

Towards a distributed Earth Science Data Infrastructure

The proposed paper will elaborate on initiatives and experiences at the European Space Agency establishment in Frascati in implementing a European distributed Earth Science data infrastructure. Of particular interest are experiences in the ESA-lead projects GENESI-DR and GENESI-DEC (short for Ground European Network for Earth Science Interoperations–Digital Repositories / Digital Earth Communities), the first one having established a data infrastructure providing transparent access to a network of (mainly European) Digital Repositories, the second one aiming at extending it to a worldwide e-Infrastructure serving heterogeneous communities interested in Planet Earth data, services and applications. The paper will describe the GENESI-DR achievements in terms of federation of distributed environmental data repositories, easy and fast access to heterogeneous data (airborne, in situ, satellite), effective data and service discovery, high performance (Grid-based) processing. It will discuss how GENESI-DEC will build upon such achievements for responding to specific needs expressed by heterogeneous user communities such as Disaster management, Seafloor and Ocean Earth Observation, Global Change Earth Observation, Global Atmosphere Observation and Agriculture Monitoring, with the final goal of establishing a multidisciplinary collaborative platform. Therefore, issues like multidisciplinary collaboration, creation of virtual research communities, interoperability between heterogeneous and regional infrastructures, integration of new scientific and technological paradigms in operational infrastructures in response to the latest Environmental and Earth Science Global Community's requirements, operations harmonisation, security and control will be discussed. Furthermore, potential contributions to the Global Earth Observation System of Systems that would enlarge the world-wide GEOSS Common Infrastructure's capabilities will be described, in response to data producers and consumers expressed needs regarding re-use and dissemination of Earth Observation data across different regions in the world. GENESI-DEC has been recently integrated in the GEO Portal to demonstrate how it can contribute to the enhancement of the GEOSS Common Infrastructure with new data access and processing capabilities. GENESI-DEC is proactive in several OpenGeoSpatial Consortium (OGC) working groups on the following topics: Catalogue Services for the Web, Web Processing Service, Ordering Services for Earth Observation Products Standard , OpenSearch GeoSpatial Standard, Publish/Subscribe Standard, Web Map Context Implementation.

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