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CAPE COD  
COMMISSION

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## **208 Area Wide Water Quality Management Plan Update Mid Cape Sub Regional Group**

Meeting One

March 4, 2014 8:30 am – 12:30 pm  
Cape Cod Commission, 3225 Main Street, Barnstable

### **Meeting Goals:**

- **Identify regulatory, legal, and institutional challenges, constraints, and opportunities associated with the 208 Plan approach for water quality**
- **Clarify the definition and components of an adaptive management plan that can be permitted**

- 8:30 Welcome & Review of 208 Goals
- 8:40 Process Overview, Meeting Overview and Goals, & Introductions
- 9:00 Scenario Planning
- *Use maps of technologies/approaches in one representative watershed to illuminate RLI and implementation discussions.*
- 9:30 Regulatory, Legal, and Institutional Interactions
- *Presentation of existing permitting framework*
  - *What are some of the hurdles and opportunities associated with permitting the above scenario?*
- 10:45 Break
- 11:00 Implementation
- *Presentation and discussion of adaptive management definition and graphic*
  - *What components of an adaptive management plan are needed to achieve permitability and water quality goals?*
- 12:15 Public Comment
- 12:30 Adjourn



# Mid Cape Sub Regional Group



Meeting 1

# 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



# 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

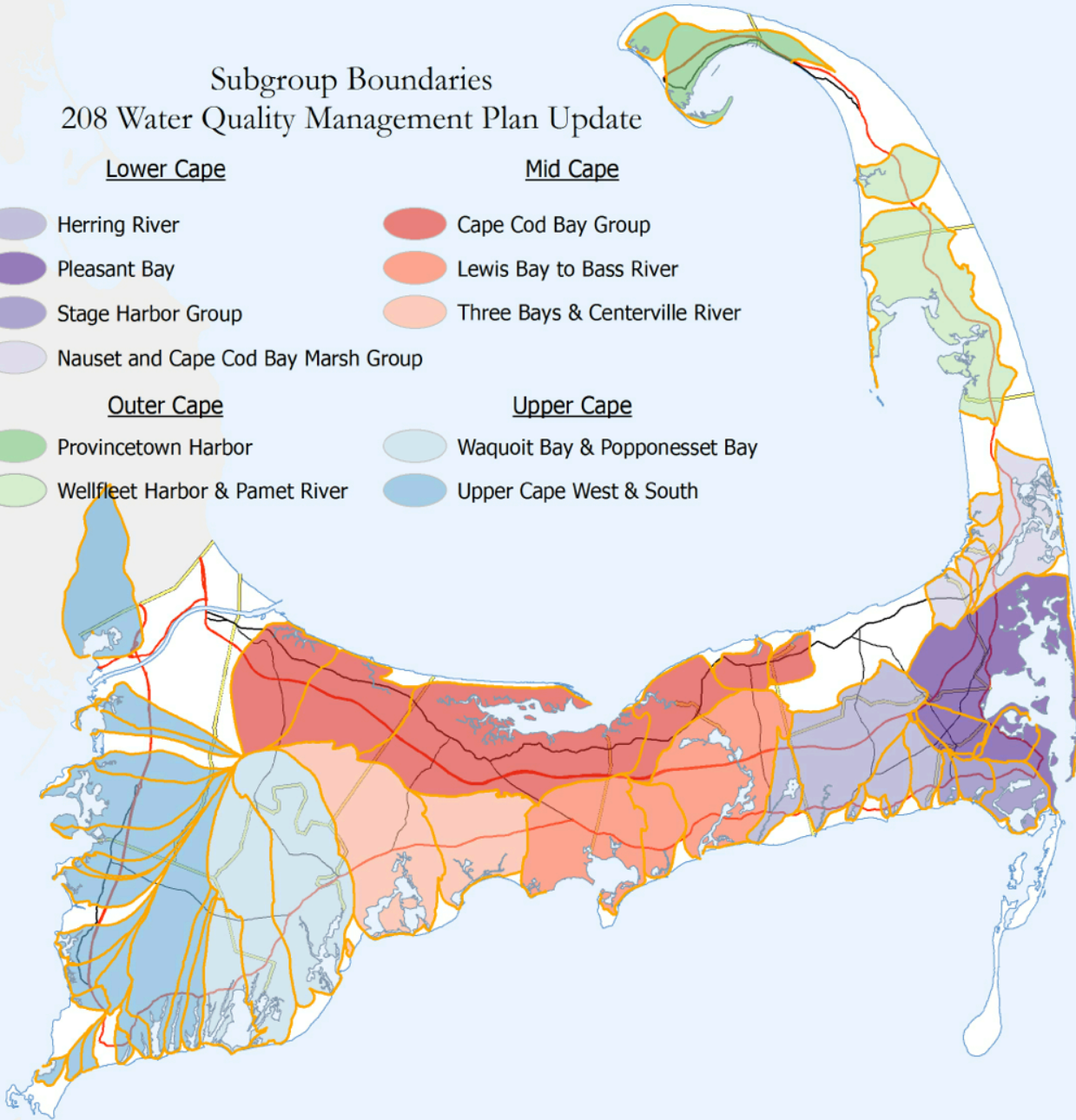
- Cape Cod Bay Group
- Lewis Bay to Bass River
- Three Bays & Centerville River

## Outer Cape

- Provincetown Harbor
- Wellfleet Harbor & Pamet River

## Upper Cape

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

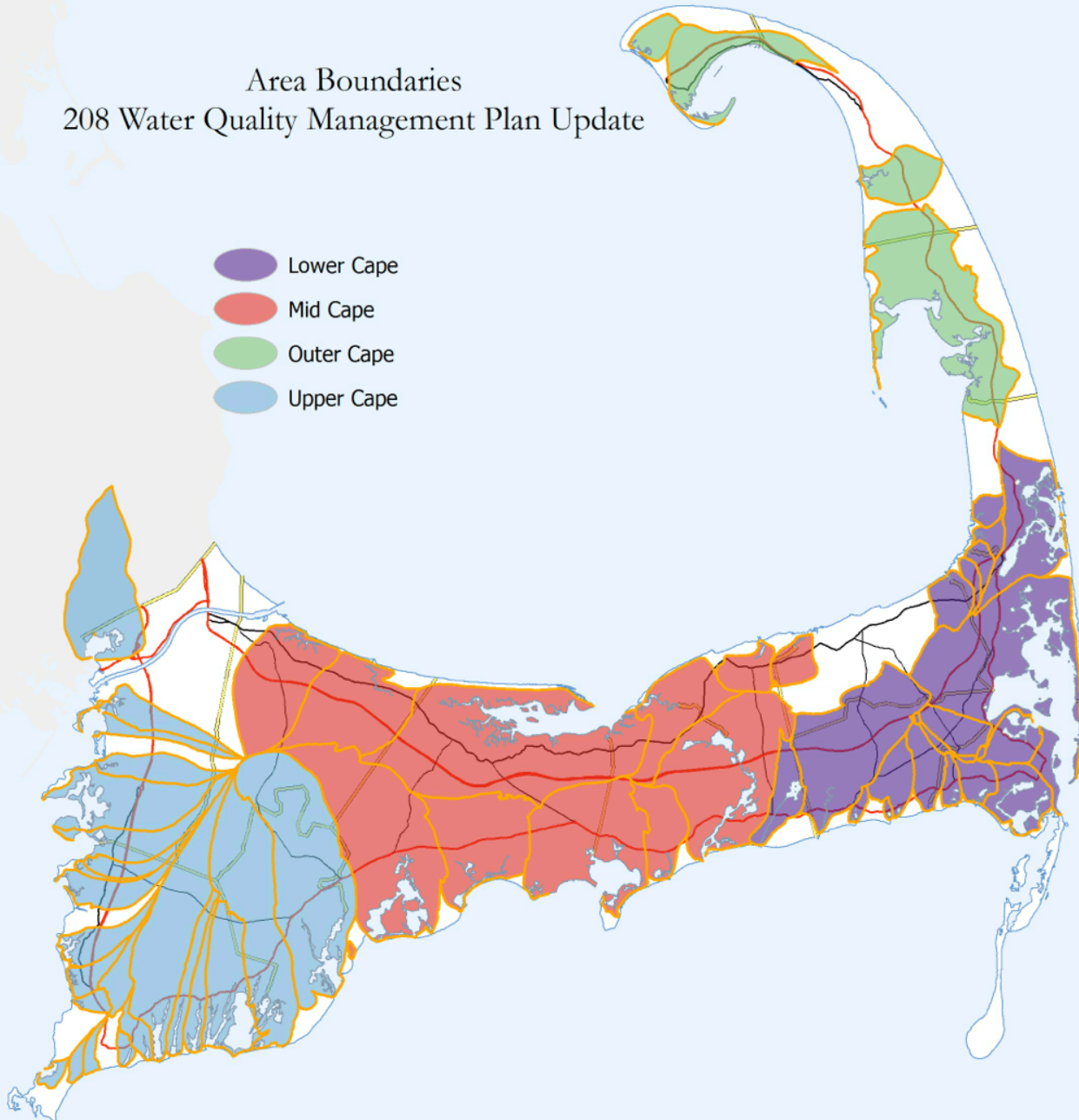






# Area Boundaries 208 Water Quality Management Plan Update

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



## Public Meetings

## Watershed Working Groups

Goals,  
Work Plan  
& Roles

Affordability,  
Financing

Baseline  
Conditions

Technology  
Options  
Review

Watershed  
Scenarios

July

August

September

October

December

**Watershed Working Group Process**

# Standing Sub Regional Meeting Topics

Scenario  
Planning

Regulatory,  
Legal,  
Institutional

Implementation

Mtg. 1

One representative  
watershed

Challenges & opportunities  
associated with permitting the  
watershed scenario

Adaptive management  
plans

Mtg. 2

All shared watersheds  
& TBL model

Tools to support  
intermunicipal cooperation

Monitoring

Mtg. 3

Subregional scenarios  
& TBL model

Structures for permitting

Financing &  
affordability

# Standing Sub Regional Meeting Topics

Scenario  
Planning

Regulatory,  
Legal,  
Institutional

Implementation

## Meeting 1 Goals:

Identify regulatory, legal, and institutional challenges, constraints, and opportunities associated with the 208 Plan approach for water quality

