# Lake Thunderbird TMDL Monitoring Plan Implementation: Sample Year (SY) 2023- March Report

OKLAHOMA

Water Resources Board

# Lake Thunderbird TMDL Monitoring Plan Implementation:

# March 2023 Monitoring Report

Oklahoma Water Resources Board
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## SUMMARY OF MARCH SAMPLING

Sampling for March 2023 occurred during base flow conditions on the twenty-second. Water samples were collected at nine locations and discharge was measured at seven locations. Samples were not collected at JB-1 due to pool conditions. Mesonet shows no precipitation on the twenty-second, 0.19 inches of precipitation in the 72 hours prior to sampling, and 1.03 inches of precipitation in the 72 hours after the sampling event. The total rainfall amount in Norman for the month of March was 3.41 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

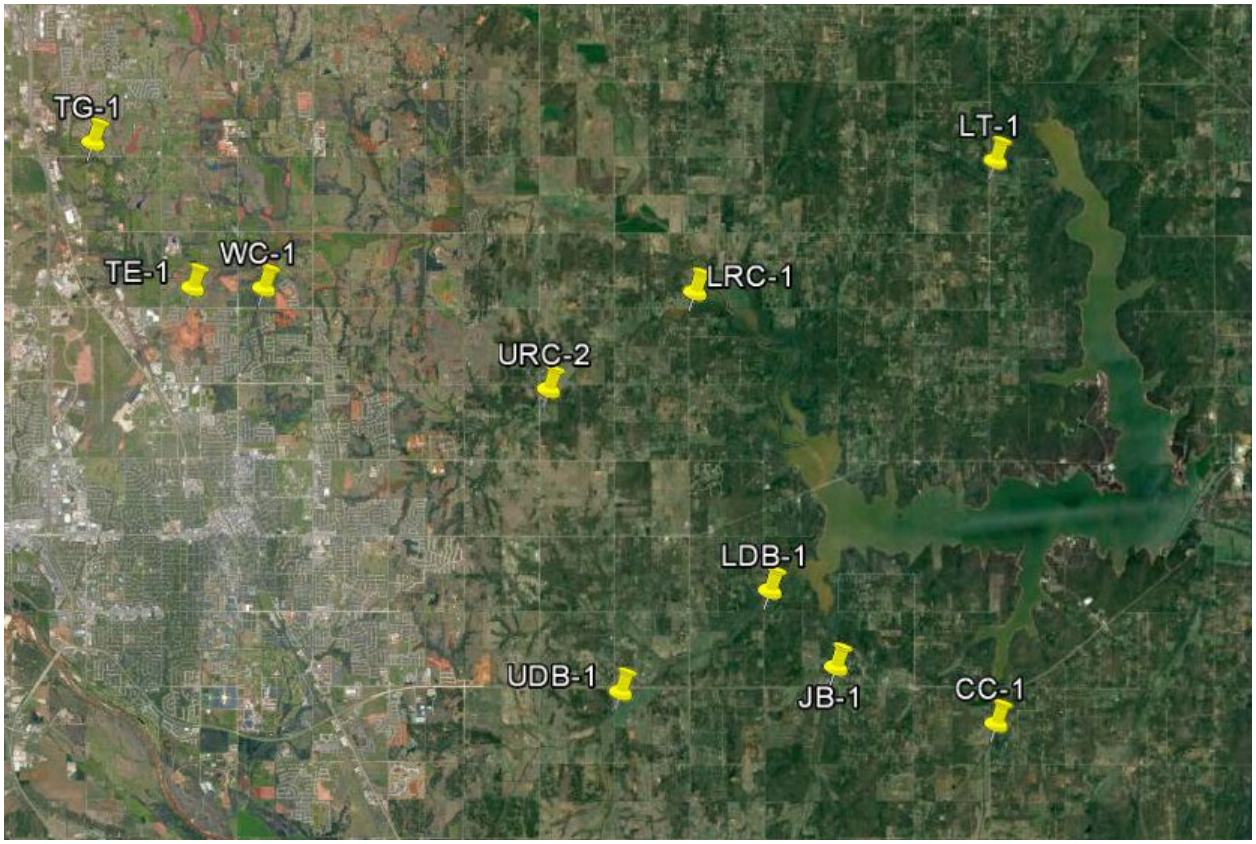



Figure 1 Monitoring Station Map

| Monitoring Location ID | Monitoring Location Name | Date | Time | Field Crew | Water Temperature (°C) | Dissolved Oxygen (DO) (mg/L) | pH | Specific Conductance (µS/cm) | Turbidity (NTU) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| CC-1 | Clear Creek | 3/22/2023 | 10:05 | SD | 14.3 | 8.03 | 7.90 | 703 | 9 | Used RP4; beaver dam still visible on upstream side of bridge |
| JB-1 | Jim Blue Creek | 3/22/2023 | 10:20 | SD | N/A | N/A | N/A | N/A | N/A | Did not sample; barely connected downstream; water clear and had filamentous algae growing at bridge |
| LDB-1 | Lower Dave Blue Creek | 3/22/2023 | 10:37 | SD | 13.1 | 11.03 | 8.19 | 658 | 17 | Lower water level but channel looked normal; small debris was petals/small leaves |
| LRC-1 | Lower Rock Creek | 3/22/2023 | 11:35 | SD | 13.9 | 10.21 | 8.01 | 596 | 14 | Channel has normal flow but appears higher than usual |
| LT-1 | Lake Laterals | 3/22/2023 | 11:05 | SD | 14.1 | 6.93 | 7.72 | 494 | 2 | Filamentous more present upstream of bridge; visible flow upstream of bridge; lots of tree debris on downsream |
| TE-1 | Little River Tributary | 3/22/2023 | 13:37 | SD | 16.3 | 14.64 | 8.33 | 762 | 32 | Normal flow but higher stage than usual; periphyton more common upstream of bridge |
| TG-1 | Little River | 3/22/2023 | 14:10 | SD | 15.7 | 12.58 | 8.27 | 579 | 21 | Normal flow but higher stage than the last few visits; fallen tree in channel upstream of bridge |
| UDB-1 | Upper Dave Blue Creek | 3/22/2023 | 9:15 | SD | 12.7 | 8.99 | 8.18 | 716 | 14 | Normal channel conditions but more flow than observed the last few visits; floating debris was mostly small leaves/petals |
| URC-2 | Upper Rock Creek | 3/22/2023 | 12:25 | SD | 14.5 | 10.20 | 8.09 | 604 | 16 | Periphyton more common upstream of bridge; normal looking conditions but channel more full than usual |
| WC-1 | Woodcrest Creek | 3/22/2023 | 13:05 | SD | 14.8 | 10.64 | 7.88 | 698 | 12 | More visual flow than normal but normal stream conditions; periphyton more present upstream of bridge |

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 | <0.05 | 0.19 | 0.031 | <5.0 |
| JB-1 | Jim Blue Creek | N/A | N/A | N/A | N/A |
| LDB-1 | Lower Dave Blue Creek | <0.05 | 0.39 | 0.035 | 24.0 |
| LRC-1 | Lower Rock Creek | <0.05 | 0.51 | 0.035 | 8.0 |
| LT-1 | Lake Laterals | <0.05 | 0.34 | 0.018 | 8.0 |
| TE-1 | Little River Tributary | 0.41 | 0.61 | 0.057 | 32.0 |
| TG-1 | Little River | 0.41 | 0.57 | 0.053 | 6.0 |
| UDB-1 | Upper Dave Blue Creek | <0.05 | 0.36 | 0.028 | <5.0 |
| URC-2 | Upper Rock Creek | <0.05 | 0.63 | 0.038 | 6.0 |
| WC-1 | Woodcrest Creek | 0.45 | 0.60 | 0.058 | 18.0 |

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 | <0.05 | 0.18 | 0.031 | 5.0 |
| Duplicate RPD | 0% | 5.41% | 0% | 66.67%* |

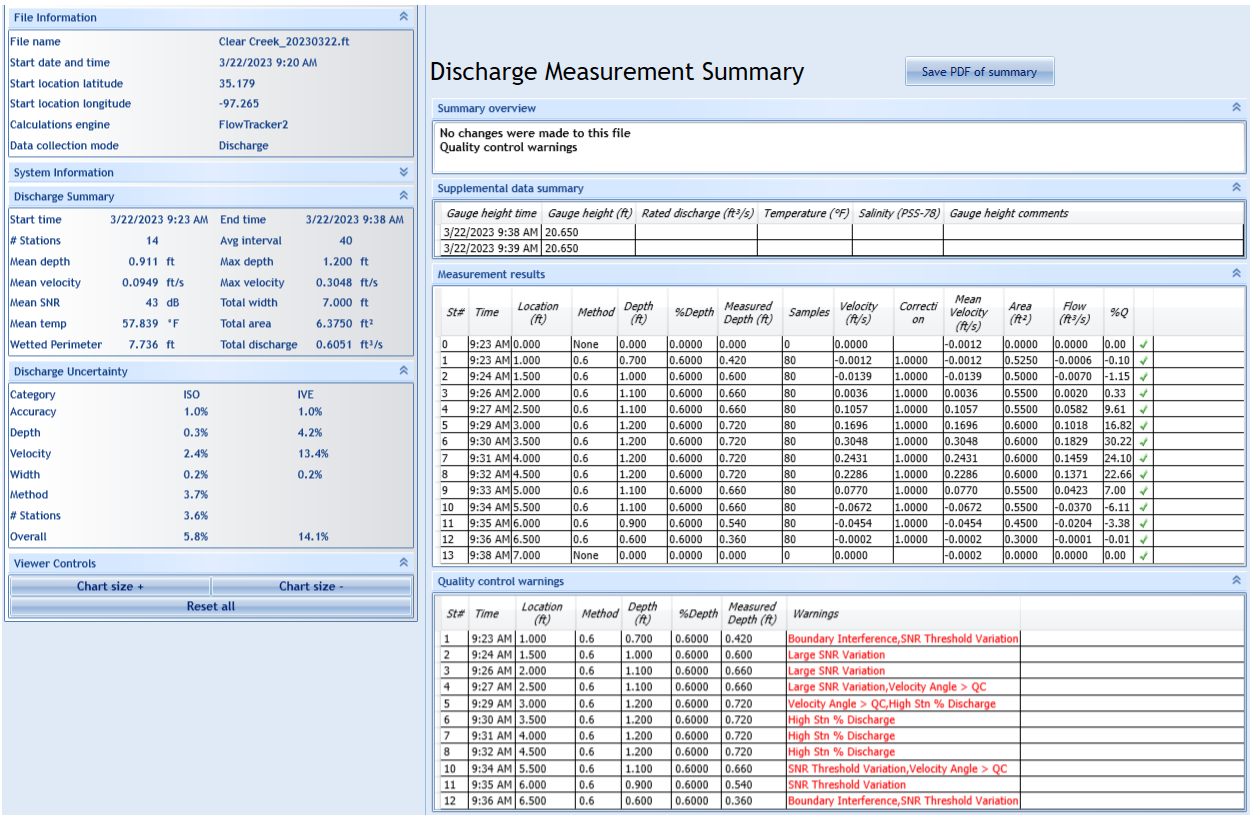
Table 3 QA/QC Data Where the Asterisk Denotes RPD4

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 | 0.61 | 20.56 |
| JB-1 | Jim Blue Creek | N/A | N/A |
| LDB-1 | Lower Dave Blue Creek | 0.55 | 15.07 |
| LRC-1 | Lower Rock Creek | 0.31 | 4.37 |
| LT-1 | Lake Laterals | 0.20 | 4.64 |
| TE-1 | Little River Tributary | 0.37 | 11.10 |
| TG-1 | Little River | 2.19 | 9.15 |
| UDB-1 | Upper Dave Blue Creek | 0.74 | 17.48 |
| URC-2 | Upper Rock Creek | 0.29 | 11.28 |
| WC-1 | Woodcrest Creek | 0.56 | 7.58 |

Table 4 Station Discharge Summary

All rated stream discharges are provisional and subject to change.



