

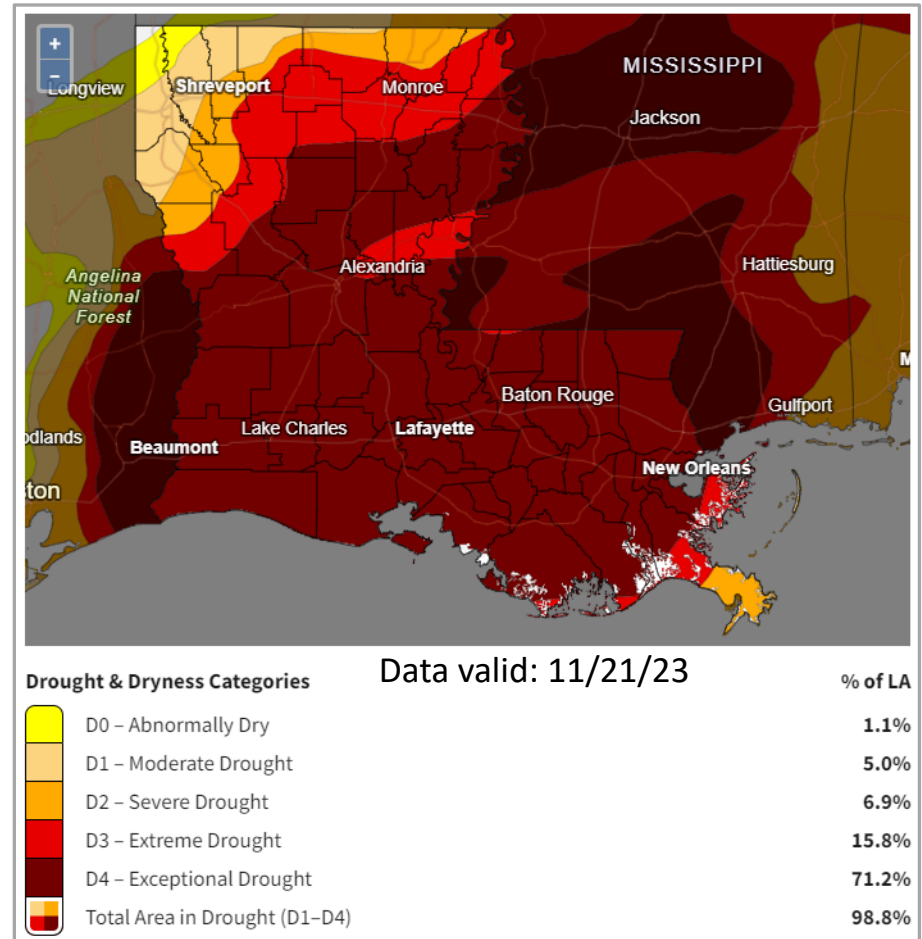


## ***Surface Water and Groundwater Conditions in Louisiana, Fall 2023***

**Max Lindaman**

Lower Mississippi Gulf Water Science Center

- Drought conditions persist; ~71% of the State is under “Exceptional Drought” as of 11/21/23.



# Streamflow conditions

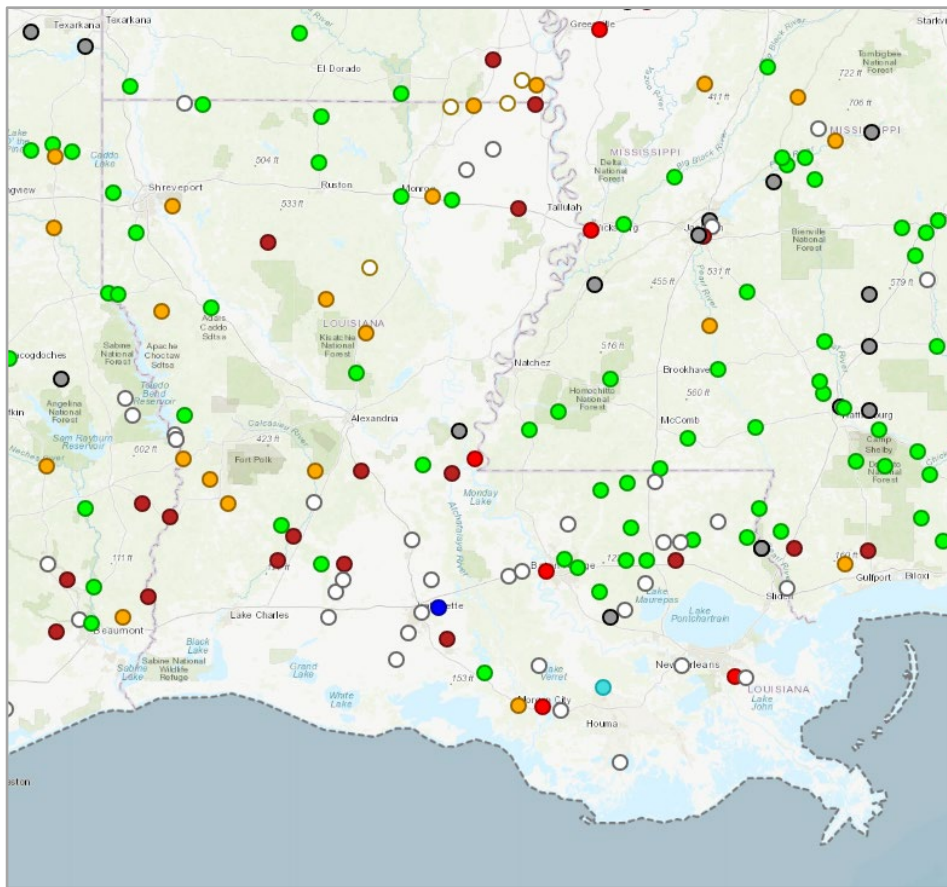
Data viewers:

USGS National Water Dashboard

<https://dashboard.waterdata.usgs.gov/>

USGS Water Watch

<https://waterwatch.usgs.gov>



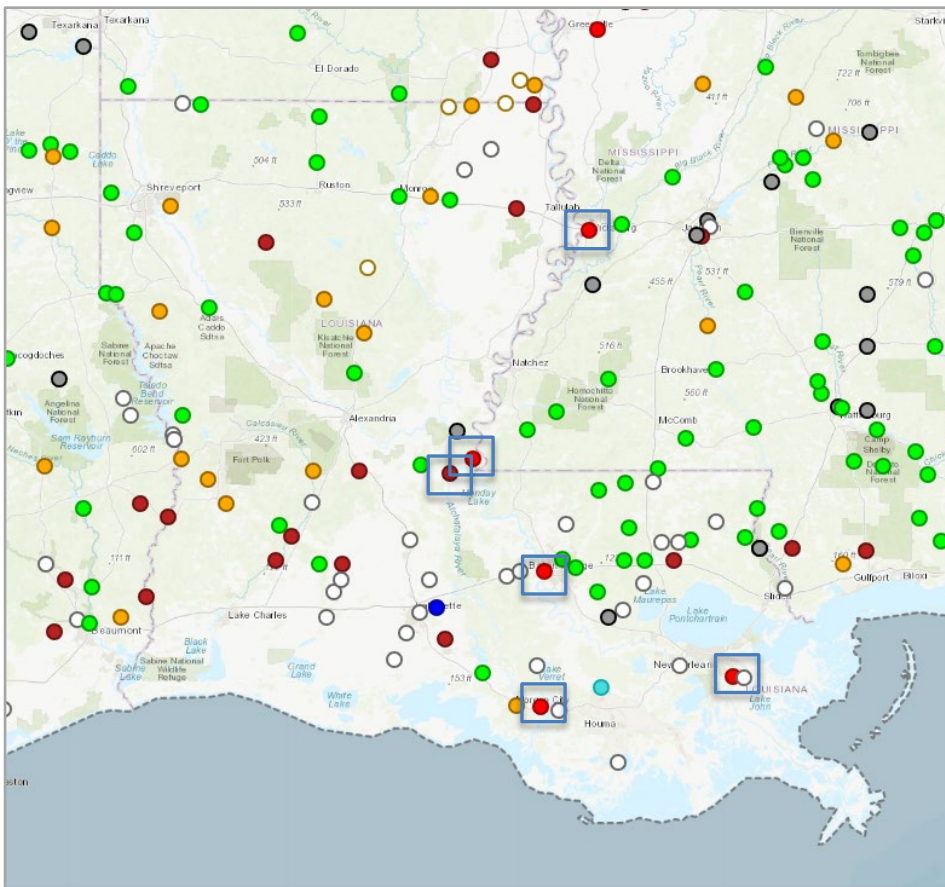
Explanation - Percentile classes							
●	●	●	●	●	●	●	○
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

11/24/2023



# Streamflow conditions

- Mississippi and Atchafalaya Rivers remain at or near daily historical lows.



Explanation - Percentile classes							
<span style="color: red;">●</span>	<span style="color: red;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: cyan;">●</span>	<span style="color: blue;">●</span>	<span style="color: black;">●</span>	<span style="color: gray;">○</span>
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

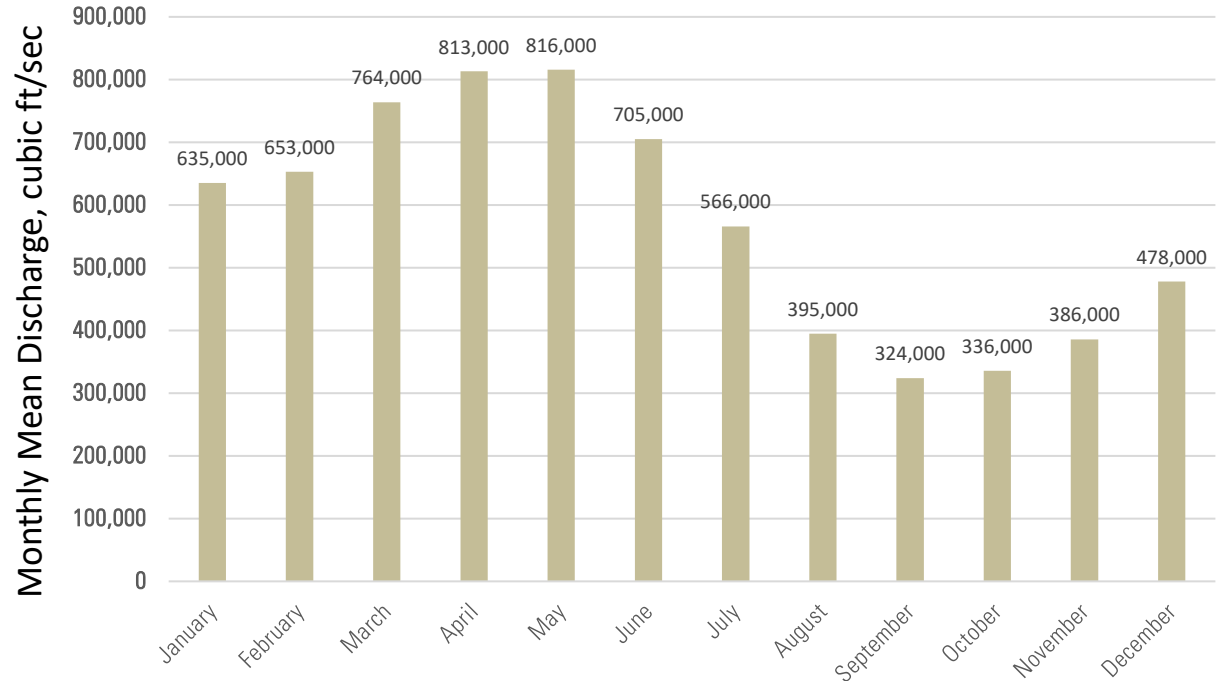
11/24/2023



# Streamflow conditions

- MS River discharge is lowest in Sep-October.
- Historical mean daily discharge of the Mississippi River at Baton Rouge on November 23<sup>rd</sup> is 376,000 ft<sup>3</sup>/sec (years 2003-2023).
- Mean daily discharge for 11/23/23 was 203,000 ft<sup>3</sup>/sec.

### Mississippi River at Baton Rouge - Monthly Mean Discharge 2004-21

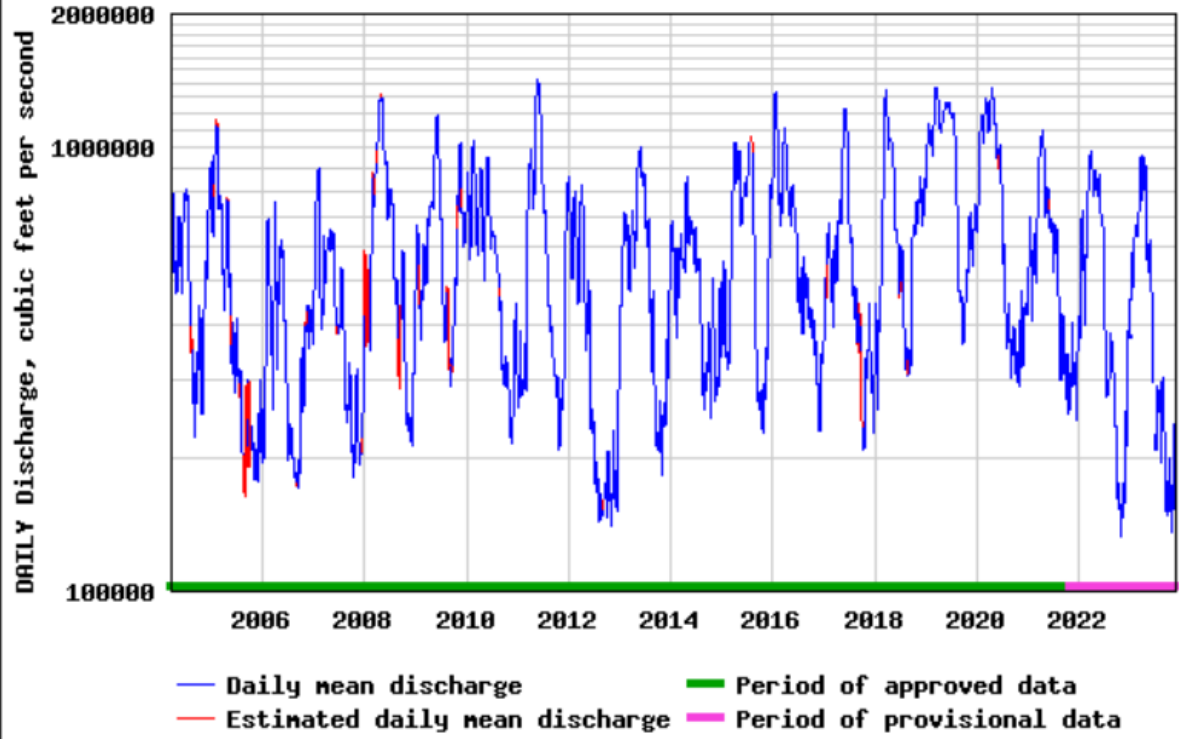


Contains preliminary information – subject to revision and not for citation.

