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## Release of old carbon from the deep South Pacific during the last deglaciation

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The release of old carbon via the Southern Ocean has been thought to contribute to the last deglacial atmospheric CO<sub>2</sub> rise, but underlying processes are not fully understood, in part, due to insufficient high-fidelity radiocarbon ( $\Delta^{14}\text{C}$ ) reconstructions minimally complicated by age models and release of "dead carbon". Here, we present a new deep-water  $\Delta^{14}\text{C}$  record for a core located at 3.3 km water depth from the Southwest Pacific, based on a robust age model using planktonic Mg/Ca along with co-existing benthic <sup>14</sup>C measurements. Our results confirm previous records that suggest enhanced ventilation in the Southern Ocean during Heinrich Stadial 1 and the Younger Dryas. For the first time, our data show a large  $\Delta^{14}\text{C}$  decline during the Antarctic Cold Reversal, indicating strengthened stratification in the deep South Pacific. Our results strongly support that the deep ocean supplied old carbon to the atmosphere during the last deglaciation.