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CAPE COD
COMMISSION

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208 Area Wide Water Quality Management Plan Update Lower Cape Sub Regional Group

Meeting One

February 27, 2014 1:00 – 5:00 pm

Chatham Community Center, 702 Main St., Chatham, MA 02633

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**

- 1:00 Welcome & Review of 208 Goals
- 1:10 Process Overview, Meeting Overview and Goals, & Introductions
- 1:30 Scenario Planning
- *Use maps of technologies/approaches in one representative watershed to illuminate RLI and implementation discussions.*
- 2:00 Regulatory, Legal, and Institutional Interactions
- *Presentation of existing permitting framework*
 - *What are some of the hurdles and opportunities associated with permitting the above scenario?*
- 3:15 Break
- 3:30 Implementation
- *Presentation and discussion of adaptive management definition and graphic*
 - *What components of an adaptive management plan are needed to achieve permit-ability and water quality goals?*
- 4:45 Public Comment
- 5:00 Adjourn



Lower 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

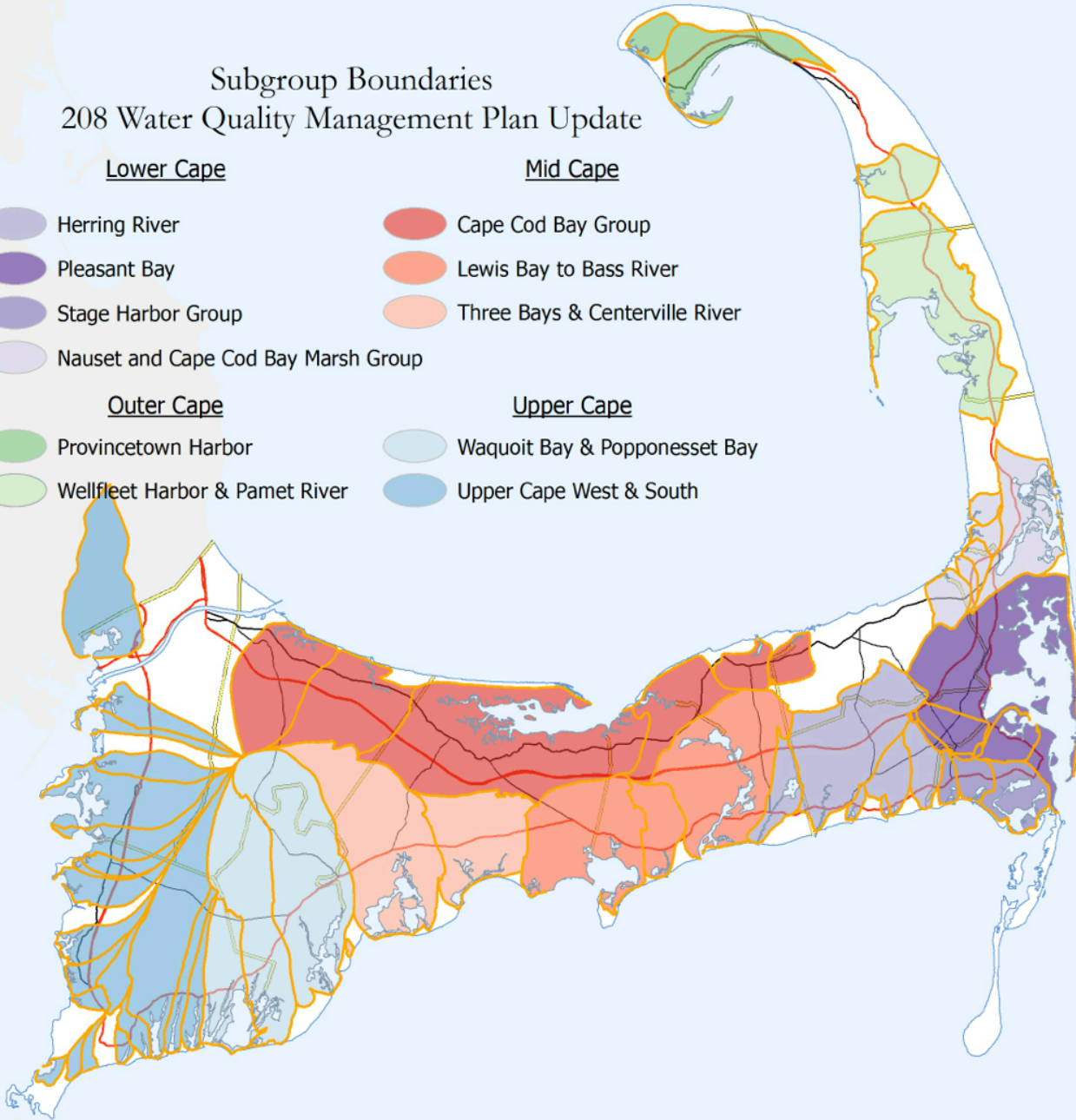
- Cape Cod Bay Group
- Lewis Bay to Bass River
- Three Bays & Centerville River

Outer Cape

- Provincetown Harbor
- Wellfleet Harbor & Pamet River

Upper Cape

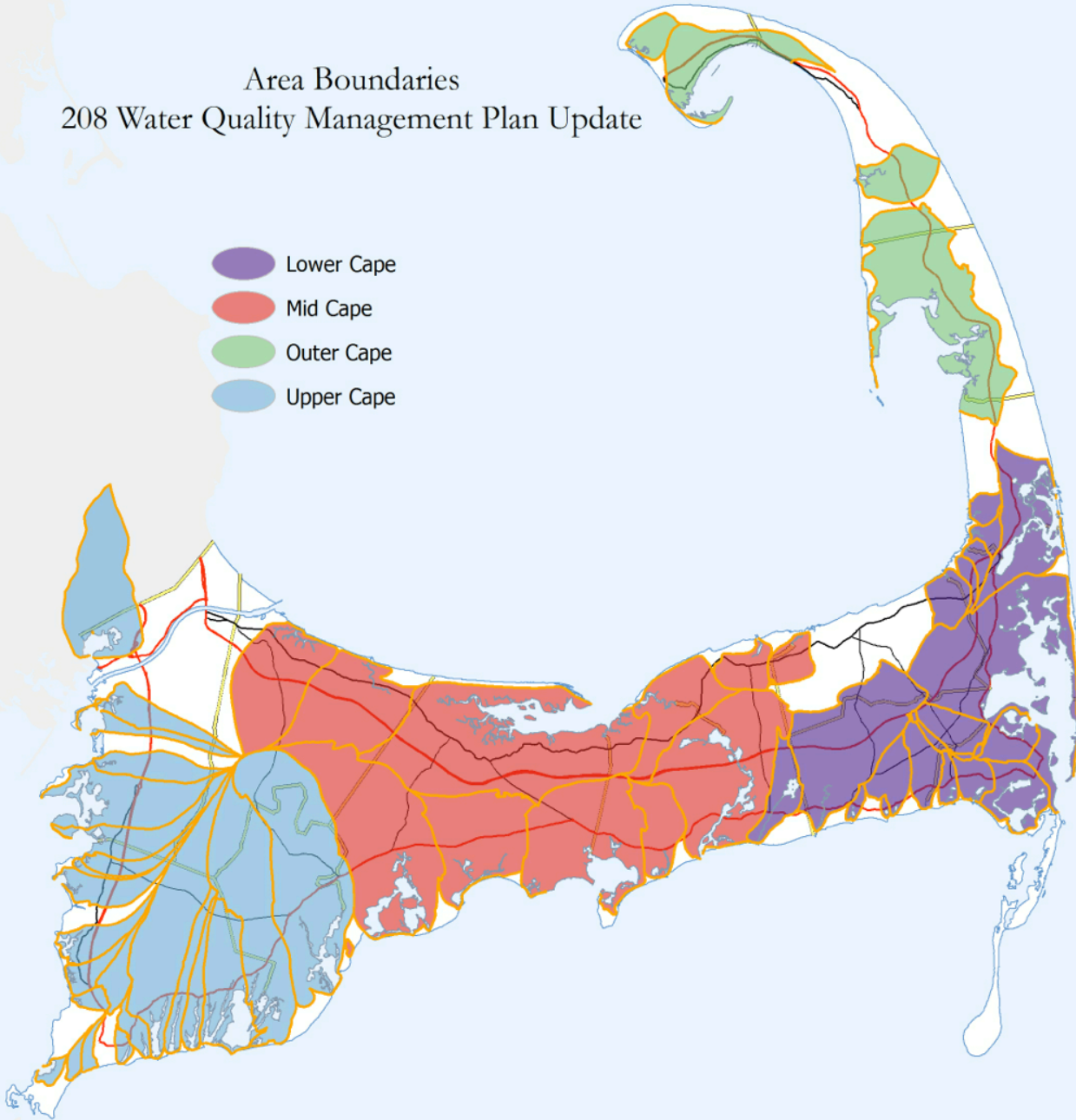
- Waquoit Bay & Popponesset Bay
- Upper Cape West & South





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:

