
***Lake Thunderbird TMDL Monitoring Plan Implementation:
Sample Year (SY) 2020- September Report***



SY2020 Monthly Report

Lake Thunderbird TMDL Monitoring Plan Implementation:

September 2020 Monitoring Report

Oklahoma Water Resources Board
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SUMMARY OF SEPTEMBER WATER QUALITY SAMPLING

Sampling for September 2020 occurred on the eighth and was considered a base flow collection. Water samples were collected at all ten locations, and discharge was measured at one location. Mesonet data shows 0.12 inches of precipitation on the eighth, no precipitation in the 72 hours prior to sampling, and 1.41 inches of precipitation in the 72 hours after the sampling event. The total rainfall amount in Norman for the month of September was 2.36 inches. All water level gauges were operational for the month, except for LT-1 and UDB-1 due to equipment malfunction.

RESULTS

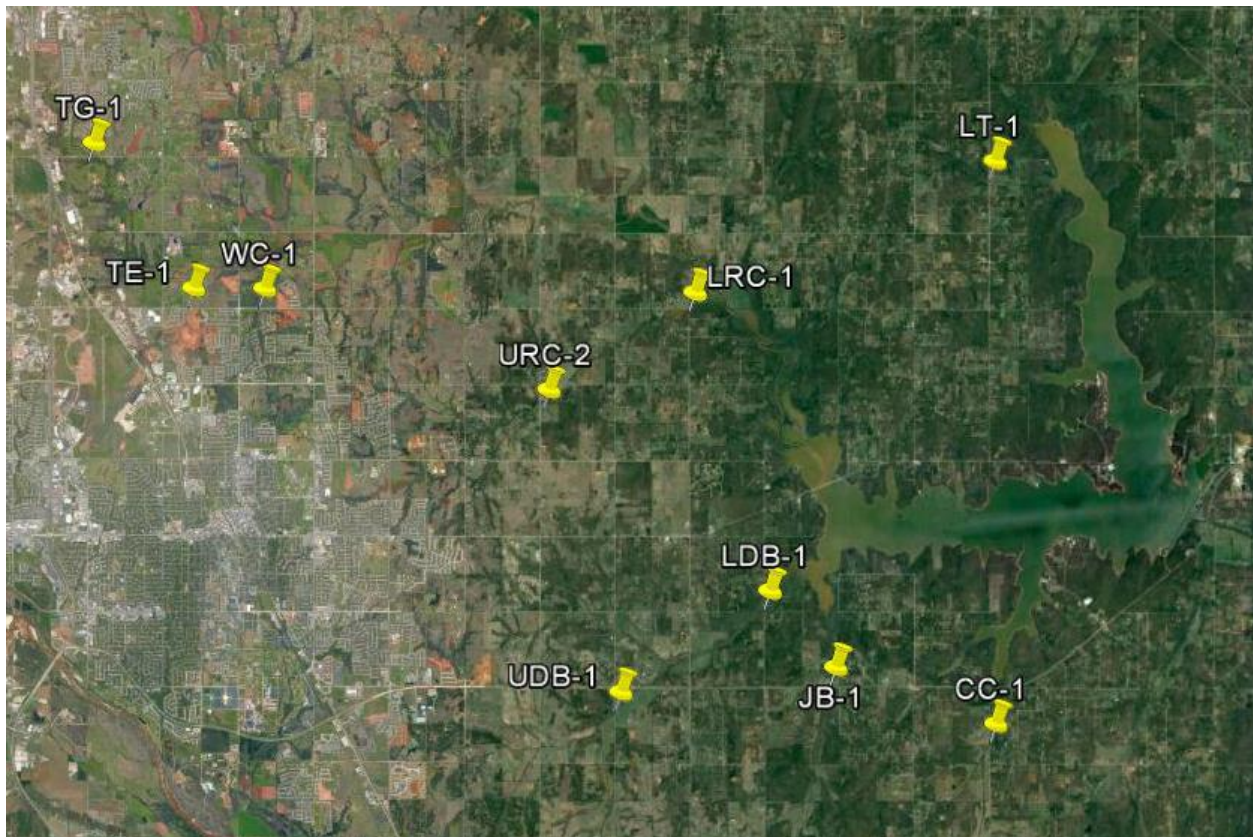


Figure 1 Monitoring Station Map

Monitoring Location ID	Monitoring Location Name	Date	Time	Field Crew	Water Temperature (°C)	Dissolved Oxygen (DO) (mg/l)	pH	Specific Conductance (mS/cm)	Turbidity (NTU)	Notes
CC-1	Clear Creek	9/8/2020	10:40	SD	24.96	7.12	7.99	702	5	Only rp3 over water, used dcp for flow
JB-1	Jim Blue Creek	9/8/2020	11:50	SD	25.46	5.70	7.45	941	53	Neither rp over water, orifice out of water, barely connected/flowing
LDB-1	Lower Dave Blue Creek	9/8/2020	12:30	SD	26.10	2.99	7.68	354	41	
LRC-1	Lower Rock Creek	9/8/2020	13:45	SD	26.36	7.88	7.88	621	6	Borderline low/normal visual flow
LT-1	Lake Laterals	9/8/2020	13:05	SD	26.69	4.44	7.87	251.00	61	Disconnected, upstream almost completely dry, sampled in downstream pool
TE-1	Little River Tributary	9/8/2020	16:05	SD	27.37	4.33	7.62	708	19	Borderline low/normal visual flow
TG-1	Little River Tributary	9/8/2020	16:40	SD	27.51	8.48	7.90	701	3	Borderline low/normal visual flow
UDB-1	Upper Dave Blue Creek	9/8/2020	9:45	SD	24.29	4.63	7.71	712	10	No bubbler, dcp not working
