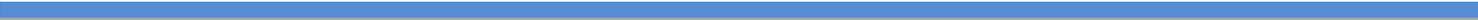


# Cape Cod 208 Plan Update



# What is the 208 Plan?

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# Clean Water Act Section 208

The Commission was directed to update the 1978 Plan

The Commonwealth provided \$3 million to fund the project

# Focus on 21<sup>st</sup> Century Problems

Nitrogen:  
Saline Waters

Phosphorus:  
Fresh Waters

Growth &  
Title 5  
Limitations



**105 Watersheds**

 Embayment Boundary

# 105 Watersheds

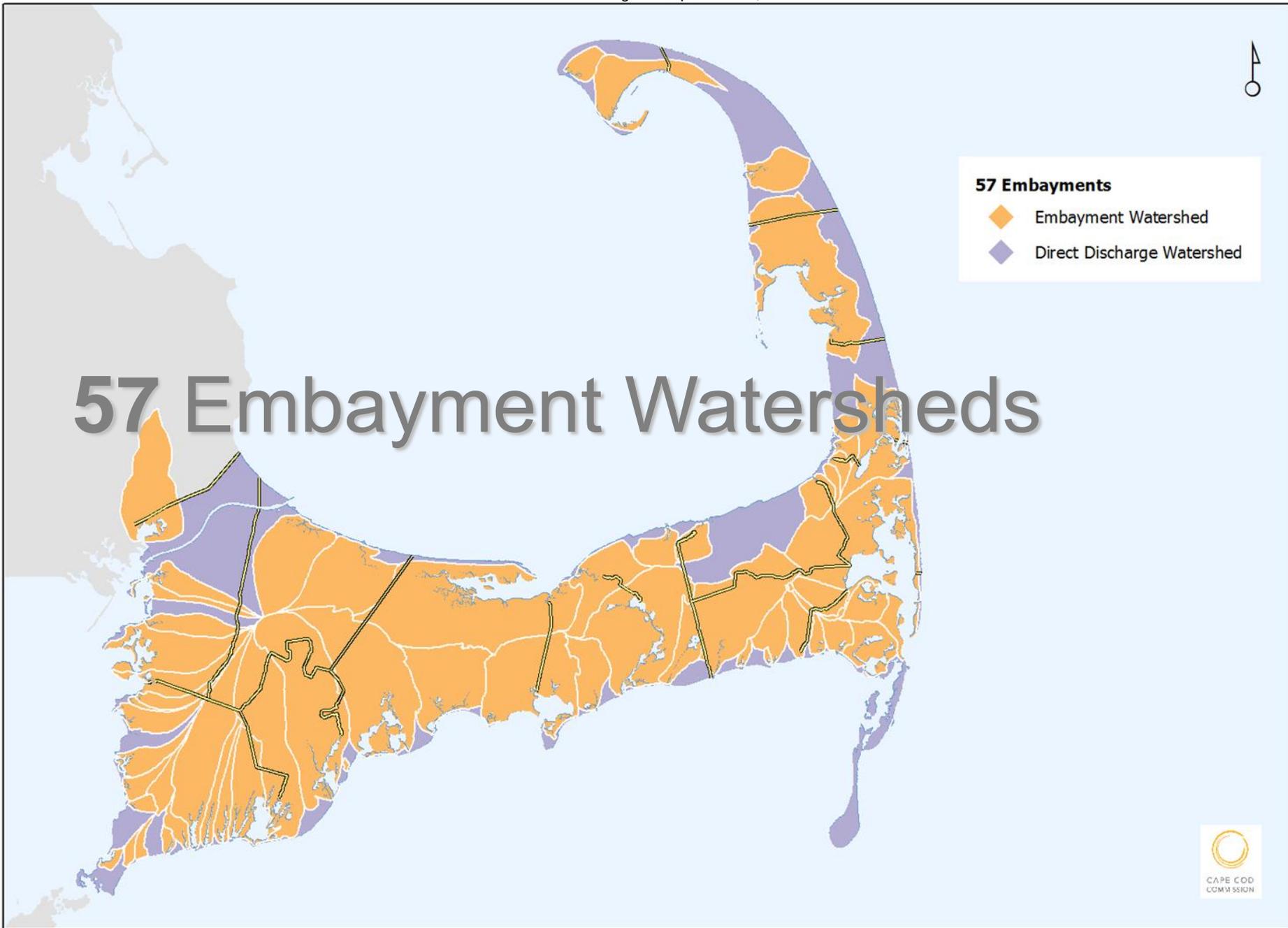




**57 Embayments**

- ◆ Embayment Watershed
- ◆ Direct Discharge Watershed

