

Open Source Technologies for Integrating Environmental Data in an Online GIS Platform for Interdisciplinary Environmental Research

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The Open Support Platform for Environmental Research (OSPER) represents a multidisciplinary collaboration between several environmental science and technology research projects across Switzerland. The main goal is to develop an integrated infrastructure for environmental data management in general, with a strong focus on sensor data in particular.

The main innovation introduced by this project is a holistic, standards-based approach for data management, documentation, visualization and distribution of environmentally relevant data, based on sustainable open source processes and technologies. The GIS Platform for Interdisciplinary Environmental Research is an innovative service-driven Web-GIS platform for the user-friendly exploration, visualization and download of environmentally relevant geospatial data. The GIS platform uses powerful open source software and technologies such as PostgreSQL/PostGIS (for the fundamental data management), QGIS Server and GDAL/OGR (for visualization and geoprocessing services), and the carto.net framework (for the Web mapping interface). These open source technologies, as well as the use of established open standards (e.g. WMS, WFS, GML, SVG) allow the efficient and transparent integration of heterogeneous environmental data with the goal of achieving full interoperability with more traditional spatial data.

Moreover, the concept of openness is influencing several additional activities. On one hand, the project strives to change the preconceptions limiting data sharing by promoting user-friendly dissemination of open environmental (e.g. public sensor data) and geospatial open data (e.g. Open Street Map, Landsat 8 and EU-DEM datasets) through a public GIS platform that will be launched later this year. On the other hand, we strive to establish new cooperation channels related to geospatial open source technologies with the establishment of an ICA-OSGeo Open Source Geospatial Laboratory at ETH Zurich.

Finally, this paper will detail recent developments focusing on improving the user experience in the Web-GIS platform: real-time data and metadata visualizations, dynamic map customization and temporal map navigation using a hypercube-based approach.

Keywords: environmental management, web cartography, sensor data, open source, OGC standards

(Relevant topics: Geospatial Open Source, Interoperability, and Source Integration, Data Integration, Information Architecture for Web Mapping, Web-based cartography)