

Using OGC standards (SOS, O&M) to standardize data flow from cabled marine observatories to the PANGAEA data archive

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Overview

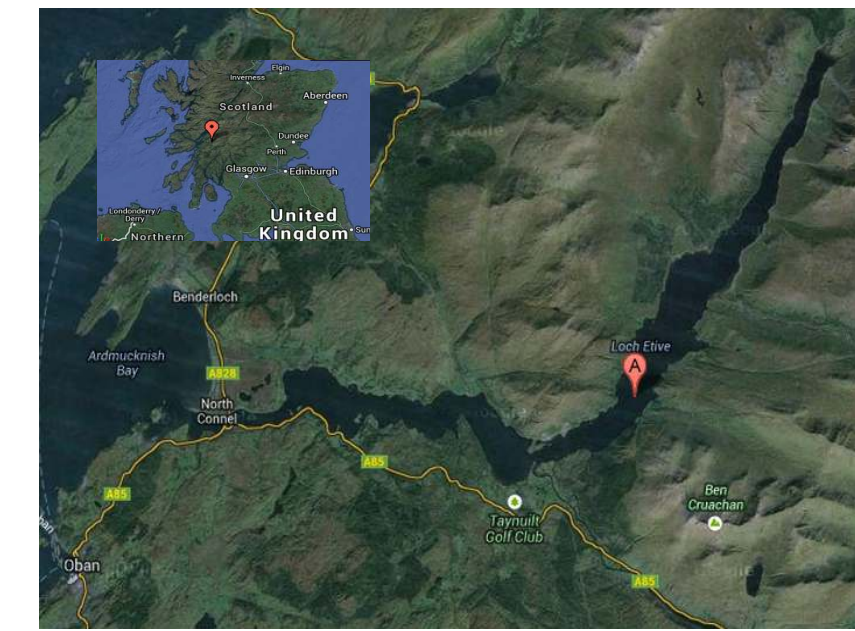
Two cabled marine observatories were deployed during the EU FP7 HYPOX project – one in Loch Etive, Scotland, and one in the Koljöefjord, Sweden. We will present a data access workflow which was implemented by us, based on a set of OGC standards, namely Sensor Observation Service (SOS) and Observations & Measurements (O&M).

