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WinMon.BE

Key results of the seabird and bat monitoring in Belgian offshore wind farms

Royal Belgian Institute of Natural Sciences

Robin Brabant

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Context

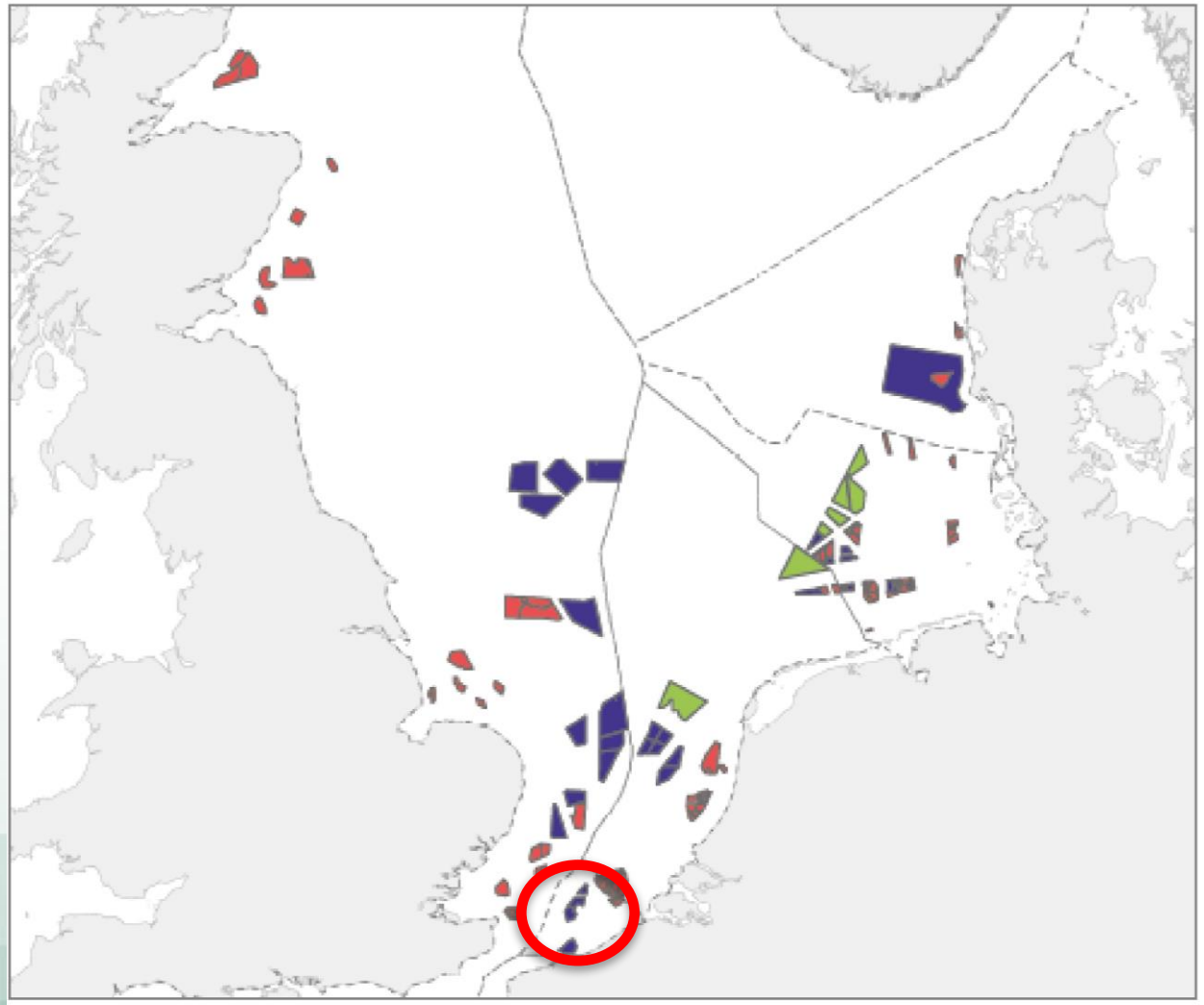

Figure 3: Installed, planned and foreseen wind farm areas in the North Sea
(red: 2023, blue: 2030, green: 2030+, as of 09/2018)

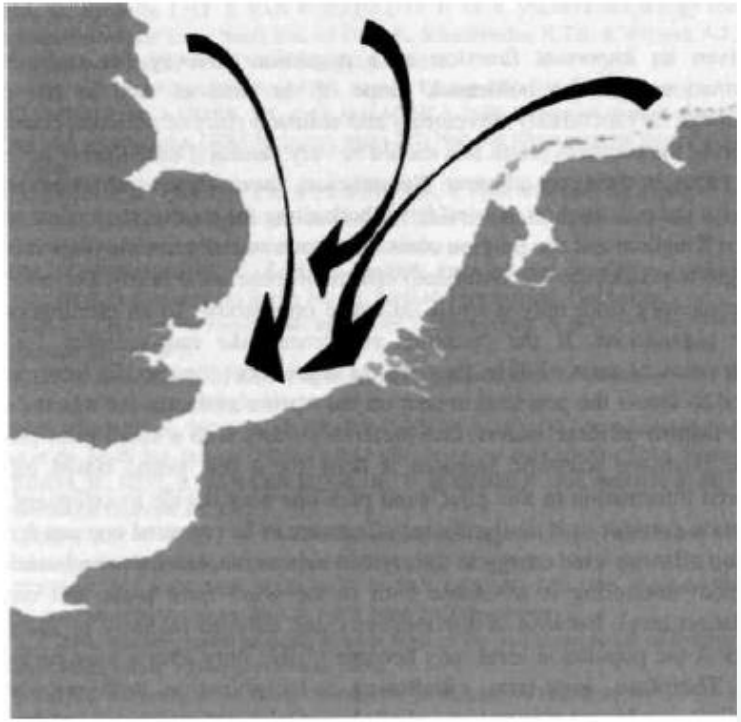

Figure 1. *Map of the North Sea showing that southwards migrating seabirds become concentrated within the cuneiform southern North Sea.*

