



Wild West Weather

Spring and Summer Weather Safety *by Jennifer Ritterling—Forecaster*

As temperatures warm and flowers bloom, western Kansas begins to hear the rumbles of thunder that usher in severe weather season. Many schools, businesses, and families use this time of year to review their tornado safety procedures. However, tornadoes are not the only threat that arrives with the warm season. Flash Flooding, excessive heat, and lightning from garden variety thunderstorms can all present hazards to the public. It is a good idea to keep in mind these safety tips during the spring and summer.

Lightning

- When you hear lightning, the best place to be is indoors. The building should be fully enclosed,

as picnic shelters are not adequate protection.

- Once you hear thunder, the lightning is close enough to strike you. It is best to get into shelter and stay there 30 minutes past the last rumble of thunder.
- Enclosed vehicles can provide protection. The lightning charge goes around the metal frame of the car instead of through you.
- Once inside, avoid talking on the telephone or taking a bath or shower. The charge could travel through phone lines or water pipes.

Flash Flooding

- Never drive through flood waters. Remember: Turn Around, Don't Drown
- If caught in rising water, evacuate to higher ground, abandoning vehicles if necessary.
- Be very wary at night. Drivers could come upon flooded rural roads quickly and be unable to stop.

Tornadoes

- Get to the lowest level. If a basement is not available, a small interior room such as a bathroom or closet can provide shelter.

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Spring and Summer Safety (continued from page 1)



Photo by Mike Umscheid – Lead Forecaster

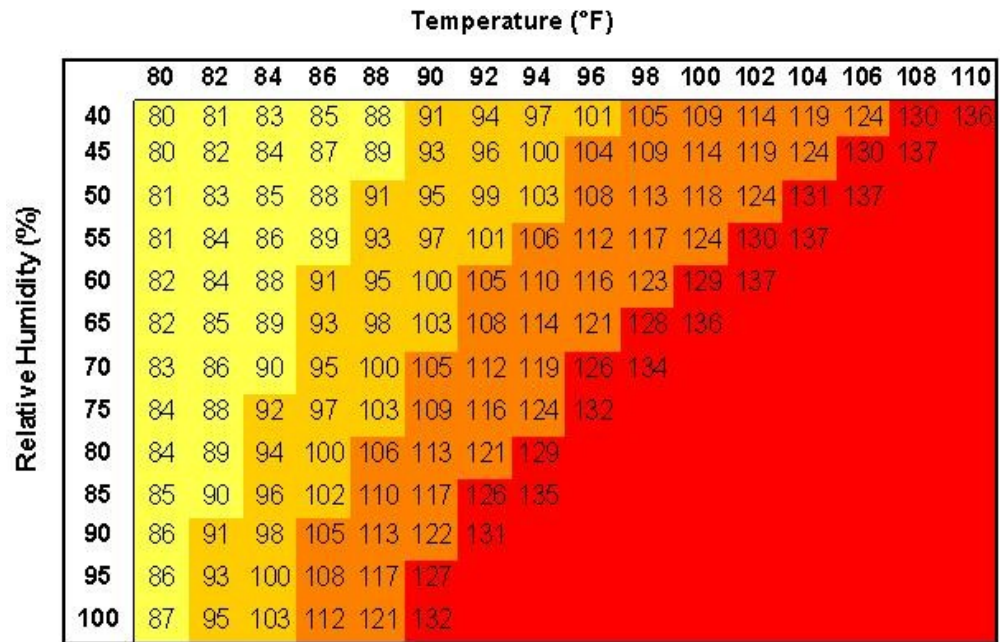
More photos at <http://www.underthameso.com>

- Even in a basement, it is best to get underneath something sturdy such as a large piece of furniture or a stairwell.
- Mobile homes are easily rolled during tornadoes. They need to be abandoned for sturdier shelter.
- People in vehicles need to get to the nearest shelter. Highway overpasses are not good shelter. As an absolute last resort, get into a ditch and cover your head.

