MILLENNIAL SCALE VARIABILITY OF AMAZON BASIN AND NORDESTE HYDROLOGY AND ASSOCIATED PALEOCEANOGRAPHIC FORCING OF THE WESTERN EQUATORIAL ATLANTIC

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Several piston cores were taken in 2010 using the new long coring system on the R/V Knorr from the continental slope offshore of the mouth of the Amazon, north and south of the mouth of the Amazon Fan. A variety of proxy measurements are presently being undertaken on these cores, including sedimentology, pollen analysis, organic geochemistry and inorganic geochemistry. Preliminary results provide insight into the paleohydrology of the South American tropics including the Amazon and Nordeste regions.

Two cores have been targeted for analysis thus far, one north and one south of the mouth. The former contains a record dating back to ca. 30 ka and the latter contains a record dating to ca. 100 ka. The sediments were dated by radiocarbon on both carbonate and organic carbon fractions, as well as by stable oxygen isotopic stratigraphy. Radiocarbon age determinations indicate a large (ca. 1700 year) and nearly constant apparent age offset between the older organic carbon fraction and the younger foraminiferal carbonate fraction of the same sample. Sedimentation rates were far higher during the last glacial stage than during the Holocene.

High-resolution stable oxygen isotope and Mg/Ca paleothermometry on the planktic foraminiferal species *Globigerinoides ruber* were undertaken to reconstruct the paleoceanographic forcing in the western equatorial Atlantic that may have affected the precipitation on the adjacent continent. High-resolution XRF analyses of elemental ratios in the cores reveal large and abrupt excursions suggesting the possibility that there were similarly large changes in the paleohydrology and paleoprecipitation of the adjacent Amazon. These data are complicated, particularly at the northern site, by the obvious dependence of the rate of detrital input to the coring sites on sea level--during sea level high stands most detrital sediment was routed northwestward on the shelf and little detrital sediment was transported to the Amazon slope. Nevertheless, Ti/Ca ratios in both northern and southern cores seem to support an association between increased runoff (i.e. increased precipitation) and northern hemisphere millennial stadial events (e.g. Heinrich events). This interpretation requires further analysis of the cores as well as more detailed comparison with land-based paleoclimatic records, especially speleothems.