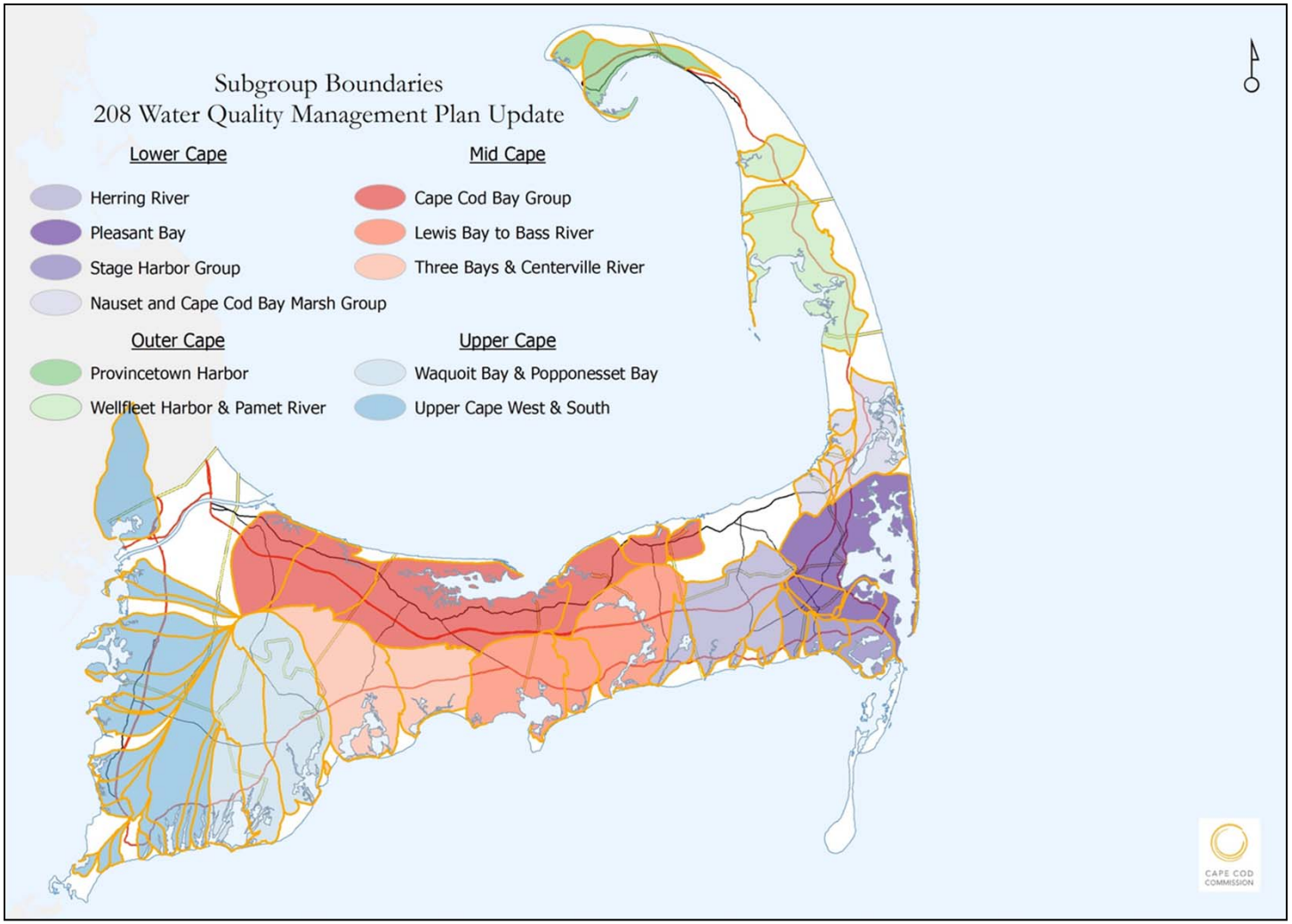
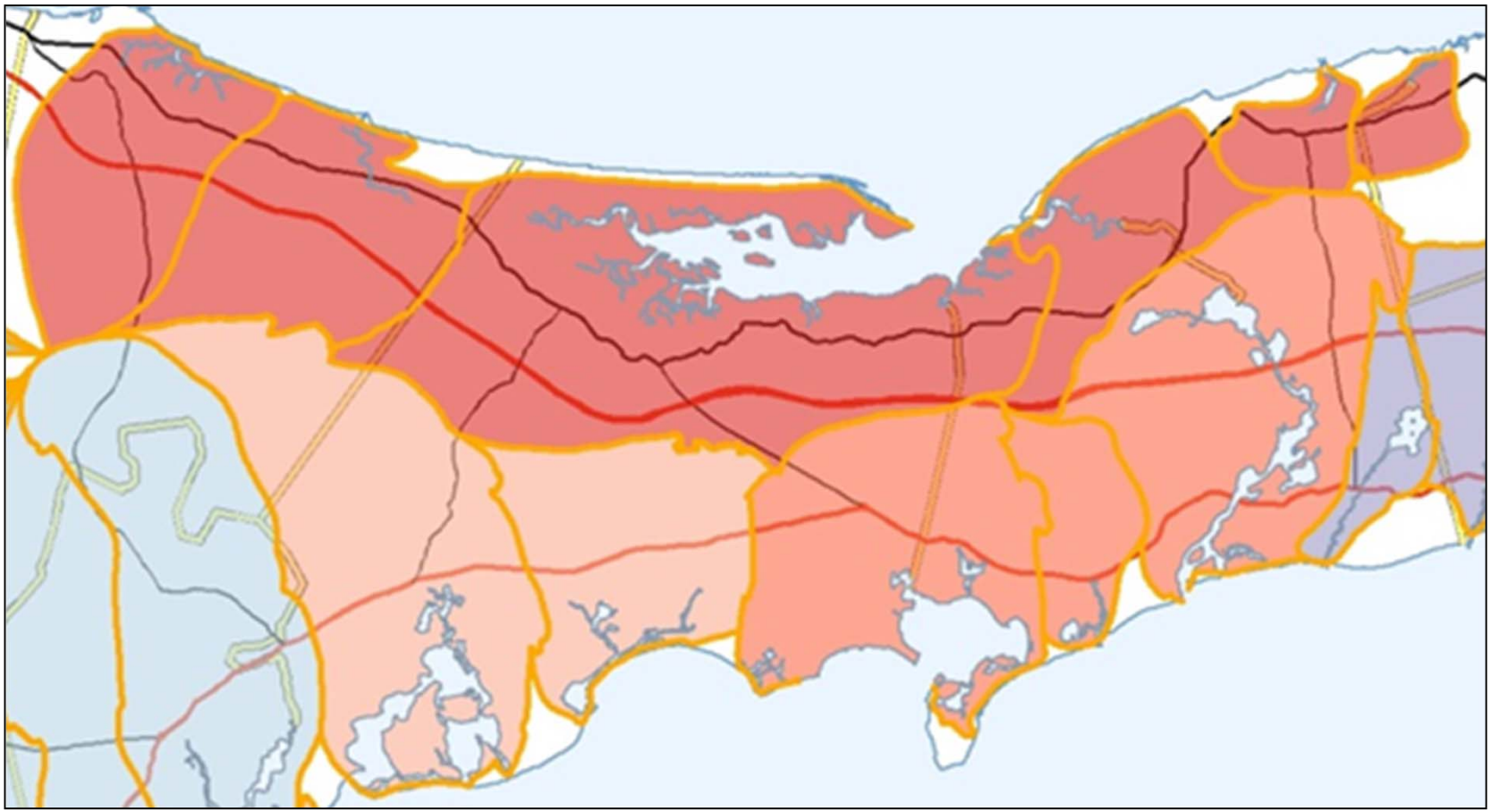
208 Plan Update Stakeholder Summit

