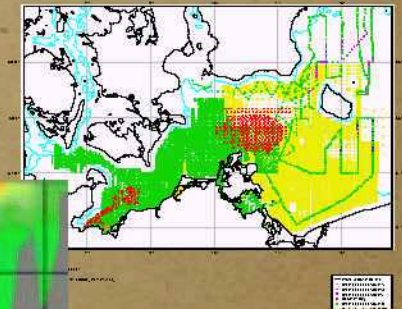
- ◆ Images

[doi:10.1594/PANGAEA.319879](https://doi.org/10.1594/PANGAEA.319879)



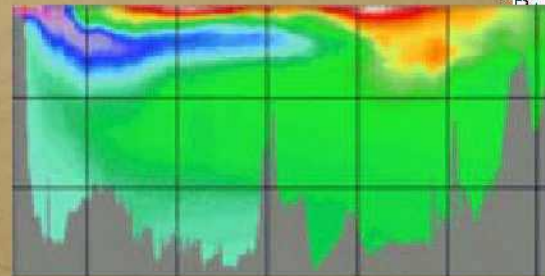
- ◆ Distributed samples

[doi:10.1594/PANGAEA.51749](https://doi.org/10.1594/PANGAEA.51749)



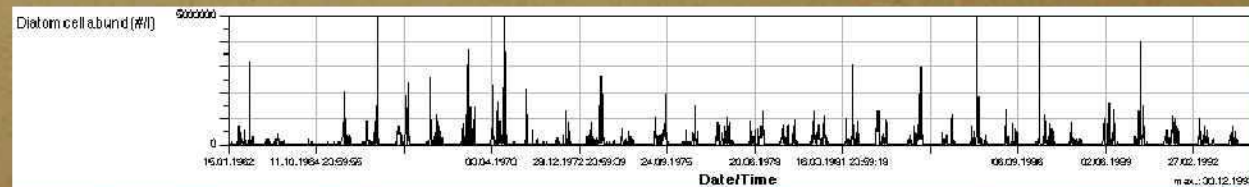
- ◆ Oceanographic profiles

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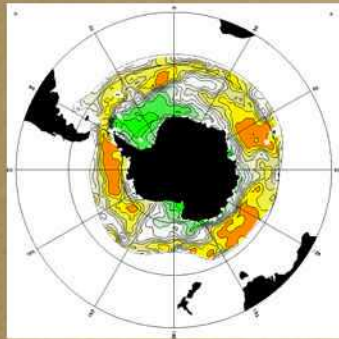


- ◆ Times Series

[doi:10.1594/PANGAEA.323487](https://doi.org/10.1594/PANGAEA.323487)



Examples from Antarctic Research



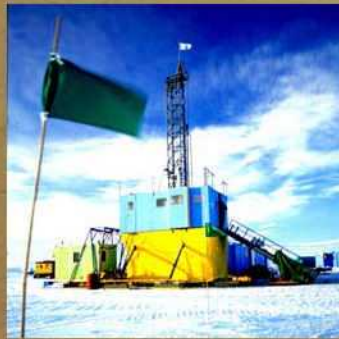
Southern Ocean Atlas



Joint Global Ocean
Flux Studies



Sediments and Rocks



CRP
Cape Roberts Project



Archive of
Underwater Imaging

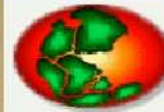


EPICA
European Project for
Ice Coring in Antarctica



JGOFS

Joint Global Ocean Flux Studies



PANGAEA

Please quote reference and citation when using data!

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

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

Search for:

project:jgofs

[Show map](#)

[Help](#)

