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

SY-2022 Monthly Report

Lake Thunderbird TMDL Monitoring Plan Implementation:

June 2022 Monitoring Report

Oklahoma Water Resources Board
Water Quality Programs Division
Monitoring and Assessment Section
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SUMMARY OF JUNE WATER QUALITY SAMPLING

Sampling for June 2022 consisted of two sampling events. The first collection occurred during high flow conditions on the eighth, where water samples were collected via autosampler at two locations. Mesonet data shows 1.84 inches of precipitation on the eighth, 1.59 inches of precipitation in the 72 hours prior to sampling, and 0.03 inches of precipitation in the 72 hours after the sampling event. The second collection occurred during base flow conditions on the thirteenth. Water samples were collected at nine locations and discharge was measured at six locations. Samples were not collected at JB-1 due to construction activity. Mesonet shows no precipitation on the thirteenth, 0.03 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 June was 5.39 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

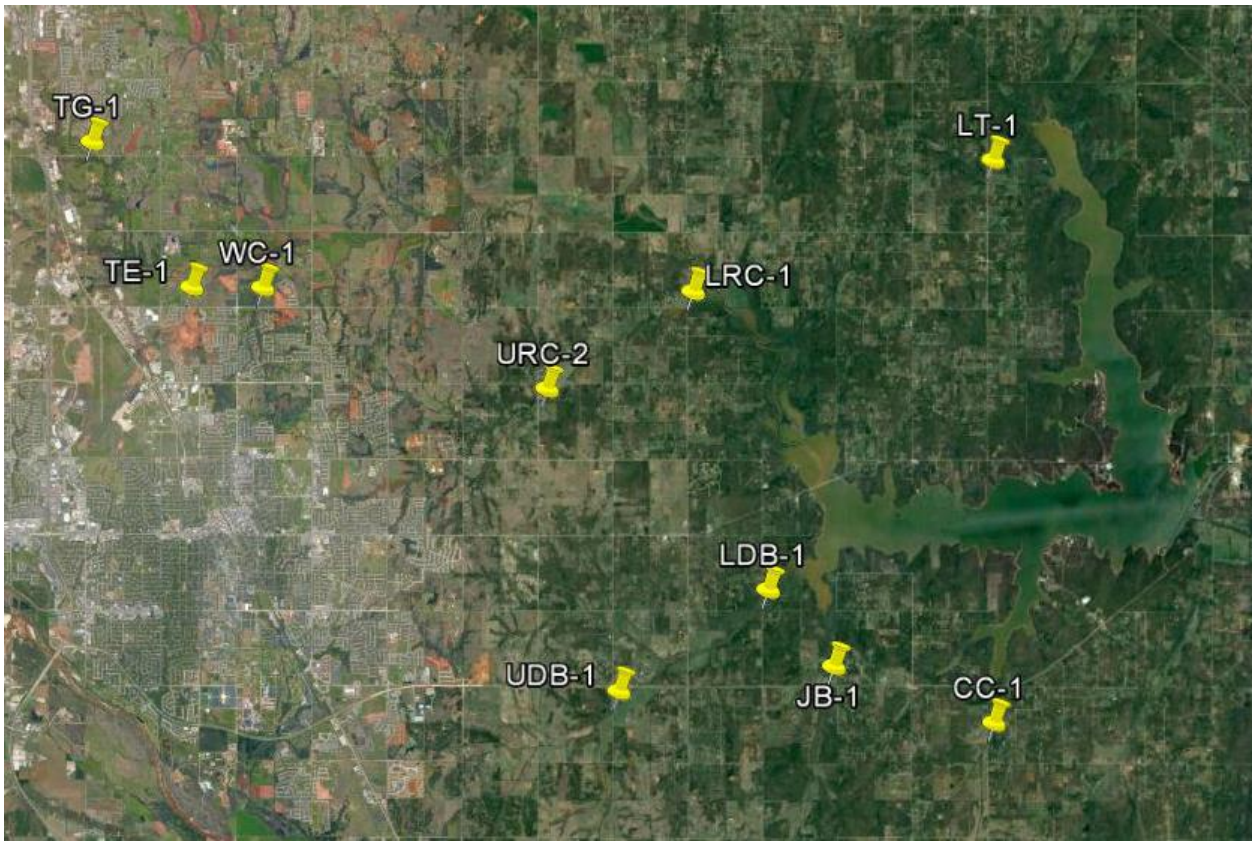


Figure 1 Monitoring Station Map

Monitoring Location ID	Monitoring Location Name	Date	Time	Field Crew	Water Temperature (°C)	Dissolved Oxygen (DO) (mg/L)	pH	Specific Conductance (mS/cm)	Turbidity (NTU)	Notes
CC-1	Clear Creek	6/13/2022	10:44	NH	23.4	7.45	8.10	705	16	aquatic vegetation common
JB-1	Jim Blue Creek	6/13/2022	11:00	NH	N/A	N/A	N/A	N/A	N/A	construction ongoing, did not sample
LDB-1	Lower Dave Blue Creek	6/13/2022	11:31	NH	26.6	8.19	8.37	723	12	very low flow
LRC-1	Lower Rock Creek	6/13/2022	13:00	NH	26.9	7.42	8.31	659	12	normal looking conditions
LT-1	Lake Laterals	6/13/2022	13:52	NH	29.1	3.62	8.27	531	12	very little visual flow
TE-1	Little River Tributary	6/14/2022	8:20	NH	23.4	4.01	7.91	868	9	beaver dam present upstream
TG-1	Little River	6/14/2022	11:24	NH	25.9	7.15	8.22	930	4	low /normal conditions, small floating debris present
UDB-1	Upper Dave Blue Creek	6/13/2022	9:21	NH	23.6	7.07	8.27	857	9	orifice clear
URC-2	Upper Rock Creek	6/13/2022	14:30	NH	26.3	6.50	8.58	646	49	normal looking conditions
WC-1	Woodcrest Creek	6/14/2022	9:16	NH	23.7	5.73	8.04	979	10	low stage

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	0.27	0.53	0.046	10.0
JB-1	Jim Blue Creek	N/A	N/A	N/A	N/A
LDB-1	Lower Dave Blue Creek	0.20	0.57	0.058	10.0
LRC-1	Lower Rock Creek	0.20	0.44	0.055	7.0
LT-1	Lake Laterals	<0.05	0.71	0.085	12.0
TE-1	Little River Tributary	<0.05	0.52	0.058	6.0
TG-1	Little River	0.14	0.38	0.057	<5.0
UDB-1	Upper Dave Blue Creek	0.21	0.29	0.042	6.0
URC-2	Upper Rock Creek	0.17	0.69	0.076	48.0
WC-1	Woodcrest Creek	0.27	0.35	0.100	10.0

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	0.27	0.54	0.045	10.0
Duplicate RPD	0%	1.87%	2.20%	0%

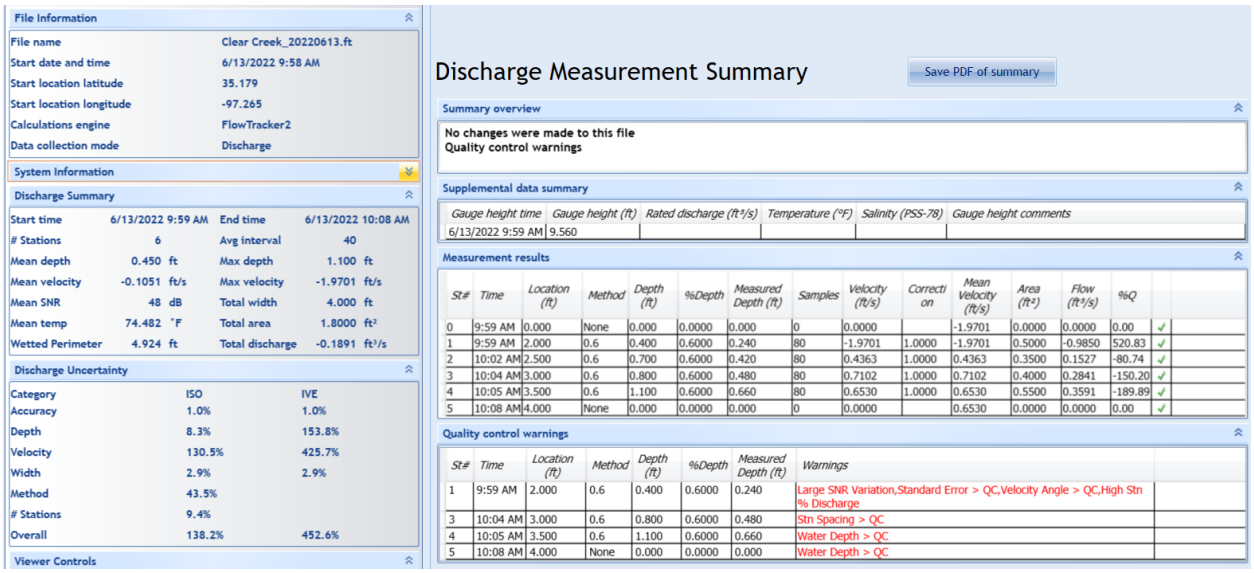
Table 3 QA/QC Data

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	-0.19	20.44
JB-1	Jim Blue Creek	N/A	N/A
LDB-1	Lower Dave Blue Creek	75.00	18.07
LRC-1	Lower Rock Creek	1.65	4.59
LT-1	Lake Laterals	0.60	4.57
TE-1	Little River Tributary	0.15	10.84
TG-1	Little River	0.50	8.74
UDB-1	Upper Dave Blue Creek	2.56	17.31
URC-2	Upper Rock Creek	1.18	11.70
WC-1	Woodcrest Creek	0.33	7.40

Table 4 Station Discharge Summary

All rated stream discharges are provisional and subject to change.



