

Wichita County LEMA Annual Review for 2023

Presented at GMD 1's 2024 Annual meeting
February 28, 2024

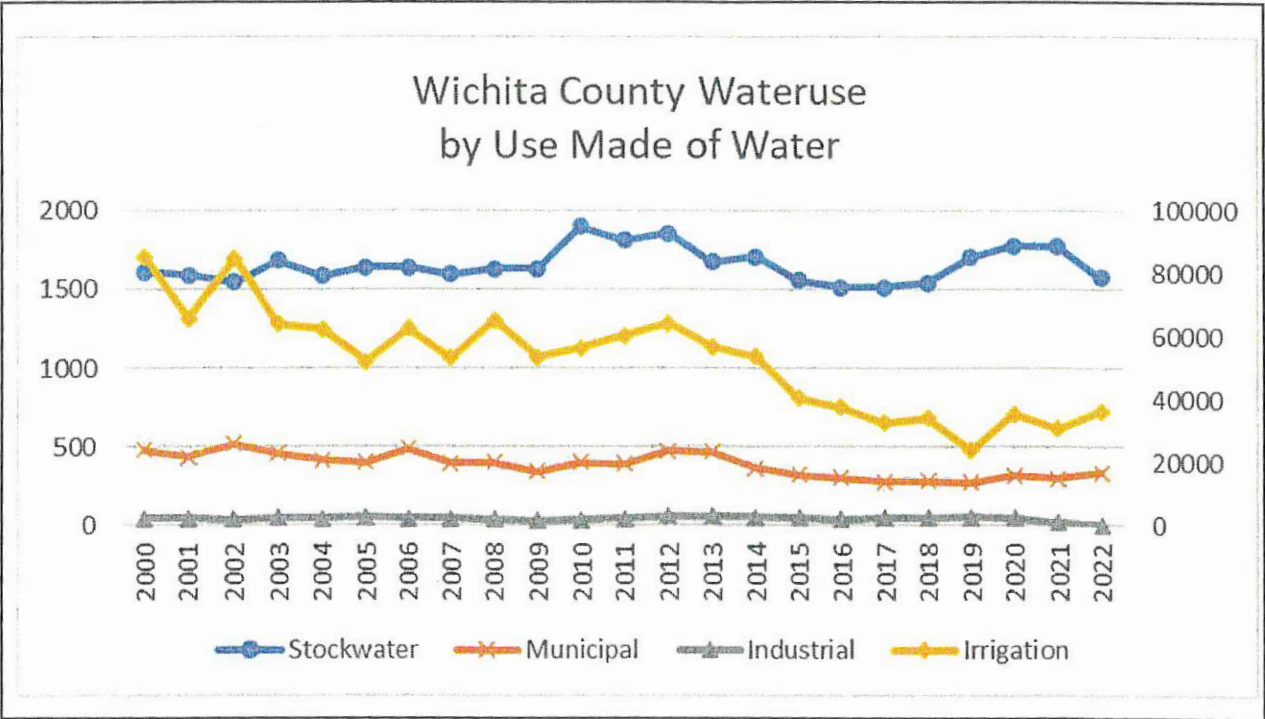
David Barfield, District consultant

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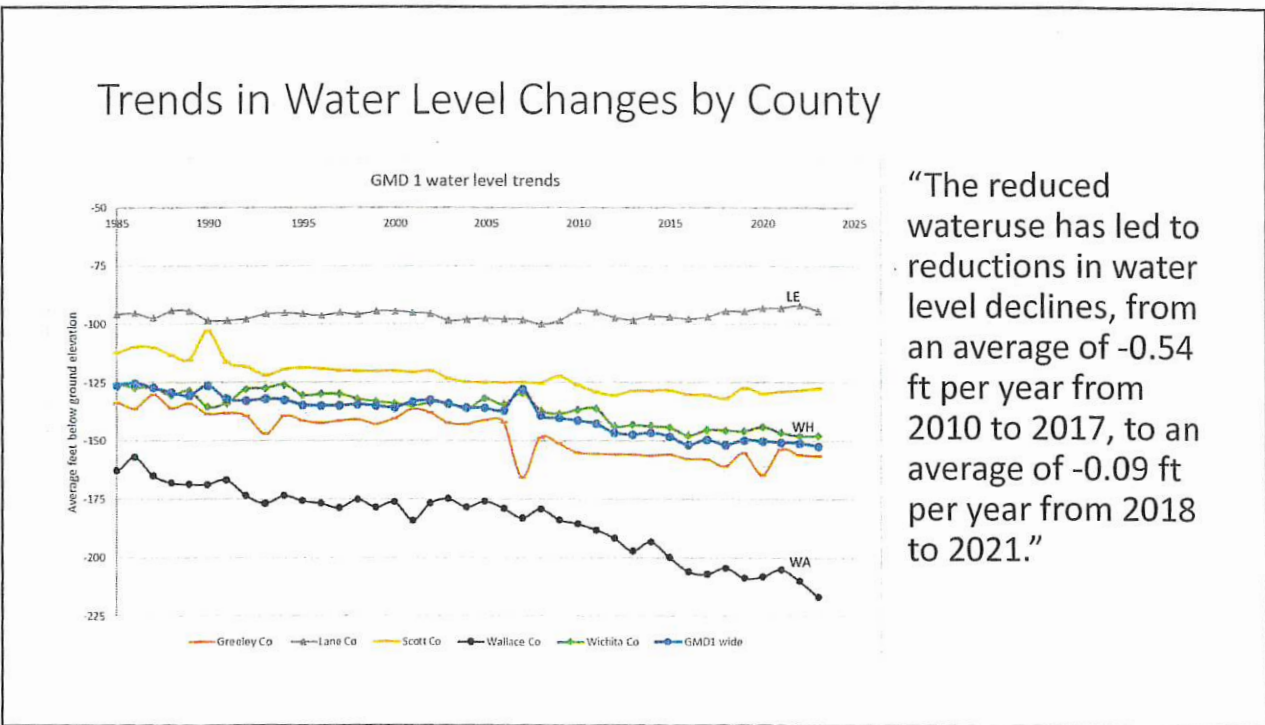
Background

- The Wichita County LEMA was implemented for the years 2021-25.
- The LEMA Plan requires annual reviews to evaluate how the LEMA is performing.
- The 2023 annual review was completed, evaluating 2021-22 water use and water level changes.
- The Wichita County Water Conservation Area (WCA), a voluntary program began in 2017, was also evaluated as it contributed to the County's overall reduction in water use.

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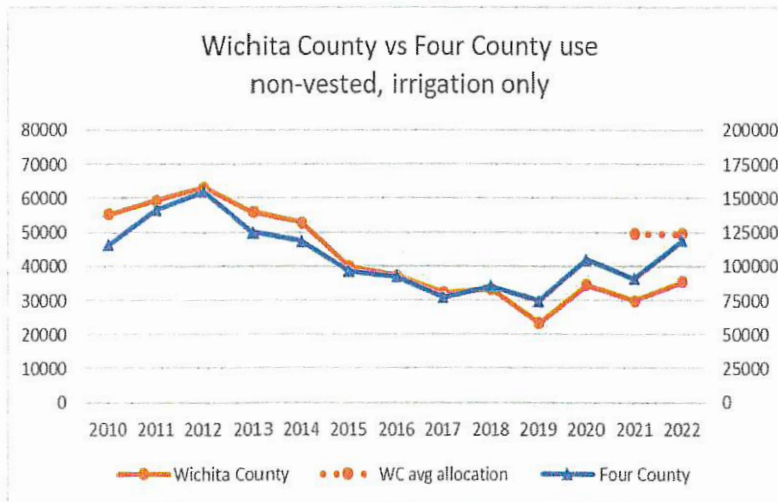
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Wichita County WCA performance

- There are 25 active WCA consent agreements covering 11,391 acres.
- The consent agreements commit participants to a 29% reduction in wateruse for the first 7-year period.
- Over the first 6 years of the WCA (2017-22), wateruse has averaged 69% of the average allocation allowed and 48% of the 2009-15 average use.
- Savings have been almost twice the initially projected savings of 2665 acre-feet/year at approximately 4500 acre-feet per year.

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Wichita County LEMA performance



- Average use for the first two years of the Wichita County LEMA (2021-22) was 66% of the average LEMA allocation.
- As compared to the wateruse in the Four Counties (blue), Wichita County's use (orange) since 2017, shows a significant reduction.

