

CURRENT STATISTICS FOR ÅRHUS BAY

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1 BACKGROUND

The following current statistics are extracted from 3D simulations with an established hydrodynamic model for the area Århus Bay for the years 2000 and 2002.

The model applies a horizontal resolution of 617 m (1/3 nautical mile) and a vertical resolution of 1 m; the surface layer, however, is about 2.5 m thick varying with the actual water level.

The simulation of the current conditions is based on actual 3-hourly wind, pressure and air temperature fields and on boundary conditions of tide, temperature and salinity provided by a regional model covering the entire North Sea – Baltic Sea area.

The model runs with 30 seconds time steps, but the result file used for the statistical analyses only includes hourly results.

The simulation results are from an ongoing calibration of the model set-up, but have been checked by available current recordings and considered appropriate.

The client for the model set-up, the County of Århus (Århus Amt), has with courtesy made the information available for the analysis of current statistics.

The statistical analyses presented in Chapter 2 show that the surface current mean speed in the Århus Bay area is 0.1-0.2 m/s, but that the current in the narrower connections may reach more than 0.8 m/s as instantaneous values. The general currents are generated by the limited tidal variation, whereas the maximum currents occur during events of strong local winds and as a result of regional changes in the water level (regional wind setup).



2 STATISTICAL RESULTS

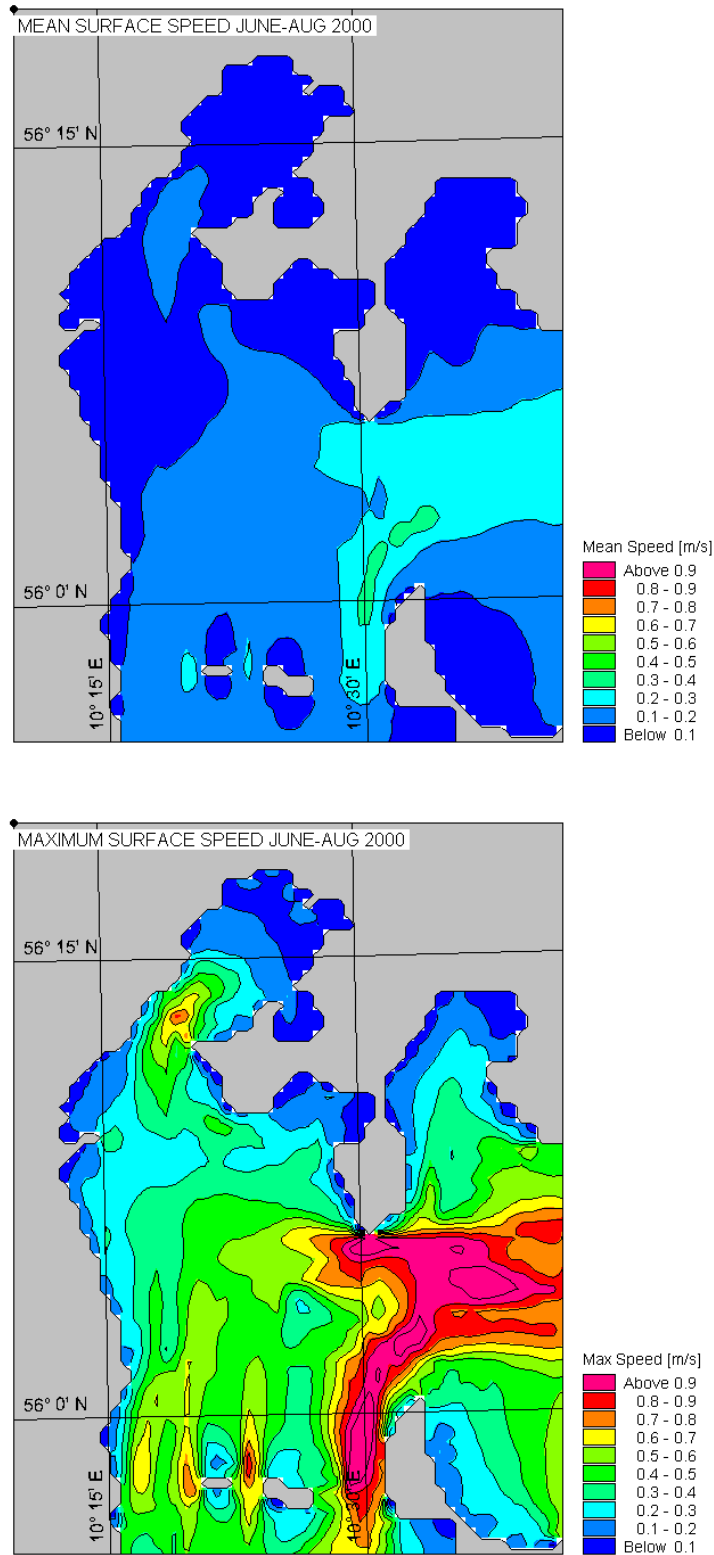


Fig. 1 Mean and maximum surface current speed June-August 2000, based on model simulations.

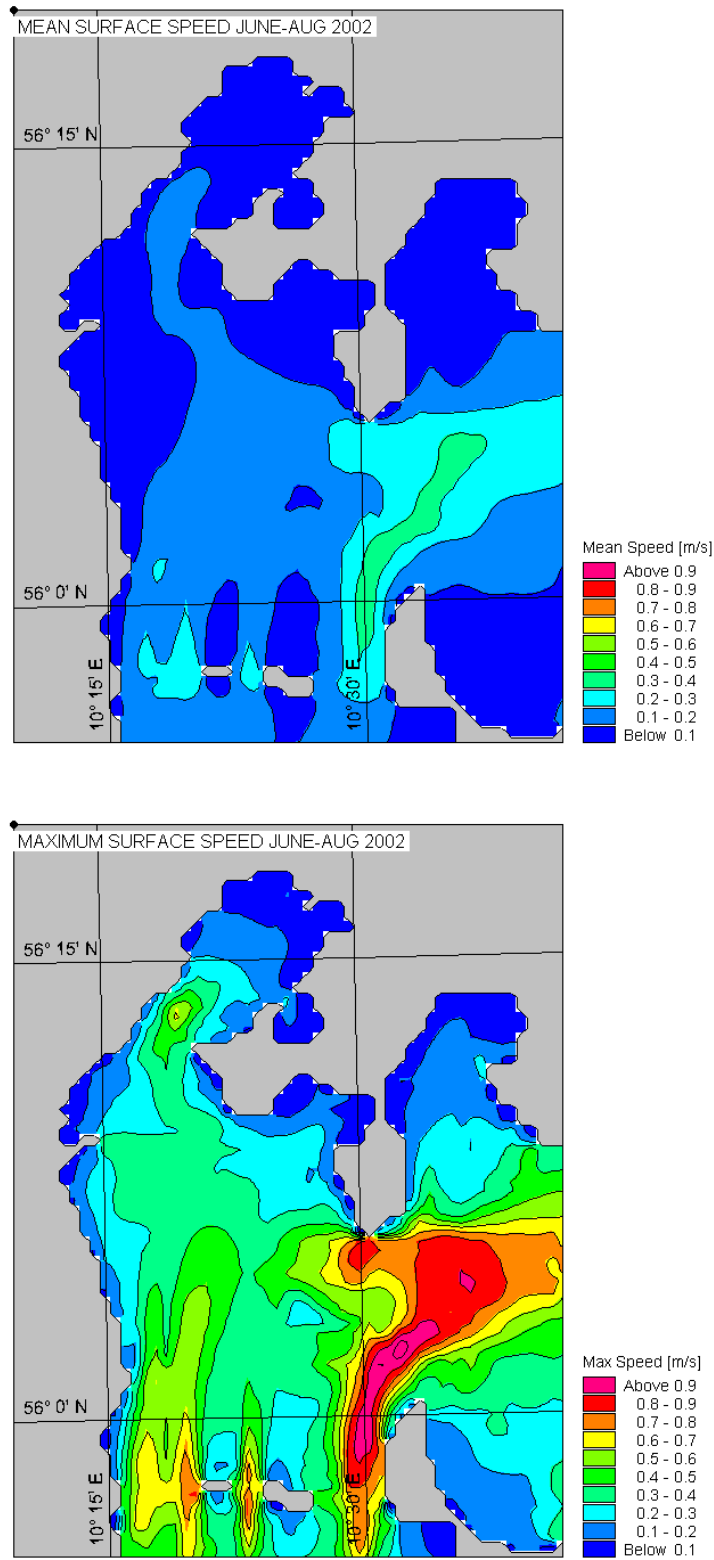


Fig. 2 Mean and maximum surface current speed June-August 2002, based on model simulations.

