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The Erosion of a Thermocline

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ABSTRACT

Measurements of winds, currents and temperature are used to describe the response of the Baltic Sea to the passage of a sequence of severe storms during the BOSEX-Experiment in September 1977.

Before the onset of the storms the thermocline was at a depth of ~ 25 m. The storms deepened the mixed surface layer and redistributed the heat content. The storms generated strong inertial waves and vertical current shears, which reduced the Richardson number within the thermocline to values of ~ 0.25 . The non-linearity of the inertial waves in this area of variable depth is demonstrated.

The response of the Baltic Sea to the meteorological conditions has been modeled numerically by means of a semispectral model. The theoretical results are compared to the observations and lead to the same conclusion, that the erosion of the thermocline is due to the strong shears of the inertial waves.

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