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***Lake Thunderbird TMDL Monitoring Plan Implementation:  
Sample Year (SY) 2022- November Report***

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**SY-2022 Monthly Report**

*Lake Thunderbird TMDL Monitoring Plan Implementation:*

*November 2022 Monitoring Report*

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## SUMMARY OF NOVEMBER WATER QUALITY SAMPLING

Sampling for November 2022 occurred during base flow conditions on the seventh. Water samples were collected at eight locations and discharge was measured at two locations. Samples were not collected at JB-1 due to construction activity, or LT-1 due to dry conditions. Mesonet shows no precipitation on the seventh, 0.11 inches of precipitation in the 72 hours prior to sampling, and 0.40 inches of precipitation in the 72 hours after the sampling event. The total rainfall amount in Norman for the month of November was 1.90 inches. All water level gauges were operational for the month, except for JB-1 due to road construction. The gauge at LT-1 was removed in 2018 as a result of equipment malfunction. The equipment has not been replaced due to intermittent streamflow and dry conditions. Furthermore, this station is being reviewed for a possible location change.

## RESULTS

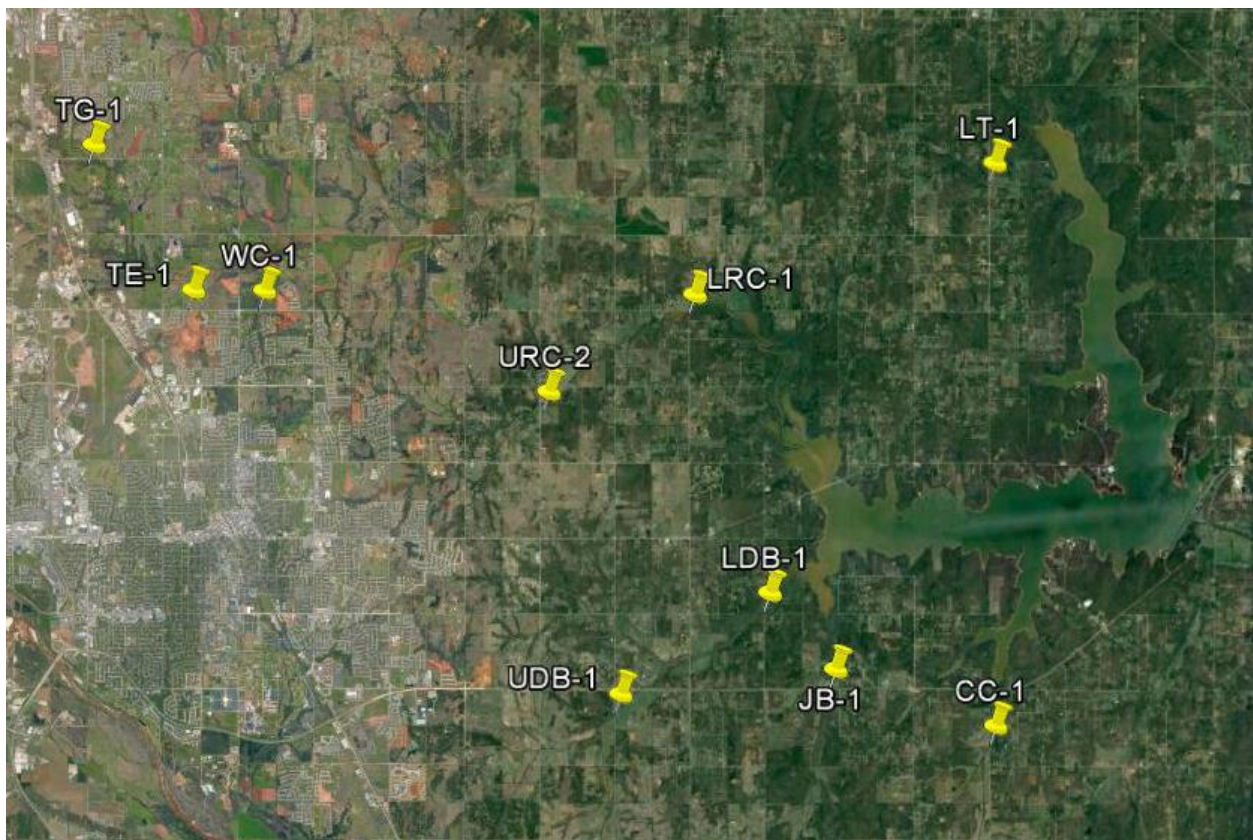


Figure 1 Monitoring Station Map

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	11/7/2022	9:10	NH	13.1	6.34	7.72	685	8	Two beaver dams- one upstream of bridge, one downstream of bridge approx 25 ft upstream of sampling area; Used RP3
JB-1	Jim Blue Creek	11/7/2022	9:50	NH	N/A	N/A	N/A	N/A	N/A	Under construction- did not sample
LDB-1	Lower Dave Blue Creek	11/7/2022	10:15	NH	12.9	2.57	7.70	645	28	Water level low ; scum on surface
