

involve rain and high winds. Each usually occurs at certain times of the year in certain locations. They can be forecast, detected, and tracked by the National Weather Service.

Thunderstorms

A thunderstorm is a disturbance in the atmosphere that has some or all of these: lightning, thunder, gusty winds, heavy rain, and hail. A severe thunderstorm can produce hail the size of golf balls, flash floods, and even tornadoes. Here are some key traits of thunderstorms:

- In the southeastern United States, thunderstorms occur most often along the Gulf Coast, especially in Florida.
- Most thunderstorms occur in the spring and summer months during the warmest part of the day. Although it is rare, some thunderstorms occur during winter. Some thunderstorms, for example, in the Central Plains, occur at night.
- A well-developed thunderstorm can cover an area as

You probably recognize these clouds as thunderclouds, or cumulonimbus clouds, which are often seen during a thunderstorm.

large as 8 to 16 square kilometers.

- If the temperature in part of a thundercloud falls below freezing and winds are strong, the raindrops in the storm can develop into hail.
- In a fraction of a second, a typical lightning bolt can discharge as much energy as a medium-sized nuclear reactor can in the same amount of time.
- At any given moment, an estimated 1500 to 2000 thunderstorms are occurring on the earth. These storms can trigger 6000 or more lightning flashes per minute.

