

The effect of the installation of offshore wind farms on soft-sediment macrofauna:

a 5-year study from the Thornton Bank

Mohammed Asebai *, Liesbet Colson, Magda Vincx, Jan Vanaverbeke

*Corresponding author: mohammed.asebai@ugent.be



1- Do we need wind farms?



By 2020, Belgium needs to obtain 13% of its consumption of electricity from renewable energy sources in order to comply with European legislation.



Belgium offshore wind farms are a good option to achieve this target.

2- How can we determine the impact of windmills on the marine environment?



MUMM started a monitoring program to determine the possible impact of offshore wind farms on the marine environment, including the soft-sediment macrobenthos (*organisms larger than 1 mm that live in the soft-sediment of the seabed*)



BUT

- ❑ To detect any **possible impacts** of the offshore wind farms on the macrofauna, a **long-period** of monitoring was **suggested** from previous studies.
- ❑ **Different sampling strategies** were applied during the last five years with **different recommendations** for the future monitoring .

3- Which objectives make this research relevant?

FIRST objective



Evaluate the **possible impact** of the offshore wind farms on macrobenthos in the Thorntonbank over a **long-period**.

SECOND objective



Provide advice on **the best sampling strategies design** for future monitoring purpose for soft sediment macrobenthos.

4- How can we achieve these two objectives?

- ❑ A 5-year dataset (2009-2013) was analyzed.
- ❑ **Two statistical** analyses were designed based on the heterogeneity of the data during the last five consecutive years

“Design 1 “

Is based on a limited number of stations, where replicate samples were obtained

“Design 2 “

Is based on more stations where only 1 replicate was obtained

5- What is the cumulative wind farm impact on macrofaunal community?

- ❖ The **changes** in macrofaunal community composition are due to **natural** internal variability.
- ❖ There is a **difference** between **locations**, but **species richness** and diversity did **not change**.
- ❖ The **installation** of windmill had **no effect** on the environmental variables (grain size composition, total OM content).

6- Which sampling strategy is the best for the future monitoring?

- ❖ Sampling **more stations** with one replicate allows to cover a larger area at the same cost and it **is better** for illustration the **short period** of biomonitoring.
- ❖ Sampling **less stations**, while increasing the number of replicates per location, increases the capacity of the analysis: it takes into account the natural, local variation in the fauna and it is **more useful** in the case of **long-term** of biomonitoring.