

APPROXIMATE AREAS OF RECHARGE TO THE CHICOT AND EVANGELINE AQUIFER SYSTEMS IN THE HOUSTON-GALVESTON AREA, TEXAS

The purpose of this report is to show the general geographic areas of recharge to the Chicot and Evangeline aquifers in the Houston area, Texas (fig. 1). The areas of recharge shown on the map were determined by interpretations of subsurface hydrology, soil surveys of Harris County, and surface and subsurface geology. Correlations of the hydrologic units and geologic units are based on reports by Turcan and others (1966) and Wesselman (1971). The subsurface hydrology is discussed in reports by Wood and Gabrysch (1965) and Jorgensen (1975). The surface geology used in determining the areas of recharge is shown on the Geologic Atlas of Texas (University of Texas, Bureau of Economic Geology, 1968a, 1968b, 1974a, 1974b, 1975). The Harris County soil surveys were made by the Soil Conservation Service of the U.S. Department of Agriculture (Crout and Wheeler, 1974; Hatcher, 1974).

Generally, the areas of recharge for the Evangeline and Chicot aquifers are between the outcrops of the Beaumont Clay of Pleistocene age and the updip part of the Fleming Formation of Miocene age, as delineated on the Geologic Atlas of Texas. The area of recharge for the Evangeline aquifer includes the most landward outcrop of the Willis Formation of Pleistocene age and, in places, the coastward outcrop of the Fleming Formation.

The area of recharge for the Chicot aquifer includes the outcrops of the Montgomery and Bentley Formations of Pleistocene age and the coastward outcrop of the Willis Formation. In the river valleys that are incised into the Beaumont Clay, the fluvial terrace deposits and alluvium are included in the recharge area of the Chicot aquifer. The approximate coastward extent of complete incision of the Beaumont Clay in the Brazos and Trinity River Valleys is shown by dashed lines on figure 1.

Because of the complexity of the geology in this area, the presentation of a geologic map showing the correlation of the outcrops of the stratigraphic and hydrologic units is beyond the scope of this paper. Figure 1, however, has been prepared at a reduced scale to the Geologic Atlas of Texas (see references), and the reader should examine appropriate sheets of these maps for additional information with regard to stratigraphic and hydrologic correlations.

Hatcher (1974) classifies most of the soils in the recharge areas as moderately permeable. Crout and Wheeler (1974, p. 65) give a rate of movement of water through a moderately permeable soil that ranges from 0.60 to 2.0 inches per hour (9 to 30 gallons per day per square foot). The surface of the Beaumont Clay is described as being very slowly permeable, with the rate of movement of water being less than 0.06 inch per hour (less than 0.9 gallon per day per square foot).

REFERENCES CITED

- Crout, J. D., and Wheeler, F. F., 1974, Soil survey report, Harris County, Texas: U.S. Dept. Agr., Soil Conserv. Service, 66 p.
- Hatcher, G. P., 1974, Soils of Harris County: U.S. Dept. Agr., Soil Conserv. Service, map.
- Jorgensen, D. G., 1975, Analog-model studies of ground-water hydrology in the Houston district, Texas: Texas Water Devel. Board Rept. 190, 84 p., 40 figs.
- Turcan, A. N., Jr., Wesselman, J. B., and Kilburn, Chabot, 1966, Interstate correlation of aquifers, southwestern Louisiana and southeastern Texas: U.S. Geol. Survey Prof. Paper 550-D, p. D231-D236.
- University of Texas, Bureau of Economic Geology, 1968a, Geologic atlas of Texas, Beaumont Sheet; Bur. Econ. Geology map.
- 1968b, Geologic atlas of Texas, Houston sheet: Bur. Econ. Geology map.
- 1974a, Geologic atlas of Texas, Austin sheet: Bur. Econ. Geology map.
- 1974b, Geologic atlas of Texas, Seguin sheet: Bur. Econ. Geology map.
- 1975, Geologic atlas of Texas, Beeville-Bay City sheet: Bur. Econ. Geology map.
- Wesselman, J. B., 1971, Ground-water resources of Chambers and Jefferson Counties, Texas: Texas Water Devel. Board Rept. 135, 183 p.
- Wood, L. A., and Gabrysch, R. K., 1965, Analog model study of ground water in the Houston district, Texas: Texas Water Comm. Bull. 6508, 103 p., 43 figs.

