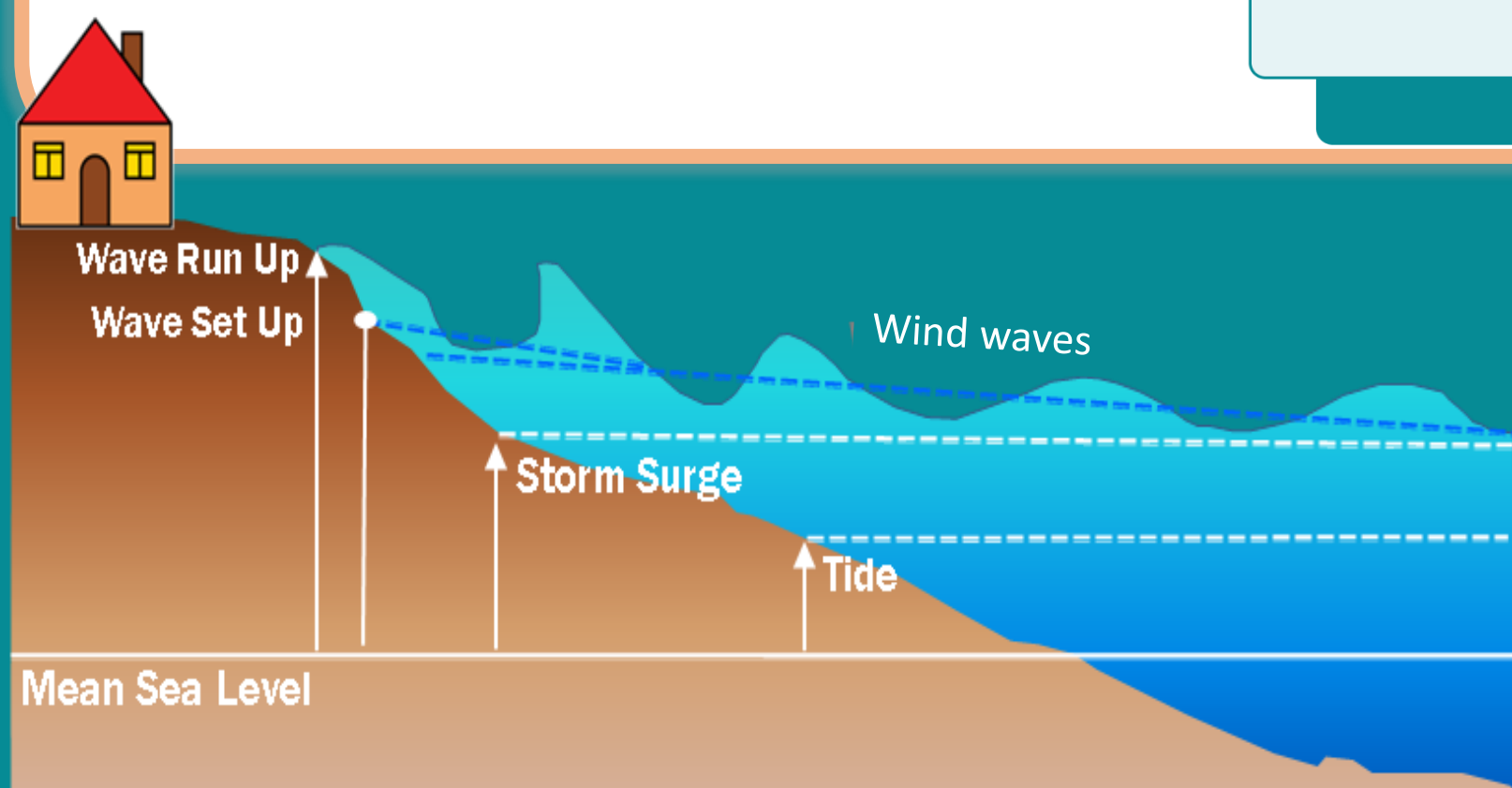
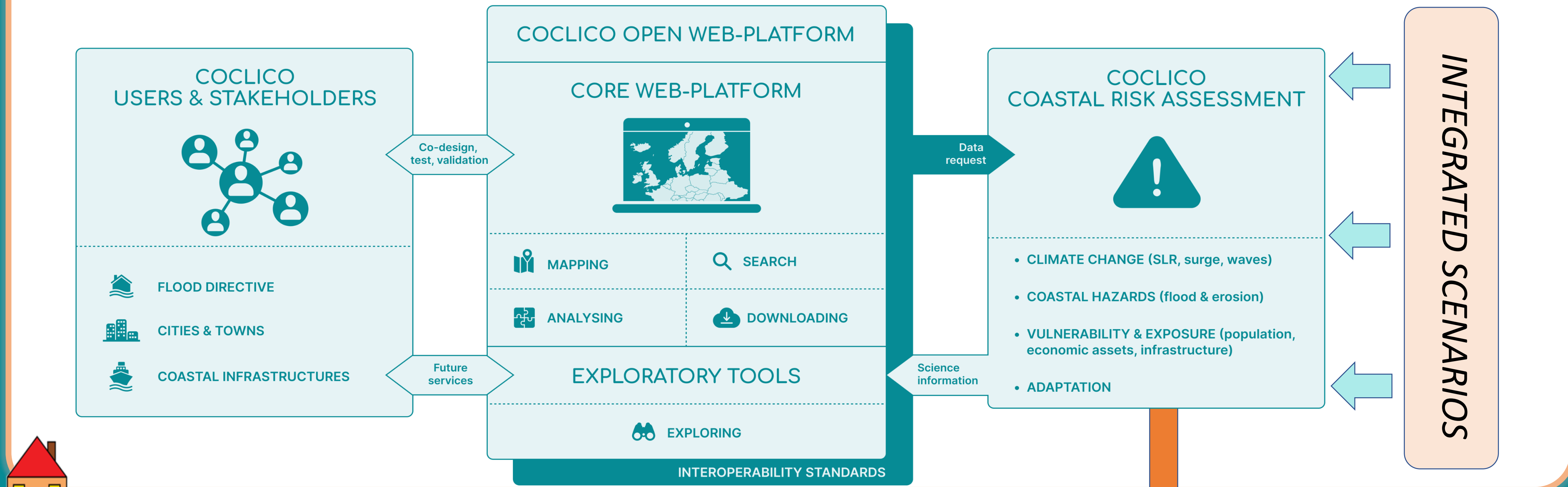