URC-2	Upper Rock Creek	9/8/2020	14:20	SD	27.45	6.64	7.40	547	26	Orifice not in water, rp1 not over water
WC-1	Woodcrest Creek	9/8/2020	15:25	SD	26.95	5.82	7.55	751	6	Changed dcp

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	0.22	0.46	0.075	7
JB-1	Jim Blue Creek	0.76	0.65	0.080	80
LDB-1	Lower Dave Blue Creek	<0.05	1.00	0.149	38
LRC-1	Lower Rock Creek	0.12	0.46	0.066	<5.0
LT-1	Lake Laterals	<0.05	1.66	0.156	32
TE-1	Little River Tributary	<0.05	0.60	0.049	20
TG-1	Little River Tributary	0.07	0.30	0.051	<5.0
UDB-1	Upper Dave Blue Creek	0.05	0.45	0.062	12
URC-2	Upper Rock Creek	<0.05	1.20	0.097	28
WC-1	Woodcrest Creek	<0.05	0.55	0.090	14

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	0.22	0.43	0.074	7
Duplicate RPD	0%	6.74%	1.34%	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	0.32	20.50
JB-1	Jim Blue Creek	-0.02	15.18
LDB-1	Lower Dave Blue Creek	1.67	16.04
LRC-1	Lower Rock Creek	0.22	17.84
LT-1	Lake Laterals	N/A	N/A
TE-1	Little River Tributary	0.58	11.35
TG-1	Little River Tributary	0.15	9.06
UDB-1	Upper Dave Blue Creek	0.16	17.38
URC-2	Upper Rock Creek	0.01	11.04
WC-1	Woodcrest Creek	-0.01	7.61

Table 4 Station Discharge Summary

Discharge Measurement Summary

Date Generated: Wed Oct 7 2020

File Information		Site Details	
File Name	CC.WAD	Site Name	CC0908
Start Date and Time	2020/09/08 09:58:31	Operator(s)	SCD

System Information		Units (English Units)		Discharge Uncertainty		
Sensor Type	FlowTracker	Distance	ft	Category	ISO	Stats
Serial #	P4713	Velocity	ft/s	Accuracy	1.0%	1.0%
CPU Firmware Version	3.9	Area	ft^2	Depth	0.7%	10.4%
Software Ver	2.30	Discharge	cfs	Velocity	0.9%	25.2%
Mounting Correction	0.0%			Width	0.2%	0.2%
				Method	3.5%	-
				# Stations	3.0%	-
				Overall	4.8%	27.3%

Summary			
Averaging Int.	40	# Stations	17
Start Edge	LEW	Total Width	9.000
Mean SNR	34.5 dB	Total Area	3.850
Mean Temp	76.56 °F	Mean Depth	0.428
Disch. Equation	Mid-Section	Mean Velocity	0.0838
		Total Discharge	0.3225

