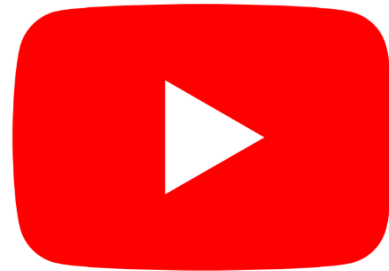


Click to access a video of this presentation:

<https://www.youtube.com/watch?v=0NDvk6rdjtU>



Modelling of the offshore wind farm footprint on organic and mineral particle deposition flux

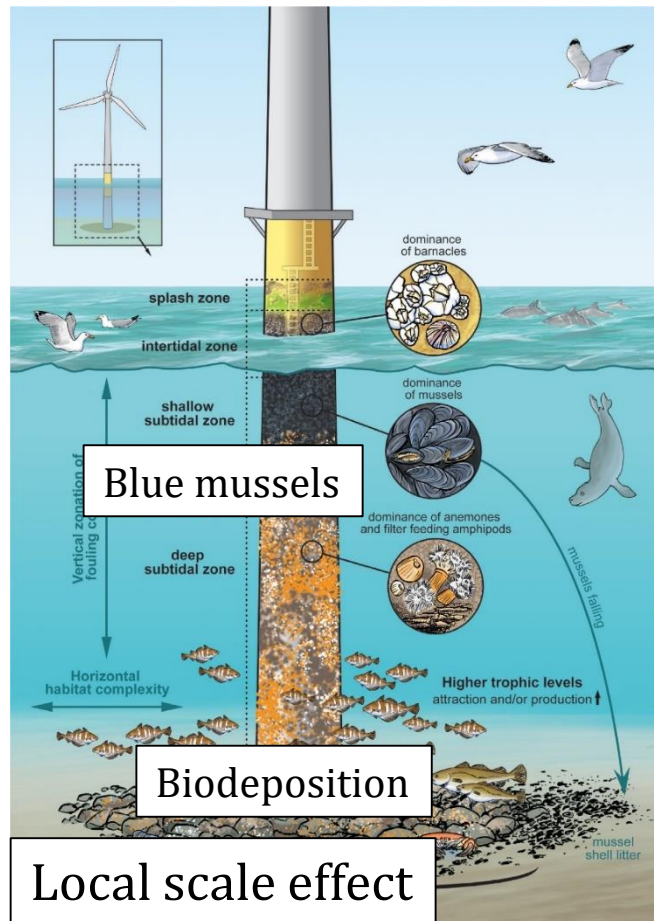
by Evgeny Ivanov
PhD student



28/04/2021

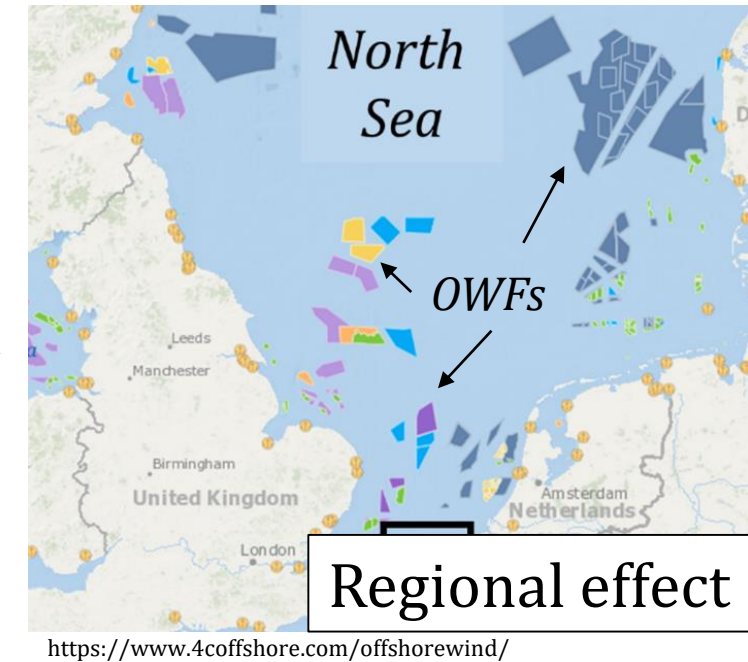
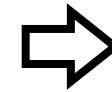


Problematics: Upscaling of filter feeders biodeposition effects



Degraer, S. et al.(2020). Offshore wind farm artificial reefs affect ecosystem structure and functioning *Oceanography*, 33(4), 48-57.

Biodeposition by filter feeders – so what?

