

WATERSHEDS: LOWER CAPE
Taylor's Pond, Sulphur Springs and Stage Harbor



The Problem

The Massachusetts Estuaries Project (MEP) technical report indicates that excess nitrogen has resulted in impaired water quality in Taylor's Pond, Sulphur Springs and Stage Harbor. According to the MEP report, the Taylor's Pond, Sulphur Springs and Stage Harbor system exceeds its critical nitrogen threshold. A Total Maximum Daily Load (TMDL) for nitrogen has been completed for all three systems.

Taylor's Pond

- **MEP TECHNICAL REPORT STATUS:** Final
- **TMDL STATUS:** Final TMDL
- **TOTAL WASTEWATER FLOW:** 30 MGY (million gal per year)
 - Treated WW Flow: 0 MGY
 - Septic Flow: 30 MGY
- **UNATTENUATED TOTAL NITROGEN LOAD (MEP):** 5,679 kg/Y (kilograms per year)
- **ATTENUATED TOTAL NITROGEN LOAD (MEP):** 5,344 kg/Y
- **SOURCES OF CONTROLLABLE NITROGEN (MEP):**
 - 89% Septic Systems
 - 6% Lawn Fertilizer
 - 5% Stormwater from Impervious Surfaces

CONTRIBUTING TOWN

- **CHATHAM**

THE MEP RESTORATION SCENARIO

- **WATERSHED TOTAL NITROGEN REDUCTION TARGET:** 51%
- **WATERSHED SEPTIC REDUCTION TARGET:** 59%
 (The scenario represents the aggregated sub-embayment percent removal targets from the MEP technical report)

TAYLORS POND ESTUARY

- **EMBAYMENT AREA:** 30 acres
- **EMBAYMENT VOLUME:** 7 million cubic feet
- **2012 INTEGRATED LIST STATUS:** Category 4a for nitrogen and fecal coliform
 - Category 4a: TMDL is completed
 - www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

TAYLORS POND WATERSHED

- **ACRES:** 607
- **PARCELS:** 789
- **% DEVELOPED RESIDENTIAL PARCELS:** 81%
- **PARCEL DENSITY:** .077 acres per parcel (approx.)
- **WASTEWATER TREATMENT FACILITIES:** 0

The Taylor's Pond, Sulphur Springs and Stage Harbor are a set of moderate to large embayment systems with shorelines located in the Town of Chatham and with outlets to Nantucket Sound. The estuaries support a variety of recreational uses including boating, swimming, shell fishing and fin fishing.

Sulphur Springs

- **MEP TECHNICAL REPORT STATUS:** Final
- **TMDL STATUS:** Final TMDL
- **TOTAL WASTEWATER FLOW:** 86 MGY
 - Treated Flow: 38 MGY
 - Septic Flow: 48 MGY
- **UNATTENUATED TOTAL NITROGEN LOAD (MEP):** 10,743 kilograms per year (kg/Y)
- **ATTENUATED TOTAL NITROGEN LOAD (MEP):** 10,606 kg/Y
- **SOURCES OF CONTROLLABLE NITROGEN (MEP):**
 - 80% Septic Systems
 - 5% Lawn Fertilizer
 - 4% Stormwater from Impervious Surfaces
 - 11% Wastewater Treatment Facilities

CONTRIBUTING TOWNS

- **CHATHAM:** 100%

THE MEP RESTORATION SCENARIO

- **WATERSHED TOTAL NITROGEN REDUCTION TARGET:** 31%
- **WATERSHED SEPTIC REDUCTION TARGET:** 39%
(The scenario represents the aggregated sub-embayment percent removal targets from the MEP technical report)

SULPHUR SPRINGS ESTUARY

- **EMBAYMENT AREA:** 52 acres

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

SULPHUR SPRINGS WATERSHED

- **ACRES:** 1,097
- **PARCELS:** 1,236
- **% DEVELOPED RESIDENTIAL PARCELS:** 80%
- **PARCEL DENSITY:** 0.89 acre per parcel (approx.)
- **WASTEWATER TREATMENT FACILITIES:** 1
 - Chatham Wastewater Treatment Facility

