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



SY2020 Monthly Report

Lake Thunderbird TMDL Monitoring Plan Implementation:

April 2020 Monitoring Report

Oklahoma Water Resources Board
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SUMMARY OF APRIL WATER QUALITY SAMPLING

Sampling for April 2020 occurred on two separate days and was considered a high flow collection. On the thirteenth, water samples were collected from four stormwater outfalls, in addition to TE-1, TG-1, and URC-2 via autosampler. Mesonet data shows 0.01 inches of precipitation occurring on the thirteenth, 1.26 inches of precipitation in the 72 hours prior to sampling, and 0.06 inches of precipitation in the 72 hours after the sampling event. Water samples were collected from JB-1, LDB-1, LRC-1, and UDB-1 via autosampler on the twenty-second. Mesonet data shows 0.20 inches of precipitation on the twenty-second, 1.09 inches of precipitation in the 72 hours prior to sampling, and no precipitation in the 72 hours after sampling. The total rainfall amount in Norman for the month of April was 2.91 inches. All water level gauges were operational for the month, except for LT-1 due to equipment malfunction. CC-1 and WC-1 were not sampled as a result of autosampler equipment issues. Additionally, due to Covid-19, changes have occurred to sampling and lab procedures.

RESULTS

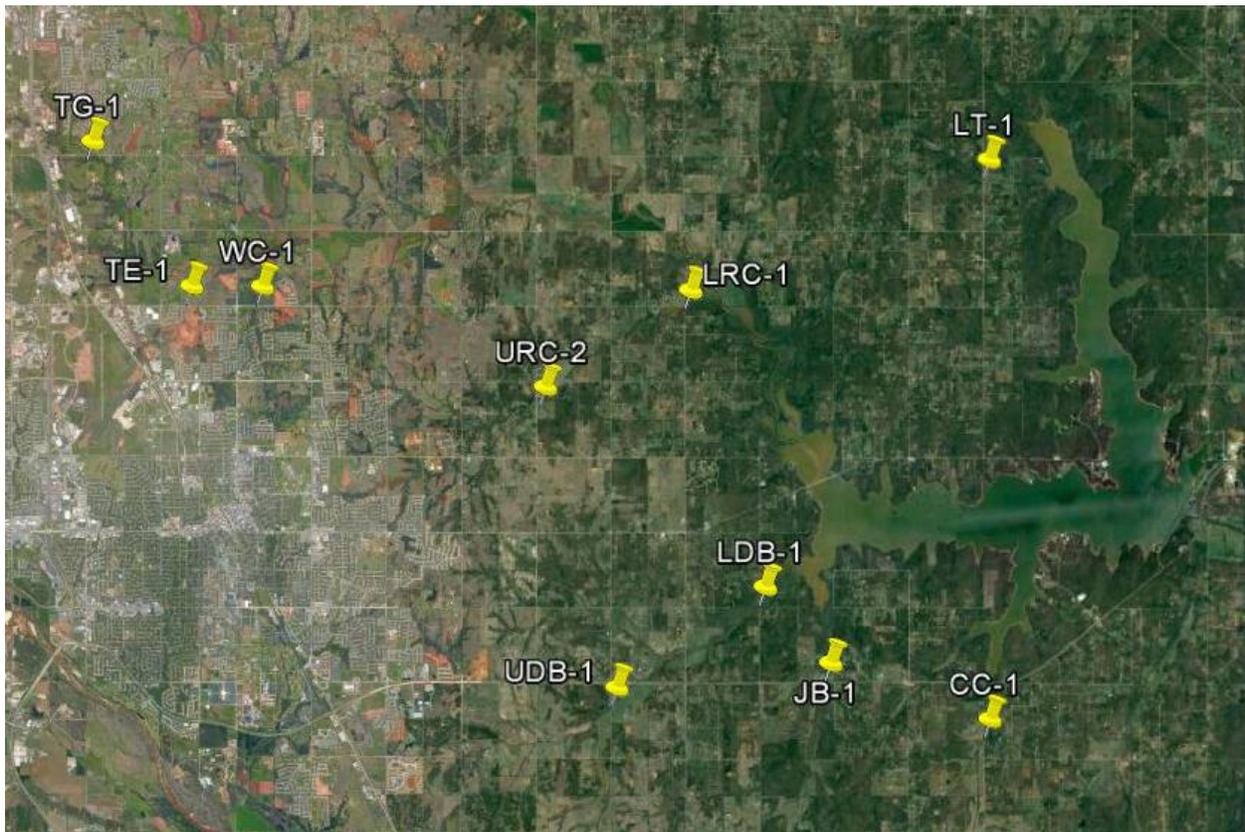


Figure 1 Monitoring Station Map

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
JB-1	Jim Blue Creek	04-22-2020	4:15	SD	*	*	7.92	575	189	T2, T1 bottle more turbid. Peak at 05:15 @ 16.75
LDB-1	Lower Dave Blue Creek	04-22-2020	1:30	SD	*	*	7.43	269	1000	T2, peak at 02:00 @ 18.63 (local time one hour ahead of data)
LRC-1	Lower Rock Creek	04-22-2020	3:15	SD	*	*	7.50	347	1000	T2, peak at 03:00 @ 23.11, datalogger time of collection 02:15 (one hour behind local time)
TE-1	Little River Tributary	04-11-2020	23:15	SD	*	*	7.68	907	532	T1, peak at 23:45 @ 13.49
TG-1	Little River Tributary	04-11-2020	23:45	SD	*	*	7.03	592	980	T1, peak at 4/12 @ 00:15 at 15.43
UDB-1	Upper Dave Blue Creek	04-22-2020	2:00	SD	*	*	7.53	265	1000	T4, peak at 02:30 @ 22.73
URC-2 ¹	Upper Rock Creek	04-12-2020	1:30	SD	*	*	7.55	847	198	T1, first peak at 02:00 @ 12.54
