



Belgian pilot : synergy between flat oyster and seaweed aquaculture and restoration of flat oyster in the Belgian part of the North Sea



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Nov 2020

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UNITED

Multi-Use platforms and co-location pilots boosting cost-effective, and Eco-friendly and sustainable production in marine environments

- Horizon 2020 BG05 research project financed by EU (<https://www.h2020united.eu/>)
- Overall project leader: Deltares
- Project duration: 2020 tot 2023
- 5 demonstration pilots in Europe
 - German pilot: wind park + mussel farming + seaweed farming
 - Dutch pilot: Noordzeeboerderij + floating solar panels + seaweed farming
 - **Belgian pilot: wind park + farming and restoration of flat oyster + seaweed farming**
 - Danish pilot: wind park + tourism
 - Greek pilot : fish farming and tourism



AQUACULTURE

RESTORATION



Ostrea edulis
or
Flat oyster

NEAR FUTURE



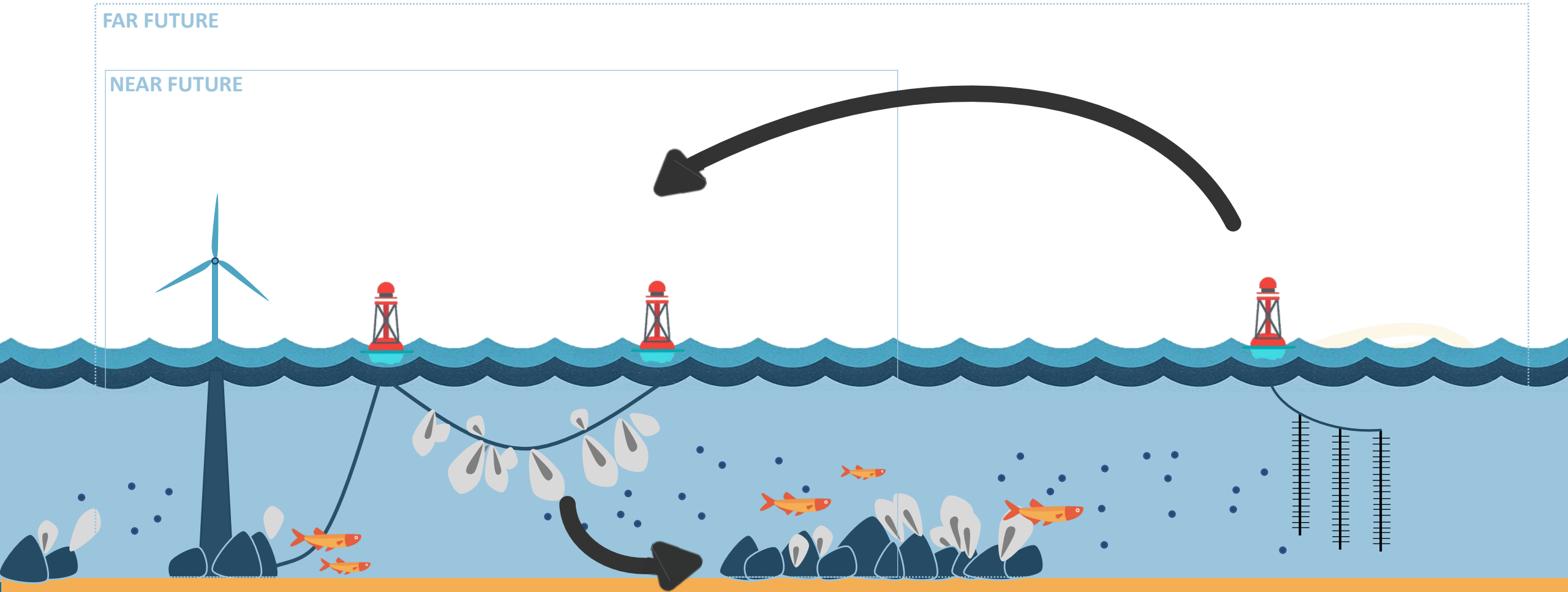
AQUACULTURE

RESTORATION



FAR FUTURE

NEAR FUTURE

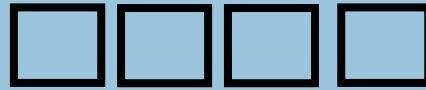
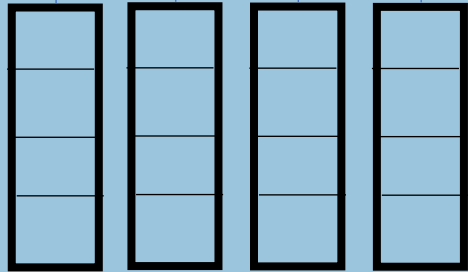




