
Lake Thunderbird TMDL Monitoring Plan Implementation: Sample Year (SY) 2024- March Report



OKLAHOMA
Water Resources Board

Lake Thunderbird TMDL Monitoring Plan Implementation:

March 2024 Monitoring Report

Oklahoma Water Resources Board
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SUMMARY OF MARCH SAMPLING

Sampling for March 2024 occurred during base flow conditions on the eighteenth. Water samples were collected at nine locations and discharge was measured at two locations. Two samples were collected at JB-1, one on the upstream side of the bridge and the other on the downstream side of the bridge. Mesonet shows no precipitation on the eighteenth, 0.03 inches of precipitation in the 72 hours prior to sampling, and 1.37 inches of precipitation in the 72 hours after sampling occurred. The total rainfall amount in Norman for the month of March was 2.61 inches. Samples were not collected at LT-1 since this station will be relocated.

RESULTS

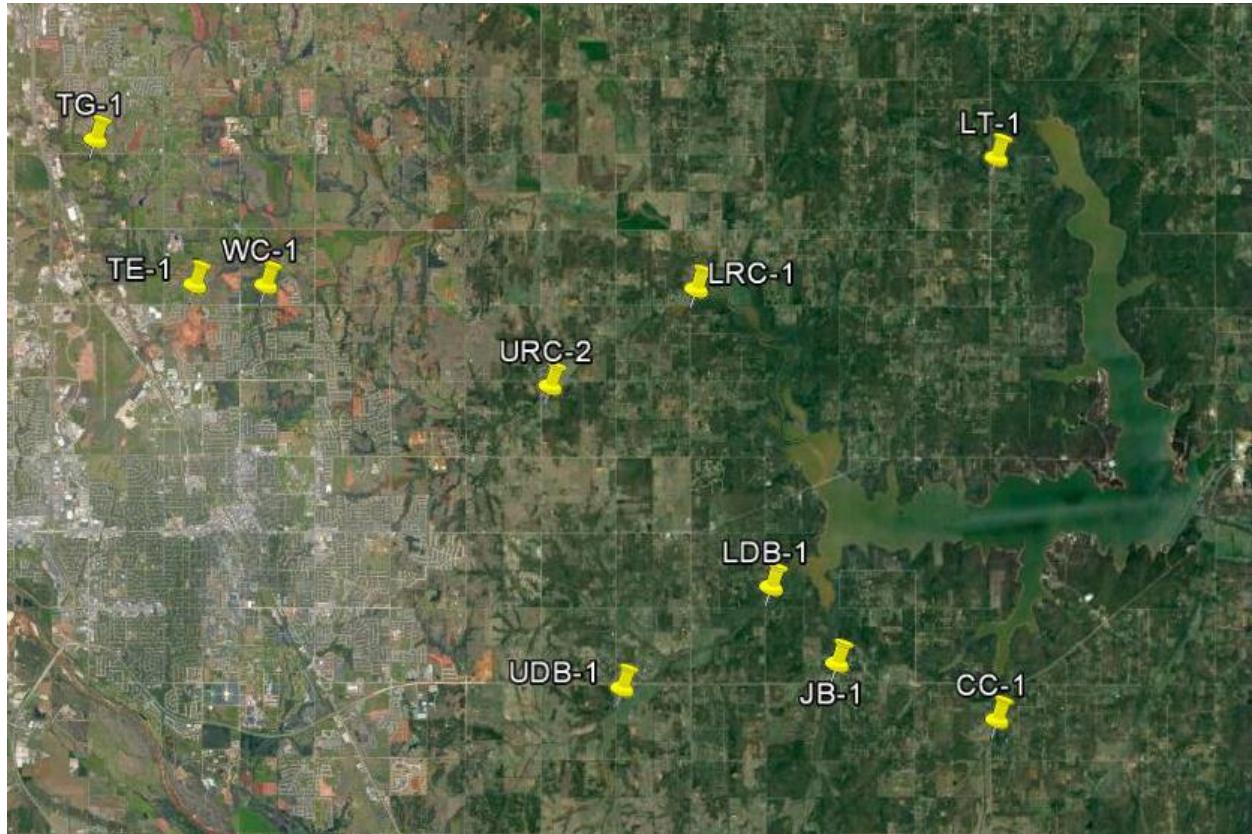


Figure 1 Monitoring Station Map

Monitoring Location ID	Monitoring Location Name	Date	Time	Field Crew	Water Temperature (°C)	Dissolved Oxygen (DO) (mg/L)	pH	Specific Conductance (µS/cm)	Turbidity (NTU)	Notes
CC-1	Clear Creek	3/18/2024	10:10	LES	11.9	8.28	7.74	663	5	Beaver dam still upstream of bridge
JB-1	Jim Blue Creek	3/18/2024	9:15	LES	8.2	7.94	7.38	955	6	Water present on both sides of bridge, so sampled up and downstream. Pool-like conditions up, low flow down; lots of filamentous algae and trash
LDB-1	Lower Dave Blue Creek	3/18/2024	11:05	LES	13.4	8.54	8.17	847	25	Brown coloration to water
LRC-1	Lower Rock Creek	3/18/2024	11:48	LES	11.5	10.30	8.17	708	5	Pool-like with low flow
TE-1	Little River Tributary	3/18/2024	14:04	LES	15.1	9.77	8.03	891	17	Continued presence of two beaver dams upstream; roadwork ongoing around bridge
TG-1	Little River	3/18/2024	15:05	LES	14.8	13.83	8.31	1064	2	Orifice half out of water
UDB-1	Upper Dave Blue Creek	3/18/2024	8:53	LES	10.1	8.83	7.67	926	18	Water has brownish tint, filamentous algae starting to grow thick
URC-2	Upper Rock Creek	3/18/2024	12:45	LES	12.4	8.82	8.02	871	8	Construction appears finished, road was repaved on both sides of bridge
WC-1	Woodcrest Creek	3/18/2024	13:20	LES	13.2	11.70	8.16	989	4	Orifice half out of water

