MOHID in MyCoast and Forcoast projects

Workshop – MOHIDING 2019

IST, Lisbon, Portugal

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MARETEC, Instituto Superior Técnico, Universidade de Lisboa, Portugal

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TÉCNICO LISBOA

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Interreg Atlantic Area
European Regional Development Fund

EUROPEAN UNION
MyCoast

MyCoast

FORCOAST

Summary

The EU has funded large scale initiatives to protect, secure and develop the potential of marine and coastal environments. **MyCoast will fill the gap between the large scale products and the end-users** whilst addressing a **transnational handling of the coastal observatories**.

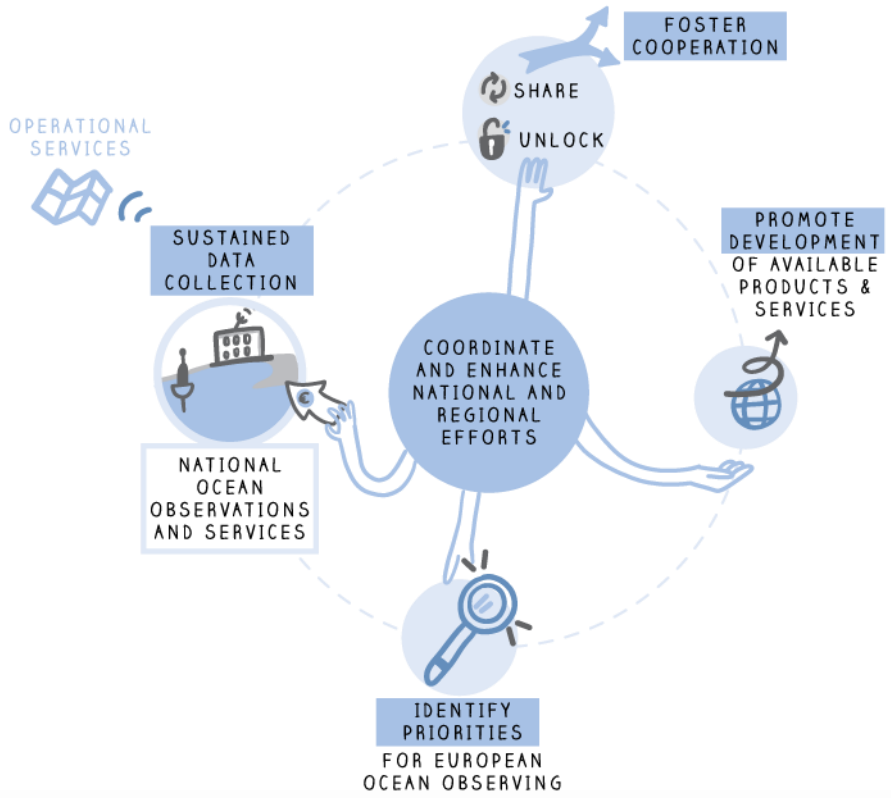
The resulting synergy will allow deploying and capitalizing innovative and **standardized tools in the risk management systems** applied mainly to extreme weather events leading to flooding, maritime safety and coastal pollution.

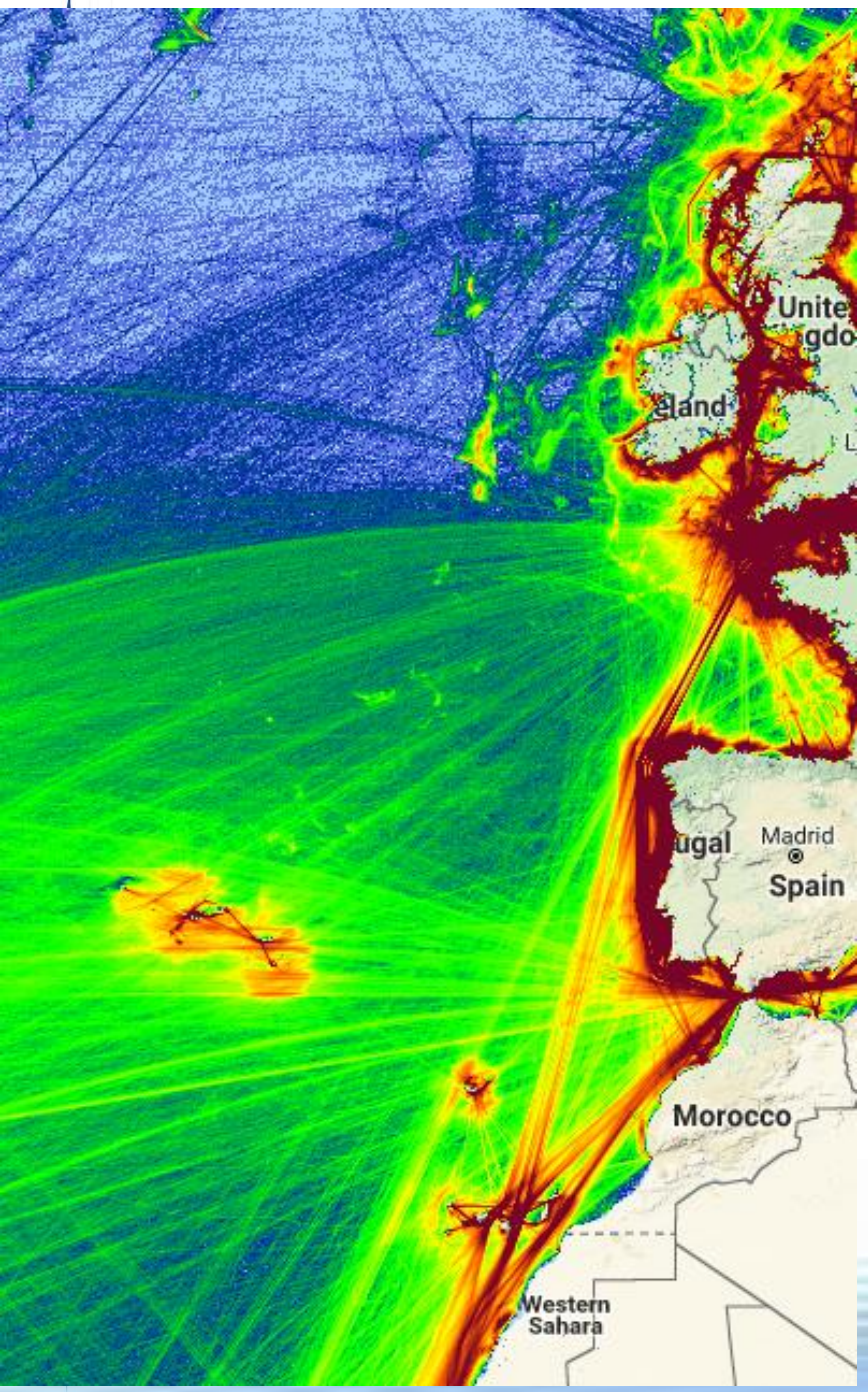
Definição de observatório costeiro

Um **Observatório Costeiro** é um sistema de **concentração** e **disseminação** de **informações e previsões meteo-oceanográficas** de uma região costeira, na perspetiva da prestação de serviços às entidades que nela desenvolvem atividade económica, de lazer ou de investigação científica.

EuroGOOS

European Global Ocean Observing System




Madrid
Spain
Morocco
Western
Sahara

MyCoast

AtlantOS
Optimising and Enhancing the Integrated Atlantic Ocean Observing Systems

Copernicus
The European Earth Observation Programme

JERICO next

EMODnet
European Marine Observation and Data Network

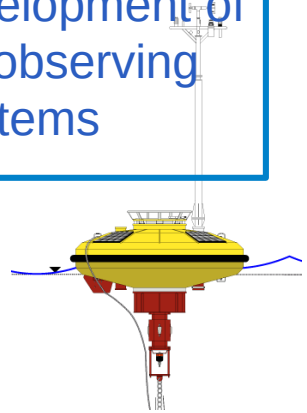
SeaDataCloud


IBIROOS
Interreg
Atlantic Area
European Regional Development Fund
European Core Service
Value added for
downstream applications
MyCoast
Copernicus
The European Earth Observation Programme
MyCoast
OBSERVATIONS
CMEMS
IN SITU
TAC
CMEMS
IBERIA-BISCAY-IRELAND
REGIONAL SEAS
MFC
END USERS
PRODUCTS & SERVICES
FOR KEY COASTAL ISSUES
boundary conditions
EMODnet
European Marine
Observation and
Data Network
SeaDataCloud