LRC-1	Lower Rock Creek	11/7/2022	11:20	NH	12.5	3.61	7.59	673	10	Installed new solar panel, got rain gauge working; looked to be some oil/grease under bridge
LT-1	Lake Laterals	11/7/2022	10:45	NH	N/A	N/A	N/A	N/A	N/A	Site completely dry, did not sample
TE-1	Little River Tributary	11/7/2022	14:55	NH	14.8	9.57	7.95	542	21	Barely connected under bridge; orifice out of water
TG-1	Little River	11/7/2022	16:00	NH	14.3	8.20	7.70	651	4	Not a very prominent periphyton line; replaced battery
UDB-1	Upper Dave Blue Creek	11/7/2022	8:40	NH	12.1	2.36	7.73	674	9	Upstream not connected; water has brownish-black tint, looks like tea
URC-2	Upper Rock Creek	11/7/2022	12:40	NH	13.1	5.52	7.44	670	23	Leaves as floating debris, mostly downstream
WC-1	Woodcrest Creek	11/7/2022	14:10	NH	13.2	5.19	7.57	669	16	Beaver signs under bridge- possible early dam construction

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	0.24	0.048	<5.0
JB-1	Jim Blue Creek	N/A	N/A	N/A	N/A
LDB-1	Lower Dave Blue Creek	<0.05	0.84	0.078	11.0
LRC-1	Lower Rock Creek	<0.05	0.35	0.076	5.0
LT-1	Lake Laterals	N/A	N/A	N/A	N/A
TE-1	Little River Tributary	0.08	0.25	0.031	7.0
TG-1	Little River	<0.05	0.35	0.048	<5.0
UDB-1	Upper Dave Blue Creek	<0.05	0.91	0.171	6.0
URC-2	Upper Rock Creek	<0.05	0.74	0.090	14.0
WC-1	Woodcrest Creek	<0.05	0.46	0.097	6.0

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	0.24	0.048	<5.0
Duplicate RPD	0%	0%	0%	0%

Table 3 QA/QC Data

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	0.27	20.24
JB-1	Jim Blue Creek	N/A	N/A
LDB-1	Lower Dave Blue Creek	0.14	13.92
LRC-1	Lower Rock Creek	1.88	4.39
LT-1	Lake Laterals	N/A	N/A
TE-1	Little River Tributary	0.01	10.67
TG-1	Little River	0.30	8.77
UDB-1	Upper Dave Blue Creek	0.01	16.92
URC-2	Upper Rock Creek	0.01	10.64
WC-1	Woodcrest Creek	0.01	7.49

Table 4 Station Discharge Summary

All rated stream discharges are provisional and subject to change.

