

EGU22-13116

<https://doi.org/10.5194/egusphere-egu22-13116>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Modeling the impacts of bottom trawling on the sediment and particulate organic carbon distribution of the North Sea

Lucas Porz¹, Rumeysa Yilmaz^{1,2}, Jan Kossack¹, Wenyan Zhang¹, and Corinna Schrum^{1,2}

¹Institute of Coastal Systems, Helmholtz-Zentrum Hereon, Max-Planck-Str. 1, 21052 Geesthacht, Germany

(lucas.porz@hereon.de)

²Institute of Oceanography, Center for Earth System Research and Sustainability, Universität Hamburg, Bundesstrasse 53, 20146 Hamburg, Germany

Bottom trawling, a fishing practice that entails the dragging of heavy fishing gear along the seafloor, is one of the most direct human interferences with the marine environment. Bottom trawling is known to resuspend a large amount of sediment, thereby releasing nutrients, organic carbon and contaminants to the water column. However, the large-scale effects of bottom trawling on sediment and carbon fluxes have remained difficult to quantify. We aim to quantify these fluxes through numerical modeling of bottom trawling activity in the North Sea. A particular focus is put on muddy areas rich in organic carbon, as chronic bottom trawling could inhibit their function as carbon sinks. By combining a three-dimensional, coupled hydrodynamics and sediment transport model with data of trawling effort in the study area, we parametrize the resuspension caused by bottom trawling on the basis of individual vessels and the subsequent transport of resuspended material by ocean currents. Results show that bottom trawling has potentially large impacts on the inventories and fluxes of suspended matter and organic carbon of the North Sea. The results may be useful in determining areas worthy of protection in the context of marine spatial planning.