File Information

File name	Clear Creek_20220613.ft
Start date and time	6/13/2022 9:58 AM
Start location latitude	35.179
Start location longitude	-97.265
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	6/13/2022 9:59 AM	End time	6/13/2022 10:08 AM
# Stations	6	Avg interval	40
Mean depth	0.450 ft	Max depth	1.100 ft
Mean velocity	-0.1051 ft/s	Max velocity	-1.9701 ft/s
Mean SNR	48 dB	Total width	4.000 ft
Mean temp	74.482 °F	Total area	1.8000 ft²
Wetted Perimeter	4.924 ft	Total discharge	-0.1891 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	8.3%	153.8%
Velocity	130.5%	425.7%
Width	2.9%	2.9%
Method	43.5%	
# Stations	9.4%	
Overall	138.2%	452.6%

Viewer Controls

Discharge Measurement Summary

Save PDF of summary

Summary overview

No changes were made to this file
Quality control warnings

Supplemental data summary

Gauge height time	Gauge height (ft)	Rated discharge (ft³/s)	Temperature (°F)	Salinity (PSS-78)	Gauge height comments
6/13/2022 9:59 AM	9.560				

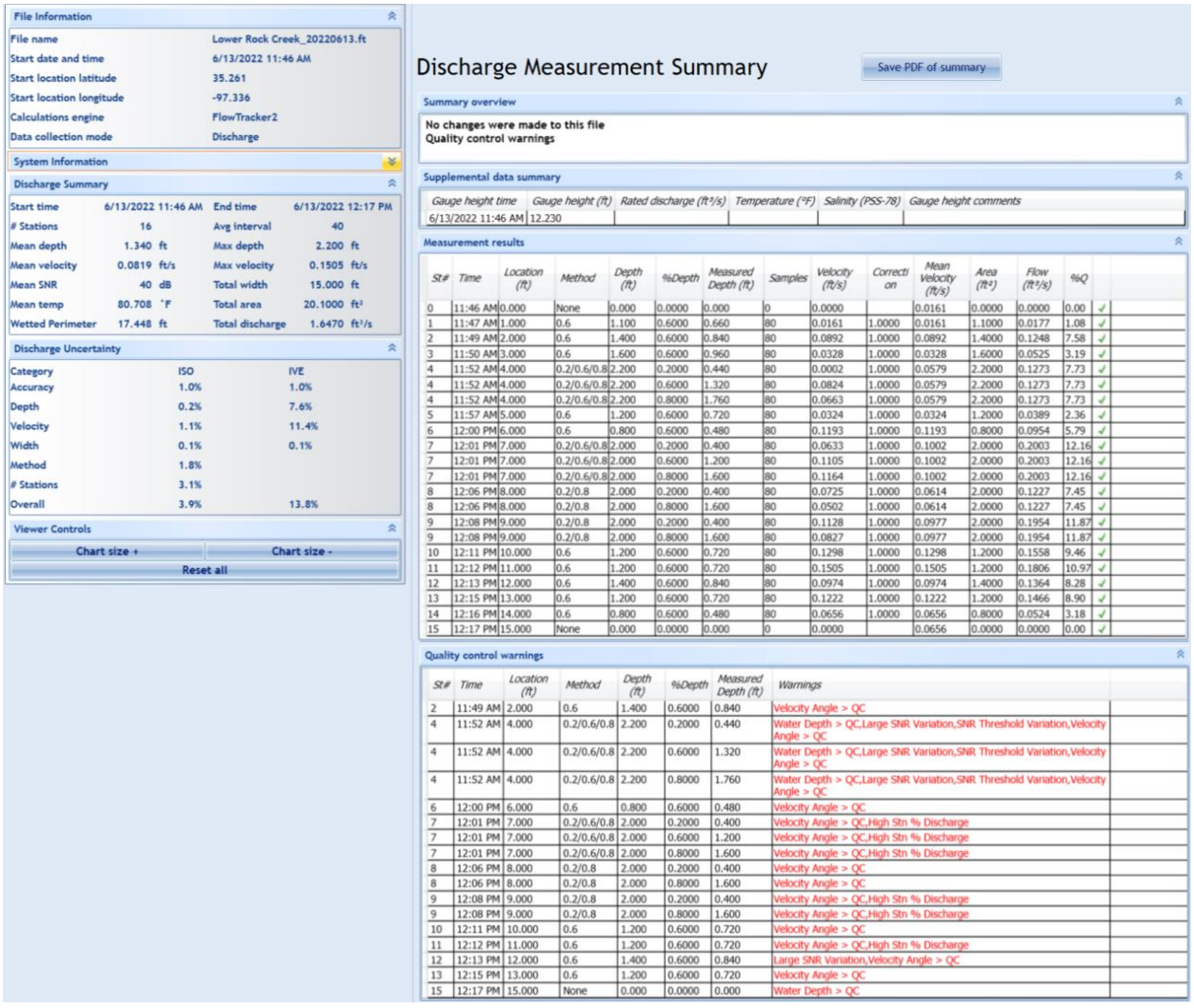
Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	9:59 AM	0.000	None	0.000	0.0000	0.000	0	0.0000		-1.9701	0.0000	0.0000	0.00	✓
1	9:59 AM	2.000	0.6	0.400	0.6000	0.240	80	-1.9701	1.0000	-1.9701	0.5000	-0.9850	520.83	✓
2	10:02 AM	2.500	0.6	0.700	0.6000	0.420	80	0.4363	1.0000	0.4363	0.3500	0.1527	-80.74	✓
3	10:04 AM	3.000	0.6	0.800	0.6000	0.480	80	0.7102	1.0000	0.7102	0.4000	0.2841	-150.20	✓
4	10:05 AM	3.500	0.6	1.100	0.6000	0.660	80	0.6530	1.0000	0.6530	0.5500	0.3591	-189.89	✓
5	10:08 AM	4.000	None	0.000	0.0000	0.000	0	0.0000		0.6530	0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	9:59 AM	2.000	0.6	0.400	0.6000	0.240	Large SNR Variation,Standard Error > QC,Velocity Angle > QC,High Stn % Discharge
3	10:04 AM	3.000	0.6	0.800	0.6000	0.480	Stn Spacing > QC
4	10:05 AM	3.500	0.6	1.100	0.6000	0.660	Water Depth > QC
5	10:08 AM	4.000	None	0.000	0.0000	0.000	Water Depth > QC

Figure 2 Discharge Measurement Summary CC-1



File Information

File name	Lower Rock Creek_20220613.ft
Start date and time	6/13/2022 11:46 AM
Start location latitude	35.261
Start location longitude	-97.336
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	6/13/2022 11:46 AM	End time	6/13/2022 12:17 PM
# Stations	16	Avg interval	40
Mean depth	1.340 ft	Max depth	2.200 ft
Mean velocity	0.0819 ft/s	Max velocity	0.1505 ft/s
Mean SNR	40 dB	Total width	15.000 ft
Mean temp	80.708 °F	Total area	20.1000 ft²
Wetted Perimeter	17.448 ft	Total discharge	1.6470 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.2%	7.6%
Velocity	1.1%	11.4%
Width	0.1%	0.1%
Method	1.8%	
# Stations	3.1%	
Overall	3.9%	13.8%

Viewer Controls

Chart size + | Chart size - | Reset all

Discharge Measurement Summary

Save PDF of summary

Summary overview

No changes were made to this file
Quality control warnings

Supplemental data summary

Gauge height time	Gauge height (ft)	Rated discharge (ft³/s)	Temperature (°F)	Salinity (PSS-78)	Gauge height comments
6/13/2022 11:46 AM	12.230				

