

Seaweed and mussel farming close to the wind farm 80km offshore – Key lessons from German pilot

Eva Strothotte FuE GmbH Kiel; Rieke Santjer Deltares

THEME: *Key results and impacts of the UNITED DE pilot*



Seaweed and mussel farming close to the wind farm 80km offshore – Key lessons from German pilot

Key results and impacts of the UNITED pilots

Eva Strothotte FuE GmbH Kiel; Rieke Santjer Deltares



funded by the European Union (H2020 Grant Agreement no 862915). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them

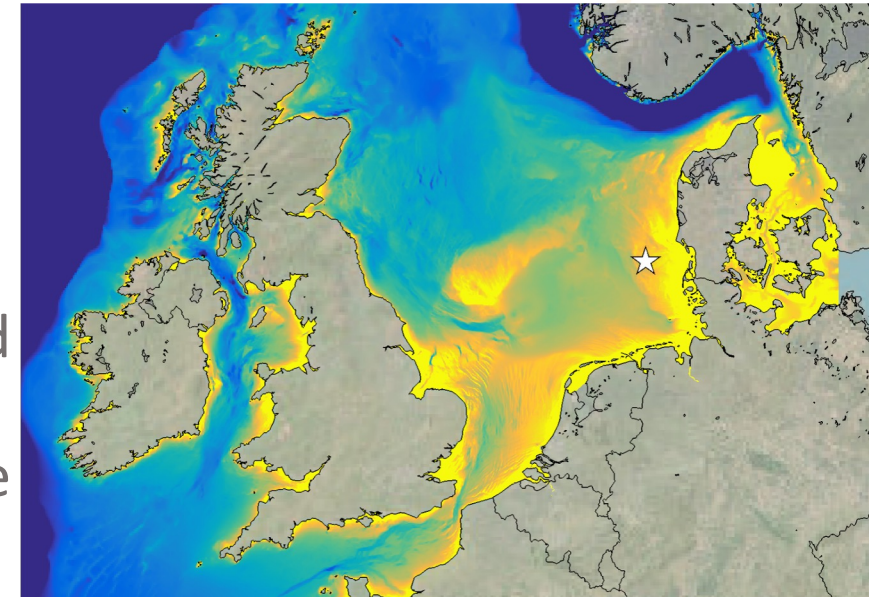
14.Nov.23 4:30pm

WWW.H2020UNITED.EU   

German pilot

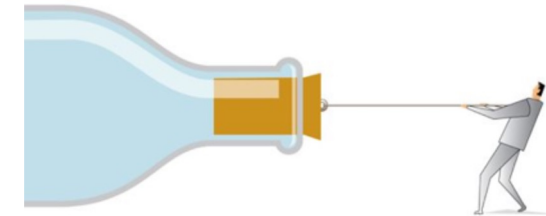
Blue mussels, seaweed & offshore wind

- **80 km** off the North-German coast (high energy environment)
- Research platform focused on **multi-use**
- **TRL 5 – TRL7**
- Demonstrate the technological, environmental and financial **feasibility of far off-shore cultivation** of seaweed, mussel longlines
- Expected **synergies**: logistics, transport, planning and maintenance far off-shore; monitoring and surveillance program far off-shore; security of tenure and insurance



Bottlenecks & Challenges

- Extreme offshore conditions (current, waves) require very flexible installation schedules within the budget
- COVID19 in 2021: restrictions, staff, increased delivery times, closed harbours
- Preventing biofouling of equipment
- Missing long term environmental data (time of mussel spat fall)
- Sufficient monitoring of protected species, establishment of remote monitoring
- Extensive policy landscape regarding multi-use of marine space governance
- Lack of procedures for far off-shore anchoring, mooring and maintenance



📍 first offshore multi-use Pilot in Germany

Impacts of the German Pilot

- Established good connection with permitting agency allowing to generate broader data basis for the future.
- Insurance: Providing examples for insurance assessment
- Stakeholder involvement: TV documentaries (up to seven Mio views)
- Contribution to roadmap and blueprint of „How to establish your offshore multi use project“



