

The impact of sand extraction on sediment biogeochemistry: preliminary results of an experimental approach.

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Sand extraction activities have a significant impact on the benthic environment through disturbance of the upper sediment layers. The ecological and physical impact of these activities in the Belgian Part of the North Sea (BPNS) are routinely investigated, but the effects on ecosystem functioning remains largely unknown.

In this study, we hypothesized that carbon and nitrogen cycles would be affected by sand extraction, and that this impact would differ between different extraction regimes. Therefore, three tidal sand banks in the BPNS, characterized by different extraction regimes and seabed morphology, were sampled in both impact and reference zones. Cores were incubated for six hours, sediment community oxygen consumption (SCOC) was continuously measured, and nutrient, dissolved inorganic carbon (DIC) and uranine were sampled at five time intervals, to investigate the bio-irrigation rate and the nitrogen and DIC fluxes. In addition to the incubation core, five sediment subsamples were taken per location and zone to measure granulometry, chlorophyll *a*, permeability, total organic carbon and total nitrogen.

On one sandbank, characterized by a continuous high extraction regime, a significant impact on seabed morphology with one meter deep drag head tracks was visible on the multibeam imagery. Nevertheless, the sediment remained well permeable in all impacted areas, which partly explains the absence of significant differences in SCOC between impact and reference samples for all extraction regimes. Data on carbon stocks, nitrogen content and nutrient fluxes are currently analyzed, which will allow to draw more holistic conclusions on how sand extraction influences the benthic ecosystem functioning.

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