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The EarthServer Federation: State, Role, and Contribution to GEOSS

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The intercontinental EarthServer initiative has established a European datacube platform with proven scalability: known databases exceed 100 TB, and single queries have been split across more than 1,000 cloud nodes. Its service interface being rigorously based on the OGC "Big Geo Data" standards, Web Coverage Service (WCS) and Web Coverage Processing Service (WCPS), a series of clients can dock into the services, ranging from open-source OpenLayers and QGIS over open-source NASA WorldWind to proprietary ESRI ArcGIS. Datacube fusion in a "mix and match" style is supported by the platform technolgy, the rasdaman Array Database System, which transparently federates queries so that users simply approach any node of the federation to access any data item, internally optimized for minimal data transfer. Notably, rasdaman is part of GEOSS GCI. NASA is contributing its Web WorldWind virtual globe for user-friendly data extraction, navigation, and analysis. Integrated datacube / metadata queries are contributed by CITE.

Current federation members include ESA (managed by MEEO sr.l.), Plymouth Marine Laboratory (PML), the European Centre for Medium-Range Weather Forecast (ECMWF), Australia's National Computational Infrastructure, and Jacobs University (adding in Planetary Science). Further data centers have expressed interest in joining.

We present the EarthServer approach, discuss its underlying technology, and illustrate the contribution this datacube platform can make to GEOSS.