

# Glacier changes in Pine Island Bay and the Antarctic Peninsula from Radarsat-1 2000-2005

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Rapid changes are taking place in Pine Island Bay, West Antarctica and the Antarctic Peninsula, with important consequences for sea level change. Here we present the latest Radarsat-1 acquisitions in these regions. The results in Pine Island Bay are as follows: 1) Summer radar imagery reveals the presence of water-saturated snow at the surface of ice shelves in Pine Island Bay, which we never observed in prior data. This suggests that the regional warming experienced in the Antarctic Peninsula is reaching as far south and west as Pine Island Bay, which is corroborated by model predictions from M. Broeke and satellite surface temperature from J. Comiso; 2) Pine Island Glacier is still accelerating; we summarize its acceleration from 1975, 1980, 1992, 1996 with Landsat/ERS and 2000 through 2005 with Radarsat-1, with a high density of data starting in 2003 till present; overall the glacier increased its speed by more than 30 percent. An animation of the imagery will be presented to illustrate the dynamic character of the glacier; 3) A new set of cracks appeared 150 km from the ice front of Pine Island Glacier in Aug-Oct 2004, which continued to extend until late Dec 2004, over a region about 30 km wide and 10 km in length. These new crevasses suggest an increase in longitudinal stretching of the glacier far inland from the grounding line, consistent with prior observations that the speed up affects a vast area quickly; 3) new cracks are also visible near the grounding line of the eastern ice shelf of Thwaites Glacier. If the ice shelf severs from the glacier, it could double the width of Thwaites Glacier. An earlier study indeed suggested that Thwaites Glacier is widening. These changes are significant and indicate no slow down of glacial retreat in this sector of Antarctica. In the Antarctic Peninsula, Crane Glacier is still experiencing a spectacular retreat in the wake of the collapse of Larsen B ice shelf, while Evans/Hektor/Green are now slowing down from their 8-fold speed up but still strongly retreating. We will discuss flow changes in other parts of the Peninsula at the meeting from the mapping of velocities along the entire coast of Graham Land.