Biscay AGL. An observatory for state of the art operational oceanography at IEO. Derived products, sensor networks and future developments.

IV ENCUENTRO DE OCEANOGRAFÍA FÍSICA ESPAÑOLA

Alicante 19th-22nd July 2016.

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V SIMPOSIO INTERNACIONAL DE CIENCIAS DEL MAR
20-22 JULIO | UNIVERSIDAD DE ALICANTE

FixO3 FIXED-POINT OPEN OCEAN OBSERVATORIES

EOF 2016 IV Encuentro Oceanografía Física Española

AGL Observatory Team

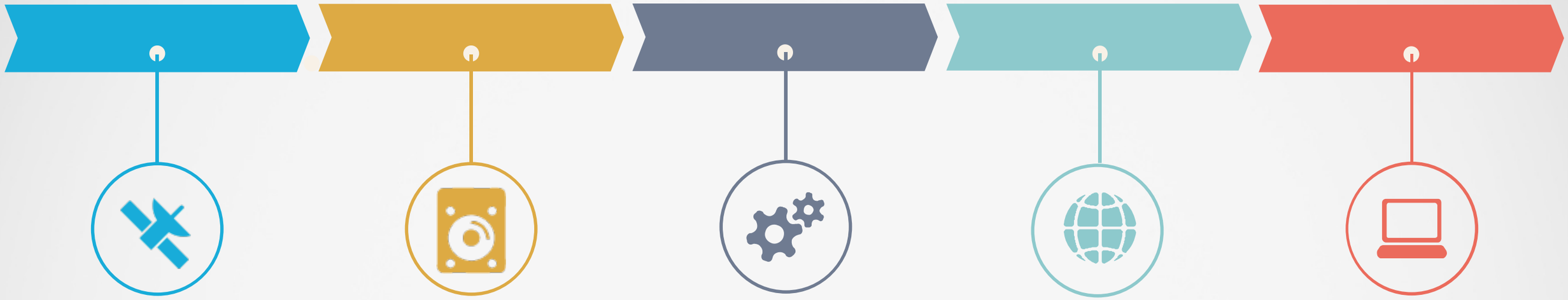
Augusto Gonzáles de Linares Oceano-meteorological buoy

Deployed June 2007 @ 22 miles north of Santander. Sensors installed include: humidity, wind, air temperature, waves, ADCP, Water Temperature, oxygen and chlorophyll

Research Vessel Ramón Margalef

Manufactured in 2011 and with a total capacity of 23 people it has a length of 46.7m and a maximum beam of 10.5m. It is the vessel used for the monthly Santander standard section.

Data Flow



Satellite Transmission

Data is hourly transferred from buoy to land station.

Data Storage

Once arrived, data is stored in several databases. Data backups are done on a daily basis.

Data Manipulation

When data is stored on the server, several format changes are done in order to comply partners requests.

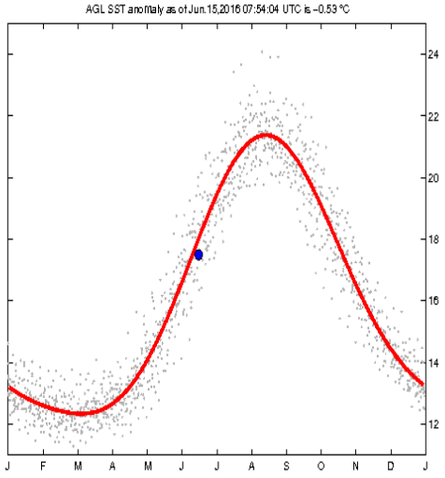
Data Dissemination

Transformed data is disseminated and sent to partners. AEMET, WMO, FixO^3, MyOcean, Puertos del Estado, Meteo Cantabria, IEO Data Center.

Data Display

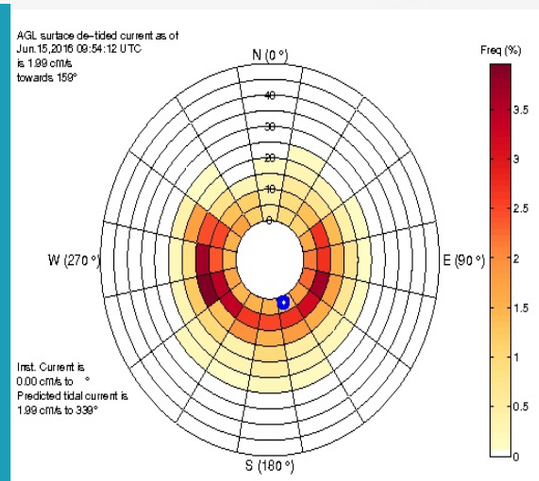
Data is shown in several web pages, including its own web page www.boya_agl.st.ieo.es where derived products can also be found.

