

# Subsurface Water Sampling Network of the Instituto Español de Oceanografía: from data acquisition to final users

Gonzalo González-Nuevo, Instituto Español de Oceanografía (Spain), gonzalo.gonzalez@vi.ieo.es  
Elena Tel, Instituto Español de Oceanografía (Spain), elena.tel@md.ieo.es  
Agueda Cabrero, Instituto Español de Oceanografía (Spain), agueda.cabrero@vi.ieo.es

Pablo Otero, Instituto Español de Oceanografía (Spain), pablo.otero@md.ieo.es  
Manuel Ruiz-Villareal, Instituto Español de Oceanografía (Spain), manuel.ruiz@co.ieo.es  
Jose Manuel Cabanas, Instituto Español de Oceanografía (Spain), jm.cabanas@vi.ieo.es

## Introduction

The Instituto Español de Oceanografía ([www.ieo.es](http://www.ieo.es)) has implemented a subsurface water sampling network in part of its fleet. This network was formed by two local (B/O Navaz and B/O Lura), two regional (B/O Ramon Margalef and B/O Angeles Alvariño) and one oceanic (B/O Miguel Oliver) research vessels and has been completed in the last years with one local (Lura) and other regional (B/O Francisco de Paula Navarro) vessels. Each of them was instrumented with a SeaBird 21 thermosalinograph (TSG) and a Turner 10 Fluorometer recording as main variables temperature, salinity and fluorescence. The vessels work around the Iberian Peninsula, Balearic Islands and Canary Islands. Their activity is more intense in the Galician and Cantabrian coasts.