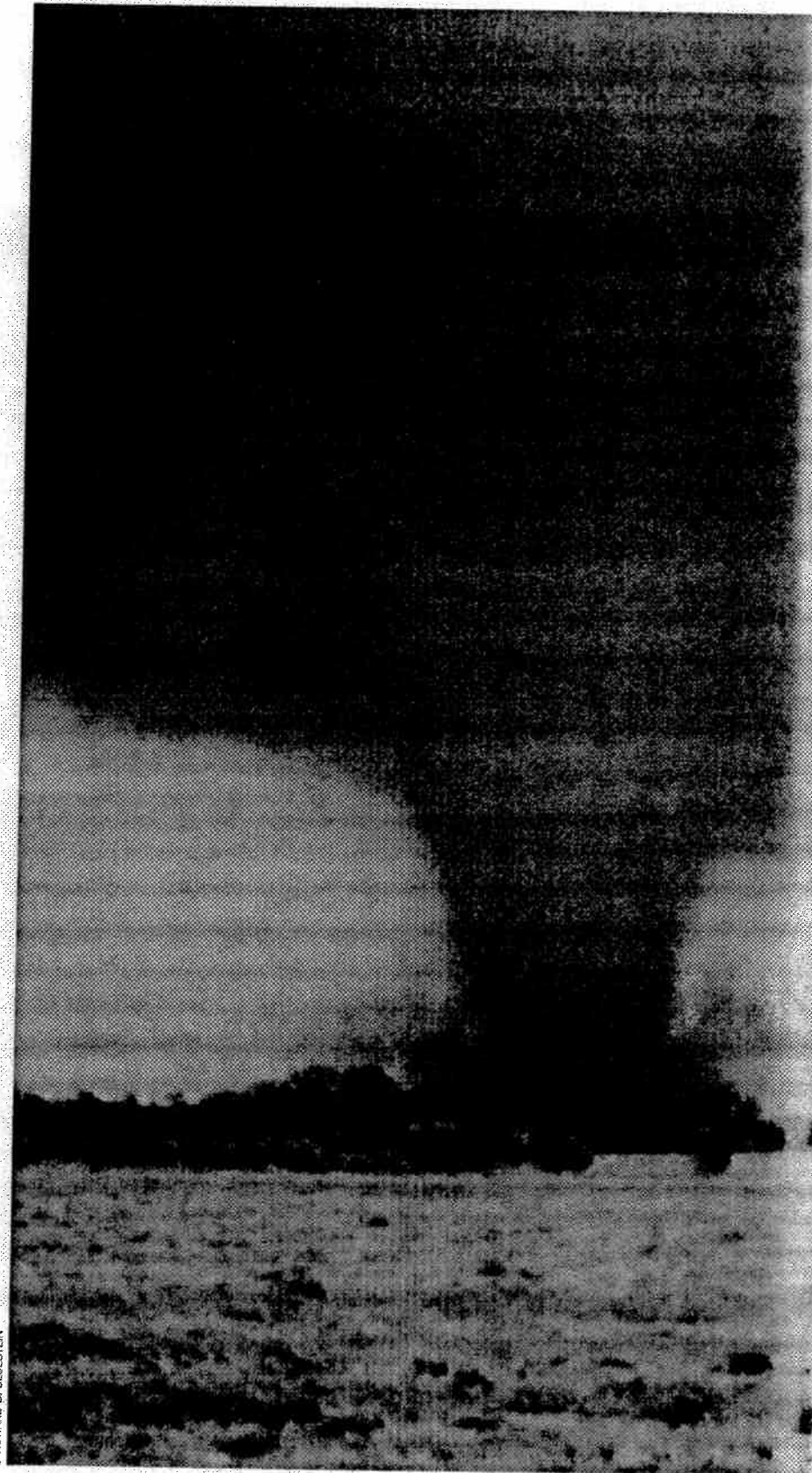
Tornadoes

How do tornadoes form? A tornado is a rotating column of air that forms from thunderstorms over dry land under special conditions: when moist warm air meets cool dry air head on. What's more, hurricanes often bring on tornadoes. Here are some things you might like to know about tornadoes:

- The United States has more tornadoes than any other country in the world. Most tornadoes in North America happen in "Tornado Alley." This area is in the Central

In May 1999, this tornado struck Oklahoma City, Oklahoma.

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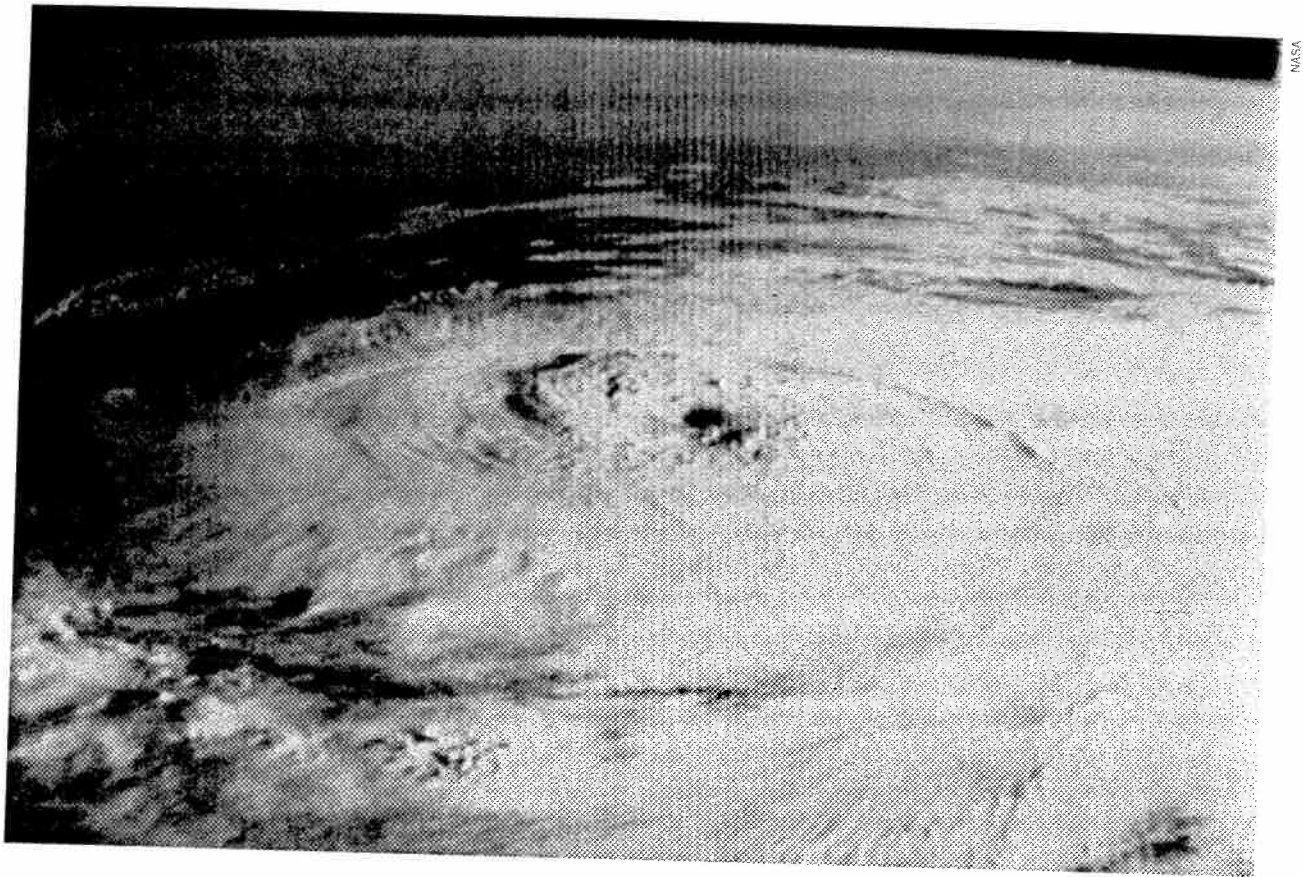


