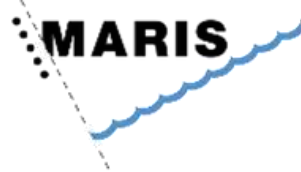


27-29 May 2024 



imdis

International conference on **Marine Data** and Information **Systems**



EMODnet near real time river data and land boundary condition services

Francisco Campuzano, Antonio Novellino, Patrick Gorringe, Caio Fonteles, Luís Figueiredo, Marco Alba

EMODnet Physics

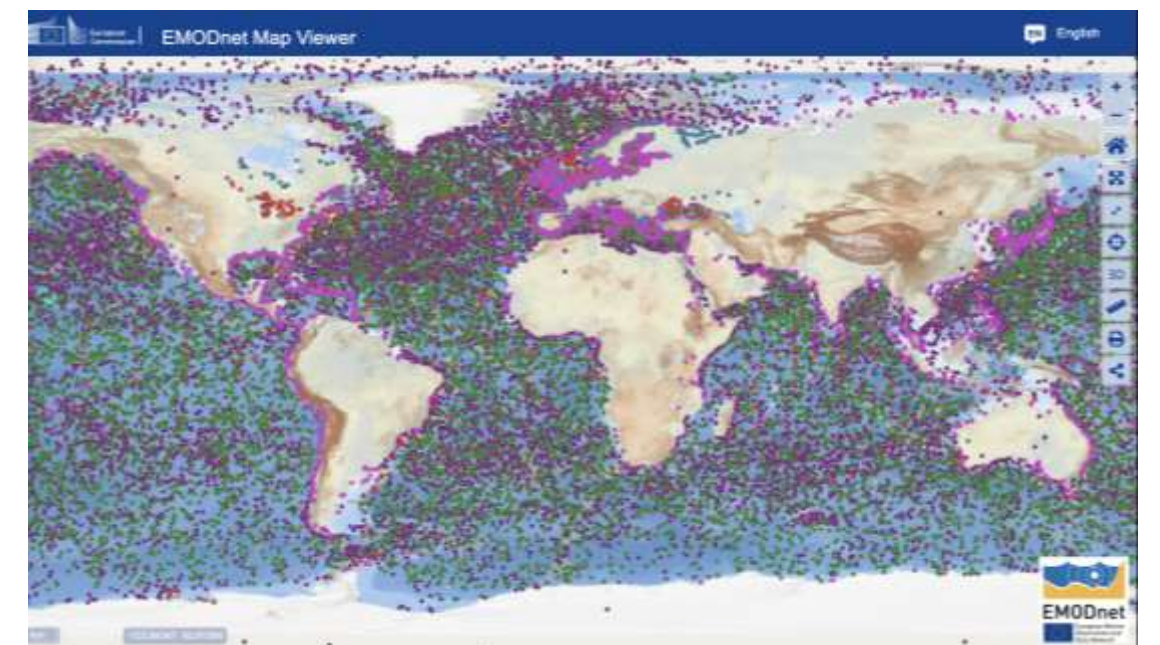
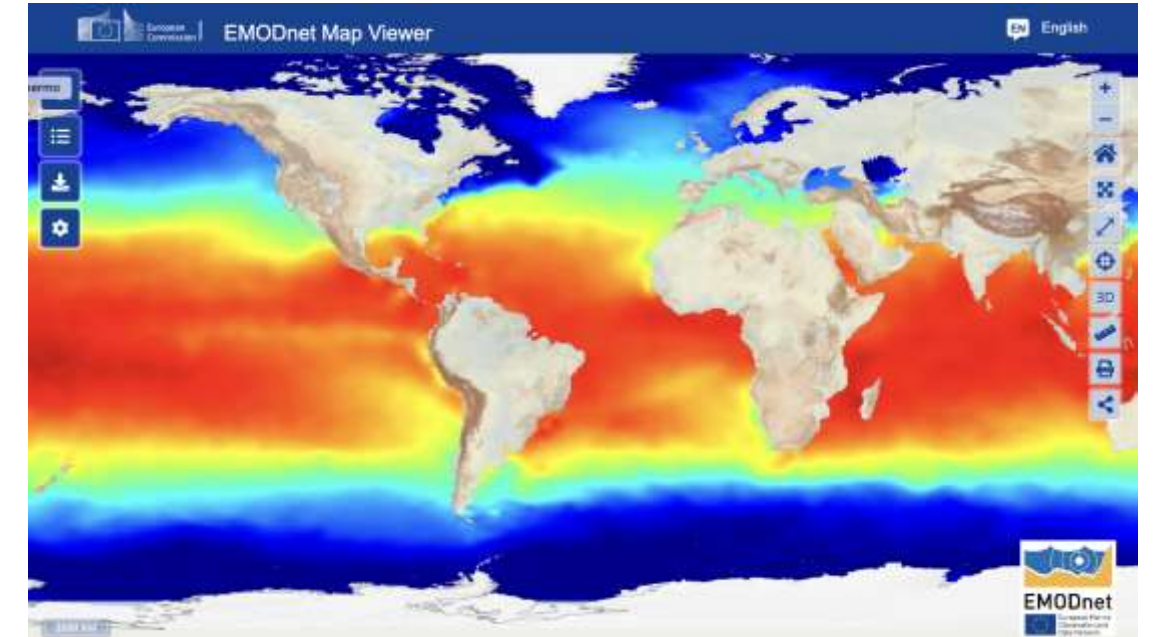
- **focus on coastal offer**

