

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

**Meeting Three
Tuesday, December 3, 2013
8:30 am- 12:30 pm
Provincetown Town Hall**

Meeting Agenda

- 8:30 Welcome, Review 208 goals and Process and the Goals of today's meeting – *Cape Cod Commission Area Manager*
- 8:45 Introductions, Agenda Overview, Updates and Action Items– *Facilitator and Working Group*
- 9:00 Presentation of Initial Scenarios for each watershed – *Cape Cod Commission Technical Lead*
- Whole Watershed Conventional Scenarios
 - Targeted Conventional Scenarios to meet the TMDLs (or expected TMDLs):
 - Whole Watershed 7-Step Scenarios
 - Working Group Reactions, Questions and Discussion
- 10:30 Break
- 10:45 Adaptive Management – *Cape Cod Commission and Working Group*
- Adaptive Management Sample Scenarios
 - Key Adaptive Management Questions
 - Defining Adaptive Management
- 11:30 Preparing for 2014 Jan-June – *Cape Cod Commission and Working Group*
- Triple Bottom Line approach
 - Identify Shared Principles and Lessons Learned
 - Describe Next Steps
- 12:15 Public Comments
- 12:30 Adjourn

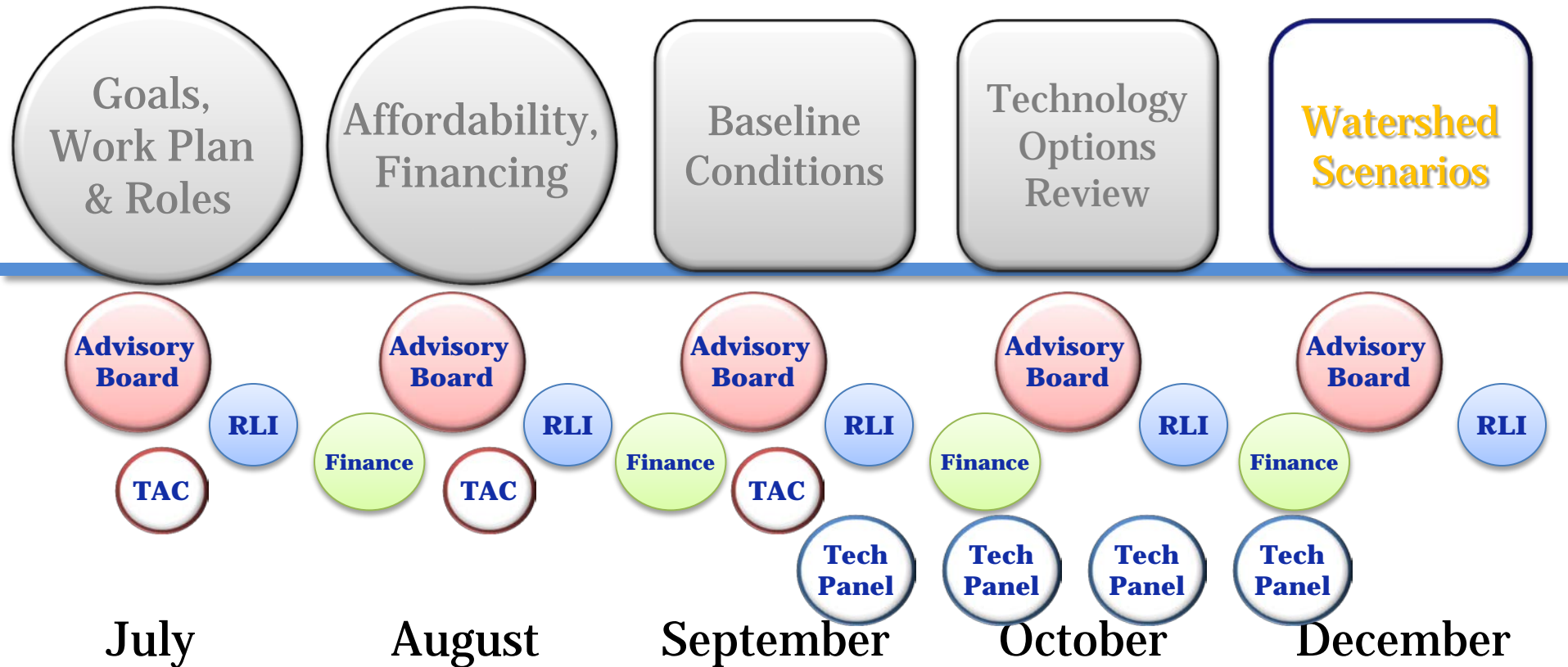
Provincetown Harbor Group



Watershed Scenarios

Public Meetings

Watershed Working Groups



RLI Regulatory, Legal & Institutional Work Group

TAC Technical Advisory Committee of Cape Cod Water Protection Collaborative

Site Scale

"Watershed Working Group - Provincetown Harbor - Workshop 3"

Neighborhood














Watershed

Cape-Wide









Prevention

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

Reduction

	Title 5	Standard Title 5 Systems		Cluster & Satellite Treatment Systems		Conventional Treatment	
	IA	I/A Title 5 Systems		STEP/STEG Collection		Advanced Treatment	
	Enhanced IA	I/A Enhanced Systems				Wastewater Collection Systems	
		Toilets: Urine Diverting				Effluent Disposal Systems	
		Toilets: Composting		Constructed Wetlands: Surface Flow			
		Toilets: Packaging		Constructed Wetlands: Subsurface Flow			
		Stormwater: Bioretention / Soil Media Filters			Effluent Disposal: Out of Watershed/Ocean Outfall		
				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				
		Surface Water Remediation Wetlands				

