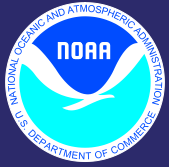


# 2019 REVIEW AND IMPLICATIONS FOR 2020 SPRING RUNOFF



**Allen Schlag**

**Hydrologist, NWS-Bismarck**

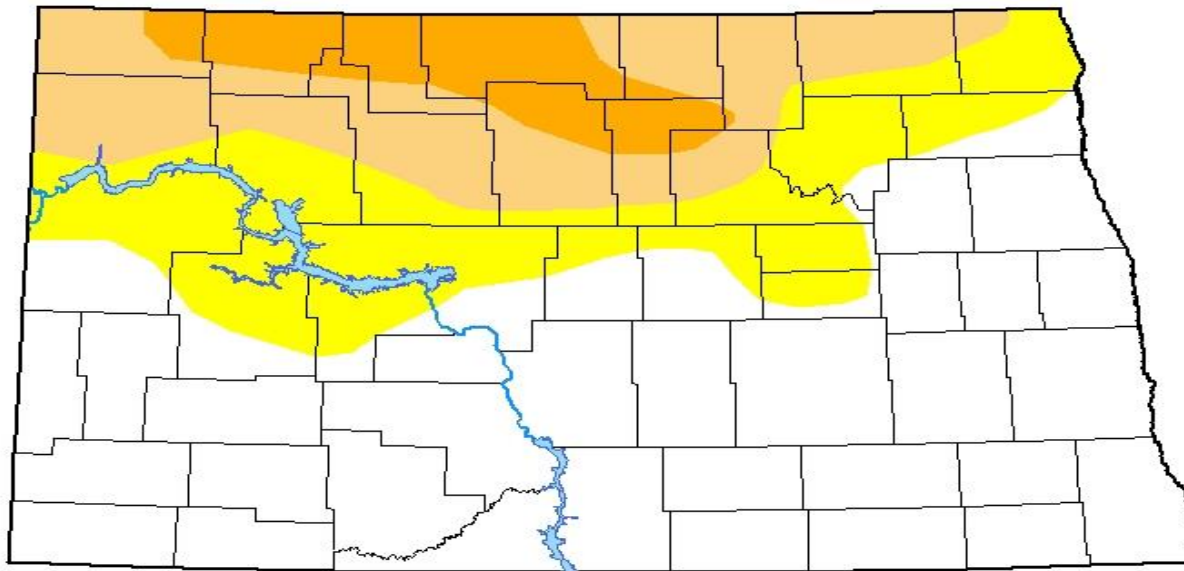


# Anyone Remember This?



## U.S. Drought Monitor North Dakota

**June 18, 2019**  
(Released Thursday, Jun. 20, 2019)  
Valid 8 a.m. EDT



### Intensity:

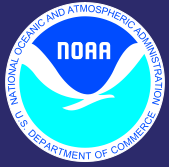
-  None
-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

