Morphological development of the Perkpolder tidal basin

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Introduction

Since 2003 the ferry between Kruiningen (Zuid-Beveland) and Perkpolder (Zeeuws-Vlaanderen) is out of service, which was a starting point for regional development initiatives at Perkpolder. These initiatives combine housing, recreation and development of a salt water natural area. For the development of this area, Rijkswaterstaat made an opening in the original dyke of 400 m and constructed a new dyke around this new tidal basin with a surface of 75 ha. After the opening in June of 2015, the area gets flooded twice per day, which results in sediment import from the Western Scheldt. The potential sediment import, and the accumulation rate are important parameters in the development of salt marches, and the possibilities for recreational usage. In this study the morphological development of the Perkpolder basin is investigated and compared with reference basins in the vicinity.

Methodology

For this study the basin hypsometry of the Perkpolder tidal basin is investigated and compared with other areas (Land van Saeftinghe and Sieperdaschor), to give an estimate of the sediment storage capacity of the newly created basin. To predict sediment accumulation rate at Perkpolder tidal basin, the elevation development of these additional areas are used in combination with field measurements, and model predictions.

Findings

Perkpolder is a relative low lying basin, this is due to the early (13th century) embankment of the polder. The tidal basin is at this point in time suitable for development of mudflats. To reach the final stage of a sediment filled basin, the average basin elevation should rise approximately 2.8 m (with Saeftinghe as a reference), and import around 1.8 x106 m3 of sediment. If sediment availability is not a limiting factor, the hypsometric curve of Perkpolder will show the most significant changes through time as compared with other basins in the vicinity.