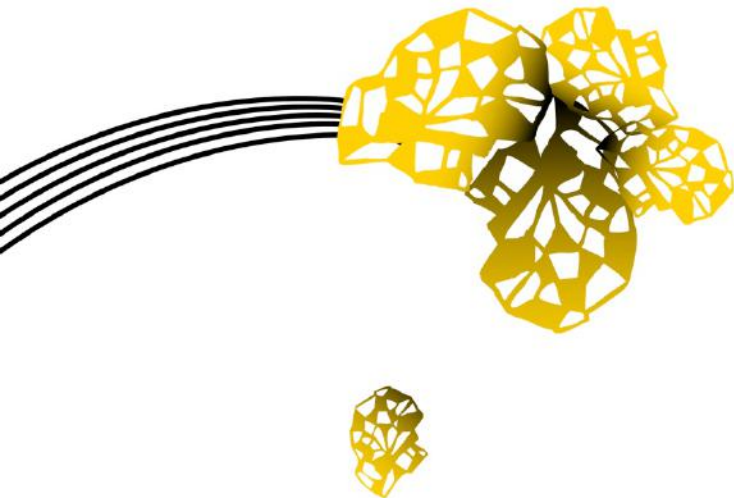


THE EBB TIDAL DELTA OF AMELAND

A FIRST VIEW UNDERWATER

Harriëtte Holzhauer



A SEAWAD-phd-project

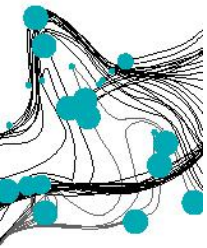
Suzanne Hulscher – 1st promotor, Twente University

Peter Herman – 2nd promotor, Deltares, Delft University

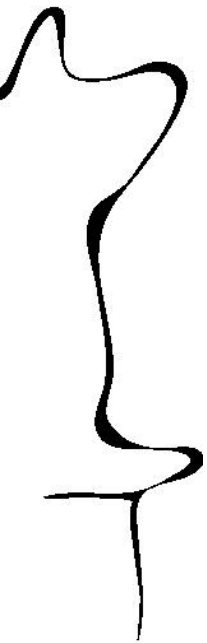
Bas Borsje – Daily supervisor, Twente University, Deltares

Kathelijne Wijnberg, Twente University





CONTENT



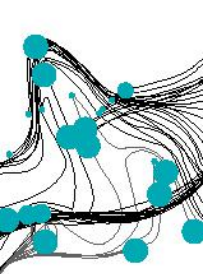
- Introduction
 - Research aim

- Measuring benthic species at the ebb tidal delta
 - Ameland ebb tidal delta
 - Grouping analysis
 - Habitats and sample locations