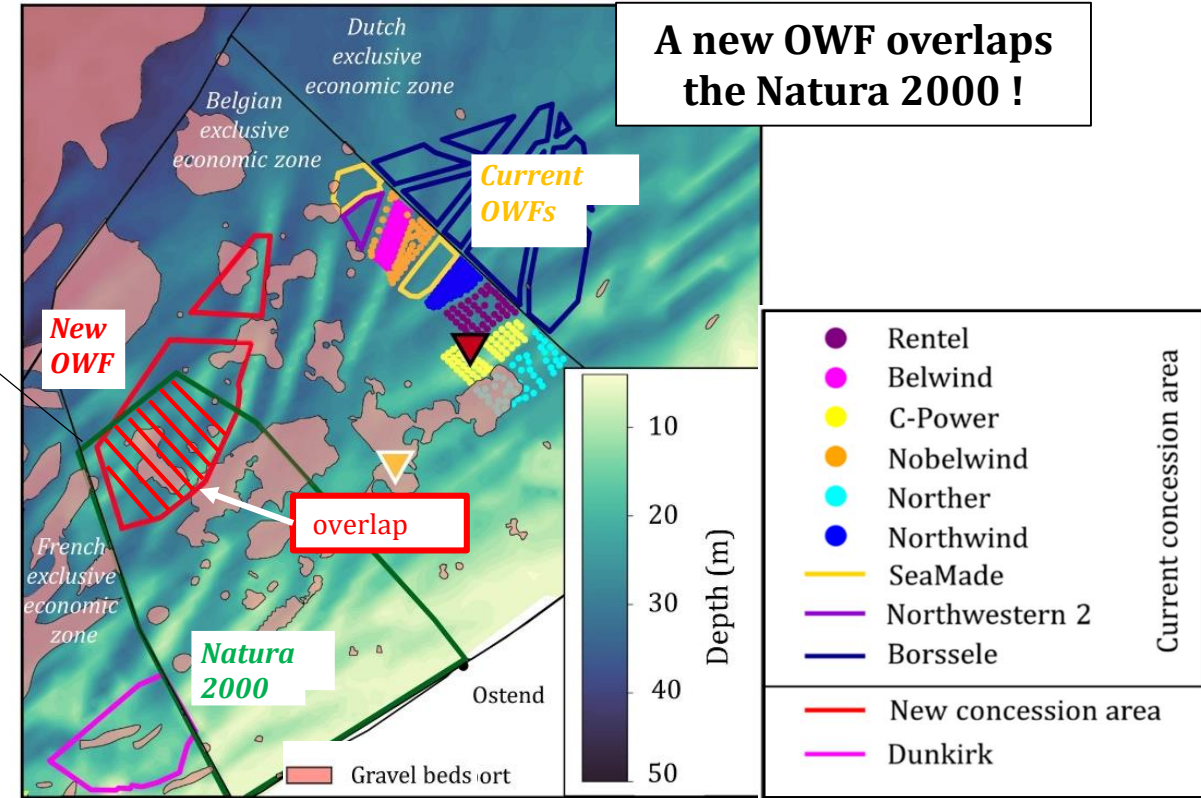
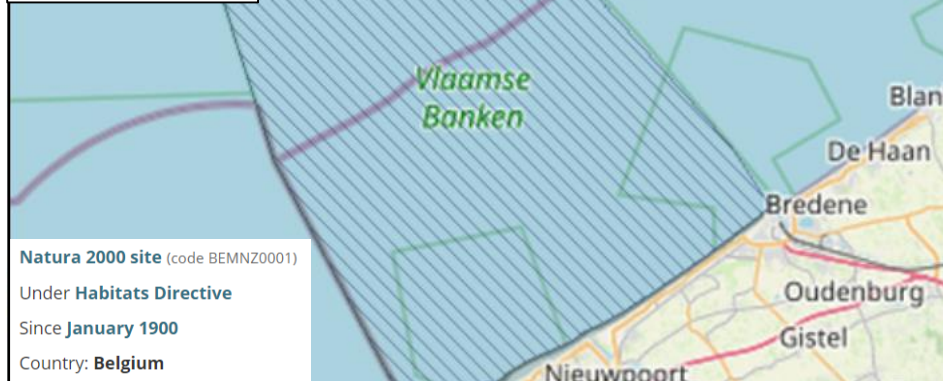