Table 1 Field Data Form

Monitoring Location ID	Monitoring Location Name	Nitrate and Nitrite (mg/L)	Kjeldahl Nitrogen (mg/L)	Phosphorus (mg/L)	Total Suspended Solids (mg/L)
CC-1	Clear Creek	<0.05	0.16	0.036	<5.0
JB-1	Jim Blue Creek (us)	<0.05	0.21	0.026	9.0
JB-1	Jim Blue Creek (ds)	<0.05	0.20	0.021	<5.0
LDB-1	Lower Dave Blue Creek	<0.05	0.33	0.041	28.0
LRC-1	Lower Rock Creek	<0.05	0.17	0.023	<5.0
TE-1	Little River Tributary	<0.05	0.44	0.038	8.0
TG-1	Little River	<0.05	0.27	0.021	<5.0
UDB-1	Upper Dave Blue Creek	<0.05	0.20	0.026	16.0
URC-2	Upper Rock Creek	<0.05	0.32	0.039	6.0
WC-1	Woodcrest Creek	<0.05	0.31	0.031	5.0

Table 2 Laboratory Analysis Summary

Monitoring Location Name	Nitrate and Nitrite (mg/L)	Kjeldahl Nitrogen (mg/L)	Phosphorus (mg/L)	Total Suspended Solids (mg/L)
Field Blank	<0.05	<0.10	<0.010	<5.0
Duplicate	<0.05	0.20	0.036	<5.0
Duplicate RPD	0%	22.22%*	0%	0%

Table 3 QA/QC Data Where the Asterisk Denotes RPD2

Quality assurance/quality control (QA/QC) of the data includes a field blank and duplicate sample from each collection event and is qualified by the OWRB. Relative Percent Difference (RPD) of the duplicate sample can be categorized into four levels, where Level 1 likely has no QA issues and Level 4 has major QA issues and should be used with caution.

Monitoring Location ID	Monitoring Location Name	Discharge (cfs)	Stream Stage (ft)
CC-1	Clear Creek	10.94	22.51
JB-1	Jim Blue Creek	0.15	7.37
LDB-1	Lower Dave Blue Creek	8.10	16.74
LRC-1	Lower Rock Creek	0.21	3.50
TE-1	Little River Tributary	0.17	10.60
TG-1	Little River	0.39	8.83
UDB-1	Upper Dave Blue Creek	0.06	17.15
URC-2	Upper Rock Creek	0.24	10.95
WC-1	Woodcrest Creek	0.03	7.28

Table 4 Station Discharge Summary

All rated stream discharges are provisional and subject to change.

File Information

File name	Jim Blue Creek_20240318.ft		
Start date and time	3/18/2024 9:44 AM		
Start location latitude	35.190		
Start location longitude	-97.303		
Calculations engine	FlowTracker2		
Data collection mode	Discharge		

System Information

Discharge Summary

Start time	3/18/2024 9:45 AM	End time	3/18/2024 10:01 AM
# Stations	14	Avg Interval	40
Mean depth	0.502 ft	Max depth	0.800 ft
Mean velocity	0.0498 ft/s	Max velocity	0.1613 ft/s
Mean SNR	32 dB	Total width	6.000 ft
Mean temp	47.462 °F	Total area	3.0125 ft ²
Wetted Perimeter	6.359 ft	Total discharge	0.1501 ft ³ /s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.7%	6.9%
Velocity	1.0%	16.3%
Width	0.2%	0.2%
Method	3.7%	
# Stations	3.6%	
Overall	5.4%	17.7%

Viewer Controls

Chart size + | Chart size - | Reset all

Discharge Measurement Summary

Save PDF of summary

Summary overview

No changes were made to this file
Quality control warnings

Supplemental data summary

Gauge height time	Gauge height (ft)	Rated discharge (ft ³ /s)	Temperature (°F)	Salinity (PSS-78)	Gauge height comments
3/18/2024 9:45 AM	7.370				

Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft ²)	Flow (ft ³ /s)	%Q
0	9:45 AM	0.000	None	0.000	0.0000	0.000	0	0.0000		0.0000	0.0000	0.0000	0.00 ✓
1	9:46 AM	0.500	0.6	0.300	0.6000	0.180	80	0.0000	1.0000	0.0000	0.1500	0.0000	0.00 ✓
2	9:47 AM	1.000	0.6	0.400	0.6000	0.240	80	0.0010	1.0000	0.0010	0.2000	0.0002	0.14 ✓
3	9:49 AM	1.500	0.6	0.500	0.6000	0.300	80	0.0002	1.0000	0.0002	0.2500	0.0000	0.03 ✓
4	9:50 AM	2.000	0.6	0.500	0.6000	0.300	80	-0.0002	1.0000	-0.0002	0.2500	0.0000	-0.03 ✓
5	9:51 AM	2.500	0.6	0.700	0.6000	0.420	80	0.0314	1.0000	0.0314	0.3500	0.0110	7.32 ✓
6	9:52 AM	3.000	0.6	0.800	0.6000	0.480	80	0.1052	1.0000	0.1052	0.3000	0.0316	21.04 ✓
7	10:01 AM	3.250	0.6	0.800	0.6000	0.480	80	0.1090	1.0000	0.1090	0.2000	0.0218	14.53 ✓
8	9:53 AM	3.500	0.6	0.700	0.6000	0.420	80	0.1613	1.0000	0.1613	0.2625	0.0423	28.21 ✓
9	9:55 AM	4.000	0.6	0.700	0.6000	0.420	80	0.1329	1.0000	0.1329	0.3500	0.0465	30.99 ✓
10	9:56 AM	4.500	0.6	0.600	0.6000	0.360	80	0.0000	1.0000	0.0000	0.3000	0.0000	0.01 ✓
11	9:57 AM	5.000	0.6	0.400	0.6000	0.240	80	-0.0142	1.0000	-0.0142	0.2000	-0.0028	-1.90 ✓
12	9:59 AM	5.500	0.6	0.400	0.6000	0.240	80	-0.0025	1.0000	-0.0025	0.2000	-0.0005	-0.33 ✓
13	10:00 AM	6.000	None	0.000	0.0000	0.000	0	0.0000		-0.0025	0.0000	0.0000	0.00 ✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	9:46 AM	0.500	0.6	0.300	0.6000	0.180	SNR Threshold Variation
2	9:47 AM	1.000	0.6	0.400	0.6000	0.240	SNR Threshold Variation
3	9:49 AM	1.500	0.6	0.500	0.6000	0.300	SNR Threshold Variation
4	9:50 AM	2.000	0.6	0.500	0.6000	0.300	SNR Threshold Variation
5	9:51 AM	2.500	0.6	0.700	0.6000	0.420	SNR Threshold Variation
6	9:52 AM	3.000	0.6	0.800	0.6000	0.480	SNR Threshold Variation,High Stn % Discharge
7	10:01 AM	3.250	0.6	0.800	0.6000	0.480	Low SNR,SNR Threshold Variation,High Stn % Discharge
8	9:53 AM	3.500	0.6	0.700	0.6000	0.420	SNR Threshold Variation,High Stn % Discharge
9	9:55 AM	4.000	0.6	0.700	0.6000	0.420	SNR Threshold Variation,High Stn % Discharge
10	9:56 AM	4.500	0.6	0.600	0.6000	0.360	SNR Threshold Variation
11	9:57 AM	5.000	0.6	0.400	0.6000	0.240	Beam SNRs Not Similar