Coastal sea-level projections for climate adaptation services within the Coastal Climate Core Services project

Maialen Irazoqui Apechechea, Angélique Melet, Guillaume Reffray, Iñigo J. Losada, Melisa Menendez, Alexandra Toimil, Hector Lobeto, Ahmed I. Elshinnawy, Ana J. Abascal, Gianmaria Sannino, Giovanna Pisacane, Roberto Iacono, Alessandro Anav, Rémi Thiéblemont, Jérémy Rohmer, Gonéri Le Cozannet, Jonathan Chenal, Benoit Meysignac and other CoCliCo contributors

Main objective: Open-source web platform with present day & future coastal risks targeting decision-making



EXISTING datasets for coastal flood and erosion drivers...

- CMIP5-based (outdated), single-model based (no *uncertainty*)
- Limited temporal and spatial *coverage*
- Coarse coastal *resolutions*
- Restricted *access*

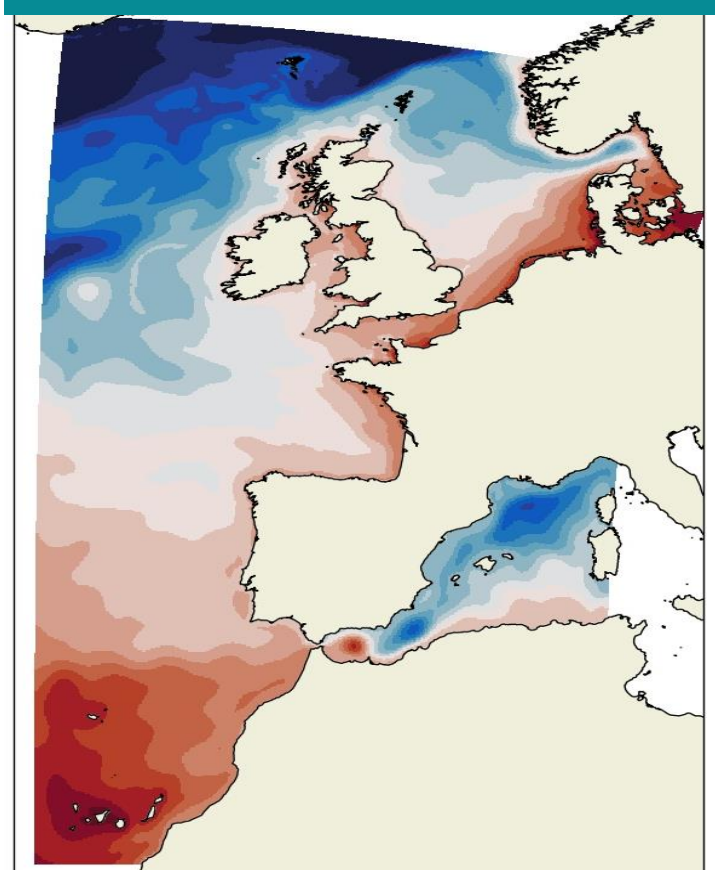
➔ **Need NEW updated, pan-European, homogeneous, high-resolution datasets**



