Lower Mississippi River Forecast Center

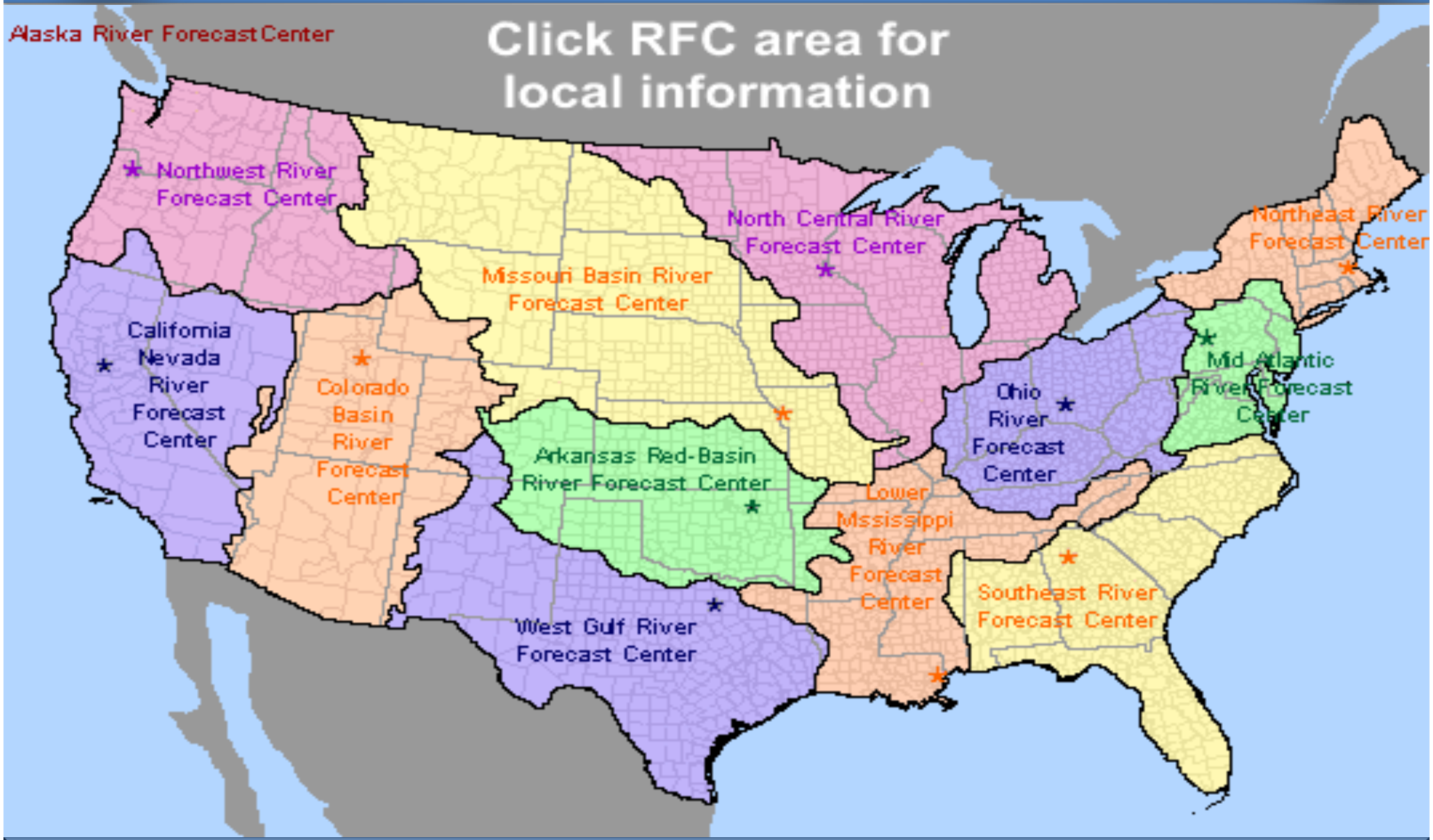
Mississippi River Forecasting

Jeff Graschel

Wednesday, Mar 13th 2019

Building a Weather-Ready Nation

LMRFC Overview



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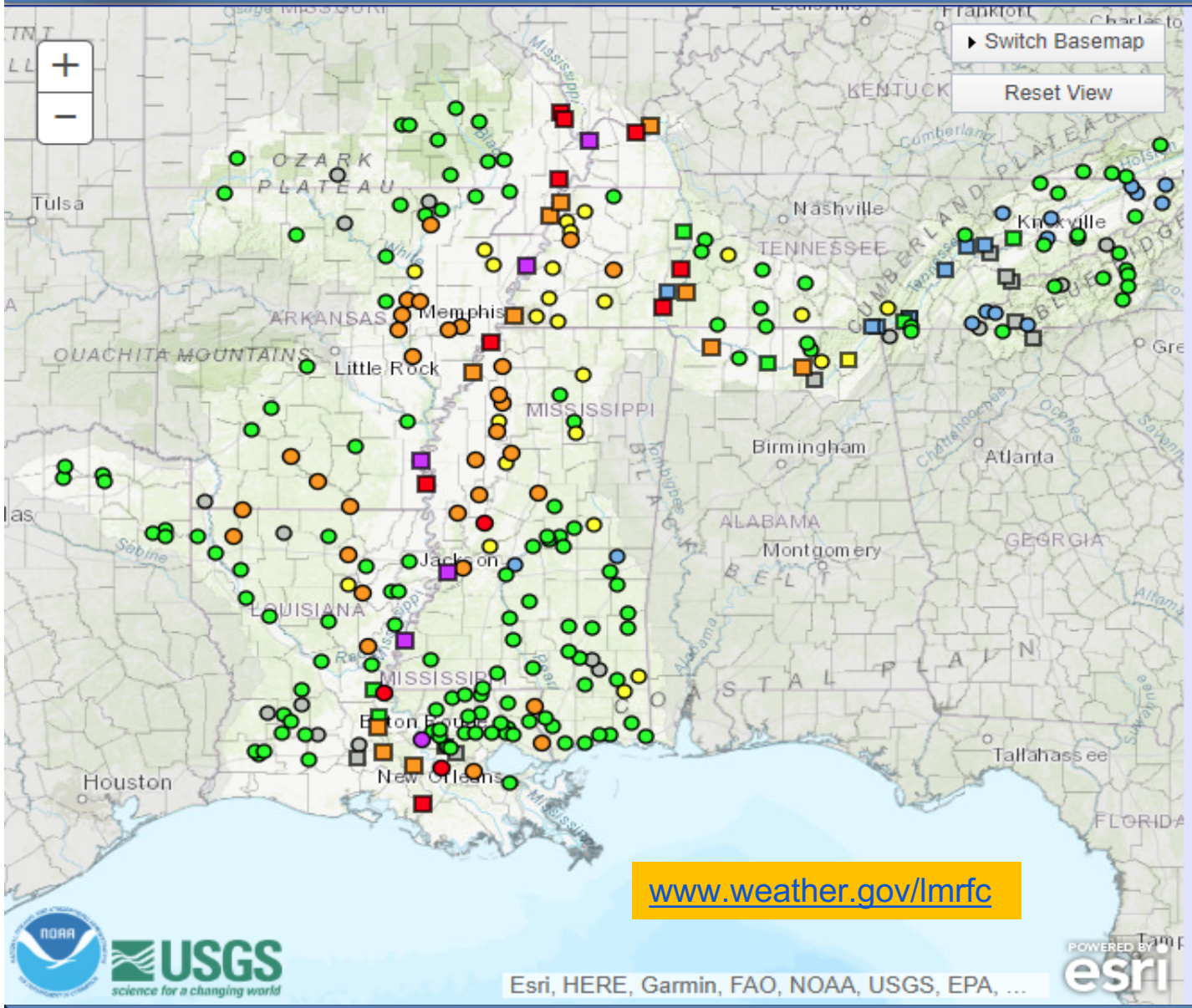
Lower Mississippi River Forecast Center



Click on the map or select one of the data views below:

- United States
- NWS Weather Forecast Offices
- Lower Mississippi River Forecast Center
- Water Resources Regions

○ Probability and forecasts available
□ Forecasts available

280 total gauges
Show all locations in flood (60)

- 6 Gauges: Major Flooding
- 12 Gauges: Moderate Flooding
- 42 Gauges: Minor Flooding
- 25 Gauges: Near Flood Stage
- 148 Gauges: No Flooding
- 21 Flood Category Not Defined
- 0 At or Below Low Water Threshold
- 26 Gauges: Forecasts Are Not Current
- 0 Gauges: No forecast within selected timeframe
- 0 Gauges: Out of Service