[https://waterdata.usgs.gov/nwis/dv?referred\\_module=sw&site\\_no=07374000](https://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=07374000)



### USGS 07374000 Mississippi River at Baton Rouge, LA

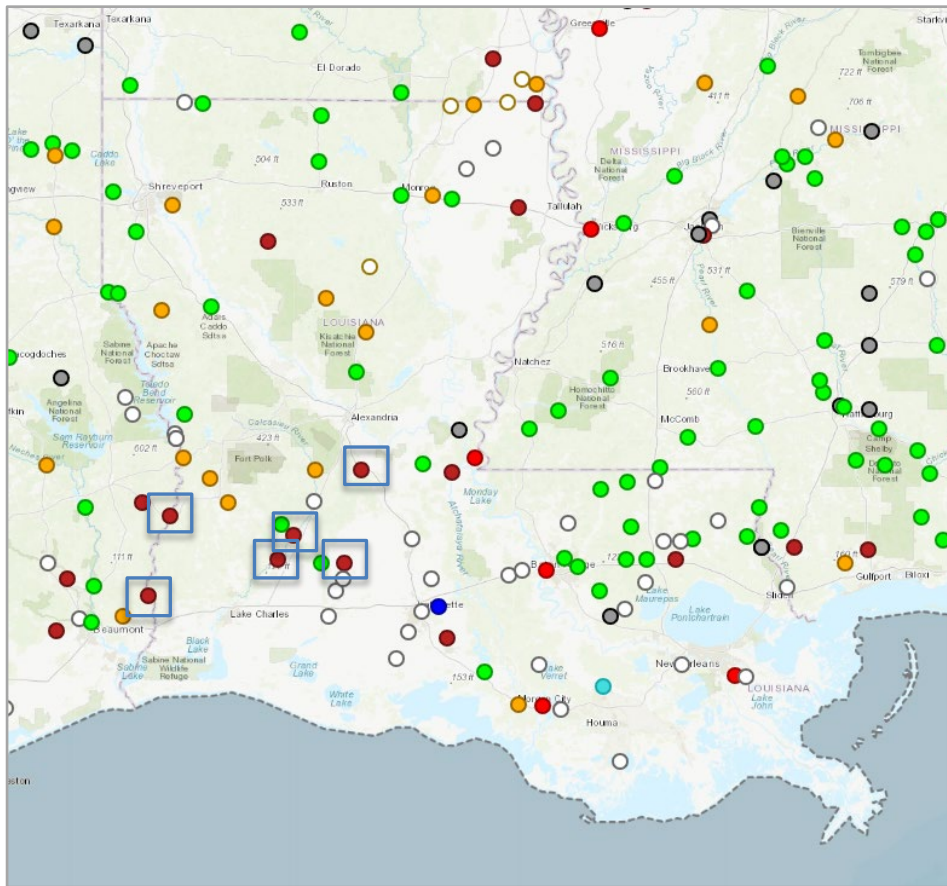


Contains preliminary information – subject to revision and not for citation.

[https://waterdata.usgs.gov/nwis/dv?referred\\_module=sw&site\\_no=07374000](https://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=07374000)

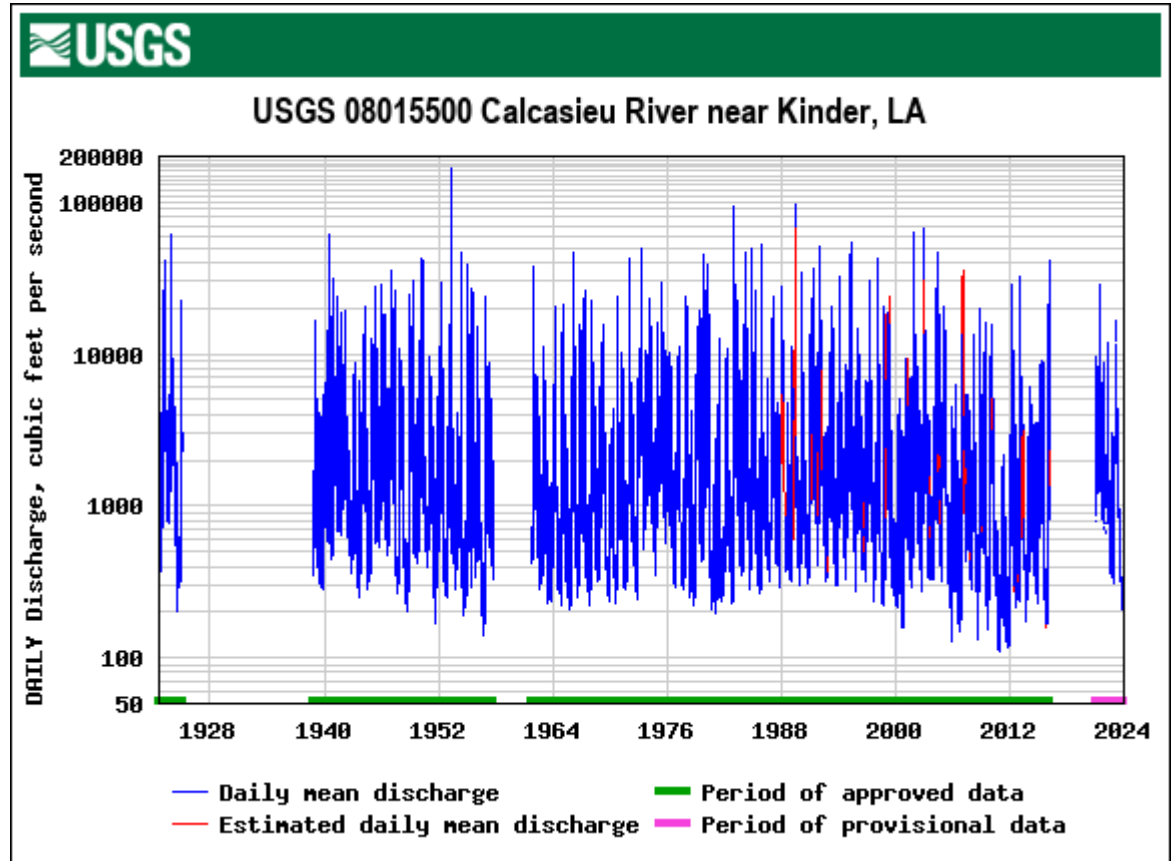
## Streamflow conditions

- Discharge at several streams in southwestern Louisiana are in the <10 percentile class (Sabine and Calcasieu Rivers, Bayou Cocodrie, Bayou Teche).
- Upstream movement of saltwater from the Gulf of Mexico during drought conditions can occur in southwestern Louisiana (Calcasieu, Iberia, Cameron, and Vermilion Parishes).



## Streamflow conditions

- Historical mean daily discharge of the Calcasieu River near Kinder on November 23<sup>rd</sup> is 1,510 ft<sup>3</sup>/sec (years 1922-2016).
- Mean daily discharge for 11/23/23 was 221 ft<sup>3</sup>/sec.

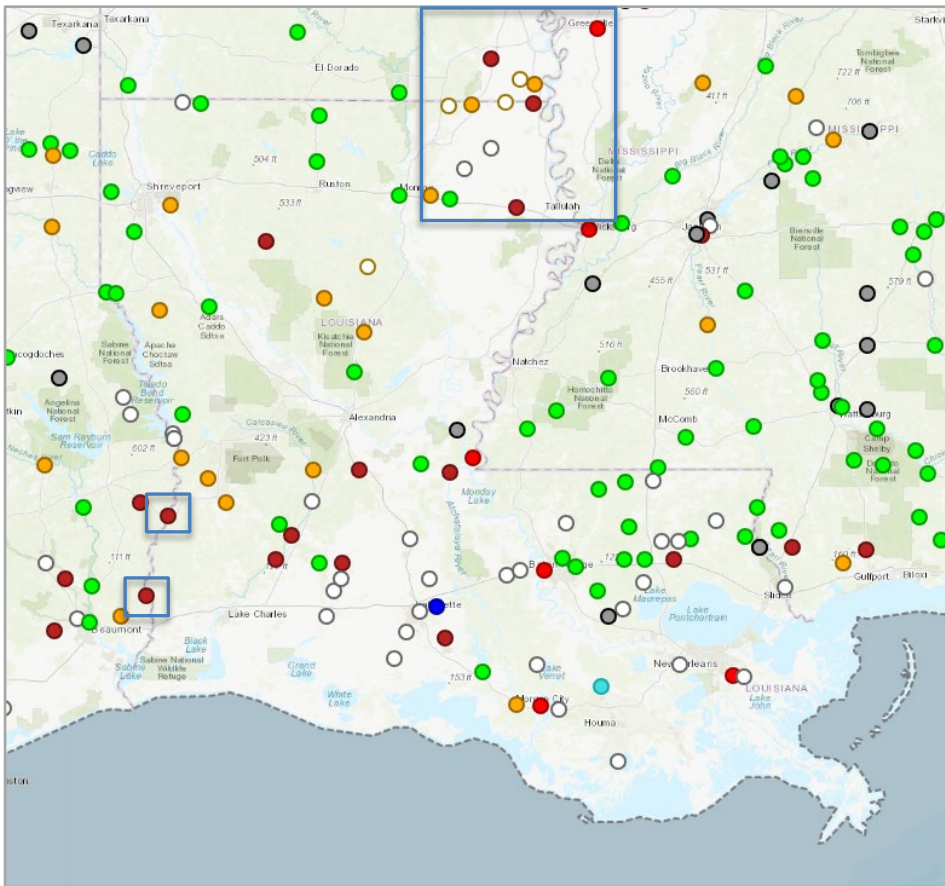


Contains preliminary information – subject to revision and not for citation.

[https://waterdata.usgs.gov/nwis/dv?referred\\_module=sw&site\\_no=0801550](https://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=0801550)

# Streamflow conditions

- Below normal (10-24 percentile) to much below normal (<10 percentile) conditions in the Tensas River Basin.

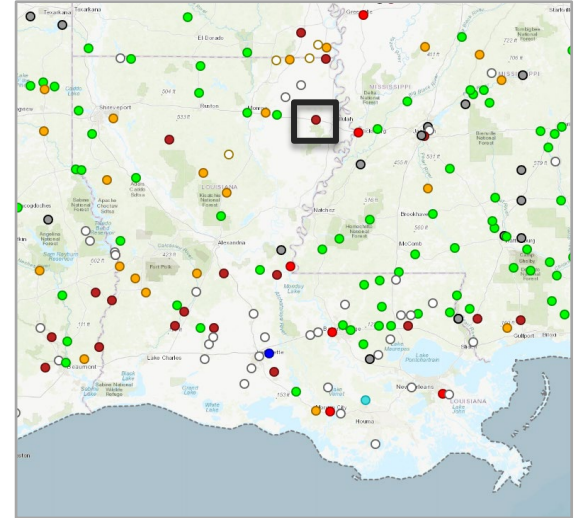
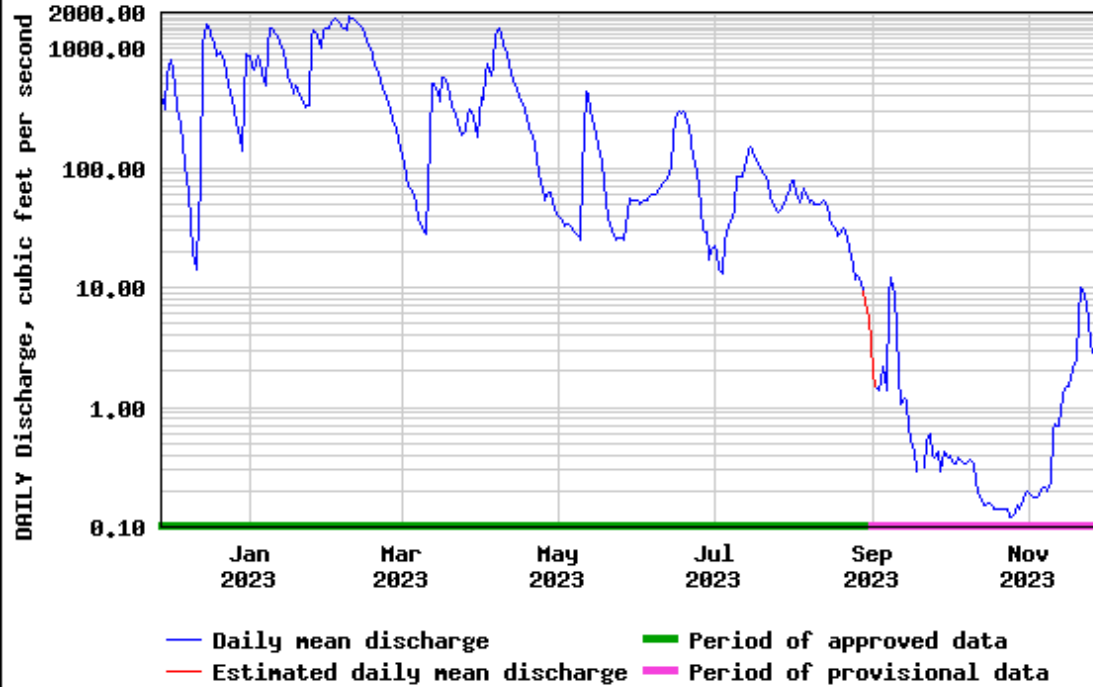


Explanation - Percentile classes							
<span style="color: red;">●</span>	<span style="color: red;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: cyan;">●</span>	<span style="color: blue;">●</span>	<span style="color: black;">●</span>	<span style="color: gray;">○</span>
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

