



Greenland and Antarctica ice sheet drainage basin mass change observations from GRACE

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On multi-decadal time scales or longer, the most important process affecting sea level are those associated with the mass balance over the Earth's ice sheets. The vulnerability of the cryosphere to climate change along with the difficulty in acquiring uniform *in situ* observations in these inhospitable regions, makes the problem of understanding ice sheet mass trends a focus within NASA's earth observing program. The Gravity Recovery and Climate Experiment (GRACE) mission has been acquiring ultra-precise inter-satellite ranging for over three years. These data provide new opportunities to observe and understand ice mass trends at unprecedented temporal and spatial resolution. In order to improve upon the ice mass trend observations obtained from GRACE we have employed unique data analysis approaches in order to obtain high resolution local mass change (mascon solution) from GRACE inter-satellite observations alone. We have applied our mascon solution technique to the Greenland and Antarctic ice sheets estimating surface mass change for irregularly shaped regions defined by the ice sheet drainage basins. We estimate the surface mass change of each ice sheet drainage basin at 10-day resolution. To date, we have computed surface mass change time series for each ice sheet drainage basin from over two years of GRACE data analysis. The results provide unprecedented observations of the seasonal and inter-annual evolution of ice-sheet mass flux. In this presentation we will discuss our analysis techniques and the details of our ice sheet drainage basin mass flux solutions.