Weather and RVing

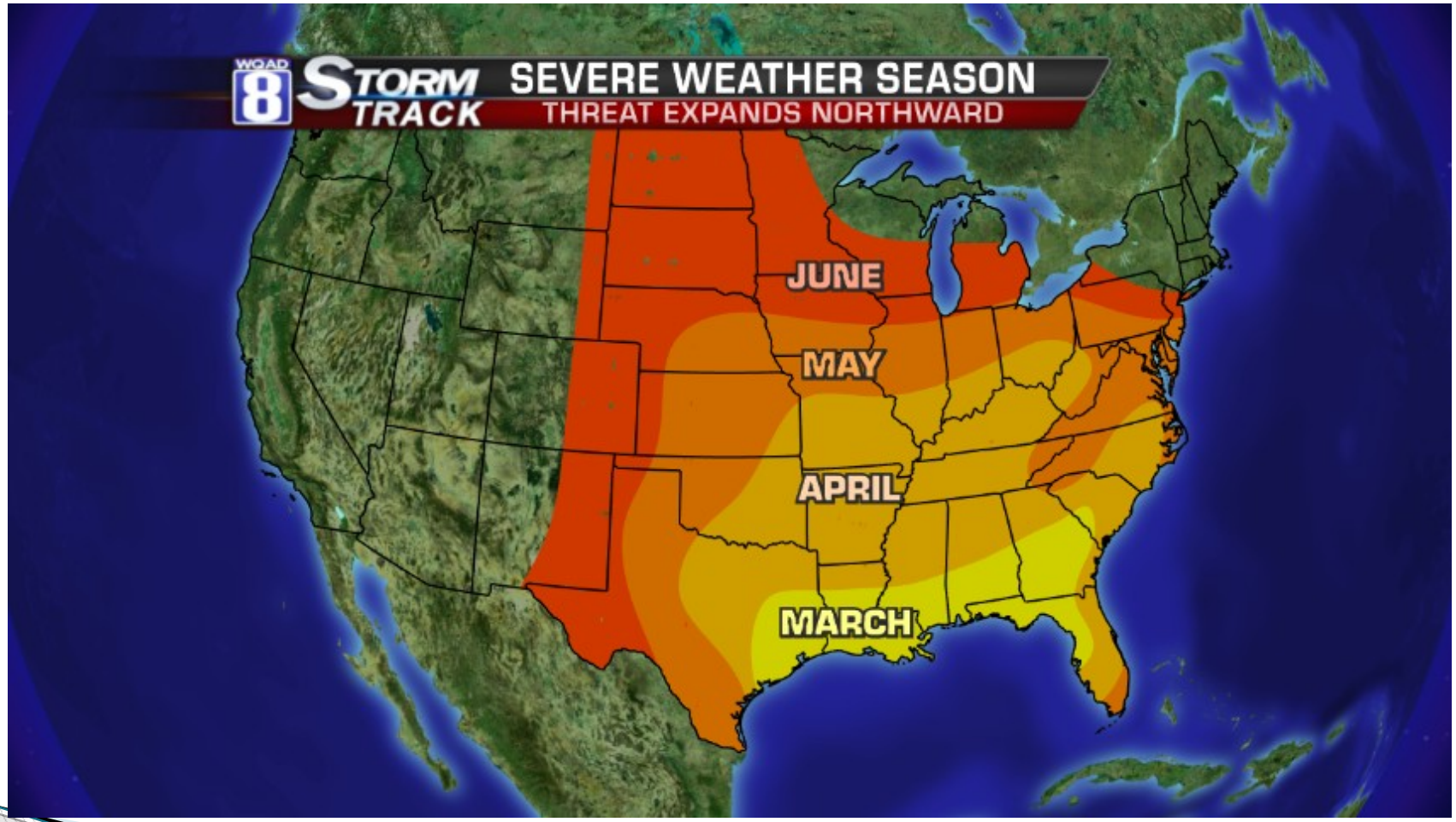
Carl Wagner

Weather Extremes

So What Concerns Us?

1. Severe or extremely severe thunderstorms
2. High Winds
3. Flooding
4. Hail
5. Lightning
6. Tornadoes
7. Cold

Where Are You Most Likely to Find Severe Weather and When



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.

Definitions Cont.