Supplemental Data					
#	Time	Location	Gauge Height	Rated Flow	Comments
1	Tue Sep 8 10:14:31 CDT 2020	9.000	20.500		

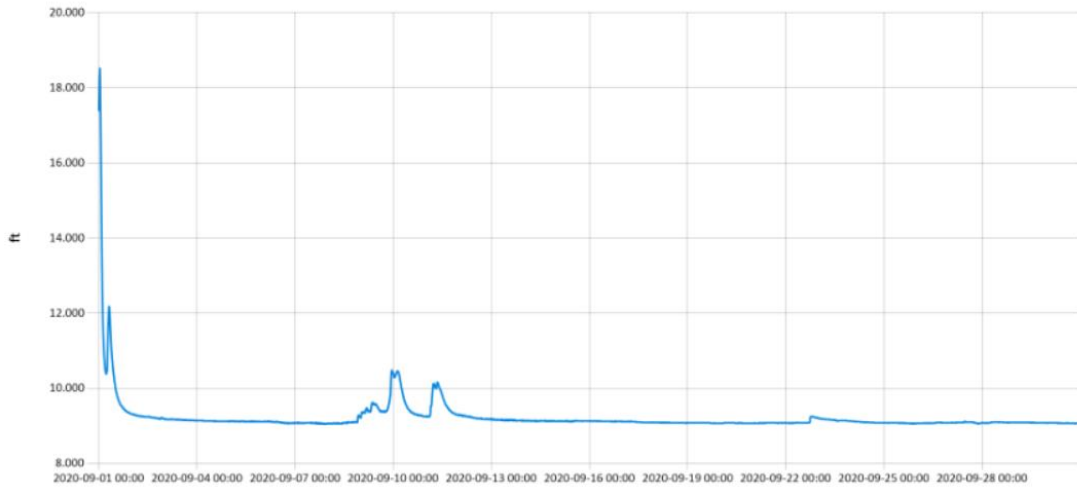
Measurement Results												
St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	09:58	0.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	09:58	0.50	0.6	0.300	0.6	0.120	-0.0007	1.00	-0.0007	0.150	-0.0001	0.0
2	09:59	1.00	0.6	0.300	0.6	0.120	0.4058	1.00	0.4058	0.150	0.0608	18.9
3	10:00	1.50	0.6	0.300	0.6	0.120	0.3599	1.00	0.3599	0.150	0.0540	16.7
4	10:01	2.00	0.6	0.300	0.6	0.120	0.3934	1.00	0.3934	0.225	0.0885	27.4
5	10:02	3.00	0.6	0.300	0.6	0.120	0.2831	1.00	0.2831	0.300	0.0849	26.3
6	10:03	4.00	0.6	0.300	0.6	0.120	-0.0092	1.00	-0.0092	0.225	-0.0021	-0.6
7	10:04	4.50	0.6	0.300	0.6	0.120	0.1270	1.00	0.1270	0.150	0.0190	5.9
8	10:05	5.00	0.6	0.400	0.6	0.160	0.0318	1.00	0.0318	0.200	0.0064	2.0
9	10:07	5.50	0.6	0.700	0.6	0.280	0.0151	1.00	0.0151	0.350	0.0053	1.6
10	10:08	6.00	0.6	0.700	0.6	0.280	0.0151	1.00	0.0151	0.350	0.0053	1.6
11	10:09	6.50	0.6	0.700	0.6	0.280	0.0030	1.00	0.0030	0.350	0.0010	0.3
12	10:10	7.00	0.6	0.800	0.6	0.320	0.0075	1.00	0.0075	0.400	0.0030	0.9
13	10:11	7.50	0.6	0.700	0.6	0.280	-0.0003	1.00	-0.0003	0.350	-0.0001	0.0
14	10:12	8.00	0.6	0.700	0.6	0.280	-0.0075	1.00	-0.0075	0.350	-0.0026	-0.8
15	10:13	8.50	0.6	0.300	0.6	0.120	-0.0049	1.00	-0.0049	0.150	-0.0007	-0.2
16	10:13	9.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0

Rows in italics indicate a QC warning. See the Quality Control page of this report for more information.

