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WEBINAR: Marine Dune Dynamics and Offshore Wind Farms

Results transfer to the ORE sector - RTE

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RTE scope regarding the future wind farm offshore Dunkirk

- RTE is France's Transmission System Operator
- RTE will be responsible for the connection of the 600 MW wind farm to the grid
- RTE will install for this:



Offshore substation

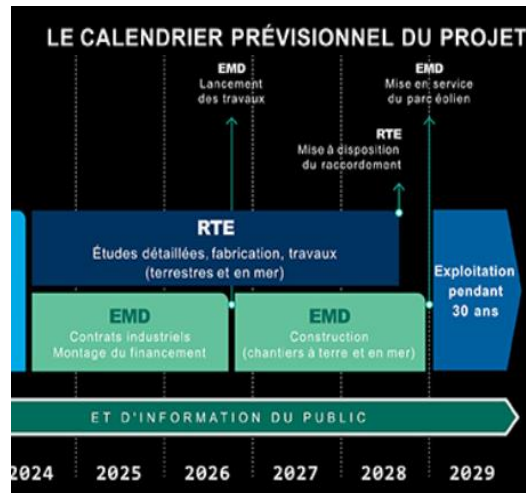


2*24 km (onshore and offshore combined)

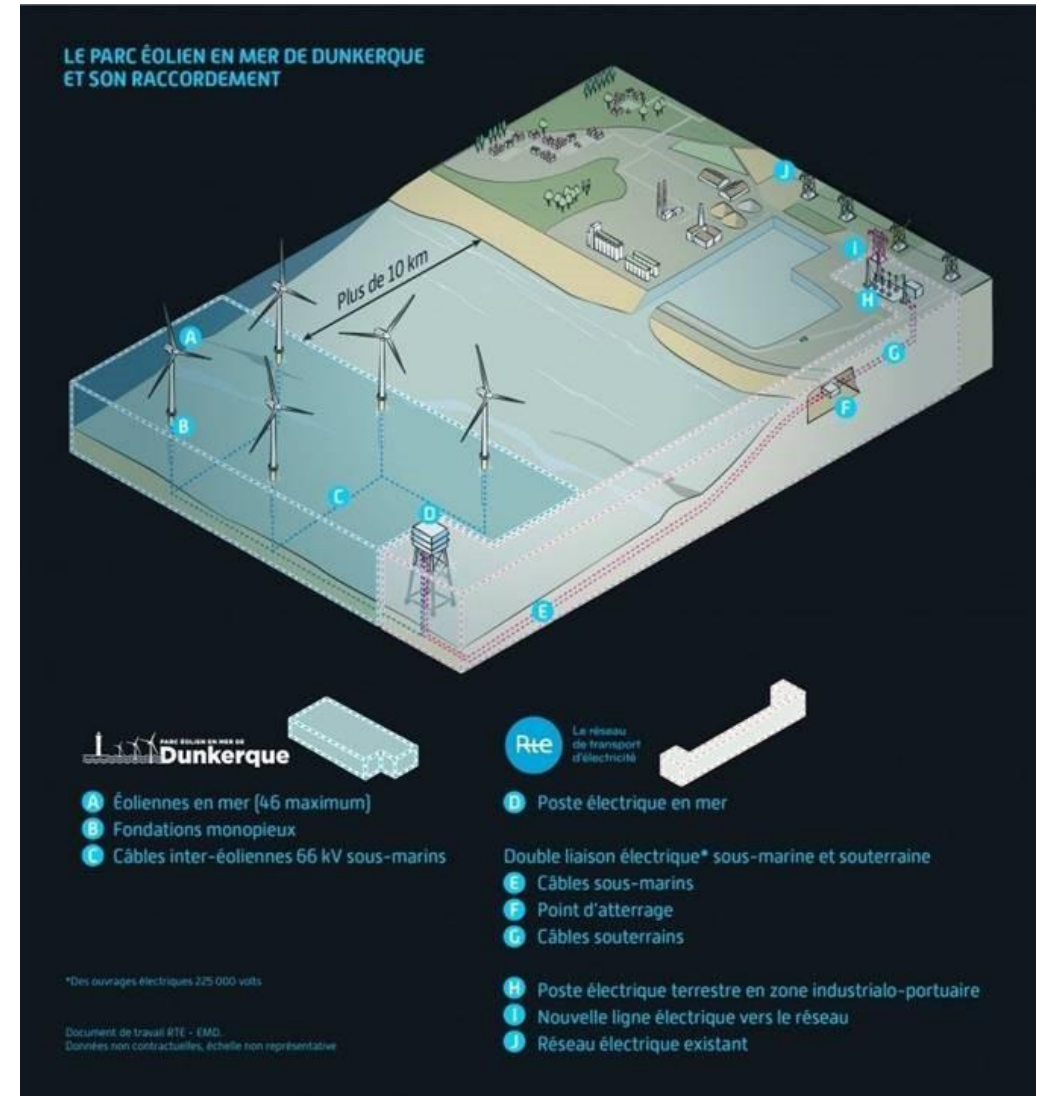


Onshore substation

- Project timeline:



Pictures retrieved from [Raccordement électrique du parc éolien en mer de Dunkerque](https://www.rte-france.com/fr/actualites/le-raccordement-electrique-du-parc-eolien-en-mer-de-dunkerque) | RTE ([rte-france.com](https://www.rte-france.com))

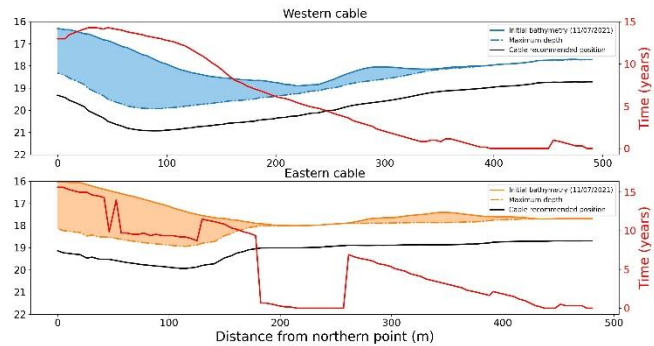


Regarding engineering

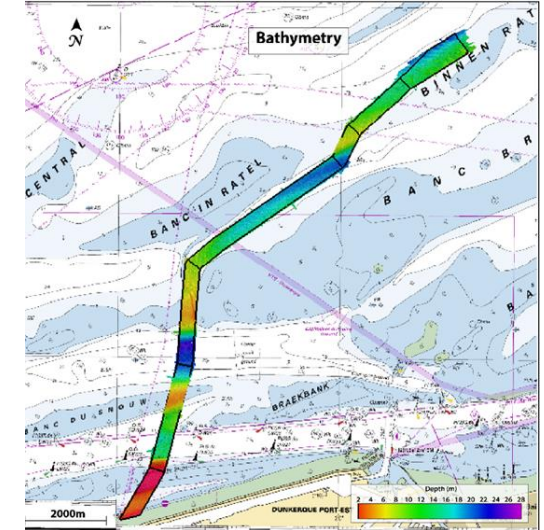
How the work carried out during Modulus will help RTE for its engineering? (1/3)

Installation wise in the corridor area

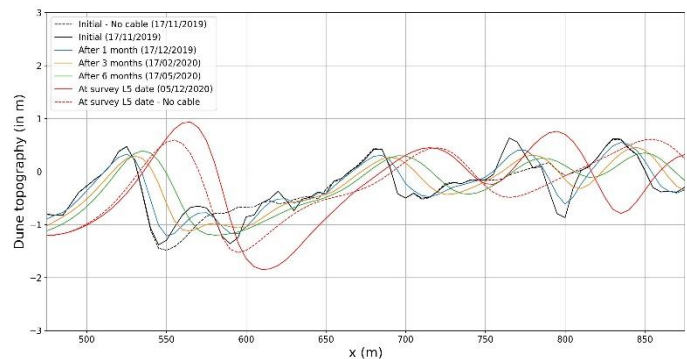
Refinement of the method to define the burial depth along the corridor



Retrieved from Nicolas Michelet WP3 Work on cable and substation impact on dune migration



Refinement of the maximum time for installing the cable after dredging



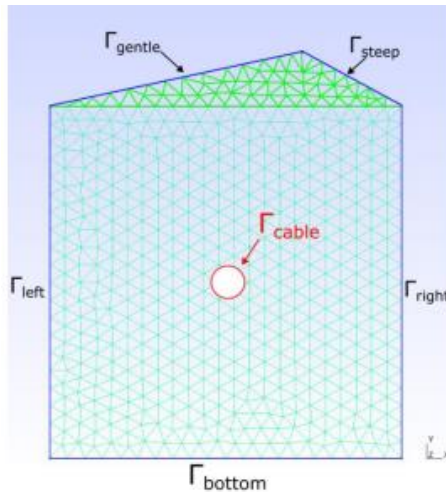
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Regarding engineering