Improved, multi-model, high-resolution pan-European sea-level hazard projections for a set of Integrated Scenarios

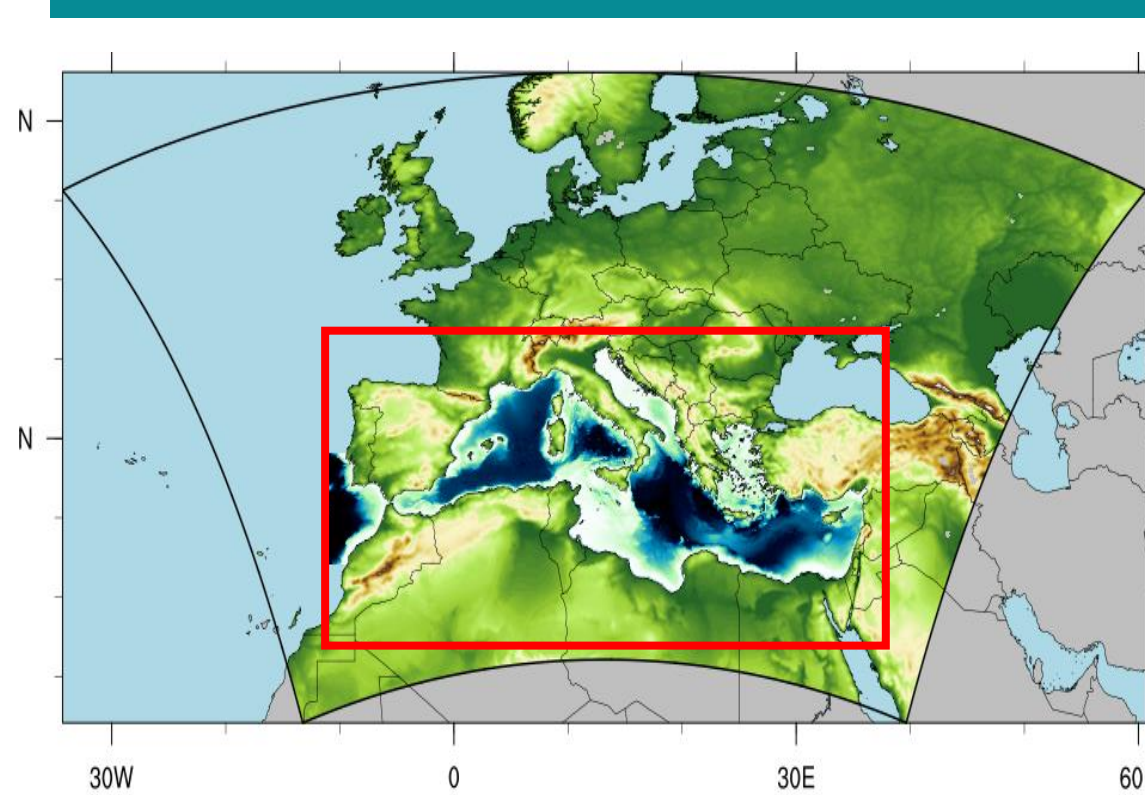
Regional Mean Sea Level projections (~10km)

IBI-CCS (Mercator Ocean)