11/24/2023



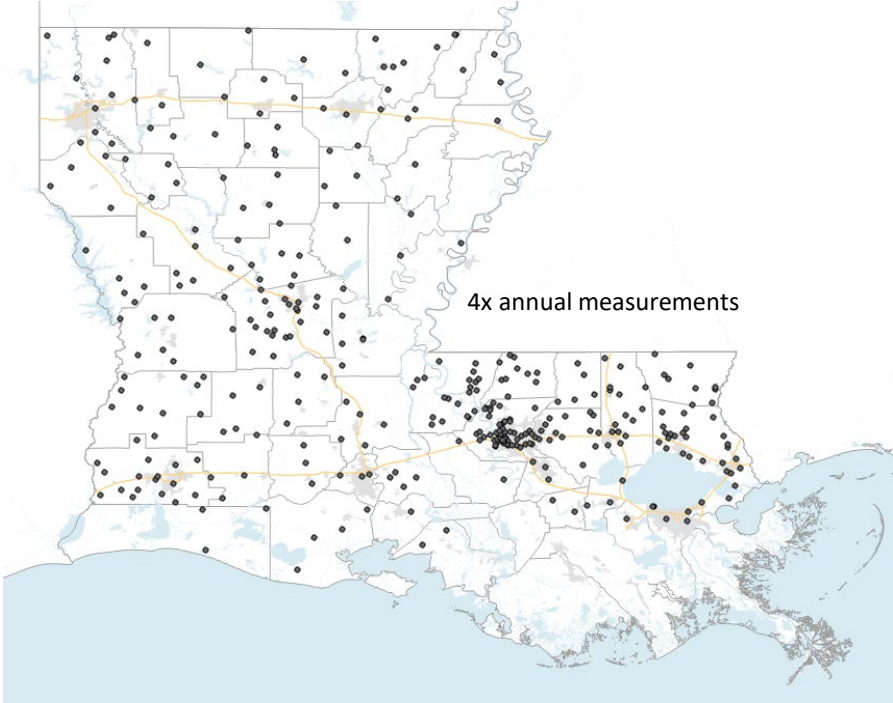
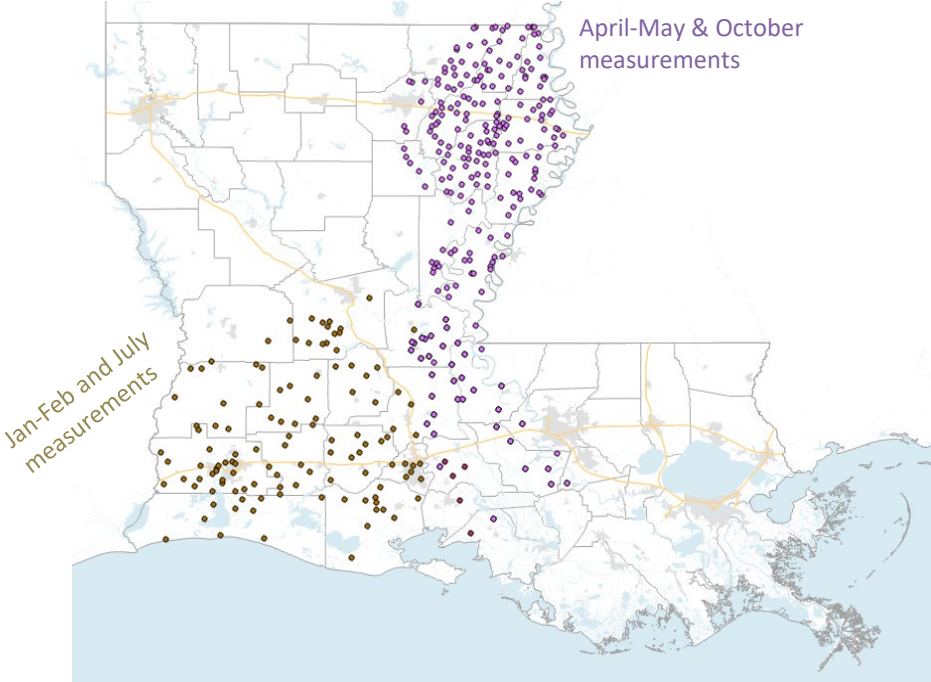
## USGS 07369500 Tensas River at Tendal, LA



[https://waterdata.usgs.gov/nwis/dv?referred\\_module=sw&site\\_no=07369500](https://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=07369500)

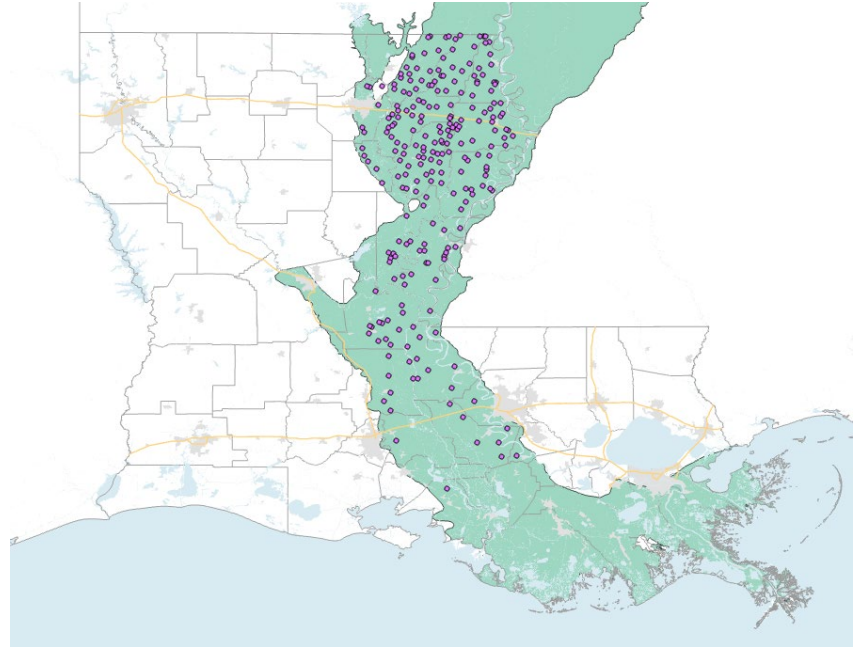


# Groundwater Level Monitoring Networks



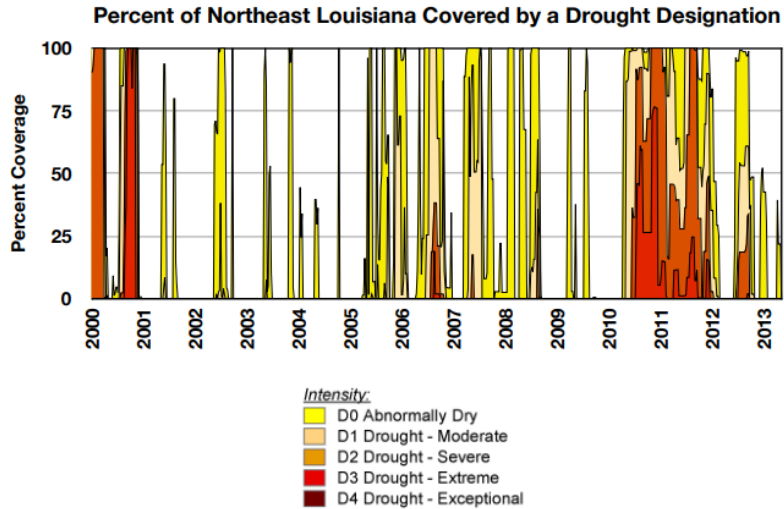
# Mississippi River alluvial aquifer

- Used for irrigation in Louisiana, Mississippi, and Arkansas (corn, soybeans, cotton, rice, aquaculture, etc.).
- Spans multiple climate zones.
- Synoptic water levels measured in October (post-irrigation, and when stream flows are lowest) and in April-May before irrigation ramps up.
- October measurements in Louisiana generally show that water levels have stopped declining from August-September measurements.

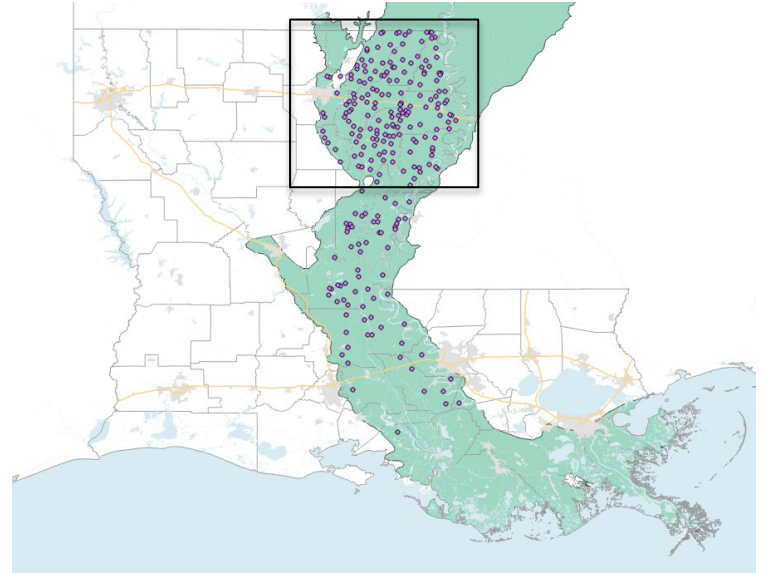


# Mississippi River alluvial aquifer

## *Northeast climate zone*

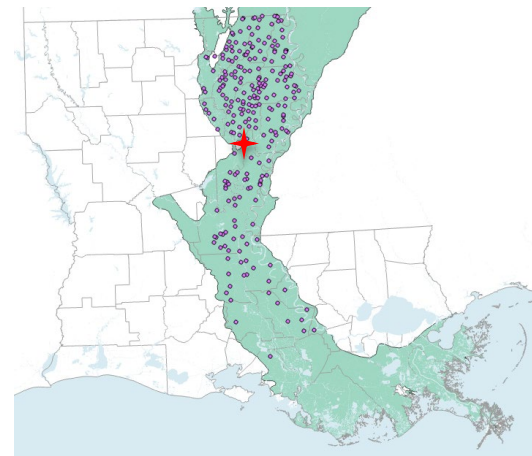
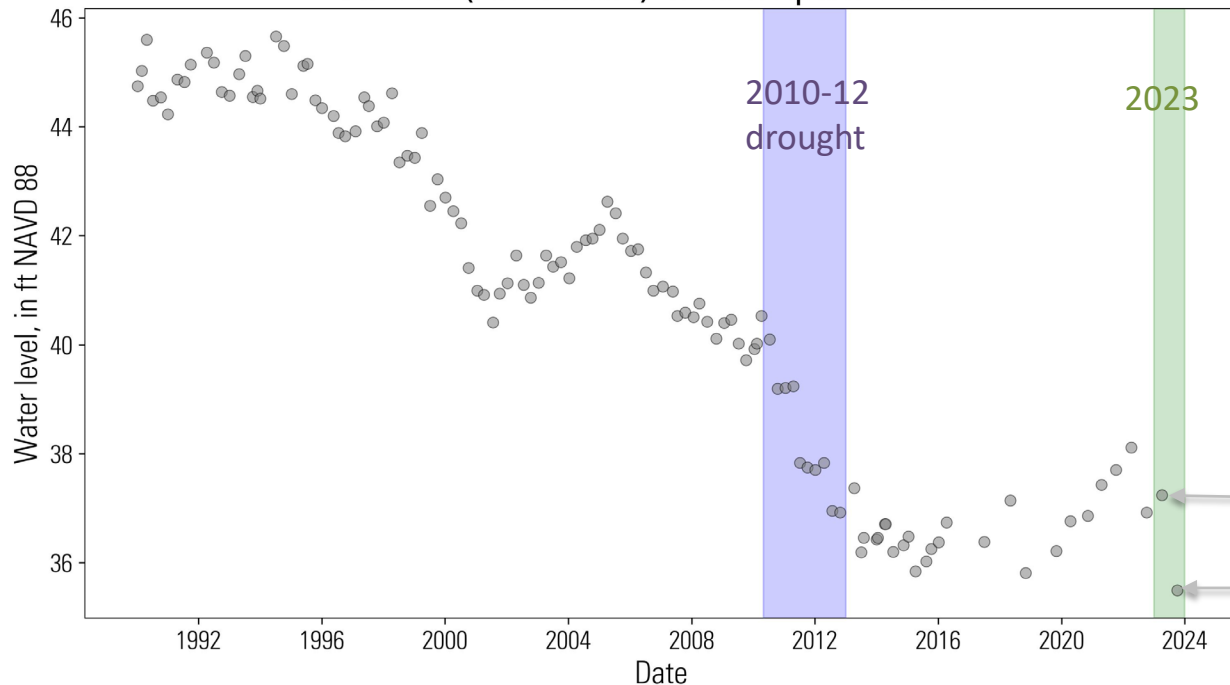


Source: <https://southcentralclimate.org/wp-content/uploads/2021/04/Drought-History-for-Louisianas-9-Regions-UPDATED-.pdf>



# Mississippi River alluvial aquifer (Northeast climate zone)

Ct-347 (112MRVA) Well Depth: 76.0 ft



4/3/23, 43.66.04 ft

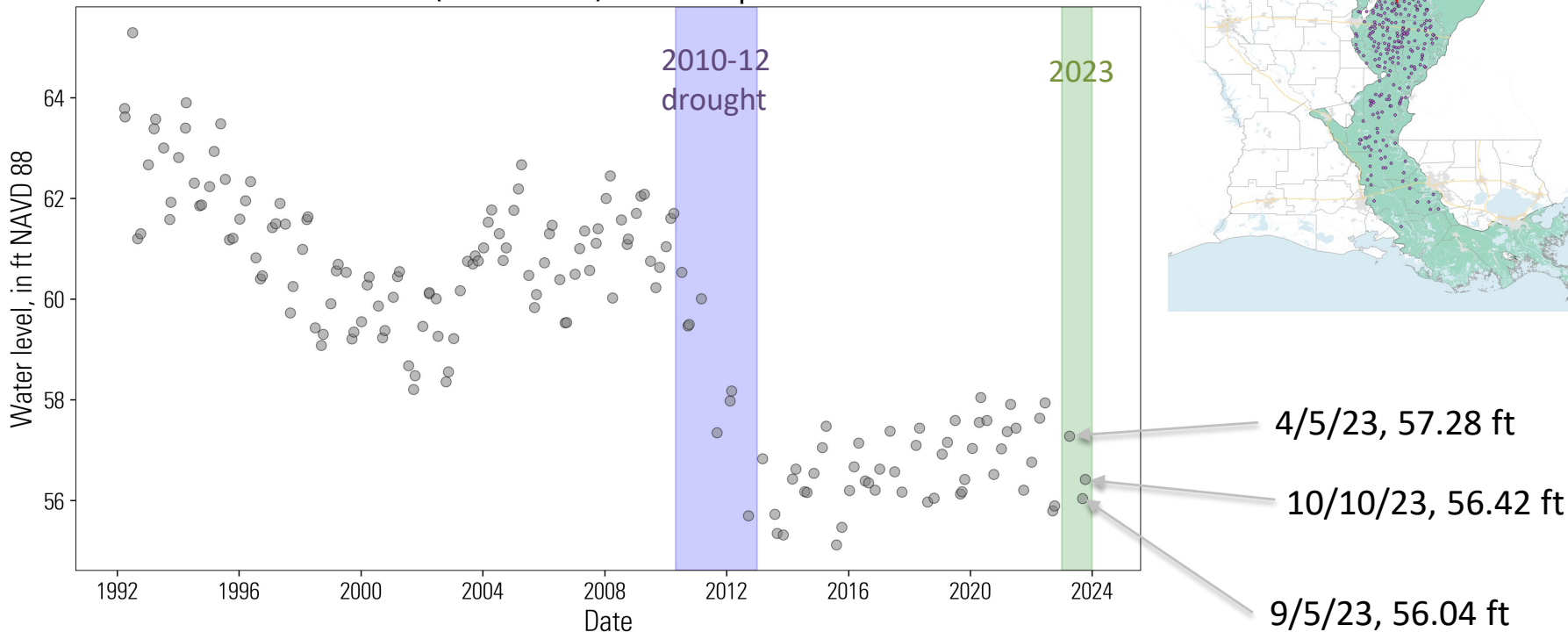
10/4/23, 41.21 ft



Contains preliminary information –  
subject to revision and not for citation.