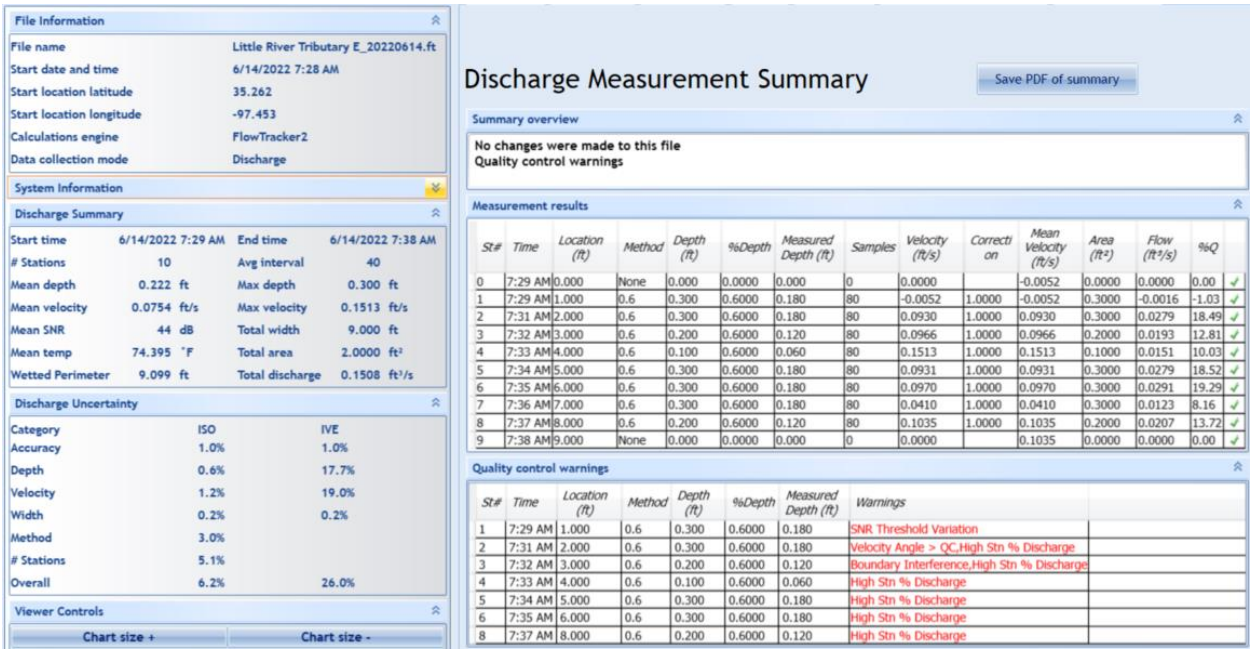
Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	11:46 AM	0.000	None	0.000	0.0000	0.000	0	0.0000		0.0161	0.0000	0.0000	0.00	✓
1	11:47 AM	1.000	0.6	1.100	0.6000	0.660	80	0.0161	1.0000	0.0161	1.1000	0.0177	1.08	✓
2	11:49 AM	2.000	0.6	1.400	0.6000	0.840	80	0.0892	1.0000	0.0892	1.4000	0.1248	7.58	✓
3	11:50 AM	3.000	0.6	1.600	0.6000	0.960	80	0.0328	1.0000	0.0328	1.6000	0.0525	3.19	✓
4	11:52 AM	4.000	0.2/0.6/0.8	2.200	0.2000	0.440	80	0.0002	1.0000	0.0579	2.2000	0.1273	7.73	✓
4	11:52 AM	4.000	0.2/0.6/0.8	2.200	0.6000	1.320	80	0.0824	1.0000	0.0579	2.2000	0.1273	7.73	✓
4	11:52 AM	4.000	0.2/0.6/0.8	2.200	0.8000	1.760	80	0.0663	1.0000	0.0579	2.2000	0.1273	7.73	✓
5	11:57 AM	5.000	0.6	1.200	0.6000	0.720	80	0.0324	1.0000	0.0324	1.2000	0.0389	2.36	✓
6	12:00 PM	6.000	0.6	0.800	0.6000	0.480	80	0.1193	1.0000	0.1193	0.8000	0.0954	5.79	✓
7	12:01 PM	7.000	0.2/0.6/0.8	2.000	0.2000	0.400	80	0.0633	1.0000	0.1002	2.0000	0.2003	12.16	✓
7	12:01 PM	7.000	0.2/0.6/0.8	2.000	0.6000	1.200	80	0.1105	1.0000	0.1002	2.0000	0.2003	12.16	✓
7	12:01 PM	7.000	0.2/0.6/0.8	2.000	0.8000	1.600	80	0.1164	1.0000	0.1002	2.0000	0.2003	12.16	✓
8	12:06 PM	8.000	0.2/0.8	2.000	0.2000	0.400	80	0.0725	1.0000	0.0614	2.0000	0.1227	7.45	✓
8	12:06 PM	8.000	0.2/0.8	2.000	0.8000	1.600	80	0.0502	1.0000	0.0614	2.0000	0.1227	7.45	✓
9	12:08 PM	9.000	0.2/0.8	2.000	0.2000	0.400	80	0.1128	1.0000	0.0977	2.0000	0.1954	11.87	✓
9	12:08 PM	9.000	0.2/0.8	2.000	0.8000	1.600	80	0.0827	1.0000	0.0977	2.0000	0.1954	11.87	✓
10	12:11 PM	10.000	0.6	1.200	0.6000	0.720	80	0.1298	1.0000	0.1298	1.2000	0.1558	9.46	✓
11	12:12 PM	11.000	0.6	1.200	0.6000	0.720	80	0.1505	1.0000	0.1505	1.2000	0.1806	10.97	✓
12	12:13 PM	12.000	0.6	1.400	0.6000	0.840	80	0.0974	1.0000	0.0974	1.4000	0.1364	8.28	✓
13	12:15 PM	13.000	0.6	1.200	0.6000	0.720	80	0.1222	1.0000	0.1222	1.2000	0.1466	8.90	✓
14	12:16 PM	14.000	0.6	0.800	0.6000	0.480	80	0.0656	1.0000	0.0656	0.8000	0.0524	3.18	✓
15	12:17 PM	15.000	None	0.000	0.0000	0.000	0	0.0000		0.0656	0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
2	11:49 AM	2.000	0.6	1.400	0.6000	0.840	Velocity Angle > QC
4	11:52 AM	4.000	0.2/0.6/0.8	2.200	0.2000	0.440	Water Depth > QC,Large SNR Variation,SNR Threshold Variation,Velocity Angle > QC
4	11:52 AM	4.000	0.2/0.6/0.8	2.200	0.6000	1.320	Water Depth > QC,Large SNR Variation,SNR Threshold Variation,Velocity Angle > QC
4	11:52 AM	4.000	0.2/0.6/0.8	2.200	0.8000	1.760	Water Depth > QC,Large SNR Variation,SNR Threshold Variation,Velocity Angle > QC
6	12:00 PM	6.000	0.6	0.800	0.6000	0.480	Velocity Angle > QC
7	12:01 PM	7.000	0.2/0.6/0.8	2.000	0.2000	0.400	Velocity Angle > QC,High Stn % Discharge
7	12:01 PM	7.000	0.2/0.6/0.8	2.000	0.6000	1.200	Velocity Angle > QC,High Stn % Discharge
7	12:01 PM	7.000	0.2/0.6/0.8	2.000	0.8000	1.600	Velocity Angle > QC,High Stn % Discharge
8	12:06 PM	8.000	0.2/0.8	2.000	0.2000	0.400	Velocity Angle > QC
8	12:06 PM	8.000	0.2/0.8	2.000	0.8000	1.600	Velocity Angle > QC
9	12:08 PM	9.000	0.2/0.8	2.000	0.2000	0.400	Velocity Angle > QC,High Stn % Discharge
9	12:08 PM	9.000	0.2/0.8	2.000	0.8000	1.600	Velocity Angle > QC,High Stn % Discharge
10	12:11 PM	10.000	0.6	1.200	0.6000	0.720	Velocity Angle > QC
11	12:12 PM	11.000	0.6	1.200	0.6000	0.720	Velocity Angle > QC,High Stn % Discharge
12	12:13 PM	12.000	0.6	1.400	0.6000	0.840	Large SNR Variation,Velocity Angle > QC
13	12:15 PM	13.000	0.6	1.200	0.6000	0.720	Velocity Angle > QC
15	12:17 PM	15.000	None	0.000	0.0000	0.000	Water Depth > QC

Figure 3 Discharge Measurement Summary LRC-1



File Information

File name	Little River Tributary E_20220614.ft
Start date and time	6/14/2022 7:28 AM
Start location latitude	35.262
Start location longitude	-97.453
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	6/14/2022 7:29 AM	End time	6/14/2022 7:38 AM
# Stations	10	Avg interval	40
Mean depth	0.222 ft	Max depth	0.300 ft
Mean velocity	0.0754 ft/s	Max velocity	0.1513 ft/s
Mean SNR	44 dB	Total width	9.000 ft
Mean temp	74.395 °F	Total area	2.0000 ft²
Wetted Perimeter	9.099 ft	Total discharge	0.1508 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.6%	17.7%
Velocity	1.2%	19.0%
Width	0.2%	0.2%
Method	3.0%	
# Stations	5.1%	
Overall	6.2%	26.0%

Viewer Controls

Chart size + | Chart size -

Discharge Measurement Summary

Save PDF of summary

Summary overview

No changes were made to this file
Quality control warnings

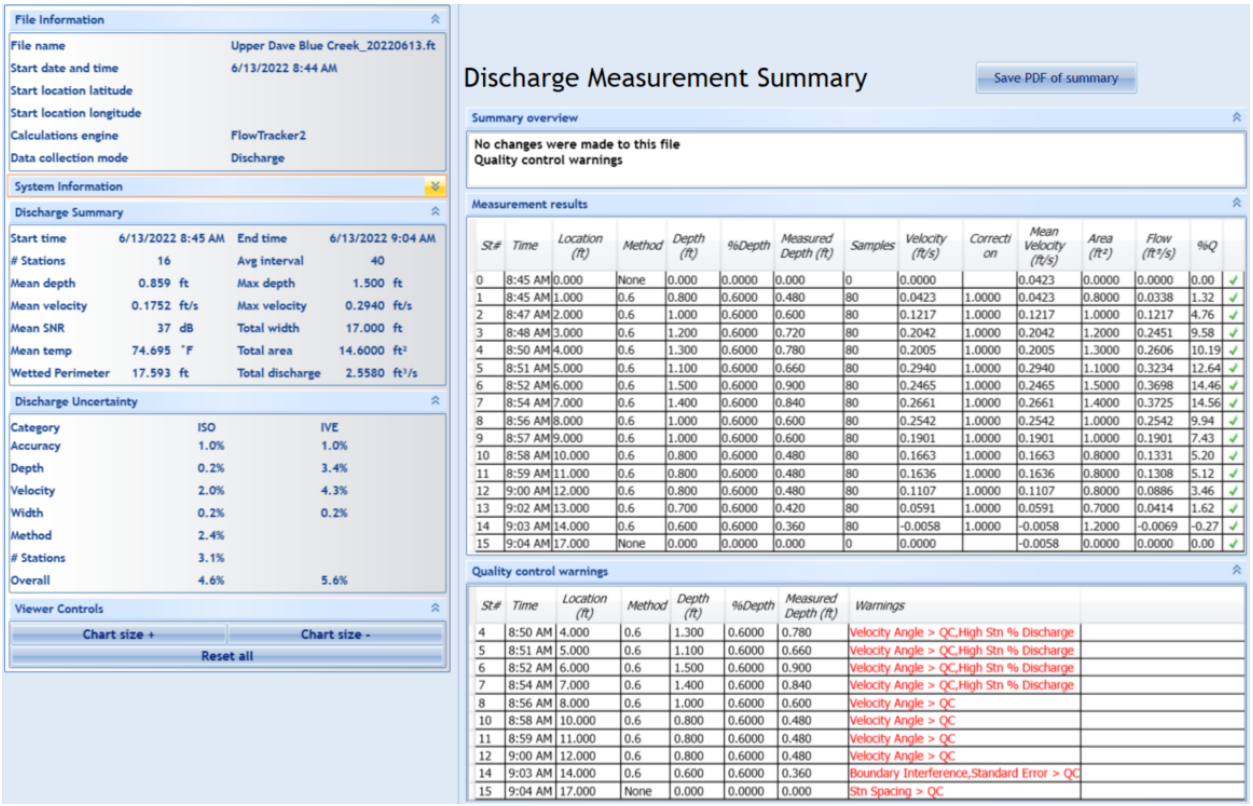
Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	7:29 AM	0.000	None	0.000	0.0000	0.000	0	0.0000		-0.0052	0.0000	0.0000	0.00	✓
1	7:29 AM	1.000	0.6	0.300	0.6000	0.180	80	-0.0052	1.0000	-0.0052	0.3000	-0.0016	-1.03	✓
2	7:31 AM	2.000	0.6	0.300	0.6000	0.180	80	0.0930	1.0000	0.0930	0.3000	0.0279	18.49	✓
3	7:32 AM	3.000	0.6	0.200	0.6000	0.120	80	0.0966	1.0000	0.0966	0.2000	0.0193	12.81	✓
4	7:33 AM	4.000	0.6	0.100	0.6000	0.060	80	0.1513	1.0000	0.1513	0.1000	0.0151	10.03	✓
5	7:34 AM	5.000	0.6	0.300	0.6000	0.180	80	0.0931	1.0000	0.0931	0.3000	0.0279	18.52	✓
6	7:35 AM	6.000	0.6	0.300	0.6000	0.180	80	0.0970	1.0000	0.0970	0.3000	0.0291	19.29	✓
7	7:36 AM	7.000	0.6	0.300	0.6000	0.180	80	0.0410	1.0000	0.0410	0.3000	0.0123	8.16	✓
8	7:37 AM	8.000	0.6	0.200	0.6000	0.120	80	0.1035	1.0000	0.1035	0.2000	0.0207	13.72	✓
9	7:38 AM	9.000	None	0.000	0.0000	0.000	0	0.0000		0.1035	0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	7:29 AM	1.000	0.6	0.300	0.6000	0.180	SNR Threshold Variation
2	7:31 AM	2.000	0.6	0.300	0.6000	0.180	Velocity Angle > QC,High Stn % Discharge
3	7:32 AM	3.000	0.6	0.200	0.6000	0.120	Boundary Interference,High Stn % Discharge
4	7:33 AM	4.000	0.6	0.100	0.6000	0.060	High Stn % Discharge
5	7:34 AM	5.000	0.6	0.300	0.6000	0.180	High Stn % Discharge
6	7:35 AM	6.000	0.6	0.300	0.6000	0.180	High Stn % Discharge
8	7:37 AM	8.000	0.6	0.200	0.6000	0.120	High Stn % Discharge

