SOUTHWEST WEATHER BULLETIN

Spring-Summer 2008 Edition

National Weather Service Santa Teresa-El Paso

Winter Storms Bring Heavy Snow High Winds and Heavy Rains

Autumn begins rather warm and thundery across southern New Mexico and far western Texas as October weather includes above normal temperatures and a few severe thunderstorms across the region. Rather tranquil weather then continues through most of November before a major winter-type low pressure system moves across the Borderland bringing record 5 to 10 inch snowfalls over portions of the El Paso Texas vicinity.

For the remainder of the winter and early spring the region experiences a progressive circulation pattern with prolonged periods of quiet benign weather occasionally interrupted by low pressure systems which generate locally heavy snows, strong winds and areas of heavy rain. Warmer dry and occasionally windy conditions during the late winter and early spring also increase the wildfire danger as a serious drought situation develops across the Borderland by mid April.

An early winter storm brings a record 5 to 10 inches of snow to portions of central and eastern El Paso on November 24 2007. (John Barns)

Weather Highlights

October 2008: A rather warm month for most of southern New Mexico and western Texas. El Paso records 5 days with maximum temperatures in the 90s and 21 days with highs of at least 80. It is also dry with much of the area receiving under a tenth of an inch of rain.

National Weather Service El Paso/Santa Teresa
Meteorologist-In-Charge - Bill Alexander
Warning Coordination Meteorologist – John Fausett
Science Officer – Val Macblain
Newsletter Editor-Writer/Senior Forecaster – Joe Rogash

Weather Highlights

October 4: Late afternoon thunderstorms produce one inch-diameter hail over Silver City.

October 10: Severe thunderstorms produce nickel-size hail over Winston in Sierra County NM.

October 12: Very warm day over southern NM and western Texas with El Paso tying a record by reaching a high of 91 degrees.

October 20: Another warm day across the region including El Paso which hits 88 degrees to set a new record.

November 24: An early winter storm brings record snows to portions of the El Paso area with 5 to 10 inches of snow falling over central and eastern portions of the city. 5 to 10 inches of snow also fall around Cloudcroft.

November 29-30: Storm brings 1 to 2 inches of rain over portions of the Gilas in Grant County. Localized flooding closes roads near Lake Roberts.

December 10: Dense fog lowers the visibility to under a quarter mile between El Paso and Las Cruces. To the west 5 to 10 inches of snow fall over the higher elevations of the Gilas.

December 21: Storm brings 4 to 6 inches of snow around Cloudcroft.

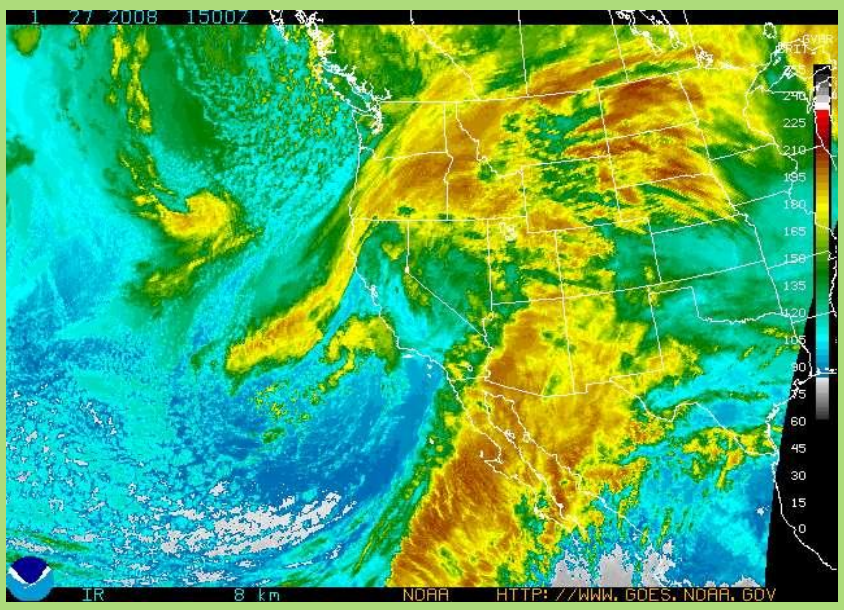
December 27: Very windy with gusts near 60 mph around El Paso.