## File Information

| | |
|---|---|
| File name | Clear Creek_20230322.ft |
| Start date and time | 3/22/2023 9:20 AM |
| Start location latitude | 35.179 |
| Start location longitude | -97.265 |
| Calculations engine | FlowTracker2 |
| Data collection mode | Discharge |

## System Information

## Discharge Summary

| | | | |
|---|---|---|---|
| Start time | 3/22/2023 9:23 AM | End time | 3/22/2023 9:38 AM |
| # Stations | 14 | Avg interval | 40 |
| Mean depth | 0.911 ft | Max depth | 1.200 ft |
| Mean velocity | 0.0949 ft/s | Max velocity | 0.3048 ft/s |
| Mean SNR | 43 dB | Total width | 7.000 ft |
| Mean temp | 57.839 °F | Total area | 6.3750 ft² |
| Wetted Perimeter | 7.736 ft | Total discharge | 0.6051 ft³/s |

## Discharge Uncertainty

| Category | ISO | IVE |
|---|---|---|
| Accuracy | 1.0% | 1.0% |
| Depth | 0.3% | 4.2% |
| Velocity | 2.4% | 13.4% |
| Width | 0.2% | 0.2% |
| Method | 3.7% | |
| # Stations | 3.6% | |
| Overall | 5.8% | 14.1% |

## 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 |
|---|---|---|---|---|---|
| 3/22/2023 9:38 AM | 20.650 | | | | |
| 3/22/2023 9:39 AM | 20.650 | | | | |

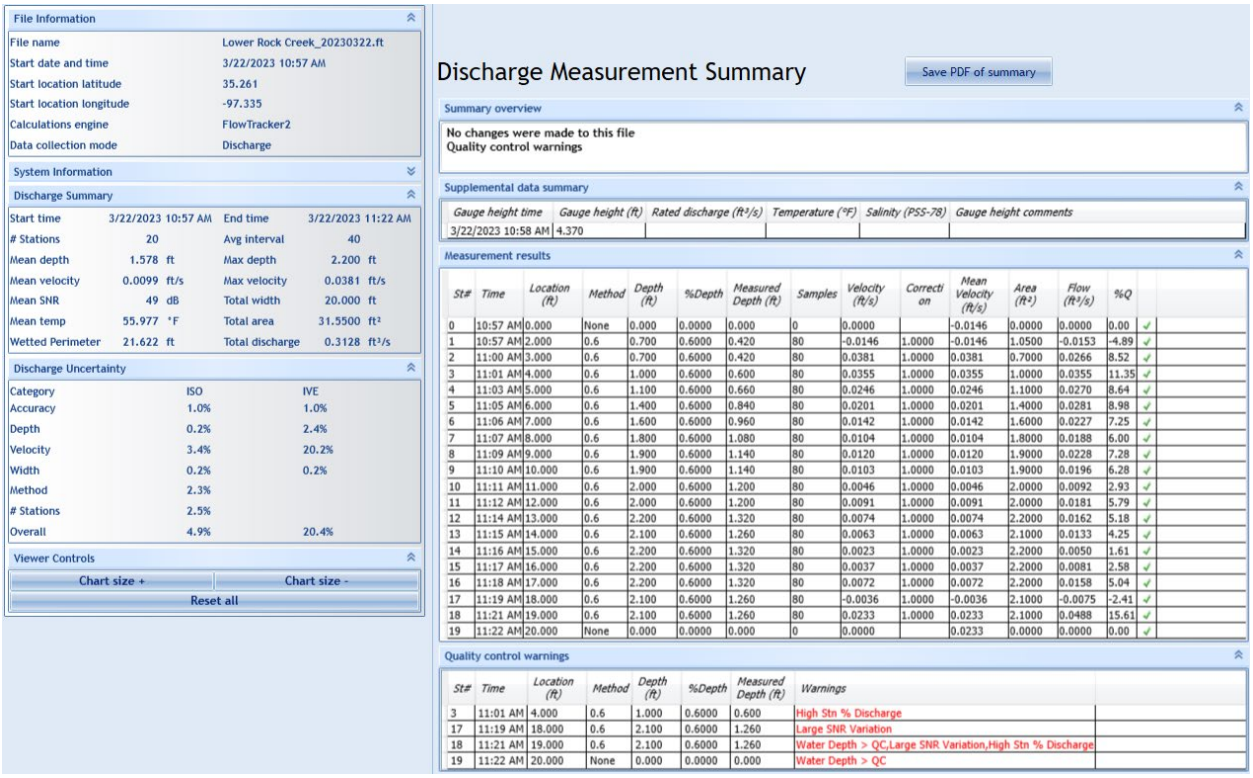
## Measurement results

| 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 | 9:23 AM | 0.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | -0.0012 | 0.0000 | 0.0000 | 0.00 | ✓ |
| 1 | 9:23 AM | 1.000 | 0.6 | 0.700 | 0.6000 | 0.420 | 80 | -0.0012 | 1.0000 | -0.0012 | 0.5250 | -0.0006 | -0.10 | ✓ |
| 2 | 9:24 AM | 1.500 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | -0.0139 | 1.0000 | -0.0139 | 0.5000 | -0.0070 | -1.15 | ✓ |
| 3 | 9:26 AM | 2.000 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | 0.0036 | 1.0000 | 0.0036 | 0.5500 | 0.0020 | 0.33 | ✓ |
| 4 | 9:27 AM | 2.500 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | 0.1057 | 1.0000 | 0.1057 | 0.5500 | 0.0582 | 9.61 | ✓ |
| 5 | 9:29 AM | 3.000 | 0.6 | 1.200 | 0.6000 | 0.720 | 80 | 0.1696 | 1.0000 | 0.1696 | 0.6000 | 0.1018 | 16.82 | ✓ |
| 6 | 9:30 AM | 3.500 | 0.6 | 1.200 | 0.6000 | 0.720 | 80 | 0.3048 | 1.0000 | 0.3048 | 0.6000 | 0.1829 | 30.22 | ✓ |
| 7 | 9:31 AM | 4.000 | 0.6 | 1.200 | 0.6000 | 0.720 | 80 | 0.2431 | 1.0000 | 0.2431 | 0.6000 | 0.1459 | 24.10 | ✓ |
| 8 | 9:32 AM | 4.500 | 0.6 | 1.200 | 0.6000 | 0.720 | 80 | 0.2286 | 1.0000 | 0.2286 | 0.6000 | 0.1371 | 22.66 | ✓ |
| 9 | 9:33 AM | 5.000 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | 0.0770 | 1.0000 | 0.0770 | 0.5500 | 0.0423 | 7.00 | ✓ |
| 10 | 9:34 AM | 5.500 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | -0.0672 | 1.0000 | -0.0672 | 0.5500 | -0.0370 | -6.11 | ✓ |
| 11 | 9:35 AM | 6.000 | 0.6 | 0.900 | 0.6000 | 0.540 | 80 | -0.0454 | 1.0000 | -0.0454 | 0.4500 | -0.0204 | -3.38 | ✓ |
| 12 | 9:36 AM | 6.500 | 0.6 | 0.600 | 0.6000 | 0.360 | 80 | -0.0002 | 1.0000 | -0.0002 | 0.3000 | -0.0001 | -0.01 | ✓ |
| 13 | 9:38 AM | 7.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | -0.0002 | 0.0000 | 0.0000 | 0.00 | ✓ |

## Quality control warnings

| St# | Time | Location (ft) | Method | Depth (ft) | %Depth | Measured Depth (ft) | Warnings |
|---|---|---|---|---|---|---|---|
| 1 | 9:23 AM | 1.000 | 0.6 | 0.700 | 0.6000 | 0.420 | Boundary Interference,SNR Threshold Variation |
| 2 | 9:24 AM | 1.500 | 0.6 | 1.000 | 0.6000 | 0.600 | Large SNR Variation |
| 3 | 9:26 AM | 2.000 | 0.6 | 1.100 | 0.6000 | 0.660 | Large SNR Variation |
| 4 | 9:27 AM | 2.500 | 0.6 | 1.100 | 0.6000 | 0.660 | Large SNR Variation,Velocity Angle > QC |
| 5 | 9:29 AM | 3.000 | 0.6 | 1.200 | 0.6000 | 0.720 | Velocity Angle > QC,High Stn % Discharge |
| 6 | 9:30 AM | 3.500 | 0.6 | 1.200 | 0.6000 | 0.720 | High Stn % Discharge |
| 7 | 9:31 AM | 4.000 | 0.6 | 1.200 | 0.6000 | 0.720 | High Stn % Discharge |
| 8 | 9:32 AM | 4.500 | 0.6 | 1.200 | 0.6000 | 0.720 | High Stn % Discharge |
| 10 | 9:34 AM | 5.500 | 0.6 | 1.100 | 0.6000 | 0.660 | SNR Threshold Variation,Velocity Angle > QC |
| 11 | 9:35 AM | 6.000 | 0.6 | 0.900 | 0.6000 | 0.540 | SNR Threshold Variation |
| 12 | 9:36 AM | 6.500 | 0.6 | 0.600 | 0.6000 | 0.360 | Boundary Interference,SNR Threshold Variation |

Figure 2 Discharge Measurement Summary CC-1



File Information

| | |
|---|---|
| File name | Lower Rock Creek_20230322.ft |
| Start date and time | 3/22/2023 10:57 AM |
| Start location latitude | 35.261 |
| Start location longitude | -97.335 |
| Calculations engine | FlowTracker2 |
| Data collection mode | Discharge |

System Information

Discharge Summary

| | | | |
|---|---|---|---|
| Start time | 3/22/2023 10:57 AM | End time | 3/22/2023 11:22 AM |
| # Stations | 20 | Avg interval | 40 |
| Mean depth | 1.578 ft | Max depth | 2.200 ft |
| Mean velocity | 0.0099 ft/s | Max velocity | 0.0381 ft/s |
| Mean SNR | 49 dB | Total width | 20.000 ft |
| Mean temp | 55.977 °F | Total area | 31.5500 ft² |
| Wetted Perimeter | 21.622 ft | Total discharge | 0.3128 ft³/s |

Discharge Uncertainty

| Category | ISO | IVE |
|---|---|---|
| Accuracy | 1.0% | 1.0% |
| Depth | 0.2% | 2.4% |
| Velocity | 3.4% | 20.2% |
| Width | 0.2% | 0.2% |
| Method | 2.3% | |
| # Stations | 2.5% | |
| Overall | 4.9% | 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 |
|---|---|---|---|---|---|
| 3/22/2023 10:58 AM | 4.370 | | | | |

