

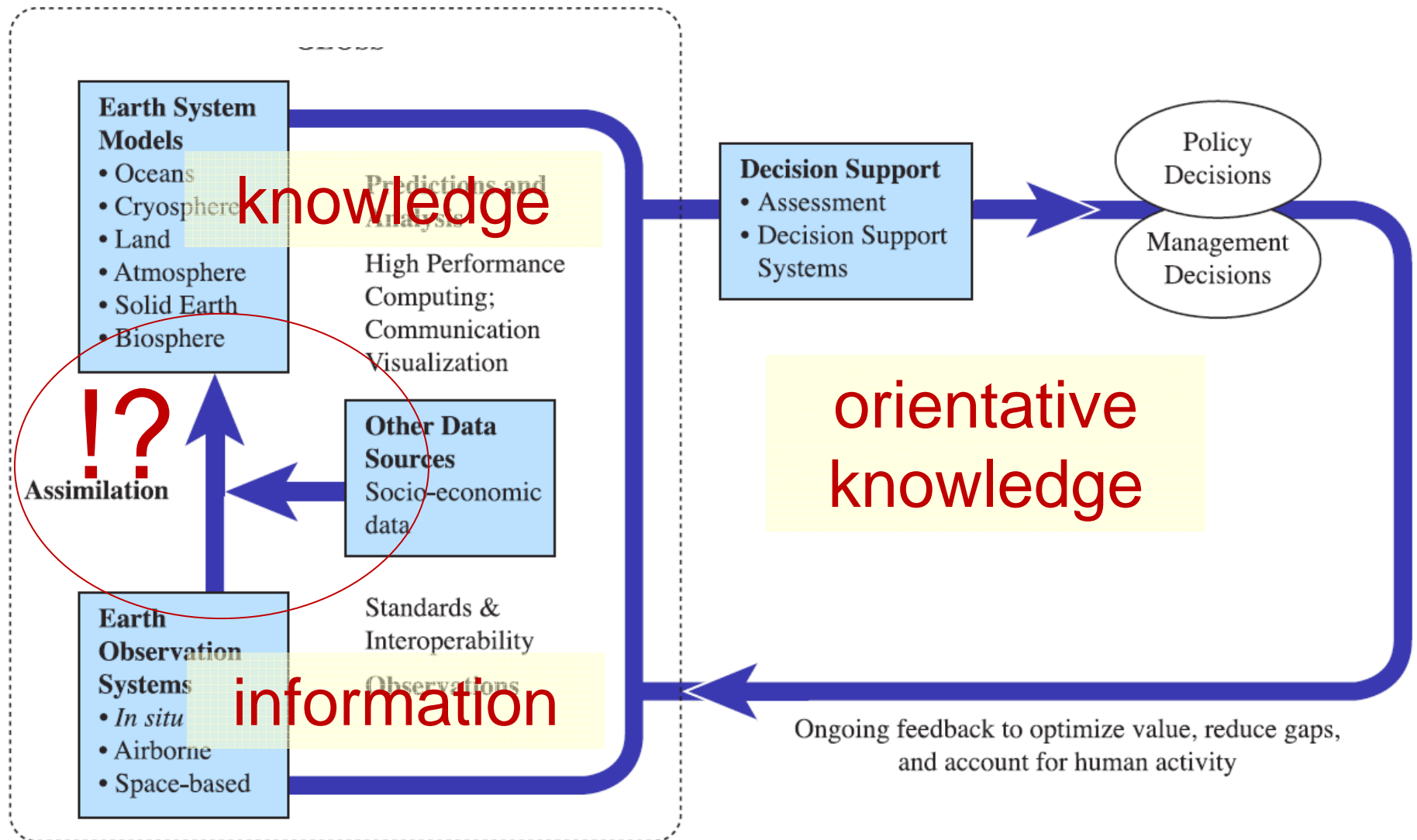
# PANGAEA® & the ICSU World Data System (WDS)