### Author:

Brad Pugh  
CPC/NOAA





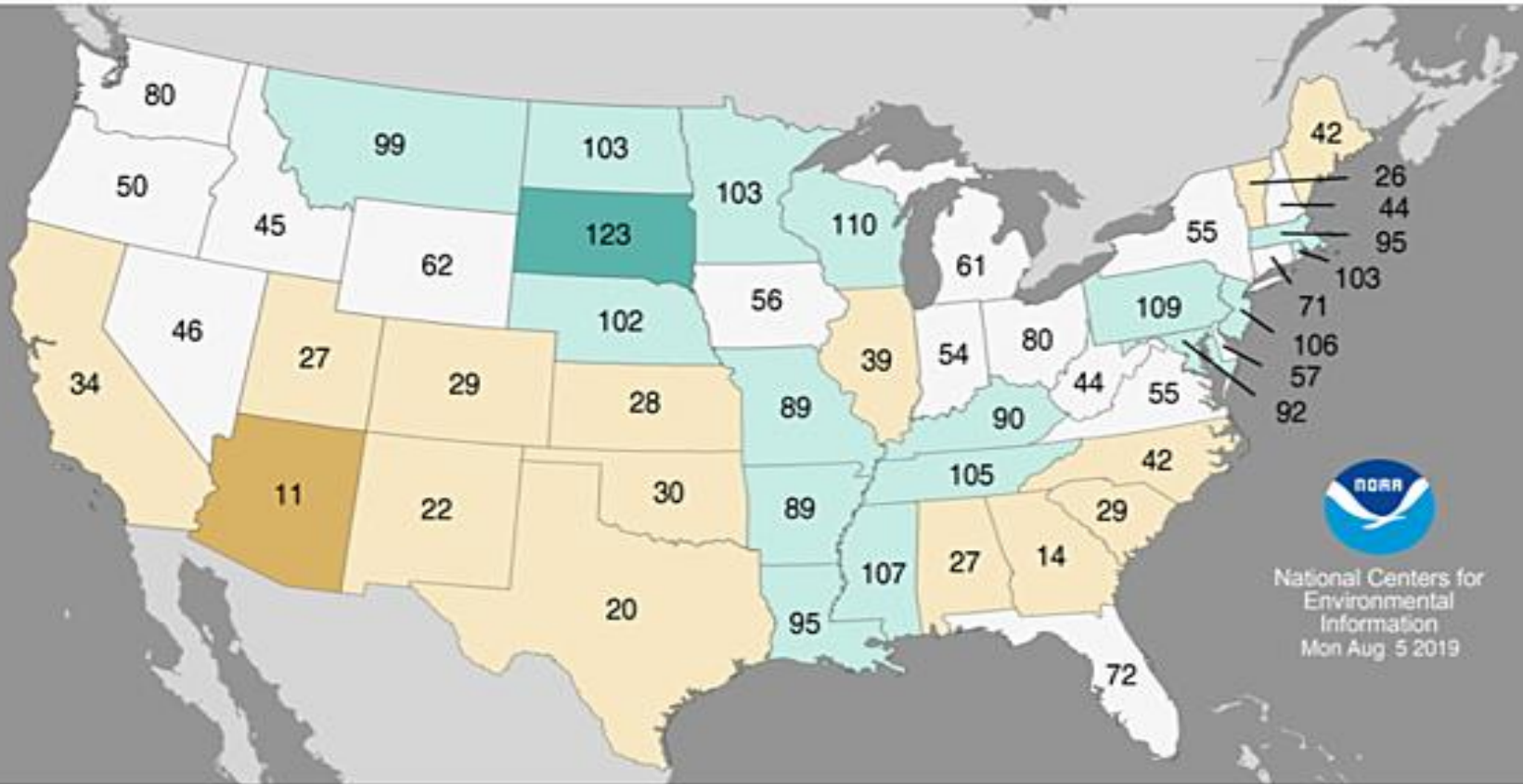
# It All Starts In July



## Statewide Precipitation Ranks

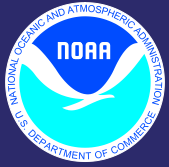
July 2019

Period: 1895-2019



National Centers for Environmental Information  
Mon Aug 5 2019

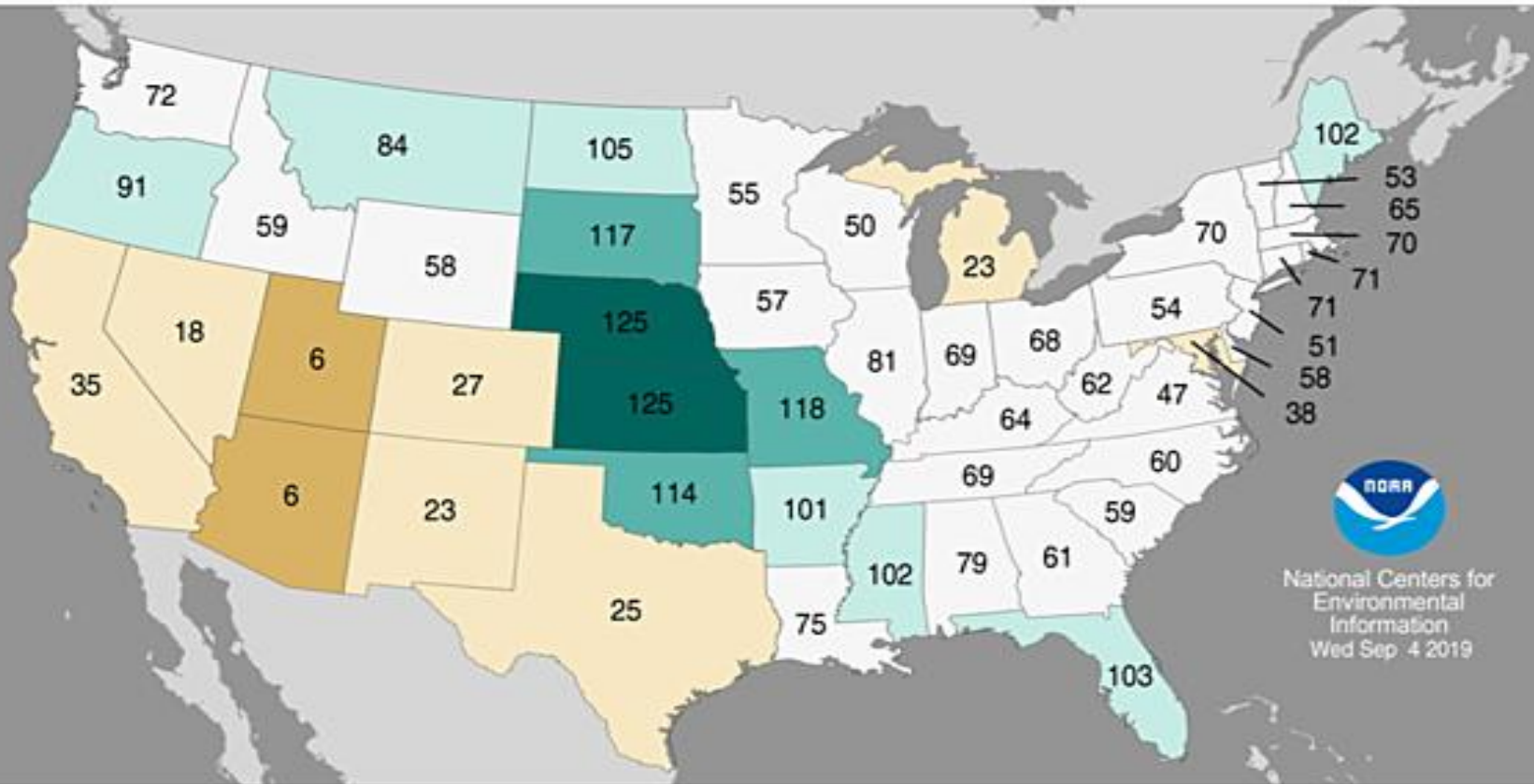




# Goes Through August

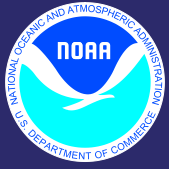