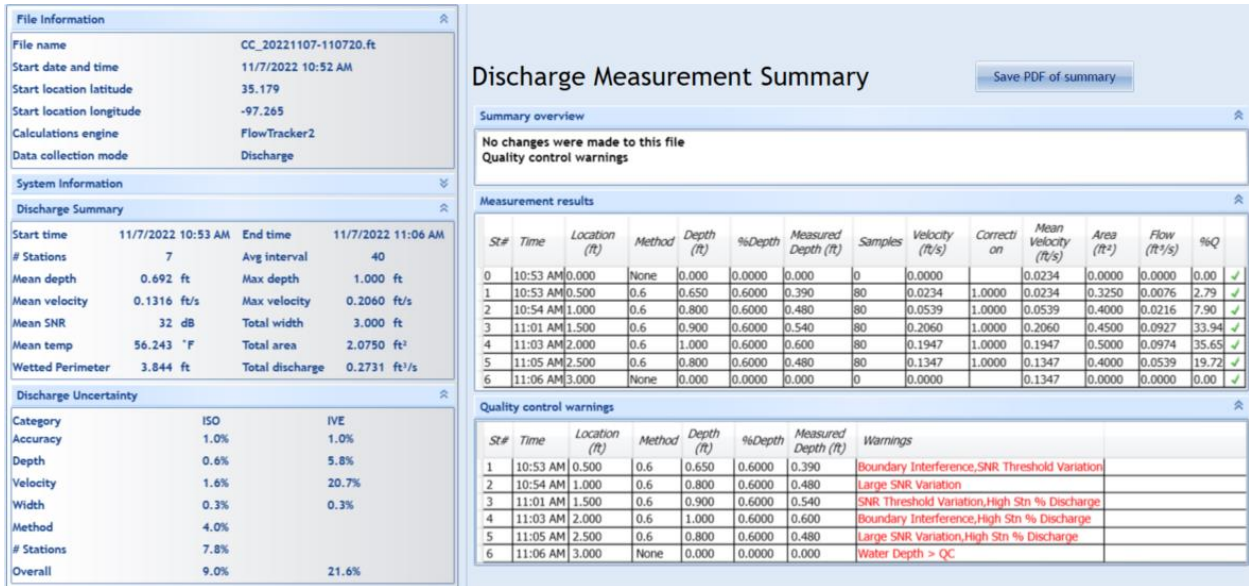


Figure 2 Discharge Measurement Summary CC-1

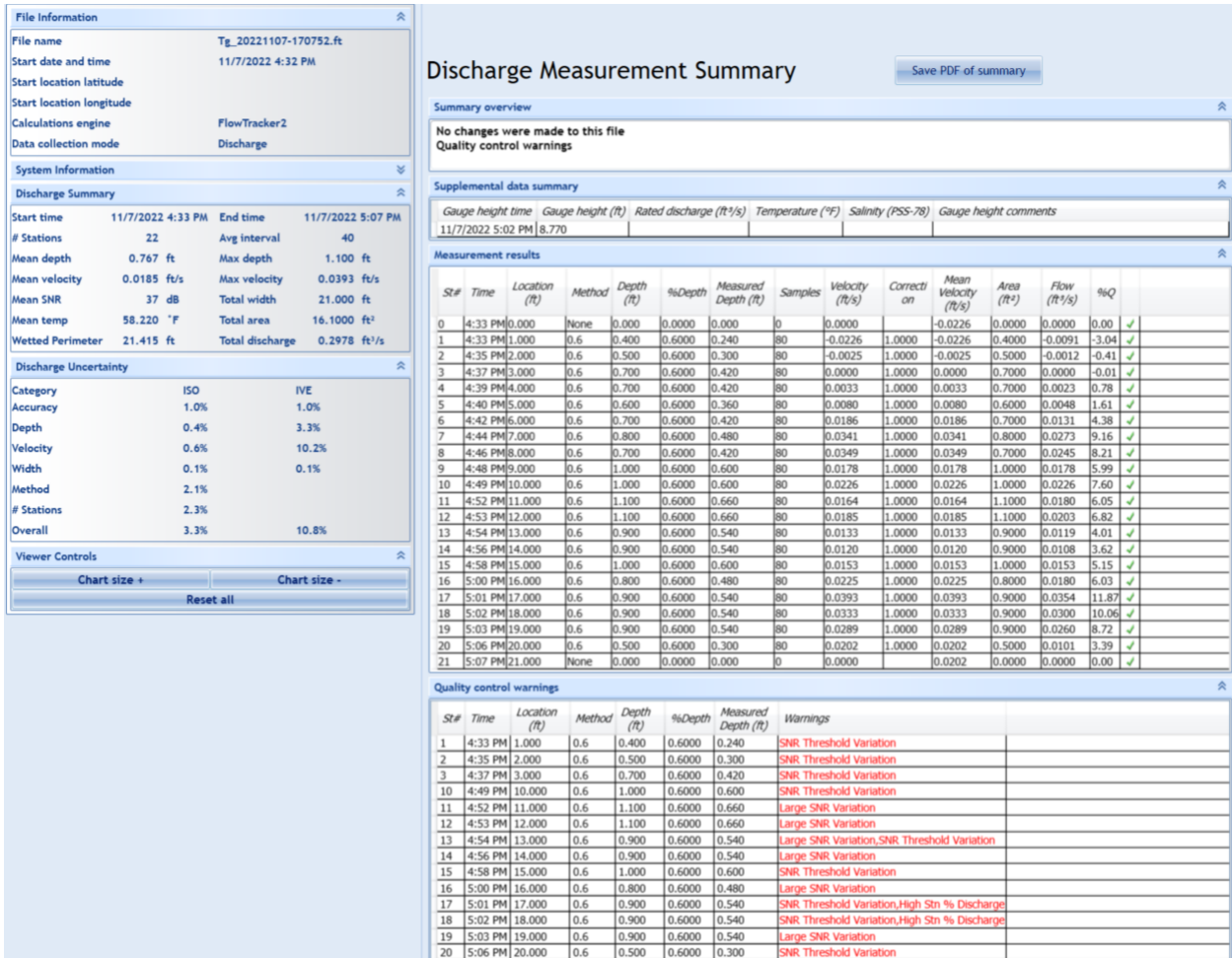


Figure 3 Discharge Measurement Summary TG-1