Excessive Heat

In an average year, about 175 people in the United States die from heat related illnesses. Due to sweat becoming less efficient at cooling the body when the relative humidity is high, humid days can be even more stressful. Meteorologists use the Heat Index or “apparent temperature” to account for the effects of humidity and heat on the body. The chart can be seen on the right. The chart was designed for conditions with shade and light wind. Full sunshine and hot winds will make the stress worse. When the temperature and or heat index is high:

- Dress in light weight, light colored clothing.
- Drink lots of water and other non-alcoholic beverages.
- Cover up and wear sunscreen to prevent sunburn. A bad sunburn is not only extremely uncomfortable, but can make heat dissipation worse.
- When a person gets very weak with heavy sweating, pale and clammy skin, and sometimes fainting and nausea, they are experiencing HEAT EXHAUSTION. Try to move the victim out of the sun, lay them down in the air conditioning, and give them sips of fluids.
- If a person is *not* sweating, has dry hot skin, very high (greater than 106 degrees) body temperature, and loses consciousness, this is HEAT STROKE. It is very dangerous and the victim needs medical attention immediately. While waiting for help, move them to a cooler environment and sponge them down. Do not try and give them liquids orally.



Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

■ Caution
 ■ Extreme Caution
 ■ Danger
 ■ Extreme Danger

STATION VISITS

Station visits have already begun for the spring and will continue into the summer. We will clean the outside temperature sensors and level the rain gages. The automated rain gages will be summarized during the early part of May. If you need any supplies or equipment moved or worked on, please give us a call at 1-800-824-9943. Ask for Jesse Lee or Duane Wolfe. If neither one of us are here you can leave a message and we will get back to you. My e-mail address is jesse.lee@noaa.gov and Duane's is duane.wolfe@noaa.gov.

AWARDS

There will be three major length-of-service awards given out this year. Ella Mae Julian near Big Bow will have 65 years of service in May, Joy Cudney near Trousdale 60 years in December and J. Hayes Baldwin of Kalvesta 50 years in December. Congratulations to these long time and dedicated observers.

Other awards presented for length-of-service this year include:

15 Years

Brad & Paula Hinkle of Liberal in September

10 Years

Mary Cunningham of Wakeeney in December

Judy & Jerry Bernbeck of Utica in December

Brett Carlson of Bison in August

Keith & Patsy Austin of Bucklin in November

NEW OBSERVERS

David Spalsbury near Brownell has replaced Tony & Loretta Basgall in January. We welcome David into the Cooperative Weather Observer Program.



Cooperative Weather Station circa 1930

NOAA Photo Library

8 INCH STANDARD RAIN GAUGES

If you have not already done so, you may place the inner tube back in the gage and put the funnel on top.

WXCODER

For those who do not use the weather coder program, you may use it if you have a computer with internet and want to report your weather data every day. This is a website where you may enter data and it will allow us to incorporate your station data in our daily report. If you are interested in using this program, please give me a call and I will get you signed up on it. For those who routinely use the program, you no longer have to mail the B91 form to us. We can download your data from the program. At the end of the month, please check your form for any missing entries. In the event there is no precipitation, enter a zero instead of leaving the entry blank.

WEATHER FORMS AND ENVELOPES

I will mail three more envelopes in April and again in July for each cooperative station that still mail their forms and keys into me. National Weather Service Headquarters is in the process making new envelopes, therefore I am sending out a small quantity of supplies.

Blizzard Reminds Us: Winter “Aint Over Till It’s Over!”

by Tom Wright, Forecaster

After a rather mild winter with record low snowfall, the blizzard that blew through Southwest Kansas on March 27th and 28th served to remind us how severe winter weather can be on the high plains. The NWS Office in Dodge City recorded 12.6 inches of snowfall during the storm which was the sixth largest snowstorm ever and the third largest ever in March. But the snow totals at Dodge City paled in comparison to the whopping 1.5 to 2 foot snowfall reports that came in from counties south and east of Dodge City. As if the heavy snow wasn’t enough, howling north winds of 40-50 mph whipped the snow into whiteouts and produced colossal drifts that inundated roads and brought many Southwest Kansas cities and towns to a standstill.

Perhaps the most important reminder the storm provided, however, was that not only can severe winter weather happen during the spring, it is actually more likely at this time of year than any other. As evidence of the fact, five of the seven largest snowstorms of all time in Dodge City have occurred during March or April. During the spring, the warmer (and usually more moist) air from the south begins its inevitable push northward while at the same time, cold winter air refuses to give way. It is this clash of air masses that produces our severe spring weather. Until the warmer air begins to win out (usually in May), blizzards like our recent March one remain possible.

