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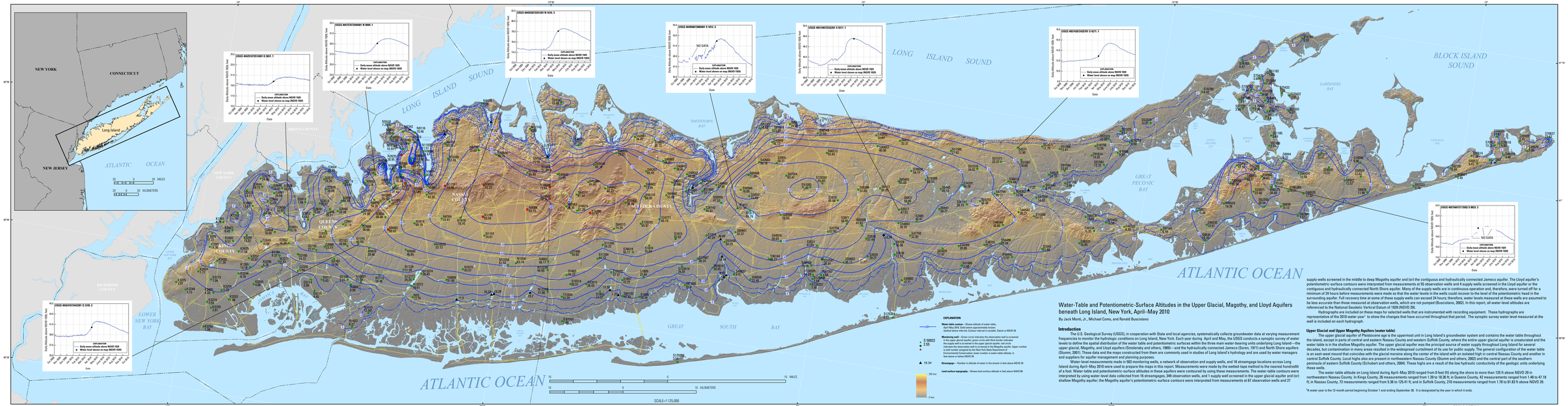
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES
SUFFOLK COUNTY WATER AUTHORITY
TOWN OF HEMPSTEAD, NEW YORK
TOWN OF SHELTER ISLAND
AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

SCIENTIFIC INVESTIGATIONS MAP 3270
Water table—SHEET 1 of 4
Monti, Jack, Jr., Como, Michael, and Busciolano, Ronald, 2013,
Water-Table and Potentiometric-Surface Altitudes in the Upper Glacial, Magothy, and Lloyd Aquifers beneath Long Island, New York, April–May 2010



Base from U.S. Geological Survey digital data 1:100,000 series
Universal Transverse Mercator projection
Zone 18 (extended 20°W to east 87° E), central meridian 74° 00' W
North American Datum of 1983

Water-Table and Potentiometric-Surface Altitudes in the Upper Glacial, Magothy, and Lloyd Aquifers beneath Long Island, New York, April–May 2010

By
Jack Monti, Jr., Michael Como, and Ronald Busciolano
2013

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Introduction

The U.S. Geological Survey (USGS), in cooperation with State and local agencies, systematically collects groundwater data at varying measurement frequencies to monitor the hydrologic conditions on Long Island, New York. Each year during April and May, the USGS conducts a synoptic survey of water levels to define the spatial distribution of the water table and potentiometric surfaces within the three main water-bearing units underlying Long Island—the upper glacial, Magothy, and Lloyd aquifers (Smolensky and others, 1989)—and the hydraulically connected Jamaica (Soren, 1971) and North Shore aquifers (Stumm, 2001). These data and the maps constructed from them are commonly used in studies of Long Island's hydrology and are used by water managers and suppliers for aquifer management and planning purposes.

Water-level measurements made in 920 monitoring wells, a network of observation and supply wells, and 16 streamgage locations across Long Island during April–May 2010 were used to prepare the maps in this report. Measurements were made by the wetted-tape method to the nearest hundredth of a foot. Water-table and potentiometric-surface altitudes in these aquifers were contoured by using these measurements. The water-table contours were interpreted by using water-level data collected from 16 streamgages, 349 observation wells, and 1 supply well screened in the upper glacial aquifer and (or) shallow Magothy aquifer; the Magothy aquifer's potentiometric-surface contours were interpreted from measurements at 87 observation wells and 27 supply wells screened in the middle to deep Magothy aquifer and (or) the contiguous and hydraulically connected Jamaica aquifer. The Lloyd aquifer's potentiometric-surface contours were interpreted from measurements at 55 observation wells and 4 supply wells screened in the Lloyd aquifer or the contiguous and hydraulically connected North Shore aquifer. Many of the supply wells are in continuous operation and, therefore, were turned off for a minimum of 24 hours before measurements were made so that the water levels in the wells could recover to the level of the potentiometric head in the surrounding aquifer. Full recovery time at some of these supply wells can exceed 24 hours; therefore, water levels measured at these wells are assumed to be less accurate than those measured at observation wells, which are not pumped (Busciolano, 2002). In this report, all water-level altitudes are referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

Hydrographs are included on these maps for selected wells that are instrumented with recording equipment. These hydrographs are representative of the 2010 water year[1] to show the changes that have occurred throughout that period. The synoptic survey water level measured at the well is included on each hydrograph.

Upper Glacial and Upper Magothy Aquifers (water table)

The upper glacial aquifer of Pleistocene age is the uppermost unit in Long Island's groundwater system and contains the water table throughout the island, except in parts of central and eastern Nassau County and western Suffolk County, where the entire upper glacial aquifer is unsaturated and the water table is in the shallow Magothy aquifer. The upper glacial aquifer was the principal source of water supply throughout Long Island for several decades, but contamination in many areas resulted in the widespread curtailment of its use for public supply. The general configuration of the water table is an east-west mound that coincides with the glacial moraine along the center of the island with an isolated high in central Nassau County and another in central Suffolk County. Local highs also are present in northwestern Nassau County (Stumm and others, 2002) and the central part of the southern peninsula of eastern Suffolk County (Schubert and others, 2004). These highs are a result of the low hydraulic conductivity of the geologic units underlying these wells.

The water-table altitude on Long Island during April–May 2010 ranged from 8 feet (ft) along the shore to more than 125 ft above NGVD 29 in northwestern Nassau County. In Kings County, 26 measurements ranged from 1.39 to 18.36 ft; in Queens County, 42 measurements ranged from 1.48 to 47.18 ft; in Nassau County, 72 measurements ranged from 5.38 to 125.41 ft; and in Suffolk County, 210 measurements ranged from 1.78 to 81.83 ft above NGVD 29.

[1]A water year is the 12-month period beginning October 1 and ending September 30. It is designated by the year in which it ends.

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