Policy-driven questions

Vlaamse Banken

Natural
reserve
in Belgian
economic
zone

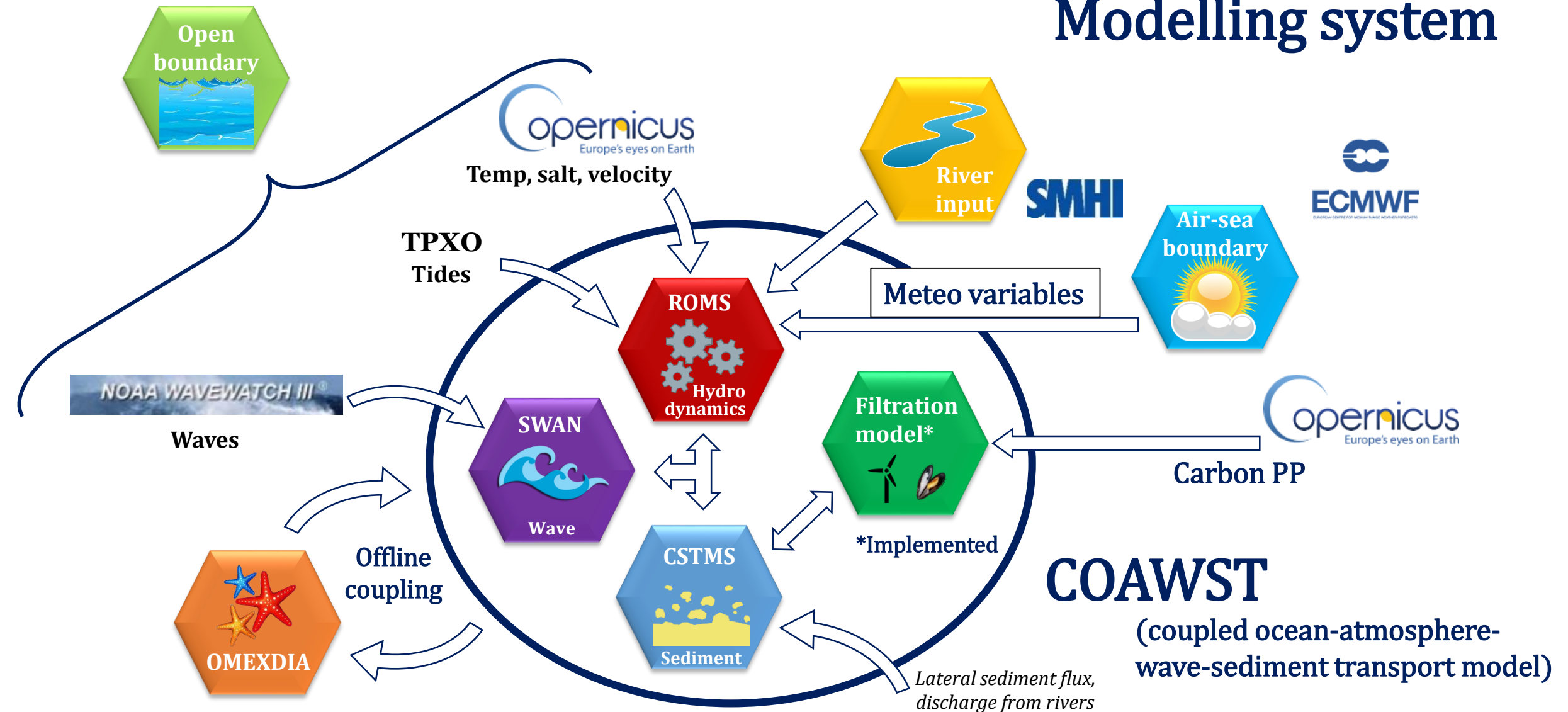
Surface area: **1099 km²** (109939.90 ha)
Marine area: **100%**
Located in **Marine Atlantic** biogeographical region
It protects **15** species of the Nature Directives
