



Physics and productivity of the platelet-affected ocean boundary layer

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Platelet ice, which forms in supercooled glacial meltwater, is a physical manifestation of the oceanic connection between ice shelf and sea ice regimes. It is ubiquitous in McMurdo Sound, through which a stream of Ross Ice Shelf Water continuously flows. Here we describe recent observations in the ocean boundary layer beneath thick layers of buoyantly-accreted, unconsolidated platelet ice. Platelet ice offers a quiescent environment that supports the growth and maintenance of thriving but patchy algal communities, reinforced by nutrients trapped within them from a range of sources. In addition, a frictional response of elevated drag, associated with upstream and tidal conditions, was evident over the upper 30 m of the ocean boundary layer. We suggest quantifiable relationships between the upstream conditions, the thickness of the platelet layer, and the longevity of supercooled Ice Shelf Water with distance from the calving front, which are intended to inform under-ice boundary layer parameterisations.