

Ozarks Environmental and Water Resources Institute (OEWRI)  
Missouri State University (MSU)

# Hydrological Monitoring of the Big Barren Creek Watershed, Mark Twain National Forest, Southeast Missouri Water Year 2021

## SUMMARY REPORT

**Prepared by:**

Marc R. Owen, M.S., Assistant Director, OEWRI  
Shoukat Ahmed, Graduate Assistant, OEWRI  
Elande' Engelbrecht, Graduate Assistant, OEWRI  
Robert T. Pavlowsky, Ph.D., Director, OEWRI

**Assisted in the field by:**

Matt Thies, Nick Bradley, Joe Nash, Hannah Adams, Grace Roman, Katy Reminga,  
Kayla Coonen, Triston Rice, Max Hillermann, Tyler Pursley, and Josh Hess

Ozark Environmental and Water Resources Institute  
Missouri State University  
Temple Hall 343  
901 South National Avenue  
Springfield, MO 65897

**Completed for:**

Kelly Whitsett, Forest Hydrologist and Cave and Karst Program Manager  
U.S. Forest Service  
Mark Twain National Forest  
401 Fairgrounds Road  
Rolla, MO 65401

**January 31, 2022**



[OEWRI EDR-21-002.7](#)

## TABLE OF CONTENTS

TABLE OF CONTENTS.....	2
LIST OF TABLES.....	2
LIST OF FIGURES.....	3
WATER YEAR 2021 SUMMARY.....	5
Rainfall.....	5
Discharge and Runoff .....	6
REFERENCES.....	7
TABLES.....	8
FIGURES.....	11
Upper North Prong Cedar Bluff Creek (0.14 km <sup>2</sup> ).....	14
Upper Cowards Hollow (0.42 km <sup>2</sup> ).....	16
Upper Wolf Pond (0.58 km <sup>2</sup> ).....	18
Upper-Upper Tributary (0.65 km <sup>2</sup> ).....	20
Tram Hollow (1.59 km <sup>2</sup> ) .....	22
Upper Barnes Hollow (2.50 km <sup>2</sup> ).....	24
Upper Big Barren (2.51 km <sup>2</sup> ) .....	26
Upper Tributary (4.19 km <sup>2</sup> ) .....	28
Wolf Pond (5.13 km <sup>2</sup> ) .....	30
Polecat Hollow (6.19 km <sup>2</sup> ).....	32
South Prong Cedar Bluff Creek (7.28 km <sup>2</sup> ).....	34
Fools Catch (7.82 km <sup>2</sup> ).....	36
Highway J (8.82 km <sup>2</sup> ).....	38
Middle Big Barren Creek (47.76 km <sup>2</sup> ).....	40
Lower Natural Area (124.2 km <sup>2</sup> ) .....	42

## LIST OF TABLES

Table 1. WY2021 gaging station locations in the Big Barren Creek watershed.....	8
Table 2. WY2021 Big Barren Creek watershed gaging station data summary. ....	9
Table 3. Water Year 2021 Records for Nearby USGS Gaging Stations. ....	10
Table 4. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Upper North Prong Cedar Bluff Creek. ..	15
Table 5. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Upper Cowards Hollow. ....	17
Table 6. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Upper Wolf Pond. ....	19
Table 7. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Upper-Upper Tributary. ....	21
Table 8. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Tram Hollow.....	23
Table 9. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Upper Barnes Hollow .....	25

Table 10. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Upper Big Barren.....	27
Table 11. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Upper Tributary.....	29
Table 12. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Wolf Pond Tributary.....	31
Table 13. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Polecat Hollow .....	33
Table 14. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at South Prong Cedar Bluff Creek. ....	35
Table 15. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Fools Catch.....	37
Table 16. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Highway J. ....	39
Table 17. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Middle Big Barren. ....	41
Table 18. Daily Mean Discharge (m <sup>3</sup> /s) for WY 2021 at Lower Natural Area.....	43

### LIST OF FIGURES

Figure 1. Location and land use of the Big Barren Creek watershed. ....	11
Figure 2. Hydrologic monitoring stations (WY2021) with burn history.....	12
Figure 3. WY2021 cumulative rainfall by season. ....	13
Figure 4. Average annual discharge for Big Barren Creek gages compared to nearby USGS gages (WY2021). ....	13
Figure 5. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Upper North Prong Cedar Bluff Creek.....	14
Figure 6. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Upper Cowards Hollow. ....	16
Figure 7. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at the Upper Wolf Pond. ....	18
Figure 8. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at the Upper-Upper Tributary. ....	20
Figure 9. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Tram Hollow. ....	22
Figure 10. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Upper Barnes Hollow. ....	24
Figure 11. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Upper Big Barren.....	26
Figure 12. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at the Upper Tributary.....	28
Figure 13. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at the Wolf Pond Tributary.....	30
Figure 14. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Polecat Hollow.....	32

Figure 15. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at South Prong Cedar Bluff Creek..... 34

Figure 16. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Fools Catch. .... 36

Figure 17. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Highway J..... 38

Figure 18. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Middle Big Barren..... 40

Figure 19. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Lower Natural Area. .... 42

## WATER YEAR 2021 SUMMARY

This report summarizes the 2021 Water Year (WY2021) discharge results for the 15 stations that were installed in the Big Barren Creek watershed in 2015-2020. The 2021 Water Year runs from October 1, 2020 to September 30, 2021. Big Barren Creek is a tributary of the Current River Basin (8-digit Hydrological Unit Code (HUC) #11010008) located in portions of Ripley, Oregon and Carter Counties in southeast Missouri (Figure 1). Gaging station locations were selected along both the main stem of Big Barren Creek and distributed along smaller tributaries throughout the watershed (Figure 2). Drainage areas for the tributary sites ranged from 0.14-7.82 km<sup>2</sup> and gage locations within the smaller tributary watersheds drain forest service lands that have either been entirely burned or unburned (Table 1). The drainage areas of the main stem sites have a mix of land uses from private lands to burned and unburned public forest, ranging in drainage area from 2.51-124.2 km<sup>2</sup>. The majority of the streams within the Big Barren Creek watershed are ephemeral due to the underlying karst landscape where sinkholes, losing streams, and caves are common (Weary et al., 2014). The perennial site along Big Barren Creek is downstream of the Big Barren Creek Natural Area and appears to be associated with a series of northeast trending faults (Weary et al., 2014; Figure 2).

Stage data was recorded every 5-minutes using Hobo U20L-04 Water Level Loggers. The level loggers were installed inside a PVC pipe assembly and secured to 1-2 m staff gages that were installed at each site. An additional level logger was installed to measure barometric pressure used to compensate for barometric pressure changes. Raw data is downloaded periodically (≈ every 10 weeks) from the level loggers using the Hobo Waterproof Shuttle. Discharge rating curves were created at each site to estimate flows for each 5-minute stage reading over the monitoring period. Specific methods used to develop these rating curves can be seen in a separate report (Owen et al., 2020). There were no missing days at 12 of the 15 sites in WY2021. Due to equipment malfunction, 71.6 days were missing at UC, 23.7 days at SPC, and 3.1 days at MBB.

### **Rainfall**

There was a total of 123.8 cm of rainfall in WY2021, which is only 4.0 cm higher than the average annual rainfall for the area between 1956-2014 (Pavlovsky et al., 2016). Of that total, 42.0 cm (33.9%) fell in the spring from April to June which was the highest seasonal total for the period (Figure 3). The highest rainfall total recorded for the year occurred in the fall between October 26-29th (14.2 cm). The second highest seasonal rainfall total occurred in the winter from January-March with 31.3 cm (25.3%) of the total annual rainfall. The lowest seasonal rainfall occurred in the summer from July-September with 19.7 cm (15.9%). While the total annual rainfall was similar to the long-term average, no daily rainfall total exceeded 7.5 cm

during WY2021 (Pavlowsky et al., 2016). WY2021 rainfall totals were recorded at two Onset HOBO rain gage data loggers (part# RG3-M) installed in the upper and middle portions of the watershed (Figure 2). The total rainfall collected at the gages located within the watershed recorded 29.4 cm ( $\approx 27\%$  RPD) more rainfall than using the inverse distance weighted method from nearby gages and 10.9 cm ( $\approx 9.2\%$  RPD) more than data from PRISM (Pavlowsky et al., 2016; Owen et al., 2021).

### **Discharge and Runoff**

The range in discharge values for WY2021 were calculated for both perennial and ephemeral gaging stations in the Big Barren Creek watershed and annual average discharges are comparable to nearby USGS gaging stations. The LNA site is the only gage in the perennial stream section of the watershed. For the ephemeral sites, average annual discharge ranged from  $0.001 \text{ m}^3/\text{s}$  to  $0.030 \text{ m}^3/\text{s}$ . Annual peak discharge ranged from  $0.2 \text{ m}^3/\text{s}$  at UNC to  $36.0 \text{ m}^3/\text{s}$  at LNA. Average annual discharge for the sites from this study were plotted by drainage area and compared to nearby USGS gaging stations. Ephemeral sites plot below the best-fit line of perennial USGS stations and the perennial site plots just above the USGS stations (Figure 4). Furthermore, the USGS station along a losing section of Logan Creek near Ellington plots below the best-fit line of the other perennial USGS station sites similar to the ephemeral sites in this study.

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Weary, D.J., R.W. Harrison, R.C. Orndorff, R.E. Weems, J.S. Schindler, J.E. Repetski, and H.A. Pierce (2014) Bedrock Geologic Map of the Spring Valley, West Plains, and Parts of the Piedmont and Poplar Bluff 30'x60' Quadrangles, Missouri, Including the Upper Current River and Eleven Point River Drainage Basins. U.S. Geological Survey Scientific Investigations Map 3280.

## TABLES

Table 1. WY2021 gaging station locations in the Big Barren Creek watershed.

Site Name	Site ID	Northing (m) NAD83, UTM15N	Easting (m) NAD83, UTM15N	Elevation (m)	Drainage Area (km <sup>2</sup> )	Stream Type	Burn History	Missing Days
Upper N. Prong Cedar Bluff Creek	UNC	4,078,382.747	662,183.045	275.7	0.14	Ephemeral	Burned	0.0
Upper Cowards	UC	4,077,019.313	669,737.599	250.6	0.42	Ephemeral	Burned	71.6
Upper Wolf	UW	4,085,653.535	664,448.946	255.6	0.58	Ephemeral	Burned	0.0
Upper-Upper Tributary	UUT	4,081,323.624	659,176.057	270.4	0.65	Ephemeral	Unburned	0.0
Tram Hollow	TH	4,080,612.536	660,800.255	257.1	1.59	Ephemeral	Unburned	0.0
Upper Barnes	UB	4,080,018.612	660,862.925	261.1	2.50	Ephemeral	Unburned	0.0
Upper Big Barren	UBB	4,082,297.631	660,727.701	253.5	2.51	Ephemeral	Burned	0.0
Upper Tributary	UT	4,081,698.540	660,910.259	247.9	4.19	Ephemeral	Unburned	0.0
Wolf Pond	WP	4,084,372.539	665,468.255	232.7	5.13	Ephemeral	Burned	0.0
Polecat Hollow	PH	4,082,395.533	664,472.252	224.5	6.19	Ephemeral	Burned	0.0
South Prong Cedar	SPC	4,078,550.511	666,420.219	210.0	7.28	Ephemeral	Burned	23.7
Fools Catch	FC	4,081,865.521	669,811.222	196.8	7.82	Ephemeral	Unburned	0.0
Highway J	HJ	4,081,730.799	661,557.484	245.5	8.82	Ephemeral	Mixed	0.0
Middle Big Barren	MBB	4,081,306.806	667,938.252	191.6	47.8	Ephemeral	Mixed	3.1
Lower Natural Area	LNA	4,079,188.630	672,767.129	158.5	124.2	Perennial	Mixed	0.0



Table 2. WY2021 Big Barren Creek watershed gaging station data summary.

Site Name	Drainage Area (km <sup>2</sup> )	Rainfall* Vol. (m <sup>3</sup> )	Runoff Vol. (m <sup>3</sup> )	Rainfall As Runoff (%)	Runoff Depth (cm)	Avg. Q (m <sup>3</sup> /s)	Max Q (m <sup>3</sup> /s)	10% Q** (m <sup>3</sup> /s)	50% Q** (m <sup>3</sup> /s)	90% Q** (m <sup>3</sup> /s)	Min Q (m <sup>3</sup> /s)
Upper N. Prong Cedar Bluff Creek	0.14	173,320	9,816	5.7	7.0	0.0003	0.20	0.00	0.00	0.00	0.00
Upper Cowards	0.42	519,960	64,463	12.4	15.4	0.002	1.42	0.00	0.00	0.00	0.00
Upper Wolf	0.58	718,040	42,136	5.9	7.3	0.001	1.15	0.00	0.00	0.00	0.00
Upper-Upper Tributary	0.65	804,700	29,115	3.6	4.5	0.001	0.75	0.00	0.00	0.00	0.00
Tram Hollow	1.59	1,968,420	78,280	4.0	4.9	0.002	1.53	0.00	0.00	0.00	0.00
Upper Barnes	2.50	3,095,000	293,575	9.5	11.7	0.009	2.21	0.018	0.00	0.00	0.00
Upper Big Barren	2.51	3,107,380	176,398	5.7	7.0	0.006	5.77	0.008	0.00	0.00	0.00
Upper Tributary	4.19	5,187,220	149,316	2.9	3.6	0.005	9.85	0.00	0.00	0.00	0.00
Wolf Pond	5.13	6,350,940	35,831	0.6	0.7	0.001	3.22	0.00	0.00	0.00	0.00
Polecat Hollow	6.19	7,663,220	21,936	0.3	0.4	0.001	2.42	0.00	0.00	0.00	0.00
South Prong Cedar	7.28	9,012,640	958,797	10.6	13.2	0.030	8.14	0.037	0.003	0.00	0.00
Fools Catch	7.82	9,681,160	158,627	1.6	2.0	0.005	6.46	0.00	0.00	0.00	0.00
Highway J	8.82	10,919,160	282,713	2.6	3.2	0.009	6.36	0.00	0.00	0.00	0.00
Middle Big Barren	47.8	59,176,400	723,870	1.2	1.5	0.023	5.57	0.045	0.010	0.00	0.00
Lower Natural Area	124.2	153,759,600	90,207,992	58.7	72.6	2.86	36.0	6.64	1.68	0.164	0.087

\*Total rainfall for WY2021 = 123.8 cm

\*\* Exceedance value

Table 3. Water Year 2021 Records for Nearby USGS Gaging Stations.

