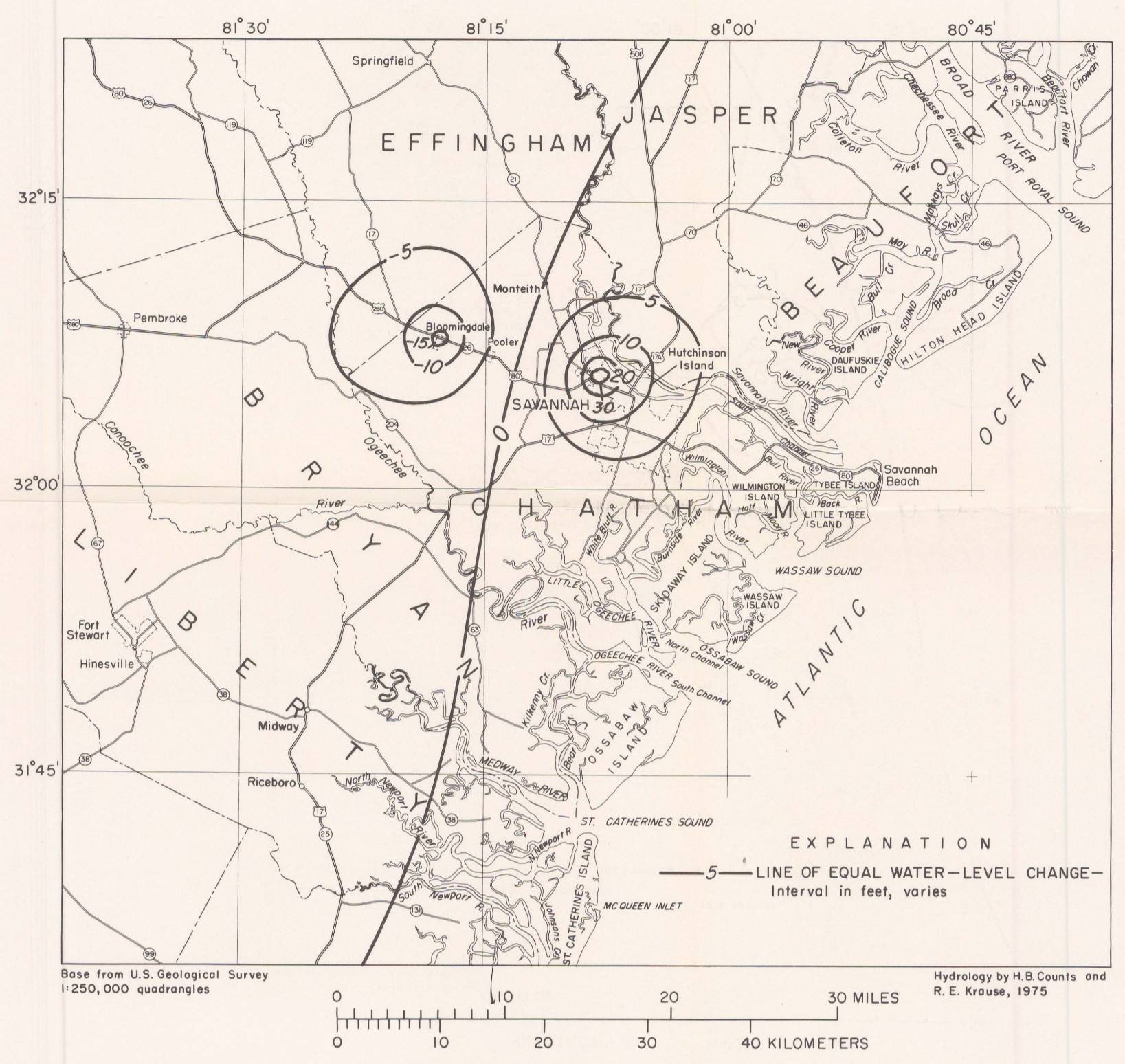
