Leibniz Institute For Baltic Sea Research Warnemünde

Mytilus LARVAE IN THE SOUTH WESTERN BALTIC SEA – A BASIS FOR MUSSEL FARMING

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Introduction & Objective

- Successful blue mussel production starts with the collection of mussel spat.
- Most areas in the Baltic Sea are characterized by sandy or muddy grounds.
- Limited amount of hard substrate leads to a limited and fluctuating blue mussel population.
- Mussel farm trial (2017 -2019) showed strong annual changes in *Mytilus* spp. larvae settlement.

- Are coastal areas, with a limited amount of hard substrate and lacking mussel beds, still suitable for site selection?
- Is external larvae transport sufficient enough to provide enough larvae for successful settlement in GWB?

Case Study Area „Greifswalder Bodden" (GWB)

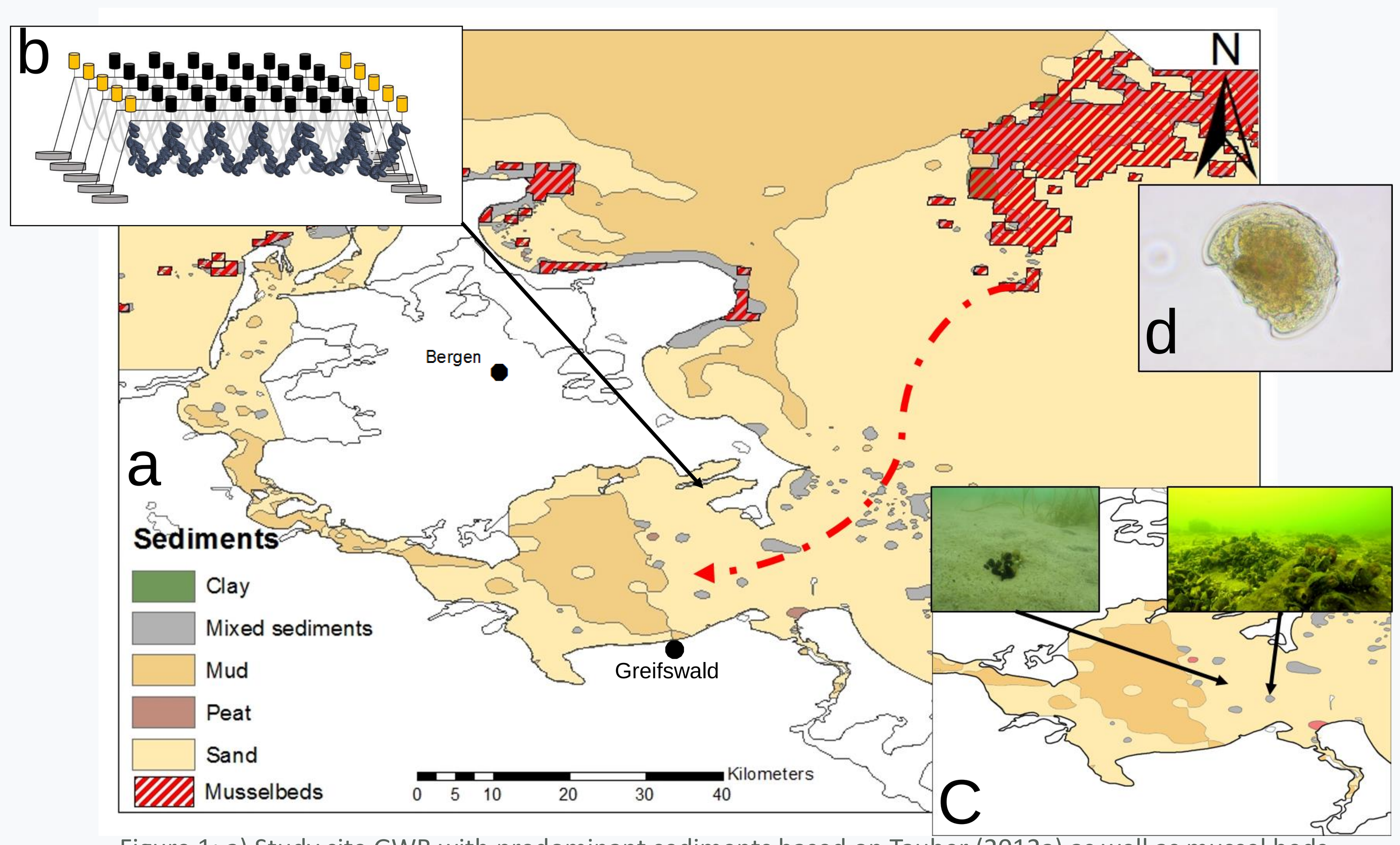

Figure 1: a) Study site GWB with predominant sediments based on Tauber (2012a) as well as mussel beds outside of GWB (red dashed area) are adopted from Schiele et al. 2015, dotted red arrow represents larvae transport; b) Mussel farm set up within GWB; c) Example of mussel population within GWB; d) *Mytilus* spp. D-larvae stage.

