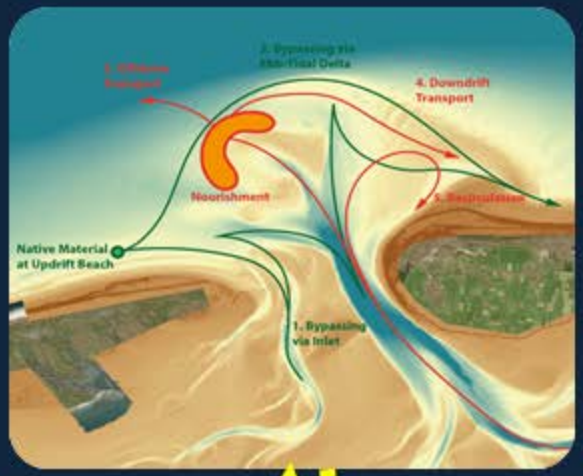
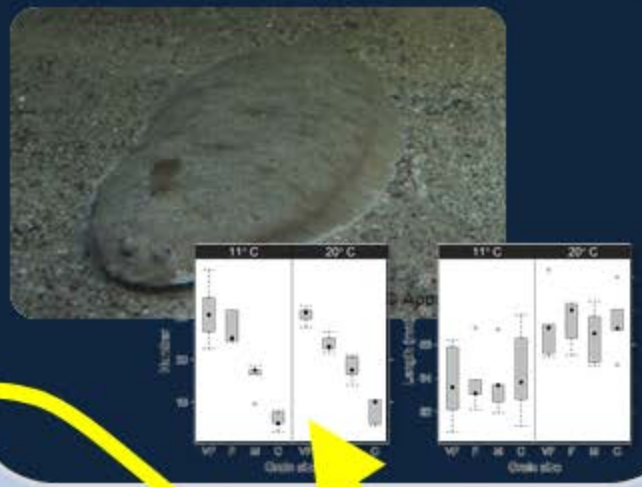
NCK theme day : Impacts of sorting

