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Daily homogenization in Norway

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Homogeneous time series of weather elements are essential for studies of climatic fluctuations and changes. When analysing trends and variability of climatic time series will the accuracy and consistency of the underlying observations be of extreme importance. A homogenous representation of climate only exists when variations in the time series are only results of variations in weather and climate (Easterling et al, 1996). Changes in the technical and/or environmental conditions such as relocations, change in instruments and sensors, change of observers, change of observing practices, new buildings etc. at observation stations might seriously affect the measurements in such a way that sudden shifts (homogeneity breaks) in the time series will be introduced. Other conditions such as land use changes, urban development and changes in vegetation and built environment introduce trends in the time series that might deviate from the regional climate characteristics. Analysing and correcting for such external influences to achieve homogeneous climatic time series is therefore necessary before making an assessment of climatic change.

This study presents the results for homogeneity analyses of daily temperature and precipitation series for ten places in Norway having different measurement challenges: There is also a challenge around the nature and the environment; e.g. mountains and valleys that generate wind. This is a part of the MIST-2 project, which is collaboration between Statkraft and MET. The aim of this study is to develop adjustment/homogenization procedures to use daily resolution data to generate high quality time series of temperature and precipitation.

The homogeneity if climatological time series have traditionally been analysed on annual, seasonal and occasionally on monthly data. Such analyses have been a focus by climatologists in particularly the last two-three decades (Peterson et al, 1998, Venema 2012).

As a part of the international effort to provide homogenous climate data series will the Norwegian Meteorological institute continue to test and adapt tools for homogeneity analysis of climate time series on different time resolutions. In this study, an analysis describe and test methods for homogenization of daily precipitation and temperature. Daily homogenization of temperature and daily homogenzation of precipitation in MIST-2-project (Lundstad & Tveito, 2016). 4 different programs/Applications/Methods have been used: HOMER, MASH, RHtest_dly_prec and SPLIDHOM. And the result are interesting...