

An archaeological survey of the land-sea transition zone at Doelpolder Noord: impact of sea level rises on the palaeolandscape and human occupation from prehistory to the middle ages. Results of the first fieldwork campaign

Verhegge J.¹, Missiaen T.², Crombé Ph.¹

→ Jeroen.Verhegge@ugent.be

1 Ghent University, Department of Archaeology, Belgium

2 Ghent University, Department of Geology & Soil Science, Belgium

After the formation of the late Pleistocene sand-ridge landscape of north-western Flanders, increased fluvial and marine influences have defined human occupation of the alluvial plain of the lower Scheldt river. Through this study we aim to reconstruct its preserved Late Pleistocene and Holocene landscape and model the impact of environmental change through time.

In a first phase, the subsurface is mapped using geophysical techniques, revealing the project area's spatial geological variation. Electromagnetic induction survey (EMI) is used to map the horizontal extent of the electrical properties of the subsoil at multiple depth extends, while electrical resistance imaging (ERI) records vertical variations. In addition, shallow seismic surveys, both on land, on creeks and on the Scheldt river, are used to image the buried geological features.

Cone Penetration testing (CPT), manual and mechanical coring is applied both as calibration for the geophysical data and as an additional mapping technique where geophysical data fail to reveal the preserved landscape. Collected samples are also used for radiocarbon dating and archaeological prospection.

The first results in 'Doelpolder Noord' indicate that all EMI datasets clearly reveal the undulating sandy substrate. The ERI data show the geological layering above the overlying peat but the limited depth penetration does not allow to reveal the transition to the top of the Pleistocene sands (except when above ground water). However, the latter stands out clearly on the preliminary terrestrial seismic data. Marine seismic results, though hampered by shallow gas most likely resulting from the peat, show locally strong reflectors that can possibly be related to peat layers and palaeogullies.

Hand-augering has been able to map and sample a micro-sandridge flanking an early Holocene gully, situated centrally in the study area. Sample sieving has revealed the presence of a prehistoric site preserved in the Pleistocene sand to peat transition. Unfortunately, the collection of archaeologically relevant samples by hand was impossible on the deeper flanks of the ridge. The CPT data allow a clear distinction between the major geological units, but the existing soil classification charts do not (as yet) allow their interpretation. Further CPT sampling is needed to provide an independent interpretation framework for the region. Nevertheless the CPT data seem to provide a rapid and cheap solution for the calibration of geophysical data.

The Scheldt polders are rich in Final Palaeolithic, Mesolithic and early Neolithic archaeological sites, yet the occupation history of the proto- and early historic peat-landscape is still badly known. At the same time this cultural heritage has become under serious threat by harbour expansion works. Through this study a cost-efficient archaeological evaluation strategy will be proposed, combining onshore and offshore surveys, using the Scheldt polders as principal area of interest.