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Natural and anthropogenic influence on sediment dynamics in the Belgian coastal zone. Can they be separated and what are the policy implications in a changing climate?

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Abstract

The Belgian Federal Science Policy project SD/NS/06A better known as QUEST4D aims at the "QUantification of Erosion/Sedimentation patterns to Trace the natural versus anthropogenic sediment dynamics".

Seabed, living and non-living resources are exploited increasingly: sand and gravel is needed for beach nourishment and for construction purposes, the accessibility of harbours requires regular dredging and dumping operations, offshore windmills contribute to our future energy supply and pipelines and cables transport gas and electricity to the mainland.

The interaction of these activities with the seabed nature and processes needs careful consideration. However, present-day impact studies remain often inconclusive because of: the lack of a 'non-disturbed' reference situation, the interference of both naturally and anthropogenically-induced changes and, the hitherto largely unknown, role of climate change on seabed processes. Moreover, the range of human activities may result in cumulative effects affecting the magnitude and extent of the impact on the seabed.

The main goal of the research is to support policy and decision makers in their decision making process for the development of (more) sustainable exploitation strategies. The QUEST4D project focuses on non-living seabed resources but can as such be seen as part of an integrated (and sustainable) coastal zone management system.

The following elements are considered important to reach that goal:

- reconstruction of the seabed ecosystem changes in the past 100 years for the Belgian part of the North Sea (BPNS). Quite unique datasets on the seabed nature and on processes are available for this.
- detailed case studies where sea bed changes are linked to naturally and/or anthropogenically induced sediment dynamics.
- improvement in sediment process modelling. This is a key to any ecosystem or impact study.
- modelling of climate change scenarios in order to evaluate their consequences on the management of the seabed.

The presentation will give an overview of the current status of this project with focus on the last item.