
**SKYWARN™
STORM
SPOTTER
TRAINING**



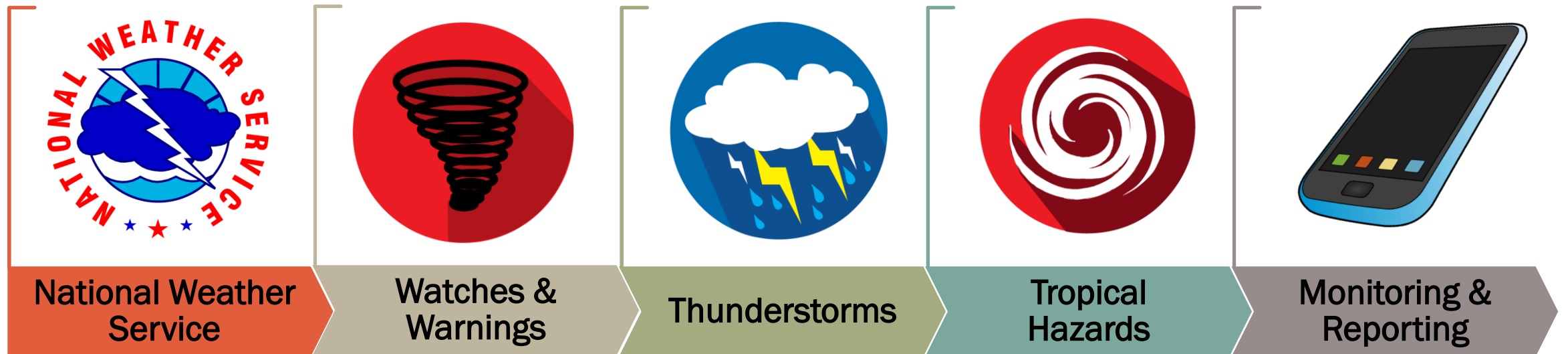
NATIONAL WEATHER SERVICE
JACKSONVILLE
WEATHER.GOV/JAX



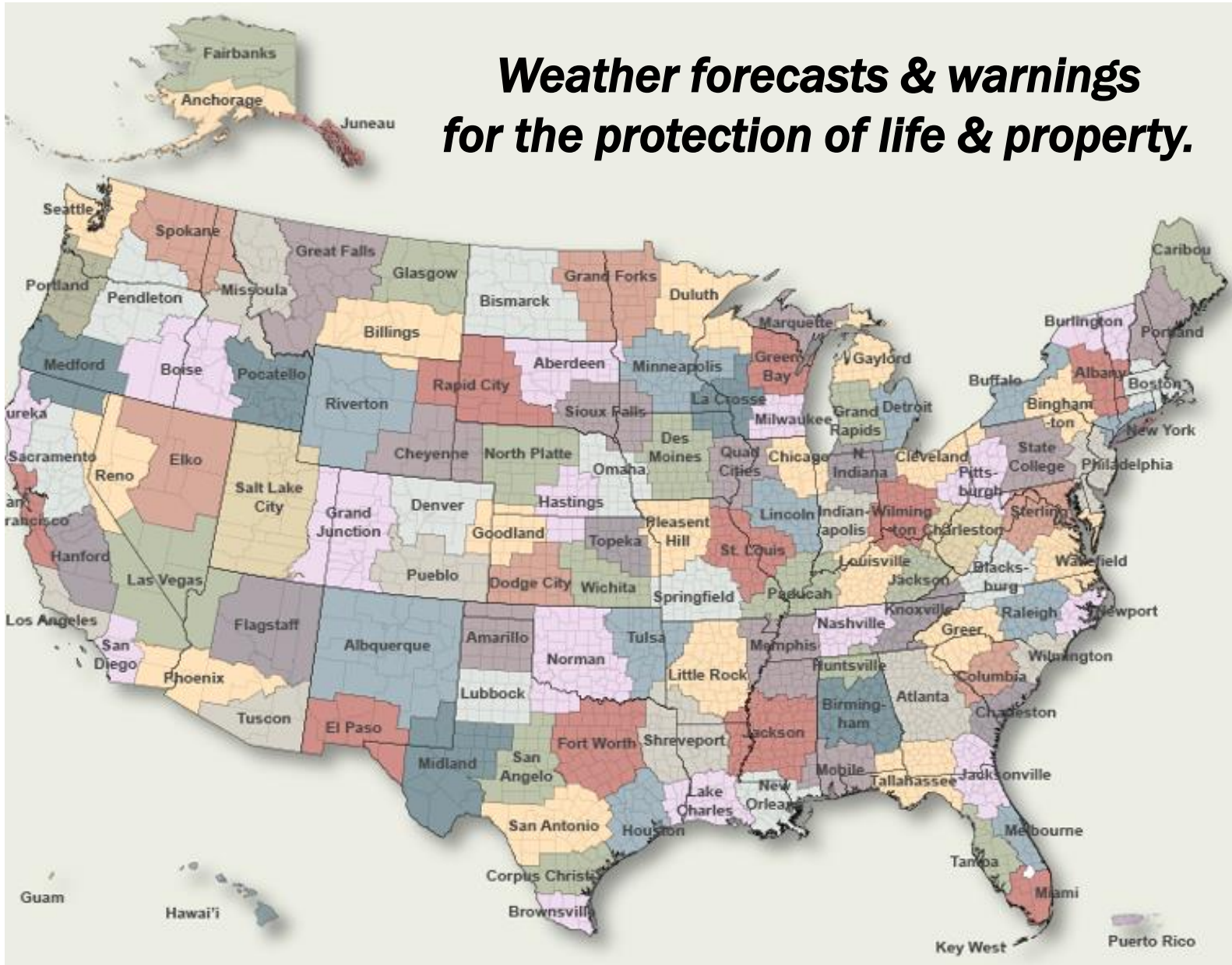
Ed Siarkowicz Photographics Images · LLC 2012

CLASS GOALS

1. Empower you with tools & observational skills to proactively monitor & appropriately respond to potential weather hazards.
2. When safe to do so, encourage you to relay ground truth weather reports to your NWS.



***Weather forecasts & warnings
for the protection of life & property.***



weather.gov

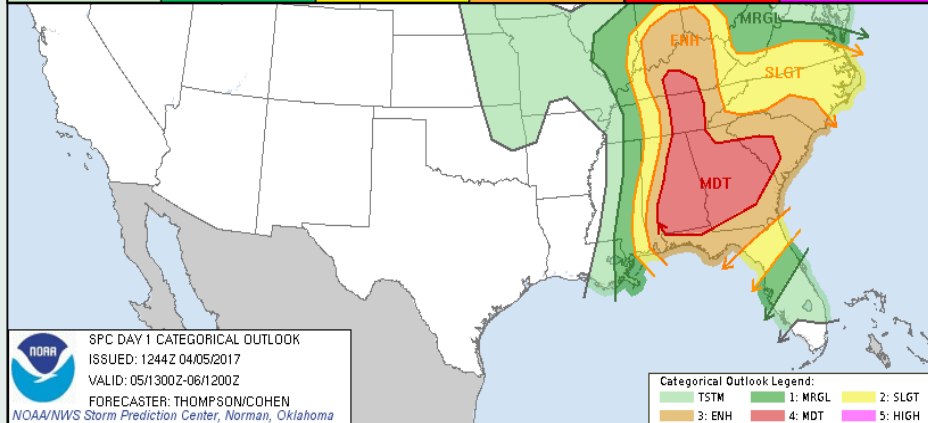
NWS NATIONAL CENTERS

Storm Prediction Center

spc.noaa.gov

- Large Scale Severe Weather Potential
- Convective Outlooks

THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe storms expected
Lightning/flooding threats exist with all thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intense



National Hurricane Center

nhc.noaa.gov

- Forecast for the Tropical Atlantic Basin
- Focus on storm scale forecast – strength, track, size

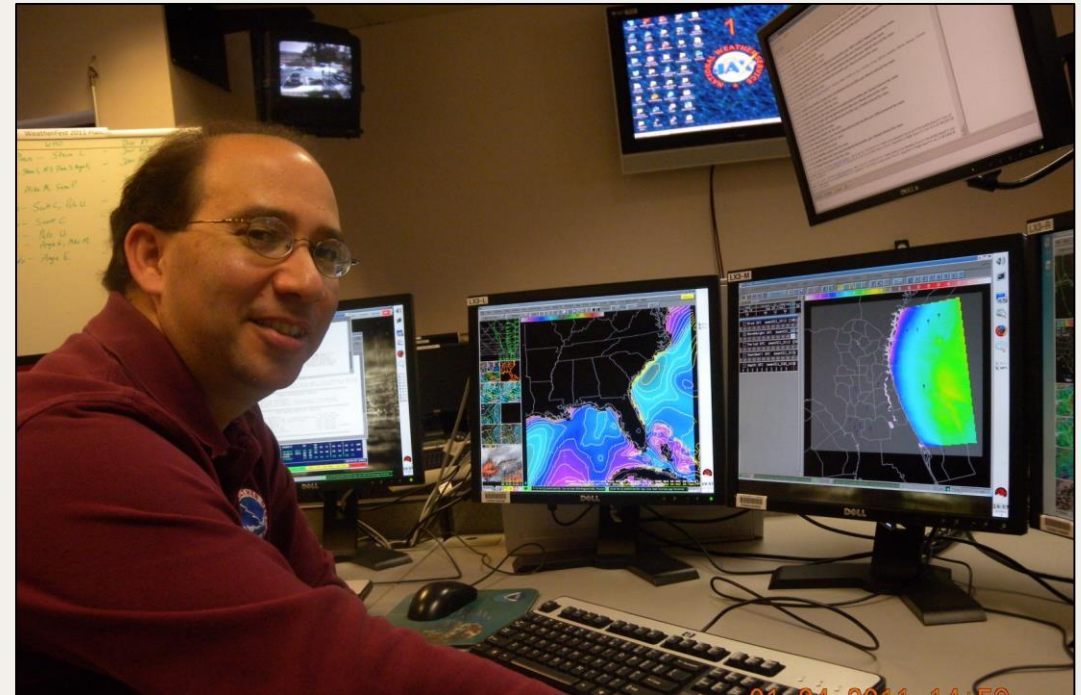


LOCAL NATIONAL WEATHER SERVICE JACKSONVILLE

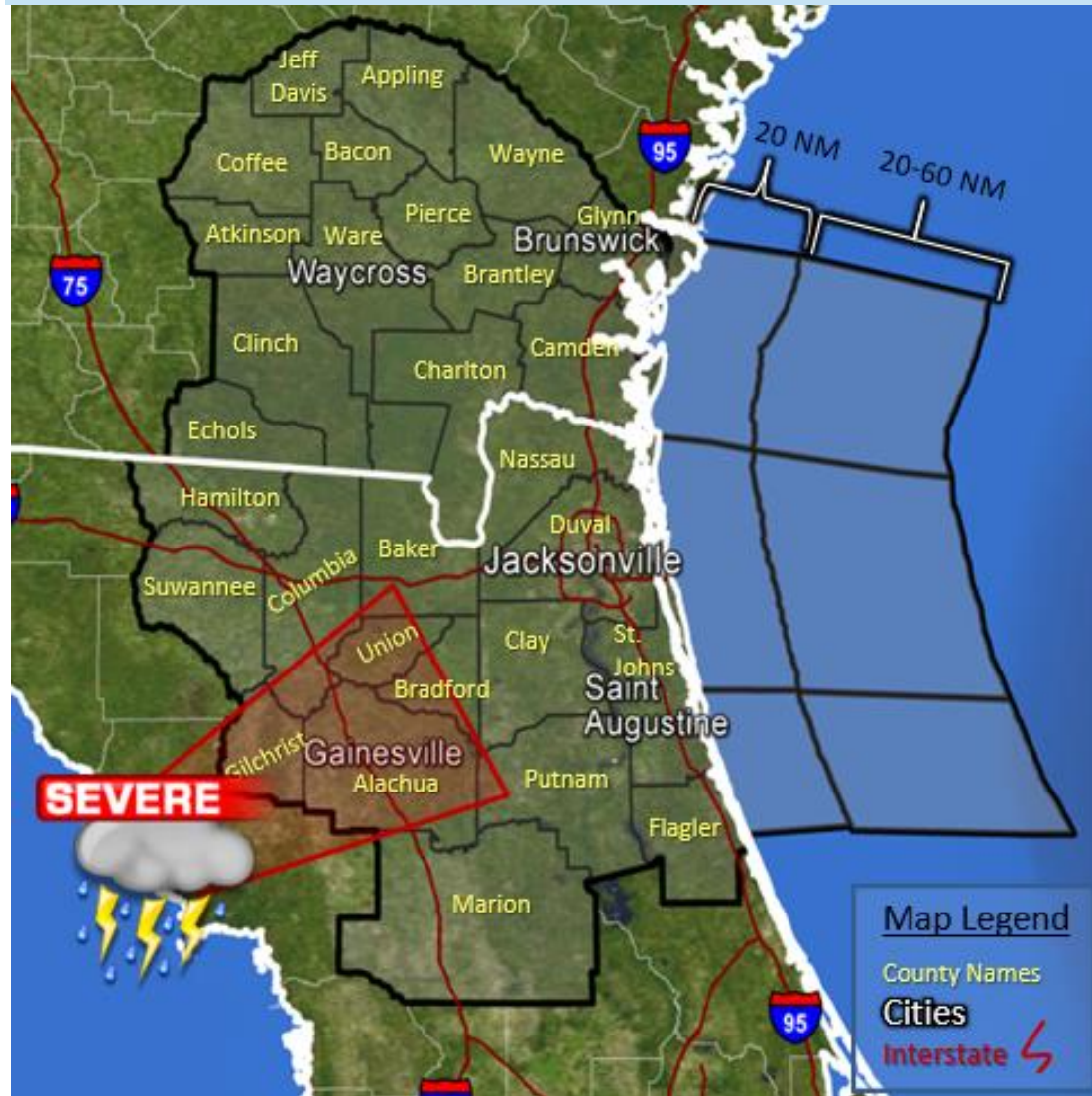


weather.gov/jax

- Constant Weather Watch
- Variety of Forecasts – public, marine, fire, aviation
- Downscaled forecasts for users



