
***Lake Thunderbird TMDL Monitoring Plan Implementation:
Sample Year (SY) 2019- February Report***



SY2019 Monthly Report

Lake Thunderbird TMDL Monitoring Plan Implementation:

February 2020 Monitoring Report

Oklahoma Water Resources Board
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SUMMARY OF FEBRUARY WATER QUALITY SAMPLING

Sampling for February 2020 occurred on the eighteenth and was considered a base flow collection. Water samples were collected at all ten locations, and discharge measurements were collected at three locations. Mesonet data shows no precipitation occurring on the eighteenth, 0.01 inches of precipitation in the 72 hours prior to sampling, and no precipitation in the 72 hours after the sampling event. The total rainfall amount in Norman for the month of February was 0.99 inches. All water level gauges were operational for the month, except for LT-1 and LDB-1 due to equipment malfunction.

RESULTS

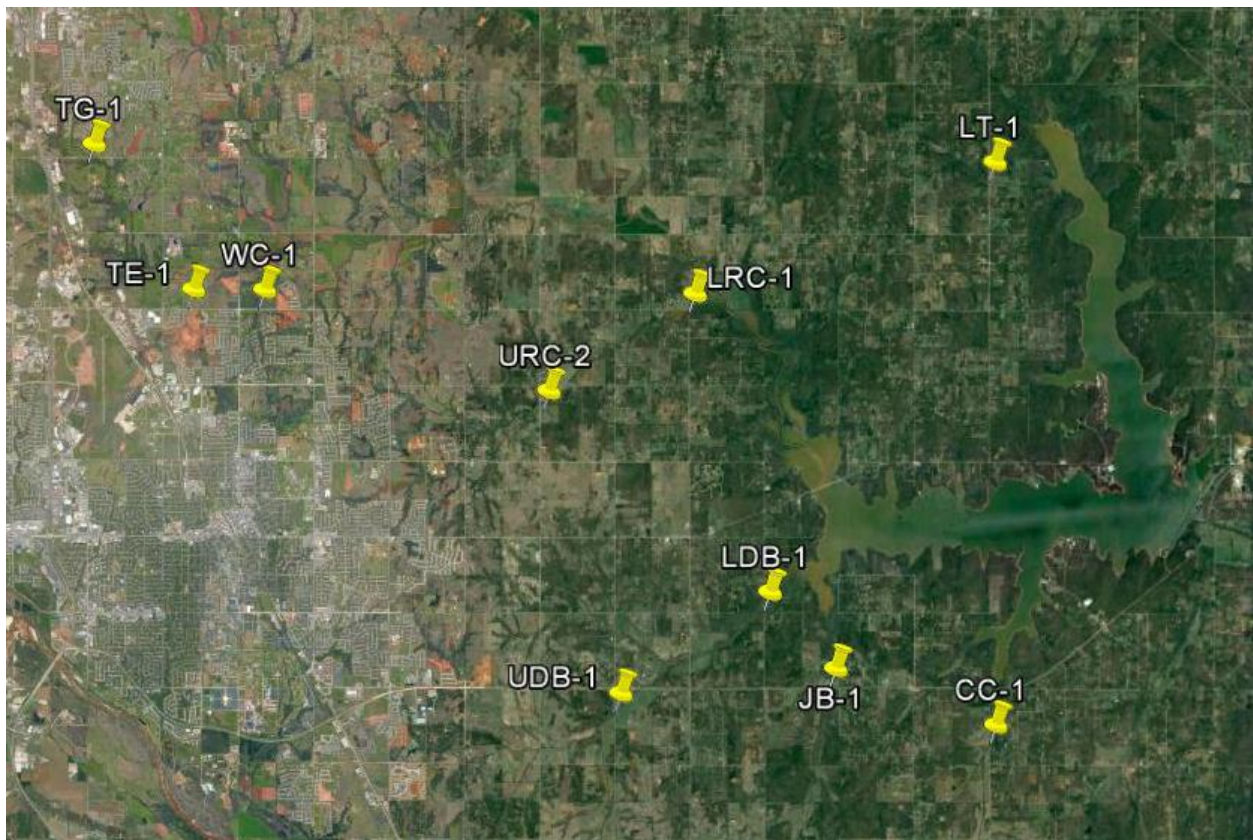


Figure 1 Monitoring Station Map

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	02-18-2020	9:10	LO	8.5	11.30	7.62	711	6	
JB-1	Jim Blue Creek	02-18-2020	9:50	LO	7.9	10.59	7.48	818	3	Neither RP over water
LDB-1	Lower Dave Blue Creek	02-18-2020	10:20	LO	9.4	13.23	7.73	924	5	Not able to connect to DCP
LRC-1	Lower Rock Creek	02-18-2020	12:10	LO	9.5	11.54	7.77	775	8	
LT-1	Lake Laterals	02-18-2020	11:30	LO	9.4	9.97	7.51	432	4	
TE-1	Little River Tributary	02-18-2020	13:05	LO	11.1	13.21	7.98	956	30	Beaver dam upstream
TG-1	Little River Tributary	02-18-2020	13:30	LO	10.3	14.29	7.78	1156	3	
UDB-1	Upper Dave Blue Creek	02-18-2020	8:40	LO	8.9	9.67	7.60	935	3	
URC-2	Upper Rock Creek	02-18-2020	12:30	LO	9.5	9.54	7.57	737	11	
WC-1	Woodcrest Creek	02-18-2020	12:55	LO	10.7	10.29	7.53	1035	10	Beaver activity on upstream

