



Burial, Uplift and Exhumation History of the Atlantic Margin of NE Brazil

Peter Japsen (1), Johan M. Bonow (1), Paul F. Green (2), Peter R. Cobbold (3), Dario Chiossi (4), and Ragnhild Lilletveit (5)

(1) GEUS, Copenhagen, Denmark (pj@geus.dk), (2) Geotrack International, Victoria 3055, Australia, (3) CNRS et Université de Rennes 1, France, (4) Statoil do Brasil, Rio de Janeiro, Brazil, (5) Statoil Angola Team, Stavanger, Norway

We have undertaken a regional study of landscape development and thermo-tectonic evolution of NE Brazil. Our results reveal a long history of post-Devonian burial and exhumation across NE Brazil. Uplift movements just prior to and during Early Cretaceous rifting led to further regional denudation, to filling of rift basins and finally to formation of the Atlantic margin. The rifted margin was buried by a km-thick post-rift section, but exhumation began in the Late Cretaceous as a result of plate-scale forces. The Cretaceous cover probably extended over much of NE Brazil where it is still preserved over extensive areas. The Late Cretaceous exhumation event was followed by events in the Paleogene and Neogene. The results of these events of uplift and exhumation are two regional peneplains that form steps in the landscape. The plateaux in the interior highlands are defined by the Higher Surface at c. 1 km above sea level. This surface formed by fluvial erosion after the Late Cretaceous event - and most likely after the Paleogene event - and thus formed as a Paleogene pene-plain near sea level. This surface was reburied prior to the Neogene event, in the interior by continental deposits and along the Atlantic margin by marine and coastal deposits. Neogene uplift led to reexposure of the Palaeogene peneplain and to formation of the Lower Surface by incision along rivers below the uplifted Higher Surface that characterise the pre-present landscape. Our results show that the elevated landscapes along the Brazilian margin formed during the Neogene, c. 100 Myr after break-up. Studies in West Greenland have demonstrated that similar landscapes formed during the late Neogene, c. 50 Myr after break-up. Many passive continental margins around the world are characterised by such elevated plateaus and it thus seems possible, even likely, that they may also post-date rifting and continental separation by many Myr.