Model Approach

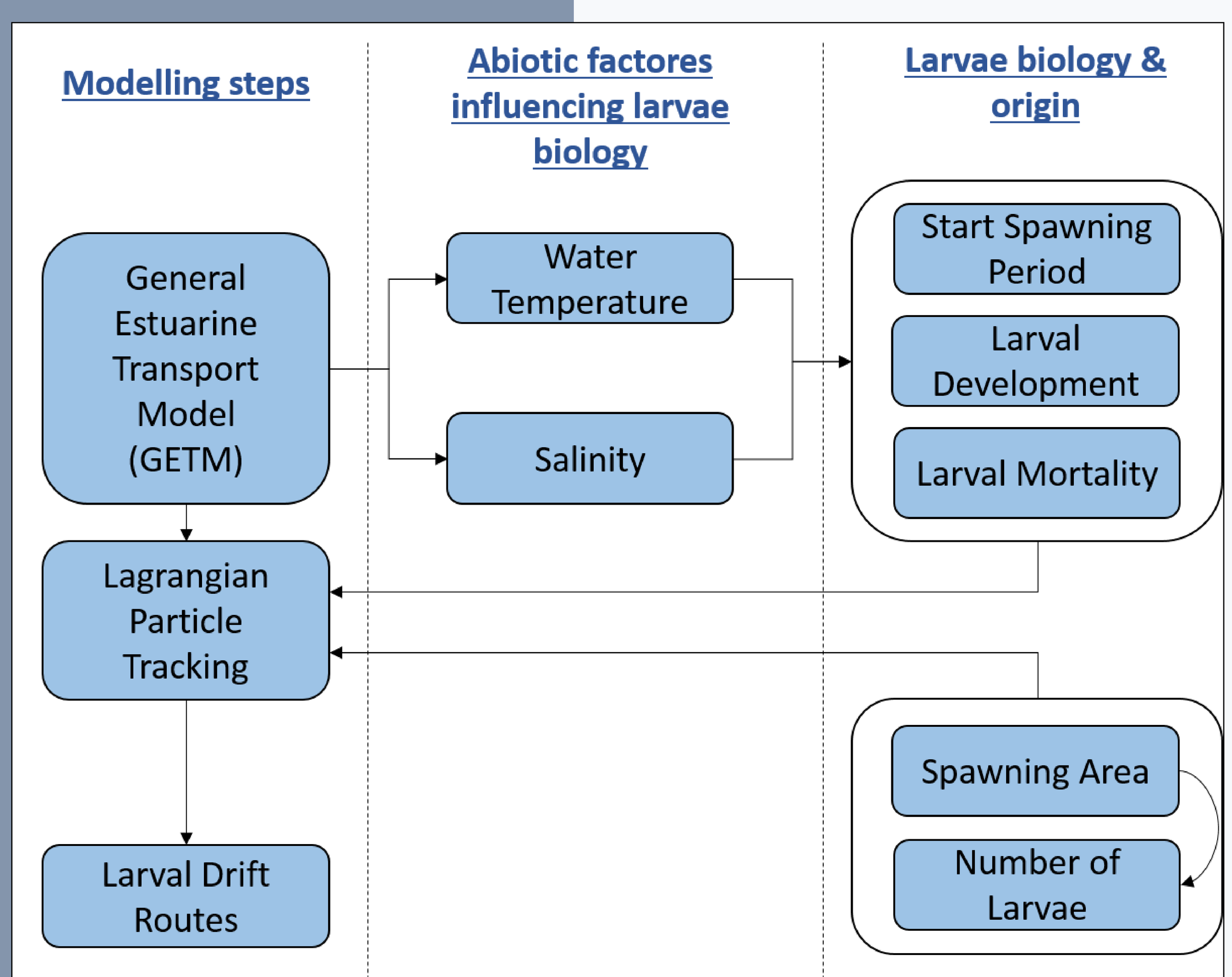

Figure 2: The applied model approach is subdivided into 3 parts, including single model steps, abiotic factors influencing mussel larvae biologiy and spawning.

Verification

- Verification of modelled larvae dispersal was conducted via direct larvae sampling from the water column and settlement on sea signs in the study areas Greifswald Bay

