



CITY OF WACO ACTION PLAN: Water Conservation & Drought Contingency Plan

Stage 2 - July 8, 2022

Plan Effective Date: July 13, 2022, 12:01 AM.

The Stage 2 Water Conservation and Drought Contingency Plan (“Plan”) is designed to slow the decline of the water level in Lake Waco by thoughtful, meaningful, reductions in outside, non-essential, water use. The Plan consists of:

- Reduction of outside water use by the City of Waco
- Reduction of outside water use by residential, commercial, and industrial customers
- Reduction of outside water use by wholesale water customers
- Communication to our community on the need and implementation of the Plan
- Enforcement

City of Waco over 30% reduction in water usage:

Parks & Recreation has submitted a plan to reduce water usage by a projected 53%. This will be accomplished by:

- Eliminate 1 day of watering – from 3 to 2 days a week
- Reduce water controller outputs by 20%
- Golf Course
 - Reduce usage by 20%
 - Reduce turf watering to a minimum
 - Decrease run times
 - Eliminate adding water to ponds
 - Prioritize sensitive areas
- Parks & Recreation’s Plan and Cottonwood Creek Golf Course’s Plan is attached. Director Jonathan Cook, Cottonwood Director, Kenny Duron, and staff will be responsible for the implementation of their plan. Consumption reduction will be monitored and reported by Water Utility Services Billing Staff.

Cameron Park Zoo has also submitted a plan to reduce water. 95% of their water usage is for animal welfare and daily cleaning. The Zoo plans to reduce water usage by:

- Cutting back landscape irrigation by 50 – 75%. This irrigation uses non-potable water and will follow the commercial days for watering except for the orangutang and large mammals who may need additional water due to the heat.
- Reduce the splash pad by approximately 4 hours a day
- Dry clean the carnivores and orangutang cages every other day

Director Johnny Binder and staff will be responsible for the implementation of their plan. Consumption reduction will be monitored and reported by Water Utility Services Billing Staff. * New water meters will be installed within the next 90 days and registered consumption may increase.

5% Reduction of water by City of Waco Water Utility Customers

Residential, Commercial, and Industrial customers will be allowed to water between 7 PM to 6 AM twice a week based on their address or customer classification.

- **Residential Customers whose address ends in an odd number (1,3,5,7,9) water on Tuesday and Saturday**
- **Residential Customers whose address ends in an even number (0,2,4,6,8) water on Wednesday and Sunday**
- **Non-residential Customers water on Monday and Friday**
- **Thursday no outside watering**
- **Hand watering permitted all days of the week**
- **Newly-planted grass, trees may receive a 30 day variance by emailing the water team (visit wacowater.com to submit)**

Consumption reduction will be monitored and reported by Water Utility Services Billing Staff using prior year, same time period, data.

Wholesale Water Customers

Wholesale water customers will be informed of the proposed Plan upon approval of the Plan. Wholesale customers are required to follow Stage 2 of their Conservation and Drought Contingency Plan or may follow the City of Waco's modified plan. Water Utility Billing staff will be responsible for monitoring consumption and reporting to Water Utility Services Director any increase above average usage for this same time of year.

Communications Plan

Communications & Marketing has submitted a communication plan to inform our customers of the implementation of Stage 2, what that means, the need for Stage 2, the water users' responsibilities, and enforcement. Implementation of the Plan will be unsuccessful without a robust communication plan. Monica Sedelmeier and staff will be responsible for communications. Their plan consists of:

- Monthly press release
- Social Media
- Bi-weekly eNews update
- Water bill insert
- Water conservation PSA
- Updated website with lake levels, drought stage, FAQs
- Conservation promotion in City Limits
- Informational message using MyWacoWater
- Information shared with Neighborhood Associations
- Communications & Marketing Plan is attached

Enforcement

Enforcement will be carried out utilizing both a warning and, after August 1st, criminal penalties.

- Code Enforcement and Water Utility Services will both be responsible to hang a “Mandatory Water Restrictions” door hanger on any customer’s door who is watering on the wrong day/time or who has excessive runoff of water (defined as more than 10 feet from their property).
- Beginning 21 days from the date of implementation, Code Enforcement will be responsible for issuing violations to customers for not following the Plan rules.

Stage 3 Implementation

Without a significant change in the current, forecasted, weather pattern the City will enter Stage 3 (449 MSL) as shown below:

Lake Level as of July 8, 2022	454.98	Days to Stage 3
Daily Drop in Lake Level	0.04	150
	0.05	120
	0.06	100
	0.07	85

Stage 3 will require an update to all elements of the Stage 2 plan.

List of Exhibits

- Exhibit A – Stage 2 Water Conservation & Drought Contingency Plan Chart
- Exhibit B – Parks & Recreation’s Plan
- Exhibit C – Cottonwood Golf Course’s Plan
- Exhibit D – Communication & Marketing’s Plan
- Exhibit E – Door Hanger
- Exhibit F – Communication & Marketing’s Talking Points

Exhibit A

Stage 2 Water Conservation & Drought Contingency Plan									
Desired Result	Action	Action	Action	Action	Action	Action	Action	Success	Success
Over 30% reduction in outside water usage by City of Waoo Departments	Reduce from 3 to 2 days a week of watering*	Reduce number of hours splash pads are operating	Reduce controller output of water by 20%	Reducing turf watering to a minimum and prioritizing sensitive areas	Decreasing watering run times	Eliminate adding water to ponds	Dry dean the carnivores and orangutang cages every other day	Plan to be implemented by each Department	Water Utilities will monitor by comparing prior periods consumption to current
5% Reduction in outside water usage by City of Waoo Water Utility Customers	Outside irrigation allowed only between 7PM - 6 AM	Outside Irrigation is only allowed 2 days a week. Assigned by address.						Plan clearly communicated to customers	Water Utilities will monitor by comparing prior periods consumption to current
Wholesale Customer's implementation of Stage 2 Plan	Letter/email sent to wholesale customer's of City going to Stage 2.	Revised Plan sent to Wholesale Customers						Implementation of Plan by wholesale customers	Water Utilities will monitor by comparing prior periods consumption to current
Clearly communicated Plan to Customers	Monthly Press Release	Sodal Media, bi-weekly eNews, PSA	Water Bill insert, MyWaoo Water, City Limits	Neighborhood Assodations				Customer's adopt Plan	Reduction in water usage
Enforcement	Door hanger warning of non-compliance	August 1st - criminal penalties enforced						Door hanger warning eliminates need for criminal penalties	Few Criminal Penalties



