

**MARAIS DES CYGNES
NON-FEDERAL PUBLIC WATER
SUPPLY ASSESSMENT**

October 2022

REGIONAL GOALS

Marais des Cygnes RAC Goals & Action Plans

Priority Goal #1: Reduce cumulative sediment loads entering Melvern Lake, Pomona Lake, and Hillsdale Lake by 10 percent every 10 years to extend the life of existing infrastructure.

IV. The KWO will create a baseline sedimentation rate and review the sedimentation rate changes of these three reservoirs by conducting bathymetric surveys every 5 years to monitor the sedimentation rate and the progress and benefit of sedimentation reduction practices. The KWO will work to secure funding for this program.

V. The KWO will evaluate possible technologies that may be feasible to remove sediment from the reservoirs.

Priority Goal #2: Ensure water supply storage in the Marais des Cygnes Region is able to supply for 110% of the projected demands through the year 2050.

Action Plans:

I. The KWO will refine population and demand growth projections to ensure accurate projections are being utilized.

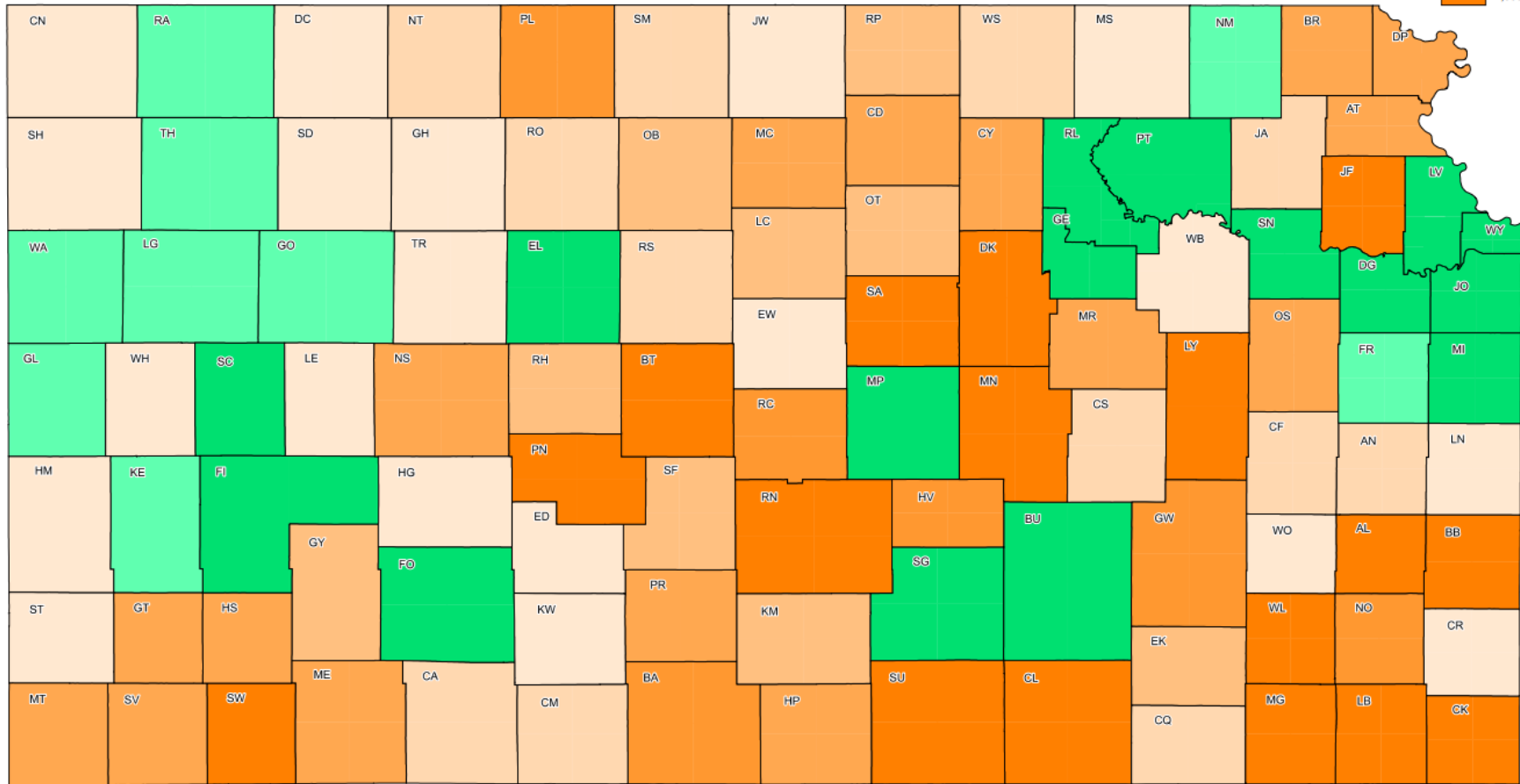
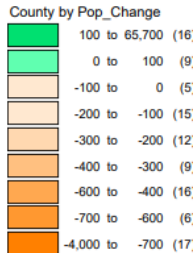
II. The KWO will evaluate the need and feasibility of creating an interconnection with municipalities within an adjacent region to be a backup water supply source.

Feedback from RAC will ensure assessment provides answers needed to achieve goals

MULTI-PURPOSE SMALL LAKES AND CITY LAKES IN MDC REGION

- Blue Mound City Lake
- Bone Creek Lake
- Bronson City Lake
- Cedar Creek Reservoir
- Cedar Creek Valley Lake
- Crystal Lake
- Fort Scott City Lake
- Garnett North Lake
- Harveyville Lake
- Lebo City Lake
- Linn Valley Lake
- Little Sugar Creek Lake
- Louisburg Old Lake
- Miola Lake
- Mound City Lake
- Osage City Reservoir
- Parker City Lake
- Pleasanton City Lake
- Richmond City Lake
- Rock Creek Lake
- Spring Hill City Lake
- Xenia Lake

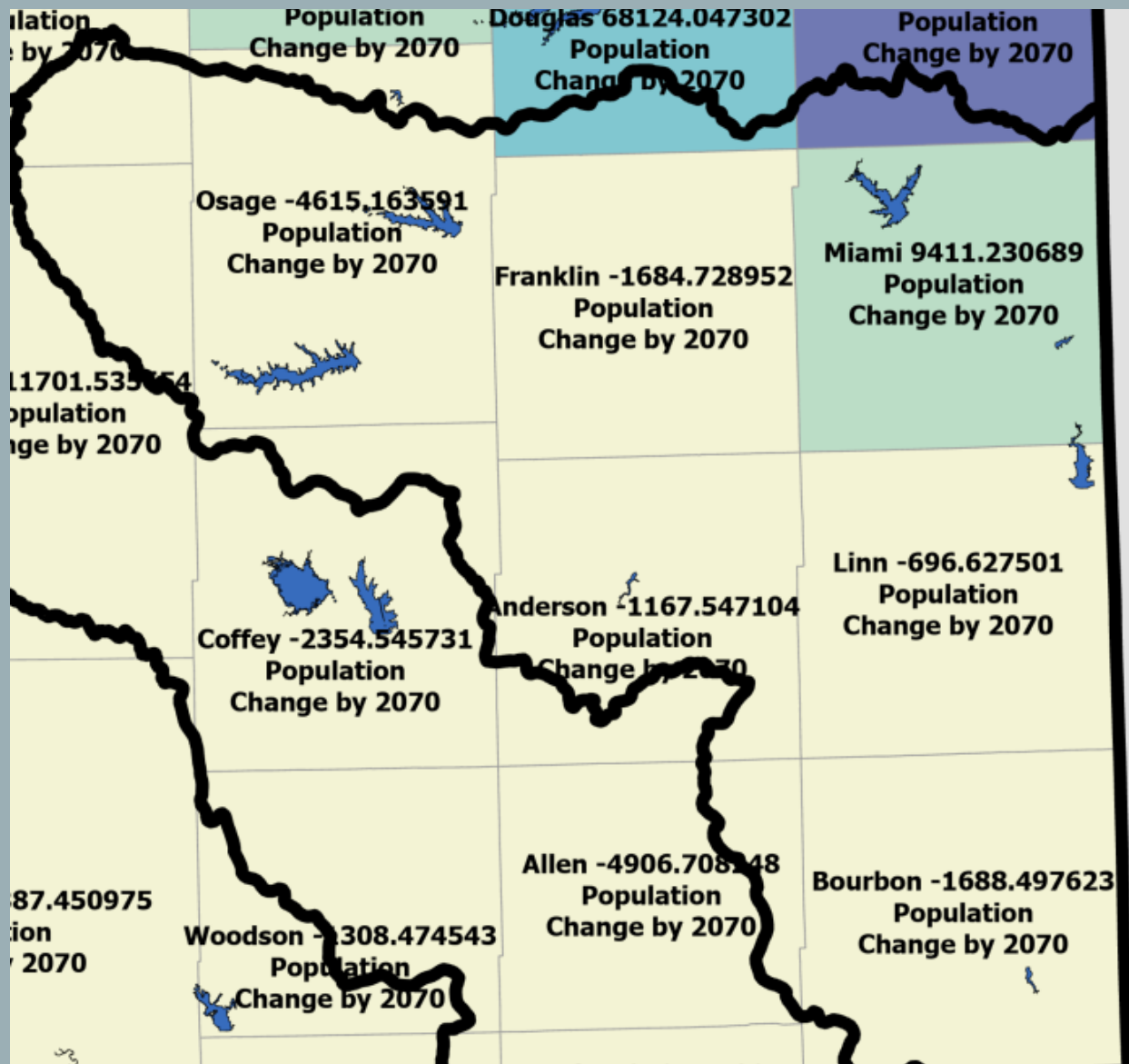
Population Change 2010 to 2020 U.S. Census by County



