

"Icebergs Behaving Shelf-ishly: Why wait for the Larsen C?"

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Over the past five years, a series of large icebergs have calved from the Ronne Ice Shelf front and drifted northward, first along the Antarctic Peninsula east coast, and later across the Scotia Sea towards South Georgia Island. The bergs broke up or disintegrated within a year of reaching the island. Observations of the icebergs using MODIS, ICESat, and QuikScat have revealed details of the evolution and break-up patterns. In cold (sea-ice covered) water, icebergs evolve slowly, with infrequent calving of large blocks, usually along pre-existing fractures. Margin profiles from ICESat show a 'berm' pattern, with a forward-leaning ice face. In warmer water north of the ice edge, bergs show more frequent edge-parallel calvings ('edge-wasting') in which berg shape is little changed, but berg area gradually decreases. ICESat profiles of these bergs show a 'rampart and moat' pattern. Scatterometry observations of the icebergs indicate the berg firn undergoes significant evolution during northward drift, due to melt and melt percolation. The pattern of winter backscatter change for icebergs (over time) is similar to the variations of ice shelf backscatter with melt frequency (over space, i.e. latitude). This supports the hypothesis that winter backscatter versus melt seasons length (or degree days) may be used as an indicator of ice shelf 'health'. A field expedition to establish automated sensors for weather, ice thickness, melt, firn temperature, and a digital camera with uplink, is planned for the February 2006.