Location

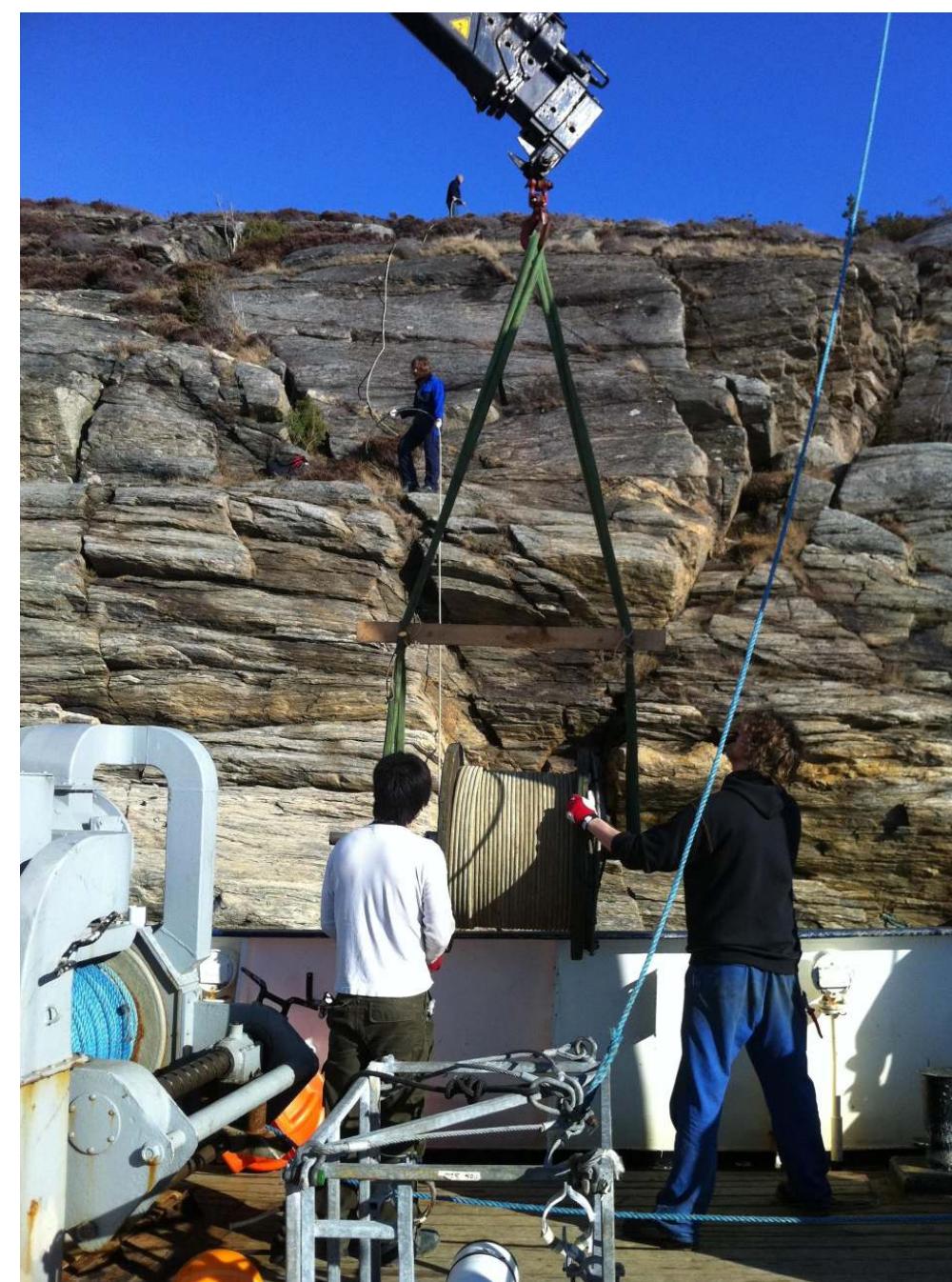


Koljöefjord, Sweden

The Koljöefjord is located on the Swedish west coast, about 100 km north of Gothenburg. It is connected to the open sea, and the observatory is deployed at around 40 m depth. Loch Etive is located on the west coast of Scotland, about 6 km north of Oban. It is about 30 km long and 150 m deep and is also connected to the ocean. This observatory was deployed at around 130 m water depth. Both observatories are equipped with RDCP and SeaGuard instruments carrying multiple sensors.



Loch Etive, Scotland



Pulling the cable up from the ship to the Koljöefjord shore station.

Koljöefjord shore station with GPRS data transmission antenna.

