

## Sediment dynamics as a proxy for soft substrata habitat distributions, Belgian part of the North Sea

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Fine-scale seabed mapping (<5m resolution) (e.g. geology, surficial sediments, morphology and benthos) was conducted at several locations along the Belgian part of the North Sea. Together with modelling results on hydrographic conditions (e.g. residual currents; sedimentation due to tidal forcing; suspended particulate matter or SPM), and current measurements, the variability in sediment processes can be linked to variations in habitat distributions. Highest biodiversity is often found where finer sediments are naturally trapped (e.g. near sediment transport convergence zones). Sometimes, this process is enhanced by changes in morphology, due to e.g. long-term disposal of dredged material or marine aggregate extraction. Evidence will be presented on disposal activities that have induced permanent modifications of hydrographic conditions. Around these areas, where mostly transient fluxes of SPM prevail, high abundances of opportunistic and invasive species occur. In the framework of Europe's Marine Strategy Framework Directive discussion is on-going whether or not this causes adverse effects on the ecosystem. The adversity of effects links to issues on biodiversity, food webs and seafloor integrity.

Understanding natural sediment dynamics is crucial to predict the spatial scale of the effects of human activities on the habitats. In the case of disposal activities, fine-grained material may be dispersed over several kilometers, though the interplay of currents, in combination with availability of SPM, will determine the importance of smothering on the benthos. The severity of the impact on the benthos will then further be determined whether or not a habitat change occurs (e.g. difference in sediment nature between disposed material and substrate type). Around the disposal grounds, habitat creation or modification takes place. The extent depends on amount, frequency and duration of disposal activities, in combination with residual currents. In any case, increased system knowledge (incl. morphological setting, substrate characteristics, sediment processes, sediment dynamics, habitat sensitivities and recovery potential) is needed to estimate final impacts.

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