

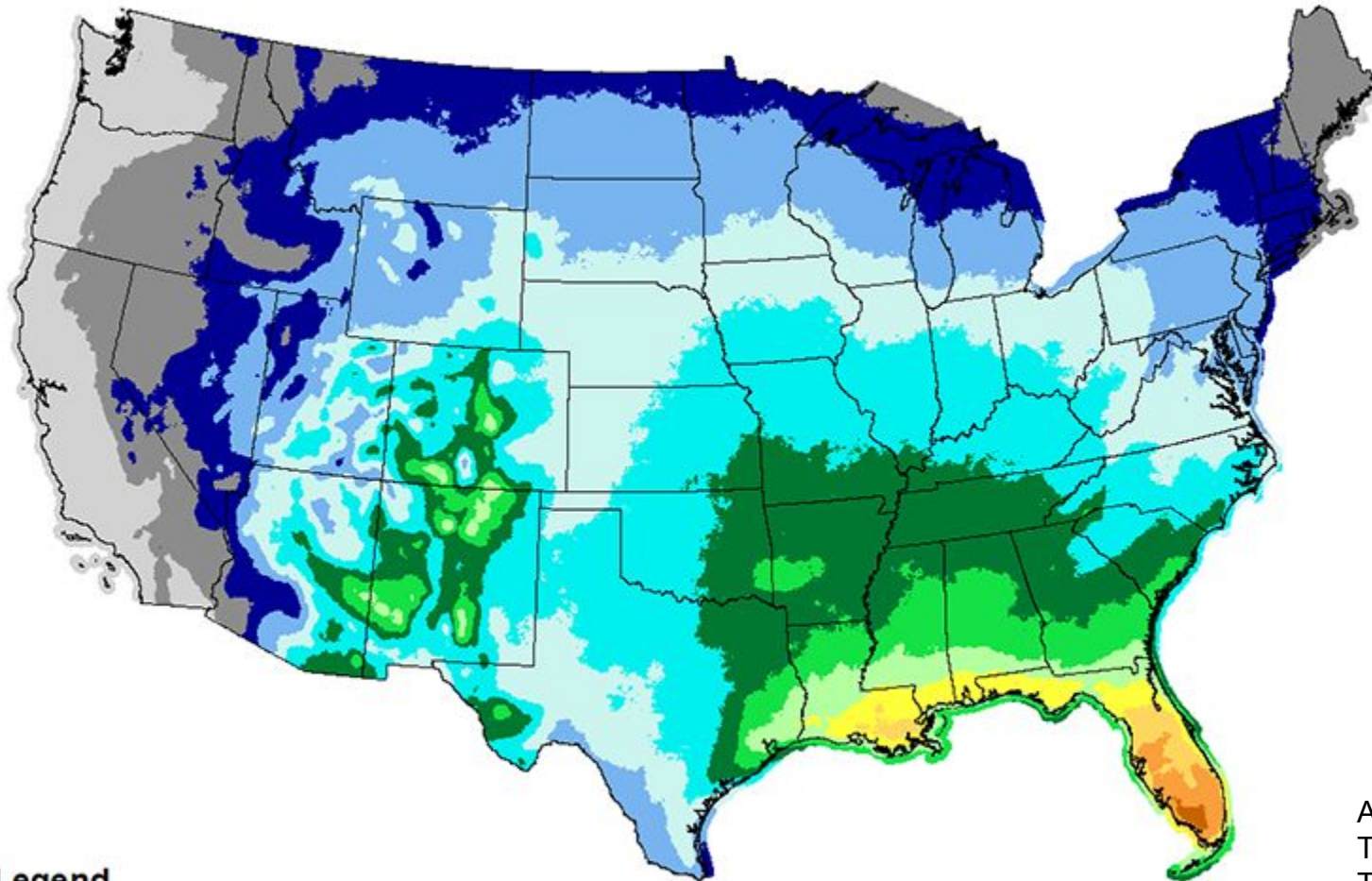
## **What type of products/headlines does the National Weather Service issue related to thunderstorms?**

Ingrid Amberger

Meteorologist

National Weather Service

## Annual Mean Thunderstorm Days (1993-2018)



### Legend



- 28 to 36 thunderstorm days across the Western NY, Finger Lakes, Central NY, Southern Tier, mid-Hudson Valley and New York City regions.
- 18 to 27 thunderstorm days across the North Country, Capital District, Mohawk Valley, and Long Island regions.

Annual number of thunderstorm days in the U.S. From: Koehler, Thomas L., 2019: Cloud-to-Ground Lightning Flash Density and Thunderstorm Day Distributions over the Contiguous United States Derived from NLDN Measurements: 1993-2018. Under review at Monthly Weather Review. Used by permission.



## SEVERE WEATHER

### HAZARDS



Over 280 fatalities  
occur each year in the  
U.S. from thunderstorm  
related hazards.

[weather.gov/safety](https://weather.gov/safety)

