Lake Thunderbird TMDL Monitoring Plan Implementation: Sample Year (SY) 2021- January Report

SY-2021 Monthly Report

Lake Thunderbird TMDL Monitoring Plan Implementation:

January 2022 Monitoring Report

Oklahoma Water Resources Board
Water Quality Programs Division
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SUMMARY OF JANUARY WATER QUALITY SAMPLING

Sampling for January 2022 occurred on the eighteenth and was a base flow collection. Water samples were collected at nine locations and discharge measurements were collected at six locations. Samples were not collected at JB-1 due to construction activity. Mesonet data shows no precipitation on the eighteenth, in the 72 hours prior to sampling, or in the 72 hours after the sampling event. The total rainfall amount in Norman for the month of January was 0.71 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

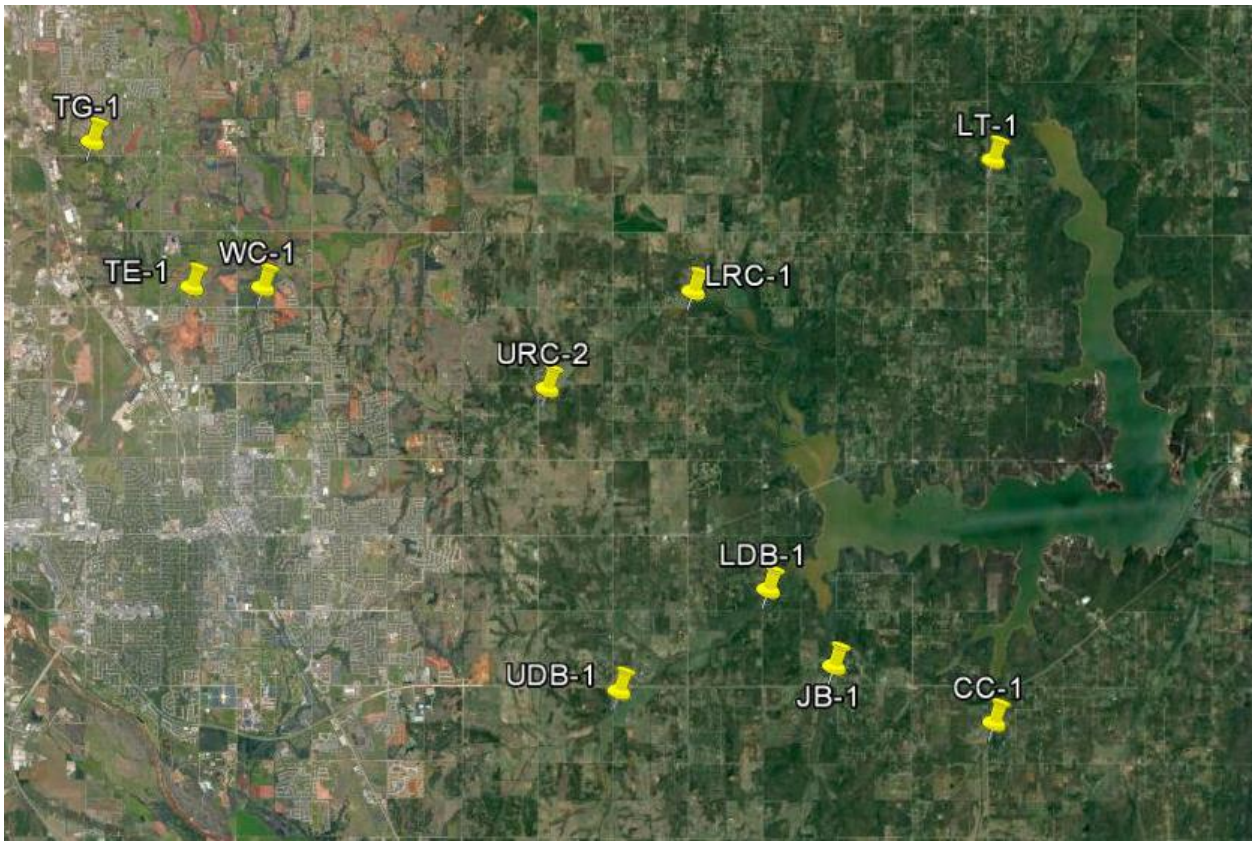


Figure 1 Monitoring Station Map

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	1/18/2022	9:40	SD	5.51	11.18	7.89	684	6	Used RP3, RP4 also over water, low water level, flow normal/low
JB-1	Jim Blue Creek	1/18/2022	10:20	SD	N/A	N/A	N/A	N/A	N/A	Did not sample, construction ongoing, no shoulder, work being done on upstream, downstream mostly dammed by rocks
LDB-1	Lower Dave Blue Creek	1/18/2022	10:30	SD	3.68	15.51	8.09	958	15	Low water level, minimal visual flow
LRC-1	Lower Rock Creek	1/18/2022	12:30	SD	5.40	11.54	7.81	762	7	Lots of filamentous algae, lots of beaver sign, possible dam visible downstream
LT-1	Lake Laterals	1/18/2022	11:10	SD	5.25	9.18	7.54	659	3	Was connected
TE-1	Little River Tributary	1/18/2022	15:25	SD	9.11	14.38	7.99	815	31	Very low stage, very minimal flow, beaver dam on upstream, bubbler still having issues bouncing around
TG-1	Little River Tributary	1/18/2022	16:25	SD	7.30	12.54	7.80	1001	7	Same tapedown as last month, low flow/water level
UDB-1	Upper Dave Blue Creek	1/18/2022	8:40	SD	3.61	10.24	7.80	1001	2	Basically same stage as last month's visit (tapedown off by 0.01ft), low flow
URC-2	Upper Rock Creek	1/18/2022	13:50	SD	8.27	18.79	8.06	885	12	Lots of filamentous algae, similar stage to last month (tapedown off by 0.03ft)
WC-1	Woodcrest Creek	1/18/2022	14:25	SD	9.20	8.76	7.43	812	17	Very low flow/stage, beaver dam remnants on upstream of bridge, filamentous more present on upstream, orifice getting close to being out of water

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	0.08	0.13	0.017	6.0
JB-1	Jim Blue Creek	N/A	N/A	N/A	N/A
LDB-1	Lower Dave Blue Creek	<0.05	0.68	0.022	15.0
LRC-1	Lower Rock Creek	<0.05	0.15	0.024	<5.0
LT-1	Lake Laterals	<0.05	0.28	0.016	<5.0
TE-1	Little River Tributary	<0.05	0.39	0.043	24.0
TG-1	Little River Tributary	0.18	0.29	0.037	<5.0
UDB-1	Upper Dave Blue Creek	<0.05	0.14	0.018	10.0
URC-2	Upper Rock Creek	<0.05	0.25	0.035	8.0
WC-1	Woodcrest Creek	<0.05	0.21	0.048	11.0

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	0.09	0.16	0.018	6.0
Duplicate RPD	11.76%*	20.69%*	5.71%	0%

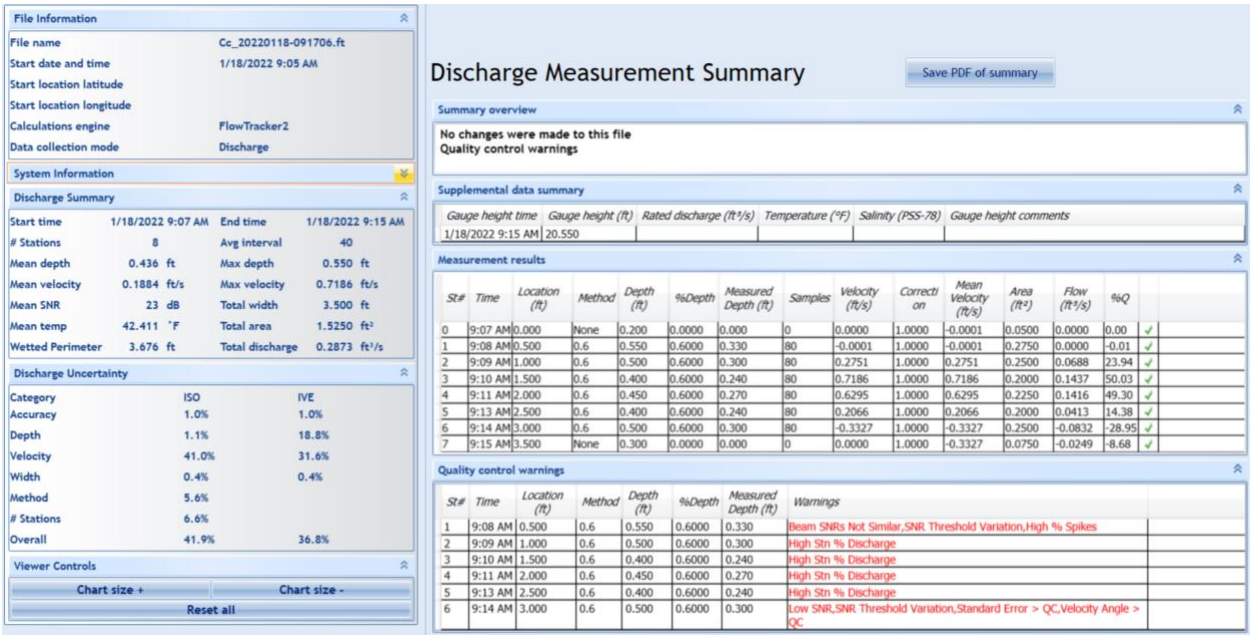
Table 3 QA/QC Data Where the Asterisk Denotes RPD 2

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	0.29	20.55
JB-1	Jim Blue Creek	N/A	N/A
LDB-1	Lower Dave Blue Creek	0.92	15.41
LRC-1	Lower Rock Creek	0.44	4.55
LT-1	Lake Laterals	0.35	4.30
TE-1	Little River Tributary	-0.03	10.83
TG-1	Little River Tributary	0.55	8.89
UDB-1	Upper Dave Blue Creek	0.32	17.23
URC-2	Upper Rock Creek	0.01	10.79
WC-1	Woodcrest Creek	0.01	7.29

Table 4 Station Discharge Summary

All rated stream discharges are provisional and subject to change.