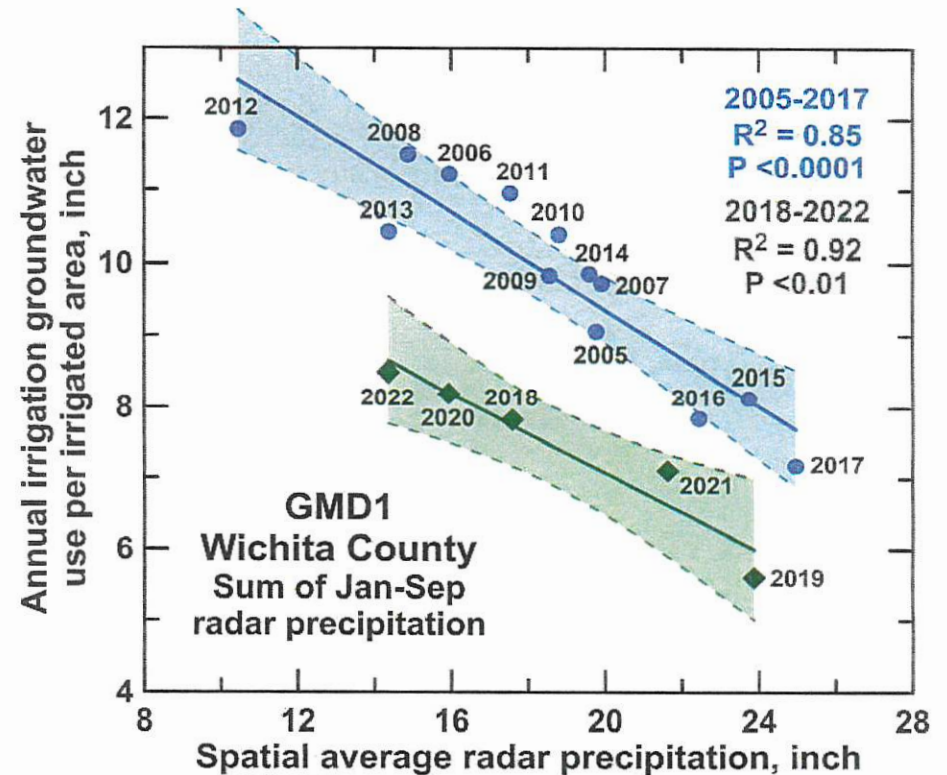
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- The non-vested irrigation use within Wichita County in 2022 was 82% of the 2011-20 average, compared to 111% in the rest of the District.

KGS Evaluation of Wichita County Wateruse vs Precipitation

The KGS compared annual water level changes to annual wateruse in the Ogallala-High Plains Aquifer generally, with emphasis in areas of enhanced management to determine if these records indicate a change in wateruse behavior. The KGS' work found evidence in both the GMD 4's Sheridan 6 LEMA and in Wichita County of a changing relationships between pumping and annual precipitation.

The figure below is a summary of part of KGS's evaluation for Wichita County. The figure plots annual wateruse, expressed as irrigation depth, versus annual precipitation, contrasting the pre-WCA/pre-LEMA period (2005-2017) with WCA/LEMA period. KGS' work indicates that total water savings from 2018 to 2022 in Wichita County is roughly 39% less than the pre-WCA/LEMA period. These savings have been in part due to management changes put in place by these described conservation methods (WCA & LEMAs). This data indicates that total savings may be broken down to 23.9% from improved irrigation management, and 15.6% from decreased irrigated areas and other factors. Importantly, this data shows that these locally based conservation plans are successful in decreasing pumping through management changes.



Future reviews

As is noted in the introduction above, next year's annual review will be the start of the Board's process to consider whether the LEMA should continue on the same or different terms. This review will start with a review of the three years of data that will soon be available and input from the public.

Summary of the 2023

Wichita County LEMA Annual Review

Introduction - The Wichita County Local Enhanced Management Area (WC LEMA) was enacted in 2021 for the five-year period, January 1, 2021, to December 31, 2025, restricting wateruse for all non-vested irrigation use, to extend the useful life of the Ogallala Aquifer in the County. The WC LEMA Plan includes annual review requirements to evaluate how the LEMA is performing, to inform whether the LEMA should continue and to assist in determining if changes to the LEMA should be considered for the future.

