



# **Weather101:**

## **Flash Flooding: The #1 Severe Weather Threat**

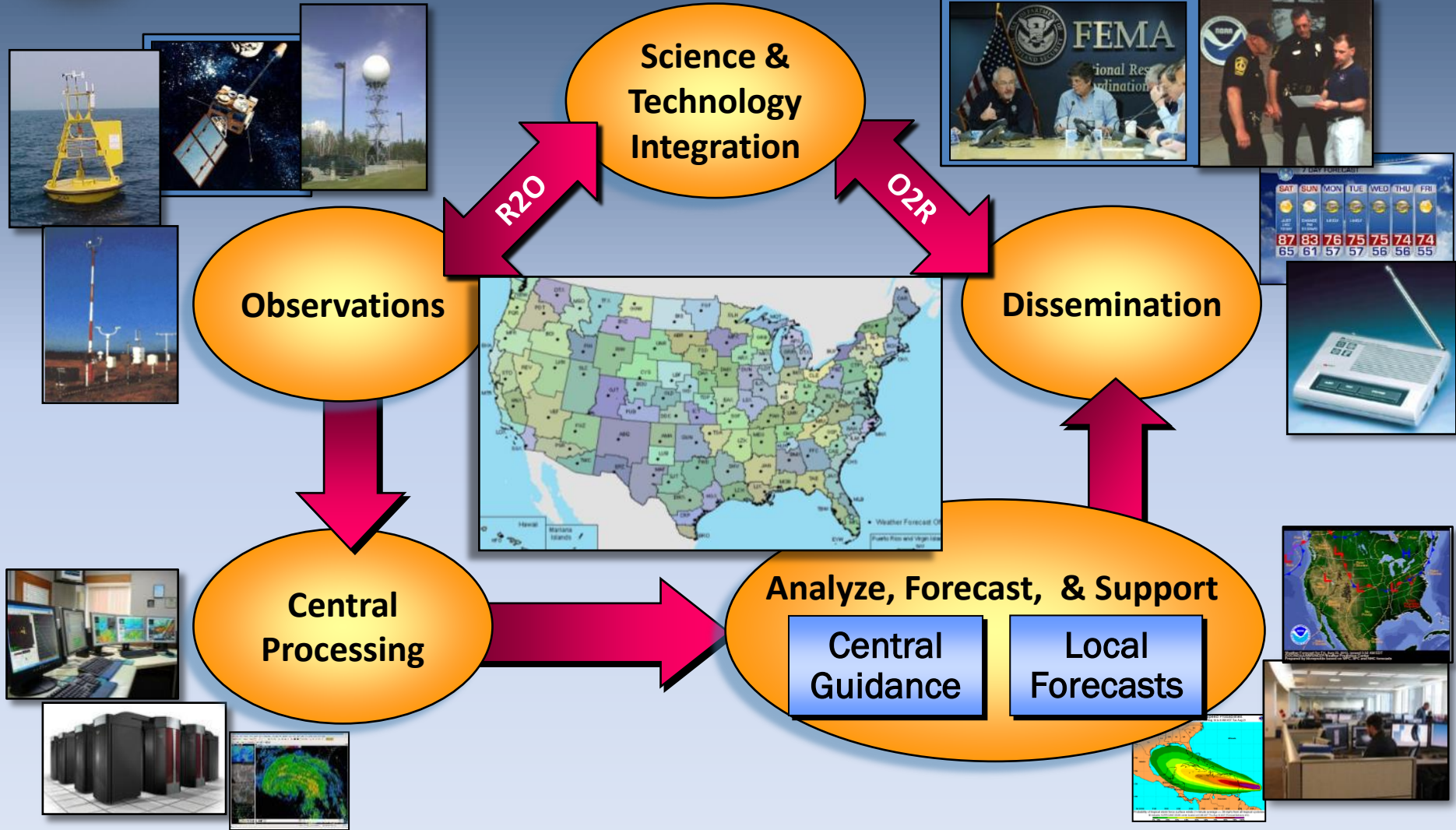
**Faith Borden – Meteorologist**

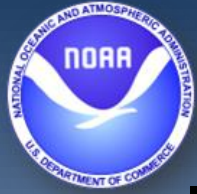
U.S. Department of Commerce  
National Oceanic and Atmospheric Administration  
National Weather Service – Nashville, TN



# National Weather Service Operations

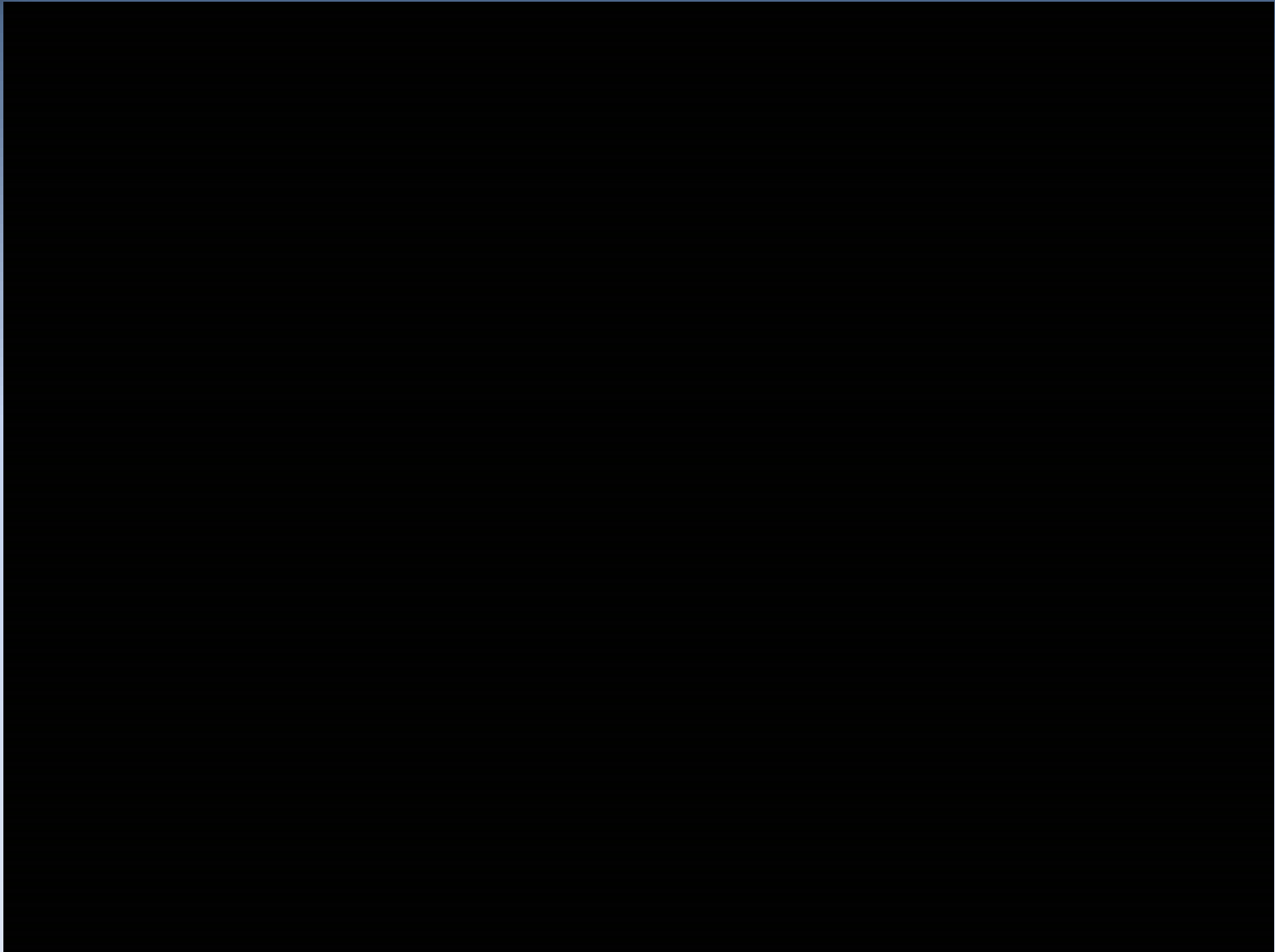
*mission: protect life and property*





# The NWS

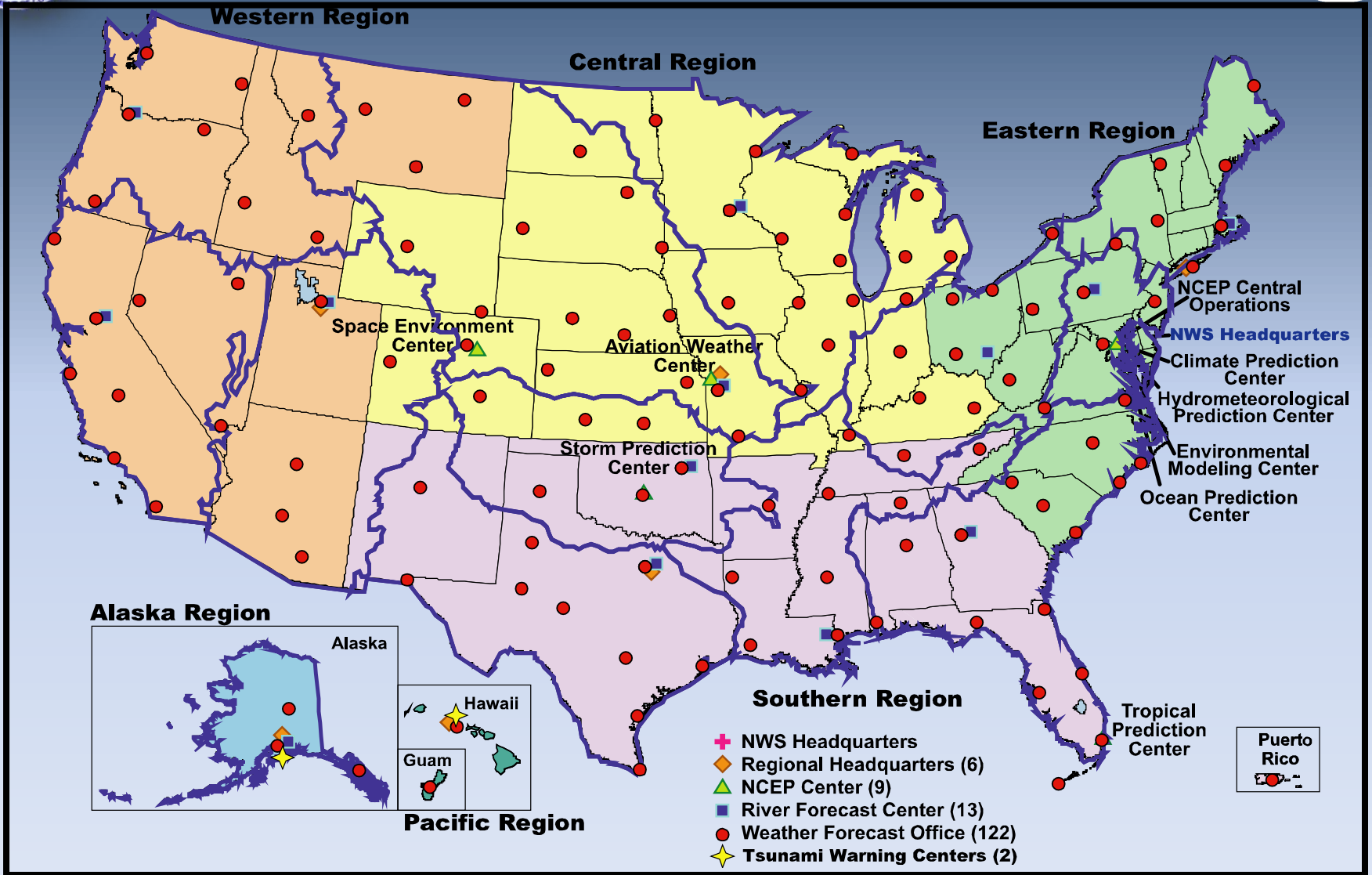
<https://youtu.be/V2yR7l14Kuw>





# NWS Offices

## 122 Weather Forecast Offices (WFOs)







# WHO ARE WE?

**U.S. Government**

**Dept. of Commerce**

**NOAA**

**National  
Weather  
Service**

**NESDIS**

**NOAA  
Research**

**Ocean  
Service**

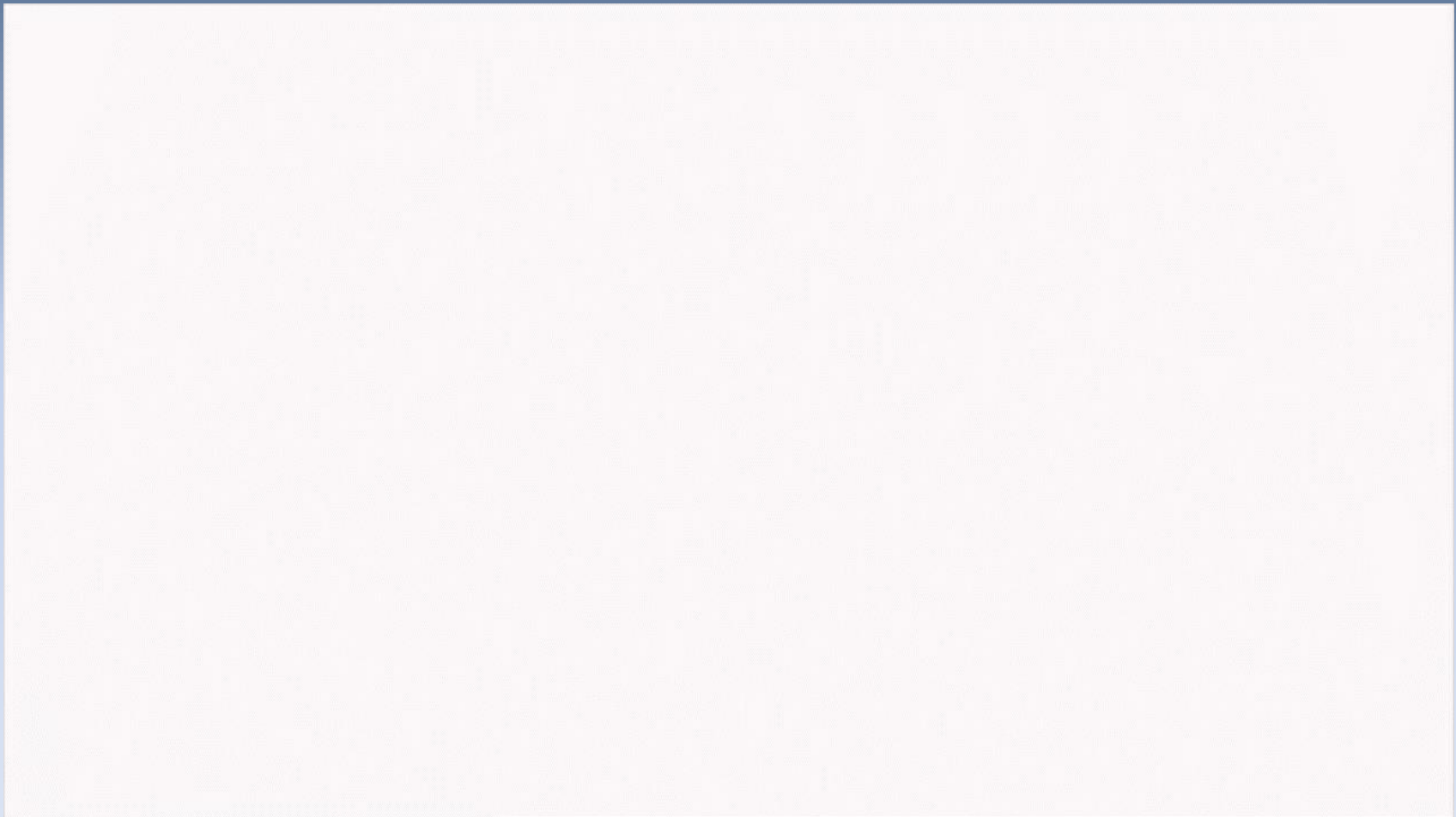
**Fisheries**

**Marine and  
Aviation  
Operations**



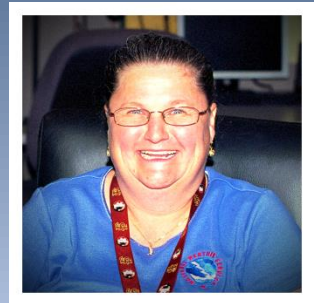
# Turn Around Don't Drown

<https://youtu.be/ZbzDo5A5yH0>





# YOUR TOUR GUIDE



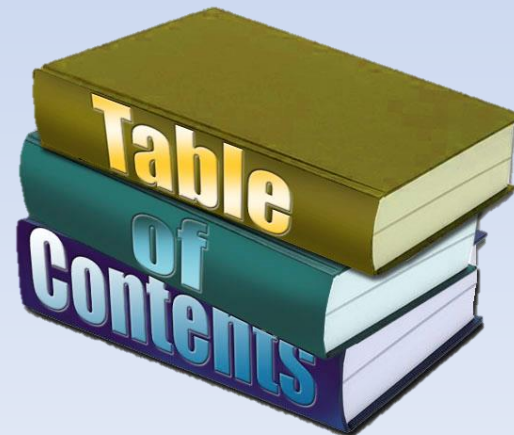
Locations I have  
Worked

- Anchorage, AK
- Albuquerque, NM
- Miami, FL
- Birmingham, AL
- Las Vegas, NV
- Charleston, WV
- Nashville, TN



# Content

- Causes – River Flooding vs Flash Flooding
- Case Studies
- What Goes Through A Forecaster's Mind
- NWS Flood Products – what does it all mean?
- CoCoRaHS





# (River) Flood vs. Flash Flood

- River Flood – over a longer period of time
  - Typically have time to prepare and evacuate
- Flash flood – happens very quickly with a rapid rise of water
  - Generally a few minutes to 6 hours or less
  - It doesn't even need to be raining over the direct area to get flash flooding





# Types of Flooding



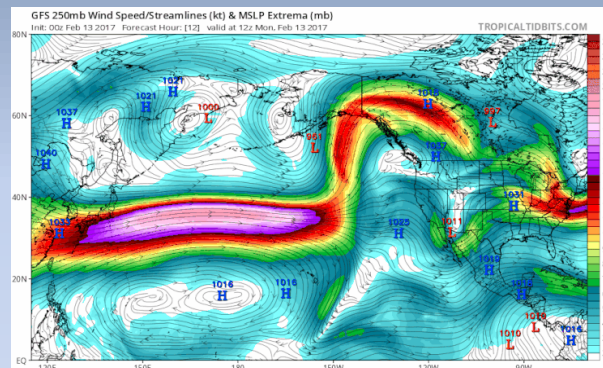
<https://youtu.be/8icc9jR6uWo>





# Types of River Flooding

- Heavy rain over a long period of time
  - **Atmospheric River** (becoming a big jargon word)
    - i.e. Pineapple Express
  - Overflowing Rivers
  - **Dam Break (typically considered flash flooding)**
  - Snow Melt
  - Storm Surge (strong winds from hurricanes)





# Flash Flooding



<https://youtu.be/OilAJM78ZN4>

## THE FLASH FLOOD

A 3D SIMULATION BY;  
alicknyangulu@gmail.com

A 2013 Visualisation.  
ALL RIGHTS RESERVED.