TRAPPED WITHIN THE CORRIDOR OF THE SOUTHERN NORTH SEA: THE POTENTIAL IMPACT OF OFFSHORE WIND FARMS ON SEABIRDS

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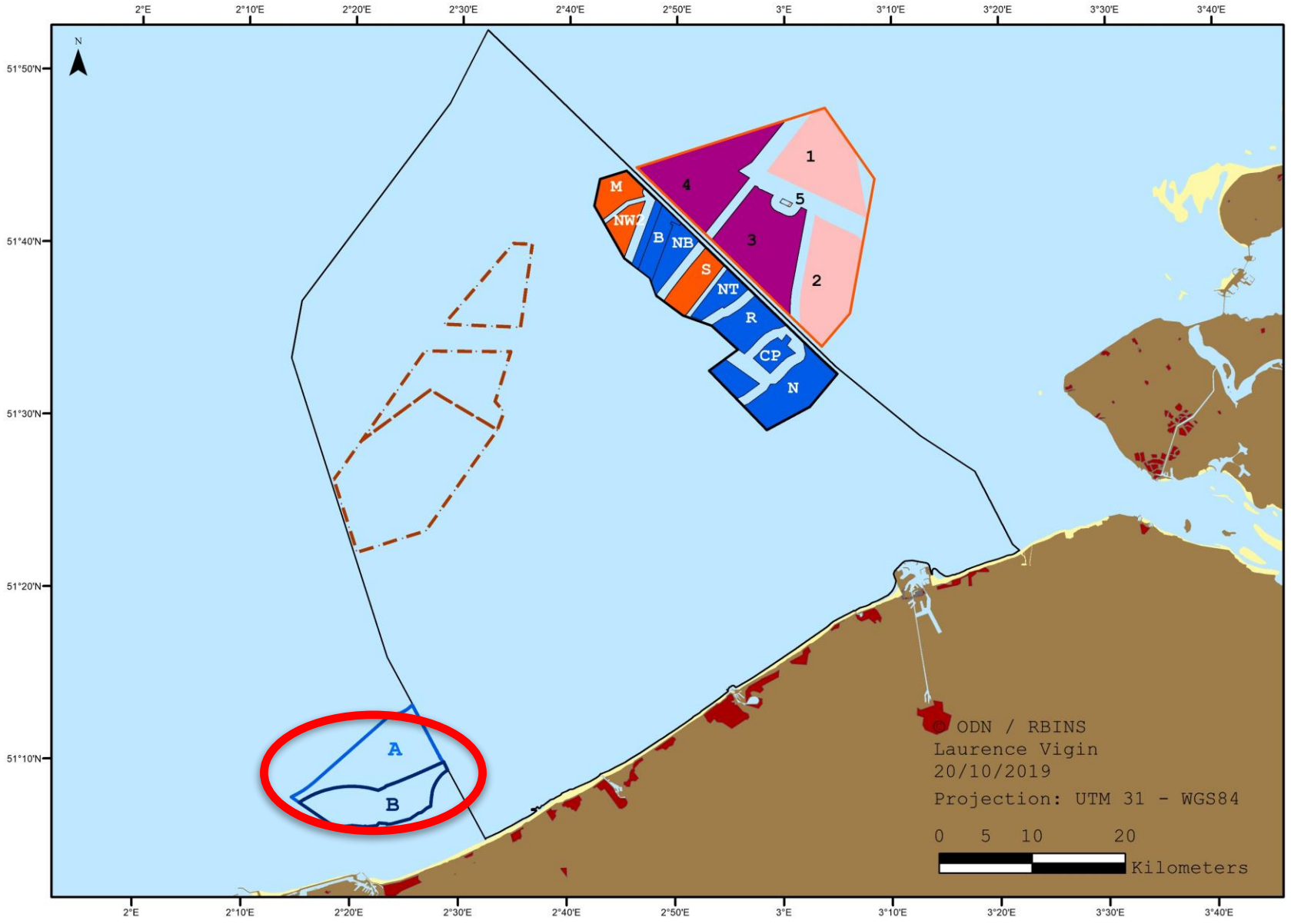

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OWF effects

Anticipated effects:

- changes in seabird abundance and/or distribution (=displacement)
  - avoidance – attraction
- Collision: increased mortality
- Barrier to migration

Monitoring / Research

- Seabird surveys
- Collision risk modelling
- Radar research

Monitoring started in 2010:
Here only a few key results!