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	0.07	0.18	0.022	6.0
JB-1	Jim Blue Creek	<0.05	0.24	0.016	6.0
LDB-1	Lower Dave Blue Creek	0.13	0.36	0.026	12.0
LRC-1	Lower Rock Creek	0.07	0.40	0.034	10.0
LT-1	Lake Laterals	<0.05	0.32	0.016	<5.0
TE-1	Little River Tributary	0.10	0.40	0.035	20.0
TG-1	Little River Tributary	0.15	0.44	0.030	12.0
UDB-1	Upper Dave Blue Creek	<0.05	0.26	0.019	10.0
URC-2	Upper Rock Creek	<0.05	0.51	0.038	8.0
WC-1	Woodcrest Creek	0.09	0.51	0.053	14.0

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	0.07	0.18	0.020	6.0
Duplicate RPD	0%	0%	9.52%	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	1.31	20.41
JB-1	Jim Blue Creek	1.04	16.63
LDB-1	Lower Dave Blue Creek	4.47	16.72
LRC-1	Lower Rock Creek	12.35	18.32
LT-1	Lake Laterals	0.32	4.44
TE-1	Little River Tributary	0.13	11.41
TG-1	Little River Tributary	1.00	9.16
UDB-1	Upper Dave Blue Creek	0.34	17.46
URC-2	Upper Rock Creek	0.50	11.33
WC-1	Woodcrest Creek	0.10	7.68

Table 4 Station Discharge Summary

Discharge Measurement Summary

Date Generated: Wed Feb 19 2020

File Information

File Name CC0218.WAD
Start Date and Time 2020/02/18 09:10:07

Site Details

Site Name CC
Operator(s) SCD

System Information

Sensor Type FlowTracker
Serial # P4713
CPU Firmware Version 3.9
Software Ver 2.30
Mounting Correction 0.0%

Units (English Units)

Distance ft
Velocity ft/s
Area ft²
Discharge cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.4%	2.0%
Velocity	1.0%	2.8%
Width	0.1%	0.1%
Method	2.2%	-
# Stations	3.0%	-
Overall	4.0%	3.5%

Summary

Averaging Int.	40	# Stations	17
Start Edge	LEW	Total Width	8.000
Mean SNR	29.6 dB	Total Area	1.925
Mean Temp	46.60 °F	Mean Depth	0.241
Disch. Equation	Mid-Section	Mean Velocity	0.6810
		Total Discharge	1.3112