Watershed Scenarios
Summarized by Subregion

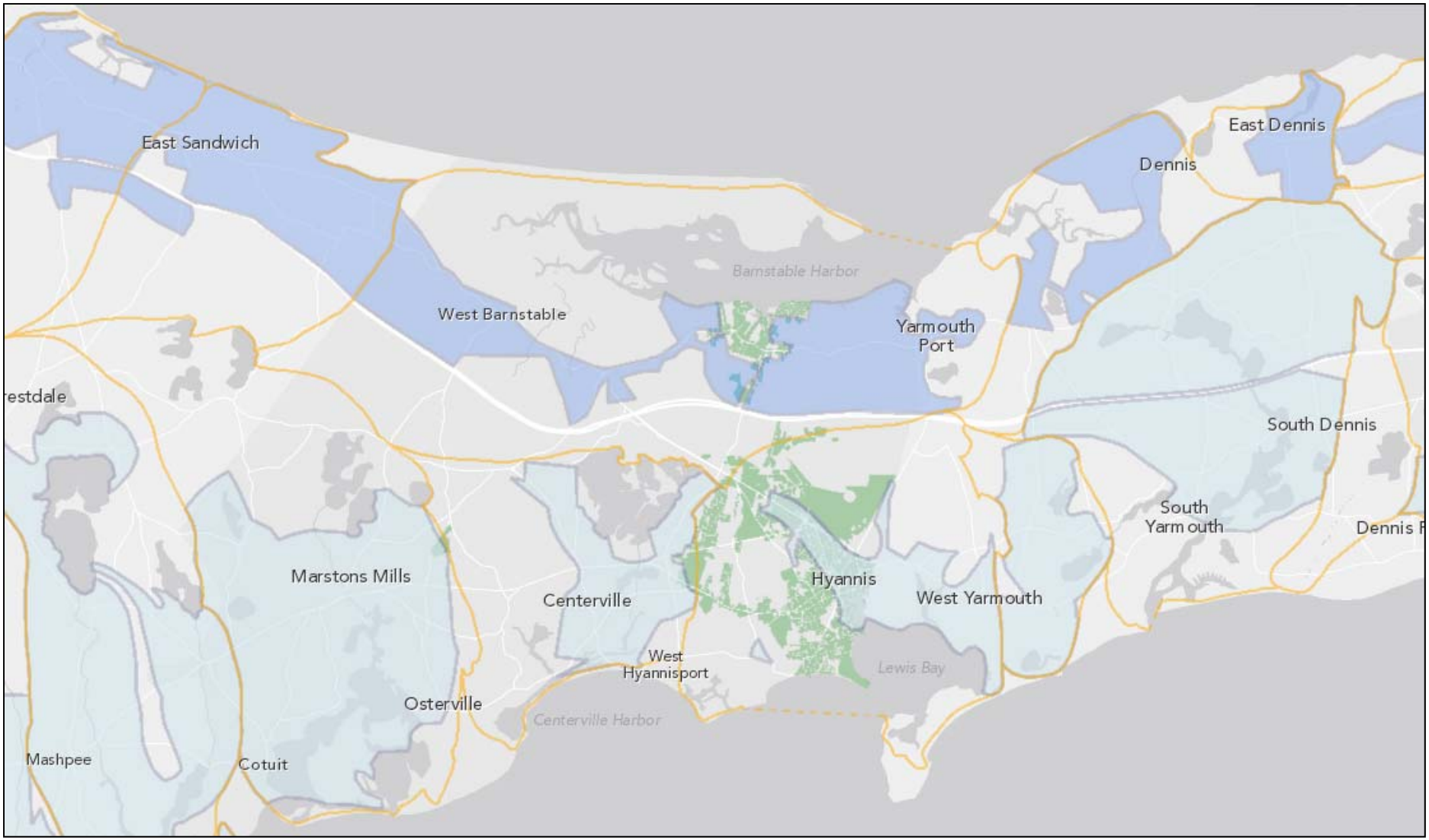


Mid Cape Watershed Groups



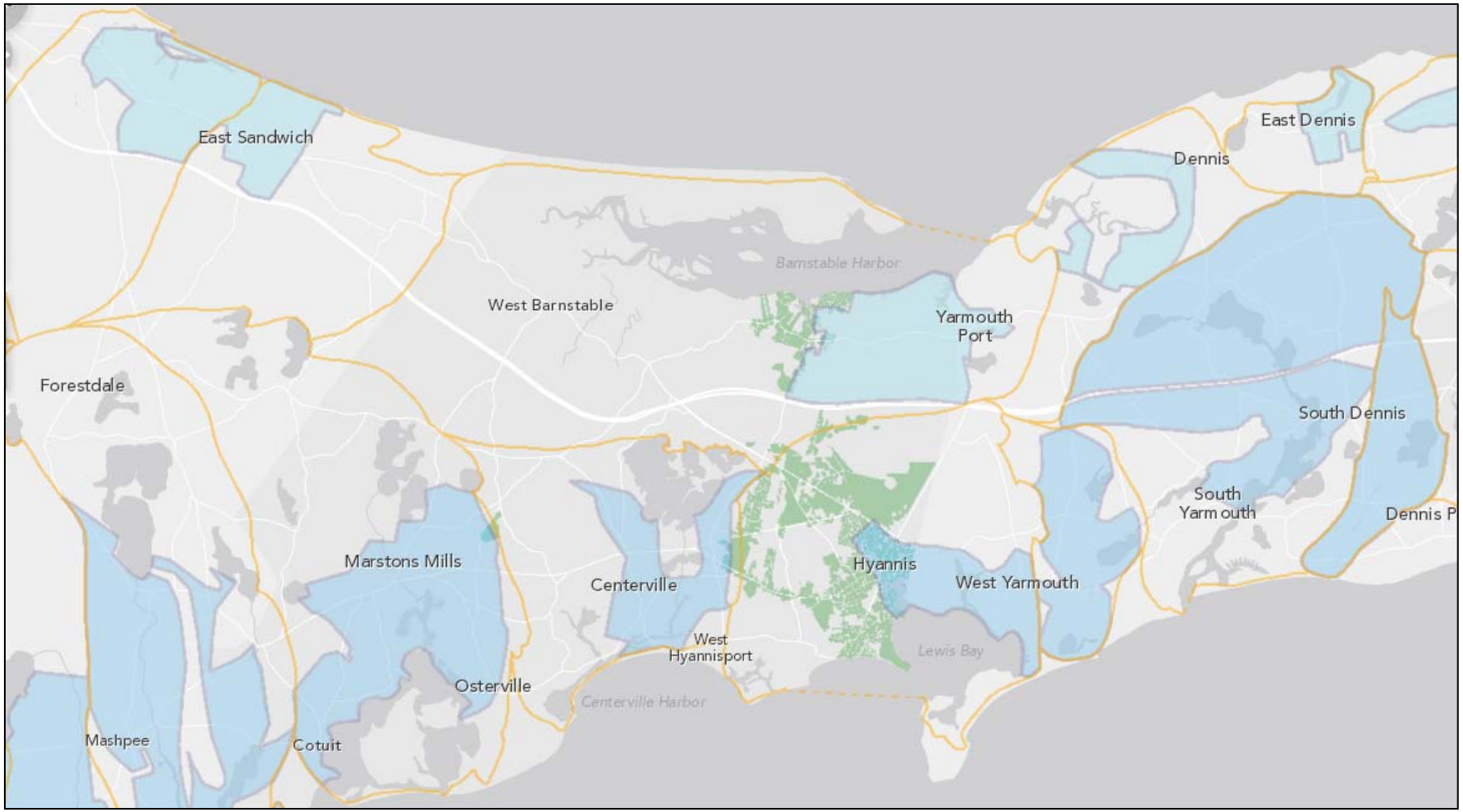
Mid Cape Watershed Groups

