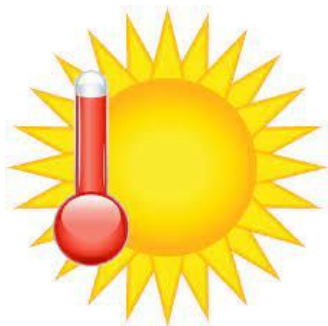


CoCoRaHS *WxTalk* Webinar Series

**2021 Meteorological Memories
January 13, 2022**

Meteorological



Memories



Greg Carbin
Chief of Forecast Operations, NWS Weather Prediction Center
College Park, Maryland
@GCarbin

1-2021

February Arctic Outbreak

Thursday, Feb. 11, 2021

135-car pile up, I35, north TX
6 dead, dozens injured

Fri-Sat, Feb.12-13, 2021

Major ice storm, NW Oregon



Sat, Feb. 13, 2021

8.9" at SEA, snowiest day since Dec. 1968!
Major ice storm, southwest Virginia

Sun, Feb. 14, 2021

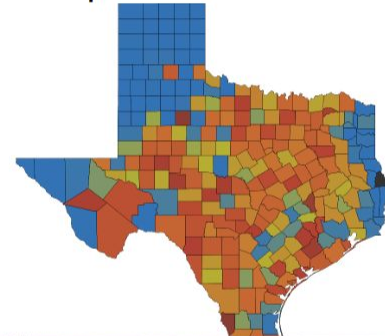
6" of snow in OKC, MaxT 12F



Sun-Mon, Feb. 14-15, 2021

All-time record cold, snow,
and ice across Texas.

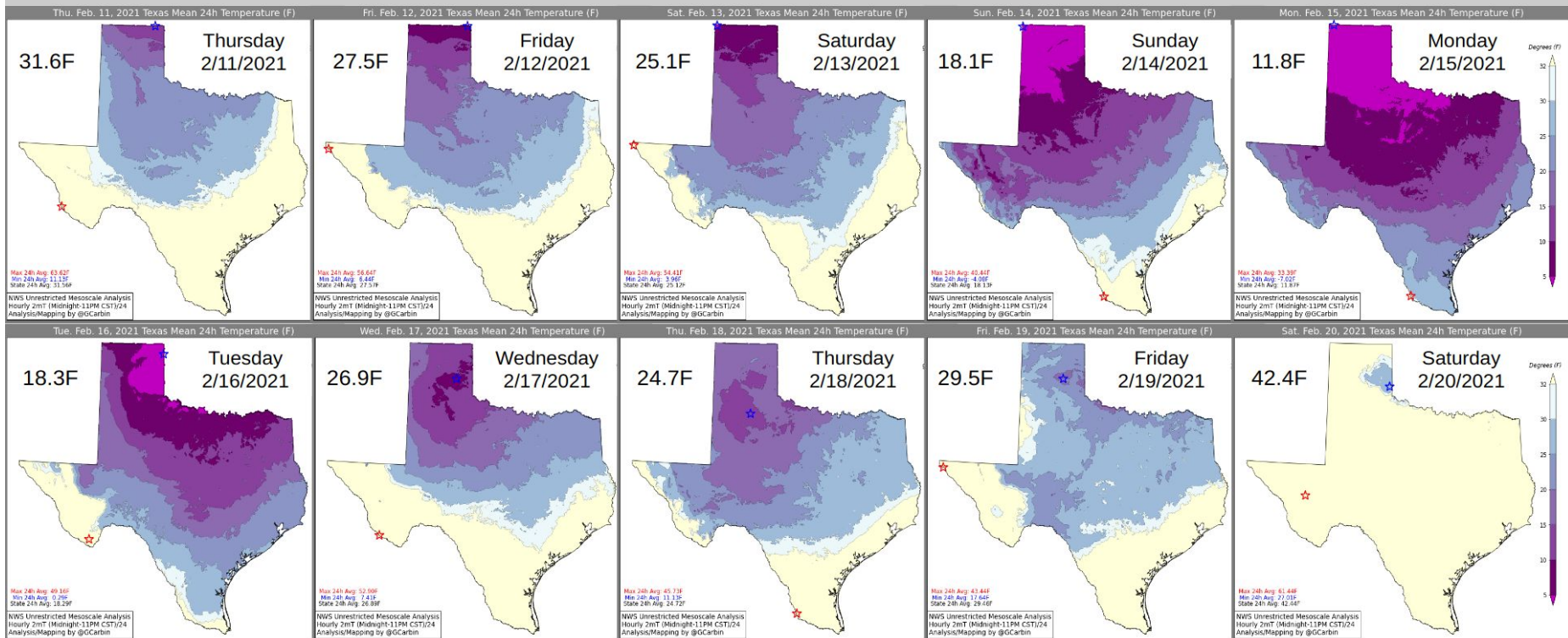
Houston I45 pile up, millions
without power.



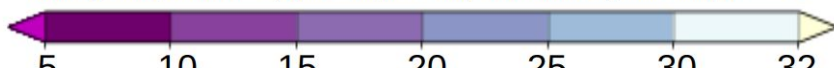
1 -2021

February Arctic Outbreak

Ten Days in Texas: Deadly Arctic Airmass Overspreads Lone Star State, Feb. 11-20, 2021



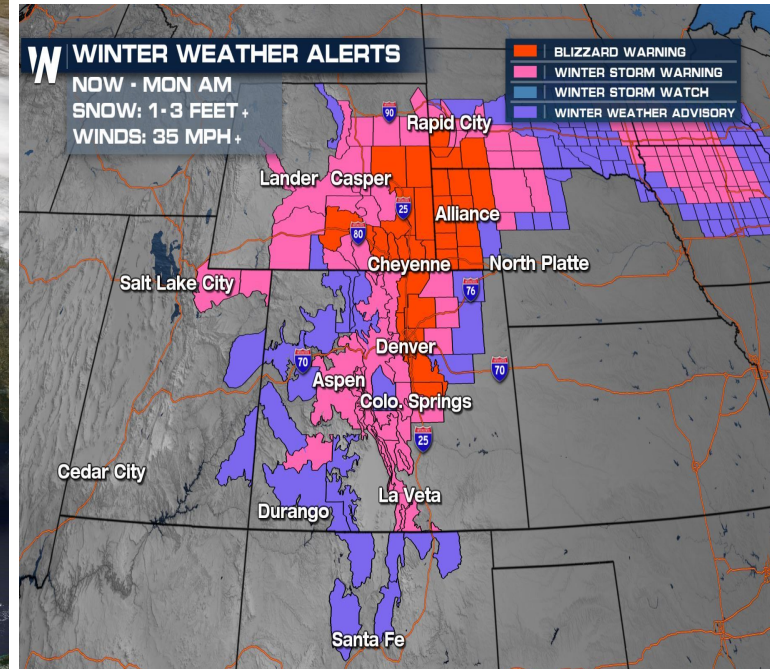
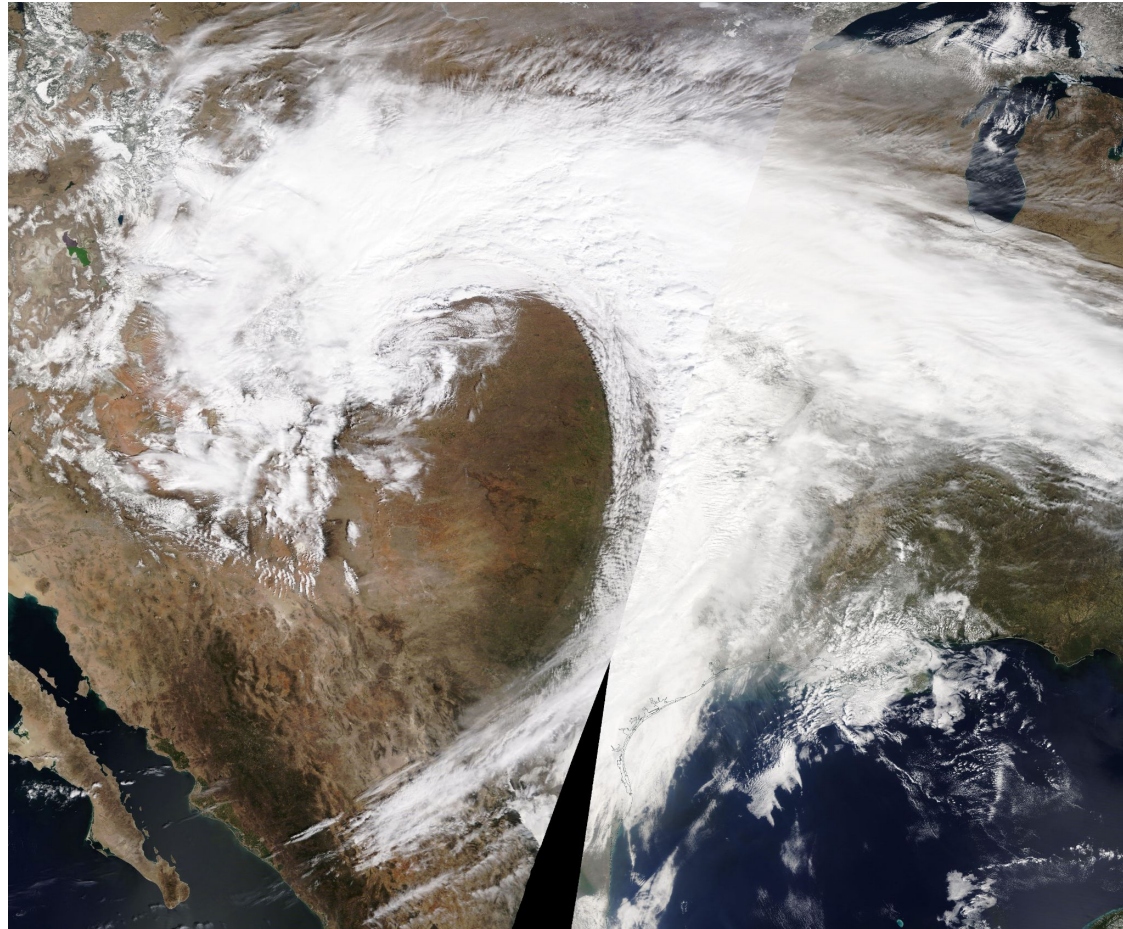
National Weather Service unrestricted mesoscale analysis (URMA)
hourly temperatures (F) averaged daily from Midnight to 11 pm CST.