Wateruse data for 2021 and 2022 as well as water level data through January 2023 water level measurements are the subject of this second annual review under the LEMA.

Wichita County's Water Conservation Area (WCA)

While the purpose of this annual review is to evaluate the performance of the LEMA, overall wateruse in Wichita County is significantly affected by Wichita County's Water Conservation Area (WCA) put in place in 2017. The Wichita County WCA is a voluntary program implemented on a countywide basis. It commits enrollees to reductions over four seven-year periods, with increasing reduction requirements with each successive period. Reduction requirements for the period 2017-2023 are 30 % from the average use for 2009-2015. There are 25 active consent agreement covering 11,391 acres and projected savings of 2,665 Acre-feet per year.

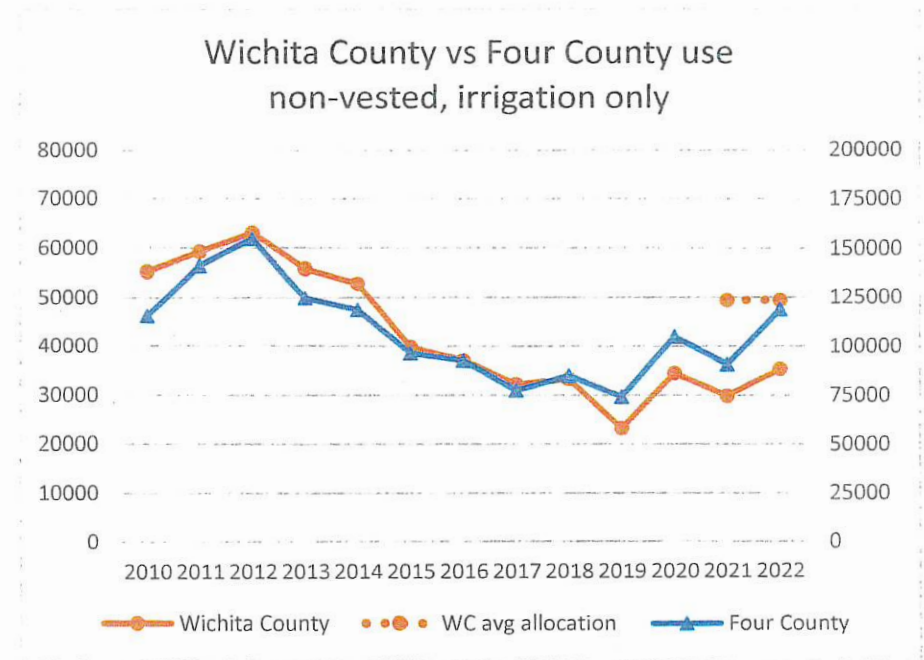
Through 2022, a review of the data indicates the following:

- Over the first 6 years of the WCA (2017-22) average use has been 69% of the average allocation allowed and 48% of the 2009-15 average use.
- Savings have been almost twice the initially projected savings of 2665 acre-feet/year at approximately 4500 acre-feet per year.

