



Effect of sea ice salinity variations on Southern Ocean water mass formation

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Sea ice has a non-zero salinity that varies in space and time. Not only does this affect the sea ice thermal properties, it also allows sea ice to store and release brine, so that the locations of sea ice formation and brine release do not necessarily coincide. Using a simple parameterization for brine entrapment and drainage, we implemented a sea ice salinity budget in the global Finite Element Sea ice Ocean Model (FESOM). The sea-ice component of this model is a single category model that neglects internal heat storage (so-called zero-layer approach), so that we can isolate the effect of a modified brine release pattern. The model is run over the period 1948-2008, forced by NCEP reanalysis data, and compared to otherwise identical simulations that assume a constant sea-ice salinity of 5 psu. While we focus on water mass modification and bottom water formation, we also assess the effect on the seasonal cycles of ice volume and extent.