Real Time Products



SSS Anomaly

Sea Surface Salinity anomaly. Calculated Hourly

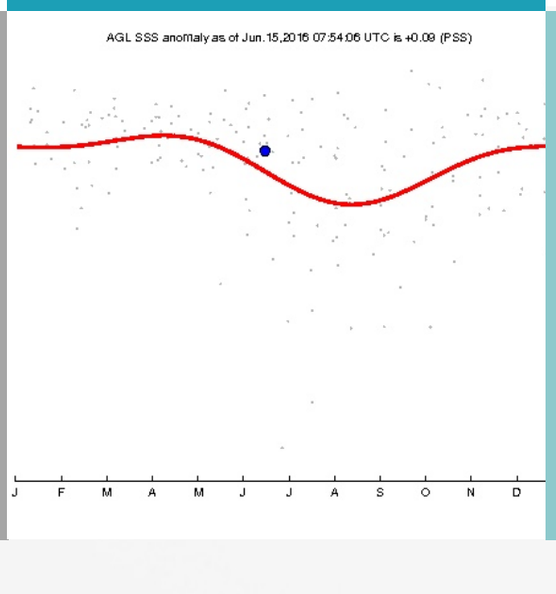


Sea State Characterization

Realtime wave significant height and period over a 2D chart of the monthly climatology.

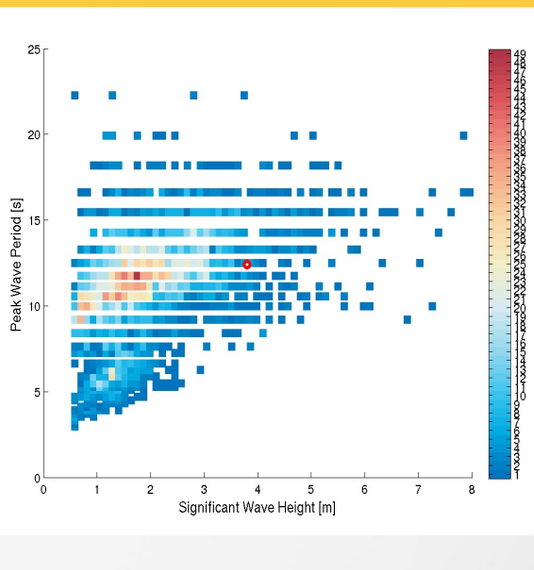
SST Anomaly

Sea Surface Temperature anomaly.Calculated hourly.