# Debris Flow From Flash Flooding

<https://youtu.be/Pvx5VMasOJQ>





# Question

- What is an example of River Flooding?
- A. Typical summertime thunderstorm over a poor drainage area
- B. Atmospheric River
- C. Runoff from a mountainous area
- D. Dam break







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# Quiz Question

- What is an example of Flash Flooding?
  - A. Dam break
  - B. River out of its bank because it has been raining for such a long period of time and the water has nowhere else to go
  - C. Snow melt/ice jam
  - D. Storm surge from a tropical system





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# Case Study – March 27<sup>th</sup>-28, 2021

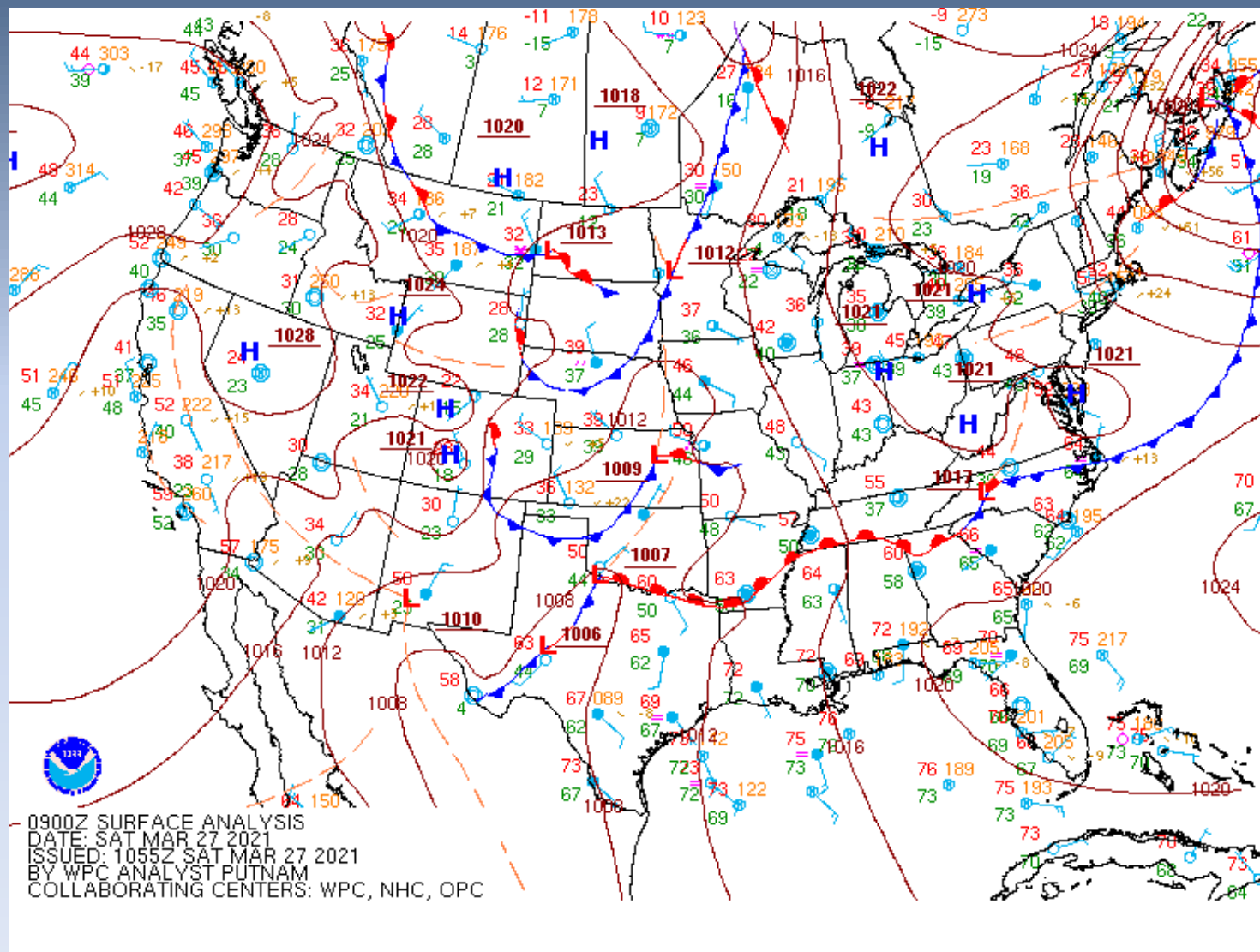
## Middle TN – Nashville Metro & Surrounding

- Background Information:
  - Stationary/Warm Front stalled along I-40 and thunderstorms trained along the front
    - In addition to several rounds of heavy rainfall, large hail up to half dollar to tennis ball size and frequent lightning occurred
  - A flash Flood Emergency was issued for southern and eastern Nashville Metro Area, including SE Davidson County, W Wilson County, N Williamson County
    - 7-9” of rain fell causing rapid rises on creeks and streams including: Sevenmile Creek (reached highest level on record), Brown Creek, and Mill Creek
    - Over 500 homes and businesses were flooded, with reports of people trapped in attics or on roofs of houses
    - Dozens of roadways were impassible, including both I-4 and I-40
    - 6 deaths occurred: 4 Davidson County, 1 Cheatham County, 1 Maury County
- Worst Flooding since May 1-2, 2010



# Animated Surface Weather Map

## Saturday March 27<sup>th</sup>- Sunday 28<sup>th</sup>, 2021

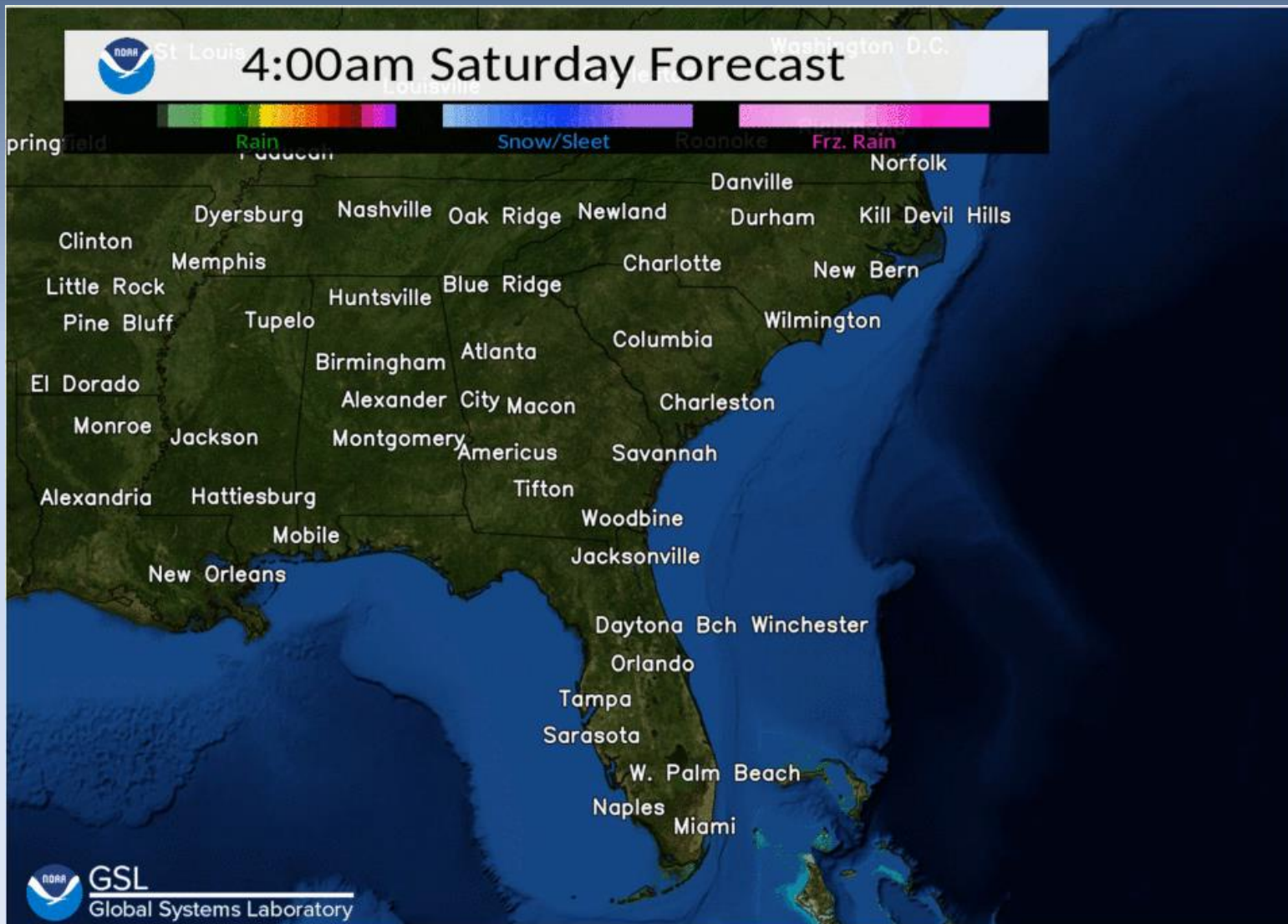






# Radar Imagery

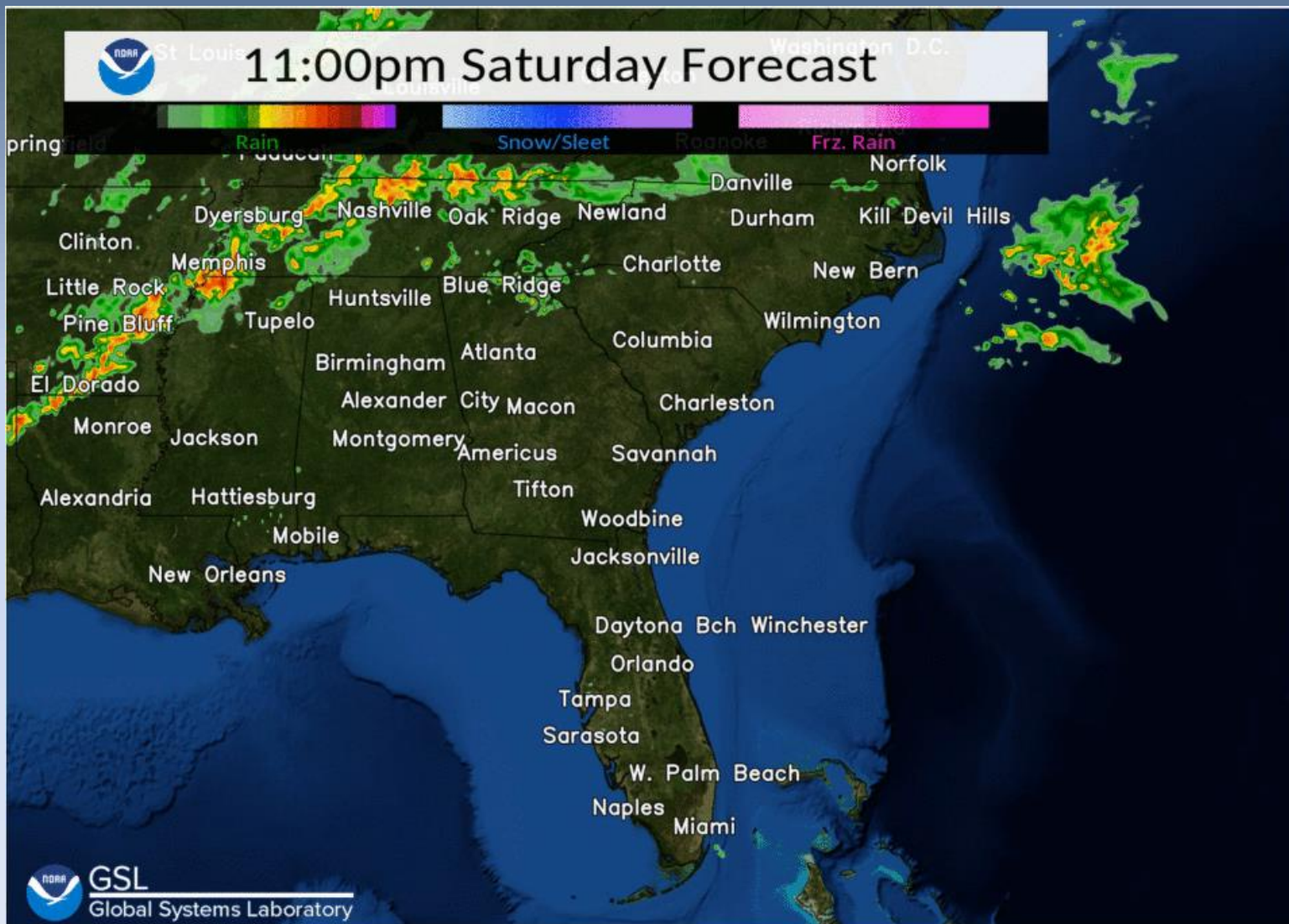
March 27<sup>th</sup> 4 am – March 27<sup>th</sup> 10 pm





# Radar Imagery

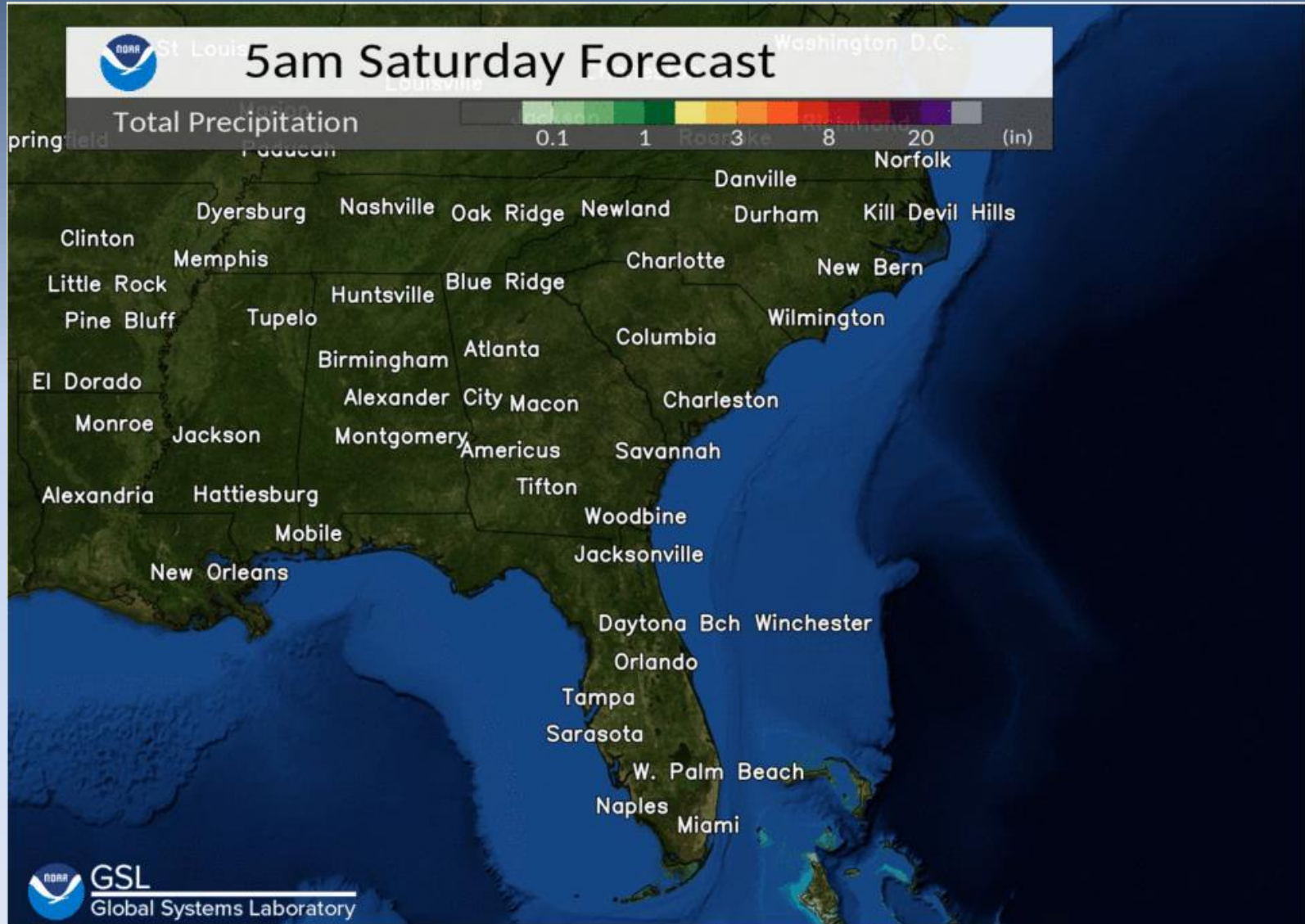
March 27<sup>th</sup> 11pm – March 28<sup>th</sup> 9 am





