

KANSAS-NEBRASKA BIG BLUE RIVER COMPACT REPORT
U.S. Geological Survey—Water Year 2022

The U.S. Geological Survey (USGS) continues to operate two streamflow gaging stations for the Compact Administration—Big Blue River at Barneston, NE (06882000), and Little Blue River at Hollenberg, KS (06884025). An electronic data logger (EDL) at each station automatically records streamflow stage every 15 minutes. Every hour, these instantaneous values are transmitted via satellite to USGS offices, where they are used to compute preliminary values of instantaneous and daily discharge that are immediately posted to the USGS National Water Information System (NWIS) website (addresses shown below). Before the data are finalized, updates and revisions are made as needed, based on a series of quality checks and reviews. Finalized values of daily discharge and daily gage height, along with associated summary statistics are published annually on a site-by-site basis on the NWIS web page (address shown below).

During water year (WY) 2022 (October 1, 2021, to September 30, 2022), periodic visits were made to the stations to maintain and calibrate the sensing and recording equipment, make discharge measurements, and download the data directly from the EDLs, as a backup to the satellite-telemetered data. The discharge measurements were used to determine shifts from the stage-discharge relations (rating curves) that were then used to convert stage values to corresponding values of discharge.

For each of the State delegations and the Compact chairman, copies of the WY 2022 published data (manuscript, discharge daily values, statistics tables, and daily discharge hydrograph) from the NWIS web page are attached for each station. These water-year summaries (PDF files) are available online within the NWIS site page for each of the streamgages, along with data for other streamgages for the Nation. Also attached are plots of the annual mean discharges for the periods of record, and plots of the daily discharges for WY 2022 compared to those for the median daily statistic for each day of the year.

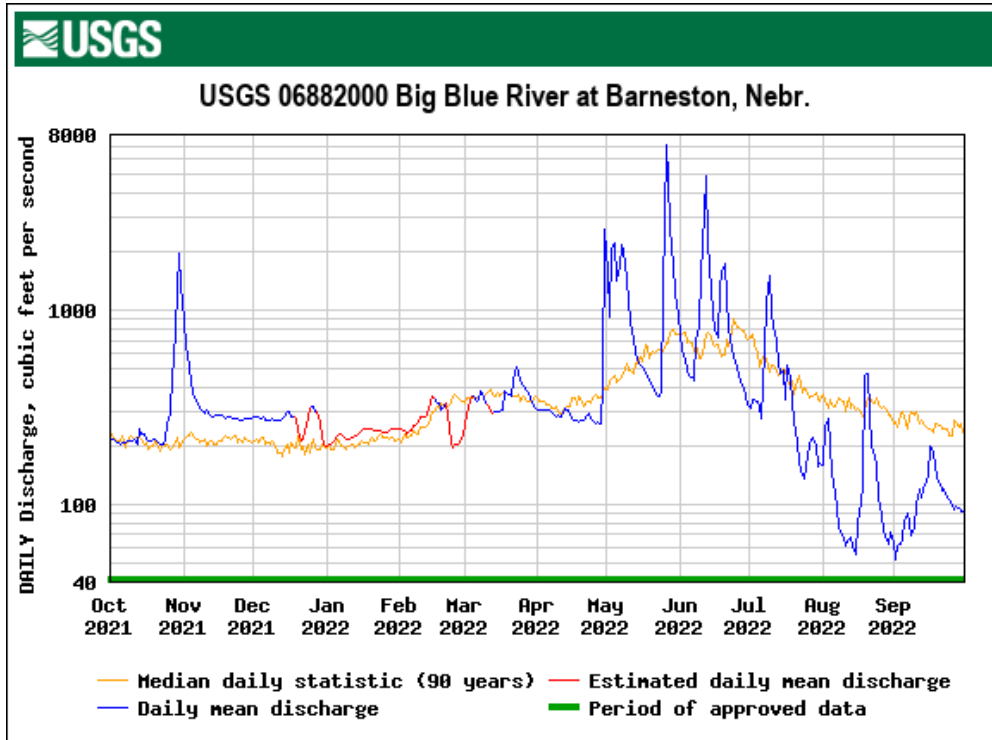
Current (real-time) and historical data on surface water, groundwater, and water quality for the Nation can be accessed and downloaded via the Water Resources of the United States website (<https://www2.usgs.gov/water/>) or from the Nebraska Water Science Center website (<https://www.usgs.gov/centers/ne-water>). All unit values and daily values of discharge can be accessed using the NWIS web, as well as all unit values and daily values of gage height since October 2007.