**TORNADO**  
Take shelter  
immediately in a  
sturdy structure



**LARGE HAIL**  
Move indoors away  
from windows



**SEVERE WIND**  
Move indoors away  
from windows



**FLOODING**  
Avoid rising  
creeks and water  
covered roads



**LIGHTNING**  
Move indoors if  
you hear thunder



# What is a severe thunderstorm?

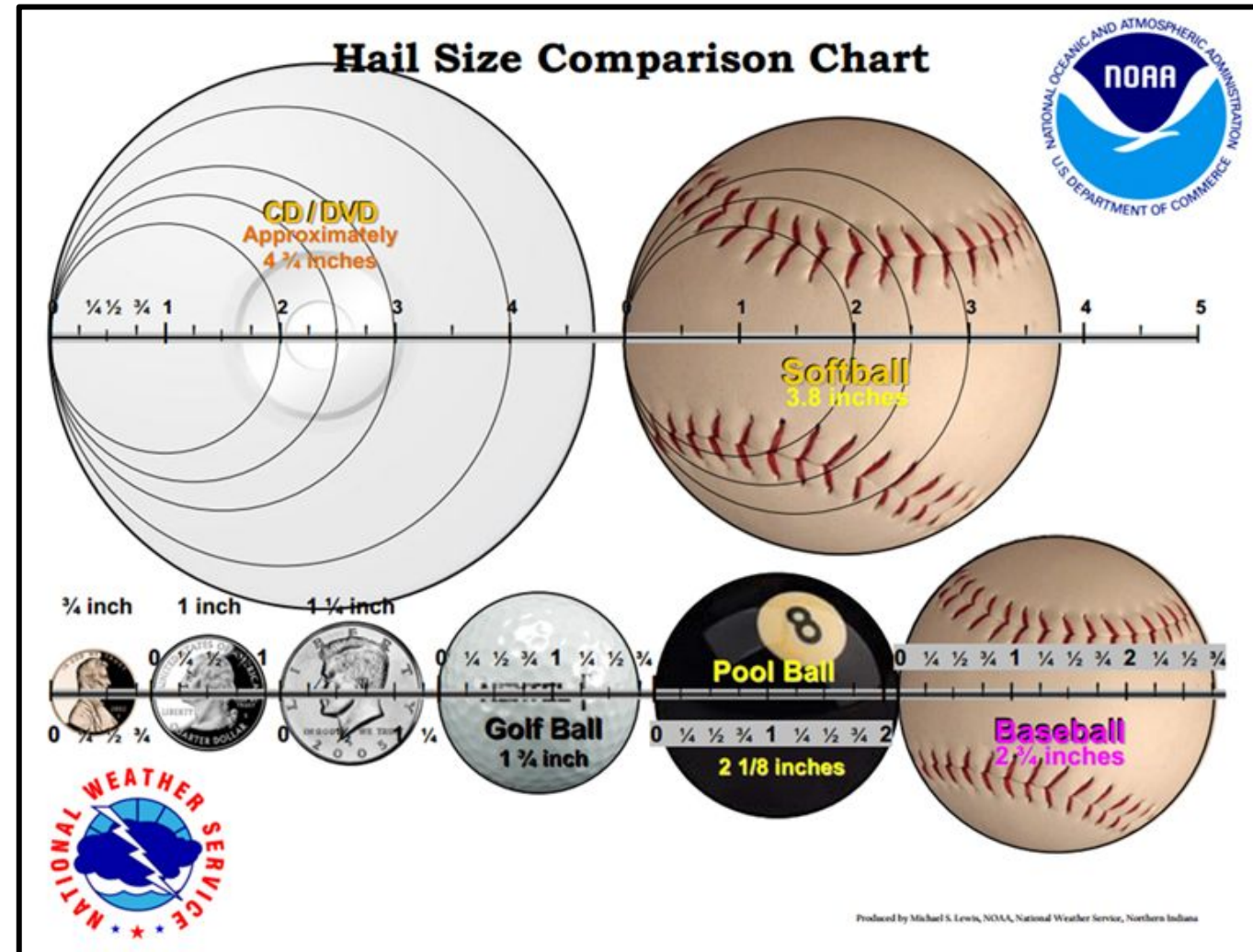


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A thunderstorm that produces one or more of the following:

- Hail 1 inch or greater in diameter
- Winds greater than 58 mph
- Damage to trees, telephone poles, utility poles and/or any structure
- Tornado

Lightning (and the resulting thunder) is what makes a storm a thunderstorm but does not make one severe.





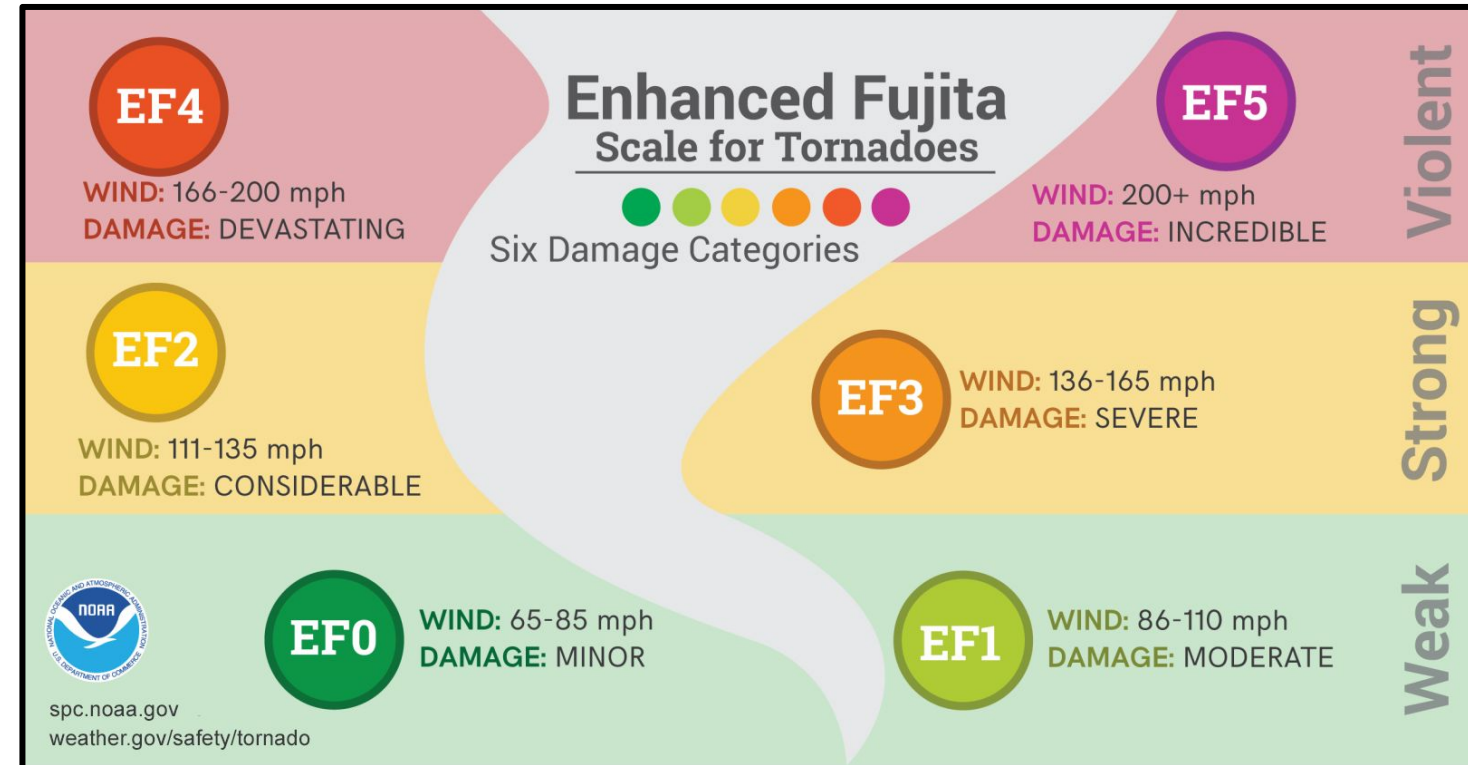
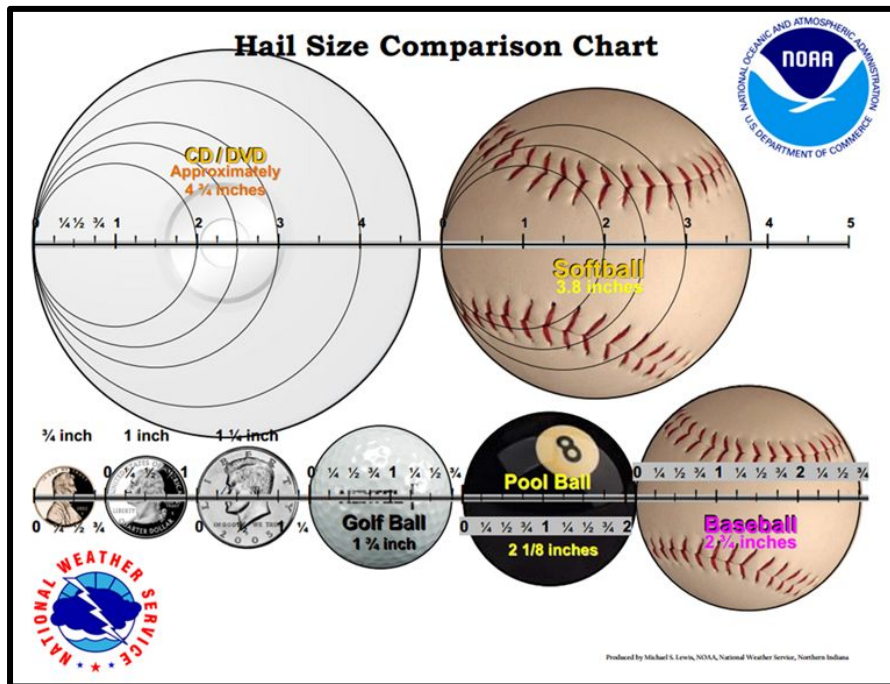
# What is Significant Severe Thunderstorm?





