Creating products and knowledge for the Mediterranean

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modelação em engenharia

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ADDED-VALUE INFORMATION SERVICES TO SUPPORT PORTS OPERATION AND SAFETY

ATELIER DE VALIDATION DE LA PLATEFORME DE DONNEES PAR LES UTILISATEURS ET DE FORMATION A L'OCEANOGRAPHIE OPERATIONNELLE

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What does it means operational?

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In this context operational means a service capable to provide information daily required to manage or operate an activity or to support the response to crisis situations.

This means to provide the most updated data (in real time whenever possible) and the capability to deliver forecasts for the near future and the capability to work out the data to produce information that can be effectively used in those activities.

Due to the need to keep the service daily running, its set-up and maintenance requires the support of some kind of "intelligence" capable to autonomously perform a chain of actions that goes from automatically acquiring and format data from different data providers to run models and algorithms and publishing information in formats easily understandable for the target users.

Ports Operational Service

The Ports Operational Service **is part of a wider service** for provision of Coastal and Marine Environment, Marine Safety, Marine Resources and Marine Weather Forecasting.

Delivers **tailored information** (**readily available**, **easily understandable** and with **proper resolution**) trough an operational service chain supported by **MARINOMICA** and **AQUASAFE platforms**.
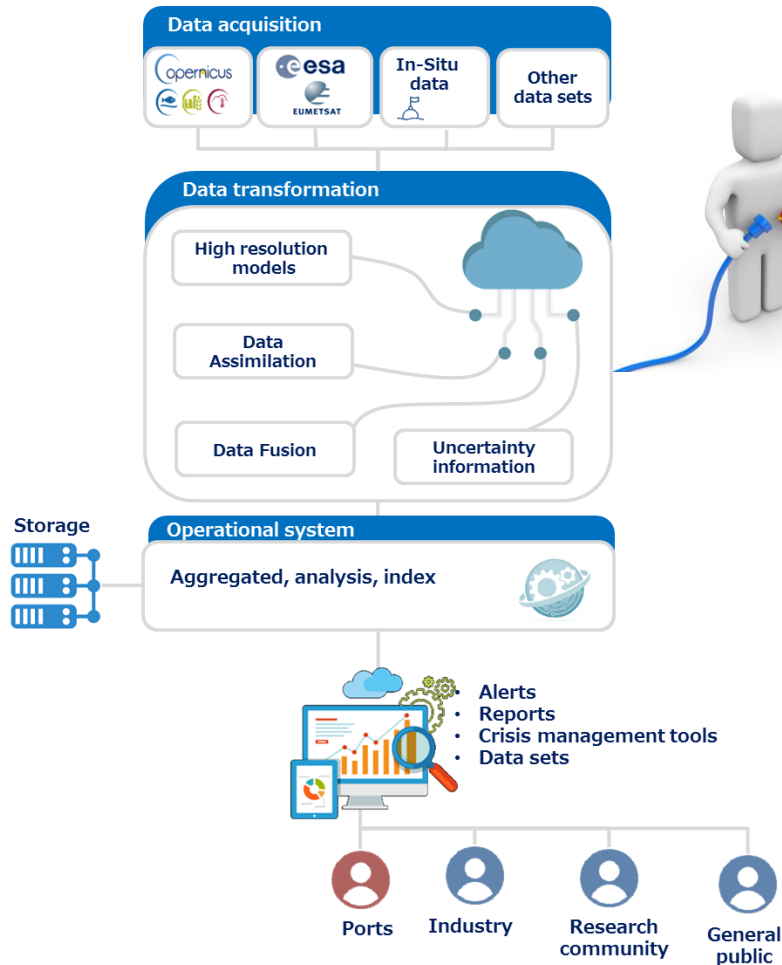
Fully exploit the synergies between **forecasts** and **data** acquired through different sources, different platforms and at different scales

