



**Creating products and knowledge
for the Mediterranean**



ODYSSEA - OPERATING A NETWORK OF INTEGRATED OBSERVATORY SYSTEMS IN THE MEDITERRANEAN SEA

Jornadas de Engenharia Hidrográfica 2018

Adélio Silva, João Rodrigues, Paulo Leitão

HIDROMOD

adelio@hidromod.com

joao.rodrigues@hidromod.com

paulo.chambel@hidromod.com

Carlos Figueiredo, Inês Pedro

EDISOFT

carlos.figueiredo@edisoft.pt

ines.pedro@edisoft.pt



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727277

The ODYSSEA Project

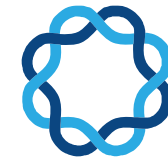


ODYSSEA is a EU **H2020** awarded **€8.4 million** to ODYSSEA Project for Developing and Deploying Integrated Observatory Systems in the Mediterranean Sea. It comprises **28 partner organizations** from **14 EU and non-EU countries** across the Mediterranean including two Portuguese partners (**HIDROMOD** and **EDISOFT**).

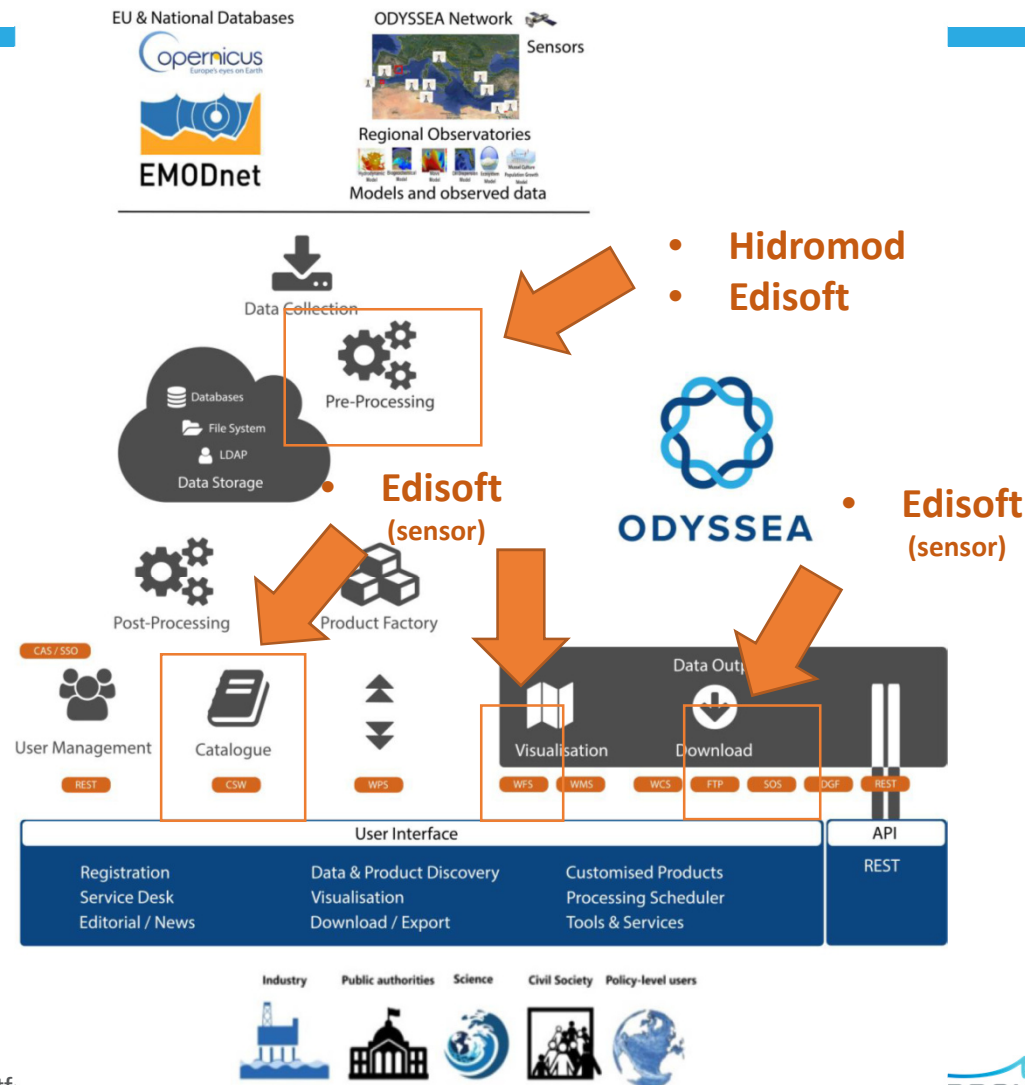
ODYSSEA main goal is to **implement a network of coastal observatories**, deploying novel in-situ sensors at sea, employing oceanographic modelling and integrating existing data and models to provide tailored information services.

