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

SY2020 Monthly Report

Lake Thunderbird TMDL Monitoring Plan Implementation:

May 2020 Monitoring Report

Oklahoma Water Resources Board
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SUMMARY OF MAY WATER QUALITY SAMPLING

Sampling for May 2020 occurred on the twenty-sixth and was considered a base flow collection. Water samples were collected at all ten locations, and discharge measurements were collected at eight locations. Mesonet data shows no precipitation on the twenty-sixth, 0.86 inches of precipitation in the 72 hours prior to sampling, and 0.12 inches of precipitation in the 72 hours after the sampling event. The total rainfall amount in Norman for the month of May was 4.25 inches. All water level gauges were operational for the month, except for LT-1 due to equipment malfunction.

RESULTS

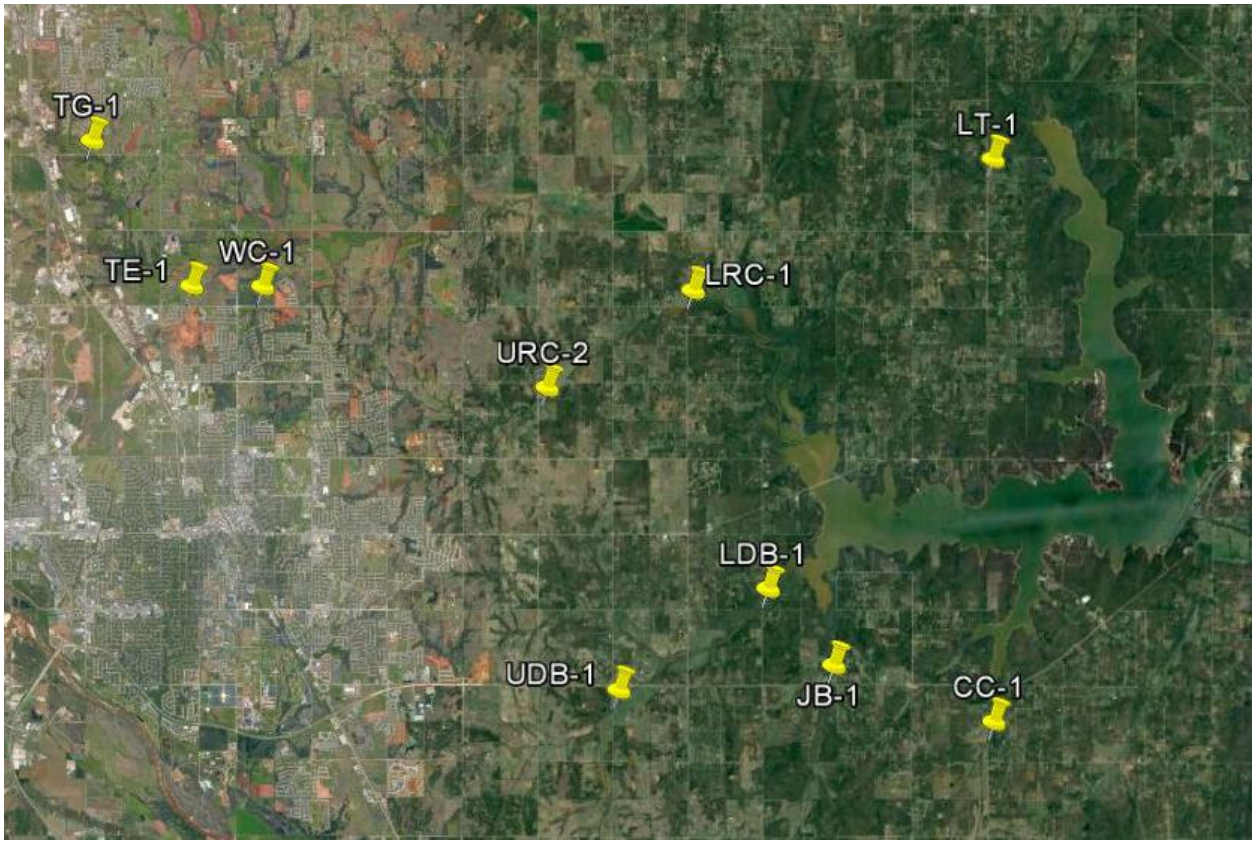

Figure 1 Monitoring Station Map

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	5/26/2020	10:40	SD	18.35	9.08	7.81	658	10	borderline normal/above visual flow
JB-1	Jim Blue Creek	5/26/2020	11:10	SD	18.33	7.77	7.69	649	32	borderline normal/above visual flow
LDB-1	Lower Dave Blue Creek	5/26/2020	10:00	SD	18.80	7.26	7.63	683	66	stage above normal, visual flow appears normal
LRC-1	Lower Rock Creek	5/26/2020	12:25	SD	19.11	8.03	7.72	482	62	more turbid than normal, visual flow appears normal
LT-1	Lake Laterals	5/26/2020	11:50	SD	19.32	3.90	7.38	377	20	
TE-1	Little River Tributary	5/26/2020	14:20	SD	21.48	8.55	7.81	445	65	more turbid than normal, visual flow appears normal
TG-1	Little River Tributary	5/26/2020	14:50	SD	20.56	8.64	7.85	492	19	more turbid than normal, borderline normal/above visual flow
UDB-1	Upper Dave Blue Creek	5/26/2020	9:20	SD	18.15	8.17	7.55	661	37	last transmission 5/25 @ 17:00 at 17.59
URC-2	Upper Rock Creek	5/26/2020	13:00	SD	18.87	7.43	7.72	527	64	borderline normal/above visual flow
WC-1	Woodcrest Creek	5/26/2020	13:45	SD	19.43	7.77	7.66	495	24	

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	0.18	0.40	0.056	6
JB-1	Jim Blue Creek	0.08	0.71	0.097	40
LDB-1	Lower Dave Blue Creek	0.18	0.80	0.112	58
LRC-1	Lower Rock Creek	0.23	0.70	0.096	44
LT-1	Lake Laterals	<0.05	0.84	0.083	18
TE-1	Little River Tributary	0.29	0.81	0.110	34
TG-1	Little River Tributary	0.23	0.75	0.135	18
UDB-1	Upper Dave Blue Creek	0.14	0.67	0.082	22
URC-2	Upper Rock Creek	0.13	1.01	0.118	52
WC-1	Woodcrest Creek	0.18	0.97	0.257	30

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	0.13	0.96	0.118	50
Duplicate RPD	0%	5.08%	0%	3.92%

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	1.91	20.64
JB-1	Jim Blue Creek	2.96	15.63
LDB-1	Lower Dave Blue Creek	26.37	17.30
LRC-1	Lower Rock Creek	5.80	18.25
LT-1	Lake Laterals	0.77	4.52
TE-1	Little River Tributary	1.77	11.63
TG-1	Little River Tributary	6.03	9.38
UDB-1	Upper Dave Blue Creek	8.13	17.91
URC-2	Upper Rock Creek	3.66	11.74
WC-1	Woodcrest Creek	1.83	7.97

Table 4 Station Discharge Summary

Discharge Measurement Summary

Date Generated: Wed Aug 19 2020

File Information	
File Name	URC0527.WAD
Start Date and Time	2020/05/26 14:22:16

Site Details	
Site Name	UPPER ROCK CREEK
Operator(s)	JTW

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	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.4%	1.6%
Velocity	0.6%	1.9%
Width	0.1%	0.1%
Method	1.8%	-
# Stations	2.5%	-
Overall	**3.3%**	**2.7%**

Summary

Averaging Int.	40	# Stations	20
Start Edge	LEW	Total Width	10.000
Mean SNR	35.5 dB	Total Area	6.700
Mean Temp	65.97 °F	Mean Depth	0.670
Disch. Equation	Mid-Section	Mean Velocity	0.5470
		Total Discharge	**3.6648**

