

Unveiling the Iceberg: Enhancing the Quality and Visibility of Research Software at Helmholtz

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Helmholtz Association

Helmholtz Open Science Office

First Research Software Day Berlin & Brandenburg, June 3rd, 2026

Agenda

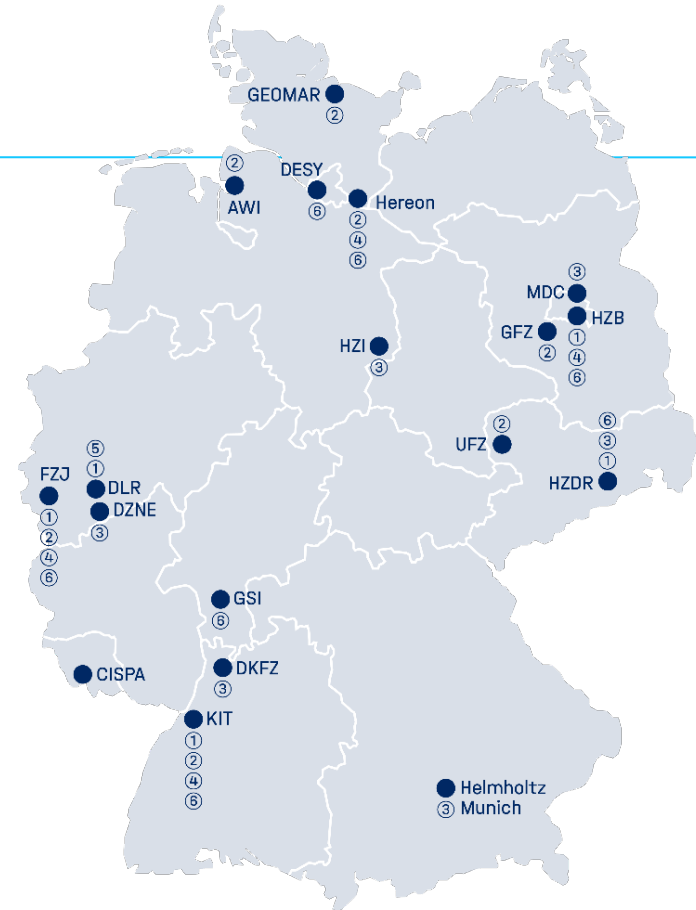
- Helmholtz Context
- Open Research Software at Helmholtz
 - Why Open Research Data and Open Research Software Matter
 - Policy Development
 - Community Building
 - Research Software Directory
 - Incentives (Helmholtz Software Award & Helmholtz Quality Indicators)
- Broader View (Research Assessment)

The Helmholtz Association

Research for Grand Challenges

The Helmholtz Association

- 18 operationally independent research Centers
- 6 Research Fields: Energy, Earth and Environment, Health, Aeronautics, Space and Transport, Matter, Information)
- Profound expertise in large scale research infrastructure
- Helmholtz Centers developed and operate almost 140 research data repositories.
- Helmholtz as a prime strategic partner at the local, national and international level
- Transfer of knowledge into economy and society



Advancing Open Science at Helmholtz and beyond!

The Helmholtz Open Science Office

- The Helmholtz Open Science Office
 - supports the Helmholtz Association and its research Centers in shaping the cultural change towards Open Science
 - promotes dialogue and provides impulses within the Association.
 - offers information and support concerning all aspects of Open Science.
 - cooperates with the centers in the Open Science working group and in joint task groups.
 - represents Helmholtz positions on Open Science on a national and international level.



