

# Coccolithophore assemblage distribution along a temperate to polar gradient in the Southern Ocean

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In recent years, several studies in different areas of the world oceans focused on the biogeography, ecology and fine-scale taxonomy of coccolithophores. Besides, coccolithophores are known to play an important role in the production of particulate inorganic carbon in the Southern Ocean within the so-called "great calcite belt", a circum-polar region between 30°- 60° latitude South (Balch *et al.*, 2011). The Southern Ocean is characterized by the eastward flow of the Antarctic Circumpolar Current (ACC), driven by the westerly winds which flow between 45-55°S (Orsi *et al.*, 1995). Different fronts within the ACC are identified as bands of enhanced lateral property gradients in surface waters and by pronounced isopycnal tilt throughout the deep water column. These fronts, namely the Subantarctic Front (SAF) and the Polar Front (PF), carry out most of the transport of the ACC and are associated with strong surface currents. The ACC fronts separate water masses with similar physical characteristics: the Subantarctic Zone (SAZ) between the STF and the SAF, the Polar Frontal Zone (PFZ) between the SAF and the PF and the Antarctic Zone (AZ) south of the PF.

In the high-latitude Southern Ocean, *Emiliana huxleyi* is the dominant coccolithophore species, but different coccolithophore assemblages are found in different water masses, as already observed from different sectors of the Southern Ocean (Böckel and Bauman, 2008; Cubillos *et al.*, 2007; Findlay and Giraudeau, 2000; Gravalosa *et al.*, 2008; Hiramatsu and De Dekker, 1996; Mohan *et al.*, 2008).

Besides, within *E. huxleyi* different morphotypes are recognised: A (Young and Westbroek, 1991), B/C (Young *et al.*, 2003) and O (Hagino *et al.*, 2005) and their distribution is also related to the position of the oceanographic fronts.

The main goals of this work are:

- to provide further data on coccolithophore diversity in the New Zealand sector of the SO;

- to describe the correlation between coccolithophore species distribution and the location of the main ACC fronts

- to provide new data on the distribution and size of the different *E. huxleyi* morphotypes along the latitudinal transect.

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