



## **Multi-year Observations Under Seasonal Ice in the Antarctic Using Arrays of Profiling Floats**

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Four winters of under-ice CTD data from the upper 2000 m of the water column have been gathered from the Wilkes Land Coast and Weddell Sea regions of Antarctica using arrays of autonomous profiling floats. A number of the floats also carried dissolved oxygen sensors. The sampling region is in the seasonal ice zone near the southern terminus of the Antarctic Circumpolar Current. The profiling floats were equipped with an ice-avoidance algorithm wherein the floats remained submerged in winter and stored their data, then transmitted the stored files during Austral Summer using the Iridium system. Our time series data show that around the Antarctic continent the rate of sea ice decay exceeds the rate of sea ice growth. During the sea ice growth period, the water column is weakly stratified due to brine rejection and is therefore only marginally stable. The average mixed layer temperature in winter is about 0.1°C above the freezing point, providing evidence of entrainment of Upper Circumpolar Deep Water. A one-dimensional model is used to quantify evolution of the winter mixed layer under a sea ice cover. The mean lifetime of floats in this environment is found to be comparable to the lifetimes at mid-latitudes, suggesting that these instruments are a promising tool for future studies of high-latitude circulation.