



Kansas Water Resources Consulting

David Barfield, P.E.  
1481 East 660 Road  
Lawrence, Kansas 66049

**Proponent Testimony on HB 2279  
Senate Committee on Agriculture and Natural Resources, March 14, 2023**

My name is David Barfield, and I am testifying as a proponent of HB 2279. My qualifications appear at the bottom of my testimony. I apologize for not being about to testify in person due to my wife and I's spring break holiday.

I was a proponent of HB 2279 during the House Committee on Water's (HCOW) hearing, offering suggestions to improve HB 2279's chances for making a lasting difference. The House Committee listened to my and others' suggestions to create an improved bill, with very strong support by the House.

**It is important to move HB 2279 into law.** This is not the first time the process outlined in the bill has been suggested. As one example, attached to my testimony is the title page and first page of recommendations from the *2001's Ogallala Aquifer Management Advisory Committee*. Its list of recommendations bears a striking resemblance to the process of HB 2279: the delineation of the Ogallala Aquifer into sub-units, the establishment of goals for each sub-unit, the identification of priorities for each, etc. From those 2001 recommendations came GMD 4's High Priorities Area (HPA) including the Sheridan 6 HPA, and ultimately the Local Enhanced Management Area (LEMA) provisions of the GMD Act. While LEMAs are being used in portions of western Kansas, large areas of concern remain. **The difference between past recommendations and HB 2279 is that HB 2279 provides a Legislative mandate to GMDs for this process in priority areas of concern** and provides a process for moving forward if where Groundwater Management Districts (GMDs) are unable to act in these high priority areas.

HB 2279's **processes have been successfully used by two of our western Kansas GMDs** to develop Local Enhanced Management Areas (LEMAs), which are slowing groundwater declines:

- first in Northwest Kansas GMD 4 in its Sheridan 6 LEMA and then its District-wide LEMA,
- then by Western Kansas GMD 1 in its Wichita County LEMA and now its Four County LEMA.

But in each case, it has required diligent effort over a period of years of working with its waterusers. In contrast, **there are no LEMAs in place in southwestern Kansas (GMD 3).**

**Improvements incorporated to HB 2279 from House deliberations:**

At my suggestion and others, the following important changes were made to HB 2279 by the HCOW after hearing:

- Amended HB 2279 now exempts areas already in LEMAs from the first round of action plan development.

- Amended HB 2272, rather than “areas of concern,” now requires the identification of “**priority areas of concern**” where the need for planning and action is most clear and urgent. See below for more explanation on why this is important.

**Priority Areas of Concern** - Attached to my testimony is the KGS’s most recent map showing average groundwater level declines from 2012 to 2021, demonstrating that declines continue in all the Ogallala, except fringe areas of limited saturated thickness and use. When KGS updates this map to reflect January 2023 water level results, it will show some acceleration of declines.

**While groundwater levels are declining throughout the Ogallala, action is not uniformly needed.**

Also attached to my testimony is a map I have titled, “KGS' Estimated Usable Life Map with draft Q-stable values 2022.” I obtained the most recent version of the map from KGS (without the Q-Stable values). The map was created by KGS per the standards identified in their Public Information Circular 18 on the High Plains Aquifer (<https://www.kgs.ku.edu/Publications/pic18/index.html>). Per Jim Butler, this map is provided with the following caveat: “...*these projections can yield a map of the estimated remaining usable lifetime for the aquifer (fig. 6). These estimates, however, are based on past water-level trends and a host of additional assumptions, so they should be considered as an illustration of just one possible aquifer future.*”

Despite this caveat, in my opinion this map is the best available as **an initial guide for determining priority areas of concern**. I recommended to the HCOW that the KGS update this map with the most recent data and that the revised map be used as a basis for determining the priority areas of concern, being **all areas with less than 50 years of remaining useable life** (red or the dark orange on the map, EXCLUDING the brown areas, labeled: “Aquifer thickness already at minimum threshold”, which for the most part represent fringe areas of Aquifer of limited saturated thickness). GMDs could identify priority areas of concern that are broader than such, but these areas should be included as a minimum, **unless substantiated otherwise**.