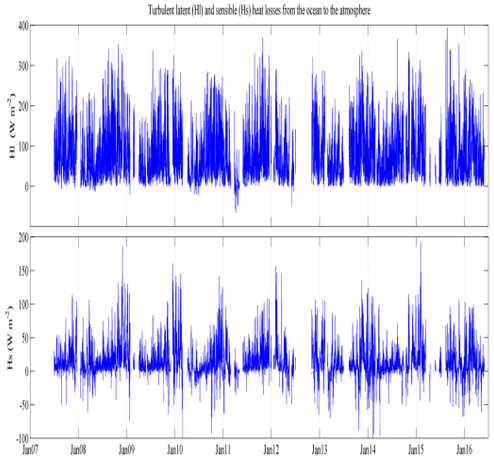


Subinertial Currents

Surface detided currents at AGL Buoy. Calculated hourly

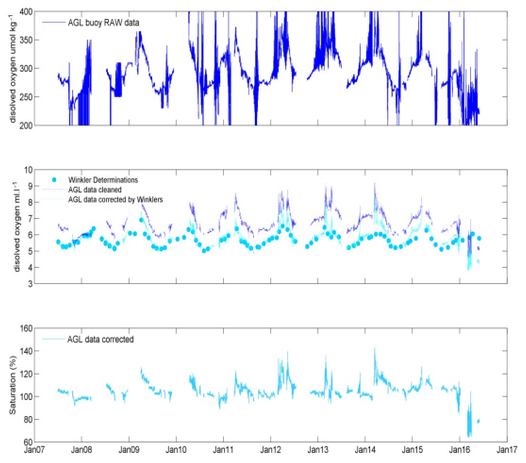


Delayed Time Products



Air-Sea Fresh Water Fluxes

Evaporation and evaporation-precipitation balance (e-p) at the AGL position

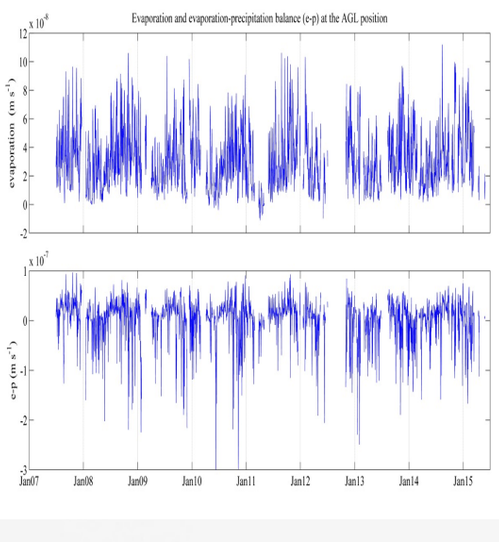


Corrected Chlorophyll

AGL Buoy data (Fluorescence) and laboratory determination (Cla mg/m^3)

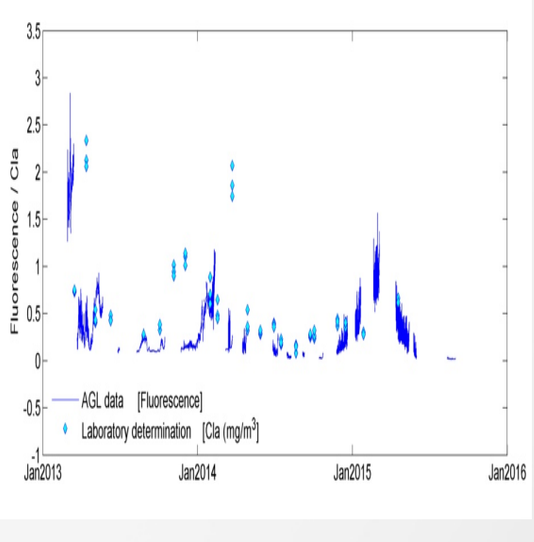
Air-Sea Heat Fluxes

Turbulent latent (HI) and sensible (Hs) heat losses from the ocean to the atmosphere

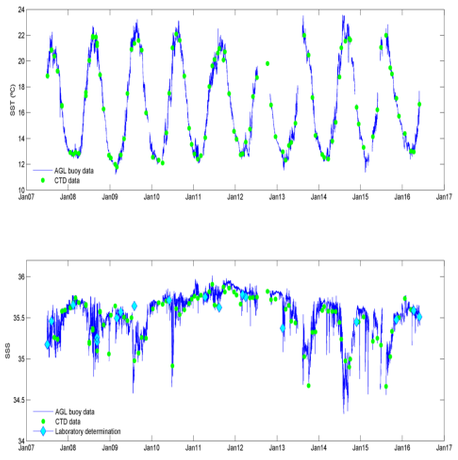


Corrected O_2

AGL buoy raw data, cleaned, corrected by winklers and finally corrected data.

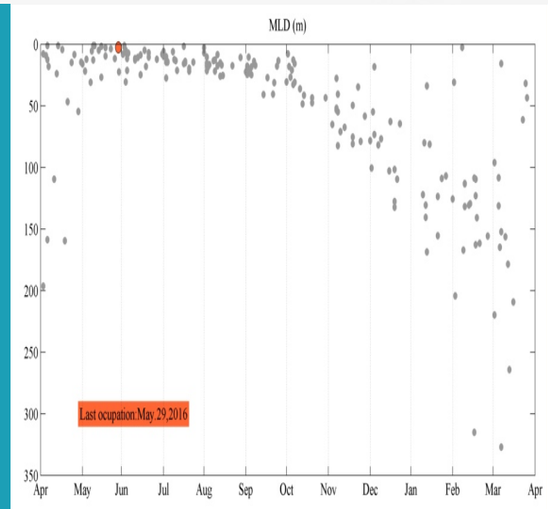


Delayed Time Products



QC Meteorological Sensors

Wind, air temperature and humidity data from the buoy monthly compared to R.V. Ramón Margalef

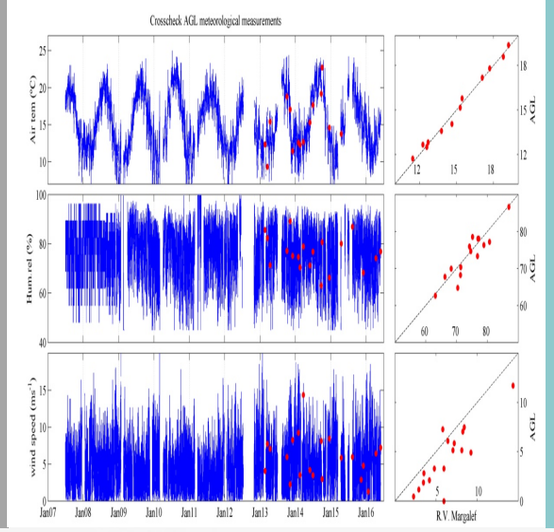


Monthly Heat Content

Monthly heat content anomalies of different water masses.