Figure 2 Discharge Measurement Summary CC-1

Period Selected: 2020-09-01 00:00 - 2020-09-30 23:59

UTC Offs et: -06:00

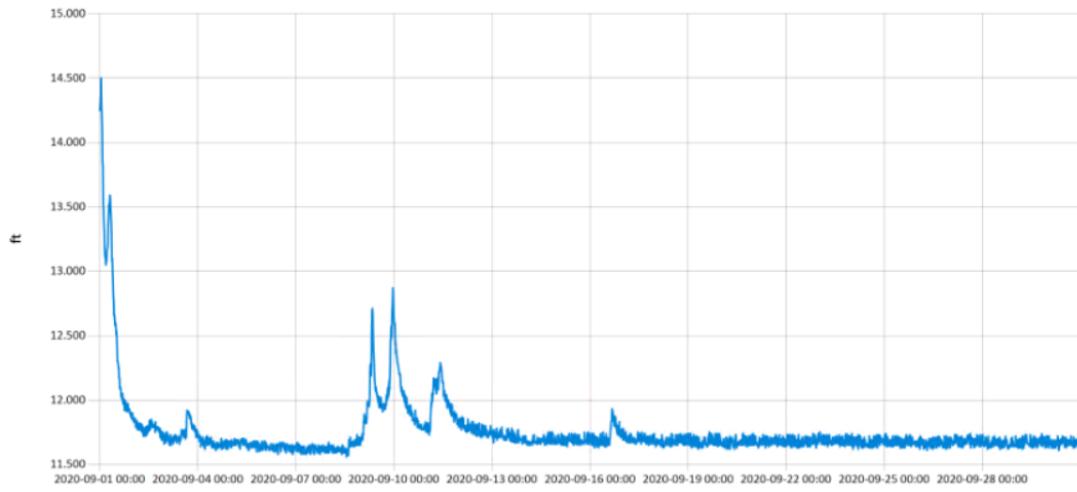


— Stage@TG

Figure 3 Monthly Hydrograph TG-1

Period Selected: 2020-09-01 00:00 - 2020-09-30 23:59

UTC Offs et: -06:00

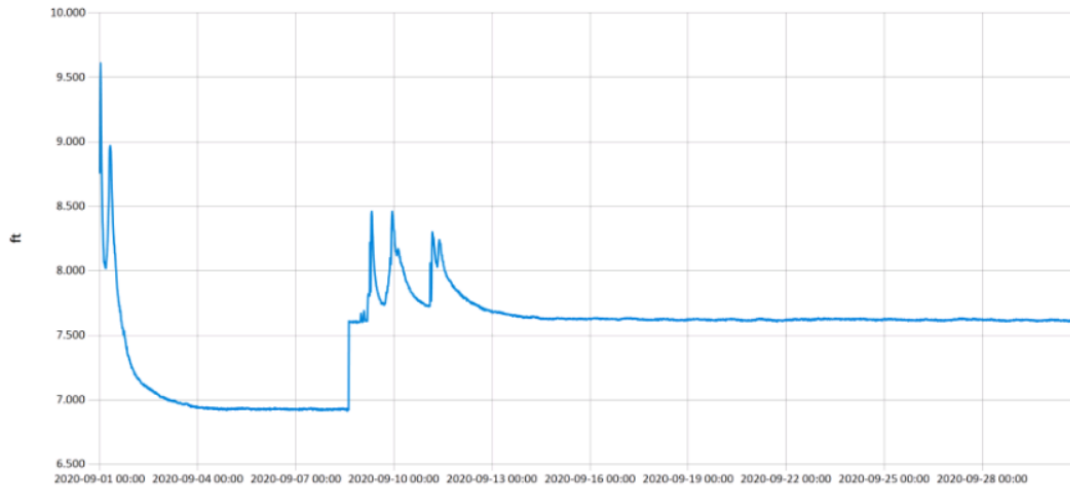


— Stage@TE

Figure 4 Monthly Hydrograph TE-1

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UTC Offset: -06:00

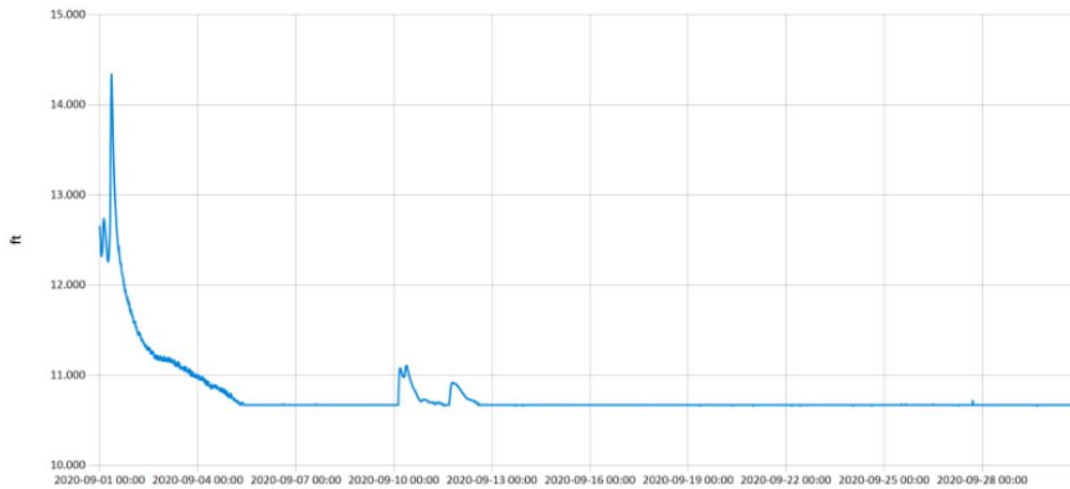


— Stage@WC

Figure 5 Monthly Hydrograph WC-1

Period Selected: 2020-09-01 00:00 - 2020-09-30 23:59

UTC Offset: -06:00



— Stage@URC

Figure 6 Monthly Hydrograph URC-2

Period Selected: 2020-09-01 00:00 - 2020-09-30 23:59

UTC Offset: -06:00

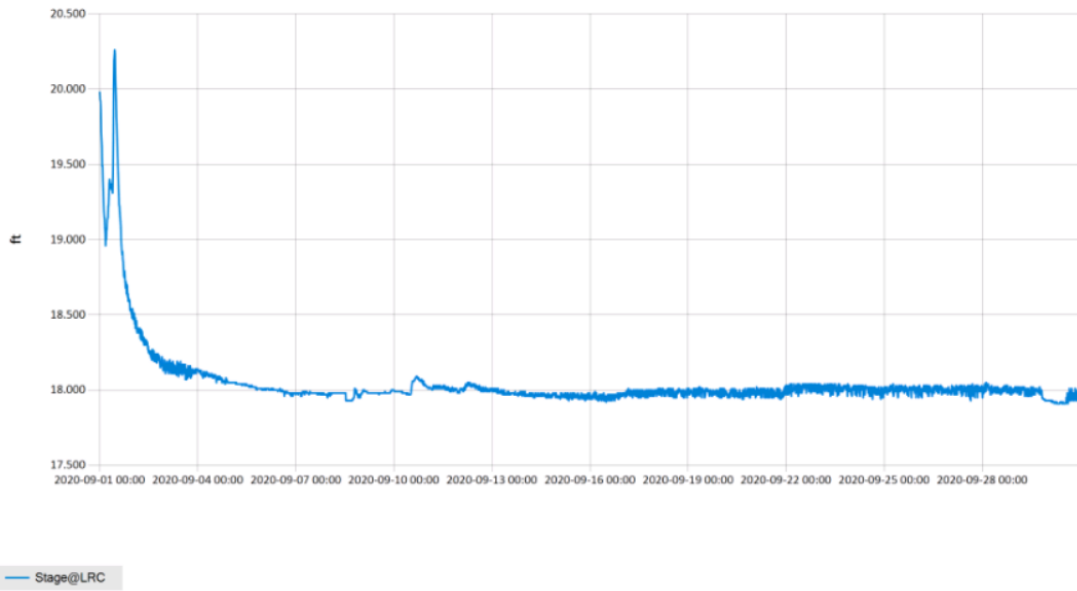


Figure 7 Monthly Hydrograph LRC-1

Period Selected: 2020-09-01 00:00 - 2020-09-30 23:59

UTC Offset: -06:00

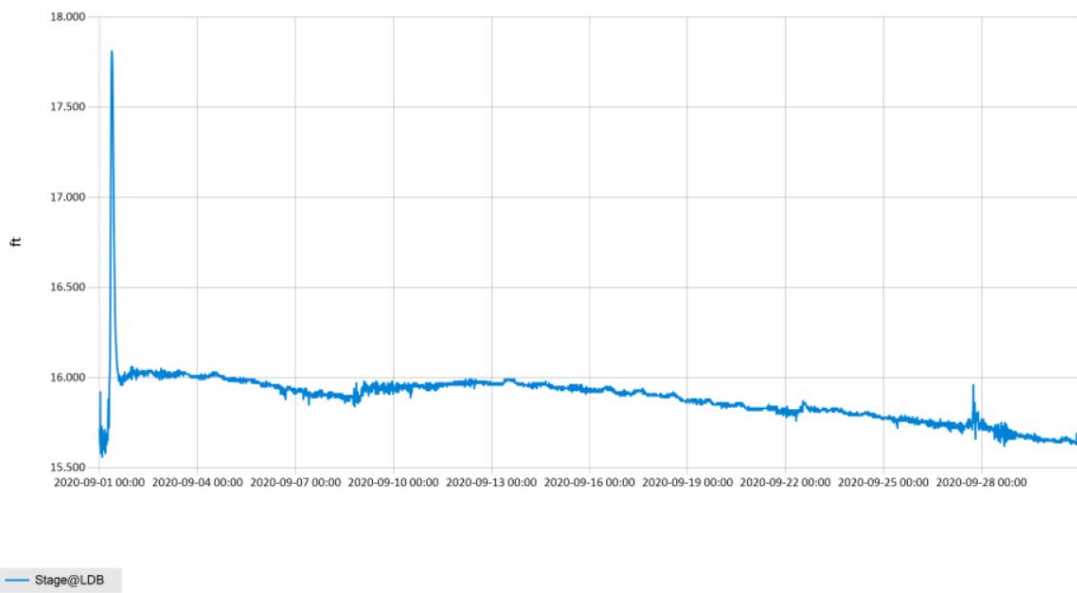


