

Tidal marsh vegetation modelling in de Scheldt Estuary: the importance of drainage regime

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The River Scheldt is a macrotidal estuary with a tidal reach up to 160km upstream and a salinity gradient including polyhaline to fresh water habitats. The estuary has been heavily influenced by anthropogenic pressures such as land reclamation, harbour expansion, dredging activities, embankments and urbanisation. As a consequence tidal mudflats and marshes deteriorate or disappear by submersion or erosion. In the future managed realignments have been planned along the whole salinity gradient to restore and strengthen the ecological functioning in the Scheldt estuary.

In order to assess the impact of hydraulic changes in the estuary on tidal marsh vegetation we have studied the link between (a)biotic factors and vegetation.

Firstly we are modelling the local water regime (flooding and drainage) in relation to measured tidal regime at tide gauges, taking into account geographical factors such as distance to the river, creek, drainage distance, geomorphological units,.... Local water regime has been recorded with dataloggers during two consecutive springtide-neap tide cycles at about one hundred locations along the fresh – brackish gradient in different vegetation types.

Subsequently the modelled water regime and salinity will be related to tidal marsh vegetation.

Salinity and surface elevation in relation to tidal inundation factors (flooding frequency and duration), together with drainage regime are the main key factors that determine the potential for tidal marsh development.

Based on the main drivers, a predictive model will be made for potential habitat development and species presence under different hydraulic conditions, as well as potential in new restoration areas along the Scheldt estuary.