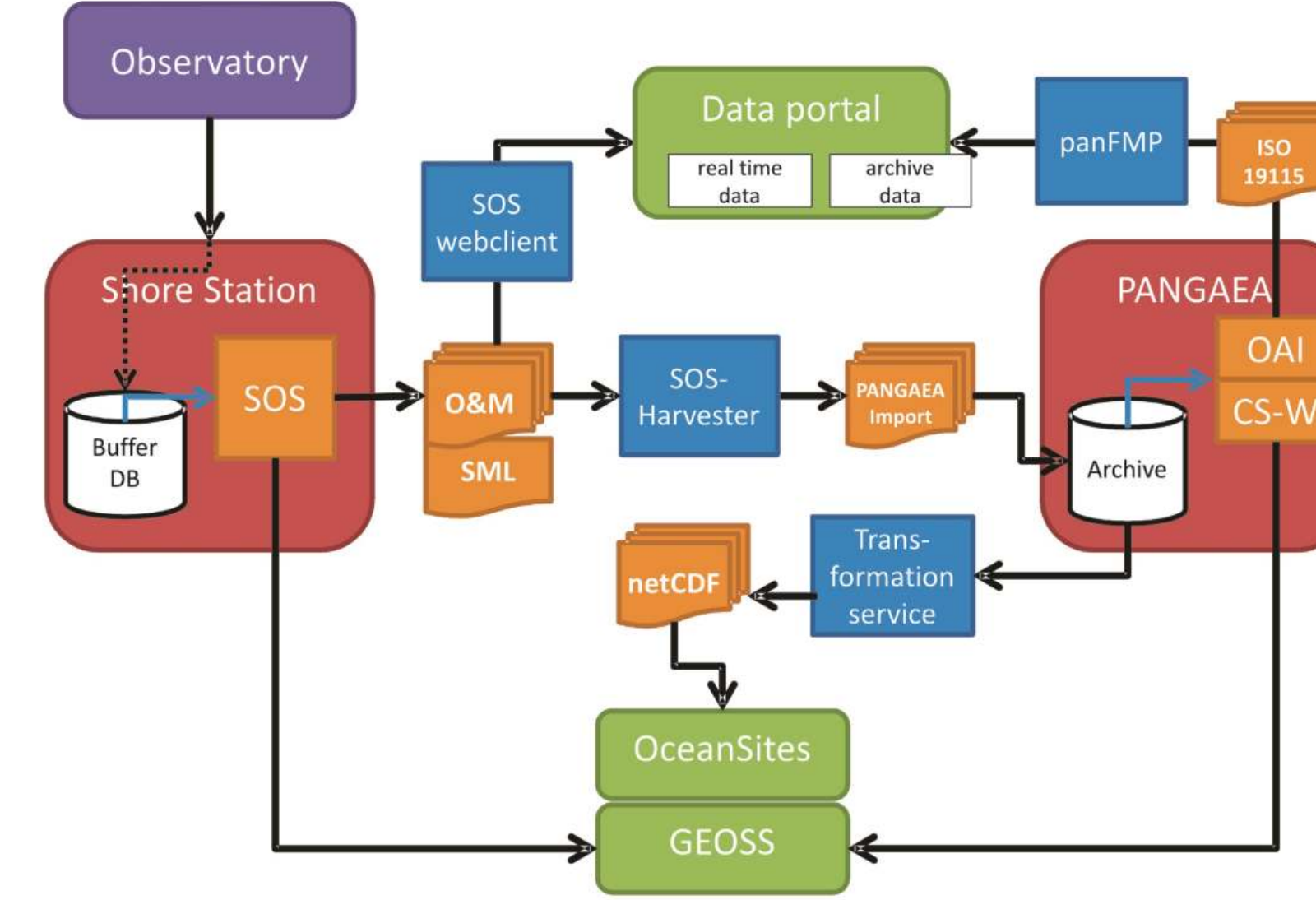


Standardized data transport

Real-time or near real-time data access as well as data retrieval for archiving purposes at PANGAEA for these two observatories has been achieved by implementing a SOS and two SOS clients. The SOS defines a web service interface which allows for querying of metadata, information about observed features and observations (data) in a standardized way.