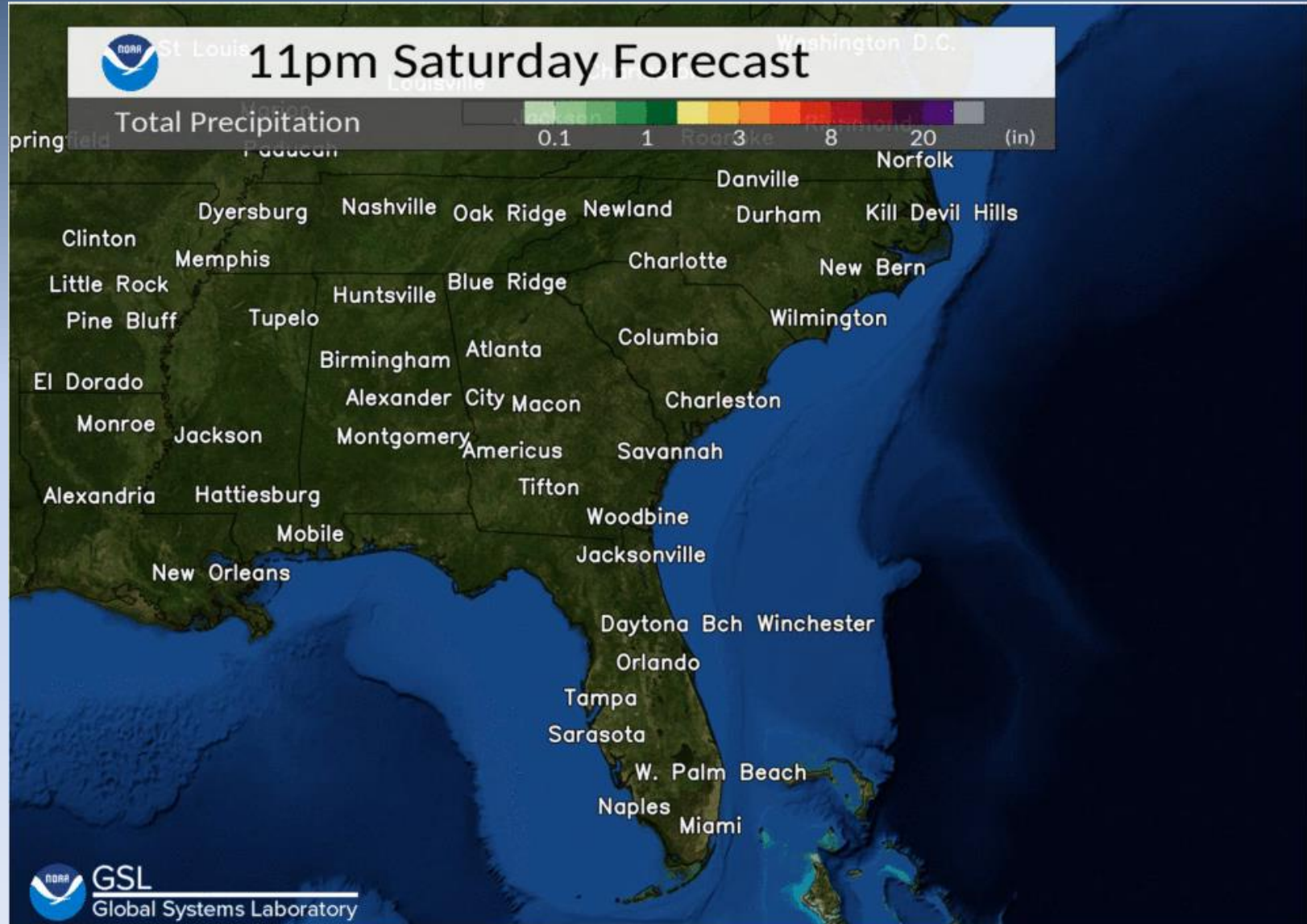


# Quantitative Precipitation 5 am Saturday – 11 pm Saturday





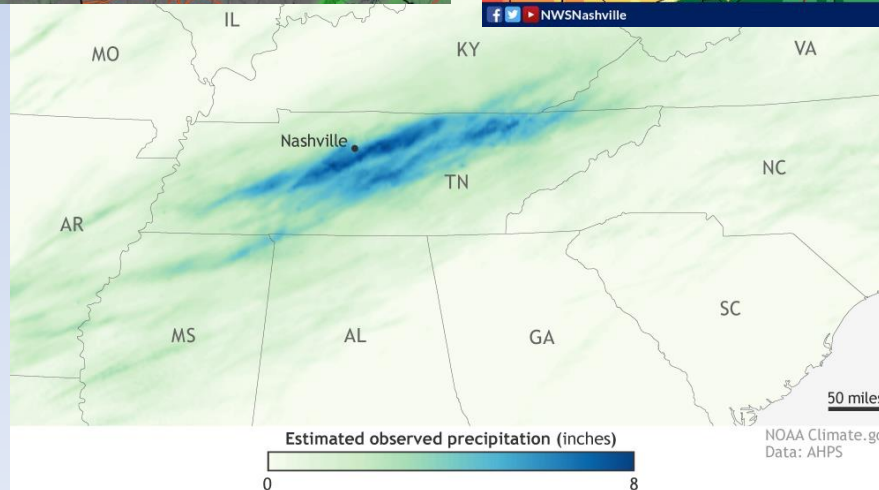
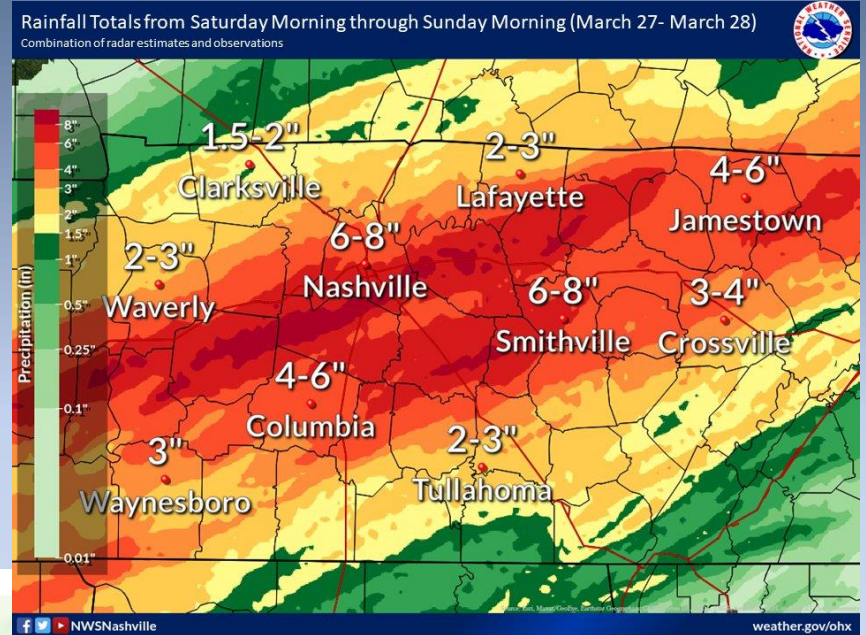
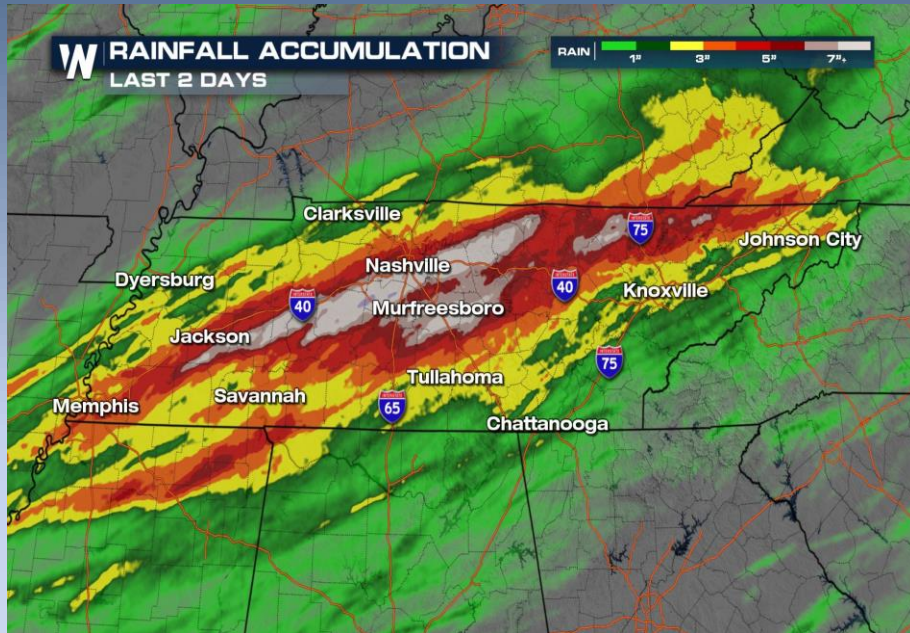
# Quantitative Precipitation 11 pm Saturday – 5 pm Sunday







# Two Day Rainfall Totals March 27<sup>th</sup>-28<sup>th</sup>







# Rainfall Amounts

...Measured Rainfall from Saturday, March 27 through Sunday March 28...

Repeated rounds of very heavy rainfall caused widespread flooding issues in many areas across Middle Tennessee from Saturday morning, March 27th, through Sunday morning March 28th. Below are some of the highest measured rainfall totals during that time period. Amounts are in inches.

Location	Amount	Source
Franklin	8.65	CoCoRaHS
Clarkrange	8.41	CoCoRaHS
Brentwood	8.16	CoCoRaHS
Elmwood	7.80	CoCoRaHS
Fairview	7.83	CoCoRaHS
Centerville	7.76	CoCoRaHS
Christiana	7.28	CoCoRaHS
Hermitage	7.16	CoCoRaHS
Lebanon	7.05	CoCoRaHS
Nashville Int Airport	7.01	ASOS
Murfreesboro	7.00	CoCoRaHS
Mount Juliet	6.88	CoCoRaHS
Rock Vale	6.85	CoCoRaHS
Belle Meade	6.73	CoCoRaHS
Jamestown	6.59	CoCoRaHS
Carthage	6.32	OHX COOP
Cookeville	6.21	CoCoRaHS
Lobelville	6.20	OHX COOP
Spring Hill	5.98	CoCoRaHS
Woodbury	5.88	CoCoRaHS
Monterey	5.67	OHX COOP
Pickett State Park	5.60	OHX COOP
Cookeville	5.45	OHX COOP
Allardt	5.39	OHX COOP
Smithville 2 SE	5.30	OHX COOP
Gallatin	5.22	CoCoRaHS
Dickson	5.26	CoCoRaHS
Livingston	5.12	CoCoRaHS
Byrdstown	5.09	CoCoRaHS



# Peak Historic Flood Crests



...March 28, 2021 and Peak Historical Flood Crests...

All data and rankings shown below are provisional and subject to revision. Each site will have the name, period of record, and a few of the historical crests as well as the recent crests on March 28.

Harpeth River near Kingston Springs (1926 to present)

46.00 feet on May 2, 2010  
35.36 feet on March 28, 2021  
32.20 feet on January 7, 1946

Harpeth River at Bellevue (1921 to present)

33.23 feet on May 2, 2010  
24.34 feet on February 13, 1948  
23.29 feet on March 28, 2021  
22.30 feet on March 23, 1929

Harpeth River at Franklin (1975 to present)

35.32 feet on May 2, 2010  
33.65 feet on March 13, 1975  
31.00 feet on March 28, 2021

Sevenmile Creek at Blackman Road (1965 to 2004, 2011 to present)

15.09 feet on March 28, 2021  
10.80 feet on November 7, 2017  
10.57 feet on June 4, 1998  
\* No data for 2010

Mill Creek at near Woodbine (1965 to present)

21.77 feet on May 1, 2010  
20.85 feet on March 28, 2021  
20.63 feet on May 4, 1979

Browns Creek at State Fairgrounds (1964 to 1975, 1993 to present)

13.44 feet on May 2, 2010 (8540 cfs)  
12.72 feet on March 28, 2021 (6890 cfs)  
11.13 feet on August 21, 2017 (4810 cfs)  
10.51 feet on February 6, 2019 (4180 cfs)

\* to raise the water level from around 10 feet to 13 feet the flow is doubled (double the water)

Richland Creek at Charlotte Ave (1965 to 1990, 1994 to present)

19.99 feet on May 2, 2010  
14.79 feet on March 28, 2021  
13.48 feet on September 1, 2017

East Fork Stones River near Lascassas (1952 to 1958, 1963 to 2008, 2013 to present)

39.48 feet on March 13, 1975  
37.97 feet on September 4, 1986  
36.92 feet on March 28, 2021

West Fork Stones River at Murfreesboro (1973 to 1981, 1986 to present)

23.80 feet on March 13, 1975  
23.23 feet on March 15, 1973  
23.05 feet on March 28, 2021  
22.92 feet on October 17, 1975  
22.89 feet on January 23, 1999  
22.21 feet on May 3, 2010