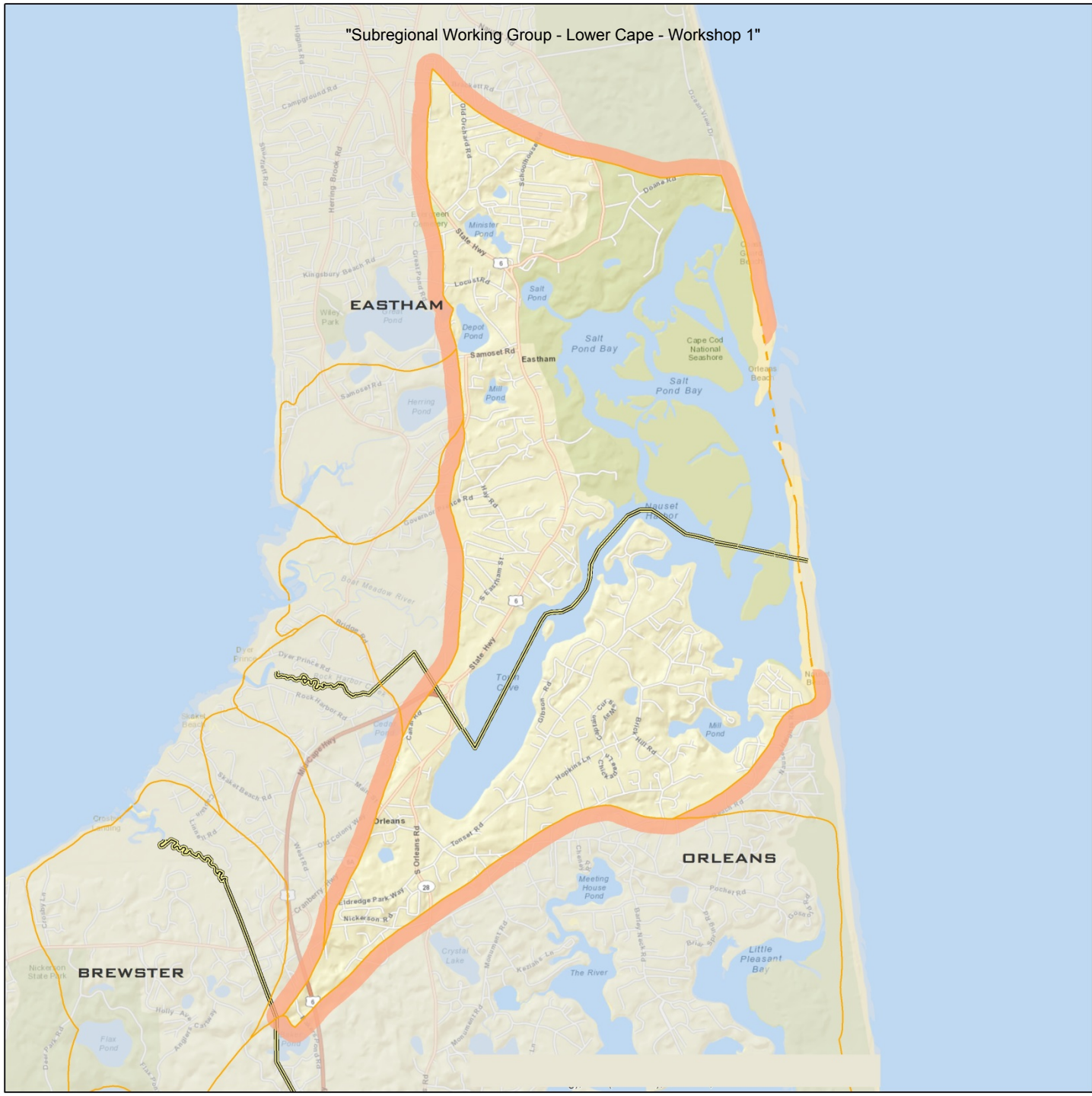
Identify regulatory, legal, and institutional challenges, constraints, and opportunities associated with the 208 Plan approach for water quality

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

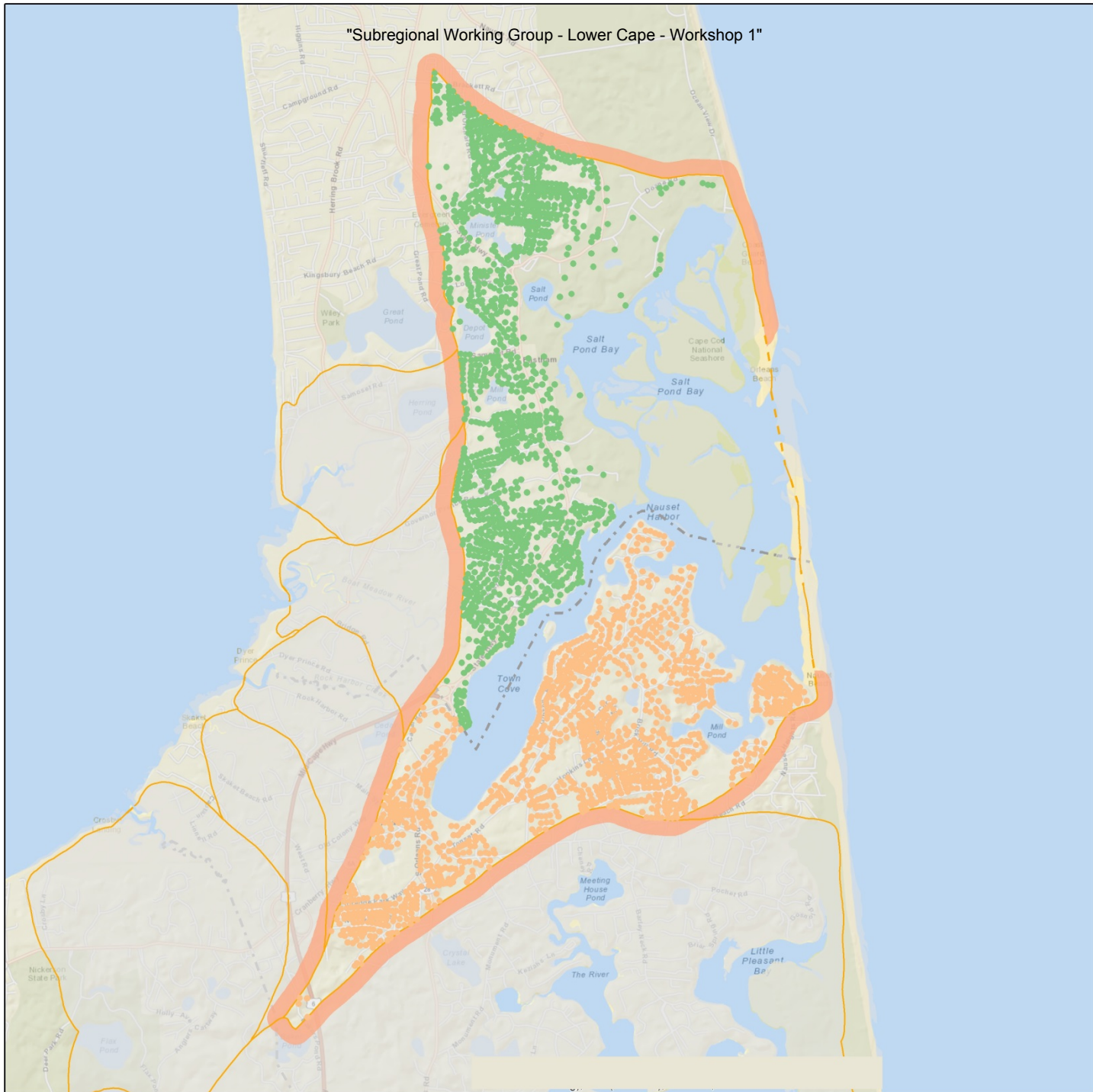
Scenario Planning

Nauset Marsh

"Subregional Working Group - Lower Cape - Workshop 1"

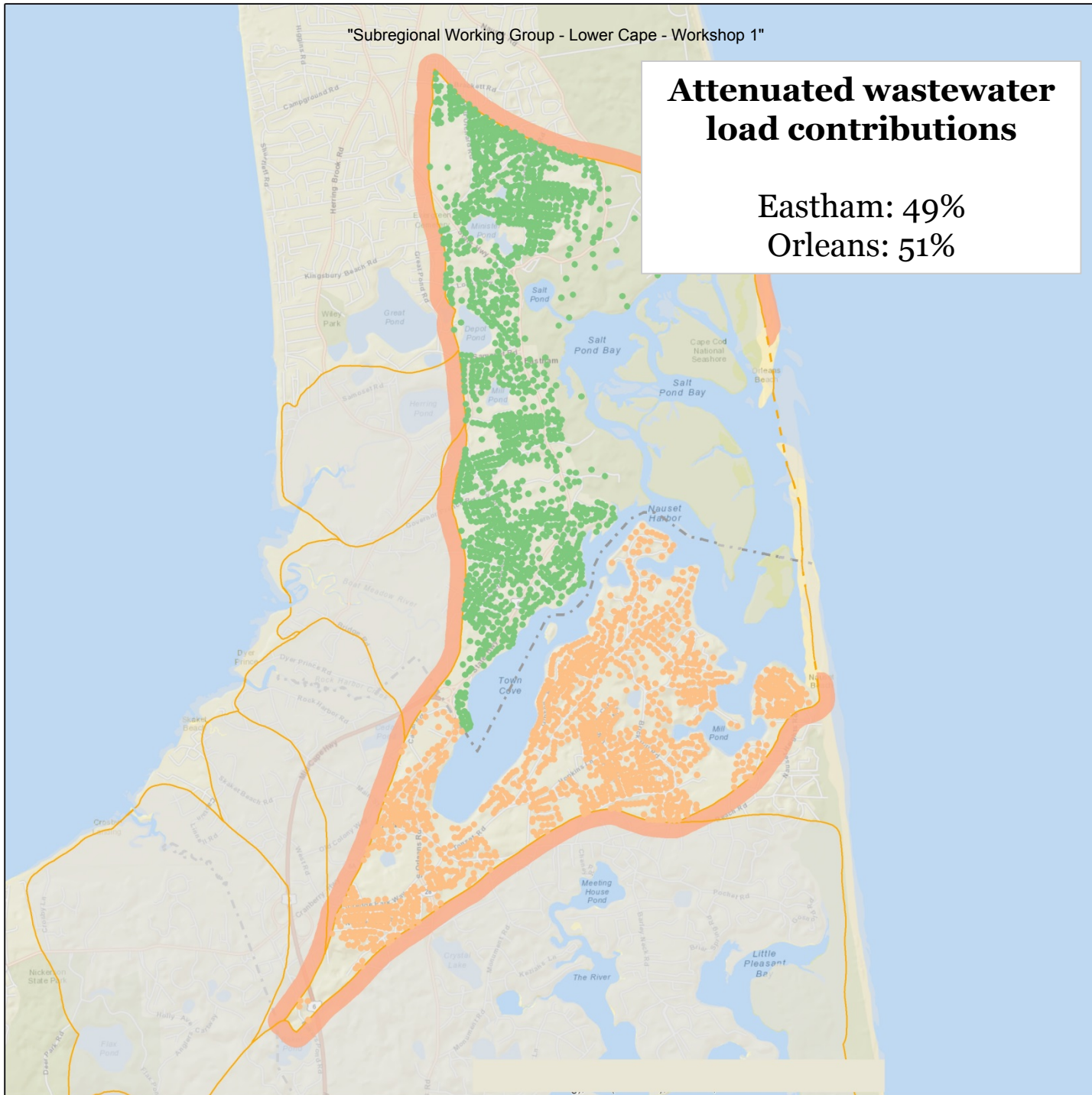


"Subregional Working Group - Lower Cape - Workshop 1"

