Drowned but not deserted. Interactions between social and ecological processes of estuarine landscapes after flooding. Test-case: the Waasland polders on the west-bank of the River Scheldt (16th-19th centuries)

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This pitch presentation will be used to give an overview of four years of doctoral research on the post-medieval interactions in the estuarine landscape of the Waasland Scheldt polders.

Estuarine landscapes are very dynamic ecosystems which makes it very difficult to model social and ecological adaptations after catastrophic inundations. In this research project the evolution of tidal channels after historical inundations and the human re-occupation of flooded areas in the late medieval and early modern Western Scheldt Estuary are used to enhance our knowledge of the long-term interactions between ecological and social processes.

In the period after the late-16th century inundations both ecological and social (or socio-economical) processes took place, each interacting with one another. In this presentation we will discuss four elements that shaped and interacted within the study area from the late 16th to the 19th century: (1) the extensively mapped tidal channels which were responsible for heightening the marshlands to an 'embankable' height, (2) the soil structure in later embankments, determined by the former tidal marsh structure, (3) the embankment process (mainly induced by the Arenberg family) in which technical solutions had to be found in order to deal with complications due to the tidal marsh structure and (4) land use and land value in the embankments (as results of the above mentioned processes).

1. After the 16th century inundations an extensive tidal channel network developed. This network allowed the transport of sediments into the tidal marsh, resulting in a natural heightening of the marshlands, which was a *conditio sine qua non* for later embankments of the tidal marsh, since at least a major part of the marsh should be raised above mean high water level. Furthermore, the tidal channel structure was extensively mapped since the former imposed technical difficulties during future embankments.

2. The second element of interaction is formed by the soil (or sediment) conditions inside and outside the embankments. The outer dike area is formed by tidal channels, mudflats and (higher) tidal marsh. This three-partition is reflected in the embanked areas (the former tidal marsh) which have a subdivision in sand, silt and clay. Therefore, quantitative evidence for the correlation between the (former) tidal marsh structure and the soil structure within the embanked marshes was gathered using soil samples and grain size analysis.

3. In the third part we will focus on the human activity in the inundated area. Over a period of three centuries the extensive tidal marsh (drowned in 1583-85) was gradually re-embanked under a growing influence of the Arenberg family. These embankers had to handle the complexities imposed by the natural situation of the tidal marsh.

4. Interaction of the above mentioned elements created a typical soil structure in the different embankments, which resulted in different opportunities for land use. Since the quality of the soils has an influence on crop yields, this pattern also translated in different land values within the embankment. Quantitative spatial micro-level analysis was used to establish a proven correlation of these physical and socio-economical properties.

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