The ultimate goal is to provide, through a public portal, **on-demand information services** (including near-real time data, EO data and high resolution forecasts). The project also seeks to increase local **capacity building** to maximise exploitation of the information services for **creating business** and research opportunities across the Mediterranean Sea basin.

The ODYSSEA Platform



ODYSSEA



Data management approaches



ODYSSEA aims to address two different kinds of public, representing different challenges in terms of data management:

- Data discovering and download;
- Services focused in specific user needs

While the former option is mainly used for information retrieval (simple answers for specific questions), the latter is mostly focused on data contents.

The data access



ODYSSEA platform provides a service chain capable to receive the raw data and convert it to the standard NetCDF-CF format. To implement this approach it was necessary to introduce changes in the data format and connect it to the metadata catalogue.

The general procedure is:

1. Standardize all input data
2. Generate associated Metadata
3. Convert data to be NetCDF-CF SeaDataNet compliant
4. Feed services (SOS, WFS, FTP)

The metadata



It was agreed to adopt standard procedures for the metadata maintenance, in order to maximise system interoperability.

All metadata generated by or for ODYSSEA follow the ISO standard and European Union INSPIRE Directives.

The Geonetwork Software (Open-source) was selected to be the metadata repository of ODYSSEA.



INSPIRE Full Operating Capability Testing



What's this?
INSPIRE
Conformity



What's this?
INSPIRE
Interoperability



Resource Verification Report

The data formats



ODYSSEA, similarly to initiatives such as CMEMS and SeaDataNet, adopts the following approaches regarding data harmonisation:

- ✓ General format is **NetCDF-CF**.
- ✓ For the gridded data, CMEMS recommendations are to be used.
- ✓ For the ***in situ data***, the SeaDataNet convention is adopted and slightly adjusted, in order to facilitate the SOS ingestion process.

The vocabulary



ODYSSEA adopts the **NERC/BODC vocabulary**, following the examples of CMEMS and SeaDataNet initiatives.

NERC/BODC provides a rich and complete set of terms covering not only the oceanography thematic, but also environment, geology and atmosphere subjects. (http://seadatanet.maris2.nl/v_bodc_vocab_v2/vocab_relations.asp).

The data access



The data discovery and retrieval is based on standard services. Although these services (such as **OGC WMS**) are already quite disseminated for the gridded data (maps), they are not yet common for time series.

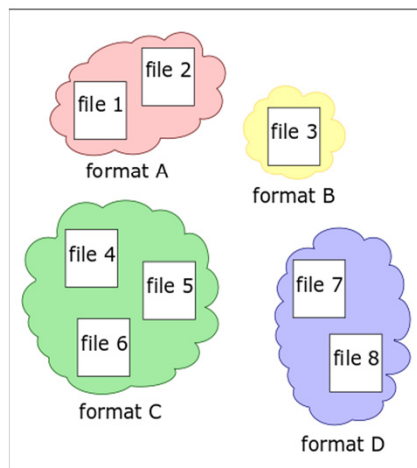
In order to overcome this limitation, it was decided to use the **OGC SOS service** implementation, supported by **52° North**.

