

Coccolith carbonate export dynamics at ODP Site 1089 (Southern Ocean) during the last deglaciation

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Paleoproductivity dynamics and carbonate system changes are crucial components in past ocean biogeochemistry. Coccolithophores play a key role in the global carbon cycle as primary producers and marine calcifiers (Baumann *et al.*, 2004). We analyzed coccolith assemblages, their absolute abundances, and carbonate export for the last 25ky in the subantarctic South Atlantic in the TNO57-21 core, which was drilled as part of ODP Site 1089 (40.950°S; 9.883°E). The site is located at a 4,620m water depth, which is close to the CCD and to the carbonate saturation horizon, which is located at a 4,000m water depth in Cape Basin (Flores *et al.*, 2003). Generally, this site experienced high productivity conditions during glacial periods, which is confirmed by coccolith export production that reached a peak at terminations (Flores *et al.*, 2012). By contrast, during the last deglaciation (TI), low surface ocean pH occurred in the Southern Ocean (Martínez-Botí *et al.*, 2015), and this could be expected to influence phytoplankton distribution, morphology, and carbonate export. We evaluated coccolith export production in order to differentiate any signals that may have influenced carbonate production at this site. We found that phases of enhanced glacial productivity coincided with periods of water mixing, which is indicated by a low relative abundance of *Florisphaera profunda* and

high chlorophyll-*a* concentrations. During an interglacial, *Emiliania huxleyi* showed a decrease in platelet calcification and a drop in its relative abundance, which could be linked either to dissolution or to ecological changes.

References

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