

## REPRODUCING THE MORPHOLOGY OF THE SCHELDT MOUTH USING AN IDEALIZED PROCESS-BASED MODEL

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### Description of research

The morphology of the Scheldt mouth is characterised by an extensive shallow area (Vlakte van de Raan), which is flanked by two deeper (shipping) channels (Wielingen and Oostgat). The latter channels provide access to the port of Antwerp (see Fig. 1). On the one hand, the morphology of the Scheldt mouth echoes the characteristics of ebb-tidal deltas, which usually occur offshore of tidal inlets. On the other hand, however, the northern part of this area features presence of elongated tidal sand bars, which have a different formation mechanism.

Both natural processes and human interventions have influenced the morphological evolution of the estuary and its mouth area over the past two centuries (Kornman et al., 2000). Initially, these human interventions mainly consisted of land reclamations, which resulted in loss of intertidal areas and a fixation of the alignment of the estuary. In the 20th century, human interventions shifted from land reclamation to sand extraction and dredging and dumping activities to maintain the navigation route to the Antwerp harbour. Recently, the Flemish government announced new large-scale measures in the Belgium coastal region in support of safety, navigation and ecology. These measures, which are formulated in the so-called Master Plan Vlaamse Baaien, aim at adapting the coastal region (including the mouth area) by creating new offshore dune islands to the east of harbour of Zeebrugge and constructing a new navigation channel across the Vlakte van de Raan. Implementation of this master plan, however, rises the question of how these interventions would affect hydro- and morphodynamics in this area.

The main objective of this research is to obtain a better understanding of the morphodynamic response of the mouth area to the human interventions formulated in the Master Plan Vlaamse Baaien. For this, an idealized model approach is adopted, as the focus is on getting fundamental insight into this response rather than understanding all quantitative details. As a first step in achieving the research objective, we will present an idealized depth-averaged morphodynamic model (Delft3D), which is able to reproduce the main characteristics of the observed bottom patterns in the mouth area and the estuary.

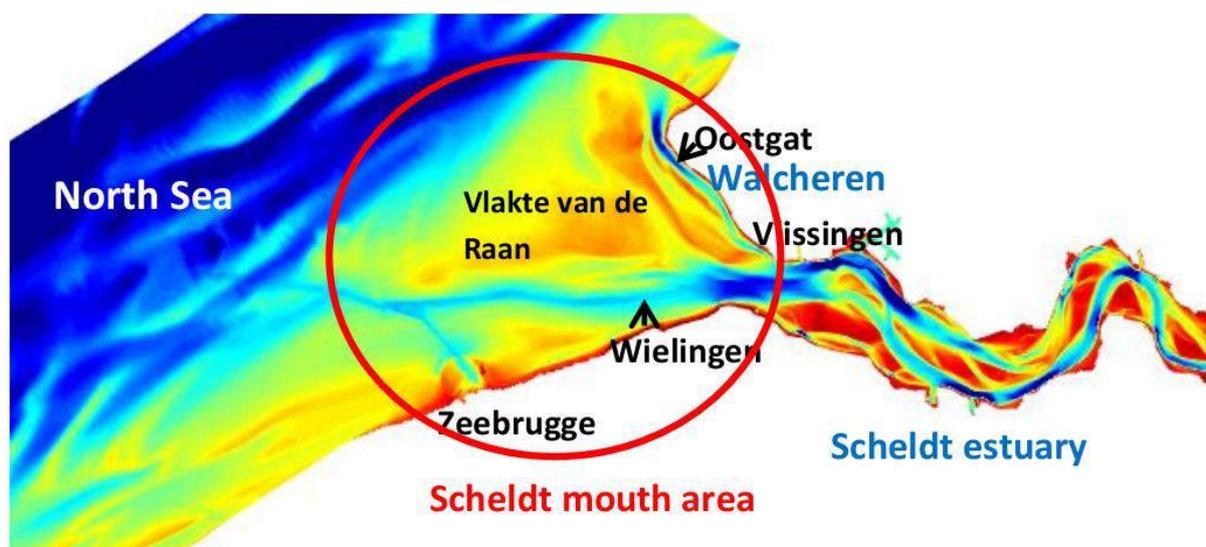


Figure 1 Bathymetric map of the Scheldt mouth area.

### References

Kornman, B.; Arends, A.; Dunsbergen, D. (2000) Westerscheldemond 1970 – 2020: een morfologische blik op de toekomst. Ministerie van Verkeer en Waterstaat, Directoraat-Generaal Rijkswaterstaat, Rijksinstituut voor Kust en Zee/RIKZ.