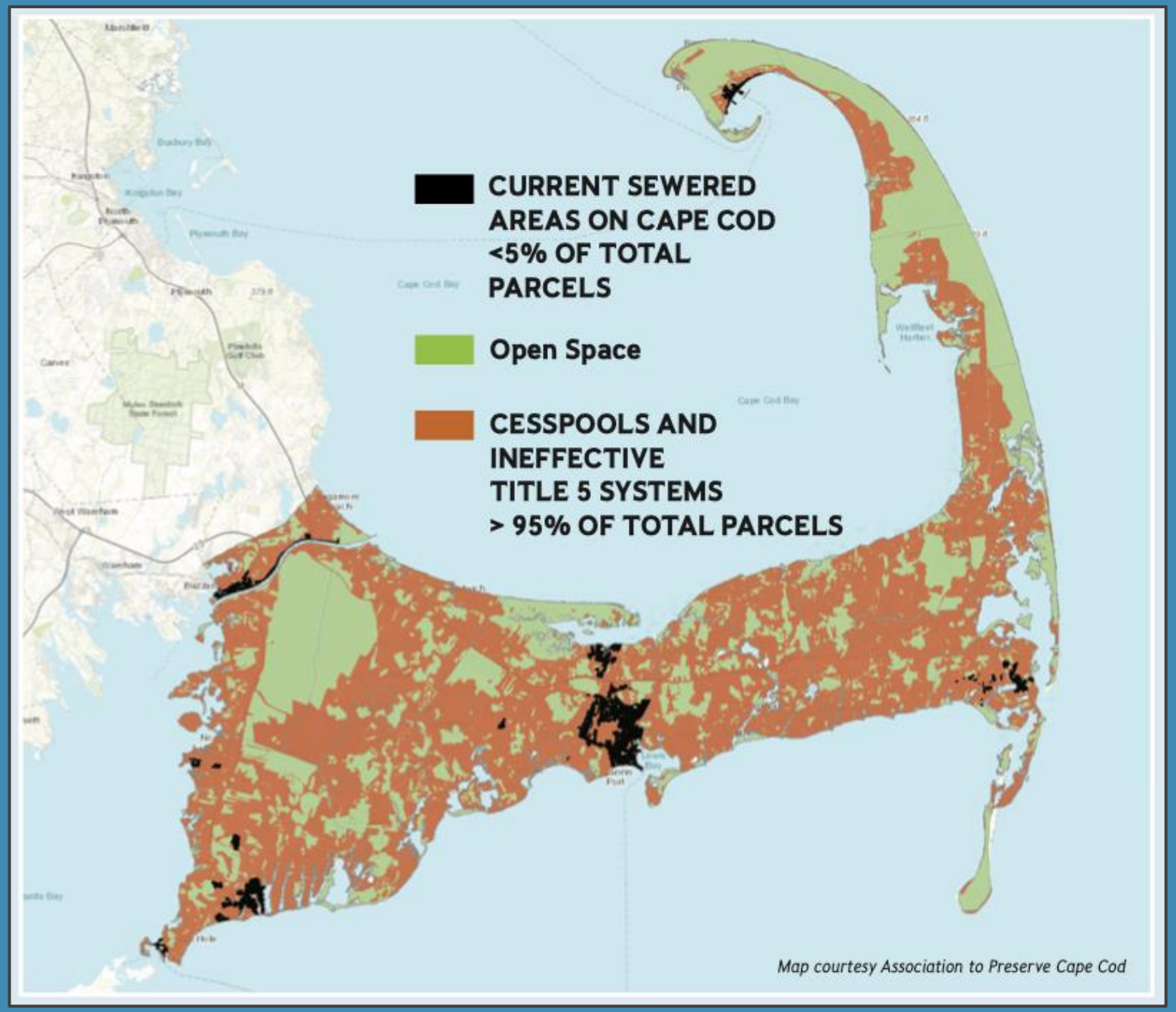
Barnstable
CLEAN WATER
Coalition

Barnstable Town Council
Marstons Mills Cranberry Bog Eco-Restoration
November 19, 2026