Station Name	Start Year	Years of Record	Drainage Area km <sup>2</sup>	WY 2020 Avg. Annual Q (m <sup>3</sup> /s)	Flow Exceedance (%)			
					90% (m <sup>3</sup> /s)	50% (m <sup>3</sup> /s)	10% (m <sup>3</sup> /s)	0% (Max) (m <sup>3</sup> /s)
EAST FORK BLACK RIVER NEAR LESTERVILLE, MO	2003	19	135.2	2.06	0.16	0.75	4.25	106.2
CURRENT RIVER AT MONTAUK STATE PARK, MO	2007	15	152.3	4.06	2.83	3.57	5.65	63.7
E. FORK BLACK R. BELOW LOWER TAUM SAUK RESERVOIR	2008	14	226.1	3.34	0.31	1.43	8.81	NA
LOGAN CREEK AT ELLINGTON, MO	1994	28	360.0	0.72	0.10	0.35	1.09	89.8
JACKS FORK NEAR MOUNTAIN VIEW, MO	2001	21	479.2	6.24	0.93	3.20	12.09	300.2
BIG CREEK AT SAM A. BAKER STATE PARK	2005	17	489.5	7.57	1.08	3.48	17.99	255.7
LITTLE BLACK RIVER BELOW FAIRDEALING, MO	2007	15	502.5	8.00	1.32	4.53	14.57	143.6
SOUTH FORK SPRING RIVER AT SADDLE, AR	2010	12	686.4	9.03	1.82	4.22	18.36	390.8
CURRENT RIVER ABOVE AKERS, MO	2001	21	764.1	15.36	8.18	10.48	27.46	NA
JACKS FORK AT ALLEY SPRING, MO	1993	29	771.8	9.91	1.93	5.52	21.10	342.7
JACKS FORK AT EMINENCE, MO	1921	101	1,030.8	19.31	5.90	12.69	38.35	345.5
BLACK RIVER NEAR ANNAPOLIS, MO	1939	83	1,253.6	18.71	5.21	10.90	36.93	410.6
BLACK RIVER BELOW ANNAPOLIS, MO	2006	16	1,276.9	21.15	5.61	12.15	42.59	407.8
ST. FRANCIS RIVER NEAR SACO, MO	2005	17	1,719.8	28.80	1.97	11.04	74.99	753.3
ELEVEN POINT RIVER NEAR BARDLEY, MO	1921	101	2,053.9	32.94	17.86	26.42	53.75	223.7
SPRING RIVER AT TOWN BRANCH BRIDGE AT HARDY, AR	2001	21	2,188.6	34.27	12.66	23.68	61.74	1,113.0
ST. FRANCIS RIVER NEAR PATTERSON, MO	1921	101	2,476.0	39.14	4.39	18.46	102.24	906.2
BLACK RIVER AT LEEPER, MO	2008	14	2,556.3	36.28	12.66	22.15	94.53	115.0
BLACK RIVER ABOVE WILLIAMSVILLE, MO	2008	14	2,608.1	43.07	13.91	28.60	105.35	186.1
ELEVEN POINT RIVER NEAR RAVENDEN SPRINGS, AR	2000	22	2,926.7	44.29	22.22	32.85	78.28	447.5
BLACK RIVER AT POPLAR BLUFF, MO	1939	83	3,224.6	50.86	18.31	35.68	116.23	175.9
ST. FRANCIS RIVER AT WAPPAPELLO, MO	1940	82	3,395.5	52.39	5.55	41.63	104.56	231.7
CURRENT RIVER AT VAN BUREN, MO	1912	110	4,317.5	75.87	35.12	56.36	139.45	648.5
BLACK RIVER NEAR CORNING, AR	1938	83	4,532.5	64.06	18.77	47.01	126.82	NA
CURRENT RIVER AT DONIPHAN, MO	1918	104	5,278.4	109.23	54.54	83.83	189.97	787.3

\* Losing section of Logan Creek, ephemeral

# FIGURES

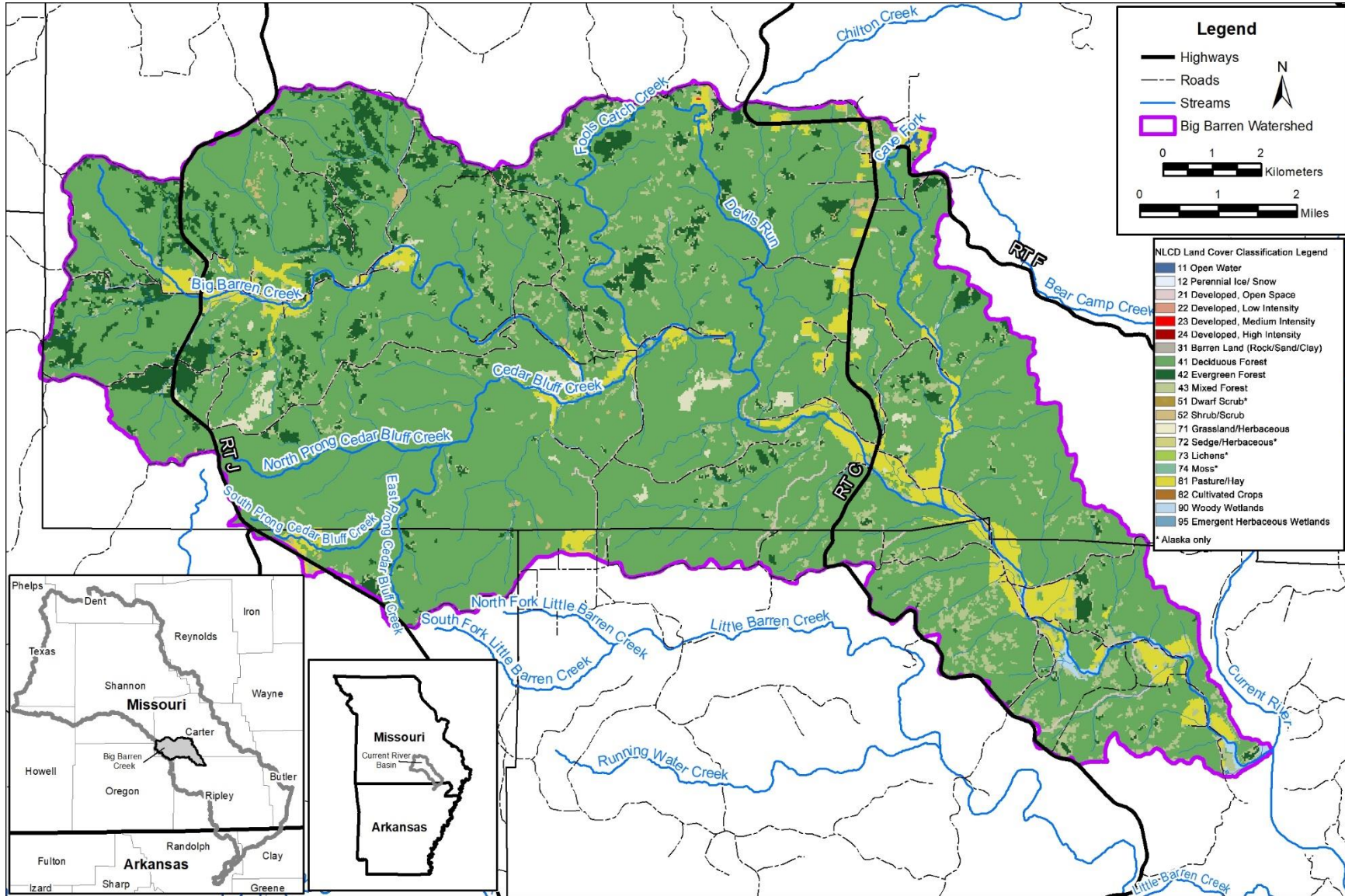


Figure 1. Location and land use of the Big Barren Creek watershed.

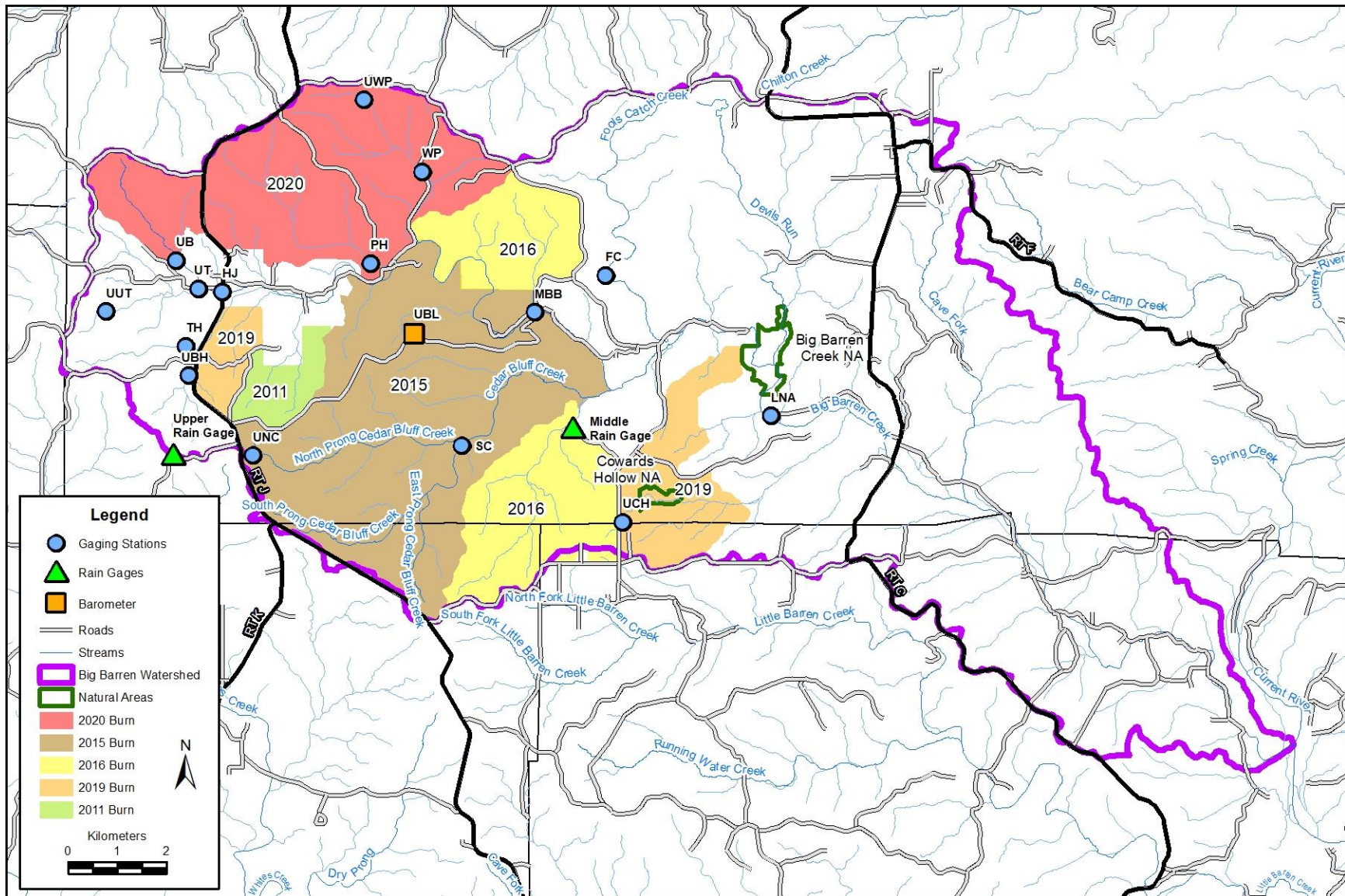


Figure 2. Hydrologic monitoring stations (WY2021) with burn history.

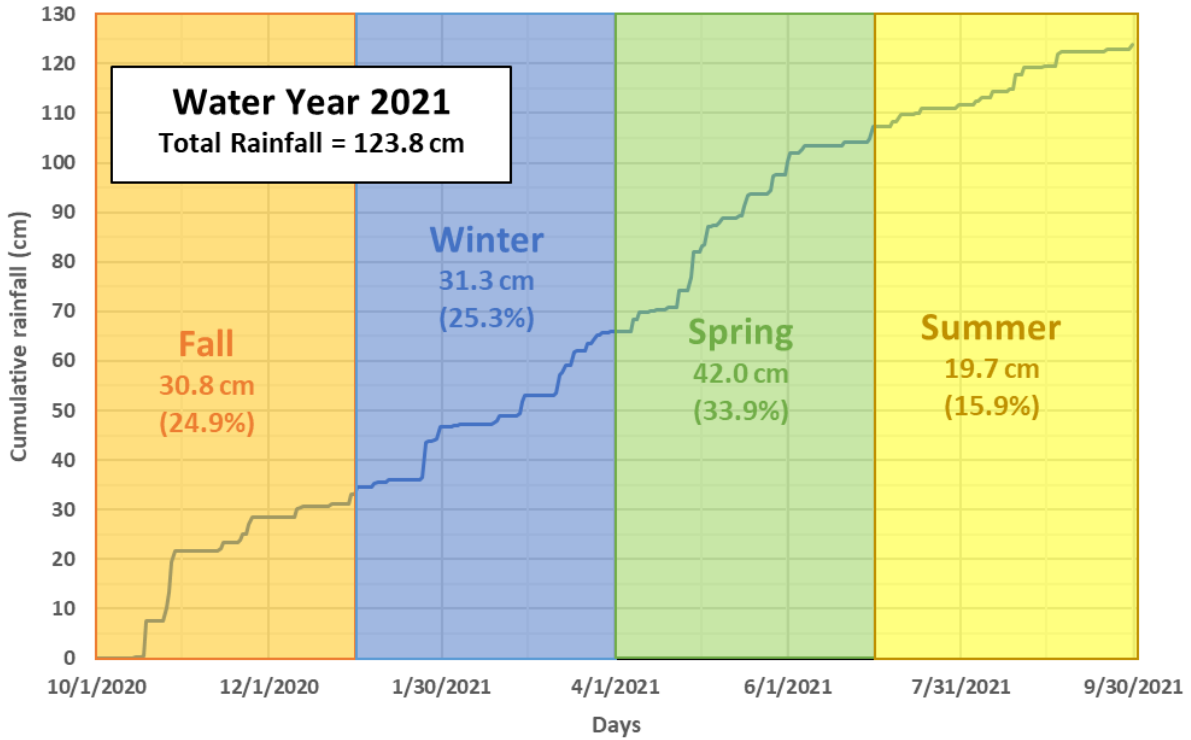


Figure 3. WY2021 cumulative rainfall by season.

