

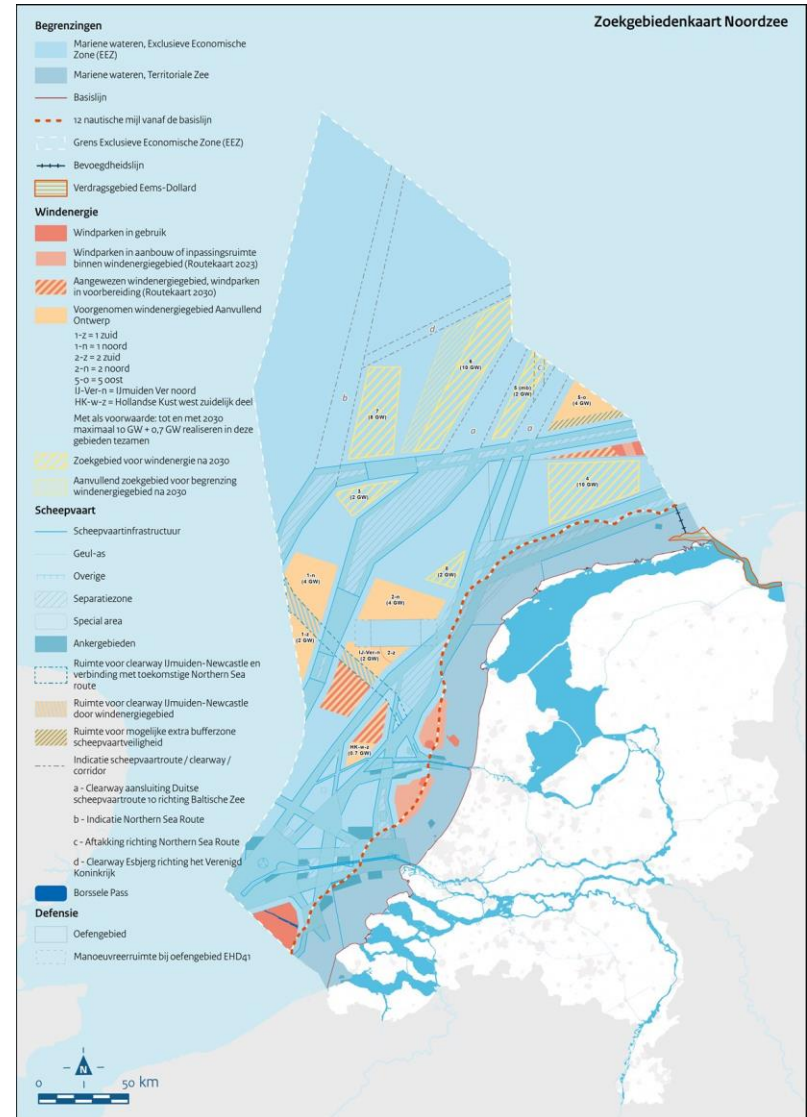
Building up knowledge to enable exploitation of crab and lobster in Offshore Wind Farms

27-3-2023, Marcel JC Rozemeijer



Long term positioning

- Challenge:
 - Crowded North Sea
 - Claims for large surfaces
- Fisheries loose substantial exploitation surface
- Multi use might aid
- Challenge: engage stakeholders
 - Transition needed