- *towards a global system of data publishers and data libraries.*



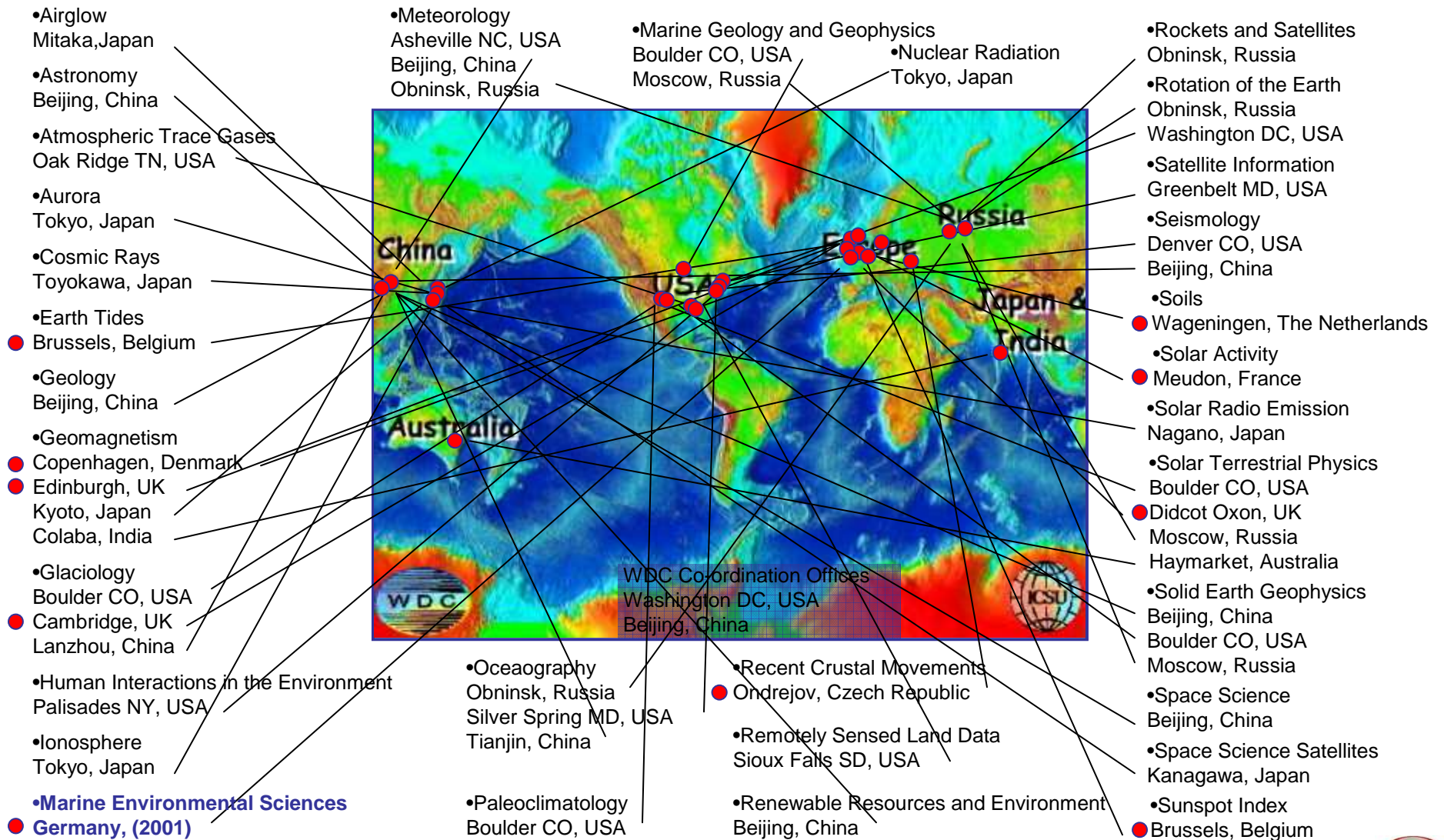
*Michael Diepenbroek  
MARUM, University Bremen*

