

OPENCoastS⁺: on-demand forecast of circulation and water quality in coastal regions

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Demonstration

EGI Conference 2022
September 21, 2022



Outline



- Coastal forecasting and the OPENCoastS+ service
- 3D baroclinic and water quality forecast: implementing a coastal forecast with OPENCoastS+
- Service automated deployment using an Infrastructure as Code (IaC) approach
- Questions & Answers / Final remarks



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Coastal forecasting and the OPENCoastS⁺ service



Context and motivation for a digital water resources strategy

- Anticipate contamination events and support emergency actions
- Support water economy daily tasks and leisure & recreation
- Guide management to minimize risks in the coastal areas
- Can contribute towards Destination Earth, Earth System Modeling Framework and other digital global initiatives
- Can contribute to UN Ocean Decade and Sustainable Development Goals implementation



Forecast systems



Forcings

Prediction simulations

Post-processing, archiving and visualization

Comparison with real time data



Day 1



Day 2



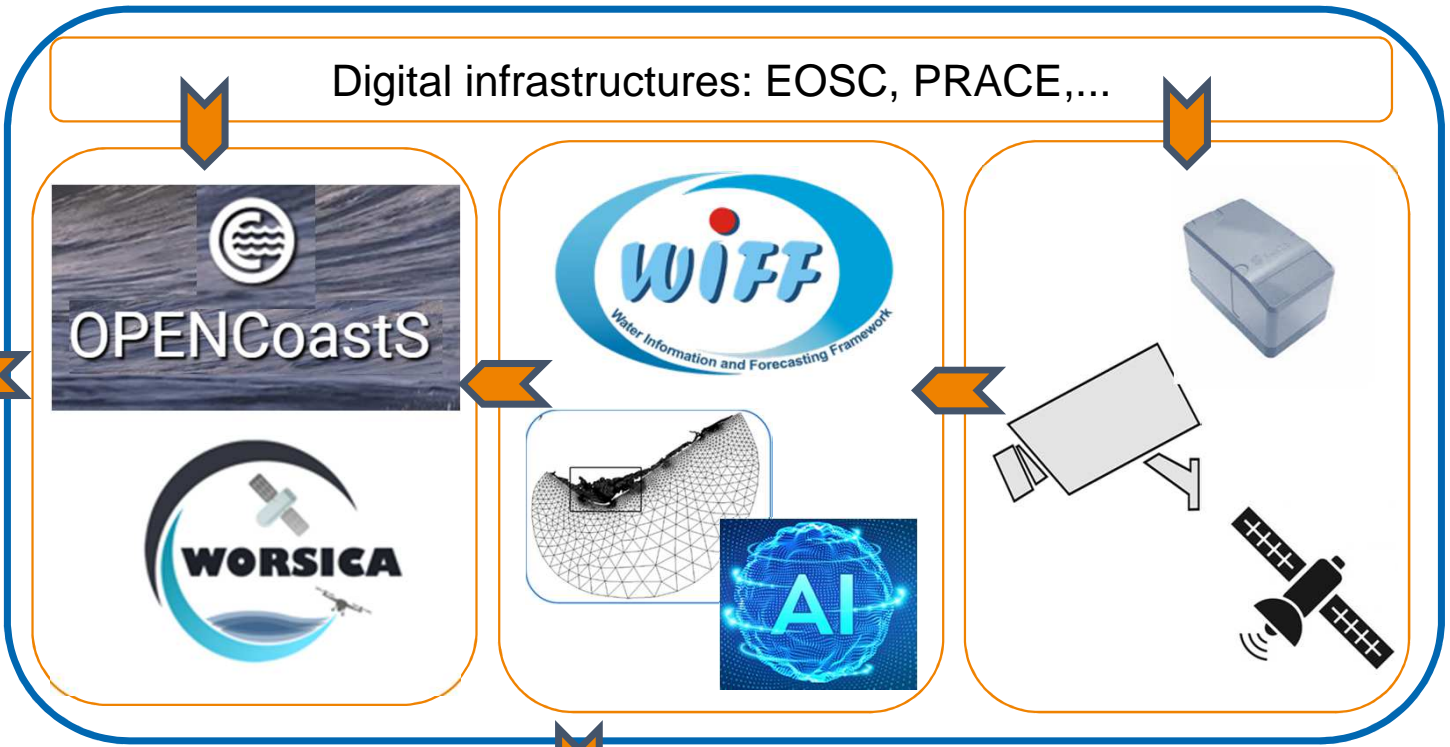
Day 3



Digital water resources: coastal forecasting



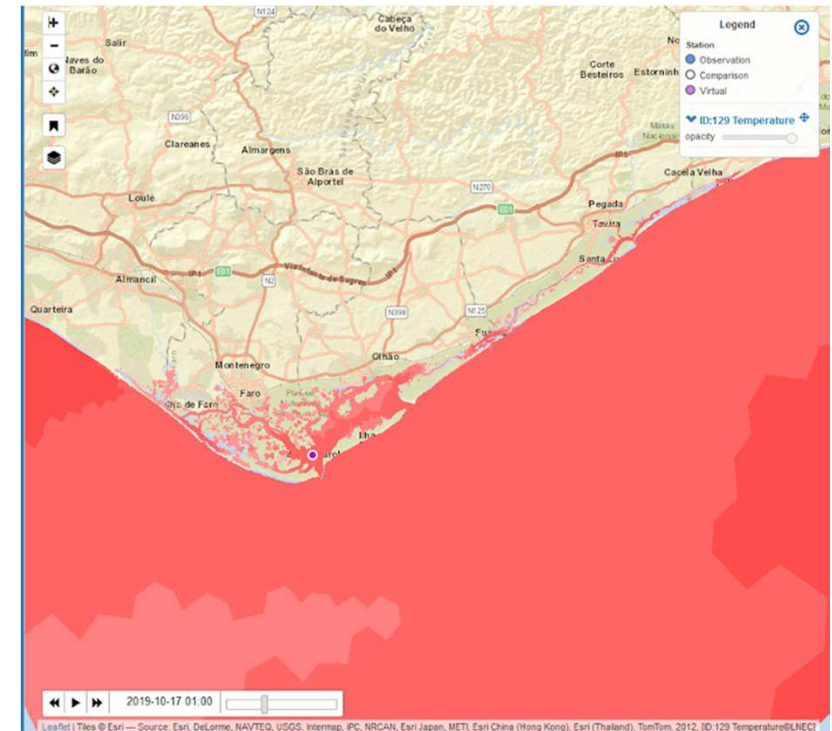
Managers
Companies
Researchers
Public
....





in a nutshell

It assembles on-demand circulation forecast systems for selected coastal areas and generates daily forecasts of water levels, wave parameters, 2D and 3D velocities, and 3D salinities, temperatures and water quality variables over the region of interest for 48 hours, based on numerical simulations of all relevant physical and biogeochemical processes



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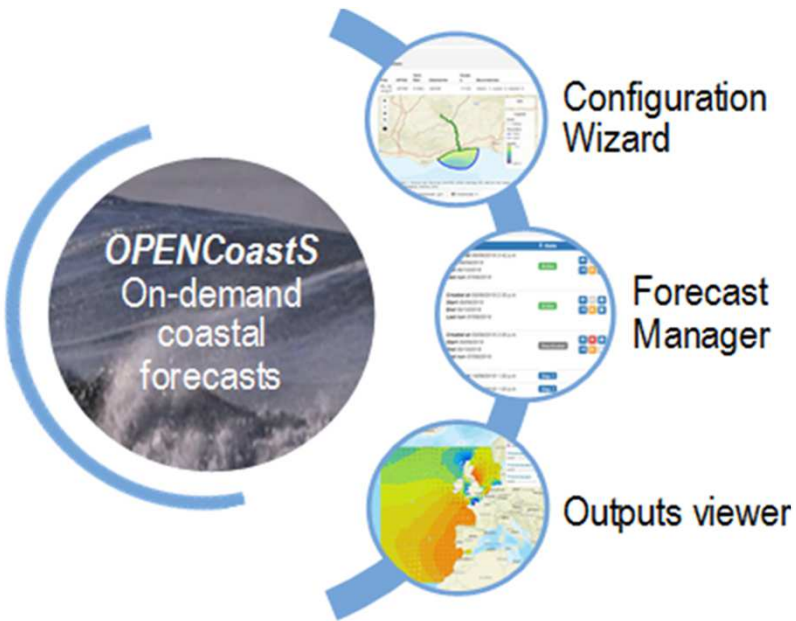


a new paradigm in coastal forecasting to empower users

A service to:

- Make the implementation of coastal forecasts fast and easy: build forecast systems for a location chosen by the user, using a browser-based, user-friendly, interface
- Make the service flexible in its configuration (forcings, processes and models)
- Flexible IT architecture that can grow to additional processes
- Take advantage of the EOSC infrastructure and core-services to provide the required computational resources

Navigating in the 3 pillars: user-centred approach



- One-stop-shop for all forecast activities
- User-selected options on every step

Useful links

OPENCoastS PLATFORM	https://opencoasts.ncg.ingrid.pt/
Users Manual	http://opencoasts.lnec.pt/pdfs/Manual_opencoasts_v11.docx.pdf
Link to previous training events	http://opencoasts.lnec.pt/ Next hands-on training at 2nd MEDGU, Marrakech, Morocco
Source code	https://gitlab.com/opencoasts/eosc-hub

Next: live demo on how to use OPENCoastS for a water quality deployment



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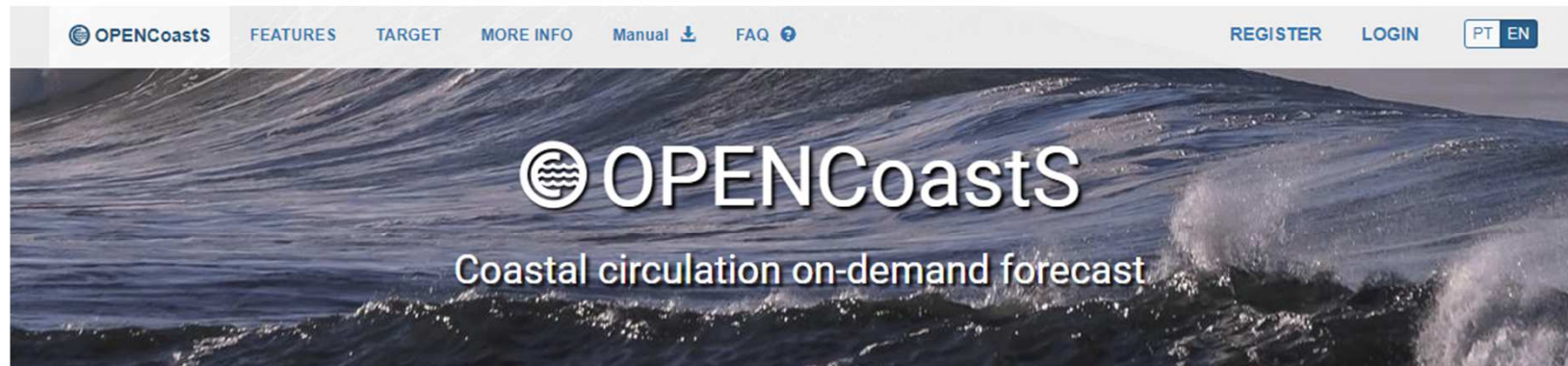


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**3D baroclinic and water quality
forecast: implementing a coastal
forecast with OPENCoastS⁺**

Live demonstration



Forecast systems are fundamental assets for emergency response and everyday management of coastal regions

The OPENCoastS service assembles on-demand circulation forecast systems for selected coastal areas and keeps them running operationally for a period defined by the user. This service generates daily forecasts of water levels, vertically averaged velocities and wave parameters over the region of interest for 48 hours, based on numerical simulations of all relevant physical processes.

Presently, all forecasts are made with the [SCHISM model](#). Tide gauge data are provided by [EMODnet Physics](#).