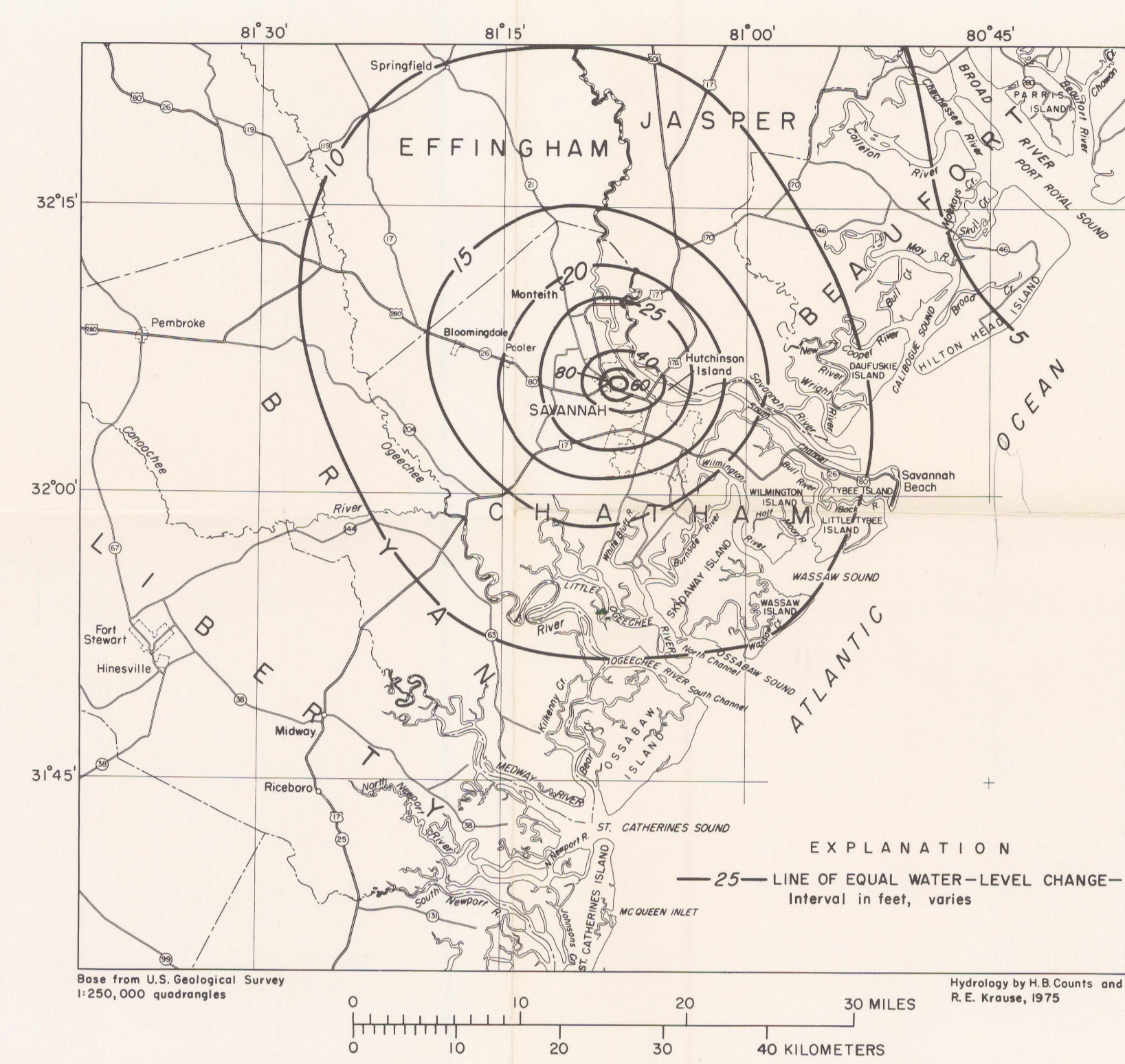


