



SOUTH-WESTERN AFRICAN CLIMATE DEPENDS ON ANTARCTIC SEA ICE

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The typical Fynbos vegetation of the Cape region of South-western Africa is brought about by the local Mediterranean (winter rainfall) climate and its associated sharp seasonal contrasts, especially in precipitation. This biome is bordered by hyper-arid deserts which may rapidly expand in response to future global warming, such as during the last warm period 125.000 years ago. It is therefore essential to understand the mechanisms that drive the winter rainfall in such a restricted area. We relate variations in South-western African humidity to changes in Antarctic sea-ice extent. New records of Antarctic sea-ice extent compared to existing palaeoclimate records of South-western Africa reveal a coherent signal during the last 50 kyr BP, with enhanced continental humidity and trade-wind intensity during periods of increased sea-ice presence. We propose that greater glacial Antarctic sea-ice extent causes a Northward shift of oceanic and atmospheric frontal zones, thereby increasing latitudinal temperature and pressure gradients, leading to enhanced trade-wind intensities. In addition, the equatorward shift and increased intensity of the Southern Westerlies causes an expansion of the winter-rain region and increased precipitation in South-western Africa. This relationship implies enhanced desertification in South-western Africa in response to retreating sea-ice edge in the Atlantic sector of the Southern Ocean if global warming continues.