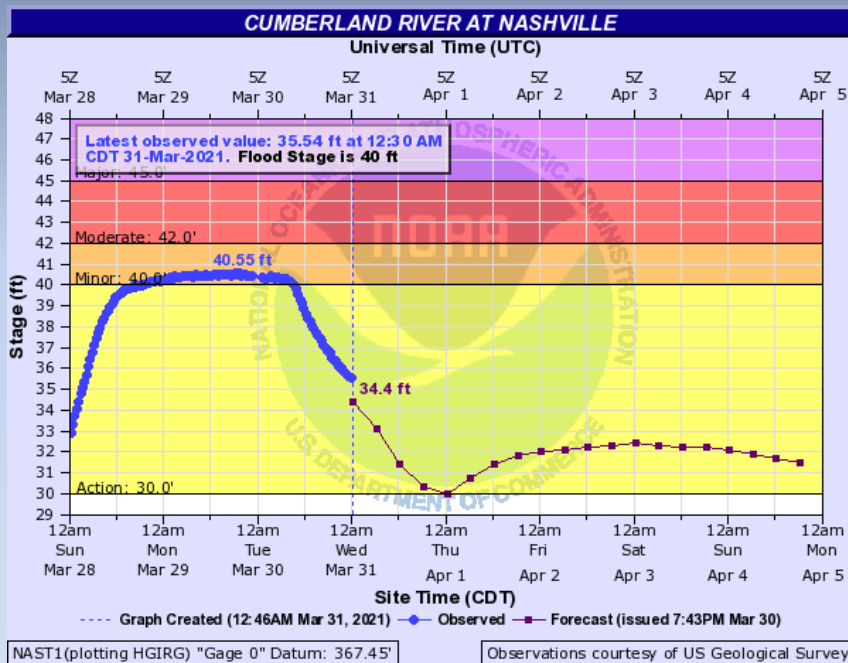




# Cumberland River



<https://water.weather.gov/ahps/forecasts.php>



Nashville  
\*Picture from the  
Tennessean

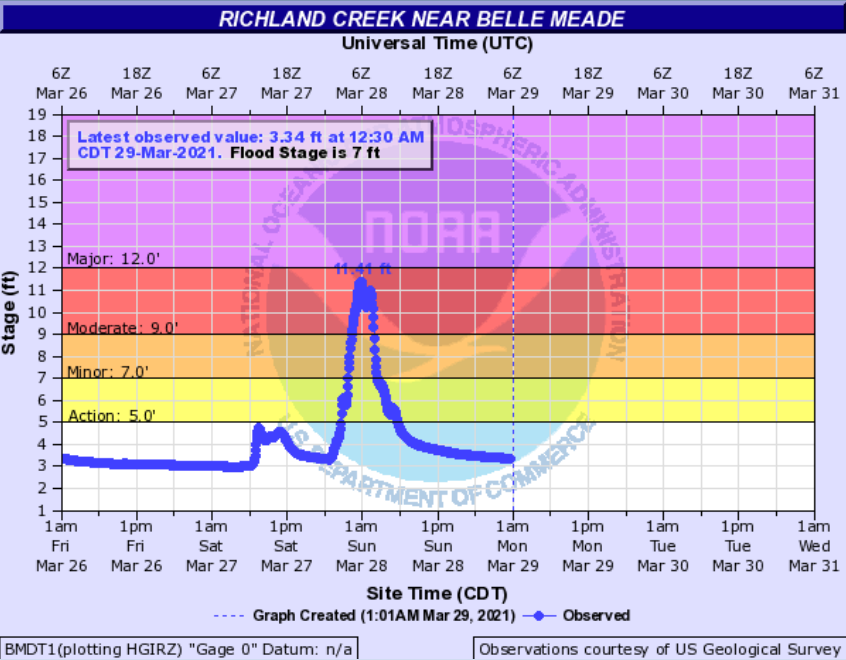




# Richland Creek



<https://water.weather.gov/ahps/forecasts.php>



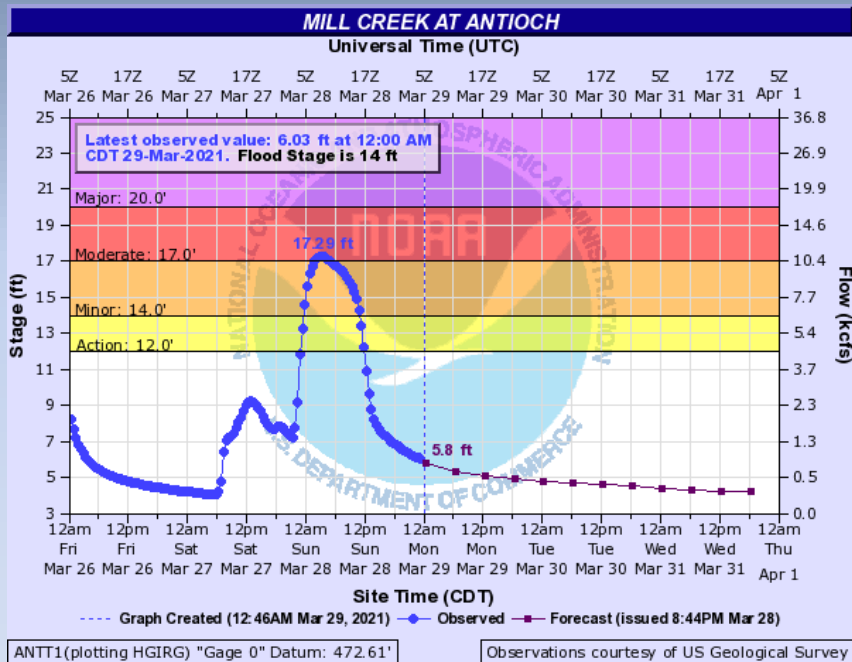
\*Picture from the Tennessean



# Mill Creek



<https://water.weather.gov/ahps/forecasts.php>

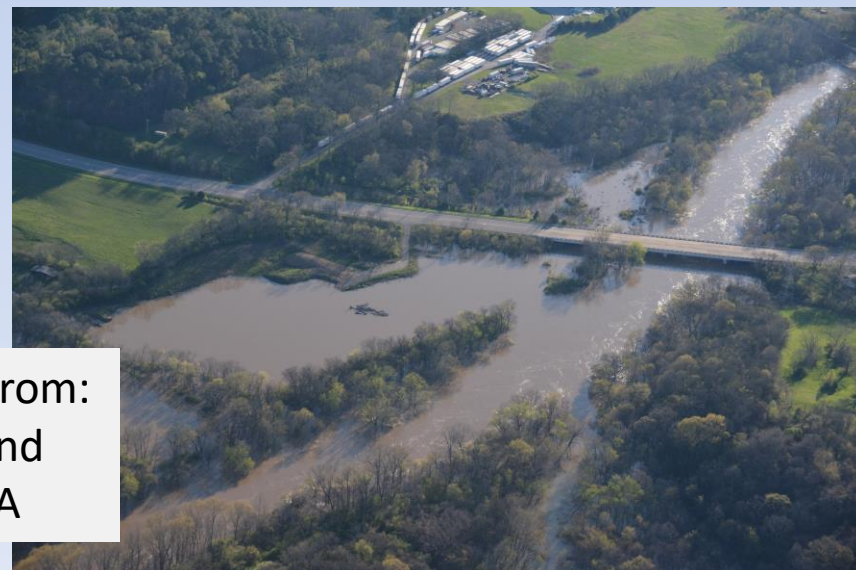
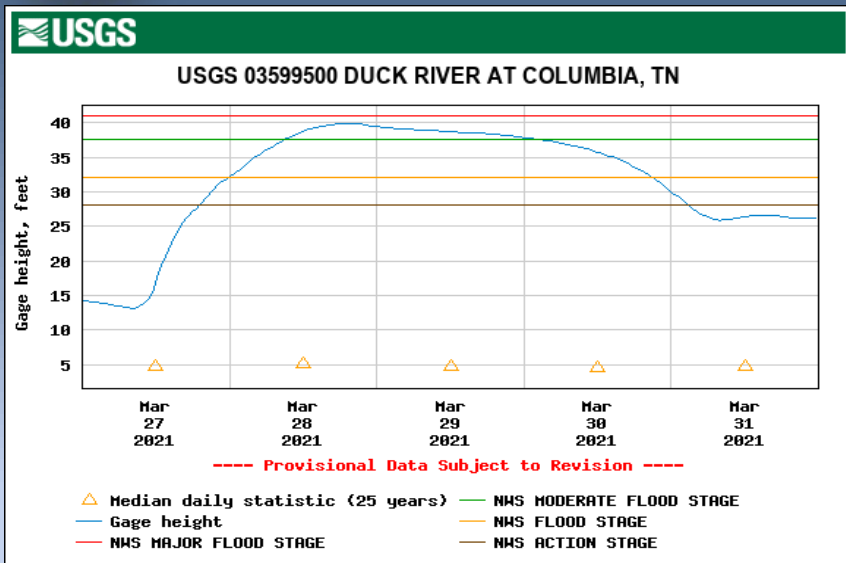
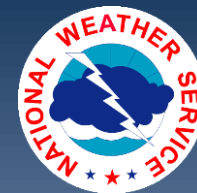


Antioch Pike  
\*Pictures from the  
Tennessean





# Duck River at Columbia

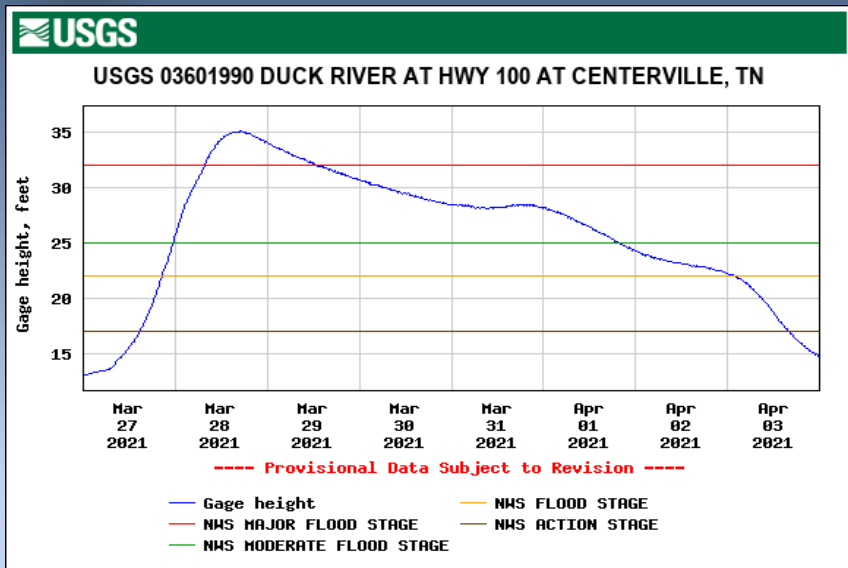


Picture from:  
CAP and  
TEMA





# Duck River at Centerville



Picture from:  
CAP and  
TEMA





# Cumberland River Ashland to Nashville



Picture from:  
CAP and  
TEMA



# Cedar Creek Mount Juliet



\*Picture from the  
Tennessean



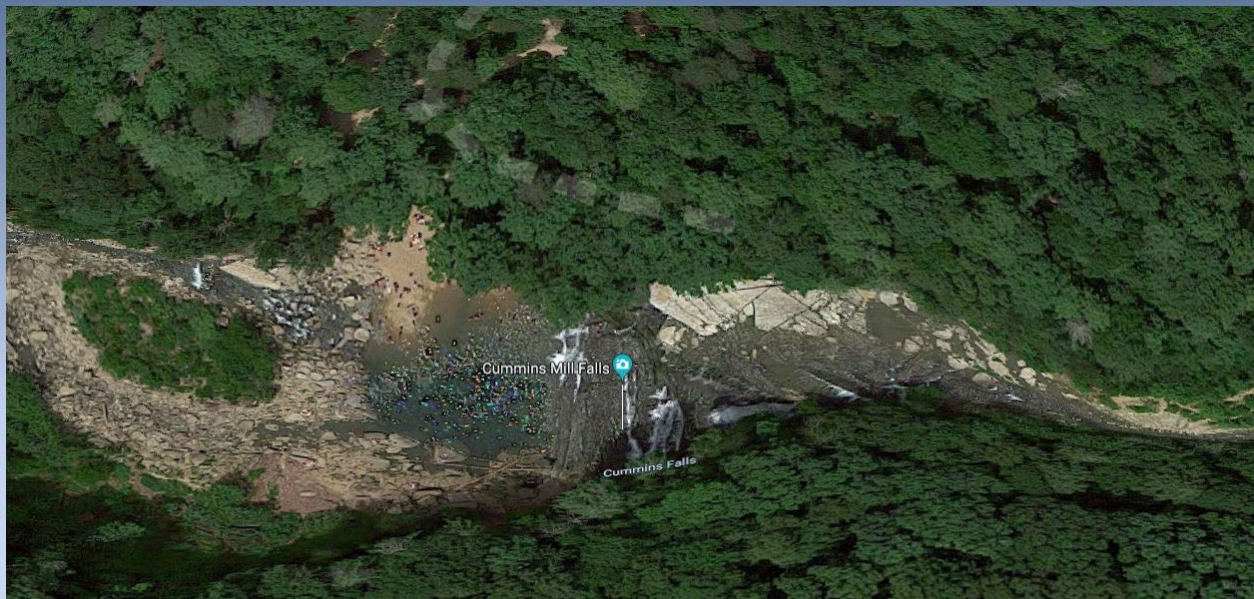
# Conclusion

- Training storms can cause a lot of rainfall over a relatively period of time.
- Extremely high rainfall amounts are possible!
- When something like this happens overnight it can be especially dangerous.
- If you live in a flood prone area please make sure you have multiple ways to get warnings!
- It's **important** to stay away from creeks and streams due to rapid rises.





# Cummins Falls State Park



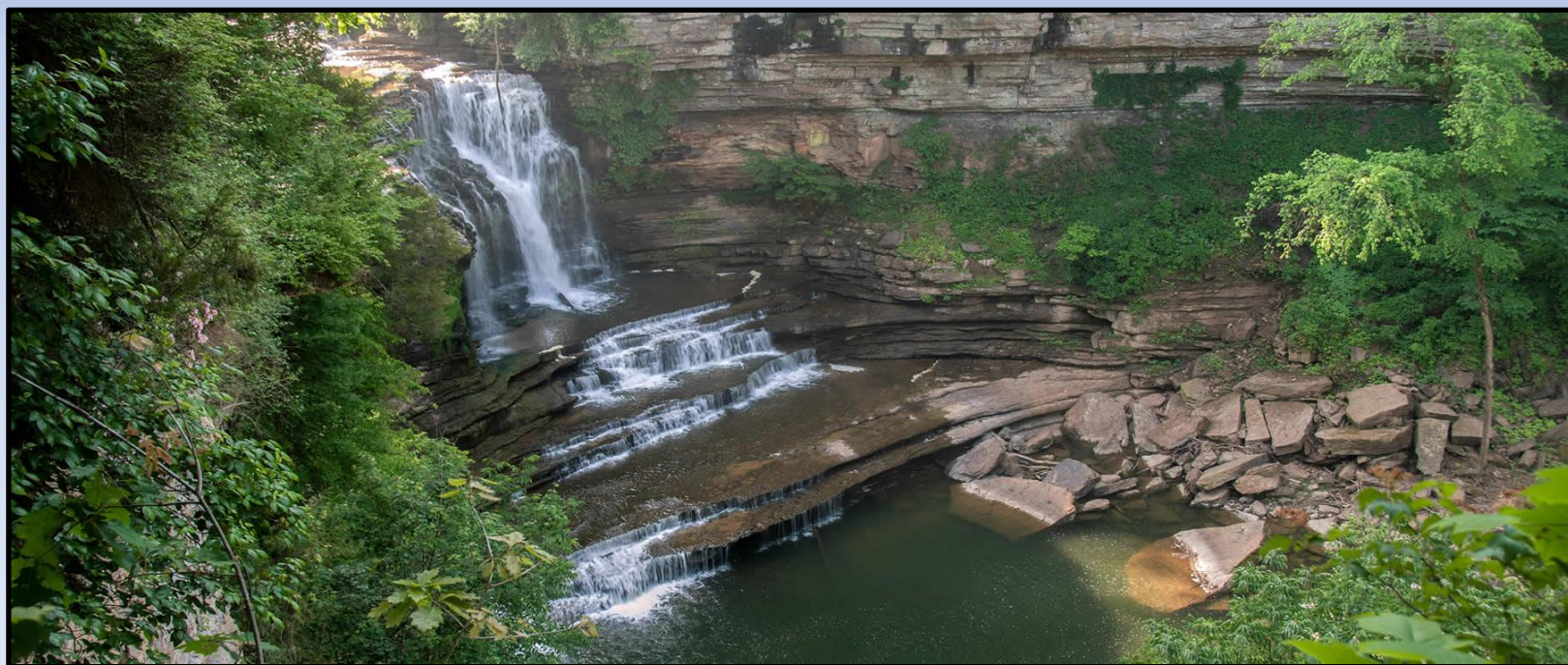
- This event occurred in July 2018
- Like other events at this location, the park saw impacts from the rain even though the park is well away from where the heaviest rain fell



# Cummins Falls State Park



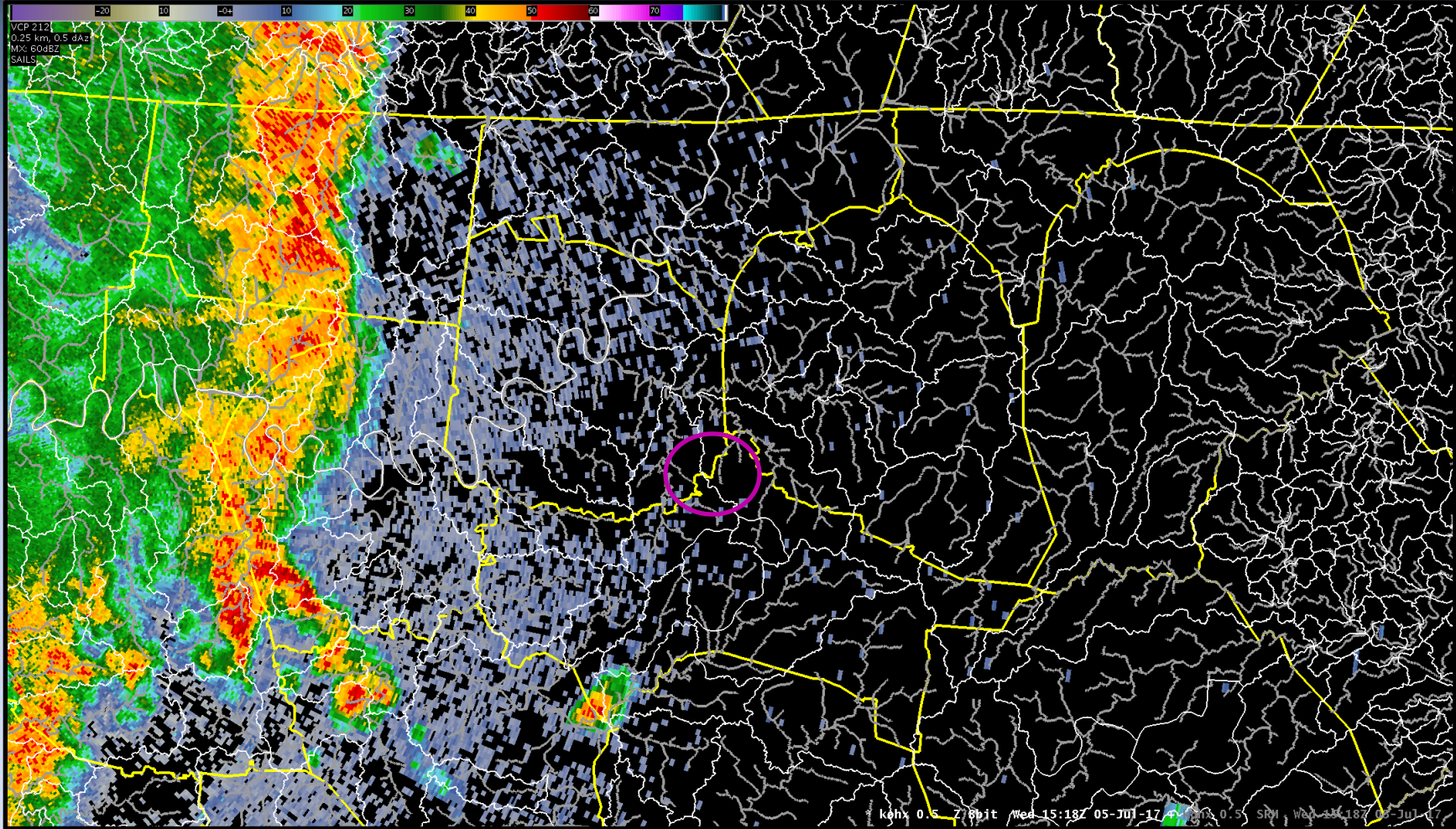
- Water quickly overwhelmed the falls, and numerous people had to be rescued
- One fatality did occur from the flooding, with another fatality occurring later