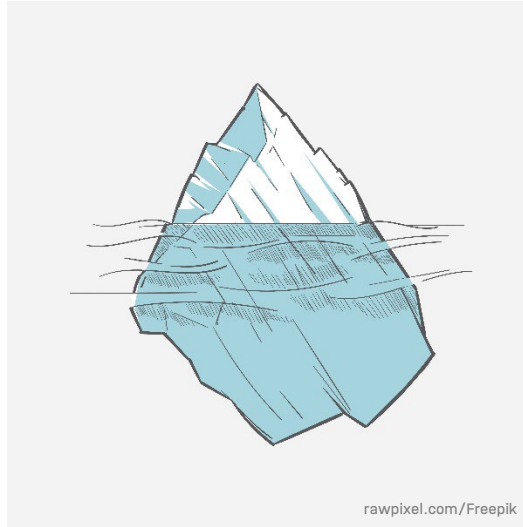
Open Research Software at Helmholtz

Why Open Research Data and Open Research Software Matter

Turning “Invisible Work” into Academic Credit

Boosting Reproducibility,
Trust & Efficiency

Ensuring Recognition &
long-term Impact



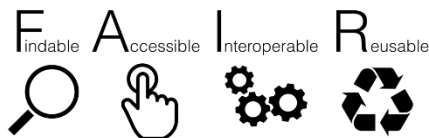
Improving Research Quality,
Transparency, and Impact

Open Research Data and Software Policy Development

2022 Helmholtz Open Science Policy

What are our commitments?

- Centers must have publicly available policies for managing research data (and software if needed)
- Outputs should be managed responsibly and made as FAIR as possible.
- Research findings should be openly accessible whenever possible.
- Minimum requirements for metadata (licensing, in accordance with FAIR principles)



“give value to all relevant research activities and scientific outputs including high-quality FAIR data and metadata, well-documented and reusable software, protocols and workflows, machine-readable summaries of findings, and teaching, outreach and engagement of societal actors”



unesco

Recommendation
on Open Science

Policies

Research Software Policies of the Helmholtz Centers

1. AWI: Guidelines for the development and handling of research software at the AWI
2. DZNE (internal)
3. DLR: Software-Engineering-Empfehlungen des Deutschen Zentrums für Luft- und Raumfahrt e.V. (DLR)
4. FZJ: Guidelines for the development and distribution of software at Forschungszentrum Jülich
5. GFZ: Policy on the use and licensing of research software
6. GSI: Open source software licences at GSI/FAIR-Guidelines
7. Hereon: Leitlinie für die Entwicklung und Weitergabe von Software
8. HZDR: HZDR Software Policy



Open Research Data and Software Community Building across Helmholtz and beyond

Helmholtz Task Groups

- [Task Group](#) Research Software (since 2016)
- [Task Group](#) Helmholtz Quality Indicators for Data and Software Products (since 2022)

Community events

- Annual [Helmholtz Research Software Forums](#)
- [Helmholtz Codes!](#)

Internal and national cooperation

- Joint initiatives with infrastructure networks like [HIFIS](#) (Federated IT services) and [HiRSE](#) (Research Software Engineering)
- Cooperation with de-RSE e.V. (Gesellschaft für Forschungssoftware)
- Involvement in [NFDI](#) consortia and basic services like [nfdi.software](#) (GFZ)



Infrastructure

Research Software Directory

Online service to collect and present software in an academic context

For Research Software Engineers

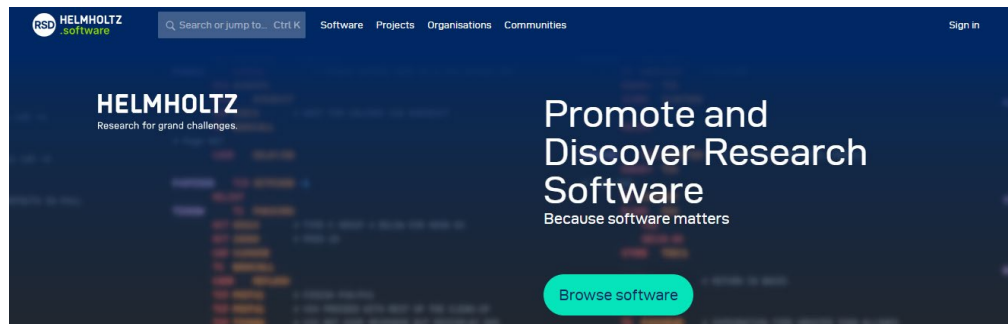
- Show impact their software has in research
- Show relations to organizations, research projects and other software
- Guide visitors to codebase

