SEDIMENT-STABILISING AND -DESTABILISING ECOENGINEERING SPECIES FROM RIVER TO ESTUARY: THE CASE OF THE SCHELDT SYSTEM

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Interactions between organisms and landscape-forming processes play an important role in evolution of coastal landscapes. In particular, biota has a strong potential to interact with important geomorphological processes such as sediment dynamics. Although many studies worked towards quantifying the impact of different species groups on sediment dynamics, information has been gathered on *ad hoc* base. Depending on species' traits and distribution, functional groups of ecoengineering species may have differential effect on sediment deposition and erosion. We hypothesize that the spatial distribution of sediment-stabilising and -destabilising species across the channel and along the whole salinity gradient of an estuary partly determines the planform shape and channel-shoal morphology of estuaries.

To test this hypothesis, we analyse vegetation and macrobenthic data taking the Scheldt river-estuarine continuum as model ecosystem. We identify species traits with important effects on sediment dynamics and use them to form functional groups. We are able to accurately describe the distributions of the different functional groups along the estuarine gradient and observe a clear distinction of dominant ecosystem-engineering functional groups and their potential effects on the sediment in the river-estuarine continuum.

The first results for the longitudinal cross section show the highest effects of stabilising plant species in riverine and sediment bioturbators in the weak polyhaline part of the river-estuarine continuum. Analysis of the distribution of functional groups in transverse cross sections shows dominant stabilizing effects in the supratidal zone compared to dominant destabilizing effects in the lower intertidal zone (Figure 1).

This analysis offers a new and more general conceptualisation of the distribution of sediment-stabilizing and -destabilizing functional groups of ecoengineering species and their potential impacts on sediment dynamics, shoal patterns and planform shapes in the river-estuarine continuum. We will test this concept in future modelling and experiments.

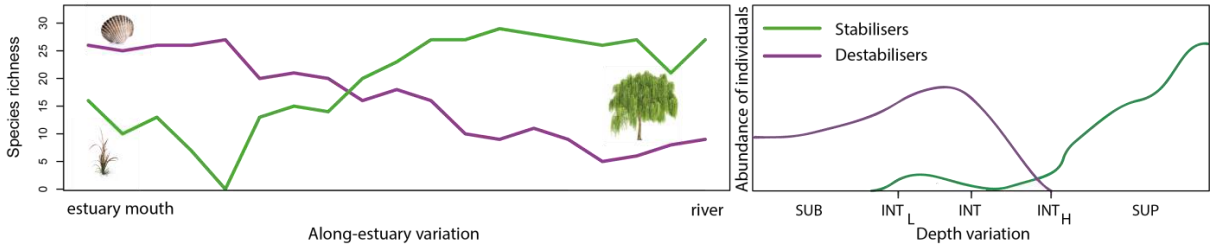

Figure 1. Distribution of sediment-stabilising and -destabilising ecoengineering species in Scheldt system.