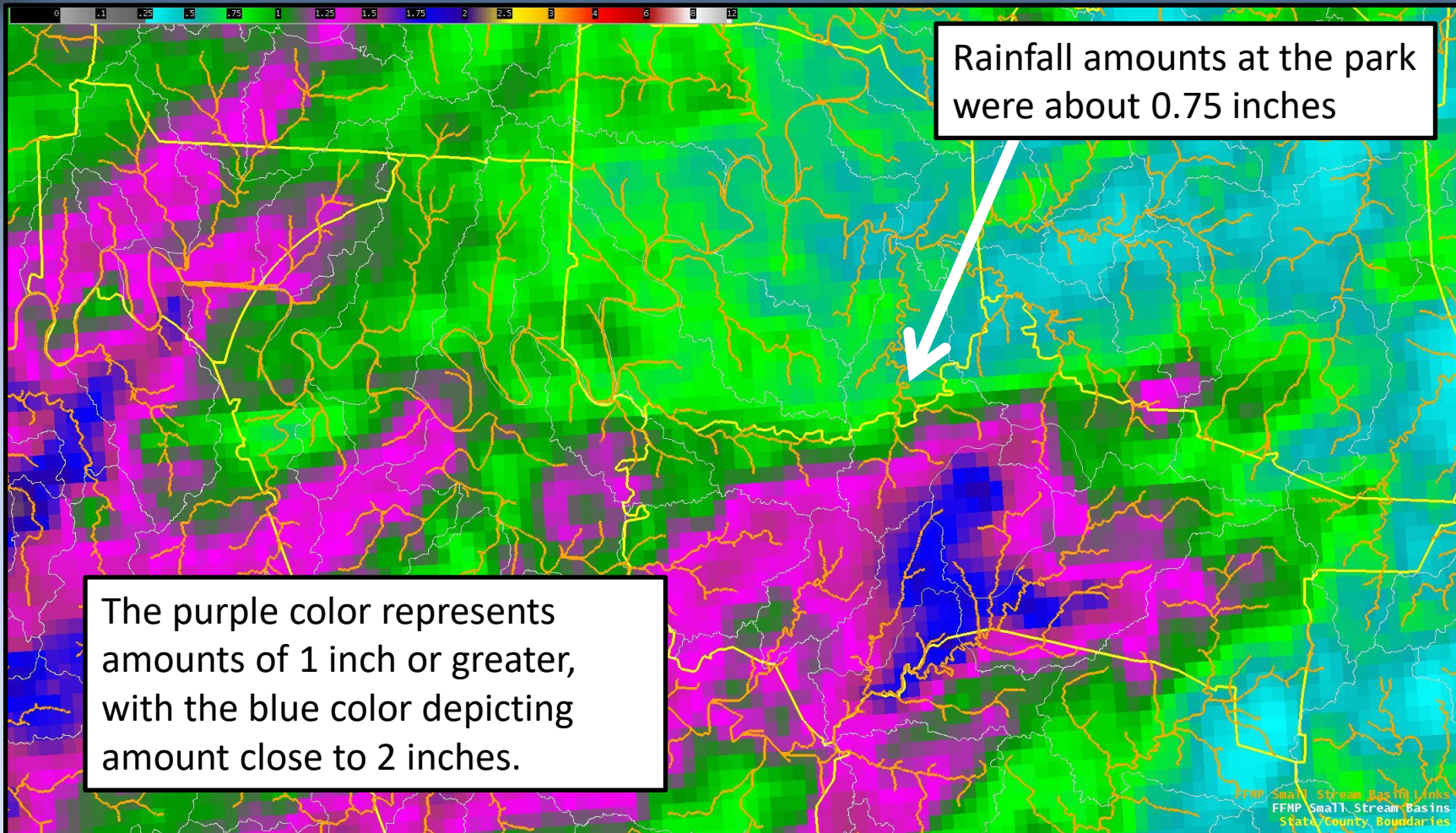
# Cummins Falls State Park







# Cummins Falls State Park





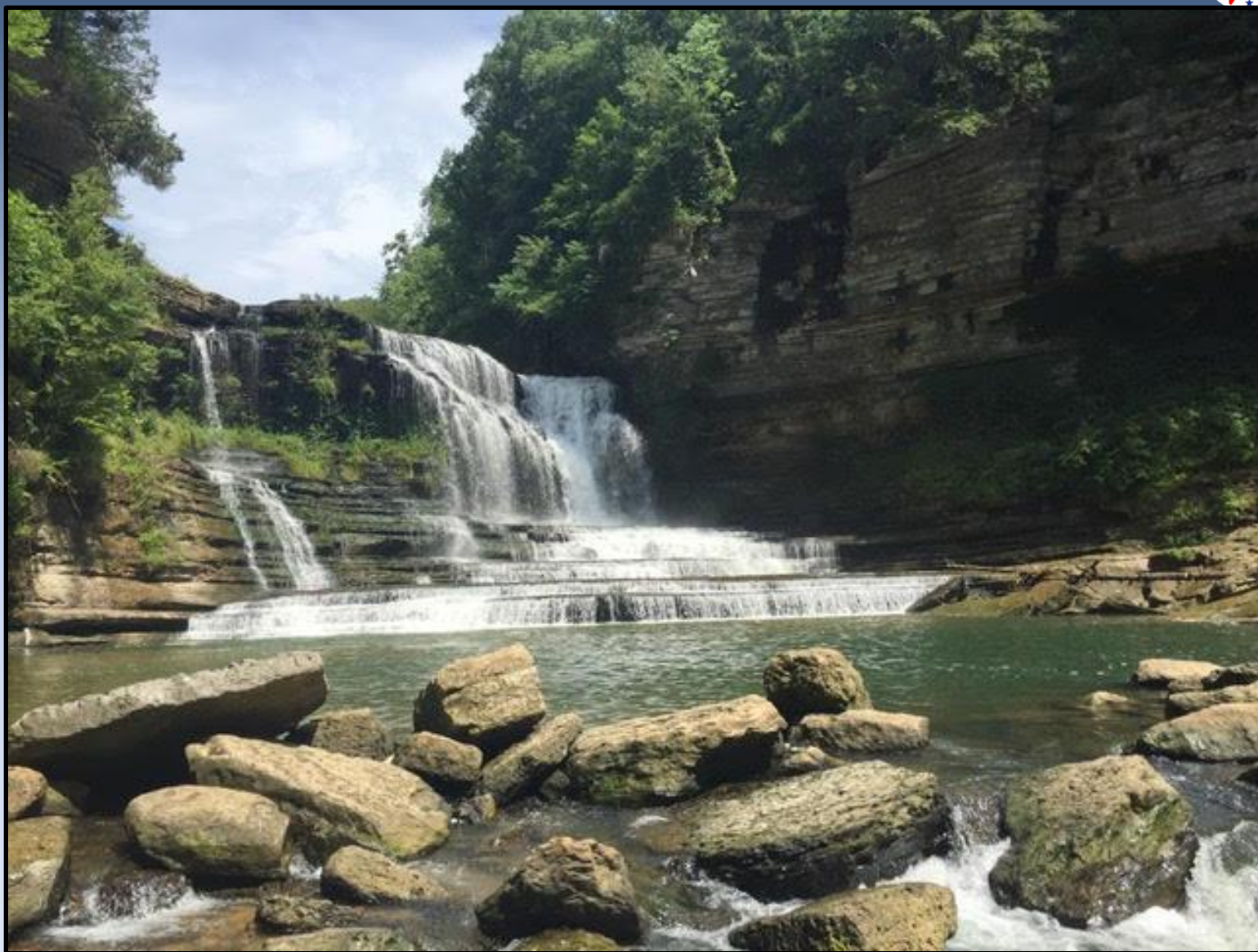


# Cummins Falls State Park





# July 13<sup>th</sup> – 3:00pm







July 13<sup>th</sup> – 3:51pm





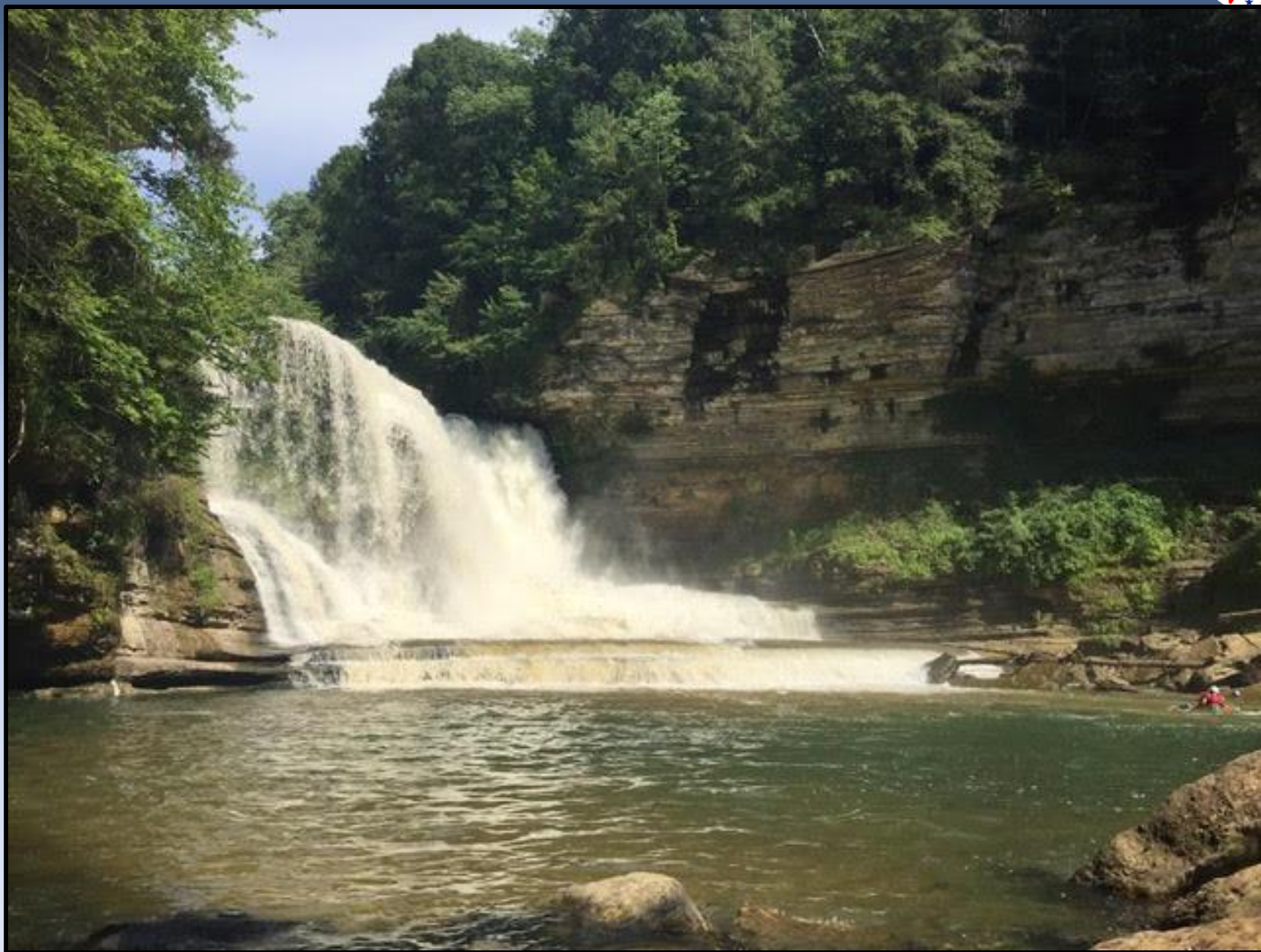
July 13<sup>th</sup> – 3:52pm







# July 13<sup>th</sup> – 3:53pm







# July 13<sup>th</sup> – 3:54pm







# July 13<sup>th</sup> – 3:55pm







# July 13<sup>th</sup> – 4:30pm





# Cummins Falls Video



<https://youtu.be/MOlGhe1np3A>





# Conclusion

- In steep locations like Cummins Falls or out west in slot canyons it doesn't have to rain in your area for rapid flash flooding to occur.
- Never play in these areas when rain is forecast to be around the area.
- This applies to greenways, which are designed to be water overflow areas!

## What is a greenway?

Greenways are linear parks that connect neighborhoods and provide recreational opportunities. They provide scenic views and offer a natural link to surrounding parks and green spaces. Greenways are designed to be multi-use paths for walking, jogging, and bicycling.

## Greenways Masterplan and Updates

Greenways are a key component of the city's strategy to create a more vibrant, walkable, and bicycle-friendly community. The Masterplan and Updates provide a comprehensive framework for the development and maintenance of greenways across the city. Key updates include the addition of new greenway segments, improved signage, and enhanced safety features.

## SPECIAL GREENWAY ATTRACTIONS

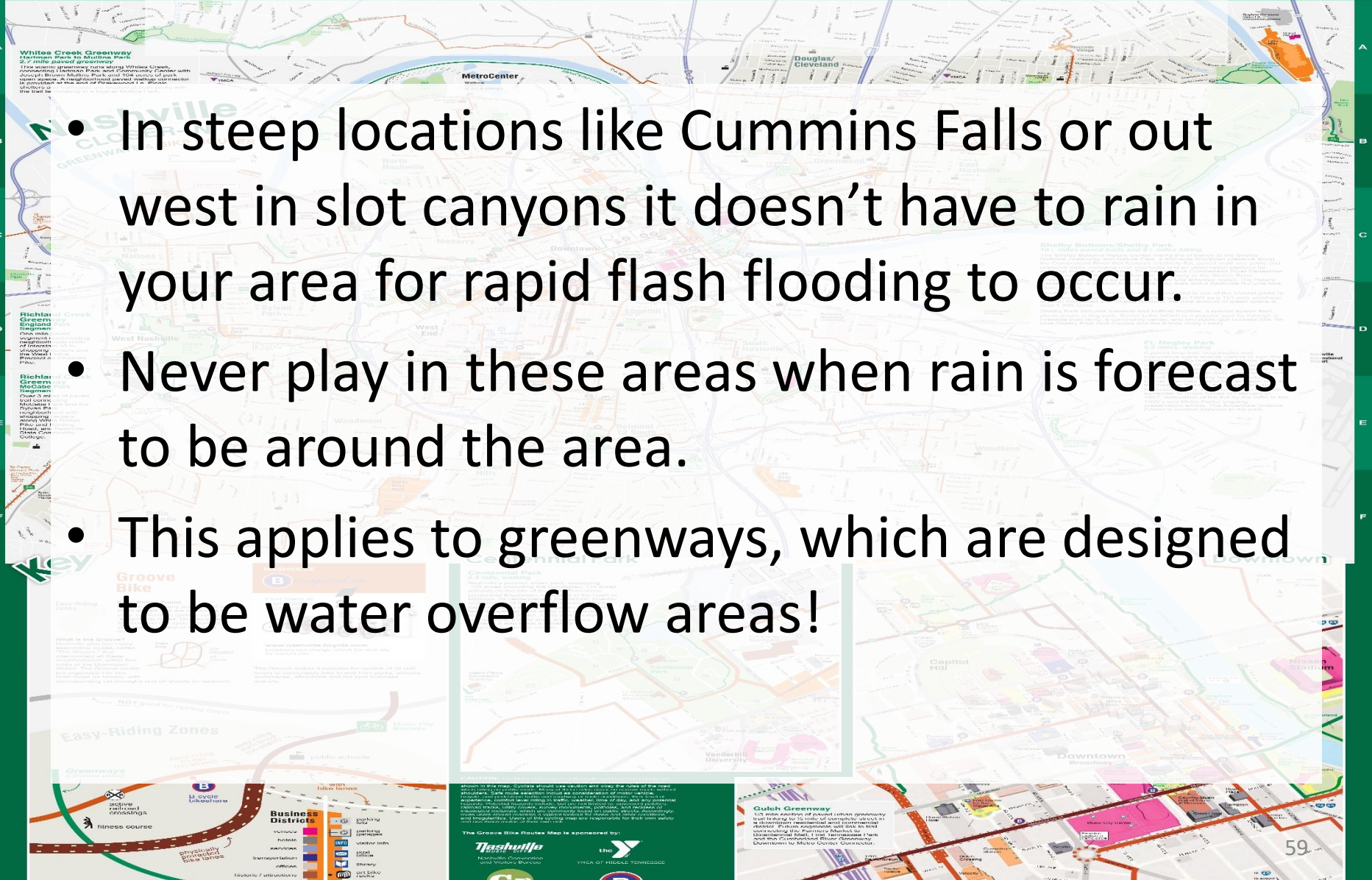
1. **John Sevier National Battlefield** - A historic site offering a glimpse into the past.
2. **Donelson River Park** - A scenic park with beautiful views of the river.
3. **Rollins Park** - A large park with many recreational facilities.
4. **Shelby Bottoms State Park** - A natural area with diverse wildlife.
5. **Shelby Forest Greenway** - A wooded area perfect for hiking and biking.
6. **Metrolink** - A transit station providing easy access to greenway destinations.

## Help Protect the Park

- ✓ All paved trails are free way and mulch-free; please observe the following rules:
  - Maximum speed on trails is 10 mph.
  - Stay to the right side on the left.
  - Stay on the trail and do not drive off-trail.
  - Do not use motor vehicles on trails.
  - Do not use motor vehicles on trails.
  - Do not use motor vehicles on trails.
- ✓ Trail rules apply to all users.
- ✓ Motor vehicles are not allowed on trails.
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**Important Numbers:**  
Call 615-259-3128 for more information.  
**Important Links:**  
[www.nashville.gov](http://www.nashville.gov)  
[www.nashville.gov/greenways](http://www.nashville.gov/greenways)



**White Creek Greenway**  
A scenic greenway route along White Creek, providing a natural link to surrounding parks and green spaces.

**Richard Craig Greenway**  
A greenway route connecting the city to the surrounding countryside, offering scenic views and recreational opportunities.

**Easy-Riding Zones**  
Designated areas where bicyclists can ride more freely, providing a safe and enjoyable experience.

**Gulch Greenway**  
A scenic greenway route through the city, providing a natural link to surrounding parks and green spaces.

**Business Districts**

- Financial
- Medical
- Government
- Education
- Arts & Entertainment
- Industrial
- Residential
- Office
- Manufacturing
- University
- Other

**The Groove Bike Routes Map is sponsored by:**

- Tennessee Department of Transportation**
- Metropolitan Government of Nashville and Davidson County**
- Metrolink**
- Metrolink**

**Gulch Greenway**

A scenic greenway route through the city, providing a natural link to surrounding parks and green spaces. The map shows the route along the river and through the city center.



# So What's Going through a Forecaster's Mind?



## Flash Flood Warning Operations Methodology

Familiarize with the environment

Familiarize with antecedent soil conditions and topography

Choose your optimal precip source

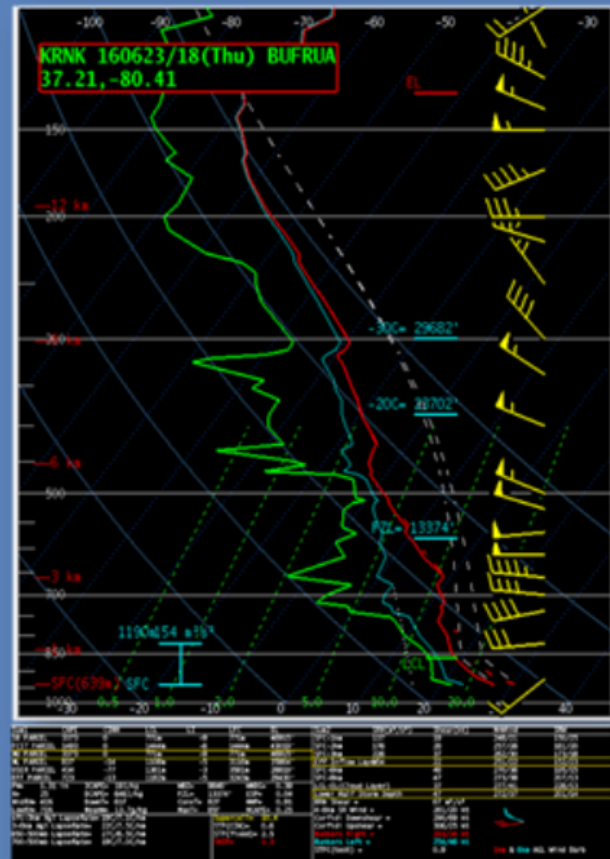
Analyze heavy rainfall and streamflow in radar, FFMP, and FLASH

Issue FFWs with proper criteria and routinely reassess



# #1) Familiarize with the Environment

- Long, skinny CAPE •  $< 1000 \text{ J/kg}$
- Moist vertical profile • Low/Mid RH  $> 70\%$
- Above average PWs •  $> 75^{\text{th}}$  percentile
- Deep Warm Cloud Layer •  $> 10 \text{ kft}$
- Slow "LCL-EL (Cloud Layer)" wind •  $< 10 \text{ kt}$
- Slow Corfidi Up/Down shear vectors •  $< 10 \text{ kt}$
- Storm Motion •
  - With respect to forcing
  - Training potential





# #2 Familiarize Yourself with Antecedent Soil Conditions and Topography

Look at 1-, 3-, 6-hr Flash Flood Guidance

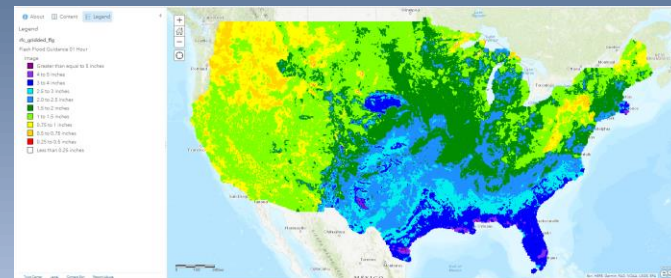
- **Low values = Less rain needed to cause flooding**

