



## **Near-bottom palaeocurrents variability in the Bornholm Basin (Baltic Sea) and its links to climate changes over last 7000 years - evidence from grain size records**

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Irregularly inflows of dense, saline and oxygenated waters from the North Sea determine near-bottom oxygen conditions and overall ecological situation in the Baltic Sea. The Bornholm basin is on pathway of these inflows. The inflows pass along the west slope of the basin as near-bottom (contour) currents and have had a pronounced effect on bottom sediment distribution.

We present for the first time reconstruction of near-bottom palaeocurrent intensity variations in the Bornholm basin using sediment grain size data. It is assumed that the grain size of fine-grained sediments reflects velocity of the near-bottom current. Higher bottom current velocities prevent deposition of the finest particles and cause increasing in sediment grain size.

Two sediment cores have been analyzed. The sediment core ANS-33060 was taken in south-western part of the basin with RV "Akademik Nikolaj Strakhov" in 2016. The sediment core POS-303770 was retrieved with RV "Poseidon" in 2005 in western part of the basin (Jensen et al., 2017). We have studied organic-rich marine muds of upper core sections accumulated during the Littorina and Post-Littorina Sea stages of the Baltic Sea (last 7000 years): 0-285 cm of ANS-33060 and 0-770 cm of POS-303770.

High resolution grain size analyses of terrigenous fractions were carried out using laser diffraction. Mean of grain size distributions was used as proxy for reconstruction of palaeocurrents intensity. We also measured organic carbon content in sediment core ANS-33060. Three calibrated AMS 14C dates were obtained for chronology of the core. Early published data of organic carbon content and 26 calibrated AMS 14C dates of POS-303770 were used (Jensen et al., 2017).

Three periods of near-bottom palaeocurrents intensification were distinguished in POS-303770 and two in ANS-33060. These intervals are characterized by increasing of mean grain size of sediment and relatively low organic carbon content. We have found that identified periods correspond with climate cooling in Europe during Holocene. The first period was 4000-2000 cal. BP after the Holocene Thermal Maximum. This was registered in both cores. The second interval of mean size increasing was registered at 1500-800 cal. BP also in both cores. It corresponds to cold climate of the Dark Ages and the beginning of Medieval Warm Period. The third period of near-bottom currents intensification was documented during 250-50 cal. BP in the sediment core POS-303770 and it is related to the end of Little Ice Age.

Jensen J.B., Moros M., Endler R. & IODP Expedition 347 Members. 2017: The Bornholm Basin, southern Scandinavia: a complex history from Late Cretaceous structural developments to recent sedimentation // *Boreas* 46, 3-17.