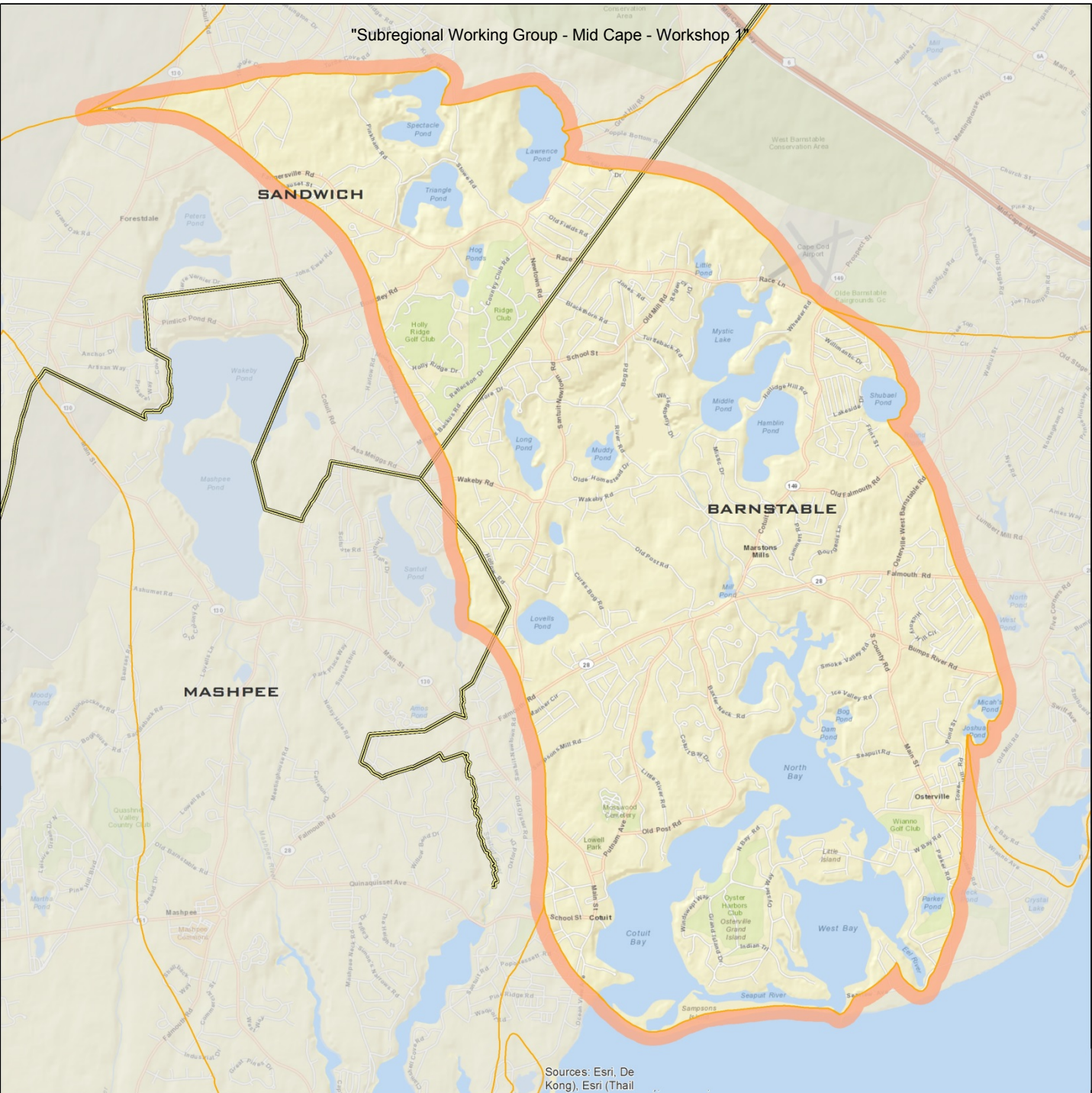
Clarify the definition and components of an adaptive management plan that can be permitted

# Scenario Planning

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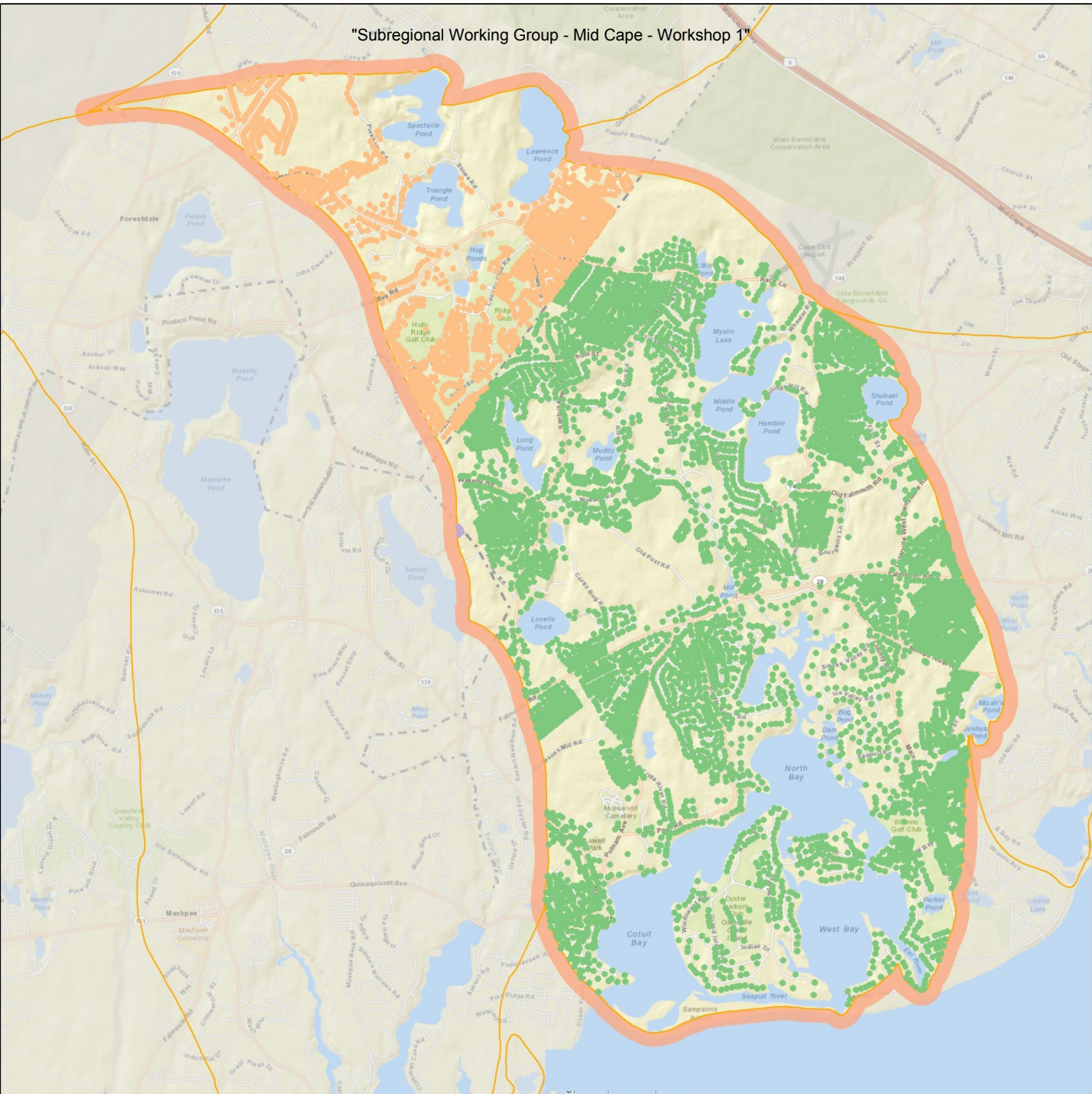
**Three Bays**

"Subregional Working Group - Mid Cape - Workshop 1"





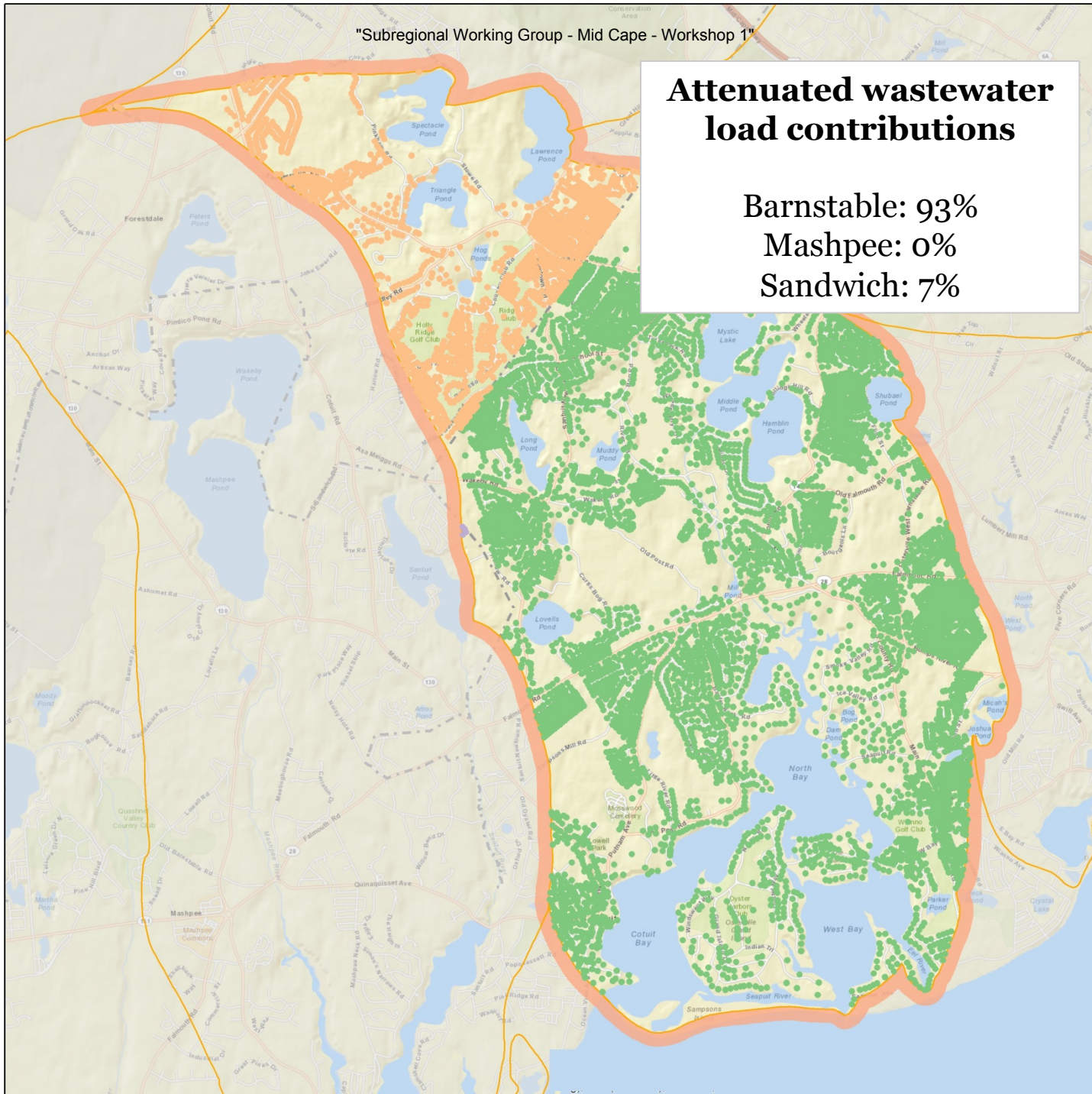
"Subregional Working Group - Mid Cape - Workshop 1"





