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Identification of dust storm sources area using Ackerman index in Kermanshah province, Iran

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ABSTRACT:

Dust storms are one of the most important environmental challenges in the last decade at Kermanshah province, which greatly endangers the health of all living things, especially humans. The first step in controlling this destructive environmental phenomenon is to identify the dust storm sources, which is the main purpose of this research. For this purpose, horizontal visibility data were obtained from the meteorological organization of Kermanshah during the various periods (2005-2015), and the years of 2008 and 2009 The months of May, June and July were selected due to the most frequent occurrence of dusty days. In the next step, the most important dust events were selected in the years and months based on the two criteria: The minimum horizontal visibility and the maximum duration of continuity. MODIS Satellite Images were prepared (MOD 02) for these courses of dusty storms. Ackerman dust index and Gaussian plum diffusion model were used to reveal the center of the dust storm in the images. Total of 67 dust storm sources were identified in the MODIS images, which are located in Iraq (29 points), Syria (17 points), Syria and Iraq border (15 points), and Kermanshah province (6 points), respectively. The important point in the results of this study is the increase of the number of dust storm source area at the Iran in Kermanshah province during 2008 (1 point) and 2009 (5 points), which should be followed by appropriate strategies to prevent their occurrence.