Severe Weather and RVing

How is a Tennessee Divorce and a Tornado alike?

You can bet someone is going to lose a double wide in both of them!

What You Don’t Want to See In Your Mirrors!

SEVERE WEATHER DEFINITIONS

Severe thunderstorms can be assessed in three different categories. These are "approaching severe", "severe", and "significantly severe".

Approaching severe is defined as hail between ½ to 1 inch (13 to 25 mm) diameter or winds between 50 and 58 M.P.H. (50 knots). In the United States, such storms will usually warrant a Significant Weather Alert.

Severe is defined as hail 1 inch (25 mm) diameter or larger, winds 58 M.P.H. or stronger, or a tornado.

Significant severe is defined as hail 2 inches (51 mm) in diameter or larger, winds 75 M.P.H. (65 knots) or stronger, a tornado of strength EF2 or stronger, the occurrence of flash flood phenomena by heavy precipitation, or extreme temperatures.

Both *severe* and *significant severe* events warrant a severe thunderstorm warning from the United States National Weather Service (excludes flash floods), or the Environment Canada. If a tornado is occurring (a tornado has been seen by spotters) or is imminent (Doppler weather radar has observed strong rotation in a storm, indicating an incipient tornado), the severe thunderstorm warning will be superseded by a *tornado warning* in the United States and Canada.[9]

A severe weather outbreak is typically considered to be when 10 or more tornadoes, some will likely be long tracked and violent, and *many* large hail or damaging wind reports. Severity is also dependent on the size of the geographic area affected, whether it covers hundreds or thousands of square kilometers

Hail

Tennis Ball Size Hail

Soft Ball Size Hail

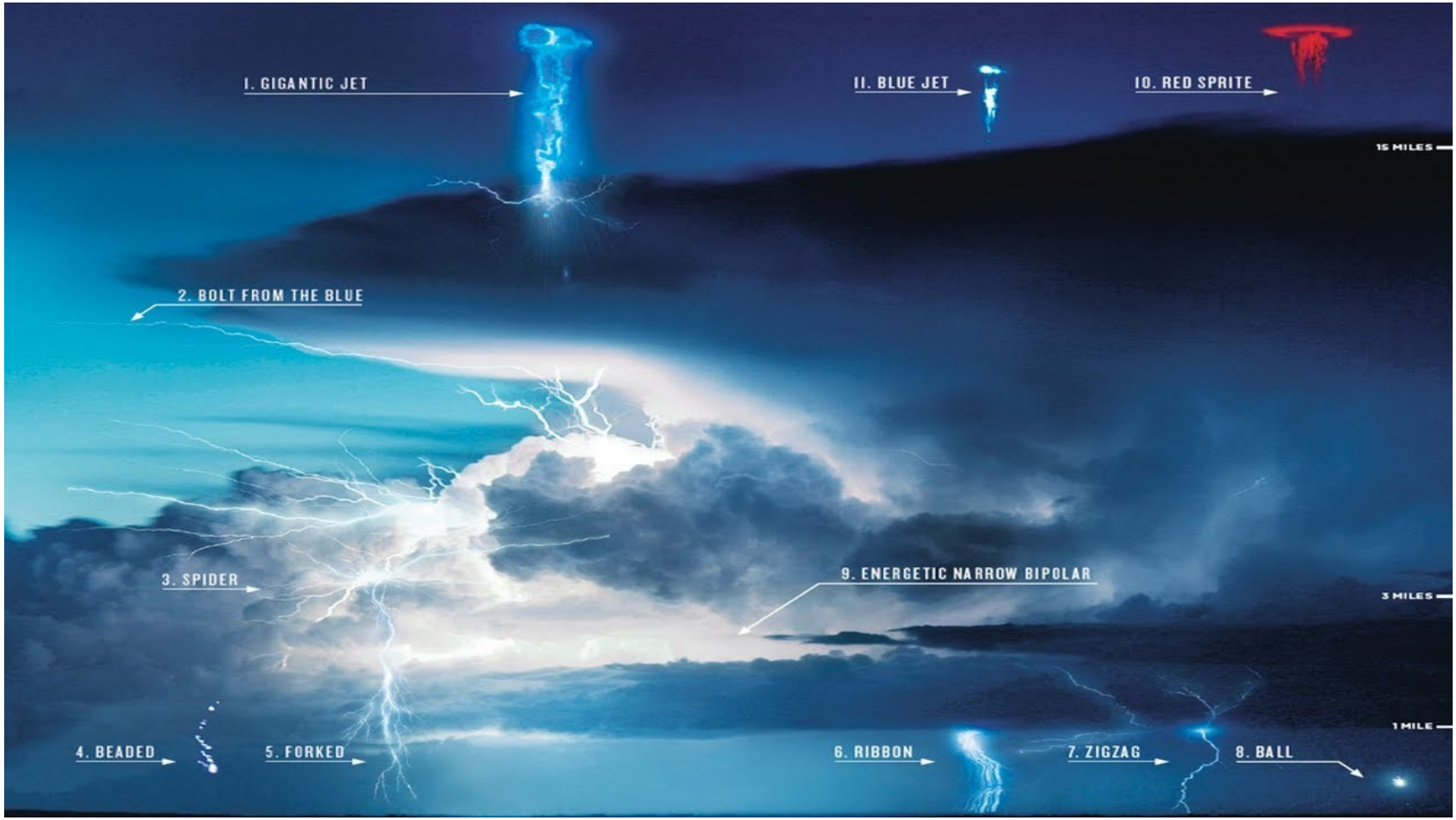
As you can see none of these would be good for our trailers or trucks and when this size, tornadoes are likely.