MEP Centralized Plus Non-MEP 50% Reduction



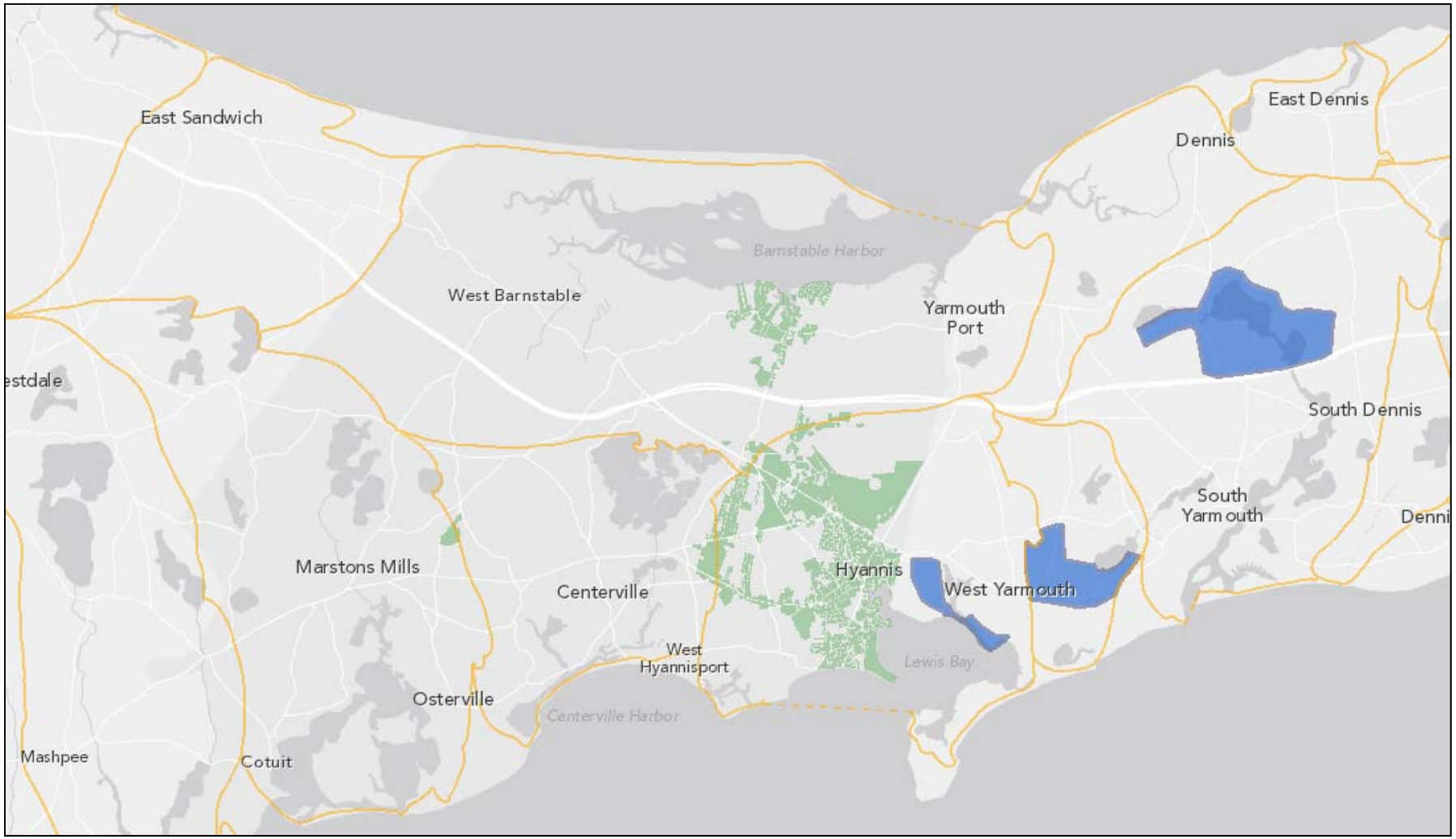
Mid Cape Watershed Groups

50% Reduction in Watershed Wide Fertilizer Stormwater Load with MEP Centralized Plus Non-MEP 25% Reduction



