ANALYSIS OF CLIMATIC VARIABILITY AND TREND OF THE HYDROMETEOROLOGICAL STATIONS OF THE ALTO PARAGUAY RIVER

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ABSTRACT

The Alto Paraguay Basin has ecosystems of great importance due to its rich biodiversity and its crucial role in regulating water resources in the region. However, in recent years, there has been a growing interest in understanding the changes affecting this area. Although there is previous research on climate change at a global level, the need for a detailed analysis of climate variability and trends specifically in the Alto Paraguay Basin has been recognized, which covers an area of approximately 600,000 km² across Bolivia, Brazil, and Paraguay. This study analyzes the variability and climate trend of the hydrometeorological stations of the Alto Paraguay River, aiming to provide essential information for decision-making in the planning, design, and operation of the Puerto Busch, ensuring its sustainability and resilience in the face of current and future climate challenges, using the Quantile Perturbation method. This method requires two time series: one series is taken as a reference or baseline series, while the other is selected as a subseries. The subseries are subperiods selected from these complete time series and represent the periods of interest, with a length of 12 years in this study. The application of this method will provide the climatic anomalies for each station analyzed. The results suggested a strong temporal variability, where the possible teleconnection with the Southern Oscillation Index (SOI) patterns in rainfall events was explored. Patterns were found where the stations are entering a dry period cycle.

Keywords: Climate variability, Southern Oscillation Index, Anomalies, Climate trend, Upper Paraguay River.

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