

Perspectives on the EOSC Federation: FAIR-EASE contribution to the Build-up phase

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FAIR-EASE in a nutshell

3 years, from
September 2022 to
August 2025

HOW LONG?

WHY?

A huge amount of
heterogeneous data to
be discovered,
accessed and analysed
for multidisciplinary
scientific applications

28 partners from 9
different EU member
and associated
countries

HOW MANY?

about **WHAT?**

Customization and
integration of pre-
operational services

Bringing together IT
experts and scientists

HOW?

for **WHOM?**

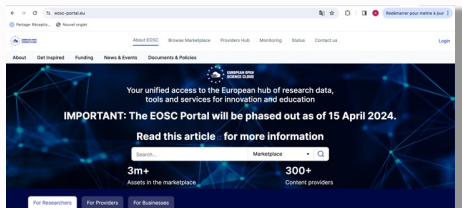
Earth Sciences and
environmental related
research communities

September 2022

August 2025

Y1		Y2		Y3	
Landscaping	Specifications	Development & Integration		Test	EOSC

April 2024



- **Interdisciplinarity** → multi and cross domain analysis
- **Simple and efficient data access** → heterogeneous and distributed data
- **Technical complexity** →
 - Provide a workflow management solution
 - (Re)Use existing solutions, apply for other domain/context and improve their TRL
 - Provide new and innovative concepts and technical solutions
- **Computing resources & storage** → intensive processing, user space

Making it easier to dive into data



- **Standards and Interoperability**

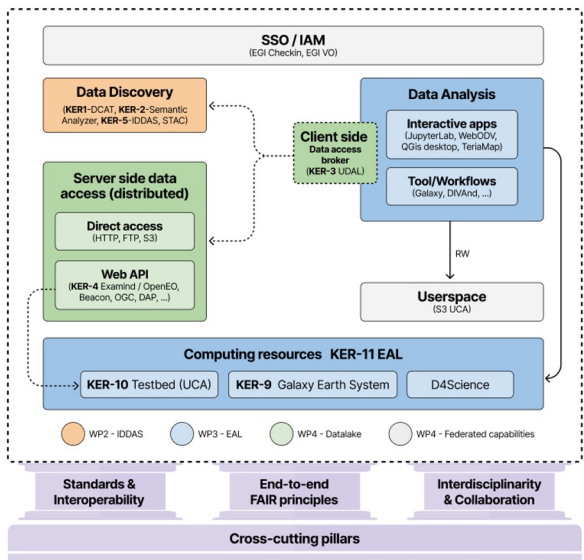
- Adoption of open, community-driven standards (e.g. ISO, OGC, CF, ARCO formats)
- Promote Semantic Web and web foundations (e.g. DCAT, mapping/alignment, RO)
- Interoperability across domains, platforms, and tools with cloud ready solutions (e.g. containers, S3)

- **End-to-End FAIR Principles**

- Across the full data lifecycle, from discovery to production/publication and reuse
- For all Research Objects (e.g. Data, Software, Process)

- **Interdisciplinarity and collaboration**

- Share knowledge (e.g. webinars, hackathon, books)
- Stimulate scientific and technical innovation



Data Discovery

IDDAS (Interdisciplinary Data Discovery and Access Service)

Semantically enriched metadata catalogue based on a customised DCAT-AP profile, enabling seamless data discovery and access across domains and platforms, both for human and machine.



Data Access

UDAL (Uniform Data Access)

Innovative client-side layer that decouples data functionality from its source and format, reducing technical complexity and enhancing flexibility.

High-performance subsetting with S3/ARCO/STAC/OpenEO, and Beacon.



Data Analysis

EAL (Earth Analytics Lab)

Collaborative analysis environment offering integrated tools for data processing, visualisation, and workflow design, supporting collaborative research. Thanks to federated capabilities, it is possible to move from one EAL to another.

Demonstrators

Water Coastal Dynamics



KER-12 Ocean BGC



KER-13 Volcano Space Observatory



KER-14 Earth Critical Zone



KER-15 Marine Omics Observation



Hunga Tonga

- Real use cases guided the design of the architecture, and contributed to showcase concepts and technical solutions.
- Iterative approach (i.e. DevCycles) helped to break down the silos and work together (technical WPs).
- Collaboration with external projects enabled to share best practices and improve technical solution.
- FAIR-EASE also contributed to EOSC federation (e.g. candidate Nodes).


EuroScienceGateway
Blue-Cloud2026
AquaINFRA
FAIR-IMPACT*Opportunity Areas (OA2, OA4), Task Forces*

The last mile to be exploitable and and more visible through a more structured coordination

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KERs

The Key Exploitable Results of the FAIR-EASE project provide a transformative approach to multidisciplinary environmental research by integrating distributed data discovery, access, and processing services into a seamless and FAIR-compliant ecosystem. Designed to benefit scientists, policymakers, research infrastructures, and industry stakeholders, these results include tools, real-world pilots and advanced environmental processing services that enhance data interoperability, visualisation, and analytics. FAIR-EASE fosters cross-disciplinary collaboration by bridging Earth system, biodiversity, and environmental sciences, ensuring that data from diverse sources—ranging from satellite observations to in-situ measurements and omics experiments—are more easily discoverable, accessible, and reusable. Through its strong alignment with EOSC, the project advances Open Science by implementing FAIR principles across multiple research domains, enabling high-performance computing, machine learning applications, and real-world use cases in areas such as climate change, food security, and environmental monitoring.