GROW-OUT

SPAT COLLECTION

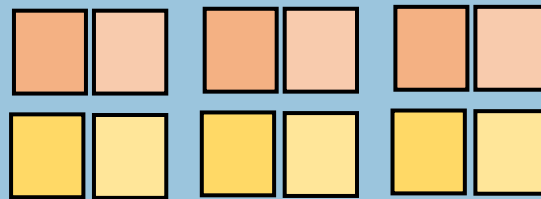
SEAWEED



April - October

October - april

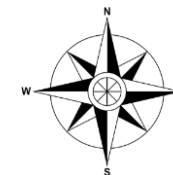
Year-round AQUACULTUUR



RESTORATION

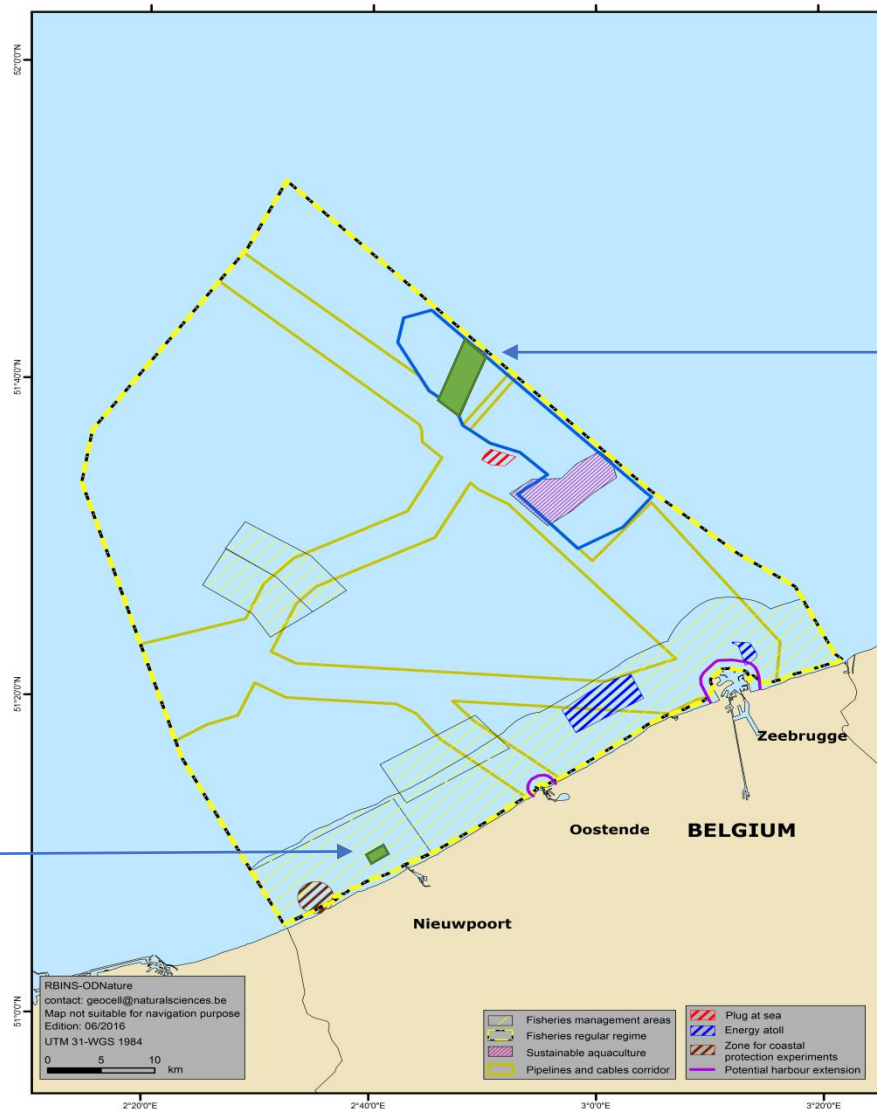


Location



Pre-operational phase

Operational phase



Objectieven

- Evaluation windfarms as location for restoration of flat oyster reefs and for aquaculture of flat oyster for human consumption
- Seaweed culture nearshore versus offshore :
 impact on morphology and nutritional characteristics
 - Multi-use of space
 - Multi-use of infrastructure



