

# WINDSERV

Offshore wind farms role in securing biodiversity and ecosystem services: bridging the gap from a multi-model approach to services indicators

**DURATION: 24 months (2020-2022) | Total budget: €1,076K**

## CONTEXT

Marine ecosystems provide ecosystem services to human populations but under increasing anthropogenic pressure their production is disrupted. In addition, the development of offshore wind farms is required and is leading to the idea of a "win-win" strategy by reconciling clean energy production and preservation of biodiversity and the resulting ecosystem services. But for that, it is essential to understand and predict impacts, both positive or negative, of offshore wind farms on the ecosystems and to assess current ecosystem services and their evolution.

## OBJECTIVES

- To develop a multi-model approach to predict offshore wind farm impacts on ecosystems and the resulting services.
- To guide a win-win strategy between offshore wind farm developments and conservation strategies.

## MAIN ACHIEVEMENTS

- Development of an innovative End-to-End model consisting of a spatialized trophic model (Ecospace) forced by outputs of ecological niche models and by outputs of a biogeochemical model (ERSEM)
- Proposal of new spatializable ecosystem service indicators in relation to offshore wind energy

## CONCLUSION

WINDSERV has enabled the development of the first ever conceptual model approach to characterise the link between ORE development and ecosystem services. This will provide a basis for understanding the conflicts and synergies between offshore wind development and socio-ecosystem considerations. WINDSERV's End-to-End model will provide robust future predictions and projections of the functioning of the ecosystems into which ORE farms are integrated through the coupling of ecological and biogeochemical approaches. WINDSERV's innovative approaches will be key tools for the study of cumulative impacts at sea in the NESTORE project.



© Shilly / Pixabay

### TECHNOLOGY



### STAGES OF THE VALUE CHAIN



Preliminary studies

## OUTPUT RESOURCES

- Models for representing the trophic functioning of ecosystems in the Eastern Channel and Southern North Sea as well as the Gulf of Lion in the Mediterranean
- An integrated conceptual model to characterise the effects of offshore wind farms on ecosystem services: case study of the Dunkirk offshore wind farm
- Recommendations for the transfer of the integrated conceptual model developed in the Dunkirk area to other ORE farm development areas

## PARTNERS



This project benefited from French State funding managed by the National Research Agency under the France 2030 investment plan. It also received financial support from the Normandy Region and Region Sud Provence-Alpes-Côte d'Azur.



# WINDSERV

Offshore wind farms role in securing biodiversity and ecosystem services: bridging the gap from a multi-model approach to services indicators



© Shilly / Pixabay

## LIST OF SCIENTIFIC PUBLICATIONS RESULTING FROM THE PROJECT

### 2023

- Baulaz *et al.* An integrated conceptual model to characterize the effects of offshore wind farms on ecosystem services. *Ecosystem services*, Vol. 60, 101513  
-> <https://doi.org/10.1016/j.ecoser.2023.101513>

## PARTNERS



This project benefited from French State funding managed by the National Research Agency under the France 2030 investment plan.

