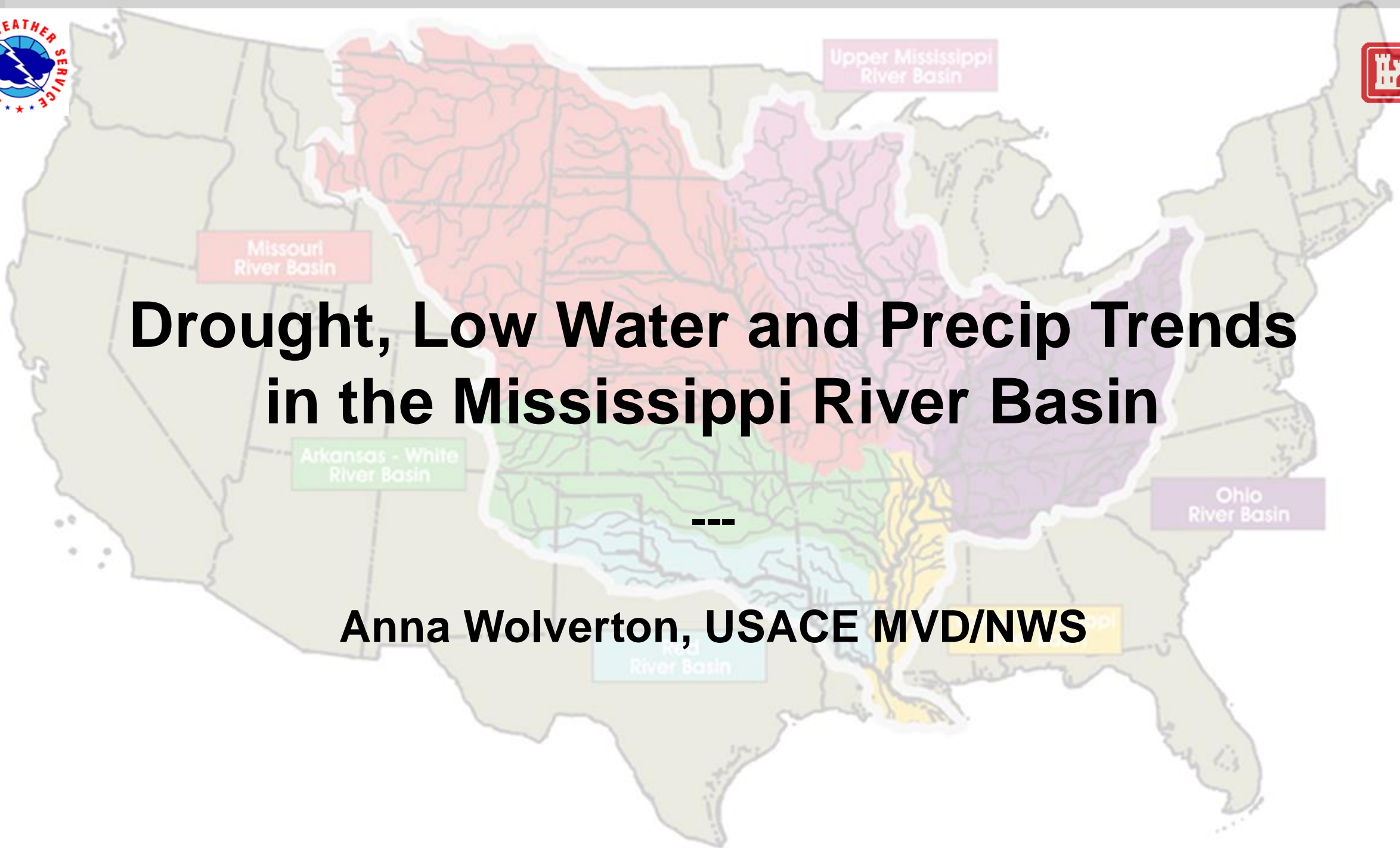




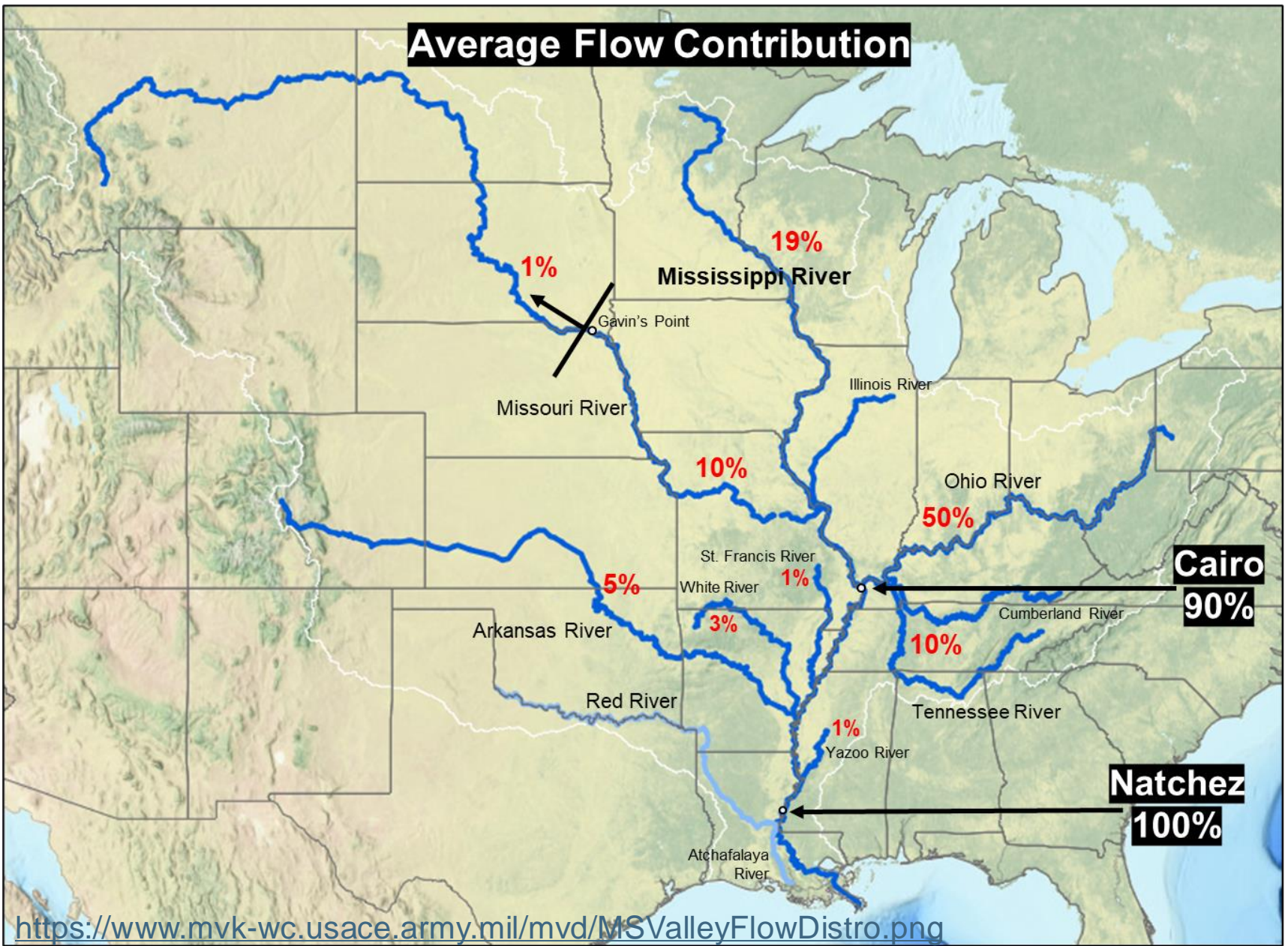
Drought, Low Water and Precip Trends in the Mississippi River Basin



