



The mesoscale and seasonal variability of the interbasin water exchange in the Baltic Sea

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This work is devoted to the investigation of the mesoscale and seasonal variability of the interbasin water exchange in the Baltic sea and the estimations of the water transport through the borders of the economical areas of the Baltic region states. The 3D numerical non hydrostatic model MIKE3-FlowModel (DHI Water & Environment, www.dhi.dk) was used. The calibration and verification of the model was performed using mean-annual characteristics of the thermohaline fields of the Baltic sea, interbasin water exchange data, general sketch of the water circulation in the Baltic sea. The dimensions of the numerical grid are 152x306 horizontal cells (5x5 km) and 4 m each in vertical.

It was pointed out, that the numerical model reproduces seasonal variations of the thermohaline fields of the Baltic sea quite good. The estimations of the interbasin water exchange were performed. The mean-annual water volumes through the cross-section in the deeps and troughs are roughly equal or 3-5 times more than the mean-annual runoff of the rivers. The most active water exchange was observed in the Slupsk trough: water transport is around 800 km³ per year to the west, 1000 km³ to the east and 0.04 km³ per year per km on the average, which is 2-2.3 times more than the mean-annual runoff. The geographical demarcation of the Baltic sea was performed on base of the interbasin discharges results. The work is supported by grant of RFBR 07-05-00850, 09-05-00446.