Stakeholder Engagement

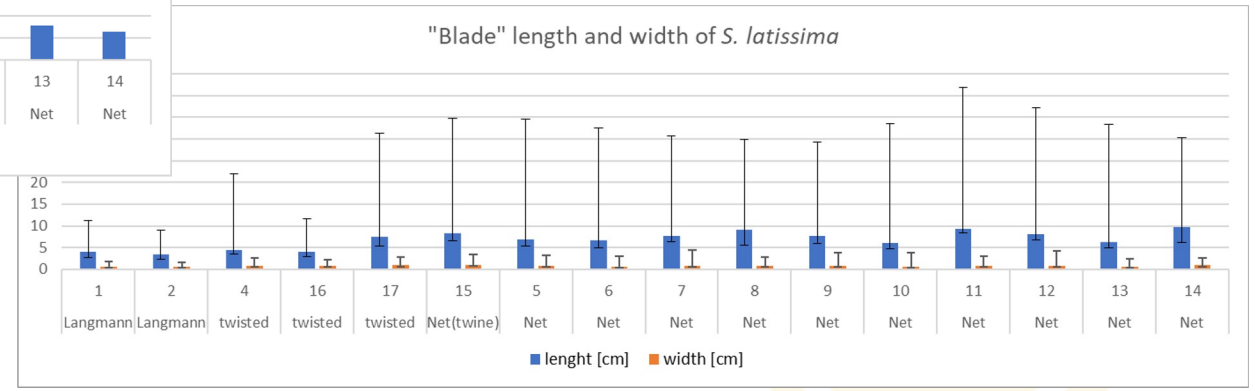
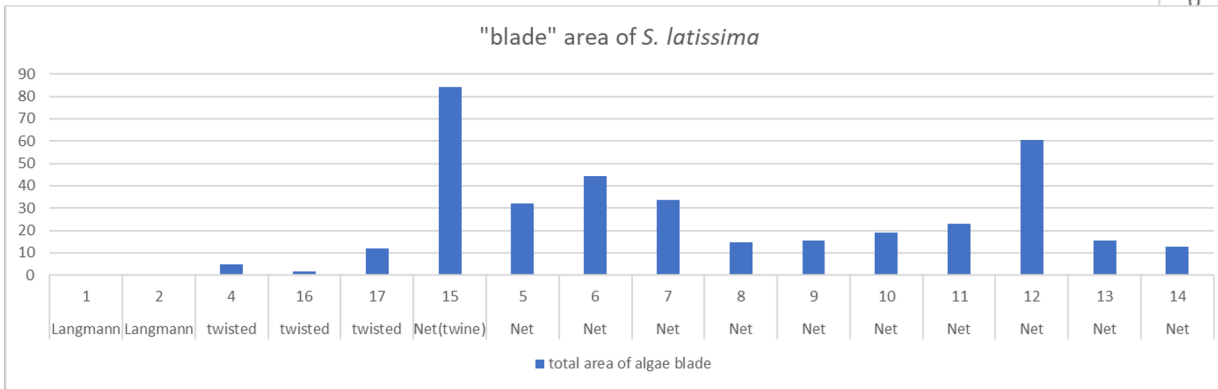
- Public awareness materials (flyer, poster, roll-up, QR-code, deliverables, SOMOS-videos, website)
- Educational learning and training blocks

1. Multi-Use Business Cases and Economics
2. Multi-use offshore Operation, Safety and Logistics Workshop
3. Environment and biology workshop
4. Technology workshop
5. Socio-Economic workshop
6. Law and regulation workshop

