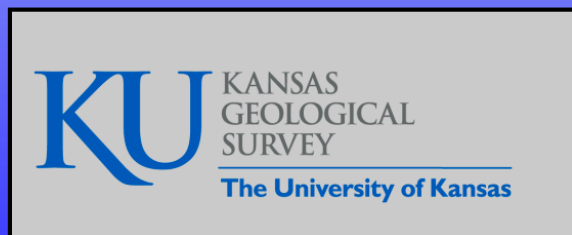
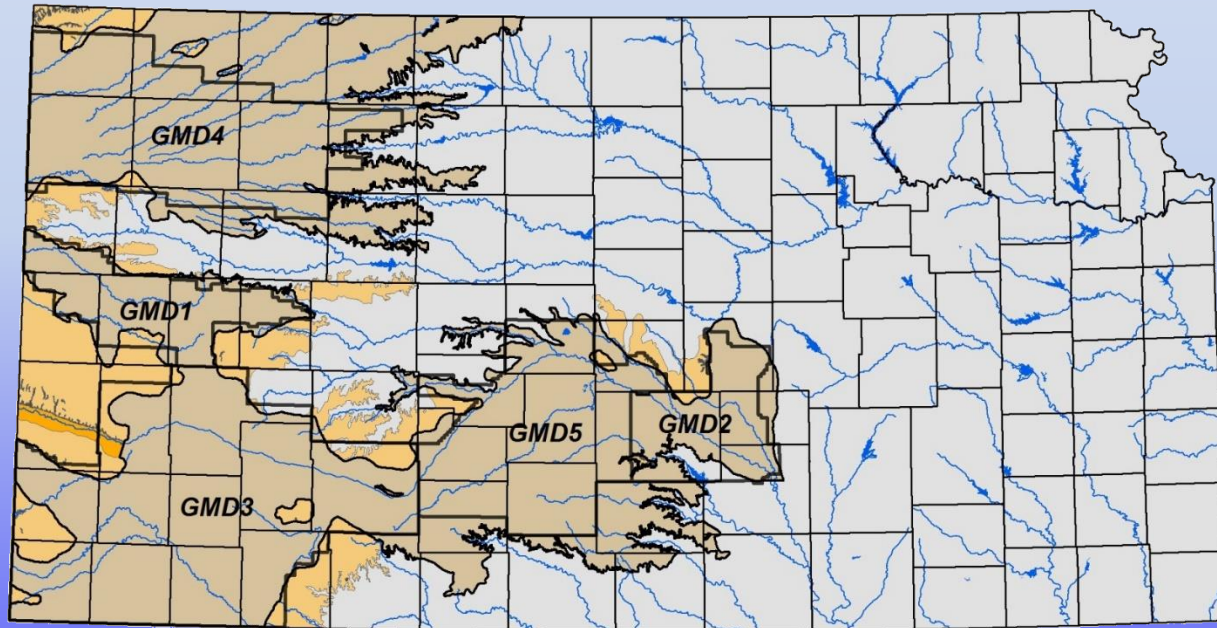


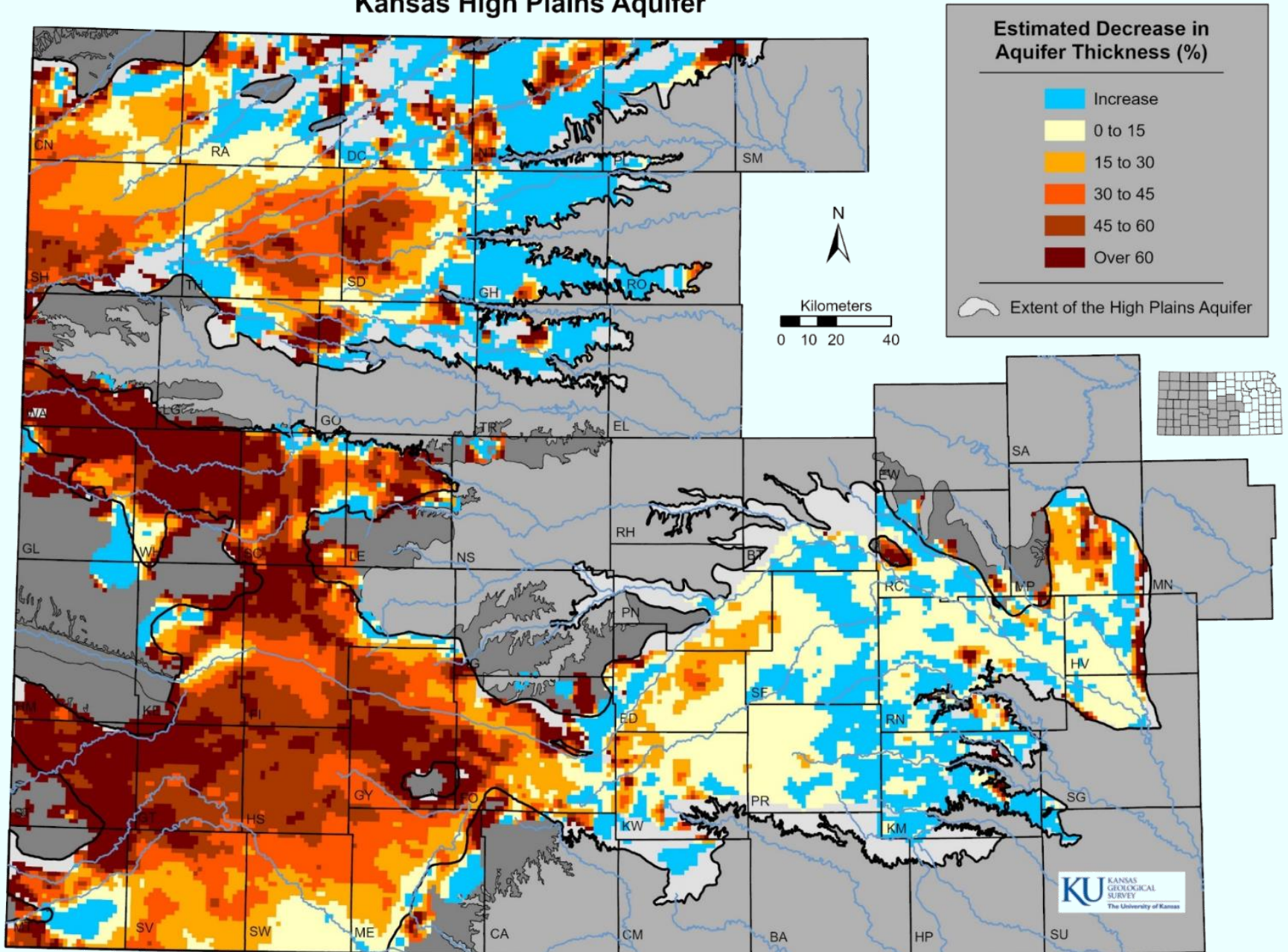
Are Groundwater Conservation Management Areas in the High Plains Aquifer Truly Saving Water?

Don Whittemore, Jim Butler, Brownie Wilson, and John Woods



***Governor's Conference on the
Future of Water in Kansas
November 17, 2022***

Percent Change in Aquifer Thickness, Predevelopment to Average 2020-2022, Kansas High Plains Aquifer