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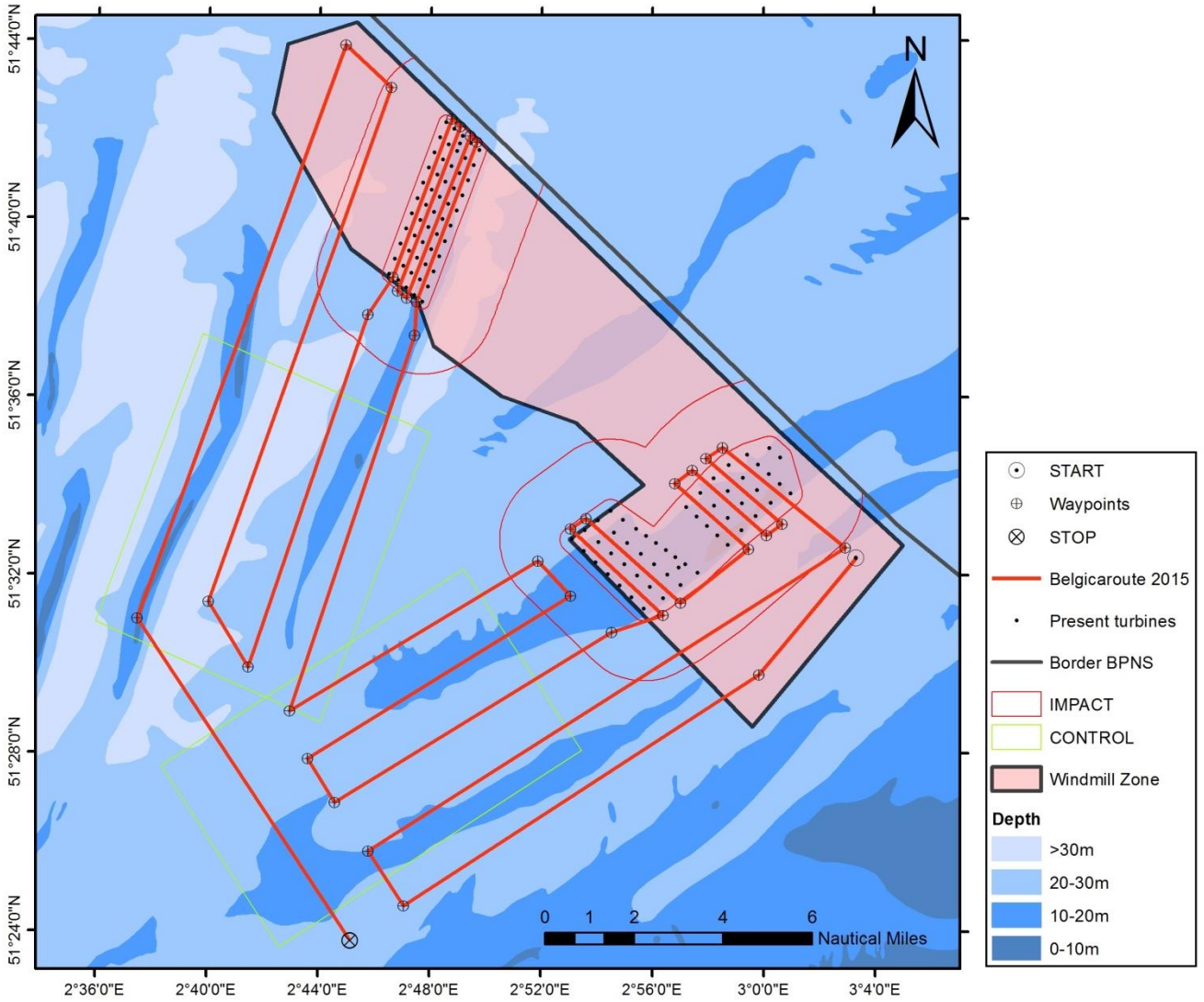
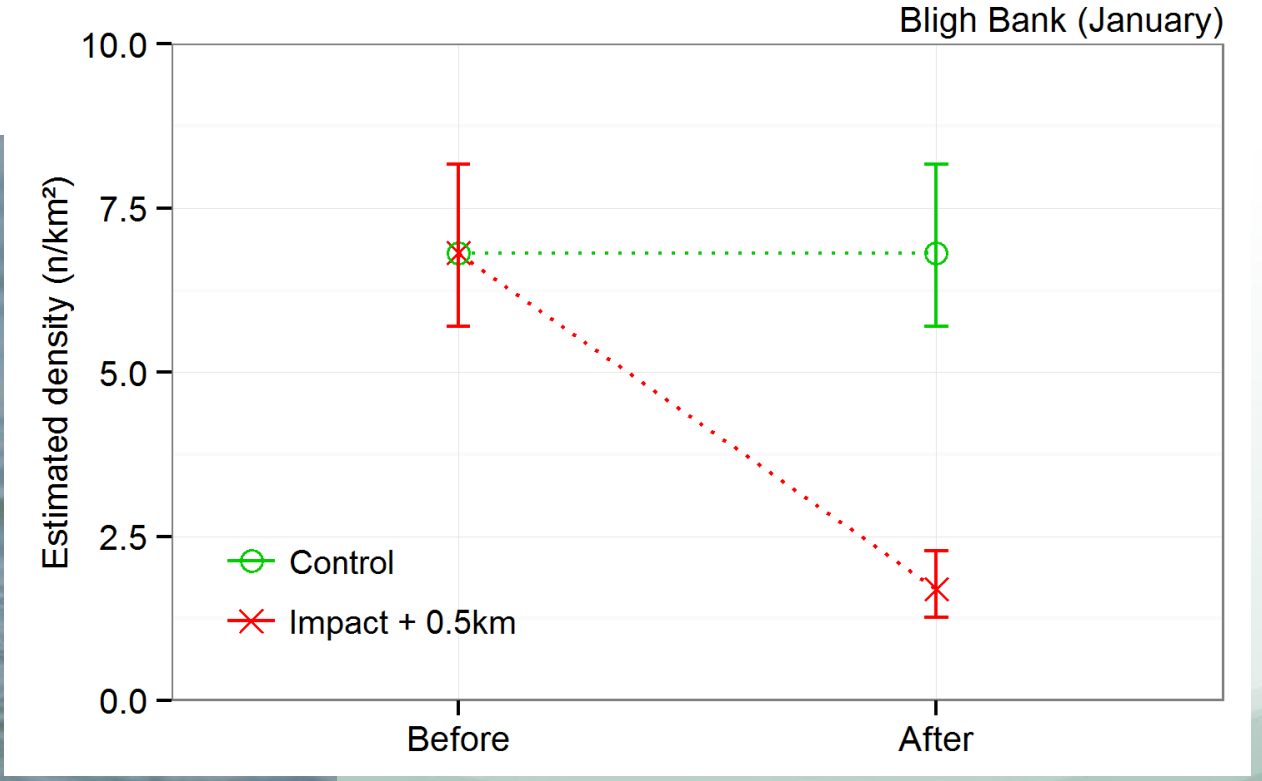
Seabird displacement



- Monthly ship-based counts since 2010
- In impact and control areas
- INBO (Research Institute Nature and Forest)

