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Analyzing the Relationship Between Dust Storm Occurrence and Climatic Parameters

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Abstract

Since climate has a major impact on dust generation, it is essential to identify the climatic parameters affecting this phenomenon. In this study, climatic parameters including temperature, relative humidity, rainfall, maximum wind speed and direction were selected and their relationship with visibility data and also dust storm days (recorded at meteorological stations) was analyzed on monthly and yearly scales using multivariable linear regression. Results showed that the number of dust storm days has reached 366 days in the last five years. The minimum dust storm days occurred in autumn in all the stations of Khuzestan province including Abadan, Ahvaz, Omidiyeh, Dezful, and Masjed Soleiman and the maximum dust days for Abadan and Ahvaz stations and three remaining stations occurred in spring and summer, respectively. Results also showed that the highest frequency of dust storms in Abadan and Ahvaz stations did not coincide with summer season which has the lowest rainfall of the year. As a result, it seems that the main reason for this difference is the climatic characteristics of dust sources and deposition regions. The occurrence of dust events in the remaining stations in summer time indicated that the sources of dust storms might be local and within the study area. The regression analysis confirmed this issue as the number of climatic parameters which had significant correlations with visibility data increased from 8 to 16 from west to east in the region. Overall, the results showed that with the increasing distance from Arab countries such as Iraq and Saudi Arabia, dust sources were mostly local and provincial.

Keywords: Dust storm, Climatic parameter, Visibility.

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