Water Conservation Management Areas

- **Local Enhanced Management Area**

Program established in 2012

Initiated by stakeholders in a specific area

Approved by GMD, accepted/rejected by KDA-DWR

Regulatory oversight

- **Water Conservation Area**

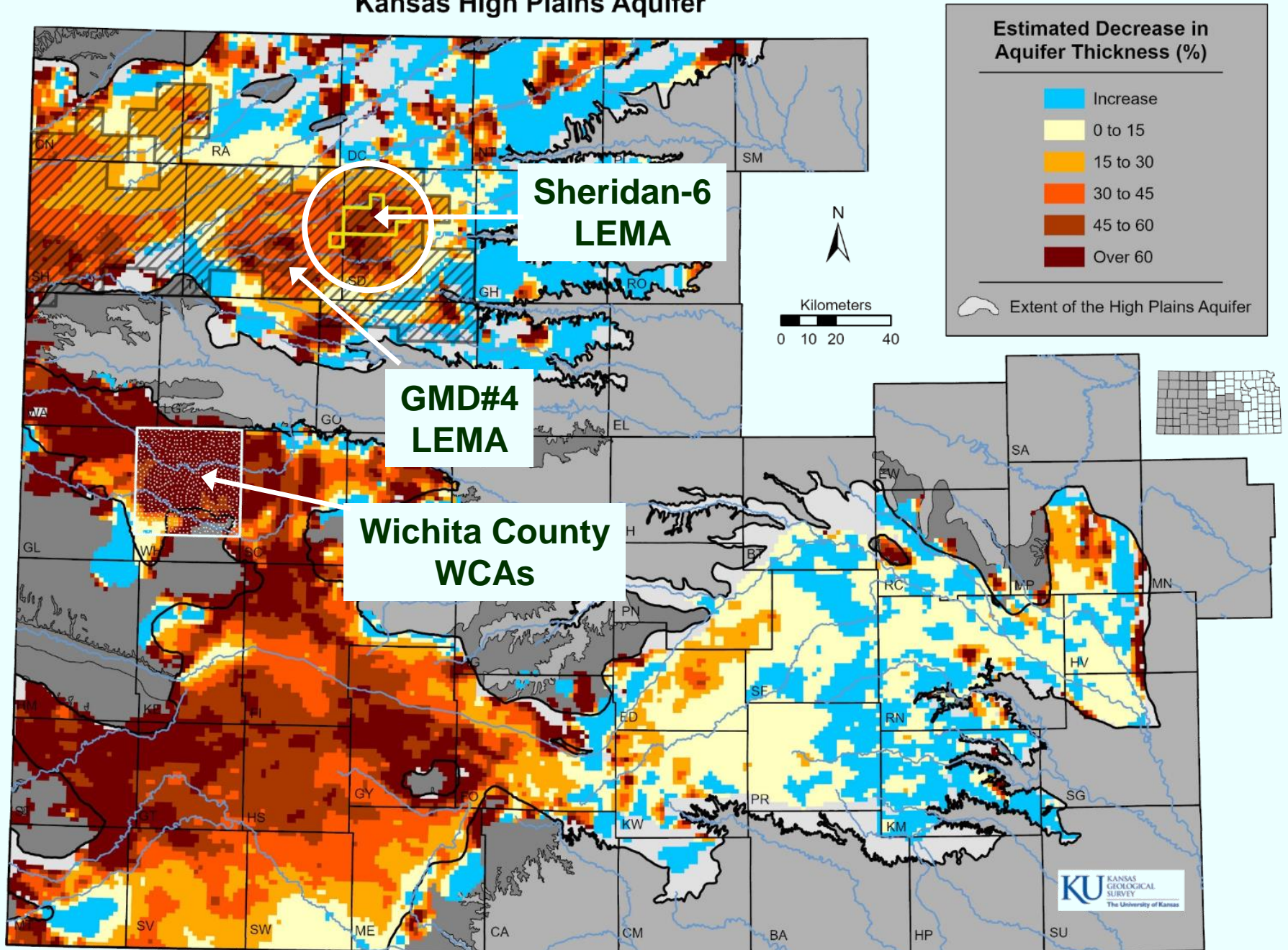
Program established in 2015

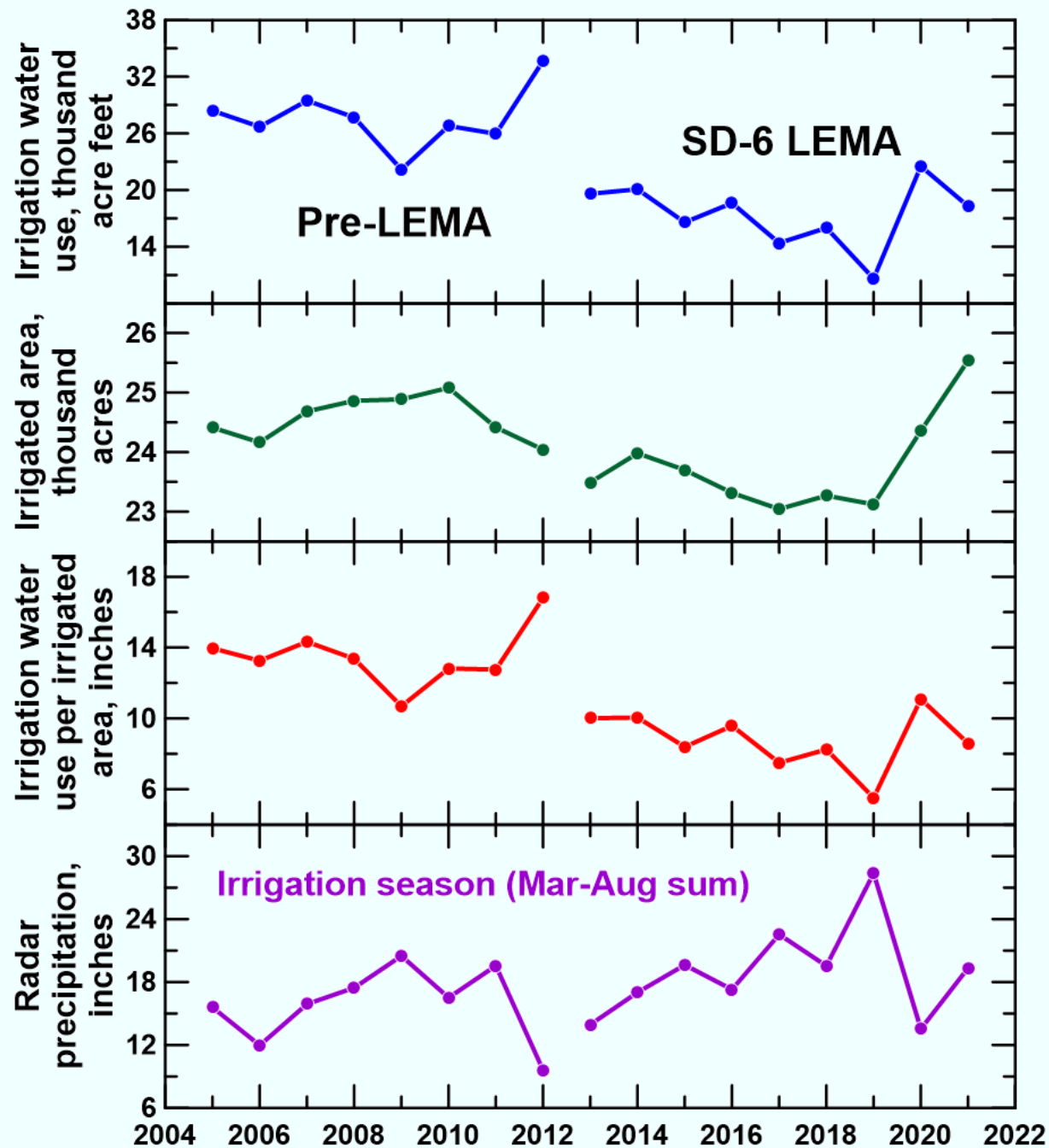
Initiated by water right holder(s)