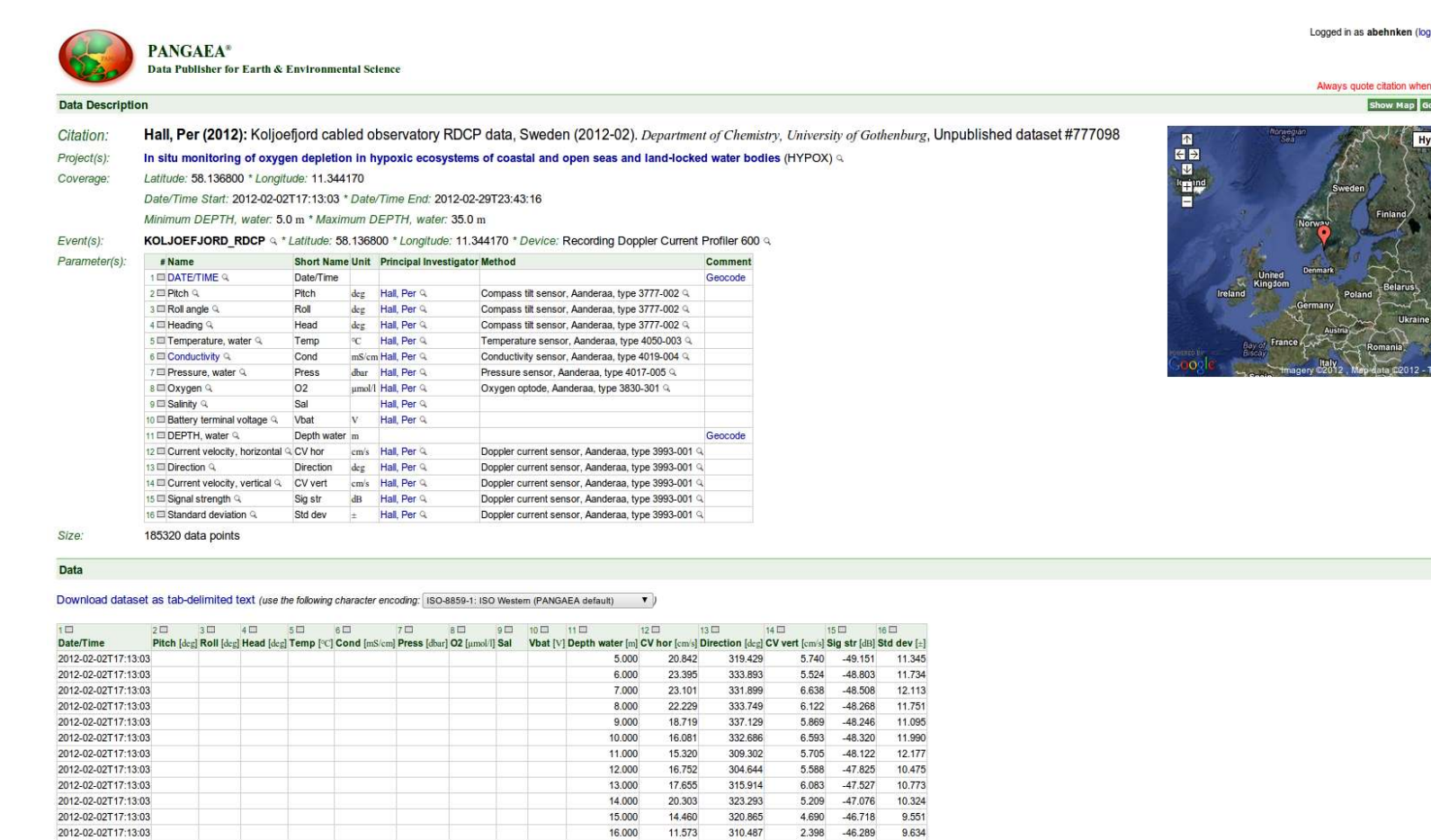
A SOS instance deployed at MARUM is constantly retrieving data from the Koljöefjord observatory. One of the implemented SOS clients is used to request real-time data from the SOS and pass it on to an AJAX web client for display on the HYPOX portal page (<http://dataportal.pangaea.de/hypox>). The second client can be regarded as a harvesting service, requesting data from the SOS once monthly in order to prepare it for semi-automatized archiving in the PANGAEA long-term data archive. In both scenarios, requested data is streamed conforming to OGC's Observations and Measurements XML implementation standard. Using the described OGC standards allows for managing sensor-/observatory data in an interoperable way.

