

# OPTIMIZATION OF SHOREFACE NOURISHMENT PERFORMANCE USING COASTAL AREA MORPHOLOGICAL MODELING TOOLS

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## BIOGRAPHY OF PRESENTER

Dr Zyserman is a Principal Engineer with DHI Water & Environment and has broad experience in coastal engineering, coastal erosion and protection topics, as well as in storm surge and coastal circulation modeling studies. Over the almost 18 years spent working for DHI, Dr Zyserman has managed a large number of projects involving the application of advanced mathematical modeling tools to solve coastal engineering problems. He has also lead DHI's participation in several research programs, both at Danish and European levels. Dr Zyserman was involved in the development of DHI's numerical models for non-cohesive sediment transport and coastal area morphological modeling.

## STUDY METHODOLOGY AND RESULTS

The use of shoreface nourishment as soft shore protection is optimized through a series of tests with the coastal area morphological model MIKE 21 CAMS developed by DHI. The model computes the evolution of the bathymetry in response to forcing from incident waves and associated littoral currents and sediment transport and updates the wave, current and sediment transport fields as the bathymetry changes in time.

In total, 19 tests (including both pre- and post-nourishment conditions) were carried out with the morphological model. In these tests, the dimensions of the shoreface nourishment (length, crest width, distance to initial shoreline, and water depth above crest) were systematically varied. Analysis of the model results after one month of bathymetry evolution allows deriving design curves for optimization of the nourishment with regards to the amount of sediment supplied to the coast and the expected rates of re-nourishment.

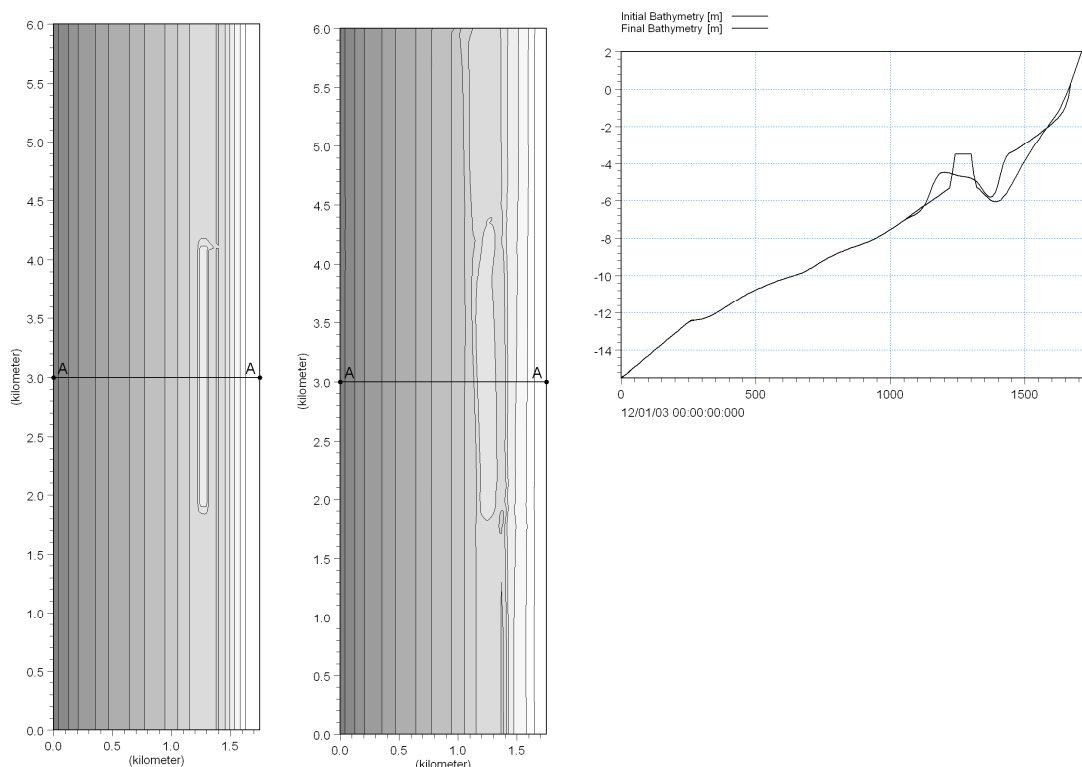


Figure 1 Example of results from the morphological model. Left: initial bathymetry showing shoreface nourishment. Center: bathymetry after 1 month of wave action. Right: initial and final beach profiles extracted along line A-A.