Computational services in support of Coastal Digital Twins

A.Oliveira*, A. Azevedo+, M. Rodrigues+, A.B. Fortunato+, R. Martins+, G. Jesus+, S. Bernardo#

* LNEC, aoliveira@lnec.pt; + LNEC; # LIP

Digital Twins provide a virtual representation of a physical asset enabled through data and models.

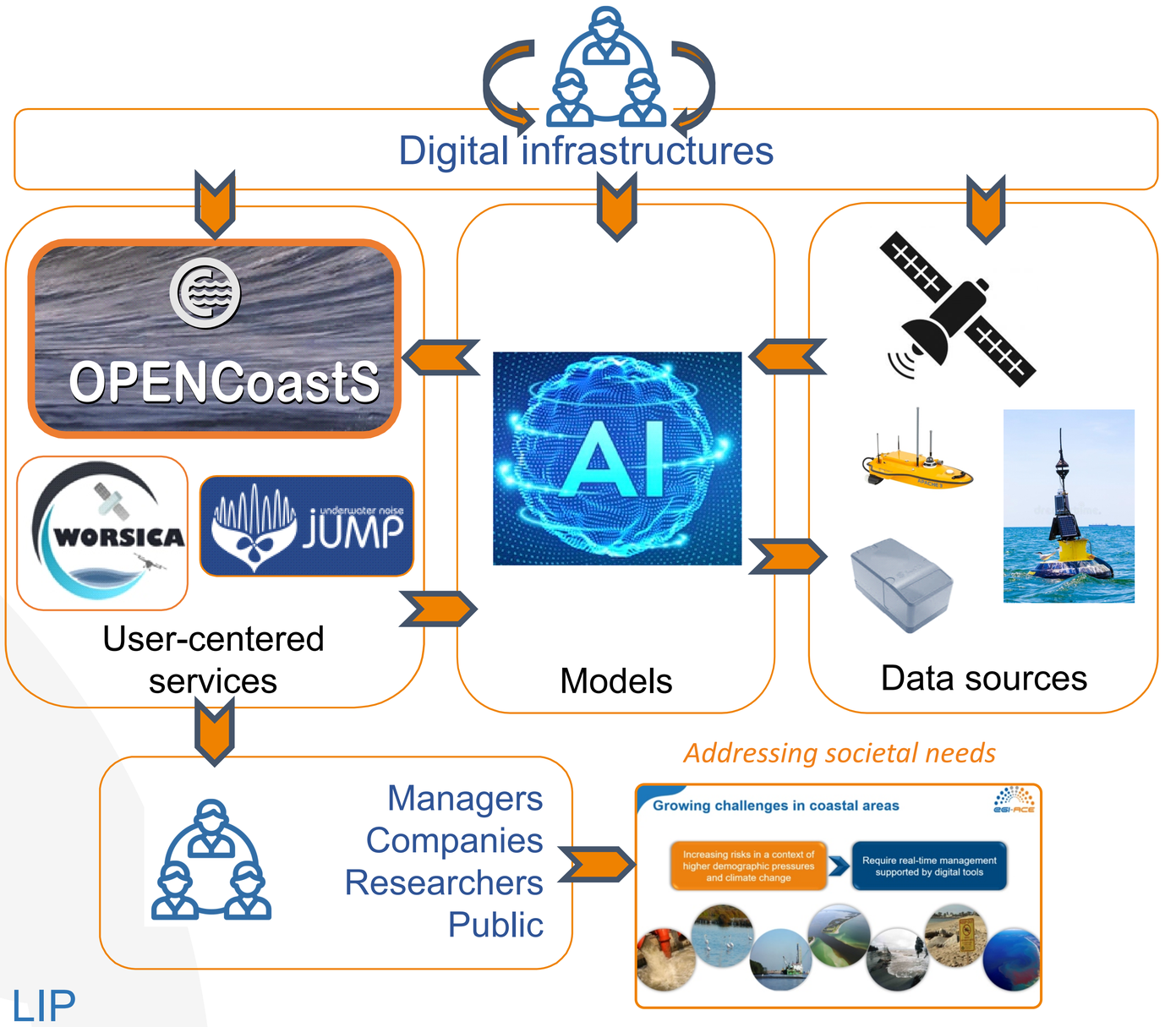
They can be used for multiple applications such as real-time forecast, system optimization, monitoring and controlling, and support enhanced decision making.

The development of Digital Twins, targeting user creation of knowledge and products (DestinEarth, Digital Twins of the Ocean) have set the stage for a user-centered digital vision to support all coastal interventions.

Actions within Digital Twins are materialized through computational services, devoted to address specific concerns.