# Mississippi River alluvial aquifer (Northeast climate zone)

Mo-842 (112MRVA) Well Depth: 90.0 ft

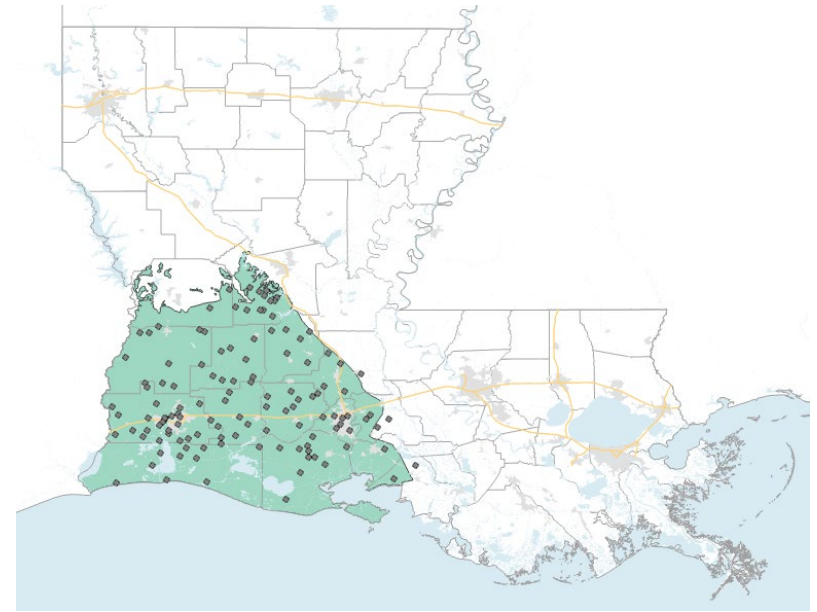


Contains preliminary information –  
subject to revision and not for citation.

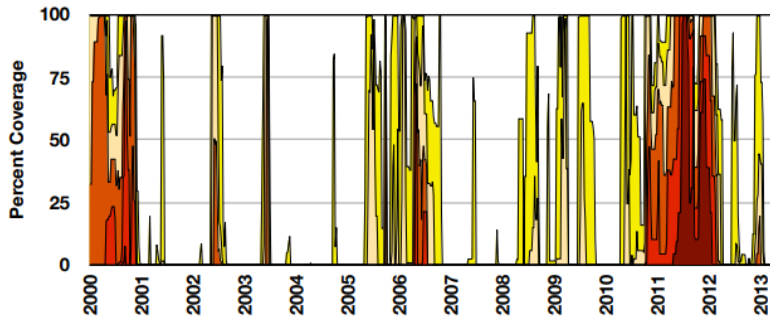
# Chicot aquifer system

## Southwest Climate Zone

- Withdrawals primarily for irrigation (especially rice), aquaculture, public supply, and industrial uses.
- Water levels measured for synoptics in July (after rice irrigation peak), and in Jan-Feb.
- Last water-level data collection was in July 2023 (no new data to report on).









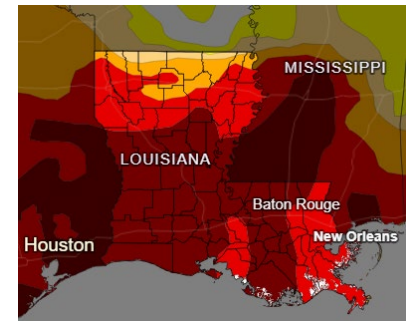
Percent of Southwest Louisiana Covered by a Drought Designation



### Legend

#### Drought & Dryness Categories

	D0 - Abnormally Dry	0.1%
	D1 - Moderate Drought	2.3%
	D2 - Severe Drought	7.8%
	D3 - Extreme Drought	33.7%
	D4 - Exceptional Drought	56.1%
	Total Area in Drought (D1-D4)	99.9%

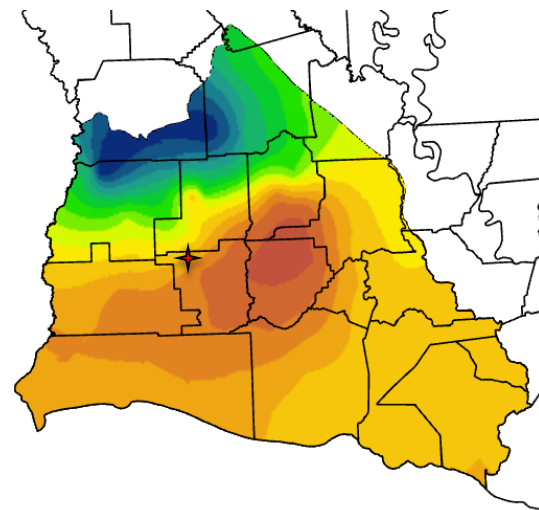
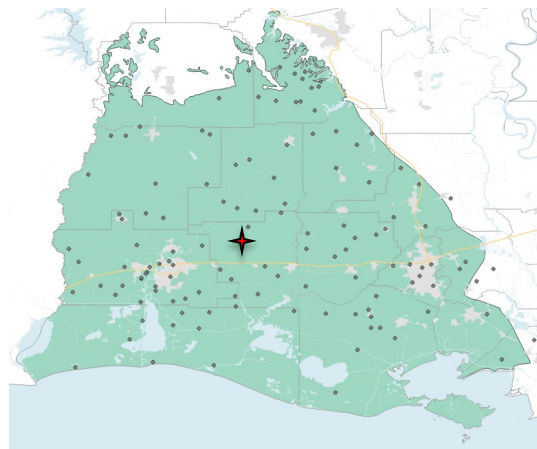
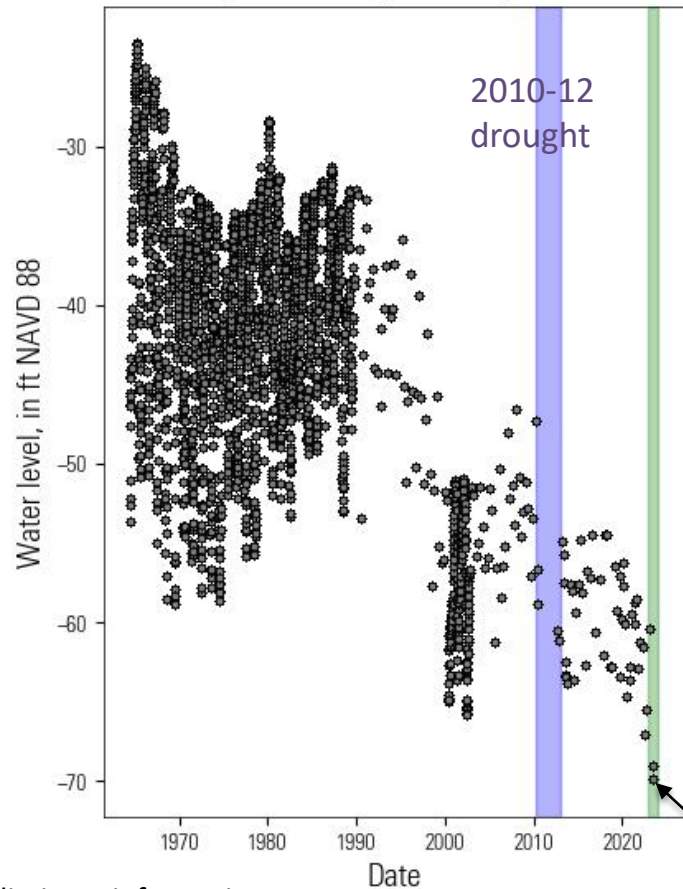


Source: <https://www.drought.gov/states/louisiana>

Data valid: 9/19/2023



Ac-326 (112CHCTU) Well Depth: 202.0 ft

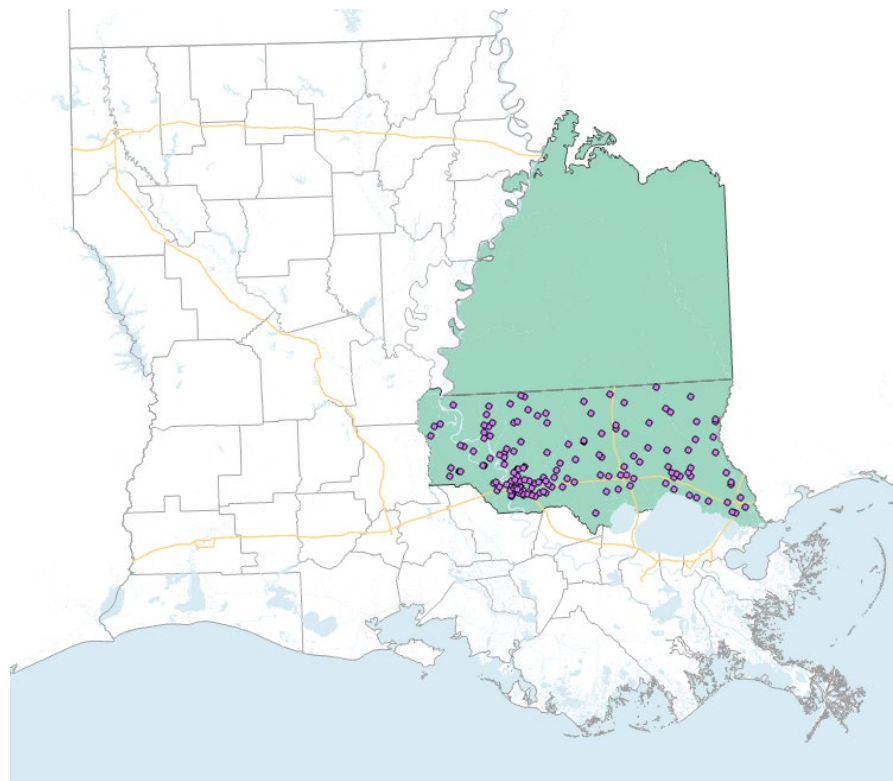
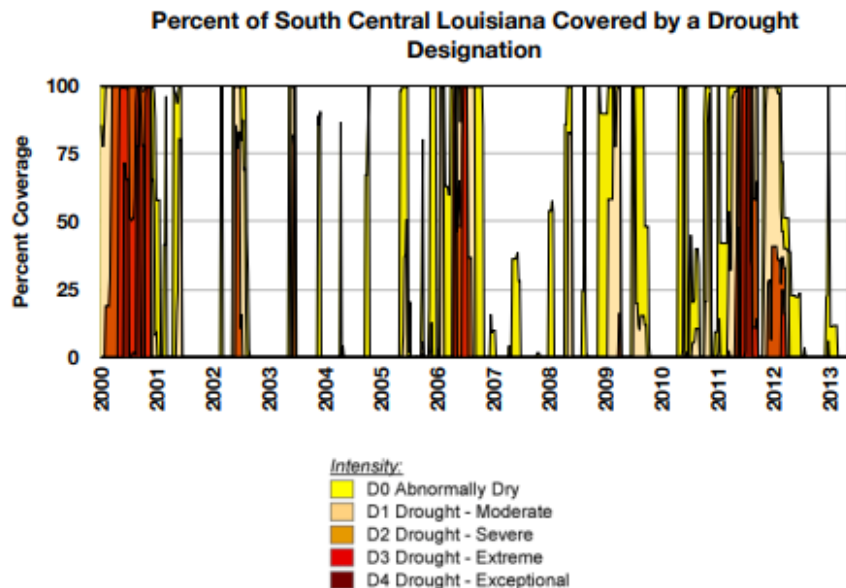


Contains preliminary information –  
subject to revision and not for citation.

