



# City of Fredericksburg Water Supply Update

April 15, 2025

# Today's Presentation

## City of Fredericksburg and HCUWCD

1. Historical Local Rainfall
2. Current Water Well Levels, Trends and History
3. Residential Water Use vs. Residential Connections
4. Water Conservation Program – Goals
5. Water Rates and Watering Restrictions
6. Water Distribution System Integrity
7. Gillespie County Population Projections and Water Demand
8. Local, State and Nation-Wide Short and Long-Term Weather Forecast

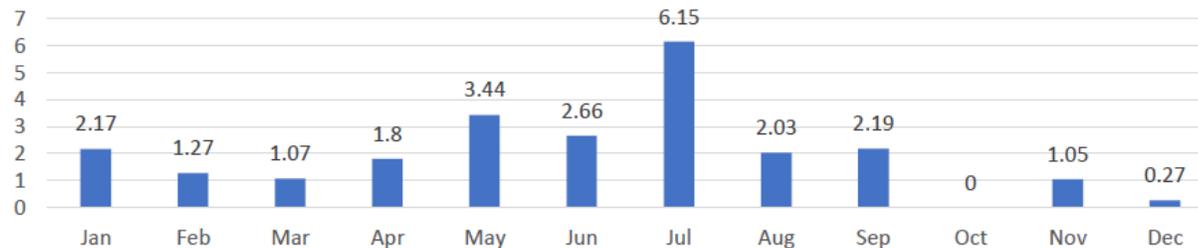
# City of Fredericksburg 2024 Rainfall

- Rainfall total 2023: 24.10 inches measured at LBJ Park
- Annual average rainfall for Fredericksburg is about 28 inches

Engineering Department			Year: 2024		
Rainfall Report - Lady Bird Johnson Park Data					
Month	Month's Rainfall	Running Total	Month	Month's Rainfall	Running Total
January	2.17	2.17	July	6.15	18.56
February	1.27	3.44	August	2.03	20.59
March	1.07	4.51	September	2.19	22.78
April	1.80	6.31	October		
May	3.44	9.75	November	1.05	23.83
June	2.66	12.41	December	0.27	24.10
<b>YTD Rainfall:</b>	<b>24.10</b>	<b>Annual Average:</b>	<b>27.83</b>	<b>Over/Under:</b>	<b>-3.73</b>