Approved by KDA-DWR

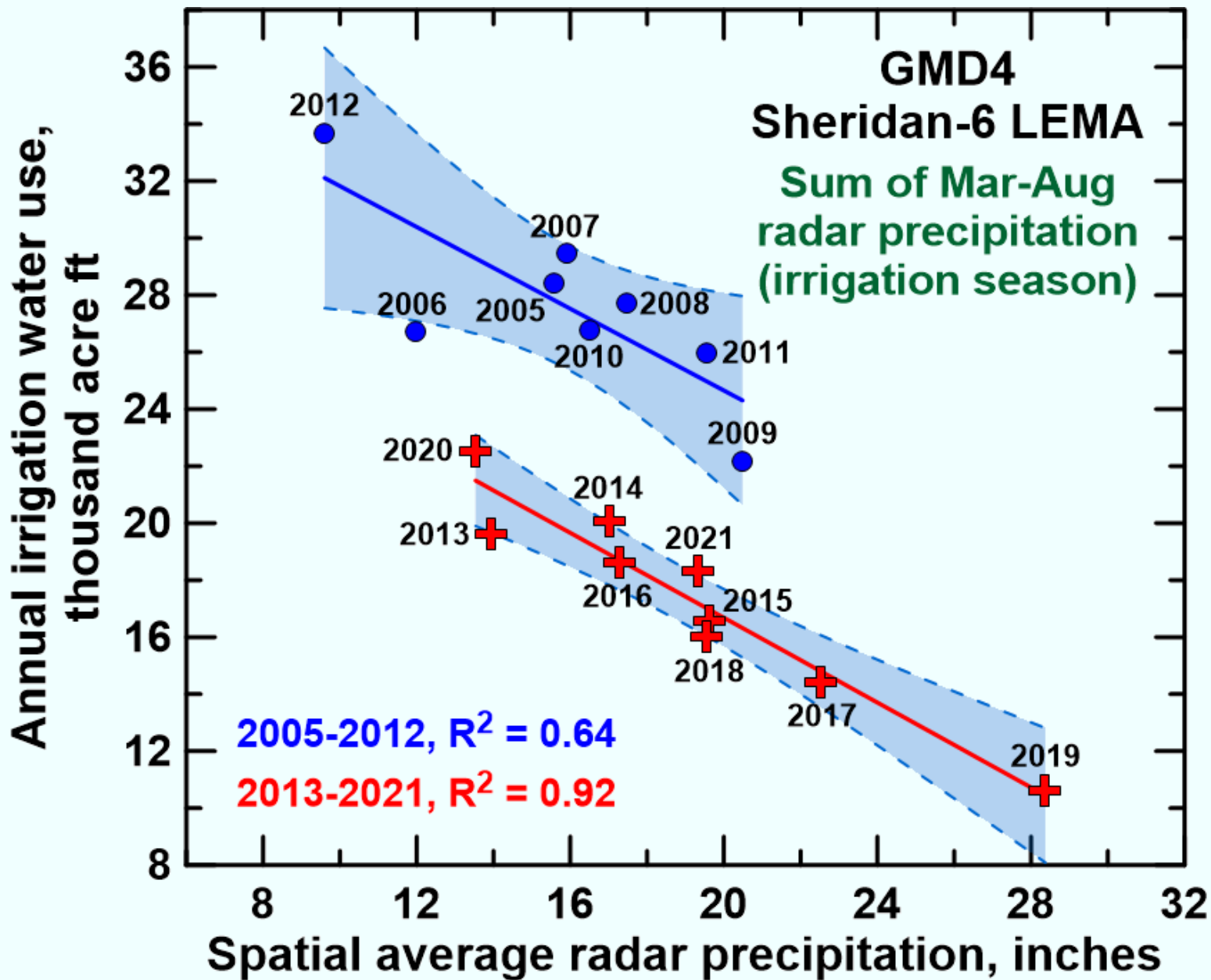
Regulatory oversight

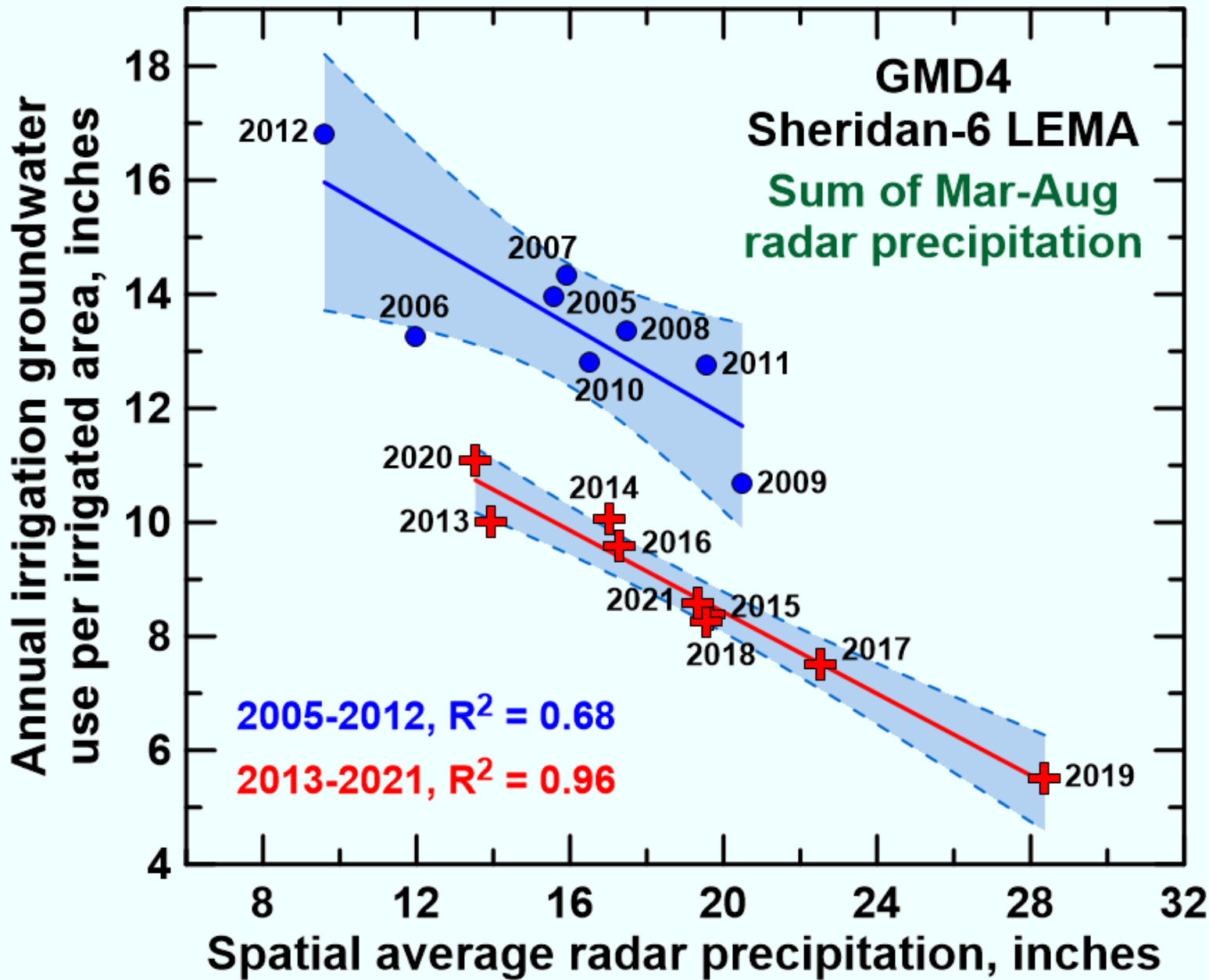
Percent Change in Aquifer Thickness, Predevelopment to Average 2020-2022, Kansas High Plains Aquifer



