

The influence of sea-ice and the Ross Ice shelf on water properties

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A regional ocean model (ROMS), with a 5 km grid spacing, has been developed for the Ross Sea which includes thermodynamically active ice shelves and dynamic sea ice. Simulations are driven by ECMWF (ERA-40) daily averaged, 2.5 degree atmospheric conditions. The CICE sea-ice model is coupled to the ocean model. High Salinity Shelf water, the dense precursor to Antarctic Bottom Water, is created in the western Ross Sea primarily in the coastal polynyas. Cold Ice Shelf Water is created by circulation under and basal melting of the Ross Ice Shelf (RIS). The warm Circumpolar Deep Water intrudes over the shelf break providing heat to moderate the sea ice cover and to support basal melt under the RIS.