Spring Snows in Dodge City

March 1957 had 18.5 inches between the 22nd and 25th. 24.3 inches fell during the month of March in 1924.

April 7–9, 1938, a blizzard brought 14.3 inches of snow with drifts up to 8 to 10 feet.

May had snow for two consecutive years: 0.9 inches fell on May 3, 1978 and 0.3 inches fell on May 4, 1979



Photo by Scott Reiter, Information Technology Officer

Hailstorm Climatology for Central and Southwestern Kansas

by Jonathan Finch – Forecaster

There are 27 counties served by the Dodge City National Weather Service office. This area encompasses Scott City, Syracuse, Elkhart and Liberal in the west, Hays, Stafford, Pratt and Medicine Lodge in the east, and Dodge City, Ness City and Ashland in between. The number of days with at least one report of golfball or larger sized hail were counted for each 1/3 month period through each year from 1955 to 2008. For example, for June 1957, the number of days with at least one report of golfball or larger sized hail were counted for June 1-10, June 11-20 and June 21-30. These results are graphed in Figure 1.

There were no reports of golfball or larger sized hail in any November to January period from 1955 to 2008. There was only one report in February and this occurred on February 24, 2000. There has been only one report in late October. So large hail is extremely rare from late October through February. During this time of year, severe weather tends to occur in states such as Mississippi and Alabama where moisture from the Gulf of Mexico is occasionally abundant and the jet stream is strong. Southwest Kansas has a fairly dry and cool climate during this period although significant snowstorms and even an occasional rainy day can occur.

The frequency of hailstorms increases only slightly in March, but more so by mid April

when 14 days with at least one report of golfball or larger sized hail have occurred. This number shoots up to 38 by early May, 57 by late May and 53 in early June. The most favorable time of the year for large hail, for the Dodge City area of forecast/warning responsibility is mid June as there have been 73 days with at least one report of golfball or larger hail since 1955. In years with active mid June periods, there tends to be multiple days in a row of active weather. The same is not true of April and early May when severe weather tends to progress across the region followed by a cold front that sweeps the

ence in temperature from the surface of the earth up to the jet stream level. This difference in temperature is called the "lapse rate." When lapse rates are large, the chances for severe weather increase provided there is sufficient moisture from the Gulf of Mexico at low levels (surface to 4000 feet above ground level). Deep, rich moisture return from the Gulf of Mexico tends to occur at about the same time that the lapse rates are becoming steep. Finally, although the jet stream weakens some by late spring, it is still strong enough to promote severe storm development. This means that high lapse rates, rich low level moisture and

the jet stream overlap to the greatest extent in May and June. In the winter, the jet stream is strong but the other ingredients are lacking. Deep into summer, the warmth and moisture are often present at low levels, but the jet stream has typically retreated into the northern United States and Canada by this time. Also, lapse rates tend to decrease in summer due to