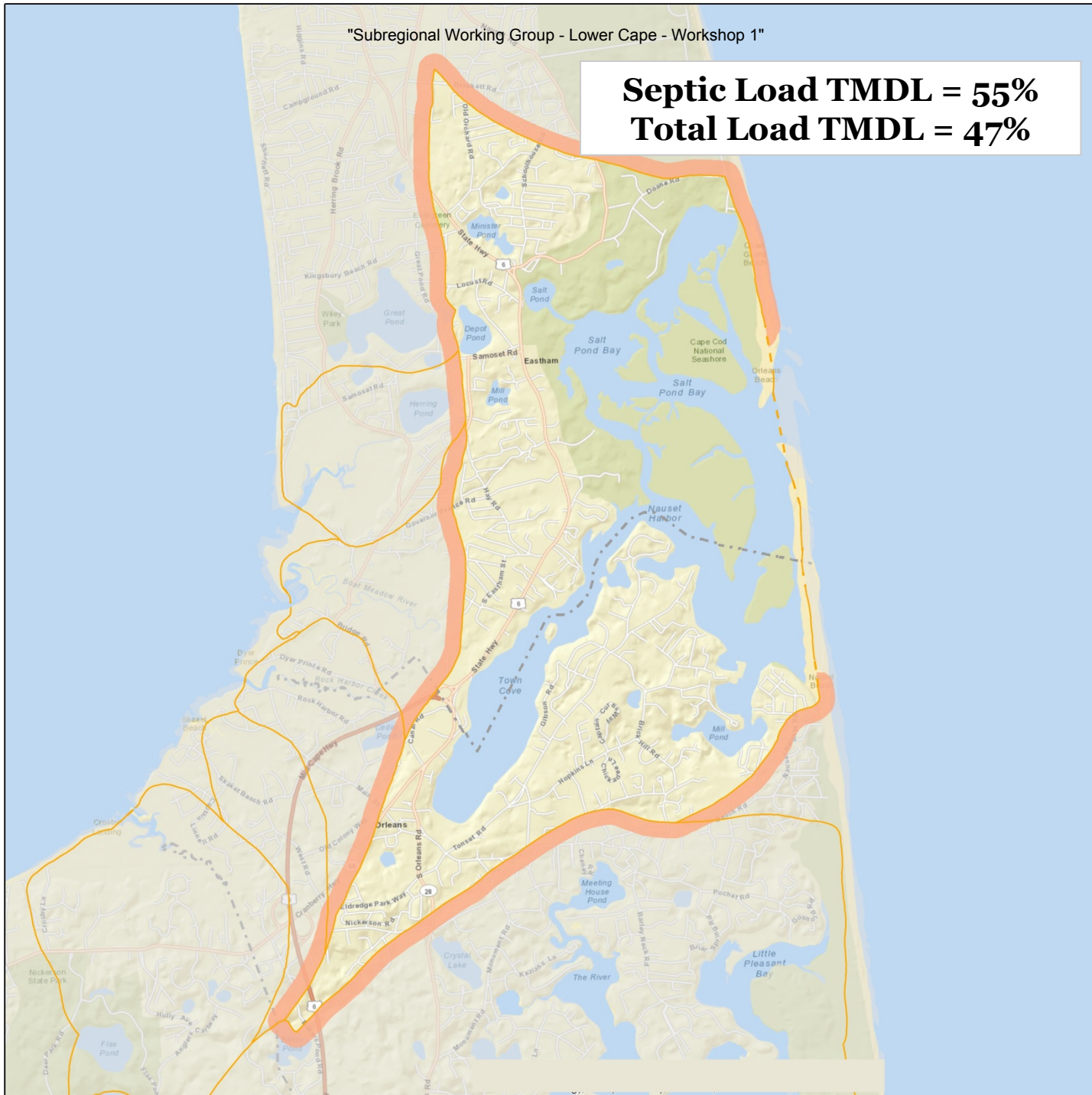


Attenuated wastewater load contributions

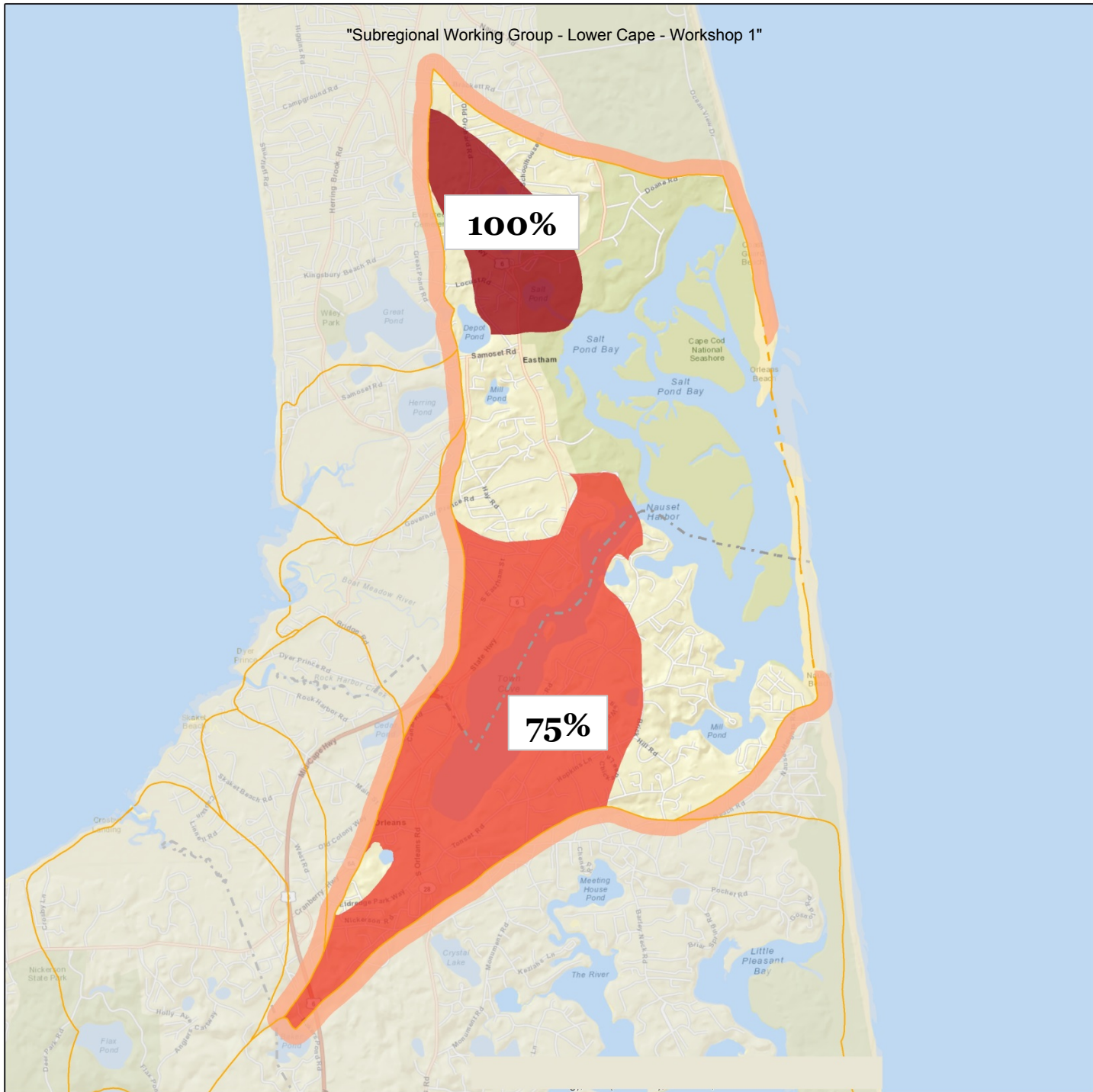
Eastham: 49%
Orleans: 51%



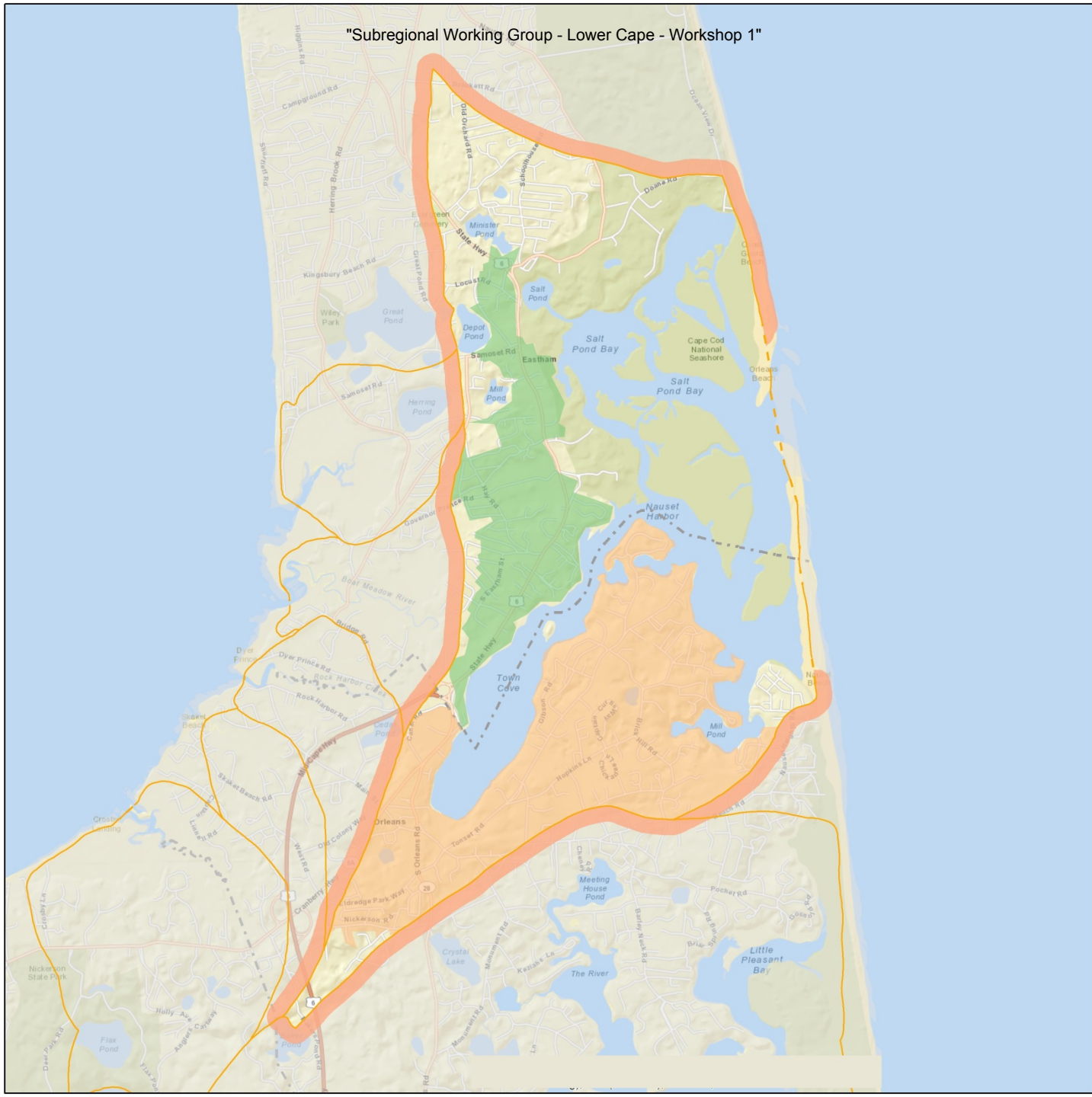
Septic Load TMDL = 55%
Total Load TMDL = 47%