Quarter Sized Hail Damage

And If You Fly Thru at 500mph!

Lightning

Lightning “Types”



“Sprites”

Sprite from the Space Station with a “Red Jet”

Vehicle Strike

These guys are lucky!

Jet Strike with branch


Delt
By
830

Lightning strikes somewhere on the earth about 100 times per second.

- About 2000 people are killed worldwide by lightning strikes each year. Between 40-50 per year in the U.S. More are injured, some with permanent neurologic injury.
- Most common cause of death is cardiac arrest

Actual Human Strike

Lightning Actually Blew Off A Shoe. Man Survived

LIGHTNING POWER

- Each bolt can contain up to ONE BILLION VOLTS of Electricity
- Strongest ever recorded was SIX BILLION VOLTS
- Enough “power” when you do the math to power 56 homes for a day
- Air around the bolt can heat to FIVE times the temperature of the sun. (56,000 degrees F.)

Statistics

- Lightning can literally be “out of the blue” with strikes documented to occur 5-10 miles from a thunderstorm.
- Bolts travel at about 60,000 miles per second.
- Florida has the most deaths from lightning strikes.
- Bolts can be as narrow from cloud to ground as a finger or trace a zig-zag path as wide as 5 miles.

What Should You Do In Lightning?

- **Get Indoors!!! An open garage, patio, or pavilion is not adequate shelter from a lightning strike.**
- Trailers with Aluminum Structural Frames act as Faraday Cage Much Like a Car. Wood framed RVs not as good a cage although better than outdoors.
- Order of Safety from Strike: Building (enclosed)>Car (hard top)>Trailer≥Truck (because of fiberglass top)>Outdoors
- If you have time unplug shore power from pedestal. Strike even in the vicinity may cause electrical damage .
- **DO NOT** take a shower, touch faucets, sit on toilet during lightning storm. Try not to sit near windows.
- Surge protectors are not going to save you with a near or direct strike!

- Legs up, down, or on wooden supports does not significantly change outcome of direct strike despite the “wives tales”. Wooden supports “may” give some protection from nearby ground strike. Plenty of other pathways via rain water, shore power cord, etc. for energy to travel.
- Rubber tires **DO NOT** insulate the trailer or car. “Remember the bolt has traveled 5 miles to touch you. A few feet more to ground doesn’t matter.”
- Despite Faraday Cage Effect, lightning can still punch a hole in fiberglass trailers or truck tops. Aluminum clad trailers *may* have an advantage. (Remember the plane)
- TV Antennas Down

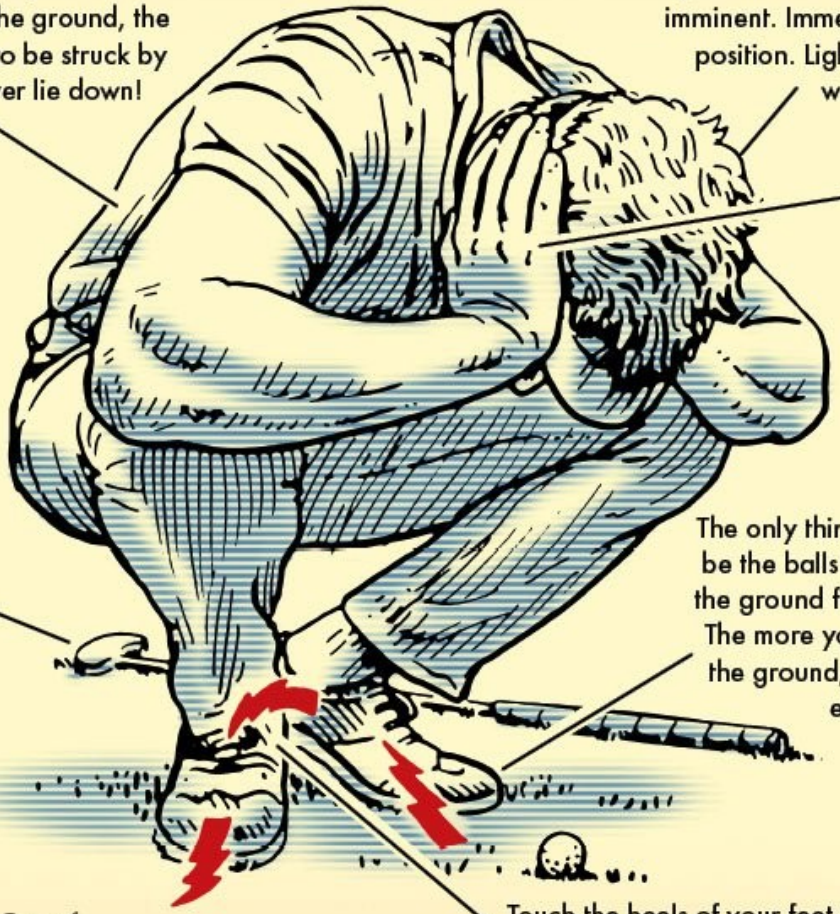
- Abandon tents or “pop-ups” for cars when able.
- If caught in the open crouch and get on balls of feet to minimize ground contact. (If you’re old and can’t hold this position, better pray!).
- Do not seek shelter under a tree or in a grove of trees unless in a forest then get in grove of smallest trees, closest to ground.
- Controversial whether to seek shelter under rock outcroppings or caves. If you do, do not touch top or sides if possible. (Note: May have same risk as outdoors so at least staying dry may be preferable.)