2 -2021

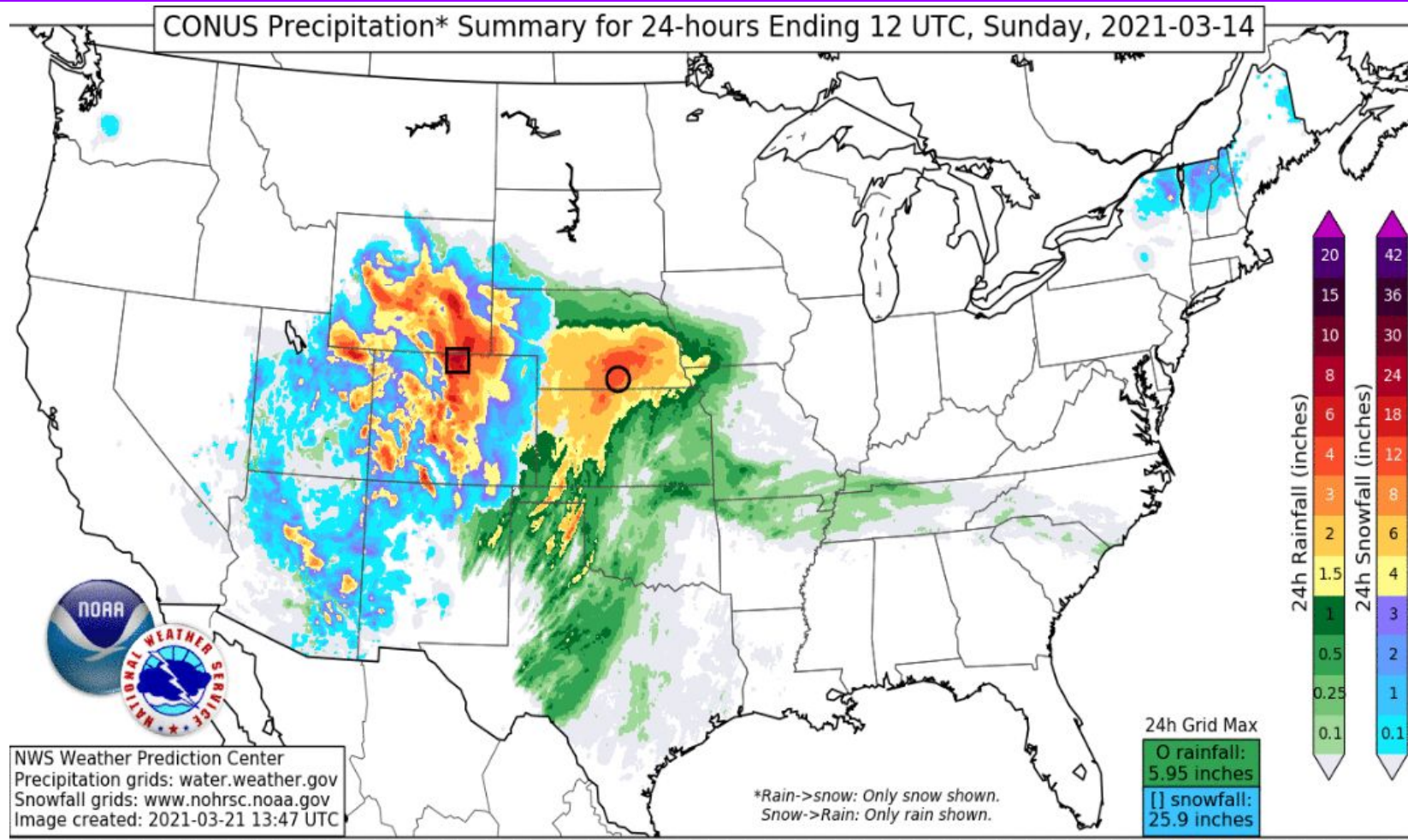
Front Range Snowfall Records

Front Range Blizzard March 13-14, 2021



2 -2021

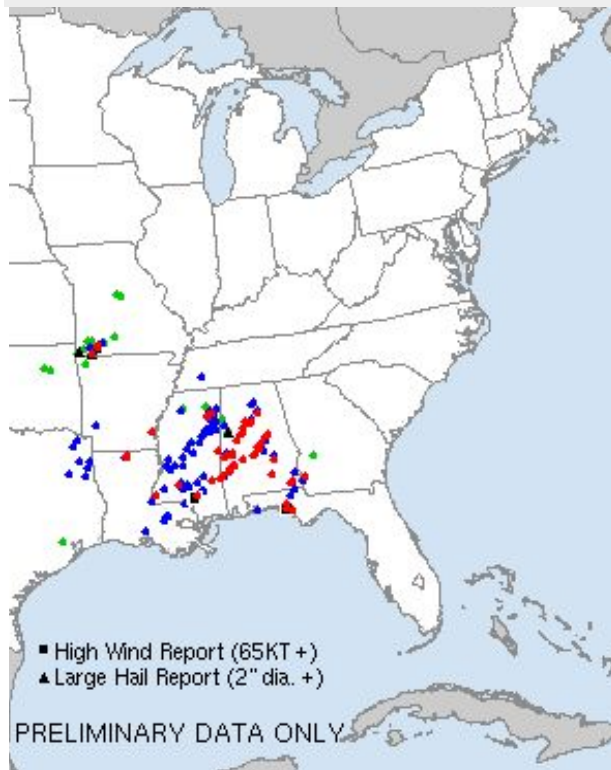
Front Range Snowfall Records



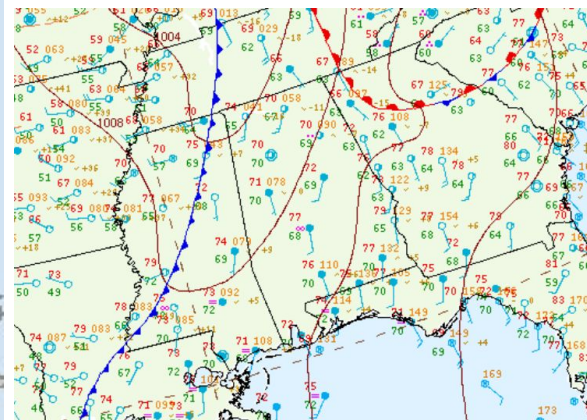
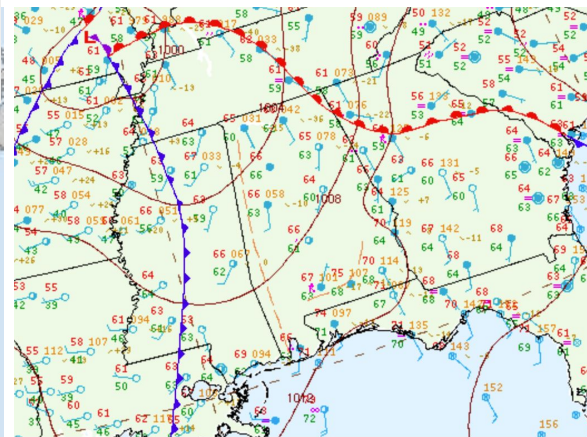
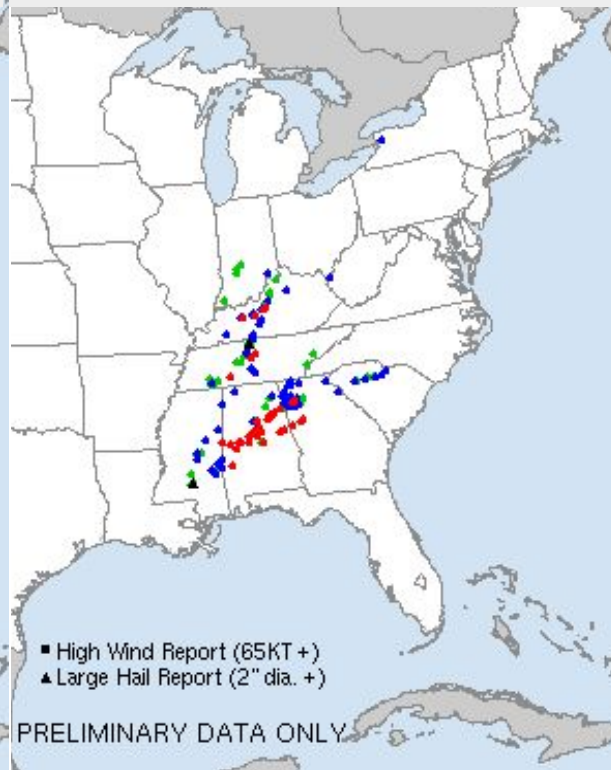
3 -2021

