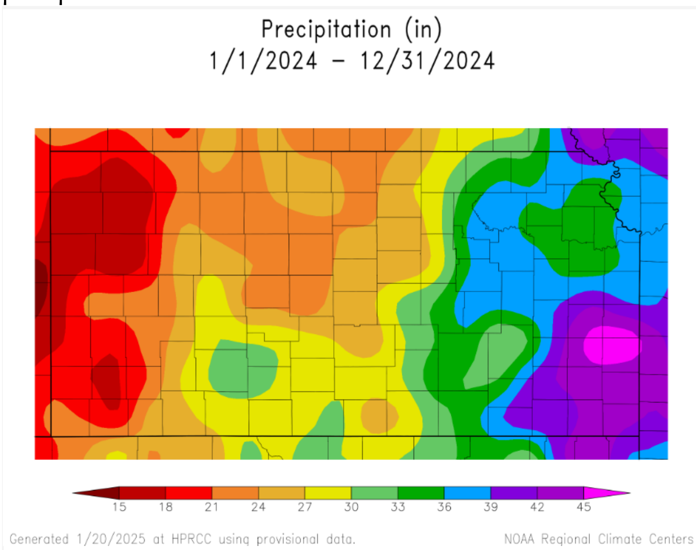
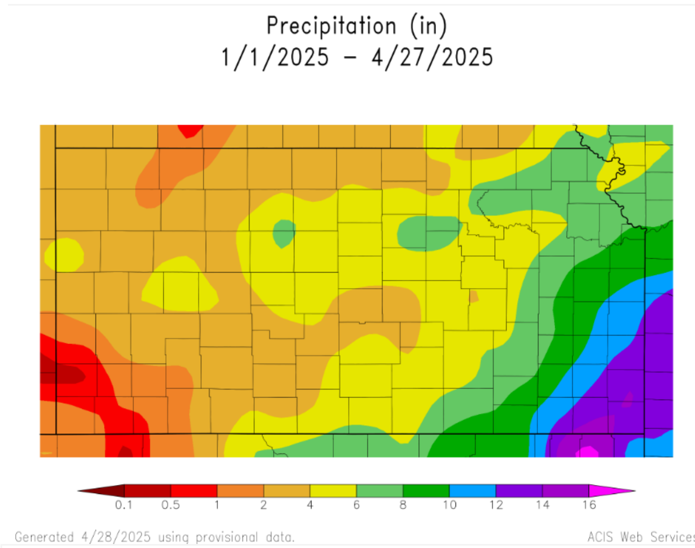
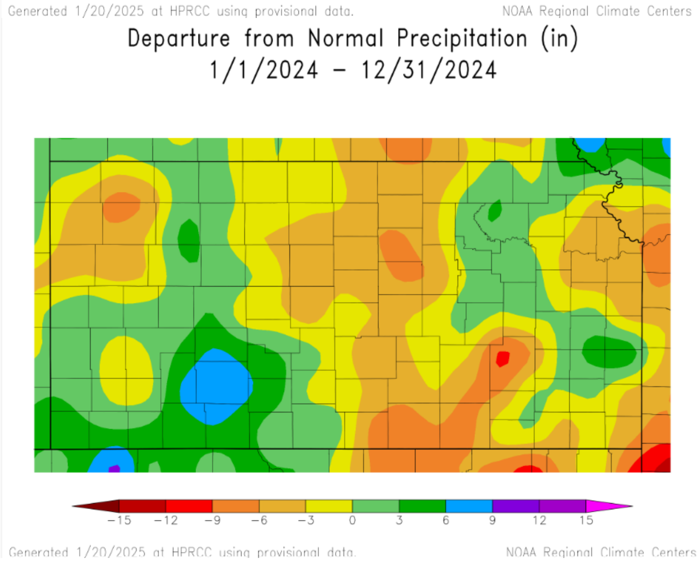
Kansas-Nebraska Big Blue River Compact Meeting, May 7, 2025
Report by Kansas Department of Agriculture, Division of Water Resources
Topeka Field Office

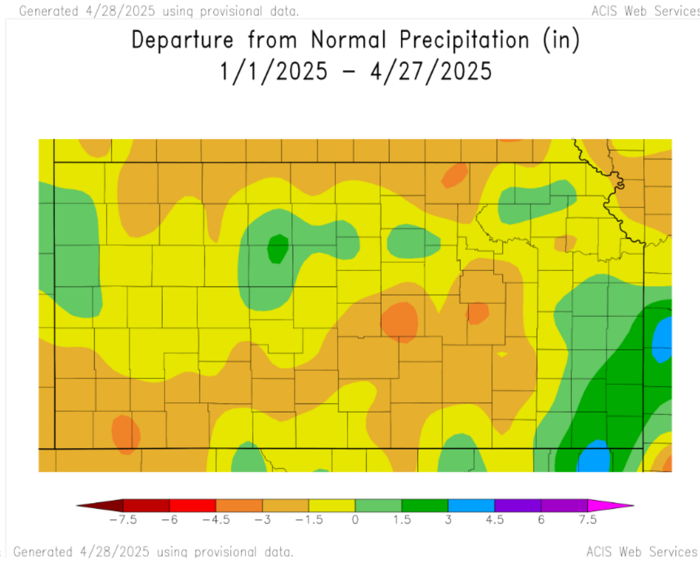
Climatic Conditions - Precipitation & Temperatures

Precipitation was mostly uniform across the Big Blue River basin during the 2024 calendar year, although that was rather less than normal. The High Plains Regional Climate Center reported between 24 and 39 inches of precipitation in calendar year 2024 across the entire Big and Little Blue River basin area in Kansas, including the tributary basins. This represents 80 to 100% of normal precipitation for the year. The 2024 precipitation ranged from 3 inches above normal to 6 inches below normal. In 2025 so far, the Kansas portion of the basin has received 2 to 8 inches of precipitation, which is 3 inches below to about normal precipitation.

