

Development of the automatic data processing system of the Instituto Español de Oceanografía surface water sampling network

Gonzalo González-Nuevo, Jose Manuel Cabanas,
Manuel Ruiz Villarreal, Elena Tel, Pablo Otero,
Jesus Gago and Alicia Lavin



Presentation Outline

- RAlA project
- Surface Water Sampling Network
 - Vessels
 - Processing system
 - OGC data servers
- Data examples
- Work in progress and future



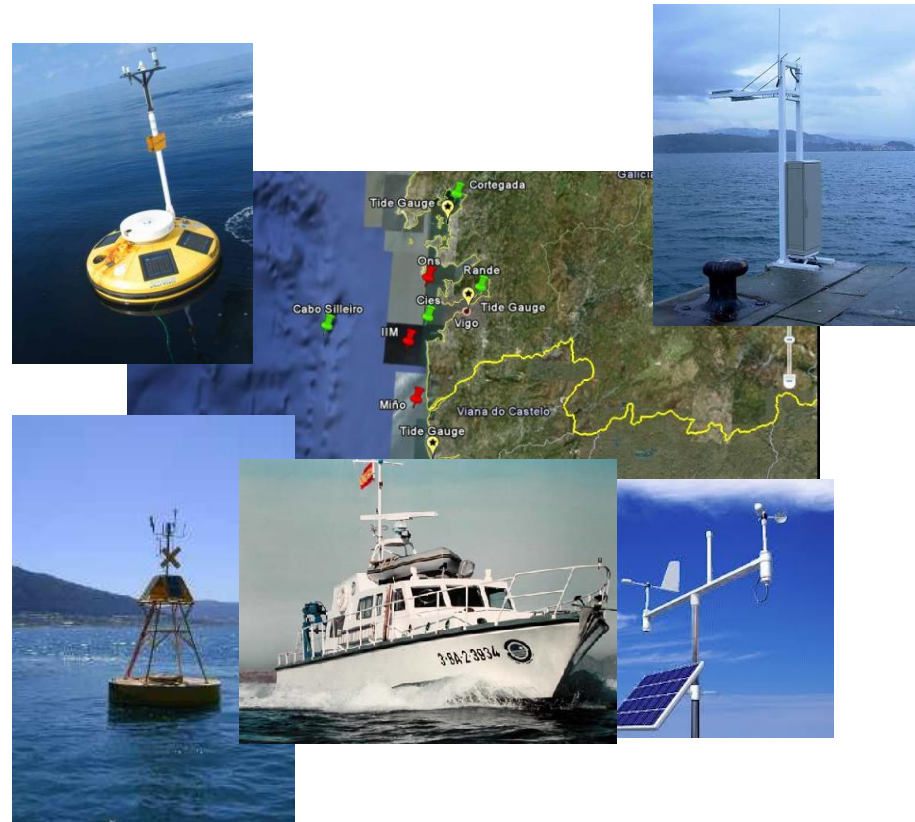
RAIA observatory

RAIA Project



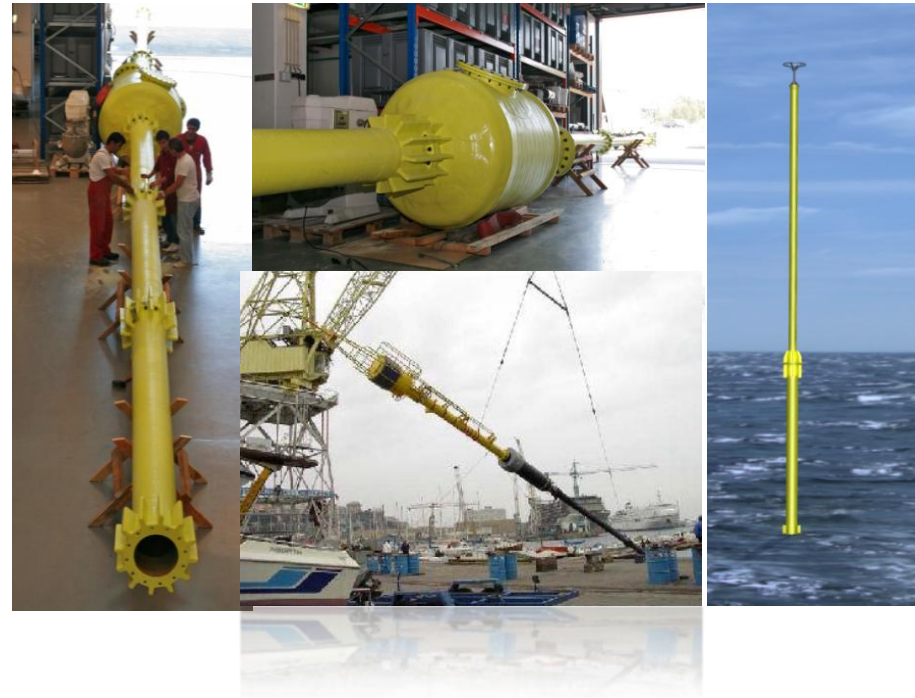
RAIA project

- Consolidate oceano-meteorologic observation network Galicia and north Portugal
- Development of new technologies in the field of oceanography monitoring
- Operational implementation of the hydrodynamic and wave models for the continental shelf and littoral
- Creation of common data infrastructure platform to feed a common viewer.
- Development of specific final user products



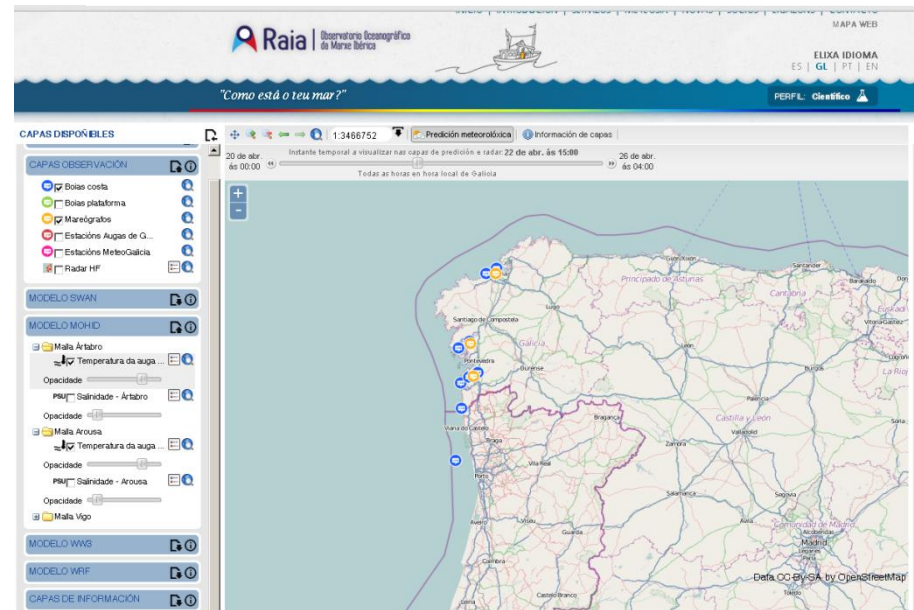
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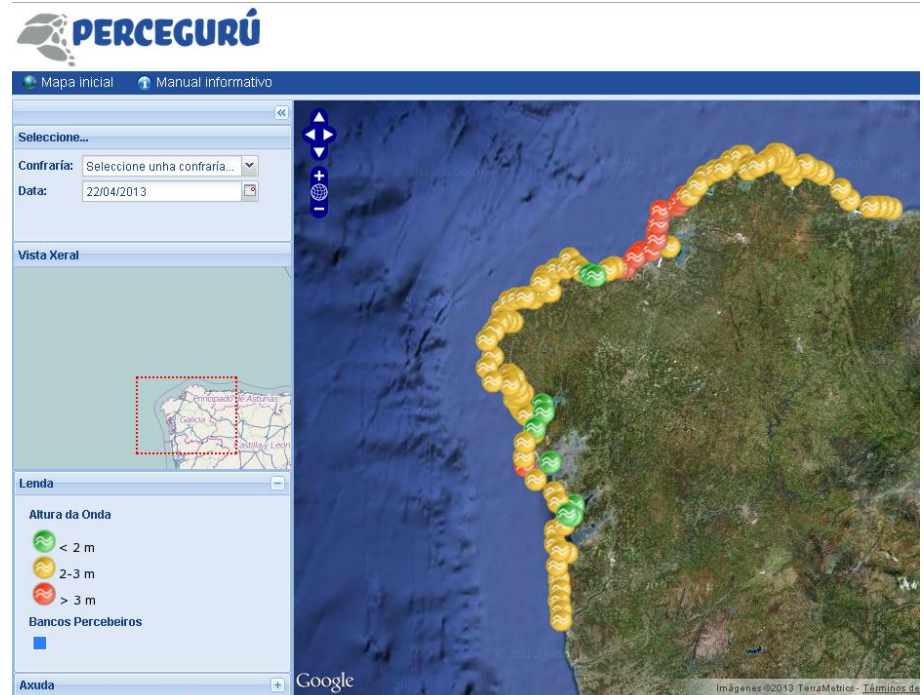
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Surface Sampling Network