- **in situ FAIR** data and products
- integrates and makes available **near real time and delayed** mode data on ocean physics
- builds on **marine data infrastructures and programs**
- **common standards** and tools

Parameters

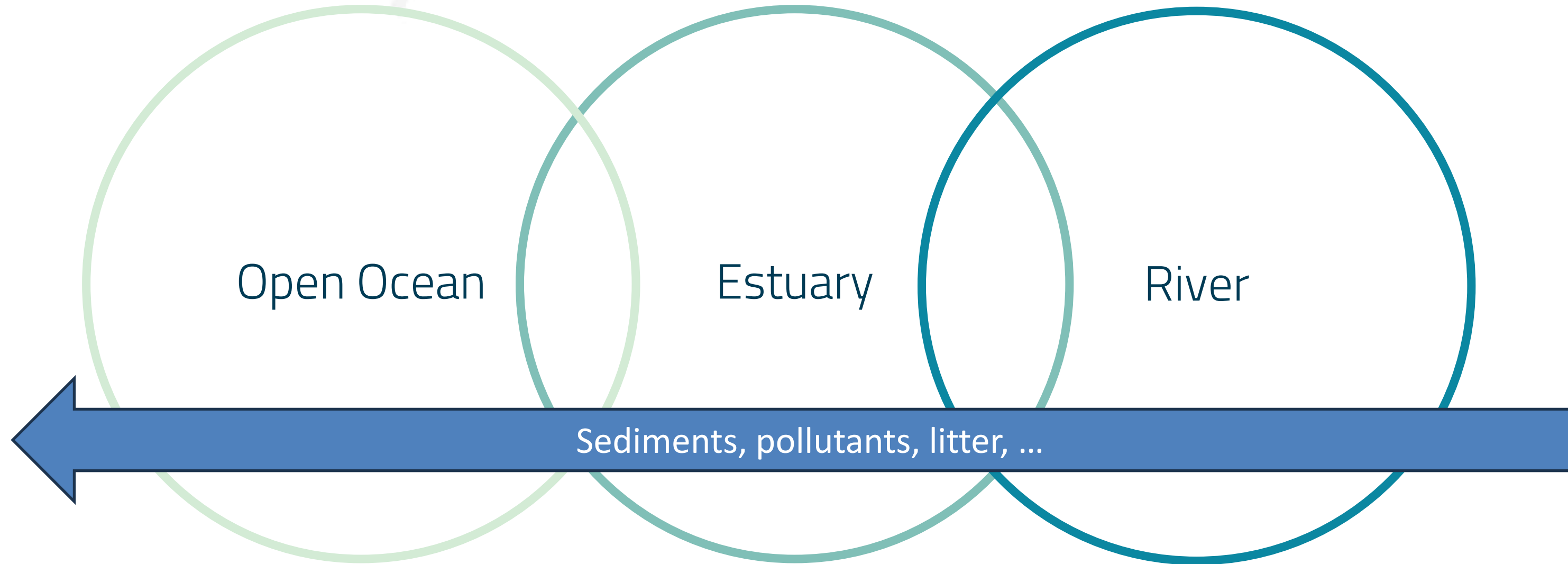
Temperature, Salinity, Sea Level, Currents, Waves and Winds, Optical properties of the water, Under water noise, Ice data, River runoff, Meteorological data at sea level

- **continuous data flow**
 - 950 Rivers, 2200 Sea Level stations, 2300 Mooring, ...
 - 330 Vessels data, ...



Integrated water cycle approach/Water Continuum

- Coastal water are deeply influenced by river outflow



Complete description at:

Campuzano F (2018). Coupling watersheds, estuaries and regional seas through numerical modelling for Western Iberia. PhD Thesis, Instituto Superior Técnico, Universidade de Lisboa, Portugal.

Ocean (modeling) community needs

- OceanPrediction Workshop 15th June 2023

improving the coastal circulation in regional ocean model needs a better characterisation of the land-ocean boundary conditions

2 participants typing

8

Which are the main gaps for ocean forecasting today in the region?