# 57 Embayment Watersheds

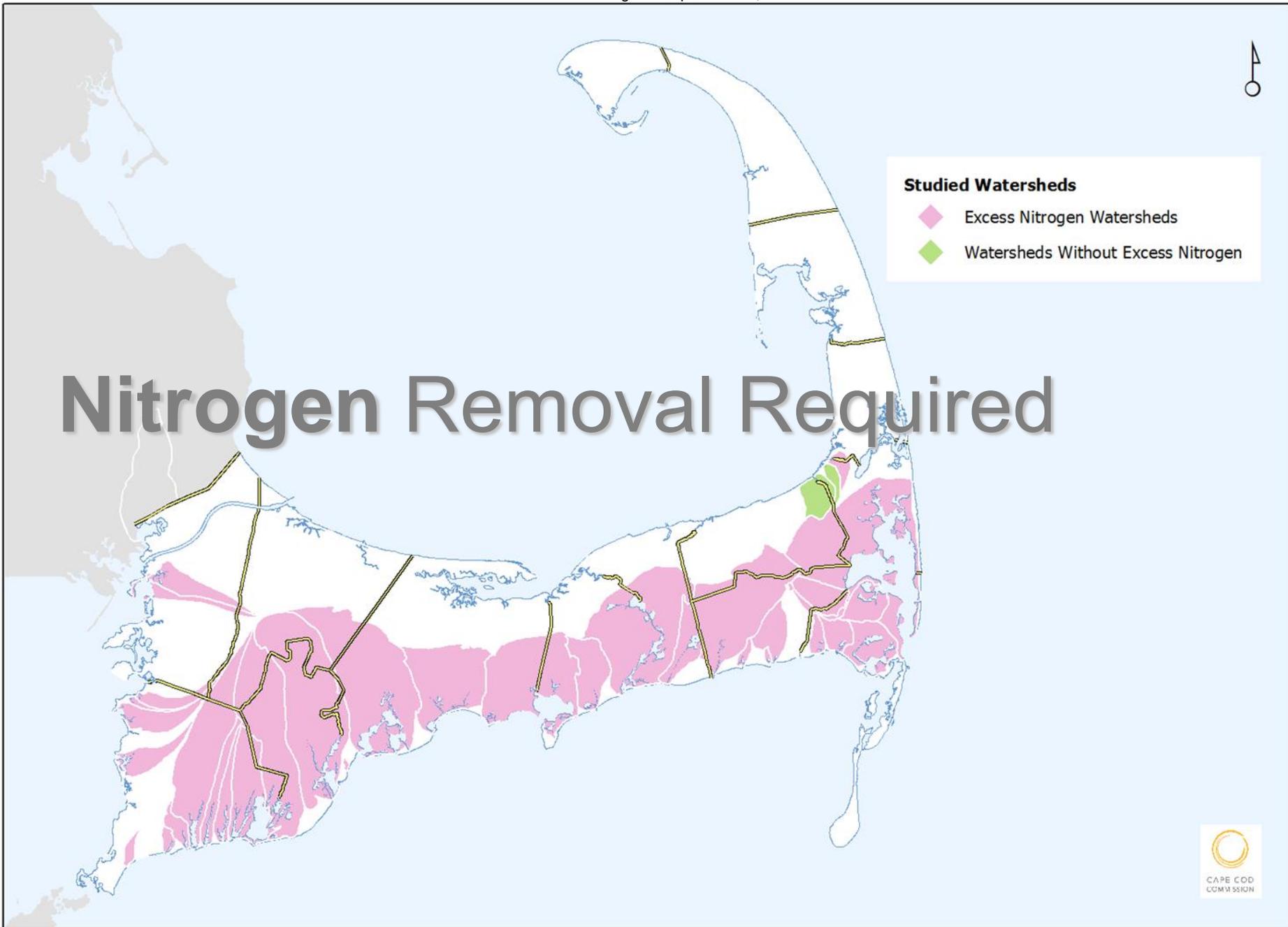




**Studied Watersheds**

- ◆ Excess Nitrogen Watersheds
- ◆ Watersheds Without Excess Nitrogen

# Nitrogen Removal Required

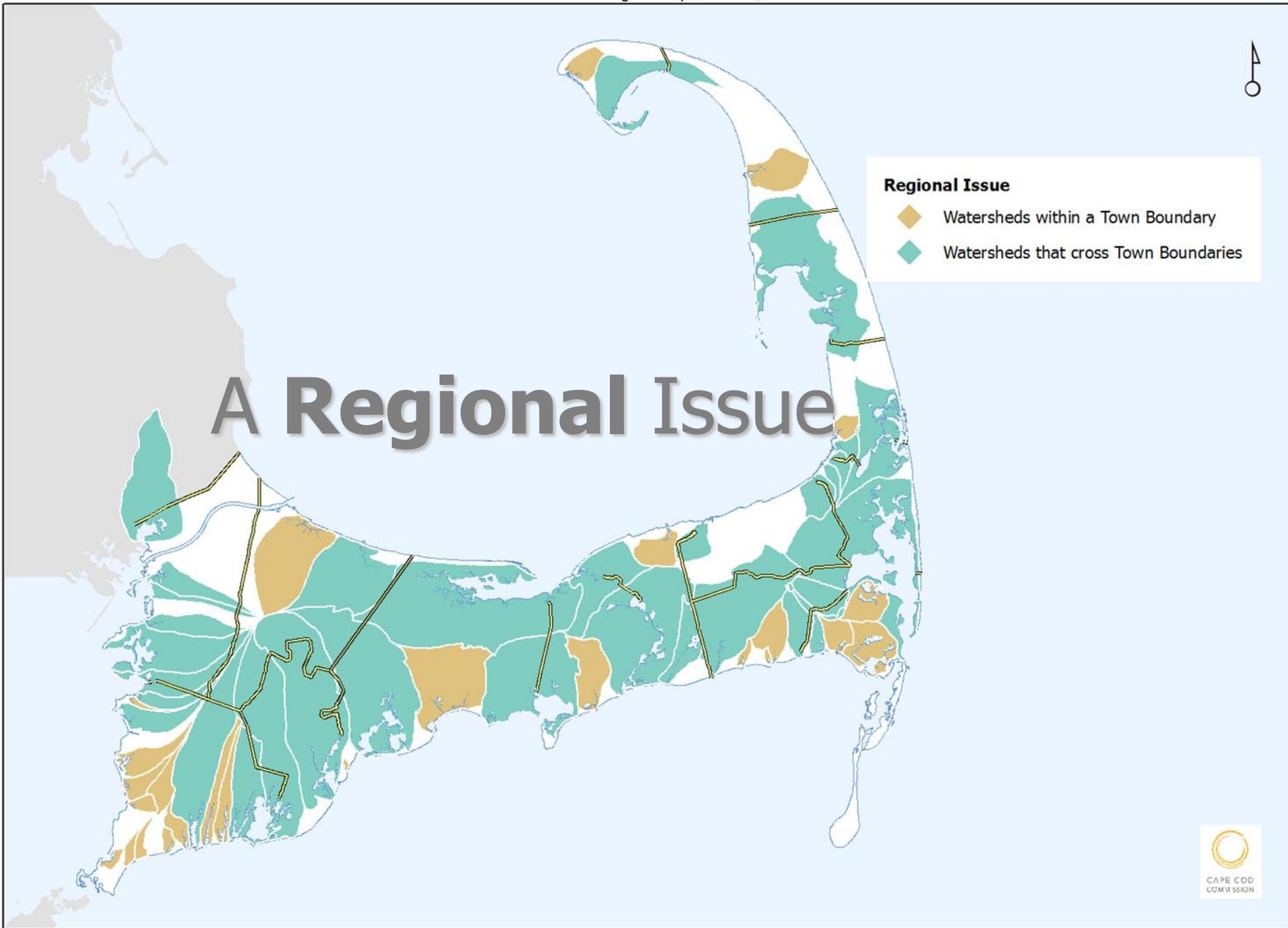




**Regional Issue**

- ◆ Watersheds within a Town Boundary
- ◆ Watersheds that cross Town Boundaries