Wichita County LEMA annual review

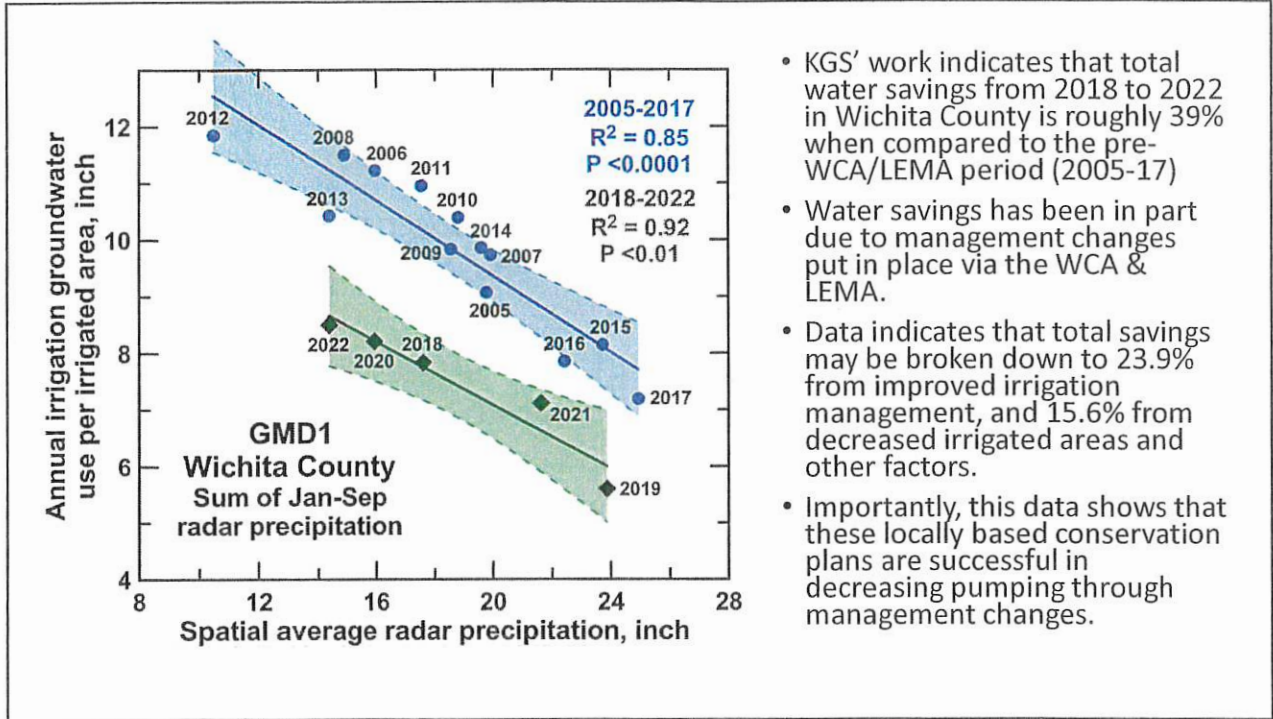
Wateruse data - Wichita County's 2021-22 wateruse was compared with the average use allowable under the Wichita County LEMA and Wichita County wateruse trends were also comparing with the Four County trends.

The figure below shows annual total use for Wichita County (using the left axis), the total use of the Four Counties (using the right axis), and the average annual Wichita County LEMA allocations, all measured in acre-feet/year.




In summary, this county-wide review of the 2021-22 wateruse found the following:

- Average use for the first two years of the Wichita County LEMA (2021-22) was 66% of the average LEMA allocation.



- KGS' work indicates that total water savings from 2018 to 2022 in Wichita County is roughly 39% when compared to the pre-WCA/LEMA period (2005-17)
- Water savings has been in part due to management changes put in place via the WCA & LEMA.
- Data indicates that total savings may be broken down to 23.9% from improved irrigation management, and 15.6% from decreased irrigated areas and other factors.
- Importantly, this data shows that these locally based conservation plans are successful in decreasing pumping through management changes.

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Water Right Allocation Group

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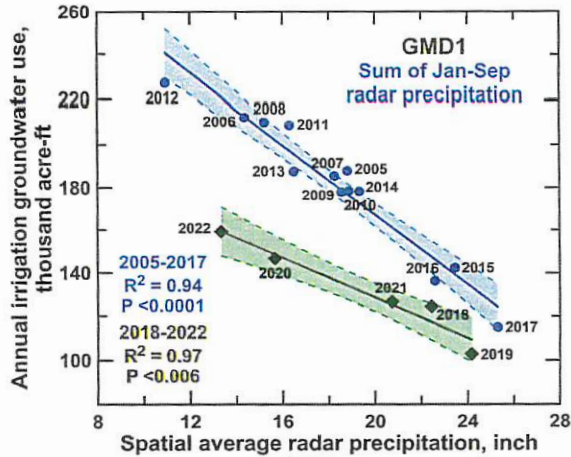
Allocation Type:	Four County	Group Number:	330.0
Start Year:	2023	Depth (inches):	
Duration (years):	5	Acres:	463,000