Supplemental Data

#	Time	Location	Gauge Height	Rated Flow	Comments
1	Tue Feb 18 09:28:46 CST 2020	8.000	20.410		

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	09:10	0.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	09:10	0.50	0.6	0.550	0.6	0.220	0.8428	1.00	0.8428	0.275	0.2317	17.7
2	09:11	1.00	0.6	0.400	0.6	0.160	0.7904	1.00	0.7904	0.200	0.1580	12.1
3	09:13	1.50	0.6	0.300	0.6	0.120	0.7897	1.00	0.7897	0.150	0.1184	9.0
4	09:14	2.00	0.6	0.300	0.6	0.120	0.7359	1.00	0.7359	0.150	0.1103	8.4
5	09:14	2.50	0.6	0.300	0.6	0.120	0.6594	1.00	0.6594	0.150	0.0989	7.5
6	09:15	3.00	0.6	0.200	0.6	0.080	0.7139	1.00	0.7139	0.100	0.0714	5.4
7	09:16	3.50	0.6	0.200	0.6	0.080	0.7641	1.00	0.7641	0.100	0.0765	5.8
8	09:17	4.00	0.6	0.200	0.6	0.080	0.6207	1.00	0.6207	0.100	0.0621	4.7
9	09:18	4.50	0.6	0.200	0.6	0.080	0.6227	1.00	0.6227	0.100	0.0623	4.8
10	09:19	5.00	0.6	0.200	0.6	0.080	0.6542	1.00	0.6542	0.100	0.0655	5.0
11	09:20	5.50	0.6	0.200	0.6	0.080	0.7011	1.00	0.7011	0.100	0.0702	5.4
12	09:21	6.00	0.6	0.200	0.6	0.080	0.5151	1.00	0.5151	0.100	0.0515	3.9
13	09:22	6.50	0.6	0.200	0.6	0.080	0.4318	1.00	0.4318	0.100	0.0432	3.3
14	09:23	7.00	0.6	0.200	0.6	0.080	0.5797	1.00	0.5797	0.100	0.0580	4.4
15	09:24	7.50	0.6	0.200	0.6	0.080	0.3314	1.00	0.3314	0.100	0.0332	2.5
16	09:24	8.00	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

Discharge Measurement Summary

Date Generated: Wed Feb 19 2020

File Information

File Name JB0218.WAD
Start Date and Time 2020/02/18 09:48:57

Site Details

Site Name JB
Operator(s) SCD

System Information

Sensor Type FlowTracker
Serial # P4713
CPU Firmware Version 3.9
Software Ver 2.30
Mounting Correction 0.0%

Units (English Units)

Distance ft
Velocity ft/s
Area ft²
Discharge cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.6%	1.7%
Velocity	1.1%	4.3%
Width	0.2%	0.2%
Method	2.8%	-
# Stations	4.6%	-
Overall	5.6%	4.7%

Summary

Averaging Int.	40	# Stations	11
Start Edge	LEW	Total Width	5.000
Mean SNR	37.8 dB	Total Area	1.675
Mean Temp	45.89 °F	Mean Depth	0.335
Disch. Equation	Mid-Section	Mean Velocity	0.6186
		Total Discharge	1.0360

Supplemental Data

#	Time	Location	Gauge Height	Rated Flow	Comments
1	Tue Feb 18 09:59:31 CST 2020	5.000	16.630		

Measurement Results

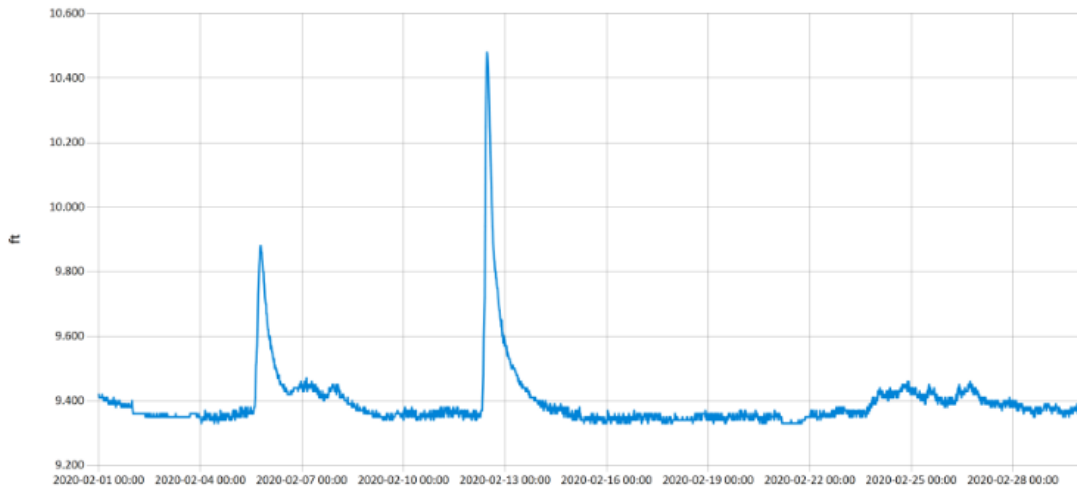
St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	09:48	0.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	09:48	0.50	0.6	0.550	0.6	0.220	0.0666	1.00	0.0666	0.275	0.0183	1.8
2	09:50	1.00	0.6	0.500	0.6	0.200	0.6693	1.00	0.6693	0.250	0.1673	16.2
3	09:51	1.50	0.6	0.450	0.6	0.180	0.8898	1.00	0.8898	0.225	0.2003	19.3
4	09:52	2.00	0.6	0.400	0.6	0.160	0.8550	1.00	0.8550	0.200	0.1710	16.5
5	09:53	2.50	0.6	0.350	0.6	0.140	0.7726	1.00	0.7726	0.175	0.1352	13.1
6	09:54	3.00	0.6	0.300	0.6	0.120	0.7444	1.00	0.7444	0.150	0.1116	10.8
7	09:55	3.50	0.6	0.300	0.6	0.120	0.7083	1.00	0.7083	0.150	0.1062	10.3
8	09:56	4.00	0.6	0.300	0.6	0.120	0.6053	1.00	0.6053	0.150	0.0908	8.8
9	09:57	4.50	0.6	0.200	0.6	0.080	0.3530	1.00	0.3530	0.100	0.0353	3.4
10	09:57	5.00	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 3 Discharge Measurement Summary JB-1