# A Regional Issue



# Approach to the 208 Plan Update

Watershed  
Based

Stakeholder  
Engagement

Maximize Benefits  
of Local Planning

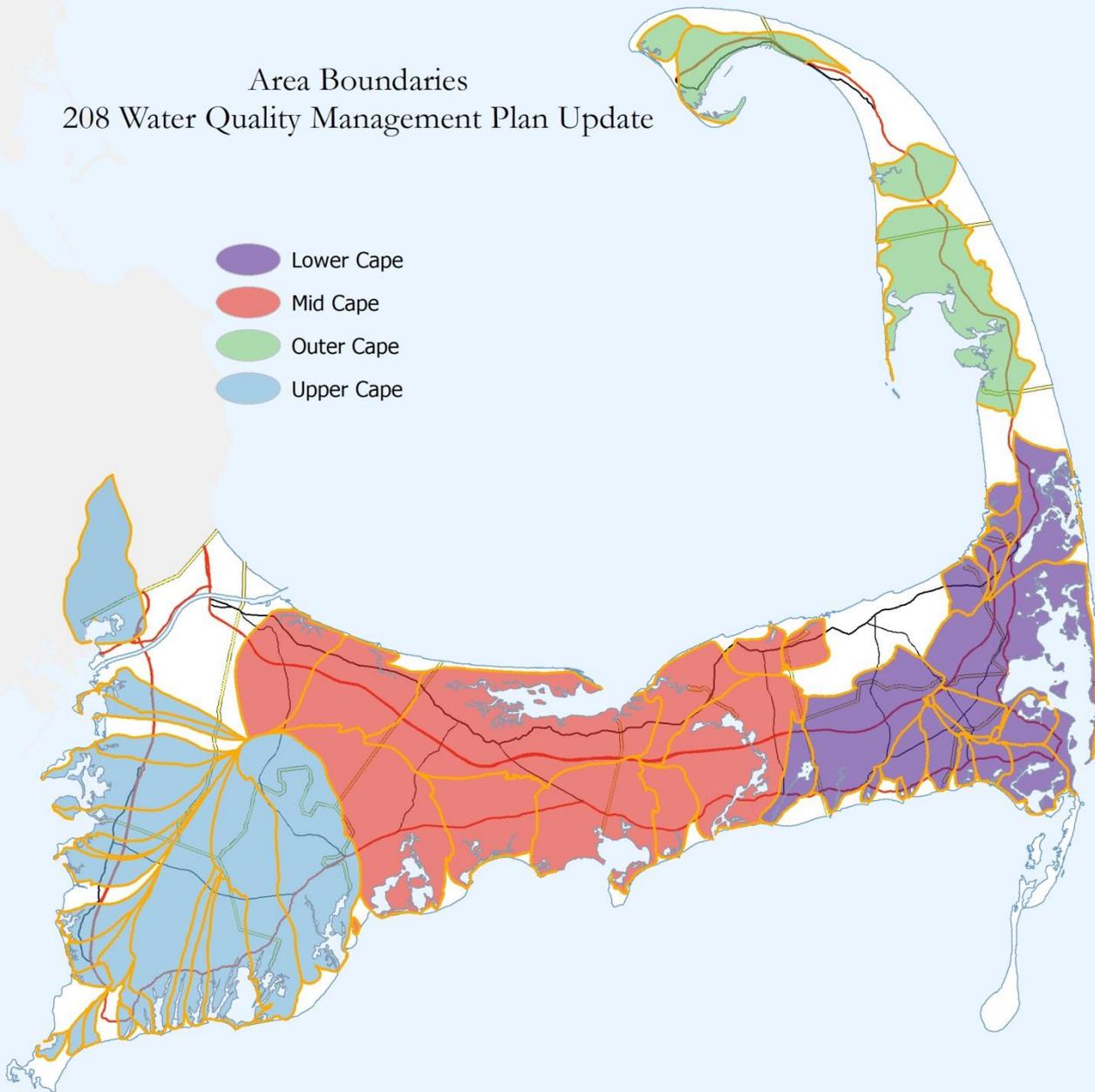
No Optimal  
Solutions

## **Goal:**

To generate a series of approaches in each watershed that will meet water quality standards