Fujita Scale of Tornadoes

F-Scale Number	Intensity Phrase	Wind Speed	Type of Damage
F0	Gale tornado	65–116 kilometers per hour (kph) (40–72 miles per hour [mph])	Some chimney damage. Tree branches broken and shallow-rooted trees pushed over. Sign damage.
F1	Moderate tornado	117–181 kph (73–112 mph)	Roof surfaces peeled off. Mobile homes overturned or pushed off foundations. Moving automobiles pushed off roads. Trees snapped. Windows broken.
F2	Significant tornado	182–253 kph (113–157 mph)	Considerable damage. Roofs torn off frame houses, and mobile homes demolished. Railroad boxcars pushed over. Large trees uprooted. Light objects become missiles.
F3	Severe tornado	254–332 kph (158–206 mph)	Walls torn from buildings. Cars overturned. Most trees in forests uprooted.
F4	Devastating tornado	333–419 kph (207–260 mph)	Well-constructed houses leveled. Buildings with weak foundations blown some distance. Cars thrown. Large objects become missiles.
F5	Incredible tornado	420–513 kph (261–318 mph)	Automobile-sized structures carried more than 100 meters. Bark stripped from trees. Steel-reinforced concrete buildings badly damaged.

Plains between the Rocky Mountains and the Mississippi River.

- About three-fourths of all tornadoes in the United States develop from March to July, during late afternoon. The month of May normally has the greatest number of tornadoes in the United States (averaging about five per day), while the most violent tornadoes seem to occur in April.
- The diameter of most tornadoes is between 100 and 600 meters, although some are just a few meters wide, and others are wider than 1600 meters (1 mile).
- Some tornadoes stand nearly still, while others move at speeds faster than 100 kilometers (62 miles) per hour.
- A tornado's vortex contains swirling winds that can move up to 350 kilometers (217 miles) per hour.
- Waterspouts are tornadoes that form over water.
- Much of a tornado's destructive power comes from its strong winds, which can lift huge objects and turn them into dangerous, high-speed missiles.
- Japanese-born meteorologist Tetsuya "Ted" Fujita, who was known as "Mr. Tornado," developed the Fujita scale for measuring tornadoes on the basis of the damage they cause (see the table entitled "Fujita Scale of Tornadoes").