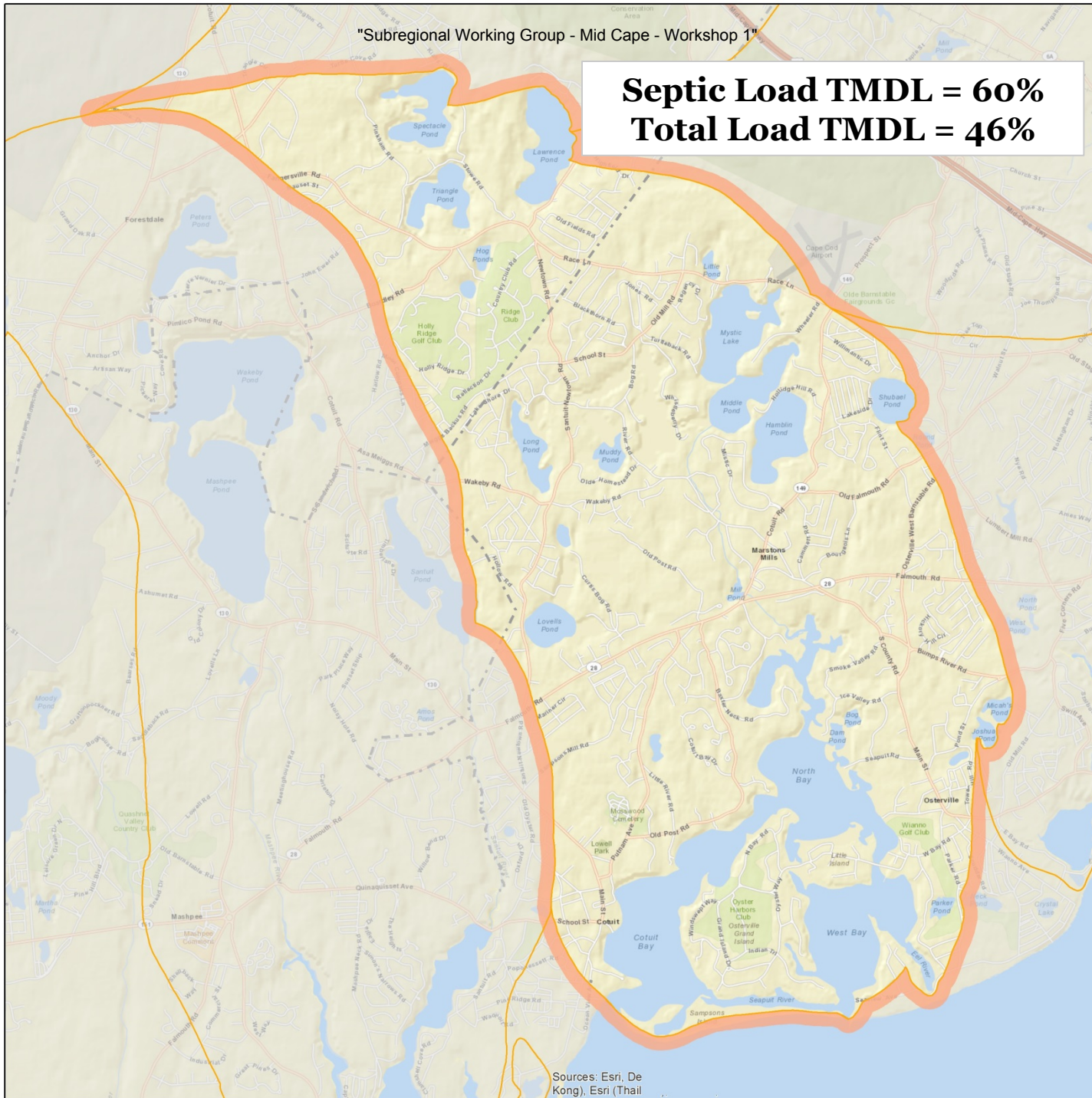
# Attenuated wastewater load contributions

Barnstable: 93%  
Mashpee: 0%  
Sandwich: 7%



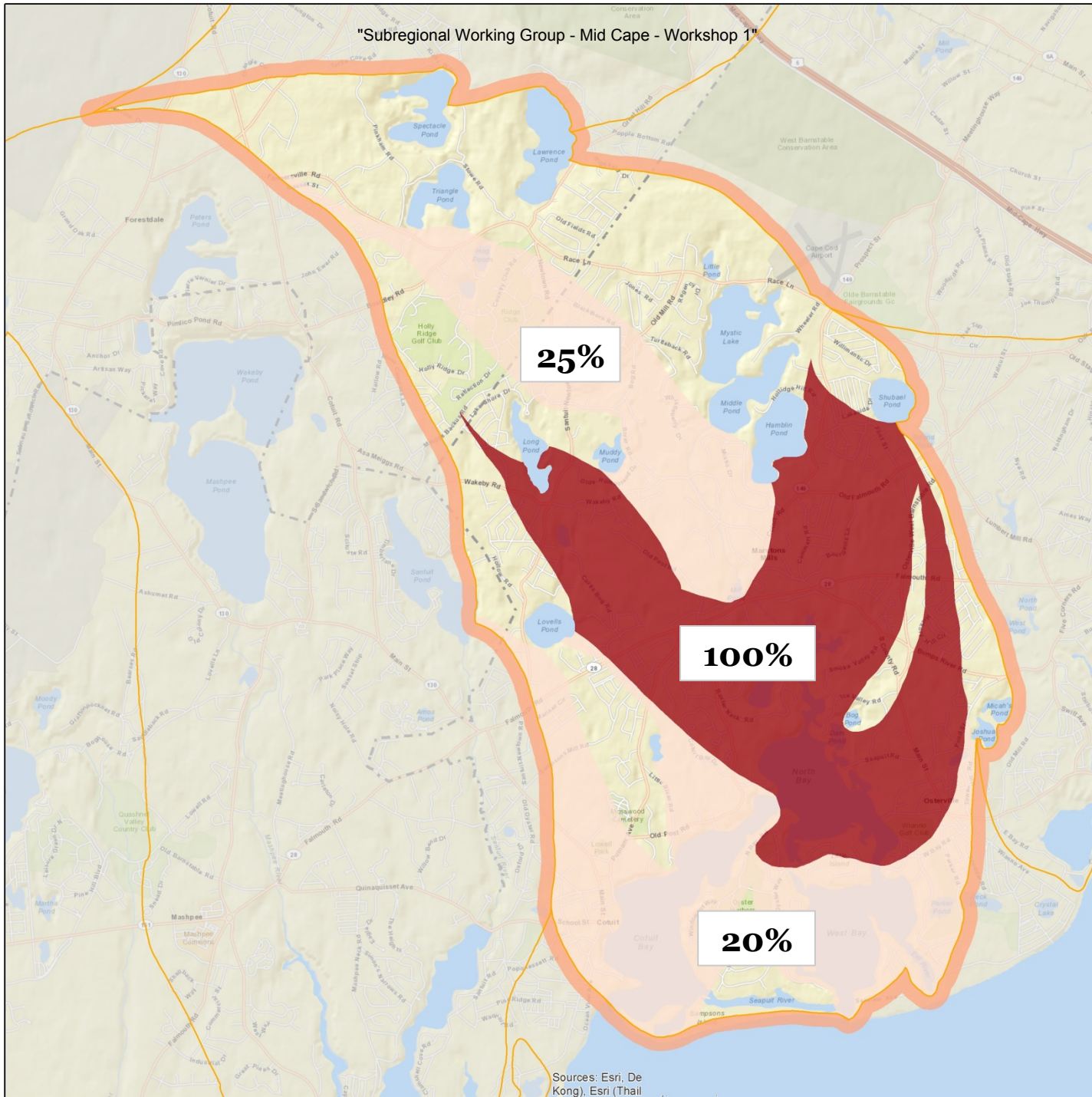


**Septic Load TMDL = 60%**  
**Total Load TMDL = 46%**

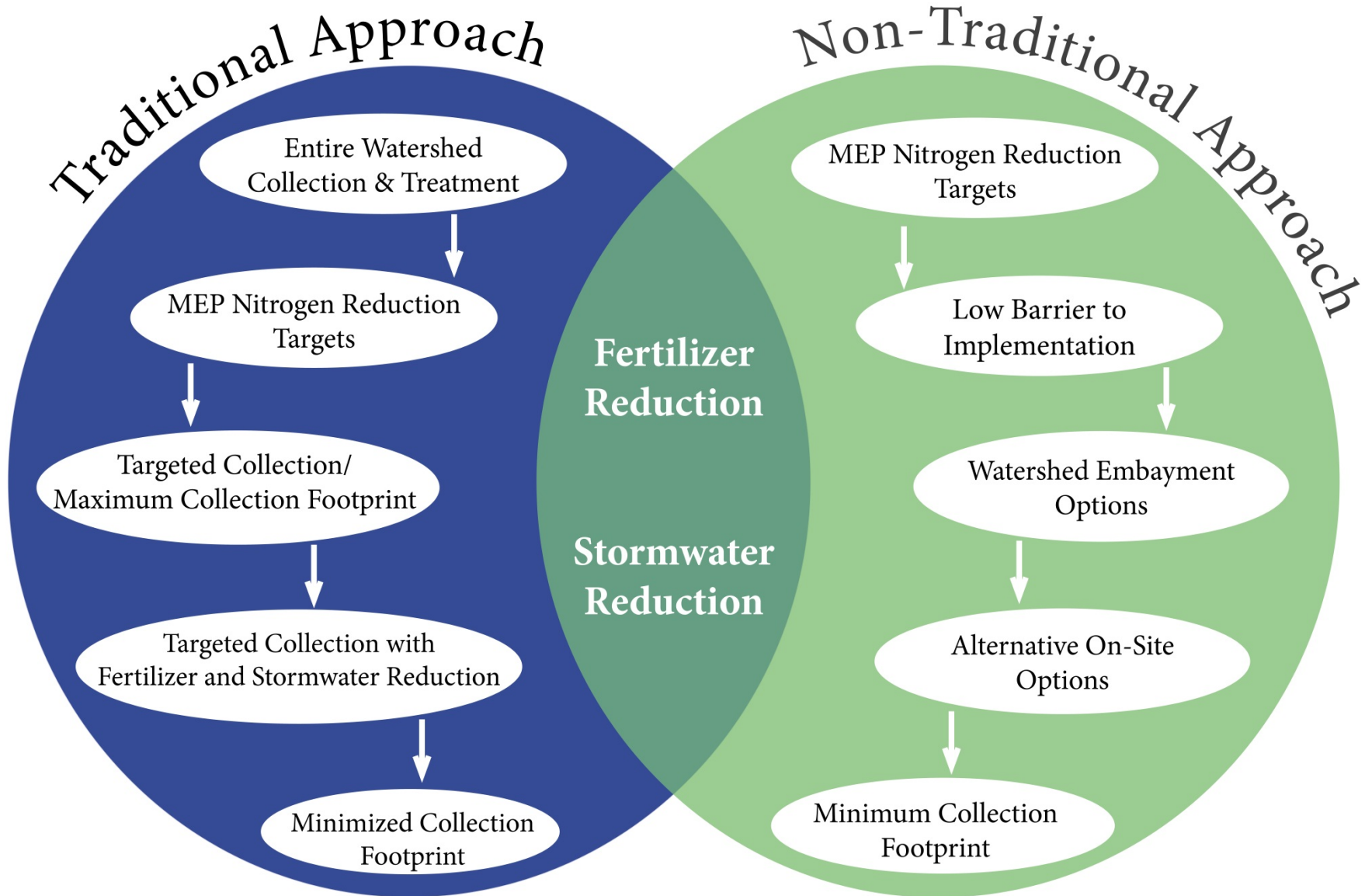




"Subregional Working Group - Mid Cape - Workshop 1"