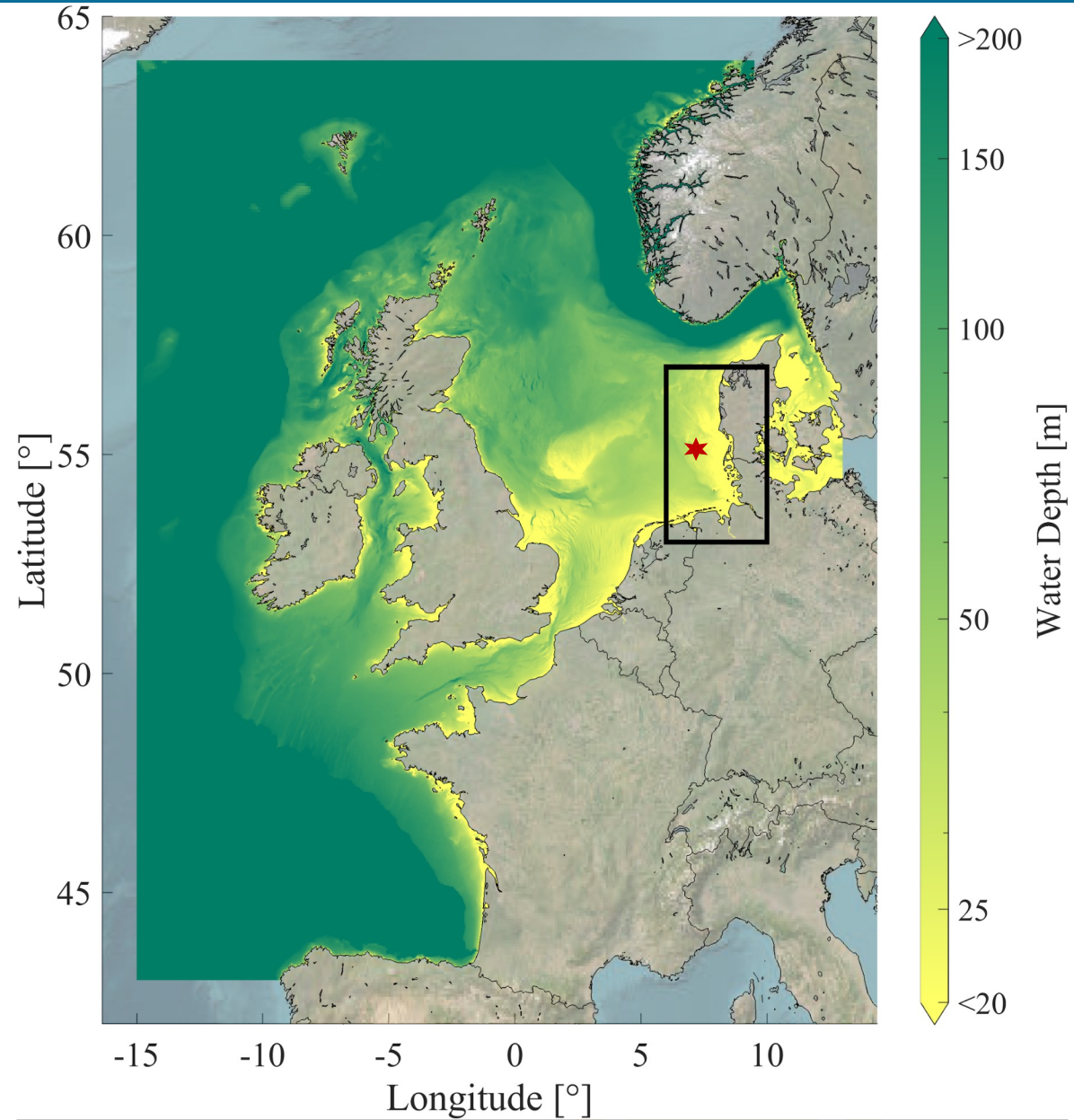