Jason Lambrecht
Deputy Director, Hydrologic Observations Chief

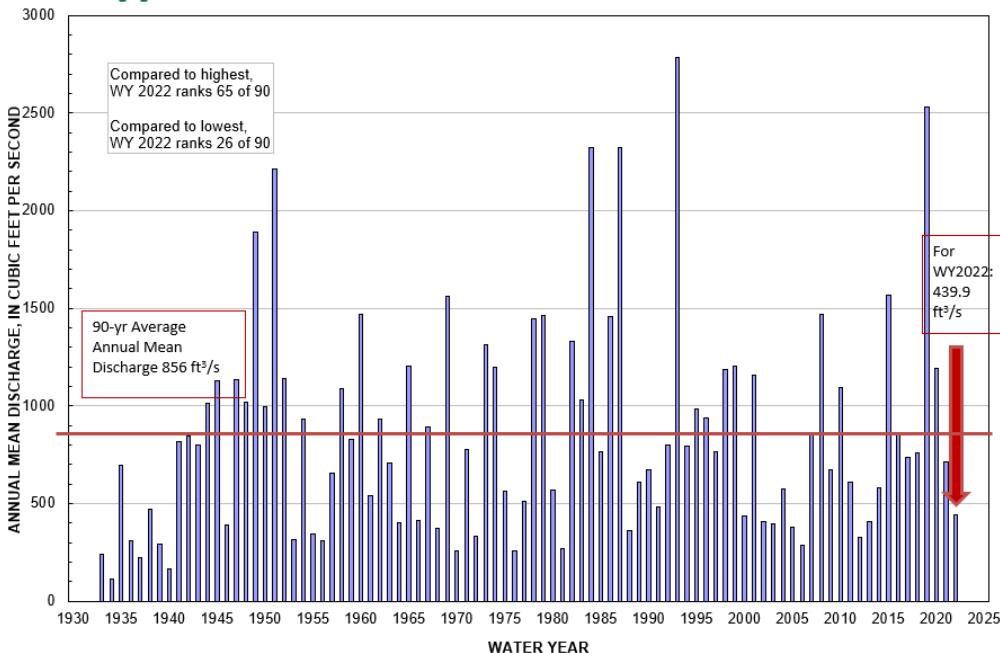
U.S. Geological Survey, Nebraska Water Science Center
5231 S. 19th St., Lincoln, NE 68512-1271
(jlambre@usgs.gov)
402-328-4124 (office), 402-416-2363 (mobile)