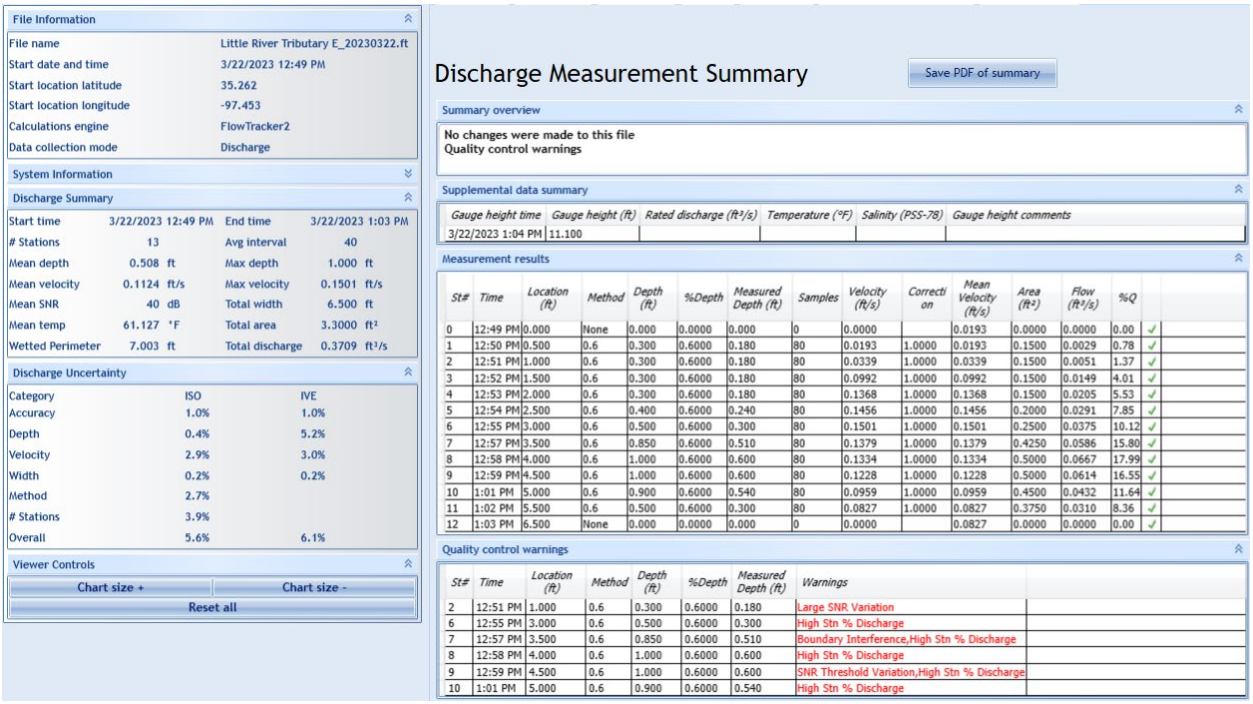
Measurement results

| 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 | 10:57 AM | 0.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | -0.0146 | 0.0000 | 0.0000 | 0.00 | ✓ |
| 1 | 10:57 AM | 2.000 | 0.6 | 0.700 | 0.6000 | 0.420 | 80 | -0.0146 | 1.0000 | -0.0146 | 1.0500 | -0.0153 | -4.89 | ✓ |
| 2 | 11:00 AM | 3.000 | 0.6 | 0.700 | 0.6000 | 0.420 | 80 | 0.0381 | 1.0000 | 0.0381 | 0.7000 | 0.0266 | 8.52 | ✓ |
| 3 | 11:01 AM | 4.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.0355 | 1.0000 | 0.0355 | 1.0000 | 0.0355 | 11.35 | ✓ |
| 4 | 11:03 AM | 5.000 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | 0.0246 | 1.0000 | 0.0246 | 1.1000 | 0.0270 | 8.64 | ✓ |
| 5 | 11:05 AM | 6.000 | 0.6 | 1.400 | 0.6000 | 0.840 | 80 | 0.0201 | 1.0000 | 0.0201 | 1.4000 | 0.0281 | 8.98 | ✓ |
| 6 | 11:06 AM | 7.000 | 0.6 | 1.600 | 0.6000 | 0.960 | 80 | 0.0142 | 1.0000 | 0.0142 | 1.6000 | 0.0227 | 7.25 | ✓ |
| 7 | 11:07 AM | 8.000 | 0.6 | 1.800 | 0.6000 | 1.080 | 80 | 0.0104 | 1.0000 | 0.0104 | 1.8000 | 0.0188 | 6.00 | ✓ |
| 8 | 11:09 AM | 9.000 | 0.6 | 1.900 | 0.6000 | 1.140 | 80 | 0.0120 | 1.0000 | 0.0120 | 1.9000 | 0.0228 | 7.28 | ✓ |
| 9 | 11:10 AM | 10.000 | 0.6 | 1.900 | 0.6000 | 1.140 | 80 | 0.0103 | 1.0000 | 0.0103 | 1.9000 | 0.0196 | 6.28 | ✓ |
| 10 | 11:11 AM | 11.000 | 0.6 | 2.000 | 0.6000 | 1.200 | 80 | 0.0046 | 1.0000 | 0.0046 | 2.0000 | 0.0092 | 2.93 | ✓ |
| 11 | 11:12 AM | 12.000 | 0.6 | 2.000 | 0.6000 | 1.200 | 80 | 0.0091 | 1.0000 | 0.0091 | 2.0000 | 0.0181 | 5.79 | ✓ |
| 12 | 11:14 AM | 13.000 | 0.6 | 2.200 | 0.6000 | 1.320 | 80 | 0.0074 | 1.0000 | 0.0074 | 2.2000 | 0.0162 | 5.18 | ✓ |
| 13 | 11:15 AM | 14.000 | 0.6 | 2.100 | 0.6000 | 1.260 | 80 | 0.0063 | 1.0000 | 0.0063 | 2.1000 | 0.0133 | 4.25 | ✓ |
| 14 | 11:16 AM | 15.000 | 0.6 | 2.200 | 0.6000 | 1.320 | 80 | 0.0023 | 1.0000 | 0.0023 | 2.2000 | 0.0050 | 1.61 | ✓ |
| 15 | 11:17 AM | 16.000 | 0.6 | 2.200 | 0.6000 | 1.320 | 80 | 0.0037 | 1.0000 | 0.0037 | 2.2000 | 0.0081 | 2.58 | ✓ |
| 16 | 11:18 AM | 17.000 | 0.6 | 2.200 | 0.6000 | 1.320 | 80 | 0.0072 | 1.0000 | 0.0072 | 2.2000 | 0.0158 | 5.04 | ✓ |
| 17 | 11:19 AM | 18.000 | 0.6 | 2.100 | 0.6000 | 1.260 | 80 | -0.0036 | 1.0000 | -0.0036 | 2.1000 | -0.0075 | -2.41 | ✓ |
| 18 | 11:21 AM | 19.000 | 0.6 | 2.100 | 0.6000 | 1.260 | 80 | 0.0233 | 1.0000 | 0.0233 | 2.1000 | 0.0488 | 15.61 | ✓ |
| 19 | 11:22 AM | 20.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | 0.0233 | 0.0000 | 0.0000 | 0.00 | ✓ |

Quality control warnings

| St# | Time | Location (ft) | Method | Depth (ft) | %Depth | Measured Depth (ft) | Warnings |
|---|---|---|---|---|---|---|---|
| 3 | 11:01 AM | 4.000 | 0.6 | 1.000 | 0.6000 | 0.600 | High Stn % Discharge |
| 17 | 11:19 AM | 18.000 | 0.6 | 2.100 | 0.6000 | 1.260 | Large SNR Variation |
| 18 | 11:21 AM | 19.000 | 0.6 | 2.100 | 0.6000 | 1.260 | Water Depth > QC,Large SNR Variation,High Stn % Discharge |
| 19 | 11:22 AM | 20.000 | 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_20230322.ft |
| Start date and time | 3/22/2023 12:49 PM |
| Start location latitude | 35.262 |
| Start location longitude | -97.453 |
| Calculations engine | FlowTracker2 |
| Data collection mode | Discharge |

System Information

Discharge Summary

| | | | |
|---|---|---|---|
| Start time | 3/22/2023 12:49 PM | End time | 3/22/2023 1:03 PM |
| # Stations | 13 | Avg interval | 40 |
| Mean depth | 0.508 ft | Max depth | 1.000 ft |
| Mean velocity | 0.1124 ft/s | Max velocity | 0.1501 ft/s |
| Mean SNR | 40 dB | Total width | 6.500 ft |
| Mean temp | 61.127 °F | Total area | 3.3000 ft² |
| Wetted Perimeter | 7.003 ft | Total discharge | 0.3709 ft³/s |

Discharge Uncertainty

| Category | ISO | IVE |
|---|---|---|
| Accuracy | 1.0% | 1.0% |
| Depth | 0.4% | 5.2% |
| Velocity | 2.9% | 3.0% |
| Width | 0.2% | 0.2% |
| Method | 2.7% | |
| # Stations | 3.9% | |
| Overall | 5.6% | 6.1% |

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 |
|---|---|---|---|---|---|
| 3/22/2023 1:04 PM | 11.100 | | | | |

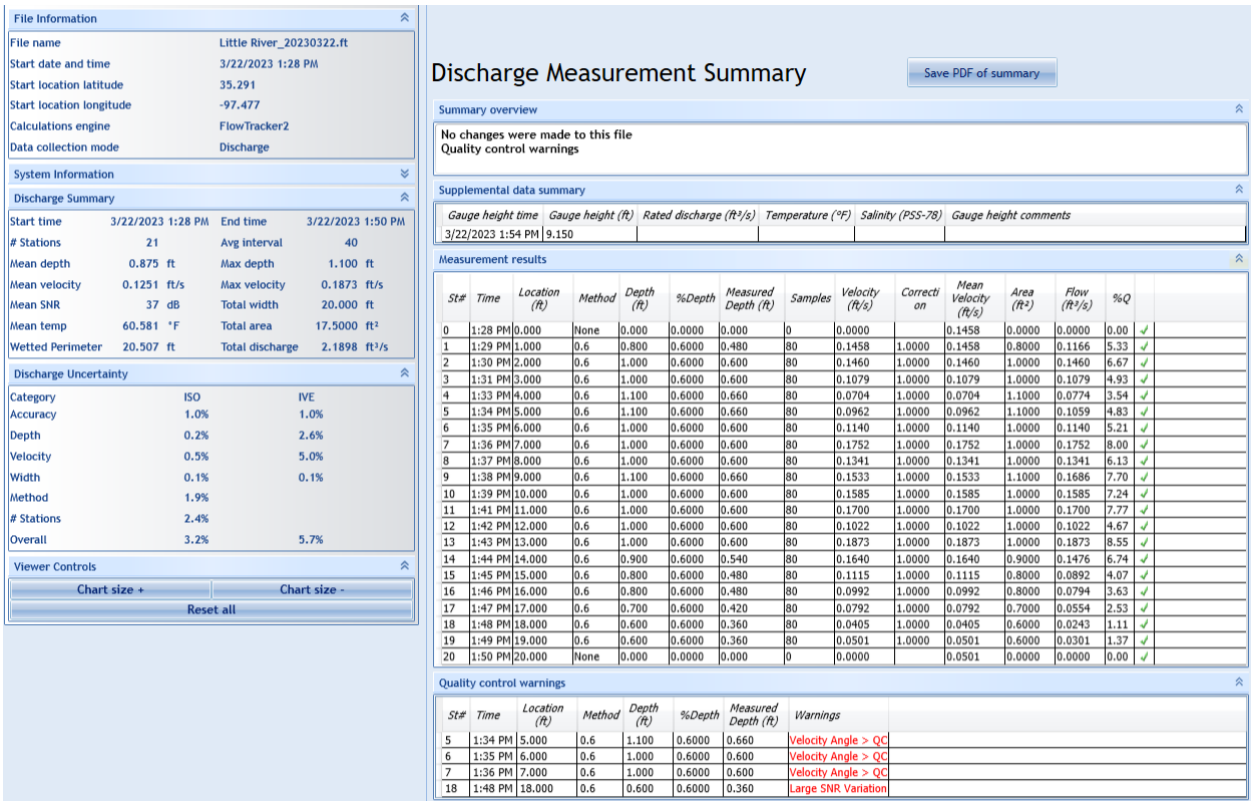
Measurement results

| 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 | 12:49 PM | 0.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | 0.0193 | 0.0000 | 0.0000 | 0.00 | ✓ |
| 1 | 12:50 PM | 0.500 | 0.6 | 0.300 | 0.6000 | 0.180 | 80 | 0.0193 | 1.0000 | 0.0193 | 0.1500 | 0.0029 | 0.78 | ✓ |
| 2 | 12:51 PM | 1.000 | 0.6 | 0.300 | 0.6000 | 0.180 | 80 | 0.0339 | 1.0000 | 0.0339 | 0.1500 | 0.0051 | 1.37 | ✓ |
| 3 | 12:52 PM | 1.500 | 0.6 | 0.300 | 0.6000 | 0.180 | 80 | 0.0992 | 1.0000 | 0.0992 | 0.1500 | 0.0149 | 4.01 | ✓ |
| 4 | 12:53 PM | 2.000 | 0.6 | 0.300 | 0.6000 | 0.180 | 80 | 0.1368 | 1.0000 | 0.1368 | 0.1500 | 0.0205 | 5.53 | ✓ |
| 5 | 12:54 PM | 2.500 | 0.6 | 0.400 | 0.6000 | 0.240 | 80 | 0.1456 | 1.0000 | 0.1456 | 0.2000 | 0.0291 | 7.85 | ✓ |
| 6 | 12:55 PM | 3.000 | 0.6 | 0.500 | 0.6000 | 0.300 | 80 | 0.1501 | 1.0000 | 0.1501 | 0.2500 | 0.0375 | 10.12 | ✓ |
| 7 | 12:57 PM | 3.500 | 0.6 | 0.850 | 0.6000 | 0.510 | 80 | 0.1379 | 1.0000 | 0.1379 | 0.4250 | 0.0586 | 15.80 | ✓ |
| 8 | 12:58 PM | 4.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1334 | 1.0000 | 0.1334 | 0.5000 | 0.0667 | 17.99 | ✓ |
| 9 | 12:59 PM | 4.500 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1228 | 1.0000 | 0.1228 | 0.5000 | 0.0614 | 16.55 | ✓ |
| 10 | 1:01 PM | 5.000 | 0.6 | 0.900 | 0.6000 | 0.540 | 80 | 0.0959 | 1.0000 | 0.0959 | 0.4500 | 0.0432 | 11.64 | ✓ |
| 11 | 1:02 PM | 5.500 | 0.6 | 0.500 | 0.6000 | 0.300 | 80 | 0.0827 | 1.0000 | 0.0827 | 0.3750 | 0.0310 | 8.36 | ✓ |
| 12 | 1:03 PM | 6.500 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | 0.0827 | 0.0000 | 0.0000 | 0.00 | ✓ |

Quality control warnings

| St# | Time | Location (ft) | Method | Depth (ft) | %Depth | Measured Depth (ft) | Warnings |
|---|---|---|---|---|---|---|---|
| 2 | 12:51 PM | 1.000 | 0.6 | 0.300 | 0.6000 | 0.180 | Large SNR Variation |
| 6 | 12:55 PM | 3.000 | 0.6 | 0.500 | 0.6000 | 0.300 | High Stn % Discharge |
| 7 | 12:57 PM | 3.500 | 0.6 | 0.850 | 0.6000 | 0.510 | Boundary Interference,High Stn % Discharge |
| 8 | 12:58 PM | 4.000 | 0.6 | 1.000 | 0.6000 | 0.600 | High Stn % Discharge |
| 9 | 12:59 PM | 4.500 | 0.6 | 1.000 | 0.6000 | 0.600 | SNR Threshold Variation,High Stn % Discharge |
| 10 | 1:01 PM | 5.000 | 0.6 | 0.900 | 0.6000 | 0.540 | High Stn % Discharge |

Figure 4 Discharge Measurement Summary TE-1



## File Information

| | |
|---|---|
| File name | Little River_20230322.ft |
| Start date and time | 3/22/2023 1:28 PM |
| Start location latitude | 35.291 |
| Start location longitude | -97.477 |
| Calculations engine | FlowTracker2 |
| Data collection mode | Discharge |

