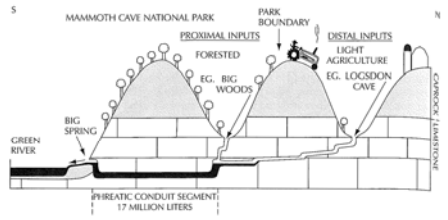
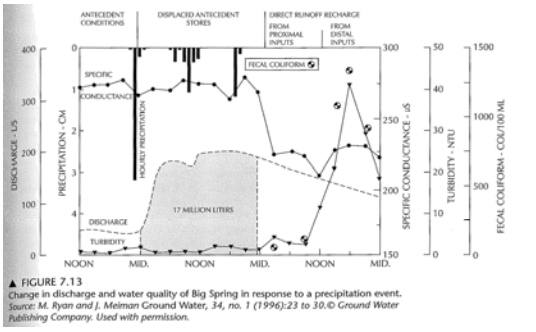
Regional Flow: Karst



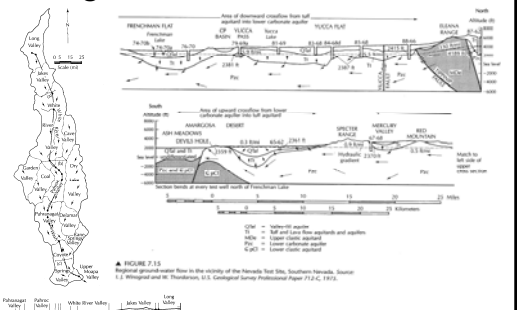
▲ FIGURE 7.12
Diagrammatic cross section of the Big Spring ground-water basin of Mammoth Cave National Park. Note the phreatic conduit section that is below the water table. *Source: M. Ryan and J. Meiman* Ground Water, *34, no. 1 (1996):23 to 30. © Ground Water Publishing Company. Used with permission.*

Regional Flow: Karst

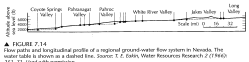


▲ FIGURE 7.13
Change in discharge and water quality of Big Spring in response to a precipitation event. *Source: M. Ryan and J. Meiman* Ground Water, *34, no. 1 (1996):23 to 30.© Ground Water Publishing Company. Used with permission.*

Regional Flow: Nevada

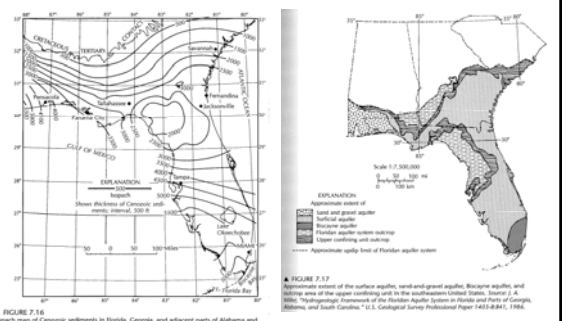


▲ FIGURE 7.15
Regional ground-water flow in the vicinity of the Nevada Test Site, Southern Nevada. *Source:* I.J. Winograd and W. Thordarson, U.S. Geological Survey Professional Paper 712-C, 1975.



▲ FIGURE 7.14
Flow paths and longitudinal profile of a regional ground-water flow system in Nevada. The water table is shown as a dashed line. *Source:* T. F. Dales, Water Resources Research *2* (1966): 237–71. Used with permission.

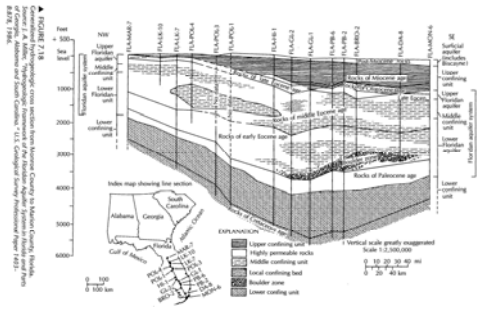
Regional Flow: Florida



▲ FIGURE 7.16
Isopach map of Cenozoic sediments in Florida, Georgia, and adjacent parts of Alabama and South Carolina. *Source: V. T. Stringfield, U.S. Geological Survey Professional Paper 517, 1966.*