For Researchers

- Discover software they need in their research field
- Get help for citing code they use

For Organizations

- Keep track of software
- Metrics and evaluation



The Helmholtz RSD in numbers

484

Registered software packages

2256

Contributors to research software

68724

Mentions of research software in science

261

International partner organisations

<https://helmholtz.software/>

Incentives

Incentives

Helmholtz Software Award

The Helmholtz Research Software Award aims to promote the development of professional, high-quality, and sustainable research software and to recognize commitment to software as the basis of modern data science.

The Helmholtz Software Award is presented by Helmholtz Federated IT Services (HIFIS), the Helmholtz Information & Data Science Academy (HIDA), and the Helmholtz Open Science Office.

- Under review: Winners of the Helmholtz Software Award 2026
- Winners of the Helmholtz Software Award 2024
- Winners of the Helmholtz Software Award 2023



<https://os.helmholtz.de/en/open-research-software/helmholtz-software-award/>

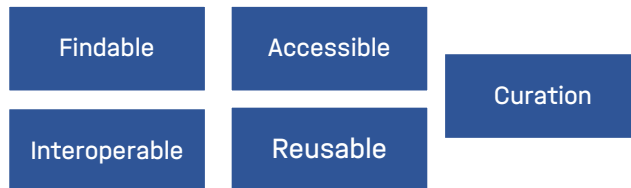
Incentives

Helmholtz Quality Indicators for Data and Software Products

Background

- 2022:
 - Helmholtz Open Science Policy
 - Indicators approved by General Assembly of Helmholtz as a mandatory Key Performance Indicator (KPI) from 2028 onwards
 - Start of the Task Group
- 2023: First counting of citable data and software publications as part of annual institutional evaluations
- 2025: Two sets of criteria were developed based on the FAIR-C and FAIR-ST principles, each comprising several attributes.

FAIR-C (data)



FAIR-ST (software)



Helmholtz Quality Indicators

Qualitative and quantitative assessment

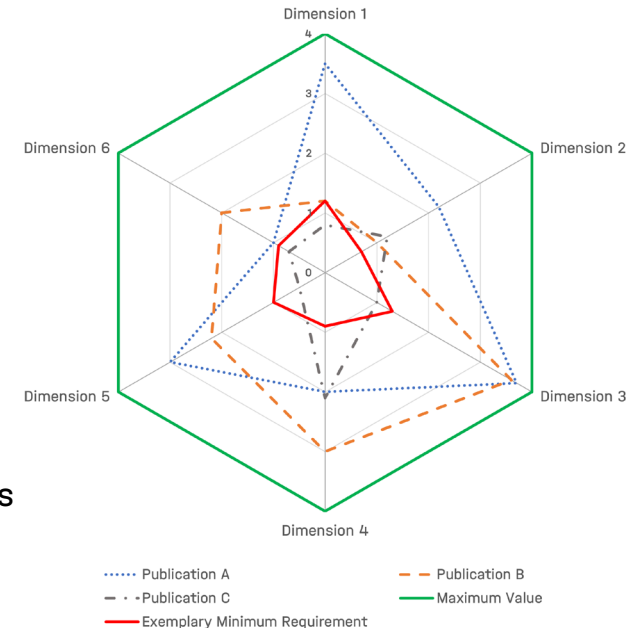
- Every publication receives average scores (0-4) for each dimension (FAIR-C / FAIR-ST)
- These are visualized using a radar plot (dashed lines)

Qualitative Assessment (individual publications)

- Definition of a "minimum polygon" (red line)
- Do individual publications meet the required quality standards?
- Which attributes can/should be improved on?