weather.gov/jax



NWS JACKSONVILLE SERVICE AREA

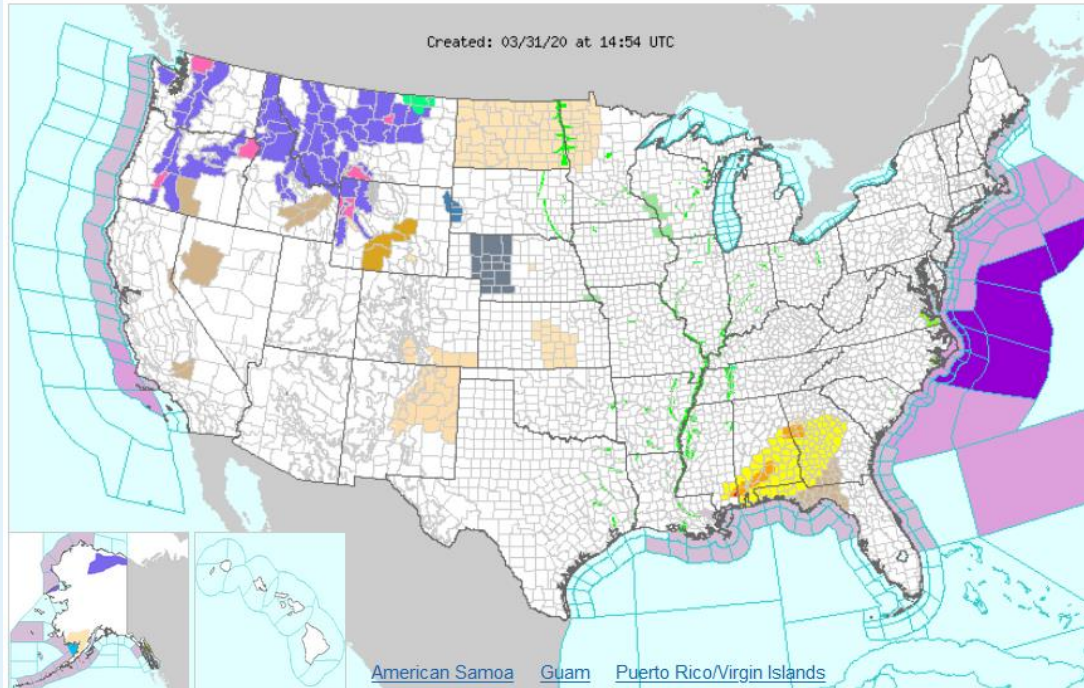
- Weather watch & forecast 29 counties
- Adjacent Atlantic waters out to 60 NM

INTERNET RESOURCES

weather.gov

- National Overview
- Travel resource
- Click interest area, go to local NWS webpage

ACTIVE ALERTS FORECAST MAPS RADAR RIVERS, LAKES, RAINFALL AIR QUALITY SATELLITE PAST WEATHER



weather.gov/jax

- Detailed Local Weather
- Local Briefing
- Radar Data

MY FORECAST
Jacksonville
International Airport FL



Mostly Cloudy

79°F

26°C [Get Detailed Info](#)

This Afternoon



Mostly Cloudy and Breezy
High: 88°F

Tonight



60%
T-storms Likely and Windy
Low: 54°F

[change location](#)

NWS Forecast Office Jacksonville, FL

[Weather.gov](#) > Jacksonville, FL

Jacksonville, FL
Weather Forecast Office

[Current Hazards](#) [Current Conditions](#) [Radar](#) [Forecasts](#) [Rivers and Lakes](#) [Climate and Past Weather](#)
[Local Programs](#)

Today

Tonight

Wednesday

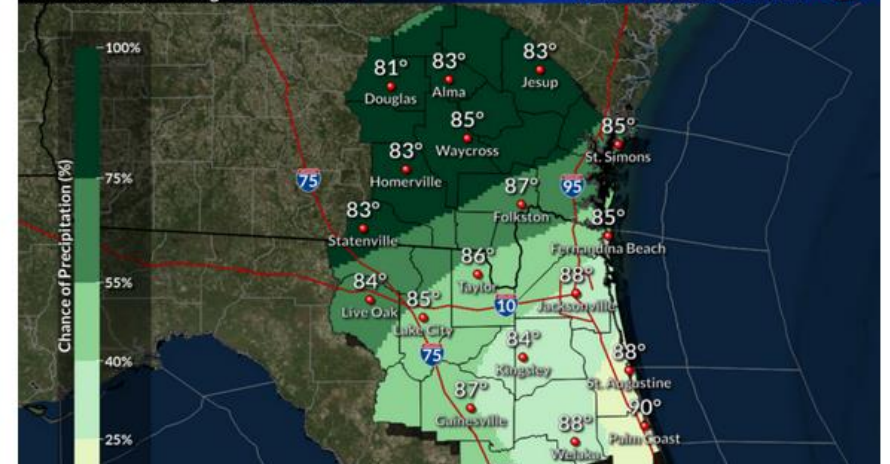
Climate

Today

Valid Tue 8:00AM through Tue 8:00PM EDT

Weather Forecast Office
Jacksonville, FL

Issued Mar 31, 2020 2:39 AM EDT

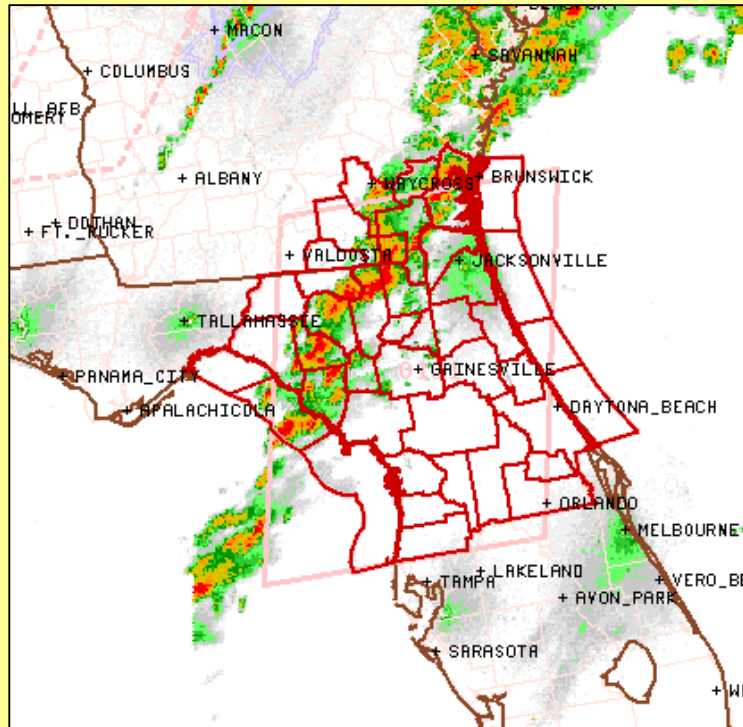


SEVERE WEATHER WATCHES & WARNINGS

WATCH

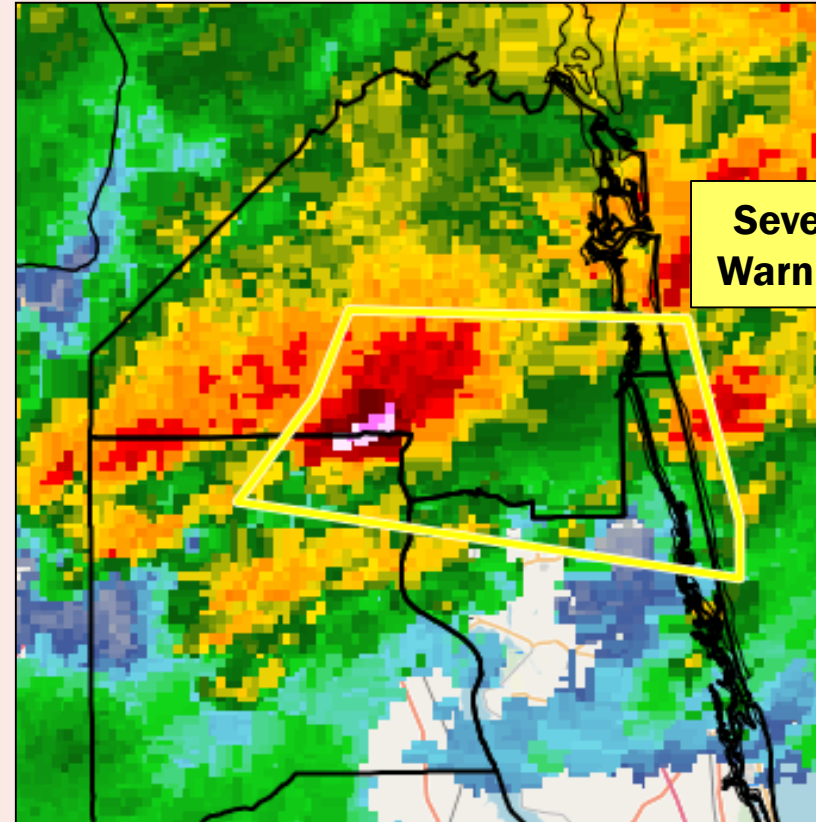
Severe Weather Possible – Monitor Weather

- Ingredients phasing for possible severe storms
- Monitor for potential warnings