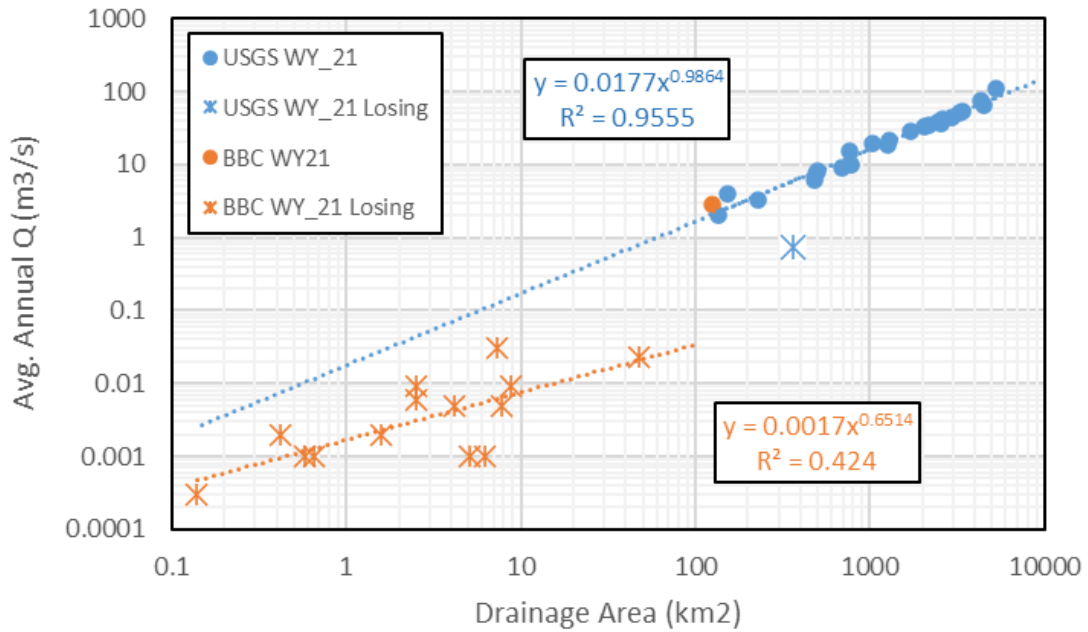


Figure 4. Average annual discharge for Big Barren Creek gages compared to nearby USGS gages (WY2021).

## WY2021 GAGING STATION RESULTS

### Upper North Prong Cedar Bluff Creek (0.14 km<sup>2</sup>)

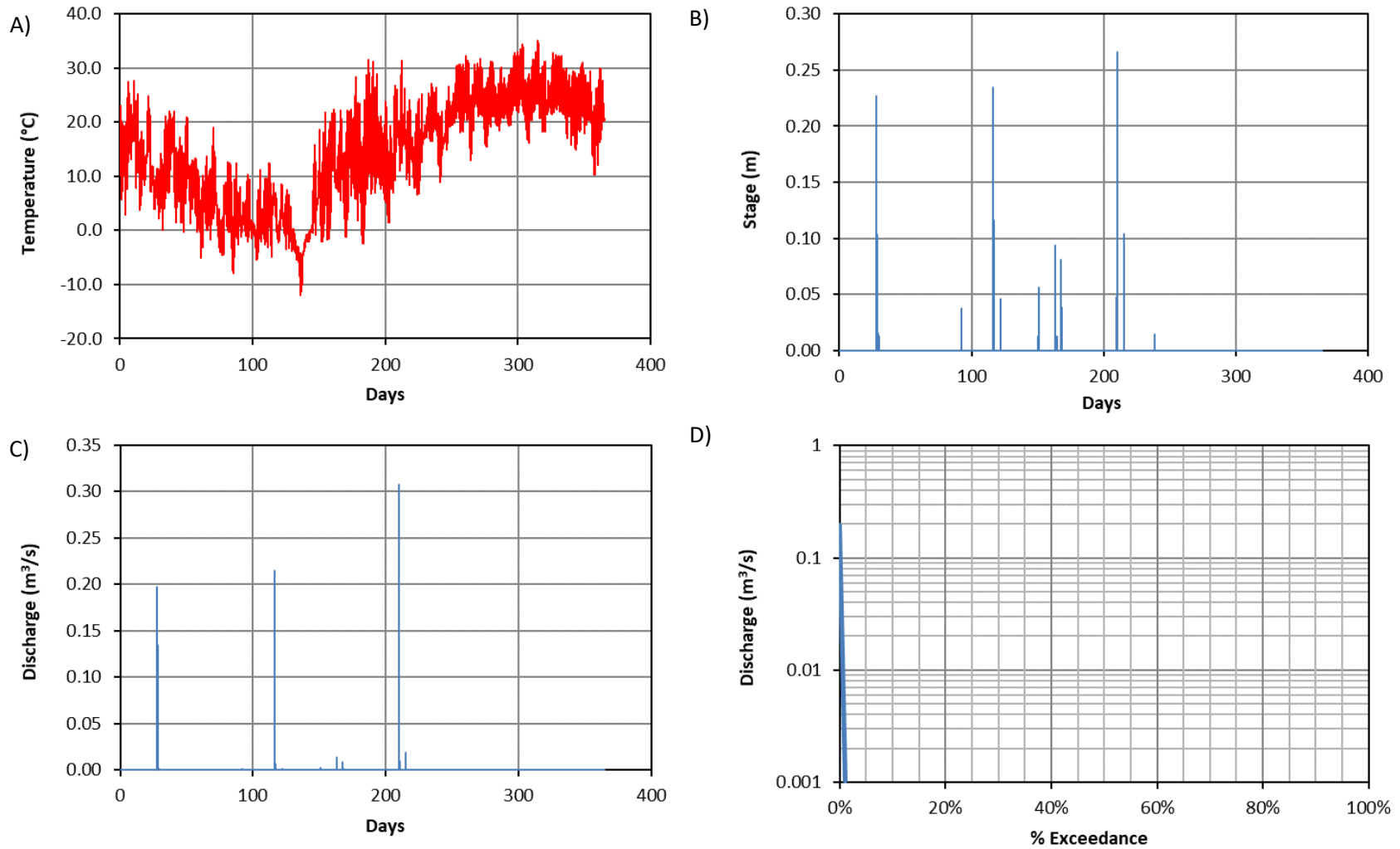


Figure 5. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Upper North Prong Cedar Bluff Creek.

Table 4. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Upper North Prong Cedar Bluff Creek.

<b>Day</b>	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
<b>1</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>2</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>3</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>4</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>5</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>6</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>7</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>8</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>10</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>11</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>12</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>13</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>14</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>15</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>16</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>17</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>18</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>19</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>20</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>21</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>22</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>23</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>24</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>25</b>	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>26</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>27</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>28</b>	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>29</b>	0.03	0.00	0.00	0.00		0.00	0.03	0.00	0.00	0.00	0.00	0.00
<b>30</b>	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>31</b>	0.00		0.00	0.00		0.00		0.00		0.00	0.00	
<b>Total</b>	0.05	0.00	0.00	0.04	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
<b>Mean</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Max</b>	0.03	0.00	0.00	0.04	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Upper Cowards Hollow (0.42 km<sup>2</sup>)

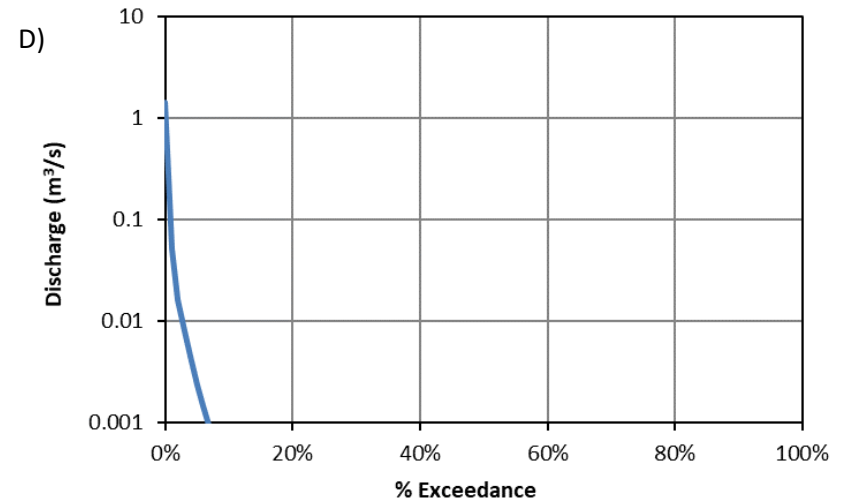
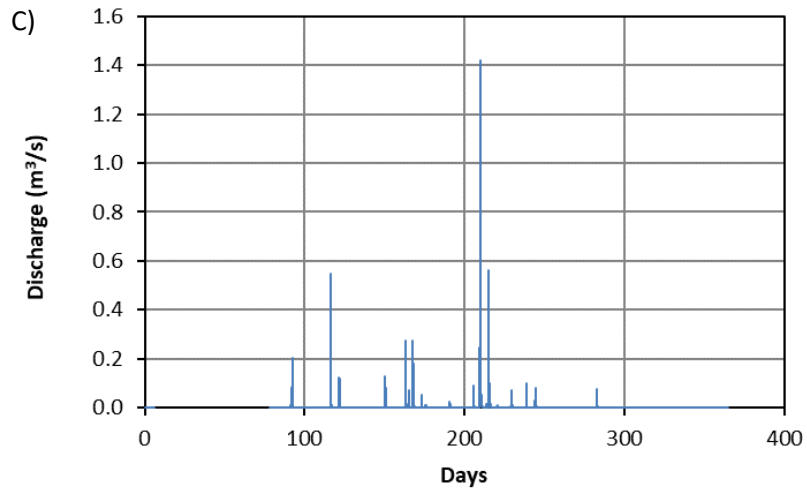
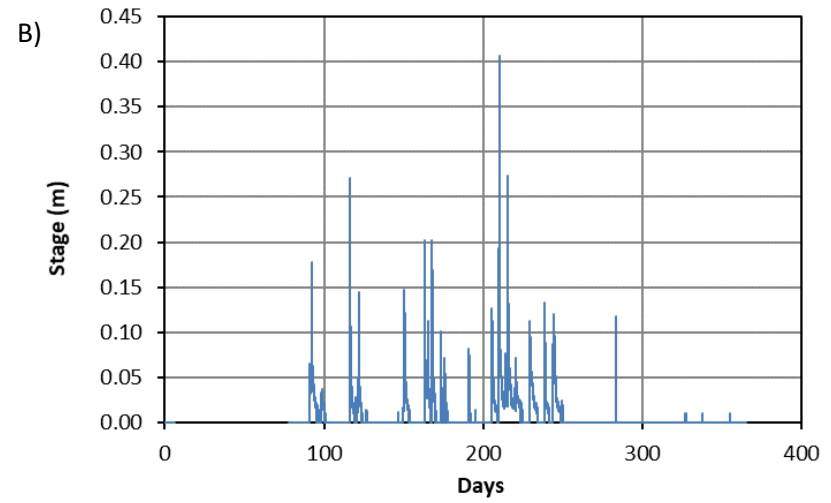
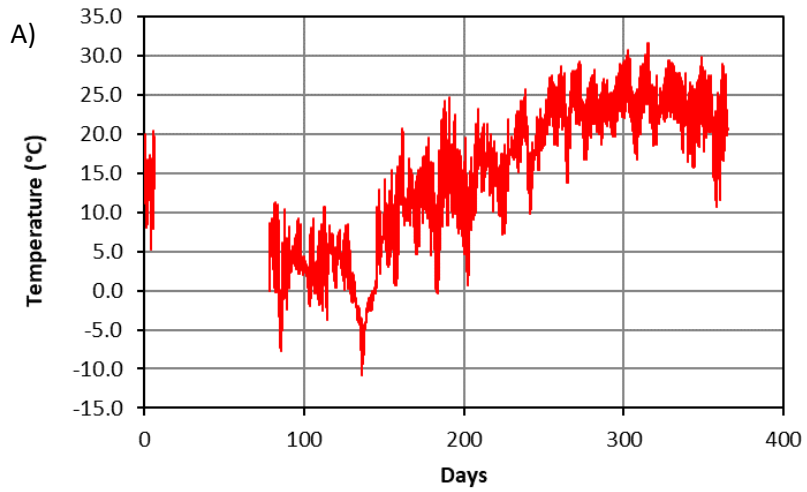


Figure 6. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Upper Cowards Hollow.