Consider topography

- **Flat, hilly, mountainous?**

Consider urban areas

- **Usually require less rainfall to flash flood**

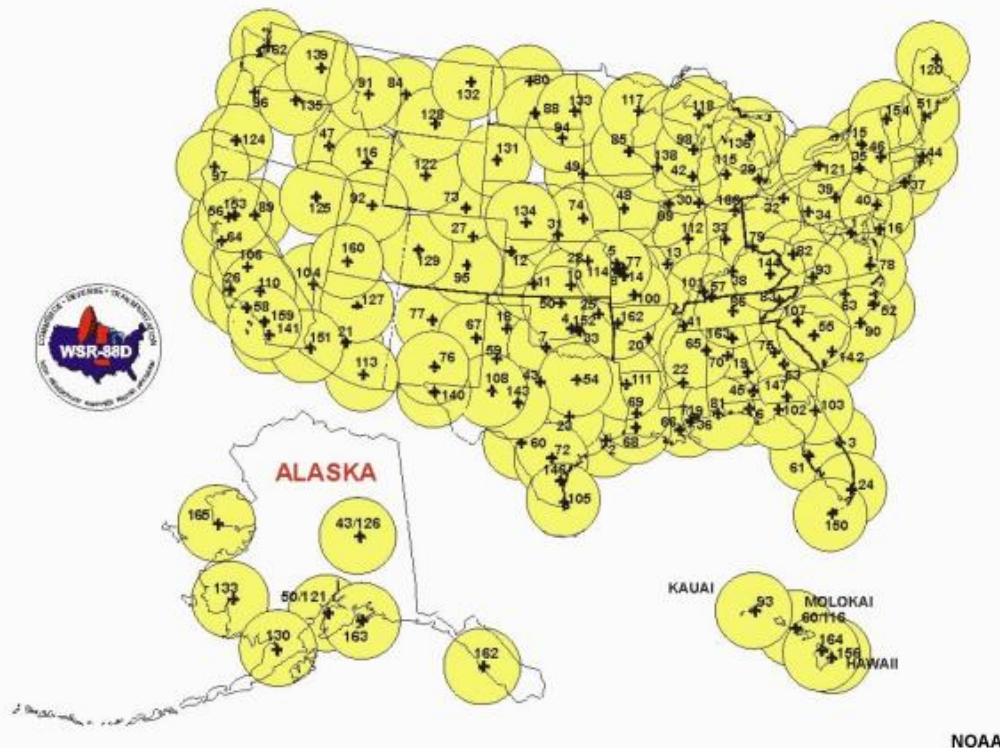




# #3 Choose Your Optimal Precip Source

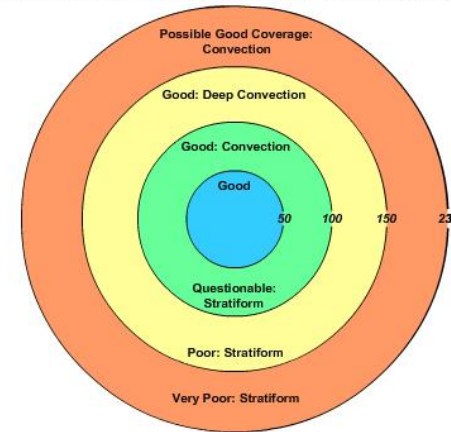
## Radar Coverage

Locations of WSR-88D Radars with the idealized 230-km Coverage Areas



Radar Coverage of Precipitation with Range (km)—Assuming No Beam Blocking

Radar Coverage of Precipitation with Range (km)—Assuming No Beam Blocking



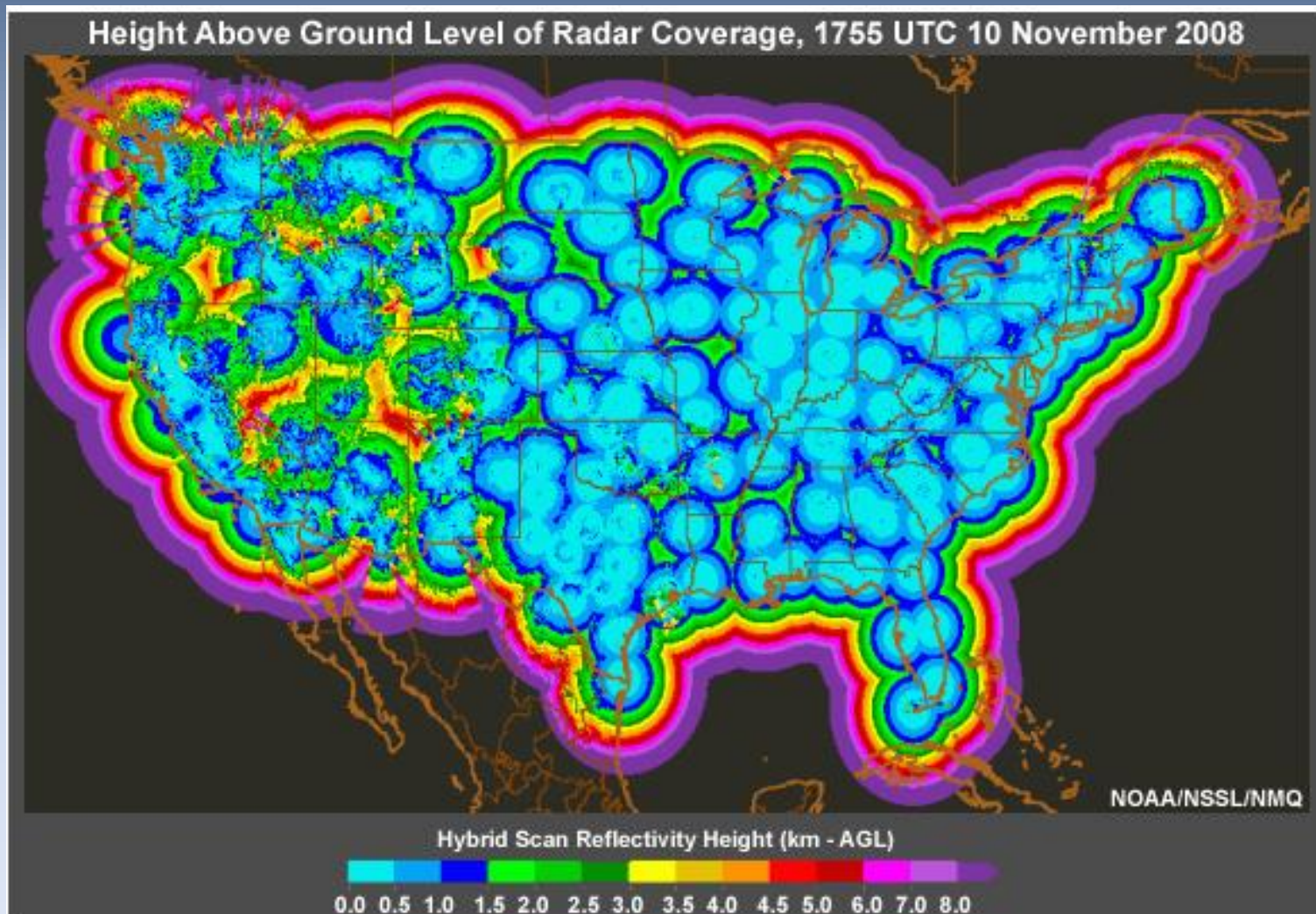
Note: Coverage is worse for snow, and in areas of rugged terrain

©The COMET Program



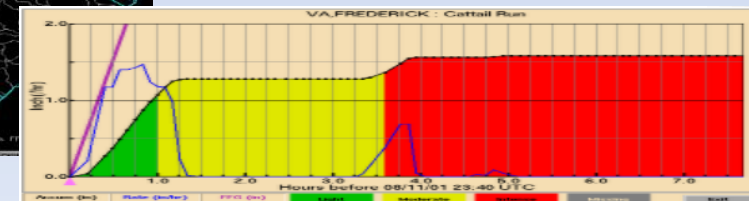
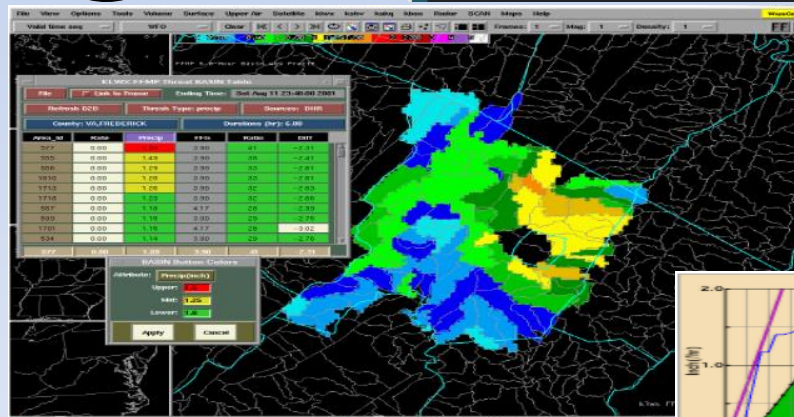
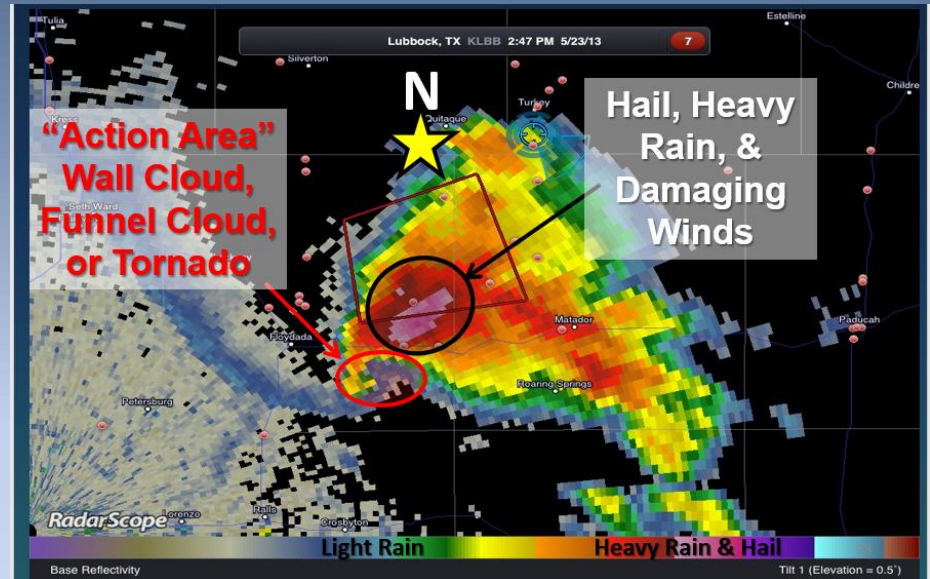
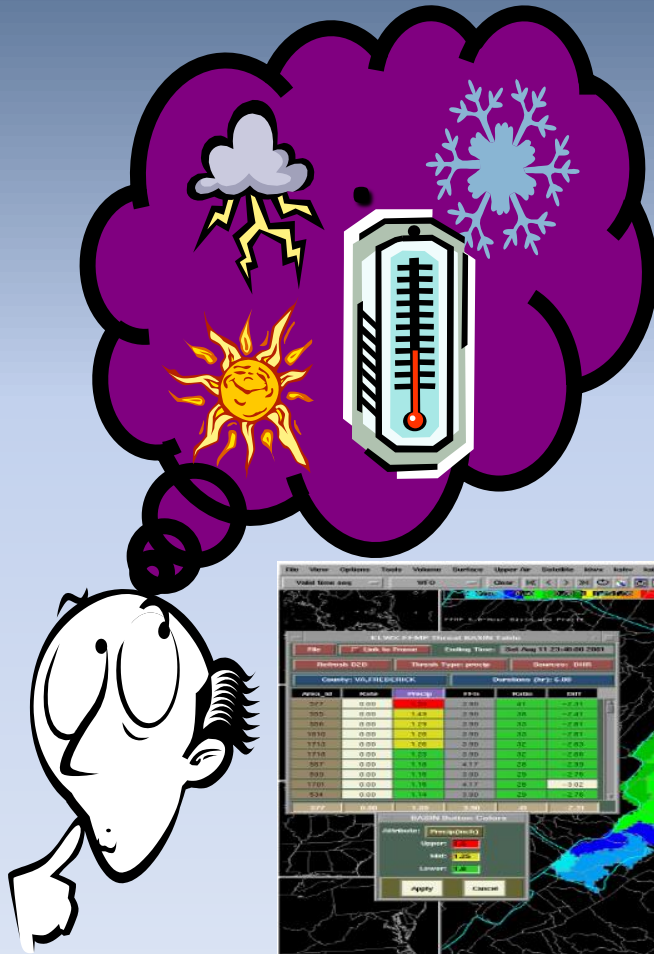


# #3 Choose Your Optimal Precip Source





# #4 Analyze Heavy Rainfall and Streamflow in Radar, FFMP and FLASH







# #5 Issue Your Warning



The screenshot shows the WarnGen software interface. On the left, there are several control panels: 'Backup' with a 'JKL' dropdown; 'Track type' with 'One Storm' and 'Line of Storms' options; 'Edit' with 'Box', 'Track', and 'Box and Track' options; 'Product type' with a list of warning types including 'Tornado Warning', 'Severe Thunderstorm Warning', 'Severe Weather Statement', 'Flood -or- Flash Flood Warning (FFW/FLW)', 'Annual Flood Advisory INITIAL ISSUANCE (FLS)', 'Flood Followup Statements (FFS/FLS)', 'Special Storm Statement', 'Short Term Forecast', and 'Other: Dam Break Flash Flood Warning'; and 'Time range' with a 'Duration' of '30 min' and a time range from '00:00 Sat 03-Mar' to '00:30 Sat 03-Mar'. Below these is a list of 'Optional bullets' for the warning, such as 'Confirmed tornado (WSR-88D was tracking a tornado)' and 'Confirmed LARGE TORNADO'. At the bottom left are 'Create Text', 'Restart', and 'Close' buttons. The main area is a radar map with a yellow warning box drawn over a storm system. The map includes a color scale for intensity and a 'WarnGen' window title. At the bottom right, there is a status bar with text: 'Interactive WarnGen (Editable) Fri: 23:56Z 02-Mar-12', 'SRM: 0.5 SRM', 'Fri: 23:56Z 02-Mar-12', 'Frames: 12', and 'Time: 00:00 Z 03-Mar-12'.

**Steps to issuing warning:**

1. Choose warning type
2. Choose storm type (one storm or line of storms)
3. Track and draw the warning box
4. Set length of time for warning
5. Select basis for issuing warning
6. Select specific hazards expected and appropriate action statements
7. Create text and issue warning





# NWS Flood Products

**FLOODING AHEAD  
TURN AROUND  
DON'T DROWN**



## Never drive around barricades

- 🏠 Most flood fatalities occur in vehicles
- 🏠 12 inches of water can sweep a car off the road

[weather.gov/flood](https://www.weather.gov/flood)



### Don't underestimate the power of water!



- 6 inches of fast-moving water can knock over and carry away an adult.
- 12 inches of fast-moving water can carry away a small car.
- 18-24 inches of fast-moving water can carry away most large SUVs, vans and trucks.








# Watch



**Flood Watch** means  
be prepared:  
Flooding is possible

-  Check for forecast updates
-  Prepare to move to higher ground
-  Stay weather ready

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





# Warning



**Flood Warning** means  
take action!

Flooding is expected



Move to higher ground  
immediately



Use extra caution if driving



Check forecast updates



Stay weather ready

Photo credit: USGS

[weather.gov/flood](https://www.weather.gov/flood)







# Current Key NWS Products

- Hazardous Weather Outlook (HWO)
  - [Middle TN Hazardous Weather Report](#)
- Flood Potential Outlooks (ESF)
- Flood/Flash Flood Watches (FFA)
- Flood/Flash Flood Warnings (FFW)
  - Dam Break – Downstream will be a Flash Flood Warning
- Flood Statements (FLS)
- Flood Advisories (FAY)
- Urban and Small Stream (FAY)



# Hazardous Weather Outlook

## HWO



FLUS44 KOHX 070643  
HWOOHX

Hazardous Weather Outlook  
National Weather Service Nashville TN  
1241 AM CST Tue Nov 7 2017

TNZ005>011-023>034-056>066-075-077>080-093>095-071130-  
Stewart-Montgomery-Robertson-Sumner-Macon-Clay-Pickett-Houston-  
Humphreys-Dickson-Cheatham-Davidson-Wilson-Trousdale-Smith-  
Jackson-Putnam-Overton-Fentress-Perry-Hickman-Lewis-Williamson-  
Maury-Marshall-Rutherford-Cannon-De Kalb-White-Cumberland-Bedford-  
Coffee-Warren-Grundy-Van Buren-Wayne-Lawrence-Giles-  
1241 AM CST Tue Nov 7 2017

This Hazardous Weather Outlook is for portions of Middle Tennessee.

.DAY ONE...Overnight

Strong thunderstorms producing heavy rainfall are possible in all but extreme southern Middle Tennessee, and some flooding is possible as rainfall amounts accumulate.

.DAYS TWO THROUGH SEVEN...Tuesday through Sunday

No hazardous weather is expected at this time.

.SPOTTER INFORMATION STATEMENT...

Spotter reports of flooding may be needed.

\$\$

FLUS44 KOHX 071152  
HWOOHX

Hazardous Weather Outlook  
National Weather Service Nashville TN  
552 AM CST Tue Nov 7 2017

TNZ005>011-023>034-056>066-075-077>080-093>095-081200-  
Stewart-Montgomery-Robertson-Sumner-Macon-Clay-Pickett-Houston-  
Humphreys-Dickson-Cheatham-Davidson-Wilson-Trousdale-Smith-  
Jackson-Putnam-Overton-Fentress-Perry-Hickman-Lewis-Williamson-  
Maury-Marshall-Rutherford-Cannon-De Kalb-White-Cumberland-Bedford-  
Coffee-Warren-Grundy-Van Buren-Wayne-Lawrence-Giles-  
552 AM CST Tue Nov 7 2017

This Hazardous Weather Outlook is for portions of Middle Tennessee.