Addressed to professional users such as **port** authorities, **environmental** authorities, **civil protection** services or **pollution response** authorities.
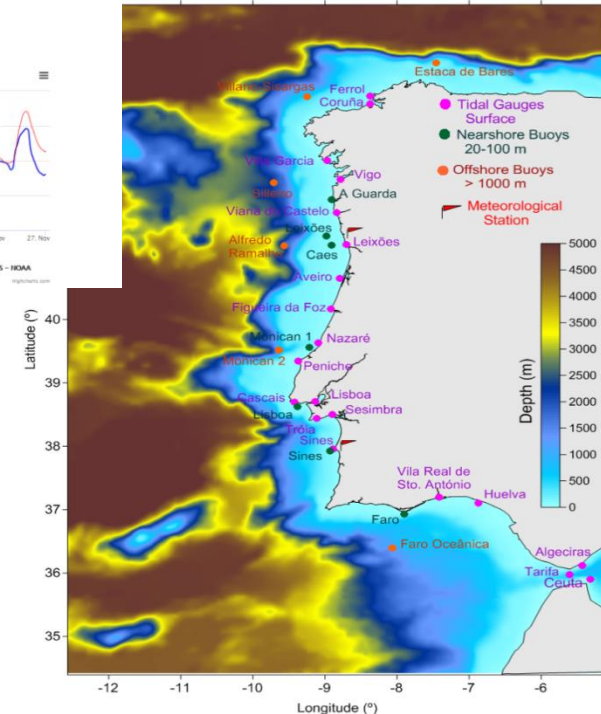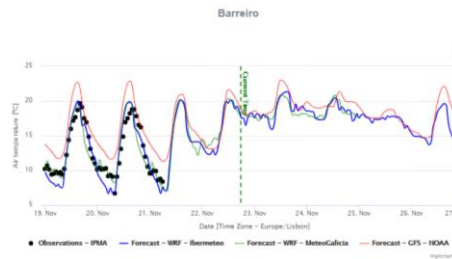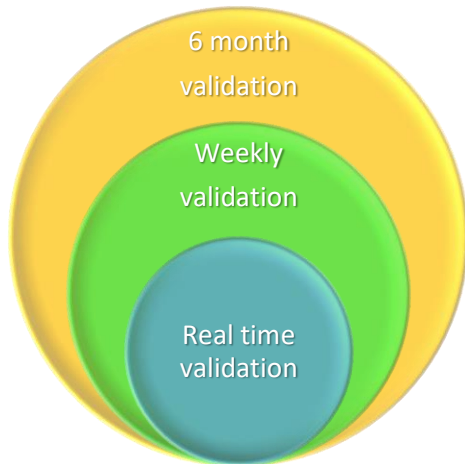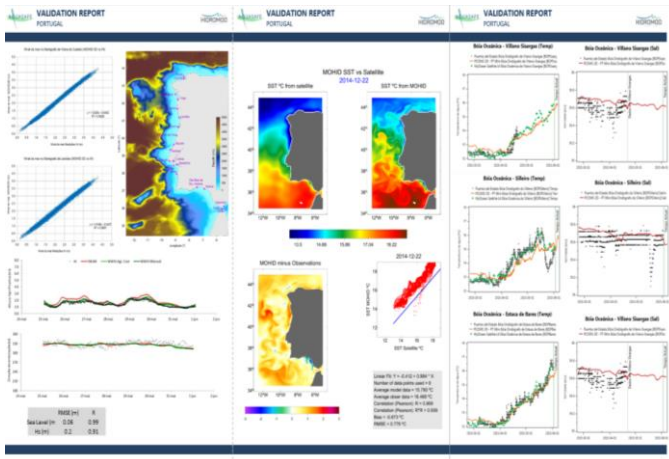
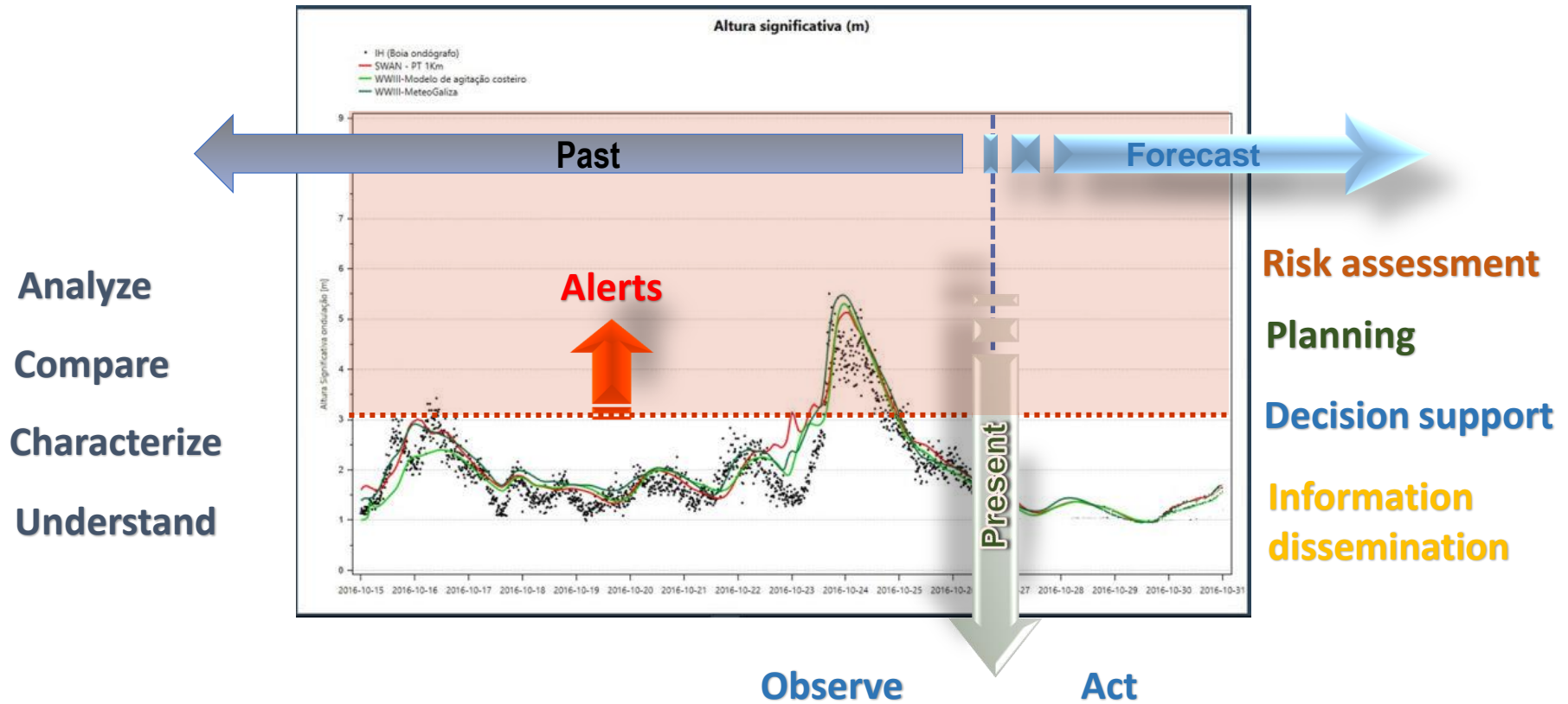# A full integrated service capable to fulfil the needs of multiple users