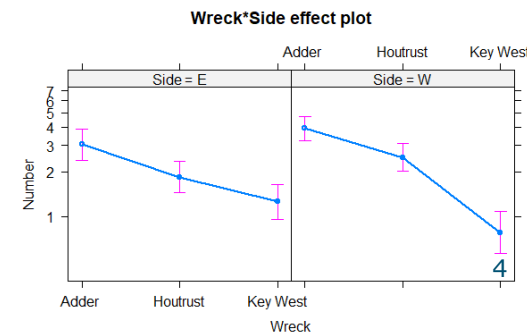
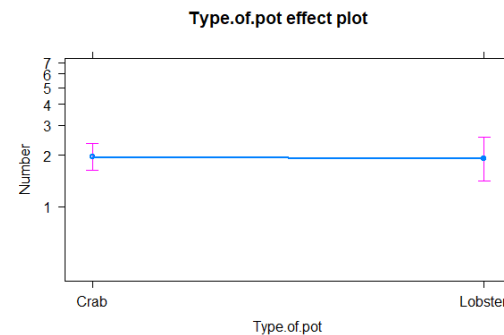
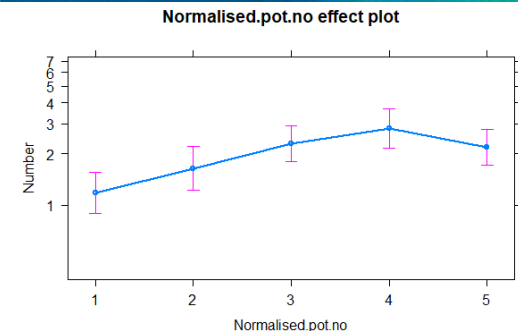
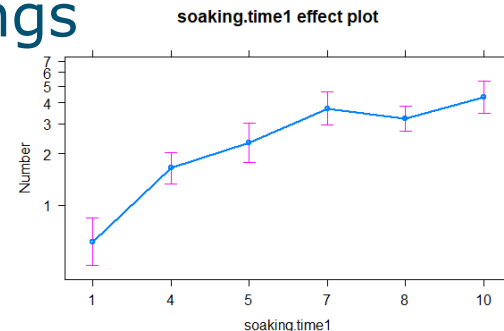
Department of Agriculture, Nature, Food innovation: knowledge need on multi-use

- Research multi-use of OWFs, through projects on cage-fisheries brown crab and lobster
- Anchor/string stability, CPUE, LPUE, Population
 1. Scheveningen: near wrecks (2021)
 2. Borssele II OWF (2022):
"new park": multi use obligatory
 3. Prinses Amalia Wind Park (2023)
"old park": permission needed from operator
 4. Borssele II (2023):
sepia, sole, cod
gill net



Scheveningen: wrecks

- Anchor & string mobilisation
- Research questions:
 - CPUE
 - LPUE
 - Population size
 - Mobilisation of strings
- Strings parallel to current and wrecks



