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Oceanographic Control of Siliceous Productivity in the South Western Atlantic during the last Two Glacial Cycles

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The upper-level circulation in the SW Atlantic is dominated by the Brazil and the Malvinas (Falklands) Currents. The Brazil Current (BC) flows southward along the continental margin of SE Southern America. Between 35˚ and 38˚S, the BC presently encounters the Malvinas Current (MC), which transports cold Antarctic water equatorward along the Argentina continental shelf, and builds the Brazil-Malvinas Confluence (BMC). Based on two gravity cores collected in the Argentina Basin south and north of the present-day position of the BMC (GeoB6211-2: 32˚30.3'S, 50˚14.6'W, water depth 657 m; and GeoB6340-2: 44˚55.0'S, 58˚05.8'W, water depth 2785 m), this study reconstructs the variations of the siliceous productivity during the last 180 kyr, and the effect of water masses on diatom productivity and preservation.

Sedimentation rates varies between 4-6.6 cm kyr^{-1} at 44˚S and 8-10.5 cm kyr^{-1} at 32˚S, the latter being a consequence of the shallower core position, and hence higher lithogenic contribution by lateral advection. Biogenic silica (B_{si}) shows higher values during glacial stages 6, 4 and 2 at both stations. However, the B_{si}content was four times higher at 44˚S than at 32˚S during both glacial and interglacial stages. Diatom assemblages reflect dominant hydrographical features. The highest contribution of Antarctic-displaced diatoms at 44˚S during glacial stages mirrors the northward displacement of rich-silicate, low-salinity Antarctic water masses. North of the BMC at 32˚S, highest contribution of tropical/subtropical, pelagic diatoms, typical for nutrient-poor and high salinity waters, occurred during interglacials. The low contribution of Antarctic-displaced diatoms at 32˚S mirrors the diminished equatorward transport of southern cold waters into the SW Atlantic. The concentration of $B_{si}$and diatoms re-

flects the main hydrographic conditions, but is less correlated with surface water productivity: our observations prove that a major portion of the $B_{si}$and diatoms preserved in late Quaternary sediments of the Argentina Basin accumulated far away from their main production area. Although heavily-silicified Antarctic diatoms survive the equatorward transport from their source areas in the Southern Ocean, mostly broken and corroded valves are preserved, probably as an effect of (a) the long-distance transport by southern-originated waters, and (b) the dissolution in sediment, as suggested by benthic Si-reflux pattern. In contrast, tropical/subtropical and coastal planktonic diatoms show a better degree of preservation, likely as a consequence of being transported a shorter distance or being produced in overlying waters