Land-sea interactions

biogeochemistry

high resolution biogeochemistry

link watershed models to coastal models

observations in south Med

River input

data assimilation

resolution

high-res atmospheric models

Coastal resolution

Atm-Oce Coupling at Coastal Scale

in at
o.com
4567

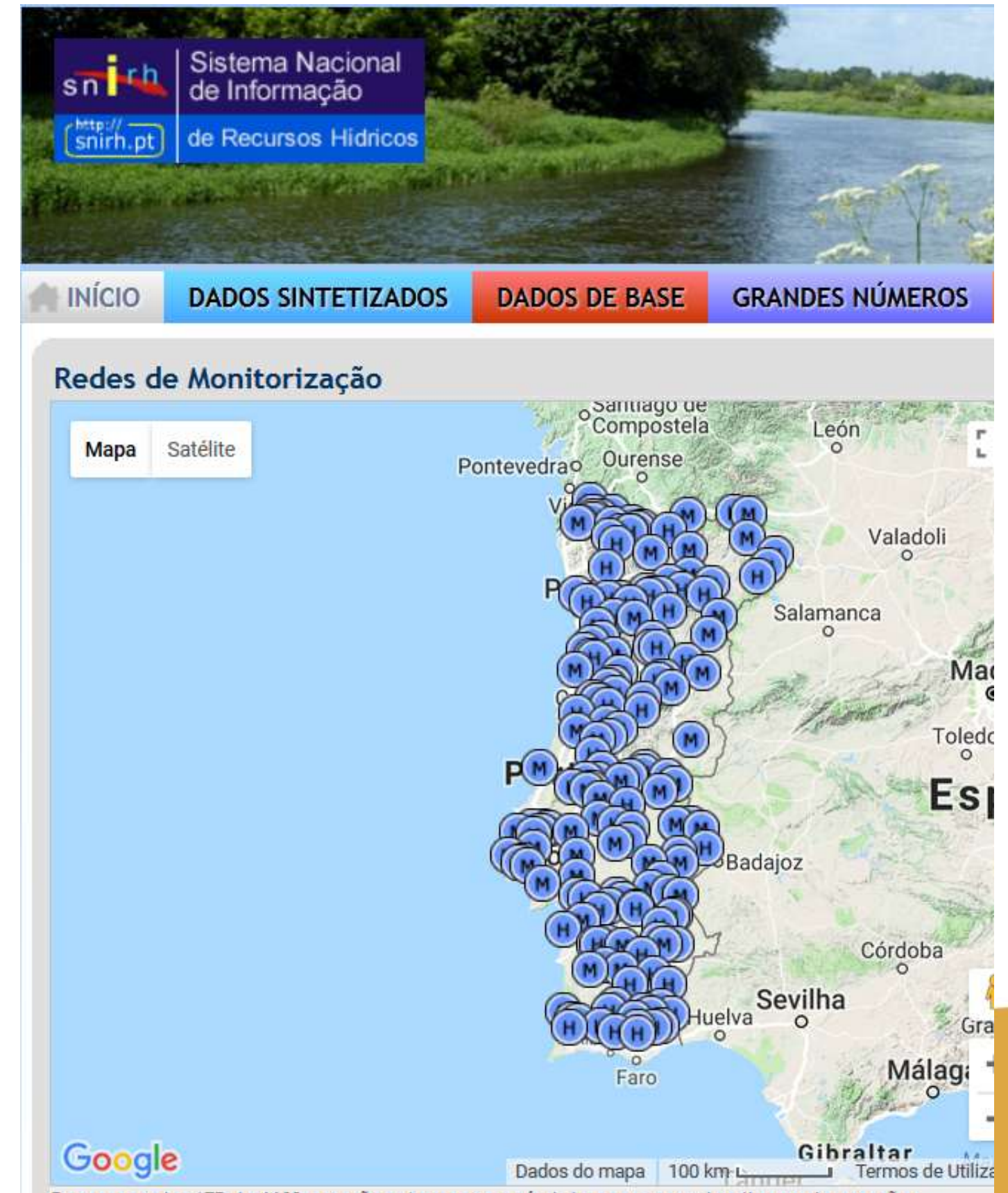
Participantes 24
Chat 6
Compartilhar tela
Gravar
Reações
Aplicativos
Quadros brancos

The screenshot shows a Zoom meeting interface. At the top, it indicates '2 participants typing' and a page number '8'. The main content is a poll question: 'Which are the main gaps for ocean forecasting today in the region?'. Below the question is a word cloud of responses. The most prominent response is 'River input', which is significantly larger than the others. Other responses include 'Land-sea interactions', 'biogeochemistry', 'high resolution biogeochemistry', 'link watershed models to coastal models', 'observations in south Med', 'data assimilation', 'resolution', 'high-res atmospheric models', 'Coastal resolution', and 'Atm-Oce Coupling at Coastal Scale'. On the left side of the screen, there is a QR code and some partially visible text: 'in at', 'o.com', and '4567'. At the bottom, the Zoom control bar is visible with icons for 'Participantes' (24), 'Chat' (6), 'Compartilhar tela', 'Gravar', 'Reações', 'Aplicativos', and 'Quadros brancos'.