## Statewide Precipitation Ranks August 2019 Period: 1895-2019



National Centers for  
Environmental  
Information  
Wed Sep 4 2019

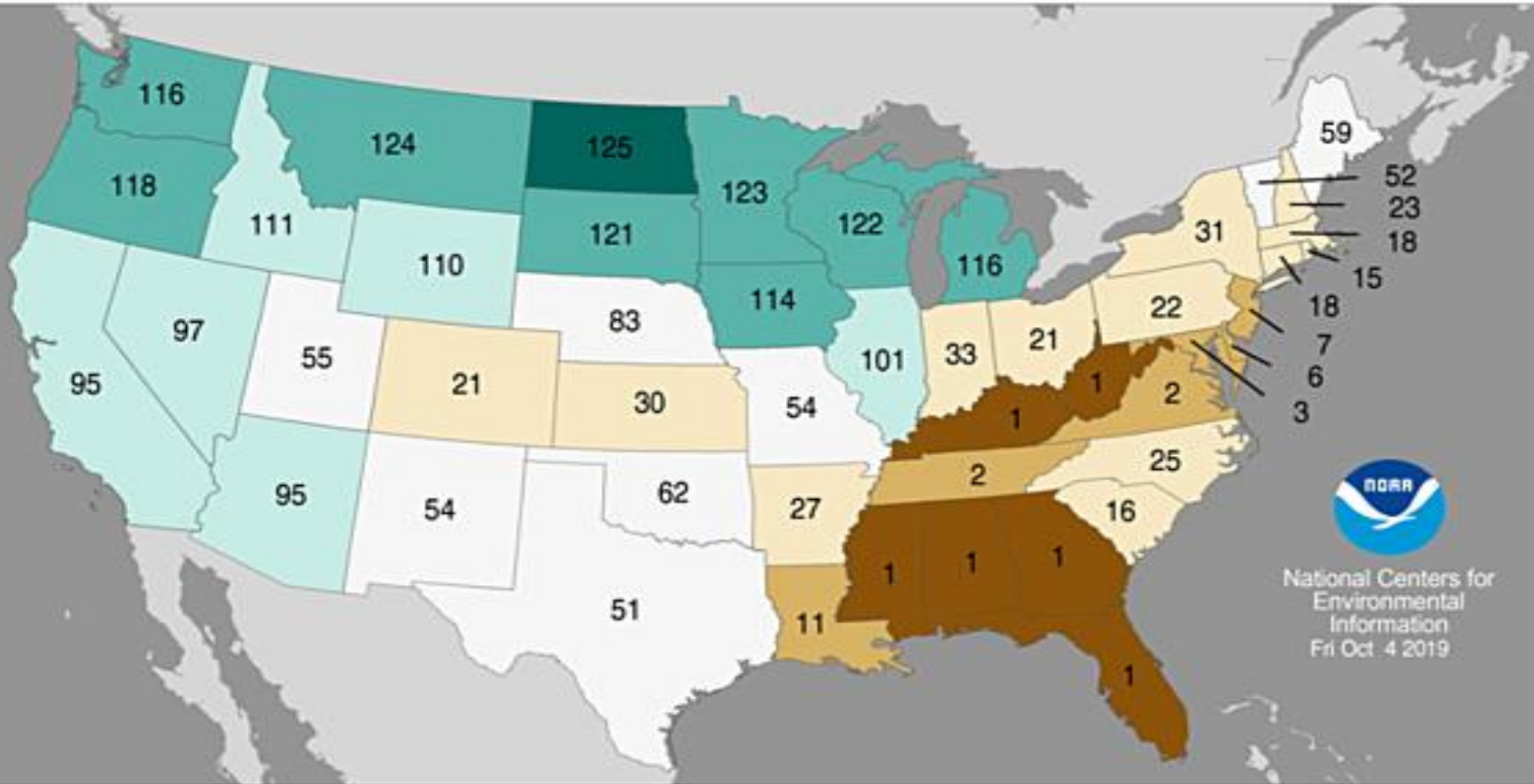




# September

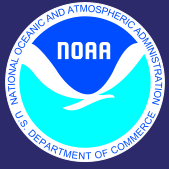


## Statewide Precipitation Ranks September 2019 Period: 1895-2019



National Centers for Environmental Information  
