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CAPE COD COMMISSION

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

Meeting One
February 26, 2014 8:30 am – 12:30 pm
Gestalt Int'l Study Center, 1035 Cemetery Road, Wellfleet, Ma 02663

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 permit-ability and water quality goals?*
12:15	Public Comment
12:30	Adjourn

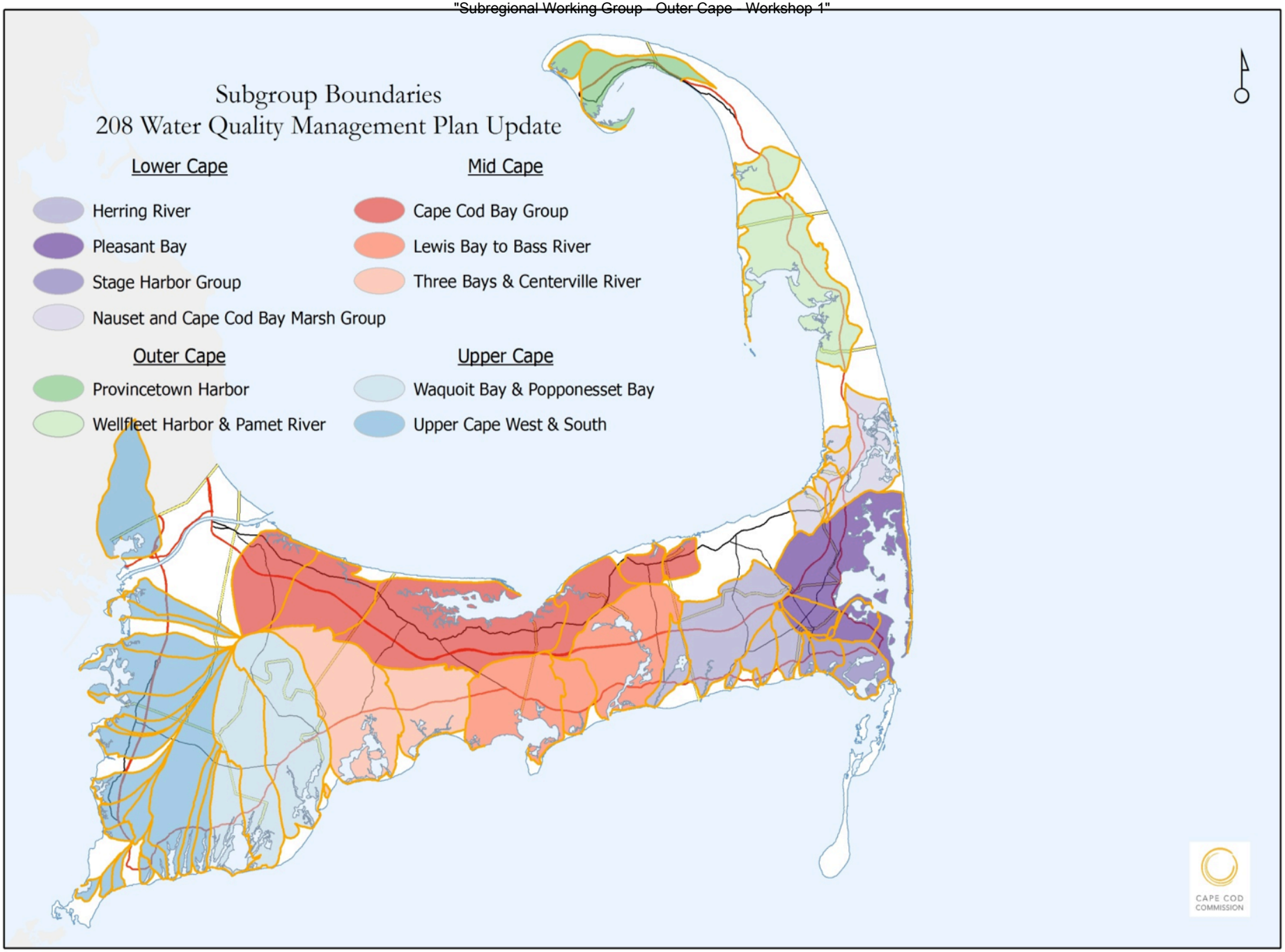
Outer Cape Sub Regional Group

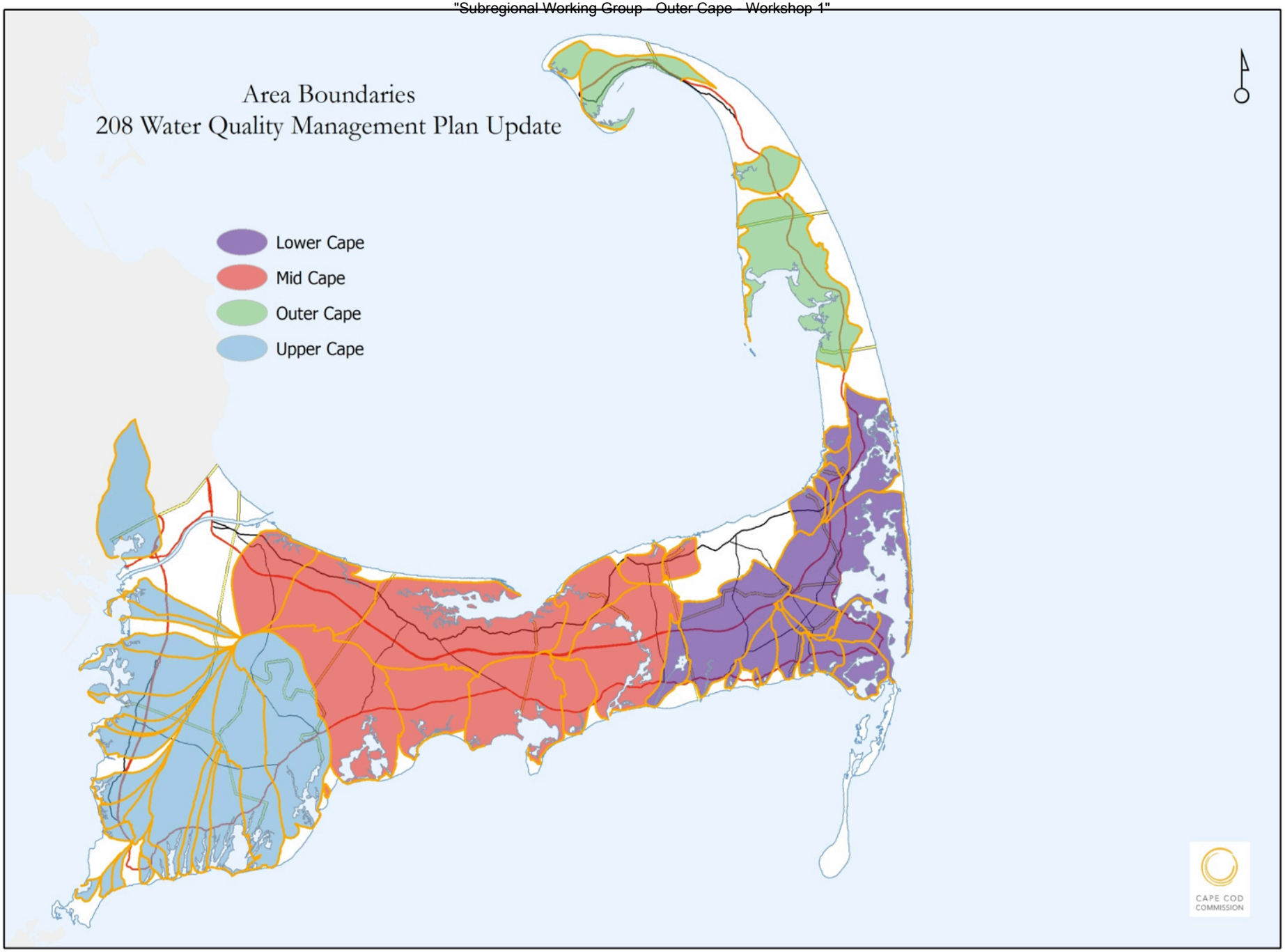
Meeting 1

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
