

## **Significant Glacier Thinning (or not), 2002-2007, Larsen B Embayment, Antarctica**

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### **Abstract**

Laser altimetry data from two long-range NASA/CECS aircraft missions using the ATM instrument and eleven ICESat operational periods between November 2002 and April 2007 quantify dramatic elevation changes that now extend over the >50 km length of the Crane Glacier. This glacier flows into the area of the Larsen B Ice Shelf that collapsed in early 2002. At a location on the Crane ~5 km in from its new ice edge and ~13 km from its pre-collapse grounding line, the combined ATM-ICESat time series shows a >152 m total elevation change over a ~4.5 year period. An average >40 cm/day elevation loss was observed over ~3 months in late 2004 into early 2005 at this location as the glacier responded to the collapse of the Larsen B. Very recently, the nearby but smaller Melville Glacier that also flows into the open Larsen B embayment has shown a ~9 m elevation loss near its terminus as does the larger and more southerly Leppard Glacier (-6, -9 m) whereas the Flask Glacier shows a ~6 m elevation rise and changes to its roughness near its seaward end. Smaller elevation changes (few m level) are observed elsewhere in the region. The Flask and Leppard glaciers are similar in size to the Crane but are buttressed by the remainder of the Larsen B Ice Shelf. Although the recent mass loss from the Crane is now reduced and a small portion of sea level rise, these results suggest additional losses may be coming from the area.