

Spatiotemporal variability and anisotropy in correlation decay distance and influence on angular-distance weighting interpolation of daily precipitation over mainland China

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The correlation decay distance (CDD), used to select correlated neighbors within a searching radius and calculate the distance component of their weights, is a key element in angular-distance weighting (ADW) interpolation of irregular meteorological observations to regular grids. The CDD of daily precipitation in China varies spatially and seasonally, and is anisotropic as a result of topography and the predominant atmospheric circulation. CDD is largest in winter and smallest in summer except in limited regions such as the Tibetan plateau. Cross validation shows that taking account of spatial and seasonal variations in CDD generally improves the ADW interpolation. However in northwestern China a CDD based on year-round data for that region performs best. Use of anisotropic CDDs increases skill scores in regions with significant elevation variation (southwestern China) or strongly anisotropic CDDs (Tibetan plateau and northeastern China).