May 9, 2023

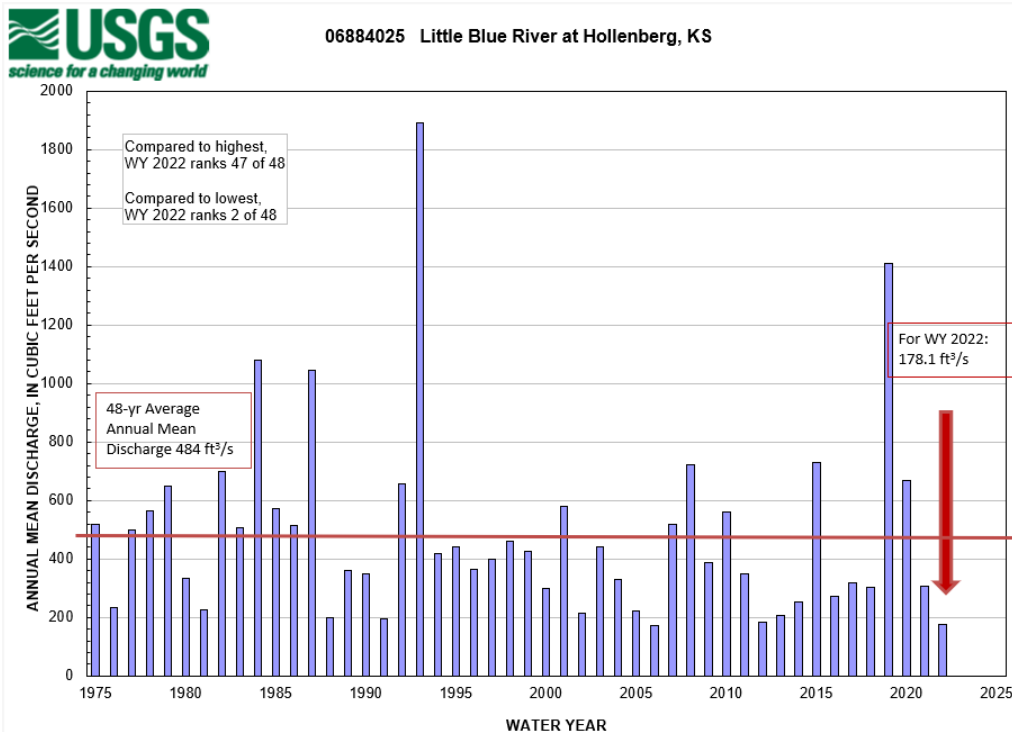
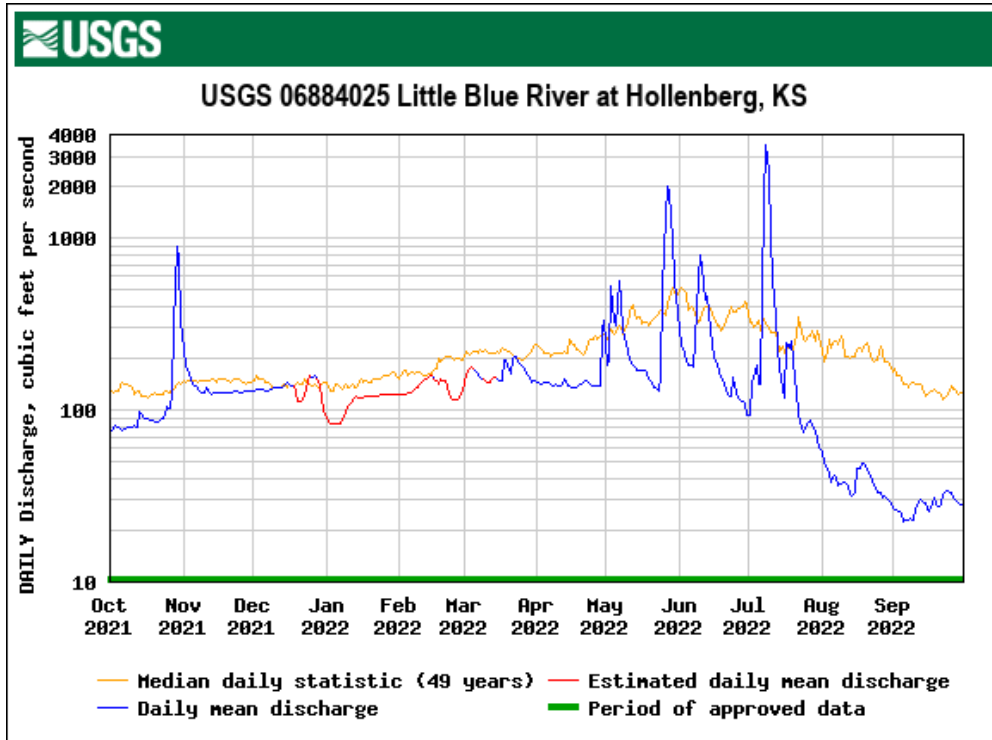
For station **06882000 Big Blue River at Barneston**, 11 discharge (and stage) measurements, ranging from 73.1 ft³/s (3.14 ft stage) to 1,130 ft³/s (5.51 ft stage), were made during WY 2022. The annual mean discharge of 439.9 ft³/s was 1.6 times less than that of the WY 2021 mean of 712.6 ft³/s; and 1.9 times lower than the new historical mean of 856 ft³/s for WYs 1933–2022 (90 years of record). The maximum and minimum daily discharges were 7,030 ft³/s on May 26, 2022 (peak of record daily mean was 50,000 ft³/s on June 9, 1941); and 52.0 ft³/s on September 1, 2022.



