

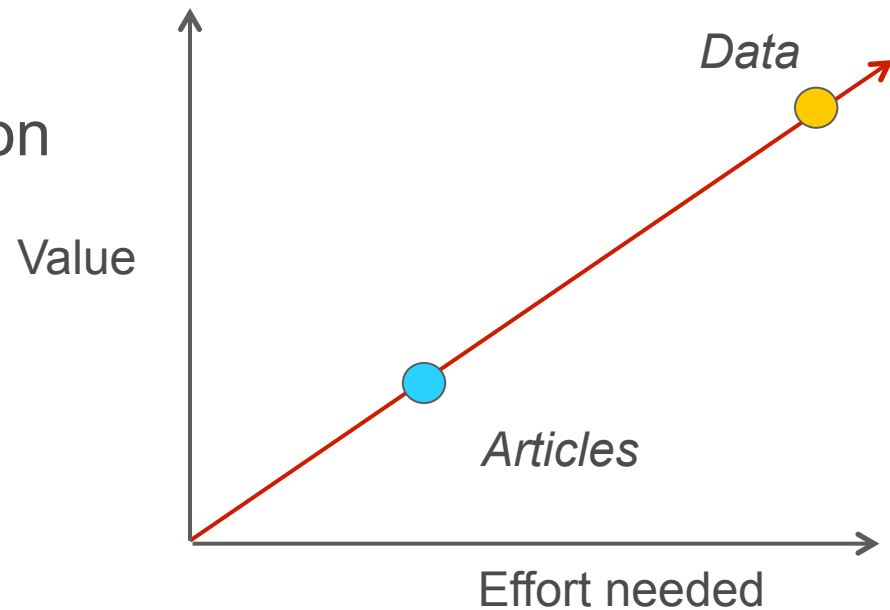
RESEARCH DATA ENTERS SCHOLARLY COMMUNICATION

TOWARDS AN INFRASTRUCTURE FOR DATA PUBLICATION IN THE
EMPIRICAL SCIENCES

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Hannes Grobe,
Uwe Schindler
PANGAEA® - AWI / MARUM

PREREQUISITES FOR DATA PUBLICATION?

- ✓ Licenses (Creative Commons)
- ✓ Business models
 - Open Access
- ✓ Persistent identification



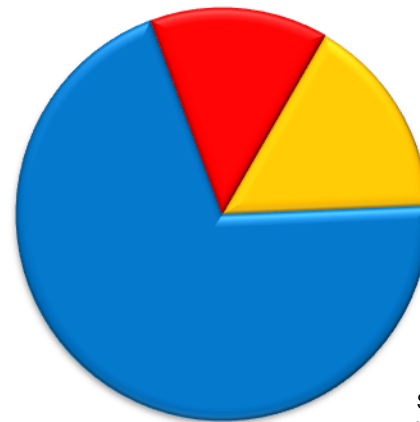
PREREQUISITES FOR DATA PUBLICATION?

- ✓ Trusted & certified archives

Publishers: Researchers:



Is there a need for an international archive infrastructure?



■ Don't know
■ Yes
■ No

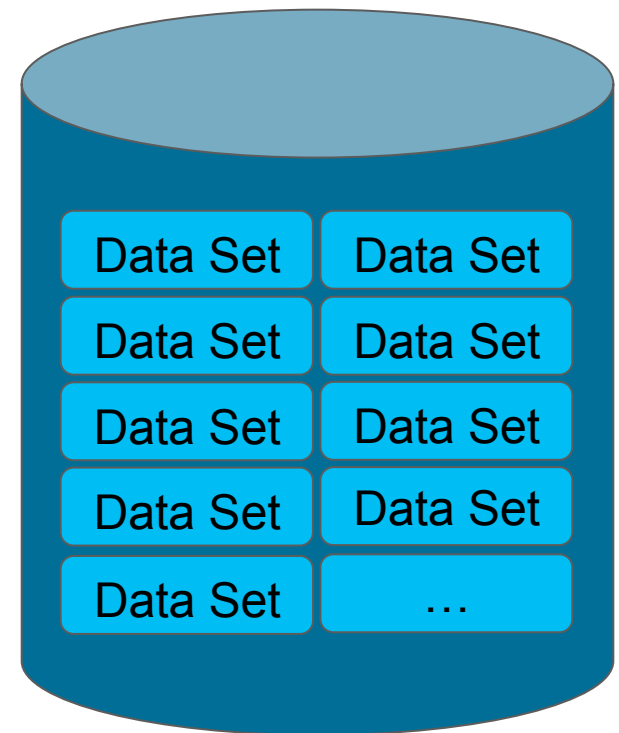
Source: PARSE Insight, Report 3.4
www.parse-insight.eu

PREREQUISITES FOR DATA PUBLICATION?