- Measurements
 - Field approach
 - A first look

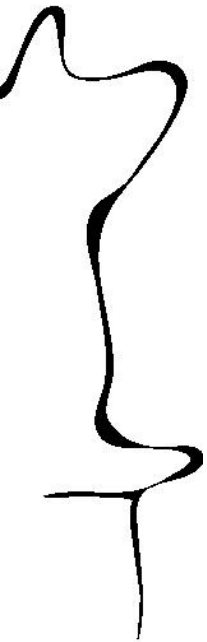


- Upcoming activities



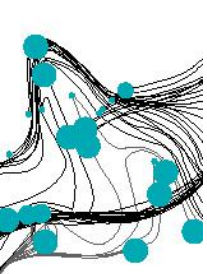
RESEARCH AIM

ENVIRONMENTAL PROCESSES DETERMINING BENTHIC SPECIES DISTRIBUTION NEAR THE COAST

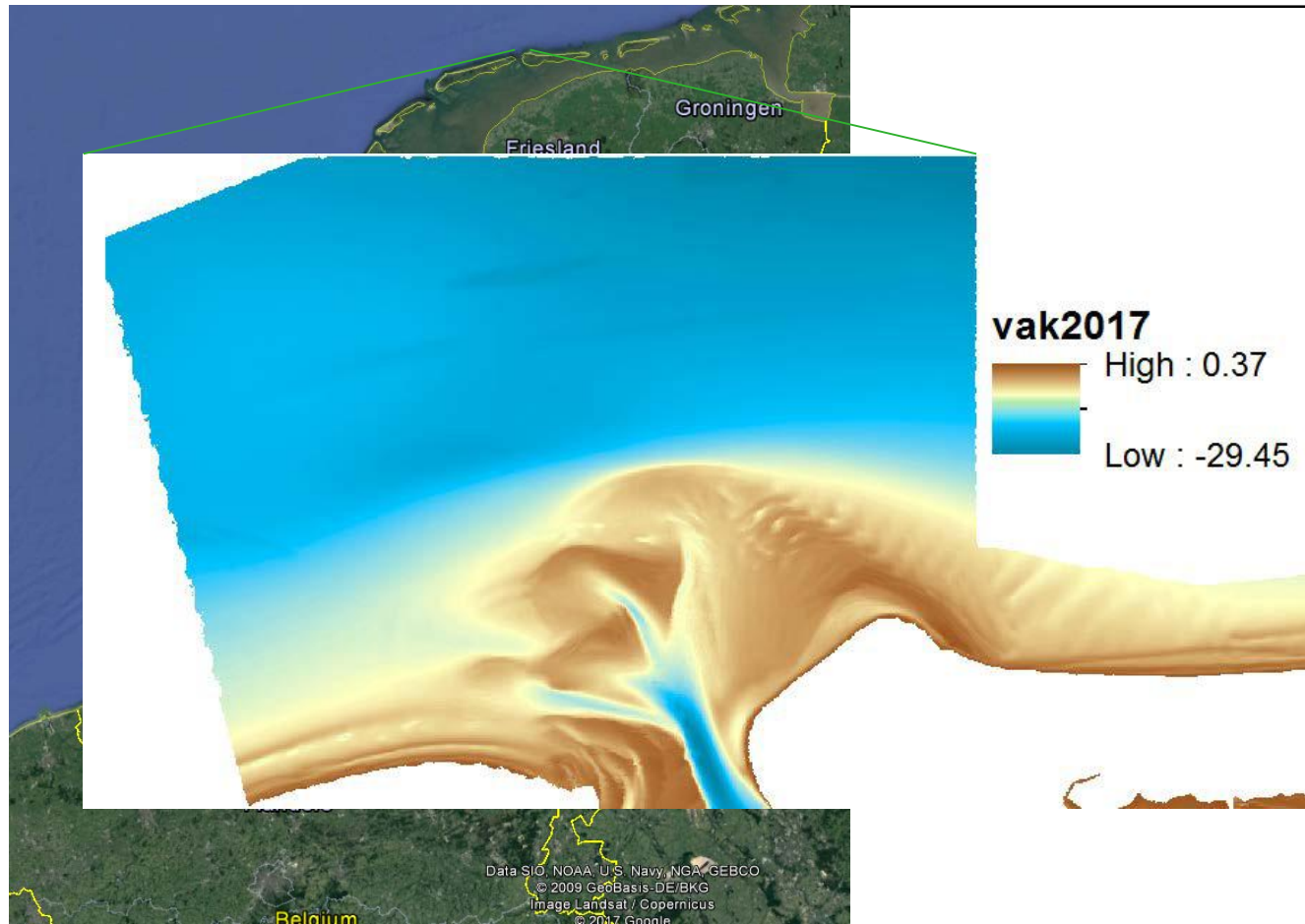
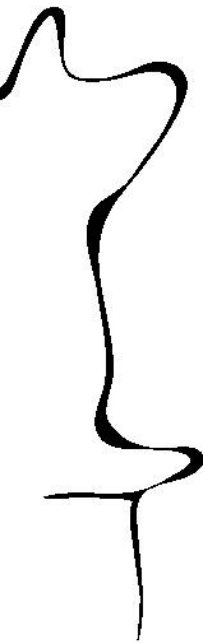


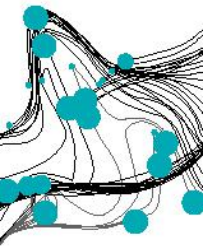
- Gain a better understanding of the **combination and dynamics** of **interacting environmental parameters** relevant for steering the benthic species distribution in the coastal zone.
- Benthic species are an important food source for higher trophic species such as birds and fish.
- Benthic species live in the sediment and are largely impacted by changes in morphology and hydrodynamics