EMODnet Physics

Setting up the EU River node

- Identify the **main river** inputs and the **institutions** responsible for setting up and maintaining the hydrographic networks;
- Select the **most reliable stations** near the coastal area. Coastal/ocean **local experts'** contribution is important;
- Provide the river observations in a one stop shop and with a common format and metadata information;
- **operational** service for **daily** river data
- **Comprehensive** river data trying to estimate properly freshwater budget. Not only major rivers;
- Include estuarine mixing with proxies;
- Complete the observations with complementary properties.



EMODnet Physics

- Why an operational river data node?



la Repubblica

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adv

for Cyber Monday.
oud All Apps for the first year. Buy now Adobe

ISTA

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Alluvione in Emilia Romagna, il meteorologo: "Danni dell'acqua aggravati dalla siccità"

di Giacomo Talignani

Secondo Pierluigi Randi "in tre giorni è caduta la pioggia di tre mesi. Ma questo è il nuovo clima, ormai non è più un modello ma una realtà. Dobbiamo prepararci con tutti i mezzi"



EMODnet Physics

- <https://emodnet.ec.europa.eu/geoviewer/>

The screenshot displays the EMODnet Map Viewer interface. At the top, the browser address bar shows the URL emodnet.ec.europa.eu/geoviewer/. The interface includes a navigation bar with the European Commission logo, the title "EMODnet Map Viewer", and a language selector set to "English".

On the left side, there is a "Layers" panel with a "Catalogue" tab. The "EMODnet Physics" layer is expanded, showing a list of data layers: "In situ data", "Alkalinity", "Noise", "Optical properties", "River outflow", "Salinity", "Sea level", "Temperature", and "Wind". Below this list are sections for "EMODnet Seabed Habitats" and "EU-China EMOD-PACE project". At the bottom of the panel, there are search fields for "Marine regions" and "Change basemap" (currently set to "OpenStreetMap").

The main area of the interface is a map of Europe and the Mediterranean region, showing various geographical features and data layers. The map includes labels for major cities and countries. On the right side of the map, there is a vertical toolbar with navigation and interaction tools, including a home button, a 3D view button, and a search button.

At the bottom of the map, there is a scale bar showing 500 km and a coordinate display: -367.60705, 49.83610. The bottom right corner features the EMODnet logo and the text "© OpenStreetMap contributors".

EMODnet Physics

emodnet.ec.europa.eu/geoviewer/

Hoort - Station st... Progetti RAISE - S... Gridded data, Net... Delayed mode dat...

