

Optimisation of the design of the Hedwige-Prosperpolder depoldering: a multi-model approach

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The area Hedwige-Prosperpolder was designated for depoldering in the bilateral (Flemish-Dutch) vision for the Scheldt Estuary "Ontwikkelingsschets 2010". The VNSC ("Vlaams Nederlandse Schelde Commissie") commissioned research in 2015 to look into an optimisation of the existing design of the depoldering. Flanders Hydraulics, together with Deltares and Unesco-IHE looked at the question whether it was possible to achieve the goals of the project while minimising initial human intervention. A flow model was set-up in Telemac-2D to estimate flow velocity and bottom shear stress and the efficiency of tidal filling and emptying. An empirical tidal marsh development model was used to estimate the time-scale of expected vegetation development. A wave model was used to predict the impact of wind and ship waves in the area after depoldering.

Predicting the evolution of a depoldered area is a difficult question to tackle because of the many processes involved (flow and waves driving erosion and sedimentation, vegetation development influencing morphological development, ...) and still a matter of active research. The experience of the Hedwige-Prosperpolder project shows that a smart combination of different model types can provide elements of an answer that can be combined through expert judgement.