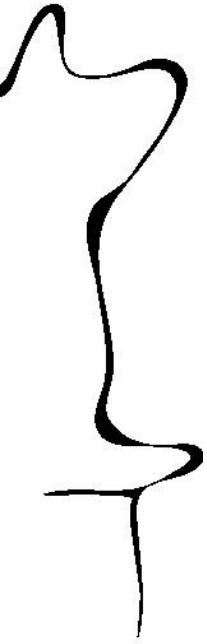
THE EBB TIDAL DELTA OF AMELAND

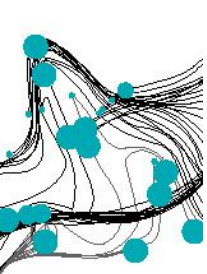




MEASURING BENTHIC SPECIES AT THE EBB TIDAL DELTA

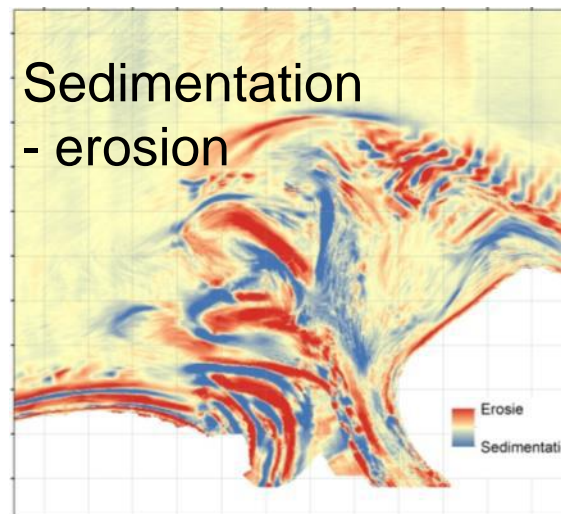
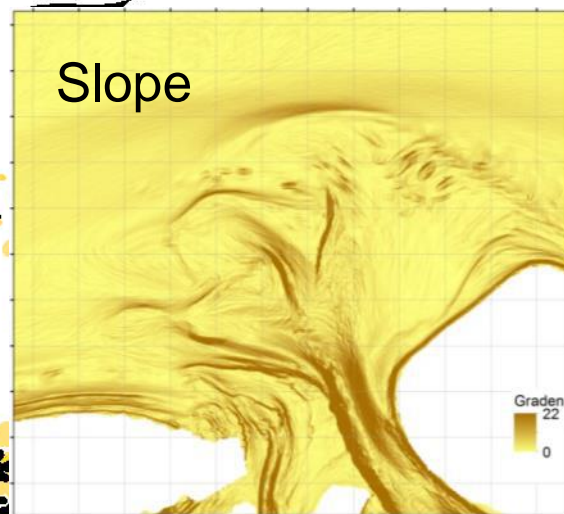
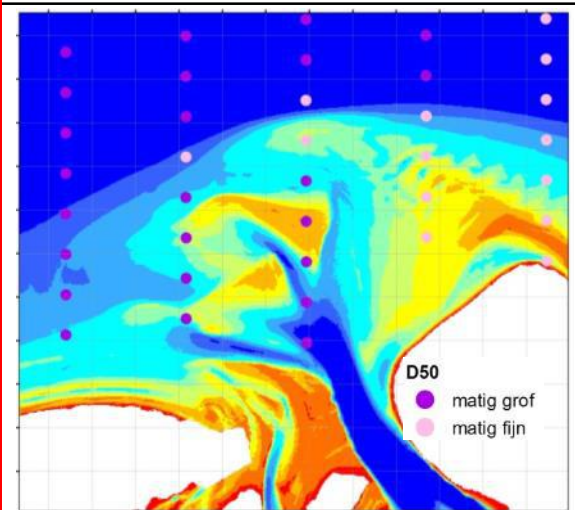
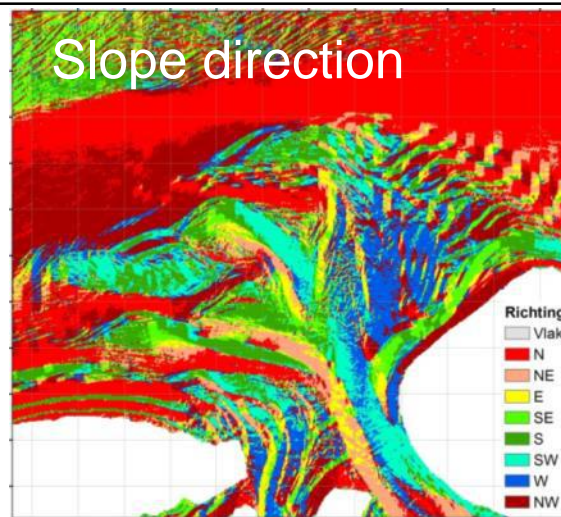
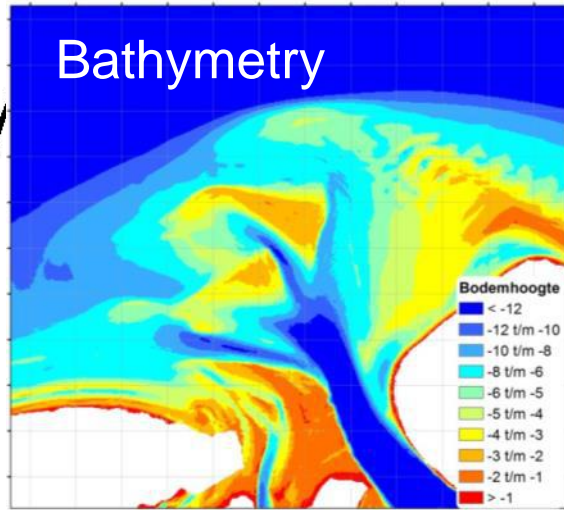
WHERE TO SAMPLE?

