

**Cape Cod 208 Area Water Quality Planning
Provincetown Harbor Watershed Working Group**

**Meeting One
Wednesday, September 18, 2013
Provincetown Town Hall
260 Commercial Street, Provincetown, MA 02657**

Meeting Agenda

- 8:30 am Welcome – *Cape Cod Commission*
- 8:35 Introductions, confirm working group membership and participation – *Kate Harvey (Facilitator) and Working Group*
- 9:00 Review 208 goals and process and the goals of today’s meeting – *Cape Cod Commission*
- 9:15 Local Progress to Date: Chronology of what has been done to protect the watersheds in your area – *Cape Cod Commission*
- 9:30 Review and add to chronology of work to date – *Working Group*
- 9:45 Discussion: drawing on past work to move forward – *Kate Harvey (Facilitator) and Working Group*
- 10:00 Baseline Conditions: Understanding Your Watershed and its Water Quality Problem – *Scott Horsley (Area Manager)*
- 10:45 Break
- 11:00 Discussion of Baseline Conditions - *Kate Harvey (Facilitator) and Working Group*
- 11:30 Review/Discuss Process Protocols - *Kate Harvey (Facilitator) and Working Group*
- 12:00 Framework for Moving Forward: Preview Meetings 2 and 3 – *Scott Horsley (Area Manager)*
- 12:10 Public Comments
- 12:30 Adjourn

Provincetown Harbor



Baseline Conditions & Needs Assessment

What is the 208 Plan?