March Tornadoes

Storm Reports, March 17, 2021

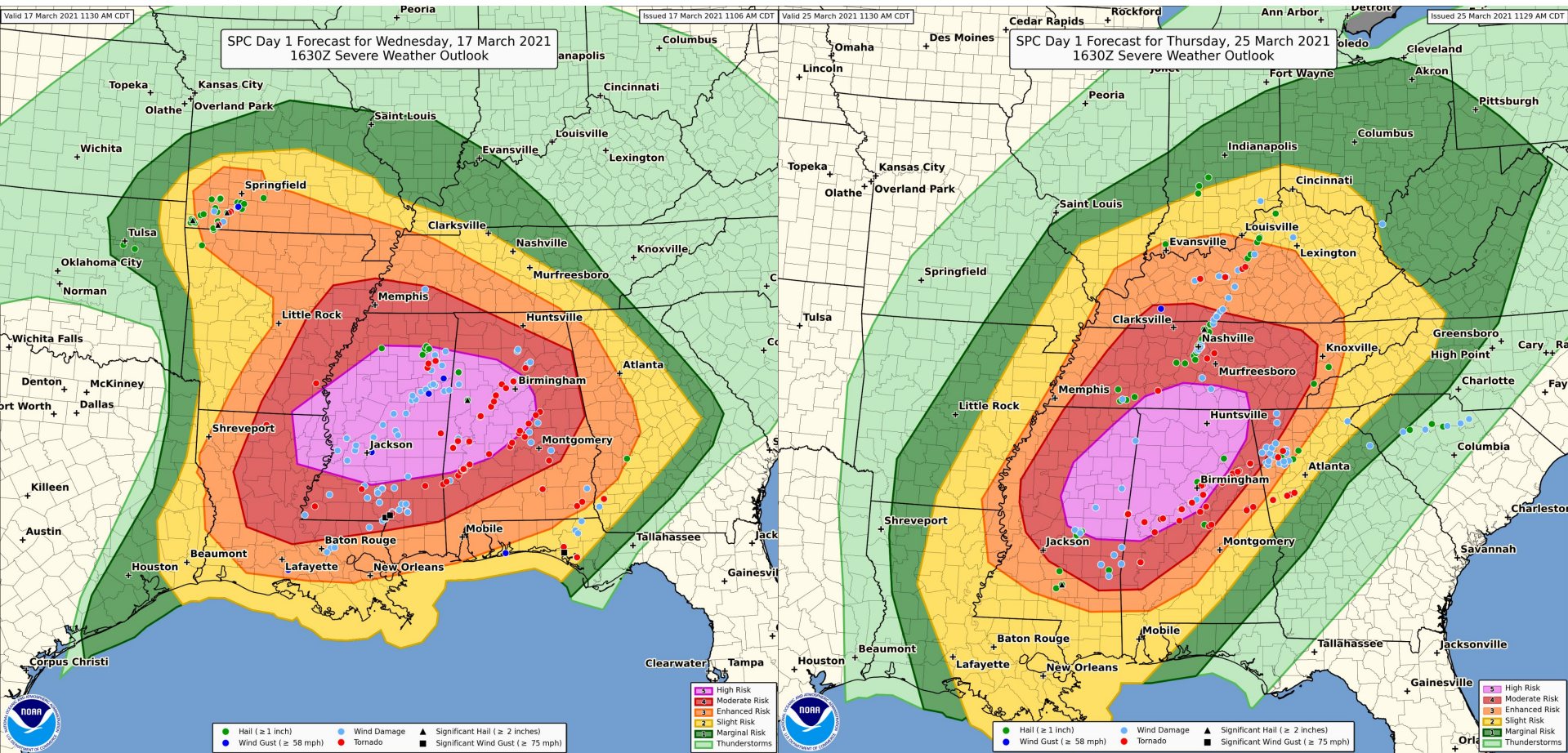


Storm Reports, March 25, 2021



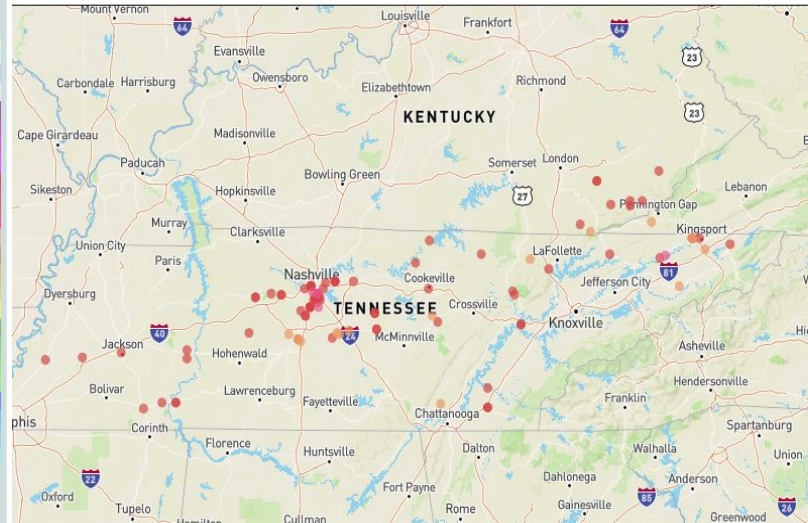
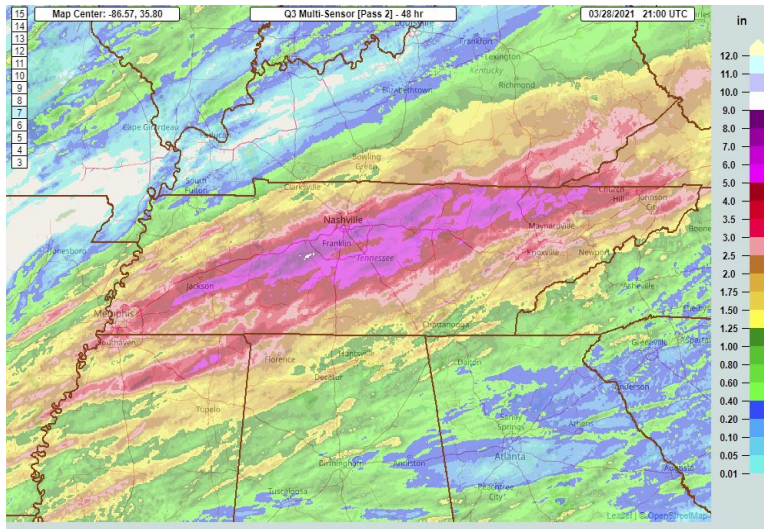
3 -2021

March Tornadoes



Base Reflectivity loop from 6:00 PM 3/27/21 to 4:30 AM 3/28/21



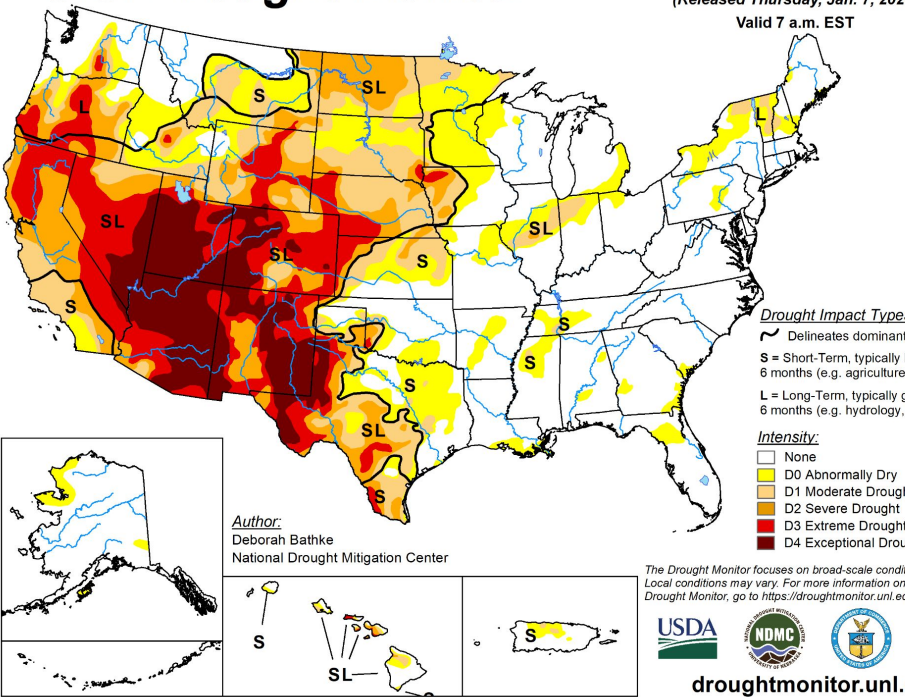


Heavy rainfall/Flash Flood event of March 27-28, 2021

- Overall totals (left image) reached 5-9" across Middle Tennessee.
- Second wettest two day period on record for Nashville, 7.01" (#1 remains 13.57" from May 1-2, 2010)
- Flood/flash flood reports covered much of Tennessee, southeast Kentucky, and westernmost Virginia
- Significant flash flooding led to at least 6 deaths