Figure 2 Discharge Measurement Summary JB-1

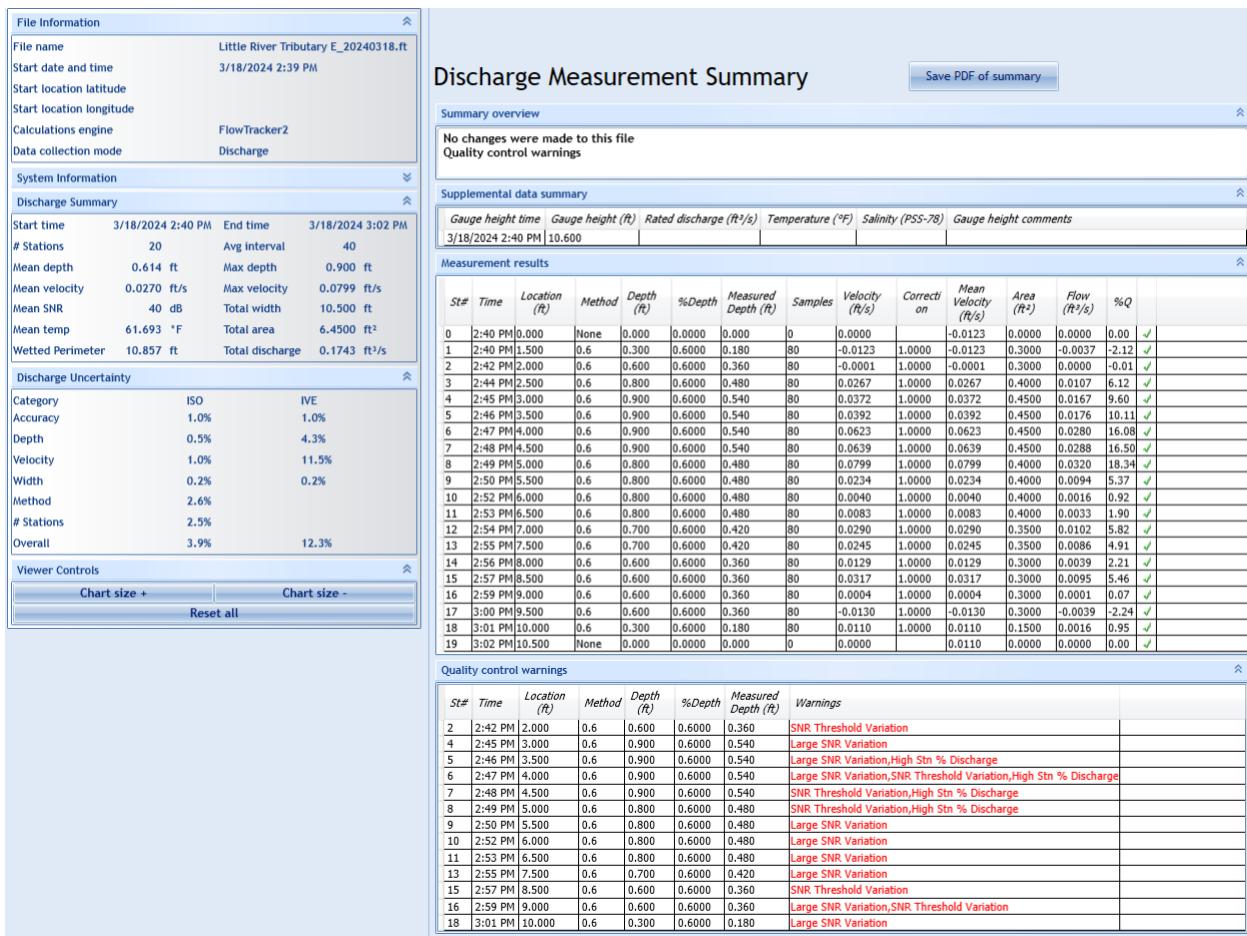


Figure 3 Discharge Measurement Summary TE-1

Period Selected: 2024-03-01 00:00 - 2024-03-31 23:59

UTC Offset: -06:00

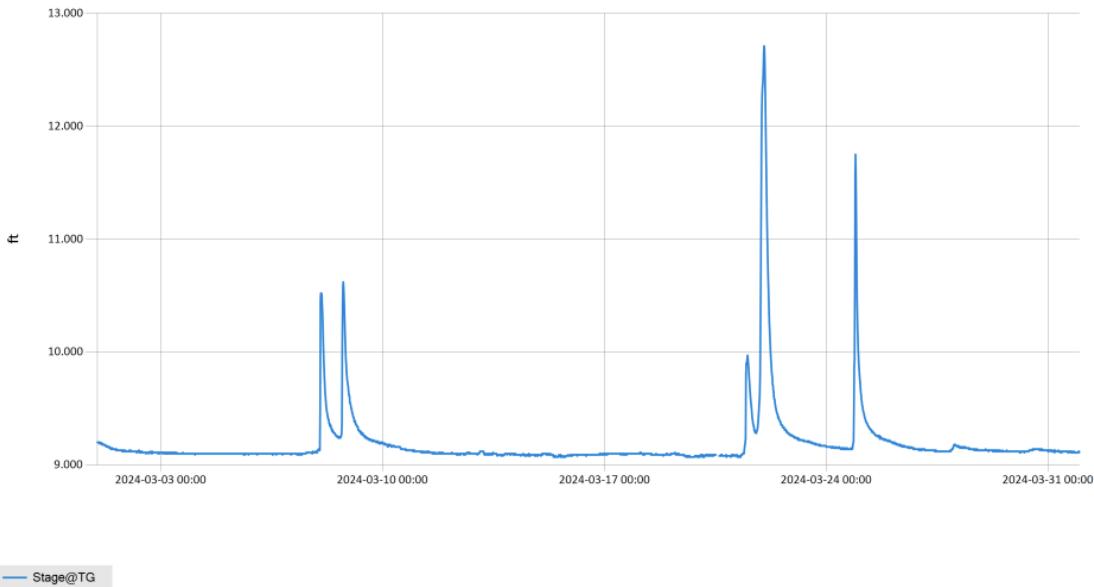


Figure 4 Monthly Hydrograph TG-1

Period Selected: 2024-03-01 00:00 - 2024-03-31 23:59

UTC Offset: -06:00

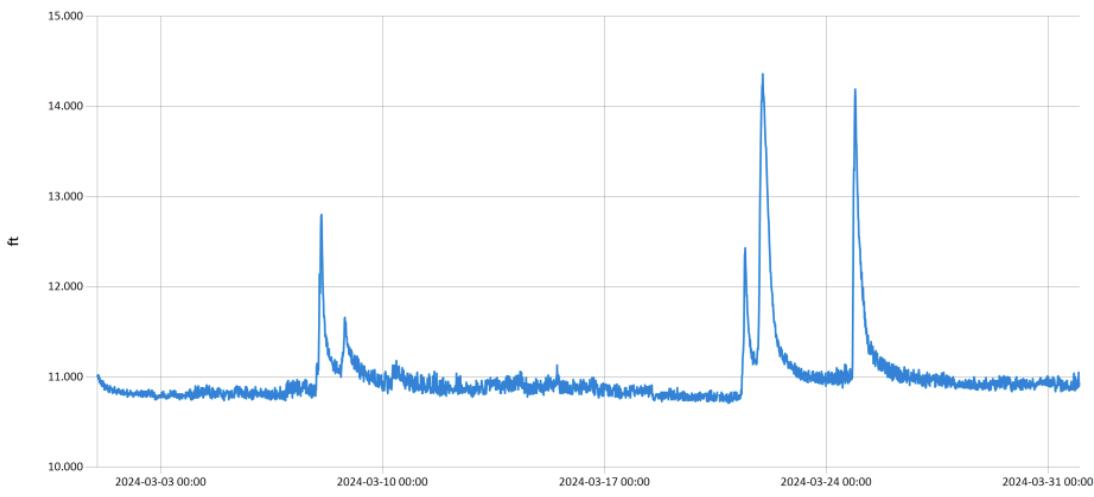


Figure 5 Monthly Hydrograph TE-1

Period Selected: 2024-03-01 00:00 - 2024-03-31 23:59

UTC Offset: -06:00

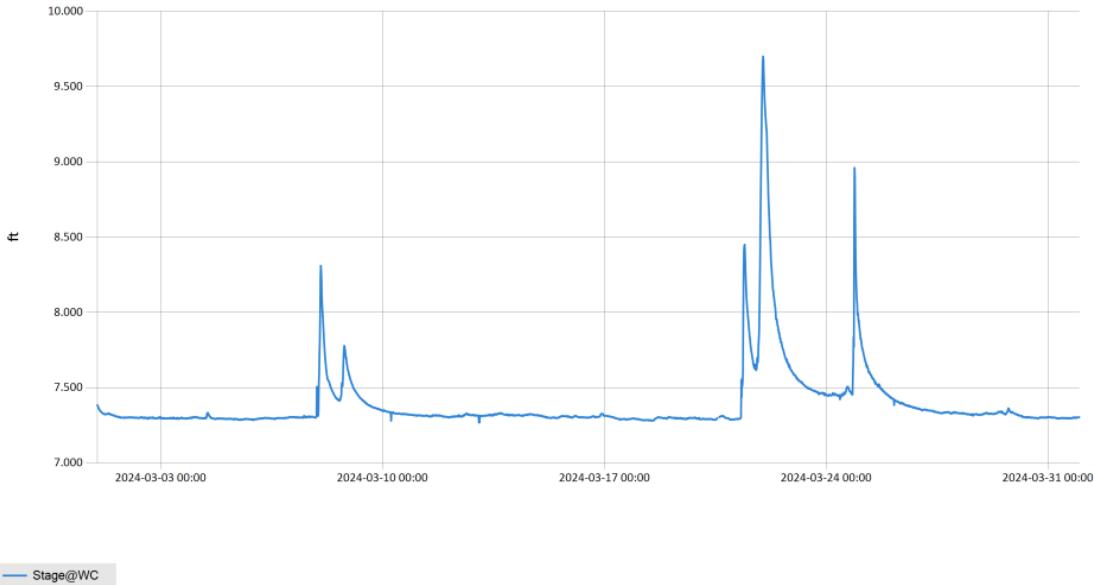


Figure 6 Monthly Hydrograph WC-1

Period Selected: 2024-03-01 00:00 - 2024-03-31 23:59

UTC Offset: -06:00

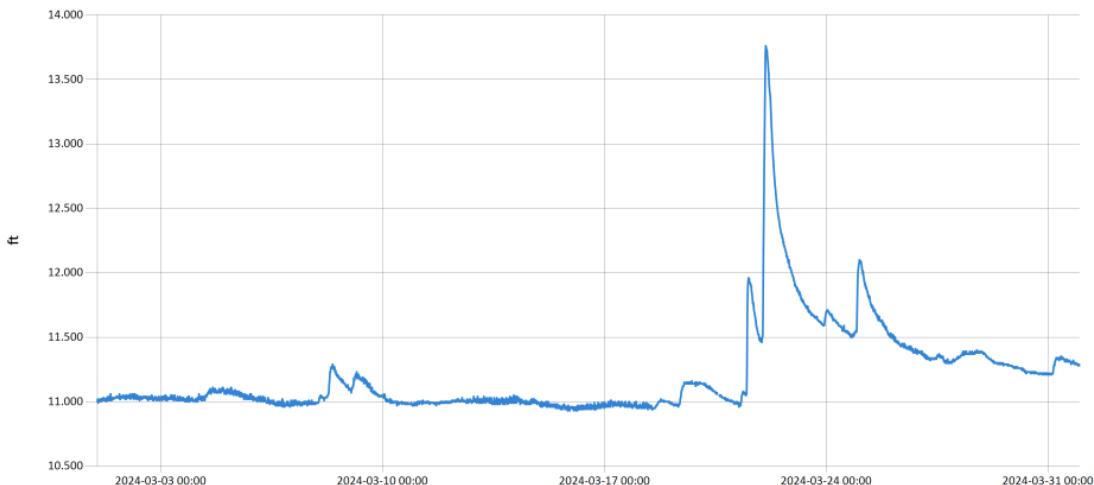


Figure 7 Monthly Hydrograph URC-2

Period Selected: 2024-03-01 00:00 - 2024-03-31 23:59

UTC Offset: -06:00

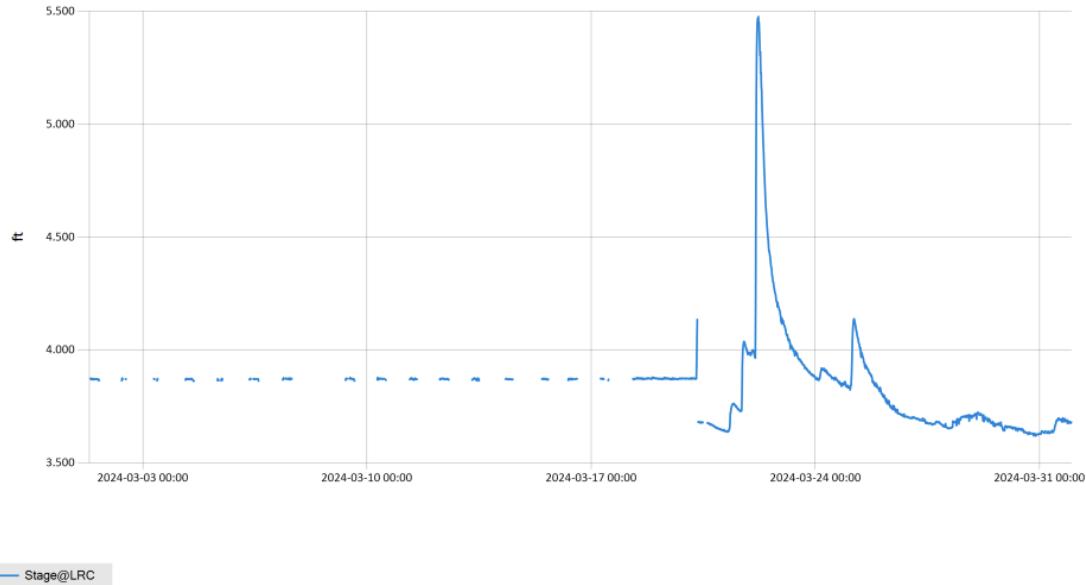


Figure 8 Monthly Hydrograph LRC-1

Period Selected: 2024-03-01 00:00 - 2024-03-31 23:59

UTC Offset: -06:00

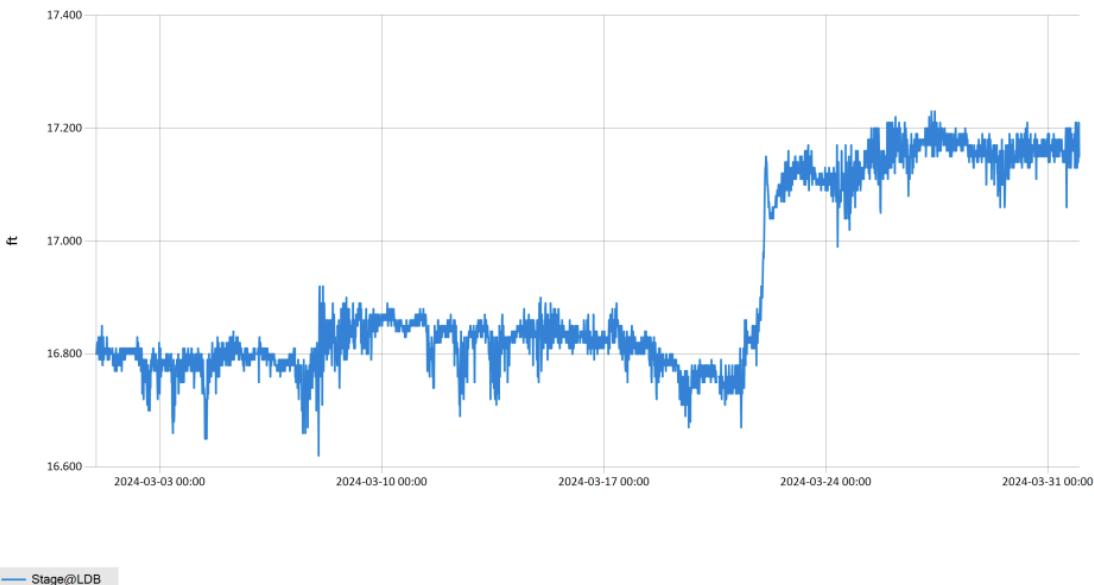


Figure 9 Monthly Hydrograph LDB-1

