

Our (success?) experience with PPI PROAS Project. Algeciras Port Authority

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ORITIA & BOREAS
Wind Engineering

Intellectual Property Rights and Innovation procurement
Jan 25th 2024



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Spin-off company of the University of Granada

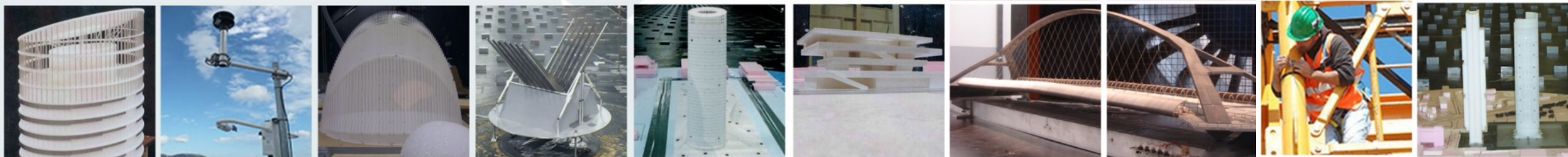
Official partner with Western University

Founding Partners originate from the A. G. Davenport Wind Engineering Lab.

Over 25 years' experience in wind engineering



ORITIA & BOREAS
Wind Engineering



WIND ENGINEERING

Applied investigation and advanced consulting services in the study of wind effects on structural systems.

WIND TUNNEL TESTING

Detailed boundary layer wind tunnel studies of wind effects on tall buildings and singular structures.

STRUCTURAL CONTROL AND MONITORING

of environmental conditions and structural health during construction and in service.

WIND FORECAST MODELLING

Mesoscale & Microscale modelling of environmental data to aid decision-making.

Studies of wind effects on Buildings

- Structural loading (global base shear, moments and torsion)
- Net differential pressures on façade elements
- Accelerations and torsional velocities in the upper levels
- Study of pedestrian comfort and safety

O Tower
250m
Rabat, Morocco



Sevilla Tower
180m
Sevilla, Spain



Bicentenario Towers
170m
Toluca, Mexico



New Marina Tower
160m
Casablanca, Morocco



Studies of wind effects on Bridges

- Aerodynamic instabilities (vortex induced vibration, flutter, galloping, etc)
- Structural loading
- Aeroelastic phenomena and equivalent static loads
- Structural response of the bridge deck.