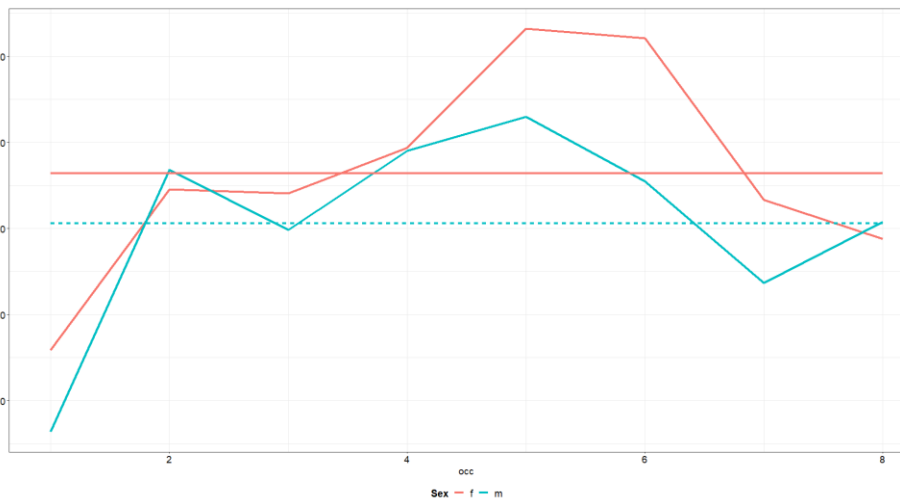
Scheveningen: wrecks

■ Population estimates: 2 models

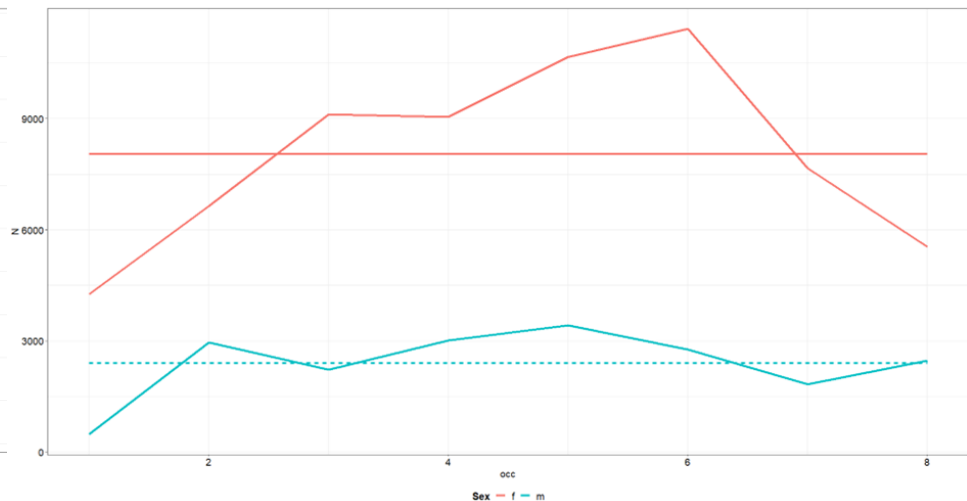
1. Mortality $\sigma < \text{♀}$
Catchability $\sigma = \text{♀}$
2. Mortality $\sigma = \text{♀}$
Catchability $\sigma > \text{♀}$



■ 1



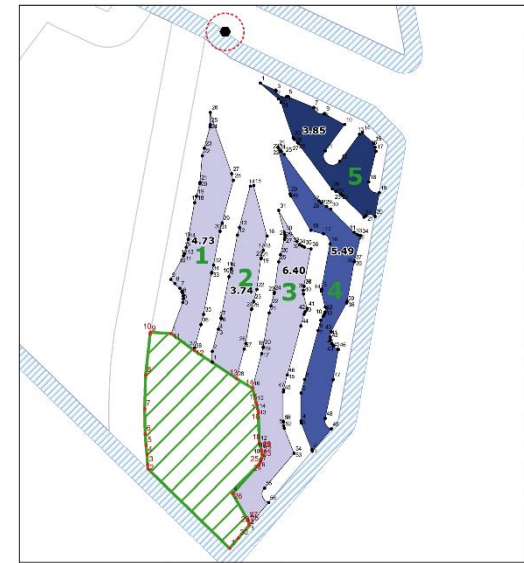
2



Borssele II OWP

- First Multi-use cage fishing
- Research questions:
 - CPUE
 - LPUE
 - Population size
 - Mobilisation of strings
 - Comparing OWFs