General Overview

Vessels



Data Processing



OGC Data servers



GeoServer

Final Users



Vessels



Navaz



Margalef



Alvariño



Cornide



Oliver



Vessels

Sensor description

SBE 21 Thermosalinograph



Turner 10-AU fluorometer



Vessels

Calibration Program



<http://webs.cetmar.org/utmar>

Vessels

Jose María Navaz



- Coastal ship (16 m)
- HAB monitoring
- RADIALES section

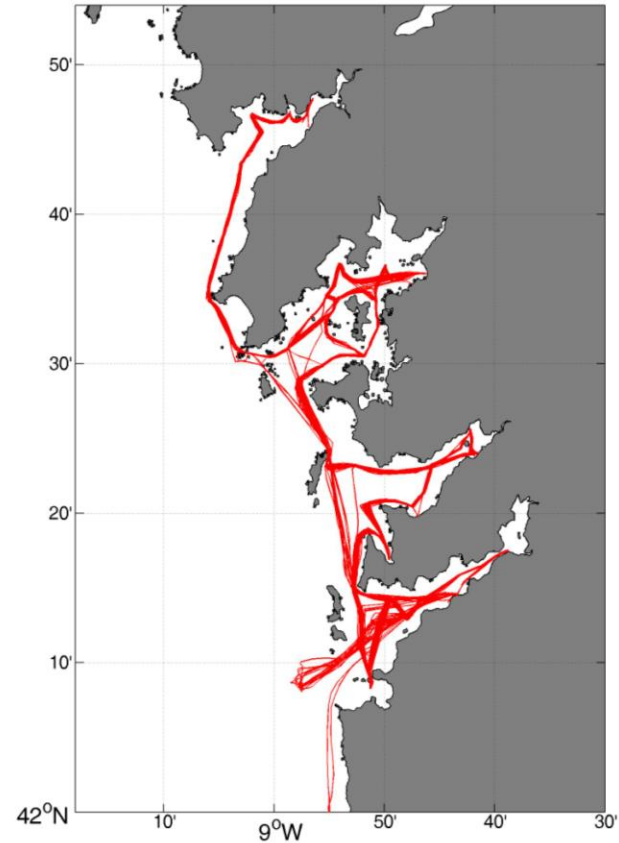


Vessels

Jose María Navaz



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- RADIALES section

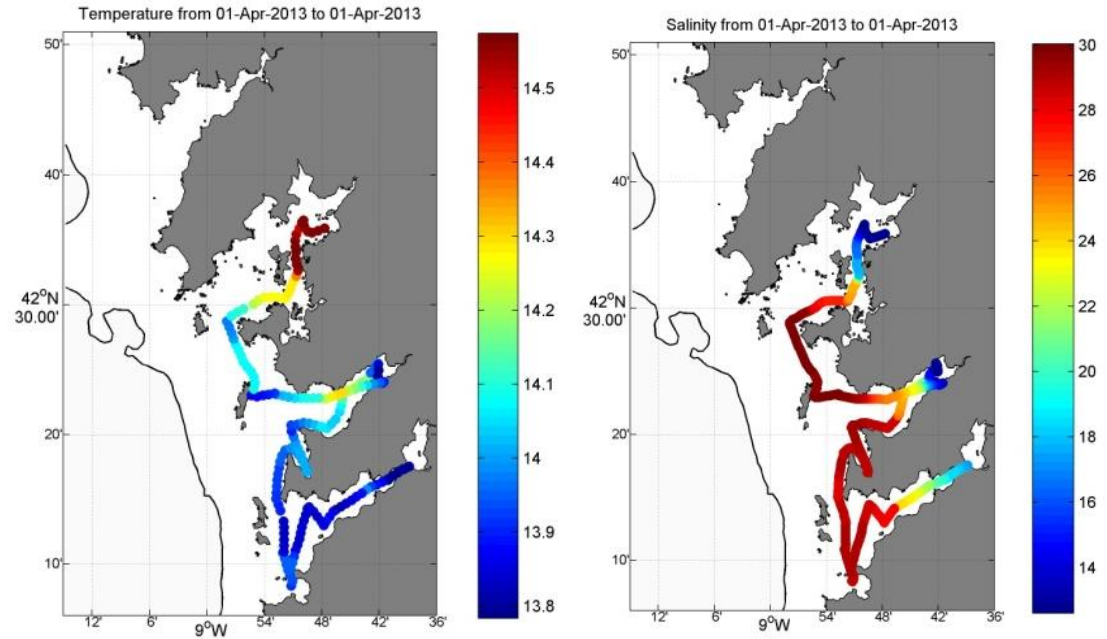


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Jose María Navaz



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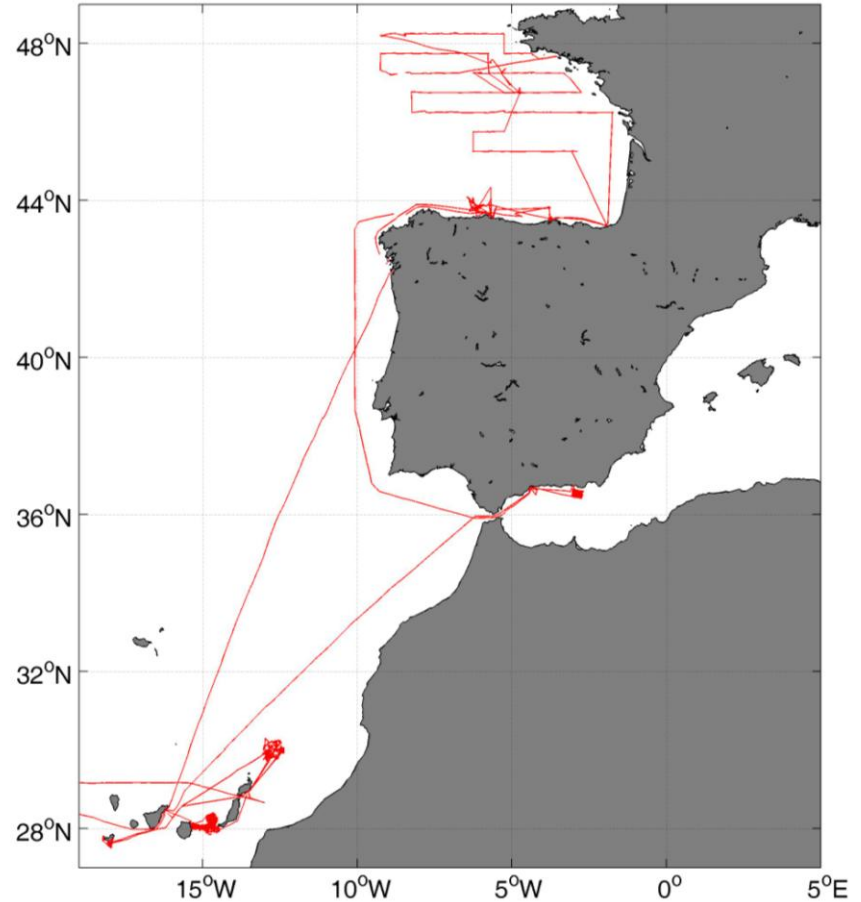


Vessels

Angeles Alvariño



- Regional ship (46 m)
- Multidisciplinary campaign
- El Hierro

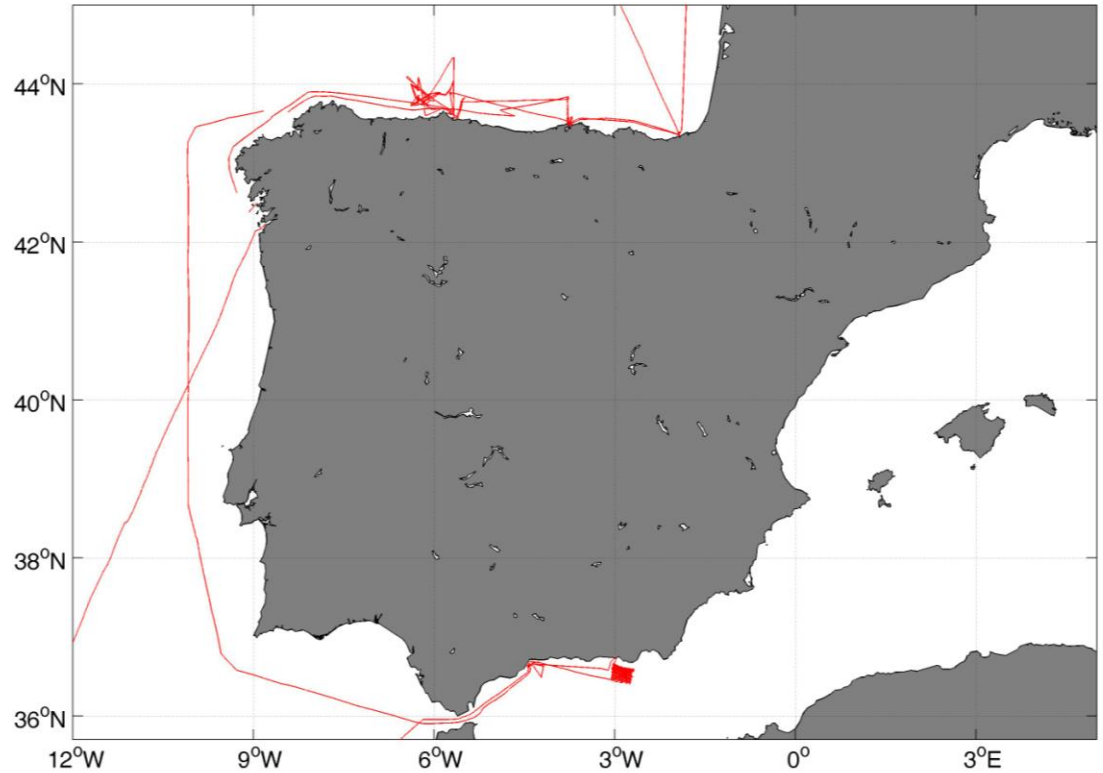


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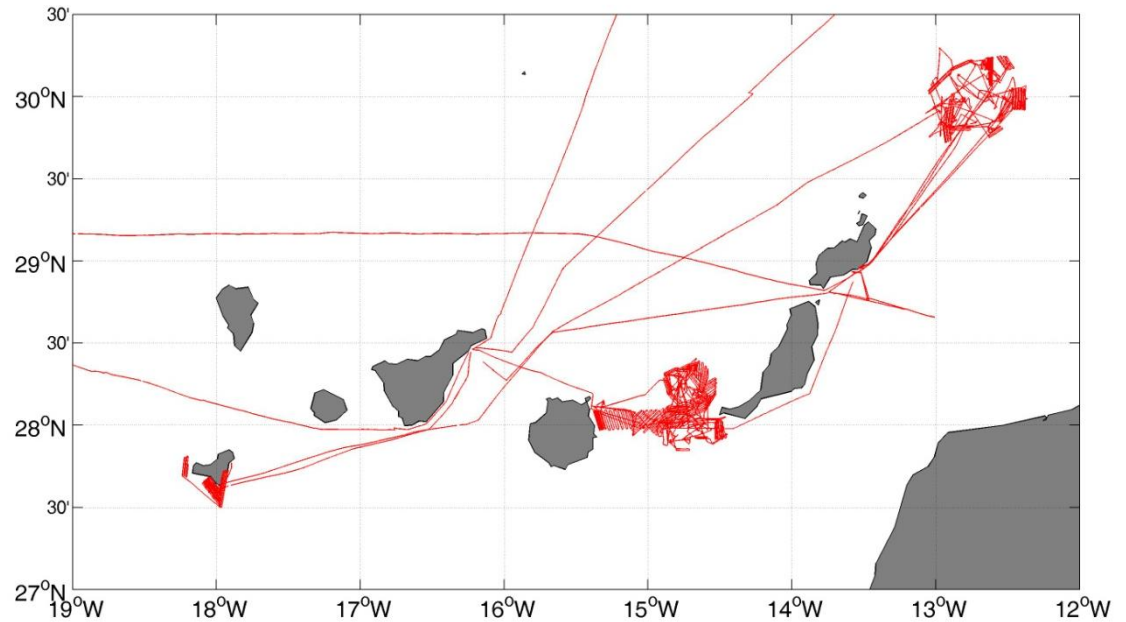


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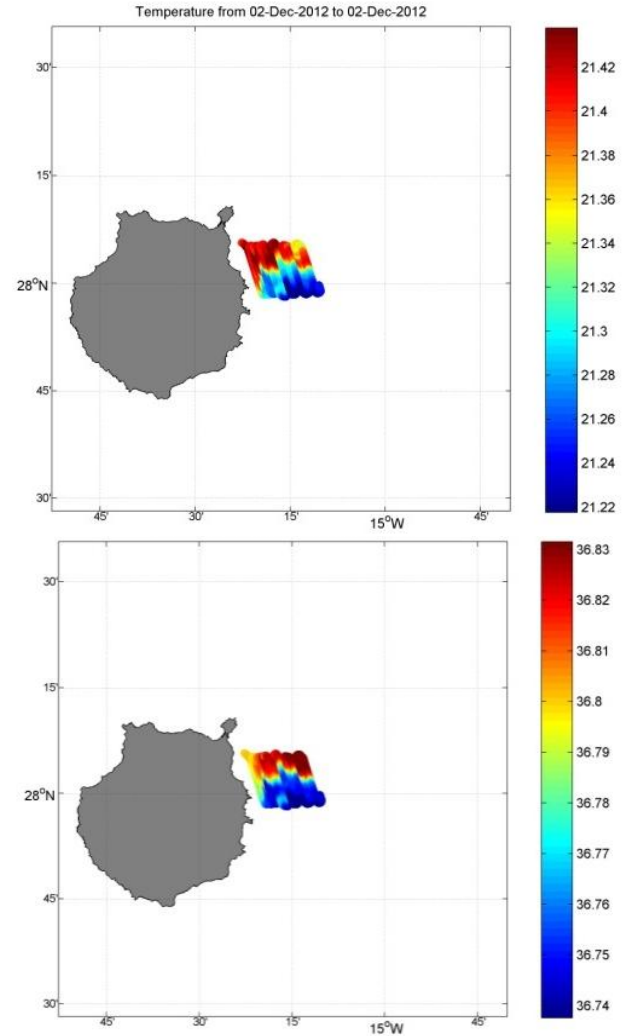