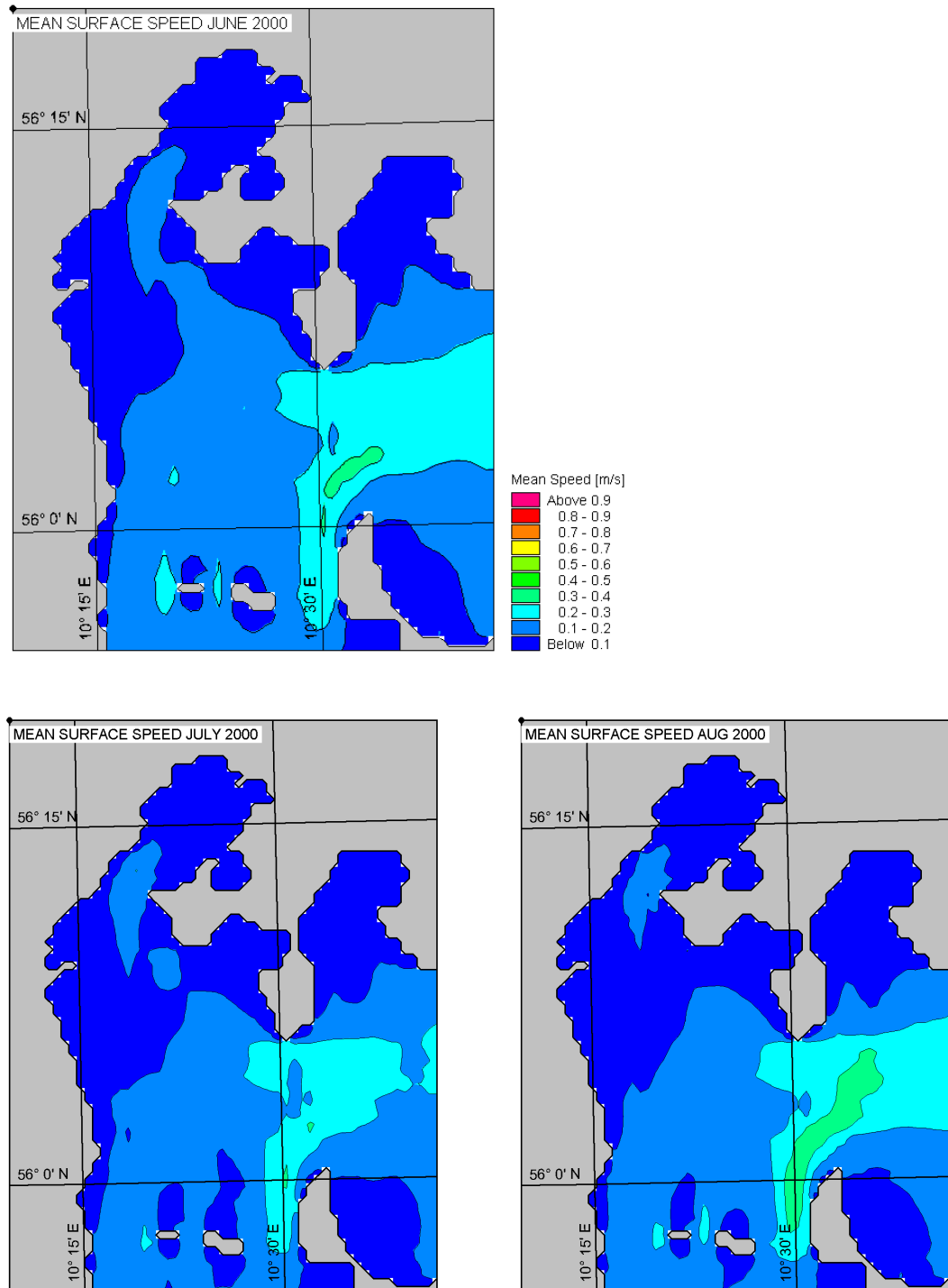


Fig. 3 Mean surface current speed June, July and August 2000, based on model simulations.