- 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has observed strong rotation in a storm, indicating an incipient tornado), the severe thunderstorm warning will be superseded by a *tornado warning* in the United States and Canada.[9]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

Severe Weather Tips

- Plan trips and locations around likely severe weather states during certain times.
- Realize severe storms and tornadoes can occur year round but are most likely in the mid U.S. during Spring and late summer.
- Know where you are! County of campground because alerts are by counties.
- Know where you can shelter
- Prepare in advance to abandon truck and trailer and go to stronger shelter *well in advance NOT during a severe storm.*

Tips Cont.

- Have a NOAA equipped radio handy and set to alert if severe weather nearby
- Absolutely necessary to have weather app or two on your phone or iPad.
- Controversial whether to pull in slides or leave out. “Catamaran for stability” vs. “even a barn door can fly”. Winds going under camper exert lifting effect, therefore, more surface area, the more the lifting.

Tips cont.

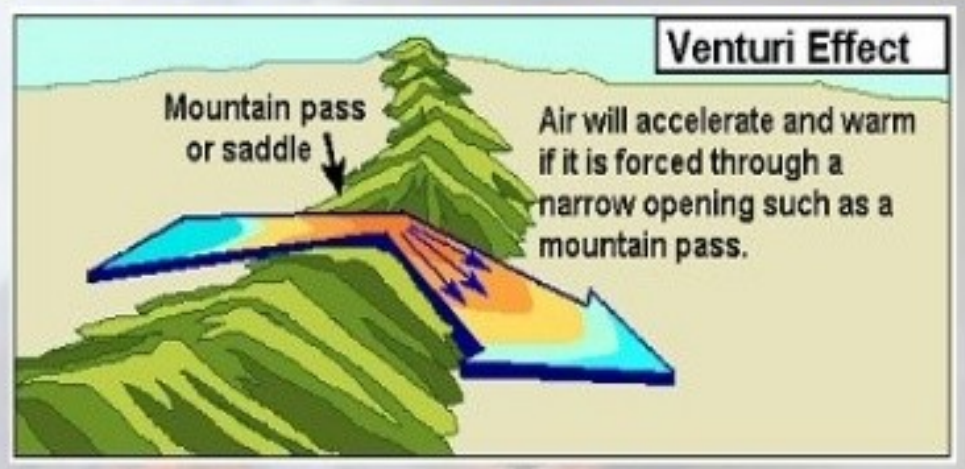
- Do not park under an overpass if a tornado is headed your way. (more later)

High Winds

- Can occur on perfectly clear days with no severe weather around especially in the Southwest and Mountain Passes
- In Cades Cove in the Smokey Mountains winds have been funneled into the valley and clocked at over 100 mph.
- I have personally experienced sustained winds of 35-45 mph with gusts up to 55 mph in the Southwest while driving my rig.