It protects **2** habitat types of the Habitats Directive



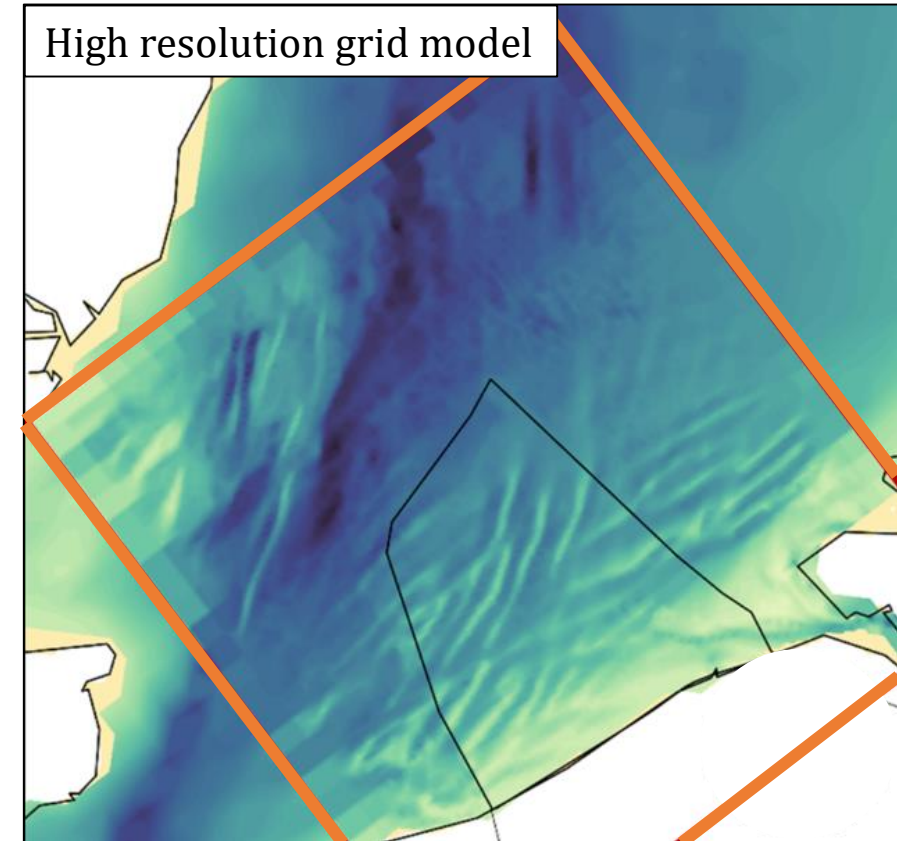
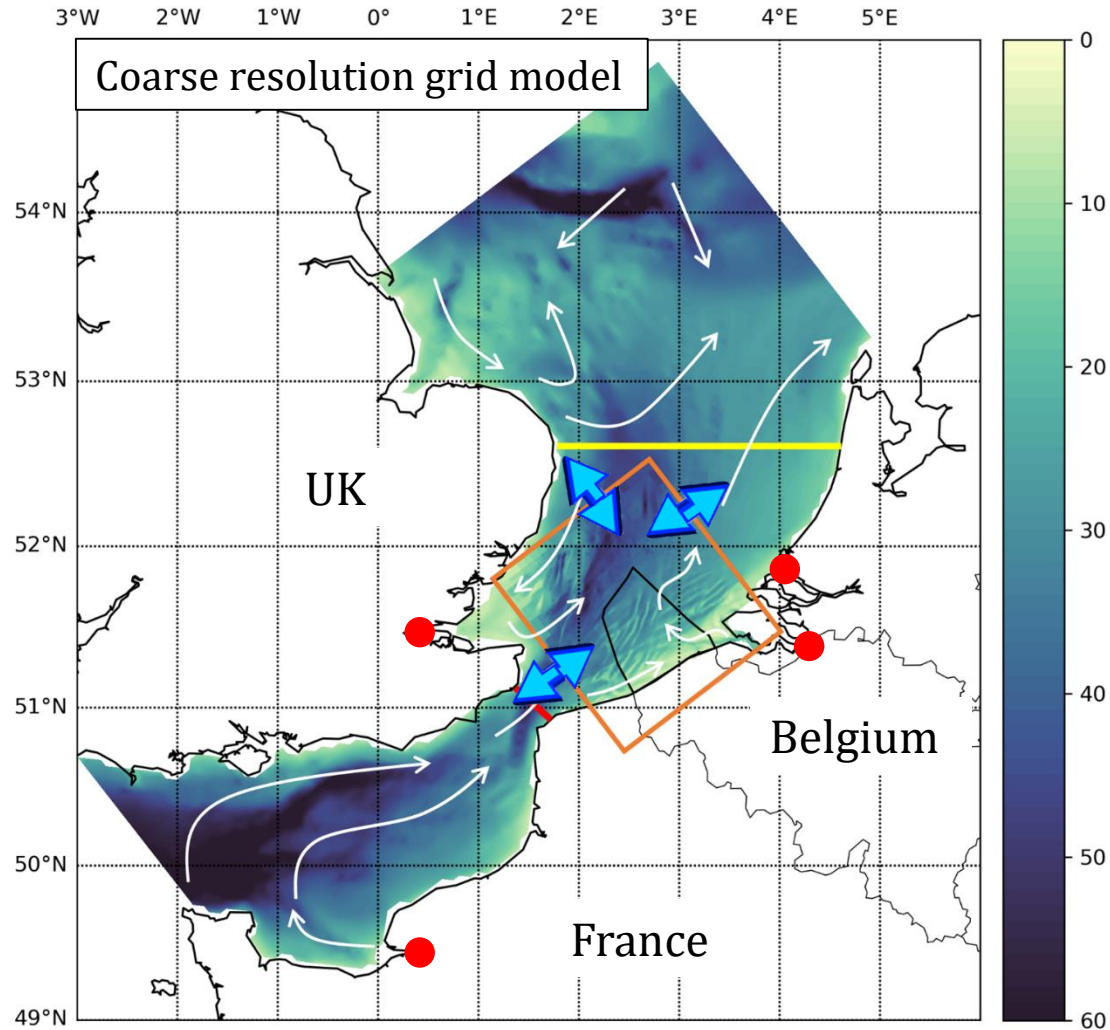
- 1) What effect will the new OWF cause to the protected gravel beds?
- 2) How can we minimize this effect in terms of placement and number of turbines?