7/11/2023

# Southern Hills regional aquifer system

## *South Central climate zone*

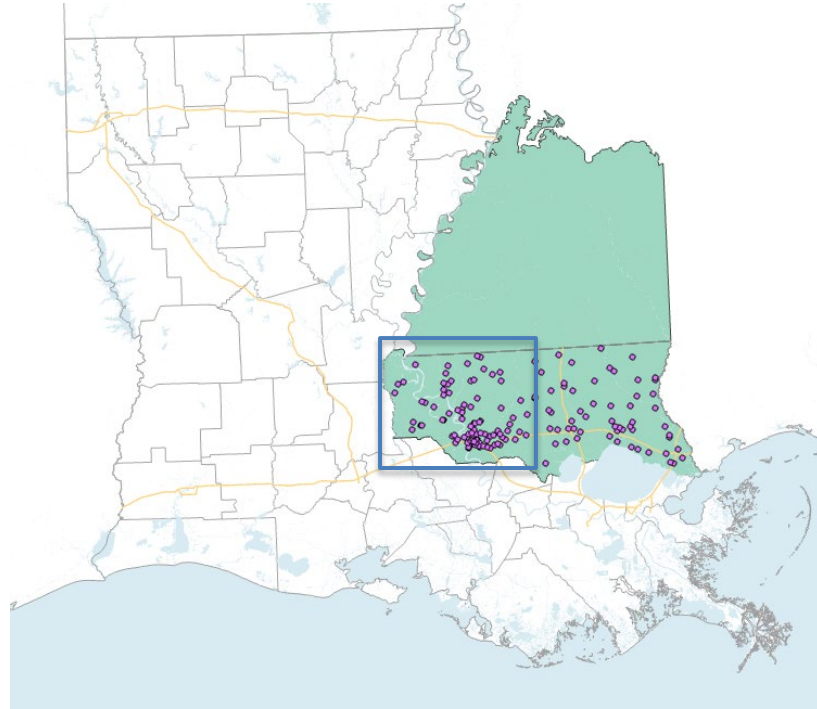


Source: <https://southcentralclimate.org/wp-content/uploads/2021/04/Drought-History-for-Louisianas-9-Regions-UPDATED-.pdf>

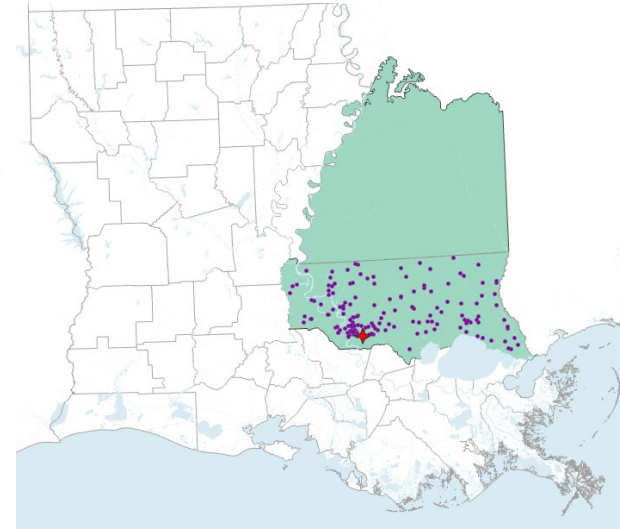
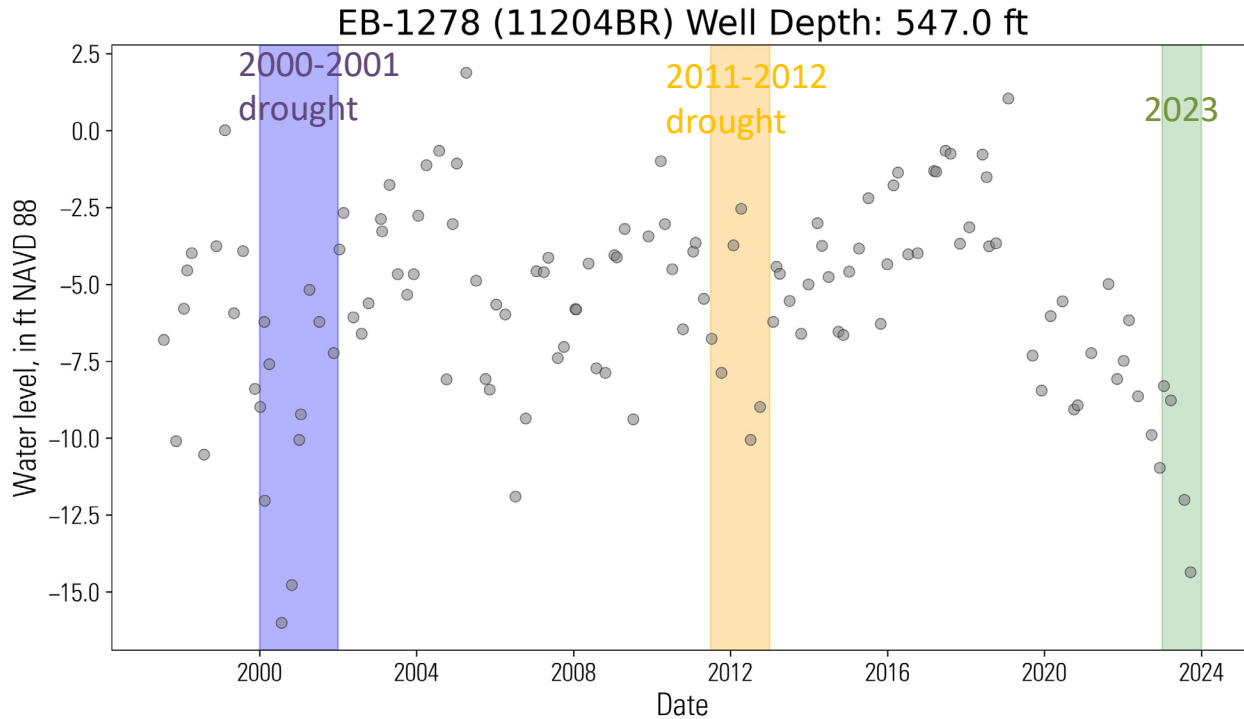
# Southern Hills regional aquifer system

(western part / Baton Rouge area)

- Groundwater withdrawals are primarily for public supply and industry.
- Saltwater intrusion is occurring in East and West Baton Rouge parishes.
- Withdrawals are made from a wide range of depths.
- Previous period of exceptional- to extreme-drought from 2000-01 caused 5-15 ft of water level decline in most aquifers near centers of withdrawal because of increased withdrawals. Water levels recovered soon after the drought ended.



# “400-foot” sand of the Baton Rouge area



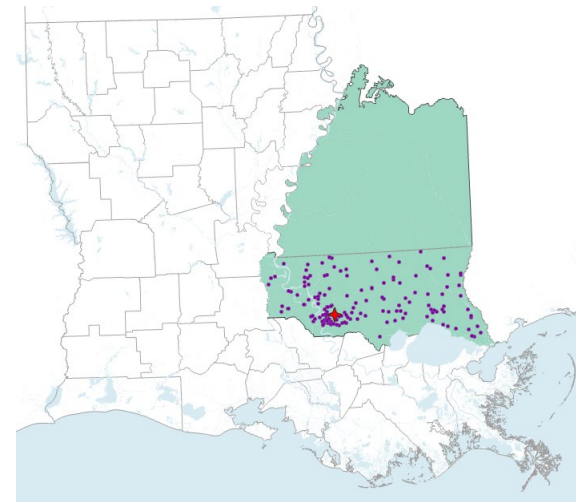
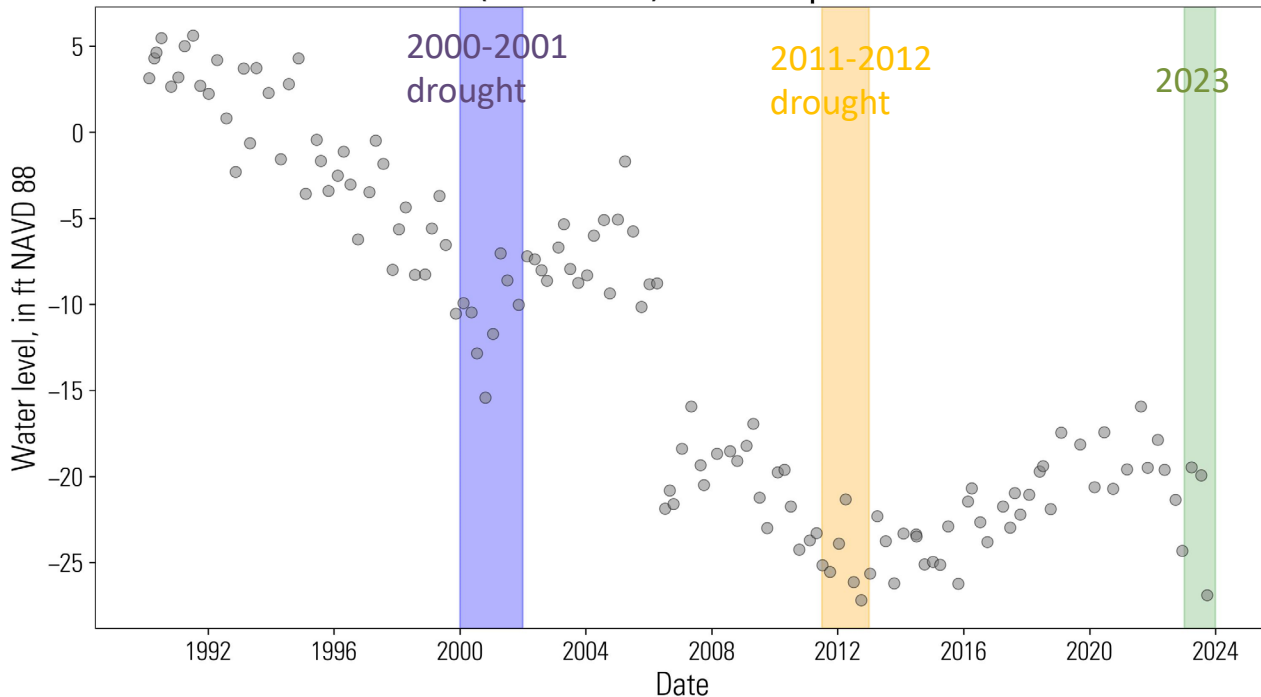
- < 1 mile from a golf course well
- ~1.5 miles from a public supply well



Contains preliminary information –  
subject to revision and not for citation.

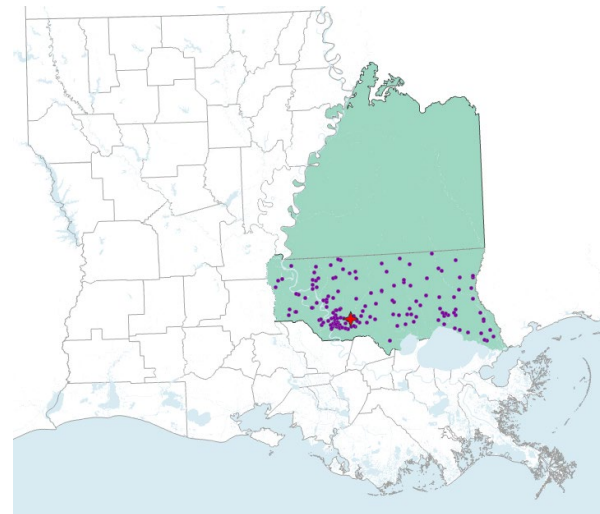
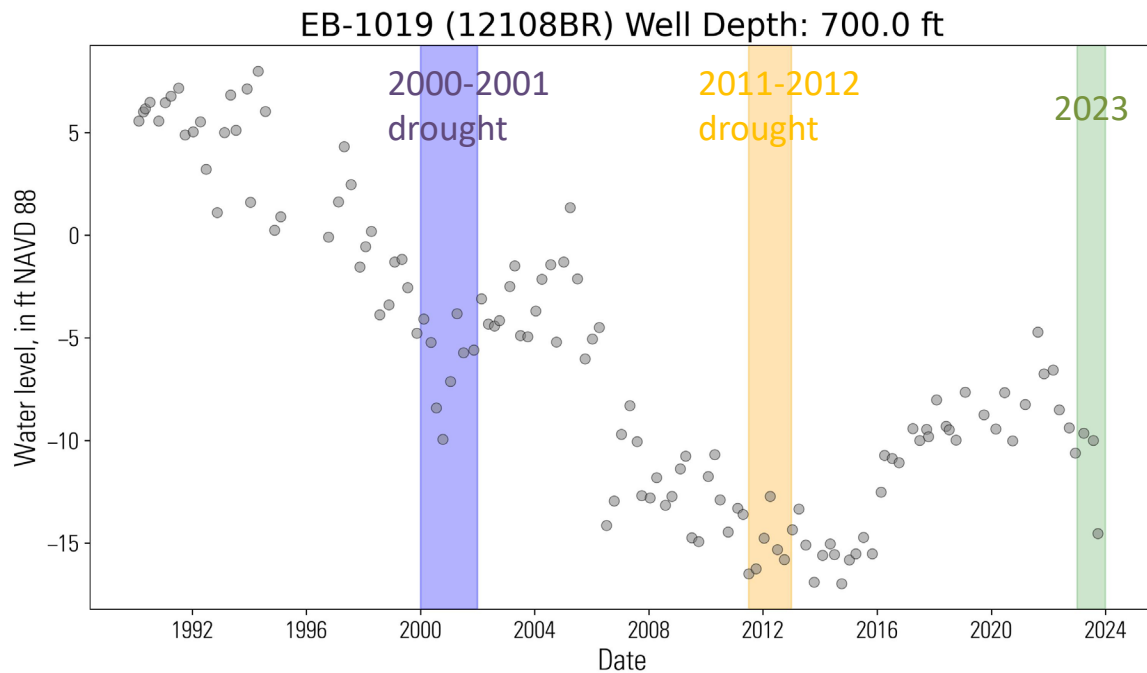
# “600-foot” sand of the Baton Rouge area

EB-933 (11206BR) Well Depth: 603.0 ft



Contains preliminary information –  
subject to revision and not for citation.

