Calcification and latitudinal distribution of extant coccolithophores across the Drake Passage during late austral summer 2016

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There has been recent interest in polar coccolithophore communities, but field observations regarding their biogeographic distributions are scarce for the Southern Ocean. This study documents the latitudinal variability in coccolithophore assemblage compositions and coccolith mass variations of the ecologically-dominant species *Emiliania huxleyi* across the Drake Passage. Ninety-six water samples were collected, from 10 to 150 m water depth at 18 stations, during the POLARSTERN Expedition PS97 (February–April 2016). A minimum of 200 coccospheres per sample were identified using the scanning electron microscope, and the coccolith mass was estimated using light microscopy. We found that coccolithophore abundance and diversity decreased southwards, marking different oceanographic fronts as ecological boundaries. We were able to characterise three zones: 1) the Chilean margin, where *E. huxleyi* type A (normal and overcalcified) and type R are present; 2) the Subantarctic Zone, where *E. huxleyi* reaches maximum values of 212.5×10^3 cells/L, and types B/C, C and O are dominant; and 3) the Polar Front Zone, where *E. huxleyi* types B/C and C dominate. We link the decreasing trend in *E. huxleyi* coccolith mass to the poleward latitudinal succesion of type A to type B. Remarkably, we found that coccolith mass is strongly anticorrelated to total alkalinity, total CO_2, bicarbonate ion and pH. We speculate that low temperatures are a greater limiting factor than carbonate chemistry in the Southern Ocean. However, further in-situ oceanographic data are needed to verify the proposed relationships. We hypothesise that assemblage composition and calcification modes of *E. huxleyi* in the Drake Passage will be strongly influenced by the ongoing climate change.