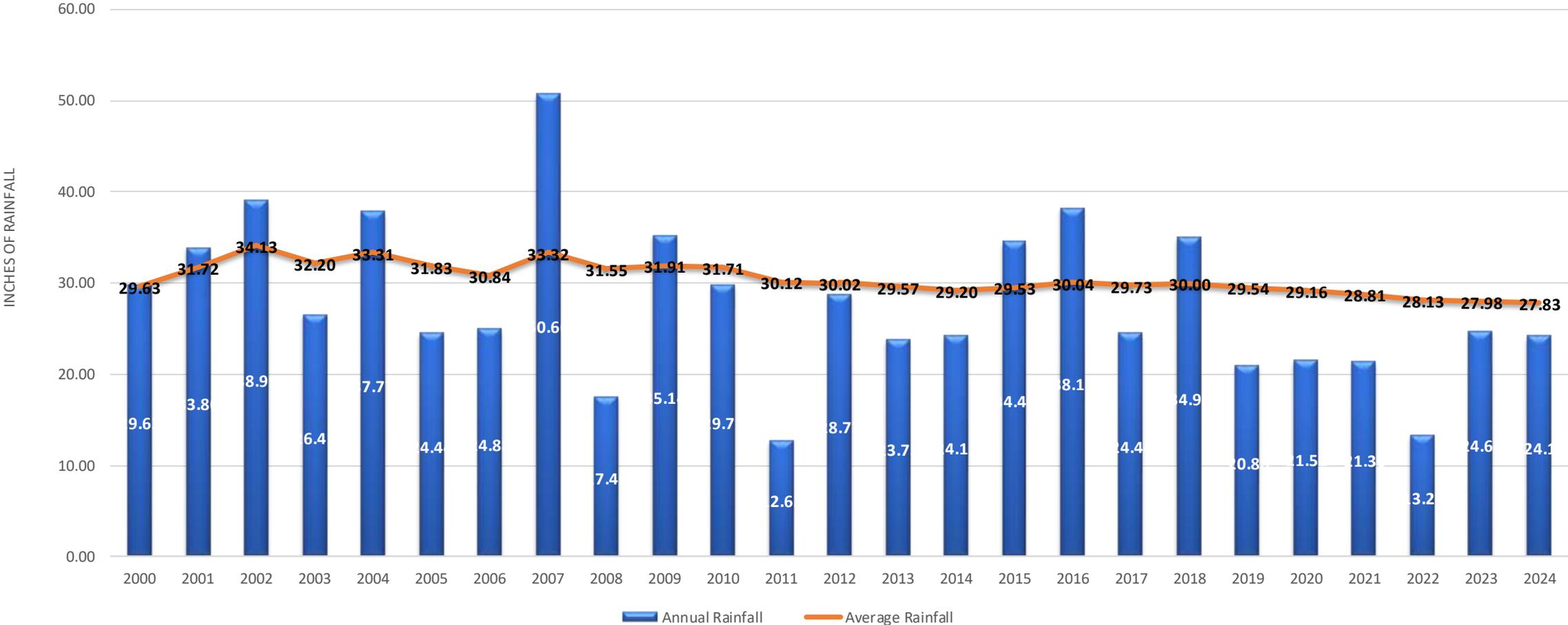
Sum of Rain/melted snow

2024 Monthly Rainfall

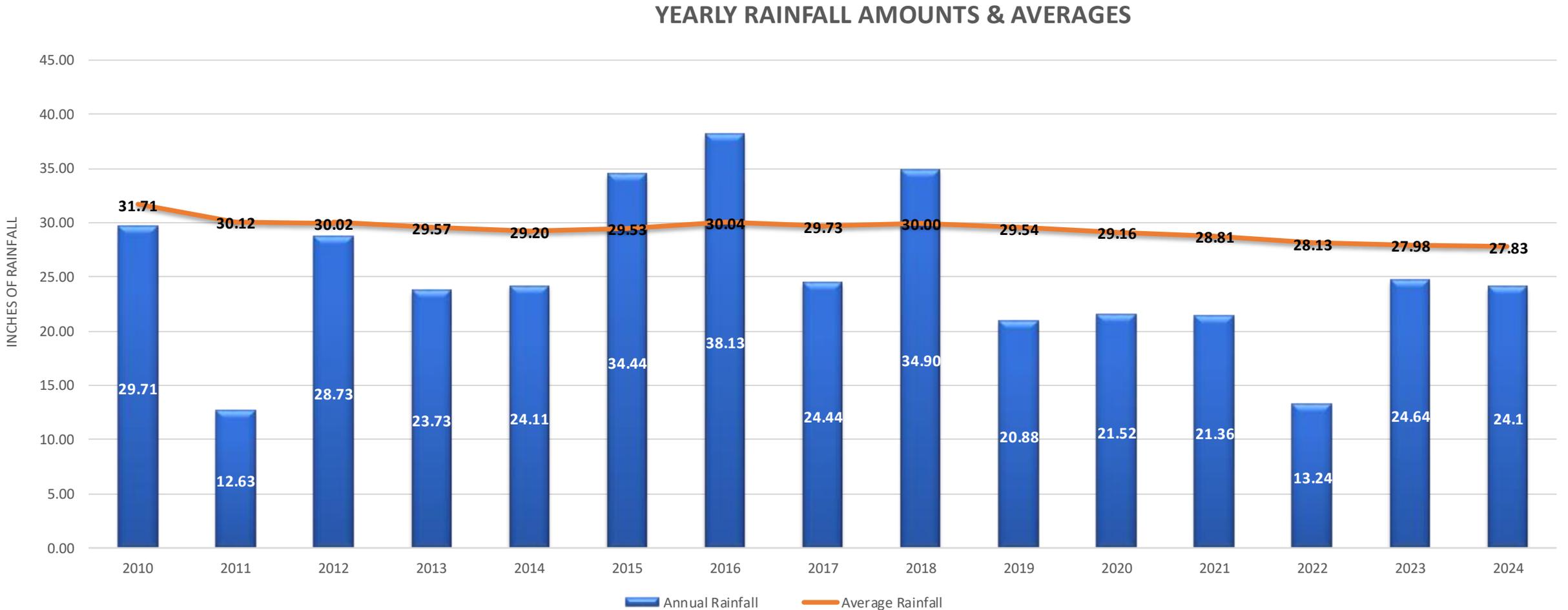


# Historical Rainfall: 2000-2024

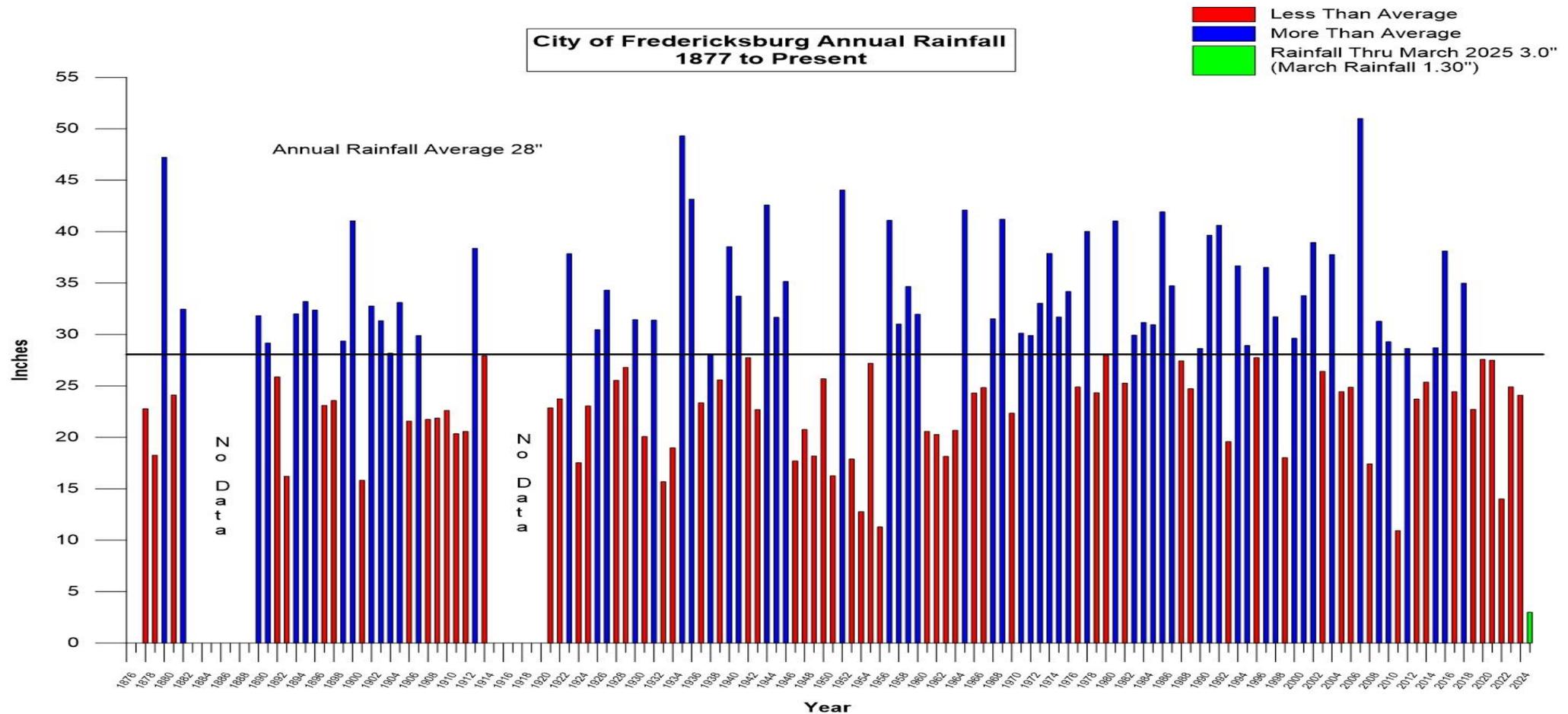
### YEARLY RAINFALL AMOUNTS & AVERAGES



# Historical Rainfall: 2010-2024

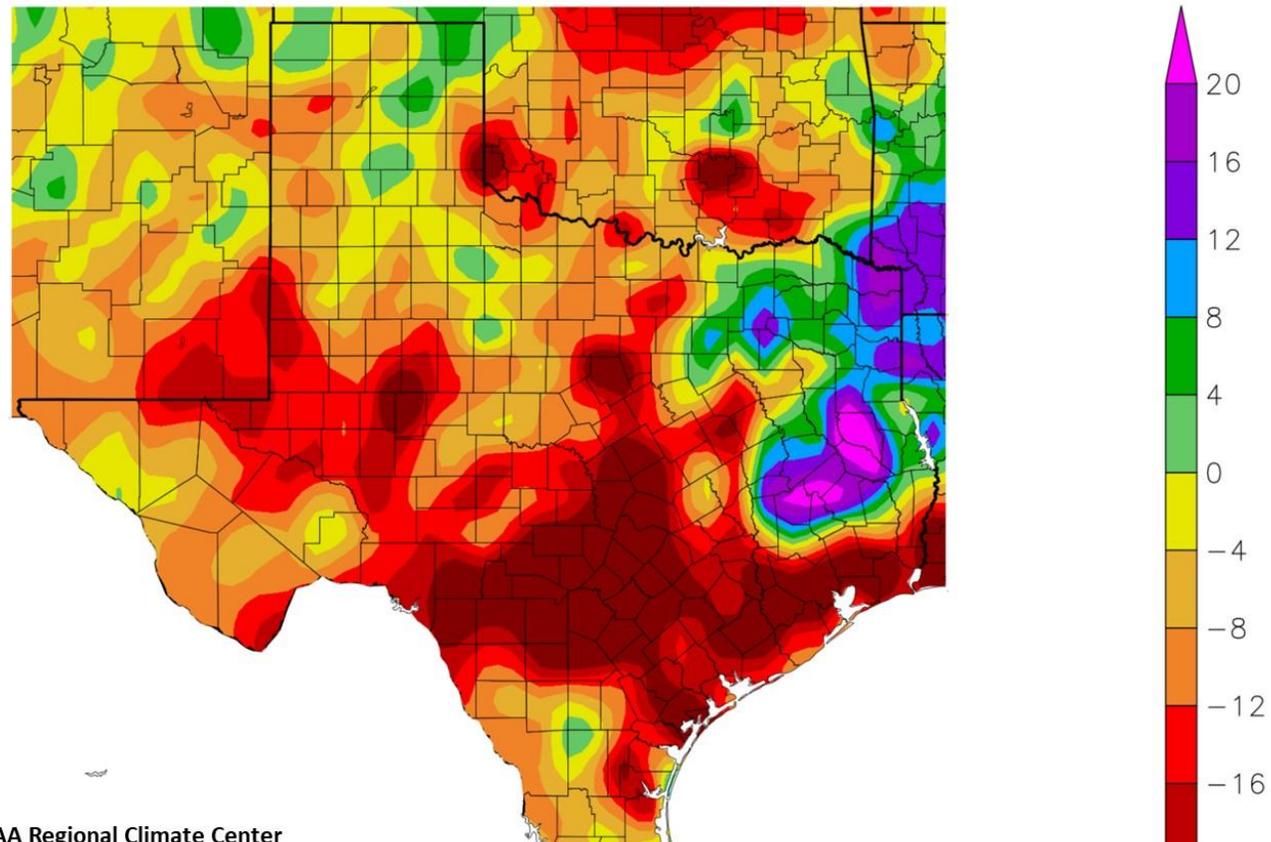


# Historical Rainfall: 1877-2025



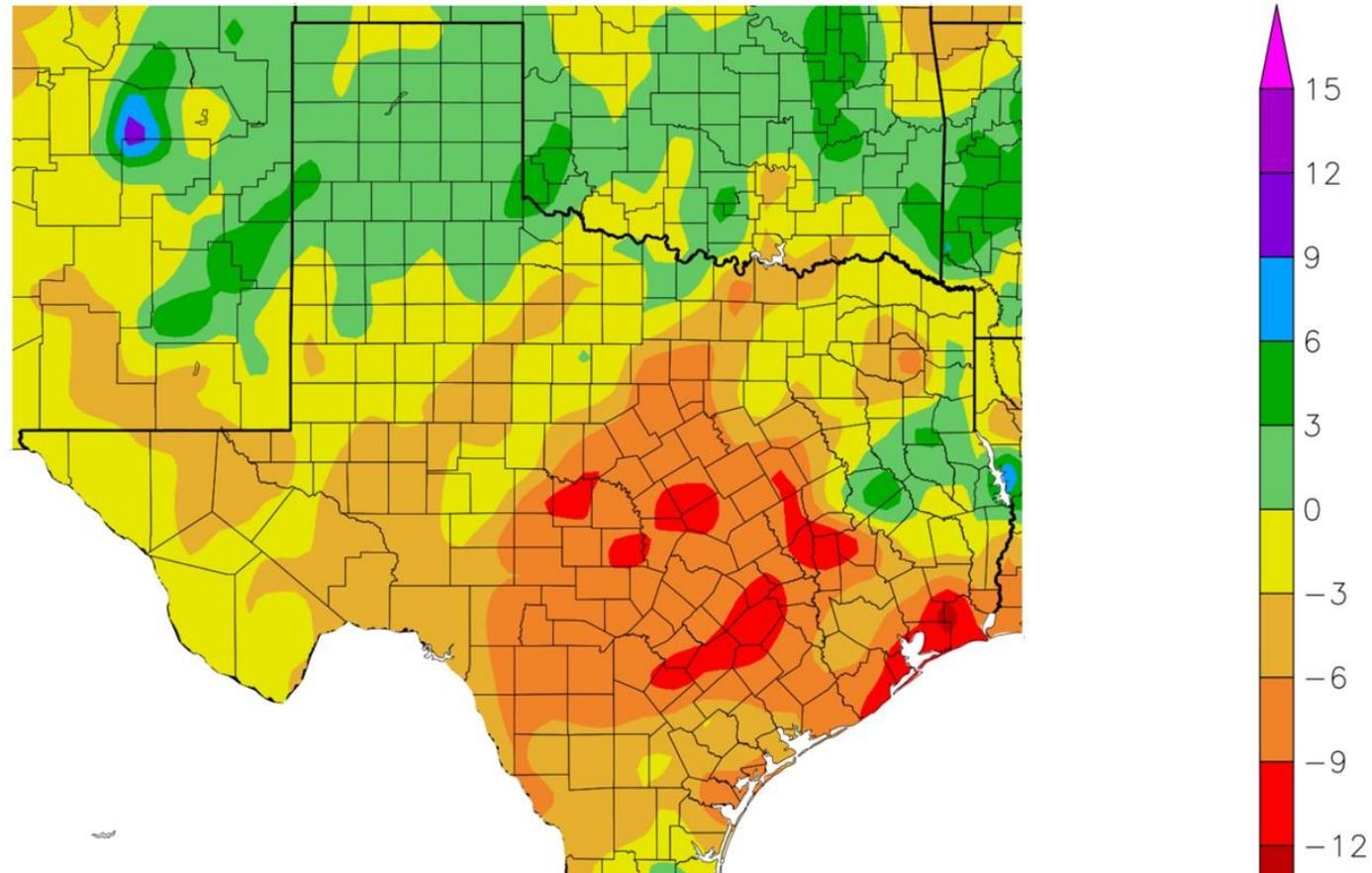
# 3 Year Departure from Normal 20+ Inches