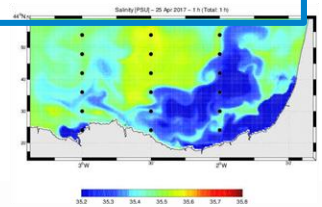
MyCoast work plan

WP 0 Project Preparation

WP 4 Development of coastal observing systems



WP 5 Downscalling from regional to coastal services



WP 6 Complying with Data Interoperability Standards

WP 7 Development of coastal risks tools

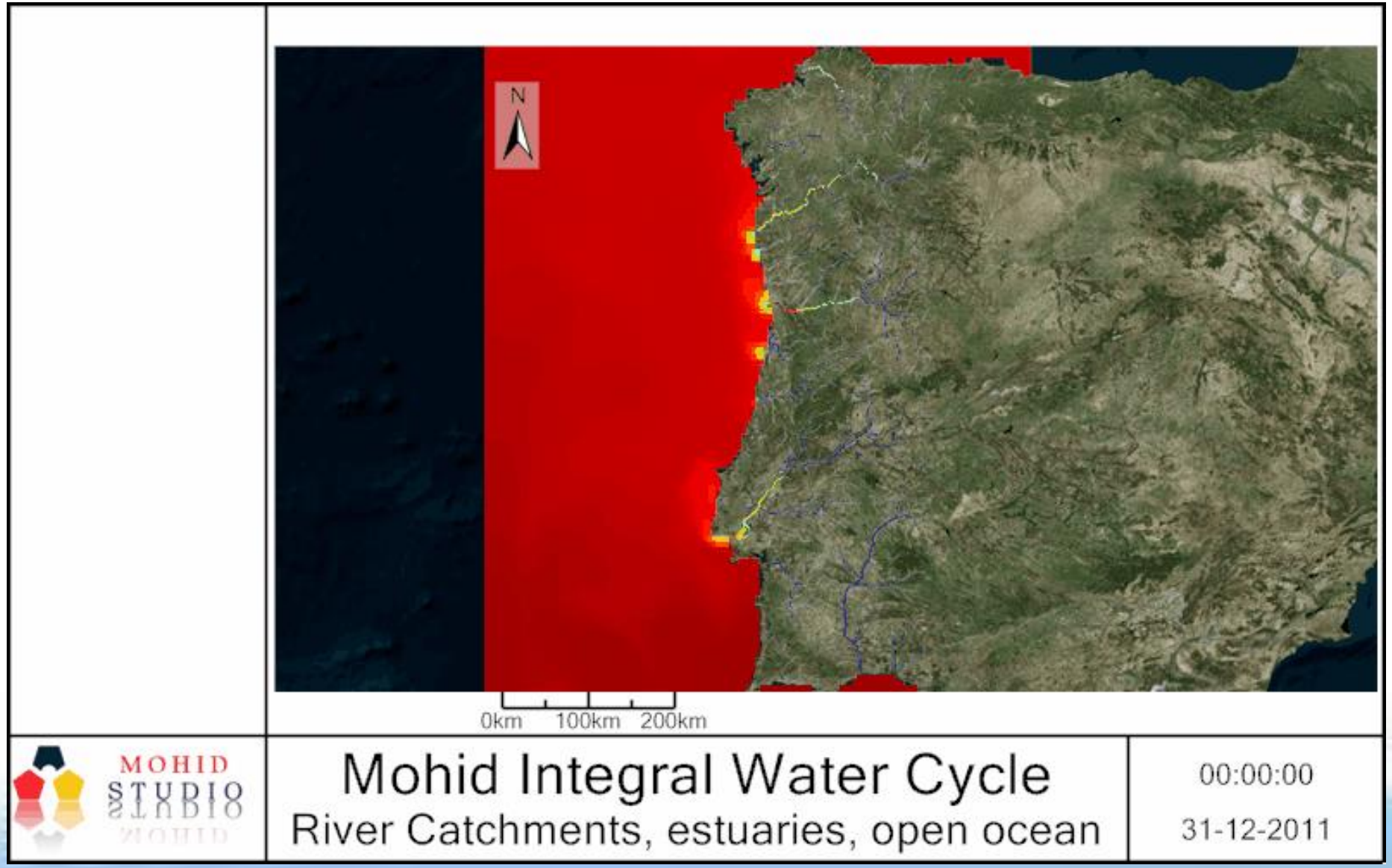
WP 8 Pilot implementations of coastal risk tools