Supplemental Data

#	Time	Location	Gauge Height	Rated Flow	Comments
1	Tue May 26 14:21:11 CDT 2020	0.000	11.740		

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	14:22	0.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	14:22	1.00	0.6	0.600	0.6	0.240	0.4544	1.00	0.4544	0.450	0.2045	5.6
2	14:24	1.50	0.6	0.700	0.6	0.280	0.4334	1.00	0.4334	0.350	0.1517	4.1
3	14:25	2.00	0.6	0.700	0.6	0.280	0.5052	1.00	0.5052	0.350	0.1769	4.8
4	14:26	2.50	0.6	0.800	0.6	0.320	0.5614	1.00	0.5614	0.400	0.2245	6.1
5	14:27	3.00	0.6	0.800	0.6	0.320	0.5535	1.00	0.5535	0.400	0.2214	6.0
6	14:28	3.50	0.6	0.800	0.6	0.320	0.5515	1.00	0.5515	0.400	0.2206	6.0
7	14:29	4.00	0.6	0.900	0.6	0.360	0.5869	1.00	0.5869	0.450	0.2641	7.2
8	14:29	4.50	0.6	0.700	0.6	0.280	0.5856	1.00	0.5856	0.350	0.2050	5.6
9	14:30	5.00	0.6	0.700	0.6	0.280	0.5961	1.00	0.5961	0.350	0.2087	5.7
10	14:31	5.50	0.6	0.700	0.6	0.280	0.6808	1.00	0.6808	0.350	0.2383	6.5
11	14:32	6.00	0.6	0.700	0.6	0.280	0.6211	1.00	0.6211	0.350	0.2174	5.9
12	14:33	6.50	0.6	0.600	0.6	0.240	0.7260	1.00	0.7260	0.300	0.2178	5.9
13	*14:34*	*7.00*	*0.6*	*0.600*	*0.6*	*0.240*	*0.6545*	*1.00*	*0.6545*	*0.300*	*0.1964*	*5.4*
14	14:35	7.50	0.6	0.700	0.6	0.280	0.6913	1.00	0.6913	0.350	0.2420	6.6
15	14:36	8.00	0.6	0.800	0.6	0.320	0.4934	1.00	0.4934	0.400	0.1973	5.4
16	14:37	8.50	0.6	0.800	0.6	0.320	0.4232	1.00	0.4232	0.400	0.1693	4.6
17	14:38	9.00	0.6	0.800	0.6	0.320	0.4216	1.00	0.4216	0.400	0.1686	4.6
18	14:39	9.50	0.6	0.700	0.6	0.280	0.4009	1.00	0.4009	0.350	0.1403	3.8
19	14:39	10.00	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 URC-2

Discharge Measurement Summary

Date Generated: Wed Aug 19 2020

File Information	
File Name	CC0526.WAD
Start Date and Time	2020/05/26 11:38:04

Site Details	
Site Name	CLEAR CREEK
Operator(s)	JTW

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	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.6%	7.2%
Velocity	1.9%	19.8%
Width	0.2%	0.2%
Method	3.2%	-
# Stations	3.9%	-
Overall	**5.5%**	**21.1%**

Summary

Averaging Int.	40	# Stations	13
Start Edge	REW	Total Width	7.000
Mean SNR	41.1 dB	Total Area	3.000
Mean Temp	65.18 °F	Mean Depth	0.429
Disch. Equation	Mid-Section	Mean Velocity	0.6359
		Total Discharge	**1.9075**

Supplemental Data

#	Time	Location	Gauge Height	Rated Flow	Comments
1	Tue May 26 11:36:22 CDT 2020	0.000	20.640		

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	11:38	0.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	*11:38*	*1.00*	*0.6*	*0.500*	*0.6*	*0.200*	*0.0154*	*1.00*	*0.0154*	*0.375*	*0.0058*	*0.3*
2	*11:39*	*1.50*	*0.6*	*0.800*	*0.6*	*0.320*	*0.0469*	*1.00*	*0.0469*	*0.400*	*0.0188*	*1.0*
3	*11:40*	*2.00*	*0.6*	*0.600*	*0.6*	*0.240*	*0.1171*	*1.00*	*0.1171*	*0.300*	*0.0351*	*1.8*
4	11:41	2.50	0.6	0.500	0.6	0.200	1.0659	1.00	1.0659	0.250	0.2665	14.0
5	*11:42*	*3.00*	*0.6*	*0.500*	*0.6*	*0.200*	*0.7241*	*1.00*	*0.7241*	*0.250*	*0.1810*	*9.5*
6	*11:43*	*3.50*	*0.6*	*0.600*	*0.6*	*0.240*	*1.6096*	*1.00*	*1.6096*	*0.300*	*0.4829*	*25.3*
7	11:44	4.00	0.6	0.500	0.6	0.200	1.5860	1.00	1.5860	0.250	0.3965	20.8
8	11:45	4.50	0.6	0.500	0.6	0.200	1.5052	1.00	1.5052	0.250	0.3763	19.7
9	*11:46*	*5.00*	*0.6*	*0.500*	*0.6*	*0.200*	*0.0738*	*1.00*	*0.0738*	*0.250*	*0.0185*	*1.0*
10	*11:47*	*5.50*	*0.6*	*0.300*	*0.6*	*0.120*	*-0.0538*	*1.00*	*-0.0538*	*0.150*	*-0.0081*	*-0.4*
11	*11:48*	*6.00*	*0.6*	*0.300*	*0.6*	*0.120*	*0.5968*	*1.00*	*0.5968*	*0.225*	*0.1342*	*7.0*
12	11:48	7.00	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 CC-1

Discharge Measurement Summary

Date Generated: Wed Aug 19 2020

File Information	
File Name	JB0526.WAD
Start Date and Time	2020/05/26 12:16:41

Site Details	
Site Name	JIM BLUE
Operator(s)	JTW

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	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.5%	2.3%
Velocity	1.2%	4.5%
Width	0.2%	0.2%
Method	2.7%	-
# Stations	5.1%	-
Overall	**6.1%**	**5.1%**

Summary

Averaging Int.	40	# Stations	10
Start Edge	LEW	Total Width	5.000
Mean SNR	45.3 dB	Total Area	2.825
Mean Temp	65.27 °F	Mean Depth	0.565
Disch. Equation	Mid-Section	Mean Velocity	1.0488
		Total Discharge	**2.9631**

Supplemental Data

#	Time	Location	Gauge Height	Rated Flow	Comments
1	Tue May 26 12:13:50 CDT 2020	0.000	15.630		

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	12:16	0.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	12:16	0.50	0.6	0.700	0.6	0.280	0.4383	1.00	0.4383	0.350	0.1534	5.2
2	12:18	1.00	0.6	0.800	0.6	0.320	0.9642	1.00	0.9642	0.400	0.3856	13.0
3	12:19	1.50	0.6	0.700	0.6	0.280	1.0971	1.00	1.0971	0.350	0.3841	13.0
4	12:20	2.00	0.6	0.700	0.6	0.280	1.0138	1.00	1.0138	0.350	0.3549	12.0
5	12:21	2.50	0.6	0.700	0.6	0.280	1.2805	1.00	1.2805	0.350	0.4483	15.1
6	12:21	3.00	0.6	0.700	0.6	0.280	1.4072	1.00	1.4072	0.350	0.4926	16.6
7	12:23	3.50	0.6	0.600	0.6	0.240	1.0958	1.00	1.0958	0.300	0.3288	11.1
8	12:24	4.00	0.6	0.500	0.6	0.200	1.1079	1.00	1.1079	0.375	0.4155	14.0
9	12:24	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 4 Discharge Measurement Summary JB-1

Discharge Measurement Summary

Date Generated: Wed Aug 19 2020

File Information	
File Name	LRC0526.WAD
Start Date and Time	2020/05/26 14:59:20

Site Details	
Site Name	LOWER ROCK
Operator(s)	JTW

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	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.3%	1.8%
Velocity	0.3%	1.8%
Width	0.1%	0.1%
Method	1.7%	-
# Stations	2.1%	-
Overall	**2.9%**	**2.7%**

Summary

Averaging Int.	40	# Stations	24
Start Edge	LEW	Total Width	14.000
Mean SNR	34.9 dB	Total Area	8.350
Mean Temp	67.79 °F	Mean Depth	0.596
Disch. Equation	Mid-Section	Mean Velocity	0.6941
		Total Discharge	**5.7954**

