

GROUND-WATER AND POND LEVELS, CAPE COD, MASSACHUSETTS, 1950-82

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INTRODUCTION

The sole source of freshwater for Cape Cod, Massachusetts, is a water-table aquifer in glacial sand and gravel that is surrounded by sea water (fig. 1). Except for a few areas, the water table is less than 50 feet below land surface. Recharge to the aquifer is entirely through infiltration of precipitation.

This report contains water-level measurements from a network of 68 observation wells located throughout Cape Cod (Barnstable County, fig. 2), that have been maintained cooperatively by the Cape Cod Planning and Economic Development Commission, the National Park Service, the Massachusetts Department of Public Works, and the U.S. Geological Survey. The report also contains pond levels for 10 ponds measured by the Association for the Preservation of Cape Cod. Levels for the entire period of record are reported through December 1982 for each site. Previously, water-level records for 13 wells were published annually in "Water Resources Data for Massachusetts and Rhode Island" by the U.S. Geological Survey and in Massachusetts Hydrologic-Data Report No. 17 (see table 4 of this report).

The purposes of the water-level-monitoring network are to provide:

- A record of seasonal and long-term responses to variations in climate as indices of long-term trends and for assessing water-level changes as a result of water-supply development and wastewater management and conservation programs.
- A measure of the status of freshwater storage in the aquifer and a measure of the rates of its depletion and recharge.
- An index of water-level changes to predict high ground-water levels for use in the design and regulation of septic systems.
- A basis for the design and management of water withdrawal and disposal, and for the calibration and verification of aquifer models.
- A historical baseline of water-level information to predict future water levels and to evaluate and analyze water level problems.

Water-level measurements are made monthly at 21 sites and bimonthly at 47 sites (fig. 3). Water levels are recorded in feet below land-surface datum (land-surface datum is a horizontal datum plane that is approximately at land surface at each well site). To convert the water levels from depth below land-surface datum to water-level elevation above sea level, subtract the water level, in feet below land-surface datum, from the land-surface datum elevation. Land-surface datum for each well is given in table 1. Benchmarks have been established at each pond. Pond-levels are measured periodically and are reported in feet above sea level.

A description of each observation well and pond is given in table 1. Water-level measurements are reported in table 2 and as graphs in figure 3. The location of each observation well and pond is shown in figure 2. Several observation wells were not measured from March 1977 through August 1978, and the graphs in this report show no data for that hiatus. Periods when measurements of the ponds were not made are shown as dashed lines in figure 3.

The observation-well sites represent water levels 2 to 140 feet below land surface. The greatest known depth to water in Massachusetts (about 230 feet) is on Cape Cod. The depth to water in observation well Sandwich 261 (143 feet) is the greatest of any observation well in Massachusetts. Fluctuations at individual sites were generally from 2 to 7 feet. A general water-level decline was reflected by water levels in most wells and ponds during a dry period in 1980 and 1981.