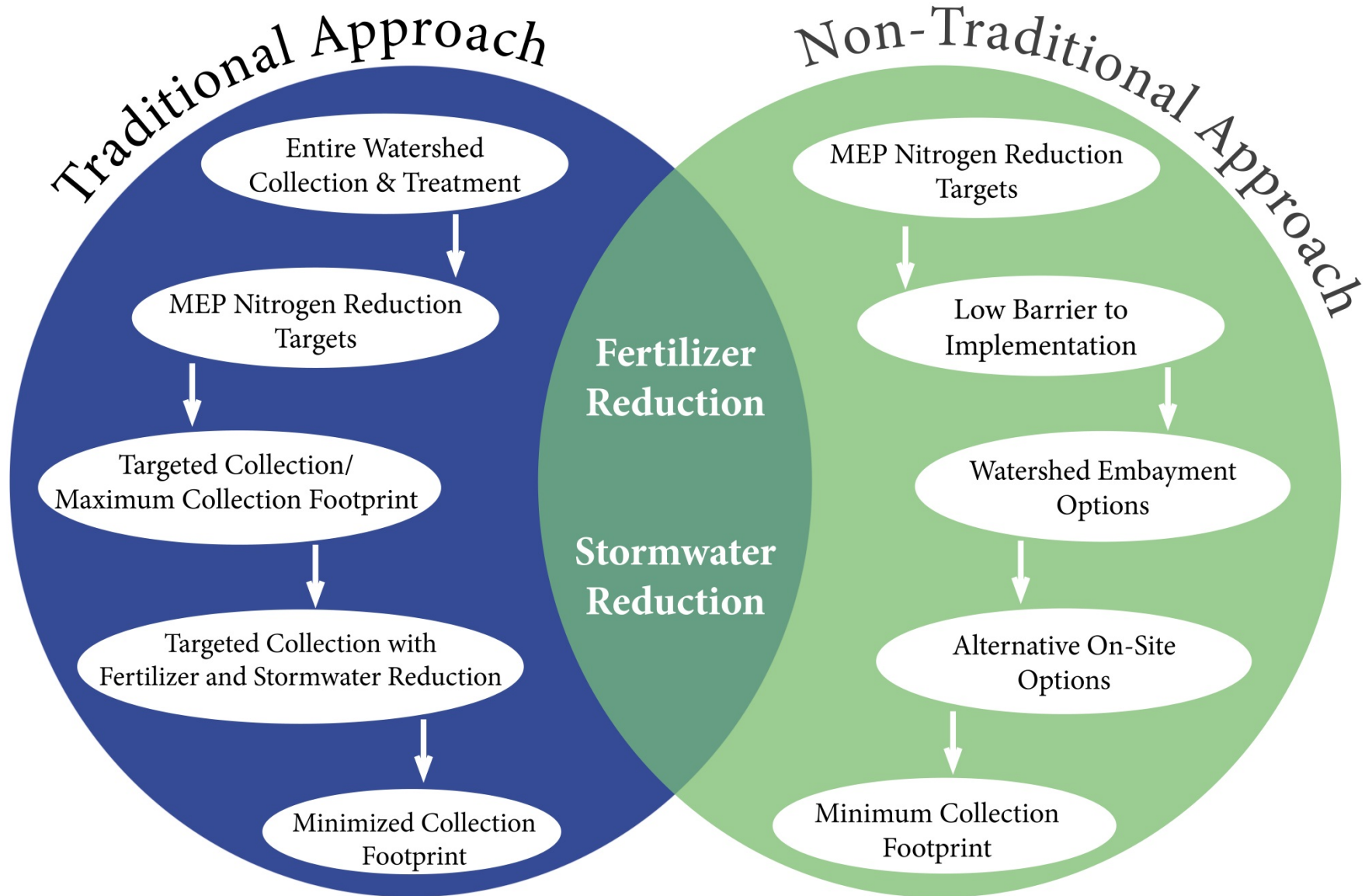


"Subregional Working Group - Lower Cape - Workshop 1"

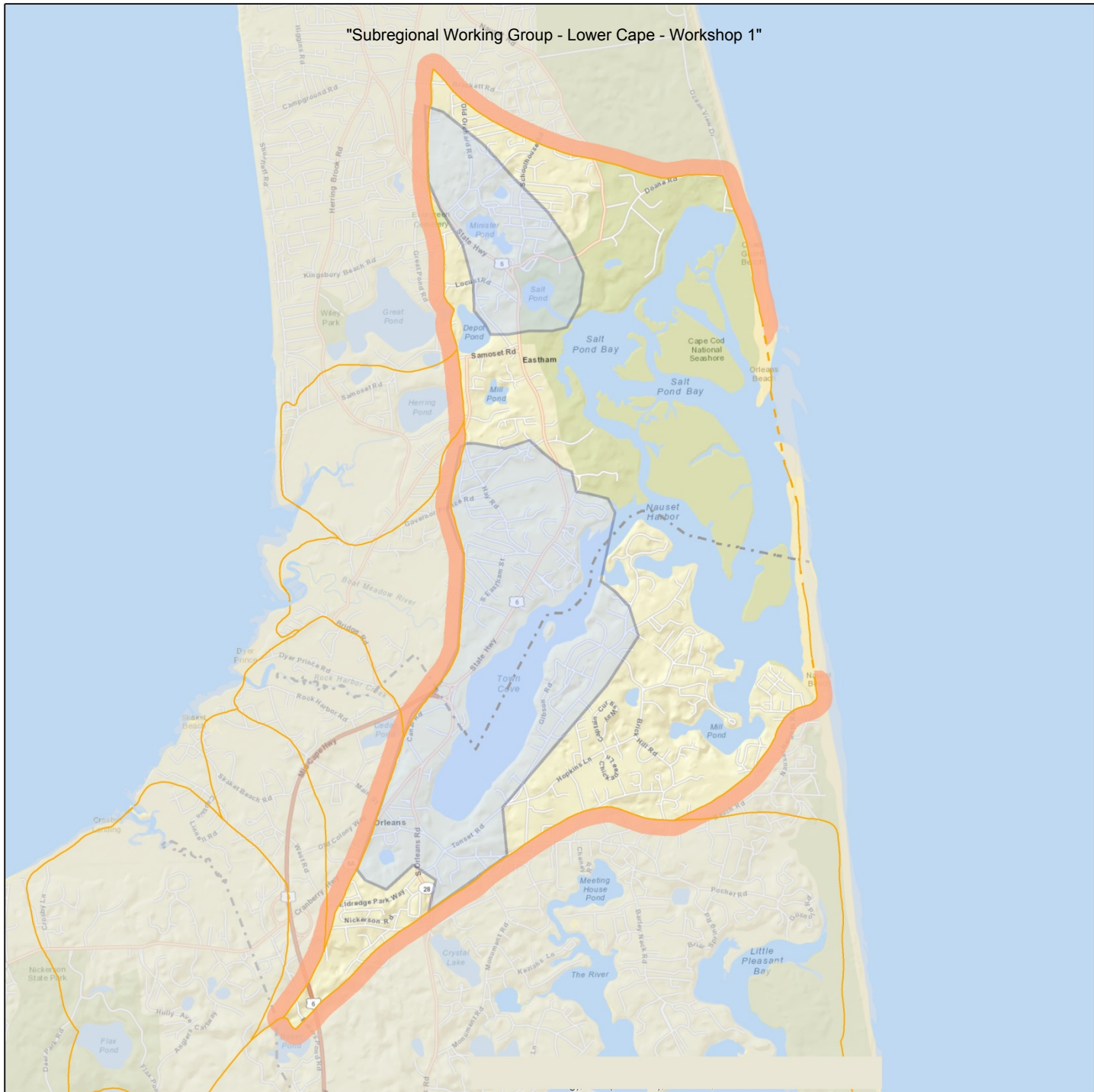


"Subregional Working Group - Lower Cape - Workshop 1"





"Subregional Working Group - Lower 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