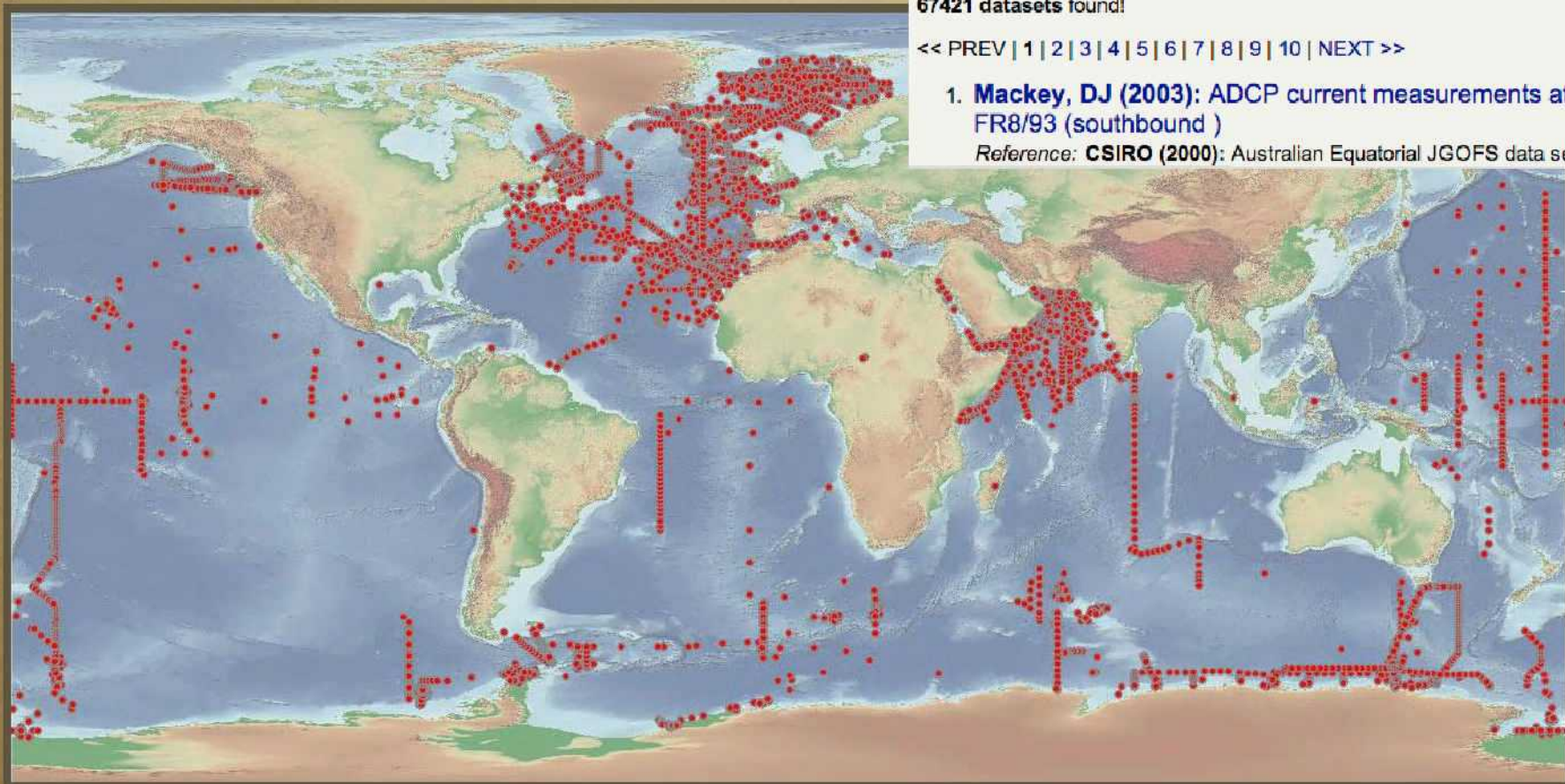


67421 datasets found!

