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Observed Changes in Constructed Precipitation at High Resolution in Southern Vietnam

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Abstract : Precipitation plays a key role in water cycle, defining the local climatic conditions and in ecosystem. It is also an important input parameter for water resources management and hydrologic models. With spatial continuous data, a certainty of discharge predictions or other environmental factors is unquestionably better than without. This is, however, not always willingly available to acquire for a small basin, especially for coastal region in Vietnam due to a low network of meteorological stations (30 stations) on long coast of 3260 km2. Furthermore, available gridded precipitation datasets are not fine enough when applying to hydrologic models. Under conditions of global warming, an application of spatial interpolation methods is a crucial for the climate change impact studies to obtain the spatial continuous data. In recent research projects, although some methods can perform better than others do, no methods draw the best results for all cases. The objective of this paper therefore, is to investigate different spatial interpolation methods for daily precipitation over a small basin (approximately 400 km2) located in coastal region, Southern Vietnam and find out the most efficient interpolation method on this catchment. The five different interpolation methods consisting of cressman, ordinary kriging, regression kriging, dual kriging and inverse distance weighting have been applied to identify the best method for the area of study on the spatio-temporal scale (daily, 10 km x 10 km). A 30-year precipitation database was created and merged into available gridded datasets. Finally, observed changes in constructed precipitation were performed. The results demonstrate that the method of ordinary kriging interpolation is an effective approach to analyze the daily precipitation. The mixed trends of increasing and decreasing monthly, seasonal and annual precipitation have documented at significant levels.

Keywords : interpolation, precipitation, trend, vietnam
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