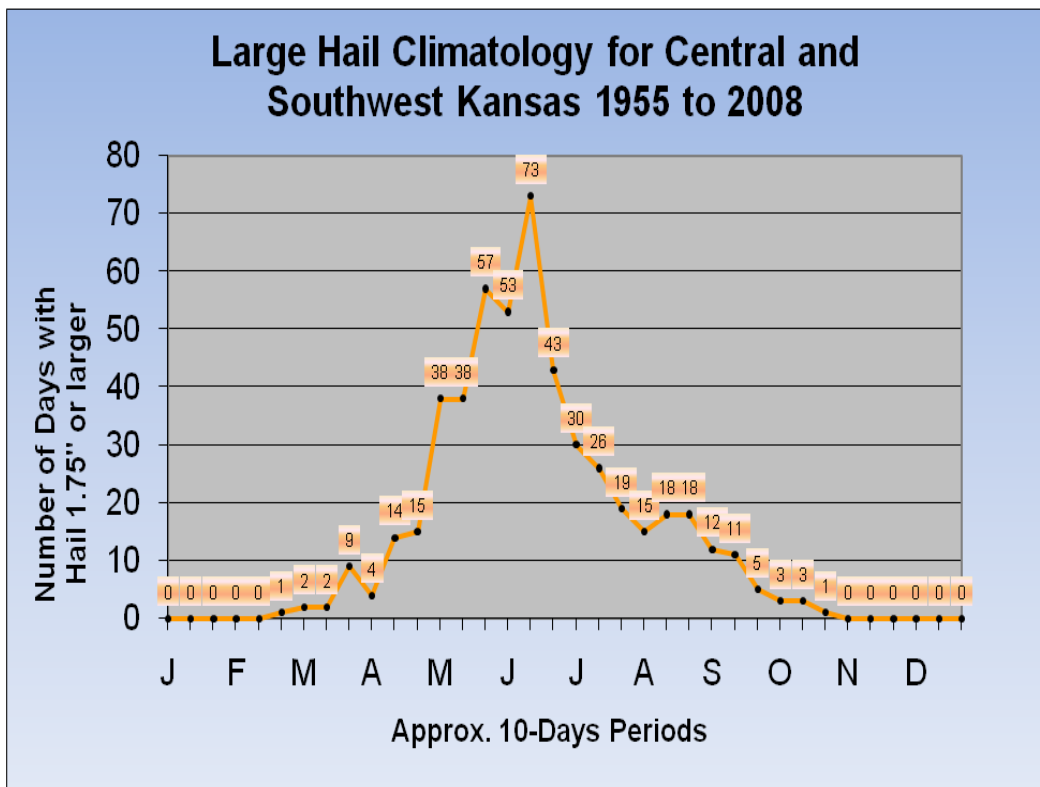


Figure 1: Golfball sized hail frequency by month

moisture away. So why are May and June the most active months for large hail? During these months, the sun is becoming much higher in the sky so that the air near the ground becomes much warmer. However, the air in the upper troposphere (where airplanes fly) is still fairly cold since this part of the troposphere warms up last (there is a lag time). As a result, there is a sharp differ-

the delayed warming of the upper troposphere.

Late June is still fairly active, with 43 days of at least one report of golfball or larger sized hail. Interestingly, there are more days with golfball or larger hailstorms in late June (43) than early May (38) or mid May (38). This is probably because there are more days with isolated

Hailstorm Climatology (cont.)

storms in late June in general. While some ferocious severe weather outbreaks can occur in early and mid May, strong cold fronts can often lead to stable conditions in May for extended periods of time. So outbreaks of severe weather are often intense, but less frequent in early to mid May. However, hail events in mid to late June are generally less isolated than in April or early to mid May, and can occur on several days within a period of a week.

Even in the dog days of summer, severe storms are no stranger to southwest and central Kansas. In July and August, there have been 75 and 51 days respectively with at least one report of golfball or larger sized hail. It may come as a surprise to some that large hail is more common in August (54 days) than in March (13 days) or April (33 days). But compared to June, severe weather is definitely on the decline in July since the high level jet stream becomes very weak.

Next, the number of days (shown in Figure 2) in which there was at least one report of golfball or larger sized hail in Dodge City's 27 county warning area for each year from 1955 to 2009 were counted.

This graph shows clearly that there are many more days after 1991 in which golfball size

or larger hail was reported. This is likely due to National Weather Service modernization which resulted in greater staffing and an increased push to warn for severe storms, and to pursue ground truth severe weather occurrences. In fact, 47% of the large hail days in southwest Kansas have occurred in the 14 years from 1995 to 2008. The other 53% occurred from 1955 to 1994. Also, 72%

ties.

Despite the differences in reporting practices, some years clearly stand out from the others, with some being more active and some less active. For example, 1958 and 1959 were active compared to the years before and after. 1967 and 1968 were active years as well. It would be very interesting to see how these years would compare to recent years using

modern methods and technology. 1960, 1972, 1976 and 1978 were fairly inactive years in terms of very large hail, while 1977 and 1986 were very active. 1988 and 1990 were extremely inactive, especially given the increased reporting during these years. Further

research would probably show that the storm track was north of our area during the spring and summer of 1990, since this was an active severe weather year from northeast Colorado into Nebraska. 2000 and 2005 were less active than adjacent years. Interestingly, the most active year so far was 2008 as there were 25 days with at least one report of golfball or larger sized hail!