Anna Wolverton, USACE MVD/NWS



MISSISSIPPI RIVER BASIN



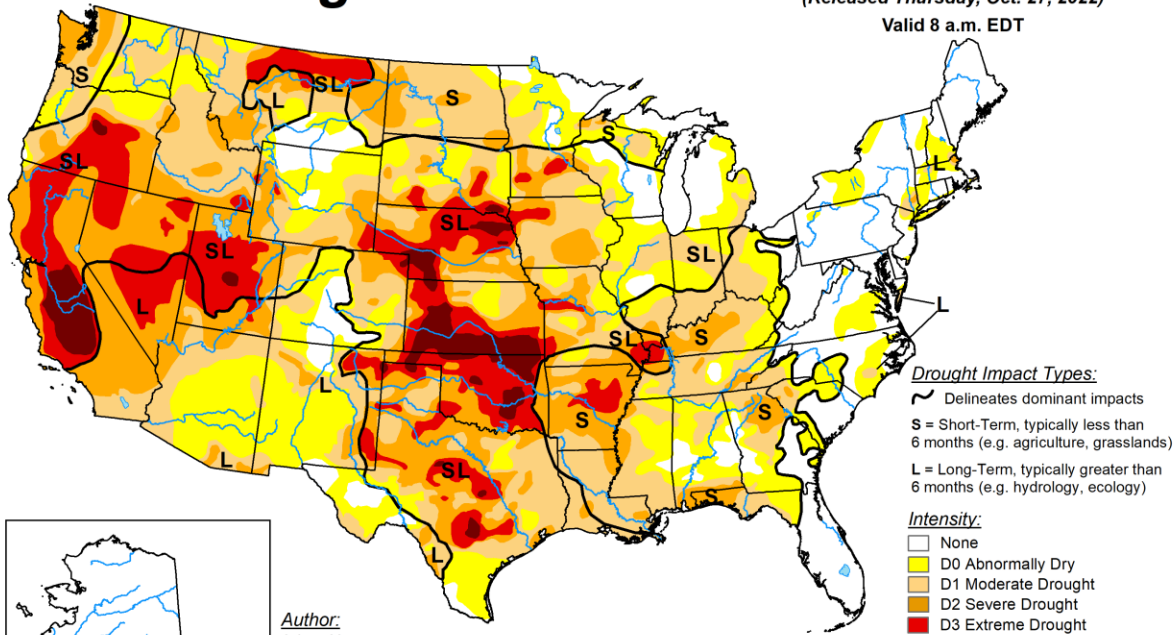
<https://www.mvk-wc.usace.army.mil/mvd/MSValleyFlowDistro.png>

2022 & 2023 PEAK DROUGHT



U.S. Drought Monitor

October 25, 2022
 (Released Thursday, Oct. 27, 2022)
 Valid 8 a.m. EDT

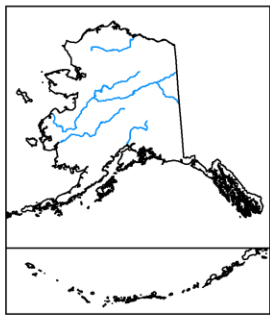


Drought Impact Types:
 ~ Delineates dominant impacts
 S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
 L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

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

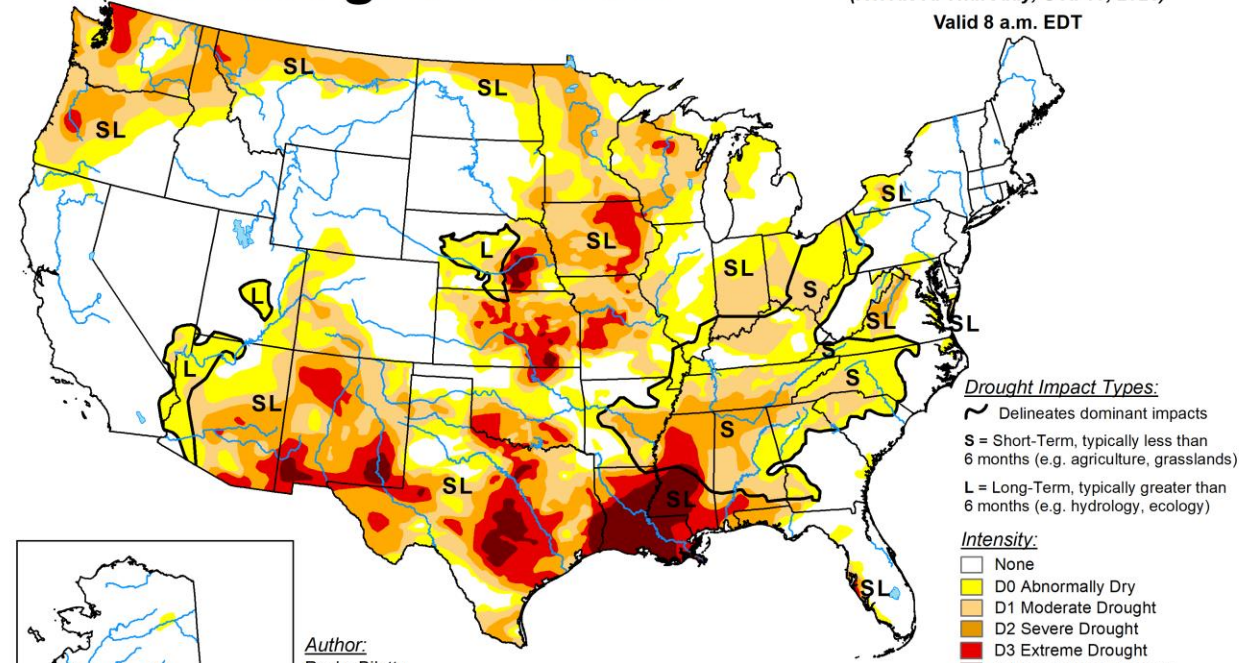
Author:
 Adam Hartman
 NOAA/NWS/NCEP/CPC

