Picture taken by:Siebe Zwart

Reconstructing Holocene palaeolandscape development by LOI-analysis in the Rhine-Meuse Delta



Reinder Hemstra, Elena Familetto, Kim Cohen, Wim Hoek[a]

[a] Departement of Physical Geography, Faculty of Geosciences, Utrecht University, The Netherlands

Utrecht University

r.c.hemstra@students.uu.nl



Determening the sediments with Elena Familetto



Identifying a possible palaeosoil?



Taking samples in the laboratory



Putting the samples in the oven to loose OM*

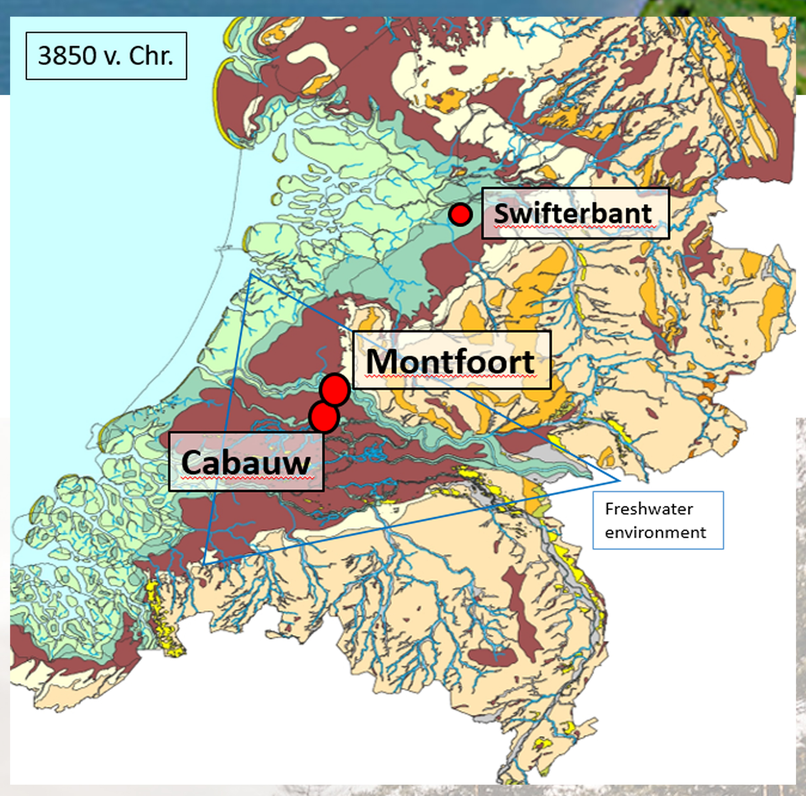


Weighing the samples to determine the loss of OM*

* OM = Organic Matter

1. Background

Virtually all of the Holocene delta of the Rhine-Meuse deltaic plain was created either by river sedimentation in a back-barrier or by peat formation (Berendsen & Stouthamer, 2000). Floodbasins between Rhine-Meuse branches first formed in the Middle-Holocene, which collected clayey sediments (low organic content). In areas distal from active river branches, peat formation (high organic content) occurred due to rising sea- and groundwater levels. The aim of this project is to reconstruct periods of river sedimentation and peat formation at the Montfoort-Cabauw region during the Middle-Holocene.