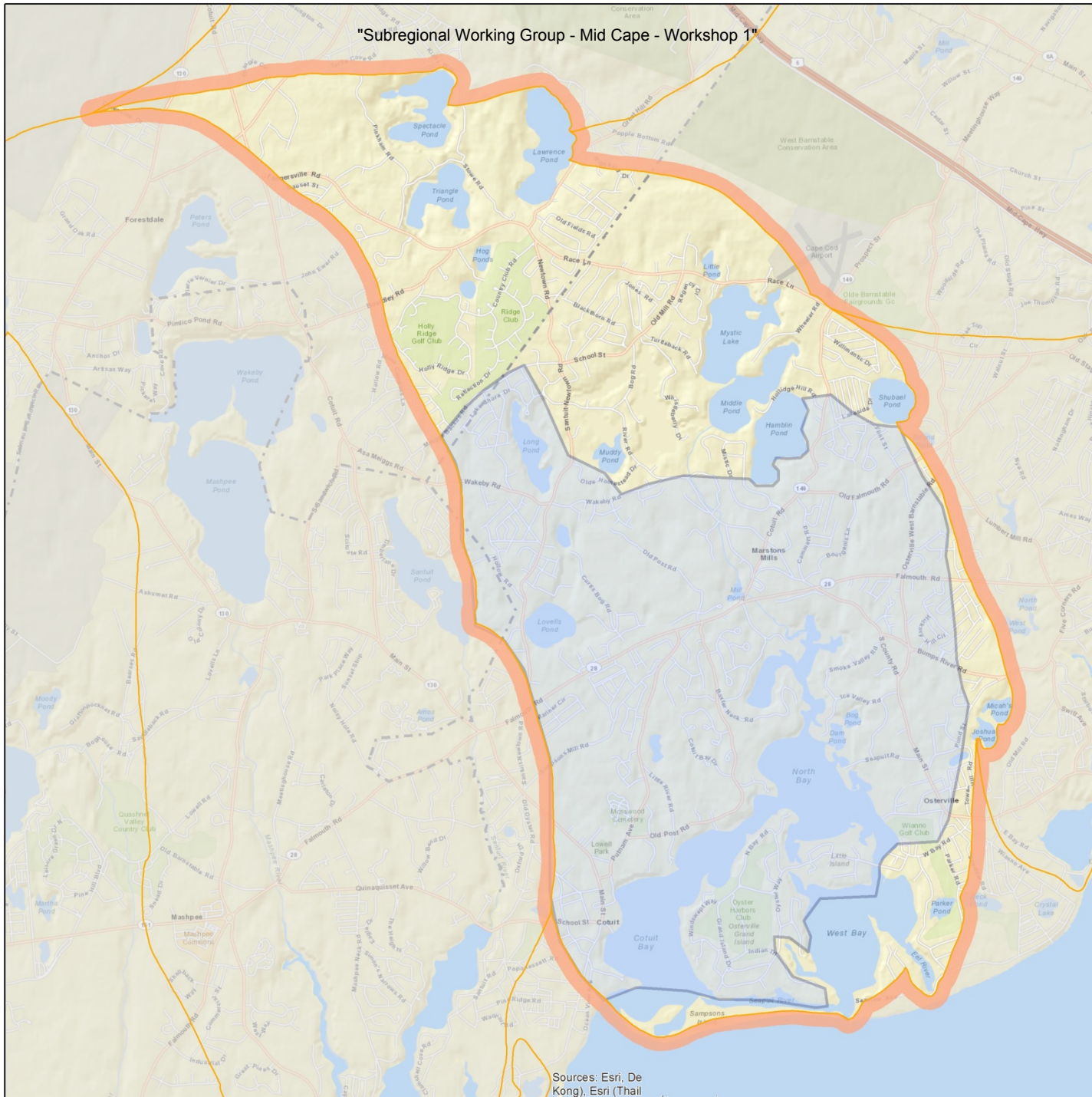


Sources: Esri, De Kong, Esri (Thailand)



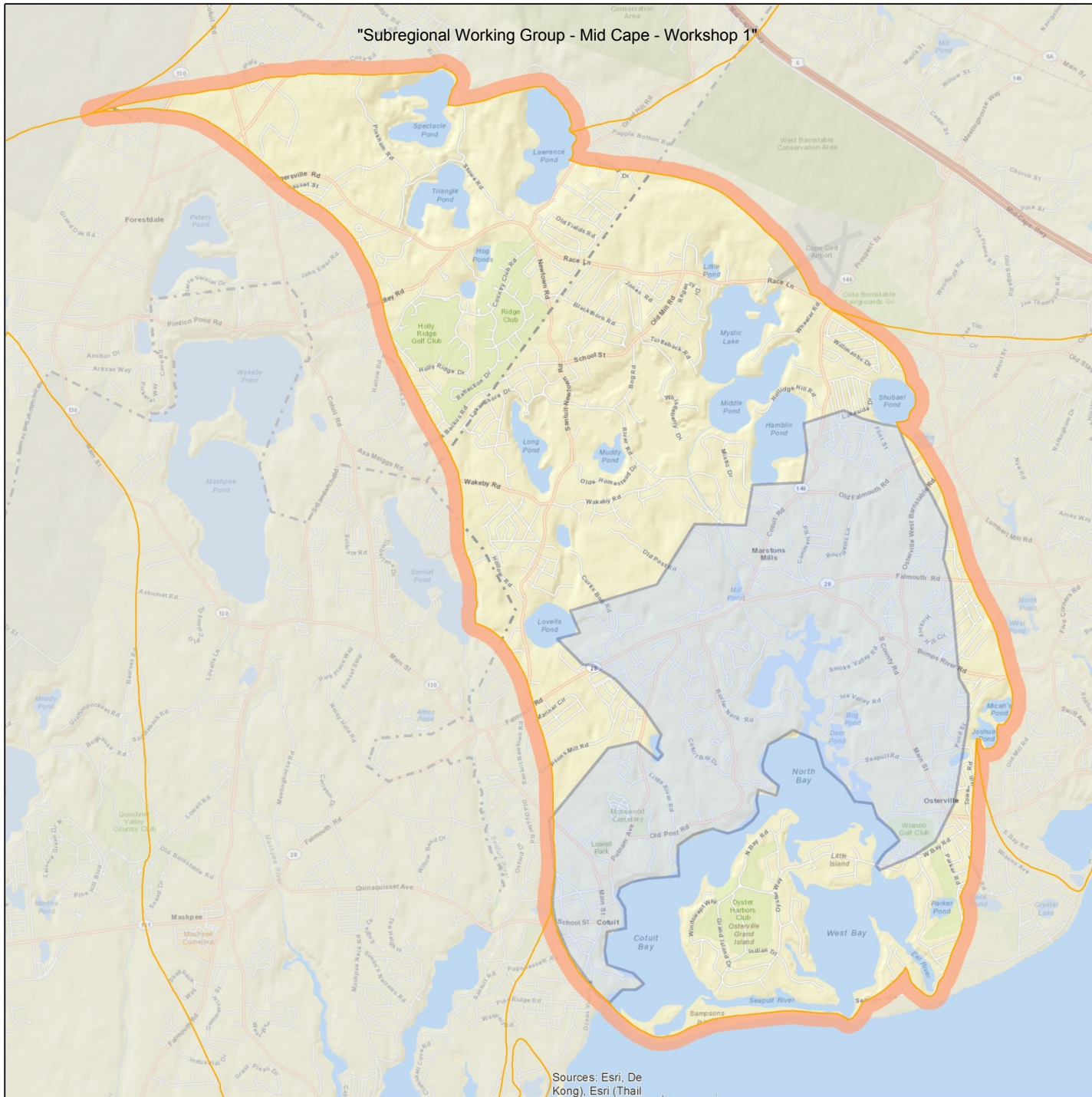


"Subregional Working Group - Mid Cape - Workshop 1"





# "Subregional Working Group - Mid Cape - Workshop 1"



Site Scale

Neighborhood

Watershed

Cape-Wide

Prevention

- Remediation of Existing Development
- Fertilizer Management
- Transfer of Development Rights
- Stormwater BMPs
- Compact Development