File Information

File name	Cc_20220118-091706.ft
Start date and time	1/18/2022 9:05 AM
Start location latitude	
Start location longitude	
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	1/18/2022 9:07 AM	End time	1/18/2022 9:15 AM
# Stations	8	Avg interval	40
Mean depth	0.436 ft	Max depth	0.550 ft
Mean velocity	0.1884 ft/s	Max velocity	0.7186 ft/s
Mean SNR	23 dB	Total width	3.500 ft
Mean temp	42.411 °F	Total area	1.5250 ft²
Wetted Perimeter	3.676 ft	Total discharge	0.2873 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	1.1%	18.8%
Velocity	41.0%	31.6%
Width	0.4%	0.4%
Method	5.6%	
# Stations	6.6%	
Overall	41.9%	36.8%

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
1/18/2022 9:15 AM	20.550				

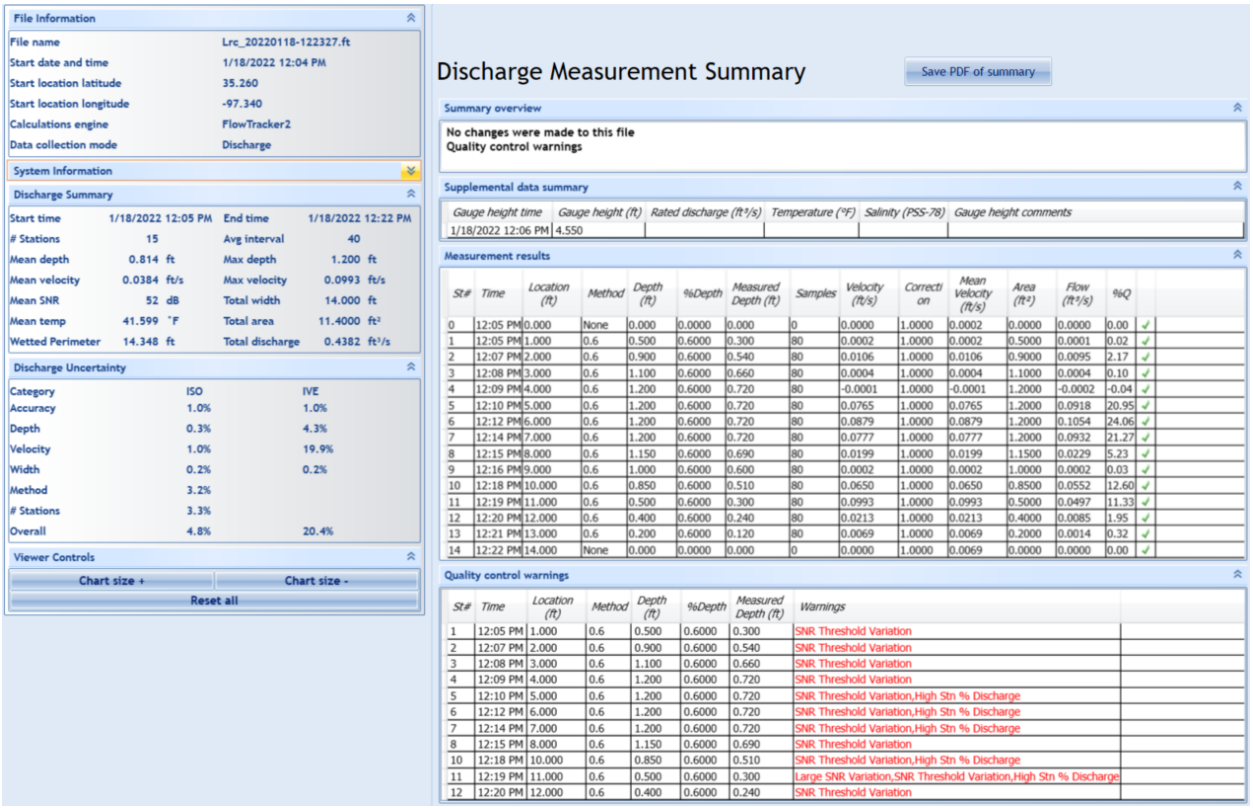
Measurement results

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	9:07 AM	0.000	None	0.200	0.0000	0.000	0	0.0000	1.0000	-0.0001	0.0500	0.0000	0.00	✓
1	9:08 AM	0.500	0.6	0.550	0.6000	0.330	80	-0.0001	1.0000	-0.0001	0.2750	0.0000	-0.01	✓
2	9:09 AM	1.000	0.6	0.500	0.6000	0.300	80	0.2751	1.0000	0.2751	0.2500	0.0688	23.94	✓
3	9:10 AM	1.500	0.6	0.400	0.6000	0.240	80	0.7186	1.0000	0.7186	0.2000	0.1437	50.03	✓
4	9:11 AM	2.000	0.6	0.450	0.6000	0.270	80	0.6295	1.0000	0.6295	0.2250	0.1416	49.30	✓
5	9:13 AM	2.500	0.6	0.400	0.6000	0.240	80	0.2066	1.0000	0.2066	0.2000	0.0413	14.38	✓
6	9:14 AM	3.000	0.6	0.500	0.6000	0.300	80	-0.3327	1.0000	-0.3327	0.2500	-0.0832	-28.95	✓
7	9:15 AM	3.500	None	0.300	0.0000	0.000	0	0.0000	1.0000	-0.3327	0.0750	-0.0249	-8.68	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	9:08 AM	0.500	0.6	0.550	0.6000	0.330	Beam SNRs Not Similar,SNR Threshold Variation,High % Spikes
2	9:09 AM	1.000	0.6	0.500	0.6000	0.300	High Stn % Discharge
3	9:10 AM	1.500	0.6	0.400	0.6000	0.240	High Stn % Discharge
4	9:11 AM	2.000	0.6	0.450	0.6000	0.270	High Stn % Discharge
5	9:13 AM	2.500	0.6	0.400	0.6000	0.240	High Stn % Discharge
6	9:14 AM	3.000	0.6	0.500	0.6000	0.300	Low SNR,SNR Threshold Variation,Standard Error > QC,Velocity Angle > QC

Figure 2 Discharge Measurement Summary CC-1



File Information

File name	Lrc_20220118-122327.ft
Start date and time	1/18/2022 12:04 PM
Start location latitude	35.260
Start location longitude	-97.340
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	1/18/2022 12:05 PM	End time	1/18/2022 12:22 PM
# Stations	15	Avg interval	40
Mean depth	0.814 ft	Max depth	1.200 ft
Mean velocity	0.0384 ft/s	Max velocity	0.0993 ft/s
Mean SNR	52 dB	Total width	14.000 ft
Mean temp	41.599 °F	Total area	11.4000 ft²
Wetted Perimeter	14.348 ft	Total discharge	0.4382 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.3%	4.3%
Velocity	1.0%	19.9%
Width	0.2%	0.2%
Method	3.2%	
# Stations	3.3%	
Overall	4.8%	20.4%