January 7: Strong winds gust to near 50 mph across the deserts. Blowing dust and sand lower visibilities to near zero in the Deming vicinity.

This thunderstorm produces a wall cloud over Las Cruces on October 1 2007. (Jeff Passner)

Evening thunderstorms move into the Las Cruces area on October 4 2007. (Jeff Passner)

Heavy snow over northeast El Paso during the November 24 2007 storm. (Dave Novlan NOAA/NWS)



Satellite image showing the storm which brings heavy rain to portions of southwestern New Mexico January 27-28 2008.

Weather Highlights Continued

January 27-28: Low pressure system brings 1 to 2 inches of rain over portions of southwestern New Mexico with minor flooding around Gila Hot Springs.

February 4: Windy across much of the Borderland with gusts to 76 mph measured at Organ NM.

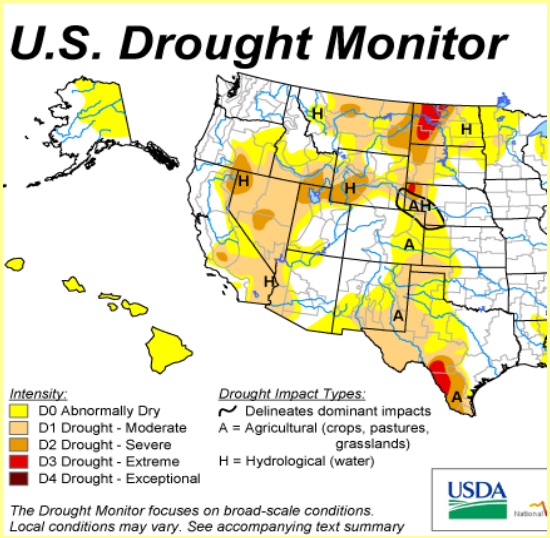
February 15: Winter storm brings 3 to 5 inches of snow around Silver City with 2 inches of snow over Cloverdale NM.

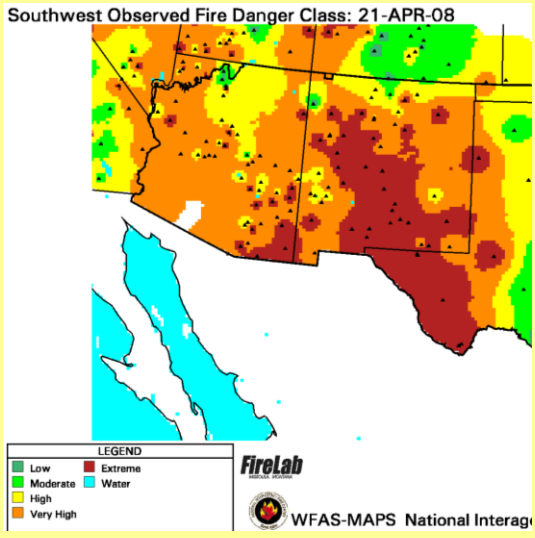
March 2-3: Five inches of snow fall around Cloudcroft.

March 16: Very windy across southern New Mexico and western Texas with widespread blowing dust and sand. Visibilities fall under a quarter-mile around Deming forcing the closure of Interstate 10.

High winds near 50 mph damage a roof at the Kennedy Recreational Center in El Paso on March 16. (El Paso Times)

April 9-10: A strong slow-moving low pressure system causes high winds and blowing dust and sand across the region with gusts around 50 mph occurring both days. The winds damage a building in east El Paso and almost zero visibilities from blowing dust force road closures near Deming.





Dry weather prevails over most of southern New Mexico and western Texas from mid winter through early spring resulting in drought conditions and a high to extreme wildfire danger.

On March 18-19 a wind-driven wildfire burns about 1000 acres of scrub and brush and destroys a home near Radium Springs in northern Dona Ana County NM. (Shari Vialpando Las Cruces Sun News)

El Paso firefighters combat a wind-driven fire on March 16. (Vanessa Monsisvais El Paso Times)