Storebaelt Bridge - **1624m** - Danmark



Rande Bridge - **1558m** - Spain



La Constitución de 1812 Bridge - **3092m** - Spain



Almonte River Bridge - **384m** - Spain



solar energy systems

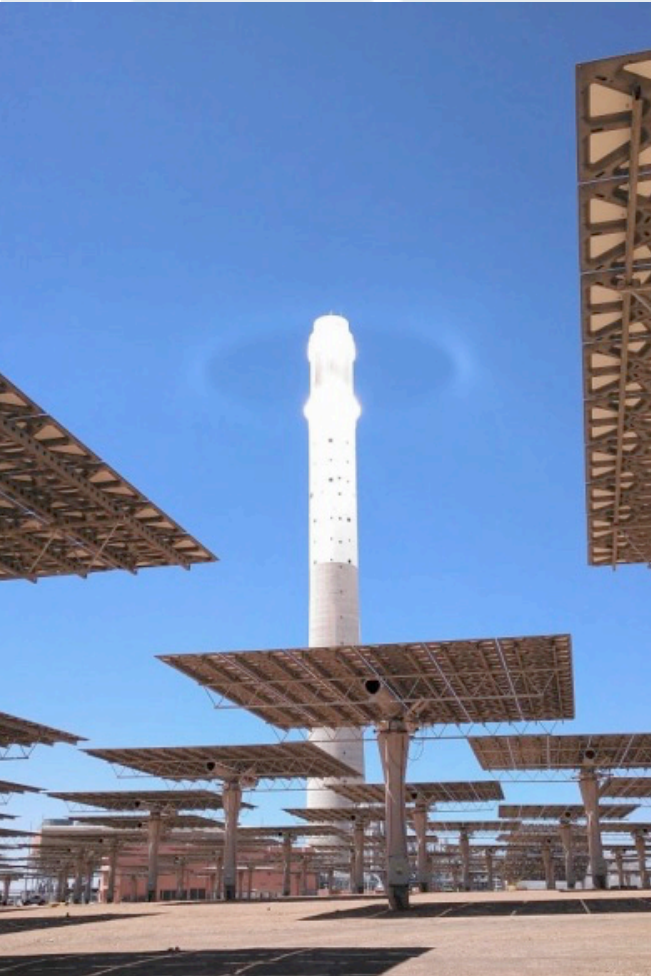
- SOLAR TOWER
- SOLAR TRACKERS
- PARABOLIC COLLECTORS
- ROOF MOUNTED SYSTEMS

Noor III
250m, SENER
Rabat, Morocco

Concentration PV
Abengoa / Reenergy (...)
Multiple locations

CSP
SENER / Abengoa (...)
Multiple systems

Roof mounted
Sunlink
USA and others

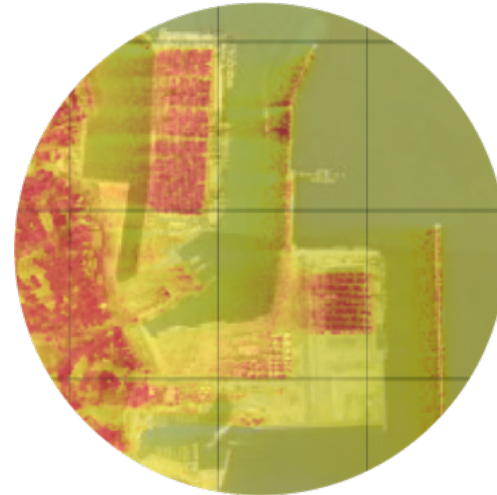


Expertise in Ports

Environmental monitoring