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>



U.S. Drought Monitor

October 17, 2023
 (Released Thursday, Oct. 19, 2023)
 Valid 8 a.m. EDT

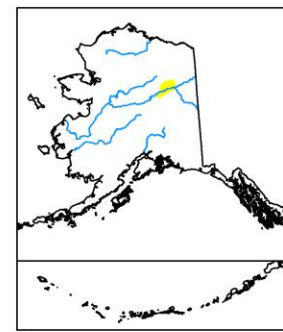


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Author:
 Rocky Bilotta
 NCEI/NOAA

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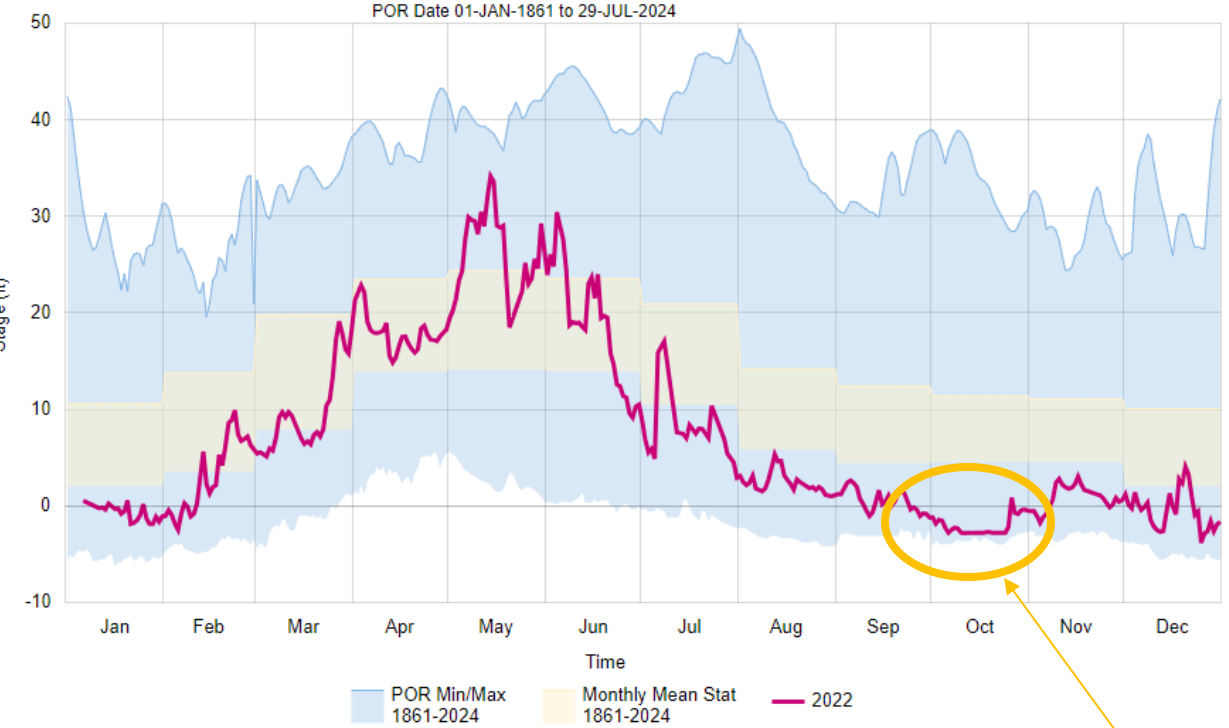




2022 RIVER LEVELS

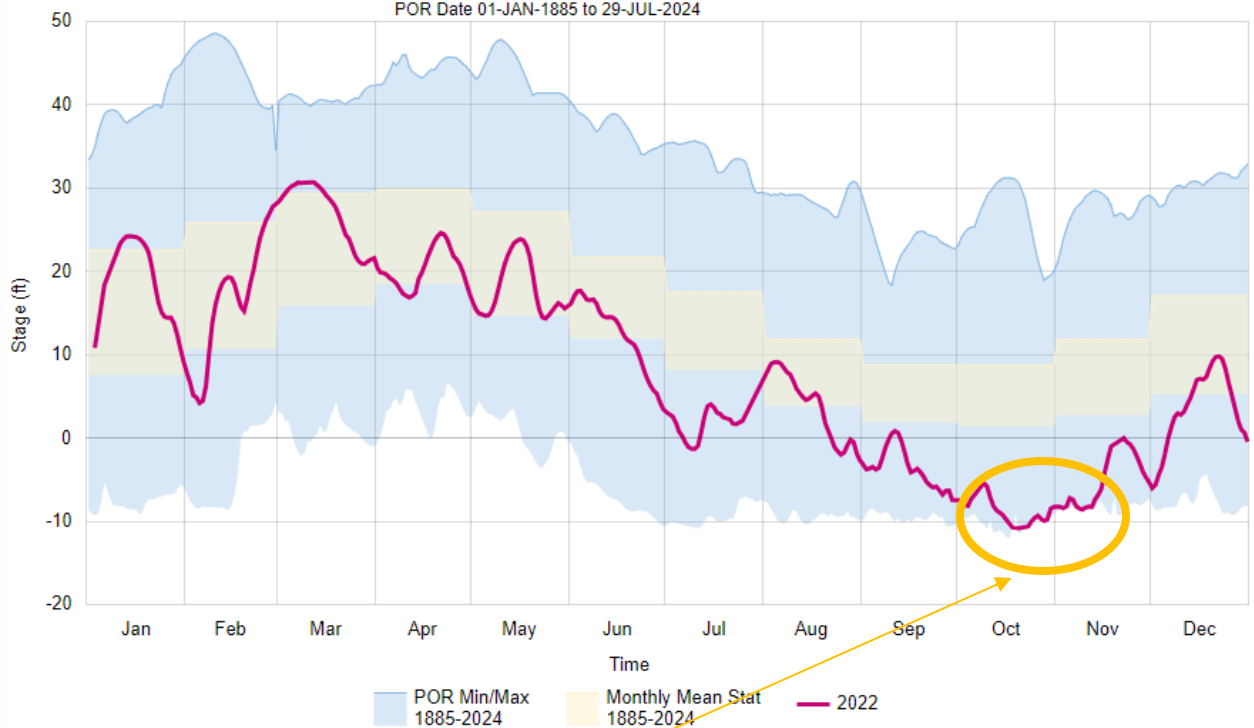
Mississippi River @ St. Louis

St Louis-Mississippi.Stage.Inst.~1Day.0.MVDhist-rev
POR Date 01-JAN-1861 to 29-JUL-2024



