

From seabed mapping to geo-environmental knowledge base, a pathway towards a more sustainable resource management

{single line spacing, centre-alignment}

Vera Van Lancker¹, Lars Kint¹, Giacomo Montereale Gavazzi¹, Nathan Terseleer¹,
and the TILES team²⁻⁵

{single line spacing, centre-alignment}

¹ *Royal Belgian Institute of Natural Sciences, Belgium. *vera.vanlancker@naturalsciences.be;*

² *Ghent University, Dpt. Geology, Renard Centre of Marine Geology, Belgium;*

³ *Ghent University, Dpt. Telecommunications, Database, Document and Content Management, Belgium;*

⁴ *TNO-Geological Survey of the Netherlands, The Netherlands;*

⁵ *Federal Public Service Economy. Continental Shelf Service, Belgium.*

Global developments in seafloor mapping demand significant areal expansion and coordination of seabed mapping efforts. However, to address today's challenges and tomorrow's opportunities key is also to strive towards in-depth integration of various sources of information that can be queried and analysed using most flexible and easy-to-use tools.

For the surface and subsurface of the Belgian and southern part of the North Sea a voxel-based (volume pixels with information) geological knowledge base is now available of which the backbone is a 3D geological model of the Quaternary, together with 4D numerical tools allowing scenario analyses of resource use on the long term [1]. As such, resource quality and quantity can be balanced amongst various applications whilst minimizing environmental impact.

In this presentation we will demonstrate how this geological knowledge base supports decision making related to Marine Spatial Planning (e.g., subsurface planning of offshore wind versus sand and gravel exploitation); Marine Policy, i.e. its environmental pillars European Marine Strategy Framework Directive, Habitat and Water Framework Directive (e.g., habitat change; hydromorphology), as well as industry applications.

In the framework of the Belgian Federal State's responsibility to manage and monitor its seabed resources, we envisage expanding the knowledge base modularly, e.g., with various ecosystem components, as well as socio-economic models. Overall aim is to build on the concept of natural capital and to safeguard its integrity for future generations.

References

- [1] Van Lancker V, Francken F, Kapel M, Kint L, Terseleer N, Van den Eynde D, Hademenos V, Missiaen T, De Mol R, De Tré G, Appleton R, van Heteren S, van Maanen PP, Stafleu J, Stam J, Degrendele K, Roche M. *Transnational and Integrated Long-term Marine Exploitation Strategies (TILES)*. Final Report. Brussels : Belgian Science Policy 2018 – 82 p. (BRAIN-be - Belgian Research Action through Interdisciplinary Networks). (<https://odnature.naturalsciences.be/tiles/>)