3D model including MSL, tides and surges

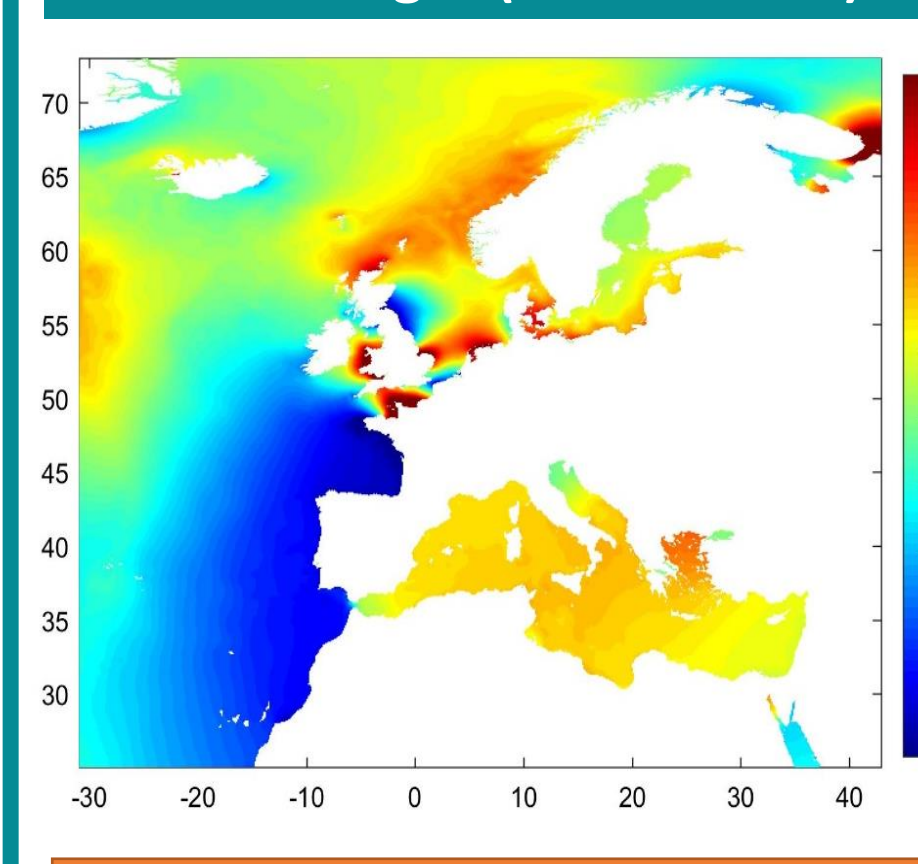
ENEA regional Earth System Model: ENEA-REG



Coupled atmospheric-ocean system including MSL and surges

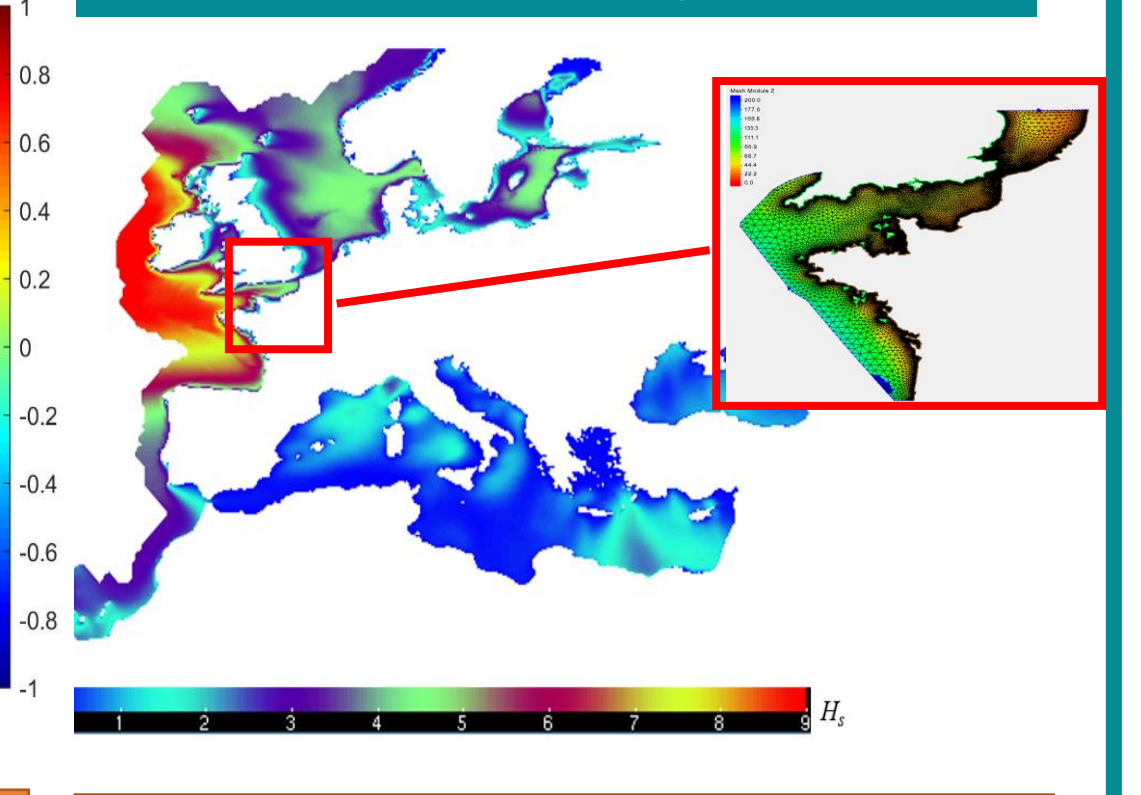
Regional storm-surge and wave projections (1-5km)