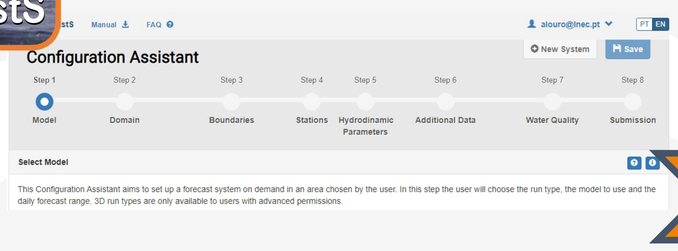
The concept of web-based coastal computational services, available through user-friendly interfaces, has promoted their usefulness for coastal knowledge creation and coastal management.

Computational effort and data requirements for these services are high, requiring the integration of Coastal Digital Twins in federated computational infrastructures, such as the European Open Science cloud.



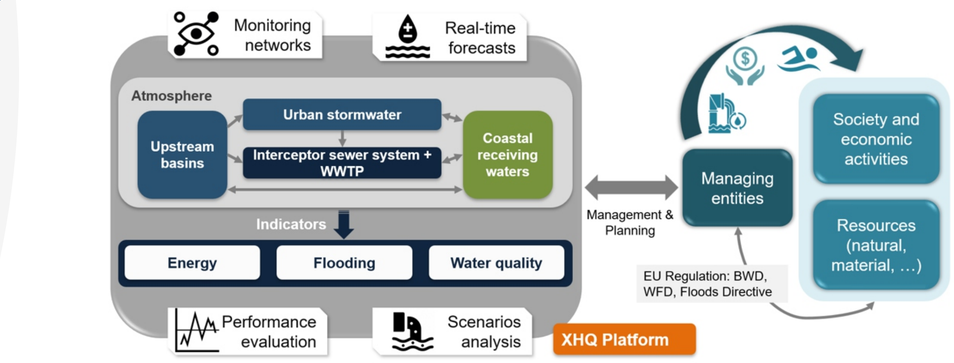
Examples: 3 Computational services @LNEC & LIP

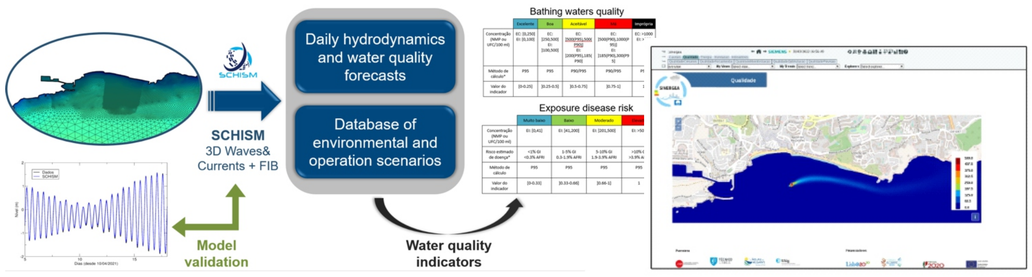
OPENCoastS



DEMO

OPENCoastS builds on-demand hydrodynamic and water quality forecast systems for user-selected regions worldwide and maintains them running operationally everyday. This daily service generates forecasts of water levels, 2D and 3D velocities, including wave and current interaction, wave parameters and water quality variables over the spatial region of interest for periods of 48 hours, based on numerical simulations of the relevant physical and biological processes.



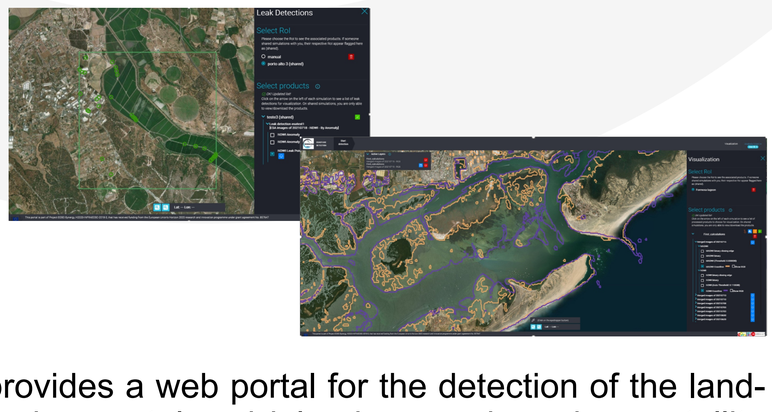


SINERGEA Digital Twin platform

- Addresses multiple challenges of coastal cities management
- Framed in an integrated approach, with tailored information to the managing entities

More details on this demo in the poster "*Towards Coastal Digital Twins for bathing waters protection: predicting water quality with OPENCoastS+*"

WORSICA



This service provides a web portal for the detection of the land-water interface in coastal and inland areas, based on satellite remote sensing methodologies, UAV (Unmanned Aerial Vehicles) and in situ data.

jUMP

This service provides a web portal for an underwater sound propagation prediction tool for marine life impact assessment.

Try our freely available services!

OPENCoastS: https://opencoasts.ncg.ingrid.pt
WORSICA: https://worsica.incd.pt/index/
jUMP: http://jump-app.lnec.pt/index/

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