Data acquisition
Copernicus · esa EUMETSAT · In-Situ data · Other data sets

Data transformation
- High resolution models
- Data Assimilation
- Data Fusion
- Uncertainty information

Storage

Operational system
Aggregated, analysis, index

- Alerts
- Reports
- Crisis management tools
- Data sets

Ports · Industry · Research community · General public

MARITIME SAFETY · MARINE RESOURCES · COASTAL AND MARINE ENVIRONMENT · WEATHER FORECAST

A continuous validation process

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Learn with the past and prevent the future

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Altura significativa (m)

- IH (Boia ondógrafo)
- SWAN - PT 1Km
- WWIII-Modelo de agitação costeiro
- WWIII-MeteoGaliza

Past → **Forecast**

Alerts

Present

Analyze

Compare

Characterize

Understand

Risk assessment

Planning

Decision support

Information dissemination

Observe   **Act**

Different service distribution media
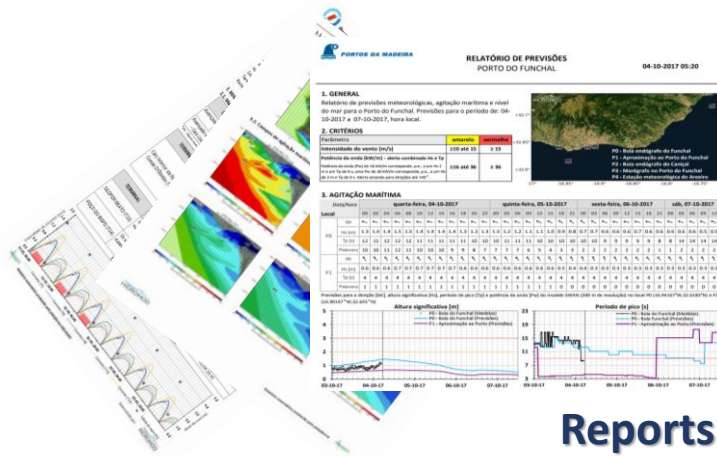
Reports
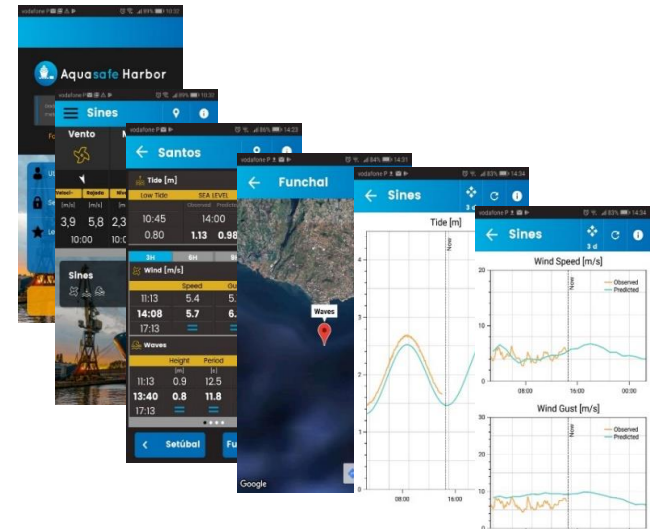
Mobile App
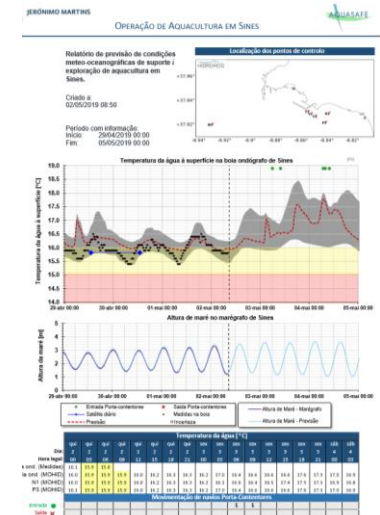
Web
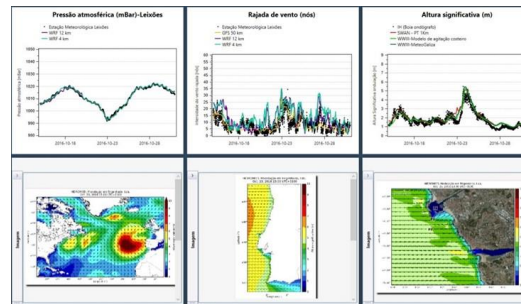
Video wall