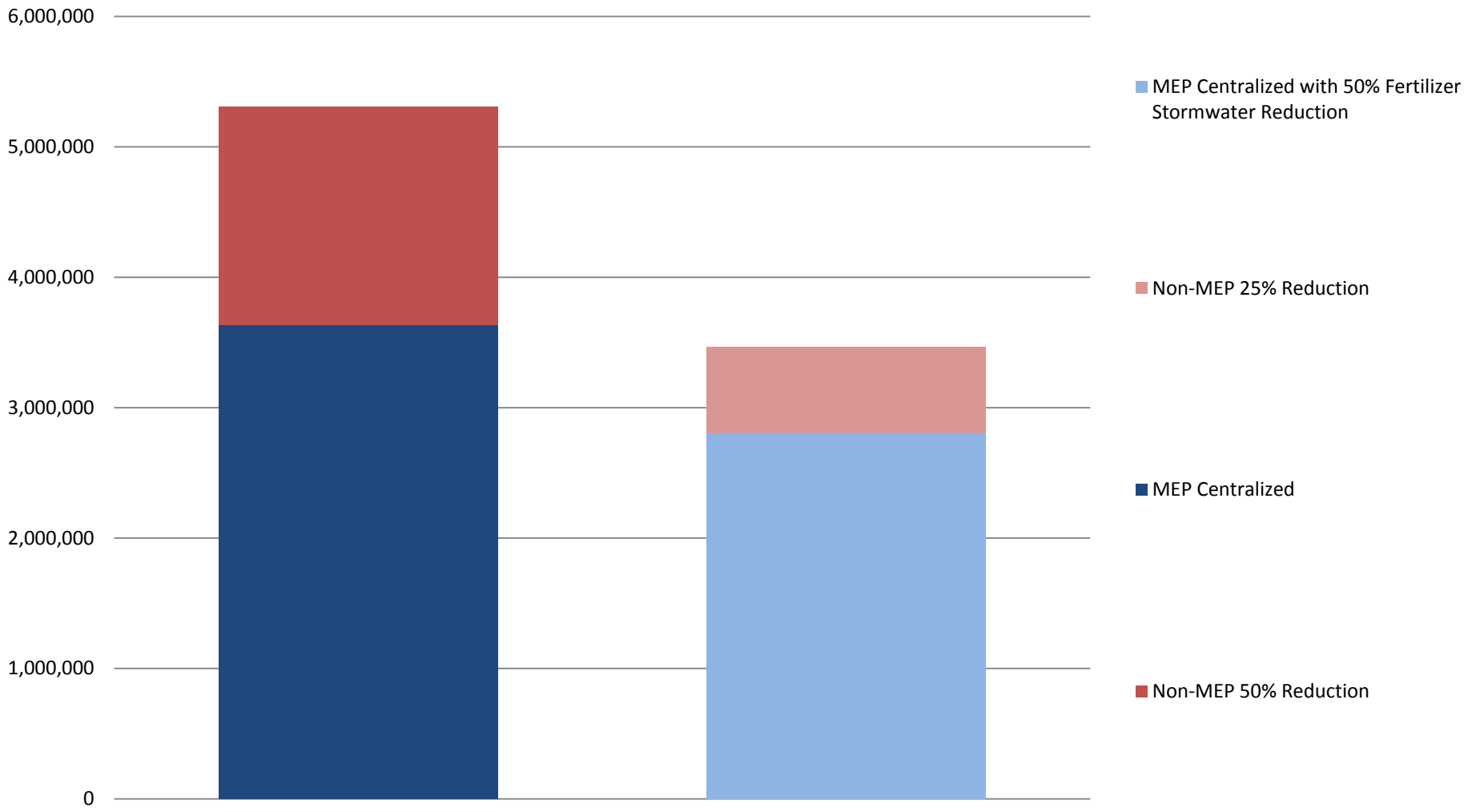
Mid Cape Watershed Groups

Non-Traditional Remainder



Mid Cape Watershed Group

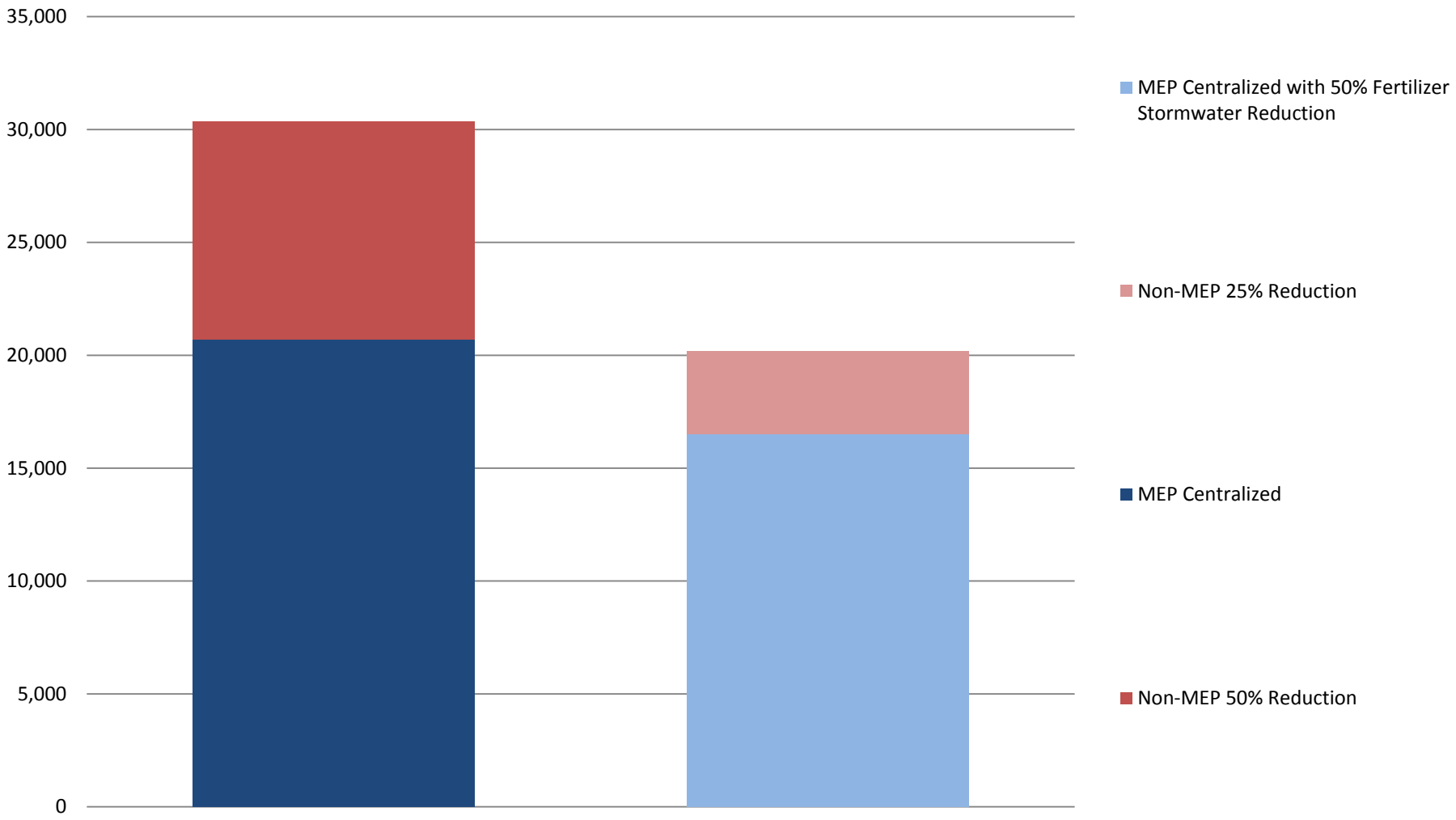
Centralized Inside Treatment: Captured Wastewater Flow (gpd)



-All MEP Watersheds Sewered to TMDL Compliance
-All Non-MEP Watersheds Sewered for a Reduction in Existing Septic Load