Data source: 2020 U.S. Census

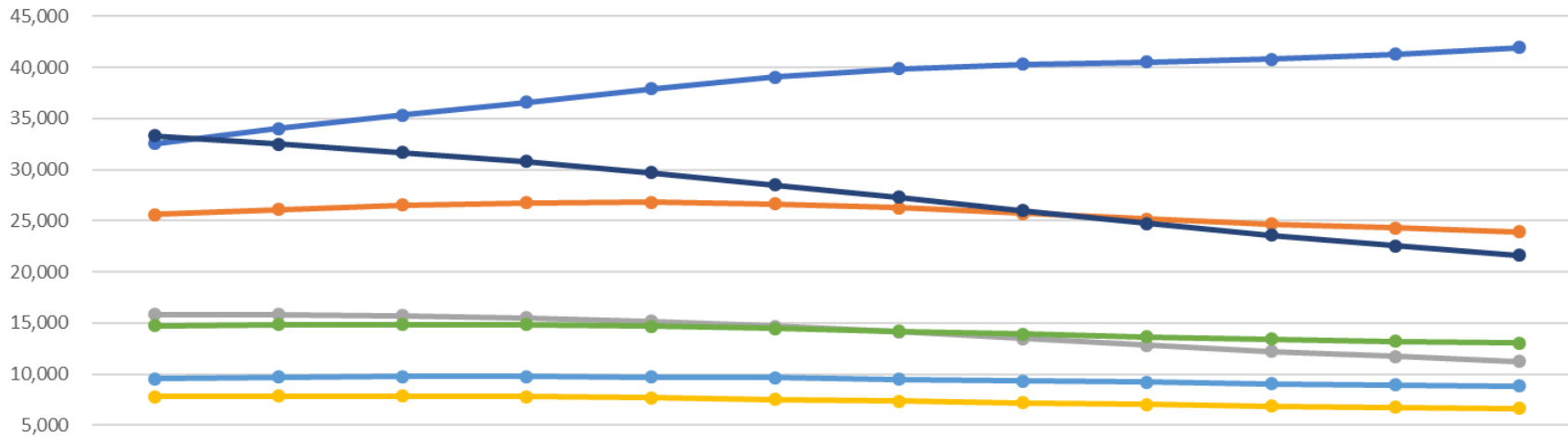
Kansas Legislative Research Department August 16, 2021 Pop Change 10-20 by County orange - green.WOR

2010 to 2020 Census Population Change



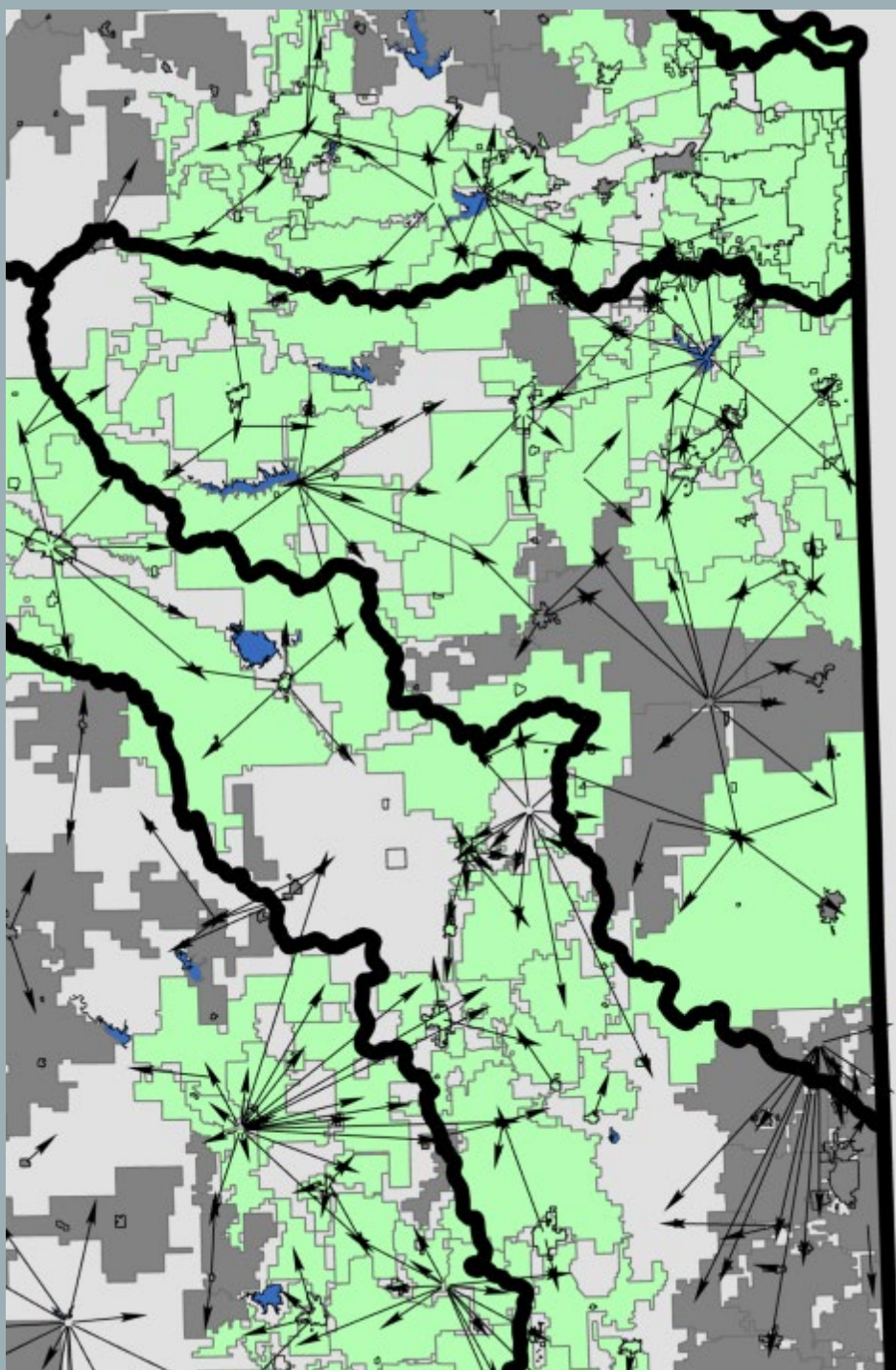
WSU – EFC 2020 to 2070 Population Change Projections

Population Projections



	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
— Miami County	32,553	34,022	35,326	36,594	37,912	39,079	39,902	40,326	40,517	40,817	41,330	41,964
— Franklin County	25,609	26,131	26,533	26,769	26,801	26,628	26,253	25,721	25,154	24,689	24,291	23,924
— Osage County	15,847	15,853	15,747	15,522	15,175	14,701	14,112	13,454	12,798	12,240	11,721	11,232
— Anderson County	7,808	7,850	7,842	7,771	7,658	7,511	7,354	7,187	7,017	6,868	6,744	6,640
— Linn County	9,536	9,685	9,741	9,746	9,720	9,627	9,496	9,351	9,190	9,053	8,942	8,839
— Bourbon County	14,712	14,831	14,864	14,827	14,704	14,485	14,199	13,909	13,632	13,417	13,220	13,024
— Lyon County	33,339	32,526	31,671	30,808	29,716	28,530	27,309	25,994	24,741	23,602	22,571	21,637