HR Wind forecasting: 1km-50 meters



Dispersion Modelling of Air Pollutants



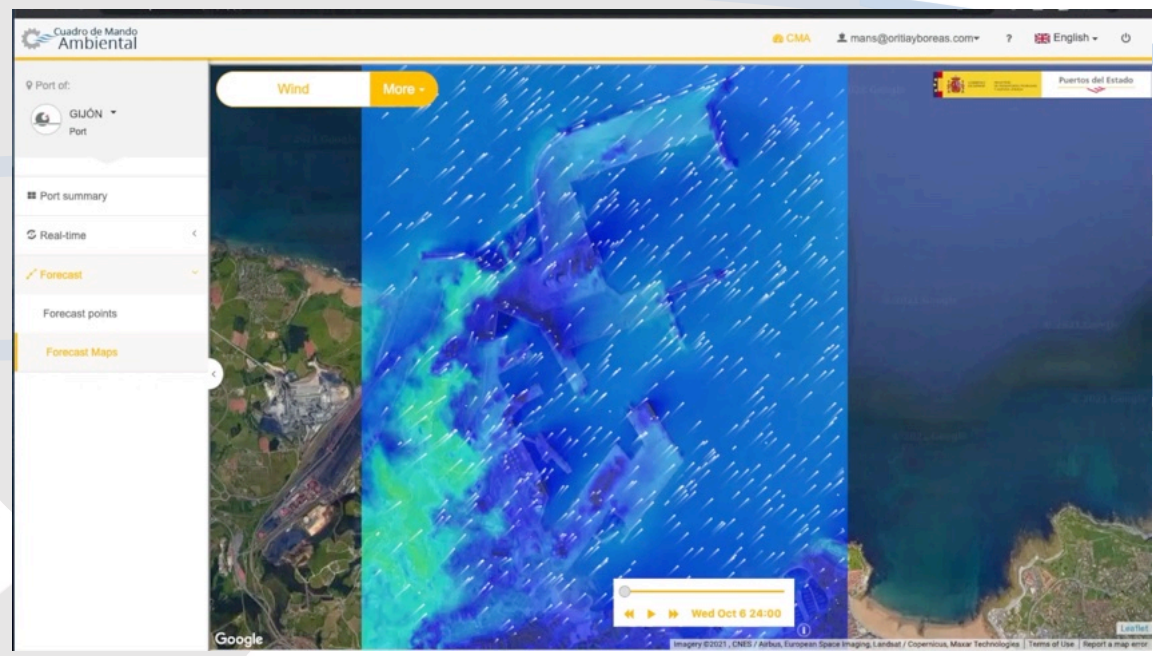
Decision Support Tools



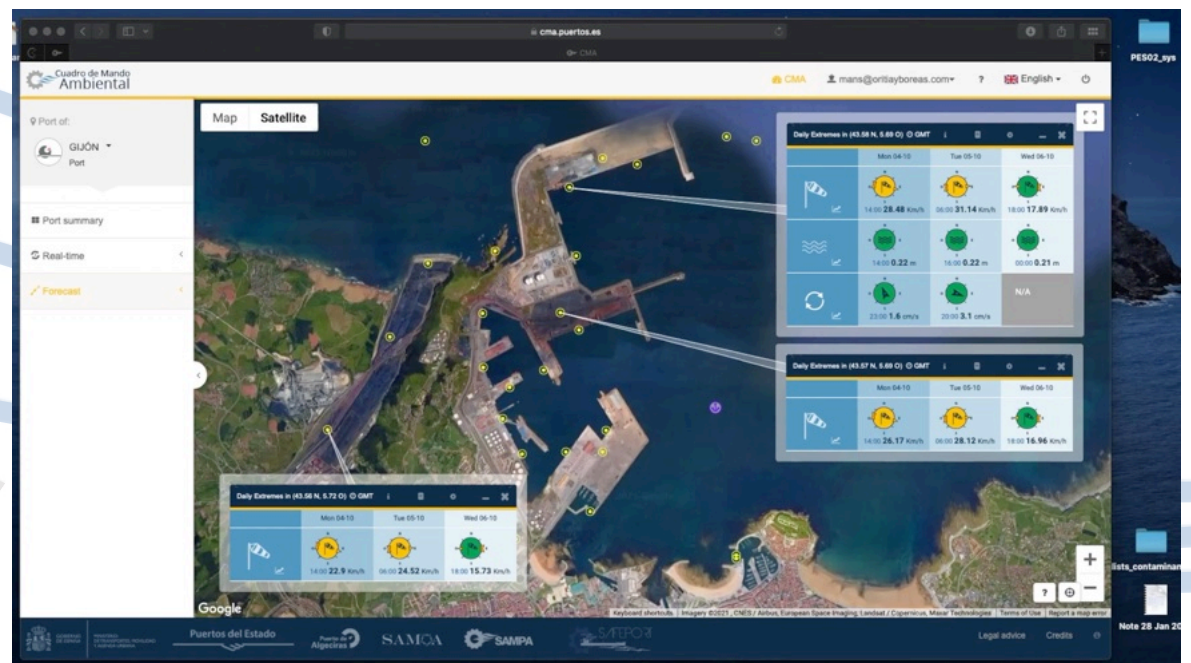
DECISION SUPPORT TOOLS. CMA

- Visualization tool (web) specifically developed for Port Authorities in order to properly exploit all the Operational Oceanography
- Developed in: SAMOA Project (Spanish Ports Authority) and SAFEPOR Project (Algeciras Port Authority).
- Main functionalities:
 - Forecast maps and points predictions.
 - Daily reports.
 - User defined alarms.
 - Support for third party applications.