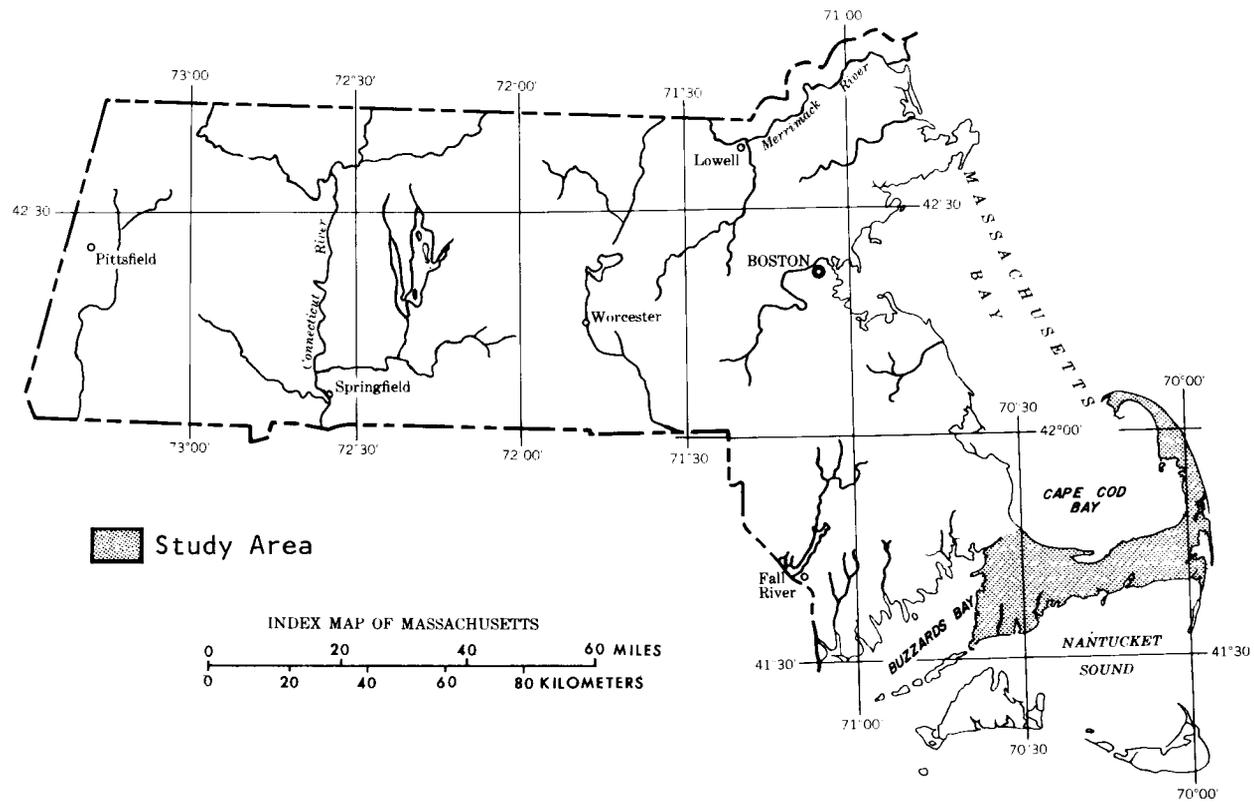


Figure 1.-- Location of Cape Cod area.

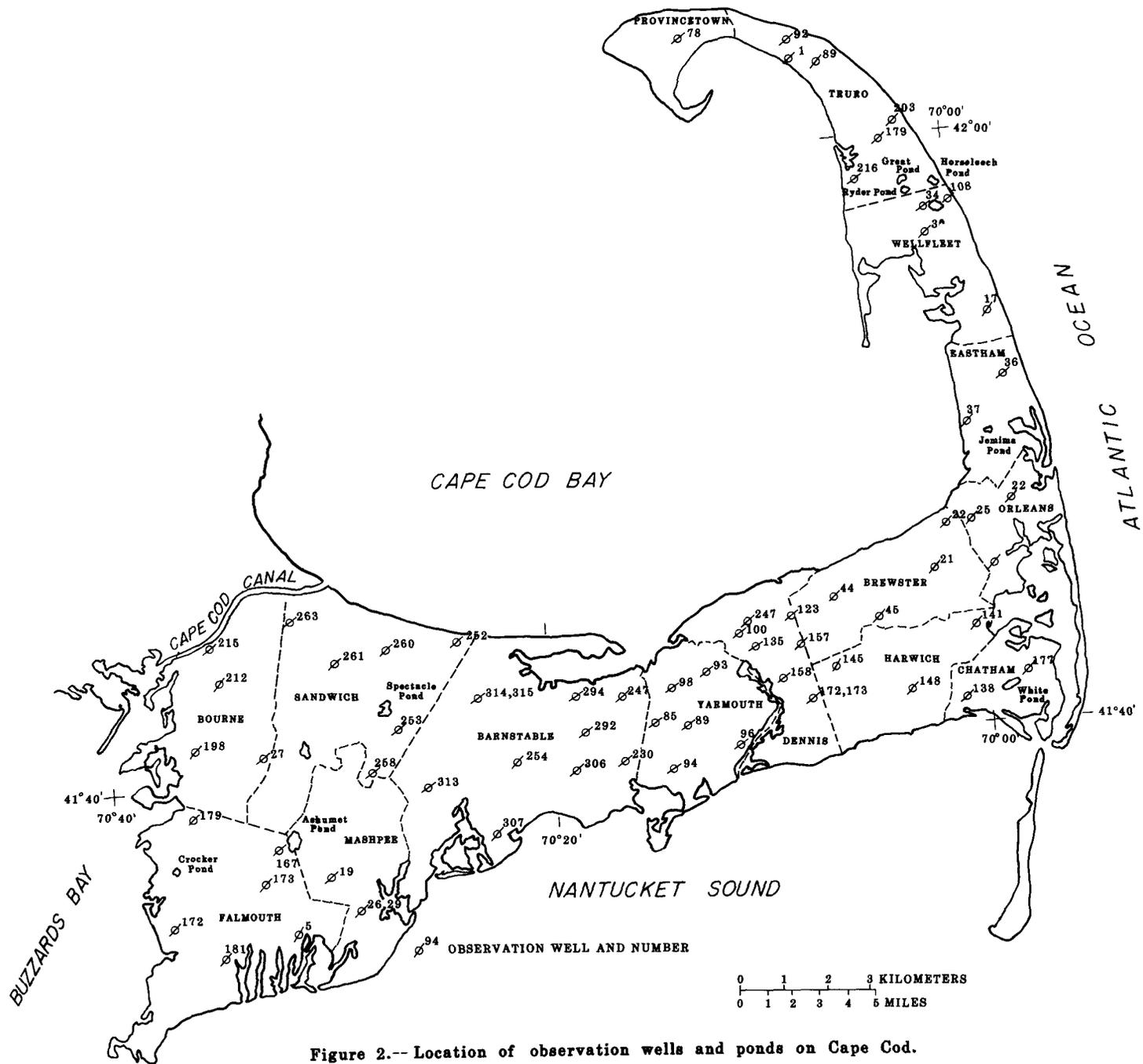


Figure 2.-- Location of observation wells and ponds on Cape Cod.