The following forcing sources are used:

- Atmosphere forcings:
 - [GFS \(NOAA\)](#)
 - [ARPEGE \(MétéoFrance\)](#)
- Ocean forcings:
 - [PRISM2017 \(LNEC\)](#)
 - [FES2014 \(LEGOS\)](#)



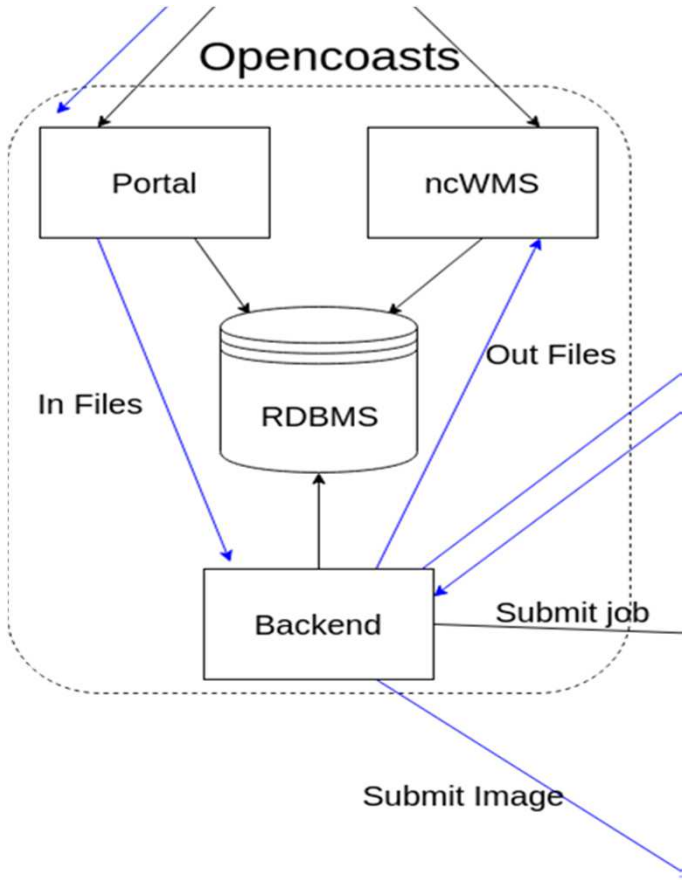
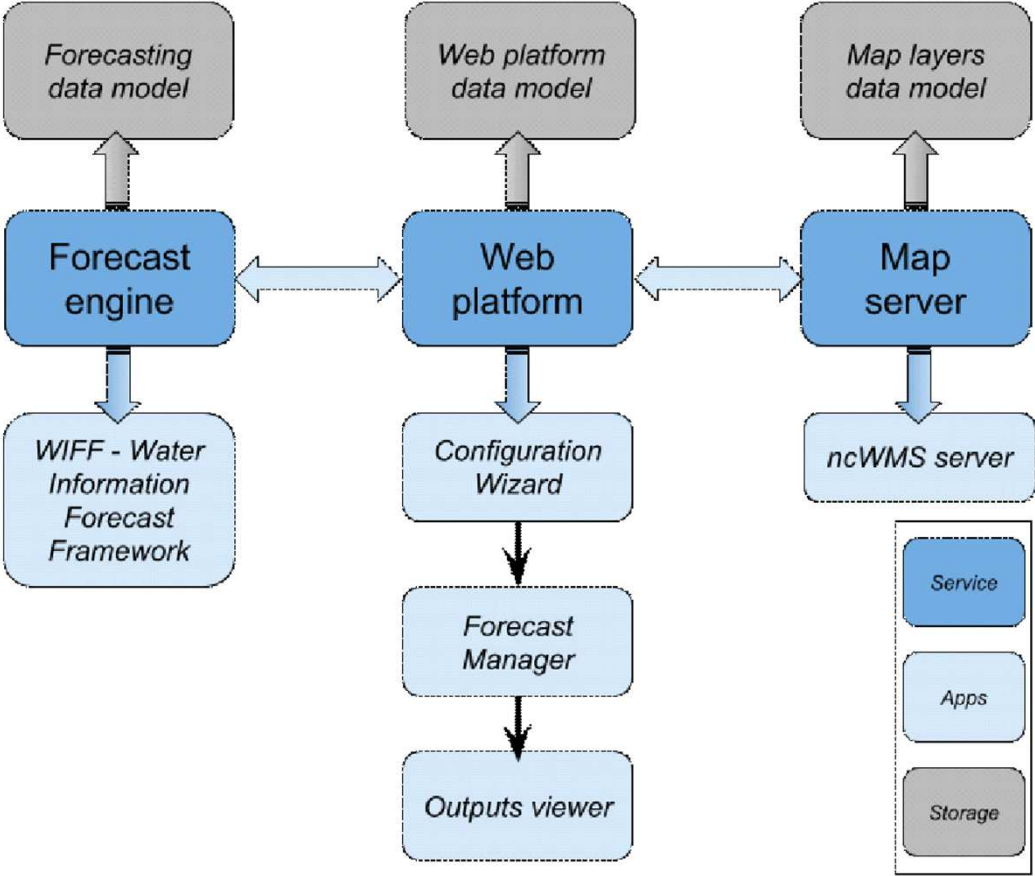