Clean Water Act Section 208



The Commission was directed to update the 1978 Plan

The Commonwealth provided \$3 million to fund the project

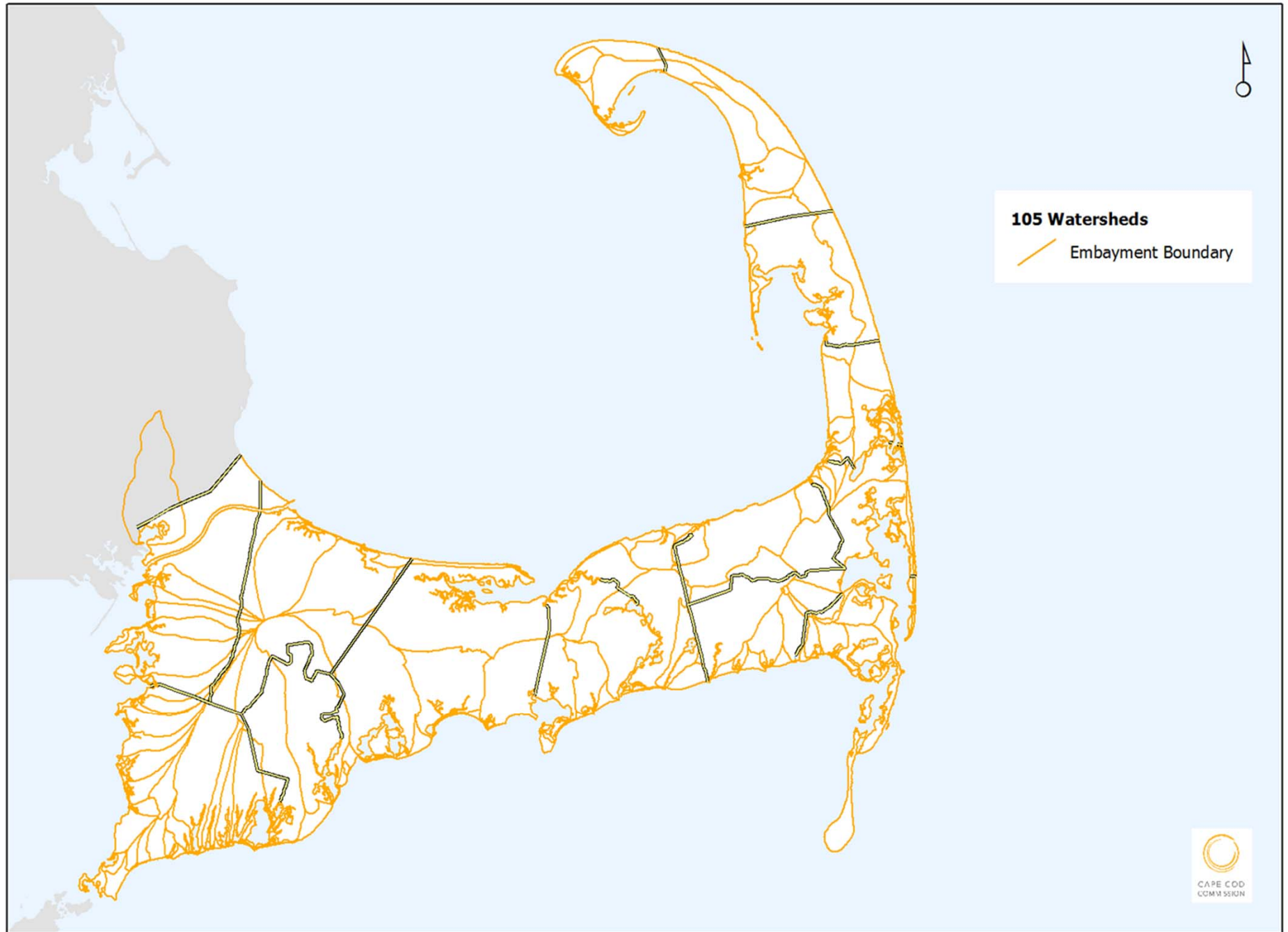
Focus on 21st Century Problems

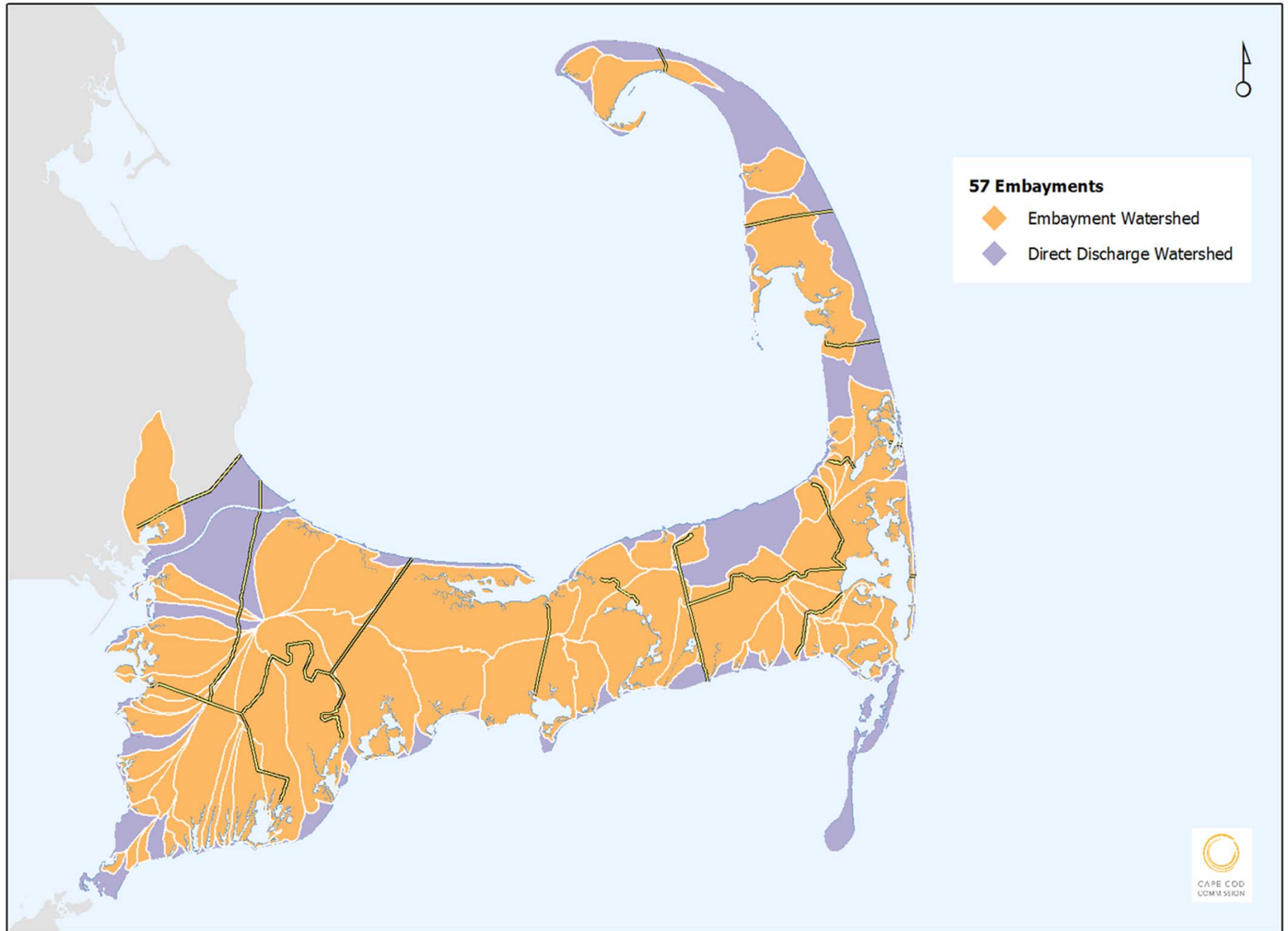


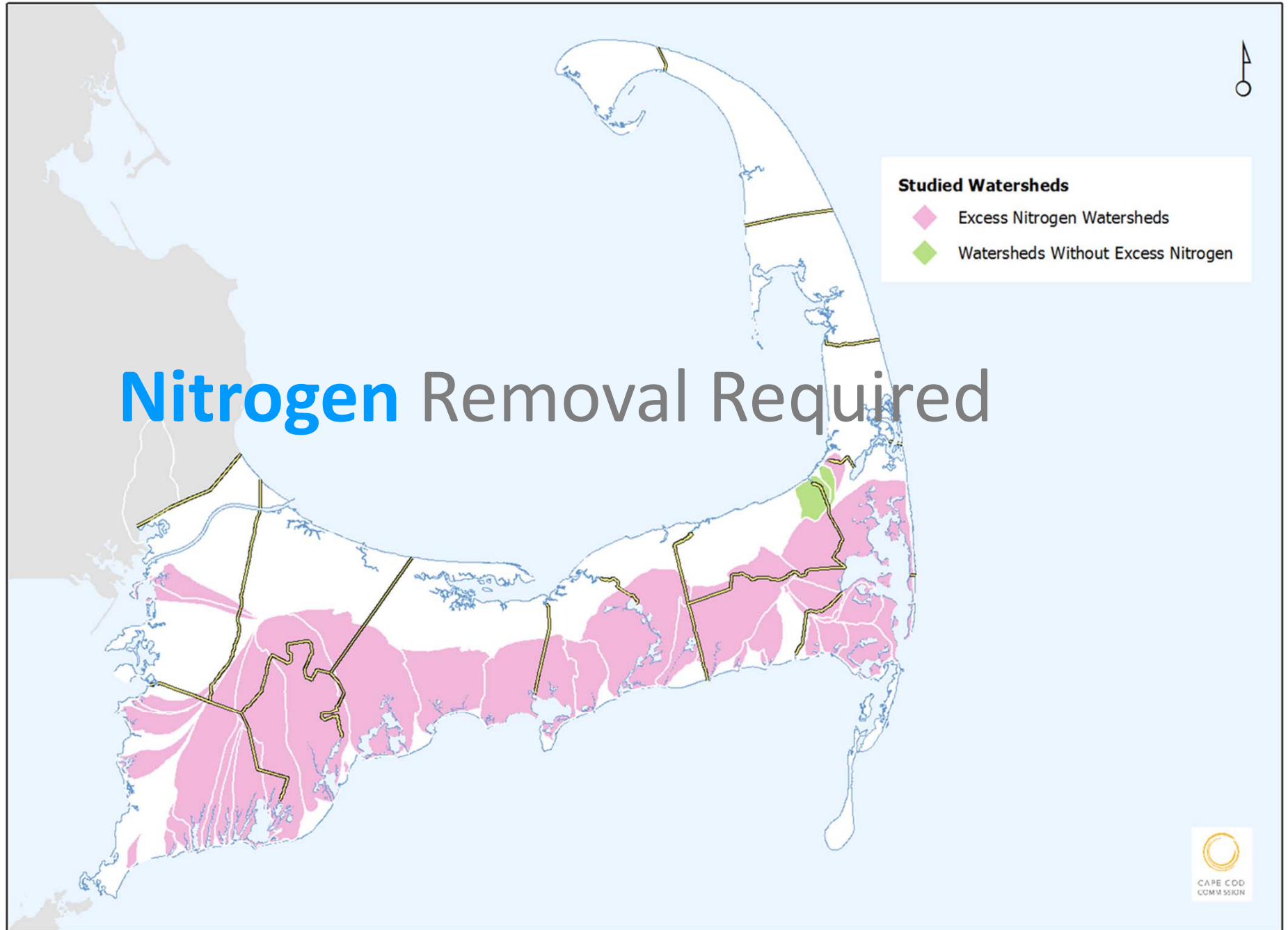
**Nitrogen:
Saline Waters**

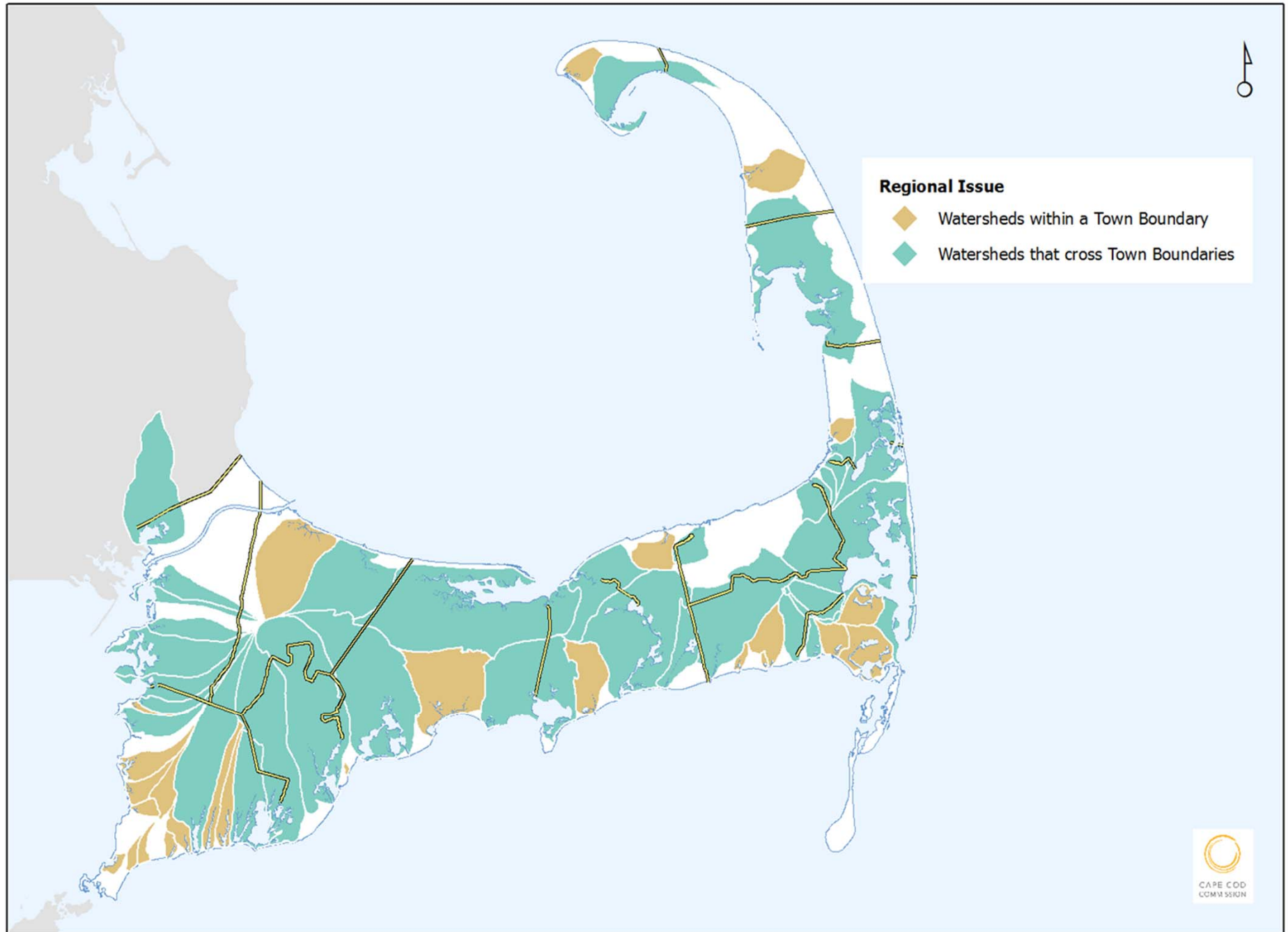
**Phosphorus:
Fresh Waters**

**Growth &
Title 5
Limitations**

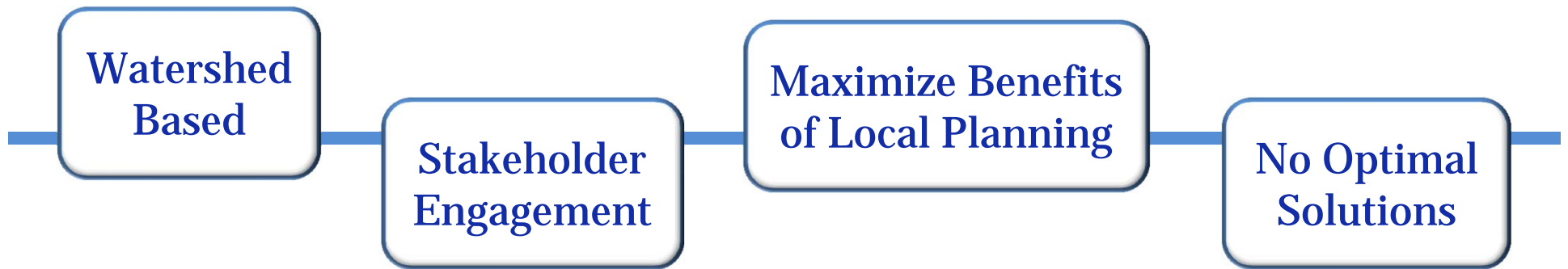






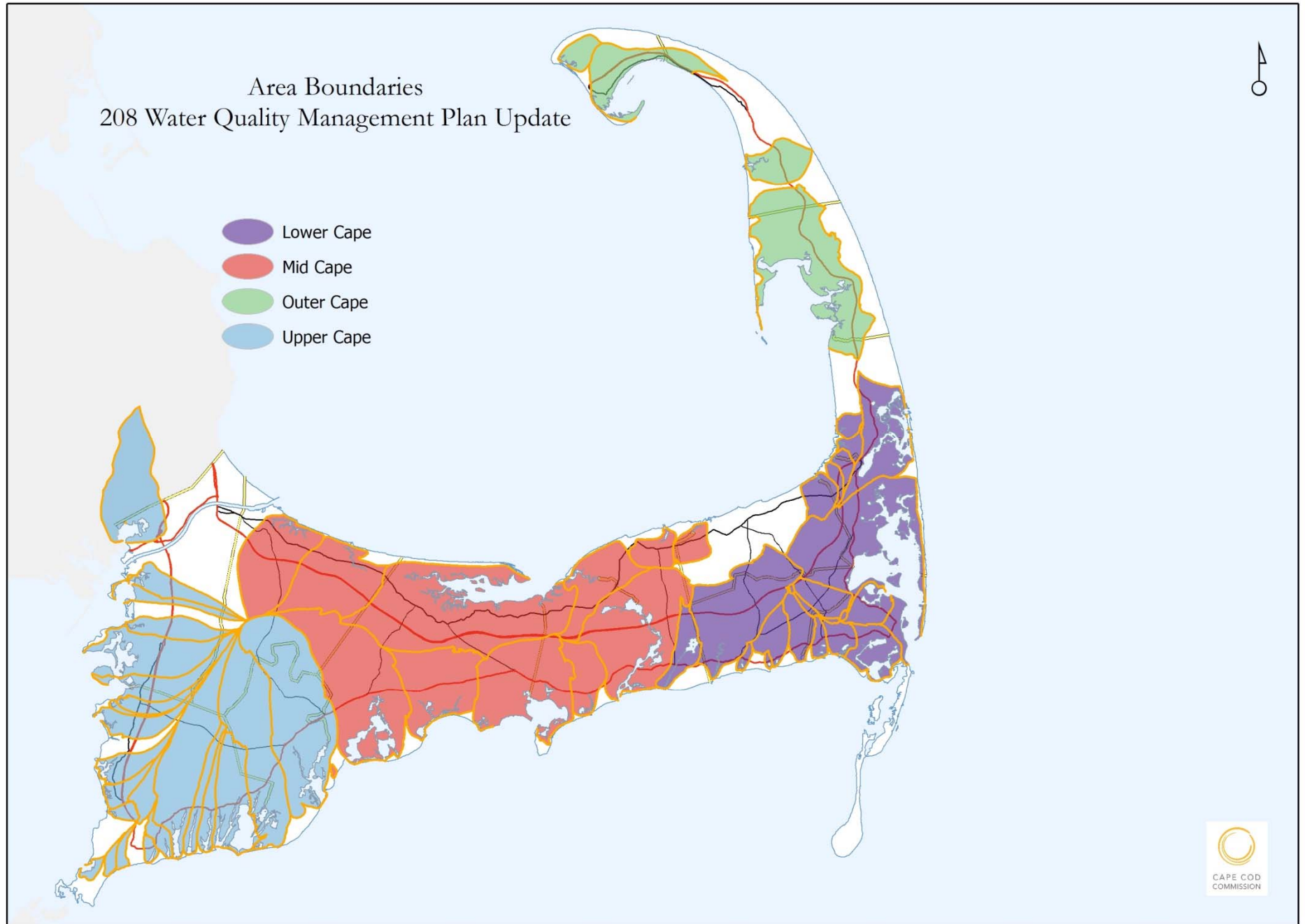


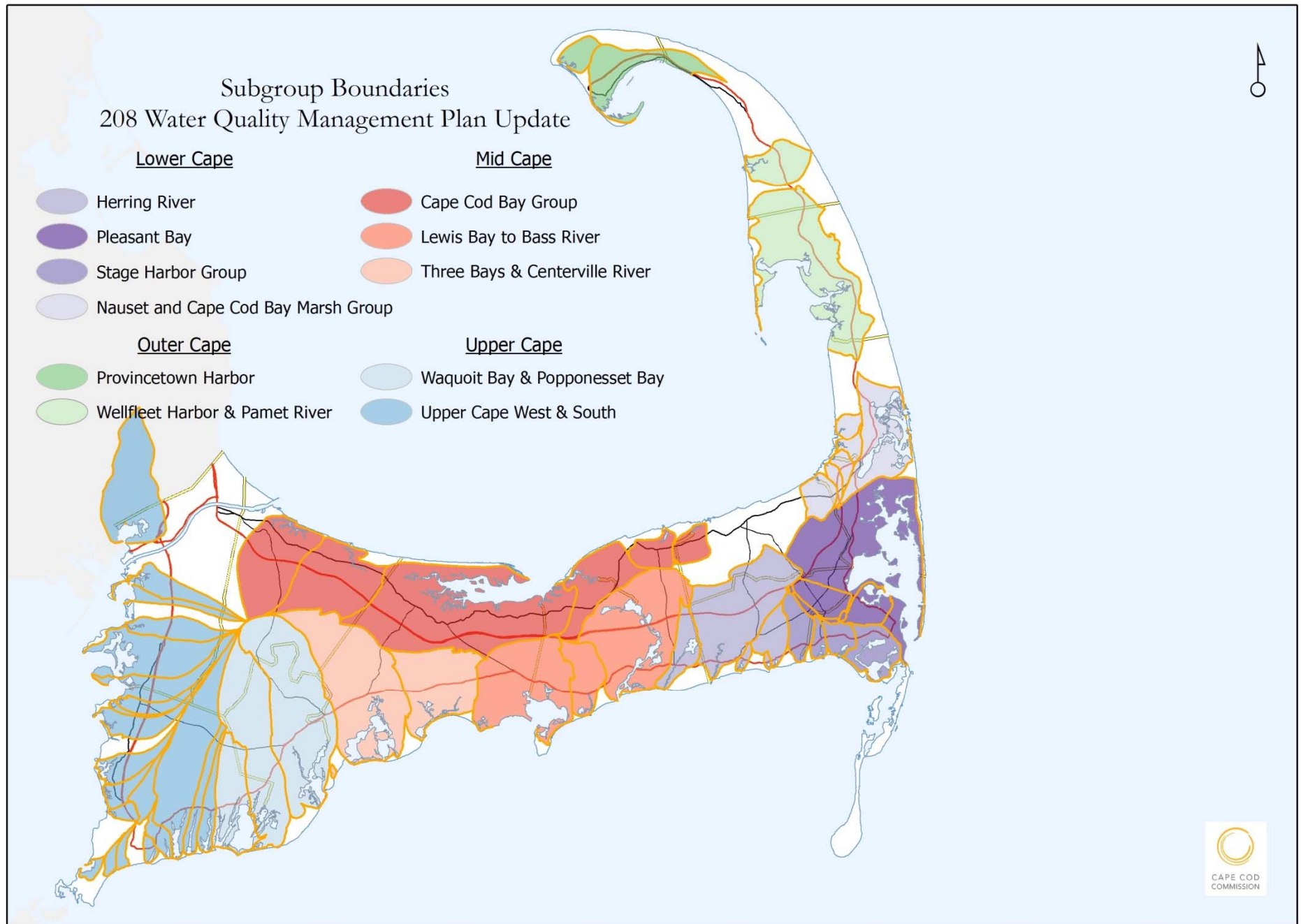
Approach to the 208 Plan Update



Goal:

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

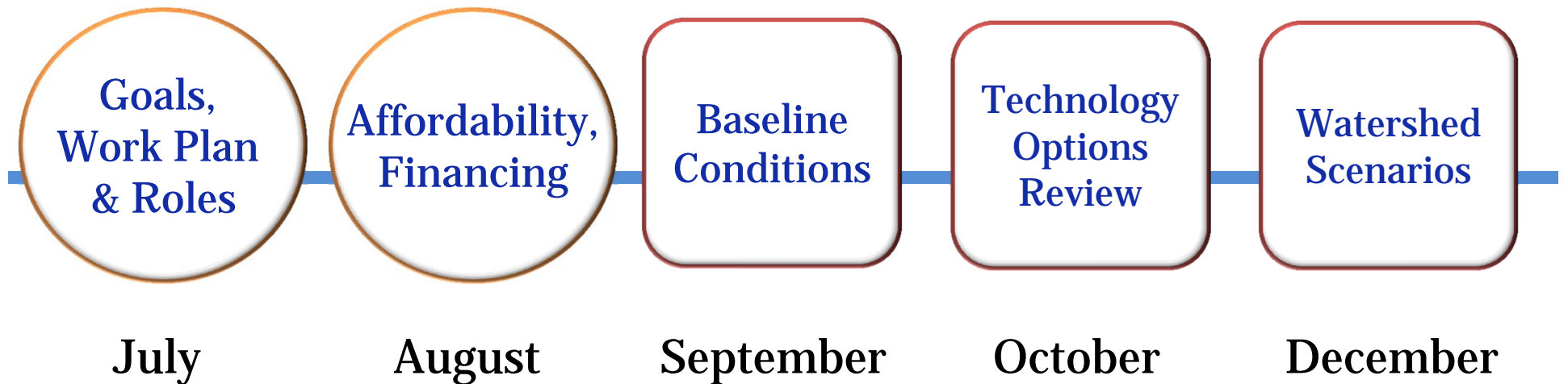




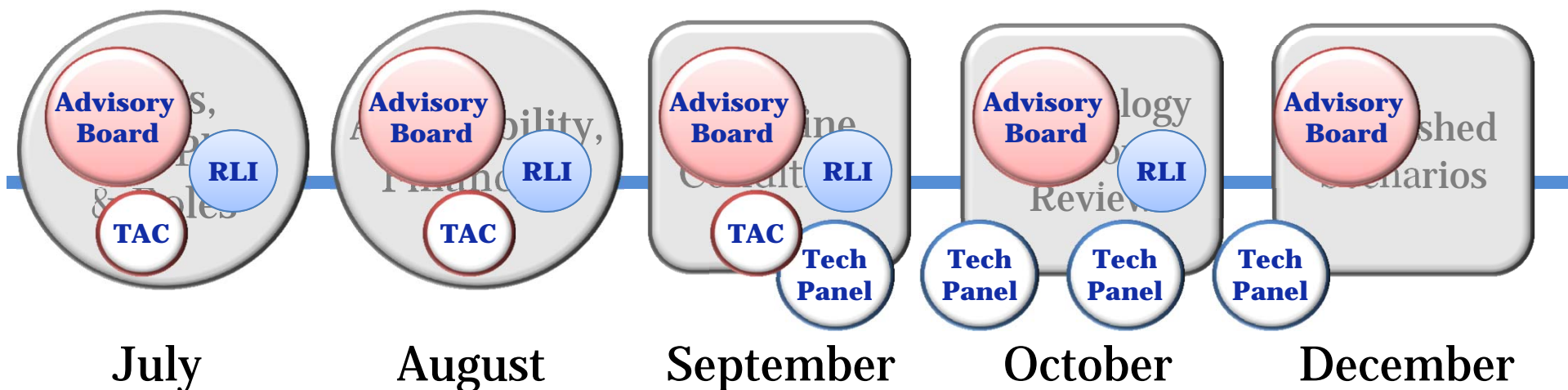
What is the stakeholder process?

Public Meetings

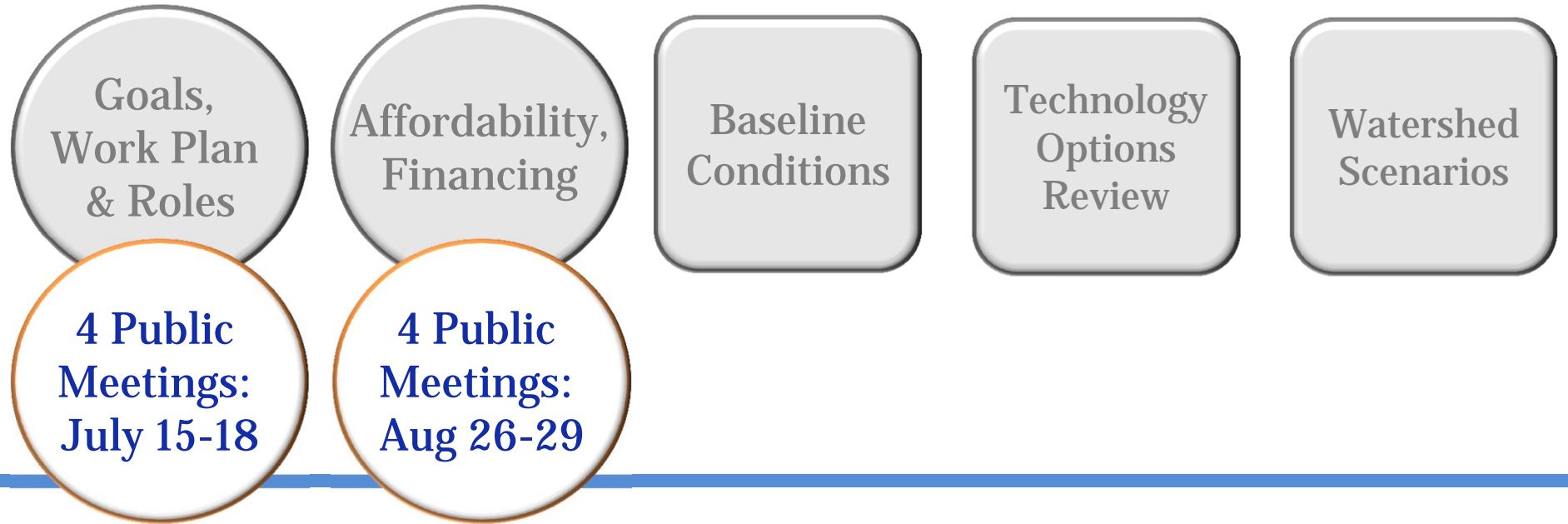
Watershed Working Groups



208 Planning Process



208 Planning Process



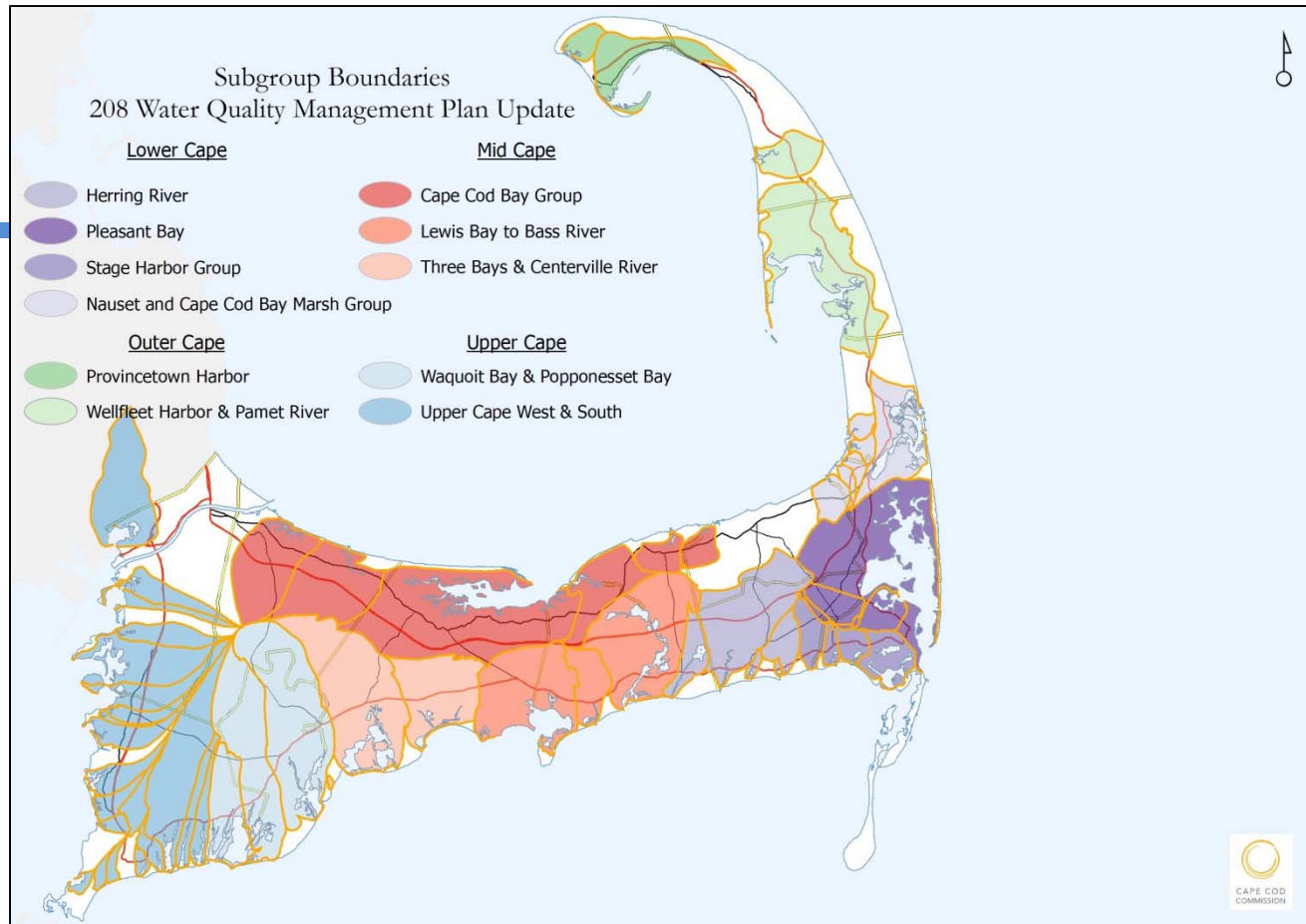
208 Planning Process

Baseline
Conditions

11 Working
Group Meetings:
Sept 18-27

Technology
Options
Review

Watershed
Scenarios

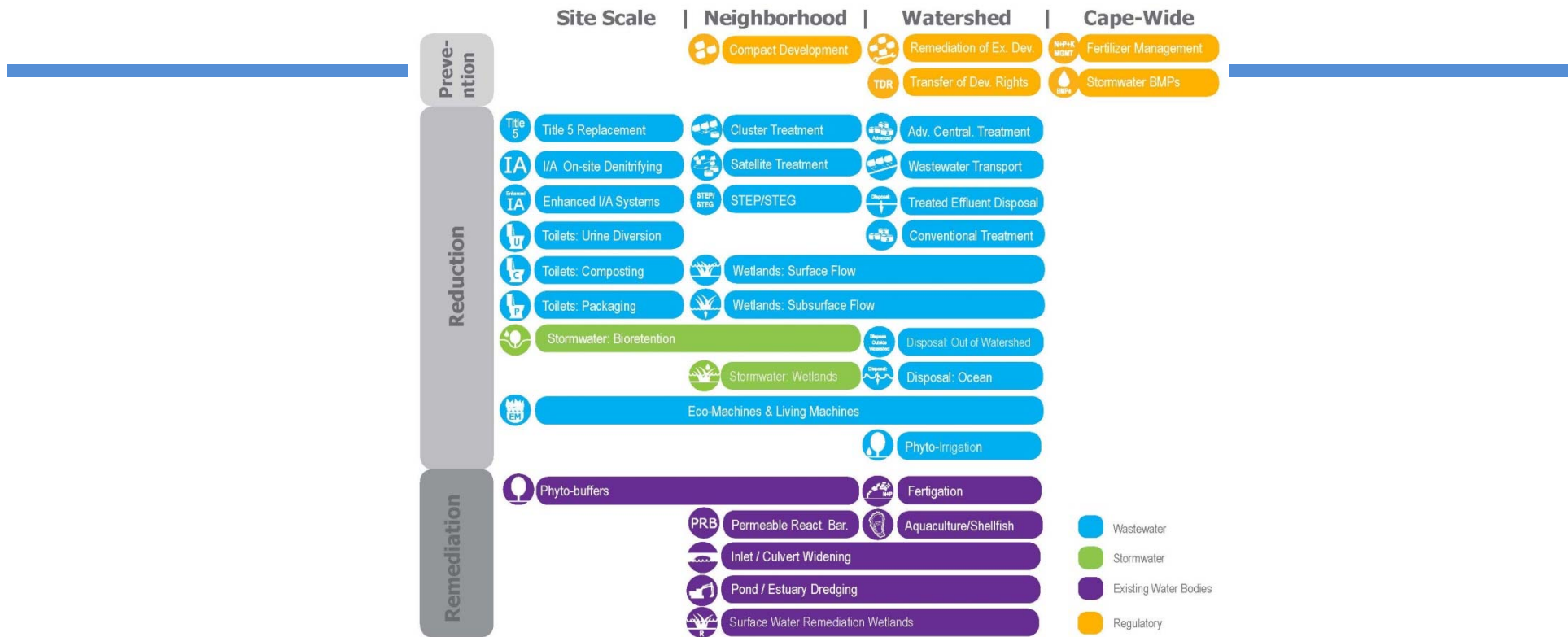


208 Planning Process

Baseline Conditions
11 Working Group Meetings: Sept 18-27

Technology Options Review
11 Working Group Meetings: Oct 21-Nov 5

Watershed Scenarios



208 Planning Process

Baseline
Conditions

11 Working
Group Meetings:
Sept 18-27

Technology
Options
Review

11 Working
Group Meetings:
Oct 21-Nov 5

Watershed
Scenarios

11 Working
Group Meetings:
Dec 2-11

208 Planning Process

**Baseline
Conditions**

**11 Working
Group Meetings:
Sept 18-27**

Goal of Today's Meeting:

To review and develop shared understanding of the characteristics of these watersheds, the work done to date, existing data and information available, and how to apply all of this to planning for water quality improvements for these watersheds moving forward.