Architecture

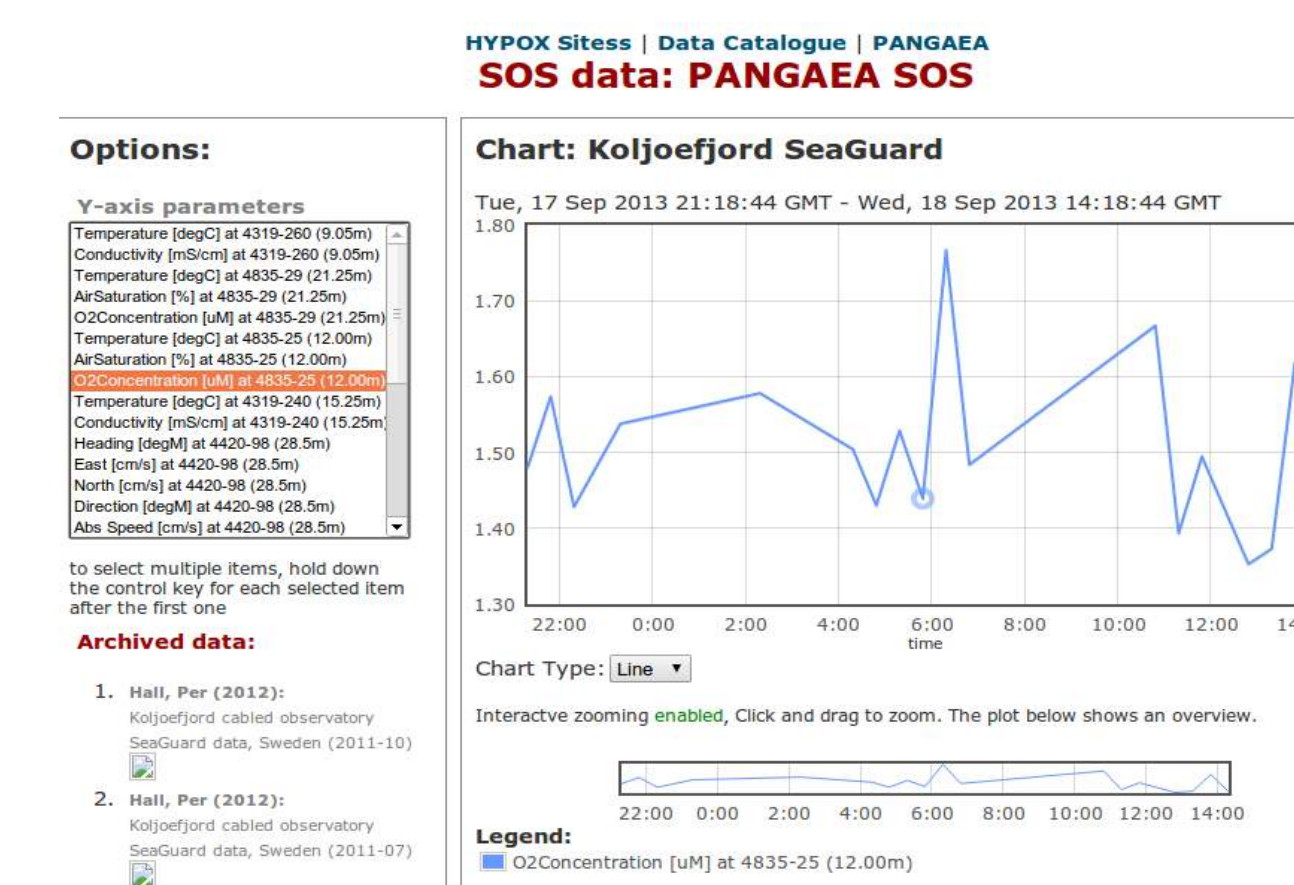


Data infrastructure overview

Observatory data is being pushed to a collection service and stored in a buffer database running at MARUM. A SOS web client immediately publishes data on the HYPOX data portal. A second SOS client harvests the data buffer in regular intervals and prepares the data for the PANGAEA archiving process.

