Reconstructing hydrological changes in (sub)tropical South America over the last 36 kyrs: insights into the low-latitude expressions of high-latitude climate forcing

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The hydrological cycle in tropical South America depends strongly on the intensity of the South American Summer Monsoon (SASM) and the latitudinal migration of the Intertropical Convergence Zone (ITCZ). Global warming is predicted to severely alter both rainfall amount and its spatial distribution in South America. Hence, it is essential to constrain the natural variability of the SASM in order to assess potential impacts of future climate change on continental moisture availability. As the expected rate of of global warming is paralleled by only few periods of earth's history, we evaluate the hydrological variability in South America by studying analogue periods of rapid climatic shifts during the last glacial and deglaciation.

To constrain the impact of abrupt oceanic forcing on continental moisture availability we will reconstruct river run-off in climatically very sensitive regions of tropical South America during the last 36 kyr. The study relies on marine cores from strategically located positions off the Orinoco, Amazon and Paraíba do Sul Rivers. Outflow of the Orinoco River reflects climatic variability in the nothern extent of the area influenced by the insolation-driven shifts of the ITCZ. In contrast the Paraíba outflow in southern East Brazil is located south of the ITCZ-influence, but is affected by the South American Convergence Zone (SACZ). The Amazon occupies an intermediate position influenced by both systems. Reconstructions are based on high-resolution multi-proxy data (foraminiferal Ba/Ca, Mg/Ca, $\delta^{18}O$, XRF-, color-scanning). Focus lies on critical time intervals with high rates of climate change (late Pleistocene/early Holocene transition, LGM, MIS3 with D/O-cycles 5-7). As all sites are strongly influenced by abrupt climate shifts originating from the high-northern and high-southern latitudes, novel insights are gained about the sensitivity of the continental hydrological cycle in South America during climatically dynamic periods.