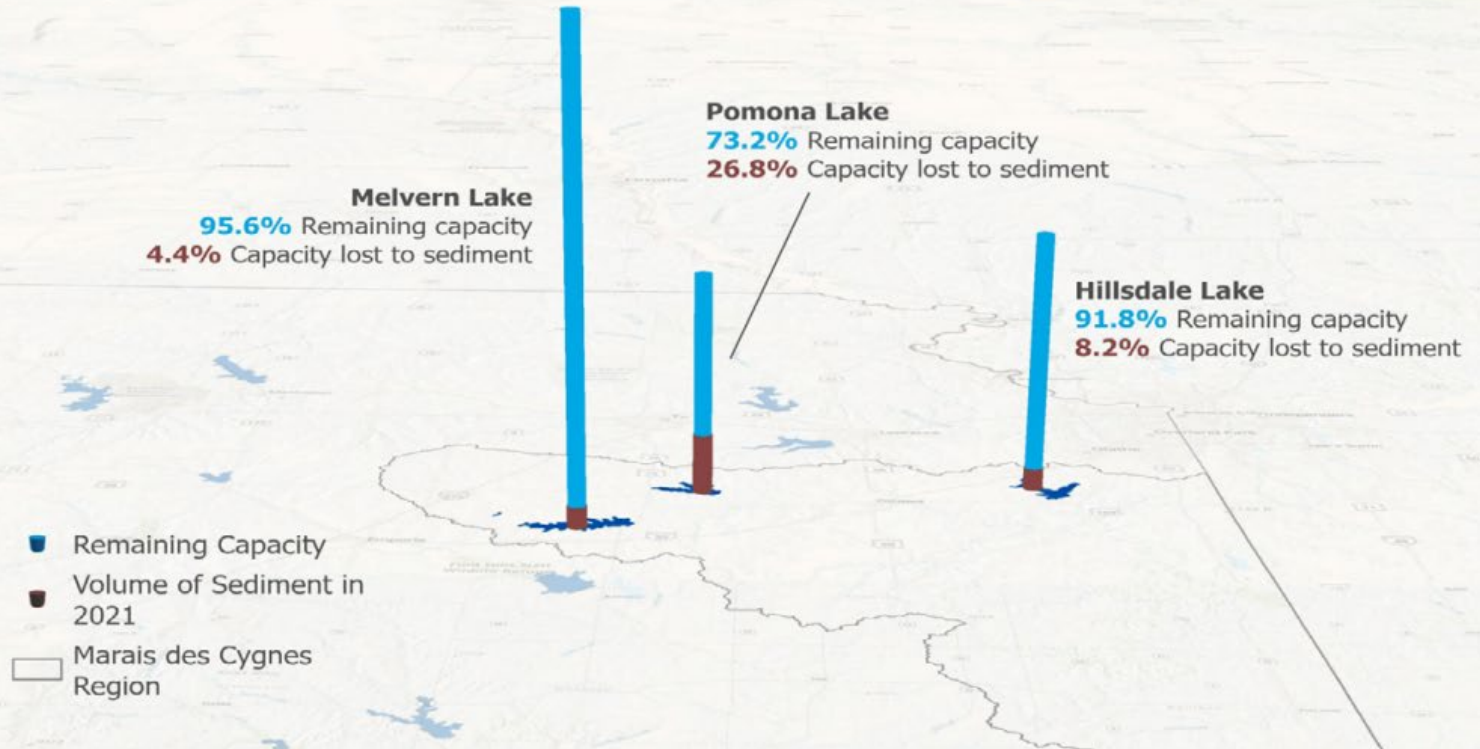
Population Projections 2015 – 2070
WSU Center for Economic Development



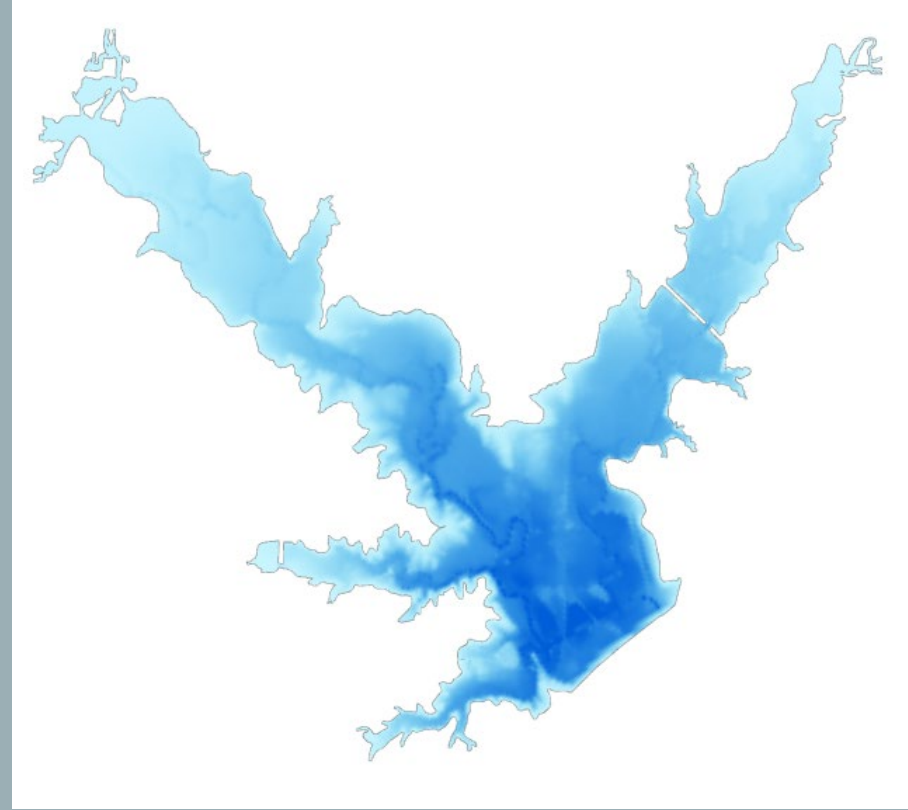
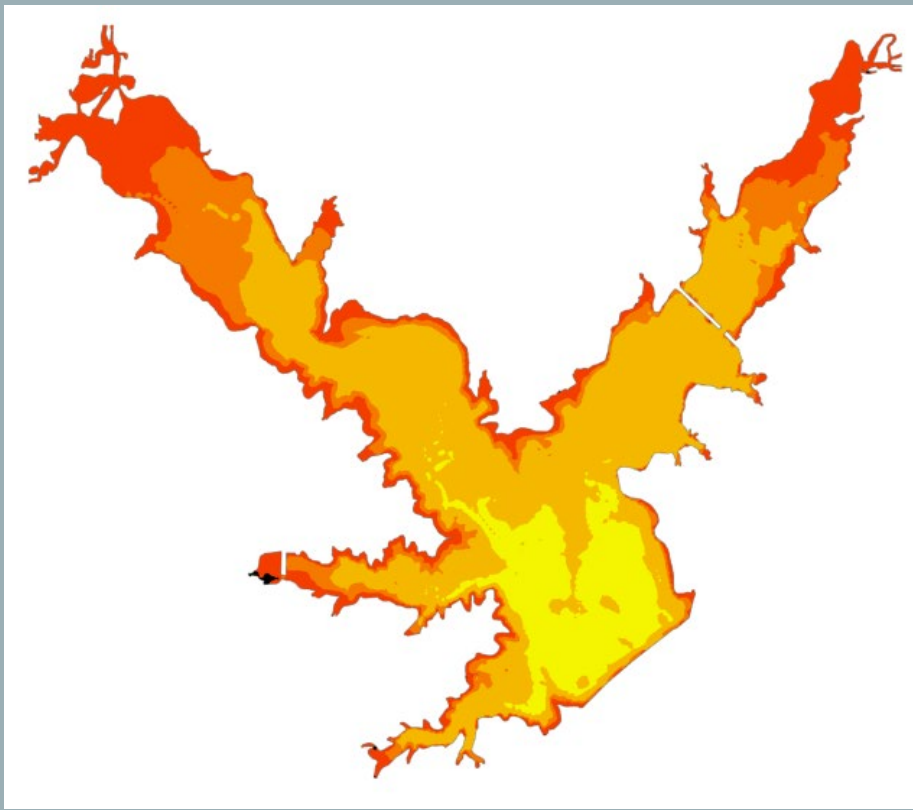
- Regional public water supply Interconnections
- Green areas connected to federal reservoir storage source
- (sometimes as secondary backup supply)

Remaining Storage within Kansas Reservoirs

The vertical height of each bar represents total storage capacity. The blue indicates the 2021 capacity of each reservoir. The brown indicates the volume of sediment in each reservoir.

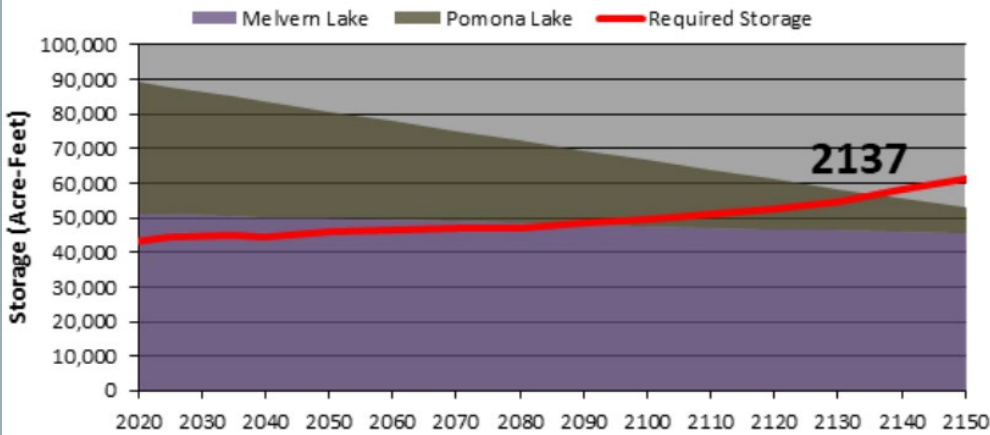


- Hillsdale surveyed in Summer 2022 – updated sedimentation rate and volume calculation coming soon.