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SIGNIFICANT SEVERE: if any of the following hazards occur:

- Hail 2 inch or greater in diameter
- Winds of at least 75 mph
- Tornado of at least EF-2 rating



## WATCH VS WARNING

-  **WATCH:** We have the ingredients to make tacos.
-  **WARNING:** We're having tacos. **RIGHT NOW!**



**Be Prepared!**

**TACO WATCH**



**Take Action!**

**TACO WARNING**



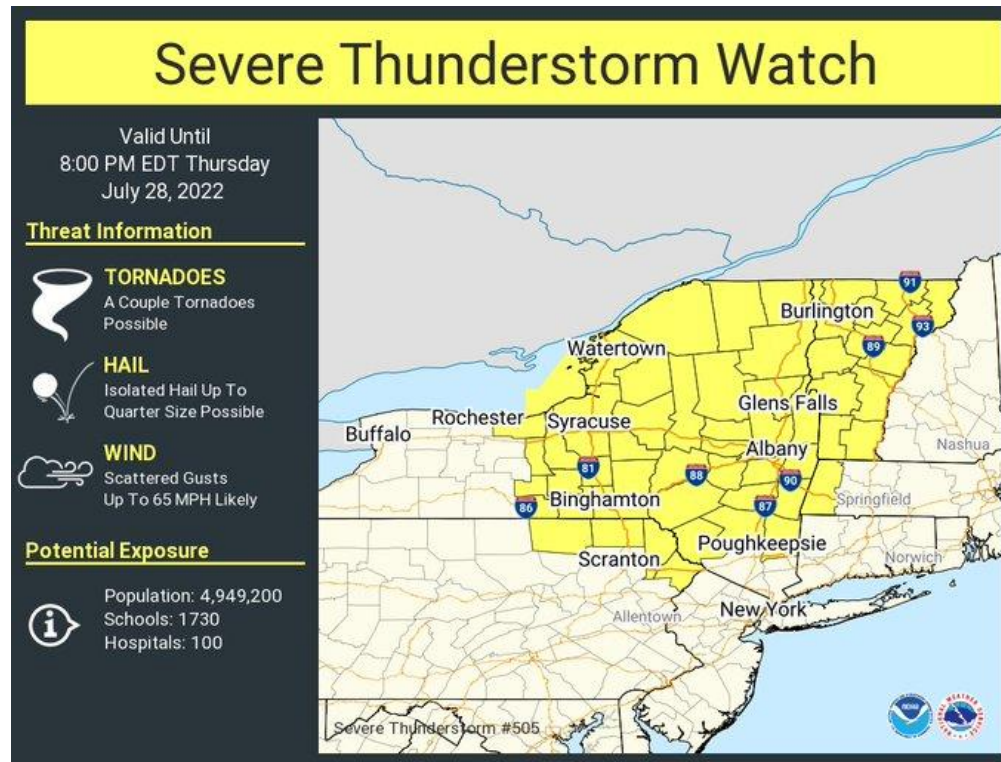
# Severe Thunderstorm Watch



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Severe Thunderstorm **Watch** is issued when severe thunderstorms are **possible**.

The watch is issued for a large area and is usually in effect for several hours.



## Severe Thunderstorm Watch Means **Be Prepared.**

Damaging wind and large hail are possible.

Have a way to receive weather warnings

Check for forecast updates

Have a shelter planned

Stay weather ready



[weather.gov/thunderstorm](https://weather.gov/thunderstorm)

Atmospheric conditions are favorable for the development of thunderstorms which can produce any one or combination of the following:

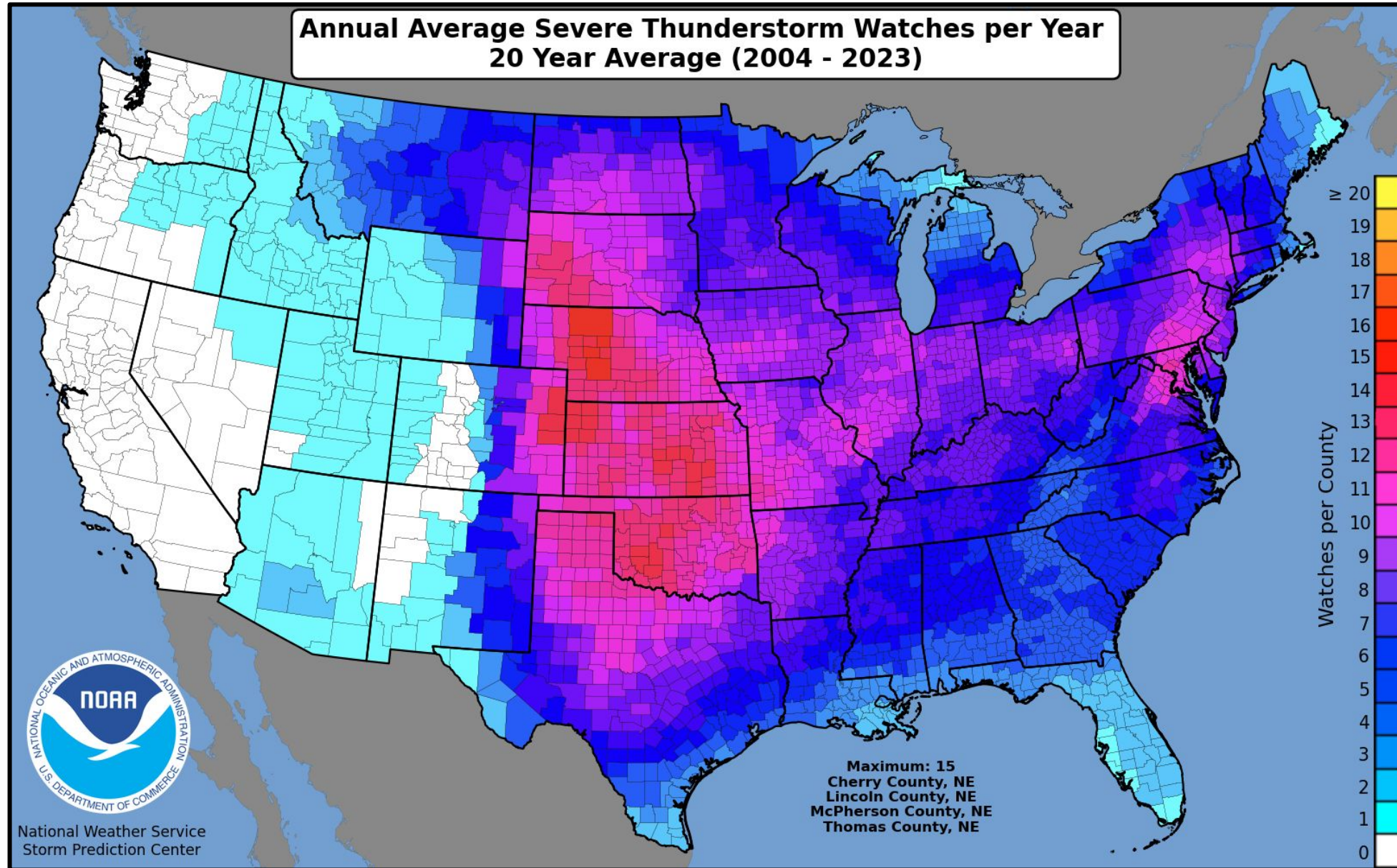
- Hail 1 inch or greater in diameter
- Winds greater than 58 mph
- Damage to trees, telephone poles, utility poles and/or any structure
- Tornado