Mississippi River @ Memphis

Memphis-Mississippi.Stage.Inst.~1Day.0.MVDhist-rev
POR Date 01-JAN-1885 to 29-JUL-2024

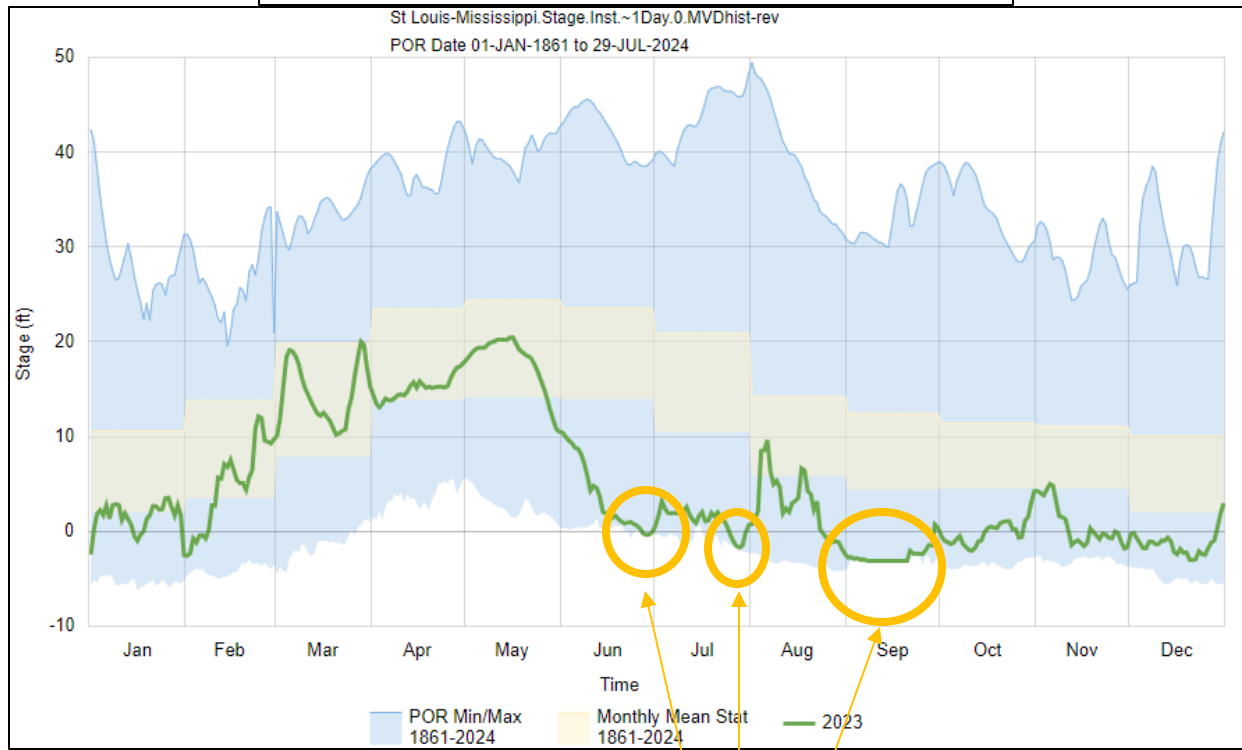


Record low stages



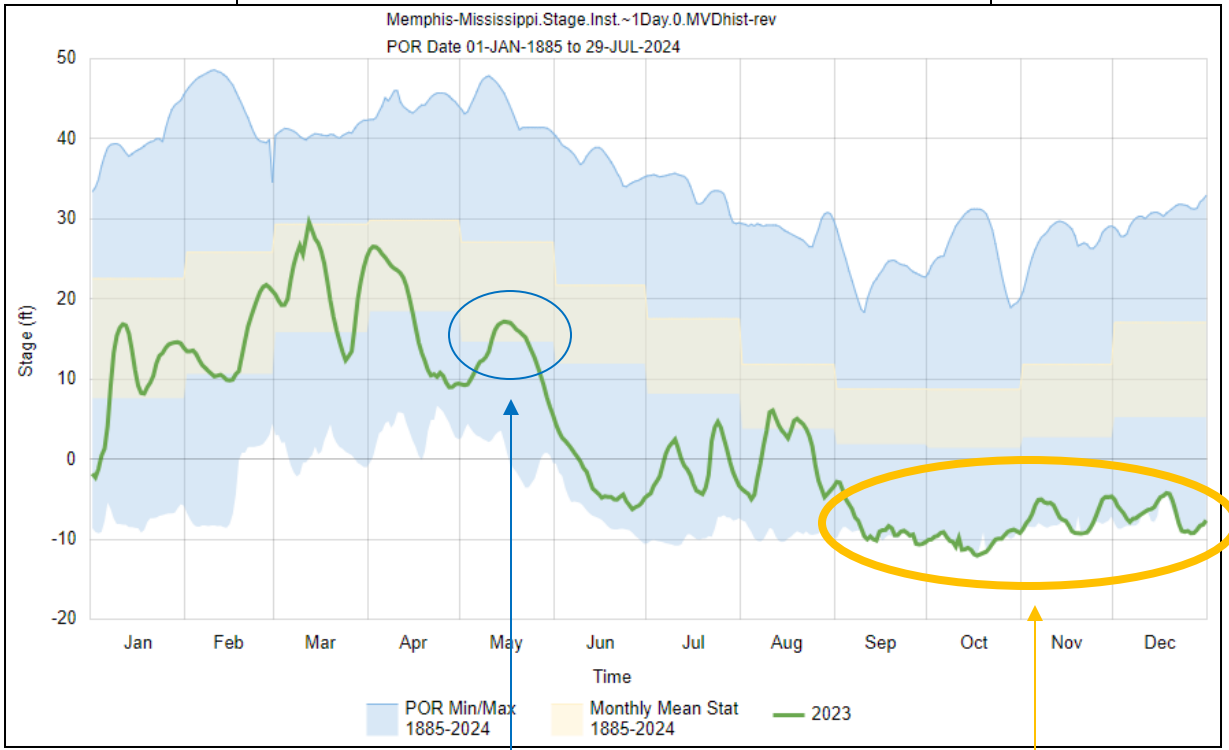
2023 RIVER LEVELS

Mississippi River @ St. Louis



Record low stages

Mississippi River @ Memphis



Rise from Upper Miss snowmelt

Record low stages



2023 RECORDS BROKEN



RECORD LOW WATER STAGES on the Mississippi River

Gage Location	Record Low Stage (Date)	Previous Record (Year)
Cairo, IL	4.54 ft 10/13/2023	4.83 ft 2022
New Madrid, MO	-6.55 ft 10/15/2023	-5.51 ft 2022
Caruthersville, MO	-2.98 ft 10/15/2023	-1.82 ft 2022
Osceola, AR	-11.80 ft 10/16/2023	-11.60 ft 2022
Memphis, TN	-12.04 ft 10/17/2023	-10.81 ft 2022
Helena, AR	-5.11 ft 10/18/2023	-4.20 ft 1988