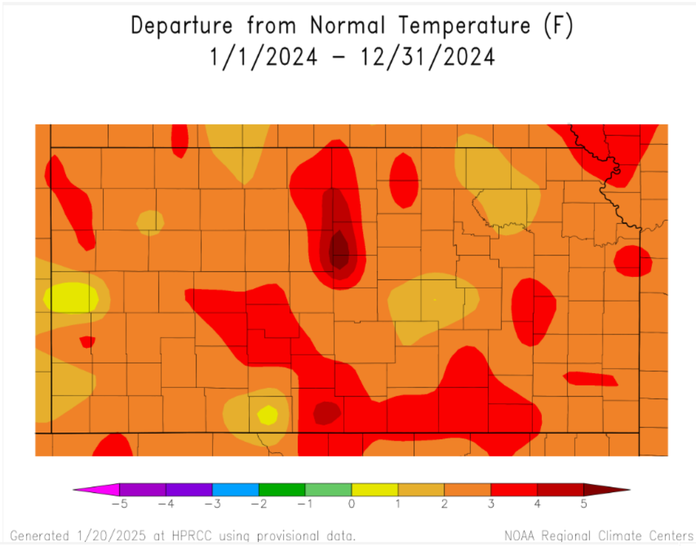


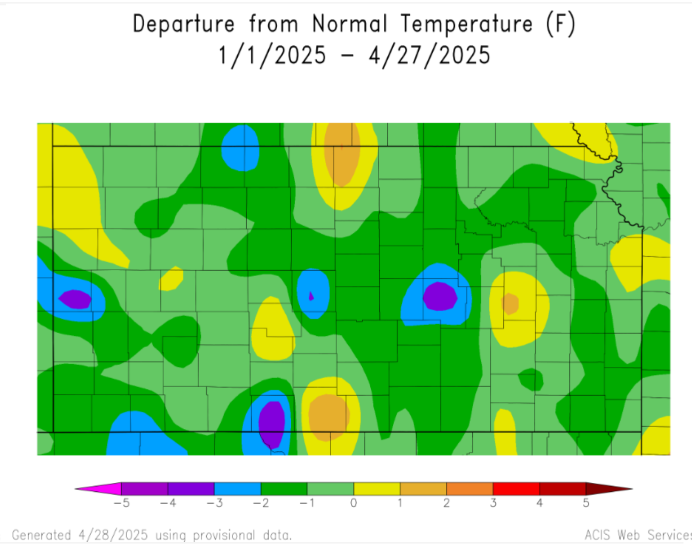


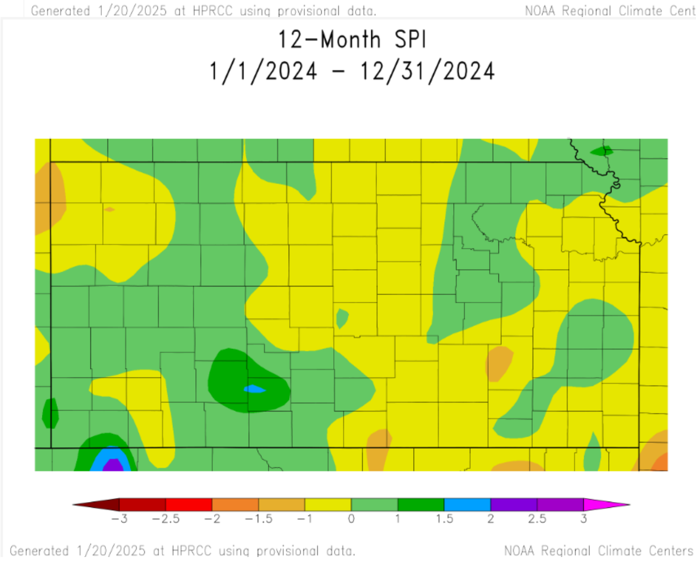


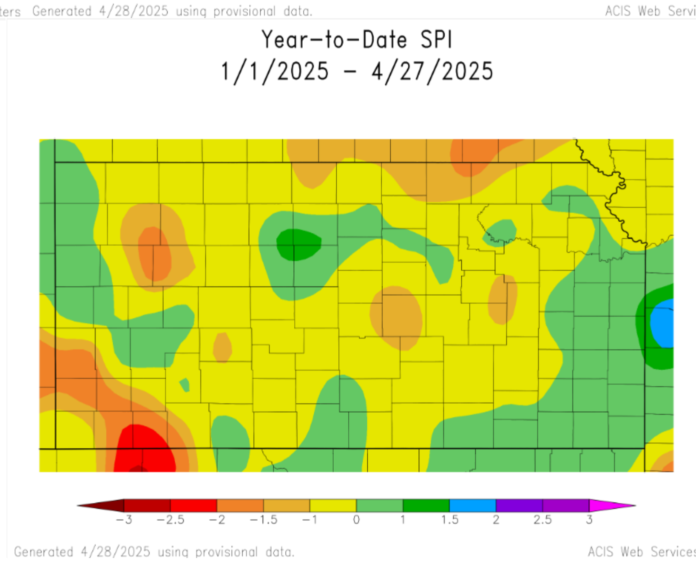


Temperatures during calendar year 2024 ranged from 1 degrees warmer to 3 degrees warmer than normal. So far in 2025, temperatures have ranged from normal to 1 degrees cooler than normal. We saw last year's trends continue, which is reflected in the Standardized Precipitation Index (SPI). The SPI fits precipitation data to a Gamma distribution and then transforms it to a normal distribution (bell curve), resulting in values independent of location and magnitude, allowing different seasons and climate areas to be compared. Ranges greater than 1 in either direction on the scale mark moderate drought and moderately wet conditions, respectively. In 2024, the SPI of the Little Blue River basin and Mill Creek Basins continued the trend of the drought being more prominent. So far in 2025 the SPI shows the drought has increased across the basins.