Barnstable Clean Water Coalition

ZEE CROCKER
EXECUTIVE DIRECTOR

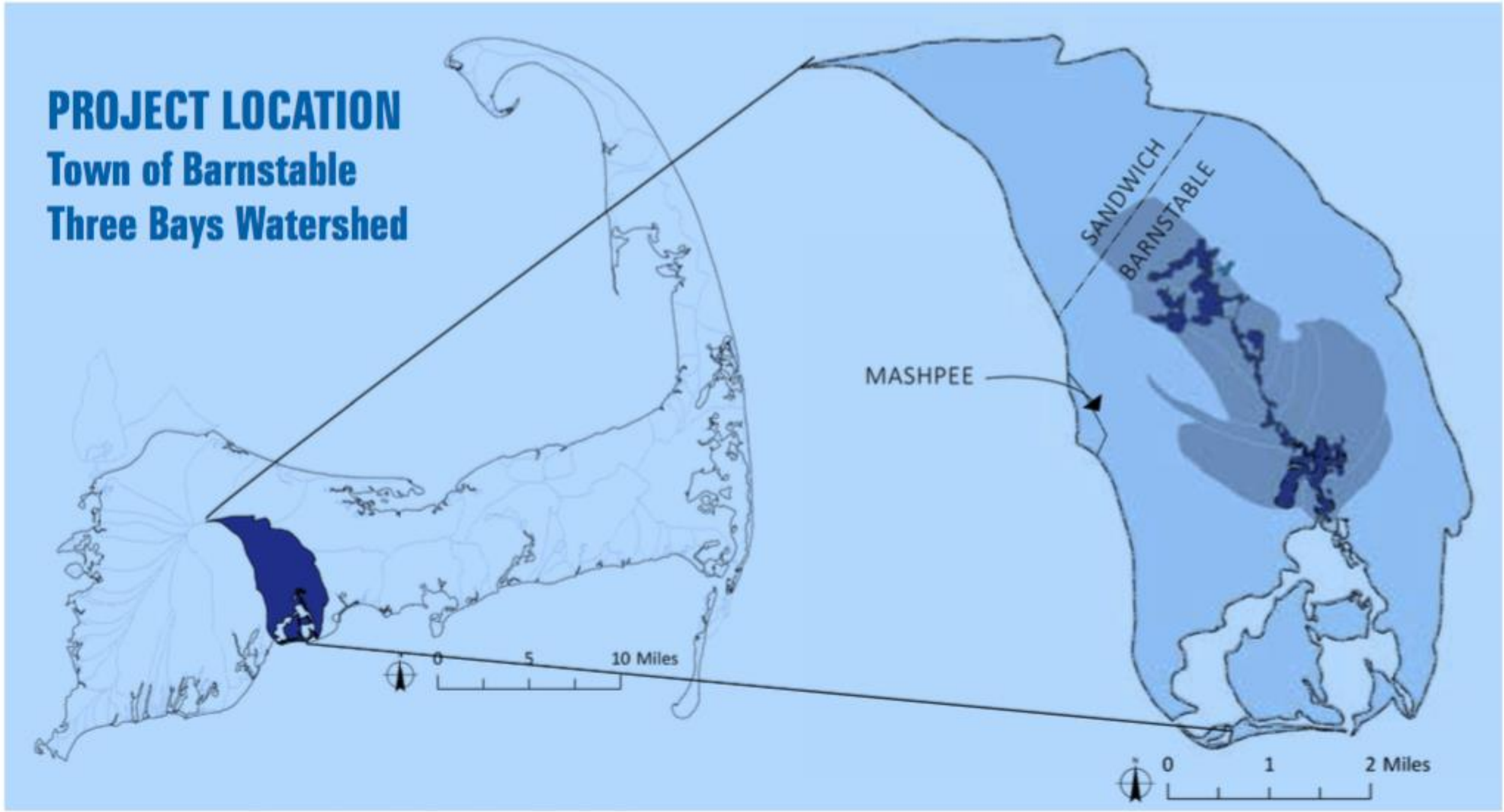
Nature-Based Solutions to Clean Water

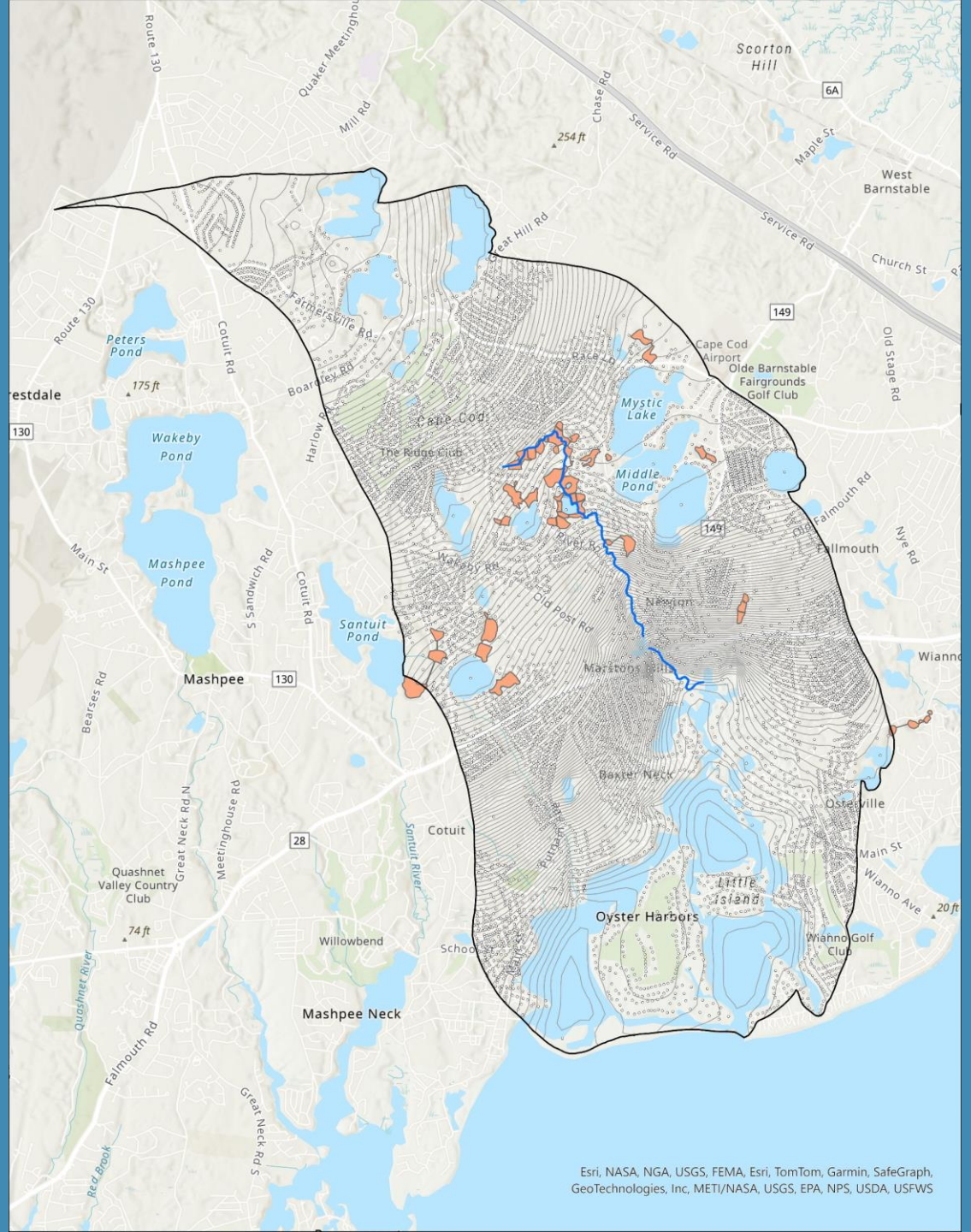


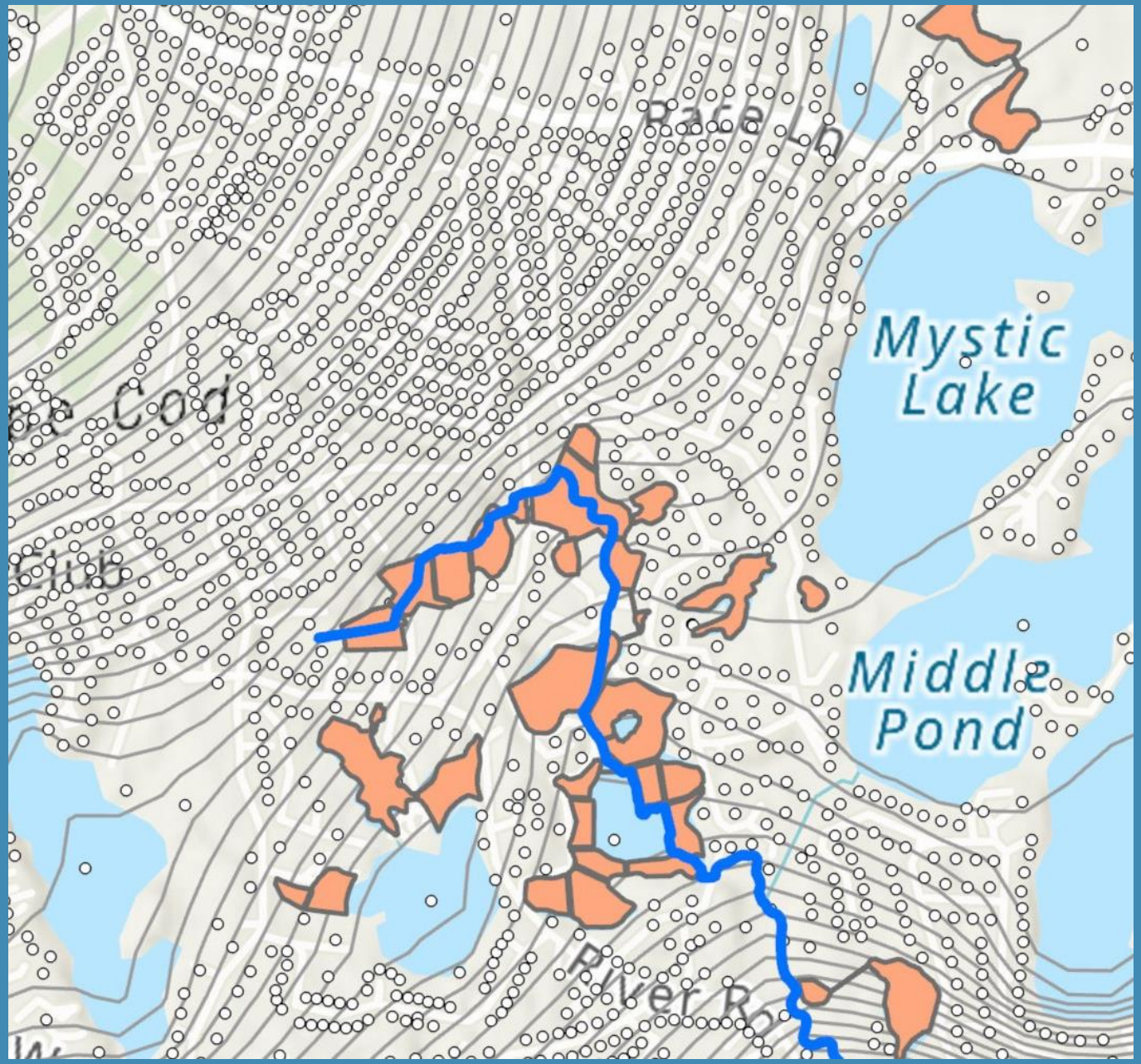