▲ FIGURE 7.17
Approximate extent of the surface aquifer, sand-and-gravel aquifer, Biscayne aquifer, and outcrop area of the upper confining unit in the southeastern United States. *Source: J. A. Miller, "Hydrogeologic Framework of the Floridan Aquifer System in Florida and Parts of Georgia, Alabama, and South Carolina." U.S. Geological Survey Professional Paper 1403-B-B41, 1986.*

Regional Flow: Florida

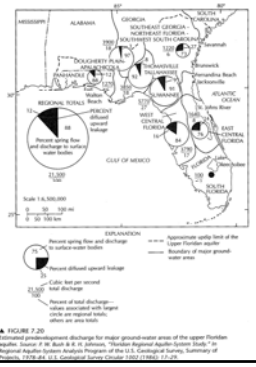


▲ FIGURE 7.18
Generalized hydrogeologic cross section from Monroe County to Marion County, Florida. *Source: J. A. Miller, "Hydrogeologic Framework of the Floridan Aquifer System in Florida and Parts of Georgia, Alabama and South Carolina." U.S. Geological Survey Professional Paper 1403-B,B78, 1986.*

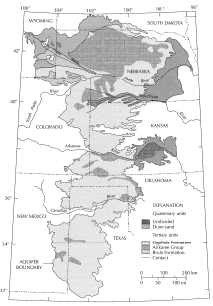
Regional Flow: Florida

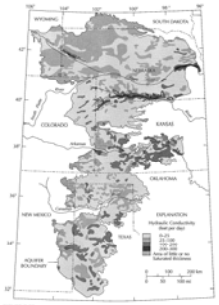
▲ FIGURE 7.19
Potentiometric surface of water in the principal artesian aquifer of the southeastern United States. *Source: V. T. Stringfield, U.S. Geological Survey Professional Paper 517, 1966.*

Regional Flow: Florida

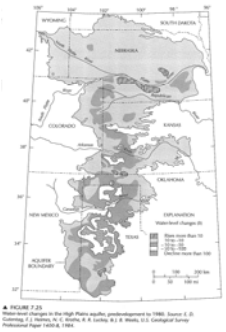


Mining Groundwater: Great Plains

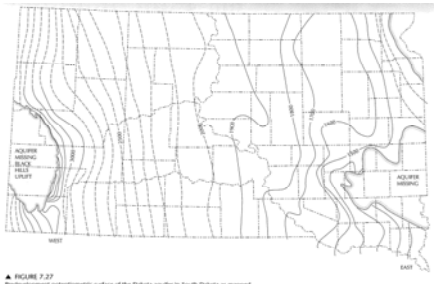




Mining Groundwater: Great Plains

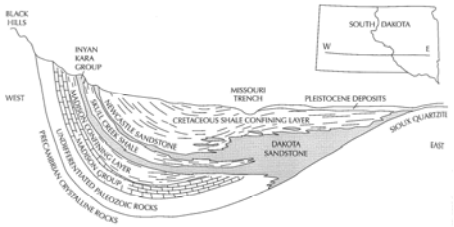


Mining Groundwater:Dakota



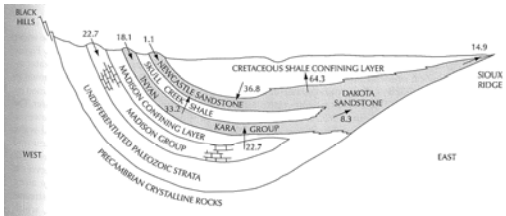
▲ FIGURE 7.27
Predevelopment potentiometric surface of the Dakota aquifer in South Dakota as mapped by Darton (1909, Plate XI). *Source: Bredehoeft, J. D., C. E. Neuzil and P. C. D. Milly. 1983. Regional flow in the Dakota aquifer: A study of the role of confining layers.* U.S. Geological Survey Water Supply Paper *2237*.

Mining Groundwater:Dakota



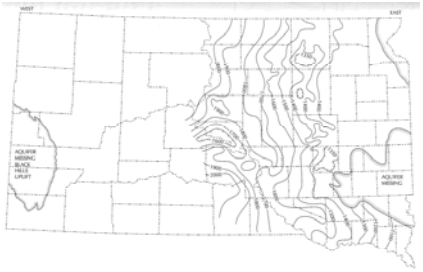
▲ FIGURE 7.28
Generalized west to east cross section of the bedrock aquifers of South Dakota. Not to scale, vertical exaggeration. *Source: Bredehoeft, J. D., C. E. Neuzil and P. C. D. Milly. 1983. Regional flow in the Dakota aquifer: A study of the role of confining layers.* U.S. Geological Survey Water Supply Paper *2237*.