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
1/18/2022 12:06 PM	4.550				

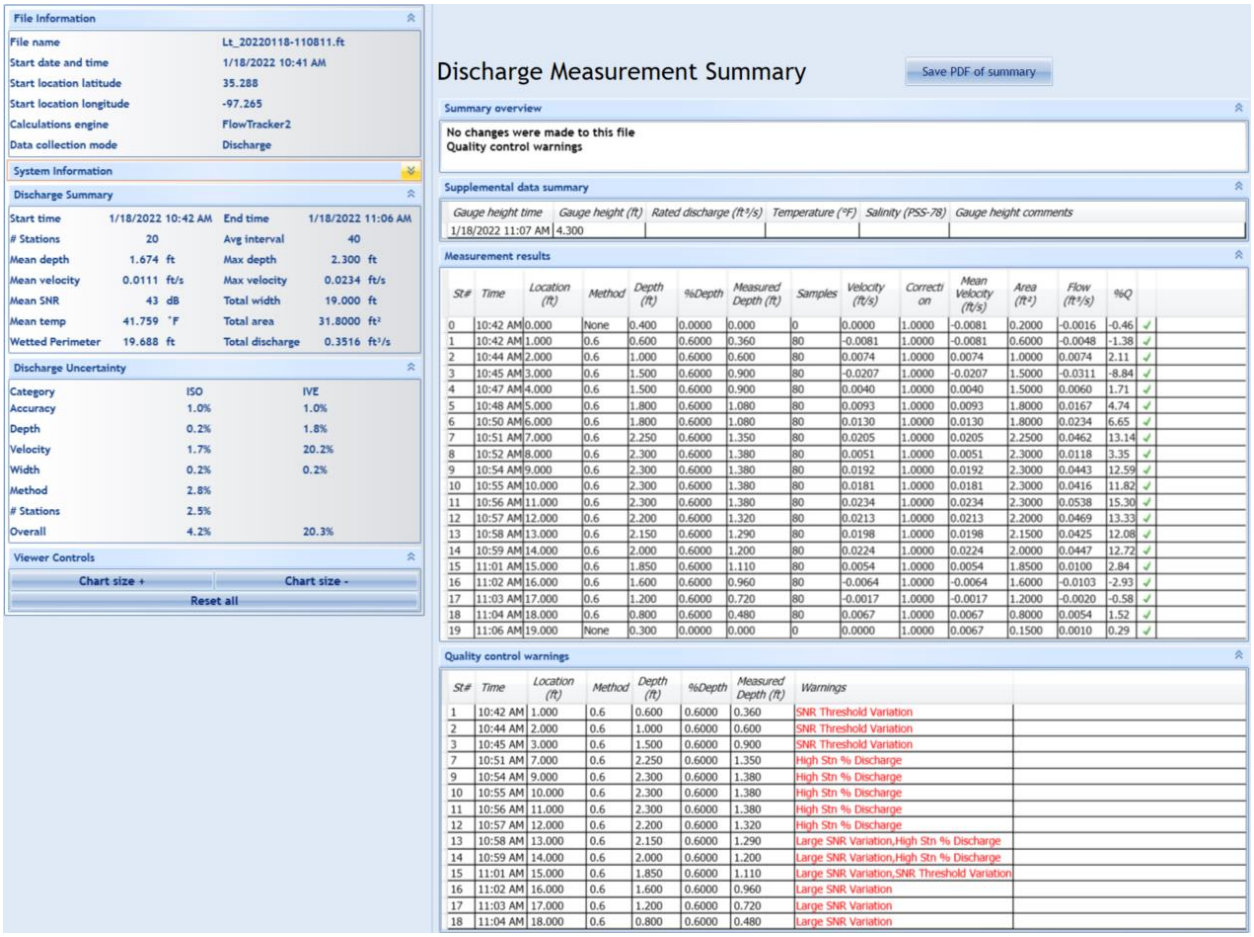
Measurement results

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	12:05 PM	0.000	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.0002	0.0000	0.0000	0.00	✓
1	12:05 PM	1.000	0.6	0.500	0.6000	0.300	80	0.0002	1.0000	0.0002	0.5000	0.0001	0.02	✓
2	12:07 PM	2.000	0.6	0.900	0.6000	0.540	80	0.0106	1.0000	0.0106	0.9000	0.0095	2.17	✓
3	12:08 PM	3.000	0.6	1.100	0.6000	0.660	80	0.0004	1.0000	0.0004	1.1000	0.0004	0.10	✓
4	12:09 PM	4.000	0.6	1.200	0.6000	0.720	80	-0.0001	1.0000	-0.0001	1.2000	-0.0002	-0.04	✓
5	12:10 PM	5.000	0.6	1.200	0.6000	0.720	80	0.0765	1.0000	0.0765	1.2000	0.0918	20.95	✓
6	12:12 PM	6.000	0.6	1.200	0.6000	0.720	80	0.0879	1.0000	0.0879	1.2000	0.1054	24.06	✓
7	12:14 PM	7.000	0.6	1.200	0.6000	0.720	80	0.0777	1.0000	0.0777	1.2000	0.0932	21.27	✓
8	12:15 PM	8.000	0.6	1.150	0.6000	0.690	80	0.0199	1.0000	0.0199	1.1500	0.0229	5.23	✓
9	12:16 PM	9.000	0.6	1.000	0.6000	0.600	80	0.0002	1.0000	0.0002	1.0000	0.0002	0.03	✓
10	12:18 PM	10.000	0.6	0.850	0.6000	0.510	80	0.0650	1.0000	0.0650	0.8500	0.0552	12.60	✓
11	12:19 PM	11.000	0.6	0.500	0.6000	0.300	80	0.0993	1.0000	0.0993	0.5000	0.0497	11.33	✓
12	12:20 PM	12.000	0.6	0.400	0.6000	0.240	80	0.0213	1.0000	0.0213	0.4000	0.0085	1.95	✓
13	12:21 PM	13.000	0.6	0.200	0.6000	0.120	80	0.0069	1.0000	0.0069	0.2000	0.0014	0.32	✓
14	12:22 PM	14.000	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.0069	0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	12:05 PM	1.000	0.6	0.500	0.6000	0.300	SNR Threshold Variation
2	12:07 PM	2.000	0.6	0.900	0.6000	0.540	SNR Threshold Variation
3	12:08 PM	3.000	0.6	1.100	0.6000	0.660	SNR Threshold Variation
4	12:09 PM	4.000	0.6	1.200	0.6000	0.720	SNR Threshold Variation
5	12:10 PM	5.000	0.6	1.200	0.6000	0.720	SNR Threshold Variation,High Stn % Discharge
6	12:12 PM	6.000	0.6	1.200	0.6000	0.720	SNR Threshold Variation,High Stn % Discharge
7	12:14 PM	7.000	0.6	1.200	0.6000	0.720	SNR Threshold Variation,High Stn % Discharge
8	12:15 PM	8.000	0.6	1.150	0.6000	0.690	SNR Threshold Variation
10	12:18 PM	10.000	0.6	0.850	0.6000	0.510	SNR Threshold Variation,High Stn % Discharge
11	12:19 PM	11.000	0.6	0.500	0.6000	0.300	Large SNR Variation,SNR Threshold Variation,High Stn % Discharge
12	12:20 PM	12.000	0.6	0.400	0.6000	0.240	SNR Threshold Variation

Figure 3 Discharge Measurement Summary LRC-1



File Information

File name	Lt_20220118-110811.ft
Start date and time	1/18/2022 10:41 AM
Start location latitude	35.288
Start location longitude	-97.265
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	1/18/2022 10:42 AM	End time	1/18/2022 11:06 AM
# Stations	20	Avg interval	40
Mean depth	1.674 ft	Max depth	2.300 ft
Mean velocity	0.0111 ft/s	Max velocity	0.0234 ft/s
Mean SNR	43 dB	Total width	19.000 ft
Mean temp	41.759 °F	Total area	31.8000 ft²
Wetted Perimeter	19.688 ft	Total discharge	0.3516 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.2%	1.8%
Velocity	1.7%	20.2%
Width	0.2%	0.2%
Method	2.8%	
# Stations	2.5%	
Overall	4.2%	20.3%