The Belgian team

Partners and experience

Brevisco

- Nearshore shipping;
- Pioneer mussel & flat oyster production North Sea



Colruyt

- Retailer



Jan De Nul

- Dredging company; installation windfarms



Parkwind

- Concession holder windfarms



RBINS

- Marine ecology and management; remote sensing data



Het Belgische team

Partners & experience

UGent ARC

- Aquaculture bivalves, larval production and diseases, nutrition

UGent Biology

- Seaweed production & genetica

UGent Law

- Internationalisation and marine law

UGent MTD

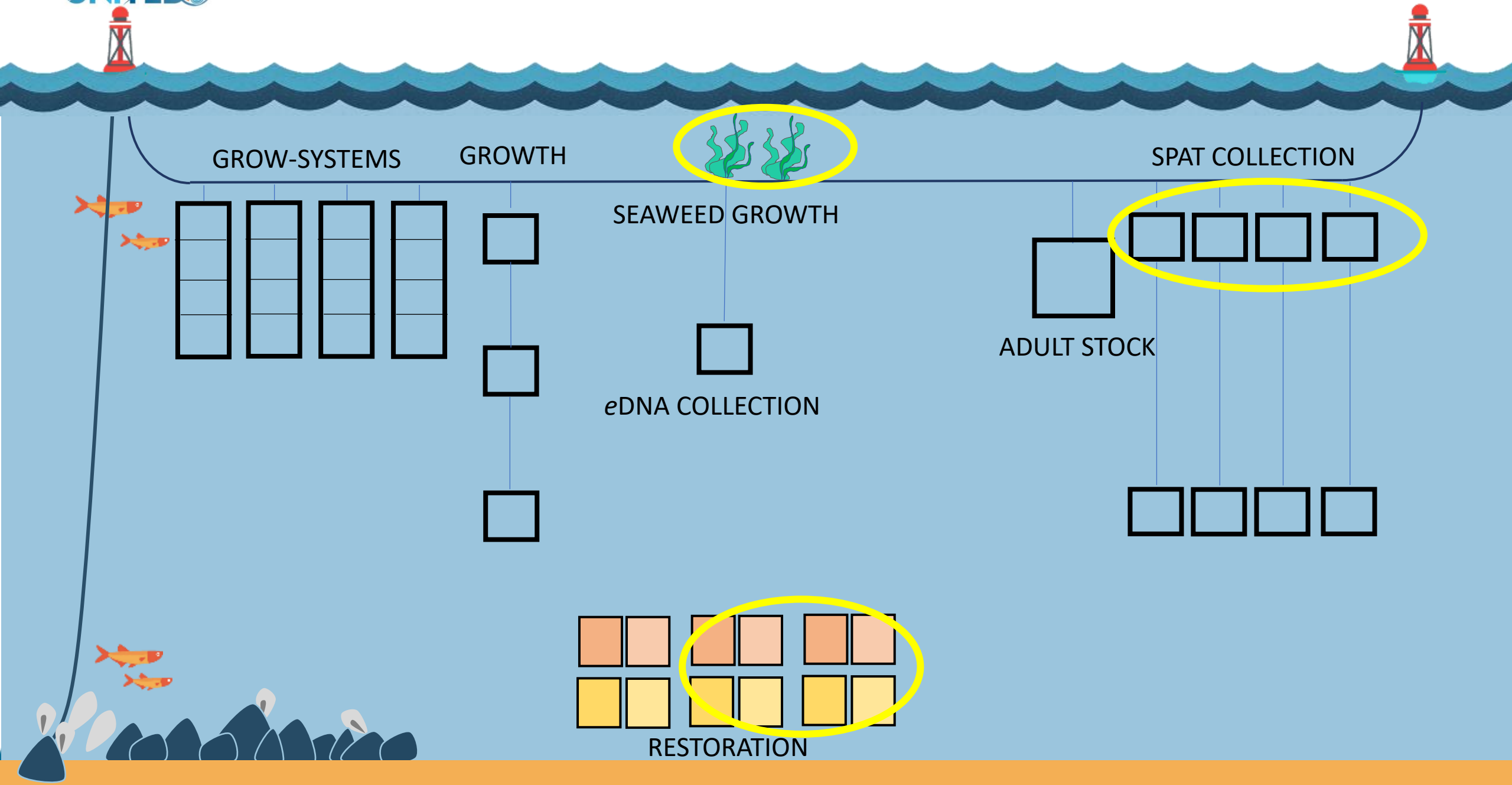
- Numeric modelling of longlines ; “MoorDyn-UGent” tool

