The mechanisms of Dust storms in Sudan

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Abstract

Dust storms are of special interest to meteorologist in this country because of their impact on human health and daily activities as well as on the environment. They create real hazards to aviation and road traffic by reducing the visibility to critical levels. The Objective of this study is to analyze the reasons behind dust storms in Sudan and to find ways to improve their forecast. Several cases of dust storms occurrence and frequency were studied for the period between May and September for the years 2005 to 2015. We used the archive of thermal channels data of the meteorological satellites EUMETSAT 10 to extract composite space images to detect and monitor dust storms over Sudan. The GIS technique was used to analyze the monthly number of dust storms days and to determine the occurrence and frequency of dust storms in the study area. During the dry season the dust storms were triggered by strong gusty winds generated by pressure and temperature gradients. Absence of rainfall left the soil loose so that sand and dust particles were easily picked up and removed from the dry surface. During the rainy season the study found that wide spread rain activities cool the southern areas. High pressure builds up and strong southerly winds speed up and transport dust from south to north. Localized thunderstorms create steep pressure gradients and lead to haboob dust storms.

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