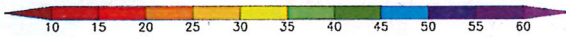
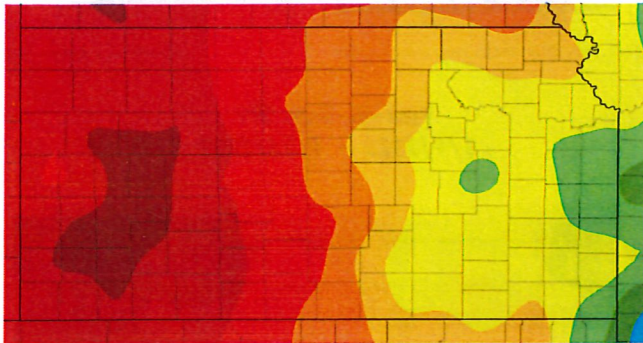


Kansas-Nebraska Big Blue River Compact Meeting, May 9, 2023
Report by Kansas Department of Agriculture, Division of Water Resources
Topeka Field Office

Climatic Conditions - Precipitation & Temperatures

Precipitation was mostly uniform across the Big Blue River basin during the 2022 calendar year, although there was rather less than normal. The High Plains Regional Climate Center reported between 20 and 35 inches of precipitation in calendar year 2022 across the entire Big and Little Blue River basin area in Kansas, including the tributary basins. This represents 70 to 95% of normal precipitation for the year. 2022 precipitation ranged from about normal to 8 inches below normal. In 2023 so far, the Kansas portion of the basin has received 2 to 8 inches of precipitation, which is 3 inches below to 1 inch above normal precipitation.

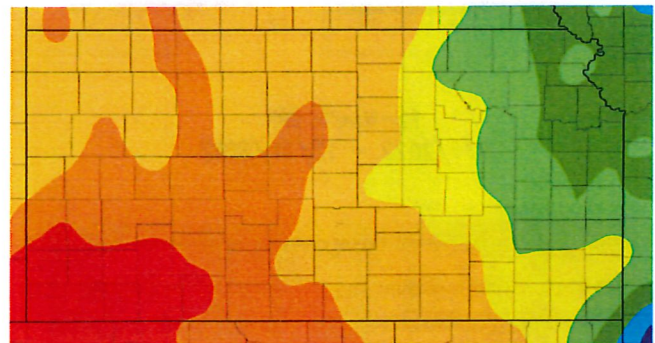
Precipitation (in)
1/1/2022 - 12/31/2022



Generated 1/20/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

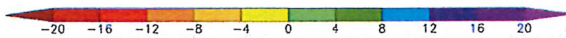
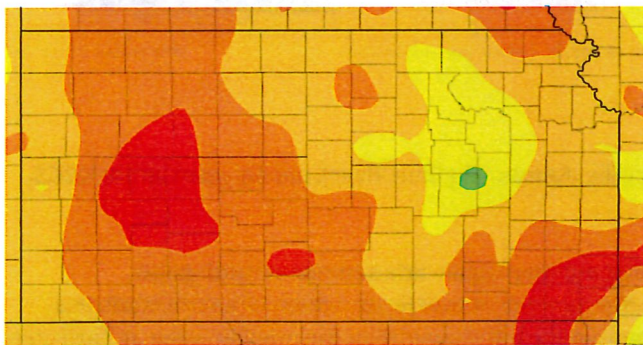
Precipitation (in)
1/1/2023 - 4/25/2023



Generated 4/26/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

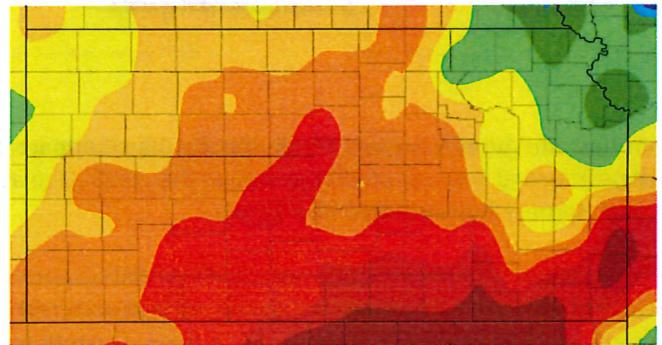
Departure from Normal Precipitation (in)
1/1/2022 - 12/31/2022



