The effect of the installation of offshore wind farms on soft-sediment macrofauna: a 5-year study from the Thornton Bank



UNIVERSITEIT GENT

Mohammed Alsebai *, Liesbet Colson, Magda Vincx, Jan Vanaverbeke *Corresponding author: mohammed.alsebai@ugent.be

1- Do we need wind farms?



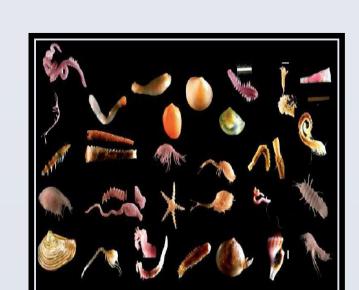
By 2020, Belgium needs to obtain 13% of its consumption of electricity from renewable energy sources in order to comply with European legislation.



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

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

- ❖ Sampling <u>more stations</u> with one replicate allows to cover a larger area at the same cost and it <u>is better</u> for illustration the <u>short period</u> of biomonitoring.
- ❖ Sampling <u>less stations</u>, 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 <u>more useful</u> in the case of <u>long-term</u> of biomonitoring.