Streamflow and Administration Within the Big Blue Compact Basin

Statistics reflect 40 years of discharge data at the USGS gage at Marysville, Kansas (Big Blue River) and 66 years at the USGS gage near Barnes, Kansas (Little Blue River).

2024 streamflow data shows that the peak runoff periods occurred in spring and a couple intermittent high points during the summer, but overall flows were quite lower than normal. So far in 2025, streamflow has been significantly lower than the median value at both gages.

From April 13, 2023 through February 7, 2024, 23 surface water rights junior in priority to Kansas's Minimum Desirable Streamflow (MDS) Statute (K.S.A. 82a-703) were under administration in the Little Blue River basin (including the tributary Mill Creek basin) upstream of the USGS stream discharge gage near Barnes, Kansas. Those same 23 surface water rights became subject to administration again on April 12, 2024. MDS administration on these 23 surface water rights was rescinded on June 13, 2024. On October 4, 2024, MDS administration began on 25 surface water rights: the 24 surface water rights from the previous administration plus one new approved application. Administration on these 25 surface water rights remains in effect.

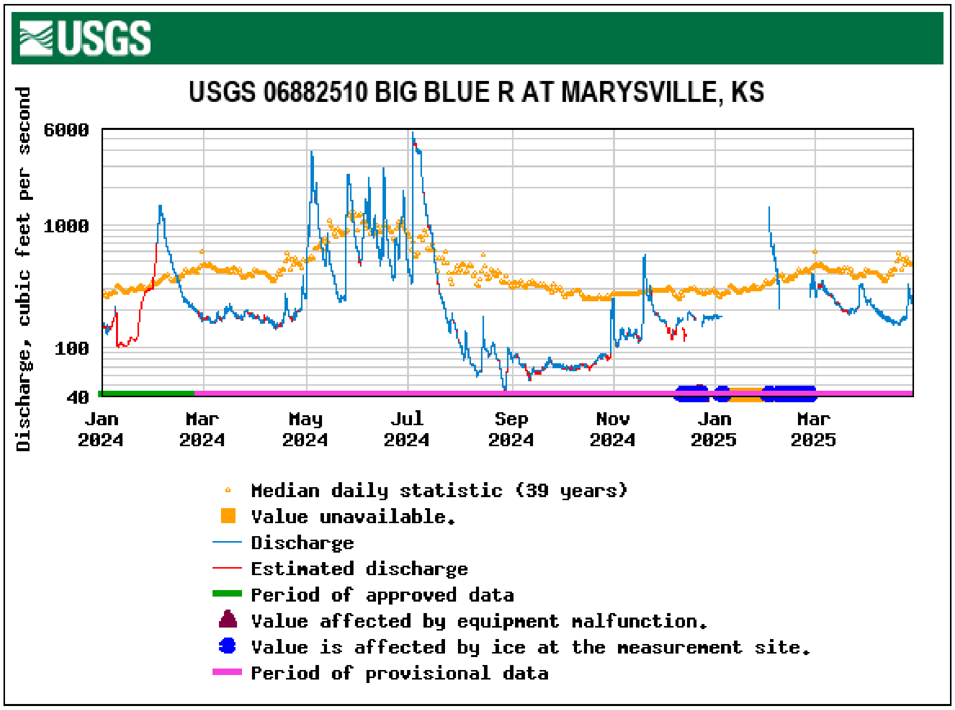
Streamflow at the USGS discharge gage on the Big Blue River at Marysville, Kansas was unable to remain sufficient to avoid MDS administration of surface water rights in the Big Blue River basin upstream of that gage. From October 12, 2024 through November 21, 2024, 12 surface water rights junior in priority to Kansas's Minimum Desirable Streamflow (MDS) Statute (K.S.A. 82a-703) were under administration in the Big Blue River basin.

Minimum Desirable Streamflows (cfs)

