Easy research data handling with an OpenEarth DataLab for geo-monitoring research

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OpenEarth DataLab is an open source-based collaboration and processing platform to enable streamlined research data management from raw data ingest and transformation to interoperable distribution. It enables geo-scientists to easily synchronise, share, compute and visualise the dynamic and most up-to-date research data, scripts and models in multi-stakeholder geo-monitoring programs. This DataLab is developed by the Research Data Services team of TU Delft Library and 3TU.Datacentrum together with coastal engineers of Delft University of Technology and Deltares.

Based on the OpenEarth software stack an environment has been developed to orchestrate numerous geo-related open source software components that can empower researchers and increase the overall research quality by managing research data; enabling automatic and interoperable data workflows between all the components with track & trace, hit & run data transformation processing in cloud infrastructure using MatLab and Python, synchronisation of data and scripts (SVN), and much more. Transformed interoperable data products (KML, NetCDF, PostGIS) can be used by ready-made OpenEarth tools for further analyses and visualisation, and can be distributed via interoperable channels such as THREDDS (OpenDAP) and GeoServer.

An example of a successful application of OpenEarth DataLab is the Sand Motor, an innovative method for coastal protection in the Netherlands. The Sand Motor is a huge volume of sand that has been applied along the coast to be spread naturally by wind, waves and currents. Different research disciplines are involved concerned with: weather, waves and currents, sand distribution, water table and water quality, flora and fauna, recreation and management. Researchers share and transform their data in the OpenEarth DataLab, that makes it possible to combine their data and to see influence of different aspects of the coastal protection on their models. During the project the data are available only for the researchers involved. After the project a large part of the data and scripts will be published with DOI in the Data Archive of 3TU.Datacentrum for reuse in new research. For the 83 project members of the Sand Motor, the OpenEarth DataLab is available on www.zandmotordata.nl.

The OpenEarth DataLab not only saves time and increases quality, but has the potential to open new frontiers for exploring cross-domain analysis and visualisations, revealing new scientific insights.