# Area Boundaries 208 Water Quality Management Plan Update

- Lower Cape
- Mid Cape
- Outer Cape
- Upper Cape





# Subgroup Boundaries 208 Water Quality Management Plan Update

## Lower Cape

- Herring River
- Pleasant Bay
- Stage Harbor Group
- Nauset and Cape Cod Bay Marsh Group

## Mid Cape

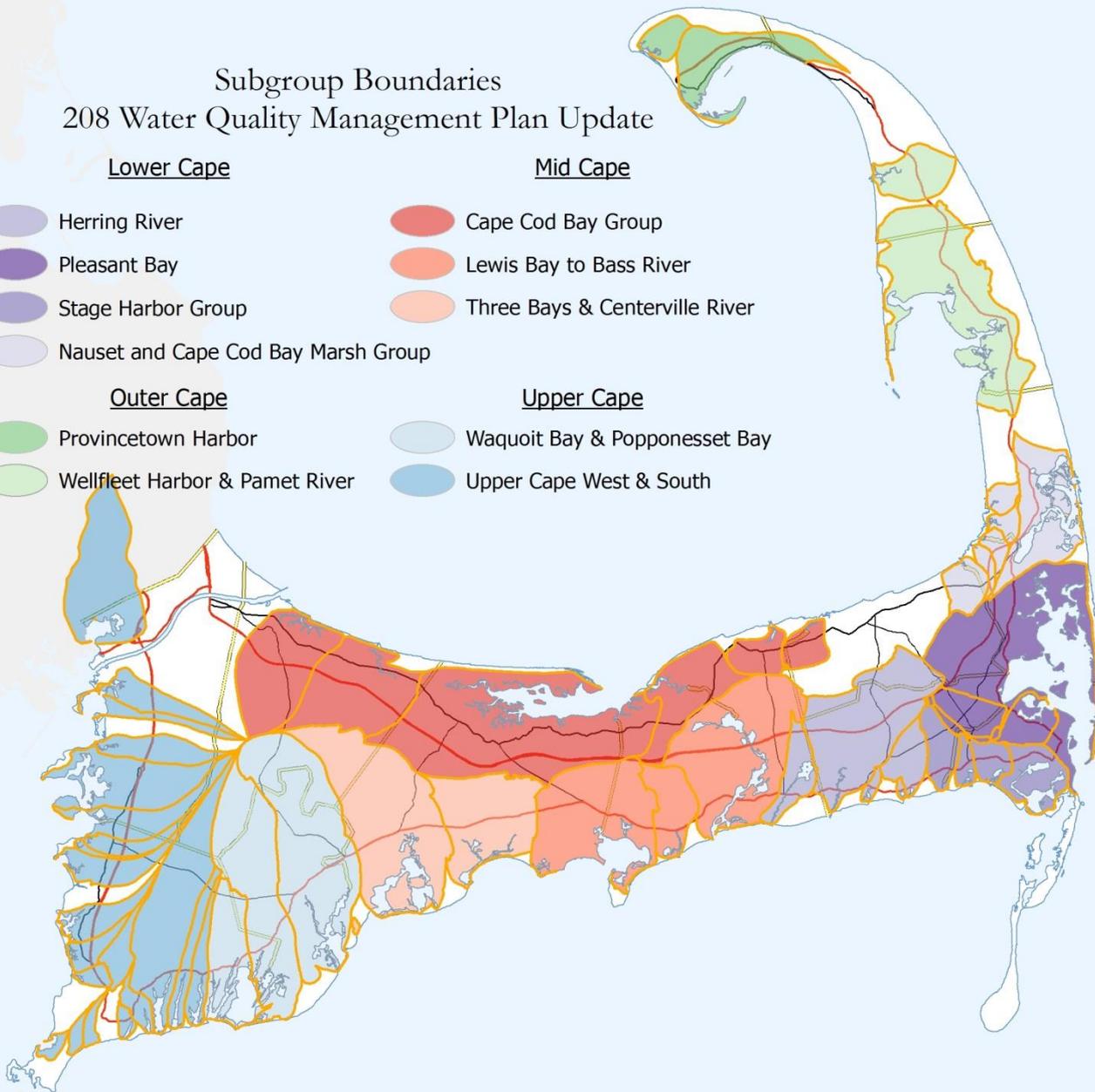
- Cape Cod Bay Group
- Lewis Bay to Bass River
- Three Bays & Centerville River

