

## Homogeneity and Trend Analyses of Temperature Indices: The Case Study of Umbria Region (Italy) in the Mediterranean Area

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**Abstract :** The climate change, mainly due to greenhouse gas emissions associated to human activities, has been modifying hydrologic processes with a direct effect on air surface temperature that has significantly increased in the last century at global scale. In this context the Mediterranean area is considered to be particularly sensitive to the climate change impacts on temperature indices. An analysis finalized to study the evolution of temperature indices and to check the existence of significant trends in the Umbria Region (Italy) is presented. Temperature data were obtained by seven meteorological stations uniformly distributed in the study area and characterized by very long series of temperature observations (at least 60 years) spanning the 1924-2015 period. A set of 39 temperature indices represented by monthly and annual mean, average maximum and average minimum temperatures, has been derived. The trend analysis was realized by applying the non-parametric Mann-Kendall test, while the non-parametric Pettit test and the parametric Standard Normal Homogeneity test (SNHT) were used to check the presence of breakpoints or in-homogeneities due to environmental changes/anthropic activity or climate change effects. The Umbria region, in agreement with other recent studies exploring the temperature behavior in Italy, shows a general increase in all temperature indices, with the only exception of Gubbio site that exhibits very light negative trends or absence of trend. The presence of break points and in-homogeneity was widely explored through the selected tests and the results were checked on the basis of the well-known metadata of the meteorological stations.

**Keywords :** reception theory, reading, literary translation, horizons of expectation, reader

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