1st Meeting – June 26 2015 (Fjord-Lab, Kerteminde)

Odense Harbour Mussel Project

Florian Lüskow, Baojun Tang, Hans Ulrik Riisgård,
Camille Gros & Sébastien Delaunay

A pilot project to assess the feasibility of cleaning sea water in Odense harbour by means of filter-feeding blue mussels on suspended nets

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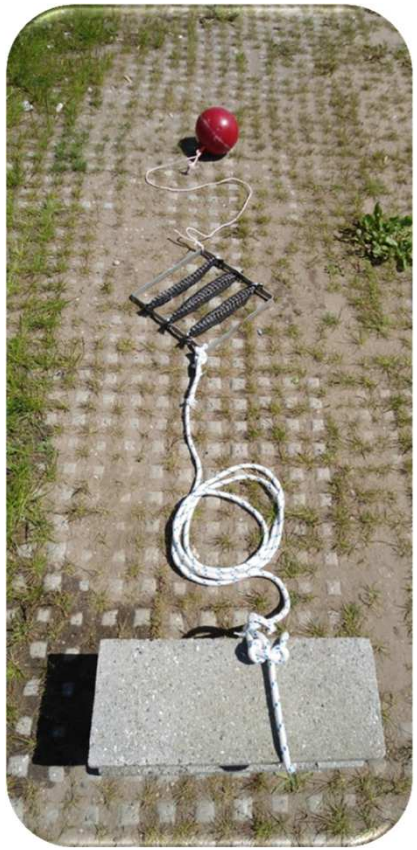
Odense Harbour Mussel Project

Attendants:
Florian Lüskow (SDU)
Baojun Tang (SDU)
Hans Ulrik Riisgård (SDU)
Camille Gros (SDU)
Sébastien Delaunay (SDU)
Mads Anker van Deurs (NordShell)
Richard Jensen (Odense Kommune)

Outline

I	Goals & Study area
II	Hydrography
III	Mussel larval population
IV	Larval settlement
V	Mussel growth studies
VI	Outlook



