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Quantile Kriging of Temperature data in South Africa regarding inversions

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Air Temperature data is an important input variable in hydrological and ecological modeling, and kriging methods are often used to interpolate point observations in order to generate areal distributions.
The newly suggested kriging method "Quantile Kriging" (QK) has been applied to daily temperature data in South Africa, in which theoretical distribution parameters and respective quantiles are interpolated. QK implies a constant expectation value of the quantiles over the entire domain. However, this cannot be assumed for the effect of temperature inversion. Therefore, temperature stations where inversion occurred were separated from non-inversion stations and interpolated independently.
Therefore, the Diurnal Temperature Range (DTR) and the Sea Level Pressure were used in order to identify two different inversion types (radiation and high-pressure inversion). Daily temperature data for the period between Jan.1st. 1986 and Dec.31st 2008 (= 8401 days) were used for this study. Results are presented for a study area enclosing 119 stations.