

The ECCO Consortium: Antarctic Circumpolar Current fronts inferred from ECCO2 and mean dynamic topography products

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The Antarctic Circumpolar Current (ACC) represents a system of fronts characterized by strong horizontal gradients of temperature, salinity, oxygen, and sea surface height. There are three main circumpolar fronts identified from subsurface temperature, salinity, and oxygen: the Subantarctic Front, the Polar Front, and the Southern ACC Front. More recent analyses of satellite altimetry data added to climatology of dynamic height above 2500 dbar have shown that more fronts can be identified. We use a high-resolution eddy-permitting ECCO2 product, constrained by available satellite and in situ data, to determine the time-mean and time-dependent positions of the ACC fronts. The obtained frontal positions are validated against those from previous studies. The variability of frontal positions is studied in relation to associated subsurface changes in water mass distribution.