Show all locations

Last map update:
03/12/2019 at 06:50:44 am EDT
03/12/2019 at 10:50:44 UTC

What is UTC time?
Map Help

Disclaimer

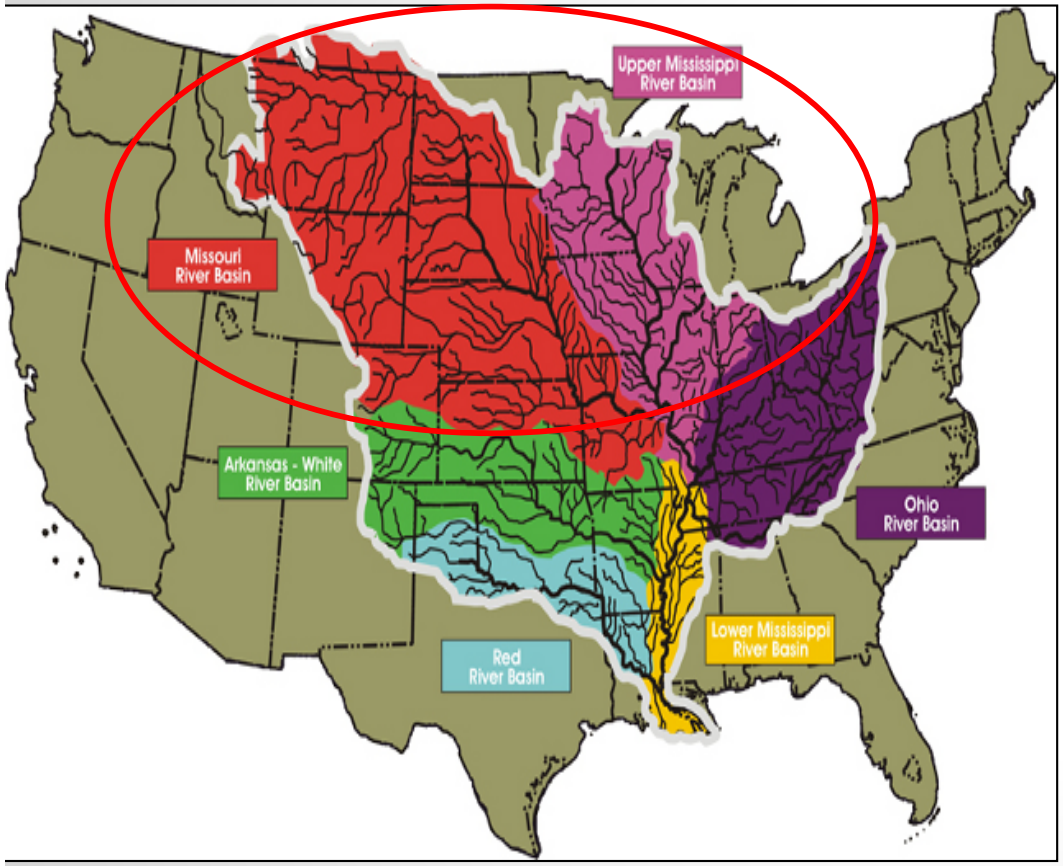
KML

Building a Weather-Ready Nation

Mississippi River Basin

Background for MS River forecasting

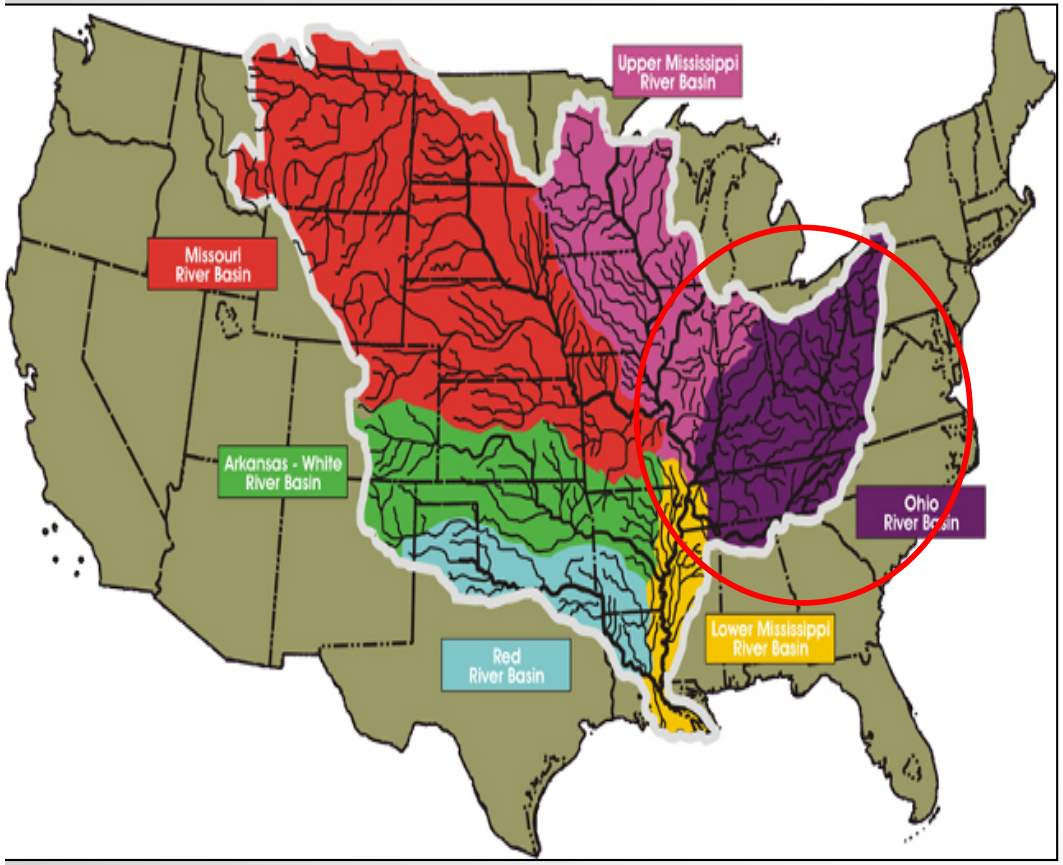
Missouri and Upper Mississippi Basins



- Rainfall and Temperature Forecasts (snowmelt) play key roles
- Typically less precipitation in this basin so provides less total flow to Cairo, IL Exception (1993)
- Upper MS snowmelt generally between mid Mar – mid Apr
- Missouri snowmelt generally mid Apr – mid May

Background for MS River forecasting

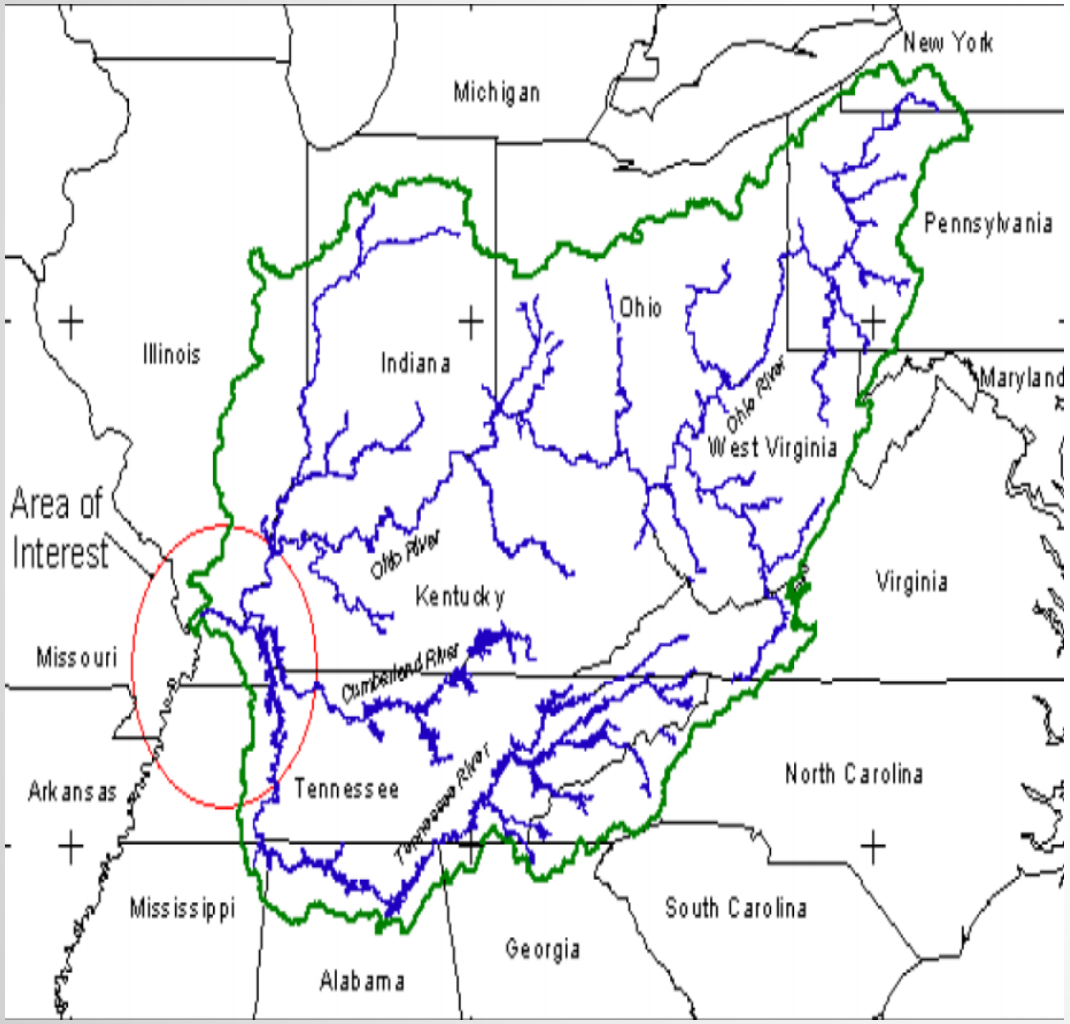
Ohio and Tennessee Basins



- Rainfall Forecasts play key role
- Typically more precipitation in this basin so provides more total flow to Cairo, IL
- TVA forecasts the TN River
- USACE Flood Control Operations when Cairo, IL is above 40’ or 35’ and forecast to >= 40’

USACE Flood Control Operations

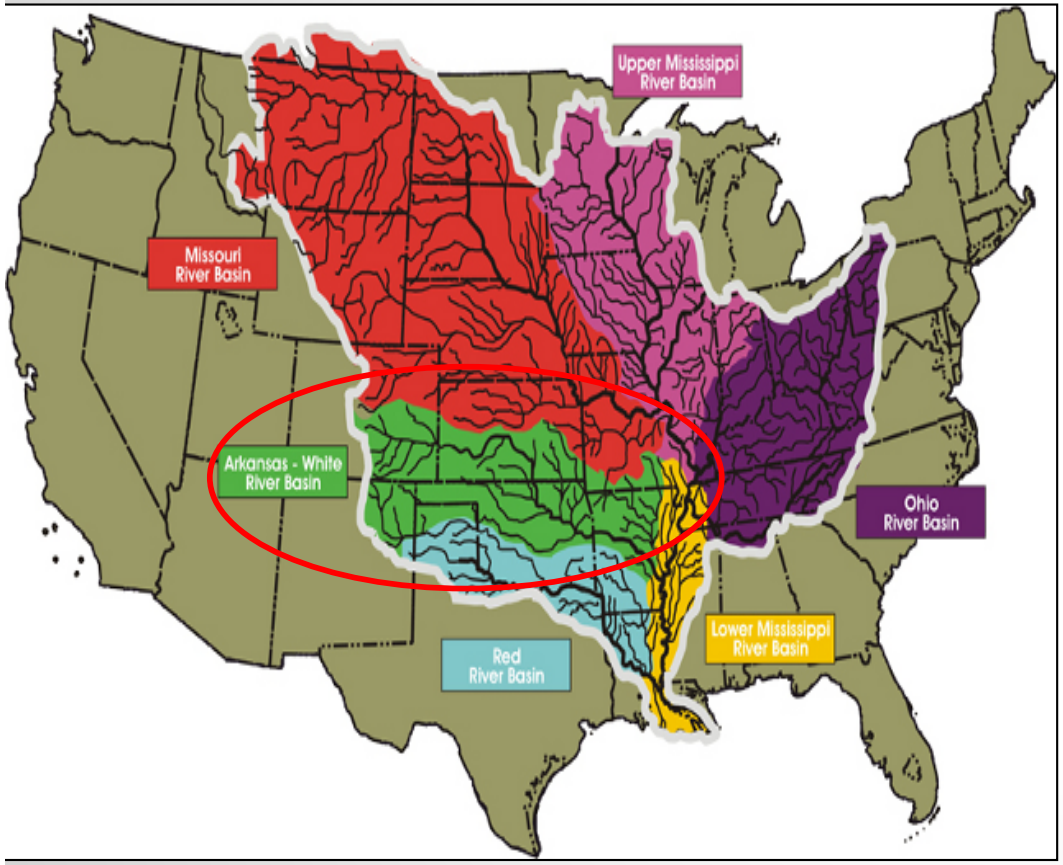
Barkley and Kentucky Dams



- USACE manages both lakes to minimize flood impacts at Cairo, IL and upstream of lakes
- If storage allows, discharges can be managed to reduce crest at Cairo, IL by several feet
- Also, discharges can be managed to help the White River Backwater Levee when Arkansas City, AR exceeds 48’

