

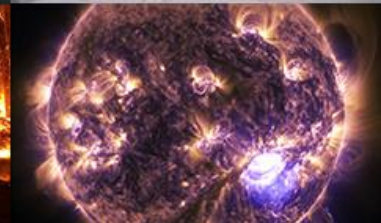
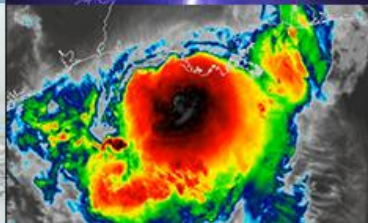


**NATIONAL
WEATHER
SERVICE**

February 2019 in the TN Valley: The intersectionality of multiple hazards and the impact on forecasters

JANUARY 13, 2020

Katie Magee, Chelly Amin, and Andrew Pritchett | WFO Huntsville

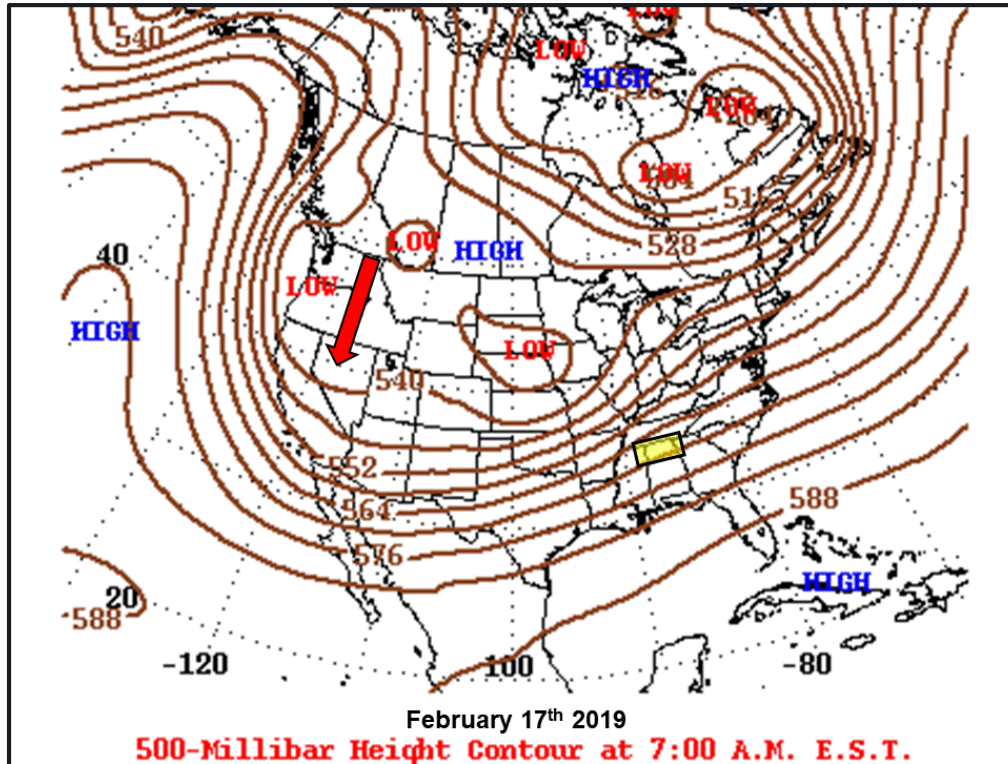




500 mb heights

Sun. Feb. 17 – Sun. Feb. 24

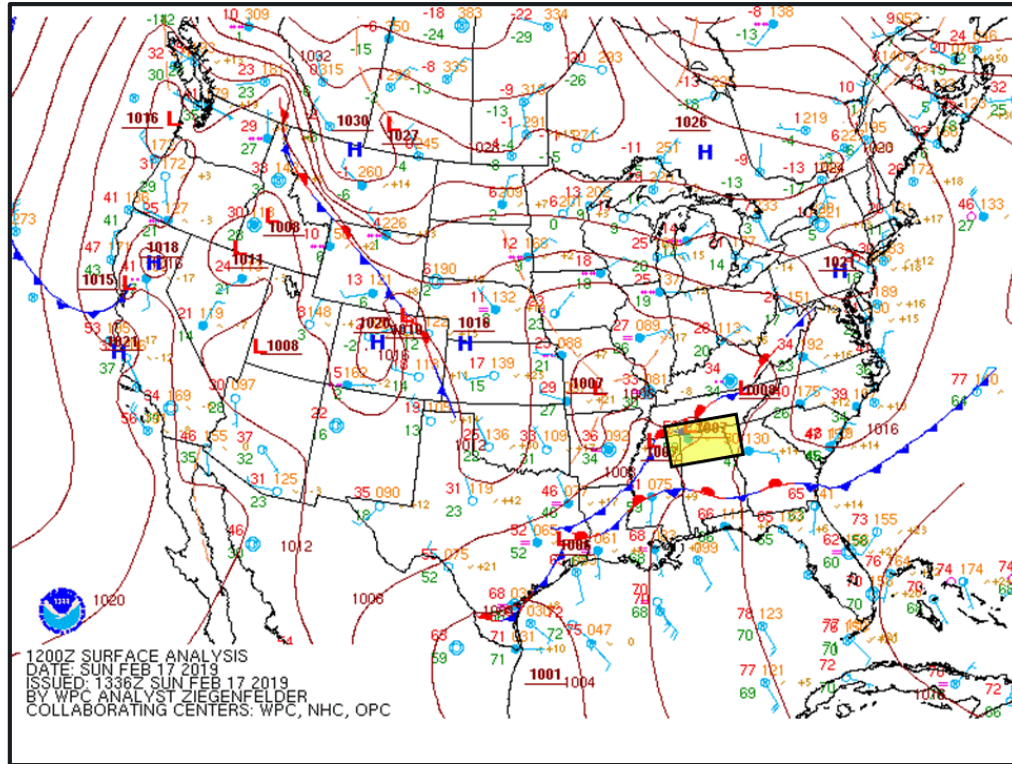
Series of shortwave troughs led to persistent southwest flow



Mean Sea Level Pressure

Sun. Feb. 17 – Sun. Feb. 24

Series of coastal low pressure systems and stalled boundaries led to multiple rounds of precipitation ranging from wintry to severe





Excessive Rainfall Outlooks

[illegible]