.DAY ONE...Today and Tonight

Heavy rainfall overnight has caused significant flooding along a corridor that extends from Waverly, to Dickson, to Fairview, to Brentwood and South Nashville, to Smyrna, to Watertown, to Smithville, to Sparta, to Crossville. Rainfall amounts of 2 to 5 inches are common in these areas. Flood waters will begin to subside once rain exits the region later this morning.

.DAYS TWO THROUGH SEVEN...Wednesday through Monday

No hazardous weather is expected at this time.

.SPOTTER INFORMATION STATEMENT...

Spotter reports are needed this morning.


\$\$



# Middle TN Hazardous Weather Report



<https://www.weather.gov/media/ohx/briefing/SitRep.pdf>



**National Weather Service**  
Nashville, Tennessee

**Situation Report**  
Monday, April 6, 2020 2:49 PM

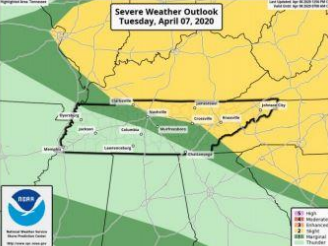
**Slight Risk of Severe Storms Midweek**

Mon	Tue	Wed	Thu	Fri	Sat	Sun
82° 61°	81° 65°	83° 55°	63° 42°	59° 41°	66° 47°	68° 47°
10% 20%	30% 30%	25% 50%	50% 12%	12% 20%	35% 45%	45% 40%
SW 4-8	SW 9-13	W 7-11	N 8-12	NW 5-9	S 3-7	NW 4-8


**7 Day Forecast - Nashville, TN**

**FORECAST SUMMARY**

- Unusually warm through Wednesday then much cooler Thursday through the weekend
- A few showers today and tonight, with rain chances increasing tomorrow and Wednesday; showers and storms most likely Wednesday night into Thursday morning
- Some strong storms are possible Tuesday into Tuesday night with gusty winds and hail; a few severe storms possible Wednesday night into Thursday morning



**Severe Weather Outlook  
Tuesday, April 07, 2020**



**Severe Weather Outlook  
Wednesday, April 08, 2020**





# Hydrologic Outlook ESF



FGUS74 KOHX 272034  
ESFOHX  
TNZ005>011-023>034-056>066-075-077>080-093>095-281100-

Hydrologic Outlook  
National Weather Service Nashville TN  
334 PM CDT Sun May 27 2018

...Remnants of Subtropical Storm Alberto to Soak the Mid-State  
Tuesday and Wednesday...

The remnants of Subtropical Storm Alberto will move across Middle Tennessee Tuesday and Wednesday, and bring along some heavy downpours. Since the low pressure center is still expected to track close to Interstate 65, it looks like the heaviest rainfall will occur over western sections of the Mid-State, generally between Interstate 65 and the Tennessee River. This includes areas around Nashville, Clarksville, Dickson, Columbia and Waynesboro.

Between two and three inches of rain are likely to fall over western Middle Tennessee Tuesday and Wednesday, with locally higher amounts to around four inches.

Training of heavy showers will be likely, especially Tuesday afternoon and Tuesday night, and this will produce the possibility of localized flooding. In addition, heavy rain amounts will cause some creeks and streams in the Mid-State to run near bankfull. Right now it looks like the heaviest rains will occur over western Middle Tennessee. However, if the track of the low pressure system shifts further to the east, the area of heaviest rains will shift eastward as well.

\$\$



# Flood/Flash Flood Watch FLA



FFAOHX

Flood Watch  
National Weather Service Nashville TN  
355 PM CDT Tue May 29 2018

...Periods of Heavy Rainfall Are Expected Today into Tonight  
Across Middle Tennessee...

.Subtropical Depression Alberto is expected to approach and move  
across mid state through tomorrow morning. Storm total rainfall  
amounts 1.5 to 3.0 inches possible, with locally higher amounts  
approaching 4.0 inches near TN River Valley Region. One concern  
associated with tropical weather systems is likelihood for heavy  
showers training over the same area. Heavy rainfall can accumulate  
quickly and lead to possible flash flooding across these areas.  
Locations that have received saturating rainfall amounts over the  
previous few days could also be more prone to flash flooding.

TNZ005>011-023>034-056>066-075-077>080-093>095-301200-  
/O.CON.KOHX.FF.A.0001.00000T0000Z-180530T1200Z/  
/00000.0.ER.00000T0000Z.00000T0000Z.00000T0000Z.OO/  
Stewart-Montgomery-Robertson-Sumner-Macon-Clay-Pickett-Houston-  
Humphreys-Dickson-Cheatham-Davidson-Wilson-Trousdale-Smith-  
Jackson-Putnam-Overton-Fentress-Perry-Hickman-Lewis-Williamson-  
Maury-Marshall-Rutherford-Cannon-De Kalb-White-Cumberland-Bedford-  
Coffee-Warren-Grundy-Van Buren-Wayne-Lawrence-Giles-  
Including the cities of Dover, Clarksville, Springfield,  
Hendersonville, Gallatin, Goodlettsville, Lafayette, Celina,  
Byrdstown, Erin, Waverly, New Johnsonville, McEwen, Dickson,  
Ashland City, Kingston Springs, Nashville, Lebanon, Mount Juliet,  
Hartsville, Carthage, South Carthage, Gordonsville, Gainesboro,  
Cookeville, Livingston, Jamestown, Allardt, Linden, Lobelville,  
Centerville, Hohenwald, Franklin, Brentwood, Columbia, Lewisburg,  
Murfreesboro, Smyrna, La Vergne, Woodbury, Smithville, Sparta,  
Crossville, Shelbyville, Tullahoma, Manchester, McMinnville,  
Altamont, Coalmont, Spencer, Clifton, Waynesboro, Lawrenceburg,  
and Pulaski  
355 PM CDT Tue May 29 2018

...FLASH FLOOD WATCH REMAINS IN EFFECT THROUGH WEDNESDAY  
MORNING...

The Flash Flood Watch continues for

\* A portion of Middle Tennessee, including the following areas,  
Bedford, Cannon, Cheatham, Clay, Coffee, Cumberland, Davidson,

3/21/2018

De Kalb, Dickson, Fentress, Giles, Grundy, Hickman, Houston,  
Humphreys, Jackson, Lawrence, Lewis, Macon, Marshall, Maury,  
Montgomery, Overton, Perry, Pickett, Putnam, Robertson,  
Rutherford, Smith, Stewart, Sumner, Trousdale, Van Buren,  
Warren, Wayne, White, Williamson, and Wilson.

- \* Through Wednesday morning
- \* Average rainfall amounts of one to three inches, with locally  
higher amounts approaching four inches.
- \* Some flash flooding is possible. In addition, you can expect  
rises to occur on area creeks and streams, and possibly along  
larger rivers as well.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

WGUS64 KOHX 281707  
FFAOHX

URGENT - IMMEDIATE BROADCAST REQUESTED  
Flood Watch  
National Weather Service Nashville TN  
1207 PM CDT Thu Jun 28 2018

...Heavy Thunderstorm Rains May Produce Flash Flooding Today...

.Several episodes of heavy thunderstorm rains are expected this  
afternoon over southern and western parts of Middle Tennessee,  
producing the potential for rain totals of 3 to 5 inches and  
localized flash flooding.

TNZ023>025-056>061-075-077-093>095-290000-  
/O.NEW.KOHX.FF.A.0002.180628T1707Z-180629T0000Z/  
/00000.0.ER.00000T0000Z.00000T0000Z.00000T0000Z.OO/  
Houston-Humphreys-Dickson-Perry-Hickman-Lewis-Williamson-Maury-  
Marshall-Bedford-Coffee-Wayne-Lawrence-Giles-  
Including the cities of Erin, Waverly, New Johnsonville, McEwen,  
Dickson, Linden, Lobelville, Centerville, Hohenwald, Franklin,  
Brentwood, Columbia, Lewisburg, Shelbyville, Tullahoma,  
Manchester, Clifton, Waynesboro, Lawrenceburg, and Pulaski  
1207 PM CDT Thu Jun 28 2018

...FLASH FLOOD WATCH IN EFFECT UNTIL 7 PM CDT THIS EVENING...

The National Weather Service in Nashville has issued a

\* Flash Flood Watch for a portion of Middle Tennessee, including  
the following areas, Bedford, Coffee, Dickson, Giles, Hickman,  
Houston, Humphreys, Lawrence, Lewis, Marshall, Maury, Perry,  
Wayne, and Williamson.

\* Until 7 PM CDT this evening

\* Several periods of heavy thunderstorm rains with potential  
totals of 3 to 5 inches.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

2/21/2018

A Flash Flood Watch means that conditions may develop that lead  
to flash flooding. Flash flooding is a very dangerous situation.

You should monitor later forecasts and be prepared to take action  
should Flash Flood Warnings be issued.

&&

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# River Flood Warning FLW



WGUS44 KOHX 070604

FLWOHX

Bulletin - Immediate Broadcast Requested

Flood Warning

National Weather Service Nashville TN

1204 AM CST Tue Nov 7 2017

...The National Weather Service in Nashville, Tn has issued a flood warning for the following rivers in middle Tennessee...

Richland Creek At Belle Meade Near Harding Place AFFECTING Davidson County

.Thunderstorms with heavy rain have caused creek in southern Davidson County to rise above flood stage.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Avoid flooded areas along the river...And move personal belongings to higher ground. Never drive through flooded roads as the depth of water may be too great to pass...Even in trucks or sport utility vehicles. If you come across a flooded road...Turn around don't drown.

Stay tuned to noaa weather radio or other local media for further information from the National Weather Service.

&&

TNC037-071804-

/O.NEW.KOHX.FL.W.0017.171107T0604Z-000000T0000Z/

/BMDT1.2.ER.171107T0511Z.171107T0545Z.000000T0000Z.UU/

1204 AM CST Tue Nov 7 2017

The National Weather Service in Nashville, Tn has issued a

\* Flood Warning for

The Richland Creek At Belle Meade Near Harding Place

\* From early this morning until further notice.

\* At 11PM Monday the stage was...10.0 feet

\* Flood stage is 7.0 feet.

\* The river will rise to near 11.0 feet then begin falling.

\* At 11.0 feet...The parking lot of Belle Meade Terrace condominiums begins to flood.

\* At 10.0 feet...The parking area near the creek and Harding Place begins to be flooded.

&&

LAT...LON 3606 8690 3617 8689 3616 8683 3606 8680

\$\$

Shamburger





# River Flood Warning Follow Up FLS



WGUS84 KOHX 071427

FLSOHX

Flood Statement

National Weather Service Nashville TN

827 AM CST Tue Nov 7 2017

...The flood warning is cancelled for the following rivers in Tennessee...

Richland Creek At Belle Meade Near Harding Place AFFECTING Davidson County

.Water levels on Richland Creek will continue to subside this morning, and the Flood Warning has been cancelled.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Avoid flooded areas along the river...And move personal belongings to higher ground. Never drive through flooded roads as the depth of water may be too great to pass...Even in trucks or sport utility vehicles. If you come across a flooded road...Turn around don't drown.

Stay tuned to noaa weather radio or other local media for further information from the National Weather Service.

&&

TNC037-071457-

/O.CAN.KOHX.FL.W.0017.000000T0000Z-171107T1427Z/

/BMDT1.2.ER.171107T0511Z.171107T0605Z.171107T0820Z.UU/

827 AM CST Tue Nov 7 2017

The Flood Warning is cancelled for

The Richland Creek At Belle Meade Near Harding Place

\* Until 12/31 17:59.

\* At 07AM Tuesday the stage was 4.0 feet and falling.

\* Flood stage is 7.0 feet.

\* Water levels have fallen below Flood Stage and will continue to subside this morning.

&&

LAT...LON 3606 8690 3617 8689 3616 8683 3606 8680



# River Flood Advisory

## FLS



WGUS84 KOHX 070606  
FLSOHX  
Flood Advisory  
National Weather Service Nashville TN  
1206 AM CST Tue Nov 7 2017

...The National Weather Service in Nashville, Tn has issued a flood advisory for the following rivers in middle Tennessee...

Sevenmile Creek At Blackman Road - Nashville AFFECTING Davidson County

.Thunderstorms with heavy rain have caused creek in southern Davidson County to rise above flood stage.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Stay tuned to noaa weather radio or other local media for further information from the National Weather Service.

&&

TNC037-071806-  
/O.NEW.KOHX.FL.Y.0044.171107T0606Z-171108T1804Z/  
/SVCT1.N.ER.000000T0000Z.000000T0000Z.000000T0000Z.00/  
1206 AM CST Tue Nov 7 2017

The National Weather Service in Nashville, Tn has issued a  
\* Flood Advisory for  
The Sevenmile Creek At Blackman Road - Nashville  
\* At 11PM Monday the stage was 7.0 feet.  
\* Flood stage is 9.0 feet.  
\* The river will rise to near 9.0 feet then begin falling.

\$\$



# Flash Flood Warning

## FFW



FFWOHX  
TNC041-071445-  
/O.NEW.KOHX.FF.W.0033.171107T1144Z-171107T1445Z/  
/00000.0.ER.000000T0000Z.000000T0000Z.000000T0000Z.00/

BULLETIN - EAS ACTIVATION REQUESTED  
Flash Flood Warning  
National Weather Service Nashville TN  
544 AM CST TUE NOV 7 2017

The National Weather Service in Nashville has issued a

- \* Flash Flood Warning for...  
De Kalb County in Middle Tennessee...
- \* Until 845 AM CST
- \* At 541 AM CST, emergency management reported water rescues in the city of Dowelltown due to high water from overnight thunderstorms. Since yesterday afternoon, 3 to 5 inches of rain have fallen across a broad area in DeKalb County, and additional rainfall is occurring this morning.
- \* Some locations that will experience flooding include...  
Smithville, Alexandria, Dowelltown, Liberty, Center Hill Lake and Edgar Evans State Park.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Turn around, don't drown when encountering flooded roads. Most flood deaths occur in vehicles.

&&

LAT...LON 3609 8577 3607 8576 3607 8575 3601 8565  
3595 8566 3590 8565 3589 8567 3589 8565  
3587 8565 3586 8566 3585 8565 3586 8567  
3585 8567 3586 8590 3589 8593 3607 8605  
3609 8587 3611 8581

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# Flash Flood Warning Follow Up

## FFS



WGUS74 KOHX 171205

FFSOHX

Flash Flood Statement

National Weather Service Nashville TN

705 AM CDT FRI AUG 17 2018

TNC111-169-171345-

/O.CON.KOHX.FF.W.0024.000000T0000Z-180817T1345Z/

/00000.0.ER.000000T0000Z.000000T0000Z.000000T0000Z.OO/

Macon TN-Trousdale TN-

705 AM CDT FRI AUG 17 2018

...THE FLASH FLOOD WARNING REMAINS IN EFFECT UNTIL 845 AM CDT FOR  
SOUTHEASTERN MACON AND CENTRAL TROUSDALE COUNTIES...

At 702 AM CDT, local law enforcement has reported several roads  
flooded across Macon and Trousdale counties. While rains are  
slowing, up to four inches of rain have already fallen and it will  
take awhile for waters to recede. Please use extreme caution on  
roads in Macon and Trousdale counties over the next couple of hours.

Some locations that will experience flooding include...

Lafayette, Hartsville and Red Boiling Springs.

PRECAUTIONARY/PREPAREDNESS ACTIONS...



# Flood Advisory (Not River)

## FA.Y



WGUS84 KOHX 070426  
FLSOHX

Flood Advisory  
National Weather Service Nashville TN  
1026 PM CST MON NOV 6 2017

TNC021-037-043-187-070630-  
/O.NEW.KOHX.FA.Y.0091.171107T0426Z-171107T0630Z/  
/00000.N.ER.000000T0000Z.000000T0000Z.000000T0000Z.OO/  
Davidson TN-Dickson TN-Williamson TN-Cheatham TN-  
1026 PM CST MON NOV 6 2017

The National Weather Service in Nashville has issued a

- \* Flood Advisory for...  
Southern Davidson County in Middle Tennessee...  
Southern Dickson County in Middle Tennessee...  
Northern Williamson County in Middle Tennessee...  
South central Cheatham County in Middle Tennessee...
- \* Until 1230 AM CST
- \* At 1025 PM CST, Doppler radar indicated heavy rain due to thunderstorms continuing to move across the area. Radar estimates up to 2 inches of rain has fallen in the past hour from Dickson to Kingston Springs to Brentwood. This will cause minor flooding in the advisory area.
- \* Some locations that will experience flooding include...  
Franklin, Dickson, Brentwood, Nolensville, Forest Hills, Oak Hill, White Bluff, Belle Meade, Kingston Springs, Pegram, Burns, Bellevue, Antioch, Fairview, Charlotte, Berry Hill, Bells Bend and Natchez Trace At Highway 96.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Be especially cautious at night when it is harder to recognize the dangers of flooding.

&&



# Flood Advisory (Not River) Follow Up FA.Y



WGUS84 KOHX 070508  
FLSOHX

Flood Advisory  
National Weather Service Nashville TN  
1108 PM CST MON NOV 6 2017

TNC021-037-043-187-070630-  
/O.CON.KOHX.FA.Y.0091.000000T0000Z-171107T0630Z/  
/00000.N.ER.000000T0000Z.000000T0000Z.000000T0000Z.OO/  
Davidson TN-Dickson TN-Williamson TN-Cheatham TN-  
1108 PM CST MON NOV 6 2017

...THE FLOOD ADVISORY REMAINS IN EFFECT UNTIL 1230 AM CST FOR  
SOUTHERN DAVIDSON...SOUTHERN DICKSON...NORTHERN WILLIAMSON AND SOUTH  
CENTRAL CHEATHAM COUNTIES...

At 1105 PM CST, trained weather spotters and the public reported  
street flooding in Brentwood and Bellevue due to thunderstorms  
continuing to move across the area. Radar estimates two to three  
inches of rain has fallen this evening. Minor flooding is expected  
to continue in the advisory area for another 1 to 2 hours.

Some locations that will experience flooding include...  
Franklin, Dickson, Brentwood, Nolensville, Forest Hills, Oak Hill,  
White Bluff, Belle Meade, Kingston Springs, Pegram, Burns, Bellevue,  
Antioch, Fairview, Charlotte, Berry Hill, Bells Bend and Natchez  
Trace At Highway 96.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Be especially cautious at night when it is harder to recognize the  
dangers of flooding.