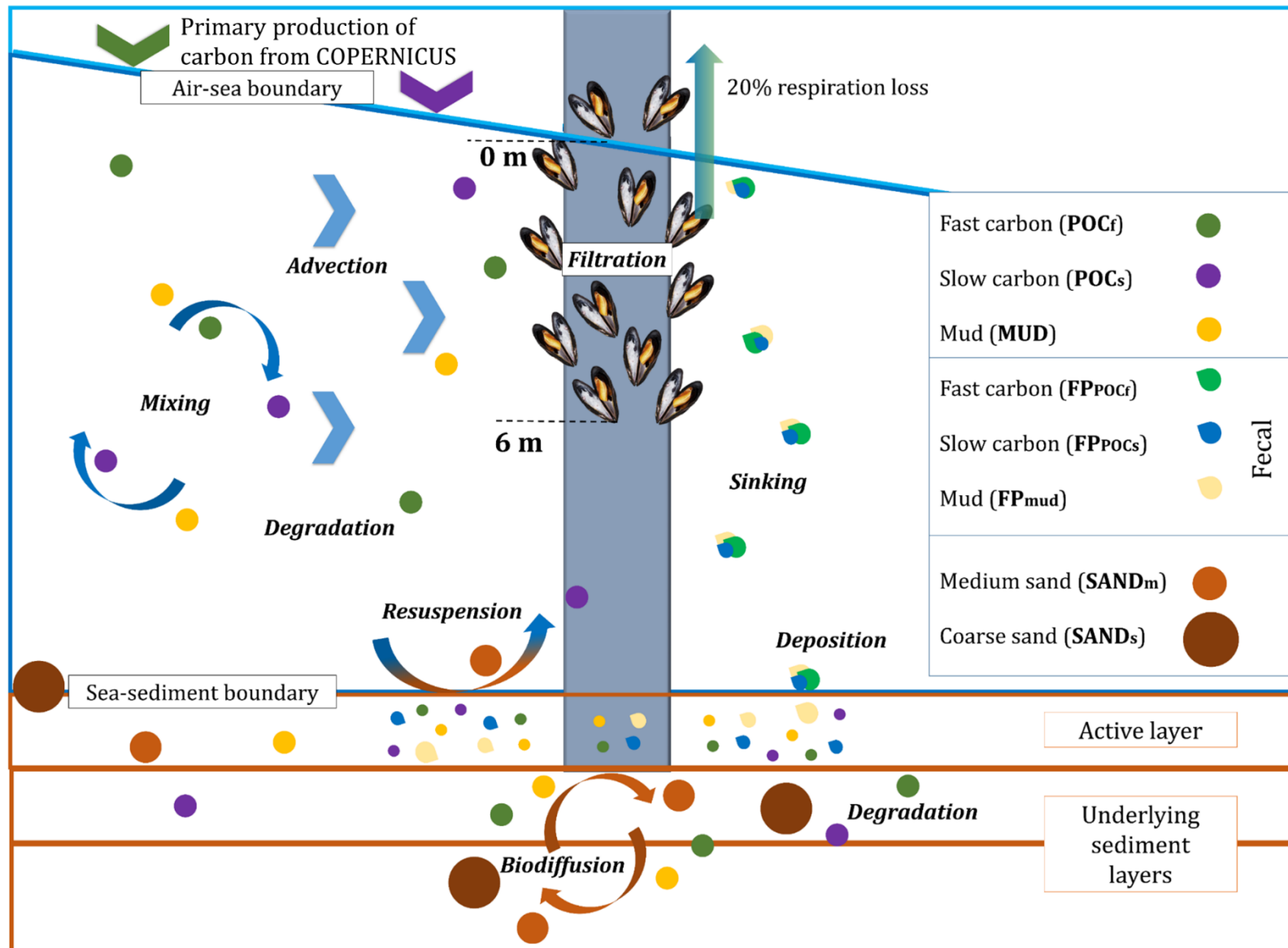
Modelling system



Modelling grids



Filtration model



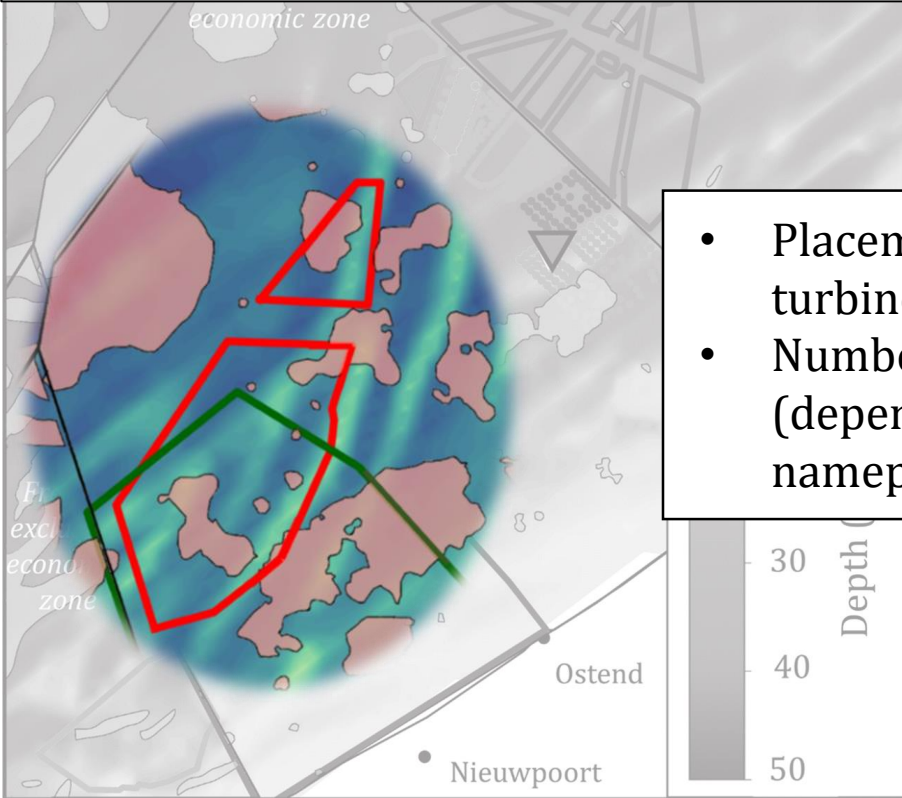
Modificaiton is inspired by the model from : Slavik, K., Lemmen, C., Zhang, W., Kerimoglu, O., Klingbeil, K., & Wirtz, K. W. (2019). The large-scale impact of offshore wind farm structures on pelagic primary productivity in the southern North Sea. *Hydrobiologia*, 845(1), 35-53.



Scenarios development

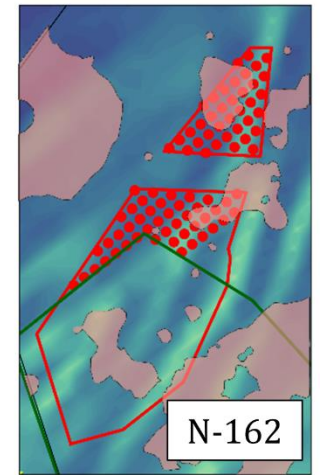
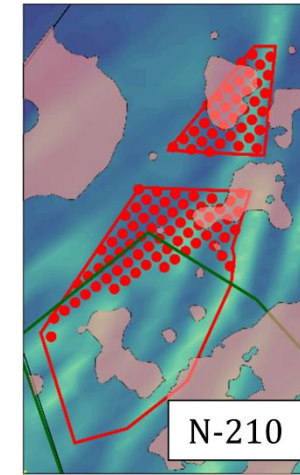
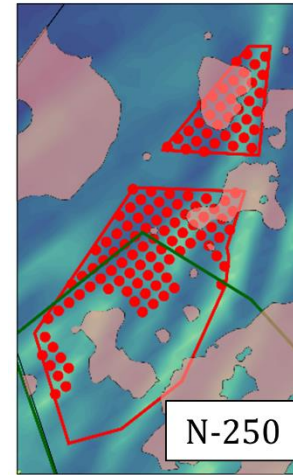
Additional scenarios:

- R-0 (reference) – no OWFs
- D-210 (Dunkirk) – N-210 + Dunkirk OWF

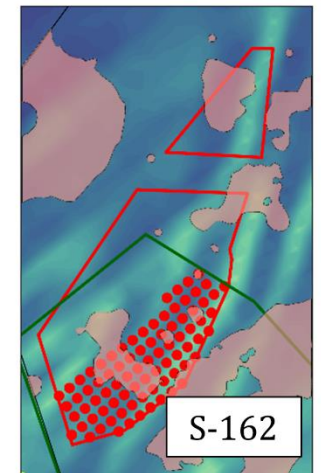
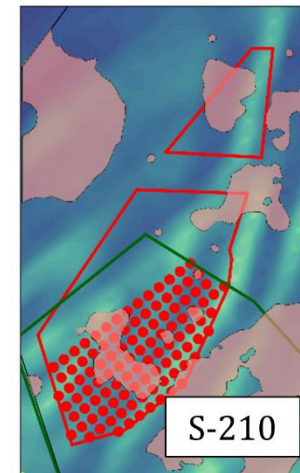
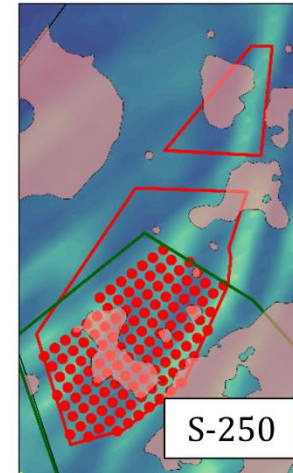


- Placement of turbines
- Number of turbines (depends on their nameplate capacity)

