

Changes in diapycnal mixing conditions due to deep inflow events in the EGB?- a case study

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An inflow of saline and exceptionally warm water with a mean volume flux of about 10 km³/d had been observed in autumn/winter 1997/98, which lasted for 130 days. Among other things this warm inflow was recorded by two subsurface moorings (northeast and southwest), which were deployed in the Eastern Gotland Basin (EGB) to measure temporal variations in the mass and current field. Both moorings were equipped with a current meter at 170m and additional temperature sensors in 140 and 155 m.

During the MESODYN project (Meso-scale Dynamics 1996-2000), a set of 16 hydrographic zonal sections have been conducted in the EGB. Each of them represented 13 CTD stations with a spacing of 2.5 nautical miles to profile temperature, salinity and pressure. The measurements in August/September 1997 and April 1998 characterised the situation before and after the strong, warm inflow event. Changed hydrographic conditions, compared to 30 years of temperature and salinity measurements, as well as changes in the current patterns are described. It can be shown that prevailing diapycnal mixing drastically modified the thermohaline properties. Both moorings monitored the increase in temperature with each of the six pulses like intrusions and increase of speed of the deep cyclonic rim current. The moorings are the missing link between the two T/S profiles and can explain the processes of diapycnal mixing that are visible in these profiles of the two MESODYN campaigns.