How to Survive a Lightning Strike

Crouch down low like a baseball catcher. Get as low as you can. The nearer you are to the ground, the less likely you are to be struck by lightning. But never lie down!

If your hair begins to stand on end or your skin starts to tingle, a lighting strike is imminent. Immediately get into the crouching position. Lighting may strike without this warning, however.

Place hands over ears to minimize hearing loss from the loud clap of thunder that will boom very close to you.



Don't touch any possible conductors.

The only thing touching the ground should be the balls of your feet. Lightning can hit the ground first, and then enter your body. The more you minimize your contact with the ground, the less chance of electricity entering your body.

Touch the heels of your feet together. If electricity from a ground strike enters through your feet, this increases the chances of the electricity going in one foot and out the other, rather than into the rest of your body.

The Art of MANLINESS

EST. 2008

Long Exposure Photo of Lightning Striking a Tree


© Daily Record

Survivor

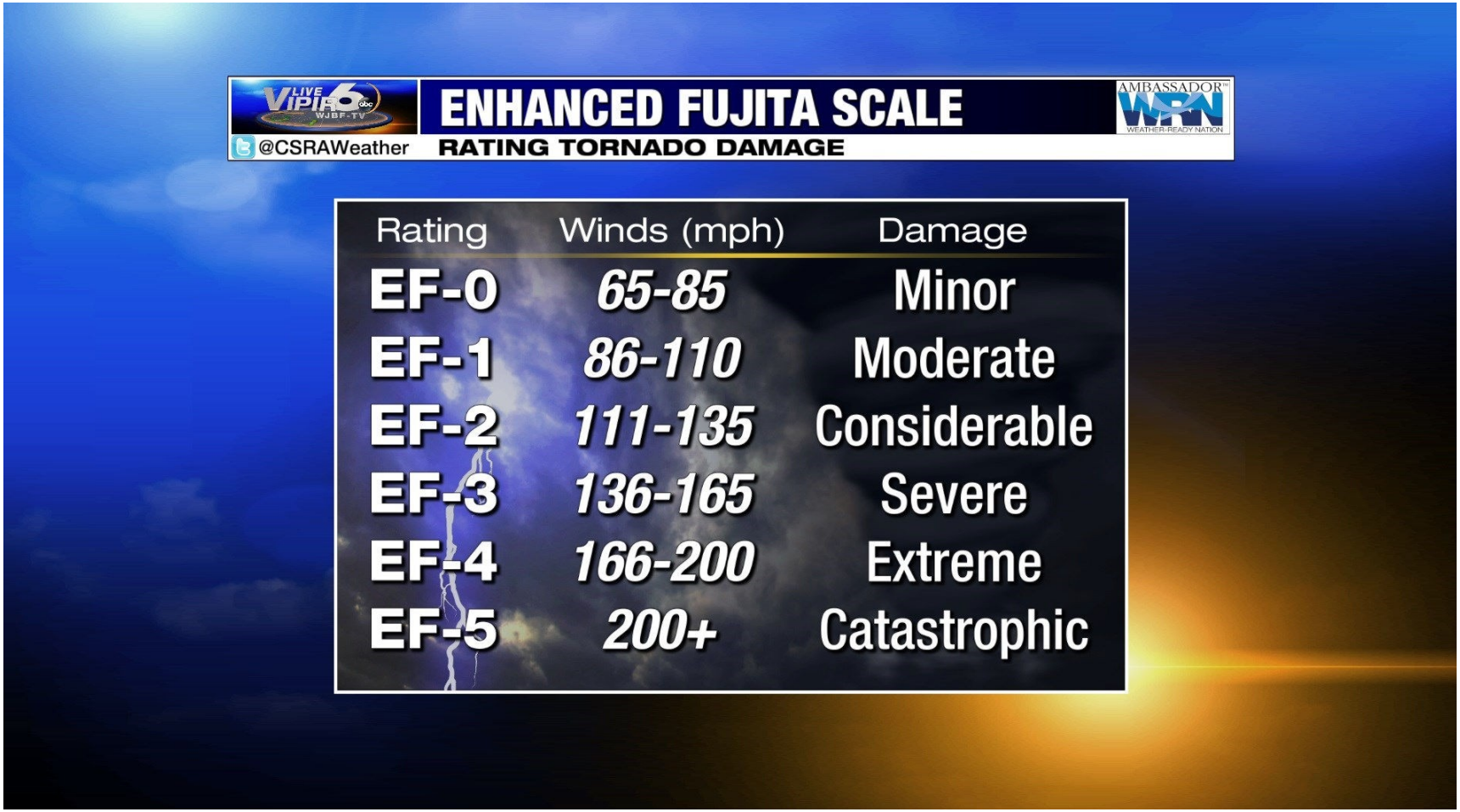
Tornadoes

- The Fujita Scale was introduced in 1971 by Tetsuya Fujita and aptly named the Fujita Scale to help quantify tornado damage.
- It was updated to the Enhanced Fujita Scale in 2007 in the U.S. and Canada in 2013 after more data and better metrics identified.