Background for MS River forecasting

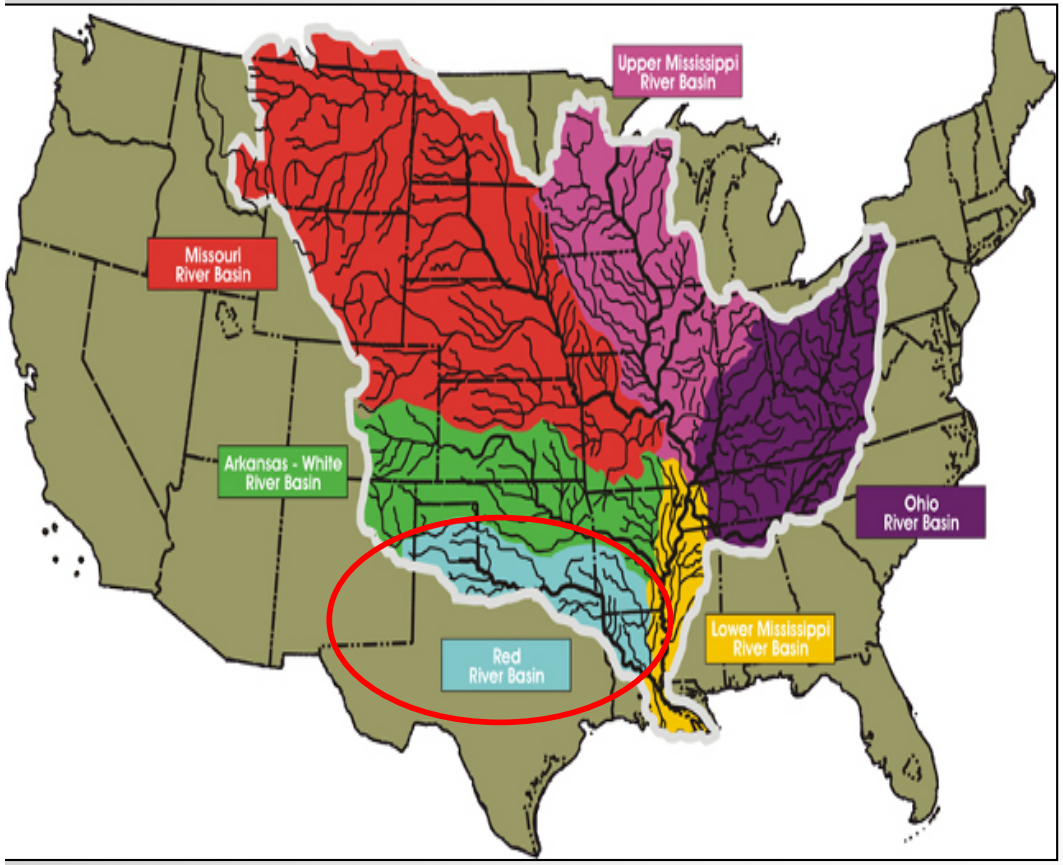
Arkansas and White Basins



- Since much of the flow is in the MS River by the time it reaches the Arkansas River outlet, this basin plays a smaller role in total flow for the Mississippi River
- Can add 2-3 feet to crests from Arkansas City, AR southward
- When forecasting MS River crests, usually have to estimate AR River flows 2 to 3 weeks out

Background for MS River forecasting

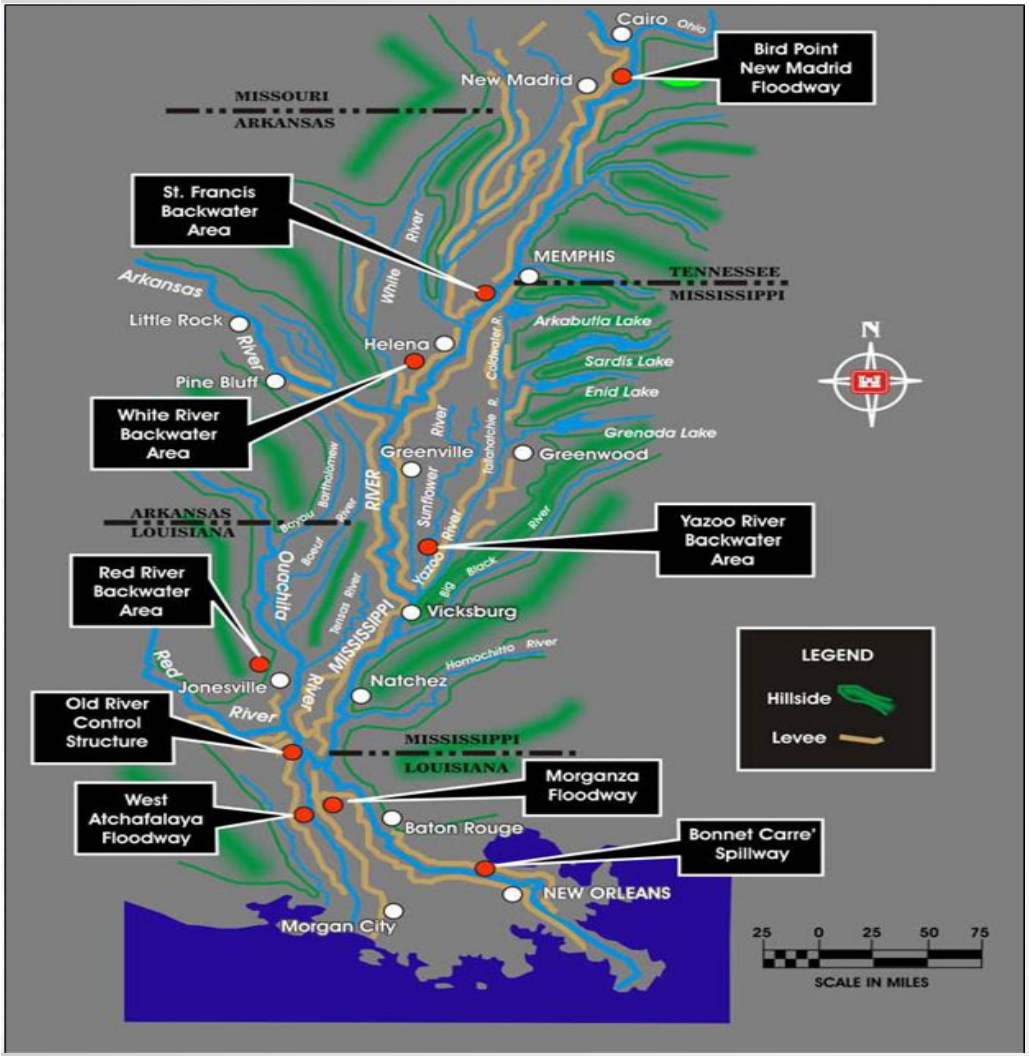
Red and Ouachita Basins



- Like the Arkansas White Basins, this basin plays a smaller role in forecasting the lower MS River
- Can add a couple of feet to crests from Red River Landing to New Orleans & Atchafalaya River
- When forecasting MS River crests, usually have to estimate flows 2 to 4 weeks out

Background for MS River forecasting

Floodways and Backwater Areas

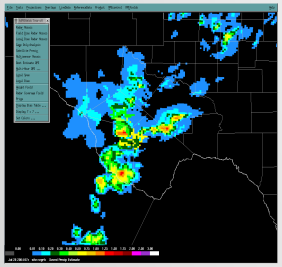


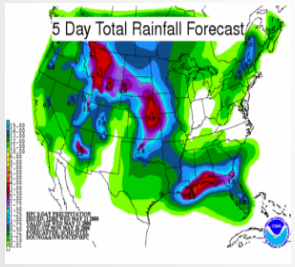
- Birds Point New Madrid reduces stages at Cairo, IL
- Backwater areas store flow and reduce stages on the Mississippi River
- Old River Control Structure distributes water between the Mississippi and Atchafalaya Rivers
- Bonnet Carre reduces stages for Reserve & New Orleans
- Morganza reduces stages for Baton Rouge through New Orleans

Mississippi River Forecast Process

Input Data

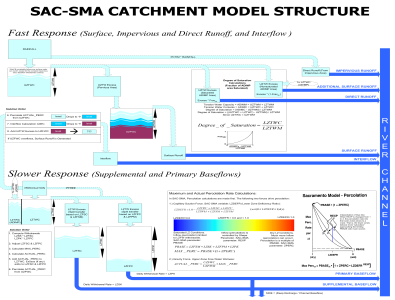
Stream observations and reservoir regulation