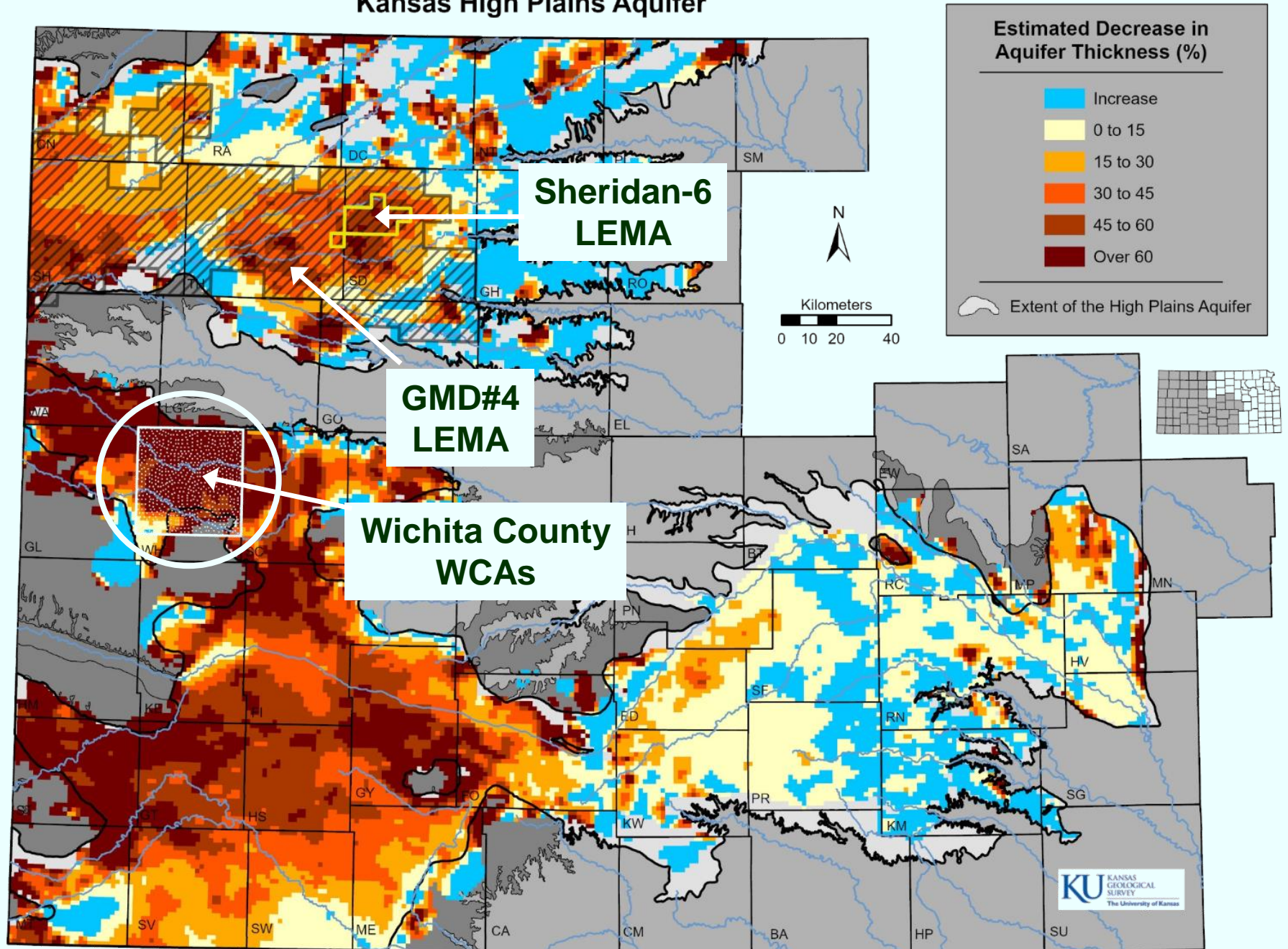


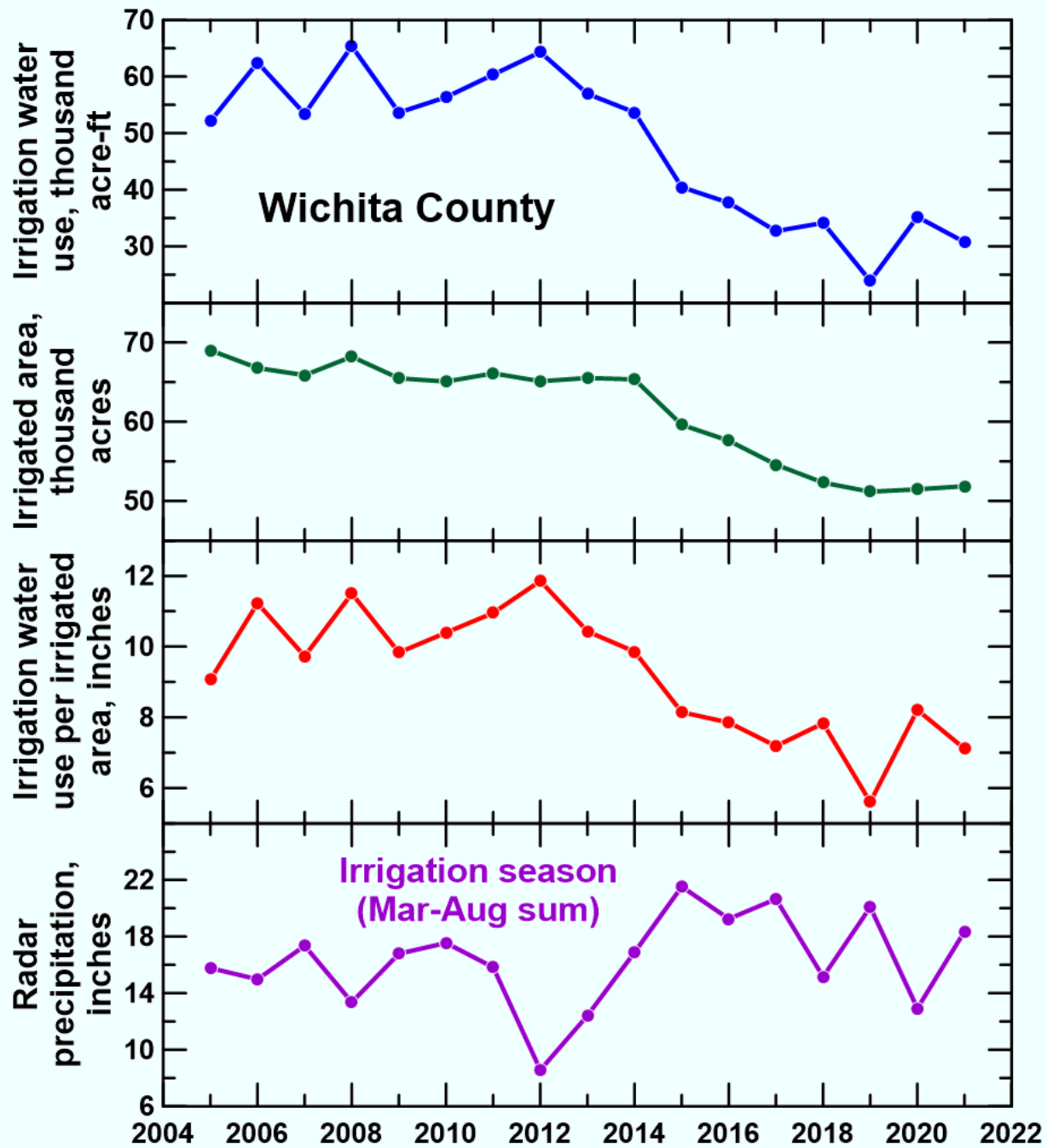
**GMD4
Sheridan-6
LEMA**

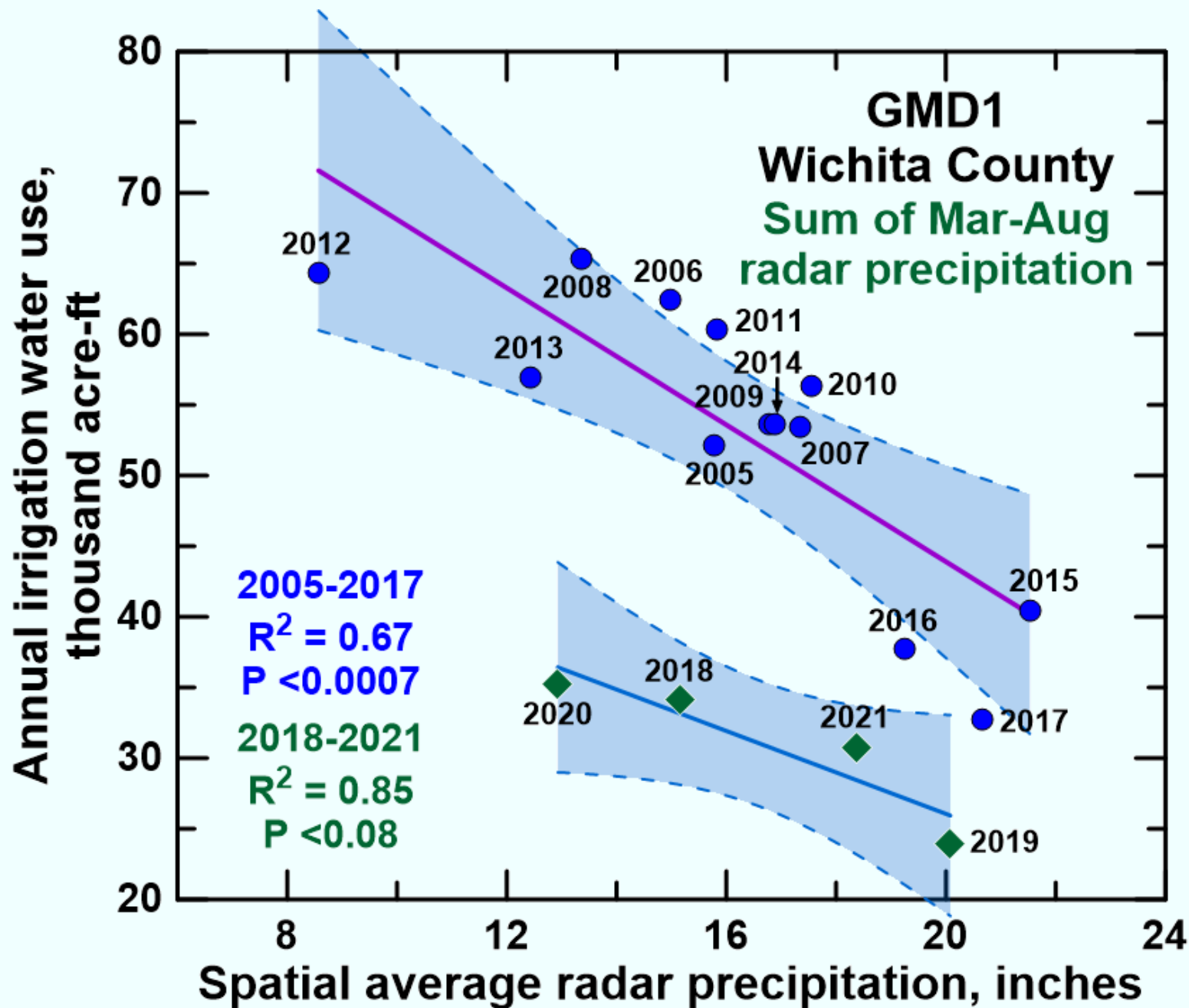