Period Selected: 2022-11-01 00:00 - 2022-11-30 23:59

UTC Offset: -06:00

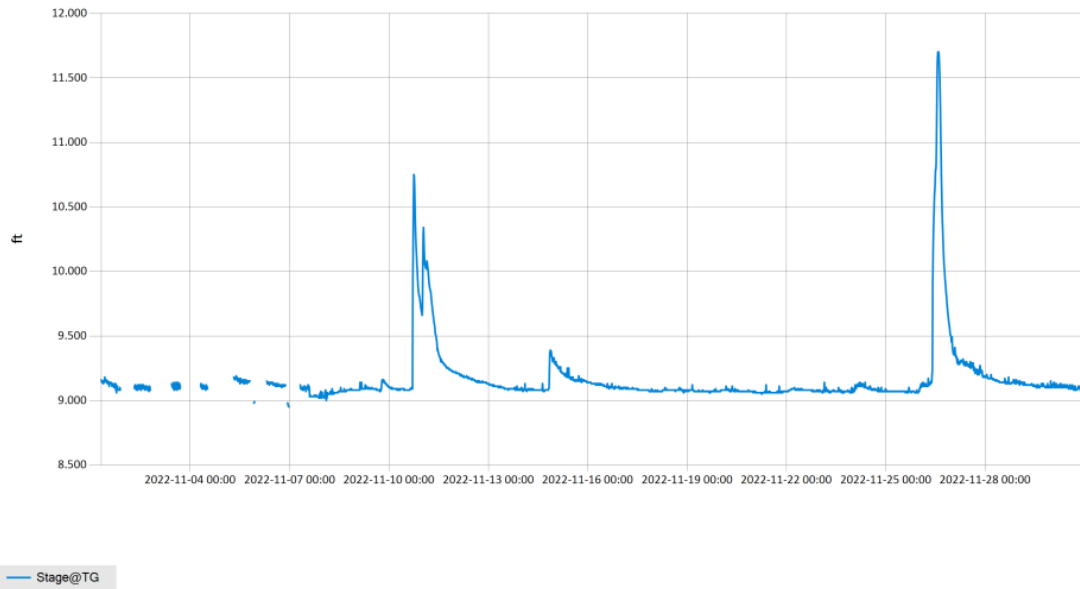


Figure 4 Monthly Hydrograph TG-1

