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Advancing the FAIRness and Openness of Earth system science in Europe

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Focused environmental research projects and continuously operating research infrastructures (RIs) designed for monitoring all subdomains of the Earth system contribute to global observing systems and serve as crucial information sources for environmental scientists in their quest for understanding and interpreting the complex Earth System and contribute to global observing systems. The EU funded ENVRI-FAIR project [1] builds on the Environmental Research Infrastructure (ENVRI) community that includes principal European producers and providers of environmental research data and services.

ENVRI-FAIR targets the development and implementation of both technical frameworks and policy solutions that make subdomain boundaries irrelevant for environmental scientists and prepare Earth system science for the new Open Science paradigm. Cross-discipline harmonization and standardization activities, together with the implementation of joint data management and access structures at the RI level, facilitate the strategic coordination of observation systems required for truly interdisciplinary science. ENVRI-FAIR will ultimately create the open access ENVRI-Hub delivering environmental data and services provided by the contributing environmental RIs.

The architecture and functionalities of the ENVRI-Hub are driven by the applications, use cases and user needs, and will be based on three main pillars: (1) the ENVRI Knowledge Base as the human interface to the ENVRI ecosystem; (2) the ENVRI Catalogue as the machine-actionable interface to the ENVRI ecosystem; and (3) subdomain and cross-domain use cases as demonstrators for the capabilities of service provision among ENVRI and across Science Clusters. The architecture is designed in anticipation of interoperability with the European Open Science Cloud (EOSC) and is intended to act as a key platform for users and developers planning to include ENVRI services in their workflows.

The ENVRI community objectives of sharing FAIRness experience, technologies and training as well as research products and services will be realized by means of the ENVRI-Hub. The architecture, design features, technology developments and associated policies will highlight this example of how ENVRI-FAIR is promoting FAIRness, openness and multidisciplinary of an entire scientific area by joint developments and implementation efforts.

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[1] Petzold, A., Asmi, A., Vermeulen, A., Pappalardo, G., Bailo, D., Schaap, D., Glaves, H. M., Bundke, U., and Zhao, Z.: ENVRI-FAIR - Interoperable environmental FAIR data and services for society, innovation and research, 15th IEEE International Conference on eScience 2019, 1-4, doi: <http://doi.org/10.1109/eScience.2019.00038>, 2019.