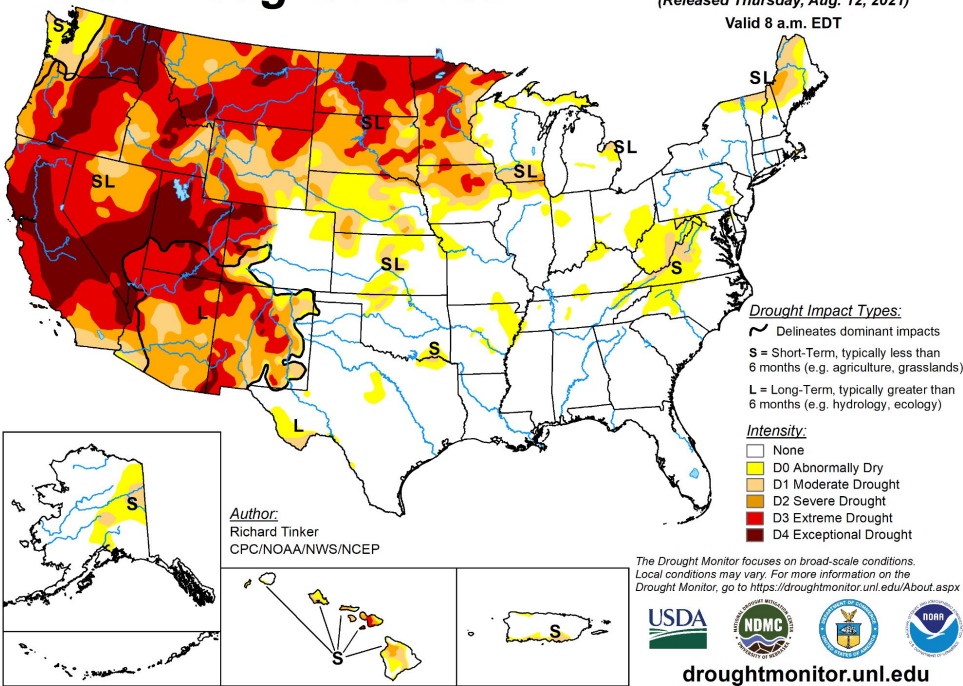
U.S. Drought Monitor

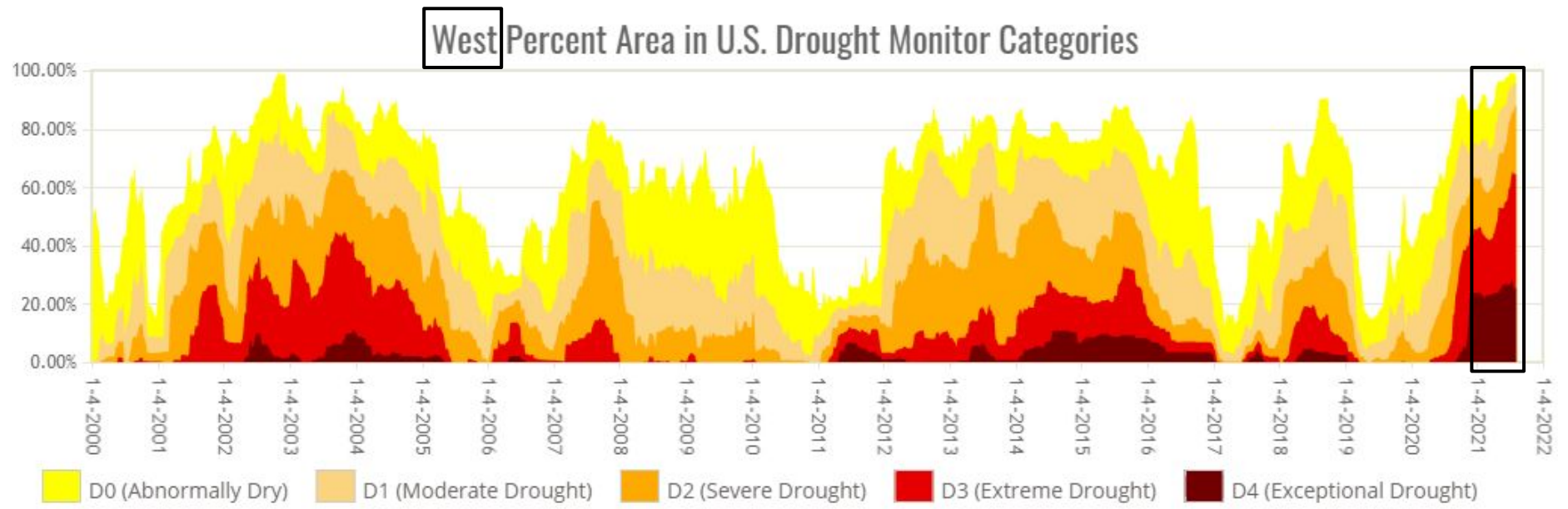
January 5, 2021
(Released Thursday, Jan. 7, 2021)
Valid 7 a.m. EST



U.S. Drought Monitor

August 10, 2021
(Released Thursday, Aug. 12, 2021)
Valid 8 a.m. EDT





6 -2021

Where Have All the Watches Gone?



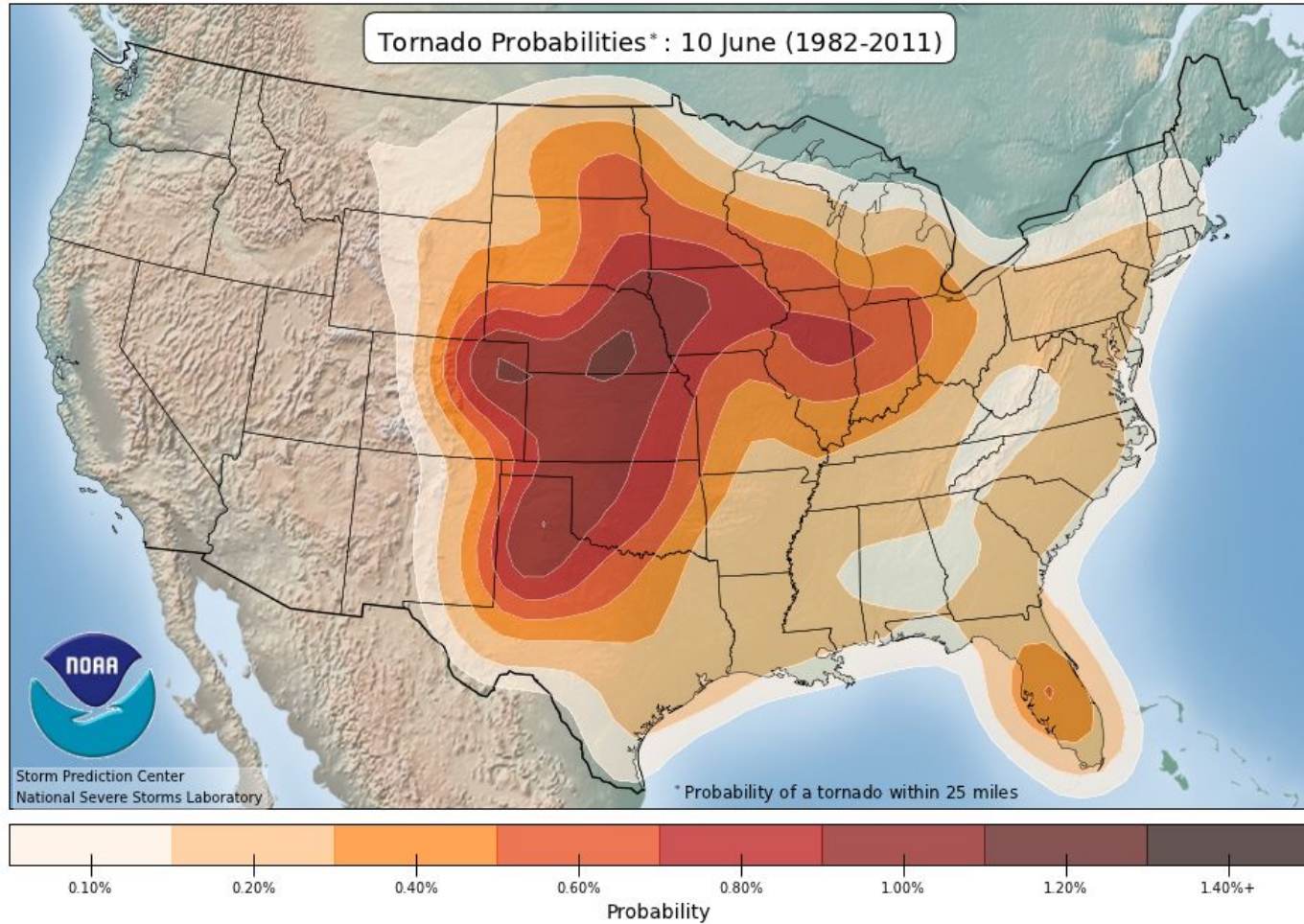
T-3rd Fewest June Tornado Watches (1970-present)



Rank	Number of June Tornado Watches	Year
1	6	2020
2	8	2019
T-3	10	2021
T-3	10	1988
T-5	11	2016
T-5	11	2000
7	14	2006
T-8	15	2002
T-8	15	2017