Figure 8 Monthly Hydrograph LDB-1

Period Selected: 2020-09-01 00:00 - 2020-09-30 23:59

UTC Offset: -06:00

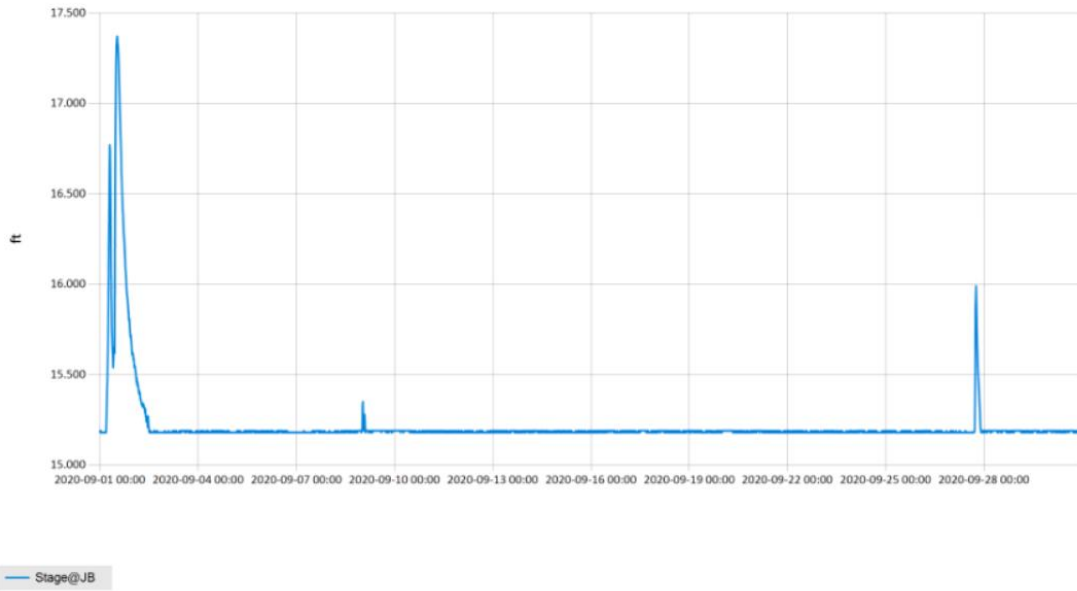


Figure 9 Monthly Hydrograph JB-1

Period Selected: 2020-09-01 00:00 - 2020-09-30 23:59

UTC Offset: -06:00

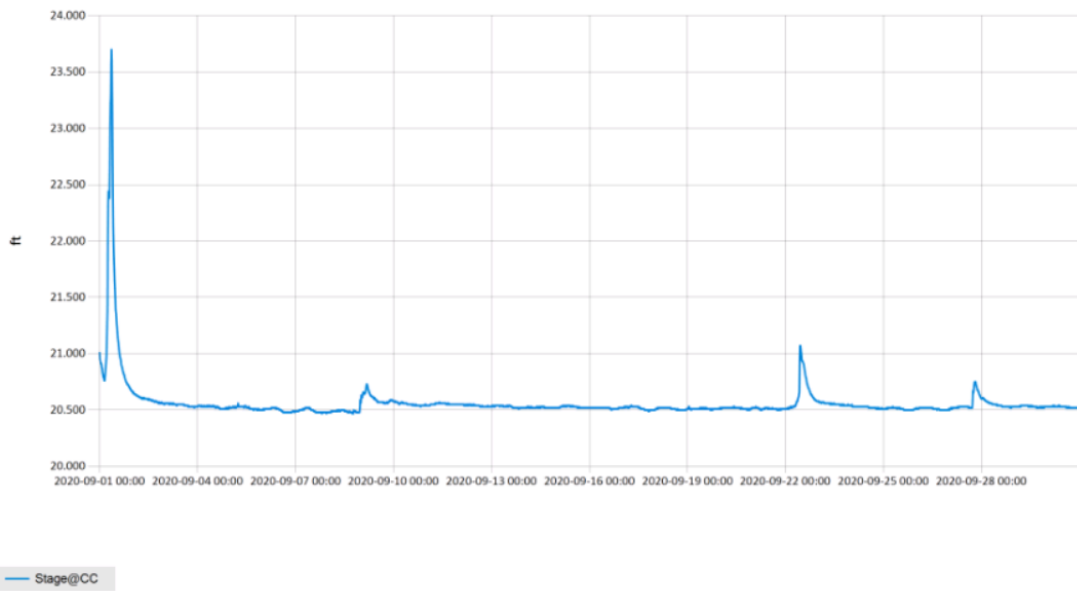


Figure 10 Monthly Hydrograph CC-1

MESONET CLIMATOLOGICAL DATA SUMMARY				September 2020				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 (in)		PRESSURE (in)		WIND SPEED (mph)		SOLAR	4" SOIL TEMPERATURES			
	MAX	MIN	AVG	DEWPT	HDD	CDD	MAX	MIN	AVG	(in)	STN	MSL	DIR	AVG	MAX	(MJ/m ²)	SOD	BARE	MAX	MIN
1	76	69	70.7	68.7	0	7	99	81	94	0.73	28.57	29.81	SSE	7.6	25.4	7.80	76.0	77.1	80	75
2	86	68	74.7	69.5	0	12	99	59	85	0.00	28.65	29.89	ESE	4.5	20.1	17.83	77.3	77.8	84	74
3	89	67	77.9	68.4	0	13	98	48	75	0.00	28.71	29.96	SSW	3.8	12.1	23.44	78.9	79.0	85	73
4	90	70	79.3	70.2	0	15	99	52	76	0.00	28.88	30.13	SE	4.5	13.8	22.09	79.8	79.7	85	75