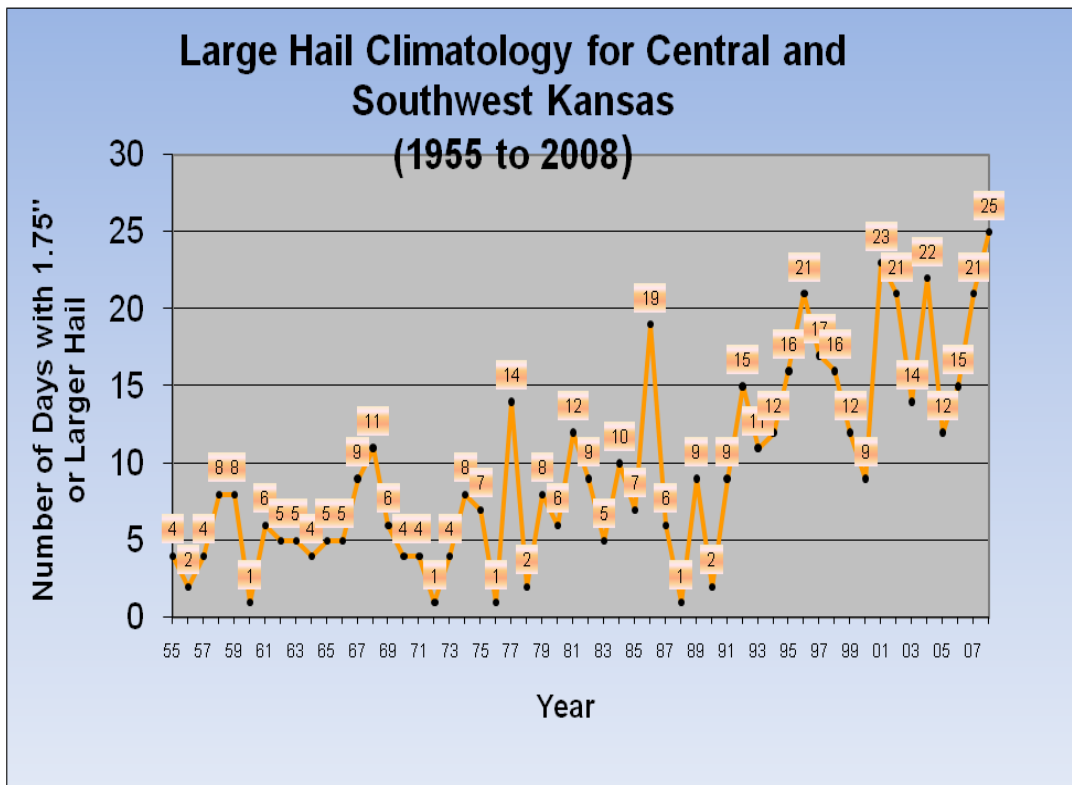


Figure 2: Golfball sized hail frequency by year

of the large hail days occurred in the 27 year period from 1981 to 2008, but only 28% in the 26 year period from 1955 to 1980. Some improvement in hail documentation occurred in the mid 1970s, but it is unclear as to the exact reason. Possible reasons for the apparent further increase in large hail reports since the late 1990s include a large increase in the number of storm enthusiasts, the increased use of rural phone directories by the National Weather Service during warning verification, and heightened severe weather awareness by the local communi-