CAPE COD COMMISSION


Area Boundaries
208 Water Quality Management Plan Update
Lower Cape
Mid Cape
Outer Cape
Upper Cape
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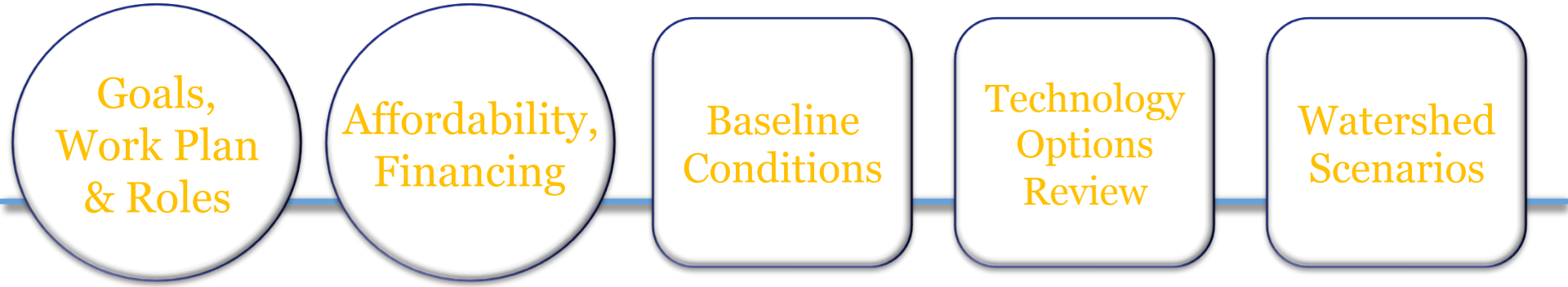
Public Meetings

Watershed Working Groups



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:

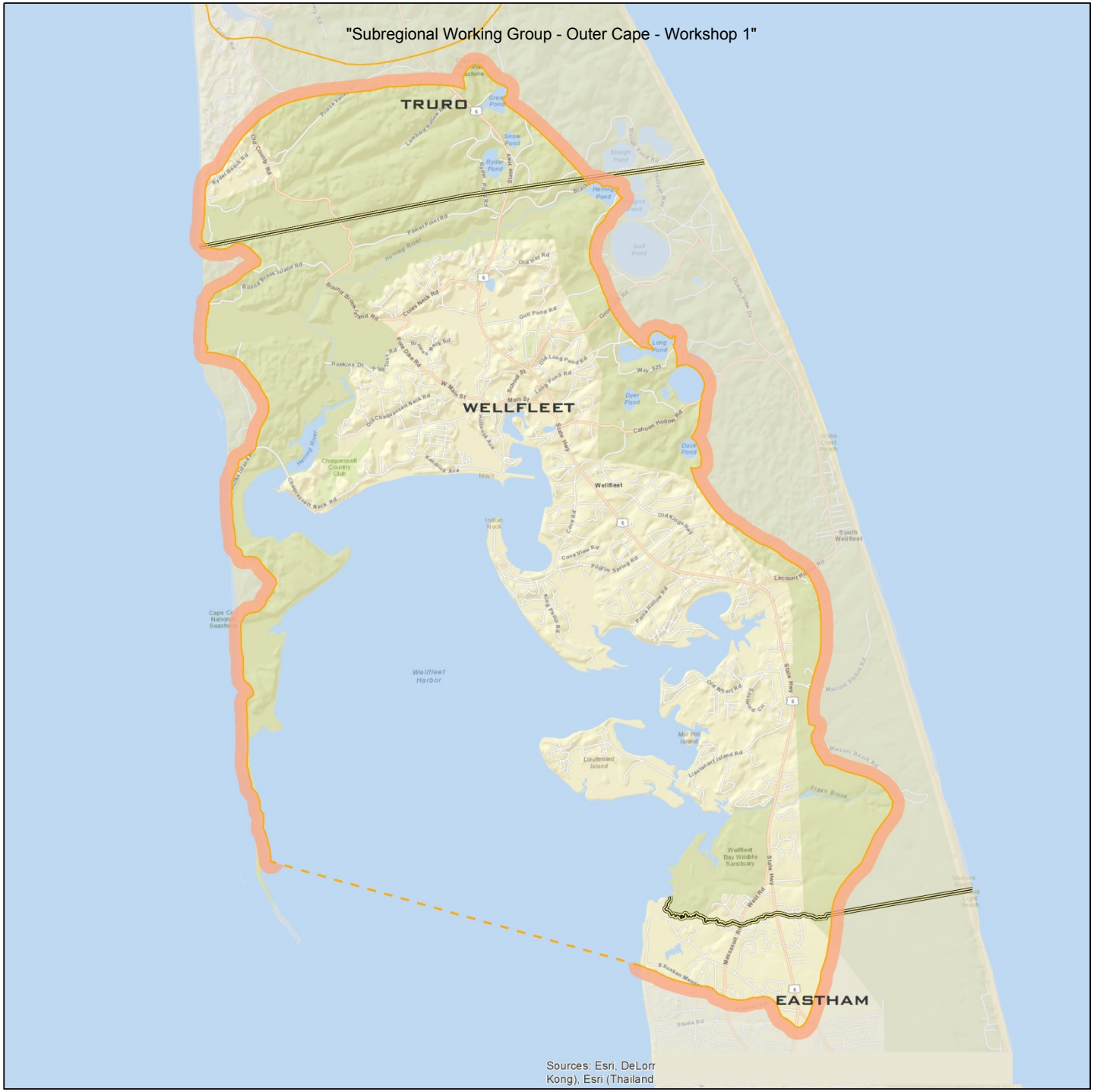
Identify regulatory, legal, and institutional challenges, constraints, and opportunities associated with the 208 Plan approach for water quality

