

# Reproducibility and Open Science

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<https://doi.org/10.48440/os.helmholtz.060>

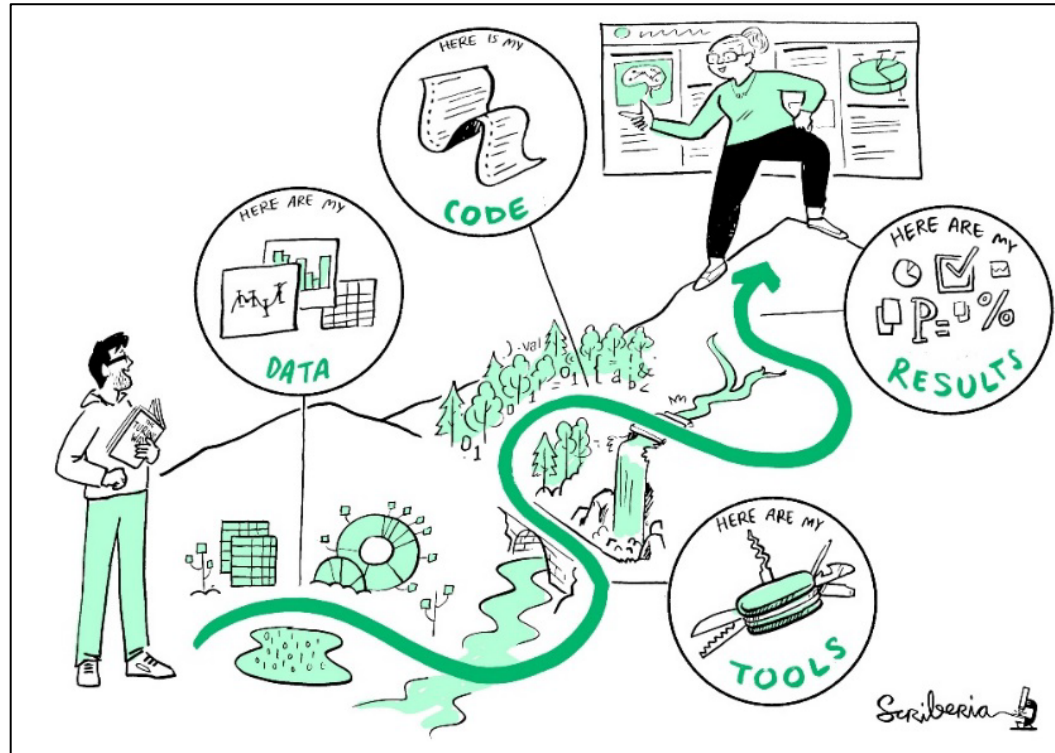


how are open science and reproducibility linked to each other



Open science and reproducibility are closely linked as they both strive for greater transparency and accountability in scientific research. Open science promotes sharing and collaboration in the scientific process, while reproducibility requires that results can be independently verified through repeating the experiment. **By making research more open and accessible, open science helps to increase reproducibility and build trust in scientific findings.**

<https://chat.openai.com/chat>



The Turing Way Community, & Scriberia. (2019). Illustrations from the Turing Way book dashes. Zenodo.  
<https://doi.org/10.5281/zenodo.3332808>

Reproducibility is the ability to recalculate a figure from data, parameters and programs  
(Schwab M, et al., 2000)

Reproducibility is the ability of independent investigators to draw the same conclusions from an experiment by following the documentation shared by the original investigators.  
(Gundersen, O.E., 2021)

- Repeatability (same team, same experimental setup)
- Reproducibility (different team, same experimental setup)
- Replicability (different team, different experimental setup)

(ACM, 2020, <https://www.acm.org/publications/policies/artifact-review-and-badging-current>)

## The best time to argue about what a replication means? Before you do it

To avoid stalemates and provide lessons, replicators and original researchers must reach agreement on a study design and set out expectations ahead of time.

