Review of: "Spatio-Temporal Analysis of Precipitation Patterns in Xinjiang Using TRMM Data and Spatial Interpolation Methods: A Comparative Study"

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Potential competing interests: No potential competing interests to declare.

This article utilizes 20 years of Tropical Rainfall Measuring Mission (TRMM) precipitation data and ground-based rain gauge data to conduct a comprehensive spatiotemporal analysis of precipitation distribution in Xinjiang, China. Additionally, the effectiveness of four interpolation techniques is evaluated. By employing the Mann-Kendall trend analysis method, the study reveals that 63.64% of the regions in Xinjiang exhibit a positive trend in annual precipitation, particularly in the northern areas. This observed trend is of utmost importance for comprehending climate change dynamics and managing water resources effectively.

However, the article necessitates certain revisions to enhance its quality. These revisions include optimizing the standardization of figures and tables, clarifying the main points of the article, establishing explicit research objectives, ensuring consistency between the analysis results and their corresponding visual representations, and providing valuable and actionable conclusions. Therefore, the article demands careful reorganization and thorough revision. Considering these concerns, I propose the following four suggestions:

1.Clearly define the research objectives and improve the quality of figures and language.

2.In terms of interpolation methods, it is observed that the Inverse Distance Weighting (IDW) method does not demonstrate a pronounced advantage in terms of accuracy compared to other methods. Moreover, the Root Mean Square Error (RMSE) of the IDW method is higher than that of other methods. To address these limitations, it is recommended to explore alternative approaches such as integrating satellite precipitation data with ground-based measurements. By doing so, the accuracy of satellite data can be improved, providing more reliable support for subsequent spatiotemporal analyses.

3.It is not advisable to solely rely on histograms to analyze the distribution characteristics of precipitation, as this approach would confine the study to urban scales. Instead, it is recommended to employ geostatistical and spatial analysis methods to better leverage the spatial coverage advantage of satellite precipitation data. This will facilitate a more comprehensive examination of the multiscale spatiotemporal distribution characteristics of Xinjiang, China.

4.The findings presented in Section 3.4 of the article are incredibly intriguing. Thus, it is highly recommended to conduct further in-depth analysis of these results and attribute them from climatological and geographical perspectives. Elaborating

on these analyzed outcomes will yield crucial insights with significant value for the production, living conditions, and water resource management in Xinjiang.