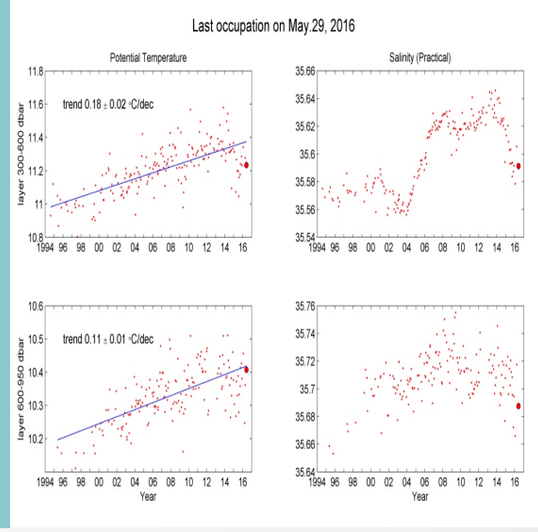
TS Crosscheck

Salinity crosscheck between AGL Buoy and CTD performed monthly. No correction required



Mixed Layer Depth Estimation

Monthly determination of Mixed layer depth



Sensor Web Enablement

OVERVIEW

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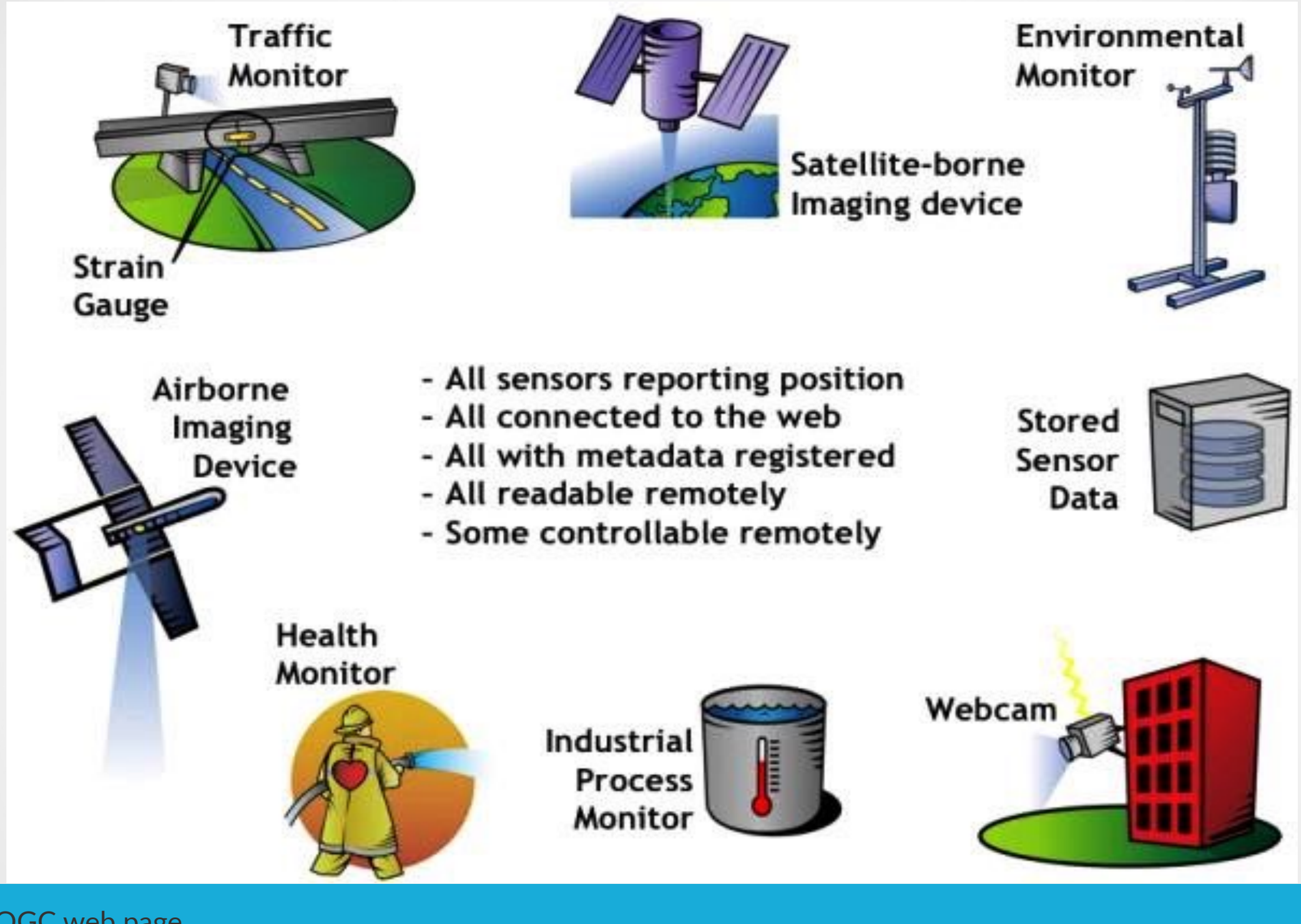
Sensor Web Enablement