5	89	69	79.4	70.2	0	14	99	52	76	0.00	28.99	30.25	S	4.9	16.8	21.18	80.0	79.6	85	74
6	89	69	79.6	67.3	0	14	91	47	68	0.00	28.83	30.08	S	9.1	24.9	23.04	79.6	80.7	88	74
7	90	73	80.6	68.5	0	16	87	46	69	0.00	28.59	29.83	S	10.2	26.3	21.00	79.3	81.8	88	76
8	88	57	74.6	65.8	0	7	93	53	76	0.12	28.62	29.86	SSE	10.1	27.7	17.75	79.0	81.8	88	77
9	57	51	53.3	52.0	11	0	98	93	95	1.01	28.86	30.12	N	12.4	23.4	2.88	72.7	68.4	77	63
10	65	51	56.7	52.2	7	0	97	70	85	0.08	29.00	30.25	NNW	10.2	23.6	13.72	69.6	64.7	69	62
11	67	55	60.2	57.4	4	0	97	80	91	0.32	28.91	30.16	NNW	4.3	11.8	7.54	69.8	66.2	70	63
12	78	59	67.1	63.0	0	4	100	63	88	0.01	28.76	30.01	SSE	2.8	10.7	15.99	71.2	69.8	75	65
13	81	59	69.6	62.6	0	5	100	52	80	0.00	28.85	30.10	NE	4.9	16.5	17.85	72.0	70.7	76	65
14	79	58	68.3	61.0	0	4	95	58	79	0.00	28.95	30.21	NE	5.8	15.4	18.13	72.4	70.2	75	65
15	82	64	71.4	64.8	0	8	96	59	81	0.00	28.88	30.14	NNE	3.0	9.5	14.34	73.2	72.2	78	68
