



Projecting the long-term sea-level contribution from Antarctica (CR Division Outstanding ECS Award Lecture)

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The Antarctic Ice Sheet is by far the largest potential source of future sea-level change, storing approximately 58 m sea-level equivalent. Its past and future evolution is thus of primary importance for coastal communities, infrastructure and ecosystems worldwide. To this day, the complex dynamics of the ice sheet and its surrounding ice shelves are one of the key challenges for sea-level projections. Recent observations show that part of the West Antarctic Ice Sheet is rapidly retreating, and that this retreat is likely irreversible on human timescales. Other regions are currently protected by ice plugs which hinder the onset of a dynamic instability. We will discuss the underlying mechanisms and potential critical thresholds for triggering persistent and possibly rapid ice discharge from Antarctic basins. As a consequence of these processes, sea-level might continue to rise for centuries or millennia. The magnitude and rate of ice loss depend critically on the warming trajectory and the feedbacks between the ice-sheet and the surrounding atmosphere and ocean.