



Numerical modelling of marine dunes: Large-scale evolutions in an offshore wind farm context

Noémie Durand

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Source: <https://map.4coffshore.com/offshorewind>

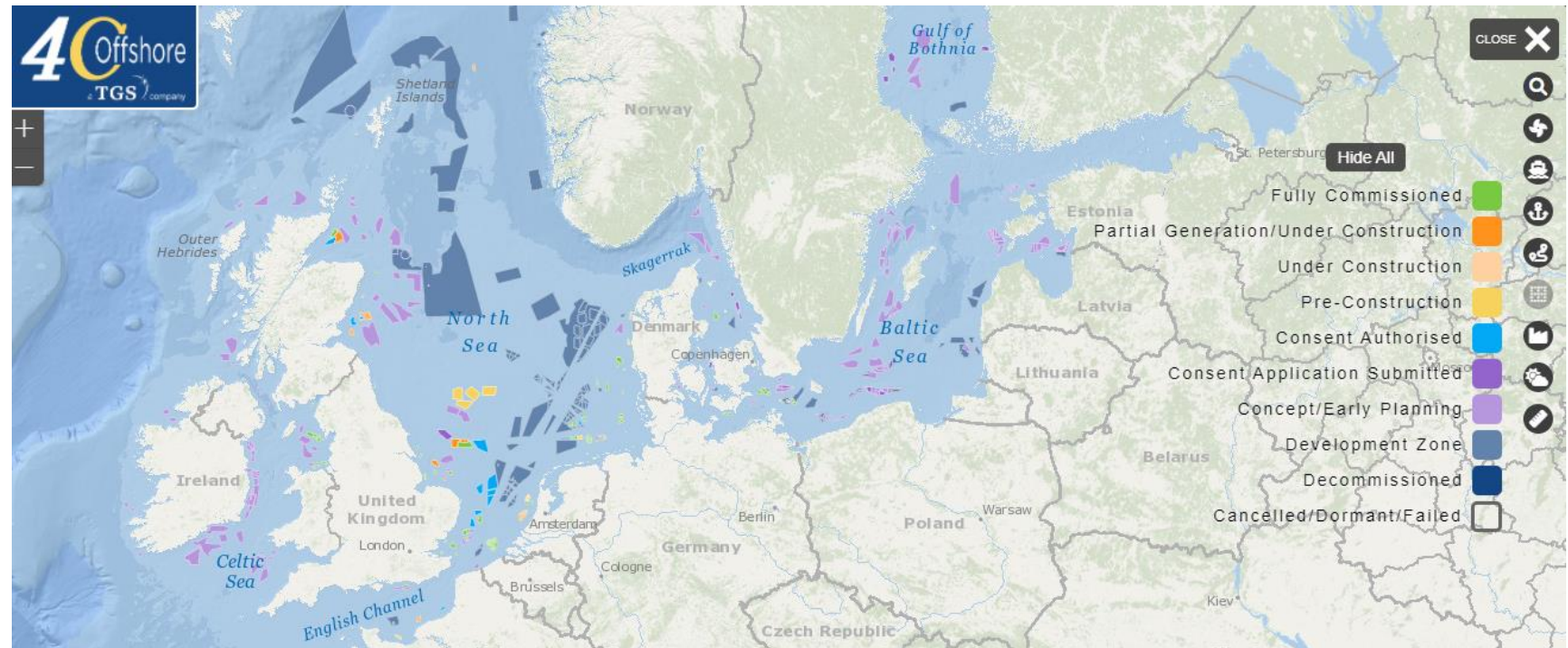
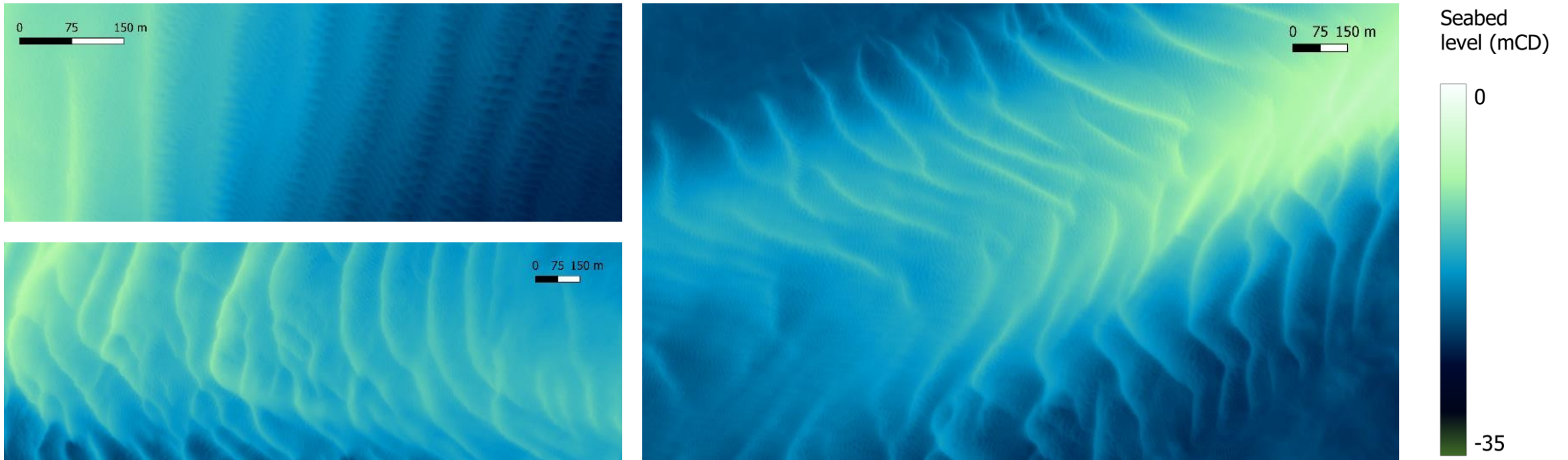


