

TIDE FACTS

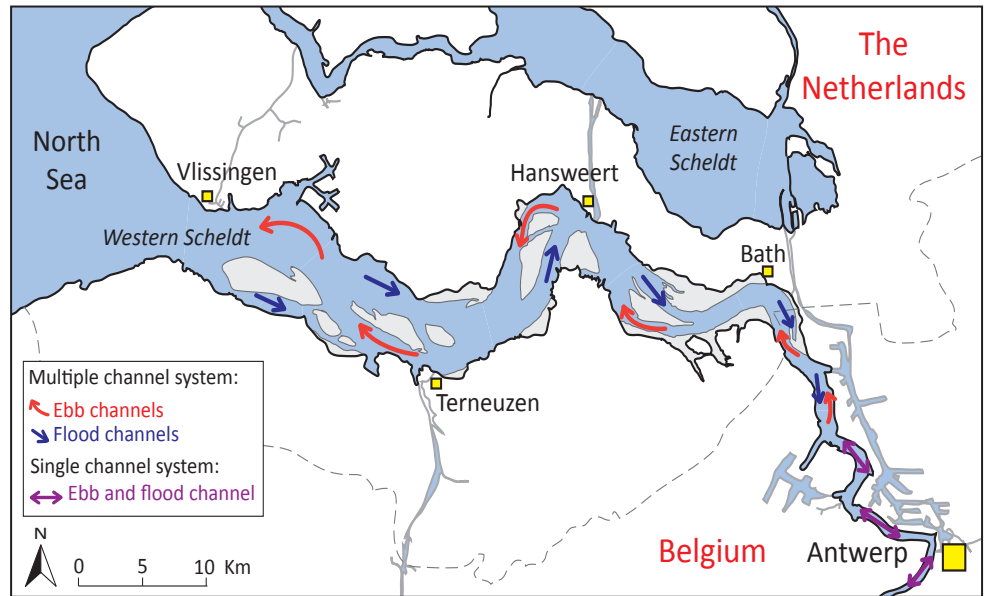
Tidal River Development

A New Sediment Disposal Strategy for the Scheldt

TIDE is an EU project which seeks to make integrated management and planning a reality in the estuaries of the Elbe, Scheldt, Humber and Weser rivers. It is partly funded by the INTERREG IV B North Sea Region Programme.

The challenge: Conciliating port accessibility and nature development

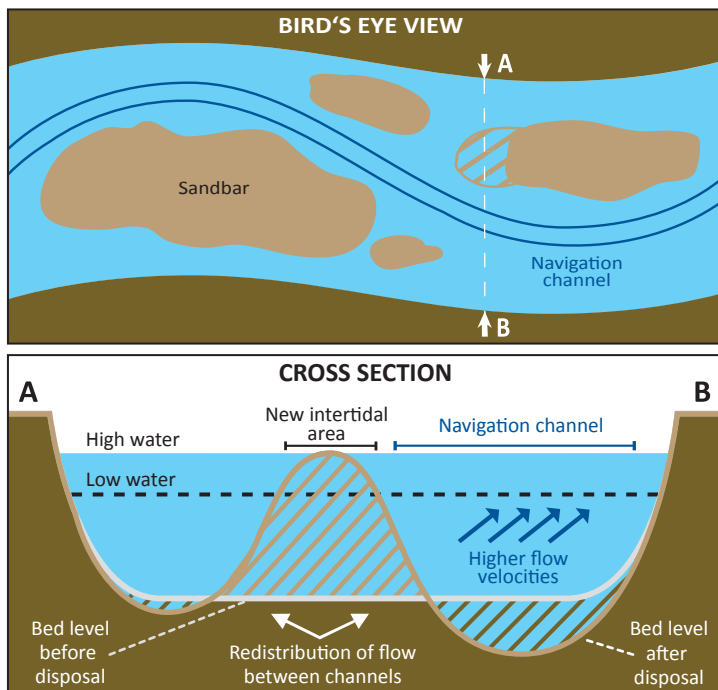
In 2002, it was determined that a deepening of the Scheldt river fairway was necessary for the Port of Antwerp to remain competitive. Historically, material dredged from the navigation channel was disposed in nearby secondary channels. But if the amount of sediment disposed there is too high, these channels may silt up, resulting in a single channel system. Given the advantages of a multiple channel system, this evolution is not desirable. The main concern with the recent deepening campaign was whether these secondary channels could resist the volumes that would need to be disposed. The challenge: how to conduct the deepening while both safeguarding the multiple channel system and if possible improving the natural state of the estuary.



