

Van Lancker Vera

Royal Belgian Institute of Natural Sciences

Author(s): Van Lancker, V.R.M.¹, Baeye, M.¹, Evangelinos, D.^{1,2}, Montereale-Gavazzi, G.^{1,2}, Terseleer, N.¹ & Van den Eynde, D.¹

Affiliation(s) : ¹ Royal Belgian Institute of Natural Sciences, Operational Directorate Natural Environment. Gulledele 100, B-1200 Brussels, Belgium

² Ghent University, Dep. Geology. Renard Centre of Marine Geology, Belgium

MSFD-compliant investigative monitoring of the effects of intensive aggregate extraction on a far offshore sandbank, Belgian part of the North Sea

In 2012, unprecedented sand extraction activities started on a far offshore sandbank in the Belgian part of the North Sea, just north of a Habitat Directive area. The Flemish Authorities, being in demand of large volumes of sand for coastal safety, agreed on a dedicated follow-up of the effects of extraction (MOZ4 project). In synergy with the long-term monitoring, paid from the revenues of extraction activities (ZAGRI programme), investigative monitoring was set-up, with focus on assessing changes in seafloor integrity and hydrographic conditions, two descriptors that define Good Environmental Status within Europe's Marine Strategy Framework Directive (MSFD). Results relate to: (1) quantification of natural variability of currents and turbidity; (2) sediment plume formation and deposition, differentiating between small and large trailing suction hopper dredgers; (3) far-field impacts, with focus on the gravel beds within the Habitat Directive area, and (4) improvement of models that predict the impact of extraction activities. New insights were revealed on the four levels. Striking was an increase in sand, as well as an enrichment of fine sediments in the coarse permeable sands in the gravel area, though no direct relationship could yet be made with the intensive extractions. Further monitoring is required, since favourable colonization and growth of epifauna on the gravel beds is critical for the maintenance and increase of biodiversity in the Belgian part of the North Sea. Recommendations were formulated for the exploitation of the sandbanks.

Keywords: Aggregates, Sand, Gravel, Habitat, Seafloor Integrity, Marine Strategy Framework Directive, Uncertainty, Resource Suitability, 3D Voxel Modelling; 4D Impact Assessment, North Sea, Belgium, Netherlands