Generated 1/20/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from Normal Precipitation (in)
1/1/2023 - 4/25/2023

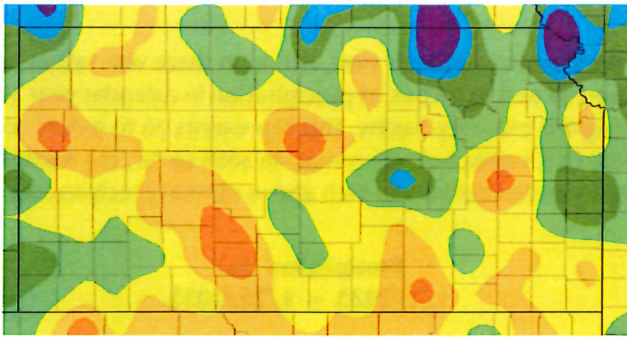


Generated 4/26/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Temperatures during calendar year 2022 ranged from normal to 2.5 degrees colder than normal. So far in 2023, temperatures have ranged from normal to 1 degree warmer than normal. We are seeing 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 2022, the SPI of the central Big Blue River basin was beginning to show a trend developing towards drought. That trend had become more significant in 2023 until the very recent precipitation event occurred.

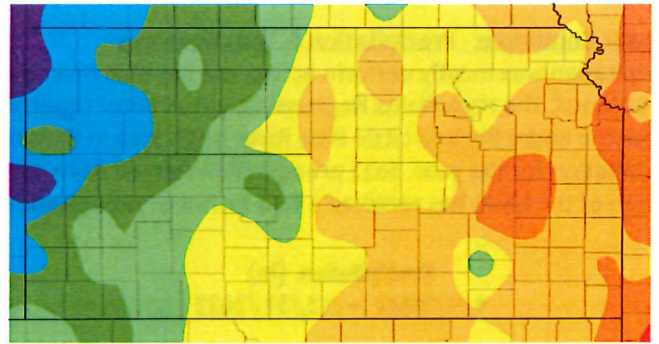
Departure from Normal Temperature (F)
1/1/2022 – 12/31/2022



Generated 1/20/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

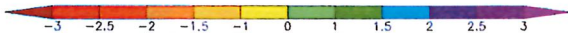
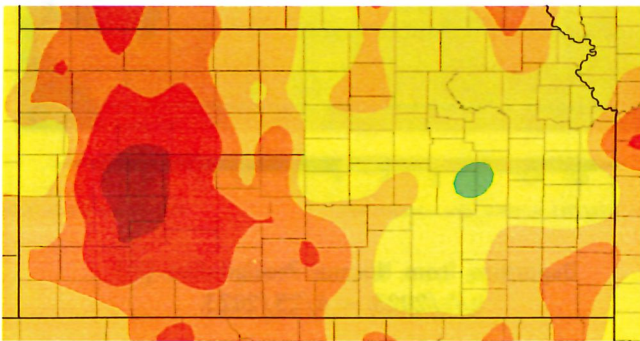
Departure from Normal Temperature (F)
1/1/2023 – 4/25/2023