Windenergiegebied Borssele



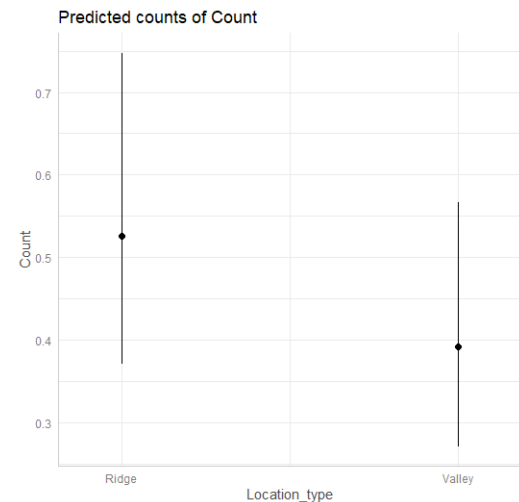
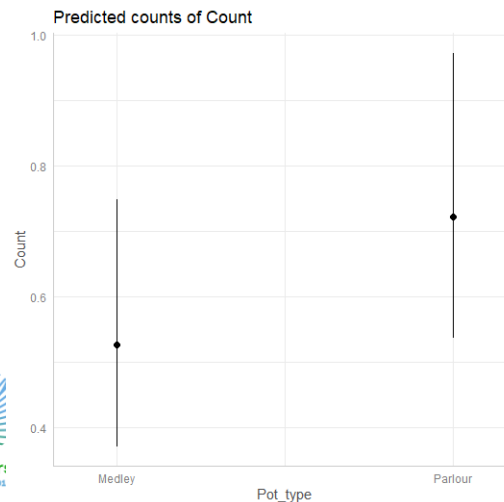
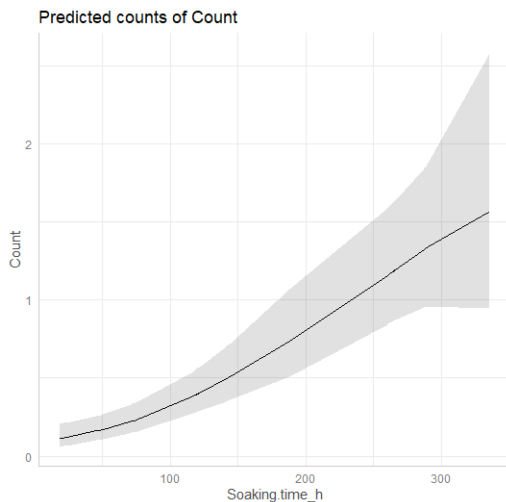
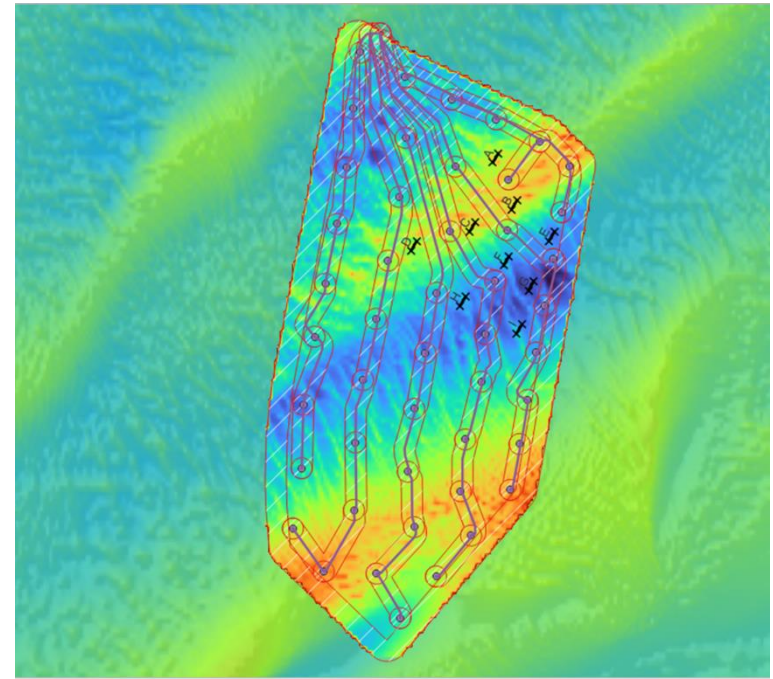
Borssele II impressions