208 Planning Process

Local Progress to Date

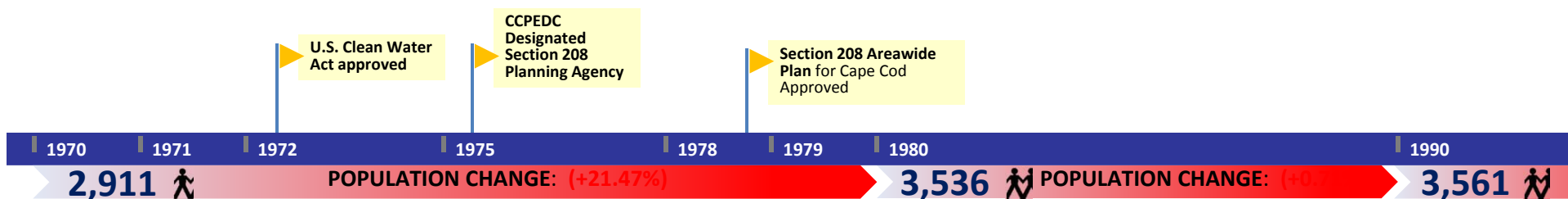


Provincetown Harbor
Hatches Harbor

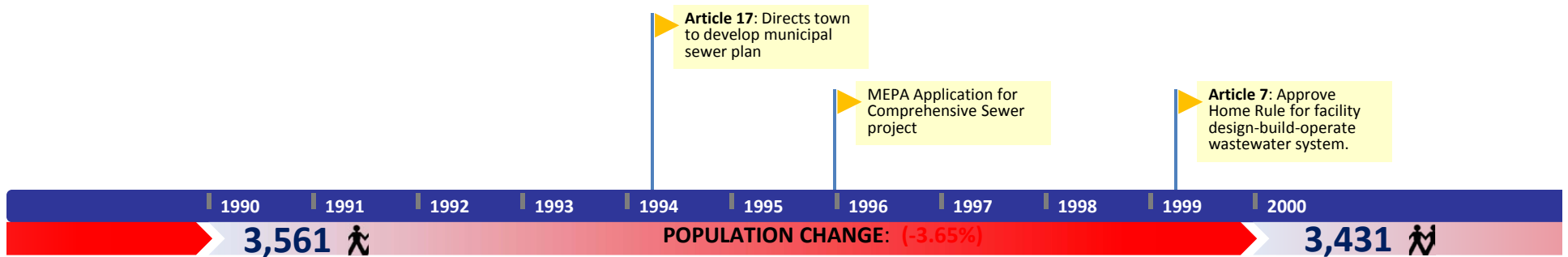
Provincetown

From 1978 Section 208 Plan

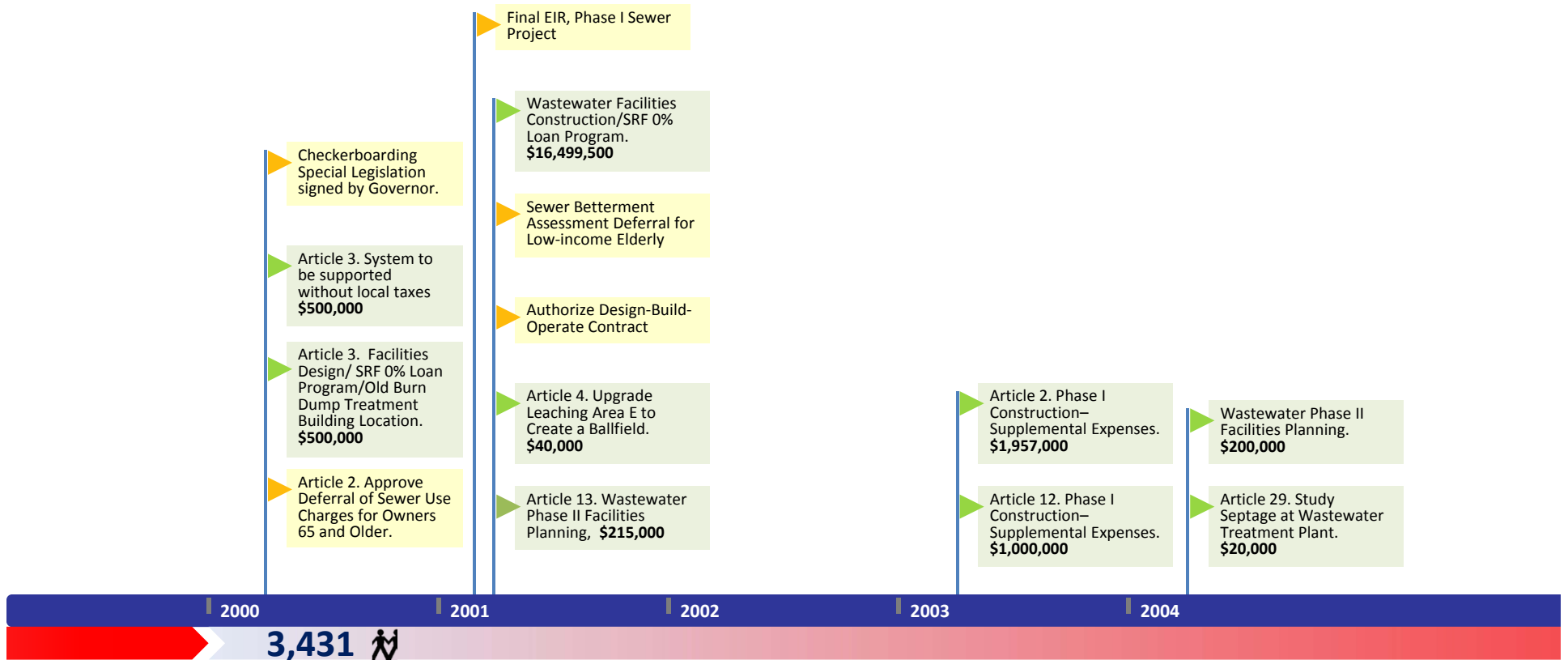
- ▶ Provincetown also has a serious wastewater management problem in the downtown area.
Several private studies of water quality ... concluded that contamination threatening public health exists in the harbor. Storm drains have been cited as the major source, to which septic system overflows are believed to be contributors.
- ▶ It is public knowledge that failing cesspools are widely used by commercial establishments and are pumped as often as three times a day during the summer.
It is recommended that if the town fails to initiate a 201 study to update and implement facility plans completed for the town ... by 1980, the DEQE should take enforcement action against the town for violations of Title 5.
- ▶ Augmentation of water supply to be disposed of on-site will raise the water table in downtown Provincetown, aggravating on-site system problems.
- ▶ Finally, the limitations of the water supply must be recognized and firm measures taken to prevent stimulation of growth by sewer construction.



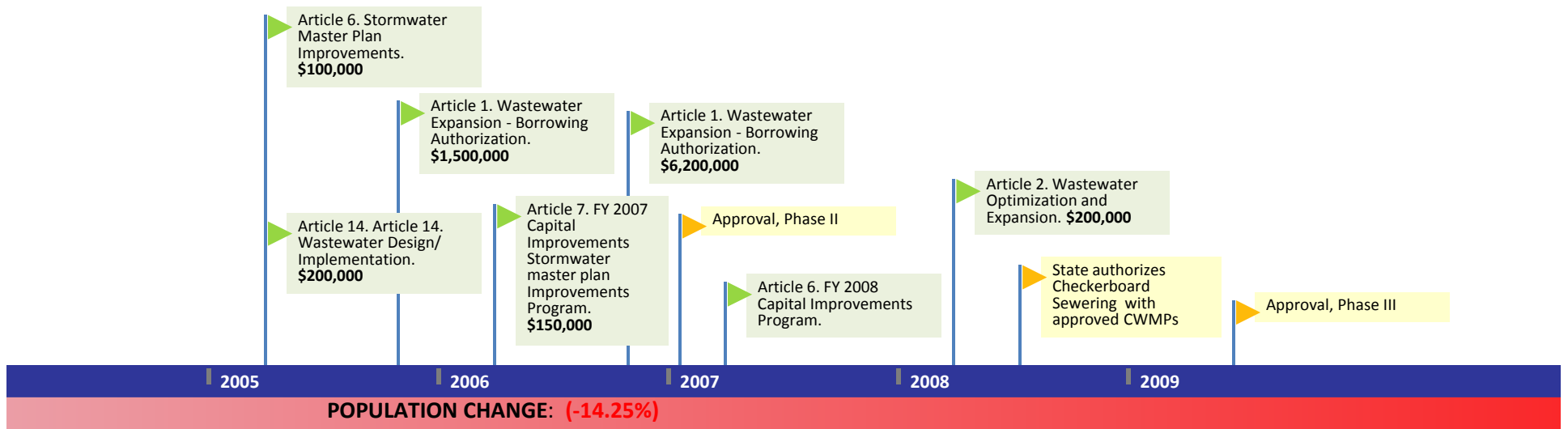
Provincetown: 1970-2013



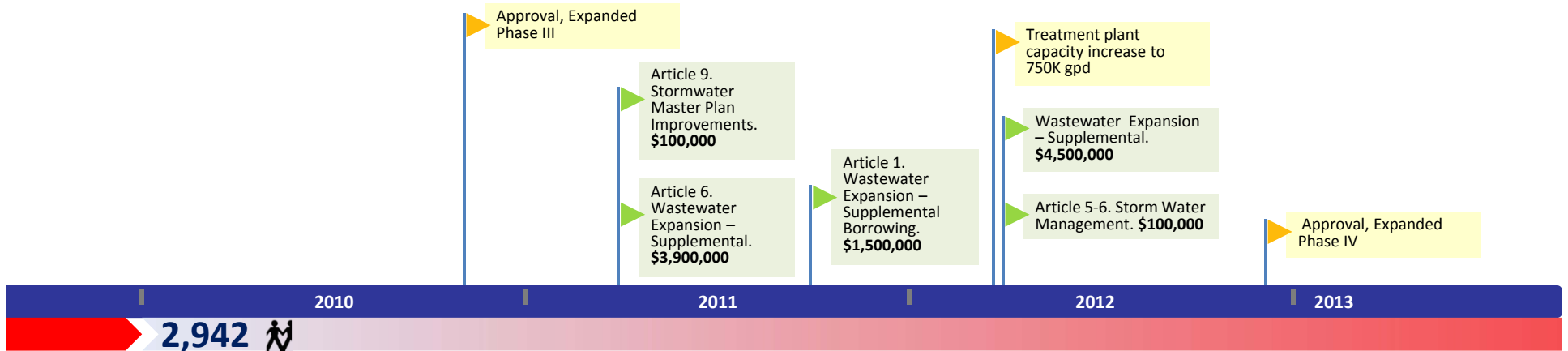
Provincetown: 1970-2013



Provincetown: 1970-2013



Provincetown: 1970-2013



Truro: 1970-2013

From 1978 Section 208 Plan

- ▶ A recent gasoline spill from a leaking service station storage tank has resulted in contamination of the groundwater approximately 600 feet from the South Hollow Well field.
- ▶ Even if the South Hollow Wellfield is put back into production, however, Provincetown presently needs an additional permanent water supply.
- ▶ Development of a water supply plan for the outer Cape groundwater basins should be given immediate priority by

local, regional and federal agencies.

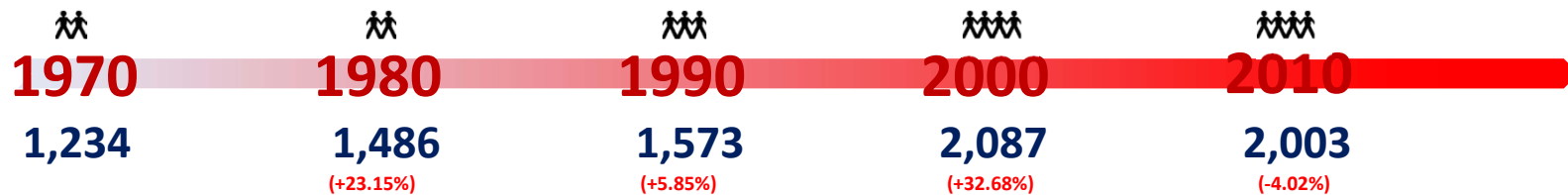
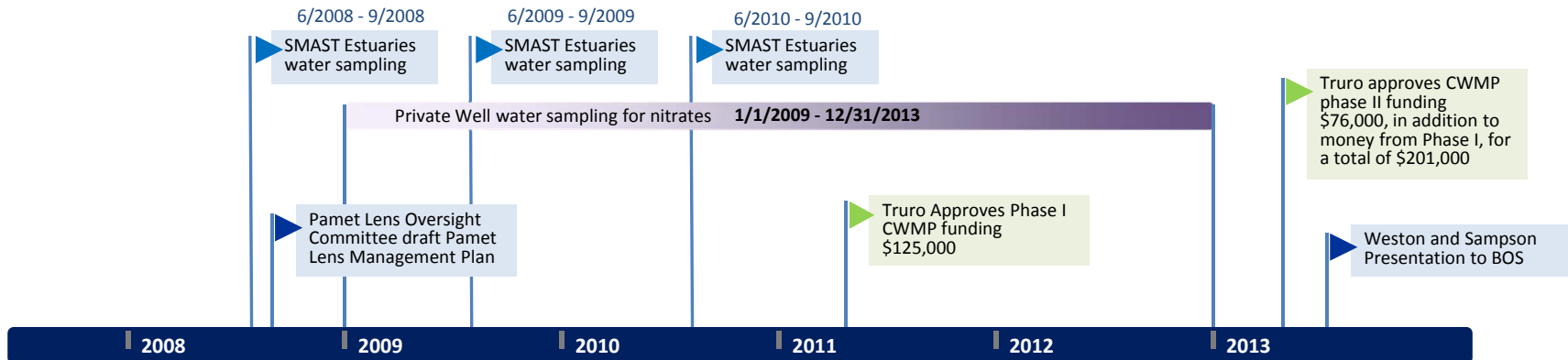
- ▶ Growth controls and water conservation must be given full consideration in such a planning effort to assure that the groundwater resource is not overdeveloped.
- ▶ With Truro's naturally sandy soils, the town's wastewater problems are limited to a small strip of commercial development along a low-lying barrier beach known as Beach Point.

This area of was included in the Sewer Service Areas Map on the basis of the

likely cost-effectiveness if a sewer is built for Provincetown.

- ▶ Local officials of Truro expressed concern over possible growth impacts of sewerage. A means of growth control should be included in any facility plan for this reason.

Further investigation is also recommended of the water quality impacts of the landfill and septage pits.



Did we miss anything?