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
1/18/2022 11:07 AM	4.300				

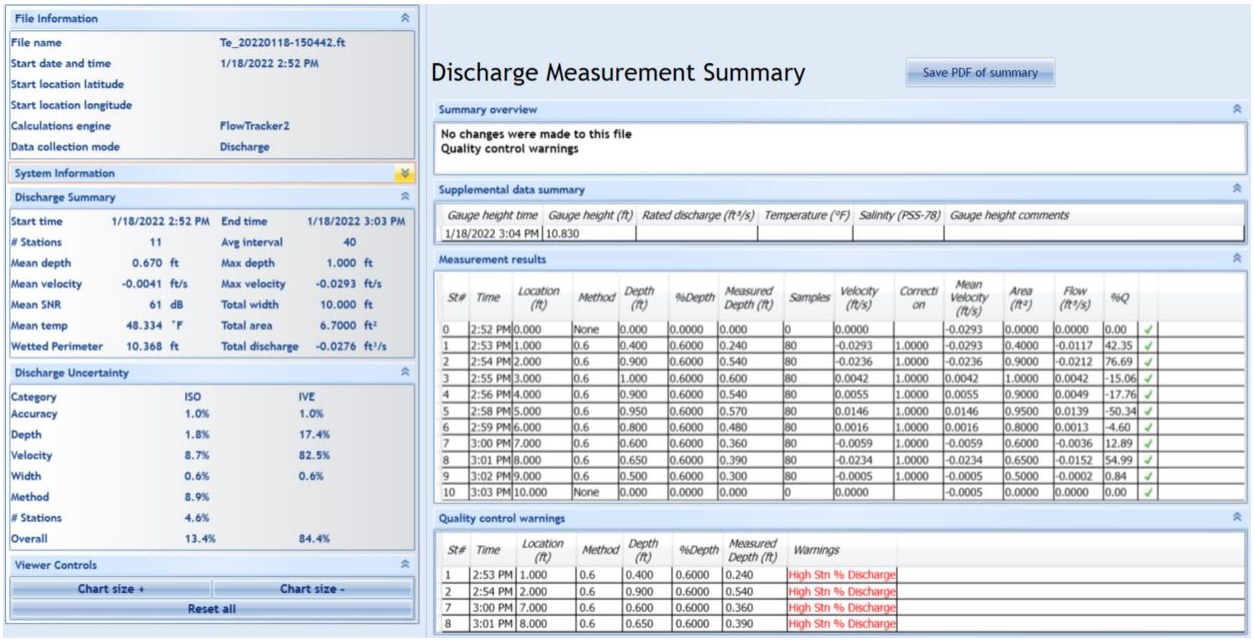
Measurement results

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	10:42 AM	0.000	None	0.400	0.0000	0.000	0	0.0000	1.0000	-0.0081	0.2000	-0.0016	-0.46	✓
1	10:42 AM	1.000	0.6	0.600	0.6000	0.360	80	-0.0081	1.0000	-0.0081	0.6000	-0.0048	-1.38	✓
2	10:44 AM	2.000	0.6	1.000	0.6000	0.600	80	0.0074	1.0000	0.0074	1.0000	0.0074	2.11	✓
3	10:45 AM	3.000	0.6	1.500	0.6000	0.900	80	-0.0207	1.0000	-0.0207	1.5000	-0.0311	-8.84	✓
4	10:47 AM	4.000	0.6	1.500	0.6000	0.900	80	0.0040	1.0000	0.0040	1.5000	0.0060	1.71	✓
5	10:48 AM	5.000	0.6	1.800	0.6000	1.080	80	0.0093	1.0000	0.0093	1.8000	0.0167	4.74	✓
6	10:50 AM	6.000	0.6	1.800	0.6000	1.080	80	0.0130	1.0000	0.0130	1.8000	0.0234	6.65	✓
7	10:51 AM	7.000	0.6	2.250	0.6000	1.350	80	0.0205	1.0000	0.0205	2.2500	0.0462	13.14	✓
8	10:52 AM	8.000	0.6	2.300	0.6000	1.380	80	0.0051	1.0000	0.0051	2.3000	0.0118	3.35	✓
9	10:54 AM	9.000	0.6	2.300	0.6000	1.380	80	0.0192	1.0000	0.0192	2.3000	0.0443	12.59	✓
10	10:55 AM	10.000	0.6	2.300	0.6000	1.380	80	0.0181	1.0000	0.0181	2.3000	0.0416	11.82	✓
11	10:56 AM	11.000	0.6	2.300	0.6000	1.380	80	0.0234	1.0000	0.0234	2.3000	0.0538	15.30	✓
12	10:57 AM	12.000	0.6	2.200	0.6000	1.320	80	0.0213	1.0000	0.0213	2.2000	0.0469	13.33	✓
13	10:58 AM	13.000	0.6	2.150	0.6000	1.290	80	0.0198	1.0000	0.0198	2.1500	0.0425	12.08	✓
14	10:59 AM	14.000	0.6	2.000	0.6000	1.200	80	0.0224	1.0000	0.0224	2.0000	0.0447	12.72	✓
15	11:01 AM	15.000	0.6	1.850	0.6000	1.110	80	0.0054	1.0000	0.0054	1.8500	0.0100	2.84	✓
16	11:02 AM	16.000	0.6	1.600	0.6000	0.960	80	-0.0064	1.0000	-0.0064	1.6000	-0.0103	-2.93	✓
17	11:03 AM	17.000	0.6	1.200	0.6000	0.720	80	-0.0017	1.0000	-0.0017	1.2000	-0.0020	-0.58	✓
18	11:04 AM	18.000	0.6	0.800	0.6000	0.480	80	0.0067	1.0000	0.0067	0.8000	0.0054	1.52	✓
19	11:06 AM	19.000	None	0.300	0.0000	0.000	0	0.0000	1.0000	0.0067	0.1500	0.0010	0.29	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	10:42 AM	1.000	0.6	0.600	0.6000	0.360	SNR Threshold Variation
2	10:44 AM	2.000	0.6	1.000	0.6000	0.600	SNR Threshold Variation
3	10:45 AM	3.000	0.6	1.500	0.6000	0.900	SNR Threshold Variation
7	10:51 AM	7.000	0.6	2.250	0.6000	1.350	High Stn % Discharge
9	10:54 AM	9.000	0.6	2.300	0.6000	1.380	High Stn % Discharge
10	10:55 AM	10.000	0.6	2.300	0.6000	1.380	High Stn % Discharge
11	10:56 AM	11.000	0.6	2.300	0.6000	1.380	High Stn % Discharge
12	10:57 AM	12.000	0.6	2.200	0.6000	1.320	High Stn % Discharge
13	10:58 AM	13.000	0.6	2.150	0.6000	1.290	Large SNR Variation,High Stn % Discharge
14	10:59 AM	14.000	0.6	2.000	0.6000	1.200	Large SNR Variation,High Stn % Discharge
15	11:01 AM	15.000	0.6	1.850	0.6000	1.110	Large SNR Variation,SNR Threshold Variation
16	11:02 AM	16.000	0.6	1.600	0.6000	0.960	Large SNR Variation
17	11:03 AM	17.000	0.6	1.200	0.6000	0.720	Large SNR Variation
18	11:04 AM	18.000	0.6	0.800	0.6000	0.480	Large SNR Variation

Figure 4 Discharge Measurement Summary LT-1



File Information

File name	Te_20220118-150442.ft
Start date and time	1/18/2022 2:52 PM
Start location latitude	
Start location longitude	
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	1/18/2022 2:52 PM	End time	1/18/2022 3:03 PM
# Stations	11	Avg interval	40
Mean depth	0.670 ft	Max depth	1.000 ft
Mean velocity	-0.0041 ft/s	Max velocity	-0.0293 ft/s
Mean SNR	61 dB	Total width	10.000 ft
Mean temp	48.334 °F	Total area	6.7000 ft²
Wetted Perimeter	10.368 ft	Total discharge	-0.0276 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	1.8%	17.4%
Velocity	8.7%	82.5%
Width	0.6%	0.6%
Method	8.9%	
# Stations	4.6%	
Overall	13.4%	84.4%

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
1/18/2022 3:04 PM	10.830				

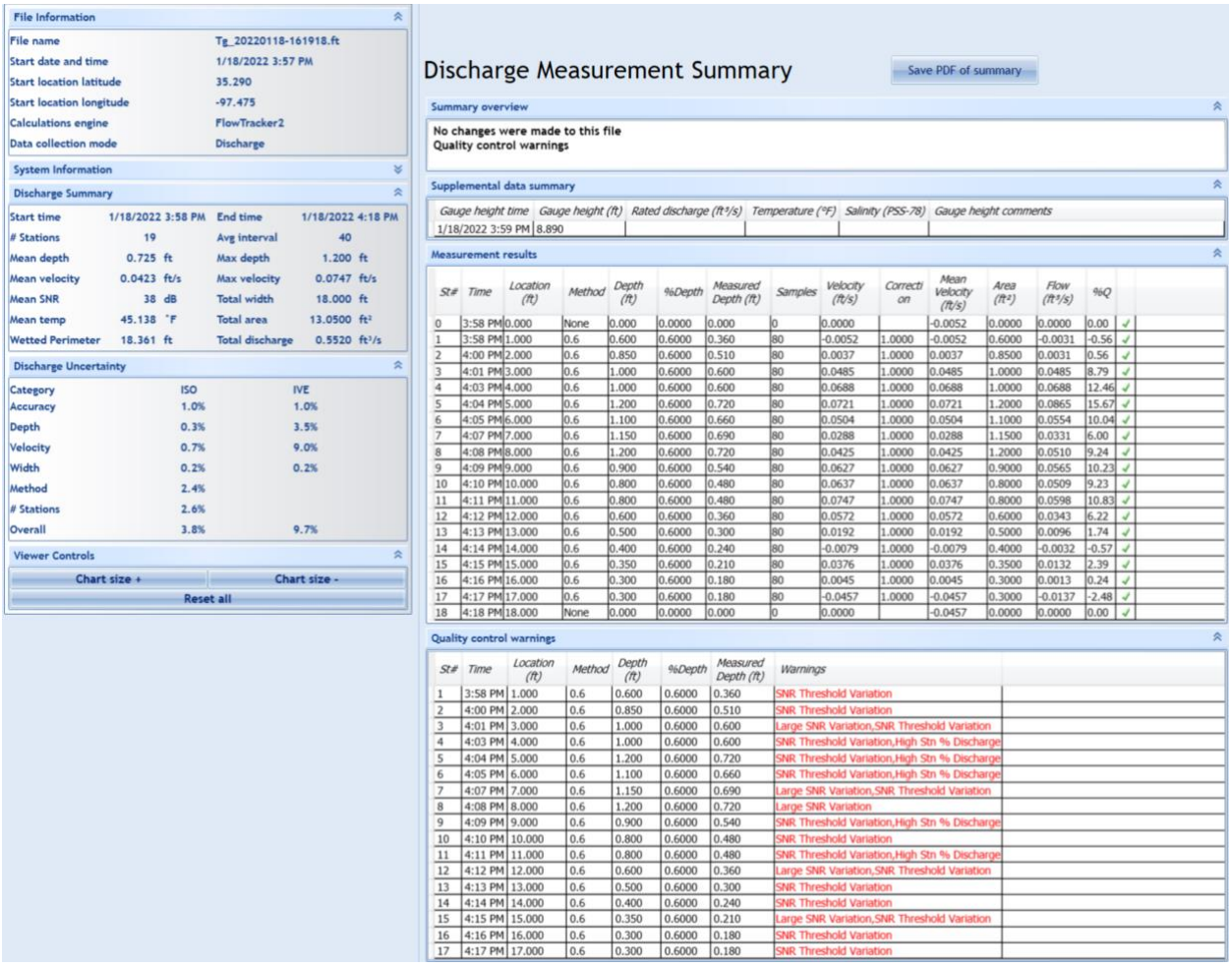
Measurement results

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	2:52 PM	0.000	None	0.000	0.0000	0.000	0	0.0000		-0.0293	0.0000	0.0000	0.00	✓
1	2:53 PM	1.000	0.6	0.400	0.6000	0.240	80	-0.0293	1.0000	-0.0293	0.4000	-0.0117	42.35	✓
2	2:54 PM	2.000	0.6	0.900	0.6000	0.540	80	-0.0236	1.0000	-0.0236	0.9000	-0.0212	76.69	✓
3	2:55 PM	3.000	0.6	1.000	0.6000	0.600	80	0.0042	1.0000	0.0042	1.0000	0.0042	-15.06	✓
4	2:56 PM	4.000	0.6	0.900	0.6000	0.540	80	0.0055	1.0000	0.0055	0.9000	0.0049	-17.76	✓
5	2:58 PM	5.000	0.6	0.950	0.6000	0.570	80	0.0146	1.0000	0.0146	0.9500	0.0139	-50.34	✓
6	2:59 PM	6.000	0.6	0.800	0.6000	0.480	80	0.0016	1.0000	0.0016	0.8000	0.0013	-4.60	✓
7	3:00 PM	7.000	0.6	0.600	0.6000	0.360	80	-0.0059	1.0000	-0.0059	0.6000	-0.0036	12.89	✓
8	3:01 PM	8.000	0.6	0.650	0.6000	0.390	80	-0.0234	1.0000	-0.0234	0.6500	-0.0152	54.99	✓
9	3:02 PM	9.000	0.6	0.500	0.6000	0.300	80	-0.0005	1.0000	-0.0005	0.5000	-0.0002	0.84	✓
10	3:03 PM	10.000	None	0.000	0.0000	0.000	0	0.0000		-0.0005	0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	2:53 PM	1.000	0.6	0.400	0.6000	0.240	High Stn % Discharge
2	2:54 PM	2.000	0.6	0.900	0.6000	0.540	High Stn % Discharge
7	3:00 PM	7.000	0.6	0.600	0.6000	0.360	High Stn % Discharge
8	3:01 PM	8.000	0.6	0.650	0.6000	0.390	High Stn % Discharge