URC-2 ²	Upper Rock Creek	04-12-2020	10:00	SD	*	*	7.43	525	251	T2, second peak at 10:45 @ 13.47
SW-01	Stormwater Outfall 01	04-13-2020	10:40	SD	*	*	7.30	828	706	Current conditions less turbid than sample
SW-04	Stormwater Outfall 04	04-13-2020	11:30	SD	*	*	7.96	202	1000	
SW-06	Stormwater Outfall 06	04-13-2020	12:25	SD	11.77	9.72	8.03	562	14	Bottles didn't fill completely, so mixed with current conditions
SW-07	Stormwater Outfall 07	04-13-2020	12:45	SD	*	*	7.73	128	305	Lots of small particles floating in sample

Table 1 Field Data Form Where an Asterisk Denotes a Sample from an Autosampler

Monitoring Location ID	Monitoring Location Name	Nitrate and Nitrite (mg/l)	Kjeldahl Nitrogen (mg/l)	Phosphorus (mg/l)	Total Suspended Solids (mg/l)
JB-1	Jim Blue Creek	0.09	1.45	0.254	216
LDB-1	Lower Dave Blue Creek	0.28	6.23	1.370	3000
LRC-1	Lower Rock Creek	0.31	6.31	1.210	4080
TE-1	Little River Tributary	0.30	1.70	0.406	250
TG-1	Little River Tributary	0.20	3.26	0.990	1270
UDB-1	Upper Dave Blue Creek	0.33	5.40	2.290	3600
URC-2 ¹	Upper Rock Creek	0.05	1.08	0.178	200
URC-2 ²	Upper Rock Creek	0.12	1.54	0.248	210
SW-01	Stormwater Outfall 01	0.32	2.32	0.745	760
SW-04	Stormwater Outfall 04	0.41	3.49	1.510	1390
SW-06	Stormwater Outfall 06	<0.05	0.61	0.052	12.0
SW-07	Stormwater Outfall 07	0.33	5.57	0.870	628

Table 2 Laboratory Analysis Summary

Monitoring Location ID	Monitoring Location Name	Discharge (cfs)	Stream Stage (ft)
JB-1	Jim Blue Creek	10.33	16.54
LDB-1	Lower Dave Blue Creek	170.60	18.25
LRC-1	Lower Rock Creek	111.30	22.68
TE-1	Little River Tributary	28.06	13.01
TG-1	Little River Tributary	211.80	14.70
UDB-1	Upper Dave Blue Creek	888.10	22.32
URC-2 ¹	Upper Rock Creek	1.24	12.51
URC-2 ²	Upper Rock Creek	6.18	13.11

Table 3 Station Discharge Summary

URC-2 experienced two separate peaks during this rain event, and the autosampler collected near both peaks. The initial flush is noted by ¹ in the tables above, while the second peak, which was higher than the initial peak, is represented by ² in the tables above. Since the second peak occurred about nine hours after the first peak, both samples were collected and analyzed. These two collections will be compared to analyze the variation in different stages during a runoff event, as well as changes between an initial and secondary flush during a runoff event.