Example: High Resolution Wind field visualization



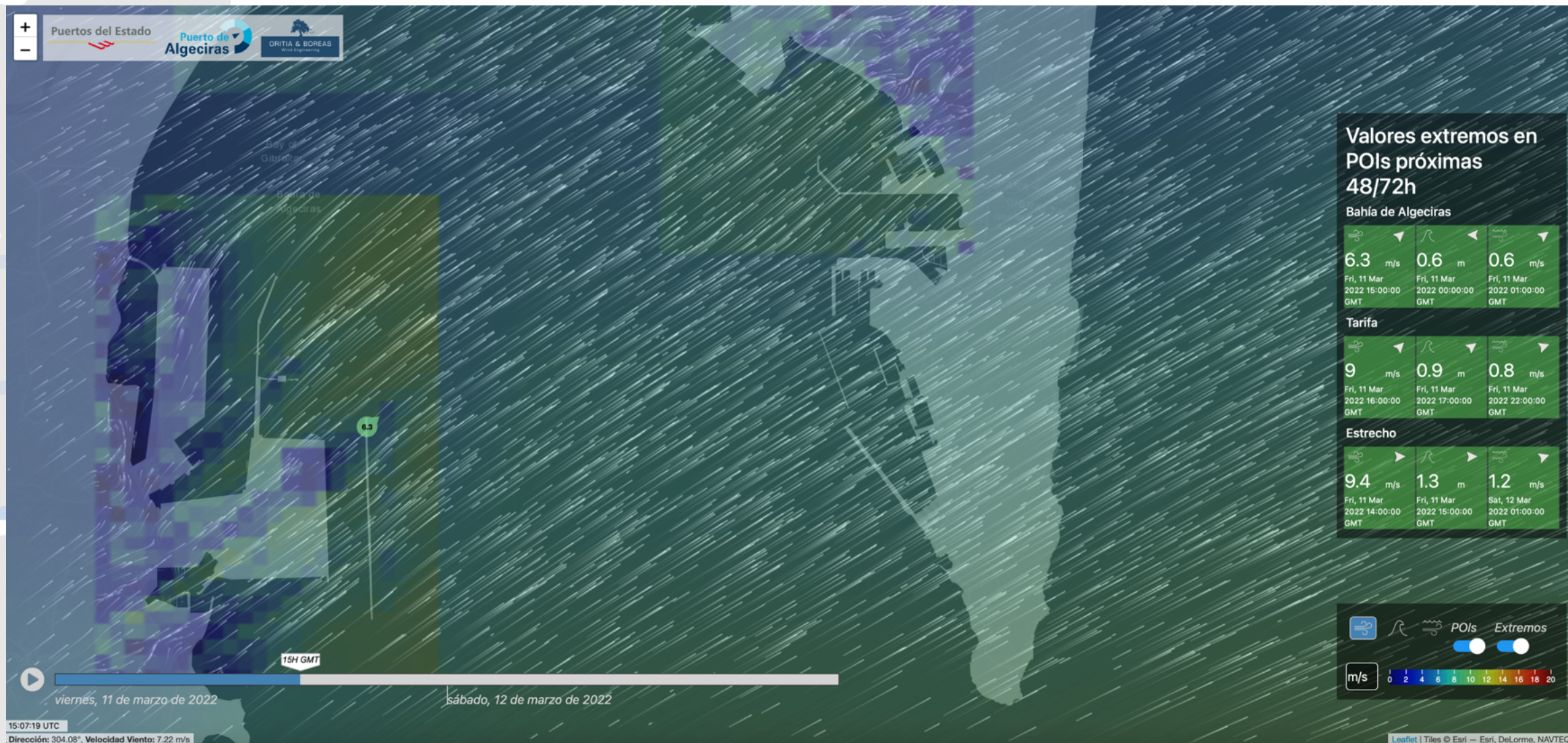
Example: Forecast visualization and on-demand reports