Figure 5 Discharge Measurement Summary TE-1



File Information

File name	Tg_20220118-161918.ft
Start date and time	1/18/2022 3:57 PM
Start location latitude	35.290
Start location longitude	-97.475
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	1/18/2022 3:58 PM	End time	1/18/2022 4:18 PM
# Stations	19	Avg interval	40
Mean depth	0.725 ft	Max depth	1.200 ft
Mean velocity	0.0423 ft/s	Max velocity	0.0747 ft/s
Mean SNR	38 dB	Total width	18.000 ft
Mean temp	45.138 °F	Total area	13.0500 ft²
Wetted Perimeter	18.361 ft	Total discharge	0.5520 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.3%	3.5%
Velocity	0.7%	9.0%
Width	0.2%	0.2%
Method	2.4%	
# Stations	2.6%	
Overall	3.8%	9.7%

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
1/18/2022 3:59 PM	8.890				

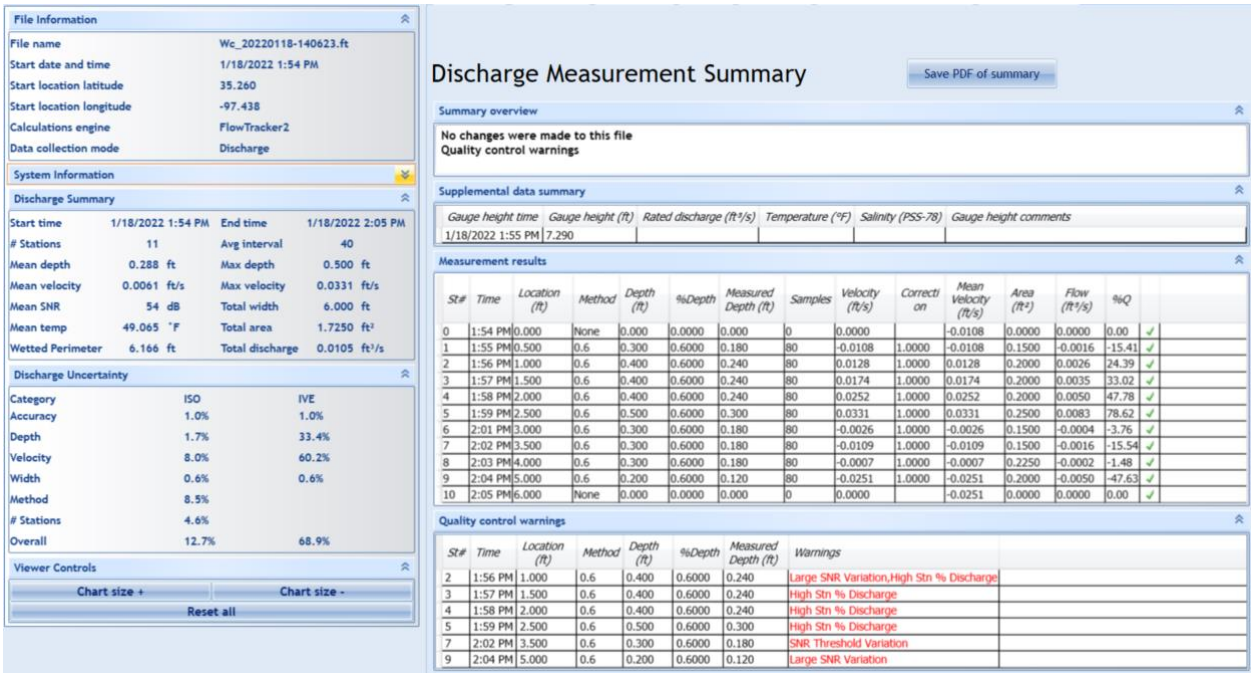
Measurement results

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	3:58 PM	0.000	None	0.000	0.0000	0.000	0	0.0000		-0.0052	0.0000	0.0000	0.00	✓
1	3:58 PM	1.000	0.6	0.600	0.6000	0.360	80	-0.0052	1.0000	-0.0052	0.6000	-0.0031	-0.56	✓
2	4:00 PM	2.000	0.6	0.850	0.6000	0.510	80	0.0037	1.0000	0.0037	0.8500	0.0031	0.56	✓
3	4:01 PM	3.000	0.6	1.000	0.6000	0.600	80	0.0485	1.0000	0.0485	1.0000	0.0485	8.79	✓
4	4:03 PM	4.000	0.6	1.000	0.6000	0.600	80	0.0688	1.0000	0.0688	1.0000	0.0688	12.46	✓
5	4:04 PM	5.000	0.6	1.200	0.6000	0.720	80	0.0721	1.0000	0.0721	1.2000	0.0865	15.67	✓
6	4:05 PM	6.000	0.6	1.100	0.6000	0.660	80	0.0504	1.0000	0.0504	1.1000	0.0554	10.04	✓
7	4:07 PM	7.000	0.6	1.150	0.6000	0.690	80	0.0288	1.0000	0.0288	1.1500	0.0331	6.00	✓
8	4:08 PM	8.000	0.6	1.200	0.6000	0.720	80	0.0425	1.0000	0.0425	1.2000	0.0510	9.24	✓
9	4:09 PM	9.000	0.6	0.900	0.6000	0.540	80	0.0627	1.0000	0.0627	0.9000	0.0565	10.23	✓
10	4:10 PM	10.000	0.6	0.800	0.6000	0.480	80	0.0637	1.0000	0.0637	0.8000	0.0509	9.23	✓
11	4:11 PM	11.000	0.6	0.800	0.6000	0.480	80	0.0747	1.0000	0.0747	0.8000	0.0598	10.83	✓
12	4:12 PM	12.000	0.6	0.600	0.6000	0.360	80	0.0572	1.0000	0.0572	0.6000	0.0343	6.22	✓
13	4:13 PM	13.000	0.6	0.500	0.6000	0.300	80	0.0192	1.0000	0.0192	0.5000	0.0096	1.74	✓
14	4:14 PM	14.000	0.6	0.400	0.6000	0.240	80	-0.0079	1.0000	-0.0079	0.4000	-0.0032	-0.57	✓
15	4:15 PM	15.000	0.6	0.350	0.6000	0.210	80	0.0376	1.0000	0.0376	0.3500	0.0132	2.39	✓
16	4:16 PM	16.000	0.6	0.300	0.6000	0.180	80	0.0045	1.0000	0.0045	0.3000	0.0013	0.24	✓
17	4:17 PM	17.000	0.6	0.300	0.6000	0.180	80	-0.0457	1.0000	-0.0457	0.3000	-0.0137	-2.48	✓
18	4:18 PM	18.000	None	0.000	0.0000	0.000	0	0.0000		-0.0457	0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	3:58 PM	1.000	0.6	0.600	0.6000	0.360	SNR Threshold Variation
2	4:00 PM	2.000	0.6	0.850	0.6000	0.510	SNR Threshold Variation
3	4:01 PM	3.000	0.6	1.000	0.6000	0.600	Large SNR Variation,SNR Threshold Variation
4	4:03 PM	4.000	0.6	1.000	0.6000	0.600	SNR Threshold Variation,High Stn % Discharge
5	4:04 PM	5.000	0.6	1.200	0.6000	0.720	SNR Threshold Variation,High Stn % Discharge
6	4:05 PM	6.000	0.6	1.100	0.6000	0.660	SNR Threshold Variation,High Stn % Discharge
7	4:07 PM	7.000	0.6	1.150	0.6000	0.690	Large SNR Variation,SNR Threshold Variation
8	4:08 PM	8.000	0.6	1.200	0.6000	0.720	Large SNR Variation
9	4:09 PM	9.000	0.6	0.900	0.6000	0.540	SNR Threshold Variation,High Stn % Discharge
10	4:10 PM	10.000	0.6	0.800	0.6000	0.480	SNR Threshold Variation
11	4:11 PM	11.000	0.6	0.800	0.6000	0.480	SNR Threshold Variation,High Stn % Discharge
12	4:12 PM	12.000	0.6	0.600	0.6000	0.360	Large SNR Variation,SNR Threshold Variation
13	4:13 PM	13.000	0.6	0.500	0.6000	0.300	SNR Threshold Variation
14	4:14 PM	14.000	0.6	0.400	0.6000	0.240	SNR Threshold Variation
15	4:15 PM	15.000	0.6	0.350	0.6000	0.210	Large SNR Variation,SNR Threshold Variation
16	4:16 PM	16.000	0.6	0.300	0.6000	0.180	SNR Threshold Variation
17	4:17 PM	17.000	0.6	0.300	0.6000	0.180	SNR Threshold Variation

Figure 6 Discharge Measurement Summary TG-1



File Information

File name	Wc_20220118-140623.ft
Start date and time	1/18/2022 1:54 PM
Start location latitude	35.260
Start location longitude	-97.438
Calculations engine	FlowTracker2
Data collection mode	Discharge

System Information

Discharge Summary

Start time	1/18/2022 1:54 PM	End time	1/18/2022 2:05 PM
# Stations	11	Avg interval	40
Mean depth	0.288 ft	Max depth	0.500 ft
Mean velocity	0.0061 ft/s	Max velocity	0.0331 ft/s
Mean SNR	54 dB	Total width	6.000 ft
Mean temp	49.065 °F	Total area	1.7250 ft²
Wetted Perimeter	6.166 ft	Total discharge	0.0105 ft³/s