Period Selected: 2020-02-01 00:00 - 2020-02-29 23:59

UTC Off. et: -06:00

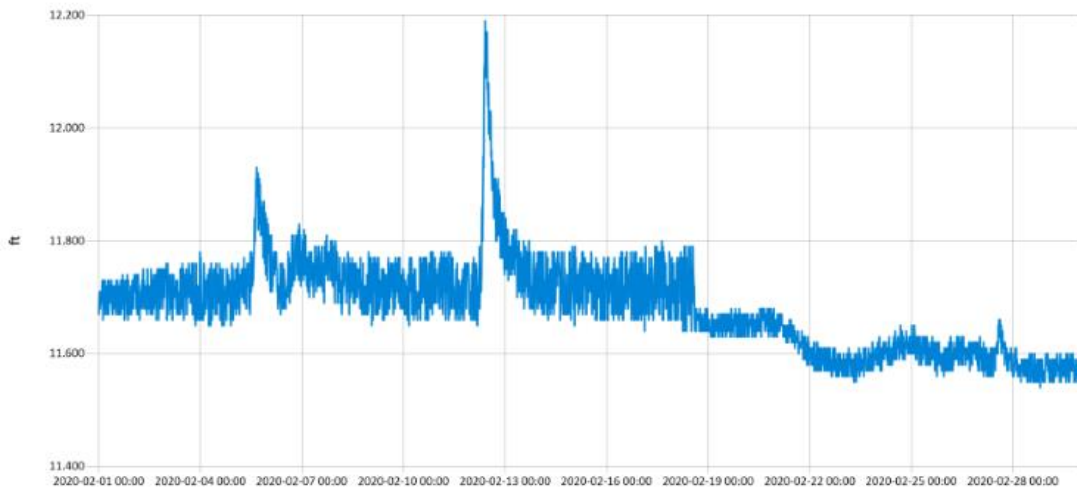


— Stage@TG

Figure 5 Monthly Hydrograph TG-1

Period Selected: 2020-02-01 00:00 - 2020-02-29 23:59

UTC Off. et: -06:00

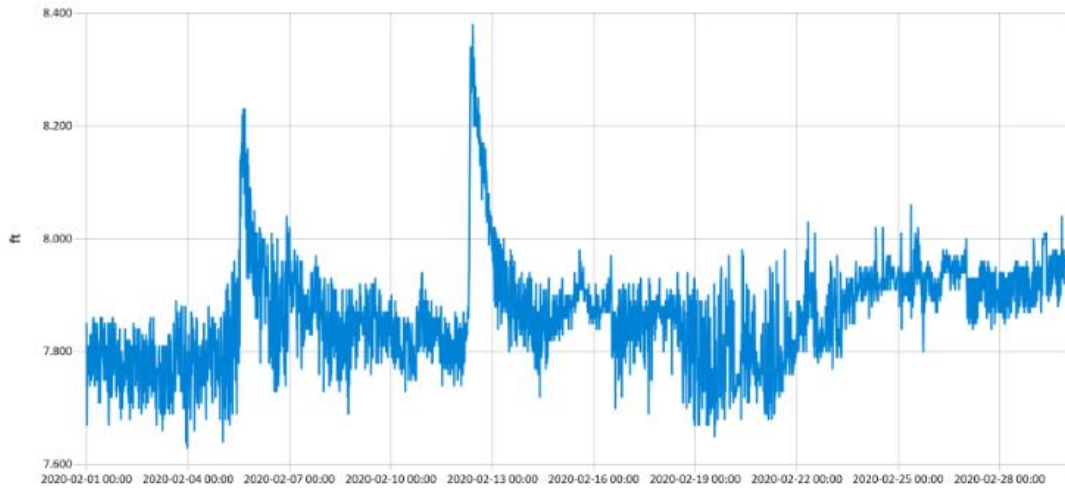


— Stage@TE

Figure 6 Monthly Hydrograph TE-1

Period Selected: 2020-02-01 00:00 - 2020-02-29 23:59

UTC Off. et. -06:00

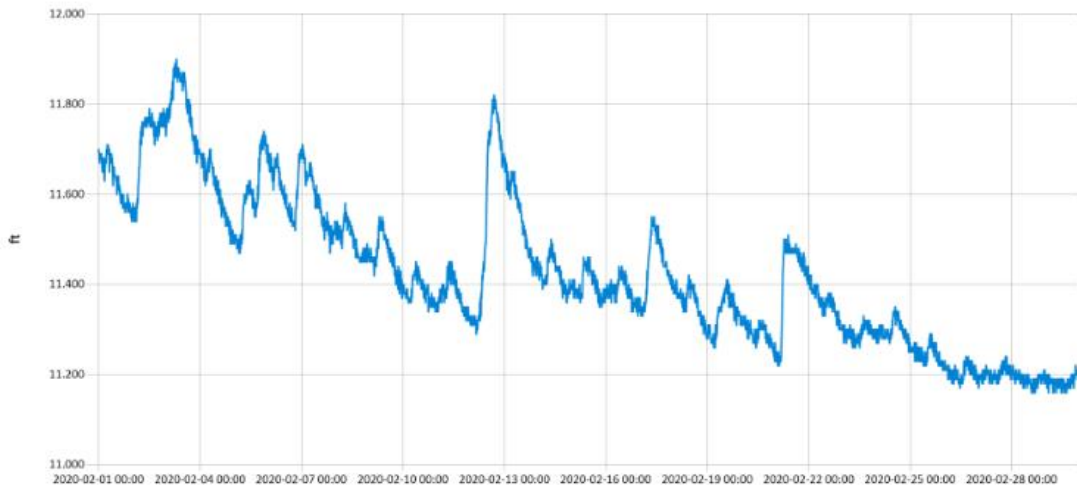


— Stage@WC

Figure 7 Monthly Hydrograph WC-1

Period Selected: 2020-02-01 00:00 - 2020-02-29 23:59

UTC Off. et. -06:00

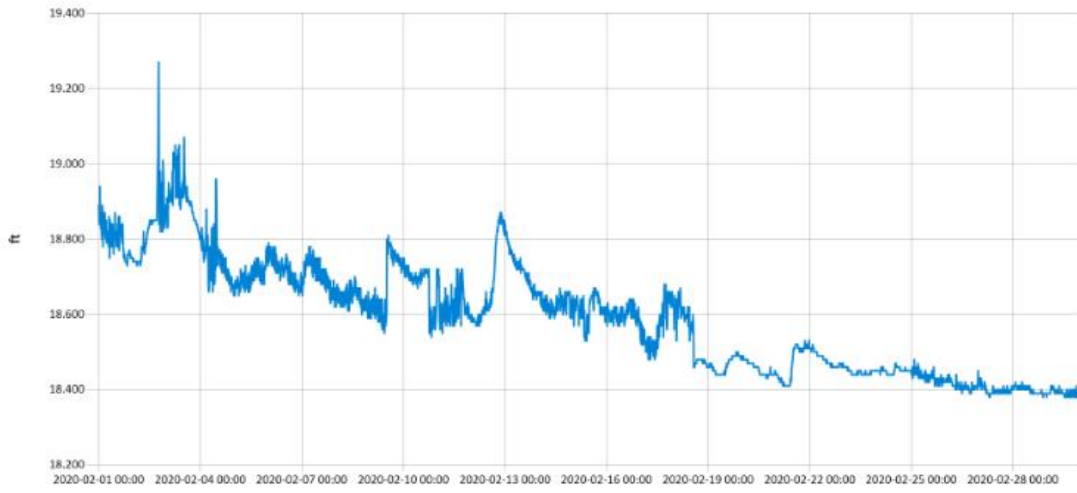


— Stage@URC

Figure 8 Monthly Hydrograph URC-2

Period Selected: 2020-02-01 00:00 - 2020-02-29 23:59

UTC Off. et: -06:00

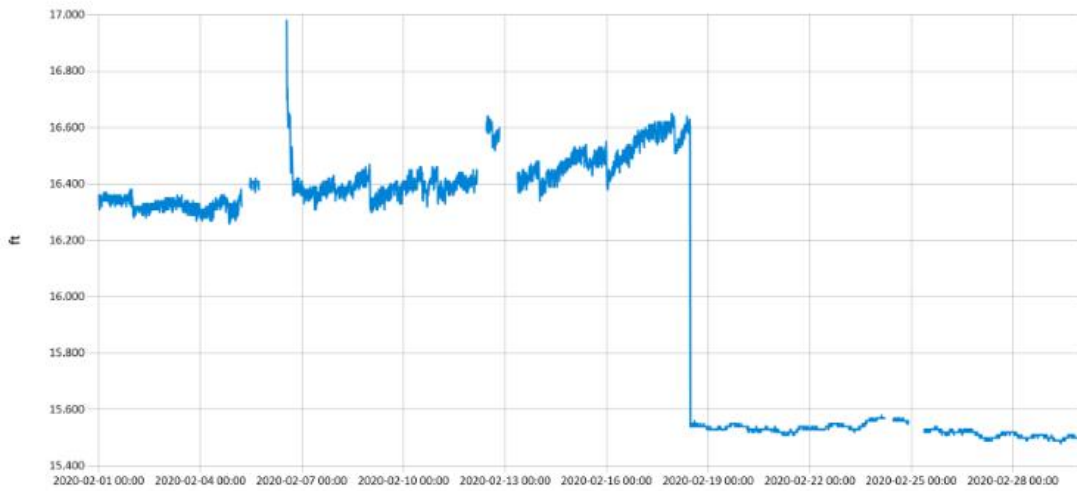


— Stage@LRC

Figure 9 Monthly Hydrograph LRC-1

Period Selected: 2020-02-01 00:00 - 2020-02-29 23:59