SeaBird 21 thermosalinograph



Turner 10 Fluorometer

## Vessels

Navaz



Lura



Navarro



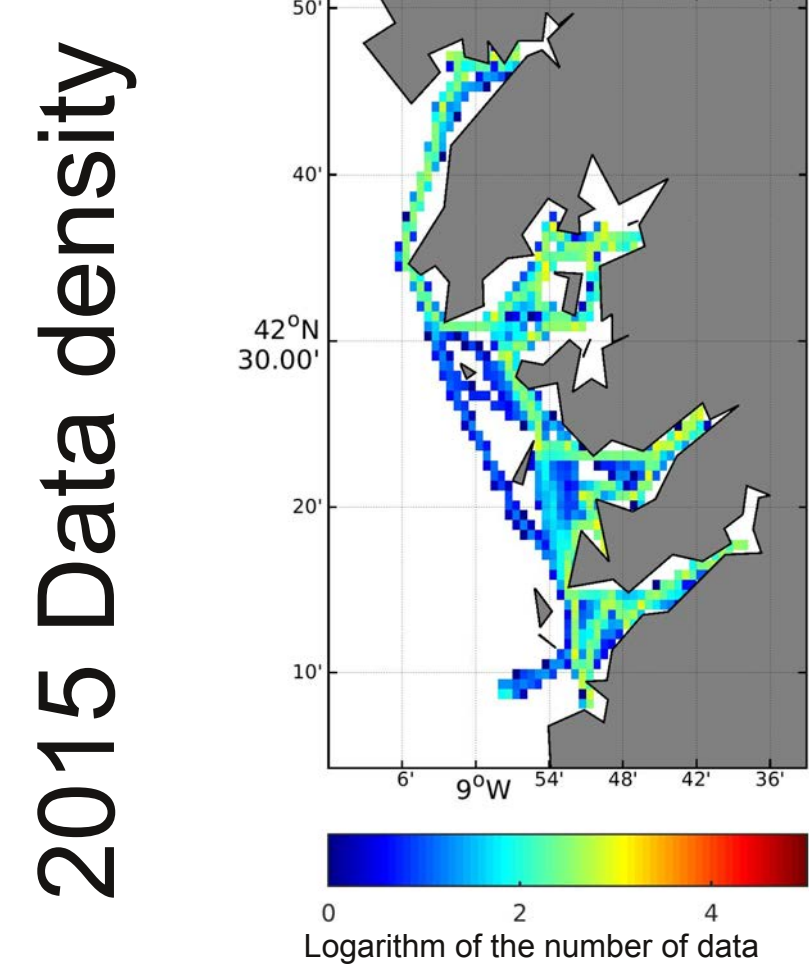
Angeles Alvariño



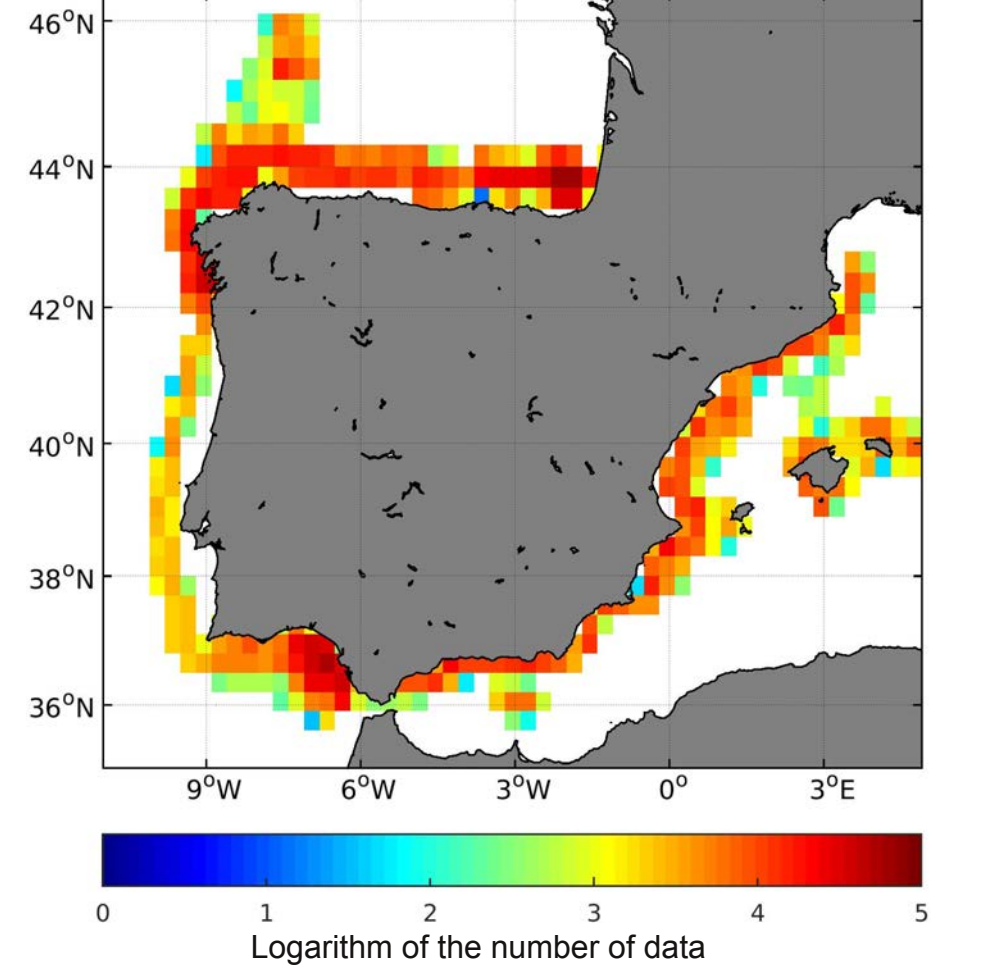
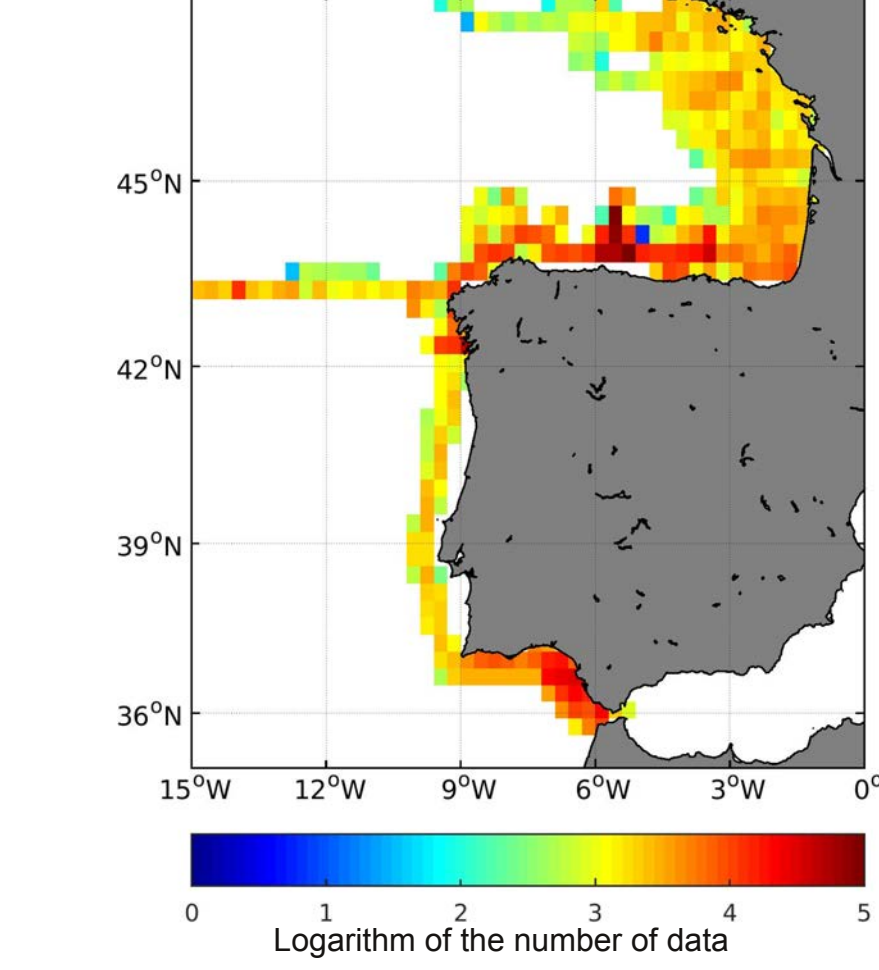