Supplemental Data

#	Time	Location	Gauge Height	Rated Flow	Comments
1	Tue May 26 14:57:36 CDT 2020	0.000	18.250		

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	14:59	0.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	15:00	2.00	0.6	0.600	0.6	0.240	0.5315	1.00	0.5315	0.750	0.3987	6.9
2	15:01	2.50	0.6	0.900	0.6	0.360	0.6476	1.00	0.6476	0.450	0.2914	5.0
3	15:03	3.00	0.6	0.900	0.6	0.360	0.7320	1.00	0.7320	0.450	0.3294	5.7
4	15:04	3.50	0.6	0.900	0.6	0.360	0.5823	1.00	0.5823	0.450	0.2620	4.5
5	15:05	4.00	0.6	1.100	0.6	0.440	0.7710	1.00	0.7710	0.550	0.4241	7.3
6	15:06	4.50	0.6	1.000	0.6	0.400	0.8025	1.00	0.8025	0.500	0.4012	6.9
7	15:07	5.00	0.6	1.100	0.6	0.440	0.7762	1.00	0.7762	0.550	0.4270	7.4
8	15:08	5.50	0.6	1.000	0.6	0.400	0.7539	1.00	0.7539	0.500	0.3770	6.5
9	15:09	6.00	0.6	0.900	0.6	0.360	0.7648	1.00	0.7648	0.450	0.3441	5.9
10	15:10	6.50	0.6	0.800	0.6	0.320	0.7828	1.00	0.7828	0.400	0.3131	5.4
11	15:11	7.00	0.6	0.800	0.6	0.320	0.7894	1.00	0.7894	0.400	0.3157	5.4
12	15:12	7.50	0.6	0.700	0.6	0.280	0.7352	1.00	0.7352	0.350	0.2574	4.4
13	15:13	8.00	0.6	0.700	0.6	0.280	0.7438	1.00	0.7438	0.350	0.2604	4.5
14	15:14	8.50	0.6	0.600	0.6	0.240	0.7283	1.00	0.7283	0.300	0.2185	3.8
15	15:15	9.00	0.6	0.600	0.6	0.240	0.7300	1.00	0.7300	0.300	0.2190	3.8
16	15:16	9.50	0.6	0.500	0.6	0.200	0.6503	1.00	0.6503	0.250	0.1626	2.8
17	15:16	10.00	0.6	0.500	0.6	0.200	0.6778	1.00	0.6778	0.250	0.1695	2.9
18	15:17	10.50	0.6	0.500	0.6	0.200	0.5689	1.00	0.5689	0.250	0.1422	2.5
19	15:18	11.00	0.6	0.400	0.6	0.160	0.6430	1.00	0.6430	0.200	0.1286	2.2
20	15:19	11.50	0.6	0.400	0.6	0.160	0.5577	1.00	0.5577	0.200	0.1115	1.9
21	15:20	12.00	0.6	0.300	0.6	0.120	0.6119	1.00	0.6119	0.150	0.0917	1.6
22	15:21	12.50	0.6	0.300	0.6	0.120	0.5016	1.00	0.5016	0.300	0.1504	2.6
23	15:21	14.00	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 5 Discharge Measurement Summary LRC-1

Discharge Measurement Summary

Date Generated: Wed Aug 19 2020

File Information	
File Name	WC0526.WAD
Start Date and Time	2020/05/26 17:15:50

Site Details	
Site Name	WOODCREST
Operator(s)	JTW

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	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.5%	1.8%
Velocity	0.6%	4.1%
Width	0.2%	0.2%
Method	2.4%	-
# Stations	3.0%	-
Overall	**4.0%**	**4.6%**

Summary

Averaging Int.	40	# Stations	17
Start Edge	LEW	Total Width	12.000
Mean SNR	36.2 dB	Total Area	3.299
Mean Temp	67.16 °F	Mean Depth	0.275
Disch. Equation	Mid-Section	Mean Velocity	0.5547
		Total Discharge	**1.8298**

Supplemental Data

#	Time	Location	Gauge Height	Rated Flow	Comments
1	Tue May 26 17:14:27 CDT 2020	0.000	7.965		

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	17:15	0.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	*17:15*	*2.00*	*0.6*	*0.300*	*0.6*	*0.120*	*-0.0233*	*1.00*	*-0.0233*	*0.375*	*-0.0087*	*-0.5*
2	*17:16*	*2.50*	*0.6*	*0.400*	*0.6*	*0.160*	*-0.0066*	*1.00*	*-0.0066*	*0.200*	*-0.0013*	*-0.1*
3	*17:17*	*3.00*	*0.6*	*0.400*	*0.6*	*0.160*	*0.0463*	*1.00*	*0.0463*	*0.200*	*0.0093*	*0.5*
4	17:18	3.50	0.6	0.400	0.6	0.160	0.3652	1.00	0.3652	0.200	0.0730	4.0
5	17:19	4.00	0.6	0.400	0.6	0.160	0.7402	1.00	0.7402	0.200	0.1480	8.1
6	17:20	4.50	0.6	0.400	0.6	0.160	0.7595	1.00	0.7595	0.200	0.1519	8.3
7	17:21	5.00	0.6	0.400	0.6	0.160	0.8743	1.00	0.8743	0.200	0.1748	9.6
8	*17:22*	*5.50*	*0.6*	*0.400*	*0.6*	*0.160*	*0.8586*	*1.00*	*0.8586*	*0.200*	*0.1717*	*9.4*
9	*17:22*	*6.00*	*0.6*	*0.400*	*0.6*	*0.160*	*0.7615*	*1.00*	*0.7615*	*0.200*	*0.1523*	*8.3*
10	*17:23*	*6.50*	*0.6*	*0.400*	*0.6*	*0.160*	*0.7343*	*1.00*	*0.7343*	*0.200*	*0.1468*	*8.0*
11	*17:24*	*7.00*	*0.6*	*0.300*	*0.6*	*0.120*	*0.8363*	*1.00*	*0.8363*	*0.150*	*0.1254*	*6.9*
12	*17:25*	*7.50*	*0.6*	*0.300*	*0.6*	*0.120*	*0.7372*	*1.00*	*0.7372*	*0.150*	*0.1105*	*6.0*
13	*17:26*	*8.00*	*0.6*	*0.300*	*0.6*	*0.120*	*0.8780*	*1.00*	*0.8780*	*0.150*	*0.1316*	*7.2*
14	*17:27*	*8.50*	*0.6*	*0.300*	*0.6*	*0.120*	*0.6660*	*1.00*	*0.6660*	*0.150*	*0.0999*	*5.5*
15	*17:28*	*9.00*	*0.6*	*0.300*	*0.6*	*0.120*	*0.6568*	*1.00*	*0.6568*	*0.525*	*0.3447*	*18.8*
16	17:28	12.00	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 6 Discharge Measurement Summary WC-1

Discharge Measurement Summary

Date Generated: Wed Aug 19 2020

File Information	
File Name	UDB0527.WAD
Start Date and Time	2020/05/26 12:55:27

Site Details	
Site Name	UPPER DAVE
Operator(s)	JTW

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	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.2%	2.8%
Velocity	0.9%	3.3%
Width	0.1%	0.1%
Method	1.7%	-
# Stations	1.9%	-
Overall	**2.9%**	**4.4%**

Summary

Averaging Int.	40	# Stations	27
Start Edge	LEW	Total Width	16.000
Mean SNR	35.0 dB	Total Area	12.775
Mean Temp	64.60 °F	Mean Depth	0.798
Disch. Equation	Mid-Section	Mean Velocity	0.6365
		Total Discharge	**8.1312**

Supplemental Data

#	Time	Location	Gauge Height	Rated Flow	Comments
1	Tue May 26 12:53:02 CDT 2020	0.000	17.910		

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	12:55	2.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	*12:55*	*3.00*	*0.6*	*0.600*	*0.6*	*0.240*	*0.3691*	*1.00*	*0.3691*	*0.450*	*0.1661*	*2.0*
2	*12:56*	*3.50*	*0.6*	*0.700*	*0.6*	*0.280*	*0.0699*	*1.00*	*0.0699*	*0.350*	*0.0245*	*0.3*
3	12:57	4.00	0.6	0.800	0.6	0.320	0.3353	1.00	0.3353	0.400	0.1341	1.6
4	12:58	4.50	0.6	1.000	0.6	0.400	0.4012	1.00	0.4012	0.500	0.2006	2.5
5	12:59	5.00	0.6	1.100	0.6	0.440	0.4685	1.00	0.4685	0.550	0.2577	3.2
6	13:00	5.50	0.6	0.900	0.6	0.360	0.6302	1.00	0.6302	0.450	0.2836	3.5
7	13:01	6.00	0.6	1.300	0.6	0.520	0.4908	1.00	0.4908	0.650	0.3190	3.9
8	*13:02*	*6.50*	*0.6*	*1.300*	*0.6*	*0.520*	*0.4016*	*1.00*	*0.4016*	*0.650*	*0.2610*	*3.2*
9	13:04	7.00	0.6	1.100	0.6	0.440	0.7454	1.00	0.7454	0.550	0.4100	5.0
10	13:04	7.50	0.6	1.400	0.6	0.560	0.9331	1.00	0.9331	0.700	0.6531	8.0
11	13:06	8.00	0.6	1.300	0.6	0.520	0.9603	1.00	0.9603	0.650	0.6241	7.7
12	13:06	8.50	0.6	1.300	0.6	0.520	0.9990	1.00	0.9990	0.650	0.6493	8.0
13	13:07	9.00	0.6	1.100	0.6	0.440	1.0226	1.00	1.0226	0.550	0.5625	6.9
14	13:08	9.50	0.6	1.200	0.6	0.480	0.8412	1.00	0.8412	0.600	0.5048	6.2
15	13:09	10.00	0.6	0.900	0.6	0.360	0.9495	1.00	0.9495	0.450	0.4272	5.3
16	13:11	10.50	0.6	1.000	0.6	0.400	0.8012	1.00	0.8012	0.500	0.4006	4.9
17	13:11	11.00	0.6	0.900	0.6	0.360	0.6211	1.00	0.6211	0.450	0.2795	3.4
18	13:12	11.50	0.6	1.000	0.6	0.400	0.5705	1.00	0.5705	0.500	0.2853	3.5
19	13:14	12.00	0.6	0.800	0.6	0.320	0.6365	1.00	0.6365	0.400	0.2546	3.1
20	13:15	12.50	0.6	0.800	0.6	0.320	0.5994	1.00	0.5994	0.400	0.2397	2.9
21	*13:16*	*13.00*	*0.6*	*0.900*	*0.6*	*0.360*	*0.2861*	*1.00*	*0.2861*	*0.450*	*0.1287*	*1.6*
22	13:17	13.50	0.6	0.800	0.6	0.320	0.5577	1.00	0.5577	0.400	0.2231	2.7
23	13:18	14.00	0.6	0.800	0.6	0.320	0.5968	1.00	0.5968	0.400	0.2387	2.9
24	13:19	14.50	0.6	0.500	0.6	0.200	0.6089	1.00	0.6089	0.250	0.1522	1.9
25	*13:21*	*15.00*	*0.6*	*0.500*	*0.6*	*0.200*	*0.5157*	*1.00*	*0.5157*	*0.875*	*0.4513*	*5.5*
26	13:21	18.00	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 7 Discharge Measurement Summary UDB-1