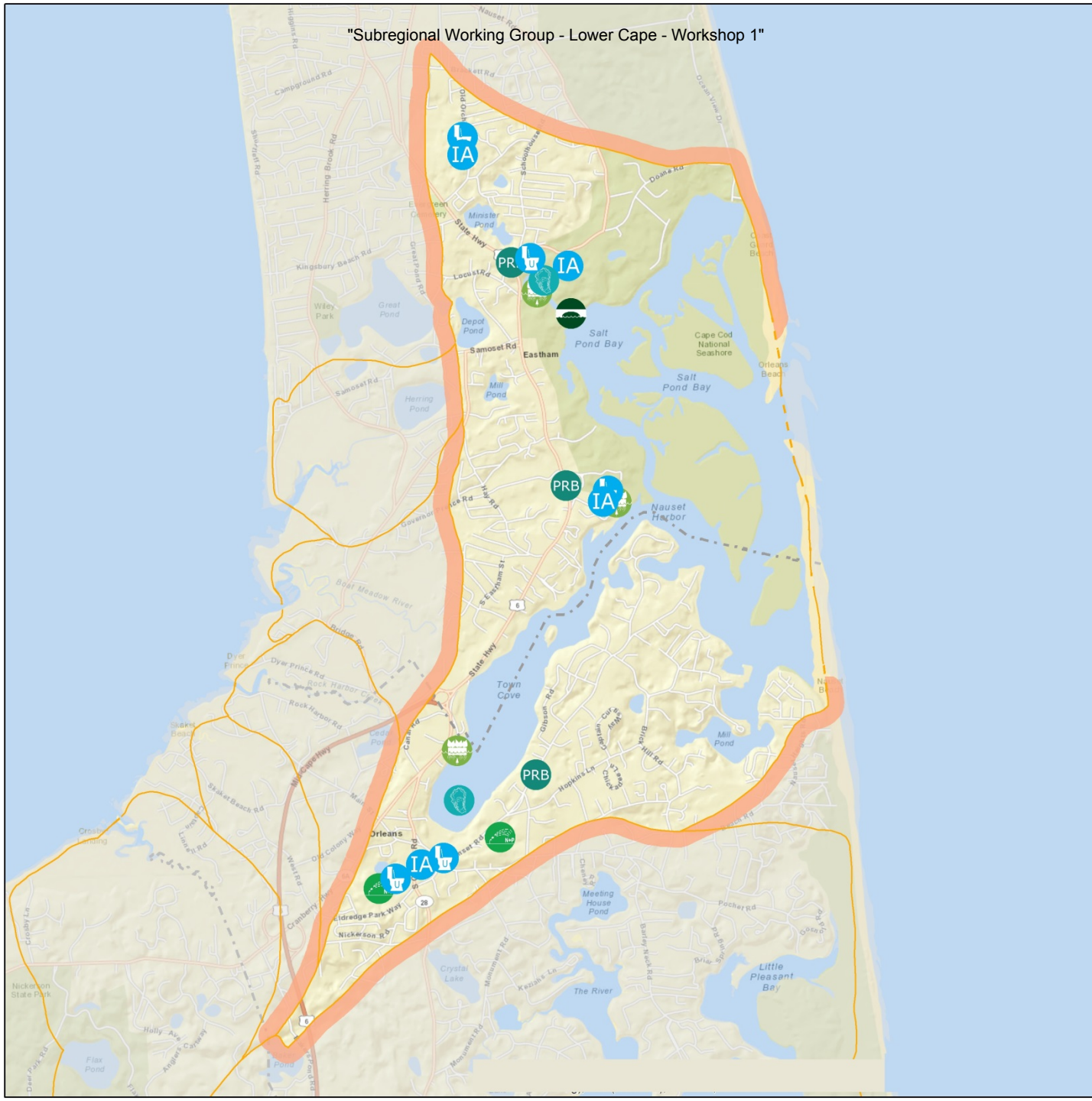
- A. Greater Than 1 Dwelling Unit/acre
- B. Village Centers
- C. Economic Centers
- D. Growth Incentive Zones

7

Supplemental Collection / Sewer Areas



"Subregional Working Group - Lower Cape - Workshop 1"



Technology/Approach	Federal		DEP		MADOT	BOH	ConComm	MEPA
	<i>CWA</i>	<i>GWDP</i>	<i>WMA</i>	<i>I&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

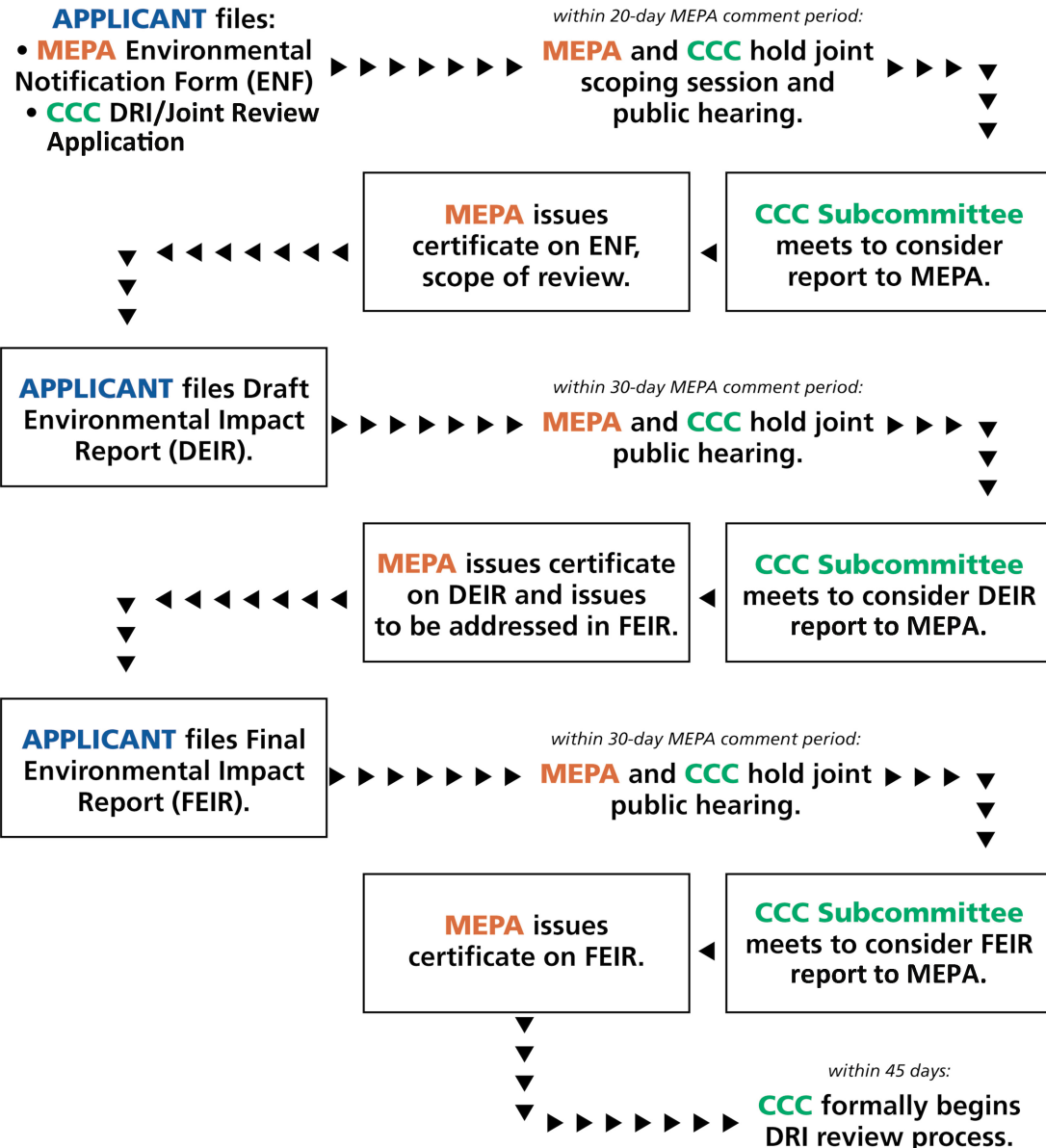
Regulatory, Legal, and Institutional Interactions

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

Regulatory Purposes

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

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

Implementation

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

Adaptive Management

Definition

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.

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



<http://watersheds.capecodcommission.org/index.php/watersheds/lower-cape>

Total acreage:

4,751 acres

Total acreage: 4,751 acres

Acreage by town:

Eastham 2,804 acres

Orleans 1,947 acres

Total built parcels: 2,768 parcels

Total built parcels: 2,768 parcels

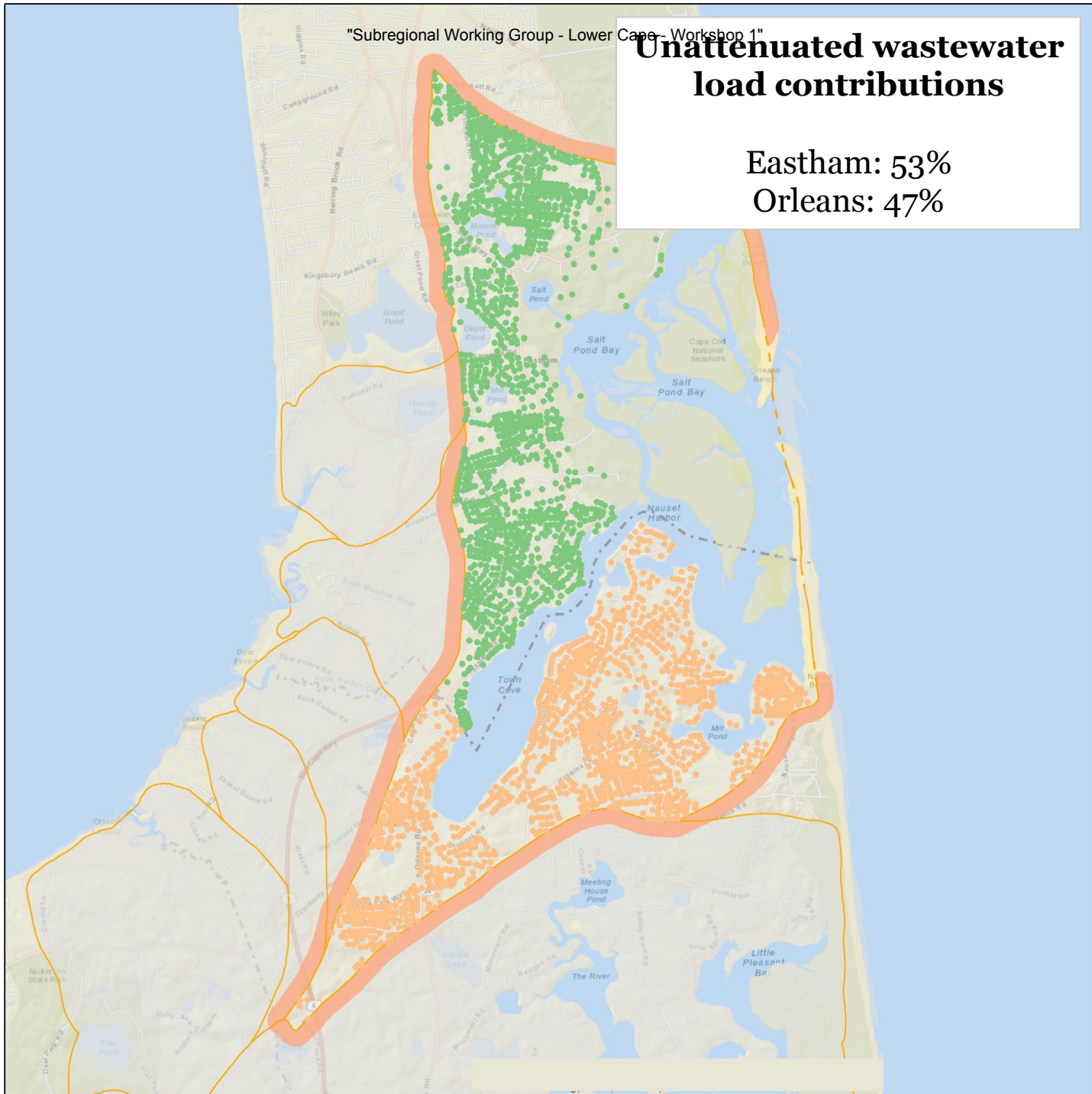
Built parcels by town:

Eastham 1,392 parcels (green)

Orleans 1,376 parcels (orange)

Unattenuated wastewater load contributions

Eastham: 53%
Orleans: 47%



Site Scale

Neighborhood

Watershed

Cape-Wide

Prevention

- Remediation of Existing Development
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- Stormwater BMPs
- Compact Development

Reduction

- Title 5 Standard Title 5 Systems
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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 – Wellhead Protection Area

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

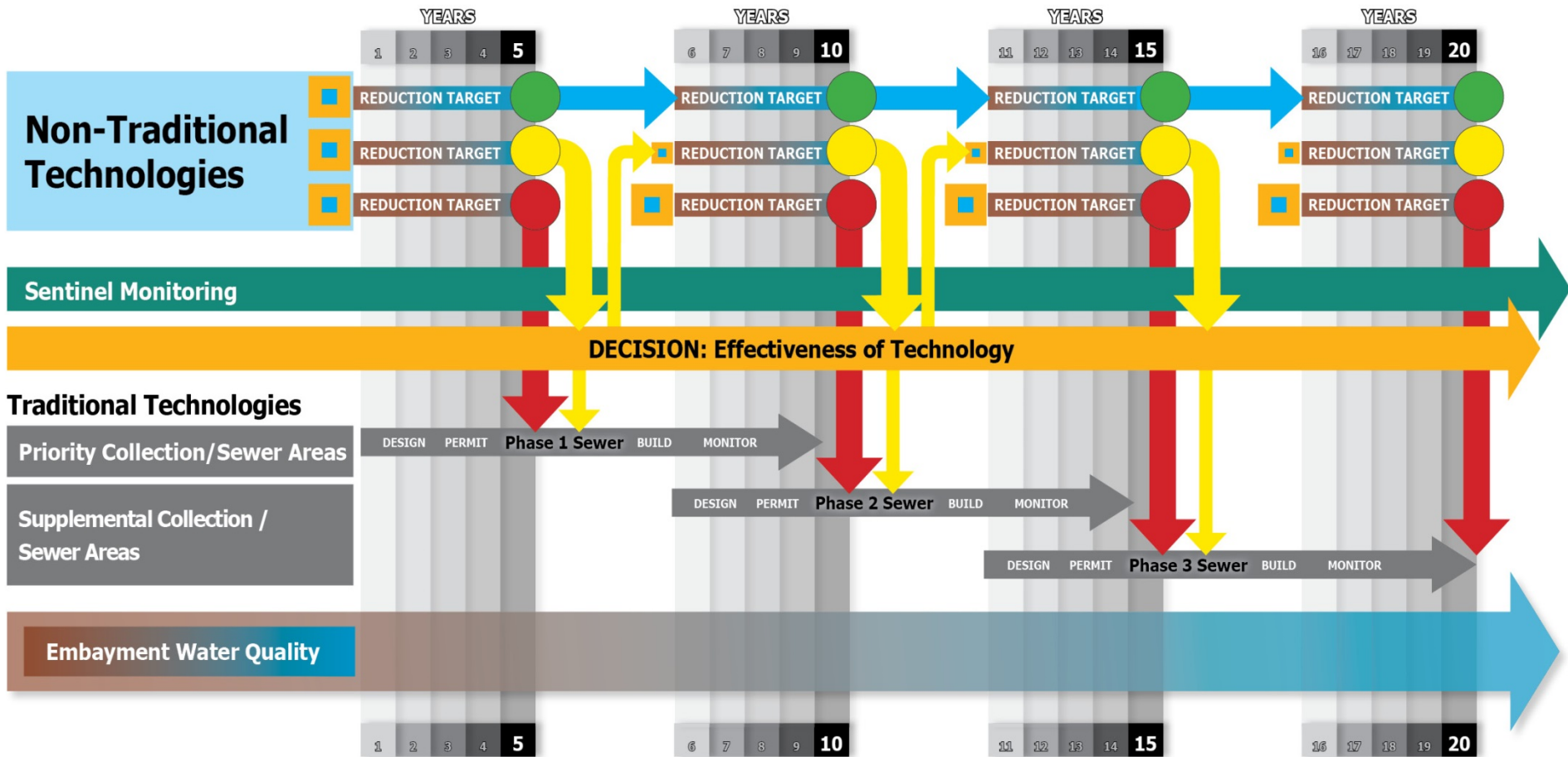
DEIR – Draft Environmental Impact Report

FEIR – Final Environmental Impact Report

TWMP – Targeted Watershed Management Plan

SRF – State Revolving Fund

How do you implement adaptive management?



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

Meeting One
February 27, 2014 1:00 pm – 5:00 pm
Chatham Community Center, 702 Main Street, Chatham

Revised Meeting Summary Prepared by the Consensus Building Institute

I. ACTION ITEMS

Cape Cod Commission

- Commission to compile information on monitoring currently being done, data that is available, and existing monitoring protocols.

II. WELCOME AND OVERVIEW

The meeting opened with a welcome from Paul Niedzwiecki, Executive Director of the Cape Cod Commission.

Stacie Smith, facilitator from the Consensus Building Institute, introduced herself as the facilitator of the Lower Cape meetings for the sub-regional group process. She noted that the group was large, and therefore would require more vigilance from all to ensure a productive, efficient meeting. To help maximize participation and effectiveness, she provided the following groundrules:

- Speak one at a time – share the floor
- Avoid personal attacks – be polite
- Stay on track – no side topics
- Be concise – no speeches

Ms. Smith briefly reviewed the agenda, and suggested that off-topic comments could be posted in a “parking lot” to be addressed at another time. She then invited group participants to introduce themselves and their affiliations, which they did. A participant list can be found in Appendix A. 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. Niedzwiecki provided an overview of the 208 Plan update process and how this meeting fit within that context. He explained that the 208 Update process is watershed based, places a high priority on stakeholder engagement, seeks to maximize the benefits of existing local wastewater planning efforts, such as the Comprehensive Wastewater Management Plans (CWMPs) that many towns have developed, and does not a drive towards any one “optimal outcome.” Instead, the intention is to identify a range of approaches that could meet the water

quality standards and then leave the choice about which one(s) to select to the local, or even hyper-local, level. The goal of the 208 Plan Update is “to generate a series of approaches in each watershed that will meet water quality standards.”

Mr. Niedzwiecki reviewed the timeline of the 208 Plan update process, which began with public meetings in July and August of 2013 and proceeded to meetings of 11 watershed working groups from September through December, 2013. The structure of the process has shifted from being organized by 11 “watershed subgroups” to 4 “sub-regional” groups in the current set of meetings. Mr. Niedzwiecki said that the meetings had shifted from looking at the “jurisdiction of the problem” at the watershed subgroup level to, now, the “jurisdiction of the solution” at the sub-regional level. 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.

Mr. Niedzwiecki explained that the current series of three sub-regional meetings would proceed according to a unified format. Each of the three meetings, in each sub-region, would begin with presentation of a concrete scenario; proceed to discussion of regulatory, legal, and institutional concerns; and conclude with discussion of a topic related to implementation. Figure 1, shown here, outlines the process over the three meetings of each of the sub-regional groups.

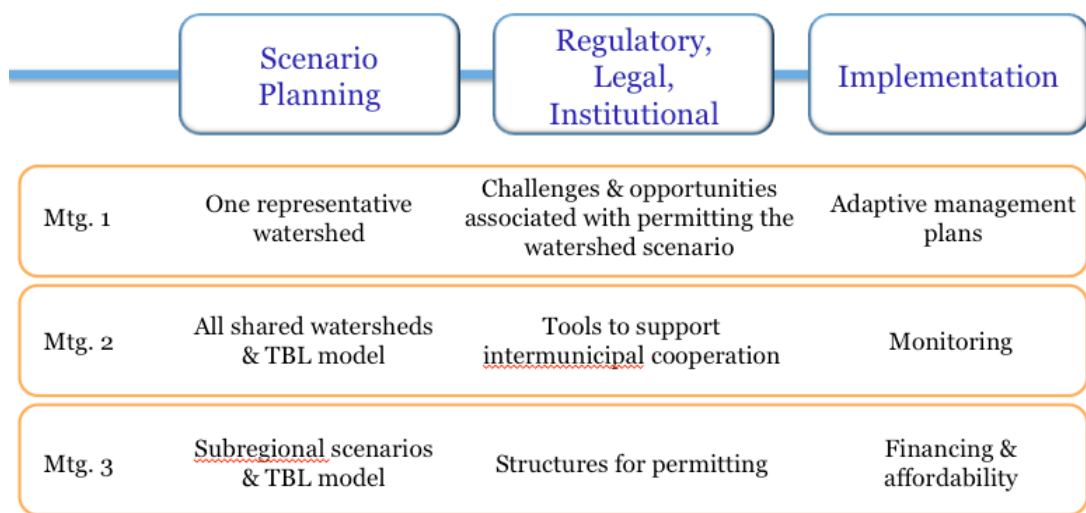


Figure 1

Mr. Niedzwiecki recounted the goals of the first meeting:

- 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.

III. SCENARIO PLANNING

Cape Cod Commission representatives presented Nauset Marsh as a sample scenario to ground discussions for the Lower Cape working group. Mr. Niedzwiecki noted that the Nauset Marsh watershed included 2792 parcels, including 1392 parcels in the town of Eastham and 1376 parcels in the town of Orleans. Eastham contributes 49% of the attenuated wastewater load (and 53% of the unattenuated load), and Orleans contributes 51% of the attenuated wastewater load and 47% of the unattenuated load. Will need to be a method by which we associate responsibility to the problem and the solutions. How will we assign load responsibility going forward? Mr. Niedzwiecki noted that that required total septic load TMDL for Nauset Marsh was 55%, while the total nitrogen load TMDL reduction – including contributions from stormwater and fertilizer – was 47%. Sub-watersheds within the watershed have different removal requirements. For example, Nauset Marsh requires 100% removal in the northern subwatershed and 75% removal in the southern subwatershed.