Exhibit B

PARKS AND RECREATION DEPARTMENT

Post Office Box 2570
Waco, Texas 76702-2570
254 / 750-8071

To: Lisa Blackmon, Assistant City Manager
Lisa Tyer, Director of Utilities
From: Jonathan Cook, Director of Parks & Recreation
Date: June 29, 2022
Re: **Parks and Recreation Department Drought Plan – Stage 2**

On Tuesday, we were notified that the Water Utilities Department and City Manager's Office are moving forward to implement the Water Conservation and Drought Contingency Plan

In response to the request to implement Stage 2 drought measures with an over 30% reduction in water usage, below, you will find our department's standard irrigation and watering practices, our proposed implementation plans, and several variance requests related to cost/aesthetics, along with and health and wellness matters.

Parks & Recreation Standard Irrigation and Watering Practices

Currently, all irrigation controllers are programmed to water on Monday, Wednesday, and Friday between the hours of 9 p.m. to 6 a.m. On average, spray heads run 15 minutes and rotors run 45 minutes at 100% capacity.

- 31 controllers are smart and use data from evapotranspiration.
- 39 controllers are standard.
- 19 controllers are in-ground and battery operated (mostly on trees and shrubs).

The current splash pad hours of operation are 8 a.m. to 10 p.m. daily, which is a total of 14 hours per day.

Stage 2 Implementation Plan

To achieve an overall reduction of 30% in water usage, the Parks & Recreation Department will implement the following:

- Eliminate one day of watering (Wednesday)
- Eliminate all outdoor watering/irrigation on Thursdays
- Program and reduce all controllers by 20% (operation at 80% instead of 100% capacity)
- Turn off evapotranspiration devices to eliminate potential of water during the day

- All irrigation controllers will be programmed to water on Monday and Friday between the hours of 9 p.m. to 6 a.m. By programming spray heads and rotors to run at 80% capacity instead of 100%, this will reduce the run time of spray heads to 12 minutes and rotors to 36 minutes.
 - Eliminating one full day of watering = 33% reduction
 - Programming/reducing controllers by 20% capacity = 20% reduction
 - **Total reduction = 53% (13% above request)**

Protection of Sensitive Areas

For purposes of this plan, we are requesting variances for areas identified as sensitive. We propose these areas fall under a three-day a week watering schedule (Monday, Wednesday and Friday) at 80% capacity. This capacity will reduce 15-minute sprays to 12 minutes.

Requests are as follows:

- **Annual Color Beds** (including City Hall) – to be watered a maximum of two days a week. If beds do not survive on this schedule, they will be pulled.
- **Landscape Beds** – This is general shrubbery that are sensitive to not being watered on a regular basis.
- **Riverbend Park** – Specialized turf area to be maintained for tournament play, which provides revenue and economic impact
- **Tree Farms** – These areas are growing stations for saplings and young trees that will eventually be transferred to areas across the city as part of our reforestation program. The farms provide a cost-savings and eliminate the need to purchase of some trees.

Additional Variances

- **Fountains** - We are requesting fountains remain at regular capacity and include a special exception for the following reasons:
 - Fountains are operated by re-circulated water. If you turn them off and stop circulating the water, they become a health issue due to things such as mosquitoes and bacteria.
 - If they are shut down, they will require full drainage of the fountains. Draining of the fountains would incur a large cost to refill in the future.
- **Splash Pads** – The city has splash pads located at six parks that operate mainly during the daytime. While the primary focus is recreation for children, the splash pads do provide heat relief to visitors to the parks as well.
 - We request that splash pads still operate seven days a week; however, we would reduce hours of operation to 11 a.m. through 7 p.m. This alteration will eliminate six hours of water usage per day.
- **Greenhouse** – The department greenhouse provides the ability to grow various types of plants, which are transplanted throughout the city at a cost savings.
 - All potted plants are watered by hand 5 days a week. If they do not follow this watering schedule, the plants will not survive.

Exhibit C



PARKS AND RECREATION DEPARTMENT

Post Office Box 2570
Waco, Texas 76702-2570
254 / 750-8071

To: Lisa Tyer, Director of Utilities
From: Kenny Duron, Cottonwood Creek General Manager
Jonathan Cook, Director of Parks & Recreation
Date: June 29, 2022
Re: **Cottonwood Creek Golf Course Drought Plan – Stage 2**

On Tuesday, we were notified that the Water Utilities Department and City Manager's Office are moving forward to implement the Water Conservation and Drought Contingency Plan

In response to the request to implement Stage 2 drought measures with a 20% reduction in water usage, below you will find our department's standard irrigation and watering practices and our proposed implementation plans related to cost/aesthetics, along with health and wellness matters.

Cottonwood's Standard Irrigation and Watering Practices

To keep all turf areas that can be irrigated plush and healthy by watering with irrigation system at and then using supplemental watering during the day if needed. This includes keeping lakes and ponds full of water.