Your Watersheds

**Provincetown Harbor
Hatches Harbor**










Cape Cod National Seashore


Natural Features


Base Map

 Town Lines


 Rivers


Embayment Boundary


 On Land


 On Sea

Major Roads

 US Highway


 State Highway

 Roads


 Structures


 Ponds


Natural Areas

 Cranberry Bogs

 Wetlands


 Natural Heritage & Endangered Species Program (NHESP) Certified Vernal Pools

 Sea, Lake, & Overland Surges from Hurricanes (SLOSH) Update 2013

 Preliminary FEMA Flood Rate Insurance Map (FIRM) Zones 2013


Managed Surfaces


Base Map

 Town Lines


 Rivers


Embayment Boundary

 On Land


 On Sea

Major Roads

 US Highway


 State Highway


 Roads


 Structures


 Ponds

Managed Surfaces

 Approximate Managed Ground Surfaces


 Approximate Residential Managed Lawns

 Approximate Managed Golf Courses

 Approximate Municipal Managed Natural Surfaces


Regulatory


Base Map

 Town Lines


 Rivers


Embayment Boundary


 On Land


 On Sea

Major Roads

 US Highway


 State Highway

 Roads


 Structures


 Ponds

Regulatory

 Areas of Critical Environmental Concern


OpenSpace: Level of Protection


 In Perpetuity

 Limited


 None


Landuse Vision Map


 Economic Center

 Industrial and Service Trade Area

 Village


 Resource Protection Area

 Other

 Undesignated


Land Use Change


Base Map

 Town Lines


 Rivers


Embayment Boundary

 On Land


 On Sea

Major Roads

 US Highway


 State Highway


 Roads


 Structures


 Ponds


LandUse Change

 Residential

 Commercial

 Industrial

 Wooded, Natural, or Wetlands

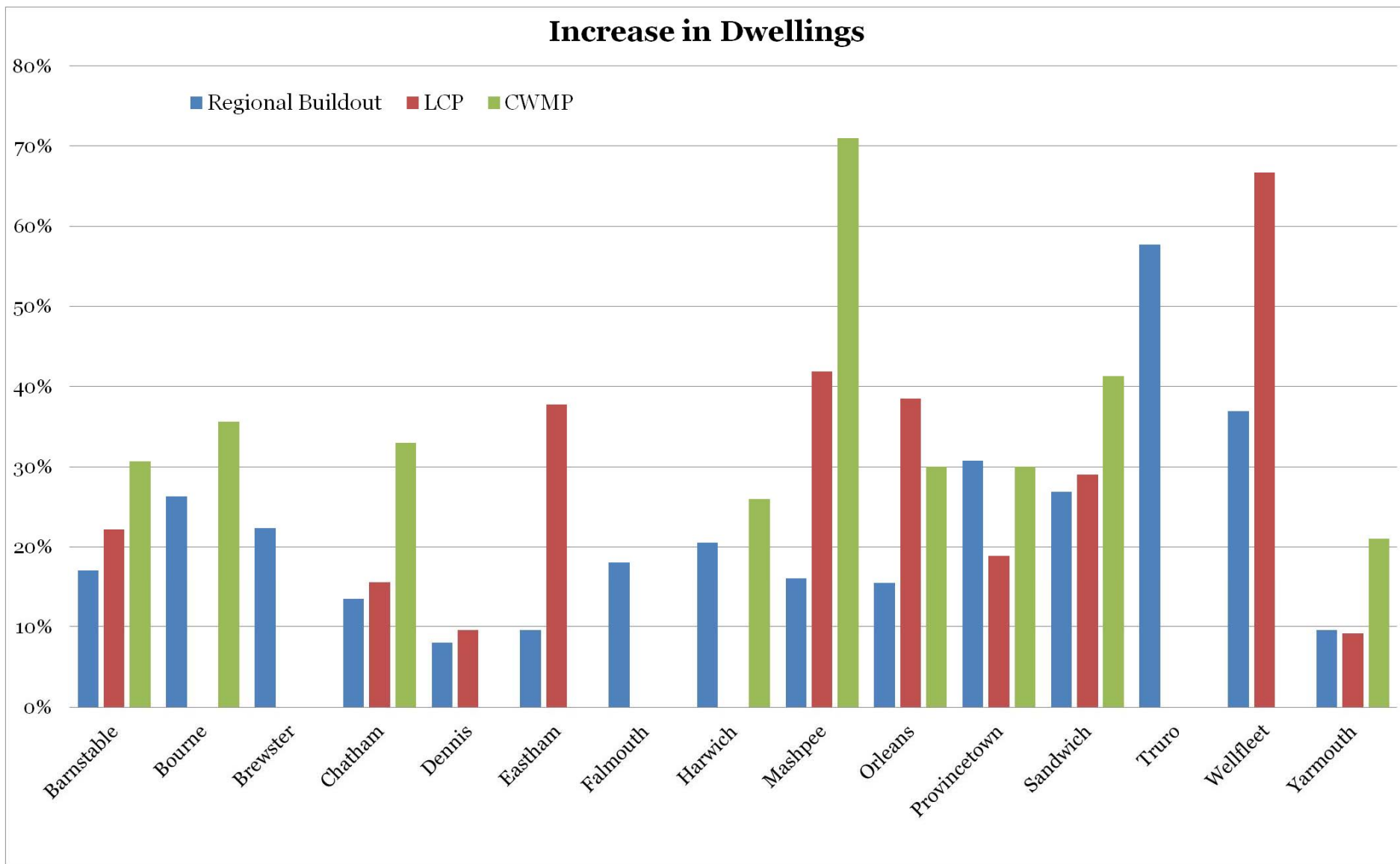
 Open - Disturbed or Managed

 Water

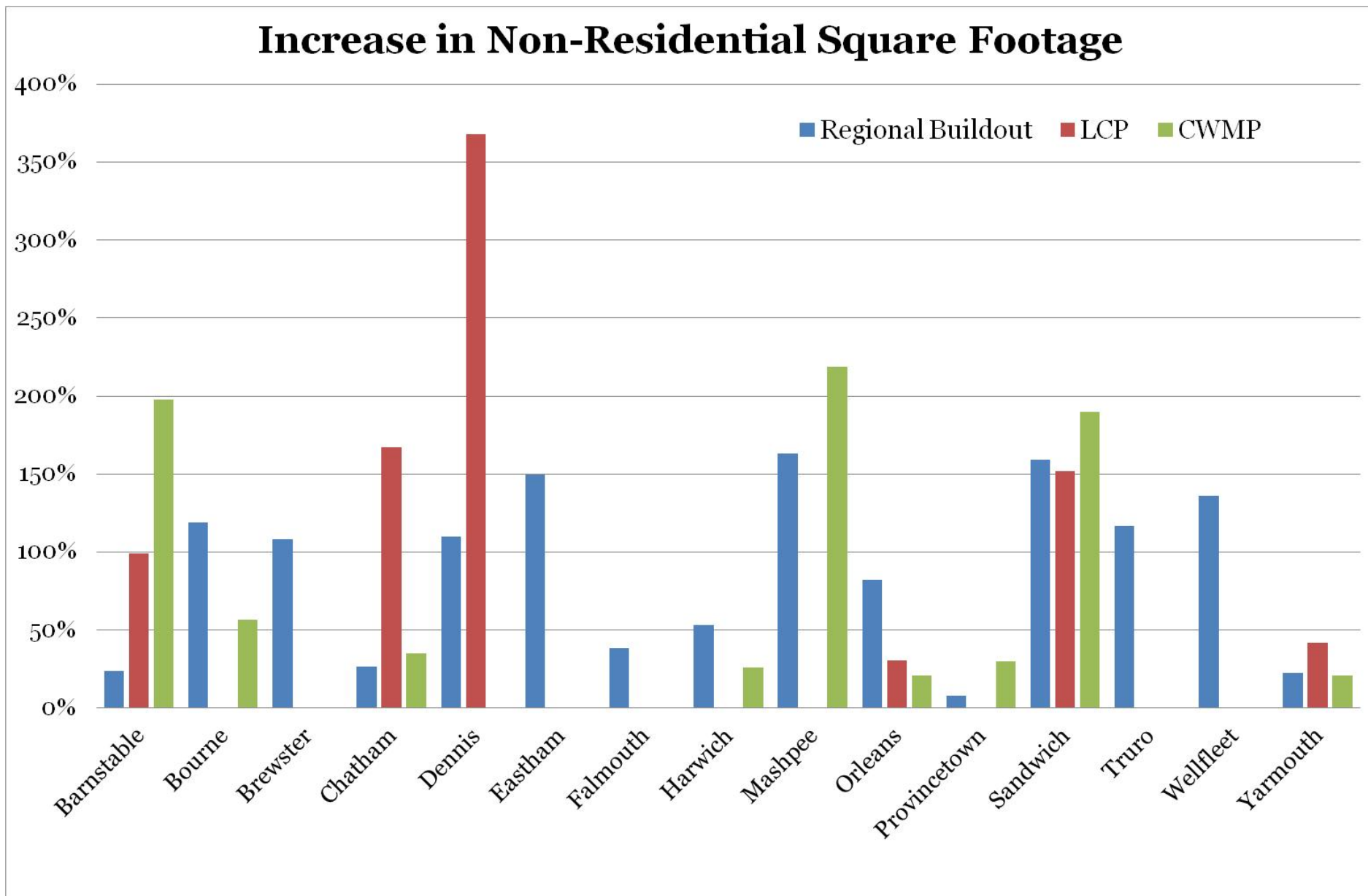
Density

**Cape Wide Cost Estimate:
30% growth will increase
capital costs by 40%**

Buildout



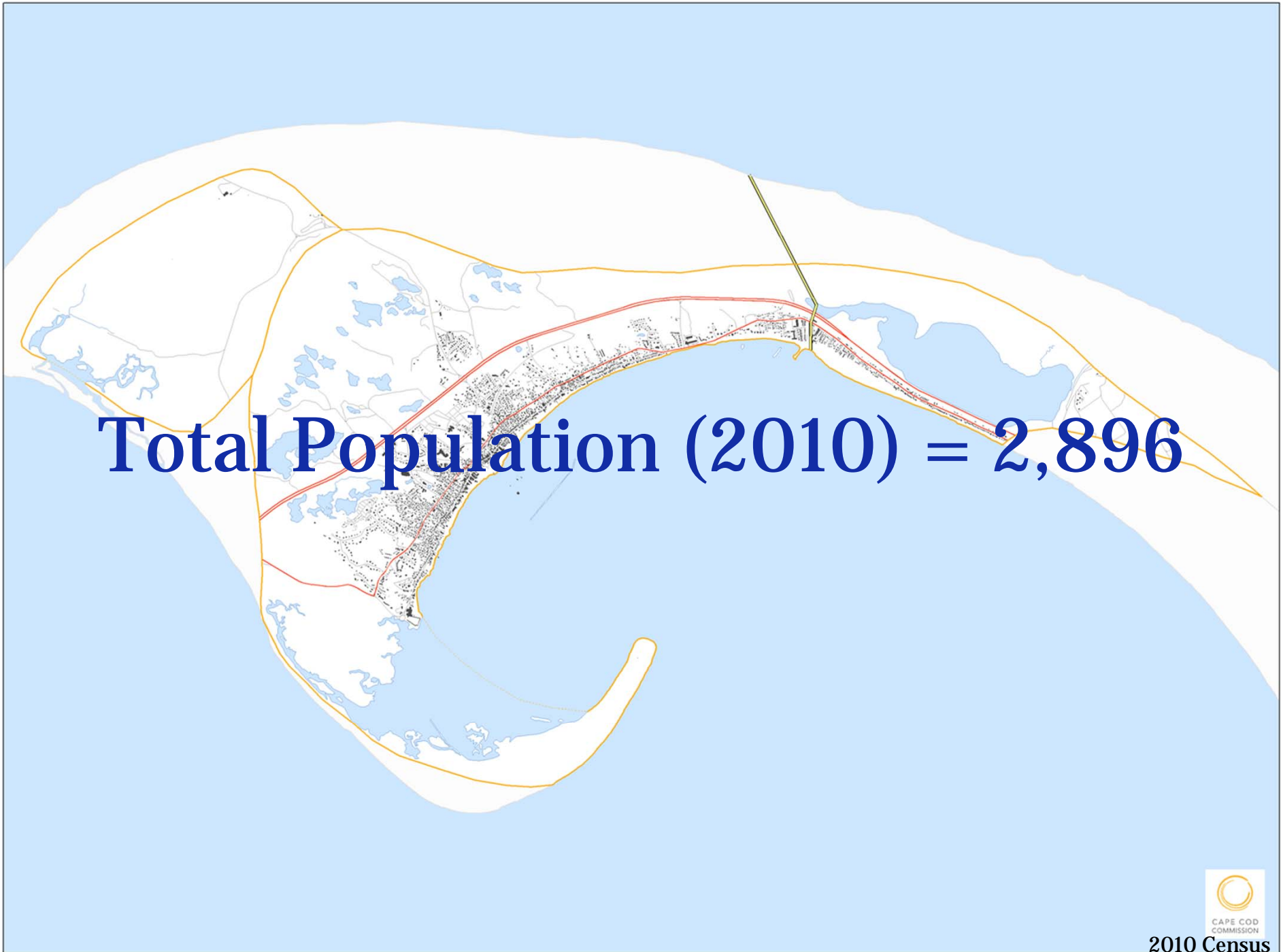
Buildout





The People

Provincetown Harbor
Hatches Harbor

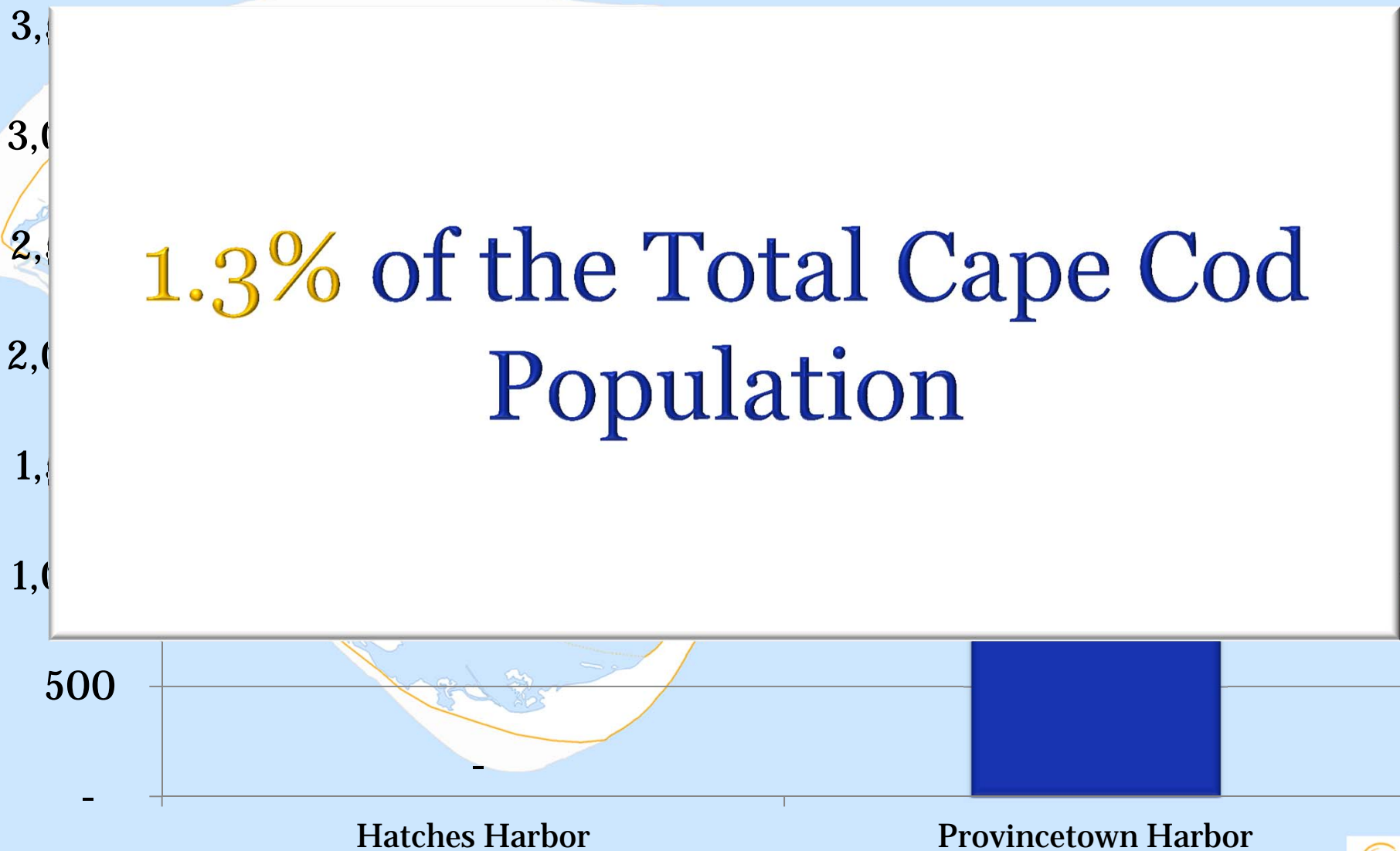


Total Population (2010) = 2,896

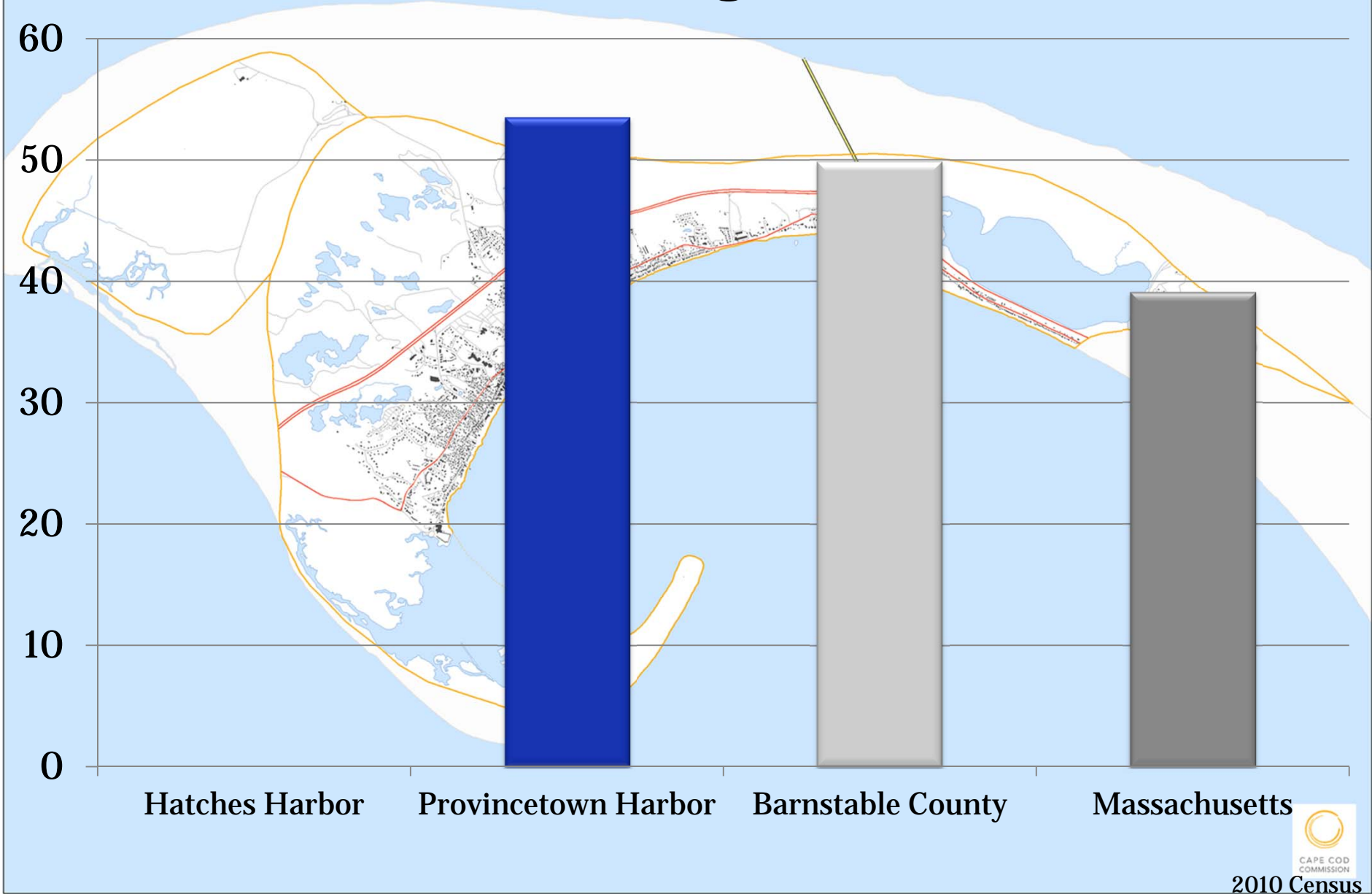


Population (2010)

1.3% of the Total Cape Cod Population



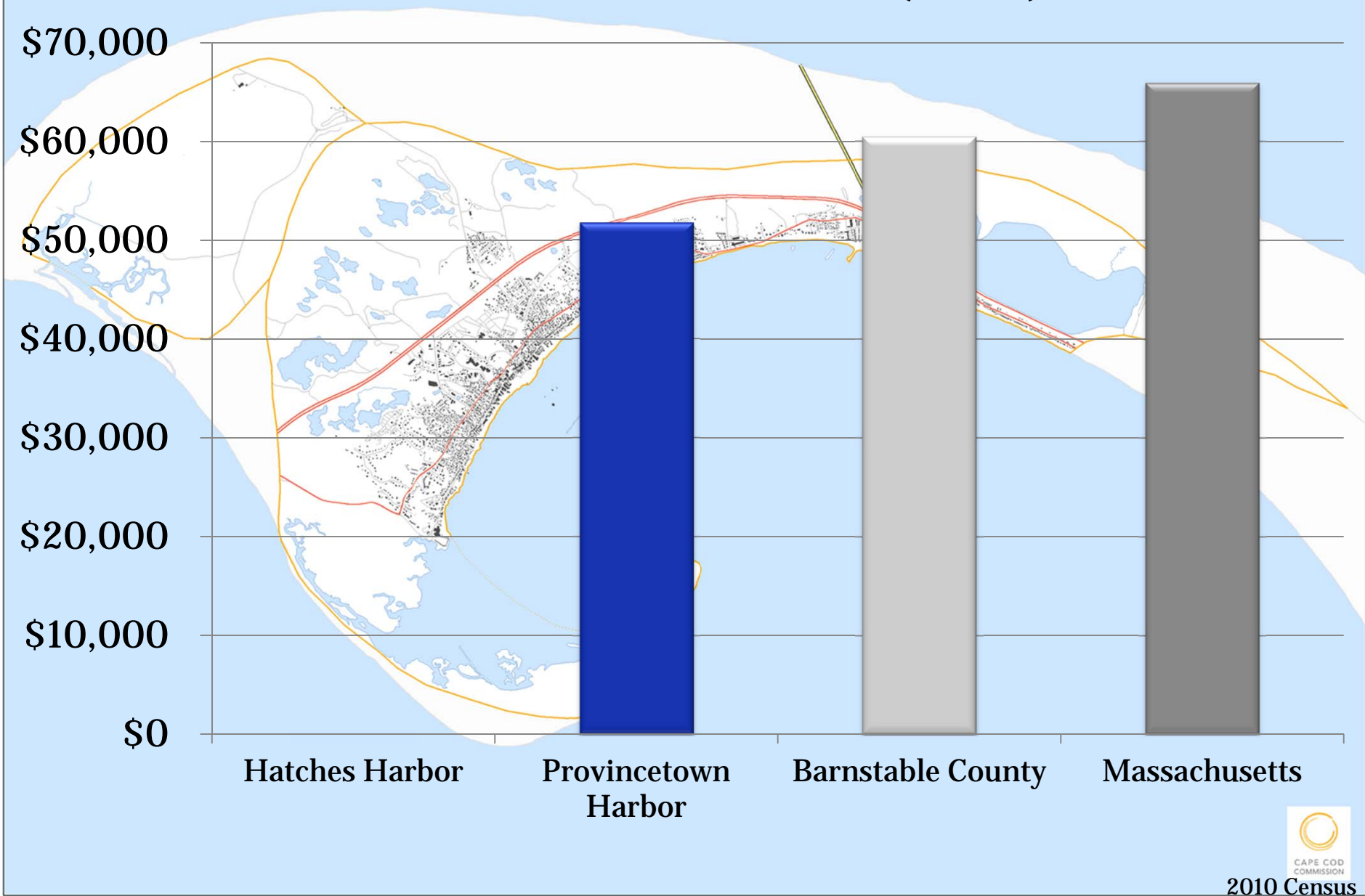
Median Age (2010)



