Belgian Pilot: Offshore wind, oyster restoration and seaweed cultivation in the Belgian part of the North Sea

Dr. Annelies M. Declercq, Dr. Jessica Knoop

This Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement no 862915

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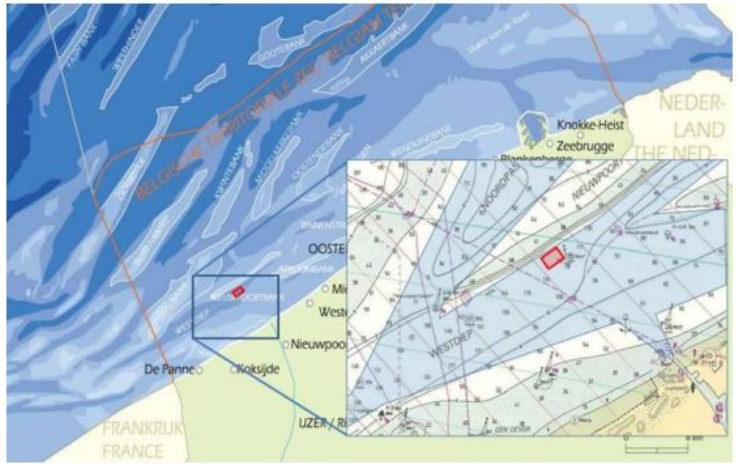
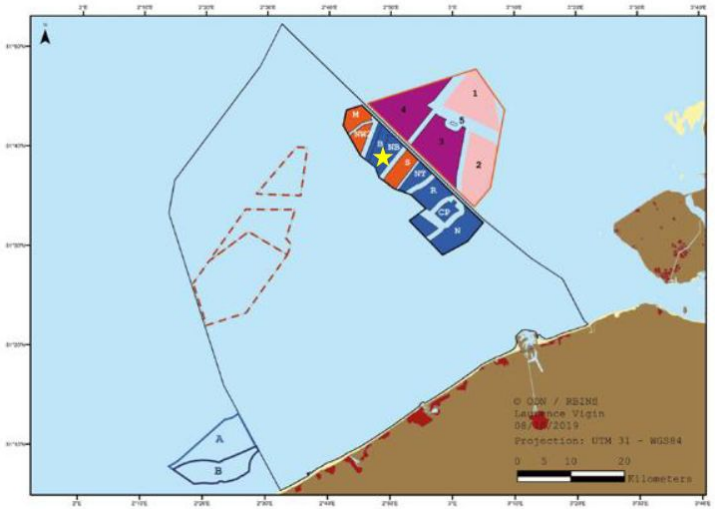
Partners:

UGent (lead ARC)
Royal Belgian Institute of Natural Sciences
Jan De Nul Group: dredging company
Parkwind: windpark Belwind (Bligh Bank)
Brevisco: mussel- & seaweed farmer
Colruyt Group: retail

Preoperational: Nearshore (5 km)



Operational: Offshore (46 km)



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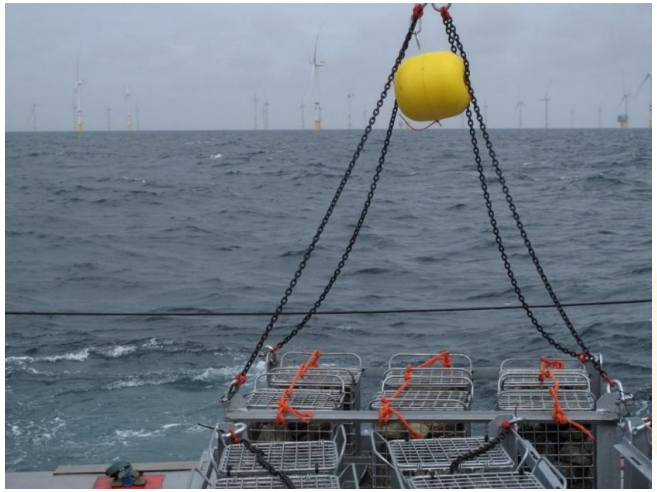