Table 5. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Upper Cowards Hollow.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00			0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00			0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
3	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00			0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
5	0.00			0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
6	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13				0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
14				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15				0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
16				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17				0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
18			0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00
19			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24			0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
25			0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27			0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
28			0.00	0.00	0.02	0.00	0.03	0.00	0.00	0.00	0.00	0.00
29			0.00	0.00		0.00	0.10	0.00	0.00	0.00	0.00	0.00
30			0.00	0.02		0.00	0.00	0.00	0.00	0.00	0.00	0.00
31			0.00	0.00		0.00		0.00		0.00	0.00	
<b>Total</b>				0.16	0.03	0.12	0.15	0.12	0.02	0.00	0.00	0.00
<b>Mean</b>				0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Max</b>				0.11	0.02	0.04	0.10	0.07	0.01	0.00	0.00	0.00
<b>Min</b>				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Upper Wolf Pond (0.58 km<sup>2</sup>)**

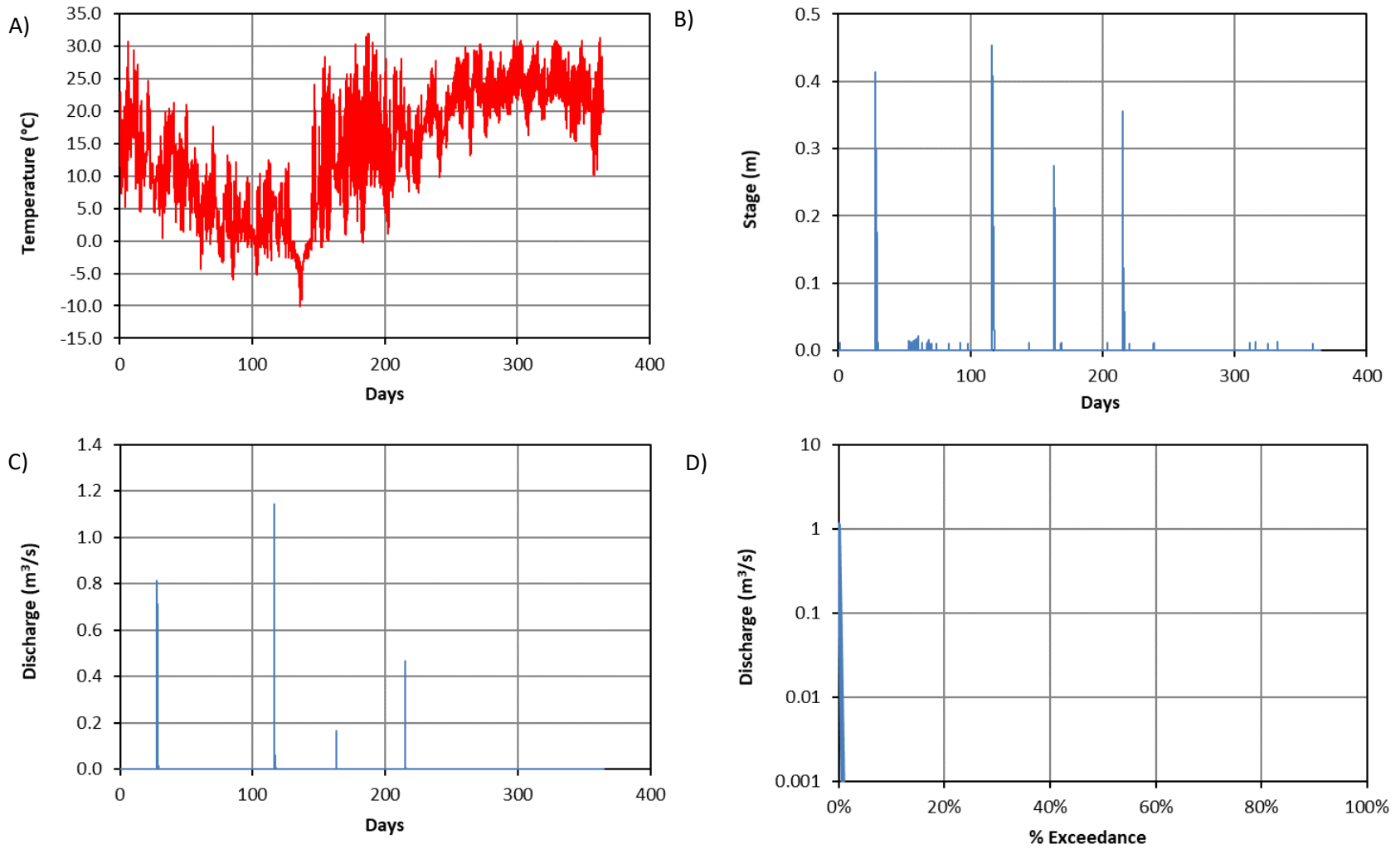


Figure 7. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at the Upper Wolf Pond.

Table 6. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Upper Wolf Pond.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.16	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.00	0.00		0.00		0.00		0.00	0.00	
<b>Total</b>	0.17	0.00	0.00	0.24	0.00	0.02	0.00	0.06	0.00	0.00	0.00	0.00
<b>Mean</b>	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Max</b>	0.16	0.00	0.00	0.24	0.00	0.02	0.00	0.06	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

### Upper-Upper Tributary (0.65 km<sup>2</sup>)

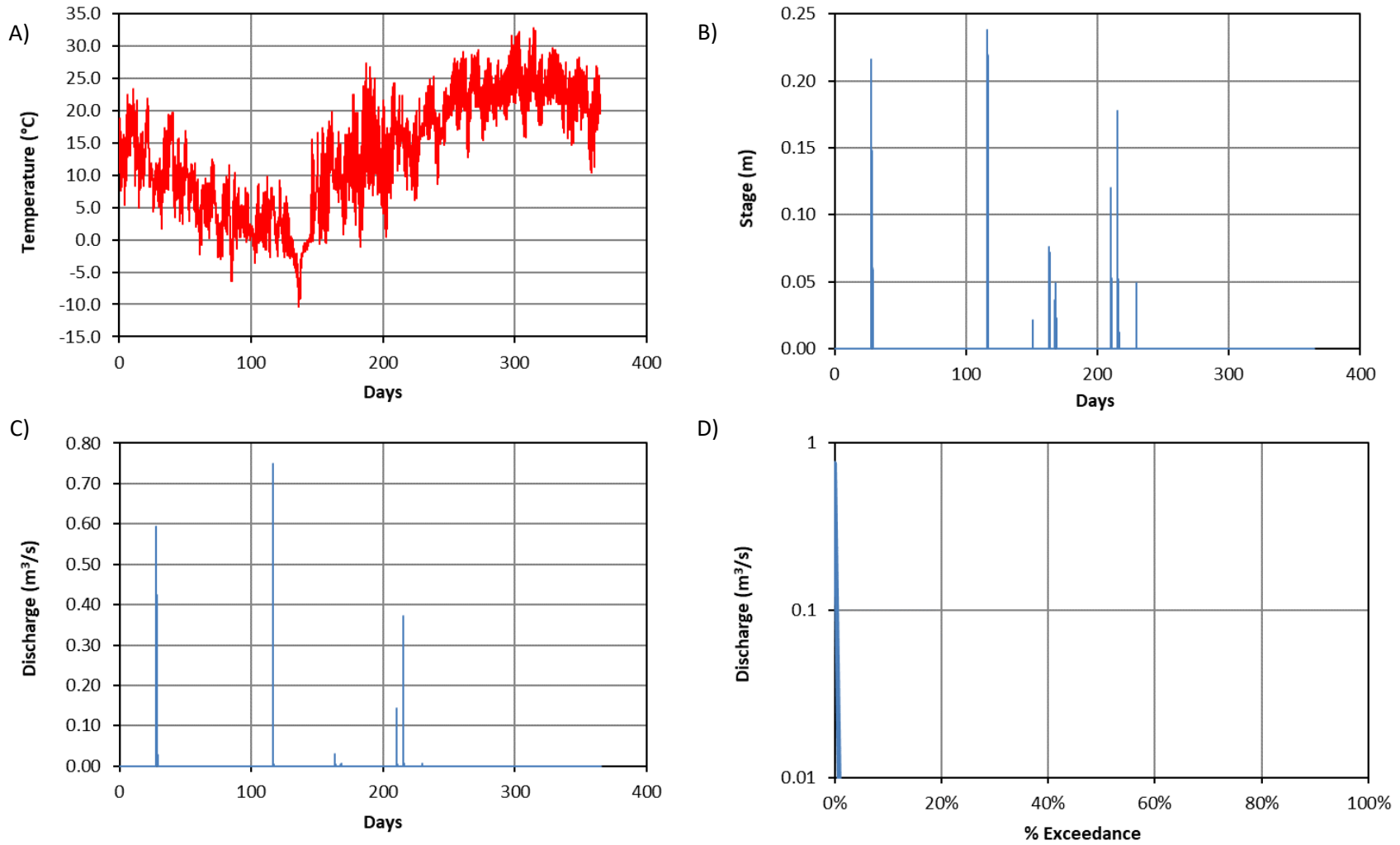


Figure 8. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at the Upper-Upper Tributary.

Table 7. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Upper-Upper Tributary.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.13	0.00	0.00	0.00		0.00	0.02	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.00	0.00		0.00		0.00		0.00	0.00	
<b>Total</b>	0.14	0.00	0.00	0.12	0.00	0.01	0.02	0.04	0.00	0.00	0.00	0.00
<b>Mean</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Max</b>	0.13	0.00	0.00	0.12	0.00	0.01	0.02	0.04	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Tram Hollow (1.59 km<sup>2</sup>)**

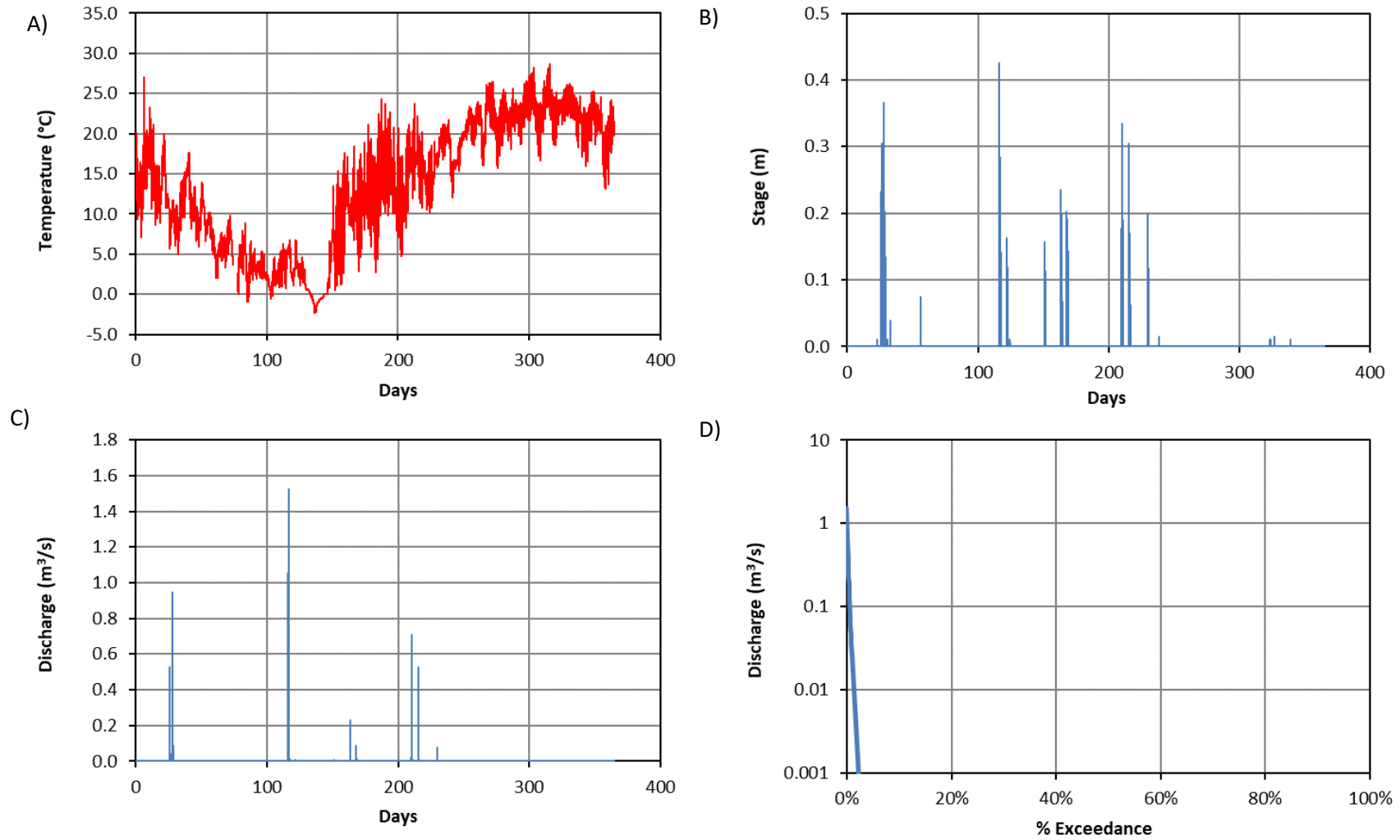


Figure 9. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Tram Hollow.