UTC Off. et: -06:00



— Stage@JB

Figure 10 Monthly Hydrograph JB-1

Period Selected: 2020-02-01 00:00 - 2020-02-29 23:59

UTC Offs et: -06:00

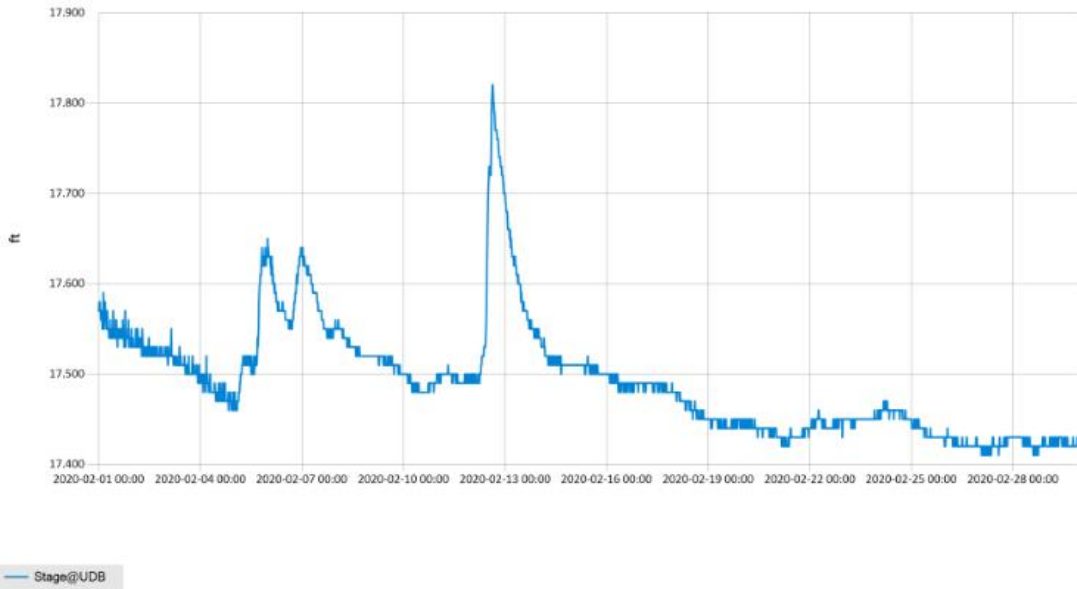


Figure 11 Monthly Hydrograph UDB-1

Period Selected: 2020-02-01 00:00 - 2020-02-29 23:59

UTC Offs et: -06:00

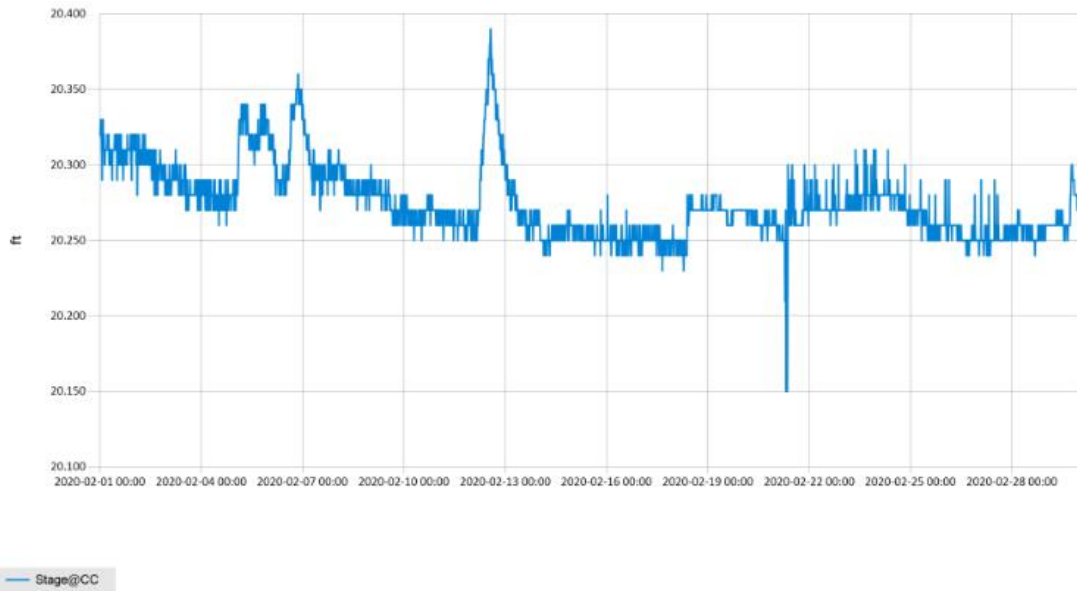


Figure 12 Monthly Hydrograph CC-1

MESONET CLIMATOLOGICAL DATA SUMMARY
(NRMN) Norman
Latitude: 35-14-09

February 2020
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/m ²)	4" SOIL TEMPERATURES			
	MAX	MIN	AVG	DEWPT	HDD	CDD	MAX	MIN	AVG		STN	MSL	DIR	AVG	MAX		SOD	BARE	MAX	MIN
1	65	25	45.9	27.1	20	0	94	21	54	0.00	28.87	30.12	SSW	5.2	17.9	15.22	41.5	44.3	50	39
2	77	41	59.6	30.9	6	0	59	20	35	0.00	28.65	29.89	SSW	7.9	20.5	14.75	44.7	47.3	54	41
3	69	39	55.0	34.1	11	0	79	28	48	0.00	28.46	29.69	S	12.4	27.9	9.76	47.4	48.3	52	46