As you see in the amended language, the HCOW included this suggestion in the amended bill, focusing the Bill’s required action where most urgently needed.

Under the amended HB 2279, both Western Kansas GMD No 1 and Northwest Kansas GMD 4 would be exempt from the first 5-year cycle by virtue of their LEMAs already in place. **For Southwest Kansas GMD 3, which has no LEMAs, approximately 25% of the district would be “priority areas of consideration,” required to go through this process.**

### **One suggestion NOT incorporated by the House Committee on Water**

The most significant suggestion I made to the HCOW not included in their amended bill was the adoption of a minimum standard of plan adequacy. Despite this, I am still a strong proponent of the bill in its current form.

I offer the comments below, which were provided to the HCOW, as I believe they provide insight into **the complex nature of the problem and need why locally developed plans**, which HB 2279 encourages, **are necessary and the best path forward**.

On the attached KGS' Remaining Usable Life Map, I have added KGS's draft county Q-stable values which Brownie Wilson of the KGS provided me during February 2022. Again, these should be updated with the most recent data as well.

KGS stated that the **Q-Stable values represent the percentage reduction in recent pumping required to get to stable water levels**, i.e. for the next couple of decades. As an example, the value on the map for Haskell County is 40.6. This means the KGS estimates it would take a 40.6% reduction in pumping in Haskell County to get Haskell County to stable water levels. To halve the rate of decline in Haskell County would take a reduction of half of this, or 20.3%.

Again, the map reinforces that action is required in the high priority area (the red and dark orange areas) is not uniform.

**Attachments:**

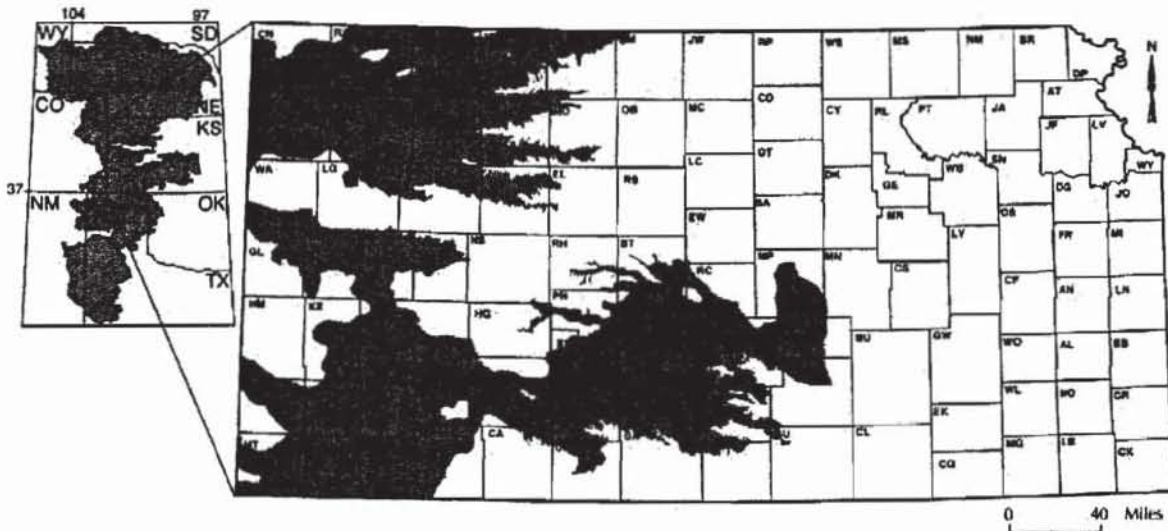
- 2001's Ogallala Aquifer Management Advisory Committee, excerpt
- KGS's Interpolated Water Level Change, Kansas High Plains Aquifer Region, Average 2011-2013 to Average 2020-2022
- KGS' Estimate Usable Life Map with draft Q-stable values 2022

**Notes:**

- I am a professional civil engineer with over 40 years of water resources experience. I worked for the Kansas Dept. of Agriculture's Division of Water Resources (DWR) from 1984 until my retirement from the state during early 2020. From June 2007 until early 2020, I was DWR's Chief Engineer. During that tenure, the LEMA and WCA tools were developed and implemented, as well as substantial improvements to the MYFA tool and more. Since mid-2020, I have been a water resources consultant. A significant part of my work has been assisting two GMDs in their LEMA development and implementation.
- In my testimony and recommendations, I rely on data of the Kansas Geological Survey. I have conferred with them to ensure I am using their data appropriately. However, the views and recommendations herein are mine and mine alone.
- In response to a question from GMD 2's Tim Boise, I confirmed with Jim Butler that the relationship between pumping reductions and rate of decline in the aquifer is linear.