11 jan 2018
Art Centre, Delft

Large scale - Sediment balance

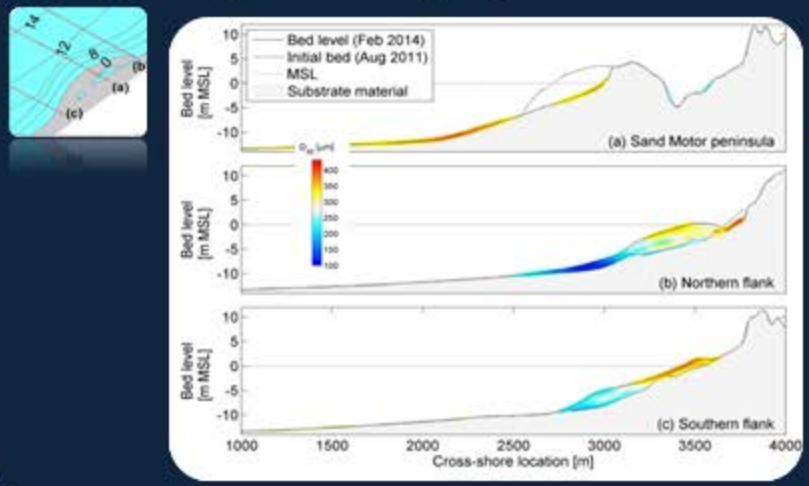


Habitat selection marine species

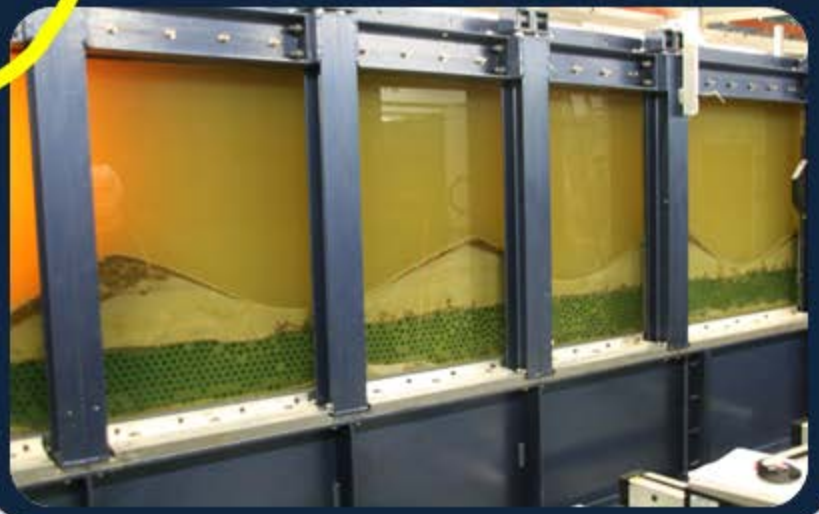


Influence of benthic species in the bed

Morphological changes (& Nourishments)



Local - Bed armouring



Impact of bed sediment composition on the environment

9:15 Welcome and Introduction

9:30 Key note : Steven Degraer (University of Gent)

About sediments and marine life: A clear cut and tight relationship?

10:15 Session 1 : *Bed sediment composition of the Dutch coast :*

- Stuart Pearson (TU-Delft) : Sediment Connectivity and Transport Pathways as a Function of Grain Size
- Hariette Holzhauer (Deltares / Univ. Twente): Ecology and bed composition of the Amelander Zeegat
- Bas Huisman (Deltares, TU-Delft) : Relevance of suspension sorting at the lower shoreface of the Sand Motor

11:15 Coffee

11:30 Session 2 : *Relevance of the abiotic environment for marine ecology :*