CPUE brown crab: ~ 0.15

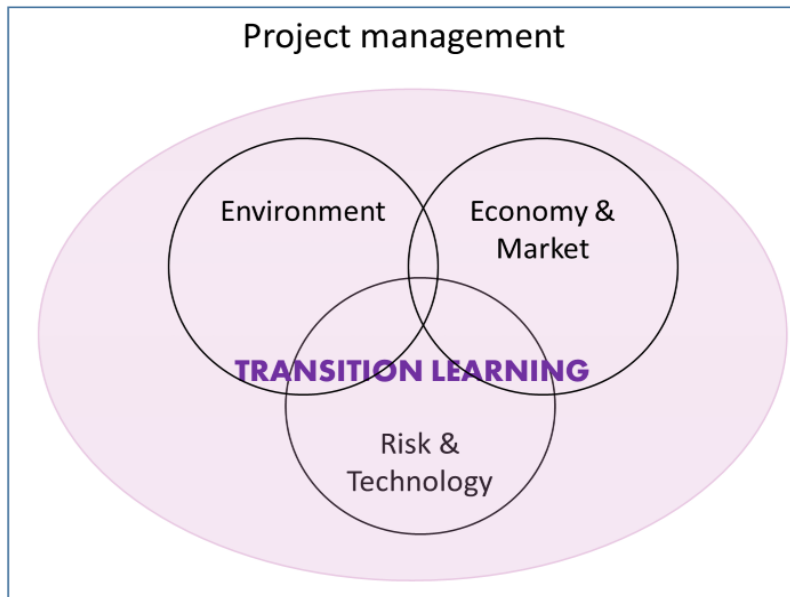
CPUE velvet crab: ~ 1

Parlour > Medley

Ridge > Valley



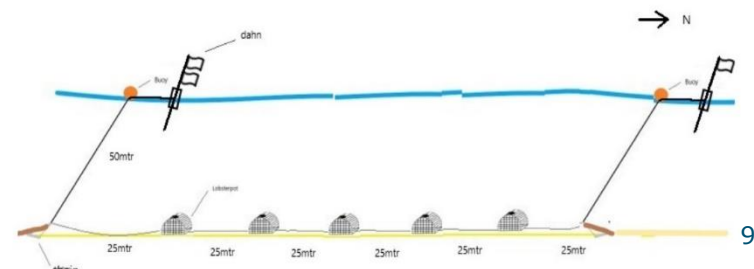
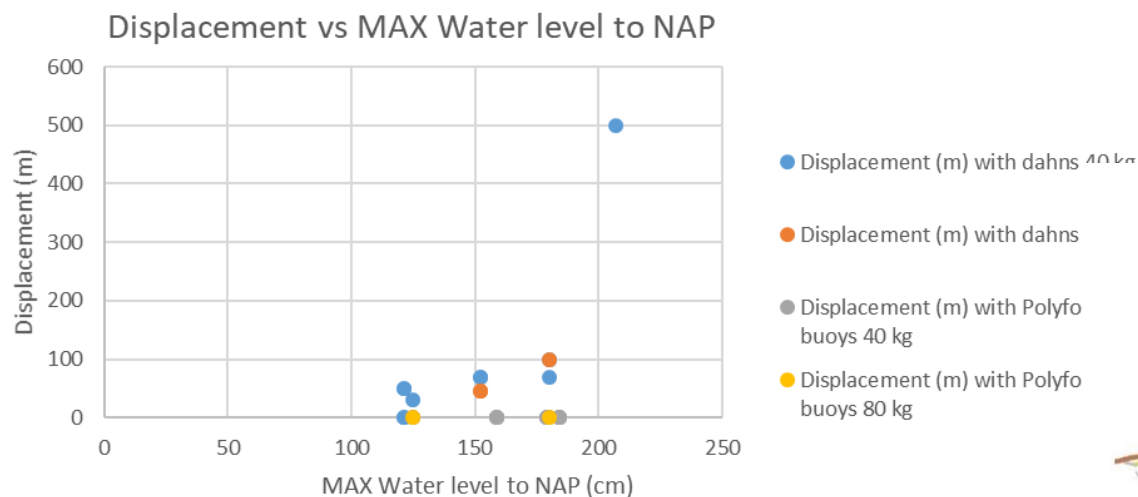
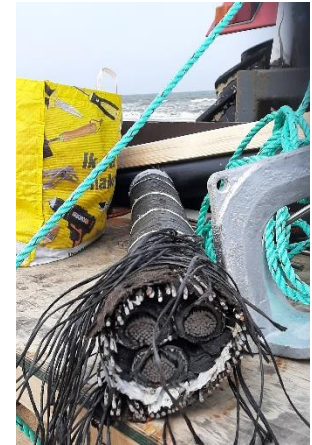
TKI: PAWP



- WP-Program management (WMR)
- WP-Ecology: general ecology, population dynamics, enhancement strategies and impacts (WMR with Fisheries cluster)
- WP-Market: economic feasibility (WEcR)
- WP-Risk reduction: safe working in OWFs (Fisheries cluster)
- WP-Transition: how can we stimulate dialogue, exchange and collaboration

