Towards Coastal Digital Twins for bathing waters protection: predicting water quality with OPENCoastS

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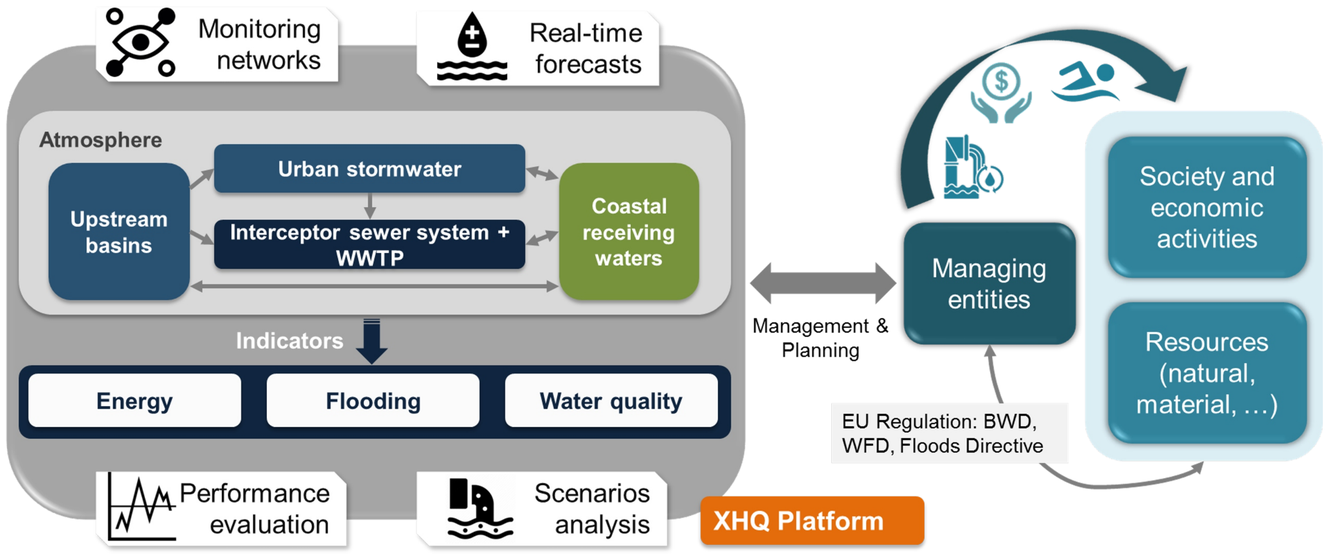
SINERGEA: smart city view

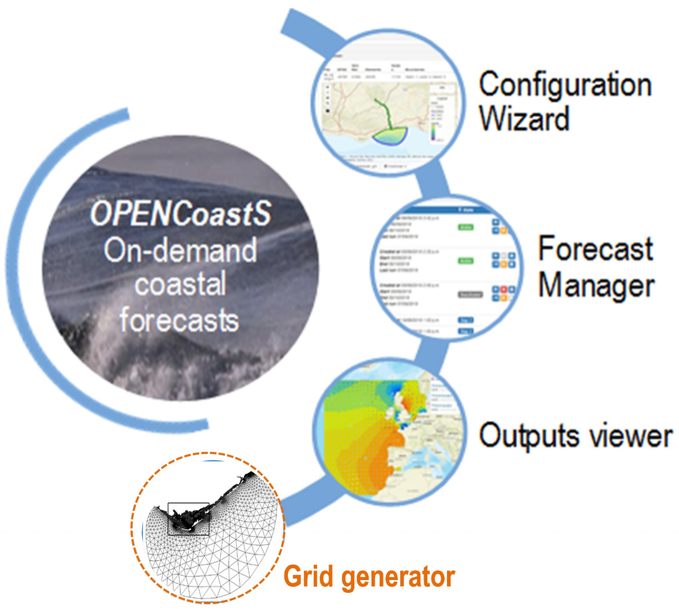
Coastal cities face growing challenges due to high demographic pressures and climate change.

SINERGEA is framed in a smart city view, based on an intelligent platform for decision-making. This platform allows the integrated and optimized management of bathing waters quality, flooding emergencies and energy consumption by sanitation infrastructures in coastal cities.

The bathing waters quality forecasts are deployed with the OPENCoastS service, as a stepping stone to the implementation of a Digital Twin for bathing waters management.



