

## REDROCK AQUIFERS

Aquifers in upstate New York occur in two rock types--unconsolidated deposits and bedrock formations. The unconsolidated aquifers are primarily sand and gravel; the more productive bedrock aquifers are limestone, sandstone, and shale.

During the past 40 years the U.S. Geological Survey, in cooperation with many State and local government agencies, has mapped and appraised many aquifer systems in New York. In the late 1960's, a statewide (excluding Long Island) evaluation of aquifer yields was compiled from data published in more than 30 county reports and from information obtained from more than 100 private investigators in progress, although the Statewide evaluation was never published, the data compilation and mapping were completed. In 1981, in response to the growing need for information on aquifers throughout the State, the information was compiled for publication in map format to provide a convenient reference for those concerned with ground-water occurrence or with water planning and management.

The data are based on hydraulic methods used in the 1960's; estimates of recharge and aquifer yield were obtained from methods used by Kantowitz (1970). More recent studies in upstate New York and New England have evaluated recharge rates and indicate that the recharge rates assigned on this map to some types of material in selected areas are probably conservative. Readers who require more detailed information on specific areas are referred to regional reports which provide greater detail. References to these reports are available in preparing these maps in 1969 are listed at the right.

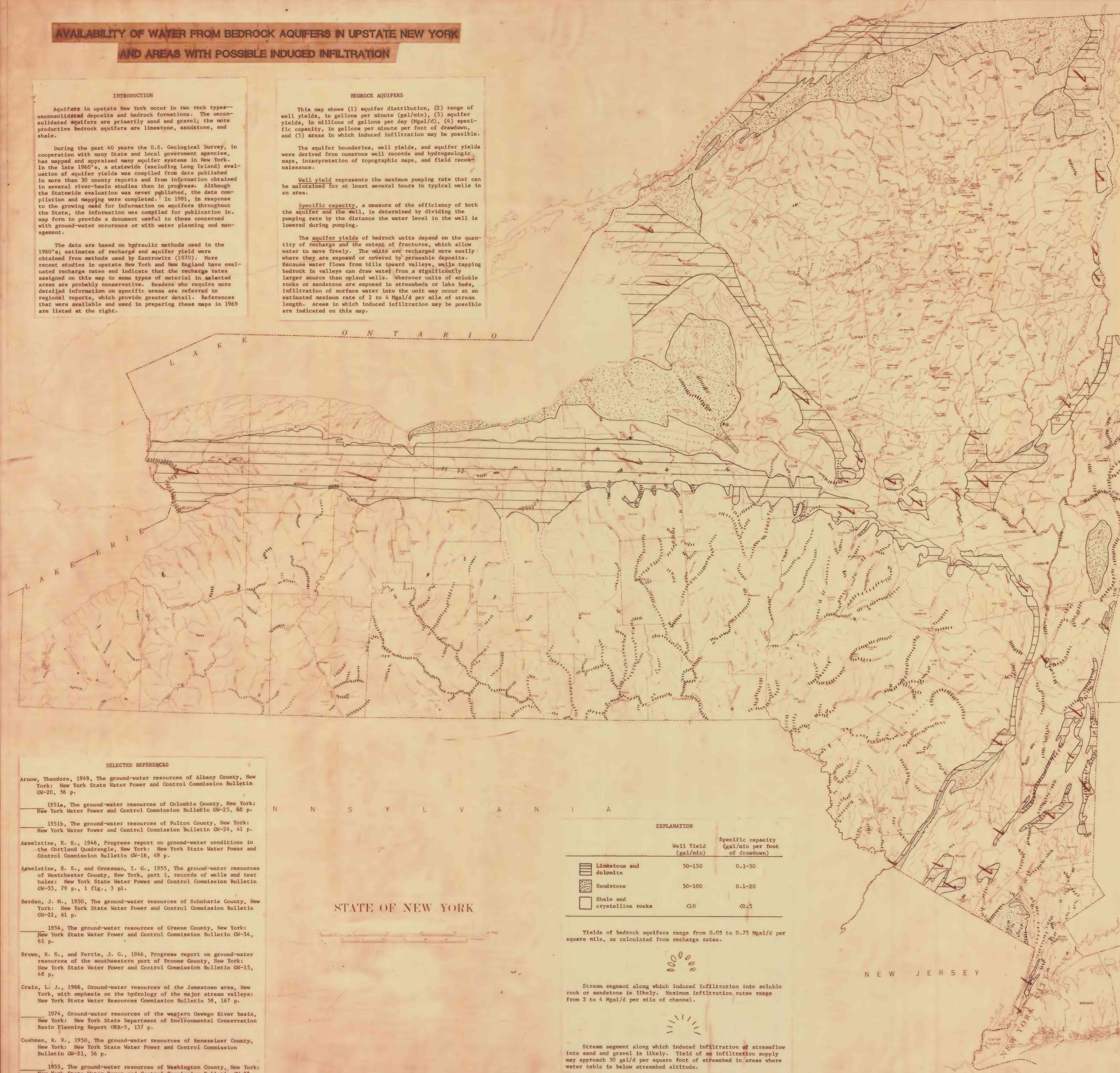
This map shows (1) aquifer distribution, (2) range of well yields, in gallons per minute (gal/min), (3) aquifer yields, in millions of gallons per day (Mgal/d), (4) specific capacity, in gallons per minute per foot of drawdown, and (5) areas in which induced infiltration may be possible.