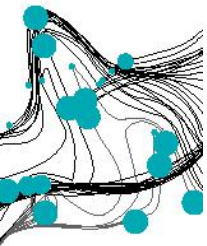




GROUPING ANALYSIS

INPUT PARAMETERS



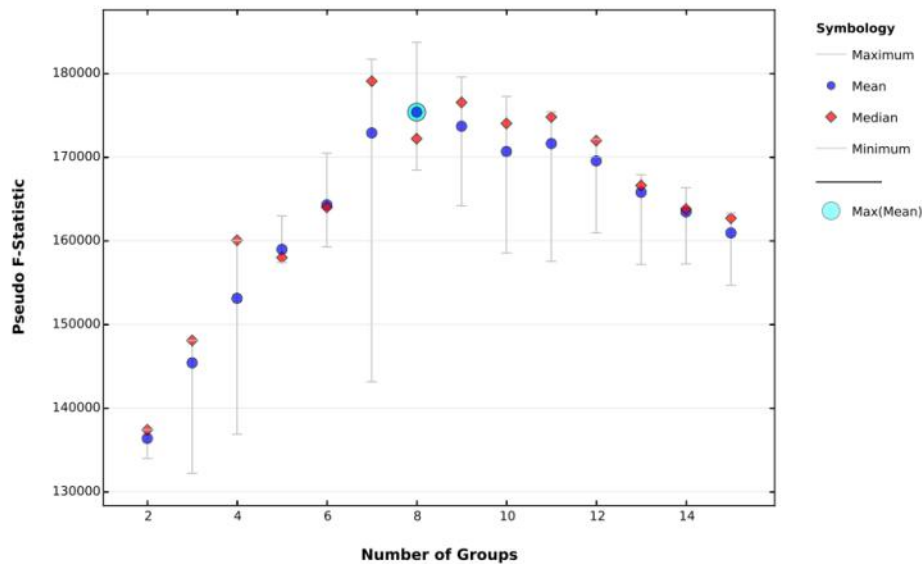


GROUPING ANALYSIS

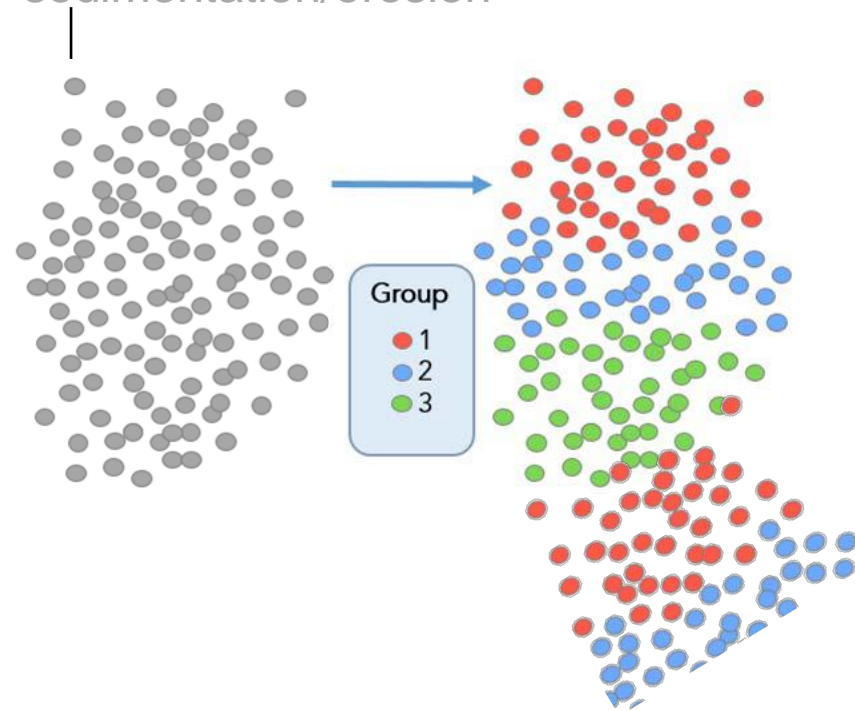


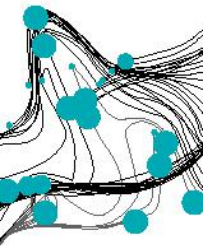
- Input parameters on a 20x20 grid
- No spatial constraints
- Evaluation of the optimal number of groups