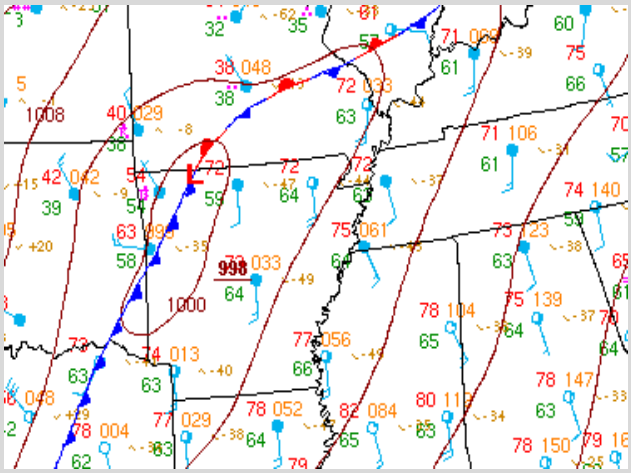
Wind gusts around 50 mph tear a roof from a building in El Paso on April 10. (Mark Lambie El Paso Times)

WINTER TORNADO OUTBREAK BRINGS DEATH AND DESTRUCTION ACROSS THE SOUTH

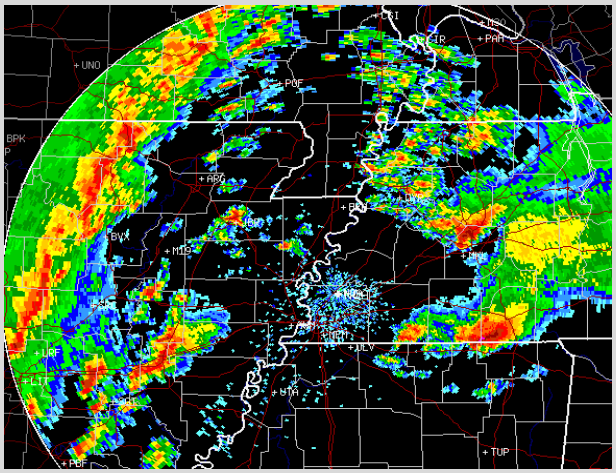
During February 5-6, 2008 a major outbreak of strong and violent tornadoes strikes the south central United States, killing 56 people and destroying homes, buildings and other property across the region. Most of the death and destruction takes place across Tennessee and Arkansas with Kentucky and Alabama also hard hit. A few of the tornadoes generate winds greater than 200 mph as they demolish buildings and other property, including dormitories at the Union University in Jackson Tennessee.

Tornado destruction in Clint Arkansas. (NWS/NOAA Little Rock)

The storms develop ahead of a strong cold front associated with a major low pressure system approaching the Mississippi River Valley. In addition there are high winds aloft with speeds greater than 100 mph in the upper atmosphere. This weather pattern creates an unstable air mass causing warm humid air at the surface to flow beneath cooler air above. As the warm air collides with the much colder air behind the cold front, violent thunderstorms erupt resulting in the deadliest tornado outbreak in over 20 years.



Surface weather map showing late afternoon conditions on Feb. 5 2008.



Weather radar images of tornado-producing thunderstorms over Arkansas and Tennessee.

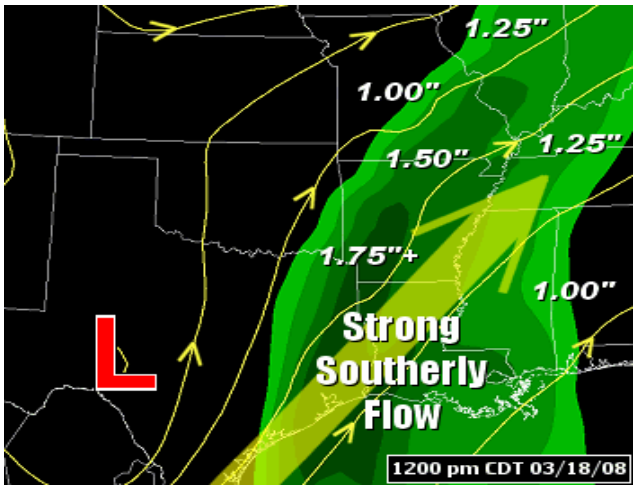
Major Flooding Strikes the Southern and Central United States

