Quantifying marine aggregate resources of the Belgian part of the North Sea, first results using a layered voxel modelling approach

Vasileios CHADEMENOS[1,*], Tine MISSIAEN[1], Jan STAFLEU[2], Vera VAN LANCKER[1,3], Maikel DE CLERCQ[1]

[1] Ghent University, Renard Centre of Marine Geology, Department of Geology and Soil Sciences, Krijgslaan 281/S8, 9000 Gent, BELGIUM
[2] TNO, Geological Survey of the Netherlands, Princetonlaan 6, 3508 TA Utrecht, THE NETHERLANDS
[3] Royal Belgian Institute of Natural Sciences (RBINS), OD Nature, Gulledelle 100, 1200 Brussels, BELGIUM

*Corresponding author: Vasileios.Chademenos@UGent.be

Keywords: North Sea, sand extraction, resource estimation, 3D voxel model, geostatistics

<u>Abstract</u>

With increasing exploitation of marine aggregates, the need for dedicated resource estimations becomes urgent. This is also the case for the North Sea, where sand extraction already takes place for more than 30 years. To enable long-term predictions of the availability of the main resource qualities in the Belgian and southern Netherlands part of the North Sea, a 3D voxel modelling approach was followed. Focus is on the unconsolidated sediments of the Quaternary of which only the most modern deposits are suitable for exploitation. Therefore, Holocene and Pleistocene stratigraphic units were defined, based on bathymetric, borehole and 2D seismic data. The resulting 2 layers were then used in a geostatistical interpolation, for which a voxel resolution of 200 m x 200 m x 1 m was chosen. First results will be presented starting with a high-resolution model of the Top Paleogene (De Clercq et al., in review). Next, for both Holocene and Pleistocene units, the distribution of up to 7 lithological classes (clay to gravel) will be shown, as also their probabilities of occurrence based on 100 renditions of the interpolation. Additionally, first volume calculations were made providing insight into expected resource quantities. The presentation contributes to the BELSPO Brain-be project TILES (Transnational and Integrated Long-term Marine Exploitation Strategies; www.odnature.be/tiles).

<u>Reference</u>:

De Clercq, M., Chademenos, V., Van Lancker, V. and Missiaen, T. (in review). High-resolution DEM for the Top-Palaeogene surface. Journal of Maps.