- ✓ QA/QC -> review procedures
- ✓ (Meta)data & interoperability standards (machine readable)

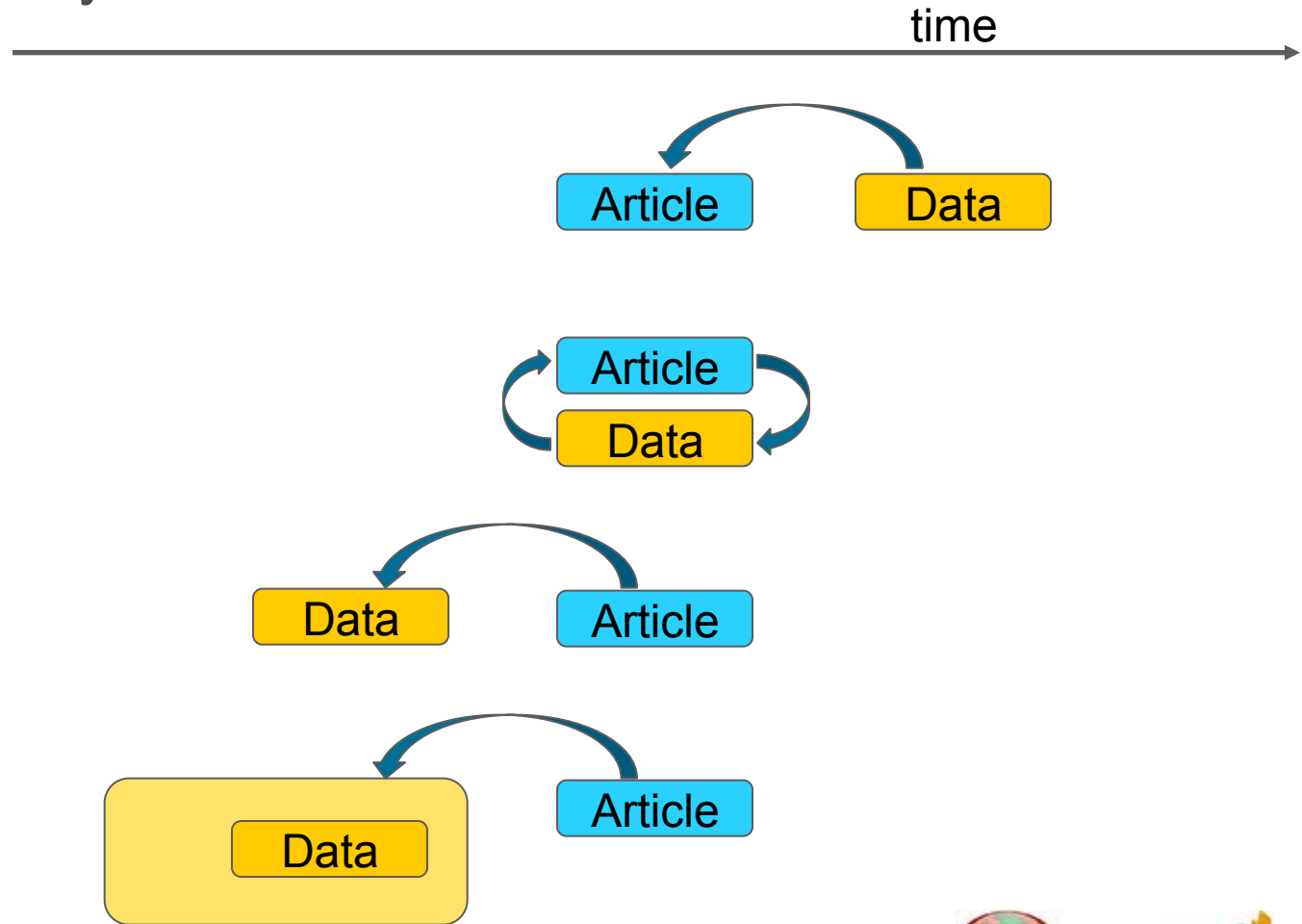
OECD principles and guidelines for access to research data (2007)

- *Professionalism*
- *Interoperability*
- *Quality*
- *Efficiency*



PREREQUISITES FOR DATA PUBLICATION?