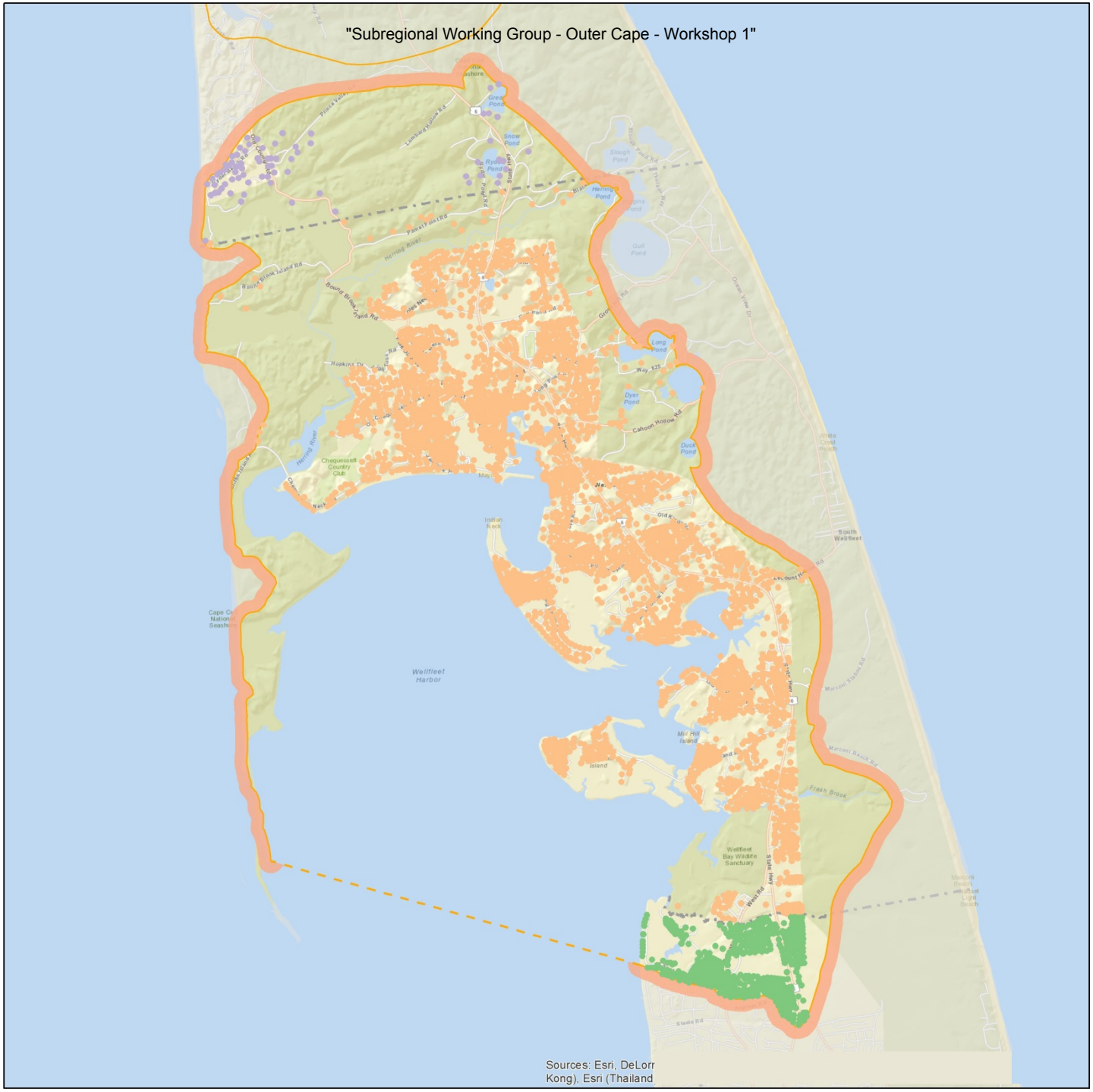
Clarify the definition and components of an adaptive management plan that can be permitted

Scenario Planning

Wellfleet Harbor

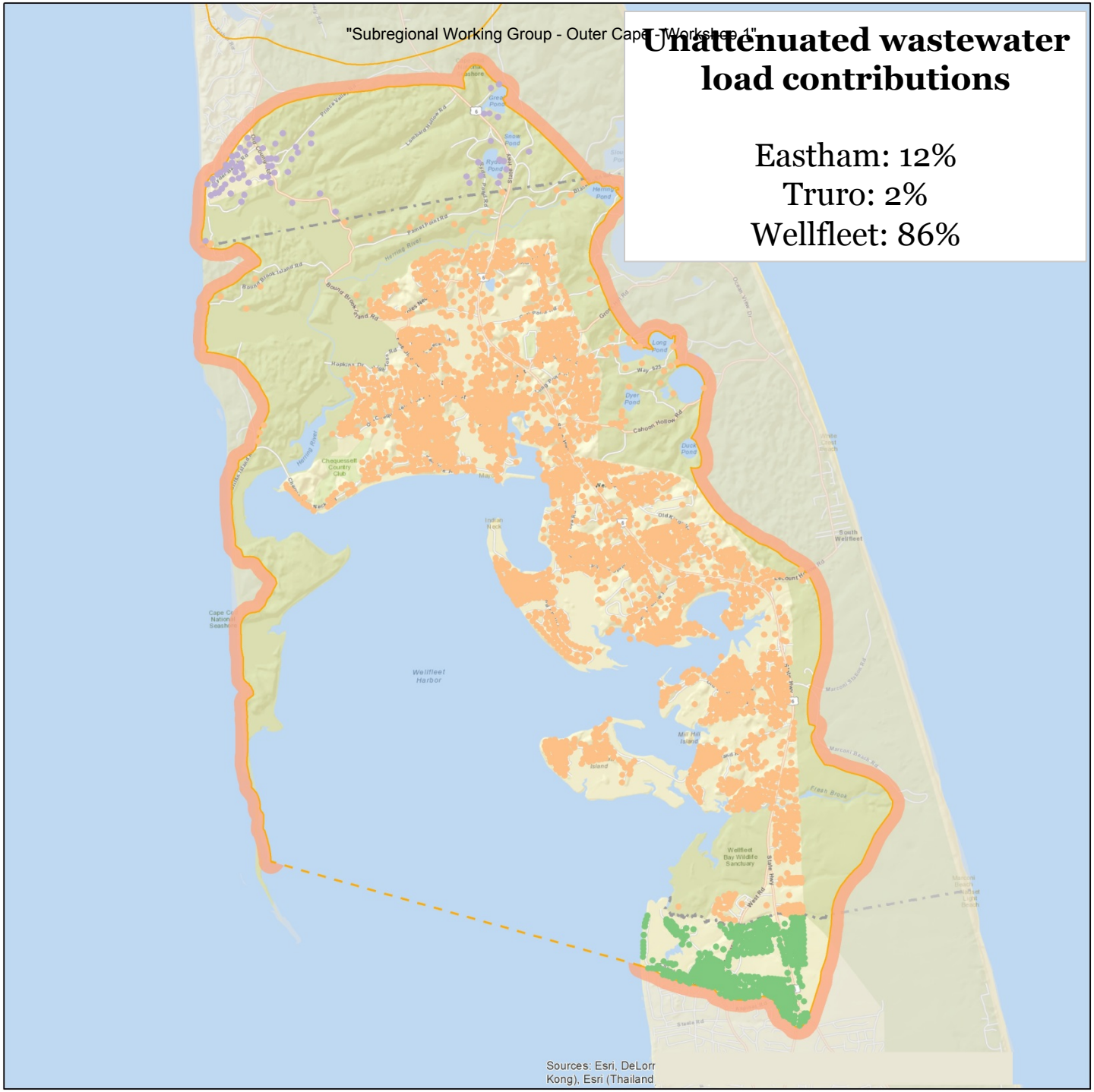
"Subregional Working Group - Outer Cape - Workshop 1"