Departure from Normal Precipitation (in)  
4/4/2022 - 4/3/2025



# 6 Month Departure from Normal 6 to 9 Inches

Departure from Normal Precipitation (in)  
10/1/2024 – 4/3/2025



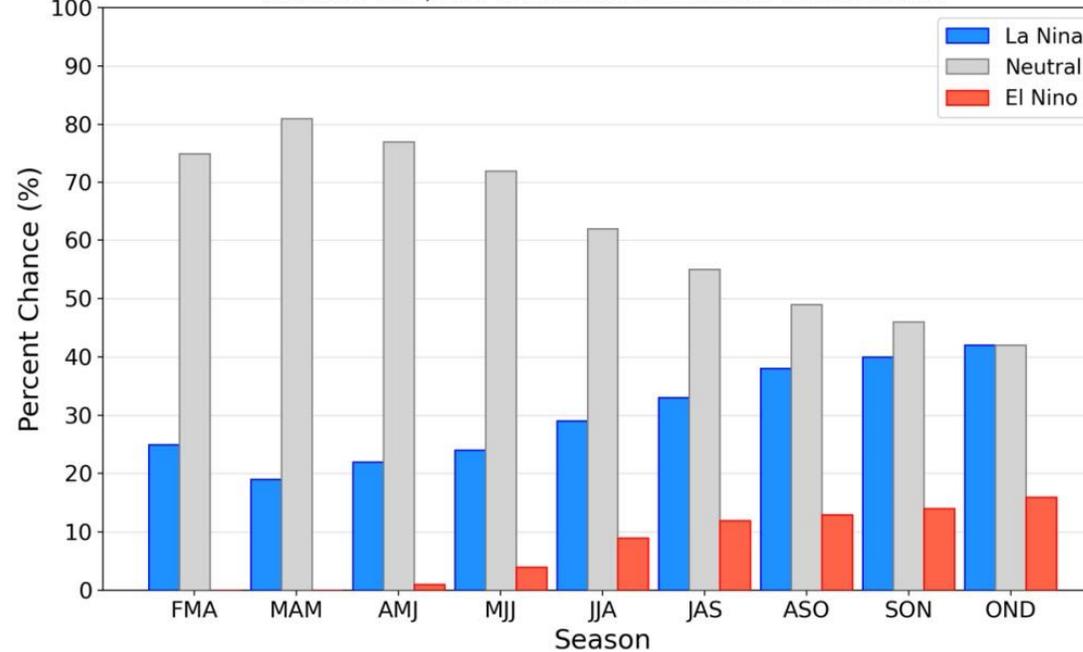
# CPC Probabilistic ENSO Outlook

Updated: 13 March 2025

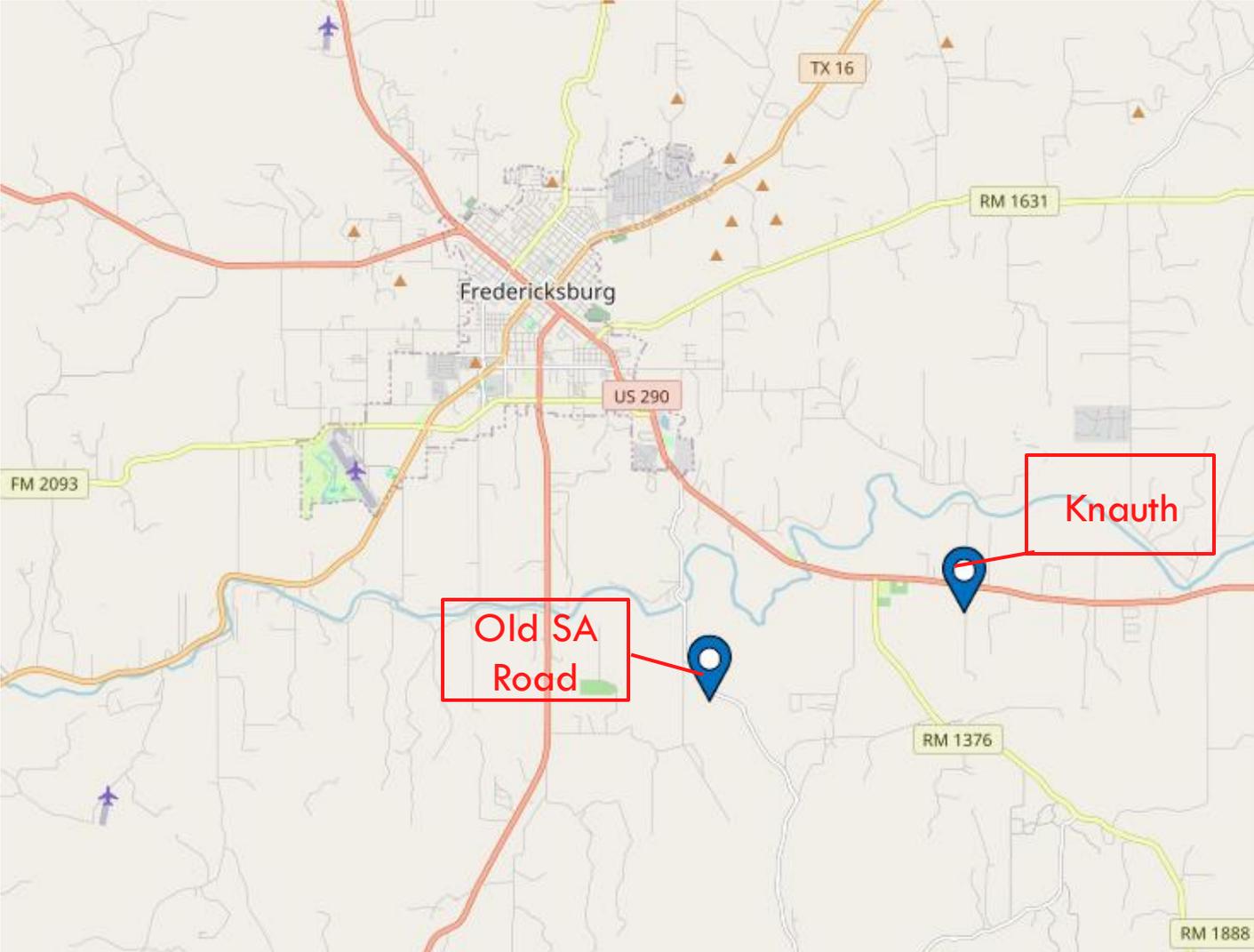
A transition to ENSO-neutral most likely during February-April 2025 (75% chance) and is favored to persist through the Northern Hemisphere summer 2025. During October-December 2025, there are equal chances (42%) of ENSO-neutral and La Niña.

Official NOAA CPC ENSO Probabilities (issued March 2025)

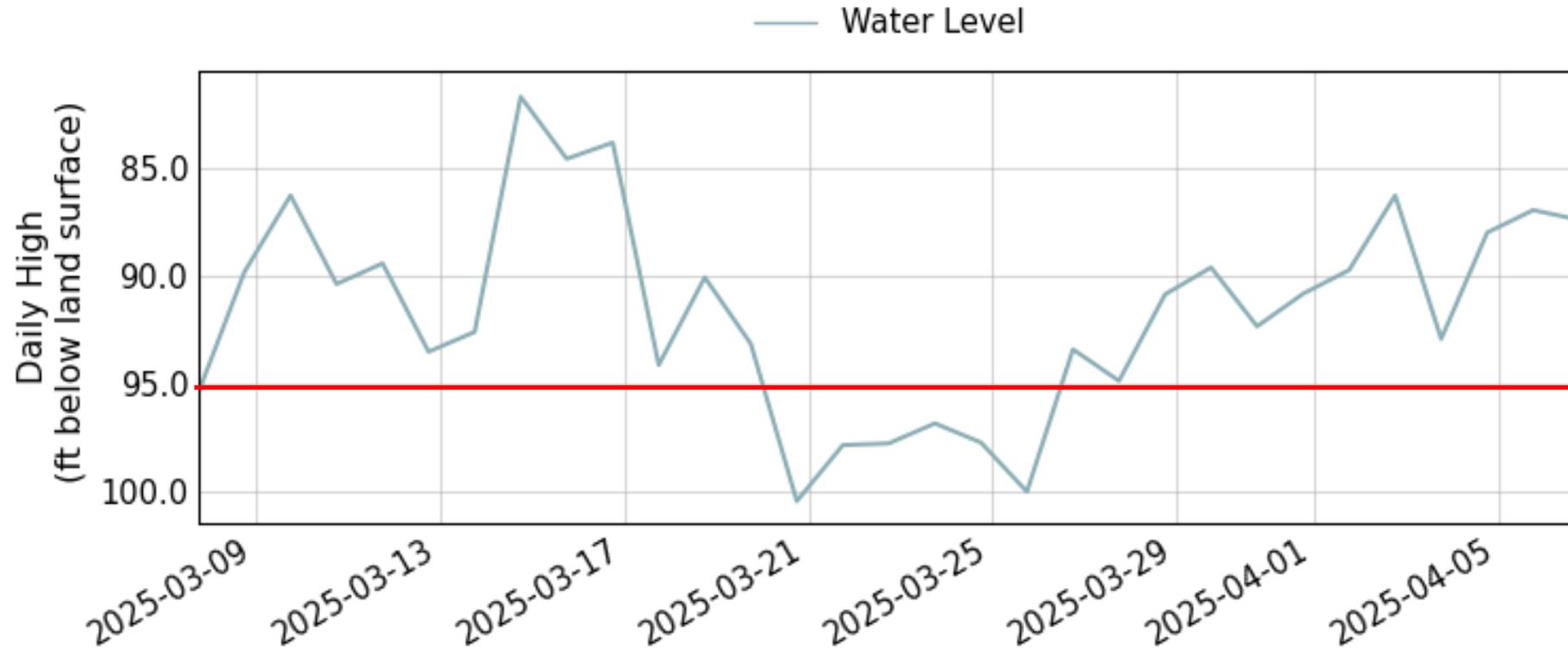
based on  $-0.5^{\circ}/+0.5^{\circ}\text{C}$  thresholds in ERSSTv5 Niño-3.4 index