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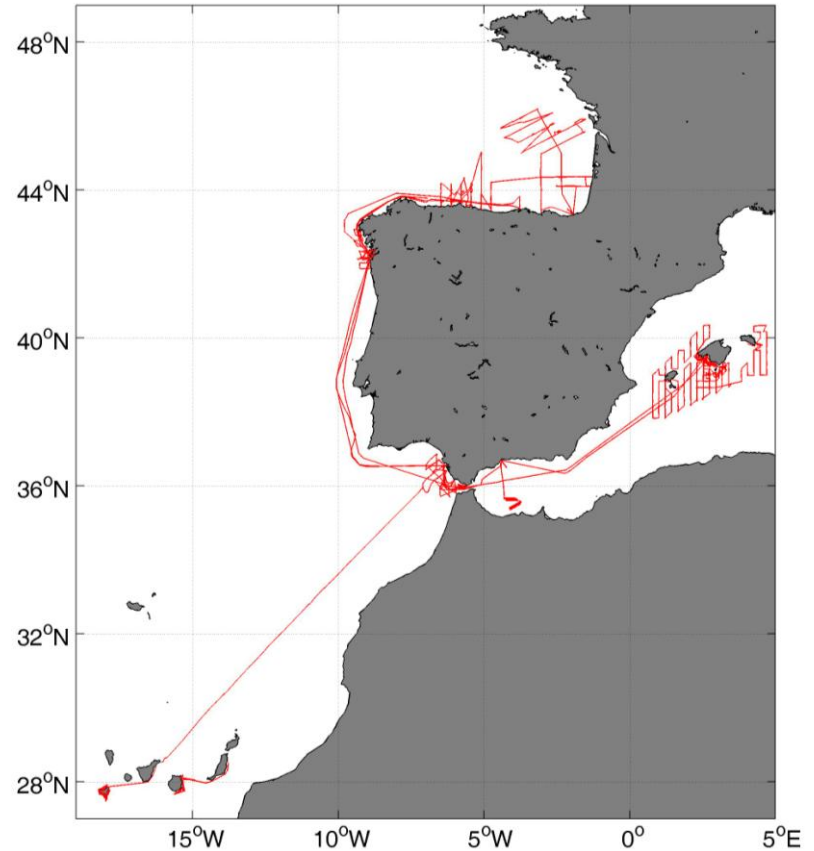


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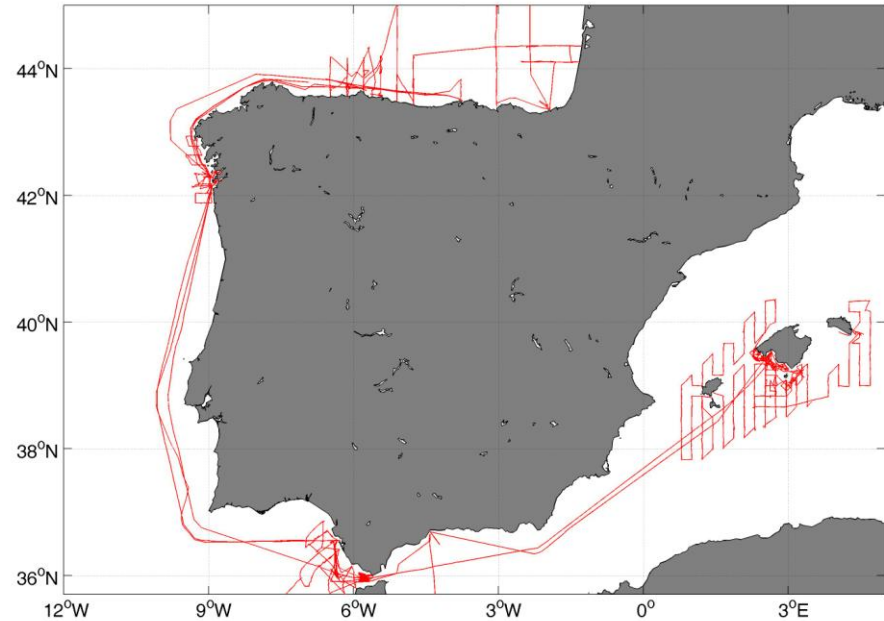


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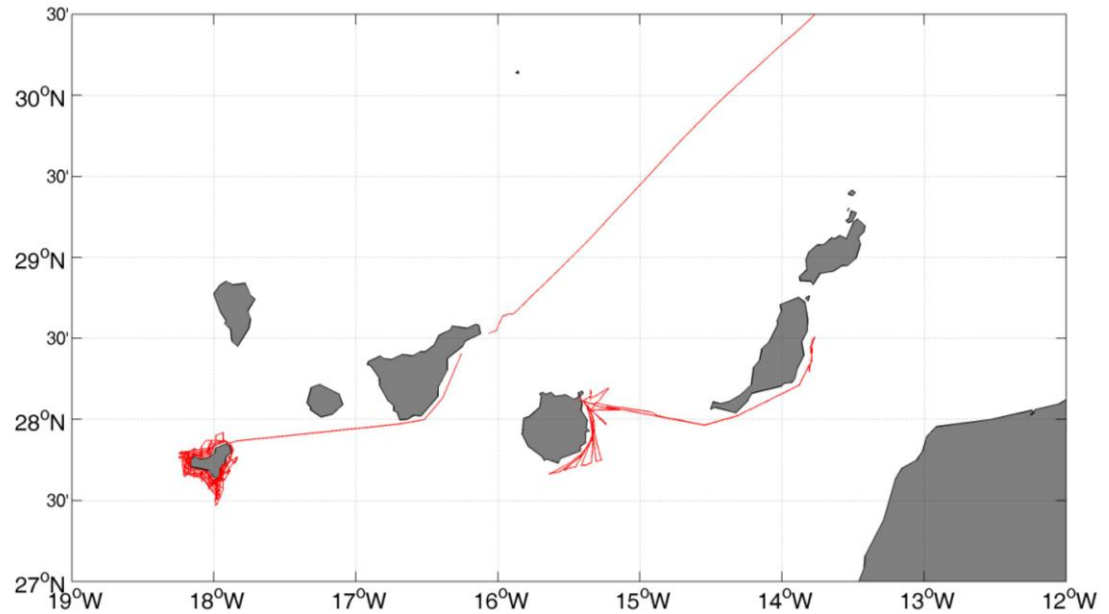


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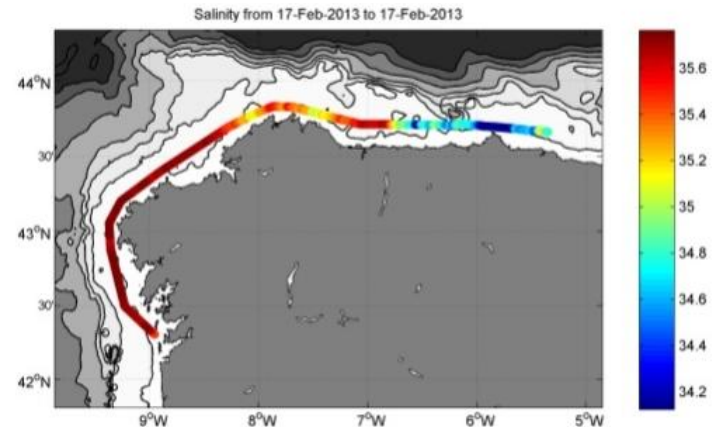
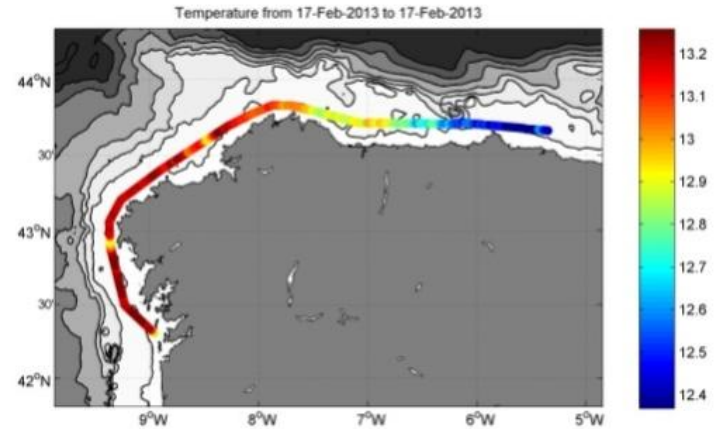


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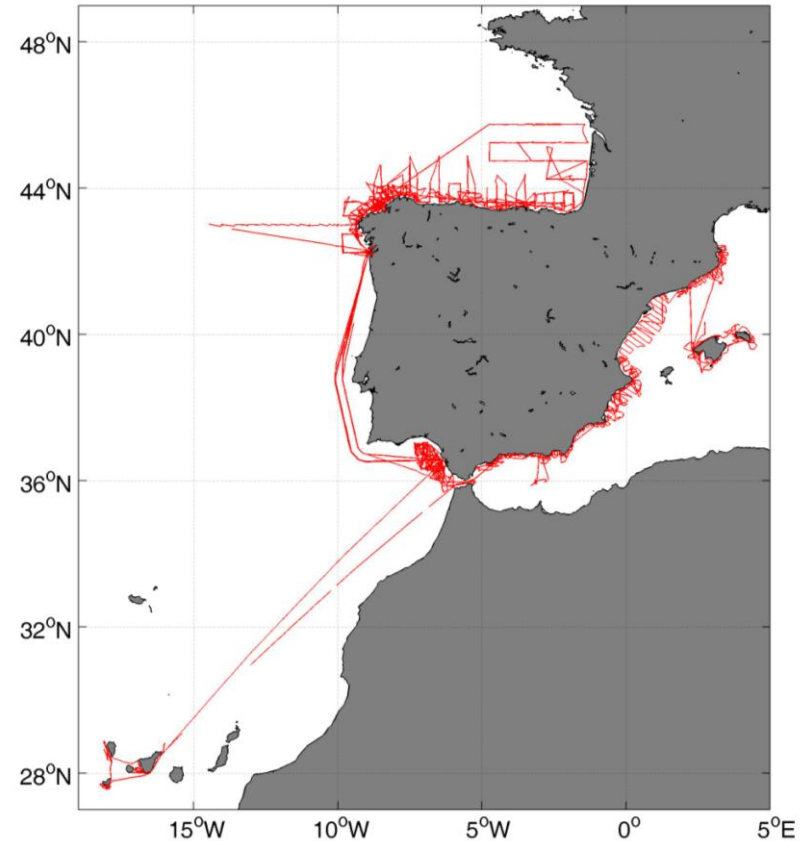


