UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
GENESEE/FINGER LAKES REGIONAL PLANNING COUNCIL

WATER-RESOURCES INVESTIGATIONS REPORT 86-4048
SHEET 1 --SURFICIAL GEOLOGY AND AVAILABILITY OF GROUND WATER IN THE NORTHERN PART OF THE BASIN

PREFACE

The aquifers and well yields in the Genesee River basin were studied by the Geological Survey in the 1960's, in cooperation with the New York State Department of Environmental Conservation, as part of a series of water-resources appraisals. The final report from that study (Gilbert and Kammerer, 1969), which included the maps presented here, was never published formally. (Most of the data were used in two subsequent reports by Kammerer and Hobba, 1967; and Gilbert and Kammerer, 1971, however.)

INTRODUCTION

New York State's need to develop a ground-water-management strategy for protection of its aquifers led in 1985 to a cooperative program between the U.S. Geological Survey and the New York State Department of Environmental Conservation, through the Genesee/Finger Lakes Regional Planning Council, to publish basinwide ground-water-availability maps. As a part of this program, several maps that had been compiled during the 1960's but either had never been released or were published only at reduced scale or in limited numbers were selected for publication through a grant between the State and several regional planning agencies.

PURPOSE AND SCOPE

These maps depict the surficial geology and ground-water availability of the basin at 1:125,000 scale. Each map consists of two sheets; thus, sheets 1 and 2 depict the ground-water availability and geology of the northern and southern parts of the basin, respectively, and sheets 3 and 4 depict well and test-hole locations within the northern and southern parts of the basin.

SURFICIAL GEOLOGY

The surficial geology of the basin has more recently been compiled by modern mapping techniques on a regional map by Muller (1977). Muller's map depicts the basin geology at 1:250,000 scale and is the first in a series of five State maps on the glacial geology of New York. The reader interested in a more detailed discussion of basin geology is referred to the report by Muller (1977).

SELECTED REFERENCES

Gilbert, B. K., and Kammerer, J. C., 1969, Analysis and interpretation of water resources data of the Genesee River basin, New York and Pennsylvania: U.S. Geological Survey Open-File Report, 363 p.

Gilbert, B. K., and Kammerer, J. C., 1971, Hydrology of the Genesee River basin: U.S. Geological Survey Hydrologic Investigations Atlas HA-368, 4 sheets.

Kammerer, J. C., and Hobba, W. A., Jr., 1967, The geology and availability of ground water in the Genesee River basin, New York and Pennsylvania: U.S. Army Corps of Engineers, Genesee River Basin Comprehensive Study, v. V., App. 1 (Ground Water Resources), 102 p.

Muller, E. H., 1977, Quaternary geology of New York, Niagara sheet: New York State Museum and Science Service, Map and Chart Series No. 28, 1 sheet.

EXPLANATION

GEOLOGIC UNITS

g — SURFICIAL SAND AND GRAVEL AQUIFERS OF FLUVIAL ORIGIN--Stratified sand and gravel at or near land surface was deposited by glacial streams as outwash or ice-contact deposits

c/g — SAND AND GRAVEL AQUIFERS BURIED BENEATH LACUSTRINE DEPOSITS--Stratified sand and gravel of glacial origin, buried beneath finer grained materials such as clay, silt, and fine-grained sand

s-c/g — SAND AND GRAVEL AQUIFERS BURIED BENEATH LACUSTRINE AND ALLUVIAL DEPOSITS--Same as above, except that the finer grained materials are overlain by 5 to 20 feet of sand and gravel. These surficial beds of sand and gravel are saturated near the mouths of tributary streams; elsewhere may be largely unsaturated. Therefore, the buried sand and gravel deposit is the principal aquifer

c — FINE-GRAINED LACUSTRINE DEPOSITS--Stratified clay, silt, and very fine-grained sand deposited in glacial lakes; includes quicksand. On most valley floors, thin deposits of alluvium cover these lake deposits

s/c — FINE-GRAINED DEPOSITS BURIED BENEATH ALLUVIAL OR GLACIAL DEPOSITS--Same as above except that the finer grained materials are overlain by 5 to 20 feet of sand, or sand and gravel. The clay and silt yield little or no water to wells. Small yields are obtainable from saturated deposits of very fine-grained sand, but development of wells in such deposits is seldom attempted because of the difficulty of obtaining clear, particle-free water. Thin deposits of alluvium cover these lake deposits in many valleys. A few feet of sand or sand and gravel may underlie the fine-grained deposits in some areas identified by the above symbol. In such places, however, these coarser materials generally are too thin and too limited in areal extent to supply adequate water except for small domestic supplies

s — SURFICIAL COARSE DEPOSITS--Isolated sand, or sand and gravel, 5 to 20 feet thick at or near land surface, and underlain by till. Surficial deposits identified by this symbol are commonly too thin or too well drained to be dependable aquifers

t — TILL AND BEDROCK--Till, an unsorted clay-sand-gravel mixture, forms the land surface in most upland areas and ranges in thickness from a few feet to more than 100 feet. Bedrock (shale, sandstone, limestone) underlies all unconsolidated deposits. Surface exposures of bedrock are uncommon except along steep roadcuts and some streambanks and channels. Some alluvial deposits in upstream parts of small valleys are included within the areas identified by this symbol.