Brian A. Nosek & Timothy M. Errington

Reproducibility is the

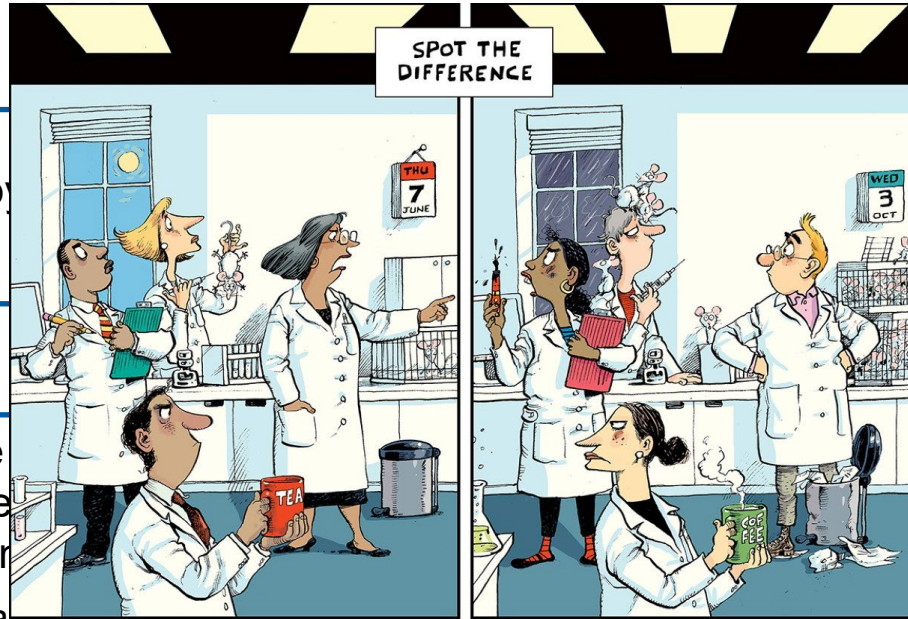
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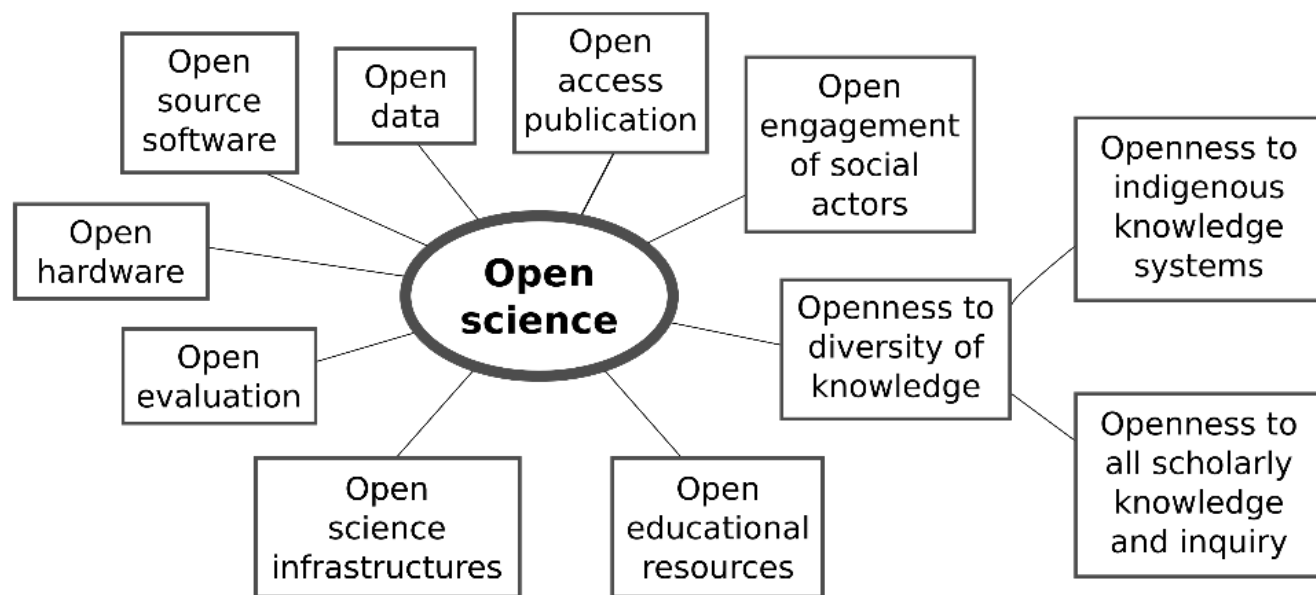
Reproducibility is the  
from an experiment b