4	39	30	34.0	30.5	31	0	96	78	87	0.01	28.68	29.93	N	14.4	27.6	2.12	44.7	42.2	46	39
5	31	25	28.7	24.9	37	0	98	73	86	0.00	28.68	29.93	N	12.1	22.6	5.63	41.2	37.0	39	36
6	41	16	28.1	19.1	37	0	94	39	71	0.25	28.50	29.74	WNW	5.8	13.1	16.30	39.8	37.5	42	35
7	51	25	38.3	28.8	27	0	91	43	70	0.14	28.63	29.88	NW	6.6	21.8	13.88	39.9	40.6	47	36
8	60	28	46.3	30.5	21	0	91	32	57	0.00	28.83	30.08	SSE	6.9	22.0	15.73	41.6	43.4	50	38
9	72	38	55.3	44.6	10	0	87	48	68	0.00	28.70	29.94	N	13.6	30.3	5.80	46.2	48.3	53	45
10	40	32	35.8	28.6	29	0	88	60	75	0.06	28.85	30.10	N	11.4	23.2	4.43	44.0	41.9	46	40
11	44	35	39.4	29.5	26	0	90	50	69	0.00	28.94	30.19	NNE	10.1	23.5	4.47	42.9	40.9	43	40
12	42	36	38.8	35.3	26	0	97	67	87	0.33	28.66	29.91	NNW	7.2	25.3	3.19	43.0	41.7	44	40
13	37	20	29.2	14.1	36	0	86	33	55	0.00	29.07	30.32	N	13.1	27.7	17.06	41.2	41.7	46	39
14	47	20	32.6	17.9	32	0	73	35	56	0.00	29.10	30.36	SSE	8.5	23.4	15.94	39.9	40.4	46	37