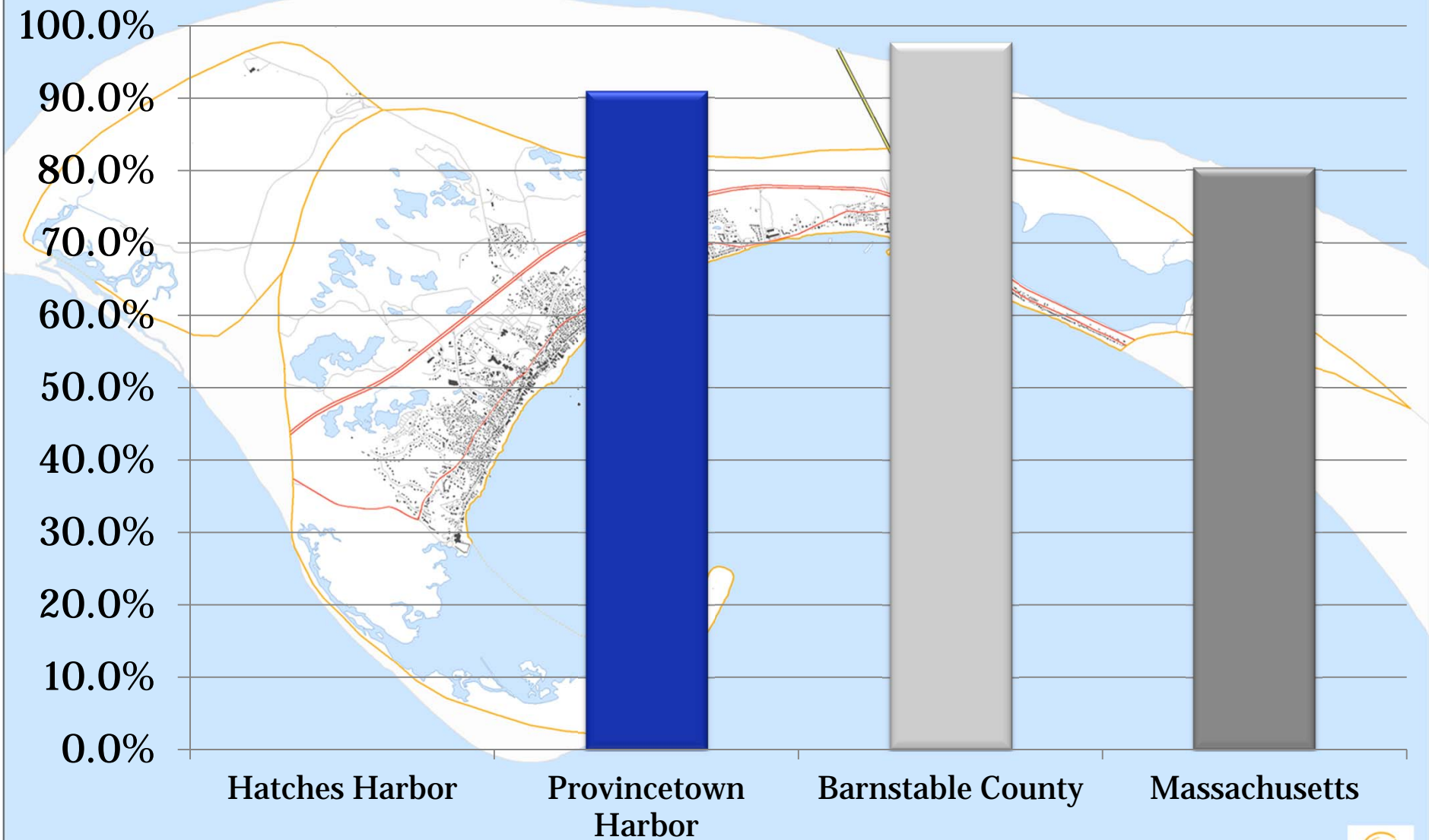
CAPE COD
COMMISSION

2010 Census

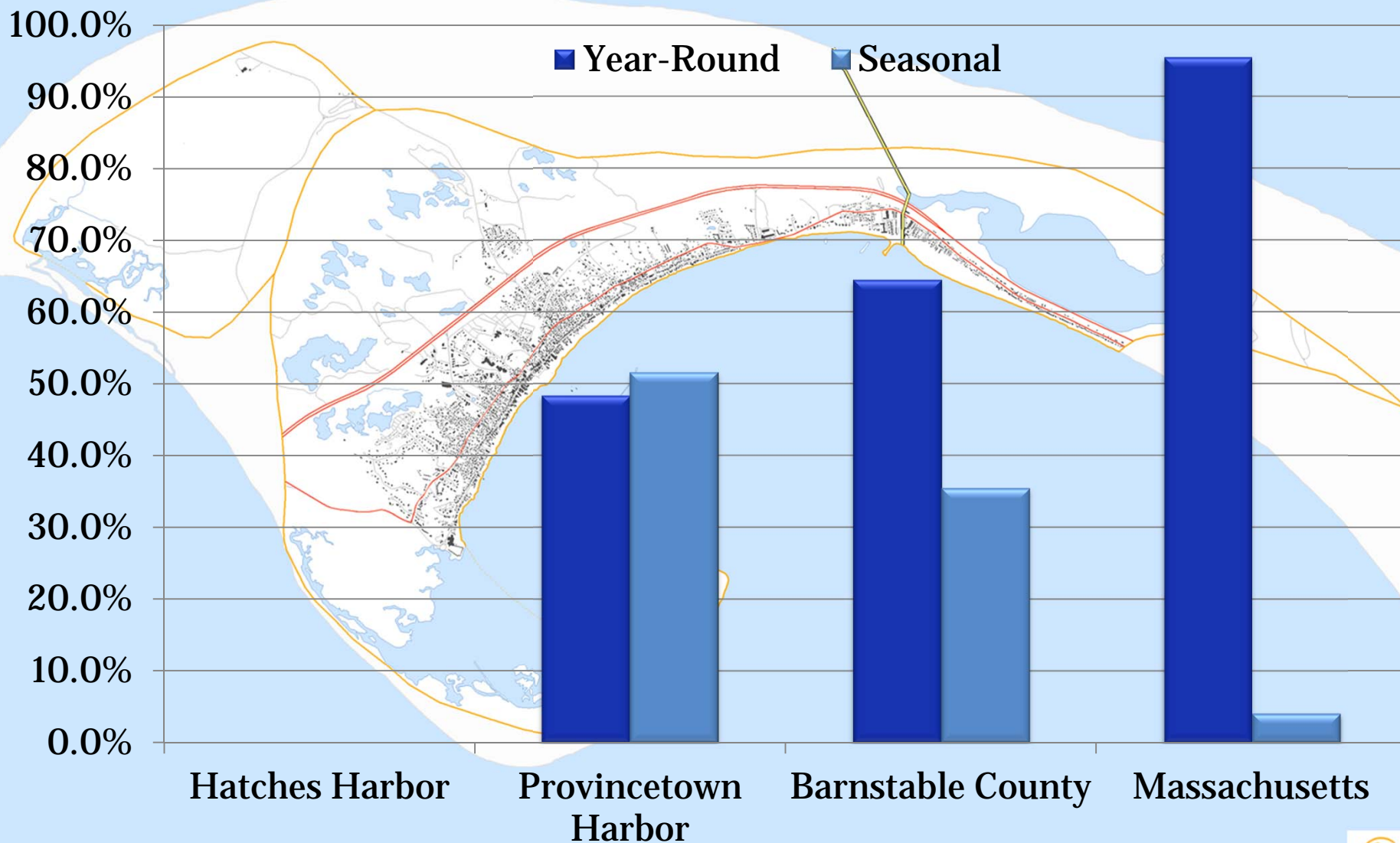
Median Income (2010)



Race - % White (2010)



Seasonal vs. Year Round Housing (2010)



Average Assessed Home Value (2010)

\$1,200,000

\$1

Total Assessed Value of
Residential Homes=
\$1,984,079,400

\$0

Hatches Harbor

Provincetown
Harbor

Barnstable County

Massachusetts

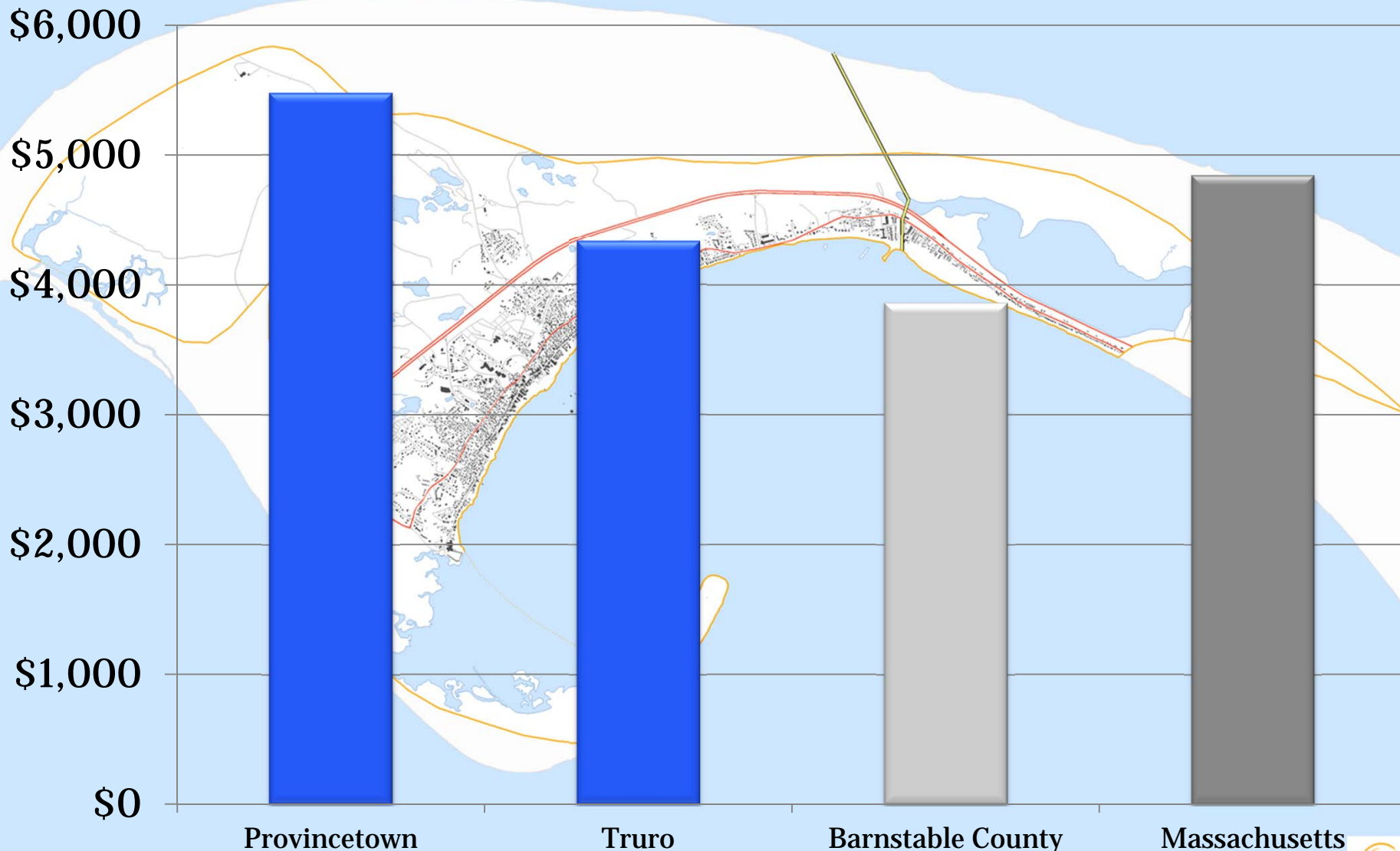


Your Government & Taxes

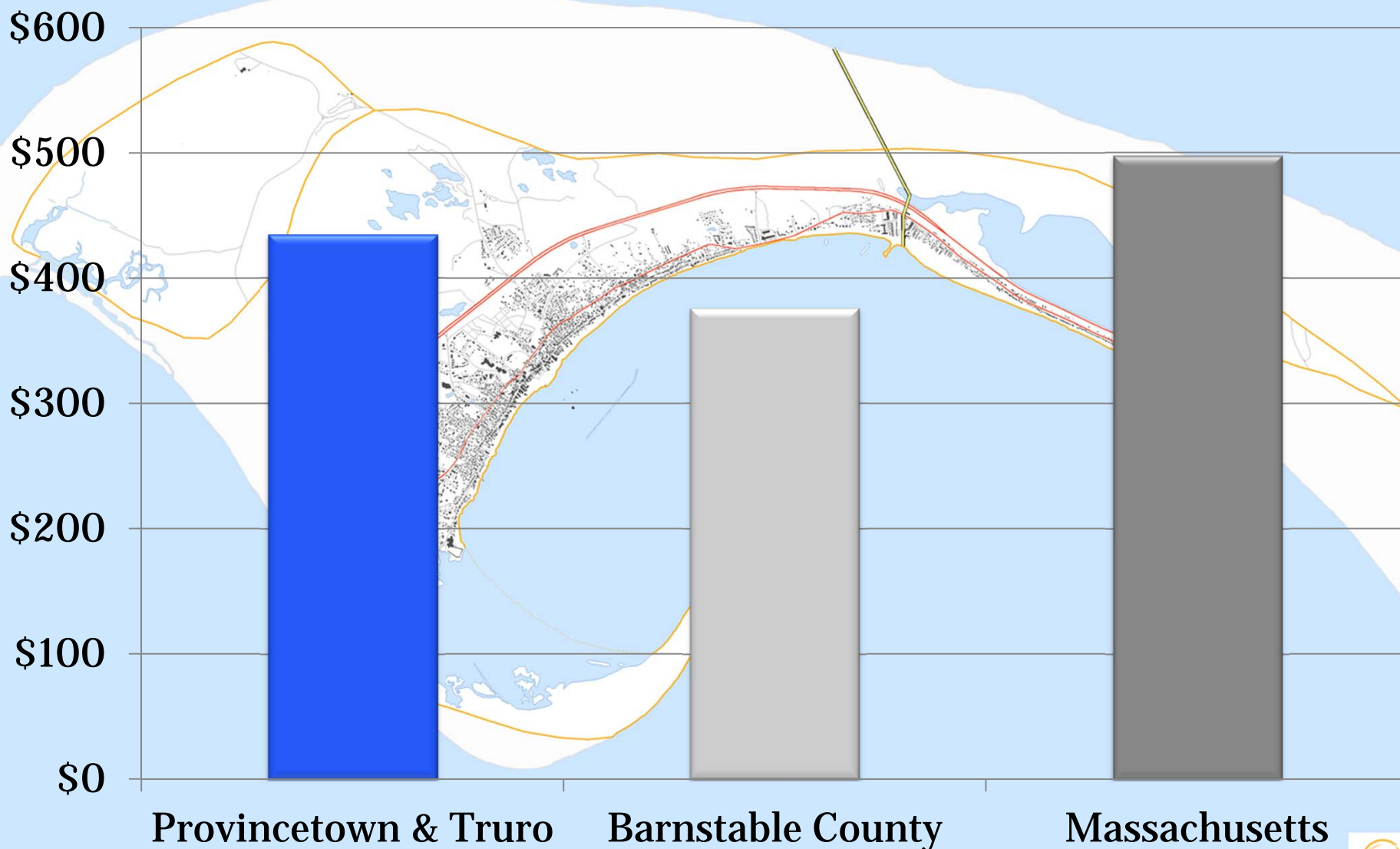


**Provincetown Harbor
Hatches Harbor**

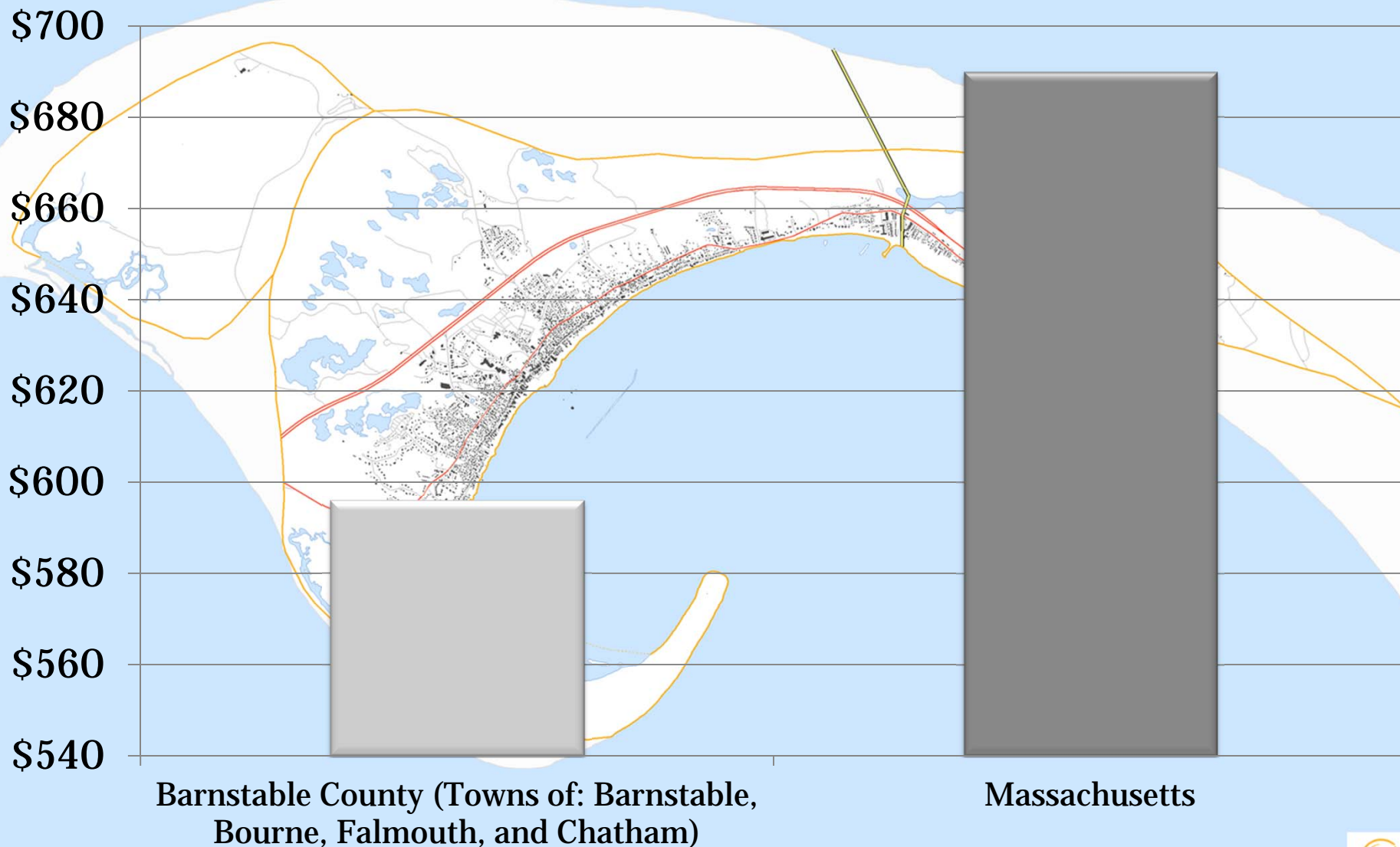
Average Single Family Property Tax Bill (2013)



Average Annual Water Bill (2012)



Average Annual Sewer Bill (2012)