Long-Term High-Impact Prediction



- Tools to bolster confidence
 - Tables – NAEFS/ENS Ensemble Situational Awareness Table
 - SPC Sounding Climatology
 - Pattern recognition



Social Media Communications



Increased Risk For Flooding Next Week



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Huntsville, AL

Weather.gov

SATURDAY



Showers ending in the AM.
Cooler with cloudy skies.

SUNDAY



Rain chances increase in the AM
and continue through the
evening.

MONDAY



Slight chance for rain. Rain
chances increase overnight.

TUE & WED



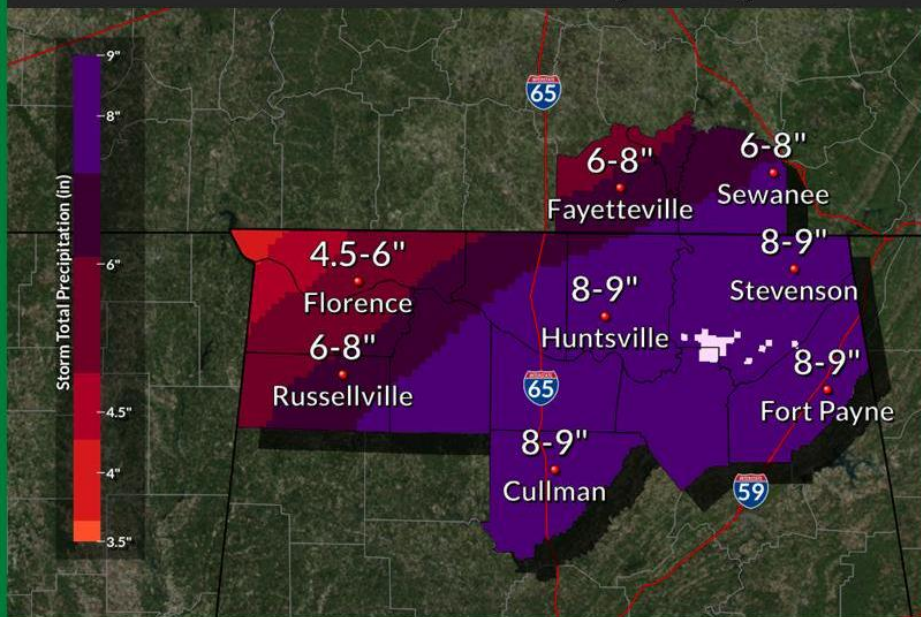
Heaviest rainfall threat exists
from Tue through Wed. Multiple
rounds of heavy rain will likely
lead to flooding. Embedded T-
storms possible Wed.