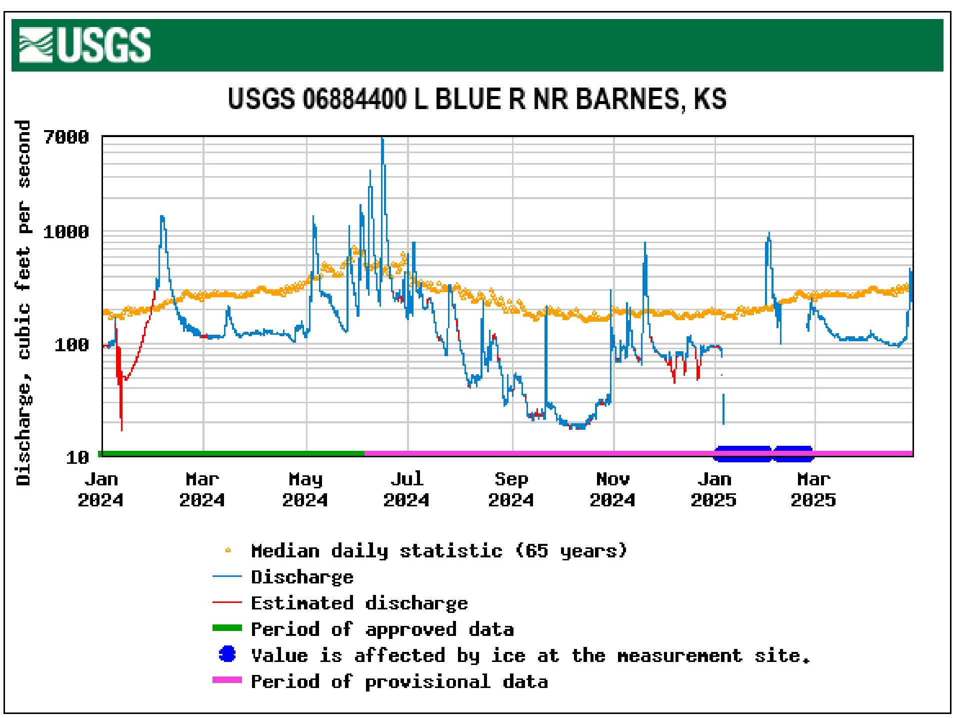
Watercourse	J	F	M	A	M	J	J	A	S	O	N	D
Big Blue												
Marysville	100	100	125	150	150(d)	150(d)	80	90	65	80	80	80
Little Blue												
Barnes	100	100	125	150	150(d)	150(d)	75	80	60	80	80	80

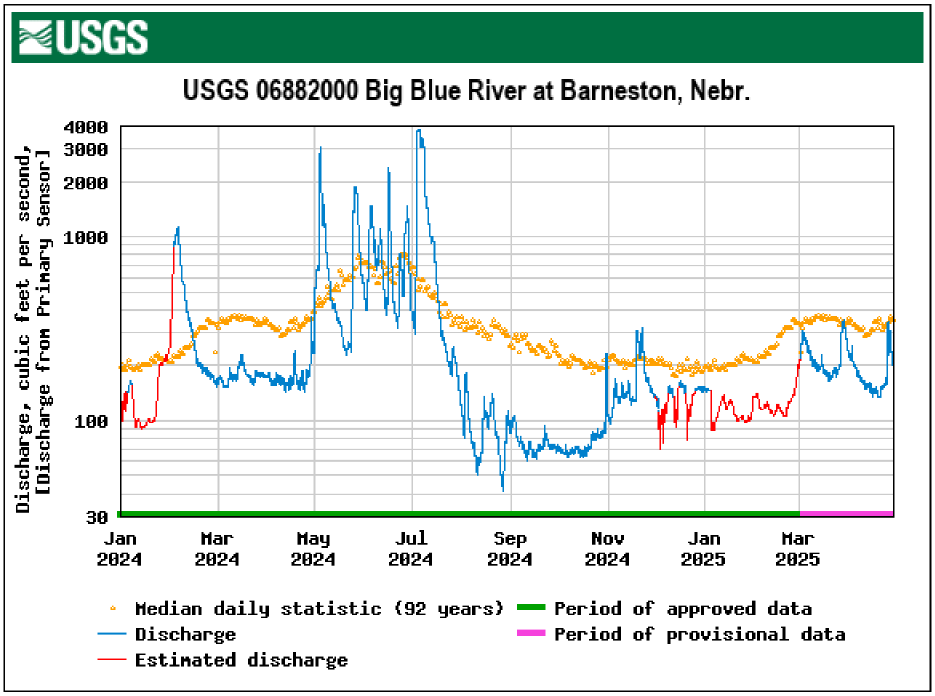
(d) Subject to the stateline flows contained in the Blue River Compact.

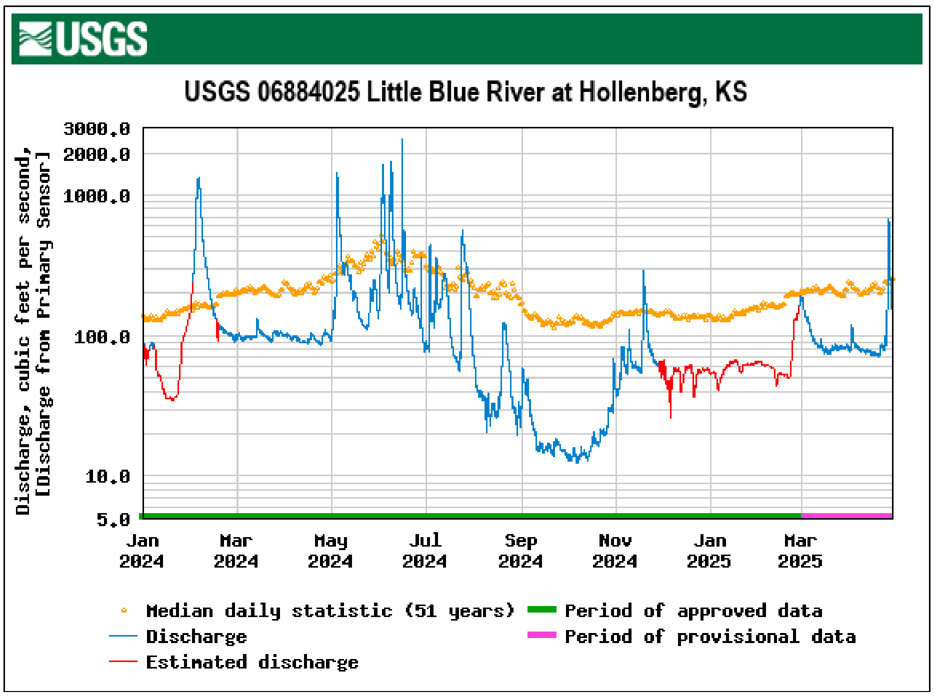
USGS 06882510 BIG BLUE R AT MARYSVILLE, KS



