Source-to-Sink Sedimentary Budget of the African Equatorial Atlantic Rifted Margin

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Résumé

Despite their very low relief and erosion rates, non-orogenic continental domains account for over 60 % of Earth's exposed land areas. As a result, they contribute significantly to the clastic sediments and solutes exported to the ocean and should be accounted for in global studies. Nonetheless, they have been much less studied than orogenic domains. In this study, we establish the source-to-sink sedimentary budget of the sub-saharian West Africa non-orogenic domain and its Equatorial Atlantic rifted margin using published low-temperature thermochronological data to estimate onshore denudation and regional geological cross-sections to estimate offshore accumulation. We show that during the rifting and the immediate post-rift period (130-94 Ma), the build-up and subsequent erosion of the rift-related relief resulted in a transient 100-200 km wide strip along the margin recording high denudation rates while the inland cratonic domain underwent only steady and very low denudation (< 10m/Myr). Following this, the whole onshore domain underwent very low and steady denudation. Thus, changes in post-rift accumulation rates documented in the rifted margin basins were caused by changes in global climate and/or by drainage network. In particular, the regional increase in accumulation rates during the late Cretaceous was due to the enlargement of the drainage areas feeding the basins as a consequence of the hinterlandward migration of the continental divide. Instead, the Paleogene general drop in accumulation rates in all the basins of the African Atlantic margin was caused by greenhouse climate, which enhanced the development of lateritic weathering mantles storing clastic sediments on the continent and favoring solute exports to the ocean.

Mots-Clés: Sediment routing systems, Equatorial Atlantic Rift, Rifted margin basins

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