Vessels

Cornide de Saavedra



- Oceanic ship (67 m)
- Multidisciplinary campaign
- Fisheries assessment

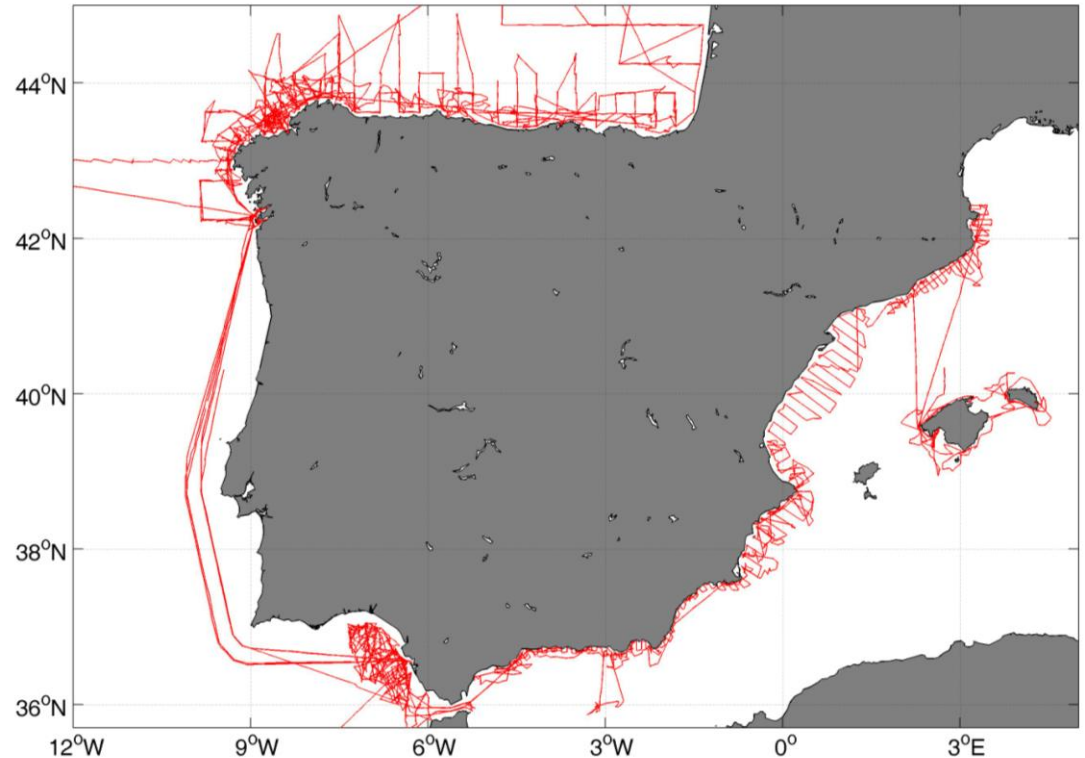


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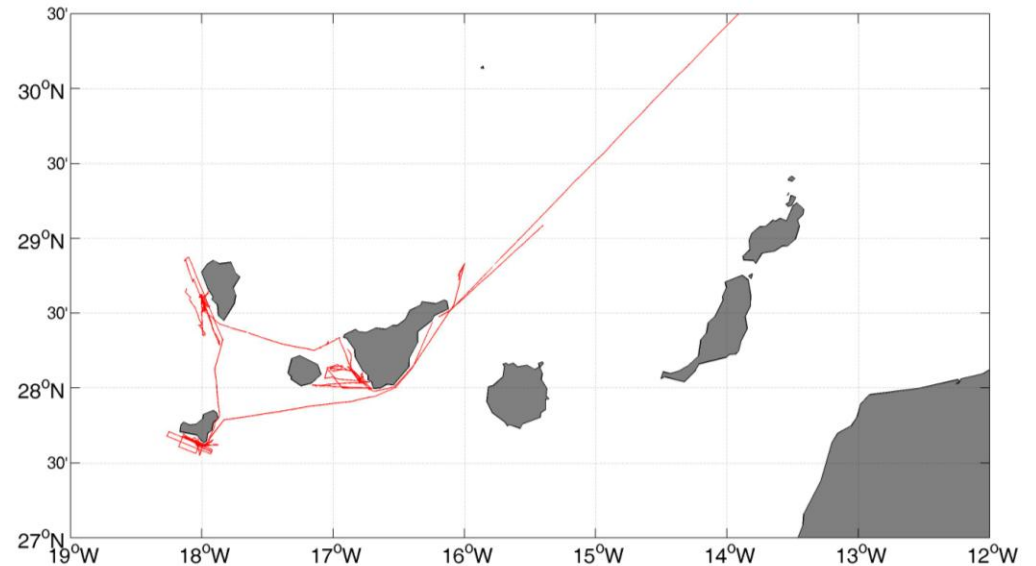


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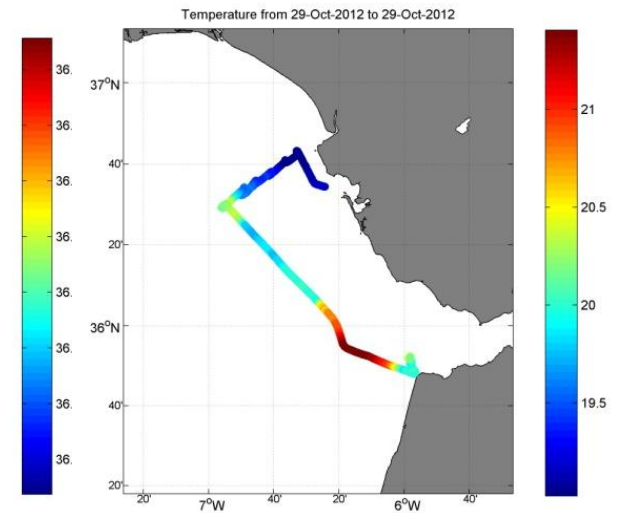
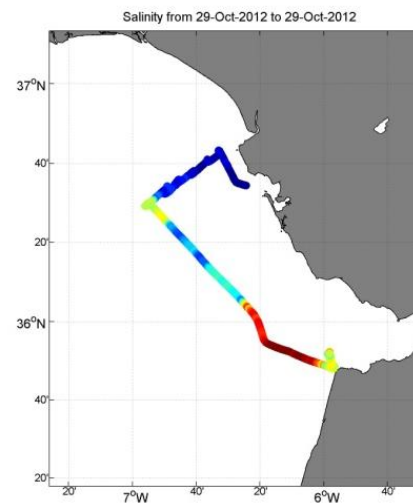


Vessels

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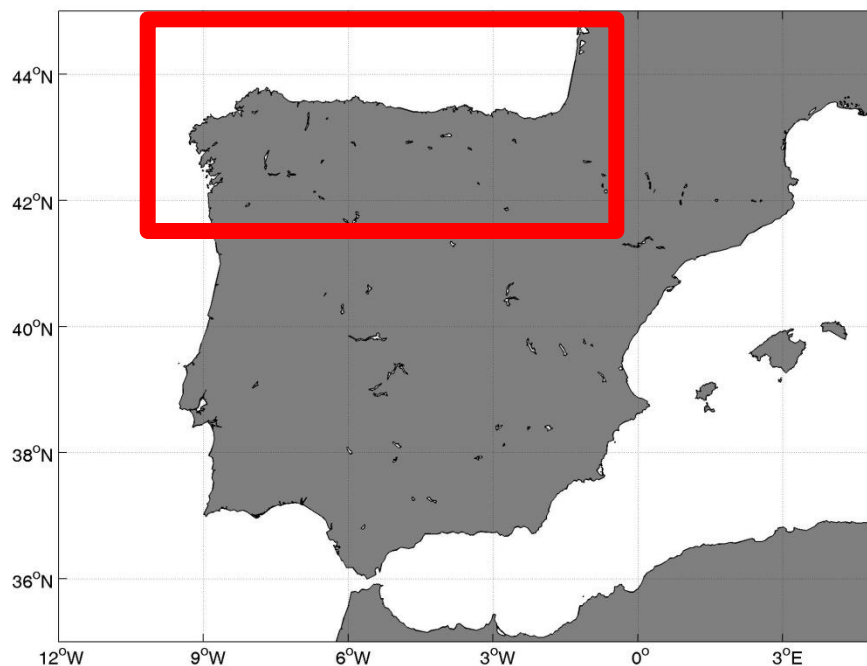


Vessels

Miguel Oliver



- Oceanic ship (70 m)
- Multidisciplinary campaign
- Fisheries assessment



Processing System

General Overview

Vessels



Data Processing



OGC Data servers



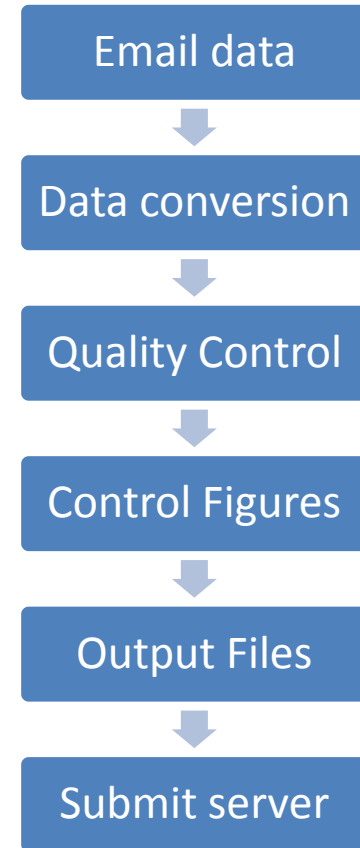
GeoServer

Final Users



Data processing system

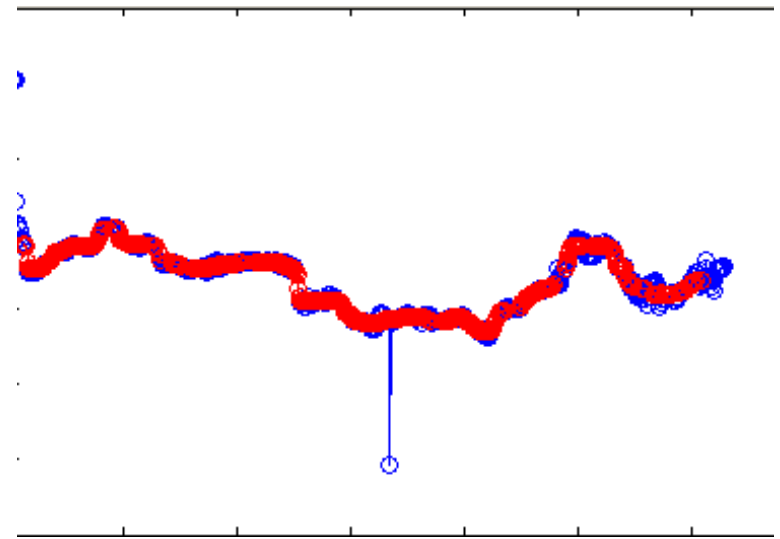
- Reception of vessel data by email
- Data conversion
- Quality Control
- Control figures.
- Convert to output formats
 - netcdf
 - shapefiles (GIS)
- Submit to data servers
 - Thredds
 - Geoserver



Data processing system

Quality Control

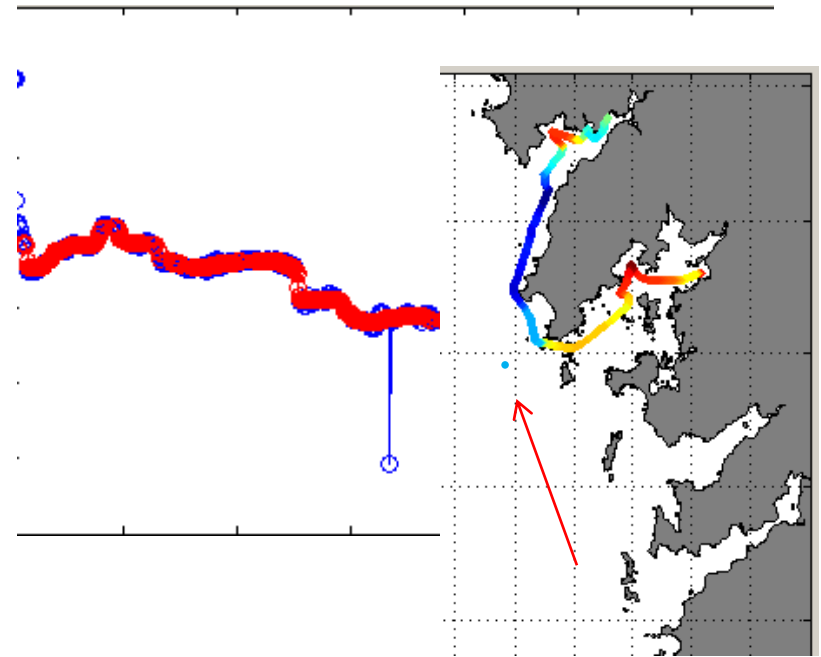
- Range filter
- Spike filters.
- Position filters
- Vessel operation filters
 - Speed filters
 - Pump errors



