WATER THREAT LEVEL

MODERATE

WATERSHEDS: UPPER CAPE

Oyster Pond

The Problem

The Massachusetts Estuaries Project (MEP) technical report (available at www.oceanscience.net/estuaries/) indicates the Oyster Pond system exceeds its critical threshold for nitrogen, resulting in impaired water quality. Following the critical nitrogen load put forth in the MEP report, a total maximum daily load (TMDL) for nitrogen was established by MassDEP and US EPA.

- **MEP TECHNICAL REPORT STATUS:** Final
- **TMDL STATUS:** Final TMDL
- **TOTAL WASTEWATER FLOW:** 10 MGY (Million Gal/Per Year)
  - Treated WW Flow: 0 MGY
  - Septic Flow: 10 MGY
- **UNATTENUATED TOTAL NITROGEN LOAD (MEP):** 1,609 kg/Y (kilograms per year)
- **ATTENUATED TOTAL NITROGEN LOAD (MEP):** 1,603 kg/Y
- **SOURCES OF CONTROLLABLE NITROGEN (MEP):**
  - 88% Septic Systems
  - 5% Lawn Fertilizer
  - 7% Stormwater From Impervious Surfaces

CONTRIBUTING TOWN

- **FALMOUTH**

THE MEP RESTORATION SCENARIO

- **WATERSHED TOTAL NITROGEN REDUCTION TARGET:** 58%
- **WATERSHED SEPTIC REDUCTION TARGET:** 77% (The scenario represents the aggregated sub-embayment percent removal targets from the MEP technical report)

OSTER POND ESTUARY

- **EMBAYMENT AREA:** 63 acres
- **EMBAYMENT VOLUME:** Unknown
- **2012 INTEGRATED LIST STATUS:** Category 4A for estuarine bioassessments, fecal coliform and nitrogen
  - Category 4A: TMDL is completed
  - www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

OYSTER POND WATERSHED

- **ACRES:** 339
- **PARCELS:** 190
- **% DEVELOPED RESIDENTIAL PARCELS:** 79%
- **PARCEL DENSITY:** 1.8 acres per parcel (approx.)
- **WASTEWATER TREATMENT FACILITIES:** 0

The Oyster Pond estuary and embayment system has shoreline located entirely in the Town of Falmouth. The estuary was formed by rising sea levels flooding a series of kettle ponds and accesses Nantucket Sound via an armored, narrow, tidal inlet passing through a barrier beach. While Oyster Pond has had a number of outlets to the Sound in the past, after the construction of Surf Drive and the paralleling railroad, the outlet became fixed to a single location.

Freshwater Sources

PONDS

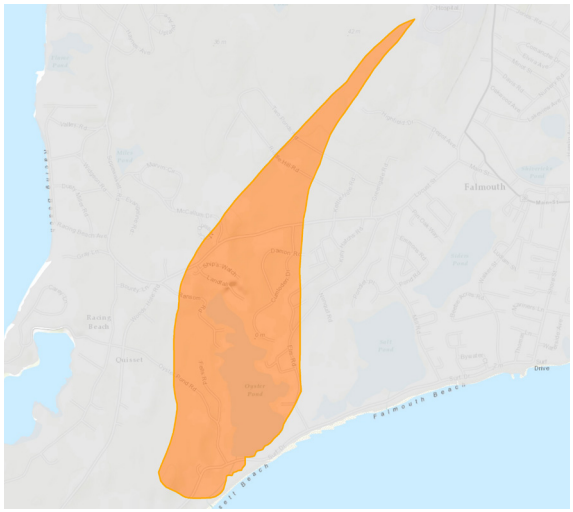
- **IDENTIFIED SURFACE WATERS:** 3
- **NUMBER OF NAMED FRESHWATER PONDS:** 0
- **PONDS WITH PRELIMINARY TROPHIC CHARACTERIZATION:** 0
  (Listed In Appendix 4C, Ponds With Water Quality Data)
- **2012 INTEGRATED LIST STATUS:** None listed

STREAMS

- **SIGNIFICANT FRESHWATER STREAM OUTLETS:** 1
  Stream:
  - Average Flow: 97 cubic meters per day (m3/d)
  - Average Nitrate Concentrations: 0.197 milligrams per liter (mg/L)
- **DISCUSSION:** Characterization of fresh water streams like these is a regular part of the MEP technical reports. These concentrations are higher than areas of the aquifer with less than 0.05 mg/L background concentrations that are evident in public supply wells located in pristine areas. This provides evidence of the impact of non-point source nitrogen pollution from residential areas on the aquifer and receiving coastal waters.