Workpackage Risk reduction

- Dahns, fenders, anchors: no chains
- Insurance
- IMCA vs Minimal safety equipment
- Coordination and communication protocol
- Obligated work method statement vs voluntary WMS
- Loss of material main threat



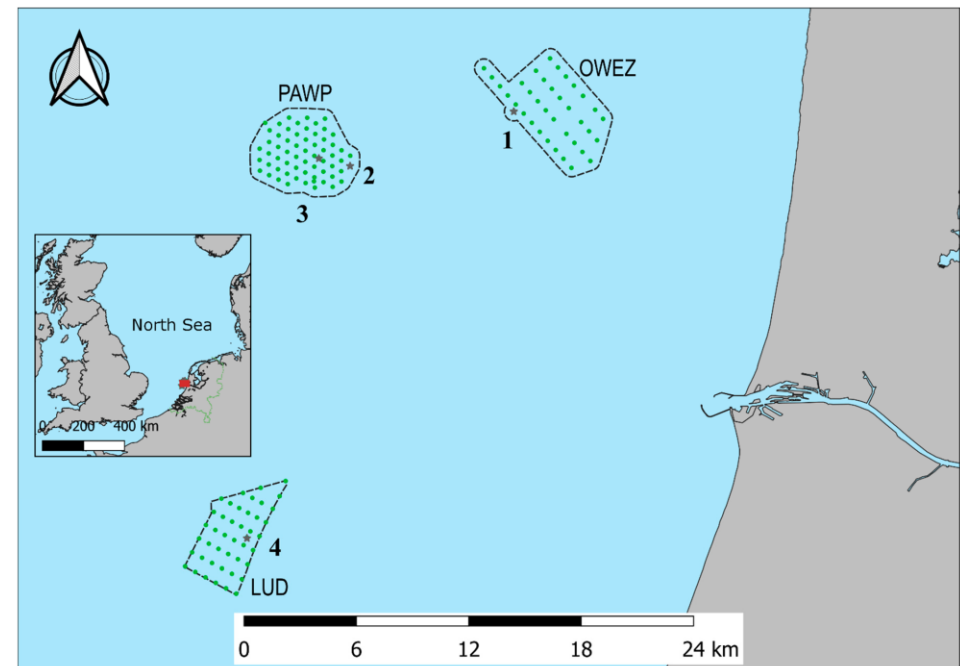
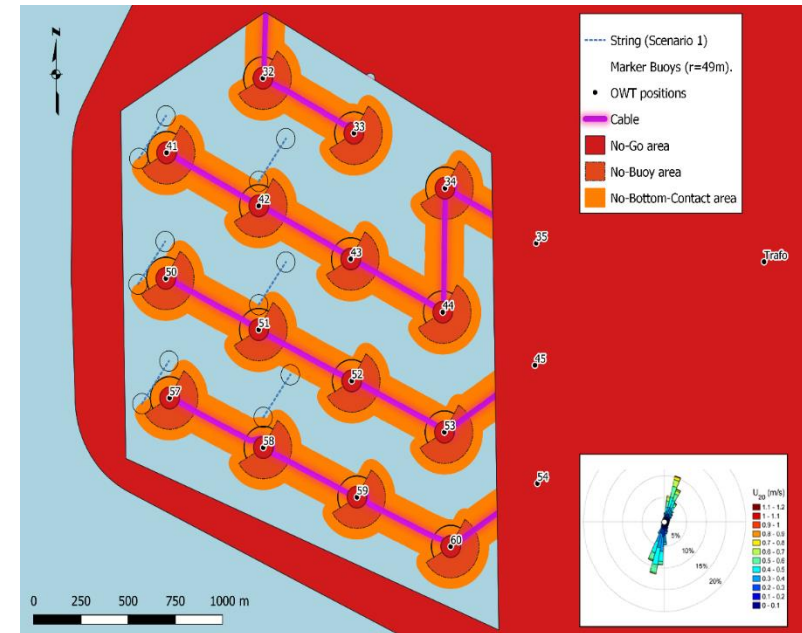
WP-Ecology PAWP