Mid Cape Watershed Group

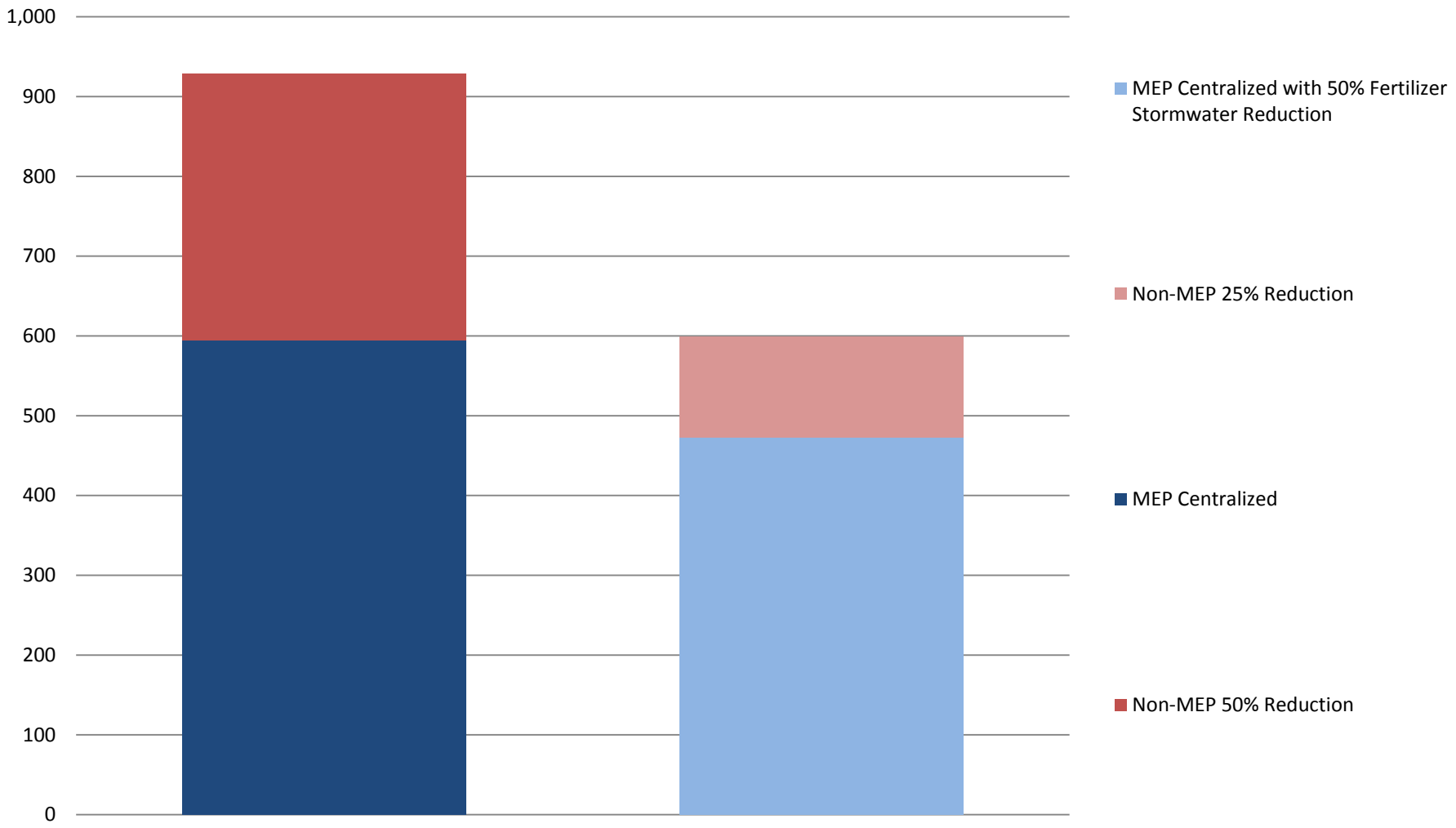
Centralized Inside Treatment: Sewered Parcels



-All MEP Watersheds Sewered to TMDL Compliance
-All Non-MEP Watersheds Sewered for a Reduction in Existing Septic Load

Mid Cape Watershed Group

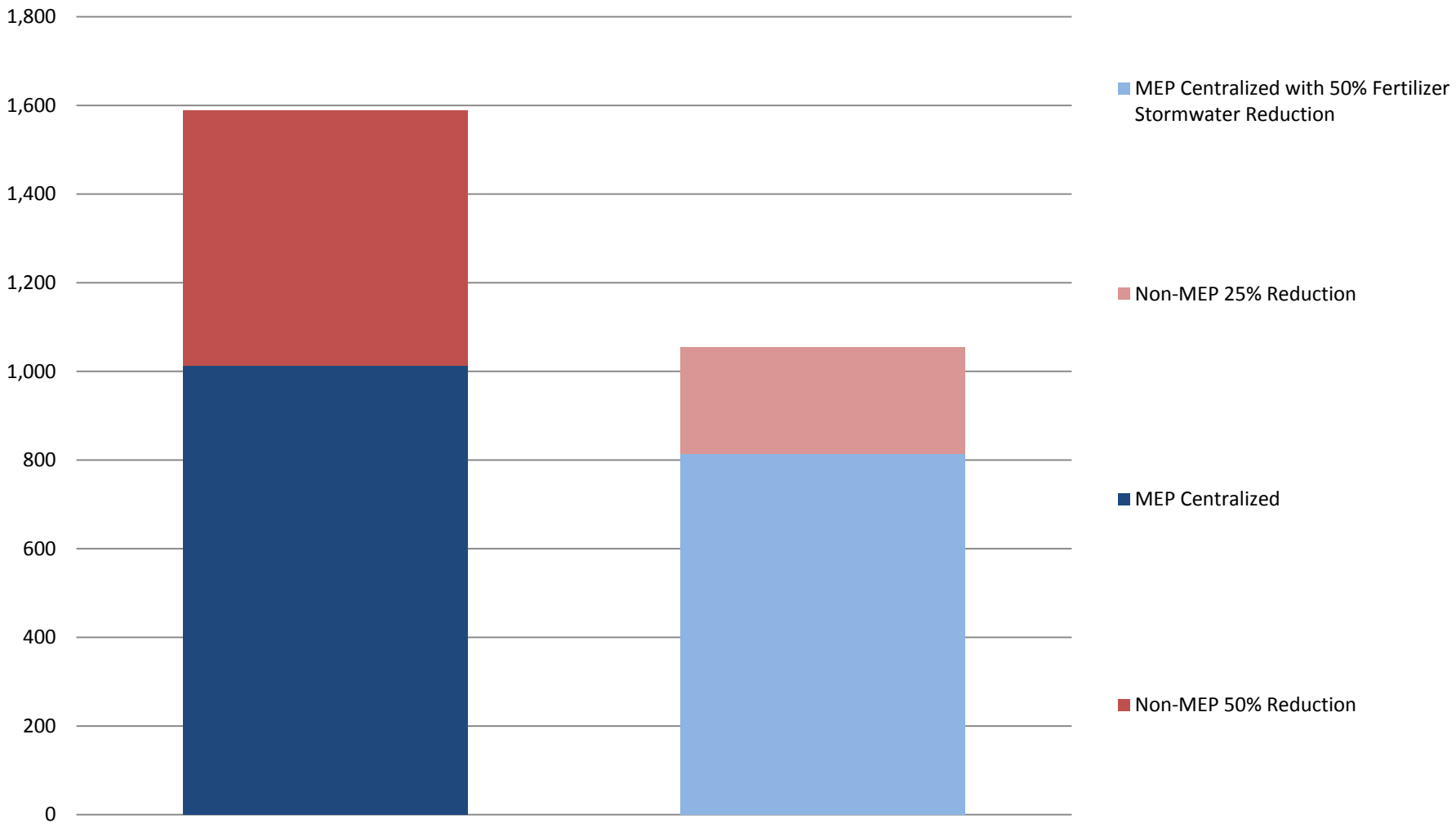
Centralized Inside Treatment:Miles of Sewer



