



## Temperature Trends, Variability, and Extreme Events in the Berkeley Earth Homogenized Daily Temperature Data Set

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Climate change has been altering the pattern of weather over Europe. However, it is often difficult to accurately characterize these changes over long periods due to biases and inhomogeneities that have affected weather monitoring efforts over time. This is particularly true when considering rare extremes whose statistics may be more sensitive to inhomogeneous measurements. Only relatively recently have efforts begun to fully correct these issues in the context of daily data at global scales.

Analyses of European temperature statistics derived from the new Berkeley Earth daily temperature data set will be presented. This data set provides 1 degree resolution daily gridded fields of TAVG, TMAX, and TMIN for Earth's land areas derived from homogenized weather station data. Where sufficient data is available, the provided temperature fields begin in 1880 and continue to the present. Europe, with its broad and long history of weather monitoring, is one of the regions where long and comprehensive study is possible.

Preliminary analysis of European data indicates that not only did the mean temperature increase during the 20th century, but that the variance in temperature has also increased. The number of freezing nights has significantly decreased in most regions, while the number of very warm days has significantly increased. Since 1990, daily record highs have occurred at several times greater frequency than record lows. Further, heatwaves have become more common and more severe than at any time in the 20th century. A variety of temperature-derived statistics will be presented to characterize the changes in European climate. Where useful for context European statistics will be contrasted with changes that have occurred in other regions of the globe.