# “800-foot” sand of the Baton Rouge area

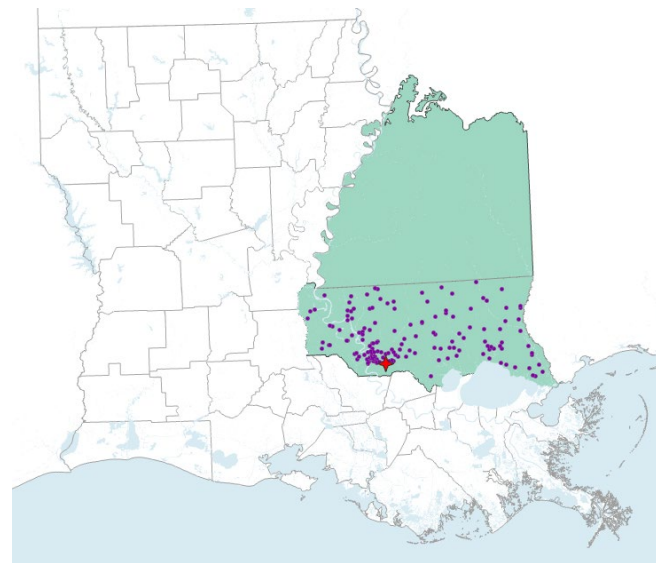
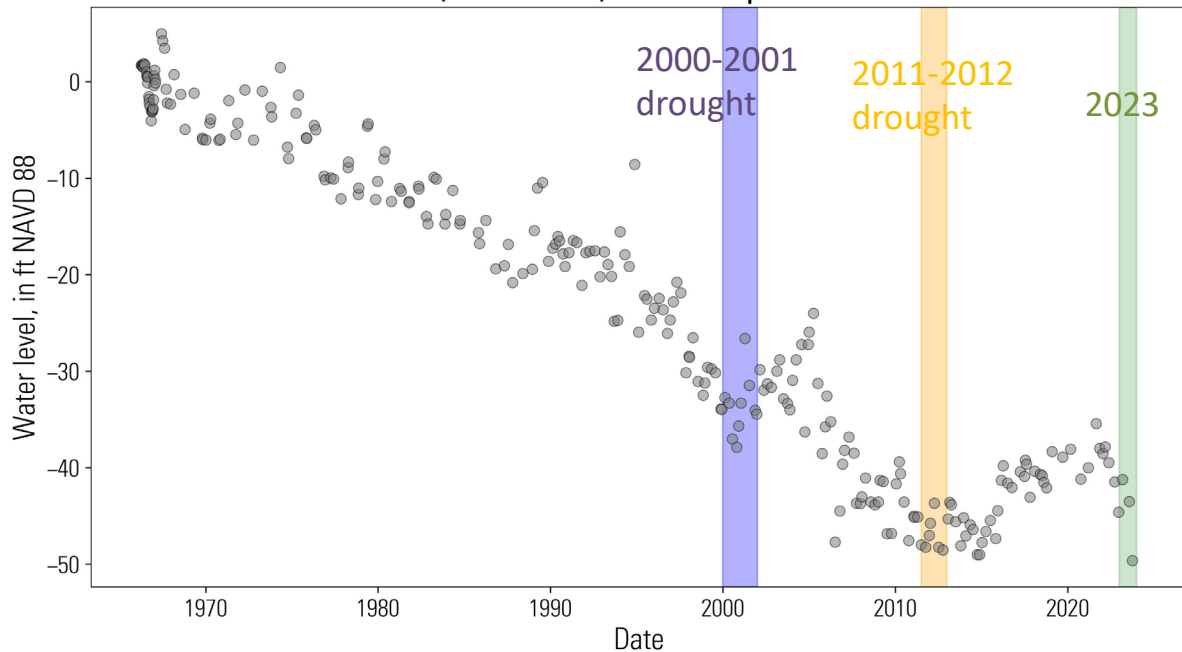


Contains preliminary information –  
subject to revision and not for citation.



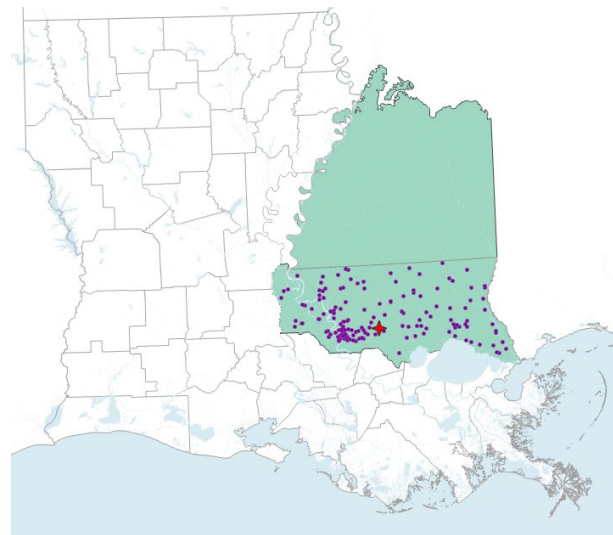
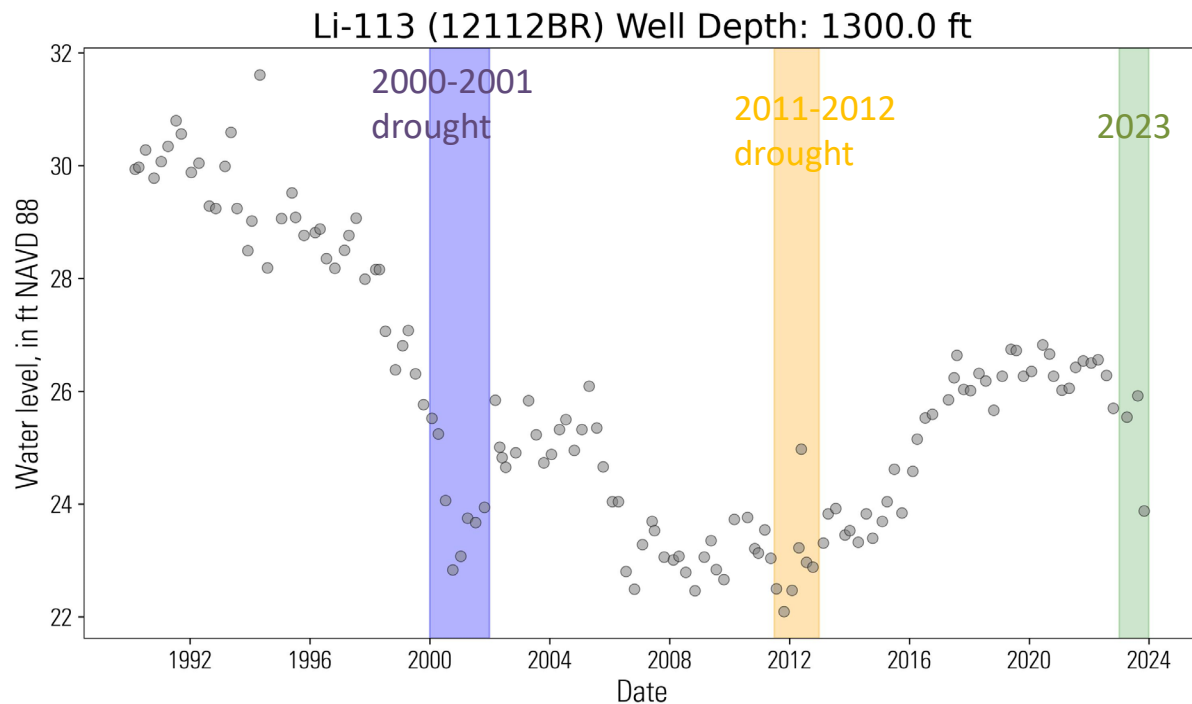
# “1,000-foot” sand of the Baton Rouge area

EB-805 (12110BR) Well Depth: 1072.0 ft



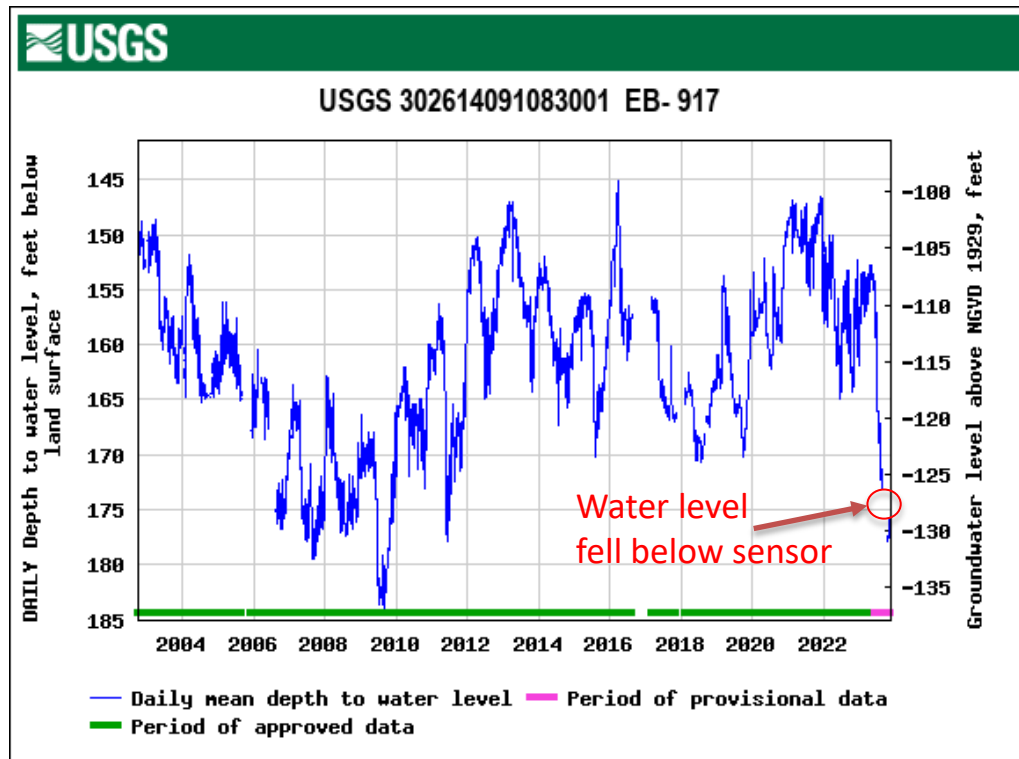
Contains preliminary information –  
subject to revision and not for citation.

# “1,200-foot” sand of the Baton Rouge area

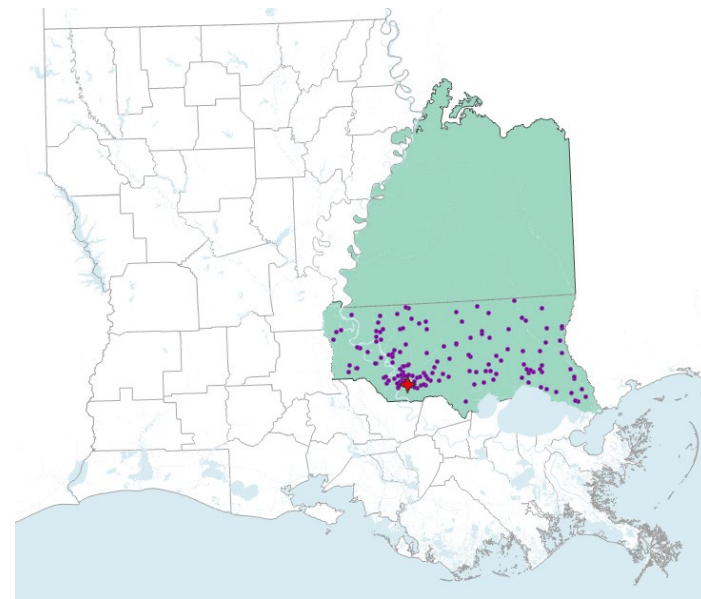


Contains preliminary information –  
subject to revision and not for citation.

# “1,500-foot” sand of the Baton Rouge area



[https://waterdata.usgs.gov/nwis/dv?referred\\_module=sw&site\\_no=0801550](https://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=0801550)



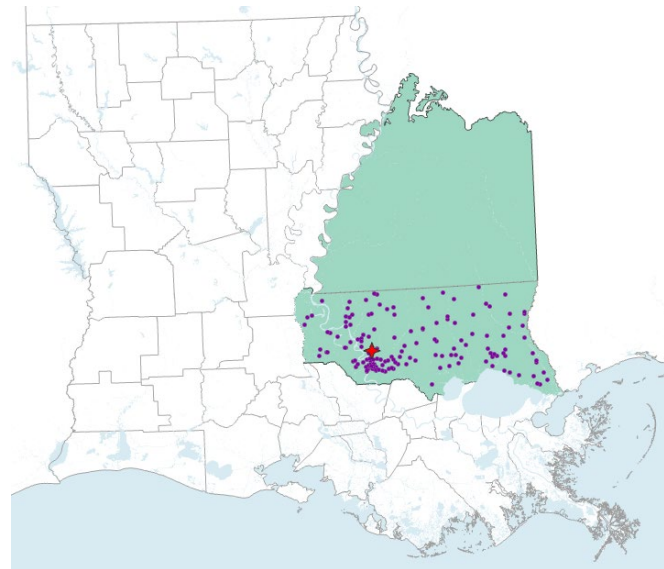
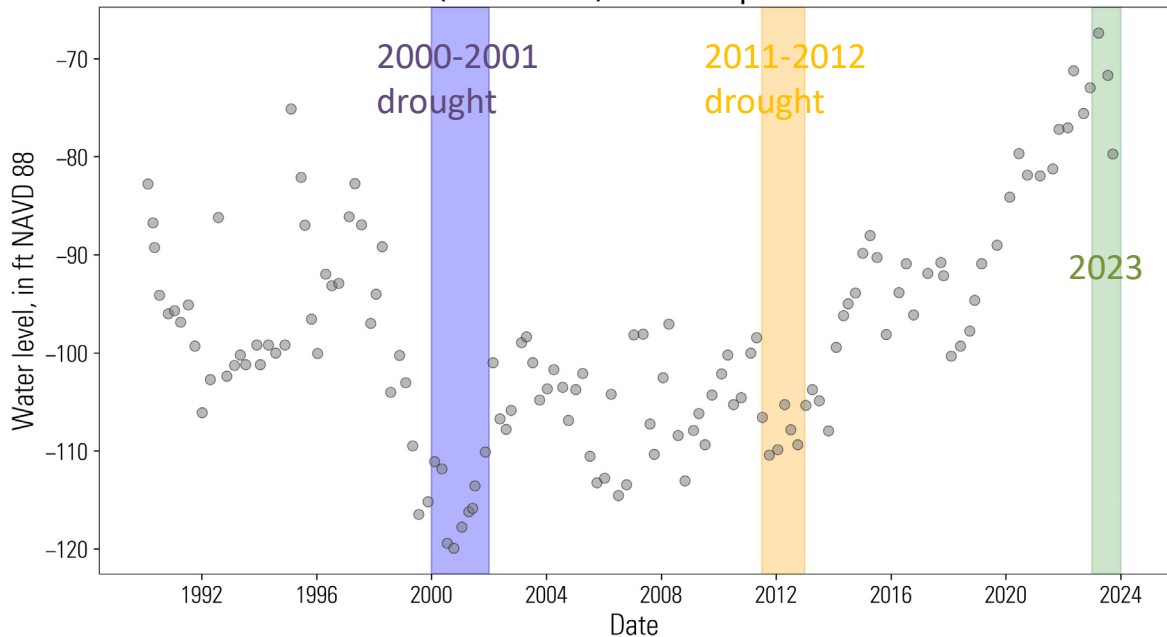
- 0.5 miles from two public supply wells
- Real-time data site.