The Challenge



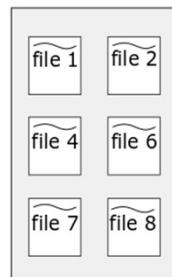
WHAT WE HAVE

Oceanographic data in different formats



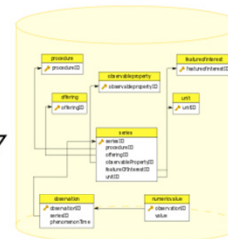
harmonize files

ODYSSEA harmonized format



WHAT WE NEED

52N SOS Database



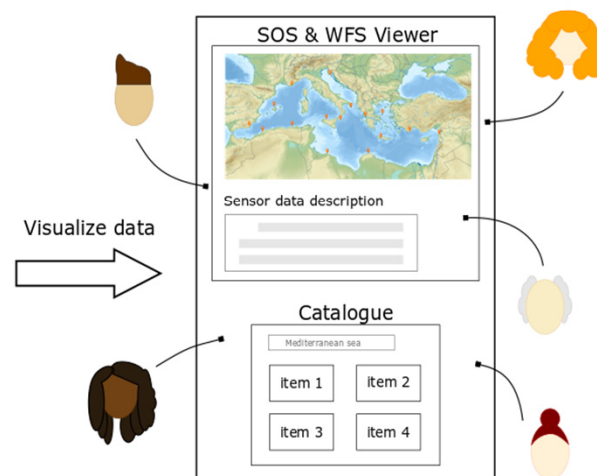
52N SOS