OVERVIEW



From OGC web page

"The OGC's Sensor Web Enablement (SWE) standards enable developers to make all types of sensors, transducers and sensor data repositories discoverable, accessible and useable via the Web."

In few words

REALLY VERY ULTRA SUPER SIMPLIFIED SCHEMA

Any server containing any data

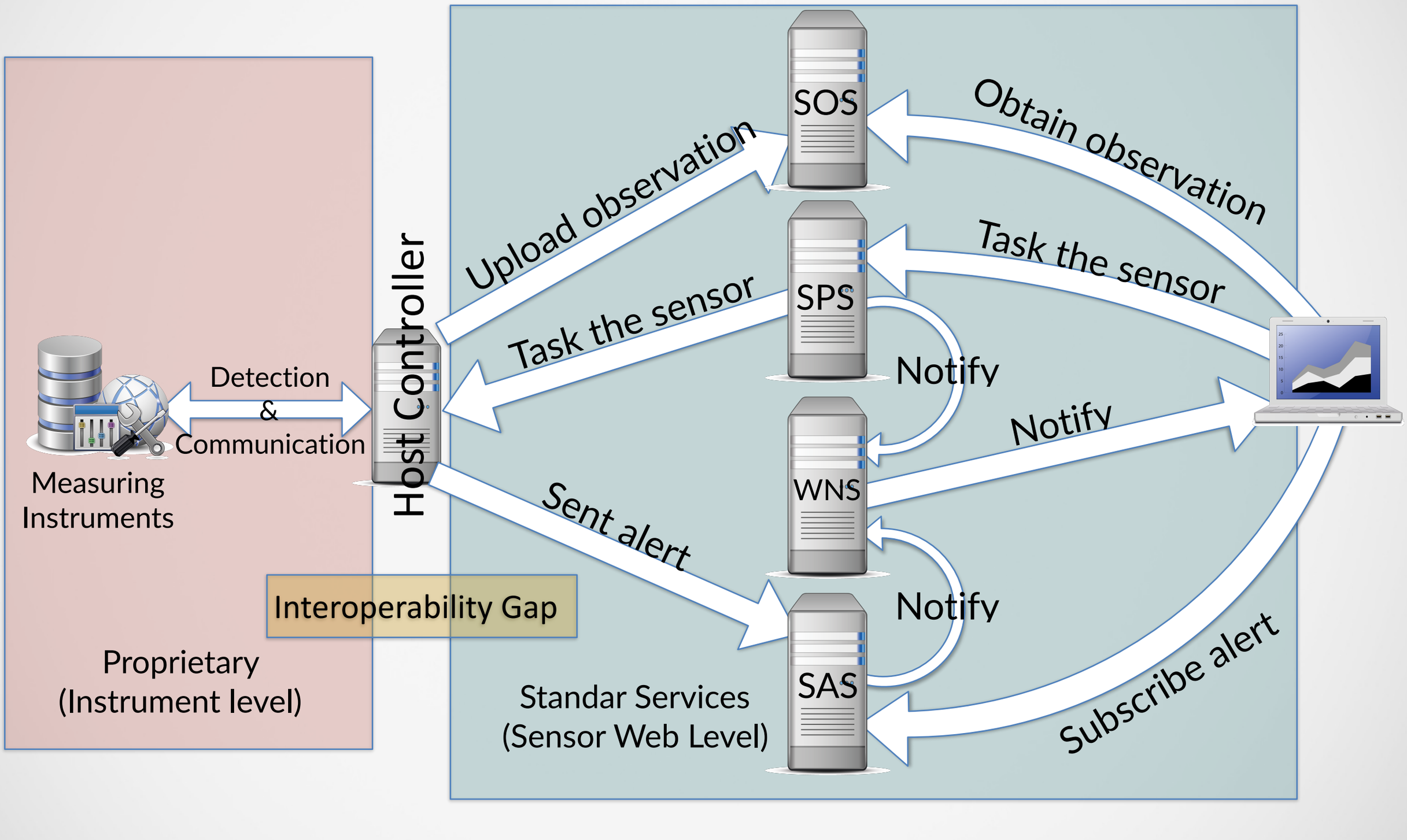
Might be dragons

Client can connect to any SOS instance

SWE Framework

- *Observations & Measurements (O&M)* –The general models and XML encodings for observations and measurements.
- *PUCK Protocol Standard* – Defines a protocol to retrieve a SensorML description, sensor "driver" code, and other information from the device itself, thus enabling automatic sensor installation, configuration and operation.
- *Sensor Model Language (SensorML)* – Standard models and XML Schema for describing the processes within sensor and observation processing systems.
- *Sensor Observation Service (SOS)* – Open interface for a web service to obtain observations and sensor and platform descriptions from one or more sensors.
- *Sensor Planning Service (SPS)* – An open interface for a web service by which a client can 1) determine the feasibility of collecting data from one or more sensors or models and 2) submit collection requests.
- *SWE Common Data Model* – Defines low-level data models for exchanging sensor related data between nodes of the OGC® Sensor Web Enablement (SWE) framework.
- *SWE Service Model* – Defines data types for common use across OGC Sensor Web Enablement (SWE) services. Five of these packages define operation request and response types.