✓ Citability

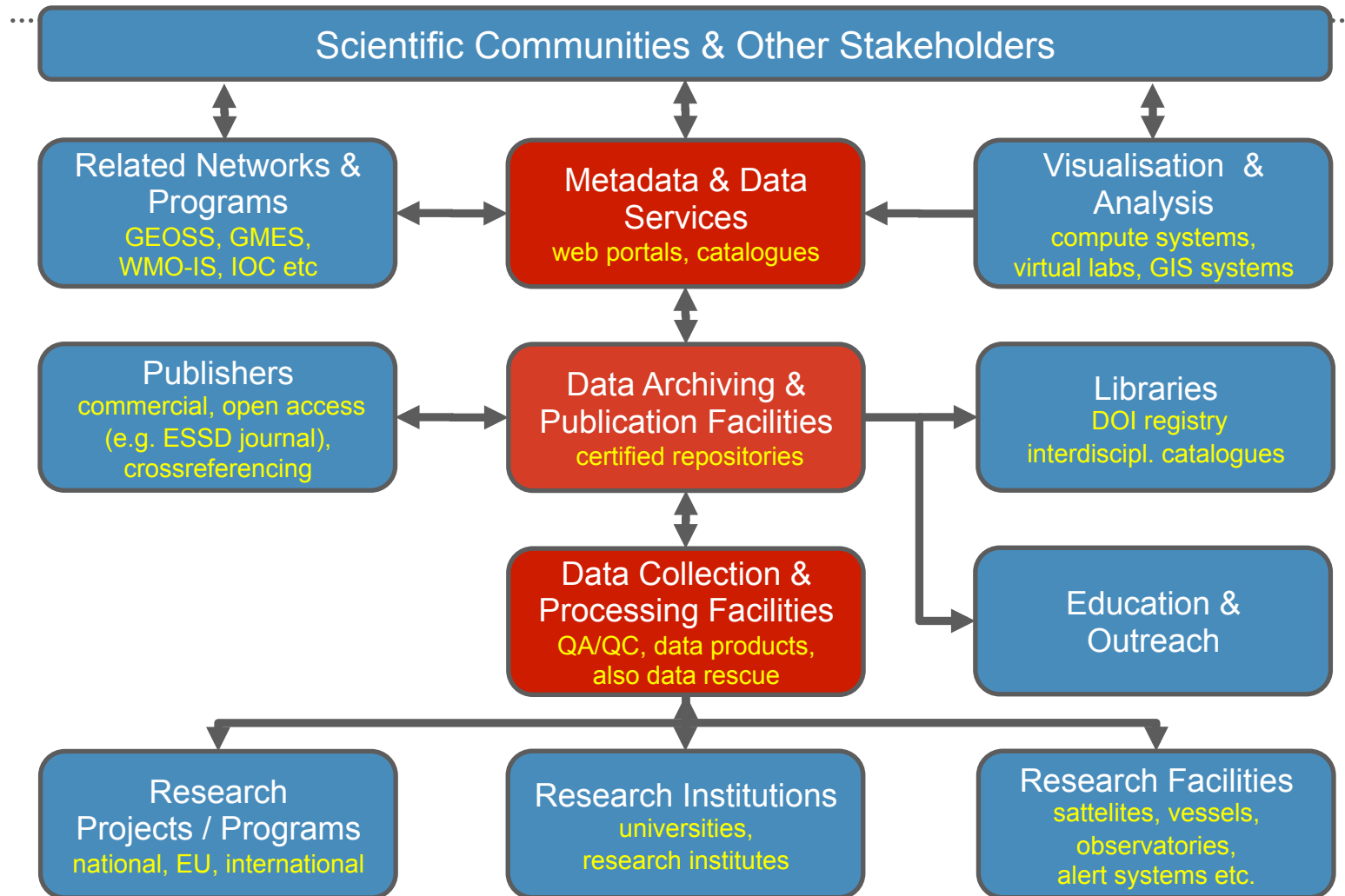


COLLABORATION BETWEEN DATA ARCHIVES & SCIENCE JOURNALS

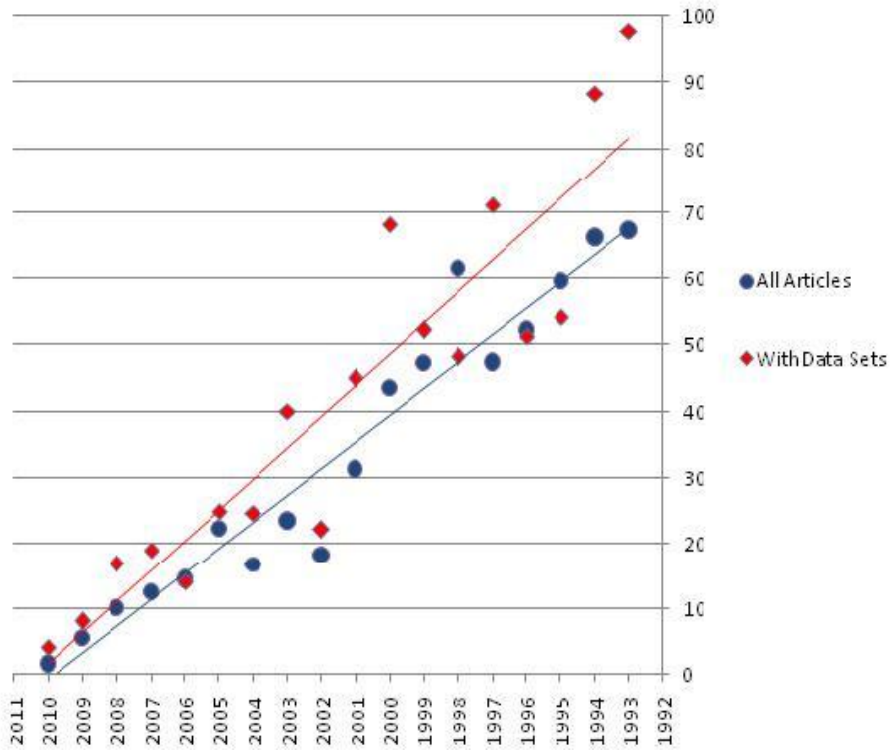
- ✓ Linking editorial workflows
- ✓ Linking services