Pseudo F-Statistic Plot

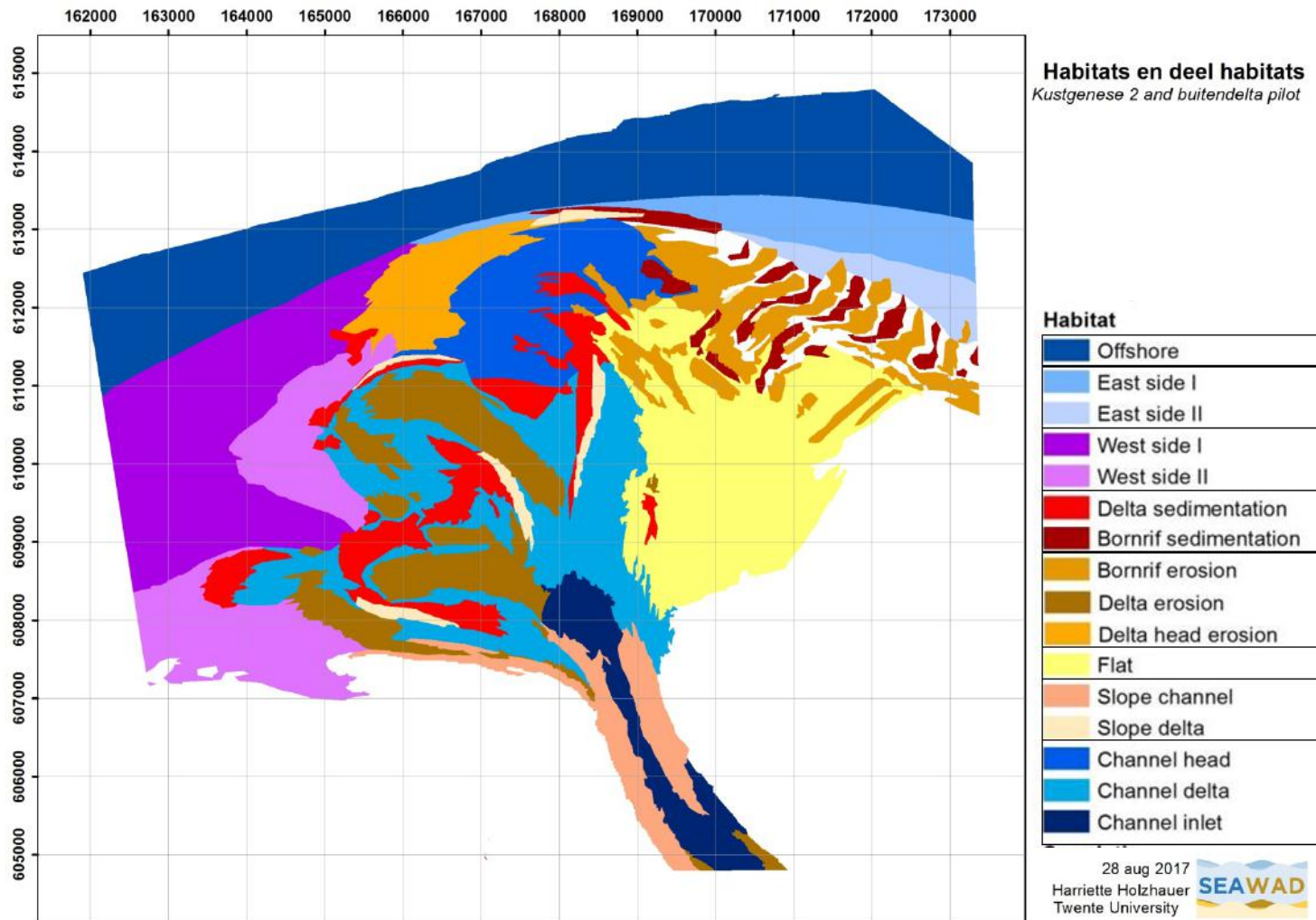


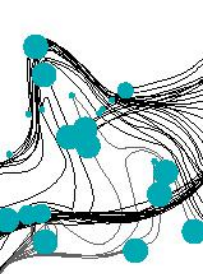
= Bathymetry + slope + direction + sedimentation/erosion