-All MEP Watersheds Sewered to TMDL Compliance
-All Non-MEP Watersheds Sewered for a Reduction in Existing Septic Load

Mid Cape Watershed Group

Centralized Inside Treatment: Capital Cost (Millions)



-All MEP Watersheds Sewered to TMDL Compliance
-All Non-MEP Watersheds Sewered for a Reduction in Existing Septic Load


Site Scale
Neighborhood
Watershed
Cape-Wide
Prevention
Reduction
Remediation
Remediation of Existing Development
Fertilizer Management
Transfer of Development Rights
Stormwater BMPs
Compact Development
Standard Title 5 Systems
Conventional Treatment
I/A Title 5 Systems
Cluster & Satellite Treatment Systems
Advanced Treatment
I/A Enhanced Systems
Wastewater Collection Systems
Effluent Disposal Systems
Toilets: Urine Diverting
Constructed Wetlands: Surface Flow
Toilets: Composting
Constructed Wetlands: Subsurface Flow
Toilets: Packaging
Stormwater: Bioretention / Soil Media Filters
Toilets: Incinerating
Stormwater: Wetlands
Phytoirrigation
Eco-Machines & Living Machines
Phytobuffers
Fertigation Wells
Permeable Reactive Barrier
Shellfish and Salt Marsh Habitat Restoration
Aquaculture/Shellfish Farming
Inlet / Culvert Widening
Pond and Estuary Dredging
Constr. Wetlands - Groundwater, Salt Water, Floating