USGS 06884400 L BLUE R NR BARNES, KS

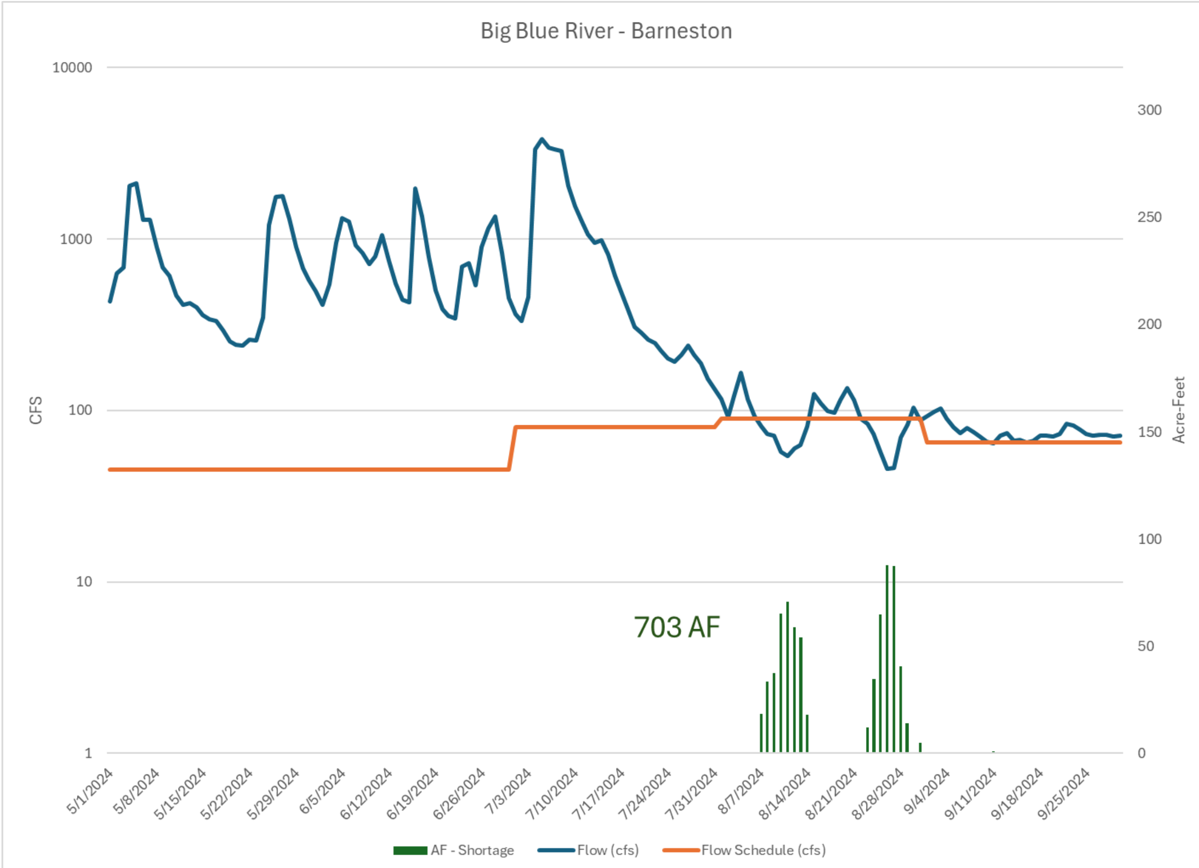


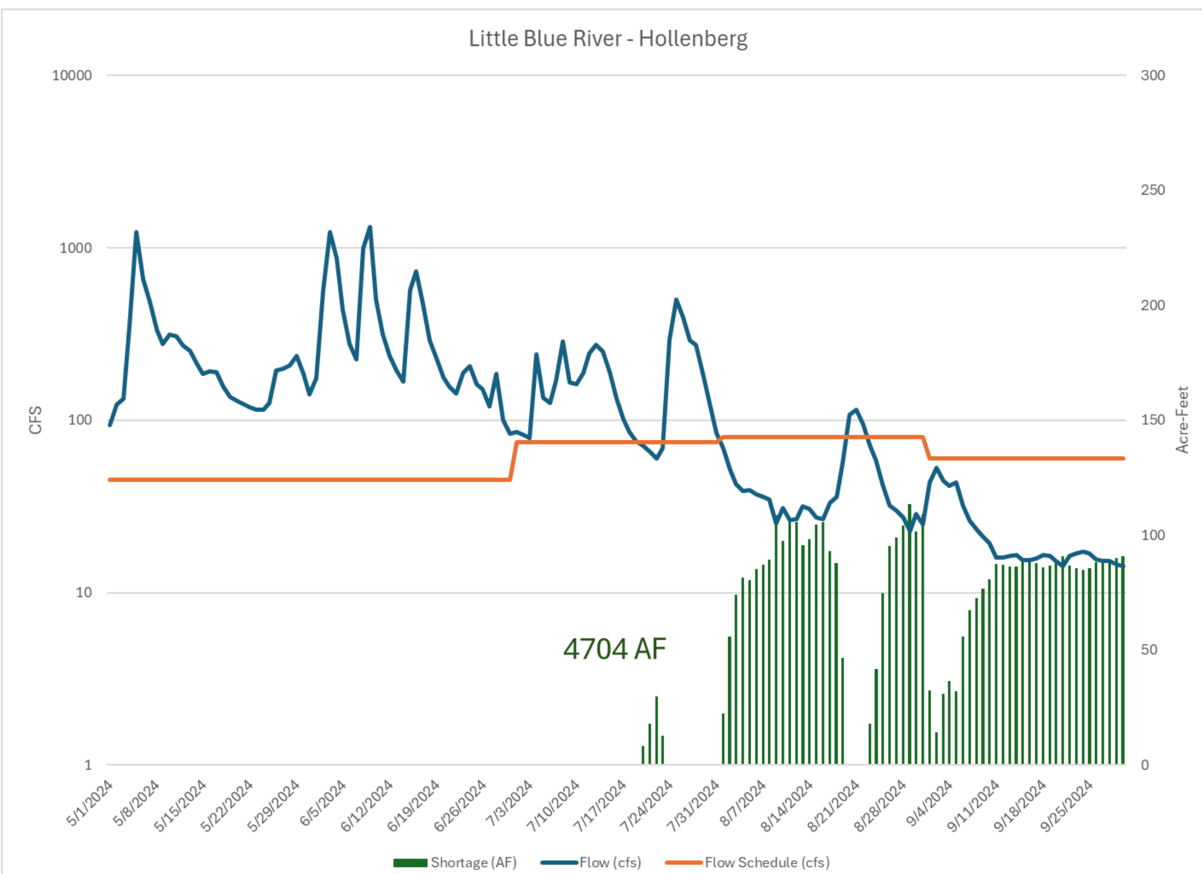




The Compact Gages at Barneston, Nebraska (Big Blue River) and Hollenberg, Kansas (Little Blue River) experienced similar conditions throughout 2024 as well. So far in 2025, flows have remained below the median