Meet The Forecaster—Marc Russell

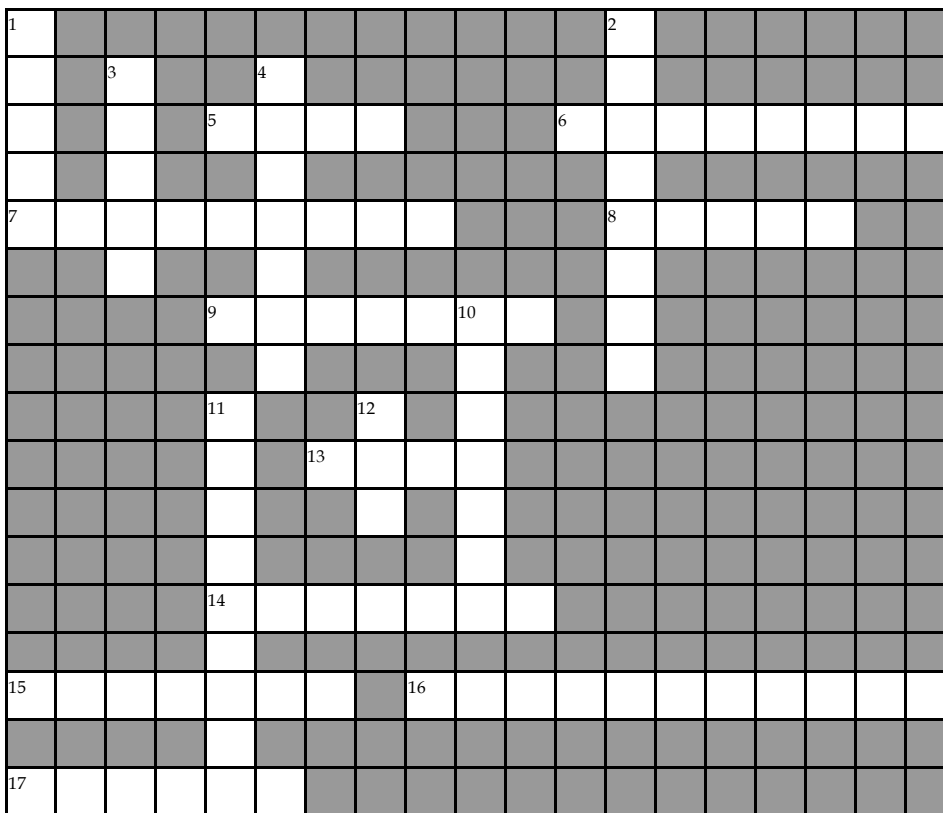
One of the newer forecasters at the Dodge City National Weather Service office is Marc Russell. Marc graduated with a degree in meteorology from Iowa State University in 1999. After graduation, he got a job at the National Weather Service office in Williston, North Dakota, where he worked from 2000 to 2002.

From the wilds of northwestern North Dakota, Marc moved to the office in Des

Moines, Iowa in 2002. He stayed active in office outreach, participating in public information booths, safety fairs, and giving spotting training presentations. Weather in Iowa was memorable during Marc's tenure from 2002 to 2008. Catastrophic floods affected northern Iowa during the spring and summer of 2008. Marc had an extremely busy day at work on May 25, 2008, when a tornado hit the town of Parkersburg. Later storm surveys revealed the tornado to be an EF5, the first

since Greensburg was hit in 2007.

Marc arrived at the Dodge City office in September of 2008. While here, he hopes to find better ways to detect severe thunderstorms and tornadoes in western and central Kansas. We hope that Marc enjoys his new position in Dodge City and is settling in to his new home in southwestern Kansas.



ACROSS

5. Suspension of dust or particles in the air.
6. Temperature that the air needs to cool to for saturation.
7. Electrifying.
8. Change in wind speed and/or direction with height.
9. A rapidly rotating column of air.
13. Frozen precipitation that comes in the summer.
14. Radar that sees rotation.
15. Rising air.
16. Rotating part of a thunderstorm that could produce a tornado.
17. Damage rating scale for tornadoes.

DOWN

1. The top part of a thunderstorm that spreads out.
2. Weight of the air on a point.
3. Rain that evaporates before hitting the ground.
4. Pretty display when sunshine hits rain.
10. Separation between moist air and dry air that thunderstorms can form along.
11. Air that sinks in a thunderstorm.
12. Can put a lid on thunderstorms.

National Weather Service
Dodge City

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Phone: 620-225-6514
Recorded Forecast 620-227-3311
Fax: 620-227-2288
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"NOAA's National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community."

Severe Weather Criteria

Watch: Conditions are favorable for severe weather. Pay attention to the National Weather Service and the media for possible warnings.

Warnings: Severe Weather is imminent. Take shelter immediately.

Severe Thunderstorm: A thunderstorm in which hail over one inch and winds 58 miles per hour and higher can be expected.

Tornado: A violently rotating column of air in contact with the ground.