Period Selected: 2022-11-01 00:00 - 2022-11-30 23:59

UTC Offset: -06:00

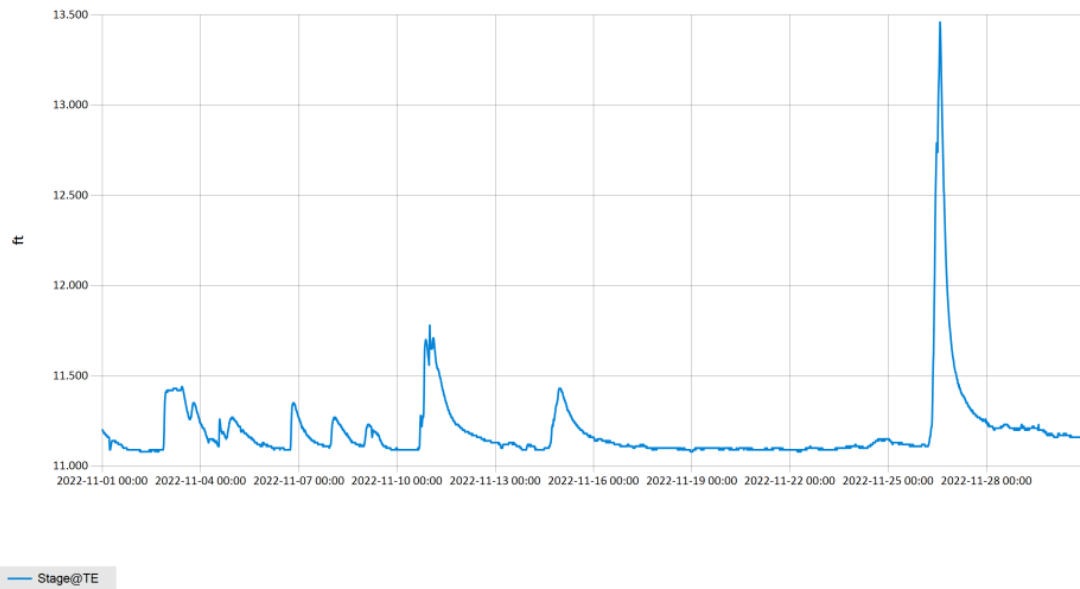
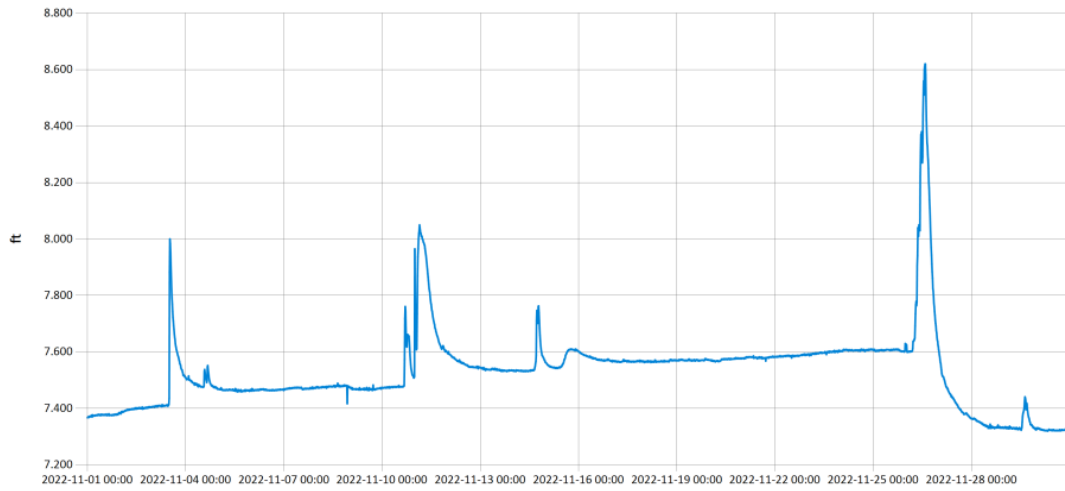