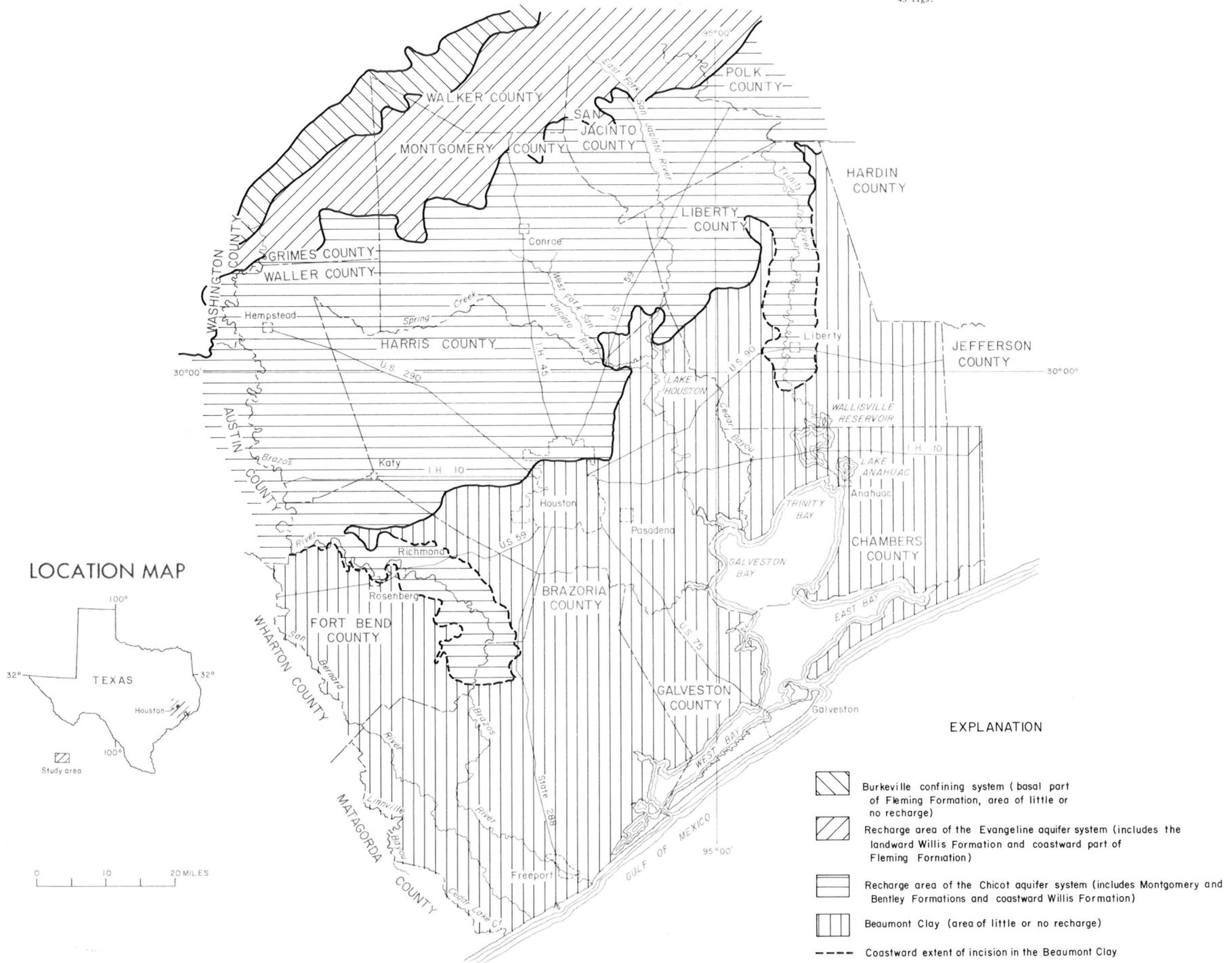


FIGURE 1.—APPROXIMATE AREAS OF RECHARGE TO THE CHICOT AND EVANGELINE AQUIFER SYSTEMS