Spatio-temporal precipitation climatology over complex terrain using a censored additive regression model - DTU Orbit (30/09/2017)

Flexible spatio-temporal models are widely used to create reliable and accurate estimates for precipitation climatologies. Most models are based on square root transformed monthly or annual means, where a normal distribution seems to be appropriate. This assumption becomes invalid on a daily time scale as the observations involve large fractions of zero observations and are limited to non-negative values. We develop a novel spatio-temporal model to estimate the full climatological distribution of precipitation on a daily time scale over complex terrain using a left-censored normal distribution. The results demonstrate that the new method is able to account for the non-normal distribution and the large fraction of zero observations. The new climatology provides the full climatological distribution on a very high spatial and temporal resolution, and is competitive with, or even outperforms existing methods, even for arbitrary locations.

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