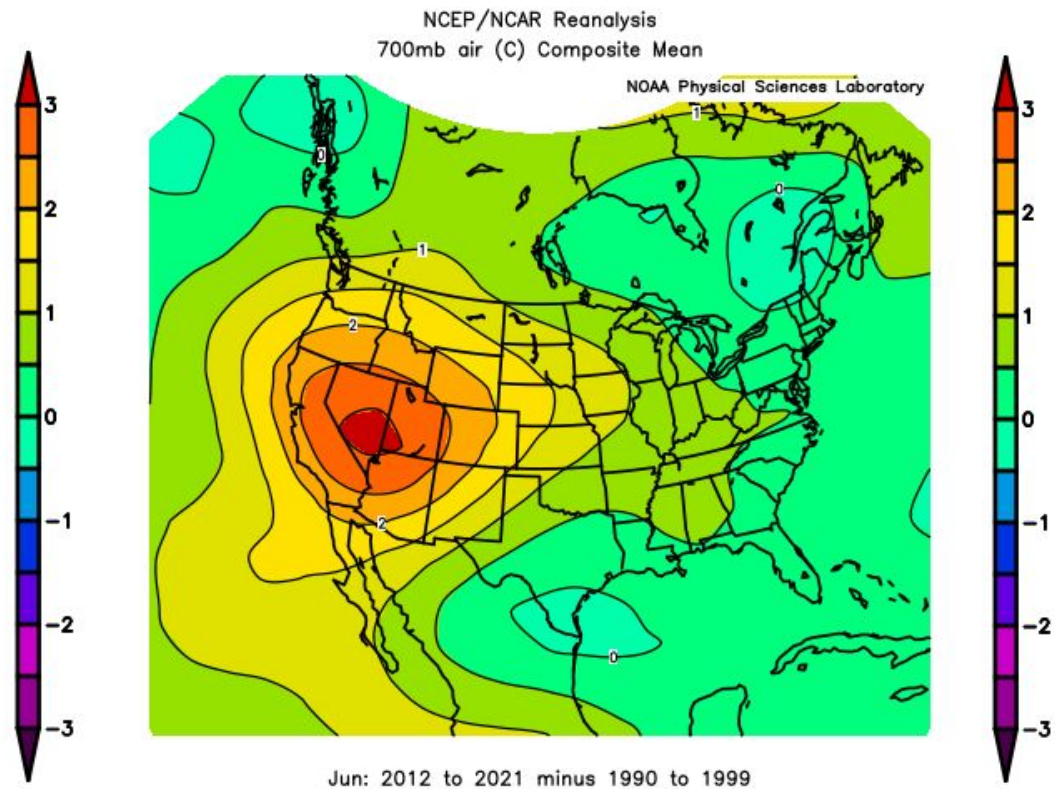
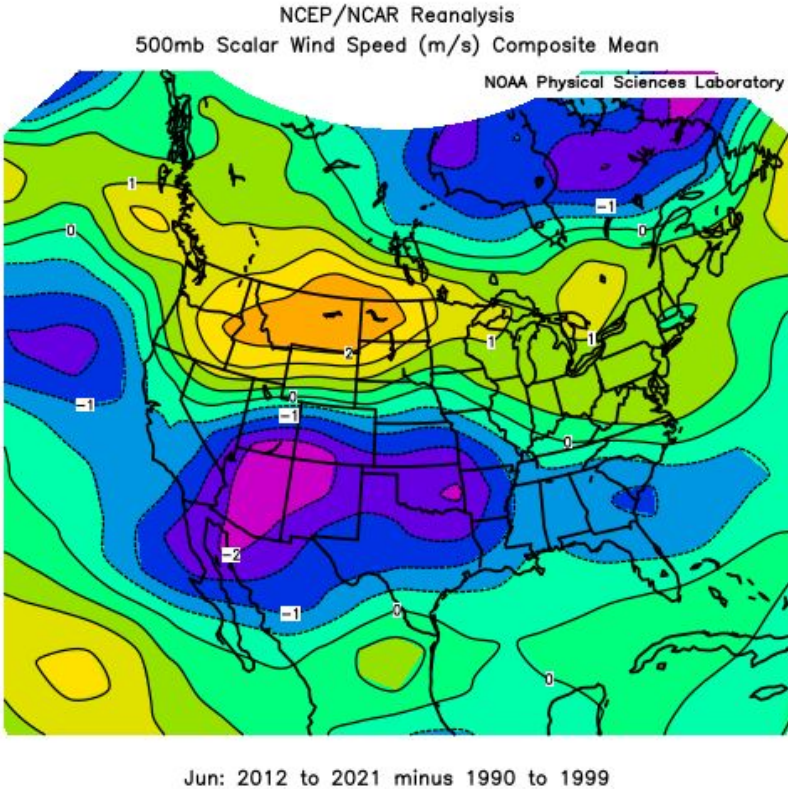
6 -2021

Where Have All the Watches Gone?

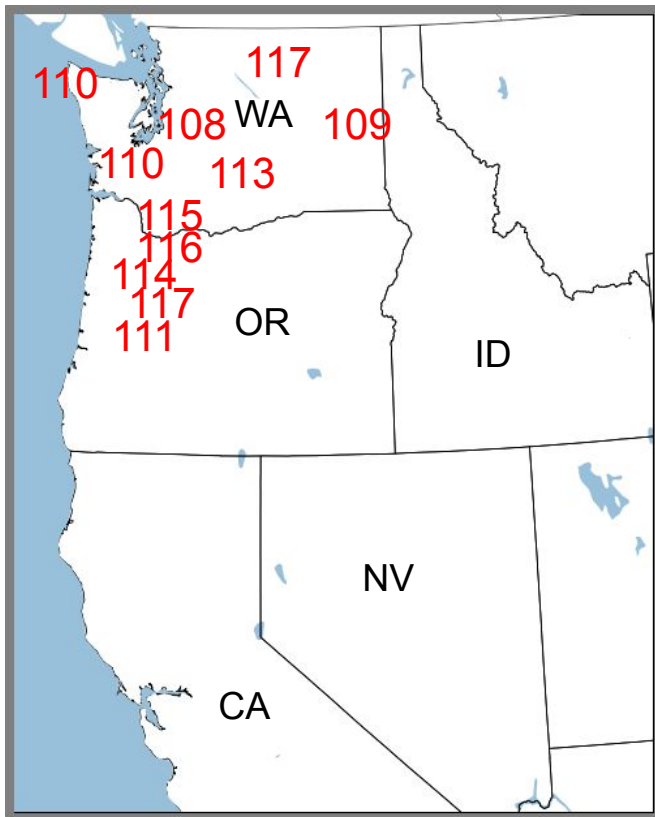


6 -2021

Where Have All the Watches Gone?



Northwestern U.S. Preliminary New All-time Maximum Temperature Records



Since Sunday, the following locations in Washington and Oregon established new preliminary all-time maximum temperature records for any calendar day. It is quite remarkable for these temperature records to occur in June, even more remarkable some locations obliterated their previous all-time records by more than 10 degrees, and quite incredible that, in the majority of cases, the prior all-time record maximum temperature had only been set 24 hours earlier!

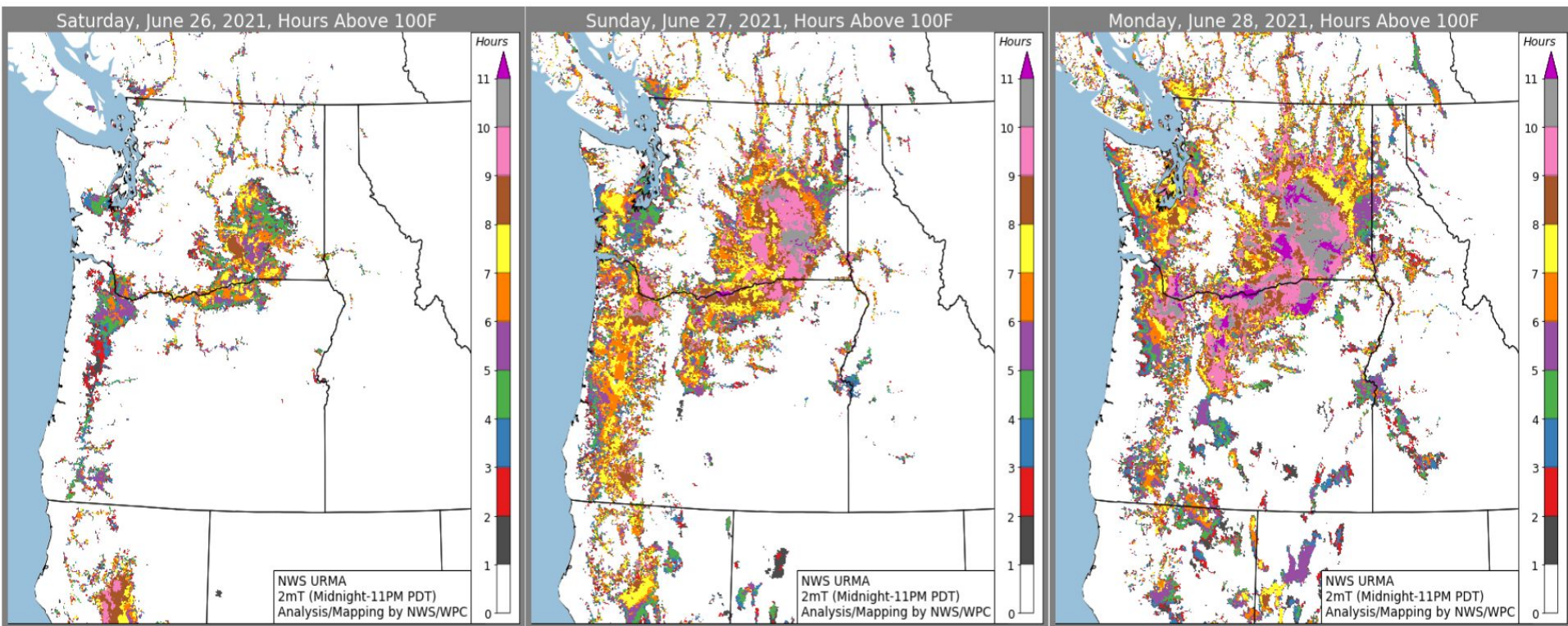
Washington (State all-time maximum temperature record: 118F, August 5, 1961)

6/29/2021 - 117F at Omak breaks previous all-time maximum temperature of 114F, July 26, 1928
6/28/2021 - 115F at Vancouver breaks previous all-time maximum temperature of 112, June 27, 2021
6/29/2021 - 113F at Yakima breaks previous all-time maximum temperature of 109, June 27, 2021
6/28/2021 - 110F at Quillayute breaks previous all-time maximum temperature of 99, August 9, 1981
6/28/2021 - 110F at Olympia breaks previous all-time maximum temperature of 105, June 27, 2021
6/29/2021 - 109F at Spokane breaks previous all-time maximum temperature of 108, August 4, 1961
6/28/2021 - 108F Seattle/Tacoma breaks prev. all-time maximum temperature of 104, June 27, 2021

Oregon (State all-time maximum temperature record: 119F, August 10, 1898)

6/28/2021 - 117F at Salem breaks breaks prev. all-time maximum temperature of 113, June 27, 2021
6/28/2021 - 116F at Portland breaks breaks prev. all-time maximum temp. of 112, June 27, 2021
6/28/2021 - 114F at McMinnville breaks breaks prev. all-time maximum temp. of 111, June 27, 2021
6/27/2021 - 111F at Eugene breaks breaks prev. all-time maximum temp. of 108, August 9, 1981