ame conclusions  
final investigators.

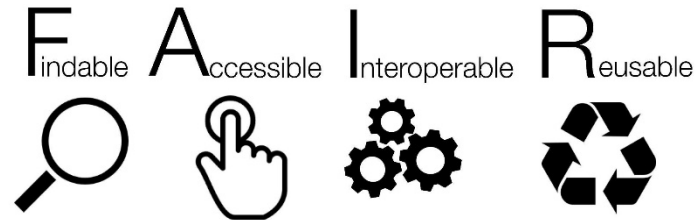
- Repeatability (same)
- Reproducibility (diffe)
- Replicability (differen

(ACM, 2020, <https://www.nature.com/articles/d41586-020-02142-6>)





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doi:10.1594/PANGAEA.947265

1. **Zabel, M (2022):** Pore water and solid phase data from deep-sea trench sediments

Size: 17 datasets

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2. **Hoppmann, M; Kuznetsov, I; Fang, Y-C et al. (2022):** Processed data of CTD buoys 201901 to 201908 as part of the MOSAIC Distributed Network

*Related to:* **Hoppmann, M; Kuznetsov, I; Fang, Y-C et al. (2022):** Mesoscale observations of temperature and salinity in the Arctic Transpolar Drift: a high-resolution dataset from the MOSAIC Distributed Network. *Earth System Science Data*

**Kruppen, T; Sokolov, V (2020):** The Expedition AF122/1 : Setting up the MOSAIC Distributed Network in October 2019 with Research Vessel AKADEMIK FEDOROV. *Berichte zur Polar- und Meeresforschung = Reports on Polar and Marine Research*

Size: 8 datasets

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3. **Dorschel, B; Hehemann, L; Viquerat, S et al. (2022):** The International Bathymetric Chart of the Southern Ocean Version 2 (IBCSO v2)

Size: 50 data points

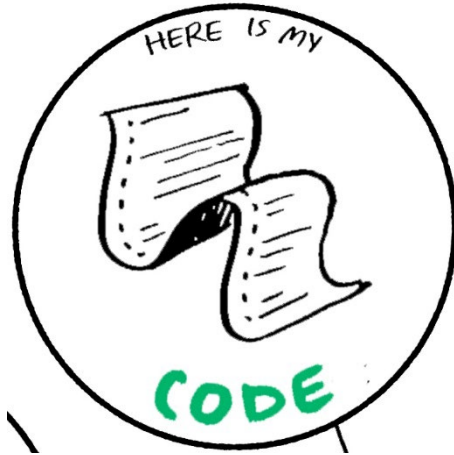
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4. **Weber, ME (2021):** Antiphased dust deposition and productivity in the Antarctic Zone over 1.5 million years