THU & FRI



Rain ending but flooding risk
will continue.

Storm Total Rainfall Sunday - Friday



3:31 PM Friday, February 15, 2019



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Social Media Communications



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OCEANIC AND ATMOSPHERIC ADMINISTRATION

Wet Weather Next Week



**Clear gutters
and drains of
leaves**



**Ensure sump
pump works**



**Monitor latest
forecast, especially
if near stream/river**



Social Media Communications



Increased Risk For Flooding This Week



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NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION

Huntsville, AL

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Tonight
2/17



Rainfall exits northeastern Alabama shortly after midnight. Drier weather briefly returns.

MONDAY
2/18



Break in rain continues. But...Rain chances increase again late Monday night.

TUE - FRI
2/19 - 2/22



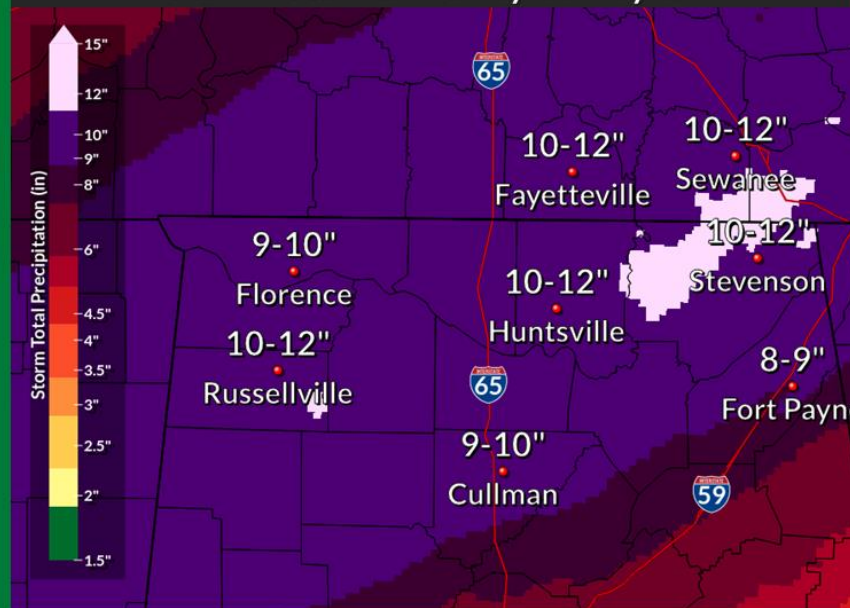
- Multiple rounds of heavy rain are expected from Tue. - Fri.
- Increasing confidence that all of the TN Valley will see 6-9+ inches of rain.
- **Flooding is expected.**
- Embedded thunderstorms possible and could make flooding worse.

SAT & SUN
2/23 - 2/24



Additional round of rain and thunderstorms possible.