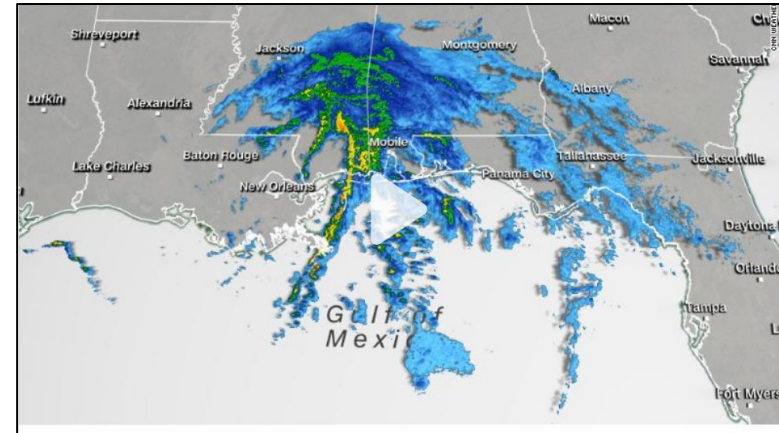
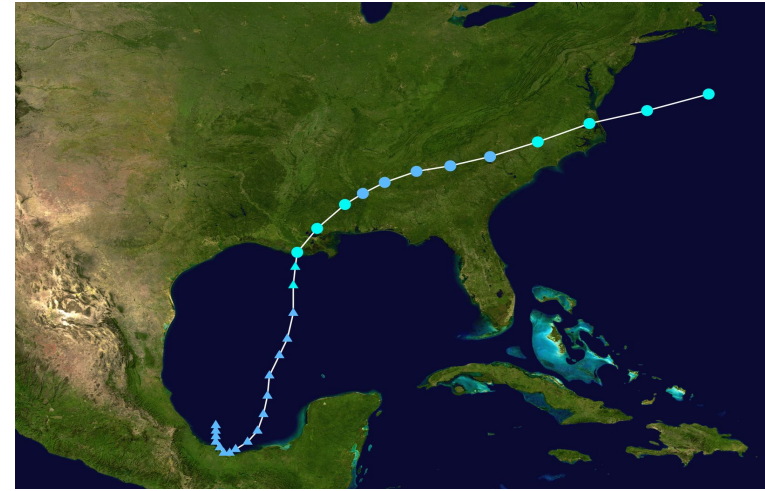
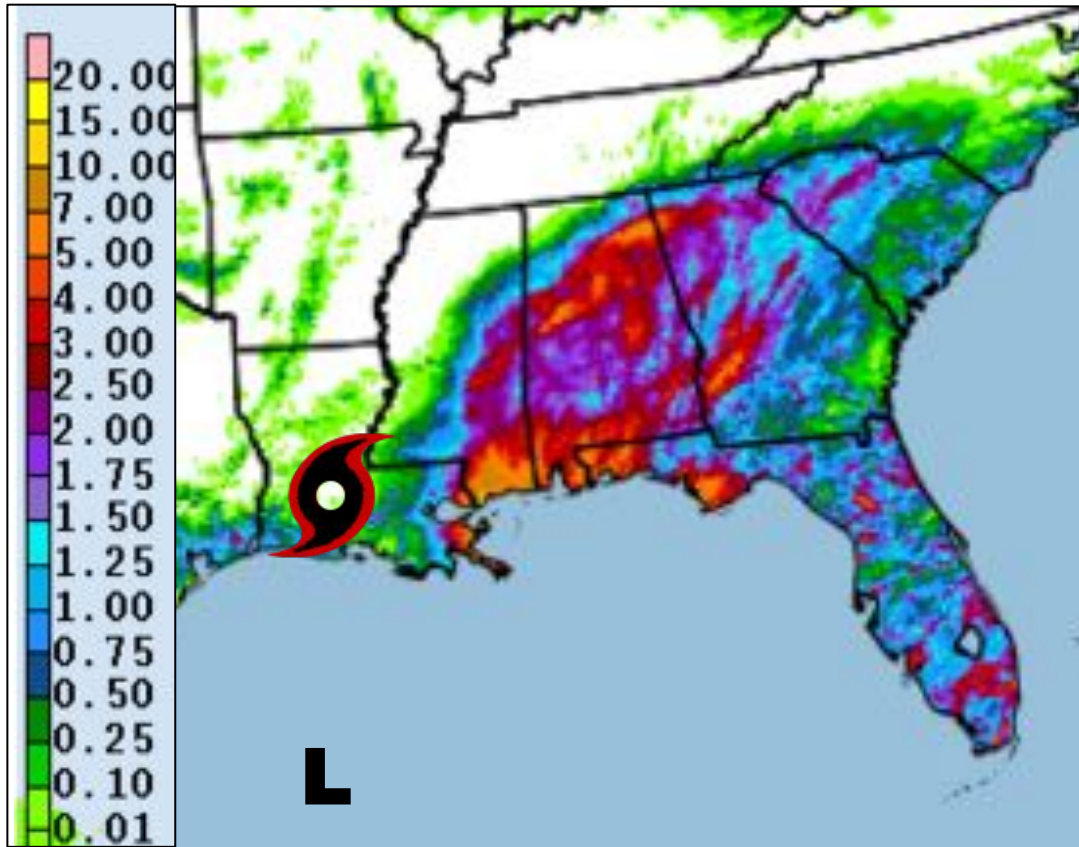
Estimated daily hours above 100F from NWS URMA (2.5 km resolution)
Saturday, Sunday, and Monday, June 26, 27, 28, 2021



