Clastic lake fills in the Rhine-Meuse delta
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Introduction and study area
Lakes occur in distal zones of deltaic plains. They form in peat areas where fluvial activity is absent. These lakes may fill in with organic mud or with clastic deposits when a river occupies the area. In the Rhine-Meuse delta so-called clastic lake fills have been reported but never described in detail. This hampers e.g. the assessment of hydrological and geomorphological properties of the deposits. The aim of this study is to identify the architecture and facies distribution of clastic lake fills in the Rhine-Meuse delta. Two study areas were selected: 1) the central delta where clastic lake fills are present at the base of the Holocene succession and 2) the Angstel-Vecht area (Fig.1). The results of the Angstel-Vecht area are presented here.

Methods
In the Angstel-Vecht area clastic lake fills are present near the surface. This enabled detailed analyses of the facies distribution of the clastic lake fills. Based on a high resolution DEM and corings a geomorphogenetic map and cross sections were constructed. From these the architecture and facies distribution were determined. Facies interpretations were based on sedimentary, pollen and diatom analyses. Diatom and pollen analyses were carried out on 44 samples distributed over two mechanical cores.

Results
The area of the investigated clastic lake fills is up to 30 km², the thickness is 3-5 m (Fig. 1-2). The transitions to the surrounding peat are generally sharp and marked. The deposits consist of a clastic layer that includes a coarsening-upward sequence overlain by organic lake sediments (gypjas). The sedimentary logs (Fig. 3-4) show the laminated character of the deposits, indicative for lacustrine deposition. The diatom and pollen analyses clearly indicate deposition in a standing freshwater body of which the depth decreases upward in the sequence. Comparable results are found in other investigated areas in the Rhine-Meuse delta.

Conclusions and further research
Lakes act as sediment traps. Therefore, the sediment characteristics of the fluvial system are reflected in the composition of clastic lake fills. Clastic lake fills can be recognized as separate architectural elements in the Holocene. High resolution studies of clastic lake fills are important to understand the development of clastic lake fills. Studies of clastic lake fills are important to understand the development of clastic lake fills.