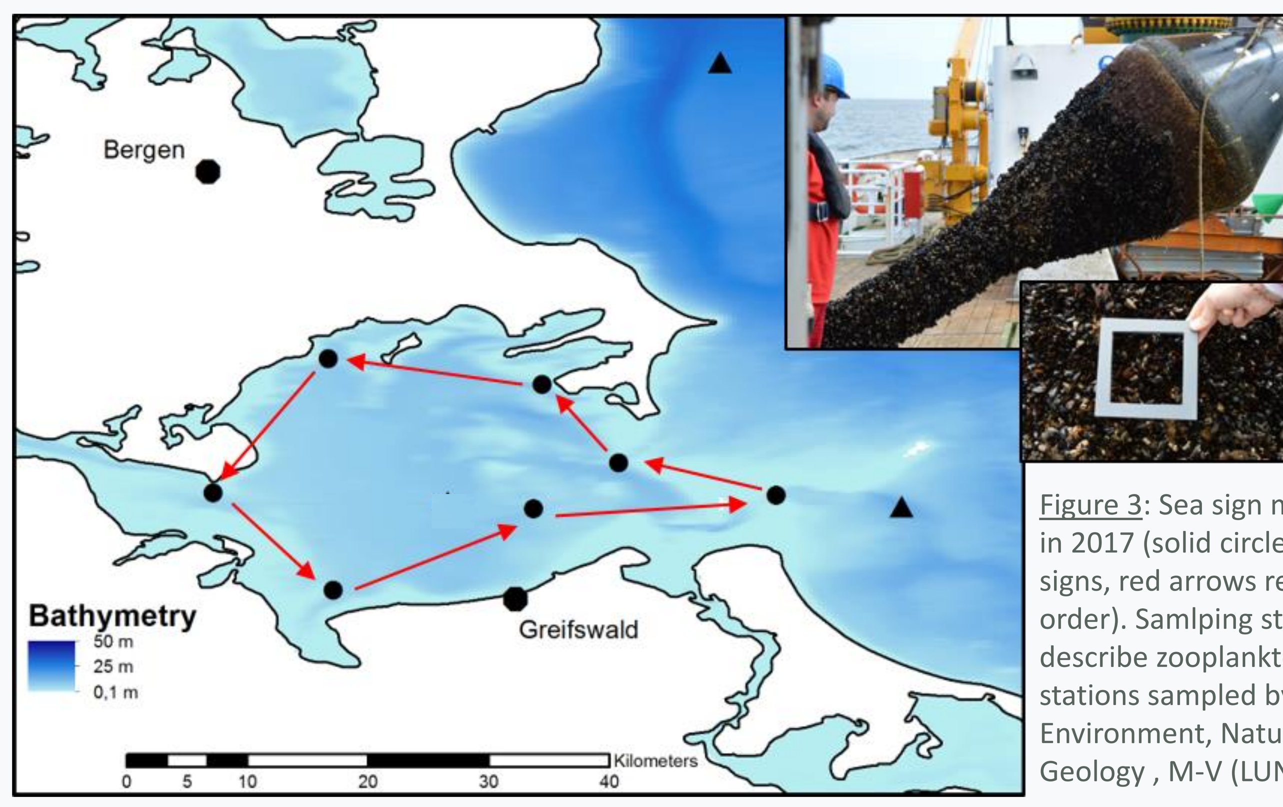

Figure 3: Sea sign monitoring conducted in 2017 (solid circles display single sea signs, red arrows represent monitoring order). Sampling station O11 & O133 describe zooplankton monitoring stations sampled by Agency for the Environment, Nature Conservation and Geology , M-V (LUNG).