System Information

## Discharge Summary

| | | | |
|---|---|---|---|
| Start time | 3/22/2023 1:28 PM | End time | 3/22/2023 1:50 PM |
| # Stations | 21 | Avg interval | 40 |
| Mean depth | 0.875 ft | Max depth | 1.100 ft |
| Mean velocity | 0.1251 ft/s | Max velocity | 0.1873 ft/s |
| Mean SNR | 37 dB | Total width | 20.000 ft |
| Mean temp | 60.581 °F | Total area | 17.5000 ft² |
| Wetted Perimeter | 20.507 ft | Total discharge | 2.1898 ft³/s |

## Discharge Uncertainty

| Category | ISO | IVE |
|---|---|---|
| Accuracy | 1.0% | 1.0% |
| Depth | 0.2% | 2.6% |
| Velocity | 0.5% | 5.0% |
| Width | 0.1% | 0.1% |
| Method | 1.9% | |
| # Stations | 2.4% | |
| Overall | 3.2% | 5.7% |

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 |
|---|---|---|---|---|---|
| 3/22/2023 1:54 PM | 9.150 | | | | |

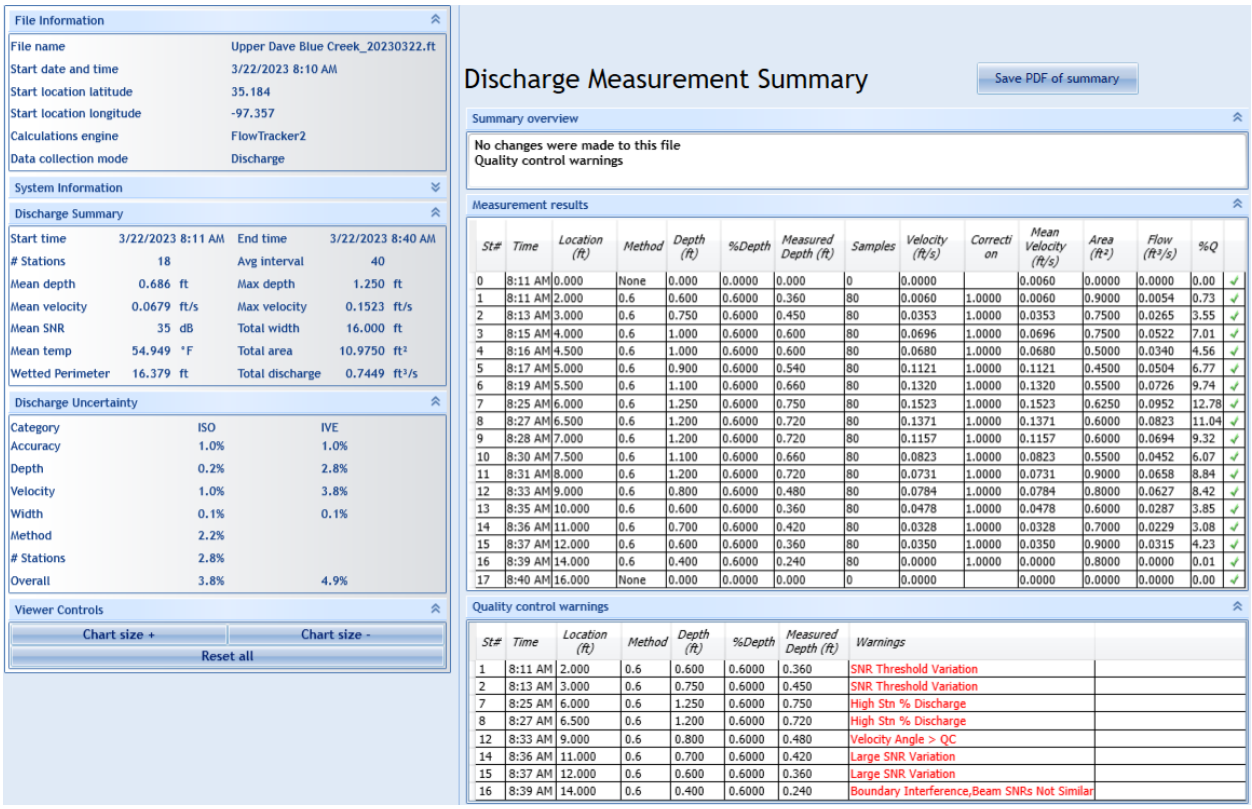
## Measurement results

| 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 | 1:28 PM | 0.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | 0.1458 | 0.0000 | 0.0000 | 0.00 | ✓ |
| 1 | 1:29 PM | 1.000 | 0.6 | 0.800 | 0.6000 | 0.480 | 80 | 0.1458 | 1.0000 | 0.1458 | 0.8000 | 0.1166 | 5.33 | ✓ |
| 2 | 1:30 PM | 2.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1460 | 1.0000 | 0.1460 | 1.0000 | 0.1460 | 6.67 | ✓ |
| 3 | 1:31 PM | 3.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1079 | 1.0000 | 0.1079 | 1.0000 | 0.1079 | 4.93 | ✓ |
| 4 | 1:33 PM | 4.000 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | 0.0704 | 1.0000 | 0.0704 | 1.1000 | 0.0774 | 3.54 | ✓ |
| 5 | 1:34 PM | 5.000 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | 0.0962 | 1.0000 | 0.0962 | 1.1000 | 0.1059 | 4.83 | ✓ |
| 6 | 1:35 PM | 6.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1140 | 1.0000 | 0.1140 | 1.0000 | 0.1140 | 5.21 | ✓ |
| 7 | 1:36 PM | 7.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1752 | 1.0000 | 0.1752 | 1.0000 | 0.1752 | 8.00 | ✓ |
| 8 | 1:37 PM | 8.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1341 | 1.0000 | 0.1341 | 1.0000 | 0.1341 | 6.13 | ✓ |
| 9 | 1:38 PM | 9.000 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | 0.1533 | 1.0000 | 0.1533 | 1.1000 | 0.1686 | 7.70 | ✓ |
| 10 | 1:39 PM | 10.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1585 | 1.0000 | 0.1585 | 1.0000 | 0.1585 | 7.24 | ✓ |
| 11 | 1:41 PM | 11.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1700 | 1.0000 | 0.1700 | 1.0000 | 0.1700 | 7.77 | ✓ |
| 12 | 1:42 PM | 12.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1022 | 1.0000 | 0.1022 | 1.0000 | 0.1022 | 4.67 | ✓ |
| 13 | 1:43 PM | 13.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1873 | 1.0000 | 0.1873 | 1.0000 | 0.1873 | 8.55 | ✓ |
| 14 | 1:44 PM | 14.000 | 0.6 | 0.900 | 0.6000 | 0.540 | 80 | 0.1640 | 1.0000 | 0.1640 | 0.9000 | 0.1476 | 6.74 | ✓ |
| 15 | 1:45 PM | 15.000 | 0.6 | 0.800 | 0.6000 | 0.480 | 80 | 0.1115 | 1.0000 | 0.1115 | 0.8000 | 0.0892 | 4.07 | ✓ |
| 16 | 1:46 PM | 16.000 | 0.6 | 0.800 | 0.6000 | 0.480 | 80 | 0.0992 | 1.0000 | 0.0992 | 0.8000 | 0.0794 | 3.63 | ✓ |
| 17 | 1:47 PM | 17.000 | 0.6 | 0.700 | 0.6000 | 0.420 | 80 | 0.0792 | 1.0000 | 0.0792 | 0.7000 | 0.0554 | 2.53 | ✓ |
| 18 | 1:48 PM | 18.000 | 0.6 | 0.600 | 0.6000 | 0.360 | 80 | 0.0405 | 1.0000 | 0.0405 | 0.6000 | 0.0243 | 1.11 | ✓ |
| 19 | 1:49 PM | 19.000 | 0.6 | 0.600 | 0.6000 | 0.360 | 80 | 0.0501 | 1.0000 | 0.0501 | 0.6000 | 0.0301 | 1.37 | ✓ |
| 20 | 1:50 PM | 20.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | 0.0501 | 0.0000 | 0.0000 | 0.00 | ✓ |

## Quality control warnings

| St# | Time | Location (ft) | Method | Depth (ft) | %Depth | Measured Depth (ft) | Warnings |
|---|---|---|---|---|---|---|---|
| 5 | 1:34 PM | 5.000 | 0.6 | 1.100 | 0.6000 | 0.660 | Velocity Angle > QC |
| 6 | 1:35 PM | 6.000 | 0.6 | 1.000 | 0.6000 | 0.600 | Velocity Angle > QC |
| 7 | 1:36 PM | 7.000 | 0.6 | 1.000 | 0.6000 | 0.600 | Velocity Angle > QC |
| 18 | 1:48 PM | 18.000 | 0.6 | 0.600 | 0.6000 | 0.360 | Large SNR Variation |

Figure 5 Discharge Measurement Summary TG-1



## Discharge Measurement Summary

Save PDF of summary

**File Information**

| | |
|---|---|
| File name | Upper Dave Blue Creek_20230322.ft |
| Start date and time | 3/22/2023 8:10 AM |
| Start location latitude | 35.184 |
| Start location longitude | -97.357 |
| Calculations engine | FlowTracker2 |
| Data collection mode | Discharge |

**System Information**

**Discharge Summary**

| | | | |
|---|---|---|---|
| Start time | 3/22/2023 8:11 AM | End time | 3/22/2023 8:40 AM |
| # Stations | 18 | Avg interval | 40 |
| Mean depth | 0.686 ft | Max depth | 1.250 ft |
| Mean velocity | 0.0679 ft/s | Max velocity | 0.1523 ft/s |
| Mean SNR | 35 dB | Total width | 16.000 ft |
| Mean temp | 54.949 °F | Total area | 10.9750 ft² |
| Wetted Perimeter | 16.379 ft | Total discharge | 0.7449 ft³/s |

**Discharge Uncertainty**

| Category | ISO | IVE |
|---|---|---|
| Accuracy | 1.0% | 1.0% |
| Depth | 0.2% | 2.8% |
| Velocity | 1.0% | 3.8% |
| Width | 0.1% | 0.1% |
| Method | 2.2% | |
| # Stations | 2.8% | |
| Overall | 3.8% | 4.9% |