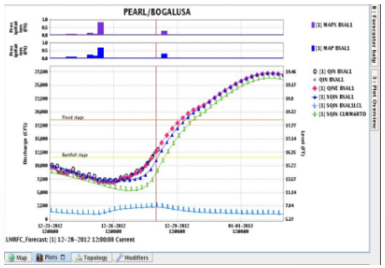




Precipitation estimates and forecasts merged into continuous dataset

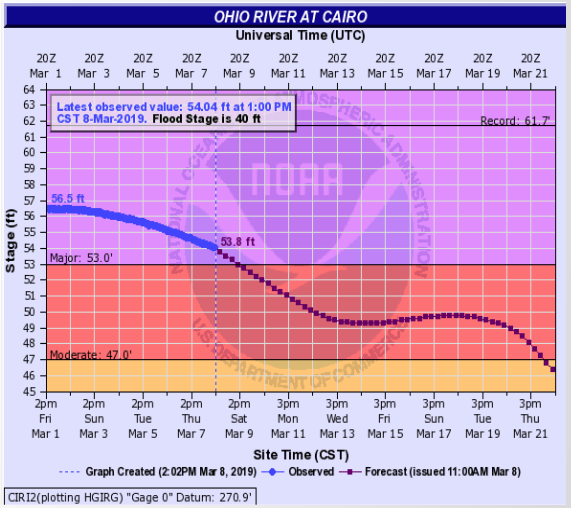
Models





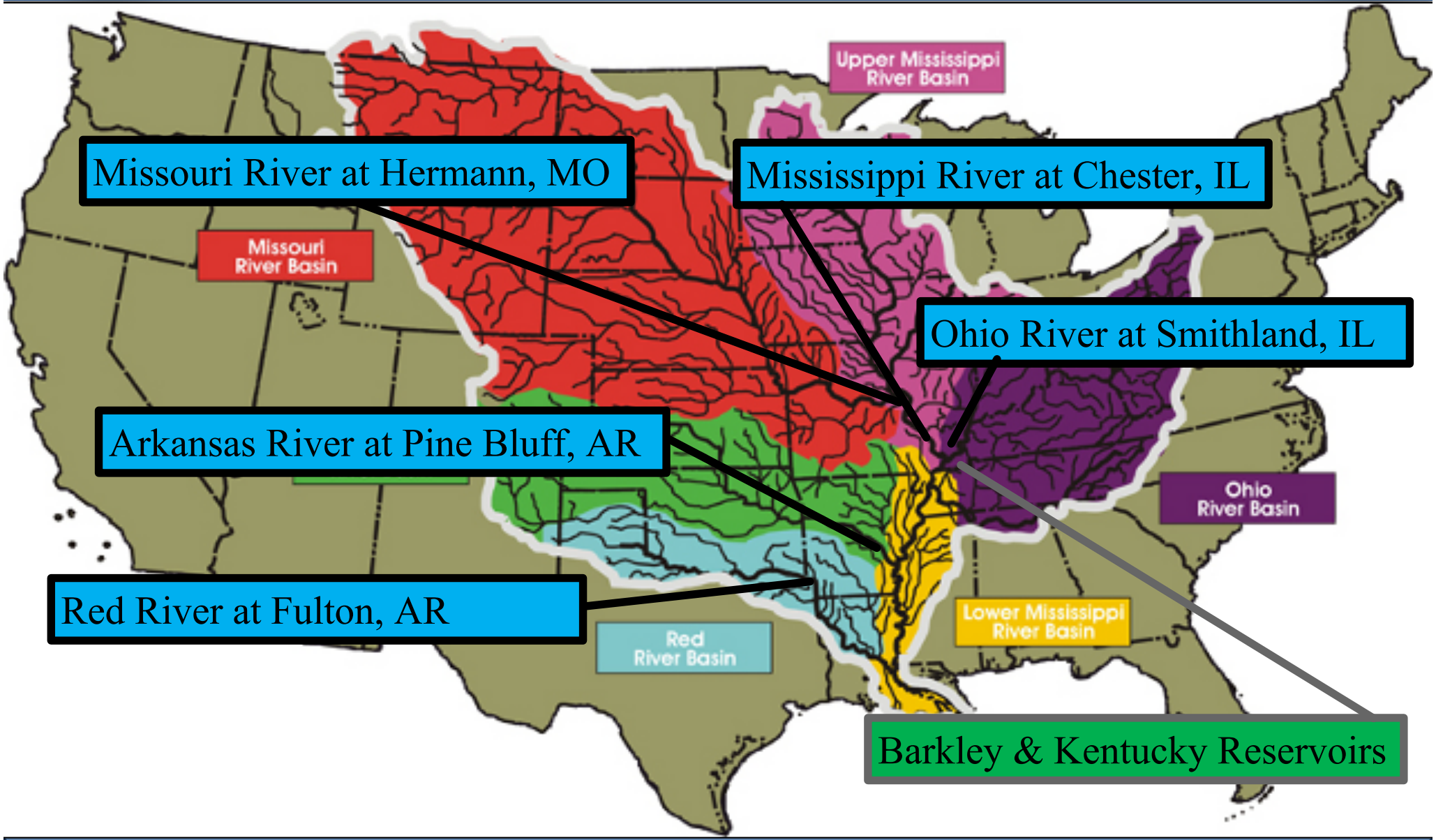
Datasets ingested into hydraulic model. Forecasters adjust model parameters in real time

Products

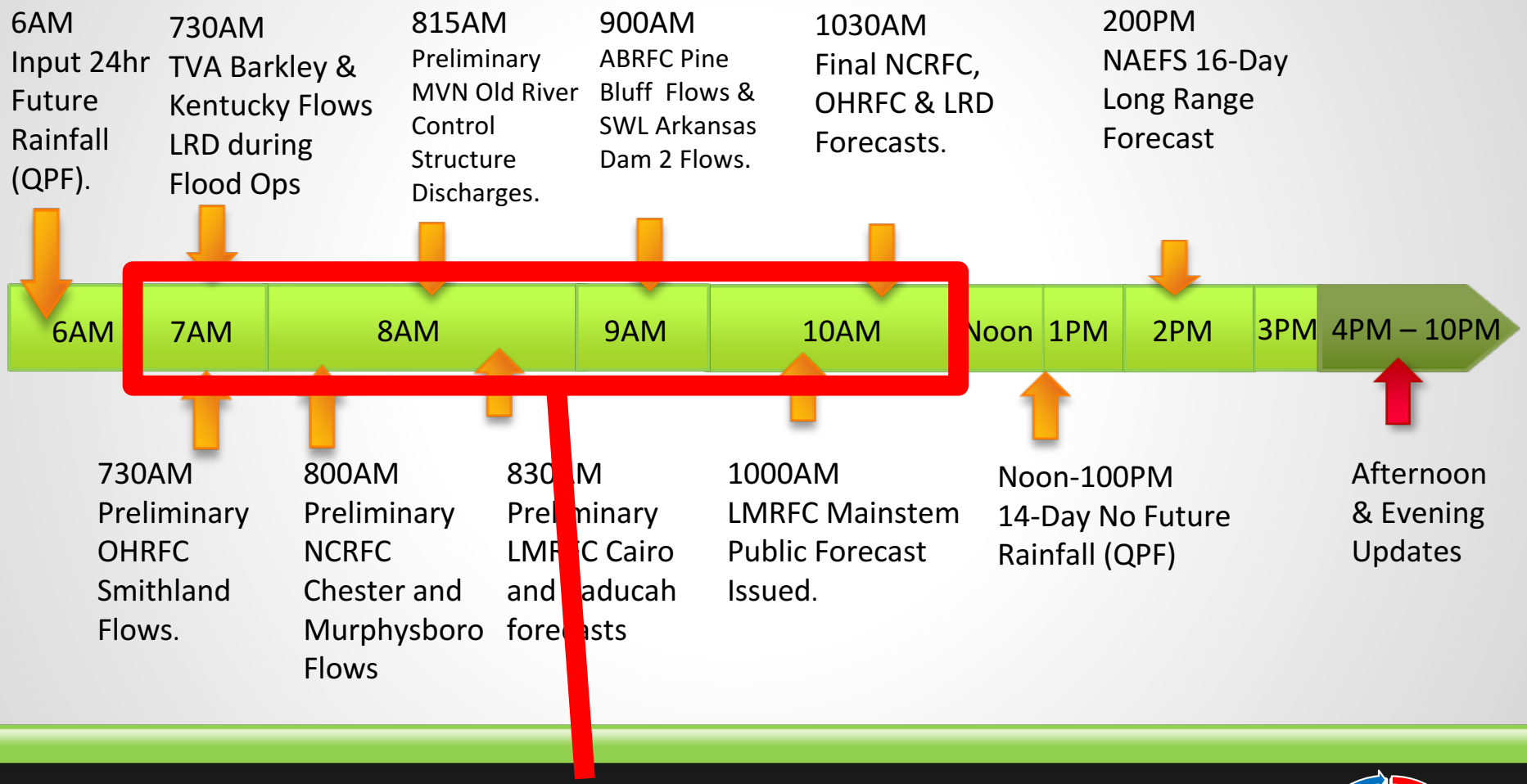


River forecast issued to public

Mississippi Forecast



Mississippi River Forecast Timeline



Coordination and Collaboration with USACE, TVA, and Upstream RFCs.

Current Forecast

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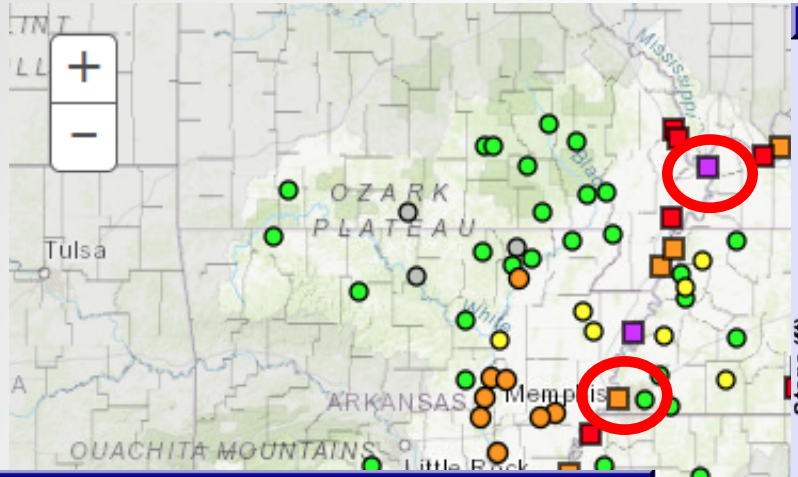
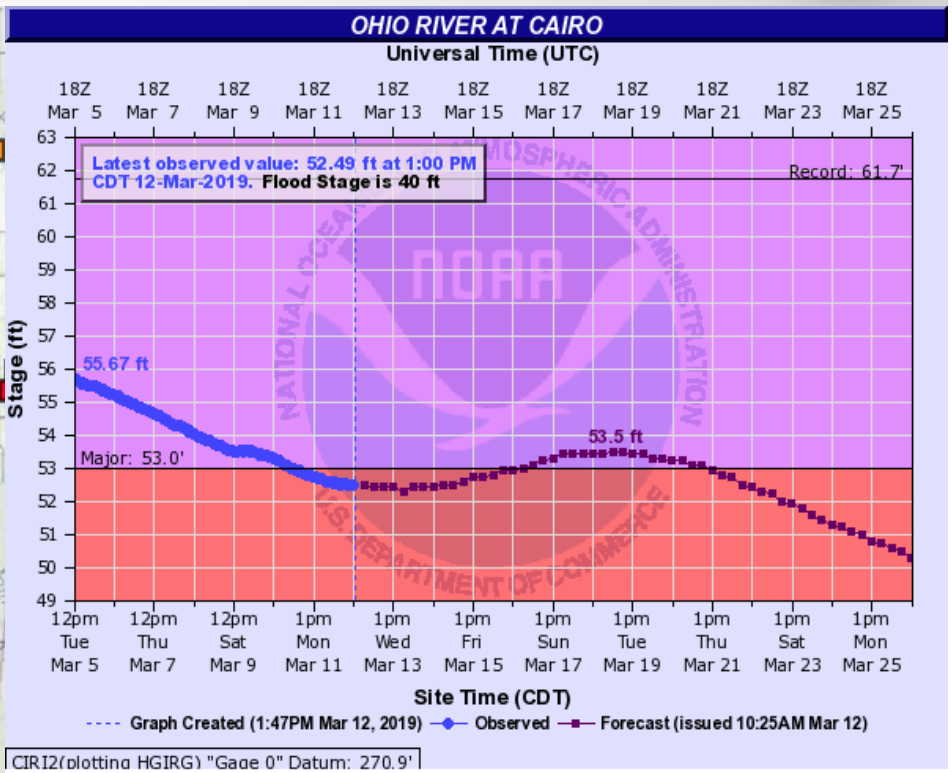
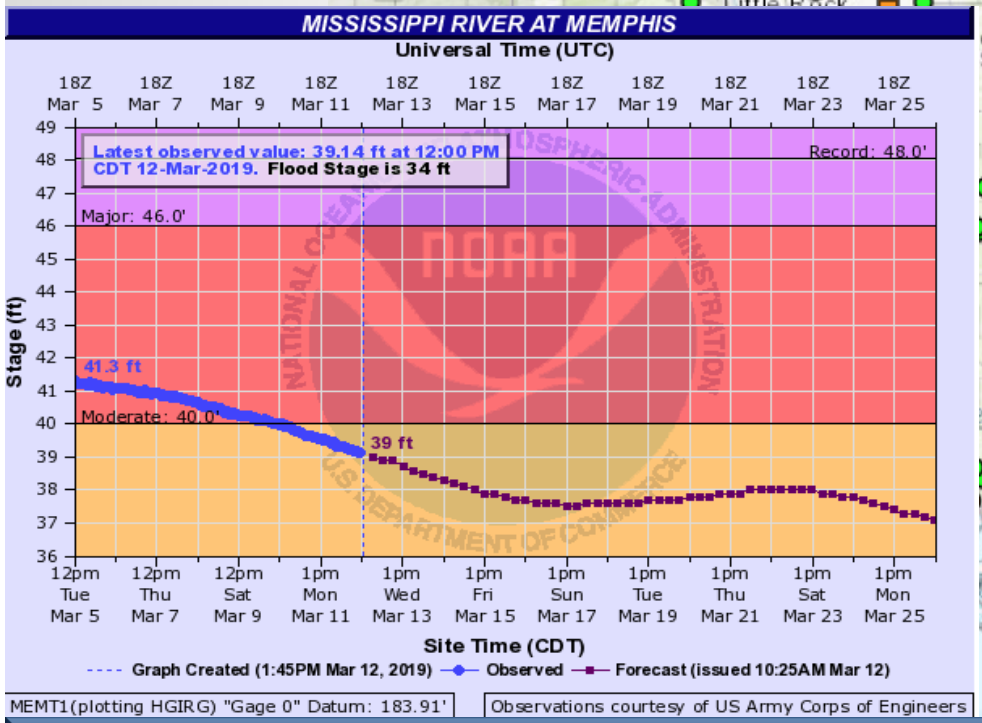
Current Forecast