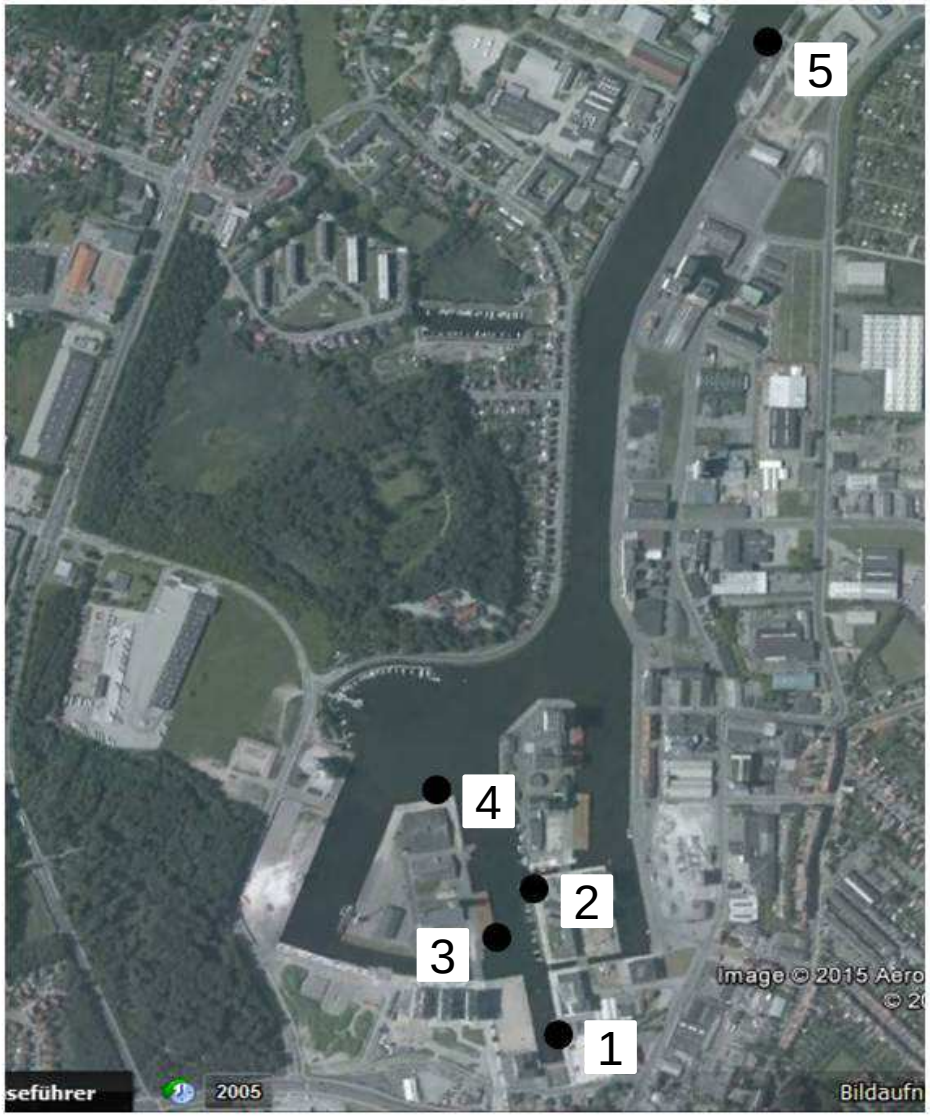
Goals

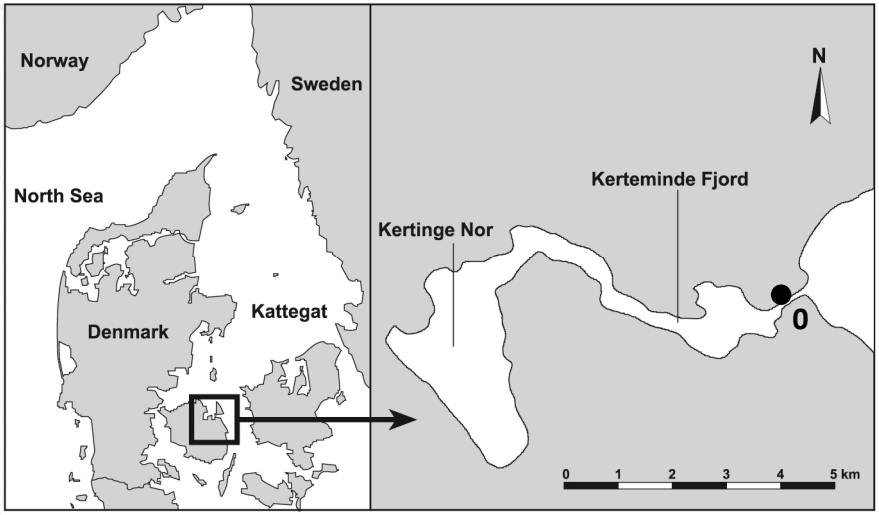
- developments in the harbour area but still a problem with green and turbid water
- Odense Kommune asked for a solution to improve the water clarity (mussels as bio-filters)
- to follow appearance of veliger larvae, settlement, and growth of juvenile mussels in the harbour area taking the hydrography into account
- pilot growth study to estimate their potential feeding impact
- harsh growth conditions (low salinity, high algal conc.)

Goals

- How many mussels are needed to control the algal population?
- Are blue mussels realising their maximal filtration potential in the Odense harbour?
- How big is the background filtration capacity of the local mussel population?
- How is the water moving in the harbour?
- What factors affect the salinity in the harbour?