-  Wastewater
-  Stormwater
-  Existing Water Bodies
-  Regulatory

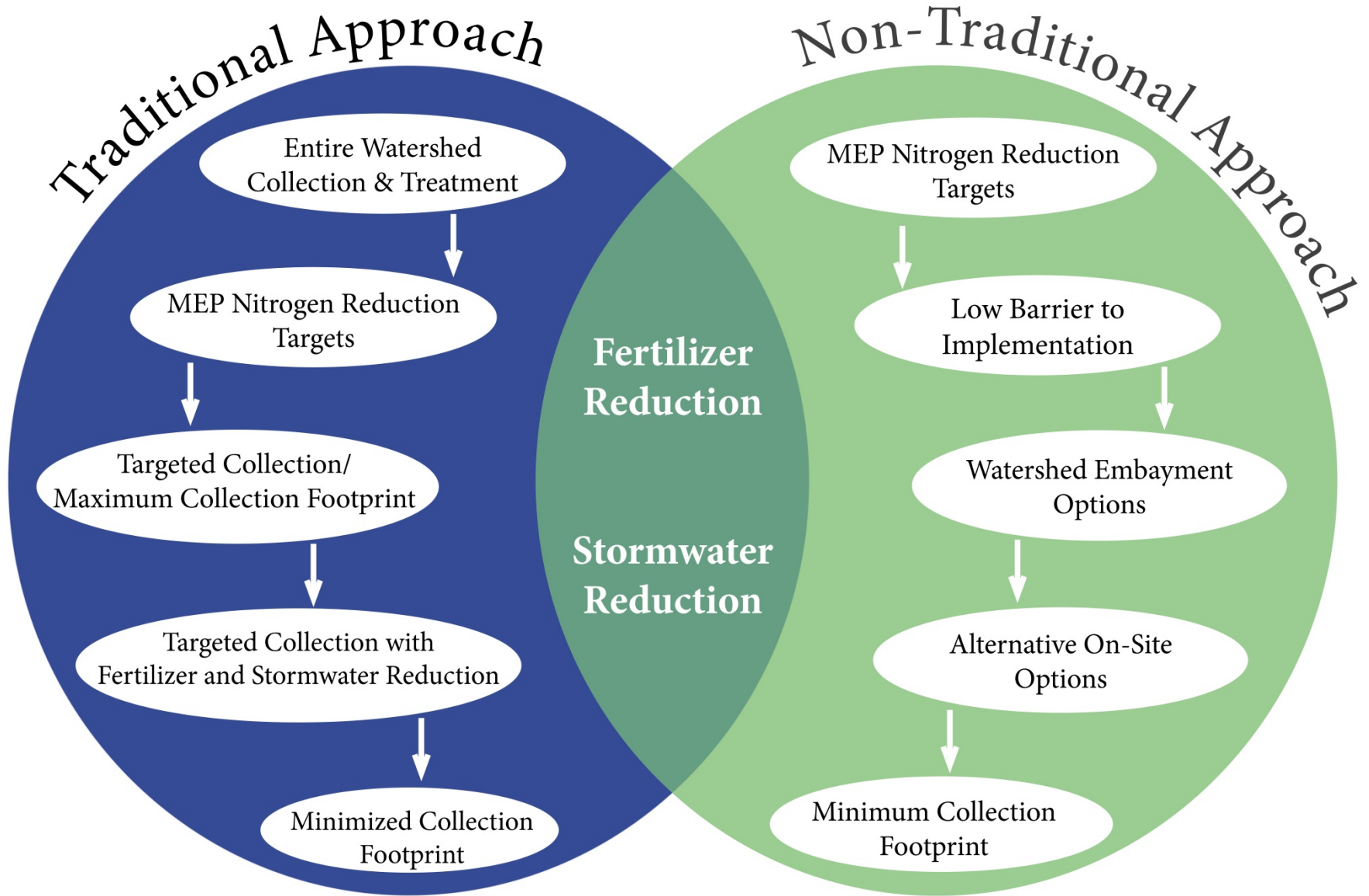
Watershed
Scenarios

11 Working
Group Meetings:
Dec 2-11

Goal of Today's Meeting:

- To discuss the approach for developing watershed scenarios that will remediate water quality impairments in your watersheds.
- To identify preferences, advantages and disadvantages of a set of scenarios of different technologies and approaches, and
- To develop a set of adaptive management principles to guide sub-regional groups in refining scenarios for the 208 Plan.

208 Planning Process



Site Scale

"Watershed Working Group - Provincetown Harbor - Workshop 3"

Neighborhood

Watershed

Cape-Wide

Prevention

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

Reduction

- Title 5 Standard Title 5 Systems
- Cluster & Satellite Treatment Systems
- Conventional Treatment
- I/A Title 5 Systems
- STEP/STEG Collection
- Advanced Treatment
- I/A Enhanced Systems
- Wastewater Collection Systems
- Toilets: Urine Diverting
- Effluent Disposal Systems
- Toilets: Composting
- Constructed Wetlands: Surface Flow
- Toilets: Packaging
- Constructed Wetlands: Subsurface Flow
- Stormwater: Bioretention / Soil Media Filters
- Effluent Disposal: Out of Watershed/Ocean Outfall
- 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
- Surface Water Remediation Wetlands

- Wastewater
- Stormwater
- Existing Water Bodies
- Regulatory

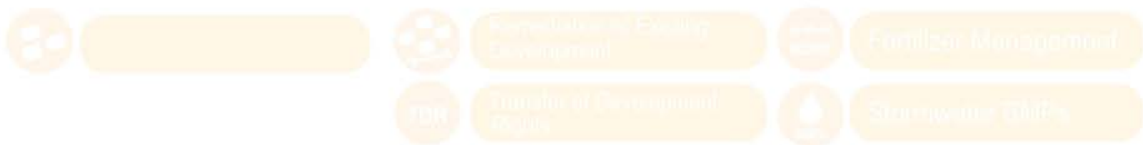
Site Scale

Neighborhood

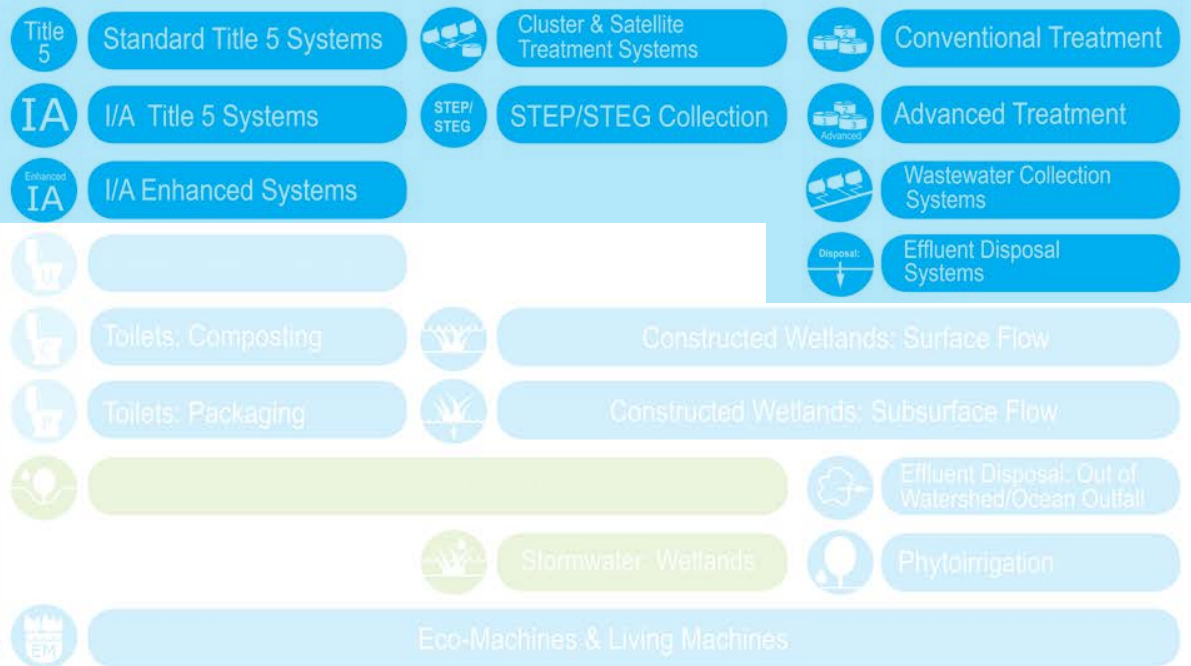
Watershed

Cape-Wide

Prevention



Reduction



Traditional Approach

Remediation



- Wastewater
- Stormwater
- Existing Water Bodies
- Regulatory

Site Scale






"Watershed Working Group - Provincetown Harbor - Workshop 3"

