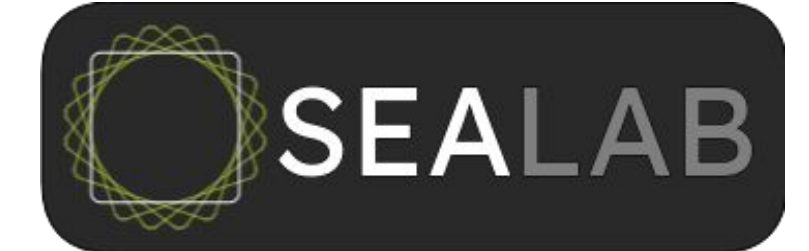


SeaLab: A Cloud-Based Platform for Digital Twins of the Coastal Ocean



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Run advanced coastal hydrodynamic and transport simulations anywhere in the world through a simple web interface

1 | Why SeaLab?

Running ocean models is not straightforward.

- Coastal modelling is powerful but hard to access
- Requires HPC + expertise
- Many non-modeler stakeholders need simulations (research, industry, authorities)

SeaLab bridges advanced coastal ocean modelling and accessible digital twins through a cloud-based platform.

No local installation. No HPC configuration. Fully browser-based.

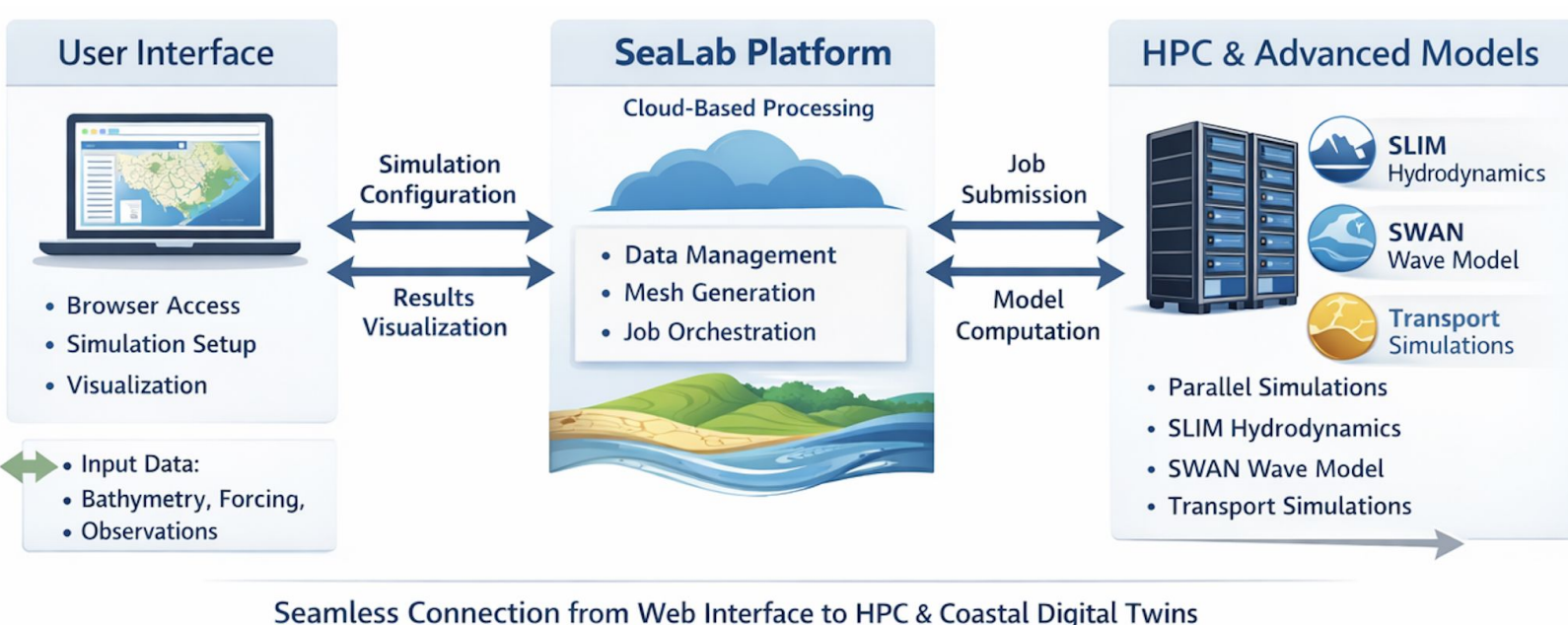
2 | What is SeaLab?

