

EARLY OPENING HISTORY OF THE EQUATORIAL ATLANTIC: THE VIEW FROM THE WEST AFRICAN MARGIN

1PLETSCH, T, 2ERBACHER, J., 3HOLBOURN, A., 3KUHNT, W., 4MOULLADE, M., 5OBOH-IKUENOBE, F., 6SOEDING, E. and 7WAGNER, T. 1Geology Dept., Univ. Cologne, Germany; 2BGR, Hannover, Germany; 3IfG, Univ. Kiel, Germany; 4Univ. Nice, France; 5Univ. Missouri, Rolla, USA; 6Geomar, Kiel, Germany; 7FB 5, Univ. Bremen, Germany

The opening of the Equatorial Atlantic Gateway during the Cretaceous led to the disruption of sedimentary basins on the conjugate margins of Africa and South America. Drilling along the Cote d'Ivoire-Ghana Transform Margin (ODP Leg 159) provided a transect across the northern rim of this gateway. The interplay of tectonic and oceanic processes along the gateway created a complex continental margin that evolved in three stages interrupted by dramatic changes in sedimentary facies, water depths, and subsidence rates. The earliest stage records the formation of small basins with restricted connection to the world ocean and rapid infill with siliciclastic deposits in an Early Cretaceous intracratonic rift or transform setting. This stage ends with an erosional event and the formation of a regional unconformity. During the mid-Cretaceous differentiation stage, the oceanward side of the margin subsided below the CCD and a deepwater connection between Central and South Atlantic became established. Deepening of the basement ridge and its northern margin, in contrast, were delayed and detrital limestones intercalated with carbonaceous shales accumulated at shelf to slope depths. During the ensuing, latest Cretaceous stage, passive margin subsidence led to continuous deepening of the basement ridge and in the northern basin. Condensation and gradually decreasing organic contents point to an intensified exposure to deepwater circulation. The replacement of the zonal circulation system through the Mesozoic Tethys and Central Atlantic with a Modern, oxidizing meridional circulation system through the opening equatorial Atlantic gateway, appears to be intimately related to the changing depositional conditions over larger parts of the Cretaceous Atlantic.