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35th Annual Midwest Groundwater Conference

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35TH ANNUAL MIDWEST GROUNDWATER CONFERENCE

Midwestern scientists, policy experts, and natural resource managers face many challenges regarding groundwater management. Pressing problems include limiting and properly managing areas of groundwater decline, reducing contamination from agricultural and industrial chemicals, and fruitfully studying these issues. The original Midwest Groundwater Conference, in 1956, initiated the exchange of ideas between groundwater professionals working in the region. The 35th annual conference convened in Lincoln, NE, on October 17-19, 1990. The conference was sponsored by the University of Nebraska's Water Center, Conservation and Survey Division, Agricultural Research Division, and Geology Department, and by the Nebraska District of the US Geological Survey's Water Resources Division. Speakers from 10 midwestern states and Washington, DC, participated in two general sessions on governmental roles in and chemical aspects of groundwater, and in four concurrent sessions.

Jeffrey A. Zinn, a specialist in natural resources policy with the Congressional Research Service in Washington, DC, asked in his keynote address, "Is there a federal groundwater policy?" Zinn said there is no explicit federal groundwater policy at present nor should there be. Cooperation already exists at many levels. In this era of cooperation, a new coordination mechanism would be more disruptive than helpful. Zinn also outlined some of the 51 bills relating to groundwater that were before Congress, particularly the new farm bill.

The first general session focused on governmental roles. Bob G. Volk, director of the NU Water Center, the session that reviewed the activities of some of the federal, state, and local agencies working with groundwater issues suggested what those agencies should do. Gale Hutton, chief of the Water Quality Division of the Nebraska Department of Environmental Control (NDEC), said the primary responsibility for groundwater protection should be vested at the state and local levels. Dick Ehrman, also of NDEC, spoke on the progress of Nebraska's Special Protection Area program.

The first concurrent session, moderated by Eric M. Durrance, (UNL, Geology), focused on geophysical applications to groundwater. Jerry F. Ayers, (UNL, Conservation and Survey Division), spoke on the conjunctive use of geophysical and geological data in the construction of a groundwater-flow model. He combined geophysical survey information from seismic-refraction, seismic-reflection, and geoelectric surveys with geological data from test holes to develop a computer model of the City of Lincoln's well field at Ashland, NE.

Other topics discussed in the session were the use of geoelectrics for defining transport properties for groundwater-pollution studies (W. Kelley, UNL, Civil Engineering, O. Mazes and S. Mazes, Prague), the use of geoelectrics and geostatistics for characterizing groundwater-protection zones (Kelly and I. Bogardi, UNL Civil Engineering, and A. Basdossy, Karlsruhe, Germany), and the use of seismic refraction to determine the depth to water and saturated thickness of an alluvial aquifer (E. Greene, USGS, Rapid City).

The second concurrent session, moderated by You-Kuan Zhang (UNL, Conservation and Survey Division), focused on computer applications to groundwater. Ralph K. Davis, former manager of the Big Bend Groundwater Management District in Kansas and a graduate student within the Department of Geology, said that areas of groundwater decline are not now managed with respect to the whole groundwater basin. Management agencies typically regulate the wells only within the zone of significant decline. This research with Darryll T. Pederson (CSD) shows that wells outside the zone also affect decline within their zone. A computer model used to demonstrate the theory that wells behave as the centers of circular islands of decline regardless of the locations of wells. Other topics in the session included groundwater movement in a shallow unconfined aquifer (V. Zlotnik, UNL Geology), environmental factors of nitrate and atrazine concentrations (A. Chen and A. Druliner, USGS, Lincoln), and delineation of wellhead protection areas (G. Grondia and P. Vander Heijde (Butler University).

The third concurrent session, moderated by Blaine Blad examined the impacts of climatic change on groundwater. Robert W. Buddemeier (Kansas Geological Survey), explained that the reduced streamflow observed over the past several decades in western and central Kansas may be related to the increasing use of agricultural conservation practices, which reduce runoff. Traditionally, he said, only irrigation has been blamed for the problem. Other topics included a review of Nebraska's Drought Assessment Response Team, (G. Beattie, NE Department of Agriculture), the impact of climatic changes on groundwater remediation projects (J. K. Powers, Leggette-Brashears-Graham, St. Paul), and the use of short-term climatic/groundwater relations to estimate the effects of long-term climatic variations on groundwater conditions in the High Plains (J. Ougan, USGS, Lincoln).

The fourth concurrent session, moderated by Mike Shulters (district chief, USGS Water Resources Division), focused on geographic information system (GIS) and remote sensing applications to groundwater. Topics included groundwater resources for expanded subirrigation (B. Vieux and C. He, Resource Development, Michigan State), the use of any ARC/INFO GIS for regional aquifer studies (D. Whittemore, S. Shamsnia, and T-M.

Chu, Kansas Geological Survey), the application of GIS procedures to a groundwater model in southwest Nebraska (J. Peckenpaugh, USGS, Lincoln), a multiple-cell solute transport model and cell-size error analysis using a GIS (D. Adelman and S. Soberski, NE Natural Resources Commission), and using GIS to evaluate performance of a groundwater-pollution vulnerability model (S. Merchant, UNL Conservation and Survey Division).

David C. Gosselin, research hydrogeologist, moderated the second general session, which focused on chemical aspects of groundwater. Patrick J. Emmons (USG, Huron, SD), spoke about the potential for artificial recharge of glacial aquifers in eastern South Dakota. The project will evaluate the use of injection wells to recharge glacial aquifers with excess water from the James River, determine water-level effects of artificial recharge on the aquifer, determine changes in water quality from the recharge, and develop techniques to evaluate the artificial-recharge potential of other glacial aquifers in eastern South Dakota. Other topics included results of groundwater-quality studies in rural Iowa (D. Bruner, R. Libra, G. Hallberg, IA Department of Natural Resources, and B. Kross, University of Iowa), in the Nemaha Natural Resources District in Nebraska (D. Tanner and G. Steele, USGS, Lincoln), and in the Missouri River alluvial aquifer (D. Blevins and A. Ziegler, USGS, Independence, MO, and G. Carlson, MO Department of Health). Industrial pollution near Chicago as discussed by S Cravens (IL State Water Survey). The determination of atrazine, alachlor, and selected degradation products in contaminated groundwater, an analysis of the risk of contamination with chemigation (applying agricultural chemicals through a sprinkler irrigation system) and a critical evaluation of agricultural-chemical policy performance regarding groundwater protection were also discussed.

For more information on the proceedings of the 35th Annual Midwest Groundwater Conference, contact the Conservation and Survey Division, 113 Nebraska Hall, University of Nebraska-Lincoln, 68588-0517, (402) 472-3471.

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