Neighborhood




















Watershed

Cape-Wide









Prevention

	Compact Development		TDR		N+P+K MGMT		Fertilizer Management
					Stormwater BMPs		

Reduction

	Title 5	Standard Title 5 Systems		Cluster & Satellite Treatment Systems		Conventional Treatment
	IA	I/A Title 5 Systems		STEP/STEG Collection		Advanced Treatment
	Enhanced IA	I/A Enhanced Systems				Wastewater Collection Systems
	Toilets: Urine Diverting					Effluent Disposal Systems
	Toilets: Composting			Constricted Wetlands: Surface Flow		
	Toilets: Packaging			Constructed Wetlands: Subsurface Flow		
	Stormwater Bioretention / SMI Media Filters					Effluent Disposal Out of Watershed/Ocean Outfall
				Stormwater Wetlands		Phytoremediation
	EM	Eco-Machines & Living Machines				

Remediation

	Phytobuffers		Fertigation Wells
	PRB		Sediment and Salt Marsh Habitat Restoration
			Aquaculture/Shellfish Farming
			Inlet / Culvert Widening
			Pond and Estuary Dredging
			Surface Water Remediation Wetlands

Traditional Approach Plus Fertilizer & Stormwater Reduction

-  Wastewater
-  Stormwater
-  Existing Water Bodies
-  Regulatory

Site Scale

"Watershed Working Group - Provincetown Harbor - Workshop 3"

Neighborhood

Watershed

Cape-Wide

Prevention

	Compact Development		Remediation of Existing Development		Fertilizer Management
			TDR		Stormwater BMPs

Reduction

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	I/A Enhanced Systems				Wastewater Collection Systems
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	Stormwater: Bioretention / Soil Media Filters			Effluent Disposal: Out of Watershed/Ocean Outfall	
			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			
		Surface Water Remediation Wetlands			

Non-Traditional Approaches

- Wastewater
- Stormwater
- Existing Water Bodies
- Regulatory

Site Scale

Neighborhood

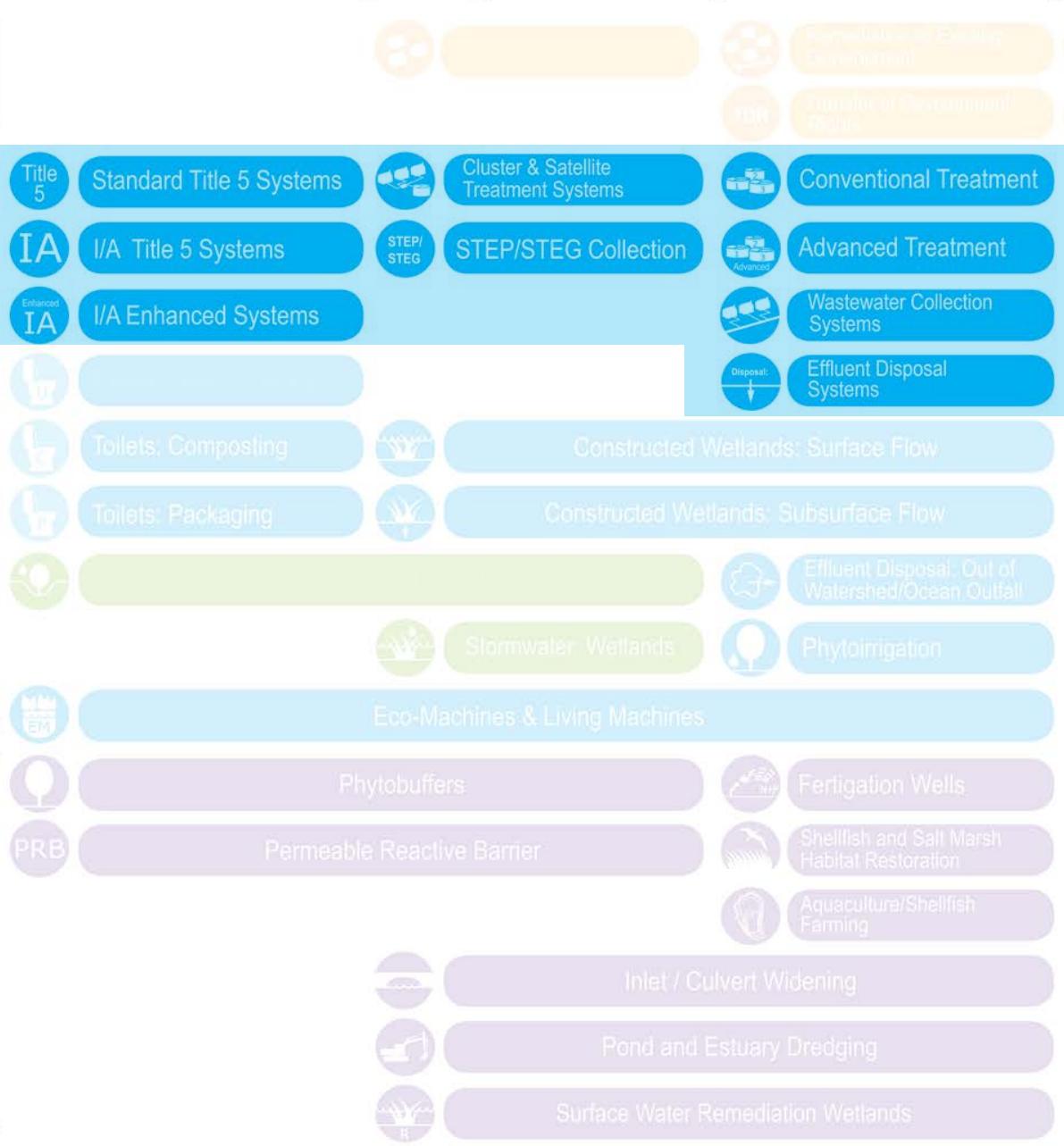
Watershed

Cape-Wide

Prevention

Reduction

Remediation



Traditional Approach

- Wastewater
- Stormwater
- Existing Water Bodies
- Regulatory

Watershed-Wide Centralized Treatment with Disposal Inside the Watershed

Link: <http://www.watershedmvp.org/Default.aspx?s>
[Go to Dashboard](#)

Scenario Settings

Baseline Value Existing Future

Use Override Factors

Flow Thru %

Water Use: Res % Com %

I/I Increase %

Treatment Type Settings

Factor Centralized Facility (within wat)

