

## Numerical modeling of water mass circulation and variability

### in the Terra Nova Bay, Antarctica

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Using a 3 dimensional ocean circulation model, we investigate the variability and circulation of water mass overlying the continental shelf and beneath the ice shelves in the Terra Nova Bay (TNB), Ross Sea, Antarctica. The interaction between ocean and ice shelf is an important process to both water mass transformations and ice shelf melting and freezing regimes at the ocean/ice interface, The goal of this study is to better understand how ocean-ice interactions affect ocean circulation and water mass properties which govern the ice shelf stability. Properties of water mass and circulation in the TNB and the corresponding affect on sub ice shelf basal melting are explored using the Regional Ocean Modeling System (ROMS) with explicit ice shelf thermodynamic and sea ice dynamic-thermodynamic. In this study, we especially investigate uncertainties in basal melting, which is affected by ocean temperatures, ocean currents, and model geometries, particularly in cavity geometry