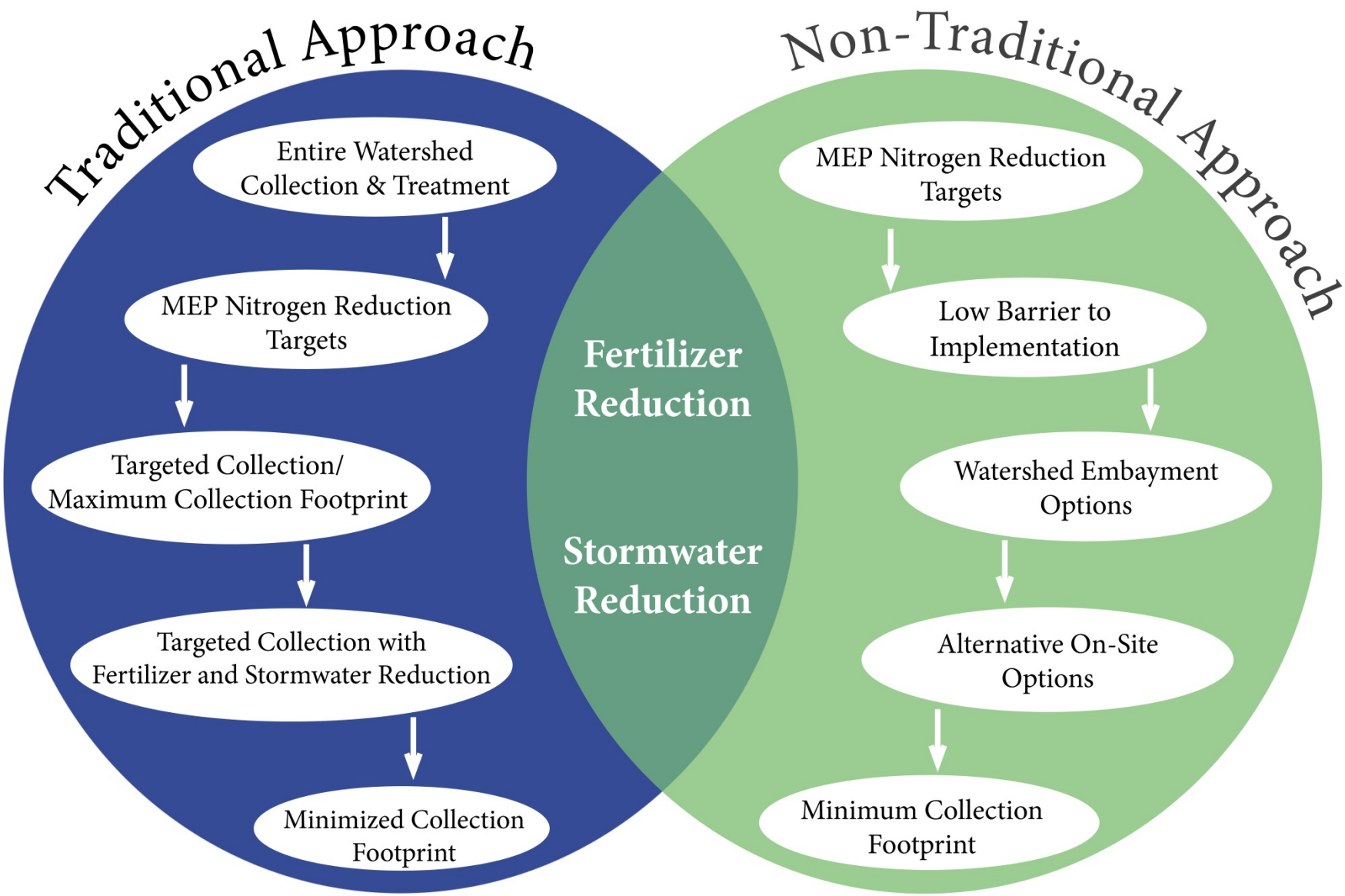



"Subregional Working Group - Outer Cape - Workshop 1"
Wellfleet Harbor
Sources: Esri, DeLorr
Kong), Esri (Thailand

Unattenuated wastewater load contributions

Eastham: 12%
Truro: 2%
Wellfleet: 86%




Traditional Approach
Entire Watershed Collection & Treatment
MEP Nitrogen Reduction Targets
Targeted Collection/ Maximum Collection Footprint
Targeted Collection with Fertilizer and Stormwater Reduction
Minimized Collection Footprint
Fertilizer Reduction
Stormwater Reduction
Non-Traditional Approach
MEP Nitrogen Reduction Targets
Low Barrier to Implementation
Watershed Embayment Options
Alternative On-Site Options
Minimum Collection Footprint

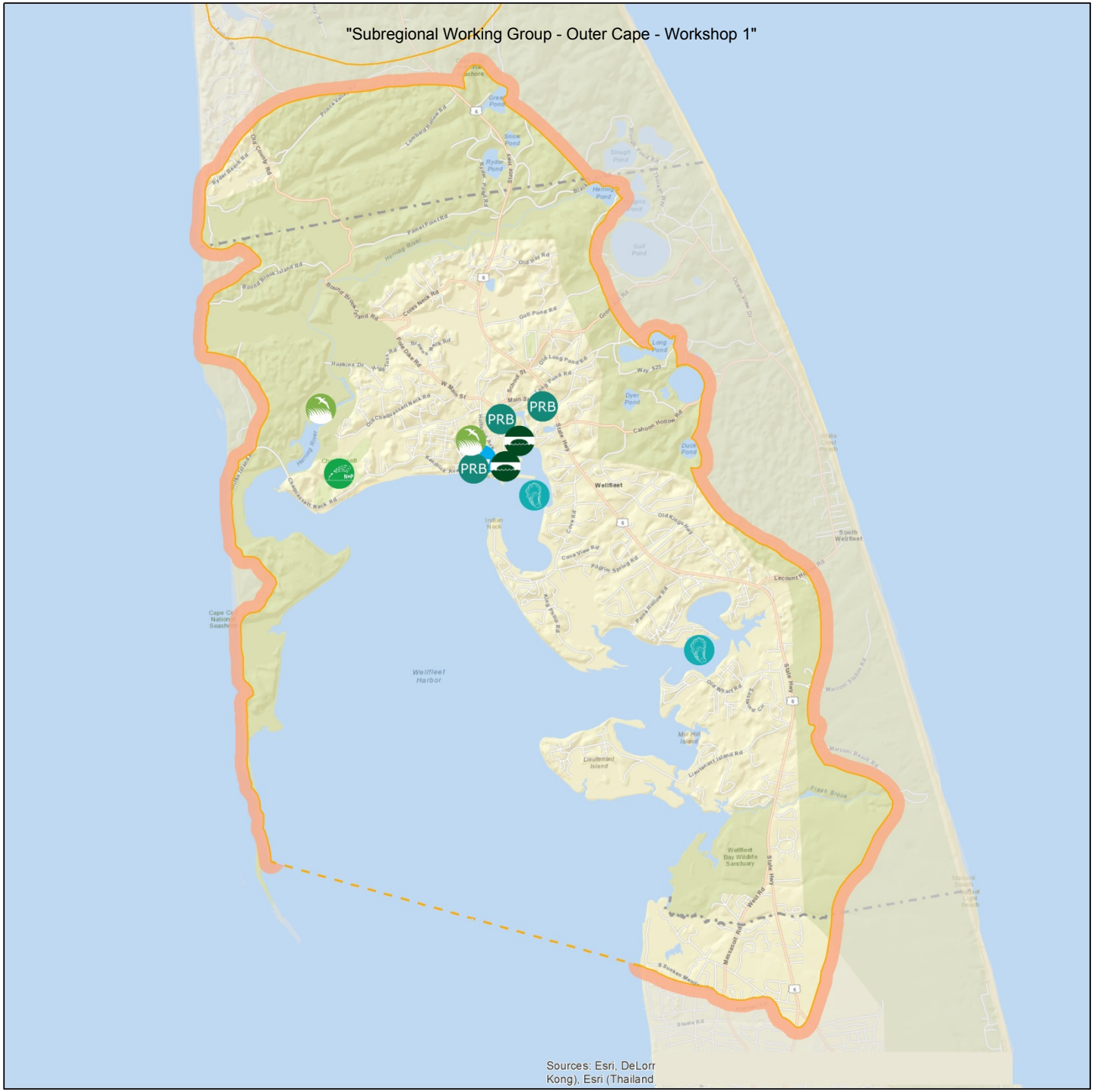

"Subregional Working Group - Outer Cape - Workshop 1"
Wellfleet
Wellfleet Harbor
Sources: Esri, DeLorr
Kong), Esri (Thailand