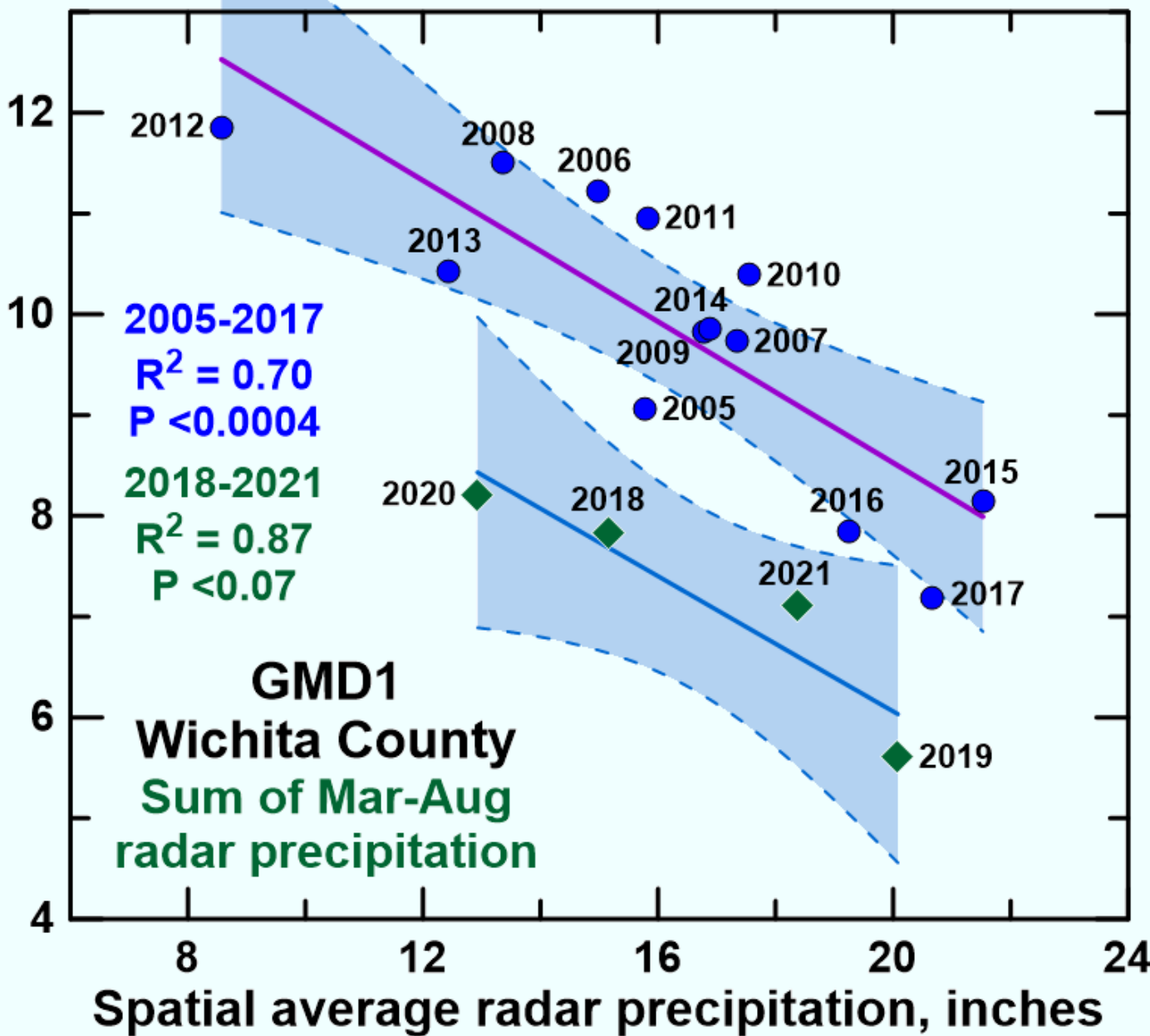
Percent Change in Aquifer Thickness, Predevelopment to Average 2020-2022, Kansas High Plains Aquifer