- Eelke Folmer (NIOZ): Sediment composition and benthos communities in the intertidal Dutch Wadden Sea
- Marjolein Post (WMR): Sediment preference of juvenile flatfish
- Marin van Regteren (WMR) : Oligochaetes in muddy sediments

12:30 Lunch

13:30 Key note : Maarten Kleinhans (Utrecht University)

Sorting out estuaries: similar effects of bed armouring and inherited cohesive layers on non-alluviated behaviour of rivers and estuaries

14:15 Session 3 : *Bed sediment composition monitoring & modelling*

- Joep van der Zanden (Univ. Twente) : Cross-shore sediment sorting: laboratory experiments and modelling
- Helena van der Vegt (TU-Delft) : The selective preservation of sediment supply in deltas
- Bas Borsje (Univ. Twente) : Bed level changes at saltmarsh-mudflat transitions

15:15 Panel discussion : About current and future applications

16:00 Drinks

17:00 Closing

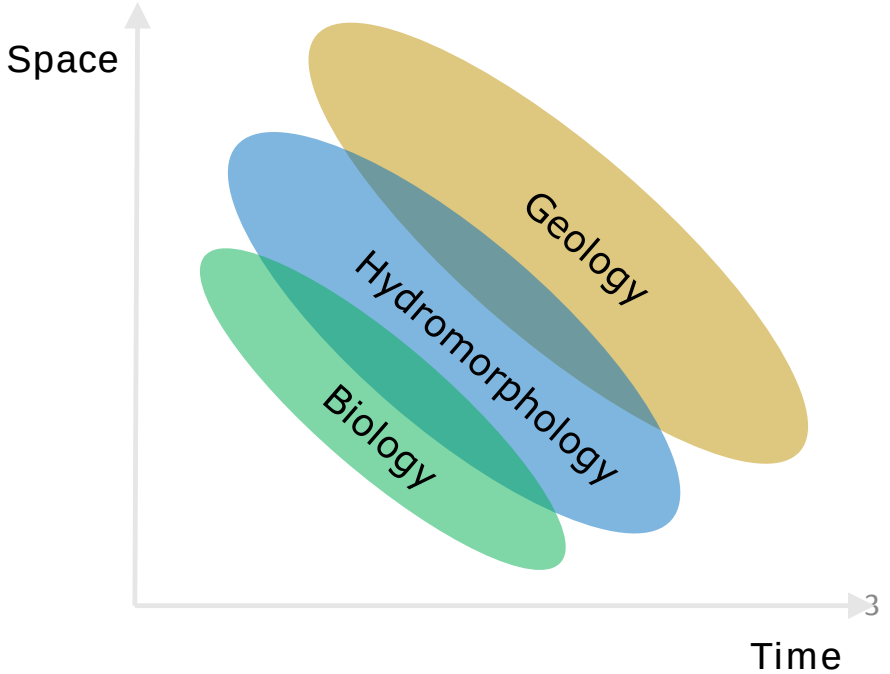
Introduction to bed sediment composition