Figure 4 Discharge Measurement Summary TE-1



File Information

File name	Upper Dave Blue Creek_20220613.ft
Start date and time	6/13/2022 8:44 AM
Start location latitude	
Start location longitude	
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	6/13/2022 8:45 AM	End time	6/13/2022 9:04 AM
# Stations	16	Avg interval	40
Mean depth	0.859 ft	Max depth	1.500 ft
Mean velocity	0.1752 ft/s	Max velocity	0.2940 ft/s
Mean SNR	37 dB	Total width	17.000 ft
Mean temp	74.695 °F	Total area	14.6000 ft²
Wetted Perimeter	17.593 ft	Total discharge	2.5580 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.2%	3.4%
Velocity	2.0%	4.3%
Width	0.2%	0.2%
Method	2.4%	
# Stations	3.1%	
Overall	4.6%	5.6%

Viewer Controls

Chart size + | Chart size -

Reset all

Discharge Measurement Summary

Save PDF of summary

Summary overview

No changes were made to this file
Quality control warnings

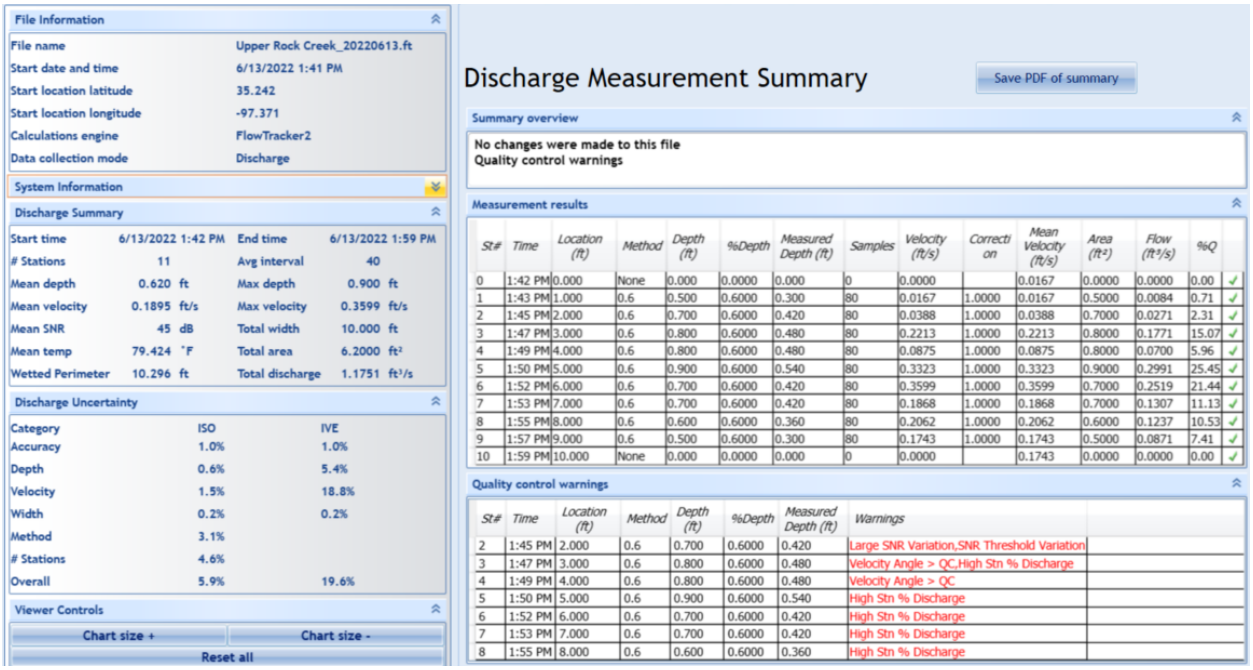
Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	8:45 AM	0.000	None	0.000	0.0000	0.000	0	0.0000		0.0423	0.0000	0.0000	0.00	✓
1	8:45 AM	1.000	0.6	0.800	0.6000	0.480	80	0.0423	1.0000	0.0423	0.8000	0.0338	1.32	✓
2	8:47 AM	2.000	0.6	1.000	0.6000	0.600	80	0.1217	1.0000	0.1217	1.0000	0.1217	4.76	✓
3	8:48 AM	3.000	0.6	1.200	0.6000	0.720	80	0.2042	1.0000	0.2042	1.2000	0.2451	9.58	✓
4	8:50 AM	4.000	0.6	1.300	0.6000	0.780	80	0.2005	1.0000	0.2005	1.3000	0.2606	10.19	✓
5	8:51 AM	5.000	0.6	1.100	0.6000	0.660	80	0.2940	1.0000	0.2940	1.1000	0.3234	12.64	✓
6	8:52 AM	6.000	0.6	1.500	0.6000	0.900	80	0.2465	1.0000	0.2465	1.5000	0.3698	14.46	✓
7	8:54 AM	7.000	0.6	1.400	0.6000	0.840	80	0.2661	1.0000	0.2661	1.4000	0.3725	14.56	✓
8	8:56 AM	8.000	0.6	1.000	0.6000	0.600	80	0.2542	1.0000	0.2542	1.0000	0.2542	9.94	✓
9	8:57 AM	9.000	0.6	1.000	0.6000	0.600	80	0.1901	1.0000	0.1901	1.0000	0.1901	7.43	✓
10	8:58 AM	10.000	0.6	0.800	0.6000	0.480	80	0.1663	1.0000	0.1663	0.8000	0.1331	5.20	✓
11	8:59 AM	11.000	0.6	0.800	0.6000	0.480	80	0.1636	1.0000	0.1636	0.8000	0.1308	5.12	✓
12	9:00 AM	12.000	0.6	0.800	0.6000	0.480	80	0.1107	1.0000	0.1107	0.8000	0.0886	3.46	✓
13	9:02 AM	13.000	0.6	0.700	0.6000	0.420	80	0.0591	1.0000	0.0591	0.7000	0.0414	1.62	✓
14	9:03 AM	14.000	0.6	0.600	0.6000	0.360	80	-0.0058	1.0000	-0.0058	1.2000	-0.0069	-0.27	✓
15	9:04 AM	17.000	None	0.000	0.0000	0.000	0	0.0000		-0.0058	0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
4	8:50 AM	4.000	0.6	1.300	0.6000	0.780	Velocity Angle > QC,High Stn % Discharge
5	8:51 AM	5.000	0.6	1.100	0.6000	0.660	Velocity Angle > QC,High Stn % Discharge
6	8:52 AM	6.000	0.6	1.500	0.6000	0.900	Velocity Angle > QC,High Stn % Discharge
7	8:54 AM	7.000	0.6	1.400	0.6000	0.840	Velocity Angle > QC,High Stn % Discharge
8	8:56 AM	8.000	0.6	1.000	0.6000	0.600	Velocity Angle > QC
10	8:58 AM	10.000	0.6	0.800	0.6000	0.480	Velocity Angle > QC
11	8:59 AM	11.000	0.6	0.800	0.6000	0.480	Velocity Angle > QC
12	9:00 AM	12.000	0.6	0.800	0.6000	0.480	Velocity Angle > QC
14	9:03 AM	14.000	0.6	0.600	0.6000	0.360	Boundary Interference,Standard Error > QC
15	9:04 AM	17.000	None	0.000	0.0000	0.000	Stn Spacing > QC