Discharge Measurement Summary

Date Generated: Wed Aug 19 2020

File Information	
File Name	LT0526.WAD
Start Date and Time	2020/05/26 15:54:11

Site Details	
Site Name	LAKE LATERAL
Operator(s)	JTW

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	ft^2
Discharge	cfs

Discharge Uncertainty		
Category	**ISO**	**Stats**
Accuracy	1.0%	1.0%
Depth	0.1%	1.5%
Velocity	1.6%	8.0%
Width	0.1%	0.1%
Method	2.2%	-
# Stations	1.6%	-
Overall	**3.3%**	**8.2%**

Summary			
Averaging Int.	40	# Stations	33
Start Edge	REW	Total Width	19.000
Mean SNR	37.5 dB	Total Area	34.151
Mean Temp	68.78 °F	Mean Depth	1.797
Disch. Equation	Mid-Section	Mean Velocity	0.0225
		Total Discharge	**0.7678**

Supplemental Data

#	Time	Location	Gauge Height	Rated Flow	Comments
1	Tue May 26 15:51:42 CDT 2020	0.000	4.520		

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	15:54	1.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	15:54	1.50	0.6	0.800	0.6	0.320	-0.0197	1.00	-0.0197	0.400	-0.0079	-1.0
2	*15:55*	*2.00*	*0.6*	*1.000*	*0.6*	*0.400*	*-0.0069*	*1.00*	*-0.0069*	*0.500*	*-0.0034*	*-0.4*
3	15:56	2.50	0.6	1.300	0.6	0.520	-0.0115	1.00	-0.0115	0.650	-0.0075	-1.0
4	*15:57*	*3.00*	*0.6*	*1.700*	*0.6*	*0.680*	*-0.0079*	*1.00*	*-0.0079*	*0.850*	*-0.0067*	*-0.9*
5	*15:58*	*3.50*	*0.6*	*1.900*	*0.6*	*0.760*	*0.0354*	*1.00*	*0.0354*	*0.950*	*0.0337*	*4.4*
6	*15:59*	*4.00*	*0.6*	*2.000*	*0.6*	*0.800*	*0.0276*	*1.00*	*0.0276*	*1.000*	*0.0276*	*3.6*
7	16:00	4.50	0.6	2.200	0.6	0.880	0.0203	1.00	0.0203	1.100	0.0224	2.9
8	16:01	5.00	0.6	2.400	0.6	0.960	0.0194	1.00	0.0194	1.200	0.0232	3.0
9	16:02	5.50	0.6	2.400	0.6	0.960	0.0344	1.00	0.0344	1.200	0.0413	5.4
10	*16:03*	*6.00*	*0.6*	*2.500*	*0.6*	*1.000*	*0.0335*	*1.00*	*0.0335*	*1.250*	*0.0418*	*5.4*
11	*16:04*	*6.50*	*0.6*	*2.600*	*0.6*	*1.040*	*0.0374*	*1.00*	*0.0374*	*1.300*	*0.0486*	*6.3*
12	*16:05*	*7.00*	*0.6*	*2.600*	*0.6*	*1.040*	*0.0361*	*1.00*	*0.0361*	*1.300*	*0.0469*	*6.1*
13	*16:06*	*7.50*	*0.6*	*2.600*	*0.6*	*1.040*	*0.0453*	*1.00*	*0.0453*	*1.300*	*0.0589*	*7.7*
14	*16:07*	*8.00*	*0.6*	*2.700*	*0.6*	*1.080*	*0.0318*	*1.00*	*0.0318*	*1.350*	*0.0430*	*5.6*
15	*16:08*	*8.50*	*0.6*	*2.700*	*0.6*	*1.080*	*0.0381*	*1.00*	*0.0381*	*1.350*	*0.0514*	*6.7*
16	*16:08*	*9.00*	*0.6*	*2.700*	*0.6*	*1.080*	*0.0308*	*1.00*	*0.0308*	*1.350*	*0.0416*	*5.4*
17	*16:09*	*9.50*	*0.6*	*2.700*	*0.6*	*1.080*	*0.0338*	*1.00*	*0.0338*	*1.350*	*0.0456*	*5.9*
18	*16:11*	*10.00*	*0.6*	*2.700*	*0.6*	*1.080*	*0.0341*	*1.00*	*0.0341*	*1.350*	*0.0461*	*6.0*
19	*16:12*	*10.50*	*0.6*	*2.700*	*0.6*	*1.080*	*0.0492*	*1.00*	*0.0492*	*1.350*	*0.0664*	*8.7*
20	*16:13*	*11.00*	*0.6*	*2.600*	*0.6*	*1.040*	*0.0509*	*1.00*	*0.0509*	*1.300*	*0.0661*	*8.6*
21	*16:14*	*11.50*	*0.6*	*2.600*	*0.6*	*1.040*	*0.0469*	*1.00*	*0.0469*	*1.300*	*0.0610*	*7.9*
22	*16:15*	*12.00*	*0.6*	*2.700*	*0.6*	*1.080*	*0.0577*	*1.00*	*0.0577*	*1.350*	*0.0780*	*10.2*
23	*16:16*	*12.50*	*0.6*	*1.800*	*0.6*	*0.720*	*0.0427*	*1.00*	*0.0427*	*0.900*	*0.0384*	*5.0*
24	16:17	13.00	0.6	1.600	0.6	0.640	0.0066	1.00	0.0066	0.800	0.0052	0.7
25	*16:18*	*13.50*	*0.6*	*1.500*	*0.6*	*0.600*	*0.0039*	*1.00*	*0.0039*	*0.750*	*0.0030*	*0.4*
26	16:19	14.00	0.6	1.400	0.6	0.560	-0.0016	1.00	-0.0016	1.050	-0.0017	-0.2
27	*16:20*	*15.00*	*0.6*	*1.200*	*0.6*	*0.480*	*-0.0046*	*1.00*	*-0.0046*	*1.200*	*-0.0055*	*-0.7*
28	*16:21*	*16.00*	*0.6*	*1.400*	*0.6*	*0.560*	*-0.0059*	*1.00*	*-0.0059*	*1.400*	*-0.0083*	*-1.1*
29	*16:22*	*17.00*	*0.6*	*1.200*	*0.6*	*0.480*	*-0.0171*	*1.00*	*-0.0171*	*1.200*	*-0.0205*	*-2.7*
30	*16:24*	*18.00*	*0.6*	*1.100*	*0.6*	*0.440*	*-0.0518*	*1.00*	*-0.0518*	*1.100*	*-0.0570*	*-7.4*
31	*16:25*	*19.00*	*0.6*	*0.700*	*0.6*	*0.280*	*-0.0056*	*1.00*	*-0.0056*	*0.700*	*-0.0039*	*-0.5*
32	16:25	20.00	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 8 Discharge Measurement Summary LT-1

Station Number:
Station Name: ldb

Meas. No: 0
Date: 05/26/2020

Party: jtw	Width: 39.5 ft	Processed by:
Boat/Motor:	Area: 134 ft²	Mean Velocity: 0.198 ft/s
Gage Height: 17.30 ft	G.H.Change: 0.000 ft	Discharge: 26.4 ft³/s

Area Method: Avg. Course	ADCP Depth: 0.270 ft	Index Vel.: 0.00 ft/s	Rating No.: 1
Nav. Method: Bottom Track	Shore Ens.:10	Adj.Mean Vel: 0.00 ft/s	Qm Rating: U
MagVar Method: None (0.0°)	Bottom Est: Power (0.1667)	Rated Area: 0.000 ft²	Diff.: 0.000%
Depth: Composite (BT)	Top Est: Power (0.1667)	Control1: Unspecified	
Discharge Method: None		Control2: Unspecified	
% Correction: 0.00		Control3: Unspecified	

