



## **Assessment of climate variability in a Mediterranean coastal region from reconstructed climatic time series**

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The description of the climate of a region and of its variability depends on the analysis of long term time series of observed variables such as temperature, precipitation, humidity, wind, etc. However, in most of the cases, long time series of daily observations not only are affected by inhomogeneities, but they also present missing values for periods of few days or more.

A methodology is presented to reconstruct missing values in time series of variables following either a Gaussian or non-Gaussian distribution. For each meteorological variable we selected a homogenized reference series and we applied a quantile regression procedure to reconstruct the candidate series. For each day of the year a 10 days window is selected and the characteristic probabilistic distribution determined. The two series, the reference and the candidate, are compared for each quantile and the corresponding formula describing the relationship between the two series is found and used to calculate the missing values for the candidate series and the RMSE evaluated.

The methodology described in this paper has been applied to reconstruct the time series of few climate variables in the period 1951-2000 at locations in the coastal zone of Latium Region in central Italy. This area includes the “Tenuta Presidenziale di Castelporziano” (Castelporziano Presidential Estate), a well preserved natural park, whose climate is representative of coastal Mediterranean climate, covered by the typical Mediterranean shrub, the major natural biome in the Mediterranean, and only to a minor extent influenced by the presence of the town of Rome. As a first example the time series for maximum and minimum temperatures have been reconstructed and

analyzed. Preliminary results of the reconstructed and homogenized time series show changes in the climate of the region in and around the Presidential Estate in the last few decades which can certainly affect the flora and fauna typical of the Mediterranean shrub not only along the Latium coastline but also in the well preserved natural environment of the “Tenuta”.