Ingest files into

GeoServer

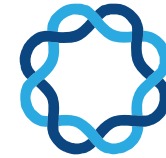
GeoServer Database



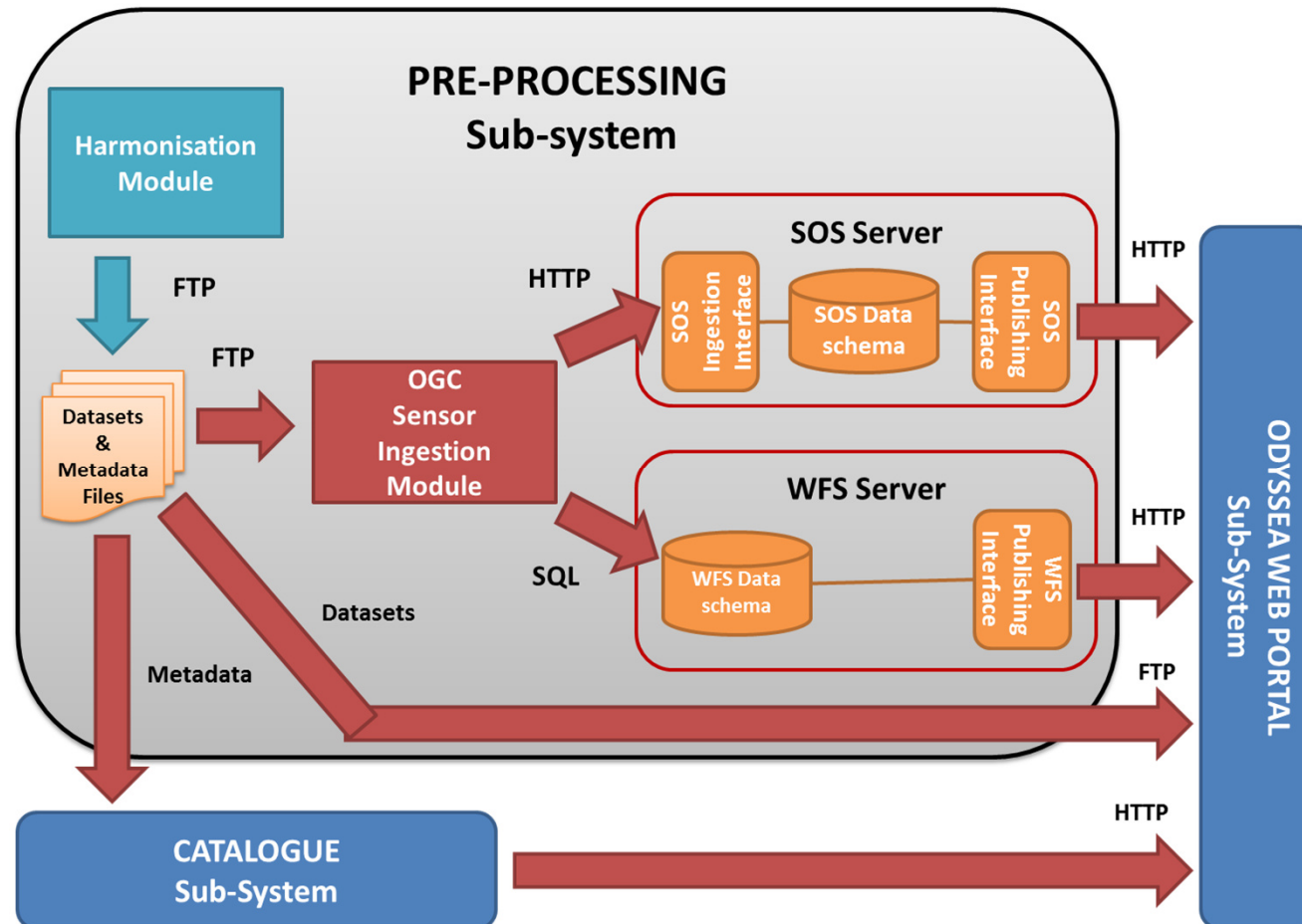
WHAT WE WANT



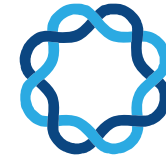
The ODYSSEA Platform



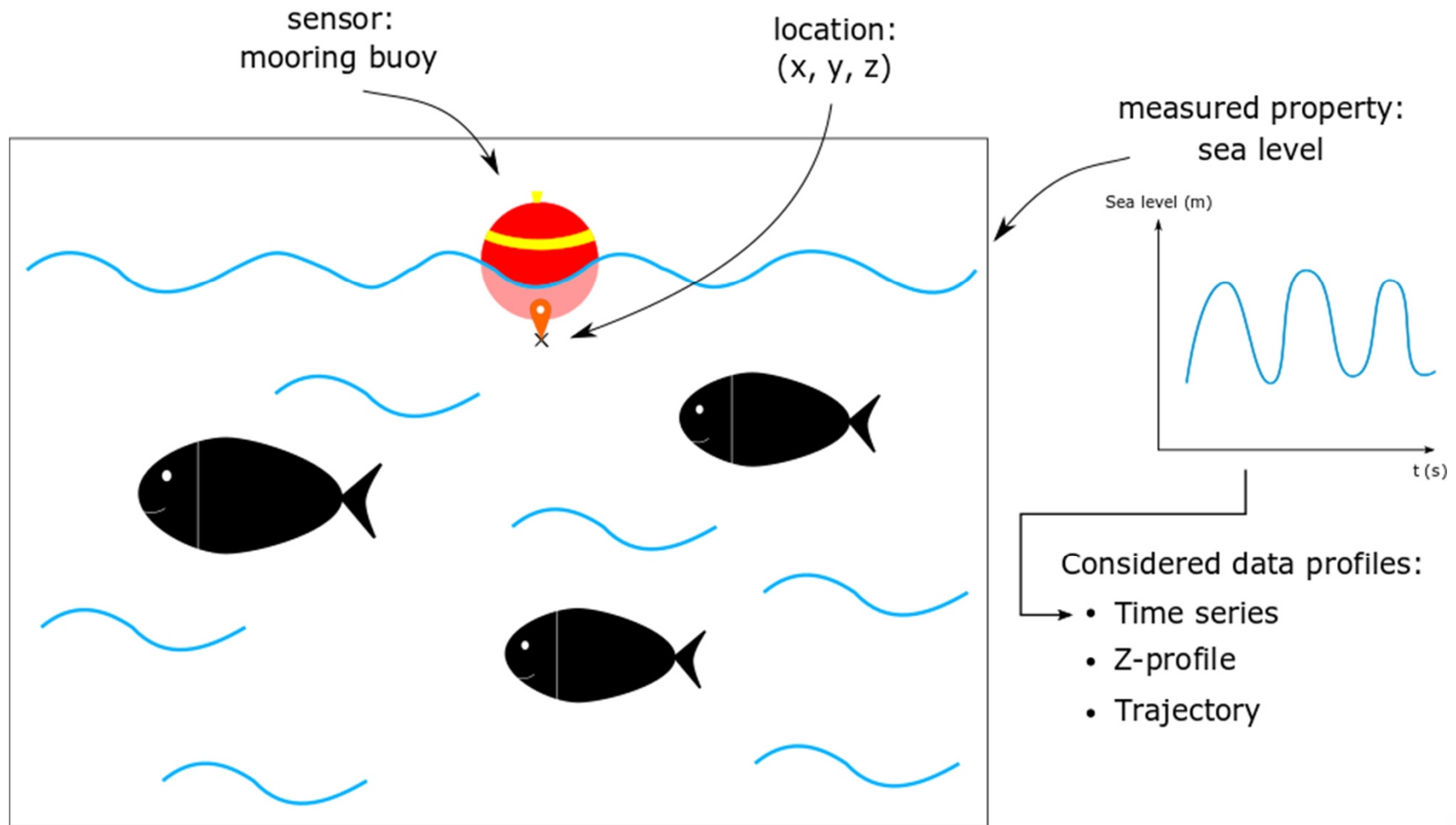
ODYSSEA



Sensor's Data