WP 3 Project Capitalization

WP 2 Project Communication

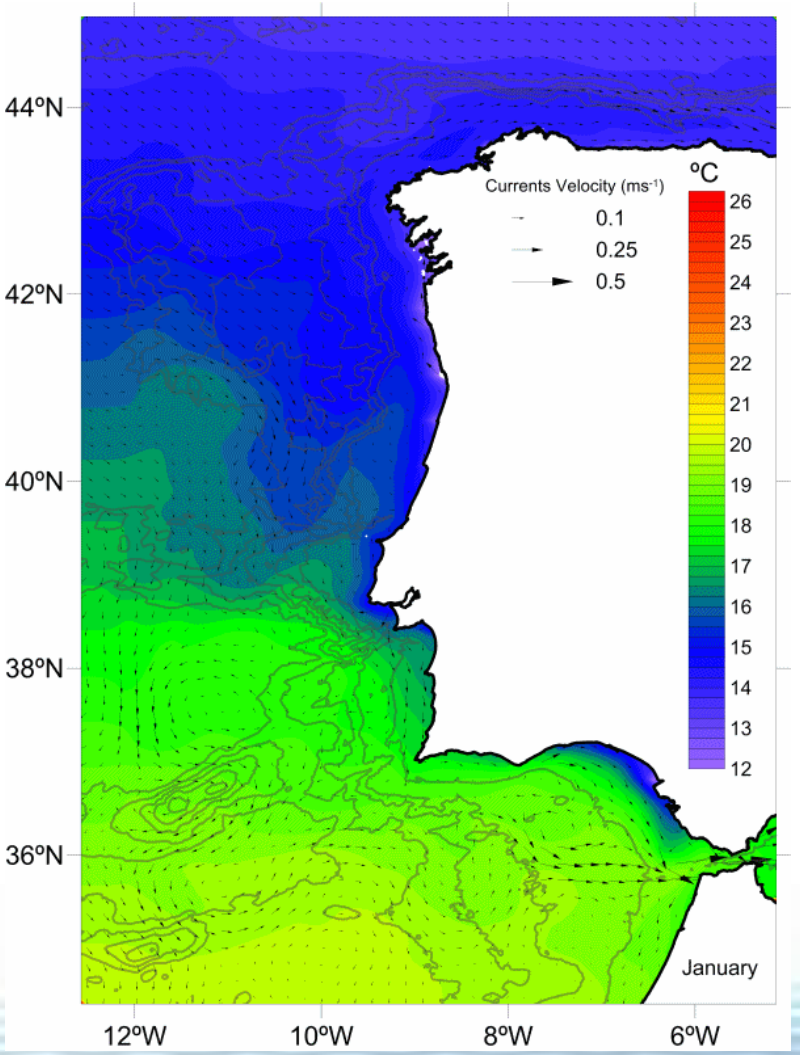
WP 1 Project coordination

Mohid Integral Water Cycle in the portuguese continental coast

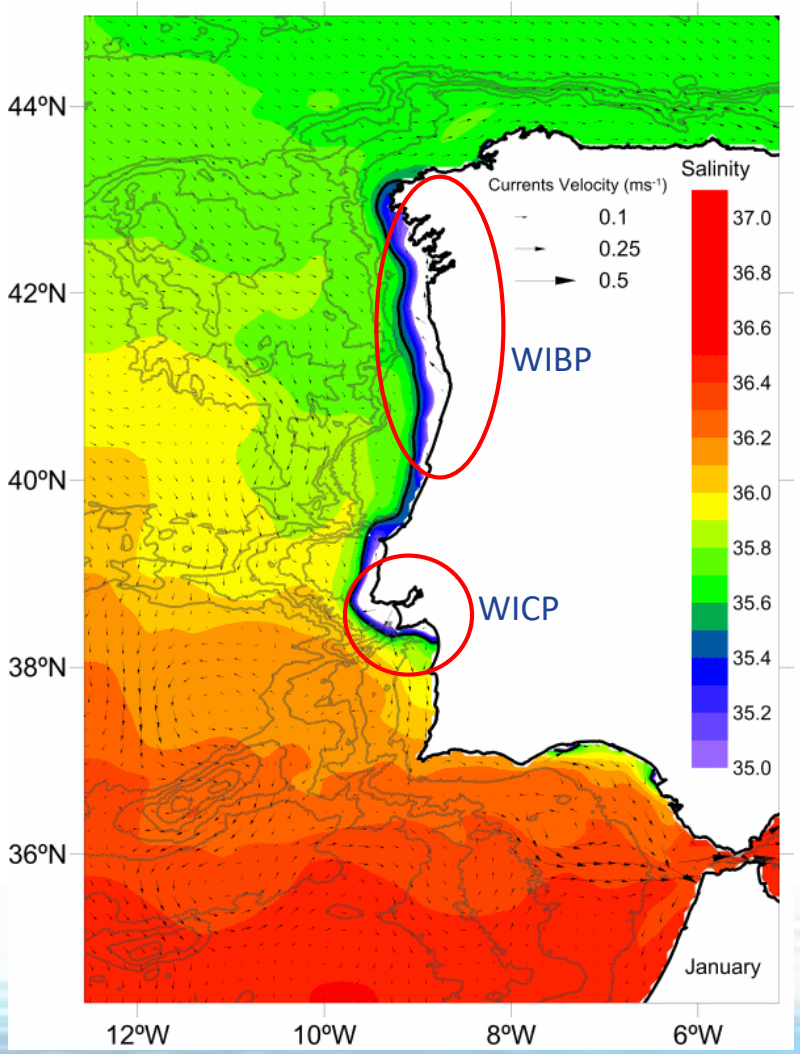


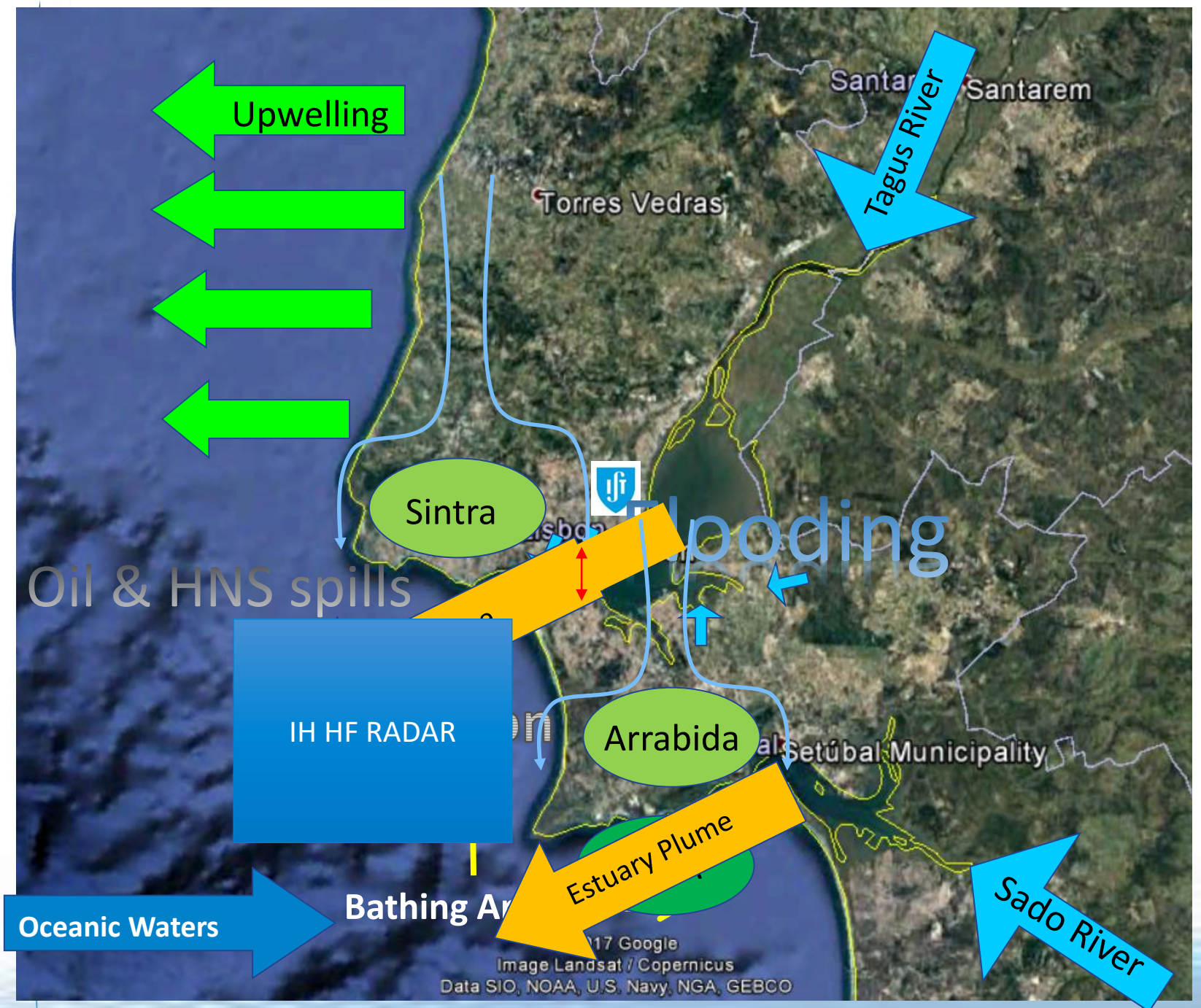
Monthly climatology 2011-2015 period

WIBP = Western Iberia Buoyant Plume
WICP = Western Iberia Central Plume



White values indicate salinity below 35
Dark line contours salinity 35.5

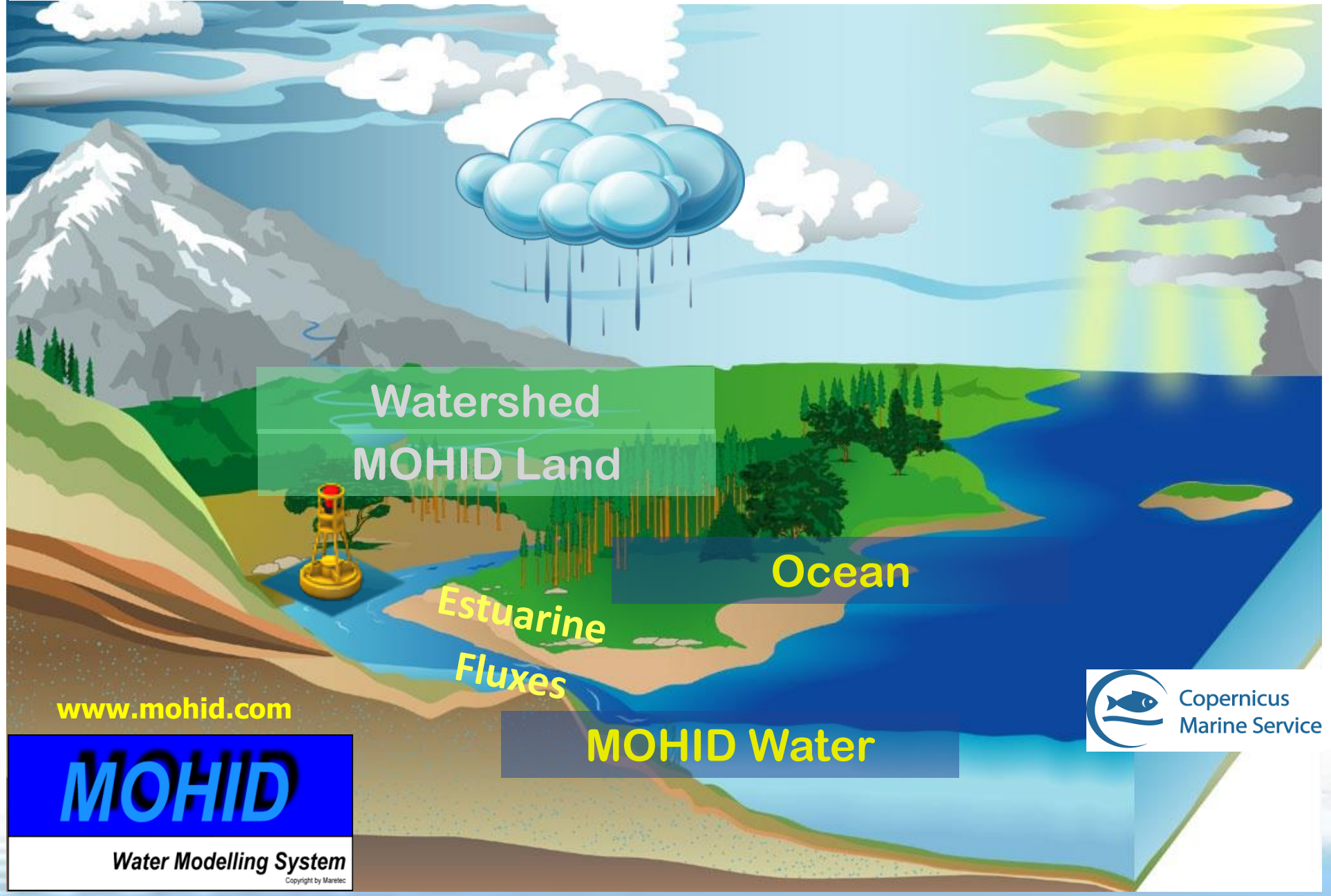



Upwelling
Santarem
Tagus River
Torres Vedras
Sintra
Flooding
Oil & HNS spills
IH HF RADAR
Arrabida
Setúbal Municipality
Estuary Plume
Sado River
Oceanic Waters
Bathing Ar
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO