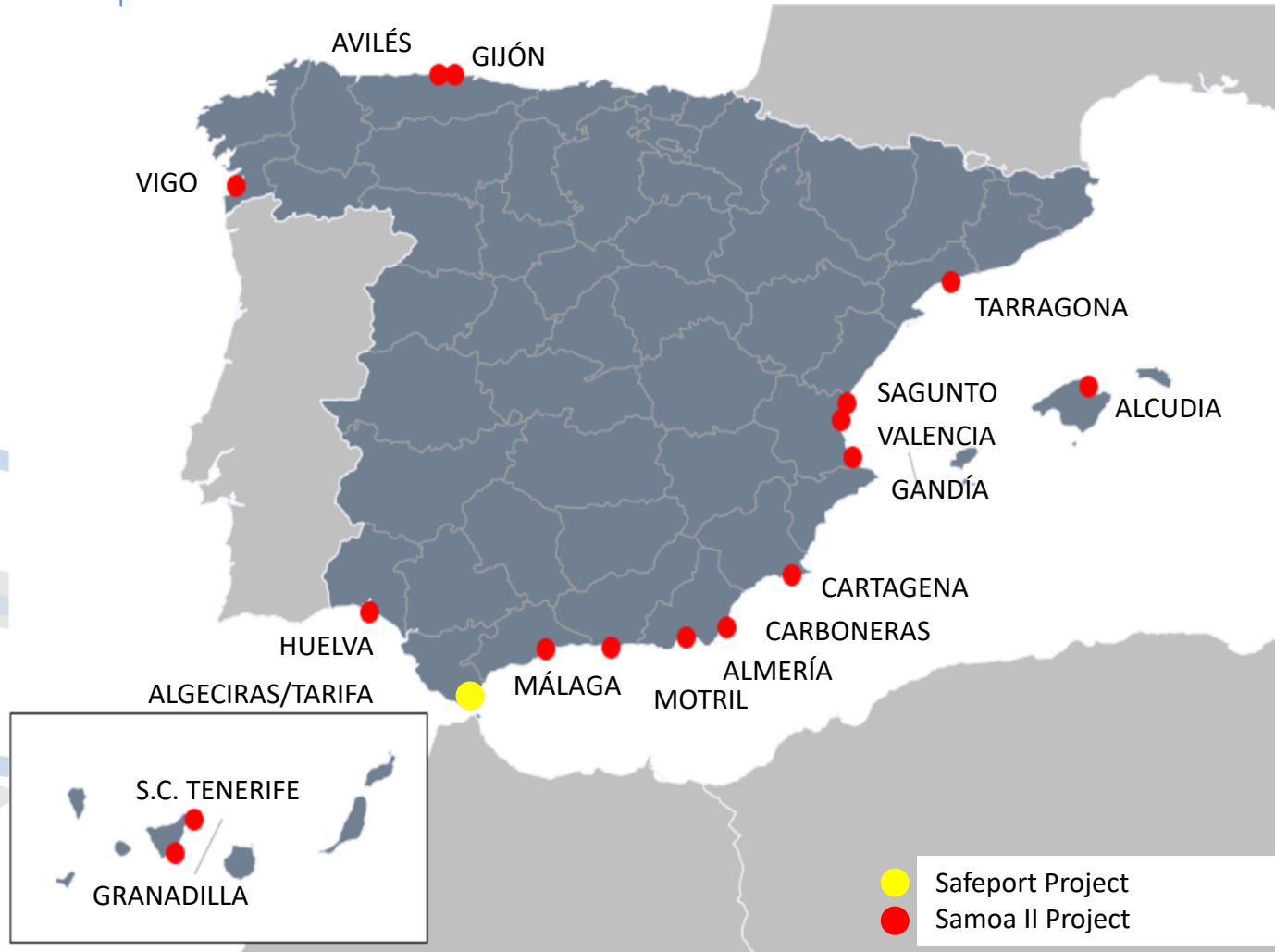
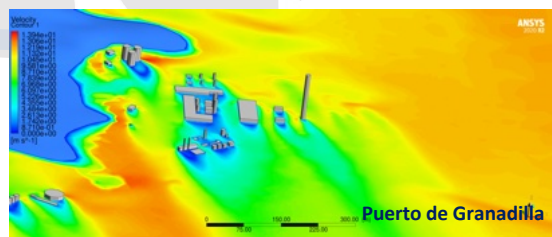
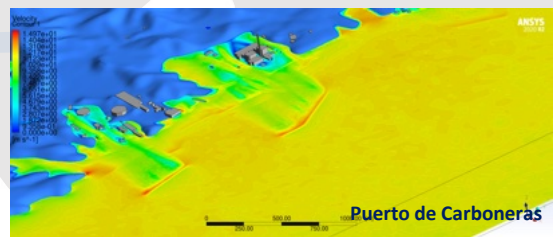
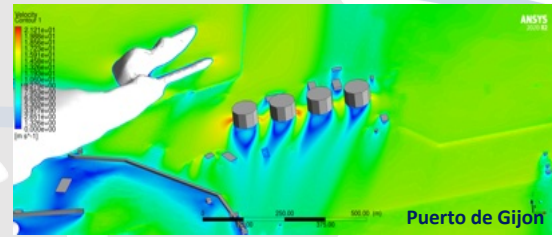
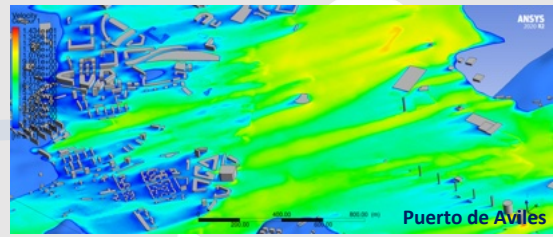