The Problem



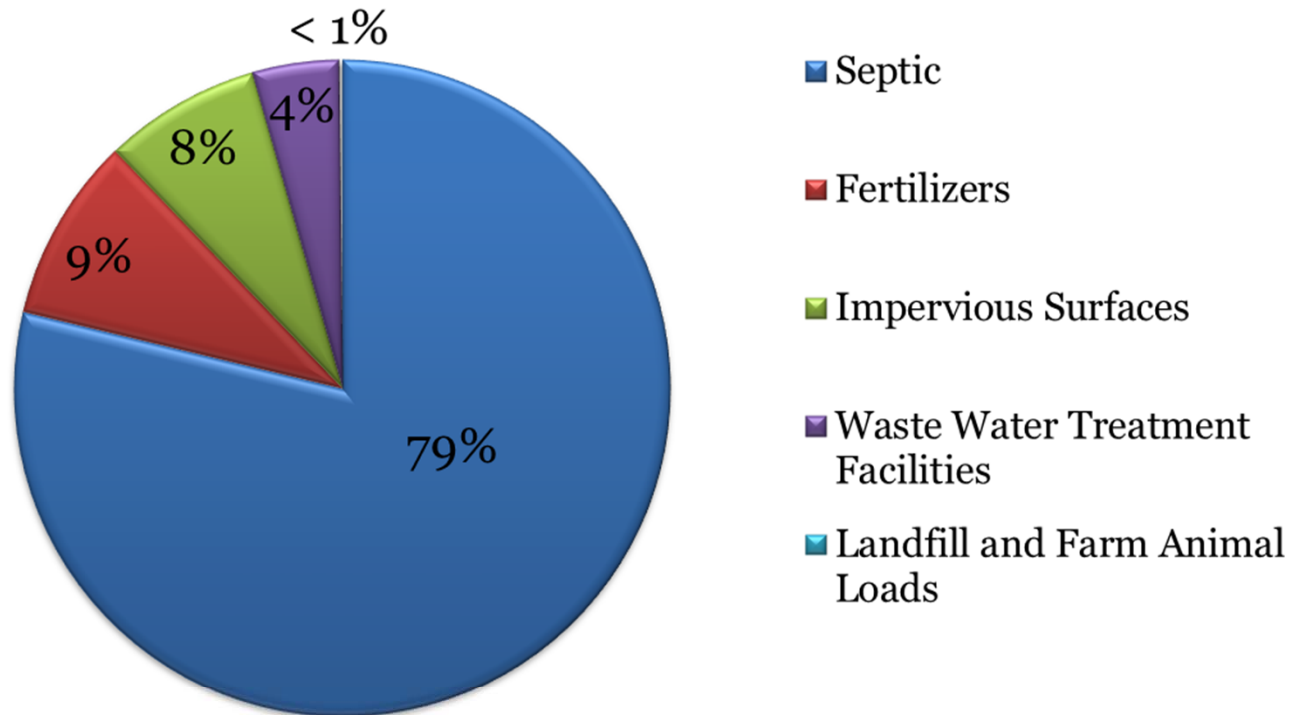
**Provincetown Harbor
Hatches Harbor**



Massachusetts Estuaries Project

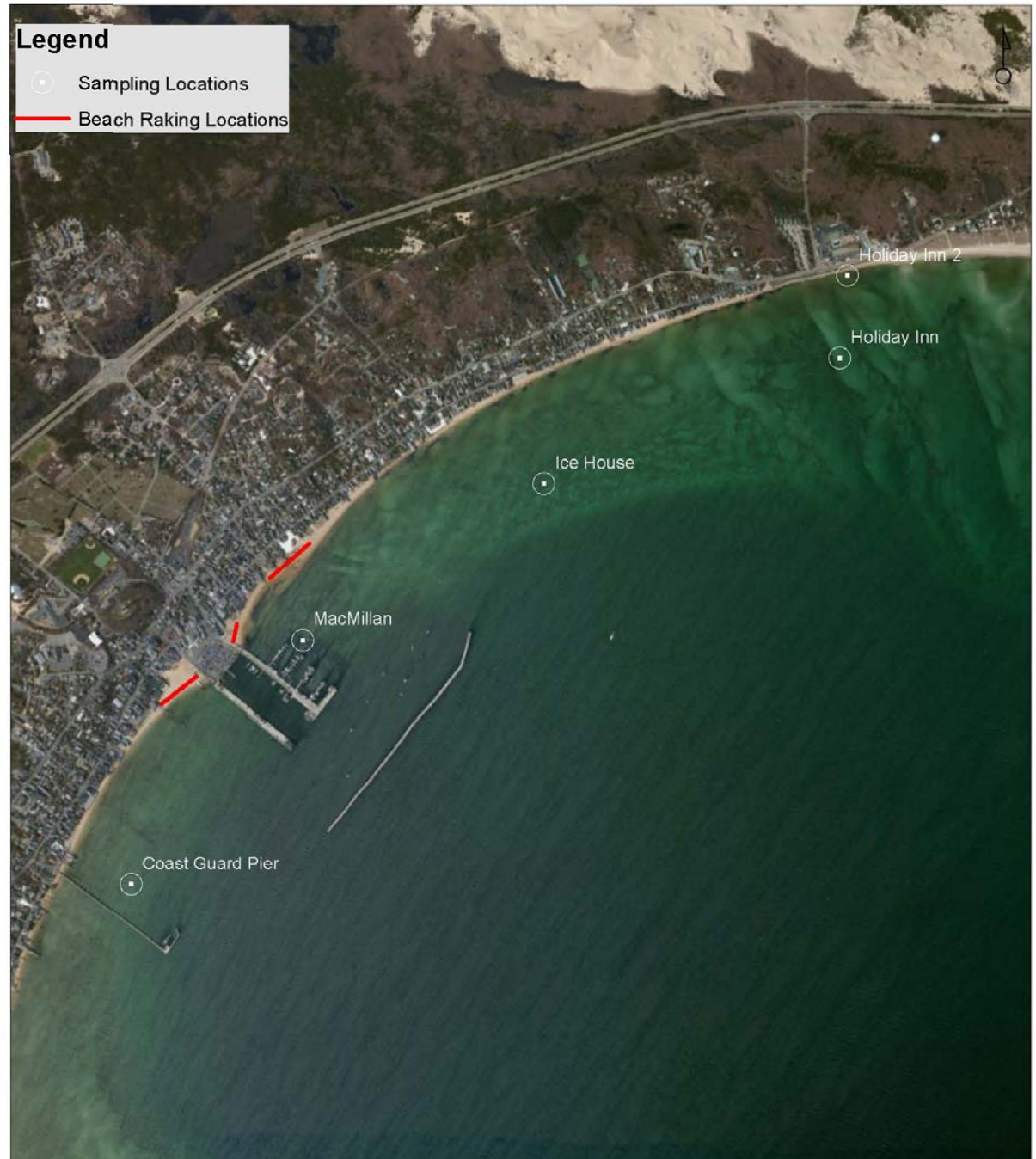
- Opportunity for towns to obtain independent analysis of nitrogen loading and its impact on water quality
- Provides water quality, nutrient loading, and hydrodynamic information
- Water quality monitoring – minimum of 3 years of data for each embayment
- Watershed model links water quality data to nitrogen loads

Cape Wide Controllable Nitrogen Loads

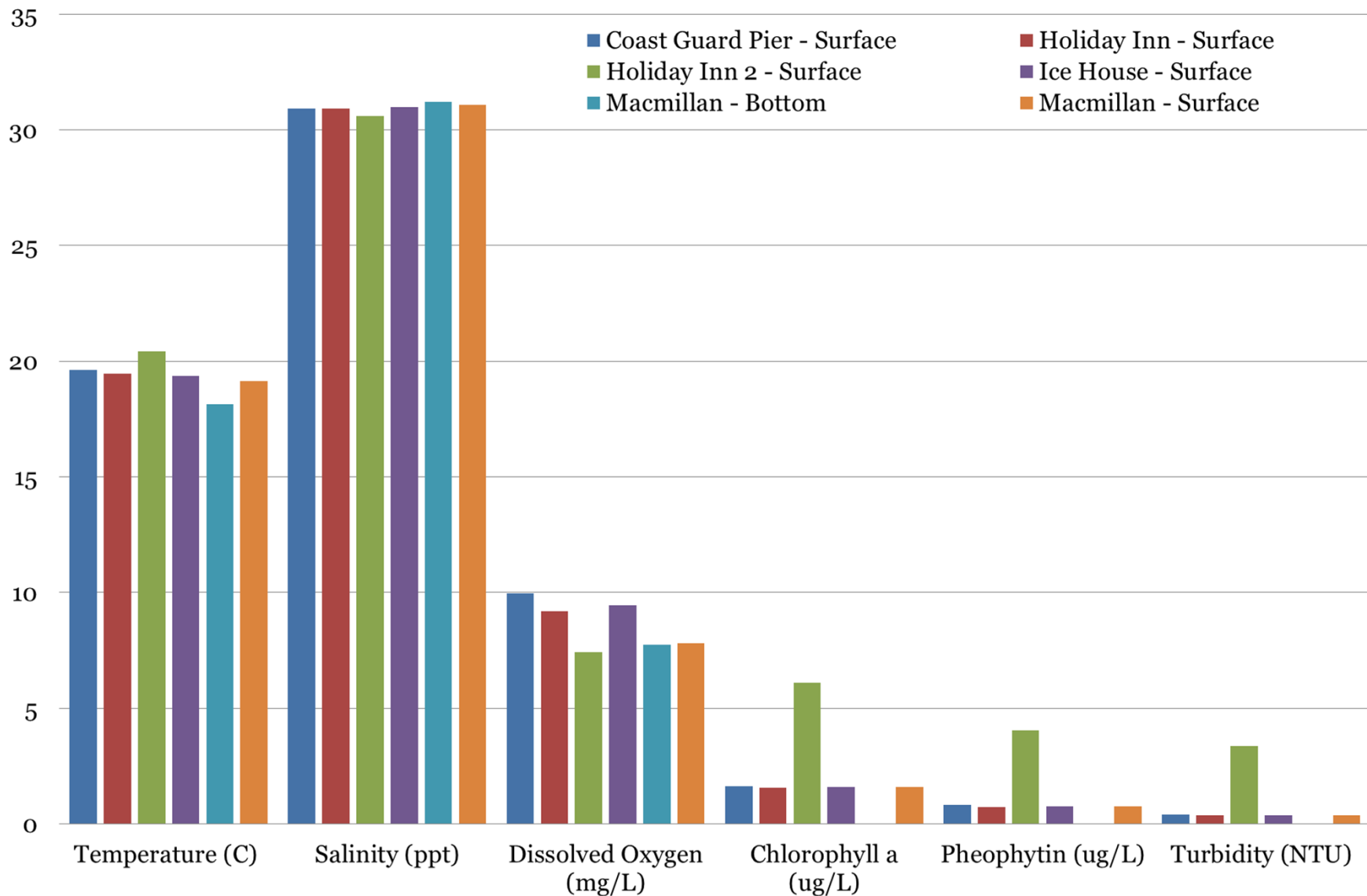


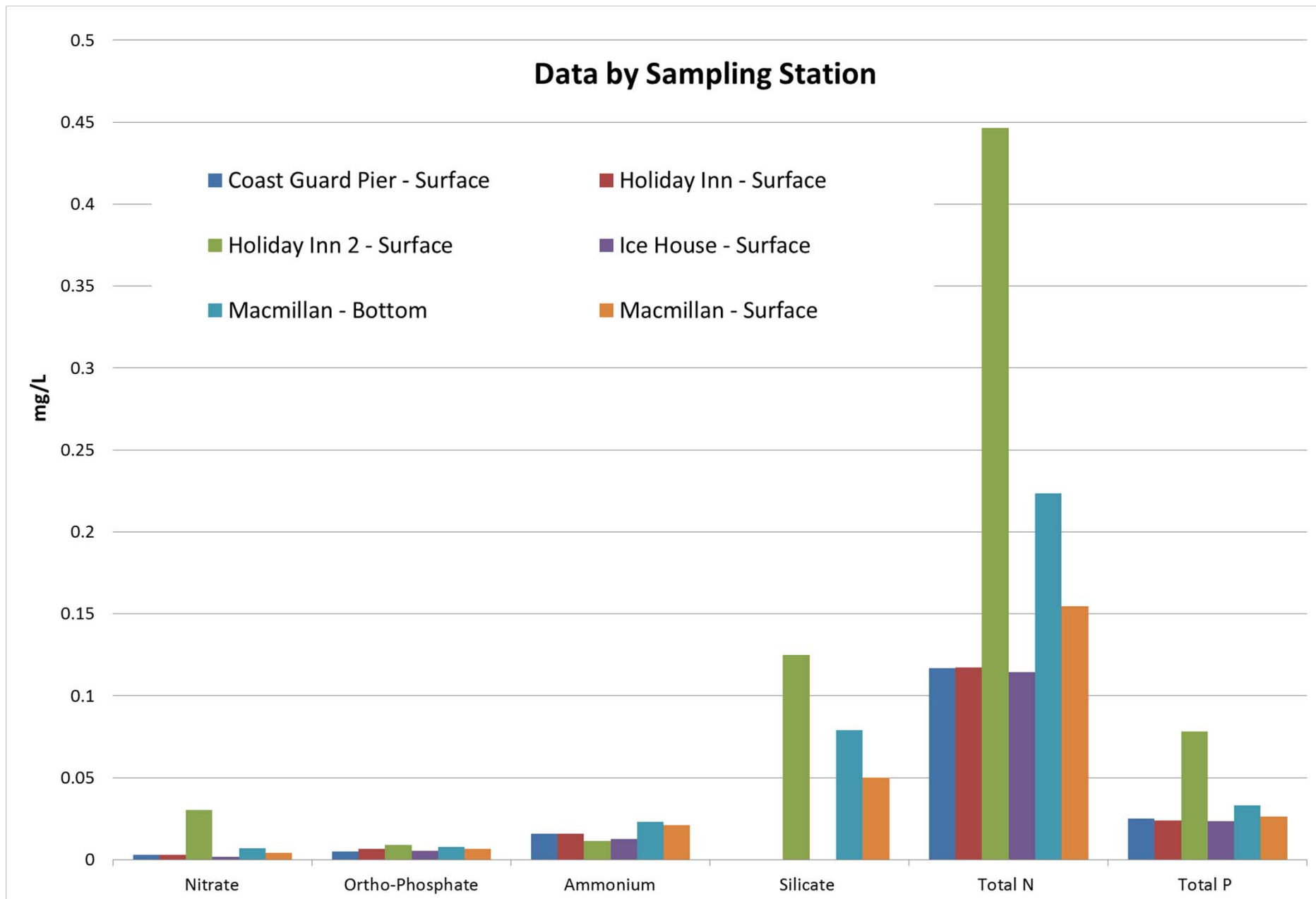
Note: Data Averaged from Existing Massachusetts Estuaries Project Reports

