

Detection of heat and cold waves in Montevergine time series (1884-2015)

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In recent years, extreme events related to cooling and heating have taken high resonance, motivating the scientific community to carry out multiple research activities in order to detect their frequency and variability.

In this work, we present an analysis of minimum and maximum daily temperature data registered at Montevergine Observatory (Campania Region, Southern Italy) for the period 1884-2015, in order to estimate mean trends in the extreme events such as “heat waves” and “cold waves”. Montevergine Observatory, being located at 1280 m a.s.l., is one of the oldest of Appennine mountains and it’s very meaningful for high-altitude climate features comprehension.

The occurrence of “heat waves” has been analyzed considering the persistence of temperature higher than 90th percentile for 5 consecutive days; analogously, the occurrence of “cold waves” has been found out considering the persistence of temperature lower than the 10th percentile for 5 consecutive days.

Before being used for the purposes of this study, Montevergine’s temperature time series was subjected to a homogenization procedure, in order to detect abrupt changes due to unnatural causes.

In addition, main characteristics of large-scale atmospheric conditions which caused the largest cold and heat waves in Montevergine site were analyzed.