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Daily extreme temperatures spatialisation over France at 1km resolution from 1947 to present, and its use for climate monitoring and heat/cold waves detection

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Since 2007 real time climate monitoring for temperature at national scale has been performed over France using a subset of 30 long-term series. This approach does not allow to derive climate indexes at regional or county scales. In order to get information at those scales, a spatialisation of extreme daily temperatures on a 1km regular grid using a kriging with external drift method is applied. Spatialisation of minimum and maximum temperature are performed separately using daily observations. The external drift consists of a monthly climatology built to account for the influence of orography on temperature at climatological time scale (AURELHY). The kriging method is set to retrieve the observed values within the produced spatial field. The production covers the 1947 to present period. The number of available observations over France throughout this period increases from about 250 to 2250. The 1-Km grid meshes values are aggregated to produce indexes at county/regional/national scales. Their homogeneity is assessed through a comparison to gathered homogenized long-term series. Depending on spatial scale, the production is homogeneous throughout different time spans. This allows to monitor temperature in real time at different time scale over France.

An other application of this production is the detection of heat and cold wave episodes from 1947 using daily mean temperatures. Each wave is characterized by its duration, magnitude and severity allowing to produce a climatology of heat/cold waves over France at local scales and to monitor them in real-time.A focus on summer 2018 will be presented to illustrate the potential of this method.