Stage 2 Implementation Plan

Reduce watering to the minimum amounts to keep the turf healthy wherever the irrigation system can reach. This will incorporate decreasing the water settings for irrigation run times and not adding any water in the ponds except for the irrigation tank.

Protection of Sensitive Areas

All turf areas are important to maintain to keep from causing turf loss and other damage. The priorities are as follows: 1. Greens 2. Tees 3. Fairways 4. Roughs 5. Lakes. On Thursdays, sensitive areas will be water by hand prior to opening.

Requests are as follows:

To follow guidelines in Stage 2 plan

Additional Variances

If additional stages are implemented, the next phases will require to not irrigate some areas. This will result in turf loss and damage. Staff will find the most efficient options to cope with the situation.

Exhibit D

WATER RESTRICTIONS COMMUNICATION PLAN

[illegible]

Exhibit E

DOOR KNOB HOLE
IMAGES/TEXT
IN THIS
AREA
WILL BE CUT-OFF



MANDATORY WATER RESTRICTIONS ARE NOW IN EFFECT

RESTRICCIONES OBLIGATORIAS DE RIEGO ESTÁN EN VIGOR

YOU ARE IN VIOLATION OF STAGE 2 DROUGHT CONTINGENCY PLAN OUTDOOR WATERING RESTRICTIONS

All landscape and outdoor water use is currently prohibited from 6:00 a.m. - 7:00 p.m. and limited to two days per week, based on meter service address.

Violation of City of Waco, TX, Code of Ordinances art. IV, § 26-98 (2020) is a misdemeanor, punishable by a fine of up to \$2,000.

This notification is a warning. A repeat violation of this ordinance will result in a citation.

ESPAÑOL

USTED ESTÁ EN VIOLACIÓN DE LAS RESTRICCIONES DE RIEGO DEL PLAN DE CONTINGENCIA DE SEQUÍA DE LA ETAPA 2

Actualmente, todo uso de agua al aire libre está prohibido de 6:00 a.m. a 7:00 p.m. y limitado a dos días por semana, según la dirección de servicio del medidor.

Violación del Código de Ordenanzas de la Ciudad de Waco, TX, art. IV, § 26-98 (2020) es un delito menor, con una multa posible de hasta \$2,000.

Esta notificación es una advertencia. Una violación repetida de esta ordenanza resultará en una multa.

WATERING SCHEDULE

Last Digit of Address

**ODD (1, 3, 5, 7, 9) -
TUESDAY AND SATURDAY**

**EVEN (0, 2, 4, 6, 8) -
WEDNESDAY AND SUNDAY**

**ALL NON RESIDENTIAL -
MONDAY AND FRIDAY**

NO WATERING ON THURSDAY

HORARIO DE RIEGO

Último dígito de dirección

**IMPAR (1, 3, 5, 7, 9) -
MARTES Y SABADO**

**PAR (0, 2, 4, 6, 8) -
MIÉRCOLES Y DOMINGO**

**TODO NO RESIDENTIAL -
LUNES Y VIERNES**

NO RIEGO DE AGUA LOS JUEVES

Exhibit F

Water Conservation and Drought Contingency Plan

Plan Effective Date: July 13, 2022

Talking Points:

- Following a prolonged period of hot and dry conditions and a continued decline in water levels at Lake Waco, the City of Waco is enacting Stage 2 of its water conservation and drought contingency plan, effective Monday, July 13.
 - The City of Waco is bypassing Stage 1 of the plan given the long-term forecast and lack of inflow into Lake Waco and the Bosque River.
 - The plan is part of an ordinance approved by the City of Waco City Council and allows the City Manager to implement the applicable provision and authority to initiate or terminate drought measures.
 - The current weather pattern does not indicate rain, or significant rain, in the near future. Minus a tropical storm, Lake Waco will be at the lowest level by the end of summer since daily record track began in 2000.
- Lake Waco is at the lowest level since 2013, it began to rain shortly after the Lake hit 455. As of today, the current elevation is 454.98.
- In a normal year, summer usage for a typical residence is 76% higher than winter usage, largely due to irrigation.
- The actual yield of water declines each year in the Lake Waco reservoir due to inflows of sediment and the annual usage increases each year due to new businesses and households coming into the region.
- Stage 2 is designed to slow the decline of the water level by the thoughtful, meaningful reduction in outside, non-essential water use.
- Water Conservation Plan includes:
 - The City of Waco commits to the reduction of outside water use by 30% to include reductions in water use for the Parks and Recreation Department and the Cameron Park Zoo.
 - Residential, Commercial, and Industrial customers will be allowed to water between 7 PM to 6 AM twice a week based on their address or customer classification.
 - Excessive watering will be monitored (run-off beyond 10 feet of the property).
 - Wholesale water customers will be required to follow Stage 2 guidelines.
 - Enforcement of the water restrictions will include warnings and the issuance of criminal penalties.

Outdoor Watering Schedule:

If your address ends in:	Allowed Watering Days under Stage 2 Drought Restrictions
Odd Number	Tuesday and Saturday

Even Number	Wednesday and Sunday
Non-Residential	Monday and Friday
No Watering	Thursday
Watering is allowed between 7:00 p.m. and 6:00 a.m. only.	