Period Selected: 2024-03-01 00:00 - 2024-03-31 23:59

UTC Offset: -06:00

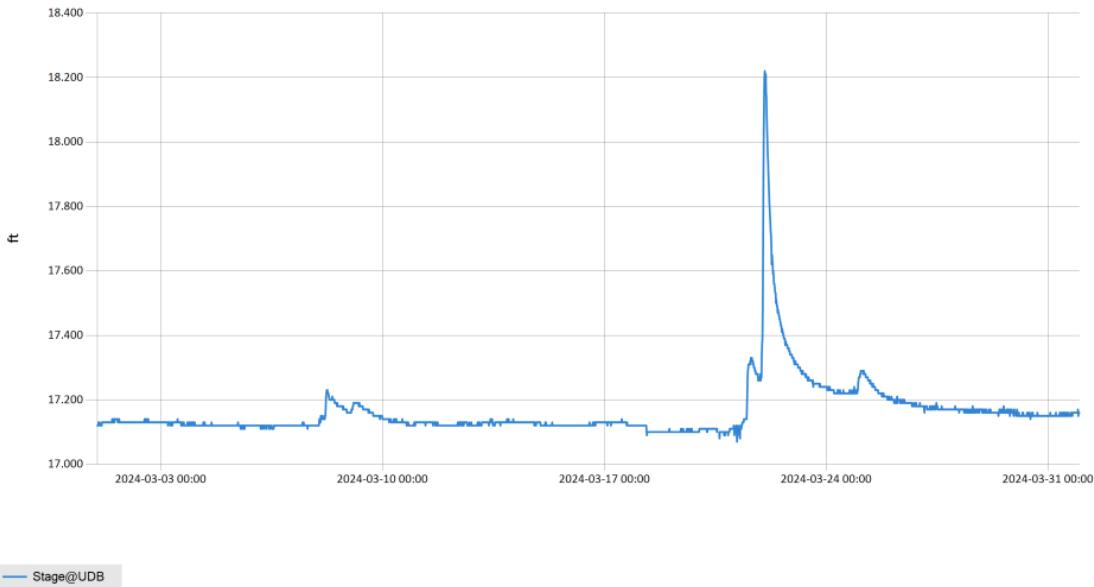


Figure 10 Monthly Hydrograph UDB-1

Period Selected: 2024-03-01 00:00 - 2024-03-31 23:59

UTC Offset: -06:00

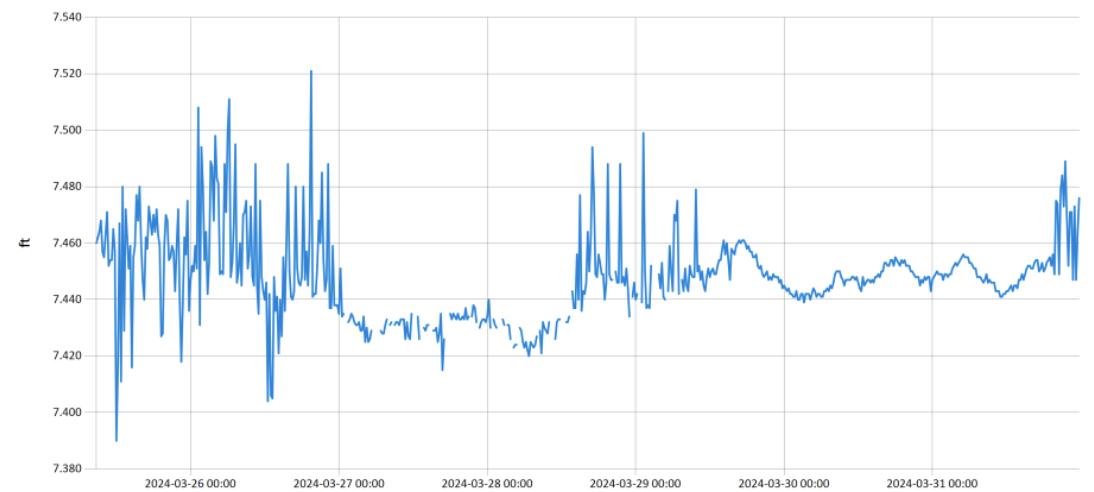


Figure 11 Monthly Hydrograph JB-1

Period Selected: 2024-03-01 00:00 - 2024-03-31 23:59 UTC Offset: -06:00

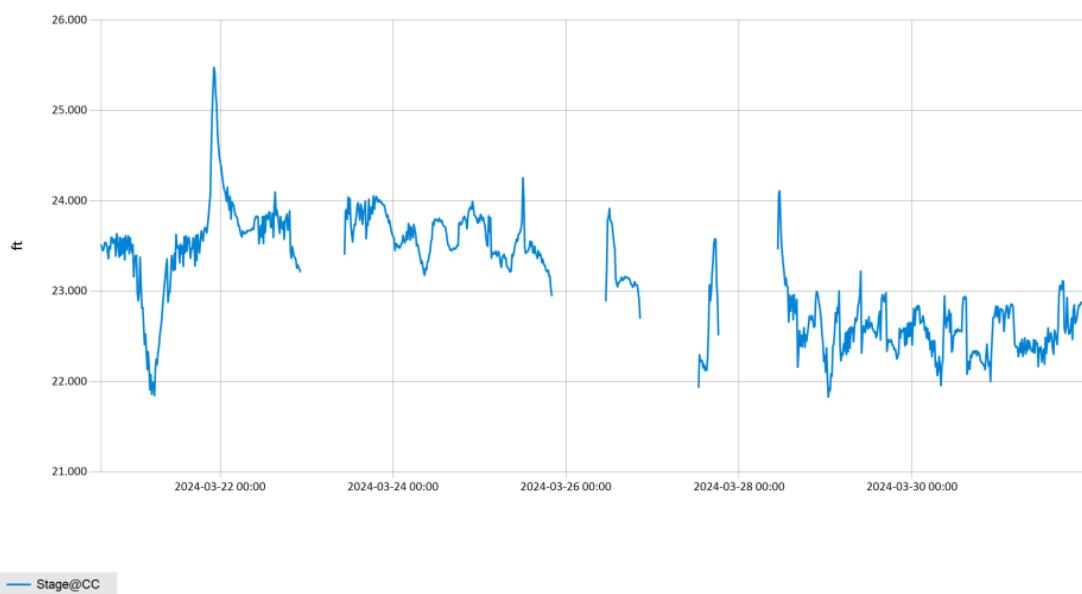


Figure 12 Monthly Hydrograph CC-1

MESONET CLIMATOLOGICAL DATA SUMMARY (NRMN) Norman Latitude: 35-14-09								March 2024 Nearest City: 2.1 NW Norman Longitude: 97-27-53								Time Zone: Midnight-Midnight CST County: Cleveland Elevation: 1171 feet					
DAY	TEMPERATURE (°F)				DEG DAYS		HUMIDITY (%)			RAIN (in)	PRESSURE (in)		WIND SPEED (mph)	SOLAR (MJ/m²)	4" SOIL TEMPERATURES						
	MAX	MIN	AVG	DEWPT	HDD	CDD	MAX	MIN	AVG		STN	MSL			SOD	BARE	MAX	MIN			
1	60	34	44.6	38.4	18	0	98	55	81	0.00	28.77	30.02	SSE	8.7	20.5	13.93	46.8	46.0	53	42	
2	81	45	62.0	42.3	2	0	94	20	56	0.00	28.59	29.84	S	11.4	29.4	18.77	49.9	52.7	62	46	