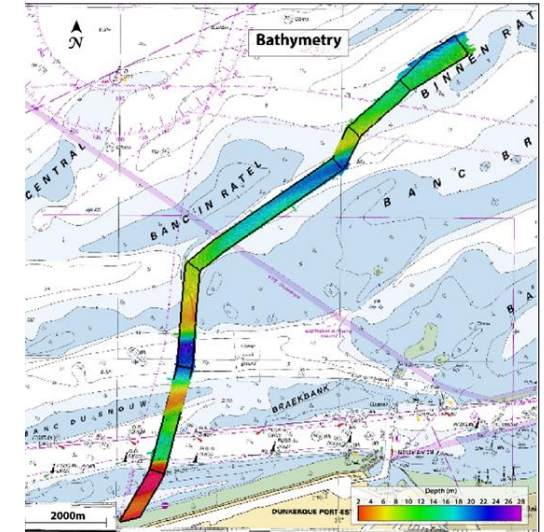
How the work carried out during Modulus will help RTE for its engineering? (2/3)

Thermal wise in the corridor area

Improvement of thermal sizing for a cable buried below a marine dune



Retrieved WP5 Work on cable heat transfer in marine dunes

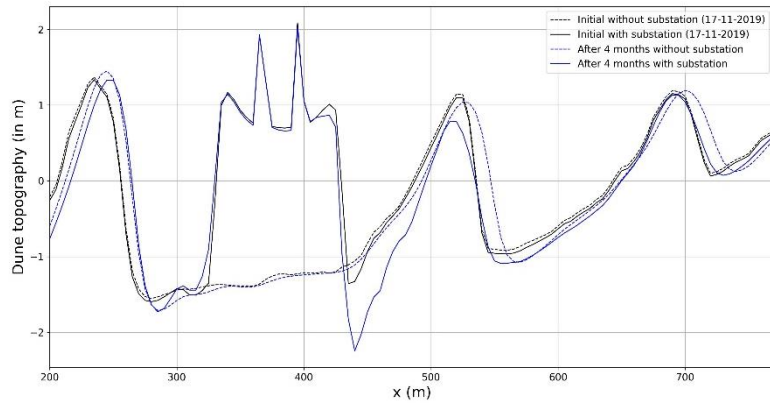


Regarding engineering

How the work carried out during Modulus will help RTE for its engineering? (3/3)

Installation wise in the offshore substation area

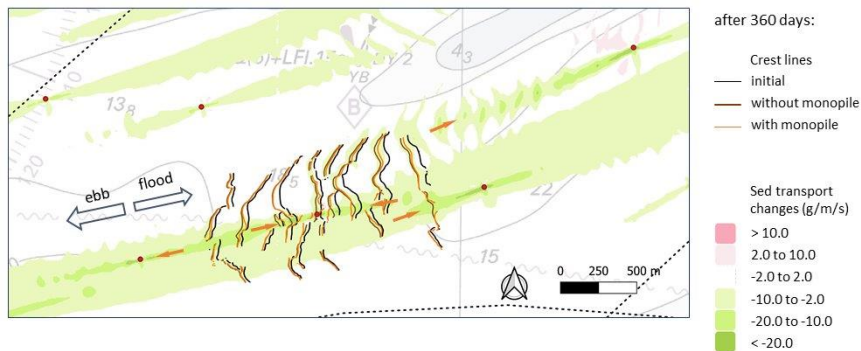
Improved understanding of the impact of the offshore substation on the surrounding dunes



Retrieved from Nicolas Michelet WP3 Work on cable and substation impact on dune migration



Improved understanding of the impact of multiple wind turbine monopiles on the surrounding dunes

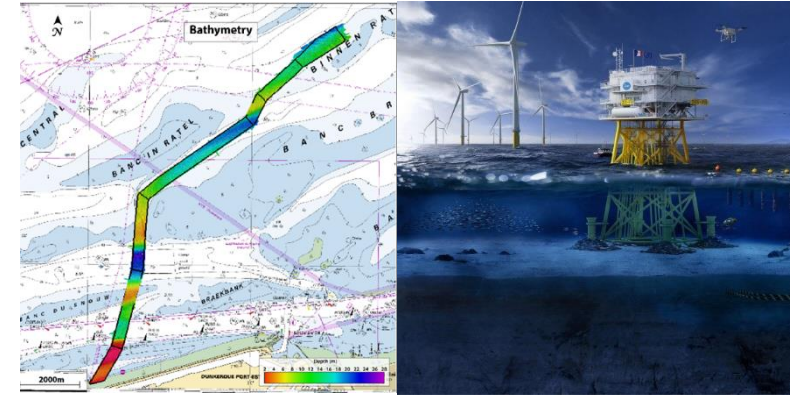


Retrieved from Noémie Durand WP3 Work on modelling marine dunes interacting with a wind farm offshore Dunkirk

Regarding engineering

Which research work will further help us?

