



Understanding the drivers of environmental changes in West Africa from sedimentary deep-sea records (Alfred Wegener Medal Lecture)

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Ocean circulation plays an important role for terrestrial climates including the tropical monsoonal belt. Information about continental climate as well as the state of the ocean is continuously recorded in marine hemipelagic sediments which offer the opportunity to study relationships between terrestrial and marine climates at various time scales. Here, we review the history of African vegetation and precipitation during the past ~ 200 kyrs and its relation to changes in the Atlantic meridional overturning circulation. We use the stable isotopic composition of benthic foraminifera as a proxy for ocean ventilation. Information about continental climate has been derived from bulk geochemistry and grain size (as a proxy for dust input), the carbon isotopic composition of plant leaf wax (as a proxy for the composition of vegetation) and the hydrogen isotopic composition of plant leaf wax (as proxy for the amount of precipitation). The data show that changes in both, ocean circulation and Earth's orbit are important modulators of African precipitation on the orbital to centennial time scale. A strong anthropogenic overprint is observed since the beginning of the nineteenth century, when a sharp increase in dust deposition accompanies the advent of commercial agriculture in the Sahel region.