Benefits for Clients

On time **alerts** based on user's defined constraints

Support to frame **responsibility** in relation to incidents or potential conflicting decisions (availability of data to justify the decisions or the eventual lack of responsibility)

Improved relations with the local society (**better public image**)

Benefits for Clients

Availability of **audited** and **validated** information focused on user' specific requirements through a single access point (including real time data and high resolution forecasts)

- **lower risks** in decision making
- **improved safety**
- **better** operations **planning**
- contribution to a **safer environment**
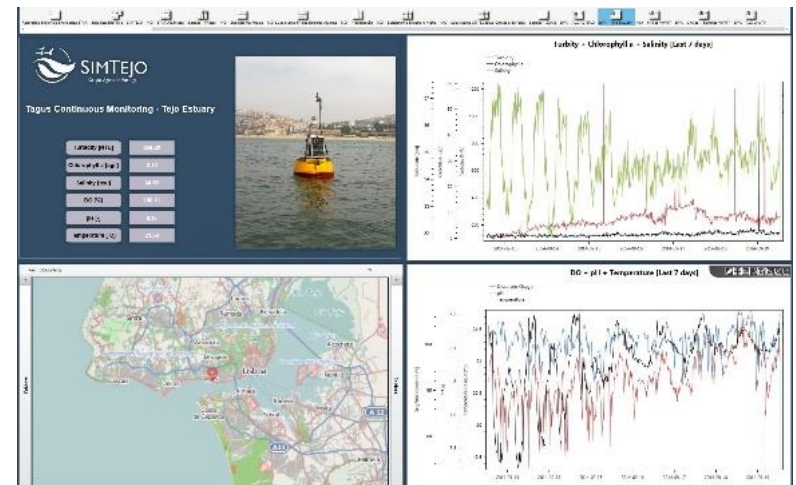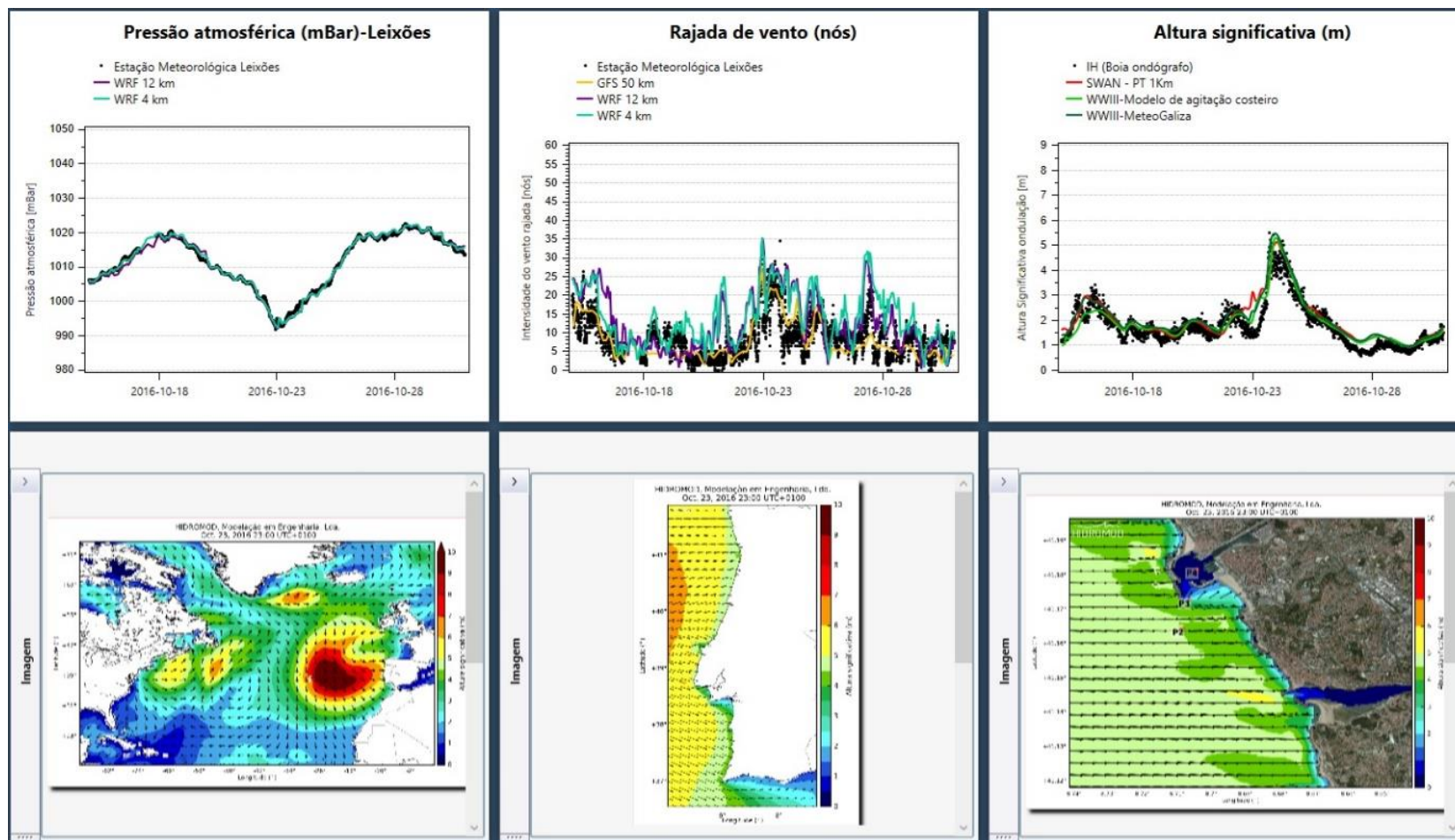
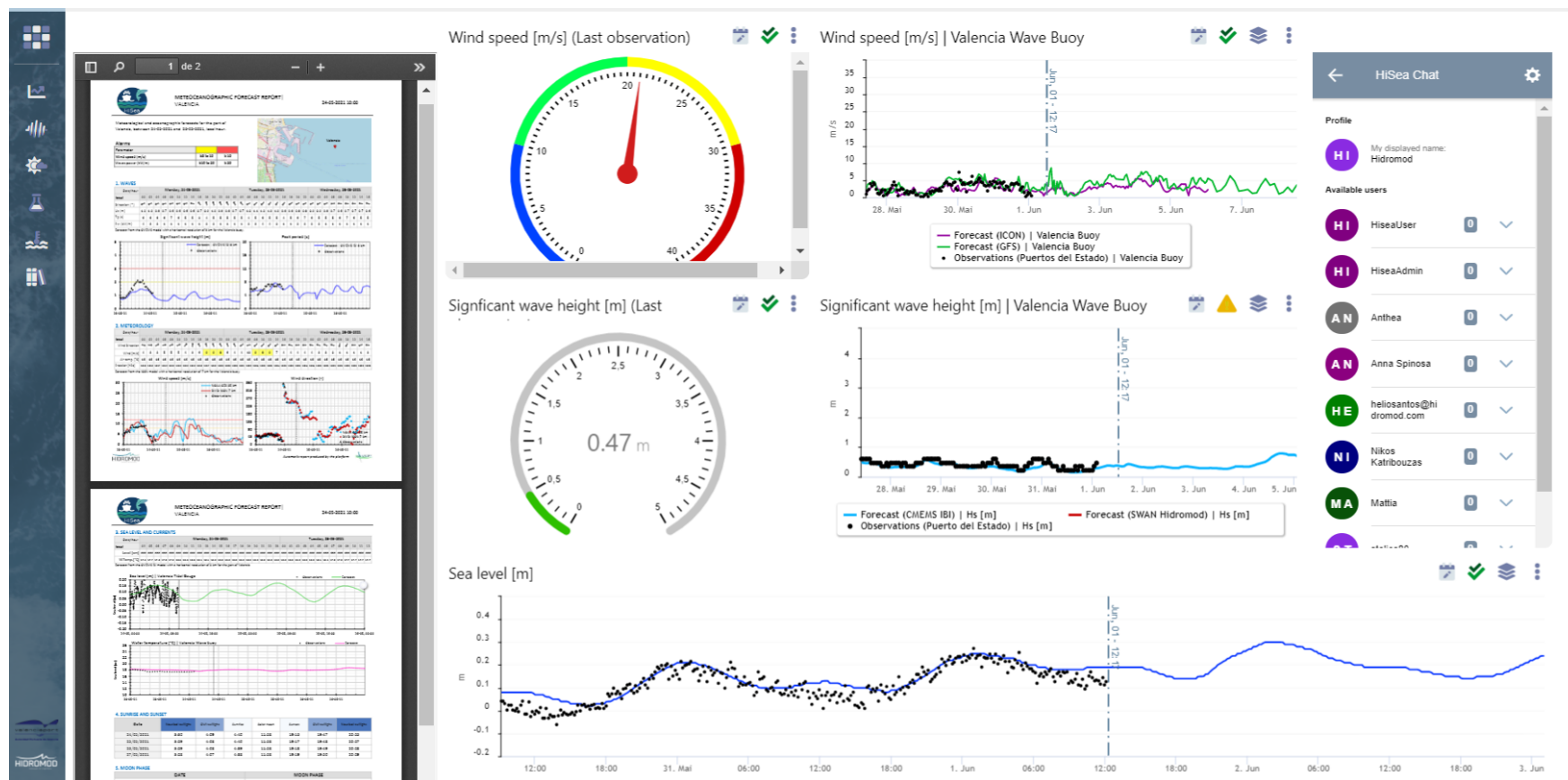# Some Examples