OPENCoastS: on-demand coastal forecasts for circulation and water quality

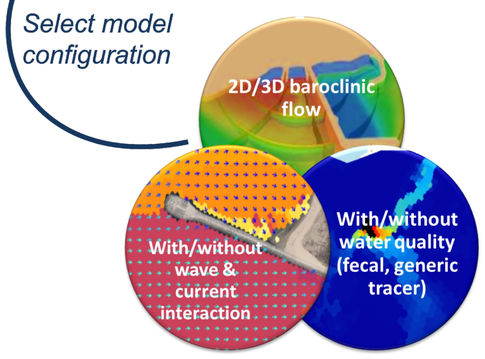


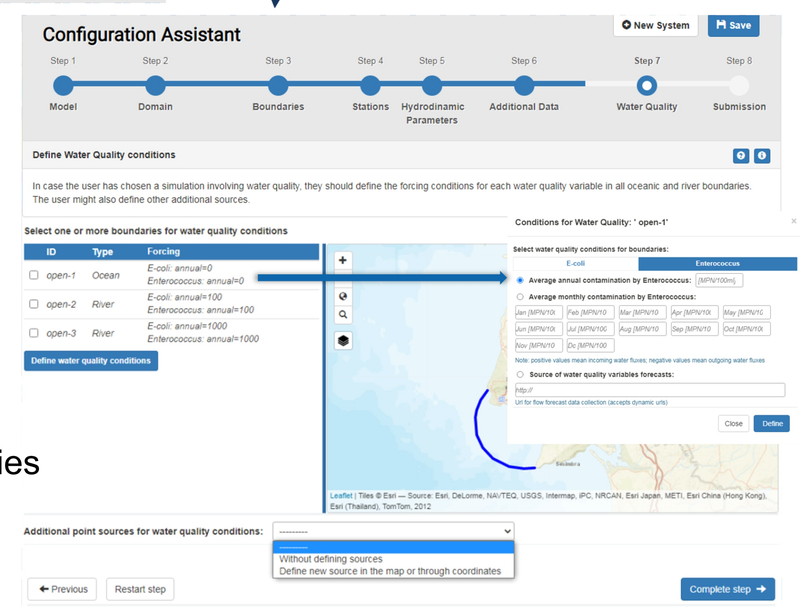
OPENCoastS builds on-demand hydrodynamic and water quality forecast systems for user-selected areas and maintains them running operationally. The service generates forecasts of water levels, 2D or 3D velocities, temperature, salinity, waves and water quality variables.

OPENCoastS: https://opencoasts.ncg.ingrid.pt

Configure boundary conditions for water quality

Select model configuration



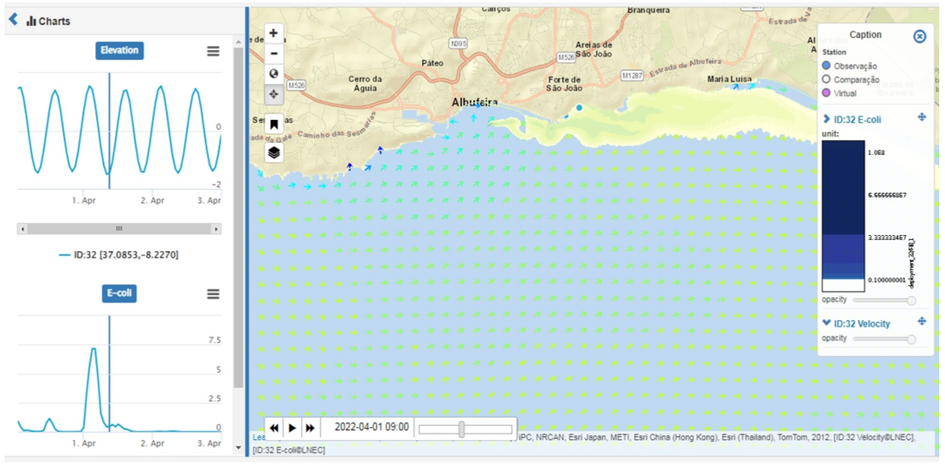


- User-centred approach
- One-stop-shop for all forecast activities
- User-selected options on every step

Predicting the quality of bathing waters in the coastal area of Albufeira

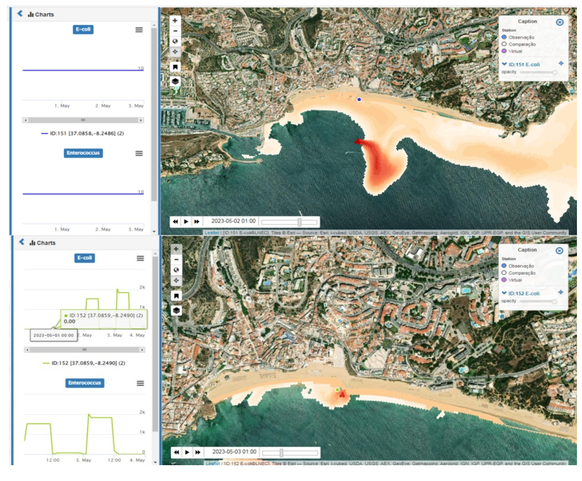
Stormwater discharges from the city of Albufeira and upstream peri-urban area can contaminate the adjacent bathing waters.

Digital real-time tools allow to predict the quality of bathing waters and assess the need to prohibit beach water usage.



Coastal circulation and bathing waters quality 2-day forecasts in OPENCoastS:

- water levels, velocities, salinity, temperature and FIB (*E. coli* and enterococus).



"What-if" failure scenarios (e.g., failure in the WWTP or in one pumping station and discharge of untreated wastewater).

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