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UTC Offset: -06:00

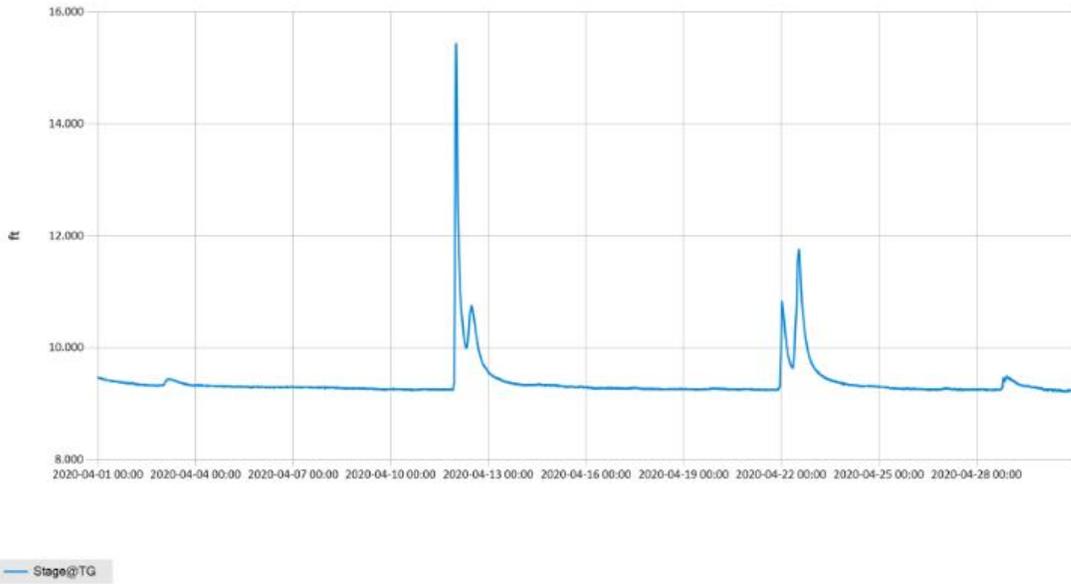


Figure 2 Monthly Hydrograph TG-1

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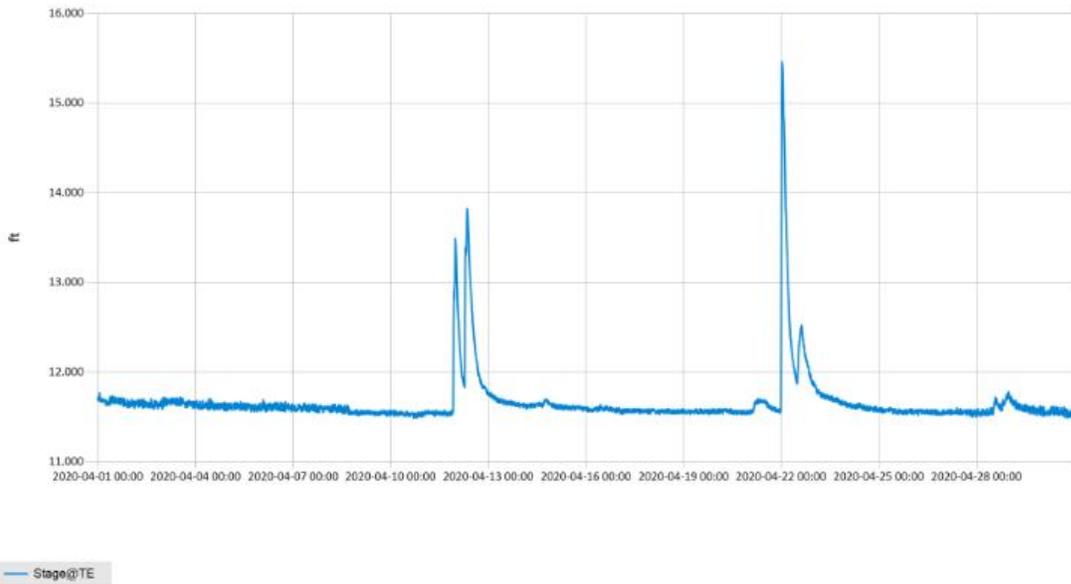