End to end

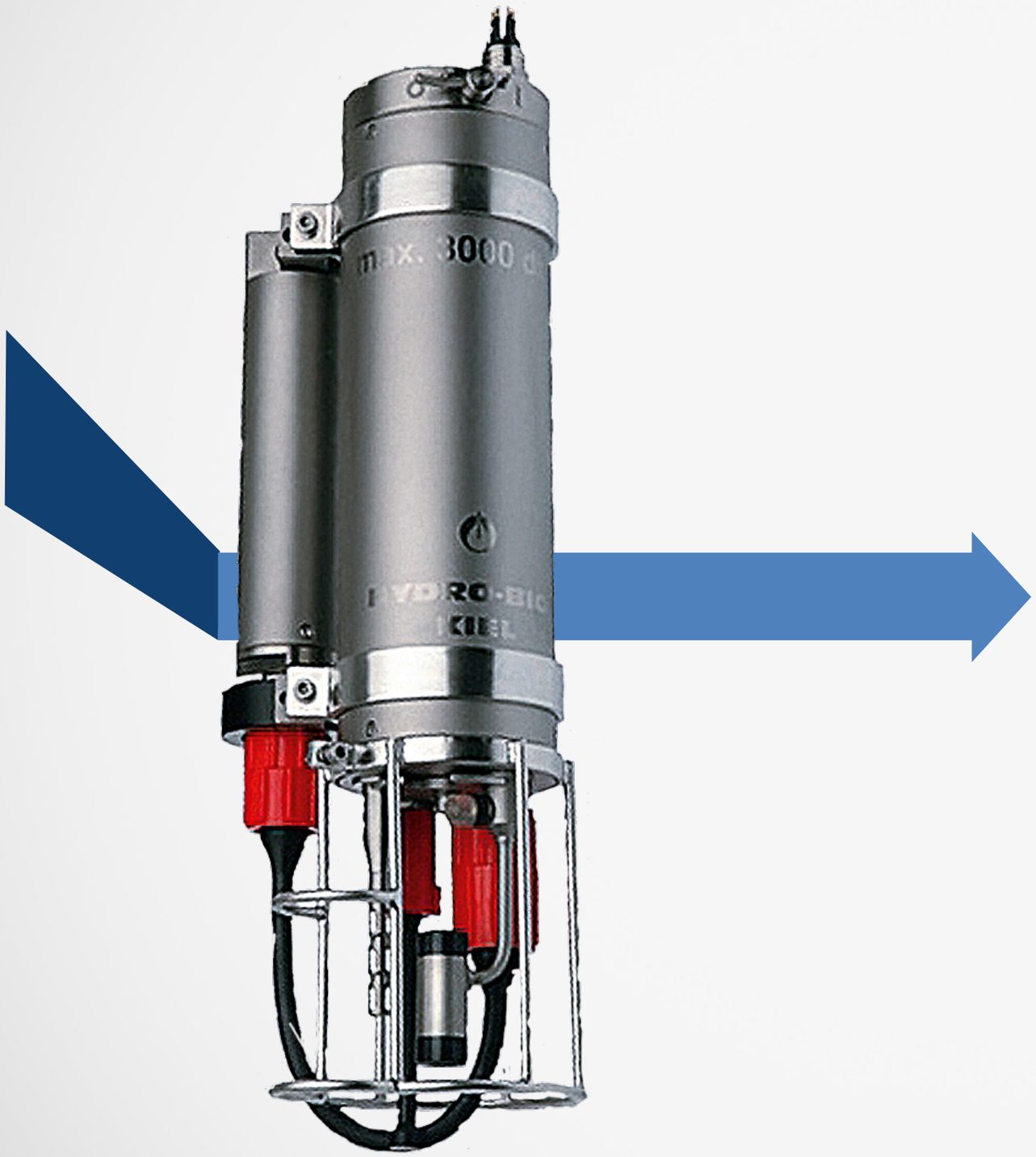

SOS
SPS
WNS
SAS
Upload observation
Obtain observation
Task the sensor
Task the sensor
Notify
Notify
Sent alert
Notify
Subscribe alert
Host Controller
Detection
&
Communication
Measuring
Instruments
Interoperability Gap
Proprietary
(Instrument level)
Standar Services
(Sensor Web Level)