Septic: 150,681

Sewer: 7,773

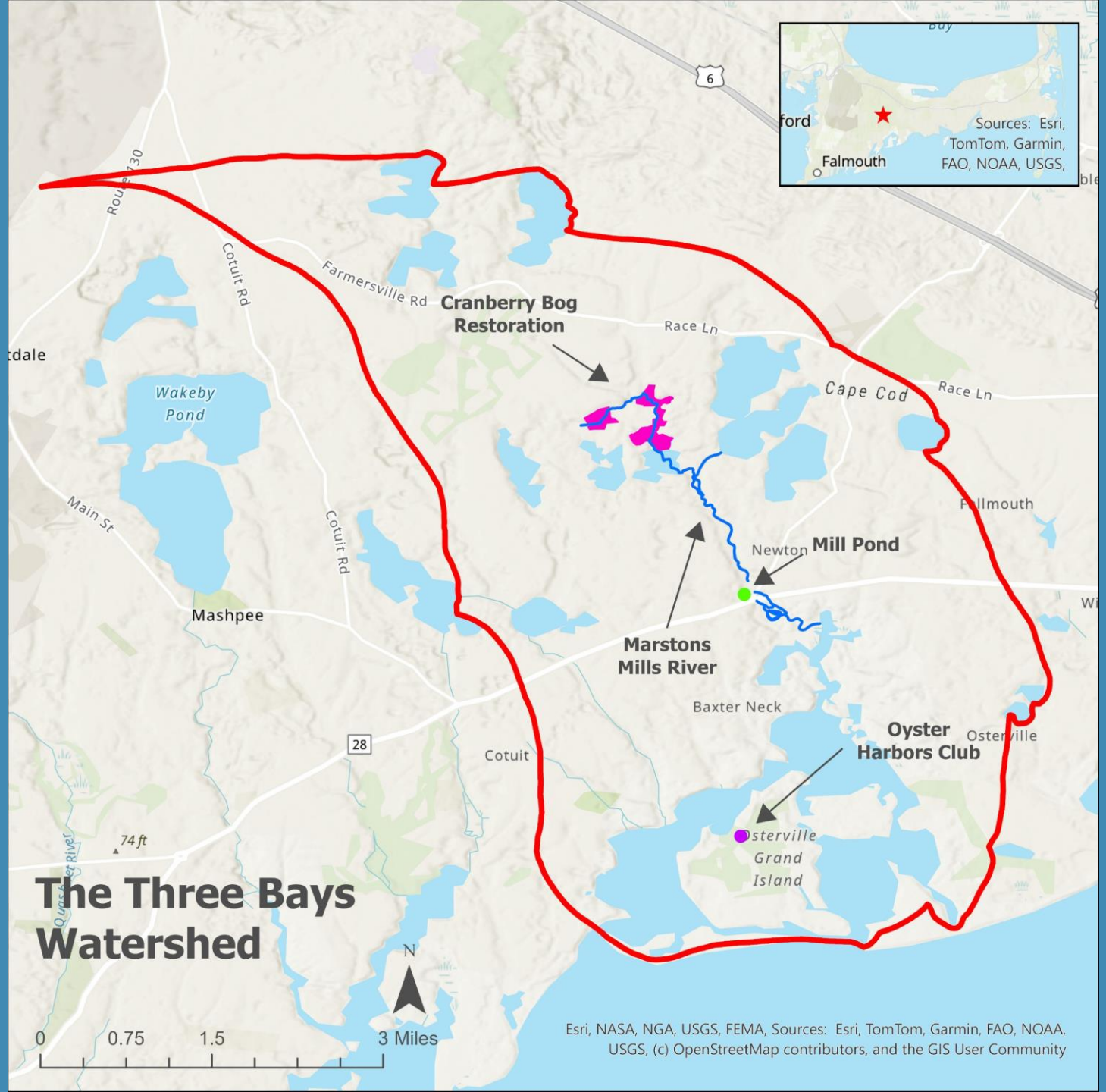
I/A: 2,066

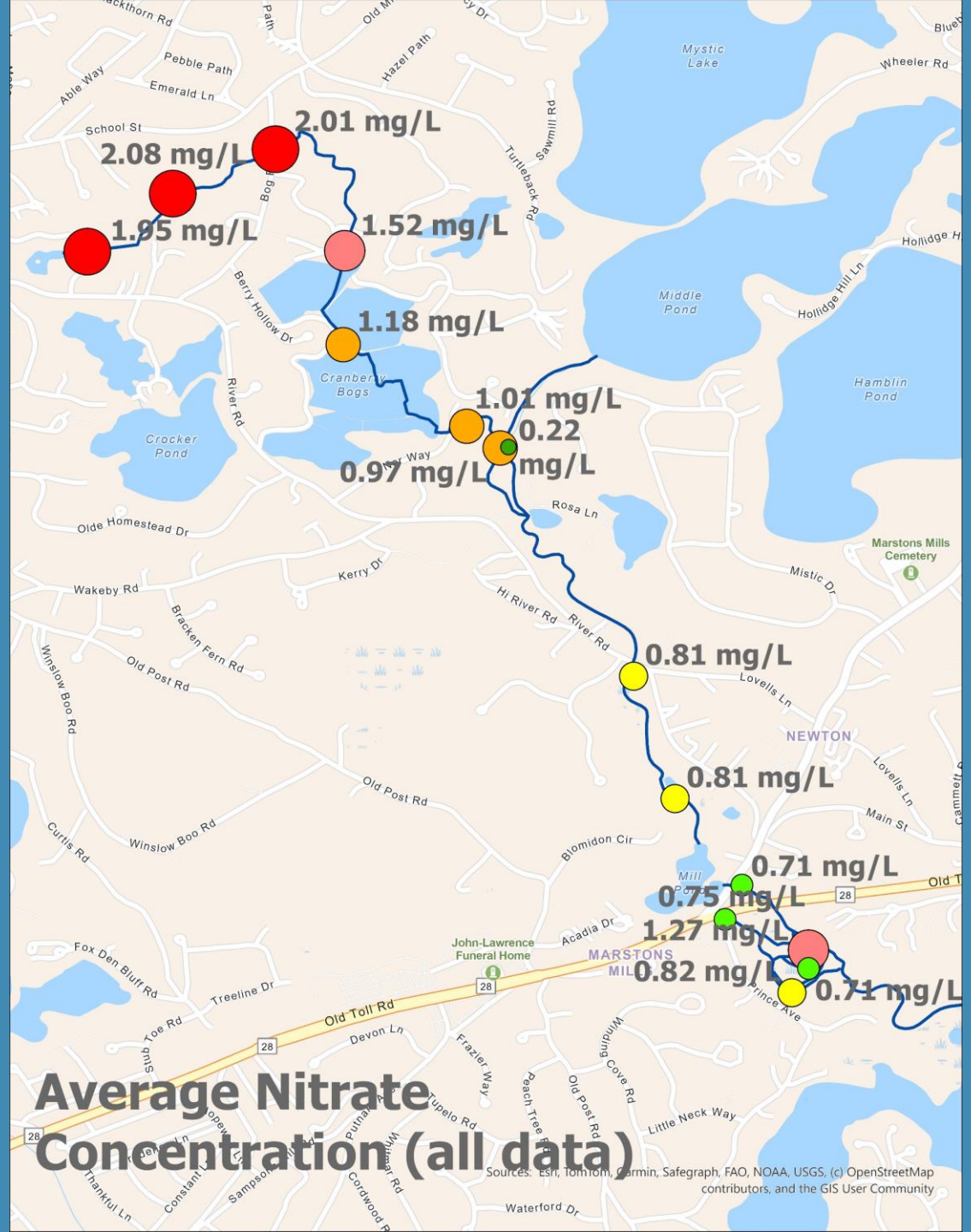

PROJECT LOCATION
Town of Barnstable
Three Bays Watershed
SANDWICH
BARNSTABLE
MASHPEE
0
5
10 Miles
0
1
2 Miles