Portugal

SINCE 1985

https://github.com/Mohid-Water-Modelling-System/Mohid

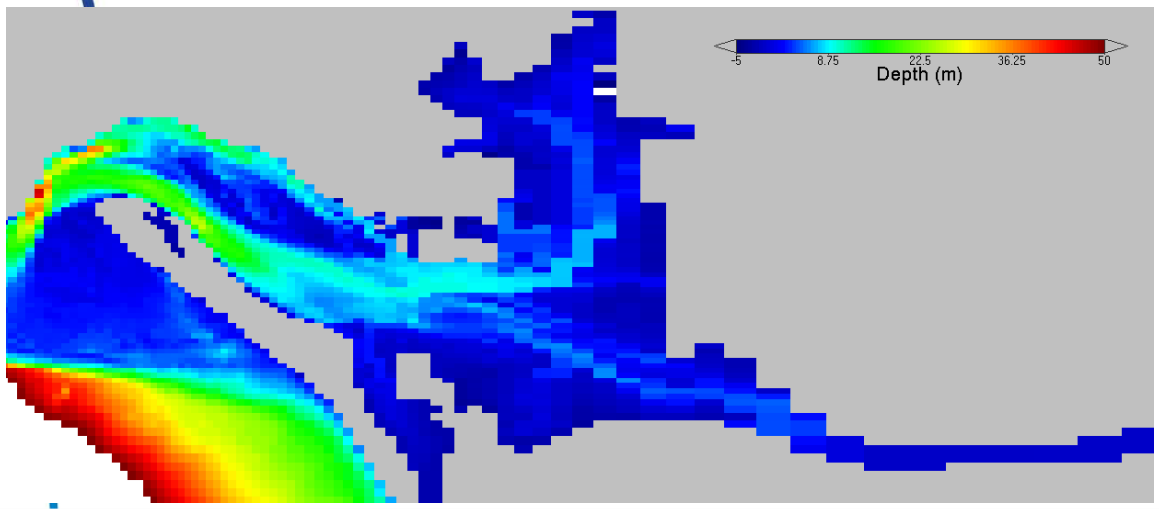


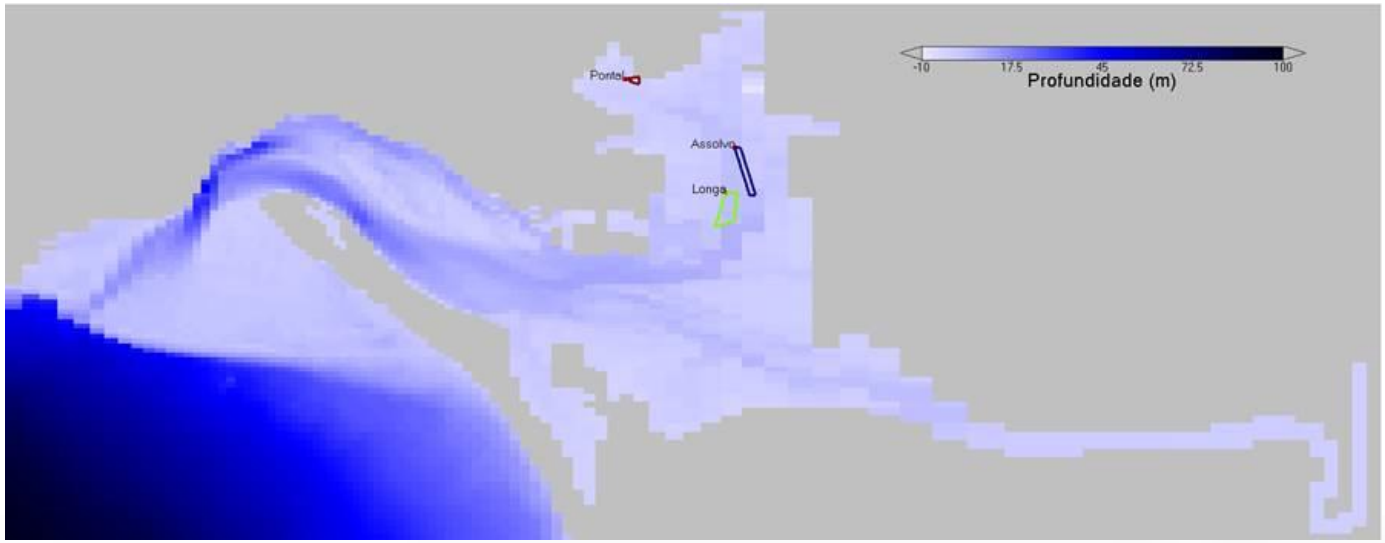
Sado Estuary modelling old configuration

Shallow estuary with orientation (NW-SE). Main axis around 25 km, maximum depths found at the channel (around 40-50 m). Two main channels with 7 and 5 m depth approx.

2D model with 600 m resolution

Nested on PCOMS (Portuguese Coast Operational Modelling System)

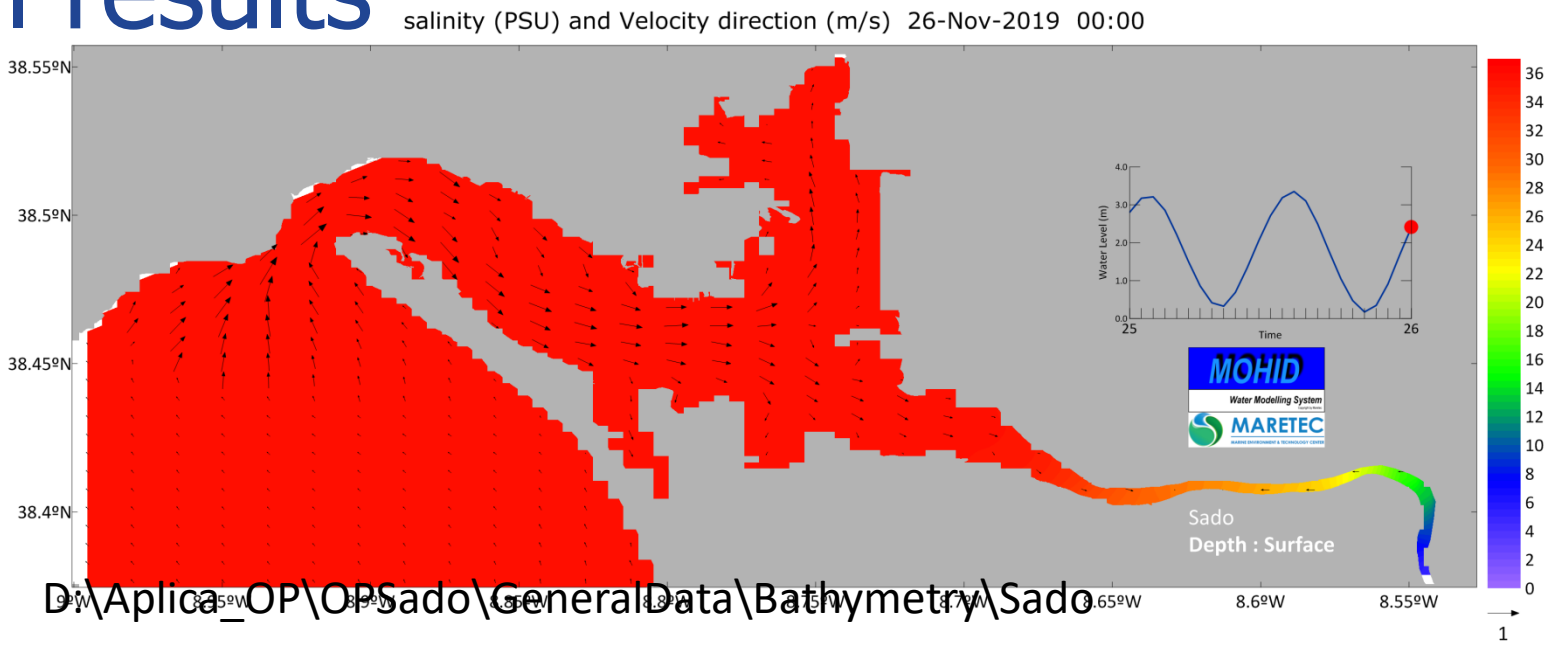




Operational results

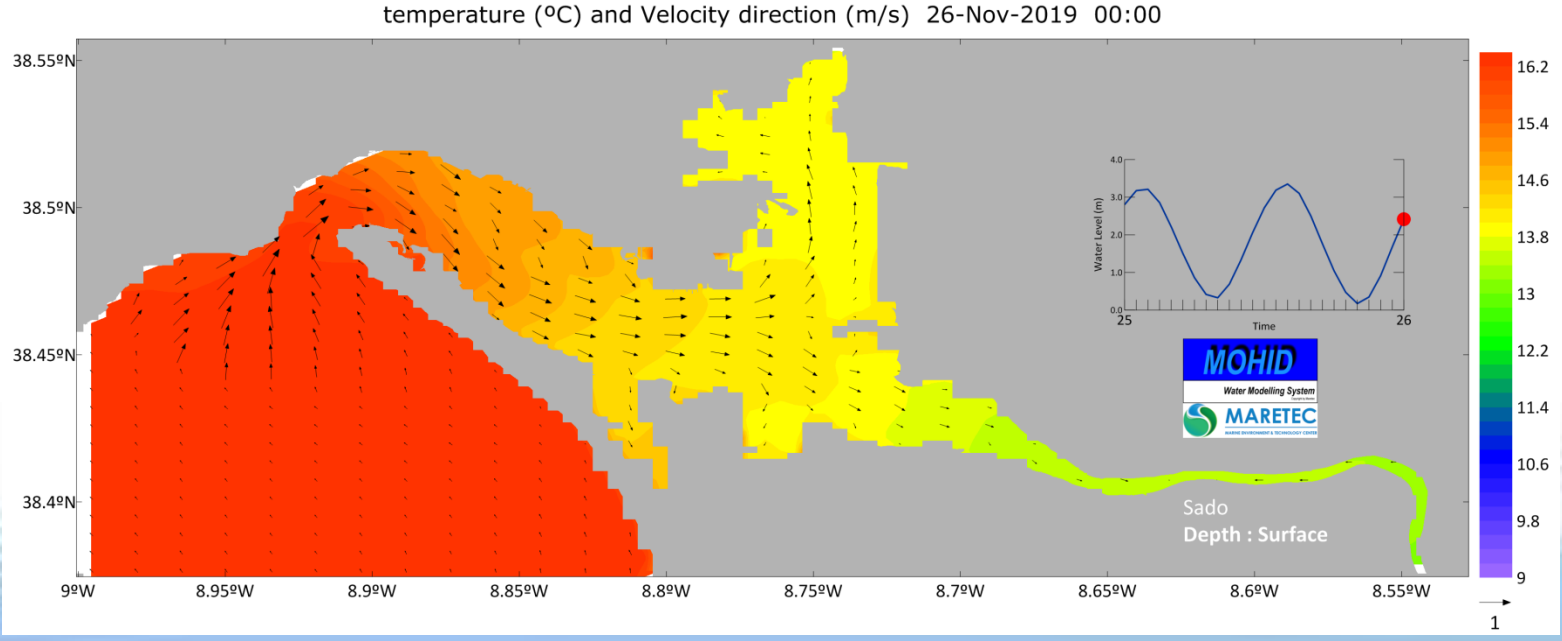
http://forecast.maretec.org/maps_Sado.asp

