



## **Short and medium time dynamics of carbon exchange between the Baltic Sea and the North Sea**

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Carbon exchange between the Baltic and the North Sea is important as regards the carbon cycles in the both reservoirs. Accurate estimations of the carbon fluxes across the Danish Straits require establishing two components: volume of water passing the straits and carbon concentrations in the passing water. Previous carbon exchange evaluations based on the annual averages of both mentioned above components. In order to investigate dynamics of the exchange, an approach based on high temporal resolution of water fluxes and carbon concentration was applied.

Literature data, modelled seasonal variations and experimental results of carbon species concentrations were used in this study in order to evaluate short time (daily, weekly, monthly) and seasonal variations of carbon concentrations.

Dynamics of water exchange between the Baltic Sea and the North Sea was estimated using CMOD hydrodynamical model of high spatial (2 nm), vertical (1 m) and temporal resolution (1 hour). This model supplied information as regards water volume, salinity and direction of the flux. Three horizontal transects were selected in the Danish Straits. The contributions of Baltic and North Sea water masses were calculated using salinity values obtained from the model grid point and salinities of the Baltic water and the North Sea water using the 'end members' approach.