3	82	58	68.8	52.2	0	5	82	23	59	0.00	28.50	29.74	S	13.0	28.5	18.66	53.7	59.4	67	53	
4	79	50	65.8	48.7	0	0	89	22	58	0.00	28.52	29.76	S	11.4	29.2	16.54	56.0	61.9	68	58	
5	65	43	53.1	40.6	11	0	81	45	64	0.00	28.68	29.92	N	9.5	21.4	19.05	54.0	58.0	65	52	
6	72	43	56.5	47.2	7	0	95	48	73	0.00	28.66	29.90	NE	5.2	16.5	16.87	54.3	58.9	67	53	
7	76	52	64.8	51.9	1	0	95	39	65	0.31	28.48	29.72	S	10.2	32.0	13.70	56.1	61.6	67	58	
8	53	37	45.3	42.9	20	0	96	85	91	0.27	28.67	29.92	NNW	15.1	33.0	2.80	54.0	54.1	61	47	
9	54	36	43.4	27.8	20	0	86	31	57	0.01	28.95	30.20	N	10.7	26.9	19.98	50.3	48.3	54	44	
10	65*	31*	48.6*	31.5*	17*	0*	87*	29*	56*	0.00*	28.96*	30.21*	SSW*	5.6*	22.6*	NA	49.8*	47.9*	56*	41*	
11	70	40	55.8	37.4	10	0	73	34	52	0.00	28.86	30.11	S	9.8	25.9	19.77	51.3	51.3	59	44	
12	77	51	63.4	49.5	1	0	82	36	62	0.00	28.62	29.87	S	12.5	33.0	18.90	53.7	56.5	64	50	
13	82	58	69.4	56.2	0	5	91	26	67	0.00	28.44	29.68	S	12.9	30.1	19.57	56.8	61.8	69	56	
14	80	55	69.9	55.9	0	2	92	25	66	0.00	28.55	29.79	S	11.3	33.8	17.91	59.8	66.2	73	62	