Preliminary Results: Sea Sign Monitoring – Distribution Model – Larvae Sampling

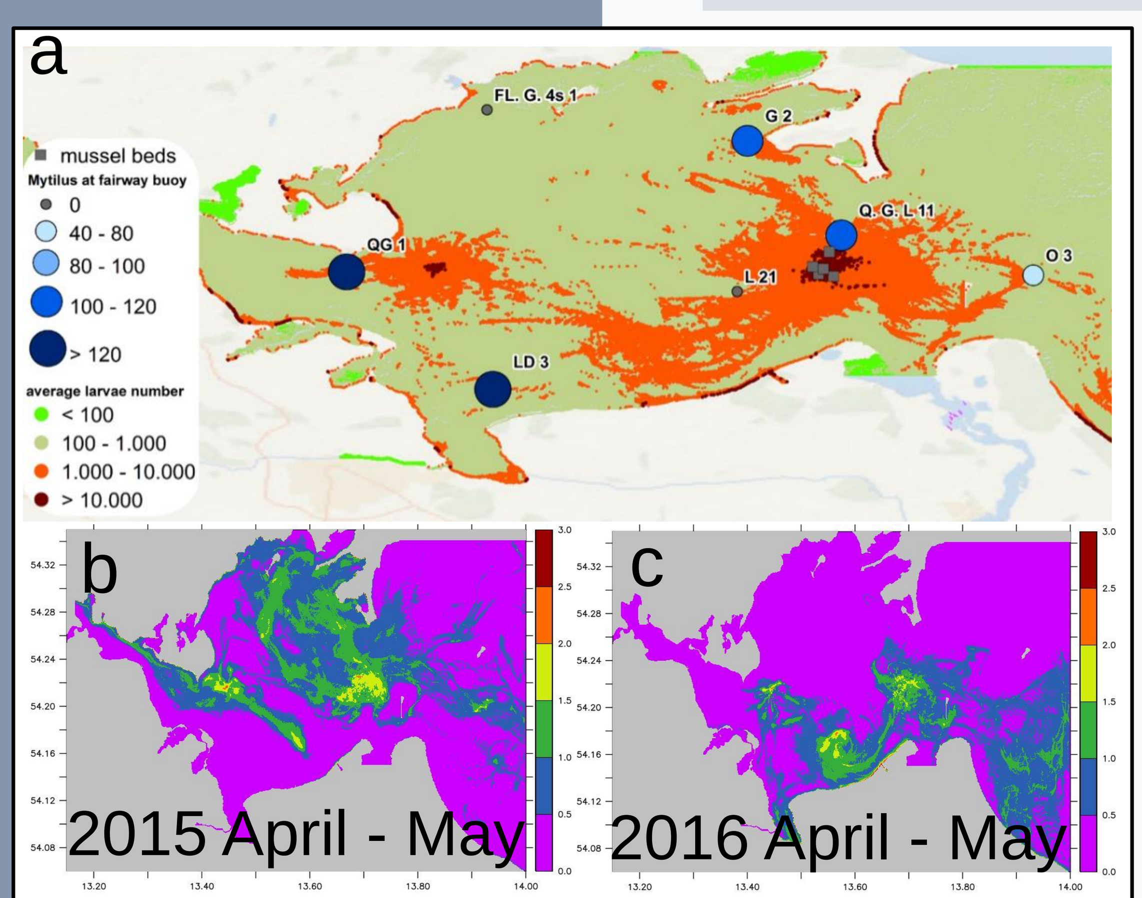

Figure 4: a) Results of the sea sign monitoring (blue grading) and modelled larvae dispersal (green = < 100 larvae, red => 10.000) 2016; b, c) Modelled larvae dispersal during estimated spawning time April-May (2015, 2016).