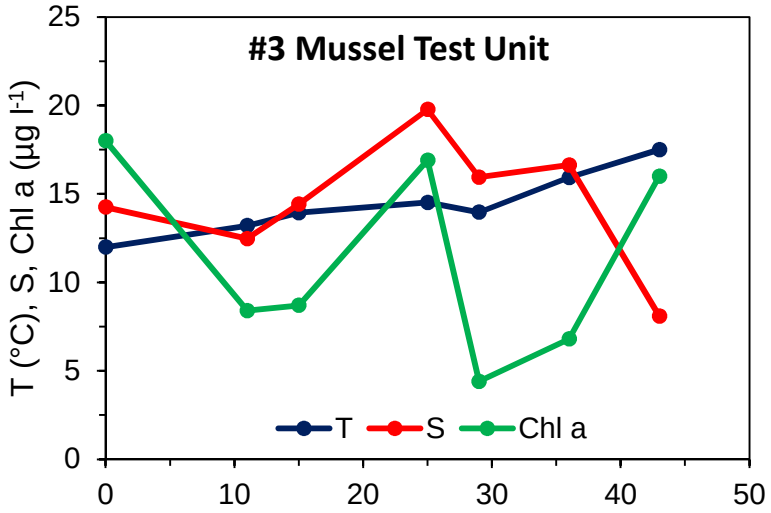
Study area

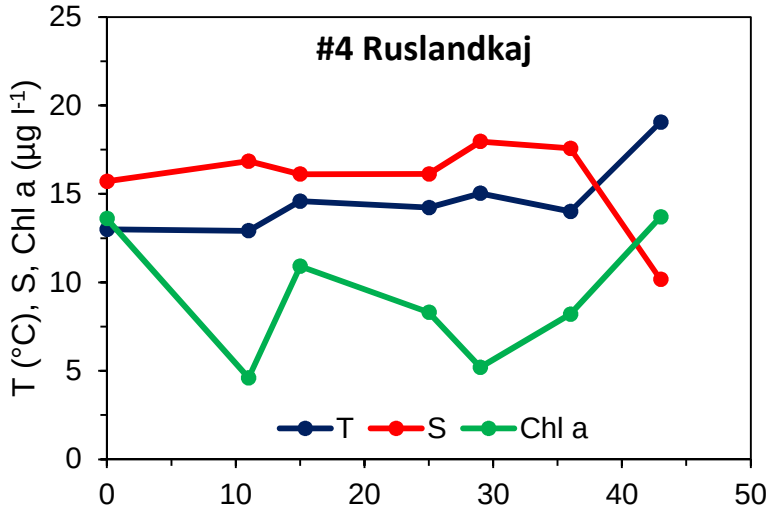


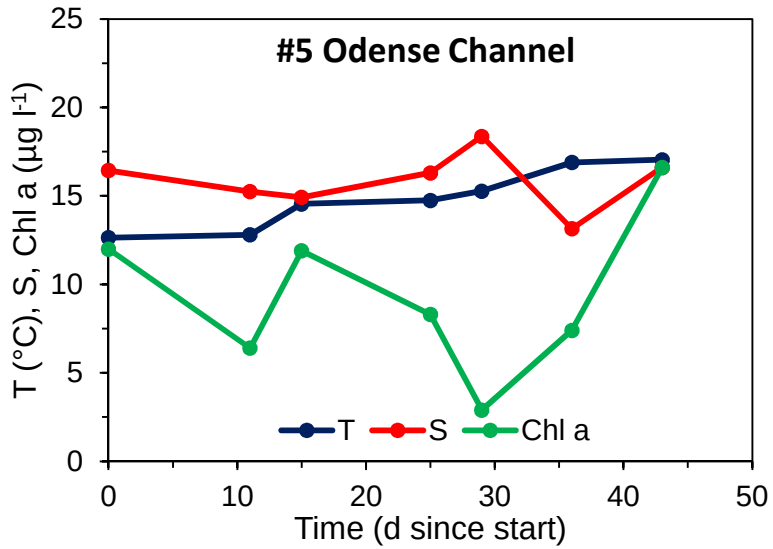


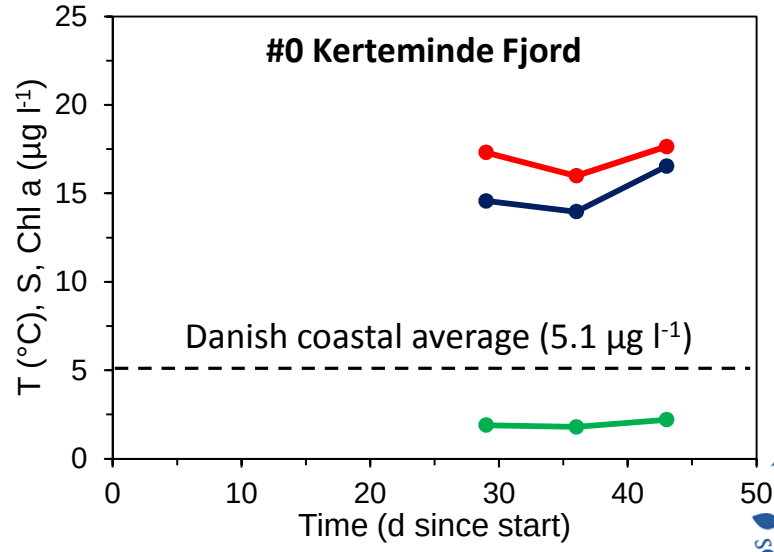
#0	Kerteminde Fjord
#1	Inner Harbour
#2	Middle Harbour
#3	Mussel Test Unit
#4	Ruslandkaj
#5	Odense Channel