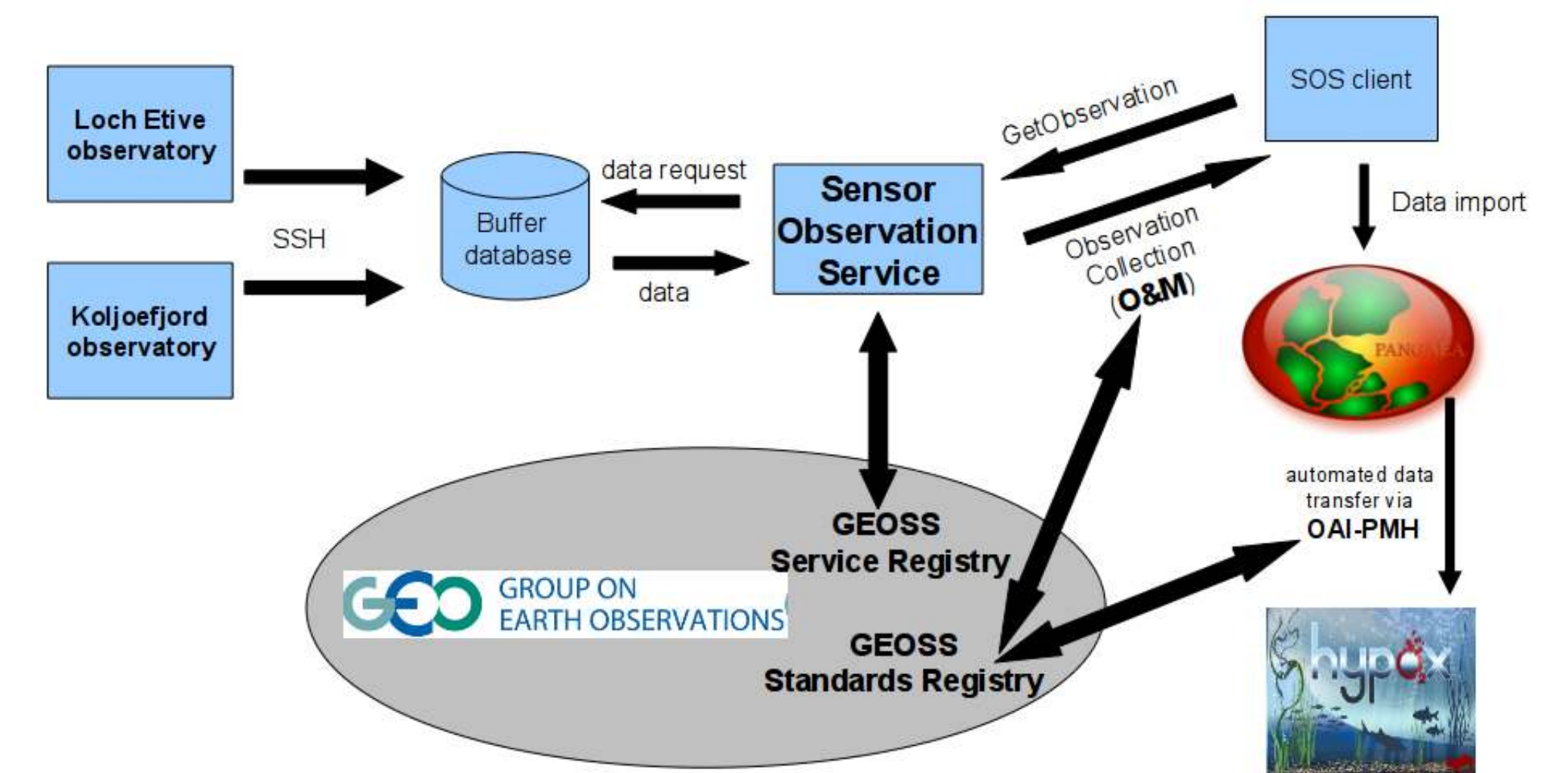


Observatory dataset archived in PANGAEA



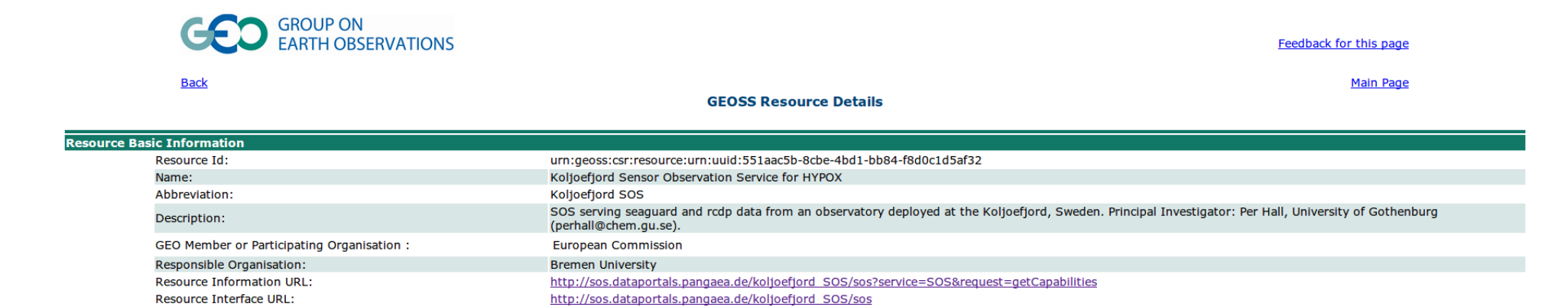
Near real-time data per sensor displayed by the SOS web client.