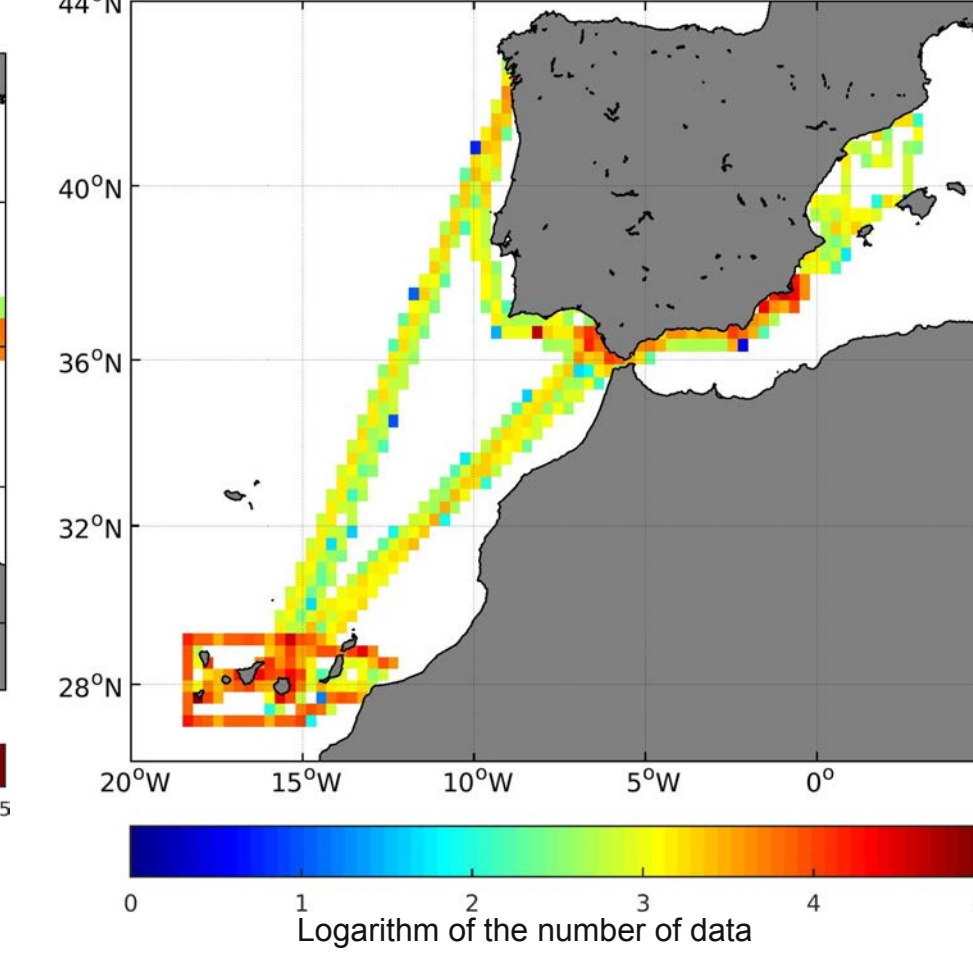
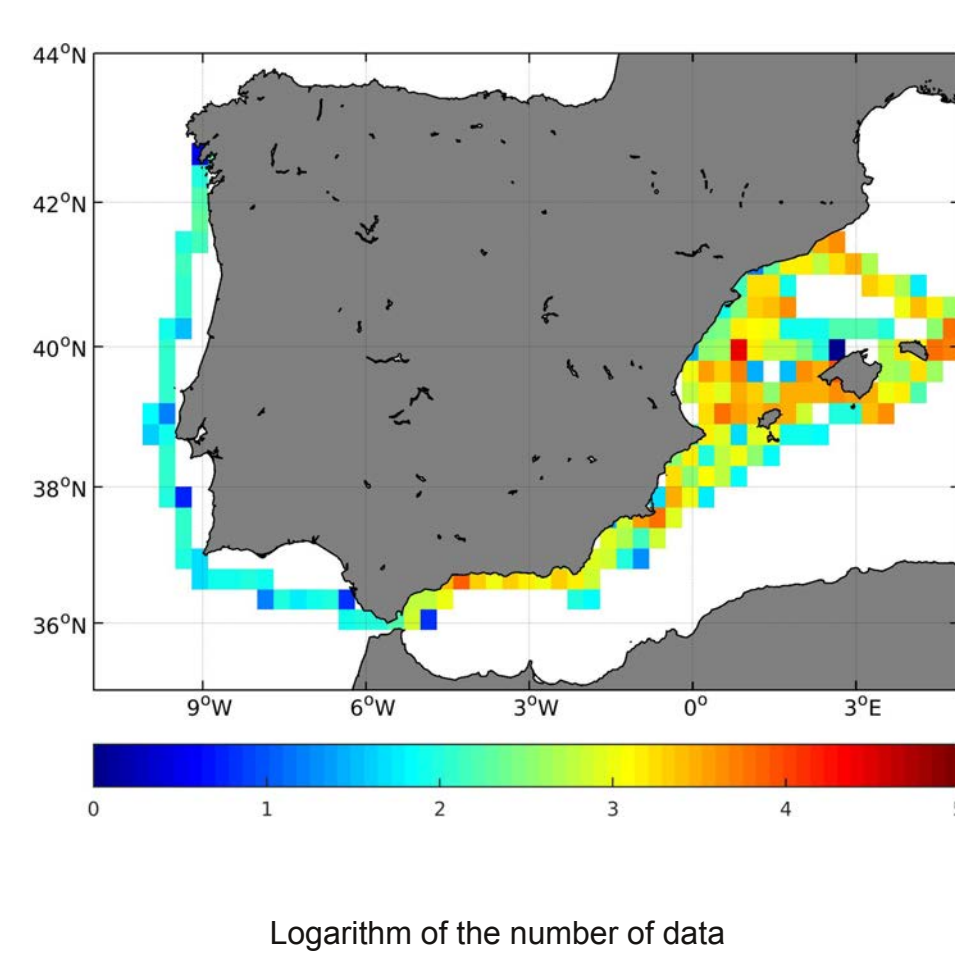
Ramon Margalef



