

HUMAN AND ENVIRONMENTAL EFFECTS ON THE TOP OF THE MUD LAYER IN THE ENTRANCE OF THE ZEEBRUGGE HARBOUR

Dujardin Arvid^{1,2}, Joris Vanlede¹ and Youri Meersschaut³

¹ Waterbouwkundig Laboratorium, Berchemlei 115, B-2140 Borgerhout, Belgium
E-mail: arvid.dujardin@mow.vlaanderen.be

² Soresma, Business Unit Water
Poortakkerstraat 41, B-9051 Sint-Denijs-Westrem (Gent), Belgium

³ Vlaamse Overheid, Departement Mobiliteit en Openbare Werken, afdeling Maritieme Toegang, Tavernierkaai 3, B-2000 Antwerpen, Belgium

Navigation in the port of Zeebrugge can be hindered by the presence of a high concentrated benthic suspension (hcbs). Depth averaged suspended sediment concentrations (including the hcbs layer) range from 10mg.l⁻¹ up to 4,000mg.l⁻¹. The suspended sediment concentration within the benthic layer can reach several tens of grams per litre. The top of this hcbs layer is identified by the 210kHz acoustic reflection surface. The Nautical Bottom, a site-specific upper limit for the bulk density, above which navigation is concerned to be safe, is defined at 1,200kg.m⁻³. A better understanding of the human and environmental effects on the hcbs layer could result in countermeasures reducing siltation and maintenance dredging.

A statistical analysis of parameters such as weekly dredging intensity, location of the top of the mud layer, growth rate of the mud layer, fresh water input from the Leie by-pass channel, wind force and wave height in the period from 1999 till 2005 resulted in poor correlation coefficients. Three interpretations are given. Week averaged hydro-meteo data masks the occurrence of short-time events such as storms. The mud layers calculated growth rate can be levelled out due to the variable time span between soundings. Finally, dredging works are not planned solely based on the level of nautical depth, which reduces the correlation between environmental conditions and dredged volumes. However, seasonally trends are clearly visible in both human and environmental effects.

References

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