Hydrography – Development



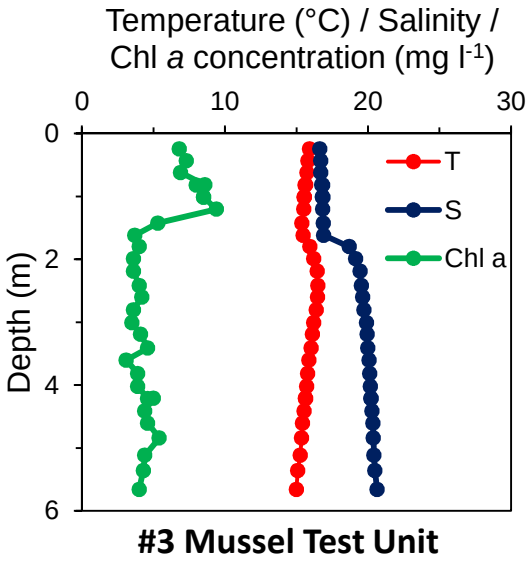




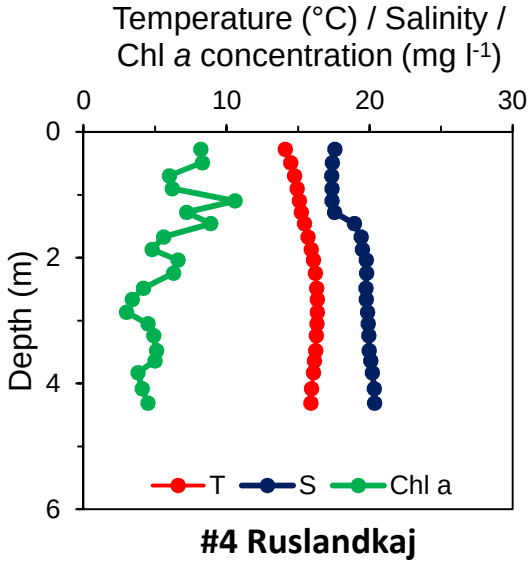


Hydrography – Vertical profiles

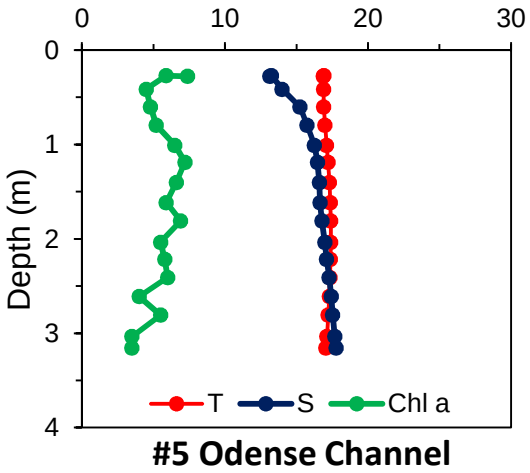
YSI 650



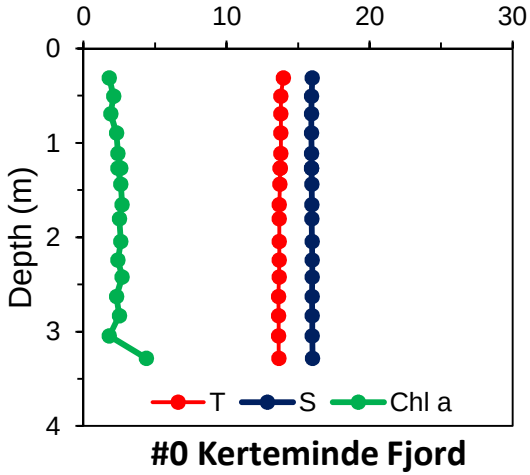
#3 Mussel Test Unit



#4 Ruslandkaj



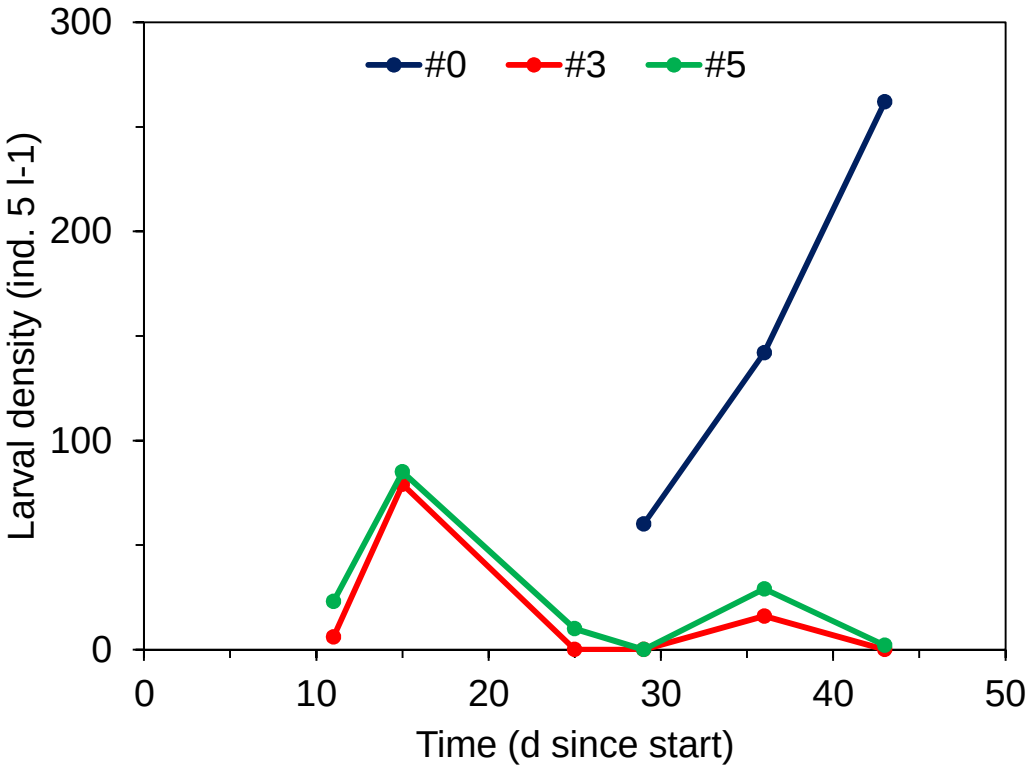