Seabird displacement

Common Guillemot avoidance of the Bligh Bank offshore wind farm



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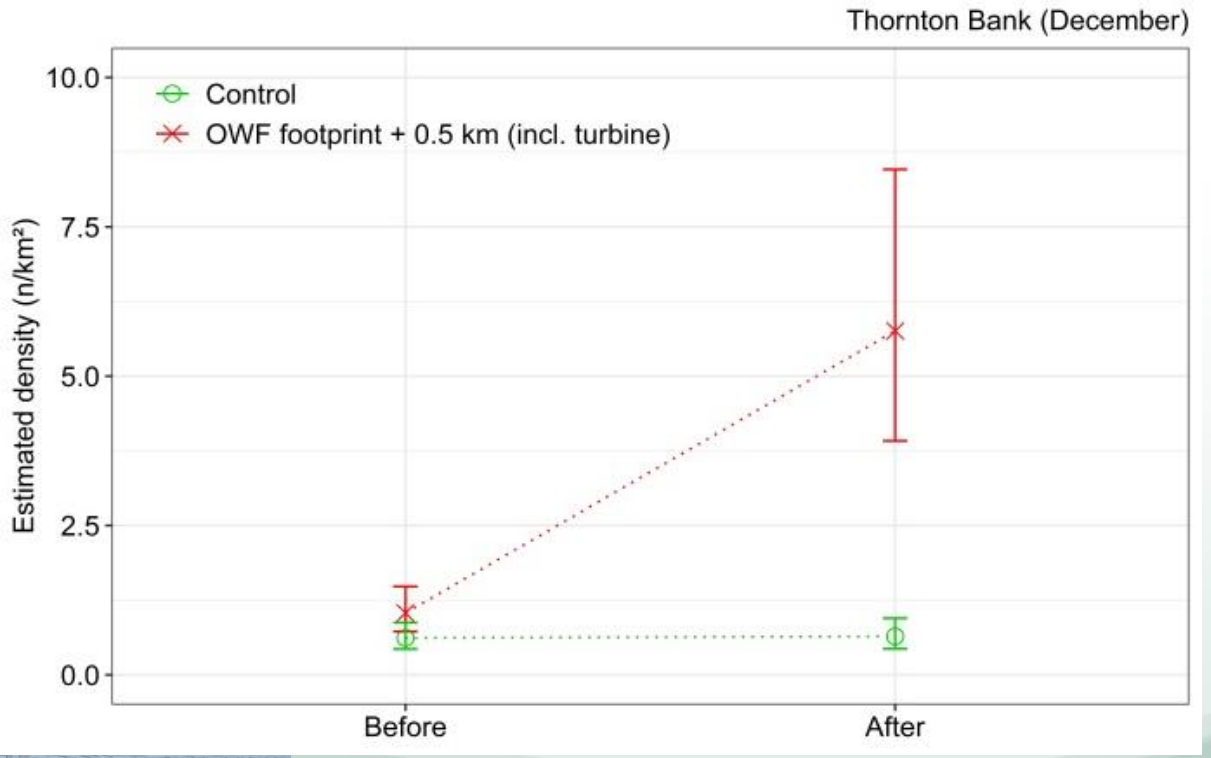
Seabird displacement

Great black-backed gull attraction at the Thornton Bank offshore wind farm



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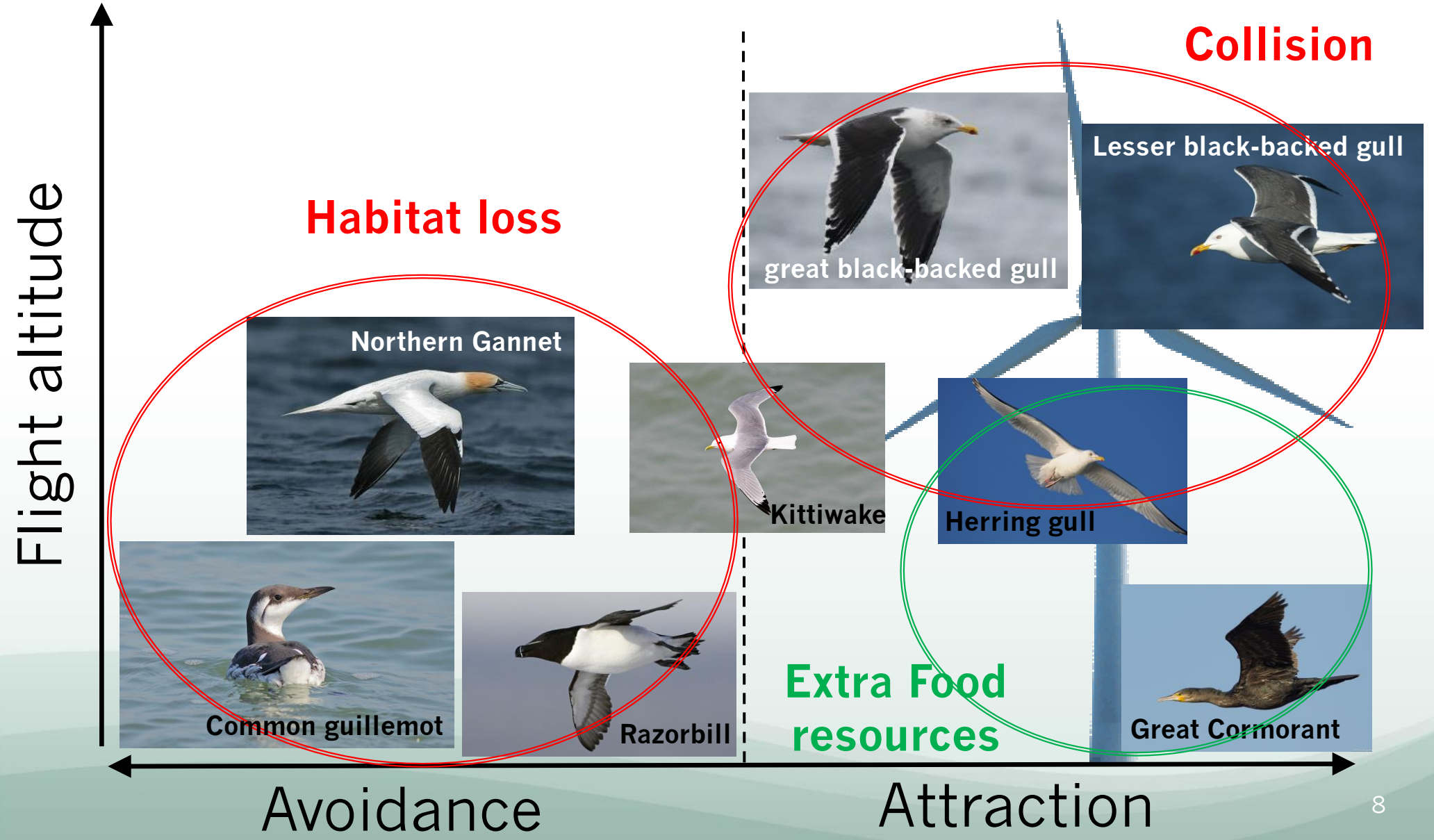
Seabird displacement



