Biogeography of Picoplankton within the Patagonia Large Marine Ecosystem

The Patagonia Large Marine Ecosystem region in the South Atlantic is characterized by the confluence of several currents and shelf break fronts. The region sustains a rich diversity of marine life and contributes significantly to the world’s annual fisheries yield. During Austral spring and summer, the PLME experiences calcite-producing coccolithophore blooms, large enough to be seen by satellite. However, little is known about the picoplankton communities in this region. In summer 2008, my lab analyzed the picophytoplankton communities throughout this region using flow cytometry and found that marine cyanobacteria dominated the photosynthetic populations in all areas except across the shelf-break region and at higher latitudes, where picoeukaryotic phytoplankton became more prominent. The marine cyanobacterial populations correlate positively with temperature and heterotrophic bacterial populations but negatively with total dissolved nitrogen, whereas the photosynthetic picoeukaryote did not. Amplicon analyses of the picoplankton using a combination of petB and 16S-23S rRNA ITS primers for the marine cyanobacteria, 18S rRNA primers for the photosynthetic picoeukaryotes, and 16S rRNA primers for Bacteria was carried out to examine the picoplankton diversity and explore these correlations in a species-specific context rather than simply at the population level.