

Spatial and temporal isotopic patterns across the West Antarctic Ice Sheet Divide from five new snowpits and firn cores

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Sub-annually resolved shallow firn and ice cores were collected during the 2010-2011 field season across the West Antarctic Ice Sheet (WAIS) divide. A high resolution depth-age relationship was determined through a combination of electrical conductivity (ECM), density, and isotope data. These new records are used to extend the existing isotope records over the central WAIS. A new core drilled 10 km from the WAIS divide deep-core site correlates significantly with the original ITASE core recovered from the same site, giving confidence in the utility of the new records. These new isotopic records are combined with existing isotopic records in the region to quantify the spatial and temporal patterns in the isotopes. These patterns are compared to temperature records over the same time period. The results of the isotope-temperature comparisons are used to re-evaluate the warming of the West Antarctic interior over recent decades; the proposed mechanisms (Steig et al., 2009) are regional changes in atmospheric circulation, sea surface temperature, and sea ice.