

# **BARNSTABLE COUNTY**

## **CAPE COD COMMISSION**

### **WATER RESOURCES OFFICE**

### **PUBLICATIONS**

---

The publications below are distributed by the Cape Cod Commission

**How to order:**

Address your request to Cape Cod Commission, 3225 Main Street, P.O. Box 226, Barnstable, MA 02630, or fax your request to: (508) 362-3136, or email: [frontdesk@capecommission.org](mailto:frontdesk@capecommission.org). Include the book title(s) and number of copies per book. If there is a fee for photocopying (current price is \$0.20 per page), please make your check payable to Barnstable County Treasurer.

If you prefer, you may pick up the publication(s) from the Cape Cod Commission at 3225 Main Street, Barnstable, MA. Business hours are 8:00 - 4:30 p.m., Monday through Friday. The phone number is (508) 362-3828.

Please feel free to photocopy these documents if multiple copies are required.

### **WATER RESOURCES**

**Baker Pond Water Quality Assessment Final Report; by E. Eichner, J. Scanlon, G. Heufelder, J. Wood  
December, 2001.**

This report summarized the field water quality sampling program conducted over a two year period including analysis of dissolved oxygen, temperature, nutrients, sediment, chlorophyll-a, plankton, benthic invertebrates and vegetation. Land use in the watershed and around the shoreline was also examined. (34 pages)

**Cape Cod Coastal Embayment Project - Interim Final Report; (September 1998).**

Examines the impacts of development on coastal water quality, with a focus on identifying the nitrogen sensitivity of nine embayment systems. It studies the nitrogen loads these systems currently receive and will receive upon build-out, and reviews potential management strategies. (160 pages)

**Cape Cod Commission, Technical Bulletin 92-001, Updated 1991.**

Estimation of High Ground-Water Levels for Construction and Land Use Planning, A Cape Cod, MA, Example - prepared in cooperation with U.S. Geological Survey, Water Resources Division

**Cape Cod Commission Technical Bulletin 91-001 Nitrogen Loading, by E.M. Eichner and T.C.  
Cambareri, April 1992.**

This bulletin presents the methodology which is used by the Water Resources Office of the Cape Cod Commission to review Developments of Regional Impact (DRIs) and to evaluate cumulative nitrogen loading to Water Resource Areas.

**Cape Cod Comprehensive Regional Wastewater Management Strategy Development Project; T.  
Cambareri, E. Eichner, B. Dupont, June 2003.**

Under an Executive Office of Environmental Affairs grant the commission provided a regional strategy to help Cape Cod towns with wastewater management planning by establishing the Wastewater Implementation Committee(WIC) as an advisory committee to Barnstable County. The WIC serves as a

regional forum for sharing information on wastewater issues and coordinating town, state, and county wastewater programs. This report provides a regional assessment of wastewater planning and land use analysis that will help Cape Cod towns collectively seek effective solutions for common wastewater problems. (55 pages)

**Cape Cod Golf Course Monitoring Project; prepared by CCPEDC, February, 1990.  
(Available for photocopy only)**

This report looks at the impact of golf course turf management at four golf courses on nitrate-nitrogen and pesticide concentrations in groundwater in a sand and gravel aquifer. (180 pages)

**Cape Cod Pond and Lake Atlas, Final Report; Cape Cod Commission Water Resources Office, May 2003.**

This atlas is a status report on the Pond and Lake Stewardship (PALS) program. It documents the outreach and education activities that led to the creation of the PALS program, reviews water quality data collected by volunteers from over 190 ponds, uses this data to develop Cape Cod-specific indicators of pond impacts, reviews data collected in previous studies, and details further efforts necessary to move pond protection and remediation forward on the Cape. (290 pages)

**Cape Cod Water Table Contours and Public Water Supply Wellhead Protection Areas, September, 1995.**

A regional reference map for groundwater flow direction and depth to groundwater that also depicts the location of wellhead protection areas to public water supplies.

**Coastal Nitrogen Loading Project Final Report; E. Eichner, T. Cambareri, et al, June 2002**

This report documents nitrogen loading assessments completed by the Cape Cod Commission for the Centerville River/East Bay coastal system in Barnstable, the Town Cove/Nauset Marsh system in Orleans and Eastham, the Herring River system in Harwich, and the Popponesset Bay system in Mashpee and Barnstable. (51 pages)

**"Effects of High Precipitation of Cape Cod's Water Resources", by G. Belfit, in Environment Cape Cod, vol. 1, no.1, 1997, pp. 67-71.**

The article reviews the impact on groundwater and surface waters from the abnormally high rainfall in autumn 1996. It discusses the weather conditions earlier in the year that made the ground vulnerable to heavy rains of autumn, and the physical conditions of Cape Cod's soil and aquifers that led to major impacts for ponds, houses and roads.