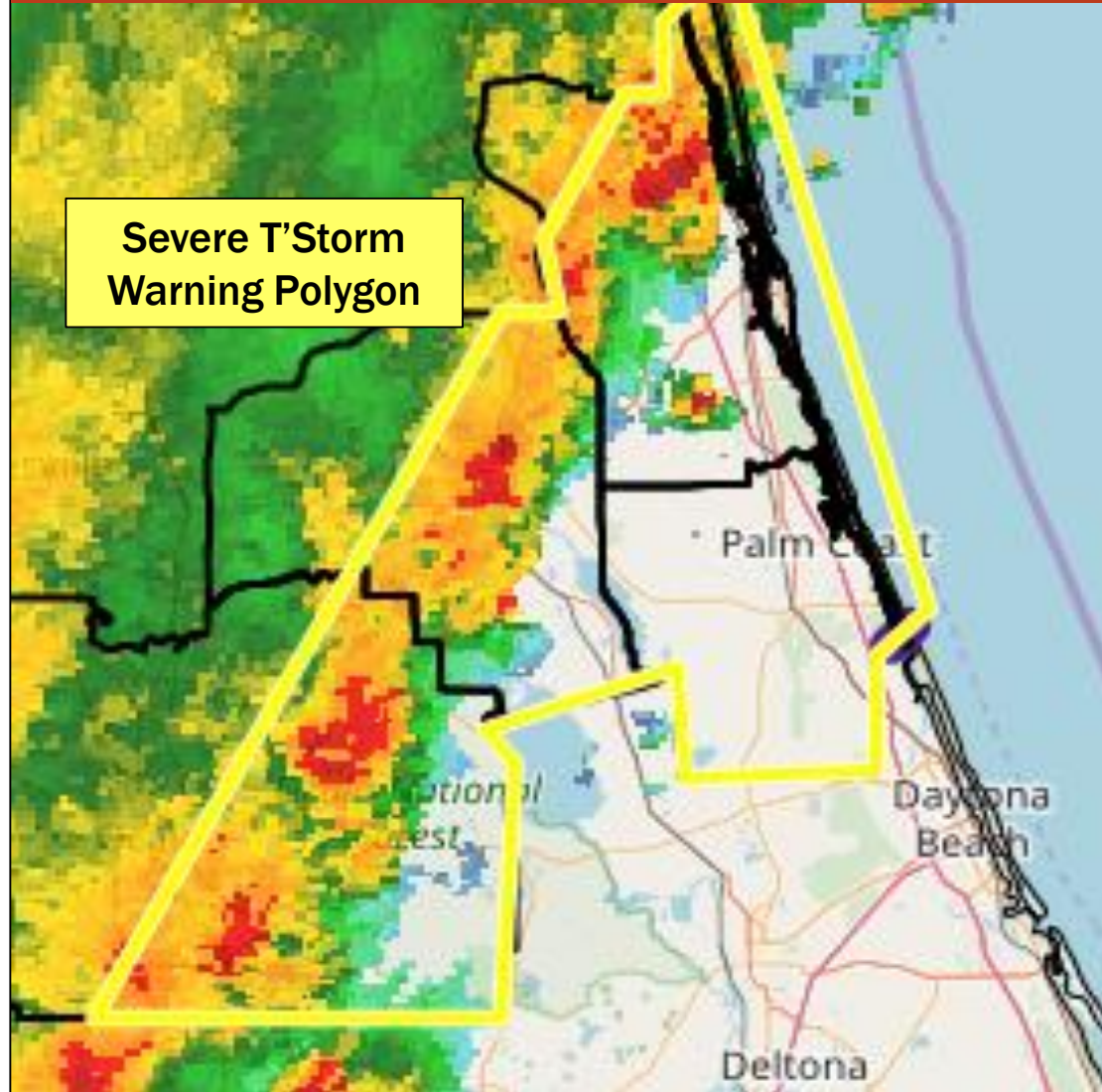
WARNING

Severe Weather Expected – Take Shelter



WARNING

Severe Weather Expected – Take Shelter



WARNING CRITERIA

Severe Thunderstorm Warning

Damaging Winds \geq 58 mph

Hail \geq 1 inch

Tornado Warning

Radar Indicated

Ground truth report from trusted source

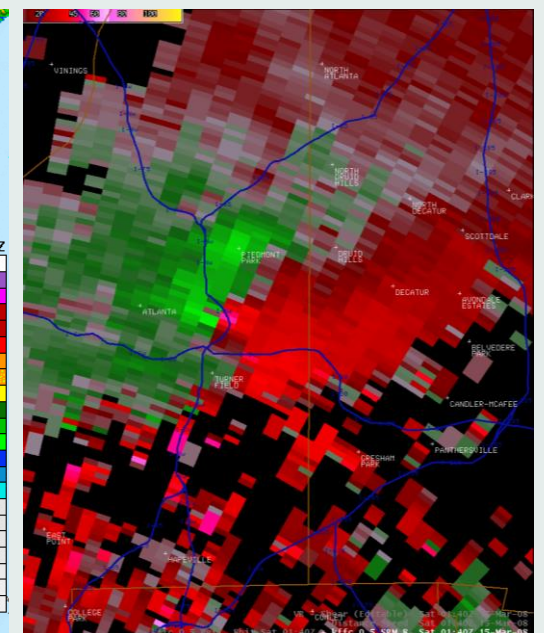
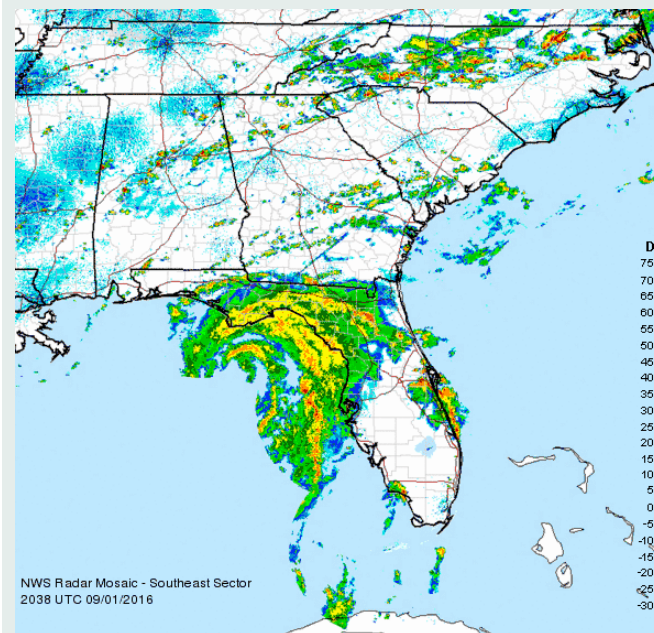
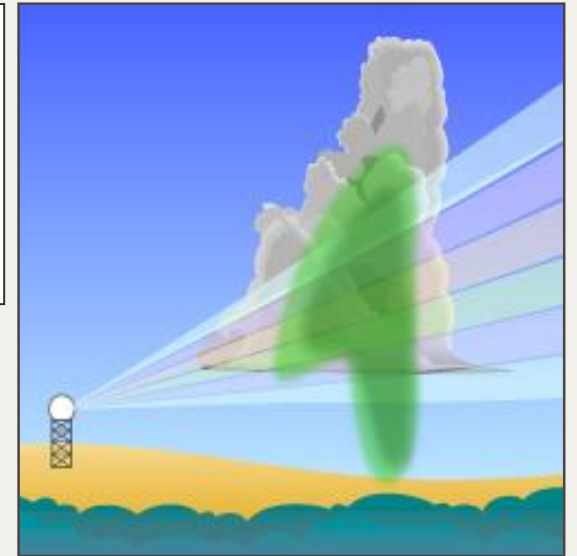
**If in the warning & storm approaching,
Go to your safe place!**

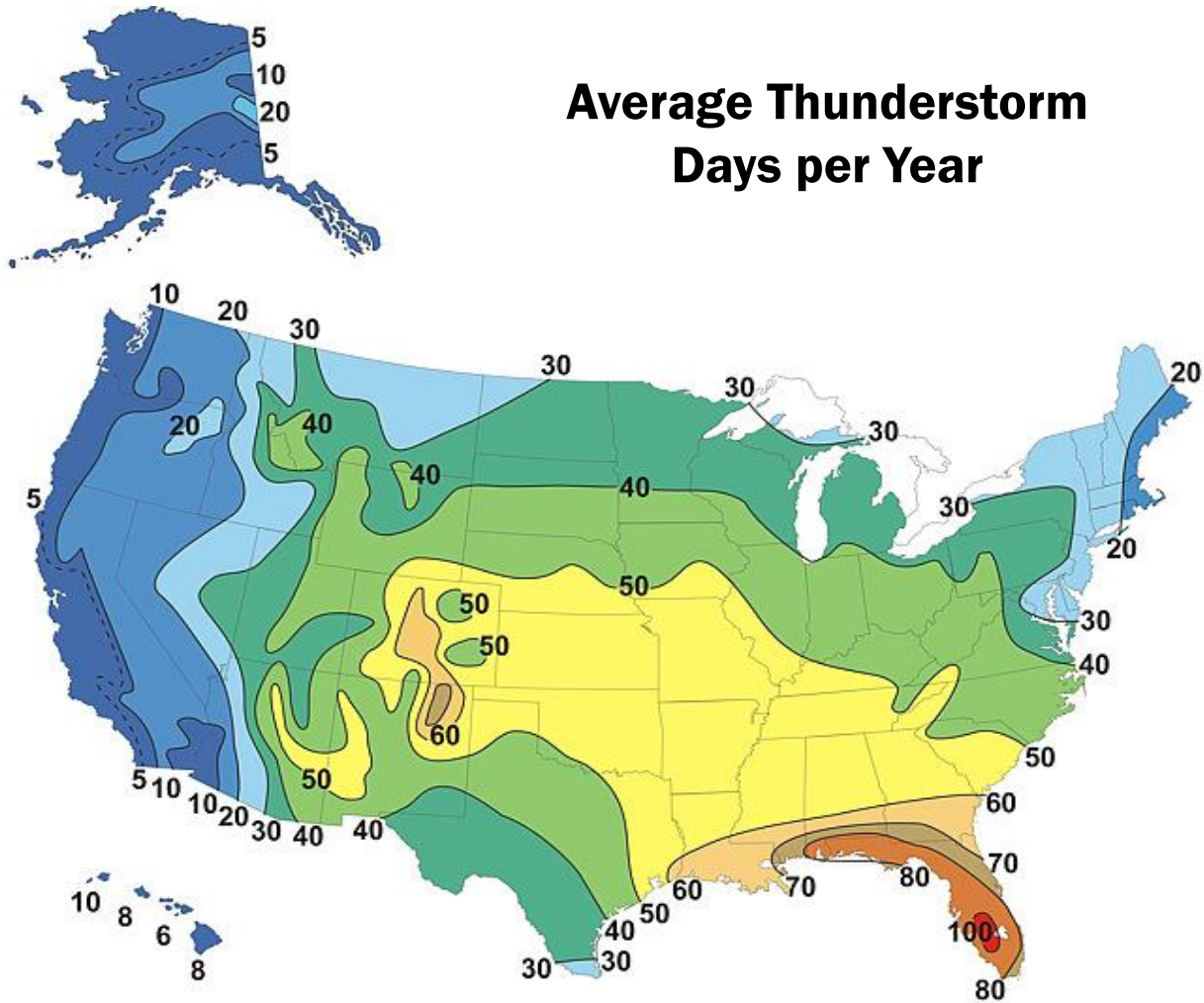
DOPPLER RADAR

radar.weather.gov



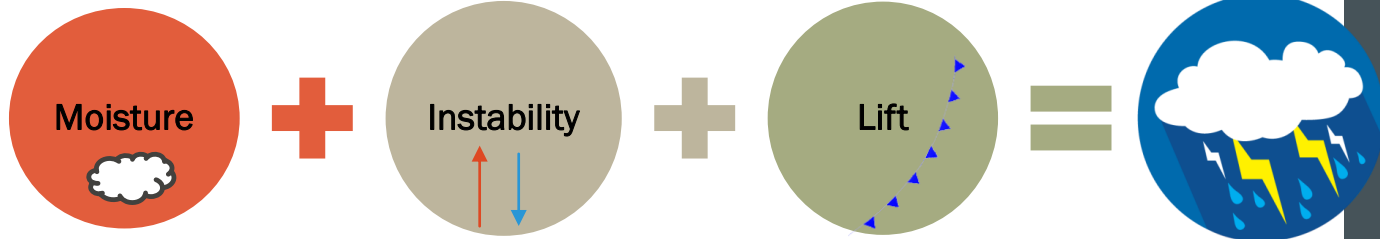
- Pulses of radio wave energy
- Dish rotates 360° & up 14 levels
- Yields vertical storm profile





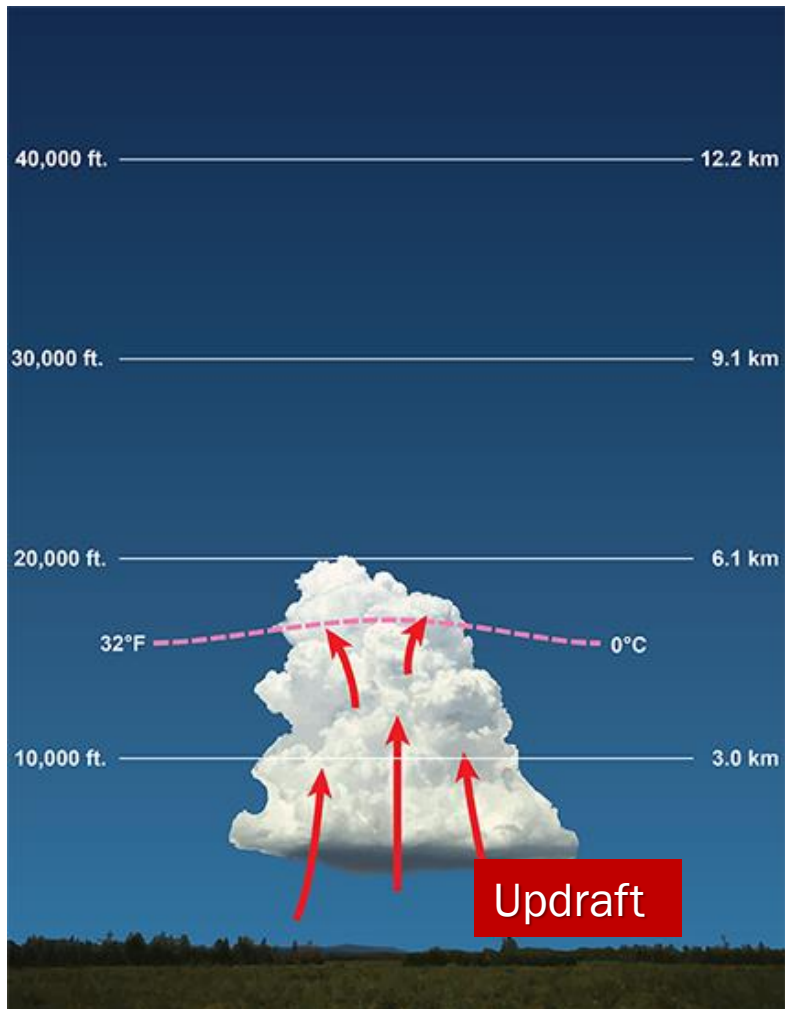
THUNDERSTORMS

- All Thunderstorms have Lightning!
- Severe Thunderstorms can produce:
 - Large Hail
 - Damaging Wind Gusts
 - Tornadoes



