

Spatio-temporal variability of environmental parameters in the surface layer of the Gulf of Finland in spring (on the basis of Tallinn-Helsinki FerryBox data 2007-2009)

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The Gulf of Finland is a typical wide estuary with a major fresh water inflow in the eastern end and relatively open water exchange with the Baltic Proper through the gulf's western boundary. Residual circulation consists of an outflow of gulf's waters in the northern part and an inflow of open Baltic Sea waters in the southern part of the gulf. Wind-driven circulation in the Gulf of Finland is highly variable and is characterized by intense meso-scale features – eddies, upwelling/downwelling, coastal and frontal jet currents. These intense meso-scale motions can cause significant vertical advection of water masses and substances (incl nutrients), e.g. due to the average, estuarine-like inclination of isopycnal surfaces in the gulf. The aim of the present paper is to describe the spatial and temporal variability of environmental parameters in the Gulf of Finland in spring. Temperature, salinity and chlorophyll *a* fluorescence data are recorded autonomously twice a day along the ferry line Tallinn-Helsinki (time step 20 s, spatial resolution 150 m) and water samples for chlorophyll *a* and nutrient analyses are taken once a week at 14-17 locations. An earlier start and longer duration of spring bloom is revealed in the northern part of the Gulf of Finland. It is shown that on the basis of FerryBox measurements with high temporal and spatial resolution, the influence of meso-scale phenomena on the spatial distribution and temporal variability of environmental parameters can be identified.