O2A: A Generic Framework for Enabling the Flow of Sensor **O**bservations **to** **A**rchives and Publications

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Abstract.

Over the last two decades, the Alfred Wegener Institute (AWI) has been continuously committing to develop and sustain an e-Infrastructure for coherent discovery, visualization, dissemination and archival of scientific information in polar and marine regions. Most of the data originates from research activities being carried out in a wide range of AWI-operated research platforms: vessels, land-based stations, ocean-based stations and aircrafts. Archival and publishing in PANGAEA repository along with DOI assignment to individual datasets is a typical end-of-line step for most data owners.

Within AWI, a workflow for data acquisition from vessel-mounted devices along with ingestion procedures for the raw data into the institutional archives has been well-established for many years. However, the increasing number of ocean-based stations and respective sensors along with heterogeneous project-driven requirements towards satellite communication, sensor monitoring, QA/QC control and validation, processing algorithms, visualization and dissemination has recently lead us to build a more generic and cost-effective framework. This framework, hereafter named O2A, has as main strength its seamless flow of sensor observation to archives and the fact that it complies with internationally used OGC standards and thus assuring interoperability in international context (e.g. SOS/SWE, WPS, WMS WFS,..).

O2A is comprised of several extensible and exchangeable modules (e.g. controlled vocabularies and gazetteers, file type and structure validation, aggregation solutions, processing algorithms, etc) as well as various interoperability services. At the first data tier level, not only each sensor is being described following SensorML data model standards but the data is being fed to an SOS interface offering streaming solutions along with support to O&M encoding. Project administrators or data specialists are now able to monitor the individual sensors displayed in a map by simply clicking on the station and viewing the near real-time data for the selected station and sensor. In addition, the monitoring dashboards we built provide assistance to data scientists and administrators in terms of early detection of malfunction of sensors (e.g., email/SMS notification), filtering of data values for certain range (e.g. temperature values above a certain range) and data aggregation (e.g. calculation of daily averages).