

## Managed Realignment of Lillo's Potpolder

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The Sea Scheldt restoration plan aims to establish 2000 hectares of new estuarine habitat in Flanders (Belgium). Managed realignment or depoldering is an effective but irreversible estuarine restoration measure. In 2012, the Lillo's Potpolder was depoldered and divided into two compartments with distinct realignment designs. Lillo-West had the dike fully removed, whereas Lillo-East retained a partial dike with a single breach.

Over the first decade, sedimentation, vegetation dynamics and macrozoobenthos populations (mud scud and ragworm) were monitored. Creek development was reconstructed using aerial photographs and LiDAR data. Within one year, a dendritic creek system had formed, and after ten years both compartments showed substantial sediment accretion, with higher net sedimentation in Lillo-West. Vegetation established via two pathways: clonal expansion from higher zones (e.g. reed, bulrush) and pioneer colonization on creek ridges, starting with the algae (*Vaucheria* sp.) and followed by pioneer species (e.g. sea aster, orache). While pioneer species emerged simultaneously in both compartments, their expansion was faster in Lillo-West. Macrozoobenthos populations settled rapidly and reached similar densities in both compartments.

Estuarine habitat development processes progressed more rapidly in Lillo-West due to the complete dike removal, which maximized tidal exchange, accelerated sedimentation, and enhanced creek density. These factors contributed to a faster transition from unvegetated mudflats to vegetated tidal marshes. Ultimately, both compartments developed into fully functional estuarine environments, confirming that well-implemented managed realignment facilitates natural estuarine ecosystem restoration. Long-term monitoring has proven essential for understanding these processes and guiding future restoration efforts.

### Keywords

Estuarine Restoration; Managed Realignment