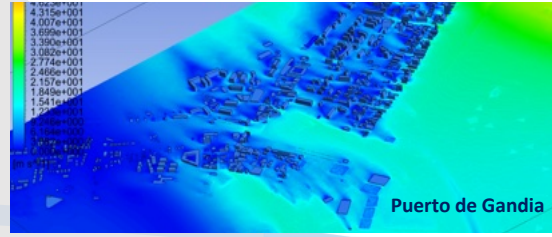
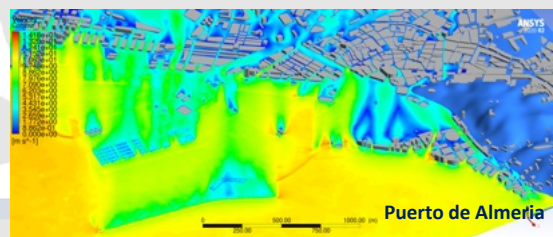
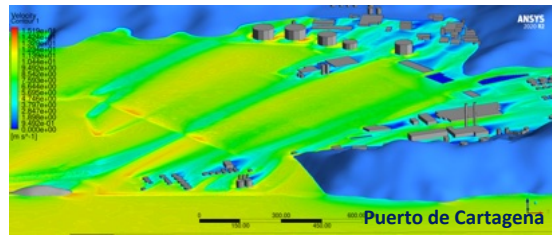
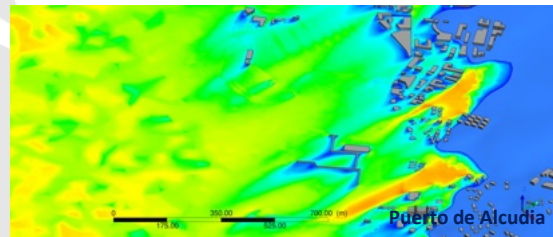


