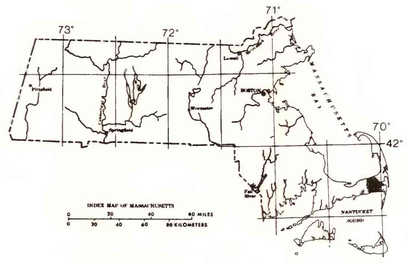
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING
DIVISION OF WATER POLLUTION CONTROL
and the towns of BREWSTER and HARWICH, MASSACHUSETTS

OPEN-FILE REPORT 88-330



70°02′30″

70°07′30″

41°45′

41°40′

WATER-TABLE MAP OF BREWSTER AND HARWICH, MASSACHUSETTS: SEPTEMBER 21 TO OCTOBER 22, 1987

By David G. Johnson and Nancy M. Davis

1988

EXPLANATION

- SALINE SURFACE WATER, FALL 1976 - Areas assumed to be affected by tides (from LeBlanc, D.R., Guswa, J.H., Frimpter, M.H., and Londquist, C.J., 1986, Ground-water resources of Cape Cod, Massachusetts: U.S. Geological Survey Hydrologic Investigations Atlas, HA-692, 4 sheets, scale 1:48,000).
- 12 — WATER-TABLE CONTOUR - Shows altitude in feet above National Geodetic Vertical Datum (NGVD) of 1929. Line dashed where location inferred or affected by tides. Contour interval 2 feet, except near the shorelines. Arrow indicates general direction of ground-water flow.
- GROUND-PENETRATING-RADAR SURVEY LINE
- PUBLIC-SUPPLY WELL
- 30.3 OBSERVATION WELL - Number indicates altitude of water table.
- (30.0) POND ALTITUDE - Altitude used to construct the water-table map. Pond altitudes on the base map were not used.

Base from U.S. Geological Survey
1:25,000 Topographic Quadrangles

SCALE 1:25,000
1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

This map shows the altitude and configuration of the water table in the unconfined sand and gravel aquifer in the Towns of Brewster and Harwich, Cape Cod, Massachusetts, for the period September 21 - October 22, 1987. The altitude and configuration of the water-table contours are based on water-level measurements at 75 observation wells, 36 ponds, and 1 point on the Herring River along the ground-penetrating-radar (GPR) survey line. In addition, 180 water levels derived from 38 GPR surveys were used where water-level data were sparse. Water levels were measured at 68 of the 75 wells from September 22 - October 1, 1987, and again from October 19-22. Between these two periods, water levels declined an average of 0.3 foot. The average of the two measurements at each well was used for the water-table altitude at that well. Water levels at the 36 ponds, Herring River, the remaining seven wells, and from the GPR surveys were measured once from September 21 - October 22, 1987. The altitudes of water levels in wells and ponds are accurate to ± 1 foot and from the GPR surveys are accurate to ± 2 feet.

The altitude of the water table in Brewster and Harwich ranged from sea level along Cape Cod Bay and Nantucket Sound to more than 34 feet northwest of Long Pond in Brewster. Ground-water levels near the coast are affected by tides, which can cause daily ground-water-level fluctuations of up to 2 feet (LeBlanc and others, 1986). Ground-water levels at two observation wells in Brewster, which have been measured monthly since 1962, were about 1 foot above normal in September and October 1987. Therefore, the water-table altitudes shown on the map probably are higher than long-term average water-table altitudes for September and October.

Thirteen public-supply wells in Brewster and Harwich were pumped intermittently during the measurement period. Therefore, the water-table contours near the discharging wells may not be representative of average conditions during September 21 - October 22, 1987. Average daily withdrawals from the three Brewster public-supply wells totaled 0.7 Mgal/d (million gallons per day) and from the 10 Harwich public-supply wells totaled 1.36 Mgal/d during this period.

The water-table map indicates that ground water flows outward from three ground-water mounds located west of Upper Millpond near the Dennis town line, northwest of Long Pond, and south of Long Pond. Flow lines indicate that the general direction of ground-water flow from the ground-water mound west of Upper Millpond was north toward Cape Cod Bay, east to Upper Millpond, and southeast to Slough Pond and Pine Pond. The direction of ground-water flow from the ground-water mound northwest of Long Pond was toward Stony Brook to the west, Cape Cod Bay to the north, Orleans and Pleasant Bay to the east, and Long Pond to the south. The direction of ground-water flow from the ground-water mound south of Long Pond was toward Hinckley's Pond and Herring River to the west, Long Pond to the north, Pleasant Bay to the east, and Nantucket Sound to the south. The upstream bend in the water-table contour lines along Stony Brook and Herring River indicate that ground water is discharging to these streams.