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	1.7%	33.4%
Velocity	8.0%	60.2%
Width	0.6%	0.6%
Method	8.5%	
# Stations	4.6%	
Overall	12.7%	68.9%

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
1/18/2022 1:55 PM	7.290				

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	1:54 PM	0.000	None	0.000	0.0000	0.000	0	0.0000		-0.0108	0.0000	0.0000	0.00	✓
1	1:55 PM	0.500	0.6	0.300	0.6000	0.180	80	-0.0108	1.0000	-0.0108	0.1500	-0.0016	-15.41	✓
2	1:56 PM	1.000	0.6	0.400	0.6000	0.240	80	0.0128	1.0000	0.0128	0.2000	0.0026	24.39	✓
3	1:57 PM	1.500	0.6	0.400	0.6000	0.240	80	0.0174	1.0000	0.0174	0.2000	0.0035	33.02	✓
4	1:58 PM	2.000	0.6	0.400	0.6000	0.240	80	0.0252	1.0000	0.0252	0.2000	0.0050	47.78	✓
5	1:59 PM	2.500	0.6	0.500	0.6000	0.300	80	0.0331	1.0000	0.0331	0.2500	0.0083	78.62	✓
6	2:01 PM	3.000	0.6	0.300	0.6000	0.180	80	-0.0026	1.0000	-0.0026	0.1500	-0.0004	-3.76	✓
7	2:02 PM	3.500	0.6	0.300	0.6000	0.180	80	-0.0109	1.0000	-0.0109	0.1500	-0.0016	-15.54	✓
8	2:03 PM	4.000	0.6	0.300	0.6000	0.180	80	-0.0007	1.0000	-0.0007	0.2250	-0.0002	-1.48	✓
9	2:04 PM	5.000	0.6	0.200	0.6000	0.120	80	-0.0251	1.0000	-0.0251	0.2000	-0.0050	-47.63	✓
10	2:05 PM	6.000	None	0.000	0.0000	0.000	0	0.0000		-0.0251	0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
2	1:56 PM	1.000	0.6	0.400	0.6000	0.240	Large SNR Variation,High Stn % Discharge
3	1:57 PM	1.500	0.6	0.400	0.6000	0.240	High Stn % Discharge
4	1:58 PM	2.000	0.6	0.400	0.6000	0.240	High Stn % Discharge
5	1:59 PM	2.500	0.6	0.500	0.6000	0.300	High Stn % Discharge
7	2:02 PM	3.500	0.6	0.300	0.6000	0.180	SNR Threshold Variation
9	2:04 PM	5.000	0.6	0.200	0.6000	0.120	Large SNR Variation