Fri Oct 4 2019





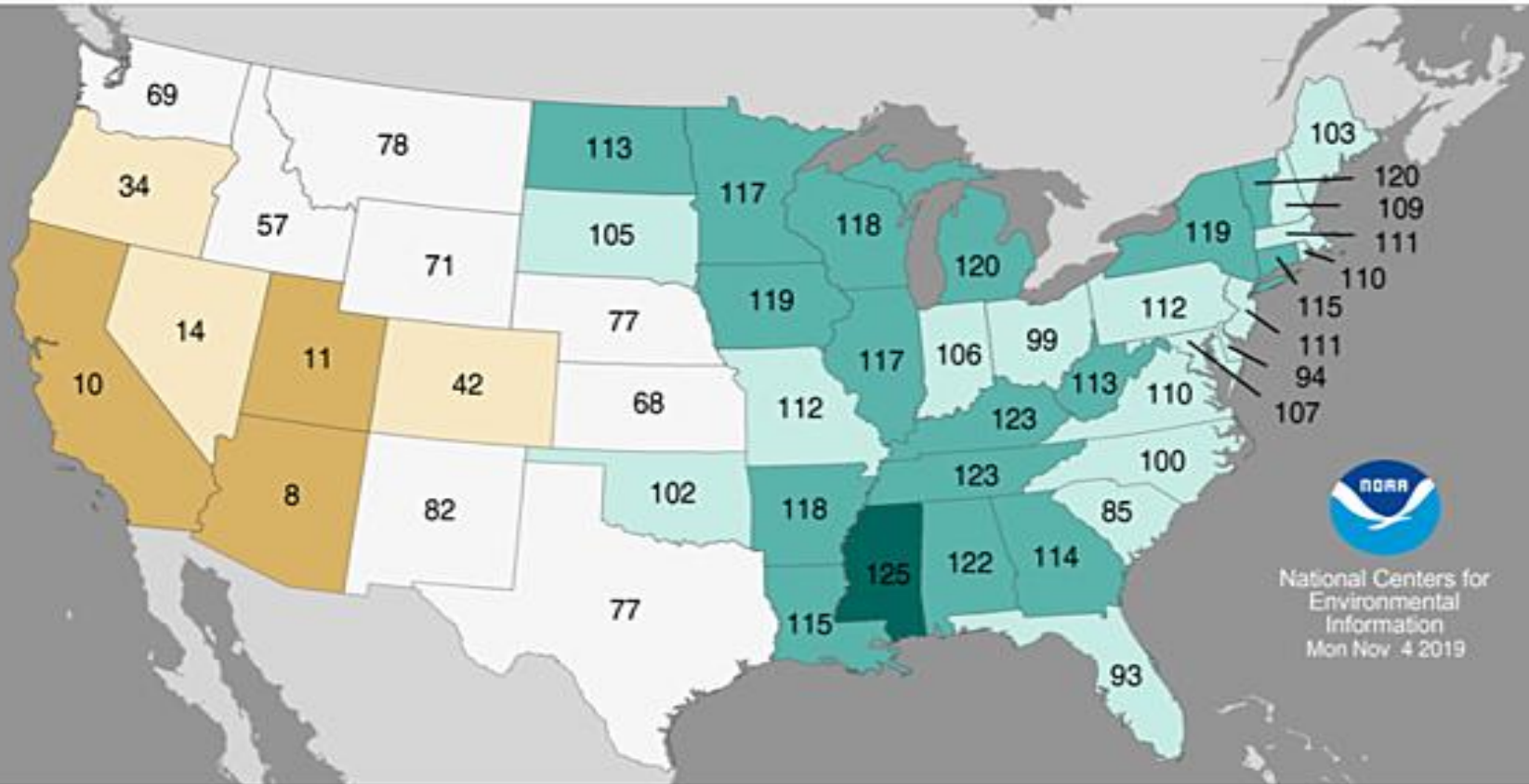
# October



## Statewide Precipitation Ranks

October 2019

Period: 1895-2019



National Centers for Environmental Information  
Mon Nov 4 2019

Record Driest (1)

Much Below Average

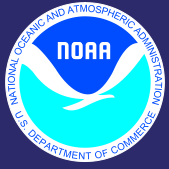
Below Average

Near Average

Above Average

Much Above Average

Record Wettest (125)



