User scenarios in action: How European Open Science Cloud services can help Earth System Scientists

Anna-Lena Flügel¹, Beate Krüss¹, Heinrich Widmann¹, Hannes Thiemann¹, Stephan Kindermann¹, Fanny Adloff¹

¹ German Climate Computing Center, Hamburg

Climate Change Case Study

Within the Horizon Europe project FAIRCORE4EOSC, the German Climate Computing Center (DKRZ) is exploring the integration of FAIR-enhancing services from the European Open Science Cloud (EOSC) with the infrastructure of the European Network for Earth System Modeling (IS-ENES).

The objective is to evaluate improvements in the discoverability, reusability, and traceability of climate data. This case study demonstrates how the ENES community benefits from integrating DTR, RAiD, PIDGraph, **RDGraph** and **MSCR** into the data delivery workflow to generate and provide data provenance information alongside research data.

FAIRCORE4EOSC @ DKRZ

DTR enables the registration and assignment of persistent identifiers to single and complex data types, achieving machine-actionable standardization of type metadata used for typical climate data objects.

RAiDs provide research context for given data collections, helping users gain an aggregated view of related details - from data generation by Earth System modelers to publication of final assessment reports. RAiD metadata is fed into Open Science Graphs such as **PIDGraph** and **RDGraph**.

Using MSCR, it is possible to automate and pre-process necessary type conversions, making it easier to adapt existing workflows. Focusing on improving the prerequisites for machineaided analysis, including semantic aspects, is a high priority due to typically large volumes of data in climate science.







funder.



to climate data.



Contact: Beate Krüss Email: kruess@dkrz.de

いののの FAIRCORE4EOSC

Use new EOSC services!





Acknowledgement:



Benefits



Next steps

As an infrastructure, it is important to optimise the use of limited resources. That's why it's advantageous to have services outside ENES.



These services must not only be cost-effective and tailored to the needs of climate research, but also scalable, reliable and trustworthy. Most importantly, they must be sustainable in the long term.

Additional efforts aim to level the pass to future developments, such as potentially extending existing ENES Web Processing Services (WPS) to be able to publish RAiD details.

This work has been funded by the European Commission under the projects IS-ENES grant no. 824084 and FAIRCORE4EOSC grant no. 101057264.











Within IS-ENES European partners from the areas of climate modeling, computational science, data management and climate impacts work together, to deliver services providing access to climate model data and tools boosting the understanding of climate variability and changes.

CORESCIENCE FAIRCORE4EOSC

FAIRCORE4EOSC focused on the development and realisation of core services for EOSC. Supporting a FAIR EOSC and addressing gaps identified in the Strategic Research and Innovation Agenda (SRIA). Leveraging existing technologies and services, the project develops nine new EOSC-Core services aimed to improve the discoverability and interoperability of an increased amount of research outputs.

meosc

The vision for **EOSC** is to put in place a system in Europe to find and access data and services for research and innovation. This is to help researchers store, share, process, analyse and reuse FAIR research outputs within and across disciplines and borders. The deployment of a network between data repositories and services will be instrumental for Open Science to progress in Europe. For this, the EOSC Federation of nodes is being created. The ongoing build-up phase is the first phase of development of an operational EOSC Federation.

References

IS-ENES: https://is.enes.org FAIRCORE4EOSC: https://faircore4eosc.eu EOSC: https://eosc.eu ESGF: https://esgf.llnl.gov/ WDCC: https://www.wdc-climate.de/ui/ ESIWACE: https://www.esiwace.eu/

Funded by the European Union