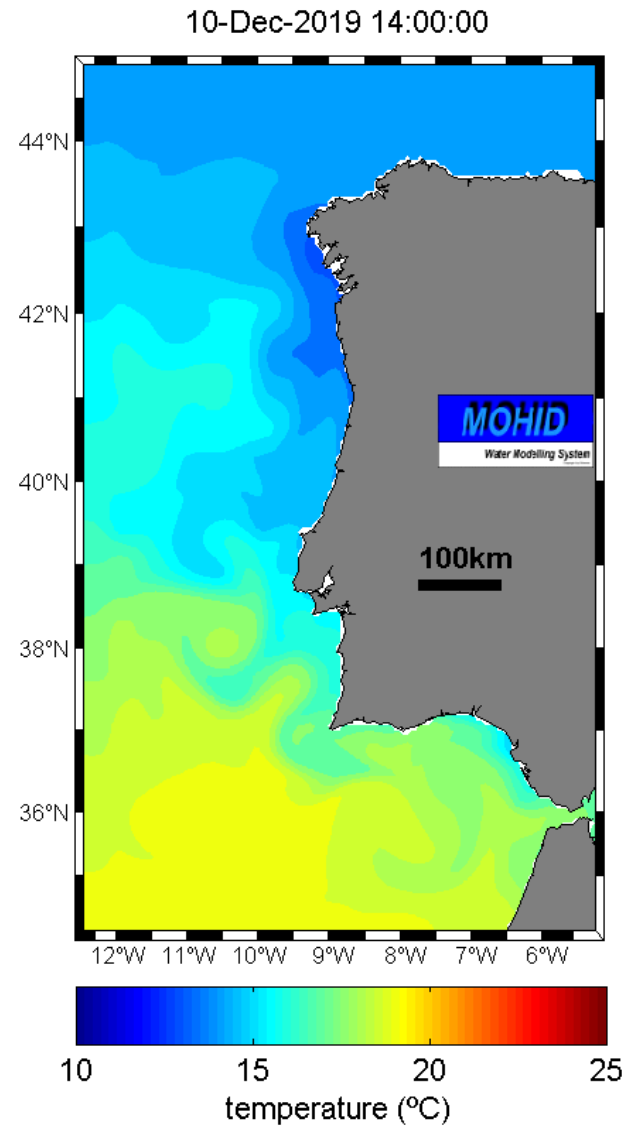
Salinity

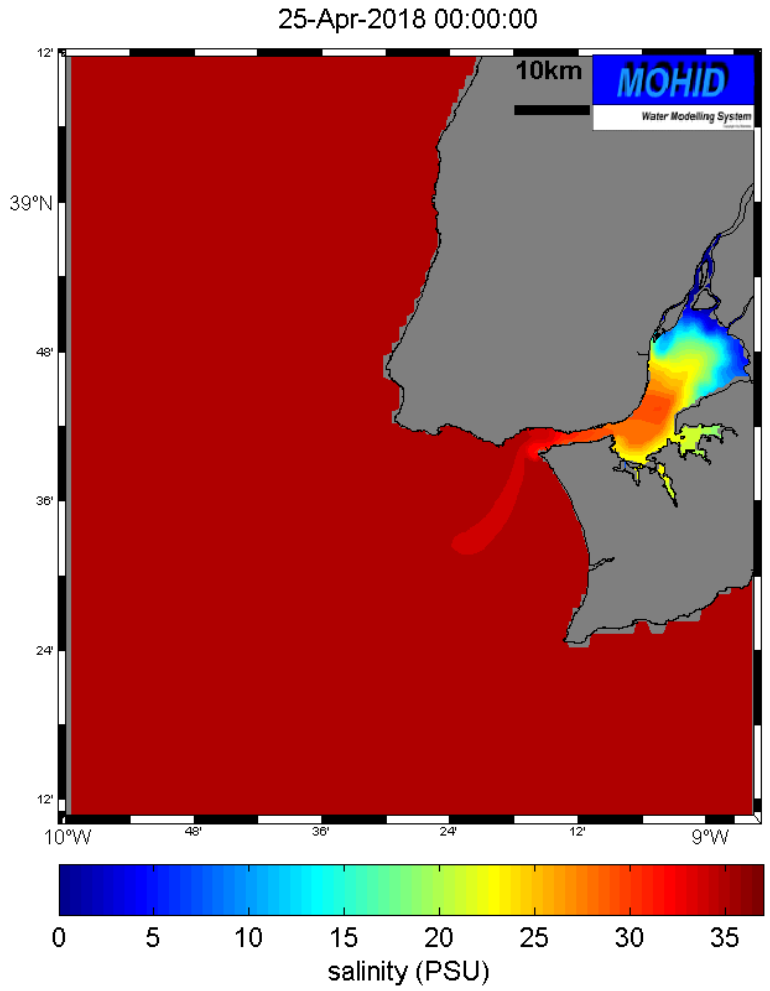


D:\Aplica_OP\OPSado\GeneralData\Bathymetry\Sado

Temperature




10-Dec-2019 14:00:00
44°N
42°N
40°N
38°N
36°N
12°W 11°W 10°W 9°W 8°W 7°W 6°W
MOHID
Water Modelling System
100km
10
15
20
25
temperature (ºC)

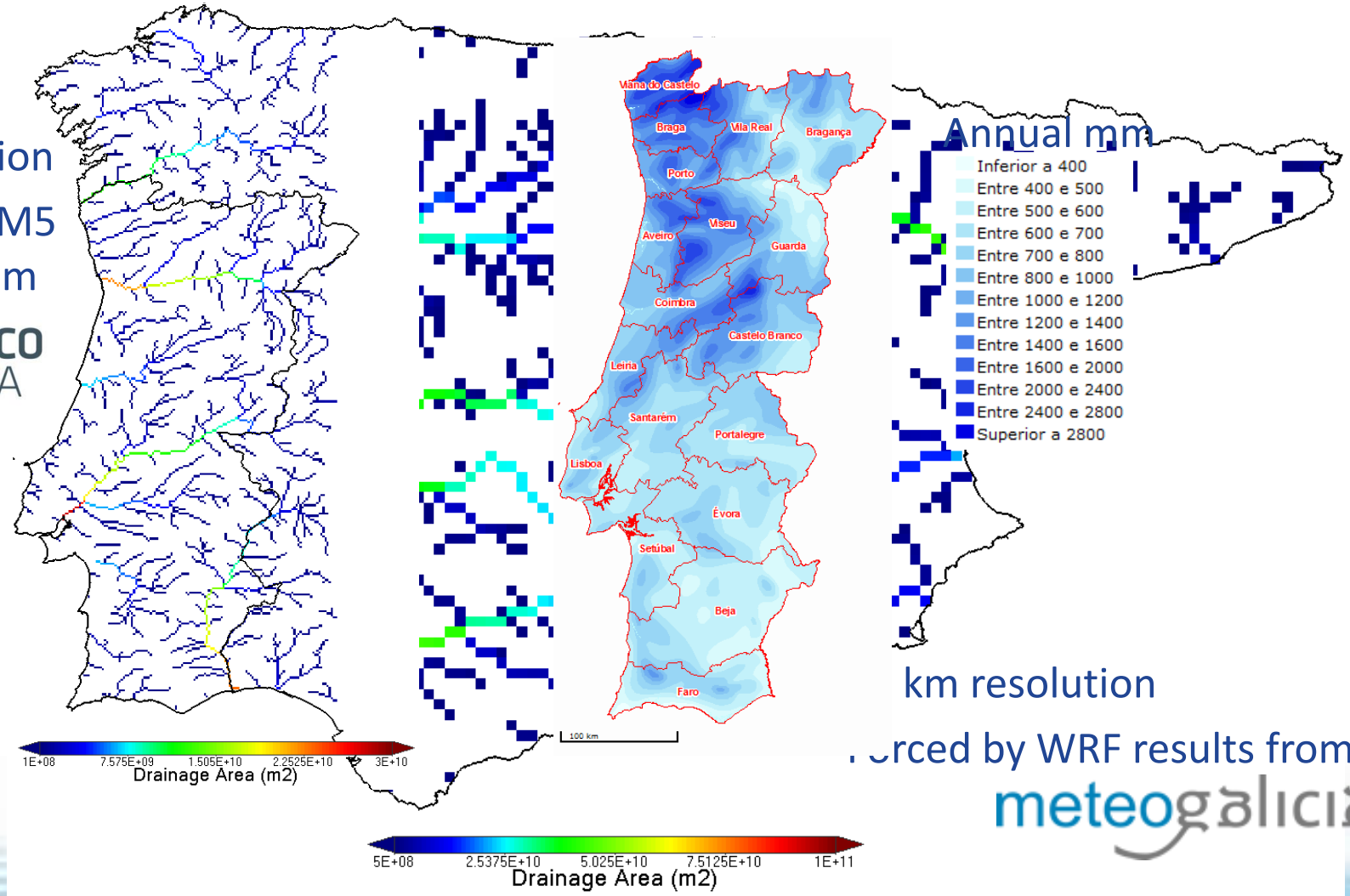

25-Apr-2018 00:00:00
12'
39°N
48'
36'
24'
12'
10°W
48'
36'
24'
12'
9°W
10km
MOHID
Water Modelling System
0
5
10
15
20
25
30
35
salinity (PSU)

