Wednesday, January 9, 2002

Rudi Lechner's
2503 S. Gessner (1/2 block north of Westheimer)
Dinner 6:30–7:30 p.m.
Presentation 7:30–8:30 p.m.

Cost: $25 Preregistered members; $30 Nonmembers & Walk-ups

Make your reservations now by calling 713-463-8920 **(5-0-2)** or by e-mail to Joan@hgs.org (include your name, meeting you are attending, phone number, and membership ID#).

YOU MUST MAKE RESERVATIONS 48 HOURS IN ADVANCE OR RISK NOT BEING ADMITTED.

Environmental and Engineering Dinner Meeting

Speaker: Mark C. Kasmarek
U.S. Geological Survey
Houston, Texas

Hydrogeology and Simulation of Ground-Water Flow and Land-Surface Subsidence in the Chicot and Evangeline Aquifers, Houston Area, Texas

In November 1997, the U.S. Geological Survey, in cooperation with the City of Houston's Utilities Planning Section and the City of Houston's Department of Public Works & Engineering, began an investigation of the Chicot and Evangeline aquifers in the greater Houston area to better understand the hydrology, flow, and associated land-surface subsidence. As part of the investigation, a numerical model was developed to simulate ground-water flow and land-surface subsidence in the greater Houston area. The study area covers 18,100 square miles. Simulations were made under transient conditions for 31 ground-water withdrawal (stress) periods that began January 1, 1991, and ended on December 31, 1996. The finite-difference computer code MODFLOW was used to simulate the Chicot and Evangeline aquifer system. Simulation of land-surface subsidence and water released from storage in the clay layers was accomplished using the Interbed-Storage Package. The elastic and inelastic skeletal specific storage coefficients are parameters that were calibrated interactively with potentiometric surfaces of the aquifers. Simulated and measured potentiometric surfaces of the Chicot and Evangeline aquifers for 1977 show a good correlation. Water-level measurements indicate that by 1977, large volumes of ground-water withdrawal in east central and southeast areas of Harris County had caused the potentiometric surfaces to decline as much as 250 feet below sea level in the Chicot aquifer and as much as 350 feet below sea level in wells in the Evangeline aquifer. Simulated and measured potentiometric surfaces of the Chicot and Evangeline aquifers for 1996 also show a good correlation. The large potentiometric-surface declines in 1977 in the southeastern Houston area now show significant recovery. In 1996, new centers of potentiometric-surface declines are shown much farther to the northwest. Potentiometric surface declines of more than 200 feet and 350 feet below seal level in the Chicot and Evangeline aquifers, respectively, were measured in observation wells and simulated in the flow model.

Biographical Sketch

MR. KASMAREK received his BS in geological sciences from the University of Texas at Austin. He served in the Strategic Air Command maintaining navigation electronics in the late seventies and then became a logging consultant in San Angelo, Texas. He worked as a hydrogeologist for the USGS in Houston from 1984 to 1994 and then was promoted to the Chief of the Groundwater Section. In 1997, he created a groundwater flow model for the Chicot and Evangeline aquifers covering a 21 county area. Currently, he is working on a ground-water flow model (MODFLOW) of the Chicot, Evangeline, and Jasper aquifers that encompasses a 30-county area and incorporates the Interbed-Storage Package to compute land-surface subsidence interactively during transient model calibration. □