Figure 3 Monthly Hydrograph TE-1

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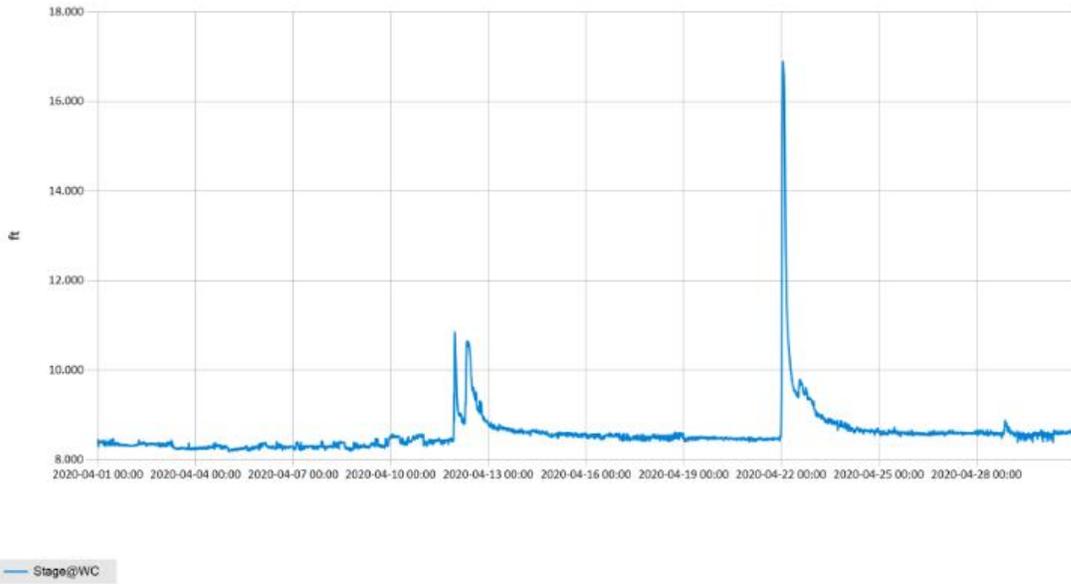


Figure 4 Monthly Hydrograph WC-1

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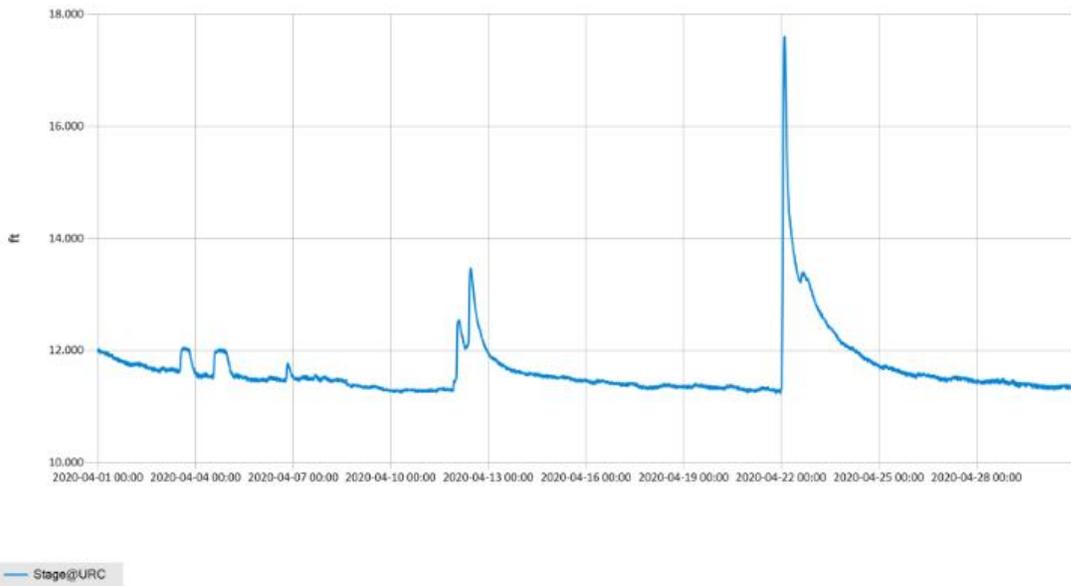