16	84	62	72.5	63.6	0	8	99	49	76	0.00	28.81	30.05	NE	3.2	14.9	19.19	73.6	73.2	79	68
17	83	61	72.1	62.4	0	7	96	45	74	0.00	28.84	30.09	NE	6.4	20.6	19.79	73.5	73.3	80	67
18	78	56	67.0	57.1	0	2	93	46	72	0.00	28.92	30.18	NE	6.0	16.6	18.30	72.9	72.3	78	67
19	78	54	65.6	57.2	0	1	98	51	76	0.00	28.93	30.18	ESE	4.3	14.7	19.00	71.6	71.9	80	66
20	78	52	64.9	54.4	0	0	96	43	72	0.00	28.93	30.18	E	4.3	15.6	21.06	70.8	71.9	79	65
21	80	55	68.6	59.2	0	2	99	47	74	0.00	28.91	30.17	ESE	6.1	18.8	19.61	71.0	73.2	81	66
22	70	65	66.2	64.3	0	2	98	84	94	0.07	28.83	30.08	E	5.1	13.5	4.21	71.6	71.9	74	70
23	70	61	65.9	62.4	0	1	99	74	89	0.02	28.77	30.02	ENE	4.3	13.5	6.91	71.5	70.3	72	68
24	81	53	68.3	60.8	0	2	99	55	79	0.00	28.70	29.94	S	3.8	15.3	20.89	71.4	72.5	81	64
25	83	61	71.0	63.1	0	7	95	56	78	0.00	28.67	29.92	S	8.7	21.8	20.09	72.1	74.2	81	68
26	85	62	73.1	64.1	0	9	95	51	75	0.00	28.59	29.83	S	9.5	24.6	20.44	72.7	75.4	82	69
27	84	58	69.7	62.9	0	6	94	63	80	0.00	28.53	29.77	SSE	13.1	46.7	9.80	72.8	75.0	80	72
