



Daily and climatological fields of precipitation and temperature over the western Alps

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There is still considerable uncertainty about precipitation and temperature at high elevation in mountain terrain due to the relatively few in-situ measurements available and to the particular variability of the meteorological parameters.

In this study, several spatialization techniques were tested, some for climatological time-scale, others for daily fields, for precipitation over the western Alps for the period 1990-2012. The study domain and period were chosen for the quality of available in-situ observations and density of the network.

In a first step, a weather type classification was established with a technique based on canonical correlation analysis combining large scale and regional scale data.

The spatialization techniques applied for the climatological time scale were adapted from the Aurelhy method which uses elevation and principal components of the topography as predictors. The spatialization techniques applied to daily fields were based on kriging of daily rain gauges and used the climatological fields as predictors. This study aims to validate the advantage of using a climatology of the weather type of the day as predictor for daily fields over a monthly climatology. The climatology of the weather type of the day seems to demonstrate some improvement.

Finally, annual means over the period 1990-2012 were produced using several methods, including some from accumulation of daily fields, and others from the spatialization of in-situ station means. Precipitation at high elevations and vertical climatological gradients were particularly scrutinized. Annual means based on sums of daily fields seem to have better performances.