15	60	36	46.9	35.6	17	0	83	46	66	0.00	28.83	30.08	S	10.8	33.0	14.29	42.3	42.4	48	38
16	62	34	46.8	43.3	17	0	100	60	89	0.00	28.70	29.94	E	4.0	11.4	8.84	44.2	44.9	51	40
17	65	46	54.3	49.2	9	0	98	57	84	0.01	28.55	29.79	N	8.7	23.0	12.60	47.1	49.5	54	45
18	53	34	44.7	29.1	22	0	73	37	55	0.00	28.95	30.20	NNE	13.9	28.7	16.96	46.7	46.6	51	43
19	57	32	44.3	22.8	21	0	78	22	47	0.00	29.07	30.33	ENE	8.1	18.6	16.71	45.1	44.0	51	38
20	44	24	36.7	25.4	31	0	82	45	64	0.00	29.31	30.58	NNE	13.8	28.6	7.86	44.6	42.4	45	39
21	49	16	33.0	15.9	33	0	90	25	54	0.00	29.32	30.58	S	4.6	14.5	18.54	41.7	39.7	46	35
22	62	35	47.4	29.9	17	0	64	35	51	0.00	28.96	30.22	S	10.8	26.5	14.16	43.5	42.6	48	37
23	55	46	50.1	44.6	15	0	97	62	82	0.07	28.66	29.91	SSE	9.5	22.8	3.06	45.9	46.3	48	45
24	55	41	47.9	43.6	17	0	98	70	85	0.05	28.47	29.71	NW	14.1	33.8	3.91	47.2	47.5	49	46
25	53	35	43.0	33.5	21	0	93	42	71	0.03	28.76	30.01	NW	14.1	30.0	14.92	46.3	46.0	50	43