Reduction

- Title 5 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

Remediation

- 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

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

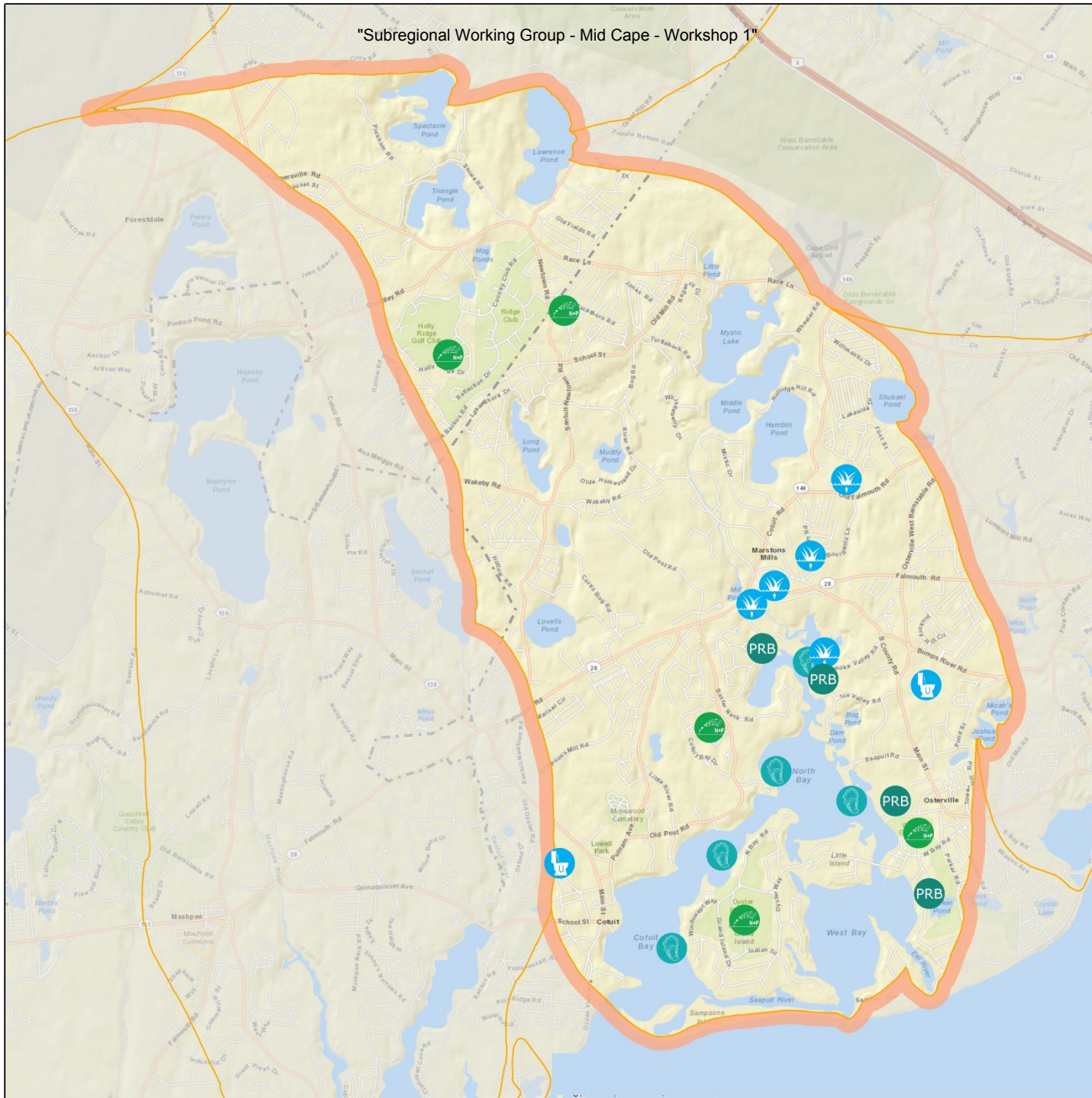
- A. Greater Than 1 Dwelling Unit/acre
- B. Village Centers
- C. Economic Centers
- D. Growth Incentive Zones

7

## Supplemental Collection / Sewer Areas



"Subregional Working Group - Mid Cape - Workshop 1"





<b>Technology/Approach</b>	<b>Federal</b>		<b>DEP</b>		<b>MADOT</b>	<b>BOH</b>	<b>ConComm</b>	<b>MEPA</b>
	<i>CWA</i>	<i>GWDP</i>	<i>WMA</i>	<i>I&amp;A</i>		<i>Title 5</i>	<i>WPA</i>	<i>Thresholds</i>
Stormwater Mngmnt	●					●	●	●
Fertilizer Mngmnt						●		
Oyster/Aquaculture	●						●	●
Ecotoilets				●		●		
PRBs							●	●
Constructed Wetlands	●	●					●	●
Fertigation Wells		●	●					●
Phytoremediation							●	●
Habitat Restoration	●						●	●
Inlet Widening	●						●	●
Dredging	●						●	●

Additional permits may apply. Other agencies involved could include:

- MA Natural Heritage and Endangered Species Program
- MA Historical Commission
- US Fish & Wildlife Service/Division of Marine Fisheries

# **Regulatory, Legal, and Institutional Interactions**

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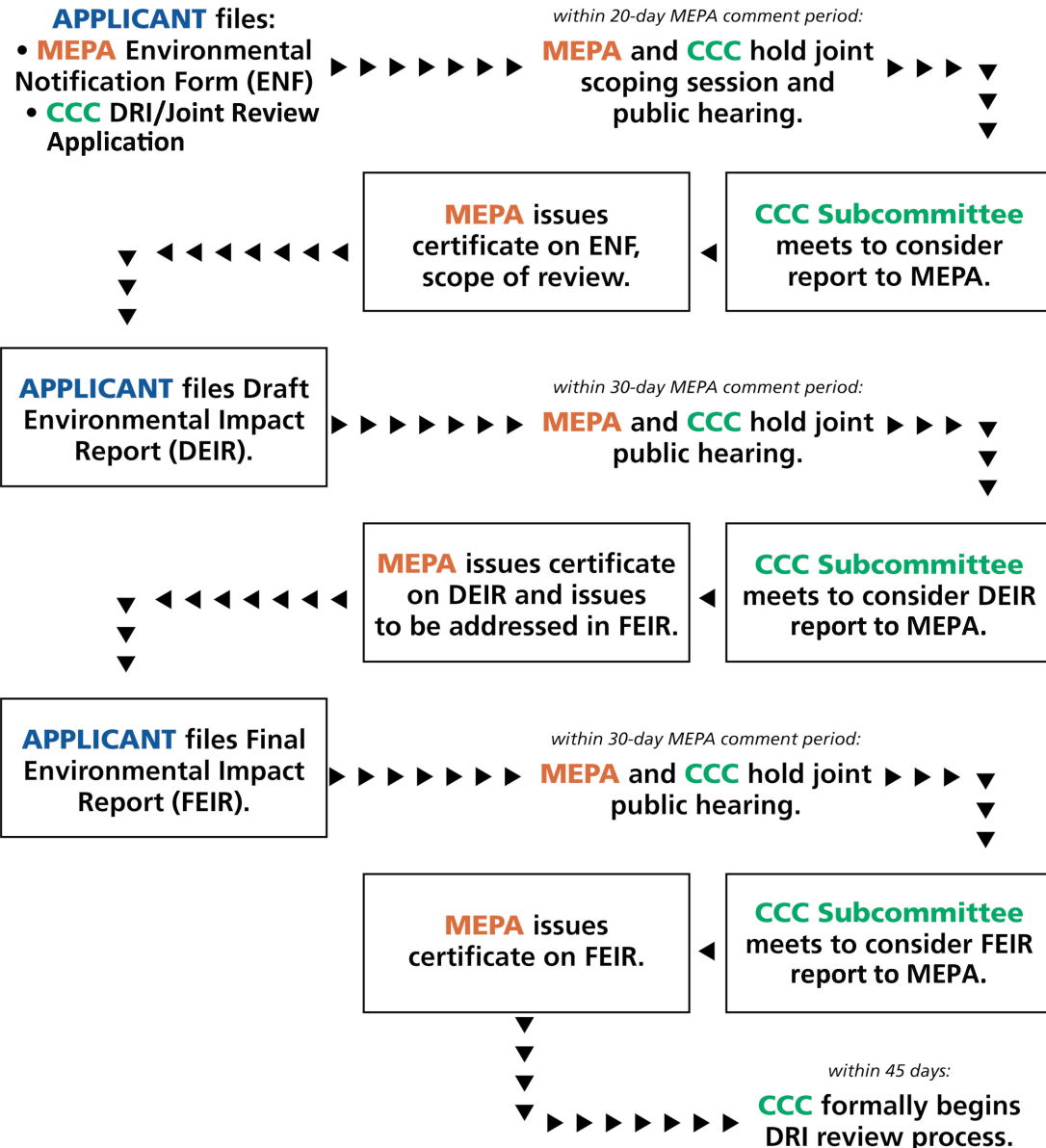
**What are some of the hurdles and opportunities associated with permitting the above scenarios?**

# Regulatory Purposes

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**MEPA**  
**CCC**  
**DEP**

# Joint MEPA/CCC Review: Projects Requiring Environmental Impact Report (EIR)



**Traditional technology permitting path**

**Fertilizer and stormwater reduction credit**

**Alternative technology permitting paths**

# **Need for Permitting Flexibility**

# MEPA Certificate for Falmouth CWMP

“Adaptive management acknowledges the uncertainties in design and implementation of projects, carefully monitors outcomes, assesses progress in a transparent fashion and requires recalibration of plans and projects as necessary.”

“The FEIR represents an evolution towards the development and implementation of a Targeted Watershed Management Plan for each of the Town’s coastal watersheds and includes concrete commitments to projects...that will provide significant reductions in nitrogen loading.”

The Secretary certified the plan “to support the towns adaptive management approach to developing long-term solutions and in acknowledgement of the town and its residents concrete support for projects that will reduce nitrogen in the short-term.”

“MassDEP comments indicate that an approvable TWMP will satisfy SRF requirements necessary to secure 0% financing.”

# **MEPA/CCC Special Review Procedure**



# **Regulatory, Legal, and Institutional Interactions**

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**What are some of the hurdles and opportunities associated with permitting the above scenarios?**

# Implementation

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**What components of an adaptive management plan are needed to achieve permitability and water quality goals?**

# Adaptive Management

## Definition

A structured approach that monitors outcomes for meeting water quality goals, assesses progress over time, and requires recalibration of plans and projects, as necessary, based on review and evaluation of monitoring.

**All materials and resources for the Mid Cape Sub  
Regional Group will be available on the Cape Cod  
Commission website:**



<http://watersheds.capecodcommission.org/index.php/watersheds/mid-cape/regional-stakeholder-group-mid-cape>

**Total acreage:**

**12,458 acres**

**Total acreage:** 12,458 acres

**Acreage by town:**

Barnstable 9,695 acres

Mashpee 85 acres

Sandwich 2,679 acres

**Total built parcels:** 6,744 parcels

**Total built parcels:** 6,744 parcels

**Built parcels by town:**

Barnstable 5,480 parcels (green)

