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## Dynamics of the Baltic Sea Straits via Numerical Simulation of Exchange Flows

*Friday 31 January 2020 09:00 (30 minutes)*

The Semi-implicit Cross-scale Hydrosience Integrated System Model (SCHISM), which uses unstructured grids, is set up for the North and Baltic Seas. With a resolution of ~100m in the narrow straits connecting the two basins, this model accurately resolves the inter-basin exchange. Validation against observations in the straits shows the model has good skill in simulating the transport and vertical profiles of temperature, salinity and currents. The timing and magnitude of the major inflow event in 2014–2015 is also realistically simulated. The analysis is focused on the two-layer exchange, its dependence on the atmospheric forcing, and dominant physical balances. The two-layer flows in the three connecting straits show different dependencies upon the net transport. The spatial variability of this dependence is also quite pronounced. The three-strait system developed specific dynamics, with time lags and differences between currents in the individual straits during inflow and outflow conditions. Analysis on the impact of resolution indicates that the performance of the model changes depending on whether the narrow parts of the straits are resolved with a resolution of 500m or 100 m. With this ultra-fine resolution, gravity flows, secondary circulation and variability of salinity in deep layers is generally more adequately simulated. This paper identifies the needs for more profound analysis of the coupled dynamics of Baltic and North Seas with a focus on the Danish straits.

### Do you need an official invitation letter?

No

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