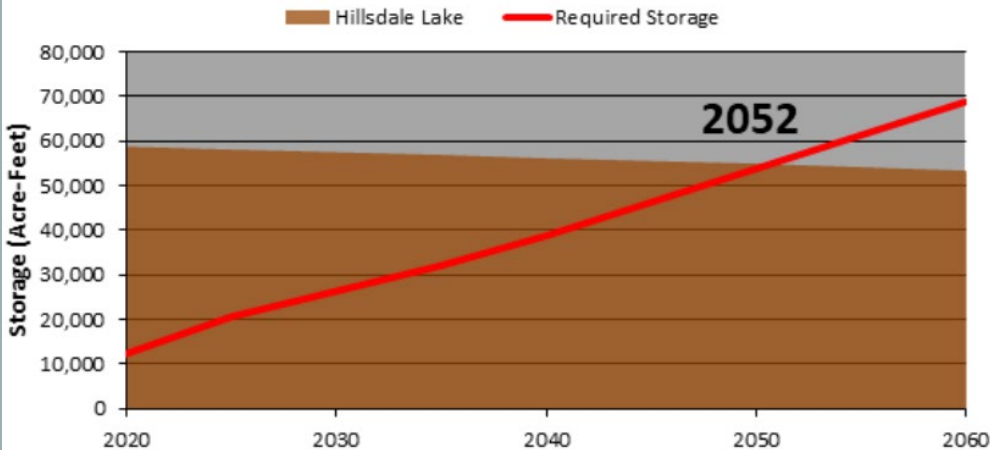


- Hillsdale surveyed in Summer 2022
- updated sedimentation and volume calculation coming.

Marais des Cygnes River Basin Projected Water Supply



Hillsdale Projected Water Supply



- Corps of Engineers reallocation study for Marais des Cygnes

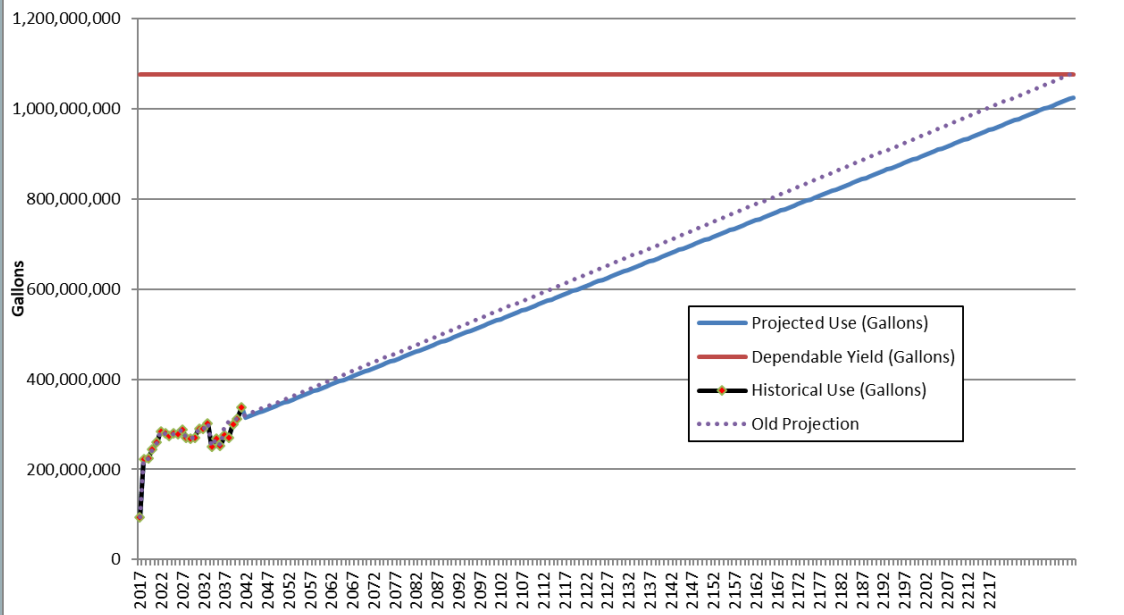
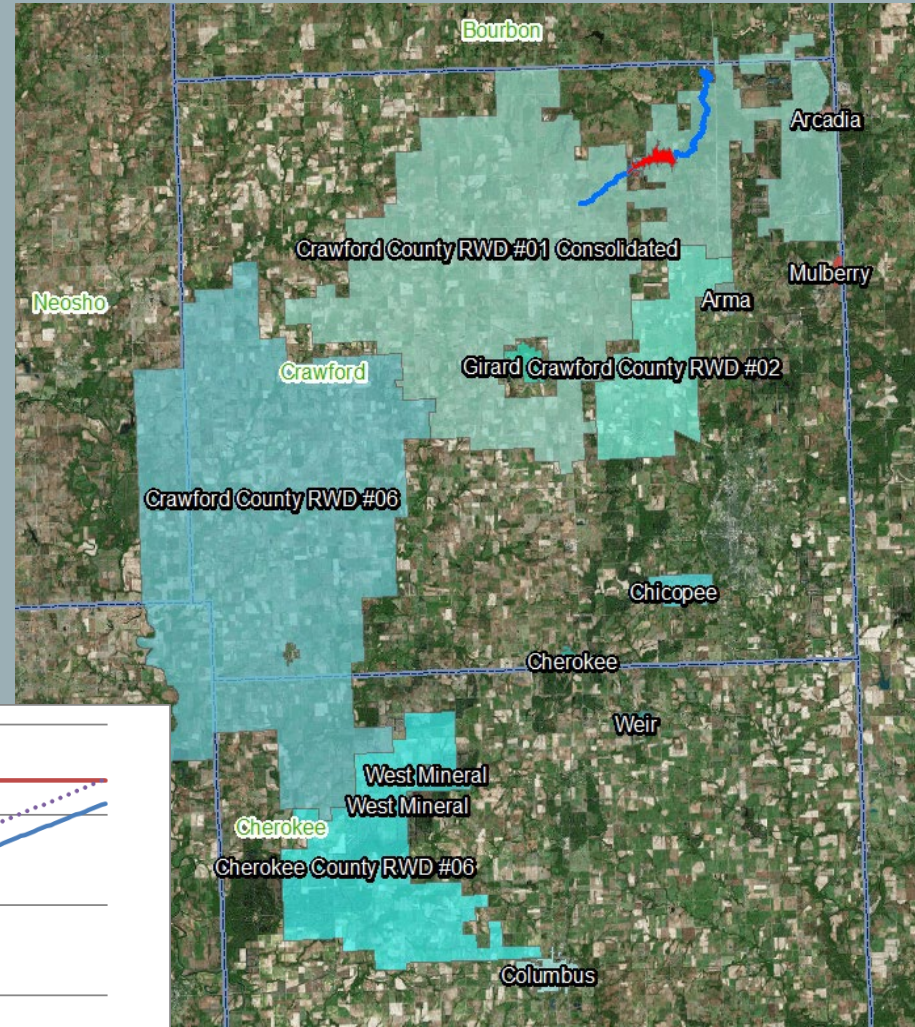
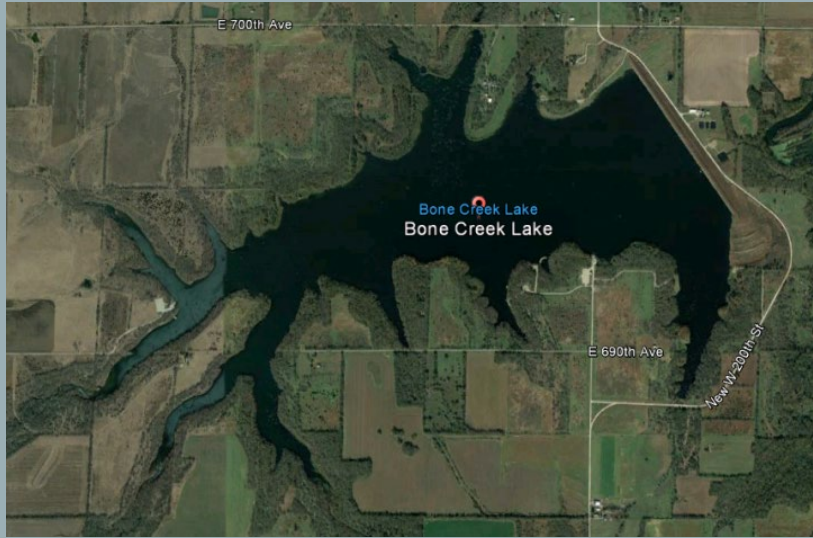
- WaterSMART - Climate scenario model grant in progress