# Severe Thunderstorm Watch



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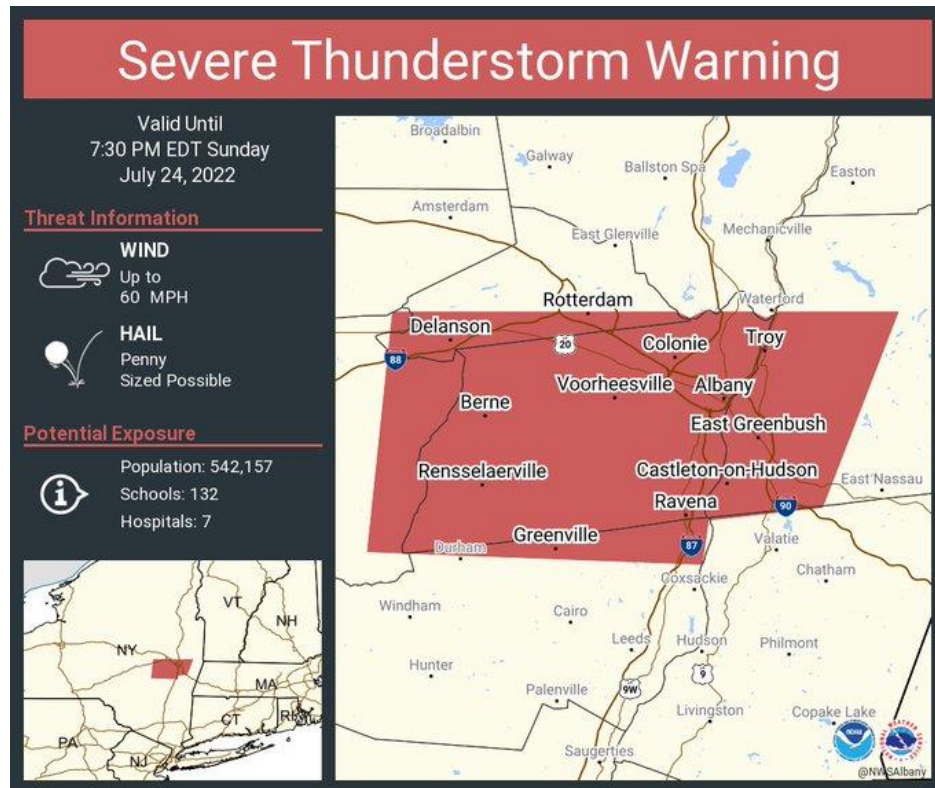
# Severe Thunderstorm Warning



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Severe Thunderstorm **Warning** is issued when severe weather from a thunderstorm is imminent or occurring. **Take Action!**

The warning is issued for a small area and is in effect up to an hour.



**Severe Thunderstorm  
Warning Means  
TAKE ACTION!**

Damaging winds and large hail are expected.

Take shelter indoors  
immediately

Use caution while driving

Check forecast updates

Stay weather ready

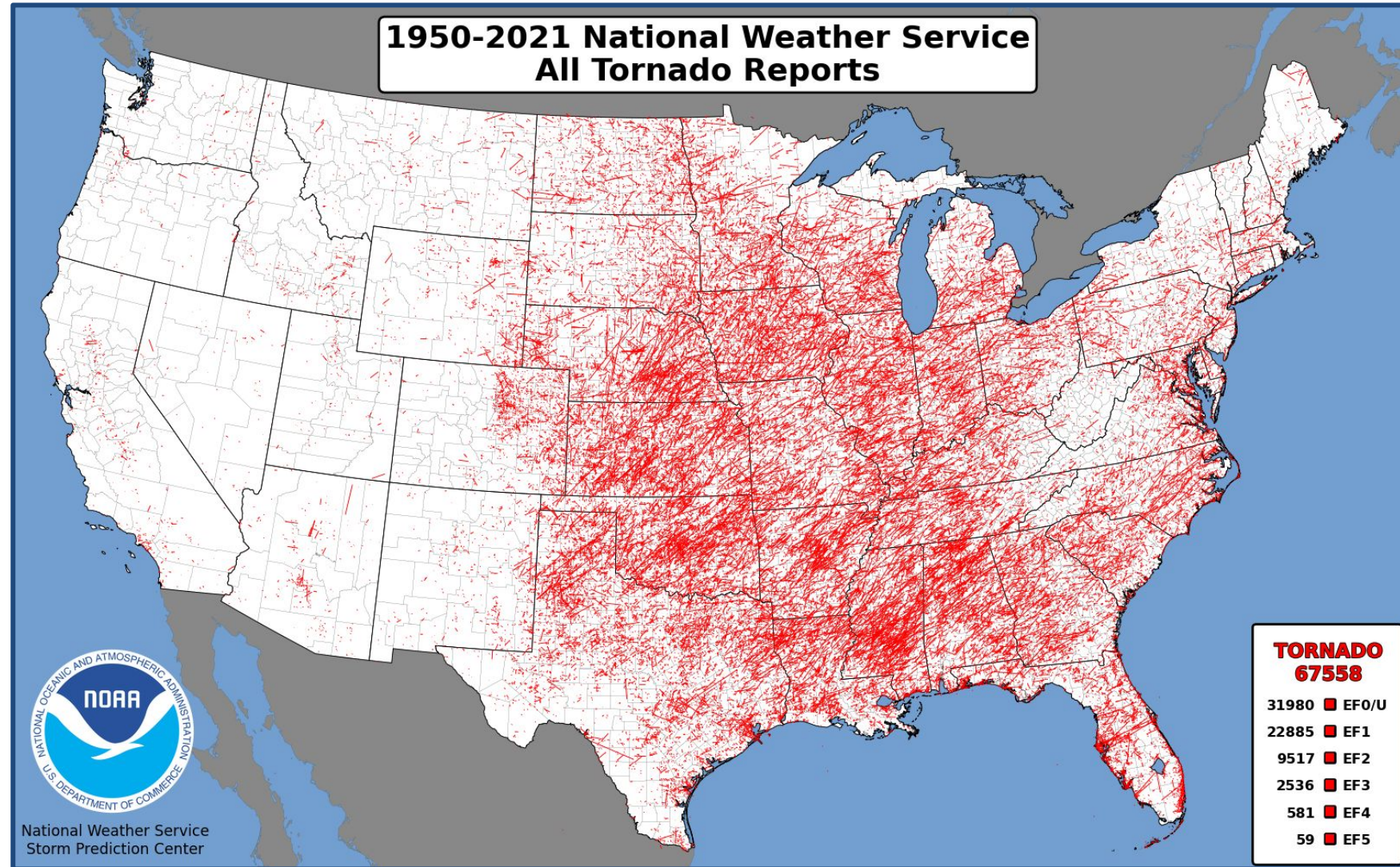
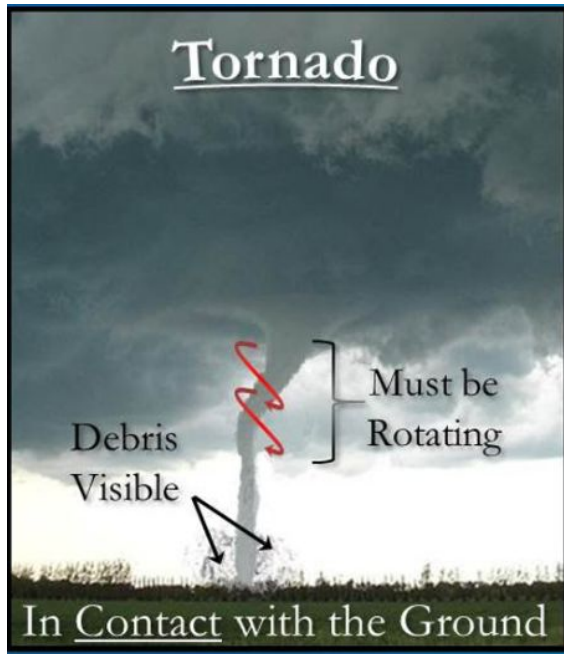
weather.gov/thunderstorm

Warnings can be radar indicated or a spotter reports a thunderstorm producing hail 1 inch or greater in diameter, winds of 58 mph or greater and/or damage due to thunderstorm winds.