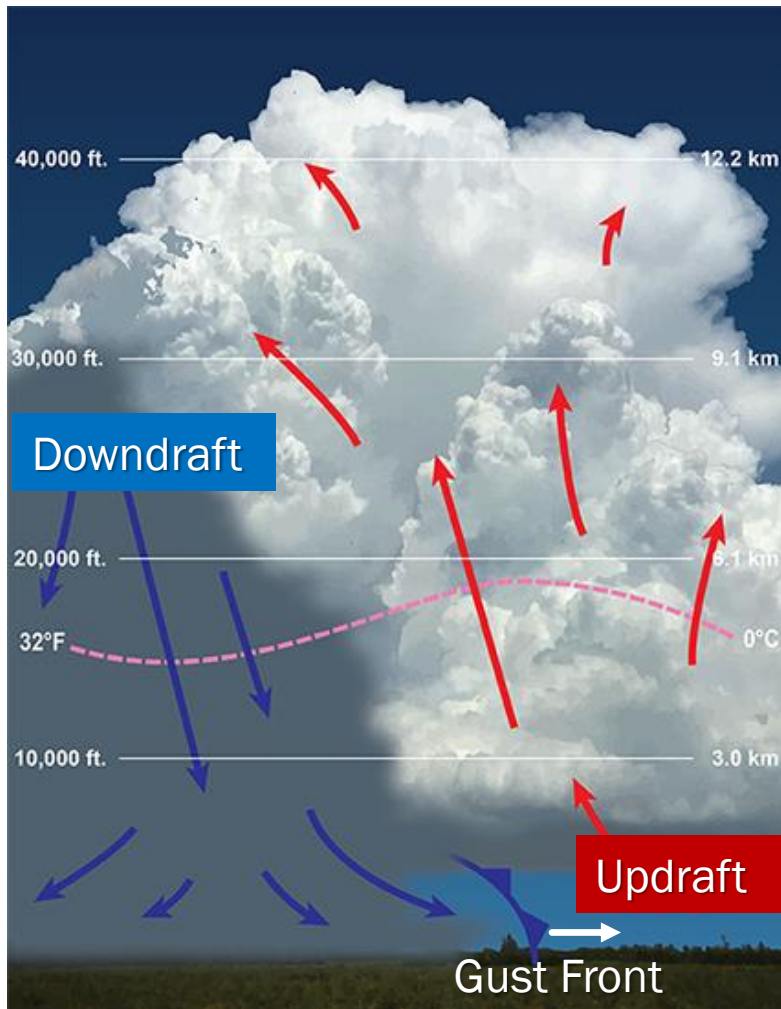
Building Stage

Warm, moist air rises → Updraft
Condensation Occurs → Clouds Form



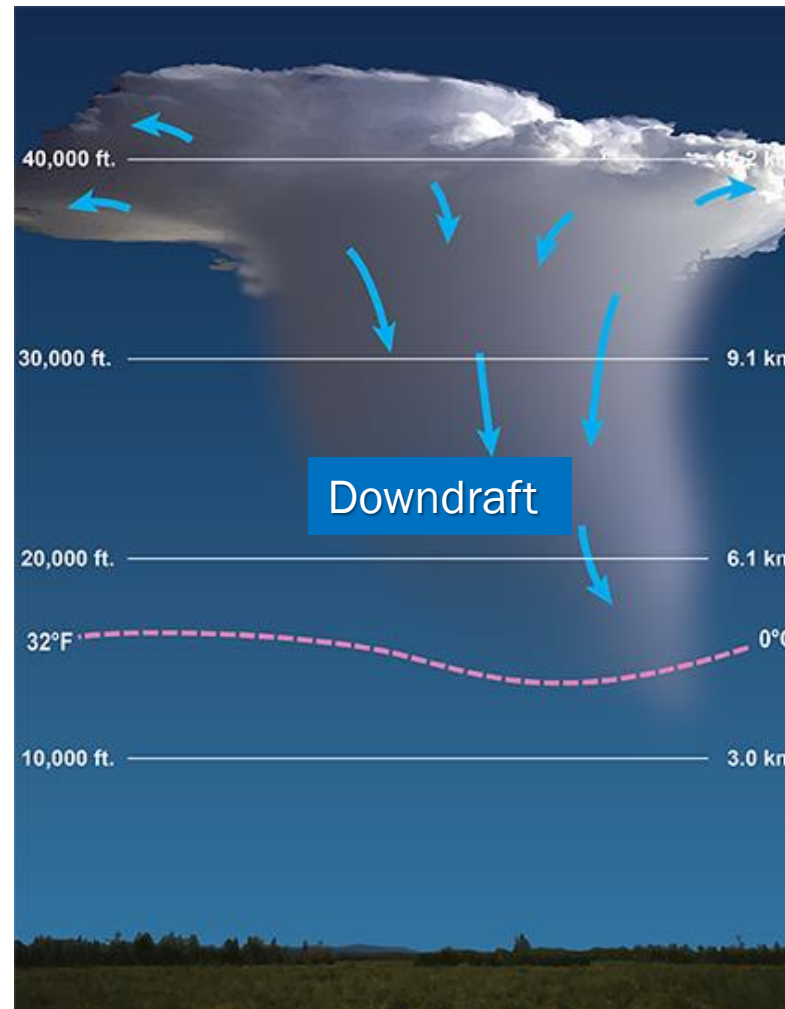
Mature Stage

Inflow to fuel storm → Updraft
Lightning Occurs
Downdraft Occurs → Rain Cooled Air



Dissipation Stage

Updraft/fuel gone → Storm Dissipates
Lightning still occurs
Downdraft weakens



THUNDERSTORM HAZARDS



Photo Twitter
@cnd4ua95

GENERAL

- Lightning
- Gusty Winds
20-40 mph
- Heavy Rain



STRONG

- Hail
- Gusty Winds
40-57 mph



SEVERE

- Large Hail
 ≥ 2 inches
- Damaging
Winds ≥ 58 mph
- Tornadoes



LIGHTNING

Do NOT

- Stay Outside - **OUTSIDE IS NOT SAFE!**
- Shelter under a tree
- Touch metal objects with outdoor exposure
- Use electrical equipment (includes corded devices)

Shelter

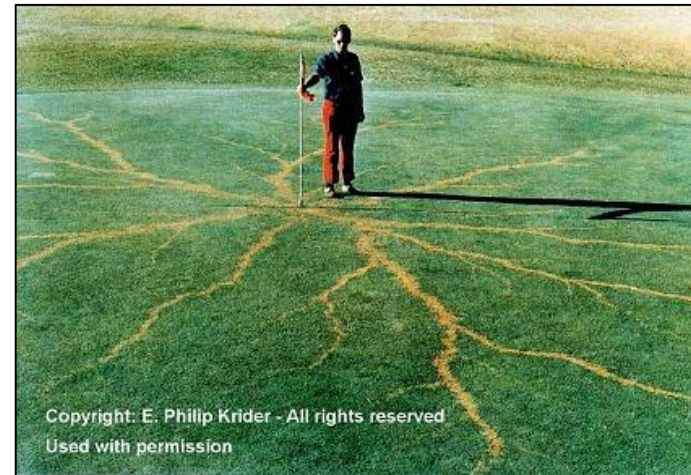
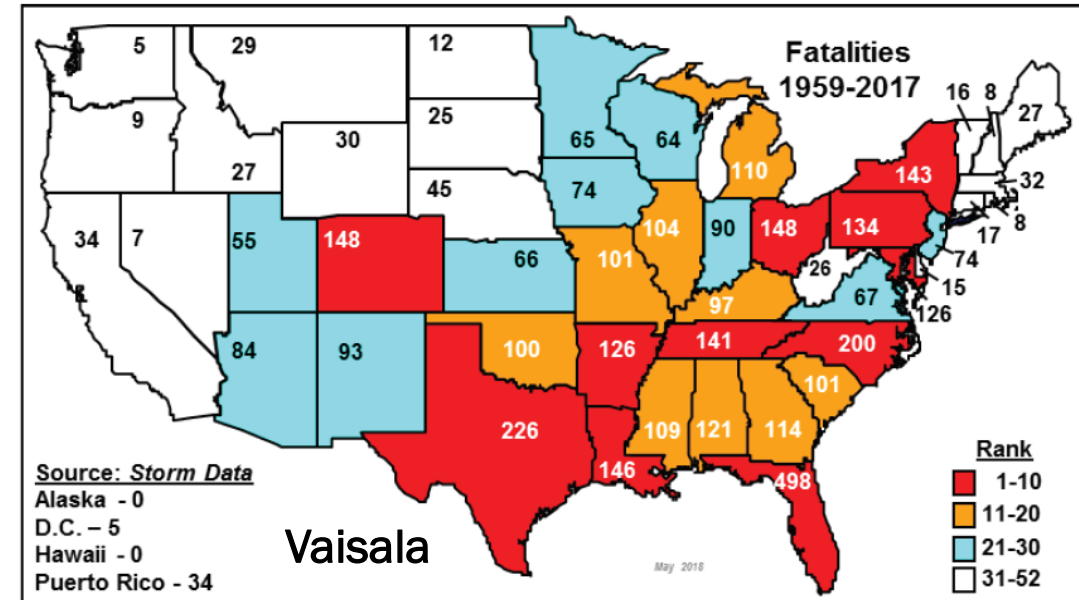
Inside a fully enclosed building with wiring & plumbing that can conduct lightning safely to the ground

If trapped outdoors: Avoid open fields, high terrain & tall objects. Stay away from wet areas. If in a group, spread out and get to low lying areas. Vehicle shelter if available.

Do

- Stay off corded phones. Can use cell phones.
- Avoid plumbing. Do not wash or shower.
- Stay away from exterior windows & doors.
- Stay off balconies & porches.
- Do not stay in open garages or car ports.
- Wait 30 minutes after thunder to go outside

Lightning Fatalities by State, 1959-2017



When Thunder Roars, Go Indoors!

FLOODING RAINFALL



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- Slow moving clouds = slow storm motion
- Training cells: rain over same area
- Tall storm clouds with uniform anvil



- Even if your location never floods, access routes may flood which could cut off emergency services
- High water, unseen sinkholes, reptiles, rats, fire ants, contamination, electrical current, sharp objects, etc. are all flood water hazards
- When flooding occurs, go to high ground
- NEVER drive on flooded roadways
- NEVER drive around flood road barricades



Image Terry Brown
My St. Johns Sun

Image Gabe Cox
@tornadotrackers

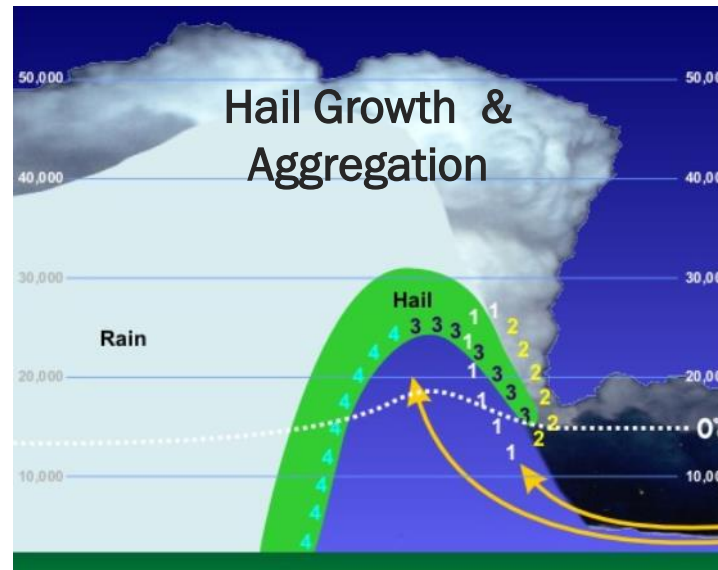


Image Social Media



HAIL

- Grows through aggregation
- Hail \geq 1 inch = Severe Storm
- Stay in shelter, away from windows
- Report hail size if possible



1. Hail forms aloft
2. Stone circulates within storm
3. Strong updrafts keeps stone aloft
4. Once too heavy, descends

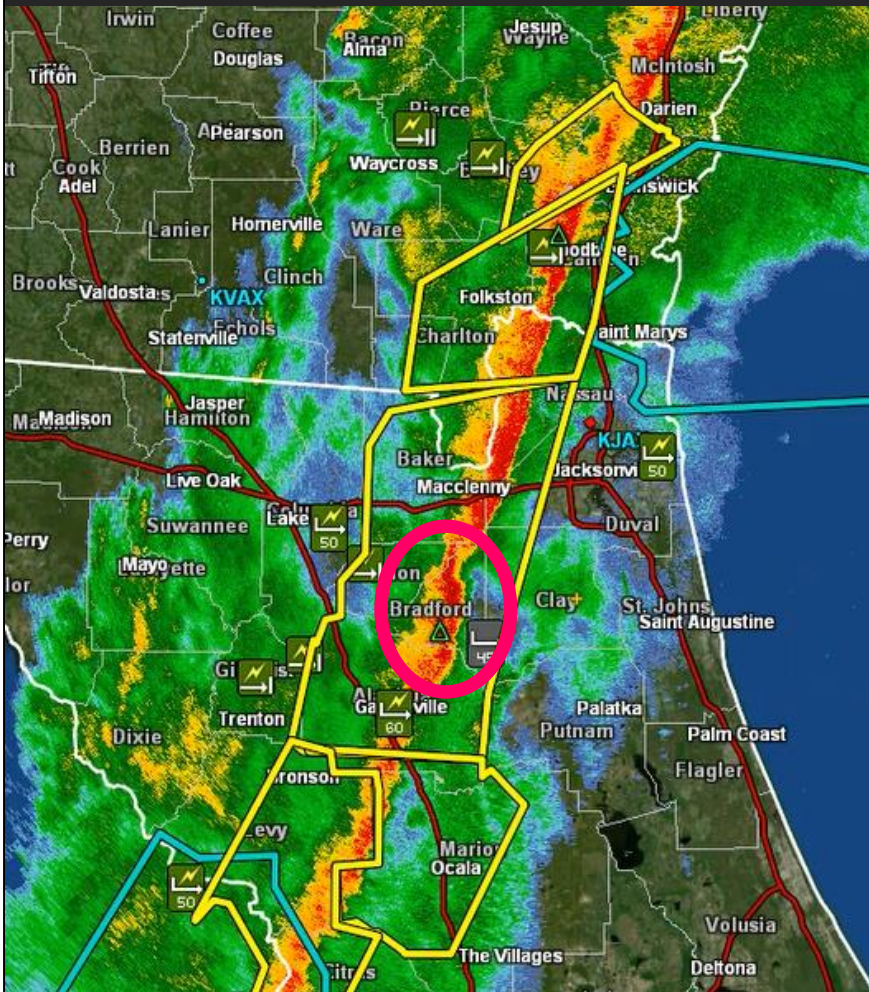
Hail Size Reference Chart

0.25 inches		2.00 inches	
Pea		Lime	
0.75 inches		2.50 inches	
Penny		Tennis Ball	
1.00 inches		2.75 inches	
Quarter		Baseball	
1.50 inches		4.00 inches	
Ping Pong Ball		Softball	
1.75 inches		4.50 inches	
Golf Ball		Grapefruit	

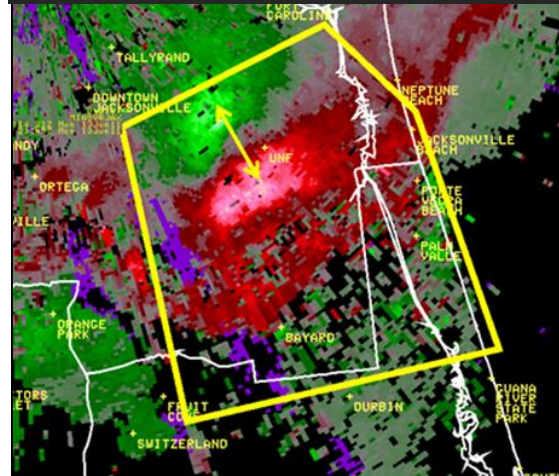
Report the largest size stone
Refer to common object