SeaLab is a cloud-based platform for running and analysing coastal ocean simulations through a simple web interface.

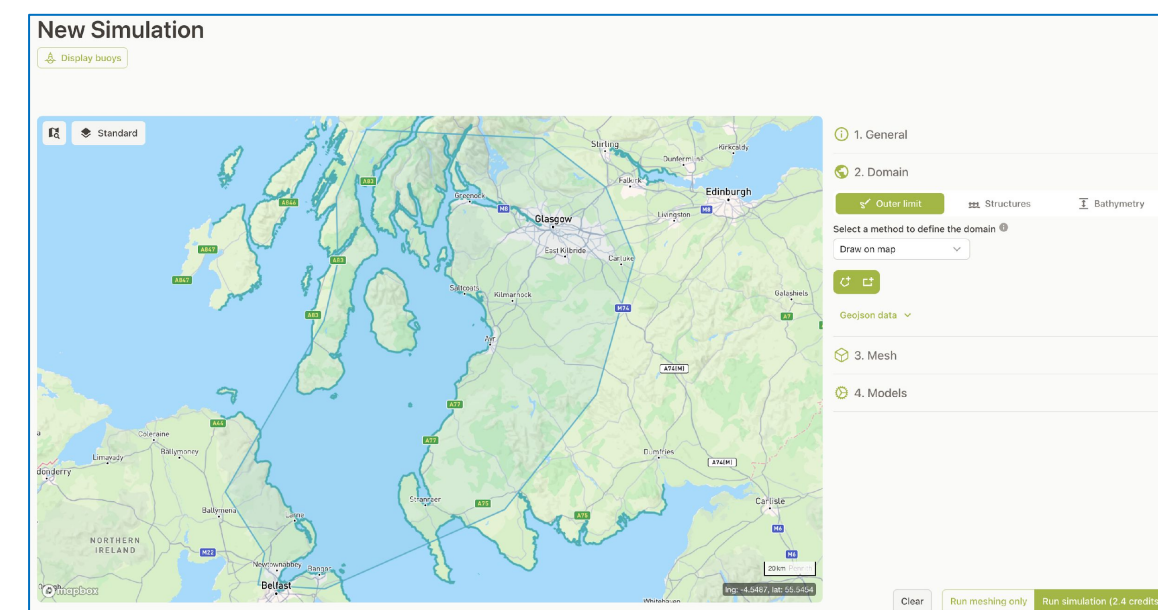
It seamlessly connects users to numerical ocean models and high-performance computing to create high-resolution digital twins of coastal environments.

Core capabilities

- Hydrodynamics and waves (SLIM & SWAN)
- Reactive transport (oil, sediment, drifting objects)
- Custom hindcasts anywhere in the world
- Operational forecast digital twins for selected regions



