



EarthServer

Agile Analytics on Big Data Cubes

Vision: Spatio-temporal Earth data should be n-D cubes allowing any question on any-size datacubes, anytime - because „one cube tells more than a million images“.

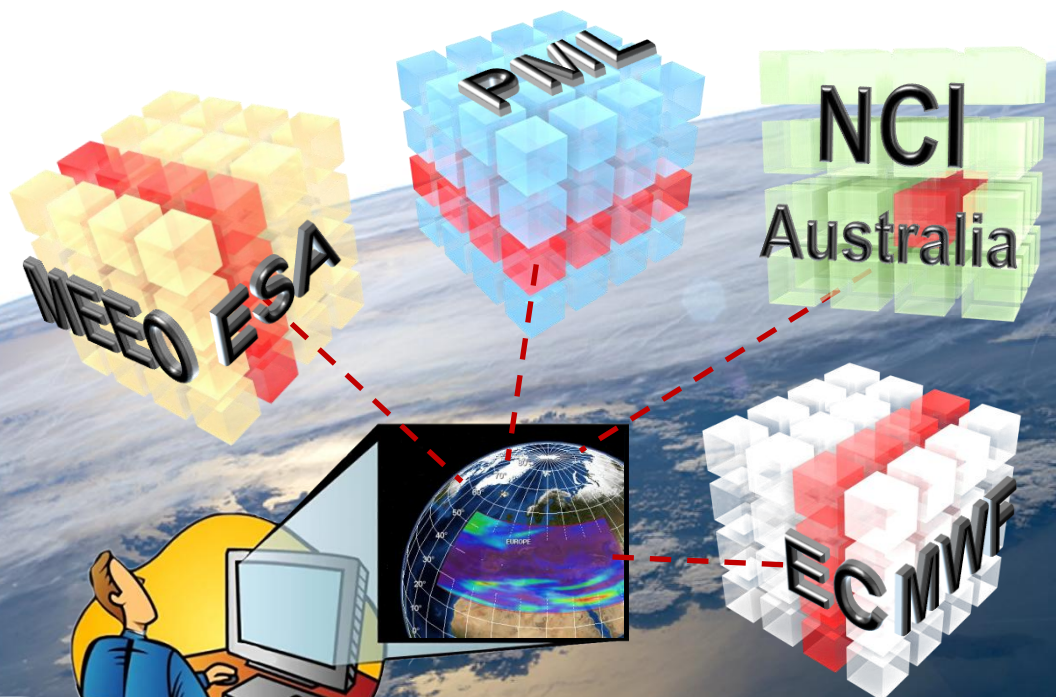
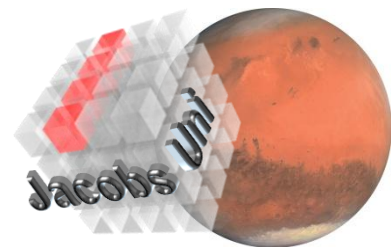
Mission: to establish standards-based, distributed on-demand analytics on Petabyte-size spatio-temporal Planetary and Earth Science datacubes. Fast, scalable services are being established for all regular and irregular n-D gridded types, with tight integration of data and metadata search.

Game changer in Big Earth Data: In phase 1, EarthServer has established agile analytics on massive Earth data, based on the parallel array engine rasdaman and the open OGC coverage standards. Independent experts have attested that, based on "proven evidence", rasdaman will "significantly transform the way scientists access and use data in a way that hitherto was not possible". And "with no doubt" EarthServer "has been shaping the Big Earth Data landscape".

In phase 2, this is being advanced even further: Petabyte 3-D and 4-D cubes are being built in Europe and Australia for ad-hoc querying and fusion.

Operational Petascale Earth & Planetary Science

Datacube Services: EarthServer is establishing an inter-continently distributed service mashup for the Earth and Planetary Sciences enabling on-demand data fusion.



Project brief:

Title: EarthServer

Start phase 1: Sep 2011

Start phase 2: May 2015

Duration: 2*36 months

Budget (1+2): 8.69m€

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Technology: Leveraging the pioneer Array Database technology, rasdaman, for declarative queries on n-D regular and irregular grids:

- powerful array query language for image & signal processing, statistics, etc.
- highly effective optimizations and parallelization utilizing new hardware
- integrated data & metadata retrieval
- visual clients, from diagrams up to virtual globes



Standards: Being committed to open standards, EarthServer uses OGC coverages for the unified modeling of massive regular and irregular grids representing spatio-temporal sensor, image, simulation, and statistics data. On these coverages, EarthServer offers a flexible, scalable, and interoperable service ecosystem through OGC Web Coverage Service (WCS) and Web Coverage Processing Service (WCPS), ranging from simple sub-setting to complex on-demand search, extraction, aggregation, and analysis.

Consortium:

- Jacobs University (coordinator), DE
- rasdaman GmbH, DE
- MEEO s.r.l., IT
- Athena/CITE s.a., GR
- PML, UK
- ECMWF, UK
- NASA, US
- NCI, AUS

Consortium Roles



Outreach: EarthServer utilizes the OGC coverage data and service standards while, reciprocally, shaping and proliferating them to ISO, INSPIRE, and W3C.

- **OGC:** editing and extending the WCS/WCPS standards suite; co-leading the Coverages.DWG, WCS.DWG, and BigData.DWG working groups.
- **ISO:** In SC32/WG3, establishing ISO 9075 SQL Part 15: MDA (Multi-Dimensional Arrays), aka „Science SQL“; in TC211, establishing ISO 19123-1 (based on current 19123) and 19123-2 (based on the OGC Coverage Information Schema).
- **INSPIRE:** participate in establishing WCS as INSPIRE Coverage Download Service.
- **RDA:** co-leading the „Big Data“ and „Geospatial“ Interest Group.



Further, EarthServer is building alliances with GEO/GEOSS, ESFRI, and further important players in the field of Big Data in Science and Engineering.