**Viewer Controls**

Chart size + | Chart size - | Reset all

**Summary overview**

No changes were made to this file
Quality control warnings

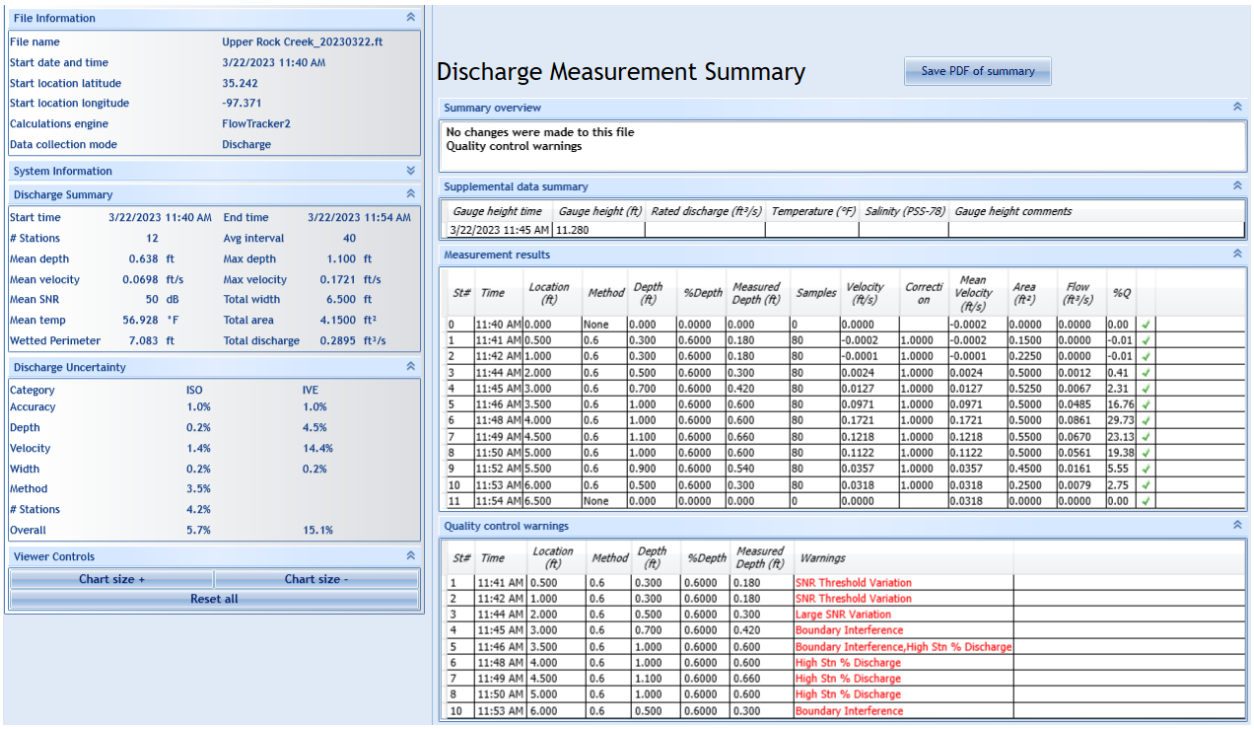
**Measurement results**

| 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 | 8:11 AM | 0.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | 0.0060 | 0.0000 | 0.0000 | 0.00 | ✓ |
| 1 | 8:11 AM | 2.000 | 0.6 | 0.600 | 0.6000 | 0.360 | 80 | 0.0060 | 1.0000 | 0.0060 | 0.9000 | 0.0054 | 0.73 | ✓ |
| 2 | 8:13 AM | 3.000 | 0.6 | 0.750 | 0.6000 | 0.450 | 80 | 0.0353 | 1.0000 | 0.0353 | 0.7500 | 0.0265 | 3.55 | ✓ |
| 3 | 8:15 AM | 4.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.0696 | 1.0000 | 0.0696 | 0.7500 | 0.0522 | 7.01 | ✓ |
| 4 | 8:16 AM | 4.500 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.0680 | 1.0000 | 0.0680 | 0.5000 | 0.0340 | 4.56 | ✓ |
| 5 | 8:17 AM | 5.000 | 0.6 | 0.900 | 0.6000 | 0.540 | 80 | 0.1121 | 1.0000 | 0.1121 | 0.4500 | 0.0504 | 6.77 | ✓ |
| 6 | 8:19 AM | 5.500 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | 0.1320 | 1.0000 | 0.1320 | 0.5500 | 0.0726 | 9.74 | ✓ |
| 7 | 8:25 AM | 6.000 | 0.6 | 1.250 | 0.6000 | 0.750 | 80 | 0.1523 | 1.0000 | 0.1523 | 0.6250 | 0.0952 | 12.78 | ✓ |
| 8 | 8:27 AM | 6.500 | 0.6 | 1.200 | 0.6000 | 0.720 | 80 | 0.1371 | 1.0000 | 0.1371 | 0.6000 | 0.0823 | 11.04 | ✓ |
| 9 | 8:28 AM | 7.000 | 0.6 | 1.200 | 0.6000 | 0.720 | 80 | 0.1157 | 1.0000 | 0.1157 | 0.6000 | 0.0694 | 9.32 | ✓ |
| 10 | 8:30 AM | 7.500 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | 0.0823 | 1.0000 | 0.0823 | 0.5500 | 0.0452 | 6.07 | ✓ |
| 11 | 8:31 AM | 8.000 | 0.6 | 1.200 | 0.6000 | 0.720 | 80 | 0.0731 | 1.0000 | 0.0731 | 0.9000 | 0.0658 | 8.84 | ✓ |
| 12 | 8:33 AM | 9.000 | 0.6 | 0.800 | 0.6000 | 0.480 | 80 | 0.0784 | 1.0000 | 0.0784 | 0.8000 | 0.0627 | 8.42 | ✓ |
| 13 | 8:35 AM | 10.000 | 0.6 | 0.600 | 0.6000 | 0.360 | 80 | 0.0478 | 1.0000 | 0.0478 | 0.6000 | 0.0287 | 3.85 | ✓ |
| 14 | 8:36 AM | 11.000 | 0.6 | 0.700 | 0.6000 | 0.420 | 80 | 0.0328 | 1.0000 | 0.0328 | 0.7000 | 0.0229 | 3.08 | ✓ |
| 15 | 8:37 AM | 12.000 | 0.6 | 0.600 | 0.6000 | 0.360 | 80 | 0.0350 | 1.0000 | 0.0350 | 0.9000 | 0.0315 | 4.23 | ✓ |
| 16 | 8:39 AM | 14.000 | 0.6 | 0.400 | 0.6000 | 0.240 | 80 | 0.0000 | 1.0000 | 0.0000 | 0.8000 | 0.0000 | 0.01 | ✓ |
| 17 | 8:40 AM | 16.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.00 | ✓ |

**Quality control warnings**

| St# | Time | Location (ft) | Method | Depth (ft) | %Depth | Measured Depth (ft) | Warnings |
|---|---|---|---|---|---|---|---|
| 1 | 8:11 AM | 2.000 | 0.6 | 0.600 | 0.6000 | 0.360 | SNR Threshold Variation |
| 2 | 8:13 AM | 3.000 | 0.6 | 0.750 | 0.6000 | 0.450 | SNR Threshold Variation |
| 7 | 8:25 AM | 6.000 | 0.6 | 1.250 | 0.6000 | 0.750 | High Stn % Discharge |
| 8 | 8:27 AM | 6.500 | 0.6 | 1.200 | 0.6000 | 0.720 | High Stn % Discharge |
| 12 | 8:33 AM | 9.000 | 0.6 | 0.800 | 0.6000 | 0.480 | Velocity Angle > QC |
| 14 | 8:36 AM | 11.000 | 0.6 | 0.700 | 0.6000 | 0.420 | Large SNR Variation |
| 15 | 8:37 AM | 12.000 | 0.6 | 0.600 | 0.6000 | 0.360 | Large SNR Variation |
| 16 | 8:39 AM | 14.000 | 0.6 | 0.400 | 0.6000 | 0.240 | Boundary Interference,Beam SNRs Not Similar |

Figure 6 Discharge Measurement Summary UDB-1



File Information

| | |
|---|---|
| File name | Upper Rock Creek_20230322.ft |
| Start date and time | 3/22/2023 11:40 AM |
| Start location latitude | 35.242 |
| Start location longitude | -97.371 |
| Calculations engine | FlowTracker2 |
| Data collection mode | Discharge |

System Information

Discharge Summary

| | | | |
|---|---|---|---|
| Start time | 3/22/2023 11:40 AM | End time | 3/22/2023 11:54 AM |
| # Stations | 12 | Avg interval | 40 |
| Mean depth | 0.638 ft | Max depth | 1.100 ft |
| Mean velocity | 0.0698 ft/s | Max velocity | 0.1721 ft/s |
| Mean SNR | 50 dB | Total width | 6.500 ft |
| Mean temp | 56.928 °F | Total area | 4.1500 ft² |
| Wetted Perimeter | 7.083 ft | Total discharge | 0.2895 ft³/s |

Discharge Uncertainty

| Category | ISO | IVE |
|---|---|---|
| Accuracy | 1.0% | 1.0% |
| Depth | 0.2% | 4.5% |
| Velocity | 1.4% | 14.4% |
| Width | 0.2% | 0.2% |
| Method | 3.5% | |
| # Stations | 4.2% | |
| Overall | 5.7% | 15.1% |

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 |
|---|---|---|---|---|---|
| 3/22/2023 11:45 AM | 11.280 | | | | |

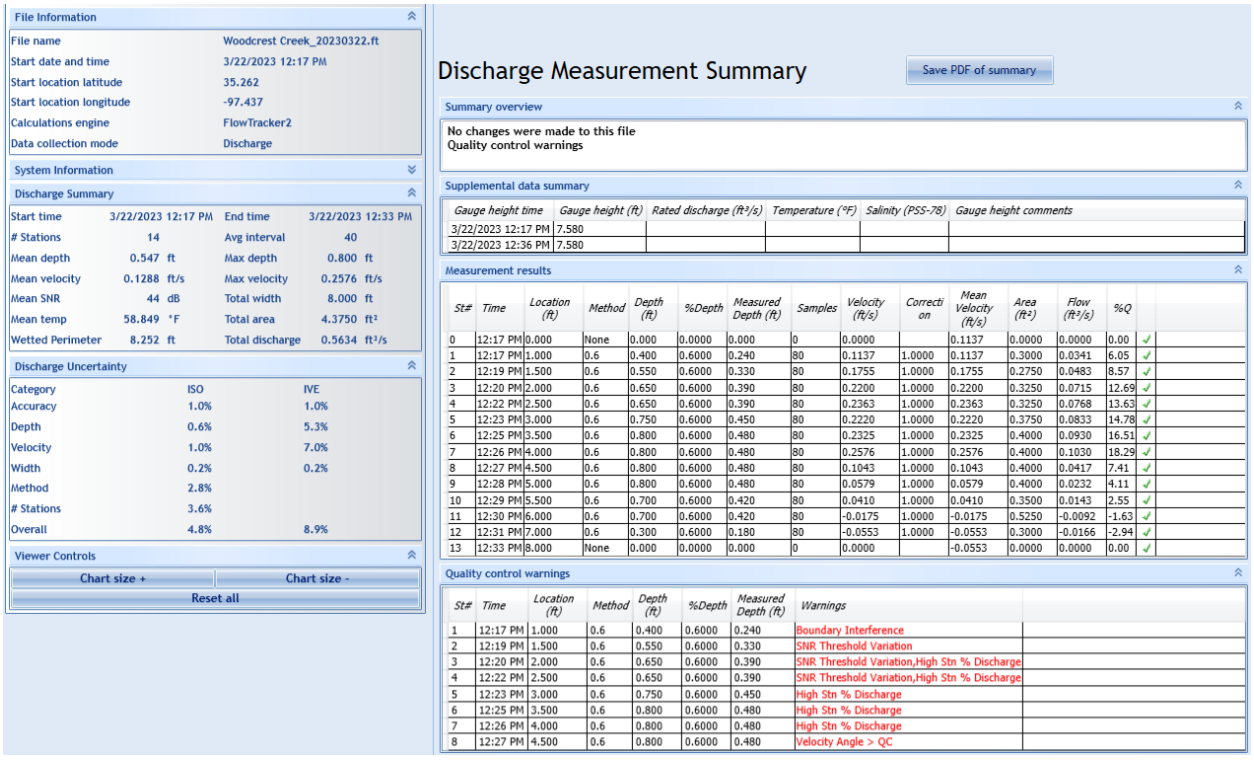
Measurement results

| 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 | 11:40 AM | 0.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | -0.0002 | 0.0000 | 0.0000 | 0.00 | ✓ |
| 1 | 11:41 AM | 0.500 | 0.6 | 0.300 | 0.6000 | 0.180 | 80 | -0.0002 | 1.0000 | -0.0002 | 0.1500 | 0.0000 | -0.01 | ✓ |
| 2 | 11:42 AM | 1.000 | 0.6 | 0.300 | 0.6000 | 0.180 | 80 | -0.0001 | 1.0000 | -0.0001 | 0.2250 | 0.0000 | -0.01 | ✓ |
| 3 | 11:44 AM | 2.000 | 0.6 | 0.500 | 0.6000 | 0.300 | 80 | 0.0024 | 1.0000 | 0.0024 | 0.5000 | 0.0012 | 0.41 | ✓ |
| 4 | 11:45 AM | 3.000 | 0.6 | 0.700 | 0.6000 | 0.420 | 80 | 0.0127 | 1.0000 | 0.0127 | 0.5250 | 0.0067 | 2.31 | ✓ |
| 5 | 11:46 AM | 3.500 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.0971 | 1.0000 | 0.0971 | 0.5000 | 0.0485 | 16.76 | ✓ |
| 6 | 11:48 AM | 4.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1721 | 1.0000 | 0.1721 | 0.5000 | 0.0861 | 29.73 | ✓ |
| 7 | 11:49 AM | 4.500 | 0.6 | 1.100 | 0.6000 | 0.660 | 80 | 0.1218 | 1.0000 | 0.1218 | 0.5500 | 0.0670 | 23.13 | ✓ |
| 8 | 11:50 AM | 5.000 | 0.6 | 1.000 | 0.6000 | 0.600 | 80 | 0.1122 | 1.0000 | 0.1122 | 0.5000 | 0.0561 | 19.38 | ✓ |
| 9 | 11:52 AM | 5.500 | 0.6 | 0.900 | 0.6000 | 0.540 | 80 | 0.0357 | 1.0000 | 0.0357 | 0.4500 | 0.0161 | 5.55 | ✓ |
| 10 | 11:53 AM | 6.000 | 0.6 | 0.500 | 0.6000 | 0.300 | 80 | 0.0318 | 1.0000 | 0.0318 | 0.2500 | 0.0079 | 2.75 | ✓ |
| 11 | 11:54 AM | 6.500 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | 0.0318 | 0.0000 | 0.0000 | 0.00 | ✓ |

Quality control warnings

| St# | Time | Location (ft) | Method | Depth (ft) | %Depth | Measured Depth (ft) | Warnings |
|---|---|---|---|---|---|---|---|
| 1 | 11:41 AM | 0.500 | 0.6 | 0.300 | 0.6000 | 0.180 | SNR Threshold Variation |
| 2 | 11:42 AM | 1.000 | 0.6 | 0.300 | 0.6000 | 0.180 | SNR Threshold Variation |
| 3 | 11:44 AM | 2.000 | 0.6 | 0.500 | 0.6000 | 0.300 | Large SNR Variation |
| 4 | 11:45 AM | 3.000 | 0.6 | 0.700 | 0.6000 | 0.420 | Boundary Interference |
| 5 | 11:46 AM | 3.500 | 0.6 | 1.000 | 0.6000 | 0.600 | Boundary Interference,High Stn % Discharge |
| 6 | 11:48 AM | 4.000 | 0.6 | 1.000 | 0.6000 | 0.600 | High Stn % Discharge |
| 7 | 11:49 AM | 4.500 | 0.6 | 1.100 | 0.6000 | 0.660 | High Stn % Discharge |
| 8 | 11:50 AM | 5.000 | 0.6 | 1.000 | 0.6000 | 0.600 | High Stn % Discharge |
| 10 | 11:53 AM | 6.000 | 0.6 | 0.500 | 0.6000 | 0.300 | Boundary Interference |