Cairo, IL & Memphis, TN







www.weather.gov/lmrfc

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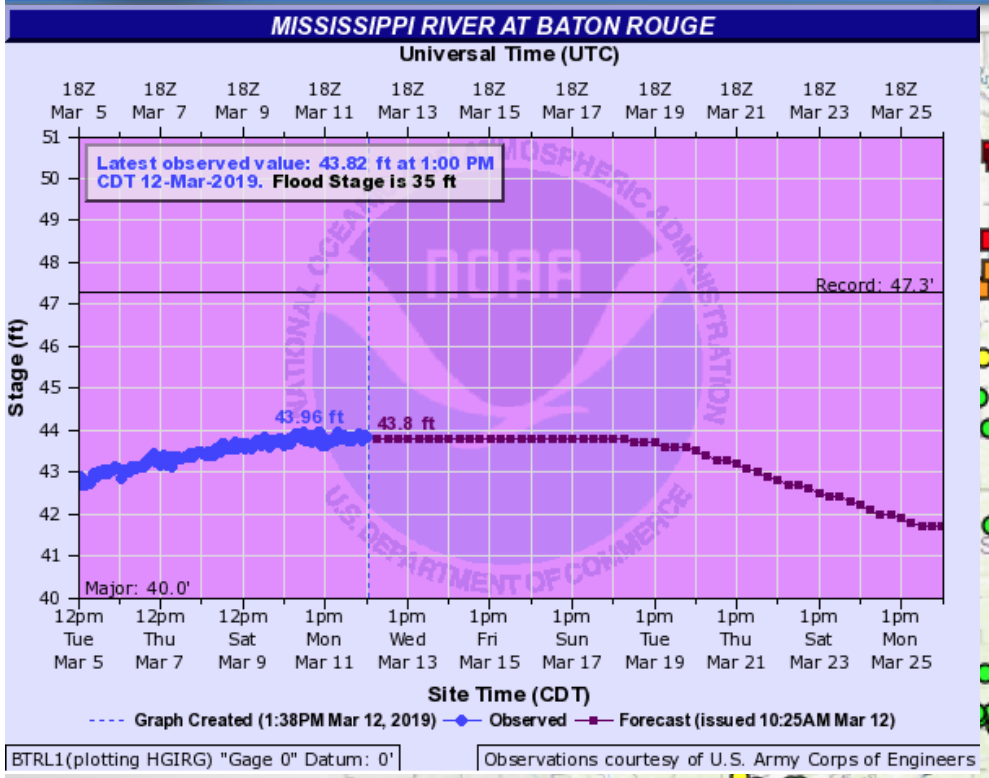
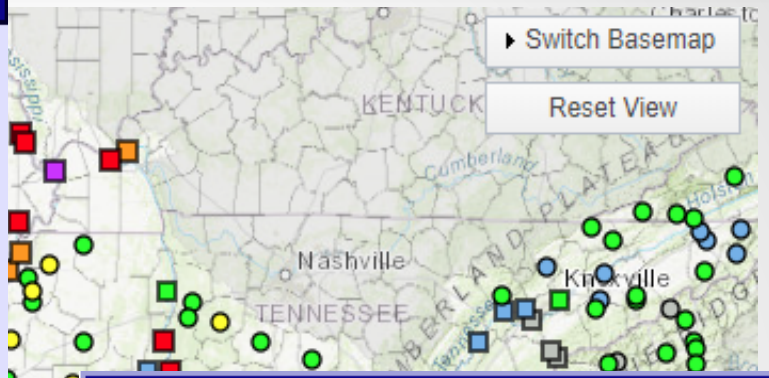
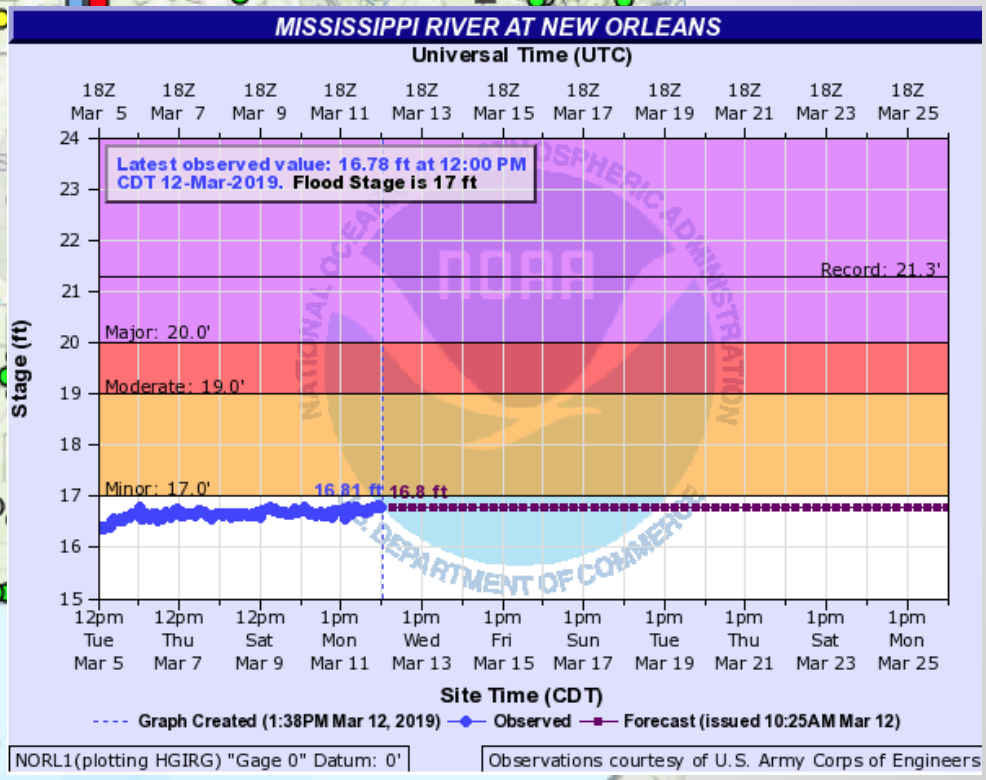
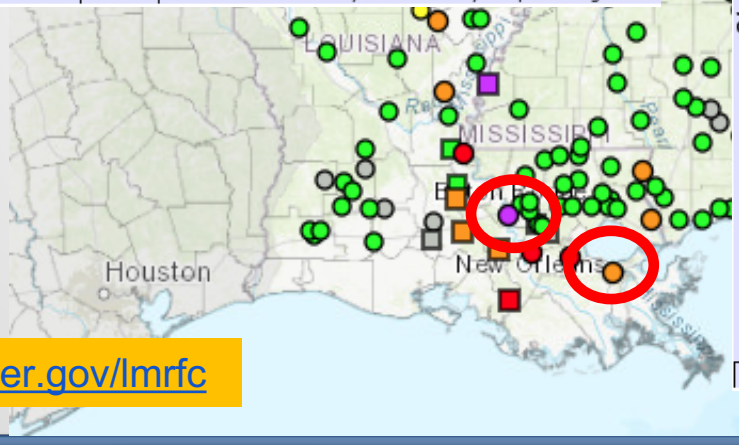
Current Forecast
Baton Rouge & New Orleans









