



UPLOAD LOGO

Exploiting an Underutilized Trove of Agrohydrology Information: Interpretation of Hydrographs from Aquifers Supporting Irrigated Agriculture

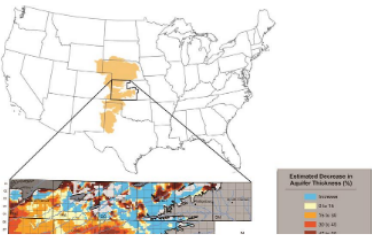
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UPLOAD AUTHOR
PHOTOS

The High Plains Aquifer



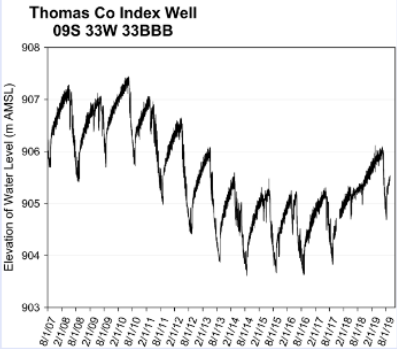
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Kansas HPA Index Well Program



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Thomas County Index Well



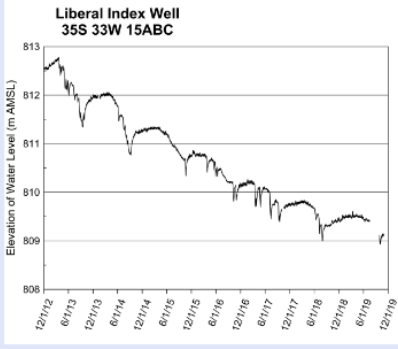
Key features from hydrograph:

- seasonally pumped unconfined aquifer;
- depth to water likely large;
- levels rise until the next pumping season;
- small yearly changes in average to wet years;
- sizable yearly decreases in dry years;
- irrigation schedule from pumping history;
- no indication of episodic recharge;
- near-constant and relatively large net inflow;
- aquifer response to meteorological extremes;
- significant impact of large pumping reductions.

Overall conclusion: Although the HPA in this area has undergone relatively large water-level declines, the hydrograph indicates that modest

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Liberal 436 Index Well



Key features from hydrograph:

- seasonally pumped confined aquifer;
- water levels stabilize each recovery season;
- recovery often faster than duration of pumping;
- decreases in water level every year;
- larger decreases in dry years;
- irrigation schedule from pumping history;
- no indication of episodic recharge;
- aquifer interval appears laterally isolated;
- large reductions will not stop declines.

Overall conclusion: Although the HPA in this area has undergone relatively small declines, the hydrograph indicates that there is little potential for stabilizing water levels. Pumping reductions will lessen the rate of decline, but the declines will

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Insights for Agrohydrology

Kansas HPA hydrographs reveal:

1. Temporal variations in net inflow are small
 - magnitude estimated from field data
 - see Butler et al. (2016, 2018);
 - net inflow tightly linked to pumping reductions.

Water Balance Equation

Water Volume Change in Aquifer =

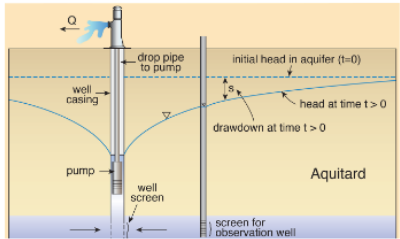
Inflows into Aquifer - Outflows from Aquifer

Water Volume Change in Aquifer =

Net Inflow - Pumping

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Final Comments



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