## Tornado:

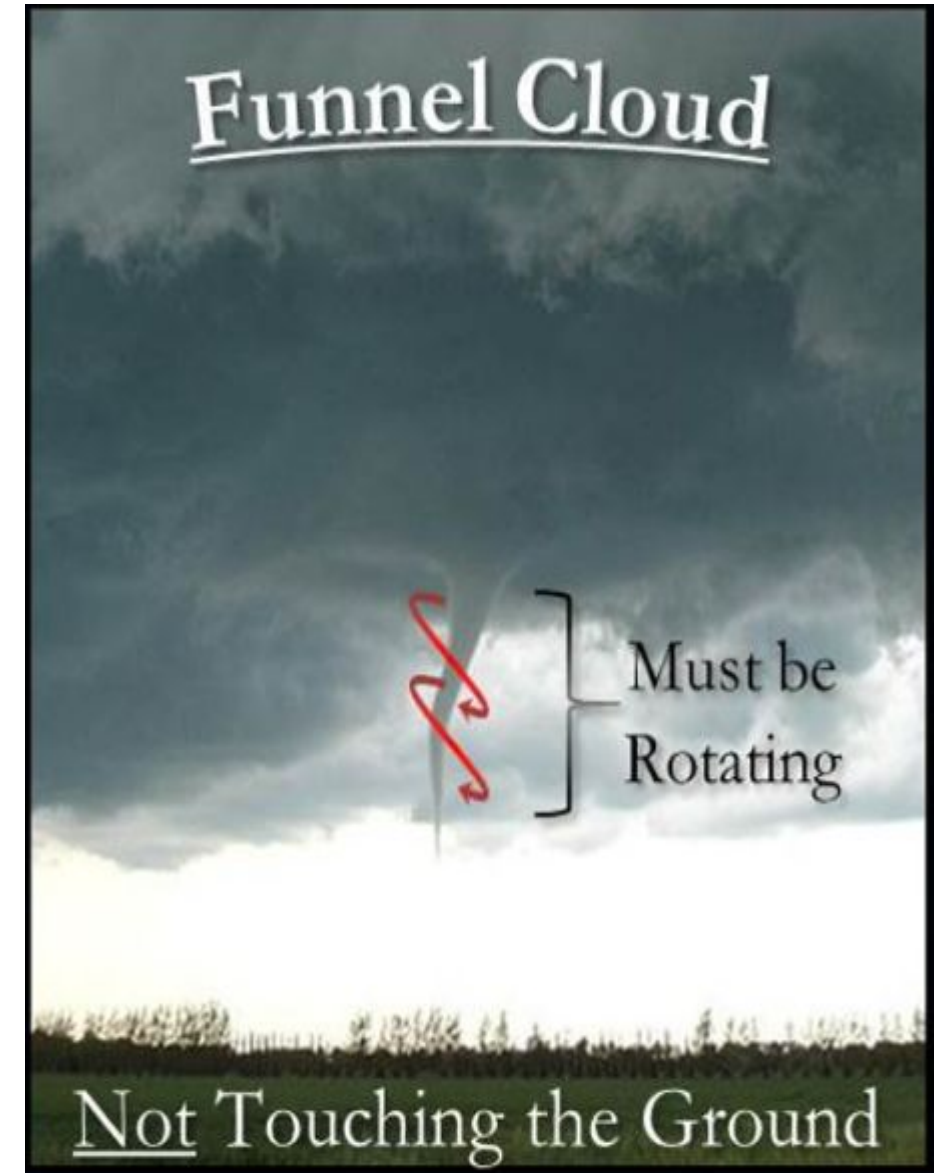
A condensation funnel in contact with the ground, or a debris cloud or dust whirl is visible beneath it.





**Funnel Cloud:** A condensation funnel extending from the base of a cloud associated with a rotating column of air that is not in contact with the ground.

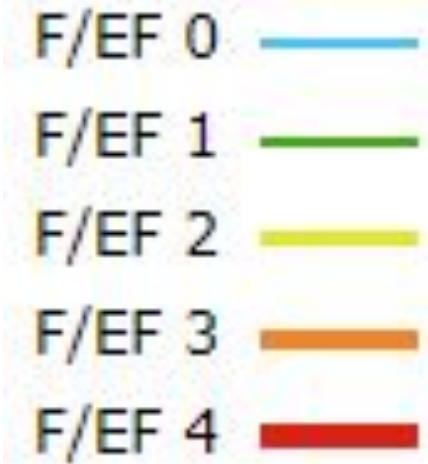
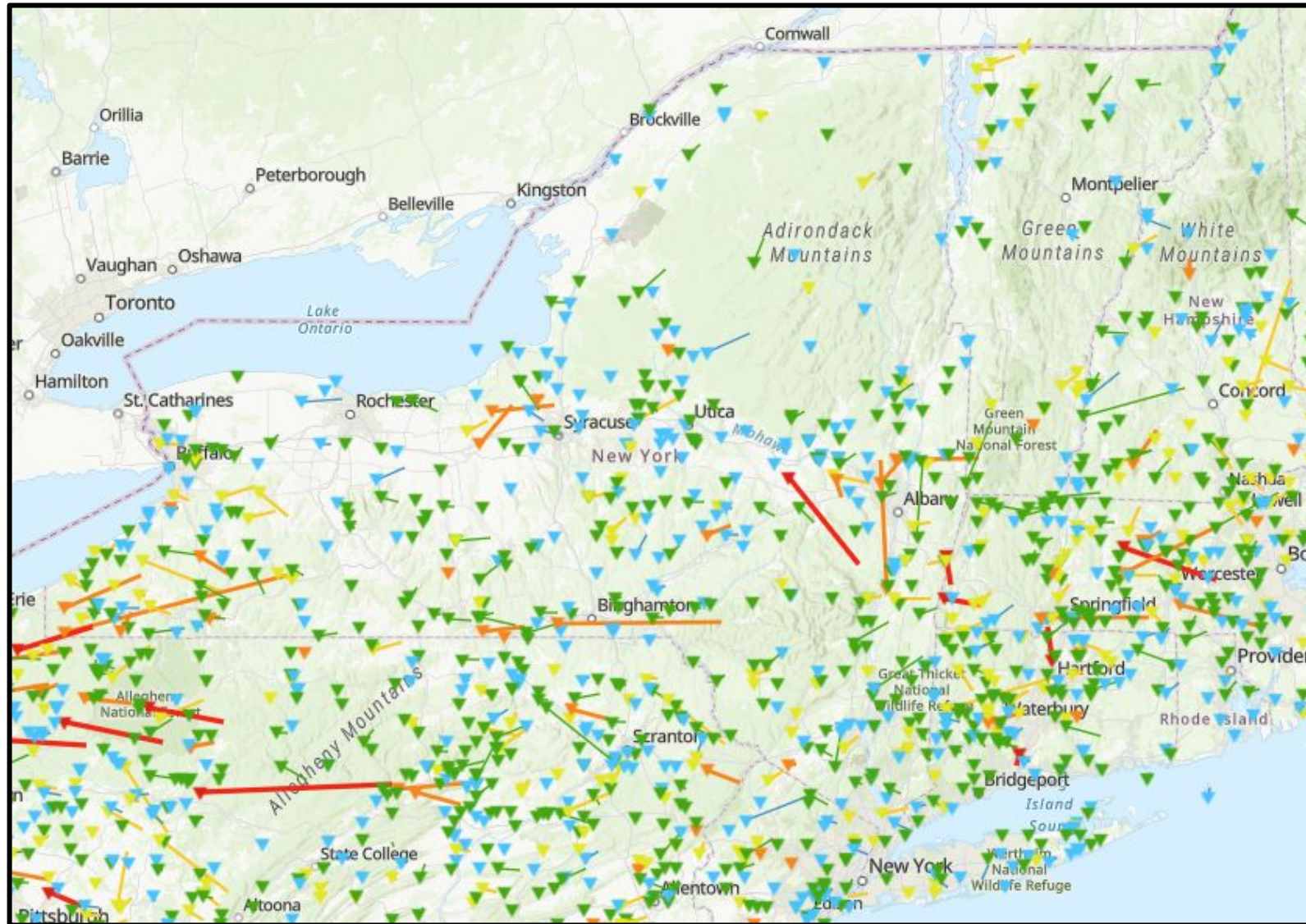
**Cold Air Funnel:** a small, relatively weak tornado that can develop from a small shower or thunderstorm when the air aloft is unusually cold (hence the name). They are much less violent than other types of tornadoes.