www.weather.gov/lmrfc

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Experimental Forecast

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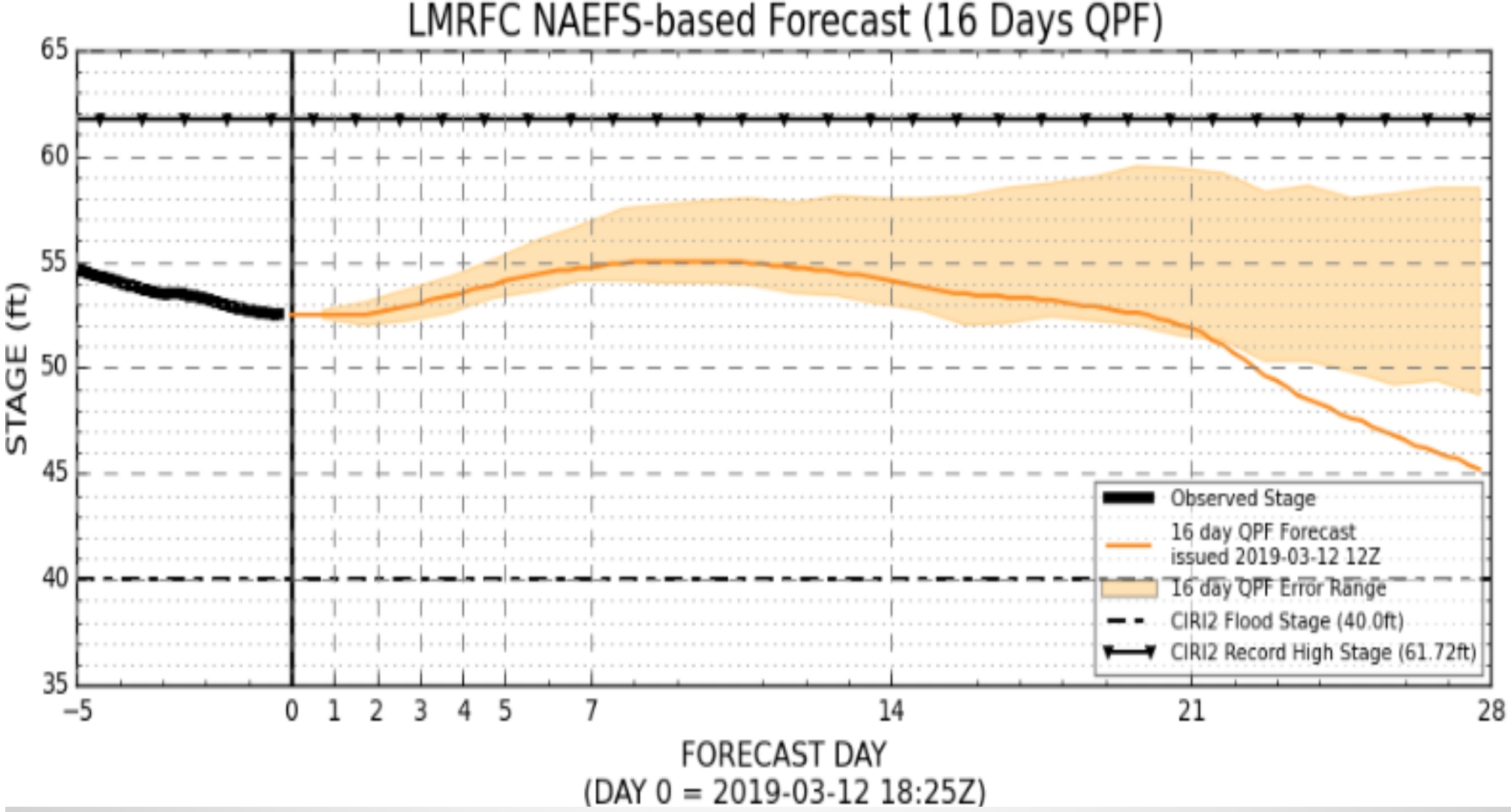
Experimental 16 Day Future Rainfall Guidance



https://www.weather.gov/lmrfc/experimental_28day_mississippi_plot

Winter/Spring Outlook

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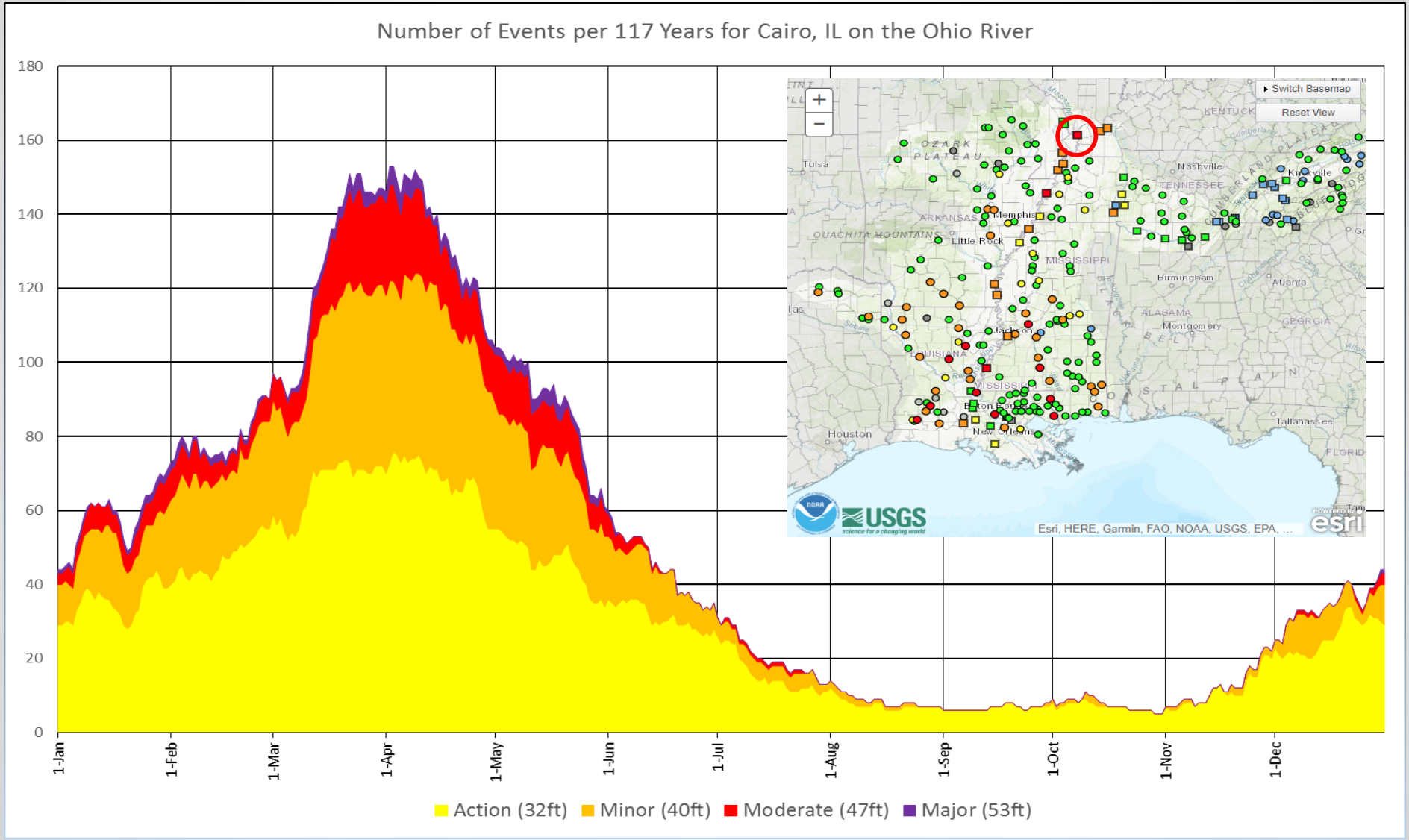
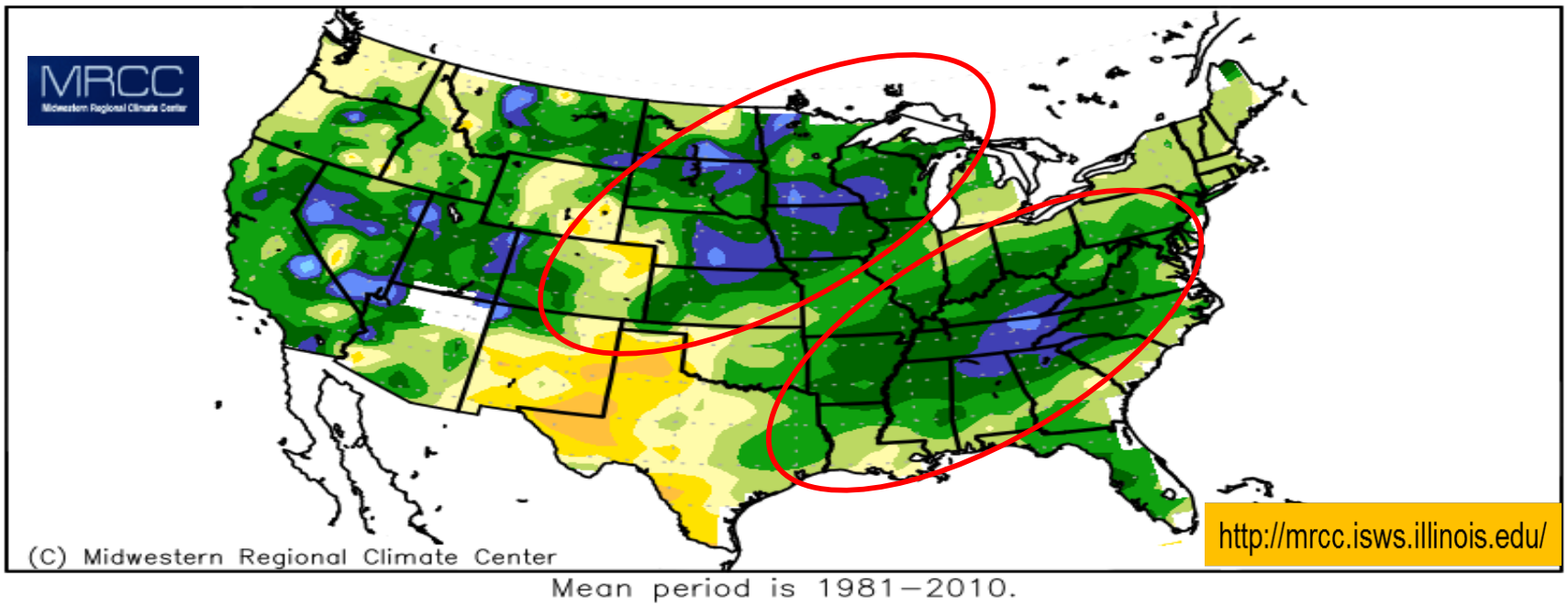
Average Category/Timing of Flooding at Cairo, IL



Travel Times from New Orleans

Late Winter/Early Spring Precipitation

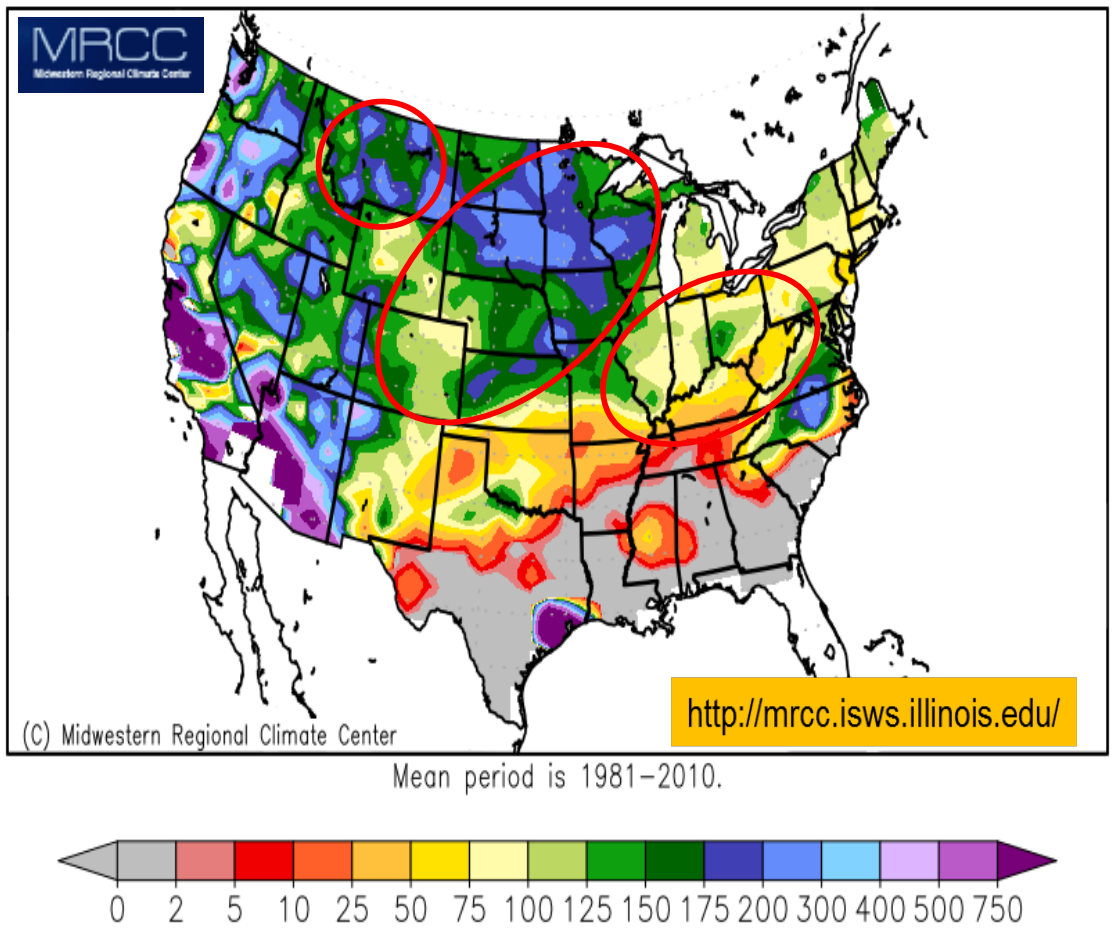


- **Most of the area continues to be wetter than normal; greater than 200% of normal. This is a continuation of the 2018 record annual rainfall for the east Tennessee Valley.**