Table 8. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Tram Hollow.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.18	0.00	0.00	0.00		0.00	0.13	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.00	0.00		0.00		0.00		0.00	0.00	
<b>Total</b>	0.24	0.00	0.00	0.23	0.00	0.10	0.13	0.09	0.00	0.00	0.00	0.00
<b>Mean</b>	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Max</b>	0.18	0.00	0.00	0.22	0.00	0.07	0.13	0.08	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

### Upper Barnes Hollow (2.50 km<sup>2</sup>)

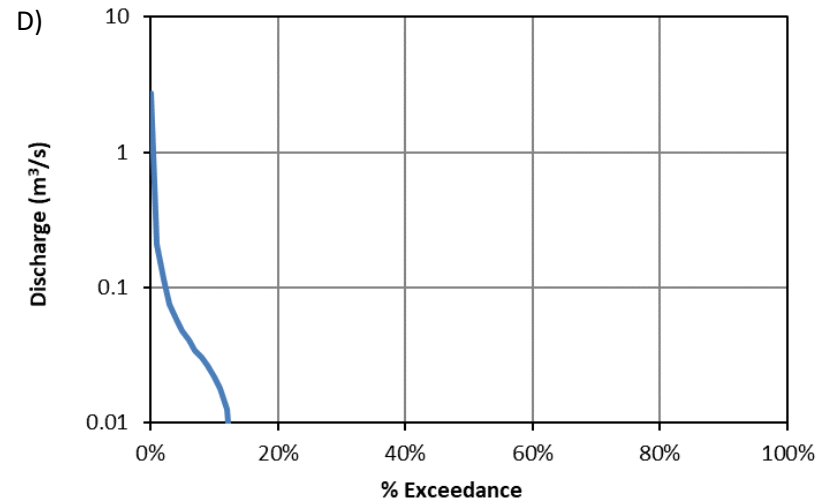
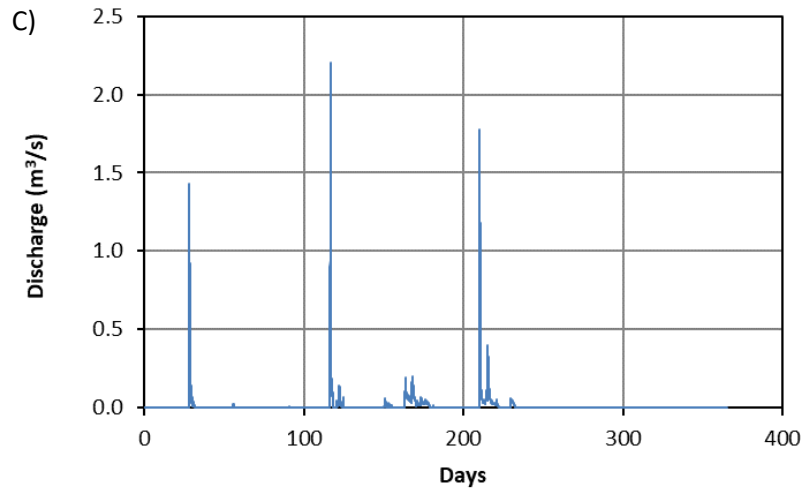
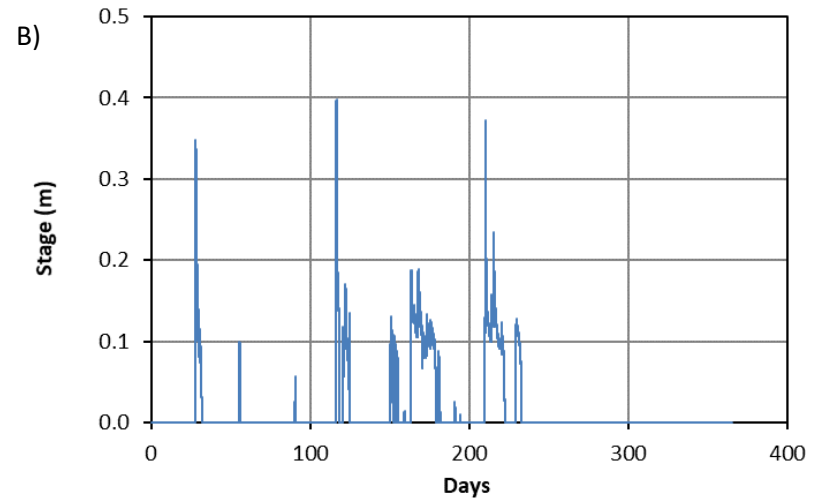
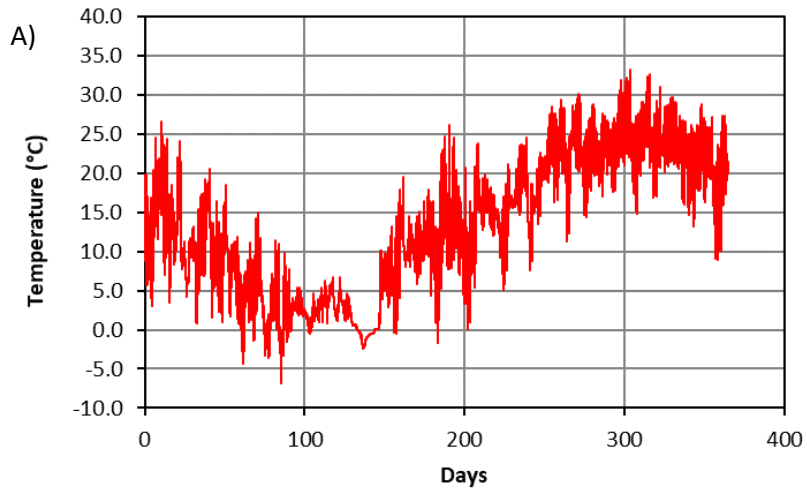


Figure 10. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Upper Barnes Hollow.



Table 9. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Upper Barnes Hollow

<b>Day</b>	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
<b>1</b>	0.00	0.01	0.00	0.00	0.02	0.01	0.00	0.04	0.00	0.00	0.00	0.00
<b>2</b>	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.04	0.00	0.00	0.00	0.00
<b>3</b>	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.07	0.00	0.00	0.00	0.00
<b>4</b>	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.19	0.00	0.00	0.00	0.00
<b>5</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
<b>6</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
<b>7</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
<b>8</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
<b>9</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00
<b>10</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
<b>11</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>12</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>13</b>	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
<b>14</b>	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
<b>15</b>	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
<b>16</b>	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
<b>17</b>	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00
<b>18</b>	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.03	0.00	0.00	0.00	0.00
<b>19</b>	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.04	0.00	0.00	0.00	0.00
<b>20</b>	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.00	0.00	0.00	0.00
<b>21</b>	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00
<b>22</b>	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
<b>23</b>	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
<b>24</b>	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
<b>25</b>	0.00	0.01	0.00	0.58	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
<b>26</b>	0.00	0.00	0.00	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
<b>27</b>	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
<b>28</b>	0.00	0.00	0.00	0.00	0.02	0.01	0.02	0.00	0.00	0.00	0.00	0.00
<b>29</b>	0.49	0.00	0.00	0.01		0.00	0.40	0.00	0.00	0.00	0.00	0.00
<b>30</b>	0.06	0.00	0.00	0.05		0.00	0.06	0.00	0.00	0.00	0.00	0.00
<b>31</b>	0.02		0.00	0.07		0.00		0.00		0.00	0.00	
<b>Total</b>	0.57	0.01	0.00	0.83	0.05	0.83	0.48	0.62	0.00	0.00	0.00	0.00
<b>Mean</b>	0.02	0.00	0.00	0.03	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00
<b>Max</b>	0.49	0.01	0.00	0.58	0.02	0.12	0.40	0.19	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Upper Big Barren (2.51 km<sup>2</sup>)

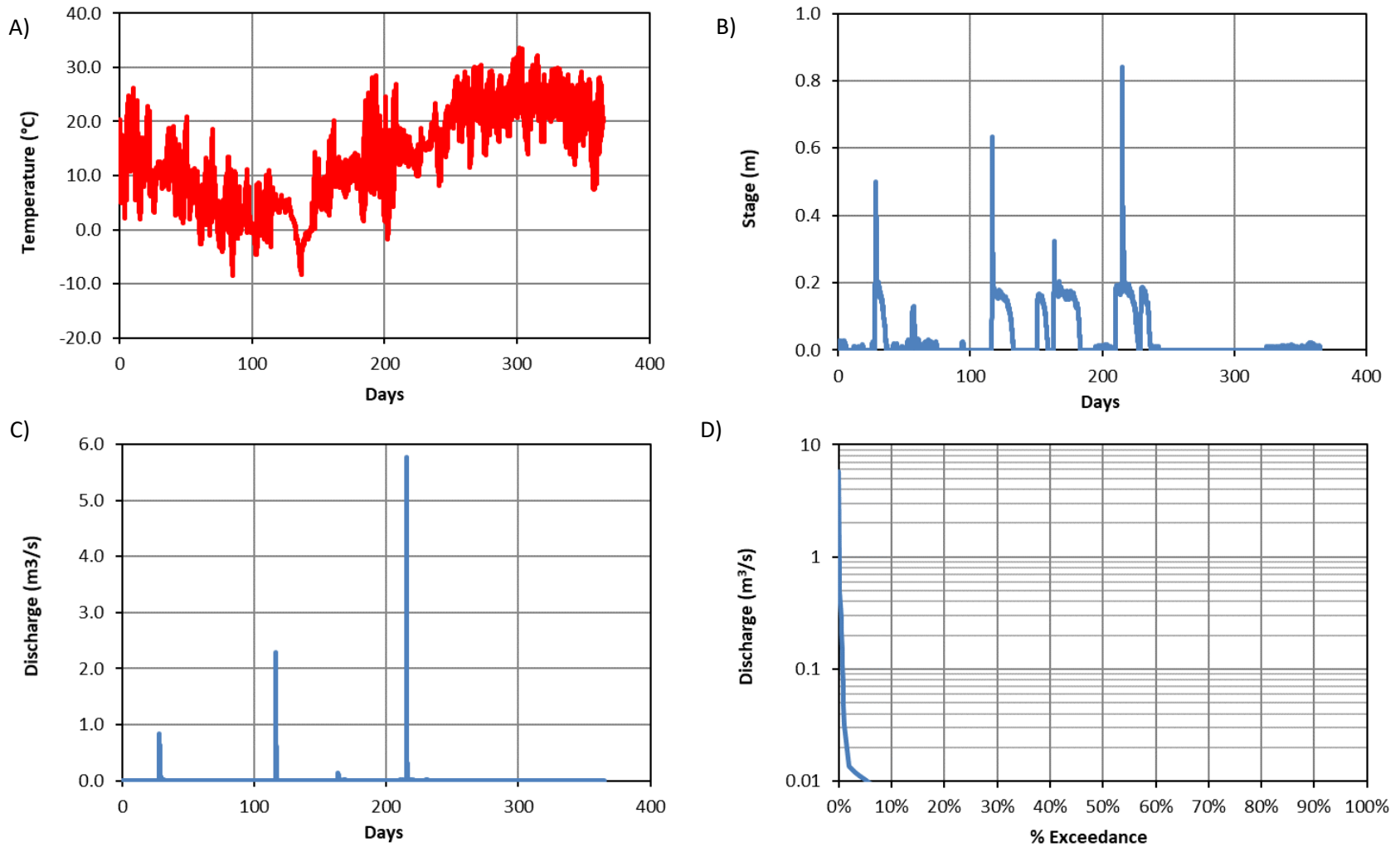


Figure 11. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Upper Big Barren.

Table 10. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Upper Big Barren.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00
2	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.70	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.36	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
29	0.40	0.00	0.00	0.01		0.00	0.01	0.00	0.00	0.00	0.00	0.00
30	0.03	0.00	0.00	0.01		0.00	0.01	0.00	0.00	0.00	0.00	0.00
31	0.01		0.00	0.01		0.00		0.00		0.00	0.00	
<b>Total</b>	0.44	0.02	0.00	0.42	0.04	0.21	0.02	0.89	0.00	0.00	0.00	0.00
<b>Mean</b>	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.03	0.00	0.00	0.00	0.00
<b>Max</b>	0.40	0.01	0.00	0.36	0.01	0.04	0.01	0.70	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

### Upper Tributary (4.19 km<sup>2</sup>)

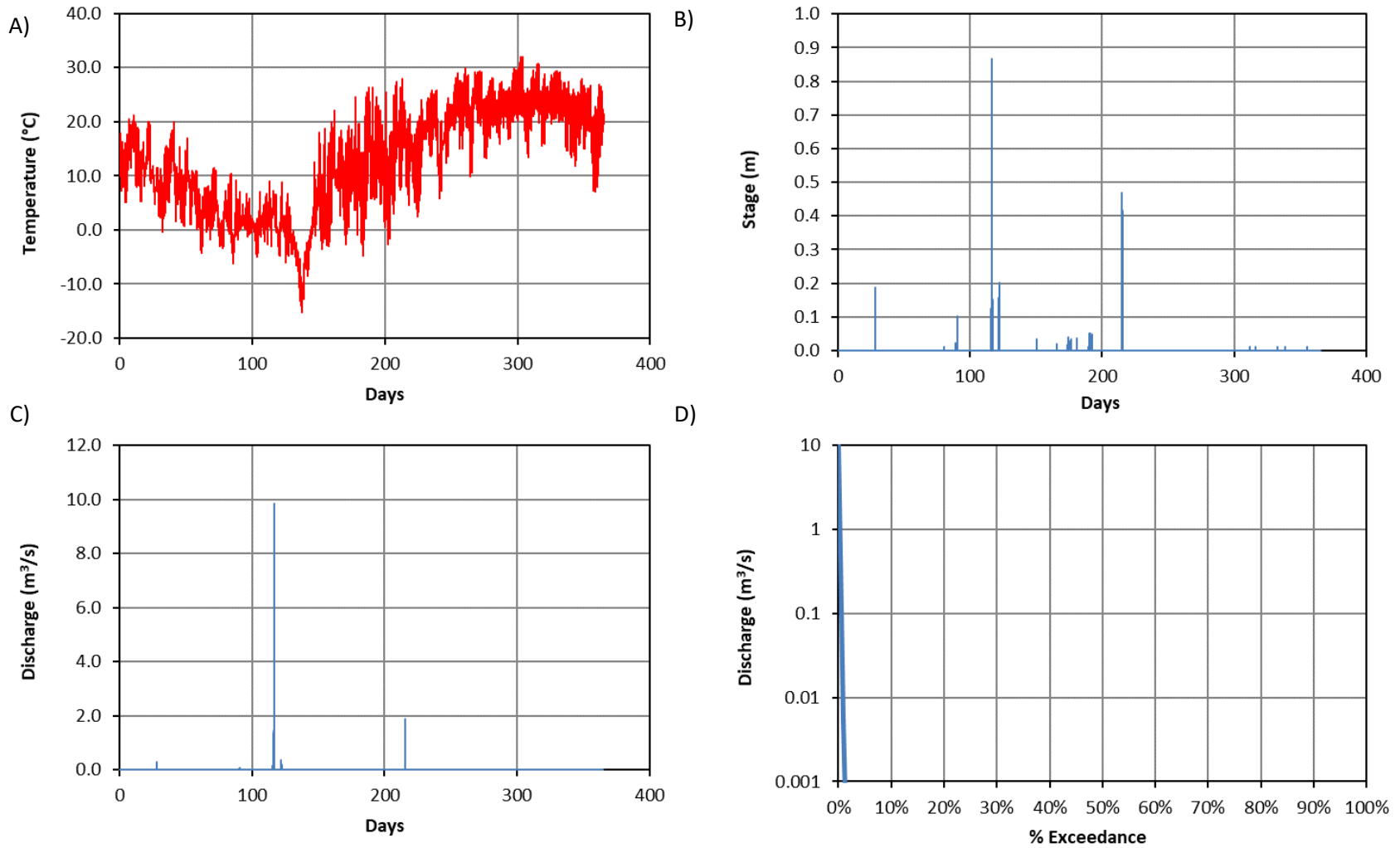


Figure 12. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at the Upper Tributary.