Problem Solving Approach

Wastewater | Existing Water Bodies | Regulatory

1 Identify Current N Removal Needs (Targets/Reduction Goals)

Present Load: X kg/day — **Target**: Y kg/day = **Reduction Required**: N kg/day

2 Additional N Removal Needs

A. Title 5 Problem Areas
B. Pond Recharge Areas
C. Growth Management

3 Low Barrier Technologies

A. Fertilizer Management
B. Stormwater Mitigation

4 Watershed Alternative Technologies

A. Permeable Reactive Barriers
B. Inlet/Culvert Openings
C. Constructed Wetlands
D. Aquaculture

5 On-Site Alternative Technologies

A. Eco-toilets (UD & Compost)
B. I/A Technologies
C. Enhanced I/A Technologies
D. Shared Systems

6 Priority Collection/Sewer Areas

A. Greater Than 1 Dwelling Unit/acre
B. Village Centers
C. Economic Centers
D. Growth Incentive Zones

7 Supplemental Collection / Sewer Areas

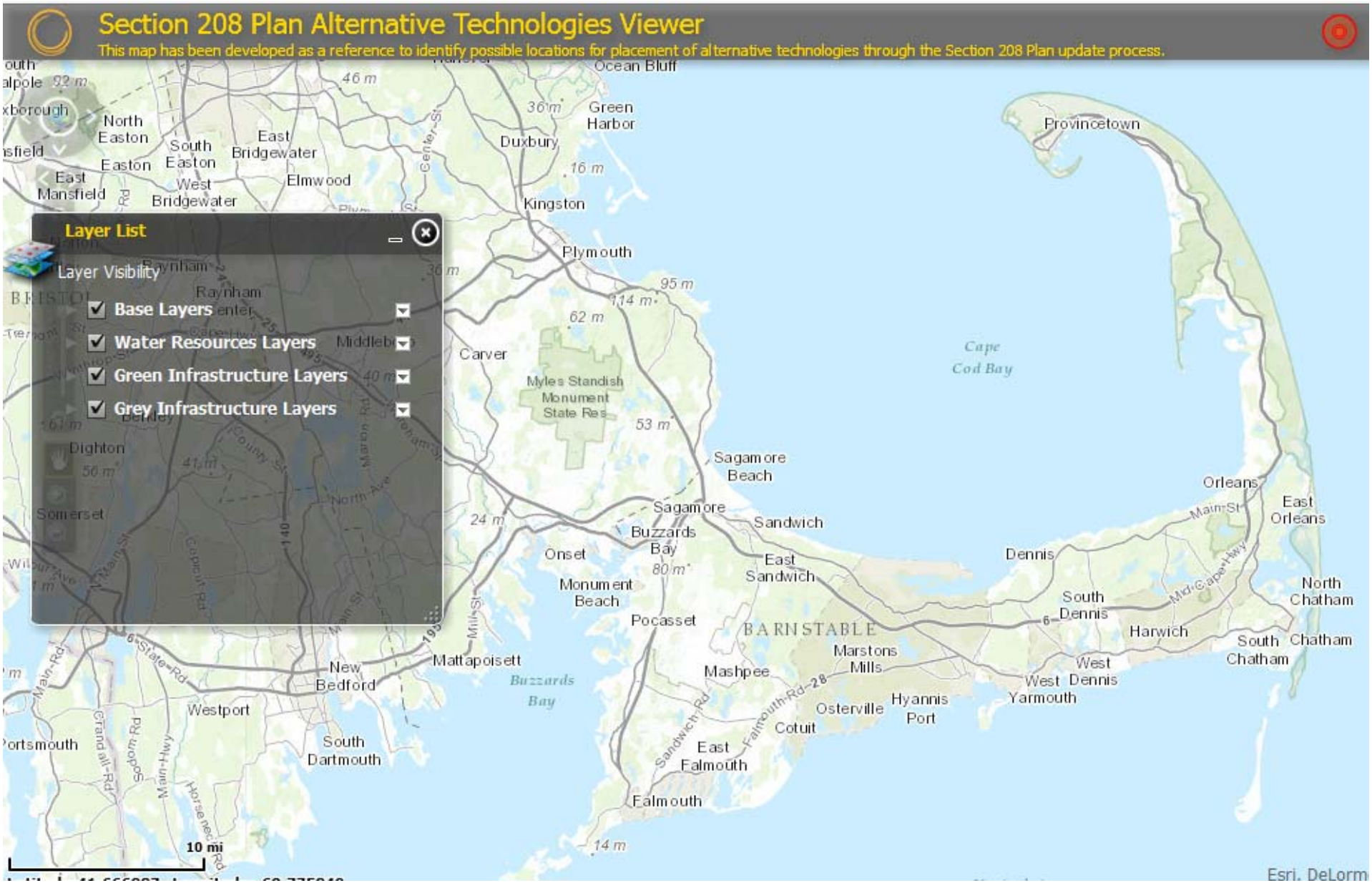
Summary Table

MEP Targets and Goals		kg/year	kg/day	kg/day	Nitrogen (kg/yr)
Present Total Nitrogen Load				1934.9	706,222
	Controllable Nitrogen Load				
	Wastewater	501,866	1375.0		
	Fertilizer	100,494	275.3		
	Stormwater	89,912	246.3		
Target Nitrogen Load				1072.7	391,545
Nitrogen Removal Required				**862.1**	**314,677**
Total Number of Properties	113,303				

Low Barrier to Implementation	Percent of Total Removed	Reduction by Technology (Kg/yr)	Remaining to Meet Target (Kg/yr)
A) Fertilizer Management	50	50,247	264,430
B) Stormwater Mitigation	50	44,956	219,474

Watershed/Embayment Options	Quantity		Reduction by Technology (Kg/yr)	Remaining to Meet Target (Kg/yr)
A) Permeable Reactive Barrier (PRB)	23,569	homes	75,185	144,289
B) Constructed Wetlands (No Collection System)	57	acres	28,250	116,039
