

BASELINE MAPPING OF SEDIMENT DISTRIBUTION IN THE WESTERN SCHELDT ESTUARY PRIOR TO TUNNEL BORING

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ABSTRACT

Large infrastructural construction projects may have a profound impact on the environment and ecology of environmentally sensitive areas. The construction of a tunnel below the Western Scheldt and the associated sediment dumping in the Western Scheldt Estuary may influence the sediment budget and the quality and quantity of pelagic and benthic life in the estuary. For the purpose of monitoring the effects of the dumping, it is essential to know the baseline situation, which (in this case) is an inventory of a) the temporal and spatial dynamics and distribution of suspended matter in the estuary and b) the deposition of sediments on tidal flats. Because of the size of the potentially affected area and the dynamic character of the tidal water system it was decided to use besides field measurements, remote sensing and mathematical models to set a baseline for the sediment distribution. The added value of an integration of modern techniques such as remote sensing and sediment transport modeling together with a sensible use of in-situ measurements was demonstrated. SPOT images rendered accurate synoptic distributions on suspended sediments, and were a valuable data set for model calibration. Having established the baseline, the model predicts the distribution of dumped suspended matter in the Western Scheldt. The deposition of mud on tidal flats was analyzed both with models and from remote sensing. In this study it was shown that effects of the dumping will be observable in spring and summer periods. Therefore, close monitoring of the estuary during the tunnel construction is required.