# Tornado Touchdowns and Tracks: 1950-2022



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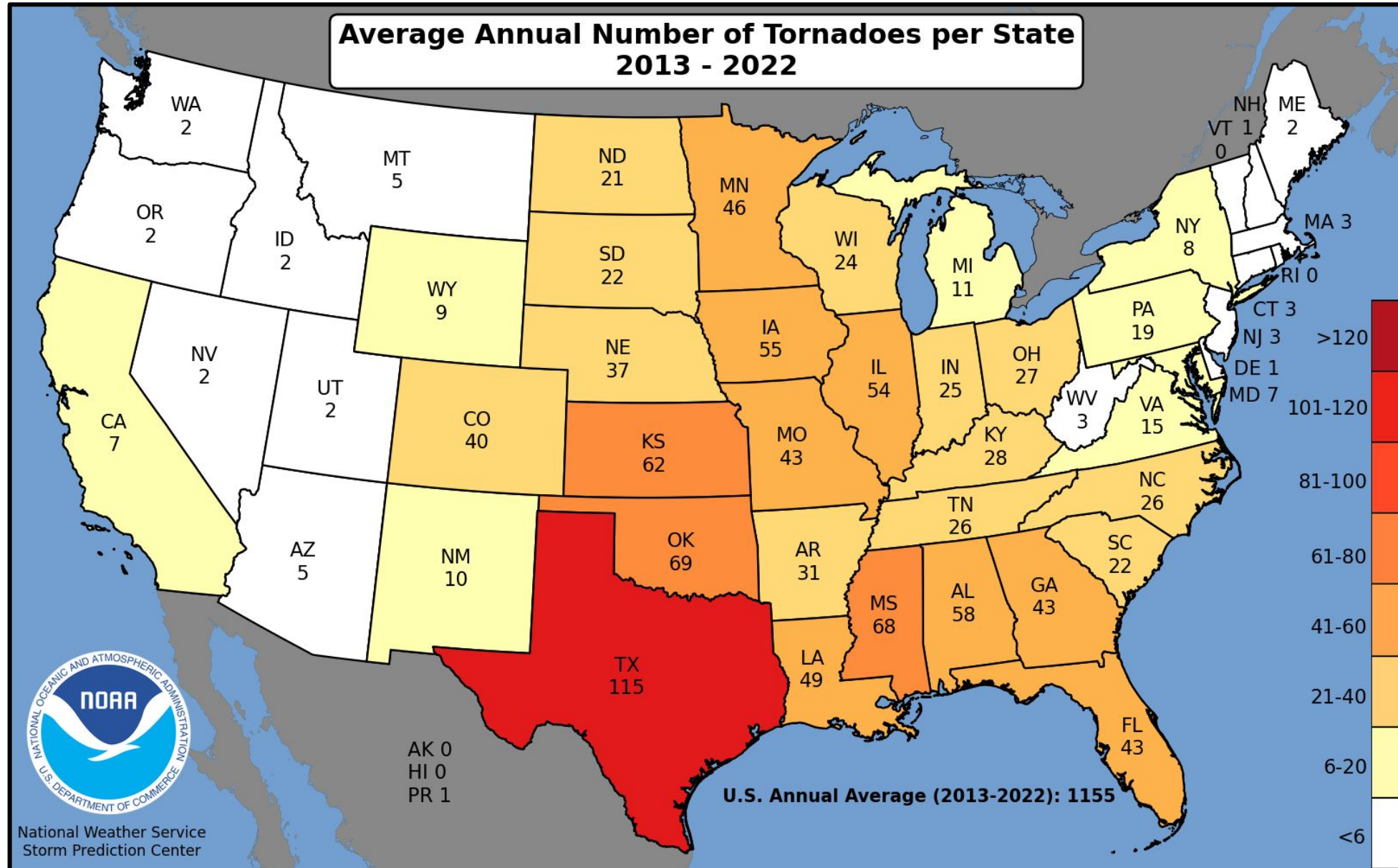
The colored triangles indicate tornadoes that are only a touchdown point



# Tornado



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## TORNADO TERMINOLOGY

### Tornado Watch

Weather conditions could lead to the formation of severe storms and tornadoes. **BE PREPARED:** Know your safe location. Be ready to act quickly if a Warning is issued or you suspect a tornado is approaching.

### Tornado Warning

A tornado has been spotted or indicated by weather radar, meaning a tornado is occurring or expected soon. **TAKE ACTION:** There is imminent danger to life and property. Immediately seek refuge in the safest location possible.

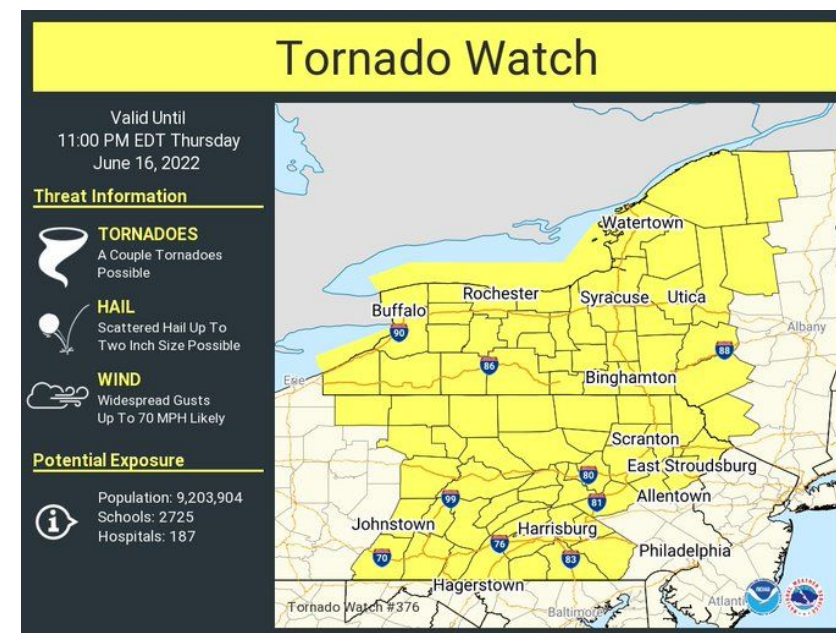
### Tornado Emergency

An exceedingly rare situation with a severe threat to human life and catastrophic damage due to a confirmed violent tornado. **TAKE ACTION:** There is imminent danger to life and property. Immediately seek refuge in the safest location possible.