Storm Total Rainfall 2/17 - 2/24

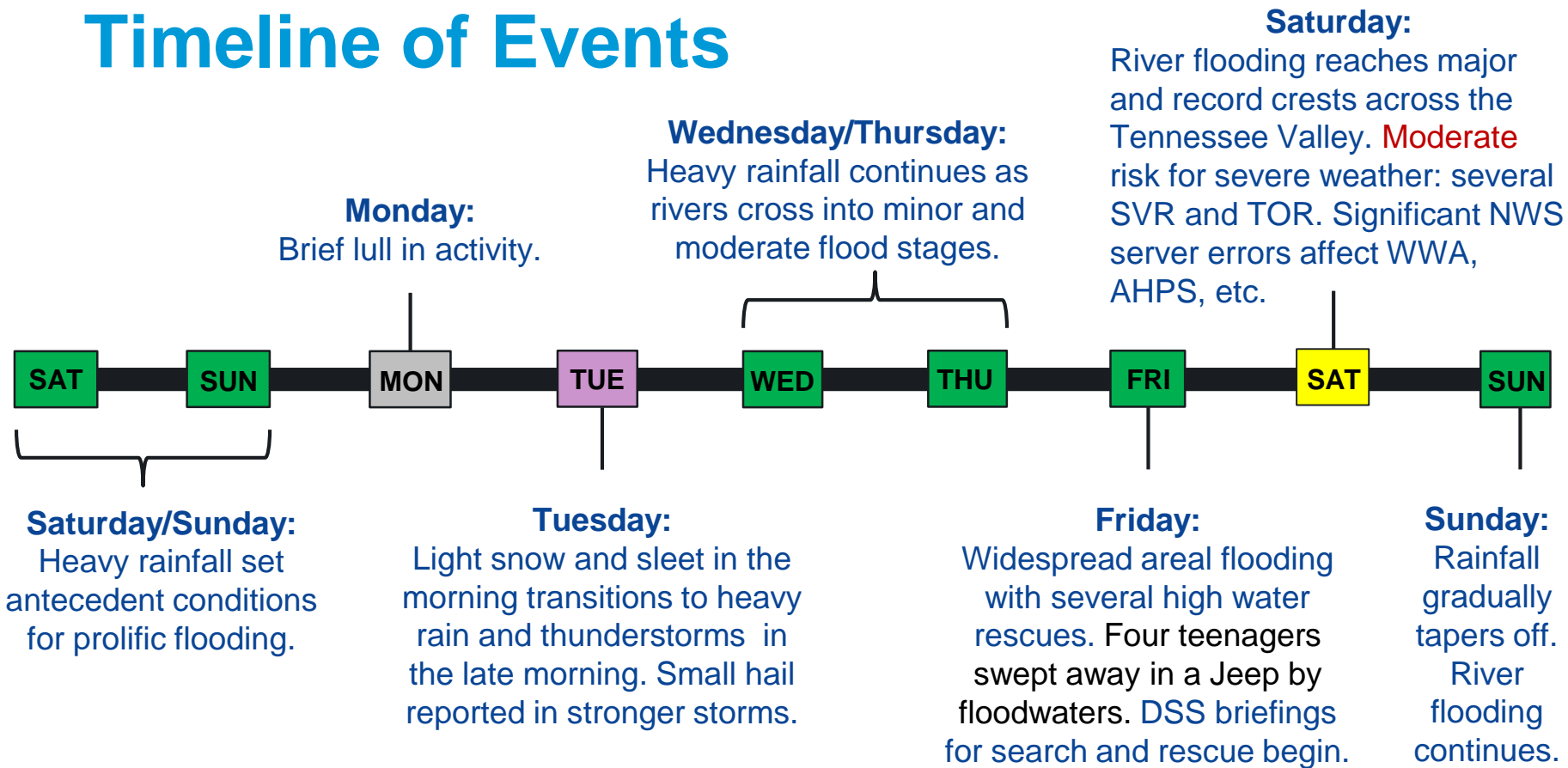


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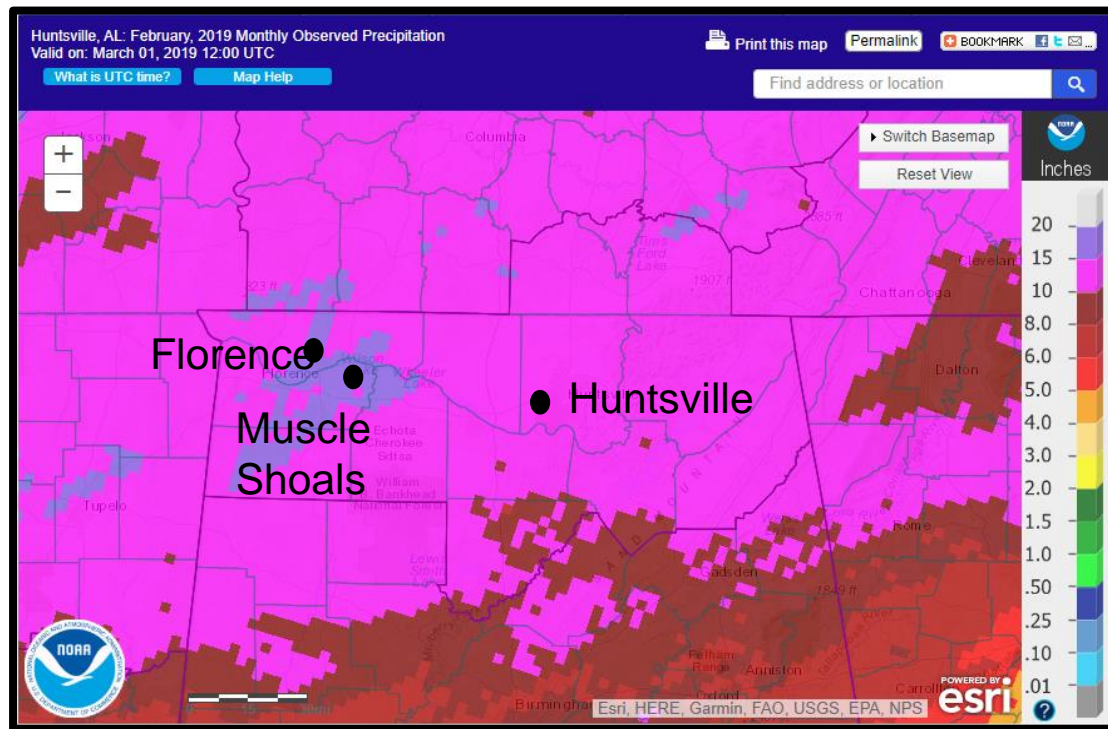
Timeline of Events





Rainfall Amounts

- 10" - 15"+
- 300-500% of normal for February
- Highest COOP Rainfall: 15.25" Lynchburg, TN





Hydrologic Impact: River Crests

Site Name	Crest Height (Flood Cat.)	Significance of Crest
Big Nance Creek at Courtland	21.70 ft (2.7 above Major)	#13 all-time**
Flint River at Brownsboro	22.12 ft (0.12' above Major)	#5 all-time
TN River at Whitesburg	22.90 ft (0.1' below Major)	#9 all-time**
Elk River above Fayetteville	24.17 ft (1.8' below Major)	#8 all-time (1st top-10 since 1990)
TN River at Florence	28.99 ft (3.1' below Major)	#3 all-time (2nd since dams)**
Paint Rock River at Woodville	19.56 ft (0.56' above Moderate)	#32 all-time**
TN River at Decatur	10.11 ft (0.11 above FS)	#3 all-time (2nd since dams)

** denotes Flood of Record
in March 1973



Major Flood Stage



Moderate Flood Stage



Minor Flood Stage





Bucks Pocket DSS

- Search and rescue for a local teenager
- Persistent rainfall and runoff from area rivers and streams prevented life saving operations
- 2x daily briefings sent until March 13th