&&





# Urban and Small Stream FA.Y



Flood Advisory  
National Weather Service Nashville TN  
559 PM CDT FRI AUG 17 2018

TNC061-180200-  
/O.NEW.KOHX.FA.Y.0103.180817T2259Z-180818T0200Z/  
/00000.N.E.R.000000T0000Z.000000T0000Z.000000T0000Z.OO/  
Grundy TN-  
559 PM CDT FRI AUG 17 2018

The National Weather Service in Nashville has issued a

- \* Urban and Small Stream Flood Advisory for...  
Central and Southeastern Grundy County in Middle Tennessee...
- \* Until 900 PM CDT.
- \* At 559 PM CDT, Doppler radar indicated heavy rain due to thunderstorms continuing to move into the county. This will cause urban and small stream flooding in the advisory area. Doppler radar estimates up to locally two inches of rain have already fallen. The potential of up to another two inches of rainfall falling in isolated locations across central and southeastern portions of Grundy County that have already received rainfall as the afternoon hours have progressed.
- \* Some locations that will experience flooding include...  
Gruetli-Laager, Tracy City, Monteagle, Coalmont, Palmer, Pelham and Fiery Gizzard State Park.

This includes Interstate 24 between mile markers 128 and 134.

#### PRECAUTIONARY/PREPAREDNESS ACTIONS...

In hilly terrain there are hundreds of low water crossings which are potentially dangerous in heavy rain. Do not attempt to cross flooded roads. Find an alternate route.

A Flood Advisory means river or stream flows are elevated, or ponding of water in urban or other areas is occurring or is imminent.

&&

LAT...LON 3524 8582 3523 8588 3524 8588 3530 8590  
3549 8554 3543 8554 3540 8549 3536 8551



# Confused Yet?!?

## Hazard Simplification

Proposal to Simplification  
& Consolidation of Flood  
Watches, Warnings &  
Advisories

[https://www.weather.gov/  
hazardsimplification/](https://www.weather.gov/hazardsimplification/)





# There is Hope (2024?)

## Visualizing the Major Change

What Will Remain  
the Same?

**WATCH**

*What should I do? - Prepare!*



**WARNING**

*What should I do? - Take action!*



What Will Change?

ADVISORY

&

SPECIAL WEATHER STATEMENT

*Become*



PLAIN LANGUAGE HEADLINES

An event less serious than a Warning is *happening*

*What should I do? - Exercise caution* to avoid impacts.







# New Impact-Based Warning “Standard FFW”



## Flash Flood Warning – No Damage Threat Tag...Base

### Current Product

WGUS55 KBOU 250327  
FFWBOU  
COC087-250600-  
/O.NEW.KBOU.FF.W.0011.180725T0327Z-180725T0600Z/  
/00000.0.ER.000000T0000Z.000000T0000Z.000000T0000Z.CC/

BULLETIN - EAS ACTIVATION REQUESTED  
Flash Flood Warning  
National Weather Service Denver CO  
927 PM MDT TUE JUL 24 2018

The National Weather Service in Denver Colorado has issued a

\* Flash Flood Warning for...  
North central Morgan County in northeastern Colorado...

\* Until midnight MDT.

\* At 926 PM MDT, Doppler radar indicated thunderstorms producing very heavy rain over Fort Morgan. The rain is moving south at 5 mph. Up to three inches of rain have already fallen north of Fort Morgan, while the town of Fort Morgan may see up to 2 inches in 30 minutes. Flash flooding is expected to begin shortly.

\* Some locations that will experience flooding include...  
Fort Morgan and Log Lane Village.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Be especially cautious at night when it is harder to recognize the dangers of flooding.

Excessive runoff from heavy rainfall will cause flooding of small creeks and streams, highways and underpasses. Additionally, country roads and farmlands along the banks of creeks, streams and other low lying areas are subject to flooding.

66

LAT...LON 4046 10398 4048 10378 4023 10378 4030 10389

\$\$

### Product in IBW Format

WGUS55 KBOU 250327  
FFWBOU  
COC087-250600-  
/O.NEW.KBOU.FF.W.0011.180725T0327Z-180725T0600Z/  
/00000.0.ER.000000T0000Z.000000T0000Z.000000T0000Z.CC/

BULLETIN - EAS ACTIVATION REQUESTED  
Flash Flood Warning  
National Weather Service Denver CO  
927 PM MDT TUE JUL 24 2018

The National Weather Service in Denver Colorado has issued a

\* Flash Flood Warning for...  
North central Morgan County in northeastern Colorado...

\* Until midnight MDT.

\* At 926 PM MDT, Doppler radar indicated thunderstorms producing very heavy rain over Fort Morgan. The rain is moving south mph. Up to three inches of rain have already fallen north Morgan. The town of Fort Morgan may see rainfall rates of to 2 inches in 30 minutes. Flash flooding is expected to b

HAZARD...Flash flooding caused by heavy rain.

SOURCE...Radar rainfall estimates.

IMPACT...Flash flooding of small creeks and streams, highways and underpasses.

\* Some locations that will experience flooding include...  
Fort Morgan and Log Lane Village.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Be especially cautious at night when it is harder to recognize the dangers of flooding.

66

LAT...LON 4046 10398 4048 10378 4023 10378 4030 10389

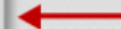
FLASH FLOOD...RADAR INDICATED  
EXPECTED RAINFALL...2 INCHES IN 30 MINUTES

HAZARD...Flash flooding caused by heavy rain.

SOURCE...Radar rainfall estimates.

IMPACT...Flash flooding of small creeks and streams, highways and underpasses.

No Flash Flood  
Damage Threat tag





# New Impact-Based Warning “Damage Threat Considerable FFW”

## Flash Flood Warning – Damage Threat...Considerable

### Current Product

WGUS52 KMHK 150702  
FFWHRK  
NCC013-049-103-107-151000-  
/O.NEW.KMHK.FF.W.0017.180915T0702Z-180915T1000Z/  
/00000.O.ER.00000T0000Z.000000T0000Z.000000T0000Z.CD/

BULLETIN - EAS ACTIVATION REQUESTED  
Flash Flood Warning  
National Weather Service Newport/Morehead City NC  
302 AM EDT SAT SEP 15 2018

The National Weather Service in Newport has issued a

- \* Flash Flood Warning for...  
Northeastern Jones County in eastern North Carolina...  
Northern Lenoir County in eastern North Carolina...  
Craven County in eastern North Carolina...  
Southwestern Beaufort County in eastern North Carolina...

\* Until 600 AM EDT.

- \* At 254 AM EDT, emergency management reported flash flooding from rain bands associated with Tropical Storm Florence. Around 9 to 13 inches of rain have fallen since Thursday, and an additional 2 to 4 inches are possible across the warned area over the next hour.

- \* Some locations that will experience flooding include...  
New Bern, Kinston, La Grange, River Bend, Grifton, Blounts Creek, Vanceboro, Askins, Cayton, Fort Barnwell, Jasper, Tuscarora, Dawson, Rhems, Wilmar, Edward, Craingers, Institute, Cox Crossroads and Wyse Fork.

#### PRECAUTIONARY/PREPAREDNESS ACTIONS...

Turn around, don't drown when encountering flooded roads. Most flood deaths occur in vehicles.

Be especially cautious at night when it is harder to recognize the dangers of flooding.

\$\$

LAT...LON 3537 7780 3538 7770 3535 7767 3543 7748  
3535 7743 3533 7738 3533 7735 3538 7729  
3535 7725 3539 7724 3542 7719 3553 7716  
3530 7677 3524 7687 3525 7690 3523 7694  
3518 7697 3506 7717 3529 7782 3531 7783

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### Product in IBW Format

WGUS52 KMHK 150702  
FFWHRK  
NCC013-049-103-107-151000-  
/O.NEW.KMHK.FF.W.0017.180915T0702Z-180915T1000Z/  
/00000.O.ER.00000T0000Z.000000T0000Z.000000T0000Z.CD/

BULLETIN - EAS ACTIVATION REQUESTED  
Flash Flood Warning  
National Weather Service Newport/Morehead City NC  
302 AM EDT SAT SEP 15 2018

The National Weather Service in Newport has issued a

- \* Flash Flood Warning for...  
Northeastern Jones County in eastern North Carolina...  
Northern Lenoir County in eastern North Carolina...  
Craven County in eastern North Carolina...  
Southwestern Beaufort County in eastern North Carolina...

\* Until 600 AM EDT.

- \* At 254 AM EDT, emergency management reported flash flooding from rain bands associated with Tropical Storm Florence. Around 9 to 13 inches of rain have fallen since Thursday, and an additional 2 to 4 inches are possible across the warned area over the next hour.

\* HAZARD...Flash flooding caused by heavy rain.

\* SOURCE...Emergency management.

\* IMPACT...Life-threatening flash flooding of creeks and streams, urban areas, highways, streets, and underpasses.

- \* Some locations that will experience flooding include...  
New Bern, Kinston, La Grange, River Bend, Grifton, Blounts Creek, Vanceboro, Askins, Cayton, Fort Barnwell, Jasper, Tuscarora, Dawson, Rhems, Wilmar, Edward, Craingers, Institute, Cox Crossroads and Wyse Fork.

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3518 7697 3506 7717 3529 7782 3531 7783

FLASH FLOOD...OBSERVED

FLASH FLOOD DAMAGE THREAT...CONSIDERABLE

\$\$

HAZARD...Flash flooding caused by heavy rain.

SOURCE...Emergency management.

IMPACT...Life-threatening flash flooding of creeks and streams, urban areas, highways, streets, and underpasses.









# New Impact-Based Warning

## “Damage Threat Flash Flood Emergency”

### Flash Flood Statement for Flash Flood Emergency

#### Current Product

WCUS71 KLMX 272040  
FFSLWX

Flash Flood Statement  
National Weather Service Baltimore MD/Washington DC  
440 PM EDT SUN MAY 27 2018

MDC005-027-272330-  
/O.CON.KLMX.FF.W.0017.000000T0000Z-180527T2330Z/  
/00000.O.EE.000000T0000Z.000000T0000Z.000000T0000Z.00/  
Howard MD-Baltimore MD-  
440 PM EDT SUN MAY 27 2018

...THIS IS A FLASH FLOOD EMERGENCY FOR Ellicott City in Howard County...

...THE FLASH FLOOD WARNING REMAINS IN EFFECT UNTIL 730 PM EDT FOR EAST CENTRAL HOWARD AND SOUTHWESTERN BALTIMORE COUNTIES...

At 439 PM EDT, Emergency Management reported multiple water rescues on Main Street in Ellicott City. Rainfall rates of 2-4 inches per hour are expected. Seek higher ground immediately.

This is a FLASH FLOOD EMERGENCY for Ellicott City in Howard County. This is a PARTICULARLY DANGEROUS SITUATION. SEEK HIGHER GROUND NOW!

Some locations that will experience flooding include...  
Ellicott City, Catonsville, Woodlawn, Arbutus, Ellicott City and Oella.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Move to higher ground now. This is an extremely dangerous and life-threatening situation. Do not attempt to travel unless you are fleeing an area subject to flooding or under an evacuation order.

Turn around, don't drown when encountering flooded roads. Most flood deaths occur in vehicles.

Move to higher ground now. Act quickly to protect your life.

##

LAT...LON 3928 7611 3927 7670 3924 7670 3924 7678  
3925 7687 3927 7688 3931 7671

\$\$

#### Product in IBW Format

WCUS71 KLMX 272040  
FFSLWX

Flash Flood Statement  
National Weather Service Baltimore MD/Washington DC  
440 PM EDT SUN MAY 27 2018

MDC005-027-272330-  
/O.CON.KLMX.FF.W.0017.000000T0000Z-180527T2330Z/  
/00000.O.EE.000000T0000Z.000000T0000Z.000000T0000Z.00/  
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3925 7687 3927 7688 3931 7671

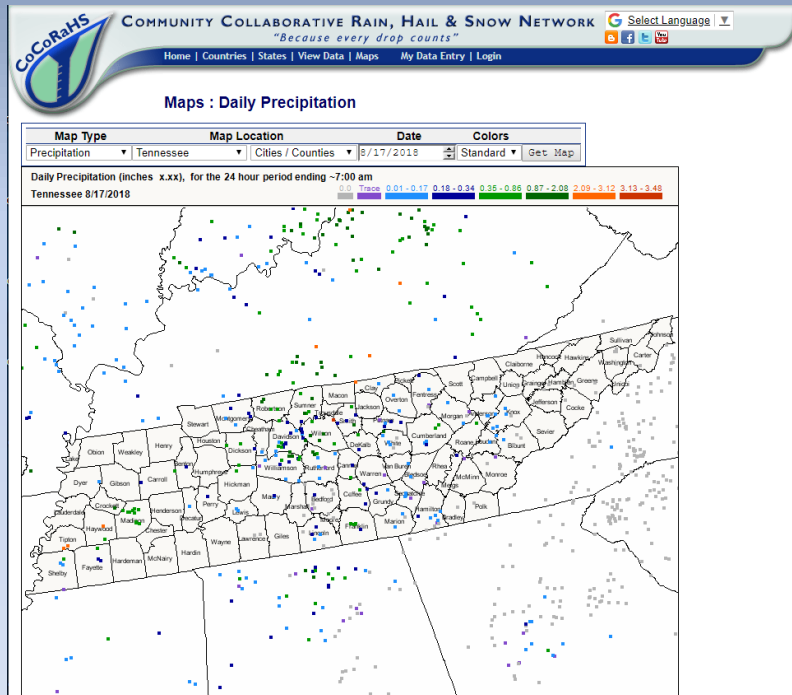
FLASH FLOOD...OBSERVED  
FLASH FLOOD DAMAGE THREAT...CATASTROPHIC  
EXPECTED RAINFALL...2-4 INCHES PER HOUR

\$\$



# CoCoRaHS

## Help us with rainfall reports – Become a CoCoRaHS observer



## What is CoCoRaHS?

CoCoRaHS is a national grassroots, non-profit, community-based, high-density precipitation network ...

... made up of volunteers of all ages and backgrounds



... who take daily measurements of precipitation right in their own backyards



<https://www.cocorahs.org/>



# True or False

- If I drive a pickup truck or large SUV, will this keep me safe from river flooding or flash flooding.







# True or False

- False!!!!
- As little as 6-12” of fast moving water can sweep most any vehicle off a roadway. Besides, you can't determine the condition of the road bed under the water. The road could be washed out, or the water could be hiding a huge sinkhole.

**TRIVIA**  
**QUIZ!**



# True or False

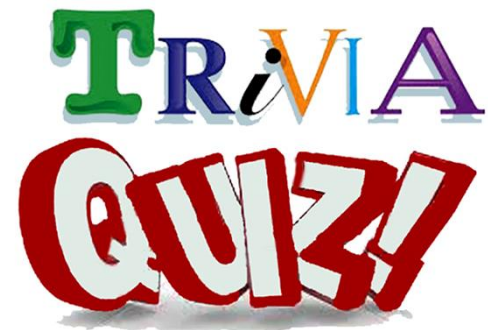
- A 100-year flood occurs once every 100 years on average?





# True or False

- False!!!!
- The 100-year flood is a climatic average, that there is a 1 in 100% (1 percent) chance of that magnitude of flood occurring in any year.

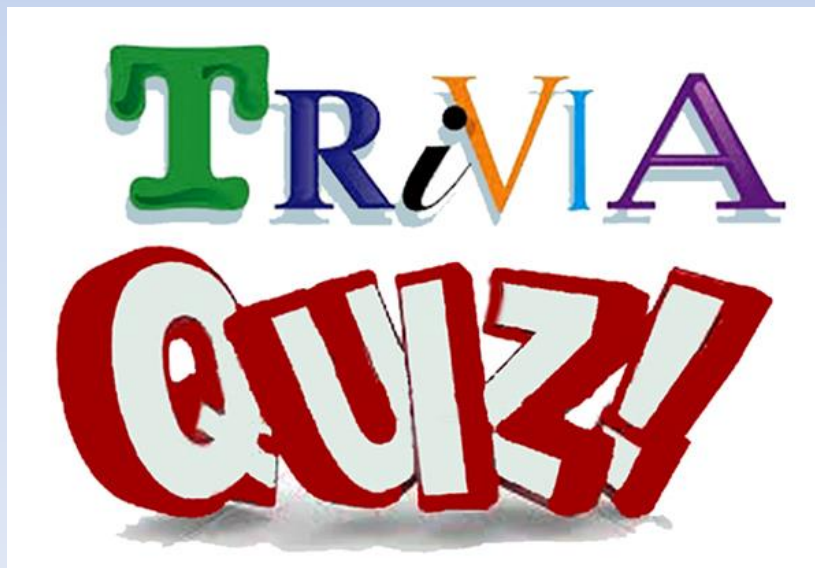






# True or False

- A 500-year flood would be a 1 in 500% (.2 percent) chance of that magnitude of flood occurring in any year.





# True or False

- True!!!!
- A 500-year flood would be a 1 in 500% (.2 percent) chance of that magnitude of flood occurring in any year.

**TRIVIA**  
**QUIZ!**



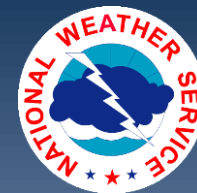
# Flooding FAQs

- How can I find out if I am in danger from a flood?
  - NOAA Weather Radio, Opt in on cell phone alerts, know your surroundings
- How do I know how severe a flood will be?
  - Once a river reaches flood stage, the flood severity categories used by the NWS include minor flooding, moderate flooding, and major flooding.
    - Minor Flooding – minimal or no property damage, but possibly some public threat or inconvenience (i.e. multiuse fields).
    - Moderate Flooding – some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevation are necessary.
    - Major Flooding – extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevation.





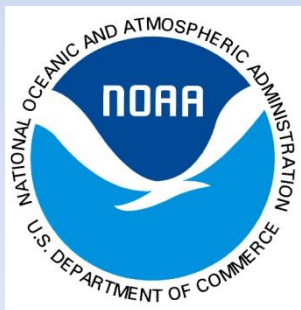
# Questions or Comments?



Email:

Faith Borden – [faith.borden@noaa.gov](mailto:faith.borden@noaa.gov)

Please, send me an email with the number of people in attendance at your computer, if more than one



U.S. Department of Commerce  
National Oceanic and Atmospheric Administration  
National Weather Service – Nashville, TN