Late Winter/Early Spring Snowfall

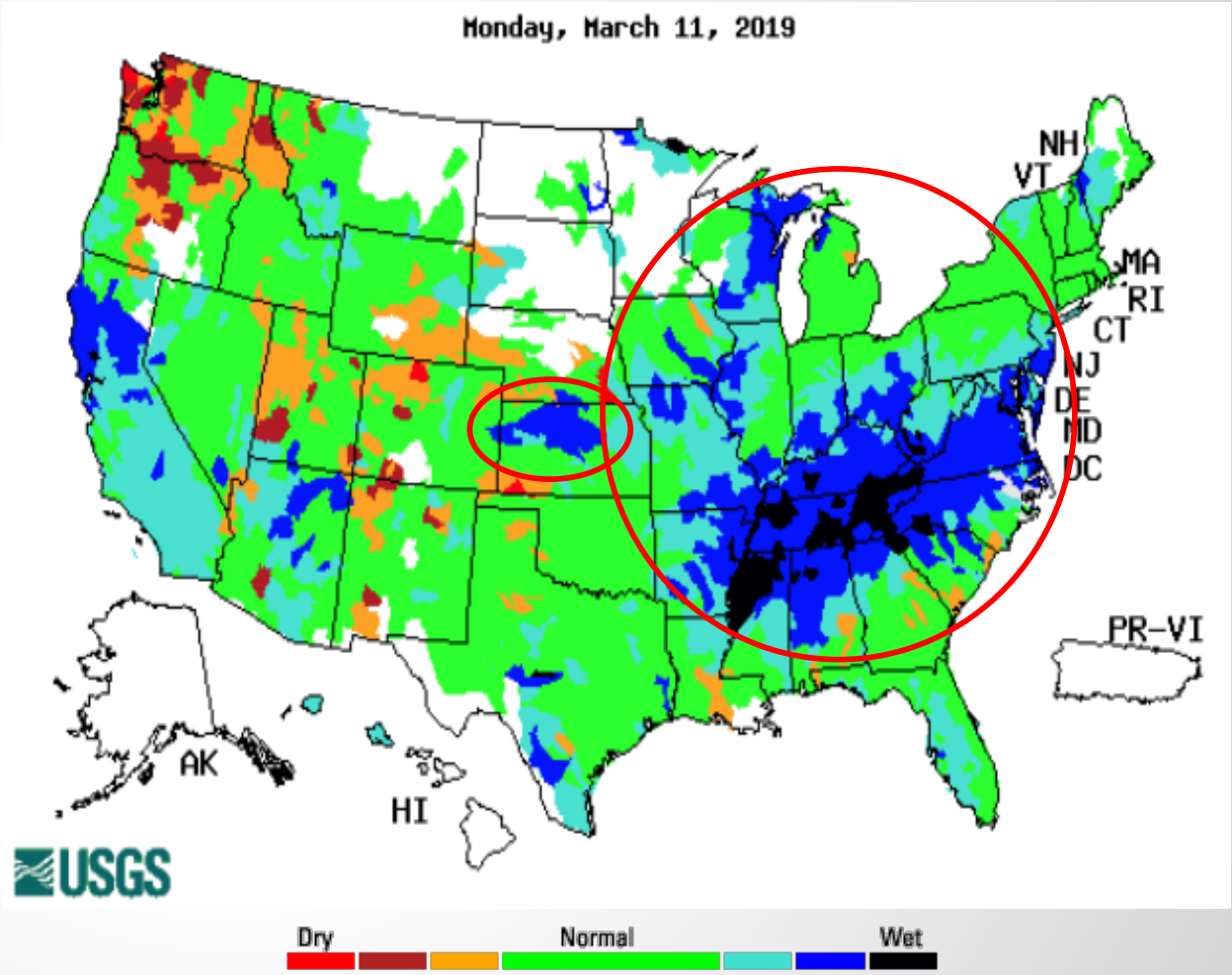
- **Snowfall has continued to be above normal in much of the northern areas, upwards of 2 to 5 times as normal.**

- **Snowfall has continued to be below normal in much of the Ohio basin where near to above normal temperatures have occurred.**



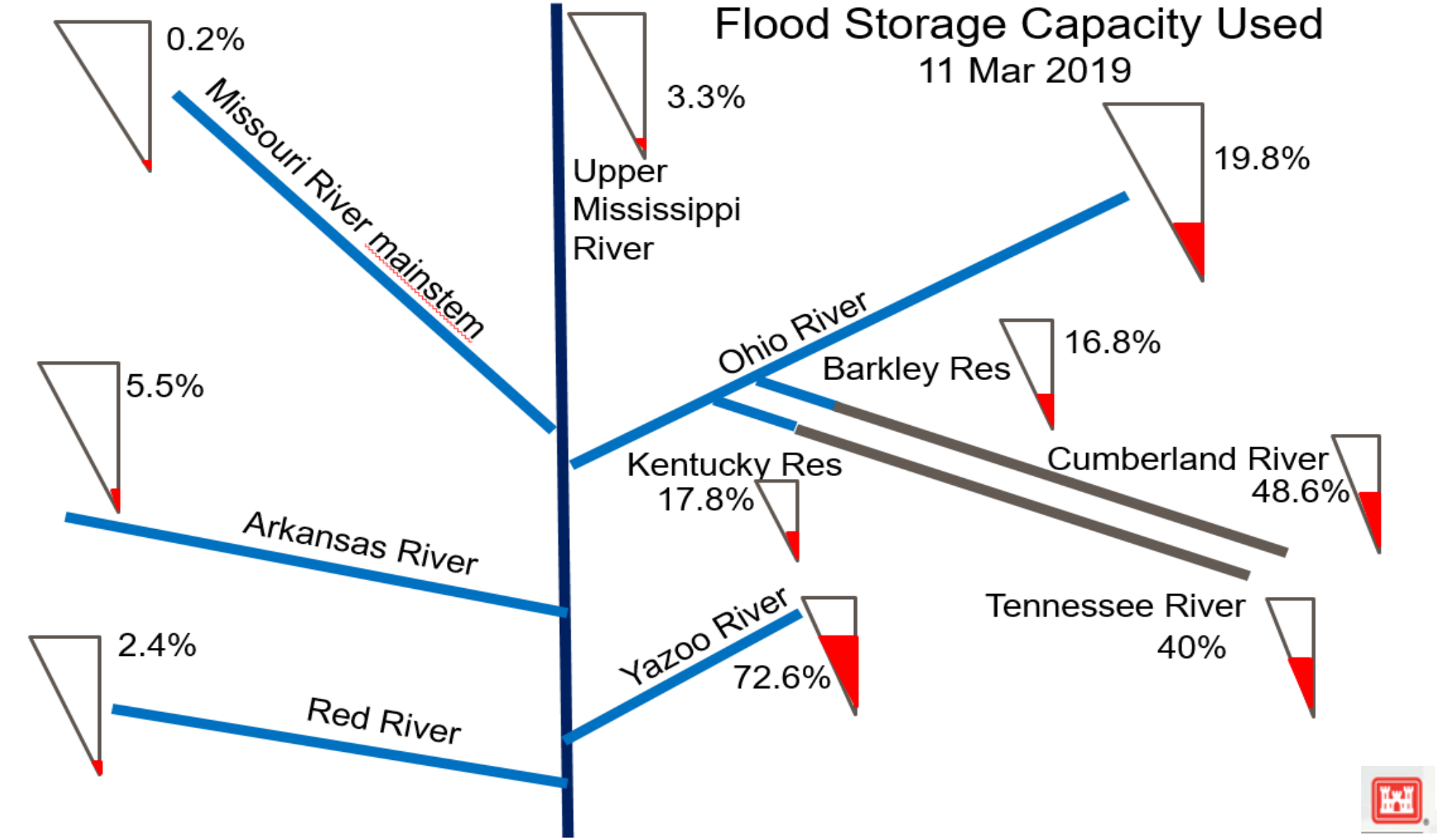
Early Spring USGS Streamflow Conditions

- **USGS 28-day avg stream flows reflect the above normal soil moisture conditions.**
- **Above normal flows in much of the region except western section.**
- **Ice remains in place in northern areas and ice jam action is at or above normal due to cold weather in upper Midwest and northern Plains**



