



The SeaDataCloud Sensor Web Approach

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The publication of real-time observation data streams is an important factor to increase the value of such data (e.g. supporting the re-use by other researchers from potentially different domains). Doing this in an interoperable manner, e.g. based on the Sensor Web Enablement (SWE) standards of the Open Geospatial Consortium (OGC), will further facilitate the update of observation data sets by reducing the necessary data harmonisation and integration efforts.

An important ongoing project within the marine community that aims at promoting and facilitating the interoperable access to collected measurement data is SeaDataCloud (EU Horizon 2020). Within our contribution we built upon the concept of the SWE Ingestion Service that was introduced during the ESSI 1.1 session at the EGU General Assembly 2018.

The SWE Ingestion Service is intended to support sensor operators, researchers and data owners during the publication of collected marine observation data by offering a reusable publication workflow. On the one hand it offers means for describing of the structure and content of a data sets as well as metadata providing information on how the data was collected. On the other hand this information is used for auto-configuring an import mechanism for decoding and loading incoming observation data streams.

An ingestion workflow is declared through the description of the sensor or observatory as well as the processing steps in OGC SensorML: each component of the workflow description represents a source, processor or sink in the Spring Cloud Data Flow Server. These highly flexible components can be connected and chained together to create various complex ingestion pipelines that adopt to the requirements of specific sensors, observatories, networks or ways of distribution, and can be deployed in different environments. Workflows can be created in the integrated and user-friendly SensorML editor "smle" that additionally offers templates for typical ingestion scenarios.

Compared to the previous prototype introduced in 2018, further work was undertaken to validate the proposed approach in practice. To showcase the suitability of the SWE Ingestion Service, different types of data sets from multiple providers are integrated:

- * data of a weather buoy in the Galway Bay operated by the Marine Institute (Ireland) that is provided as CSV-like structures via an MQTT stream
- * meteorological and physical parameters measured by the SCENES buoy of the PHRESQUES network operated by IFREMER (France) that is served as regularly updated CSV files via HTTP
- * FerryBox cruise files in the NetCDF format provided by SYKE (Finland) and served via FTP (currently work in progress)
- * CTD data of the Baltic Sea from IO PAN (Poland) that is provided as CSV files via SFTP (currently work in progress)

Within our presentation we will describe the current development status and will share the experiences gathered over the last year. Furthermore, we will introduce a complementary development of downstream services (i.e. SWE Viewing Services), which are capable of visualising the published real-time observation data sets.