The Zwinproject

Medieval Bruges and its outer ports. A landscape archaeological contribution to the Zwin-debate

FWO Research Project 2013-2016

The medieval port area of ‘het Zwin’ is a dynamic landscape, influenced for centuries by the interaction between men and nature. The broad sea channel of ‘het Zwin’ supported the development of a linear portuary area with flourishing harbours settlements on its banks and crowned by Bruges which grew into an economic and cultural metropolis. After 1500, the economic importance of Bruges and the surrounding areas diminished due to increased siltation of the tidal inlet. The Zwin area lost its function as a harbour and many settlements along it became deserted.

For more than a century the debate around Bruges’ connection to the sea and the lost villages was dominated by historians and pedologists, while archaeological input was almost nonexistent. In recent years however, landscape archaeology demonstrated the potential of non-invasive prospection techniques. A combination of traditional and new non-destructive prospection techniques promises to deliver a broader and more valuable archaeological dataset, resulting in a better understanding of the evolution of the Zwin-area.

Acquisition & processing of existing data layers for the entire Zwin area

Remote sensing

Aerial Photography

Orthogonal

The UGent-database contains more than 1500 oblique aerial photographs for the Zwin area. After a first assessment, 122 of them were georectified. Approximately 1500 potential archaeological features were identified and mapped.

The picture especially revealed cropmarks located on higher ground, as well as some isolated patches. In addition, the UGent-database contains around 300 aerial photographs on the area taken during WWI.

LiDAR

The LiDAR-dataset consists of ground points with a sample density of at least 1 point/m² and an average density of 1 point/2m².

In our project area, LiDAR has two major contributions. On a macro scale, it gives information on the geomorphology of the area and it can be compared with the soil map. On a smaller scale, it reveals the micropalaeogeography thus being complementary with the oblique aerial pictures.

Archaeological data

The archaeological basis for the project lies in the fieldwork of Dekkerse, conducted by Elke Hillewaert in the early 90’s. Nearly a 1/3 of the archaeological sites in the Zwin area (Abontels) resided in the Central Archaeological Inventory (CAI) were found in this authoritative study.

Moreover, there still remain unknown datasets such as the Tilleman collection, originating from the site at Hoeke and various anonymous collections of metal objects, found by detectores.

Desktop objectives

- State of the art of the Zwin-debate, embedded in its broader geographical, historical and geomorphological framework
- Retrogressive integration of the multi-proxi data in a historical GIS
- Delimitation of test-regions

Desktop

The sites

Bonem

Michem

Monnikerede

Hoekte

Koolkerke

High-resolution scan and developing new data layers on the selected sites

Non-invasive

UAV

The Trimble UX5 is a remote-sensing prospecting tool bridging the gap between terrestrial and aerial surveying using airborne LiDAR technology. The survey is based on the use of an airborne LiDAR sensor that can capture data at a high resolution, which can be processed into a highly detailed and accurate DSM.

This technique was tested on the site of Monnikerede, where the archaeological features are most obvious in its micropalaeography.

Geophysical Survey

The outline of these test sites will be surveyed simultaneously deploying two geophysical wands sensors. They are complementary in scale, in order to reach the best results for different types of soil and archaeological features.

In a receiver loop EMI-sensor, measuring simultaneously the electrical conductivity and the magnetic susceptibility.

Fieldwalking

The artefacts found during fieldwalking will be recorded by GPS which allows for an accurate positioning. After determination, these surface finds will be analyzed using spatial analysis techniques in order to investigate the patterning amongst their spatial distribution.

Invasive

The objective of this first stage is to validate the before mentioned prospection techniques. There are three invasive options that can be used.

Augering is in specific areas where archaeological or geomorphological anomalies were detected.

Limited test-pits, depending on specific questions related to nature and date of features detected in the survey or aimed at assessing quality of preservation.

Large scale infrastructural developments that make a cross section of the project area will be follow-up closely. (Arnaud & A11)