<< [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,



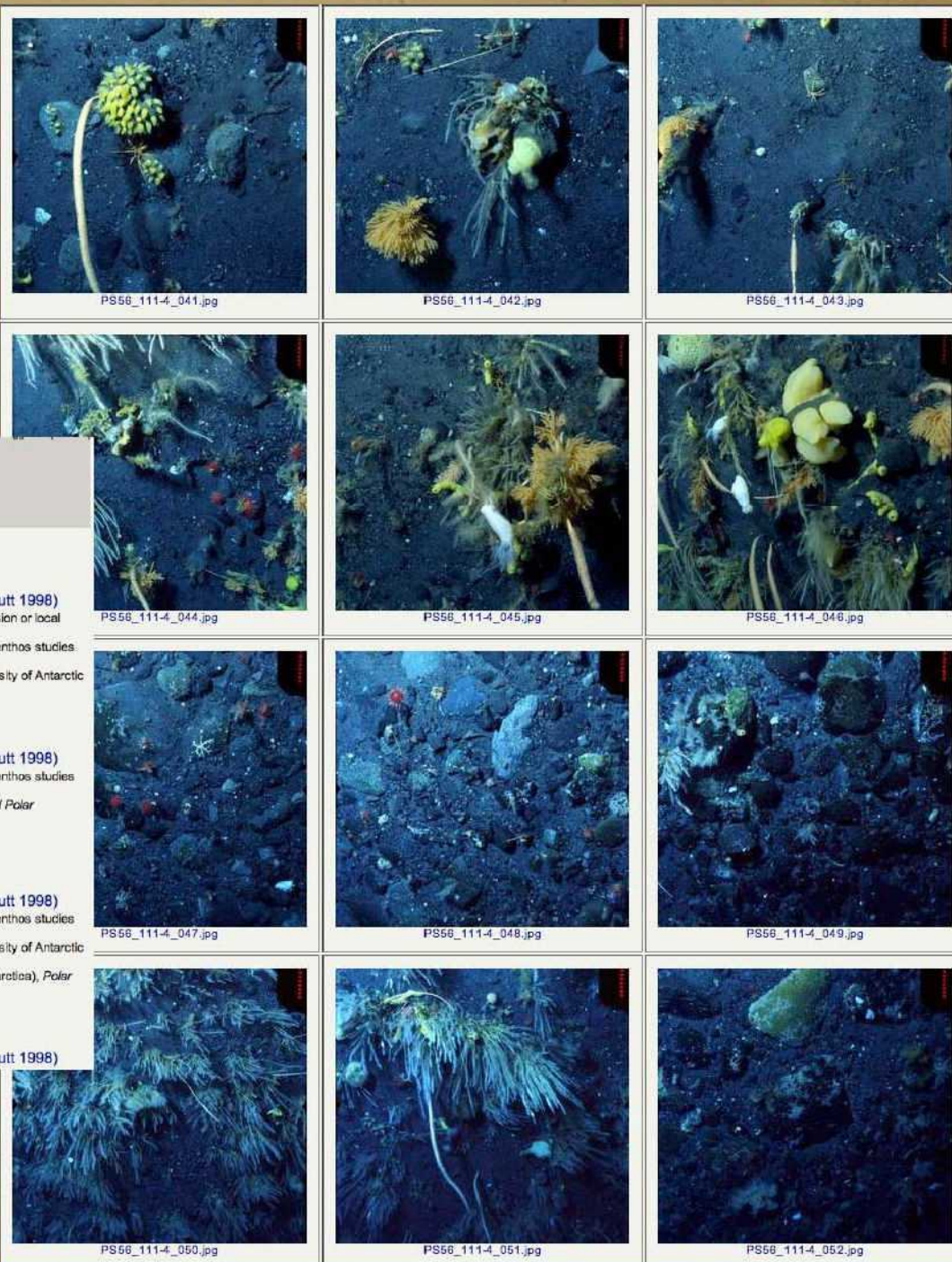
Air photos



[doi:10.1594/PANGAEA.323540](https://doi.org/10.1594/PANGAEA.323540)



Sea-bed photos



Search for:

sea-bed

Search

Help

Show map

Clear

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)
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 doi:10.1594/PANGAEA.198686 - 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)
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 doi:10.1594/PANGAEA.198685 - 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)
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 doi:10.1594/PANGAEA.198684 - 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](https://doi.org/10.1594/PANGAEA.319877)



PS1768-8 (SL)

North of SW Indian Ridge

ANT VIII/3

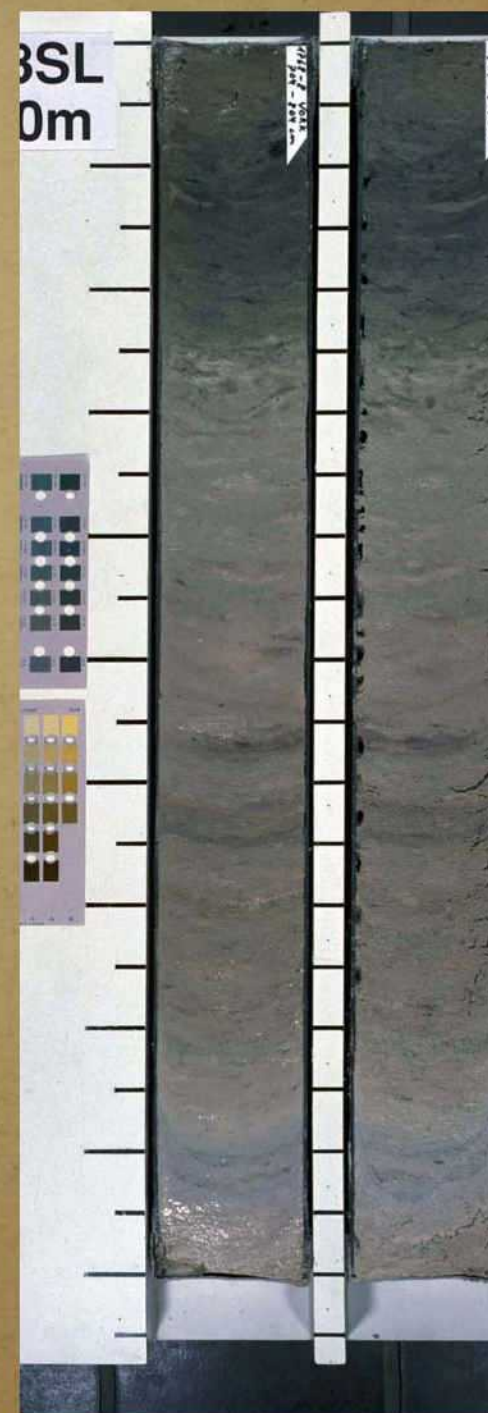
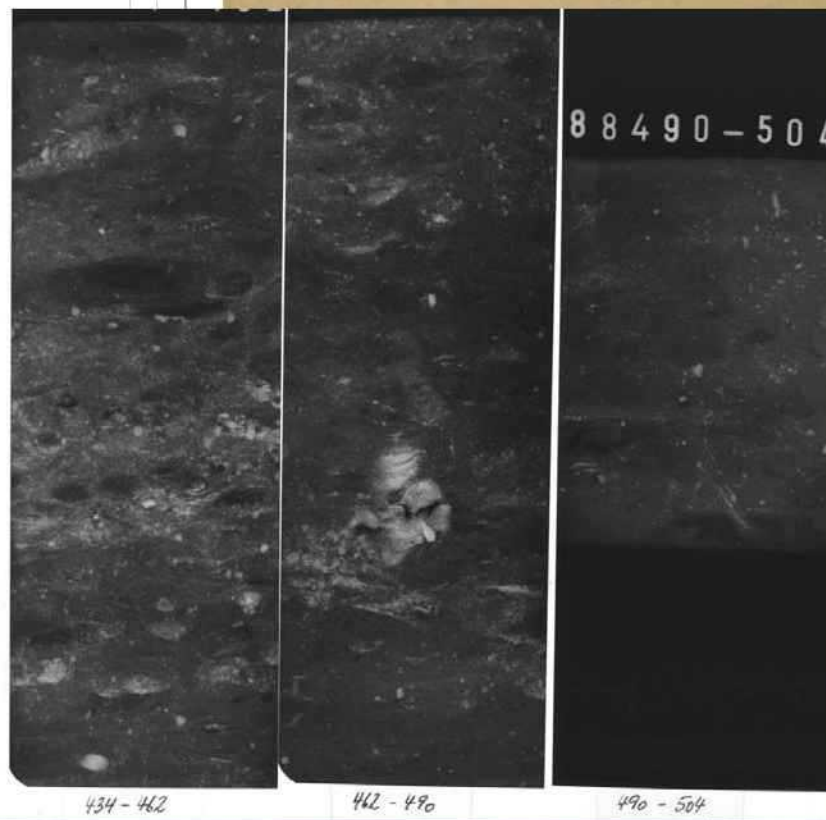
Recovery: 8.96 m