06882000 Big Blue River at Barneston, NE



For station **06884025 Little Blue River at Hollenberg**, 15 discharge (and stage) measurements, ranging from 23.1 ft³/s (1.47 ft stage) to 2,740 ft³/s (6.23 ft stage), were made during WY 2022. The annual mean discharge of 178.1 ft³/s was 1.7 times less than that of the WY 2021 mean of 306.9 ft³/s; and 2.7 times lower than the new historical mean of 484 ft³/s for WYs 1975–2022 (48 years of record). The maximum and minimum daily discharges were 3,480 ft³/s on July 8, 2022 (peak of record daily mean was 39,300 ft³/s on July 26, 1992); and 22.6 ft³/s on September 5, 2022 (new record low).





USGS Water-Year Summary 2022

06882000 Big Blue River at Barneston, Nebr.

LOCATION - Lat 40°02'41", long 96°35'14" referenced to North American Datum of 1983, in NE 1/4 NW 1/4 sec.24, T.1 N., R.7 E., Gage County, NE, Hydrologic Unit 10270202, on right bank just downstream of bridge on State Highway 8, 0.6 mi southwest of Barneston, 1.3 mi upstream from Plum Creek, and 4.3 mi upstream from Nebraska-Kansas State line.

DRAINAGE AREA - 4,447 mi² of which 77 mi² probably is noncontributing.

[REVISIONS HISTORY](#) - WSP 896: 1932, 1935. WSP 1919: Drainage area.

SURFACE-WATER RECORDS

PERIOD OF RECORD - May 1932 to current year.

GAGE - Water-stage recorder with satellite telemetry. Datum of gage is 1,162.20 ft above sea level. Prior to June 9, 1941, water-stage recorder at site 0.3 mi downstream at datum 1.56 ft higher. June 9 to Nov. 17, 1941, non-recording gage, and Nov. 18, 1941 to Sept. 30, 1979, water-stage recorder at site 0.7 mi upstream at datum 2.0 ft higher.

REMARKS - Accuracy of records for water years prior to 2014 are noted in the individual Annual Data Reports for those water years. For water years 2014 onward, records fair to good except for estimated daily discharges, which are poor, unless otherwise noted.

EXTREMES FOR PERIOD OF RECORD - Maximum peak flow, 57,700 ft³/s, June 9, 1941, gage height, 34.30 ft, at site datum then in use.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2023, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [May 1, 2023], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&93783&adr_begin_date=2021-10-01&adr_end_date=2022-09-30&site_no=06882000&agency_cd=USGS

Water-Data Report 2022
06882000 Big Blue River at Barneston, Nebr. -- Continued

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2021-10-01 to 2022-09-30
DAILY MEAN VALUES

[e, Value has been estimated.]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2021	2021	2021	2022	2022	2022	2022	2022	2022	2022	2022	2022
1	217	890	280	e201	e245	e255	306	1,570	743	315	160	52.0
2	216	650	281	e202	e245	e292	309	926	623	346	248	60.7
3	212	512	283	e205	e242	e338	304	2,090	553	347	275	62.4
4	208	425	279	e211	e231	362	304	2,210	495	338	199	65.9
5	205	379	281	e219	e234	359	304	1,420	466	310	144	81.9
6	207	343	272	e225	e242	342	306	1,680	452	277	114	91.1
7	210	324	271	e229	e253	346	298	2,180	438	619	95.3	80.4
8	212	312	272	e227	e257	383	291	1,990	706	1,080	75.8	69.7
9	212	298	275	e219	e265	352	283	1,460	819	1,510	69.7	75.9
10	213	293	274	e217	e281	336	291	1,100	1,580	989	66.9	100
11	217	304	272	e216	e285	325	284	872	2,150	823	61.2	121
12	206	286	272	e220	e282	e302	293	714	4,890	688	65.9	109
13	247	282	278	e224	e291	295	311	616	2,230	533	67.5	121
14	231	285	284	e228	e310	299	309	549	1,290	470	61.2	129
15	230	289	302	e234	e362	300	288	520	969	495	55.6	141
16	215	289	301	e242	353	303	275	515	782	349	79.8	201
17	211	286	284	e246	333	307	271	467	719	522	105	183
18	213	280	284	e247	334	382	273	466	1,310	444	124	160
19	215	278	e273	e247	309	377	265	437	1,570	338	459	135
20	219	280	e240	e244	317	369	271	407	1,750	271	475	128
21	209	281	e211	e241	335	359	272	381	1,180	207	293	117
22	203	276	e217	e240	e288	434	287	372	805	163	199	119
23	205	276	e235	e239	e208	508	296	364	634	141	178	109
24	219	276	e284	e238	e195	468	276	385	576	135	156	106
25	261	272	310	e237	e202	430	265	1,220	515	156	108	98.6
26	292	273	319	e236	e206	409	262	7,030	462	202	89.1	94.9
27	459	278	301	e236	e210	394	267	4,820	429	213	72.0	97.3
28	538	276	298	e239	e224	377	262	2,680	395	223	69.9	96.6
29	1,250	277	e267	e245		350	410	1,690	363	200	62.5	92.3
30	1,970	275	e222	e247		333	2,600	1,240	325	157	72.7	92.7
31	1,340		e202	e246		314		949		163	64.0	
Total	11,260	10,040	8,424	7,147	7,539	11,000	11,030	43,320	30,220	13,020	4,366	3,191
Mean	363	335	272	231	269	355	368	1,397	1,007	420	141	106
Max	1970	890	319	247	362	508	2600	7030	4890	1510	475	201
Min	203	272	202	201	195	255	262	364	325	135	55.6	52.0
Ac-ft	22,340	19,920	16,710	14,180	14,950	21,820	21,880	85,920	59,940	25,829	8,660	6,330