Mr. Niedzwiecki explained that the Commission modeled two approaches, a “traditional approach” and a “non-traditional approach,” for meeting each watershed’s nitrogen load reduction targets. He explained that the traditional approach relies on using targeted collection of septic waste using sewerage, combined with fertilizer and stormwater reduction measures, to meet Massachusetts Estuaries Project (MEP) nitrogen reduction targets. The non-traditional approach uses a combination of fertilizer and stormwater reduction measures, watershed technologies such as permeable reactive barriers and aquaculture, on-site technologies such as eco-toilets and innovative/alternative Title 5 technologies, and minimal sewerage in priority areas, to meet MEP nitrogen reduction targets.

Traditional Approaches to Wastewater Management

Tom Cambareri, Watershed Management Director at the Cape Cod Commission, reviewed the “traditional approach.” He noted that each watershed, such as the Nauset Marsh watershed, is itself made up of sub-watersheds, and that the MEP prescribes nitrogen-removal targets both for the whole watershed and its subwatersheds, accounting for factors such as nitrogen load and natural attenuation rates. Modeling to create the traditional approach considered different technologies, including conventional sewerage, innovative/alternative Title 5 systems, and cluster systems. The Commission used its Watershed MVP tool to identify the smallest footprint of sewerage necessary to meet the TMDLs. Mr. Cambareri showed a map illustrating a footprint for sewerage that would remove 55% of the watershed’s wastewater nitrogen load, as well as meet the TMDL requirements of the sub-watersheds. He then showed a second map illustrating a smaller footprint for sewerage that would meet watershed’s TMDLs if 50% of the nitrogen load from fertilizer and stormwater were eliminated through fertilizer and stormwater reduction measures.

Non-Traditional Approaches to Wastewater Management

Scott Horsley, consultant to the Cape Cod Commission, presented 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 - some at the source (business and resident), some in the water body (oysters), others in between (PRBs) – thereby impacting nitrogen loads over different timeframes. Mr. Horsley reviewed the seven-step problem solving approach for considering nitrogen load mitigation that the Commission is using; the approach begins with identifying nitrogen removal needs, progresses through consideration of different non-traditional technologies, and finally considers installation of sewerage, as needed per local conditions or to meet nitrogen-mitigation targets that are not met by the non-traditional technologies.

Mr. Horsley showed maps of the Nauset Marsh watershed illustrating possible locations for various technologies such as permeable reactive barriers, constructed wetlands, fertigation wells, shellfish bed restoration or aquaculture, and ecotoilets or innovative/alternative onsite systems.

Mr. Horsley then showed a table illustrating the different types of permitting that would be required in order to install 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 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, below, outlines the types of permitting that may be required for different technologies. He noted that each of these permitting agencies requires its own approach and pathway, which might not align with those of other agencies, raising significant regulatory challenges for the non-traditional approach.

Technology/Approach	ACOE	DEP		BOH	ConComm	MEPA	
	401/404	GWDP	WMA	I&A	Title 5	WPA	Thresholds
<u>Stormwater Mngmnt</u>						●	●
<u>Fertilizer Mngmnt</u>							
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

IV. REGULATORY, LEGAL, AND INSTITUTIONAL INTERACTIONS

Ms. Kristy Senatori, 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 purpose behind a few types of regulatory review:

- The Commonwealth of Massachusetts performs Massachusetts Environmental Policy Act (MEPA) review in order to recognize the environmental impacts of different projects, especially larger ones, and to scope alternatives that may be less detrimental to the environment. Following MEPA review, a certificate of adequacy is issued, and review under the Massachusetts Department of Environmental Protection, the Massachusetts Historical Commission, the US Fish & Wildlife Service/MA 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's DRI review ensures a balanced economy and environment. 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. Ms. Senatori stated that this review process is imperfect, and that the Commission wants to change the approach to better meet the Cape's needs.

- 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. Senatori 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. Senatori 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 towards a parcel-based review and is not oriented towards 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.
- Comprehensive 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. Senatori also identified a couple of positive recent developments with regards to the permitting process for wastewater projects. The innovative Falmouth CWMP/TWMP – incorporating non-traditional technologies and principles of adaptive management – received a MEPA certificate and was approved by the Cape Cod Commission (that same day). The Cape Cod Commission is also exploring the creation of a MEPA / CCC Special Review Procedure that would create a standardized review procedure 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.

Following Ms. Senatori's presentation, Ms. Smith summarized that the "scenario planning" examples meant to highlight some opportunities for approaching wastewater and water quality planning in a very different way, and that these changes would require rethinking some of the

regulatory, legal, and institutional structures that might currently stand in the way. She reiterated several possible shifts that had been noted, including:

- from single town planning to cross-jurisdictional planning
- from conventional (currently permitable and credited) technologies to both conventional and alternative technologies
- from whole town, multi-decade plans to targeted, adaptable plans

Ms. Smith then asked participants the following question: "What are some of the hurdles and opportunities association with permitting the above scenarios?" After some time to brainstorm and discuss their answers with each other, participants offered comments, which were grouped either as "hurdles/challenges" or "opportunities." The following is a summary of participant input, (with Cape Cod Commission responses in italics):

Challenges:

- Collaboration across towns in different places in the planning.
- Modifying approved CWMPs without starting over
- Non-cumulative permitting across jurisdictions
- Need for private land for implementation – fair profits
- Approval and allocation of funding from multiple town processes.
- Getting permitting/approval process with different measures and metrics
- Funding for monitoring – start-up costs for developing new monitoring protocols and programs, conducting the monitoring, establishing the database
- Inconsistent requirements across agencies (e.g., restoration of oyster habitat - Division of Marine Fisheries and Department of Fish and Game - 310CMR says harvesting cannot be deferred for more than three years, and that they not impinge on eelgrass beds. But these two requirements may be inconsistent with using oysters for the purpose of meeting Nitrogen TMDLs)
- Measurement to ensure that alternative technologies are achieving outcomes
- Uncertainty about agency pressure and timetable for improvement leading to lack of urgency. *EPA and DEP are the enforcement agencies, and could require immediate action at any time. The State could declare "nitrogen sensitive watersheds" and force upgrades of all Title 5 systems to I/A systems, resulting in across-the-board overnight property value reductions and sub-optimal outcomes. They realize their enforcement mechanisms are punitive, and not ideal for achieving water quality. They have said this is an opportunity to define a timeframe to fix this problem on our terms.*
- Limited professional technical expertise of consultants or staff to assist in this innovative planning approach. *Yes, many towns have insufficient wastewater planning expertise on staff and need to hire outside consultants. And, the typical consultants are engineers, with low risk tolerance and less experience with these alternative technologies. So the issue is empowering local decision makers and providing technical expertise, which the Commission can assist to provide – not dictating solutions, but offering support to meet local needs. The commission has been building decision support tools (like MVP) that will close the gap between the technical people and the town policy makers.*

- Education of the public about the approach, costs, and implications. *Watershed plans can incorporate decisions that are sensitive to the level of support that is required. (e.g., Eco-toilets in municipal buildings, rather than in personal homes.)*
- Conservatism of finance/bonding attorneys, reluctant to support uncertain approaches
- Opportunities for the towns to use the decision-support tools/materials the Commission has developed for watershed planning
- Danger of becoming unrealistic in our expectations. If we have a good idea in one place, it may not work elsewhere. Can't assume something easier, cheaper will work everywhere
- Getting closer to a discussion about using nitrogen as a metric for development. So should we talk about nitrogen fees?
- Regulatory review, and possible revision, of MGL Chapter 130, Section 54 and Section 74, and the DMF " Marine Artificial Reef Plan" is needed for inclusion of the CCC Technology Matrix Alternate, Shellfish Habitat (oyster reef) Restoration, in a no-harvest preserve, for nitrogen mitigation in an estuarine embayment. Such oyster reefs and eelgrass meadows are synergistic and need not be separated.
- Clarifying the goal of key metrics and measures.

Opportunities:

- Cumulative/streamlined permits
- Would be so valuable and helpful to do inter-town cooperation.
- The Commission to serve as advocates. *Advocating for regulatory changes is something we want to do. CCC worked closely with Falmouth around Falmouth's "certificate of adequacy" from MEPA. Our job is to instill confidence in regulators to do things differently, and the 208 process is an opportunity to advocate these.*
- Monitoring and many of these new technologies are business opportunities for the Cape's private sector
- A lot of existing examples of successful cross-municipal collaboration on the Cape – shared school districts, tri-town sewage agreement, etc)
- Existing models for streamlining – e.g., site plan review
- Bring towns together, through the 208 process, to strategize and coordinate water quality planning
- Allowing for nitrogen credits across town lines – towns might support infrastructure located in other towns that contributes to solving their own nitrogen reduction requirements.
- Focus on our shared and common interests – sole-source aquifer
- Current structure and regulator alternatives are sub-optimal, lots of opportunity to do things better, faster, cheaper
- Utilize alternative technologies to shorten the timeframe for observable effects
- If we can identify pilot projects, maybe we can accelerate approval process for alternatives (and gain financial support from the state to pay for it). *The Commission has already assigned money to the Barnstable Board of Health to do soil-based applications. There is also potential to get Federal money for pilots. The Cape has also*

been working for a year and a half with RI and SE Mass on habitat restoration, resulting in a \$2M earmark. Some of that funding might be used to pilot new approaches that don't currently have a funding source. We need to figure out which projects are worth piloting.

- Important not only to monitor the effectiveness of a pilot, but also the costs of the intervention over time (including monitoring costs)
- Utilizing Regional tools (e.g., MVP) and technical support
- Work with partners for outreach and public education to build public confidence in the approach *The Commission has reached out to WBNERR to assist with communications. During the 120-day comment period on the plan, the Commission will further its outreach and communications activities and support. Other partners, such as the Cape Cod National Seashore, can also help.*
- Local technical expertise. Active citizens have been engaged in many aspects of the work, and contribute to the progress. Regular citizens have led both Little Pond and Wellfleet.
- Including phosphorus reduction goals for ponds in the plans. *Yes, the 208 plan is an update to the 1978 plan, and nitrogen is the key regulatory driver, but we can and should consider interventions that help us repair the phosphorus problem. Phosphorus regulations are coming.*
- We can also anticipate other future needs (e.g., contaminants of emerging concern)
- If 208 is successful, it may lead to broader water quality conversations
- In long-term, the Commission will need to engage longer term on these issues with the towns. *The Commission can act less as a regulatory agency and more as technical resource. The Commission's current regulatory systems and tools also need to change, and can change. One example is to design a good process through the Special Review authority.*
- Watershed Governance. We can spark a new type of environmental stewardship by localizing decisions, choosing some technologies that people can watch and be interested in, help monitor, and be excited about
- We do not need to create more bureaucracies to streamline or provide better data. We just need to coordinate better and make everything transparent. We want people to be able to access these tools so they can contribute.
- Innovation opportunities, working with Universities and businesses
- Reducing Costs through sharing some systems
- Being smarter about density and growth, aligning wastewater and water quality planning with growth management considerations. Using a nitrogen lens, can we say where development should and shouldn't be?