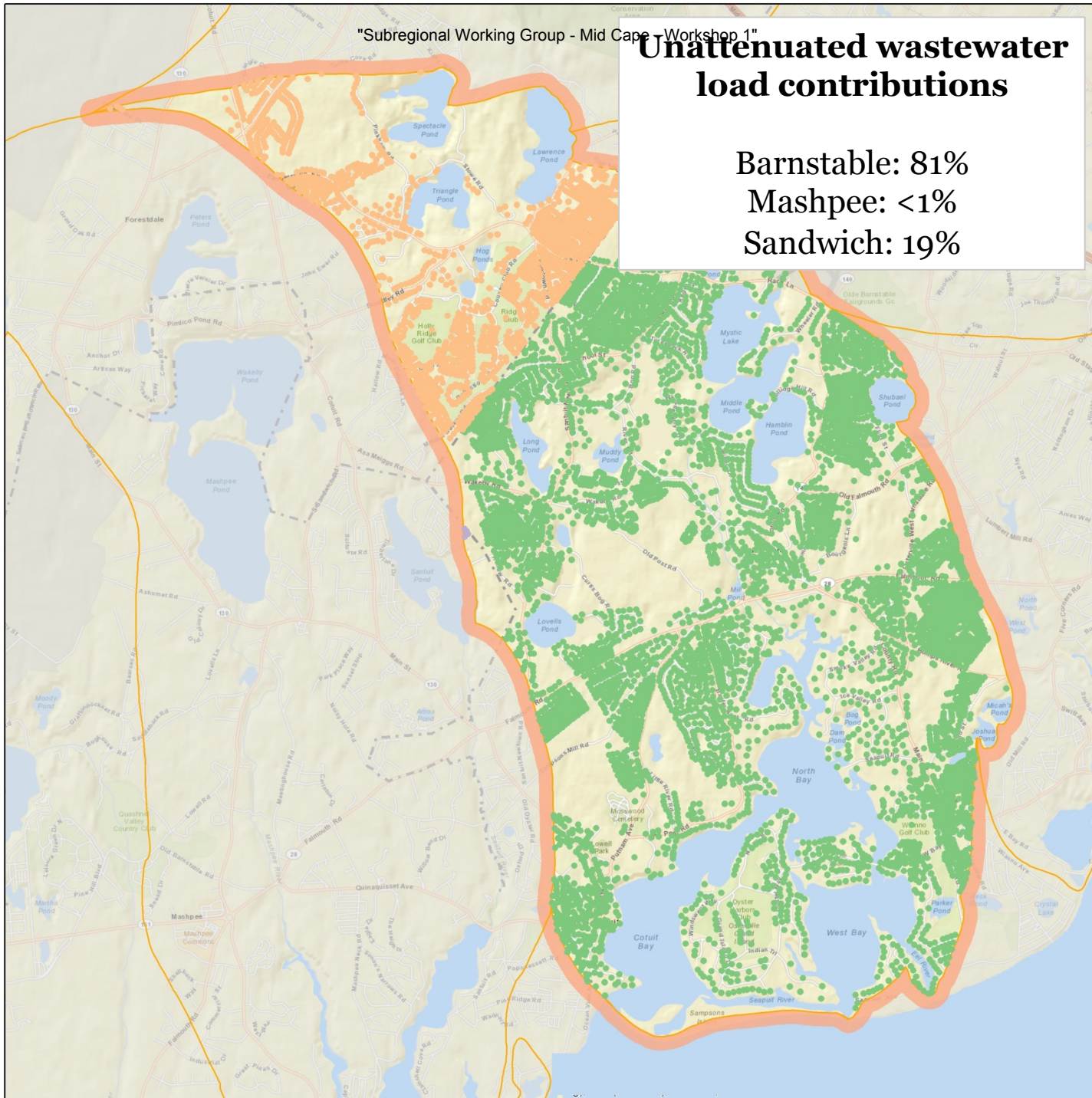
Mashpee 4 parcels (purple)

Sandwich 1260 parcels (orange)



# Unattenuated wastewater load contributions

Barnstable: 81%  
Mashpee: <1%  
Sandwich: 19%



Site Scale

Neighborhood

Watershed

Cape-Wide

Prevention

- Remediation of Existing Development
- Fertilizer Management
- Transfer of Development Rights
- Stormwater BMPs
- Compact Development

Reduction

- Title 5 Standard Title 5 Systems
- Conventional Treatment
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- Pond and Estuary Dredging
- Constr. Wetlands - Groundwater, Salt Water, Floating



Permit likely required



Permit may be required, depending on location

## **Acronyms:**

CWA – Clean Water Act

GWDP – Groundwater Discharge Permit

WMA – Water Management Act

I & A – Innovative and Alternative

WPA – Wetlands Protection Act

MEPA – Massachusetts Environmental Policy Act

MADOT – Massachusetts Department of Transportation

## **Acronyms:**

MEPA – Massachusetts Environmental Policy Act

CCC – Cape Cod Commission

DEP – MA Department of Environmental Protection

DRI – Development of Regional Impact

EIR – Environmental Impact Report

ENF – Environmental Notification Form

DEIR – Draft Environmental Impact Report

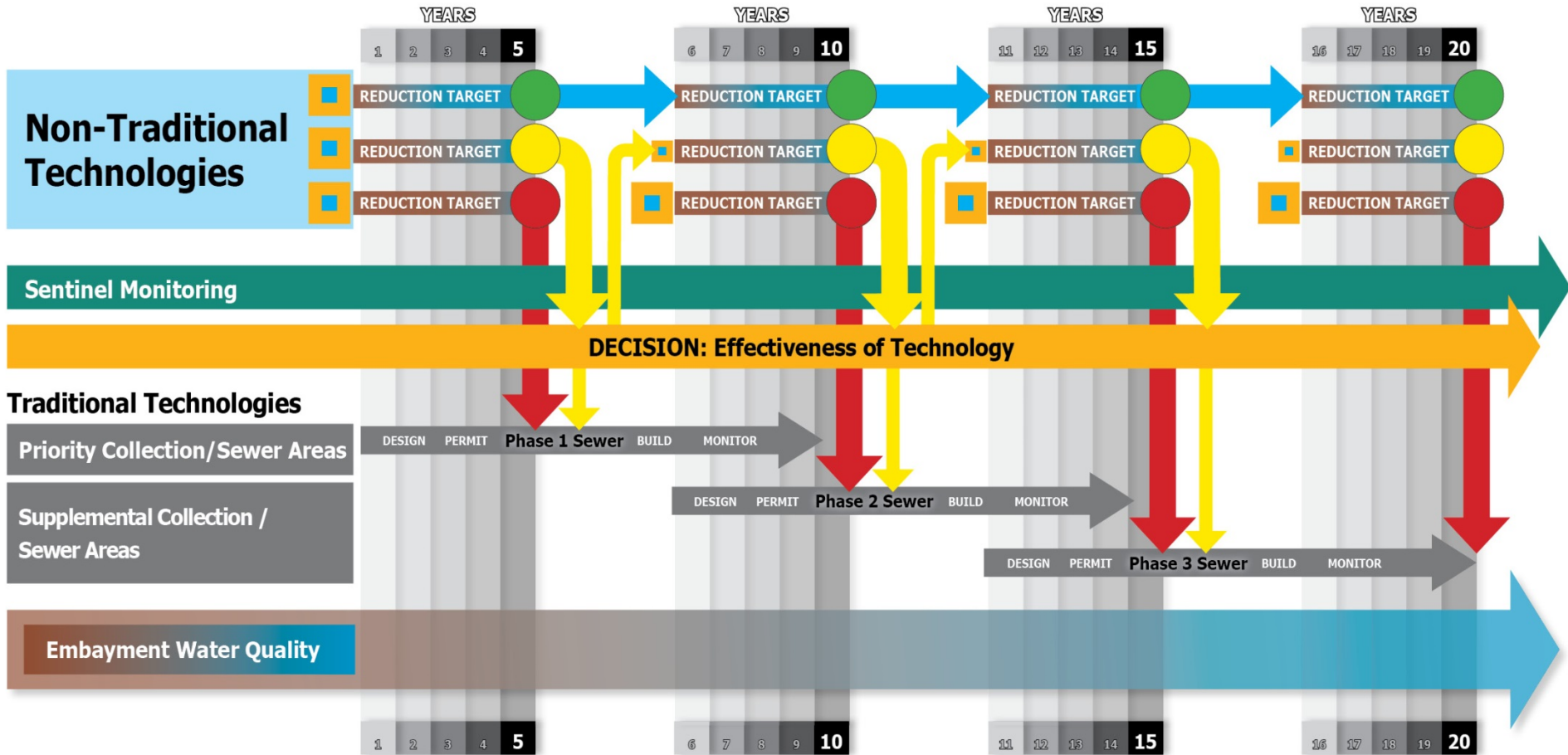
FEIR – Final Environmental Impact Report

TWMP – Targeted Watershed Management Plan

SRF – State Revolving Fund



# How do you implement adaptive management?



**Cape Cod 208 Area Water Quality Planning  
Mid Cape Sub Regional Group**

**Meeting One**

**March 4, 2014**

**8:30 am – 12:30 pm**

**Cape Cod Commission, Barnstable MA**

**Meeting Summary Prepared by the Consensus Building Institute**

**I. ACTION ITEMS**

Working Group

- Provide feedback on the draft meeting summary drafted by the Consensus Building Institute

**II. WELCOME AND OVERVIEW**

Ms. Carri Hulet, the facilitator from the Consensus Building Institute, reviewed the agenda and briefly described the process for the sub-regional group meetings. She explained that the same topics—scenario planning; regulatory, legal, and institutional issues (RLI); and implementation issues—would be discussed in each of the three sub regional group meetings. At a later point in the meeting after everyone had arrived, Ms. Hulet led introductions. Appendix A contains a list of meeting participants. Dan Milz, a PhD student from the University of Illinois, Chicago spoke to the group by speakerphone to notify participants that, although he was unable to attend, his camera was there to record the meeting, purely for his own academic use, and asked if there were any questions or concerns. Group members registered no objections to Mr. Milz' request.

Mr. Paul Niedzwiecki, Executive Director of the Cape Cod Commission, placed the meeting in the context of the larger 208 Plan Update process. He noted that the watershed-based 208 Plan Update process is strongly rooted in stakeholder engagement and will seek to maximize the benefits of existing local wastewater planning efforts. He also emphasized that the process will not promote an optimal solution in any watershed. Instead, the goal is to identify a range of approaches using different technologies that, if implemented, will meet water quality standards. Additionally, Mr. Niedzwiecki said local level decision makers will ultimately decide which set of technologies would be most appropriate to implement in their jurisdiction to meet water quality standards.

Mr. Niedzwiecki reviewed the timeline for the 208 Plan Update process, which began with public meetings in July and August 2013 and continued with meetings of 11 watershed working groups between September to December 2013. The 11 watershed working groups reviewed baseline conditions, technology options, and discussed watershed scenarios. In the current phase of the 208 Plan Update, the 11 watershed working groups have been condensed into four 'sub-regional' groups to discuss scenario planning, RLI issues, and implementation issues. He also noted that, although all of the stakeholders who participated in working group

meetings at the watershed subgroup level would not be able to participate in meetings at the sub-regional level, the Cape Cod Commission is seeking to keep stakeholders involved in the process by releasing a new section of the narrative that will accompany the 208 Plan each week on the Commission’s website for public comment.

The four sub-regional groups will each meet three times and follow the same process (see Figure 1). Each sub-regional group will start the current series of three meetings with the presentation of a concrete scenario; proceed to discussion of RLI concerns; and conclude with discussion of topics related to implementation. In regards to the monitoring conversation during the next meeting, Mr. Niedzwiecki said the Cape Cod Commission is forming an ad-hoc monitoring group to draft the monitoring protocol and present it to state and federal regulators for review. The goals of the first meeting were to:

- Identify regulatory, legal, and institutional challenges, constraints, and opportunities associated with the 208 Plan approach for water quality.
- Clarify the definition and components of an adaptive management plan that can be permitted.