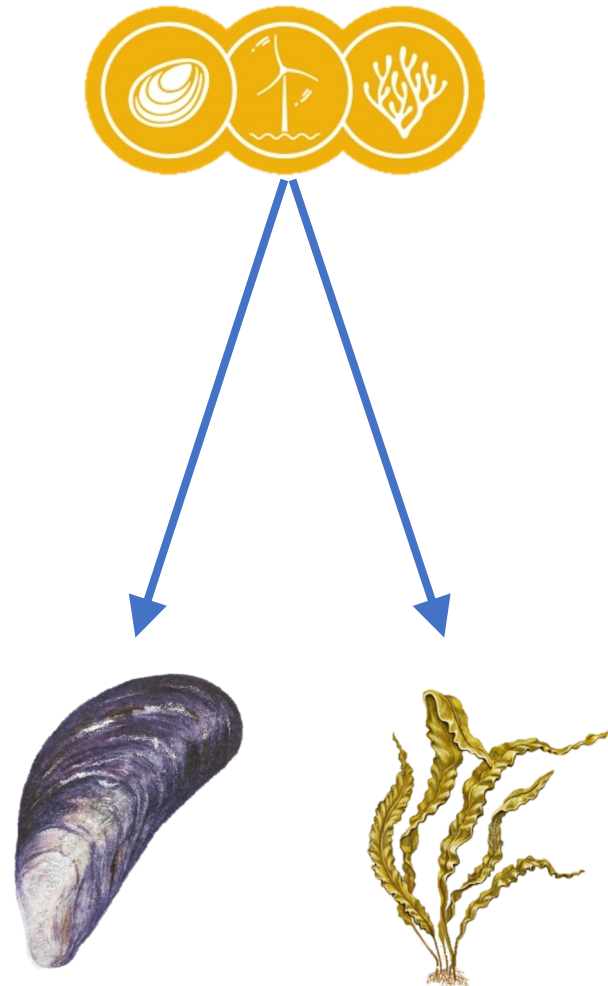