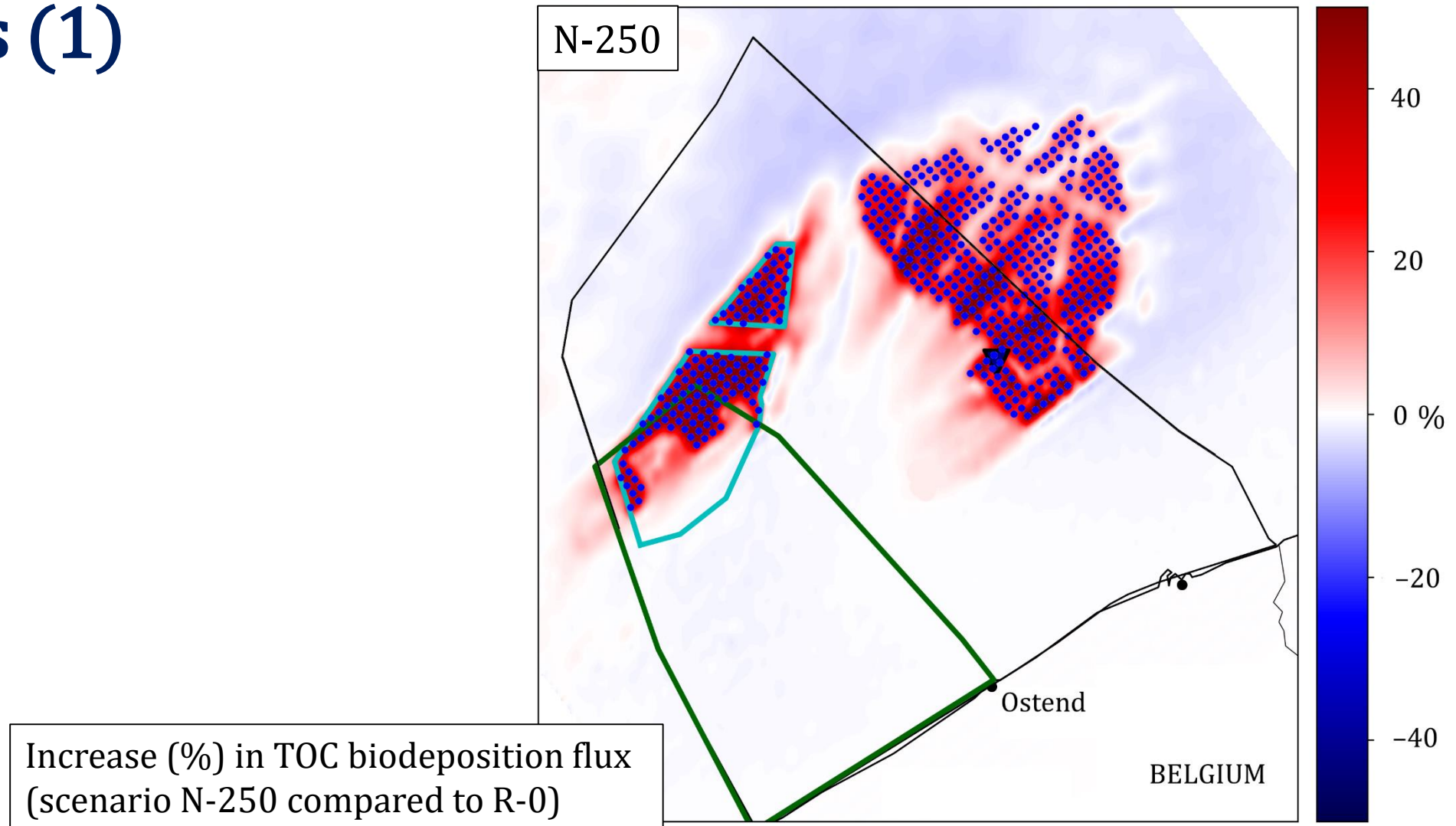
Northern placement



Southern placement

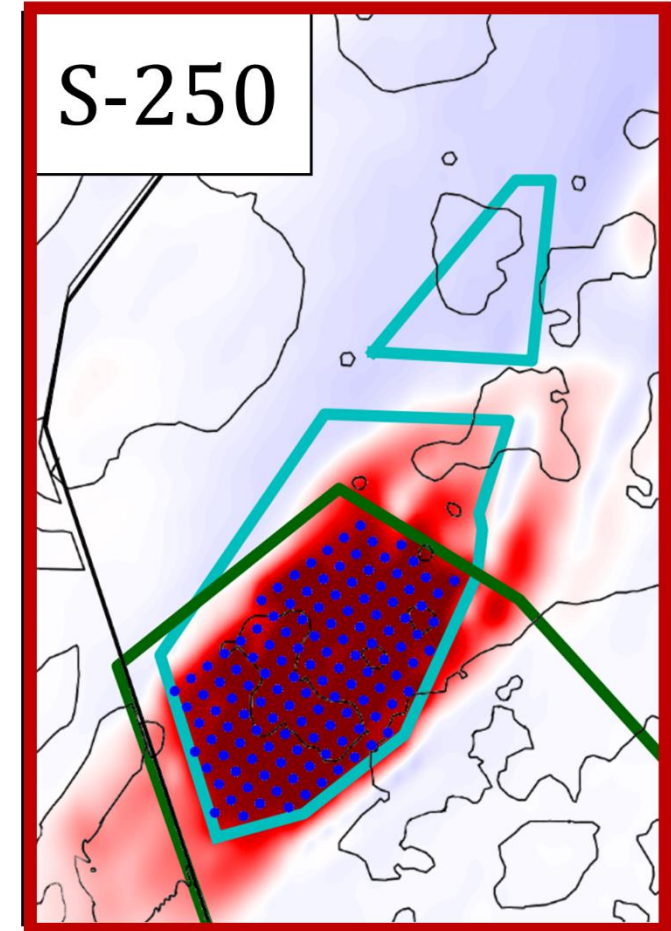
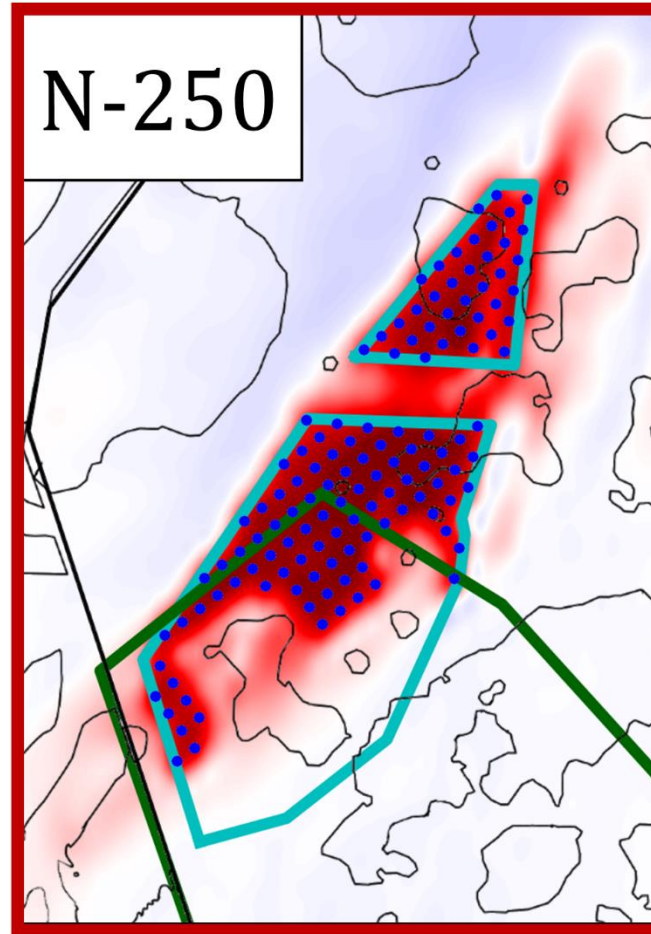


Results (1)

