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Fall 1999

Review of *The Groundwater Atlas of Nebraska*

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McFarlane, P. Allen, "Review of *The Groundwater Atlas of Nebraska*" (1999). *Great Plains Research: A Journal of Natural and Social Sciences*. 483.

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The Groundwater Atlas of Nebraska. Revised edition. Edited by C.A. Flowerday. Lincoln: Conservation and Survey Division, Institute of Agriculture and Natural Resources, 1998. 44 pp. Figures, tables, references. \$3.50 paper.

The old photographs of flowing wells and well-digging operations in *The Groundwater Atlas of Nebraska* remind us that access to water has always been the key to survival in the subhumid to semiarid Great Plains. And with this new publication, it is easy to see the importance of groundwater to Nebraskans and why the bold statement is made that Nebraska should be dubbed the Groundwater State.

Unfortunately, the atlas starts out with a somewhat fragmented and cursory overview of the hydrologic cycle in Nebraska, highlighting the relationship between groundwater and surface water and the importance of groundwater discharge to streamflow. On average, we are told, the surface water outflow from the eastern end of the state is more than four times the surface water inflow at the western end. Other facets of the hydrologic cycle, including average precipitation, evapotranspiration, and pumpage are mentioned but not placed in the context of the statewide water budget. Doing so would help put the greater than fourfold increase in streamflow across the state in perspective.

Thirteen distinct groundwater regions are defined based on similar groundwater conditions, soil types, and physiography. From a user's point of view this should be one of the most serviceable sections of the atlas, offering a subregional synthesis of most of the hydrogeologic information presented later. Regrettably, it is also one of the few places in the atlas furnishing any water quality information. Noticeably absent is a discussion of groundwater geochemistry and its variability in the shallow aquifer systems.

The atlas focuses primarily on the shallow, more accessible groundwater resources in the state, including the High Plains aquifer, river valleys, and glacial deposits (labeled as the principal groundwater reservoir). Statewide maps are presented showing the altitude of the base, the saturated thickness, and transmissivity of this principal groundwater reservoir. The volume also contains statewide maps of the configuration of and depth to the regional water table and the results of a statewide DRASTIC analysis of contamination potential. The text accompanying each map includes an interpretation of the information presented where appropriate. Development and management of groundwater resources are topics touched on later in the atlas with discussions covering trends in water use, changes in saturated thickness due

to development, and a brief but concise history of groundwater legislation since the 1970s. These provide good instruction on the evolution of water resources policy and management in Nebraska.

Overall, the atlas will be a valuable resource for the educated layman and for educating the public on Nebraska water issues. Subsequent editions would benefit considerably from having separate sections on the hydrologic cycle and on groundwater geochemistry and overall water quality. **P. Allen Macfarlane**, *Kansas Geological Survey, Lawrence*.