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## The future of Gulf of Bothnia, possible changes on salinity and currents

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Understanding the physical development of the Gulf of Bothnia is vital in estimating the future of the area, both for humans and nature alike.

In the SmartSea project we have made simulations of future scenarios for the Gulf of Bothnia. We have simulated a historical control period of 1976-2006 with three different downscaled global circulation model forcings, and use these as comparisons for runs made with corresponding model forcings for the years 2006-2100 with RCP 4.5 and RCP 8.5 scenarios.

In this presentation we analyze the changes in salinity and overturning circulation development within the simulation runs. The overturning circulation is characterized by being divided into the two basins Bothnian Sea and Bothnian Bay divided by the Quarken. The circulation in each of the basins is composed of one estuarine circulation with a cyclonic one superimposed.

Local changes in salinity within the Gulf of Bothnia are affected by the stratification, changes of current patterns and river inflows, although its general salinity development is largely determined by the changes in the Baltic Proper.

The comparison between our simulation runs demonstrate that small changes in conditions can produce very different salinity trends, as either weaken, or strengthen the general circulation of the GoB. While the general salinity trend over the 2006-2100 period is slightly decreasing, the trend can be on the rise for decades within the simulation.