Figure 7 Discharge Measurement Summary URC-2



File Information

| | |
|---|---|
| File name | Woodcrest Creek_20230322.ft |
| Start date and time | 3/22/2023 12:17 PM |
| Start location latitude | 35.262 |
| Start location longitude | -97.437 |
| Calculations engine | FlowTracker2 |
| Data collection mode | Discharge |

System Information

Discharge Summary

| | | | |
|---|---|---|---|
| Start time | 3/22/2023 12:17 PM | End time | 3/22/2023 12:33 PM |
| # Stations | 14 | Avg interval | 40 |
| Mean depth | 0.547 ft | Max depth | 0.800 ft |
| Mean velocity | 0.1288 ft/s | Max velocity | 0.2576 ft/s |
| Mean SNR | 44 dB | Total width | 8.000 ft |
| Mean temp | 58.849 °F | Total area | 4.3750 ft² |
| Wetted Perimeter | 8.252 ft | Total discharge | 0.5634 ft³/s |

Discharge Uncertainty

| Category | ISO | IVE |
|---|---|---|
| Accuracy | 1.0% | 1.0% |
| Depth | 0.6% | 5.3% |
| Velocity | 1.0% | 7.0% |
| Width | 0.2% | 0.2% |
| Method | 2.8% | |
| # Stations | 3.6% | |
| Overall | 4.8% | 8.9% |

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 |
|---|---|---|---|---|---|
| 3/22/2023 12:17 PM | 7.580 | | | | |
| 3/22/2023 12:36 PM | 7.580 | | | | |

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 | 12:17 PM | 0.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | 0.1137 | 0.0000 | 0.0000 | 0.00 | ✓ |
| 1 | 12:17 PM | 1.000 | 0.6 | 0.400 | 0.6000 | 0.240 | 80 | 0.1137 | 1.0000 | 0.1137 | 0.3000 | 0.0341 | 6.05 | ✓ |
| 2 | 12:19 PM | 1.500 | 0.6 | 0.550 | 0.6000 | 0.330 | 80 | 0.1755 | 1.0000 | 0.1755 | 0.2750 | 0.0483 | 8.57 | ✓ |
| 3 | 12:20 PM | 2.000 | 0.6 | 0.650 | 0.6000 | 0.390 | 80 | 0.2200 | 1.0000 | 0.2200 | 0.3250 | 0.0715 | 12.69 | ✓ |
| 4 | 12:22 PM | 2.500 | 0.6 | 0.650 | 0.6000 | 0.390 | 80 | 0.2363 | 1.0000 | 0.2363 | 0.3250 | 0.0768 | 13.63 | ✓ |
| 5 | 12:23 PM | 3.000 | 0.6 | 0.750 | 0.6000 | 0.450 | 80 | 0.2220 | 1.0000 | 0.2220 | 0.3750 | 0.0833 | 14.78 | ✓ |
| 6 | 12:25 PM | 3.500 | 0.6 | 0.800 | 0.6000 | 0.480 | 80 | 0.2325 | 1.0000 | 0.2325 | 0.4000 | 0.0930 | 16.51 | ✓ |
| 7 | 12:26 PM | 4.000 | 0.6 | 0.800 | 0.6000 | 0.480 | 80 | 0.2576 | 1.0000 | 0.2576 | 0.4000 | 0.1030 | 18.29 | ✓ |
| 8 | 12:27 PM | 4.500 | 0.6 | 0.800 | 0.6000 | 0.480 | 80 | 0.1043 | 1.0000 | 0.1043 | 0.4000 | 0.0417 | 7.41 | ✓ |
| 9 | 12:28 PM | 5.000 | 0.6 | 0.800 | 0.6000 | 0.480 | 80 | 0.0579 | 1.0000 | 0.0579 | 0.4000 | 0.0232 | 4.11 | ✓ |
| 10 | 12:29 PM | 5.500 | 0.6 | 0.700 | 0.6000 | 0.420 | 80 | 0.0410 | 1.0000 | 0.0410 | 0.3500 | 0.0143 | 2.55 | ✓ |
| 11 | 12:30 PM | 6.000 | 0.6 | 0.700 | 0.6000 | 0.420 | 80 | -0.0175 | 1.0000 | -0.0175 | 0.5250 | -0.0092 | -1.63 | ✓ |
| 12 | 12:31 PM | 7.000 | 0.6 | 0.300 | 0.6000 | 0.180 | 80 | -0.0553 | 1.0000 | -0.0553 | 0.3000 | -0.0166 | -2.94 | ✓ |
| 13 | 12:33 PM | 8.000 | None | 0.000 | 0.0000 | 0.000 | 0 | 0.0000 | | -0.0553 | 0.0000 | 0.0000 | 0.00 | ✓ |

Quality control warnings

| St# | Time | Location (ft) | Method | Depth (ft) | %Depth | Measured Depth (ft) | Warnings |
|---|---|---|---|---|---|---|---|
| 1 | 12:17 PM | 1.000 | 0.6 | 0.400 | 0.6000 | 0.240 | Boundary Interference |
| 2 | 12:19 PM | 1.500 | 0.6 | 0.550 | 0.6000 | 0.330 | SNR Threshold Variation |
| 3 | 12:20 PM | 2.000 | 0.6 | 0.650 | 0.6000 | 0.390 | SNR Threshold Variation,High Stn % Discharge |
| 4 | 12:22 PM | 2.500 | 0.6 | 0.650 | 0.6000 | 0.390 | SNR Threshold Variation,High Stn % Discharge |
| 5 | 12:23 PM | 3.000 | 0.6 | 0.750 | 0.6000 | 0.450 | High Stn % Discharge |
| 6 | 12:25 PM | 3.500 | 0.6 | 0.800 | 0.6000 | 0.480 | High Stn % Discharge |
| 7 | 12:26 PM | 4.000 | 0.6 | 0.800 | 0.6000 | 0.480 | High Stn % Discharge |
| 8 | 12:27 PM | 4.500 | 0.6 | 0.800 | 0.6000 | 0.480 | Velocity Angle > QC |