High Resolution Meteo-Oceanographic Forecasts

High Resolution Meteo-Oceanographic Forecasts

Bathymetry related services
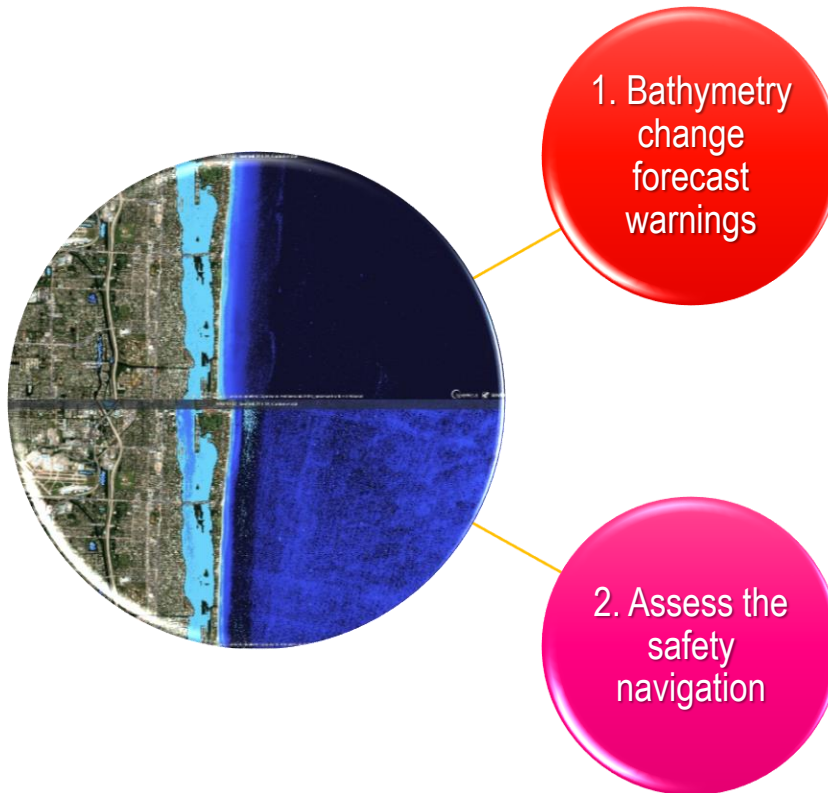
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**1. Bathymetry change forecast warnings**

- Develop a bathymetry changes service to issue alerts in case of existence of depths bellow the required level and keep an historical record of all bathymetric surveys

2. Assess the safety navigation

- Simplified service to assess the safety conditions navigation of a particular ship in a port, using updated bathymetry (Dynamic Under Keel Clearance).