Water Quality Sampling Stations

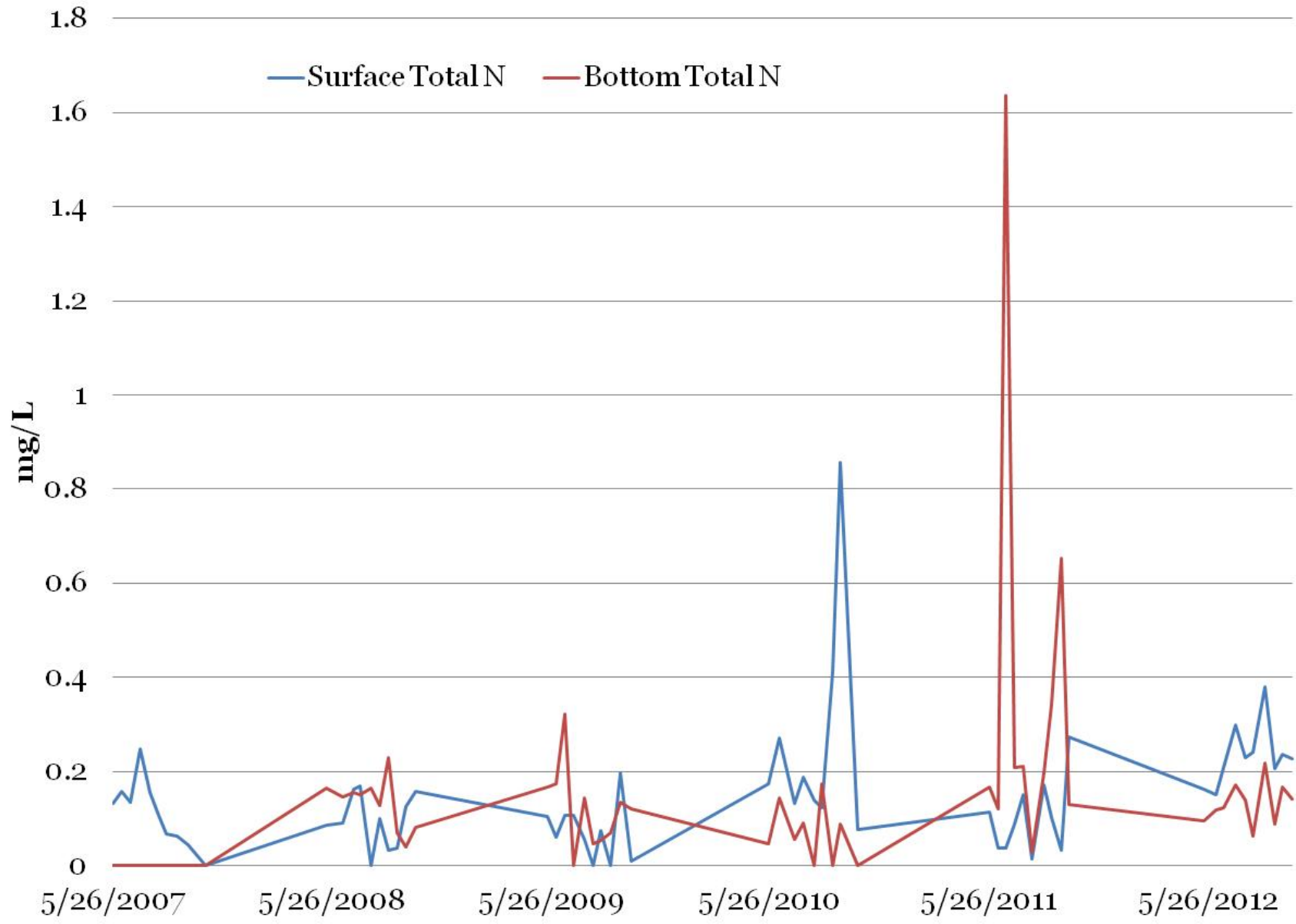


Average Water Quality Measurements for Provincetown Harbor

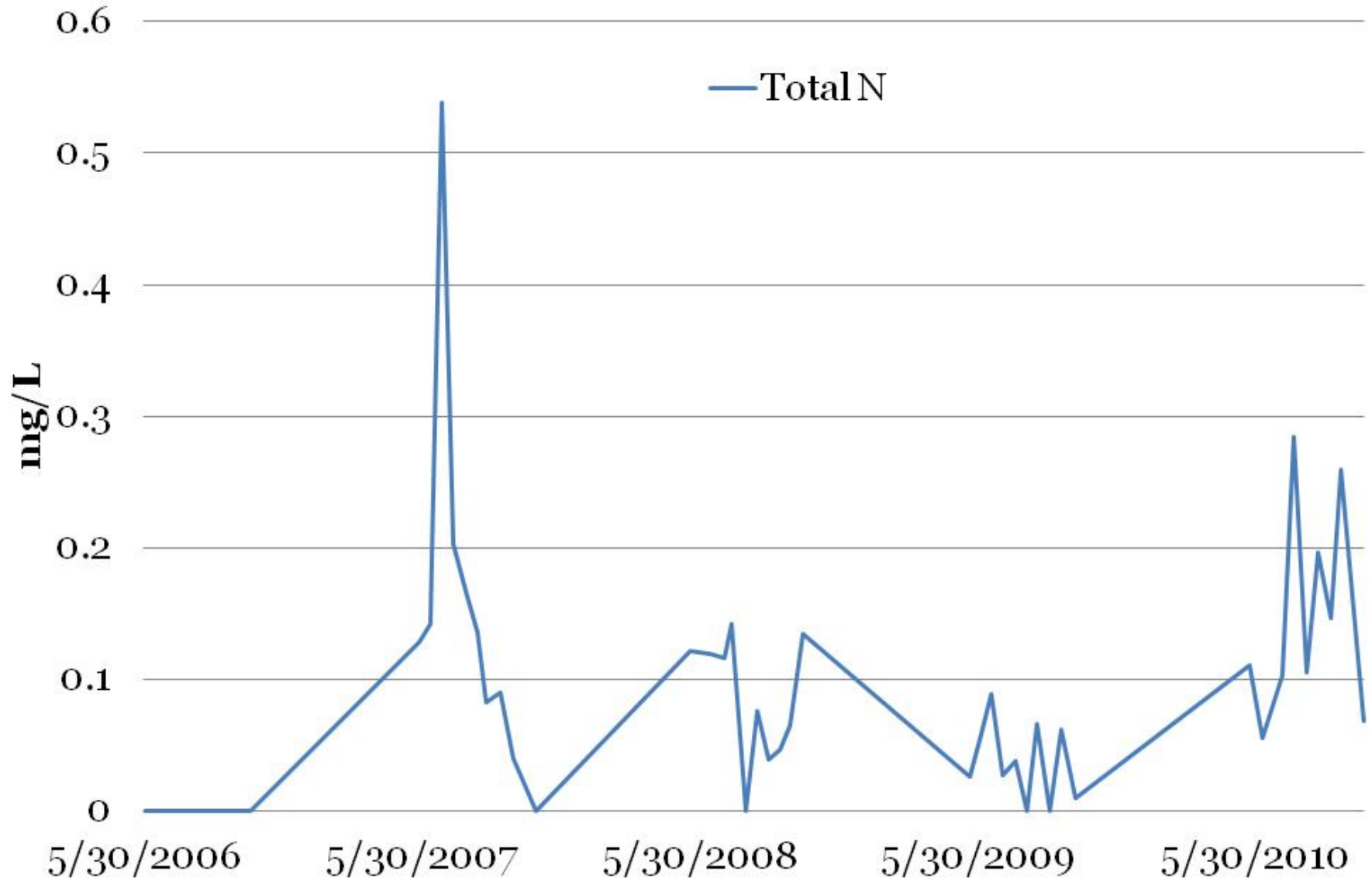


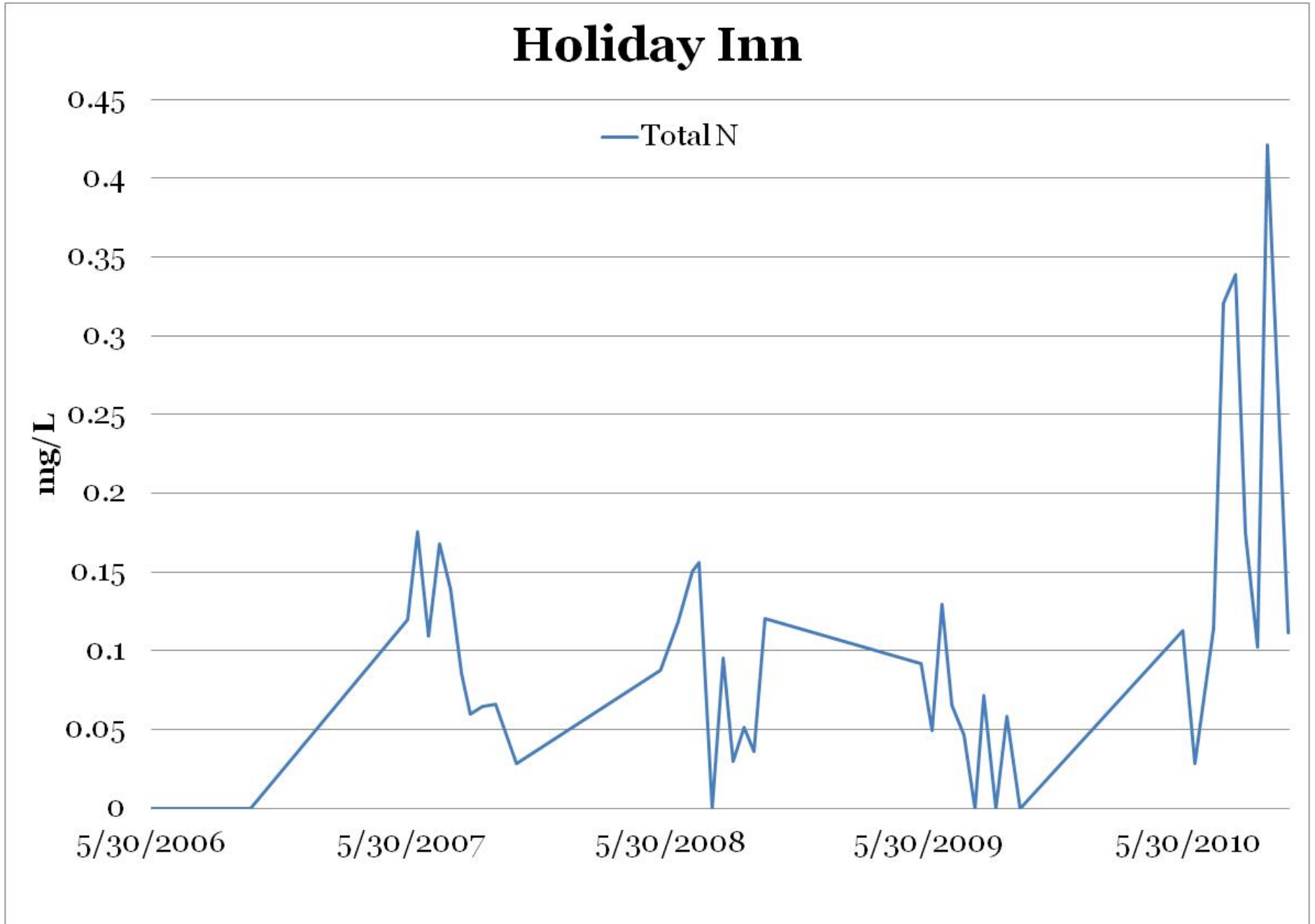


MacMillan

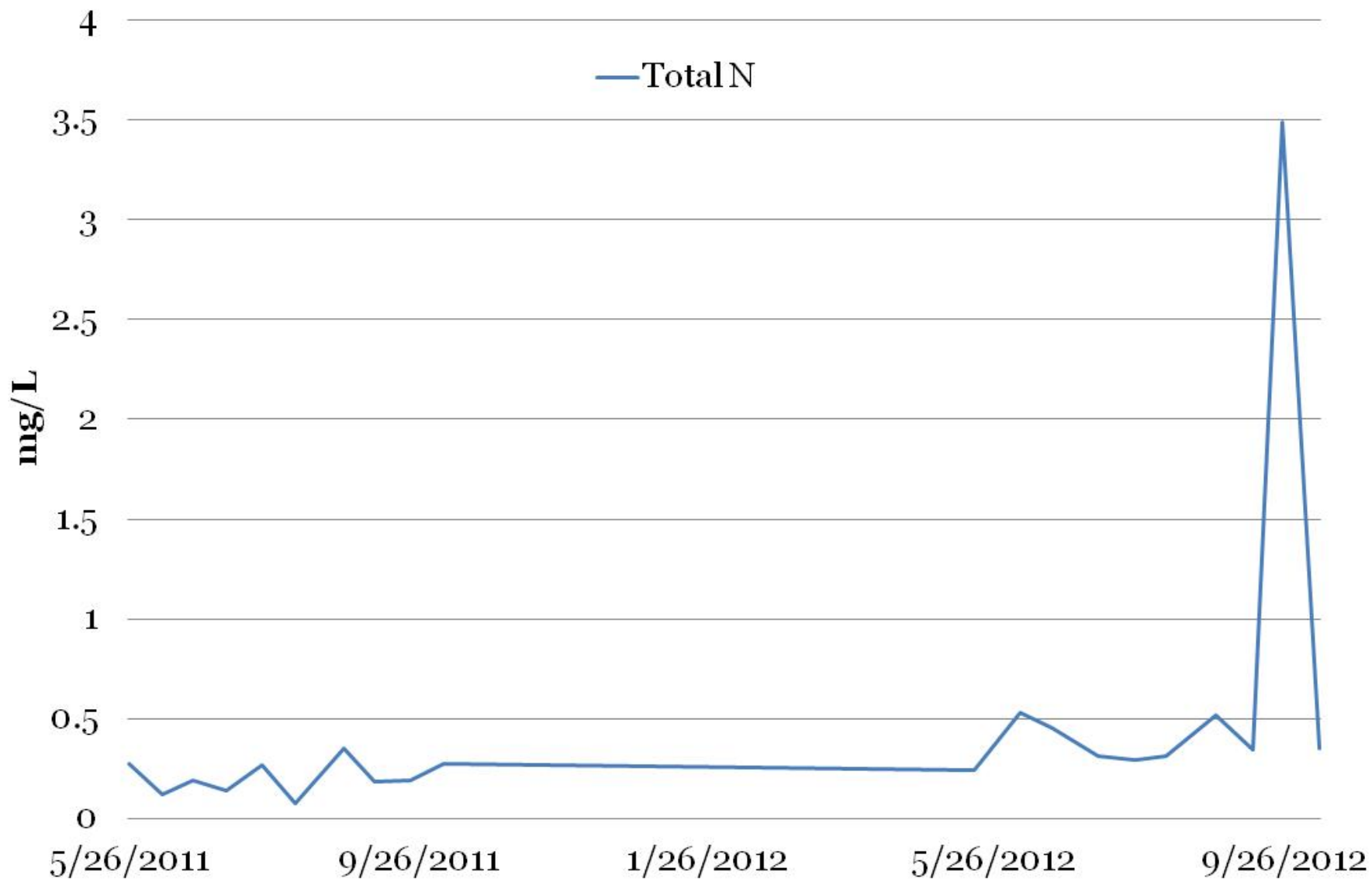


Coast Guard Pier

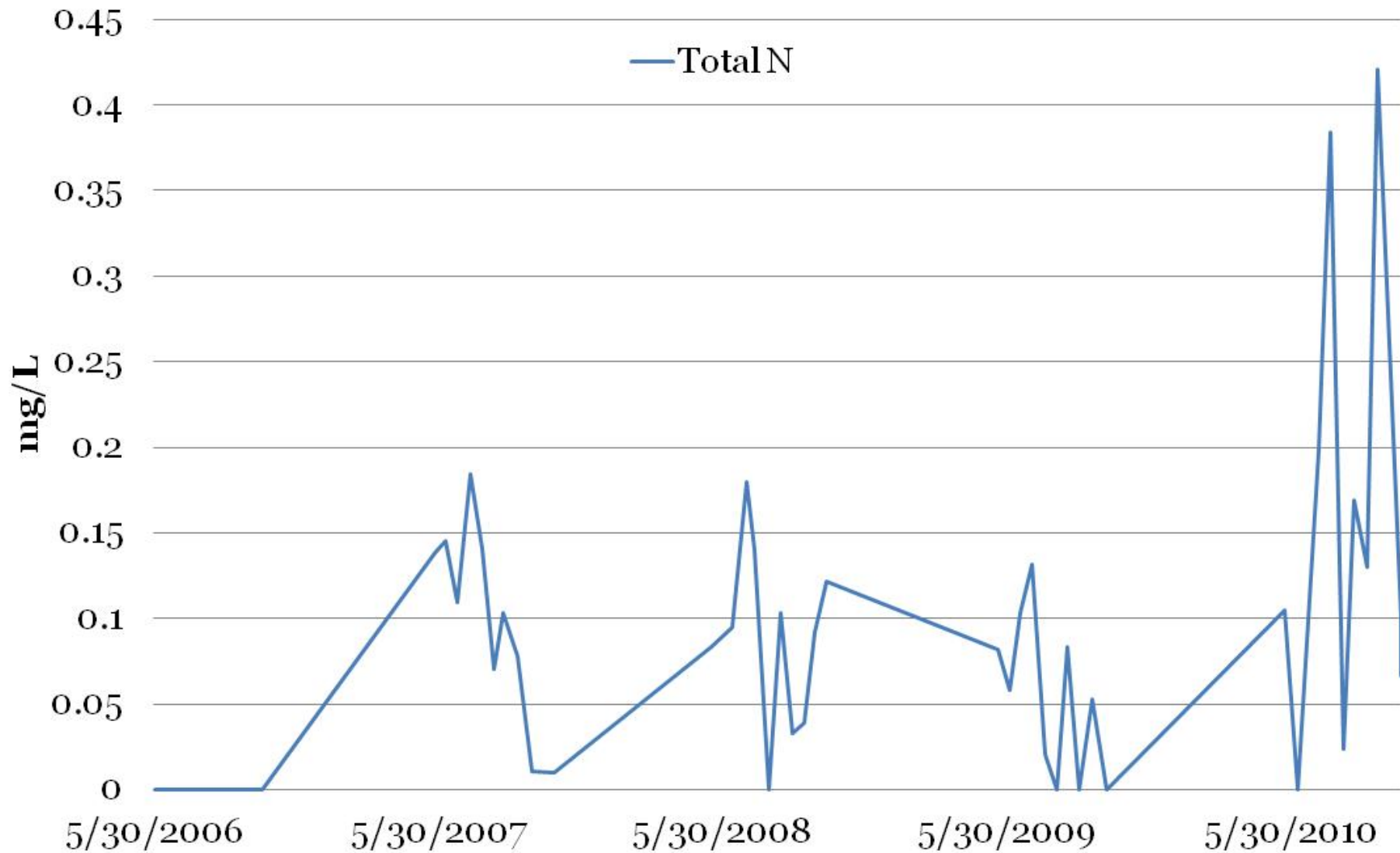




Holiday Inn 2

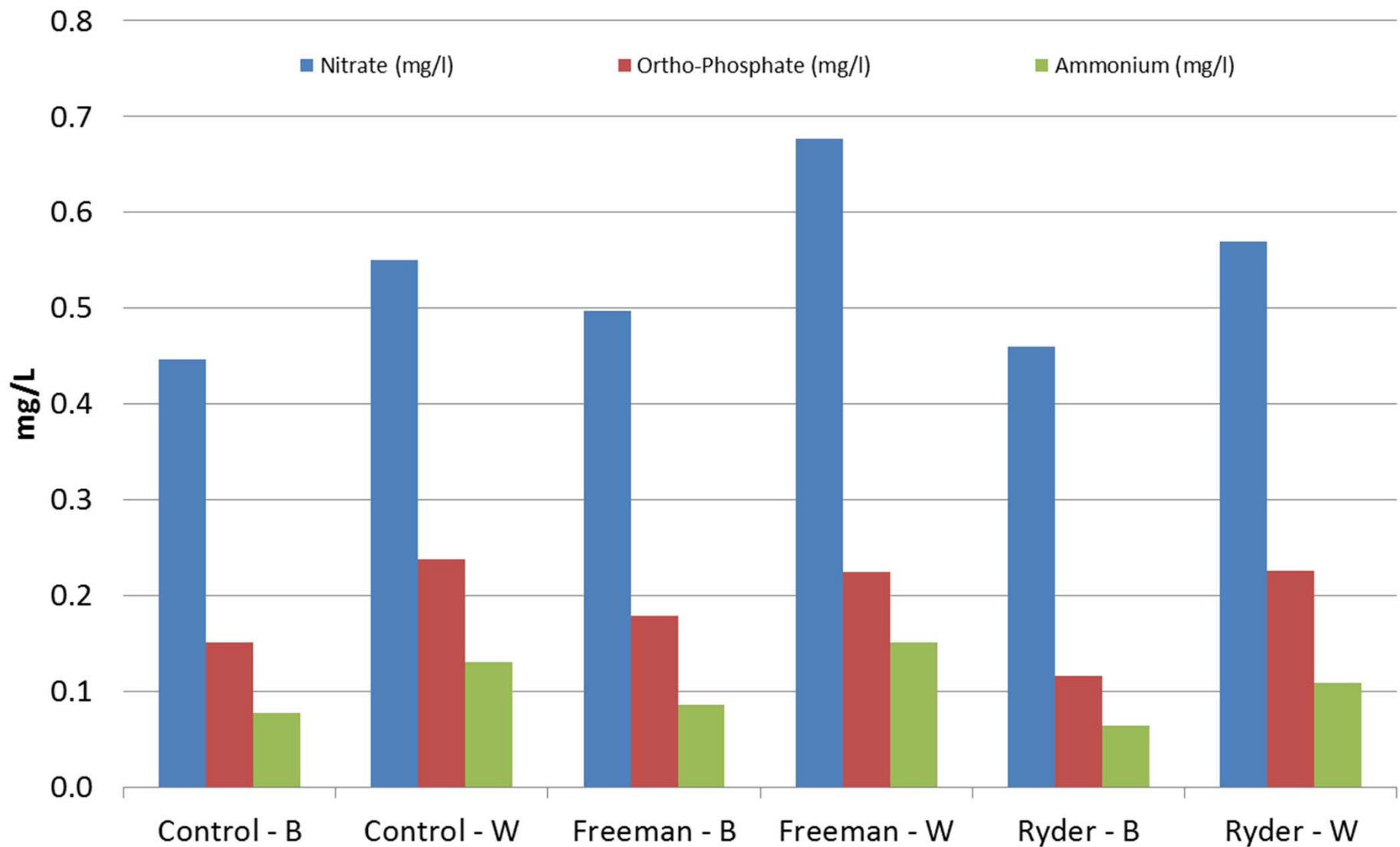


Ice House




Averaged Pore Water Quality Measurements for Beaches along Provincetown Harbor

Stations denoted "B" and "W" are located below and within the wrack line, respectively.




Nitrogen Problem


Base Map

 Town Lines


 Rivers


Embayment Boundary


 On Land


 On Sea

Major Roads

 US Highway

 State Highway



 Roads

 Structures





 Ponds

Nitrogen

Water Quality Stations






-  Healthy
-  Healthy/Moderately Impacted
-  Healthy/Significantly Impacted
-  Moderately Impacted
-  Moderately Impacted/Significantly Impacted
-  Significantly Impacted
-  Significantly Impacted/Significantly Degraded
-  Significantly Degraded

Yearly Nitrate Concentration Averages

-  0 - 0.5 mg/l **in Public Water Supply Wells**
-  0.5 - 1 mg/l
-  1 - 2.5 mg/l
-  2.5 - 5 mg/l



Embayments with Removal Target

Total NLoad Percent Removal

-  0 %
-  1 - 52 %
-  53 - 72 %
-  73 - 86 %
-  87 - 100 %

Subwatersheds with Removal Target

Total NLoad Percent Removal

-  0.1 % - 9%
-  9.1 % - 38 %
-  38.1 % - 62 %
-  62.1 % - 86 %
-  86.1 % - 100%


Eelgrass Extent


Base Map

 Town Lines


 Rivers


Embayment Boundary

 On Land


 On Sea

Major Roads

 US Highway


 State Highway

 Roads

 Structures


 Ponds

Eelgrass

 Eelgrass Extent


Phosphorus Problem


Base Map

 Town Lines


 Rivers


Embayment Boundary

 On Land


 On Sea

Major Roads

 US Highway

 State Highway

 Roads

 Structures


 Ponds


Phosphorus


Priority Ponds

Trophic Status

 Eutrophic *Most Impacted*


 Mesotrophic

 Oligotrophic *Least Impacted*

 Not Interpreted


Title 5 Compliance Issues


Base Map

 Town Lines


 Rivers


Embayment Boundary

 On Land


 On Sea


Major Roads

 US Highway


 State Highway


 Roads

 Structures


 Ponds


Existing Conditions

 Approx. Locations of Loans Issued for Title 5 Repair

 Potential Title 5 Compliance Issues

 Wastewater Treatment Facility

 Groundwater Discharge Points

 Sewered Parcels


Existing & Proposed Solutions



**Provincetown Harbor
Hatches Harbor**


Existing Infrastructure


Base Map

 Town Lines


 Rivers


Embayment Boundary

 On Land


 On Sea

Major Roads

 US Highway


 State Highway


 Roads


 Structures


 Ponds


Existing Conditions

 Approx. Locations of Loans Issued for Title 5 Repair

 Potential Title 5 Compliance Issues


 Wastewater Treatment Facility

 Groundwater Discharge Points


 Sewered Parcels

Enhanced Attenuation Sites

 Pipe


 Stormwater


Public Supply Wells

 Public Water Supply Well

 Small Volume Wells, Non-Transient


 Proposed Public Water Supply Well

 Surface Water Supply

 Small Volume Wells, Transient


Proposed Infrastructure


Base Map

 Town Lines


 Rivers


Embayment Boundary


 On Land


 On Sea

Major Roads

 US Highway

 State Highway

 Roads


 Structures

 Ponds

Proposed Conditions


Natural Attenuation Sites


 Bridge

 Culvert


 Inlet

 Pipe


 Sewer Alternatives


 Stormwater


CWMP Sewershed Phasing


 No Date Set


Phase Date

 2001 - 2010

 2011 - 2020

 2021 - 2030

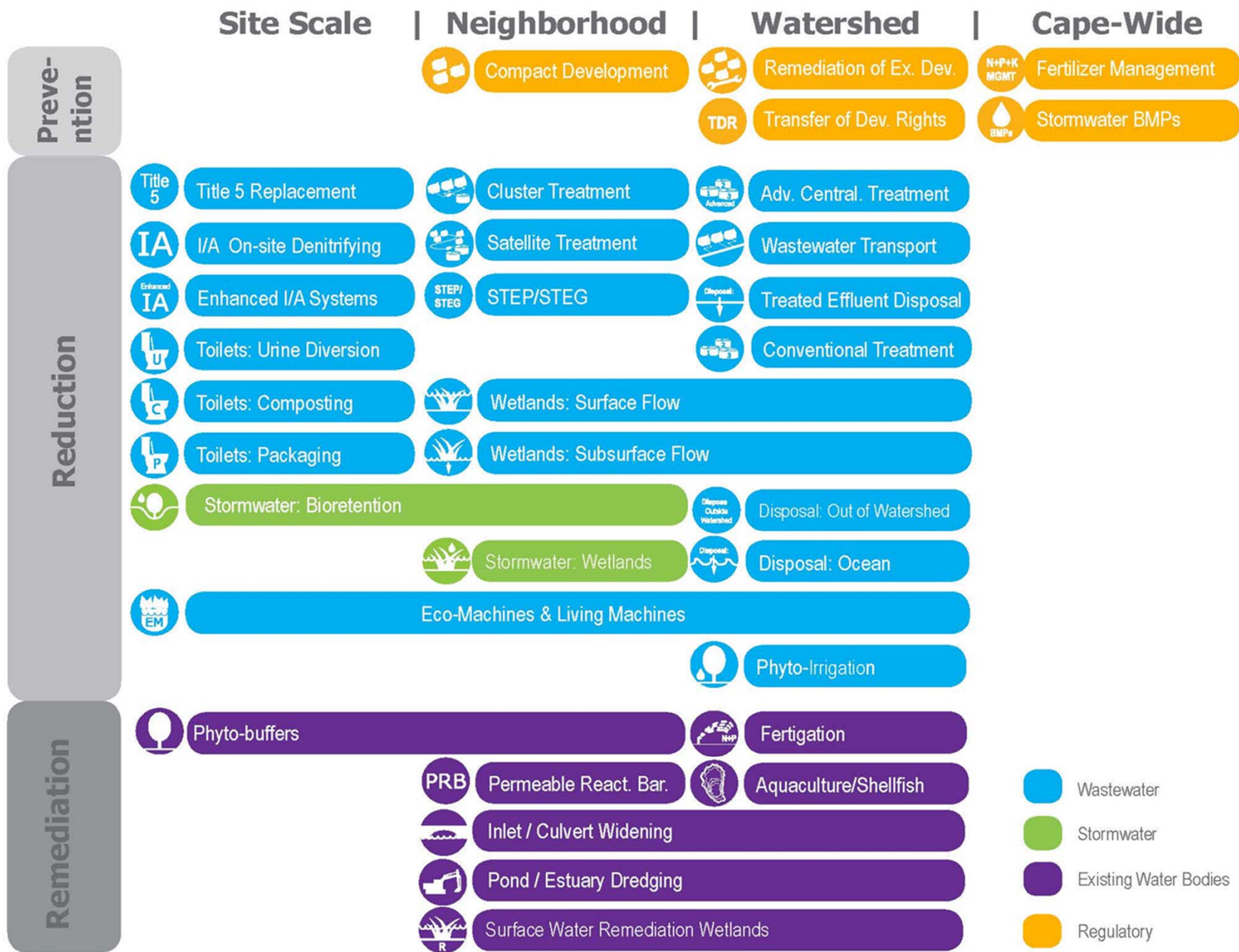
 2031 - 2040

 2041 - 2050



Framework for Addressing Solutions Moving Forward

**Provincetown Harbor
Hatches Harbor**



- Wastewater
- Stormwater
- Existing Water Bodies
- Regulatory

Alternatives: Screening Method

1
2
3
4
5
6
7



Wastewater



Existing Water Bodies



Regulatory

Targets/ Goals

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

Composite Target Areas

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

Low Barrier to Implementation

- A. Fertilizer Management
- B. Stormwater Mitigation



Watershed/Embayment Options

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



Alternative On-Site Options

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



Priority Collection/High-Density Areas

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



Supplemental Sewering



**All materials and resources for the Provincetown Harbor Group
will be available on the Cape Cod Commission website:**

<http://watersheds.capecodcommission.org/index.php/watersheds/outer-cape/provincetown-harbor>

**Provincetown Harbor
Hatches Harbor**

**Cape Cod 208 Area Water Quality Planning
Provincetown Harbor Watershed Working Group**

**Meeting One
Wednesday, September 18, 2013
Provincetown Town Hall
260 Commercial Street, Provincetown, MA 02657**

MEETING SUMMARY DRAFT

This summary is a draft. Please send your comments on any errors or omissions to the working group facilitator. This summary will be corrected and finalized after the second working group meeting.