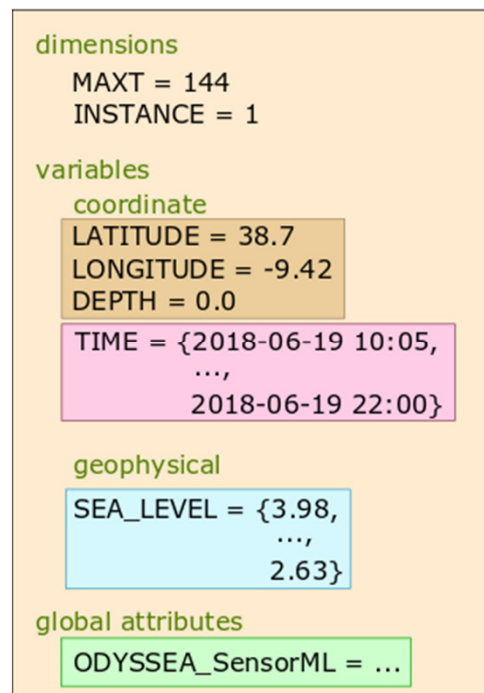


ODYSSEA

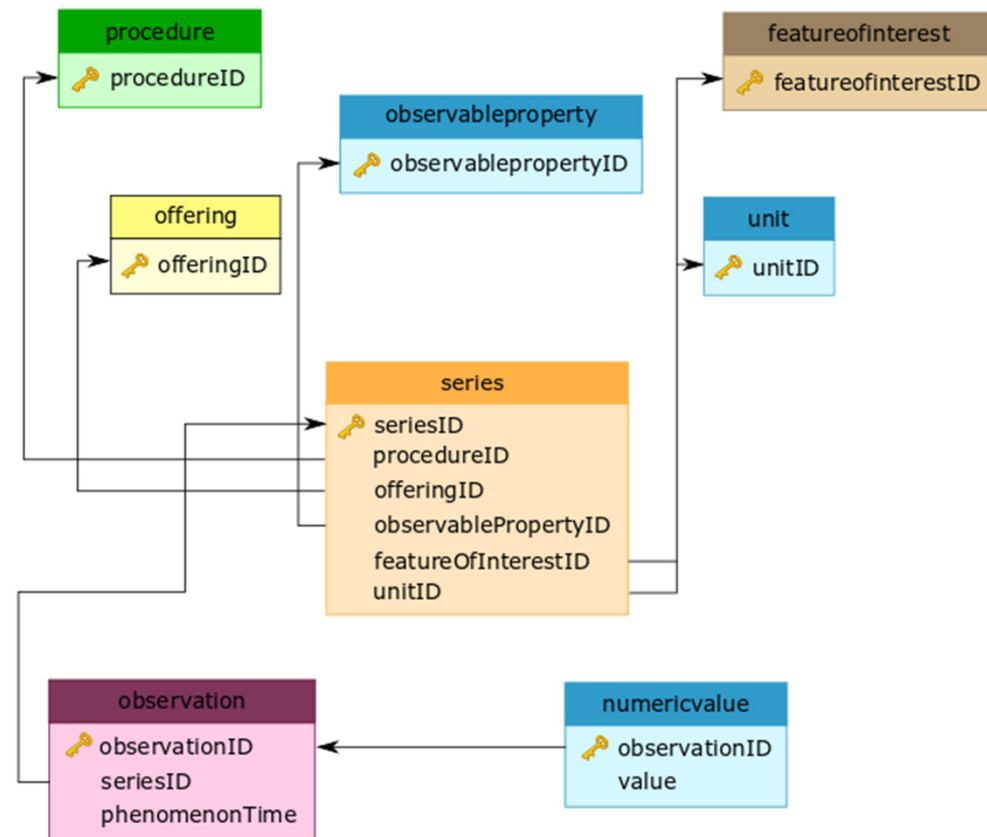


Model Mapping

NetCDF

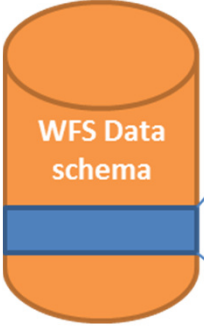


SOS Database Model



WFS publishing

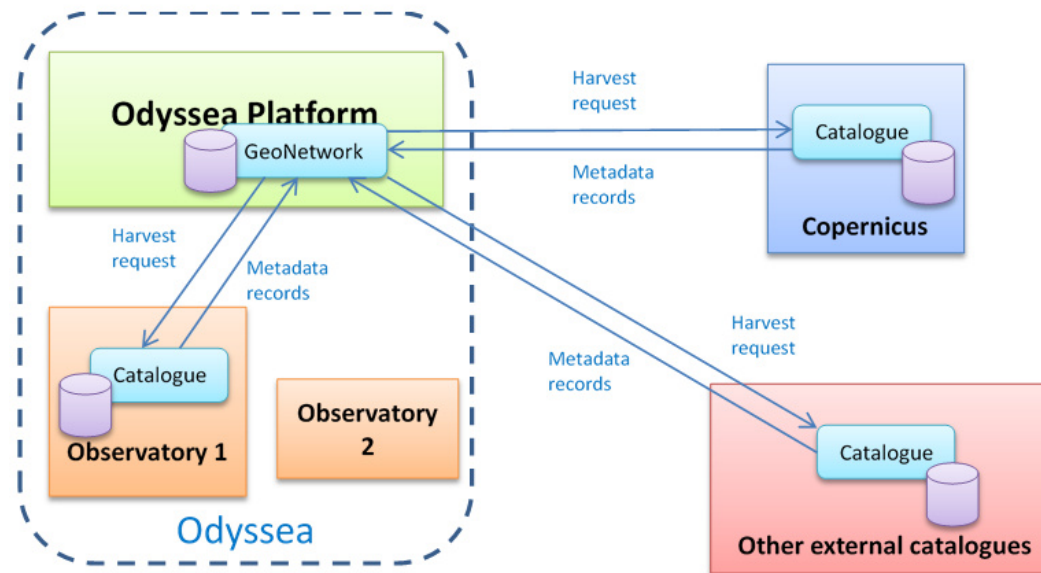
Simplified sensor data information (CTD)



ID	Lat	Long	Depth	Procedure	Phenomena	Last Value	Units	Time
1	38.53	-9.12	1	CTD_C	Conductivity	34.04211	mS/cm	2018-01-01 T00:00:01Z
2	38.53	-9.12	1	CTD_T	Water Temperature	20.2	Celsius Degrees	2018-01-01 T00:00:01Z
3	38.53	-9.12	1	CTD_D	Pressure	71.3607	Decibar	2018-01-01 T00:00:01Z