Figure 5 Monthly Hydrograph URC-2

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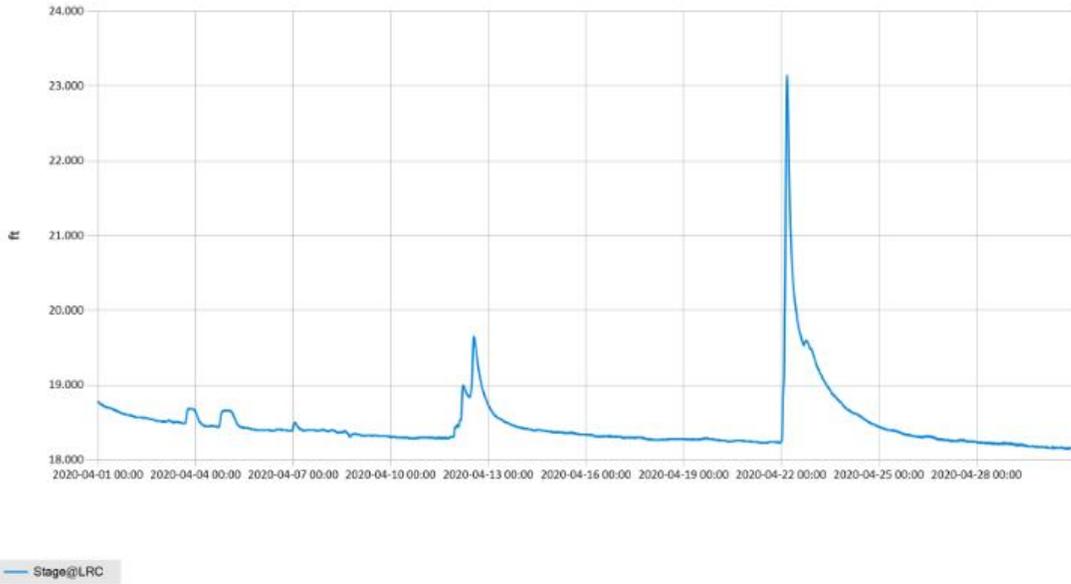


