

Computational engineering services for all: LNEC experience as a INCD/IBERGRID/EOSC user

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The computational resources necessary to address major environmental scientific questions are seldom available in-house, making shared e-infrastructures a well-suited medium for performing complex model simulations, analyzing large datasets and applying decision support tools. Despite this potential, the technical expertise required to use these computational resources and to build products on top of them is very specialized and requires a combination of environmental scientists and computer science engineers for their development and maintenance.

In the scope of the Portuguese Infrastructures Roadmap and of two H2020 European Open Science Cloud e-infrastructures projects, several e-services dedicated to environmental sciences have been developed by LNEC and its partners and made freely available to promote the work of environmental scientists and engineers. These services encapsulate several state-of-the-art numerical models and data analysis tools, and are offered through dedicated, user-friendly Web apps. These tools hide the complexity of e-infrastructures resources allocation from the user and simplify the application of the modeling and data components.

This presentation presents two of these services in detail:

- OPENCoastS, a service that assembles on-demand circulation forecast systems for user-selected coastal areas and keeps them running operationally for a period defined by the user, using INCD and IFCA computational resources.
- WorSiCa (Water mOnitoRing SentInel Cloud platform), a service that integrates remote sensing and in-situ data for the determination of water presence in coastal and inland areas, applicable to a range of purposes from the determination of flooded areas (from rainfall, storms, hurricanes or tsunamis) to the detection of large water leaks in major water distribution networks.

The OPENCoastS service is based on the application of the modeling suite SCHISM and generates daily forecasts of water levels and vertically averaged velocities over the region of interest for 48 hours, based on numerical simulations of the relevant physical processes.

WorSiCa is a one-stop-shop service to provide access to customized remote sensing services based on Copernicus data, currently applied to the detection of the coastal water land interface and the inland water detection (for large water infrastructure leak detection).

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