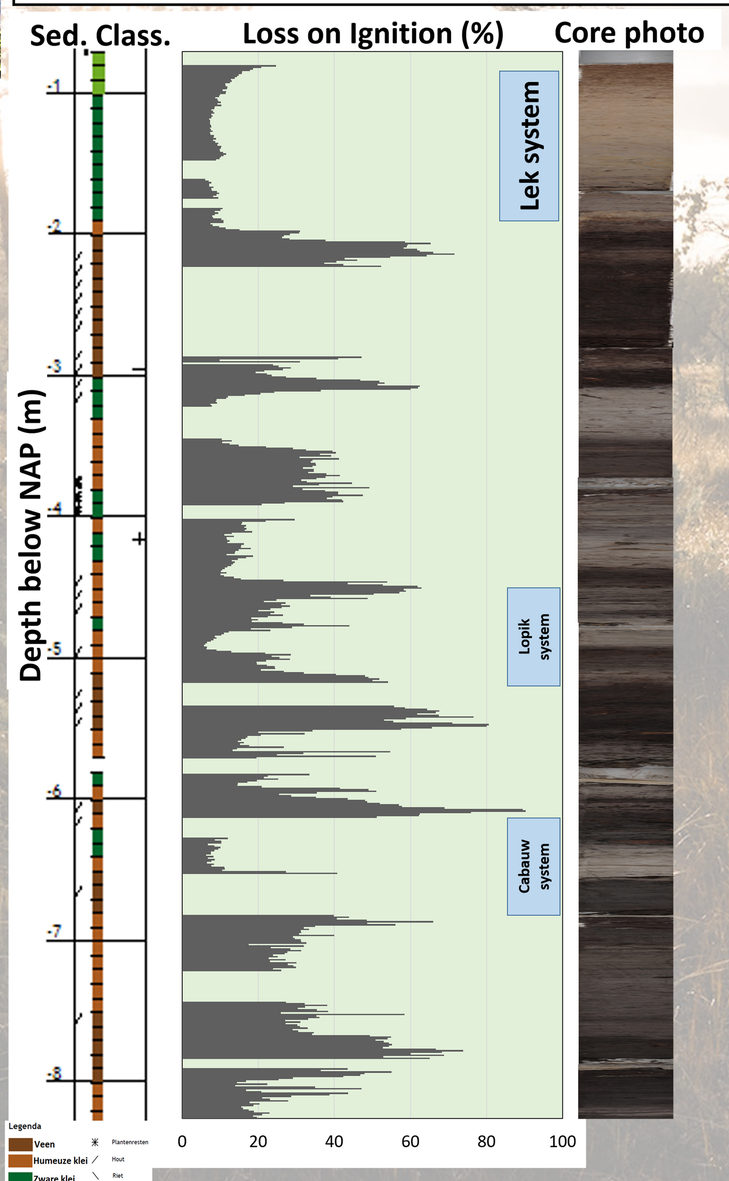
2. Finding Suitable Grounds

This project is part of a bigger project called: 'Finding suitable grounds' (Universities of Groningen and Utrecht) which aims to understand the activities of Human subsistence in the Rhine-Meuse delta between 6000 and 4000 cal. Yr. BC. In this deltaic region there is increasing evidence for early agricultural human activity (Neolithic: Swifterbant culture). Instead of a classical approach focusing on settlements, The FSG-project brings the wider surroundings and landscape management to the forefront. The reconstruction of the Holocene palaeolandscape with river levees and floodbasins is of relevance in determining whether or not a certain area was suitable for crop cultivation.

4. results

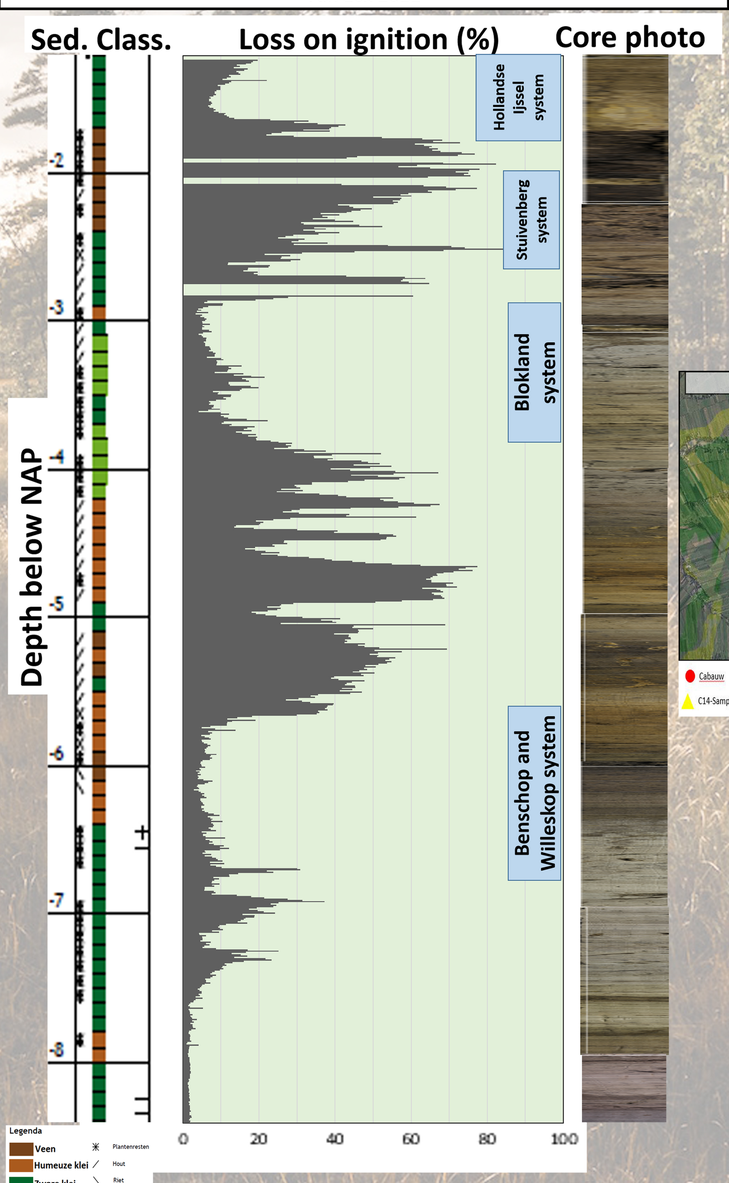
Cabauw Coring

TNO B38E2484



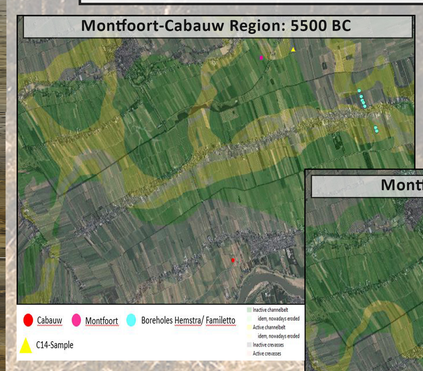
Montfoort Coring

Van Eck 2021



3. LOI-analysis UU

By doing high resolution (1 cm) LOI-analysis (Loss-on-ignition), organic content is measured in two floodbasin cores from the area between Montfoort and Cabauw (Province of Utrecht). We used the stove and oven at the ESL (Earth Simulation Laboratory) to respectively vaporize the water content and ignite the organic content of the samples. The results give a signal of alternating proximity and distality to active Rhine branches that appear to have frequently avulsed in this period.



5. To be continued

- Greyscale analysis of the core photos to indicate OM-content for the missing parts
- Radiocarbon dating
- Identifying possible palaeosoils