STUDY AND MEASURES TO REDUCE MARINA INLET SEDIMENTATION IN BLANKENBERGE AND BEACH EROSION IN WENDUINE, BELGIUM

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During last year's NCK edition we outlined a project and discussed textbook solutions and innovative alternatives to tackle the marina inlet sedimentation in Blankenberge and the coastal erosion at Wenduine. Now, one year of extensive modelling research later, we can present the results of our study and the selection of promising measures.

Problem statement

Blankenberge and Wenduine are two neighbouring Belgian coastal towns that are each experiencing specific morphological issues. The access channel to the Blankenberge marina is constrained by two low jetties and experiences sedimentation due to littoral drift. Authorities aim to restrict dredging activities in the access channel to winter months only, and avoid dredging works during the summer tourist season. However, channel sedimentation rates are currently too high and summer dredging is sometimes needed after storm events. Less than three kilometres to the west, Wenduine is located at a breakpoint in coastline orientation and experiences structural erosion. Beach nourishments are regularly performed to mitigate the erosion but typically have a short lifespan.

Description of research

The poster will present a synthesis of the results of the numerical modelling (using XBeach and Mike21-BW) of morphology, waves and currents for a range of design alternatives (Figure 1). Emphasis will be on the results and on a comparison of the various measures. As the proposed measures impact densely populated and intensively used recreational areas, the results have been evaluated from the point of view of coastal evolution as well as swimmer safety. For the Blankenberge marina the various measures affect wave penetration into the harbour basin and aim to reduce entrance-channel sedimentation.

Given the proximity of both problem areas and the complementary nature of the observed phenomena, it was investigated if measures could be identified that would solve both problems simultaneously. It was argued that, given the west-to-east oriented littoral sediment transport, reducing erosion in the West may reduce sedimentation issues in the East, or blocking the littoral drift in the East by reorientation of the coastline may (in time) reduce erosion in the West. However, XBeach simulations showed that interactions between the two zones were limited. Optimal measures will therefore be presented for each location separately.

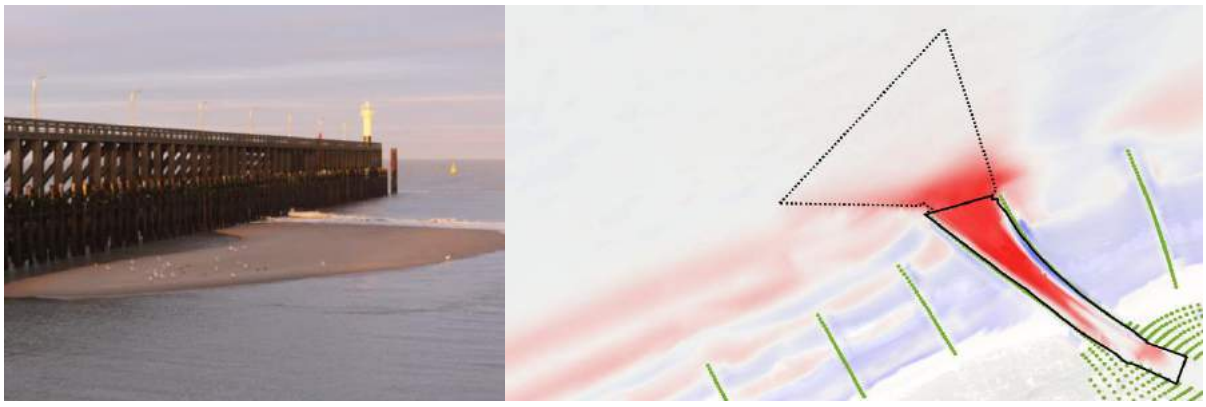

Figure 1. Illustration of the Blankenberge marina inlet sedimentation and XBeach model result of present situation.