THUNDERSTORM WINDS - DOWNBURSTS

Squall Line of Thunderstorms
Bow Echoes – leading edge strong wind potential



Divergent Winds Radar Velocity



Shelf Cloud – Leading Edge of Wind Gusts



Indicators of Strong T'storm Wind Potential

- Look for shelf clouds approaching
- Notice rapidly moving low clouds
- Look for fast moving storms or lines
- Bow echo signature
- Look for large storms (large red blobs)
- Trees broken or uprooted in unified direction

Safety Recommendations

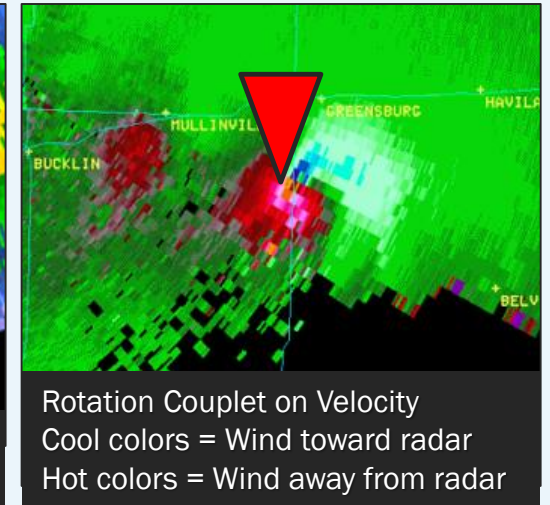
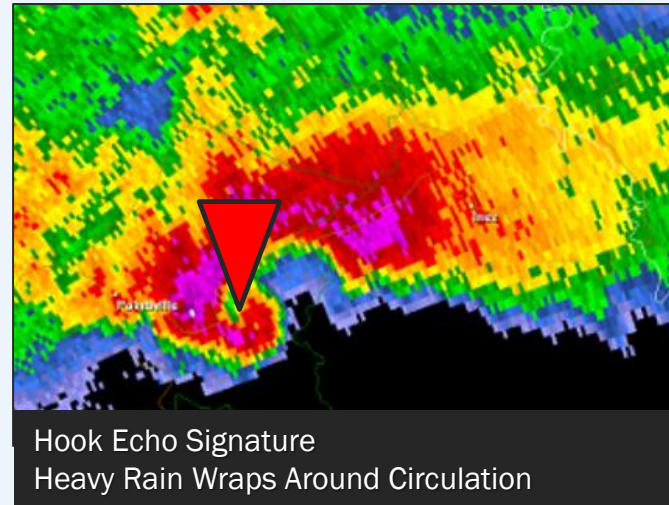
- STAY AWAY FROM WINDOWS!
- Shelter: Lowest floor, anchored strong building
- NOT Shelter: Large open rooms (gym, warehouse)

TORNADOES

- Violently rotating column of air
- Debris becomes projectiles
- Most local tornadoes EF0-EF2
- Don't wait to see it to shelter!
Rain Wrapped Tornado Danger



Tornado Radar Signatures

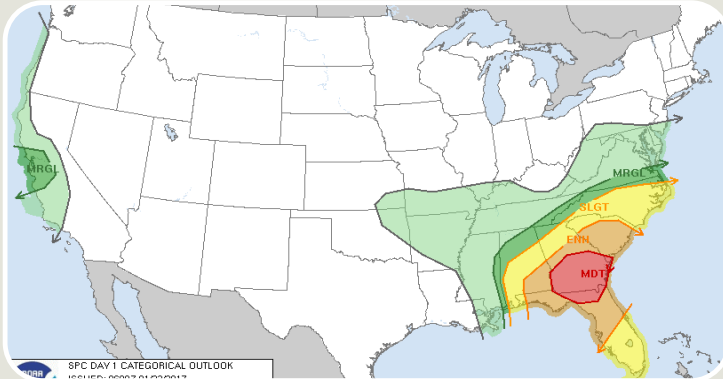


Safety Recommendations

- Shelter on lowest floor of strong structure
- Interior room/hallway – walls between you & outdoors
- STAY AWAY from windows & exterior doors
- Do NOT shelter in large open rooms (gyms, warehouse)
- If cannot drive to safe shelter, crouch down & cover in car
- If car not option, get into low ground, lie flat, cover head

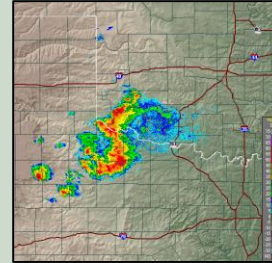


MONITORING FOR LIGHTNING/THUNDERSTORMS



Favorable for Lightning

High Returns (RED)+
Intensification +
Approaching =
HIGH Lightning Threat



Favorable for Lightning



Forecasts

Today



20%

Partly Sunny
then Slight
Chance
T-storms

High: 83 °F

- Are storms in the forecast?
- SPC Outlooks
- Even if low chances, there still a chance!

Radar

- Monitor Radar trends
- Choose Radar App & Enable GPS

Unfavorable for Lightning



Weak Returns +
No intensification =
LOW Lightning Threat

Scan the Sky

- Look for tall cumulus clouds
- Look for very dark cloud bases
- Look for crisp cloud texture

Unfavorable for Lightning



SEVERE WEATHER ALERTS

Many counties offer free text, phone call & email alerts if you are within a warning –

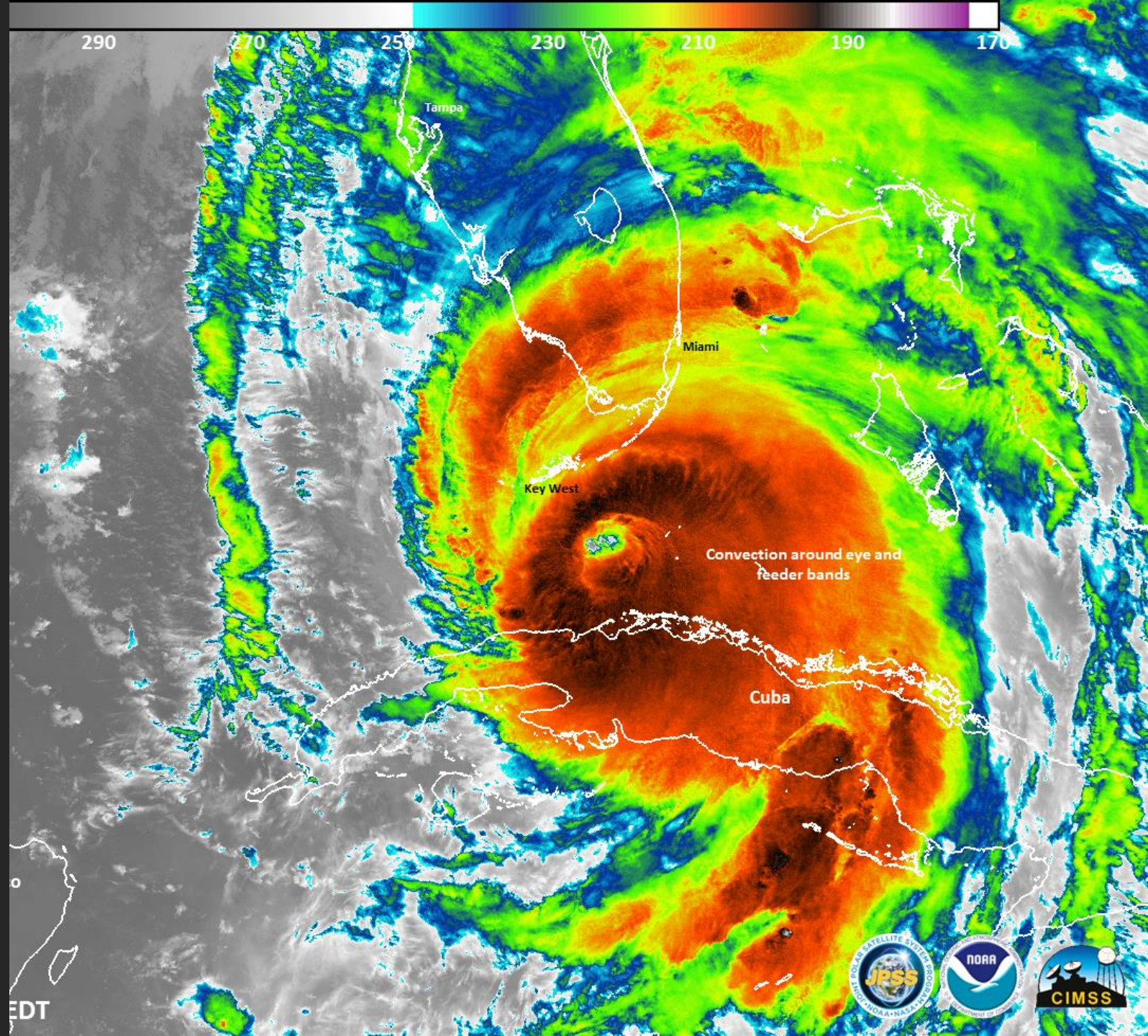
Visit your county Emergency Management website!



Have multiple ways to get warnings weather.gov



TROPICAL HAZARDS





TROPICAL THREATS



Storm Surge



Winds



Tornadoes



Flooding Rainfall



Coastal Threats:

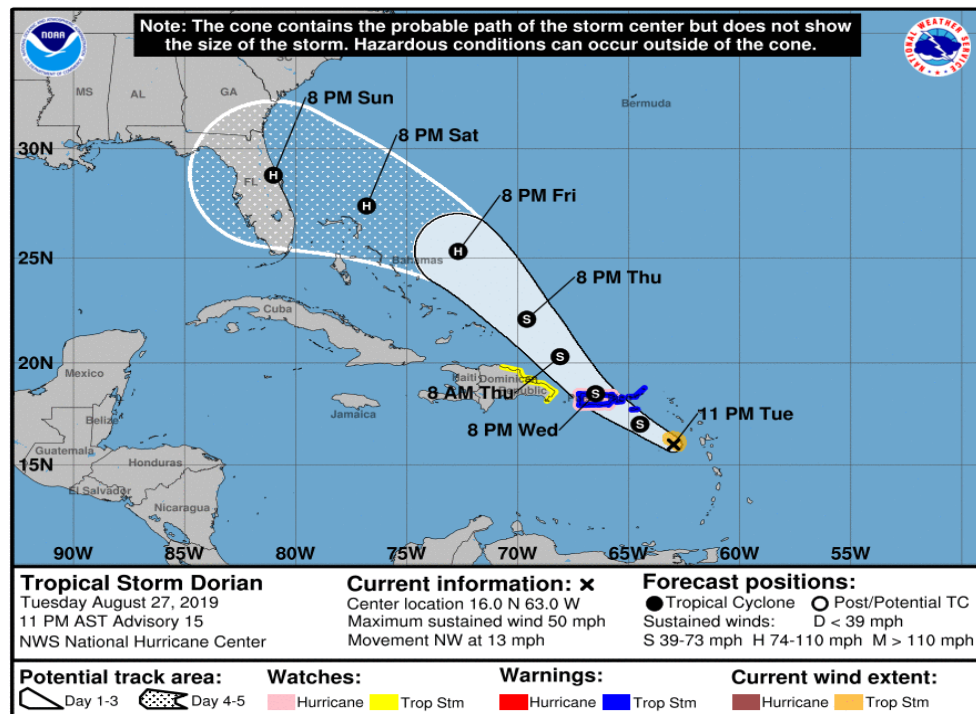
Rip Currents, Erosion, Hazardous
Marine Conditions

TROPICAL FORECASTS

National Hurricane Center

nhc.noaa.gov

- Forecast for the Tropical Atlantic Basin
- Focus on storm scale forecast – strength, track, size



National WEATHER SERVICE OFFICES

weather.gov

weather.gov/jax

- Downscales NHC forecast for local area - IMPACTS
- Issues local forecast, watch & warning products
- Works with local Emergency Response

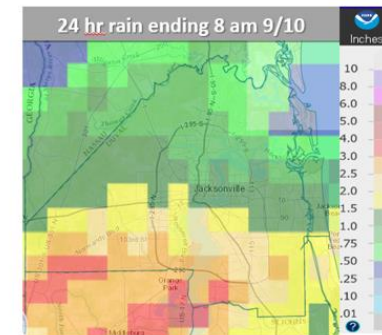
Potential Flooding Rainfall Impact: **Extreme**