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USE OF THE MODEL



COMPUTED WATER-LEVEL CHANGE, IN 2000, CAUSED BY TRANSFERRING 10 MILLION GALLONS PER DAY (440 LITERS PER SECOND) OF THE 1970 PUMPAGE FROM SAVANNAH TO BLOOMINGDALE, 10 MILES (16 KILOMETERS) TO THE WEST



COMPUTED WATER-LEVEL RISE, IN 2000, CAUSED BY DECREASING 1970 PUMPAGE BY 20 MILLION GALLONS PER DAY (880 LITERS PER SECOND) AT CENTER OF THE CONE OF DEPRESSION

CONCLUSIONS

The digital model can be a very useful tool for managing the ground-water supply in the principal artesian aquifer in the Savannah area. The model can simulate the hydrology of the aquifer, compute the water level, and be updated periodically to reflect more accurately the hydrology of the aquifer.

Computations by the model may be extended in time to show future water-level configurations, and to predict the results that real or hypothetical pumping changes will have on the aquifer. Computed water-level changes may be used to compare different management alternatives. Moreover, the model can be "asked" to indicate what effects a proposed change in stress, such as additional pumpage or redistribution of well fields, will have before it is actually applied. By using the model, a water manager would be able to employ rational methods which could help to avoid damage to this valuable water resource.

SELECTED REFERENCES

Cooke, C. W., 1943, Geology of the Coastal Plain of Georgia: U.S. Geol. Survey Bull. 941, 121 p.

Counts, H. B., 1958, The quality of ground water in the Hilton Head Island area, Beaufort County, South Carolina: Georgia Mineral Newsletter, v. 11, no. 2, p. 50-51.

Counts, H. B., and Donsky, Ellis, 1959, Summary of salt-water encroachment, geology, and ground-water resources of Savannah area, Georgia and South Carolina: Georgia Mineral Newsletter, v. 12, no. 3, p. 96-102.

1963, Salt-water encroachment, geology, and ground-water resources of Savannah area, Georgia and South Carolina: U.S. Geol. Survey Water-Supply Paper 1611, 100 p.

Herrick, S. M., 1961, Well logs of the Coastal Plain of Georgia: Georgia Geol. Survey Bull. 70, 462 p.

Krause, R. E., 1972, Effects of ground-water pumping in parts of Liberty and McIntosh Counties, Georgia, 1966-70: Georgia Geol. Survey Inf. Circ. 45, 15 p.

Krause, R. E., and Counts, H. B., 1975, Digital model analysis of the principal artesian aquifer, Glynn County, Georgia: Doraville, Ga., U.S. Geol. Survey Water-Resources Inv. 1-75, 4 sheets.

Krause, R. E., and Gregg, D. O., 1972, Water from the principal artesian aquifer in coastal Georgia: Georgia Water Resources Survey Hydrol. Atlas 1.

McCallie, S. M., 1898, A preliminary report on the artesian well system of Georgia: Georgia Geol. Survey Bull. 7, 214 p.

McCollum, M. J., 1964, Salt-water movement in the principal artesian aquifer of the Savannah area, Georgia and South Carolina: Ground Water, v. 2, no. 4, p. 4-8.

McCollum, M. J., and Counts, H. B., 1964, Relation of salt-water encroachment to the major aquifer zones, Savannah area, Georgia and South Carolina: U.S. Geol. Survey Water-Supply Paper 1613-D, 26 p.

Pinder, G. F., 1970, A digital model for aquifer evaluation: U.S. Geol. Survey Techniques Water-Resources Inv., book 7, chap. C1, 18 p.

Pinder, G. F., and Bredehoeft, J. D., 1968, Application of the digital computer for aquifer evaluation: Water Resources Research, v. 4, no. 5, p. 1069-1093.

Slichter, C. S., 1902, The motions of underground waters: U.S. Geol. Survey Water-Supply Paper 67, 106 p.

Stephenson, L. W., and Dole, R. B., 1915, Preliminary report on Savannah water supply: Mayor's Annual Report, Savannah, Ga.

Stephenson, L. W., and Veatch, J. O., 1915, Underground water of the Coastal Plain of Georgia: and a discussion of the quality of the waters, by R. B. Dole: U.S. Geol. Survey Water-Supply Paper 341, 539 p.

Stewart, J. W., and Counts, H. B., 1958, Decline of artesian pressure in the Coastal Plain of Georgia, northeastern Florida, and southeastern South Carolina: Georgia Mineral Newsletter, v. 11, no. 1, p. 25-31.

Trescott, P. C., 1973, Iterative digital model for aquifer evaluation: U.S. Geol. Survey open-file report, 63 p.

Warren, M. A., 1944, Artesian water in southeastern Georgia, with special reference to the coastal area: Georgia Geol. Survey Bull. 49, 140 p.

DIGITAL MODEL ANALYSIS OF THE PRINCIPAL ARTESIAN AQUIFER, SAVANNAH, GEORGIA AREA

By
H. B. Counts and R. E. Krause
1976

Cartography by W. G. Hester