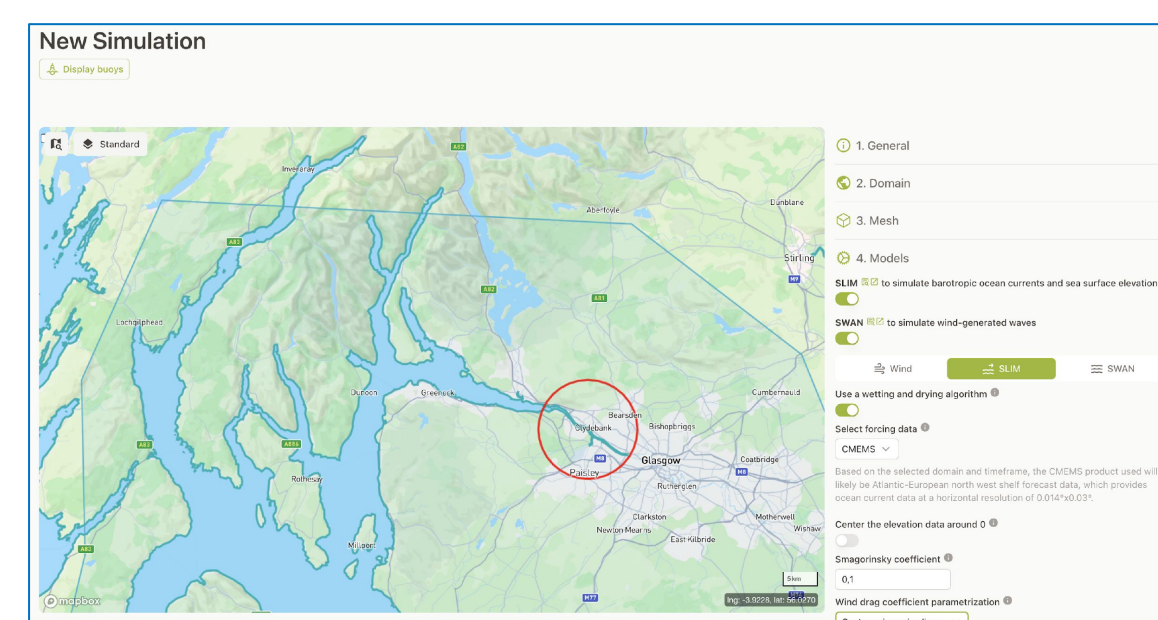
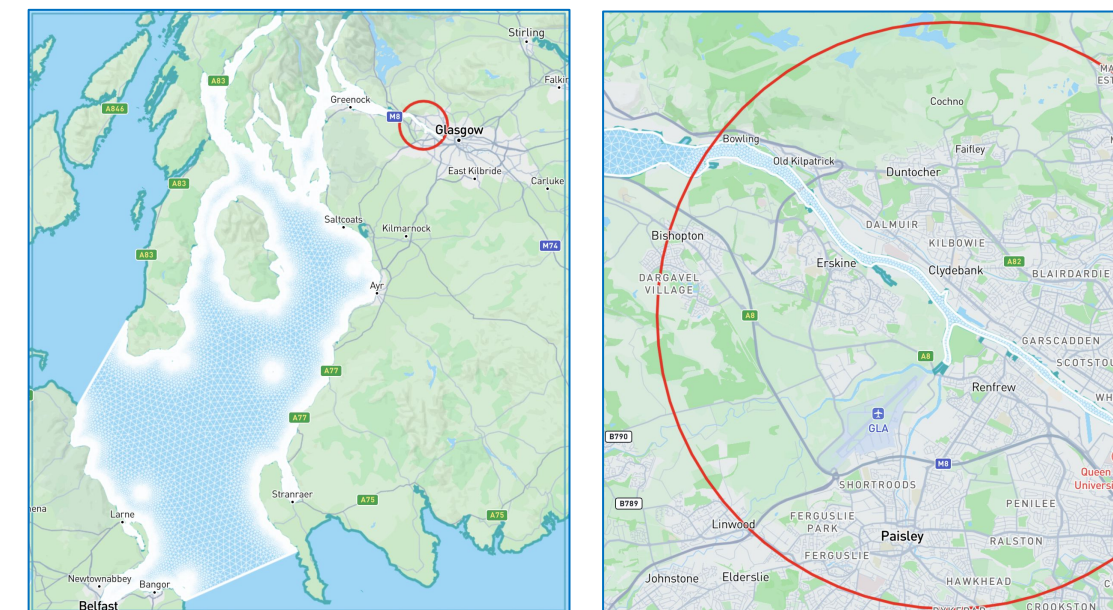
3 | From model setup to results