Screening Thresholds:		ADCP:	
BT 3-Beam Solution: YES	Max. Vel.: 20.5 ft/s	Type/Freq.: RiverRay / 0 kHz	
WT 3-Beam Solution: YES	Max. Depth: 6.00 ft	Serial #: 645654	Firmware: 44.16
BT Error Vel.: 3.28 ft/s	Mean Depth: 3.41 ft	Bin Size: 50 cm	Blank: 50 cm
WT Error Vel.: 32.81 ft/s	% Meas.: 42.21	BT Mode: 0	BT Pings: 1
BT Up Vel.: 32.81 ft/s	Water Temp.: None	WT Mode: 1	WT Pings: 1
WT Up Vel.: 32.81 ft/s	ADCP Temp.: 66.2 °F	WV : 170	
Use Weighted Mean Depth: YES			

Performed Diag. Test: NO
Performed Moving Bed Test: NO
Performed Compass Calibration: YES Evaluation: YES
Meas. Location:

Project Name: ldb052620_0.mmt
Software: 2.20

Tr.#		Edge Distance		#Ens.	Discharge						Width	Area	Time		Mean Vel.		% Bad	
		L	R		Top	Middle	Bottom	Left	Right	Total			Start	End	Boat	Water	Ens.	Bins
002	L	6	4	196	6.75	10.2	5.69	0.812	0.953	24.4	42	142	00:20	00:22	0.29	0.17	40	2
003	R	6	4	207	8.23	11.5	7.31	-0.812	1.09	27.3	41	135	00:22	00:24	0.28	0.20	40	3
005	R	6	4	195	5.93	12.4	6.46	1.09	0.459	26.4	36	123	00:27	00:29	0.28	0.22	31	5
007	R	6	4	197	4.84	12.2	7.17	0.494	1.38	26.1	35	122	00:32	00:34	0.30	0.21	42	5
009	L	6	4	187	8.05	9.36	6.96	3.67	-0.283	27.8	43	150	00:37	00:40	0.33	0.19	40	2
Mean		6	4	196	6.76	11.1	6.72	1.05	0.720	26.4	39	134	Total	00:20	0.30	0.20	39	3
SDev		0	0	7	1.43	1.33	0.660	1.64	0.652	1.31	3.7	12.1			0.02	0.02		
SD/M		0.0%	0.0%	3.6%	21.2%	11.9%	9.8%	155.5%	90.5%	5.0%	9.3%	9.0%			7.2%	9.7%		