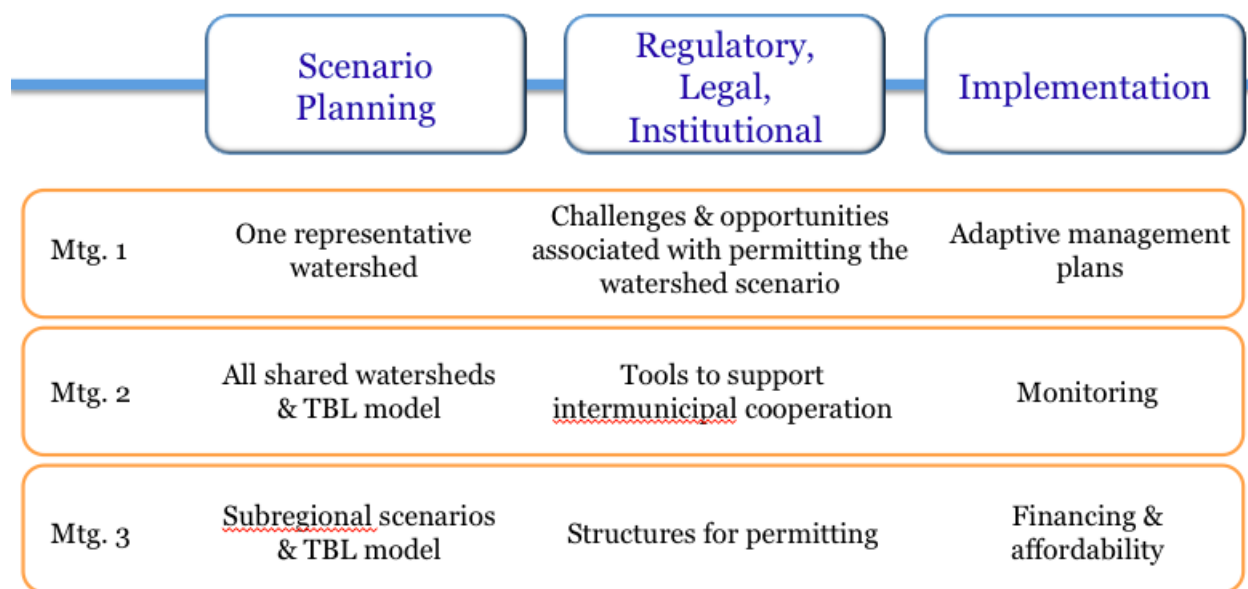


Figure 1

### III. SCENARIO PLANNING

Cape Cod Commission representatives presented the Three Bays watershed as a sample scenario for the Mid Cape Sub Regional group. Barnstable, Mashpee, and Sandwich are all located within the Three Bays watershed. The nature of the challenge and opportunity to manage water quality becomes apparent when superimposing the town jurisdictions on top of the watershed boundary—each town has a different amount of land area, number of built

parcels, and attenuated wastewater load contribution in the watershed. For example, the attenuated wastewater load contributions are 93% in Barnstable, 0% in Mashpee, and 7% in Sandwich. Mr. Niedzwiecki noted that the different contributions raise the question of how to assign responsibility, which is further complicated by the fact that some subwatersheds within the Three Bays watershed will require 100% removal of the nitrogen.

Mr. Niedzwiecki described the process the Cape Cod Commission used to develop the traditional and nontraditional approach scenarios. Two teams were created to review the traditional approach and the nontraditional approach. Both approaches reduced nitrogen levels through fertilizer reduction efforts and stormwater management efforts. Mr. Niedzwiecki noted that fertilizer does not contribute a large percent of total nitrogen Cape-wide, but in some subwatersheds, a reduction in the amount of fertilizer reaching groundwater could cause a significant impact and reduce the need to build water treatment infrastructure. Nutrient removal from stormwater sources, which will be required by the EPA in the future, is an opportunity to alleviate homeowners of some of the effort they will need to make to help meet water quality standards.

#### *Traditional Approaches to Wastewater Management*

Mr. Tom Cambareri, Watershed Management Director at the Cape Cod Commission and leader of the traditional approaches analysis, presented the findings of the traditional approach, which considered the use of common sewer infrastructure, treatment plants, innovative/alternative Title 5 systems, and cluster and satellite systems. He noted that each watershed, such as the Three Bays watershed, is itself made up of sub-watersheds, and that the MEP and TMDL reports prescribe nitrogen-removal targets both for the whole watershed and its subwatersheds, accounting for factors such as nitrogen load and natural attenuation rates.

Using land use data and data from the MEP TMDL reports, the Cape Cod Commission created a Watershed MVP Tool to track nitrogen loading and attenuation in the subwatersheds and build treatment scenarios. The team used this tool to create scenarios that would remove 60% of the nitrogen from the watershed. Mr. Cambareri showed two maps illustrating the different footprints of sewer infrastructure that would be required to achieve the 60% goal if different traditional treatment options were constructed. For one scenario, the researchers selected a centralized treatment option due to its high level of treatment capacity and the intent to keep treatment local in the watershed. The geographic expanse of the sewer system illustrated in the scenario one map was approximately twice as large as the expanse of the sewer system illustrated in the scenario two map. The reduced footprint size in scenario two was due to the inclusion of stormwater and fertilizer policies for nitrogen removal credits.

#### *Non-Traditional Approaches to Wastewater Management*

Scott Horsley, consultant to the Cape Cod Commission, presented the scenario from the non-traditional approach. He noted that the Commission's examination of non-traditional approaches includes a wide variety of different technologies that would be implemented at different points in the watershed, thereby mitigating nitrogen loads over different timeframes.



Mr. Horsley reviewed the seven-step problem solving approach the Commission has developed for the non-traditional inquiry. It begins with identifying nitrogen removal needs, then tries to meet the need using various non-traditional technologies, then adds sewer infrastructure to manage residual removal of nitrogen, if necessary.

Mr. Horsley showed maps of the Three Bays watershed to illustrate possible locations for a suite of technologies such as permeable reactive barriers, constructed wetlands, fertigation wells, shellfish bed restoration or aquaculture, and ecotoilet demonstration sites that would collectively meet the 60% nitrogen removal goal. He noted that some aquaculture projects may have been developed since the MEP report was published and that these are not accounted for in the data. Mr. Horsley said the ecotoilet demonstration sites would be located at public institutions to help raise awareness of the technology.

Mr. Horsley also showed a table illustrating the different types of permitting that would be required before installing the various non-traditional technologies. He explained that the following bodies or statutes may exercise permitting authority over many non-traditional technologies, particularly with regards to projects that exceed certain threshold sizes or which are located in certain areas: the US Army Corps of Engineers, the Massachusetts Department of Environmental Protection, local Boards of Health, local Conservation Commissions, the Massachusetts Environmental Protection Act, the Massachusetts Natural Heritage and Endangered Species Program, the Massachusetts Historical Commission, US Fish & Wildlife Service/MA Division of Marine Fisheries, and the Massachusetts Department of Transportation (MassDOT). Figure 2, shown here, outlines the types of permitting that may be required for different technologies.

Technology/Approach	ACOE	DEP	BOH	ConComm	MEPA	
	401/404	GWDP WMA	I&A	Title 5	WPA	Thresholds
<u>Stormwater Mngmnt</u>					●	●
Fertilizer Mngmnt						
Oyster/Aquaculture	●				●	●
<u>Ecotoilets</u>			●	●		
PRBs					●	●
Constructed Wetlands		●			●	●
<u>Fertigation Wells</u>			●			●
Phytoremediation		●			●	●
Habitat Restoration	●				●	●
Inlet Widening	●				●	●
Dredging	●				●	●

Additional permits may apply. Other agencies involved could include:

- MA Natural Heritage and Endangered Species Program
- MA Historical Commission
- US Fish & Wildlife Service/Division of Marine Fisheries
- MassDOT

Figure 2

#### IV. REGULATORY, LEGAL, AND INSTITUTIONAL INTERACTIONS

Ms. Patty Daley, Deputy Director of the Cape Cod Commission, provided greater detail on the current regulatory framework that is in place for permitting different types of wastewater plans and technologies. Building on the information provided by Mr. Horsley, she explained the animating purpose behind a few types of regulatory review:

- Massachusetts Environmental Policy Act (MEPA) review is performed by the Commonwealth of Massachusetts in order to recognize the environmental impacts of different projects, especially larger ones, and to scope alternatives that may be less environmentally impactful. Following MEPA review, review under the Massachusetts Department of Environmental Protection, the Massachusetts Historical Commission, the US Fish & Wildlife Service/Division of Marine Fisheries, and other agencies may still be required.
- The Cape Cod Commission is charged with conducting a type of review called “Development of Regional Impact” (DRI) review in order to provide for environmental protection and ensure that adequate infrastructure is in place for projected growth, especially for larger projects on the Cape. The Commission and MEPA have a Joint Review Process to coordinate the Commission’s DRI review with MEPA review, however, the formal DRI review takes place after the conclusion of the MEPA review.
- The Massachusetts Department of Environmental Protection issues permits for groundwater discharge and groundwater withdrawals. The agency also administers the State Revolving Fund program to pass federal funds on to local communities for water projects. Ms. Daley noted that SRF loans often have a 2% interest rate but that

municipalities can secure 0% financing in cases where they can demonstrate that the addition of new wastewater infrastructure will be "flow –neutral".

Ms. Daley identified a number of factors that could be changed about the current permitting process to better accommodate non-traditional technologies and the needs of towns on the Cape in dealing with their wastewater challenges:

- Currently the Cape Cod Commission's DRI review is oriented toward a parcel-based review and is not a town-wide or watershed-wide approach. The Commission will explore how to revise this over the next year.
- Identify how to get credit for fertilizer and stormwater reduction measures from the state permitting agencies.
- Permitting is currently done based on town boundaries because towns are the fiscal agents that are responsible for implementing plans. Most watersheds cross town boundaries, however, meaning that there is a disconnect between current permitting and implementing nitrogen mitigation measures on a watershed basis.
- Community Wastewater Management Plans (CWMPs) only include conventional technologies that are already permitted but do not incorporate the non-traditional approaches currently being explored.
- CWMPs tend to include town-wide approaches that require 30-year engineering analyses, which prove to be very (and arguably, unrealistically) costly, thereby provoking opposition at town meetings. Creating an easier pathway for permitting smaller, lower-cost technologies that enjoy widespread support would be helpful.

Ms. Daley also identified a couple of positive recent developments with regards to the permitting process for wastewater projects. Falmouth has been able to secure a MEPA certificate for two smaller projects while the larger plan is still under review. The plan itself incorporates principles of adaptive management. The Cape Cod Commission is also exploring the creation of a MEPA / CCC Special Review Procedure that would streamline the review process across all Cape towns. The Special Review Procedure could apply to projects that can commence early due to their limited scale, high level of public support, and benefit to the environment, and also for projects that need coordination between MEPA and other agency considerations, such as the 208 Plan.

The working group then identified the following regulatory, institutional and legal challenges:

- No legal entity exists that could apply for integrated projects spanning multiple town boundaries, yet communities cannot solve the issue without the help of other communities.
- Related to the above issue is the need to overcome concerns about ceding town sovereignty by collaborating with other towns or with a new entity to address the issue. Some people will fear the creation of a new entity to manage nitrogen.
- Assigning financial and legal responsibility is challenging when multiple communities share a watershed and contribute differently to the problem. Towns with small

contributions to the problem may not be incentivized to participate—they may have a low willingness to pay. Similarly, it is unclear which entity would operate, maintain, and monitor the systems once installed.