Domain definition

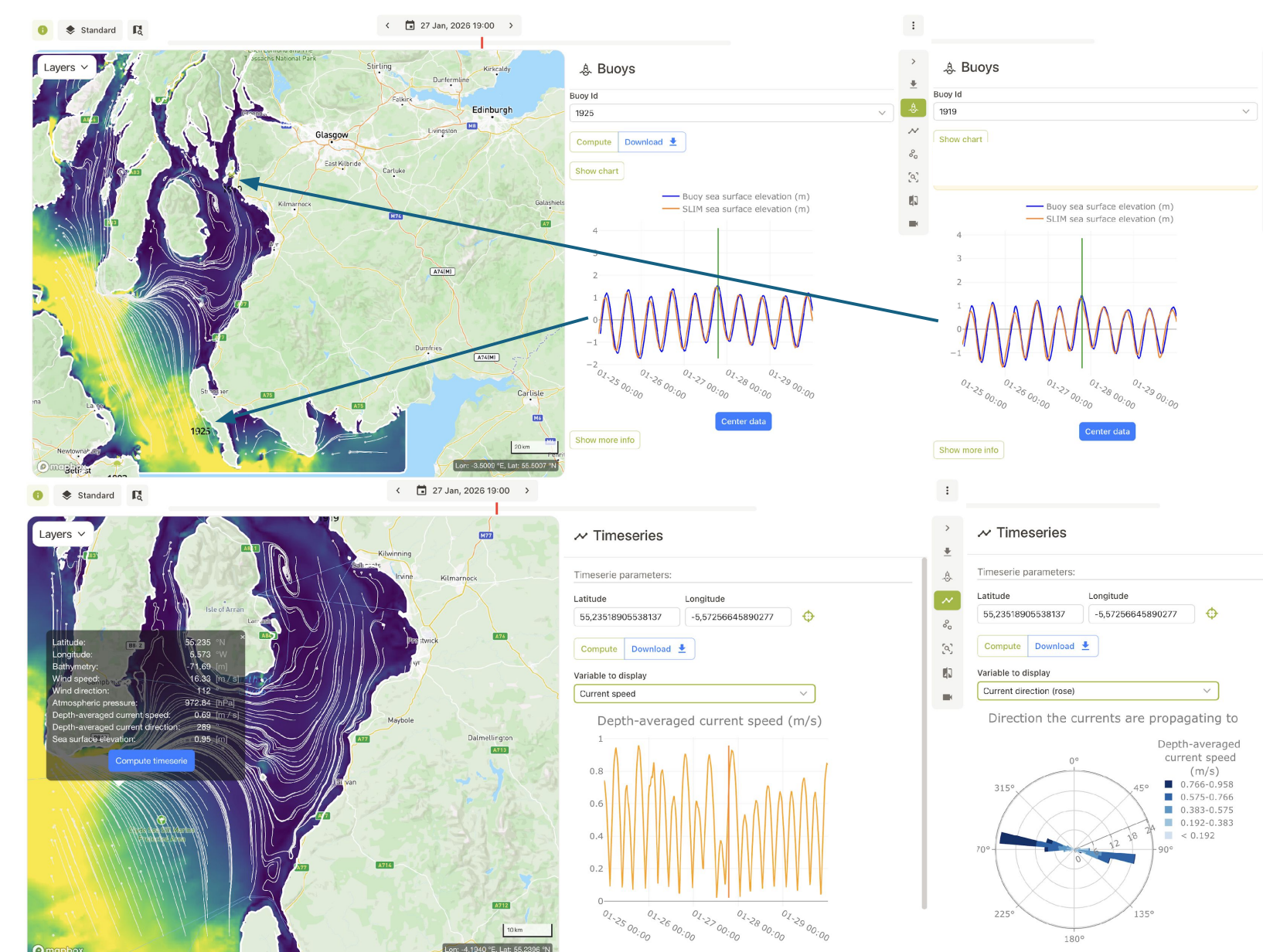
Coastline edition (e.g. structures)
Bathymetry selection/editing

