

The Belgian coast: where does the sand go?

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The Belgian coastal area is historically prone to flooding due to storms. This 65km long sandy coast is characterised by dunes and concrete sea dikes. In order to protect the coastal settlements and the hinterland from flooding, sea dikes were built in the past. From the 1970's onward, sand nourishments are the preferred way to protect the coast.

The coastal area from the dunes to 1.5km offshore is surveyed to monitor the coastal topography and bathymetry. These data are analysed, also taking into account dredging and nourishment works.

Over the whole Belgian coast, on average, there is a net increase in volume over time. However, there are large spatial differences. Areas with large accretion exist both west and directly east of Zeebrugge harbour and on the Broersbank near Koksijde. In contrast, structural erosion is found near Knokke and between De Haan and Wenduine. In these erosive areas, frequent re-nourishment is required to maintain the coast. Furthermore, it is found that the dunes and dry beach are mostly accretive. The intertidal beach is also mostly accretive; however, a large erosional area exists east of Zeebrugge. The shoreface and seabed are mostly erosive with only a few accretive areas.

When correcting for nourishments the accretive trend reduces drastically, yet remains positive. Since very few shoreface nourishments are present, the trends of the shoreface and seabed hardly change.

The analysis concludes that there is a small net component of cross-shore sediment transport from the shoreface towards the dunes. Yet, several erosion hotspots need continuous attention. Additionally, nourished volumes from beach nourishments remain in the zone above low water. Further research is needed to determine the accuracy of the surveys and the exact rates of erosion or accretion.

Keywords: Belgian coast; Beach volumes; Nourishments