52° 35.6' S, 4° 28.5' E

Water depth: 3270 m

Lithology	Struct. Colour	Description	Age
0	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 7/4	70-94 cm: diatomaceous ooze, very pale brown, darker spots	1
1	2.5Y 7/4	94-139 cm: diatomaceous ooze, light yellowish brown (94-96 cm), dark brown (96-99 cm), pale yellow (99-139 cm)	
		106-170 cm: partly core deformation	
	5Y 5/3	139-230 cm: diatomaceous mud, homogeneous, olive	
2	5Y 4/2	230-240 cm: diatomaceous mud, h	
	5Y 5/3	240-440 cm: diatomaceous mud, c occur throughout. 290-306 cm: some th black (5' 350-375 cm: alternati scatters diatomia 386-387 cm: diatomia 395 cm: large burrow	
	5Y 4/2	440-453 cm: diatomaceous mud, c	
	2.5Y 5/2	453-486 cm: diatomaceous mud, g 453-458 cm: some bu 474-478 cm: yellowish 480-483 cm: ash-rich 485-486 cm: olive (5Y	
5	5Y 5/3		

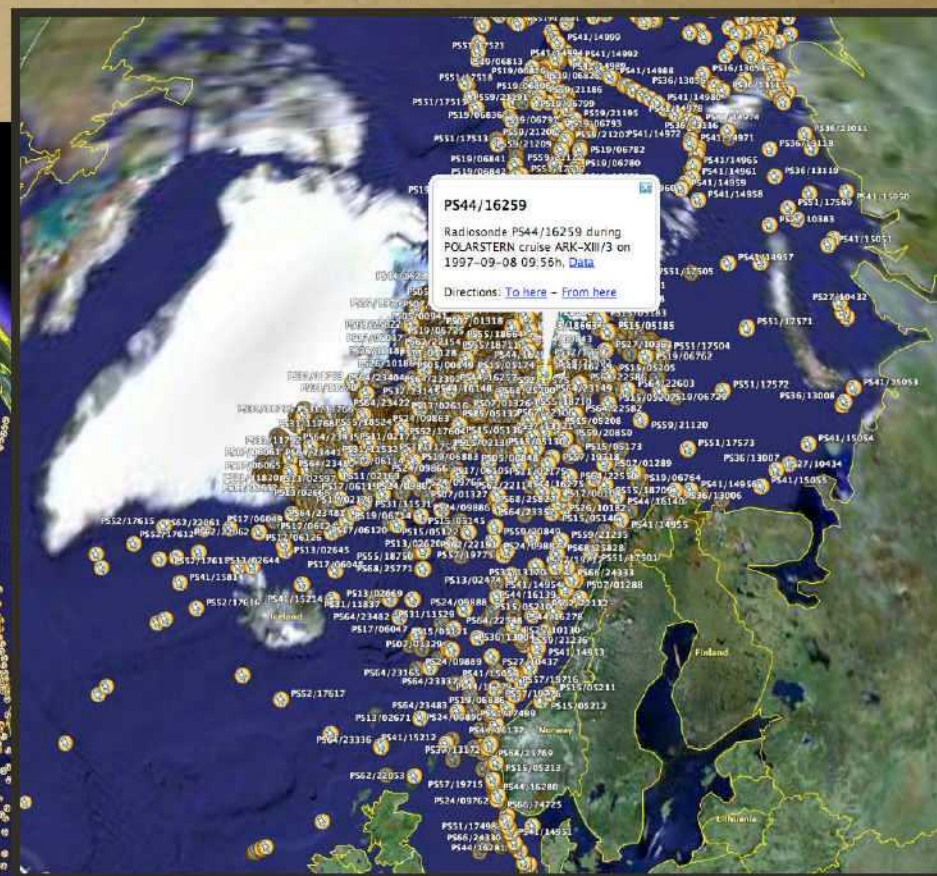
Sediment core documentation



[doi:10.1594/PANGAEA.108079](https://doi.org/10.1594/PANGAEA.108079)