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Seabird displacement

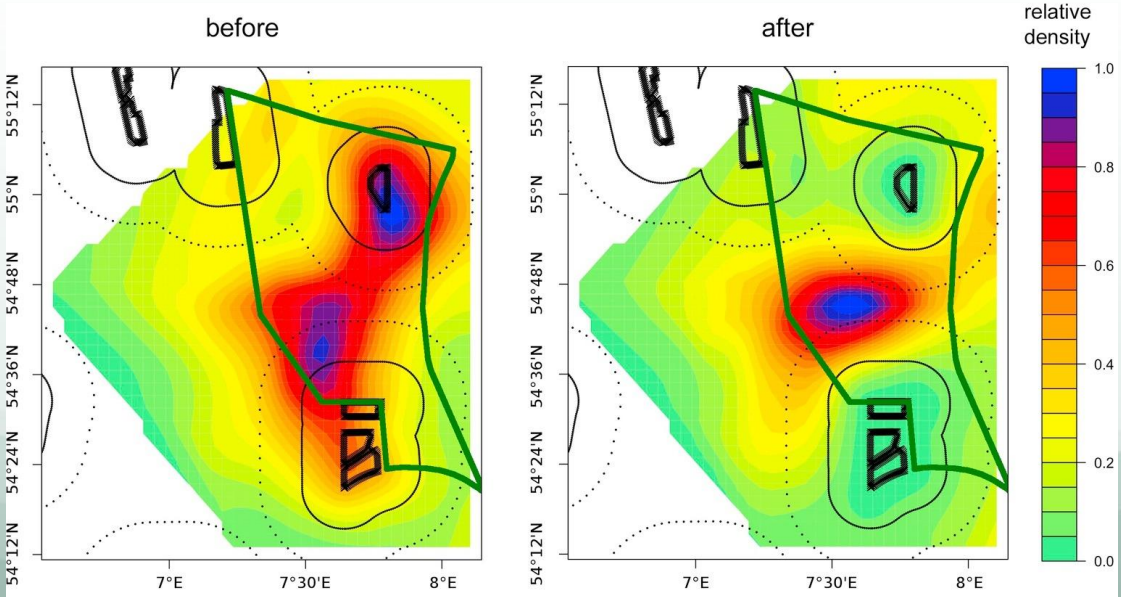
Review of seabird displacement research at 16 European OWFs:

consistent responses for several seabird species

- Attraction: **Great Cormorant** & **Great Black-backed Gull**
- Avoidance: **Northern Gannet**, **Common Guillemot, Razorbill** & **Red-throated Diver**

yet inconsistent results for e.g. Herring Gull, Lesser Black-backed Gull, Black-legged Kittiwake, …

Avoidance of Red-throated diver up to 16km from OWF (Mendel et al., 2019)
https://doi.org/10.1016/j.jenvman.2018.10.053)



Loon distribution in the eastern German Bight before and after construction of offshore windfarms

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Seabird collision risk

Collision risk modelling (CRM): estimate collision risk based on bird related variables and turbine / OWF variables (Band, 2012)

−	+
Large variability	Compare different scenarios: - siting - turbine dimensions and number
Large uncertainty	Identify species at risk

→ 290.3 ± 205.4 collision / year for six most abundant seabird species inside Belgian OWFs

→ lesser and greater black-backed gull

→ Rough extrapolation for North Sea scenario hints towards population effects


Hydrobiologia
DOI 10.1007/s10750-015-2224-2

OFFSHORE WIND FARM IMPACTS

Towards a cumulative collision risk assessment of local and migrating birds in North Sea offshore wind farms