Figure 8 Discharge Measurement Summary WC-1

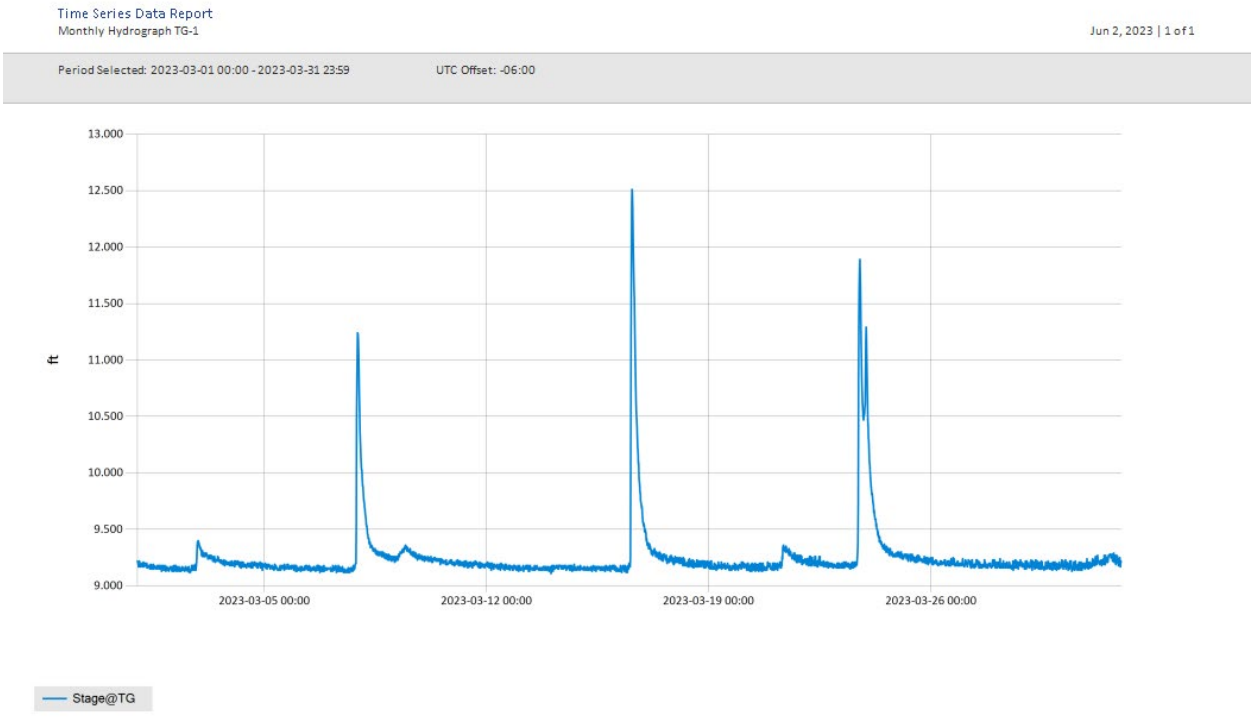



Figure 9 Monthly Hydrograph TG-1

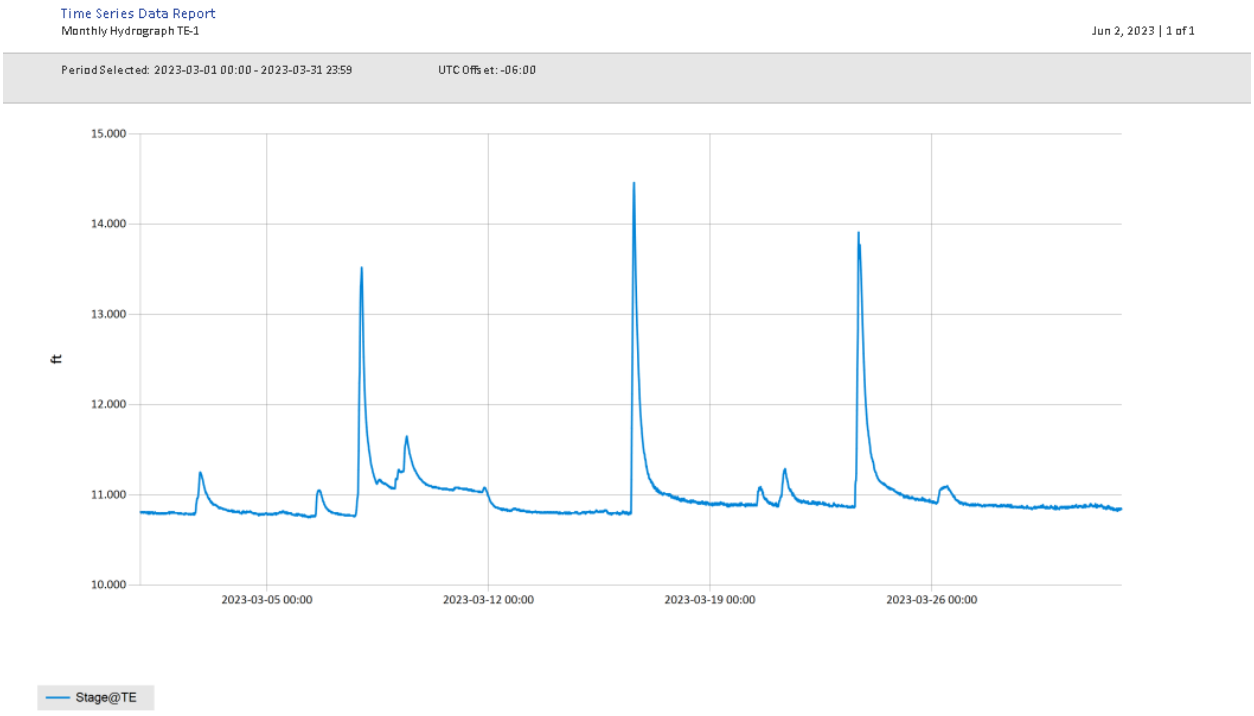



Figure 10 Monthly Hydrograph TE-1

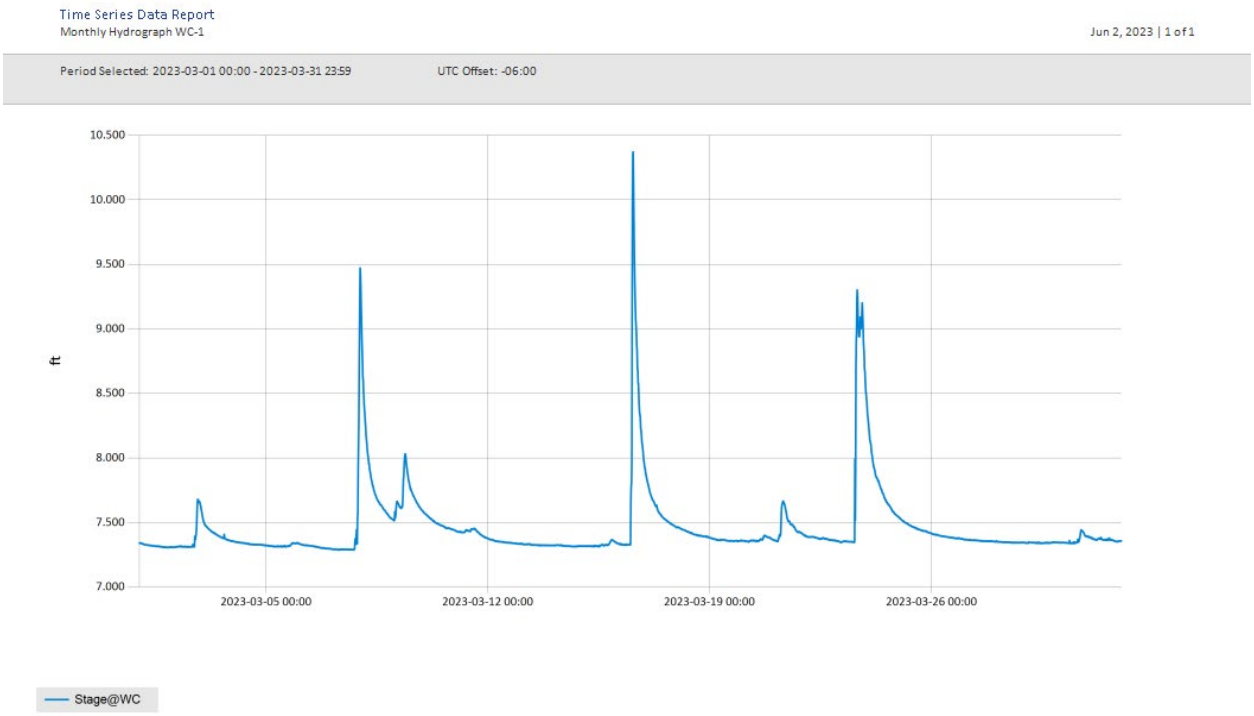



Figure 11 Monthly Hydrograph WC-1

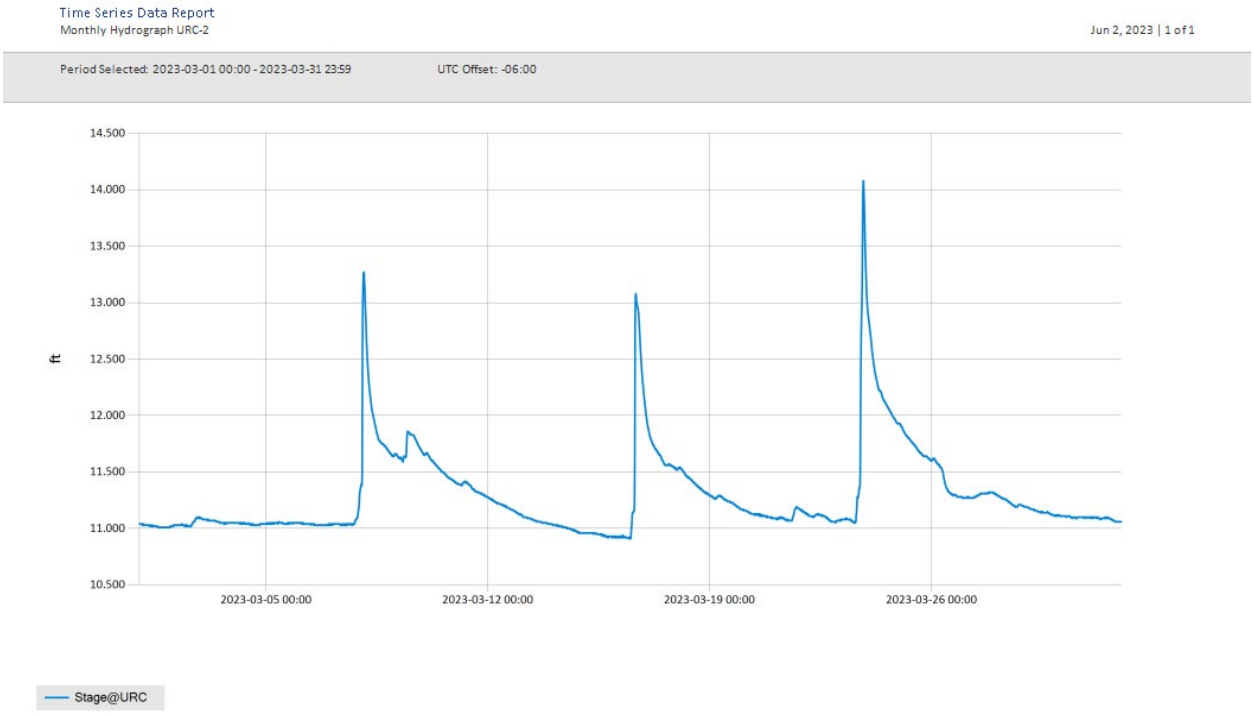



Figure 12 Monthly Hydrograph URC-2

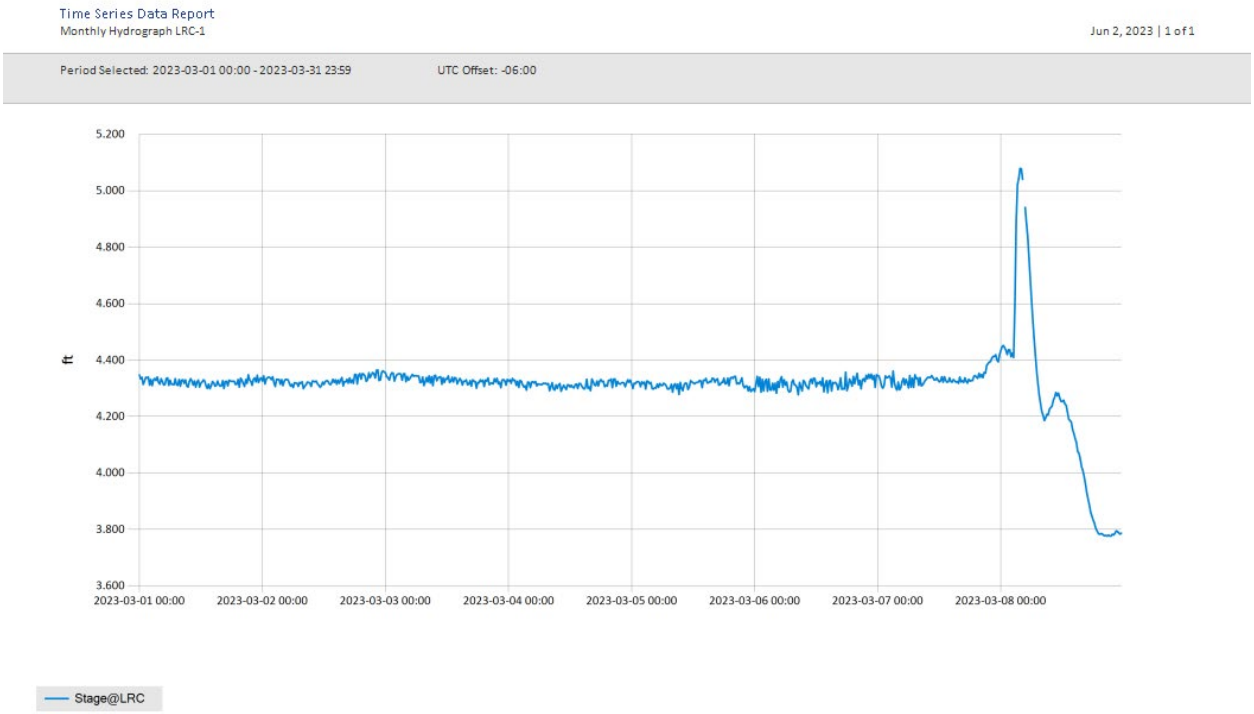



Figure 13 Monthly Hydrograph LRC-1

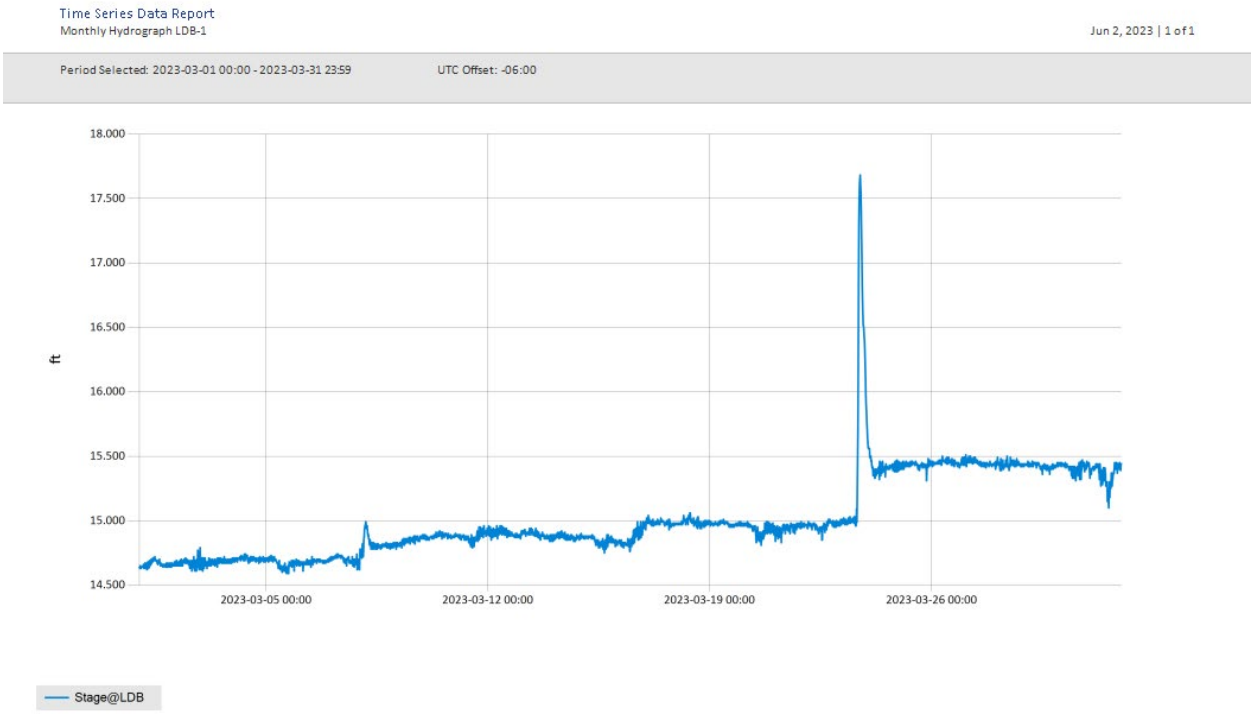



Figure 14 Monthly Hydrograph LDB-1

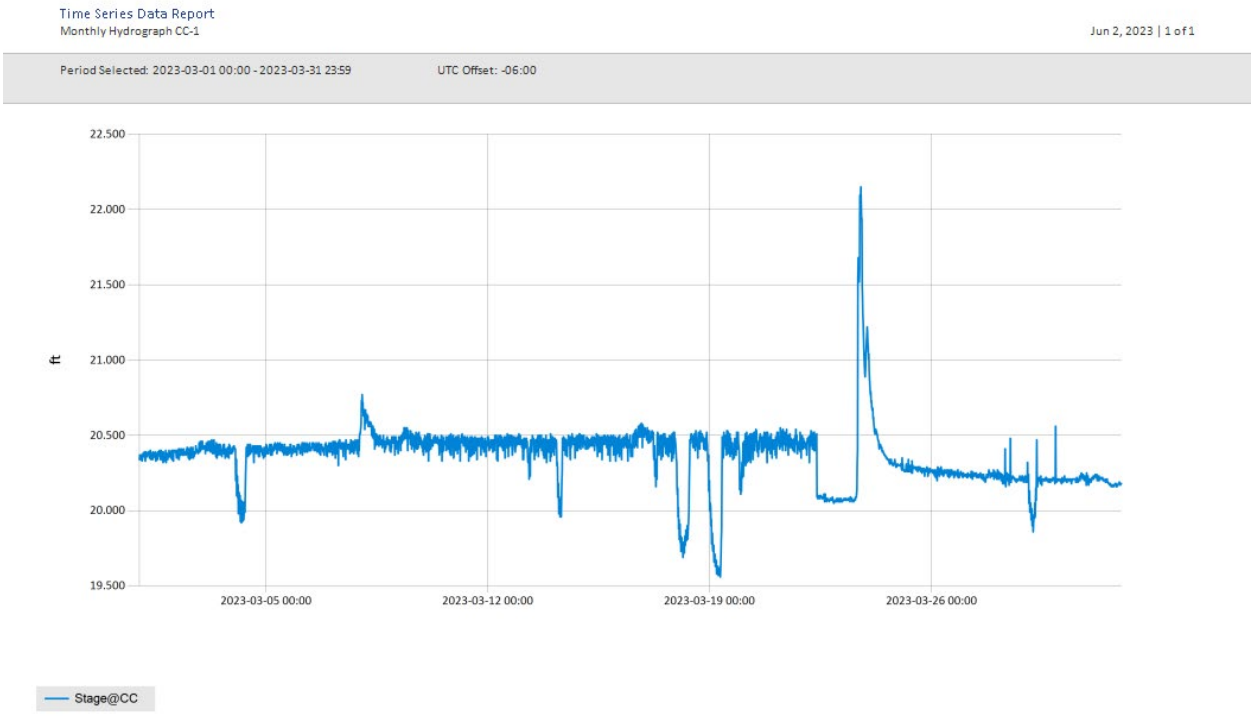



Figure 15 Monthly Hydrograph CC-1

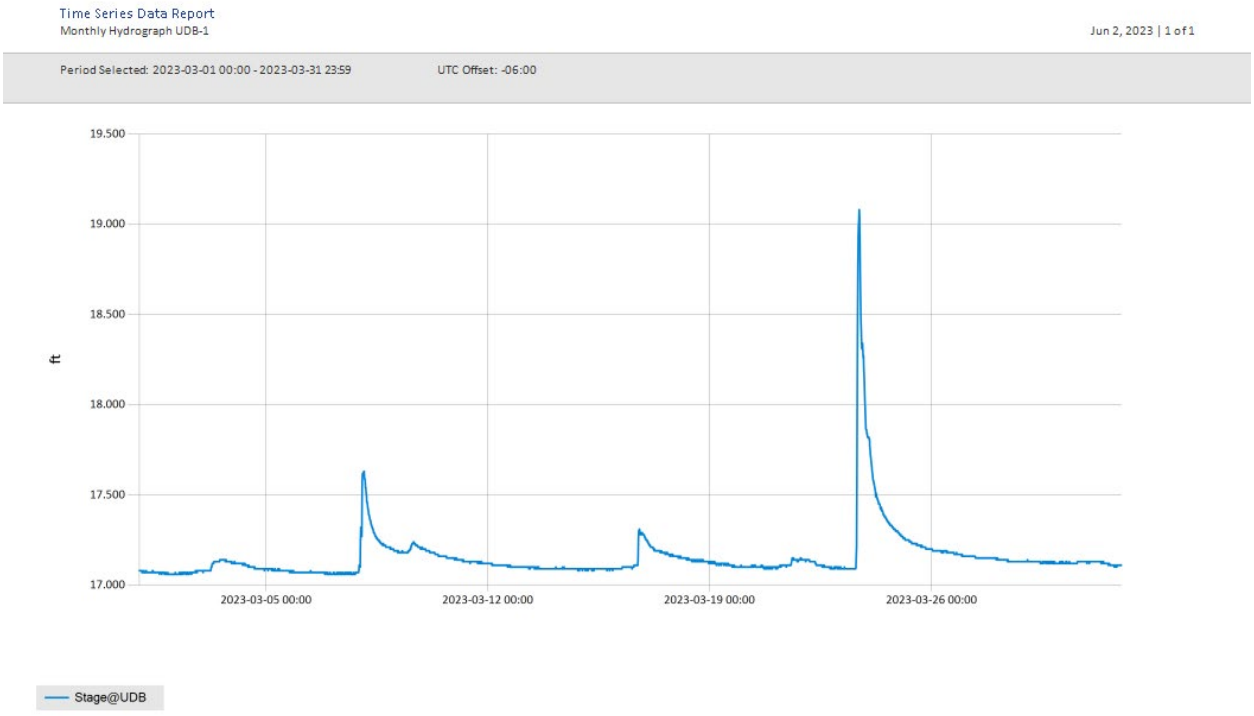



Figure 16 Monthly Hydrograph UDB-1

MESONET CLIMATOLOGICAL DATA SUMMARY — March 2023 — 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 | (mph) MAX | SOLAR ($MJ/m^2$) | 4" SOIL TEMPERATURES SOD | BARE | MAX | MIN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 64 | 47 | 55.6 | 31.7 | 10 | 0 | 62 | 30 | 41 | 0.00 | 28.53 | 29.77 | NE | 8.9 | 23.6 | 12.65 | 49.4 | 49.2 | 53 | 46 |
| 2 | 54 | 42 | 47.1 | 37.6 | 17 | 0 | 89 | 56 | 70 | 0.19 | 28.38 | 29.62 | NE | 8.8 | 28.7 | 4.83 | 48.4 | 47.0 | 50 | 44 |
| 3 | 61 | 40 | 48.6 | 30.2 | 14 | 0 | 85 | 20 | 53 | 0.00 | 28.43 | 29.67 | NNW | 11.4 | 28.4 | 19.07 | 48.4 | 47.8 | 53 | 44 |
| 4 | 69 | 45 | 55.9 | 37.6 | 8 | 0 | 76 | 34 | 51 | 0.00 | 28.65 | 29.89 | SSE | 7.0 | 18.4 | 18.94 | 48.8 | 49.3 | 58 | 42 |
| 5 | 78 | 49 | 63.5 | 44.9 | 2 | 0 | 85 | 28 | 55 | 0.00 | 28.65 | 29.90 | S | 12.5 | 33.9 | 17.54 | 51.2 | 52.8 | 58 | 48 |
| 6 | 69 | 51 | 59.8 | 45.1 | 5 | 0 | 81 | 40 | 59 | 0.00 | 28.69 | 29.93 | S | 7.0 | 26.5 | 12.05 | 52.8 | 54.4 | 59 | 51 |
| 7 | 53 | 42 | 47.8 | 39.9 | 18 | 0 | 96 | 63 | 75 | 0.73 | 28.82 | 30.06 | NE | 9.6 | 20.6 | 3.49 | 51.1 | 50.5 | 52 | 48 |
| 8 | 52 | 43 | 47.8 | 42.3 | 18 | 0 | 93 | 74 | 81 | 0.00 | 28.89 | 30.15 | NNW | 8.8 | 19.3 | 8.11 | 50.0 | 50.0 | 54 | 47 |
| 9 | 54 | 44 | 49.2 | 46.0 | 16 | 0 | 98 | 73 | 89 | 0.27 | 28.84 | 30.10 | N | 7.6 | 23.2 | 4.34 | 50.6 | 50.9 | 53 | 50 |
| 10 | 58 | 35 | 47.1 | 36.8 | 19 | 0 | 95 | 42 | 70 | 0.00 | 28.85 | 30.10 | SE | 7.0 | 16.7 | 18.51 | 49.9 | 50.5 | 57 | 44 |
| 11 | 80 | 46 | 60.8 | 49.8 | 2 | 0 | 92 | 34 | 70 | 0.00 | 28.44 | 29.68 | S | 15.9 | 30.3 | 16.69 | 52.7 | 54.8 | 61 | 50 |
| 12 | 50 | 37 | 44.0 | 34.8 | 21 | 0 | 87 | 50 | 71 | 0.00 | 28.77 | 30.02 | N | 10.9 | 24.5 | 6.87 | 51.1 | 48.9 | 53 | 45 |
| 13 | 44 | 32 | 38.3 | 21.8 | 27 | 0 | 74 | 36 | 52 | 0.00 | 29.02 | 30.28 | NNE | 8.1 | 18.5 | 8.29 | 48.0 | 42.9 | 46 | 40 |
| 14 | 55 | 31 | 42.7 | 28.5 | 22 | 0 | 83 | 42 | 58 | 0.00 | 29.02 | 30.27 | SSE | 6.1 | 16.4 | 10.70 | 47.4 | 43.3 | 48 | 39 |