Data processing system

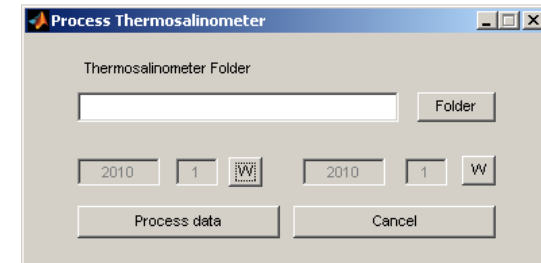
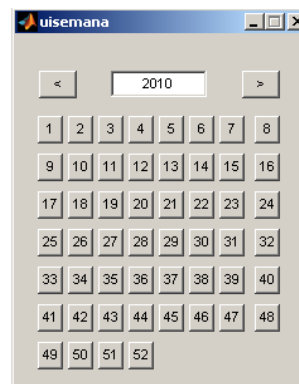
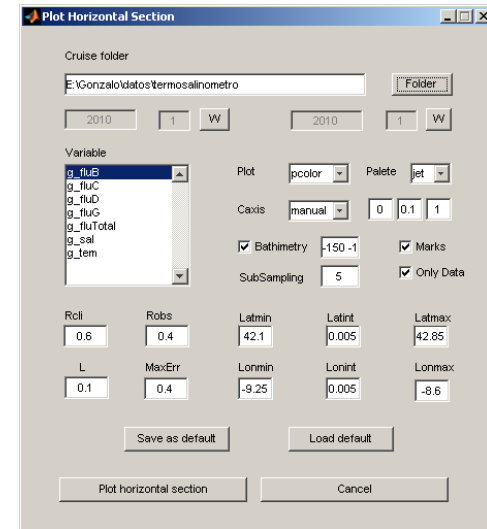
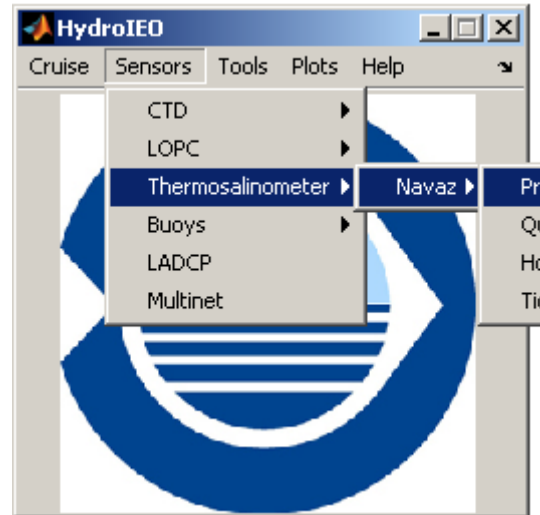
Quality Control

- Range filter
- Spike filters.
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- Vessel operation filters
 - Speed filters
 - Pump errors



Processing System Manual QC

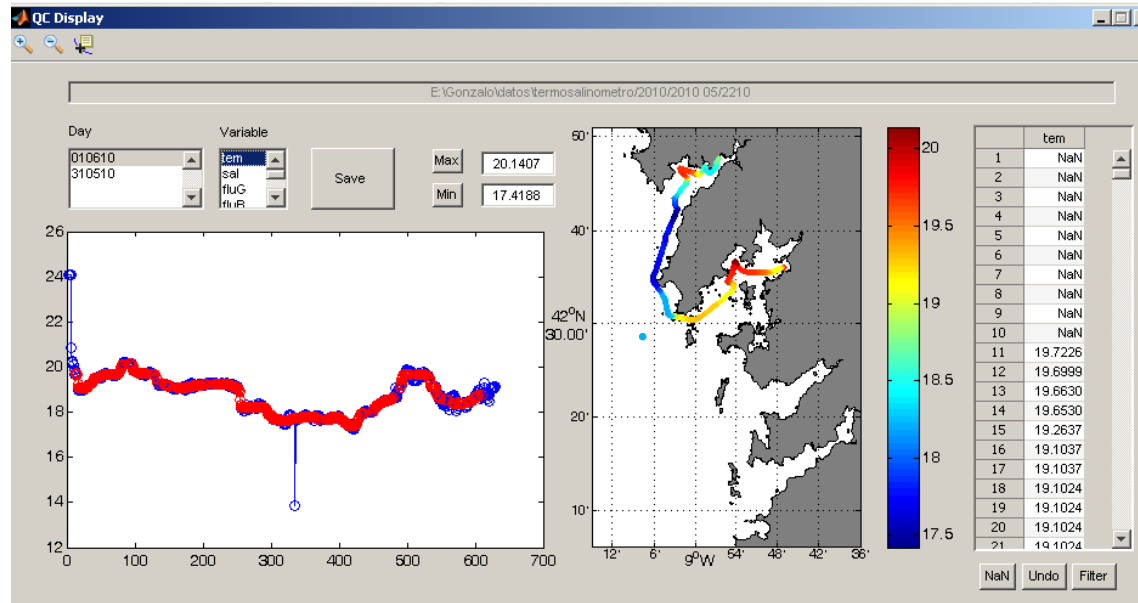
- User friendly
- Check auto-QC
- Modify and flag data manually
- Resend data to data servers



Processing System

Manual QC

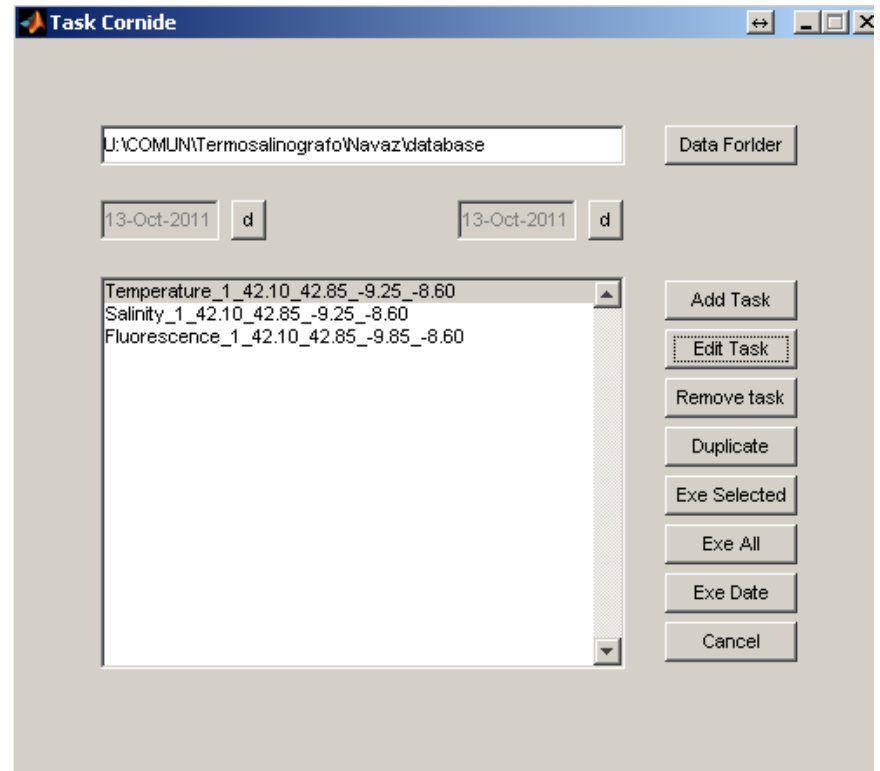
- User friendly
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- Modify and flag data manually
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Processing System

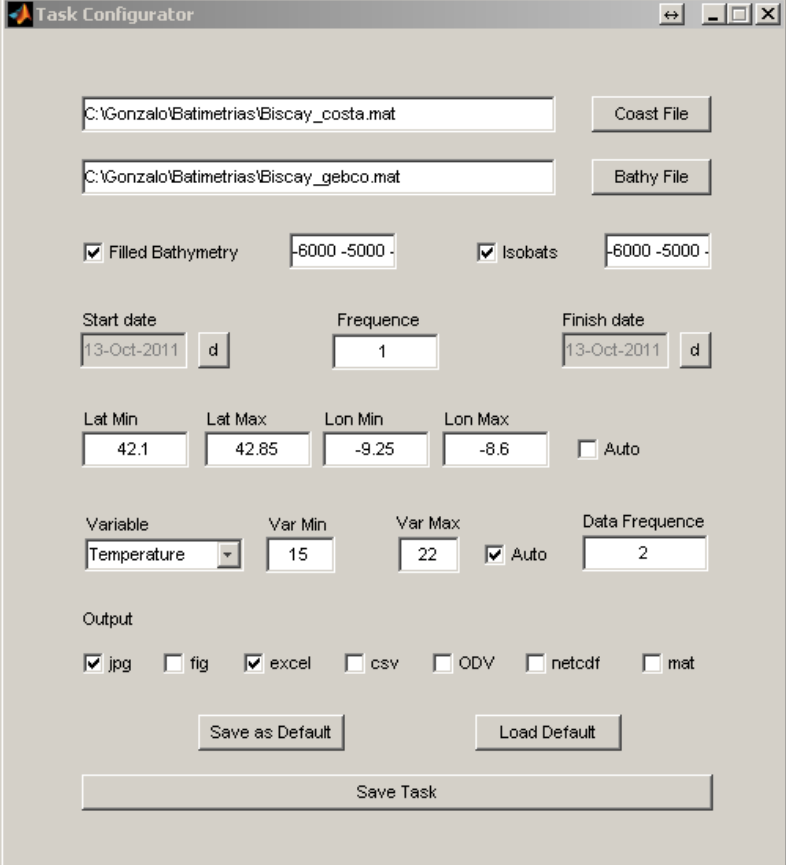
Tasks

- User Friendly
- Modular
- Configurable tasks
 - Aggregation frequencies
 - Quick figures
 - Output Formats



Processing System Tasks

- User Friendly
- Modular
- Configurable tasks
 - Aggregation frequencies
 - Quick figures
 - Output Formats



The screenshot shows the 'Task Configurator' window with the following settings:

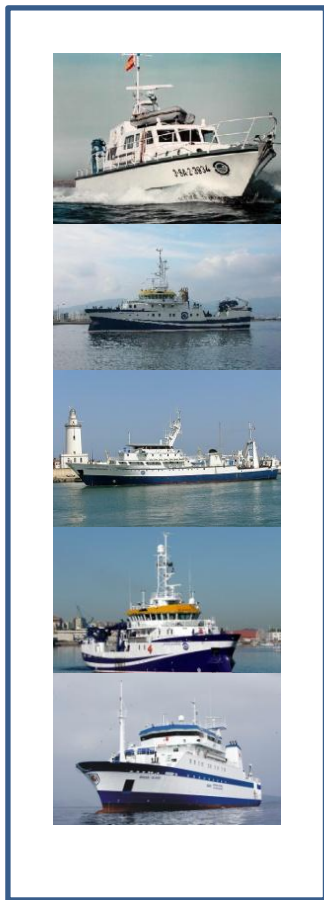
- Coast File: C:\Gonzalo\Batimetrias\Biscay_costa.mat
- Bathy File: C:\Gonzalo\Batimetrias\Biscay_gebco.mat
- Filled Bathymetry: (Range: -6000 -5000)
- Isobats: (Range: -6000 -5000)
- Start date: 13-Oct-2011 (Unit: d)
- Frequency: 1
- Finish date: 13-Oct-2011 (Unit: d)
- Lat Min: 42.1, Lat Max: 42.85, Lon Min: -9.25, Lon Max: -8.6 (Auto:)
- Variable: Temperature (Var Min: 15, Var Max: 22, Data Frequency: 2, Auto:)
- Output: jpg, fig, excel, csv, ODV, netcdf, mat
- Buttons: Save as Default, Load Default, Save Task