# GEOSS *Global Earth Observation System of Systems*

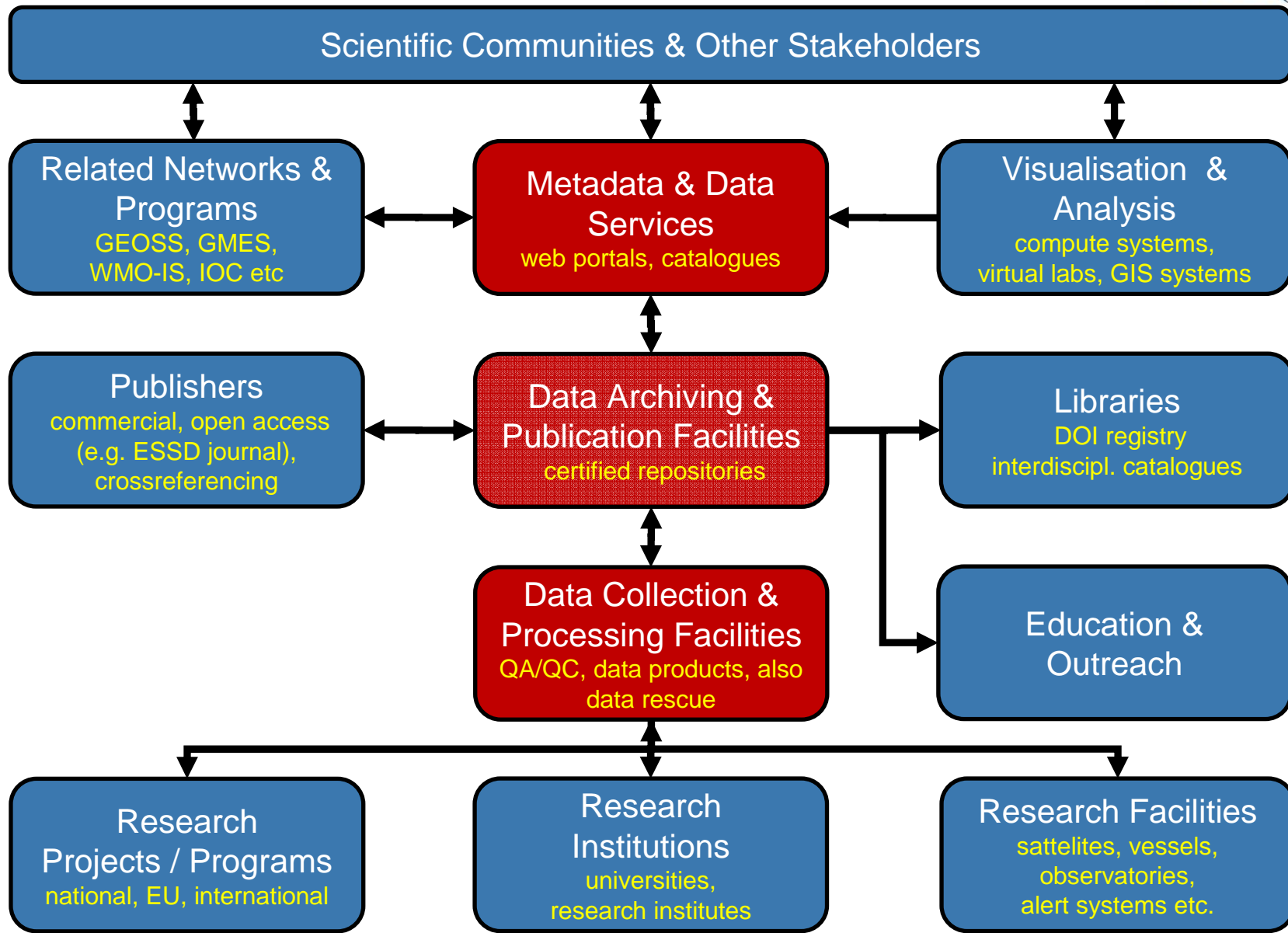


# ICSU World Data Centers (WDC)

## Geophysical Year 1957



# ICSU WDS - Roles & relations in a federated system



# PANGAEA®

*Data Publisher for Earth & Environmental Science*

*- activities & services*



ICSU  
WORLD DATA SYSTEM

- Project data management
- Long term data archive (data library)
- Data publication
- Data infrastructures

# PANGAEA®

## - *project data management*



WORLD DATA SYSTEM

- ✓ CARBOOCEAN
- ✓ CARBOCHANGE
- ✓ EPOCA
- ✓ CORALFISH
- ✓ EUR-OCEANS
- ✓ HERMES / HERMIONE
- ✓ HYPOX
- ✓ IODP
- ✓ SPICOSA
- ✓ JGOFS international
- ✓ TARA OCEANS
- ✓ ESONET / EMSO (ESFRI)
- ✓ SIOS
- ✓ Statoil
- ✓ CO2 Base
- ...