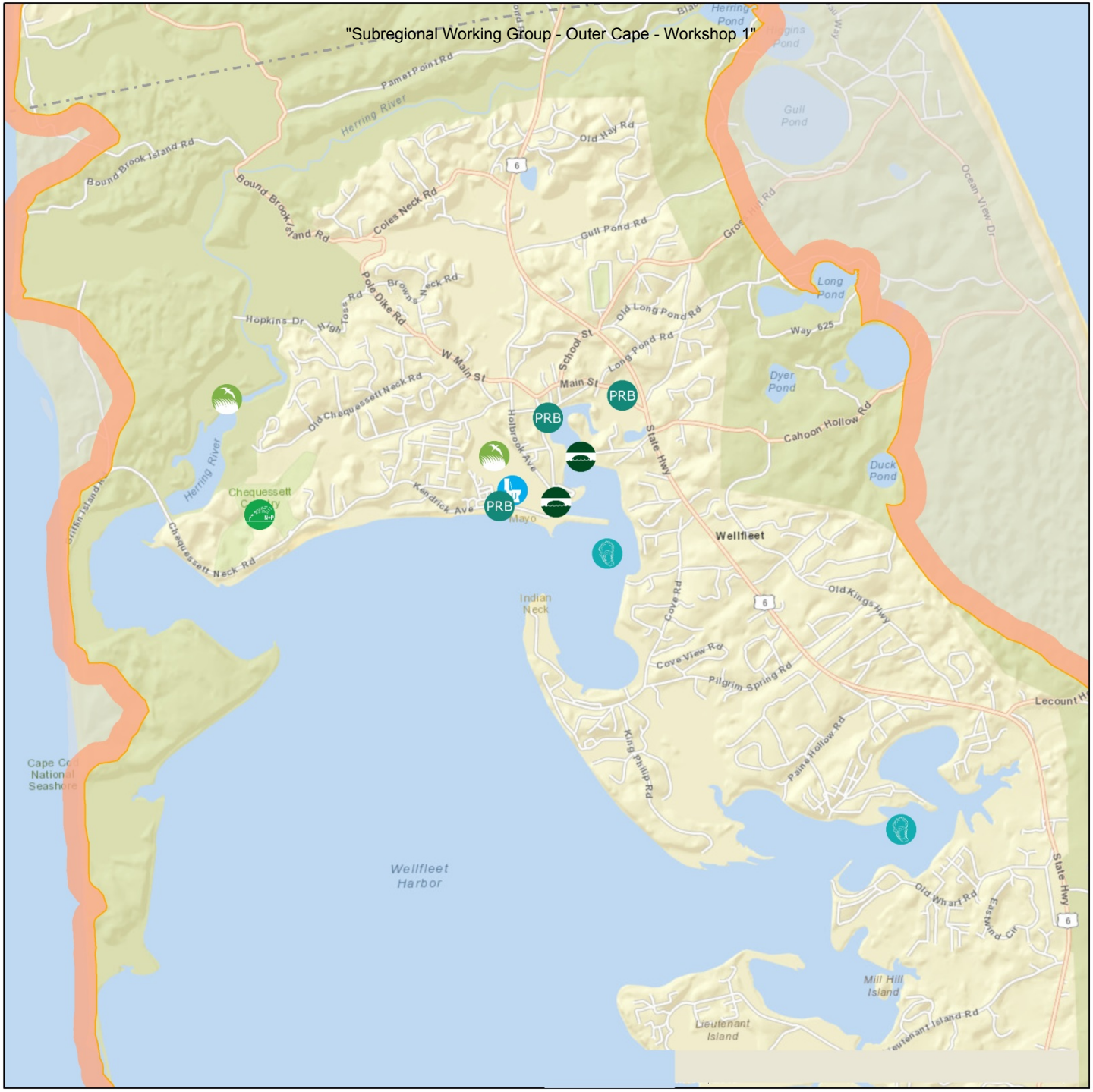

"Subregional Working Group - Outer Cape - Workshop 1"
Wellfleet
Wellfleet Harbor
Sources: Esri, DeLorr
Kong), Esri (Thailand


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


Wastewater
Existing Water Bodies
Regulatory
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
N+P+K MGMT
BMPs
4
Watershed Alternative Technologies
A. Permeable Reactive Barriers
B. Inlet/Culvert Openings
C. Constructed Wetlands
D. Aquaculture
PRB
GW
SW
5
On-Site Alternative Technologies
A. Eco-toilets (UD & Compost)
B. I/A Technologies
C. Enhanced I/A Technologies
D. Shared Systems
IA
Title 5
Enhanced IA
6
Priority Collection/Sewer Areas
A. Greater Than 1 Dwelling Unit/acre
B. Village Centers
C. Economic Centers
D. Growth Incentive Zones
Advanced
Disposal
7
Supplemental Collection / Sewer Areas
Advanced

"Subregional Working Group - Outer Cape - Workshop 1"




"Subregional Working Group - Outer Cape - Workshop 1"
Herring River
Bound Brook Island Rd
Coles Neck Rd
Old Hay Rd
Gull Pond
Gull Pond Rd
Ocean View Dr
Long Pond
Old Long Pond Rd
Long Pond Rd
Way 625
Dyer Pond
Hopkins Dr
Pole Dike Rd
Browns Neck Rd
W Main St
Main St
School St
PRB
Old Chequessett Neck Rd
Holbrook Ave
State Hwy
Cahoon Hollow Rd
Duck Pond
Herring River
Chequessett Neck Rd
Kendrick Ave
Mayo
Wellfleet
Indian Neck
Cove Rd
Old Kings Hwy
Cove View Rd
Pilgrim Spring Rd
King Phillip Rd
Paine Hollow Rd
Wellfleet Harbor
Old Wharf Rd
Mill Hill Island
Lieutenant Island
Lieutenant Island Rd

	ACOE		**DEP**		**BOH**	**ConComm**	**MEPA**
	401/404	*GWDP*	*WMA*	*I&A*	*Title 5*	*WPA*	*Thresholds*
Technology/Approach							
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/MA Division of Marine Fisheries
- MassDOT

Regulatory, Legal, and Institutional Interactions

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

Regulatory Purposes

MEPA
CCC
DEP

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 and 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

Implementation

What components of an adaptive management plan are needed to achieve permit-ability 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 Outer Cape Sub Regional Group will be available on the Cape Cod Commission website:

http://watersheds.capecodcommission.org/index.php/watersheds/outer-cape

Total acreage: 11,674 acres

Total acreage: 11,674 acres

Acreage by town:

Eastham	632 acres
Truro	1,644 acres
Wellfleet	9,398 acres

Total built parcels: 3,824 parcels

Total built parcels: 3,824 parcels

Built parcels by town:

Eastham	443 parcels (green)
Truro	72 parcels (purple)
Wellfleet	3309 parcels (orange)


