

Seminar “Ocean, Ice and Atmosphere”,  
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## Simulating AMOC sensitivity with eddy-rich ocean and climate models: freshwater and air-sea fluxes

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Atmosphere-ocean coupling, (Sub-)Arctic freshwater fluxes and ocean mesoscale dynamics are important players in the balance of the Atlantic Meridional Overturning Circulation (AMOC) and hence also crucial for a realistic estimation of AMOC strength and variability in ocean and climate model simulations. At GEOMAR the Ocean Dynamics group has long standing experience in running global forced ocean-sea ice and coupled climate simulations based on the ocean model NEMO including regional grid refinement to explicitly simulate mesoscale dynamics. Observations of currents and hydrography at 26.5° N (RAPID) and 53° N (OSNAP west) have been serving as benchmarks to validate and interpret model results for years. Investigating AMOC decadal variability and potential weakening under global warming has been and still is one of our focus activities. This presentation will provide an overview of most recent work with a focus on the subpolar North Atlantic. Among other topics, we will discuss where simulating the ocean mesoscale is crucial, what is needed for eddy parameterizations to work well, why air-sea interaction may be more relevant than Greenland meltwater and also how much of this freshwater is affecting the AMOC in a warming climate.