http://waterwatch.usgs.gov/

USACE Flood Storage Used



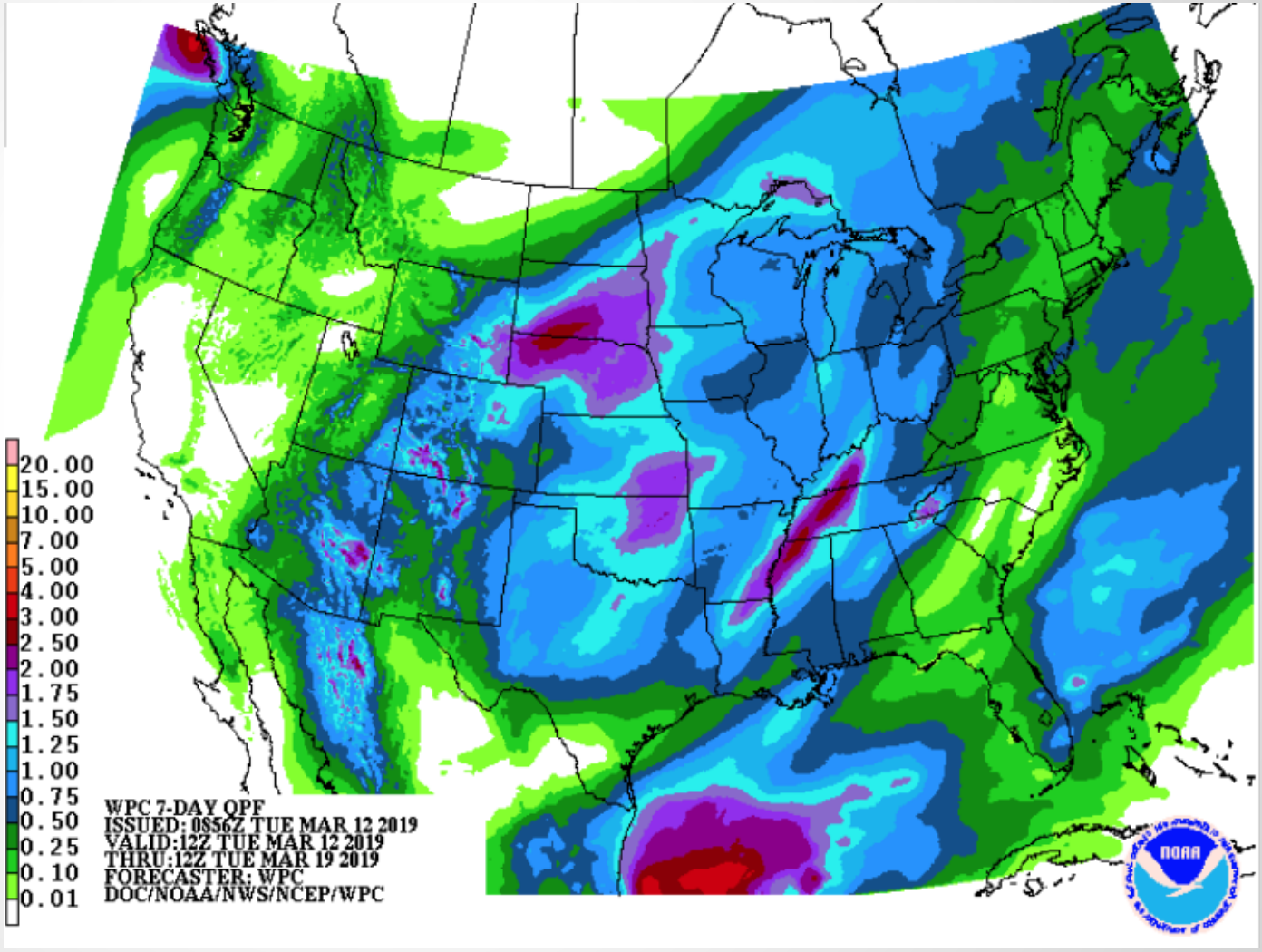
Week 1 Precipitation Forecast

Through March 19, 2019

Widespread precipitation this week

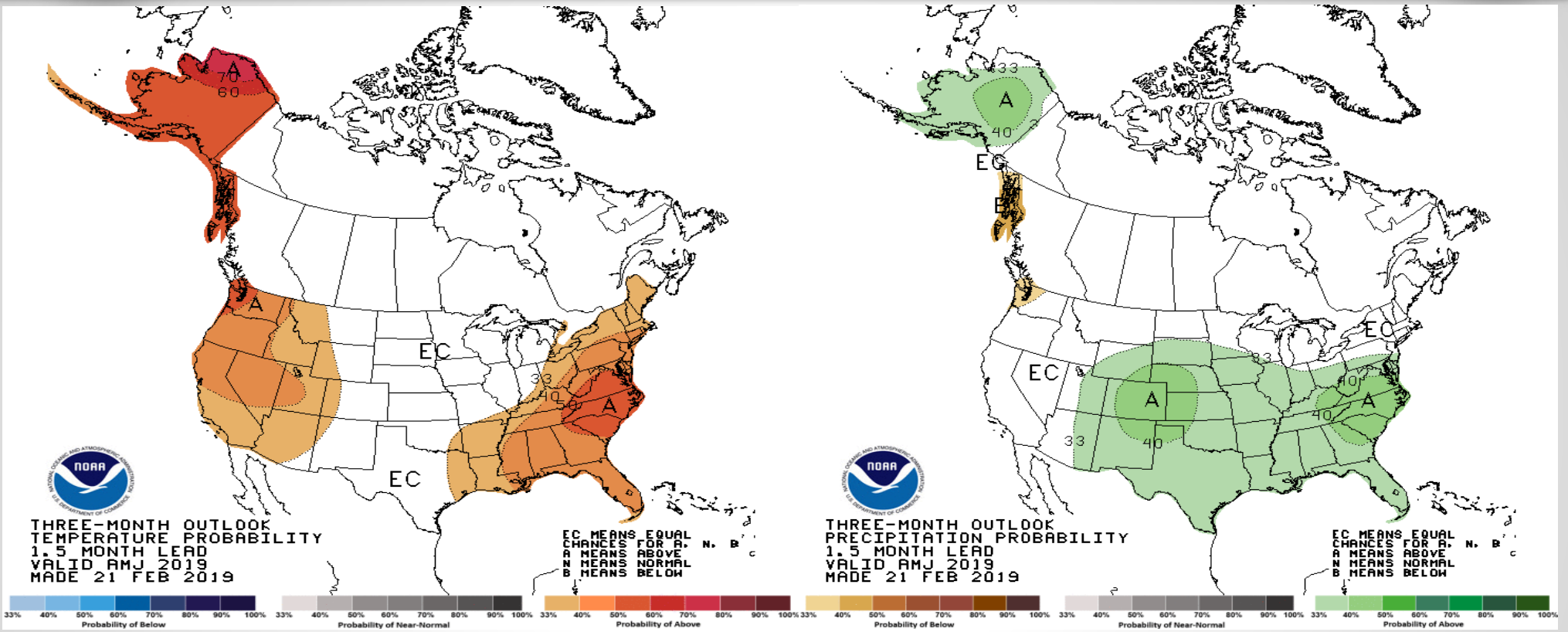
Wet/Heavy snow up in the Dakotas, north MN, and Nebraska

Rain elsewhere



http://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml

April Through June 2019 Outlook



- **A high degree of uncertainty continues into spring for both temperatures and precipitation. Wetness is currently favored over the central to eastern areas.**
- **This will impact the outcome to the spring hydrologic conditions and flood potential.**

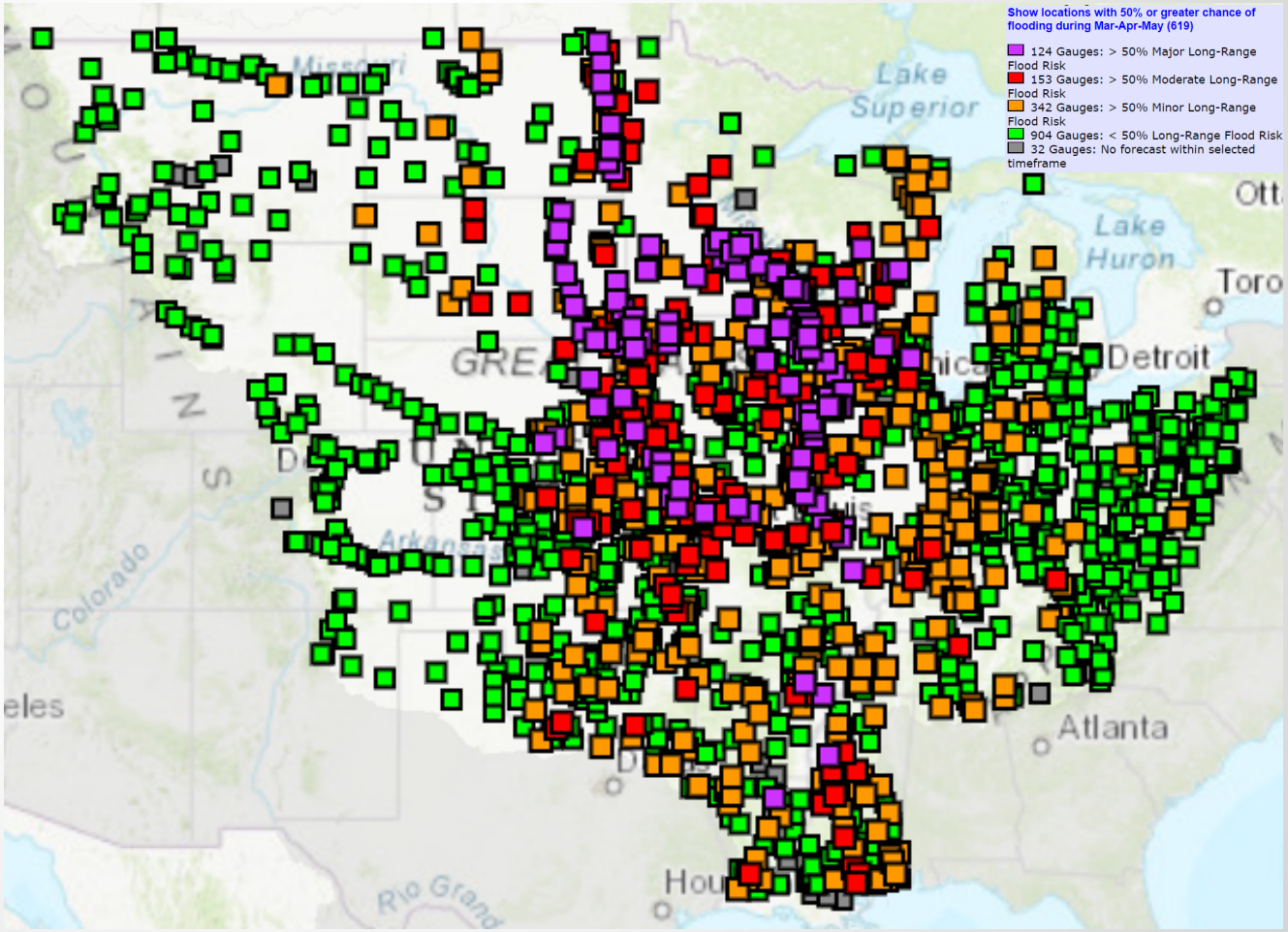
http://www.cpc.ncep.noaa.gov/

Flood Outlook
Through mid-June 2019

50% or Greater Chance of Flooding

Valid through mid-June

- **Moderate to Major flooding expected across much of the area**
- **Areas of Major flooding expected on the Mississippi, Lower Missouri, and Lower Ohio Rivers**
- **Flooding chances higher and more widespread than last year and in several years**



http://water.weather.gov/ahps/region_long_range.php?rfc=mvrfc&percent=50

Flood Outlook Headline

Due to very wet soil conditions, elevated rivers and lakes, and significant snowpack on the upper Mississippi Valley; the region is vulnerable to flooding into spring due to rainfall and thunderstorm events.

The magnitude of future flooding will be dependent on how and when the snow water content melts along with future rainfall.

Questions about LMRFC Overview