HABITATS

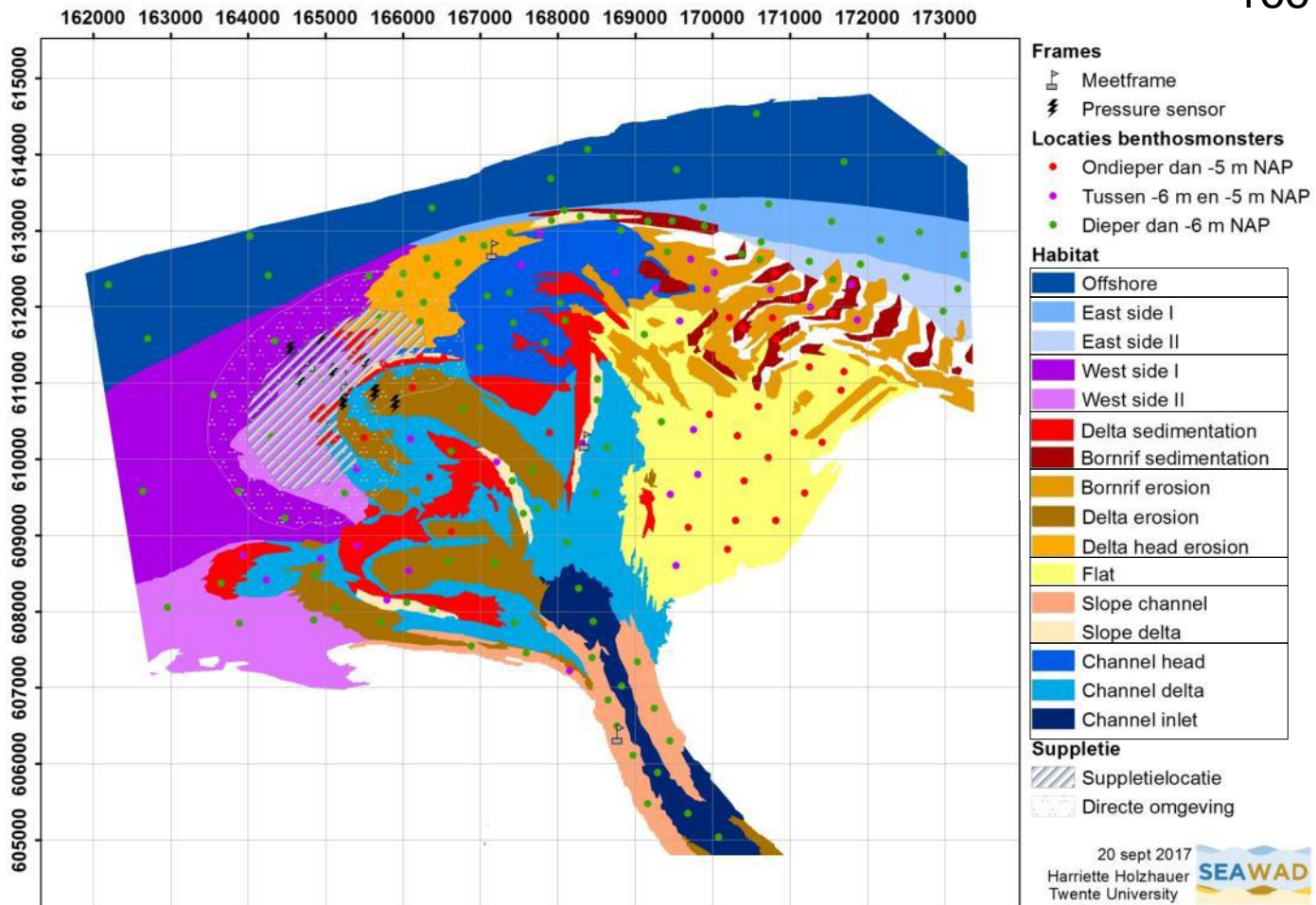


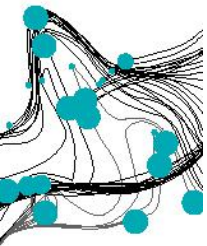


SAMPLE LOCATIONS

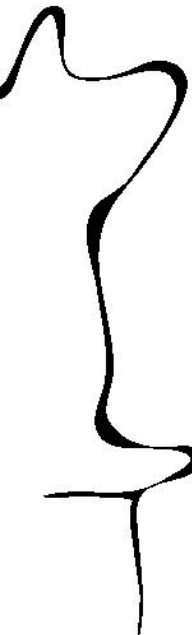
- Sample locations randomly placed within each habitat

