



## Morphodynamic computations Haringvliet Estuary

The Haringvliet Estuary south of the Port of Rotterdam was subject to significant changes in the hydraulic regime over the past decades. In 1970 the inner part of the estuary was closed off from the sea by a closure dam. At the same time, an extension was built to the port of Rotterdam (Maasvlakte). This extension was followed in 1986 by a second reclamation, the Slufterdam. In the near future, new changes are due to come: another extension of the Port of Rotterdam (Maasvlakte 2) and partial reopening of the closure dam of the Haringvliet.

Svašek Hydraulics was asked to determine the morphological developments in the entrance of the Haringvliet by morphodynamic modelling. The modelling activities started at the first major change in 1970 and continue for calibration and validation purposes to the year 2000. From 2000 onwards the study included the calculation of the expected seabed changes for different development scenarios.

In the study emphasis was given to the sensitivity of the model results for uncertainties in the boundary conditions (sequence of daily conditions, storms and high floods), for uncertainties in the modelling techniques and in the seabed and sediment properties.

For the modelling a combined 2 way linked model package of FINEL2D (hydrodynamic modelling), SWAN (wave propagation, growth and breaking) and MORFIN (morphodynamic modelling of sand, silt and sand/silt interaction) was applied. The result shows that this model package is well suited to describe the physical processes of sediment transport and seabed development under the influence of waves and currents. The quantitative results are still very sensitive to the uncertainties as specified above.

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**Client**  
Rijkswaterstaat RIKZ

**Location**  
Entrance of Haringvliet Estuary,  
The Netherlands

**Date**  
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**Services**  
Morphodynamic modelling of  
estuary development  
(FINEL/SWAN/MORFIN)