

Adaptation of the reference level for sand extraction: feasible or not?

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The sand and gravel extraction in the Belgian part of the North Sea (BPNS) is limited to 5m below the reference level determined by the Fund for sand extraction (Royal Decree of September 1, 2004 Art. 31). However, the sand extraction industry and the scientific institutes involved in the monitoring of the impact are demanding to adapt this arbitrarily defined reference surface based on clear scientific criteria. To optimally use the available sand reserves in the near future, taking into account a number of key projects (such as the master plan coastal safety), this project is indispensable.

Based on a detailed seismic study, a three-dimensional model of the sand extraction areas in the BPNS will be made. This allows an accurate evaluation of the available sand reserves and the economic potential. Two major geological boundaries are of great importance on the BPNS, namely the top of the Paleogene or the basis of the Quaternary and the top of the Eemian. Next, a new reference surface will be calculated regarding the maximum extraction depth using all the seismic data combined with the bathymetric models and the following geological and geomorphological criteria:

- extraction is not allowed below the top of the Paleogene;
- extraction is not allowed below the top of the Eemian;
- extraction on the flanks and extremities of the sandbanks is limited;
- the volume of sand available for extraction should be at least the same as present.

These criteria are consistent with the recommendations for a sustainable exploitation of tidal sandbanks (Van Lancker *et al.*, 2010). Indeed, increasing the potential volume for extraction in the upper part of the sandbanks while limiting the extraction in the less stable areas corresponds with the industrial and environmental needs.

In a next step, available sediment cores will be incorporated in order to refine the proposed reference level and the criteria. These cores will allow to include grain size distribution data which is valuable information for the sand extraction industry. In this framework new vibrocores will be obtained, mainly on the Thornton Bank and the Flemish Banks.

Finally, an impact study will be performed in order to investigate the impact of this new reference level on the environmental and hydrodynamic conditions in the extraction zones as well as the impact on the coast. Taking into account the goal to reach a Good Environmental Status by 2020 (European Marine Strategy Framework Directive), no significant changes in seafloor integrity and hydrographical conditions are allowed.

Defining a new reference level for sand extraction in the BPNS is feasible, however, an extended scientific study is necessary taking into account both economic and environmental arguments.

References

Van Lancker V.R.M., W. Bonne, V. Bellec, K. Degrendele, M. Roche, E. Garel, C. Brière, D. Van den Eynde, M.B. Collins and A.F. Velegrakis. 2010. Recommendations for the sustainable exploitation of tidal sandbanks. *Journal of Coastal Research* 51:151-161.