An integrative solution for managing, tracing and citing sensor-related information

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In a data-driven scientific world, the need to capture information on sensors used in the data acquisition process has become increasingly important. Following the recommendations of the Open Geospatial Consortium (OGC), we started by adopting the SensorML standard for describing platforms, devices and sensors.

However, it soon became obvious to us that understanding, implementing and filling such standards costs significant effort and cannot be expected from every scientist individually. So we developed a web-based sensor management solution (https://sensor.awi.de) for describing platforms, devices and sensors as hierarchy of systems which supports tracing changes to a system whereas hiding complexity. Each platform contains devices where each device can have sensors associated with specific identifiers, contacts, events, related online resources (e.g. manufacturer factsheets, calibration documentation, data processing documentation), sensor output parameters and geo-location.

In order to better understand and address real world requirements, we have closely interacted with field-going scientists in the context of the key national infrastructure project "FRontiers in Arctic marine Monitoring ocean observatory" (FRAM) during the software development. We learned that not only the lineage of observations is crucial for scientists but also alert services using value ranges, flexible output formats and information on data providers (e.g. FTP sources) for example. Mostly important, persistent and citable versions of sensor descriptions are required for traceability and reproducibility allowing seamless integration with existing information systems, e.g. PANGAEA.

Within the context of the EU-funded Ocean Data Interoperability Platform project (ODIP II) and in cooperation with 52north we are proving near real-time data via Sensor Observation Services (SOS) along with sensor descriptions based on our sensor management solution. ODIP II also aims to develop a harmonized SensorML profile for the marine community which we will be adopting in our solution as soon as available.

In this presentation we will show our sensor management solution which is embedded in our data flow framework to offer out-of-the-box interoperability with existing information systems and standards. In addition, we will present real world examples and challenges related to the description and traceability of sensor metadata.