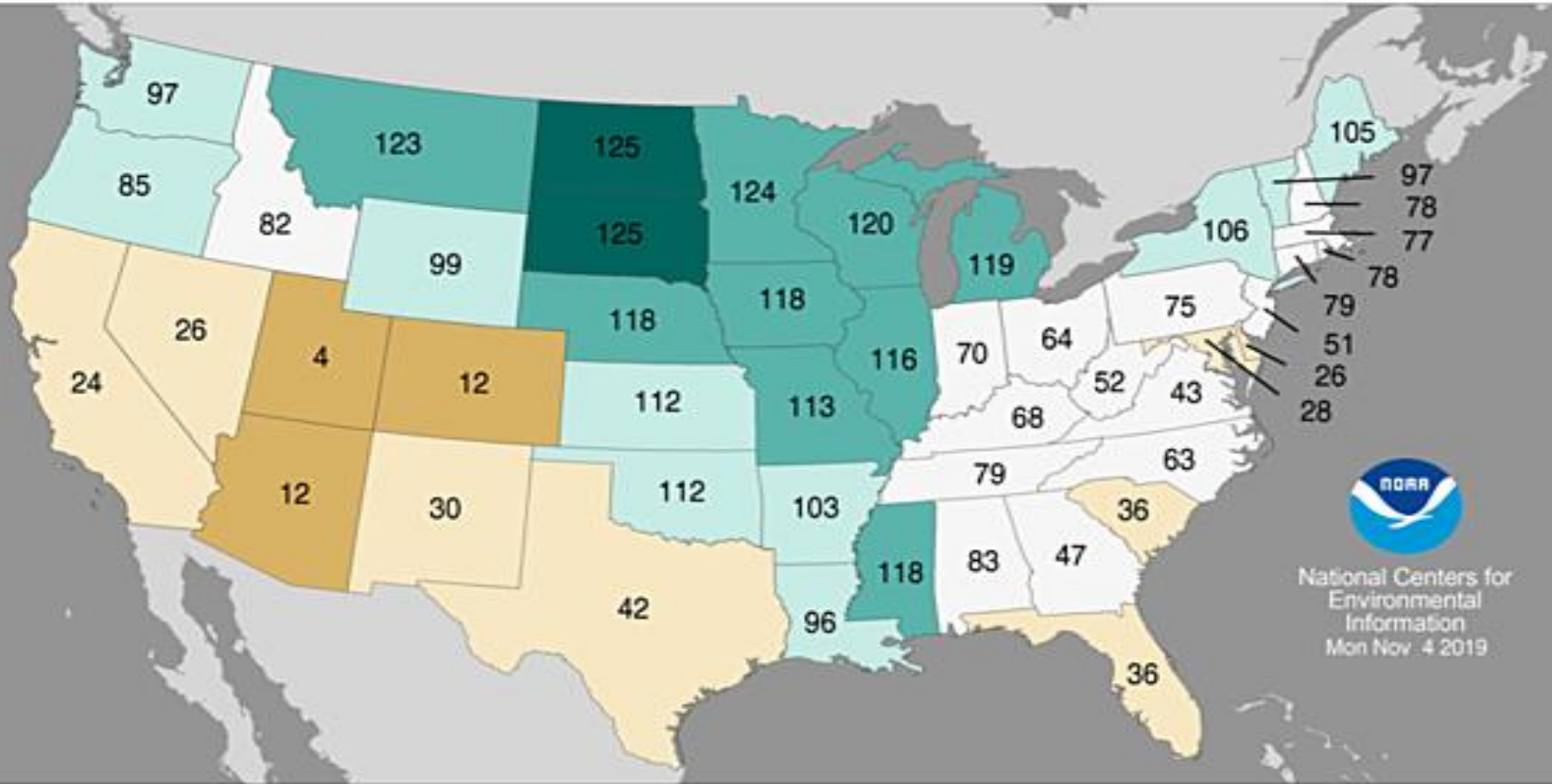
# August - October



## Statewide Precipitation Ranks

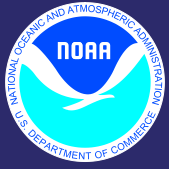
August-October 2019

Period: 1895-2019



National Centers for Environmental Information  
Mon Nov 4 2019





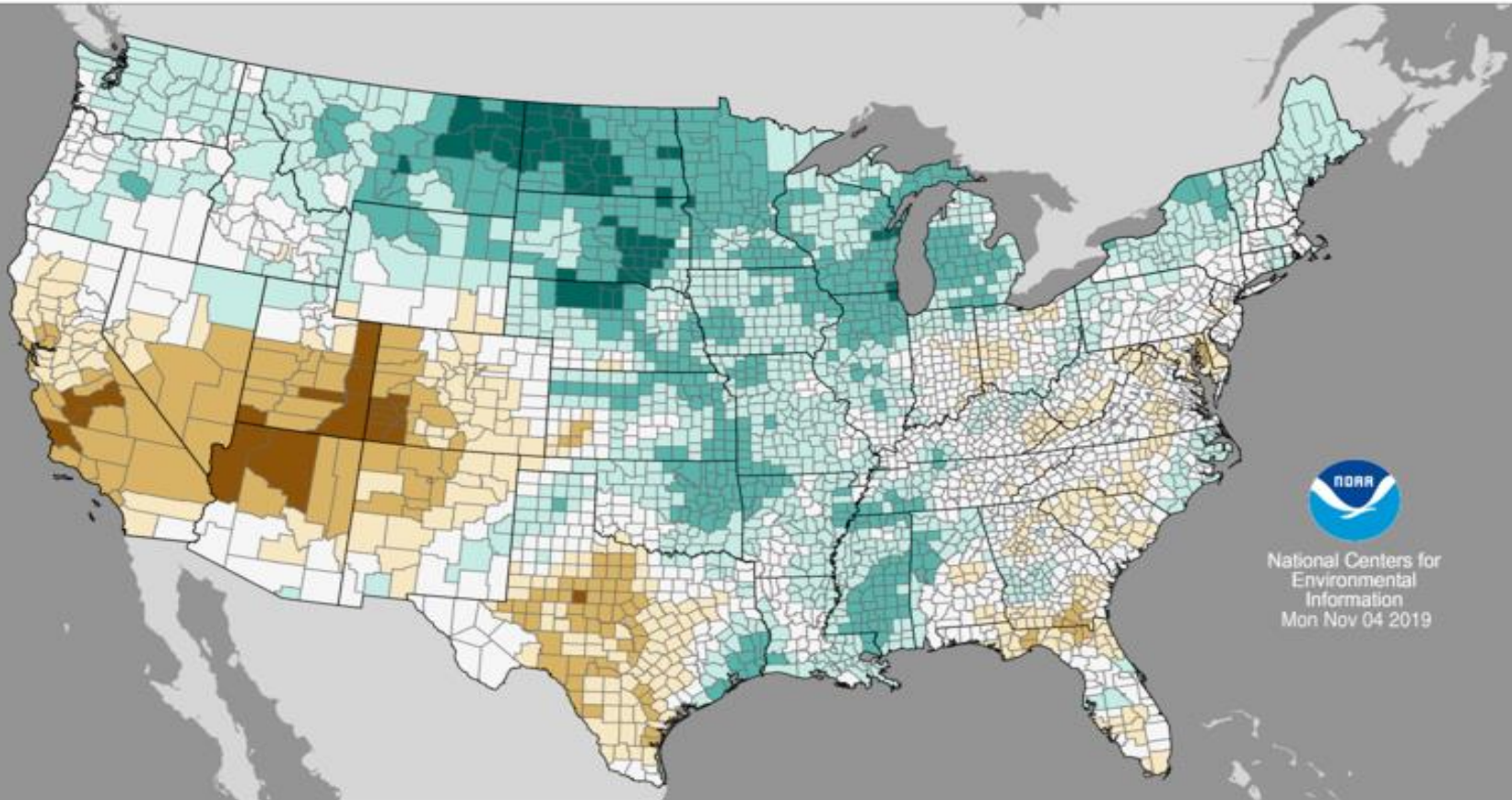