Simple example

“GetCapabilities”

- Max depth
- Measurement depth
- Measurement date
- Last calibration
- Calibration method
- Measurement location
- Instrument model

Simple example



“GetCapabilities”

- ☑ Max depth
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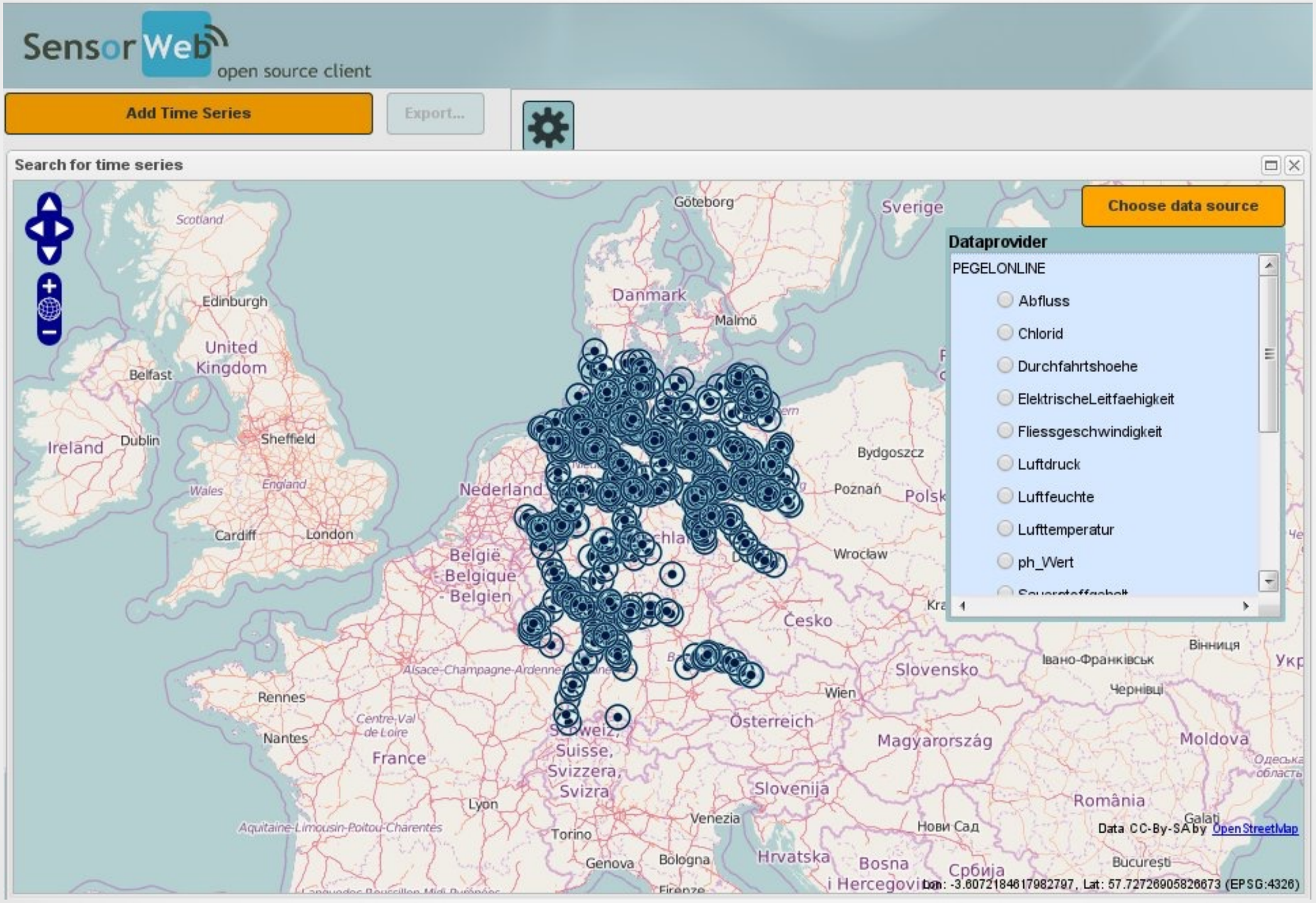
Client example