EF 1 & EF2

EF 3 & EF 4

EF 5 Kansas


LIVE VIPIR 6 WJBF-TV
ENHANCED FUJITA SCALE
AMBASSADOR WRN WEATHER-READY NATION
@CSRAWeather
RATING TORNADO DAMAGE
Rating
Winds (mph)
Damage
EF-0
65-85
Minor
EF-1
86-110
Moderate
EF-2
111-135
Considerable
EF-3
136-165
Severe
EF-4
166-200
Extreme
EF-5
200+
Catastrophic

Examples
Trailers may be damaged or tipped at EF1

- EF0

- EF1

Trailers Tipped or Destroyed

- EF2

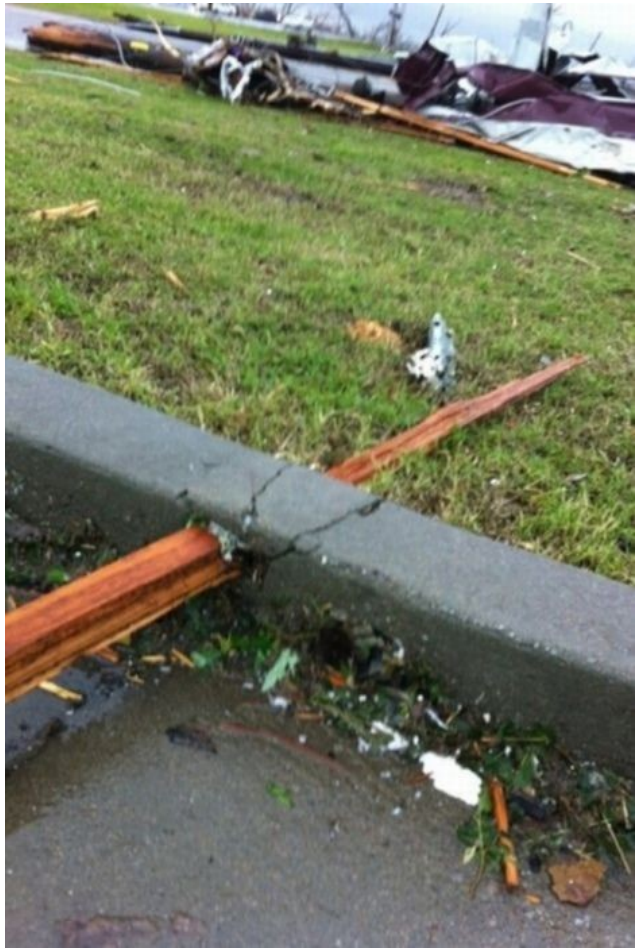
- EF3

Trailers-Trucks Destroyed
(Better have made peace with your maker!)

- EF4

- EF5

Think you are safe?



Teacher With Impaled Desk Leg
Moore, OK

So What to Do?

- **Depends on what's coming. Probably best if forecast of severe storms and/or tornadoes to seek shelter in strong building or underground. Don't be afraid to abandon your trailer, *but do it early, not later!***
- **Good to have a "go" bag always ready!**
- **If on the road, do not park under overpass if threat of high winds or tornadoes. Constriction increases wind speeds and can cause more damage and debris becomes concentrated. Also traffic concentrates.**
- **During the 1999 Moore-Oklahoma City tornado, three overpasses were struck causing more fatalities than the fatalities that occurred in the damage to over 2,000 houses, some being totally destroyed.**
- **The death rate in this tornado was 1 person per 10 mobile homes in storms path (11 deaths) with an added 7 deaths related to trying to escape a mobile home "too late". This statistic has been repeated multiple times since**.

TORNADO DO'S AND DONT'S

- **Don't try to outrun *unless* traffic is light, you can determine direction of the tornado, and you can safely go at right angles. General tornado path is southwest or west to northeast or east, so head south if possible. Hail core usually north (precedes) storm.**
- **If trapped in your vehicle, belt in, take the "crash" position.**
- **If you can get to a depression that is significantly lower than the roadway such as a ditch, abandon vehicle, lay flat away from your vehicle, and cover (National Weather Service Recommendation -controversial). Again an overpass or bridge is not recommended.**

- **More recent anecdotal data by association of weather observers states that vehicle may be preferable over ditch.**
- **Reasoning based on actual observed effects by vehicles of storm chasers caught in tornadic winds.**
- **Also this group feels debris, flooding, power lines, snakes present significant hazard in “ditching in a ditch”.**
- **Texas Tech wind tunnel data shows wind speeds near the ground slow tremendously based on terrain. (Buildings, trees, etc. better frictional slowing of winds vs. open field)**
- **BUT more debris with buildings, trees, etc.**
- **So comes to split decision, and assessment at time of event. Also the recommendation to stay with the vehicle is based on cars and minivan studies, NOT semis which are more prone to tipping at lower wind speeds.**
- **Most studies agree to abandon mobile home in favor of car, van, or minivan IF AND ONLY IF NO OTHER CHOICE! (Based on tipping and rolling values to be discussed).**