- Linking the small and short scale simulations of the scouring around piles (WP2) to the large and long scale simulations of the marine dune dynamics (WP3)
 - Improved structure calculations for the offshore substation
- Simulating marine dune dynamics for longer periods
- Further experiments on channels (WP4) to validate the simulation results
- Refining thermal design by taking into account dune migration



Regarding environmental impacts

Nature friendly ORE & grid development in the frame of marine dunes requires to :

1. Understand the ecology of those particular ecosystems
2. Evaluate the potential impacts caused by works and presence of ORE structures & cables
3. Adopt site-specific mitigation measures, where significant impacts are foreseen

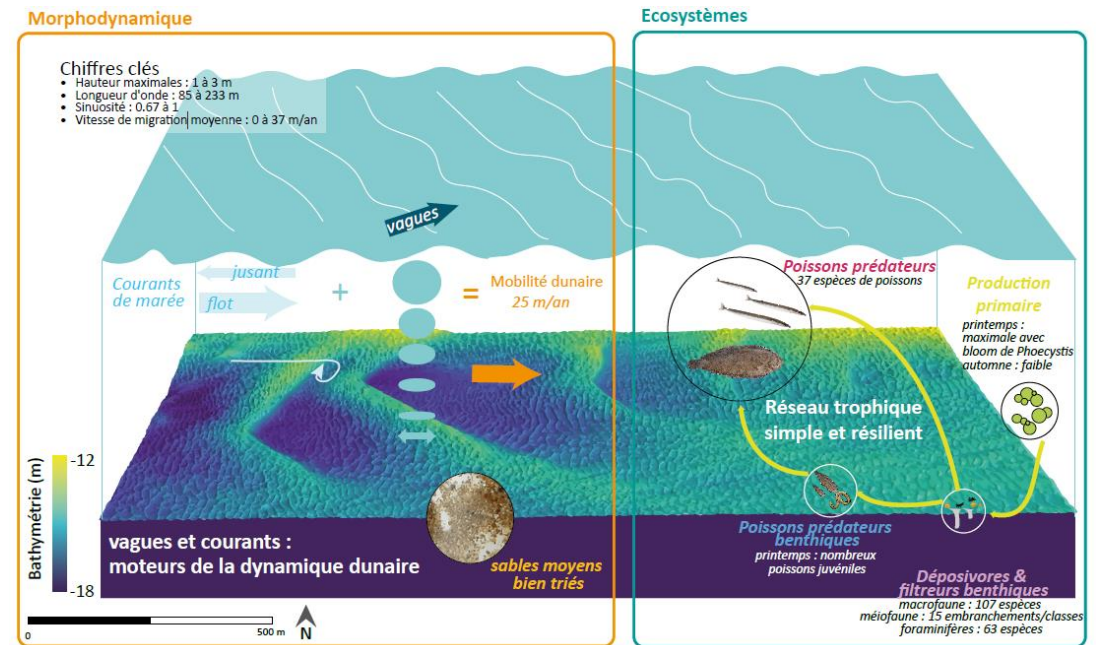
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Previous **project DUNES** (2019-2022) participated in **improving knowledge on ecology of marine dunes** and provides information on :

- The important role of nursery and foraging for many species of fish and birds;
- The links between geomorphology & ecology (species composition dependant on type of dunes as well as dune hollows and crests);
- The adaptation of benthic organisms to constant sediment movements.



Regarding environmental impacts

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Project MODULLES (2021-2024) allowed to significantly improve knowledge on :

- How to **predict** the effects of ORE structures and cable works on **geomorphology** of marine dunes;
- How to **predict** distribution of **heat** generated by cables in the sediment around and above buried cables.

It also identified what further research may be of interest (scientific article in preparation) in order to study ecological resilience of marine dunes

Together with point 1, this is valuable inputs for future EIA to assess site specific environmental impacts

May lead the way to further research

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Done on a case by case in the frame of Environmental Impact Assessments.

Knowledge from DUNES & MODULLES may also be relevant to design mitigation measures.

Examples of mitigation measures relevant to marine dune ecosystems taken within the frame of Dunkirk wind farm and its grid connection project :

- Scour protection around piles
Objective: prevent sediment resuspension and limit the subsequent impact on benthic habitats
- Replacing excavated sediments for cable installation, or placing them near the cable trench
Objective: reduce the effect of cable trenching on the morphology of marine dunes & helps maintain existing habitats



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Thank you