Figure 5 Monthly Hydrograph TE-1



Period Selected: 2022-11-01 00:00 - 2022-11-30 23:59

UTC Offset: -06:00

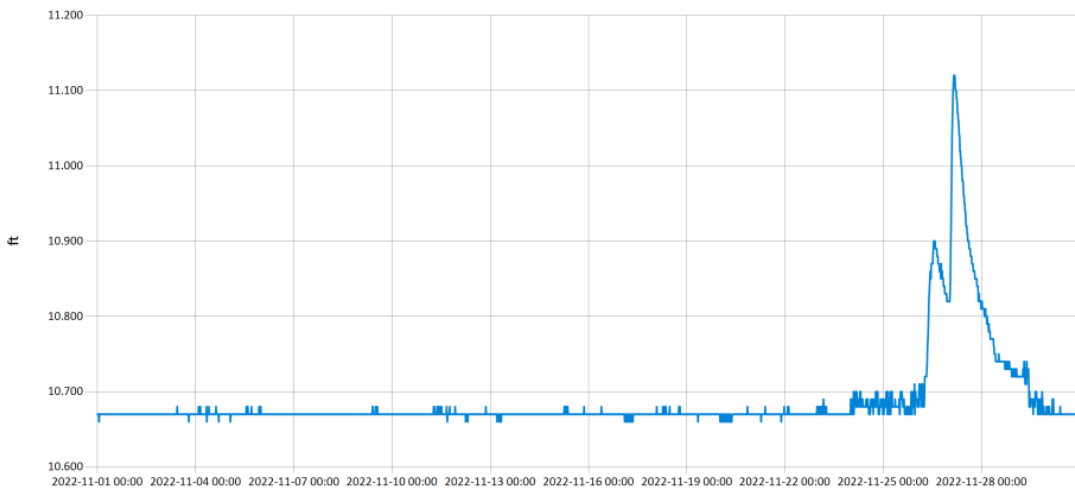


— Stage@WC

Figure 6 Monthly Hydrograph WC-1

Period Selected: 2022-11-01 00:00 - 2022-11-30 23:59

UTC Offset: -06:00

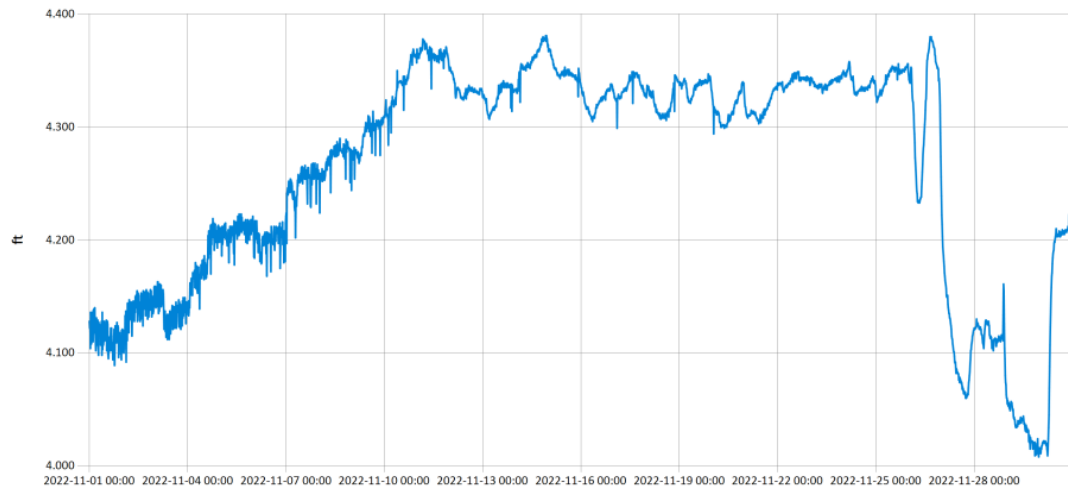


— Stage@URC

Figure 7 Monthly Hydrograph URC-2

Period Selected: 2022-11-01 00:00 - 2022-11-30 23:59

UTC Offset: -06:00

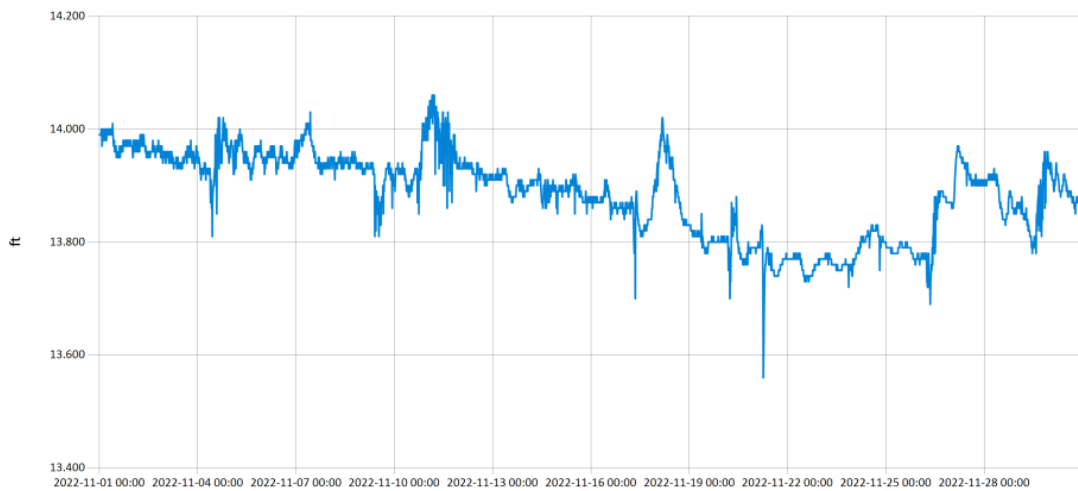


— Stage@LRC

Figure 8 Monthly Hydrograph LRC-1

Period Selected: 2022-11-01 00:00 - 2022-11-30 23:59

UTC Offset: -06:00

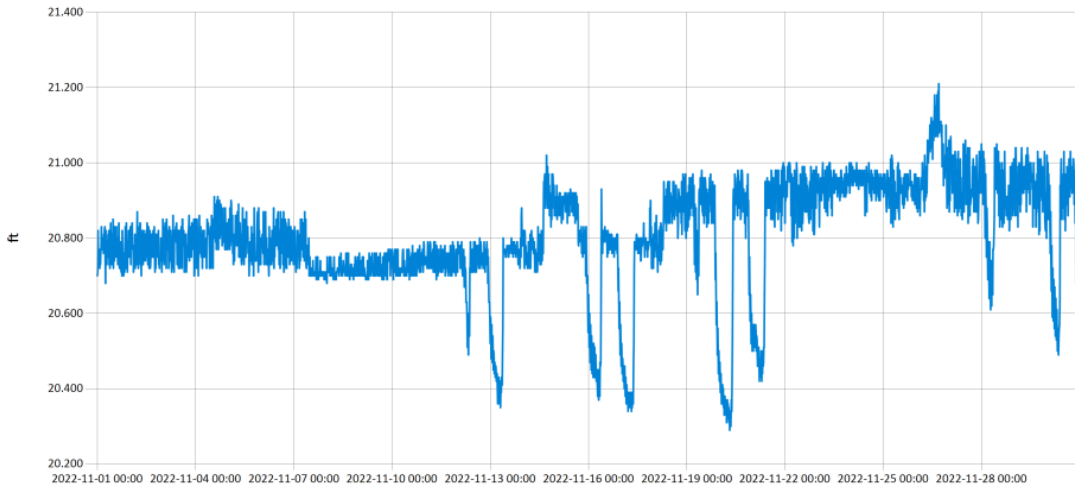


— Stage@LDB

Figure 9 Monthly Hydrograph LDB-1

Period Selected: 2022-11-01 00:00 - 2022-11-30 23:59

UTC Offset: -06:00

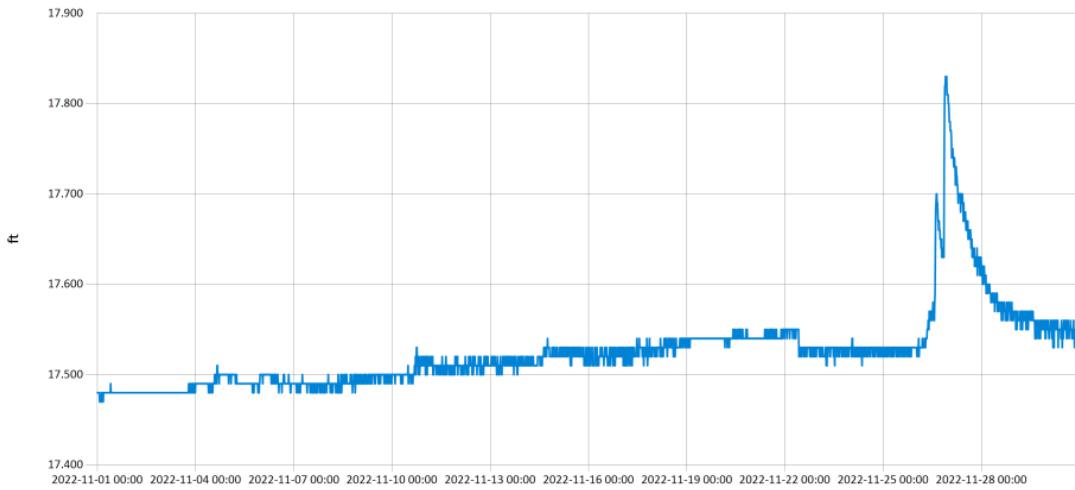


— Stage@CC

Figure 10 Monthly Hydrograph CC-1

Period Selected: 2022-11-01 00:00 - 2022-11-30 23:59

UTC Offset: -06:00



— Stage@UDB

Figure 11 Monthly Hydrograph UDB-1

MESONET CLIMATOLOGICAL DATA SUMMARY					November 2022					Time Zone: Midnight-Midnight CST											
(NRMN) Norman					Nearest City: 2.1 NW Norman					County: Cleveland											
Latitude: 35-14-09					Longitude: 97-27-53					Elevation: 1171 feet											
DAY	TEMPERATURE ( °F )				DEG DAYS		HUMIDITY (%)			RAIN		PRESSURE (in)			WIND SPEED (mph)		SOLAR (MJ/m <sup>2</sup> )	4" SOIL TEMPERATURES			
	MAX	MIN	AVG	DEWPT	HDD	CDD	MAX	MIN	AVG	(in)	STN	MSL	DIR	AVG	MAX	SOD		BARE	MAX	MIN	
1	76	46	62.5	48.6	4	0	88	37	63	0.00	28.86	30.11	S	5.9	19.4	14.97	58.9	59.8	67	53	