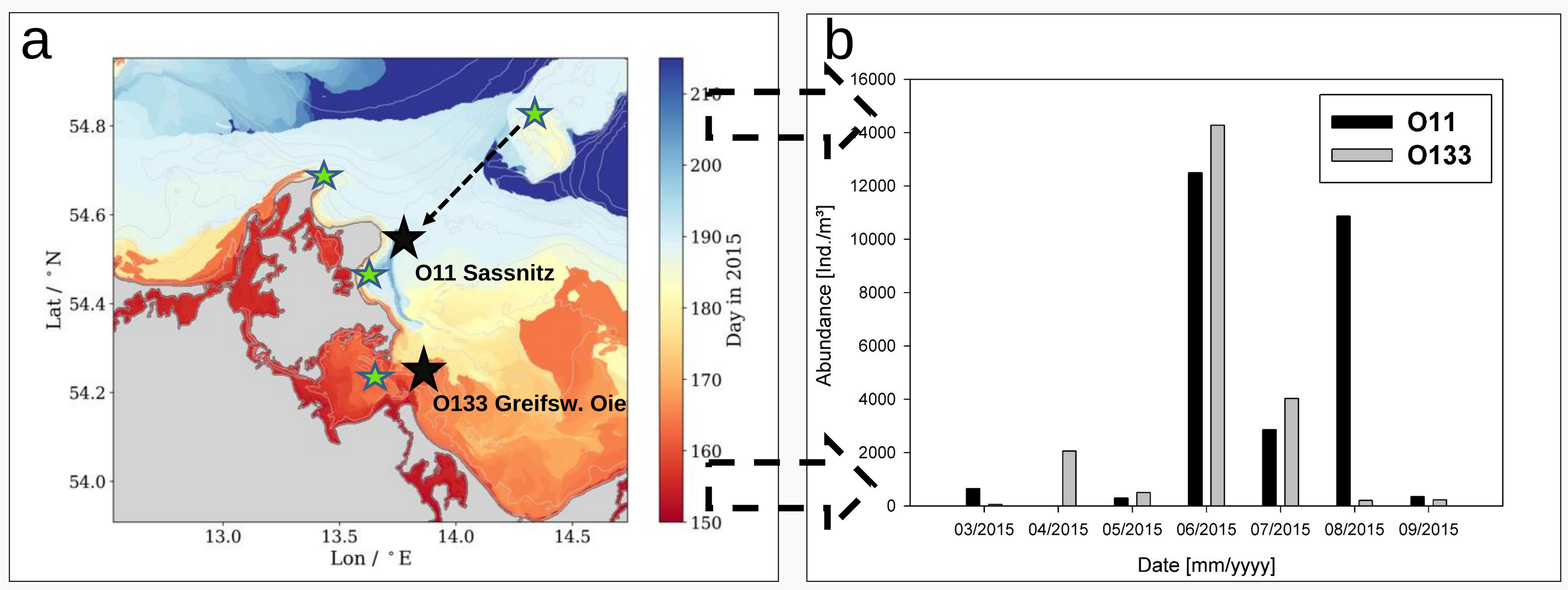

Figure 5: a) The bottom water temperature profile shows when 15 °C was reached for the first time, it was assumed that reaching 15 °C inducies spawning, green stars indicate mussel beds; b) Mussel larvae peaks recorded at the sampling stations O11 & O133).

- (Fig. 4) Preliminary results show that the sea sign monitoring partly fits modelled larvae distribution and that annual larvae dispersal show high spatial variability within GWB
- (Fig. 5) Modelled bottom temperature suggests different temporal spawning events leading to time shifted larvae peaks.

Conclusion

Mussel larvae supply originating only from mussel beds within GWB seems not sufficient enough to provide annual steady blue mussel production.

Modelled bottom temperature and recorded time-shifted larvae peaks indicate towards postponed larvae peaks within GWB.

Next Steps

Apply model approach to predict larvae dispersal from mussel population outside GWB.