Data servers

General Overview

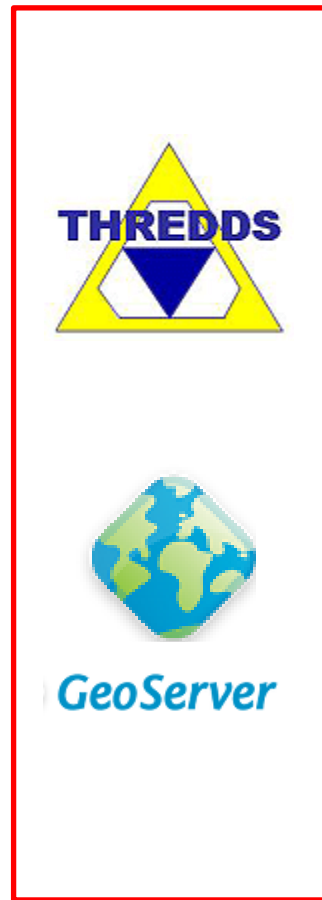
Sampling Network



Data Processing



OGC Data servers



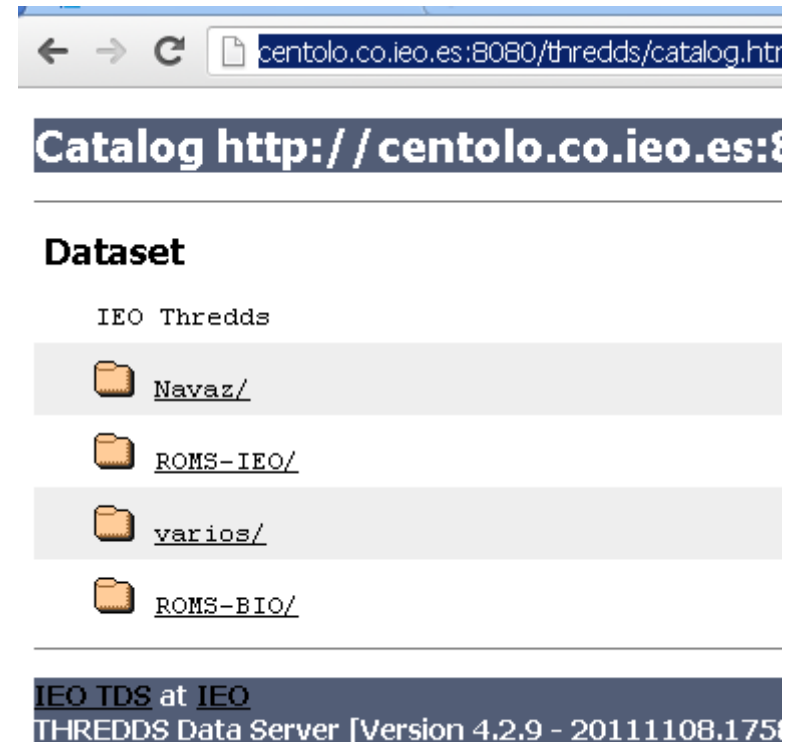
Final Users



Data servers

Thematic Realtime Environmental Distributed Data Services (Thredds)

- netCDF CF compliant
- Catalog
- OGC services
 - Data access
 - Visualization
- Ad hoc viewer
 - Openlayers
 - Google maps api

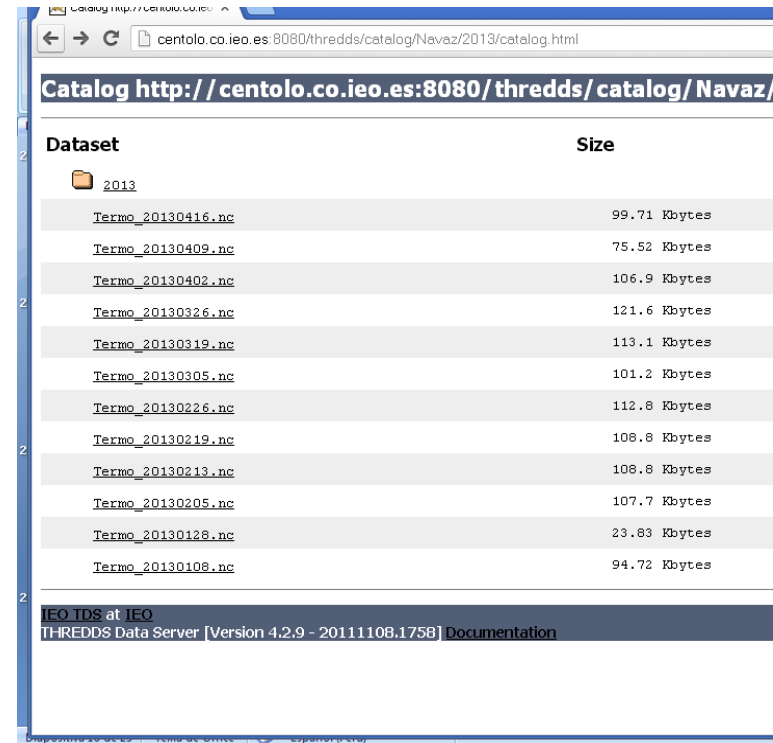


<http://centolo.co.iew.es:8080/thredds>

Data servers

Thematic Realtime Environmental Distributed Data Services (Thredds)

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Catalog [http://centolo.co.iew.es:8080/thredds/catalog/Navaz/](http://centolo.co.iew.es:8080/thredds/catalog/Navaz/2013/catalog.html)

Dataset	Size
2013	
Termo_20130416.nc	99.71 Kbytes
Termo_20130409.nc	75.52 Kbytes
Termo_20130402.nc	106.9 Kbytes
Termo_20130326.nc	121.6 Kbytes
Termo_20130319.nc	113.1 Kbytes
Termo_20130305.nc	101.2 Kbytes
Termo_20130226.nc	112.8 Kbytes
Termo_20130219.nc	108.8 Kbytes
Termo_20130213.nc	108.8 Kbytes
Termo_20130205.nc	107.7 Kbytes
Termo_20130128.nc	23.83 Kbytes
Termo_20130108.nc	94.72 Kbytes

IEO TDS at IEO
THREDDS Data Server [Version 4.2.9 - 20111108.1758] [Documentation](#)

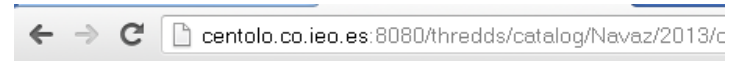


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Data servers

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IEO TDS

THREDDS Data Server

Catalog <http://centolo.co.iew.es:8080/thredds/catalog/Navaz/2013/c>

Dataset: 2013/Termo_20130416.nc

- Data size: 99.71 Kbytes
- ID: Navaz/2013/Termo_20130416.nc

Access:

1. **OPENDAP:** [/thredds/dodsC/Navaz/2013/Termo_20130416.nc](#)
2. **HTTPServer:** [/thredds/fileServer/Navaz/2013/Termo_20130416.nc](#)
3. **NetcdfSubset:** [/thredds/ncss/grid/Navaz/2013/Termo_20130416.nc](#)
4. **WCS:** [/thredds/wcs/Navaz/2013/Termo_20130416.nc](#)
5. **WMS:** [/thredds/wms/Navaz/2013/Termo_20130416.nc](#)

Dates:

- 2013-04-16 12:41:00Z (**modified**)

Viewers:

- NetCDF-Java ToolsUI (webstart)
- Godiva2 (browser-based)

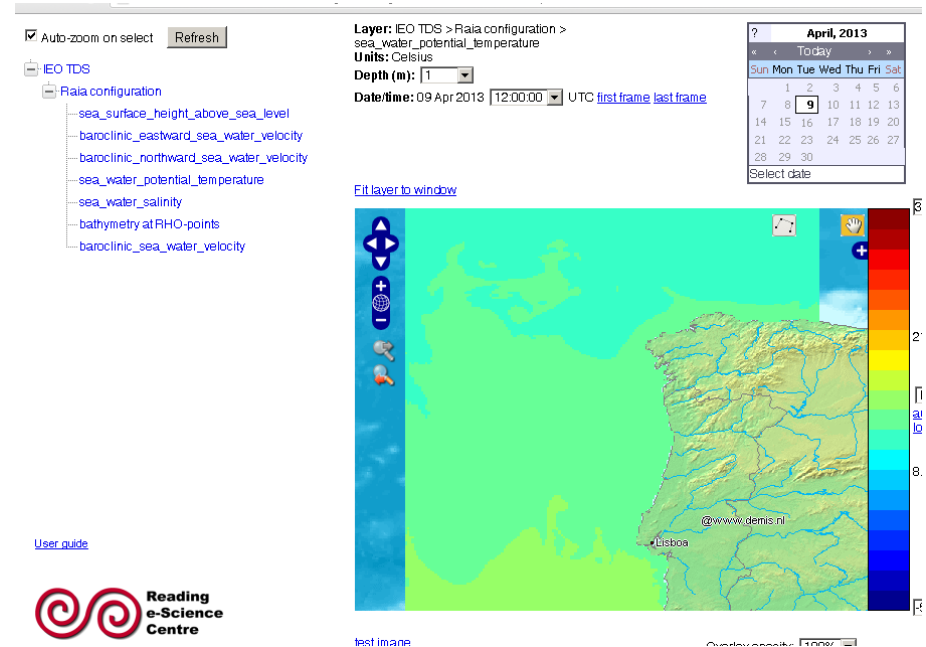


<http://centolo.co.iew.es:8080/thredds>

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<http://centolo.co.ieo.es:8080/thredds>

Data servers

Geoserver

- Shapefile (GIS)
- OGC services
 - Visualization
 - Google earth
 - Openlayers
- Ad hoc viewer
 - Openlayers
 - Google maps api

GeoServer

Nombre de usuario Contraseña Recuérdame

Previsualización de capas

Despliega todas las capas configuradas en GeoServer y proporciona una vista previa en varios formatos.