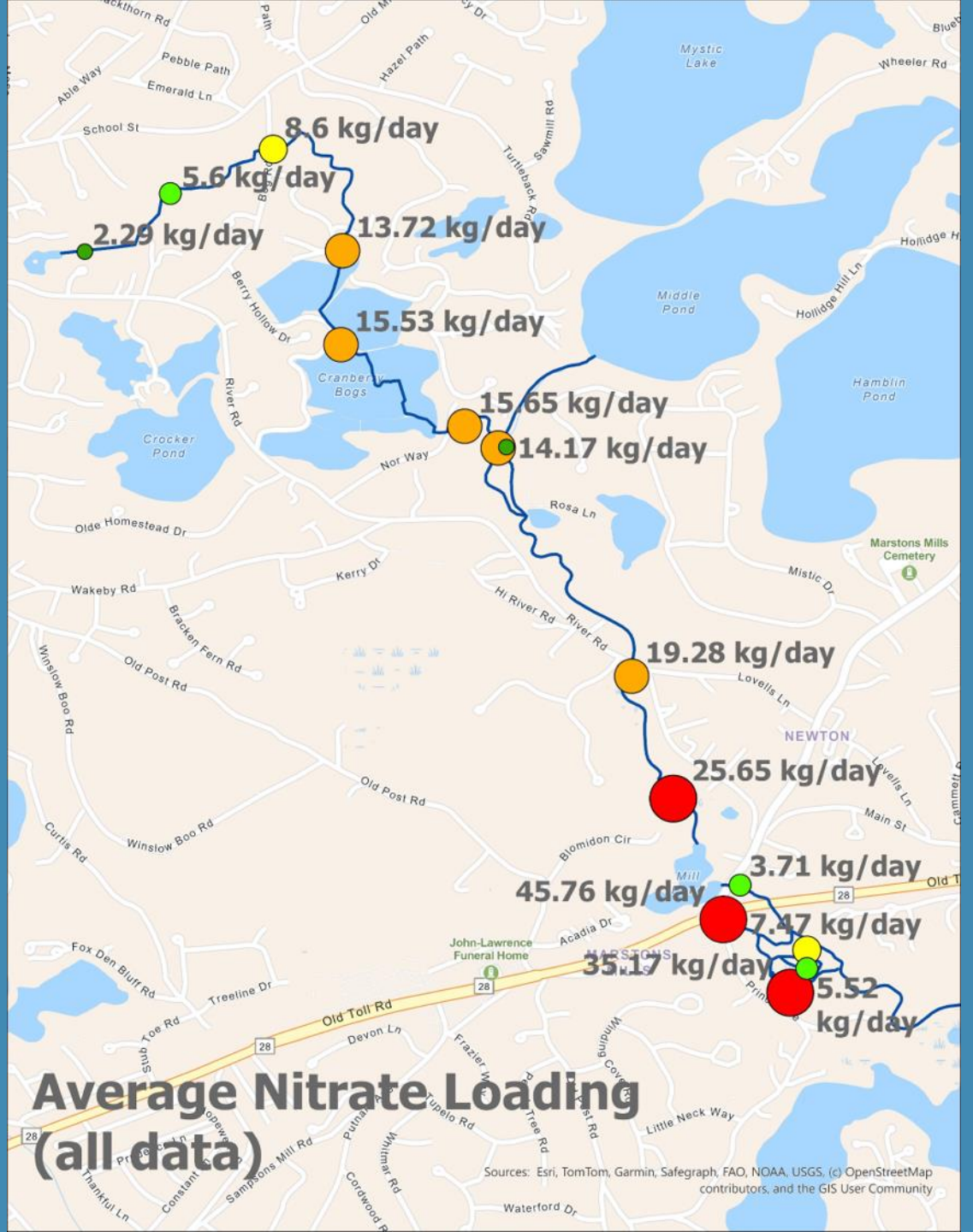

Scorton Hill
West Barnstable
Cape Cod Airport
Olde Barnstable Fairgrounds Golf Club
Mystic Lake
Middle Pond
The Ridge Club
Peters Pond
Wakeby Pond
Mashpee Pond
Santuit Pond
Mashpee
Falmouth
Newton
Marstons Mills
Baxter Neck
Osterville
Cotuit
Quashnet Valley Country Club
Willowbend
Oyster Harbors
Little Island
Wianno Golf Club
Mashpee Neck
Esri, NASA, NGA, USGS, FEMA, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, USFWS

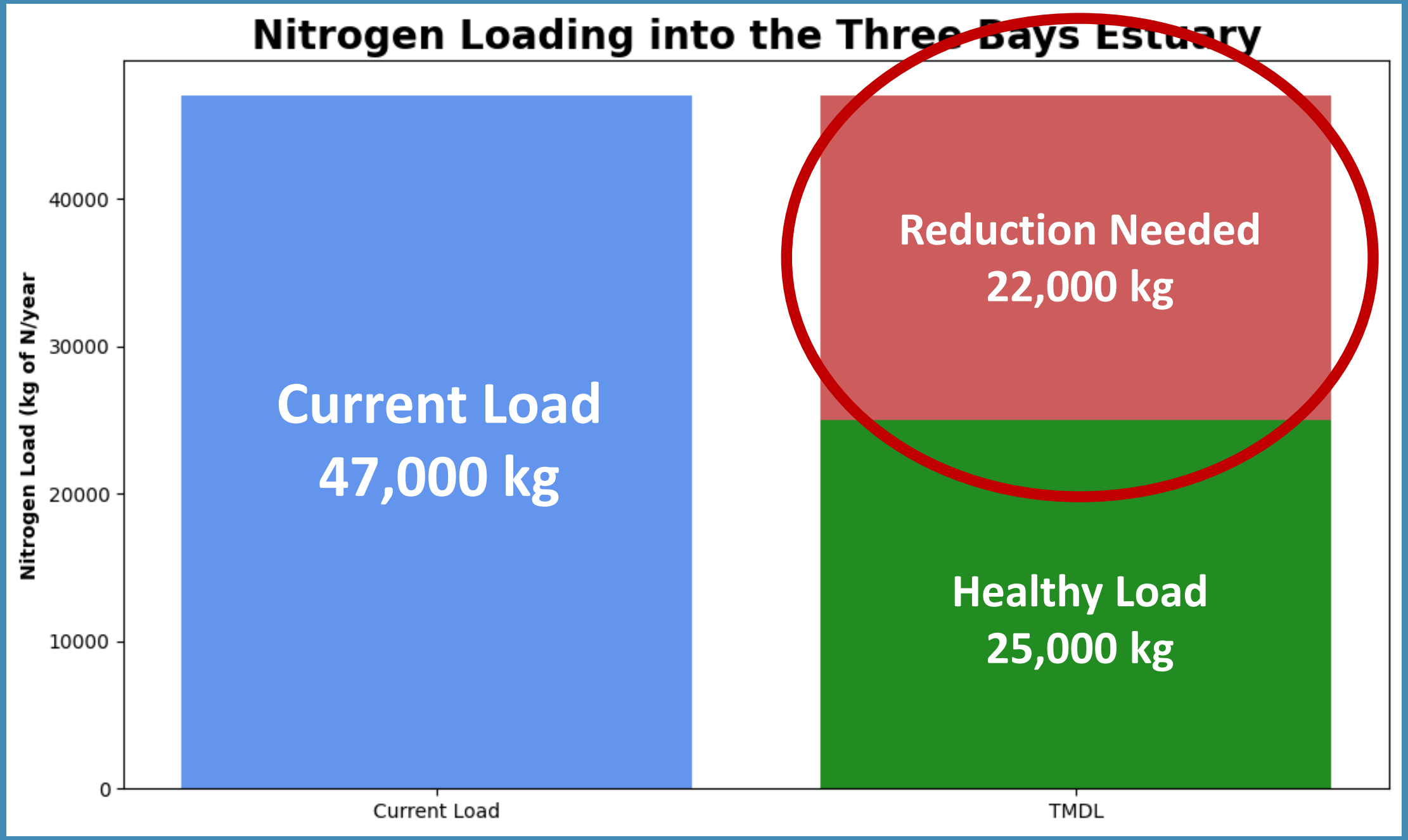

Mystic Lake
Middle Pond

THE RIVER AND THE BOGS


The Three Bays Watershed
Cranberry Bog Restoration
Mill Pond
Marstons Mills River
Oyster Harbors Club
Wakeby Pond
Mashpee
Cotuit
Baxter Neck
Grand Island
Cape Cod
Race Ln
Farmersville Rd
Cotuit Rd
Main St
Falmouth
Newton
74 ft
N
0 0.75 1.5 3 Miles
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS,
Esri, NASA, NGA, USGS, FEMA, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