Figure 7 Discharge Measurement Summary WC-1

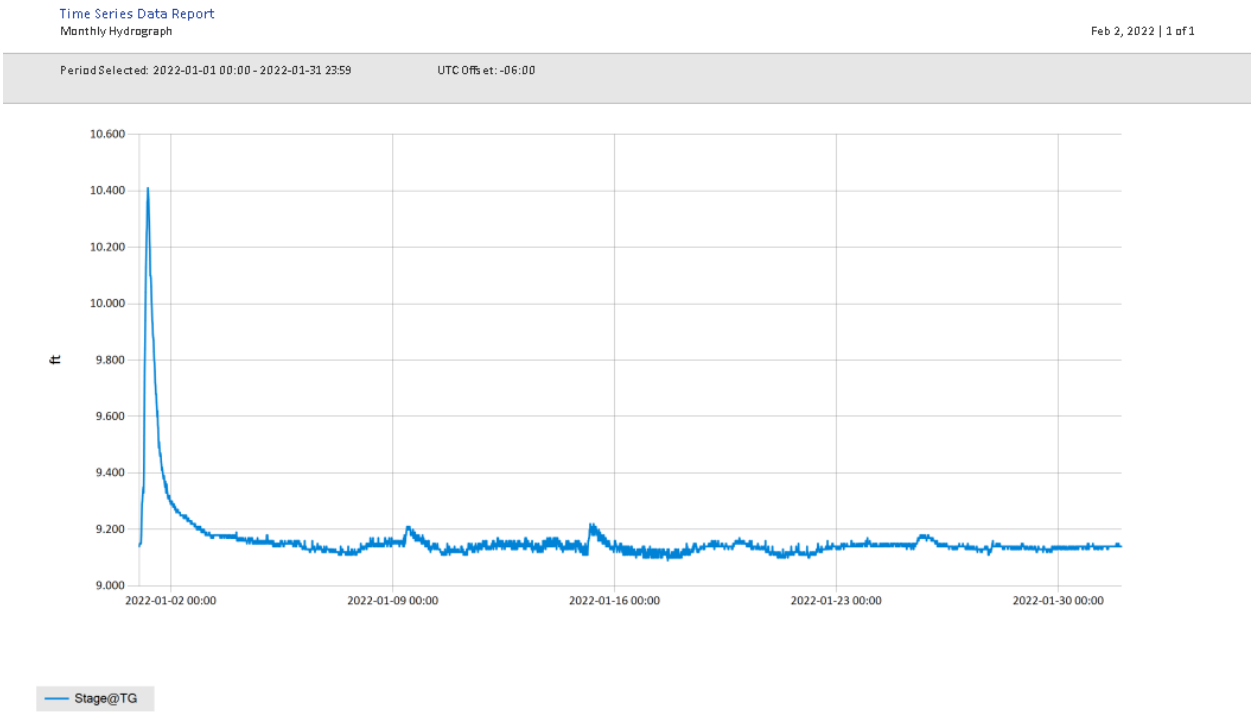


Figure 8 Monthly Hydrograph TG-1

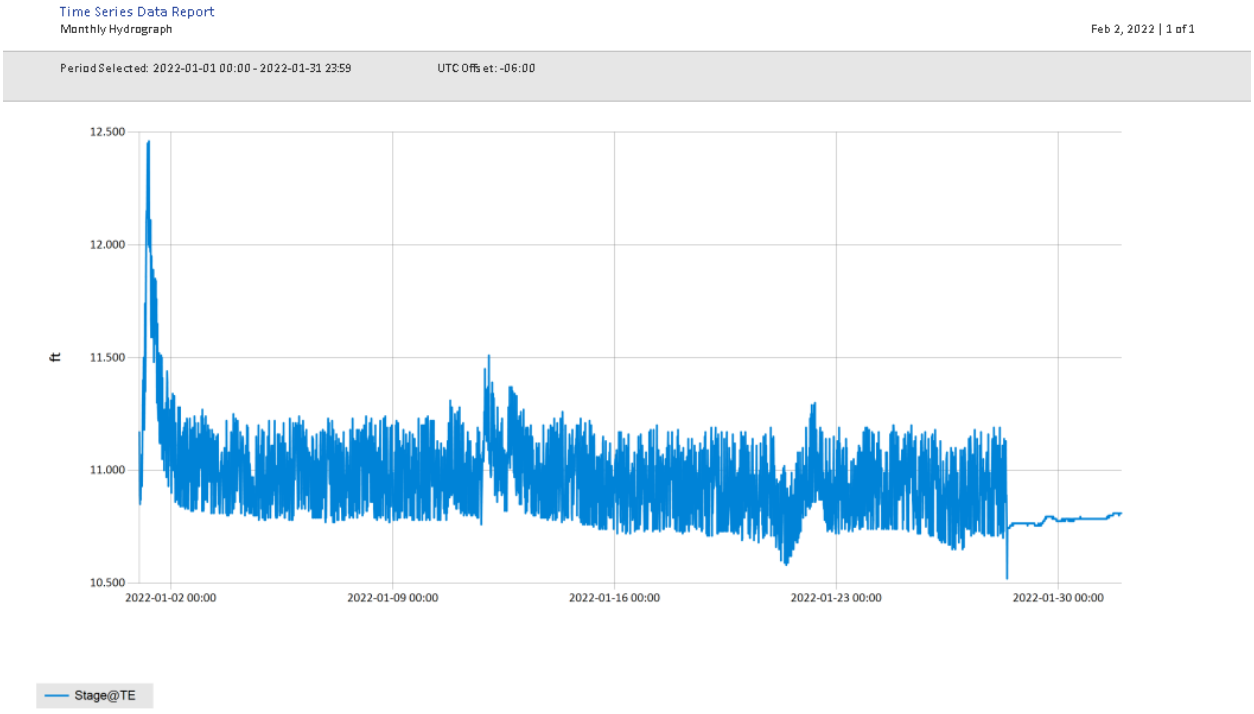


Figure 9 Monthly Hydrograph TE-1

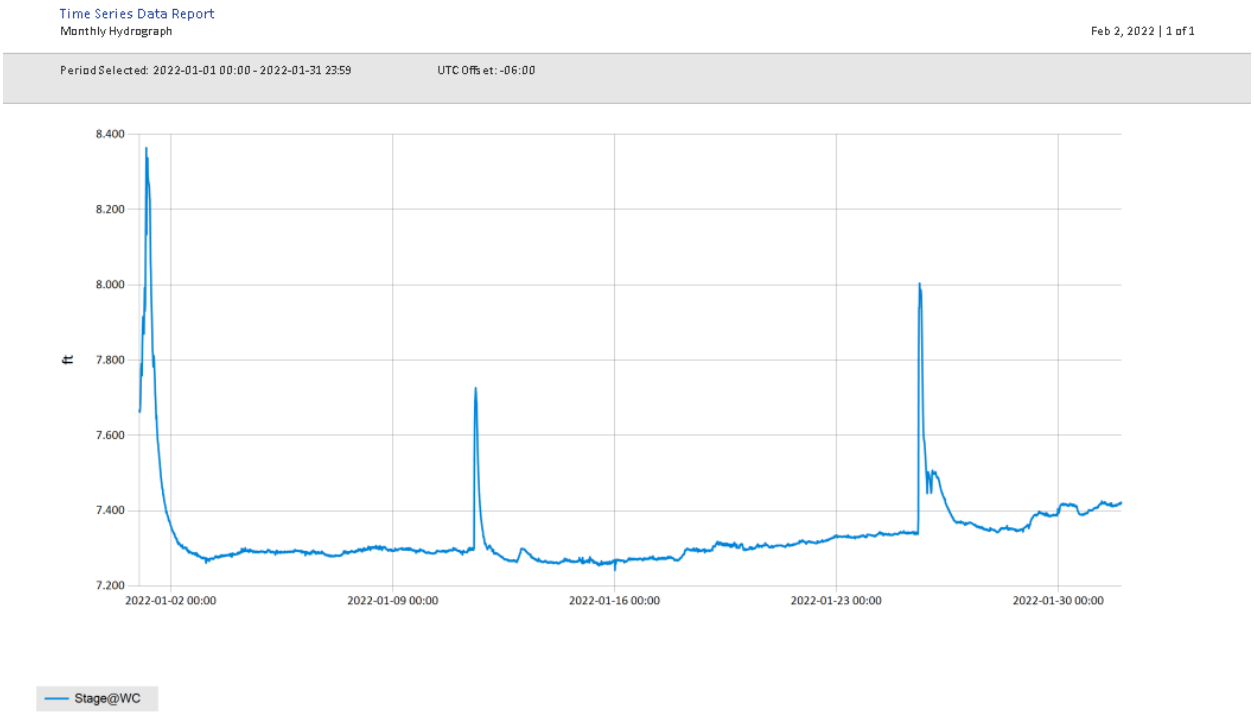


Figure 10 Monthly Hydrograph WC-1

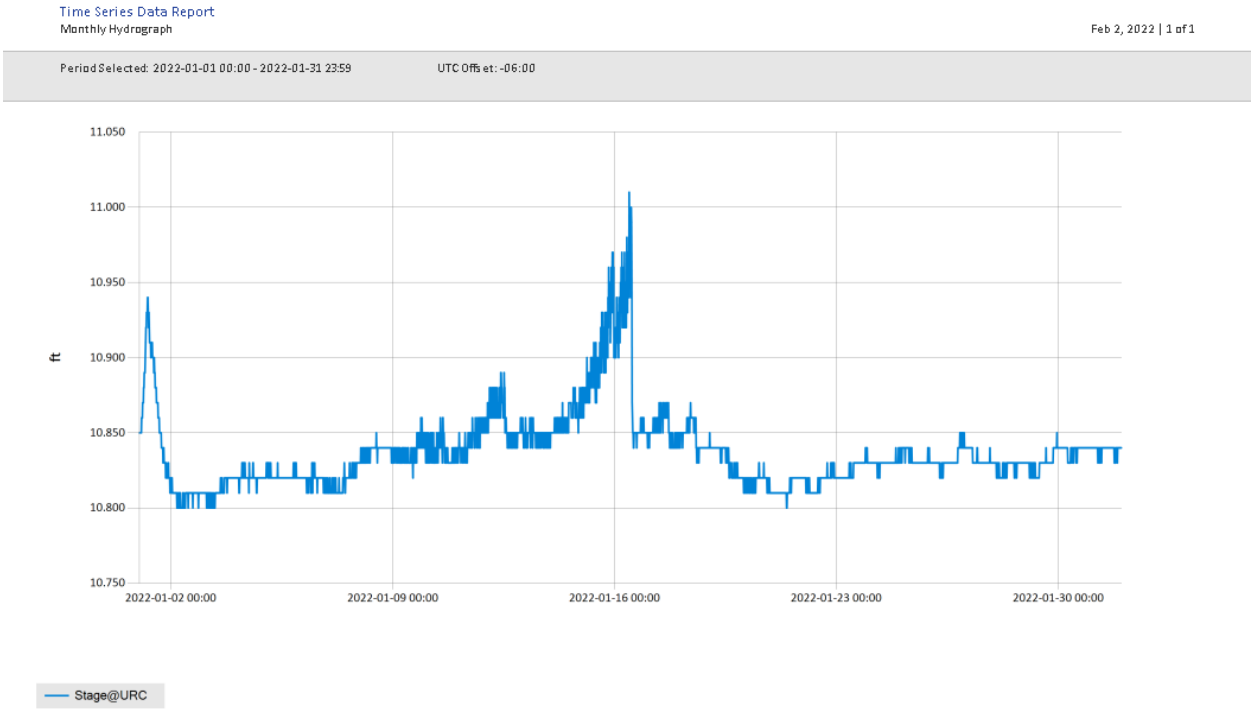


Figure 11 Monthly Hydrograph URC-2

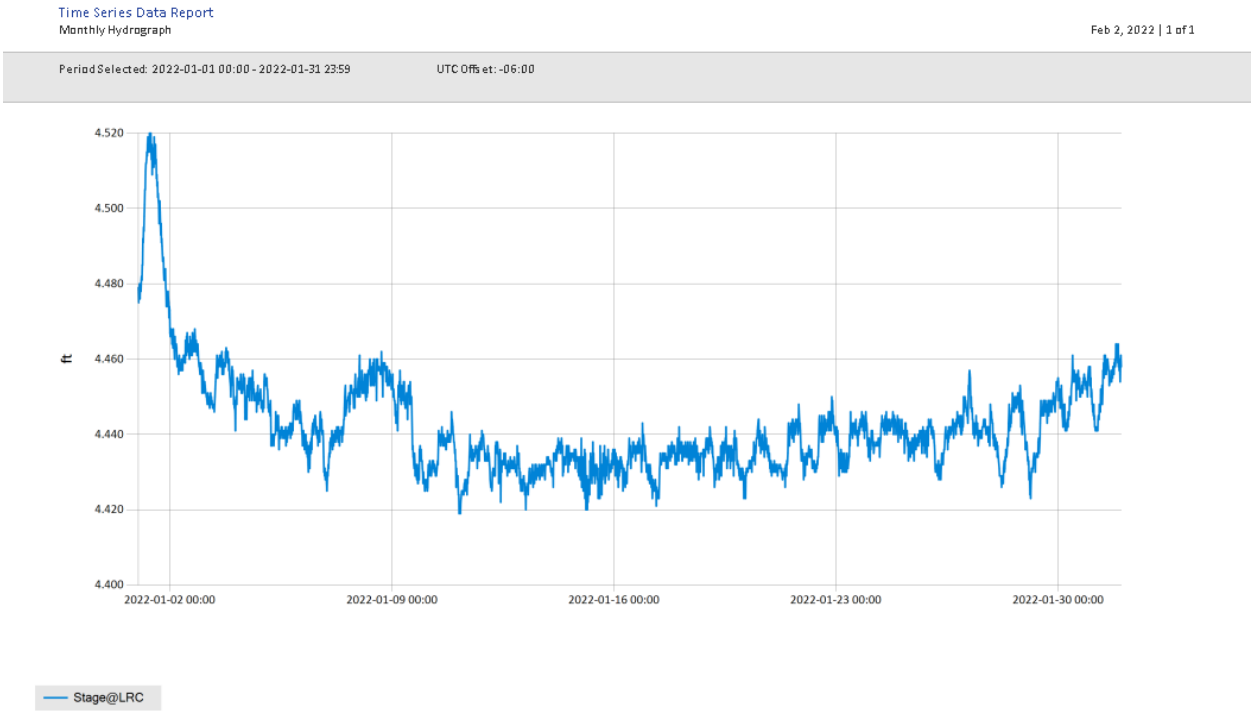


Figure 12 Monthly Hydrograph LRC-1

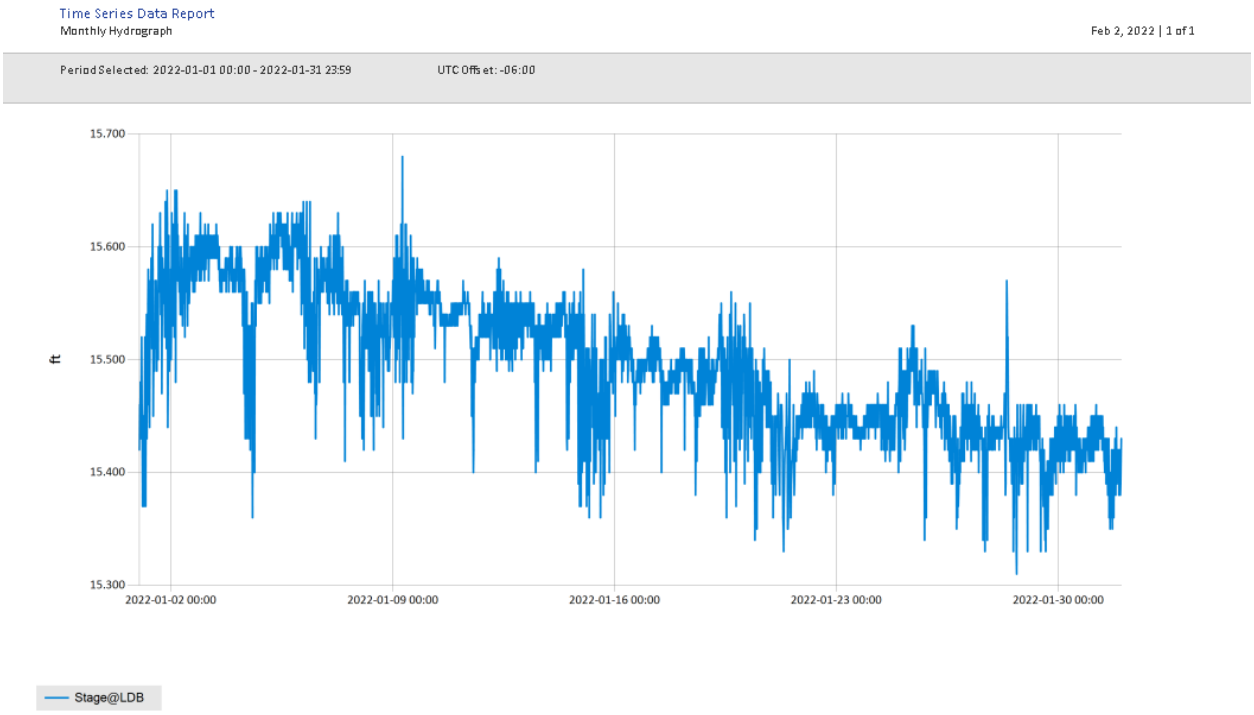


Figure 13 Monthly Hydrograph LDB-1

Figure 14 Monthly Hydrograph CC-1

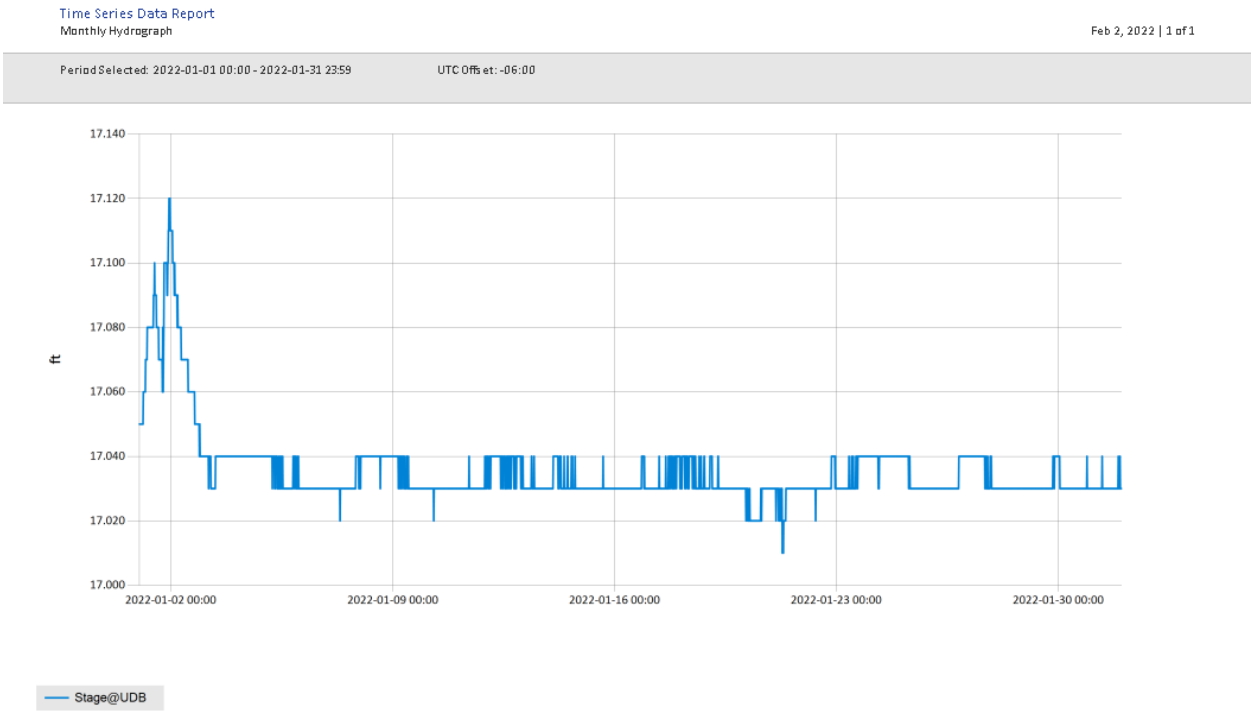


Figure 15 Monthly Hydrograph UDB-1

MESONET CLIMATOLOGICAL DATA SUMMARY — January 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	57	12	28.8	25.2	31	0	96	73	86	0.65	28.59	29.84	NNW	15.6	39.7	2.39	48.8	46.5	54	39
2	31	12	20.3	10.6	44	0	80	43	67	0.00	29.09	30.35	NNW	10.7	35.1	12.29	41.4	36.7	39	36
3	53	20	35.1	20.5	29	0	84	28	59	0.00	29.05	30.31	S	6.6	19.1	12.38	40.6	37.2	41	35
4	58	34	43.5	21.2	19	0	68	23	43	0.00	28.68	29.93	S	11.3	32.4	9.81	42.4	39.4	43	37
5	47	28	37.4	18.6	28	0	68	28	47	0.00	28.77	30.02	NE	11.4	25.6	11.72	42.7	40.2	44	38
6	28	15	20.8	8.3	44	0	70	46	58	0.00	28.97	30.22	N	15.7	38.3	10.92	39.7	36.4	39	35
7	41	12	26.2	15.7	38	0	79	43	65	0.00	28.88	30.14	SSE	8.4	25.9	12.37	38.3	34.4	36	33
8	55	39	47.1	45.8	18	0	99	70	95	0.01	28.63	29.88	S	12.7	27.9	1.76	42.2	41.2	46	36
9	54	25	39.1	24.0	25	0	98	28	58	0.01	29.14	30.40	N	15.5	34.9	10.08	44.0	44.1	47	40
10	55	19	35.7	12.3	28	0	77	13	43	0.00	29.35	30.62	SW	4.0	15.0	12.82	41.2	39.9	45	36
11	60	26	43.6	18.5	22	0	64	20	39	0.00	29.15	30.41	SSW	8.8	26.0	12.83	41.0	40.8	47	36
12	62	33	45.5	29.2	17	0	88	24	57	0.00	28.95	30.20	SW	5.9	19.4	12.39	43.1	43.9	50	39
13	68	35	49.5	27.9	14	0	70	24	46	0.00	28.87	30.12	WNW	5.3	18.9	12.32	43.2	44.8	51	39
14	62	35	49.6	32.2	16	0	84	32	54	0.00	28.65	29.90	SSE	11.8	48.1	6.02	44.4	46.1	50	43