Subcontractor

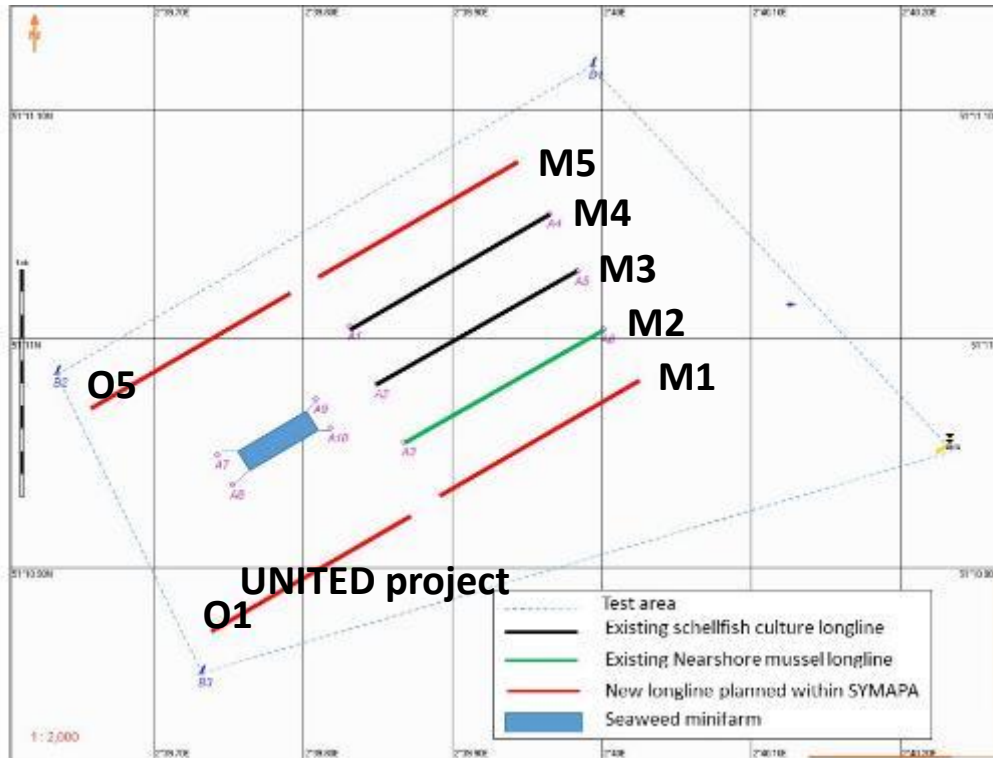
ILVO

- Fisheries & aquaculture, agro industry





Aquacultuur nearshore June 2020 : oyster



4 frames with 10 baskets (each substrate in duplicate) & 1 chinese hats

Research question spatfall

1. Preference spat for substrate : musselshells + 4 stones
2. Best period for spat collection : 1frame/2weeks (25juni – 06aug)
3. Density spatfall
4. Fouling
5. Robustness systems