Meteorological observations

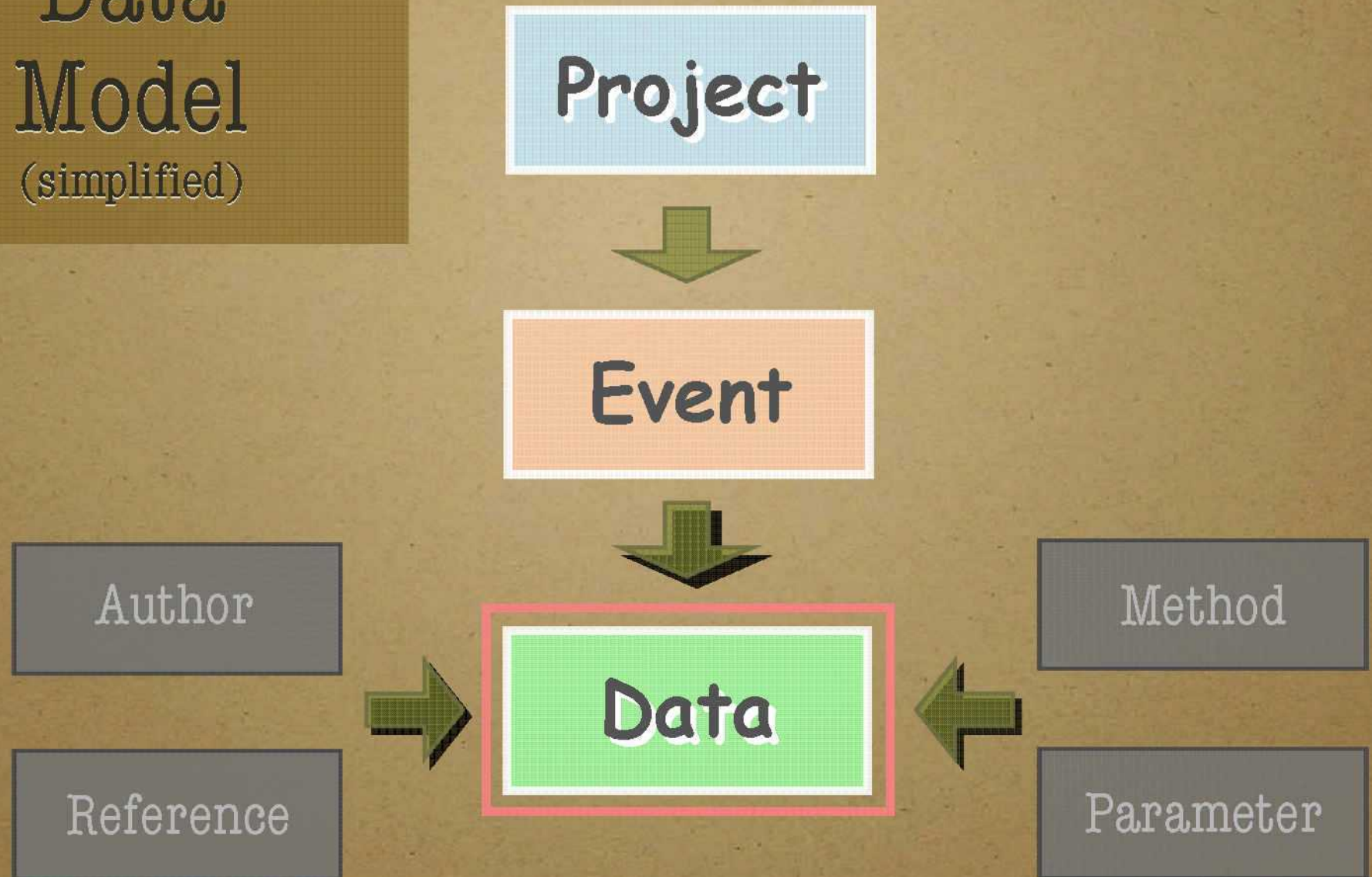


Google Earth

[doi:10.1594/PANGAEA.269619](https://doi.org/10.1594/PANGAEA.269619)



Data Model (simplified)



Digital Object Identifier



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Quick Search: within

[results list](#) [previous](#)

Computers & Geosciences

Volume 28, Issue 10, December 2002, Pages 1201-1210

DOI: [10.1016/S0098-3004\(02\)00039-0](https://doi.org/10.1016/S0098-3004(02)00039-0)

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PANGAEA—an information system for environmental sciences

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^b Alfred Wegener Institute for Polar and Marine Research, Bremerhaven 27515, Germany

^c Physics Department, University of Erlangen-Nuremberg, Erlangen 91058, Germany

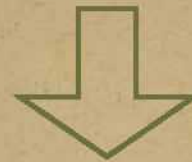
Received 23 March 2001; revised 20 April 2001; accepted 5 May 2001. Available online 20 September 2002.

