

V
E HydroQuest
R Ifremer
T
I - L A B

A common laboratory to develop experimental, numerical and in-situ tools for vertical axis tidal turbine

Objectives

- Accelerating the development of innovative vertical axis tidal turbines for industrial farm projects.
- Development of dedicated design tools through a series of test campaigns conducted both in a wave and current flume tank and at in-situ testing station.
- Facilitate the industrial development by a joint approach combining small to larger scale testing and modeling.
- Reinforcement of the design efficiency by complementary skills of the partners in fluid mechanics, knowledge of the behavior of structures in a marine environment and feedback from in-situ deployments of tidal turbines.
- Validation of industrial development tools based on comparisons of experimental, numerical and in-situ data at both small and large scales.
- Tidal farm project development, like the FloWatt tidal farm in the Raz-Blanchard.

Key Activities

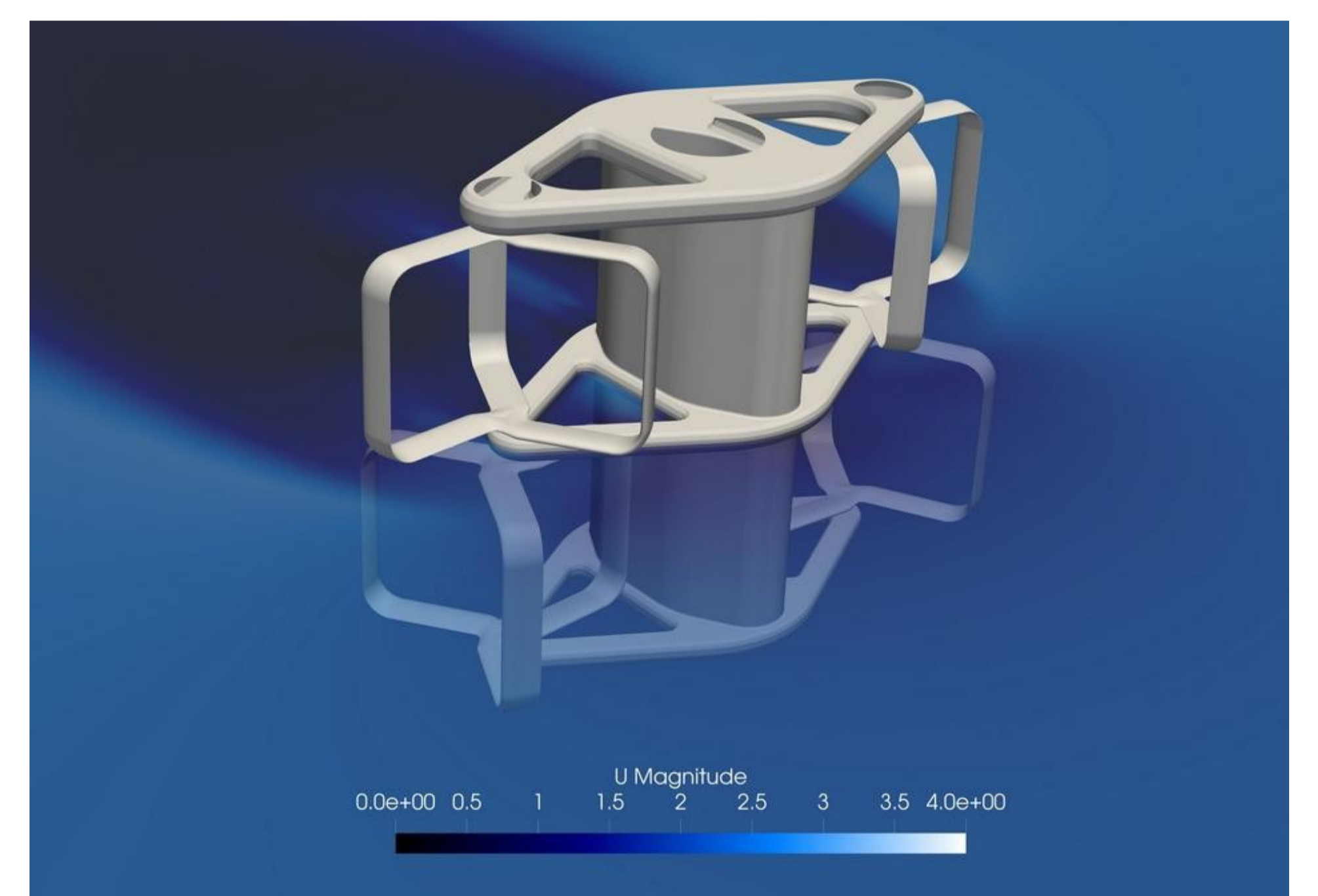
- Scale model development
- Experimental campaigns
- Numerical simulations
- Experimental and numerical results comparisons
- Turbine optimization process
- Resource assessment study
- Extremes characterization
- Sensors integration and compatibility