Figure 6 Monthly Hydrograph LRC-1

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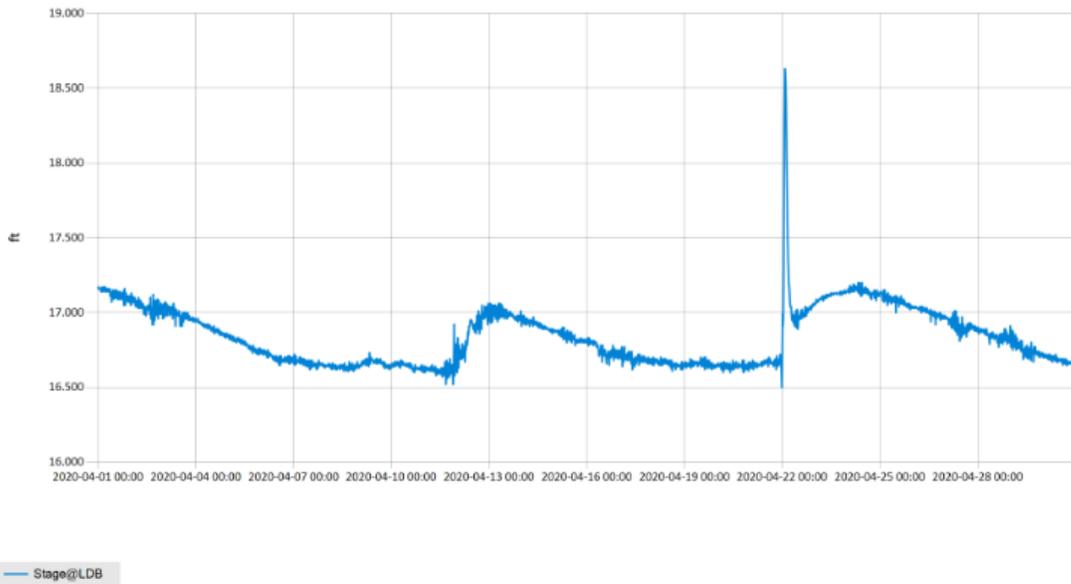
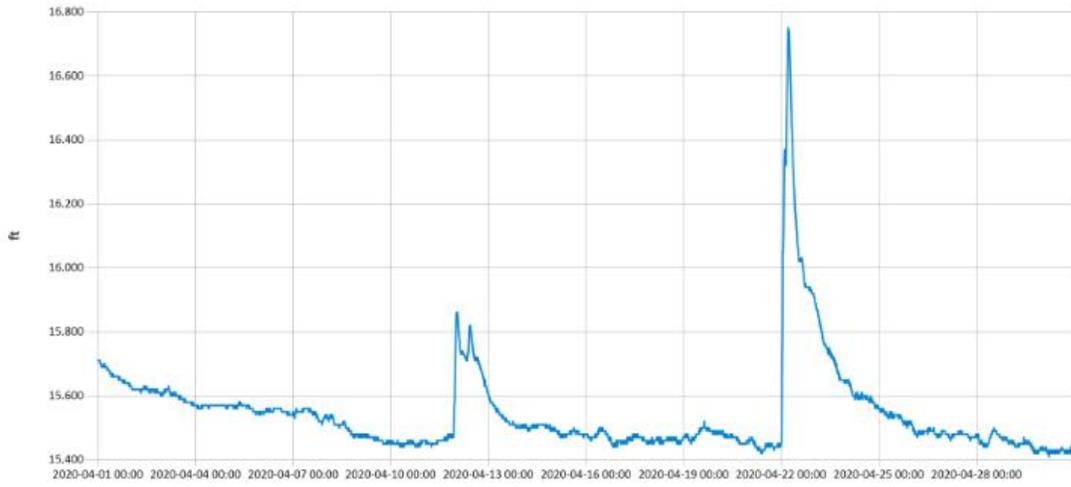