■ Research questions:

- CPUE
- LPUE
- Population dynamics
- Mobilisation of strings
- Comparing OWFs

■ Techniques

- Catch Mark Return
- Catchment registration
- Statistics



WP-Ecology: Offshore wind farms provide potential habitat

Ecology lobster

- Early benthic phase most vulnerable phase
- Long-lived top predator (>75 years)
- Hard substrate and burrows important
- High energy requirements

Ecology of crabs

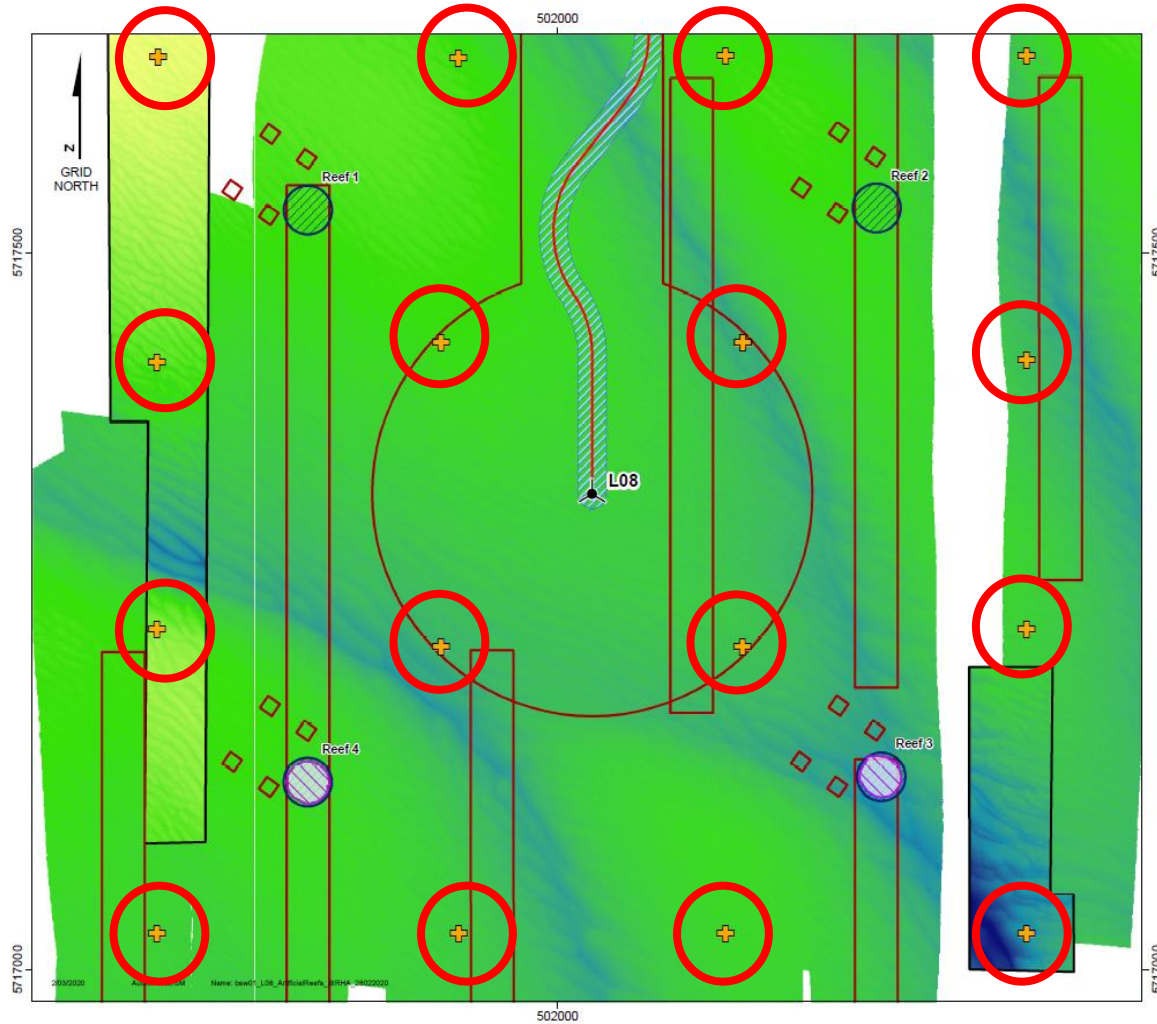
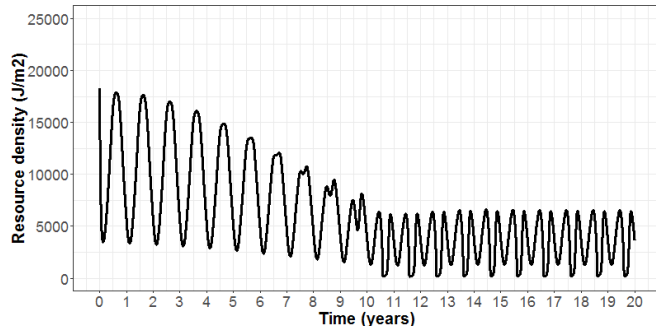
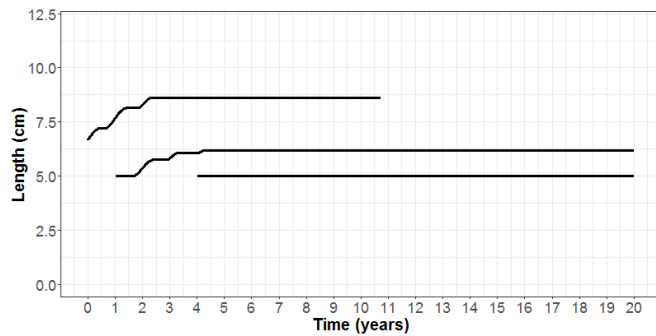
- Long-lived top predator (25-30 years)
- Early benthic phase most vulnerable phase
- Both sand and hard substrate
- High numbers in German OWFs