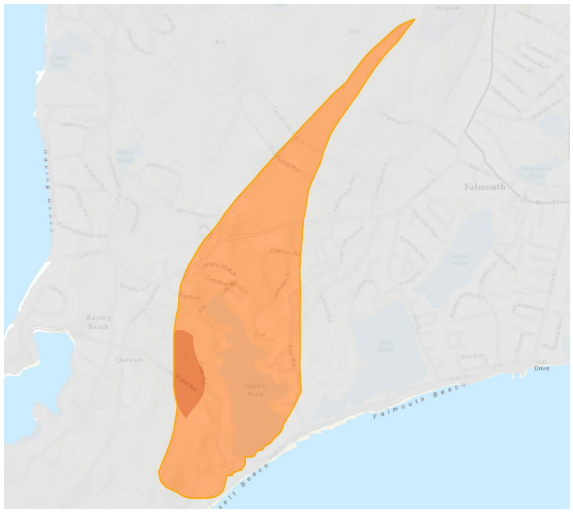
DRINKING WATER SOURCES

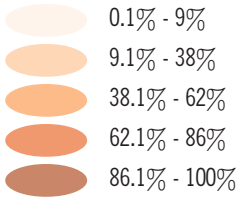
- **WATER DISTRICTS:** 1
  - Falmouth Water Department
- **GRAVEL PACKED WELLS:** 0
- **SMALL VOLUME WELLS:** 0



Subwatersheds with
Total Nitrogen Removal Targets

Figure 4-1 OP





Subwatersheds with
Septic Nitrogen Removal Targets

Figure 4-2 OP

LOCAL PROGRESS

FALMOUTH

The Town of Falmouth Comprehensive Wastewater Management Plan (CWMP) was approved under Joint Massachusetts Environmental Policy Act (MEPA)/ Development of Regional Impact (DRI) review in early 2014 and received town meeting and ballot vote approval in Spring 2014. The first phase is to implement sewering in the Little Pond watershed, upgrade the wastewater treatment facility and construct a new discharge site outside of the west Falmouth Harbor watershed. The plan also includes a series of pilot projects that will be conducted concurrently with the sewering project over the next 5 years, at which time the Town will re-evaluate its options for comprehensive wastewater management. The Town is also conducting an assessment of the Oyster Pond watershed separate from the CWMP.

Local efforts are described in more detail in Chapter 6.

Degree of Impairment and Areas of Need

For the purposes of the §208 Plan Update areas of need are primarily defined by the amount of nitrogen reduction required as defined by the TMDL and/or MEP technical report. These were referred to above as 59% of the septic nitrogen load or 58% of the total nitrogen load. The MEP technical report also provides a specific targeted amount of nitrogen reduction required by subwatershed (Figure 4-1 OP Subwatersheds with Total Nitrogen Removal Targetss and Figure 4-2 OP Subwatersheds with Septic Nitrogen Removal Targets).

The nitrogen load from the watershed exceeds the threshold or TMDL for Oyster Pond, resulting in impaired water quality. The ecological health of a water body is determined from water quality, extent of eelgrass, assortment of benthic fauna, and dissolved oxygen and ranges from 1-severe degradation, 2-significantly impaired, 3-moderately impaired, 4- healthy habitat conditions. The Oyster Pond watershed is indicated as being beyond its ability to assimilate additional nutrients. The MEP technical report further states that, due to cultural changes, it may be impossible to return Oyster Pond to pristine conditions. Restoration efforts, and not a return to pre-development conditions, are the goal for this watershed.

MEP ECOLOGICAL CHARACTERISTICS AND WATER QUALITY

- **OVERALL ECOLOGIC CONDITION:** Moderately to Significantly Impaired
- **SENTINEL STATIONS:**
  - Total Nitrogen Concentration Threshold: 0.55 mg/L
  - Total Nitrogen Concentration Existing: 0.69 mg/L (As reported at the MEP sentinel water-quality monitoring stations)