E-ICOOPS
A European Integrated Coastal Ocean Observing and Predicting Systems

CoastPredict project proposal
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JERICO RI
SCIENCE · SERVICES · SUSTAINABILITY

E-ICOOPS in CoastPredict

To improve **short-term (e.g. extremes events) to seasonal predictions** in the coastal zones through:

- a deeper **understanding of the multiscale interactions and processes** occurring at the coasts,
- an **innovative combination of observing and numerical prediction systems**,
- an appropriate **coupling between the meteorological, hydrological and oceanographic** compartments at the coast

Integration of coastal *in situ* (and remotely sensed) observations and numerical modelling
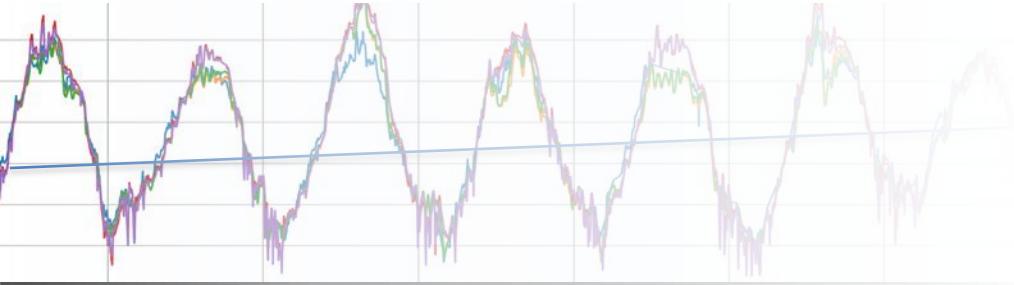
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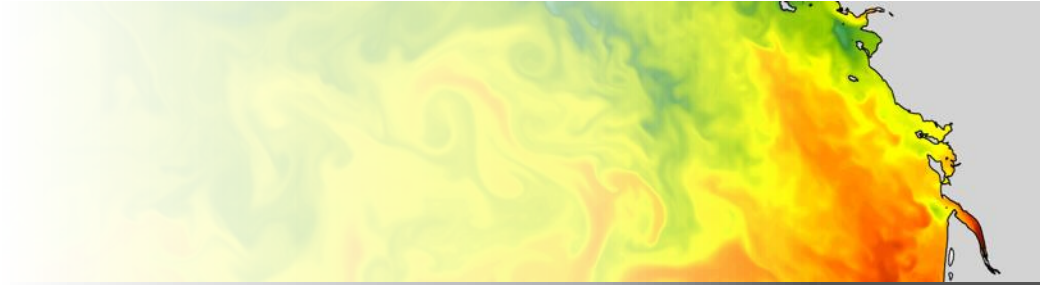
To **bridge information** between **patchy observations** (contrasts between highly sampled regions and lack of observations), **sparse** (but with a high spatial resolution) **coastal numerical models and local applications** (e.g. multi-hazard early warning systems)

Built on the **Joint European Research Infrastructure for Coastal Observatories, JERICO-RI**, an integrated pan European multidisciplinary observing system of European coastal seas

Open questions

Based mature coastal observing systems (as "supersites" in JERICO-RI or augmented sites) and coastal modelling systems combined with assimilations or data fusion strategies:

⇨ How do we **integrate, at multi-scales, high resolution and high frequency information** from coastal observations (e.g. HF Radar, continuous buoy sampling, continuously sampled FerryBox lines, wave height/spectrum) in coastal ocean models to "deeply learn" in models for coastal predicting systems? How predicting systems can benefit from such information from coastal observing systems?

⇨ How can predicting systems be able to **switch from near real time to real time** for applications such as multi-hazards alert systems (HABs, tsunamis, …)?

⇨ How systems will address **uncertainties in observations and predictions**? There is a need to change paradigm from qualified *in situ* observations to qualified *in situ* observations with robust uncertainties (e.g. accuracy, representativity errors, …). Similar needs must be explored for the model simulations (e.g. stochastic modelling generating multi-model ensembles).

Outcomes & links with COSS-TT community

Outcomes from the proposed project
- Improving the **design of the observation capabilities for coastal modelling** needs

- Delivering a larger number of **coastal observation data suitable for integrated multidisciplinary modelling and predicting** systems

- Driving a **breakthrough in integrating information** from the whole coastal observations (*in situ* and remotely sensed) in modelling and forecasting systems

The COSS-TT community

Uncertainties in observations and predictions

Multi-scales integration