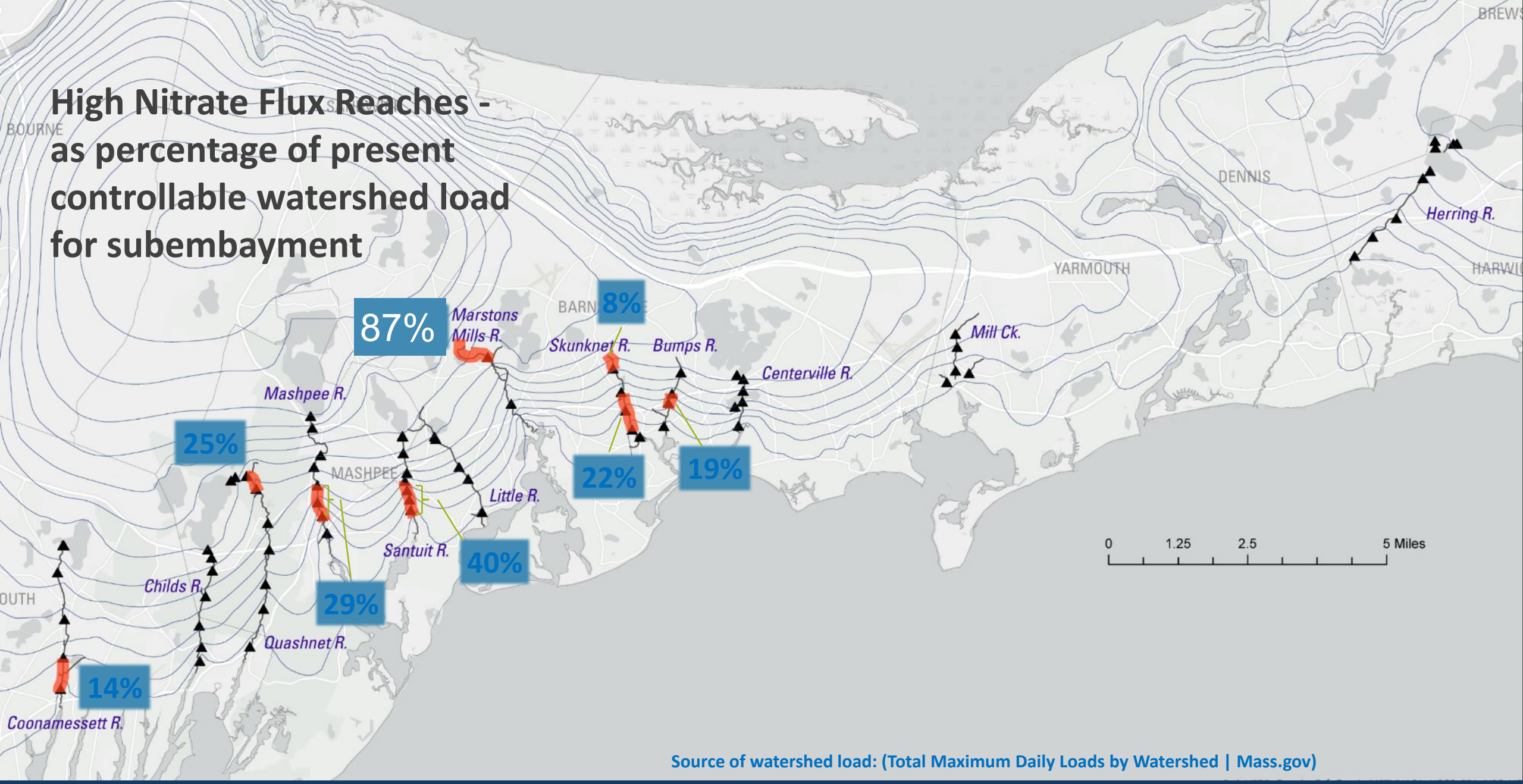

2.01 mg/L
2.08 mg/L
1.95 mg/L
1.52 mg/L
1.18 mg/L
1.01 mg/L
0.22 mg/L
0.97 mg/L
0.81 mg/L
0.81 mg/L
0.71 mg/L
0.75 mg/L
1.27 mg/L
0.82 mg/L
0.71 mg/L
Average Nitrate Concentration (all data)
Sources: Esri, TomTom, Garmin, Safegraph, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community


8.6 kg/day
5.6 kg/day
2.29 kg/day
13.72 kg/day
15.53 kg/day
15.65 kg/day
14.17 kg/day
19.28 kg/day
25.65 kg/day
3.71 kg/day
45.76 kg/day
7.47 kg/day
35.17 kg/day
5.52 kg/day
Average Nitrate Loading (all data)
Sources: Esri, TomTom, Garmin, Safegraph, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community


Nitrogen Loading into the Three Bays Estuary
Nitrogen Load (kg of N/year
40000
30000
20000
10000
0
Current Load
47,000 kg
Reduction Needed
22,000 kg
Healthy Load
25,000 kg
Current Load
TMDL

Half the excess nitrogen load transits the bogs and river…
in 6 to 8 hours

High Nitrate Flux Reaches - as percentage of present controllable watershed load for subembayment



Source of watershed load: (Total Maximum Daily Loads by Watershed | Mass.gov)

USGS science for a changing world

From: https://doi.org/10.1016/j.ejrh.2025.102787

“We should put a treatment system in the middle of the river.”

-Rob Steen, 2017

Mesocosms


SHALLOW EMERGENT WETLAND
This mesocosm contains soil from the bogs with surface water that is between 1 and 3 inches deep to replicate a shallow marsh ecosystem. This system includes plants that thrive in these conditions.
water table
Meadow Marsh
Emergent Marsh
organic material
mineral soil
Scan QR Code to view informational video.

Mesocosm Performance Results

Table 2 – Water Quality Results

	Nitrate-N	
	mg/liter	% removed
Influent	1.43	
Meso 1 (Shallow Marsh)	0.24	83%
Meso 2 (Subsurface Flow Marsh)	0.31	78%
Meso 3 (Woodchips)	0.55	62%

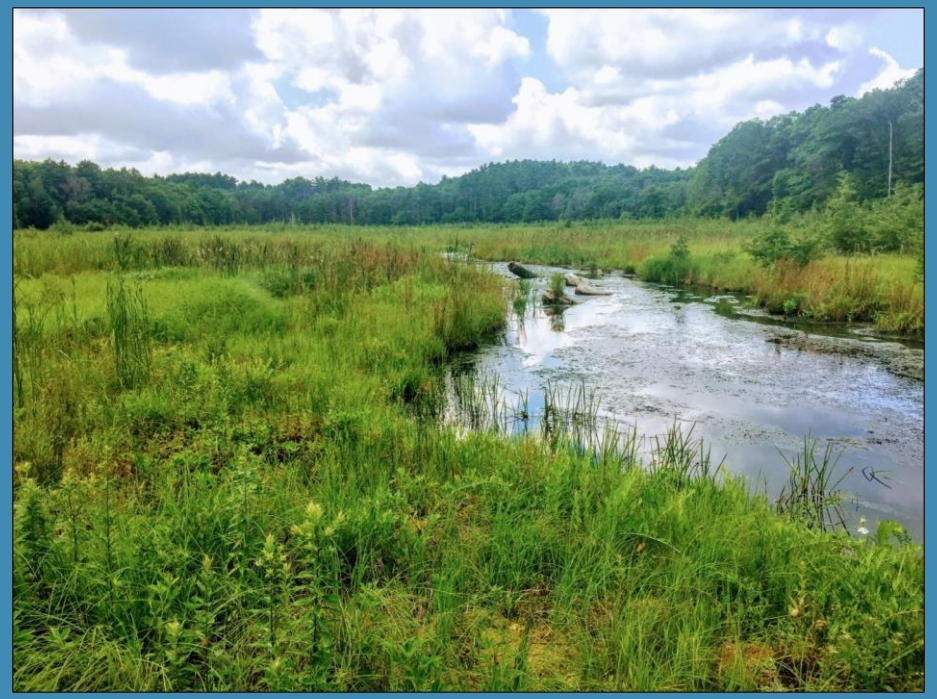
based upon 10 sampling events (July 9 - September 11, 2025)