166 samples





THE FIELD



- Vessels



WR82
max draught
0.50 cm

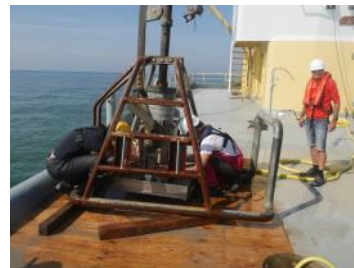
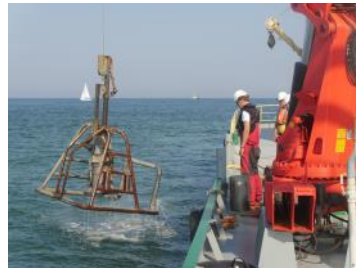


Terschelling
max draught
3m

- Boxcore

Depth: 30 cm

Opp: 0.078 m²

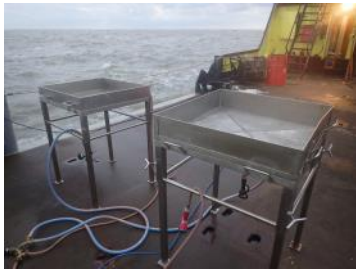


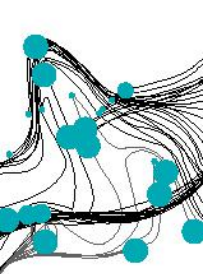
- 1 mm sieve

- Small core

Depth: 30 cm

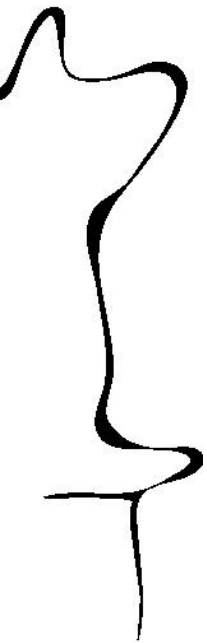
Diam: 3cm





THE SAMPLES

A FIRST LOOK



Habitat

West side
>-8 m NAP

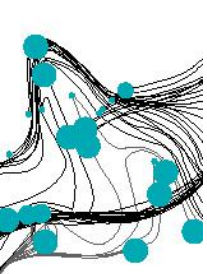
East side
>-8 m NAP

Sediment



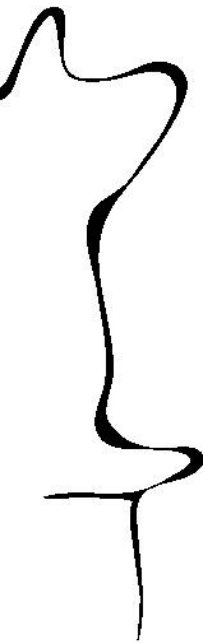
Benthic species





THE SAMPLES

A FIRST LOOK



Habitat

Delta erosion

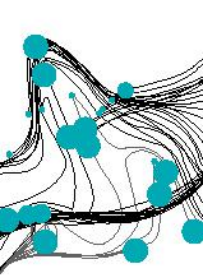
Delta sedimentation

Sediment



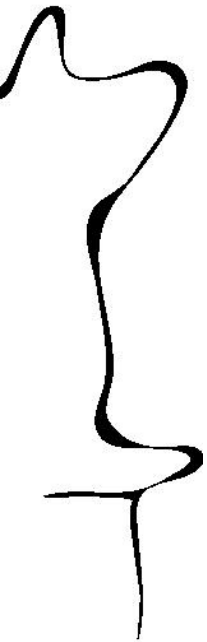
Benthic species





THE SAMPLES

A FIRST LOOK



