EFFECT OF DREDGING ON FINE SEDIMENT DISPERSION ALONG DUTCH COASTLINE

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Description of research

Harbour basins and fairways around Rotterdam are dredged almost continuously. The dredged material consists of sand and mud. Dredged sandy materials are used elsewhere and contaminated (muddy) sediments are disposed in designated contained areas. The dredged muddy sediments are deposited at allocated dispersion sites in the North Sea. In general, maintenance dredging material is dispersed at a location called "Verdiepte Loswallen" (deep dispersion sites), while capital dredging material is often dispersed at the "Loswal Noordwest" (dispersion site). In total on average 10 Mm^3 of mud is dispersed yearly at the "Verdiepte Loswallen". A large part of this material does not stay for ever at the dispersion sites but spreads from the dispersion sites along the North Sea coast and towards the Wadden Sea.

The goal of our research was to determine the effect of the present dredging and disposal strategy on the suspended sediment concentrations along the Dutch coast. Furthermore, we investigated the effect of the proposed deepening of the Nieuwe Waterweg on sediment concentrations along the coast. An advanced Delft3D-WAQ model of the southern North Sea was used to assess the large scale fine sediment transport. Several scenarios were run to determine the relative effect of dredging and disposal of fine material. Our results served as a base for the ecological evaluation of the effects of turbidity along the North Sea coast and towards the Wadden Sea.

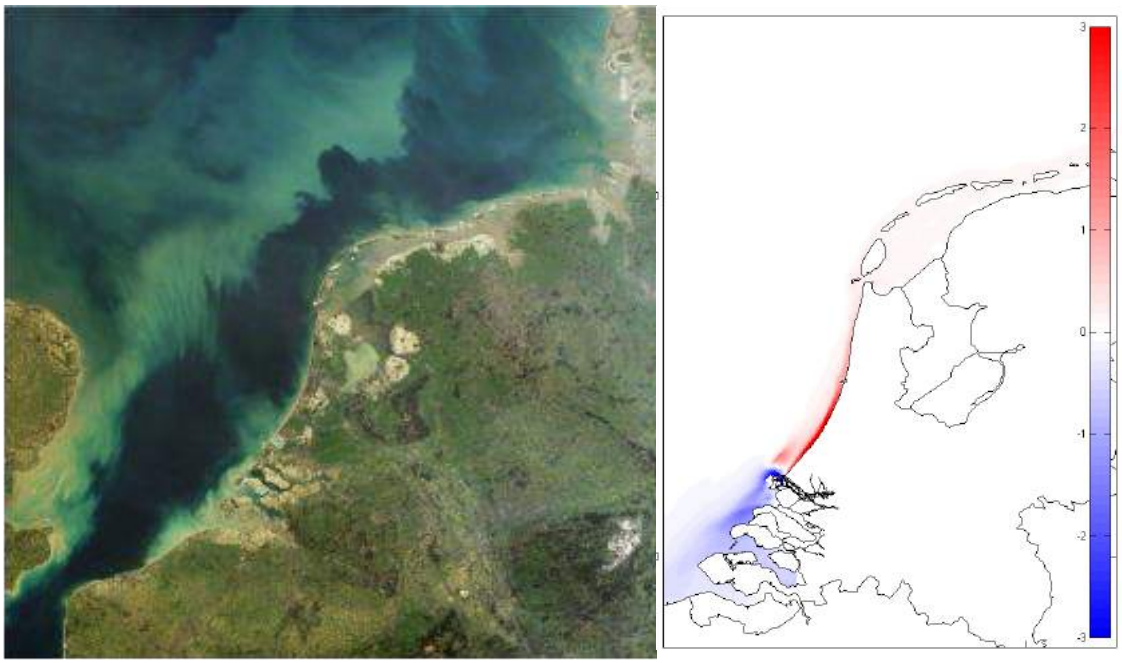

Figure 5: a) Satellite view of the North Sea. Source: MODIS rapid response project NASA/GSFC; b) Modelled spreading of fine sediment from dispersion site in the North Sea.

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