Table 11. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Upper Tributary.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.03	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.01	0.06		0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.00	0.05		0.00		0.00		0.00	0.00	
<b>Total</b>	0.03	0.00	0.01	1.46	0.00	0.00	0.01	0.21	0.00	0.00	0.00	0.00
<b>Mean</b>	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
<b>Max</b>	0.03	0.00	0.01	1.32	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Wolf Pond (5.13 km<sup>2</sup>)**

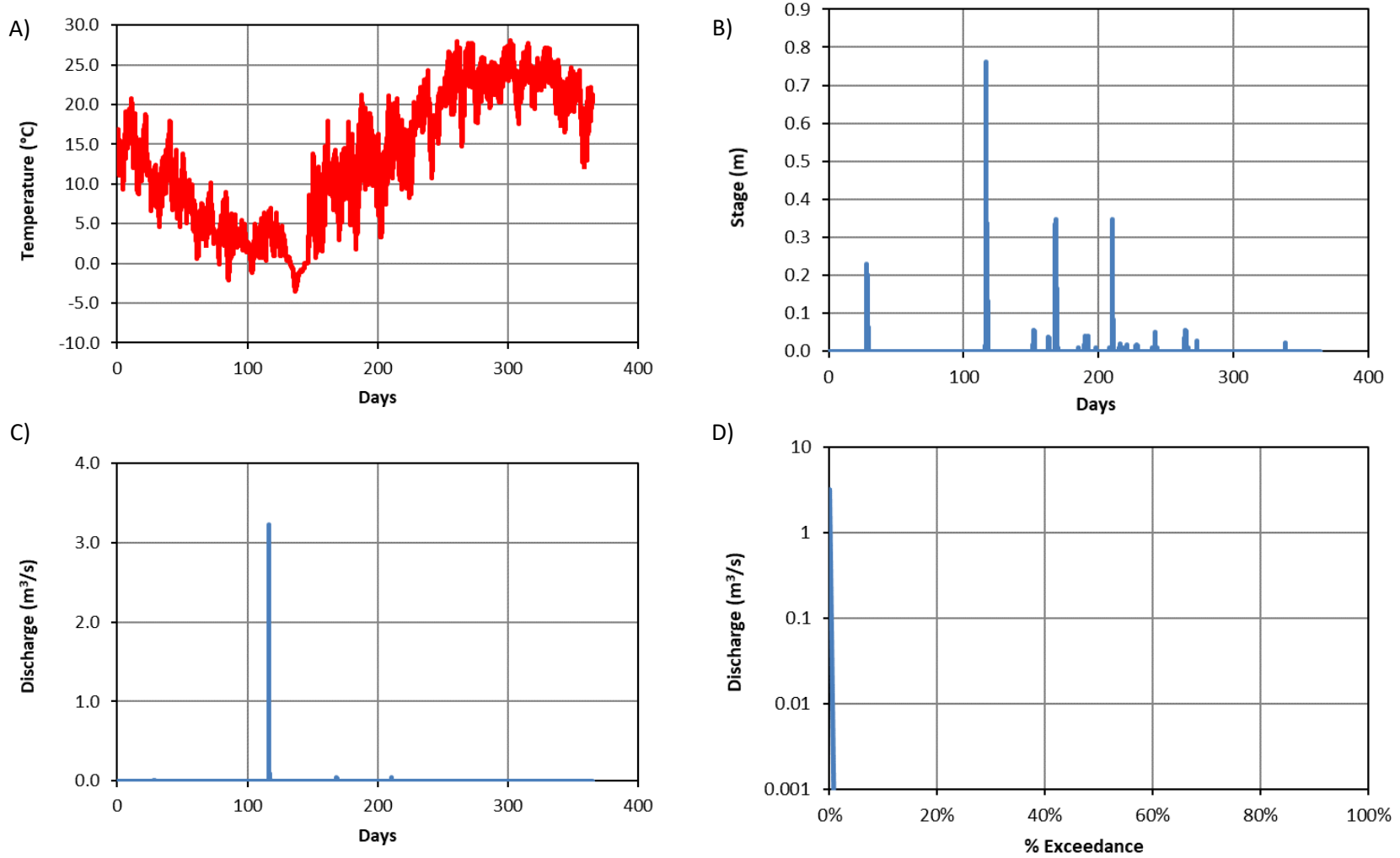


Figure 13. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at the Wolf Pond Tributary.

Table 12. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Wolf Pond Tributary.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00		0.00	0.01	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.00	0.00		0.00		0.00		0.00	0.00	
<b>Total</b>	0.00	0.00	0.00	0.38	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00
<b>Mean</b>	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Max</b>	0.00	0.00	0.00	0.38	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Polecat Hollow (6.19 km<sup>2</sup>)**

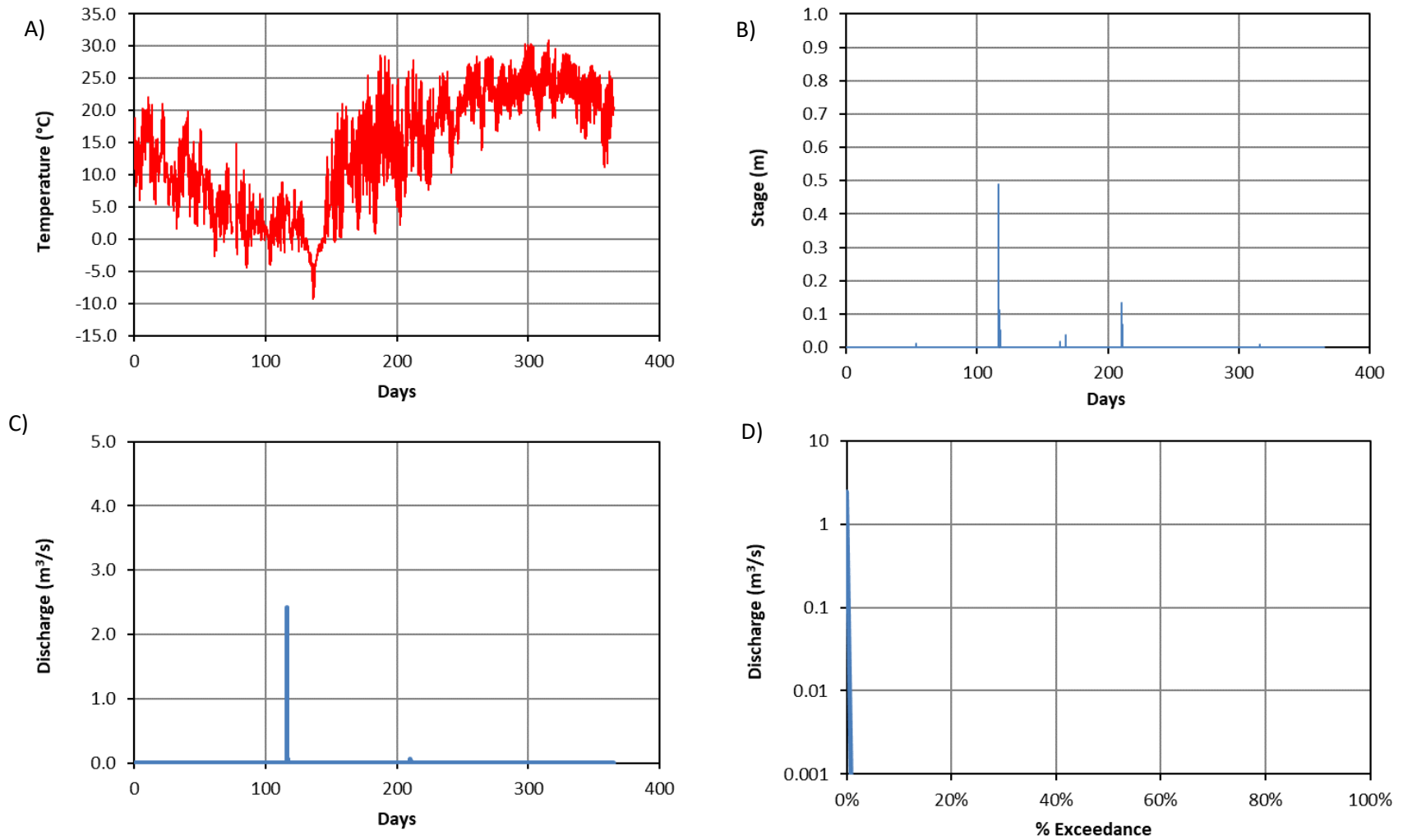


Figure 14. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Polecat Hollow.



Table 13. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Polecat Hollow

<b>Day</b>	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
<b>1</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>2</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>3</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>4</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>5</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>6</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>7</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>8</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>10</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>11</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>12</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>13</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>14</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>15</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>16</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>17</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>18</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>19</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>20</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>21</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>22</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>23</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>24</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>25</b>	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>26</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>27</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>28</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>29</b>	0.00	0.00	0.00	0.00		0.00	0.02	0.00	0.00	0.00	0.00	0.00
<b>30</b>	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>31</b>	0.00		0.00	0.00		0.00		0.00		0.00	0.00	
<b>Total</b>	0.00	0.00	0.00	0.23	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
<b>Mean</b>	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Max</b>	0.00	0.00	0.00	0.23	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

South Prong Cedar Bluff Creek (7.28 km<sup>2</sup>)

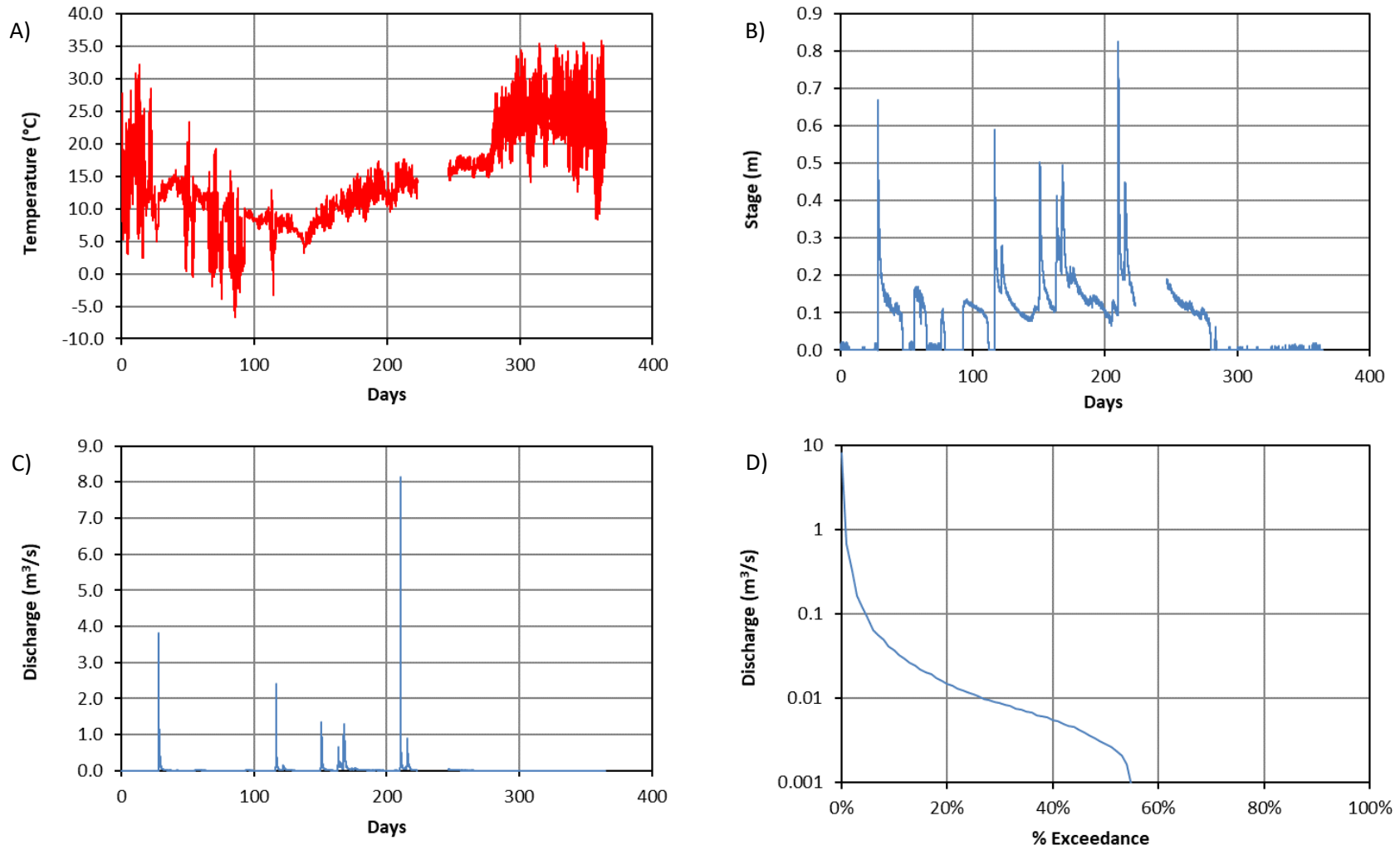


Figure 15. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at South Prong Cedar Bluff Creek.