#5 Odense Channel



#0 Kerteminde Fjord

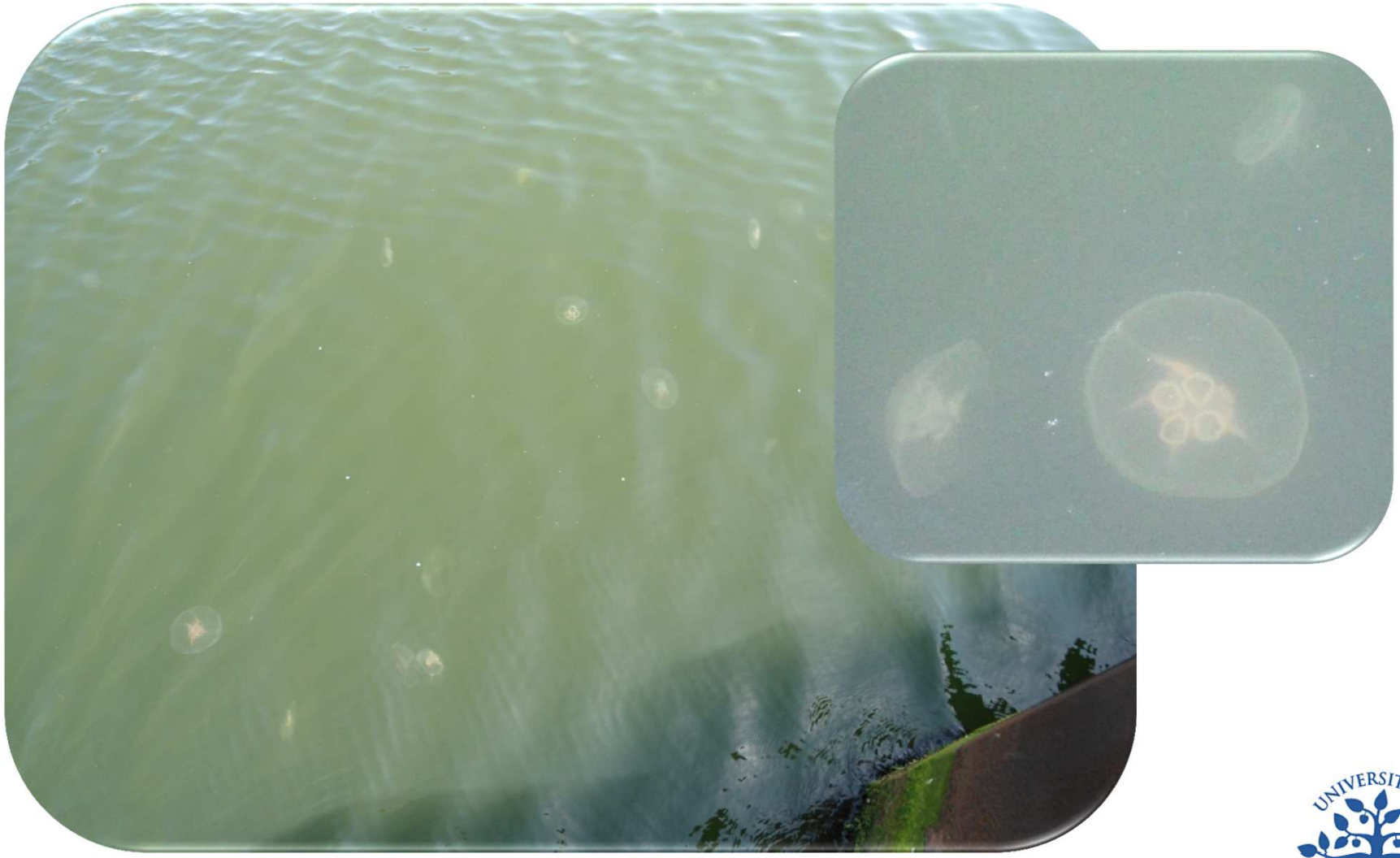
Mussel larval population

http://www.molluscs.at/images/weichtiere/muschel n/mytilus_veliger1.jpg



Day 0: 11/5/2015

Mussel larval population

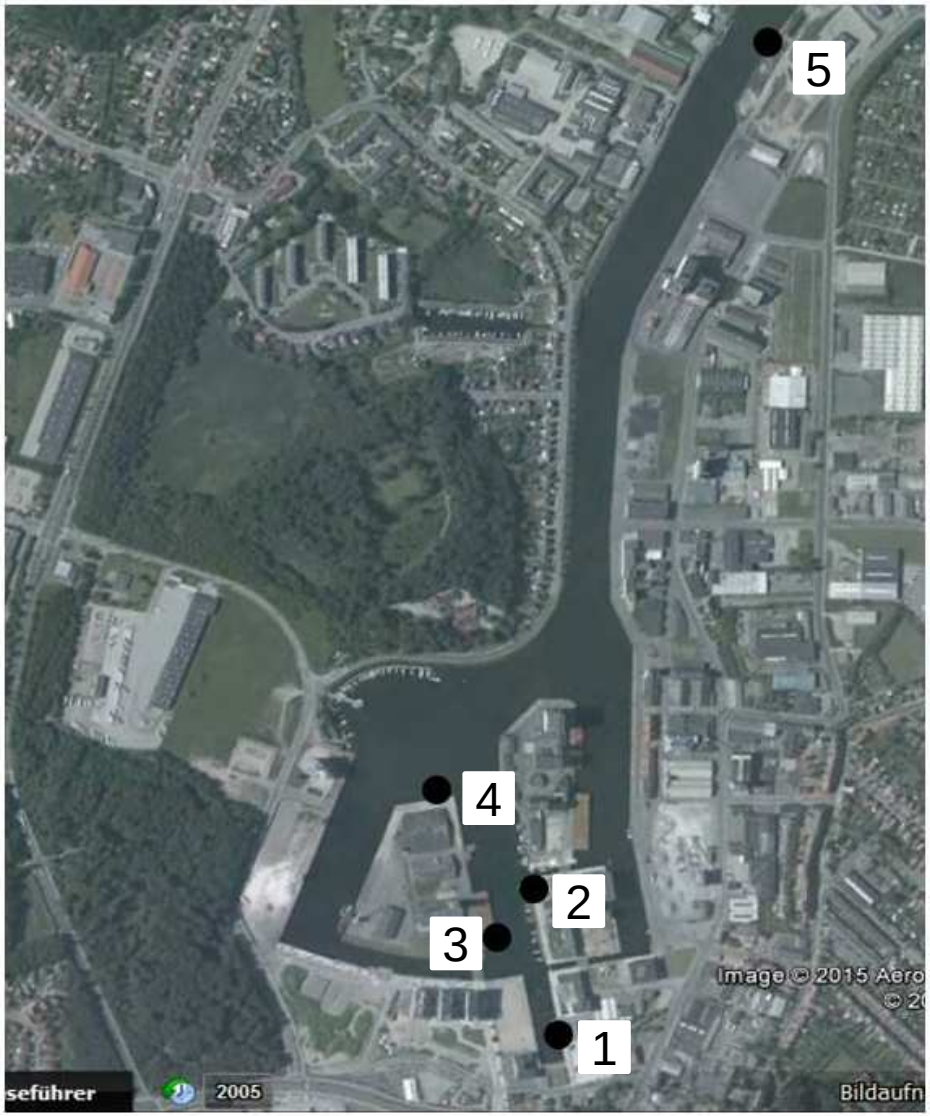


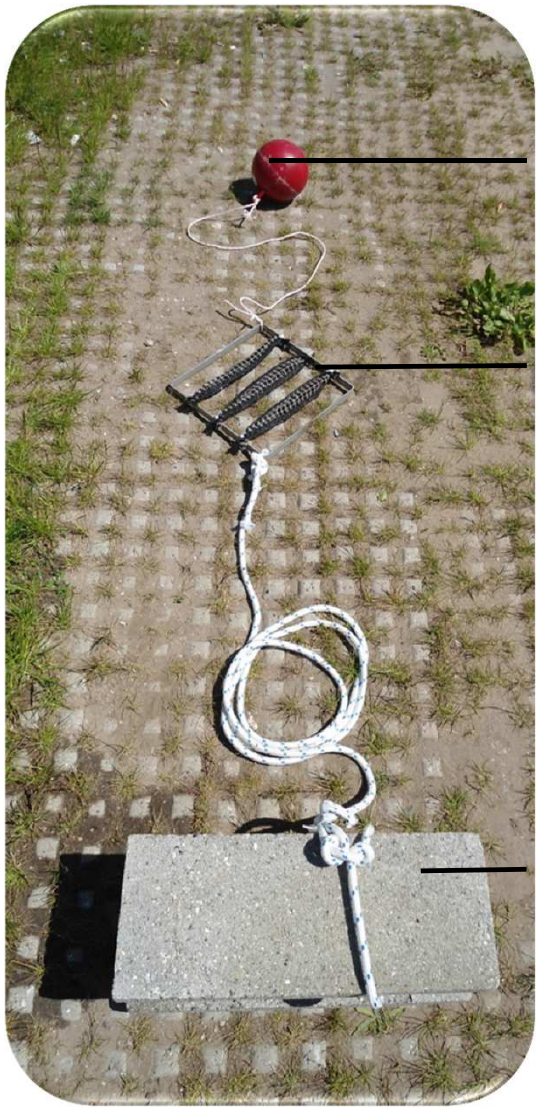
Larval settlement

Weekly investigation of 10 cm of rope (epiphytes)

⇨ first record of spat on June 23 2015 (3 ind. < 1 mm)

Mussel growth studies





Mussel growth studies

Condition index

$$CI = \frac{DW}{L^3}\left(\frac{mg}{cm^3}\right)$$

Code	*L* (mm)	*DW* (mg)	*CI* (mg cm^{-3})
G0	22.5 ± 1.6	75.3 ± 24.9	6.9 ± 2.9
Kert 1	23.8 ± 1.8	98.9 ± 30.7	7.2 ± 1.5
Kert 2			
Kert 3			
G0	22.5 ± 1.6	75.3 ± 24.9	6.9 ± 2.9
Mussel 1	25.1 ± 1.9	106.3 ± 29.4	6.7 ± 1.6
Mussel 2			
Mussel 3			
G0	22.5 ± 1.6	75.3 ± 24.9	6.9 ± 2.9
Mid 1	25.8 ± 1.6	148.6 ± 34.6	8.6 ± 1.6
Mid 2			
Mid 3			
G0	22.5 ± 1.6	75.3 ± 24.9	6.9 ± 2.9
Rus 1	25.3 ± 1.8	133.5 ± 39.0	8.2 ± 2.3
Rus 2			
Rus 3			