daily statistic. Little Blue River flows have been below the MDS threshold values and administration orders are in effect for surface water rights and permits in the Little Blue River and Mills Creek basins.

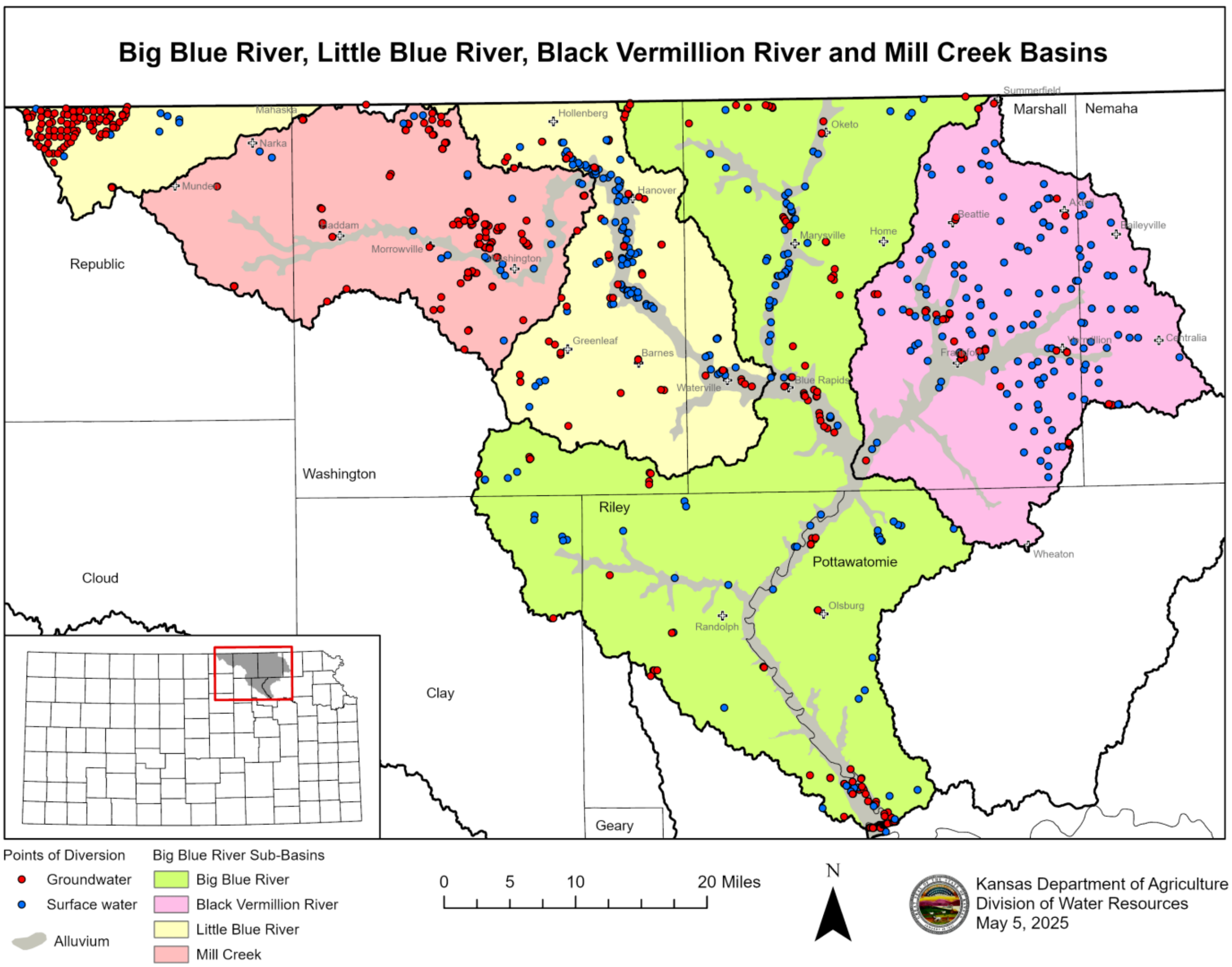
Below are charts of the daily observed flows, flow schedules, and shortages:





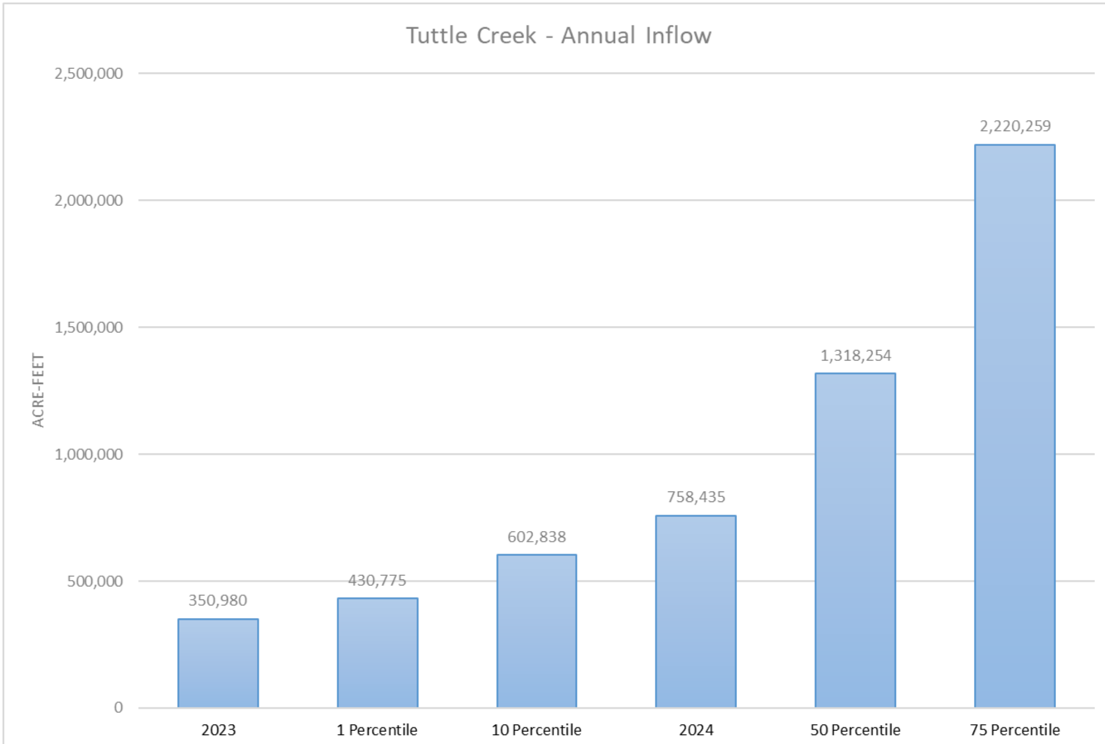
New Development
In 2024, KDA-DWR received 34 new applications (22 for appropriated water rights, 10 for temporary permits, and 2 for term permits) within the Compact area. This is a slight increase from the 32 applications received in 2023 (19 for appropriated water rights, 6 for temporary permits, and 7 for term permits) within the Compact area. In 2025 to date, KDA-DWR received 3 new applications (2 for appropriated water rights and 1 for a term permit) within the Compact area.

In 2024, KDA-DWR approved 31 applications (15 for appropriated water rights, 10 for temporary permits, and 6 for term permits) within the Compact area. In 2023, KDA-DWR had approved 16 applications (6 for appropriated water rights, 8 for temporary permits, and 2 for term permits) within the Compact area. In 2025 to date, KDA-DWR has approved 3 applications (all 3 for appropriated water rights) within the Compact area.