“GO” Bag Contents

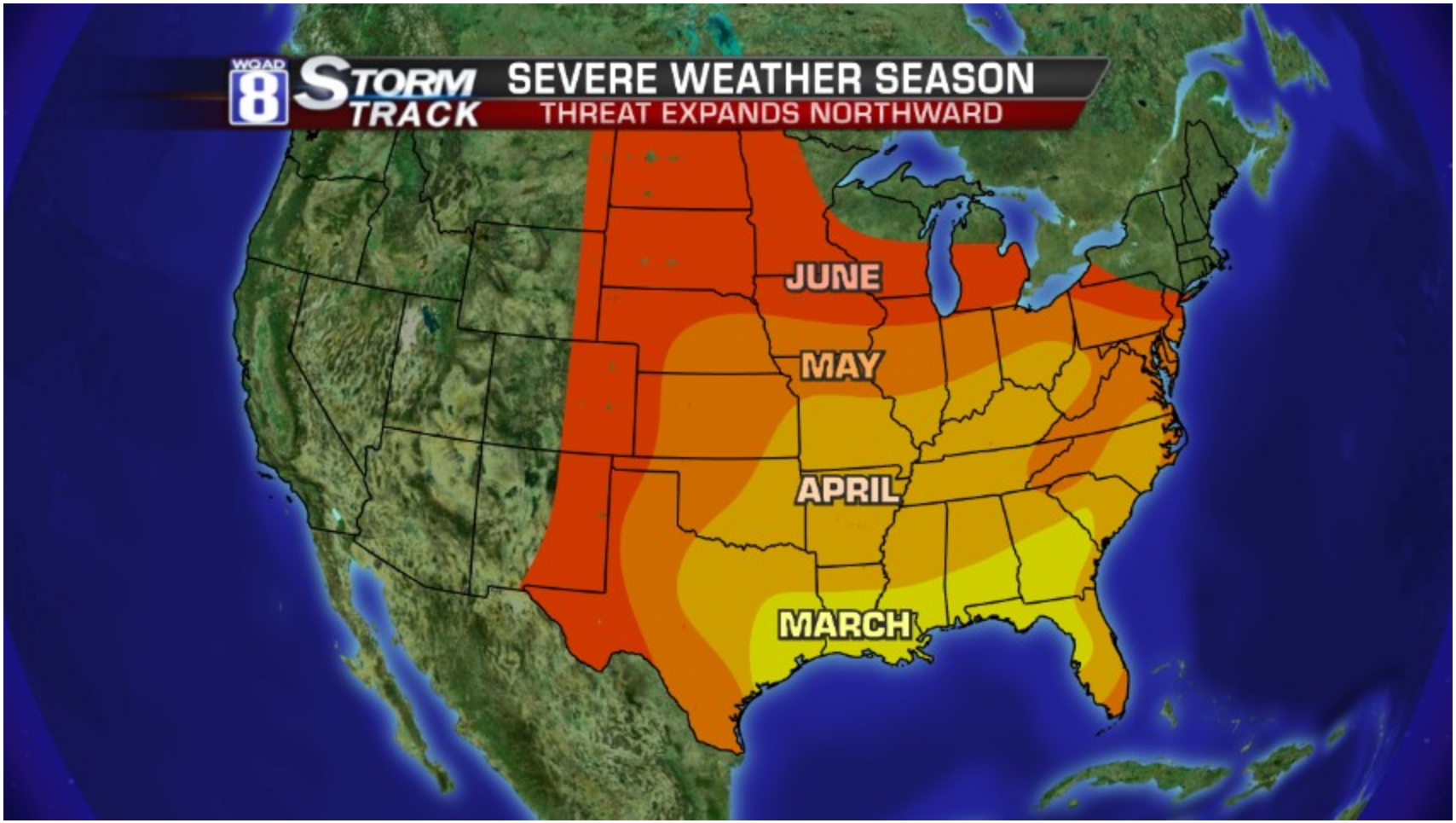
- **Medications**
- **Money**
- **Important Documents**
- **Flashlight and NOAA Radio with batteries**
- **Snack Bars, bottle water**
- **Whistle (to signal for help if trapped)**
- **Small First Aid Kit**
- **Multi-tool with knife**
- **Pencil and pad**
- **Dust Masks**
- **Light Change of Clothes (Jeans, T-shirt, underwear, socks)**
- **Cell Phone with charging cord and portable power supply**
- **Anything else you would like. Just make sure it will fit in small gym bag or backpack.**