IMPACTS TO INDUSTRY

Low flows



River channel more restricted



Reduced capacity to barge loads



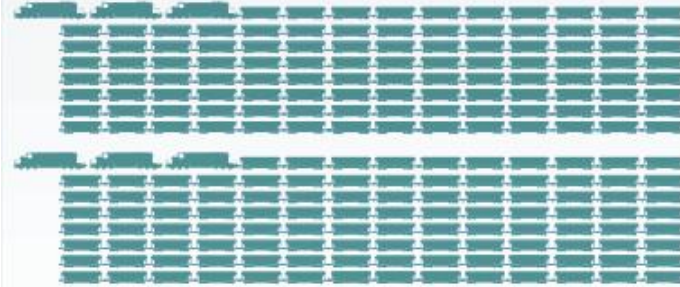
More dredging needed to maintain the 9ft navigation channel



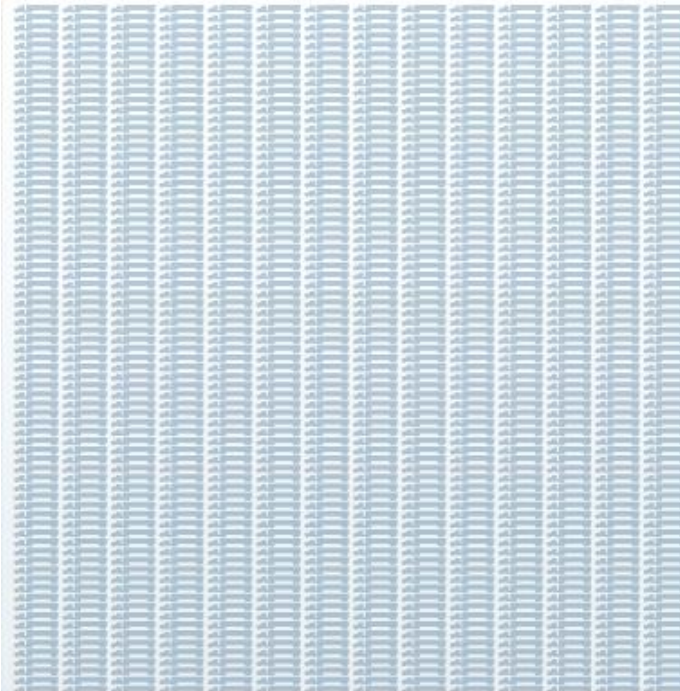
One 15-Barge Tow



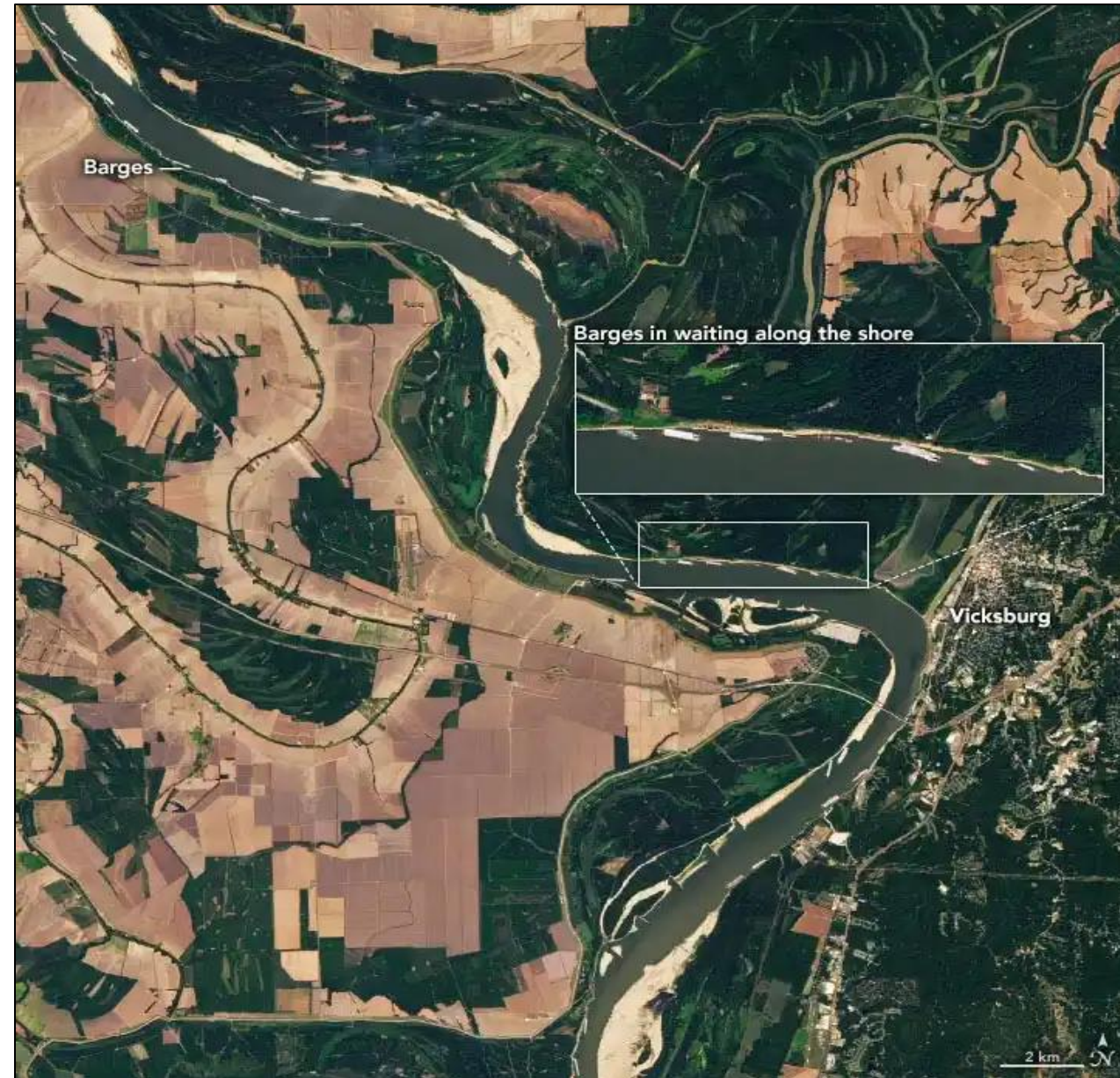
216 Rail Cars + 6 Locomotives