Stage Harbor

- **MEP TECHNICAL REPORT STATUS:** Final
- **TMDL STATUS:** Final TMDL
- **TOTAL WASTEWATER FLOW:** 79 MGY
 - Treated WW Flow: 0 MGY
 - Septic Flow: 79 MGY
- **UNATTENUATED TOTAL NITROGEN LOAD (MEP):** 15,913 kg/Y
- **ATTENUATED TOTAL NITROGEN LOAD (MEP):** 15,714 kg/Y
- **SOURCES OF CONTROLLABLE NITROGEN (MEP):**
 - 89% Septic Systems
 - 6% Lawn Fertilizer
 - 5% Stormwater from Impervious Surfaces

CONTRIBUTING TOWNS

- **CHATHAM:** 100%

THE MEP RESTORATION SCENARIO

- **WATERSHED TOTAL NITROGEN REDUCTION TARGET:** 72%
- **WATERSHED SEPTIC REDUCTION TARGET:** 85%
(The scenario represents the aggregated sub-embayment percent removal targets from the MEP technical report)

STAGE HARBOR ESTUARY

- **EMBAYMENT AREA:** 609 acres
- **EMBAYMENT VOLUME:** 143 million cubic feet
- **2012 INTEGRATED LIST STATUS:** Category 4a for nitrogen and fecal coliform
 - Category 4a: TMDL is completed
 - www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

STAGE HARBOR WATERSHED

- **ACRES:** 2,176
- **PARCELS:** 2,035
- **% DEVELOPED RESIDENTIAL PARCELS:** 76%
- **PARCEL DENSITY:** 1.1 acres per parcel (approx.)
- **WASTEWATER TREATMENT FACILITIES:** 0

Taylors Pond, Sulphur Springs and Stage Harbor Freshwater Sources

PONDS

- IDENTIFIED SURFACE WATERS: 18
- NUMBER OF NAMED FRESHWATER PONDS: 8
- PONDS WITH PRELIMINARY TROPHIC CHARACTERIZATION: 7
(Listed In Appendix 4C, Ponds With Water Quality Data)
- 2012 INTEGRATED LIST STATUS: None listed

STREAMS

- SIGNIFICANT FRESHWATER STREAM OUTLETS: 0

■ **DISCUSSION:** While characterization of freshwater streams is a regular part of the MEP technical reports there are no reported streams with quantitative measurements of flow and concentrations contributing to the Taylors Pond, Sulphur Springs and Stage Harbor watersheds. A follow-up MEP study of Cockle Cove Creek included a detailed assessment of its condition and assimilative capacity.