Generated 4/26/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

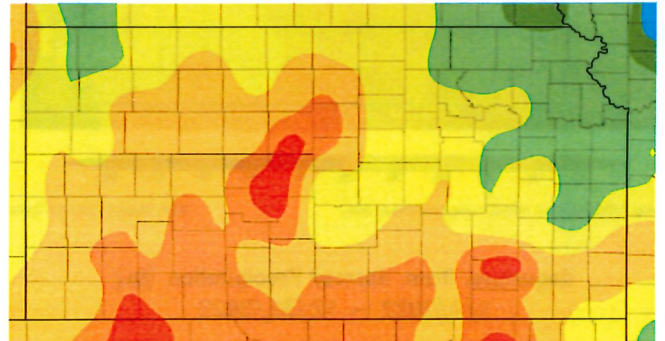
12-Month SPI
1/1/2022 – 12/31/2022



Generated 1/20/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Year-to-Date SPI
1/1/2023 – 4/24/2023



Generated 4/25/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Streamflow and Administration Within the Big Blue Compact Basin

Statistics reflect 38 years of discharge data at the USGS gage at Marysville, Kansas (Big Blue River) and 64 years at the USGS gage near Barnes, Kansas (Little Blue River).

2022 streamflow data shows that peak runoff periods occurred in spring and then again late summer at both gages. Interestingly, the peak runoff events appear to have occurred later in the summer season in 2022 than when the statistical values indicate they normally occur. So far in 2023, streamflow has been significantly lower than the median value at both gages.

From September 9, 2022 through March 15, 2023, 21 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 upstream of the USGS discharge gage near Barnes, Kansas, including the tributary Mill Creek basin. Those same 21 surface water rights went under administration again on April 18, 2023 and remain under administration.

Streamflow at the USGS discharge gage on the Big Blue River at Marysville, Kansas has remained sufficient to avoid MDS administration of surface water rights in the Big Blue River basin upstream of that gage.

Minimum Desirable Streamflows (cfs)