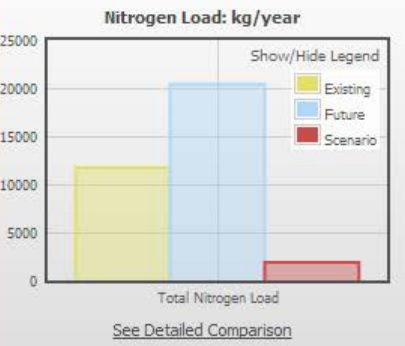
Value 5.00 ppm

Data Summary

Summarize by Nitrogen Load

Existing Future Scenario

Chart

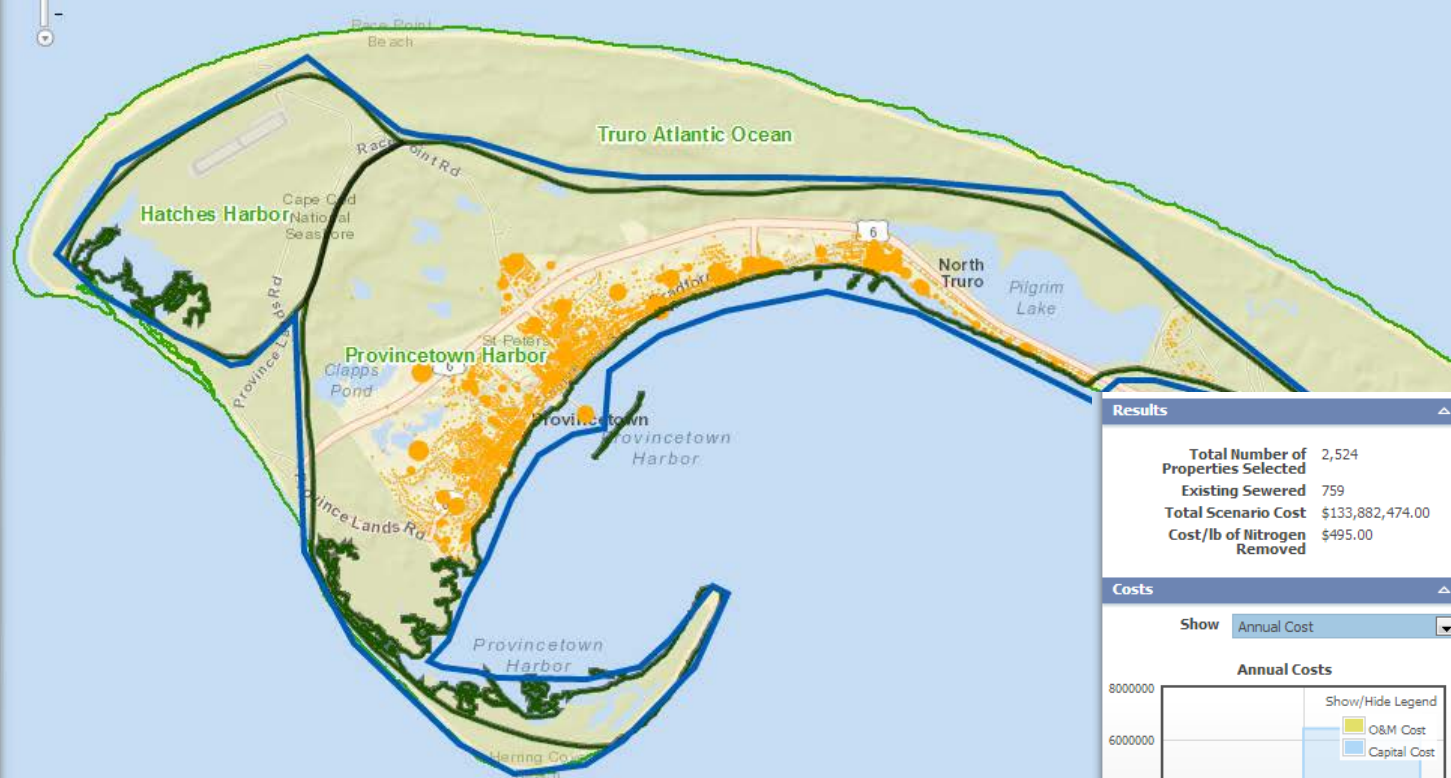


Results

Total Number of Properties Selected	2,524
Existing Sewered	759
Total Scenario Cost	\$133,882,474.00
Cost/lb of Nitrogen Removed	\$495.00

Map Tools

- Map Navigation
- Identify
- Draw a Polygon
- Add/Remove Selection



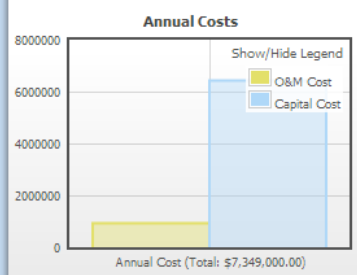
Summary Legend

Results

Total Number of Properties Selected	2,524
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Costs