- The regulatory and legal frameworks are both a maze and a minefield in terms of permitting new technologies and receiving credit for nitrogen reduction. Navigating these frames can be a costly endeavor.
- Flexibility in regulations is necessary, but who will negotiate with the Commonwealth to create a more regulatory and permitting friendly environment?
- The public is unaware of and sometimes unaccepting of nontraditional technologies, partially due to misinformation.
- There is insufficient hard data to support all the nontraditional technologies.
- The 2.5% override is always a concern.
- Public perception of the projects may be negatively influenced by past efforts such as the MWRA tax.
- Lack of awareness - The public is not aware of the 208 Process or about the consequences of doing nothing, which causes some people to postpone action until a later date. People are also unaware of the connection between groundwater and coastal resources.
- Water districts are not engaged in the 208 Plan Update process.
- Once implemented, a delay in water quality improvements could create the perception that the integrated approach is not working properly.
- The Not In My Back Yard (NIMBY) backlash—some people will not accept projects in their neighborhoods due to concerns about private property.
- Zoning regulations and land use availability may impede the use of nontraditional approaches.
- The rigidity of the natural heritage and watershed protection acts do not enable a detailed review of projects at a very fine level.

The working group next identified the following opportunities:

- Since multiple towns may share a watershed, legal and financial responsibilities may provide incentives for long-term collaboration to solve the problem. For example, if a town votes not to participate in a collaborative agreement, then that town would not receive 0% loans for wastewater projects. Additionally, if a town does not participate, then the DEP and EPA would be required to take enforcement action, which the town would then be required to implement independently.
- This process will help identify options for assigning responsibility.
- This process will help seek regulatory relief for alternative technologies.
- Clear monitoring protocols to be implemented across the communities sharing a watershed would provide a solid base of data for the project.
- Public pilot projects could raise awareness and acceptance of nontraditional technologies. Pilot projects could also create opportunities to generate data on nontraditional technologies.

- Current efforts provide the opportunity to educate people about the issue and the consequences of not addressing the issue now. It could also provide the opportunity to educate state and federal regulators about the unique qualities of the Cape.
- Public awareness could be increased by involving the public drinking water districts and linking the nitrogen issue to concerns about public drinking water sources.
- New technologies might result in more rapid improvements to water quality than traditional technologies will show. Additionally, the new technologies may be cheaper than the traditional technologies.
- Efforts made on Cape Cod could provide a model for other communities throughout the USA.
- A new framework and process to permit an integrated project could be developed.
- A new entity, a 'permanent applicant', or the Commission could help towns address watershed wide issues.
- Revisions to the permit review process could enable new partnerships between the Commission and the towns.
- Clarification of the management entities will help agencies to approve projects.
- Existing institutions could be used to amplify the need for inter-municipal coordination.
- Collaborative efforts could establish a new sense of environmental stewardship.
- The DEP and EPA seem supportive of this process.

A group member asked whether and how the 208 regulations are used in other locations. An EPA representative replied that the 208 regulations have not been utilized in the northeast in some time; but in Colorado and Utah they are frequently invoked to obtain funding to move forward with wastewater treatment planning.

## **V. IMPLEMENTATION: ADAPTIVE MANAGEMENT**

Mr. Niedzwiecki said that the implementation topic for this meeting would focus on adaptive management and framed the topic with the following question: "What components of an adaptive management plan are needed to achieve permitability and water quality goals?"

Mr. Niedzwiecki noted that adaptive management is a concept that can have many different definitions and suggested that the working group try to identify the key components of an adaptive management strategy. He provided the following definition of adaptive management as a starting point: "A structured approach for meeting water quality goals that monitors outcomes, assesses progress over time, and requires recalibration of plans and projects, as necessary, based on review and evaluation of monitoring." The working group identified the following key components of an adaptive management strategy:

- A structured approach that is customized to the watershed, lends itself to permitting and enforcement by regulators, and clearly establishes a governance or management structure;

- Clear goals or targets;
- Great baseline data;
- An overall monitoring plan, and clear monitoring protocols for each technology that can quantify success or failure;
- Flexibility – the opportunity to adjust strategies and goals based on data, new technologies, or changes to existing technologies;
- Development and retention of local monitoring expertise;
- Transparency in data collection and distribution;
- Anticipates the future, including contaminants of emerging concern, and climate change impacts;
- Includes a regulatory component to review future land use development or conservation plans, and works within comprehensive development plans;
- Ability to include net plus nitrogen credits if actions go above and beyond what was expected;
- Supported by water districts, towns, and elected officials.

Mr. Niedzwiecki presented a possible adaptive management strategy illustrated in Figure 3.

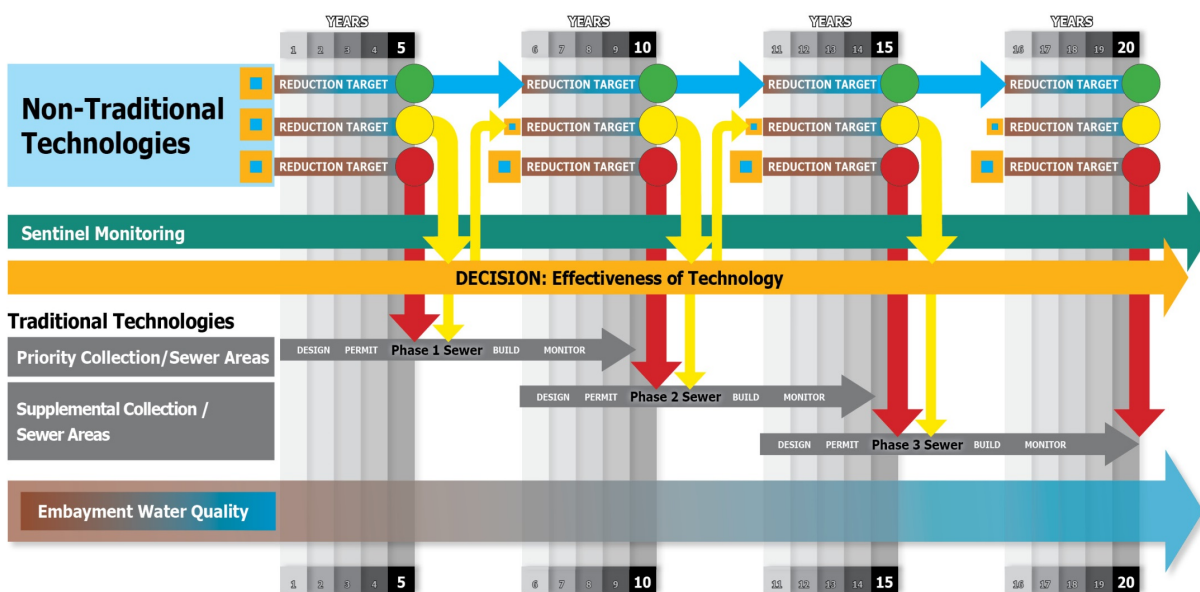


Figure 3

Mr. Niedzwiecki explained that the diagram represents five-year cycles of feedback loops such that, if a given non-traditional technology is not meeting expected performance goals, decisions can be made to continue working with that technology, and/or implement another non-traditional technology, and/or implement traditional technologies (such as sewerage). As time progresses, if non-traditional technologies are not performing adequately to meet nitrogen

reduction goals, the permittee would default to sewerage. Mr. Niedzwiecki noted that real-time monitoring of nitrogen in embayments and estuaries, which would be possible to perform in the near future, would facilitate adaptive management.

Participants discussed how the negotiation process to create an adaptive management framework would unfold. Mr. Niedzwiecki suggested that the Commission would negotiate with the DEP, MEPA, and EPA to establish the framework and the timeframe. He noted that baseline data would likely be derived from the MEP and TMDL reports. Mr. Niedzwiecki said that risk and uncertainty underpin the adoption of an adaptive management framework and that the EPA, DEP, and CCC will also need to determine an acceptable level of risk and uncertainty.

The group discussed how regulators might react to a newly proposed framework that is fundamentally different from the current framework. One participant suggested the group should not propose adaptive management since this might be challenging for regulators; instead, the participant suggested proposing the use of adaptive technology. A representative from the EPA commented that EPA Region 1 is supportive of a collective, inter-municipal approach using newer green technologies to meet water quality standards.

The group listed other criteria that might provide regulators with greater confidence in an adaptive management plan:

- Diversity of approaches;
- Freshwater monitoring of phosphorous and a clear link to co-benefits such as economic opportunities;
- Preservation of the unique qualities of Cape Cod;
- Understanding of the cost of doing nothing;
- Inclusion and support of the Massachusetts Department of Transportation.

A group member asked how towns should proceed with CWMPs considering when and if an approach could be submitted through the yet-to-be-developed permitting framework. There is no clear answer to this question at this time, but Mr. Niedzwiecki said that perhaps Three Bays Watershed is the place to initiate the use of the new permitting protocol/framework.

A participant suggested reframing the technologies. Instead of using terms such as innovative or nontraditional, the participant suggested calling the technologies site-specific. Mr. Niedzwiecki agreed that the distinction in the terminology is important and said eventually the list of technologies will become a list of all viable strategies as opposed to traditional and non traditional strategies.

## **VI. PUBLIC COMMENTS**

A member of the public asked if the narrative pieces the Commission plans to release on the website will be available to the public. Mr. Niedzwiecki said everyone will be able to review the documents, but only the stakeholders will be able to comment on them.



**APPENDIX ONE: MEETING PARTICIPANTS**

<b>Name</b>	<b>Affiliation</b>
<b><i>Working Group Members</i></b>	
George Allaire	Town of Yarmouth
Jaci Barton	Barnstable Land Trust
Steve Brown	Red Lily Pond Project
Linda Bolliger	Hyannis Park Civic Association
Philip Boudreau	Barnstable Citizens Advisory Committee
Ann Canedy	Town of Barnstable
Fred Chirigotis	Town of Barnstable
Lindsey Counsell	Three Bays Preservation
Beth Ferranti	Marstons Mills Resident
Conrad Geysler	Cotuit Solar
Jessica Rapp Grasseti	Town of Barnstable
Joanna Hunter	Environmental Protection Agency
Tom Klein	Equity Management Partners
Ed Nash	Golf Course Superintendents Association
Sypro Mitrokostas	Dennis Chamber of Commerce
Dale Saad	Town of Barnstable
Sam Wilson	Sotheby Realty
<b><i>Staff</i></b>	
Patty Daley	Cape Cod Commission
Tom Cambareri	Cape Cod Commission
Paul Niedzwiecki	Cape Cod Commission
Scott Horsley	Consultant for Cape Cod Commission
Carri Hulet	Consensus Building Institute
Eric Roberts	Consensus Building Institute
<b><i>Observers</i></b>	
Ed Gardella	
Dan Milz	University of Illinois at Chicago
Sue Phelan	