Channel inlet

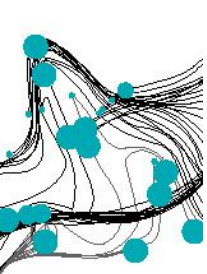


Slope channel



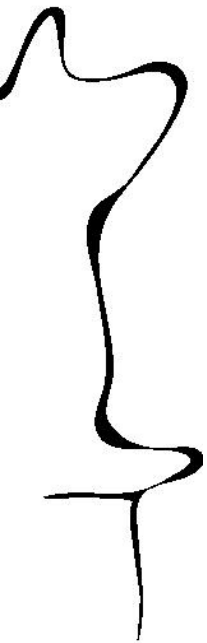
Slope delta





THE SAMPLES

A FIRST LOOK



Habitat

Offshore

Flat

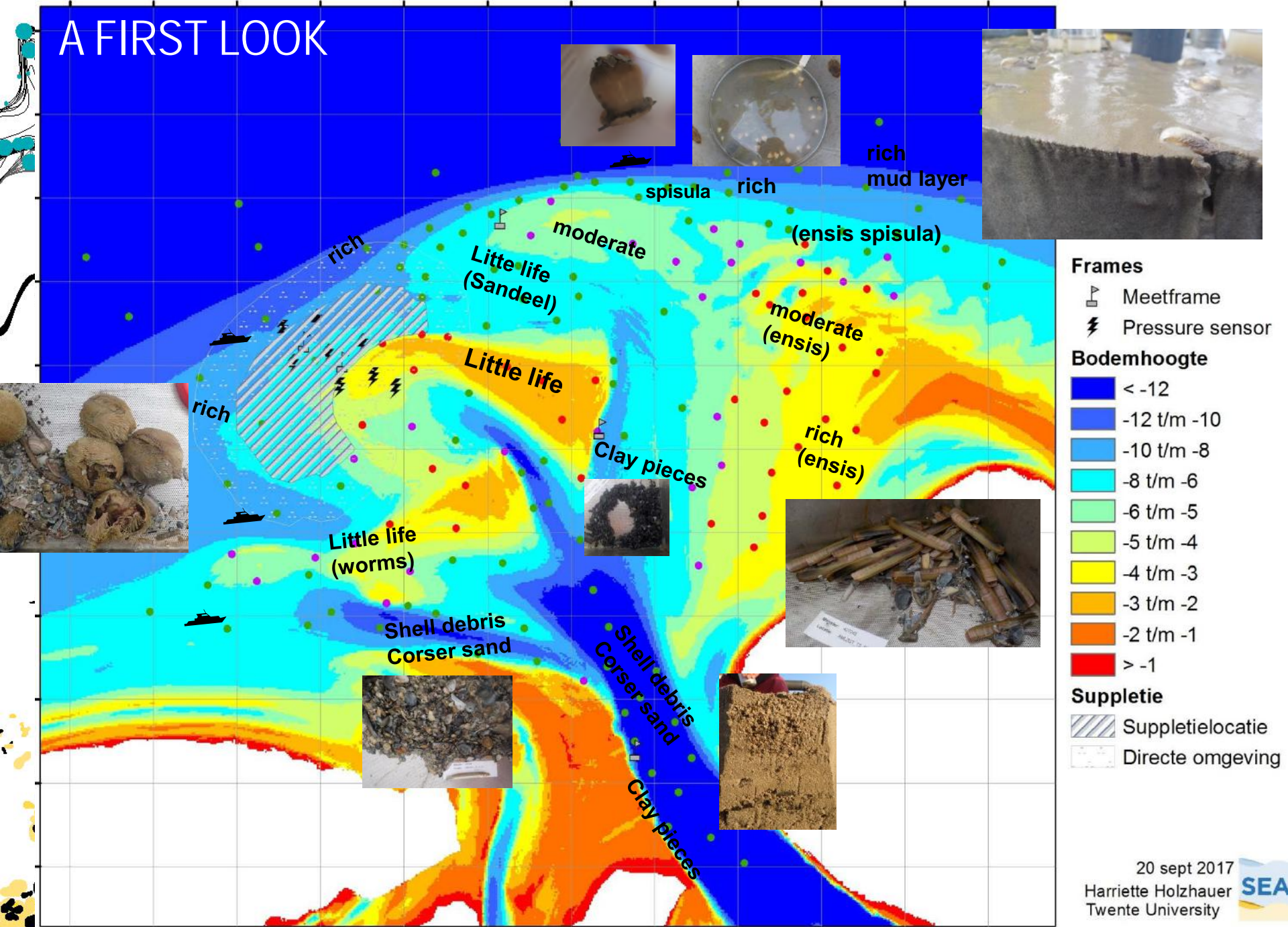
Sediment

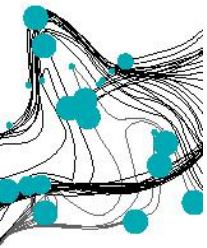


Benthic species

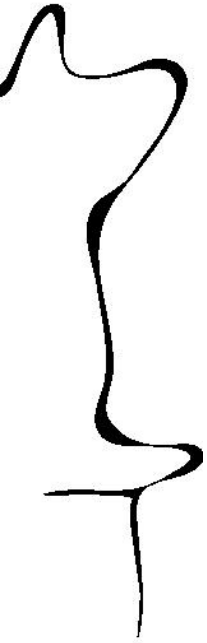


A FIRST LOOK





UPCOMING ACTIVITIES



- Species distribution at the ebb tidal delta based on the lab results
- Multivariate analysis to detect relations between the species distribution and the combination of abiotic parameters of the ebb tidal delta.
- Investigate the interaction of environmental parameters (hydrodynamic, morphodynamic in combination with meteorological conditions) with the help of existing numerical models (such as Delft3D, and Xbeach)





Questions ?