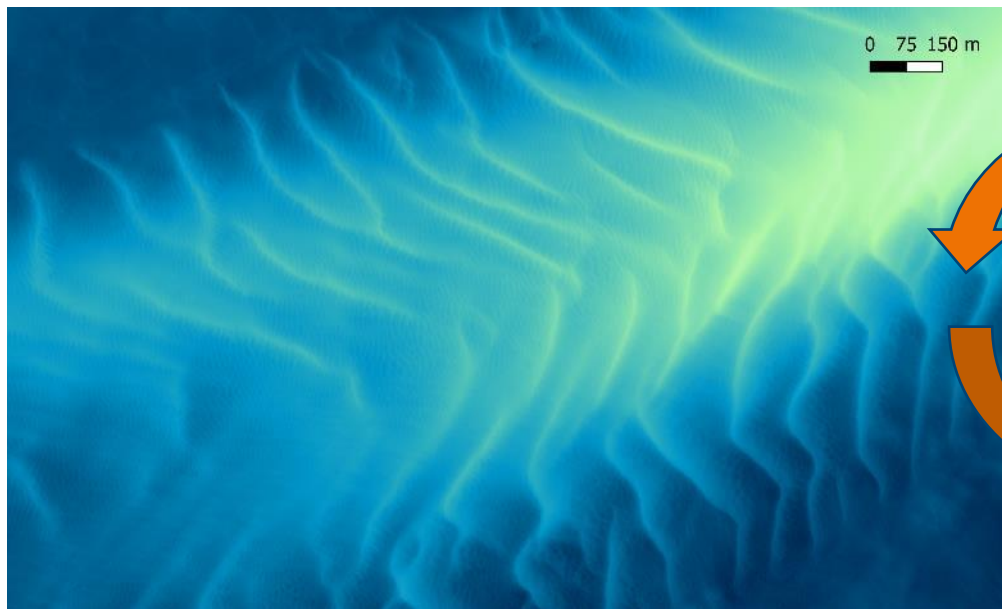
Photo Credit: Lydie Couturier/FISHOWF/France Energies Marines

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Data source: Eoliennes en Mer de Dunkerque (EMD)

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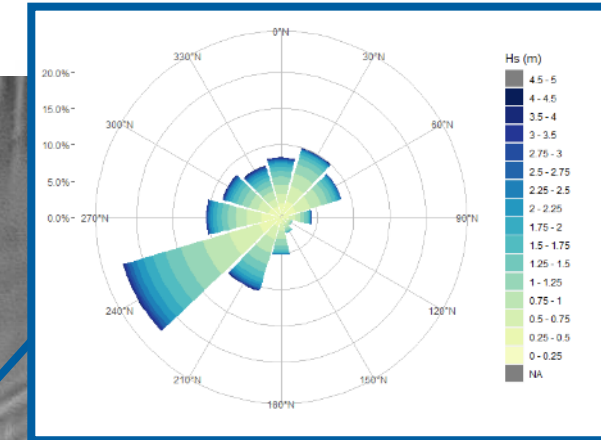
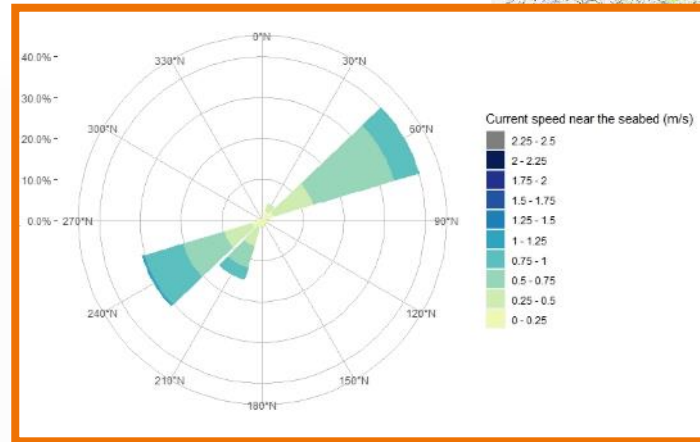
Data source: EMD