# Counties Set Records



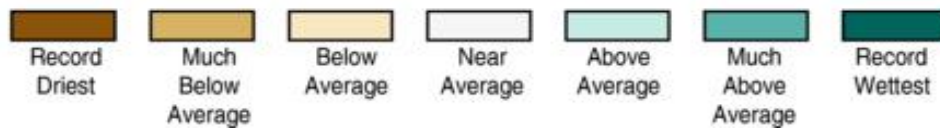
## County Precipitation Ranks

August–October 2019

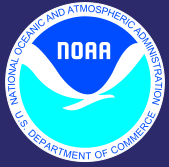
Period: 1895–2019



National Centers for  
Environmental  
Information  
Mon Nov 04 2019







# Net Effects

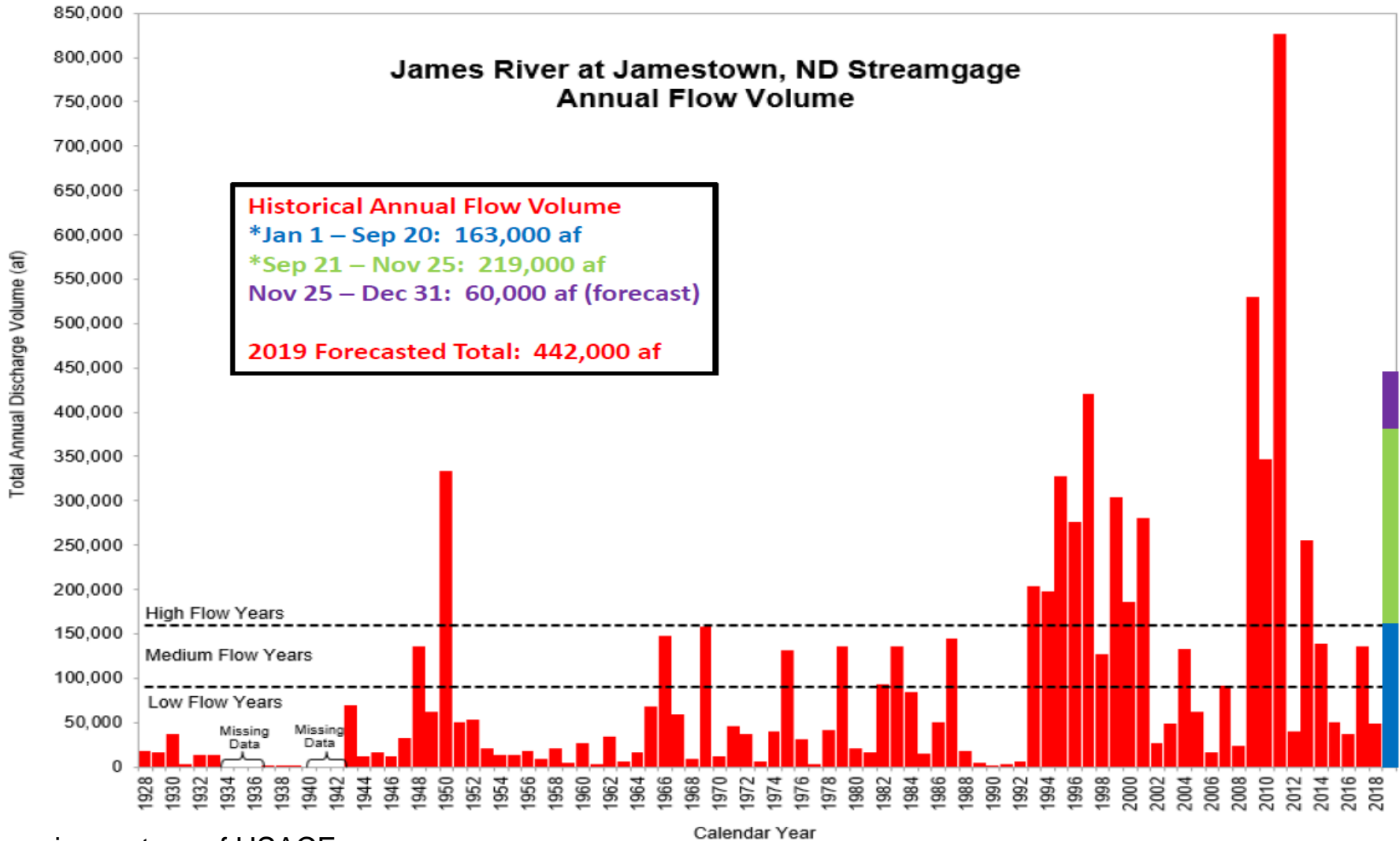
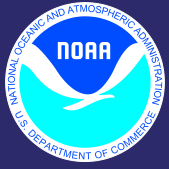