Result type

- ☐ Data discovery
- ☐ Data access
- ☐ Data analysis
- ☐ Demonstrators
- ☐ FAIR Principles

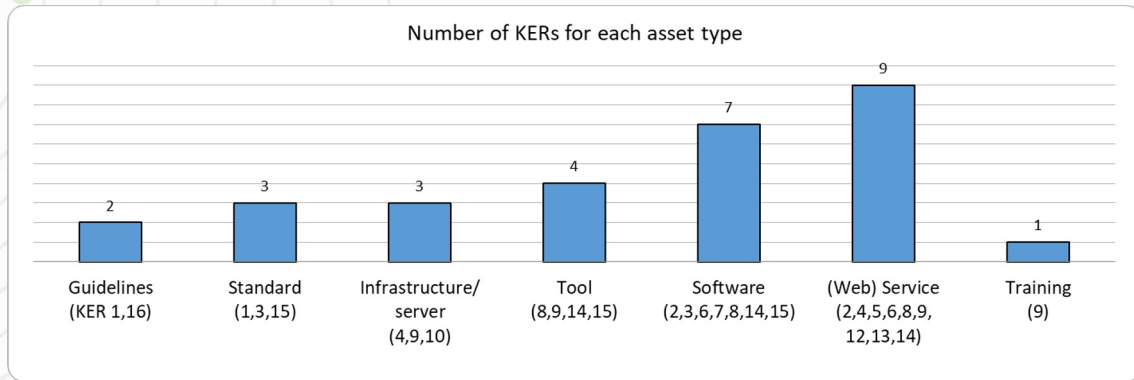
Source: FAIR-EASE

MoU under signature




MoU signed in November 2024

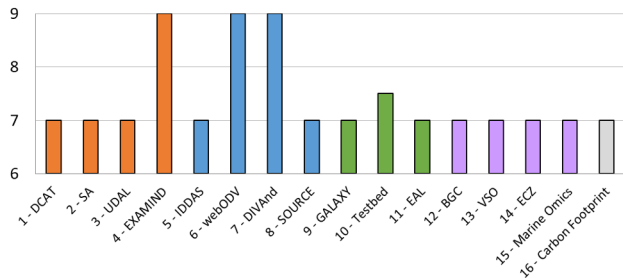


Each KER includes 1 to 4 asset types: **results are rich and various, covering the full life cycle** of asset developments

The vast majority of KERs (9/16) relates to, in fine, the **creation or enhancements of web services** and concerns all the KER categories

TRL at the end of FAIR-EASE



KERs with a **TRL of 9 were already TRL 9 for the existing functionalities at start**. Thanks to a large user base and recurrent financial and human resources, the developed functionalities can more easily achieve TRL9.

Some TRL 7 seems fragile:

- either because there remain very final steps, expected to be fulfilled before the end of the project
- or because they are basis KERs but still necessitate more shareholders, a governance, additional activities before an effective take-over of the proposed solution can be performed

- Test proof the use of Galaxy for Earth System sciences
- Create of a dedicated subdomain on Galaxy Europe
- Populate the subdomain with tools related to FAIR-EASE pilots
- Build-up analytic workflows and share on Workflowhub
- Write fitting tutorials to guide researchers and users
- Improve Galaxy itself (RO-Crate, interoperability layers, ...)

August 2025

- Set up a Earth system dedicated subdomain on Galaxy France in collaboration with IFB
- Bring entirely new earth use-cases on Galaxy
- Plug Galaxy France to new distributed resources

- Develop new tools following the users demand
- Interoperability layer to interface galaxy with all relevant earth sciences services (Earth portal and new services...)
- Trainings, webinars, courses, TiaaS, dedicated support on how to use Galaxy

- Consolidate the collaboration with Galaxy Europe and other e-infra
- Enhance linkages with other European Infrastructures
- Collaborate with other projects or nodes (Blue-Cloud, Elixir) for improving the resources catalogue
- Test on the EOSC EU Node

December 2025

- Integration of online tools (height estimator, flux calculator) in a unique interactive platform
- Sign up usage agreement of EoSAR algorithm
- Scale up computing infrastructure for EoSAR processes
- Open API access for machine to machine computation calls
- Evaluate integration of marine data (ARGO, etc) in the platform

August 2025

- Test eventual enhancement of object storage access on AERIS data
- Add ability to run containerized processes on French national grid
- Evaluate data access to CNES GEODES for inSAR data
- Test support of Argo data in the platform
- Full support of marine data (Argo) in the platform
- Set up daily alert mechanisms (highly prospective)

- Faster dedicated access to Copernicus Datasets
- Evaluate pros and cons of running processes directly on Copernicus Datastore
- Direct access to Argo datasets on Blue-Cloud
- Add ability to run containerized processes on the EOSC Federation (e.g. EGI)
- Evaluate pros and cons of running processes directly on DIAS (WEkEO...)
- Test on the EOSC EU Node

December 2025

- ★ **FAIR-EASE has used existing solutions and applied them for other domain/context**
 - [I]DDAS, Galaxy, WebODV, ...
- ★ **FAIR-EASE has driven innovation**
 - UDAL, EAL, TerriaMap challenge, Apache Iceberg + ERDDAP implementation
- ★ **FAIR-EASE has been spreading good practices**
 - Improving FAIRness of Data, Software and Process
- ★ **FAIR-EASE has promoted close collaborations and collaborative science**
 - Internal partners and external projects
- ★ **FAIR-EASE has promoted remote processing to avoid useless data transfer**
 - OGC API:processes, S3/ARCO formats, OpenEO, Galaxy Pulsar
- ★ **FAIR-EASE has provided integrated e-infrastructures and encouraging collaborative science**
 - Galaxy for Earth System, D4Science, Testbed
- ★ **FAIR-EASE has produces numerous Key Exploitable Results (KER)**

The major success? ...a great community and wonderful moments!



Thank you...