<< < | > >> Resultados 1 a 18 (de 0 encontrados en 18 items)

Tipo	Nombre	Título	Formatos habituales	Todos los formatos
	Termosal:h	bathymetry at RHO-points	OpenLayers KML	Seleccionar una Seleccionar una
•	Termosal:merged_2312_sal	merged_2312_sal	OpenLayers KML GML	WMS AtomPub GIF GeoRSS GeoTiff GeoTiff 8-bits JPEG KML (comprimido) KML (enlace de red) KML (sencillo) OpenLayers PDF PNG 8bit SVG Tiff Tiff 8-bits WFS
•	Termosal:merged_2512_sal	merged_2512_sal	OpenLayers KML GML	
•	Termosal:Termosal_Navaz_sal	Salinidad Navaz	OpenLayers KML GML	
•	Termosal:Termosal_Navaz_tem	Temperatura Navaz	OpenLayers KML GML	
•	Termosal:merged_2312_tem	merged_2312_tem	OpenLayers KML GML	
•	Termosal:merged_2512_tem	merged_2512_tem	OpenLayers KML GML	

<< < | > >> Resultados 1 a 18 (de 0 encontrados en 18 items)

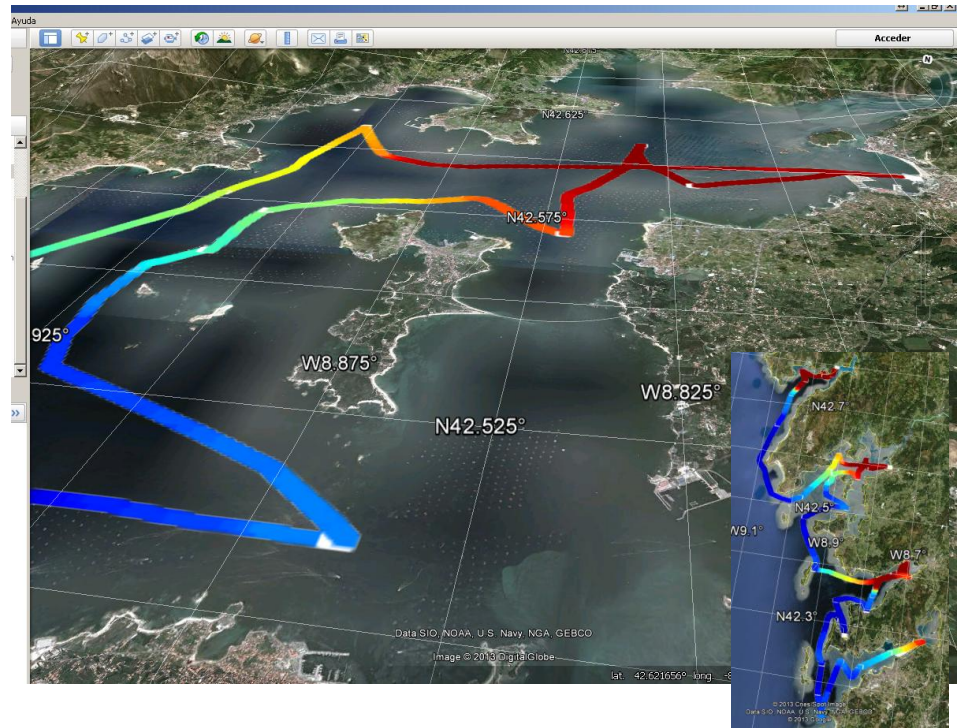


<http://centolo.co.ieo.es:8080/geoserver>

Data servers

Geoserver

- Shapefile (GIS)
- OGC services
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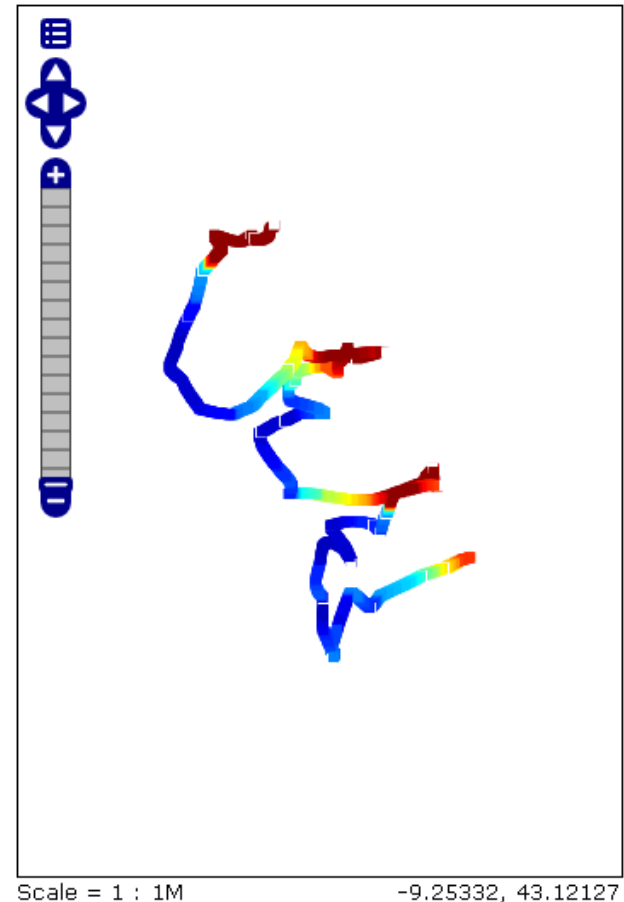


<http://centolo.co.iew.es:8080/geoserver>

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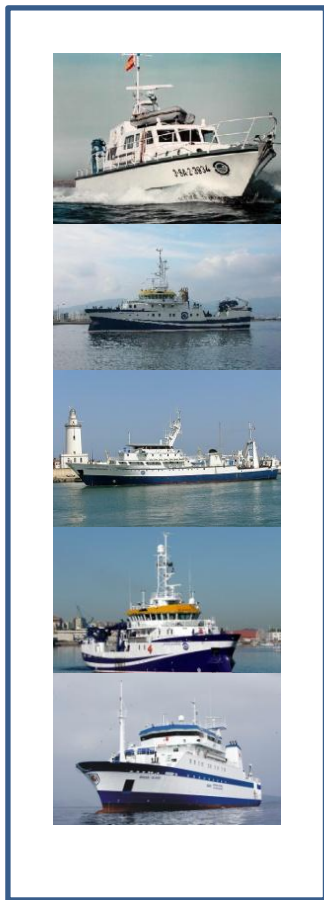


<http://centolo.co.iew.es:8080/geoserver>

Data examples

General Overview

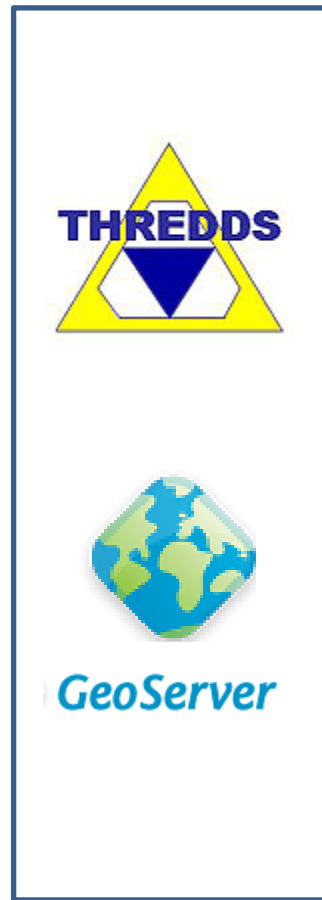
Sampling Network



Data Processing



OGC Data servers



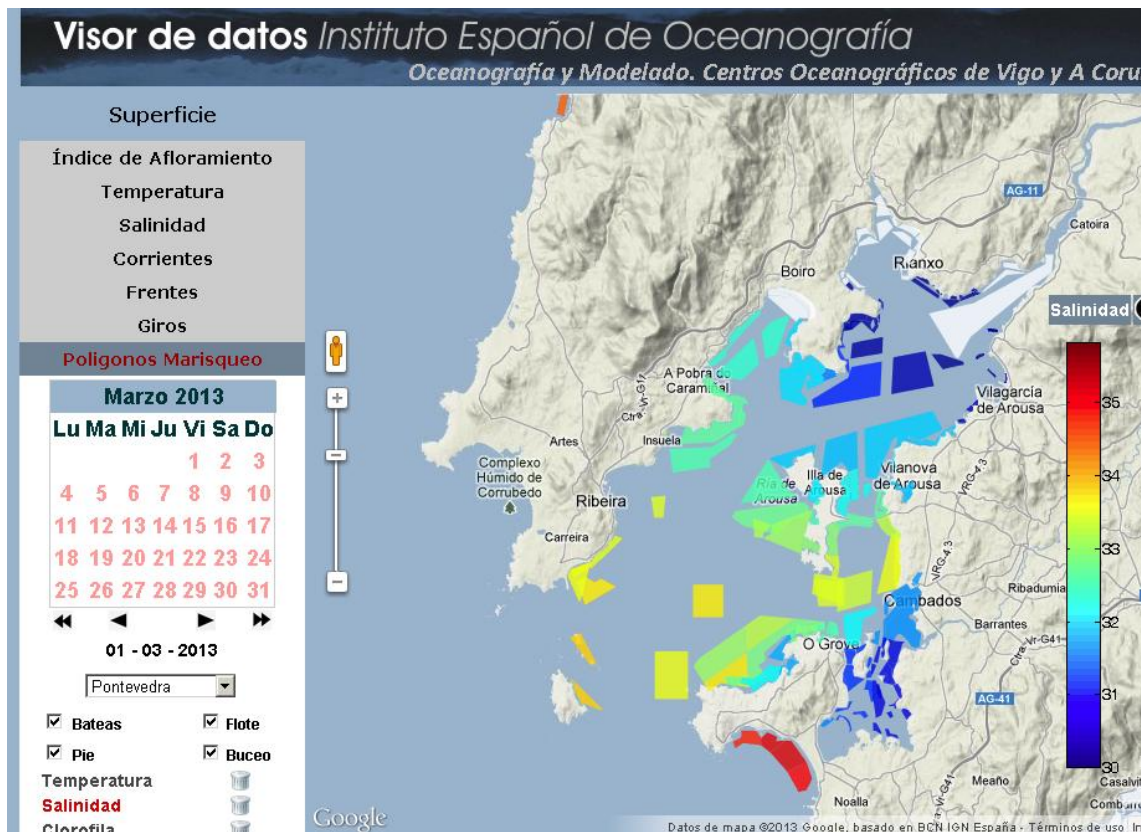
Final Users



Data examples

Shellfishing Environmental Data Information System

- Operational ROMs
- Daily update
- Present data and predictions
- Historic data
- Vessels data to validate



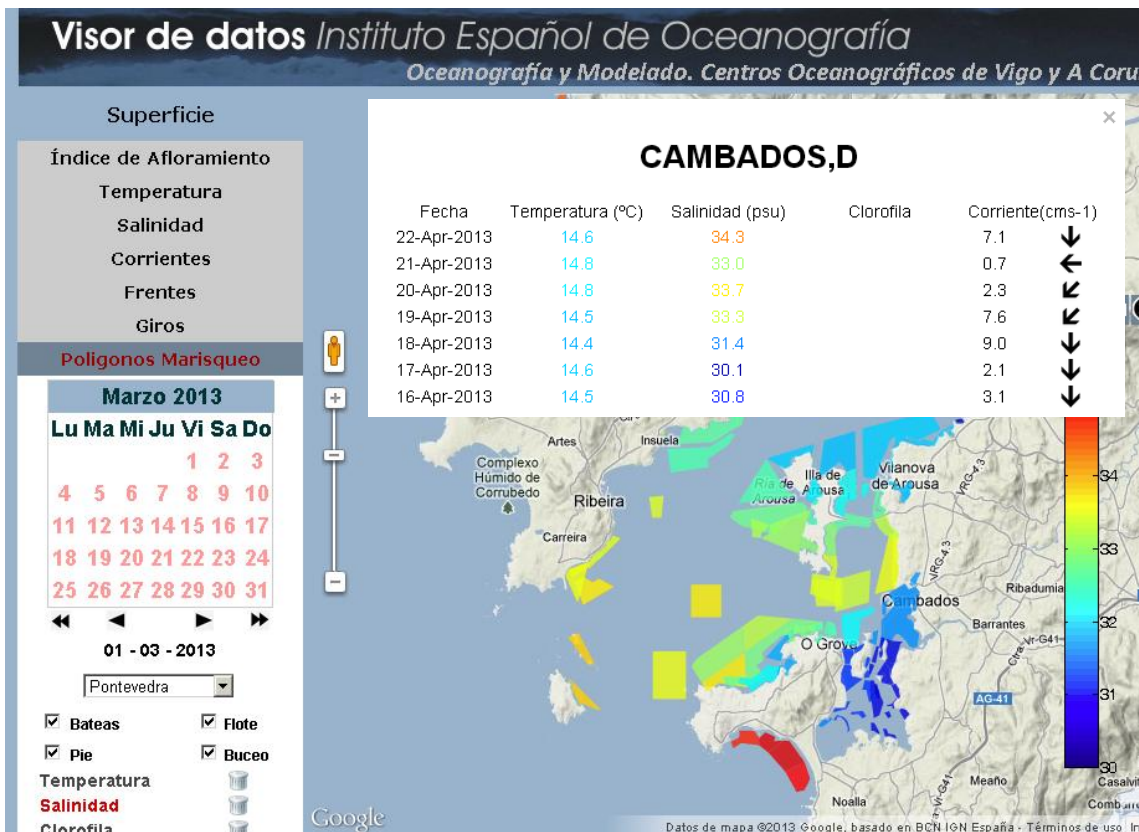
<http://www.indicedeafloramiento.ieo.es>