Watercourse

Month

Big Blue

Marysville

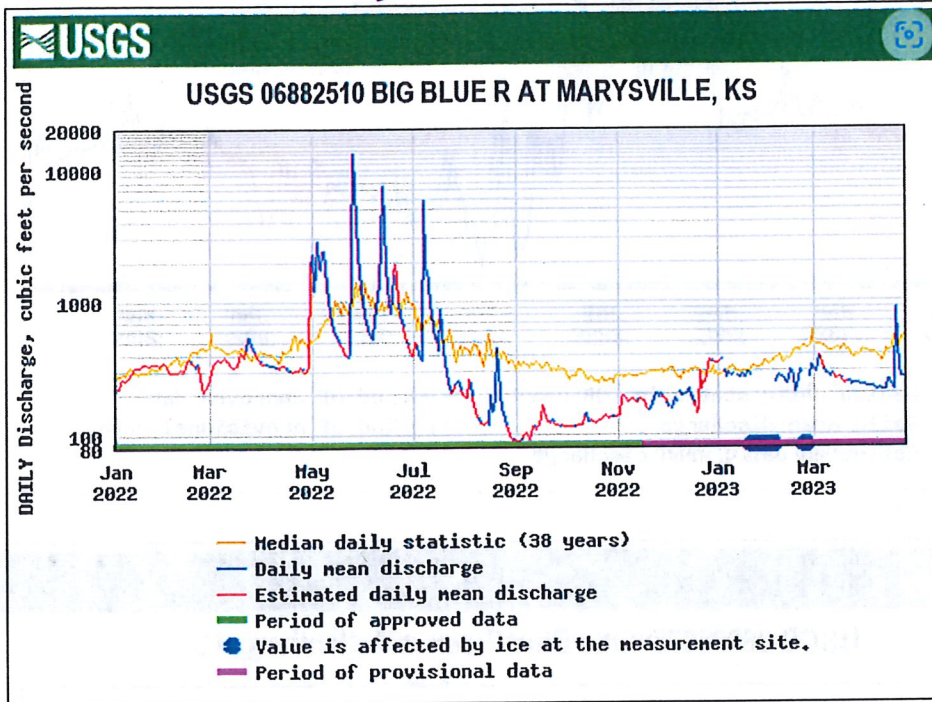
Little Blue

Barnes

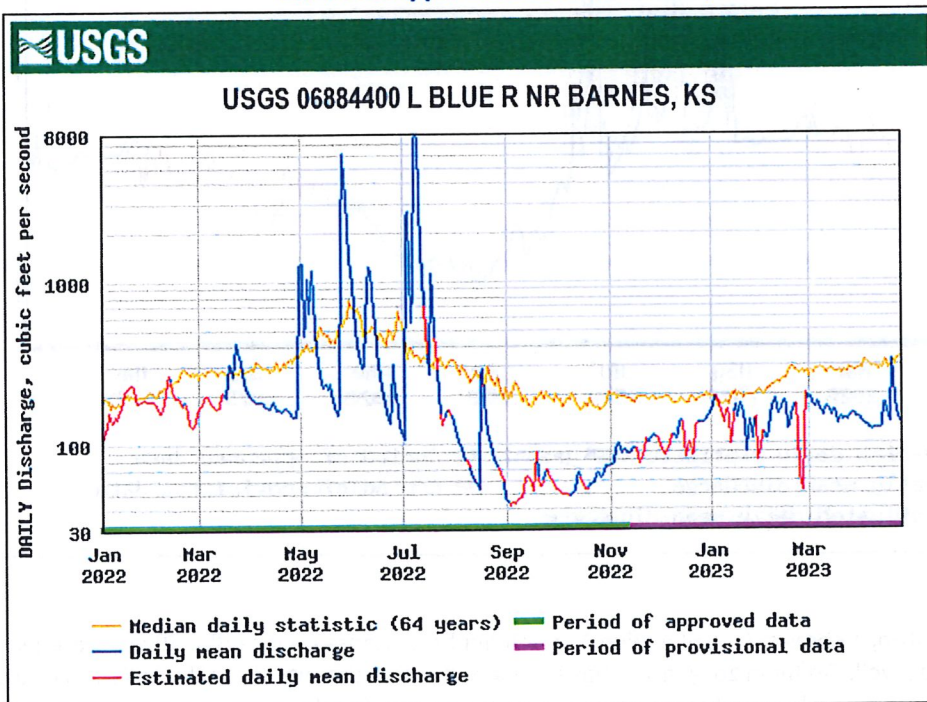
Month	J	F	M	A	M	J	J	A	S	O	N	D
Big Blue Marysville	100	100	125	150	150(d)	150(d)	80	90	65	80	80	80
Little Blue Barnes	100	100	125	150	150(d)	150(d)	75	80	60	80	80	80

