Case study Climate Change : How Earth System Science benefits from FAIRCORE4EOSC components

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Adaption of FAIRCORE4EOSC components for FAIR data management for Earth System Science within the case study 'Climate Change'

The **European Open Science Cloud (EOSC)** is an ecosystem of federated research data and services, and an open science infrastructure.
FAIRCORE4EOSC (FC4E) supports a FAIR EOSC by developing **nine new core components** improving cross-domain interoperability.

ENES-RI

ENES-RI is the research infrastructure for European Network for Earth System modelling (ENES), a collaboration of partners in climate modelling, climate impact research, IT and data management. The ENES-RI aims to

- deliver services to access climate model data
- develop tools to boost the understanding of future climate variability and change
- provide climate projections for policy decisions on mitigation and adaptation strategies, e.g. by the Intergovernmental Panel on Climate Change (IPCC)

[1] **German Climate Computing Center (DKRZ, https://www.dkrz.de)**

Requirements of Case Study 'Climate Change'

Five thematic case studies drive the development of the FAIRCORE4EOSC (FC4E) technical components. DKRZ[1] specifies the **user requirements for the case study 'Climate Change'** and works with the FC4E developers on the **integration of several components** into ENES RI.

Integration of FAIRCORE4EOSC components into ENES-RI Services

RAiDs (Research Activity identifiers) are being assigned to the CMIP6 project, providing an aggregated view on related entities (data provenance, software, people involved, etc).

The EOSC **RDGraph** (Research Discovery Graph) enables advanced and cross domain data discovery and access for the ENES community and researchers from other scientific areas.

MSCR (Metadata Schema Crosswalk Registry) improves cross-domain reuse of ENES data by mapping climate variable vocabularies to other ontologies.
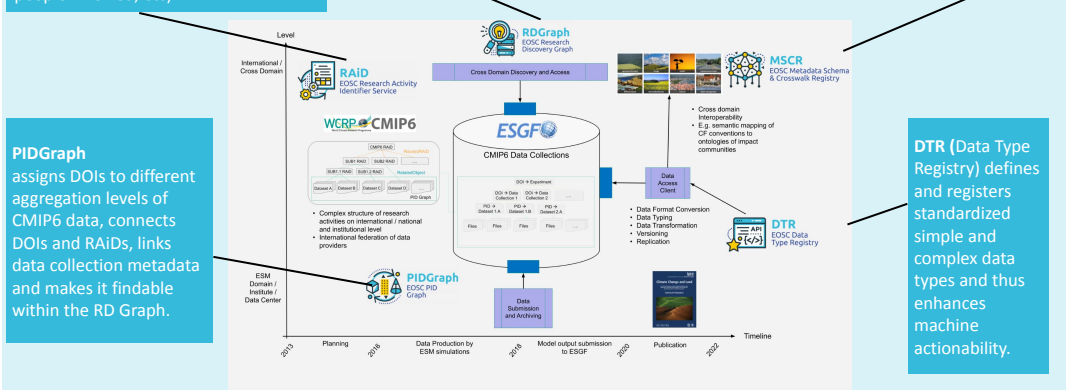
PIDGraph assigns DOIs to different aggregation levels of CMIP6 data, connects DOIs and RAiDs, links data collection metadata and makes it findable within the RD Graph.

DTR (Data Type Registry) defines and registers standardized simple and complex data types and thus enhances machine actionability.

Benefits

- improved interoperability and traceability of research activities
- enhanced discovery, access and reuse of data collections (FAIR)
- high scientific relevance for Earth system Science data producers and reusers

Challenges

- EOSC services need to be **cost-effective, scalable, reliable, trustworthy** and **sustainable long-term**
- **Required adaption on ENES side** to offer customized and easy-to-use services
- **Technical incompatibilities** due to different technologies and standards

Summary

This poster gives an overview of the integration of five FAIRCORE4EOSC components into ENES RI and the long-term benefits for Earth System Science researchers and beyond.
The use of FAIRCORE4EOSC components RAiDs, DTR, MSCR, PIDGraph and RDGraph improve discoverability, reusability and traceability of ENES data.

References

FC4E https://faircore4eosc.eu
ENES https://is.enes.org
EOSC https://eosc.eu

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