Site Scale | Neighborhood | Watershed | Cape-Wide
| Prevention
Reduction
| Remediation
Remediation of Existing Development
Transfer of Development Rights
Fertilizer Management
Stormwater BMPs
Compact Development
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Phytoirrigation
Eco-Machines & Living Machines
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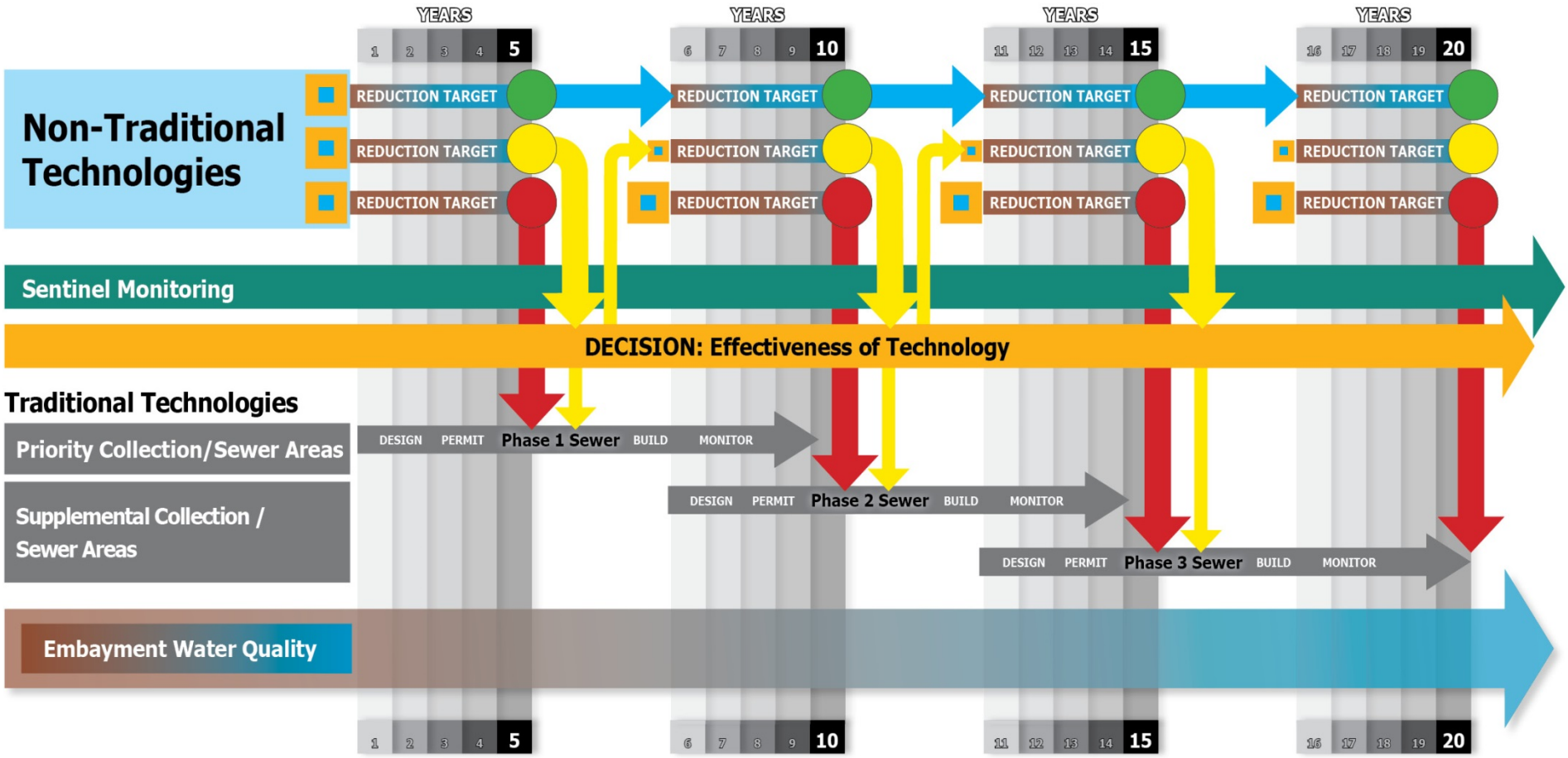
Permeable Reactive Barrier
Fertigation Wells
Shellfish and Salt Marsh Habitat Restoration
Aquaculture/Shellfish Farming
Inlet / Culvert Widening
Pond and Estuary Dredging
Constr. Wetlands - Groundwater, Salt Water, Floating

Permit likely required

Permit may be required, depending on location

How do you implement adaptive management?



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

Meeting One
February 26, 2013
8:30 am – 12:30 pm
Gestalt International Study Center, Wellfleet MA

Revised Meeting Summary Prepared by the Consensus Building Institute

I. ACTION ITEMS

Cape Cod Commission

- Create a glossary of terms to help participants with acronyms and technical terminology and concepts.
- Post a list of stakeholder organizations participating in sub-regional meetings on the Commission's website and allow stakeholders to comment on the list.
- Look into the applicability of regulatory mechanisms on both public and private lands.

II. WELCOME AND OVERVIEW

The meeting opened with a welcome from Gwynne Guzzeau, Executive Director of the Gestalt International Study Center. She welcomed meeting participants to the Study Center and briefly described the Center's programs.

Stacie Smith, the facilitator from the Consensus Building Institute, introduced herself as the facilitator of the Outer Cape meetings for the sub-regional group process. She reviewed the agenda and led introductions. A participant list can be found in Appendix A. She explained that each of the three meetings of the sub regional group would consist of three parts: scenario planning; regulatory, legal, and institutional issues (RLI); and implementation issues. Each of these three parts would be handled differently in each of the three meetings, as would be explained in greater detail by Paul Niedzwiecki. 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.

Paul Niedzwiecki, Executive Director of the Cape Cod Commission, introduced himself and placed the meeting in the context of the larger 208 Plan update process. He explained that the 208 Update process is watershed based. The process places a high priority on stakeholder engagement as such an orientation is required by the Clean Water Act and is also important to the Cape Cod Commission. He stated that the process is seeking to maximize the benefits of

existing local wastewater planning efforts such as the Comprehensive Wastewater Management Plans (CWMPs) that many towns have developed. And Mr. Niedzwiecki explained that the 208 plan is 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.