# TWDB Aquifer Monitoring

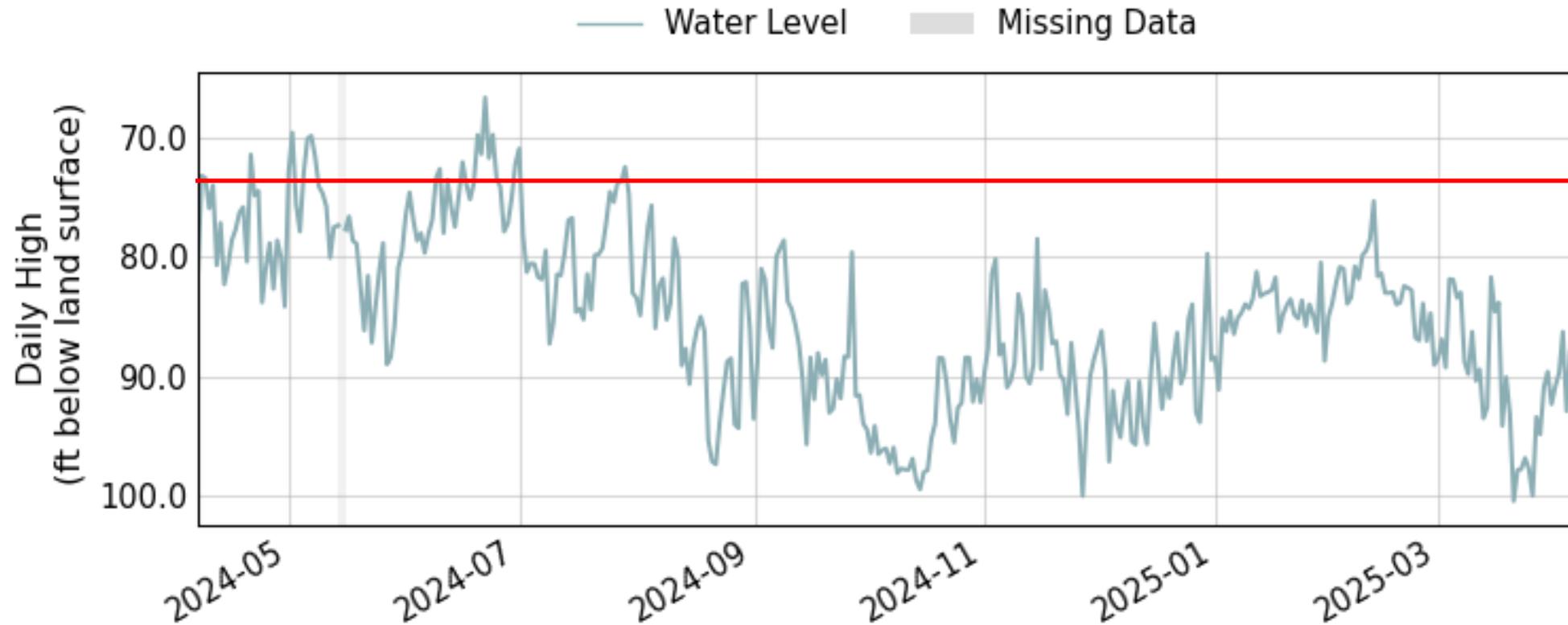


# Knauth Well Field – 30 days



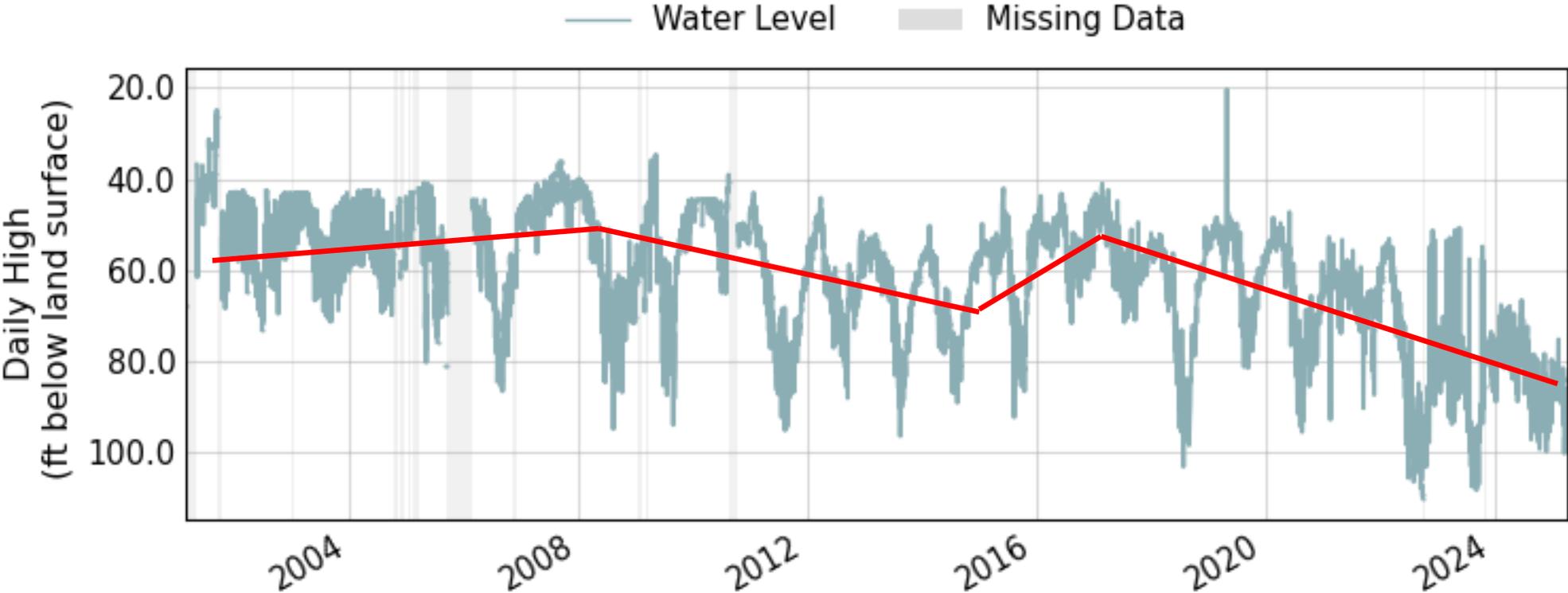
- Measurement below ground surface at well
- On April 8, 2025- – 87.43 ft OR 7 ft higher

# Knauth Well Field – 1 Year



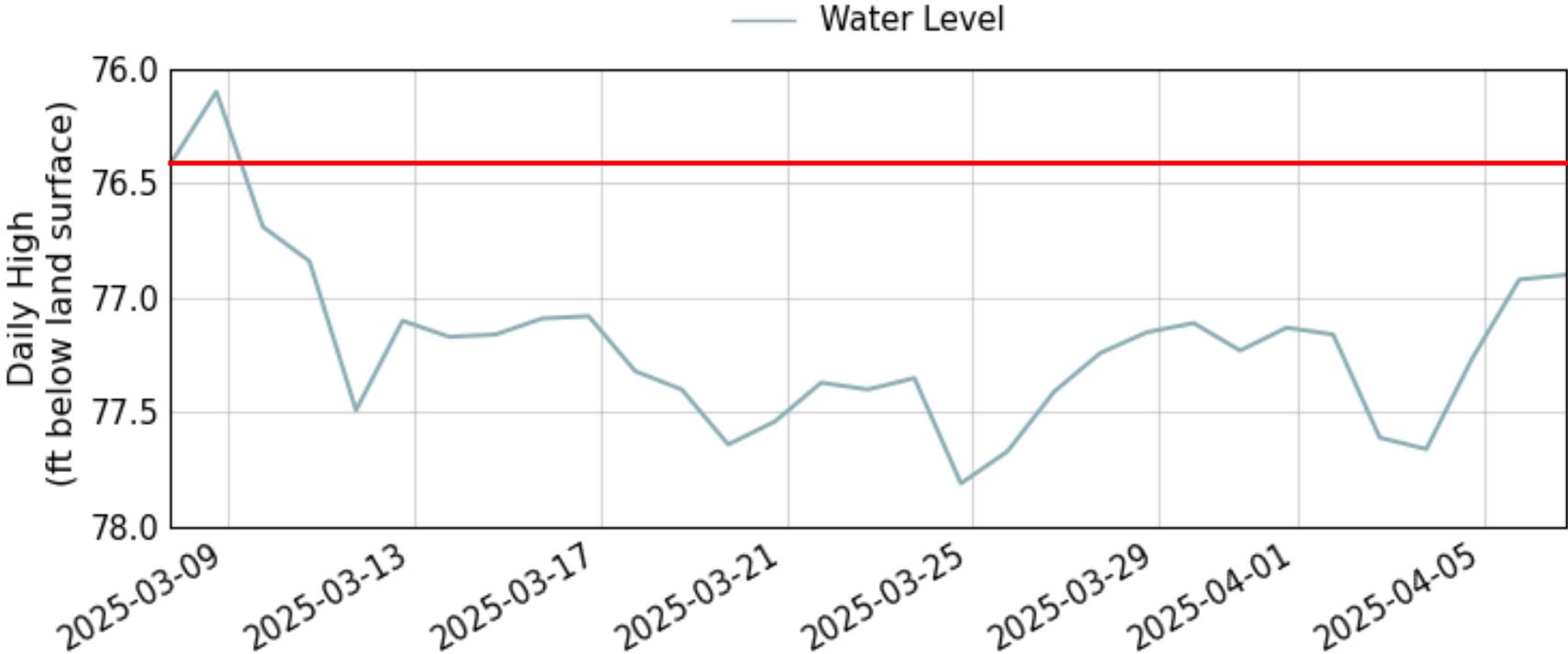
- Redline indicates aquifer level 12 months prior
- 19 feet below measurement in April 2024