Show Annual Cost

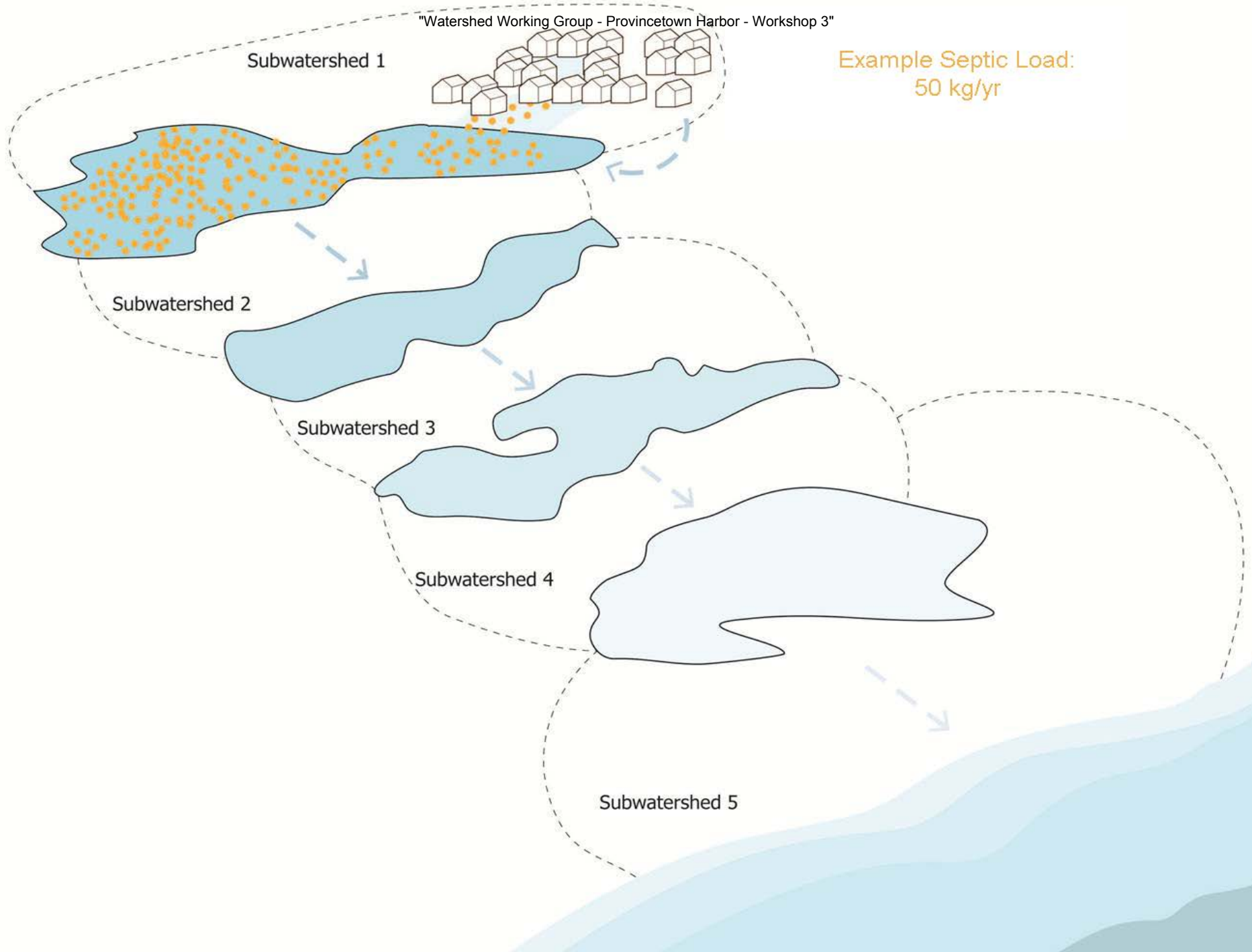


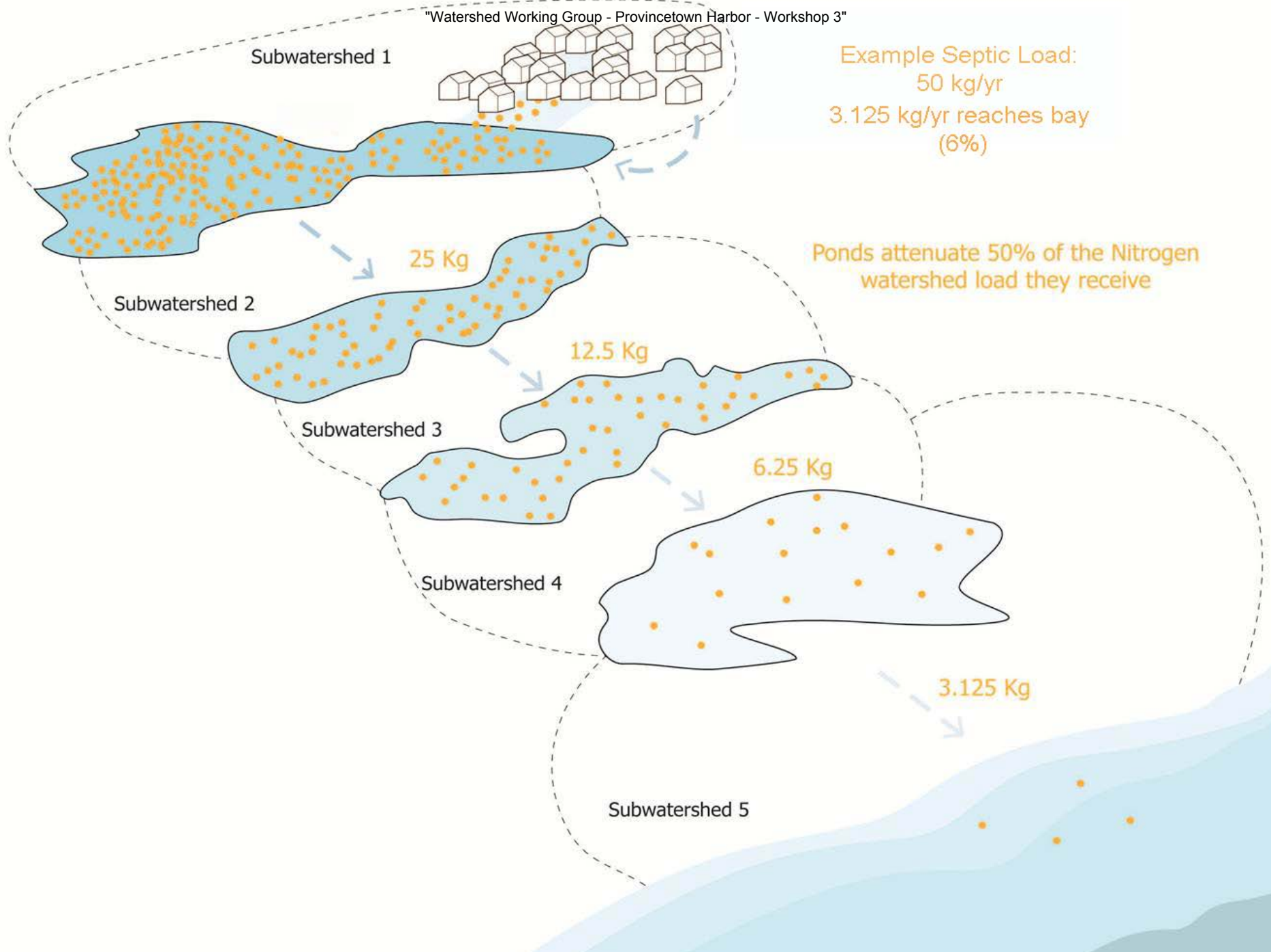
[See Detailed Comparison](#)