Size: 12 datasets

<https://doi.org/10.1594/PANGAEA.939650> – Download – Score: 1.8





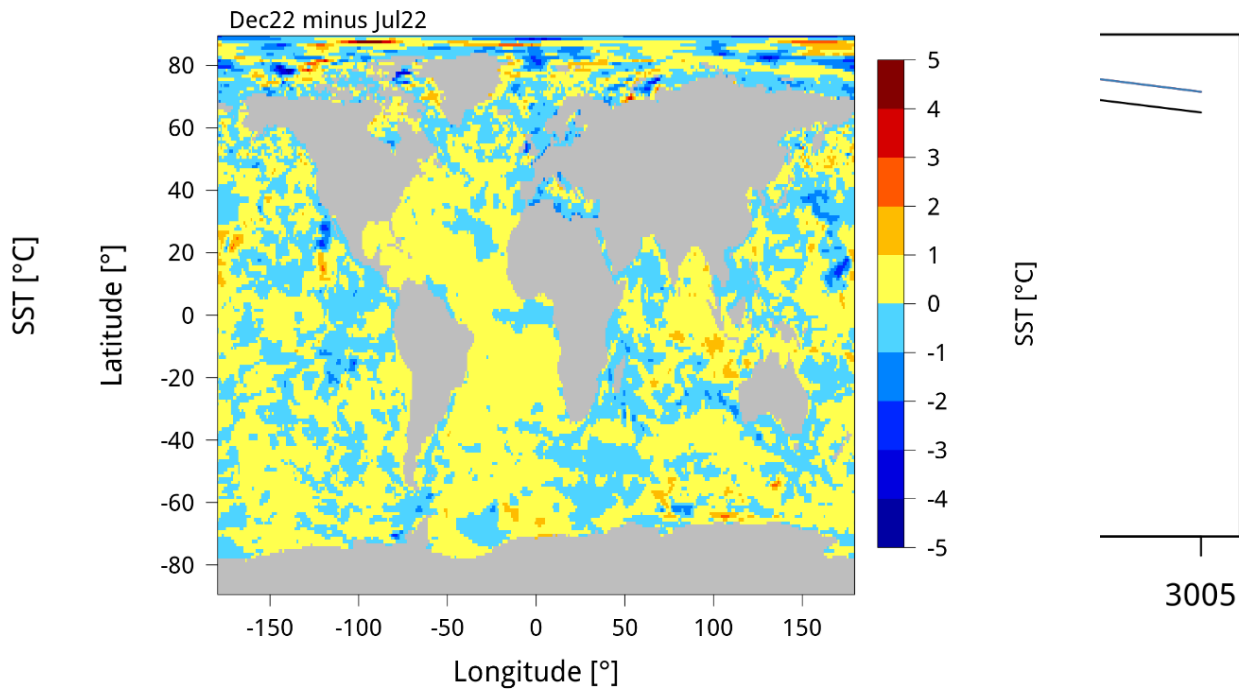
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<https://doi.org/10.5281/zenodo.3332808>



Scott Mackey, <https://www.adlibsoftware.com/blog/authors/scott-mackey.aspx>



# Example



AWI-CM1-REcoM ([cdanek@awi.de](mailto:cdanek@awi.de))

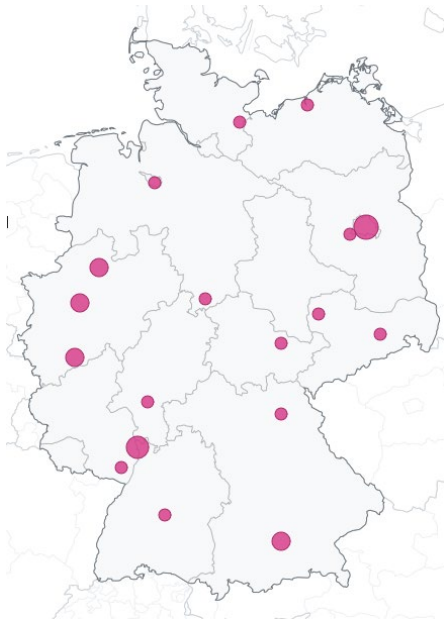
Helmholtz Open Science Office | Open Science in Helmholtz

# Helmholtz Open Science Policy

This policy was adopted by the Assembly of Members of the Helmholtz Association on 20 September 2022.

<https://os.helmholtz.de/en/open-science-in-helmholtz/open-science-policy>

- <https://reproducibilitynetwork.de/>



[info@reproducibilitynetwork.de](mailto:info@reproducibilitynetwork.de)

Subscribe to our mailing list: [grn@lists.lrz.de](mailto:grn@lists.lrz.de)



## Researchers

We **support researchers** in educating themselves about open science practices, and founding local open science communities.