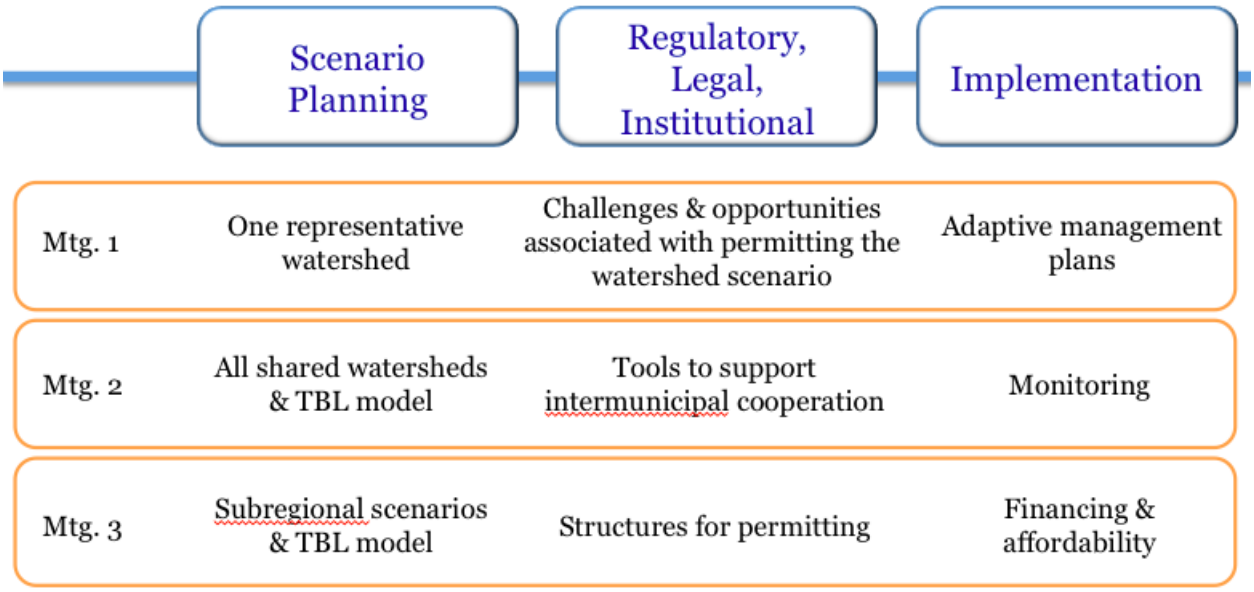


Figure 1

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 Wellfleet Harbor as a sample scenario for the Outer Cape working group. Mr. Niedzwiecki noted that the towns of Wellfleet, Eastham, and Truro each make up a portion of the Wellfleet Harbor watershed, with each constituting different portions of the watershed's land area, built parcels, and attenuated wastewater load. Wellfleet comprises 86% of the attenuated wastewater load, Eastham comprises 12%, and Truro comprises 2%. Mr. Niedzwiecki noted that these differential contributions are important to understand in order to understand respective contributions to the nitrogen-load problem faced by the watershed.

Mr. Niedzwiecki explained that the Commission modeled two approaches, a "traditional approach" and a "non-traditional approach," for meeting the Wellfleet Harbor 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 Total Maximum Daily Load (TMDL) 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, with minimal sewering in priority areas, to meet TMDL 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 Wellfleet Harbor 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 sewering, innovative/alternative Title 5 systems, and cluster systems. The Commission used its Watershed MVP tool to identify the smallest footprint of sewering necessary to meet the TMDLs. Mr. Cambareri explained that, because the Massachusetts Estuaries Project (MEP) has not yet created nitrogen-reduction targets for the Wellfleet Harbor watershed, the "traditional approach" scenario assumed that 25% of the watershed's nitrogen load would have to be reduced for purposes of illustration to the working group. Mr. Cambareri showed a map illustrating a footprint for sewering that would remove 25% of the watershed's nitrogen load, and also showed a second map illustrating a (larger) footprint for sewering that would remove 50% of the watershed's nitrogen load. He also explained that approximately 20% of the anthropogenic nitrogen load in Cape watersheds comes from fertilizer and stormwater and that taking advantage of fertilizer and stormwater reduction measures would allow towns to reduce the footprint of sewering that would be needed to tackle septic loads.

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 Wellfleet Harbor watershed illustrating possible locations for various technologies such as permeable reactive barriers, constructed wetlands, fertigation wells, shellfish bed restoration or aquaculture, and the Herring River Restoration Project that is already underway. He noted that the model also assumes that 5 percent of homes in the watershed would install ecotoilets or innovative/alternative Title 5 systems. Mr. Horsley mentioned that in the Wellfleet Harbor watershed, as in many other Cape Cod watersheds, the Commission has identified enough areas for non-traditional technologies that reduction targets

may be met without resorting to any sewering, provided that the non-traditional technologies function to the extent expected.

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 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.

	ACOE	DEP			BOH	ConComm	MEPA
	401/404	*GWDP*	*WMA*	*I&A*	*Title 5*	*WPA*	*Thresholds*
Technology/Approach							
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
- MassDOT

Figure 2

Following Mr. Horsley's presentation, a working group member suggested that aquaculture projects may need to comply with the terms of the American Fisheries Act.

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:

- 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/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.
- 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 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 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. 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.

Following Ms. Daley's presentation, working group members and Commission representatives discussed the following topics:

- In response to a working group member who said that it can be hard to keep up with the acronyms used by Commission representatives, the Commission agreed to create a glossary of terms to help participants with acronyms and technical terminology and concepts.
- Commission representatives explained that the Commission is trying to leverage the 208 Update process to push for creation of a harmonized review process that is appropriate for permitting at the watershed-level instead of the current approach of permitting individual projects.
- Meeting participants, noting that MEPA review can halt a permitting process and seem like a big roadblock, explored options of dealing with this hurdle, including trying to go through MEPA review before applying for other types of permits and designing a more integrated review process. A Commission representative stated that it would be preferable to design projects for optimal functionality and change the regulatory process to accommodate these rather than designing projects in order to avoid MEPA review.
- Participants suggested that it may be helpful to consider the purpose or mandate of each regulatory agency in order to frame the Cape's efforts to meet wastewater goals in a way that speaks to the agencies' mandates in a holistic way. A Commission representative suggested that plans could be framed as "system restoration" plans such that the larger picture of ecosystem enhancement is considered rather than focusing on isolated adverse effects. Commission representatives also reported that they have been in touch with regulators from US EPA and MA DEP, some of who are attending sub-regional working group meetings, and that those agencies are receptive to the nature of the Cape's wastewater problem and the public process that the Commission has put together. Participants suggested that adaptive management plans that include fallback approaches may be acceptable to regulatory agencies.
- Commission representatives noted that US EPA is expanding regulations to prevent polluted stormwater runoff from being transported through municipal stormwater systems to smaller municipalities, including many towns on the Cape. While this is a new regulation, is also represents an opportunity in terms of new funding opportunities for Cape communities.
- In response to questions about which stakeholders, such as NGOs and legal advisors, are being engaged in the wastewater process, Commission representatives stated that the Sierra Club, Buzzards Bay Coalition, Mass Audubon, Sierra Club, Conservation Law Foundation, and others are attending sub-regional working group meetings. The

Commission also agreed to post a list of stakeholder organizations on its website and to allow people to comment on the list as part of the stakeholder review.
- In response to a suggestion from a working group member, the Commission agreed to look into the applicability of regulatory mechanisms on both public and private lands.

Following Ms. Daley's presentation, working group participants worked to identify regulatory, legal, and institutional hurdles and opportunities associated with permitting non-traditional technologies.

The working group identified the following hurdles:
- Regulatory agencies pursue permitting with each town individually.
- Regulatory agencies are often very risk-averse and therefore require the adoption of approaches that are guaranteed to be effective (such as sewering) rather than allowing for experimentation with non-traditional technologies.
- Regulatory agencies currently permit plans for an entire town rather than allowing targeted permitting of individual projects that have widespread support.
- It would be helpful to streamline permitting so that multiple projects can be reviewed together.
- Cape towns will need to secure buy-in from MA DEP around estimates of how much nitrogen would be removed by different technologies such that DEP would give credit for the different technologies.
- Individuals in regulatory agencies are likely to enact roadblocks for permitting non-traditional approaches. Cape jurisdictions will likely have to pursue appeals.
- It will likely be difficult to engage the public around wastewater issues and convince people of the importance of taking action.

The working group identified the following opportunities:
- Develop a "special review procedure" that is better suited to reviewing non-traditional approaches and to considering issues at a watershed-scale. This process could look at the big-picture benefits of projects and "fast track" review without getting bogged down in small secondary costs and in jurisdictional silos.
- Learn from the experiences and precedents of other jurisdictions and projects, such as the Falmouth Comprehensive Wastewater Management Plan and the innovative/alternative Title V and stormwater reduction project credits that MA DEP already grants.
- Convince regulatory agencies to subrogate their authority to a regional authority, or a watershed district, that is charged with governance and environmental stewardship.
- Pursue appeals processes within existing regulatory structures.

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 has 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.