5 Year Allocation	Total Water Use	Remaining Allocation
1,645.6 Acre-feet	.0 Acre-feet	1,645.6 Acre-feet

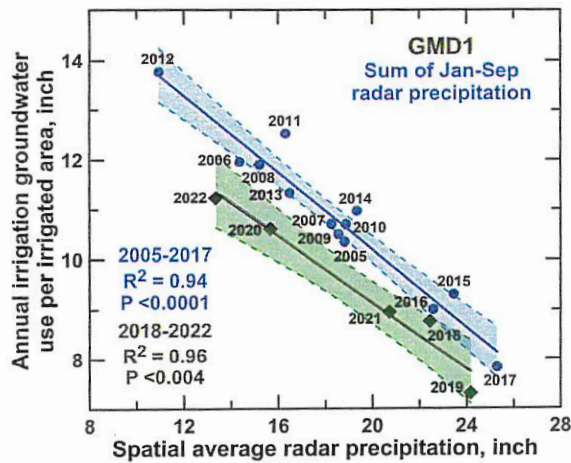
Allocated Water Rights - Reported Water Use						
File Number	Legal Description	2023	2024	2025	2026	2027
3689-00	15-16S-42W 1 CW NW SE	0	.0	.0	.0	.0
8295-00	15-16S-42W 2 NW SE NW	0	.0	.0	.0	.0
11985-00	15-16S-42W 2 NW SE NW	0	.0	.0	.0	.0
11985-00	15-16S-42W 4 CW NW NW	0	.0	.0	.0	.0
18232-00	15-16S-42W 3 SE SE NE	0	.0	.0	.0	.0
18232-00	15-16S-42W 1 CW NW SE	0	.0	.0	.0	.0
30655-00	15-16S-42W 5 NE NE NE	0	.0	.0	.0	.0
Water Use Total		0	.0	.0	.0	.0

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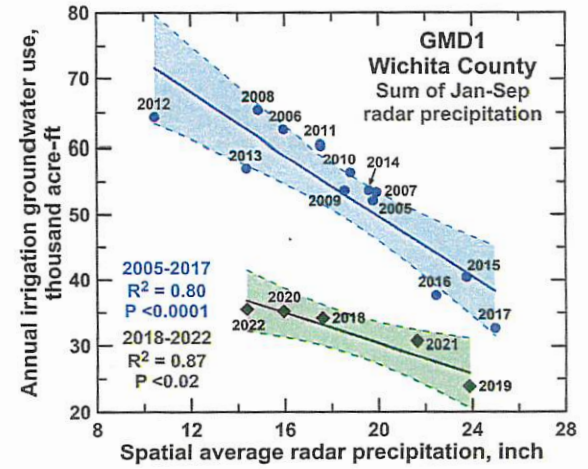
Water Savings for GMD1 and Wichita County based on 2005–2022 Data.



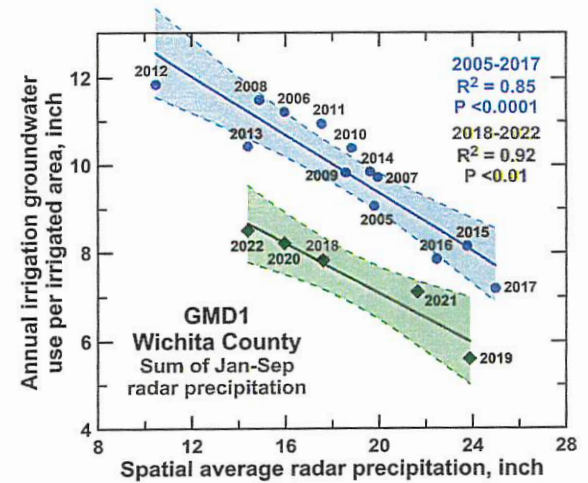
Total savings in irrigation water use in GMD 1 is 24.3%.



The total savings can be broken down into 8.6% from improved irrigation water use (based on the water use per irrigated area plot) and 15.7% from decreased irrigated area and other factors.



Total savings in irrigation water use in Wichita County is 39.5%.



The total savings can be broken down into 23.9% from improved irrigation water use (based on the water use per irrigated area plot) and 15.6% from decreased irrigated area and other factors.

Decrease in Irrigated Area during 2002–2022