SSH = Secure Shell
 SOS = Sensor Observation Service
 O&M = Observations and Measurements
 OAI-PMH = Open Archives Initiative – Protocol for Metadata Harvesting

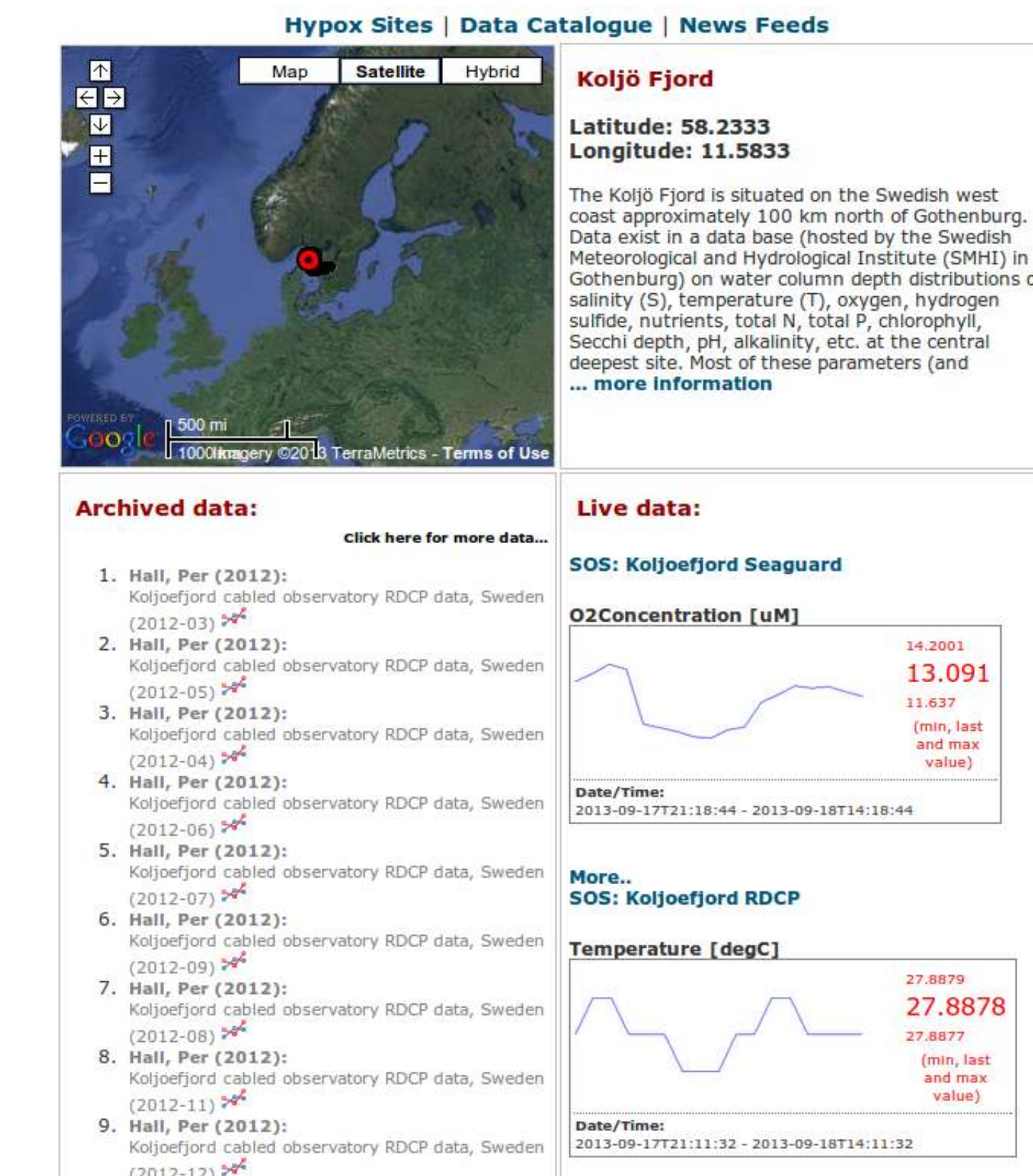


Connection to GEOS

Data archived in the PANGAEA long term data archive is made available to GEOS (geoportal.org) via OAI-PMH. This interface as well as the applied OGC standards and services are registered with the GEOS Standards and Service Registries (below).



GEOS Registry entry



Near real-time data and linked archived datasets on the HYPOX web portal.