Flash Flood Watch in Effect

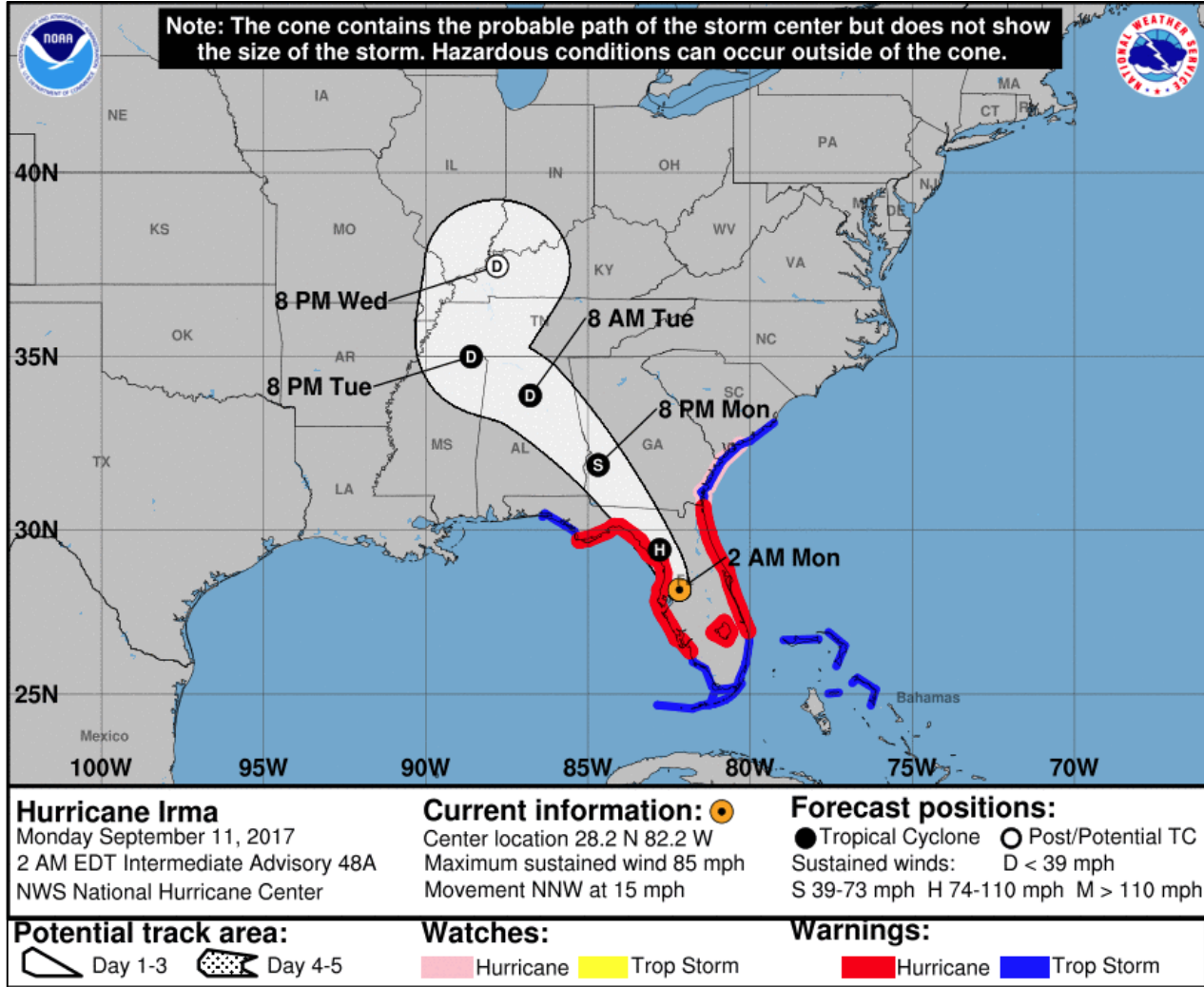
- Rainfall Total through Monday night:**
 - Widespread: 10-15 inches
 - Higher toward coast, up to 20 in.
- Vulnerable Flash Flood Areas:**
 - McCoys, Hogans, Moncrief Creeks
 - Atlantic & JAX Beach

EXTREME RAINFALL POTENTIAL IMPACTS:

- Prompt numerous evacuations & rescues.
- Rivers & tributaries may overflow their banks
- Streams, creeks, canals, and ditches raging rivers.
- Flood control systems/barriers become stressed.
- Flood waters can enter numerous structures.
- Places where flood waters cover escape routes.
- Streets & parking lots become rivers.
- Some underpasses submerged.
- Very dangerous driving conditions.
- Numerous road & bridge closures with some weakened or washed out.

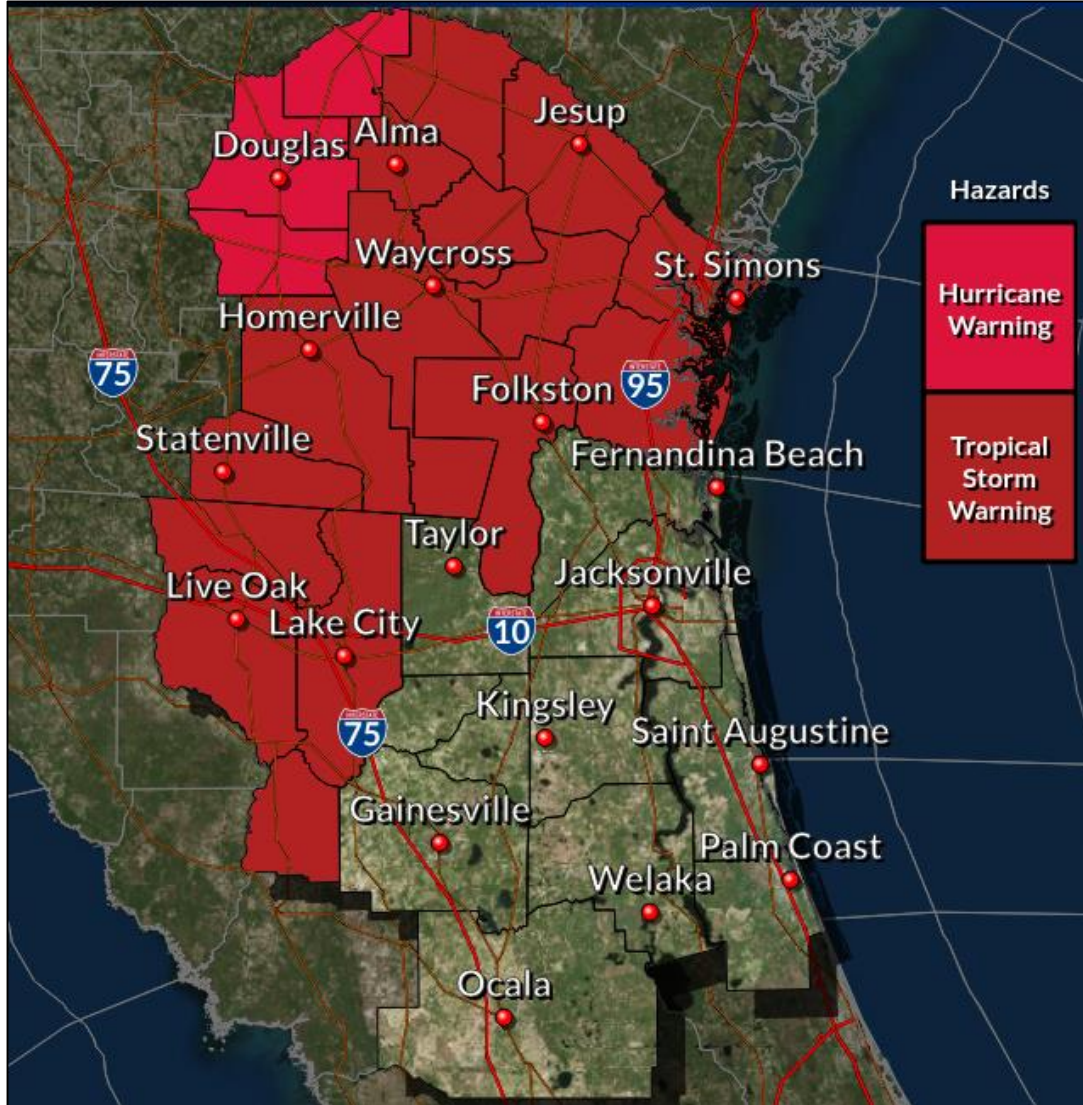


NATIONAL HURRICANE CENTER – TRACK FORECAST



- Forecast Track aka Forecast “Cone”
- Forecast for CENTER of storm
- Impacts felt well outside of cone!

TROPICAL WATCHES & WARNINGS – FOCUS ON TIMING & IMPACTS



Watch: *Possible* within 48 hrs

Warning: *Expected* within 36 hrs



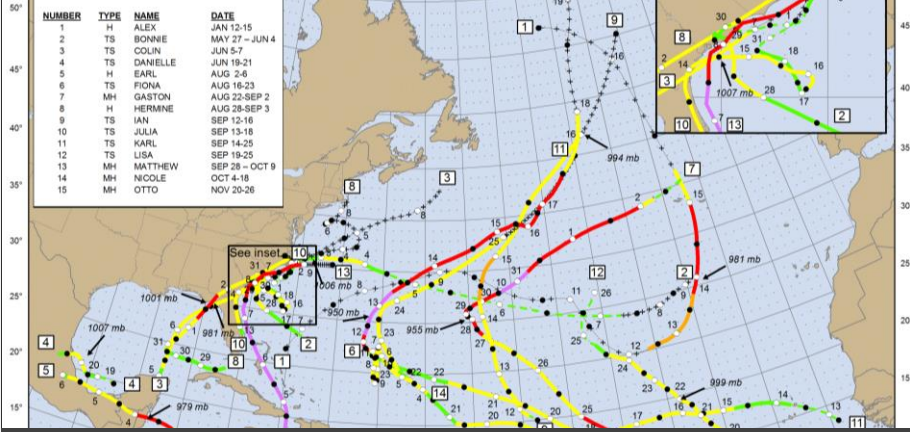
Hurricane Warning

Hurricane force winds within 36 hrs
Sustained winds \geq 74 mph



Tropical Storm Warning

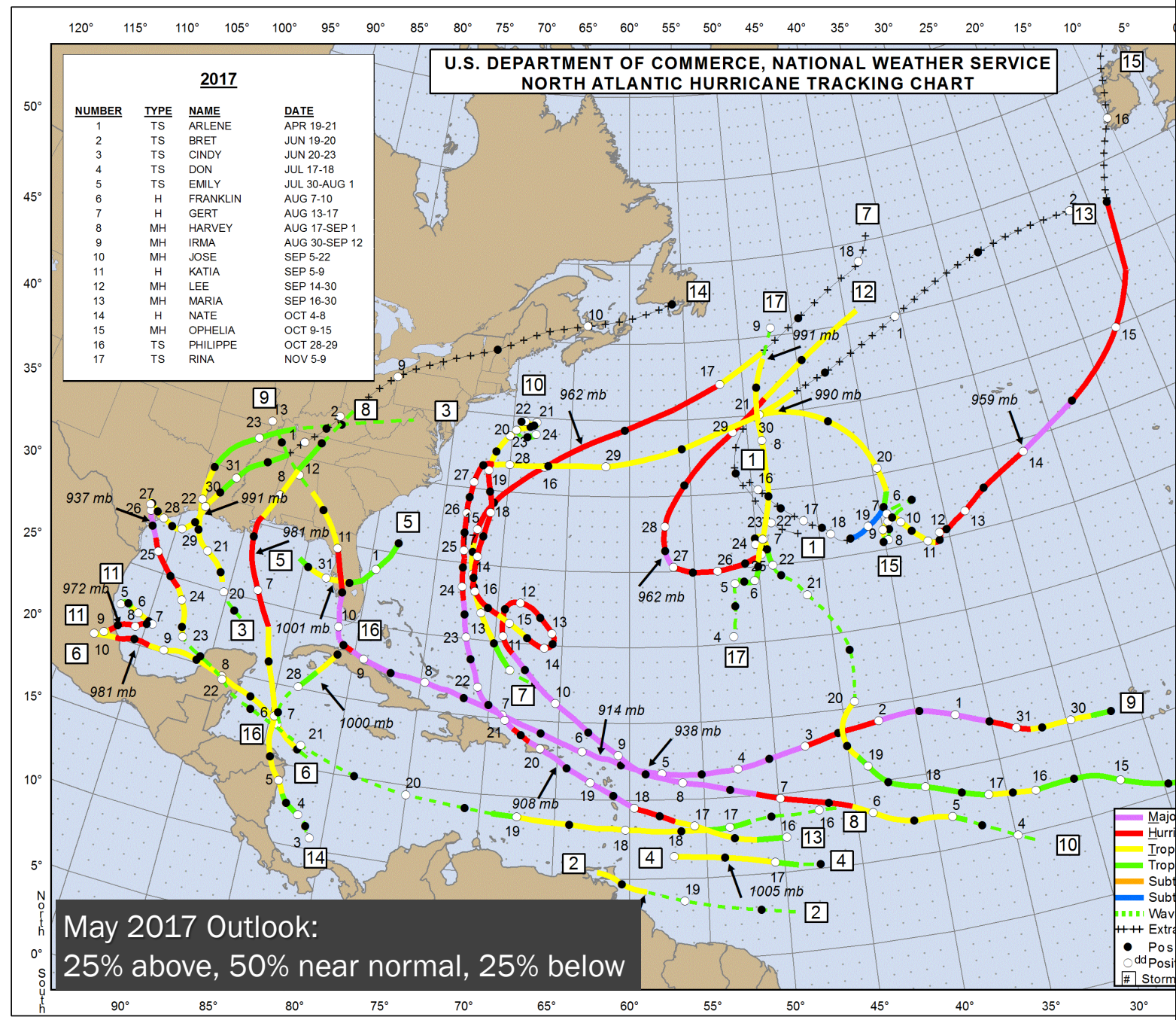
Tropical Storm force winds within 36 hrs
Sustained Winds \geq 39 mph