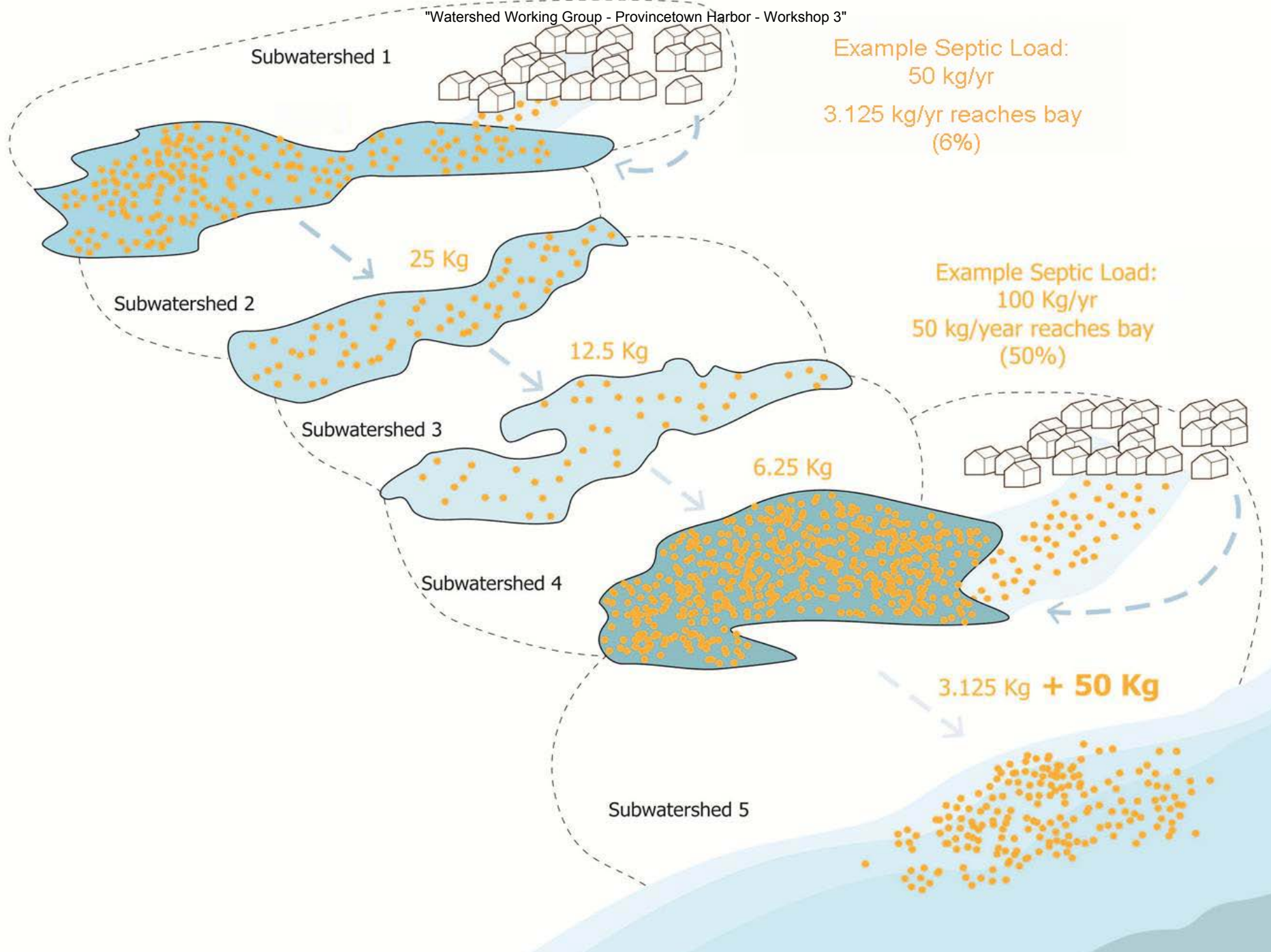
Total Cost	\$7,349,000.00
O&M Cost	\$926,000.00
Capital Cost	\$6,423,000.00

"Watershed Working Group - Provincetown Harbor - Workshop 3"

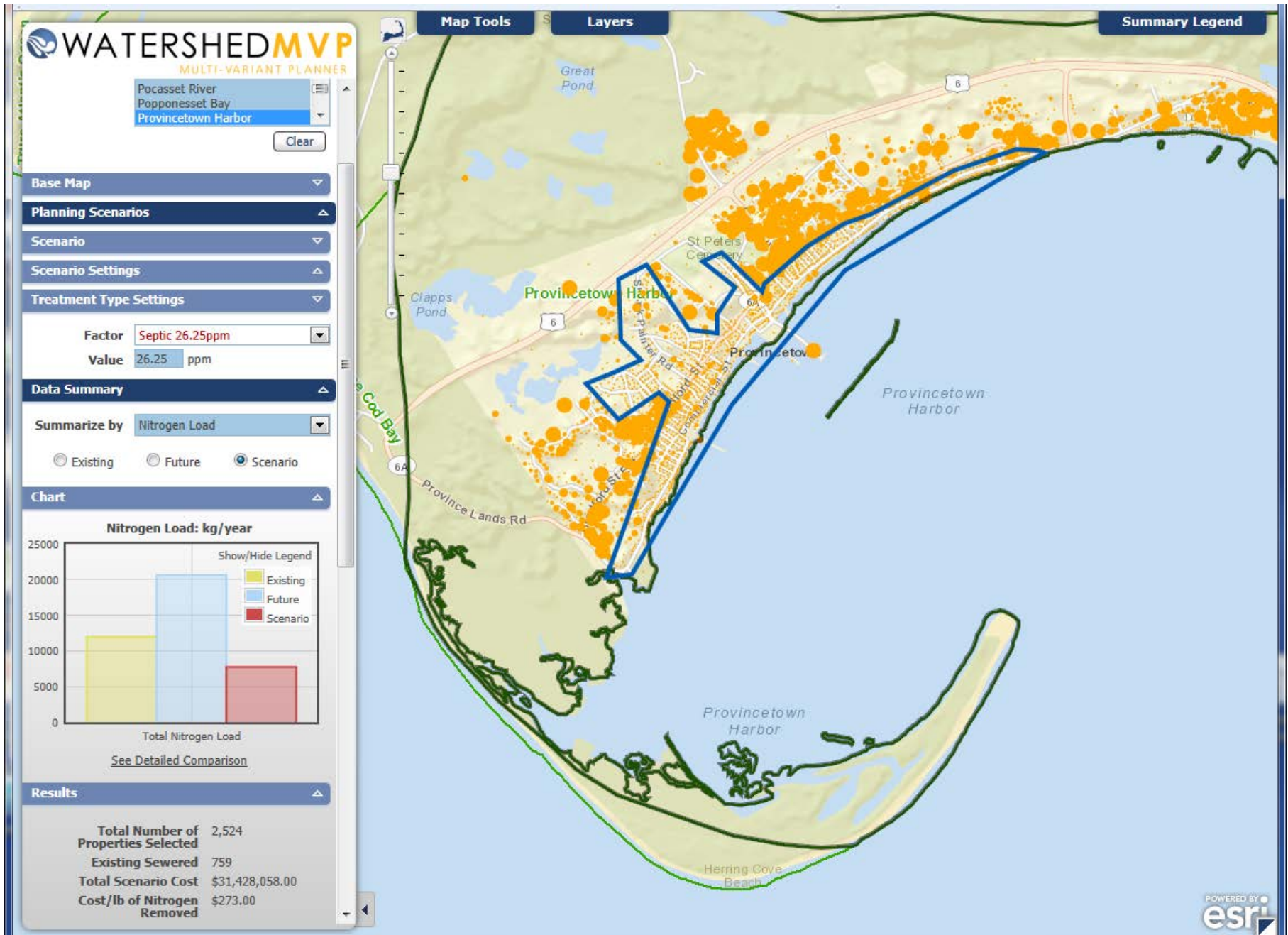
Example Septic Load:
50 kg/yr







Existing Centralized Treatment



Site Scale

"Watershed Working Group - Provincetown Harbor - Workshop 3"

Neighborhood

Watershed

Cape-Wide

Prevention

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	Eco-Machines & Living Machines				

Remediation

	Phytobuffers			Fertigation Wells	
	Permeable Reactive Barrier			Shellfish and Salt Marsh Habitat Restoration	
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Non-Traditional Approaches

- Wastewater
- Stormwater
- Existing Water Bodies
- Regulatory



Wastewater



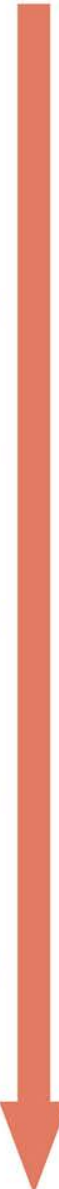
Existing Water Bodies



Regulatory

Problem Solving Approach

- 1
- 2
- 3
- 4
- 5
- 6
- 7



Targets/Reduction Goals

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

— =

Other Wastewater Management Needs

- A. Title 5 Problem Areas
- B. Pond Recharge Areas
- C. Growth Management

Low Barrier to Implementation

- A. Fertilizer Management
- B. Stormwater Mitigation



Watershed/Embayment Options

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



Alternative On-Site Options

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



Priority Collection/High-Density Areas

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



Supplemental Sewering



Adaptive Management:

A structured approach for addressing uncertainties by linking science and monitoring to decision-making and adjusting implementation, as necessary, to increase the probability of meeting water quality goals in a cost effective and efficient ways.