Figure 7 Monthly Hydrograph LDB-1

Period Selected: 2020-04-01 00:00 - 2020-04-30 23:59

UTC Offset: -06:00

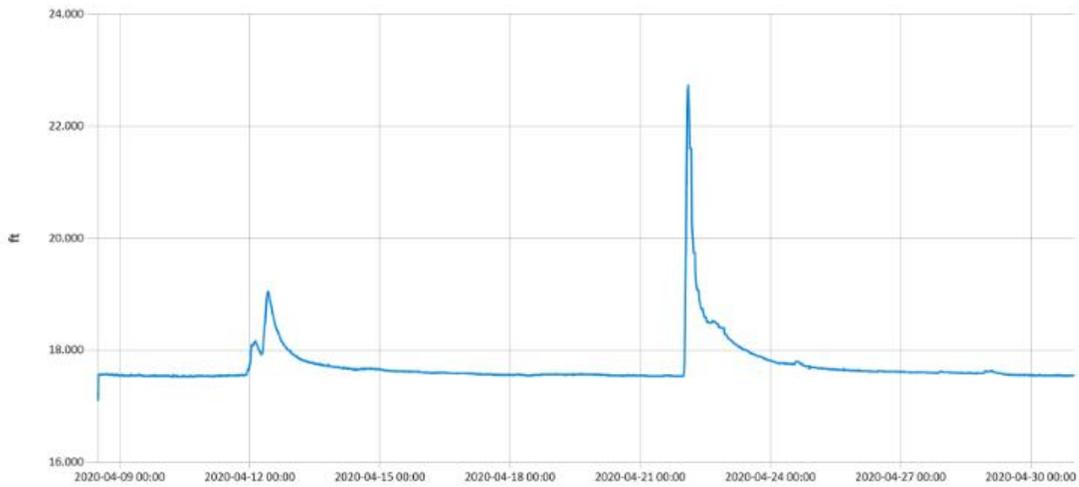


— Stage@JB

Figure 8 Monthly Hydrograph JB-1

Period Selected: 2020-04-01 00:00 - 2020-04-30 23:59

UTC Offset: -06:00



— Stage@UDB

Figure 9 Monthly Hydrograph UDB-1

Period Selected: 2020-04-01 00:00 - 2020-04-30 23:59

UTC Offset: -06:00

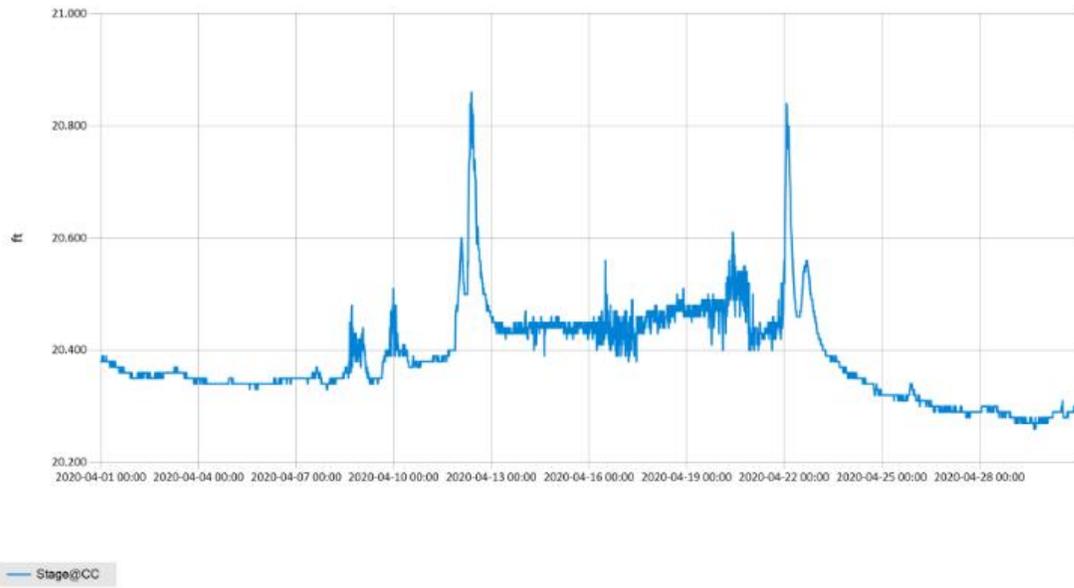


Figure 10 Monthly Hydrograph CC-1

MESONET CLIMATOLOGICAL DATA SUMMARY					April 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 (MJ/m ²)	4" SOIL TEMPERATURES			
	MAX	MIN	AVG	DEWPT	HDD	CDD	MAX	MIN	AVG	(in)	STN	MSL	DIR	AVG	MAX	SOD	BARE		MAX	MIN		
1	70	47	59.0	46.9	6	0	88	48	66	0.00	28.66	29.90	SSE	11.1	31.1	18.57	56.8	58.9	64	54		
2	68	46	60.9	54.5	8	0	98	63	80	0.05	28.58	29.82	SSE	13.0	38.2	8.55	57.3	58.6	61	56		
3	46	32	35.0	31.8	26	0	96	79	88	0.03	28.86	30.11	N	15.2	31.1	4.64	52.7	50.4	60	46		
4	43	35	39.2	35.0	26	0	91	78	85	0.00	28.85	30.10	NNE	8.6	20.7	7.05	49.4	46.6	49	44		
5	68	40	52.7	46.2	11	0	93	60	80	0.00	28.79	30.04	S	6.1	24.9	18.17	52.2	52.1	60	47		
6	71	59	64.0	58.8	0	0	92	70	84	0.00	28.70	29.94	S	11.0	27.5	8.53	56.6	58.3	62	56		
7	86	63	72.0	58.2	0	10	97	26	67	0.00	28.59	29.83	S	9.7	24.4	20.05	60.1	63.0	68	59		
8	91	54	73.8	50.7	0	7	94	18	50	0.00	28.55	29.79	S	8.9	29.7	26.11	61.6	63.7	70	57		
9	70*	49*	61.4*	38.9*	5*	0*	69*	29*	45*	0.00*	28.76*	30.01*	NE *	10.0*	24.0*	NA	60.2*	62.2*	68*	58*		
10	68	42	56.3	32.2	10	0	59	26	41	0.00	28.82	30.07	NE	7.2	16.8	25.74	57.8	61.3	70	53		
11	69	53	59.8	52.3	4	0	99	51	77	0.64	28.52	29.76	S	12.4	40.6	11.07	58.2	61.7	66	58		
12	70	36	52.1	44.8	12	0	99	60	77	0.62	28.43	29.67	NNW	15.6	45.1	8.84	57.6	58.6	62	53		
13	45	33	38.6	23.0	26	0	96	38	54	0.01	28.96	30.22	N	13.2	33.7	13.75	51.1	51.3	54	48		
14	47	33	38.5	31.5	25	0	96	52	77	0.05	29.04	30.29	NNE	5.8	17.0	12.09	50.1	50.0	54	46		
15	61	31	47.5	31.3	19	0	90	30	58	0.01	28.89	30.14	SSE	7.5	20.9	27.22	50.5	50.4	58	43		