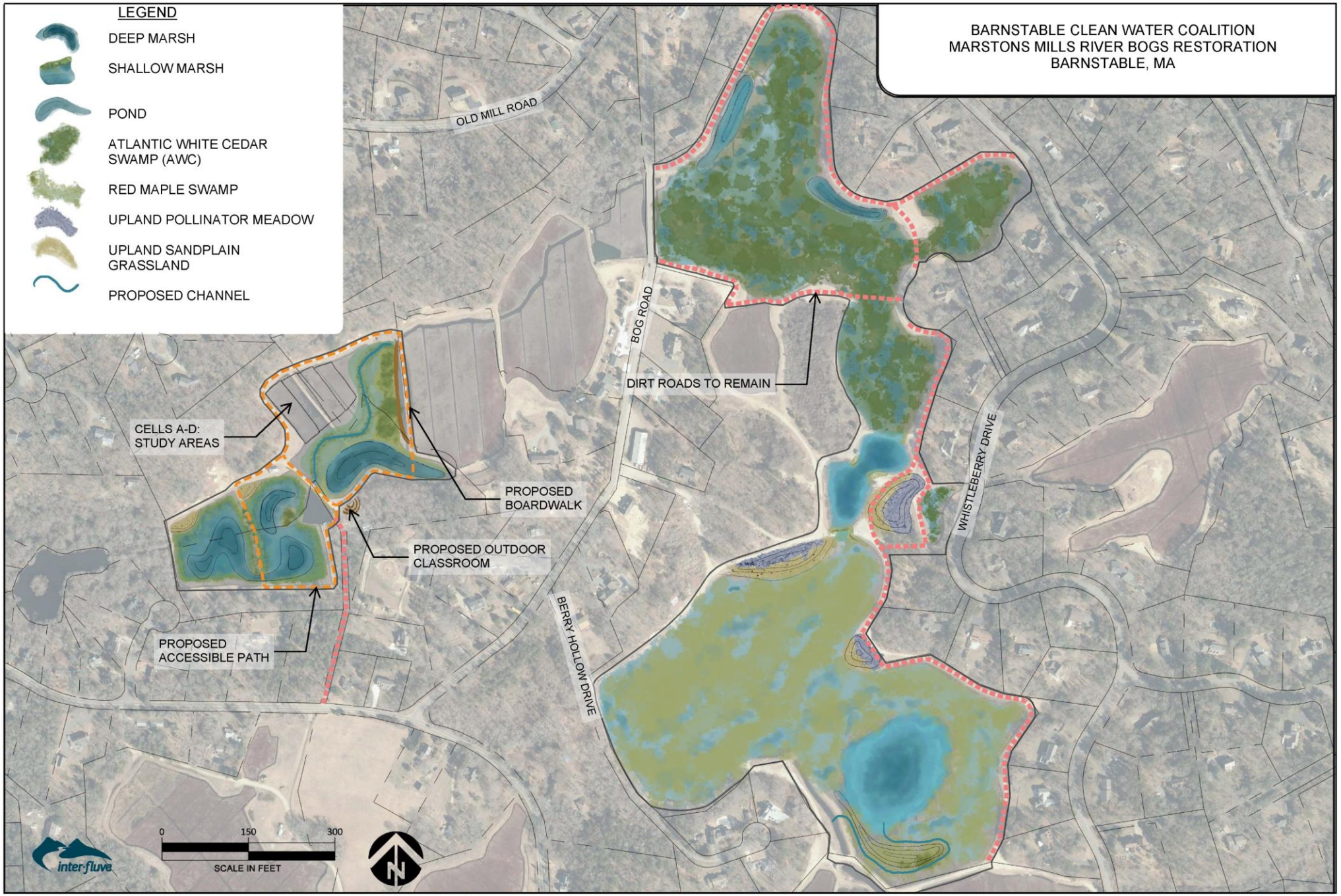

5 YEARS
OR
5 DECADES




CAT






LEGEND
DEEP MARSH
SHALLOW MARSH
POND
ATLANTIC WHITE CEDAR SWAMP (AWC)
RED MAPLE SWAMP
UPLAND POLLINATOR MEADOW
UPLAND SANDPLAIN GRASSLAND
PROPOSED CHANNEL
BARNSTABLE CLEAN WATER COALITION
MARSTONS MILLS RIVER BOGS RESTORATION
BARNSTABLE, MA
OLD MILL ROAD
BOG ROAD
DIRT ROADS TO REMAIN
CELLS A-D: STUDY AREAS
PROPOSED BOARDWALK
PROPOSED OUTDOOR CLASSROOM
PROPOSED ACCESSIBLE PATH
BERRY HOLLOW DRIVE
WHISTLEBERRY DRIVE
0
150
300
SCALE IN FEET
inter-fluve





1850s — Saved the Cape’s Economy
2050s— Save the Cape’s Environment?

