Geophysical Research Abstracts
Vol. 20, EGU2018-1815, 2018
EGU General Assembly 2018

Oceanic-forced Holocene multicentennial-scale precipitation variability in Eastern Brazil

André Bahr (1), Philipp Geppert (1), and Stefanie Kaboth (2)

(1) Heidelberg University, Institute of Earth Sciences, Heidelberg, Germany (andre.bahr@geow.uni-heidelberg.de), (2) Department of Geosciences, National Taiwan University, Taipei, Taiwan (R.O.C.)

Eastern Brazil belongs to the ecologically most vulnerable regions on Earth due to its extreme inter-annual precipitation variability. In order to assess the driving forces governing these strong natural fluctuations we investigated a high-resolution sediment core retrieved off the Jequitinhonha river mouth in central E Brazil to reconstruct Holocene river run-off and moisture availability in the river's catchment. Modern day climate in the hinterland of the Jequitinhonha is influenced by the South American Summer Monsoon (SASM), in particular by the manifestation of the South Atlantic Convergence Zone (SACZ) during austral summer. Variations in the position and strength of the SACZ will have immediate impact on the moisture balance over the continent and hence influence sediment and water delivery. Our multi-proxy records, comprising XRF core-scanning, grain size, mineralogical (XRD), as well as organic biomarker analyses indicate abrupt centennial scale variations between dry and wet conditions throughout the past 7 kyrs. Remarkable is a long-term trend to stronger wet/dry fluctuations over the course of the late Holocene parallel to an increase in southern hemisphere summer insolation. While an increase of austral summer insolation generally intensifies monsoonal rainfall over E Brazil, it apparently imposes at the same time a higher coastal precipitation variability on centennial time scales. Notably, the reconstructed wet-phases appear to concur with periods of an intensified warm-water advection by the Brazil Current (BC). The variability of the BC thereby depends on the strength of the Atlantic Meridional Overturning Circulation (AMOC) with a weak AMOC causing a stronger BC. Considering future climate warming scenarios, our new data implies that the precipitation over E Brazil might experience wetter but also more instable conditions, as meltwater release into the high latitude North Atlantic is predicted to weaken AMOC intensity and hence foster BC strength.