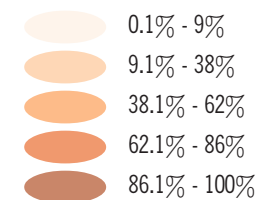
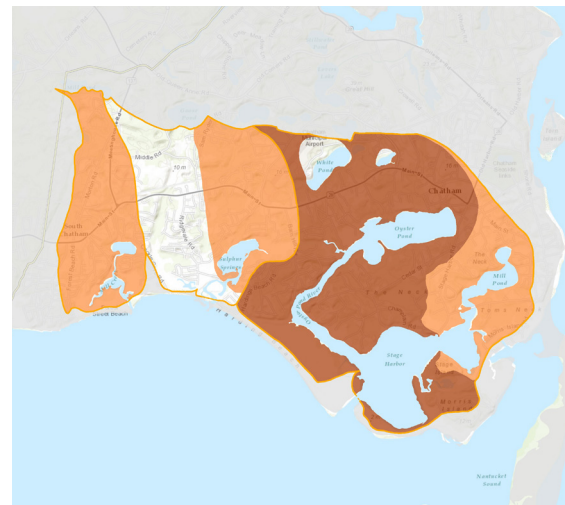
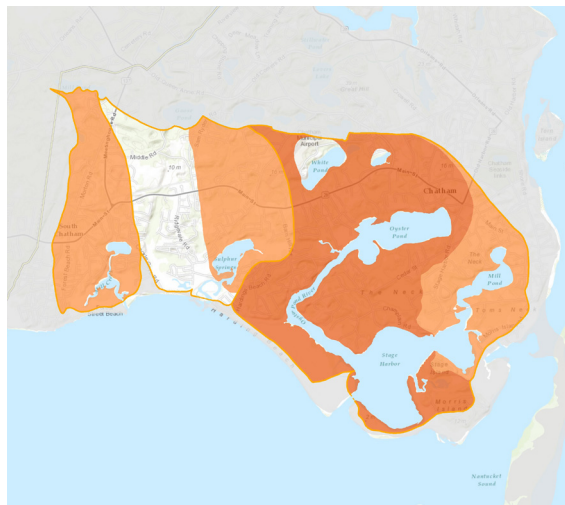
DRINKING WATER SOURCES

- **WATER DISTRICTS:** 1
 - Chatham Water Department
- **GRAVEL PACKED WELLS:** 1 (located within the Stage Harbor watershed)
- **SMALL VOLUME TRANSIENT 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. The MEP technical report also provides a specific targeted amount of nitrogen reduction required by subwatershed (Figure 4-1 TSS Subwatersheds with Total Nitrogen Removal Targets and Figure 4-2 TSS Subwatersheds with Septic Nitrogen Removal Targets).

The nitrogen load from the watershed exceeds the threshold or TMDL for Taylors Pond, Sulphur Springs and Stage Harbor, resulting in impaired water quality. While geospatially referenced ecological indicators are not available for these watersheds, an overall ecological assessment is provided.



Subwatersheds with Total Nitrogen Removal Targets

Figure 4-1 TSS

Subwatersheds with Septic Nitrogen Removal Targets

Figure 4-2 TSS

MEP ECOLOGICAL CHARACTERISTICS AND WATER QUALITY

■ TAYLORS POND

- Overall Ecologic Condition: Poor

Sentinel Stations:

- Total Nitrogen Concentration Threshold: 0.38 mg/L
- Total Nitrogen Concentration Existing: 0.51 mg/L (As reported at the MEP sentinel water-quality monitoring stations)

■ SULPHUR SPRINGS

- Overall Ecologic Condition: Poor to Moderate

Sentinel Stations:

- Total Nitrogen Concentration Threshold: 0.38 mg/L
- Total Nitrogen Concentration Existing: 0.45 mg/L (As reported at the MEP sentinel water-quality monitoring stations)

■ STAGE HARBOR

- Overall Ecologic Condition: Poor to Moderate-Fair/Decline

Sentinel Stations:

- Total Nitrogen Concentration Threshold: 0.38 mg/L
- Total Nitrogen Concentration Existing: 0.47 mg/L (As reported at the MEP sentinel water-quality monitoring stations)

LOCAL PROGRESS

CHATHAM

The Chatham Comprehensive Wastewater Management Plan (CWMP) is the first town-wide plan on Cape Cod to be completed that incorporates the state and federal total maximum daily loads (TMDLs) to restore coastal

water quality for several large coastal embayments. The CWMP provides a strategy for wastewater management and reduction of nitrogen loading to restore and protect Chatham's marine embayments, addresses other areas of concern, such as areas experiencing high groundwater, failing systems, and industrial/commercial areas, and includes an adaptive management plan for its

implementation. The CWMP is a 30 year plan to sewer the entire town, pending the results of various adaptive management options. The town completed the treatment facility upgrade and main sewer trunk line construction in 2012 and is presently expanding sewer connections to the Stage Harbor watershed system.

Local efforts in Chatham are described in Chapter 6.