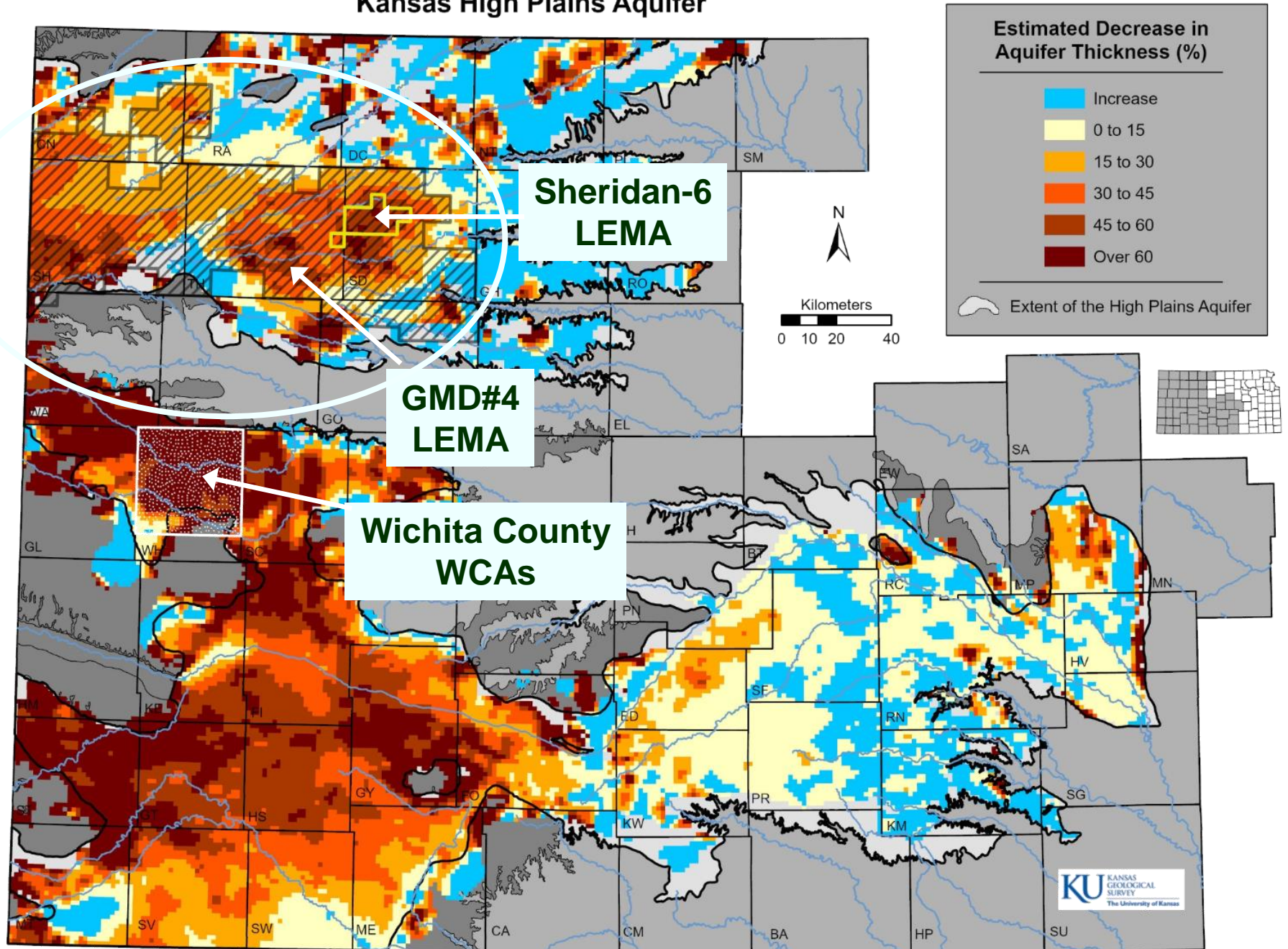


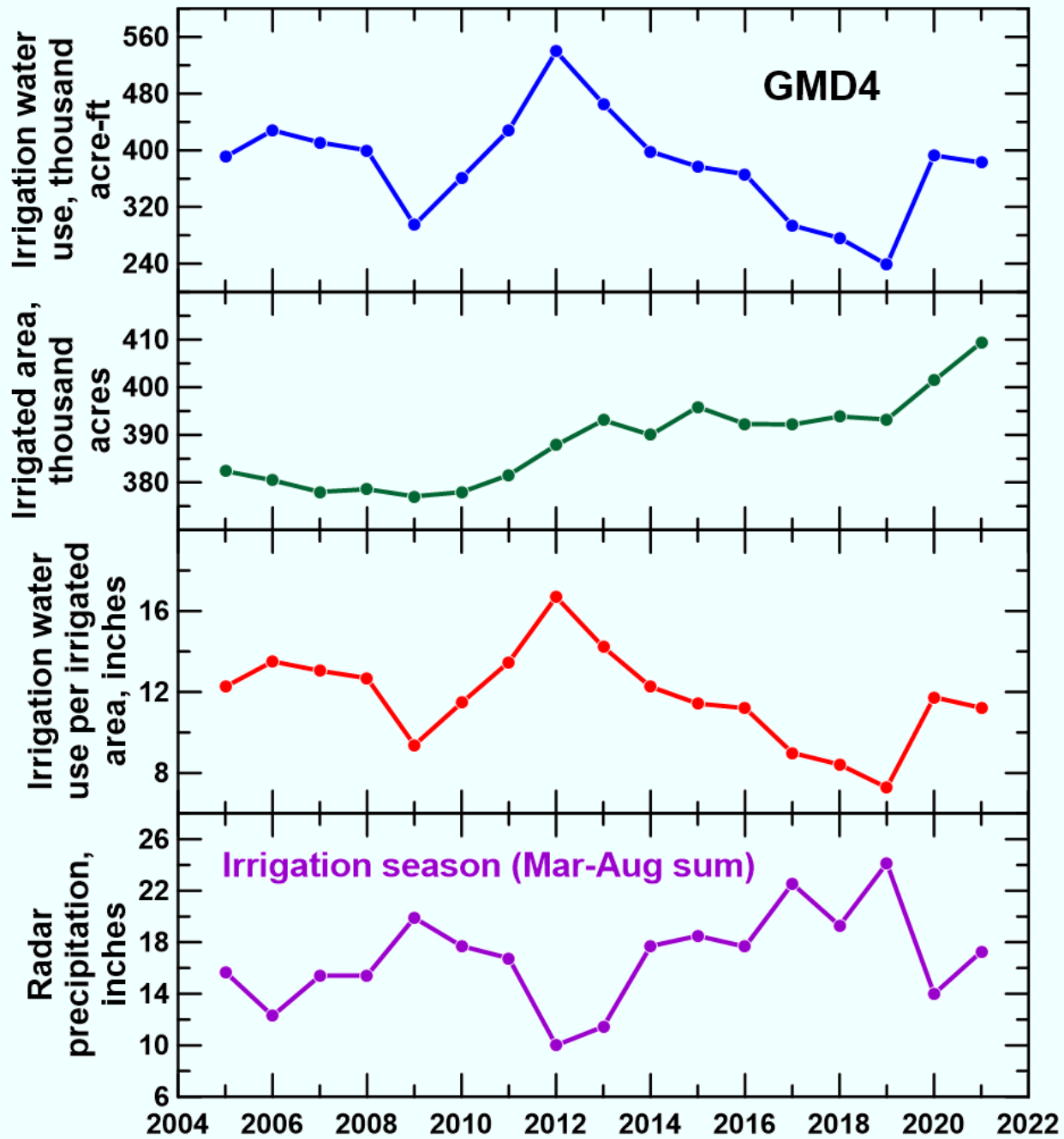


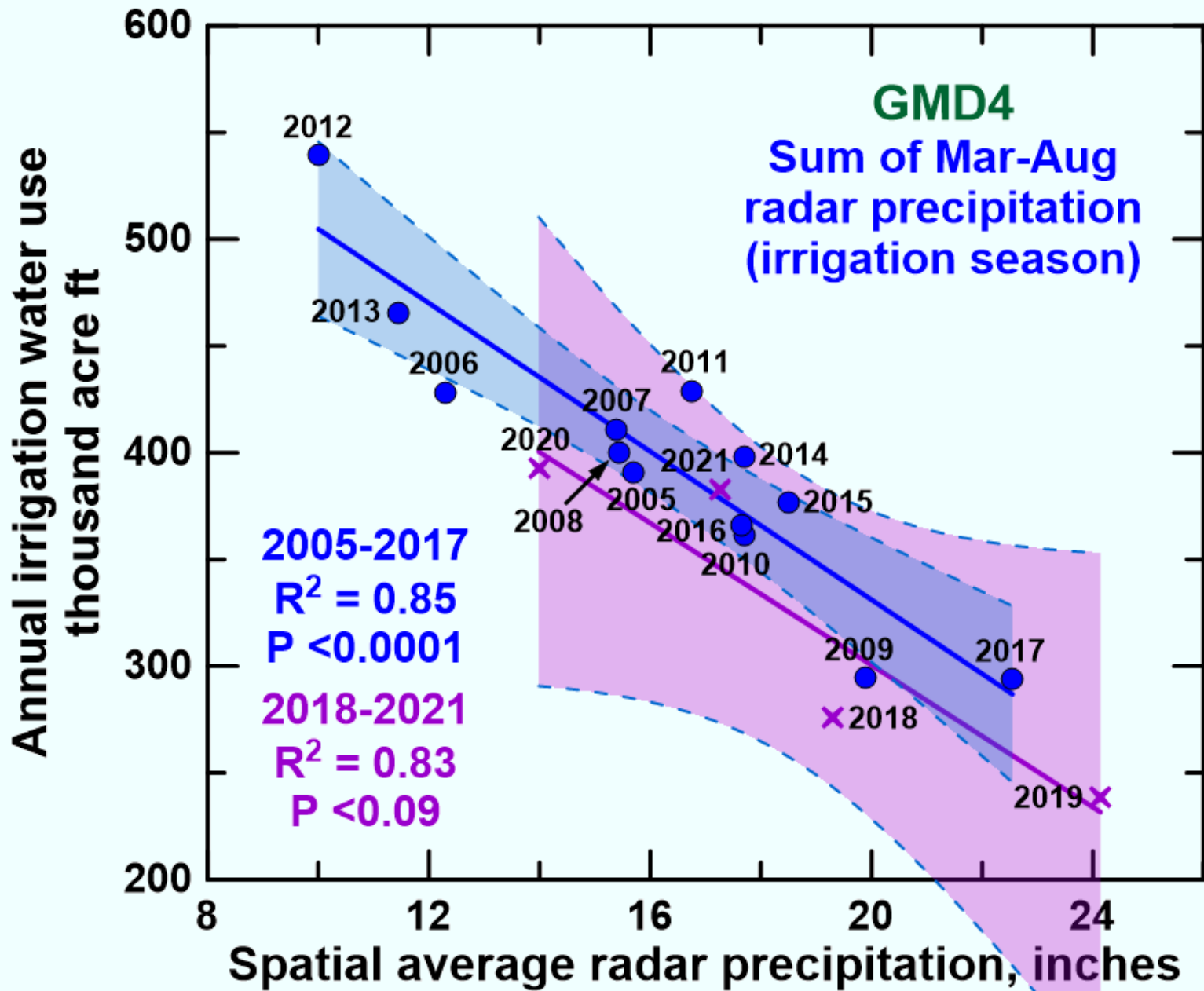
Annual irrigation groundwater use per irrigated area, inches

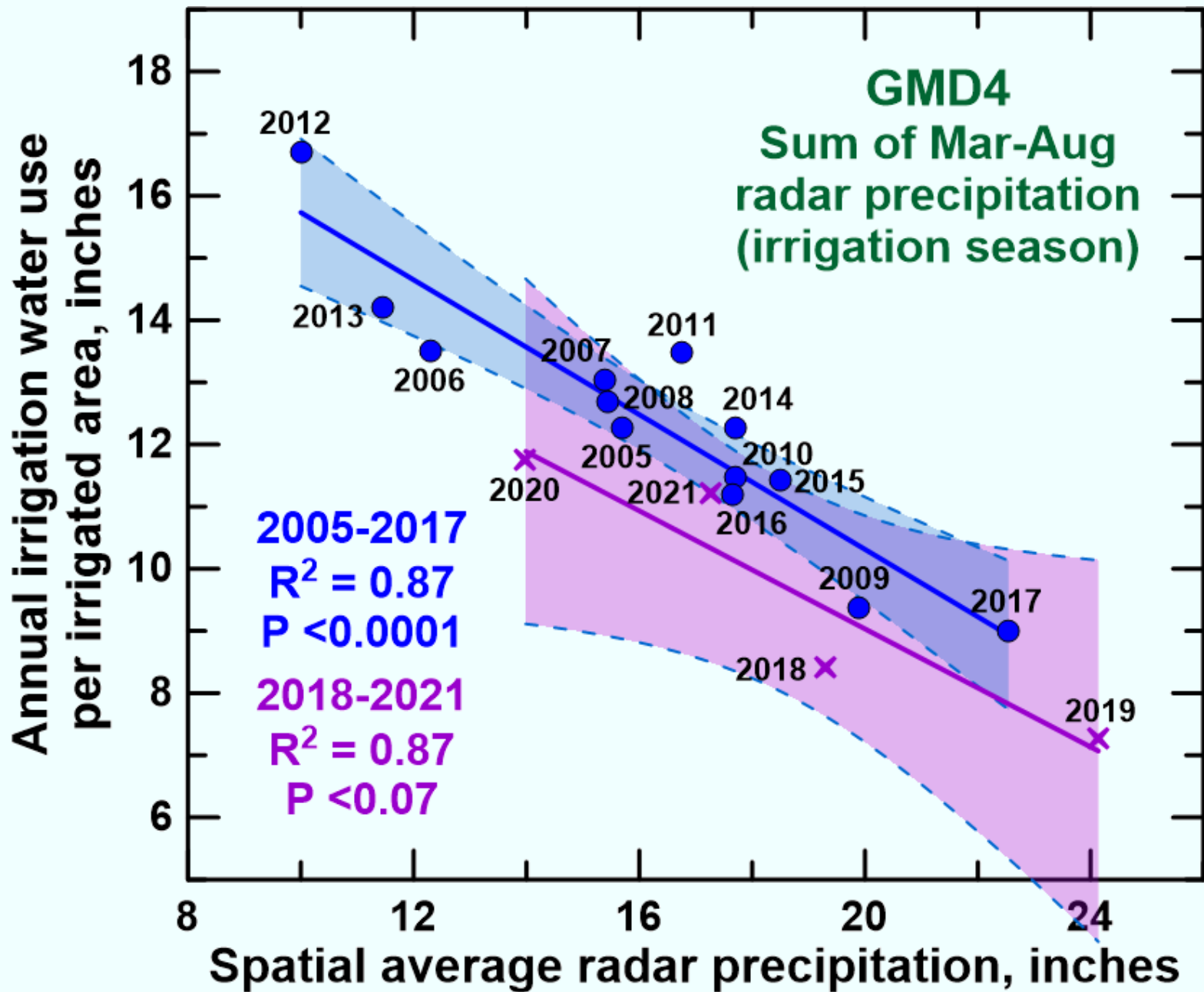


Percent Change in Aquifer Thickness, Predevelopment to Average 2020-2022, Kansas High Plains Aquifer



