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## **Landscape evolution of Antarctica**

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This paper explores the links between glacial modification and subaerial weathering of landscapes over millions of years in Antarctica. Extremely low rates of subaerial weathering mean that landscapes pre-dating the start of glaciation 34 million years ago are still well preserved. The effects of different styles of glaciation that have affected the continent subsequently can be identified and dated by cosmogenic isotope analysis and argon-argon analysis. The initial 20 million years of glaciation saw cycles of local glaciers and ice sheet expansion from the main mountain centres. At ~14 million years ago, the ice sheet as a whole expanded to the outer edge of the continental shelf at a time of sharp cooling and eroded troughs and offshore deeps. At ~13.6 million years the ice withdrew to its approximate present extent and has maintained a dry polar climate subsequently. We model the erosive capacity of the fluctuating ice sheets, predicting the location of erosion and protection. Preservation of weathering features, at least at high altitudes, has been remarkable under both subaerial conditions and beneath cold-based ice.