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Centennial-scale discharge variability of the La Plata River-Patos Lagoon (South America) during the last deglaciation

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Centennial-scale reconstructions of the hydrological cycle of lowland subtropical South America are scarce due to the lack of suited archives. Here we present a planktonic foraminifera (*Globigerinoides ruber* (white)) based oxygen isotope record (δ^{18}O) with decadal resolution from the deglacial (17 to 15.5 cal kyr BP) section of marine sediment core GeoB 6211-2 (32.51^{o}S, 50.24^{o}W, 654 m water depth). The high sedimentation rate ($\sim$ 70 cm kyr^{-1}) and the sensitive location of the core provide an excellent opportunity to reconstruct in detail the discharge variability of the La Plata River-Patos Lagoon drainage basins that cover a vast area of subtropical South America. The magnitude of the discharge controls the extension of the isotopically low freshwater plume of both drainage basins that, in turn, is recorded in the δ^{18}O of *G. ruber*. A time resolution of $\sim$ 15 yr between adjacent δ^{18}O measurements was achieved with 1 cm sampling intervals. Our results show that during the last deglaciation our site was located directly under the influence of the La Plata River-Patos Lagoon plume. A multidecadal running average of our record depicts a quasi-cyclic centennial-scale (period of $\sim$ 300 yr) variability in δ^{18}O reflecting a similar variability in the extension of the plume and therefore in the precipitation over subtropical South America. The amplitude of the averaged cycles is as big as 0.5 permil and is superimposed on a long term decrease in the oxygen isotopic composition of 0.2 permil for the complete period. Since precipitation over subtropical South America is highly sensitive to El Niño Southern Oscillation (ENSO) anomalies, we speculate that an ENSO-like mechanism could drive the cycles recorded in our site.