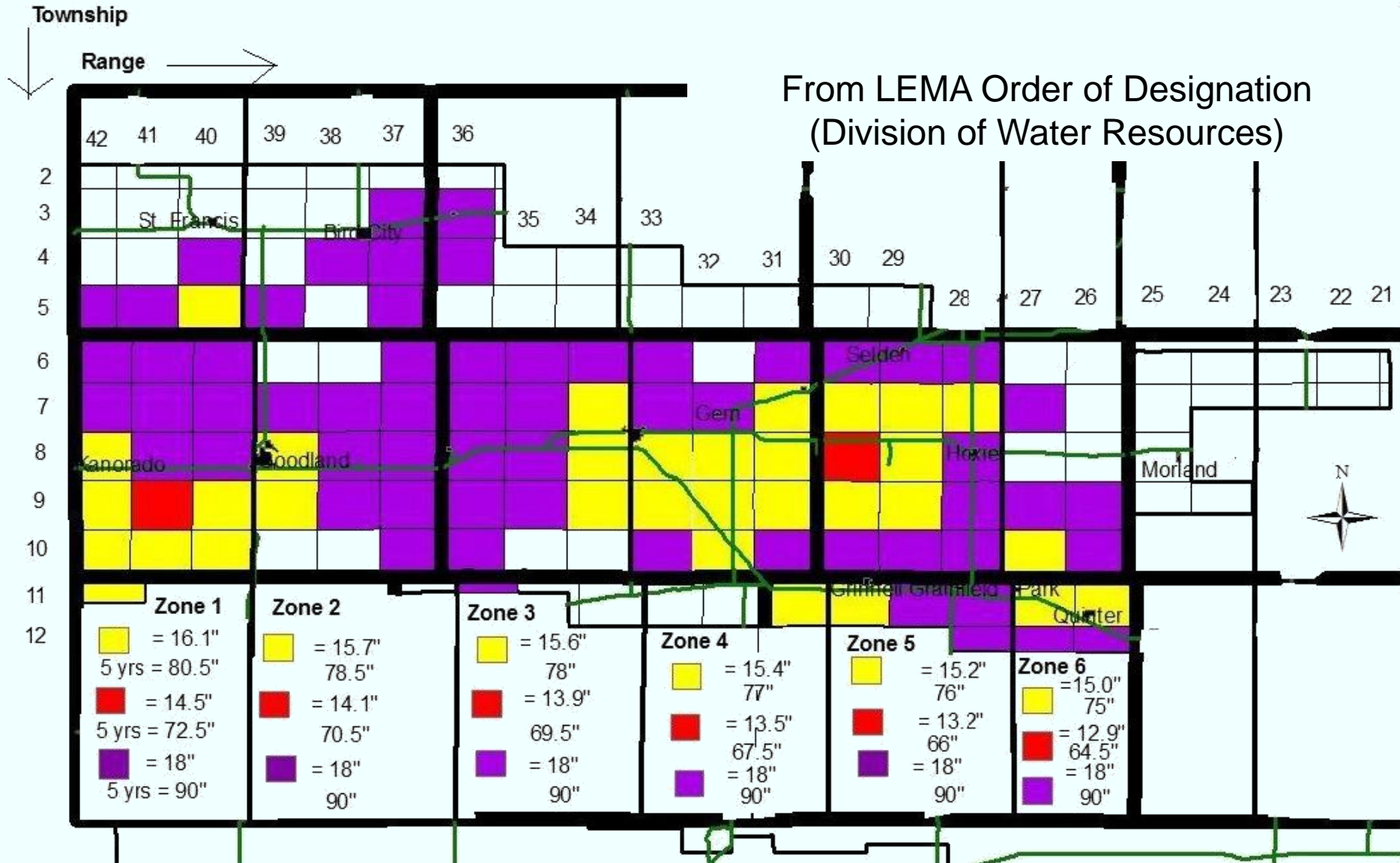


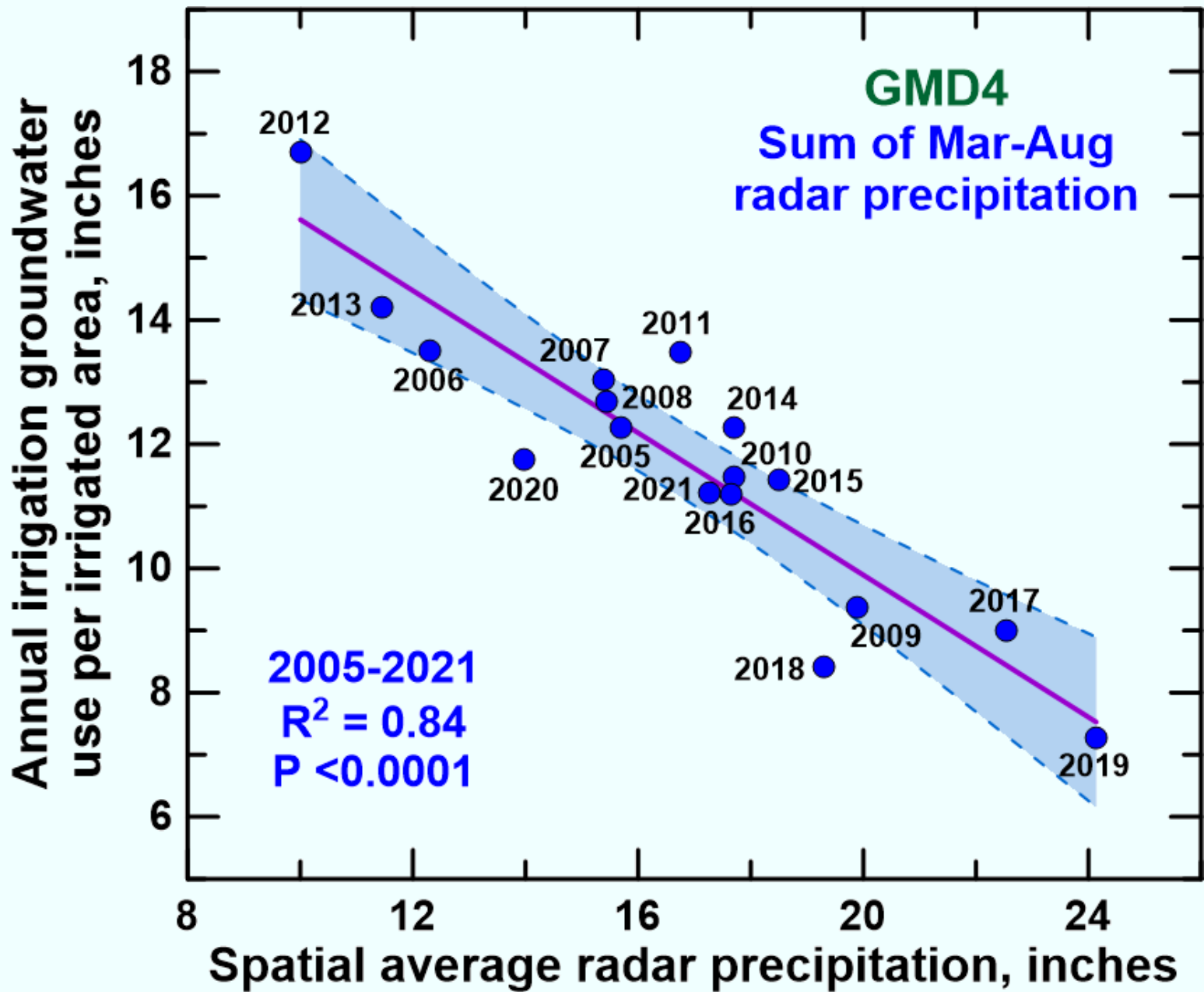


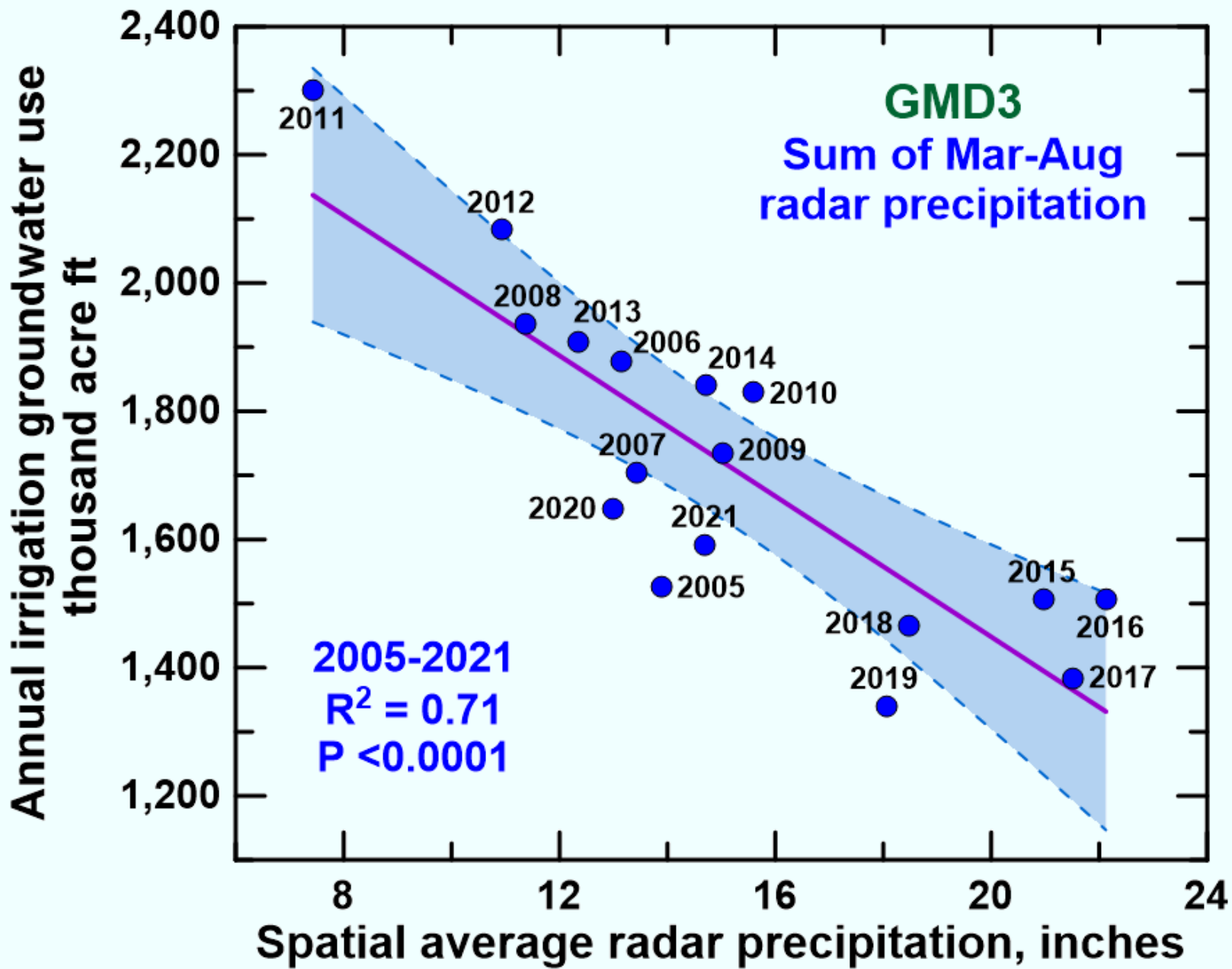


Irrigation Allocation Rates for GMD4 LEMA

Purple 18 in/yr Yellow 15.0–16.1 in/yr Red 12.9–14.5 in/yr





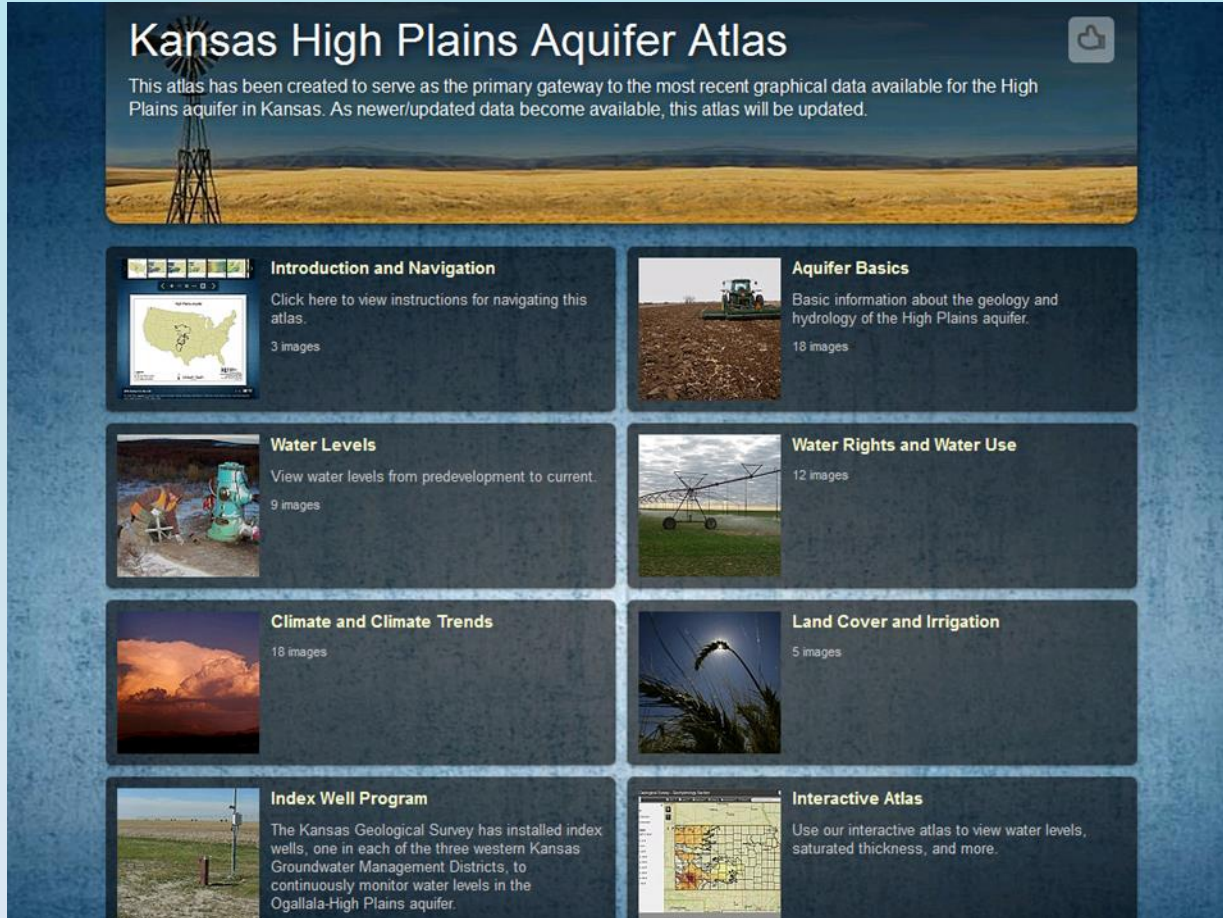


Conclusions

- **Sheridan-6 LEMA: 2013–2021 versus 2005–2012**
Total water savings 30%
Water use per irrigated area 28% less
Irrigation follows precipitation better due to improved irrigation practices such as soil moisture sensors.
- **Wichita County WCAs: 2018–2021 versus 2005–2017**
Total water savings 40%
Water use per irrigated area 26% less
Substantial decline in irrigated area
- **GMD4 LEMA: 2018–2021 versus 2005–2017**
Total water savings and water use per irrigated area for these two periods are not statistically different.
Allocation rates are greater than average water use per irrigated area.

ACKNOWLEDGMENTS

This work was supported, in part, by funding from the Kansas Water Office, Kansas Water Plan, National Science Foundation, and U.S. Department of Agriculture.



The screenshot displays the homepage of the Kansas High Plains Aquifer Atlas. At the top, the title "Kansas High Plains Aquifer Atlas" is shown in white text against a dark blue background. Below the title is a descriptive paragraph: "This atlas has been created to serve as the primary gateway to the most recent graphical data available for the High Plains aquifer in Kansas. As newer/updated data