



## Large scale meteorological factors of dust mobilization in the Bodélé Depression, Chad

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Mineral dust in the atmosphere is mainly controlled by eolian morphodynamics mobilizing particles that can be held in suspension by the wind, fostered by local turbulences. The Earth's major dust source is the Bodélé Depression (17°N, 18°E) in the south of the Tibesti Mountains. Here, sandstorms generate dust particles transported as far as the Caribbean Sea and the Amazonas Basin.

During the dry winter months the NE-Passat carries dust originating from the Bodélé Depression close to the surface as far as the Guinean Coast. These 3–4 days lasting weather extremes are referred to as *Harmattan dust events*. They cause severe weather conditions due to heat absorbtion and visibility reduction and, hence, occasion high economical losses and put the population's health at risk.

In this study we examined the mesoscale meteorological settings causing the dust generating winds in the Bodélé Depression. Atmospheric dust concentrations during the winter months were characterized by the Aerosol Index of the Total Ozone Mapping Spectrometer (TOMS-AI) on Nimbus satellite from 1981 to 1990. This daily data was correlated to the meteorological variables quantified by intrinsic data from the NCEP/NCAR-Reanalysis Programme. It has been found that dust mobilization during the Harmattan Season is highly dependent on air pressure variability in the Mediterranean area. High pressure to the north of the Bodélé causes an intensification of the near surface NE-Passat leading to an increased entrainment of dust in the Bodélé Depression. Hence, the occurrence of Harmattan dust events can at least partly be explained, an information valuable in the prediction of these severe weather conditions.