Abstract

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



International
doi> Foundation

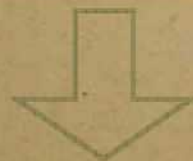


Registration Agency
for scientific primary data

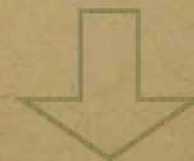
TIB | TECHNISCHE
INFORMATIONSBIBLIOTHEK



Data center
WDC-MARE
(AWI/MARUM)



Data center B
WDC-Climate
(MPI Hamburg)



Data center C
WDC-Terra
(GFZ Potsdam)



Data center
xyz...



[10.1594/PANGAEA.119754](https://doi.org/10.1594/PANGAEA.119754)



Project STD-DOI “Data Publishing”

Partner Institutions

Technische Informationsbibliothek Coordination
(TIB, Hannover)

World Data Center Climate - **WDC-Climate**
(MPI, Hamburg)

World Data Center for Marine Environmental Sciences - **WDC-MARE**
(AWI/MARUM, Bremen)

World Data Center for Remote Sensing - **WDC-RSAT**
(DLR, Oberpfaffenhofen)

GeoForschungszentrum - **WDC-TERRA**
(GFZ, Potsdam)

<http://www.std-doi.de>

Deutsche
Forschungsgemeinschaft
DFG



Workflow in data publishing

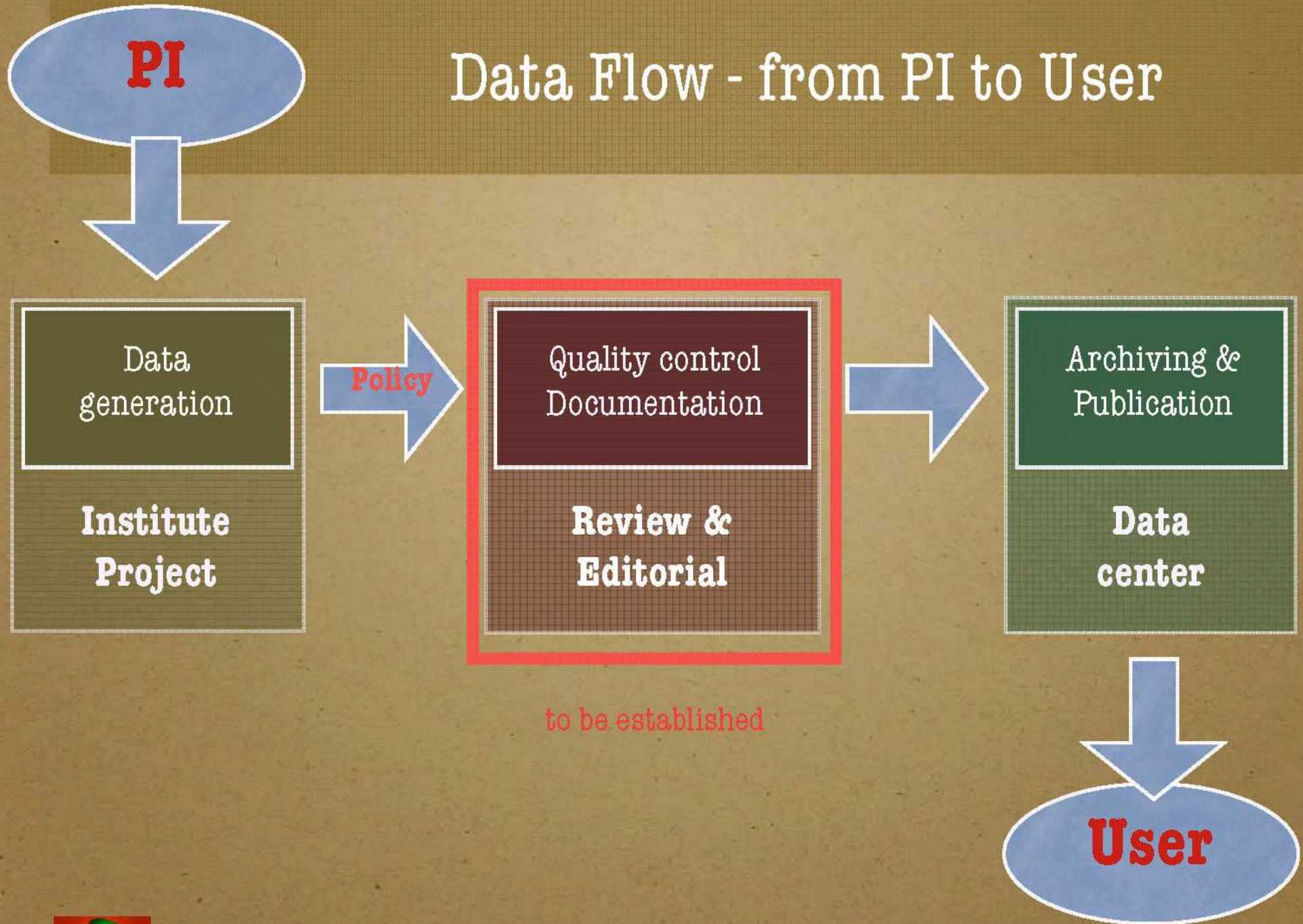
- Provision of data (PI)
- Import to PANGAEA (curator)
- Proof-Read (PI)
- ↕
- Corrections (curator/editor)
- Peer review (reviewer ?)
- Publication with DOI & citation