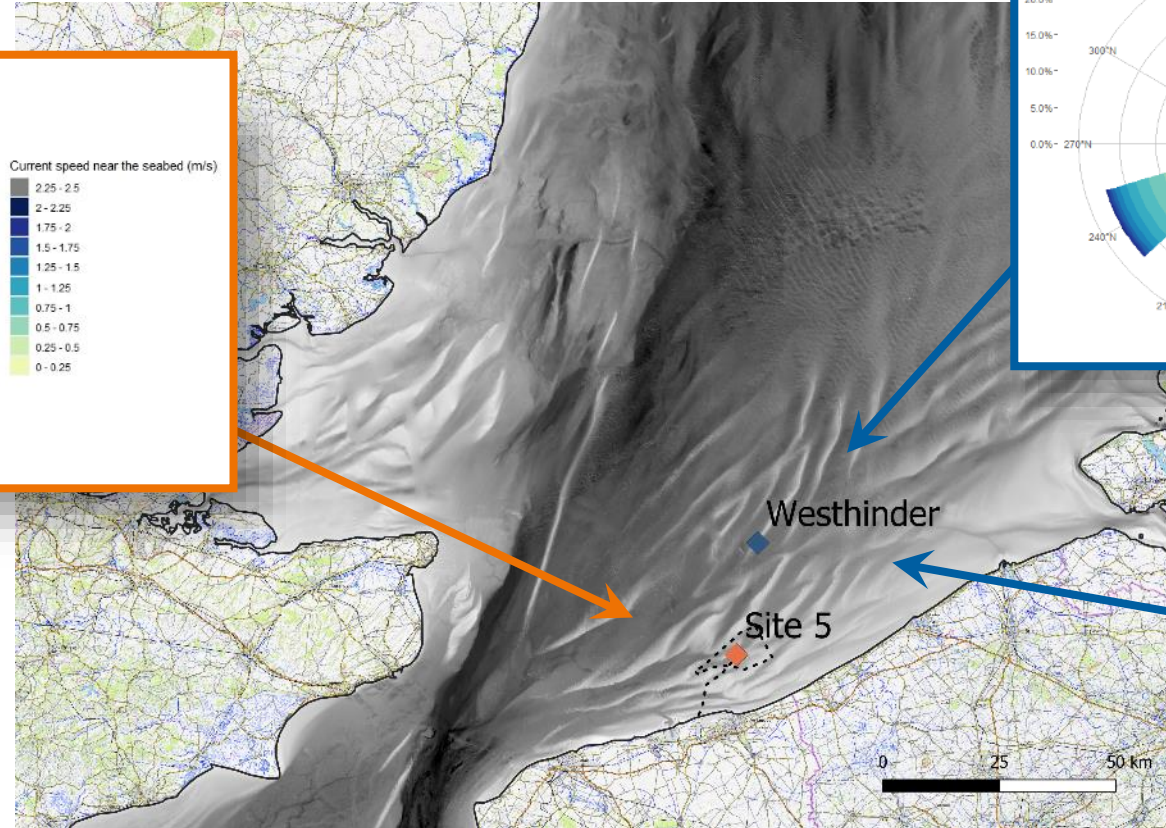
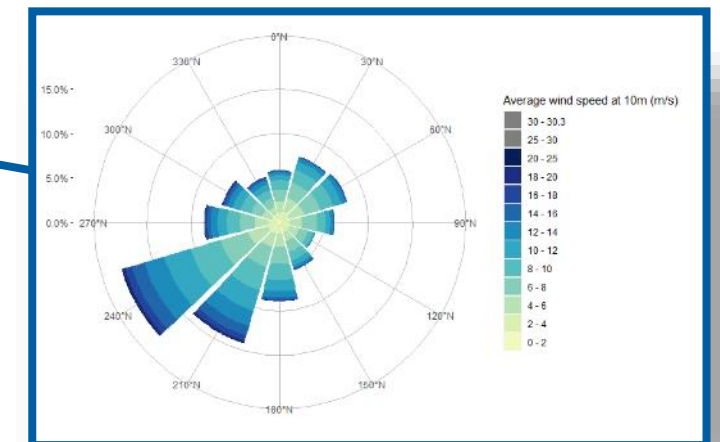
Credit: RWE