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Environment – multi-use activities

Offshore wind energy

- Bottom fishing not allowed: protected area for oyster reefs
- Hard substrate used as scour protection around wind turbine poles: attract oyster spat and initiate reef formation

Flat oyster restoration & aquaculture

Seaweed cultivation

- The EU and world demand for seafood products continues to increase (FAO, 2018) + need to capture waste and nutrients
- Oyster aquaculture could provide the initial stocking material to help develop natural reefs, and – in the long run – vice versa
- Seaweed cultivation can lower pressure on species of interest and moving offshore could allow upscaling

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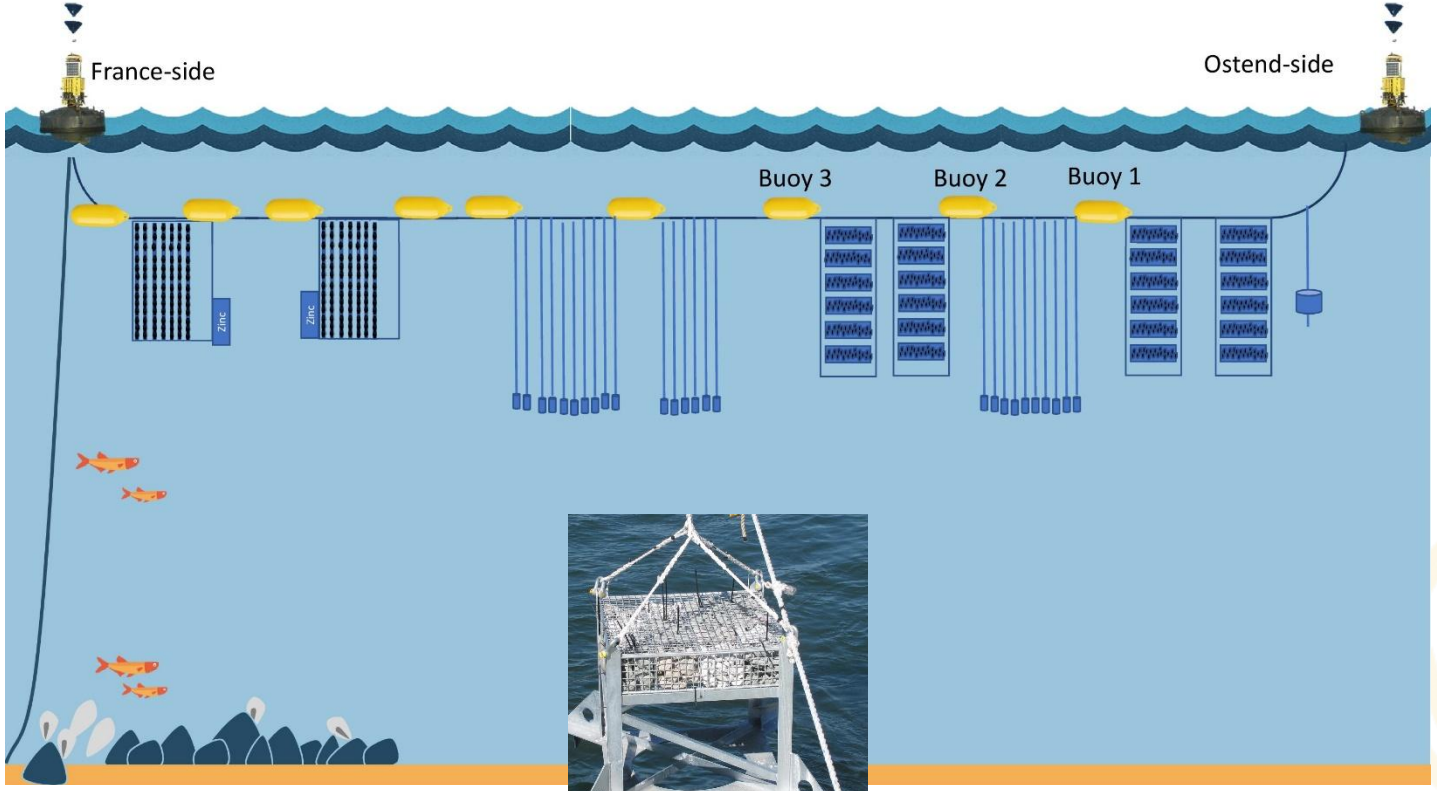
Biology – European flat oyster restoration and cultivation