Lobster mobility

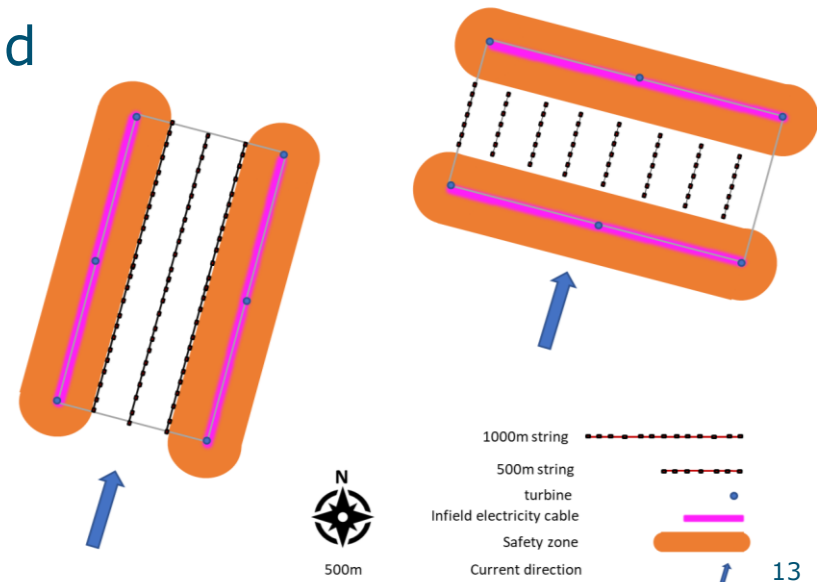


- Acoustic tagging in Borssele II
- DEB modelling



WP Economy

- Competition with Irish, British and NL fishermen fishing Germain Bight and moreen deposits
- Demand for North Sea crab growing
- Dependence on China
- Animal welfare: limits to transport of live crab?
- Earning model: seasonal: low yield
- Extra costs fishing in wind farms
- Inspection/modification of vessel
- Shorter lines, number of pots



Questions?

Marcel Rozemeijer

marcel.rozemeijer@wur.nl

+31-6-20854613

