

DRACCAR - COBHYS

Structural behaviour - Benthos & biofouling
Hydrosedimentary processes

DURATION: 60 months | LANCHING: 2023 | BUDGET: €5,107K

CONTEXT

The long-term acquisition of data at sea remains a crucial research challenge for the development of offshore wind farms. **The use of a met mast located off Fécamp makes it possible to deploy cutting-edge instrumentation and develop innovative monitoring protocols.**



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OBJECTIVES

- To optimise the design of future bottom-fixed offshore wind turbines
- To characterise the role of the reef effect of a wind turbine

SCIENTIFIC CONTENT

Structural behaviour

- Implementation of an experimental protocol to capture wave parameters and the pressures induced on the mast, determination of hydrodynamic loads
- Numerical modelling of the loadings applied to the mast, validated by in situ measurements (strain gauges, accelerometers)
- Comparison of the results obtained in situ with those of tests carried out on a model (1/75th) under different conditions, then comparison with numerical simulations
- Characterisation of the temporal structural behaviour, integrating the various damping factors involved (structural, aerodynamic, and hydraulic)

Benthos & biofouling

- Sampling in winter and late summer from various ecosystem compartments (phytoplankton and zooplankton, soft and hard substrate benthos, suprabenthos, demersal fish).
- Sorting, determination and isotopic analysis of samples
- Analysis of stomach contents of demersal fish to quantify prey-predator relationships
- Immersion of plates around the mast according to a distance gradient in and out of the current trench

Hydrosedimentary processes

- Deployment during the winter of 3 cages equipped with sensors to study the effects of wakes on hydrodynamics, particle transport in the water column and bottom scavenging
- Bathymetric campaigns using towed current measurements and sediment sampling in the water column and on the seabed
- Comparison of in situ measurements with numerical models
- Deployment of a bottom structure outside the influence of the mast to measure wave heights, study wave propagation from the open sea to the coast and compare with numerical models

TECHNOLOGIES



STAGES OF THE VALUE CHAIN



Preliminary studies



Design

EXPECTED RESULTS

Structural behaviour

- Calibrated numerical model for accurate assessment of hydrodynamic-structure interactions
- Data on the longer-term ageing of the structure (foundation, lattice)

Benthos & biofouling

- Determining the role of biofouling in the food web
- Characterisation of the role of structure in larval dispersal and colonisation dynamics in flora and fauna

Hydrosedimentary processes

- Qualified tool for numerical modelling of hydrosedimentary processes
- Quantification of sediment availability

PARTNERS



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