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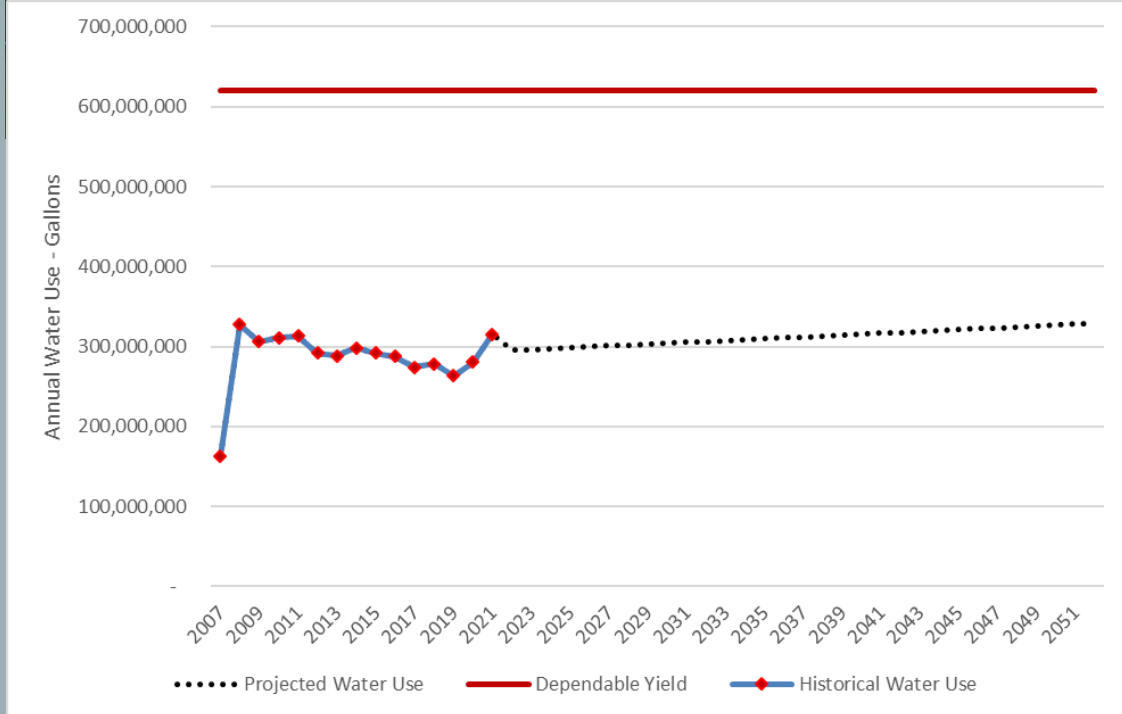
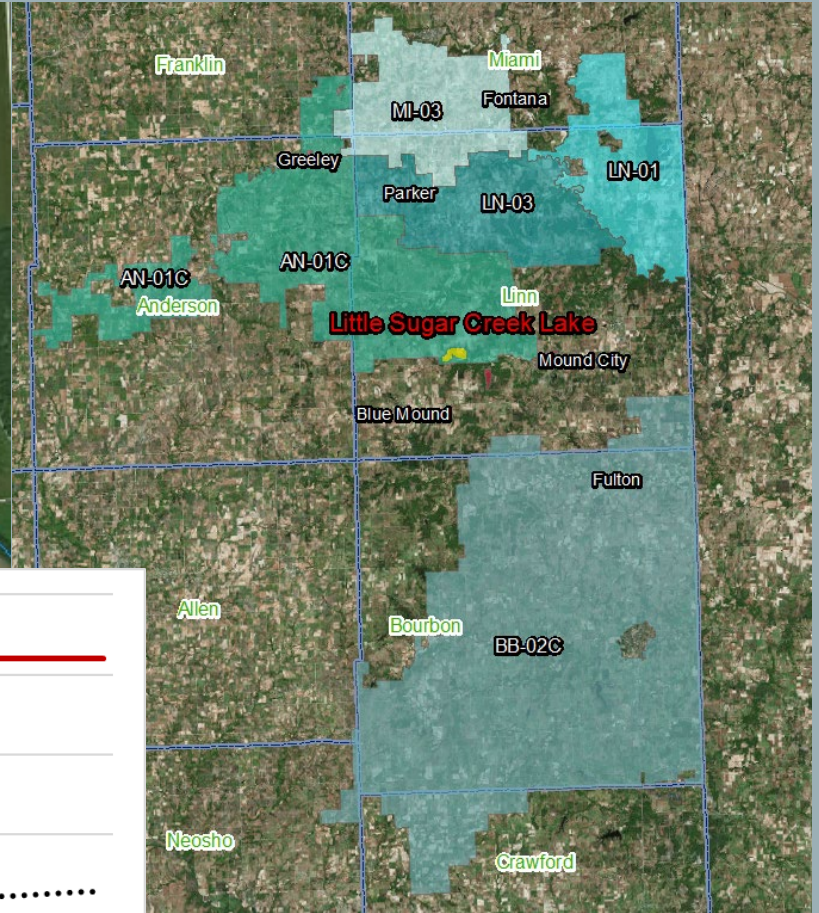
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Bone Creek Lake



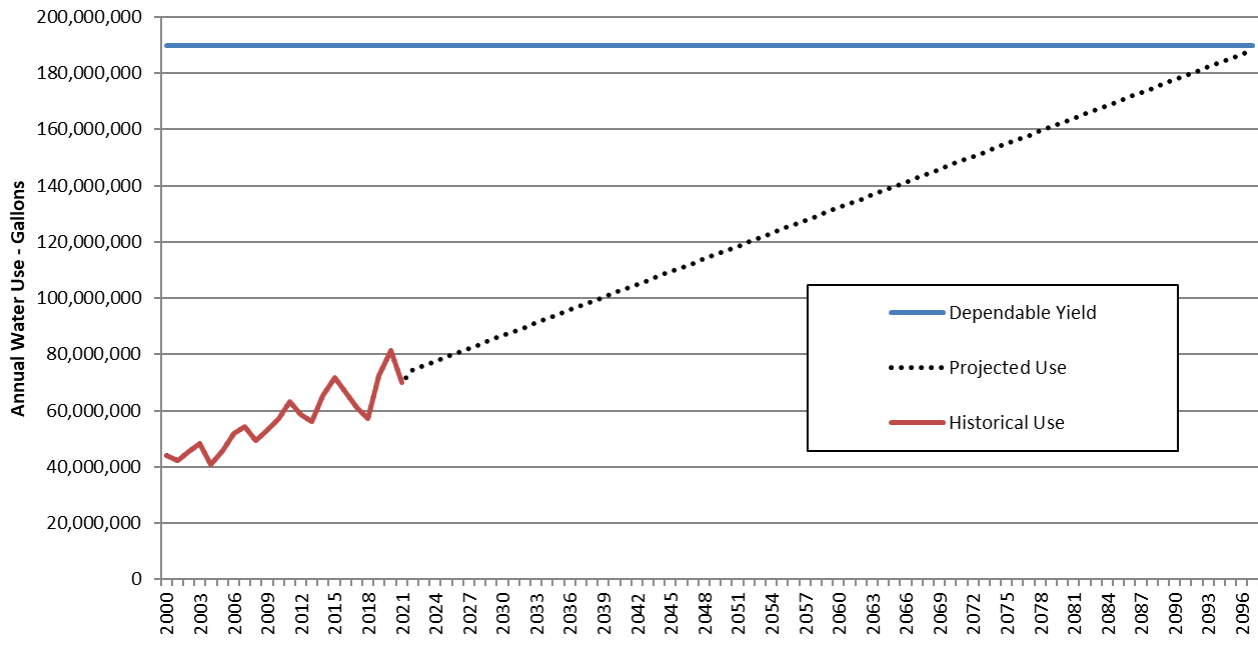
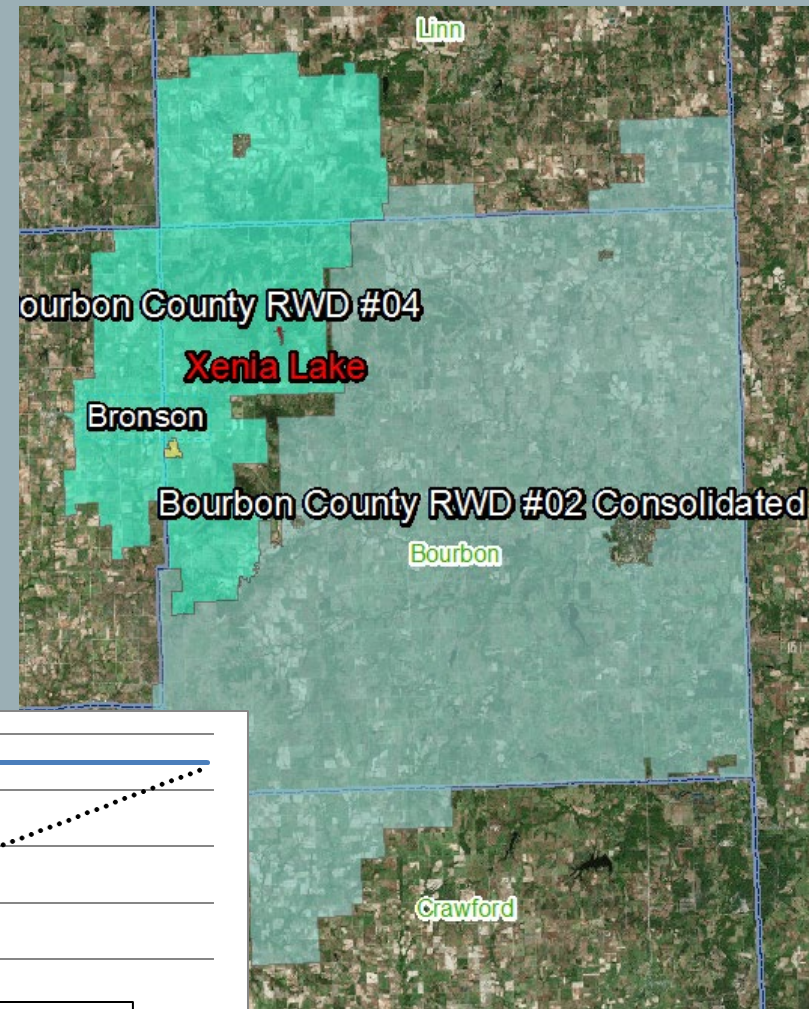
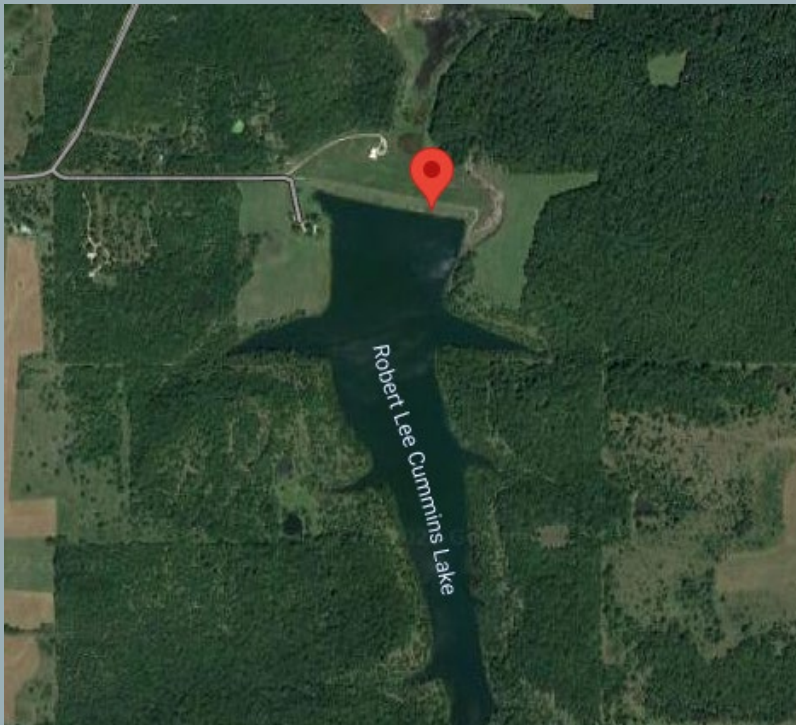
- Survey completed in Summer 2022 – Dependable Yield to be updated

