

## **Onset of grasslands in the Amazon drainage basin: Evidence from the marine record (Brazilian Equatorial Margin)**

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The history of the Amazon lowland ecosystems is only partially known and difficult to piece together due to the fragmented nature of the continental sedimentary record. Continuous research efforts by international consortia have exposed a dynamic pre-Quaternary history that was influenced both by climate change and mountain building in the Andes. Paleogeographic changes involved a shift from a fluvial system of Amazonian origin to an Andes derived fluvio-lacustrine system. The transition from the latter to the modern transcontinental Amazon River and the effects of the Plio-Pleistocene climatic fluctuations on Amazonia are still poorly documented. Here we present the results of study on a marine record that comprises a time interval ranging from 23 to 0.4 Ma and forms the marine extent of the Amazon River. Our palynological and geochemical assessment of the sediments indicates that the onset of the transcontinental Amazon River occurred between 9.4 and 9 Ma. Sediments of Andean origin and sporomorphs of plant taxa typical of the high Andes mark the transition from an Amazonian to an Andes derived fluvial system in the Atlantic sedimentary record. Remarkably, Poaceae (grasses) progressively increased from 9 Ma, with a most notable rise from 4 Ma. The rise of the grasses is likely to be a basin wide phenomenon, and their prominence suggests they represent the onset of the modern grassland ecosystems such as in the Llanos, the high Andes, the Cerrado, and river floodplains. This study was carried out in the context of the CLIMAMAZON (EU-FP7), a Brazilian and European facility for the study of the Amazon drainage basin. The extended paper is under review at the journal Global and Planetary Change.