Image is courtesy of USACE

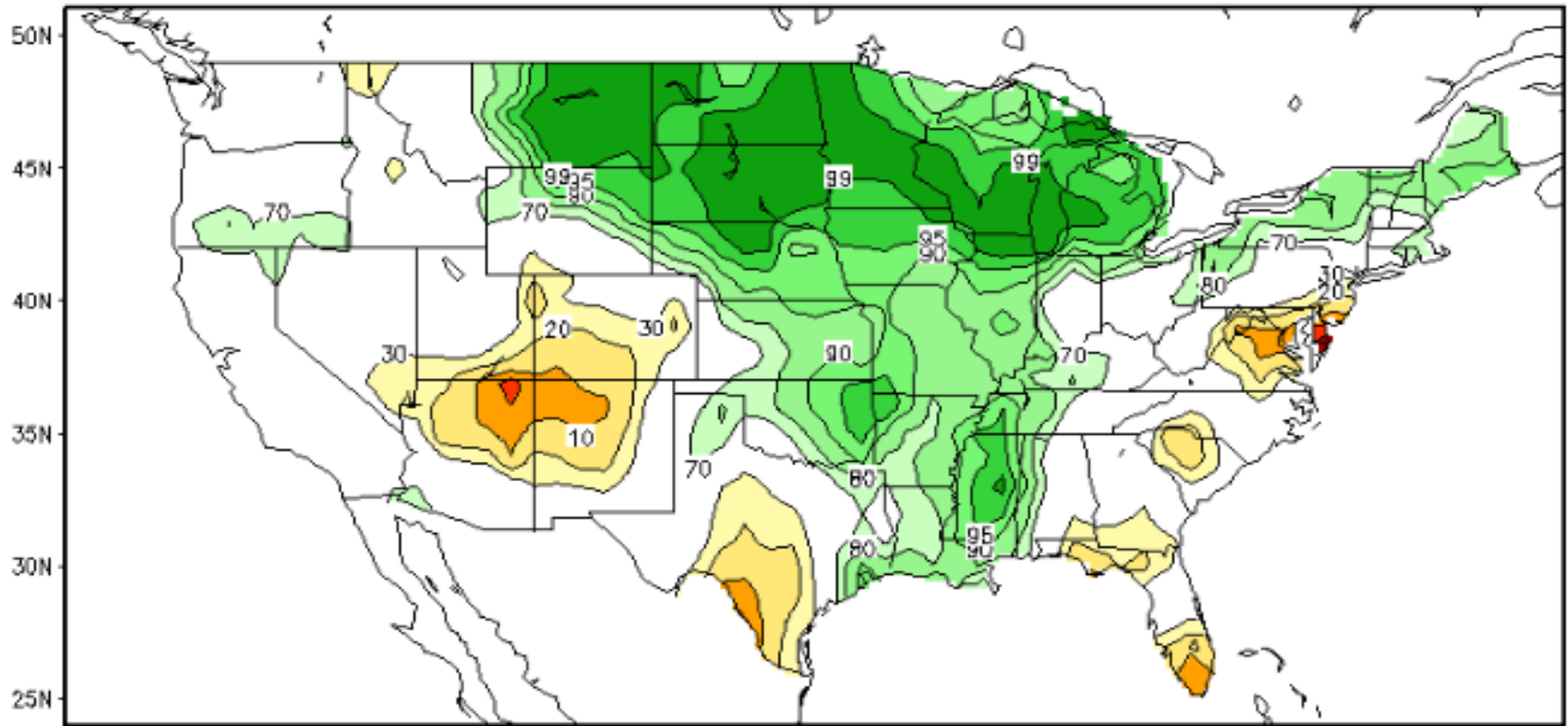
\*Provisional Data

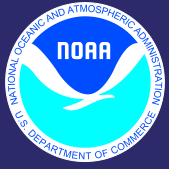


# Soil Moisture



Soil Moisture Ranking Percentile Last day of OCT, 2019



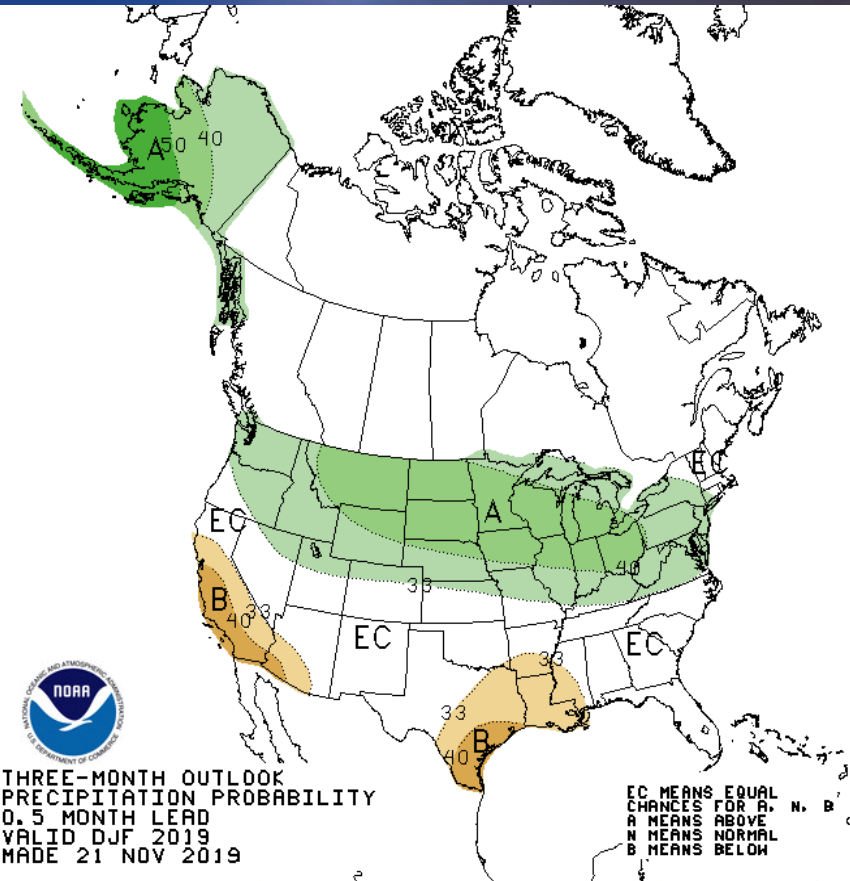
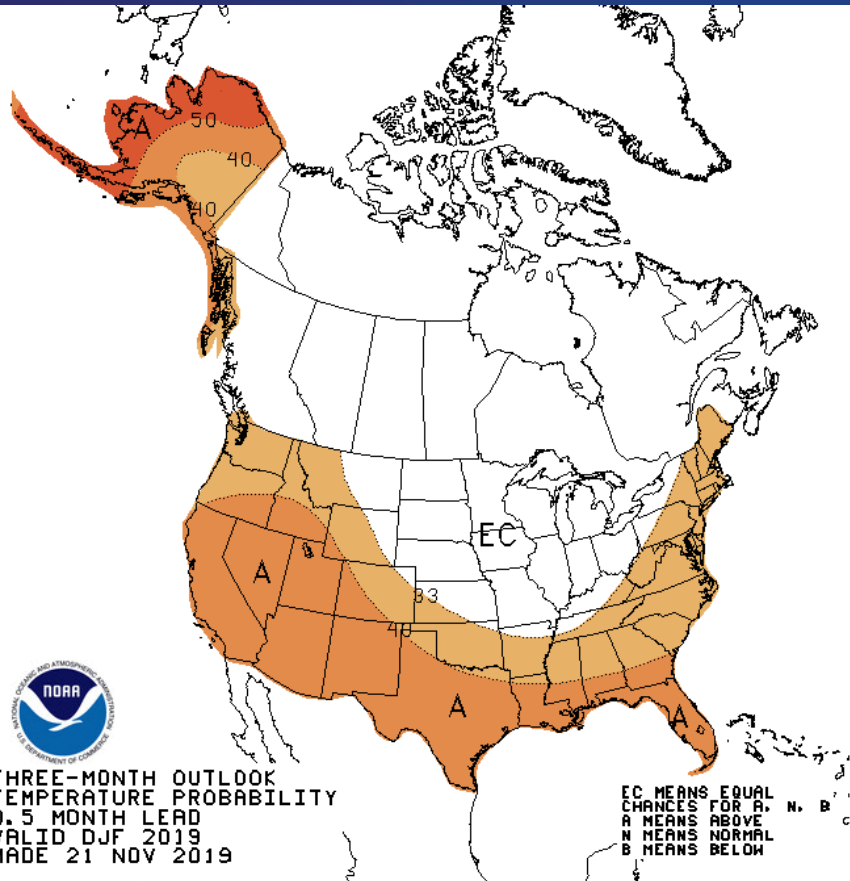


