

# The Monsoon and Dust Storms



The arid and semi-arid regions of Arizona are well known for their sudden dust storms on windy days and for their limitless vistas on quiet days. A dust storm usually arrives suddenly in the form of an advancing dust wall, which may be miles long and several thousand feet high. Ahead of the dust wall the air is very hot and the wind is light. Dust storms are natural events, but the amount of material available for transport may be related to surface disturbances such as overgrazing, ploughing, or removal of vegetation.

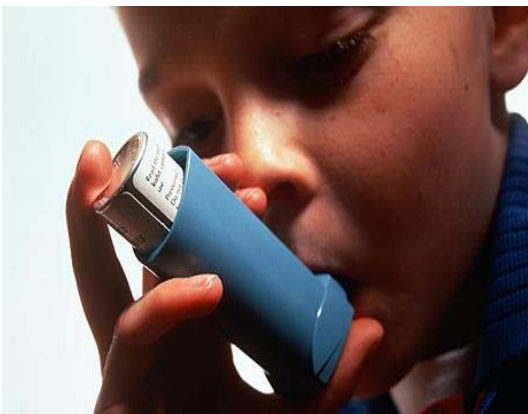


A dust storm is created when a large mass of cold, unstable air moves swiftly across dry ground covered with loose silt and fine sand. Known as haboobs (Arabic for "violent wind"), dust storms form over semi-arid areas during periods of convective instability, when large masses of air are heated near the ground surface and then rise rapidly to altitudes of more than 10km (6 miles). The area between Tucson and Phoenix is noted for being the only place in the United States to experience the "haboob", a raging dust storm that travels across the desert at 50 to 60 miles per hour.

Dust storms in central Arizona, on average, tend to be more severe than those storms experienced in other areas. The most intense and frequent dust storms in Arizona occur during the summer months and are associated with strong down drafts generated by intense monsoonal thunderstorm activity. Several less intense dust storms of longer duration also occur during the late winter and early summer months with peak occurrence in April.



We all know that dust storms can create treacherous driving conditions, but did you know that dust storms can also be a major contributor to reduced air quality, and can cause hazards to human health?



When inhaled, wind borne dust particles, especially 10 micrometers or less, can invade the respiratory system's natural defenses and lodge deep in the bronchial tubes. (Ten micrometers is about one-seventh the width of a human hair). Normal body defenses (coughing and sneezing) do not remove these harmful pollutants. These dust particles can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung disease, and reduce the body's ability to fight infections.

Certain people are especially vulnerable to adverse health effects from these particulate emissions. These "sensitive groups" include children, the elderly, exercising adults, and those suffering from asthma and bronchitis.

The best way to avoid potential health hazard is to exercise common-sense preventative measures. First, assess visual clues. That is, if the winds are blowing hard, and it really looks dusty, it is likely that sustained exposure to those conditions will result in individual exposure to concentrations that may exceed the health-based ambient air quality standard for particulate matter. So, when visibility is impaired and it looks very dusty, the best measure is to avoid spending time outdoors, and seek shelter immediately.



Also, during threatening weather, listen to commercial radio, television or NOAA Weather Radio for dust storm warnings. A dust storm (or sand storm) warning means visibility of  $\frac{1}{2}$  mile or less due to blowing dust or sand, and wind speeds of 30 miles an hour or more. Remember, dust storms may not only impair driving conditions, but can also impact the conditions of your health.