Watersheds Modelling SETUp

2 km resolution

Forced by MM5 results from

TÉCNICO LISBOA

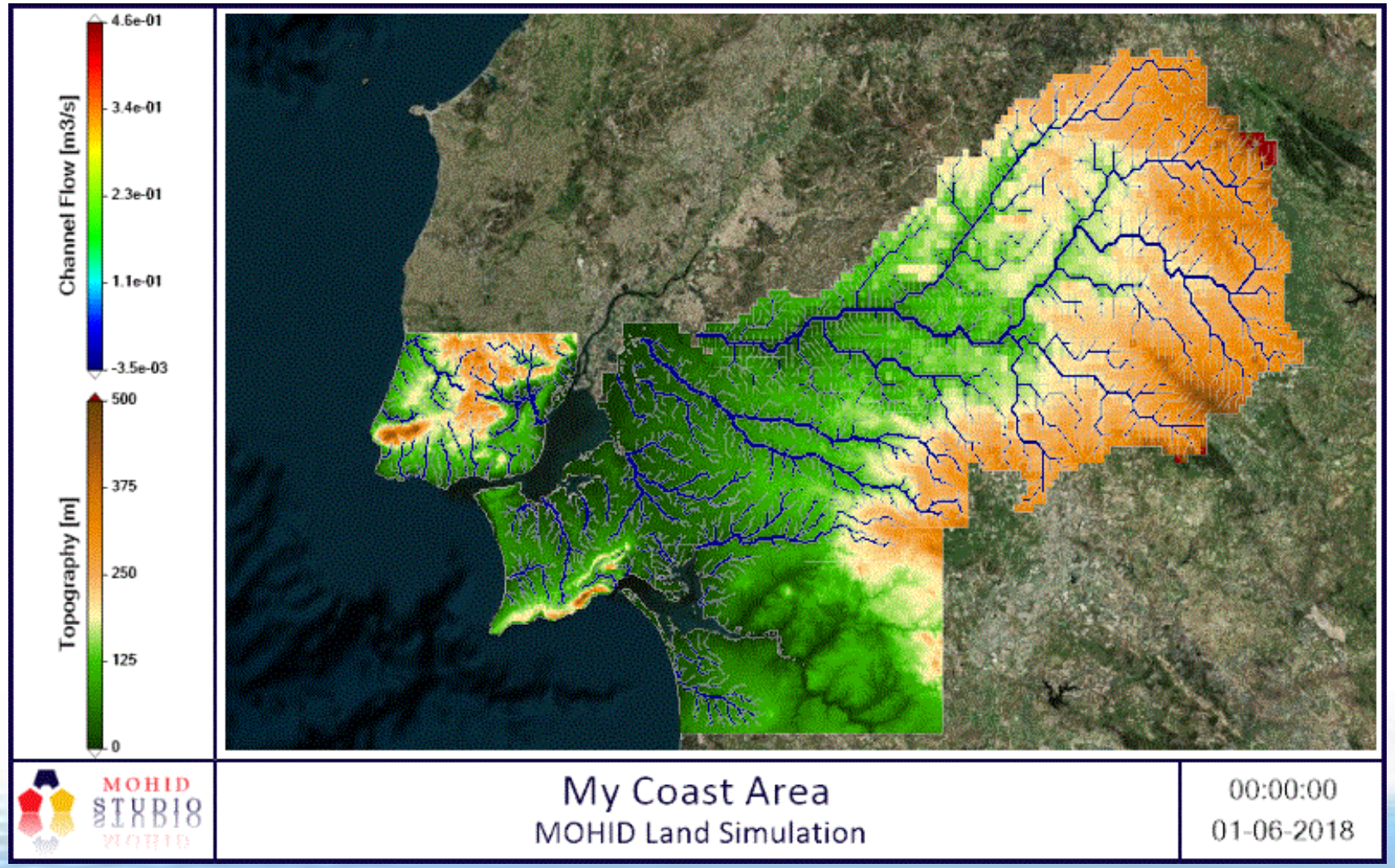


km resolution

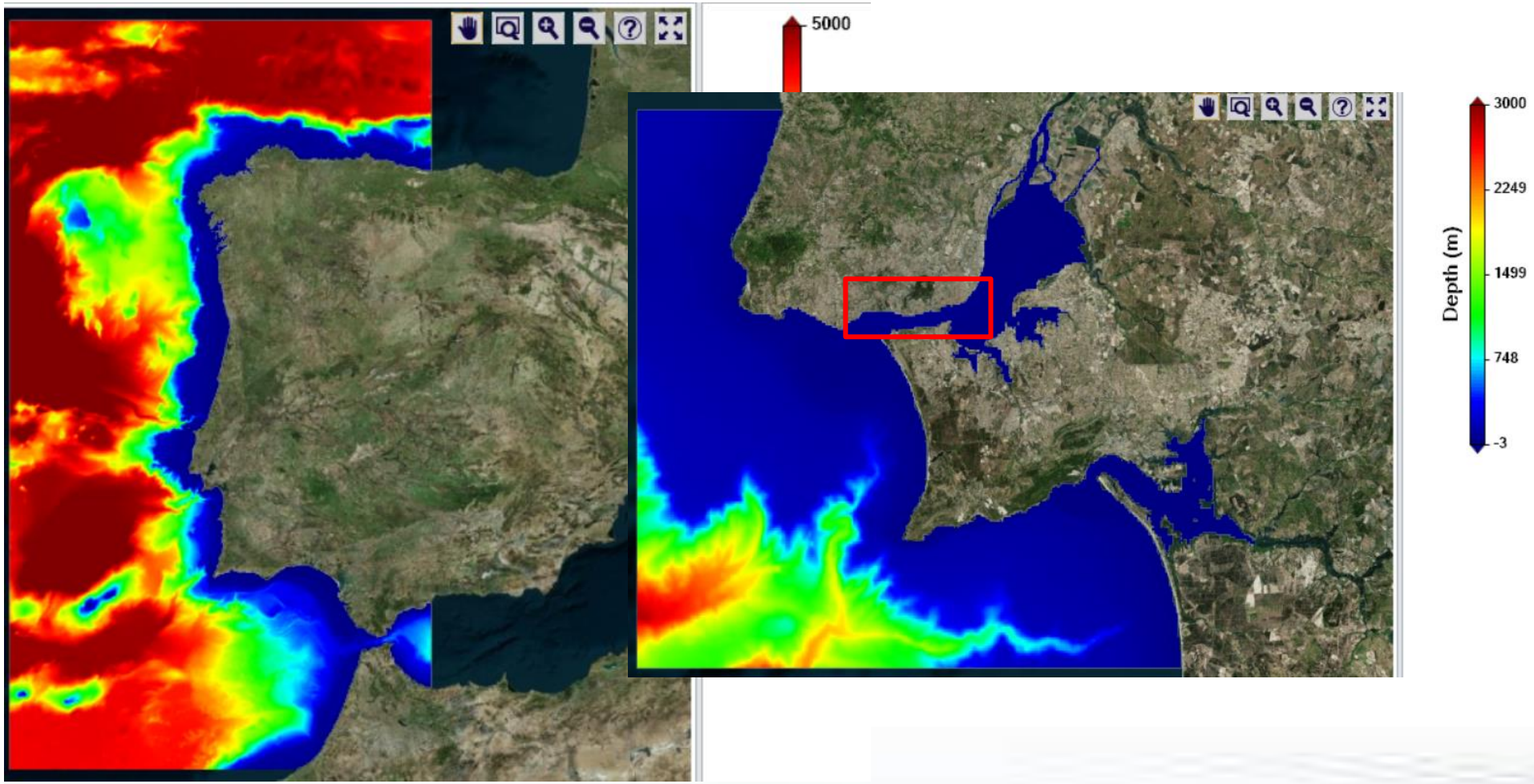
. orced by WRF results from

meteogalicia

Watershed Coverage Tagus-Sado Obsevatory (Mycoast project)