| 15 | 67 | 41 | 53.3 | 37.9 | 11 | 0 | 77 | 41 | 57 | 0.00 | 28.76 | 30.01 | SSE | 14.0 | 35.8 | 15.28 | 48.5 | 46.4 | 53 | 41 |
| 16 | 67 | 37 | 51.3 | 43.5 | 13 | 0 | 94 | 54 | 75 | 0.97 | 28.57 | 29.81 | S | 19.3 | 42.9 | 4.08 | 50.5 | 50.5 | 55 | 46 |
| 17 | 50 | 31 | 39.8 | 22.4 | 24 | 0 | 67 | 33 | 51 | 0.00 | 28.95 | 30.20 | N | 11.2 | 39.3 | 21.49 | 47.0 | 47.1 | 53 | 42 |
| 18 | 46 | 29 | 36.8 | 17.1 | 28 | 0 | 69 | 28 | 46 | 0.00 | 29.12 | 30.38 | NNE | 11.7 | 28.9 | 21.85 | 45.6 | 44.5 | 50 | 40 |
| 19 | 48 | 20 | 36.0 | 13.6 | 31 | 0 | 71 | 23 | 42 | 0.00 | 29.17 | 30.43 | NNE | 5.8 | 23.0 | 22.40 | 44.6 | 42.5 | 50 | 37 |
| 20 | 56 | 35 | 45.3 | 27.2 | 20 | 0 | 61 | 37 | 50 | 0.00 | 28.84 | 30.09 | S | 14.3 | 37.0 | 11.96 | 45.2 | 42.4 | 47 | 38 |
| 21 | 71 | 44 | 55.3 | 48.8 | 7 | 0 | 95 | 55 | 80 | 0.19 | 28.64 | 29.88 | S | 13.8 | 28.3 | 9.65 | 47.4 | 47.8 | 54 | 43 |
| 22 | 80 | 62 | 70.0 | 60.1 | 0 | 6 | 92 | 46 | 73 | 0.00 | 28.62 | 29.86 | S | 12.9 | 28.7 | 13.00 | 53.1 | 57.4 | 62 | 53 |
| 23 | 69 | 47 | 59.4 | 54.8 | 7 | 0 | 95 | 65 | 85 | 1.00 | 28.64 | 29.88 | S | 10.4 | 23.2 | 3.87 | 55.1 | 58.1 | 59 | 55 |
| 24 | 53 | 40 | 46.6 | 43.9 | 19 | 0 | 98 | 76 | 91 | 0.02 | 28.51 | 29.75 | NNE | 8.5 | 23.2 | 6.41 | 52.3 | 52.9 | 55 | 51 |
| 25 | 67 | 36 | 50.9 | 39.0 | 14 | 0 | 99 | 27 | 69 | 0.01 | 28.57 | 29.81 | SSW | 6.1 | 30.7 | 21.56 | 51.2 | 53.3 | 61 | 46 |
| 26 | 61 | 39 | 48.4 | 32.7 | 15 | 0 | 80 | 30 | 56 | 0.00 | 28.73 | 29.98 | N | 11.5 | 24.4 | 21.53 | 51.3 | 51.6 | 57 | 46 |
| 27 | 60 | 34 | 46.5 | 31.8 | 18 | 0 | 85 | 30 | 59 | 0.00 | 28.88 | 30.13 | NE | 8.5 | 27.8 | 18.57 | 50.6 | 48.8 | 56 | 42 |
| 28 | 55 | 37 | 44.9 | 30.7 | 19 | 0 | 83 | 35 | 59 | 0.00 | 29.09 | 30.35 | N | 10.2 | 31.0 | 20.24 | 50.3 | 48.3 | 54 | 43 |
| 29 | 66 | 33 | 52.1 | 35.5 | 15 | 0 | 87 | 32 | 56 | 0.00 | 28.89 | 30.14 | SSE | 7.7 | 24.3 | 20.93 | 50.3 | 49.1 | 56 | 42 |
| 30 | 69 | 52 | 59.6 | 54.9 | 5 | 0 | 97 | 71 | 85 | 0.03 | 28.63 | 29.87 | SSE | 12.2 | 30.8 | 6.30 | 52.6 | 53.5 | 57 | 49 |
| 31 | 77 | 57 | 69.5 | 39.6 | 0 | 2 | 86 | 10 | 44 | 0.00 | 28.50 | 29.74 | WSW | 19.3 | 53.1 | 22.47 | 56.2 | 59.0 | 62 | 53 |
| | 61 | 41 | 50.8 | 37.4 | <- Monthly Averages -> | | | | | | 28.74 | 29.99 | S | 10.5 | 53.1 | 13.67 | 50.0 | 49.9 | 55 | 45 |

Temperature - Highest: 80
Lowest: 20

Degree Days - Total HDD: 443
Total CDD: 8

Rainfall: Monthly Total: 3.41 in.
Greatest 24 Hr: 1.00 in.

Humidity - Highest: 99
Lowest: 10

Number of Days With:
Tmax ≥ 90: 0
Tmax ≤ 32: 0
Tmin ≤ 32: 5
Tmin ≤ 0: 0
Rainfall ≥ 0.01 inch: 9
Rainfall ≥ 0.10 inch: 6
Avg Wind Speed ≥ 10 mph: 16
Max Wind Speed ≥ 30 mph: 10



* Denotes incomplete record

Figure 17 March Mesonet Data