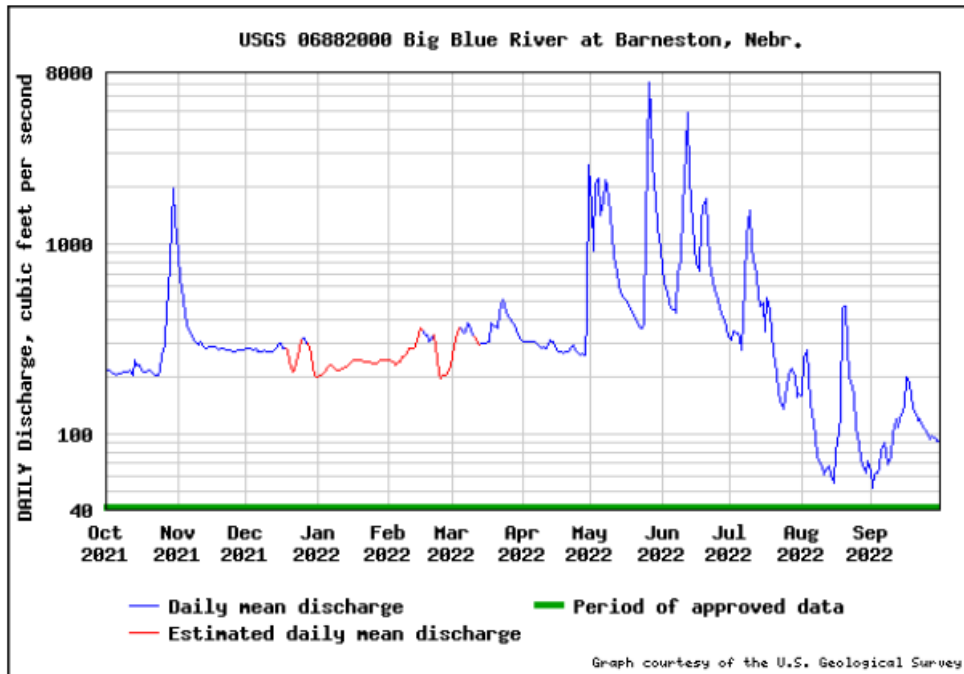
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1933 - 2022, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	586	309	288	302	592	1,279	805	1,411	2,076	1,218	693	699
Max	7,451	1,526	2,731	1,596	2,876	10,560	5,280	5,207	10,460	12,270	5,227	3,420
(WY)	(1974)	(1999)	(2019)	(1973)	(1984)	(1979)	(1984)	(1995)	(1951)	(1993)	(1954)	(1989)
Min	61.5	77.5	87.4	67.6	116	137	132	96.0	69.3	30.7	21.1	50.6
(WY)	(1941)	(1937)	(1977)	(1937)	(1940)	(1968)	(1934)	(1934)	(1934)	(1934)	(1934)	(1939)