Aquacultuur nearshore Juni 2020 : oyster



Aquacultuur nearshore 19/11/2020 : oyster

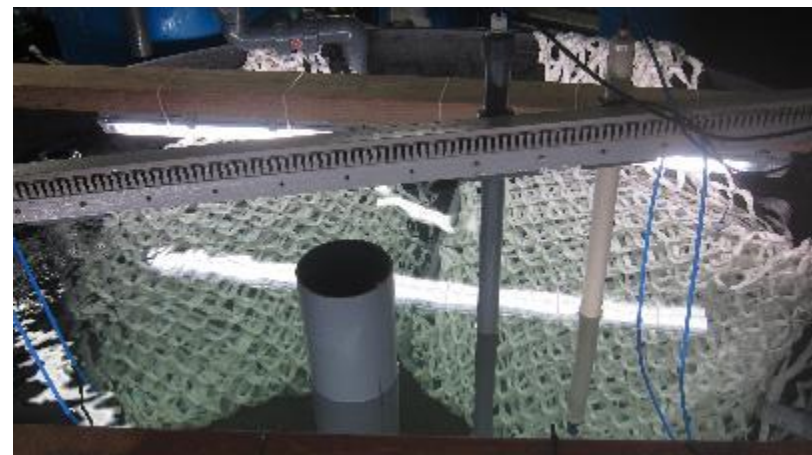


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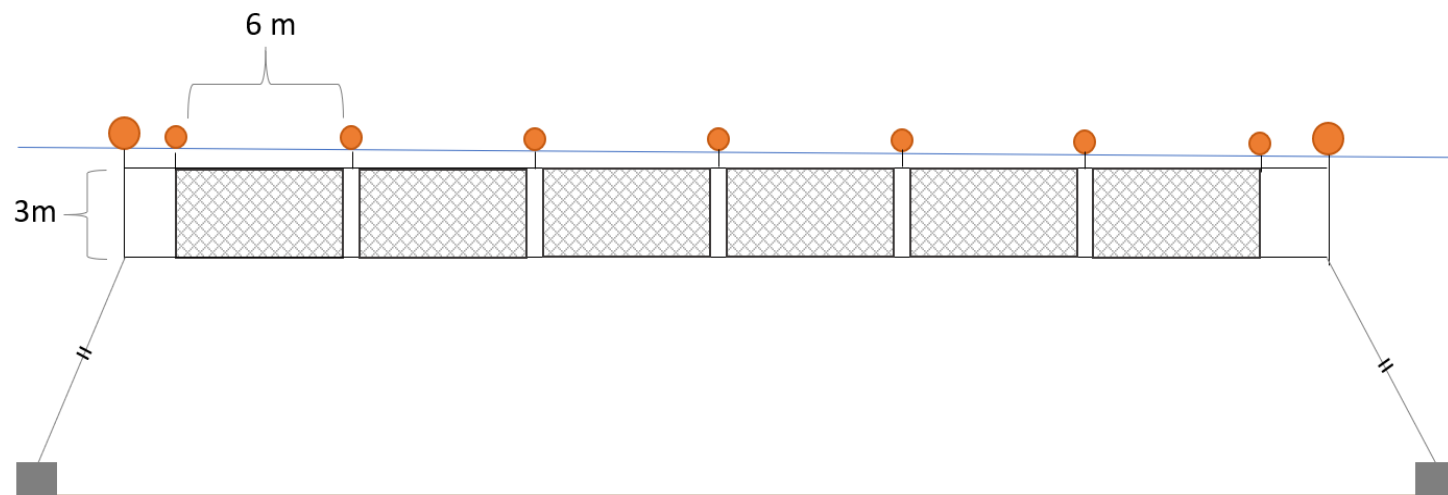


Aquaculture nearshore 10-11/2020: seaweed

- Optimisation seeding & nursery technics for sugar kelp (*Saccharina latissima*)
- Testing different strains for optimal biomass production
- Nearshore:
 - 6 nets in November consisting of 2 designs (nearshore and stronger offshore design)
 - Testing 2 seeding technics
 - Pre-seeding of gametophytes incl. hatchery period
 - Direct seeding just before deployment in sea



close-up juvenile(2wk pre-seeding)



Aquaculture nearshore Nov. 2020: seaweed



Seaweed nets (produced by AtSeaNova) being installed at the Westdiep site with vessel Stream (Brevisco). ©Jessica Knoop



Restoration Nearshore June 2020

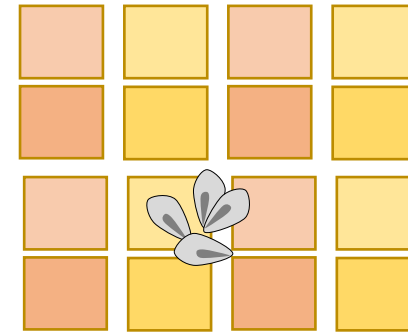
Longline
aquaculture

Labels
restoration

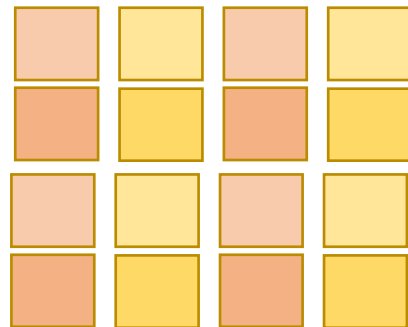
FACTORS

- 4 materials suitable for scour protection
 - Granite 0-200mm
 - Granite 25-125mm
 - Granite limed 25-125mm
 - Limestone grading 80-120mm