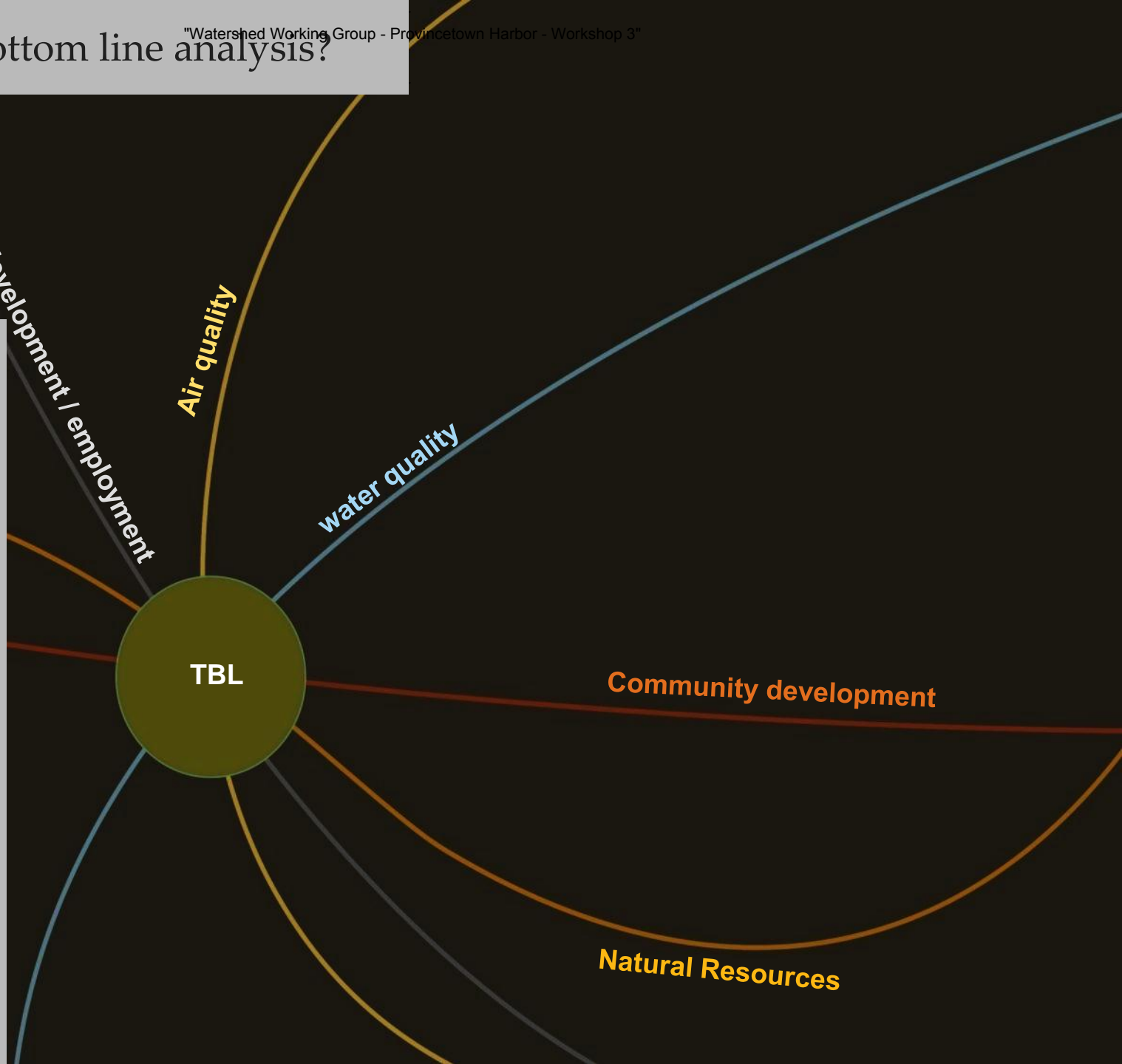


Triple Bottom Line (TBL) Introduction

What is triple bottom line analysis?

Triple Bottom Line Analysis
Provides a full accounting of the financial, social, and environmental consequences of investments or policies

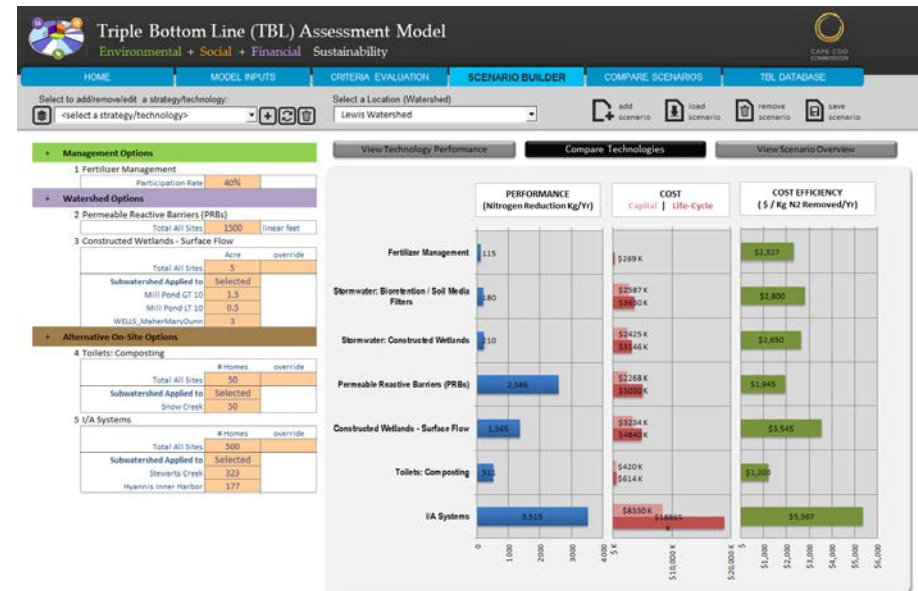
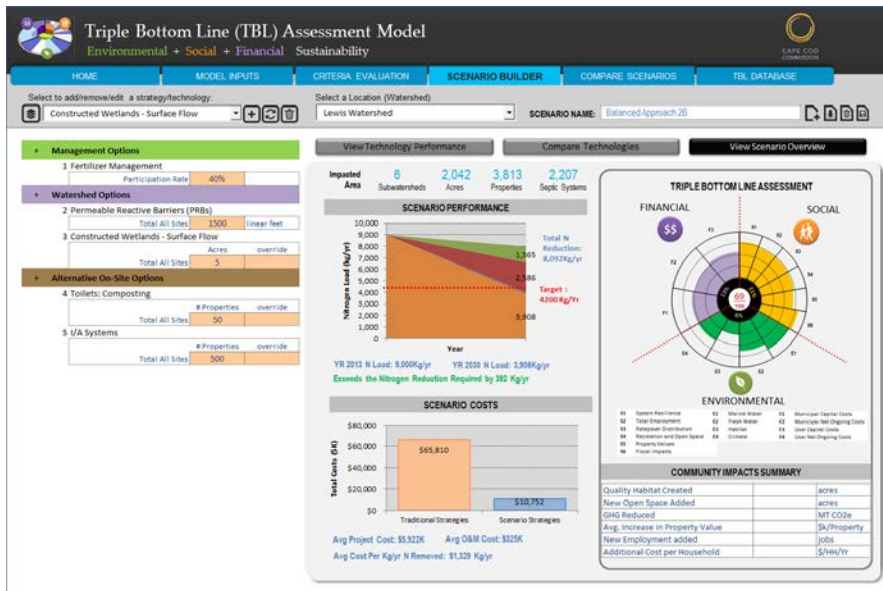
Often "TBL" analysis is used to identify the best alternative and to report to stakeholders on the public outcomes of a given investment.