become available, this atlas will be updated." To the right of the title is a small white thumbs-up icon. The main content area is a grid of eight dark blue rectangular tiles, each with a small thumbnail image on the left and text on the right. The tiles are: 1. "Introduction and Navigation" with a thumbnail of a map of the High Plains region and text: "Click here to view instructions for navigating this atlas. 3 images". 2. "Aquifer Basics" with a thumbnail of a green tractor in a field and text: "Basic information about the geology and hydrology of the High Plains aquifer. 18 images". 3. "Water Levels" with a thumbnail of a wellhead and text: "View water levels from predevelopment to current. 9 images". 4. "Water Rights and Water Use" with a thumbnail of a center pivot irrigation system and text: "12 images". 5. "Climate and Climate Trends" with a thumbnail of a sunset over clouds and text: "18 images". 6. "Land Cover and Irrigation" with a thumbnail of a field with a windmill and text: "5 images". 7. "Index Well Program" with a thumbnail of a wellhead and text: "The Kansas Geological Survey has installed index wells, one in each of the three western Kansas Groundwater Management Districts, to continuously monitor water levels in the Ogallala-High Plains aquifer." 8. "Interactive Atlas" with a thumbnail of a map and text: "Use our interactive atlas to view water levels, saturated thickness, and more."

www.kgs.ku.edu/HighPlains/HPA_Atlas/index.html