SUMMARY STATISTICS

	Water Year 2022		Water Years 1933 - 2022	
Annual total	160,600			
Annual mean	439.9		855.6	
Highest annual mean			2,781	1993
Lowest annual mean			115.0	1934
Highest daily mean	7,030	May 26	50,000	Jun 09, 1941
Lowest daily mean	52.0	Sep 01	1.00	Nov 30, 1945
Annual 7-day minimum	62.9	Aug 29	15.1	Aug 03, 1934
Maximum peak flow	7,930	May 26	57,700	Jun 09, 1941
Maximum peak stage	13.51	May 26	34.30 ^a	Jun 09, 1941
Annual runoff (cfsm)	0.099		0.192	
Annual runoff (inches)	1.34		2.61	
10 percent exceeds	842.6		1,750	
50 percent exceeds	280.0		288.0	
90 percent exceeds	109.0		110.0	

^a Gage height at different site and(or) datum





USGS Water-Year Summary 2022

06884025 Little Blue River at Hollenberg, KS

LOCATION - Lat 39°58'49", long 97°00'17" referenced to North American Datum of 1983, in NE 1/4 SW 1/4 sec.8, T.1 S., R.4 E., Washington County, KS, Hydrologic Unit 10270207, on right bank just downstream from bridge on county road, 0.6 mi west of Hollenberg, 1.8 mi downstream from Nebraska-Kansas State line, and at mile 43.1.

DRAINAGE AREA - 2,752 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD - March 1973 to February 1974 (discharge measurements only), March 1974 to current year.

GAGE - Water-stage recorder with satellite telemetry. Datum of gage is 1,216.10 ft above sea level.

REMARKS - Accuracy of records for water years prior to 2014 are noted in the individual Annual Data Reports for those water years. For water years 2014 onward, records good except for estimated daily discharges, which are poor, unless otherwise noted. Discharge measurements made prior to 1974 water year are published in table of miscellaneous sites in WDR NE-73.

EXTREMES OUTSIDE PERIOD OF RECORD - A gage height of 23.07 ft, present datum, from floodmark, discharge not determined, occurred October 12, 1973.

EXTREMES FOR PERIOD OF RECORD -

Maximum peak flow, 59,200 ft³/s, May 7, 2015, gage height, 22.97 ft, site and datum then in use.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2023, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [May 1, 2023], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=893795&adr_begin_date=2021-10-01&adr_end_date=2022-09-30&site_no=06884025&agency_cd=USGS

Water-Data Report 2022
06884025 Little Blue River at Hollenberg, KS -- Continued

**DISCHARGE, CUBIC FEET PER SECOND
YEAR 2021-10-01 to 2022-09-30
DAILY MEAN VALUES**

[e, Value has been estimated.]