- 2 systems
 - Tabel with rocks
 - Tabel with rocks and adult oyster



Juveniles



Blanc

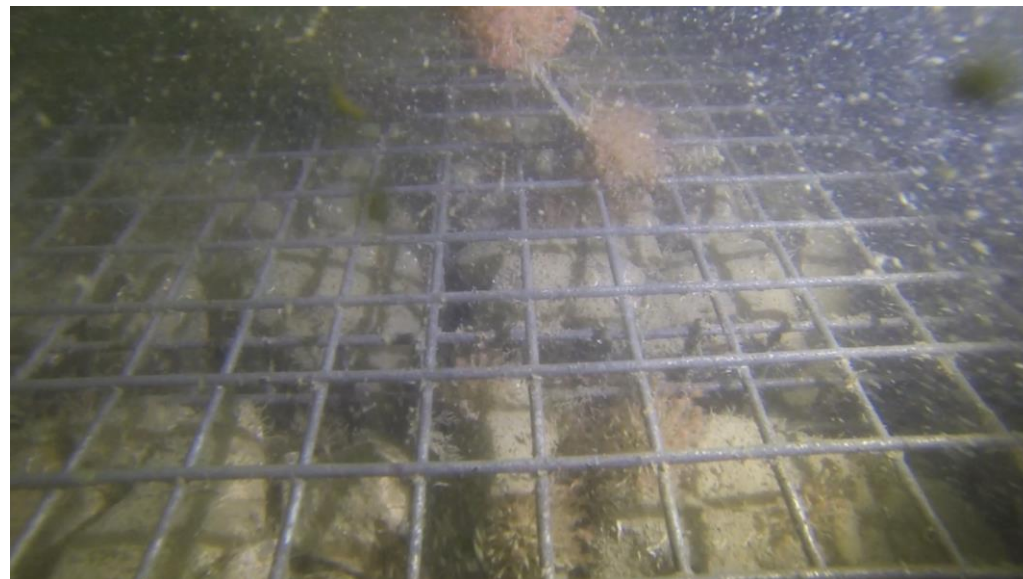
Research questions

1. Role of presence of other oysters on settlement
2. Difference in settlement near bottom & near surface
3. Preference for settlement material



Dimension tabel (mm):
1500*1500*1150 (h)





After 1 month



Restoration Nearshore 19/11/2020



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Restoration Nearshore 19/11/2020