**Tornado Watch** is issued when conditions are favorable for the development of tornadoes.

The watch is issued for a large area and is usually in effect for several hours.

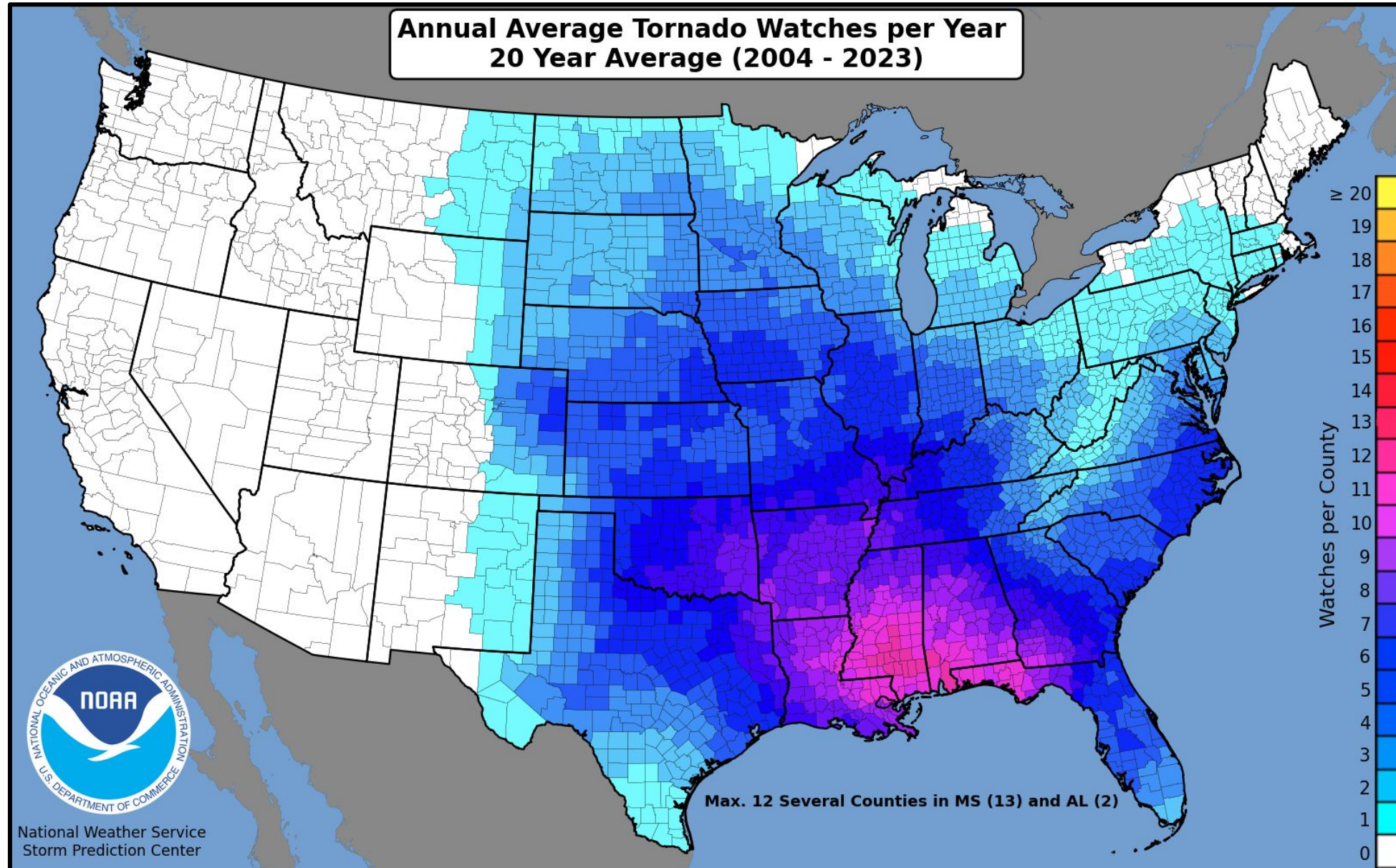




# Tornado Watch



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## TORNADO TERMINOLOGY

### Tornado Watch

Weather conditions could lead to the formation of severe storms and tornadoes. **BE PREPARED:** Know your safe location. Be ready to act quickly if a Warning is issued or you suspect a tornado is approaching.

### Tornado Warning

A tornado has been spotted or indicated by weather radar, meaning a tornado is occurring or expected soon. **TAKE ACTION:** There is imminent danger to life and property. Immediately seek refuge in the safest location possible.

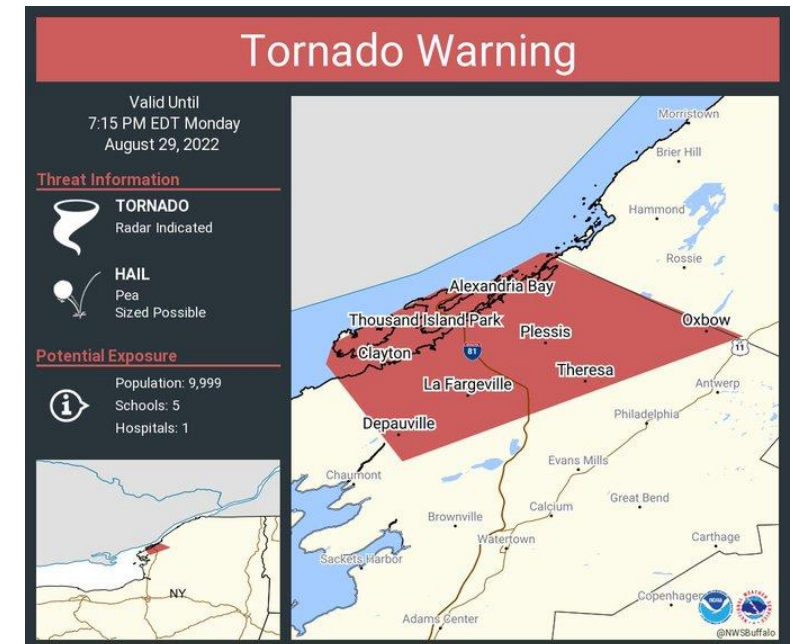
### Tornado Emergency

An exceedingly rare situation with a severe threat to human life and catastrophic damage due to a confirmed violent tornado. **TAKE ACTION:** There is imminent danger to life and property. Immediately seek refuge in the safest location possible.



**Tornado Warning** is issued when a tornado is indicated by the radar or sighted. They can be issued without a Tornado Watch being already in effect.

The warning is issued for a small area and is in effect for around 30 minutes.





## TORNADO TERMINOLOGY

### Tornado Watch

Weather conditions could lead to the formation of severe storms and tornadoes. **BE PREPARED:** Know your safe location. Be ready to act quickly if a Warning is issued or you suspect a tornado is approaching.