Data examples

Shellfishing Environmental Data Information System

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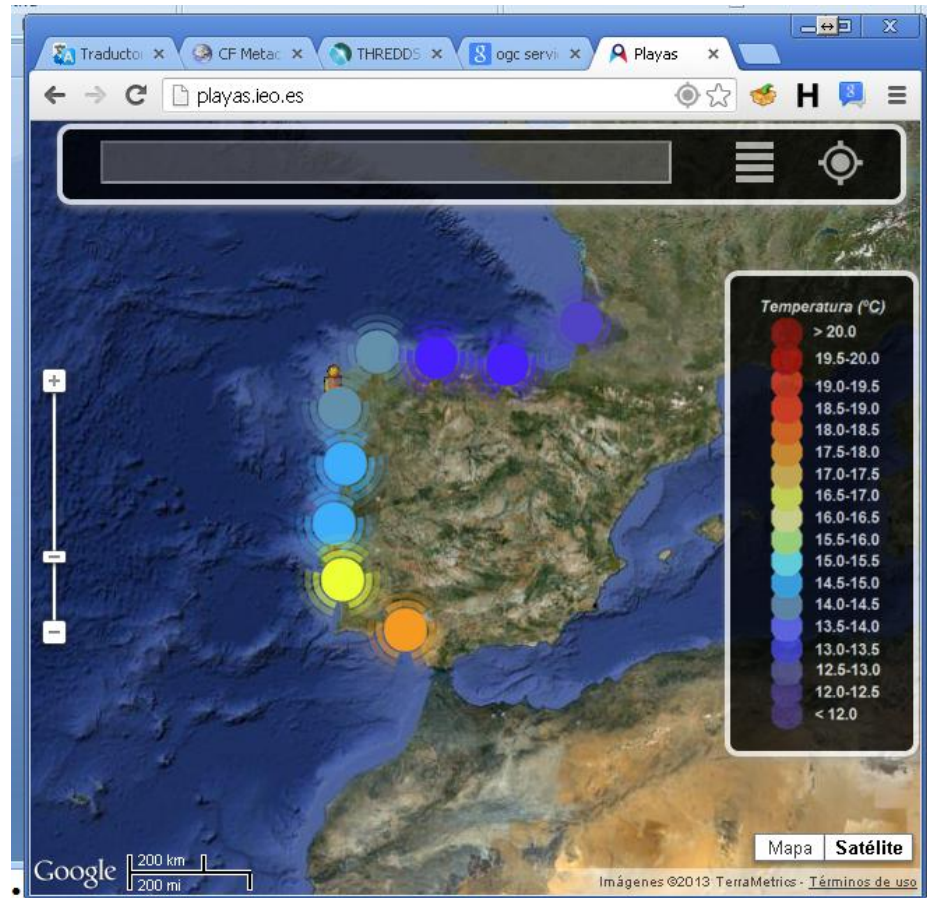
<http://www.indicedeafloramiento.ieo.es>



Data examples

Beach Environmental Data Information System

- Operational ROMs
- Daily update
- Present data and predictions
- Hourly environmental information
- Vessels data to validate

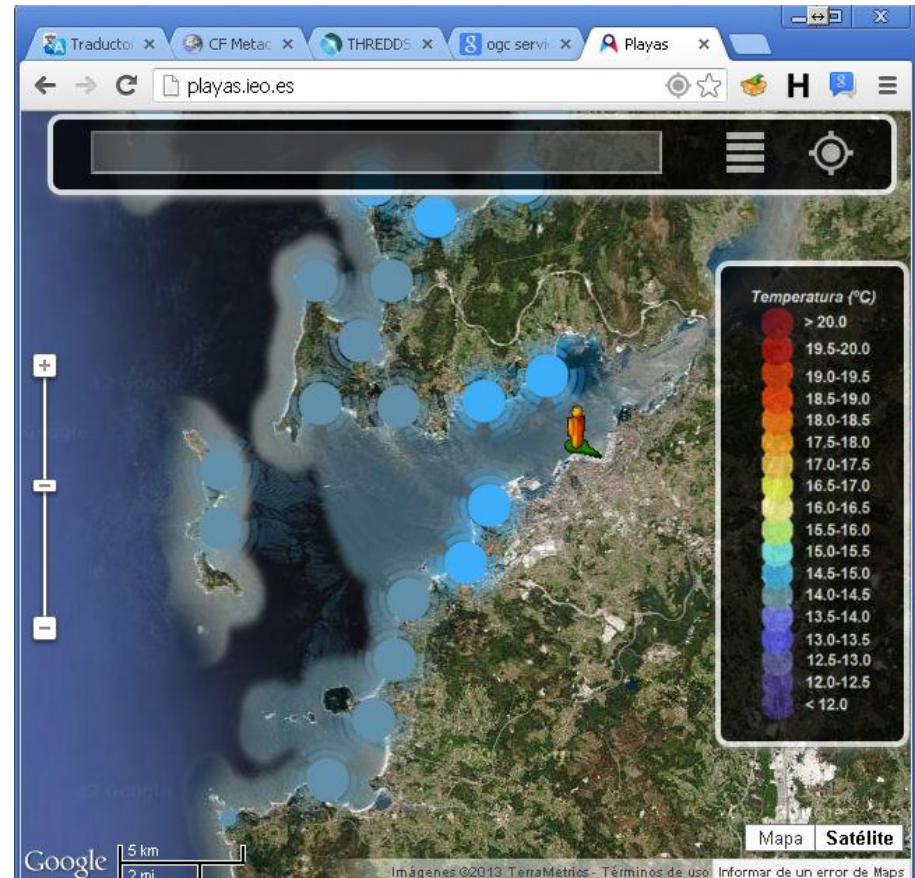


<http://playas.ieo.es>

Data examples

Beach Environmental Data Information System

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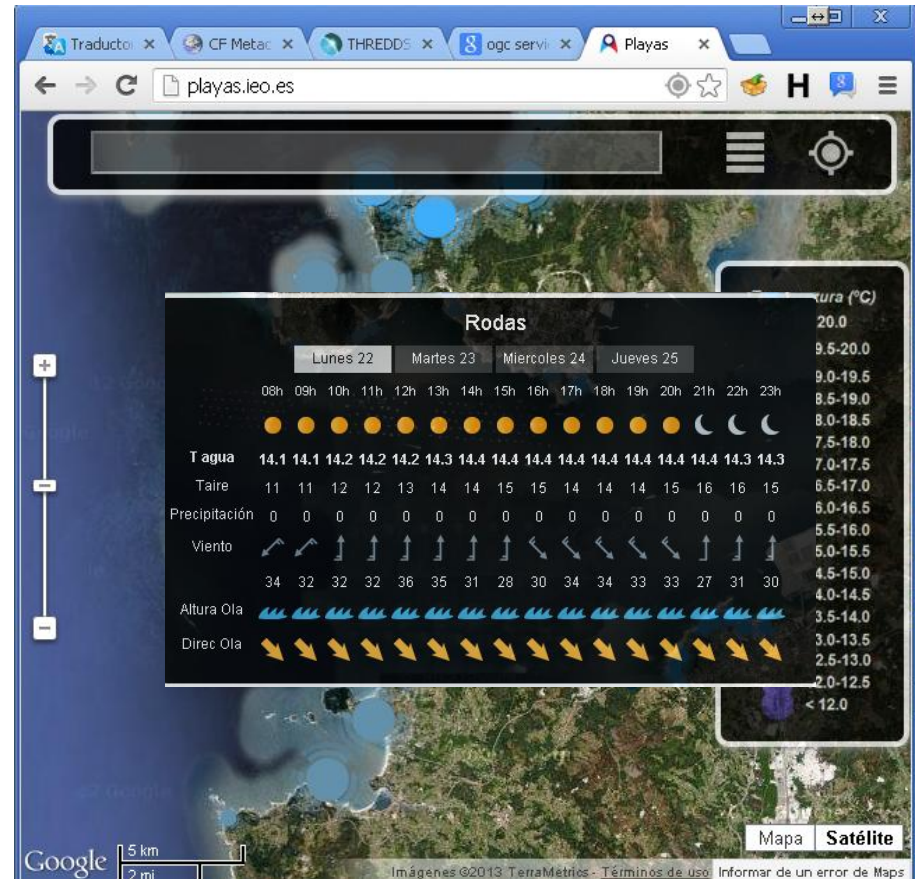


<http://playas.ieo.es>

Data examples

Beach Environmental Data Information System

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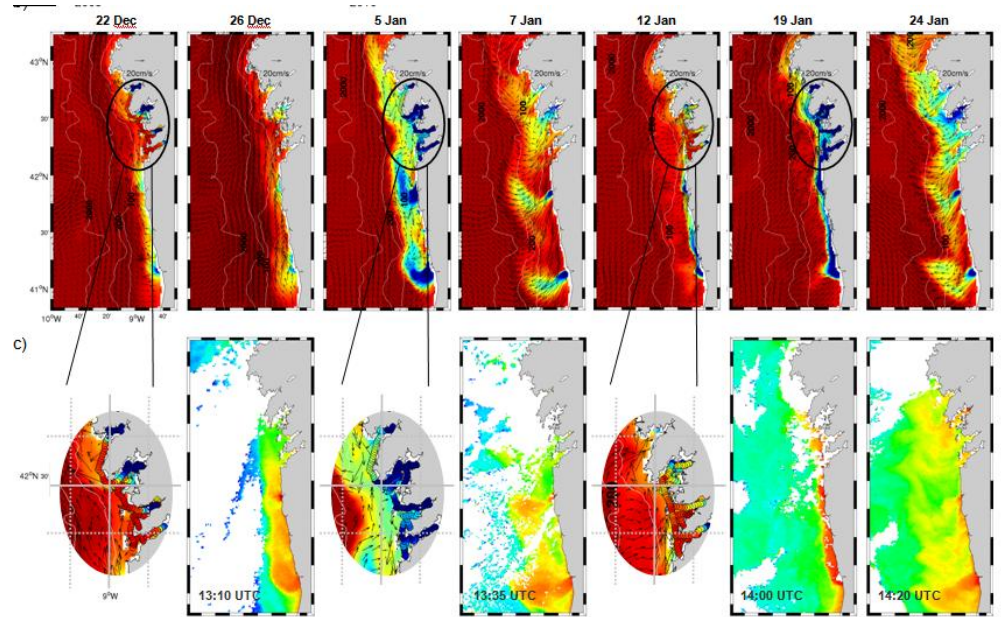


<http://playas.ieo.es>

Data examples

Validation of River Plume Expansion-Contraction event

- Expansión contraction of Iberian Bouyant plume 2011
- Validation of ROMs model with thermosalinograph and satellite data



Otero et al. 2013

Work In Progress

- Sampling Network is operative.
- The Data processing system is 90 % developed
 - Finish Data server updating
- Adapt the software and data servers to implement Inspire metadata format
- Development of ad hoc viewer



Future?





Thank you
for your attention

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Image © 2013 DigitalGlobe

Google earth

lat. 42.621656° long. -8.947970° elev. 95 m alt. ojd 5.59 km