# Knauth Well Field – Period of Record



- Redline shows trend line of aquifer

# Old SA Rd Well Field – Last 30 days



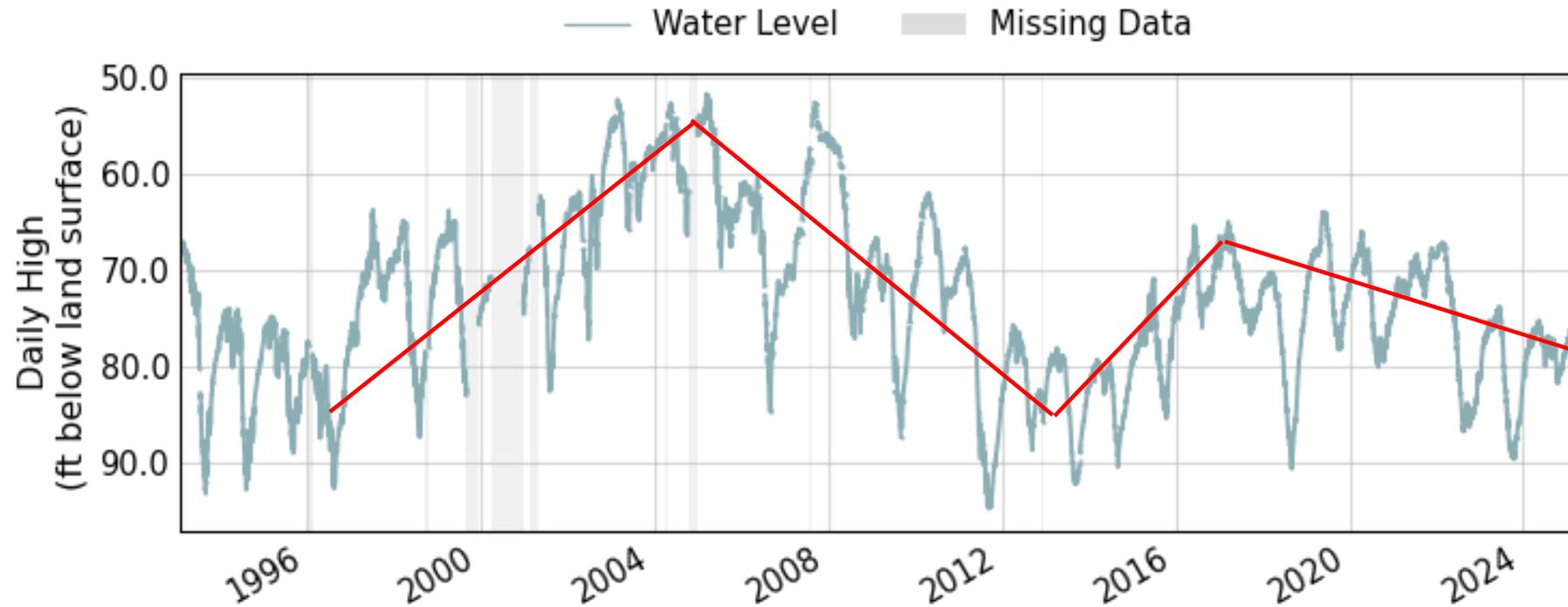
- Measurement below ground surface at well
- On April 8, 2025 – 76.90 ft OR 1 ft lower

# Old SA Rd Well Field – 1 Year



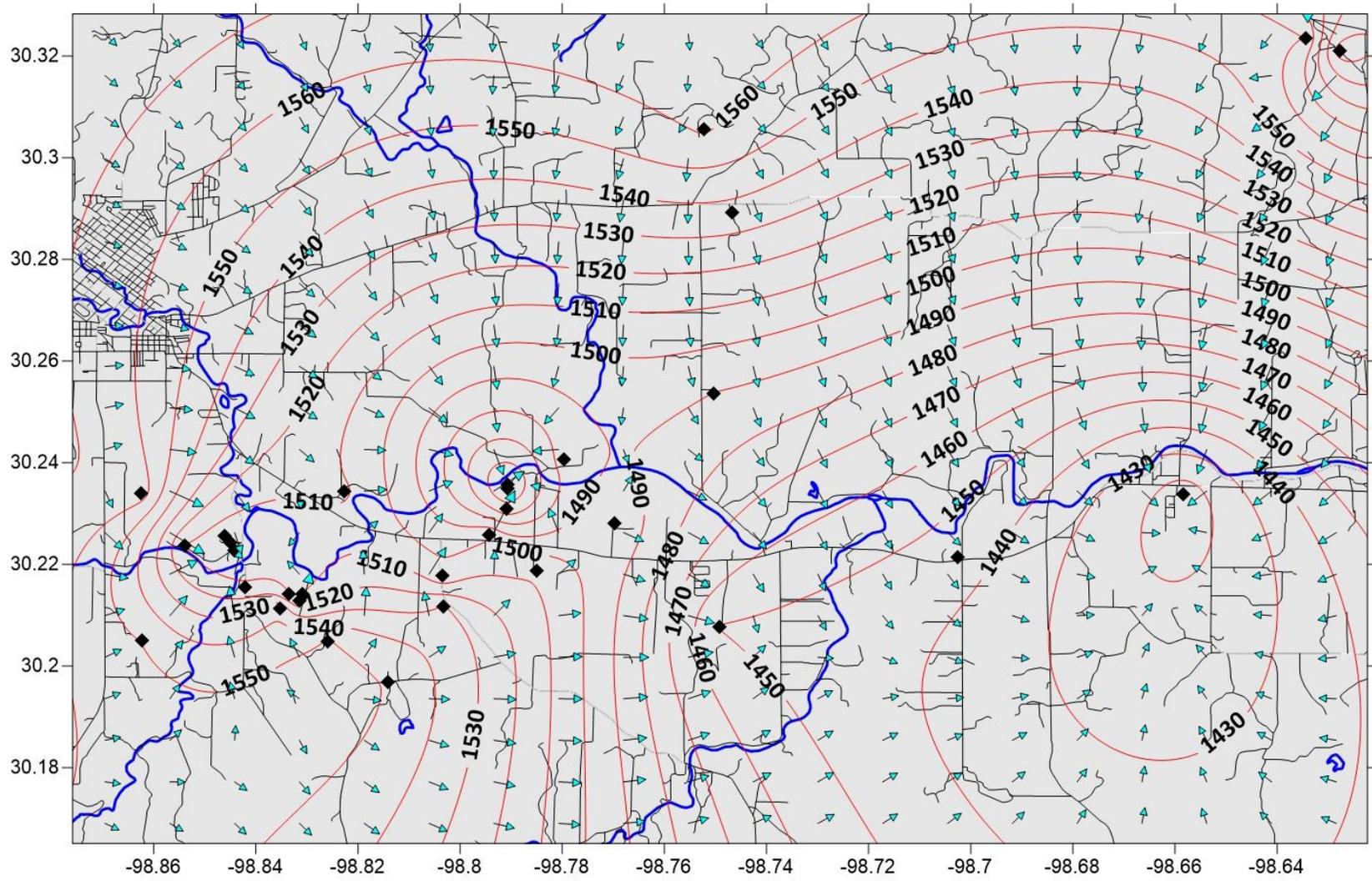
- Redline indicates aquifer level 12 months prior
- 0.22 feet below measurement in April 2024