## Outer Cape

- Provincetown Harbor
- Wellfleet Harbor & Pamet River

## Upper Cape

- Waquoit Bay & Popponesset Bay
- Upper Cape West & South



# **What is the stakeholder process?**

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## Public Meetings

## Watershed Working Groups

Goals,  
Work Plan  
& Roles

Affordability,  
Financing

Baseline  
Conditions

Technology  
Options  
Review

Watershed  
Scenarios

July

August

September

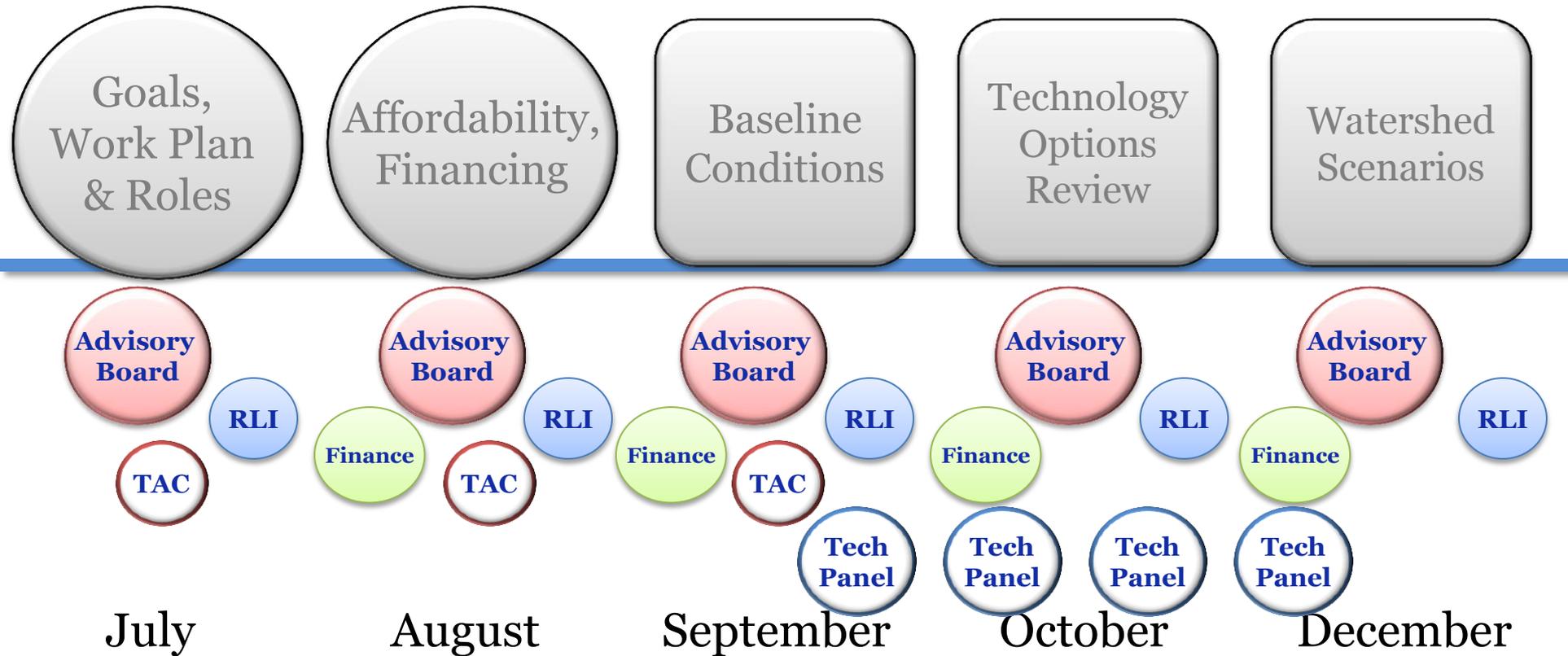
October

December

**208 Planning Process**

## Public Meetings

## Watershed Working Groups



**RLI** Regulatory, Legal & Institutional Work Group

**TAC** Technical Advisory Committee of Cape Cod Water Protection Collaborative

# 208 Planning Process

# The 208 Advisory Board

**Mission:** To support the 208 planning process by providing advice on the overall approach, reviewing draft work product and offering insight on strategic and tactical decision-making.

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## Members

*Robert Churchill*, Broker-Owner of Buyer Brokers of Cape Cod, Churchill Associates

*Robert Lawton*, former Yarmouth Town Administrator

*Wendy Northcross*, CEO of the Cape Cod Chamber of Commerce

*Sheila Vanderhoef*, Eastham Town Administrator

*Virginia Valiela*, Member of the Falmouth Water Quality Management Committee

*Robin Wilkins*, former Town of Harwich Selectman

**208 Planning Process**

# The 208 Finance Subcommittee

**Mission:** Establish a factual basis for discussing issues of affordability, financing, and resources

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## Members

*Bob Ciolek*, Chair, consultant to Barnstable County

*Bill Hinchey*, Yarmouth Town Administrator

*Mark Milne*, Finance Director, Town of Barnstable

# The 208 Panel on Technologies

**Mission:** The mission of this panel is to review, confirm, and expand upon the matrix of technology options, review the overall planning approach to be used in each watershed, and provide input on a site screening methodology for green infrastructure technologies.

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## Members