EMODnet Map Viewer English

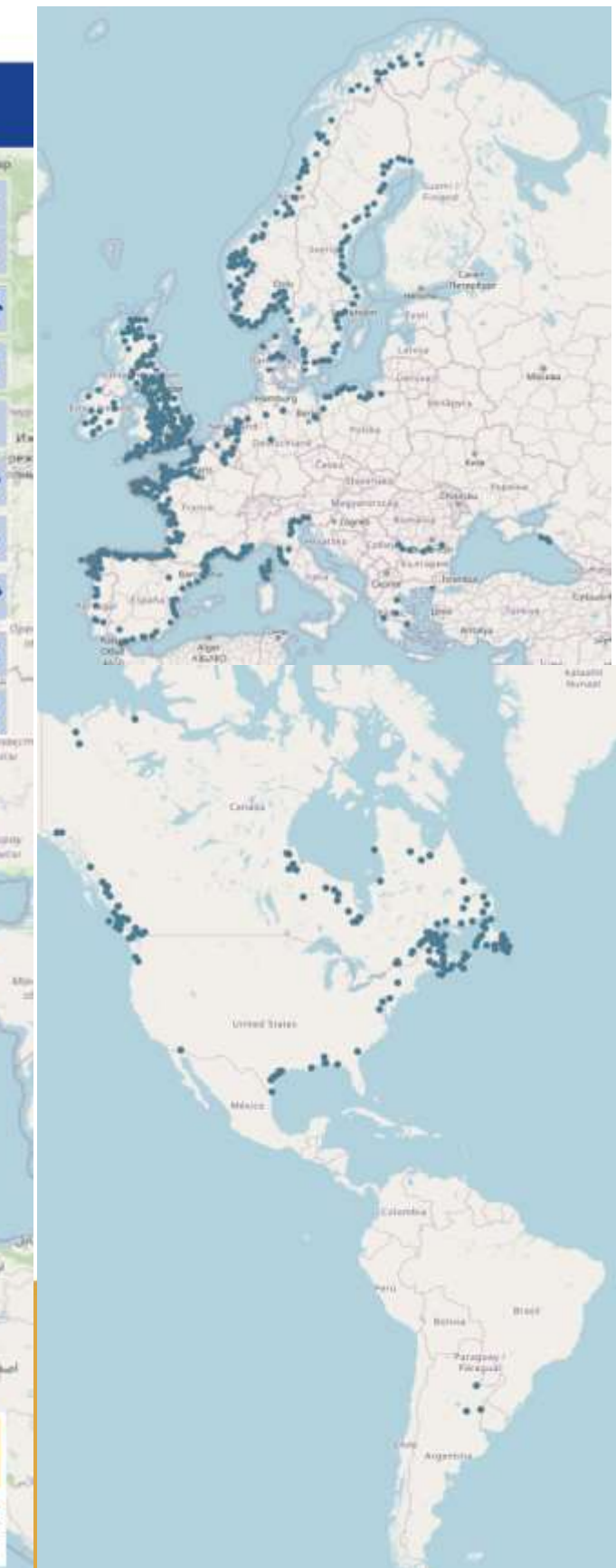
Layers | **Catalogue**

- EMODnet Biology
- EMODnet Chemistry
- EMODnet Geology
- EMODnet Human Activities
- EMODnet Physics
 - .In situ data
 - Alkalinity
 - Noise
 - Optical properties
 - River outflow
 - River outflow
 - Salinity
 - Sea level
 - Temperature
 - Wind
- EMODnet Seabed Habitats

+ Add external layers

Marine regions: Search for a region ...

Change basemap: OpenStreetMap



OpenStreetMap contributors

EMODnet Physics

The screenshot shows the EMODnet Map Viewer interface. The browser address bar displays `emodnet.ec.europa.eu/geoviewer/`. The page title is "EMODnet Map Viewer" with a language selector set to "English".

The interface is divided into several sections:

- Layers:** A sidebar on the left lists various data categories such as "EMODnet Biology", "EMODnet Chemistry", "EMODnet Geology", "EMODnet Human", "EMODnet Physics", and "EMODnet Seabed".
- Catalogue:** A central panel displays a data entry for "PoPontelagoscuro". It includes the ARPAE logo and a table with the following information:

Platform link	Platform name	Data Center/Provider	
	PoPontelagoscuro	ARPA EMILIA-ROMAGNA, SERVIZIO METEOROLOGICO REGIONALE	
Most recent data	Latitude	Longitude	Assembly Center
27/11/2023	44.888	11.608	+ATLANTIC CoLAB, Portugal

Below the table are buttons for "Prepare download link" and "Download Data". A note states "Made available by EMODnet Physics".
- Graph:** A line graph titled "NRT - river water flow - m3/second" for the period "10/28/2023 - 11/28/2023". The y-axis is labeled "m3/second" and ranges from 0 to 4k. The x-axis shows dates from 1. Nov to 28. Nov. A blue arrow points to the graph.
- Map:** A map of Europe with a focus on Italy, showing the location of PoPontelagoscuro. A context menu is open over the map with options: "Download PNG image", "Download XLS", and "Download CSV".
- Bottom Panel:** Includes "Marine regions" (Search for a region) and "Change basemap" (OpenStreetMap).

- Altro
- PoPontelagoscuro_012023.nc
 - PoPontelagoscuro_022022.nc
 - PoPontelagoscuro_022023.nc
 - PoPontelagoscuro_032022.nc
 - PoPontelagoscuro_032023.nc
 - PoPontelagoscuro_042022.nc
 - PoPontelagoscuro_042023.nc
 - PoPontelagoscuro_052022.nc
 - PoPontelagoscuro_052023.nc
 - PoPontelagoscuro_062022.nc
 - PoPontelagoscuro_062023.nc
 - PoPontelagoscuro_072022.nc
 - PoPontelagoscuro_072023.nc
 - PoPontelagoscuro_082022.nc
 - PoPontelagoscuro_082023.nc

EMODnet Physics

Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	W M S	Source Data Files	Title	Summary	FGDC, ISO, Metadata	Background Info	RSS	E mail	Institution	Dataset ID
	set	data	graph			EMODnet Physics - Collection of river flow (SDN:P02::RVDS) variables - MultiPointsObservation	?	F I M	background	RSS	✉	EMODnet Physics	ERD_EP_RVDS_INSITU
	set	data	graph		files	EMODnet Physics - Collection of river flow (SDN:P02::RVDS) variables - MultiPointsObservation - METADATA	?	F I M	background	RSS	✉	EMODnet Physics	ERD_EP_RVDS_INSITU_METADATA

- https://data-erddap.emodnet-physics.eu/erddap/tabledap/ERD_EP_RVDS_INSITU_METADATA.html
- https://data-erddap.emodnet-physics.eu/erddap/tabledap/ERD_EP_RVDS_INSITU.html