The distribution of grain size in Dutch coastal sands is determined by:

Geology:
1. Deposits of early Pleistocene river sands.
2. Deposits of Saalian glacial period.
3. Deposits of Holocene river sands from the Rhine, Meuse and Scheldt.

Hydromorphology:
Erosion, transport and deposition by currents, waves and wind.

Biology:
The reworking by organisms.



Geology

Eisma, D. (1968). Composition, origin and distribution of Dutch coastal sands between Hoek van Holland and the island of Vlieland. Netherland Journal of Sea Research 4(2): 123-267.

Regional distribution of the three types of size frequency distribution in the sea sands.

Type D:rather fine grained with a coarse admixture.
Type E: overall coarser than Type D.
Type F: overall much finer even than type D.

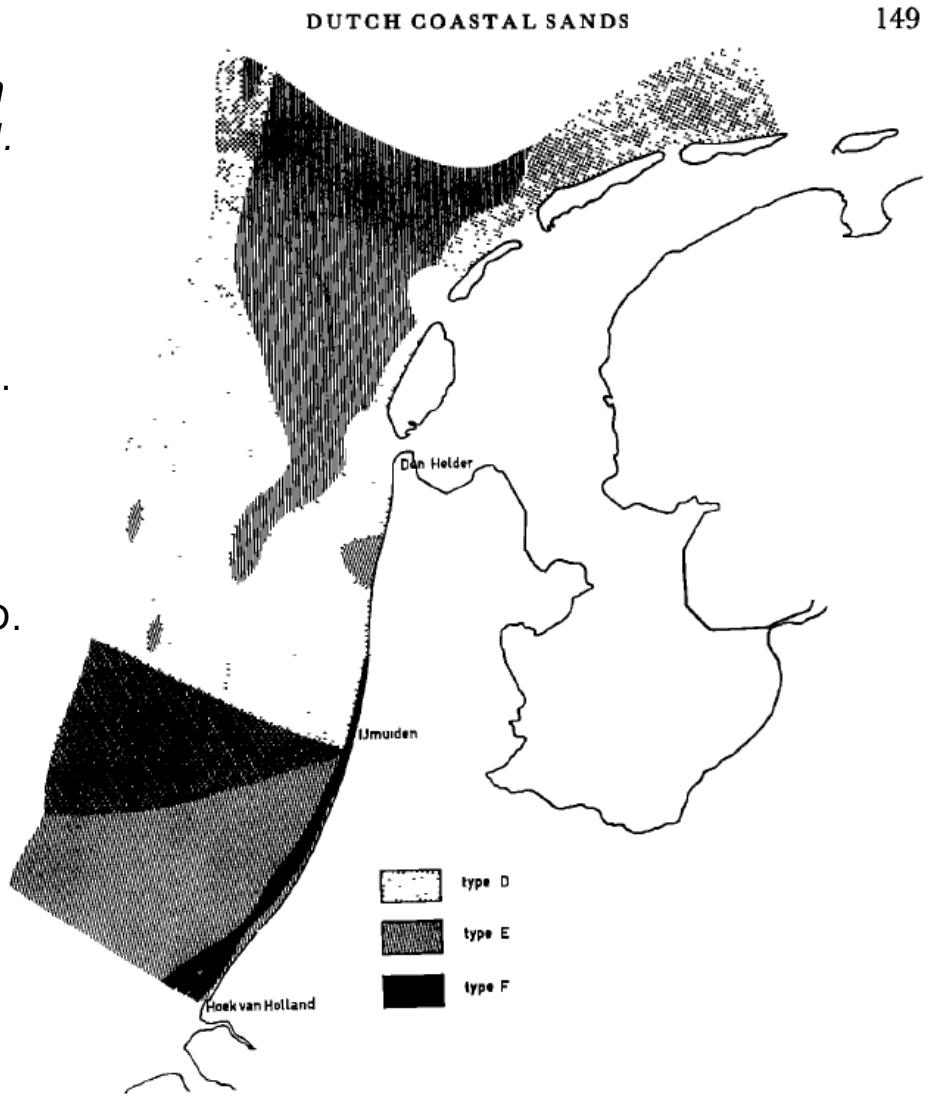


Fig. 12. Regional distribution of the three types of size frequency distribution in the sea sands.

Hydromorphology

Wolff, W.J. (1973). The estuary as a habitat. PhD thesis.

Vertical distribution of the median grain-size on tidal flats and in tidal channels.