**Hydrogeologic Assessment of the Truro Landfill, Truro, Massachusetts; prepared by CCPEDC, November 13, 1989.**

**(Available for photocopy only)**

This report defines the chemical composition and extent of the landfill leachate plume and its impact on nearby water resources, and gives recommendations for future action. (45 pages)

**Harwich/Brewster Wellhead Protection Project, December 1990.**

**(Available for photocopy only)**

Using computer modeling, this project refined Zones of Contribution for public supply wells to make them consistent with DEP Zone II criteria for Wellhead Protection Areas. GIS technology was used to compile a detailed land use inventory. Also included is a nitrogen loading assessment, a discussion of potential contamination sources within the zones, and recommendations for future protection of the water supplies. (106 pages)

**Hydrogeologic and Hydrochemical Assessment of the Brewster Landfill Brewster, Massachusetts  
August, 1993.  
(Available for photocopy only)**

This report uses water table measurements and chemical analysis from 27 wells to determine groundwater flow direction and the hydrogeology and hydrochemistry of a leachate plume from a sanitary landfill. (61 pages)

**Hydrogeologic Evaluation for the Waquoit Bay Land Margin Ecosystem Research Project  
Characterization of the Watershed and Submarine Groundwater Discharge , April  
1993.(Available for photocopy only)**

This report presents a hydrogeologic investigation of regional groundwater discharge to a marine embayment, the Waquoit Bay watershed. Included are: the development of a sub-regional water table map, definition of subsurface geology, quantifying hydraulic head, and exploring the salt water interface.

**Identification of Potential Public Water-Supply Areas of the Cape Cod Aquifer, Massachusetts, Using  
a Geographic Information System; prepared by U.S. Geologic Survey, Water-Resources  
Investigation Report 94-4156, 1994.**

A GIS screening methodology was applied to hydrogeologic and political criteria to assess remaining developable land that could support potential water supplies. A GIS map describing the results of the analysis accompanies the report.

**Lake Wequaquet Water Level Study, March 1999. (Available for photocopy only)**

This report describes an assessment of groundwater levels, lake levels, and stream flows in and around Lake Wequaquet and Long Pond (Barnstable), to better understand the interrelations and dynamics. The study includes over nine months of lake water level and stream flow data, as well as evaluation of factors affecting water level fluctuations. (36 pages)

**Long Pond Water Quality Assessment, March 1999. (Available for photocopy only).**

This report describes an assessment of Long Pond's water quality, including a shoreline survey, collection of water samples, and analysis of land use patterns and phosphorus loading. (60 pages)

**Monomoy Capacity Study: Summary report, July 1996.**

This report examines the probable impact of steady population growth on the five towns that lie over the Monomoy groundwater lens (Dennis, Brewster, Harwich, Chatham, Orleans). It reviews the issues of water resources (supply and wastewater), traffic, open space, and fiscal impacts, and offers recommendations. (300 pages)

**Monomoy Lens Focus on Groundwater Protection Poster, December, 1993.**

Color poster includes a Geographic Information System map of the Monomoy Lens, and describes its hydrogeology and water resources.

**Monomoy Lens Groundwater Protection Project, December, 1993.  
(Available for photocopy only)**

This report is a product of a Geographic Information System(GIS) analysis of regional water protection and management issues. It describes the creation and use of a GIS land use inventory, examines local groundwater protection regulations and their implementation, and makes recommendations for groundwater protection at local and regional levels.(108 pages)

**"Optimizing Well Placement in a Coastal Aquifer: Outer Cape Cod, Massachusetts" by R. Sobczak and  
T. Cambareri, in Journal of the American Water Resources Association, Vol. 38, No. 3, June 2002**

An inverse-simulation approach is used to determine optimal strategies for developing public water-supply systems in a shallow, coastal aquifer on outer Cape Cod. Potential well sites and water supply scenarios are separated into "politically-based" and "resource-based" categories. (reprints available)

**Orleans Water Table Mapping Project, Technical Memorandum: Nitrogen Sensitivity and Prioritization of Cape Cod Coastal Embayments, October, 1995.  
(Volume 1 available for photocopy only)**

Town-wide water table mapping project describes water elevations, geology and delineates watersheds. Maps of groundwater contours and watershed delineations are included. (48 pages)

**Pamet River Investigations: Groundwater Assessment Study, Truro, Massachusetts - Groundwater Impacts Associated with the Removal of the Tide Gate and Dike Structures (May 1997).**

The report discusses hydrologic fieldwork and findings conducted to characterize the groundwater and stream dynamics, and the consequences of removing flow control mechanisms in the upper Pamet River. (60 pages).

