

Quantifying the resource potential of Quaternary sands on the Belgian Continental Shelf: a 3D voxel modelling approach

Vasileios HADEMENOS¹, Lars KINT², Tine MISSIAEN¹, Jan STAFLEU³ & Vera VAN LANCKER^{1,2}

¹ RCMG - Ghent University,
Renard Centre of Marine Geology,
Krijgslaan 281 (S8),
9000 Gent, Belgium

² RBINS - Royal Belgian Institute of Natural Sciences
OD Nature,
Gulledelle 100,
1200 Brussels, Belgium

³ TNO – Geological Survey of the Netherlands,
Princetonlaan 6,
3508 TA Utrecht, the Netherlands

Abstract

The increasing demand of marine aggregates for coastal safety plans and industrial use poses new challenges for the management of sand extraction on the Belgian Continental Shelf. To anticipate on this, a 3D voxel model of the subsurface has been created (Belspo Brain-be project TILES on Transnational and Integrated Long-term Marine Exploitation Strategies). Available geological knowledge has been incorporated (cores and seismic profiles) resulting in voxels having a unique value of one of 7 lithological classes spanning in grain size from clay to gravel, together with the probability occurrence of each class derived from data and statistical calculations. Results from the voxel model gave a detailed image of the distribution of different sediment types and provided an insight on the different geological settings that are used or can be used for sand extraction. Estimates on volumes and availability of particular sand resources can be given, enabling more targeted exploitation. The information provided is critical to assess potential habitat changes in depth and time.

Keywords: Resource estimation, 3D Voxel model, North Sea, sand extraction, sustainability

E-mail: Vasileios.Chademenos@UGent.be