Figure 5 Discharge Measurement Summary UDB-1



File Information

File name	Upper Rock Creek_20220613.ft
Start date and time	6/13/2022 1:41 PM
Start location latitude	35.242
Start location longitude	-97.371
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	6/13/2022 1:42 PM	End time	6/13/2022 1:59 PM
# Stations	11	Avg interval	40
Mean depth	0.620 ft	Max depth	0.900 ft
Mean velocity	0.1895 ft/s	Max velocity	0.3599 ft/s
Mean SNR	45 dB	Total width	10.000 ft
Mean temp	79.424 °F	Total area	6.2000 ft²
Wetted Perimeter	10.296 ft	Total discharge	1.1751 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.6%	5.4%
Velocity	1.5%	18.8%
Width	0.2%	0.2%
Method	3.1%	
# Stations	4.6%	
Overall	5.9%	19.6%

Viewer Controls

Chart size + | Chart size -

Reset all

Discharge Measurement Summary

Save PDF of summary

Summary overview

No changes were made to this file
Quality control warnings

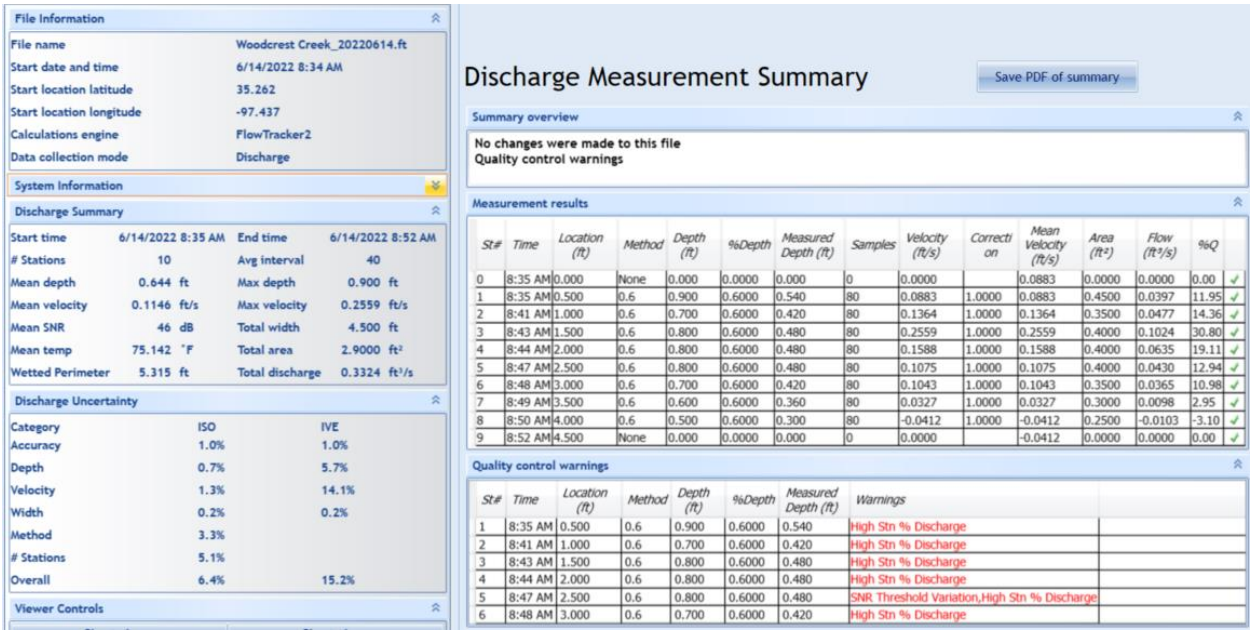
Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	1:42 PM	0.000	None	0.000	0.0000	0.000	0	0.0000		0.0167	0.0000	0.0000	0.00	✓
1	1:43 PM	1.000	0.6	0.500	0.6000	0.300	80	0.0167	1.0000	0.0167	0.5000	0.0084	0.71	✓
2	1:45 PM	2.000	0.6	0.700	0.6000	0.420	80	0.0388	1.0000	0.0388	0.7000	0.0271	2.31	✓
3	1:47 PM	3.000	0.6	0.800	0.6000	0.480	80	0.2213	1.0000	0.2213	0.8000	0.1771	15.07	✓
4	1:49 PM	4.000	0.6	0.800	0.6000	0.480	80	0.0875	1.0000	0.0875	0.8000	0.0700	5.96	✓
5	1:50 PM	5.000	0.6	0.900	0.6000	0.540	80	0.3323	1.0000	0.3323	0.9000	0.2991	25.45	✓
6	1:52 PM	6.000	0.6	0.700	0.6000	0.420	80	0.3599	1.0000	0.3599	0.7000	0.2519	21.44	✓
7	1:53 PM	7.000	0.6	0.700	0.6000	0.420	80	0.1868	1.0000	0.1868	0.7000	0.1307	11.13	✓
8	1:55 PM	8.000	0.6	0.600	0.6000	0.360	80	0.2062	1.0000	0.2062	0.6000	0.1237	10.53	✓
9	1:57 PM	9.000	0.6	0.500	0.6000	0.300	80	0.1743	1.0000	0.1743	0.5000	0.0871	7.41	✓
10	1:59 PM	10.000	None	0.000	0.0000	0.000	0	0.0000		0.1743	0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
2	1:45 PM	2.000	0.6	0.700	0.6000	0.420	Large SNR Variation,SNR Threshold Variation
3	1:47 PM	3.000	0.6	0.800	0.6000	0.480	Velocity Angle > QC,High Stn % Discharge
4	1:49 PM	4.000	0.6	0.800	0.6000	0.480	Velocity Angle > QC
5	1:50 PM	5.000	0.6	0.900	0.6000	0.540	High Stn % Discharge
6	1:52 PM	6.000	0.6	0.700	0.6000	0.420	High Stn % Discharge
7	1:53 PM	7.000	0.6	0.700	0.6000	0.420	High Stn % Discharge
8	1:55 PM	8.000	0.6	0.600	0.6000	0.360	High Stn % Discharge

Figure 6 Discharge Measurement Summary URC-2



File Information

File name	Woodcrest Creek_20220614.ft
Start date and time	6/14/2022 8:34 AM
Start location latitude	35.262
Start location longitude	-97.437
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	6/14/2022 8:35 AM	End time	6/14/2022 8:52 AM
# Stations	10	Avg interval	40
Mean depth	0.644 ft	Max depth	0.900 ft
Mean velocity	0.1146 ft/s	Max velocity	0.2559 ft/s
Mean SNR	46 dB	Total width	4.500 ft
Mean temp	75.142 °F	Total area	2.9000 ft²
Wetted Perimeter	5.315 ft	Total discharge	0.3324 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.7%	5.7%
Velocity	1.3%	14.1%
Width	0.2%	0.2%
Method	3.3%	
# Stations	5.1%	
Overall	6.4%	15.2%

Viewer Controls

Discharge Measurement Summary

Save PDF of summary

Summary overview

No changes were made to this file
Quality control warnings

Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	8:35 AM	0.000	None	0.000	0.0000	0.000	0	0.0000		0.0883	0.0000	0.0000	0.00	✓
1	8:35 AM	0.500	0.6	0.900	0.6000	0.540	80	0.0883	1.0000	0.0883	0.4500	0.0397	11.95	✓
2	8:41 AM	1.000	0.6	0.700	0.6000	0.420	80	0.1364	1.0000	0.1364	0.3500	0.0477	14.36	✓
3	8:43 AM	1.500	0.6	0.800	0.6000	0.480	80	0.2559	1.0000	0.2559	0.4000	0.1024	30.80	✓
4	8:44 AM	2.000	0.6	0.800	0.6000	0.480	80	0.1588	1.0000	0.1588	0.4000	0.0635	19.11	✓
5	8:47 AM	2.500	0.6	0.800	0.6000	0.480	80	0.1075	1.0000	0.1075	0.4000	0.0430	12.94	✓
6	8:48 AM	3.000	0.6	0.700	0.6000	0.420	80	0.1043	1.0000	0.1043	0.3500	0.0365	10.98	✓
7	8:49 AM	3.500	0.6	0.600	0.6000	0.360	80	0.0327	1.0000	0.0327	0.3000	0.0098	2.95	✓
8	8:50 AM	4.000	0.6	0.500	0.6000	0.300	80	-0.0412	1.0000	-0.0412	0.2500	-0.0103	-3.10	✓
9	8:52 AM	4.500	None	0.000	0.0000	0.000	0	0.0000		-0.0412	0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	8:35 AM	0.500	0.6	0.900	0.6000	0.540	High Stn % Discharge
2	8:41 AM	1.000	0.6	0.700	0.6000	0.420	High Stn % Discharge
3	8:43 AM	1.500	0.6	0.800	0.6000	0.480	High Stn % Discharge
4	8:44 AM	2.000	0.6	0.800	0.6000	0.480	High Stn % Discharge
5	8:47 AM	2.500	0.6	0.800	0.6000	0.480	SNR Threshold Variation,High Stn % Discharge
6	8:48 AM	3.000	0.6	0.700	0.6000	0.420	High Stn % Discharge

Figure 7 Discharge Measurement Summary WC-1

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
URC-2	Upper Rock Creek	6/7/2022	8:00	SD	*	*	6.87	263	1000	Collected T1 @ 8:00 at 16.52, peak @ 8:45 at 17.17; second runoff event on 6/8 should have collected T4 @ 11:00 at 21.06, which was peak, but only one bottle filled
LDB-1	Lower Dave Blue Creek	6/8/2022	11:15	SD	*	*	7.61	167	1000	Collected T4 @ 11:15 at 21.39, peak @ 11:30 at 21.43

Table 5 Stormwater Field Data Form Where the 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)
URC-2	Upper Rock Creek	<0.05	3.42	0.915	1440
LDB-1	Lower Dave Blue Creek	0.21	6.51	2.22	5700

Table 6 Stormwater Laboratory Analysis Summary

Monitoring Location ID	Monitoring Location Name	Discharge (cfs)	Stream Stage (ft)
URC-2	Upper Rock Creek	130.00	16.52
LDB-1	Lower Dave Blue Creek	1550.00	21.39

Table 7 Stormwater Station Discharge Summary

All rated stream discharges are provisional and subject to change.