1,050 Large Semi Tractor-Trailers

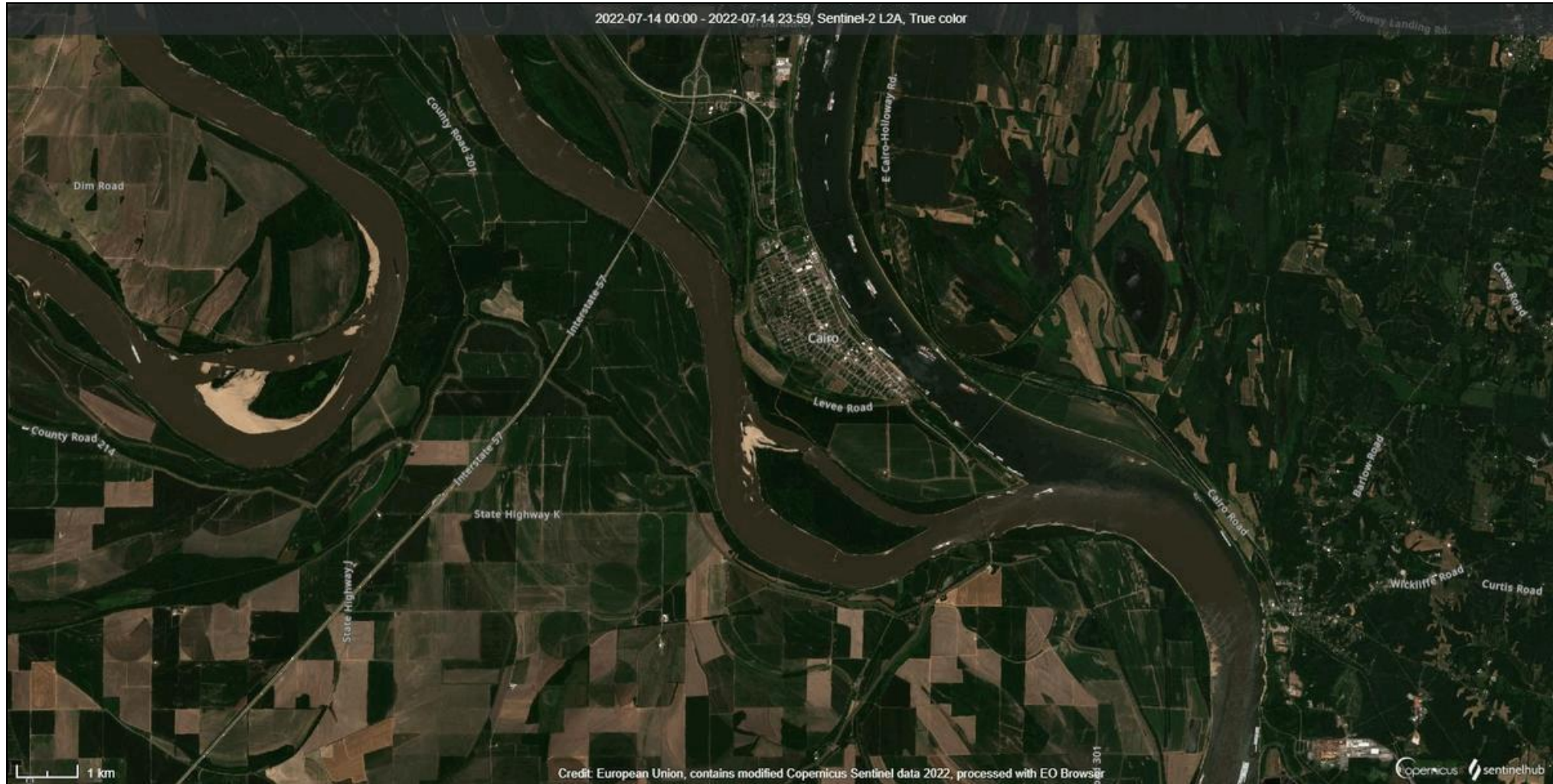


IMPACTS – SATELLITE VIEW



Landsat 9 imagery of the Mississippi River on October 7, 2022.

SATELLITE COMPARISON



Confluence of the Ohio and Mississippi Rivers between July 14 and October 17, 2022.
Satellite images from Copernicus Sentinel 2. Courtesy of NWS Paducah.