Robin Brabant · Nicolas Vanermen · Eric W. M. Stienen · Steven Degraer

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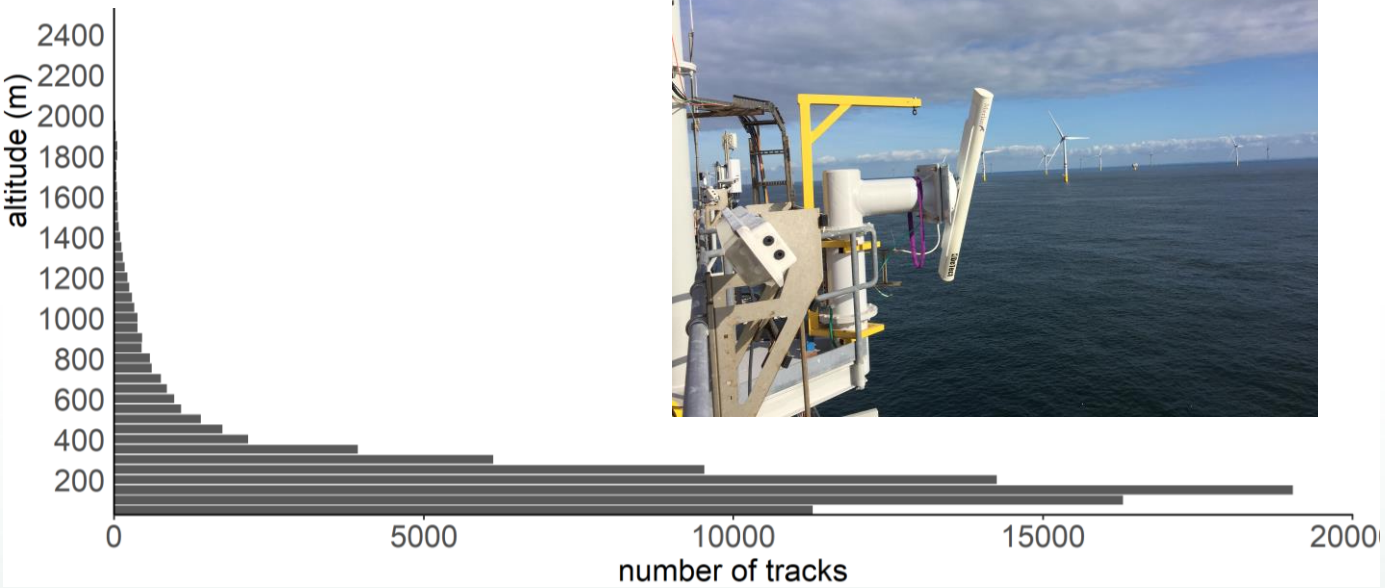
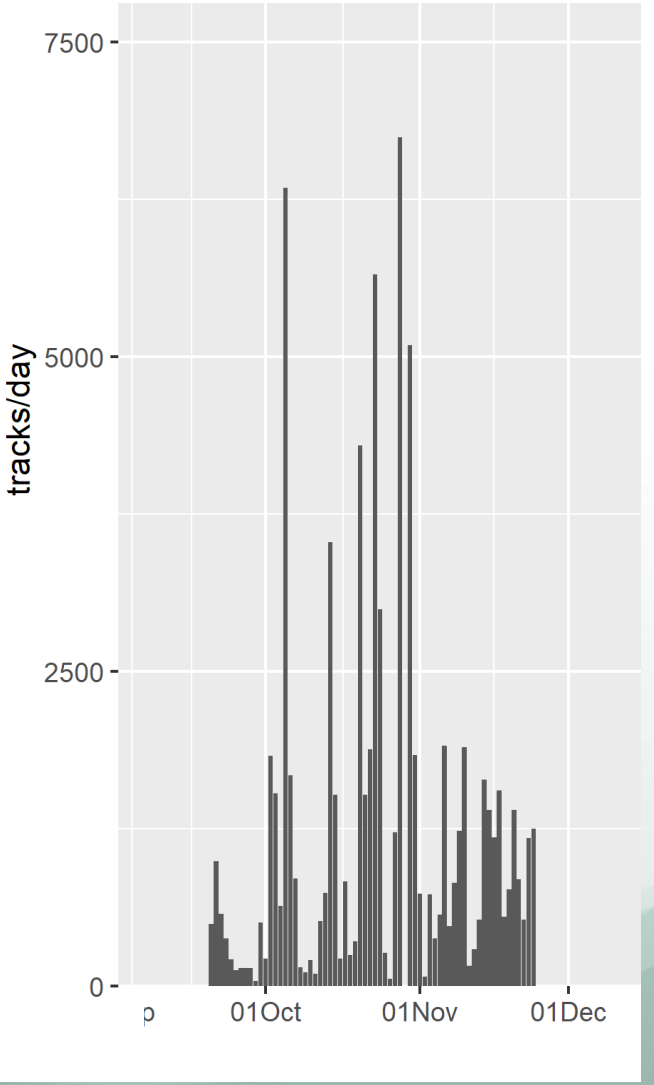
Detecting / predicting peaks in bird migration





- On certain days intense migration
- Highest peaks are nocturnal migrants (e.g. trushes)
  → if in rotor swept zone: collision risk
- Input for prediction models of peaks at rotor height
- Curtailment measures (cfr. Borssele area)

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Bat research in Belgian OWFs

Bats are detected in North sea OWFs during spring and autumn migration

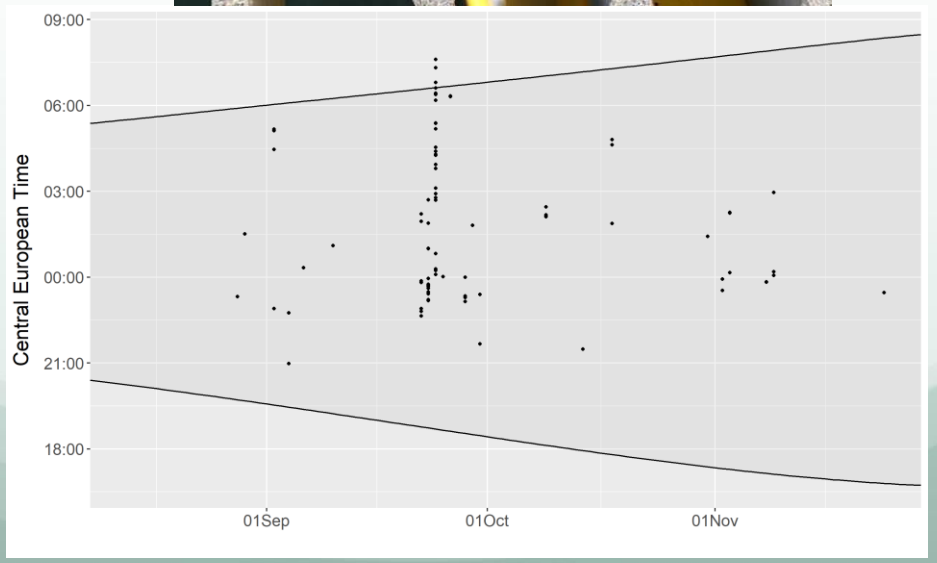
Research questions:

1. Influence weather conditions during migration?
2. Activity at nacelle height?

Study autumn 2017

- 11 Batcorders on 7 different turbines
  - 7 at 16m
  - 4 at 93m = nacelle

- 151 recordings of call sequences
- 23 nights
- All *Pipistrellus nathusii*



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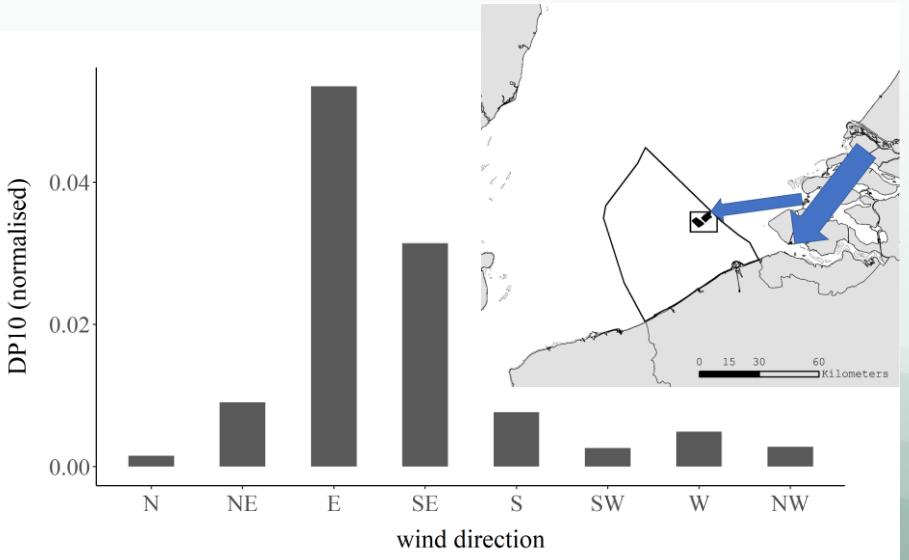
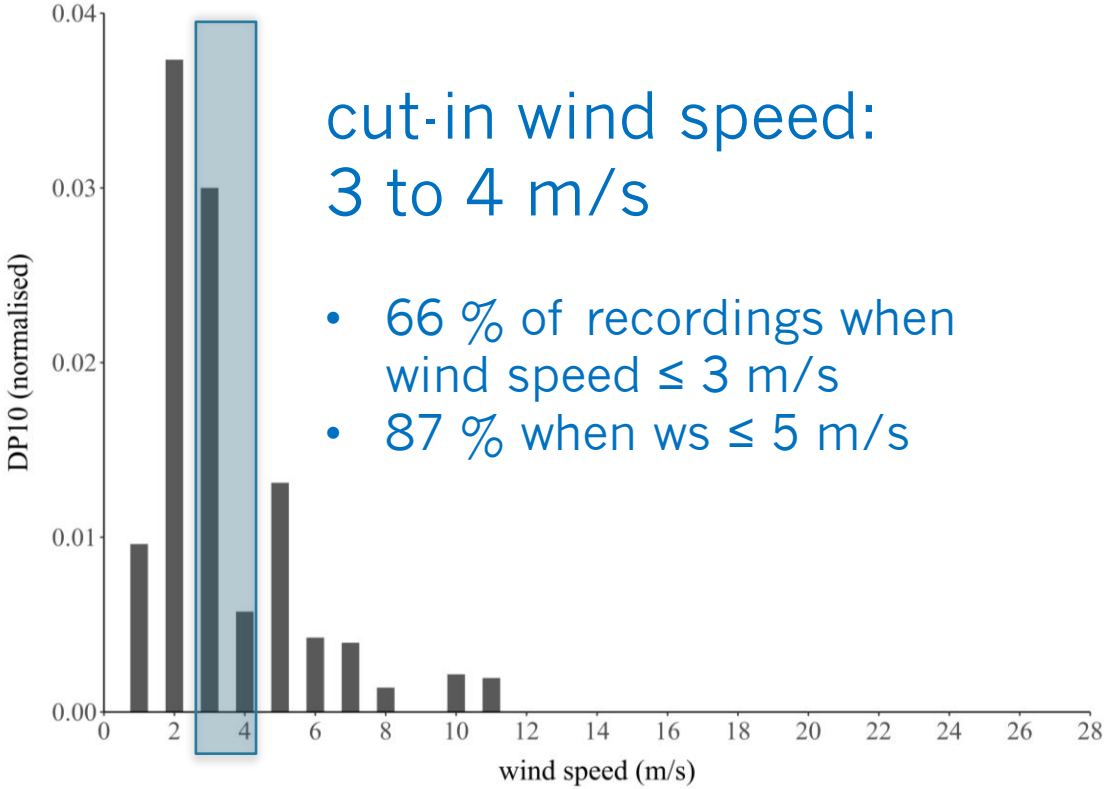
Activity of bats at sea

- average wind speed at night during study period: 7.6 ± 4.5 m/s
- Average wind speed when bats are recorded: 3.1 ± 1.9 m/s





cut-in wind speed: 3 to 4 m/s

- 66 % of recordings when wind speed ≤ 3 m/s
- 87 % when ws ≤ 5 m/s

- Preference for E and SE wind
- Tailwind conditions to cross the North Sea or wind drift?

