Biogenic carbonate composition throughout the last 140 kyr in pelagic sediments of the western South Atlantic

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This study evaluated the variation in total calcium carbonate ($CaCO_3$) content over time, as well as whether calcareous nannofossils or foraminifera contributed more to the composition of the total $CaCO_3$ content. For this study, 57 samples from a marine piston core (GL-1090), located in the western South Atlantic, were analysed for the last 140 kyr (last glacial/interglacial cycle). For this purpose, the $CaCO_3$ content was calculated in different size fractions – bulk, sand (>63 μm), coarse and medium silt (63–20 μm) and fine silt to clay (<20 μm). The observed variations were typical for the Atlantic Ocean, with higher $CaCO_3$ values during interglacial periods and lower values during glacial periods. Observing the different sediment fractions, it was noted that calcareous nannofossils were the most important contributors to carbonate deposits in the region throughout the entire studied period, but the percentages of their contribution were higher in glacial periods than interglacial intervals. This is probably due to the effects of regional preservation, which are related mainly to differences in the carbonate chemistry of the water-masses and dilution by terrigenous sediments. In addition, the calcareous nannofossil contribution showed a synchronicity with other dissolution proxies, allowing the conclusion that dissolution is the main factor controlling the contribution of each organismal group to $CaCO_3$ content. These variations revealed alternating modes of high and low carbonate preservation that were influenced by circulation-induced changes in water-masses. The lower-volume preservation events are probably related to a more corrosive, southern-sourced water-mass during a glacial at the depth where the core was collected (2225 m).