Current Conditions for McLennan County

[View More National Drought Maps](#)

[U.S. Drought Monitor](#) [Temperature \(30-Day Departure from Normal\)](#) [Precipitation \(30-Day % of Normal\)](#)

The U.S. Drought Monitor (USDM) is updated each Thursday to show the location and intensity of drought across the country using a five-category system, from Abnormally Dry (D0) conditions to Exceptional Drought (D4). The USDM is a joint effort of the National Drought Mitigation Center, USDA, and NOAA. [Learn more.](#)



D0 - Abnormally Dry

- Producers begin supplemental feeding for livestock
- Planting is postponed; forage germination is stunted; hay cutting is reduced
- Grass fires increase

100.00%
of McLennan
County
(D0-D4)



D1 - Moderate Drought

- Dryland crops are stunted
- Early cattle sales begin
- Wildfire frequency increases

100.00%
of McLennan
County
(D1-D4)



D2 - Severe Drought

- Pasture conditions are very poor
- Soil is hard, hindering planting; crop yields decrease
- Wildfire danger is severe; burn bans are implemented

100.00%
of McLennan
County
(D2-D4)



D3 - Extreme Drought

- Soil has large cracks; soil moisture is very low; dust and sand storms occur
- Row and forage crops fail to germinate; decreased yields for irrigated crops and very large yield reduction for dryland crops are reported
- Need for supplemental feed, nutrients, protein, and water for livestock increases; herds are sold

43.81%
of McLennan
County
(D3-D4)

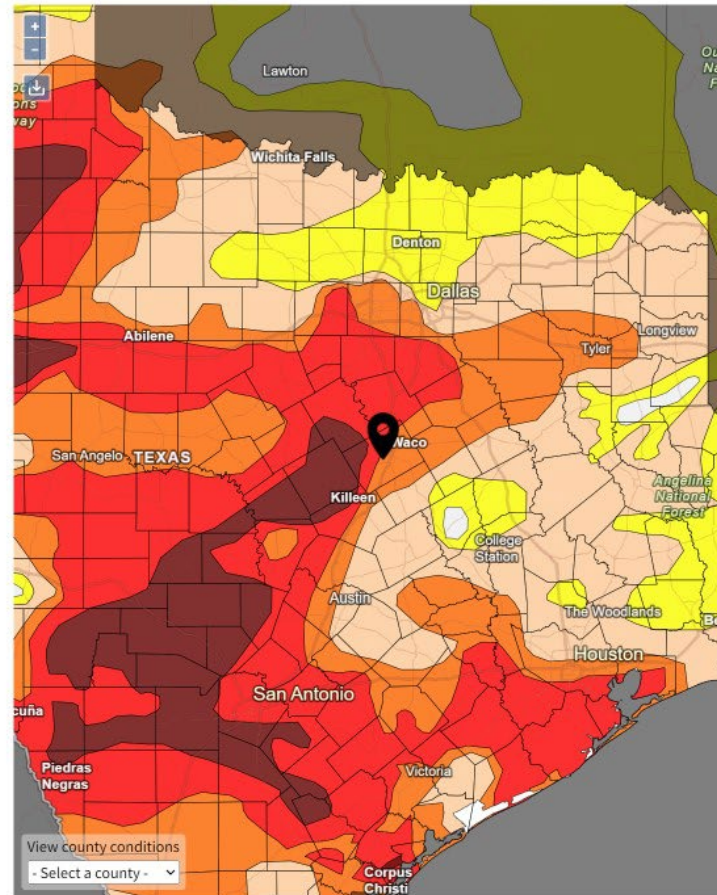


D4 - Exceptional Drought

- Exceptional and widespread crop loss is reported; rangeland is dead; producers are not planting fields
- Seafood, forestry, tourism, and agriculture sectors report significant financial loss
- Extreme sensitivity to fire danger; firework restrictions are implemented

15.30%
of McLennan
County
(D4)

Source(s): NDMC, NOAA, USDA



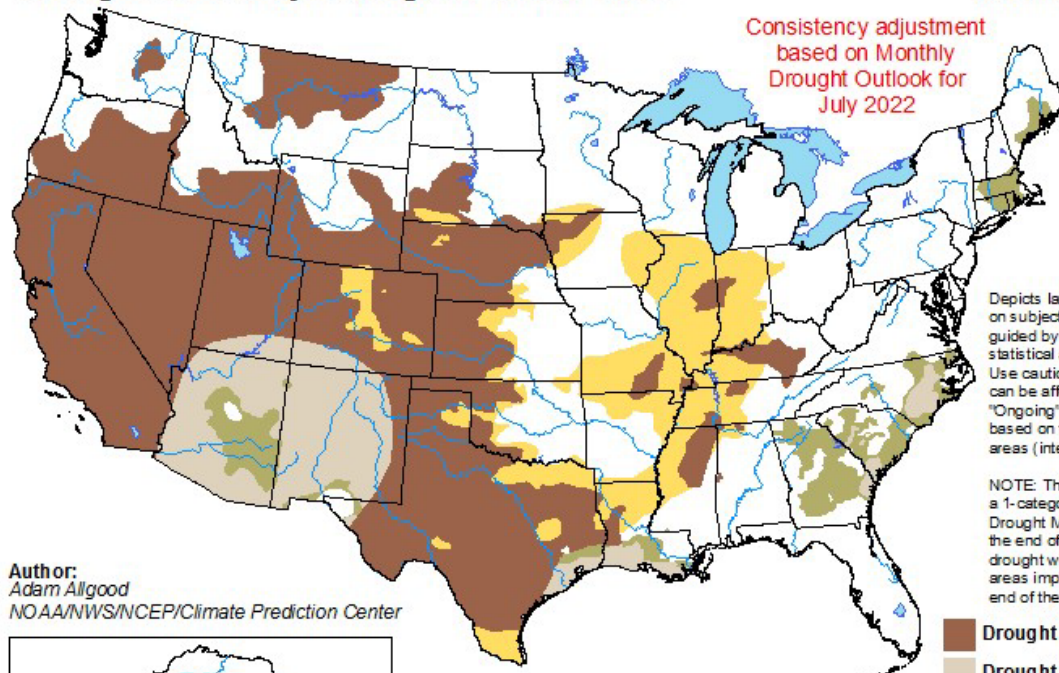
Updates Weekly - 07/05/22

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for July 1 - September 30, 2022
Released June 30, 2022

