Meteorological Conditions Conducive to Dust Storms in Southern NM

Dave DuBois, State Climatologist

College of Agricultural, Consumer and Environmental Sciences

Department of Plant and Environmental Sciences

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Weather drivers for dust events

• Local scale
  • Dust devils, gustnados & land spouts
  • Dust channels or dust ribbons
  • Winds from thunderstorm dry microburst or gust front

• Local to regional scale
  • Convective outflow

• Synoptic scale – upper level low & fronts
Dust channel or dust ribbon

Localized “channel” of dust covering a limited area.

In this case strong winds were associated with a cold front on June 24, 2017. This occurred about 8:30 am on I-10 on the Lordsburg playa.
Microburst

Of concern are dry microbursts
Size < 4km
Duration 2 to 5 minutes
Thunderstorm outflow

June 24, 2020 Las Cruces

Time-lapse from east Las Cruces

Santa Teresa radar reflectivity
June 5, 2020 Thunderstorm outflow & dust channels on Lordsburg Playa

Southern motion brings in moist air from Mexico, surface dewpoints in the evening increase to approx 50°F

Radar reflectivity from Santa Teresa, NM

NMDOT camera at mile marker 11 on I-10
Synoptic storm

Several synoptic dust events in southern NM/West Texas/Northwest Chihuahua in early 2020

March 27, 2020

Many dust sources active across the region
March 27, 2020: Wind erosion from fallow crop lands in Chihuahua, Images from Sentinel-2
January 9, 2020 synoptic event

Dry southwesterly winds, dewpoint 9°F

January 7 Sentinel image shows water covering most of Lordsburg playa

Dust emissions from dry areas
Drought

Above graph is the US Drought Monitor area of climate division 8 (southern desert of NM) since 2000.
2020 Drought

July 1 to October 24, 2020

Early summer convection resulted of several outflow, haboob events in southern NM (evidence from Las Cruces & El Paso).

However, intensifying drought conditions and suppressed convection most of summer in turn decreased the number of thunderstorms and convective dust storms in 2020.

CoCoRaHS observer northeast of Lordsburg playa received only 1.68” from June 1 to Oct 25, 2020.
Dave DuBois
Skeen Hall
Department of Plant and Environmental Sciences
NMSU College of Agricultural, Consumer and Environmental Sciences
Las Cruces, NM
Email: dwdubois@nmsu.edu
Office: 575-646-2974
Twitter @nmclimate