



Islamic Azad University-Ahar Branch

Geographic Space

An Approved Scientific, Research-based Quarterly

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Analyzing of Thunderstorm Occurrence Trends in the Western Part of Iran Applying Non-Parametric Statistical Tests

Date received: 10 April 2011 Date accepted: 9 July 2011

Abstract

In the current study, thunderstorm occurrence data taking from 17 synoptic stations with the longest periods (from 1956 to 2005) have been analyzed to identify the associated spatial and temporal changes in the western part of Iran. First, to provide an initial statement of thunderstorm conditions in the study area, average days with thunderstorm have been mapped using ArcGIS software. Then, thunderstorm trends were established using statistical methods, by applying two of well-known non-parametric Mann-Kendall and Sen's Estimator methods. Both estimators demonstrate excellent performance in the modeling of thunderstorm occurrence over time, regarding the discrete climatic data. Some spatial distributions of thundery days with significant trend were mapped in a ArcGIS setting on the subject of seasonal and annual time series. Final models determine that the number of days with thunderstorm is not homogeneous in some parts of the study area, since the thundery days decrease from the north to the south, showing an increasing trend in seasonal and annual scales consistently in the yearly extent .

Keywords: Thunderstorm Occurrence, Trend Analysis, West of Iran, Mann- Kendall, Sen's Estimator Tests.

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