Mycoast updated Regional and Coastal Models

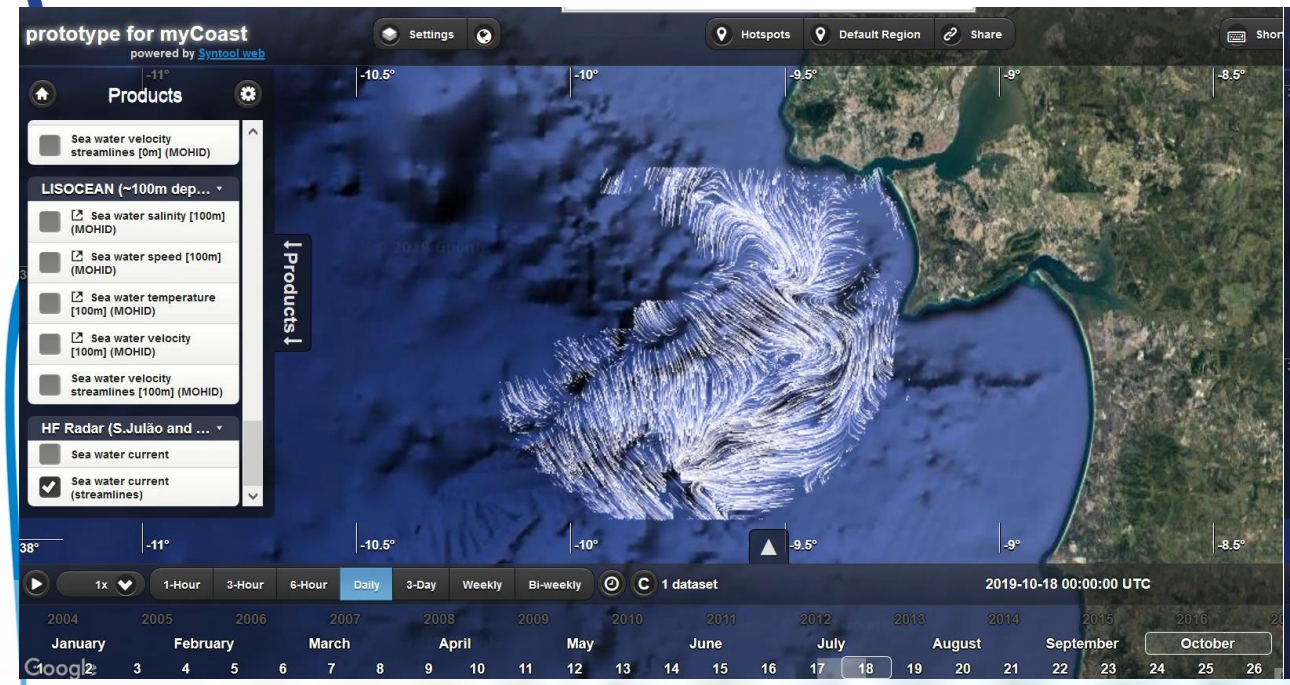


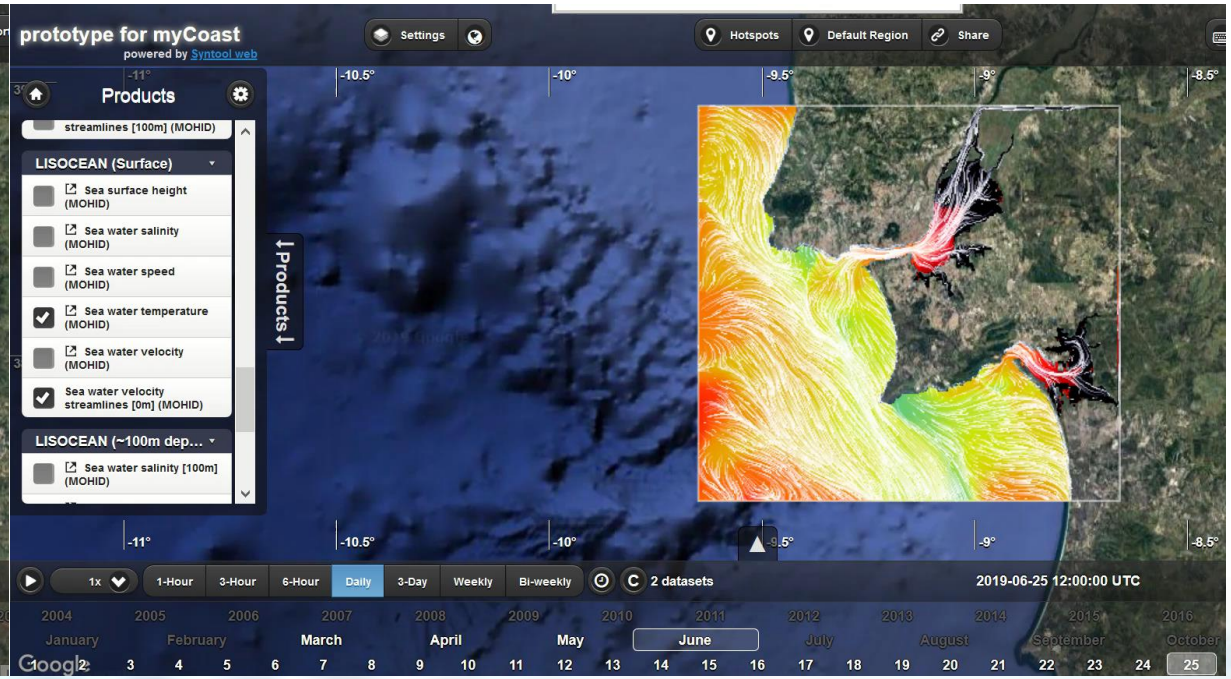
0.015º

0.0028º

Data visualisation - Platforms

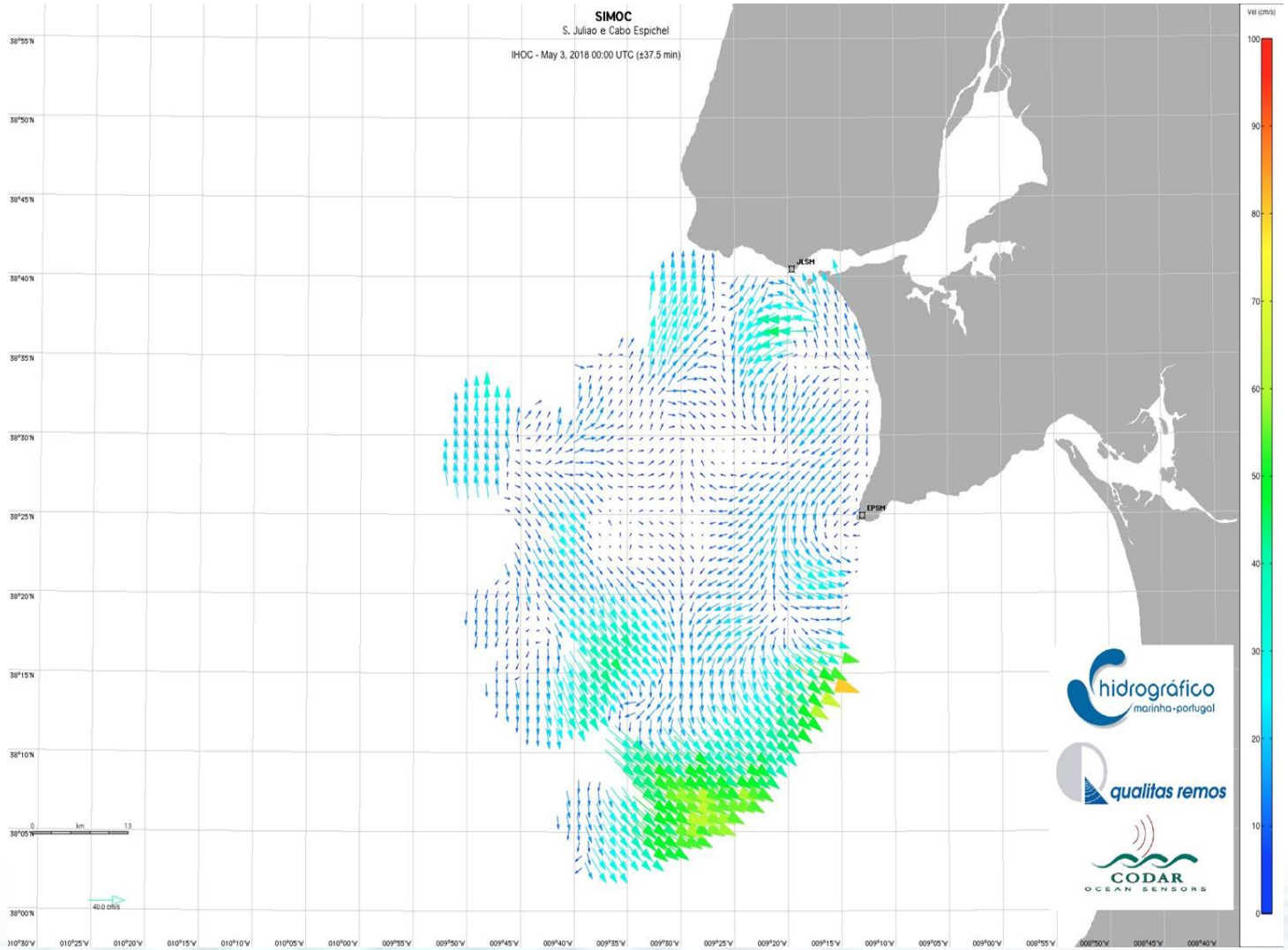
http://mycoast.maretec.org





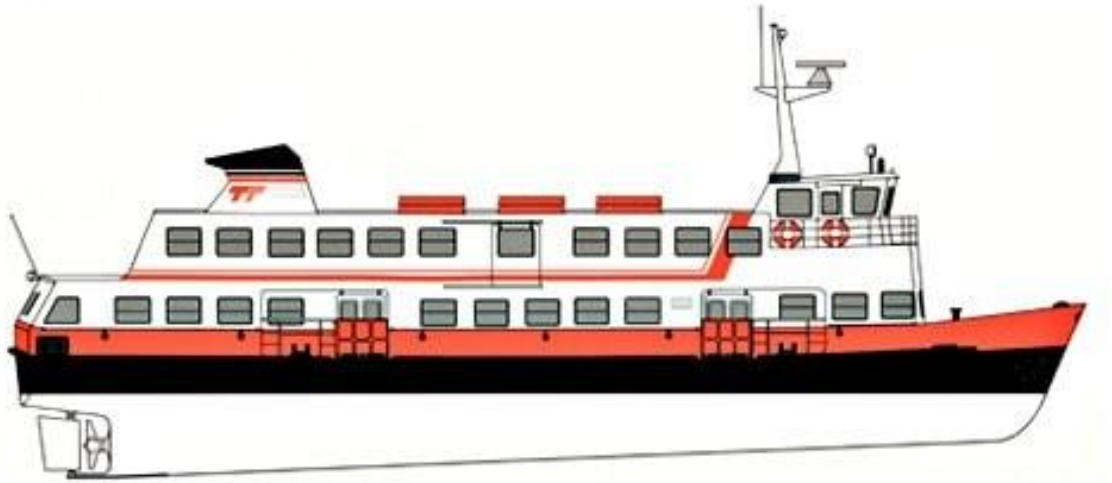
HF Radar

- Resource: Hidrografico
- Grid Spacing: ~1.4 Km
- Frequency: every hour
- Format .tuv (ASCII file)
- The output is already pre-processed by SeaDisplay 6.7.8
- Averaging Radius: 4.000 km
- DistanceAngularLimit: 20.0
- CurrentVelocityLimit: 100.0 cm/s



HF Data source:http://www.hidrografico.pt/simoc.php

Cacilheiro "DAFUNDO"



Length: 29,20m
Beam: 7,25m
Draft: 1.80 m
Gross Tonnage: 304
Boat Hull: Steel
Speed: 10 Knots

Connect: Cacilhas - Cais do Sodre
Entry into service: between 1980 and 1982
Capacity: 476 passengers

