

Surface elevation changes at the front of the Ross Ice Shelf; Implications for basal melt

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Spatial and temporal elevation changes at the calving front of the Ross Ice Shelf (RIS) are examined using GLAS ICESat laser altimetry data. Elevation profiles show a spatial trend of decreasing elevation towards the calving front, while temporal changes over a 3-4 year timeline demonstrate ongoing lowering of surface elevations. The constraint of hydrostatic equilibrium, along with assumptions regarding spreading-rate, accumulation rate, and firn-depth, allow basal melting to be quantified. Estimated melt-rate increases exponentially towards the front. Using a best-fitting exponential function for melt rate, preliminary findings indicate that melt within the front 50 km of the ice shelf is responsible for almost half of the total melt produced beneath the RIS.