What is a multiple channel system?

The Western Scheldt has flood channels, formed by currents when water is pushed inland, and ebb channels, formed when waters retreat to the sea. This results in a typical multiple channel system, with channels separated by intertidal shoals. This layout provides safety against flooding by dissipating energy from incoming tidal waves, offers more habitat areas for nature, and has advantages for navigation as it spreads the commercial and recreational vessel traffic. Given the considerable advantages of this system, its preservation remains among the main objectives of the Dutch-Flemish management strategy for the Western Scheldt.

The strategy: A new way of disposing dredged material



An independent expert team appointed by the Antwerp Port Authority suggested an alternative strategy for the Western Scheldt to avoid disposing large amounts of sediment in the secondary channels. They proposed the disposal of material along sandbars, creating ecologically valuable areas and even improving the state of the multiple channel system by a better distribution of ebb and flood flows. This, in turn, would result in higher flow velocities in the channels, reducing sediment deposition there and with it the quantity of material needing to be dredged. This would facilitate the maintenance of the fairway and as a parallel benefit create new valuable habitats. Benefits for economy and ecology!

How does it work?

The bed of the fairway consists of deep and shallow areas. The shallow parts - called sills - tend to accumulate material and need to be dredged regularly. A strategic disposal of dredged sediments can change the shape of the river and with it the flow velocity and the amount of sediments it carries. A narrower channel implies higher flow velocities and less tendency to sediment deposition, reducing the need to dredge.



The pilot project: Walsoorden sandbar



Since 2001, this new disposal strategy has been investigated as a pilot project on the sandbar at Walsoorden. Extended research was conducted to evaluate the feasibility of the site and two disposal tests were carried out (2004 and 2006). The tests were monitored thoroughly from 2004 up to 2009, and results showed a successful outcome: the disposed material seemed to remain in place, and from an ecological viewpoint no negative effects were observed.

Building on the success of the Walsoorden pilot project test, research was initiated towards the implementation of this disposal strategy on a larger scale.

Implementation: Beyond Walsoorden

The deepening of the navigation channel in the Scheldt to a minimum depth of 14.5 m was initiated in 2010. Dredged sediments are now being disposed to reshape or extend sandbars at 3 new locations in the Western Scheldt in addition to Walsoorden: Rug van Baarland, Hooge Platen Noord, and Hooge Platen West. Disposal strategies vary according to the conditions and goals at each site. An intensive monitoring program is in place to evaluate the effects of the disposal, including the stability of the disposed material and the evolution of the existing and newly created habitats. Monitoring results will allow

adjustment of the strategy if necessary and will lead, in 2012, to an evaluation report under supervision from an independent group of experts.

Different disposal strategies

Currents and sediment transport conditions are different for each location so disposal strategies vary by site. At some sandbars the goal is to construct subtidal dunes, submerged most of the time but exposed during low tide, at others to build sand masses at the tip of the sandbars which function as underwater barriers reducing currents and creating shallow water areas.



The Future

The measures applied at these sites will continue to provide important information to evaluate the new strategy. In time, it will be possible to determine with certainty: What happens with the disposed sediment in these different conditions? How stable is it? Does migration of the material occur in predicted directions? Is sedimentation in the sills reduced? How fast do living organisms migrate to these new shallow water and intertidal areas? Are these new areas as ecologically rich as the neighbouring (existing) ones?

The alternative disposal strategy is proposed as a potential mitigation measure within the campaign to deepen the fairway. Within the TIDE project, the applicability of this concept in other estuaries with similar sediment management challenges should be evaluated. This strategy may eventually be seen as an exemplary tool for creating the type of win-win solutions necessary to bring about integrated estuary management.

