



SWE-based Observation Data Delivery from the Instrument to the User - Sensor Web Technology in the NeXOS Project

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The rapidly evolving technology for building Web-based (spatial) information infrastructures and Sensor Webs, there are new opportunities to improve the process how ocean data is collected and managed.

A central element in this development is the suite of Sensor Web Enablement (SWE) standards specified by the Open Geospatial Consortium (OGC). This framework of standards comprises on the one hand data models as well as formats for measurement data (ISO/OGC Observations and Measurement, O&M) and metadata describing measurement processes and sensors (OGC Sensor Model Language, SensorML). On the other hand the SWE standards comprise (Web service) interface specifications for pull-based access to observation data (OGC Sensor Observation Service, SOS) and for controlling or configuring sensors (OGC Sensor Planning Service, SPS). Also within the European INSPIRE framework the SWE standards play an important role as the SOS is the recommended download service interface for O&M-encoded observation data sets.

In the context of the EU-funded Oceans of Tomorrow initiative the NeXOS (Next generation, Cost-effective, Compact, Multifunctional Web Enabled Ocean Sensor Systems Empowering Marine, Maritime and Fisheries Management) project is developing a new generation of in-situ sensors that make use of the SWE standards to facilitate the data publication process and the integration into Web based information infrastructures.

This includes the development of a dedicated firmware for instruments and sensor platforms (SEISI, Smart Electronic Interface for Sensors and Instruments) maintained by the Universitat Politècnica de Catalunya (UPC). Among other features, SEISI makes use of OGC SWE standards such OGC-PUCK, to enable a plug-and-play mechanism for sensors based on SensorML encoded metadata. Thus, if a new instrument is attached to a SEISI-based platform, it automatically configures the connection to these instruments, automatically generated data files compliant with the ISO/OGC Observations and Measurements standard and initiates the data transmission into the NeXOS Sensor Web infrastructure.

Besides these platform-related developments, NeXOS has realised the full path of data transmission from the sensor to the end user application. The conceptual architecture design is implemented by a series of open source SWE software packages provided by 52°North. This comprises especially different SWE server components (i.e. OGC Sensor Observation Service), tools for data visualisation (e.g. the 52°North Helgoland SOS viewer), and an editor for providing SensorML-based metadata (52°North smle).

As a result, NeXOS has demonstrated how the SWE standards help to improve marine observation data collection. Within this presentation, we will present the experiences and findings of the NeXOS project and will provide recommendation for future work directions.