C) Constructed Wetlands (With Collection System)	23	acres	11,250	104,789
D) Phytoirrigation	1	acres	6	104,783
E) Phytobuffers	15	acres	330	104,453
F) Fertigation Wells	1,898	acres	7,590	96,863
G) Surface Water Remediation Wetland	4	acres	112	96,751
H) Dredging/Inlet Widening	66,000	cu. yard	0	96,751
I) Phytoremediation	0	acres	0	96,751
J) Aquaculture/Oyster Beds	185	acres	46,250	50,501
K) Coastal Habitat Restoration	29	acres	3,393	47,108
L) Floating Constructed Wetlands	71,500	cu feet	28,600	18,508

Alternative On-Site Options	Quantity		Reduction by Technology (Kg/yr)	Remaining to Meet Target (Kg/yr)
A) Ecotoilets (UD & Compost)	3,343	homes	20,060	-1,552
B) UD School or Public Facility	6,700	people	9,648	-11,200
C) I & A Systems	3,485	homes	17,425	-28,625
D) Enhanced I & A Systems	2,742	homes	16,452	-45,077


Section 208 Plan Alternative Technologies Viewer
This map has been developed as a reference to identify possible locations for placement of alternative technologies through the Section 208 Plan update process.
Layer List
Layer Visibility
Base Layers
Water Resources Layers
Green Infrastructure Layers
Grey Infrastructure Layers
Ocean Bluff
Green Harbor
Provincetown
North Easton
South Easton
East Bridgewater
Easton
East Mansfield
West Bridgewater
Elmwood
Duxbury
Kingston
Plymouth
Carver
Myles Standish Monument State Res
Cape Cod Bay
Sagamore Beach
Sagamore
Sandwich
Buzzards Bay
Onset
East Sandwich
Monument Beach
Pocasset
BARNSTABLE
Dennis
Orleans
East Orleans
North Chatham
South Dennis
Harwich
South Chatham
Marstons Mills
West Dennis
West Yarmouth
Hyannis Port
Osterville
Cotuit
Mashpee
Mattapoisett
New Bedford
Westport
South Dartmouth
East Falmouth
Falmouth
Dighton
Somerset
10 mi
Esri, DeLorm