DECISION SUPPORT TOOLS. MET-OCEAN VIEWER.

- Simple HTML5 website to check wind, waves and currents predictions.
- Easily configurable to load data from different sources and resolutions.



WIND FORECASTING. HIGH RESOLUTION (~50 m)





PROAS Project

ADVANCED OPERATIONAL MOORED
VESSEL FORECASTING

PROAS PROJECT. ALGECIRAS PORT AUTHORITY ADVANCED OPERATIONAL MOORED VESSEL FORECASTING

Joint Venture

Subcon.



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POLITÉCNICA

ayesa



IH cantabria
INSTITUTO DE HIDRÁULICA AMBIENTAL
UNIVERSIDAD DE CANTABRIA



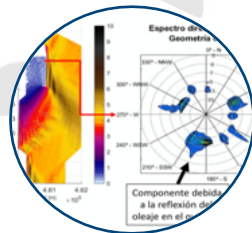
DECISION SUPPORT TOOLS. PROAS SYSTEM

- OPERATIVITY and PRODUCTIVITY FORECASTING based on: planned operations and met-ocean conditions. 1st regional PPI - 1st PPI within Spanish Ports System
- Port Agnostic methodology and particularized for Algeciras Port Authority.
- Started on 2021 and finished on 2023. Initially planned 2018-2021
- key targets
 - Advanced met-ocean modelling
 - Moored vessel and met-ocean monitoring
 - Extensive moored vessel simulations (~6.000 simulations per terminal)
 - A.I. to estimate selected KPIs
 - Functionalities and UI based on stakeholders (pilots, maritime operations, terminalists)
- 2.5M€ phase 1 + phase 2 budget

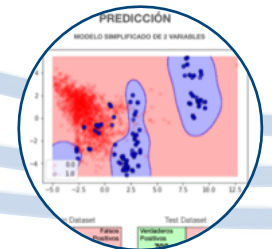
A.I.



Advanced met-ocean modelling



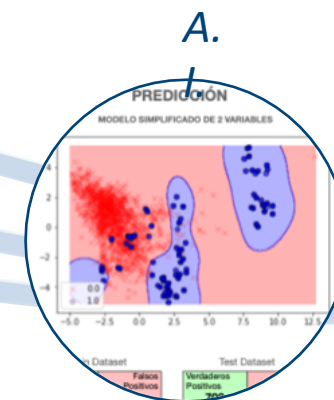
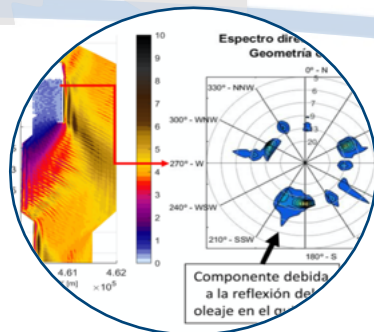
Moored vessel and met-ocean monitoring





PROAS PPI Timeline

- **2017 April** APBA announces PPI coming up – workshop
- **2017** Shortly after initiates market consultation
- **2018 April** APBA initiates PPI starting with competitive discussion
- **2019 July** APBA invites candidate to PPI
- **2019 October** PPI entries submitted.
- **2020 Feb** O&B Ayesa UPM joint venture awarded contract
- **2021 Mar** contract execution project kick off
- **2024 Jan** Phase 1 completed Phase 2 ongoing



PROAS PPI Pros and cons

ADVANTAGES

- Great framework for public purchasers to define and address solutions to complex innovative challenges
- Enables a tech Sme such as o&b to lead and engage into a 2.5M€ innovation tender
- Safe framework for IP within a public tender
- Limits relative effort process throughout by invitation only final stage

ROOM FOR IMPROVEMENT?

- Timing and resources involved can be overwhelming and might compromise costing and technology
- Change of partners might be a challenge
- Effort furthermore relative to progress in the competition
- IP ownership and protection through process/end can prove challenging to define clearly (hard, software and methodologies...)

Thanks for your attention!

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