# Old SA Rd Well Field – Period of Record



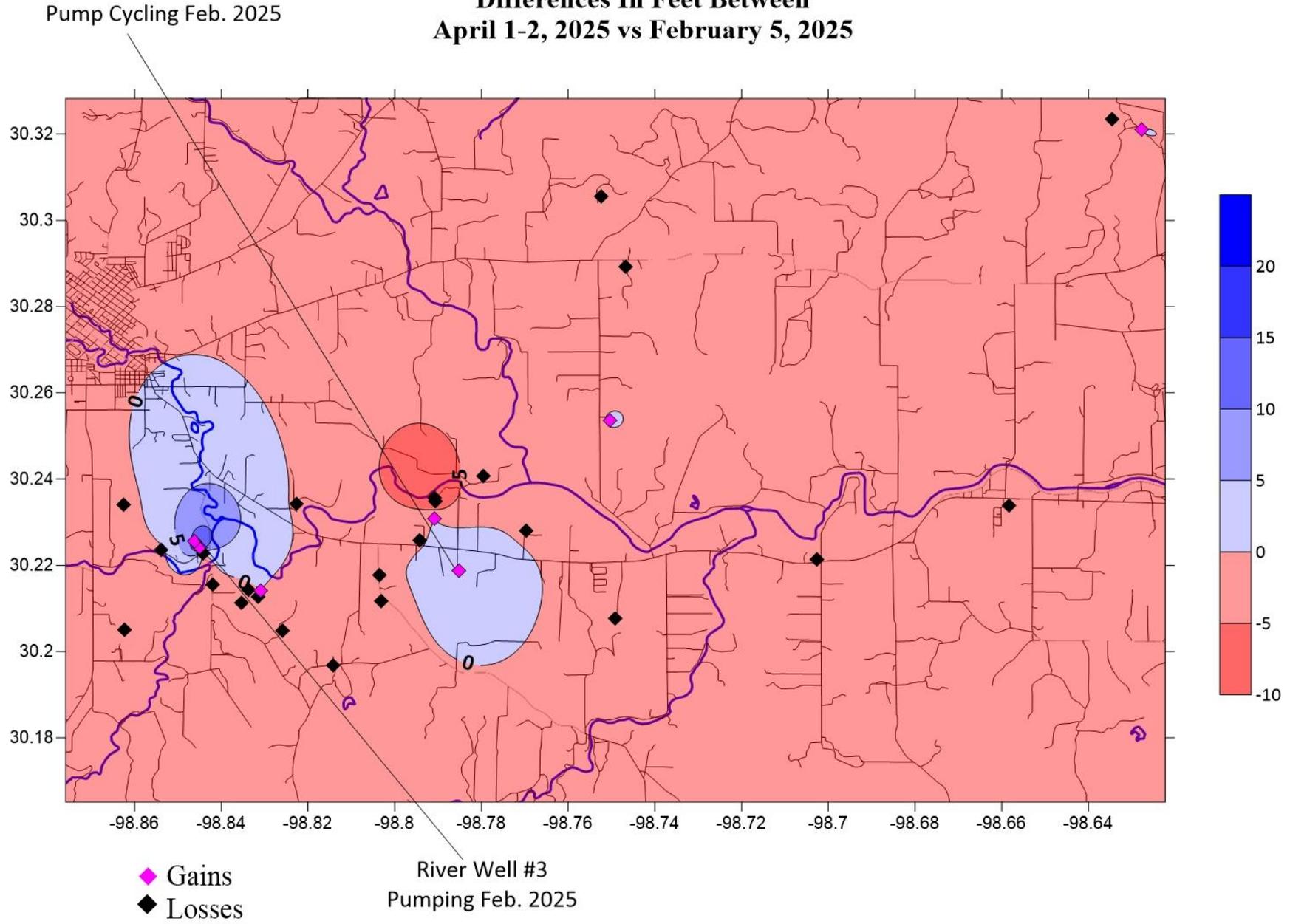
- Redline shows trend line of aquifer

**Ellenburger Water Levels**  
**Feet Above Sea Level**  
**April 1-2, 2025**



Monitor Well Location 

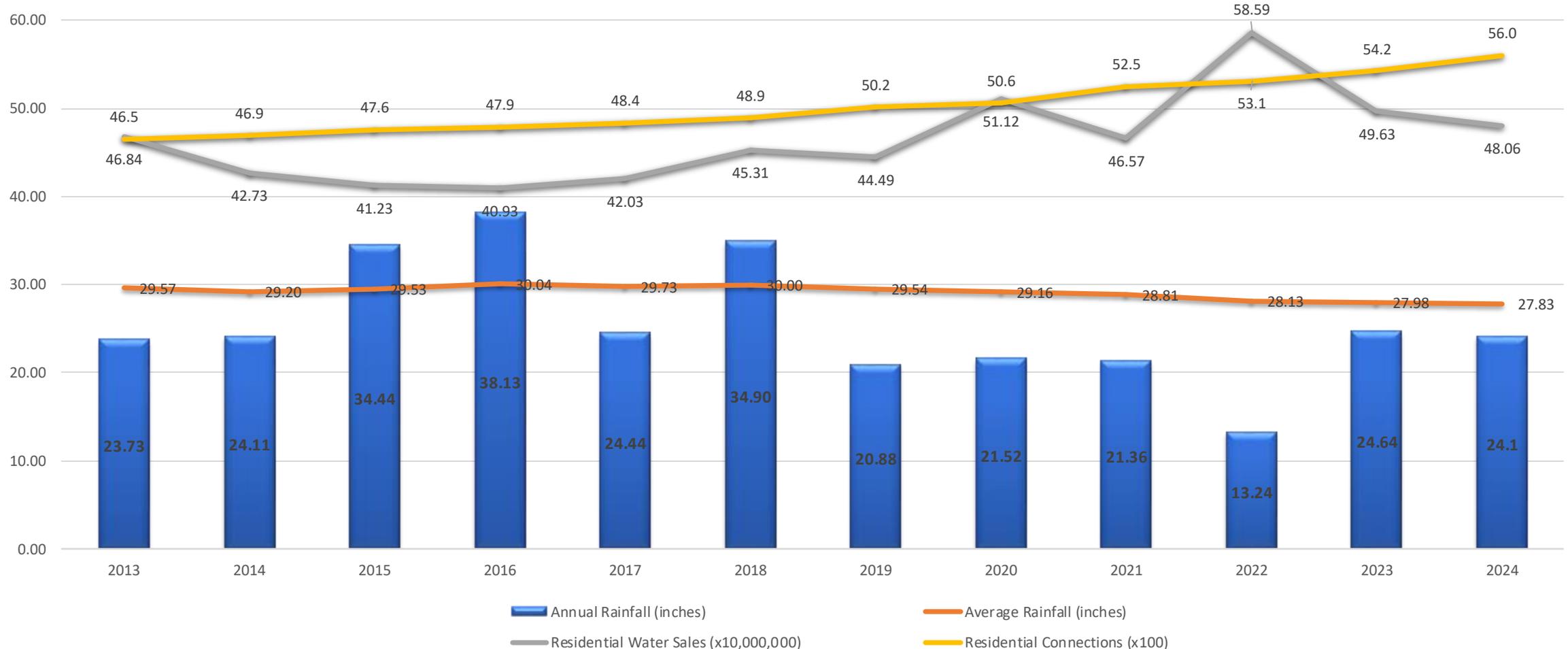
# Ellenburger Water Levels Differences In Feet Between April 1-2, 2025 vs February 5, 2025





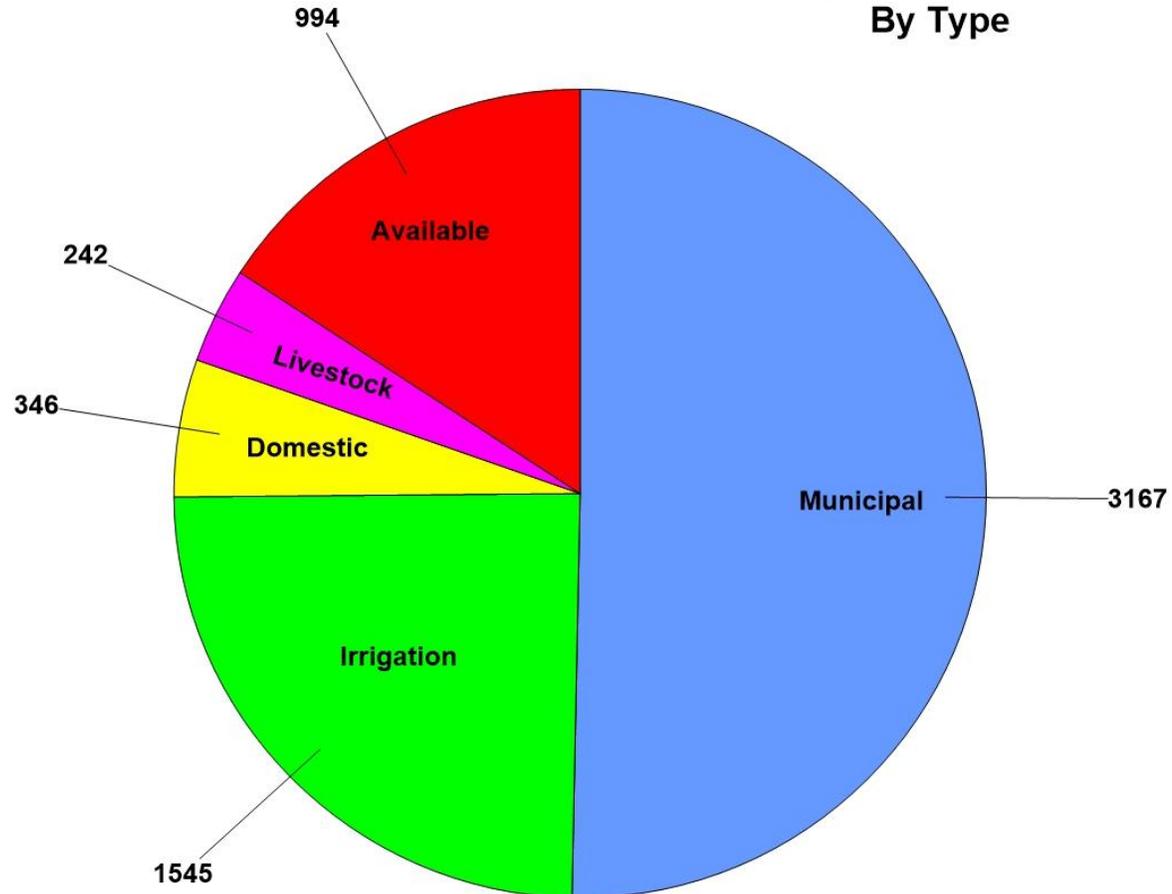
# Residential Water Use vs. Residential Connections

Residential Water Sales vs. Residential Connections vs. Rainfall



# District wide Available Ellenburger Groundwater by Use and Volume in Acre Feet

Gillespie County  
Ellenburger Aquifer  
Managed Available Groundwater  
6,294 Acre Feet  
By Type



# Water Distribution System Integrity

## Recent Projects

- Windcrest Water Storage Tank Rehabilitation
- New South Heights Water Storage Tank
- New Goehmann Ln Water Storage Tank
- Recompletion of Knauth #2 Well
- Bell Street Waterline Project
- Sensus Water Meters
- New Pump Station at Knauth Wellfield
- 290 East Water Supply Line
- 3 New 1M Gallon Concrete Water Storage Tanks
- East Main Street Waterline Rehab
- 2" Water Main Replacement Projects (various locations in town)
- Long-term Water Supply Study



# Water Conservation Measures

## What have we been doing to conserve water?

1. Water system leak detection survey
2. AMR “smart” meters
3. Re-use of reclaimed water
4. Water rate adjustment/increase
5. Watering restrictions

