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Trend and change point analysis of temperature in west of Iran

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ABSTRACT:

The present research attempted to analyze the trend of elements such as mean, maximum and minimum annual temperature, based on daily data using nonparametric Mann-Kendall method from the perspective of some meteorological elements, specifically temperature variable. The dried trees were observed using sequential Mann- Kendall methods and cumulative sum and change point analysis. For this purpose, daily temperature data of synoptic meteorological stations at Oak drying areas, including Kermanshah, Islamabad Gharb, Sarpolzahab, Ilam, Dehloran and Khorramabad with different statistical period according to history of their establishment were used. Station statistical data was evaluated in terms of quality and accuracy. The data were also examined in terms of the presence of outlier data, normality, and hemogeneity. Finally, a database proportional to the aim of the project was created. The findings indicated that station data were both identical and different from each other in terms of time variation trend. In this context, elements of temperate had a positive and significant trend at 5% level at annual scale in Kermanshah and Khorramabad stations (from the time of displacement so far). However, other stations had somewhat complied with these conditions especially in maximum and minimum temperature. The Khorramabad station before displacement showed the least evidence on time variation trend. Such trends in this region may be due to geographical factors rather than climatic factors. Displacement of stations should also be considered in data analysis. This issue changed the results obtained in Khorramabad station. A negative trend was observed in elements of this station when displacement of station was not considered in data analysis. However, a positive trend was observed in elements of this station when displacement of station was considered in data analysis, which is considerably important. Time of changes in meteorological data was also analyzed in the station. The change point analysis results showed that all stations data behaviour was mostly changed in 1998 and frequency of droughts increased in this year, which is not consistent with the time that first dried trees were observed (from 2008 to 2010).

Keywords:

Change point, Cumulative sum, Kermanshah , Mean temperature, Oak dieback, Trend analysis.

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