More than 140 European to  
international projects since 1995  
([www.pangaea.de/projects](http://www.pangaea.de/projects))

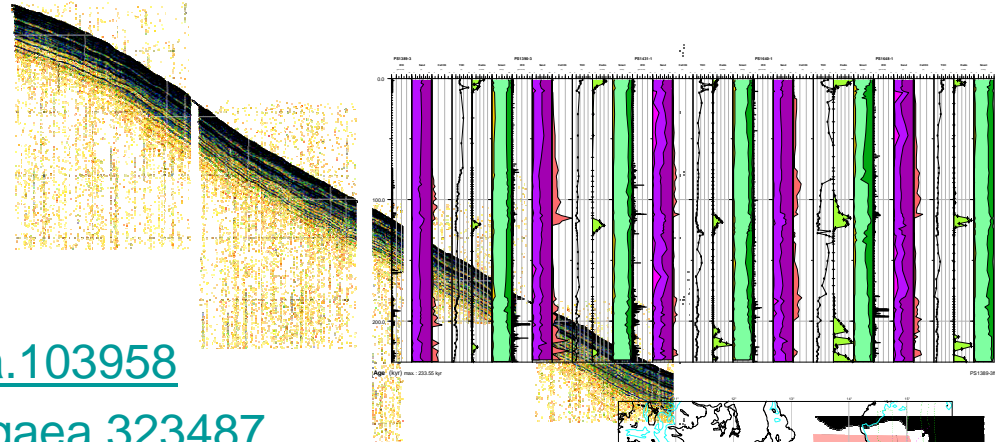
# PANGAEA®

## - long term archive

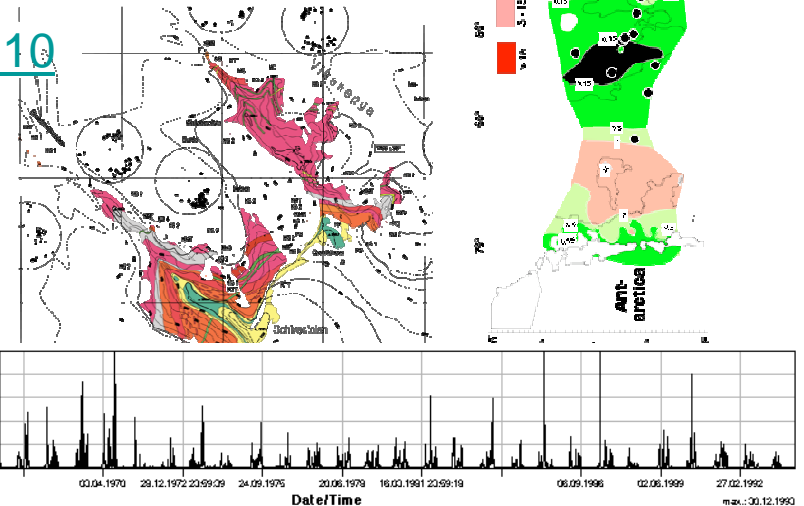
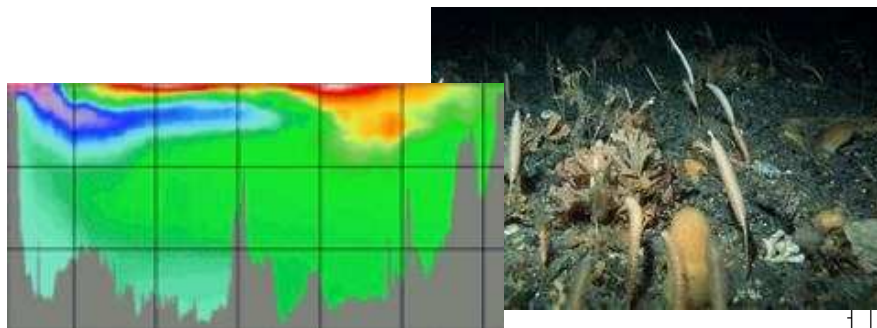


- Open access & non restricted data
  - ✓ Creative Commons licenses (mostly CC-BY)
- Data accepted from individual scientists, institutes, science & industry projects
- Long term funding for basic operation
  - ✓ hardware, software, system management & organisation
- Long term preservation of data
  - ✓ Technical: security, migration of media,
  - ✓ Usability: preserving the integrity & semantics of data sets