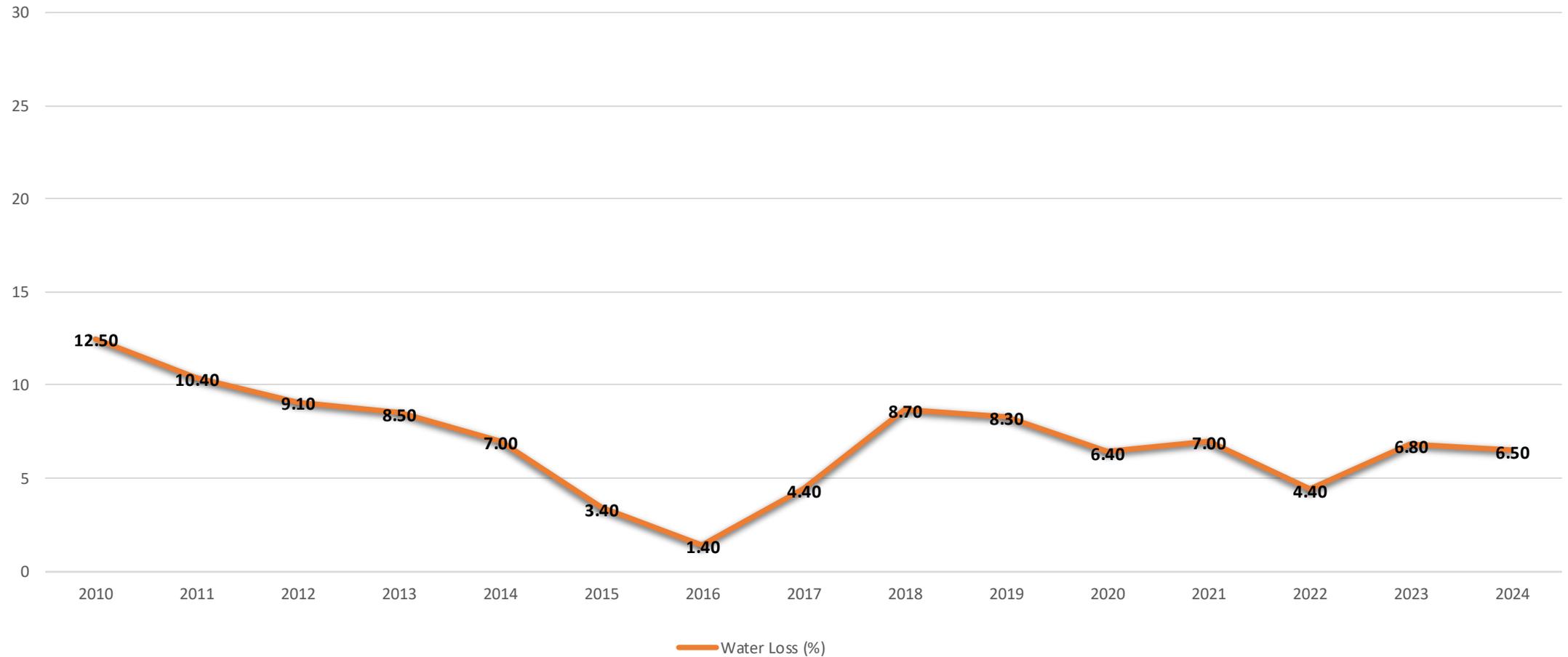
# Current Water Conservation Measures

## 1. Water System Leak Detection Survey

- Phases 1 completed in November 2022 (FY23)
- Phase 2 completed in February 2024 (FY24)
- Phase 3 completed in February 2025 (FY25)
- Surveys Included:
  - 134 miles of piping
  - 6,700 service lines
  - 350 fire hydrants
- 22 leaks were identified
- Water loss audit

# Current Water Conservation Measures

ANNUAL WATER LOSS



# Current Water Conservation Measures

## **Based on annual production of 900,000,000 gallons**

- Annual Savings from 2010 vs. 2020 = 46,757,000 gallons @ 200 GPCD....
  - Water supply for 640 additional people
  - 4.6 years of growth

## **Based on annual production of 900,000,000 gallons**

- Annual Savings from 2010 vs. 2016 = 91,300,000 gallons @ 200 GPCD....
  - Water supply for 1,250 additional people
  - 8 years of growth

*\* Population growth based on 1.21% annual compounded growth rate*

# Current Water Conservation Measures

## 2. AMR “Smart” Meters

- Meter data from new meters includes date/time/volume of consumption
- Enables utility billing and code enforcement to easily identify leaks and water violations
- Sensus Customer Portal allows customers to monitor water usage and/or receive alerts.
- <https://www.fbgtx.org/1124/Sensus-Customer-Portal>



# Current Water Conservation Measures

## **3. Re-Use of Reclaimed Water**

- 500M gallons produced annually (50% of potable water volume)
- 35-40% currently re-used annually, 100% during summer months
- Golf Courses: Boot Ranch and Lady Bird Johnson
- TCEQ 210 permit permitting sale of reclaimed water for construction use
- Frieden Subdivision Development

# Current Water Conservation Measures

## 4. Water Rate Structure Encourages Conservation

- New Rate Structure in October 2013
- Amended Rates with Rate Study in November 2019
- Inclining Block Rate Structure “Tiered”... Higher consumption = higher cost
- Commercial sewer rates based on actual water usage

Gallon Usage	Rate per thousand
0	\$11.60
1—6,000	\$2.45
6,001—12,000	\$3.92
12,001—18,000	\$6.37
18,001—25,000	\$9.31
25,001—50,000	\$10.42
Over 50,000	\$14.09

# Watering Restrictions

- New watering restrictions went into effect May 1, 2014
  - 5 stages (1-5) of watering restrictions
  - Goal of each stage is to reduce demand of water

## Trigger Conditions

1. Stage of the “Local Drought Index” based on local drought sensitive parameters
  1. Daily Average water levels from two wells in the Ellenburger aquifer
  2. Average daily flow of the Pedernales River
  3. Prior 10-month cumulative rainfall amount
  4. Palmer Drought Index
2. Pumping capacity of pumps that transfer water into the City’s distribution system
3. Decrease in well field production capacity

*\* Initiation and Termination of Stages by City Manager proclamation*

Stage	Last Digit of Address	Watering Day	Weekends	Watering Times	Reduction Goals
1	All	Mon. – Sun.	Yes	*5-9 a.m. *7-11 p.m.	
2	1 or 2 3 or 4 5 or 6 7 or 8 9 or 0	Mon & Sat Tues & Sat Wed & Sun Thurs & Sun Fri & Sun	Yes	*5-9 a.m. *7-11 p.m.	10% Avg Daily Water Demand
3	1 or 2 3 or 4 5 or 6 7 or 8 9 or 0	Mon Tues Wed Thurs Fri	Yes but with handheld hose, bucket or drip only	*5-9 a.m. *7-11 p.m.	15% Avg Daily Water Demand
4	1 or 2 3 or 4 5 or 6 7 or 8 9 or 0	Mon Tues Wed Thurs Fri	Yes but with handheld hose, bucket or drip only	6-10 a.m.	20% Avg Daily Water Demand
5	All	None	No	None	35%

\*Discussed changing watering times from 6-10am and 6-10pm for all watering stages

# Current Watering Stage

## Stage 4 – Critical Water Condition: Watering Days/Times

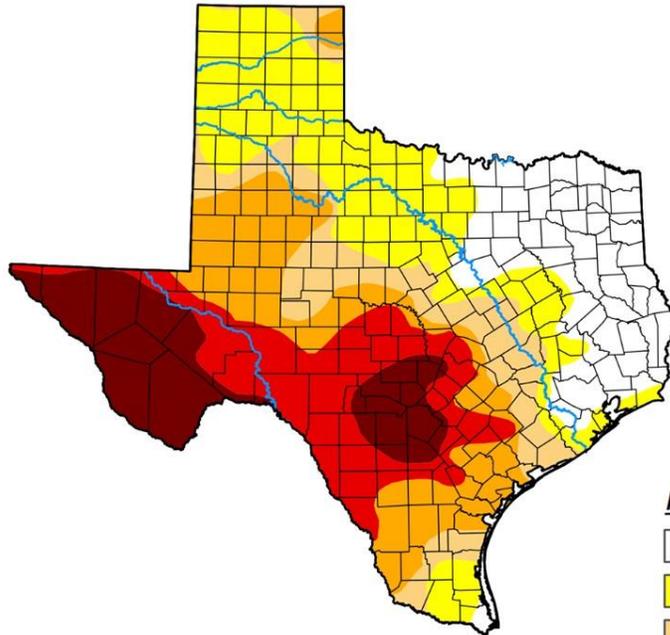
Stage	Last Digit of Address	Watering Day	Weekends	Watering Times
4	1 or 2 3 or 4 5 or 6 7 or 8 9 or 0	Mon Tues Wed Thurs Fri	Yes but with handheld hose, bucket or drip only	6 - 10 a.m. **

\*\*Council changed to morning watering 6-10am on October 17<sup>th</sup>, 2023

# US Drought Monitor for TX, April 2025 Vs 2024

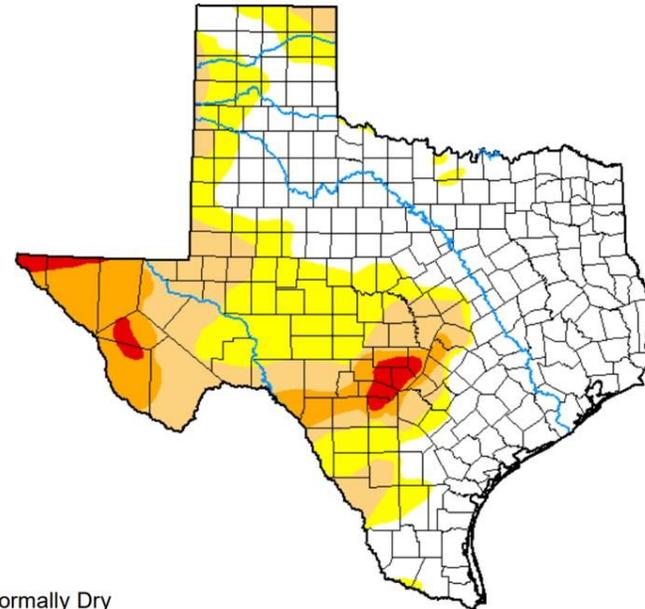
**April 8, 2025**  
(Released Thursday, Apr. 10, 2025)  
Valid 8 a.m. EDT