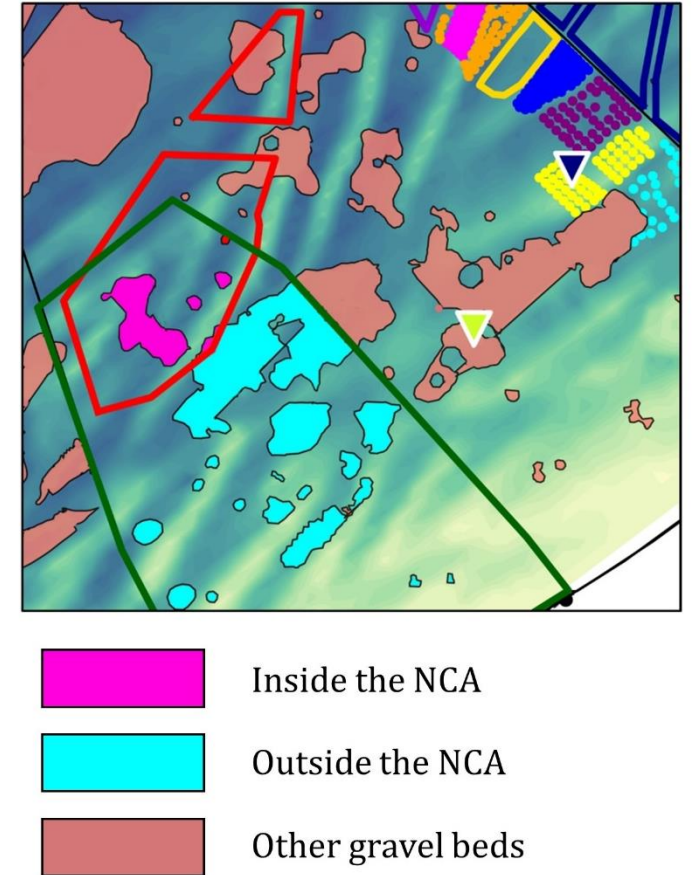
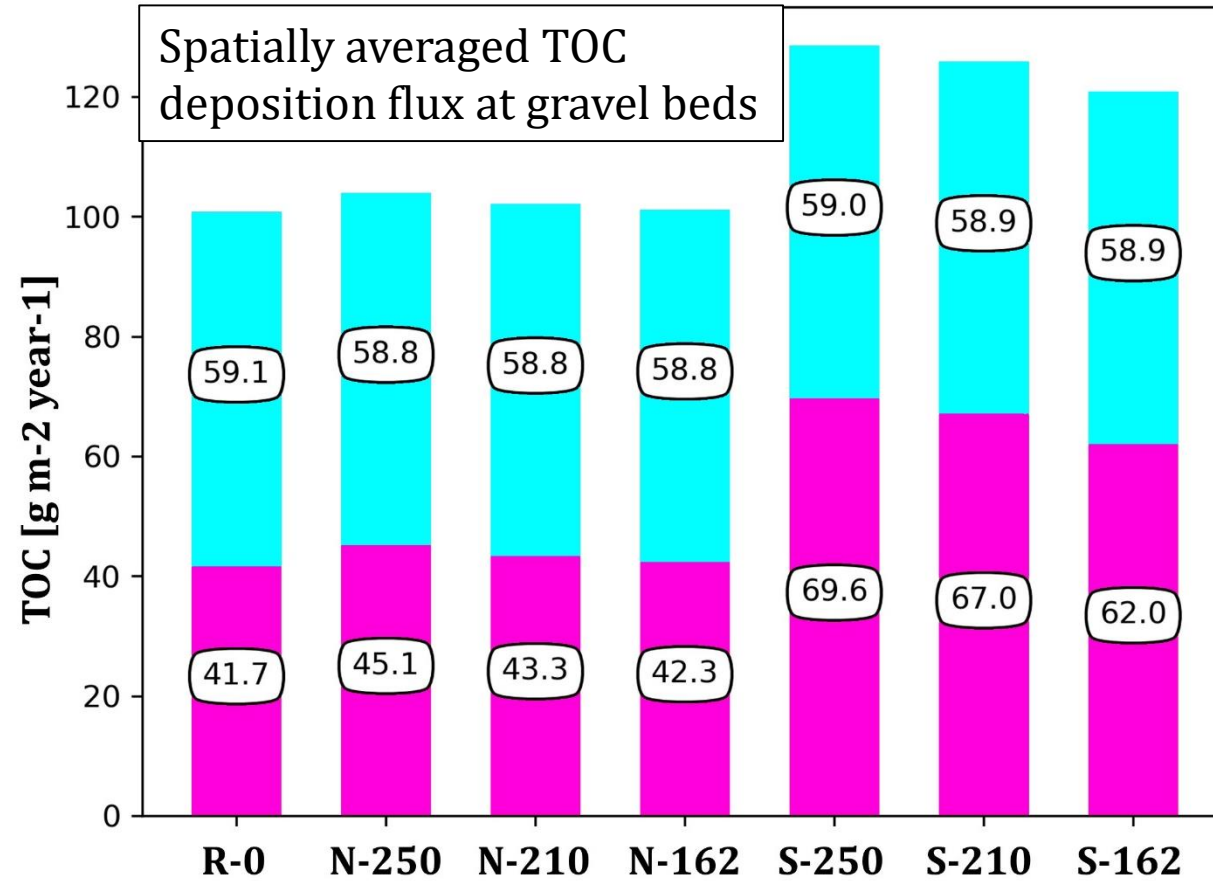


Results (2)

Comparison of scenarios
of the Northern and
Southern placements



Results (3)



Thank you for your attention !



Marilaure Grégoire, Directeur de recherches FNRS (head of the group)



Arthur Capet, post-doc



Luc Vandenbulcke, post-doc



Evgeny Ivanov, PhD
student



Modelling for Aquatic Systems (MAST)

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