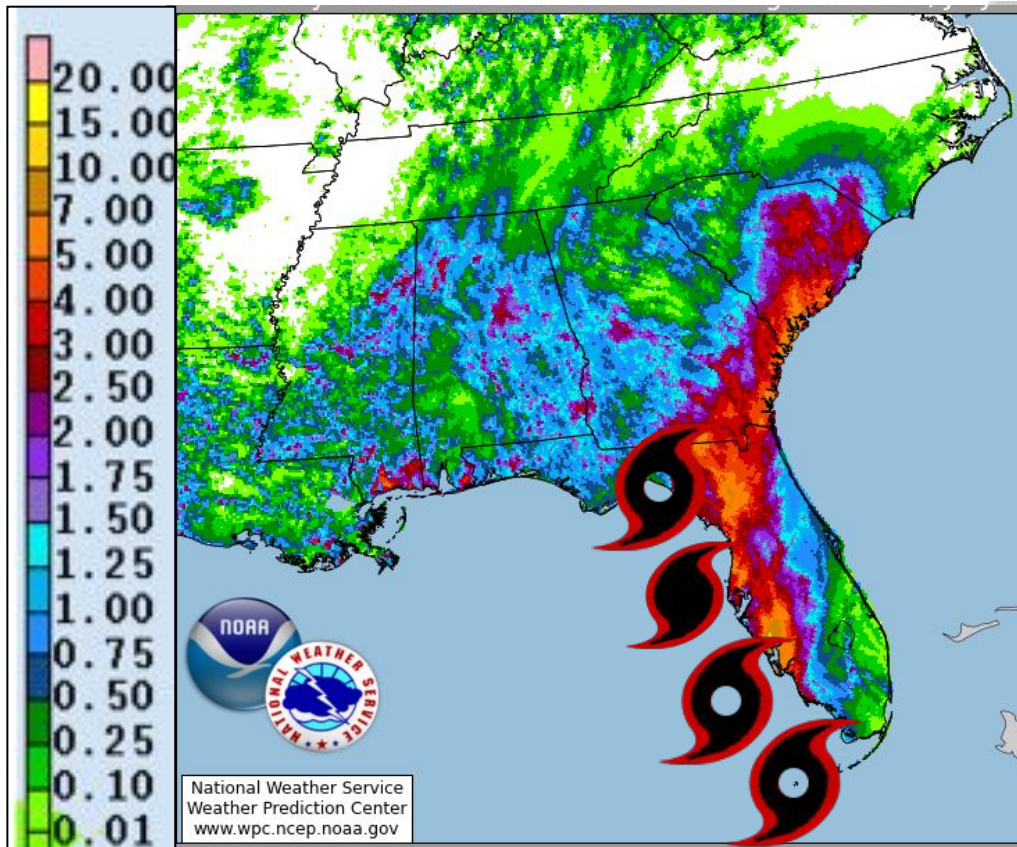
8 -2021

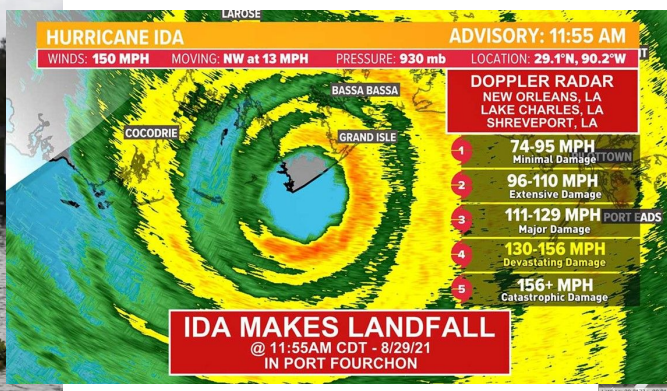
Claudette and Elsa

Estimated rainfall June 16-20 from Claudette

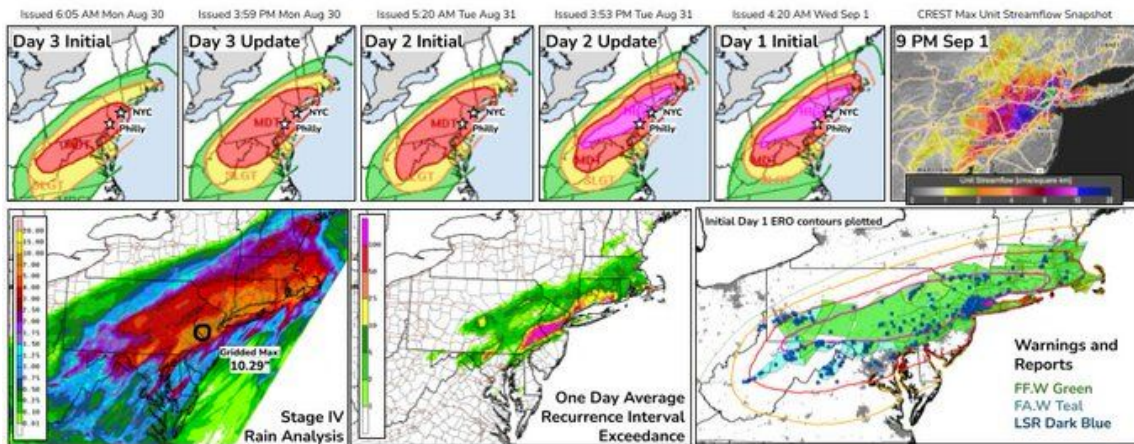


Estimated 2-day rainfall July 7-8 from Elsa

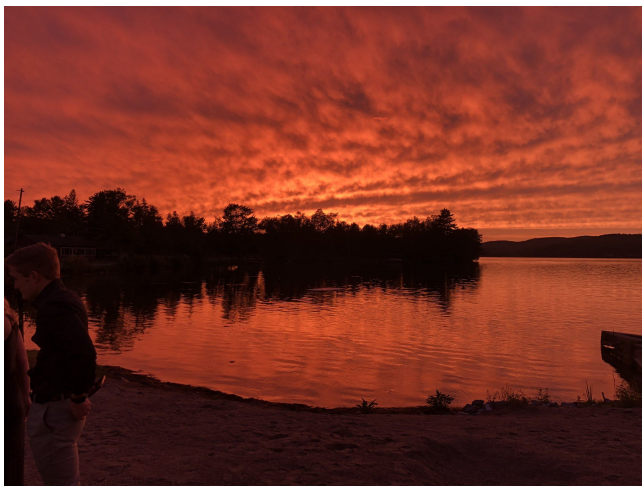




WPC Excessive Rainfall Outlooks for Period from 12Z 1 Sep 2021 to 12Z 2 Sep 2021



Approximately 58 hours lead time on initial ramp up in flash flooding in Philly metro area (61hr in NYC) with the first Moderate Risk, and 24 hours in Philly for the High Risk upgrade (27hr in NYC). 65 initial Flash Flood Warnings ("NEW" tag) in the Northeast, with 9 Flash Flood Emergencies, including NYC. High Risk entirely covered by warnings during the valid period, and all warnings were within the Moderate or High Risk areas.



- Tornado reports from 7 p.m. Dec. 10 to 5 a.m. Dec. 11

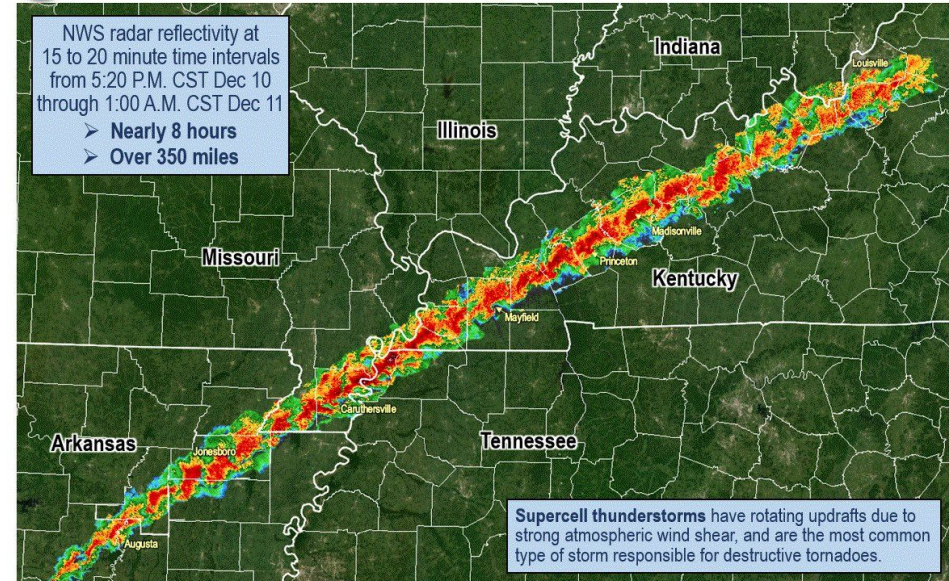


Sources: NWS, European Space Agency

DYLAN MORIARTY/THE WASHINGTON POST



December 10-11, 2021: Long-lived Supercell Thunderstorm

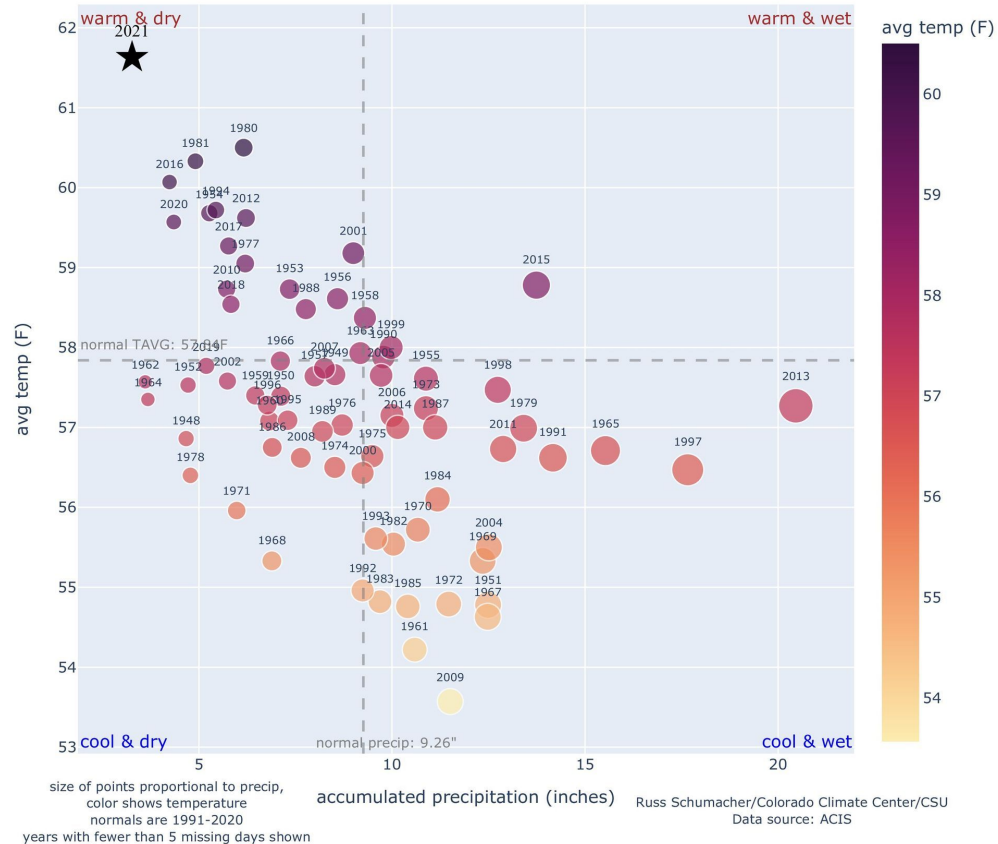


National Weather Service

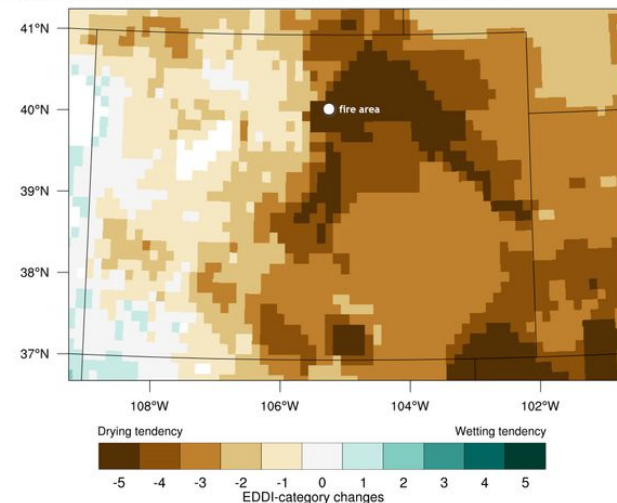
December 12, 2021

A record-setting December tornado outbreak with over 60 tornadoes and at least 80 deaths. Nighttime tornadoes over this region of the country are notoriously deadly and this was an incredibly damaging and deadly event. Total losses will be in the billions of dollars. Town of Mayfield, KY took a direct hit from EF4 tornado.

DENVER-CENTRAL PARK temperature and precipitation, June 1 - December 29

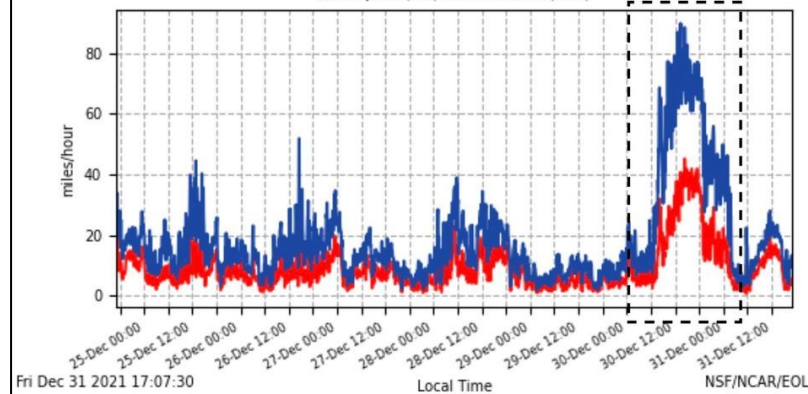


Changes in 6-month evaporative demand (July 5-December 30 versus April 6-October 3)