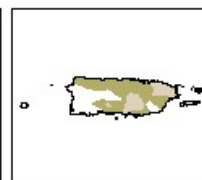
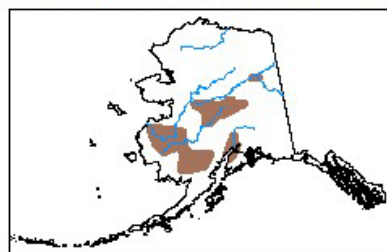
Consistency adjustment
based on Monthly
Drought Outlook for
July 2022







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:
Adam Allgood
NOAA/NWS/NCEP/Climate Prediction Center



-  Drought persists
-  Drought remains but improves
-  Drought removal likely
-  Drought development likely



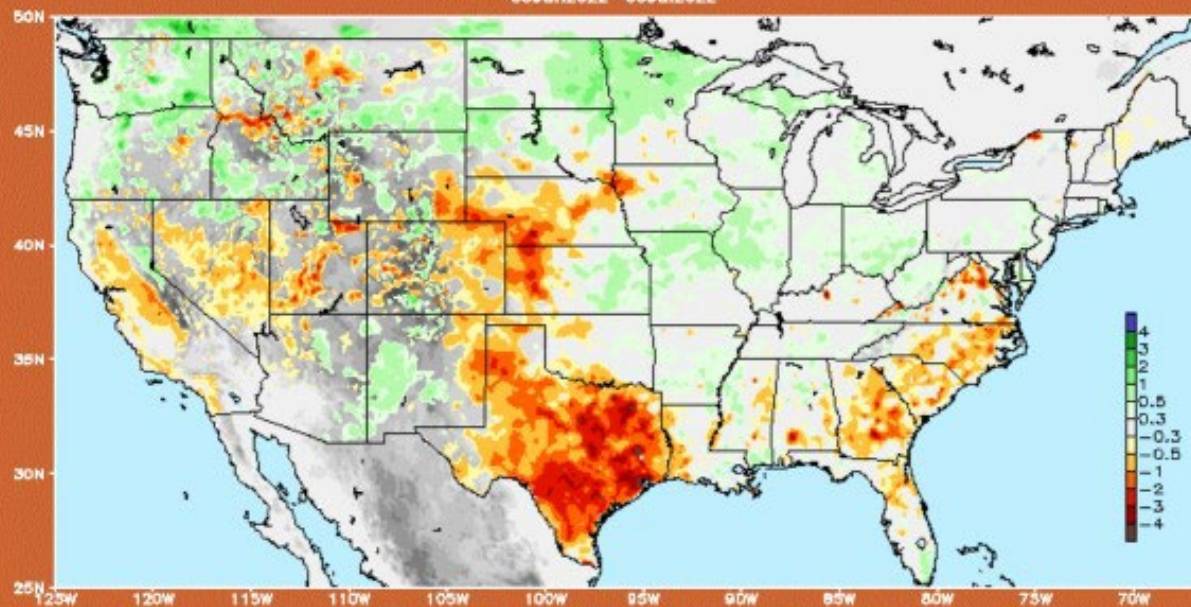
<http://go.usa.gov/3eZ73>

Surface Hydrology Evaporation Anomaly

Weekly

Monthly

03Jun2022 - 03Jul2022



Notes about this product:

- Units are millimeters per day (mm/day)
- Data source: North American Land Data Assimilation System (NLDAS)
- GeoTIFF: Undefined value is 9.999E+20

Related Links:

- [2-panel Ensemble graphic](#)
- [4-panel \(MOSAIC, NOAH, SAC, VIC\) graphic](#)
- [GeoTIFF](#)

Contacts: Muthuvel Chelliah (Muthuvel.Chelliah@noaa.gov) & Li Xu (li.xu@noaa.gov)

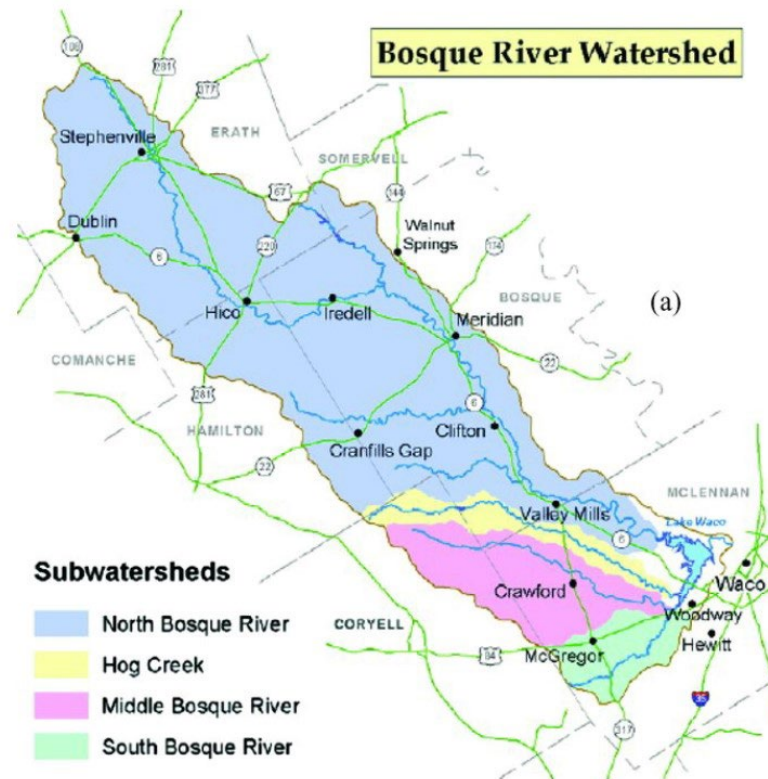
Drainage Basin for the Lake is 1,640 square miles