LARGE

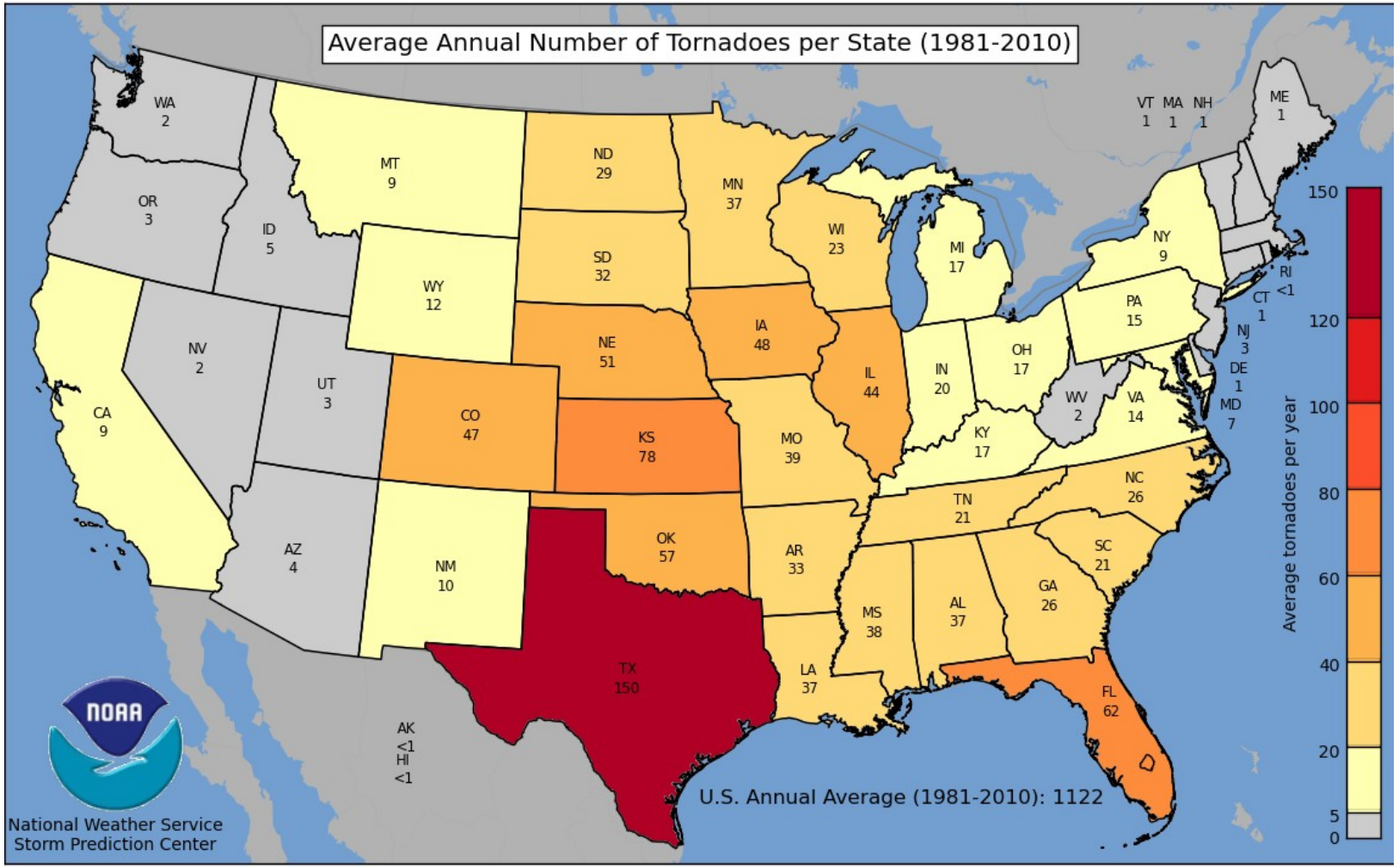

7 CH

FEMA has online plans for above ground tornado shelters that have withstood EF5 winds. Just google. Might be of value if you have permanent pad with “casita”.

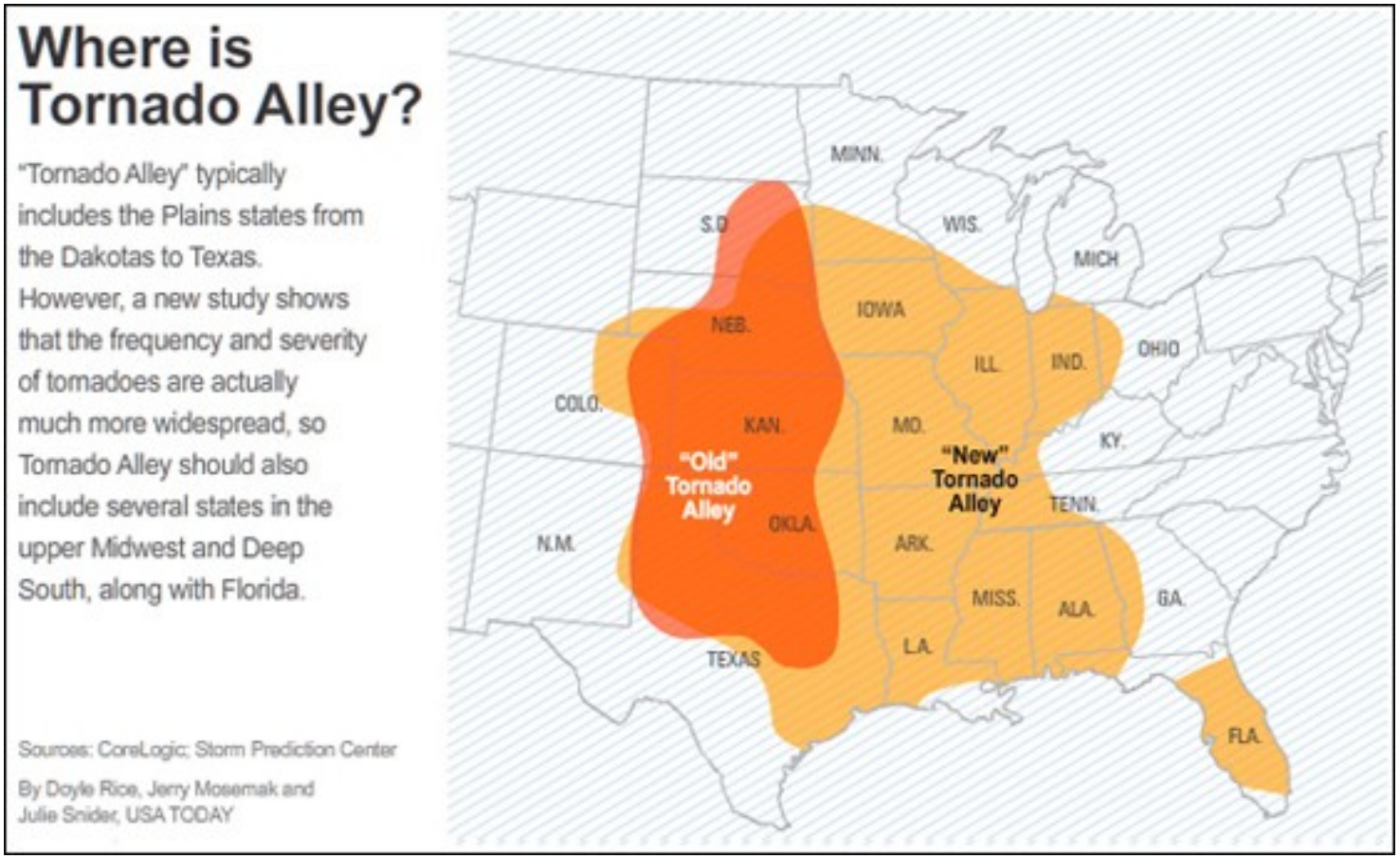
Where Are You Most Likely to Find Severe Weather and When