ICSU WDS – ROLES & RELATIONS IN A FEDERATED SYSTEM

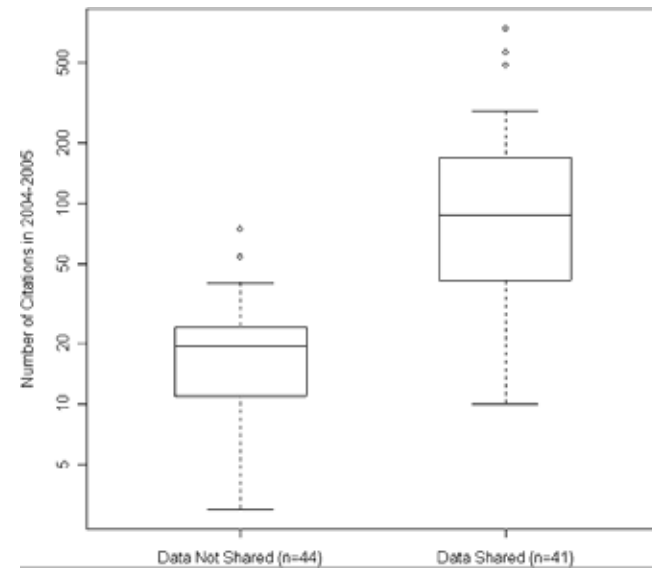


BIBLIOMETRICS



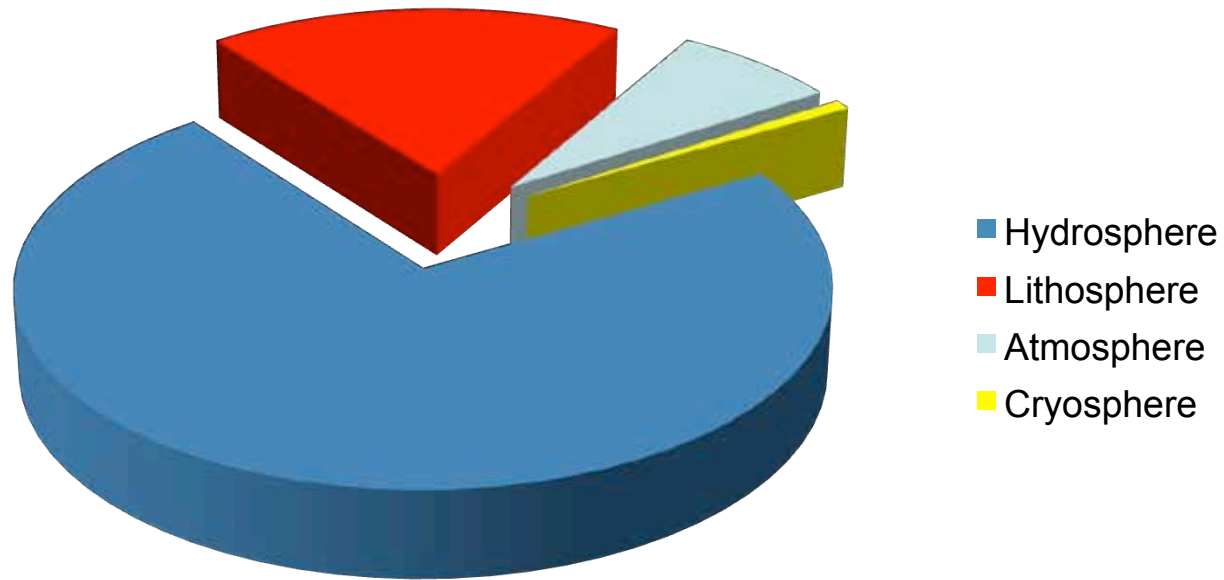
Courtesy of Jon Sears (AGU)

35% to 69% more citations



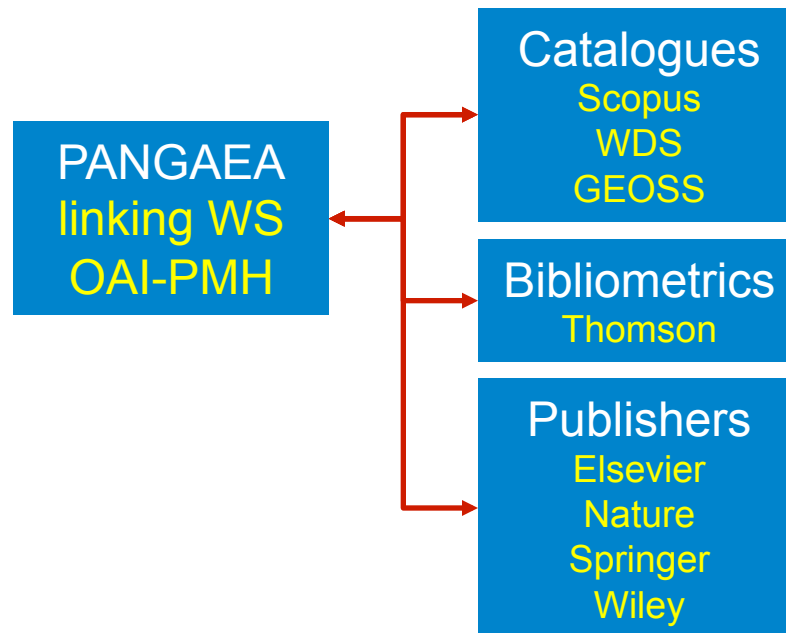
Piowar HA, Day RS, Fridsma DB (2007) Sharing Detailed Research Data Is Associated with Increased Citation Rate. PLoS ONE 2(3): e308. doi:10.1371/journal.pone.0000308

PANGEA MULTIDISCIPLINARY DATA ARCHIVE AND PUBLISHER



Total number of data sets ~350.000
Data items ~ 6.3 billions

LINKING INFRASTRUCTURE



DATA PUBLISHING – CROSS-REFERENCING

ScienceDirect - Marine Micr x Mohtadi, M et al. (2010): Su x
doi.pangaea.de/10.1594/PANGAEA.733340

Logged in as uschindler (log out, profile)

PANGAEA*
Data Publisher for Earth & Environmental Science

Always quote citation when using data
[Show Map](#) [Google Earth](#) [RIS](#) [Bibtex](#)

Data Description


Citation: Mohtadi, M et al. (2010): Surface sediment samples from several fore-arc basins west and southwest of the Indonesian Archipelago, analyzed by planktonic foraminifera, stable oxygen and carbon isotopic signals and opal and CaCO₃ contents in bulk sediment. doi:10.1594/PANGAEA.733340.
Supplement to: Mohtadi, Mahyar; Max, Lars; Hebbeln, Dierk; Baumgart, Anne; Krück, Nils; Jennerjahn, Tim C (2007): Modern environmental conditions recorded in surface sediment samples off W and SW Indonesia: Planktonic foraminifera and biogenic compounds analyses. *Marine Micropaleontology*, 65(1-2), 96-112, doi:10.1016/j.marmicro.2007.06.004