Storm-surges (IH Cantabria)



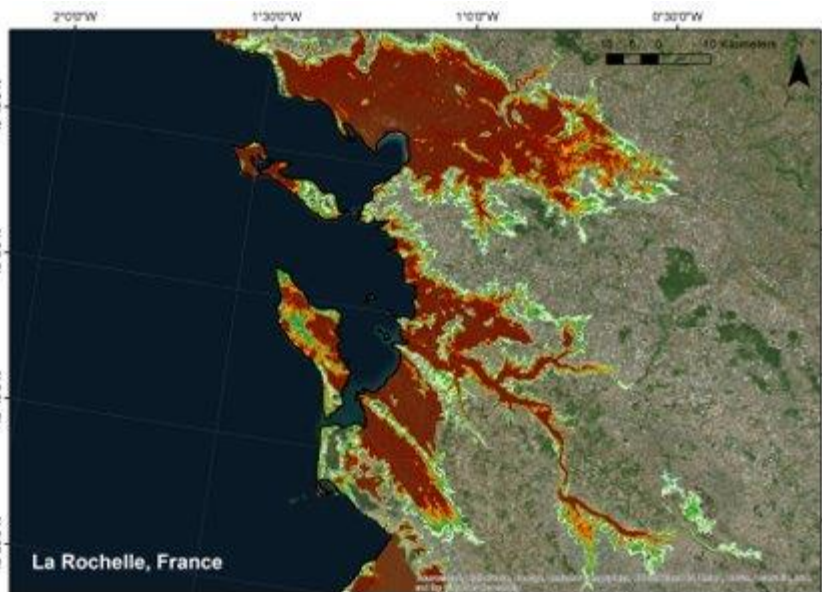
Tide and surge 2D model

Near-shore wave climate (IH Cantabria)



Hybrid downscaling (dynamic + Machine Learning)

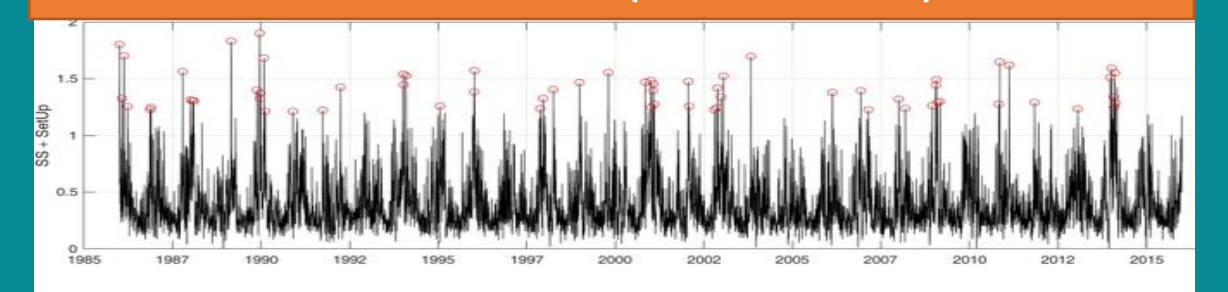
Pan-EU coastal flood & erosion projections