Figure 9 Discharge Measurement Summary LDB-1

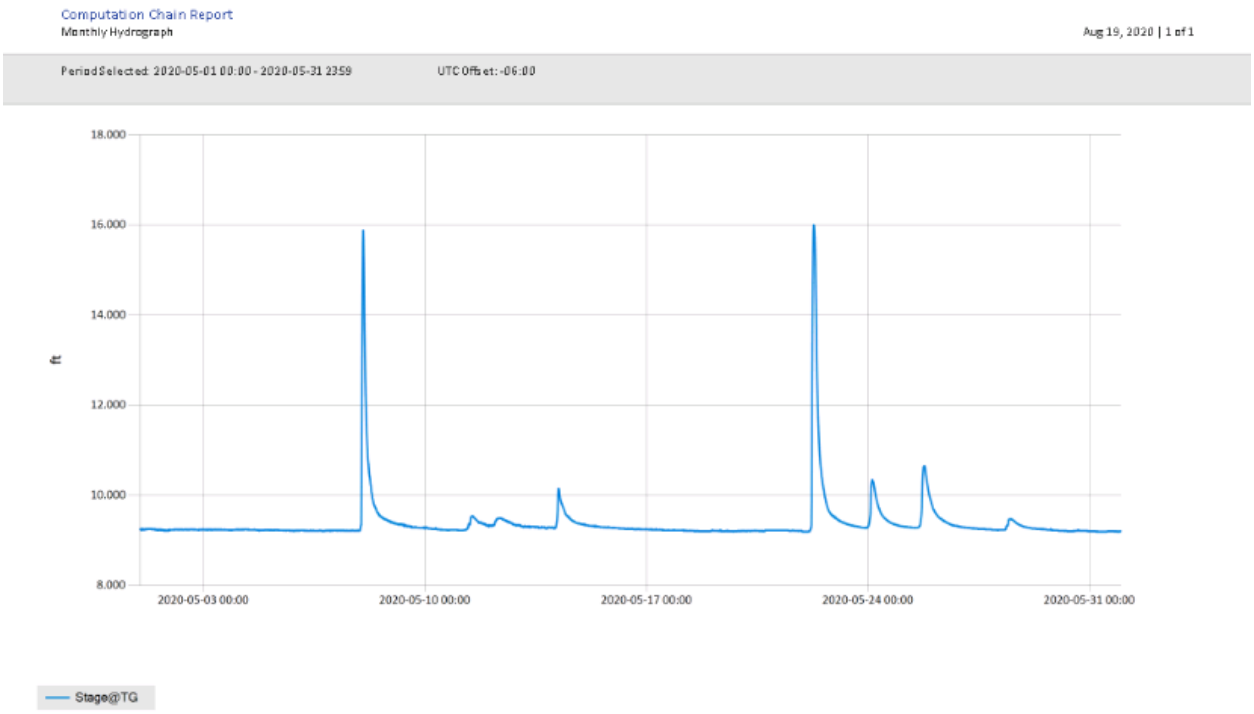

Figure 10 Monthly Hydrograph TG-1

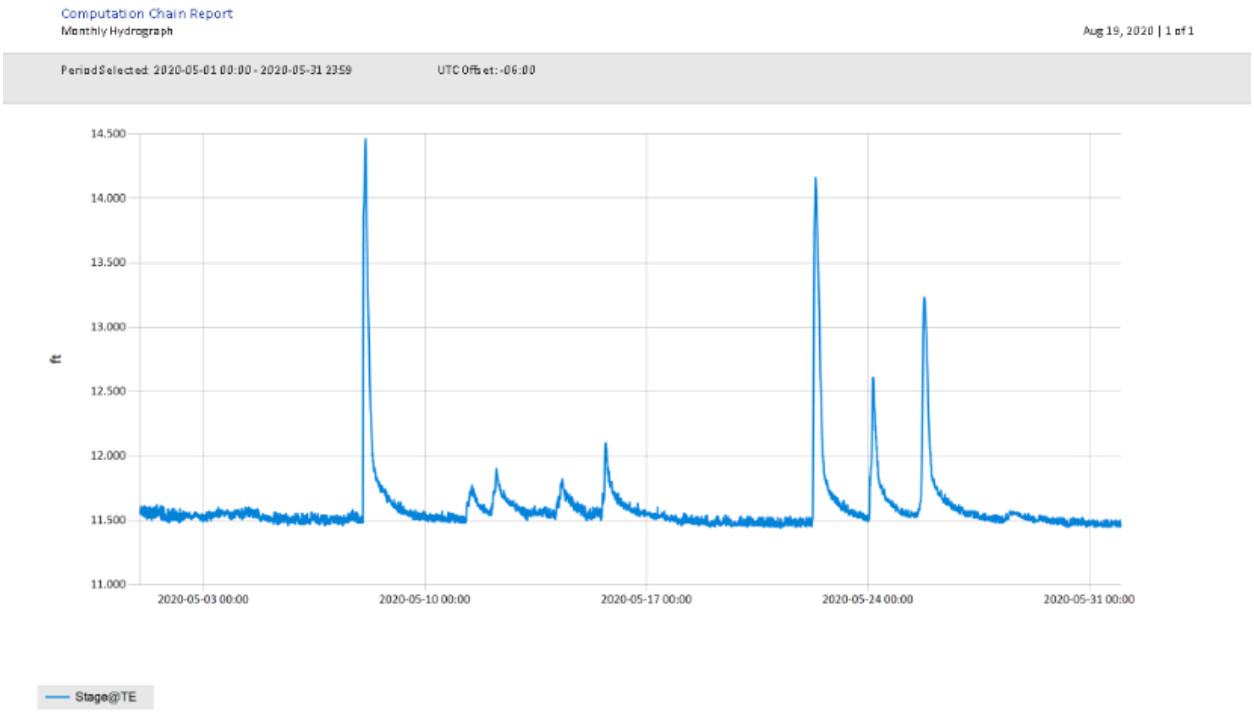

Figure 11 Monthly Hydrograph TE-1

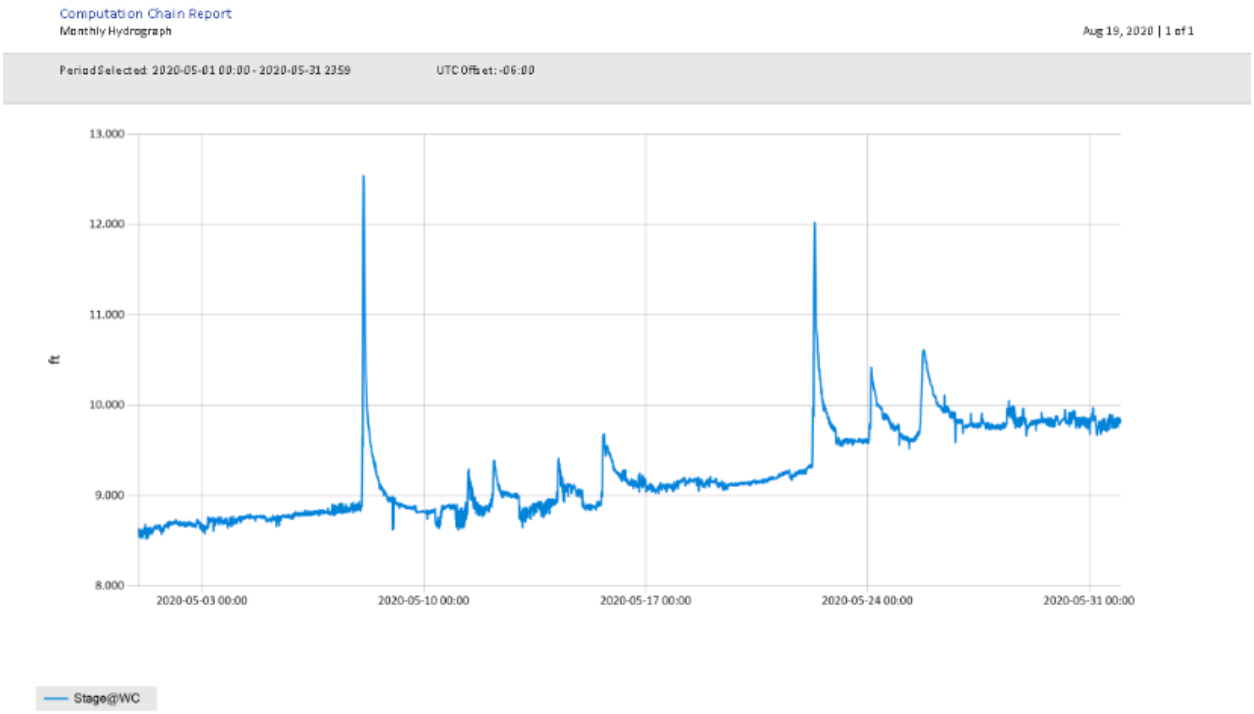

Figure 12 Monthly Hydrograph WC-1

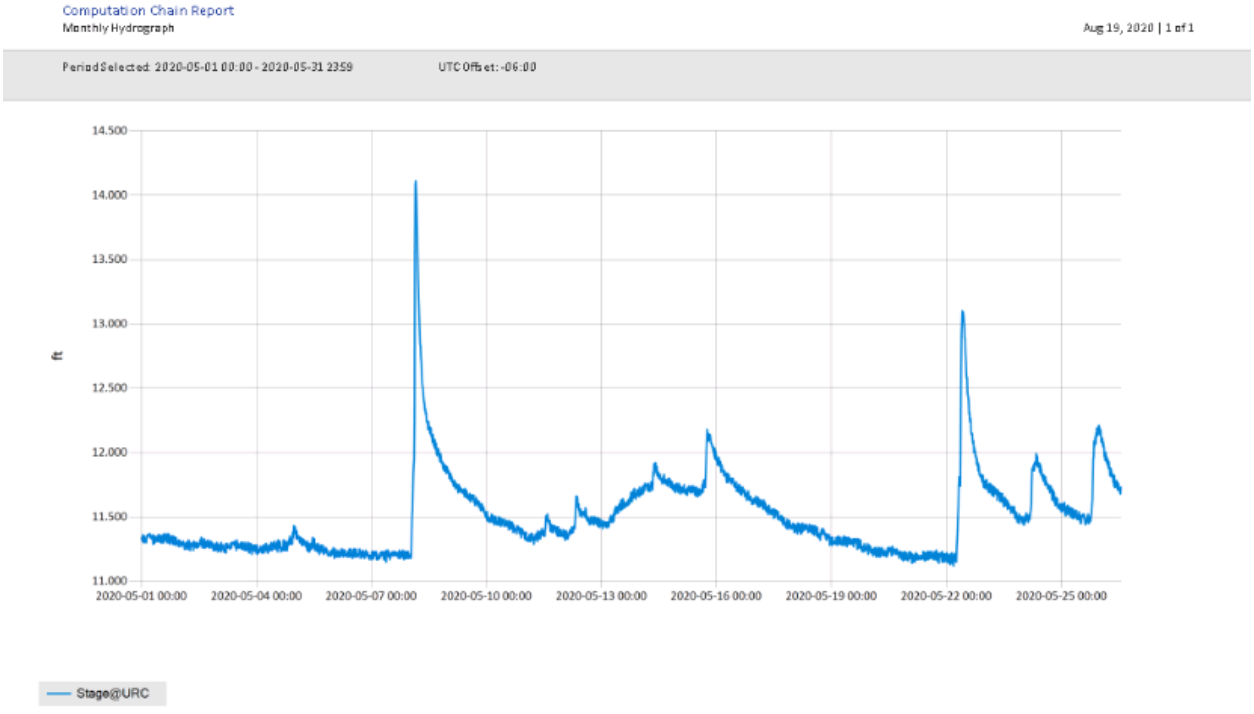

Figure 13 Monthly Hydrograph URC-2

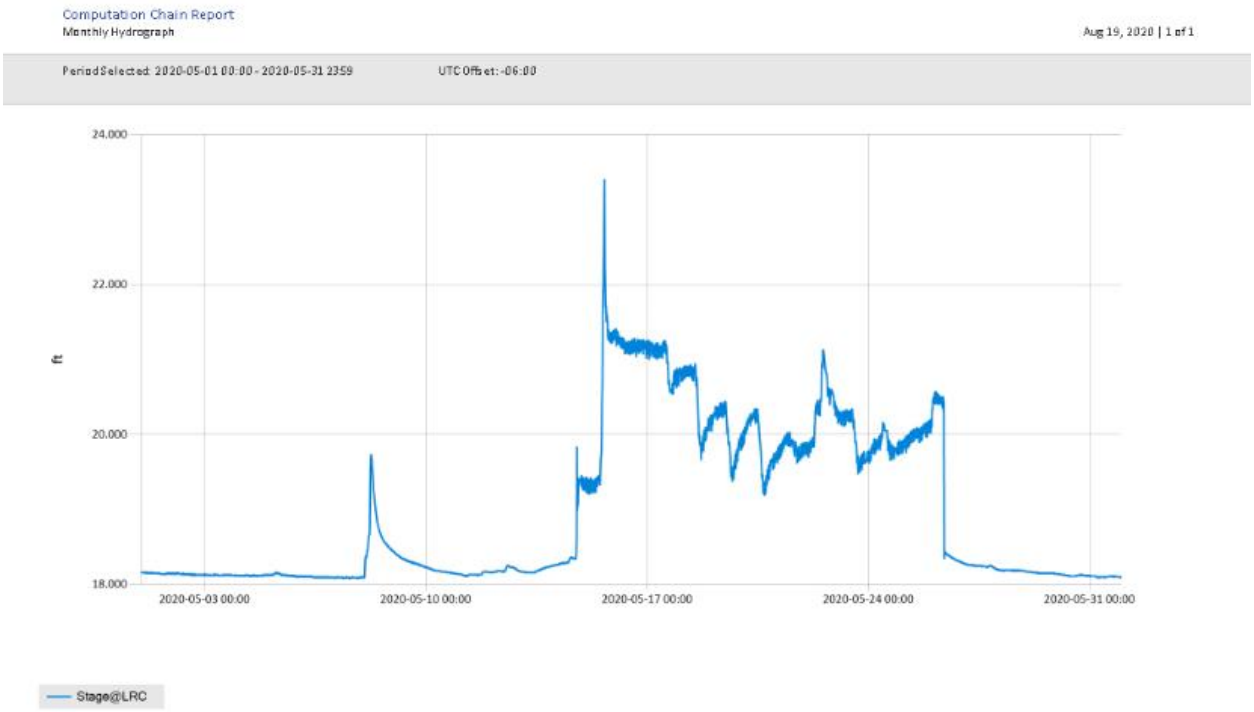

Figure 14 Monthly Hydrograph LRC-1

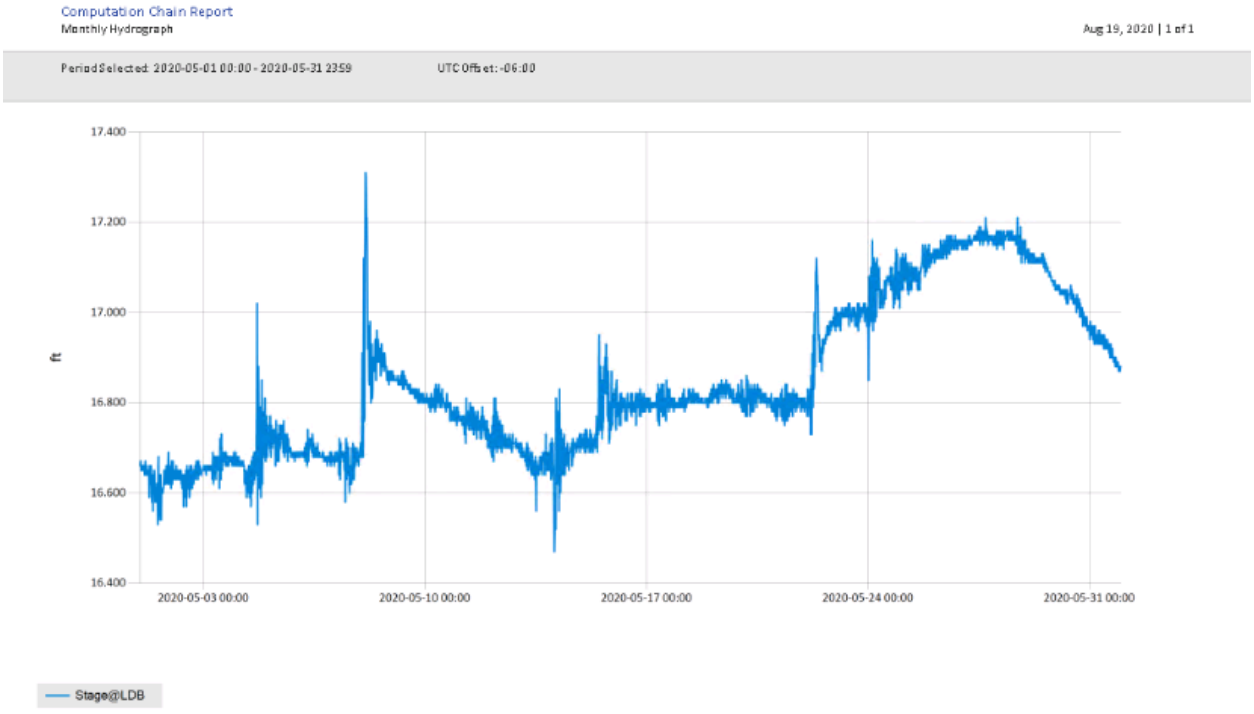

Figure 15 Monthly Hydrograph LDB-1

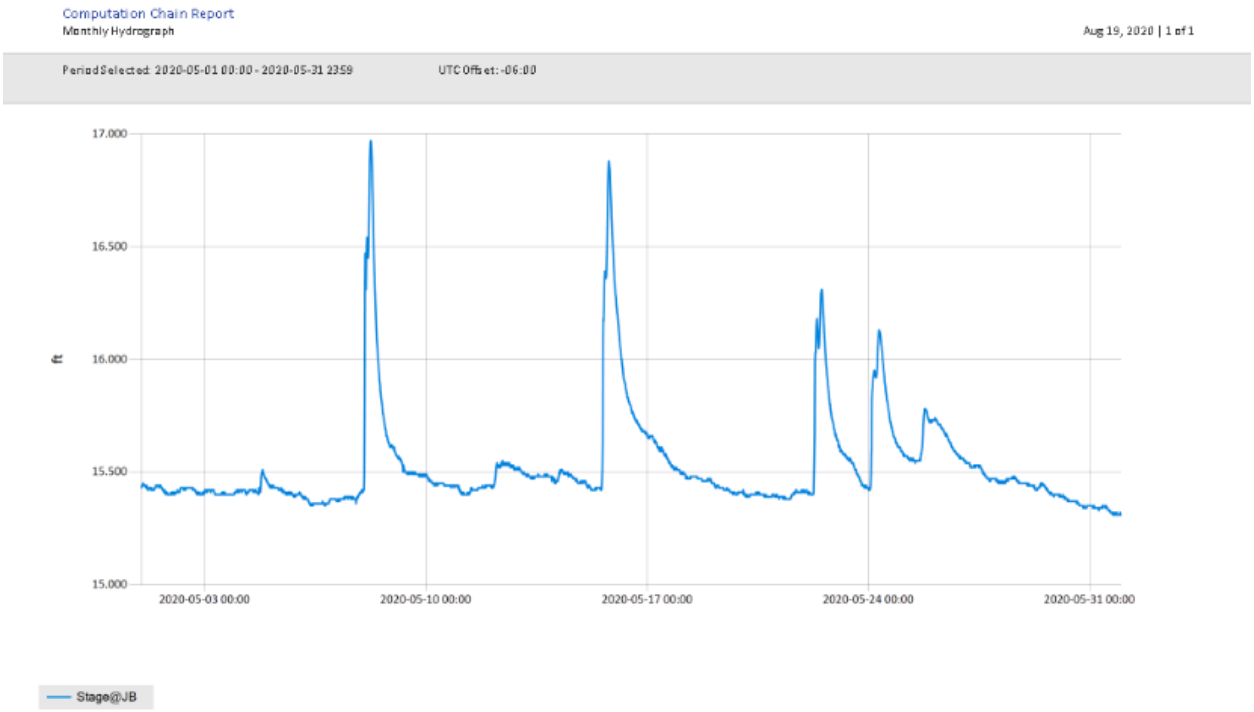

Figure 16 Monthly Hydrograph JB-1

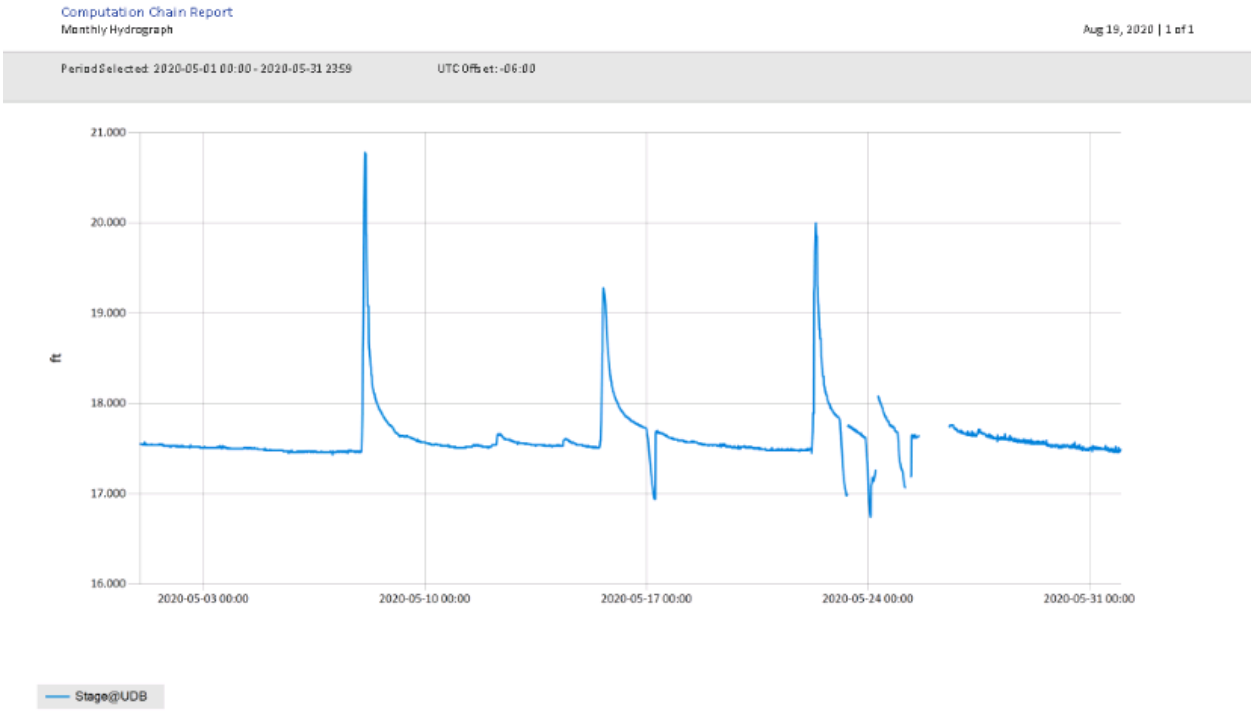

Figure 17 Monthly Hydrograph UDB-1

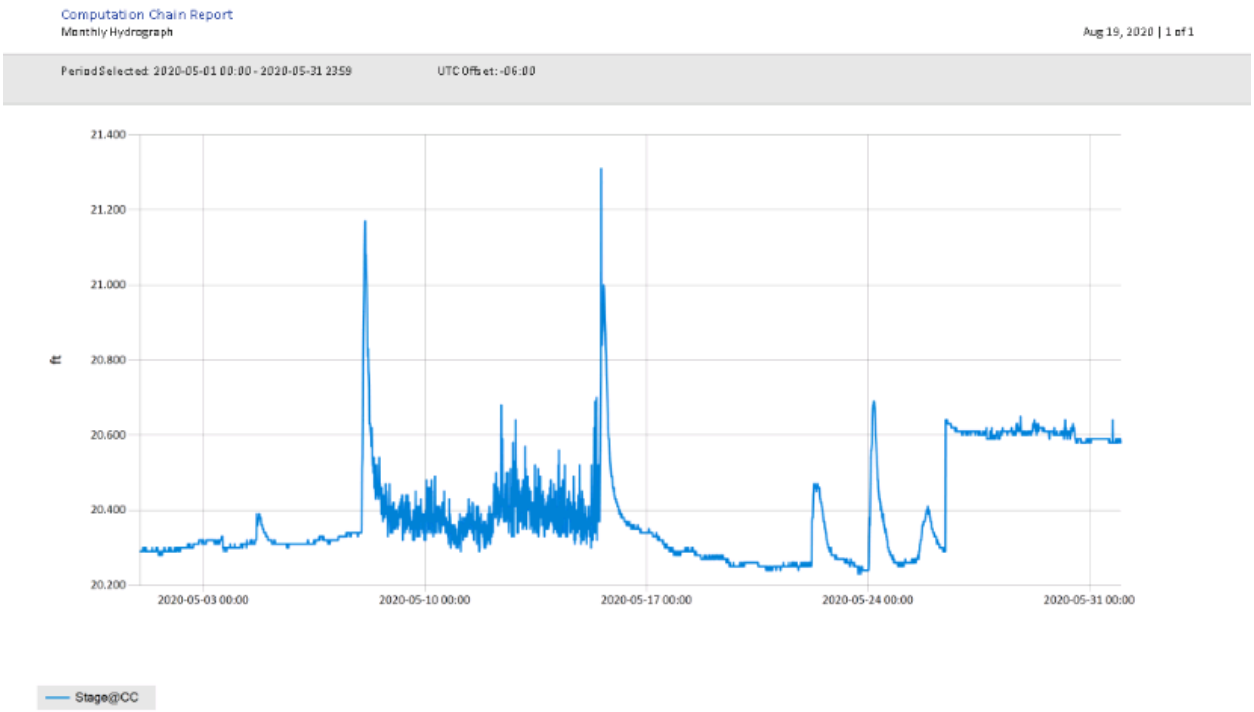

Figure 18 Monthly Hydrograph CC-1

MESONET CLIMATOLOGICAL DATA SUMMARY — May 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) MAX	MIN	AVG	DEWPT	DEG DAYS HDD	CDD	HUMIDITY (%) MAX	MIN	AVG	RAIN (in)	PRESSURE (in) STN	MSL	WIND DIR	SPEED AVG	MAX	SOLAR (MJ/m²)	4" SOIL TEMPERATURES SOD	BARE	MAX	MIN
1	87	61	73.6	53.8	0	9	67	38	51	0.00	28.61	29.85	S	12.7	35.9	26.42	64.3	70.4	78	63
2	86	65	75.1	62.9	0	10	85	53	67	0.00	28.60	29.84	S	10.4	26.8	27.65	66.8	73.9	82	67
3	81	65	74.0	68.6	0	8	98	70	84	0.00	28.61	29.86	ENE	7.5	17.1	21.12	69.1	75.7	82	70
4	93	66	77.5	66.7	0	15	96	42	72	0.00	28.53	29.77	N	13.0	34.4	27.16	70.7	77.4	85	71
5	76	50	64.5	44.7	2	0	83	24	52	0.00	28.86	30.11	N	11.3	28.8	26.83	68.9	74.0	80	69