**Physical Hydrology of Selected Vernal Pools and Kettle Hole Ponds in the Cape Cod National Seashore, Massachusetts: Groundwater and Surface Water Interactions; R. Sobczak, T. Cambareri and J. Portnoy, April 2003.**

This report provides a detailed field assessment of the morphology and hydrology of a complex of vernal pools located in Eastham, MA and presents a variety of analytical and numerical models in an attempt to quantify the ground and surface water interaction. The methods and results of this investigation have proven useful in evaluating potential drawdown impacts for a number of newly permitted water supply wells on Cape Cod. (limited reprints available)

**Pleasant Bay Nitrogen Loading Study (April 1998).**

Analyzes the sources and levels of nitrogen coming into Pleasant Bay from the eleven subembayments that contribute to the Bay. Delineates subwatersheds, determines nitrogen loading limits, compares limits to build-out conditions, and reviews potential management options to reduce nitrogen loads. (46 pages)

**Priority Land Acquisition Assessment Project: A Guide to Identifying and Evaluating the Suitability of Land for Future Water Supply Sites. (June 1999) .  
(Available for photocopy only)**

This report explains the process and criteria used to evaluate land parcels for possible acquisition as water supply sites and protective area. A follow-up to 1994 USGS study that located possible undeveloped land on Cape Cod for water supply sites. Using assessor's data for eleven towns on public water supply, a four-level rating scale was devised for tracts of contiguous parcels, based on current land use and known water quality factors. (186 pages plus 12 color plates- black and white copies only).

**Priority Land Acquisition Assessment Project: Phase II, (March , 2001).  
(Available for photocopy only)**

The second phase investigation of potential public supply well sides, completes a detailed assessment for specific sites identified in Phase I with the highest potential for supply development. The assessment included the preparation of detailed maps and analysis of water development factors including funding options, groundwater protection measures and other issues of local concern. (163 pages)

**Small Volume Well Inventory and Prioritization Project, January, 1994.  
(Available for photocopy only)**

This report identifies small volume water supplies on Cape Cod, delineates wellhead protections areas for these areas, describes land use inventories for selected wells, and makes recommendations for future groundwater protection. (70 pages)

**Sagamore Lens Focus on Groundwater Protection Poster, June, 1995.**

Color poster includes a Geographic Information System map of the Sagamore Lens, and describes its hydrogeology and water resources.

**Sagamore Lens Groundwater Protection Project, June 1996.**

**(Available for photocopy only)**

Includes a matrix comparing groundwater protection regulations in six towns, the state and county, a groundwater educational brochure for each of six towns in the Sagamore Lens, a draft groundwater protection policy developed for the MMR, and a detailed land use analysis for the public water supply recharge areas in the town of Sandwich. (162 pages)

Sagamore Lens brochures are available separately. Please specify town:

\_\_\_\_\_ Bourne  
\_\_\_\_\_ Barnstable  
\_\_\_\_\_ Sandwich  
\_\_\_\_\_ Mashpee  
\_\_\_\_\_ Falmouth  
\_\_\_\_\_ Yarmouth

**Truro/Provincetown Aquifer Assessment and Groundwater Protection Plan; prepared by CCPEDC, October, 1989.**

**(Available for photocopy only)**

This report consists of a resource-based approach to managing water supply. Included are an updated regional water table map, refined ZOCs for the public supply wells including a nitrogen loading assessment, delineation of time of travel ZOCs, a land use analysis, a toxic and hazardous material inventory, landfill assessments, screening for potential future well sites, and recommendations for long term management and protection. (86 pages)

**"Watershed Delineation and Ground Water Discharge to a Coastal Embayment" by T. Cambareri and E. Eichner, in Groundwater vol. 36, no. 4. July-August 1998.**

A study to define the watershed of Waquoit Bay (Falmouth/Mashpee) and to define near-coastal groundwater discharge properties. The study investigation included plotting reverse flow paths for groundwater, calculating the water budget mass balance for the bay's inflowing rivers, driving wells into the embayment bed, and taking deep geologic borings. (reprints available)

**Water Resources of Outer Cape Cod (May 1998)**

This report describes drinking water quality and quantity for the four outer-Cape towns (Eastham, Wellfleet, Truro, Provincetown) and the National Seashore, including the application of an optimization approach to identify potential new well sites, and their potential impacts. Accompanied by a 2'x 3' poster (100 pages).

**Zone II Delineation for the Orleans Public Supply Wells Orleans, Massachusetts, January 1993.**

**(Volume 1 available for photocopy only.)**

This report describes the hydrogeologic characteristics of the Orleans Wellfield and the method used to refine the estimates of the aquifer characteristics in determining the Zone II boundaries for the public supply wells. (32 pages)