ACTION ITEMS

The following action items were captured during the meeting:

Next Meeting: Thursday, October 31, 2013

8:30 am-12:30 pm

Provincetown Town Hall

- Watershed Working Group Members
 - Provide the Cape Cod Commission with any additional updates to the chronologies and with data that may be helpful for the group to assess the issues.
 - Review technology fact-sheets in advance of the October 31 meeting. (Technology fact sheets will be distributed in early October)
- Cape Cod Commission
 - Review data additions suggested by Working Group (p. 6), with specific focus on:
 - Contact Brian Carlson to acquire additional historical information on water quality studies, human indicator points, and nonpoint source tracking.
 - Contact Charlene Greenhalgh to update the Truro chronology.
 - Verify the seasonal and year round data numbers.
 - Verify the average single family property tax bill in Provincetown and Truro with David Guertin and Charlene Greenhalgh
 - Verify the average annual water bill estimates with David Guertin
 - Obtain the average sewer bill estimate from Provincetown
 - Map golf courses in the Provincetown and Hatches Harbors Managed Surfaces GIS layer.
 - Update existing and proposed infrastructure for stormwater projects and for Phase 3 sewer construction developments.
 - Add 'in lake management' options to the technology matrix.
- CBI
 - Distribute the link to the slides and notes from the Cape Cod Commission's affordability/financial presentation.
 - Distribute September meeting summary.
 - Distribute meeting materials for October meeting: fact sheets and agendas

WELCOME AND INTRODUCTIONS

Mr. David Gardner, Provincetown Assistant Town Administrator, welcomed the members of the Provincetown Harbor Watershed Working Group. Appendix A contains a list of the group members who were in attendance. All meeting documents and presentations for the Provincetown Harbor Watershed Working Group are located here:

<http://watersheds.capecodcommission.org/index.php/watersheds/outer-cape/provincetown-harbor>

Ms. Kate Harvey, Facilitator from the Consensus Building Institute (CBI), described CBI's role and the member selection process.¹ She noted that the Cape Cod National Seashore (CCNS) would participate in the working group, but the CCNS representative was not present due to a schedule conflict. She then described the role of Mr. Scott Horsely, Area Manager for the Outer Cape. Mr. Horsely will attend the stakeholder workshops and prepare materials for subsequent workshops. In Spring 2014, he will work with the Cape Cod Commission staff to draft a comprehensive Cape-wide plan that combines the specific recommendations from the Provincetown Harbor Watershed Working Group with the recommendations of the other 11 watershed working groups on the Cape.

She explained that the goal of the first meeting was to review and develop a shared understanding of the characteristics of each watershed, the work done to date, existing data and information available, and how to apply all of this to planning for water quality improvements for these watersheds moving forward.

REVIEW OF GOALS AND PROCESS

Ms. Erin Perry, Special Projects Coordinator for the Cape Cod Commission, presented an overview of the Clean Water Act Section 208 and described the process and goals of the proposed update to the 1978 Section 208 Area-Wide Water Quality Management Plan. In January 2013, the Massachusetts Department of Environmental Protection (MassDEP) directed the Cape Cod Commission to update the 1978 Section 208 Area-Wide Water Quality Management Plan (208 Plan Update). The goal of the three-year 208 Plan Update process is to help communities collaborate and coordinate their water quality management activities to achieve compliance with Section 208 water quality standards. The 208 Plan Update will focus on reducing nitrogen in saline waters, phosphorus concentrations in fresh waters, and address challenges posed by future growth and Title 5 limitations.

Many of the 105 watersheds and 57 embayments on Cape Cod overlap the boundaries of two or more municipalities, thus making the Section 208 update a regional issue and highlighting the need for inter-municipal collaboration. A watershed-based approach will be used to update the 208 Plan and working group members from the 11 watershed working groups, with input from other stakeholders and members of the public, will jointly identify solutions appropriate for their watershed. The approach strives to maximize the benefits of previous local planning efforts by building upon those efforts whenever possible. Ultimately, each watershed working group will generate a series of approaches recommended for their specific watershed, each of which may incorporate a different set of technologies, to meet water quality standards.

¹ CBI's role and the participant selection process are described in detail in the Draft Process Protocols located at: <http://watersheds.capecodcommission.org/index.php/watersheds/outer-cape/provincetown-harbor>

Ms. Perry reviewed the timeline of the 208 Plan Update. In July, public meetings were held across the Cape to present the 208 Plan Update goals, work plan, and participant roles in July. Public meetings were also held in August to present information on the affordability and financing of the updated comprehensive 208 Plan. Since few people attended the August meetings, the Cape Cod Commission will present this information to interested groups upon request.² As previously noted, the September working group meetings were focused on baseline conditions. During the next working group meeting in October, stakeholders will review and discuss the technological options to address the issues in their watershed. Stakeholders will develop watershed scenarios drawing on discussions from the September and October meetings during the final meeting in December.

In addition to the aforementioned stakeholder engagement meetings, an advisory board; a Regulatory, Legal, and Institutional (RLI) working group; a Technical Advisory Committee (TAC), and; a Technology Panel will provide guidance to the 208 Plan Update process. The advisory board consists of former local officials, individuals with experience advancing regional plans, and representatives of the environmental community. Representatives from the MassDEP, the EPA, the Cape Cod Commission, the Army Corp of Engineers, and other state and federal partners comprise the RLI. Local, regional, national, and international experts on water quality management technologies comprise the TAC, which is a committee of the Cape Cod Water Protection Collaborative. The Technology Panel consists of academic and research institutions, state watershed managers, and consultants.

LOCAL PROGRESS TO DATE

On two separate chronologies, Mr. Horsley highlighted past actions that had been taken in Provincetown and Truro that would either protect or inhibit water quality in Hatches Harbor and Provincetown Harbor.³ Working group members then reviewed the chronologies and, using sticky notes, added missing events or corrected the information to help create a more accurate view of past actions. The Cape Cod Commission will update the chronologies with the information provided by working group members. During discussion after the activity, group member reflected on lessons learned from reviewing the chronologies. Participants made the following comments and suggestions on the Provincetown chronology:

- Include the drinking well site development and investigations completed in the North Union Field Well Area.
- Several water quality studies, human indicator points and non point source tracking reports could be added.
- Include information about the freshwater ponds. For example, The Board of Health is testing water quality in Shank Painter Pond due to degrading water quality.
- Add the construction of the drainage pipe near Brown street that drains into Shank Painter Pond

Participants made the following comments and suggestions on the Truro chronology:

² Contact Erin Perry (eperry@capecodcommission.org) if you would like to schedule an Affordability and Financing presentation.

³ Detailed chronologies are available in the Provincetown Baseline Data Presentation located here: <http://watersheds.capecodcommission.org/index.php/watersheds/outer-cape/provincetown-harbor>

- Include the Army Corps of Engineers' modeling of East Harbor Lagoon/Pilgrim Lake to open a culvert in this area.
- Check some of the descriptions for accuracy.
- Include bathing and *E.Coli* data collection from Beach Point.

Reflecting on the chronologies, the members identified the following lessons learned that should be remembered while developing the 208 Plan Update:

- Special considerations like opt-out clauses may move a project forward, but they can result in negative financial impacts and challenging political battles.
- Density must be considered when evaluating options.
- Be willing to consider emerging technologies even if they may not seem popular at the moment.
- Consider population growth projections.
- Include a public education component to ensure citizens understand the implication of not protecting water quality.
- Create integrated planning solutions that link the completion of multiple projects simultaneously.
- Acceptance of project components/requirements can be facilitated by state mandates.
- Privatization of solutions can also produce positive results.

BASELINE CONDITIONS

Mr. Horsely and Mr. Jay Detjens, Cape Cod Commission GIS Analyst, presented GIS data layers, demographic data, and water quality data both Cape-wide and specific to Hatches Harbor and Provincetown Harbor. Working group members and members of the public are encouraged to view the layers on the Cape Cod Commission website.⁴ To ensure the accuracy of the data that will be analyzed for the 208 Plan Update, working group members were asked to identify anything they believed was missing from the data and to voice any differences of opinion they had with the Commissions' analysis or approach.

GIS Data Layers

The Cape Cod Commission presented the following GIS data layers:

Natural Features – The natural features data layer shows the locations of cranberry bogs, wetlands, Natural Heritage and Endangered Species Program (NHESP) Certified Vernal Pools Water Table Contours; Sea, Lake, and Overland Surges from Hurricanes (SLOSH) Update 2013, and preliminary FEMA Flood Insurance Rate Map (FIRM) Zones 2013.

Managed Surfaces – The managed surfaces data layer includes managed ground surfaces (impervious and disturbed surfaces), residential managed lawns, and municipal managed natural surfaces. The residential managed lawns layer includes only private land surfaces where fertilizer application might occur. The municipal managed natural surfaces layer includes only public lands likely to receive

⁴ Data used for modeling and analysis is available here: [LINK]
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fertilizer applications. Golf courses will be mapped in the Provincetown Harbor and Hatches Harbor layer.

Regulatory Layer – The regulatory layer illustrates Areas of Critical Environmental Concern, MassDEP Approved Wellhead Protection Areas, and Growth Incentive Zones. OpenSpace data is displayed in three levels of land protection: land protected in perpetuity, limited protection, and no protection. Landuse Vision Map data delineates economic centers; industrial and service trade areas, village boundaries, resource protection areas, other designations, and undesignated lands.

Land Use Change Layer – The land use changes layer is based on McConnell land use data from 1951, 1971, and 1999. These layers illustrate the locations of the following land uses: residential; commercial; industrial; wooded, natural and wetlands; water, and; open disturbed or managed. A 1995 data layer is also available, but was not displayed since the collection methodology was different than the 1951, 1971, and 1999 data.

Density and Buildout Layers – The density layer shows the current per acre density of existing dwelling units in quarter square mile grids. The regional buildout layer shows the maximum potential buildout over a 20-25 year time horizon using the towns zoning regulations and normalizing that data by applying state designated zoning layers. Mr. Horsley emphasized that buildout scenarios are an art, not a science, and that there are many ways to conduct a buildout analysis. He illustrated this point by showing a slide that depicted differences between the Regional Buildout, the Comprehensive Waste Management Plan buildout, and the Local Comprehensive Planning Buildout for communities across the Cape. He explained that the Cape Cod Commission's approach to the buildout analysis enables comparison of potential buildout across the entire Cape, but eliminates some detail on the local level. Mr. Horsely noted that density is a critical component to the 208 Update Plan since 30% growth will increase capital costs by 40%.

People Data

The Section 208 Update will also consider demographic changes that could influence the selection of technologies to improve water quality. The Cape Cod Commission presented the demographic data, most of which was derived from the 2010 Census. Approximately 2,896 people, or 1.3% of Cape Cod's total population, live in the Provincetown Harbor watershed. Those living in Provincetown Harbor are 54 years of age on average and the average median income is slightly more than \$50,000. Over 90% of the population in the watershed is white. Provincetown Harbor has a year round population of approximately 48% and a seasonal population of approximately 51%. The total assessed value of residential homes in the study area is 1.9 billion dollars. The average single-family property tax bill (2013) is approximately \$5,500 in Provincetown, which is higher than the average in the Commonwealth, and \$4,300 in Truro, which is lower than the average in the Commonwealth. The annual water bill is approximately \$670 in Provincetown and Truro.

Working group members made the following comments on the social data inputs:

- The seasonal and year round housing data appear to be inaccurate – seasonal residency should be much higher. In some places in Truro, homes were not occupied during the census, so nobody was counted. A working group member suggested that seasonality can also be determined by water consumption, trash weight, or parking.

- The average single-family tax bill in Truro seems higher than expected.
- The average annual water bill data for Provincetown seems inaccurate. Provincetown's average annual water bill is approximately 80-90 dollars.

THE PROBLEM

Mr. Horsely explained that eutrophication from nitrogen loading in coastal estuaries and phosphorous loading in ponds and lakes is the primary problem to solve. In many areas of the Cape, the Massachusetts Estuary Project (MEP) provides three years of nutrient loading, water quality monitoring data, and hydrodynamic information to link water quality data to nitrogen loads. However, site specific MEP data does not exist for Provincetown and Hatches Harbors.

Mr. Horsely next reviewed the Cape-wide MEP data, which shows that septic systems account for 79% of the controllable nitrogen loads, 9% results from lawn fertilizers, and 8% from impervious surfaces. Four percent of the controllable nitrogen is the result of wastewater treatment facility effluent and natural sources comprise the remaining one percent. In response to a question about whether nitrogen from rainfall could enhance vegetative coverage in the wetland, Mr Horsely said it could but the 208 Update will not focus on uncontrollable nitrogen from sources like rainfall. Mr. Horsely presented data collected on the average porewater (water between grains of sand) quality measurements. This data is collected every couple of weeks in a study to determine whether or not wrack is increasing the nutrient load in porewater.

Ponds and lake data in the Provincetown and Hatches Harbors watersheds is available from the Pond and Lake Stewardship Project (PALS), but this data has yet to be analyzed in the Provincetown and Hatches Harbor watersheds. The ponds in these watersheds are unique and cannot be easily categorized into the typical trophic status.

To identify areas where Title 5 compliance issues might be concentrated, the Cape Cod Commission mapped the approximate locations of the Title 5 loan applications. Mr. Detjens offered a few caveats with the data: loan applications do not signify failure and systems that were updated without acquiring loans will not be on the layer. The Potential Title 5 Compliance Issues layer attempts to identify geographic areas more likely to exhibit compliance issues due to the small size of the land parcels, shallow depth to groundwater at the parcel locations, soil structure, the quantity of water used on the parcel, and presence of loan applications. This layer is based on the assumption that all parcels are on Title 5 systems.

EXISTING AND PROPOSED SOLUTIONS

Mr. Horsely and Mr. Detjens next presented the existing and proposed infrastructure data layers. The existing infrastructure layer includes attribute data for existing conditions, enhanced attenuation sites, and public supply wells. The proposed infrastructure layer will illustrate the locations of natural attenuation sites and CWMP sewershed phasing, if applicable. They requested group members provide additional information on planned stormwater upgrades to existing infrastructure. A group member said Provincetown has a list of areas planned for stormwater upgrades, which they are completing at a rate of one to two projects per year.

WORKING GROUP FEEDBACK

Ms. Harvey prompted the group to think about additional information that should be included on these data layers or in the analysis as well as corrections that should be made to the data. Group member suggested the following:

- Include town information on infrastructure upgrades/treatments
- Include buildout data from Truro Comprehensive Plan
- Check the seasonal population data to ensure accuracy
- Include herbicides and pesticide application data
- Include data on boat use in the harbor and boat pump outs
- Include Shank Painter Pond/Quaking Bogs
- Verify inclusion of the East Harbor culvert
- Update the Truro Average Property Tax Bill estimate
- Double-check the water bill data
- Obtain sewer bill data from Provincetown
- Include SMAST data for Provincetown Harbor and Hatches Harbor
- Utilize Administrative Consent Orders to identify Title 5 failures
- Include data from the sewerage addition of 3A, 3B, and 3C in Provincetown
- Utilize nitrogen data found in the 'Rolan or Sunny'
- Include Truro and Provincetown's designated offshore aquaculture areas.

Ms. Harvey then asked group members to identify any key challenges or needs they foresee in Provincetown and Hatches Harbors. The members suggested the following challenges and needs:

- Shank Painter Pond
- Jurisdictional issues at Beach Point / East Harbor
- Bird impacts at Hatches Harbor
- Seasonal variation in population is challenging due to concentration in Provincetown and Beach Point.
- Healthy shellfish beds
- Bathing beach issues
- Obtaining support from second homeowners for actions to improve water quality
- Codes (e.g. plumbing)
- Funding in the form of debt relief and the political process
- Long-term maintenance of the harbor and related monitoring requirements of the buildings not connected to the sewer system
- Development on Provincetown Harbor
- Contaminants of emerging concern
- Land management plantings to remove nitrogen

NEXT STEPS

Mr. Horsely presented the technologies matrix and described the upcoming meetings. The technologies matrix organizes a mixture of remediation, reduction and prevention techniques that can be deployed at the site level, neighborhood level, watershed level, or Cape wide. He noted that the packaging toilets option would likely be removed from the matrix. In the coming weeks, the Cape

Cod Commission will distribute 1-2 page fact sheets about each technology. During the October meeting, group members will be expected to be prepared to discuss the merits of the technologies and begin to assess which technologies would be most appropriate to address the issues in their watershed.

- A group member suggested adding 'in lake management options' such as alum treatments to the matrix.
- Another group member suggested adding natural ecosystem remediation techniques.

Mr. Horsley reiterated that the goal of the group is to develop at least two plans with different sets of remedial options that would achieve water quality targets. He then described the alternatives screening process the group will apply over the next two meetings to achieve the aforementioned goal. The process is as follows:

- 1) Establish targets and articulate project goals.
- 2) Identify priority geographic areas
- 3) Determine which management activities should definitely be implemented. These might be the easiest and least costly management activities that should be undertaken regardless of other management actions.
- 4) Assess alternative options to implement at the watershed or embayment scale
- 5) Assess options to implement at the site-level
- 6) Examine priority collection/high density areas
- 7) Consider traditional sewerage or other grey infrastructure management options

In response to the alternatives screening process, one group member suggested the group must keep cost in mind as they assess the options and develop a plan. He suggested that the plan must be presentable in a cost-benefit format to help garner support for it.

OPERATING PROTOCOLS

Ms. Harvey briefly reviewed the draft protocols and requested the group members suggest changes to the groundrules. She reiterated the primary role of the group members is to provide guidance on the development of solutions to address the water quality issues specific to their watershed. In response to a question posed by a group member, Ms. Harvey confirmed that in addition to the meeting summaries for this group, group members will also have access to the other groups' meeting summaries.

PUBLIC COMMENTS

The facilitator opened the floor for public comments of three minutes or less each. No members of the public commented, but working group participants made the following announcements.

- NSTAR intends to spray a mixture of five different herbicides on the foliage in the power line right of ways. Community members can voice their opinion about the application of herbicides by commenting on the NSTAR Vegetation Management plan.

- It would be good to give NSTAR an alternative to herbicides. Our neighbors have found an alternative in oil of clove, with peppermint, and other natural ingredients. It is good to protest the use of herbicides, but they need alternatives to help control the mosquito population.

**Appendix A
Attendance**

Name	Affiliation
Elaine Anderson	Provincetown Board of Selectmen
Joe Buteau	Energy Committee, Truro
Brian Carlson	Conservation Agent, Provincetown
Amy Costa	Provincetown Center for Coastal Studies
Laurie Demolino	Board of Health, Provincetown
Paul DeRuyter	Whaler's Wharf
David Gardner	Assistant Town Manager, Provincetown
Charleen Greenhalgh	Town Planner, Truro
David Guertin	Director, Provincetown Department of Public Works
Jerry Irmer	Provincetown Harbor Committee
Laura Kelly	Owner, Littlefield Landscapes, Wellfleet
Rex McKinnsey	Provincetown Harbor Master
Ed Nash	Golf Superintendents Association
Pat Pajaron	Health Agent, Truro
Jonathan Sinaiko	Water and Sewer Board Chairman
Dan Milz	PhD Candidate, University of Chicago
<i>Staff</i>	
Tom Cambareri	Water Resources Program Manager, Cape Cod Commission
Jay Detjens	GIS Analyst, Cape Cod Commission
Scott Horsely	Area Manager, Cape Cod Commission
Erin Perry	Special Projects Coordinator, Cape Cod Commission
Kate Harvey	Facilitator, Consensus Building Institute
Eric Roberts	Facilitator, Consensus Building Institute