Anker-Polesworth	Anker river at Polesworth station (GRDC code 6606660)	52.627223	-1.613106	timeSeries	2022-12-14T09:00
Anllons-Carballo	Anllons-Carballo	43.21009826660156	-8.692700386047363	timeseries	2023-07-18T02:00
AnnevilleSaire	AnnevilleSaire	49.635066986083984	-1.2891345024108887	timeseries	2021-12-22T00:40
AnthiliSpercheios	AnthiliSpercheios	38.856300354003906	22.466999053955078	timeseries	2022-03-16T00:00
AntisantiTavignano	AntisantiTavignano	42.18162155151367	9.386916160583496	timeseries	2021-12-22T00:00
ArboriLiamone	ArboriLiamone	42.11641311645508	8.818493843078613	timeseries	2021-12-22T00:00

PLATFORMCODE	time	TIME_QC	depth	DEPTH_QC	latitude	longitude	POSITION_QC	RVFL	RV
	UTC	1	m	1	degrees_north	degrees_east	1	m3/s	
AbromollaVegea	2023-06-11T23:00:00Z		0.0	0	56.07419967651367	12.974499702453613	0	0.10199999809265137	
AbromollaVegea	2023-06-12T23:00:00Z		0.0	0	56.07419967651367	12.974499702453613	0	0.10000000149011612	
AbromollaVegea	2023-06-13T23:00:00Z		0.0	0	56.07419967651367	12.974499702453613	0	0.09019999951124191	
AbromollaVegea	2023-06-14T23:00:00Z		0.0	0	56.07419967651367	12.974499702453613	0	0.08659999817609787	
AbromollaVegea	2023-06-15T23:00:00Z		0.0	0	56.07419967651367	12.974499702453613	0	0.09430000185966492	
AbromollaVegea	2023-06-21T23:00:00Z		0.0	0	56.07419967651367	12.974499702453613	0	0.12099999934434891	

ERDDAP > tabledap > Make A Graph

Dataset Title: **Gourua Stations Updated**

Institution: +ATLANTIC CoLAB (Dataset ID: Greece_new)

Range: longitude = 21.26068 to 21.26068°E, latitude = 38.48053 to 38.48053°N, time = 2023-09-30T23:00:00Z to 2023-11-23T23:00:00Z

Information: [Summary](#) | [License](#) | [FGDC \(ISO 19115\) Metadata](#) | [Background](#) | [Subset](#) | [Data Access Form](#) | [Files](#)

Graph Type: **LinesAndMarkers**

X Axis: **time**

Y Axis: **WLEV**

Color: **Blue**

Constraints

Optional Constraint #1	Optional Constraint #2
time >= 2023-11-17T00:00:00Z	time <= 2023-11-24T00:00:00Z

Server-side Functions

distinct()

Graph Settings

Marker Type: **Filled Square** Size: **5**

Color: **Blue**

EMODnet Physics

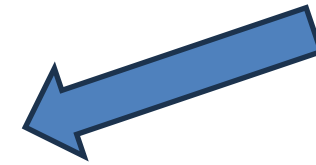
File Modifica Visualizza Inserisci Formato

