



Sediment biogeochemistry across a permeability gradient in the Southern Bight of the North Sea: a modelling approach.

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Biogeochemical sediment conditions arise as a result of biological and physical transport and transformations of organic material. Within the FaCE-It project we aim at understanding the impact of changes in sediment permeability (by fining or hardening) on the benthic biogeochemical cycle and food webs in the Southern Bight of the North Sea (SBNS). The ultimate aim is to produce maps of benthic functioning and sediment biogeochemistry, and to assess impacts of hypothetical or planned activities on both. To achieve this goal six study sites were chosen across a permeability spectrum ranging from permeable to cohesive sediments ($\pm 5 \times 10^{-11} \text{ m}^2$ to $\pm 2 \times 10^{-14} \text{ m}^2$) and physico-chemical parameters (e.g., porewater nutrient profiles, nutrient fluxes, sediment characteristics) as well as biological parameters (e.g., faunal composition and biomass, bioirrigation and bioturbation rates) were collected for all sites. This information, supplemented with existing data collected by FaCE-It partners was then used to calibrate mechanistic models of sediment biogeochemistry. In this presentation we will highlight how specific benthic activities affect biogeochemistry across the permeability spectrum and discuss the implications for benthic pelagic coupling.