The aquifer boundaries, well yields, and aquifer yields were derived from numerous well records and hydrogeologic maps, interpretation of topographic maps, and field reconnaissance.

Well yield represents the maximum pumping rate that can be maintained for at least several hours in typical wells in an area.

Specific capacity, a measure of the efficiency of both the aquifer and the well, is determined by dividing the pumping rate by the distance the water level in the well is lowered during pumping.

The aquifer yields of bedrock units depend on the quantity of recharge and the extent of fractures, which allow water to move freely. The units are recharged more easily where they are exposed or covered by permeable deposits. Because some of the hills toward valleys, wells tapping bedrock in valleys can draw water from a significantly larger source than upland wells. Wherever units of soluble rocks or sandstone are exposed in streambeds or lake beds, infiltration of surface water into the unit may occur at an estimated maximum rate of 2 to 4 Mgals/d per mile of stream length. Areas in which induced infiltration may be possible are indicated on this map.






## SELECTED REFERENCES (continued)

- Frimpter, M. H., 1974, Ground-water resources, Allegheny River basin and part of the Erie basin, New York: New York State Department of Environmental Conservation Basin Planning Report ARB-2, 98 p.
- Griswold, R. E., 1951, The ground-water resources of Wayne County, New York: New York State Water Power and Control Commission Bulletin GW-29, 61 p.
- Grossman, I. G., 1957, The ground water resources of Putnam County, New York: New York State Water Power and Control Commission Bulletin GW-37, 78 p.
- Grossman, I. G., and Yarger, L. B., 1953, Water resources of the Rochester area, New York: U.S. Geological Survey Circular 246, 30 p.
- Halberg, H. N., Hunt, O. P., and Pauszek, F. H., 1962, Water resources of the Utica-Rome area, New York: U.S. Geological Survey Water-Supply Paper 1499-C, p. C1-C46.
- \_\_\_\_\_, 1964, Water resources of the Albany-Schenectady-Troy area, New York: U.S. Geological Survey Water-Supply Paper 1499-D, p. D1-D64.
- Heath, R. C., Mack, F. K., and Tannenbaum, J. A., 1963, Ground-water studies in Schenectady County, New York: New York State Water Resources Commission Bulletin GW-49, 128 p.
- Hollyday, E. F., MacNish, R. D., Randall, A. D., and La Fleur, R. G., 1967, Principal aquifers in the Susquehanna River basin in New York State: U.S. Geological Survey open-file report, 1 sheet.
- Jeffords, R. M., 1950, The ground-water resources of Montgomery County, New York: New York State Water Power and Control Commission Bulletin GW-23, 63 p.
- Johnston, R. H., 1964, Ground water in the Niagara Falls area, New York, with emphasis on the water-bearing characteristics of the bedrock: New York State Water Resources Commission Bulletin GW-53, 93 p.
- Kantowitz, I. H., 1970, Ground-water resources in the eastern Oswego River basin, New York: New York State Water Resources Commission Basin Planning Report ORB-2, 129 p.
- La Sala, A. M., Jr., 1968, Ground-water resources of the Erie-Niagara basin, New York: New York State Water Resources Commission Basin Planning Report ENB-3, 114 p.
- La Sala, A. M., Jr., Harding, W. E., and Archer, R. J., 1964, Water resources of the Erie-Niagara area, New York, a preliminary appraisal: New York State Water Resources Commission Bulletin GW-52, 8 p.
- Mack, F. K., and Bigman, R. E., 1962, The ground-water resources of Ontario County, New York: New York State Water Resources Commission Bulletin GW-48, 99 p.
- Mozola, A. J., 1951, The ground-water resources of Seneca County, New York: New York State Water Power and Control Commission Bulletin GW-26, 57 p.
- Parker, C. G., and others, 1964, Water resources of the Delaware River basin: U.S. Geological Survey Professional Paper 381, 200 p.
- Perlmutter, N. M., 1959, Geology and ground-water resources of Rockland County, New York: New York State Water Power and Control Commission Bulletin GW-42, 133 p.
- \_\_\_\_\_, 1960, Sources of ground water in southeastern New York: U.S. Geological Survey Circular 417, 9 p.
- Perlmutter, N. M., and Arrow, Theodore, 1953, Ground water in Bronx, New York, and Richmond Counties with summary data on Kings and Queens Counties, New York City, New York: New York State Water Power and Control Commission Bulletin GW-32, 86 p.
- Reck, G. W., and Simons, E. T., 1952, Water resources of the Buffalo-Niagara Falls region: U.S. Geological Survey Circular 173, 26 p.
- Simons, E. T., Grossman, I. G., and Heath, R. C., 1961, Ground-water resources of Dutchess County, New York: New York State Water Resources Commission Bulletin GW-43, 82 p.
- Simpson, E. S., 1952, The ground-water resources of Schenectady County, New York: New York State Water Power and Control Commission Bulletin GW-30, 110 p.
- Soren, Julian, 1961, The ground-water resources of Sullivan County, New York: New York State Water Resources Commission Bulletin GW-46, 66 p.
- \_\_\_\_\_, 1963, The ground-water resources of Delaware County, New York: New York State Water Resources Commission Bulletin GW-50, 59 p.
- Thompson, J. H., ed., 1966, Geography of New York State, Syracuse University Press, 543 p.
- Trainer, F. W., and Salvas, E. H., 1962, Ground-water resources of the Massena-Waddington area, St. Lawrence County, New York, with emphasis on the effect of Lake St. Lawrence ground water: New York State Water Resources Commission Bulletin GW-47, 227 p.
- Waller, R. H., and Ayer, G. R., 1975, Water resources of the Black River basin, New York: New York State Department of Environmental Conservation Basin Planning Report BRB-1, 205 p.
- Wetterhall, W. S., 1959, The ground-water resources of Chemung County, New York: New York State Water Power and Control Commission Bulletin GW-40, 58 p.
- Winslow, J. D., Stewart, H. G., Jr., Johnston, R. H., & Crain, L. J., 1965, Ground-water resources of eastern Schenectady County, New York, with emphasis on infiltration from the Mohawk River: New York State Water Resources Commission Bulletin 57, 148 p.