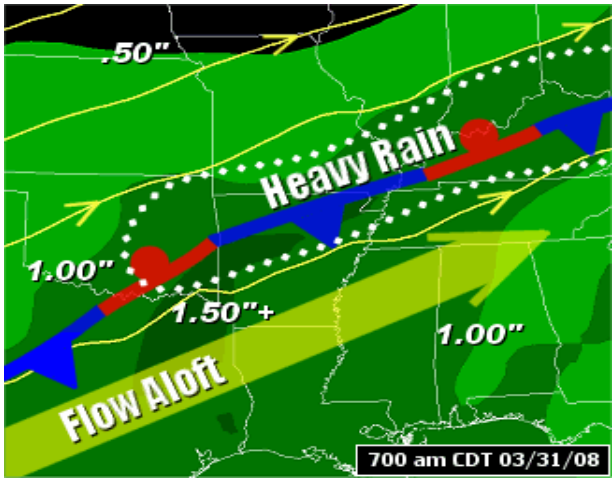
A series of storms also generate torrential rains during the late winter and early spring with floods causing widespread destruction and loss of lives from southern Texas to the Ohio River Valley. Record breaking rainfalls on March 18-19 produce over 10 inches of rain across portions Missouri and Illinois while 10 to 14 inches of rain fall over areas of eastern Texas on March 30. Arkansas, Oklahoma, Indiana, Kentucky and Ohio also suffer from the heavy rains and widespread flooding.

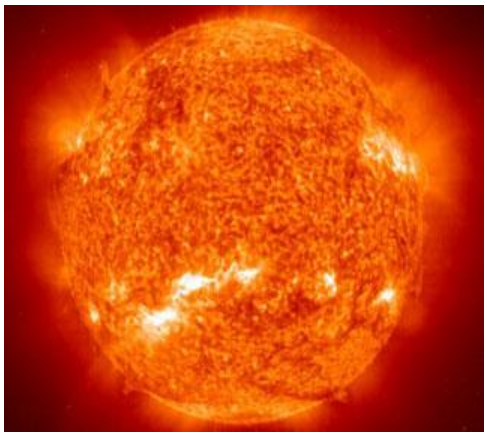
The extremely wet weather pattern includes complex low pressure systems which pull very moist air from the Gulf of Mexico northward into the United States. As this warm moist air is lifted over cooler air to the north, rainfall becomes intense and produces catastrophic flooding. In addition the combination of heavy rainfalls and melting snows force numerous rivers to overflow and flood neighborhoods across much of the American heartland.

Heavy rains flood Calico Rock Arkansas. (NWS Little Rock)

Widespread flooding across Butler County Missouri. (NWS St. Louis)







NASA

HEAT WAVE...

The Silent Killer

While most everyone loves to spend time outdoors on a sunny day it is important to remember too much heat and sunshine can be very ***DANGEROUS !***

While almost everyone is aware of the dangers of tornadoes, floods, hurricanes and other violent weather phenomena, most people do not realize that HEAT is the number one weather-related killer across the United States. Between 1979 and 2003 excessive heat exposure causes 8015 deaths across the country including 1021 Americans who die during the tragic 1995 heat wave.

The heat danger especially includes southern New Mexico and western Texas. El Paso Texas and surrounding desert areas on average experience temperatures 100 degrees or higher 15 times a year with most lowland areas reaching the 90's at least 100 days during a typical late spring and summer period. During the summer monsoon season the increase in humidity combines with the summer heat to further create dangerous conditions for the human body.

Exposure to heat and humidity can cause physical disorders such as heat exhaustion and heat stroke which result in serious illness or death. In addition even when temperatures are not considered hot, excessive sunshine and the sun's ultra-violet rays may cause serious sun burns and can contribute to eventual skin cancer. Thus even when temperatures seem mild the sun can be dangerous, especially over mountain areas where the air is thinner and provides less protection.