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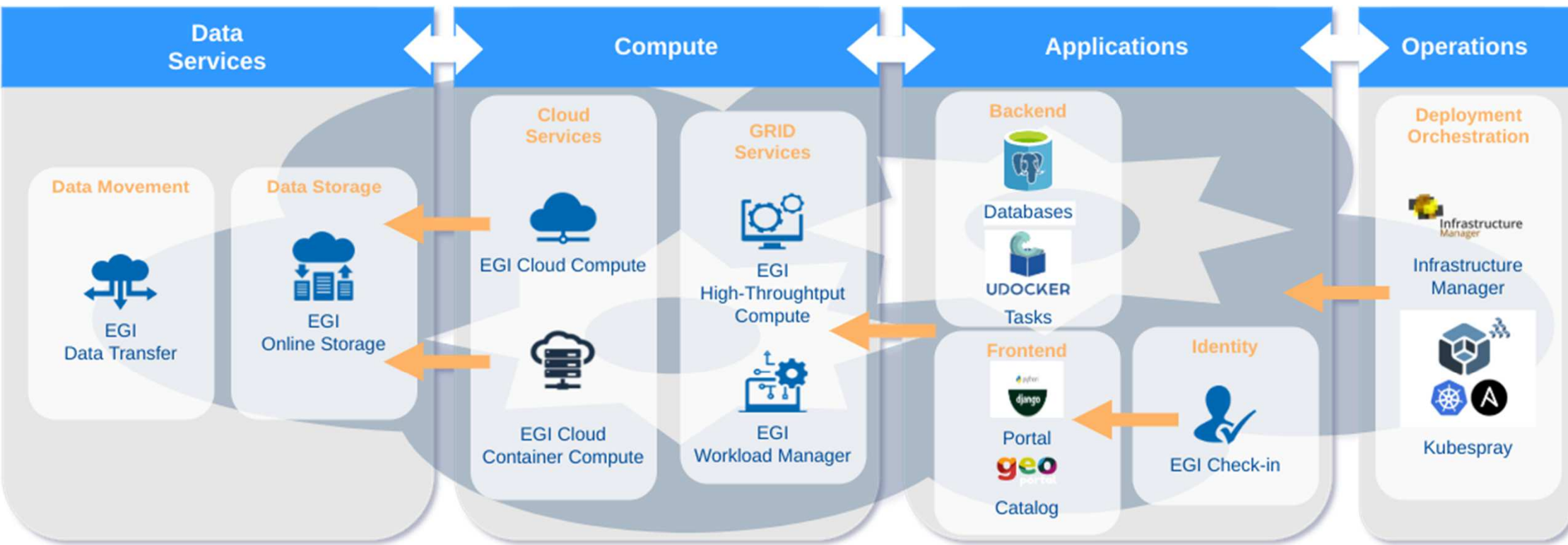


Service automated deployment using an Infrastructure as Code (IaC) approach

OPENCoastS Platform Overview



OPENCoastS deployment over EGI



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Questions & Answers / Final remarks