

# Oceanographic observations at the Dotson Ice Shelf front, West Antarctica, and calculations of basal melting

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It is well known that the ocean plays a key role in the process of mass loss from ice sheets through iceberg calving and basal melting. The Amundsen Sea, in the eastern Pacific sector of the Southern Ocean, is a region where the ice shelves are rapidly thinning. The widespread, coherent nature of the thinning suggests oceanic forcing, which has now been well documented for Pine Island Glacier. Studies using satellite data have indicated that Dotson Ice Shelf is melting at a rate of  $8 \text{ m a}^{-1}$  and thinning by about  $3 \text{ m a}^{-1}$ . This study works on the problem from an oceanographic perspective. Observations spanning nearly a decade and a half (2000–2014) have been obtained at the Dotson Ice Shelf front. A total of seven hydrographic sections reveal the oceanographic environment in front of the ice shelf as well as changes in water properties and meltwater content over time. We investigate the variability in circulation and meltwater production beneath the ice shelf and produce estimates of the basal melt rate for this 14 year period.