

# Coccolithophore productivity during MIS 11 in the Pacific sector of the Southern Ocean and its impact on the carbon cycle

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Proxy-based reconstructions of past changes in the marine biological carbon pumps are still limited, especially in the Southern Ocean. This study provides new insights into productivity variations in the Pacific sector of the Southern Ocean during Marine Isotope Stage 11 (MIS 11; between ca. 424 and 374kyr).

In this study, we present new data that was derived from three sediment cores (PS75/059-2, PS75/76-2, and PS75/079-2) that show glacial/interglacial coccolithophore variability across MIS 11. The cores were retrieved from Polarstern cruise PS75 and were located at water depths between 3613m and 3742m within an area 54.3°S

to 57.5°S and 125.4°W to 157.2°W. Coccolithophore assemblages were dominated by the species *Gephyrocapsa caribbeanica*, followed by small *Gephyrocapsa* spp. Total numbers of coccoliths, coccolith fraction (CF; <20µm-fraction), Sr/Ca data, and temperature-corrected CF Sr/Ca records consistently showed an increase in coccolithophore productivity during Termination V, highest productivity throughout most of MIS 11, and a decrease during late MIS 11 in all the cores. Additionally, we back calculated coccolith calcification rates for the ocean surface and considered its potential contribution to changes in the concentration of atmospheric CO<sub>2</sub>.