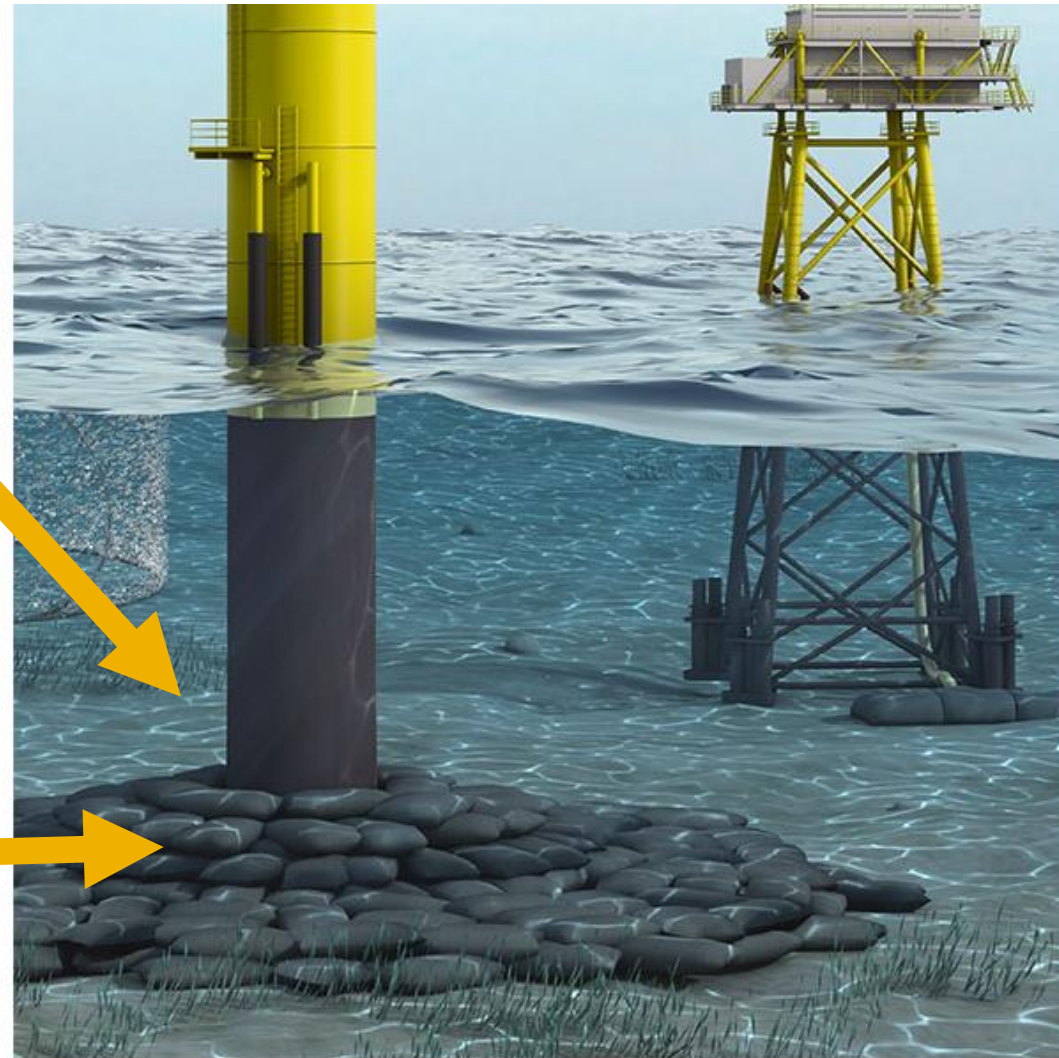
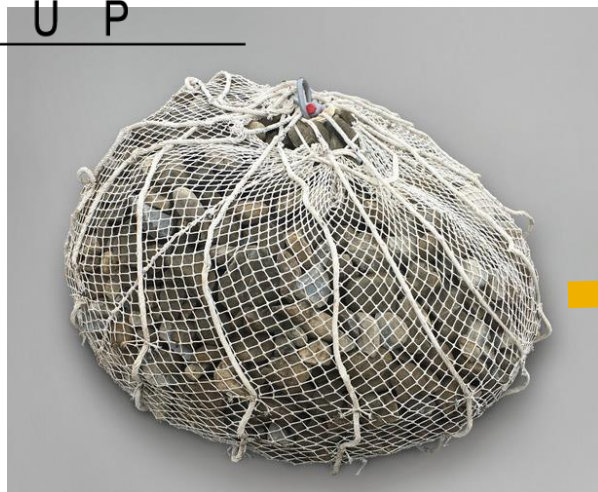


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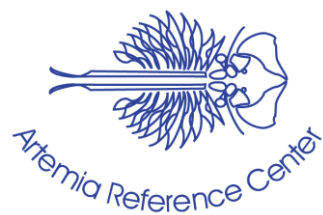