2	67	53	59.2	54.3	5	0	95	69	84	0.00	28.87	30.12	SSE	7.8	19.5	5.38	59.8	59.5	61	57	
3	72	60	67.1	61.9	0	1	91	76	84	0.00	28.70	29.94	SSE	11.0	22.8	4.40	61.4	62.1	65	59	
4	72	42	56.7	52.1	8	0	93	74	85	0.11	28.55	29.79	S	13.8	34.3	2.64	62.4	62.0	67	54	
5	60	34	48.9	37.7	18	0	95	40	68	0.00	28.57	29.81	SSE	10.0	28.9	14.92	57.6	54.7	60	49	
6	75	50	59.6	43.5	3	0	80	29	58	0.00	28.63	29.87	SSE	6.2	24.0	14.29	58.1	58.2	65	53	
7	67	50	59.6	53.2	7	0	93	69	80	0.00	28.95	30.21	NE	6.3	16.4	5.39	58.7	58.7	62	55	
8	76	66	69.0	65.6	0	6	98	72	89	0.03	28.96	30.21	SSE	9.5	22.3	5.72	62.1	64.3	67	62	
9	79	67	70.9	62.3	0	8	93	51	76	0.00	28.82	30.07	SSE	11.9	31.3	11.15	64.3	67.3	72	65	
10	69	45	61.3	57.5	8	0	96	78	88	0.37	28.65	29.90	S	12.2	27.8	3.86	64.1	64.9	67	59	
11	45	31	38.1	27.9	27	0	93	46	68	0.03	28.84	30.10	N	17.7	35.5	7.83	57.9	52.3	59	46	
12	46	25	35.3	21.7	29	0	83	35	60	0.04	29.03	30.29	NNW	6.1	16.9	14.14	52.9	46.2	51	43	
13	53	26	39.7	22.5	26	0	76	30	52	0.00	28.94	30.20	SSE	7.1	21.1	13.66	50.6	45.9	52	41	
14	40	32	36.4	29.9	29	0	96	57	78	0.20	28.84	30.09	ESE	7.9	19.1	2.61	50.4	45.6	47	44	
15	47	29	36.4	27.0	27	0	94	42	71	0.00	29.07	30.33	NNW	8.8	22.9	13.43	49.3	44.4	49	42	
16	46	26	35.0	25.5	29	0	96	40	72	0.00	29.19	30.45	NNW	5.0	19.5	13.39	47.3	43.0	48	40	
17	57	23	40.8	26.6	25	0	93	33	60	0.00	29.09	30.35	SSW	6.5	24.9	13.18	46.2	43.5	50	38	
18	38	27	31.5	16.7	33	0	81	39	55	0.00	29.18	30.45	NNE	11.8	30.0	5.05	46.3	43.4	46	41	
19	47	25	34.1	14.9	29	0	73	21	48	0.00	29.16	30.43	W	5.7	18.5	12.85	45.3	42.6	48	39	