OUR PARTNERS

The Nature Conservancy

United States Environmental Protection Agency

USGS science for a changing world

KleanTu Wastewater Treatment Technologies

Barnstable Land Trust

Seal of the Town of Barnstable, Mass. 1639. Adopted May 4, 1889

Cape Cod Commission

MassDEP

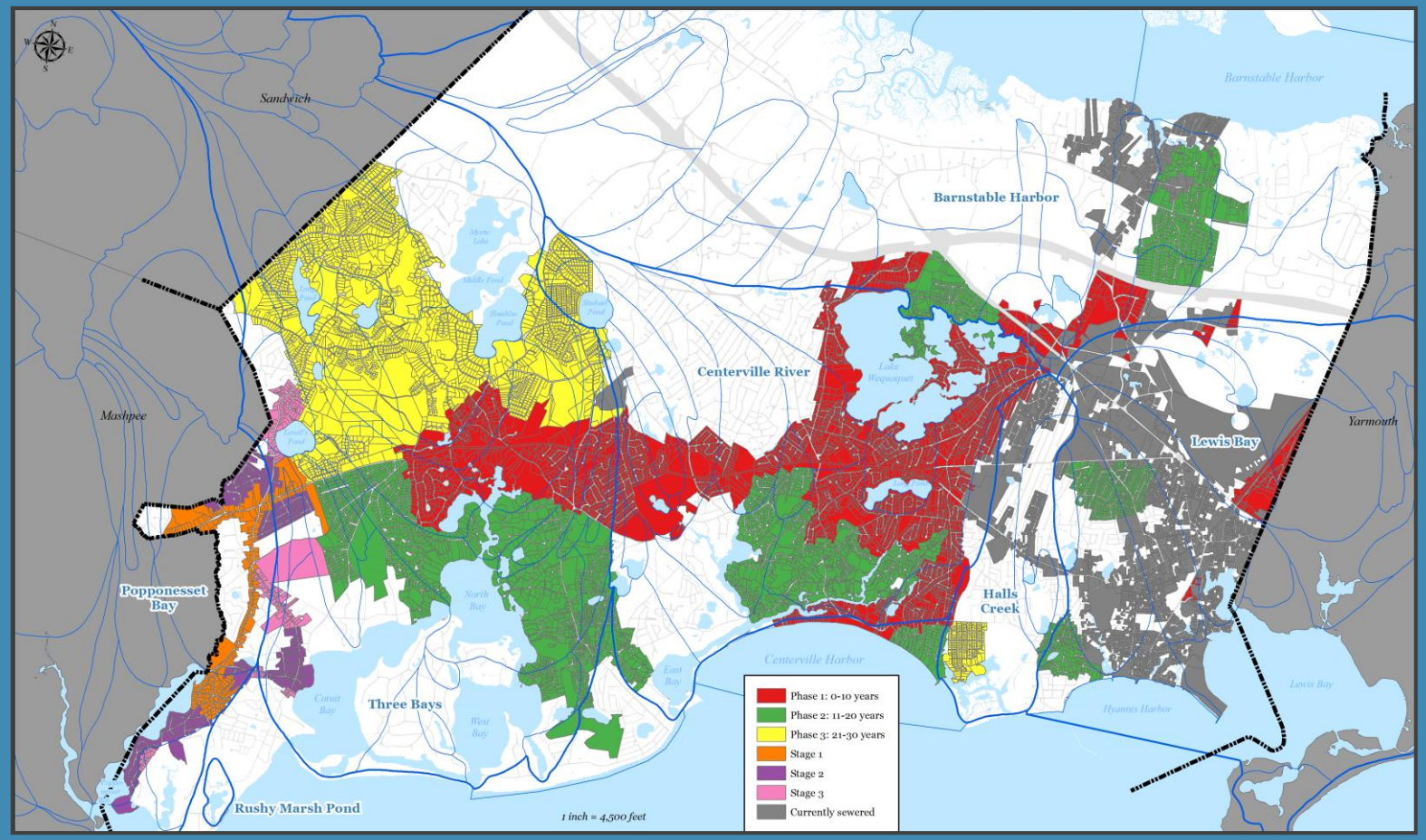
MASSTC

School for Marine Science & Technology
UMass Dartmouth



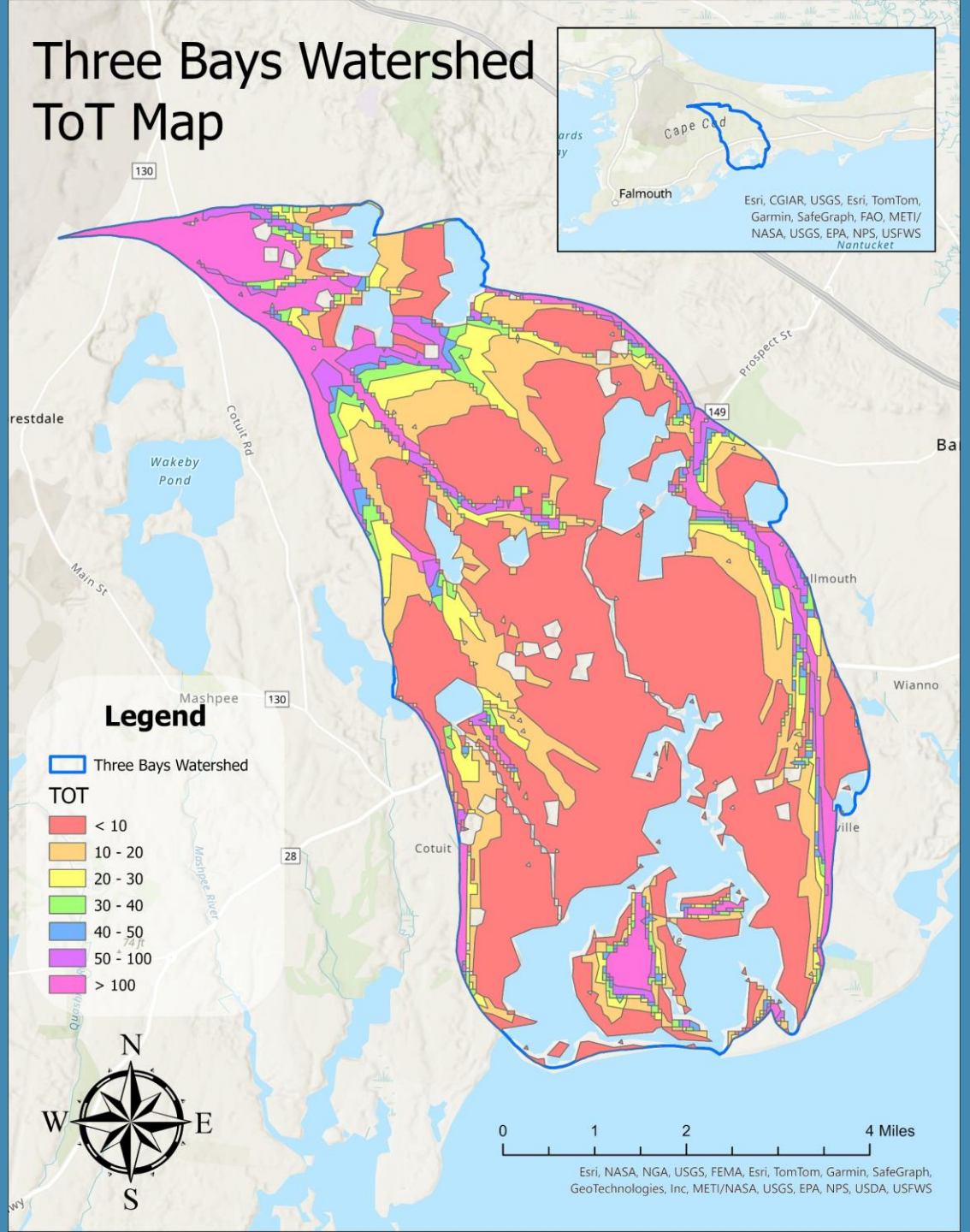
THANK YOU

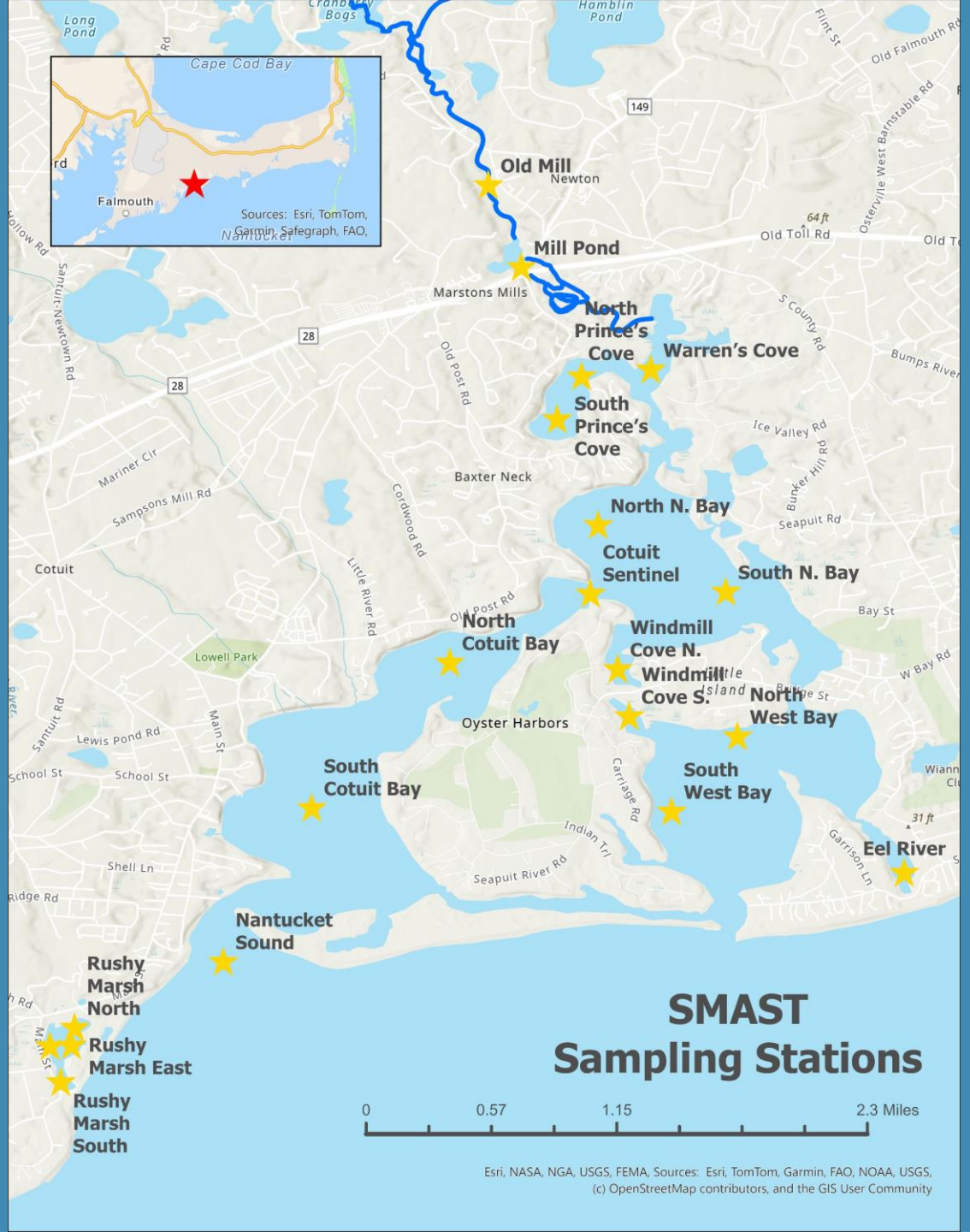
BARNSTABLE COMPREHENSIVE WASTEWATER MANAGEMENT PLAN (CWMP)