*Ivan Valiela*, Marine Biological Laboratory

*Chris Neill*, Marine Biological Laboratory

*Eric Davidson*, Woods Hole Research Center

*Sarah Slaughter*, Built Environment Coalition

*Anamarija Frankic*, UMASS Boston

*Patrick Lucey*, Aquatex, British Columbia

*Jay Prager*, Maryland Dept of the Environment

# Site Scale

# Neighborhood

# Watershed

# Cape-Wide

## Prevention

- Compact Development
- Remediation of Ex. Dev.
- Fertilizer Management
- TDR
- Transfer of Dev. Rights
- Stormwater BMPs

## Reduction

- Title 5 Replacement
- Cluster Treatment
- Adv. Central. Treatment
- I/A On-site Denitrifying
- Satellite Treatment
- Wastewater Transport
- Enhanced I/A Systems
- STEP/STEG
- Treated Effluent Disposal
- Toilets: Urine Diversion
- Conventional Treatment
- Toilets: Composting
- Wetlands: Surface Flow
- Toilets: Packaging
- Wetlands: Subsurface Flow
- Stormwater: Bioretention
- Disposal: Out of Watershed
- Stormwater: Wetlands
- Disposal: Ocean
- Eco-Machines & Living Machines
- Phyto-Irrigation

## Remediation

- Phyto-buffers
- Fertigation
- PRB Permeable React. Bar.
- Aquaculture/Shellfish
- Inlet / Culvert Widening
- Pond / Estuary Dredging
- Surface Water Remediation Wetlands

- Wastewater
- Stormwater
- Existing Water Bodies
- Regulatory



Wastewater



Existing Water Bodies



Regulatory

# Alternatives: Screening Method

1  
2  
3  
4  
5  
6  
7



### Targets/ Goals

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

### Composite Target Areas

A. High Nitrogen Reduction Areas    C. Title 5 Problem Areas  
B. Pond Recharge Areas

### Low Barrier to Implementation

A. Fertilizer Management  
B. Stormwater Mitigation

### Watershed/Embayment Options

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

### Alternative On-Site Options

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

### Priority Collection/High-Density Areas

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

### Supplemental Sewering