BEFORE



AFTER

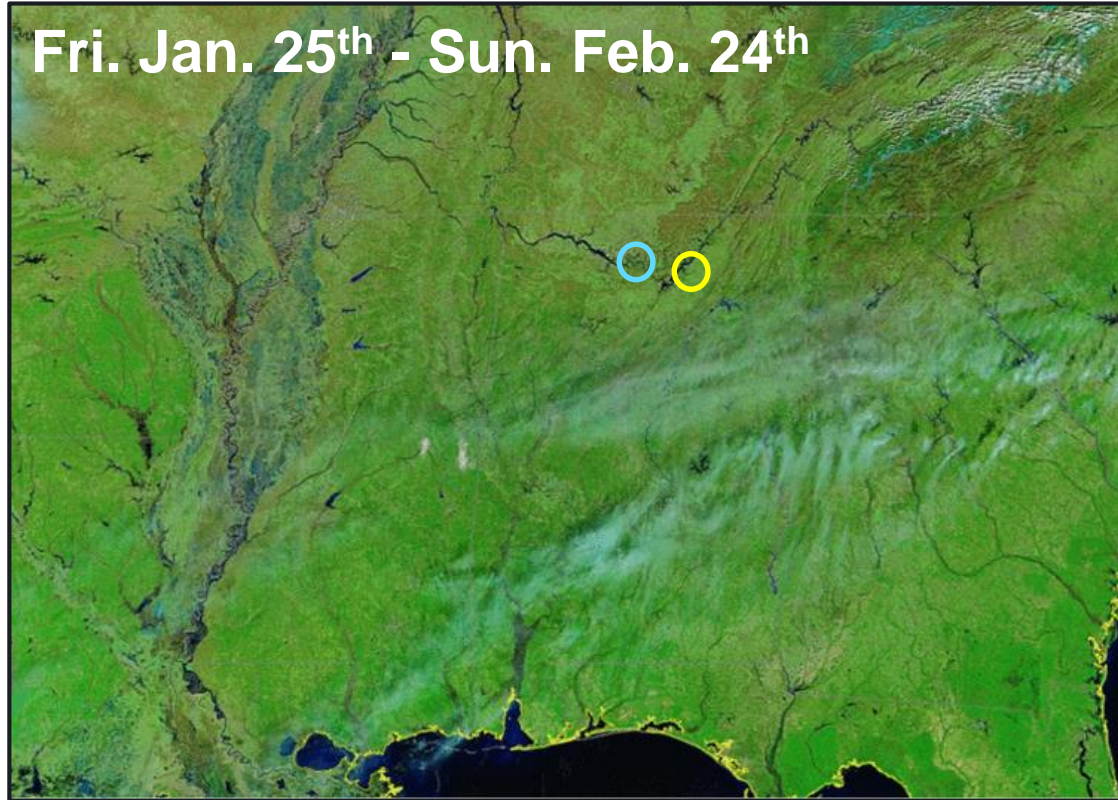


Images via Google Earth and WHNT-19





Terra/MODIS False Color



Significant rises on
area rivers and
streams, particularly
along MS and TN
river basins

Evacuations

Buck's Pocket State Park





Prolonged High-Impact Operations

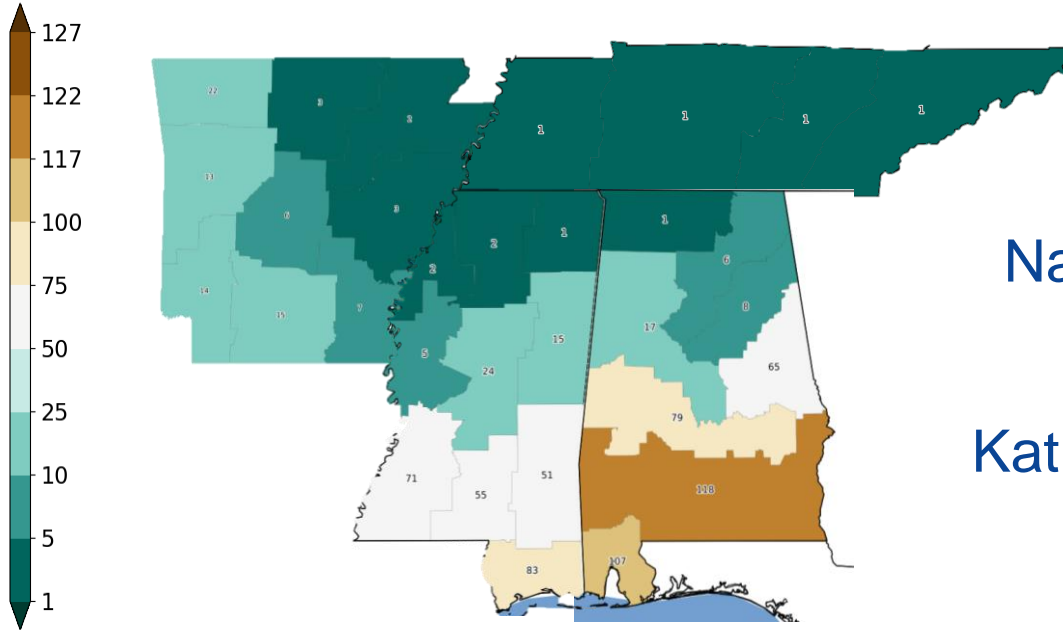


- Multiple consecutive 10-12 hour shifts
- All high-impact, high-visibility, and high-stress
- **Event coordinator** prioritizes forecaster health and forecast cohesion for prolonged events
 - Dependent on staffing levels
- Collaboration with local/regional/national offices





The Wettest February On Record



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IEM 2019 February 2019 Total Precipitation Ranks by Climate District, valid 1893 - 2019



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