Results of the German Pilot

- First successful cultivation of algae (*Saccharina latissima*) and blue mussels (*Mytilus edulis*) in far-offshore location
- Promising growth of mussels with competitive meat/weight ratio
- Establishment of local algae strain, adapted to offshore location





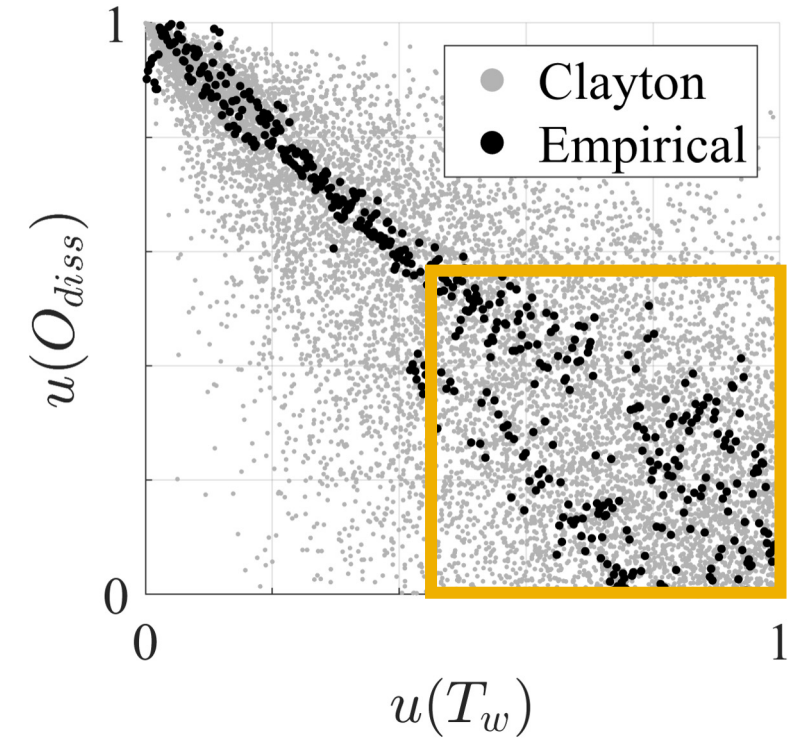
Suitability for offshore aquaculture



Approach

Optimal & critical conditions:
variable limits

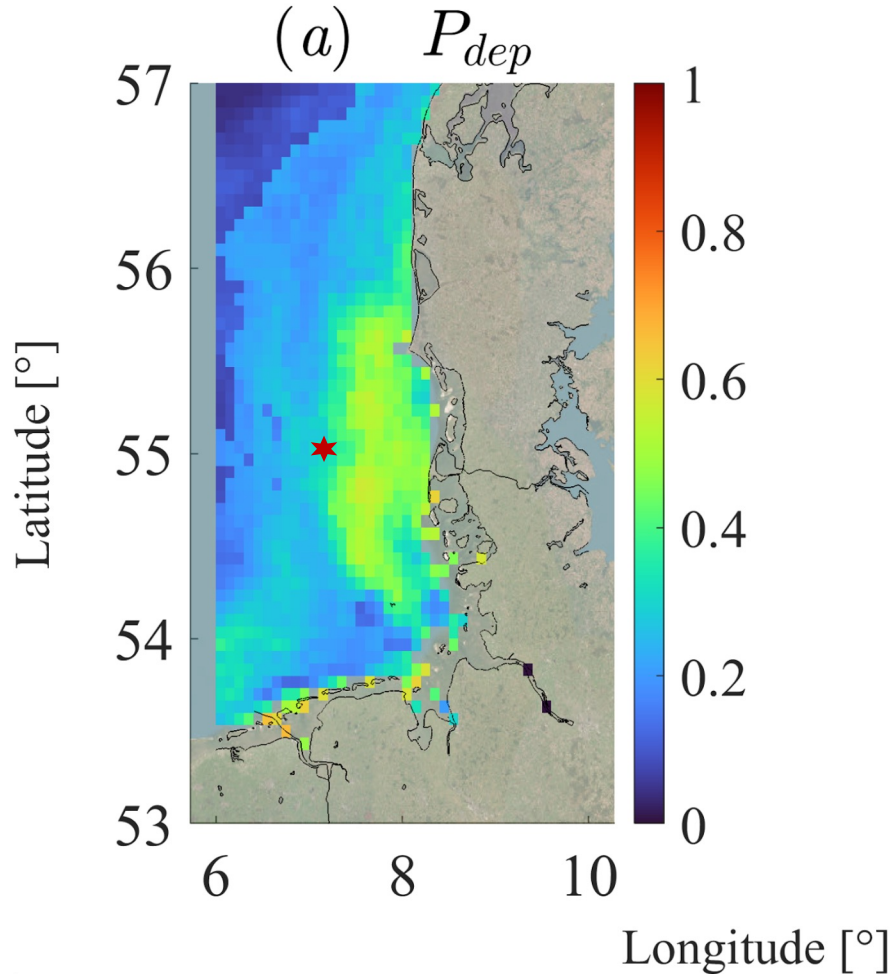
	
<p>Water Temperature Dissolved Oxygen Chlorophyll-a</p>	<p>Water Temperature Dissolved inorganic nitrogen Dissolved inorganic phosphorus</p>



Copulas: joint distribution per variable pair

Extract of Result

Optimal Probabilities (Mussel)



