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## Drainage rearrangements in a semi-arid area: a case study on the Brazilian northern passive margin

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In the last decades, there has been progress in understanding the importance of tectonic activity and climatic oscillations for the relief evolution of semi-arid regions. However, little is known about the role of drainage rearrangements in the morphogenesis of semi-arid areas. The semiarid region of Brazil, particularly in its northern passive margin, exemplifies this lack of studies. The configuration of the drainage network in the region is interpreted as a passive inheritance, given by superimpositions on Precambrian structures reactivated during the opening of the Equatorial Atlantic Ocean in the Cretaceous. Thus, this research aims to understand the current hydrographic configuration of the northern Brazilian semi-arid region, investigating geological and geomorphological evidence of possible fluvial reorganisations. Those evidences were identified on a regional scale, from the analysis of diagnostic morphologies of drainage rearrangements (e.g. capture elbows, anomalous drainage patterns, low divides and dammed river deposits) in geological maps and in data extracted from remote sensing (e.g. MDE SRTM 1 arc-second). Among the results, the following stand out: (i) dense drainage network formed by parallel exorheic rivers, in which only two very asymmetrical catchments – Jaguaribe and Piranhas-Açú – comprise about 73% of the regional flow; (ii) transverse tributaries marked by gorges that break the regional structural fabric; (iii) 4th order (or higher) river channels with sudden inflexions and reversals, especially orthogonal elbows, generally close to flattened divider sectors; (iv) concentric drainage patterns coincident with areas of natural damming of Neogene fluvial deposits, and areas with inactive pediment levels and; (v) surface dissection levels with differences of about 200 m high, with transitions limited by Precambrian structures reactivated during the Neogene-Quaternary. This evidence suggests that the region's drainage network has undergone recent and complex reorganisations, with fluvial incorporations carried out by the Jaguaribe and Piranhas-Açu catchments, probably on endorheic systems. The apparent expansion of the Jaguaribe and Piranhas-Açu catchments indicates that these rivers had their erosive power increased to the detriment of adjacent rivers, reordering regional watersheds through captures and overflows. This fact indicates that drainage rearrangement processes in semi-arid areas may have been more complex than previously thought and show the need for more research on the topic.