Table 14. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at South Prong Cedar Bluff Creek.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00	0.04	0.01	0.00	0.04	0.35	0.02	0.07		0.00	0.00	0.00
2	0.00	0.02	0.01	0.01	0.03	0.09	0.02	0.05		0.00	0.00	0.00
3	0.00	0.02	0.01	0.01	0.02	0.04	0.01	0.06		0.00	0.00	0.00
4	0.00	0.01	0.00	0.01	0.02	0.03	0.01	0.46		0.00	0.00	0.00
5	0.00	0.01	0.00	0.01	0.01	0.02	0.01	0.24	0.03	0.00	0.00	0.00
6	0.00	0.01	0.00	0.01	0.01	0.02	0.01	0.08	0.03	0.00	0.00	0.00
7	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.04	0.03	0.00	0.00	0.00
8	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.03	0.02	0.00	0.00	0.00
9	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.00	0.00	0.00
10	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.00	0.00
11	0.00	0.01	0.00	0.01	0.01	0.01	0.01		0.01	0.00	0.00	0.00
12	0.00	0.01	0.00	0.01	0.00	0.01	0.01		0.01	0.00	0.00	0.00
13	0.00	0.01	0.00	0.01	0.00	0.35	0.01		0.01	0.00	0.00	0.00
14	0.00	0.00	0.00	0.01	0.00	0.14	0.01		0.01	0.00	0.00	0.00
15	0.00	0.00	0.00	0.01	0.00	0.16	0.01		0.01	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.08	0.01		0.01	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.49	0.01		0.01	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.66	0.01		0.01	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.16	0.00		0.01	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.07	0.00		0.01	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.05	0.00		0.01	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.03	0.00		0.01	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.05	0.00		0.01	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.01	0.04	0.00		0.01	0.00	0.00	0.00
25	0.00	0.01	0.00	0.73	0.01	0.05	0.01		0.00	0.00	0.00	0.00
26	0.00	0.02	0.00	0.20	0.01	0.06	0.01		0.00	0.00	0.00	0.00
27	0.00	0.02	0.00	0.06	0.01	0.04	0.01		0.00	0.00	0.00	0.00
28	0.00	0.02	0.00	0.03	0.49	0.03	0.01		0.00	0.00	0.00	0.00
29	1.45	0.02	0.00	0.02		0.03	1.29		0.00	0.00	0.00	0.00
30	0.25	0.02	0.00	0.05		0.02	0.20		0.00	0.00	0.00	0.00
31	0.07		0.00	0.10		0.02				0.00	0.00	
<b>Total</b>	1.77	0.27	0.04	1.31	0.72	3.14	1.74	1.07	0.29	0.02	0.00	0.00
<b>Mean</b>	0.06	0.01	0.00	0.04	0.03	0.10	0.06	NA	NA	0.00	0.00	0.00
<b>Max</b>	1.45	0.04	0.01	0.73	0.49	0.66	1.29	0.46	0.03	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00

**Fools Catch (7.82 km<sup>2</sup>)**

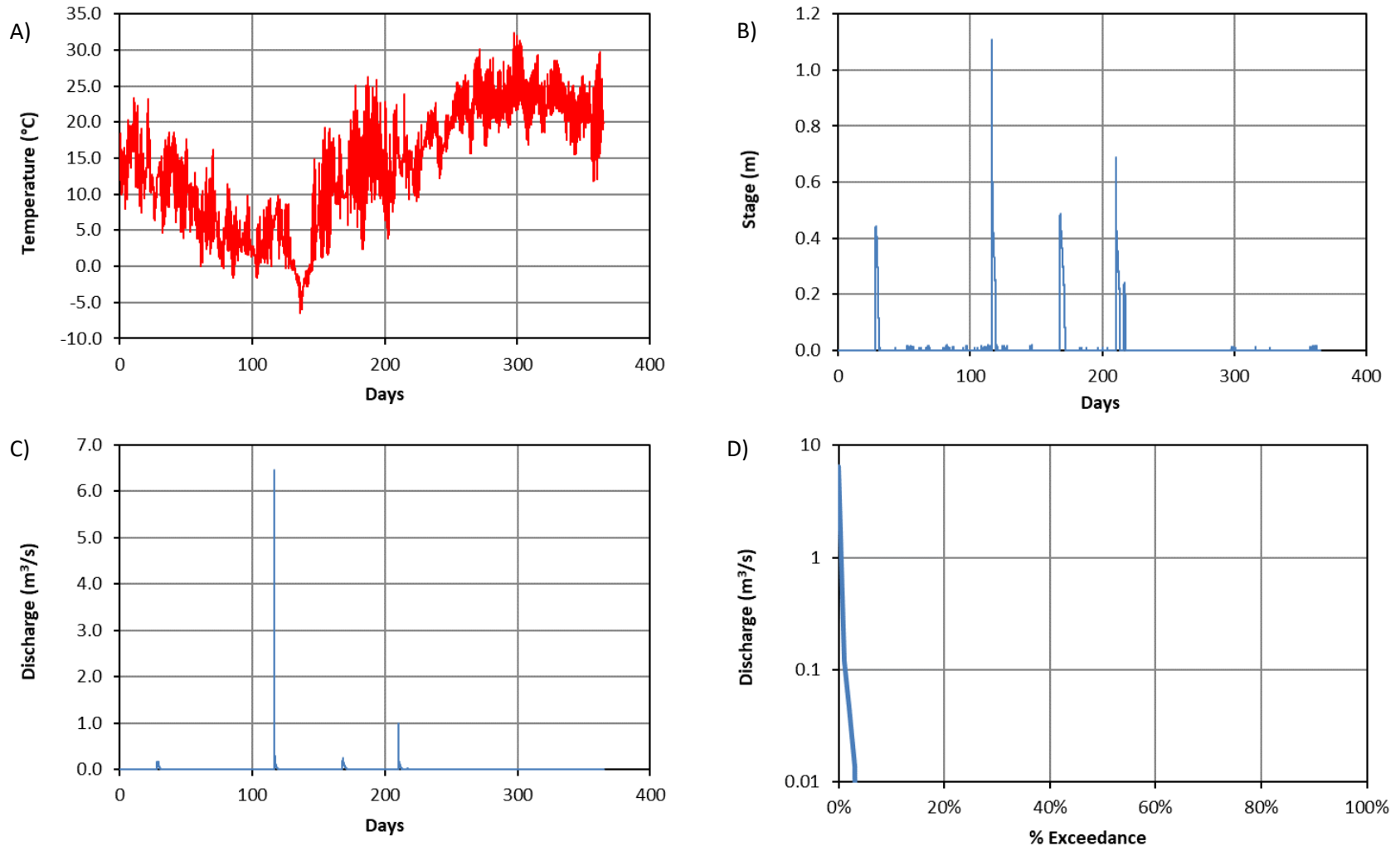


Figure 16. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Fools Catch.

Table 15. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Fools Catch

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.11	0.00	0.00	0.00		0.00	0.17	0.00	0.00	0.00	0.00	0.00
30	0.07	0.00	0.00	0.00		0.00	0.07	0.00	0.00	0.00	0.00	0.00
31	0.01		0.00	0.00		0.00		0.00		0.00	0.00	
<b>Total</b>	0.20	0.00	0.00	1.03	0.00	0.34	0.24	0.03	0.00	0.00	0.00	0.00
<b>Mean</b>	0.01	0.00	0.00	0.03	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
<b>Max</b>	0.11	0.00	0.00	0.88	0.00	0.18	0.17	0.02	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Highway J (8.82 km<sup>2</sup>)

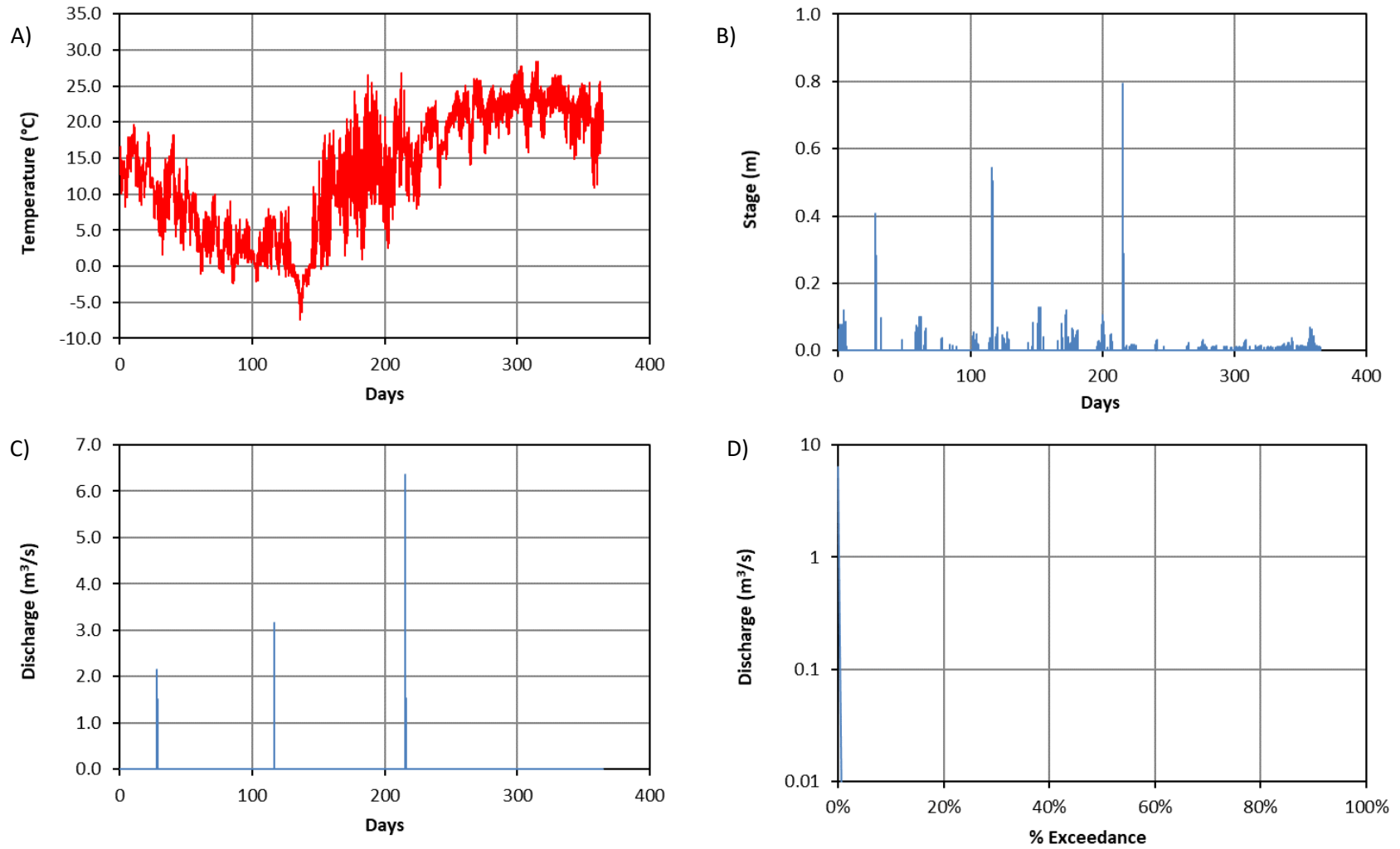


Figure 17. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Highway J.

Table 16. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Highway J.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.73	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.00	0.00		0.00		0.00		0.00	0.00	
<b>Total</b>	0.73	0.00	0.00	0.72	0.00	0.00	0.00	1.83	0.00	0.00	0.00	0.00
<b>Mean</b>	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
<b>Max</b>	0.73	0.00	0.00	0.72	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Middle Big Barren Creek (47.76 km<sup>2</sup>)

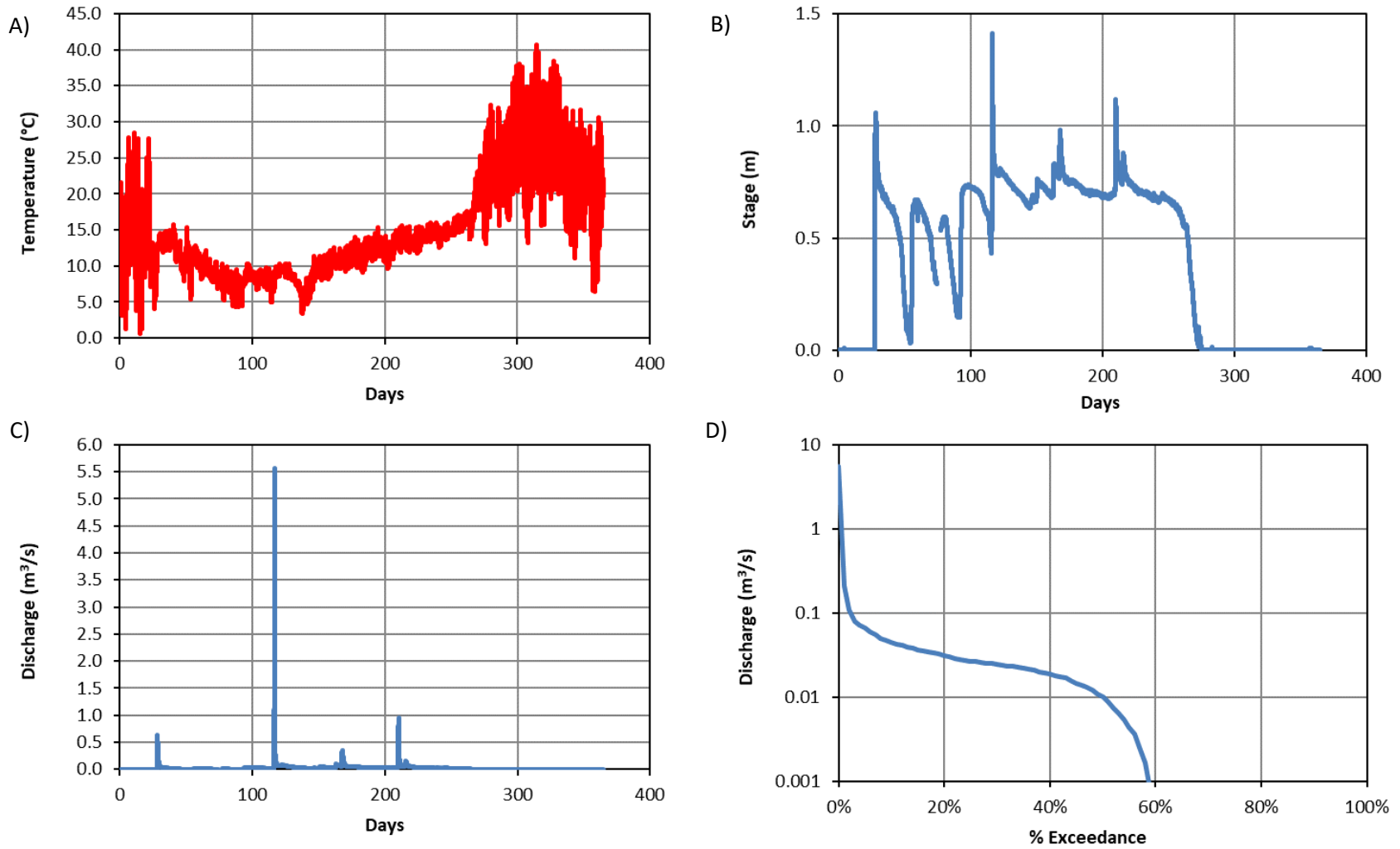


Figure 18. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Middle Big Barren.