Contains preliminary information –  
subject to revision and not for citation.

# “1,700-foot” sand of the Baton Rouge area

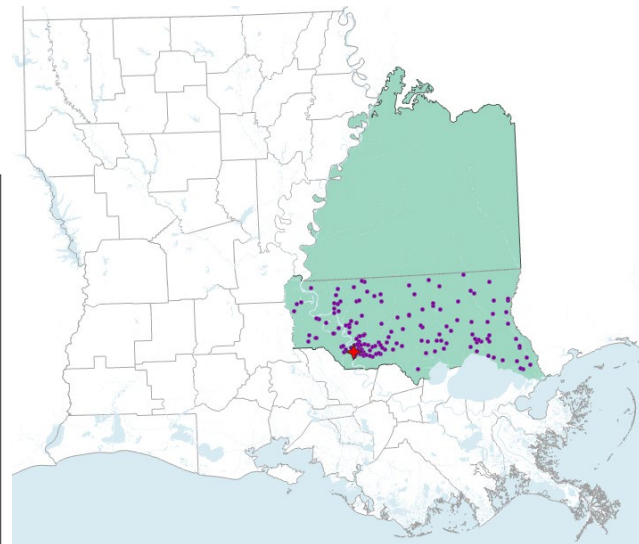
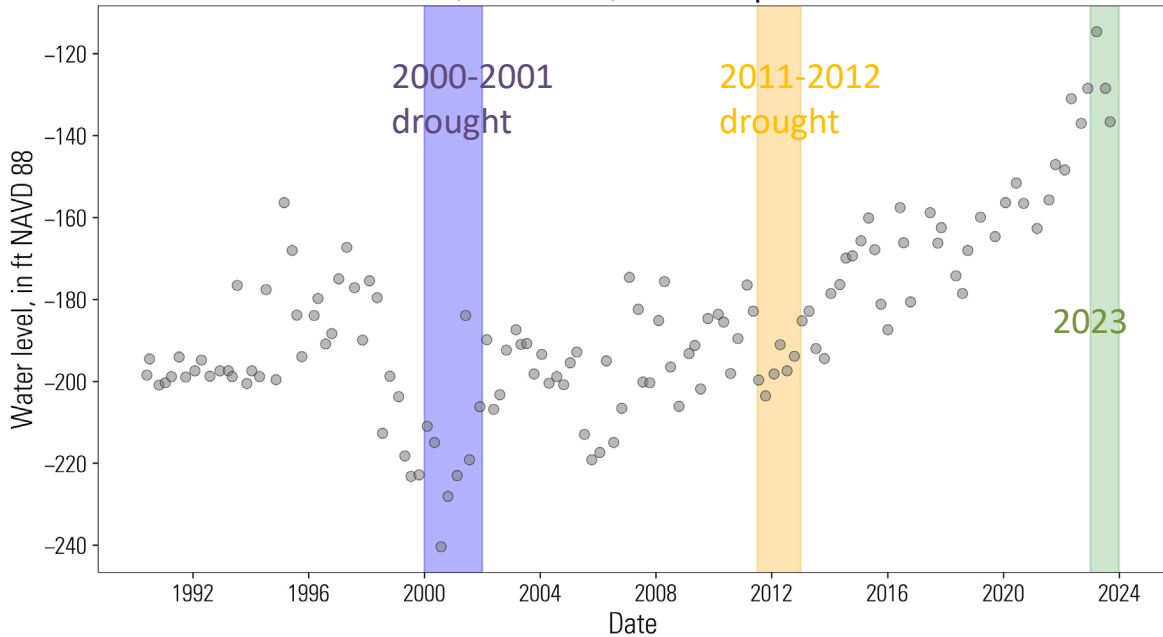
EB-685 (12117BR) Well Depth: 1640.0 ft



Contains preliminary information –  
subject to revision and not for citation.

# “2,000-foot” sand of the Baton Rouge area

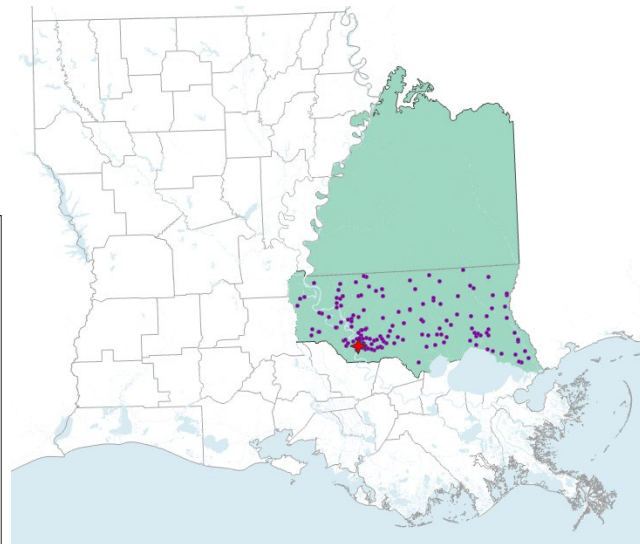
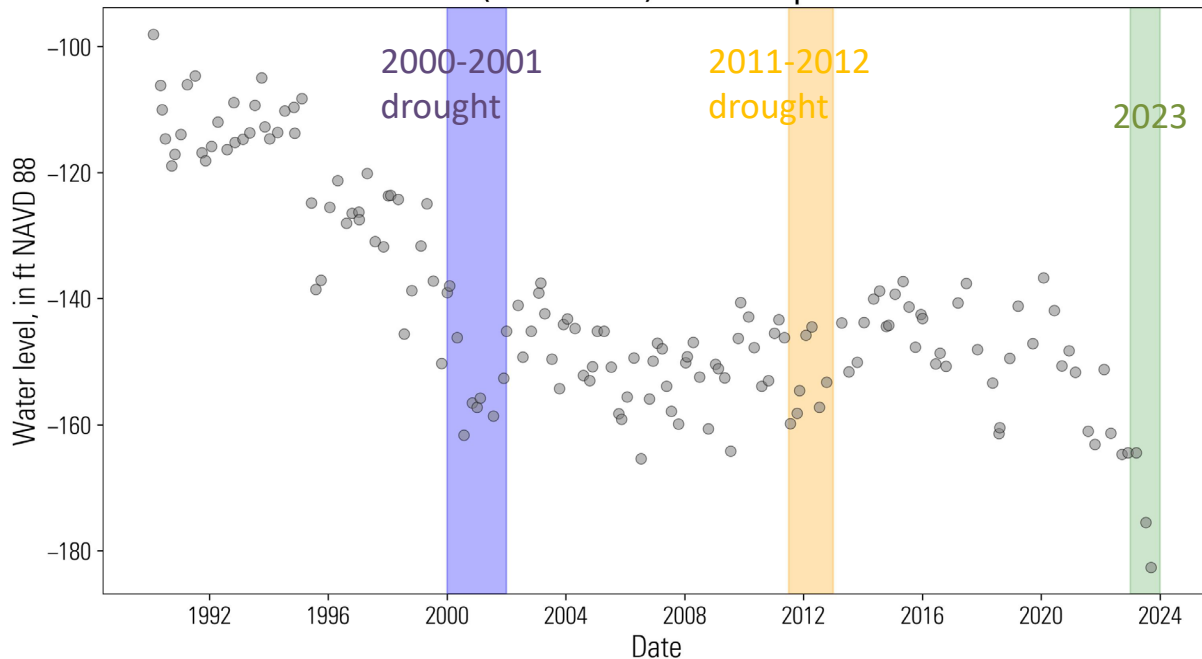
WBR-106 (12220BR) Well Depth: 2017.0 ft



Contains preliminary information –  
subject to revision and not for citation.

# “2,400-foot” sand of the Baton Rouge area

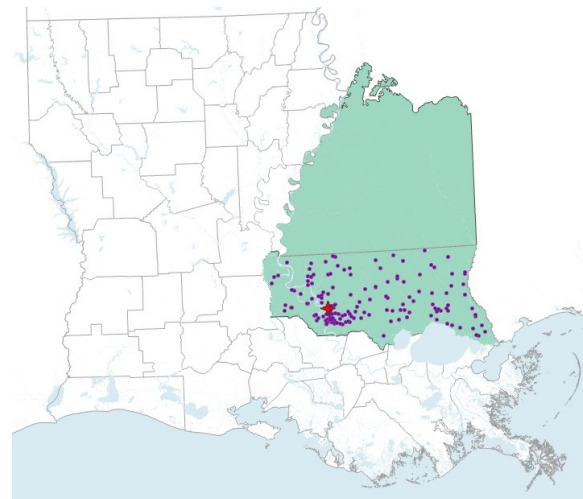
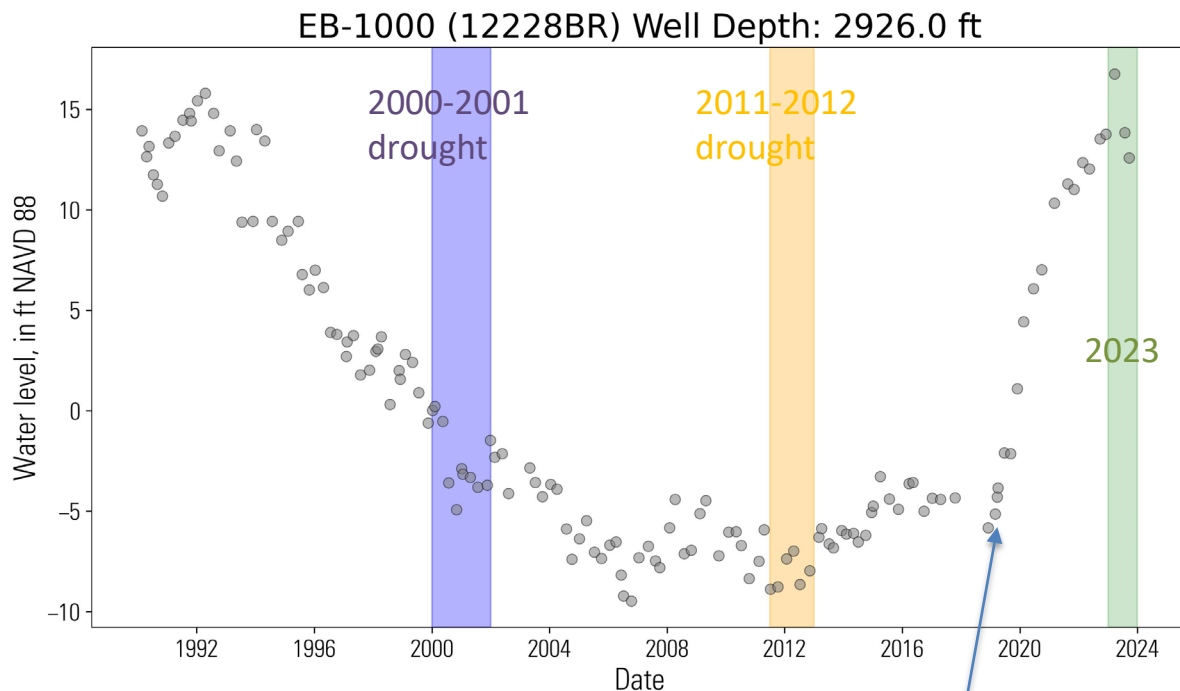
WBR-100B (12224BR) Well Depth: 2448.0 ft



Contains preliminary information –  
subject to revision and not for citation.



# “2,800-foot” sand of the Baton Rouge area



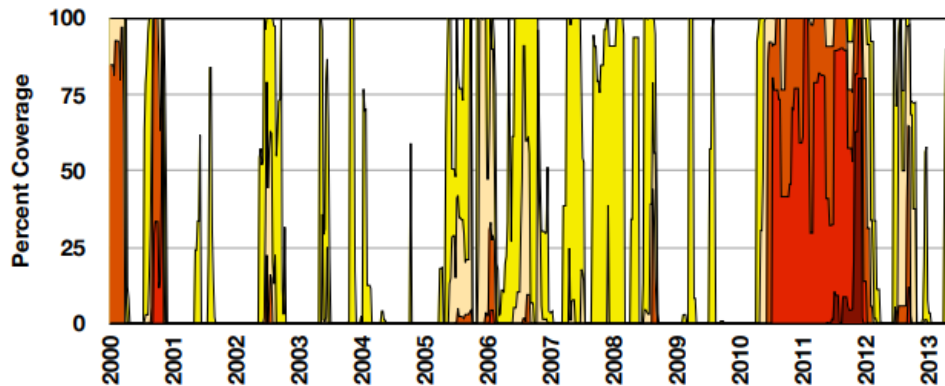
Contains preliminary information –  
subject to revision and not for citation.