Critzer Lake (Little Sugar Creek)



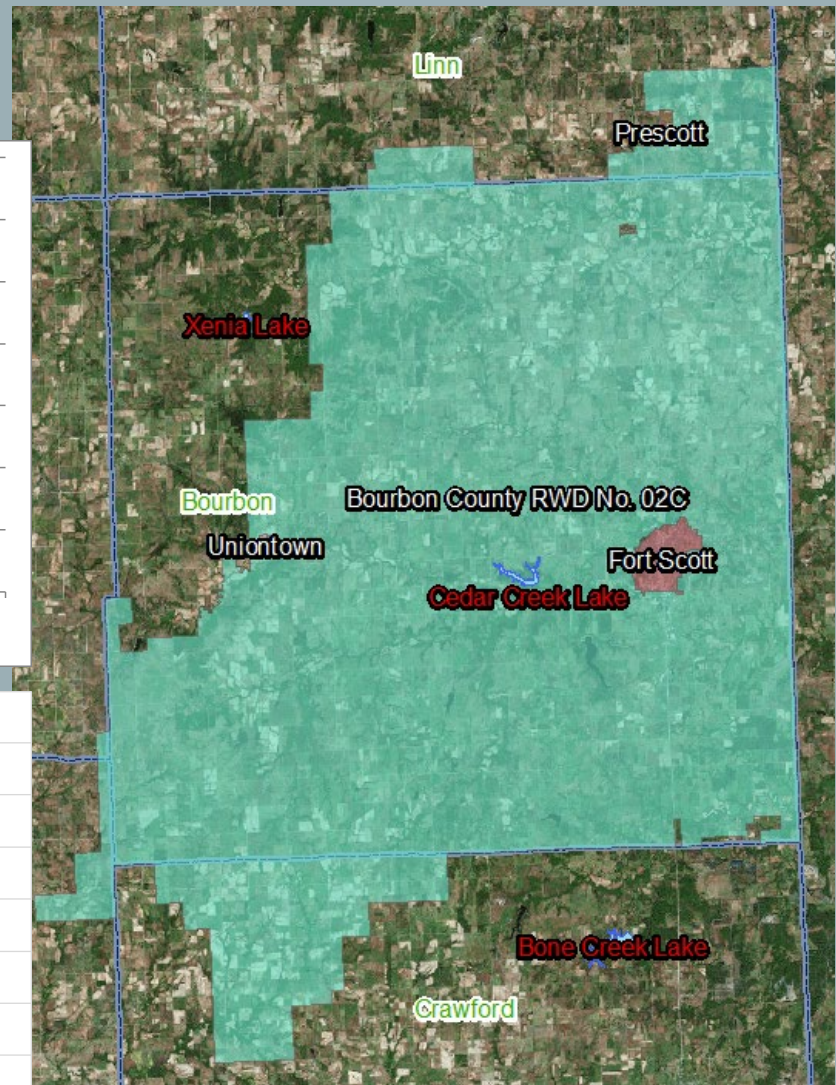
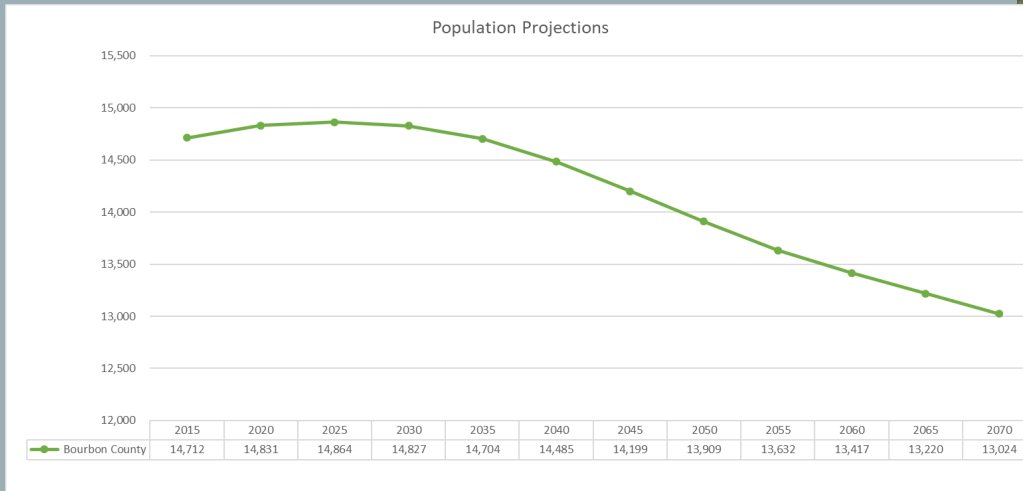
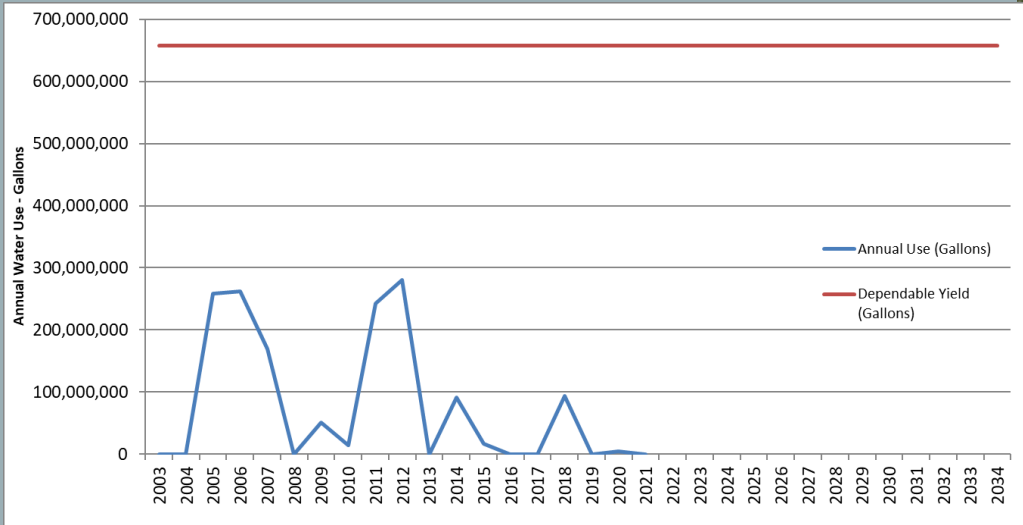
- 2022 – currently >4' low
- On list to get new survey and yield updated.

