Geophysical Research Abstracts
Vol. 15, EGU2013-12849, 2013
EGU General Assembly 2013

Climate Data Service in the FP7 EarthServer Project

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EarthServer is a European Framework Program project that aims at developing and demonstrating the usability of open standards (OGC and W3C) in the management of multi-source, any-size, multi-dimensional spatio-temporal data - in short: "Big Earth Data Analytics". In order to demonstrate the feasibility of the approach, six thematic Lighthouse Applications (Cryospheric Science, Airborne Science, Atmospheric/ Climate Science, Geology, Oceanography, and Planetary Science), each with 100+ TB, are implemented.

Scope of the Atmospheric/Climate lighthouse application (Climate Data Service) is to implement the system containing global to regional 2D / 3D / 4D datasets retrieved either from satellite observations, from numerical modelling and in-situ observations. Data contained in the Climate Data Service regard atmospheric profiles of temperature / humidity, aerosol content, AOT, and cloud properties provided by entities such as the European Centre for Mesoscale Weather Forecast (ECMWF), the Austrian Meteorological Service (Zentralanstalt für Meteorologie und Geodynamik - ZAMG), the Italian National Agency for new technologies, energies and sustainable development (ENEA), and the Sweden's Meteorological and Hydrological Institute (Sveriges Meteorologiska och Hydrologiska Institut – SMHI).

The system, through an easy-to-use web application permits to browse the loaded data, visualize their temporal evolution on a specific point with the creation of 2D graphs of a single field, or compare different fields on the same point (e.g. temperatures from different models and satellite observations), and visualize maps of specific fields superimposed with high resolution background maps. All data access operations and display are performed by means of OGC standard operations namely WMS, WCS and WCPS.

The EarthServer project has just started its second year over a 3-years development plan: the present status the system contains subsets of the final database, with the scope of demonstrating I/O modules and visualization tools. At the end of the project all datasets will be available to the users.