26	42	25	34.0	22.8	32	0	93	38	66	0.04	29.12	30.38	NNW	14.4	34.4	14.93	43.6	42.2	46	39
27	63	21	42.6	20.8	23	0	87	18	48	0.00	28.99	30.24	SSW	8.8	24.3	20.00	42.1	41.9	50	36
28	66	30	48.2	29.0	17	0	94	22	54	0.00	29.03	30.29	WNW	7.4	23.7	19.98	44.4	46.6	55	39
29	75	33	55.1	29.0	11	0	84	14	44	0.00	28.82	30.07	SSE	8.4	28.9	15.67	45.4	48.9	56	41
	54	31	42.8	30.0	←- Monthly Averages →-						28.83	30.08	N	9.9	34.4	11.96	43.7	43.7	49	40
Temperature - Highest: 77 Lowest: 16					Degree Days - Total HDD: 650 Total CDD: 0					Number of Days With: Tmax ≥ 90: 0 Rainfall ≥ 0.01 inch: 10 Tmax ≤ 32: 1 Rainfall ≥ 0.10 inch: 3 Tmin ≤ 32: 15 Avg Wind Speed ≥ 10 mph: 14 Tmin ≤ 0: 0 Max Wind Speed ≥ 30 mph: 5										
Rainfall: Monthly Total: 0.99 in. Greatest 24 Hr: 0.33 in.					Humidity - Highest: 100 Lowest: 14															

Figure 13 February Mesonet Data