15	64	45	53.7	45.2	11	0	87	55	74	0.00	28.88	30.13	N	11.1	30.4	7.74	57.3	59.9	64	57	
16	58	40	51.1	43.5	16	0	93	51	76	0.03	28.81	30.06	N	3.8	13.1	6.24	54.7	54.9	58	52	
17	64	45	55.7	31.1	10	0	84	23	43	0.00	28.83	30.08	NNE	11.9	28.3	19.34	55.0	57.3	64	53	
18	54	35	43.0	21.2	21	0	65	24	44	0.00	29.05	30.30	NNE	8.3	22.7	21.89	53.0	54.7	61	48	
19	71	37	54.3	30.7	11	0	55	27	41	0.00	28.84	30.09	SSW	10.8	25.4	21.56	52.0	54.7	64	46	
20	76	48	62.5	43.2	3	0	71	31	51	0.00	28.70	29.95	SSW	6.5	18.6	20.53	54.9	60.6	70	52	
21	63	52	56.7	53.0	8	0	97	64	88	1.37	28.68	29.93	ESE	6.3	22.4	5.40	56.0	59.2	62	57	
22	65	46	56.5	50.1	10	0	97	58	80	0.08	28.71	29.96	N	10.0	27.1	11.00	56.4	58.7	63	55	
23	63	35	49.6	38.6	16	0	90	41	68	0.00	28.83	30.08	NNE	9.4	22.7	19.08	54.6	53.6	60	47	
24	62	53	56.7	50.7	7	0	96	71	80	0.53	28.35	29.59	SSE	15.1	32.6	5.68	55.0	54.8	56	53	
25	61	34	50.1	38.3	17	0	92	44	64	0.00	28.29	29.52	WNW	13.6	31.1	16.75	54.6	55.8	61	51	
26	51	32	39.7	25.0	24	0	78	41	56	0.00	28.68	29.92	NW	10.6	30.4	22.79	50.6	48.6	54	43	
