



An examination of the freshwater content of the Beaufort Gyre and Arctic shelves in a suite of NEMO model simulations

Here we investigate model representation of salinity and freshwater in the Beaufort Gyre and on the Arctic shelves in numerical models. We use the NEMO model, coupled with either the LIM2 or LIM3 sea ice model. We run experiments at resolutions from 1/4 to 1/12 degree (plus preliminary results from a 1/60 degree simulation). We use both regional configurations (with a boundary near Bering Strait), as well as a global configuration. We also explore forcing the models with runoff from the output of a regional hydrographic model (AHYPE) rather than the traditional Dai and Trenberth fields. We show that all the regional configurations underestimate the observed freshwater content in the Beaufort Gyre, especially at 1/4 degree. Model salinities are significantly higher than observed in the near surface layers. Comparisons with mooring observations at Bering Strait suggest the inflowing salinity taken from the GLORYS reanalysis product is much higher than observed. However, the global configurations better represent the inflowing salinity at Bering Strait, and do a good job of representing the Beaufort Gyre freshwater content compared to observations. Ongoing work is looking at using the inflow fields from the global simulations to provide improved boundary conditions for the regional Arctic simulations. Behavior on the Arctic shelves is also studied to examine freshwater pathways from the shelves to the interior and the Transpolar Drift. Impacts on sea-ice in single and multiple-category versions of the LIM model will also be presented.

Paul G. Myers, Clark Pennelly, Tahya Weiss-Gibbons, Chuanshuai Fu, Carlos Ramos Portalatino Department of Earth and Atmospheric Sciences, University of Alberta, Canada