



## **Past continental shelf evolution increased Antarctic ice sheet sensitivity to climatic conditions**

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Over the past 34 Million years, the Antarctic continental shelf has gradually deepened due to ice sheet loading, thermal subsidence, and erosion from repeated glaciations. The deepening that is recorded in the sedimentary deposits around the Antarctic margin indicates that after the mid-Miocene Climate Optimum ( $\approx 15$  Ma), Antarctic Ice Sheet (AIS) dynamical response to climate conditions changed. We explore end-members for maximum AIS extent, based on ice-sheet simulations of a late-Pleistocene and a mid-Miocene glaciation. Fundamental dynamical differences emerge as a consequence of atmospheric forcing, eustatic sea level and continental shelf evolution. We show that the AIS contributed to the amplification of its own sensitivity to ocean forcing by gradually expanding and eroding the continental shelf, that probably changed its tipping points through time. The lack of past topographic and bathymetric reconstructions implies that so far, we still have an incomplete understanding of AIS fast response to past warm climate conditions, which is crucial to constrain its future evolution.