



The Problem

The Massachusetts Estuaries Project (MEP) technical report (available at www.oceanscience.net/estuaries/) indicates that the Little Pond system exceeds its critical thresholds for nitrogen, resulting in impaired water quality. A nutrient total maximum daily load (TMDL) has been established by MassDEP and US EPA indicating that the system is nitrogen overloaded.

- **MEP TECHNICAL REPORT STATUS:** Final
- **TMDL STATUS:** Final TMDL
- **TOTAL WASTEWATER FLOW:** 59 MGY (million gal per year)
 - Treated WW Flow: 0 MGY
(A portion of the commercial development in the Little Pond watershed is presently hooked up to sewer and is not reflected since the effluent is disposed of outside of the watershed.)
 - Septic Flow: 59 MGY
- **UNATTENUATED TOTAL NITROGEN LOAD (MEP):**
8,870 kg/Y (kilograms per year)
- **ATTENUATED TOTAL NITROGEN LOAD (MEP):**
7,569 kg/Y
- **SOURCES OF CONTROLLABLE NITROGEN (MEP):**
 - 81% Septic Systems
 - 12% Lawn Fertilizer
 - 7% Stormwater From Impervious Surfaces

CONTRIBUTING TOWN

- **FALMOUTH**

THE MEP RESTORATION SCENARIO

- **WATERSHED TOTAL NITROGEN REDUCTION TARGET:** 72%
- **WATERSHED SEPTIC REDUCTION TARGET:** 86%
(The scenario represents the aggregated sub-embayment percent removal targets from the MEP technical report)

LITTLE POND ESTUARY

- **EMBAYMENT AREA:** 47 acres
- **EMBAYMENT VOLUME:** 7 million cubic feet
- **2012 INTEGRATED LIST STATUS:** Category 4a for fecal coliform and estuarine bioassessments
 - Category 4a: TMDL is completed
 - www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

LITTLE POND WATERSHED

- **ACRES:** 774
- **PARCELS:** 1,333
- **% DEVELOPED RESIDENTIAL PARCELS:** 85%
- **PARCEL DENSITY:** 0.6 acres per parcel (approx.)
- **WASTEWATER TREATMENT FACILITIES:** 0

The Little Pond embayment system has shoreline that is entirely located in the Town of Falmouth. It is comprised of a large inland basin that is connected to Nantucket Sound and extends about 9/10 of a mile to its headwaters. The estuary supports a variety of recreational uses including boating, swimming, shell fishing and fin fishing.

Freshwater Sources

PONDS

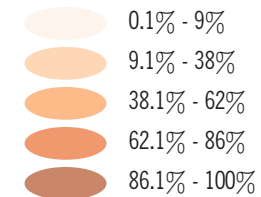
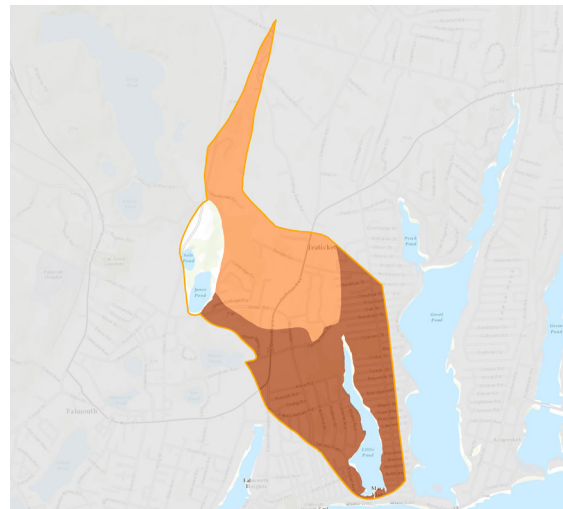
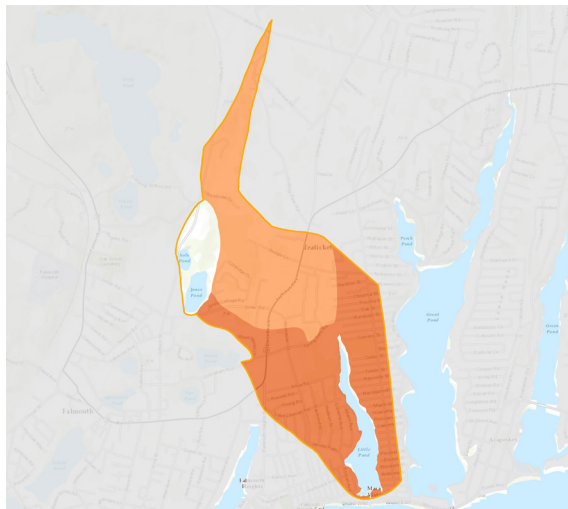
- IDENTIFIED SURFACE WATERS: 3
- NUMBER OF NAMED FRESHWATER PONDS: 2
- PONDS WITH PRELIMINARY TROPHIC CHARACTERIZATION: 0
(Listed In Appendix 4C, Ponds With Water Quality Data)
- 2012 INTEGRATED LIST STATUS: None listed

- **DISCUSSION:** The Town of Falmouth has not fully engaged in the Pond and Lake Stewardship (PALS) program that has helped establish baseline pond water quality.

STREAMS

- **SIGNIFICANT FRESHWATER STREAM OUTLETS:** 1
Stream: No name
 - Average Flow: 2,006 cubic meters per day (m3/d)

- Average Nitrate Concentrations: 1.9 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.



Subwatersheds with Total Nitrogen Removal Targets

Figure 4-1 LP

Subwatersheds with Septic Nitrogen Removal Targets

Figure 4-2 LP

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 to implement its first phase – sewerage of the Little Pond watershed. The collected wastewater will be pumped to the Town’s treatment plant on Blacksmith Shop Road. The sewerage project will remove nearly 100% of the septic nitrogen loading from the lower watershed.

This will be the Cape’s second watershed to have implemented a nitrogen removal strategy for coastal water restoration. The Falmouth CWMP also includes a series of pilot projects that may assist in further reducing nitrogen under an adaptive management approach.

Local efforts are described in more detail in Chapter 6.

LITTLE POND

DRINKING WATER SOURCES

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

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 86% of the septic load and 72% of the total load, as shown in Figure 4-1 LP Subwatersheds with Total Nitrogen Removal Targets. The MEP Technical Report also provides a specific targeted amount of nitrogen reduction required by subwatershed, as shown in Figure 4-2 LP Subwatersheds with Septic Nitrogen Removal Targets.

The nitrogen load from the watershed exceeds the threshold or TMDL for Little 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

WATERSHEDS: UPPER CAPE

habitat conditions.

MEP ECOLOGICAL CHARACTERISTICS AND WATER QUALITY

- **OVERALL ECOLOGIC CONDITION:** Significantly Impaired to Severely Degraded
- **UPPER LITTLE POND:** Significantly Impaired to Severely Degraded
- **LOWER LITTLE POND:** Significantly Impaired
- **SENTINEL STATIONS:**
 - Total Nitrogen Concentration Threshold: 0.45 mg/L
 - Total Nitrogen Concentration Existing: 0.84 mg/L (As reported at the MEP sentinel water-quality monitoring stations)