Expected Results

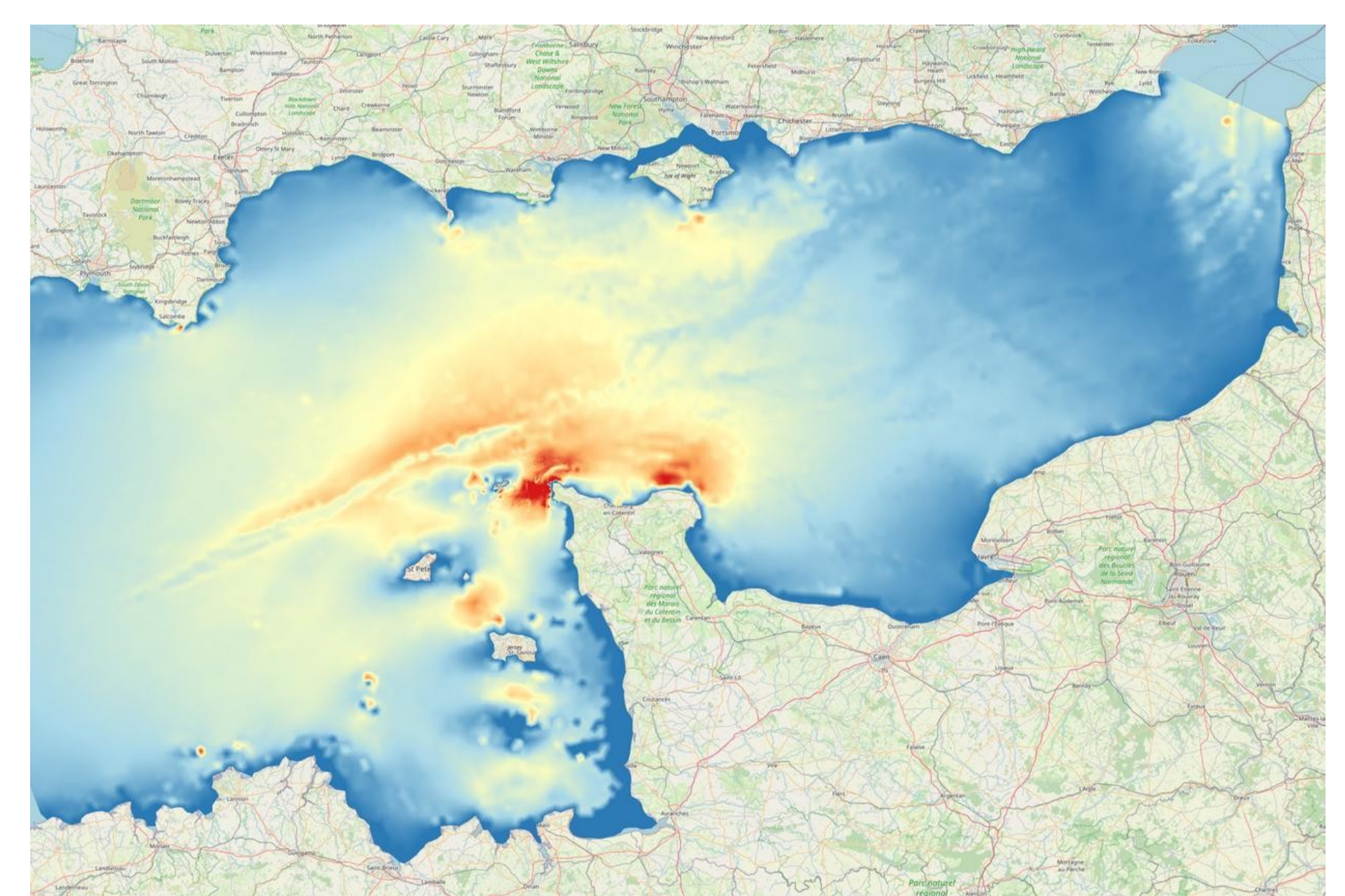
- Next generation turbine validation
- Turbine optimization for farm projects
- Dedicated bottom monitoring station



1/20 scale model of the HQ 2.5 in the wave and current flume tank for performance and flow characterization



RANS 3D flow simulation around the HQ 2.5 turbine for performance and wake characterization



TELEMAC 2D simulation of the flow variation in the English Channel with a focus in the Raz-Blanchard

Contact:

gregory.germain@ifremer.fr ; guillaume.maurice@hydroquest.net
<https://vertilab.ifremer.fr/>



This work received the financial support of the French Agence Nationale de la recherche through the Verti-Lab project (ANR-23-LCV1-0009-01).