Editorial

Review



Data Flow - from PI to User



PANGAEA Metadata dissemination

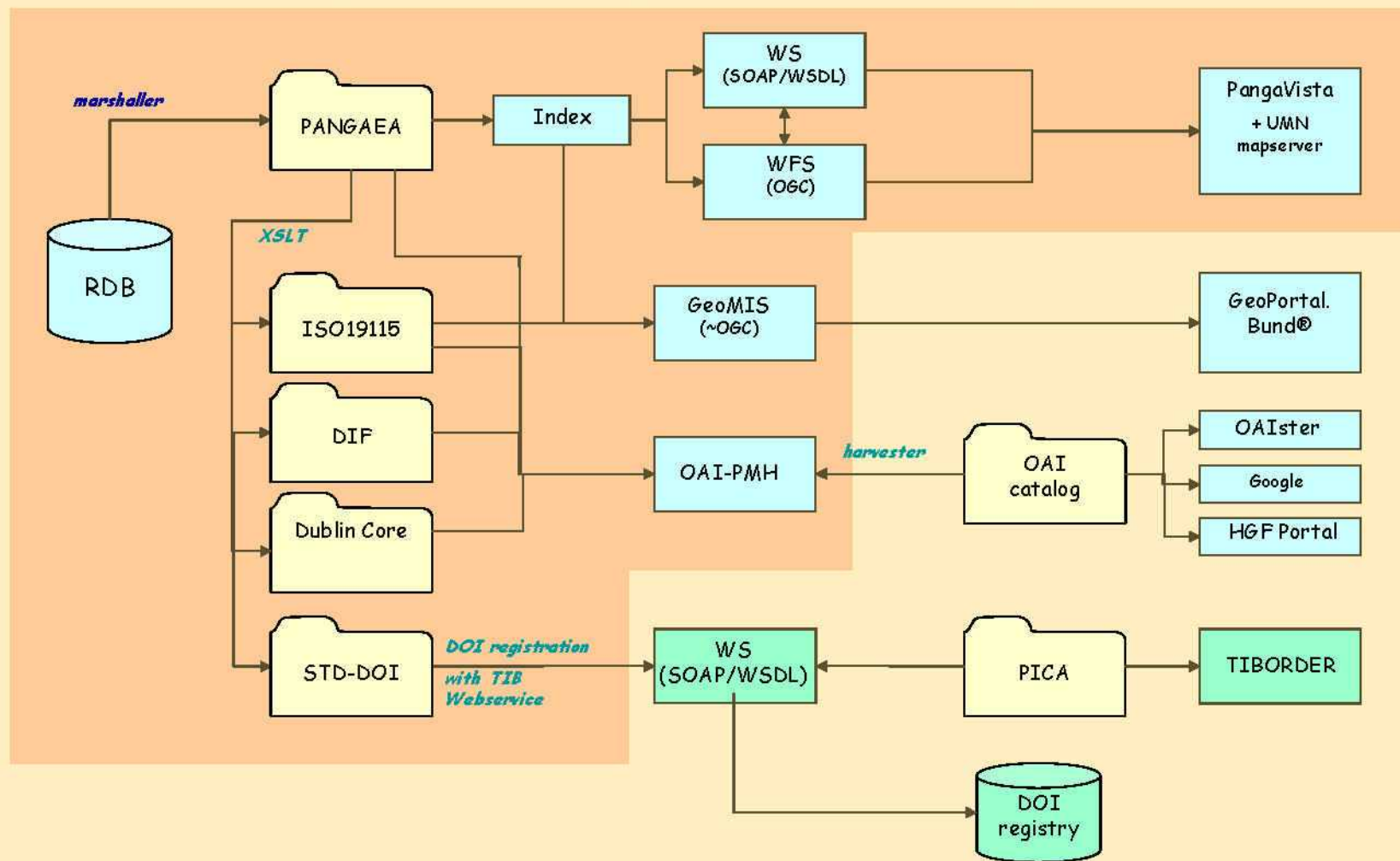
data management & longterm archiving

catalogues

protocols

catalogues

frontends



PANGAEA – ISO-19115 mapping

Rusch, A; Joergensen, Bo Barker (2002): Dynamics of the fine fraction in near-surface layers of - Microsoft Internet Explorer

Adresse <http://identificationInfo/citation>

You are not logged in (LOG IN)

Data Description

Citation: **Rusch, A; Joergensen, Bo Barker (2002): Dynamics of the fine fraction in near-surface layers of permeable shelf sediments off Sylt at Station Lister Haken 5, North Sea, PANGAEA, doi:10.1594/PANGAEA.67260**

Reference(s): **Rusch, A (2000):** Dynamik der Feinfraktion im Oberflächenhorizont permeabler Schelfsedimente, *Berichte, Fachbereich Geowissenschaften, Universität Bremen*, **155**, 102 pp