Ways Topography Alters Wind

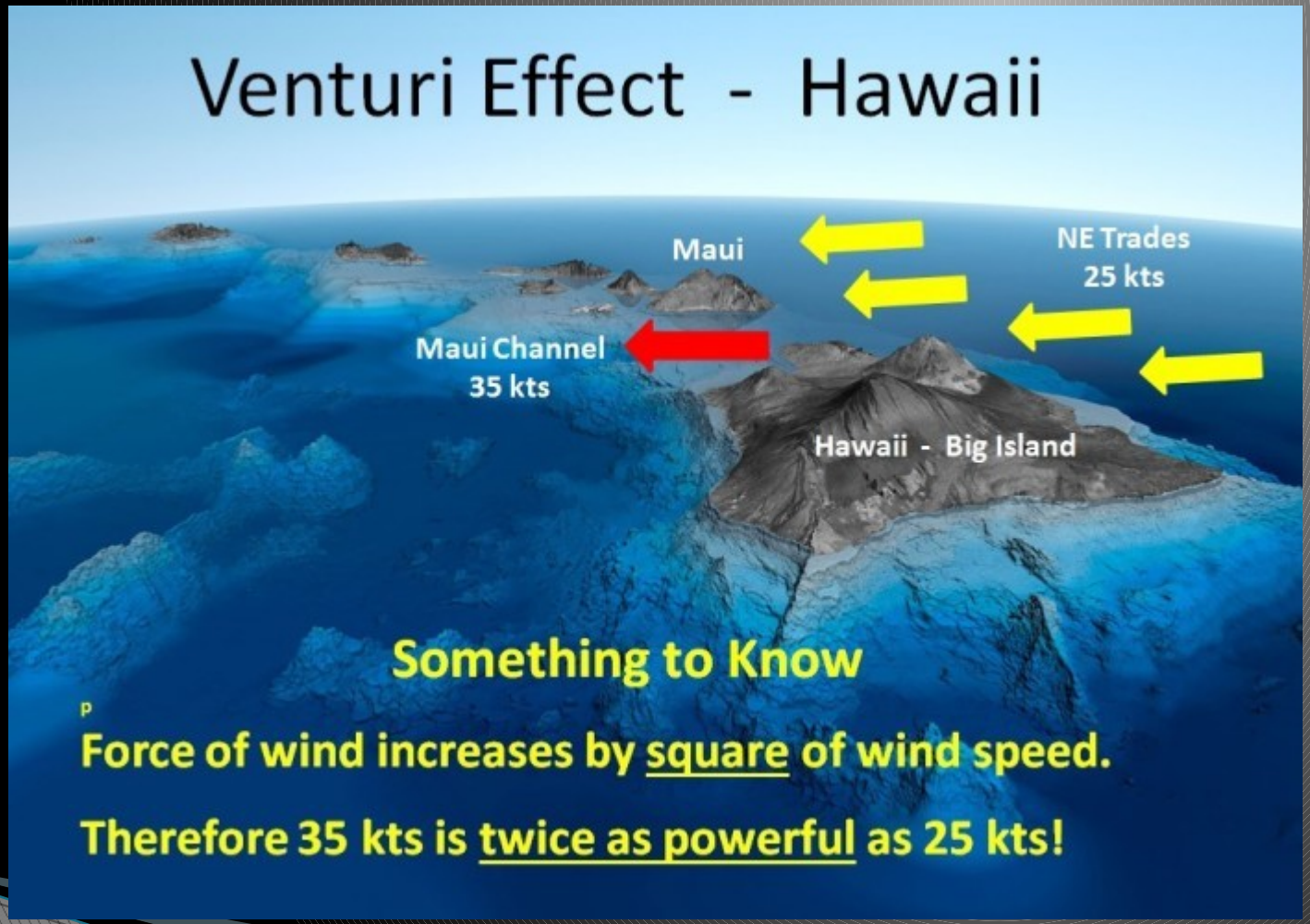
Mechanical or Diverting Effects



Venturi (Bernoulli) Effect

- Acceleration of air through a terrain constriction, such as a pass or gap
- Air accelerates through by the pressure gradient across the topographic constriction

Sailors Will Know This!



Winds cont.

Wind Speeds to Upset Vehicles

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

Mainly this study was looking at tornadic winds but applies to straight line winds as well.

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”

So How Does This Apply To Driving?

- It has been shown that gusts of as little as 45mph at a 90 degree angle to a semi-truck and trailer while moving 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

- Slow down
- Stop if winds are significant
- Carry clean underwear in the truck if you have to continue driving cause it won’t be fun.
- If stopped, point into the wind as much as possible since we somewhat have aerodynamics like a plane.
- Remember, we face relative winds of 65-70 mph just driving down the road with little notice of effects

Flooding

Flooding Cont.

- According to FEMA: - **Six inches** of water will reach the bottom of most passenger cars, causing loss of control and potential stalling. - A foot of water will float many vehicles. - Two feet of rushing water will carry away most vehicles, including SUVs and pickups
- Don’t try to cross flooded creeks. Rushing water of as little as 3 inches can push a car or truck laterally.

Flooding Cont.

- The heaviest amount of rainfall was recorded just to the south of Houston in the town of Alvin. An observer measured a record **43 inches** of rainfall in just 24 hours, which stands as the greatest 24-hour rainfall total in U.S. history. The storm total beyond the 24-hour record was 45 inches
- Summary: It can come quick so plan an out. Remember, mother nature always wins.

Flooding Cont.

- Be sure before parking by that quiet creek that the weather is going to cooperate and that creek isn’t going to flood.
- Also do not park in dry creek bed in Southwest if rains predicted. (Flash Flooding)


FLASH FLOOD
HITS QUARTZSITE
ROAD
CLOSED
RVerTV
Aerial Footage


Lance

Hail

Largest U.S. hailstone: On this date (Sept. 3, 1970) the largest hailstone officially reported in the United States fell at Coffeyville, Kansas. The hailstone measured 17.5 inches in circumference and weighed 1.67 pounds.


Regent

For every problem there is a solution.

Best Practices In Hail

- Cover if you can.
- If hail is large abandon camper and go to strong building. Truck may protect more in large hail than camper. Hail can penetrate plywood.
- Remember if it can kill animals it can kill you. If caught in the open crouch and cover your head with both arms. You'll get beat up but likely survive.

Lightning

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

- 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.)

