



Dust input to the South Atlantic: provenance and paleoclimatic implications

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Wind-blown dust can be used to trace past and present atmospheric circulation patterns, through the study of its geographical provenance, its spatial distribution and temporal variability. Antarctic and marine records indicate that Patagonia has been a principal source of dust for the southern latitudes, particularly during glacial times. To improve our understanding of dust provenance and transport mechanisms downstream from South America and part-way to Antarctica, we analyzed an extensive set of samples from the 12.76-m piston core TN057-6, located at 3751 m water depth on the Agulhas Ridge in the Southeast Atlantic, north of the present-day position of the Subantarctic Front and South of the Subtropical Convergence Zone. From the core's location downwind from South America and its depth above the abyssal plain the major source of terrigenous sediment is wind-blown dust material originating in South America, and temporal changes in the dust composition can be used to trace changes in the dust source regions.

To fingerprint better the terrigenous detritus, we measured the chemical compositions and Sr-Nd-Pb-He-Th isotope ratios in the fine ($<5 \mu\text{m}$) fraction terrigenous material, in samples ranging in age from MIS 6 to present-day. Additionally we analyzed fine fraction material from potential dust source areas in different locations around Patagonia to refine their individual geochemical signatures, improve knowledge of spatial variability, and compare them to the Southern Ocean samples. Our results show that the glacial and interglacial samples have different provenances. While the glacial dust compositions are consistent with purely Patagonian sources, the material deposited during interglacial periods presents more radiogenic Sr and Pb values and more negative ϵNd suggesting the contribution of a different lithogenic source, with possible mixing with the Patagonian sources.