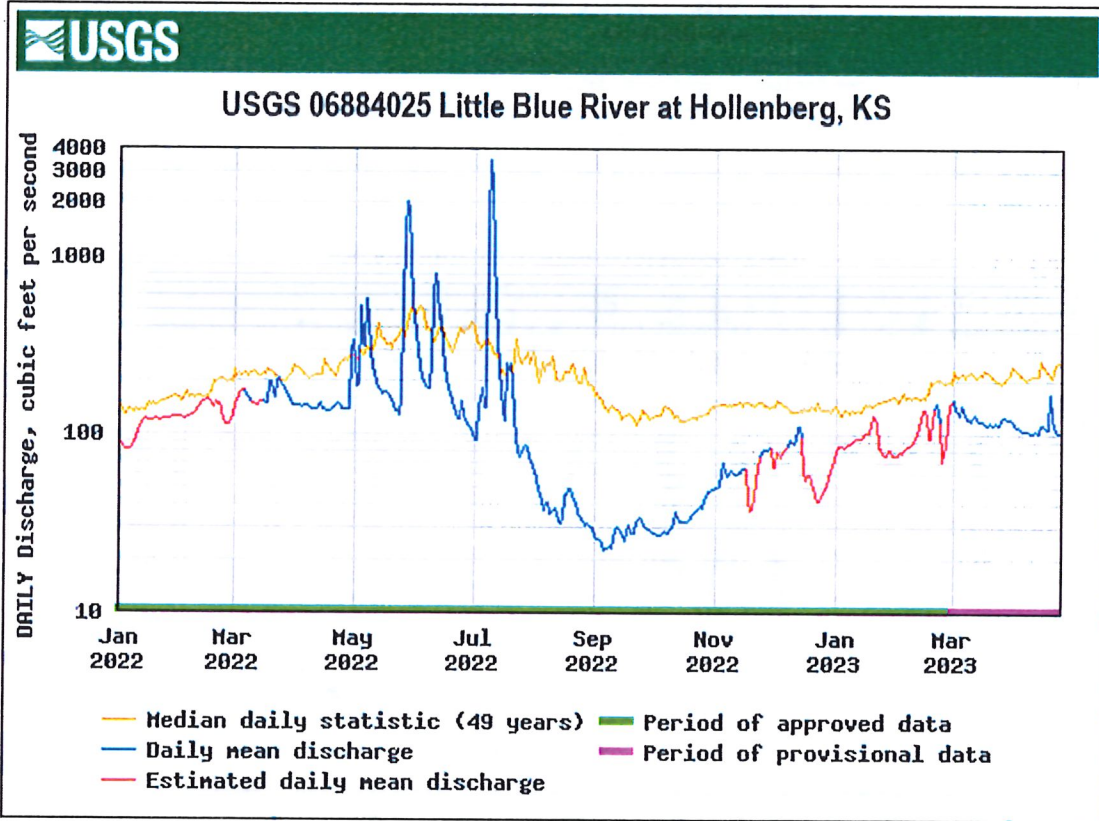
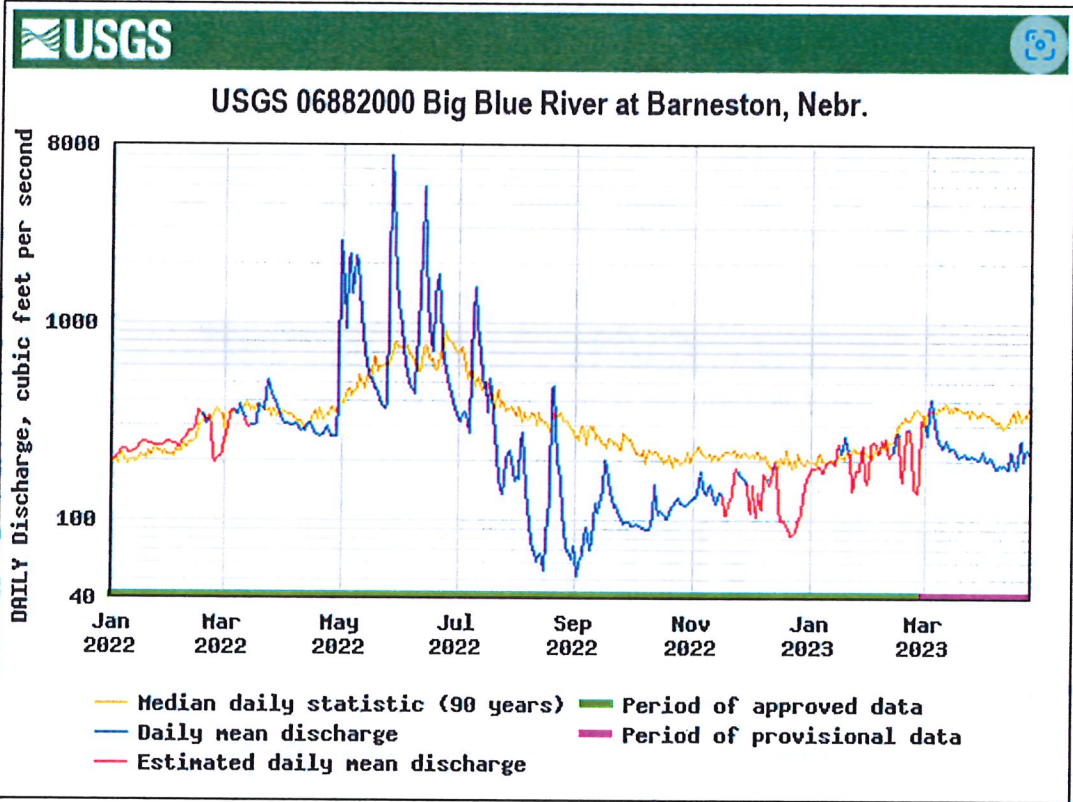
(d) Subject to the stateline flows contained in the Blue River Compact.