*U.S. Drought Monitor*  
**Texas**



**April 9, 2024**  
(Released Thursday, Apr. 11, 2024)  
Valid 8 a.m. EDT

*U.S. Drought Monitor*  
**Texas**



Intensity:

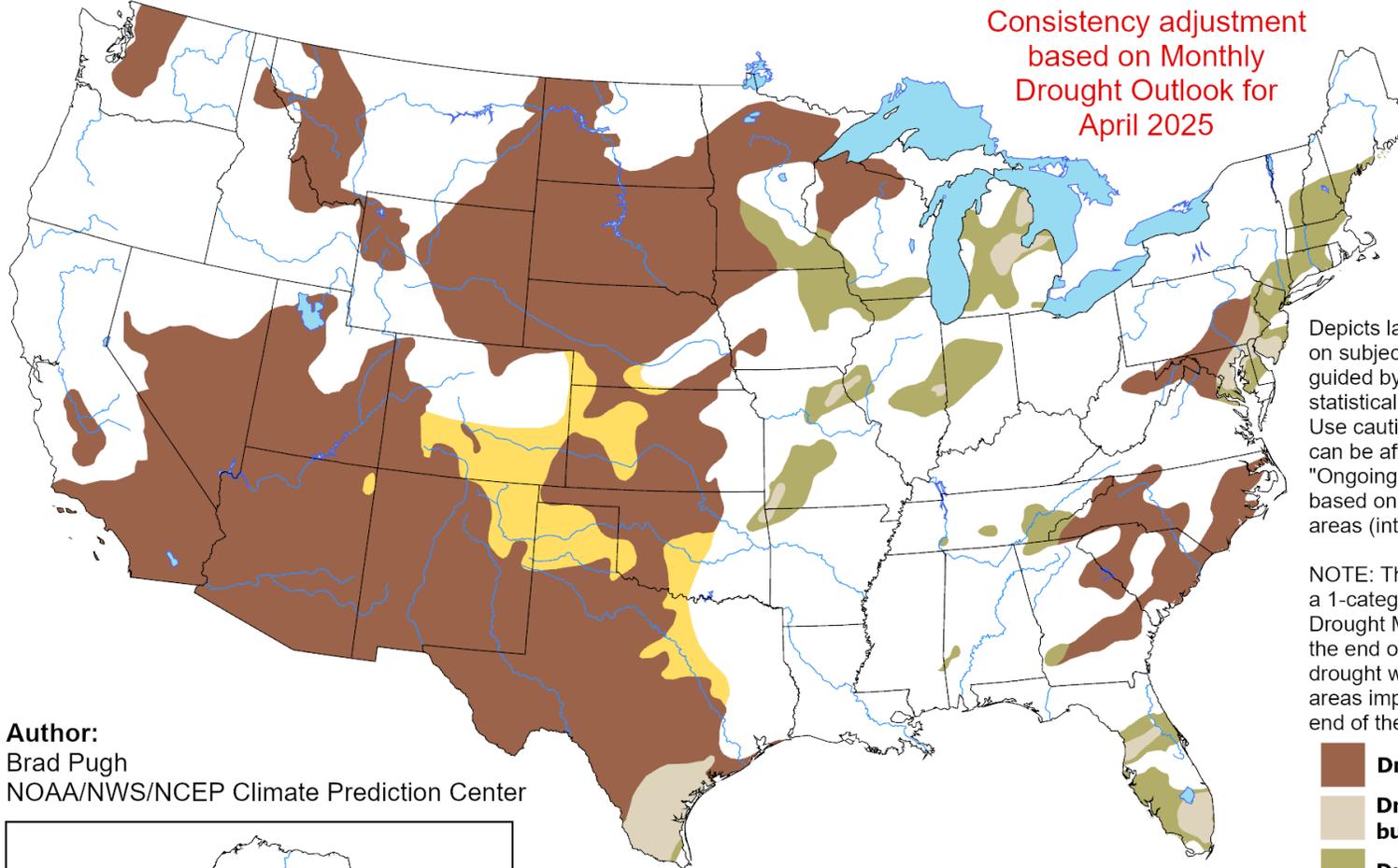
-  None
-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought

# U.S. Seasonal Drought Outlook

## Drought Tendency During the Valid Period

Valid for April 1 - June 30, 2025  
Released March 31, 2025

Consistency adjustment  
based on Monthly  
Drought Outlook for  
April 2025

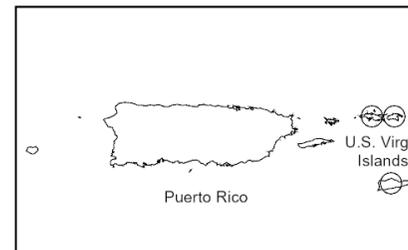
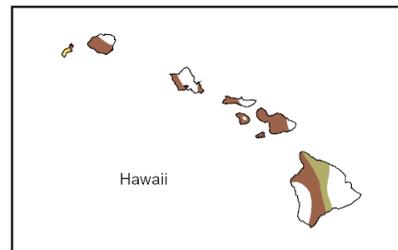


Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

**Author:**  
Brad Pugh  
NOAA/NWS/NCEP Climate Prediction Center

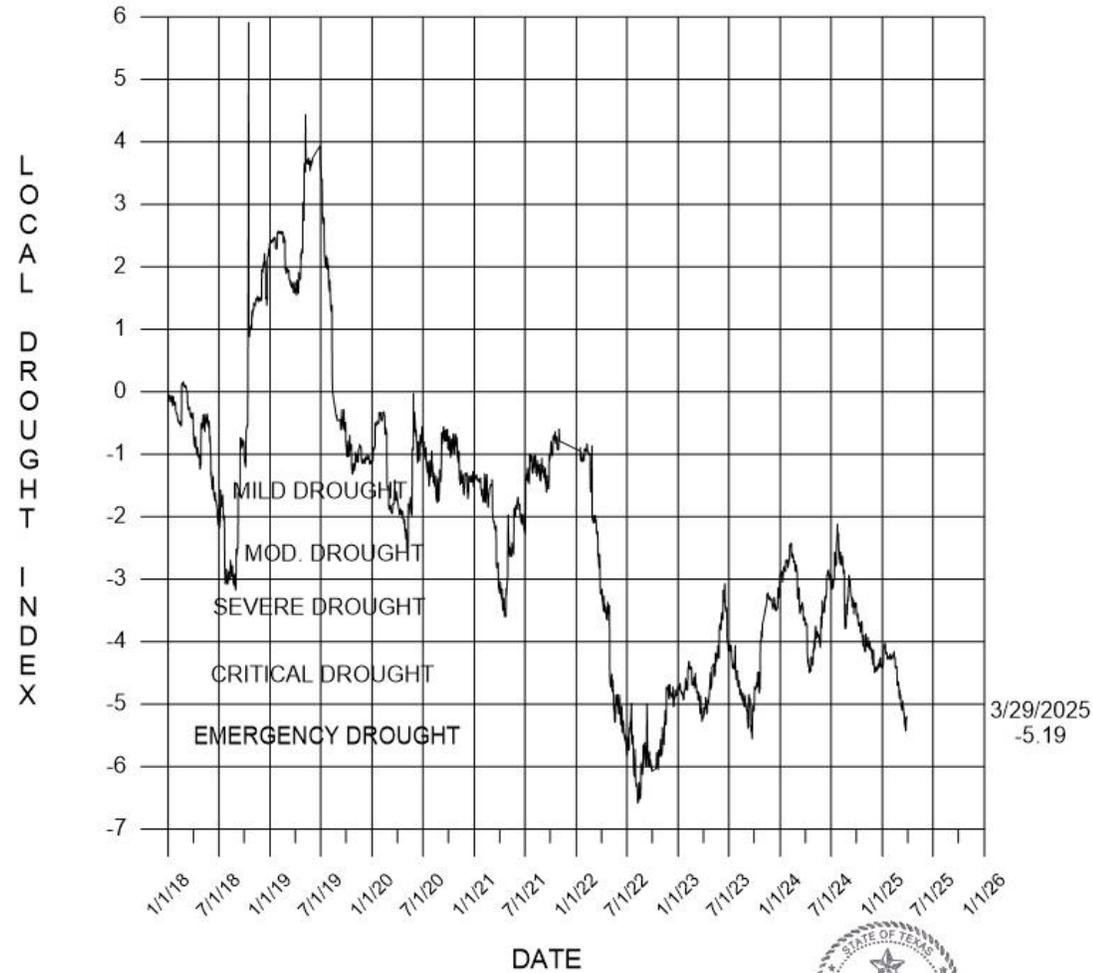
-  **Drought persists**
-  **Drought remains, but improves**
-  **Drought removal likely**
-  **Drought development likely**
-  **No drought**



<https://go.usa.gov/3eZ73>

# GILLESPIE COUNTY LOCAL DROUGHT INDEX AS OF MARCH 29th., 2025

(Based upon Ellenburger Aquifer Water Levels, Previous Weekly 10 Month Cumulative Rainfall, Pedernales River Flow and Palmer Hydrological Drought Index)



Prepared by the Hill Country Underground Water Conservation District