WOAD 8
STORM TRACK
SEVERE WEATHER SEASON
THREAT EXPANDS NORTHWARD
JUNE
MAY
APRIL
MARCH

Average Annual Tornadoes



Tornado Alley has shifted

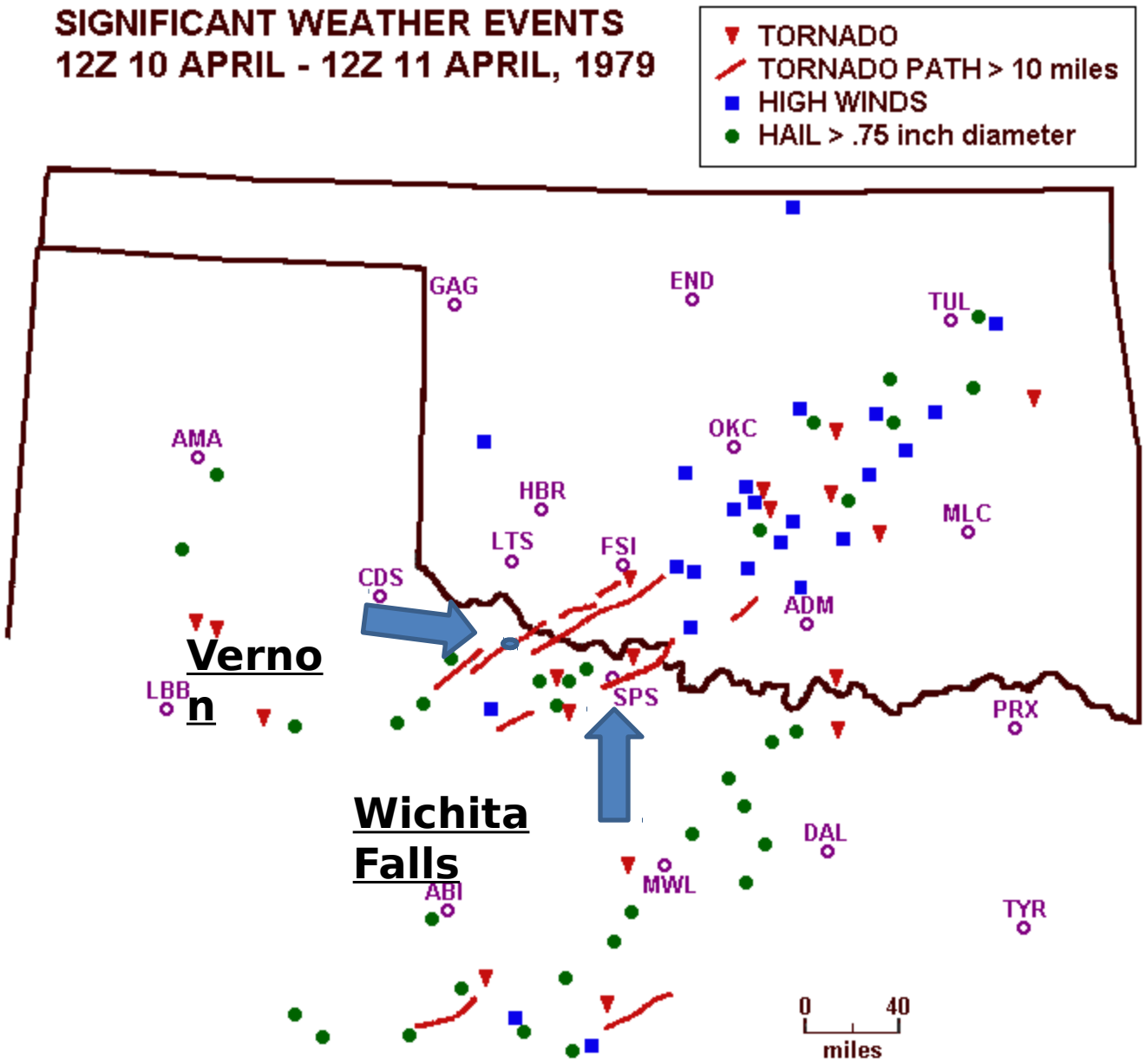


“Terrible Tuesday” April 10, 1979

Northwest Texas, Oklahoma, Indiana Deaths Recorded

State	Total	County	County total
Indiana	**1**	Warrick	1
Oklahoma	**3**	Comanche	3
Texas	**54**	Wichita	42
		Wilbarger	12
Totals	**58**		
All deaths were tornado-related,			

Tornado begins its life outside Wichita Falls, TX


SIGNIFICANT WEATHER EVENTS
12Z 10 APRIL - 12Z 11 APRIL, 1979
TORNADO
TORNADO PATH > 10 miles
HIGH WINDS
HAIL > .75 inch diameter
GAG
END
TUL
AMA
OKC
HBR
MLC
LTS
FSI
CDS
ADM
Verno
n
LBB
SPS
PRX
Wichita
Falls
DAL
MWL
ABI
TYR
0
40
miles

Path Thru Wichita Falls, TX

Vernon, TX. My Hometown.
EF4

Tornado Statistics

- Longest on record: *Tri-State Tornado* 1925. 219 miles, 3.5 hours through Missouri, Illinois, Indiana
- Deadliest: Bangladesh 1989 killed 1300 people.
- Deadliest in U.S.: Tri-State 1925 killed 695 people
- Highest Winds: Bridge Creek-Moore Oklahoma Tornado 1999. Wind speeds by doppler 301 mph.

- Widest: El Reno, OK 2013. Maximum width 2.6 miles.
- Fastest Forward Speed: Tri-State Tornado. 73mph.

Wind Speeds to Upset Vehicles

Combined Study from Kent State University, OH; Boyce Thompson Institute, NY; and Wichita State University, KS

Conclusions of Study (Stationary Vehicles)

- EF0 wind speeds (75 mph) should not tip or move stationary vehicles.
- EF1 wind speeds (95 mph) “Semi trucks and other high profile trucks, trailers, and buses may be tipped over; cars, vans, and pickups are not tipped”
- EF2 wind speeds (125 mph) “Cars, vans, and pickups may be moved but fewer than 10% are tipped over”

- EF3 wind speeds (155 mph). “Cars, vans, pickups are moved and 10-50% are tipped over. Vehicles that are tipped over may be rolled or lifted and thrown”.
- EF4 wind speeds (200 mph). “More than 50% of cars, vans, and pickups are tipped over. Vehicles often thrown.”
- EF5 wind speeds (>200 mph). “Vehicles, including semi-trucks, train cars may be lifted and thrown up to one mile”