Xenia Lake



- Planning to update survey in near future.

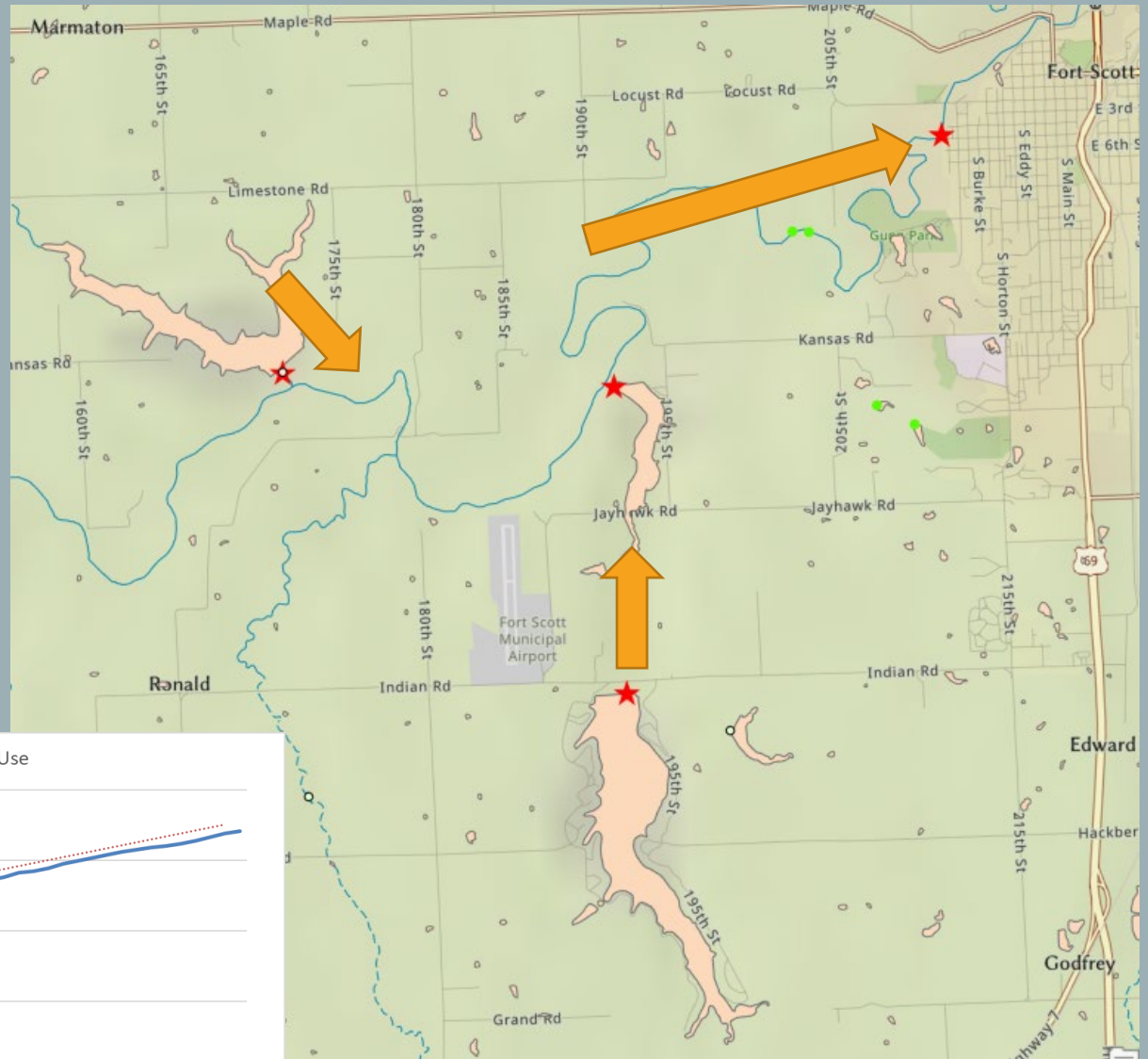
Cedar Creek Reservoir



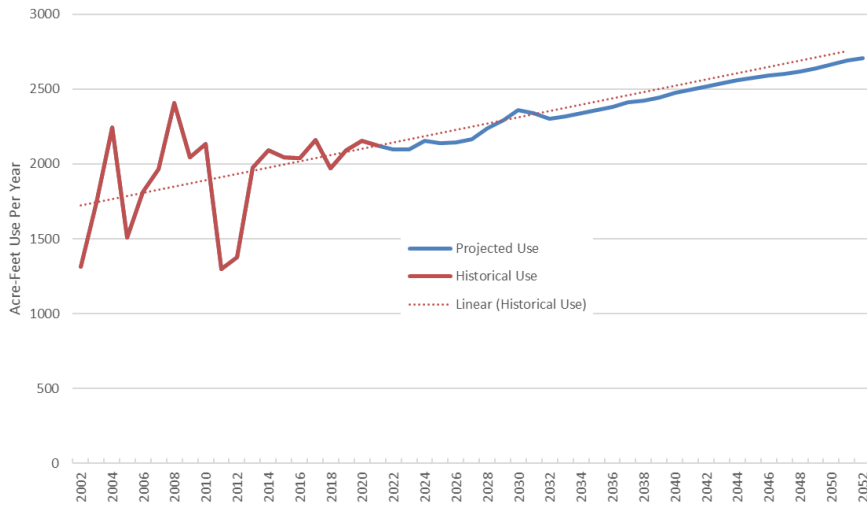
- 2022 – Heavier use, 8-10' low. Some issues with valving at other reservoirs
- Survey with refill/staff availability

Fort Scott Lake

- Just surveyed
- [October 2022](#)
- [Water Levels Lowered Next Week at Lake Fort Scott During Drought | Fort Scott Biz](#)

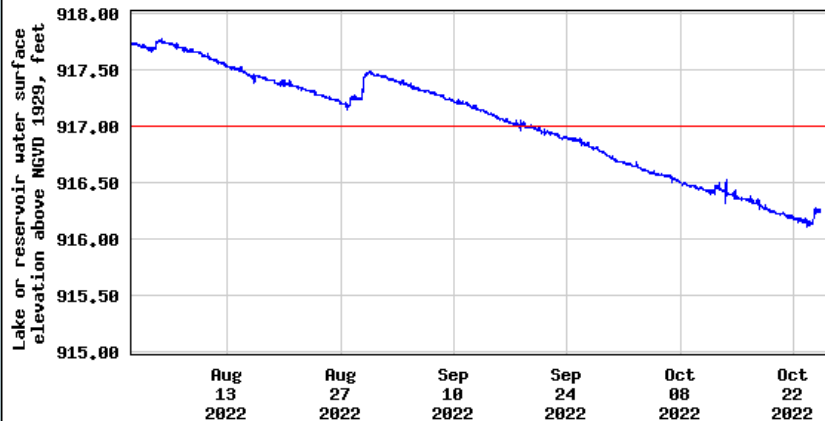


BB001 Water Right - Fort Scott Water Use





USGS 06914995 HILLSDALE LK NR HILLSDALE, KS

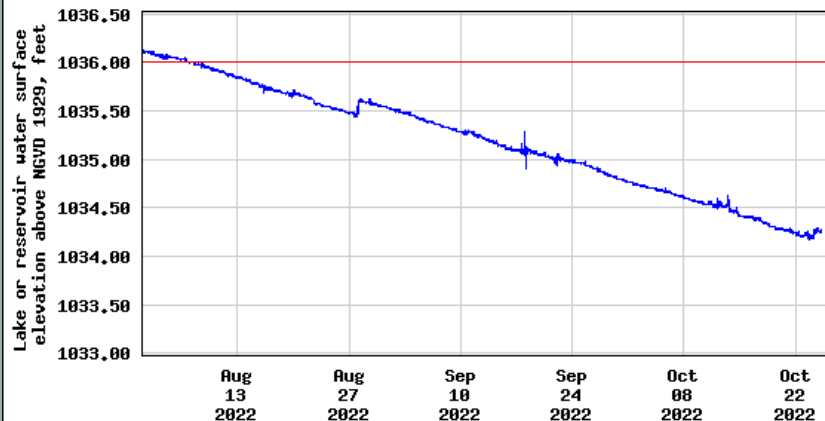


----- Provisional Data Subject to Revision -----

- Lake or reservoir water surface elevation above ngvd 1929
- Top of conservation pool elevation



