

Quaternary climate change recorded in Acre Foreland Basin, SW Amazonia

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The Acre basin is bounded to the west by the Serra do Divisor which demarcates the eastern edge of the Andean fold-thrust belt. Radiocarbon ages indicate the upper 50 to 250 m of the Solimões Formation accumulated during the past 50,000 yr. Both surficial and drill-core sediment records show lacustrine-fluvial transitions throughout the Late Quaternary. These shifts in depositional environments are in response to episodic changes in hydrological conditions as well as to geodynamic activity, such as subsidence. Juxtaposition of lacustrine and fluvial systems in the vertical Acre basin record mimics the regional-scale trends in the modern, upper and middle Solimões-Amazon floodplains.

In this record lacustrine successions are characterized by increasing calcium contents up-section. This is also manifested, in the upper portions of lacustrine sequences outcropping at the surface, as alternating clastic and calcareous layers. The up-section carbonate increase is related to increasing salinities due to drier hydrodynamic conditions. Desiccation cracks are infilled with gypsum as are cavities of fossils in bone-beds. The latter represent isolated ponds in which the original fauna died as aridity intensified and waters became increasingly saline.

Modern trunk river systems in the Acre basin flow from southwest to northeast with tributaries entering from the southwest, suggesting the influence of a domino-style, basement, fault regime. Fault or, at least, fracture control on stream channels is also suggested throughout the greater Amazon basin in the orthogonal dispositions and asymmetric terrace systems of trunk rivers as well as of major tributaries.