# Ogallala Aquifer Management Advisory Committee

## Discussion and Recommendations for long-term management of the Ogallala Aquifer in Kansas



OCTOBER 16, 2001

Legislature, as are recommendations to implement the *Kansas Water Plan*.

The Ogallala Management and Technical Advisory Committees recommendations will be considered by the Kansas Water Authority for inclusion into a preliminary draft *Kansas Water Plan*. If included, these recommendations will be reviewed through the state water planning process.

## Section II.

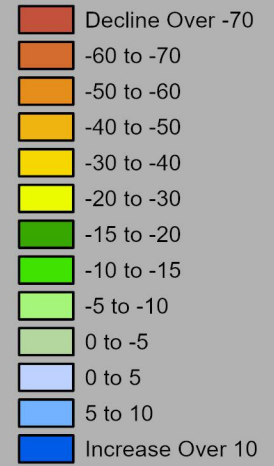
### Recommendations

The Ogallala Aquifer Management Advisory Committee recommends setting incremental milestones to extend and conserve the life of the Ogallala aquifer. The committee also decided, after discussion with the Kansas Water Authority Chairman, to abandon the “two pools” proposal. The committee strongly believes that incentive based programs, improvements in technology and education are the best way to conserve and extend the life of the aquifer. The committee makes the following recommendations:

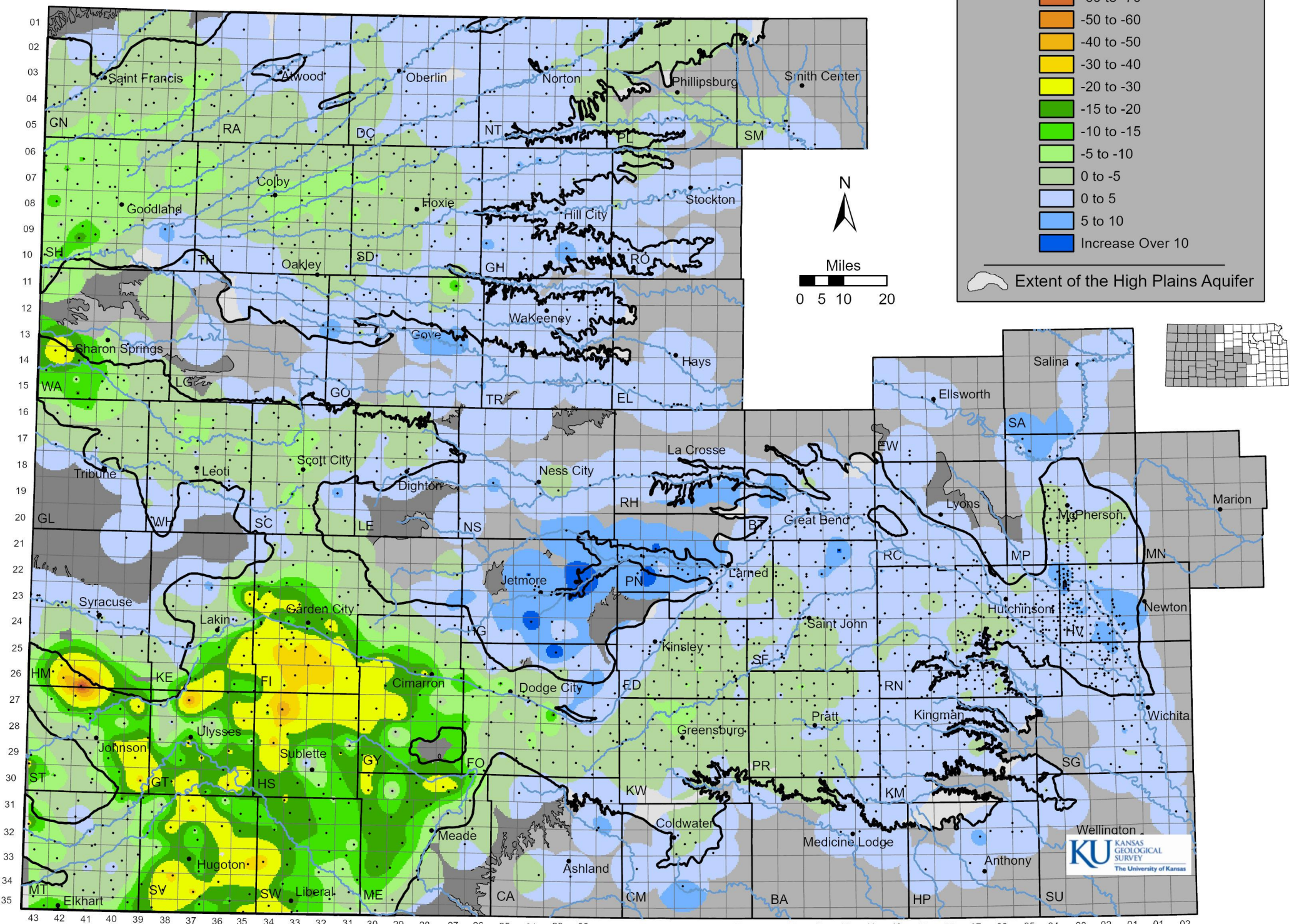
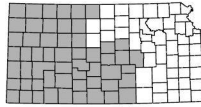
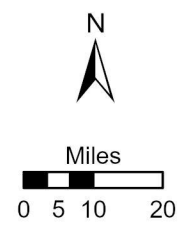
1. **Delineate the Ogallala Aquifer into aquifer subunits to allow management decisions in areas of similar aquifer characteristics.** Each Groundwater Management District, and the Division of Water Resources for areas outside of GMD’s, should delineate these subunits. The Kansas Geological Survey, Division of Water Resources, Kansas State University, and Kansas Water Office should cooperate and assist through the water planning process.
2. **The GMDs and DWR should identify each aquifer subunit in decline or suspected decline and establish water-use goals to extend and conserve the life of the Ogallala Aquifer.** Setting water-use goals in aquifer subunits helps define the enormous challenge of managing this large, extremely valuable resource today and into the future. In areas where ample supplies remain either no reductions will be necessary or modest reductions may be recommended to help extend and conserve the life of the aquifer and reduce stress on nearby subunits. In a subunit with a rapid decline and a short estimated usable lifetime, a more aggressive goal should be set. Assistance programs would be targeted to those areas to help reach the water-use goals. Variables to consider in setting the water-use goal include the estimated volume of water available, recharge, amount of annual water use, estimated usable life of the aquifer, public input and others should be determined by the GMD’s and DWR.
3. **Identify aquifer subunit priorities to extend the life of the aquifer and sustain the vitality of western Kansas.** Base priority on rate of decline, the estimated time before an area must transition to less water use due to declines and the potential socio-economic impact of the decline and other factors. High priority aquifer subunits should be candidates for acquiring additional information necessary to implement plans, assistance programs and/or other actions deemed necessary by the GMDs and DWR. If incentive and voluntary plans are unsuccessful, then strict administration of existing water law should be applied.
4. **Support and expand programs and activities to extend and conserve the life of the Ogallala Aquifer.** Provide a menu of options to extend and conserve the life of the aquifer that are consistent with the prior appropriation doctrine, including the guiding principles that are listed in Appendices A and C. In subunits where irrigation is no longer economically feasible GMDs and DWR should identify and implement management strategies to sustain the life of the aquifer in that subunit.
5. **Support and expand research and education on the Ogallala to extend and conserve the life**

# Interpolated Water Level Change, Kansas High Plains Aquifer Region, Average 2011-2013 to Average 2020-2022

## Change in Feet



Extent of the High Plains Aquifer



# KGS' Estimated Usable Life Map with draft Q-stable values 2022