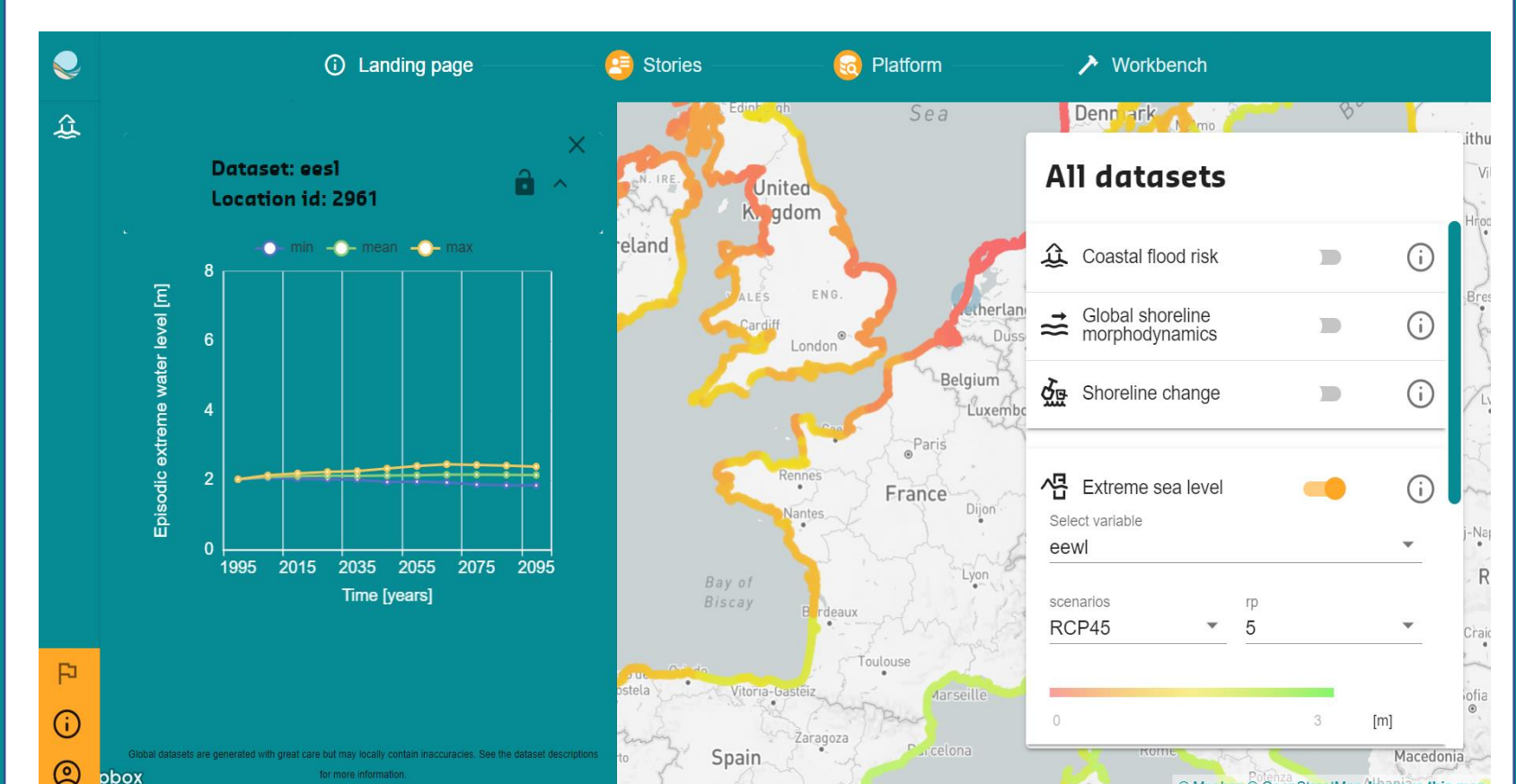
Coastal TWL reconstruction (1km) & EVA

Boundary conditions

TWL dataset (1980-2100)



Online platform



Outcomes...

...supporting informed decision-making

- **Improved understanding** of coastal sea-level (and flooding) drivers under a changing climate
- Projections aligned and adapted to fit user requirements and **policy needs**
- Quantification of **uncertainty** (ensemble)
- **Seamless** flood and erosion driver projection across EU coasts
- Assessment of **emergence** of climate change signals
- Assessments of **compound events** (*Exploratory tools*)
- **Attribution** of risks (*Exploratory tools*)



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