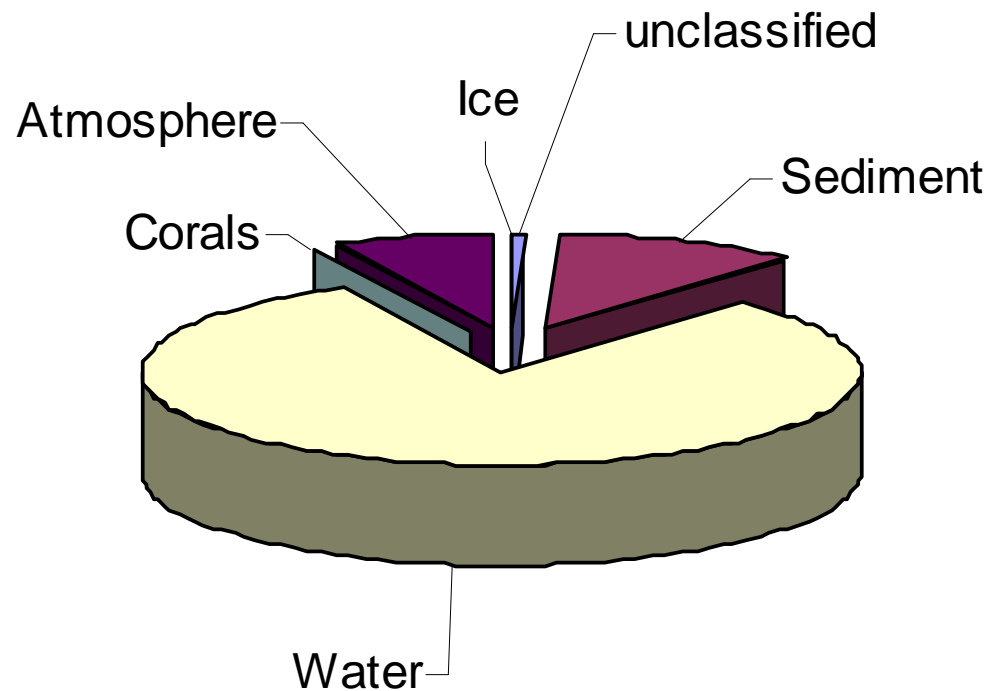
# PANGAEA® - contents



- Profiles -> [doi:10.1594/pangaea.103958](https://doi.org/10.1594/pangaea.103958)
- Time series -> [doi:10.1594/pangaea.323487](https://doi.org/10.1594/pangaea.323487)
- Sea bed photos -> [doi:10.1594/PANGAEA.319877](https://doi.org/10.1594/PANGAEA.319877)
- Distributes samples -> [doi:10.1594/pangaea.51749](https://doi.org/10.1594/pangaea.51749)
- Complex data -> [doi:10.1594/PANGAEA.108079](https://doi.org/10.1594/PANGAEA.108079)
- Air photos -> [doi:10.1594/PANGAEA.323540](https://doi.org/10.1594/PANGAEA.323540)
- Audio record -> [doi:10.1594/PANGAEA.339110](https://doi.org/10.1594/PANGAEA.339110)



# Long term archive – contents (9/2010)



Total number of data sets ~ 500,000

Data items ~ 5.5 billions

# Data infrastructures

Conform to global standards (GSDI)

- ✓ ISO19xxx, OGC, W3C, OAI

Portals

- ✓ CARBOOCEAN (4)
- ✓ EUR-OCEANS (16)
- ✓ IODP - SEDIS (4) →
- ✓ World Data Center portal (15) →
- ✓ ESONET/EMSO

