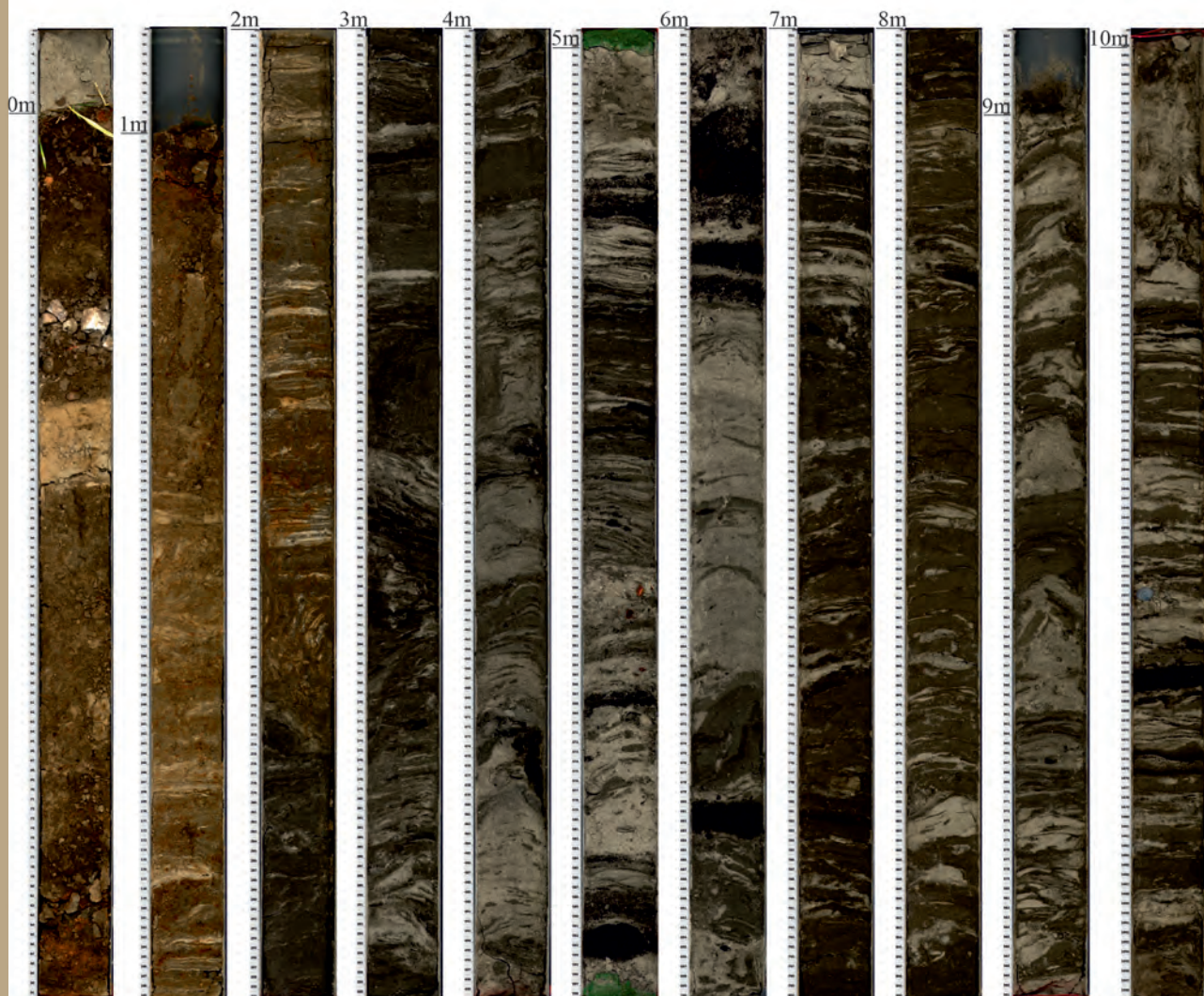


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Sedimentary analysis of mechanically drilled cores
nearby Hoeke, eastern coastal plain of Belgium

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SEDIMENTARY ANALYSIS OF MECHANICALLY DRILLED CORES NEARBY HOEKE, EASTERN COASTAL PLAIN OF BELGIUM

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Abstract

In the context of the interdisciplinary project “High Tide - Low Tide: The late-medieval harbour of Bruges as a maritime-cultural landscape”, seven mechanical undisturbed cores were drilled in the village of Hoeke (Municipality of Damme). This manuscript aims at documenting these cores; it includes 1) the detailed facies description of the cores, 2) the introduction of a lithofacies classification and the interpretation of the described deposits according to the defined lithofacies classification and 3) the identification of the different depositional forms (architectural elements) per core.

Keywords: core description, lithofacies, architectural elements, tidal channels, tidal flats

1. Introduction

The Geological Survey of Belgium has contributed to the interdisciplinary project “High Tide - Low Tide: The late-medieval harbour of Bruges as a maritime-cultural landscape” by reconstructing the Holocene sedimentary environment of the “Zwin area”. The term “Zwin area” refers to an area extending from Sluis (NL) to Damme (B; fig. 1) that was dominated in the late High and late Middle Ages by a tidal channel, named the Zwin. According to some historical sources, the Zwin tidal channel formed in the year 1134, following a storm surge (Verhulst, 1959; Pannier, 1970; De Clercq *et al.*, 2021). It assured the connection of Bruges with the North Sea. Bruges itself was located inland and had no direct access to the seashore. However, this did not prevent Bruges from becoming a hub in the international maritime trading system that linked the North Sea area with the Baltic, the Mediterranean and even with the Asian silk route (Dumolyn & Leloup, 2016; Brown & Dumolyn, 2018; De Clercq *et al.*, 2021). From archaeological research and historical sources (Trachet *et al.*, 2015, 2018; De Clercq *et al.*, 2017; Trachet *et al.*, 2017a,b,c; Leloup, 2018; De Clercq *et al.*, 2021), it is known that along the Zwin tidal channel an interconnected system of outer harbours, so-called “outports”, developed. As the Zwin lost its function as a transport route during the late Middle Ages, the port facilities of the outer harbours were abandoned

and the sites became deserted. One of the lost outports was “Hoeke”, the case study in the “High Tide - Low Tide” project. Because no information regarding the geological structure of the subsurface in Hoeke was available, first a series of electrical cone penetration tests (CPT-e) was carried out. Based on the information from the CPT-e’s, seven undisturbed mechanically drilled cores were carried out with a hollow stem auger.

This manuscript is a data repository, it is not intended to reconstruct the evolution of the sedimentary environment in Hoeke and immediate surroundings during the Late Holocene, for that we refer to Bogemans *et al.* (submitted).

2. Study area

Bruges and the lost outports are located in the eastern coastal plain of Belgium. At present, the eastern coastal plain is characterized by a low-lying flat landscape (polders) with sluices, ditches, embankments and canals with an elevation ranging between +2 and +4.5 m TAW (Mostaert, 1985; TAW is the Belgian ordnance datum, which refers to mean low water spring, *i.e.* about 2 m below mean sea level). The flat topography hides a complex Quaternary geological history. The shallow subsurface of the area is predominantly shaped by tidal processes linked to the presence of tidal inlet(s) during the Holocene (Vos, 2015). The deeper parts are formed by both coastal and purely terrestrial processes during

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