### Tornado Warning

A tornado has been spotted or indicated by weather radar, meaning a tornado is occurring or expected soon. **TAKE ACTION:** There is imminent danger to life and property. Immediately seek refuge in the safest location possible.

### Tornado Emergency

An exceedingly rare situation with a severe threat to human life and catastrophic damage due to a confirmed violent tornado. **TAKE ACTION:** There is imminent danger to life and property. Immediately seek refuge in the safest location possible.

**Tornado Emergency** is reserved for rare situations when:

- Severe threat to human life is imminent or ongoing.
- Catastrophic damage is imminent or ongoing.
- Reliable sources confirm tornado: Visual or Radar imagery strongly suggests the existence of a damaging tornado.



## Flood Advisory:

High water or flooding that creates a significant inconvenience but could become a threat if precautions aren't taken.

**BE AWARE**



## Street/Poor Drainage Flooding

Usually dissipates shortly after heavy rain ends





## Flood Warning:

Issued for any high flow, overflow, or inundation by water that is a threat to life or property. This includes flooding caused by heavy rainfall and ice jams.

**TAKE ACTION!**



# Flash Flood Warning



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## Flash Flood Warning:

A rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek. Requires immediate action to protect life and property!

**TAKE ACTION!**

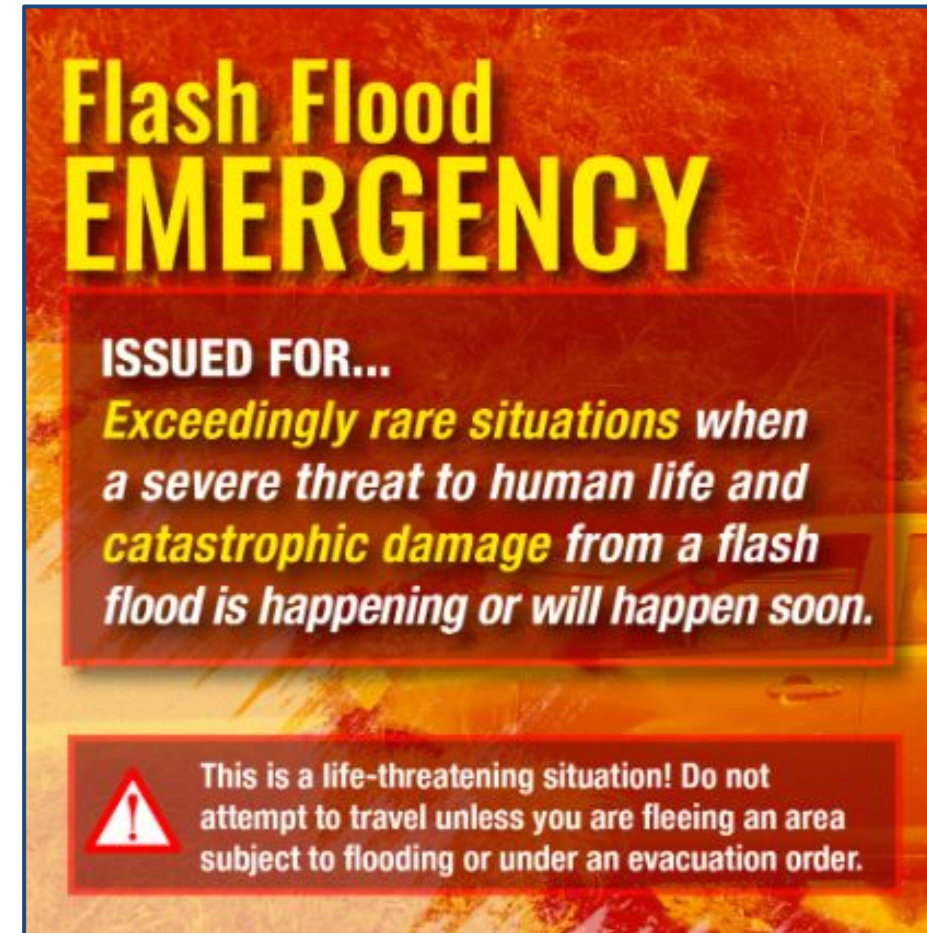




**Flash Flood Emergency:** Will be coordinated with emergency managers before issuing unless communications are down.

Examples of situations which warrant the inclusion of flash flood emergency language in flash flood warnings may include but are not limited to:

- Emergency manager(s) of the affected county(s) or the state emergency management office declare a state of emergency and have confirmed that rapidly rising flood waters are placing or will place people in life-threatening situations.
- The state of emergency for the affected areas may have been previously relayed by the emergency manager(s) or the state emergency management office through the WFO in a Non-Weather Emergency Message.
- Water has rapidly risen or will rapidly rise to levels where people are placed in life – threatening situations. For example, people in homes would experience waters that are several feet above floor level such that rescue is necessary and/or their entire home is threatened.
- Multiple swift water rescue teams have been or are being deployed in response to flash flooding of an exceptional magnitude.
- Stream gauges, where available, indicate flood waters have risen rapidly to at least major levels or if gauges are not available, flood waters have risen to levels rarely if ever seen.
- Total failure of a major high hazard dam that would have a catastrophic impact on downstream communities.



# Wireless Emergency Alerts



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Warning Type	Tag Selection Notes	Wireless Emergency Alert?
Tornado with no tag		Yes
Tornado with Considerable tag	Should only be selected when reports and/or radar signatures give high confidence for the presence of a possibly strong or violent tornado occurring in a supportive environment	Yes
Tornado with Catastrophic tag	Tornado is 100% confirmed AND destructive tornado/catastrophic potential <b>**Use of Tornado Emergency Should Be A Consensus Team Decision**</b>	Yes (Emergency Language)
Severe Thunderstorm with no tag	Wind $\geq$ 58 MPH and/or Hail $\geq$ 1.00" (US quarter)	No
Severe Thunderstorm with Considerable tag	Wind $\geq$ 70 MPH and/or Hail $\geq$ 1.75" (golf ball)	No
Severe Thunderstorm with Destructive tag	Wind $\geq$ 80 MPH and/or Hail $\geq$ 2.75" (baseball)	Yes
Flash Flood with no tag		No
Flash Flood with Considerable tag	Use rarely, when there are indications flash flooding capable of unusual severity or impact is imminent or ongoing and urgent action is needed to protect lives and property.	Yes
Flash Flood with Catastrophic tag	This must be coordinated with emergency management officials before issuing unless communications to those officials are down.  Exceedingly rare, violent flash floods which threaten lives and cause disastrous damage when floodwaters are placing or will place people in life-threatening situations by rapidly rising to levels rarely, if ever, seen.  <b>**Use of Flash Flood Emergency Should Be A Consensus Team Decision**</b>	Yes (Emergency Language)



# Other statements for severe weather



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**Severe Weather Statement:** provides follow-up information on severe weather conditions (severe thunderstorm or tornado) which have occurred or are currently occurring or to cancelled part or all of the warning.

**Special Weather Statement:** provides information about expected or ongoing significant weather that does not meet severe weather criteria.

For thunderstorms:

- Winds of 40 to 57 mph
- Hail less than one inch in diameter
- Frequent to continuous lightning
- Funnel clouds or cold air funnels (definitions next slide)
- Heavy rainfall that is not expected to cause flooding

**Local Storm Reports:** issued to share reports of severe and/or significant weather-related events.