- Testing various grow out and spat collection systems nearshore



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Biology – oyster restoration and cultivation

- First lessons learnt from nearshore :
  - Fouling on cultivation structures is a major problem
  - Requires regular maintenance
  - Successful observation of flat oyster spat settlement

With this knowledge: adjusted design and moved offshore

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Biology – oyster restoration and cultivation offshore

Installation of the tables
25th of June 2021

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Video fragment from UNITED diving campaigns in Belwind ©Alain Norro

museum

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Biology – oyster restoration and cultivation offshore

First sampling campaign:
Diving mission
with RV Belgica

museum

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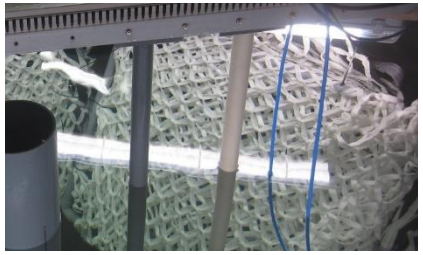
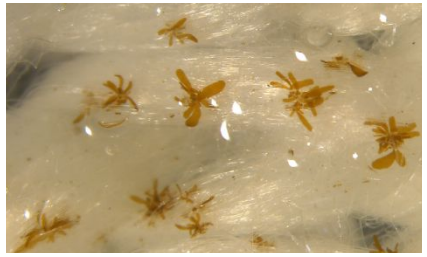
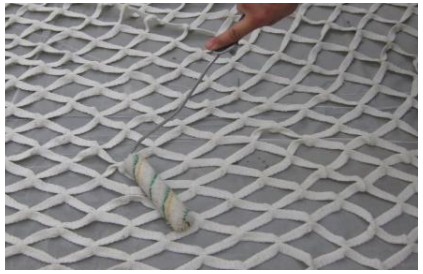
Biology – seaweed nearshore: Saccharina latissima

- Identification and development of suitable cultivation techniques for offshore conditions

	1st year (Nov 20 – May 21)		2nd year (Nov 21 – May 22)	
Substrates				
Nursery period				**Adapted**
Direct seeding				

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Biology – seaweed nearshore: Saccharina latissima

Seaweed cultivation – 1st sampling Feb 2021

Direct seeding

Nursery seeding

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Biology – seaweed nearshore: Saccharina latissima

Seaweed cultivation – 1st successful harvest May 2021

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Biology – seaweed nearshore: Saccharina latissima

Seaweed cultivation – 2nd harvest end May 2022

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Biology – seaweed nearshore: Saccharina latissima

Seaweed cultivation – current outcome and lessons learned

- Seeding technique crucial for successful cultivation
  - Poor results with direct seeding
  - Nursery period important
- Optimised seeding protocol and substrate choice for exposed environment
- Installation and harvest highly weather dependent
  possible delays

Testing improved cultivation protocols at the operational offshore site next growing season 2022/23

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Conclusion

- Moving offshore requires adaptation of existing cultivation and restoration techniques for seaweed and flat oyster systems, and entails biotechnical, legal, safety, and administrative hurdles to overcome
- Oyster restoration offshore gave promising results for the design and materials that were applied, as flat oyster settlement and reef builders were observed
- Oyster aquaculture: the search for ideal materials and methods continues
- Seaweed cultivation: the adapted cultivation protocol enhanced seeding success and need to be verified offshore

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WWW.H2020UNITED.EU

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