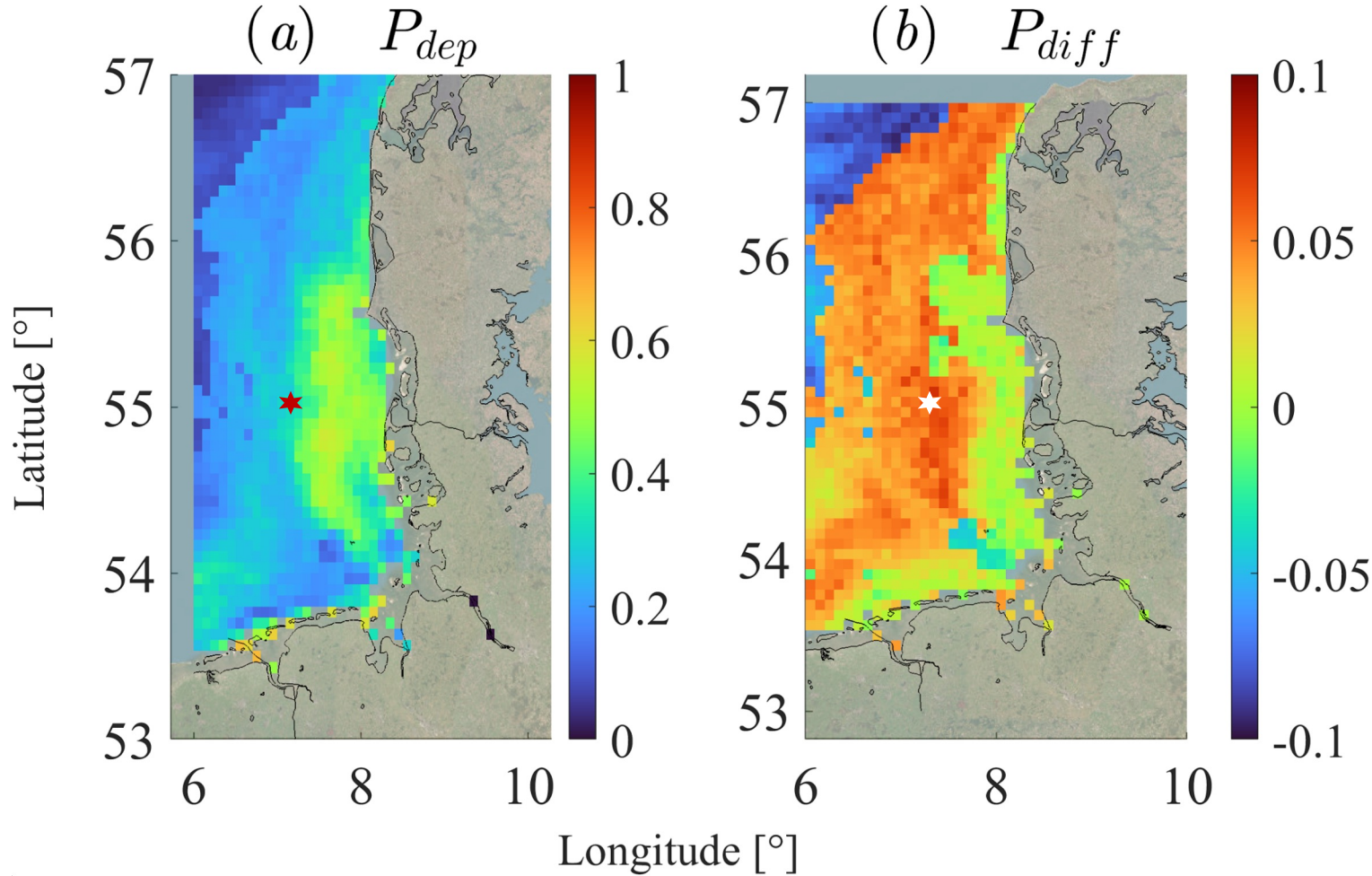
First case study:

Location of the German Pilot
(*published*)



Extract of Result

Optimal Probabilities (Mussel)



First case study:

Location of the German Pilot
(published)





WWW.H2020UNITED.EU   



Eva Strothotte ; Rieke Santjer

Eva.Strothotte@fh-kiel-gmbh.de

Rieke.Santjer@deltares.nl



Funded by the European Union (H2020 Grant Agreement no 862915). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them