#### SELECTED REFERENCES

- Arnold, Theodore, 1949, The ground-water resources of Albany County, New York: New York State Water Power and Control Commission Bulletin GW-20, 56 p.
- 1951a, The ground-water resources of Columbia County, New York: New York State Water Power and Control Commission Bulletin GW-25, 48 p.
- 1951b, The ground-water resources of Fulton County, New York: New York State Water Power and Control Commission Bulletin GW-24, 41 p.
- Asselstine, E. S., 1946, Progress report on ground-water conditions in the Cortland (quadrangle, New York: New York State Water Power and Control Commission Bulletin GW-16, 49 p.
- Asselstine, E. S., and Grossman, I. C., 1955, The ground-water resources of Westchester County, New York, part 1, records of wells and test logs: New York State Water Power and Control Commission Bulletin GW-35, 79 p., 1 fig., 3 pl.
- Berdan, J. M., 1950, The ground-water resources of Schoharie County, New York: New York State Water Power and Control Commission Bulletin GW-22, 61 p.
- 1954, The ground-water resources of Greene County, New York: New York State Water Power and Control Commission Bulletin GW-34, 61 p.
- Brown, R. R., and Ferris, J. G., 1946, Progress report on ground-water resources of the southwestern part of Broome County, New York: New York State Water Power and Control Commission Bulletin GW-15, 48 p.
- Crain, L. J., 1966, Ground-water resources of the Jamestown area, New York, with emphasis on the hydrology of the major stream valleys: New York State Water Resources Commission Bulletin 58, 167 p.
- 1974, Ground-water resources of the western Oswego River basin, New York: New York State Department of Environmental Conservation Basin Planning Report DRB-5, 137 p.
- Cushman, R. V., 1950, The ground-water resources of Kennesaw County, New York: New York State Water Power and Control Commission Bulletin GW-21, 56 p.
- 1953, The ground-water resources of Washington County, New York: New York State Water Power and Control Commission Bulletin GW-33, 65 p., 10 figs., 3 pl.

## EXPLANATION

	Well Yield (gal/min)	Specific capacity (gal/min per foot of drawdown)
 Limestone and dolomite	50-150	0.1-30
 Sandstone	50-100	0.1-20
 Shale and crystalline rocks	<10	<0.5

Yields of bedrock aquifers range from 0.05 to 0.75 Mgal/d per square mile, as calculated from recharge rates.

Stream segment along which induced infiltration into soluble rock or sandstone is likely. Maximum infiltration rates range from 2 to 4 Mgal/d per mile of channel.

Stream segment along which induced infiltration of streamflow into sand and gravel is likely. Yield of an infiltration supply may approach 50 gal/d per square foot of streambed in areas where water table is below streambed altitude.