

OVERVIEW OF THE EVIDENCE OF HIGH FREQUENCY MARINE INCURSIONS AT AMAZONIAN FORELAND BASIN DURING MIOCENE

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The depositional models for Miocene Amazonia have been contentious. Much of the recent paleoenvironmental literature pertaining to Miocene Amazonia have suggested that during the Miocene the area was covered by an extensive wetland system consisting of lakes, swamps, forests and rivers (Hoorn, 2006; Hoorn and Vonhof, 2006; Kaandorp et al., 2006), much like the present day Pantanal (Brazil, Bolivia and Paraguay). This interpretation is largely based on studies applying isotope geochemistry on mollusk-fauna (Pebas Fm.) that suggest that only during the late Middle – early Late Miocene a meso-oligohaline incursion reach the western Amazonian basin, while the Early and Middle Miocene levels are exclusively fresh-watered (Vonhof et al., 2003; Kaandorp et al., 2006). Similarly, the Late-Miocene deposits (“post Pebas”) are traditionally interpreted as continental based on vertebrate fossil finds.

However, an increasing body of literature has documented mangrove pollen, brackish-euryhaline fish fossils, brackish water ostracods, brackish water trace fossils assemblages and tidal deposits from various Miocene stratigraphic levels (Hoorn, 1993, Rasanen et al., 1995; Monsch, 1998; Gingras et al., 2002ab; Hovikoski et al., 2005; Munoz-Torres et al., 2006; Rebata et al., 2006 a,b; Hovikoski et al., 2007).

In the presentation a short overview of the data suggesting marine influence is presented (cf. Hovikoski et al. 2007 and Rebata et al. 2007). The late Early – early Late Miocene sedimentary series (Pebas Fm.) is shown to consist of stacked, 3-8 m-thick, tidally-influenced brackish to fresh water bay-margin sequences. The stratigraphically overlying Late Miocene (“post-Pebas”) strata bear evidence of tidally-influenced, low-salinity channel deposits which are interbedded with continental settings. The data suggest that large number of allocyclically generated, high-frequency incursions reach the Amazonian foreland basin during the Miocene. The incursions were shallow and restricted, and were subject to rapid progradation. Along with the prograding shorelines, the continental environments –swamps, lagoons, floodplains and forests- constrained the extent of marginal marine embayment. As a result, the Miocene marginal marine and continental strata are closely interbedded throughout the basin, explaining the controversial views presented on the Miocene Amazonian paleoenvironment.

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