

Spatial Distribution Patterns of Precipitation Depicted by Different Gridded Data Sources in the Rain-gauge Sparse Arid Region of Northwest China

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Influenced by the complex topography and moisture condition, the precipitation in arid area of northwest China showed strong temporal and spatial variability. However, the rain gauges are sparse, and the vast majority of them are located below the altitude of 3000 m, restricting the full understanding of precipitation properties in high altitude areas. Interpolated precipitation products and satellite based dataset with high spatio-temporal resolution, are potential substitute of rain gauge data. In this study, based on WORLDCLIM, APHRO, CHN and TMPA, the spatial properties of precipitation in arid area of northwest China were analyzed, including horizontal distribution and change trends of annual precipitation with elevation. The results showed that the horizontal spatial pattern of four precipitation products was consistent with atmospheric circulation and topography characters, but WORLDCLIM and APHRO tended to underestimate precipitation, TMPA and CHN performed better. Vertical change trend of precipitation was differed in sub-regions and in products. In most cases, there was only one zone of maximum precipitation, appearing at high-altitudes.