15	38	23	27.8	17.5	35	0	75	58	65	0.00	28.93	30.18	NNW	22.8	44.2	2.17	41.5	41.5	47	39
16	52	16	33.0	18.9	31	0	91	26	61	0.00	28.83	30.08	NNW	5.8	20.1	13.04	40.0	39.7	45	36
17	60	24	42.7	24.8	23	0	80	28	52	0.00	28.81	30.06	S	5.5	18.6	13.08	40.7	41.5	48	36
18	69	36	49.6	28.8	13	0	82	24	47	0.00	28.54	29.78	S	7.8	22.4	11.27	43.1	44.6	50	40
19	41	20	33.6	20.4	34	0	89	38	60	0.00	28.83	30.08	N	18.4	39.9	3.11	41.8	42.0	45	39
20	28	13	19.5	0.5	44	0	57	27	44	0.00	29.27	30.54	NNE	13.6	31.3	10.09	37.9	37.2	39	36
21	39	10	24.1	1.7	40	0	67	15	42	0.00	29.15	30.41	SE	3.8	14.0	13.67	36.0	35.1	38	33
22	50	18	34.1	10.9	31	0	74	20	41	0.00	29.12	30.38	SSW	4.9	18.1	13.33	36.7	36.7	42	33
23	59	30	41.8	22.7	20	0	79	31	48	0.00	28.87	30.12	SW	4.5	13.5	13.65	38.5	39.7	47	35
24	67	26	46.0	25.5	19	0	84	19	51	0.00	28.63	29.87	SSW	6.5	31.9	13.79	39.8	42.1	49	36
25	44	28	35.8	15.7	29	0	71	28	45	0.00	28.95	30.21	NE	13.2	25.2	13.26	41.2	43.4	47	41
26	37	22	29.9	9.6	35	0	95	27	46	0.00	29.10	30.36	NE	5.7	21.6	8.00	39.7	40.9	44	38
27	43	27	33.1	27.0	30	0	92	58	79	0.04	29.04	30.30	NNW	5.7	13.9	11.87	40.4	41.2	46	38
28	52	24	36.1	21.7	27	0	89	26	60	0.00	29.17	30.44	NW	7.6	26.0	14.43	39.8	40.2	46	36
29	69	22	44.3	17.9	19	0	86	9	45	0.00	28.92	30.17	S	7.9	29.5	14.86	39.4	40.8	47	35
30	67	26	45.8	17.7	19	0	64	12	36	0.00	28.81	30.06	SSE	4.2	12.9	14.92	40.4	42.7	50	37
31	72	27	50.5	32.0	16	0	85	25	53	0.00	28.65	29.90	S	6.9	23.0	14.37	41.6	44.6	51	38
	52	24	37.1	20.1	<- Monthly Averages ->						28.92	30.17	S	9.3	48.1	10.94	41.0	40.8	46	37

Temperature - Highest: 72
Lowest: 10

Degree Days - Total HDD: 838
Total CDD: 0

Rainfall: Monthly Total: 0.71 in.
Greatest 24 Hr: 0.65 in.

Humidity - Highest: 99
Lowest: 9

Number of Days With:
Tmax ≥ 90: 0
Tmax ≤ 32: 3
Tmin ≤ 32: 25
Tmin ≤ 0: 0
Rainfall ≥ 0.01 inch: 4
Rainfall ≥ 0.10 inch: 1
Avg Wind Speed ≥ 10 mph: 12
Max Wind Speed ≥ 30 mph: 10

* Denotes incomplete record

Figure 16 January Mesonet Data