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Changing position of Southern Ocean Westerlies decouples Holocene land and sea

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Reorganization of Southern Ocean ice-marine-atmosphere interactions at the end of the last glacial period is believed to have been a key driver of global climate change. However, discrepancies between terrestrial and marine temperature reconstructions pose interpretative problems. Here we present a high-resolution 18,000-year terrestrial temperature record from a subantarctic island (52.5degS)that shows while land and sea surface temperatures initially warmed together, they diverged 9000 years ago, with the land continuing to warm and sea cooling. We suggest equatorward displacement of westerly winds to their current position over the island warmed the land through greater summer meridional airflow while cooling the adjacent ocean through increased Ekman transport. If future warming shifts westerly airflow polewards, increased sea-ice melt and deepwater CO2 release may exaggerate anthropogenic warming.