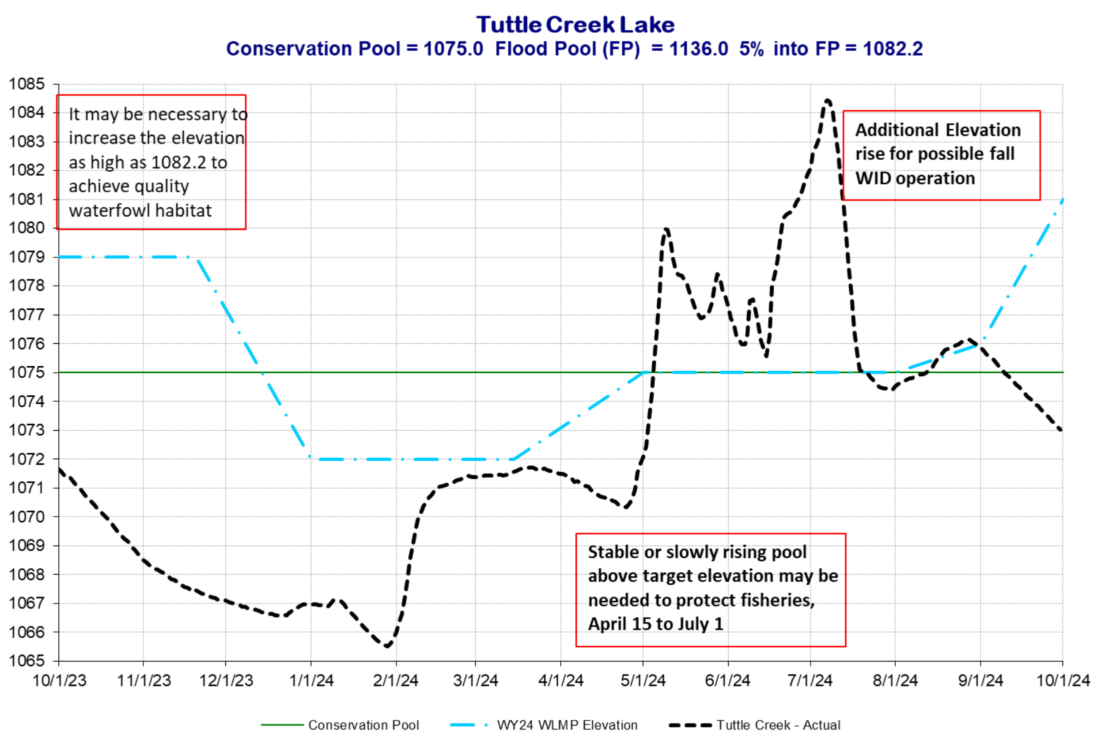


Tuttle Creek Lake

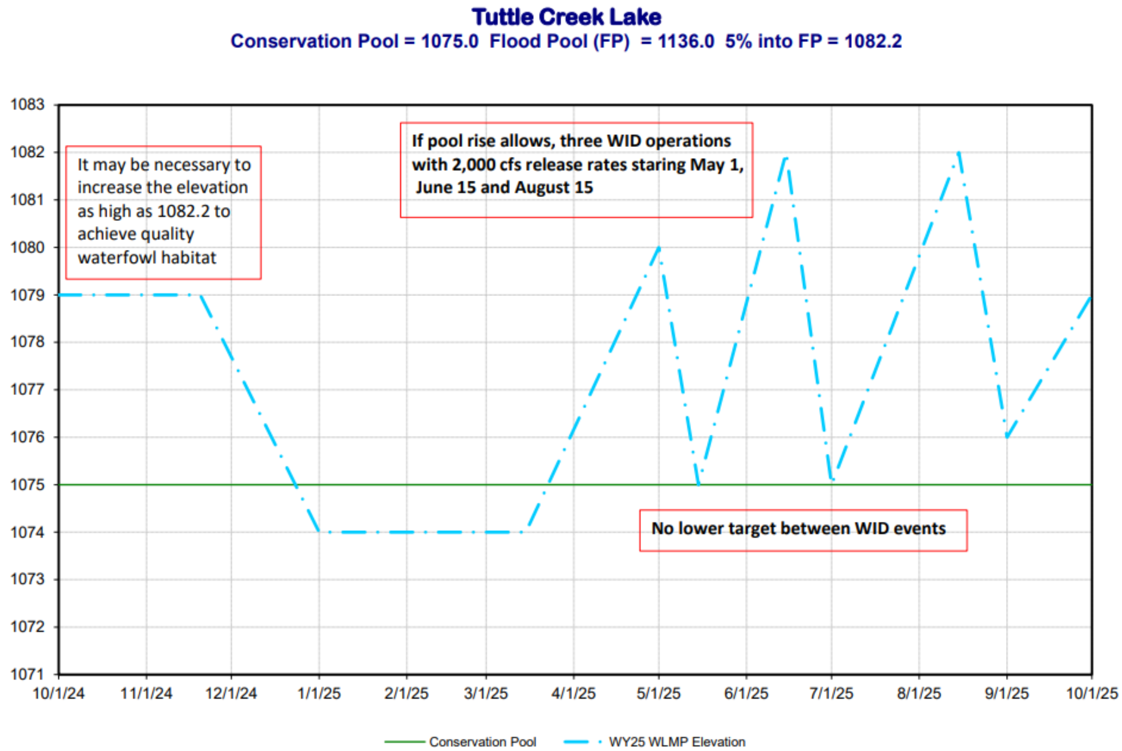
The principal benefactor of the Big Blue is Tuttle Creek and 40% of the state's population that relies on the Kansas River for water supply. Tuttle Creek provides about 70% of the flow augmentation necessary to maintain target flows on the Kansas River during drought. Calendar year 2023 is the lowest observed annual inflow. Below are some additional annual inflows for context, with CY 2024 coming in around the 16th percentile.



Lake Level Management Plan for Water Year 2024, plan vs actual elevations. Lack of inflow and flow augmentation dropped Tuttle Creek down to about 65% conservation storage. Fortunately, USACE did not call for navigation releases in 2023 or 2024.



The Water Year 2025 Lake Level Management plan was approved in fall of 2024 and is dramatically different from previously approved plans. The primary focus was to create favorable conditions for water injection dredging. At the time the plan was approved there was a hope to start dredging in the spring but is currently planned to start August 14th. Near normal inflows would greatly improve the chances of a successful demonstration.



	Time	Elevation	Comment
TUTTLE CREEK LAKE	Oct 1 – Nov 20	1079-1082.2	Attract migrating waterfowl, achieve quality habitat
	Nov 21 -- Mar 15	1074	Reduce ice damage potential and provide water storage, then hold through Mar 15
	Mar 16 – Apr 30	1080	Allow lake level to rise to 1080 for WID Operations
	May 1 – May 14		WID Operation (minimum discharge of 2,000 cfs)
	May 15 – June 14	1082	Allow lake level to rise to 1082 for WID Operations
	June 15 – June 29		WID Operation (minimum discharge of 2,000 cfs)
	July 1 – Aug 14	1082	Allow lake level to rise to 1082 for WID Operations
	Aug 15 – Aug 31		WID Operation (minimum discharge of 2,000 cfs)
	Sept 1 – Sept 30	1079	Allow lake level to rise to 1079 to attract migrating waterfowl and achieve quality wetland habitat