- 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.

- TV Antennas Down


Delt
By
NO STEP
DANGER
HEATED PROBE

- 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.)

Tornadoes

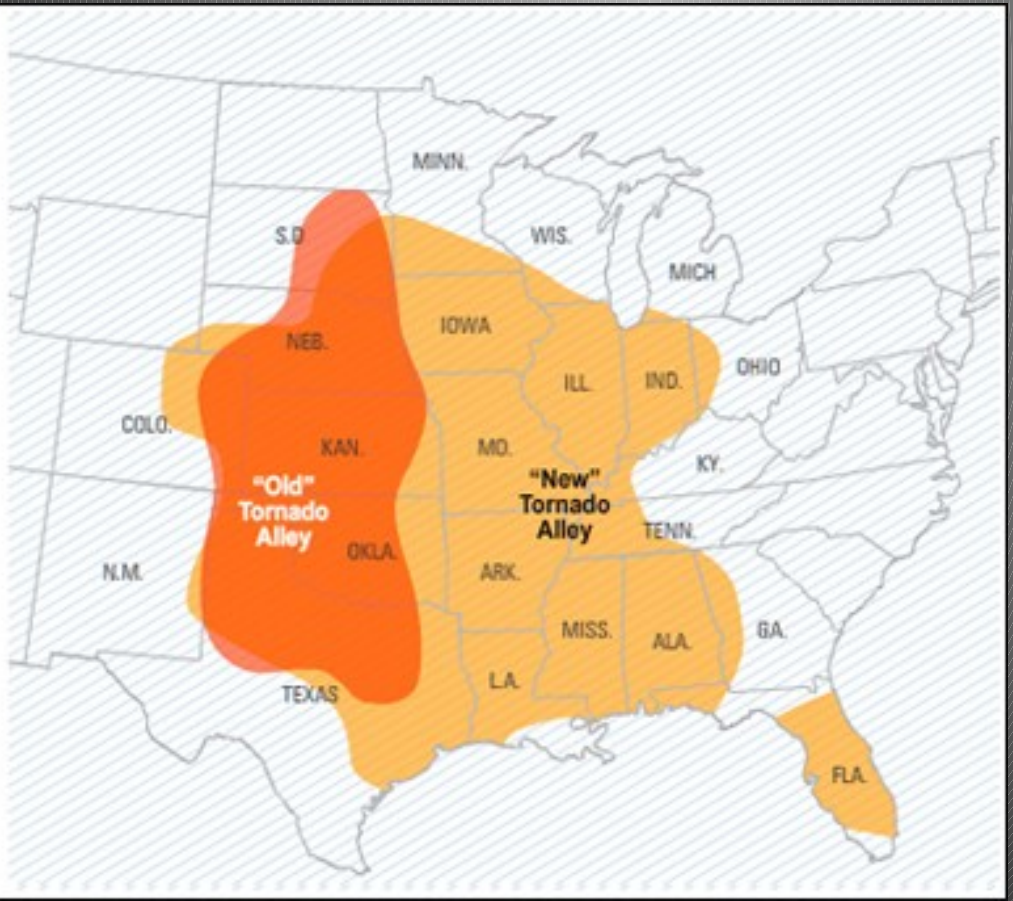
Tornado Alley has shifted

Where is Tornado Alley?