Hurricanes

What distinguishes hurricanes from thunderstorms and tornadoes? One big difference is that hurricanes are massive rotating storms. And, they always form when warm, moist air rises over tropical waters. Here are some other things you may want to know about hurricanes:

- People have different names for these rotating storms in different parts of the world. For example, a rotating storm is called a hurricane when it forms north of the equator in the Atlantic and eastern Pacific Oceans. It is called a typhoon when it

forms north of the equator in the western Pacific Ocean. It is called a cyclone when it forms in the Indian Ocean and off the coast of Australia.

- A hurricane is normally 550 kilometers (342 miles) in diameter. It rarely gets bigger when it hits land, because it gets most of its energy from the warm ocean water beneath it.
- Hurricanes can move at speeds of 8 to 24 kilometers (5 to 15 miles) per hour. Sometimes they can become nearly stationary.
- Hurricanes begin as tropical storms, which have wind speeds of 64 to 118 kilometers (40 to 73 miles) per

In late summer 1985, Hurricane Elena affected more than 1 million people when it moved from the Gulf of Mexico to Louisiana, Mississippi, Alabama, and central and northern Florida.

- hour. Hurricanes have wind speeds of 119 to 250 kilometers (74 to 155 miles) per hour or more. (See the table entitled "Saffir/Simpson Hurricane Scale.")
- Because hurricanes can last a week or longer and several can occur at the same time, naming them reduces confusion. (See the table entitled "Selected Names for Northern Hemisphere Hurricanes.") □

Saffir/Simpson Hurricane Scale

Category	Wind Speed	Damage	Type of Damage	Storm Surge*
1	119–153 kph (74–95 mph)	Minimal	No significant damage to buildings. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some coastal flooding and minor pier damage.	1–2 meters (m) (4–5 feet [ft])
2	154–178 kph (96–110 mph)	Moderate	Some damage to roofing, doors, and windows. Considerable damage to vegetation and mobile homes. Flooding damage to piers and small craft.	2–2.5 m (6–8 ft)
3	179–210 kph (111–130 mph)	Extensive	Some structural damage to small residences and utility buildings. Mobile homes destroyed. Flooding near coast destroys small structures; floating debris damages larger structures. Inland flooding possible.	2.7–3.7 m (9–12 ft)
4	211–250 kph (131–155 mph)	Extreme	Complete roof structure failure on small homes. Major erosion of beaches. Inland flooding possible.	4–5.5 m (13–18 ft)
5	250+ kph (155+ mph)	Catastrophic	Complete roof failure on many homes and industrial buildings. Some buildings completely destroyed. Small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near shoreline. Massive evacuation of people possible.	5.5+ m (18+ ft)

*An unusually high water level, primarily due to winds during a storm, especially a hurricane.

**Selected Names for Northern Hemisphere Hurricanes
(Atlantic Ocean, Gulf of Mexico, Caribbean Sea), Year 2002–2005**

2002		2003		2004		2005	
Arthur	Lili	Ana	Larry	Alex	Lisa	Arlene	Lee
Bertha	Marco	Bill	Mindy	Bonnie	Matthew	Bret	Maria
Cesar	Nana	Claudette	Nicholas	Charley	Nicole	Cindy	Nate
Dolly	Omar	Danny	Odette	Danielle	Otto	Dennis	Ophelia
Edouard	Paloma	Erika	Peter	Earl	Paula	Emily	Philippe
Fran	Rene	Fabian	Rose	Frances	Richard	Franklin	Rita
Gustav	Sally	Grace	Sam	Gaston	Shary	Gert	Stan
Hortense	Teddy	Henri	Teresa	Hermine	Tomas	Harvey	Tammy
Isidore	Vicky	Isabel	Victor	Ivan	Virginie	Irene	Vince
Josephine	Wilfred	Juan	Wanda	Jeanne	Walter	Jose	Wilma
Kyle		Kate		Karl		Katrina	

NOTE Names were selected from library sources and agreed on at meetings of the World Meteorological Organization.