

A new disposal strategy for the Western Scheldt, conciliating port accessibility and nature preservation

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1. INTRODUCTION

In 1999, Flanders and the Netherlands agreed to set up a common strategy for managing the Scheldt estuary. In 2002, both parties signed a memorandum of understanding in which was defined a “Long Term Vision” strategy and its objectives. One of these is the preservation in the Western Scheldt of a dynamic and complex flood and ebb channel network, the so-called “multi-channel system”. The present trend, a continuation of past natural morphological evolutions combined with human interference (land reclamation and polder building, dredging and other river works) may jeopardise this objective.

2. THE WALSOORDEN PILOT PROJECT

An expert team appointed by the Antwerp Port Authority stated the need for morphological management, aiming at steering the estuarine morphology. In a first phase, sediment from dredging works could be used to reshape eroded sandbars where needed, so that the flood and ebb flows would continue to maintain the multiple channels.

Since 2002, this new disposal strategy is being investigated as a pilot project on the Walsoorden sandbar. An extended research was conducted in 2002 and 2003, combining several tools: desk studies with maps on the historical morphological changes, field measurements, physical scale model tests and numerical models. As a result of the research work executed at Flanders Hydraulics Research, it was concluded that none of the results contradicted the feasibility of the new disposal strategy at the Walsoorden sandbar, although final judgement would only be possible after the execution of an in situ disposal test.

At the end of 2004, 500.000 m³ of sand was disposed during one month with a diffuser in relatively shallow water at the seaward end of the Walsoorden sandbar. The experiment was thoroughly monitored, morphological as well as ecological. One year after the execution of the in situ disposal test, it was concluded that from morphological viewpoint the test was a success. Also the ecological monitoring revealed no significant negative changes in trends due to the disposal test.

In 2006 a new disposal test was executed, using the traditional dumping (“clapping”) technique with hopper dredgers. Due to practical limitations, the disposal (again 500.000 m³) was spread over a 3 months period. The new experiment was again thoroughly monitored for morphology as well as for ecology. Due to larger currents in the disposal area, a larger percentage of the material was transported towards the Walsoorden sandbar. This morphological evolution was seen as positive within the objectives of the disposal strategy. From ecological point of view no significant negative changes in trends have been identified from this second test.

3. A NEW DISPOSAL STRATEGY FOR DEEPENING THE NAVIGATION CHANNEL

Due to the success of both in situ tests, the strategy of morphological disposal will be included in the dredging and disposal operations for the future deepening of the navigation channel. This new disposal strategy will introduce benefits for both the economy (deepening and maintenance of the fairway) and the ecology (keeping the sediment in the estuary, creating new valuable areas without endangering the multiple channel system). Therefore further research work has been carried out in 2007-2008 on how to embed this strategy in the future dredging and disposal policy and the possible use of the strategy on other locations. During execution (planned to start in 2009) an intensive monitoring programme will monitor the morphological and ecological effects of the disposed sediments, allowing adjusting the strategy if necessary. However, this is only part of a morphological management of the estuary, which would also have to include morphological dredging and modifying the hard bordering at some locations.

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