## Reproducibility Initiatives

We connect **local or topic-centered Reproducibility Initiatives** to a national network, and foster connections between them.



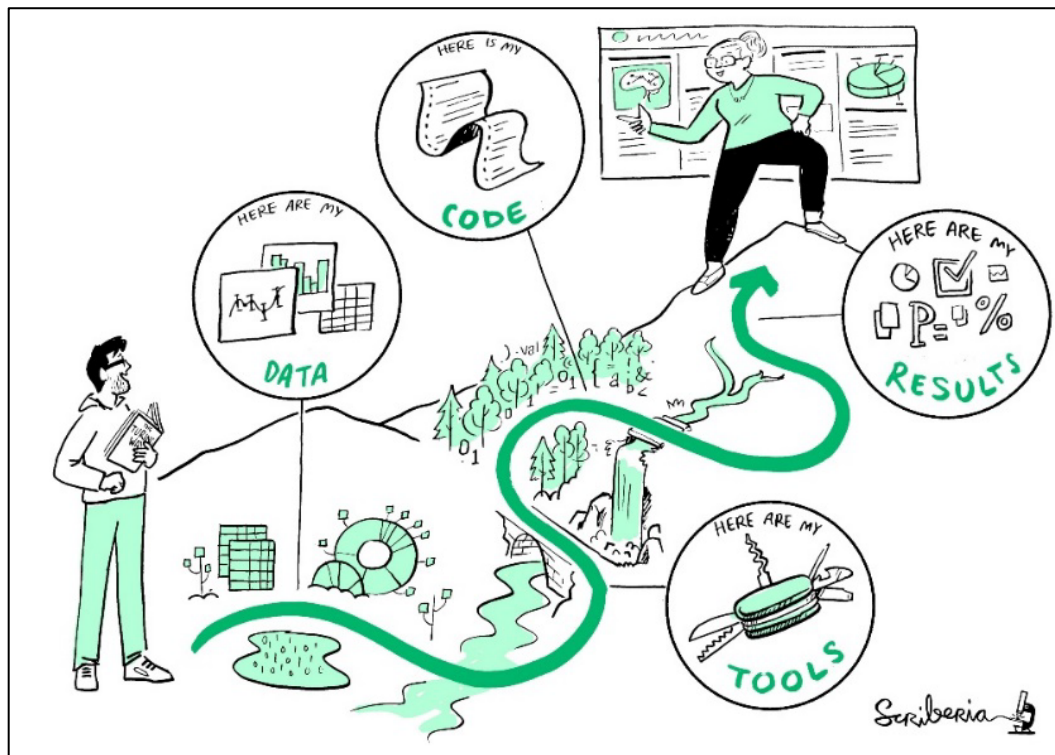
## Institutions

We advise **institutions** on how to embed open science practices in their work.



## Other Stakeholders

We represent the **open science community** toward other stakeholders in the wider scientific landscape.



The Turing Way Community, & Scriberia. (2019). Illustrations from the Turing Way book dashes. Zenodo. <https://doi.org/10.5281/zenodo.3332808>

Thank you for attention

- Nosek, B.; Errington, T. (2022) "The best time to argue about what a replication means? Before you do it." Nature **583**: 518-520.  
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- Schwab, M, Karrenbach N, Claerbout J. (2000). Making scientific computations reproducible. [doi:10.1109/5992.881708](https://doi.org/10.1109/5992.881708)
- Gundersen O. E. (2021). The fundamental principles of reproducibility.  
[doi:10.1098/rsta.2020.0210](https://doi.org/10.1098/rsta.2020.0210)
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<https://www.acm.org/publications/policies/artifact-review-and-badging-current>
- The Turing Way Community et al. (2019). The Turing Way: A Handbook for Reproducible Data Science, Zenodo [doi:10.5281/zenodo.3233986](https://doi.org/10.5281/zenodo.3233986)
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