FROM 52 NORTH, A FIXO^3 PARTNER



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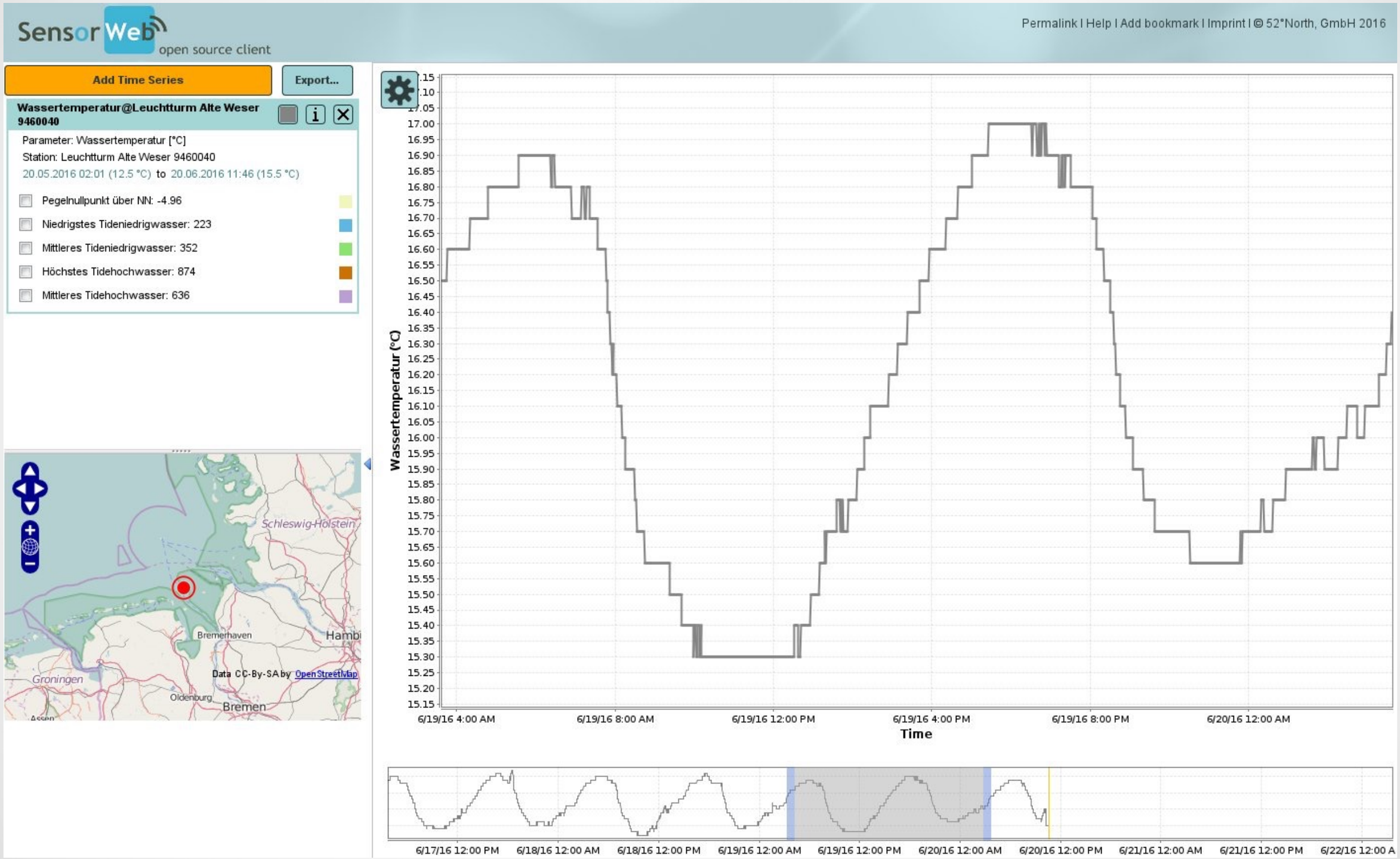

Summary and future developments

Summary

- *Products from AGL Observatory are online and up to date.*
- *This includes both real time and delayed time.*
- *The OGC SWE standards are robust, well documented and it has a huge community behind.*
- *Can be used for any type of data.*
- *As a con it has a quite steep “learning” slope.*

Future developments

- *Populate the AGL Observatory with new sensors.*
- *Develop and test new sensor generation “SWE compliant” (via agreement with OBSEA)*

Thank You

Questions?