Menu 100% € %

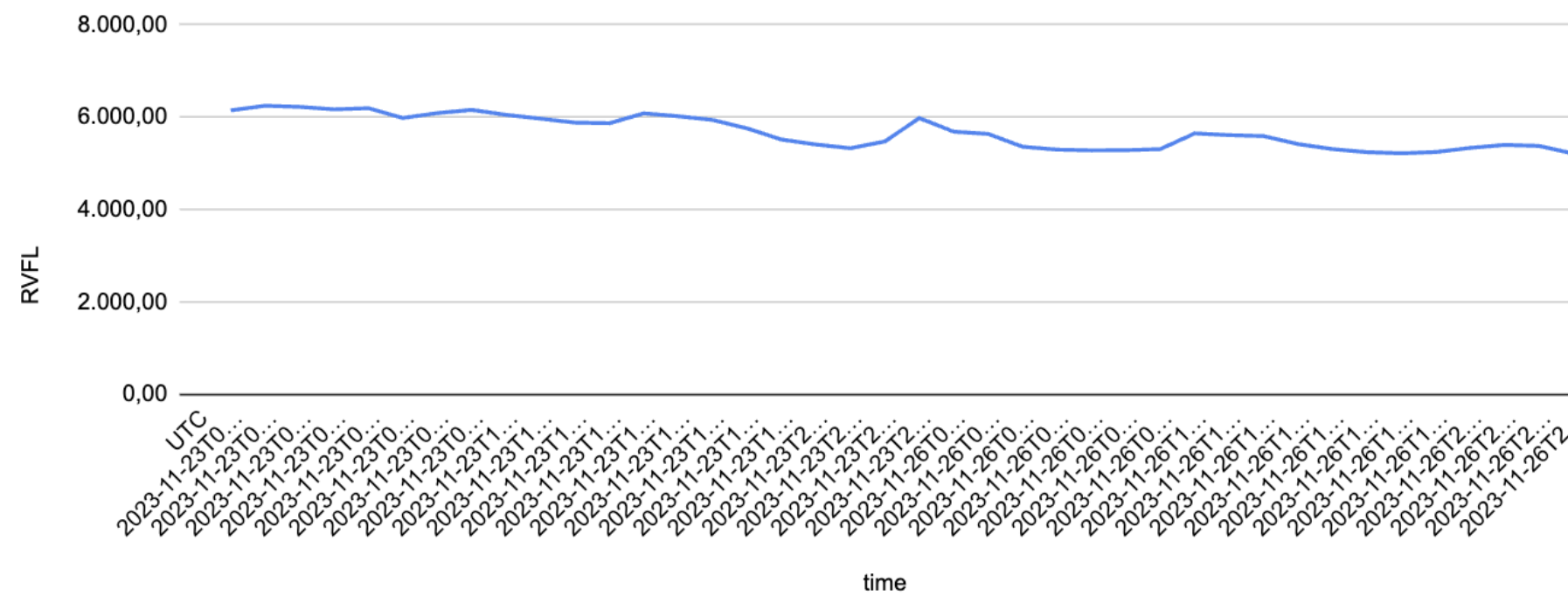
A3 $=IMPORTDATA(A1;"")$

	A	B	C
1	https://data-erddap.emodnet-physics.eu/erddap/tabledap/		
2			
3	PLATFORMCODE	time	RVFL
4		UTC	m3/s
5	Amay	2023-11-23T00:00:00	6,1531E+15
6	Amay	2023-11-23T01:00:00	6,2525E+15
7	Amay	2023-11-23T02:00:00	6,2286E+15
8	Amay	2023-11-23T03:00:00	6,1747E+15
9	Amay	2023-11-23T04:00:00	6,1997E+15
10	Amay	2023-11-23T05:00:00	6007000285317
11	Amay	2023-11-23T06:00:00	5,0884E+15

https://data-erddap.emodnet-physics.eu/erddap/tabledap/ERD_EP_RVDS_INSITU.csv?PLATFORMCODE%2Ctime%2CRVFL&PLATFORMCODE=%22Amay%22&time%3E=2023-11-19T00%3A00%3A00Z&time%3C=2023-11-26T23%3A00%3A00Z