Miguel Oliver



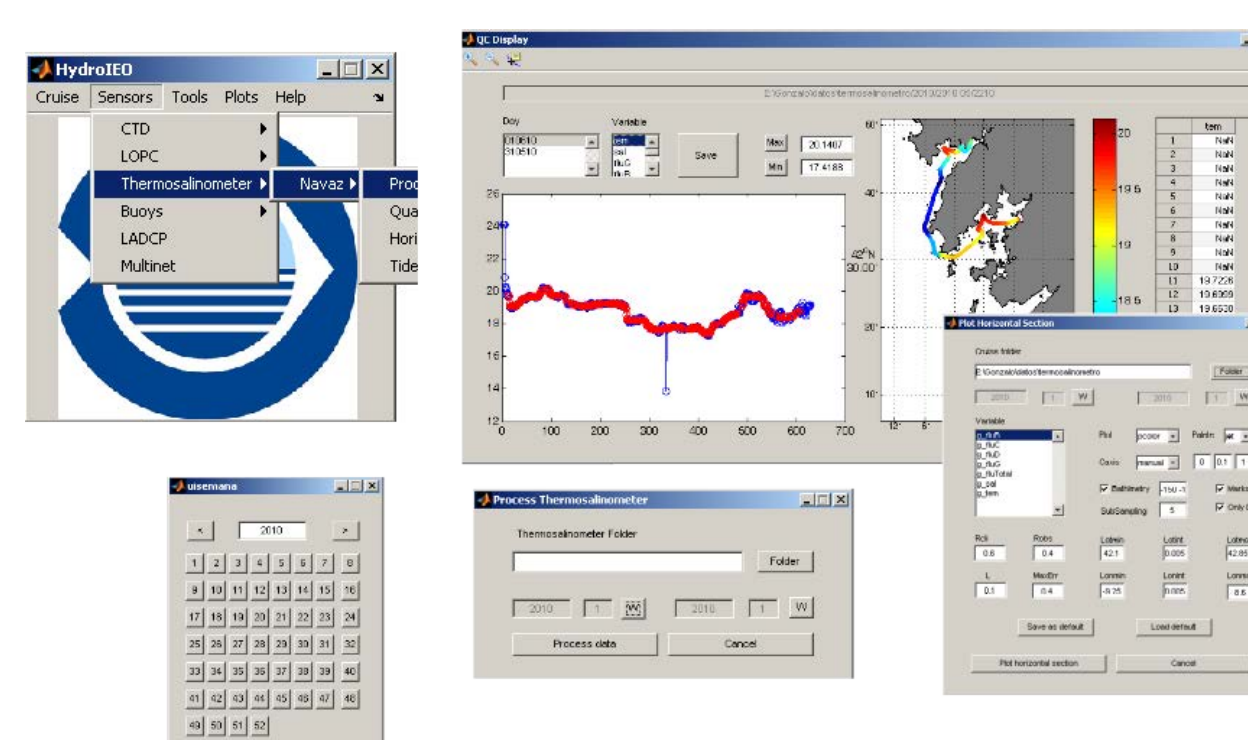
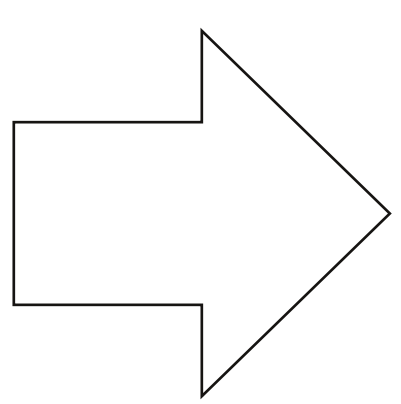
NO DATA



## Automatic processing

### Data Center

The data of each vessel is daily sent by email to a processing center. An automatic data processing system was developed to manage all the information generated in quasi-real time by this subsurface sampling network.