**Primary Direct Inflows
(Where the Water Comes From)**

- North Bosque River = 70%
- Hog Creek = 4%
- South and Middle Bosque = 20%
- Direct Runoff into Lake = 1%

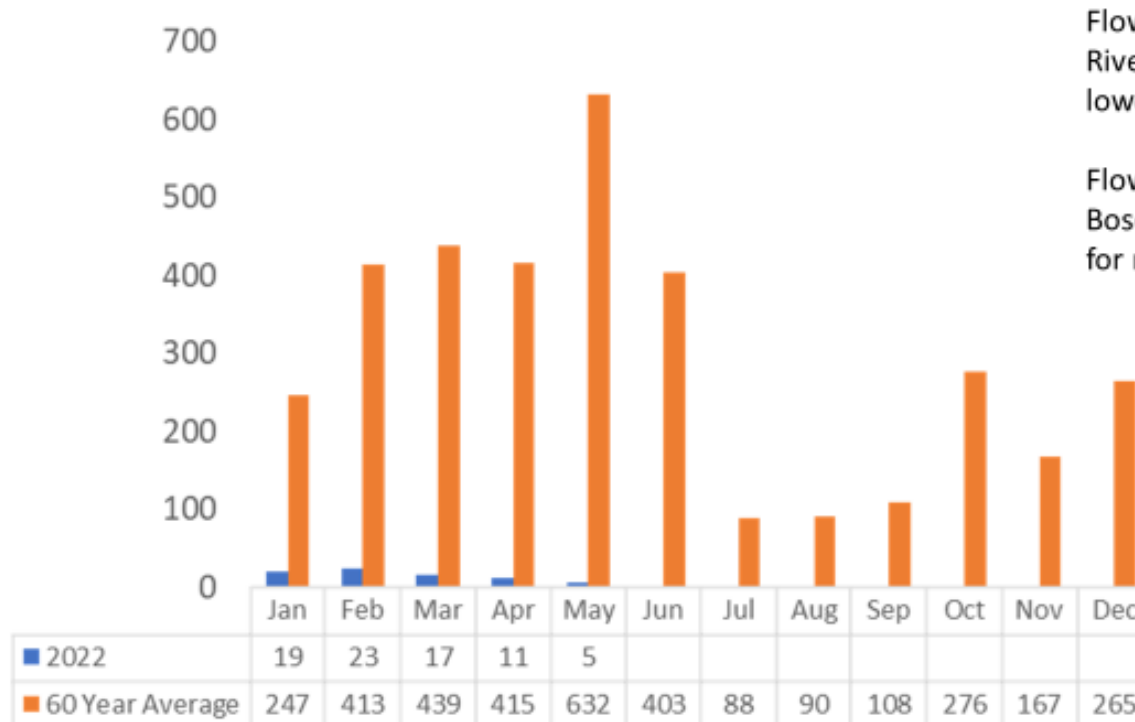
Source: Lake Waco Comprehensive Study, 2010

North Bosque River is critical to lake level since it provides 70% of the annual inflow into Lake Waco.



N Bosque Flows into the Lake Are Non-Existent

Source: USGS, National Water Information System
Gauge 08095200 - North Bosque River at Valley Mills, Texas



Flow into Lake Waco from North Bosque River for May and June will be the 2nd lowest on record (since 1959)

Flow into Lake Waco from the North Bosque has been less than 5% of normal for more than five months

Map of real-time streamflow compared to historical streamflow for the day of the year

North Bosque River

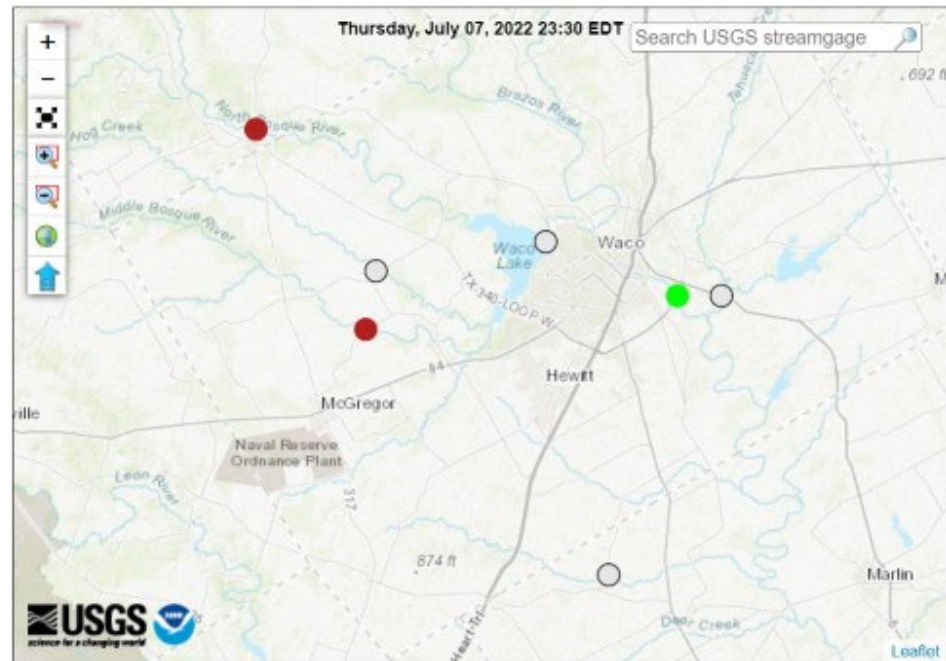
70% of flows into Lake Waco come from North Bosque River
N Bosque Gauge is running at 5% of its 60 average

