Temporal trend and budget of the suspended sediment transported in the Bananal Plain tropical wetlands, Araguaia River basin, Central Brazil

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RESUMO

One of the most notable examples of tropical savannah plains affected by seasonal flooding in South America is the Bananal Plain along the Araguaia River. The Bananal Plain represents one of the last natural refugia for the diverse fauna of the Cerrado biome. The transport of suspended sediments (TSS) along the Araguaia River and, particularly, in the Bananal Plain area is not yet fully understood. In this work the TSS between two hydro-sedimentometric stations of the Bananal Plain along the Araguaia River was analyzed. In addition to in situ data, estimates from empirical models for TM/Landsat-5 satellite images were compiled to produce a 30-year (1984-2014) temporal series of suspended sediment concentration (CSS). To obtain daily data in the CSS temporal series, missing values were imputed by the Stineman interpolation method. Discharge and CSS data were combined to obtain the solid discharge of suspended sediments (Qss). Non-parametric statistics were applied to the Qss data temporal series to examine the trend of the monthly and annual TSS temporal series by Seasonal Mann-Kendall and Mann-Kendall tests, respectively. A 14% loss of TSS is estimated downstream of the Bananal Plain (at the Conceição do Araguaia hydro-sedimentometric station) compared to upstream (Aruanã station). In this area, an average of 0.65 $Mt \bullet year^{-1}$ of suspended sediment is deposited along the river. The results indicate that there was no statistically significant increase or decrease in the annual TSS in the time period analyzed, however there is a tendency for the TSS to decrease for the dry months upstream of the Bananal Plain.

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Solid discharge; Empirical models; Time series analysis