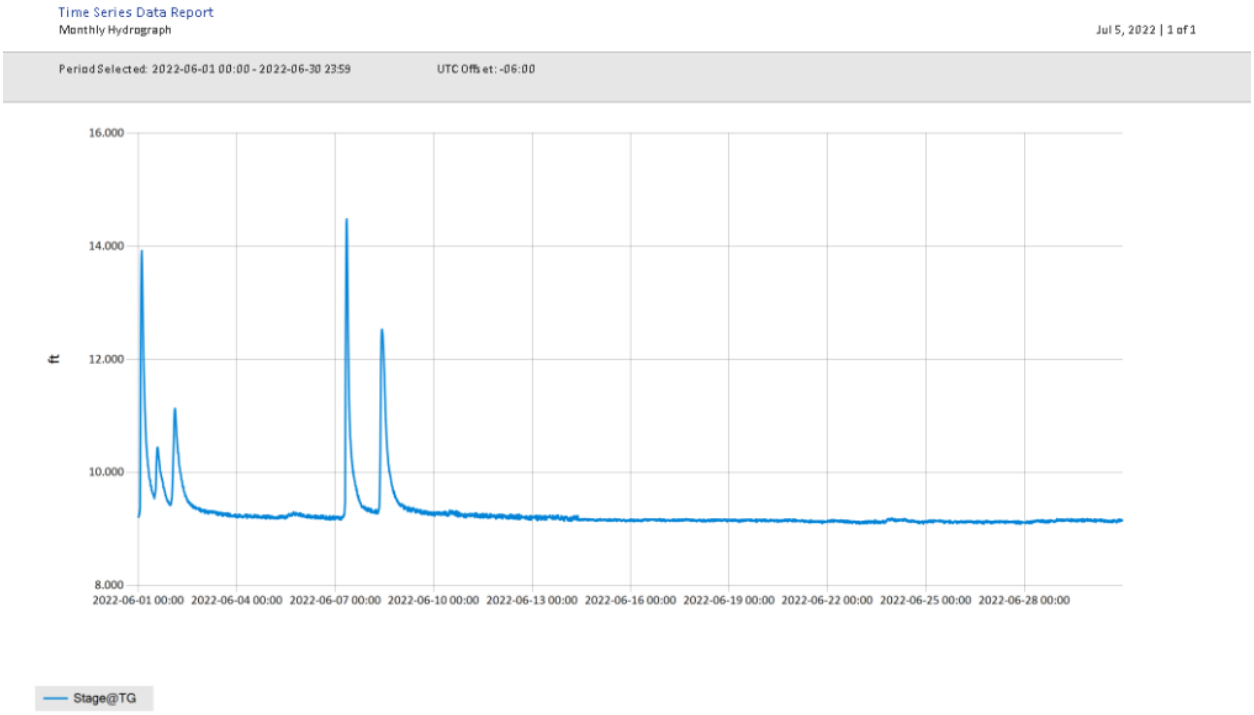


Figure 8 Monthly Hydrograph TG-1

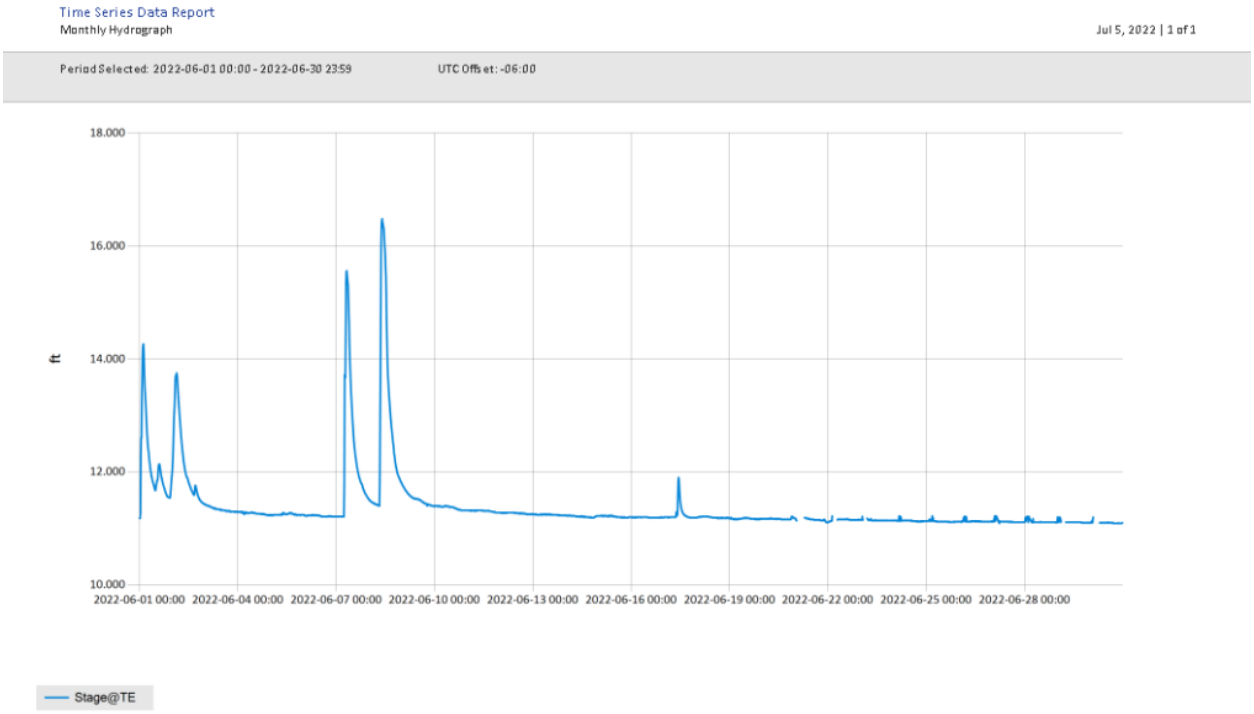


Figure 9 Monthly Hydrograph TE-1

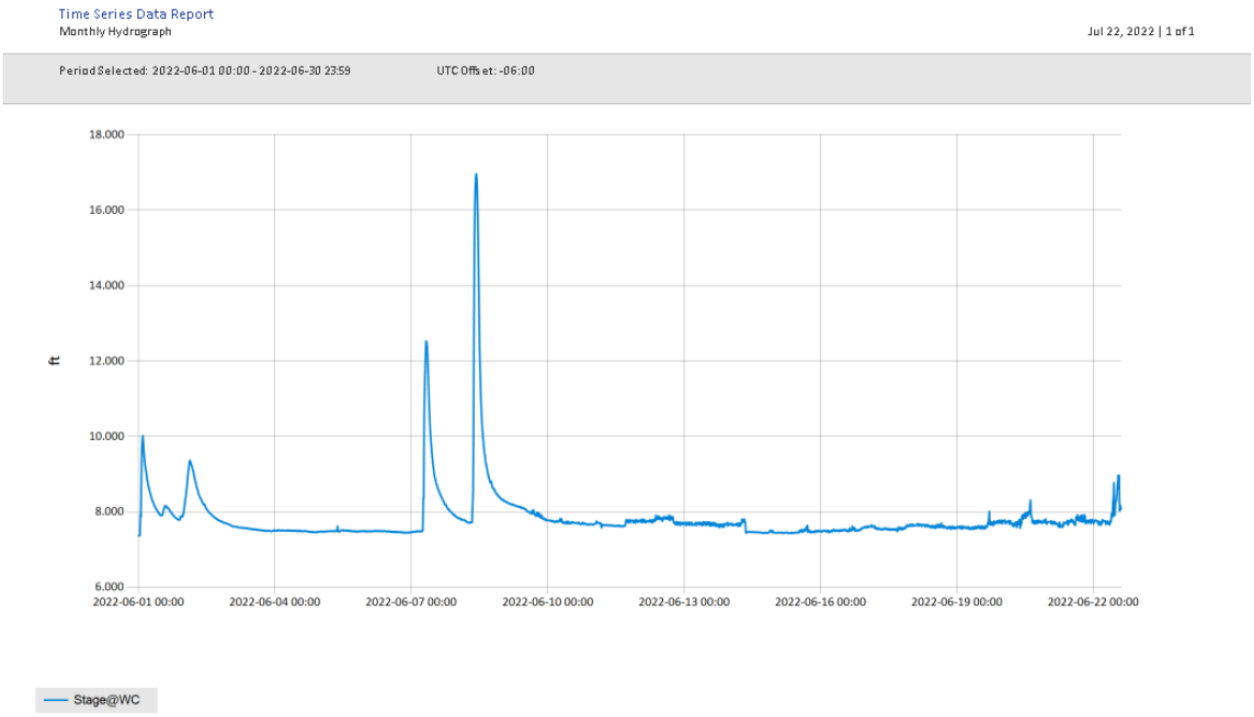


Figure 10 Monthly Hydrograph WC-1

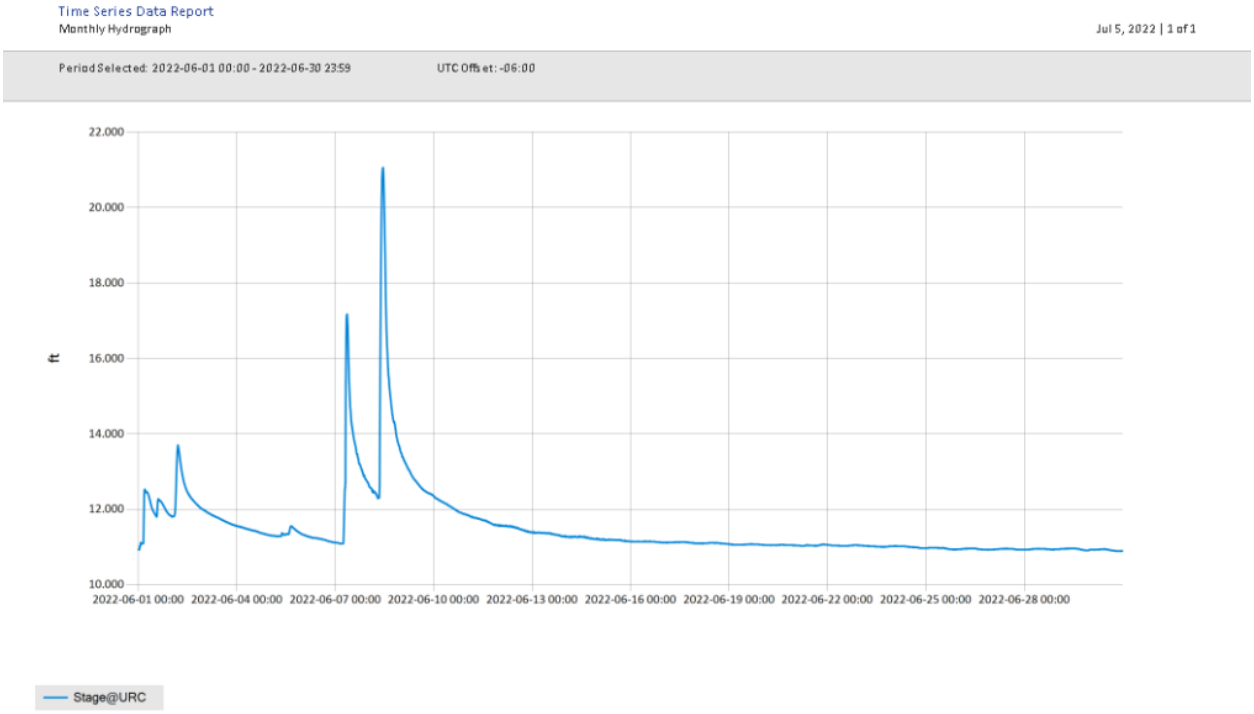


Figure 11 Monthly Hydrograph URC-2

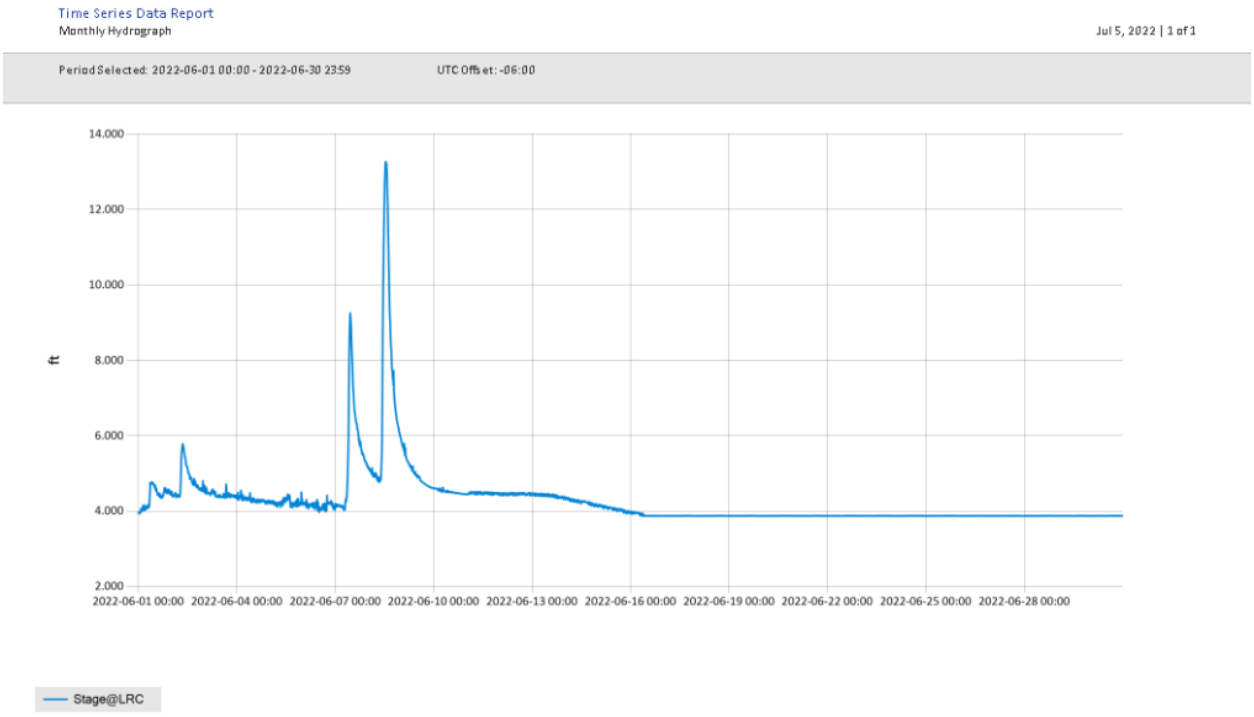


Figure 12 Monthly Hydrograph LRC-1

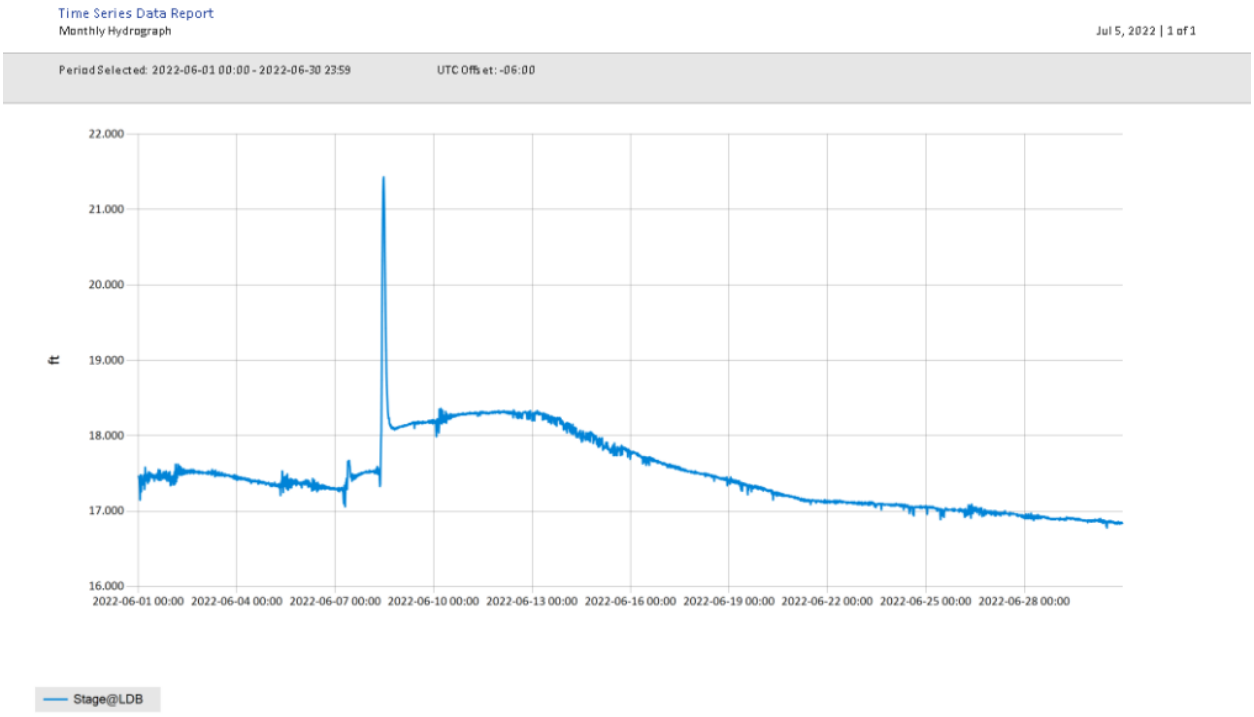


Figure 13 Monthly Hydrograph LDB-1

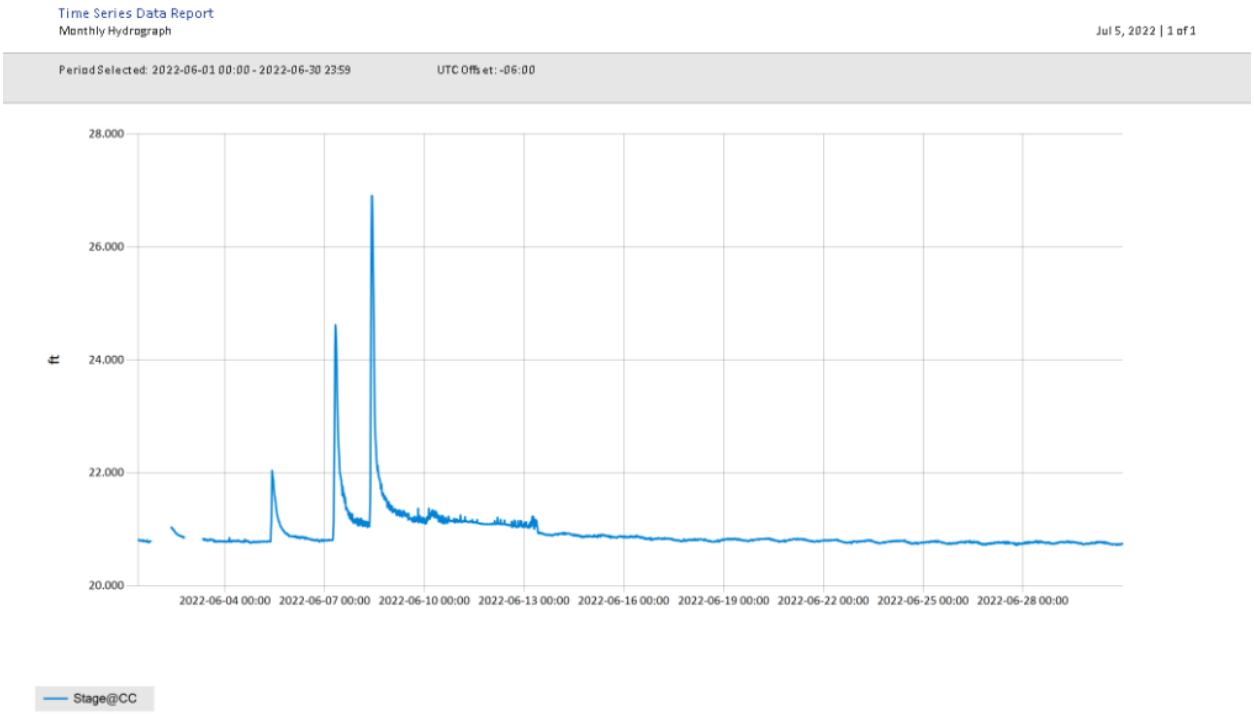


Figure 14 Monthly Hydrograph CC-1

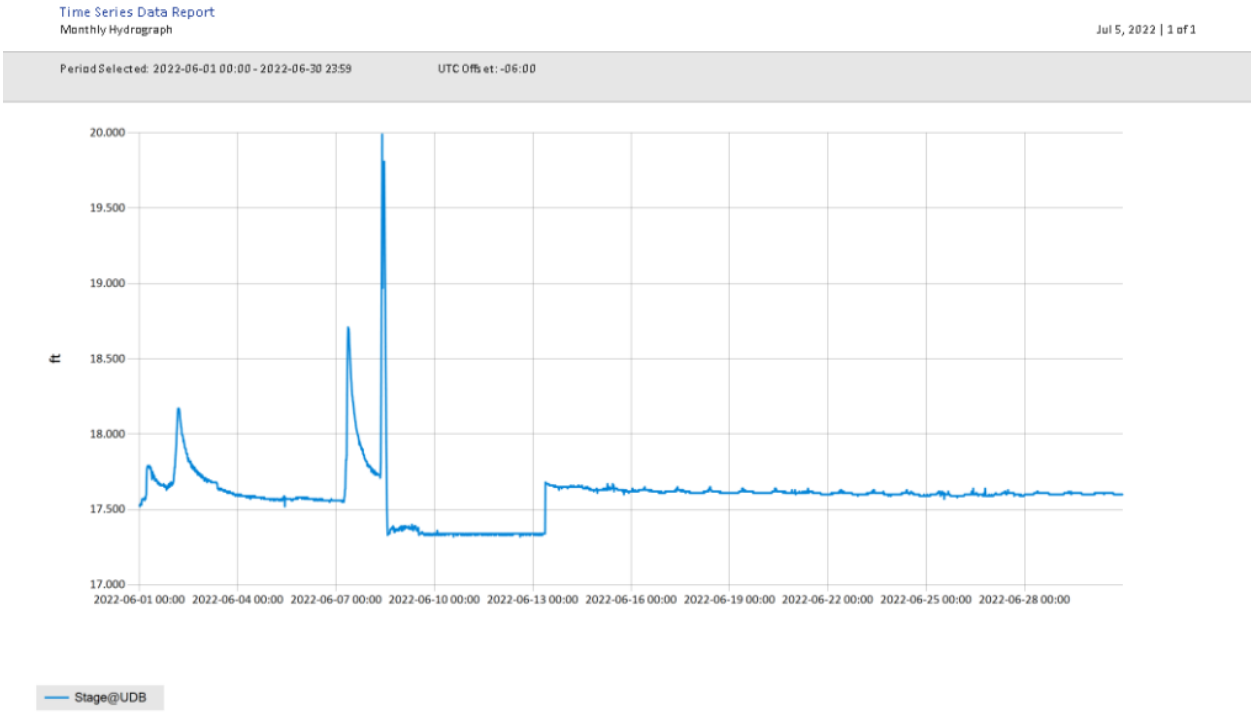


Figure 15 Monthly Hydrograph UDB-1

MESONET CLIMATOLOGICAL DATA SUMMARY — June 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) MAX	MIN	AVG	DEWPT	DEG DAYS HDD	CDD	HUMIDITY (%) MAX	MIN	AVG	RAIN (in)	PRESSURE (in) STN	MSL	WIND SPEED (mph) DIR	AVG	MAX	SOLAR (MJ/m^2)	4" SOIL TEMPERATURES SOD	BARE	MAX	MIN
1	78	63	68.8	64.2	0	5	99	66	86	1.54	28.75	30.00	N *	NA	23.0*	14.45	71.3	74.5	78	71
2	75	59	66.1	60.3	0	2	97	64	82	0.37	28.79	30.04	NNE	6.5	18.3	15.39	70.0	72.0	76	68
3	77	62	69.7	60.1	0	4	92	54	73	0.00	28.74	29.99	E	4.6	12.6	19.35	70.2	73.0	79	68
4	84	61	72.8	64.2	0	7	94	57	76	0.00	28.62	29.87	SSE	6.6	17.8	23.00	71.0	73.3	79	68
5	80	67	72.8	65.0	0	9	93	58	77	0.00	28.47	29.70	SSE	11.6	27.4	16.44	71.5	72.1	76	70