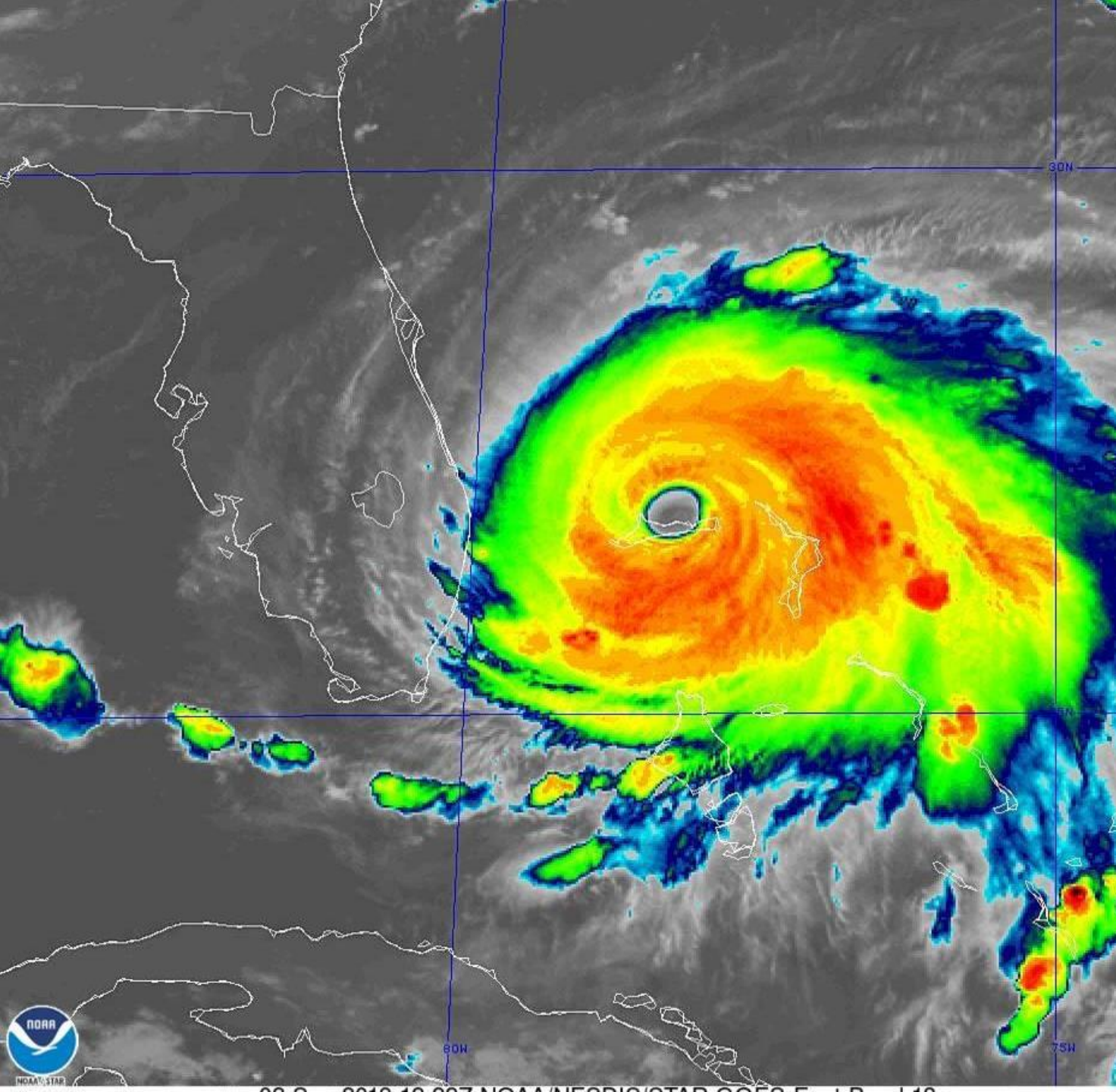
May 2016 Outlook:
30% above, 45% near normal, 25% below

OUTLOOK CAUTION

- Outlooks do not predict landfalls
- Takes one local storm to be a 'bad' year
- Do NOT base preparedness on outlook



May 2017 Outlook:
25% above, 50% near normal, 25% below



MONITOR THE TROPICS RESPONSIBLY

- ☞ **Seasonal Outlooks**
It Only Takes One!
Don't base preparedness on Outlooks
- ☞ **National Hurricane Center**
Storm Forecast: nhc.noaa.gov
- ☞ **National Weather Service Jacksonville**
Local Storm Impacts: weather.gov/jax
Monitor Daily Briefing



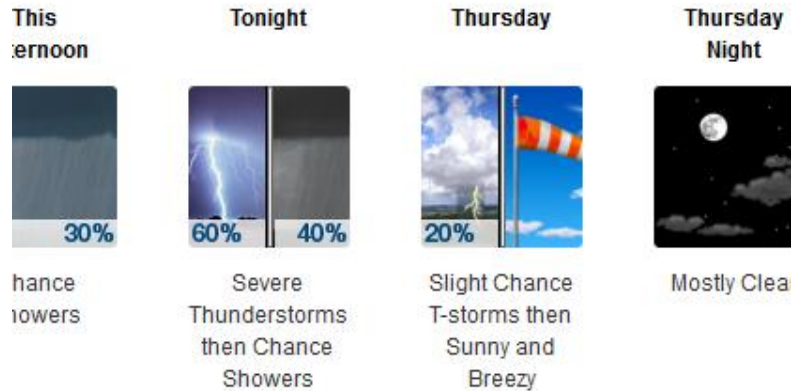
OTHER WEATHER TO REPORT

- Dense Fog – Visibility < $\frac{1}{4}$ mile
- Tidal Flooding & Beach Erosion
- Winter Weather – Snow, Sleet, Freezing Rain



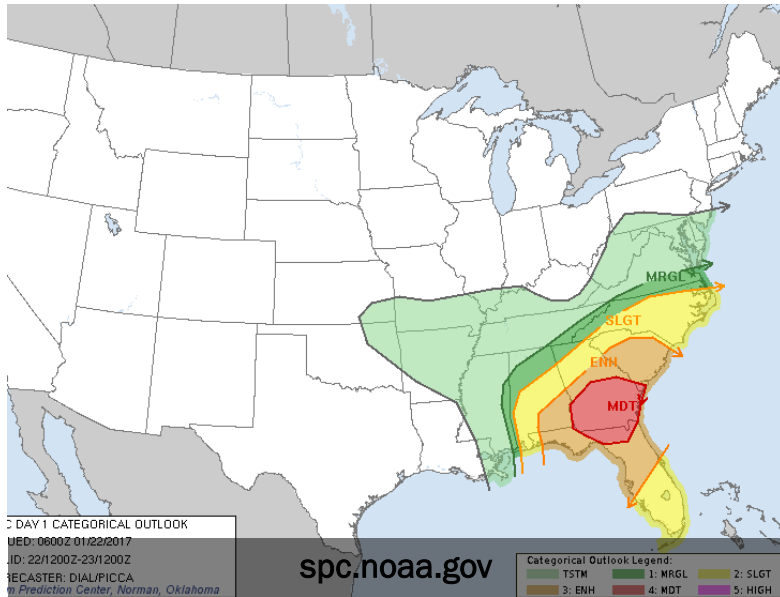
3 inches snow
Hazlehurst, GA
Alison Byczkoski

Forecast for SSW Hazlehurst GA

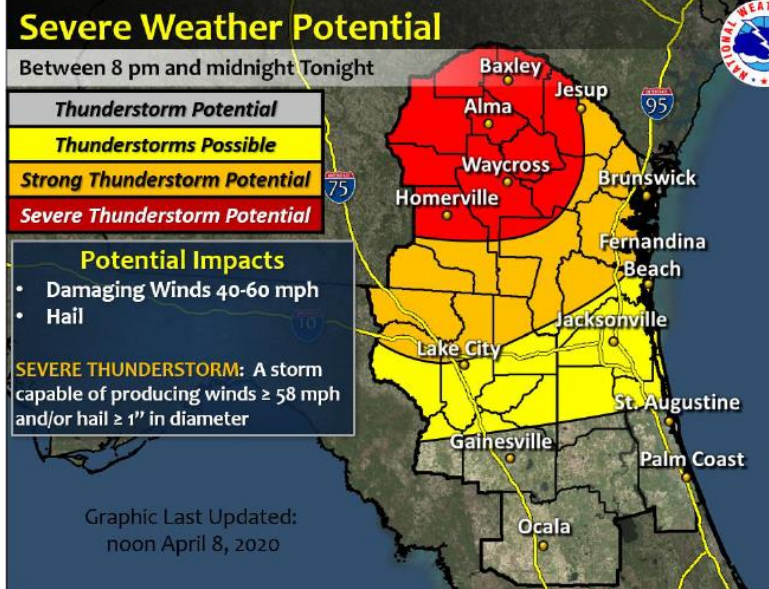
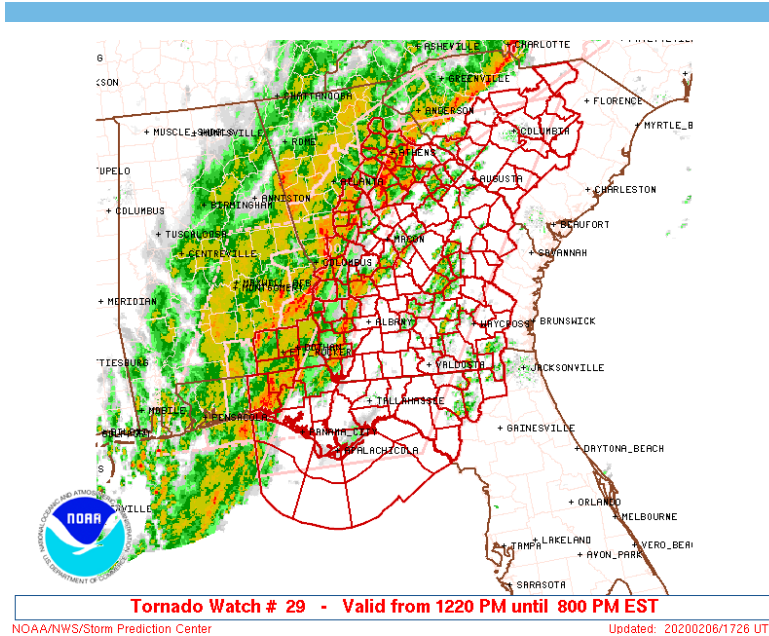


High: 86 °F Low: 68 °F High: 88 °F Low: 57 °F

weather.gov/jax



spc.noaa.gov

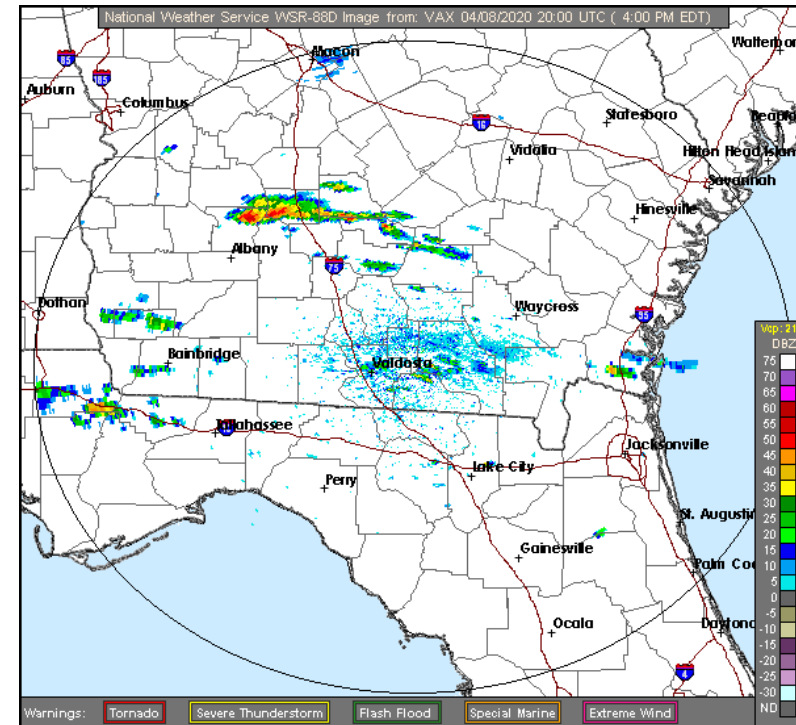
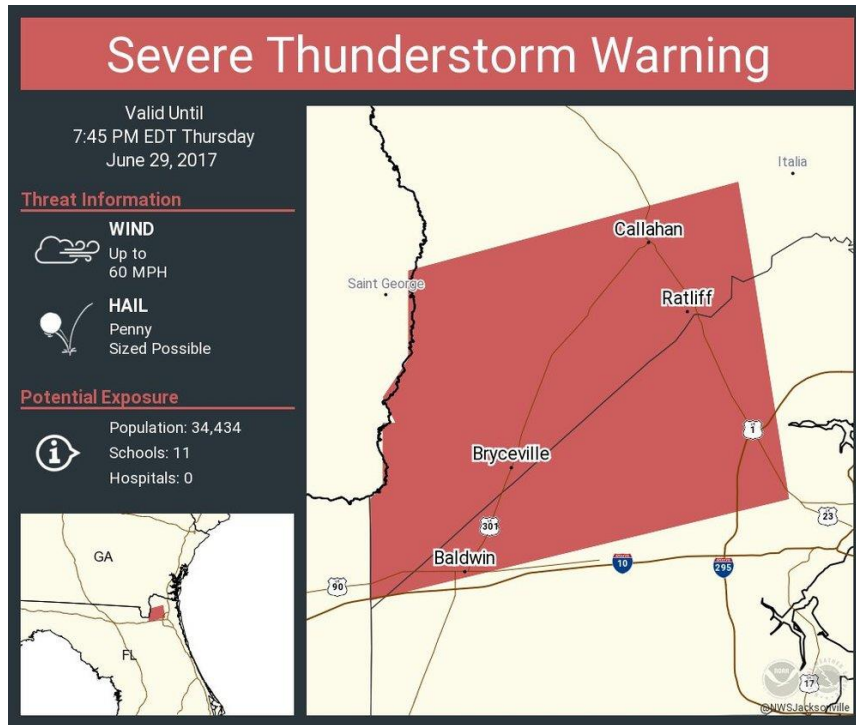