Recovery from reduced  
withdrawals at paper mill  
beginning in 2019, ~8.6 miles  
to the north

# Sparta aquifer

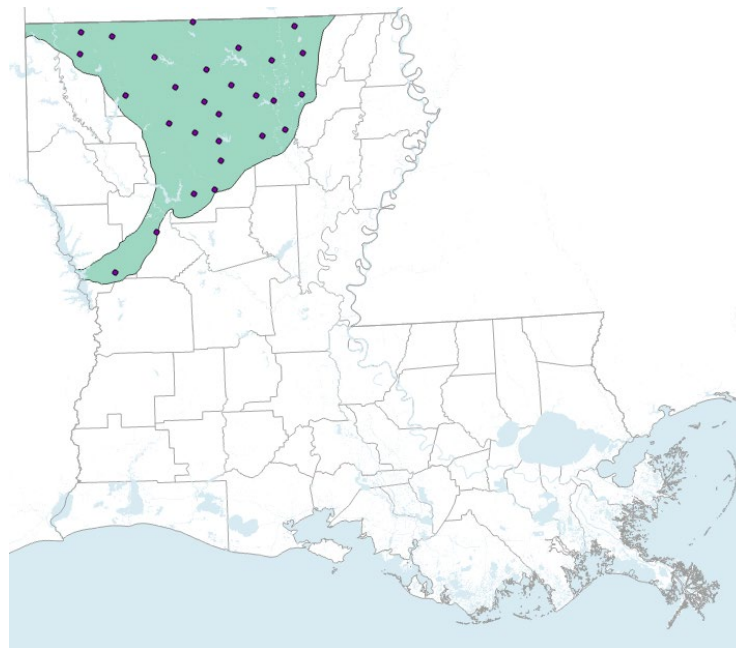
*Northwest / North Central climate zones*

Percent of North Central Louisiana Covered by a Drought Designation



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

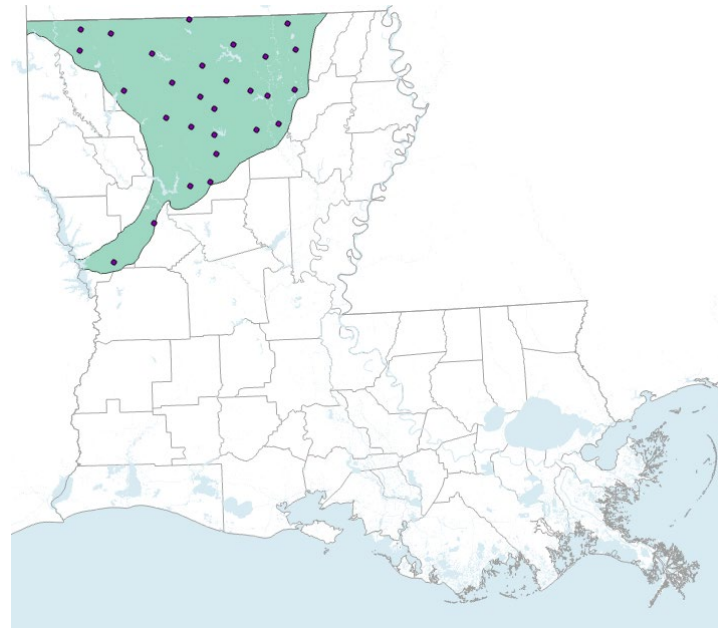


Source: <https://southcentralclimate.org/wp-content/uploads/2021/04/Drought-History-for-Louisianas-9-Regions-UPDATED-.pdf>

# Sparta aquifer

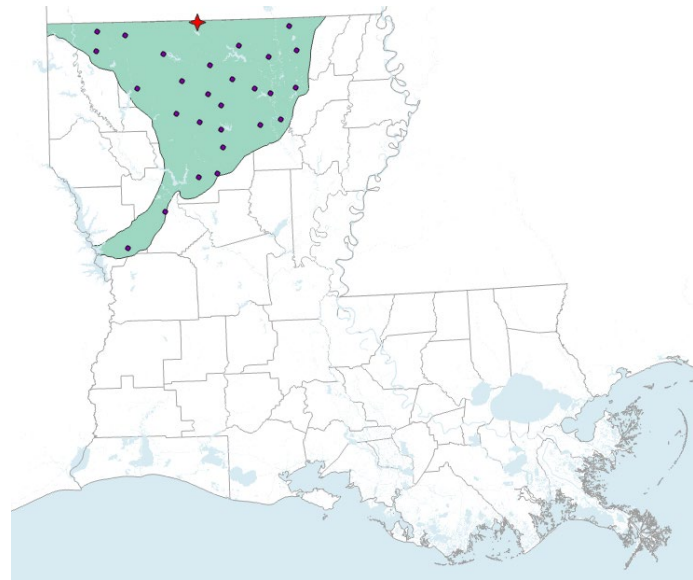
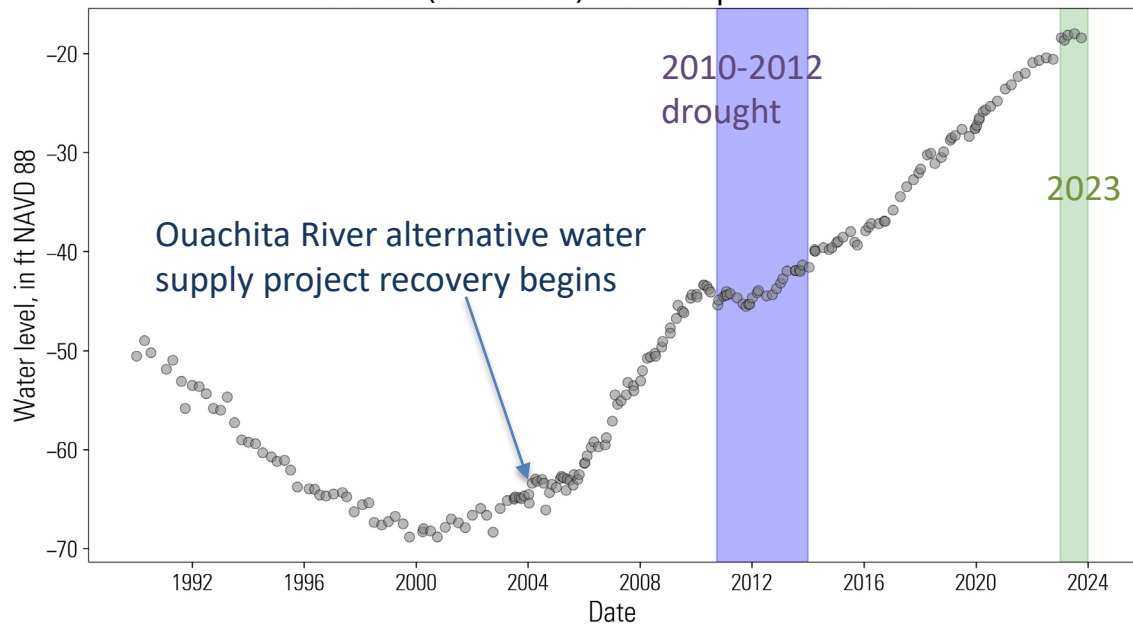
## *Northwest / North Central climate zones*

- Withdrawals primarily for public supply and industry.
- Last significant period of drought for this area (late 2010-2012) coincided with a period of water level recovery beginning in 2004-05 after construction of the Ouachita River Alternative Supply Project in Union County, Arkansas. Impact of 2010-12 drought may be overprinted.
- Water level declines during the last year have been generally less than 5 ft.



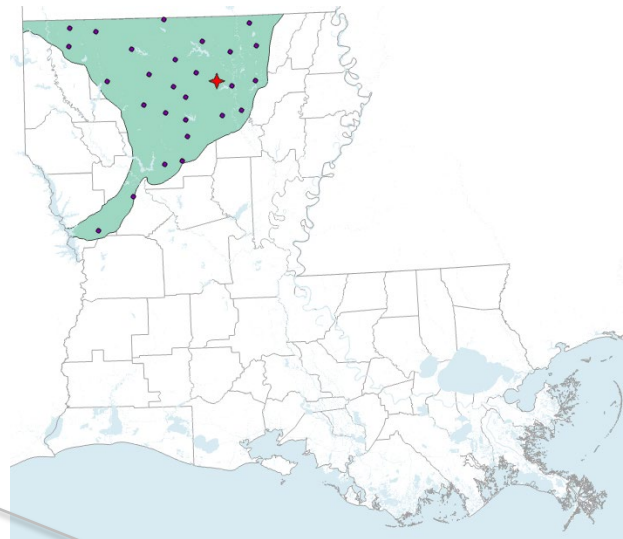
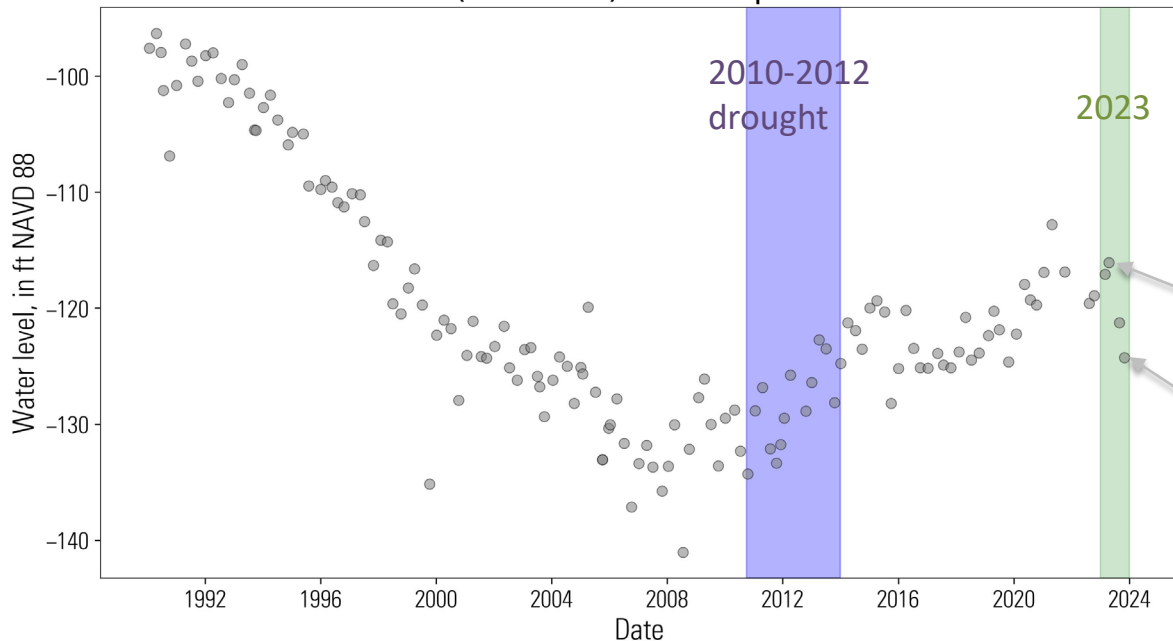
# Sparta aquifer

CI-149 (124SPRT) Well Depth: 736.0 ft



# Sparta aquifer

Ou-444 (124SPRT) Well Depth: 670.0 ft

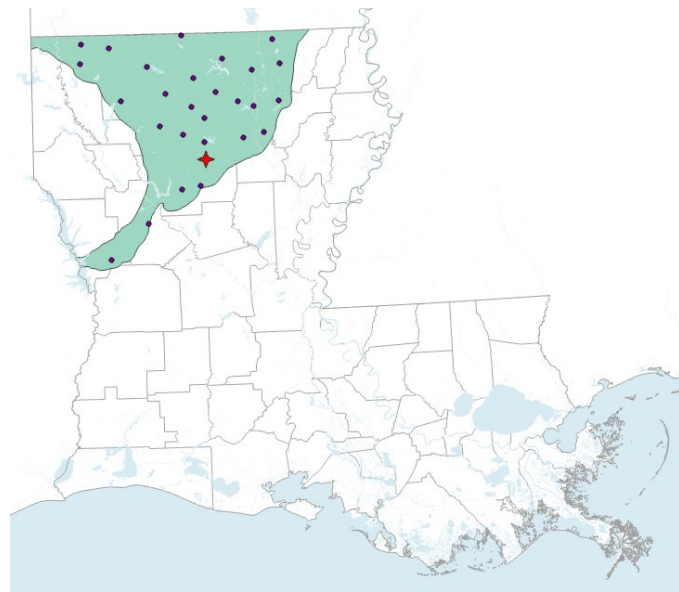
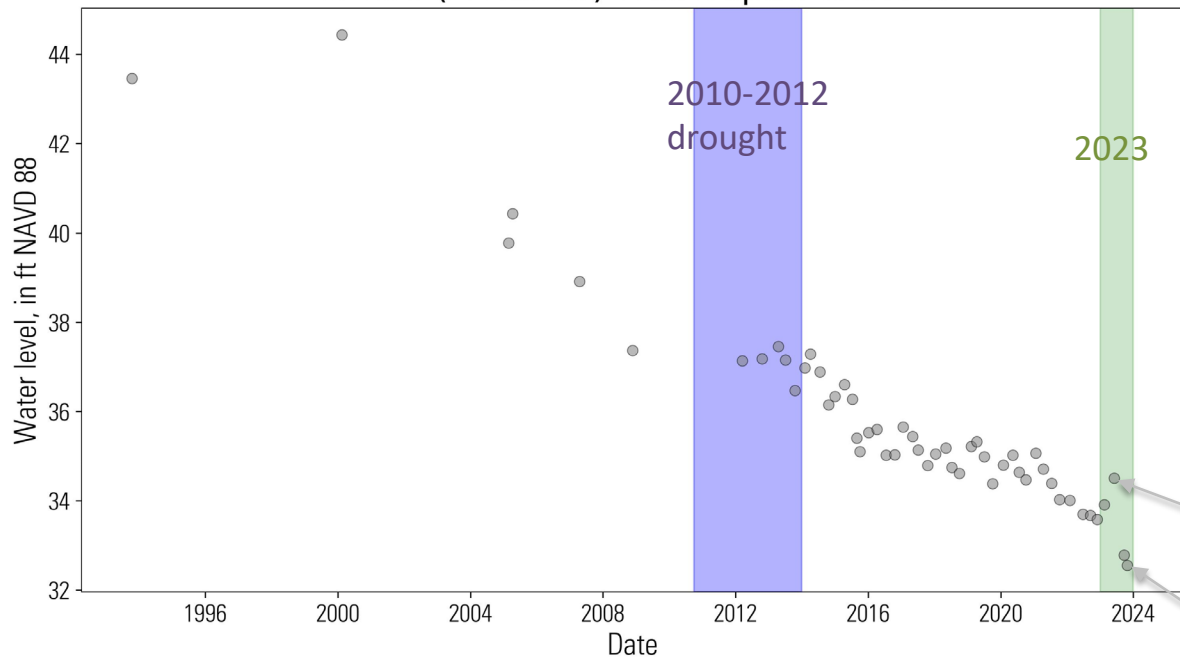


4/18/23, -116.06 ft

11/1/23, -124.25 ft

# Sparta aquifer

W-156 (124SPRT) Well Depth: 829.0 ft



6/5/23, 34.51 ft

10/25/23, 32.55 ft

## Contact:

Max Lindaman

[mlindaman@usgs.gov](mailto:mlindaman@usgs.gov)

**USGS Lower Mississippi Gulf Science & Data:**

<https://www.usgs.gov/centers/lower-mississippi-gulf-water-science-center>