Heat and Sun Safety Rules

*** Avoid strenuous activities during the hottest times of the day.**

*** Drink plenty of water and non-alcoholic beverages during hot weather.**

*** Spend more time in air-conditioned buildings.**

*** Dress in light-colored loose-fitting clothing that covers as much skin as possible.**

*** Protect the head and face by wearing wide-brimmed hats.**

*** Do *NOT* leave children or pets in closed vehicles with the windows up.**

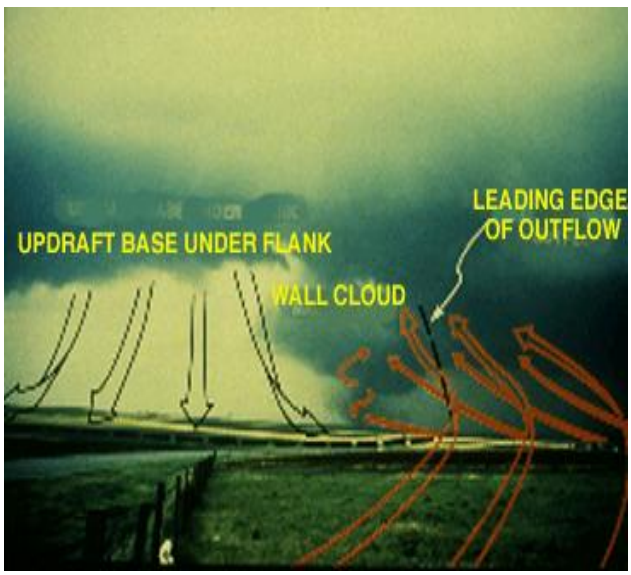
SEVERE STORM AND FLOOD DETECTION

Reliable tornado…flood and severe thunderstorm warnings depend on both visual observations from trained spotters and the latest technology.

Supercells and Tornadoes

Supercell thunderstorms produce almost all strong and violent destructive tornadoes across the United States. While most of the tornadoes that develop over southern New Mexico and far western Texas are weak and short-lived, a few stronger supercell tornadoes have developed in the region over the past several years. Fortunately they moved across open desert where they could cause no significant damage or injury. Nevertheless these storms demonstrate that the risk of damaging tornadoes does exist across the Borderland, especially during the late spring and early autumn periods.

Tornado moving across White Sands Missile Range on May 2 2007. (Miriam Rodriguez)

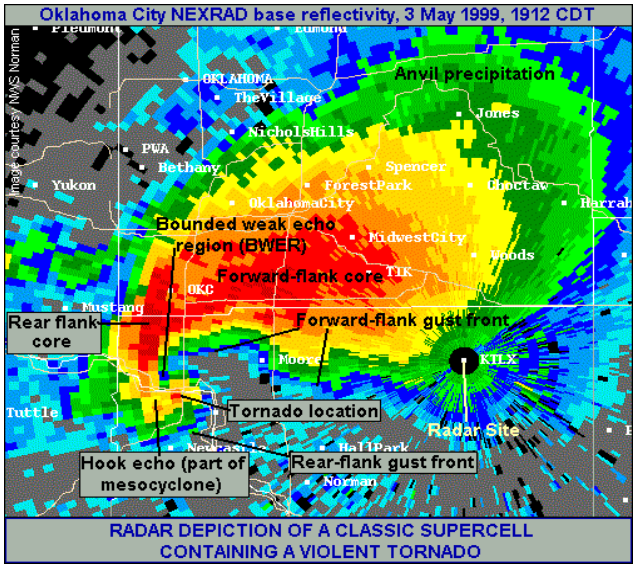


Visual Aspects

Supercell thunderstorms sometimes provide visual clues they are about to produce a tornado. A lowering and rotating wall cloud (left) is actually a warm thunderstorm updraft which is becoming very intense with upward speeds greater than 50 mph. In addition a clear slot on the flank of the storm indicates a downdraft is wrapping around or occluding the warm updraft, a process very important in tornadogenesis. A tornado with wind speeds in excess of 200 mph may form within 10 minutes after the formation of the rotating wall cloud and will usually be located near or within the updraft itself.

Radar Signatures

As a supercell thunderstorm rotates, it pulls or wraps rain and hail in a counterclockwise or cyclonic direction around the storms updraft. This aspect of the storm sometimes produces a ***HOOK ECHO*** (right) , a signature which may indicate the formation or presence of a tornado. Today weather spotters and the population in general can go to the National Weather Service web sites and directly examine Doppler Radar reflectivity signatures for the entire country. The radar signature on the right was associated with a deadly destructive tornado over Oklahoma with winds nearly 300 mph.



Supercells and Hail

While research studies show less than 25 percent of supercells produce strong or violent tornadoes, almost all supercells do produce severe weather such as large hail or damaging winds. In fact most hail greater than the size of golf balls are associated with a supercell. On April 3 2004 a supercell dropped 2 inch-diameter hail over Chaparral NM (right) causing extensive damage.