The Metadata Harvesting

ODYSSEA and other catalogues

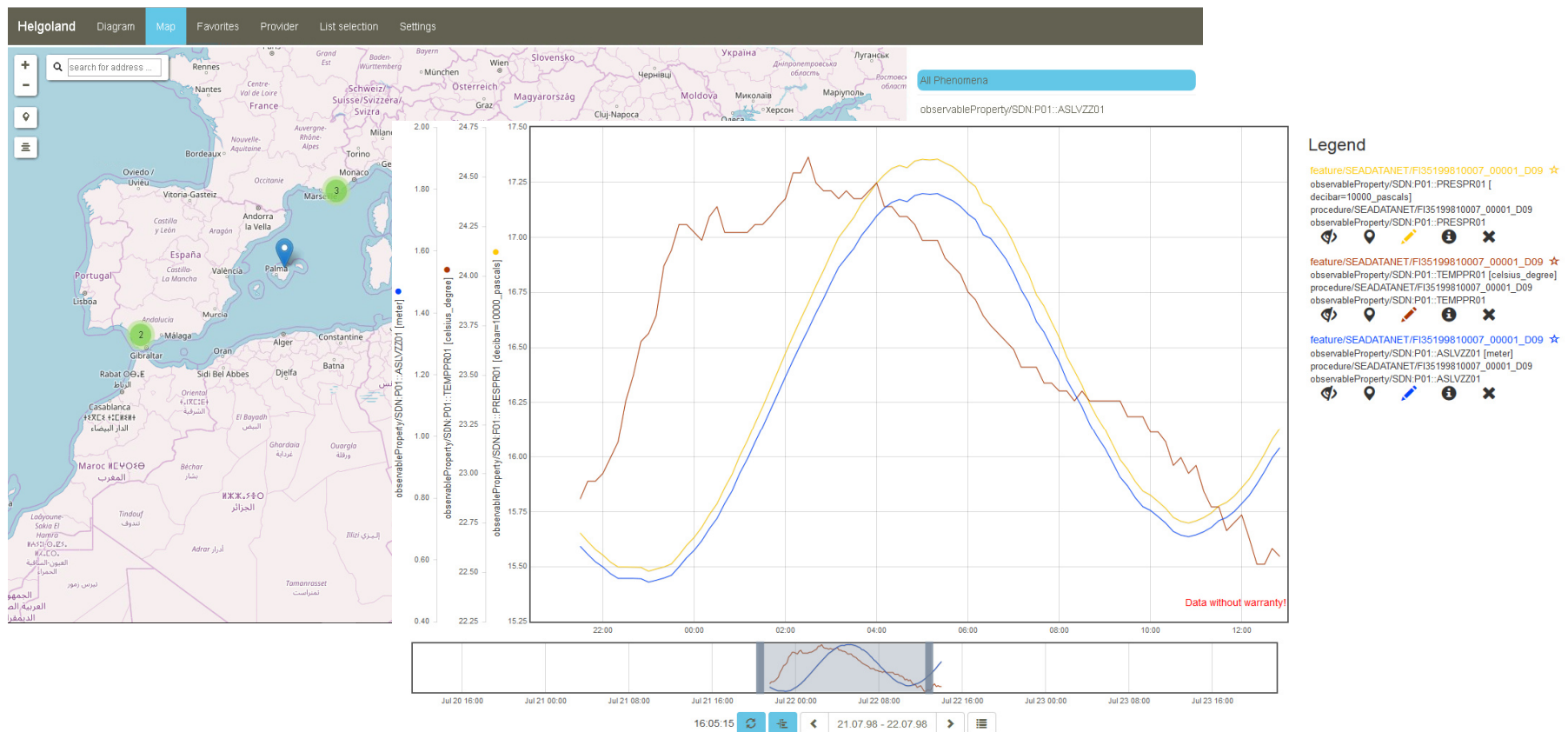


Dublin Core & ISO 19115 / 19119 / 19139 / INSPIRE

Sample Client Screens



52° North SOS Map Viewer



SOFTWARE



- Docker Infrastructure
- Linux Platform
- Java Framework
- Apache Tomcat Application Servers
- 52° North SOS Server (OGC SOS)
- GeoServer Map Server (OGC WFS)
- GeoNetwork Catalogue Server (OGC Catalogue CSW)
- PostGres/GIS Database Server
- SOS/WFS Ingestion Engine (Edisoft)



**Creating products and knowledge
for the Mediterranean**



THANK-YOU

Carlos Figueiredo

EDISOFT

carlos.figueiredo@edisoft.pt



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727277