WELL-YIELD CAPACITY

Estimated yield to individual wells tapping the most productive aquifer underlying each area. Yields are based on permeability, thickness, topographic position, and reported yields of existing wells. Several areas have more than one aquifer, but only the yield of the most productive one is indicated.

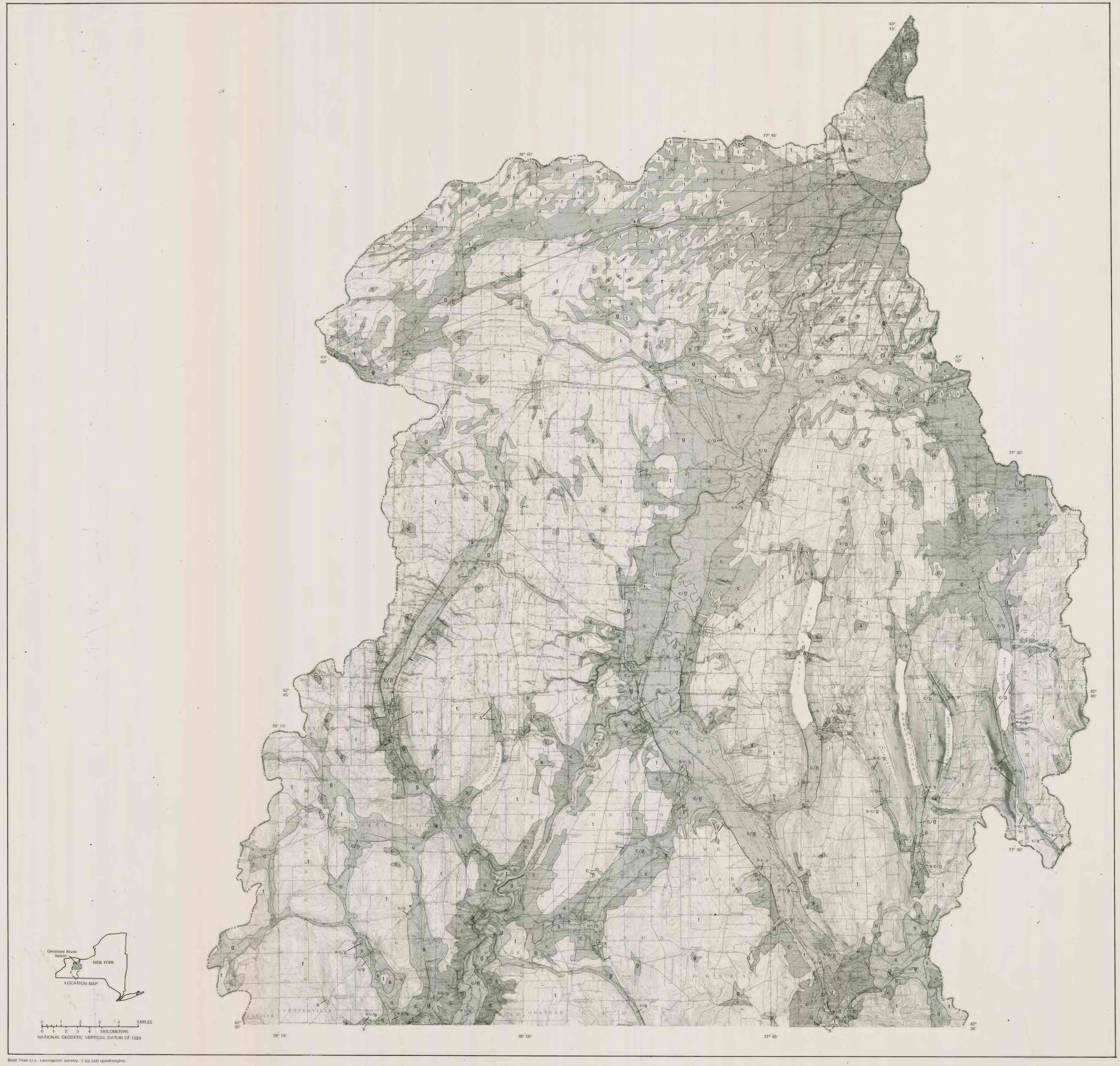
Yields of individual wells tapping sand and gravel aquifers. Areas identified by g, c/g, and s-c/g typically yield from 50 to 500 gallons per minute. Maximum dependable aquifer yields from wells in valleys containing such deposits are estimated to range from 0.2 to 5 million gallons per day per lineal mile of aquifer; this includes infiltration of water from the streams in some valleys

Generally fine-grained or thin deposits which yield less than 1 to 5 gallons per minute to wells. Small yields are obtainable from saturated deposits of very fine-grained sand, but development of wells in such deposits is seldom attempted because of the difficulty of obtaining clear, particle-free water.

Yields from wells in till are very low, usually less than 1 gallon per minute. Yields from individual wells in bedrock underlying the till are usually less than 50 gallons per minute, although higher yields have been reported in some place.

GEOLOGIC CONTACT

BASIN BOUNDARY



Base from U.S. Geological Survey, 1:62,500 quadrangles

GROUND-WATER AVAILABILITY IN THE GENESEE RIVER BASIN IN NEW YORK AND PENNSYLVANIA

By
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