6	88	70	79.0	69.0	0	14	92	57	72	0.00	28.46	29.70	ESE	8.1	22.4	26.93	73.1	75.9	83	69
7	84	66	76.1	70.9	0	10	97	65	85	1.59	28.59	29.83	ESE	6.5	27.9	15.53	74.2	76.2	81	73
8	80	65	72.3	68.1	0	8	98	69	87	1.84	28.70	29.94	NE	7.5	30.2	11.82	73.8	75.3	78	73
9	85	63	74.3	66.2	0	9	97	56	78	0.00	28.76	30.01	SE	5.9	19.4	27.20	73.1	76.6	85	69
10	89	68	79.1	67.6	0	14	88	51	69	0.03	28.62	29.87	S	9.3	43.3	26.87	74.9	78.8	85	73
11	94	73	83.7	73.3	0	19	94	49	73	0.00	28.53	29.77	SSE	7.7	18.3	27.51	77.0	80.5	87	75
12	98	77	87.1	69.6	0	22	70	42	57	0.00	28.49	29.73	S	11.5	26.0	27.38	78.1	79.9	85	75
13	94	78	86.1	67.9	0	21	70	39	56	0.00	28.57	29.81	S	12.0	25.7	29.07	78.3	82.4	91	75
14	91	76	83.8	67.4	0	19	74	45	59	0.00	28.58	29.82	S	13.6	31.3	28.53	77.9	84.5	91	78
15	91	76	83.2	70.0	0	19	79	55	65	0.00	28.64	29.88	S	13.0	32.3	27.51	77.9	85.1	92	79
16	91	75	83.3	70.9	0	18	81	54	67	0.00	28.79	30.03	SSE	8.3	19.0	28.25	78.6	86.8	94	80
17	94	72	83.5	67.8	0	18	89	40	62	0.00	28.80	30.05	SSE	6.2	16.2	28.02	78.7	87.5	95	80
18	92	73	83.8	70.5	0	18	87	50	66	0.00	28.79	30.04	SE	7.0	24.3	26.90	78.8	88.2	95	82
19	92	72	82.3	69.2	0	17	76	50	65	0.00	28.81	30.06	SE	9.3	22.4	27.52	78.7	88.0	94	82
20	93	73	82.8	68.6	0	18	78	44	63	0.00	28.82	30.07	SE	10.2	22.2	28.43	78.9	88.1	95	82
21	96	75	85.2	69.1	0	20	77	37	60	0.00	28.87	30.12	SSE	8.1	20.1	27.55	79.4	89.1	96	82