Transtejo Network – "Cacilheiro" Boat

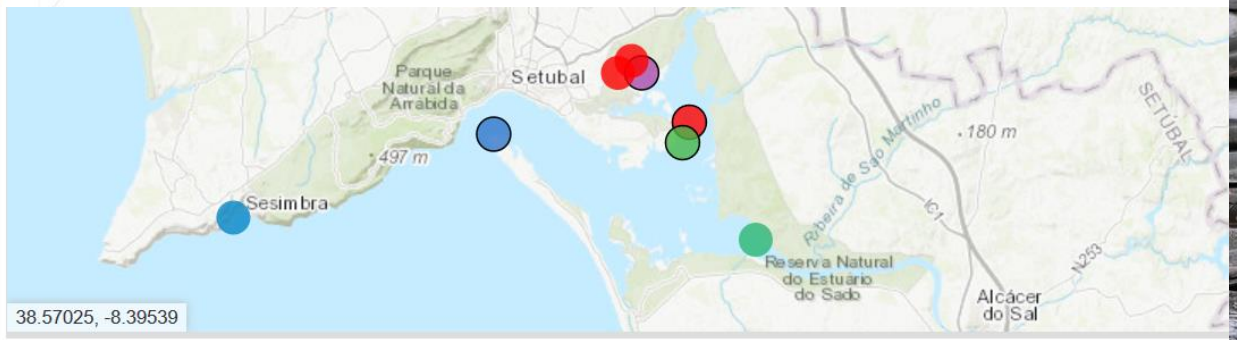
Partidas Cacilhas

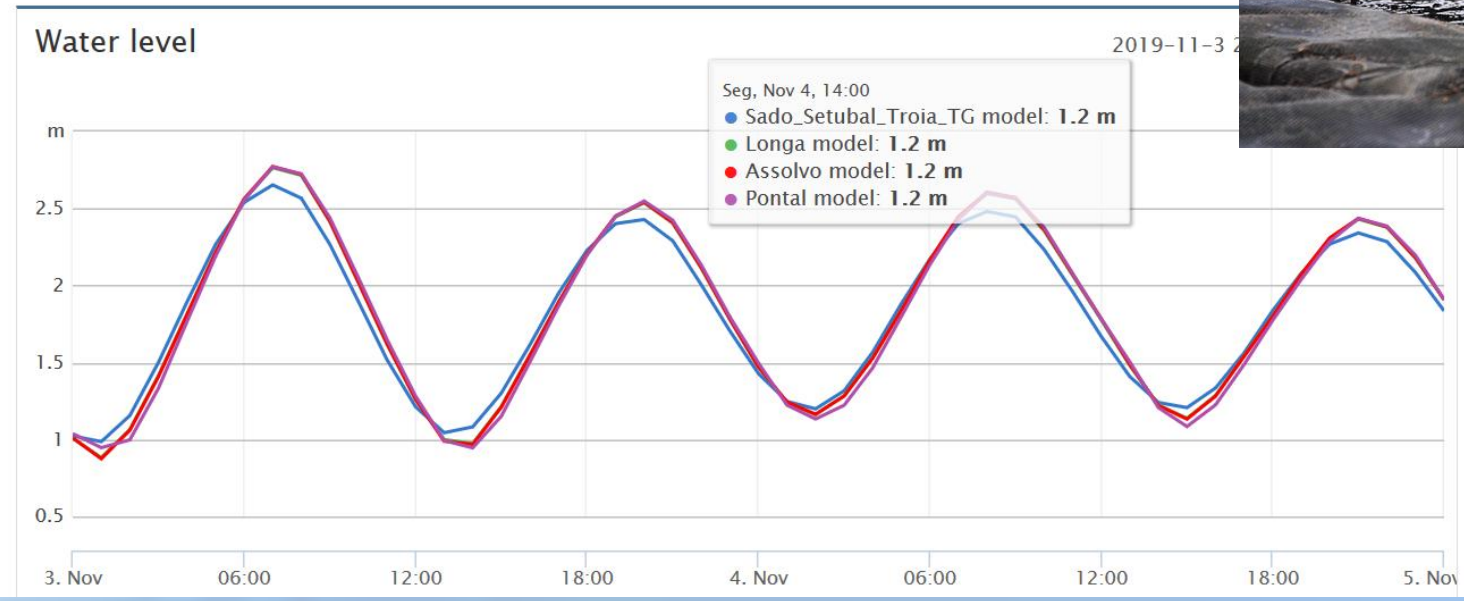
05h	06h	07h	08h	09h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	00h	01h
20	12	02	05	00	15	15	10	00	05	05	05	05	05	07	14	27	21	09	05	20
48	20	10	10	10	30	40	25	20	20	20	15	15	12	17	38	57	45	33	40	
55	37	15	20	20	55	55	40	35	35	33	30	25	22	25	55					
	45	27	30	25				50	50	47	45	35	32	35						
		35	40	35							55	45	37	52						
		45	50	45								55	50							
		55		55									57							

Partidas Cais do Sodré

05h	06h	07h	08h	09h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	00h	01h
35	00	15	07	05	00	07	10	20	05	05	02	00	00	05	05	15	09	21	20	00
	07	22	17	12	10	27	25	35	20	20	17	10	10	10	26	40	33	45		40
	25	30	25	22	28	52	40	50	35	35	30	20	20	20	50		57			
	32	42	35	32	42		57		50	47	45	30	25	30						
	50	47	45	37								40	35	40						
	58	57	55	47								50	45	50						
													55							

H2020 Project FORCOAST





- MARETEC:

MARETEC
MARINE ENVIRONMENT & TECHNOLOGY CENTER

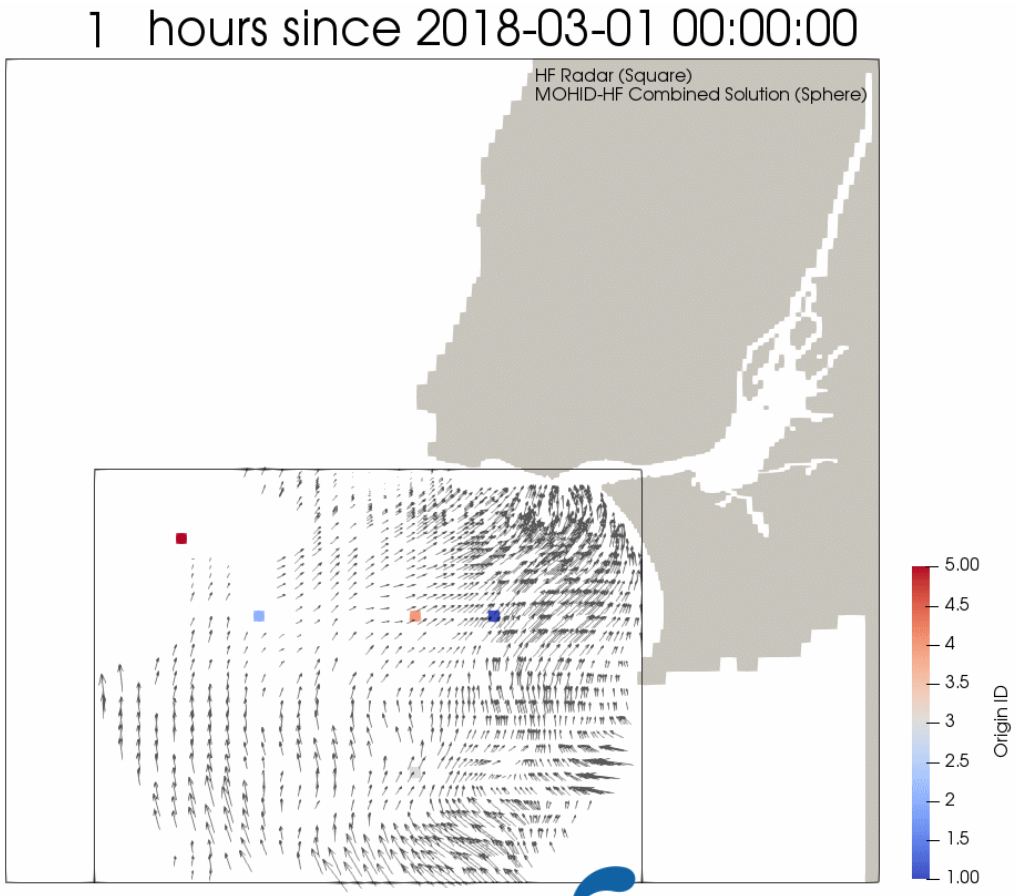
- Sado_Setubal_Troia_TG
- Longa
- Assolvo
- Pontal

HF Radar and Model Solutions Ensemble

METHODOLOGY:

- Lagrangian particle tracking modelling, *commonly used for search and rescue and oil spill clean up operations*
- Ensemble Simulation *using forcing from* HF Radar *currents and* model *results*.

  In case of ***HF radar missing data or when particles reach the*** *HF radar data* ***limit*** *modelling results)*
- The tool will be included in a data integration platform



HF radar data provided by hidrográfico marinha·portugal

Summary

The EU has funded large scale initiatives to protect, secure and develop the potential of marine and coastal environments. **MyCoast will fill the gap between the large scale products and the end-users** whilst addressing a **transnational handling of the coastal observatories**.

The resulting synergy will allow deploying and capitalizing innovative and **standardized tools in the risk management systems** applied mainly to extreme weather events leading to flooding, maritime safety and coastal pollution.

Conclusões

Os observatórios costeiros contribuem a uma melhor preparação para combater e gerir os possíveis riscos que podam afetar à orla costeira

Os utilizadores dos resultados dos observatórios são diversos e por isso logo as soluções/serviços devem ser adaptadas para cada caso particular

Partilha de informações (dados e conhecimento) é fulcral para a obtenção dos melhores resultados possíveis

Desenvolvimento de ferramentas comuns baseadas na adoção de formatos de dados estândar contribui para a colaboração internacional

A colaboração entre observatórios consegue um desenvolvimento mais eficaz e a obtenção ferramentas mais sofisticadas

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Muito Obrigado!
Questões?

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