

# Glacial history of the ridge between Mercer and van der Veen Ice Streams

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The surface topography of the ridge separating Mercer and van der Veen Ice Streams is notably different from those of other inter-stream ridges in the Ross Sea Embayment (Smith, 2005); it is more suggestive of an ephemeral topographic feature. Repeat GPS surveys across the ridge indicate a complex flow pattern, which includes the possibility that some sections are sliding at the bed. Analyses of the present-day flow field however, indicates that overall the ridge is now near balance. In contrast, ground-based radar profiles across the ridge show deep internal layers that are highly disturbed, indicating large strains in the past. In general, radar-detected layers in the upper 250m are less disturbed than the deeper layers, suggesting that the present-day flow regime had become established by about 2 ka BP. This timing is consistent with exposure ages emerging from the lower reaches of Reedy Glacier that indicate thinning, which was underway prior to 7ka BP, continued up to ~1.5 ka BP (Todd et al., 2004; Stone et al., 2005). We have not found a zone of disrupted, chaotic stratigraphy that might indicate lateral expansion of Mercer Ice Stream (at least in the recent past) into the ridge, as suggested by Shabtaie and Bentley (1988). However we do find evidence that van der Veen Ice Stream on the north side of the ridge was wider in the past. The depth of the chaotic zone below the surface (~250m) suggests that van der Veen Ice Stream migrated northward about 2 ka BP.