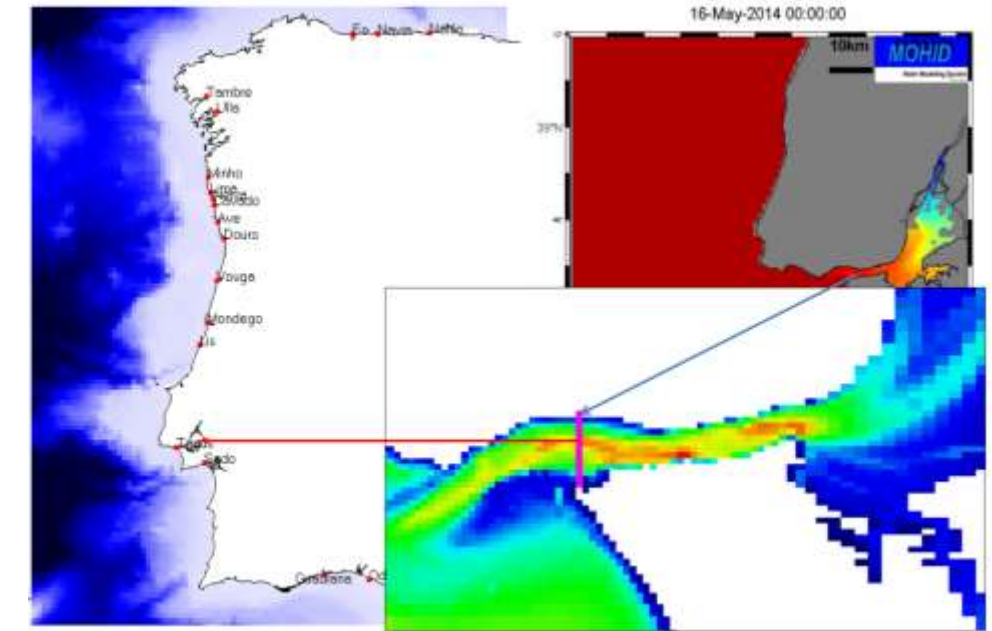
RVFL rispetto a time



What's next

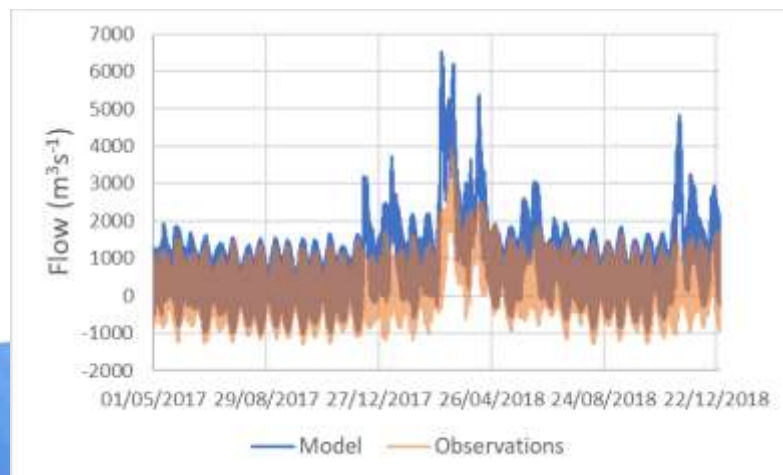
Keep consolidating and expanding:

- Time and Space
- Complementary features:
 - DB of estuarine main features (length, depth, width, mouth orientation, etc..)
 - water temperature
 - water level
 - nutrients and other periodically observed properties.

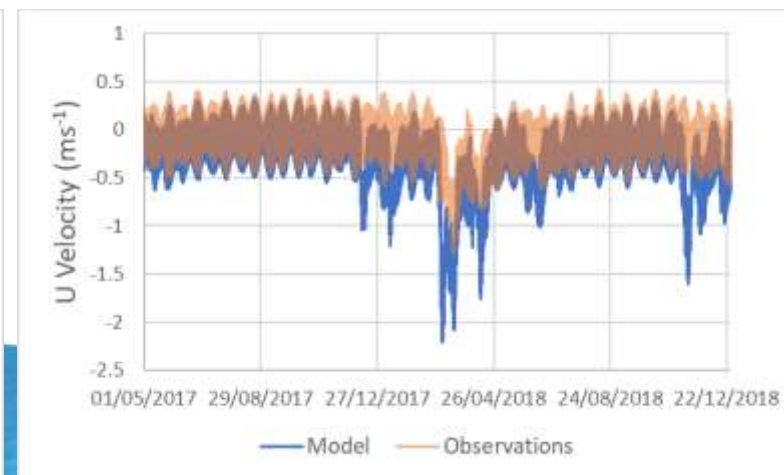


proxy is the virtual gate where you have the mixing between ocean and fresh water (tides + flow constrains + salinity + ...)

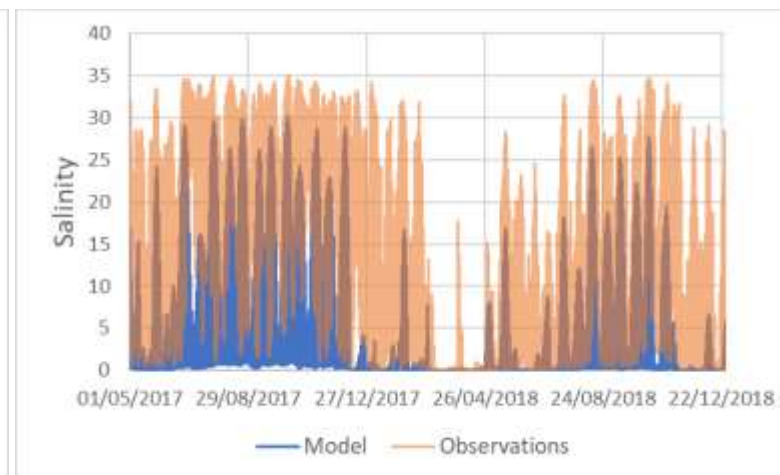
Douro (B)



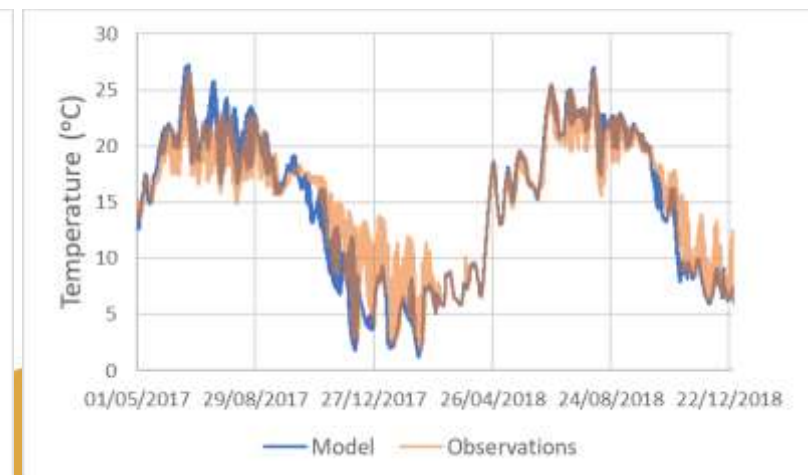
Outflow



Velocity Y



Salinity



Temperature

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