WEATHER MONITORING TOOLS

- WEATHER.GOV/JAX
- Forecasts & Briefings
- Be cautious of unofficial weather sources

NWSJacksonville



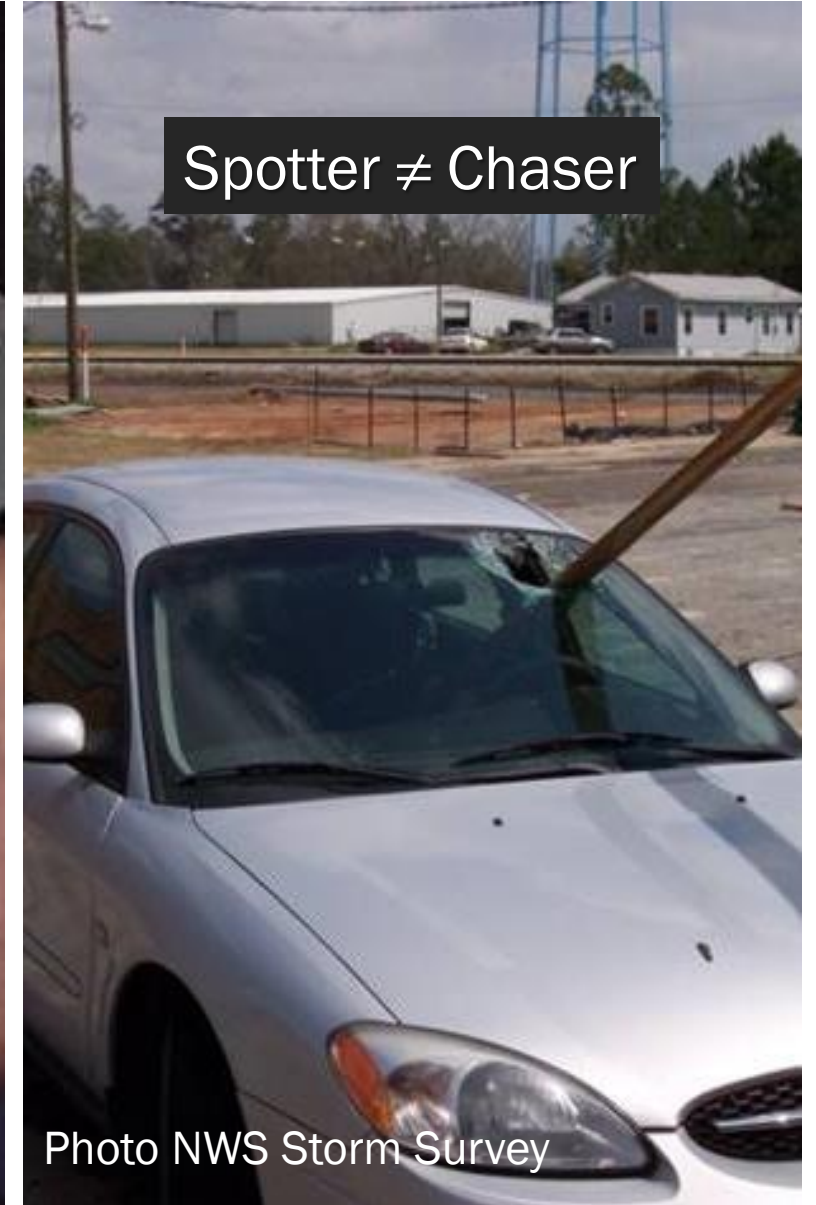


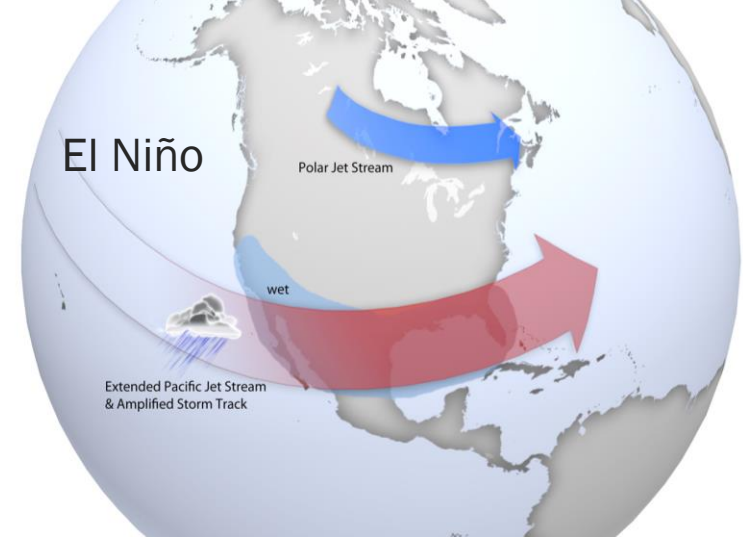
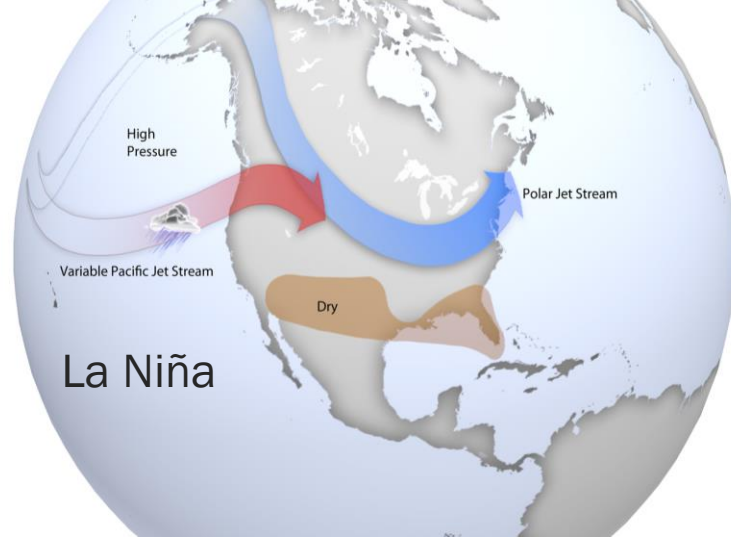
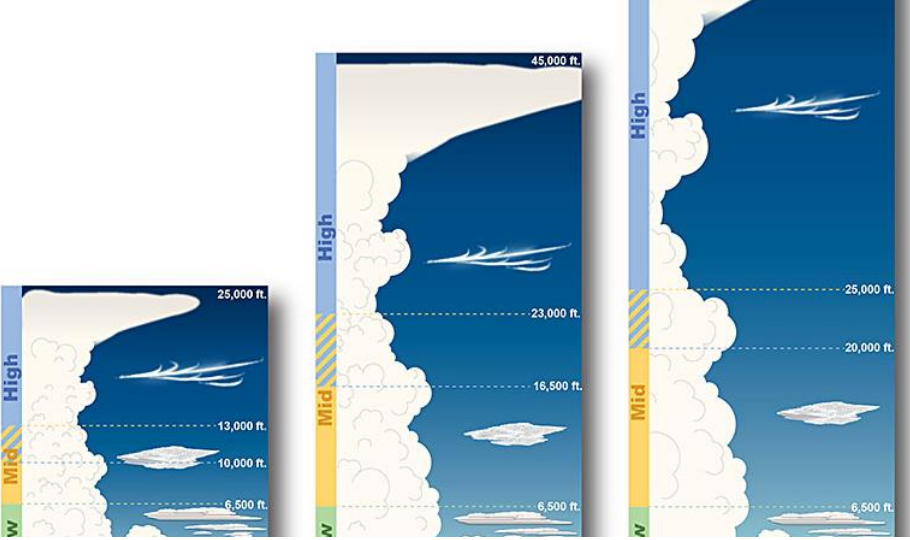
WEATHER MONITORING TOOLS

- During the Event Monitor for Watches & Warnings
- Relay Storm Reports & Images

RELAYING REPORTS

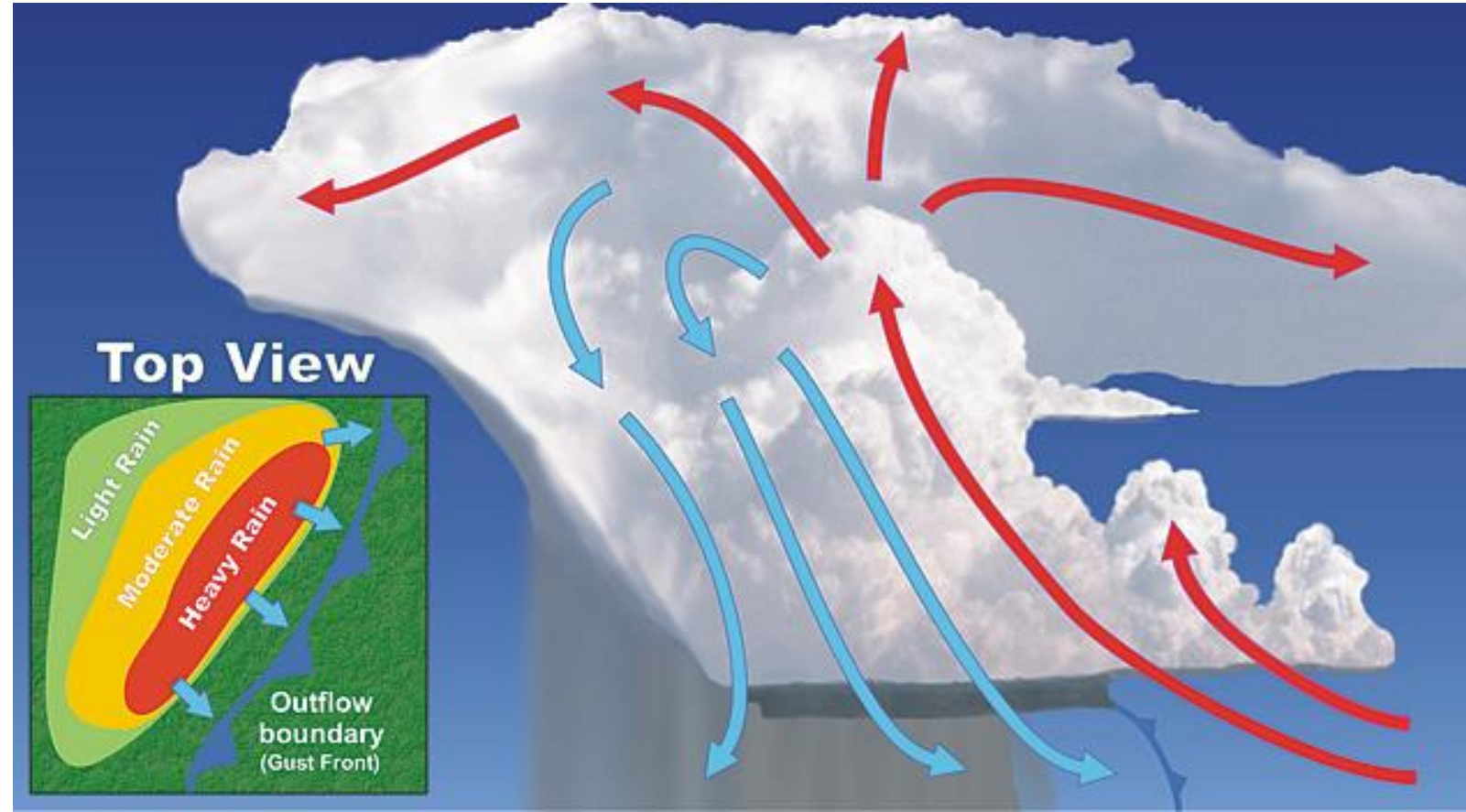
- Your Safety is ALWAYS #1
- Ways to Report:
 - **800-499-1594 ext. 1**
 - Pictures: Facebook & Twitter
 - Online Report Form
- High Priority to Report:
 - Tornado/waterspout reports
 - Wind Damage
 - Hail reports
 - Flooding

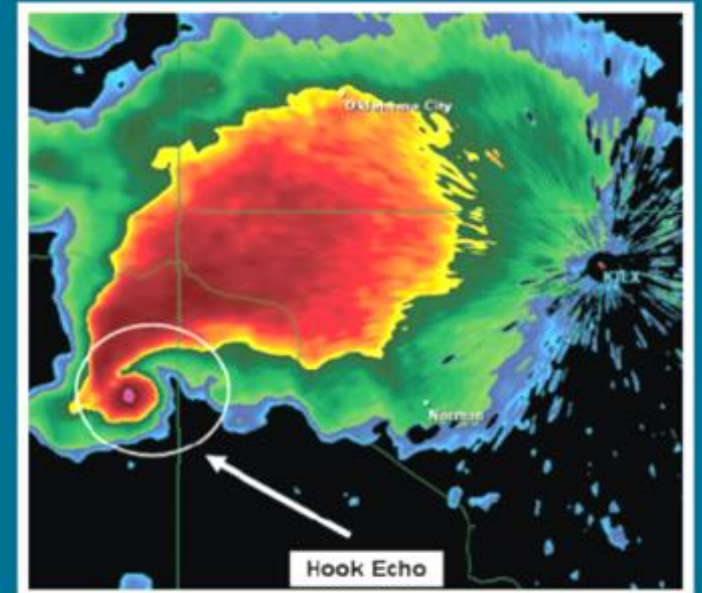




ADDITIONAL EDUCATIONAL RESOURCES

- weather.gov/learning
- NWS Storm Spotter Field Guide
- MetEd Online Spotter Classes
meted.ucar.edu





THANK YOU FOR JOINING OUR TEAM!

Angie Enyedi
angela.enyedi@noaa.gov