16	71	46	59.0	42.7	7	0	74	43	56	0.00	28.75	29.99	SSE	12.8	32.1	26.57	53.5	53.6	60	47		
17	59	36	44.2	36.8	18	0	94	59	76	0.00	28.87	30.13	NNW	11.8	30.2	11.53	53.3	51.4	55	48		
18	66	32	51.6	37.9	16	0	98	29	65	0.00	28.74	29.99	S	6.8	21.1	23.72	52.2	51.1	58	43		
19	68	48	58.7	54.2	7	0	99	63	86	0.01	28.52	29.76	NNE	6.2	20.0	9.18	55.8	56.8	61	55		
20	77	46	61.7	51.1	4	0	99	35	72	0.00	28.65	29.90	SSW	4.0	17.2	20.74	57.1	59.6	69	52		
21	82	48	67.5	52.0	0	0	99	30	63	1.08	28.70	29.95	SE	7.1	29.0	26.44	59.8	65.2	75	56		
22	66	57	61.1	58.7	3	0	98	80	92	0.20	28.45	29.69	NW	9.9	27.9	5.48	60.4	63.1	66	62		
23	81	51	66.5	52.2	0	1	97	26	64	0.00	28.50	29.74	NW	6.6	20.8	26.24	61.5	64.7	72	58		
24	77	56	66.0	52.0	0	1	77	43	62	0.00	28.53	29.77	NNW	12.9	35.9	21.13	62.9	65.0	70	61		
25	73	48	61.0	44.9	4	0	91	30	59	0.00	28.83	30.08	NNW	9.6	30.2	26.92	61.8	60.9	66	55		
26	78	45	64.2	45.3	4	0	96	30	55	0.00	28.87	30.12	SSE	6.6	22.2	24.58	60.9	60.6	67	53		
27	80	62	70.0	52.3	0	6	72	43	54	0.00	28.70	29.95	SSE	11.4	32.1	22.44	62.2	63.9	71	58		
28	86	62	72.5	61.7	0	9	91	48	70	0.21	28.57	29.81	S	10.4	32.7	21.97	65.0	69.0	77	62		
29	72	49	62.4	42.3	4	0	81	31	50	0.00	28.81	30.06	NNW	13.1	40.6	28.75	63.8	65.0	71	59		
30	79	45	64.6	47.4	3	0	97	32	58	0.00	28.79	30.04	SSE	5.4	19.2	28.32	62.5	66.6	77	57		
70* 46* 58.1* 45.6*					<- Monthly Averages ->					28.71* 29.96*		S * 9.7* 45.1*			18.43*		57.5* 58.8* 65* 53*					
Temperature - Highest: 91*					Degree Days - Total HDD: 247*					Number of Days With:												
Lowest: 31*					Total CDD: 34*					Tmax ≥ 90: 1*			Rainfall ≥ 0.01 inch: 11*									
Rainfall: Monthly Total: 2.91* in.					Humidity - Highest: 99*					Tmax ≤ 32: 0*			Rainfall ≥ 0.10 inch: 5*									
Greatest 24 Hr: 1.08* in.					Lowest: 18*					Tmin ≤ 32: 3*			Avg Wind Speed ≥ 10 mph: 14*									
										Tmin ≤ 0: 0*			Max Wind Speed ≥ 30 mph: 13*									

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Monthly data generated at 2020-05-04 16:49:28 UTC

* Denotes incomplete record

Figure 11 April Mesonet Data