Mr. Niedzwiecki presented the diagram shown in Figure 3 to represent a possible adaptive management strategy.

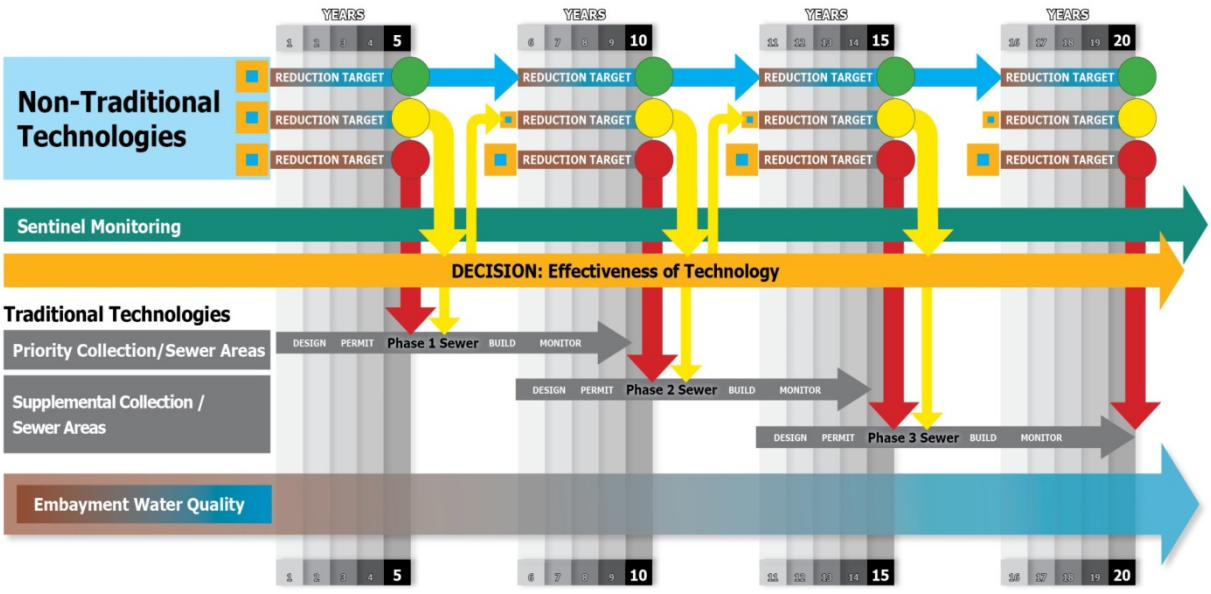


Figure 3

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 implementing another non-traditional technology, and/or implementing traditional technologies (such as sewering). As time progresses, if non-traditional technologies are not performing adequately to meet nitrogen reduction goals, the permittee would default to sewering. 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 a number of challenges and strategies related to monitoring the performance of different technologies:

- The monitoring itself should be reviewed and evaluated;
- Organizational responsibilities need to be assigned for each role: those who do the monitoring, those who collect data, those who report data, etc.;
- It is important to identify what data already exists in order to build on this existing work. NGOs that are already conducting monitoring could play a role.
- There should be transparency in sharing monitoring data and making it available to the public in order to foster innovation.
- There should be a schedule for the monitoring process, including conducting testing, compiling data, etc.
- It would make sense to standardize monitoring protocols across a given technology so that the performance of different units can be compared with one another.
- Data should be shared among organizations that are conducting monitoring to reduce duplication and wasted resources. Working group members noted that all parties performing monitoring, and the general public, all share a common goal in resource stewardship, which would be a reason to share data. Members also noted that some groups keep their data private until they publish their research findings. A participant suggested that a participatory process could be organized to set criteria for sharing information and data such that organizations and government agencies that want to contribute to improving ecosystem health under the 208 Plan would have to meet certain quality standards and standards for sharing information.
- Measurement and monitoring measures should be tailored to the specific approach or technology.
- Quality-control standards on monitoring practices will be needed. A participant suggested that US EPA has standards of this sort that might be helpful.

The group also discussed the following additional issues related to management and implementation of wastewater projects:

- Robust collaboration and conflict-resolution processes will be needed to reduce the likelihood of conflict between towns that share a watershed and to efficiently resolve conflict that does arise.
- Money and resources will be required for many items being discussed, including implementation of plans, adaptive management, monitoring, etc.
- Having a well-specified goal is important for effective management.
- Having only a manageable level of complexity is important for effective management.
- Approach issues at the most-appropriate management level. In the case of wastewater, that is likely at the watershed level or the county level, as opposed to the town level that most New England communities use.
- Projects should be designed to meet specific goals. For example, if the goal is to reduce fertilizer load by 50%, then communities need to come up with a strategy to meet that. In order to get credits for nitrogen reduction, communities need to be able to document that less fertilizer is actually being used. A possible metric of this may be whether less fertilizer is being sold in stores. *A Commission representative responded that monitoring fertilizer load will likely be one of the trickier monitoring challenges. The focus should be on how much nitrogen from fertilizer is entering embayments, not strictly on how much fertilizer is being sold, or used. One approach might be to give communities credits for fertilizer management for adopting effective-fertilization education programs. Ultimately, sentinel monitoring of embayments will be able to document overall changes in nitrogen loads and by subtracting out the reductions driven by other technologies, which should be easier to quantify, it should be possible to understand changes from fertilization also.*
- A Commission representative said that, from a financial perspective, adaptive management allows for implementing cheaper solutions and seeing how well they work before making the commitment to install sewering, which is very capital intensive. The representative also explained that Falmouth and Chatham have incorporated the retiring of debt service into the timetable for program implementation such that additional bonds could be floated in order to shield taxpayers from incurring immediate, upfront expenses.

A working group member asked about existing CWMP plans that rely on sewering and asked whether there are other towns on the Cape that are also interested in non-traditional approaches. In response, a Commission representative explained that the Commission's goal is to significantly enlarge the menu of options for local communities to consider as per their own priorities. One factor to consider is that non-traditional approaches are currently very hard to get permitted and that many towns do not have the expertise to explore nitrogen mitigation on their own. As a result, towns will hire an engineering firm to design a solution, and the firms tend to be pretty conservative and recommend sewering. Some communities will definitely need to install sewering due to their local conditions, but the Commission's goal is to provide communities with greater flexibility in choosing their solutions by making a wider variety of solutions and approaches easily permitable.

VI. PUBLIC COMMENTS

No public comments were made separate from general meeting participation.

APPENDIX ONE: MEETING PARTICIPANTS

Category	Name	Title
Local Elected Official	Elaine Anderson	Selectman, Provincetown
	John Morrissey	Selectman, Wellfleet
Appointed/Committee	Charles Harris	Water Management Committee, Eastham
	Joanna Buffington	Board of Health, Eastham
	Joseph Buteau	Truro Energy Committee
	Ned Hitchcock	Wastewater Committee, Wellfleet
Town Staff	Brian Carlson	Conservation Agent, Provincetown
	Gloria McPherson	Town Planner, Provincetown
	Patricia Pajaron	Health Agent, Truro
Environmental and Civic	Jean Schaefer	Wellfleet Non-Resident Taxpayer Association
Business/Real Estate	Tracey Rose	Real Estate Agent, Thomas D. Brown Real Estate Agency
	Laura Kelly	Owner, Littlefield Landscapes, North Eastham
Federal and State Partners	Lauren McKean	Park Planner, Cape Cod National Seashore, National Park Service
	Karen Simpson	US Environmental Protection Agency

Alternates and Members of the Public:

Holly Hobart

Ed Nash