Sediment and morphodynamics of the Belgian coastal zone

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The sediment- and morphodynamics of the sandbank-swale system of the Belgian near coastal area was studied using a variety of sedimentological and geophysical techniques and covering different spatial as well as temporal scales.

An interactive model is proposed whereby by transport of sediment is mainly dependent on the swale configuration. Especially when the tidal currents are funnelled, sandy sediments are being washed out and gradually stored at the foot of the banks. Part of the accumulated sediments is subsequently winnowed out and transported upslope the sandbanks by the combined action of currents and waves, the latter being also important in the maintenance mechanism of the sandbanks. From chrono-sequential measurements an indication could be given of the vulnerability of the coastal system and it could be stated that there is a clear relation between the observed morphological changes and the ruling hydro-meteorological conditions.

From the spatial and temporal differentiation, the near coastal area can be regarded a self-regulating sediment transport system dominated by longshore sediment fluxes.

The origin of the sandbanks is likely constrained to a time period having hydrodynamic characteristics to the nowadays situation.