22	94	75	84.6	67.6	0	20	80	34	59	0.00	28.87	30.12	ESE	6.5	16.6	28.01	79.5	89.7	96	83
23	96	73	85.4	68.3	0	19	86	33	59	0.00	28.74	29.98	SSE	7.4	18.7	28.88	79.4	89.9	97	83
24	99	77	87.9	66.6	0	23	78	30	52	0.00	28.64	29.88	SSE	9.7	22.8	28.60	79.9	90.4	97	84
25	99	75	87.7	65.2	0	22	68	32	49	0.00	28.69	29.94	S	8.6	27.8	28.66	80.0	90.4	97	84
26	84	71	77.6	61.0	0	13	85	33	58	0.00	28.93	30.19	NNE	13.9	32.6	27.84	78.7	88.4	93	84
27	85	65	74.5	55.5	0	10	70	39	52	0.00	29.00	30.25	NE	8.8	20.0	26.36	76.8	85.7	92	80
28	87	65	75.6	57.6	0	11	85	22	56	0.02	28.96	30.21	SE	4.9	14.7	25.24	76.6	85.3	92	79
29	90	62	78.0	56.6	0	11	90	20	51	0.00	28.92	30.17	SE	5.5	17.3	29.31	76.1	85.9	93	79
30	96	67	82.8	58.2	0	16	64	24	45	0.00	28.77	30.02	SSE	7.9	19.9	28.87	76.9	86.7	94	80
	89	70	79.7	65.9	<- Monthly Averages ->						28.72	29.97	SSE*	8.5*	43.3*	25.18	76.3	82.7	89	77

Temperature - Highest: 99
Lowest: 59

Degree Days - Total HDD: 0
Total CDD: 434

Rainfall: Monthly Total: 5.39 in.
Greatest 24 Hr: 1.84 in.

Humidity - Highest: 99
Lowest: 20

Number of Days With:

Tmax ≥ 90:	17	Rainfall ≥ 0.01 inch:	6
Tmax ≤ 32:	0	Rainfall ≥ 0.10 inch:	4
Tmin ≤ 32:	0	Avg Wind Speed ≥ 10 mph:	7*
Tmin ≤ 0:	0	Max Wind Speed ≥ 30 mph:	5*

* Denotes incomplete record

Figure 16 June Mesonet Data