27	45	30	38.5	29.8	27	0	97	52	72	0.01	28.89	30.15	NE	4.9	14.7	5.17	49.2	44.5	47	42	
28	69	30	51.5	37.7	16	0	98	33	65	0.00	28.88	30.13	SSE	7.0	24.3	22.93	49.7	47.7	56	39	
29	75	55	63.8	50.4	0	0	81	50	63	0.00	28.62	29.86	S	12.9	31.3	11.92	53.6	53.7	58	50	
30	78	56	67.1	57.5	0	2	91	50	72	0.00	28.59	29.83	S	8.7	19.7	17.85	56.8	58.8	65	53	
31	73	63	67.5	62.1	0	3	93	73	83	0.00	28.50	29.74	S	10.4	23.4	7.91	59.3	61.5	64	59	
	67*	44*	55.8*	42.9*	<- Monthly Averages ->				28.69*	29.94*	S	*	10.0*	33.8*	15.34*	53.8*	55.6*	62*	50*		
Temperature - Highest: 82* Lowest: 30*					Degree Days - Total HDD: 304* Total CDD: 18*								Number of Days With: Tmax ≥ 90: 0* Rainfall ≥ 0.01 inch: 8* Tmax ≤ 32: 0* Rainfall ≥ 0.10 inch: 4* Tmin ≤ 32: 4* Avg Wind Speed ≥ 10 mph: 18* Tmin ≤ 0: 0* Max Wind Speed ≥ 30 mph: 10*								
Rainfall: Monthly Total: 2.61* in. Greatest 24 Hr: 1.37* in.					Humidity - Highest: 98* Lowest: 20*																

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* Denotes incomplete record

Figure 13 March Mesonet Data