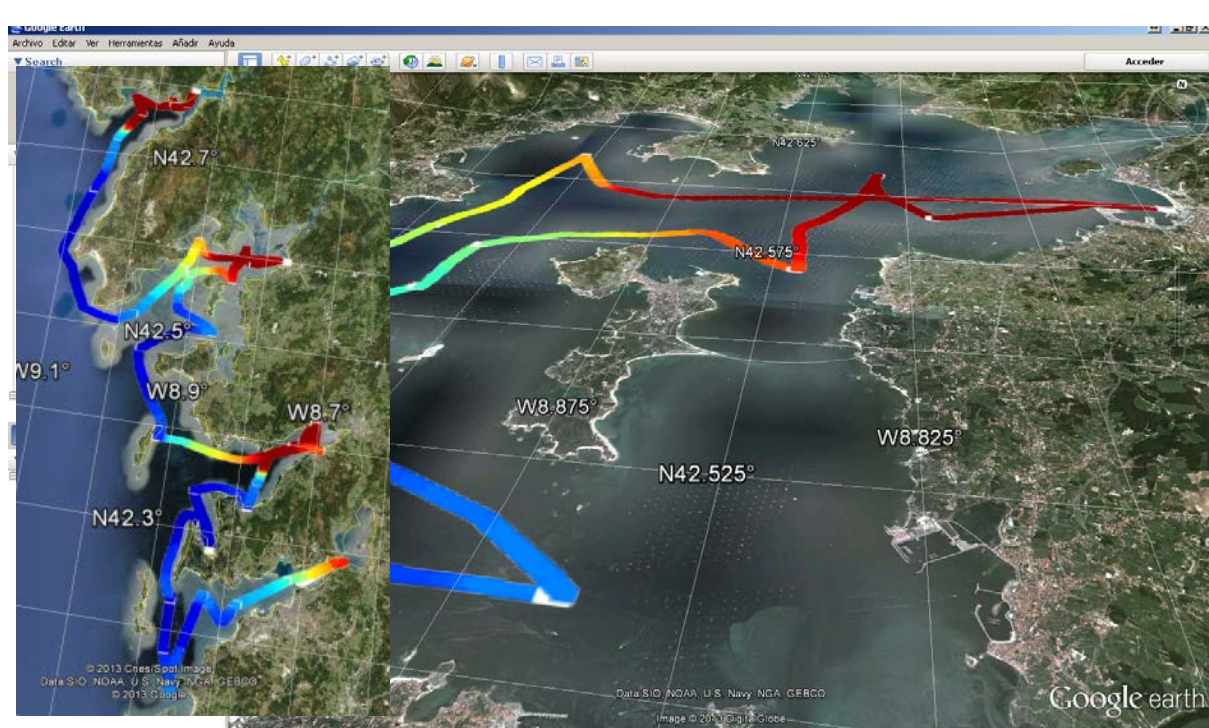
### Quality Control

The data are subjected to two types of quality control. On one hand they are treated with a series of automated controls, and quality flags are added following SeaDataNet protocol. On the other hand, a MATLAB software, with a user interface, was developed to allow review and validate data in a simple and friendly way. Thus anyone with knowledge in oceanography can validate the data without the need for advanced programming skills.



