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Carbon Burial in Shelf Sea Sediments – Anthropogenic Effects and Implications for Management

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Many continental shelves host sediment depocenters which act as natural, long-term (>100 yr) carbon sinks. Human activities can strongly affect the efficiency with which carbon is sequestered in these depocenters, either through direct disturbances of the seafloor, or indirectly through climatic, light- or nutrient-induced changes, thereby affecting habitat and ecosystem functioning. In this study, we address the short- and long-term impacts of sea-use on carbon burial in the North Sea. Specifically, we focus on the role of bottom trawling as a crucial disturbance of seafloor sediments and benthic biota. In order to quantify the large-scale impact on carbon sequestration, we employ a numerical coastal ocean model to simulate the effects of demersal fishing gear on sediment transport, bioturbation efficiency and their interactions. Based on the results, the effects of potential management scenarios are discussed.