# Winter Outlook



## Temperature

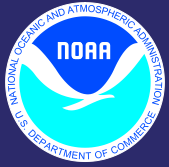
## Precipitation



THREE-MONTH OUTLOOK  
 TEMPERATURE PROBABILITY  
 0.5 MONTH LEAD  
 VALID DJF 2019  
 MADE 21 NOV 2019

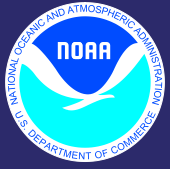
THREE-MONTH OUTLOOK  
 PRECIPITATION PROBABILITY  
 0.5 MONTH LEAD  
 VALID DJF 2019  
 MADE 21 NOV 2019

EC MEANS EQUAL CHANCES FOR A, N, B  
 A MEANS ABOVE  
 N MEANS NORMAL  
 B MEANS BELOW

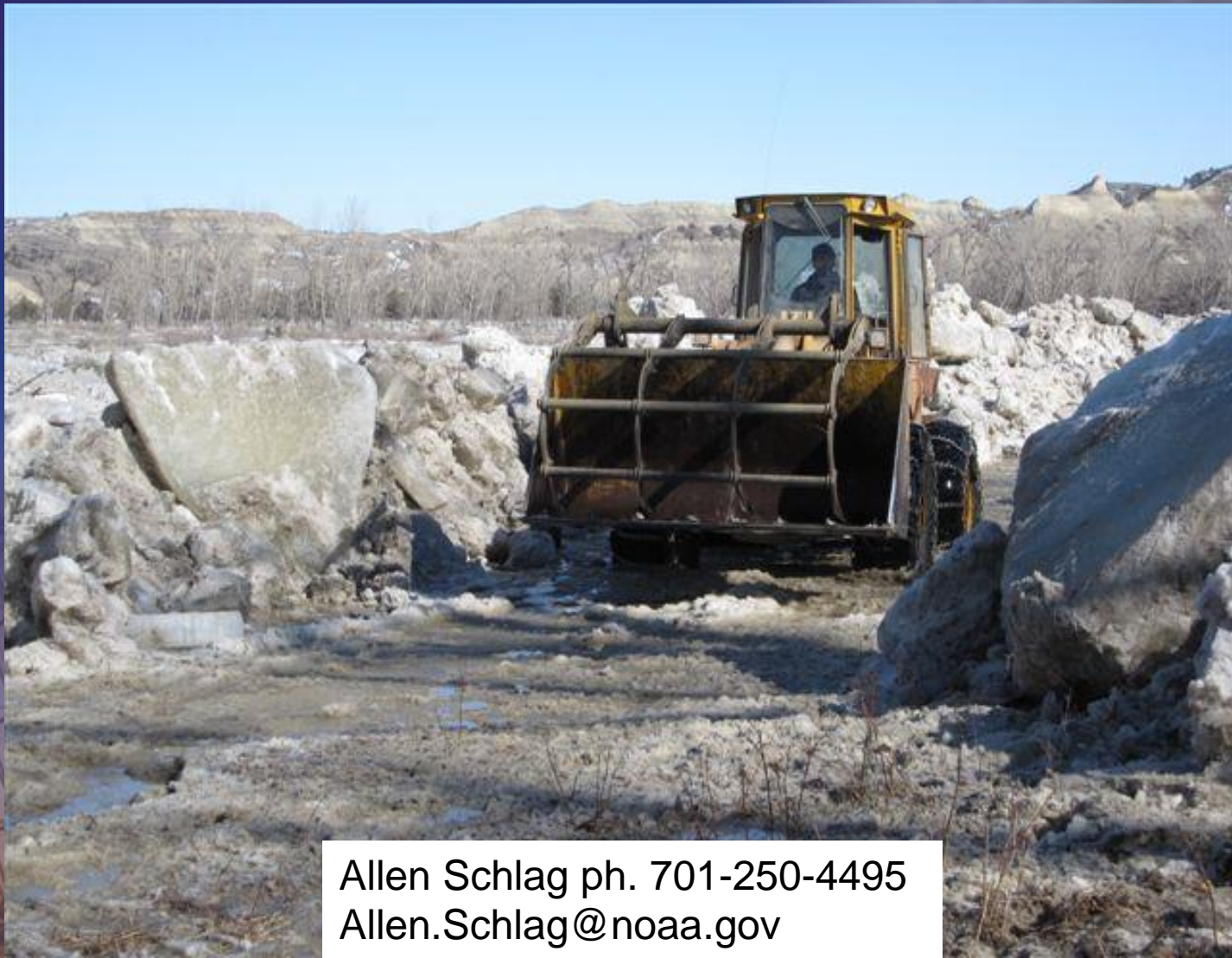


# What Does This Mean for 2020?

- **Extremely wet soils will hamper infiltration.**
- **Increased chance for above normal precipitation is not a slam dunk.** We still have a ~60% chance of normal to below normal snowpack come next spring.
- **What does the spring melt season look like?** Do we lose the snowpack in 3-5 days, or 3-5 weeks?  
FMAM = Cool and Wet
- **Spring Flood Outlook dates:**
  - *February 13*
  - *February 27*
  - *March 12<sup>th</sup>*



# Questions?



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Allen.Schlag@noaa.gov