6	75	50	63.3	44.8	2	0	85	32	54	0.00	28.95	30.21	ENE	5.1	18.8	26.92	66.4	72.2	81	65
7	78	57	67.0	50.4	0	2	80	44	56	0.14	28.70	29.94	SE	10.2	44.1	19.58	65.8	71.1	76	66
8	66	48	58.1	45.8	8	0	100	32	67	1.08	28.86	30.11	N	15.0	43.4	23.52	64.9	66.4	71	61
9	69	38	56.6	41.9	11	0	96	40	60	0.00	28.96	30.21	SE	5.1	15.9	28.93	62.5	62.2	70	54
10	67	49	58.7	43.9	7	0	93	41	60	0.00	29.01	30.27	NNE	8.3	21.9	24.72	63.7	62.7	68	58
11	62	49	55.5	42.5	9	0	86	51	62	0.17	28.95	30.20	E	10.1	24.9	12.38	62.1	59.7	62	57
12	53	47	50.5	49.2	15	0	99	74	95	0.22	28.78	30.03	ENE	7.2	15.6	4.49	60.0	57.0	59	55
13	75	52	64.5	61.5	2	0	100	78	91	0.03	28.65	29.90	SSE	8.4	28.3	10.03	61.2	61.0	66	56
14	83*	62*	73.7*	65.3*	0*	8*	94*	63*	76*	0.16*	28.58*	29.82*	S *	11.2*	43.7*	NA	65.5*	68.2*	74*	62*
15	79	61	68.1	64.3	0	5	97	75	88	0.44	28.56	29.80	S	11.0	37.2	7.20	66.7	68.0	73	65
16	69	57	63.7	60.8	2	0	99	77	90	0.01	28.61	29.85	NNE	5.3	15.8	7.10	64.9	64.6	67	62
17	80	57	68.7	55.7	0	4	97	33	68	0.00	28.68	29.92	NNW	9.1	25.6	29.17	66.7	66.8	72	62
18	82	54	68.4	56.0	0	3	95	43	67	0.00	28.69	29.94	E	3.8	14.1	28.68	67.1	68.8	77	60
19	78	60	69.1	57.3	0	4	83	51	67	0.00	28.64	29.88	ENE	8.1	17.3	28.50	69.0	72.6	81	65
20	80	56	68.8	59.1	0	3	92	58	72	0.00	28.64	29.88	E	8.1	18.2	28.78	69.3	74.3	83	66
21	77	67	70.9	65.2	0	7	92	75	82	0.00	28.59	29.83	SE	8.7	20.7	15.50	69.7	75.0	79	71