High Precipitation Supercells

High precipitation supercells (left) can be the most dangerous type of thunderstorm of all as they sometimes produce both destructive tornadoes and extremely heavy rains with flash flooding. Tornadoes within a high precipitation supercell may also be difficult or even impossible to see because the heavy rains rotating around the updraft can obstruct the view of a storm spotter. In addition to tornadoes and heavy rains, high precipitation supercells can bring large hail and damaging downdraft winds.

Greg Lundeen (NOAA/NWS)

Floods and Flash Floods

An almost stationary complex of showers and isolated thunderstorms brings the worst flooding in El Paso history on August 1 2006. (Joe Rogash NOAA/NWS)

This slow moving high precipitation supercell causes major flooding in Juarez Mexico, killing 6 people, before moving into El Paso and Santa Teresa. (Heather Bishop)

Floods are the deadliest and most destructive of all storm-related weather phenomena, killing almost 150 people a year. And despite the normally sunny dry climate of southern New Mexico and western Texas, the flood danger across the region is very real, especially during the summer monsoon season from late June through early September. In 2006 floods cause an estimated 400 million dollars in damage over the Borderland.

Typically floods are produced by either stationary or very slow moving heavy rain-producing shower and thunderstorm complexes or by “training” where showers and thunderstorms move repeatedly over the same area dumping heavy rain.

Spotters should monitor areas for flooding when they observe heavy rains falling over a given location for longer periods of time. In addition persons can monitor local weather radar on the internet to determine where heavy rains are falling. Remember radar-estimated rainfall amounts are also available to the general public on the internet.

Flooding at San Vicente NM summer 2006. Spotters remain critical in providing valuable information concerning where rivers, creeks and arroyos are overflowing. (Jim Marshall)

Spotters remain critical by providing valuable information concerning where rivers, creeks, and arroyos are running high or overflowing. Spotters are essential in informing the National Weather Service and public safety officials where streets and highways are under water. Finally spotters and cooperative observers who possess rain gages can offer important real-time data on how much rain is actually falling.

Destructive Thunderstorm Downdrafts

When rain falls through dry air aloft or near the ground, much of it evaporates which in turn cools the dry air. This cooling causes the air to become heavier or more dense and under certain conditions it will sink rapidly until it violently strikes the ground and rushes outward as a downburst or microburst. In some instances wind speeds will reach 100 mph or greater, resulting in serious damage along with death or injuries. Downdraft winds have been responsible for major airline crashes with great loss of life.

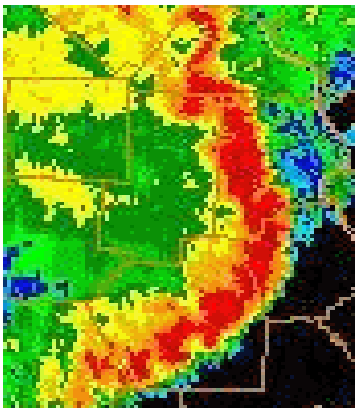
The approach of a rapidly moving shelf cloud indicates strong and possibly damaging thunderstorm winds.

This high precipitation supercell brings both high wind gusts and heavy rains to the El Paso area. (Joe Rogash NWS/NOAA)

Dry microbursts can occur with showers or thunderstorms which produce little or no rain. However one important clue is the presence of blowing dust. This dry microburst occurs near Columbus NM. (Len Zgonina)

Downbursts and microbursts can be either wet or dry. In an environment of warm most unstable air at lower levels and dry air aloft damaging thunderstorms winds may occur with heavy rains and even hail. However where the air is dry below and moist aloft strong winds can develop with little or no rainfall or even an absence of thunder.

Damaging downdrafts with moderate to heavy rains often produce a fast moving ***Bow Echo*** on radar (right).



Winter sunset over Las Cruces. (Jesse Christofaro)

Spotters…Please call the National Weather Service If You Observe:

Tornado or Funnel Cloud…Report Time, Location and Movement

Hail…1/2 Inch or Larger

Damaging Winds…Damage To Buildings, Motor Vehicles, Trees, Power Lines And Other Structures

Flash Flooding…Flooding Of Streets and Buildings , Or If Rivers, Streams And Arroyos Flood Or Overflow

Heavy Rains…1/2 Inch of Rain In Less Than 30 Minutes Or At Least 1 Inch Of Rain In Less Than 2 Hours

Blowing Dust…Whenever Blowing Dust Reduces The Visibility To Less Than 2 Miles.

Snow Amounts Greater Than An Inch