Table 17. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Middle Big Barren.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.00	0.04	0.01	0.00	0.07	0.04	0.04	0.06	0.02	0.00	0.00	0.00
2	0.00	0.03	0.01	0.02	0.06	0.04	0.03	0.05	0.02	0.00	0.00	0.00
3	0.00	0.03	0.01	0.03	0.06	0.04	0.03	0.04	0.02	0.00	0.00	0.00
4	0.00	0.02	0.01	0.03	0.06	0.04	0.03	0.11	0.02	0.00	0.00	0.00
5	0.00	0.02	0.01	0.04	0.05	0.04	0.03	0.10	0.02	0.00	0.00	0.00
6	0.00	0.02	0.01	0.04	0.05	0.03	0.03	0.06	0.02	0.00	0.00	0.00
7	0.00	0.02	0.00	0.04	0.04	0.03	0.03	0.05	0.02	0.00	0.00	0.00
8	0.00	0.01	0.00	0.03	0.04	0.03	0.03	0.05	0.02	0.00	0.00	0.00
9	0.00	0.01	0.00	0.03	0.04	0.03	0.03	0.04	0.02	0.00	0.00	0.00
10	0.00	0.01	0.00	0.03	0.03	0.02	0.03	0.04	0.02	0.00	0.00	0.00
11	0.00	0.01	0.00	0.03	0.03	0.02	0.03	0.04	0.01	0.00	0.00	0.00
12	0.00	0.01	0.00	0.03	0.03	0.02	0.03	0.03	0.01	0.00	0.00	0.00
13	0.00	0.01	0.00	0.03	0.03	0.07	0.03	0.03	0.01	0.00	0.00	0.00
14	0.00	0.00		0.03	0.03	0.08	0.03	0.03	0.01	0.00	0.00	0.00
15	0.00	0.00		0.03	0.02	0.07	0.02	0.03	0.01	0.00	0.00	0.00
16	0.00	0.00		0.02	0.02	0.06	0.02	0.03	0.01	0.00	0.00	0.00
17	0.00	0.00		0.02	0.02	0.15	0.02	0.03	0.01	0.00	0.00	0.00
18	0.00	0.00	0.00	0.02	0.02	0.23	0.02	0.03	0.01	0.00	0.00	0.00
19	0.00	0.00	0.01	0.01	0.02	0.10	0.02	0.03	0.00	0.00	0.00	0.00
20	0.00	0.00	0.01	0.01	0.01	0.06	0.02	0.03	0.00	0.00	0.00	0.00
21	0.00	0.00	0.01	0.01	0.01	0.05	0.02	0.03	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.01	0.01	0.05	0.02	0.02	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.01	0.05	0.02	0.02	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.02	0.04	0.02	0.02	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	1.08	0.02	0.04	0.02	0.02	0.00	0.00	0.00	0.00
26	0.00	0.01	0.00	0.20	0.02	0.04	0.02	0.02	0.00	0.00	0.00	0.00
27	0.00	0.01	0.00	0.09	0.02	0.04	0.02	0.02	0.00	0.00	0.00	0.00
28	0.01	0.02	0.00	0.07	0.03	0.04	0.03	0.02	0.00	0.00	0.00	0.00
29	0.39	0.02	0.00	0.06		0.04	0.33	0.02	0.00	0.00	0.00	0.00
30	0.12	0.01	0.00	0.06		0.04	0.10	0.02	0.00	0.00	0.00	0.00
31	0.05		0.00	0.08		0.04		0.02		0.00	0.00	
<b>Total</b>	0.57	0.31	0.10	2.18	0.88	1.68	1.15	1.15	0.29	0.00	0.00	0.00
<b>Mean</b>	0.02	0.01	NA	0.07	0.03	0.05	0.04	0.04	0.01	0.00	0.00	0.00
<b>Max</b>	0.39	0.04	0.01	1.08	0.07	0.23	0.33	0.11	0.02	0.00	0.00	0.00
<b>Min</b>	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.00

Lower Natural Area (124.2 km<sup>2</sup>)

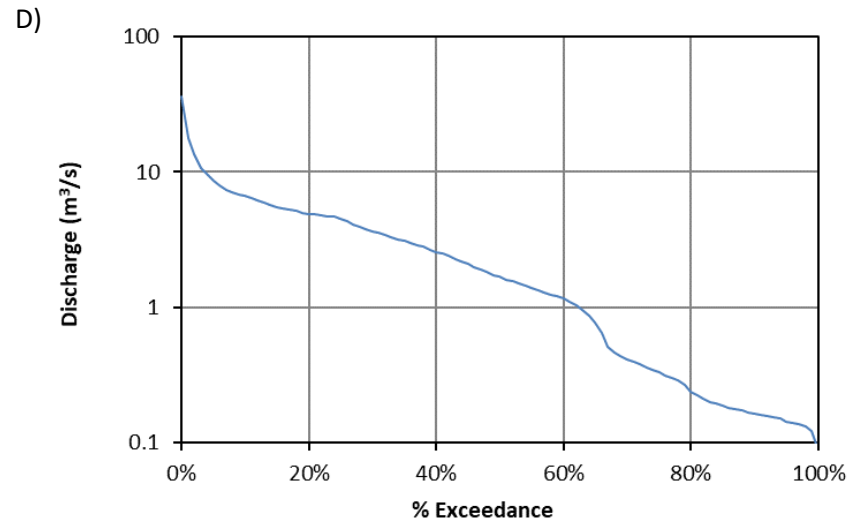
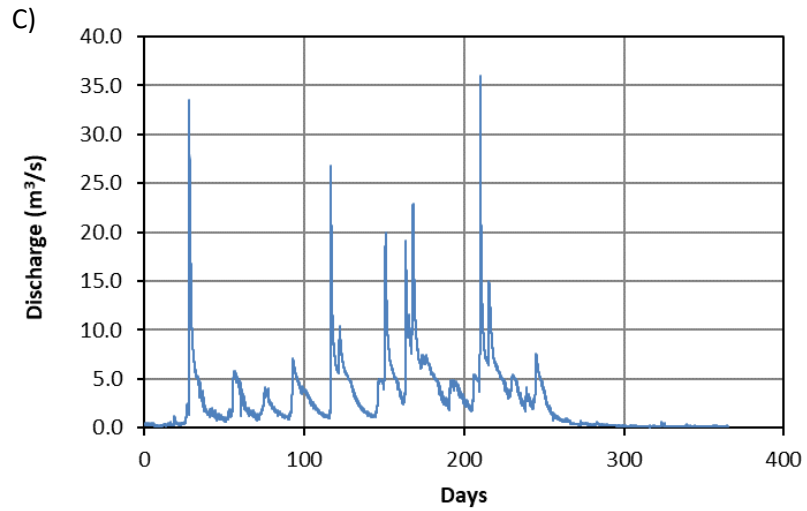
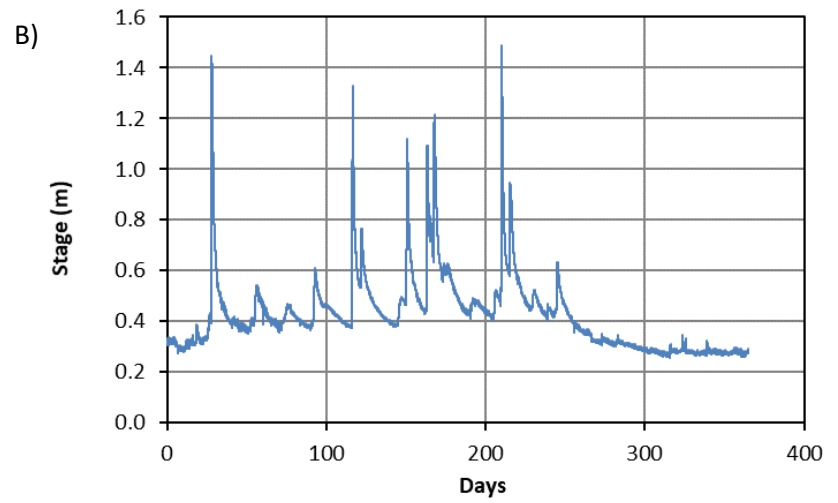
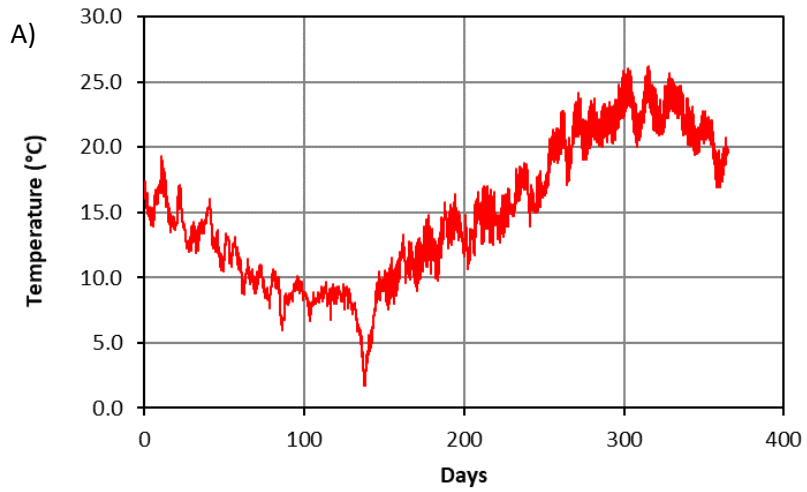


Figure 19. WY2021 A) temperature, B) stage, C) discharge, and D) flow duration curve collected from gaging station at Lower Natural Area.

Table 18. Daily Mean Discharge (m<sup>3</sup>/s) for WY 2021 at Lower Natural Area.

Day	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1	0.38	6.24	3.08	4.89	7.37	13.19	4.94	8.54	2.49	0.48	0.19	0.15
2	0.41	5.46	2.49	6.39	6.38	8.77	4.67	7.26	4.48	0.44	0.18	0.15
3	0.39	4.88	2.02	5.58	5.79	7.21	4.08	6.89	7.05	0.42	0.17	0.15
4	0.37	4.19	1.77	5.03	5.44	6.26	3.49	12.56	5.88	0.40	0.17	0.15
5	0.41	3.63	1.63	4.66	5.09	5.74	3.10	11.82	5.15	0.37	0.16	0.26
6	0.35	2.97	1.57	3.98	4.83	5.25	2.77	8.80	4.67	0.34	0.14	0.18
7	0.27	2.37	1.55	3.79	4.48	4.90	2.69	7.29	4.15	0.32	0.14	0.17
8	0.23	1.78	1.48	3.87	3.79	4.47	2.67	6.58	3.35	0.32	0.14	0.16
9	0.22	1.53	1.17	3.72	3.33	3.85	2.68	6.22	2.73	0.32	0.14	0.17
10	0.22	1.39	1.10	3.51	2.93	3.25	4.17	5.80	2.23	0.37	0.13	0.17
11	0.21	1.68	1.12	3.22	2.61	2.83	4.67	5.39	1.90	0.45	0.13	0.16
12	0.25	1.57	1.39	2.87	2.31	3.03	4.44	5.08	1.60	0.37	0.12	0.16
13	0.34	1.46	1.74	2.58	2.08	14.61	4.50	4.82	1.35	0.34	0.20	0.16
14	0.32	1.29	2.48	2.38	1.87	11.03	4.34	4.40	1.23	0.33	0.17	0.15
15	0.34	1.19	3.51	2.25	1.75	10.63	3.93	3.98	1.11	0.30	0.18	0.15
16	0.37	1.11	3.57	2.03	1.60	8.83	3.59	3.38	1.01	0.30	0.18	0.15
17	0.39	1.09	3.31	1.79	1.51	14.75	3.27	3.40	0.89	0.30	0.17	0.15
18	0.32	1.08	2.59	1.61	1.40	17.82	2.97	4.11	0.82	0.28	0.17	0.14
19	0.79	0.93	2.28	1.48	1.29	11.25	2.64	5.30	0.76	0.27	0.18	0.15
20	0.64	0.87	2.04	1.39	1.22	8.60	2.66	5.11	0.70	0.27	0.33	0.15
21	0.42	0.96	1.84	1.26	1.22	7.32	2.37	4.74	0.77	0.25	0.23	0.17
22	0.39	1.54	1.72	1.24	1.32	6.53	2.14	4.13	0.75	0.25	0.20	0.18
23	0.42	1.55	1.55	1.16	2.42	6.86	1.98	3.50	0.69	0.23	0.16	0.18
24	0.47	1.55	1.47	1.09	4.68	6.96	2.93	2.98	0.56	0.22	0.16	0.17
25	0.48	4.10	1.35	15.88	4.87	6.78	5.27	2.56	0.42	0.21	0.16	0.16
26	0.65	5.54	1.25	12.58	4.76	7.21	5.14	2.41	0.41	0.20	0.16	0.15
27	1.81	5.12	1.17	8.33	4.51	6.71	4.90	2.61	0.39	0.20	0.15	0.13
28	2.70	4.88	1.15	6.70	11.49	6.25	5.48	3.12	0.39	0.19	0.14	0.14
29	23.03	4.28	1.10	5.94		5.73	20.43	3.07	0.37	0.18	0.14	0.14
30	12.05	3.66	1.14	6.33		5.44	11.83	2.59	0.39	0.17	0.15	0.17
31	7.88		1.49	9.35		5.20		2.26		0.18	0.13	
<b>Total</b>	57.53	79.90	57.10	136.87	102.32	237.24	134.74	160.68	58.66	9.26	5.18	4.81
<b>Mean</b>	1.86	2.66	NA	4.42	3.65	7.65	4.49	5.18	1.96	0.30	0.17	0.16
<b>Max</b>	23.03	6.24	3.57	15.88	11.49	17.82	20.43	12.56	7.05	0.48	0.33	0.26
<b>Min</b>	0.21	0.87	1.10	1.09	1.22	2.83	1.98	2.26	0.37	0.17	0.12	0.13