Assess the safety navigation (DUCK*)

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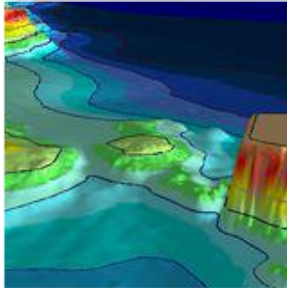
PURPOSE: A system that allows assessing the safety conditions of a ship (with certain characteristics) can enter a port, using updated bathymetry.

INPUT: The system integrates information of the tide, waves, vessel data to model the vessel's movement during the proposed transit and hydrographic survey data using updated bathymetry from Satellite-derived bathymetry.
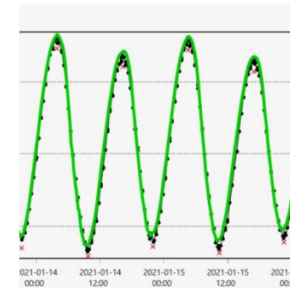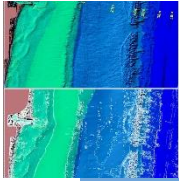

SYSTEM: To predict the clearance under the keel of a vessel based on the vessel's characteristics, environmental conditions and detailed navigation channel depths.

*Dynamic Under Keel Clearance
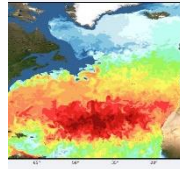
Bathymetry related alerts

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Purpose

- Kee record of bathymetric all bathymetric surveys (using local surveys, satellite images or other data sources) to identify situations that may pose safety concerns to navigation

Concept

- Analysis of consecutive bathymetry data sets and identify significant bathymetric changes;

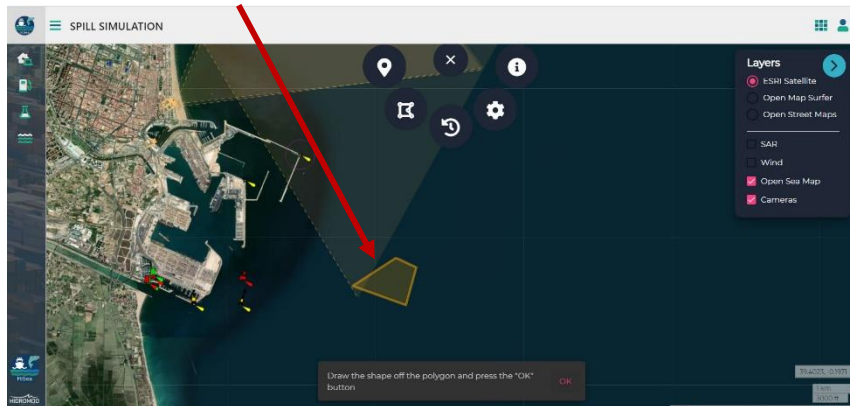- Identify locations where depths are bellow the navigation requirements (design channel)

System

- Issue of alerts whenever any concerning condition is met.

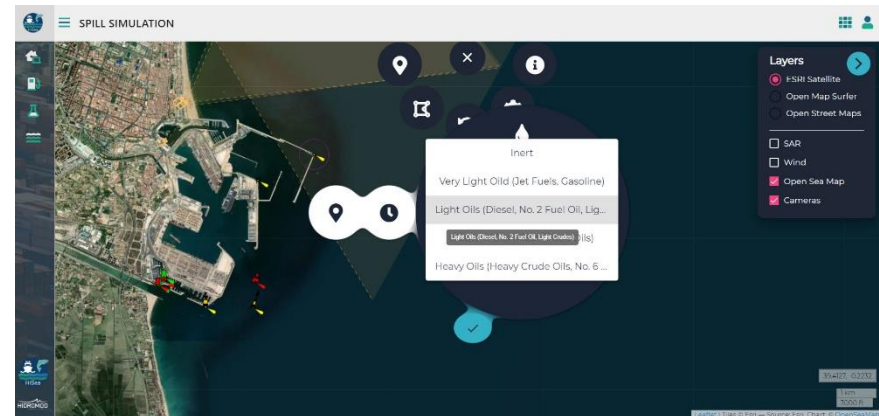# Oil Spill Simulator: a simple 4 steps procedure