20	50	20	35.6	18.2	30	0	90	26	53	0.00	29.14	30.40	S	4.4	15.4	13.18	43.7	41.7	47	37	
21	57	29	42.8	30.1	22	0	88	38	62	0.00	29.04	30.30	S	6.2	17.5	12.61	44.8	43.8	50	39	
22	58	36	45.3	39.6	18	0	98	57	82	0.00	28.99	30.25	S	6.4	21.0	12.39	46.8	46.7	52	43	
23	52	41	47.5	46.3	18	0	97	92	96	0.04	28.79	30.04	SSE	8.3	25.4	1.98	48.3	47.7	50	45	
24	53	45	49.5	46.4	16	0	98	76	89	0.03	28.82	30.07	NNE	9.7	24.1	3.17	50.2	50.0	51	49	
25	51	37	44.9	34.4	21	0	80	54	67	0.00	28.99	30.24	N	8.8	21.1	6.53	49.6	47.8	49	46	
26	49	44	46.6	44.0	18	0	97	63	91	1.04	28.57	29.81	WNW	6.8	19.3	1.64	49.9	48.7	50	48	
27	50	34	44.3	38.1	23	0	96	59	80	0.01	28.63	29.87	NW	9.3	24.6	9.93	49.9	48.0	50	45	
28	64	31	48.0	38.7	17	0	97	43	73	0.00	28.56	29.80	SSE	9.6	29.4	12.05	48.3	45.9	51	40	
29	68	32	50.8	39.8	15	0	86	40	67	0.00	28.54	29.78	S	16.8	36.2	11.99	50.7	50.0	55	45	
30	44	24	34.1	16.2	31	0	71	30	49	0.00	29.13	30.39	N	6.7	20.3	12.03	47.1	42.8	46	40	
	58	38	47.7	38.0	<- Monthly Averages ->					28.87	30.12	SSE	8.8	36.2	9.21	52.8	51.0	55	47		
Temperature - Highest: 79					Degree Days - Total HDD: 535					Number of Days With:											
Lowest: 20					Total CDD: 14					Tmax ≥ 90: 0					Rainfall ≥ 0.01 inch: 10						
Rainfall: Monthly Total: 1.90 in.					Humidity - Highest: 98					Tmax ≤ 32: 0					Rainfall ≥ 0.10 inch: 4						
Greatest 24 Hr: 1.04 in.					Lowest: 21					Tmin ≤ 32: 14					Avg Wind Speed ≥ 10 mph: 8						
										Tmin ≤ 0: 0					Max Wind Speed ≥ 30 mph: 5						

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\* Denotes incomplete record

Figure 12 November Mesonet Data