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 (*Neoglobobulimina dutertrei*) species, and the opal and CaCO₃ 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 S and SW Indonesia. Present-day oceanography and marine productivity are also reflected in the tropical to subtropical and upwelling assemblages of planktonic foraminifera in the surface sediments, which in part differ from previous studies in this region probably due to different coring methods and dissolution effects. The average stable oxygen isotopic values (δ¹⁸O) of *G. ruber* in surface sediments vary between 2.9 per mill and 3.2 per mill from basin to basin and correspond to the oceanographic settings during the SE monsoon (July-October) off west Sumatra, whereas off southern Indonesia, they reflect the NW monsoon (December-March) or annual average conditions. The δ¹⁸O values of *N. dutertrei* show a stronger interbasinal variation between 1.6 per mill and 2.2 per mill and correspond to the upper thermocline hydrology in July-October. In addition, the difference between the shell carbon isotopic values (δ¹³C) of *G. ruber* and *N. dutertrei* (Δδ¹³C) appears to be an appropriate productivity recorder only in the non-upwelling areas off west Sumatra. Consequently, joint interpretation of the isotopic values of these species is distinctive for different fore-arc basins W and SW of Indonesia and should be considered in paleoceanographic studies.

Project(s): [Center for Marine Environmental Sciences \(MARUM\)](#) q

Coverage: Median Latitude: -2.448691 * Median Longitude: 102.924024 * South-bound Latitude: -9.012150 * West-bound Longitude: 95.331100 * North-bound Latitude: 3.874500 * East-bound Longitude: 121.002536

Event(s): **GeoB10008-4** q * Latitude: -0.015914 * Longitude: 98.004331 * Date/Time: 2005-08-06T04:29:00 * Elevation: -934.0 m * Campaign: SO184/1 (PABESIA) q * Basis: Sonne q * Device: MultiCorer q * Comment: 6/6 4/4
GeoB10010-1 q * Latitude: -1.002969 * Longitude: 97.016358 * Date/Time: 2005-08-06T11:14:00 * Elevation: -2937.0 m * Campaign: SO184/1 (PABESIA) q * Basis: Sonne q * Device: MultiCorer q * Comment: 6/6 4/4
GeoB10014-1 q * Latitude: 1.011308 * Longitude: 96.016350 * Date/Time: 2005-08-08T01:30:00 * Elevation: -1158.0 m * Campaign: SO184/1 (PABESIA) q * Basis: Sonne q * Device: MultiCorer q * Comment: 6/6 4/4



DATA PUBLISHING – CROSS-REFERENCING

The screenshot shows a ScienceDirect article page for "Marine Micropaleontology". The article title is "Modern environmental conditions recorded in surface sediment samples off W and SW Indonesia: Planktonic foraminifera and biogenic compounds analyses". The authors listed are Mahyar Montadi, Lars Max, Dierk Hebbeln, Anne Baumgart, Nils Krück, and Tim Jennerjahn. The journal is "Marine Micropaleontology", Volume 65, Issues 1-2, 29 October 2007, Pages 96-112. The article is published by Elsevier.

Overlaid on the article page is a diagram illustrating the data publishing and cross-referencing workflow:

- A **USER** (yellow circle) interacts with an **SD Article** (yellow rounded rectangle) which contains an **app** (green rounded rectangle).
- The **SD Article** is linked to an **SD Server** (yellow rounded rectangle).
- The **SD Server** is connected to a database of **articles** (yellow cylinder).
- The **SD Article** is also linked to a **Research Data Server** (green rounded rectangle).
- The **Research Data Server** is connected to a database of **data sets** (green cylinder).