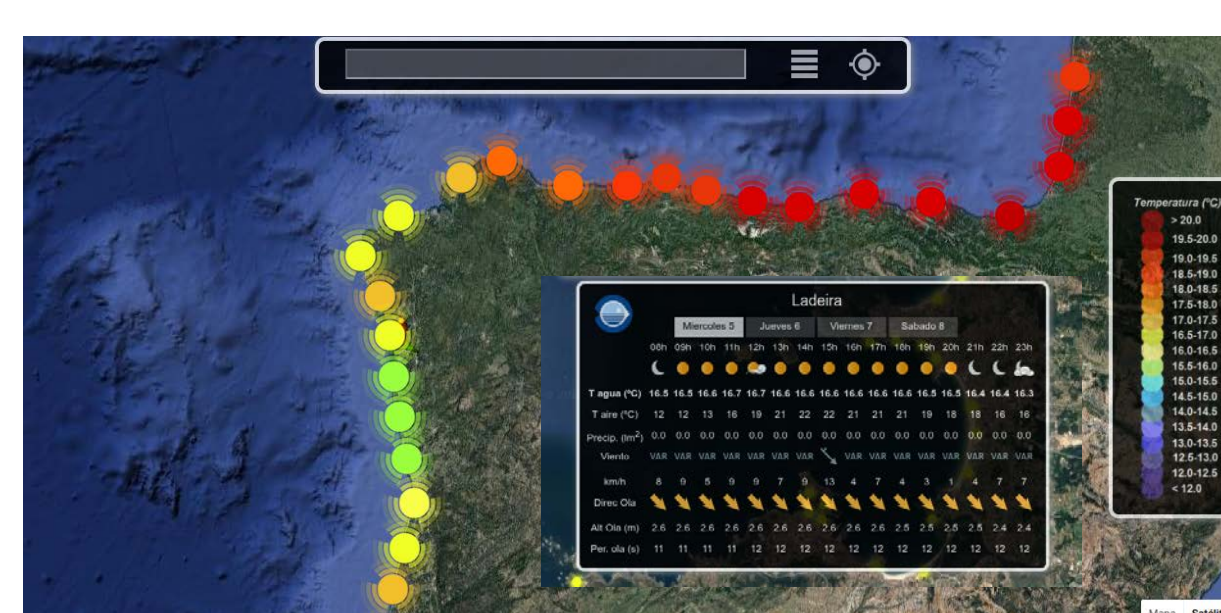
## Final User Services

### Data Viewer



Currently, we are developing a web interface that allows the access to the database generated by the network. This viewer is being developed using HTML5/JS/PHP and will be built on PostgreSQL database. The scope is to build flexible, simple and user friendly.

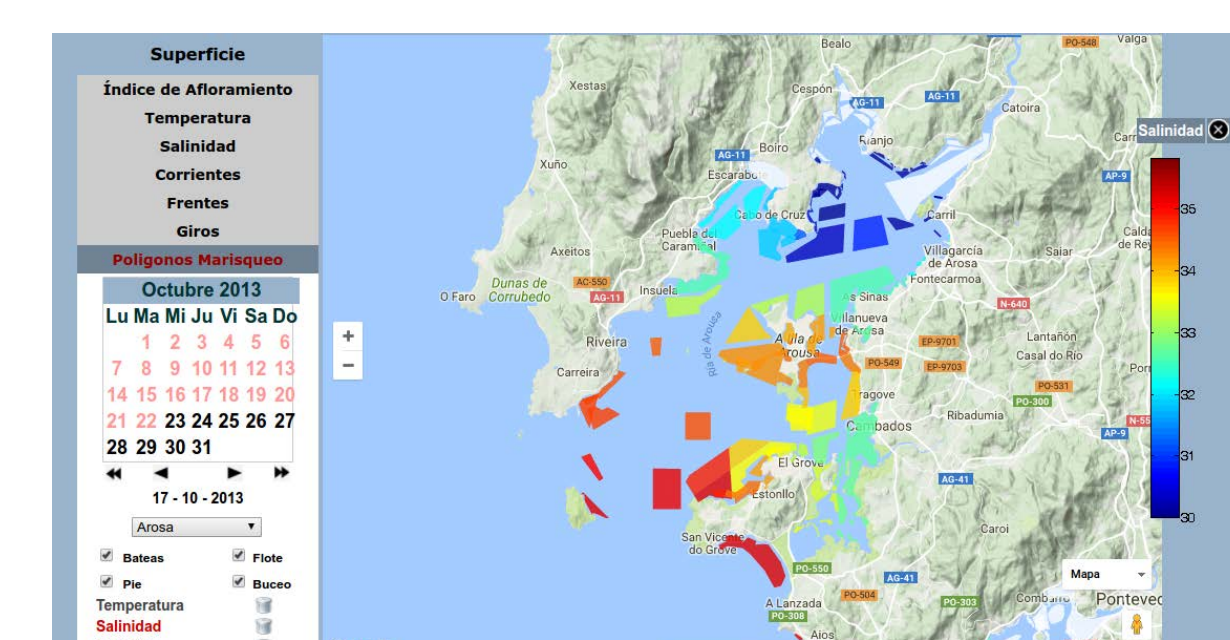
### Beaches



Environmental Information Service of beaches, has as its main data source the outputs of the regional oceanographic models. In this sense data obtained by the Subsurface Water Sampling Network are mainly used to validate the model results. Currently we are working to use this kind of data to be assimilated by ocean models.



### Aquaculture



In the same way as in the service of beaches, this service provides environmental information to Aquaculture producers. This information is of great importance for the optimal management of these resources. In this sense, the monitoring network allows giving better results and refine models to help to better manage the sector.