Mesh generation with custom refinements



SLIM and SWAN models calibration

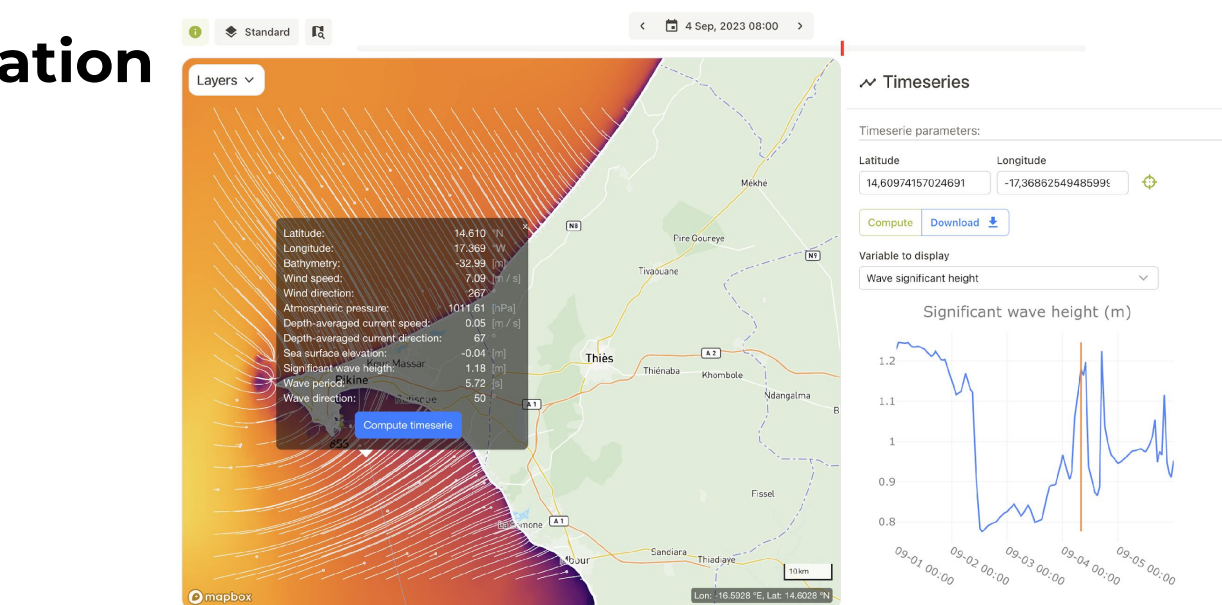
Results analysis and validation



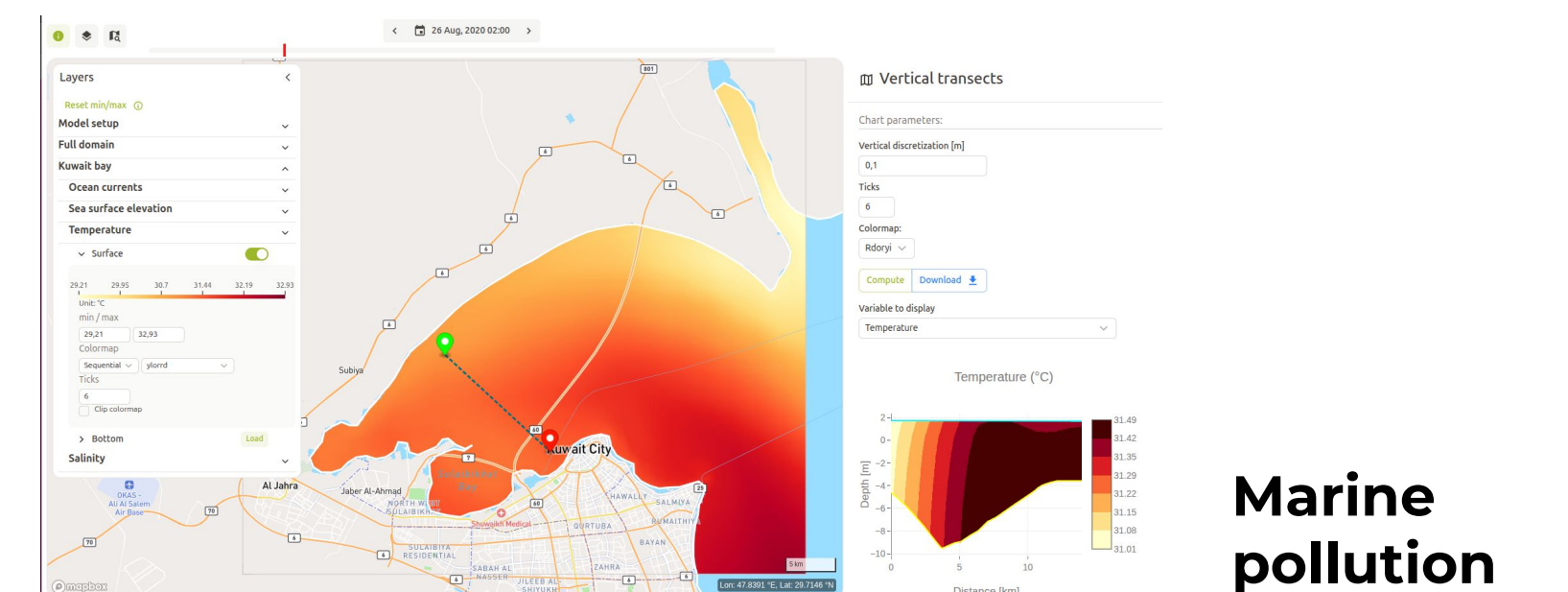