Hog Creek

No discharge occurring into Lake Waco

Middle Bosque River

No discharge occurring into Lake Waco



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

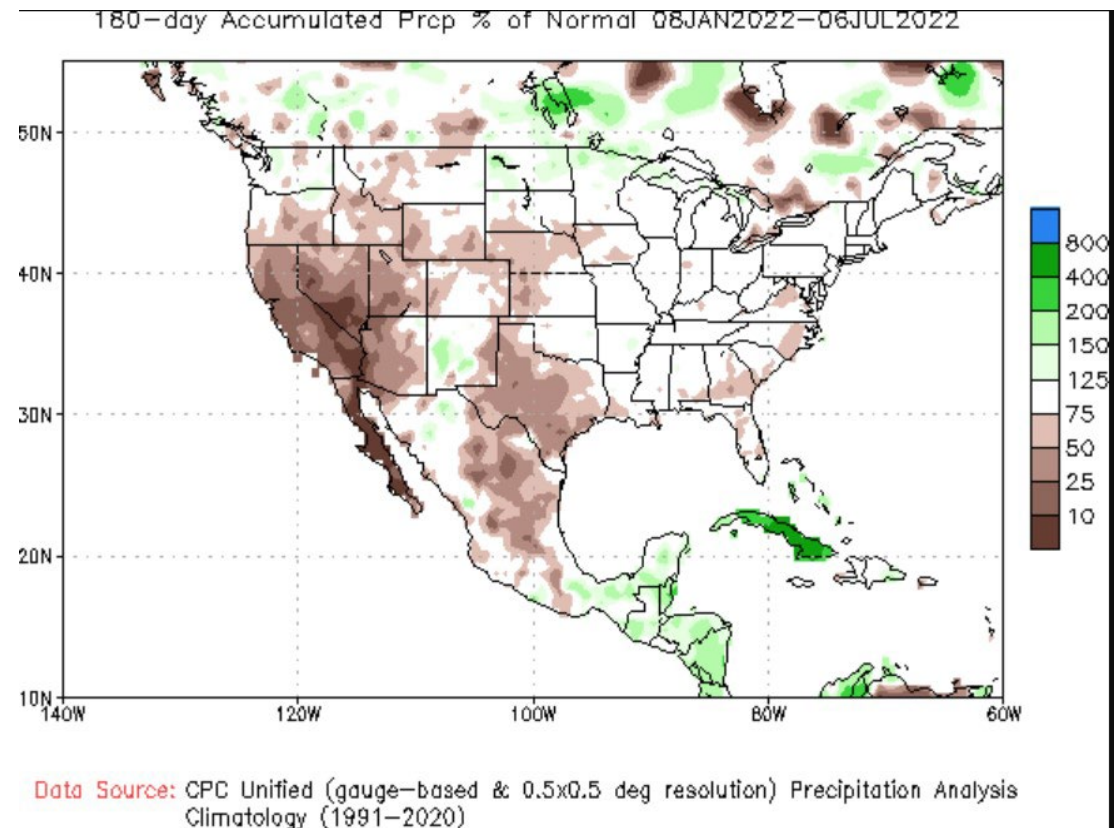
Precipitation in the Drainage Basin has been less than 50% of normal for six months

Waco Regional Airport Rain

2022: 8.6"

Avg 1901 – 2022: 18.7"

