



Instabilities and thermohaline stratification at tidal mixing front: A case study for the German Bight

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In this study we present simulation results from a nested-grid three-dimensional numerical model for the German Bight and the North Sea. The annual cycle and spatial variability of the vertical stratification and mixing is simulated using General Estuarine Transport Model (GETM). Atmospheric forcing and tides play an essential part in the synoptic and neap-spring variations of SST, stratification and tidal fronts. The processes that influence the mesoscale variability of thermal stratification have been quantified. The response of circulation and vertical stratification to surface forcing is studied as well. The development of thermohaline stratification due to baroclinic instability is evaluated. The model results are further compared with data from observations. We demonstrate some of the model capabilities for a more realistic simulation of the frontal circulation of the shelf sea areas.