Kansas Geological Survey

Set of (water availability) maps for Southwest Kansas Groundwater Management District

By

Woods, J.J., and Sophocleous, M.A.

2002-26E. Summary of procedures used to construct the GMD3 map set of KGS Open-file Report 2006-26, and interpretation of historic percent change in saturated thickness (map plate D).

By Marios Sophocleous

Kansas Geological Survey Open File Report 2002-26

GEOHYDROLOGY

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Woods, J.J., and Sophocleous, M.A., 2002. Set of (water availability) maps for Southwest Kansas Groundwater Management District. Kansas Geological Survey Open-File Report 2002-26.

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June 19, 2002

Hank Hansen, Manager
Southwest Kansas Groundwater
Management District No. 3 409
Campus Drive, Suite 106 Garden
City, KS 67846

Dear Hank:

I am pleased to enclose a set of four draft maps (Plates A-D, KGS Open-File Report 2002-26) documenting the historic depletion of the High Plains aquifer in your District for your evaluation.

Draft Plate A contains the updated predevelopment (1940) saturated thickness map of your District together with the data points considered. This map was updated to make it fully compatible with the new PLSS, aquifer extent, and bedrock coverages we employed in the maps we have recently sent to you (KGS Open-File Report 2001-45). To avoid ambiguities (and unlike previous predevelopment maps produced by KGS), we excluded data points from consideration that were tapping Cretaceous or Jurassic units in addition to Ogallala Formation, or had unspecified geologic unit designations. The remaining points are posted on the updated predevelopment saturated thickness map.

Draft Plate B is the average 2000 saturated thickness map (averaged from saturated thickness estimates during the years 1999, 2000, and 2001) together with the measured data points.

Draft Plate C is the historic change in saturated thickness from predevelopment (Plate A) to present time (Plate B); and draft Plate D is the percent change in saturated thickness since predevelopment {that is the ratio of historic saturated thickness change map - Plate C to the predevelopment saturated thickness map -Plate A, multiplied by 100 (for percent calculations), provided the current saturated thickness -Plate B is greater than 50 ft.}

Based on the results displayed in draft Plate D, approximately 75% of your District had enough data point coverage to complete these percent calculations (the remaining portion either consisted of areas where the High Plains aquifer was absent or had no data coverage). Using this area as our base (shown as colored cells or sections in Plate D), the number of cells (sections) with 20% or more historic decline amounts to 54% if we include the areas with current saturated thickness of 50 ft or less in that base, or 60% if we don't. Even if we include the entire GMD3 area as our base, the number of cells or sections with 20% or more historic decline amounts to 40% of the District.

Hope this information is useful to you. Please do not hesitate to contact me for any questions or additional needs you may have. Thank you.

Best regards,

Marios Sophocleous
Senior Scientist
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Map enclosures

cc: Don Whittemore, Bill Harrison, Rex Buchanan, Brownie Wilson, John Woods