



Managing and Integrating Open Environmental Data – Technological Requirements and Challenges

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Understanding environment conditions and trends requires information. This information is usually generated from sensor observations. Today, several infrastructures (e.g., GEOSS, EarthScope, NEON, NETLAKE, OOI, TERENO, WASCAL, and PEER-EurAqua) have been deployed to promote full and open exchange of environmental data. Standards for interfaces as well as data models/formats (OGC, CUAHSI, INSPIRE, SEE Grid, ISO) and open source tools have been developed to support seamless data exchange between various domains and organizations. In spite of this growing interest, it remains a challenge to manage and integrate open environmental data on the fly due to the distributed and heterogeneous nature of the data. Intuitive tools and standardized interfaces are vital to hide the technical complexity of underlying data management infrastructures. Meaningful descriptions of raw sensor data are necessary to achieve interoperability among different sources. As raw sensor data sets usually goes through several layers of summarization and aggregation, metadata and quality measures associated with these should be captured. Further processing of sensor data sets requires that they should be made compatible with existing environmental models. We need data policies and management plans on how to handle and publish open sensor data coming from different institutions. Clearly, a better management and usability of open environmental data is crucial, not only to gather large amounts of data, but also to cater various aspects such as data integration, privacy and trust, uncertainty, quality control, visualization, and data management policies. The proposed talk presents several key findings in terms of requirements, ongoing developments and technical challenges concerning these aspects from our recent work. This includes two workshops on open observation data and supporting tools, as well as the long-term environmental monitoring initiatives such as TERENO and TERENO-MED.

Workshops Details:

Spin the Sensor Web: Sensor Web Workshop 2013, Muenster, 21st-22nd November 2013 (<http://52north.org/news/spin-the-sensor-web-sensor-web-workshop-2013>)

Special Session on Management of Open Environmental Observation Data - MOEOD 2014, Lisbon, 8th January 2014 (<http://www.sensornets.org/MOEOD.aspx?y=2014>)

Monitoring Networks:

TERENO : <http://teodoor.icg.kfa-juelich.de/>

TERENO-MED : <http://www.tereno-med.net/>