



Decadal changes in ice flow and mass of Patagonia Glaciers, South America

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The Patagonia icefields of south America are the largest ice mass in the southern hemisphere outside Antarctica. The glaciers of Patagonia thinned rapidly this century and their retreat accelerated in the last decade. We previously quantified their total mass loss in 1975-1995 and 1995-2000. The thinning rates recorded in this region typically exceed those recorded in Alaska, which we attributed to the enhanced sensitivity to climate change of tidewater glaciers. Here, we present new digital elevation data collected in 2004 using the NASA/JPL AIRSAR system to measure mass changes in 2000-2004. The year 2000 reference is provided by topography data from the Shuttle Radar Topography Mission. The 2000-2004 comparison helps determine whether the accelerated trend in glacier thinning recorded in 1995-2000 is continuing at present. We also present the first map of ice velocity of the glaciers based on Radarsat-1 InSAR data collected in 2000. One purpose of these data is calculate mass flux and balance discharge of the glaciers, which is virtually unknown at present. Another purpose is to combine these data with SIR-C derived velocities of several glaciers from 1994 and new velocity data derived from Radarsat-1 in 2004 to quantify changes in ice dynamics of the glaciers over the last 10 years. Shorter-term changes in velocity (month-to-month) are also examined in 2000 and 2004.