

# The nature and dynamics of the bed beneath Pine Island Glacier, Antarctica

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The dramatic acceleration, recession and thinning of Pine Island Glacier observed over the last 20 years represent some of today's highest-profile contemporary glaciological phenomena, and are of global concern due to their contribution to eustatic sea level. The last decade has witnessed multiple initiatives to predict the future of the catchment with numerical modelling, but the different models disagree on the likely future pace of loss and its spread inland. Progressive aerogeophysical surveys of the catchment have increasingly constrained the catchment-wide form of the bed, providing regional boundary conditions, but there has remained a dearth of information at the smaller scales that many glaciological studies have shown can, in fact, be critical in controlling ice-stream motion.

In 2013/2014, as part of the UK NERC iSTAR (ice Sheet sTAbility Research programme) traverse across PIG, we deployed the British Antarctic Survey's DEep-LOoking Radio Echo Sounder (DELORES) to alleviate this data gap. Our goal was to survey patches of the bed at high resolution to: (a) image subglacial landforms and detect presence/absence of water and/or sediments, and (b) produce detailed subglacial topographies useful for quantifying basal roughness and modelling basal drag. We present and discuss here the form of the bed imaged at six sites across the trunk and tributaries of Pine Island Glacier.

In the light of recent findings indicating that sub-ice stream landforms may be transient and subglacial erosion high, we also undertook opportunist repeat-surveys of DELORES tracks previously surveyed in 2007/08 and 2010/11 (six and three years earlier respectively). We present and discuss preliminary findings from these surveys.

Sung to the tune of: Amundsen Sea (*West Coast Blues*)