Dallas Texas

So How Does That Apply To Us If Driving?

- It has been shown that gusts of as little as 45mph at a 90 degree angle to a semi-truck and trailer can cause a significant lateral motion (i.e. lane change) or in rare instances a tip over.
- If significant winds forecast best to slow down or park until forecast improves. Remember we are recreational and endangering your life or others is not usually warranted!!

Best Practices if Parked During Significant Winds

- If able point nose of truck and trailer into the wind direction as much as possible. Remember driving down the road we are facing relative winds of 60-70 mph with little notice of effect.
- If at a campground, best to be away from tall trees.
- Know where the campground shelter is, usually bathrooms or laundry rooms.

- If stuck in trailer during high winds, most literature says to pull in slides to decrease surface area under trailer and “airplaneing effect”.
- Some have said to leave slides out to distribute weight further out like a catamaran, but in higher winds above effect takes precedence, because in high winds a “barn door will fly”.

Summary

- **Not going to discuss extremes of cold or hot. Each person has individual ways to endure those.**
- **When you check into campground find out name of county you are in because weather alerts usually by county.**
- **Weather Apps: (Find the one you like and download).**
- **Yahoo Weather (Android, iOS), Weather & Clock Widget, AccuWeather (Android, iOS) , The Weather Channel (Android, iOS, Windows Phone) (Free), WeatherBug (Android, iOS, Windows Phone), 1Weather (Android) (Free), Intellicast, Storm**
- **NOAA Weather Radio available on CBs, Amateur Radios, and as stand alones. Newer ones have alerts which sound only if severe weather in area rather than continuous broadcast.**
- **By the way your odds of being hit by a tornado in a tornado prone area are about 1/3,000,000**


All Hazards
NOAA
Weather Radio
La Crosse
WB VOL 2
162.400 MHz
AM/FM/WB RADIO
VOL. −
MODE
VOL. +
TUNE
TUNE


NOAA
ALERT
ALL HAZARDS WEATHER RADIO WITH S.A.M.E.
select
weather
snooze