Mining Groundwater:Dakota



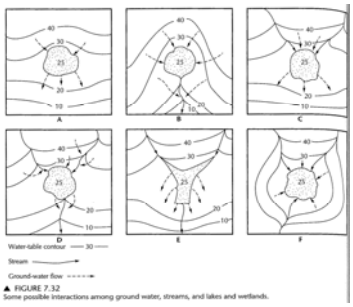
▲ FIGURE 7.30
Computed pre-development steady state ground water flows in cubic feet per second through the bedrock aquifers of South Dakota. *Source: Bredehoeft, J. D., C. E. Neuzil and P. C. D. Milly. 1983. Regional flow in the Dakota aquifer: A study of the role of confining layers.* U.S. Geological Survey Water Supply Paper *2237*.

Mining Groundwater:Dakota



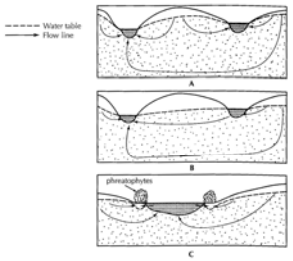
▲ FIGURE 7.31
Potentiometric surface of the Dakota aquifer in eastern South Dakota in 1915. This was after 34 years of ground-water development. *Source: Bredehoeft, J. D., C. E. Neuzil and P. C. D. Milly. 1983. Regional flow in the Dakota aquifer: A study of the role of confining layers.* U.S. Geological Survey Water Supply Paper *2237.*

Groundwater-Surface Interactions



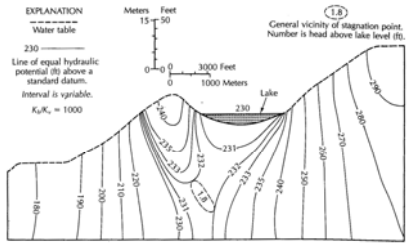
▲ FIGURE 7.32
Some possible interactions among ground water, streams, and lakes and wetlands.

Groundwater-Surface Interactions



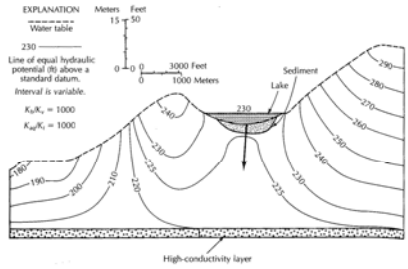
▲ FIGURE 7.33
Ground-water–lake interactions: **A.** High water table and interlake ground-water divide. **B.** Low water table and no interlake divide. **C.** Depressed water table due to fringe of phreatophytes. *Source: Redrawn from P. Meyboom,* Journal of Hydrology *5 (1967): 117–42. Used with permission of Elsevier Scientific Publishing Company, Amsterdam.*

Groundwater-Surface Interactions

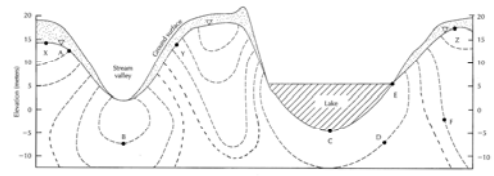


▲ FIGURE 7.34
Hydrogeologic cross section showing head distribution in a one-lake system with a homogeneous, anisotropic aquifer system. Results are based on a two-dimensional, steady-state, numerical-simulation model. *Source: T. C. Winter, U.S. Geological Survey Professional Paper 1001, 1976.*

Groundwater-Surface Interactions



▲ FIGURE 7.35
Hydrogeologic cross section showing head distribution in a one-lake system with a layered aquifer system. The high-conductivity layer has a conductivity 1000 times as great as the low-conductivity layer. The lake loses water to the aquifer. *Source: T. C. Winter, U.S. Geological Survey Professional Paper 1001, 1976.*



▲ FIGURE 7.39
Diagram for Problem 3. The dashed lines are equipotentials. Heads are in meters.