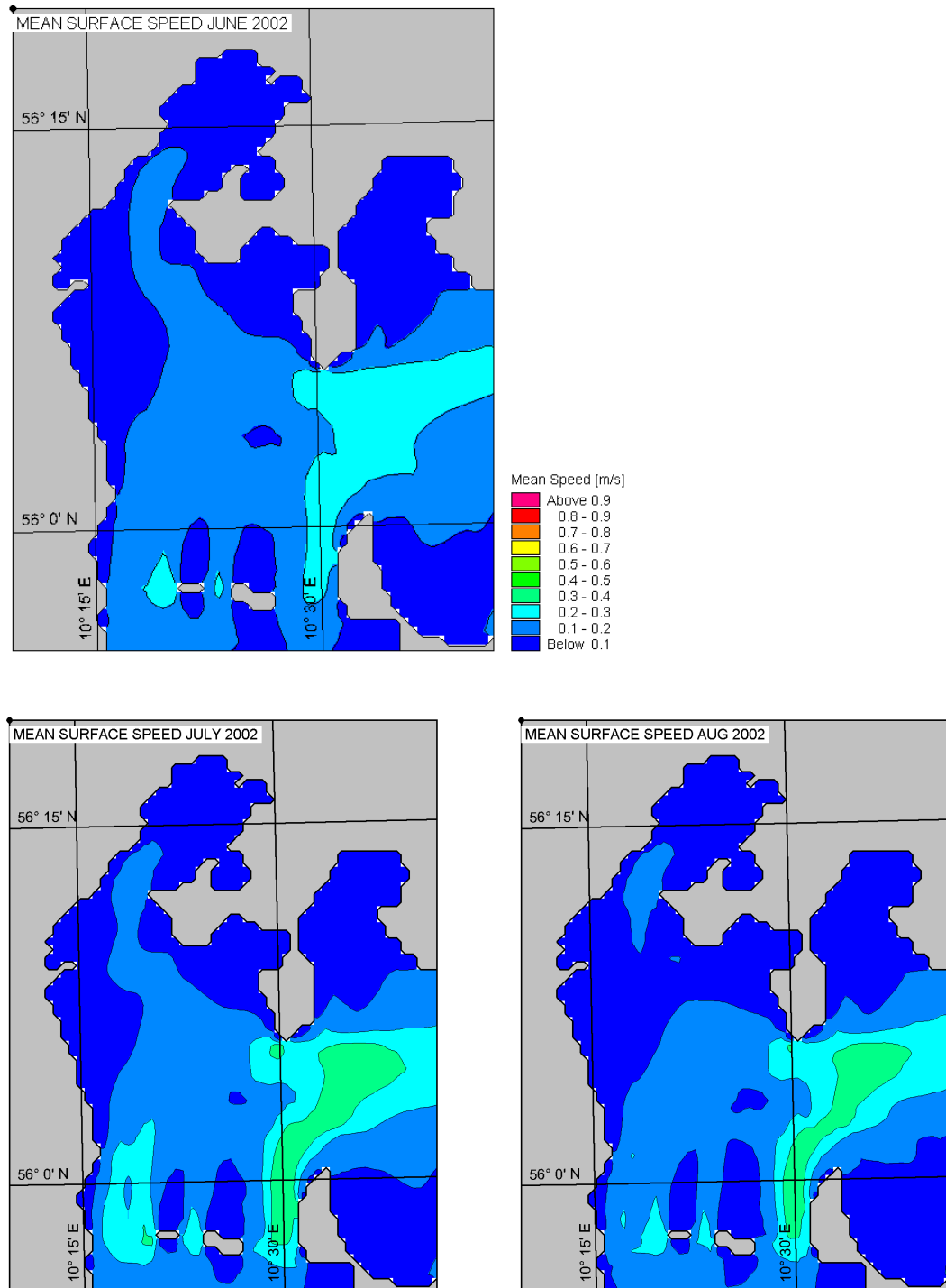


Fig. 4 Mean surface current speed June, July and August 2002, based on model simulations.