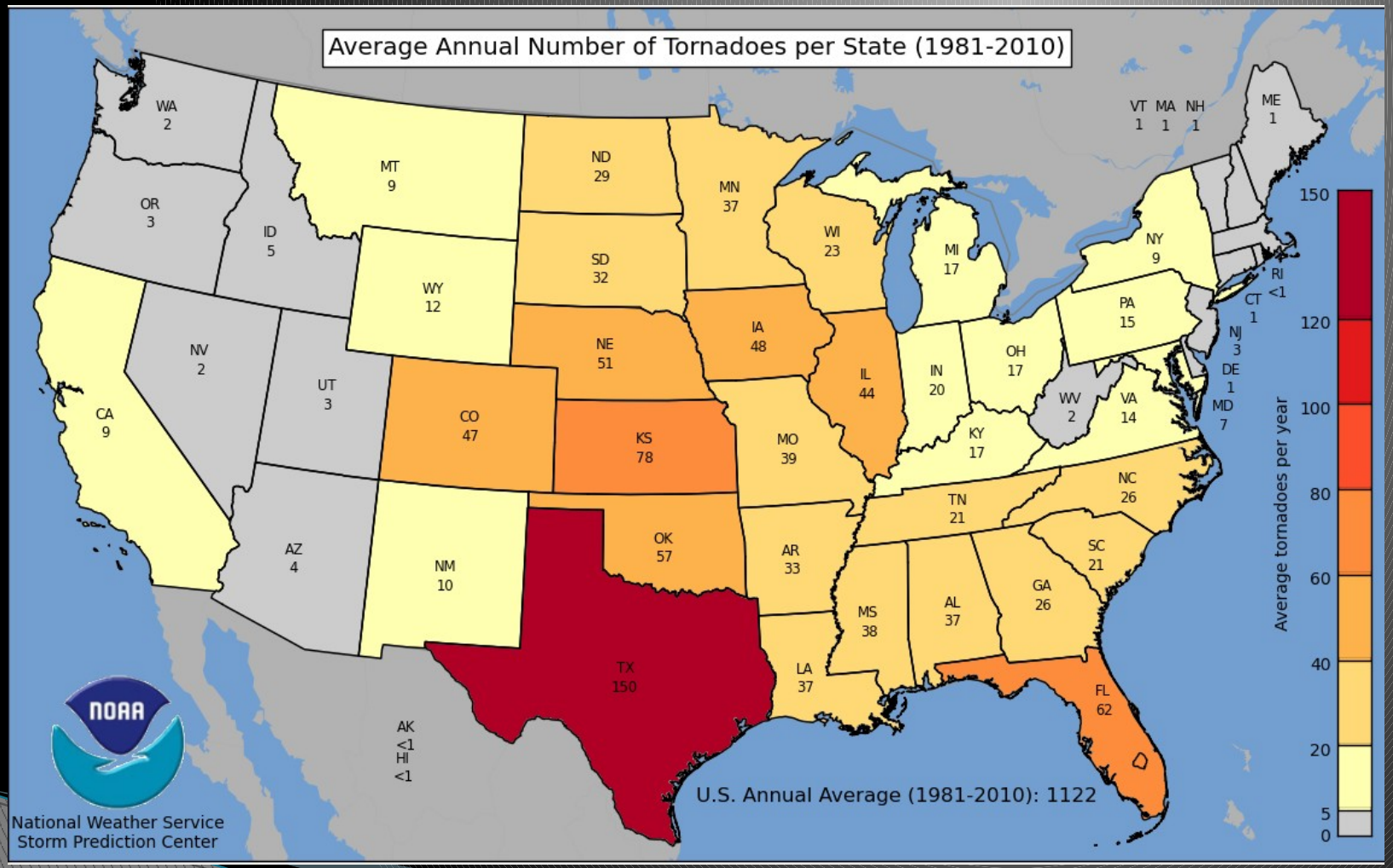
"Tornado Alley" typically includes the Plains states from the Dakotas to Texas. However, a new study shows that the frequency and severity of tornadoes are actually much more widespread, so Tornado Alley should also include several states in the upper Midwest and Deep South, along with Florida.