USGS 06910997 MELVERN LK NR MELVERN, KS

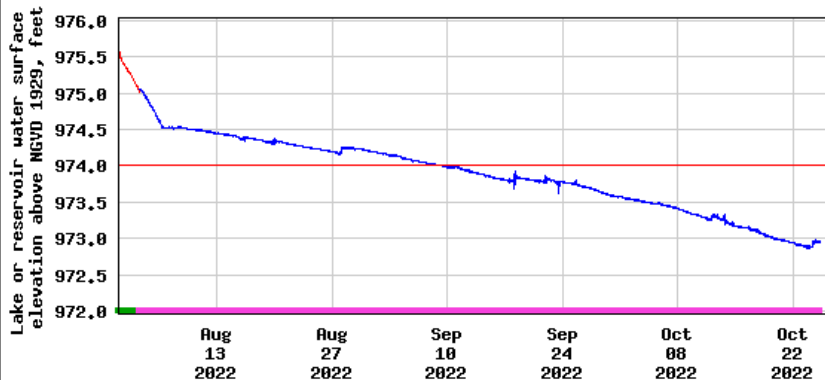


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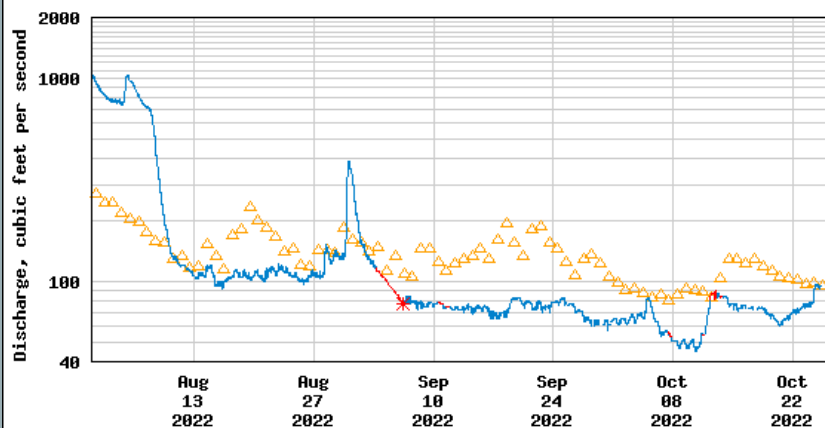
USGS 06912490 POMONA LK NR QUENEMO, KS



- Lake or reservoir water surface elevation above ngvd 1929
- Estimated lake or reservoir water surface elevation above ngvd 1929
- Period of approved data
- Period of provisional data
- Top of conservation pool elevation



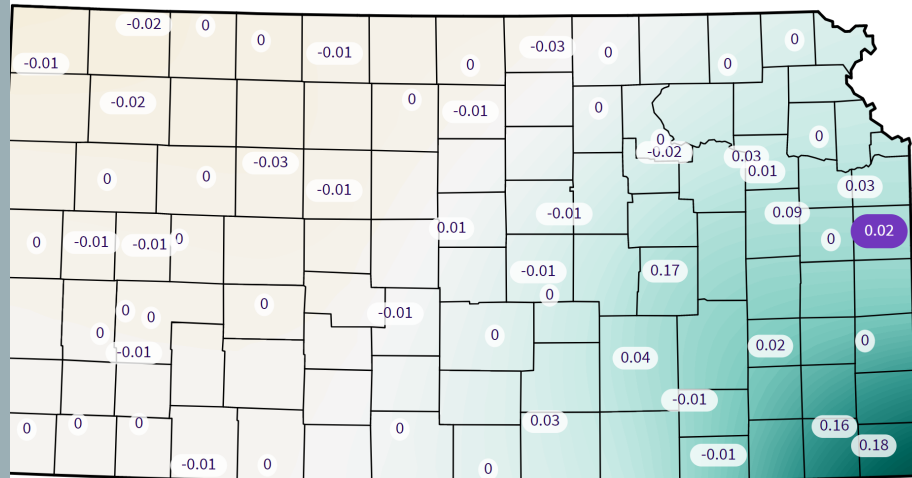
USGS 06915800 MARAIS DES CYGNES R AT LA CYGNE, KS



----- Provisional Data Subject to Revision -----

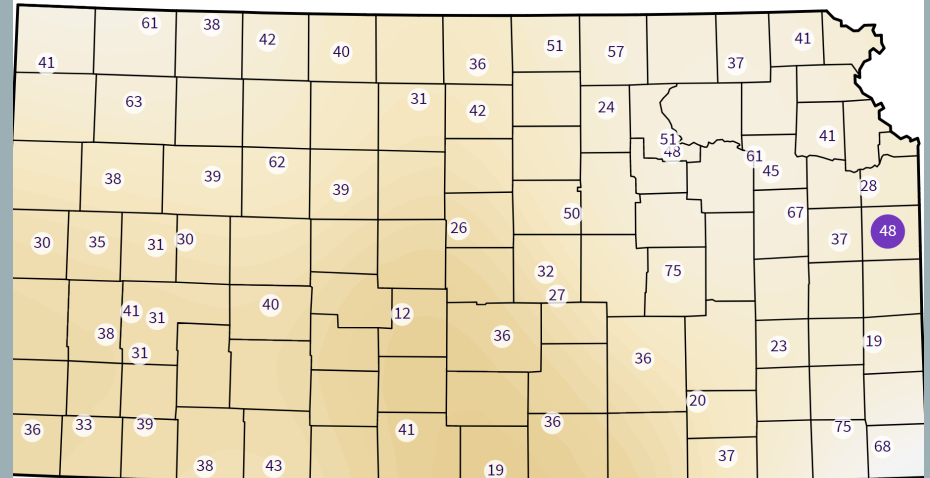
- △ Median daily statistic (36 years)
- Discharge
- Estimated discharge
- * Measured discharge

7 Day VWC Change at 10 cm



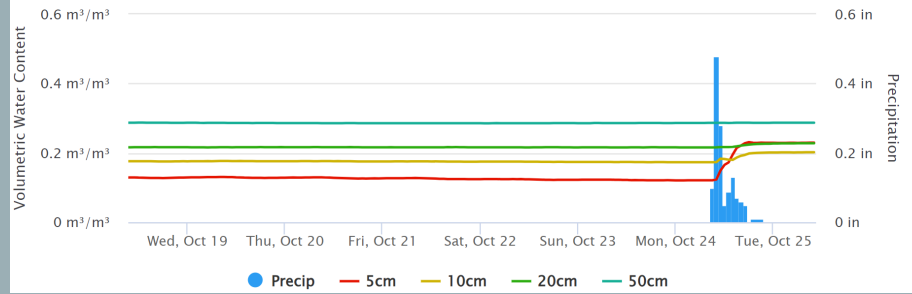
This map is representative of grassland vegetation Mesonet Data - 7 day 10 cm VWC change at Oct 25 2022 11:15 (CDT)

Percent of Saturation at 10 cm

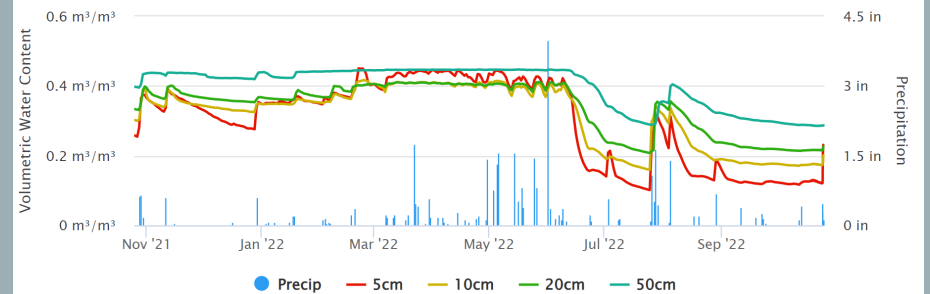


This map is representative of grassland vegetation Mesonet Data - 10 cm % Saturation at Oct 25 2022 11:15 (CDT)

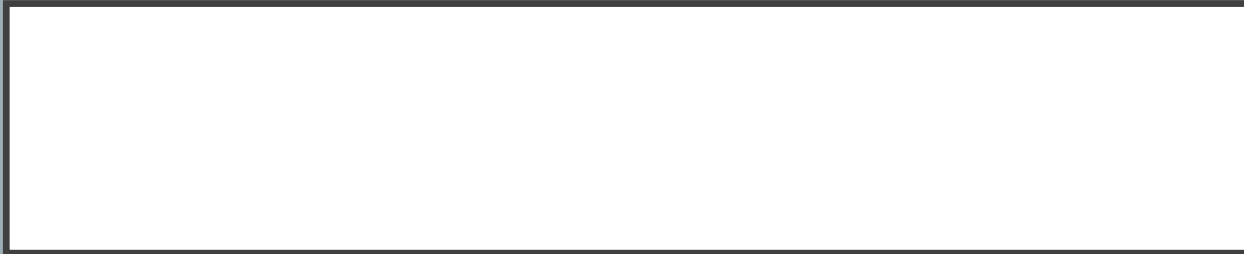
Miami 7 Day Soil Moisture



Miami 365 Day Soil Moisture



- More surveys to come within the region, lower water conditions may delay access
- Updated yield projections once get survey data finalized
- In progress: WaterSMART grant project to produce climate adjusted water supply probability assessments for federal reservoirs



- Drought vulnerable public water suppliers = most likely to first be adversely affected by drought
 - Basic source
 - Distribution system
 - Treatment capacity
 - Water purchase contract limitations
 - Single well as a sole source of supply