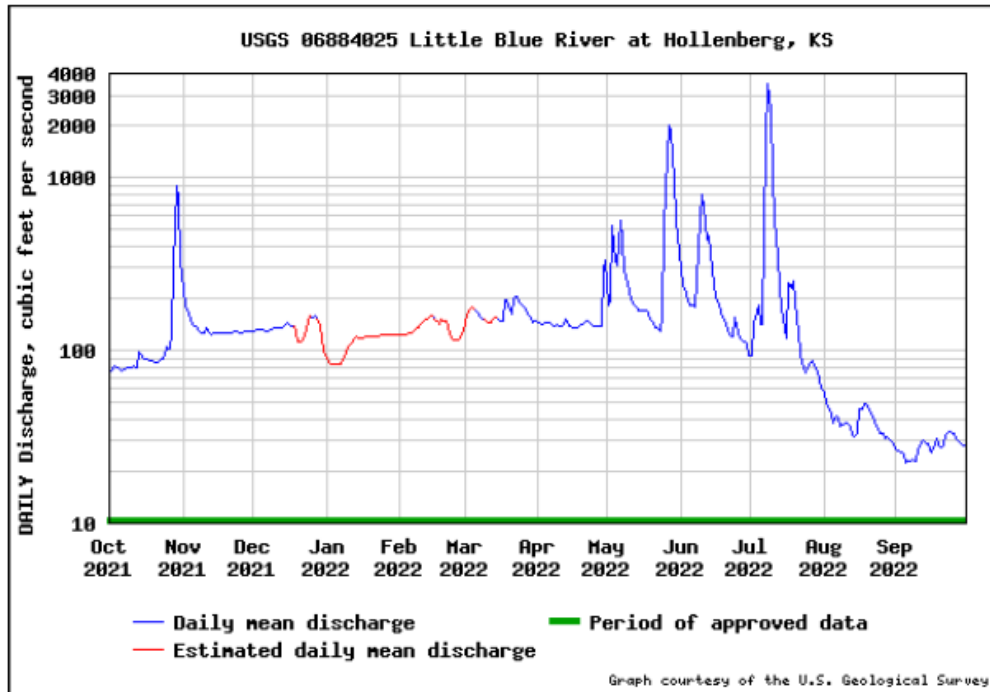
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2021	2021	2021	2022	2022	2022	2022	2022	2022	2022	2022	2022
1	76.1	225	130	e88.4	e124	e146	145	184	286	93.0	57.3	26.0
2	77.6	184	131	e84.4	e123	e163	144	190	240	145	48.6	26.2
3	80.6	161	132	e83.0	e123	e173	143	522	212	151	46.2	25.6
4	79.3	148	131	e82.5	e124	e178	145	321	193	181	42.2	24.3
5	77.4	142	132	e83.1	e125	175	146	312	184	143	38.0	22.6
6	76.8	137	130	e83.2	e127	165	145	571	181	141	41.6	23.1
7	77.8	132	129	e83.6	e130	160	141	424	180	1,620	41.1	23.1
8	78.8	129	131	e88.0	e133	154	139	291	253	3,480	36.2	23.5
9	79.0	126	132	e96.7	e136	150	140	244	592	2,490	36.8	22.9
10	80.4	126	134	e104	e141	e148	139	215	795	1,010	37.8	26.3
11	82.2	134	135	e108	e146	e145	138	196	672	578	38.2	29.6
12	80.3	125	136	e113	e151	e146	142	181	437	344	36.1	29.9
13	97.6	123	136	e118	e153	e153	150	179	456	233	32.2	29.6
14	95.6	126	138	e121	e155	154	139	169	298	175	31.8	28.7
15	88.8	126	144	e119	157	152	137	171	242	132	33.4	26.4
16	89.0	127	143	e118	153	149	136	171	203	118	46.0	25.6
17	88.5	127	139	e119	e147	149	135	169	183	248	45.8	28.3
18	87.9	125	138	e120	e142	195	136	162	168	230	49.4	31.0
19	86.5	125	e127	e121	e152	194	138	153	154	249	49.5	27.9
20	85.3	125	e112	e121	147	171	142	144	142	193	46.0	27.7
21	84.8	125	e112	e120	148	162	145	136	131	125	42.6	28.2
22	86.4	125	e115	e120	e134	198	148	134	123	95.2	41.6	32.2
23	89.5	128	e124	e121	e118	204	146	130	121	78.3	36.0	33.5
24	93.7	128	e144	e122	e114	191	140	157	154	74.5	34.8	33.7
25	105	126	157	e122	e114	186	137	517	126	78.0	33.3	32.8
26	103	127	156	e122	e115	179	138	1,350	119	85.3	32.8	30.8
27	125	128	157	e123	e119	169	138	2,020	115	87.2	30.6	30.0
28	307	128	150	e124	e130	160	137	1,820	112	82.2	31.4	29.1
29	900	129	e142	e124		153	291	974	107	75.5	29.9	28.4
30	741	130	e114	e124		146	336	560	93.2	66.9	29.8	28.0
31	334		e100	e124		147		374		60.7	26.8	
Total	4,635	4,047	4,131	3,401	3,781	5,115	4,576	13,139	7,272	12,860	1,204	835
Mean	150	135	133	110	135	165	153	424	242	415	38.8	27.8
Max	900	225	157	124	157	204	336	2020	795	3480	57.3	33.7
Min	76.1	123	100	82.5	114	145	135	130	93.2	60.7	26.8	22.6
Ac-ft	9,193	8,027	8,194	6,746	7,500	10,140	9,076	26,060	14,420	25,510	2,388	1,656

**STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 2022, BY WATER YEAR
(WY)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	341	209	202	183	285	649	439	841	950	808	475	359
Max	2,163	1,113	1,646	577	1,059	3,816	2,379	2,638	4,654	9,014	2,572	1,696
(WY)	(1987)	(1997)	(2019)	(1984)	(1993)	(1993)	(1987)	(2015)	(2015)	(1993)	(1985)	(2018)
Min	45.3	81.1	87.2	74.0	89.1	118	117	103	151	68.1	38.8	27.8
(WY)	(1992)	(1992)	(2013)	(2018)	(2018)	(1981)	(2018)	(2018)	(1981)	(2013)	(2022)	(2022)