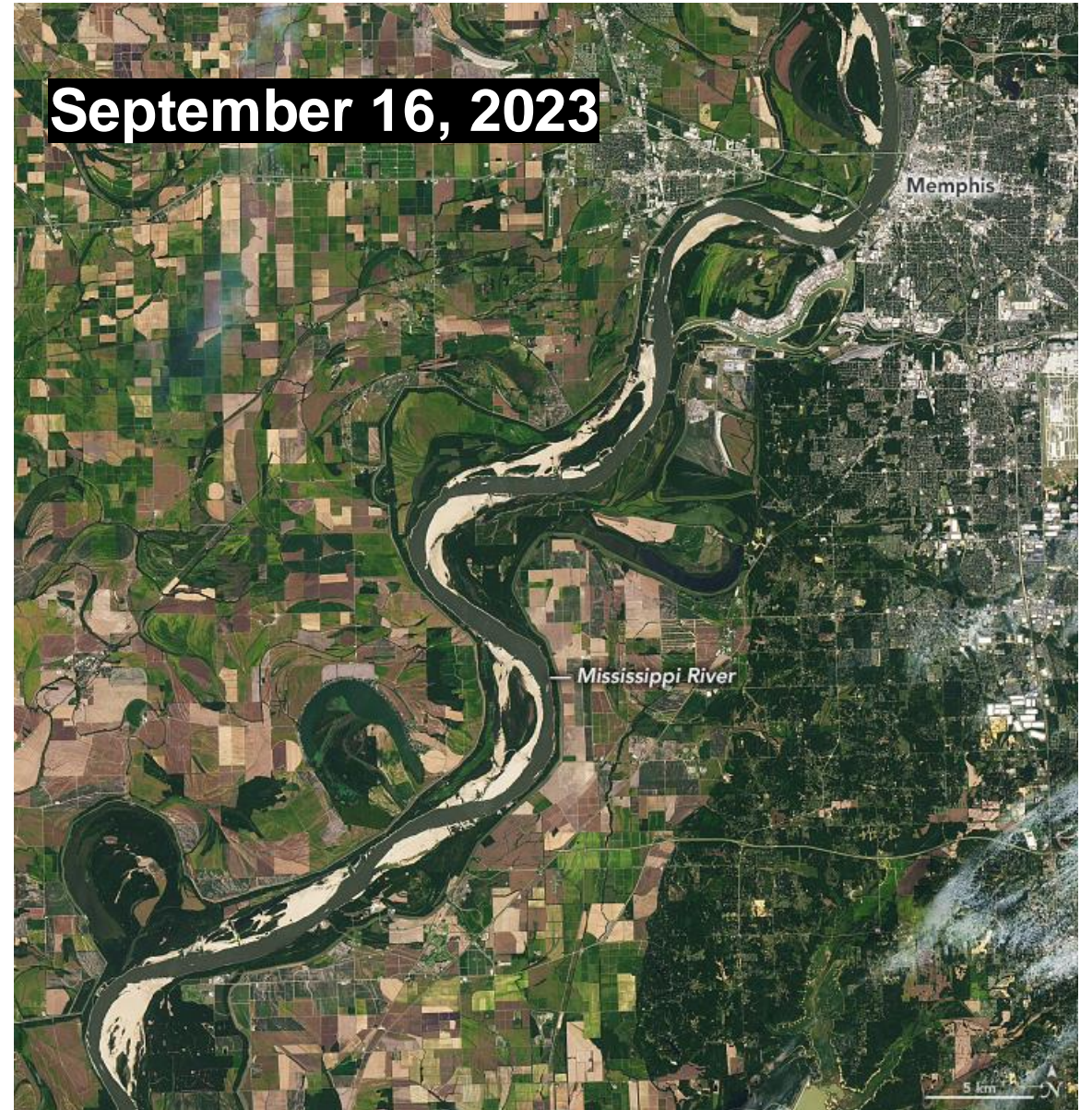


MISSISSIPPI RIVER BEACH

September 10, 2021

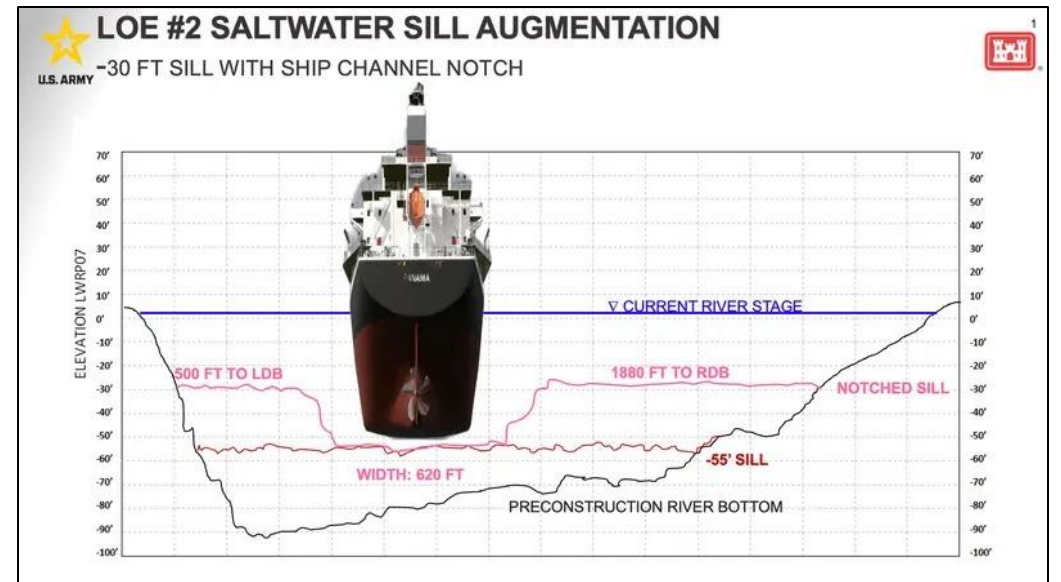
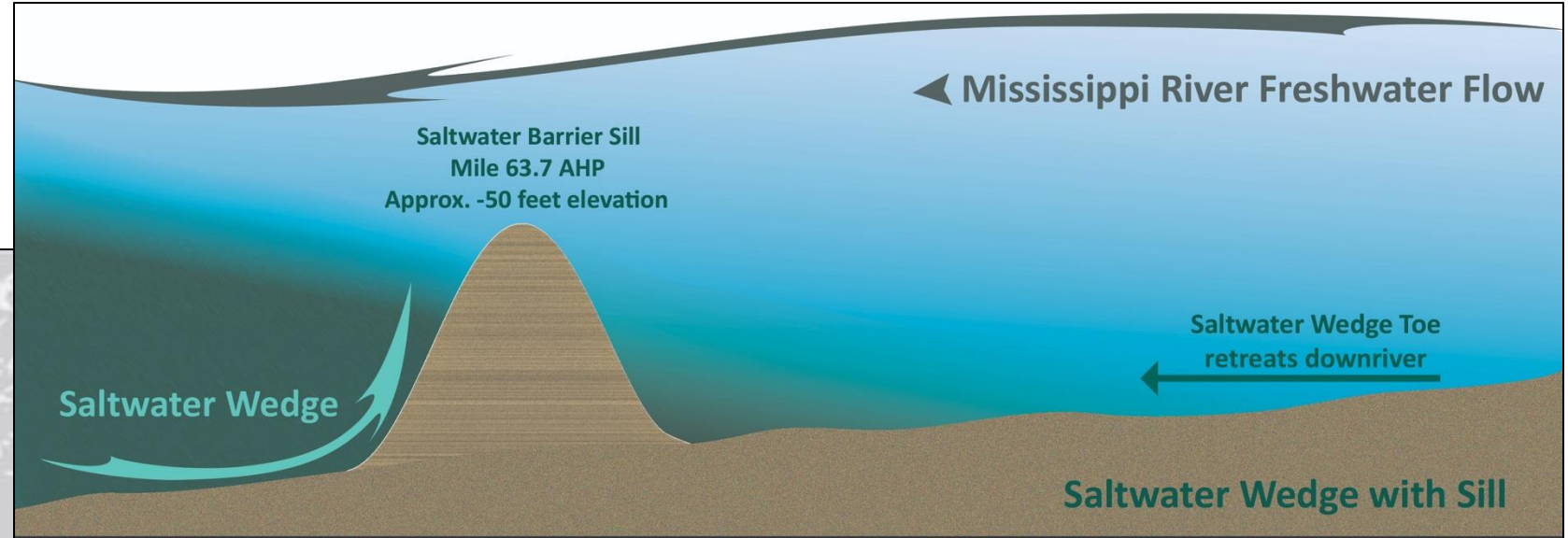