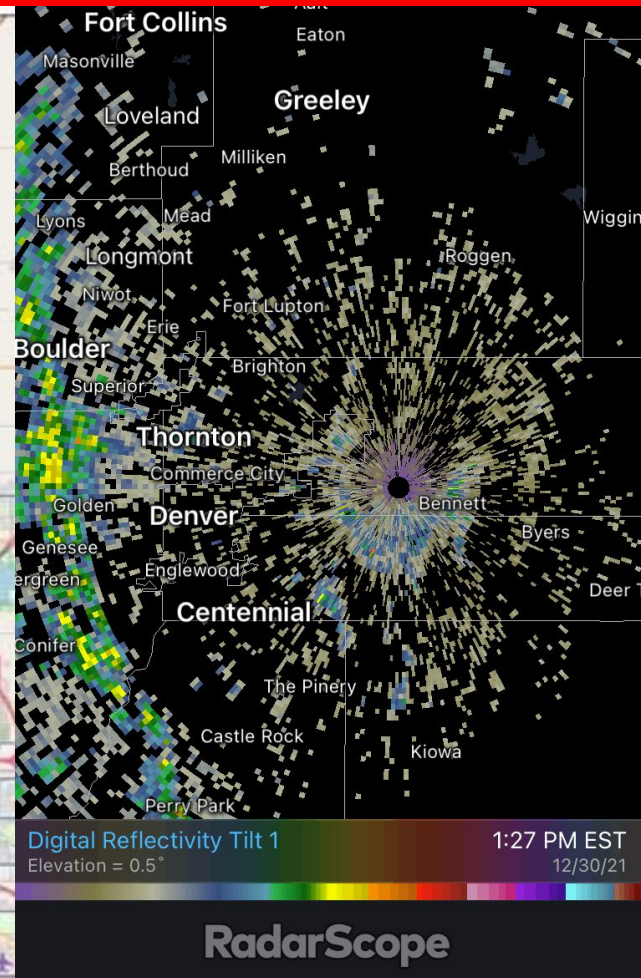
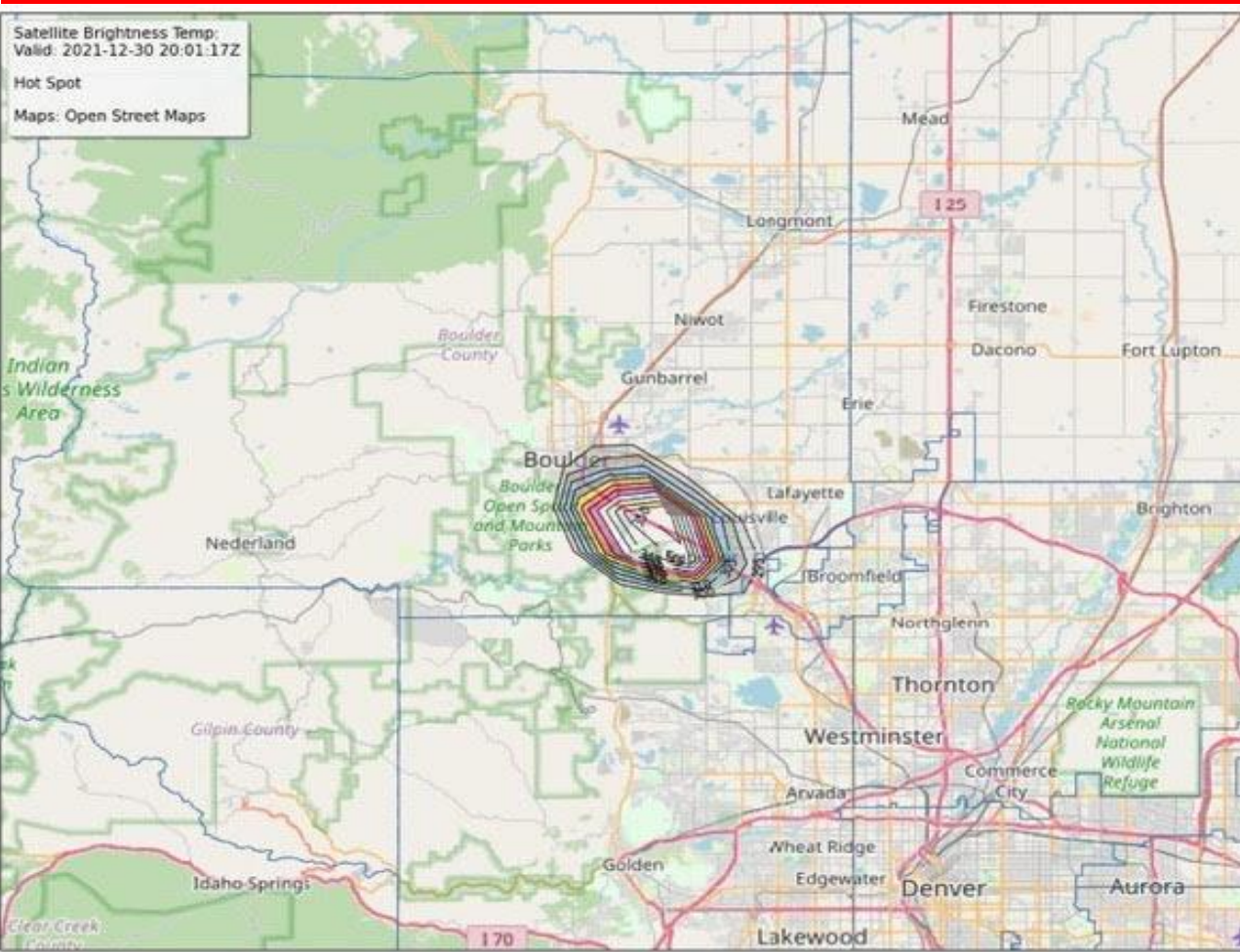
NCAR Mesa Lab

Wind Speed (red) and Peak Gust (blue)



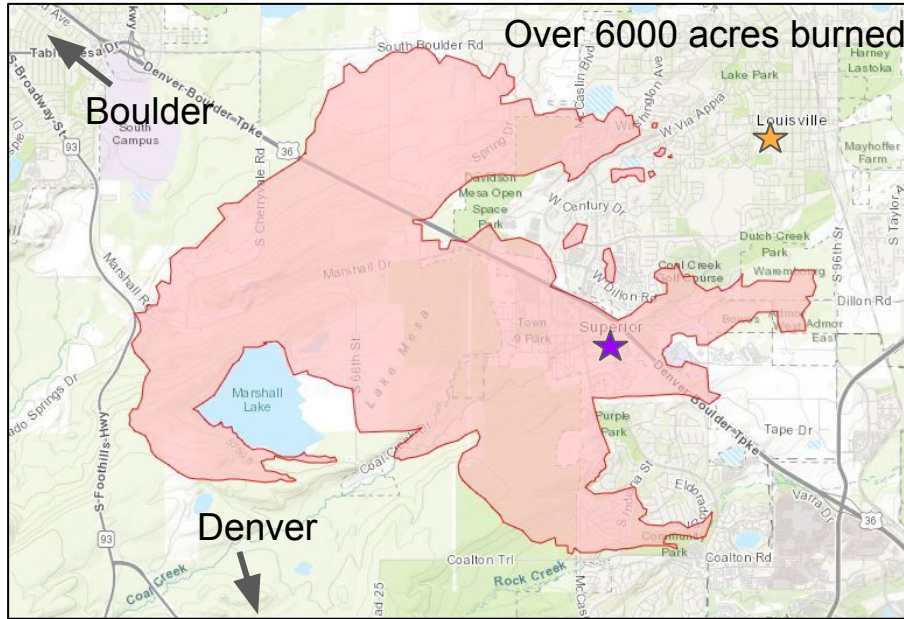
11 - 2021

Marshall Fire



11 - 2021

Marshall Fire



- ★ City of Louisville: 550 destroyed, 43 damaged
- ☆ Town of Superior: 378 destroyed, 58 damaged
- Unincorporated Boulder County: 156 destroyed, 48 damaged

Over \$0.5 billion in residential property destroyed by fire as of Jan. 6, 2022



2021 Meteorological Memories

CoCoRaHS WxTalk Webinar Series **2021 Meteorological Memories**
January 13, 2022

Meteorological **Memories**

Greg Carbin
Chief of Forecast Operations, NWS Weather Prediction Center
College Park, Maryland
@GCarbin

1 - 2021 February Arctic Outbreak

Thursday, Feb. 11, 2021
1.26 ice pile up, 120, north TX
6 dead, 1000s injured

Sat, Feb. 13, 2021
6" P at SEA, snowiest day since Dec. 1969
Major ice storm, southwest Virginia

Sun-Mon, Feb. 14-15, 2021
all-time record cold, snow, and ice across Texas

Fri-Sat, Feb. 12-13, 2021
Major ice storm, NW Oregon

Sun, Feb. 14, 2021
17" of snow in OKC, MaxT 12F

Houston 145 pile up, millions without power

2 - 2021 Front Range Snowfall Records

Front Range Blizzard
March 13-14, 2021

3 - 2021 March Tornadoes

Storm Reports, March 17, 2021

Storm Reports, March 25, 2021

4 - 2021 Tennessee Floods

Base Reflectivity loop from 6:00 PM 3/27/21 to 4:30 AM 3/28/21

5 - 2021 Drought Expands in the West

U.S. Drought Monitor January 5, 2021

U.S. Drought Monitor August 10, 2021

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T-3rd Fewest June Tornado Watches (1970-present)

Rank	Number of June Tornado Watches	Year
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1-3	10	1990
1-3	11	2014
1-5	11	2000
7	14	2004
1-6	15	2002
1-6	15	2017

7 - 2021 PacNW Sizzles

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8 - 2021 Claudette and Elsa

Estimated rainfall June 16-20 from Claudette

9 - 2021 Ida

WPC Executive Rainfall Outlooks for Period from 12Z 1 Sep 2021 to 12Z 2 Sep 2021

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10 - 2021 December Outbreak

December 10-11, 2021 Long-lived Supercell Thunderstorms

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11 - 2021 Marshall Fire

DENSE-CENTRAL FIRE temperature and precipitation, June 1 - December 29