Restoration offshore June 2021

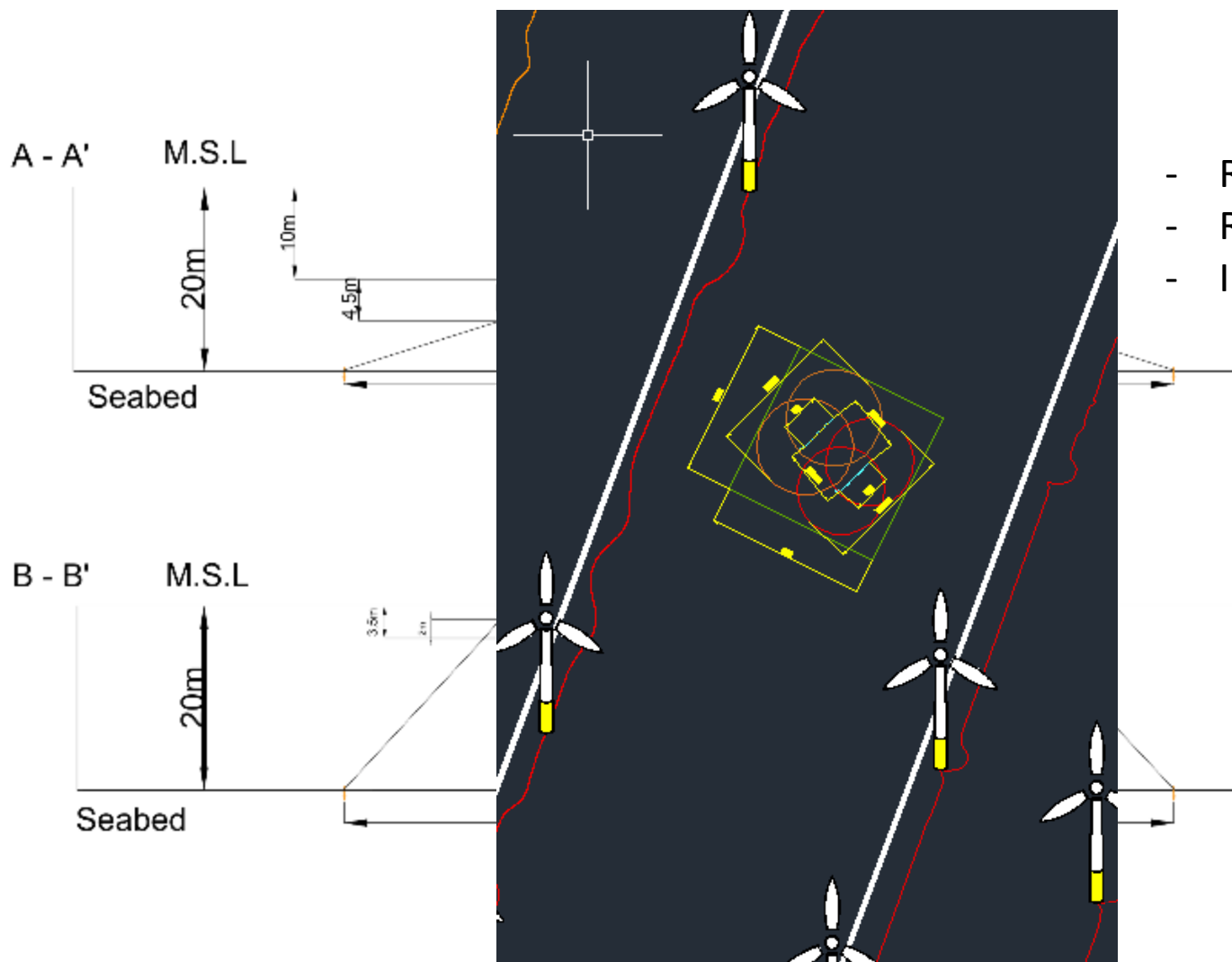
Different options like tables or bazalt bags



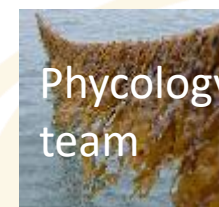
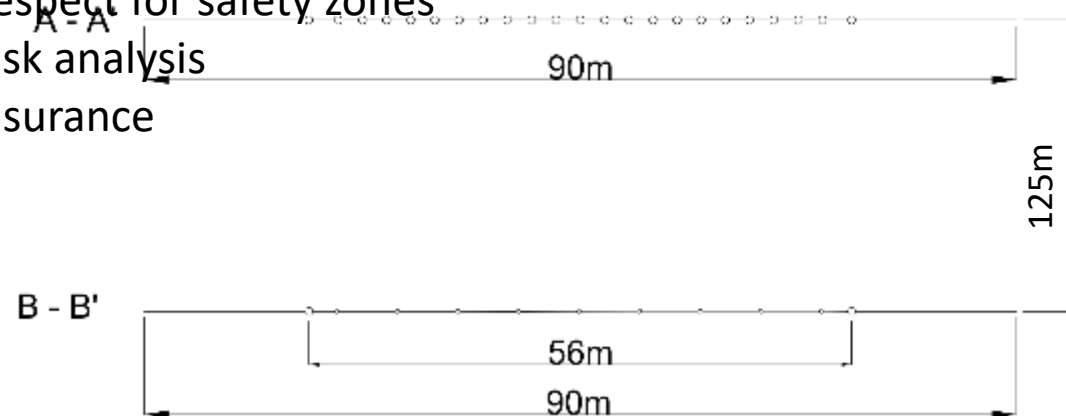
Jan De Nul
G R O U P



Aquaculture offshore : challenges



- Respect for safety zones
- Risk analysis
- Insurance



Aquacultuur offshore : challenges

Seaweed

- Genetics
- System (longline versus nets)
- Best seeding technology



Oysters

- SPS <50mg/L
- current 0.5-1m/s
- Hard substrate
- *Bonamia* & *Marteilia* vrij





BREVISCO
Serving the Fishing- & Aquaculture Industries



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Brecht Stechele



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