

# Coeval Minimum South American and Maximum Antarctic Last Glacial Maximum Dust Deposition: Causal Link?

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## Abstract

We present a regional study of the Pampean loess in South America based on a detailed analysis of three sections across the core of the Pampas. High-resolution luminescence dating resulted in a new chronology that covers a period from Marine Isotope Stage 3 to the early Holocene. Reliable estimations of mass accumulation rates (MARs) for loess were used to infer the temporal dust flux variation during the last glacial/interglacial transition in southern South America (SSA). Minimum MARs in each section were identified for the Last Glacial Maximum (LGM), contrasting with high dust fluxes observed in more distal Southern Atlantic Ocean (SAO) and East Antarctica. We hypothesize that the power of the Pampean loess as a sink of dust was reduced during the LGM, allowing long-range transport of SSA dust to SAO and East Antarctica. This hypothesis is consistent with proxy data and models suggesting drier conditions in the Pampas during the LGM, which would have shut down loess accumulation. It is also consistent with isotopic evidence that points to northern Patagonia and southern central-western Argentina as main contributors of dust to East Antarctica during glacials, given that the prevailing regional wind system implies that dust emitted from these regions would have necessarily passed through the Pampas in its way to the SAO and East Antarctica. Forthcoming Nd, Sr, and Pb isotope results for the Pampean loess will allow further testing of this hypothesis.

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