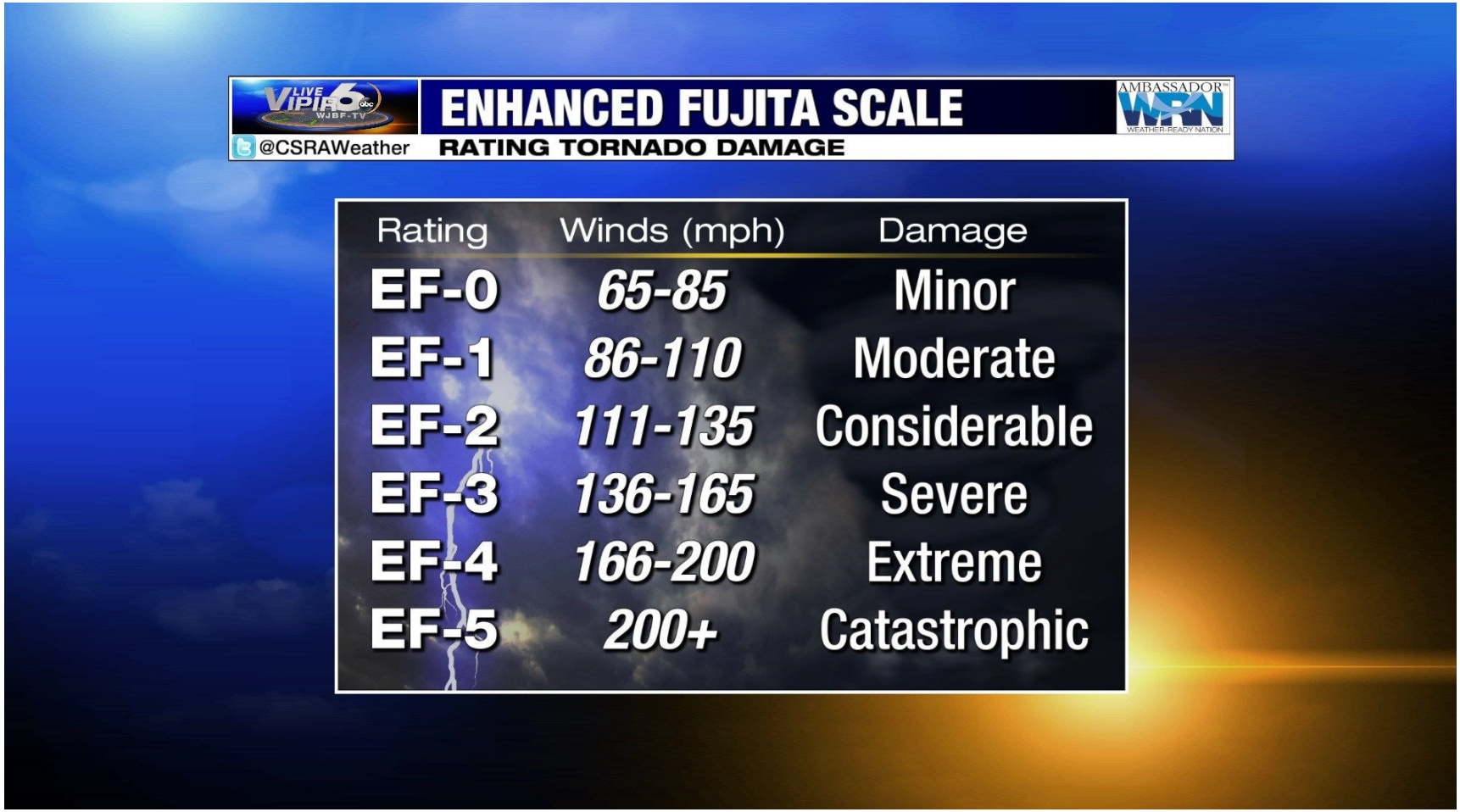
Sources: CoreLogic; Storm Prediction Center

By Doyle Rice, Jerry Mosemak and Julie Snider, USA TODAY



Average Annual Tornadoes

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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


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I Find This Humorous (photo shopped)

To Put it in perspective.

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**.

- **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 discussed).**

Tornado “wives tales”

- “Opening the windows in your house before a tornado will reduce damage by balancing the pressure inside and outside the structure.”
- “Tornadoes cannot cross lakes, large rivers or wide bodies of water. Also they follow rivers”
- “Tornadoes never strike the same area twice.”
- “A tornado is more likely to hit a mobile home park.”
- “The safest place to take shelter from a tornado is in the southwest corner of a basement.”
- If a tornado is not coming directly towards me, I am out of harm’s way.”
- “A tornado cannot travel up and down hillsides.”
- “The damage to homes during a tornado is caused by an explosion from changes in air pressure.”

Cold Weather Tips

- Pick a site that is exposed to the sun.
- Know if your rig is designed for cold weather
- Know how your forced air heater works and if it heats the basement
- Know approximate LP usage and how to replenish.
- Add window coverings and vent coverings
- Consider an electric blanket

Cold Weather tips cont.

- Consider skirting-most folks recommend foam pads with aluminum reflectors, but straw or hay may be acceptable (can be a fire hazard and can become home for varmits and rodents), commercial tarps or skirting is available.
- Some consider small heater in skirting or 100w incandescent light bulbs under critical areas.
- Heated water hose
- Have extra water in your holding tank in case

Cold Weather tips cont.

- Do check your seams and weather stripping before cold weather
- Consider small ceramic heater with fan in basement if needed especially around water manifold and tanks. Always consider potential fire hazard so nothing combustible near.
- Don’t necessarily leave sewer hose connected all the time or you might end up with a “poopsicle”.

Cold Weather Tips

- Finally make sure your carbon monoxide and propane detector or up to date and functioning.
- Best to replace every five year.
- Have fire extinguishers handy.

Summary

- Rving can be fun and safe if you take appropriate precautions and obtain the proper equipment.
- Remember you can’t buy your life back so don’t take unnecessary chances!


Whoa, Carl! You been working out?