Broker function

- ✓ GBIF, OBIS

Sensor webs

- ✓ ESONET/EMSO, Statoil

Data warehouse



# PANGAEA<sup>®</sup> – standard interfaces for metadata

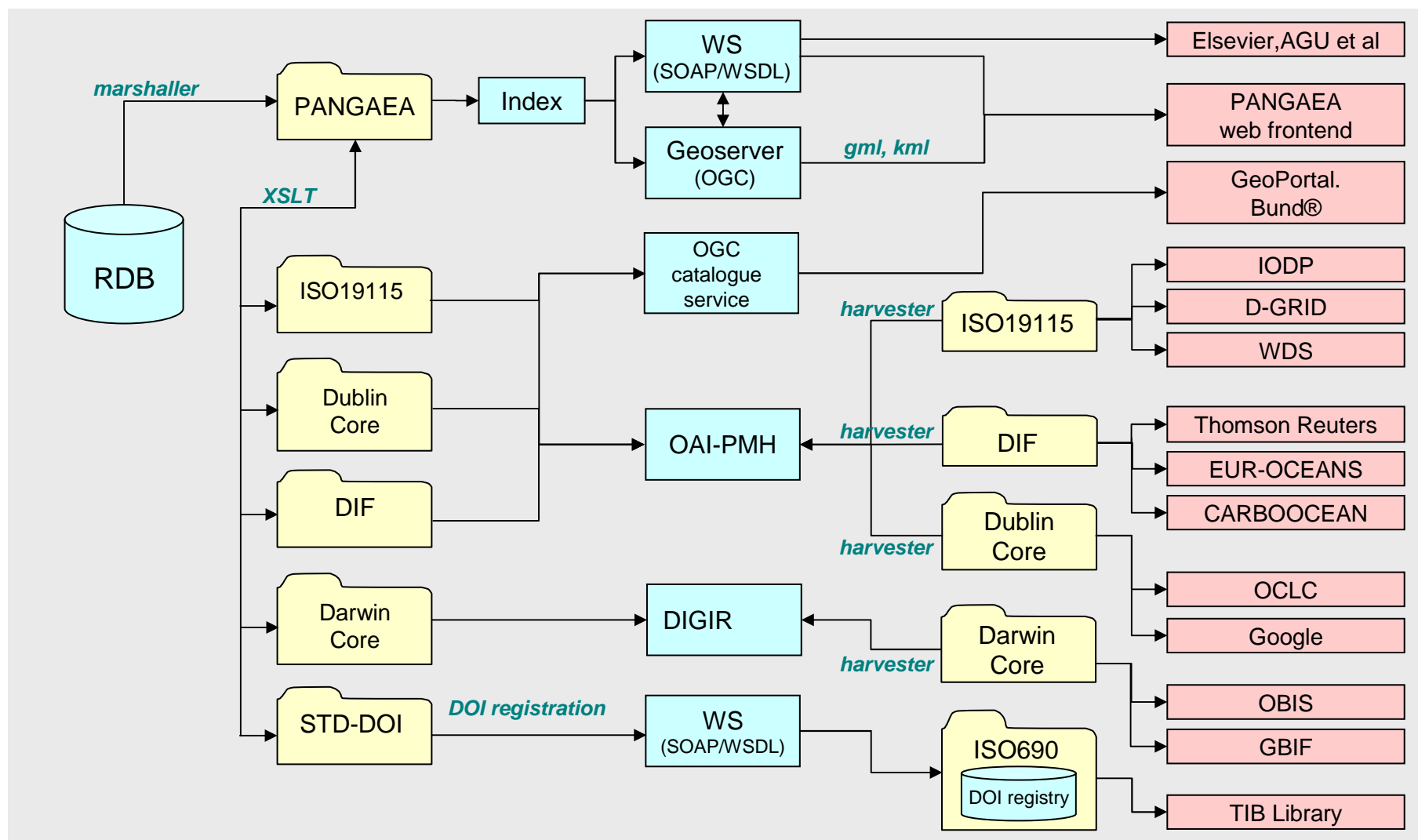
*data management & longterm archiving*

*catalogues*

*protocols*

*catalogues*

*Frontends / portals*



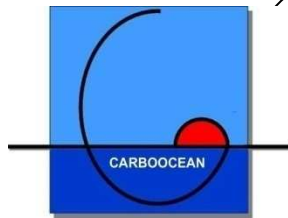
# PANGAEA® – Dissemination of Data & Metadata



