

Measuring Changes to the Seal Nunataks Ice Shelf Remnant from Imagery and Altimetry

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Acquisition and analysis of a combination of repeated imagery and ICESat-1 altimetry has enabled the ongoing losses from the northern Larsen B ice shelf remnant to be visualized and measured. The northern remnant, the Seal Nunataks Ice Shelf (SNIS), has four ICESat tracks that cross it as well as a track that obliquely crosses adjacent Robertson Island (RI). The available altimetry data from ICESat (2003-2009) shows that elevation losses generally increase from west to east across the SNIS. In addition, the adjacent ice shelf thickness losses adjacent to Robertson Island are almost 1.5x the average elevation losses measured for the grounded ice suggesting a significant amount of basal shelf melting. Imagery analysis shows that ice area losses continued on both margins of SNIS with the largest losses occurring on the north side in late 2004 into 2005. New rifts that form on SNIS do not tend to fill with melt water and soon release icebergs. In contrast, RI has experienced relatively minor area losses suggesting that most of its ice is grounded and is less impacted by ocean interactions as compared to SNIS. This analysis is compatible with the analyses of Pritchard et al. (2012) and Rignot et al. (2013) and provides some insights about ongoing ice loss processes.