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Data source: FEM

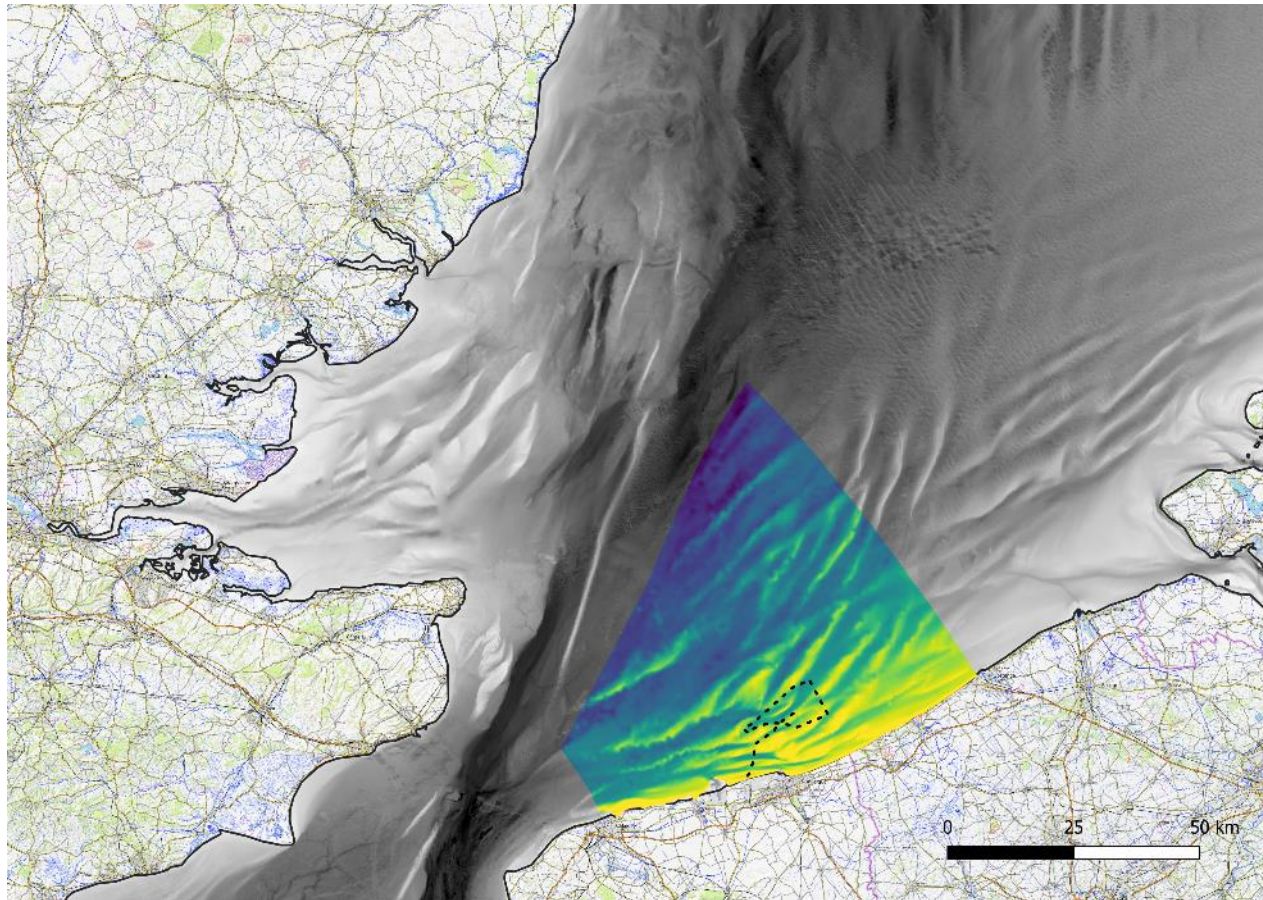


Data sources: Flanders Marine Institute



Data sources: SHOM and OpenTopoMap background imagery

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open TELEMAC-MASCARET

The mathematically superior suite of solvers



Physics

Processes

Tides + waves + wind & pressure
Bedload and suspended load transport
Bed evolution

Geometry

Domain size

representing ca. 55 km x 75 km

Domain content

1) Without

2) With OWF elements

Boundary conditions

Bottom

Friction law (can be spatially varying, can include bed roughness predictor)
Infinite sediment layer
One sediment class (uniform distribution)

Offshore

Tidal levels from TPXO
Winds from AROME or ERA5
Waves from ANEMOC-3 or other regional model
No sediment supply

Time scales

Physical duration

14 days to 5 years



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THANK YOU !