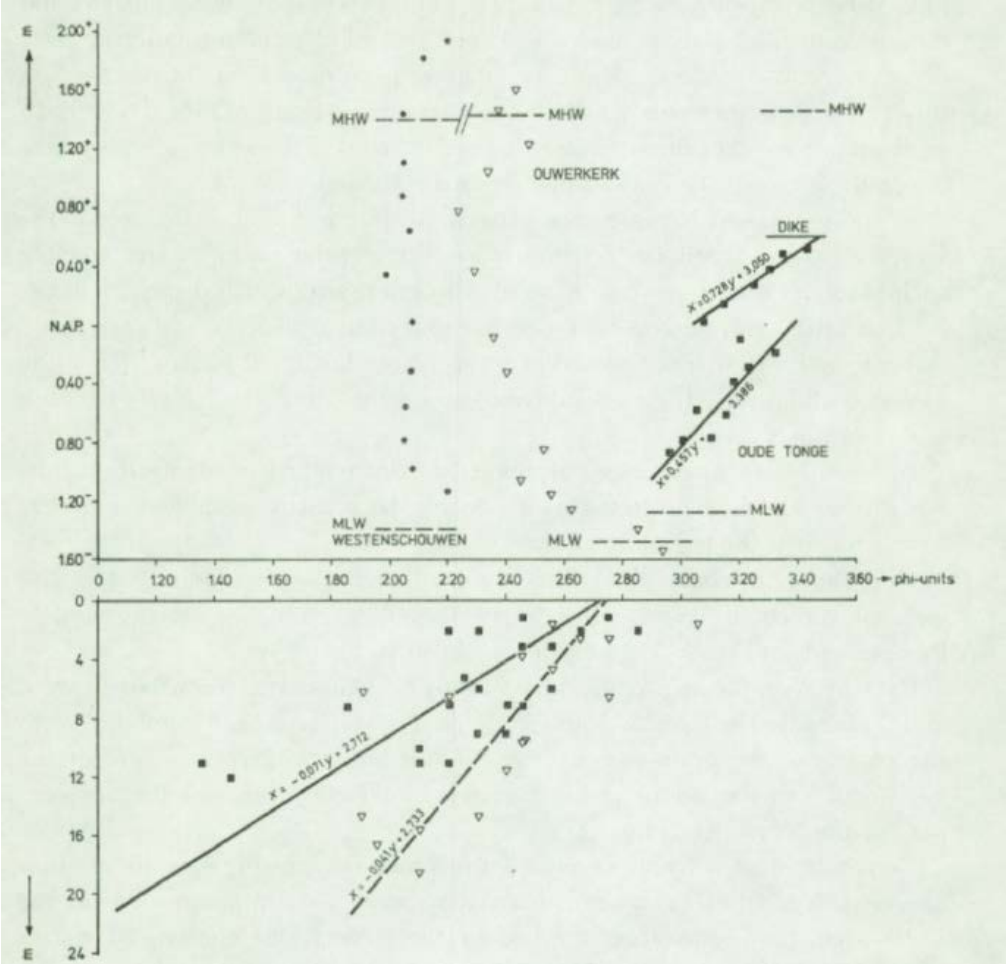


Fig. 3. Vertical distribution of the median grain-size on tidal flats and in tidal channels: near Oude Tonge (■, solid line), near Ouwerkerk (▽, dashed line) and near Westenschouwen (●). The median grain-size, expressed in phi-units, is represented horizontally. The level with regard to Dutch Ordnance Datum (NAP) is shown vertically in the upper part of the figure, whereas the depth below mean low water level is shown in the lower part. The vertical scale of both parts is not equal.

Biology

Van Straaten, L.M.J.U. (1954). Composition and structure of recent marine sediments in The Netherlands. Leidse Geologische Mededelingen, Deel XIX.

Sediment structures below pits of recent individuals of Arenicola marina. Basin of Arcachon, May 1953.

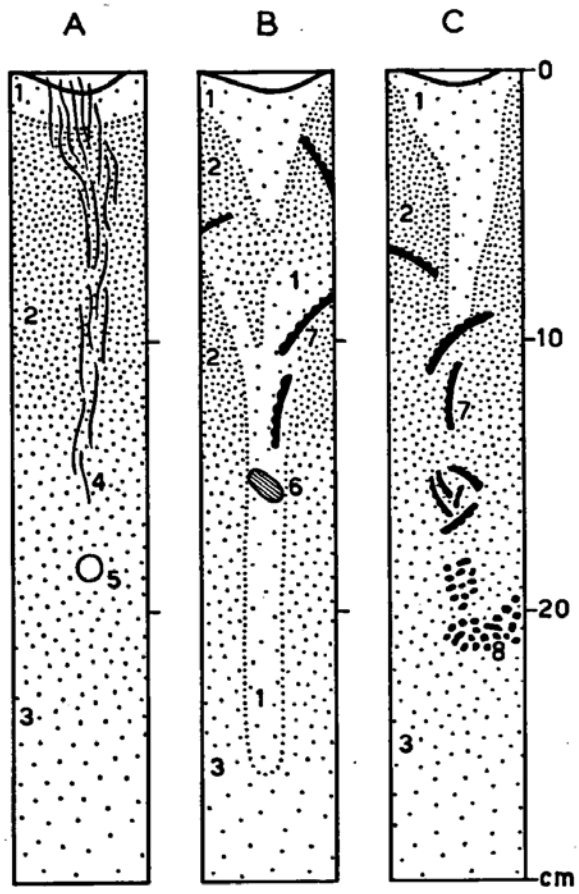


Fig. 25. Sediment structures below pits of recent individuals of *Arenicola marina*. Basin of Arcachon, May 1953.

1: Hydroxide zone;
2: Monosulphuric zone;
3: Pyritic zone;
..... Limit of Hydroxide zone;
4: *Zostera* leaves;
5: Cross section of horizontal gallery of *Arenicola*;
6: Piece of wood;
7: Shell fragments;
8: Accumulations of shells of *Bittium reticulatum, Hydrobia ulvae* etc.

Panel discussion

- Geologist: Sytze van Heteren
- Hydromorphologist: Bram van Prooijen
- Ecologist: Peter Herman

- We will discuss the outcomes of the presentations and key questions of today:
  - When does sediment grading become a key factor for morphological change?
  - To what extent is marine ecology affected by the bed composition?
  - What are the benefits of using information on bed grading?

- The panel will make future research recommendations.