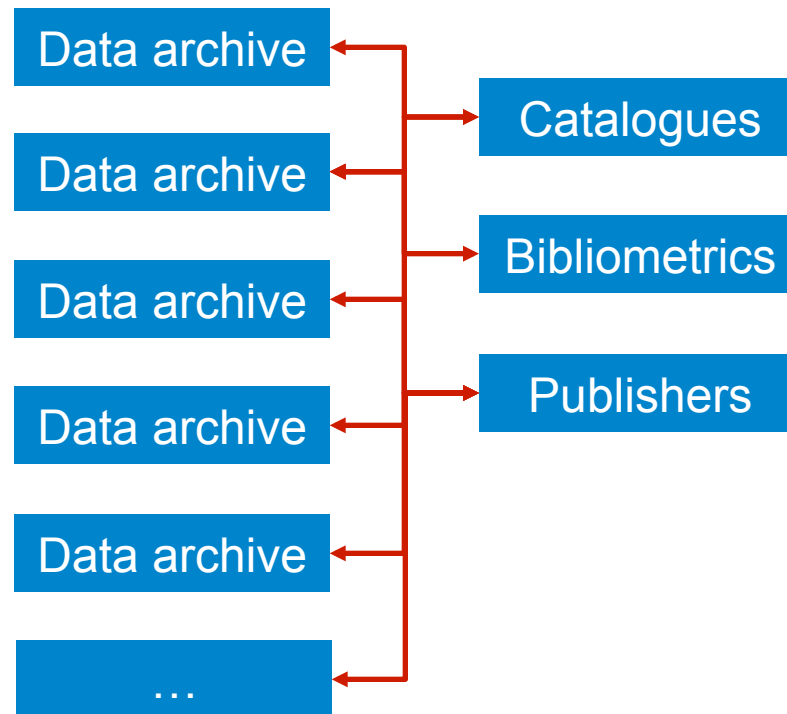
The diagram shows the integration of research data with scientific articles through a central application and server infrastructure.

DATA PUBLISHING – CROSS-REFERENCING

The screenshot displays a Scopus document page for the article "High-resolution record of Northern Hemisphere interglacial period". The page includes the following sections:

- Metadata:** Scopus logo, search bar, and document details (Volume 431, Issue 7, September 2004, Pages 147-151).
- Abstract:** Two deep ice cores from central Greenland, drilled in the 1990s, have plain Hemisphere, but the oldest sections of the cores were disturbed in chron... present an undisturbed climate record from a North Greenland ice core, w... within the last interglacial period. The oxygen isotopes in the ice imply that... with temperatures 5 °C warmer than today. We find unexpectedly large tem... northern Greenland and the undisturbed sections of the cores from central... Northern Hemisphere revealed the latitudinal temperature gradients in G... temperatures that marked the initiation of the last glacial period. Our record... by an abrupt climate warming about 115,000 years ago, before glacial con... appear to have an immediate Antarctic counterpart, suggesting that the cli... dominated the last glacial period) was not operating at this time.
- Language of original document:** English
- Index Keywords:** Engineering controlled terms: Geochronology; Glacial geology; Ice; Isotope; Engineering uncontrolled terms: Bedrock; Greenland; Northern hemisphere; Engineering main heading: Climate change; GEORASE Subject Index: ice core; Last interglacial; Northern Hemisphere; paleoclimate; Quaternary; ENTREE medical terms: Antarctica; article; chronology; climate change; cold climate; document examination; geographic elevation; glacial mass balance; information retrieval; last glacial maximum; latitude; low temperature; priority journal
- Map:** A satellite-style map of Greenland with a red location pin in the interior. A text box above the map reads: "PANGAEA - Supplementary Data 10 year means of oxygen isotope data from ice core 10248".
- References (50):** A list of references, with the first one being: "1 Johansen, S.J., Clausen, H.B., Dansgaard, W., Fuhrer, K., Gundestrup, N., Hammer, C.U., Iversen, P., L., Steffensen, J.P., Irregular glacial interstadials recorded in a new Greenland ice core (1997) *Nature*, 389 (6625), pp. 344-348. [CrossRef](#) [PubMed](#)
- Related documents:** A section titled "Showing the 2 most relevant related documents by all shared references" with two entries: "Linsley, A., Vimeux, C., Masson-Delmotte, V. On the limits of Antarctic and marine climate records synchronization: Lag estimates during marine isotopic stages 5d and 5c (2007) *Paleogeography*" and "Linsley, A., Clark, D.K., Marshall, S.J. Tracer transport in the Greenland Ice Sheet: Constraints on ice cores and glacial history (2007) *Quaternary Science Reviews*".
- My Applications:** A section with a "Store By These Authors" button and a message: "Data for this application is temporarily unavailable."

LINKING INFRASTRUCTURE



ICSU WDS PERSPECTIVE