THOMSON REUTERS



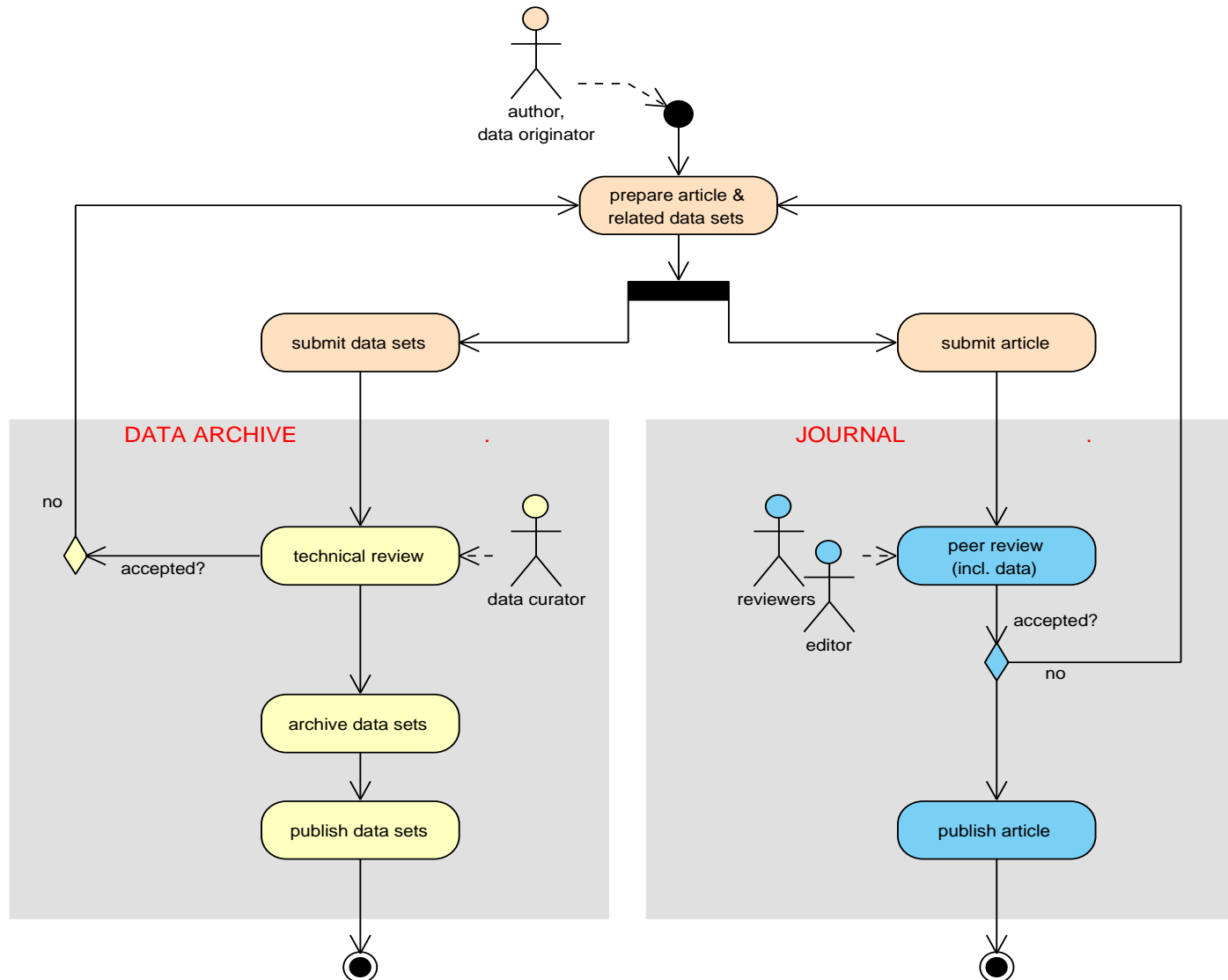
ScienceDirect



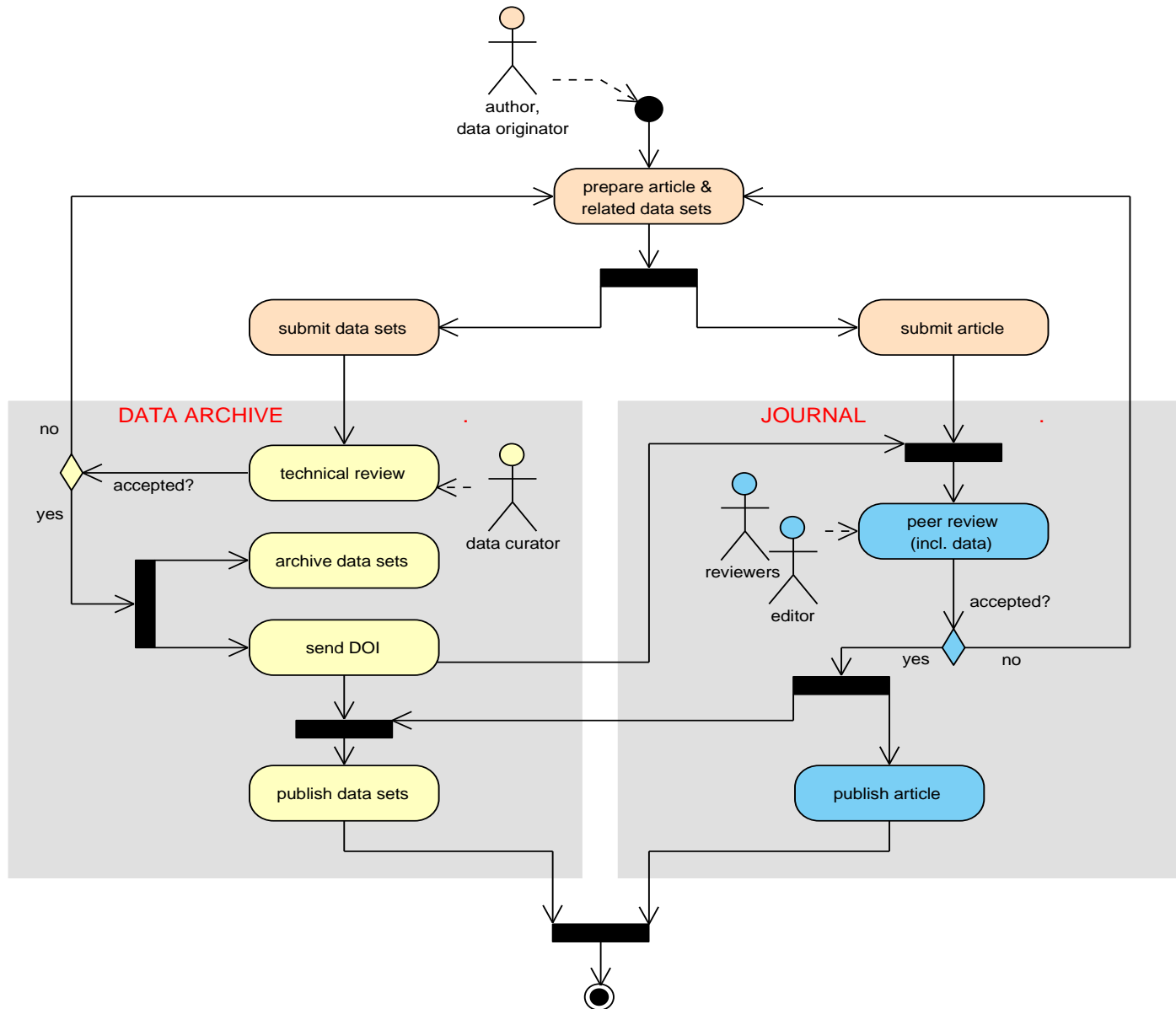
The world's libraries.  
Connected.



# Publishing data - asynchron



# Publishing workflow - synchronized



# Data publishing – cross-referencing

ScienceDirect - Marine Micropaleontology: Modern environmental conditions recorded in surface - Windows Internet Explorer

http://www.sciencedirect.com/science?\_ob=ArticleURL&\_udi=B6VCV-4P4FV4B-1&\_user=10&\_coverDate=10%2F29%2F2007&\_rdoc=1&\_fmt=high&\_orig=search&\_origin=search&\_sort=d8

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Marine Micropaleontology  
Volume 65, Issues 1-2, 29 October 2007, Pages 96-112

doi:10.1016/j.marmicro.2007.06.004 | How to Cite or Link Using DOI  
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**Modern environmental conditions recorded in surface sediment samples off W and SW Indonesia: Planktonic foraminifera and biogenic compounds analyses**

Mahyar Mohtadi<sup>a, b</sup>, Lars Max<sup>b</sup>, Dierk Hebbeln<sup>a, b</sup>, Anne Baumgart<sup>c</sup>, Nils Krück<sup>c</sup> and Tim Jennerjahn<sup>c</sup>


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Received 23 April 2007; revised 19 June 2007; accepted 20 June 2007. Available online 6 July 2007.

**Abstract**  
A total of 69 surface sediment samples from several fore-arc basins located west and southwest of the Indonesian Archipelago was analyzed with respect to the faunal composition of planktonic foraminifera, the stable oxygen and carbon isotopic signal of a surface-dwelling (*Globigerinoides ruber*) and a thermocline-dwelling (*Neogloboquadrina dutertrei*) species, and the opal and CaCO<sub>3</sub> contents in bulk sediment. Our results show that the distribution pattern of opal in surface sediments corresponds well to the upwelling-induced chlorophyll concentration in the upper water column and thus represents a reliable proxy for marine productivity in the coastal upwelling area off E and SW Indonesia. Present-day oceanographic and marine productivity are

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PANGAEA® – Supplementary Data  
Surface sediment samples from several fore-arc basins west and southwest of the Indones...



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*Ecology of Insular Southeast Asia*
- Morphologic gradation and ecology in *Neogloboquadrina p...*  
*Marine Micropaleontology*

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