t = 0, 2, 4, and 6 weeks, *n* = 30, Mean ± SD

Outlook – Vertical transect

Surface

0:43

Depth: 2 m

2:55

Bottom

0:14

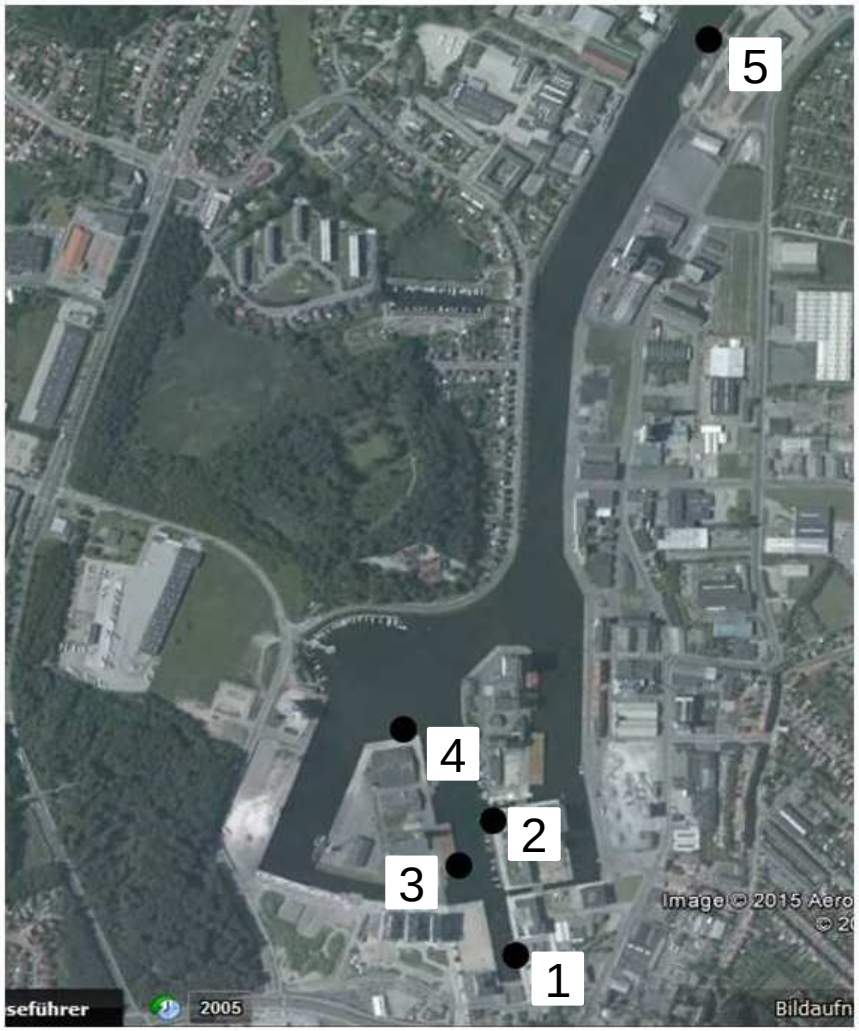
0:14

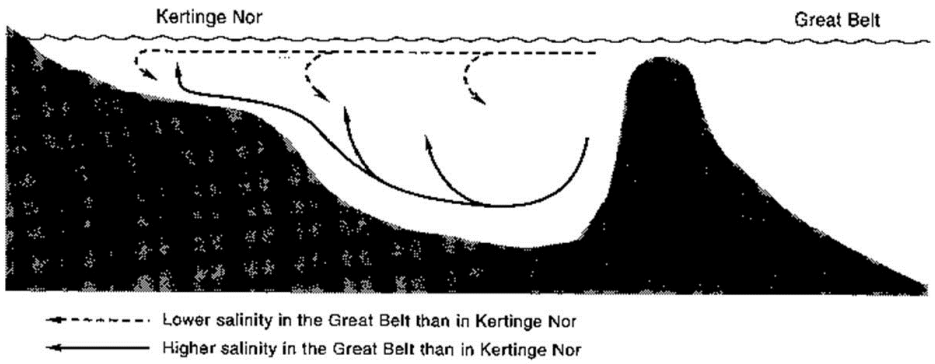
Kerteminde Fjord

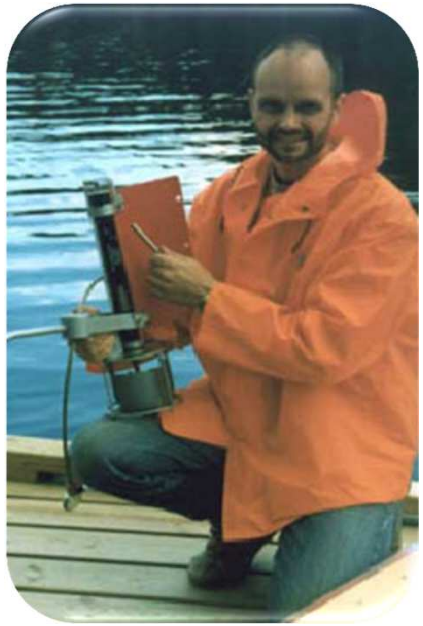
0:13

Outlook – Vertical transect, *SOD*

Outlook – Water movements and exchange







http://www.ngdir.ir/Data_SD/GeoLab/Pics/GeoLabPic_2486_2.jpg

Outlook – Full scale mussel growth study

http://nordshell.dk/wp-content/uploads/2014/02/forside1box.jpg

Thank Odense Kommune for financial support!

Thank you for your attention!

Pictures taken by Florian Lüskow