Quantitative Assessment (institute-level KPIs)

- If a publication meets the minimum requirements: count as "1"
- Aggregation for research groups / departments / research centers
- The minimal polygon can be raised over time to incentivize improvements



Status report (2026)

<https://doi.org/10.48440/OS.HELMHOLTZ.085>

Helmholtz Quality Indicator for Software products

Example F1: Quality Dimension and Attributes

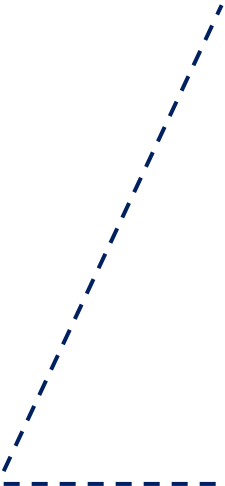
FAIR-ST (software)

Findable	Reusable
Interoperable	Scientific embedding
Accessible	Technical grounded

Dimension "Findable"

Attributes	F1 - Open Publication Repository
	F2 - Versioning
	F3 - Published with identifier
	F4 - Rich Metadata

Maturity Model

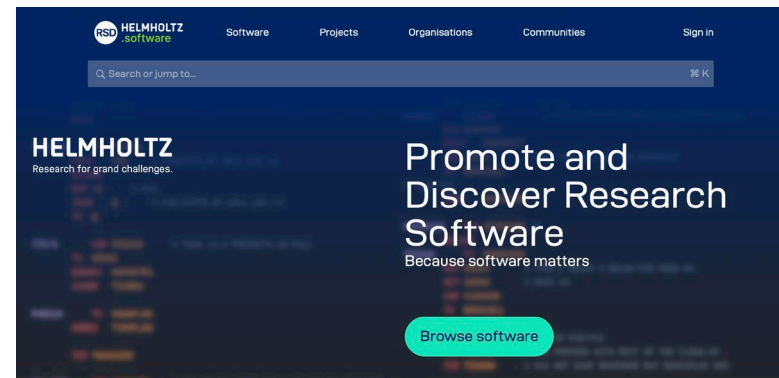
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- (4) The repository is listed in some overarching metarepository (e.g., (RSD), re3data).
 - (3) A structured meta data description (e.g., following DataCite) given for software is in this repository.
 - (2) **Some kind of description is available giving further information on the software in this repository (e.g. readme file).**
 - (1) **The software is contained in an online repository.**
 - (0) **There is no information available on where to find the software.**

Helmholtz Quality Indicators

Automation and Implementation

Helmholtz Software Indicator

- Helmholtz Research Software Directory
- Self-assessment by research software developers
- Pilot implementation starting now
- Full implementation starting 2028



Helmholtz Data Indicator

- Helmholtz Metadata Collaboration
- (semi)-automated analysis of lists of PIDs
- Pilot implementation starting early 2027
- Full implementation starting 2028



Incentives

Research Assessment

- The San Francisco Declaration on Research Assessment (DORA) deals with the reform of research assessment and contains recommendations for funders, organizations and individuals.
 - Helmholtz signatories: DKFZ, FZJ, GFZ, KIT, MDC
- Reforming the practice of research assessment in the Coalition for Advancing Research Assessment (CoARA)
 - Recognizing diverse outcomes, practices, and activities in the assessment of research, researchers, and research institutions
 - Helmholtz signatories: MDC, Helmholtz OS Office
 - Since March 2025: OS Office coordinates the CoARA German National Chapter Germany



Keep in touch



open-science@helmholtz.de



<https://os.helmholtz.de>



[Open Science Newsletter](#)



[LinkedIn](#)  | [Mastodon](#)  | [Bluesky](#) 



Publications and recommended readings: [Zotero](#)

Mailing list for members at Helmholtz – [Helmholtz Open Science Professionals](#) and [Mattermost](#) 

Thank you for your attention!

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Based on slides by Lea Maria Ferguson, Steffi Genderjahn, & Mathijs Vleugel



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Now, it's your turn:

- In your field, what is the biggest barrier to treating research software as a first-class research output?
- How do you balance the pressure for traditional publications with the time investment needed for sustainable research software?
- Do institutional policies truly support your daily work, or is there a gap between policy goals and the reality?