USGS 06882510 BIG BLUE R AT MARYSVILLE, KS



USGS 06884400 L BLUE R NR BARNES, KS

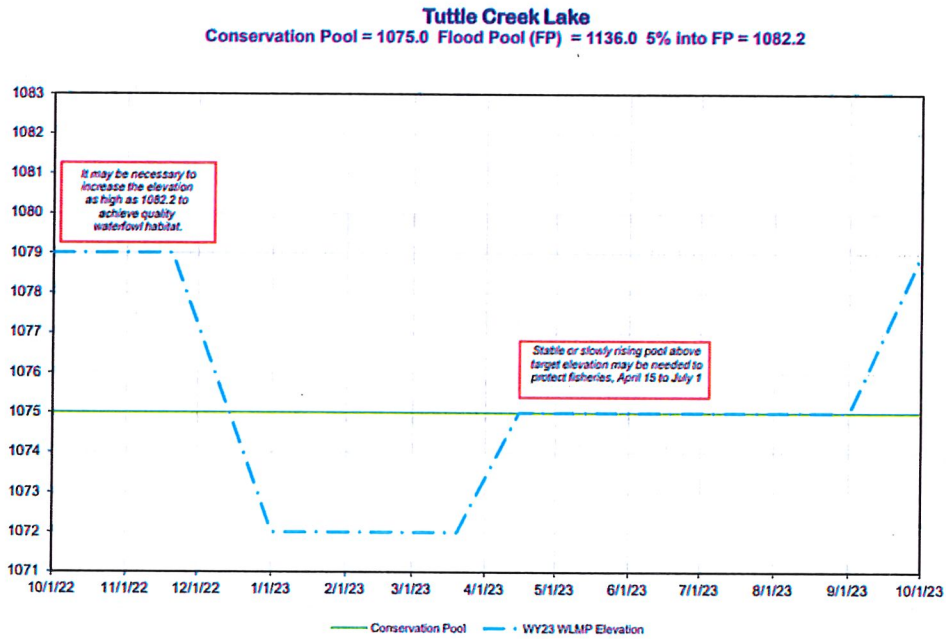




The Compact gages at Barneston, Nebraska (Big Blue River) and Hollenberg, Kansas (Little Blue River) experienced similar conditions throughout 2022 as well. So far in 2023, flows have remained below the median daily statistic. Little Blue River flows have been below the MDS threshold values and administration orders are in effect for surface water rights and permits in the

Tuttle Creek Reservoir

Lake Level Management plans were approved in fall of 2022 and are the same as the previous approved versions. The main focus is support of spawning fish and wildlife habitat.



TUTTLE CREEK LAKE	Time	Elevation	Comment
	Oct 1 – Nov 20	1079-1082.2	Attract migrating waterfowl, achieve quality habitat
	Nov 21 -- Mar 20	1072	Reduce ice damage potential and provide water storage, then hold through Mar 20
	Mar 20 – Apr 15	1075	Rise to reach top of conservation pool and enhance boating then hold through Sep 1
	Apr 15 – July 1	1082.2 max	Evacuate flood water to enhance crappie population. Protect tern and plover nests on the Kansas River
	July 1 – Sep 1	1075	Maintain conservation pool to re-vegetate shoreline. Consideration for navigation.
	Sep 1 – Sep 30	1079	Rise to inundate wetland habitat and attract migrating waterfowl