Stacie noted that the current system relies on the Town as the locus of all decision-making and action. This new approach does not remove the power of Towns, but also offers the potential for working together up at the county level for some actions – such as setting monitoring protocols for technologies – and moving some solution planning down to the watershed level. Paul reminded the group that, a few years ago, any discussion of regional cooperation raised

alarms (a la MWRA). But the Commission's approach has always been about empowering local decisionmaking – providing tools, knowledge, assistance – while supporting collaboration and coordination.

V. IMPLEMENTATION

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, in the past, adaptive management had been defined in different ways, 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." From this definition, Mr. Niedzwiecki drew the following key components of an adaptive management strategy:

- An adaptive management plan has a structure that lends itself to permitting
- The plan has to lead to meeting water quality goals, particularly but not only the TMDLs. There are also other ways to articulate the goals.
- There needs to be monitoring protocols for every technology selected as well as the outcomes as a whole
- The plan has to assess progress over time – it needs a clear timeframe, with information feedback loops that determine the need for recalibration
- The plan should recalibrate plans and projects along a clearly defined process
- Decisions are based on review and evaluation of the monitoring data – someone has to collect the information and someone has to evaluate it.

Participants offered the following comments:

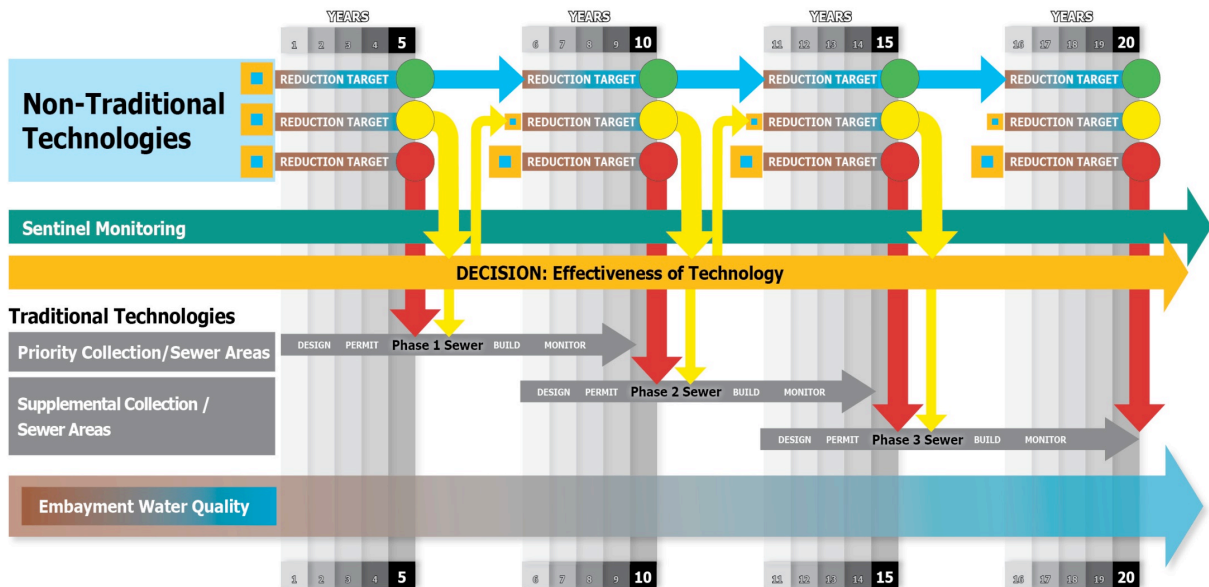
- Assessing progress over time requires a specified time-frame, but also needs flexibility or specificity for different watersheds
- "Recalibration" might be the wrong word - maybe just "rethink" or "reassess." Or could require recalibration of the model. This might be based on monitoring of actions, but also could be based on new information – for example, the drop in atmospheric nitrogen, requiring a recalibration of the model. That would be a "recalibration of the model." *The Commission has created a calculator that helps determine how well the combination of technologies should work together to reach a goal. If one of those variables has to be changed, the whole "computation" can be recalibrated.*

Participants then named additional components, along with criteria or other requirements, for successful adaptive management plans:

- Clear actions – the technologies and interventions selected
- Contingencies

- Scalability
- Generates new knowledge and improves our understanding of how the water system works
- Clear allocation of who does what
- Open acknowledgement of uncertainty
- Inspires confidence
- Involves stakeholders
- Seeks consensus
- Stems from a clear understanding/statement of the baseline

Mr. Niedzwiecki presented a draft diagram (shown in Figure 3) representing a possible adaptive management strategy.



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 implementing another non-traditional technology, and/or implementing traditional technologies (such as sewerage). In order to monitor the pilots, they need to be tested and monitored independently. Otherwise, we won't know how each has performed. 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.

He stated his hope that an adaptive management plan with such a structure would inspire the confidence we're hoping for with the agencies. He noted that some strategies might be more

challenging to monitor than others. For example, reductions of nitrogen from fertilizer. It can be measured in the waterbody, but that will include reductions from other technologies, so we would have to "back into" the calculation looking at each of the other technologies.

Participants offered the following questions and comments (Commission responses in italics):

- How do we ensure that this approach does not simply prolong the cleanup, by choosing a technology that won't prove itself for eight years, after which time we learn that it doesn't work. Then we've delayed our action for eight years and we haven't solved the problem. *The plan would not implement approaches one-at-a-time, or rely on a single untested technology, but rather would simultaneously implement and separately monitor multiple actions, and would need to overall fit within the timeframe that we are all comfortable with.*
- It will be difficult in some cases to establish baselines. How is this being done for Wellfleet's aquaculture pilot? *Since it's an in-water intervention and they don't have a TMDL, they would need to establish the beds and compare to water quality over time compared with historical levels. They would have to decide whether/how much of the change in quality is due to oysters.*
- This is all amenable to the Administrative Consent Order, which is a permitting mechanism that is currently available.
- *What we're trying to do here is a watershed-level permit so communities can get credit for some of the non-structural improvements they put in place. This process starts to define the permit. If we can't get DEP to go to watershed permitting, this is going to be tough.*
- We need to consider not just nitrogen goals, but habitat quality. Need to think about the whole system.
- If you're contemplating pilots, you may want a less rigorous monitoring plan because in the pilot phase you need to be able to accommodate higher risk.
- The evaluation of risk will be quite different between towns and a regulatory agency. *Yes, but our opportunity to define that level of risk is in the development of this plan now.*
- *The adaptive management approach can be compared to a stock portfolio. Most stock advisors recommend diversification in your investment portfolio. In this graphic, we're showing just three technologies, but in reality we're probably looking at 10 in each watershed. We're not putting all our eggs in one untested basket.*
- We need to get beyond theory and start looking at actual numbers. *We will do this at future meetings.*
- Need to be concerned about many types of institutions – not just regulatory agencies. Need to frame the plan to accommodate other interests (other federal, but non-regulatory institutions like Dept of Ag, Fisheries, etc.), we can make friends and partners and secure funding.

- What are the institutions that have power over different decisions in this process? Not just in the MEPA process, but throughout the towns (town board, town meetings, etc.) We need to consider and involve all of these.
- Are we going to fix the CWMP process, too? *Yes. We, at the Commission, can change our process. And if we do, that's our most persuasive argument to the state to change THEIR process. Communities should not have to go through a cumbersome permitting process every time it wants to make a change to the plan.*
- Part of the problem is the engineering oligopoly – almost impossible to break it up. It's a lock-in for unfair bidding. *We have a lot to worry about to get our own house in order. But if we need to lobby for that, we can.* The communities have some of their own tools to do that, too, if they want to.

Ms. Smith reviewed the agenda for the next meeting, and asked if anyone had ideas of things to prepare for the conversation. Participants asked the Commission to compile information on monitoring currently being done, data that is available, and existing monitoring protocols.

Public Comment

No public comments were made separate from general meeting participation.

APPENDIX ONE: MEETING PARTICIPANTS

	Name	Title
Local Elected Official	Jason Klump	Brewster Planning Board
	Peter McDowell	Dennis Water District Commissioner
	Florence Seldin	Chatham Selectman
	Larry Ballantine	Harwich Selectman
	David Dunford	Orleans Selectman
Appointed Committee members	Charles Harris	Eastham, Chair, Water Management Committee
	Russell Schell	Brewster Wastewater Committee
	Joan Kozar	Harwich Planning Board
	Jane Corlette	(for Judith Bruce, Former Orleans Wastewater Committee)
	Robert Donath	Former Orleans Wastewater Committee
Town Staff	Robert Duncanson	Chatham, Program manger of CWMP
	Heinz Proft	Harwich, Natural Resources Director
	George Meservey	Orleans Planning Director
Environmental and Civic Groups	Carole Ridley	Coordinator, Pleasant Bay Alliance
	John Payson	Chatham Concerned Taxpayers
	Sandy Bayne	Eastham, Orleans Ponds Coalition
	Michael Lach	Harwich Land Trust
	Brooke Williams	Harwich Civic Association
	Lynn Bruneau	Orleans Conservation Trust
	Jeff Eagles	Orleans Citizens Peer Review Group
	Charles Ketchuck	Orleans Water Alliance
	Jim McCauley	Orleans Pond Coalition
Federal and State Partners	Sophia Fox	Aquatic Ecologist, Cape Cod National Seashore, National Park Service
	Karen Simpson	U.S. Environmental Protection Agency
Business	David Bennett	Brewster Chamber of Commerce
Other	Lori Rouche	Orleans

Alternates and Members of the Public

Mark Fiegel
 Mike Domenica
 Ed Nash
 Ginia Patti
 Judy Thomas