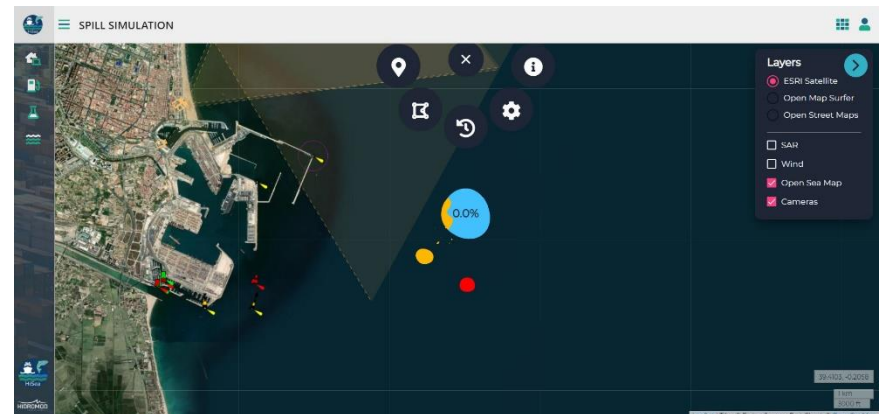**ODYSSEA**

1. Select a spill location

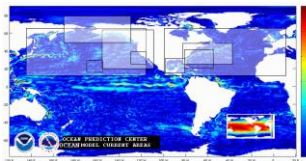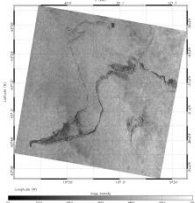## 2. Select a simulation period

3. Select a product (oil) type

4. Perform the simulation

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A professional solution capable to work offline and including a large product database (ADIOS) is also available
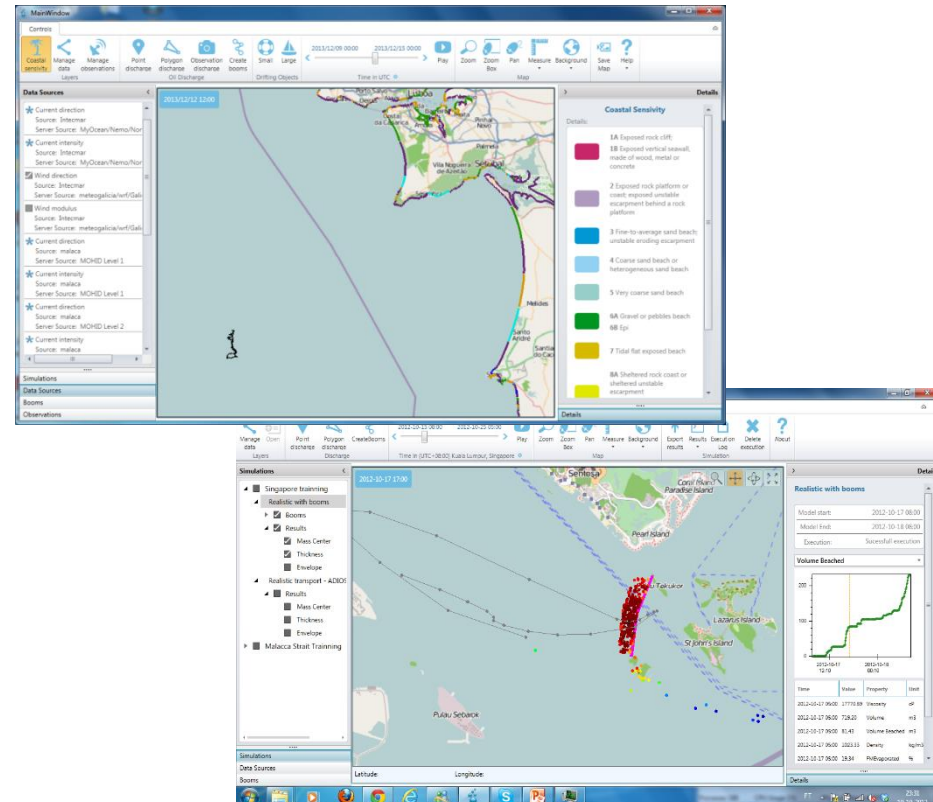
Application to marine pollution prevention and response

Observations (e.g. SAR, plane, etc)

Forecasts (wind, currents, waves)

Coastal sensitivity

The same procedure may be used to track floating objects such as debris or plastic

Other possible services

The services **may include** relevant information regarding the ports environmental concerns related both with **water quality** and **air quality** issues

A **risk assessment** and **emergency** service capable to provide support in the case of accidental release of hazardous materials with different release scenarios, evaporation, chemical fires, explosion and spills in air or water. Continuous modeling and short term forecasts make the system immediately "ready" for emergency simulations

To conclude...

AQUASAFE delivers advanced high resolution forecast services providing:

- A **unique access point** to different meteorological and oceanographic **data sources** and **forecasts**

- High resolution meteorological and oceanographic forecasts providing reliable information on the required locations and with the **required time and space scales**

- **Automatic reports** and **alerts** personalized according to users' requests

- Support to **marine pollution** prevention and response actions and **search and rescue** missions

- Continuous model **validation** results (check of forecast level of confidence)

- An **easy-to-use tool** to support the forecast of transport, dispersion and fate of an **pollution** at sea

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THANK-YOU

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