6th Driest January – June on record since 1901

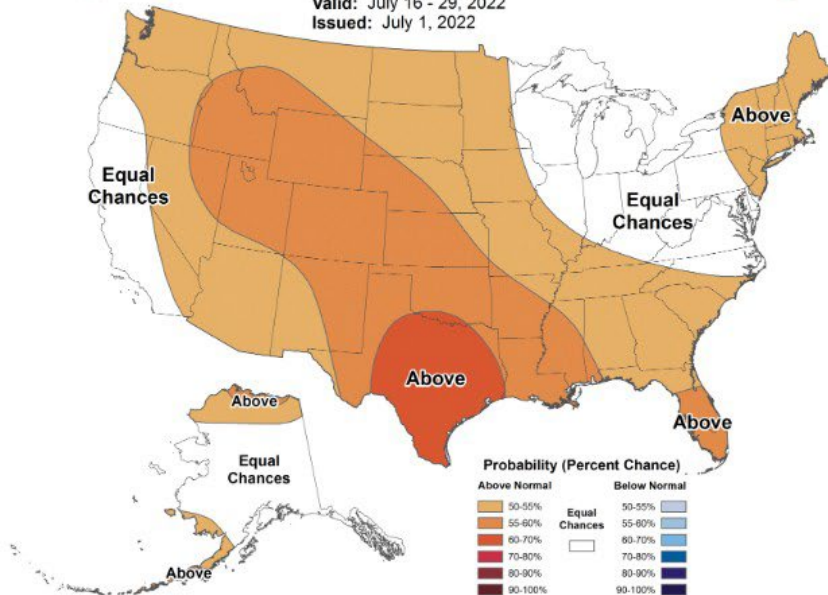




Weeks 3-4 Temperature Outlook



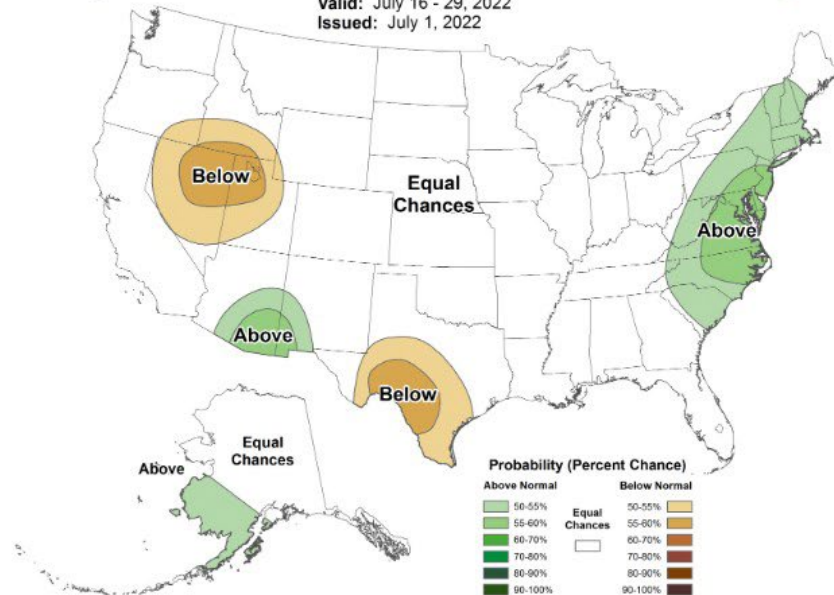
Valid: July 16 - 29, 2022
Issued: July 1, 2022



Weeks 3-4 Precipitation Outlook

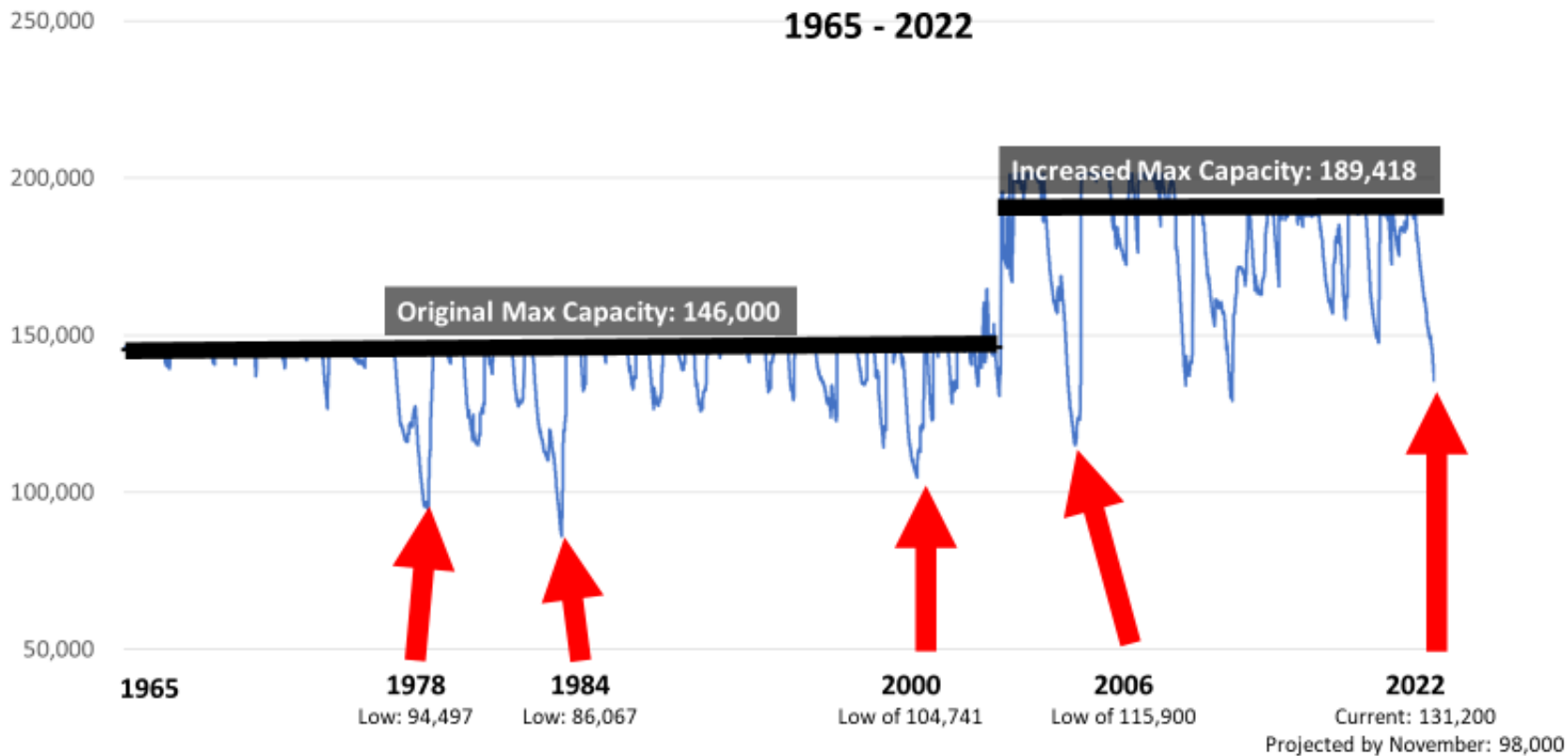


Valid: July 16 - 29, 2022
Issued: July 1, 2022



Lake Waco Storage Data in Acre-Feet

1965 - 2022



Summary

- **Lake Level**
 - Lower than Median at this time of year
 - Has dropped 8' in six months
 - Now at 71% of capacity with potential to be at 50% by the end of 2022
- **Precipitation**
 - Historically Low; ~~8~~ driest on record (January-June)
- **Inflow into the Lake**
 - Historically Low; Less than 5% of the ~~60~~ year average
- **Soil Moisture Content**
 - Very Low; Between 1%–5% of historical averages
- **Temperatures**
 - Historically High; ~~5~~ hottest on record (June 2022); hottest May on record as well
 - Excessive Heat Warning for next three days with highs up to 106
 - Evaporation in the streams, ponds, and Lake Waco occurring more quickly due to high temperatures
- **Drought**
 - All of Drainage Basin for Lake Waco is in Extreme Drought (D3) and Exceptional Drought (D4) Status
 - Climate Prediction Center indicates that will persist through September 2022