SUMMARY STATISTICS

	Water Year 2022		Water Years 1974 - 2022	
Annual total	65,000			
Annual mean	178.1		484.2	
Highest annual mean			1,891	1993
Lowest annual mean			172.9	2006
Highest daily mean	3,480	Jul 08	39,300	Jul 26, 1992
Lowest daily mean	22.6	Sep 05	22.6	Sep 05, 2022
Annual 7-day minimum	23.6	Sep 03	23.6	Sep 03, 2022
Maximum peak flow	4,230	Jul 08	59,200	May 07, 2015
Maximum peak stage	7.46	Jul 08	23.07	Oct 12, 1973
Annual runoff (cfsm)	0.065		0.175	
Annual runoff (inches)	0.878		2.38	
10 percent exceeds	242.8		802.0	
50 percent exceeds	130.0		188.0	
90 percent exceeds	33.1		96.0	



Water Year 2022 Discharge Measurements

Site #	Meas. #	Meas. Date & Time	Meas. Used	Meas. Party	Meas. Agency	Discharge	Gage Height	Meas. Rating	Control Condition
06882000	1514	10/21/2022 11:27	Yes	bhi	USGS	116	3.36	Fair	Clear
06882000	1513	9/6/2022 10:07	Yes	bhi	USGS	90.5	3.22	Fair	Clear
06882000	1512	8/26/2022 9:30	Yes	bhi	USGS	90.1	3.22	Fair	Clear
06882000	1511	8/8/2022 11:22	Yes	kek	USGS	73.1	3.14	Fair	Clear
06882000	1510	7/26/2022 9:10	Yes	bhi	USGS	210	3.65	Fair	Clear
06882000	1509	6/24/2022 12:28	Yes	bhi	USGS	588	4.54	Fair	Clear
06882000	1508	5/10/2022 11:34	Yes	bhi/kek	USGS	1130	5.51	Fair	Clear
06882000	1507	3/29/2022 12:23	Yes	bhi	USGS	347	4.07	Fair	Clear
06882000	1506	2/16/2022 7:32	Yes	bhi	USGS	352	3.98	Fair	Clear
06882000	1505	1/7/2022 14:27	Yes	bhi	USGS	230	4.30	Poor	IceCover
06882000	1504	11/17/2021 11:52	Yes	bhi	USGS	283	3.90	Fair	Clear
06882000	1503	10/5/2021 9:31	Yes	bhi	USGS	211	3.64	Fair	Clear
06884025	636	10/21/2022 9:39	Yes	bhi	USGS	36.1	1.56	Fair	Clear
06884025	635	9/6/2022 11:50	Yes	bhi	USGS	23.1	1.47	Fair	Clear
06884025	634	8/26/2022 11:05	Yes	bhi	USGS	34.3	1.56	Fair	Clear
06884025	633	8/8/2022 13:27	Yes	kek	USGS	36.3	1.58	Fair	DebrisModerate
06884025	632	8/1/2022 10:12	Yes	bhi	USGS	59.7	1.70	Fair	Clear
06884025	631	7/26/2022 10:41	Yes	bhi	USGS	85.1	1.86	Fair	Clear
06884025	630	7/13/2022 13:52	Yes	bhi	USGS	226	2.44	Fair	Clear
06884025	629	7/8/2022 11:40	Yes	bhi	USGS	2740	6.23	Fair	Clear
06884025	628	6/24/2022 10:39	Yes	bhi	USGS	167	2.20	Fair	Clear
06884025	627	5/12/2022 10:28	Yes	bhi	USGS	182	2.30	Fair	Clear
06884025	626	3/29/2022 10:25	Yes	bhi	USGS	158	2.16	Fair	Clear
06884025	625	2/16/2022 9:10	Yes	bhi	USGS	160	2.19	Fair	Clear
06884025	624	1/7/2022 12:17	Yes	bhi	USGS	82.4	2.38	Poor	IceCover
06884025	623	11/17/2021 10:01	Yes	bhi	USGS	124	2.08	Fair	Clear
06884025	622	10/5/2021 11:29	Yes	bhi	USGS	79.2	1.84	Fair	Clear