September 16, 2023



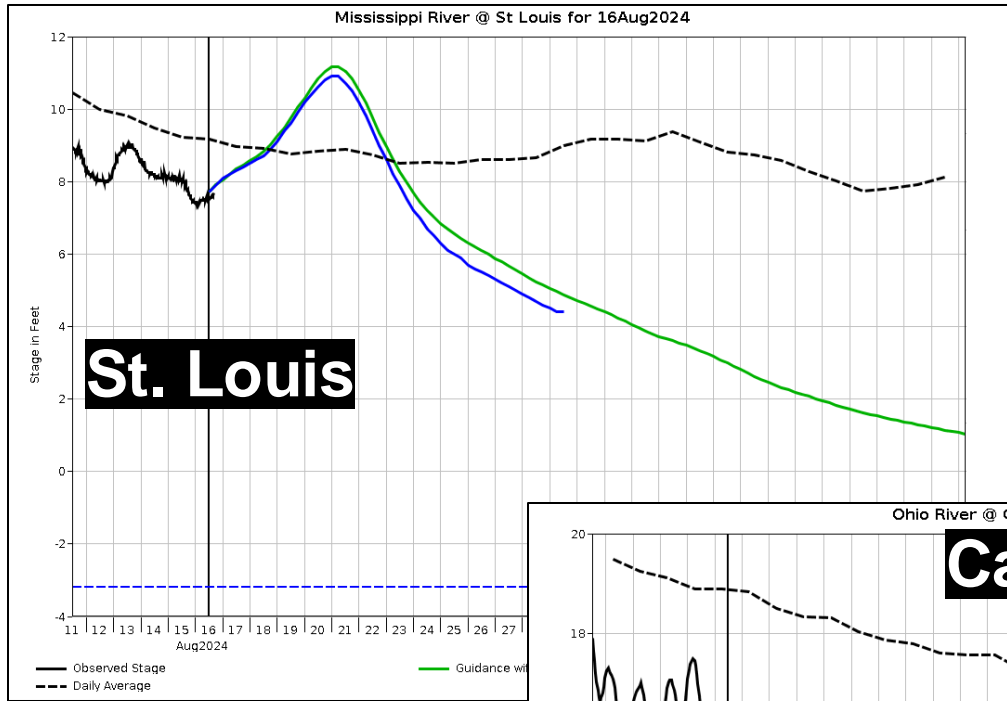


LOWER MISS IMPACTS

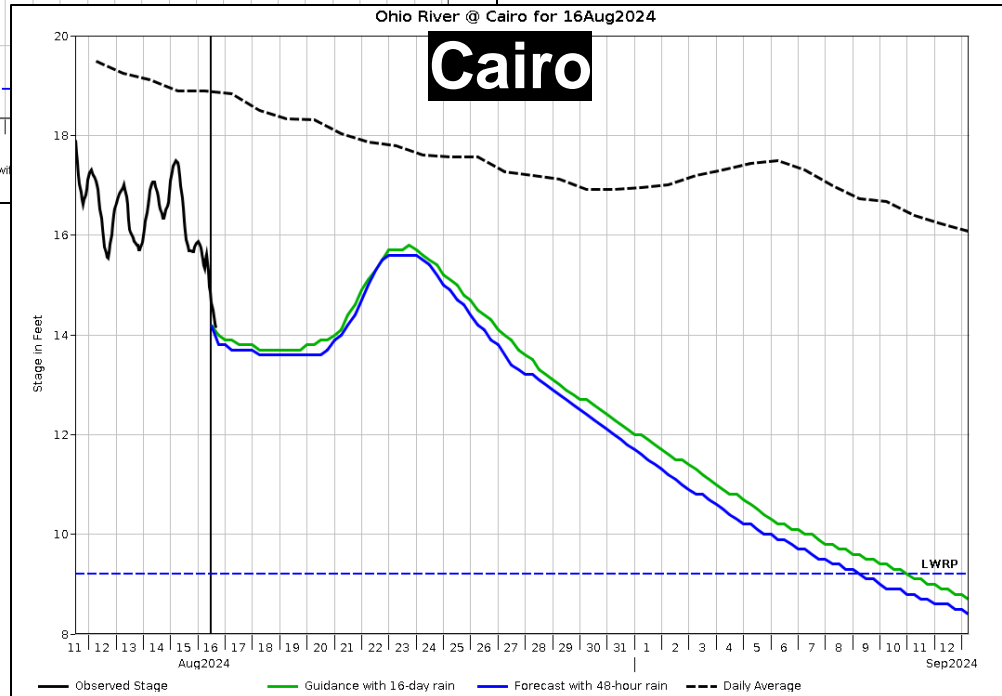




HOW'S THE RIVER DOING NOW?



- About 3-4 weeks out from low water stages at Cairo
- Saltwater wedge at river mile 22.1 as of 13 AUG





MISSISSIPPI BASIN PRECIP TRENDS



- Multi-agency collab - input from NWS, USACE, and USGS.
- Info and data on seasonal, extreme precip, and drought trends.
- Updated info on the precip and river trends.



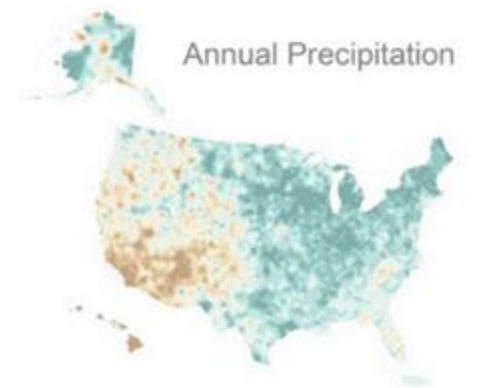
Greater Mississippi River Basin

Precipitation Trends

Precipitation is Increasing

Total annual precipitation is on the rise throughout the Greater Mississippi River Basin. The 30-year moving average has increased by about 0.7" per decade for the last 50 years.

The Upper Miss is the basin that has seen the greatest increases.





THE END

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Anna.Wolverton@noaa.gov**