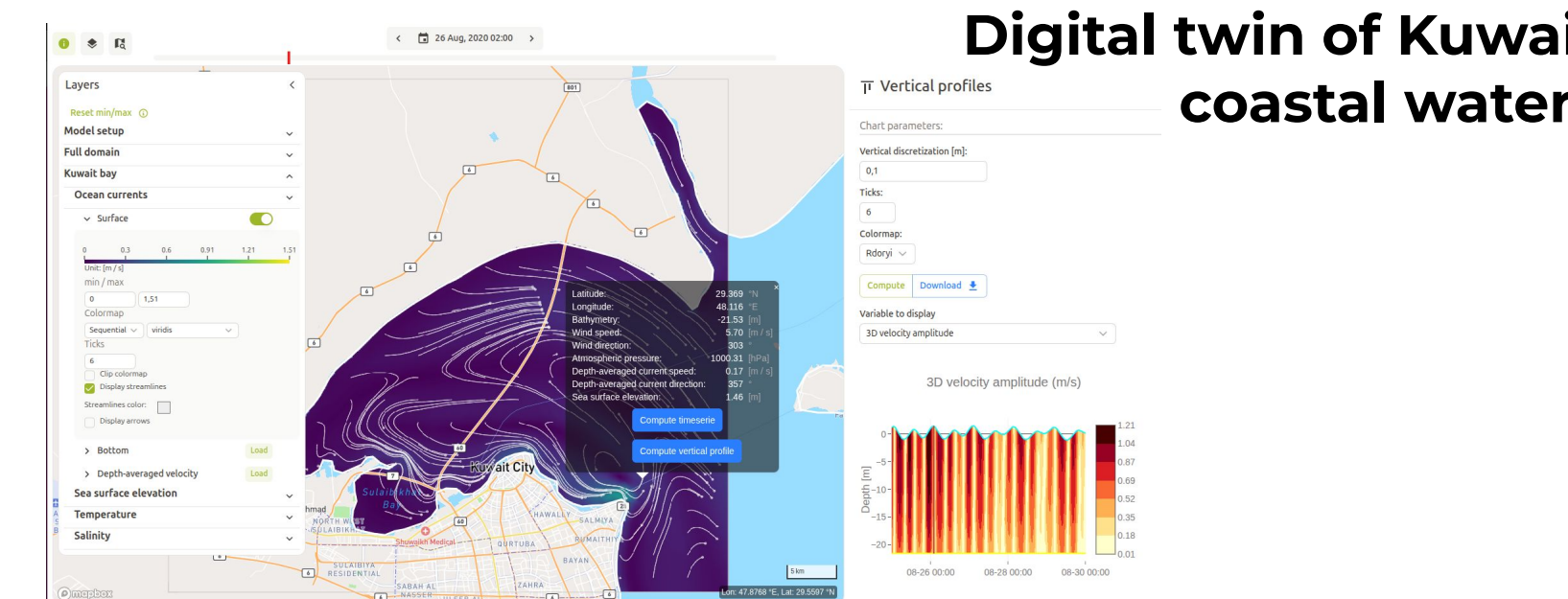
Postprocessing of the results

4 | Example use cases

Coastal circulation and waves



Digital twin of Kuwait coastal waters



Marine pollution