Abstract for “RCEM 2009”

Title paper: **Using dredged material to reshape sandbars: development of a new disposal strategy in the Western Scheldt, conciliating nature preservation and port accessibility**

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Abstract:
In 1999, Flanders and The Netherlands agreed to set up a common strategy for managing the Scheldt river in its estuarine reach. 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”.

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, in order to sustain the multiple channel system, maintained by flood and ebb flows. This strategy would not only make the estuary ecologically and morphologically healthier, but it could also possibly reduce the quantity of material to be dredged on the sills if the self-dredging capacity of the flow on these could be increased.

Since 2002, this new disposal strategy is being investigated as a pilot project on the Walsoorden sandbar. An extended research was conducted at Flanders Hydraulics Research in 2002 and 2003 to investigate the feasibility of the idea. As a result the expert team 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 m^3 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 (again 500.000 m^3 of sand), using the traditional dumping (“clapping”) technique with hopper dredgers. 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, extending the existing 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.

Due to these successful in situ tests, the strategy of morphological disposal will be included in the disposal operations for the future deepening of the navigation channel. Thereby it introduces 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 (combining several tools, i.e. desk studies, field measurements and numerical modelling of hydrodynamics) work has been carried out by Flanders Hydraulics Research on how to embed this strategy in the future disposal policy.