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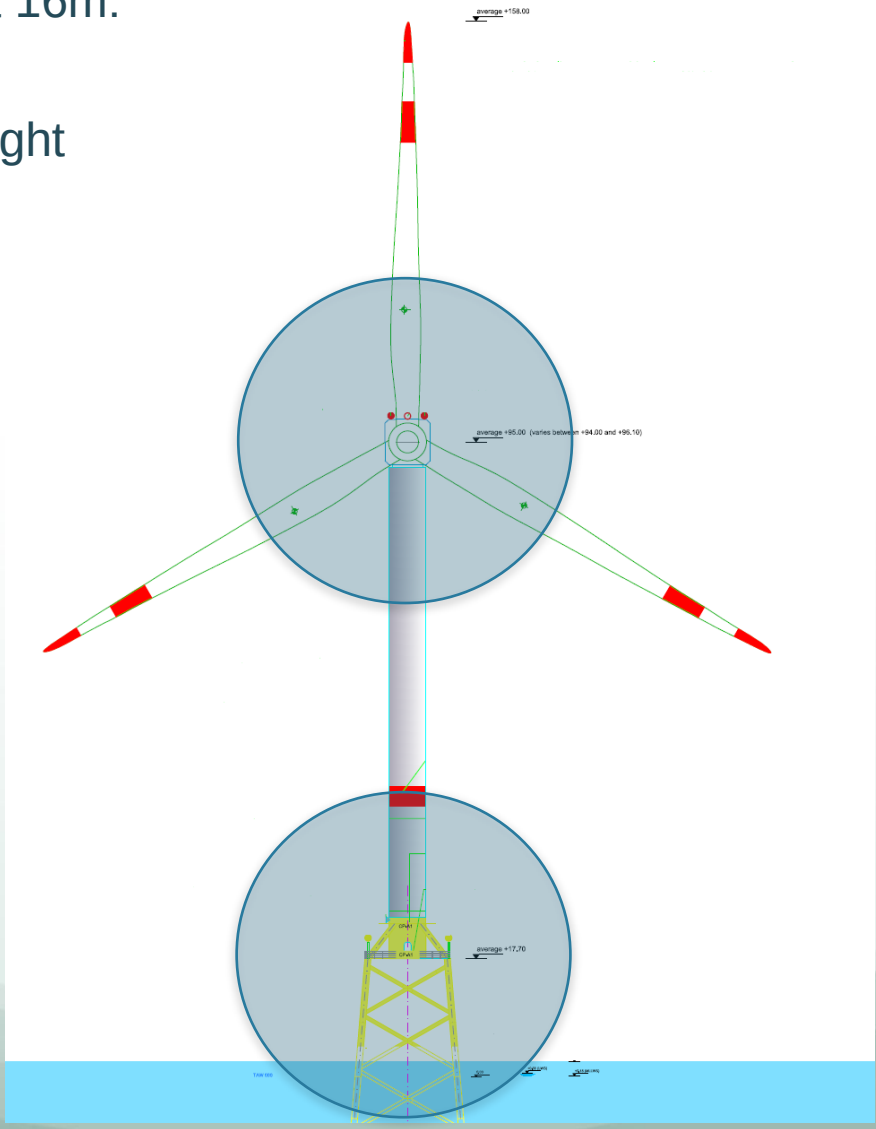
Activity at nacelle height

Registered activity at nacelle height is 10% of activity at 16m:

- 20.3 recordings on average by ‘low’ bat detectors
- 2.3 recordings on average by detectors at nacelle height

Remarks:

- detection range ca. 25 m for Pipistrellus sp.
  → need for recordings in the entire rotor swept zone
- N recordings ≠ collision risk



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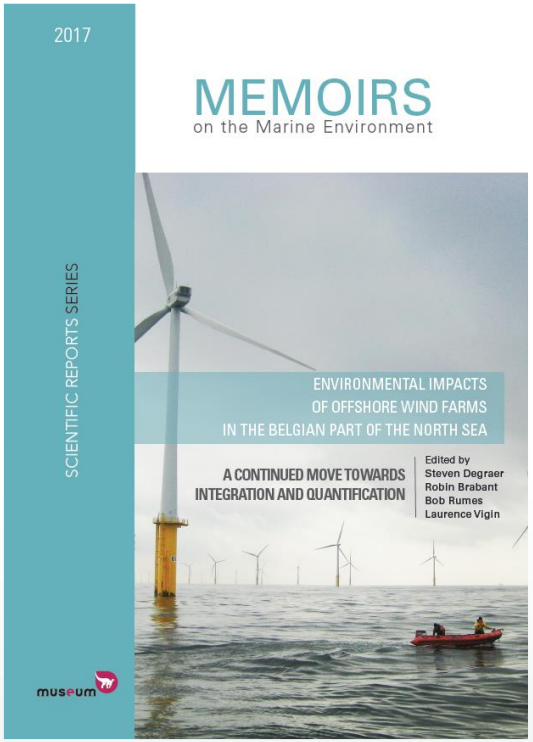
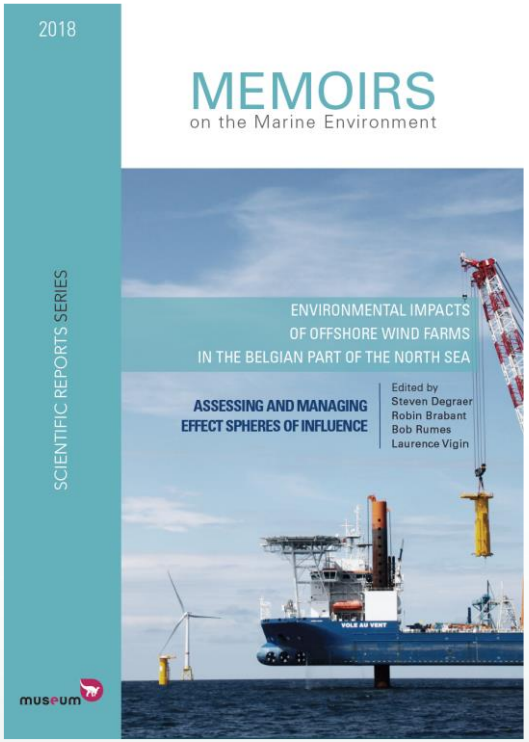
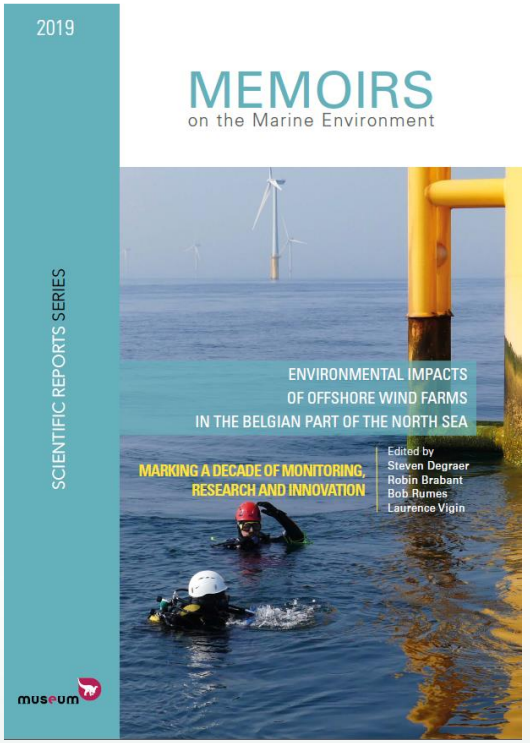
More information







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