28	73	49	61.0	40.2	4	0	87	23	50	0.00	28.89	30.14	NNW	10.5	32.2	21.12	69.8	71.3	77	66
29	79	43	61.2	37.7	4	0	76	18	46	0.00	28.85	30.10	WNW	5.2	21.3	20.66	66.9	68.7	77	61
30	90	49	69.8	45.4	0	4	75	20	45	0.00	28.77	30.02	SSW	5.7	19.8	19.98	67.3	70.7	79	62
	80	59	69.3	60.5	<- Monthly Averages ->						28.80	30.05	S	6.5	46.7	16.85	73.3	73.5	79	68
Temperature - Highest: 90					Degree Days - Total HDD: 30					Number of Days With:										
Lowest: 43					Total CDD: 170					Tmax ≥ 90: 3					Rainfall ≥ 0.01 inch: 8					
Rainfall: Monthly Total: 2.36 in.					Humidity - Highest: 100					Tmax ≤ 32: 0					Rainfall ≥ 0.10 inch: 4					
Greatest 24 Hr: 1.01 in.					Lowest: 18					Tmin ≤ 32: 0					Avg Wind Speed ≥ 10 mph: 6					
										Tmin ≤ 0: 0					Max Wind Speed ≥ 30 mph: 2					

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* Denotes incomplete record

Figure 11 September Mesonet Data