Huettenlocher, J; Rusch, A (2000): Transport and degradation of phytoplankton in permeable sediment, *Limnology and Oceanography*, **45**, 534-549

Rusch, A; Forstner, M (2001): Bacteria, diatoms and detritus in an intertidal sandflat subject to advective transport across the water-sediment interface, *Estuarine, Coastal and Shelf Science*, **53**, 1-12

Rusch, A; Huettenlocher, J (2000): Transport of organic matter in permeable marine sand, *Estuarine, Coastal and Shelf Science*, **51**, 1-12

Rusch, A; Huettel, M (2000): Advective particle transport into permeable sand, *Limnology and Oceanography*, **45**, 525-533

Project(s): **Geosciences, University of Bremen (GeoB)**

Coverage: *West: 8.4333 * East: 8.4333 * South: 55.0333 * North: 55.0333*
*Minimum DEPTH, sediment: -0.0 m * Maximum DEPTH, sediment: 0.2 m*

Event(s): **ListerHaken_5 * Latitude: 55.0333 * Longitude: 8.4333 * Date/Time: 1998-03-15T00:00:00 * Device: Gravity corer**

Comment: fine fraction defined as fine-grained material <70 μm

Parameter(s):

Parameter	Short Name	Unit	Label	Principal Investigator	Met	
DEPTH, sediment	Depth	m				
LATITUDE	Latitude					Geocode
LONGITUDE	Longitude					Geocode
Bacteria abundance	Bact abund	10 ⁹ #km ⁻³	ListerHaken_5.3	Joergensen, Bo Barker	Epifluorescence microscopy (Boetius et al. 2000)	
Carbon, total	C	%	ListerHaken_5.10	Joergensen, Bo Barker	Element analyser Fisons NA 1500N	fine fraction
Carbon/Nitrogen ratio			ListerHaken_5.12	Joergensen, Bo Barker	calculated	POC:N
Carbon/Nitrogen ratio			ListerHaken_5.13	Joergensen, Bo Barker	calculated	TC:N
Carbohydrate	C	%/ml	ListerHaken_5.7	Joergensen, Bo Barker	Phenol/sulphuric acid	
Carbohydrate	C	%	ListerHaken_5.8	Joergensen, Bo Barker	ASW-extract	
Carbohydrate	CH	%	ListerHaken_5.9	Joergensen, Bo Barker	EDTA-extract	
Chlorophyll total, fine fraction	Chl a	μg/l	ListerHaken_5.4	Joergensen, Bo Barker	Spectrophotometry	
Carbon, inorganic dissolved						fine fraction
Nitrogen						sediment
Nitrogen	N	%	ListerHaken_5.16	Joergensen, Bo Barker	Element analyser CHN	
Ammonium	NH4	μmol/l	ListerHaken_5.2	Joergensen, Bo Barker	Colorometric analysis, manual	
Nitrate and Nitrite	NO3+NO2	μmol/l	ListerHaken_5.14	Joergensen, Bo Barker	Continuous Flow Automated Analysis	
Carbon, organic, particulate	POC	%	ListerHaken_5.11	Joergensen, Bo Barker	Element analyser Fisons NA 1500N	fine fraction

[dataQualityInfo/lineage/source](#)

[identificationInfo/extent](#)

[dataQualityInfo/lineage/processStep](#)

[contentInformation/coverageDescription](#)

PANGAEA - ISO-19115 mapping

Rusch, A.; Joergensen, Bo B...

Adresse htt

Data Descript

Citation: **Rusch, A.**
Sylt at S

Reference(s): **Rusch, A (2002)**
Sediment, 1

Huetter,

Rusch, A. F
interfara

Rusch, J
Scient

Rusch, A; H
Oceanogr

Project(s): **Geoscience**

Coverage: West: 8.4330
Minimum DE

Event(s): **ListerHaker**

Comment: fine fraction c

Parameter(s):

Parameter
DEPTH, sedim
LATITUDE
LONGITUDE
Bacteria abund
Carbon, total
Carbon/Nitroge
Carbon/Nitroge
Carbohydrate
Carbohydrate
Carbohydrate
Chlorophyll tot
Carbon, inorga
Nitrogen
Nitrogen
Ammonium
Nitrate and Nit
Carbon, organ

http://ws.pangaea.de/oai/?verb=GetRecord&metadataPrefix=iso19139&identifier=oai:pangaea.de:doi:10.1594/PANGAEA.67260 - Microsoft Internet Explorer

Adresse http://ws.pangaea.de/oai/?verb=GetRecord&metadataPrefix=iso19139&identifier=oai:pangaea.de:doi:10.1594/PANGAEA.67260

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  <CI_ResponsibleParty id="dataset.author670">
```

Contact

info@pangaea.de

This presentation is a modified version of:

Grobe, Hannes; Diepenbroek, Michael (2006): Introduction to the Information System PANGAEA - Publishing Network for Geoscientific & Environmental Data, presentation in different formats, *PANGAEA*, [doi:10.1594/PANGAEA.351396](https://doi.org/10.1594/PANGAEA.351396)