22	83	59	73.3	67.0	0	6	95	64	82	1.02	28.57	29.81	SE	8.5	38.1	22.74	70.1	74.8	80	68
23	86	64	76.2	65.3	0	10	96	52	70	0.05	28.57	29.82	S	8.5	42.7	24.93	71.5	74.5	79	70
24	85	63	72.0	65.1	0	9	96	63	79	0.33	28.58	29.82	SSE	10.2	36.8	22.50	71.8	73.8	79	70
25	69	60	64.8	62.4	0	0	97	81	92	0.48	28.59	29.83	NW	7.0	23.5	4.72	70.0	69.5	71	68
26	73	58	64.6	58.8	0	1	98	62	82	0.00	28.64	29.89	NW	6.6	18.3	13.80	68.8	68.7	73	65
27	78	54	67.0	58.5	0	1	100	47	77	0.00	28.65	29.89	NNE	4.7	21.6	21.36	68.4	68.7	74	63
28	79	63	68.5	63.0	0	6	97	60	83	0.11	28.75	30.00	NNW	6.7	19.3	14.25	69.3	69.7	74	67
29	82	59	71.7	59.5	0	5	98	44	69	0.01	28.91	30.17	E	4.6	17.3	29.40	69.9	71.4	79	64
30	83	60	71.8	54.6	0	6	85	35	57	0.00	28.91	30.16	ESE	6.5	18.9	29.96	70.6	72.5	80	65
31	83	59	72.5	57.9	0	6	86	45	62	0.00	28.91	30.16	SSE	6.3	21.8	29.56	70.7	75.2	85	66
	77*	57*	67.5*	57.2*	<- Monthly Averages ->						28.71*	29.96*	E *	8.4*	44.1*	21.26*	67.3*	69.7*	75*	64*

Temperature - Highest: 93*
Lowest: 38*

Degree Days - Total HDD: 59*
Total CDD: 128*

Rainfall: Monthly Total: 4.25* in.
Greatest 24 Hr: 1.08* in.

Humidity - Highest: 100*
Lowest: 24*

Number of Days With:

Tmax ≥ 90:	1*	Rainfall ≥ 0.01 inch:	14*
Tmax ≤ 32:	0*	Rainfall ≥ 0.10 inch:	10*
Tmin ≤ 32:	0*	Avg Wind Speed ≥ 10 mph:	10*
Tmin ≤ 0:	0*	Max Wind Speed ≥ 30 mph:	9*

* Denotes incomplete record

Monthly data generated at 2020-06-05 14:50:57 UTC

Figure 19 May Mesonet Data