

Changes of the Overturning Circulation of the Baltic Sea Towards the End of the 21st Century

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Simulations of the Baltic Sea are conducted with different forcing datasets extracted from two climate models for the period 1961-2099, and using two emission scenarios (RCP 4.5 and RCP 8.5) for the period 2005-2099.

The changes in overturning circulation are analysed and show that there is a consistent decrease of the overturning circulation that reaches up to 20%. The decrease of overturning is higher when warming is higher.

An analysis of the changes of stratification shows that there is an increase of thermal stratification in the mixed layer down to 30m. Based on a simplified analysis of the buoyancy fluxes, we conclude that there is a drop of the entrainment velocity that erodes the permanent stratification. This drop is related with the increase in thermal stratification, and is responsible for the decrease of overturning circulation.