



Analysis Ready Data to support the EVER-EST Virtual Research

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Over recent decades huge amounts of data about our Planet have become available. If this information could be easily discoverable, accessible and properly exploited, preserved and shared, it would potentially represent a wealth of information for a whole spectrum of stakeholders: from scientists and researchers to the highest level of decision and policy makers. By creating a virtual research environment (VRE) using a service oriented architecture (SOA) tailored to the needs of Earth Science (ES) communities, the EVER-EST project provides a range of both generic and domain specific data analysis and management services to support a dynamic approach to collaborative research. EVER-EST provides the means to overcome existing barriers to sharing of Earth Science data and information allowing research teams to discover, access, share and process heterogeneous data, algorithms, results and experiences within and across their communities, including those domains beyond Earth Science.

The main components of the EVER-EST Virtual Research Environment are:

- Presentation Layer, the element that provides the user interfaces and all the technologies that shall guarantee the availability of those services and functions (VRE portal, ROHub, Collaboration Sphere).
- Service Layer that provides both generic VRE services and Earth Science specific services. These components represent the reasoning engine of the e- infrastructure and actually orchestrate and manage the services available to the VRE final users.

Central to the EVEREST approach is the concept of the Research Object (RO), which provides a semantically rich mechanism to aggregate related resources about a scientific investigation so that they can be shared together using a single unique identifier. Although several e-laboratories are incorporating the research object concept in their infrastructure, the EVER-EST VRE is the first infrastructure to leverage the concept of Research Objects and their application in observational rather than experimental disciplines.

- Data Layer that references the data holdings made available to the VRCs: data is linked and proper means are provided, where feasible, to access it from the VRE.

As a default setting, data will not be copied or duplicated, but will continue to reside on the provider's local servers unless it is directly retrieved by the user. The Data Layer relies on interoperable OGC standard services (i.e. OpenSearch, Web Coverage Service) and permits the integration with Big Data services: the integration with EO Data Service (<https://eodataservice.org>) enables the provision of Analysis Ready Data (ARD) and makes quicker and easier to explore a time series of images stored in multidimensional geospatial datasets.

The EVER-EST e-infrastructure is validated by four virtual research communities (VRC) covering different multidisciplinary Earth Science domains including: ocean monitoring, natural hazards, land monitoring and risk management (volcanoes and seismicity).

In the framework of the current work the case how an Analysis Ready Data (ARD) service supports the studies "EVALUATE HOW HUMAN ACTIVITIES CAN CAUSE POSIDONIA MEADOWS REGRESSION" and "CROSS-FERTILIZATION BETWEEN JELLYFISH OUTBREAKS & ANOMALIES DETECTION IN THE MEDITERRANEAN SEA" is described.