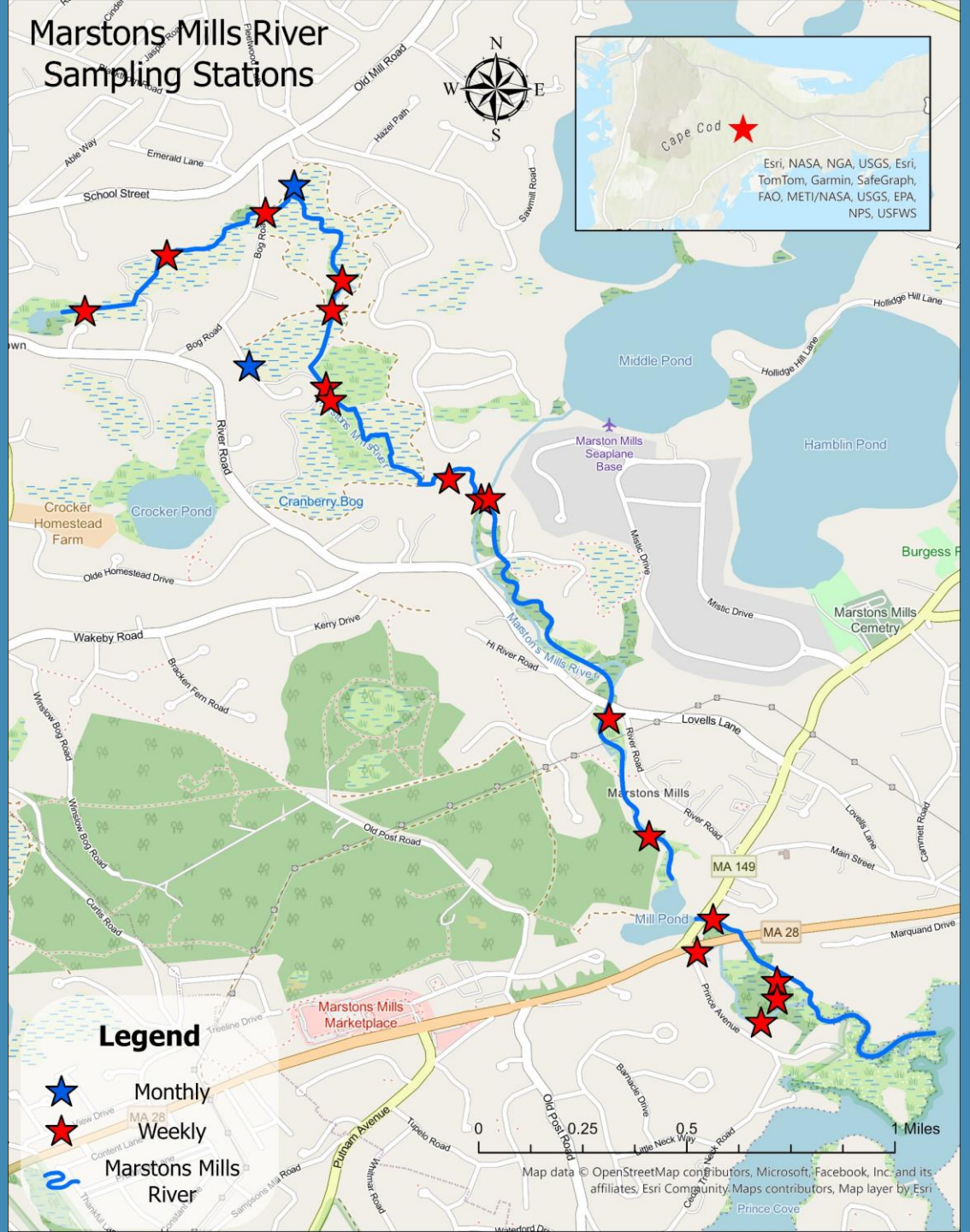


- $1.46 Billion, 30 year plan
- 26,965 parcels in Barnstable
- 3,100 currently served by sewer; 100+ I/A septic systems with 85% reducing nitrogen
- 11,823 part of CWMP

ONLY 55% OF THE TOWN WILL BE SERVED

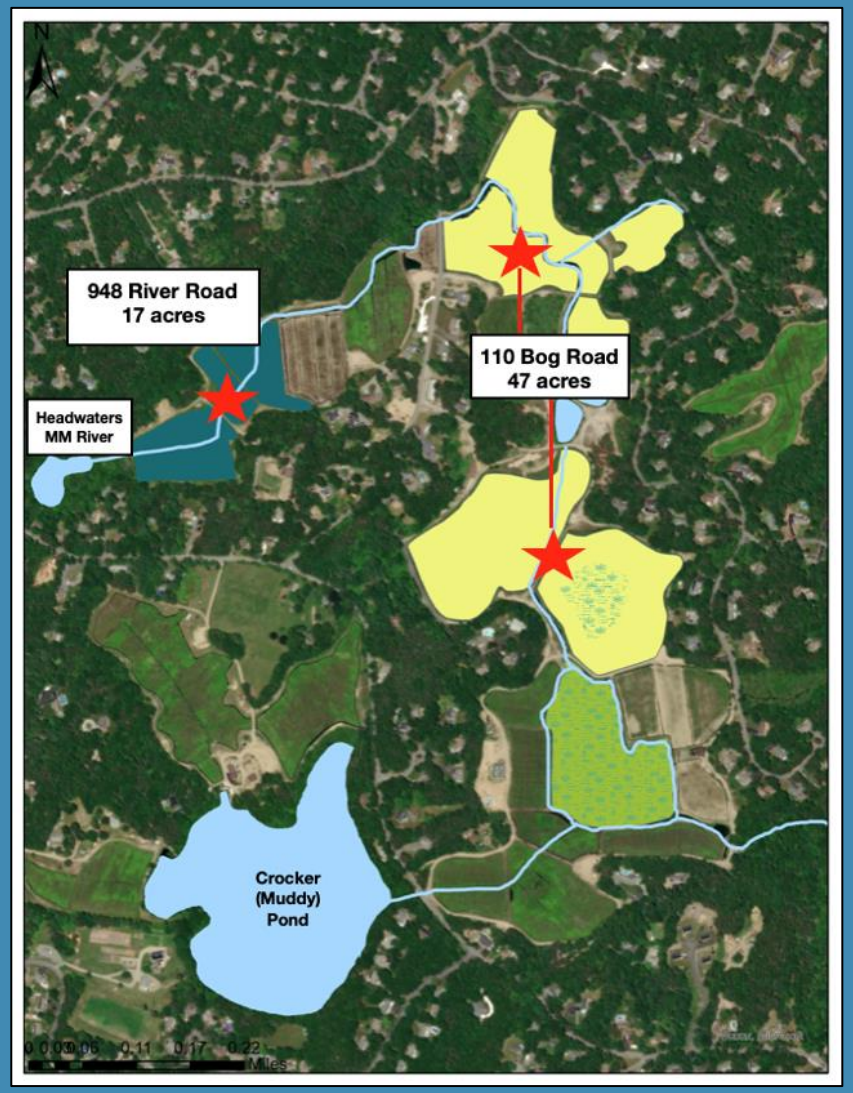

Three Bays Watershed
ToT Map
Cape Cod
Falmouth
Nantucket
Esri, CGIAR, USGS, Esri, TomTom, Garmin, SafeGraph, FAO, METI/ NASA, USGS, EPA, NPS, USFWS
130
149
28
Prospect St
Cotuit Rd
Wakeby Pond
Main St
Mashpee
Cotuit
Wianno
Mashpee River
Legend
Three Bays Watershed
TOT
< 10
10 - 20
20 - 30
30 - 40
40 - 50
50 - 100
> 100
N
W
E
S
0
1
2
4 Miles
Esri, NASA, NGA, USGS, FEMA, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, USFWS


Cape Cod Bay
Falmouth
Sources: Esri, TomTom, Garmin, Safegraph, FAO,
Old Mill
Newton
Mill Pond
Marstons Mills
North Prince's Cove
Warren's Cove
South Prince's Cove
Baxter Neck
North N. Bay
Cotuit Sentinel
South N. Bay
North Cotuit Bay
Windmill Cove N.
Windmill Cove S.
North West Bay
Oyster Harbors
South Cotuit Bay
South West Bay
Eel River
Nantucket Sound
Rushy Marsh North
Rushy Marsh East
Rushy Marsh South
Cotuit
Lowell Park
Old Toll Rd
Old Falmouth Rd
Osterville West Barnstable Rd
Old Post Rd
Sampsons Mill Rd
Mariner Cir
Santuit-Newtown Rd
Cordwood Rd
Little River Rd
Ice Valley Rd
Bunker Hill Rd
Seapuit Rd
Bay St
W Bay Rd
Lewis Pond Rd
School St
Main St
Santuit Rd
Carriage Rd
Indian Trl
Seapuit River Rd
Shell Ln
Ridge Rd
Garrison Ln
S County Rd
Bumps River
Hollow Rd
Flint St
64 ft
31 ft
149
28
SMAST
Sampling Stations
0
0.57
1.15
2.3 Miles
Esri, NASA, NGA, USGS, FEMA, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS,
(c) OpenStreetMap contributors, and the GIS User Community


Marstons Mills River
Sampling Stations
N
W
E
S
Cape Cod
Esri, NASA, NGA, USGS, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS
Old Mill Road
Hazel Path
Able Way
Emerald Lane
School Street
Sawmill Road
Bog Road
River Road
Hollidge Hill Lane
Middle Pond
Hamblin Pond
Marston Mills Seaplane Base
Cranberry Bog
Crocker Homestead Farm
Crocker Pond
Olde Homestead Drive
Mistic Drive
Burgess P
Marstons Mills Cemetery
Wakeby Road
Kerry Drive
Hi River Road
Marston's Mills River
Lovells Lane
Bracken Fern Road
Winslow Bog Road
Old Post Road
Curtis Road
Marstons Mills
Main Street
Cammett Road
MA 149
Mill Pond
MA 28
Marquand Drive
Prince Avenue
Marstons Mills Marketplace
Treeline Drive
Putnam Avenue
Tupelo Road
Barnacle Drive
Little Neck Way
Prince Cove
Legend
Monthly
Weekly
Marstons Mills River
0
0.25
0.5
1 Miles
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MARSTONS MILLS CRANBERRY BOG ECO-RESTORATION PROJECT





GOAL – 100+ ACRES