Why develop a TBL model?

- Develop triple bottom line model to consider the financial, environmental, and social consequences of water quality investments and policies in Cape Cod.
- TBL Model evaluates the “ancillary” or downstream consequences of water quality investments not the direct Phosphorous or Nitrogen levels.





Triple Bottom Line (TBL) Assessment Model

Environmental + Social + Financial Sustainability



HOME

MODEL INPUTS

CRITERIA EVALUATION

SCENARIO BUILDER

COMPARE SCENARIOS

TBL DATABASE

Alternative Definition

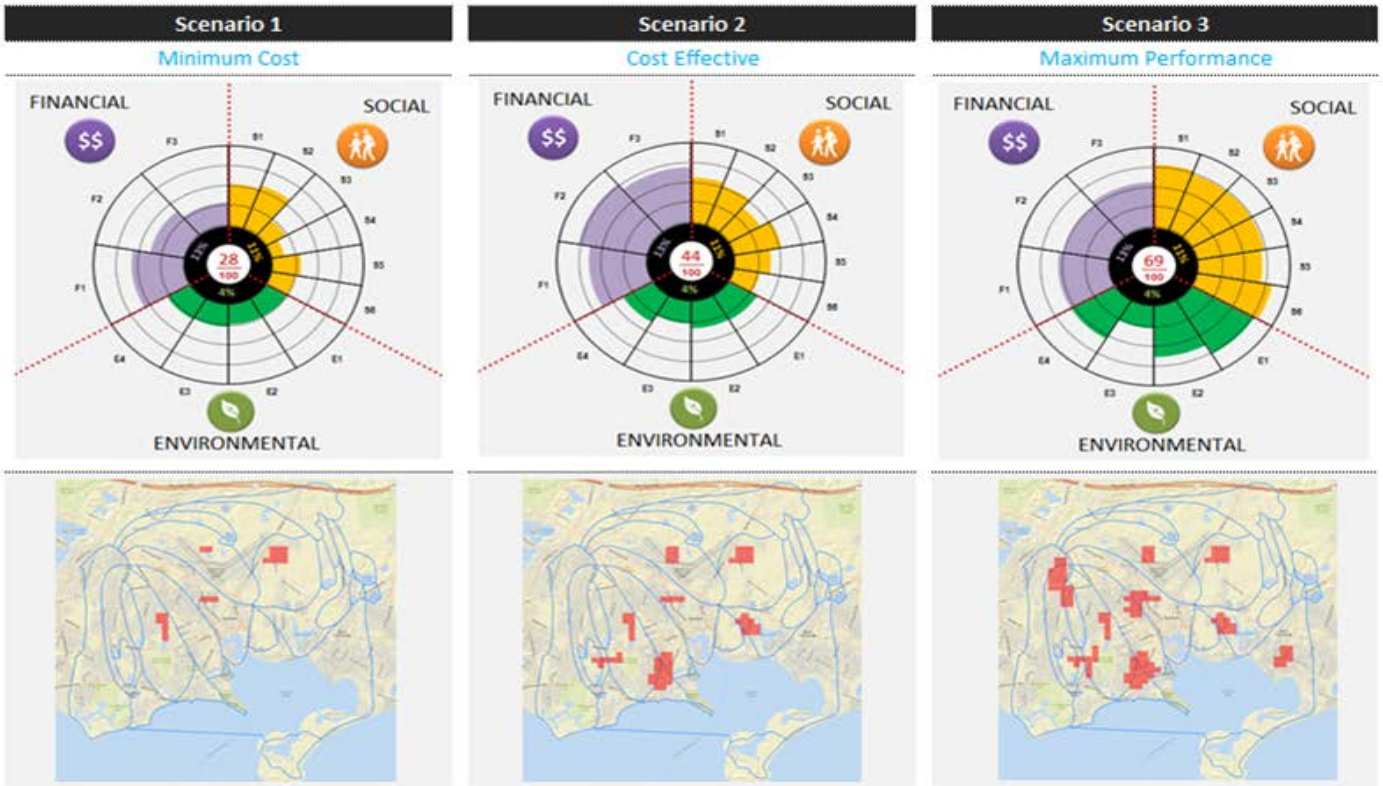
Alternative Results

Alternative Scoring Rules

Criterion Scores

SOCIAL	
System Resilience	S1
Employment	S2
Ratepayer Distribution	S3
Recreation and Open Space	S4
Property Values	S5
Fiscal Impacts	S6
ENVIRONMENTAL	
Marine Water	E1
Fresh Water	E2
Habitat	E3
Climate	E4
FINANCIAL	
Municipal Capital Costs	F1
Municipal O&M Costs	F2
Property Owner Capital Costs	F3
Property Owner O&M Costs	F4

Strategy/Technology Distribution



COST & PERFORMANCE

Nitrogen Reduction %	30%	52%	61%
Remaining Nitrogen Load (Kg N)	8,400	5,760	4,680
Life Cycle Costs (\$K)	\$5,922	\$7,350	\$9,800
Municipal O&M Cost (\$K)	\$325	\$425	\$610
Municipal Project Cost (\$K)	\$1,329	\$1,600	\$1,800
Property Owner O&M Cost (\$K)	\$98	\$128	\$183
Property Owner Project Cost (\$K)	\$397	\$480	\$540

COMMUNITY BENEFITS

Quality Habitat (acres)	0.5	1.8	2.4
New Open Space Added (acres)	1.5	4.6	5.0
GHG Reduced (MT CO2e/yr)	2.1	3.1	3.3
Avg. Increase in Property Value (\$/pty)	\$200	\$1,200	\$2,000
New Employment Added (jobs)	152	188	252
Additional Cost per Household (\$/HH/yr)	\$20	\$26	\$37



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

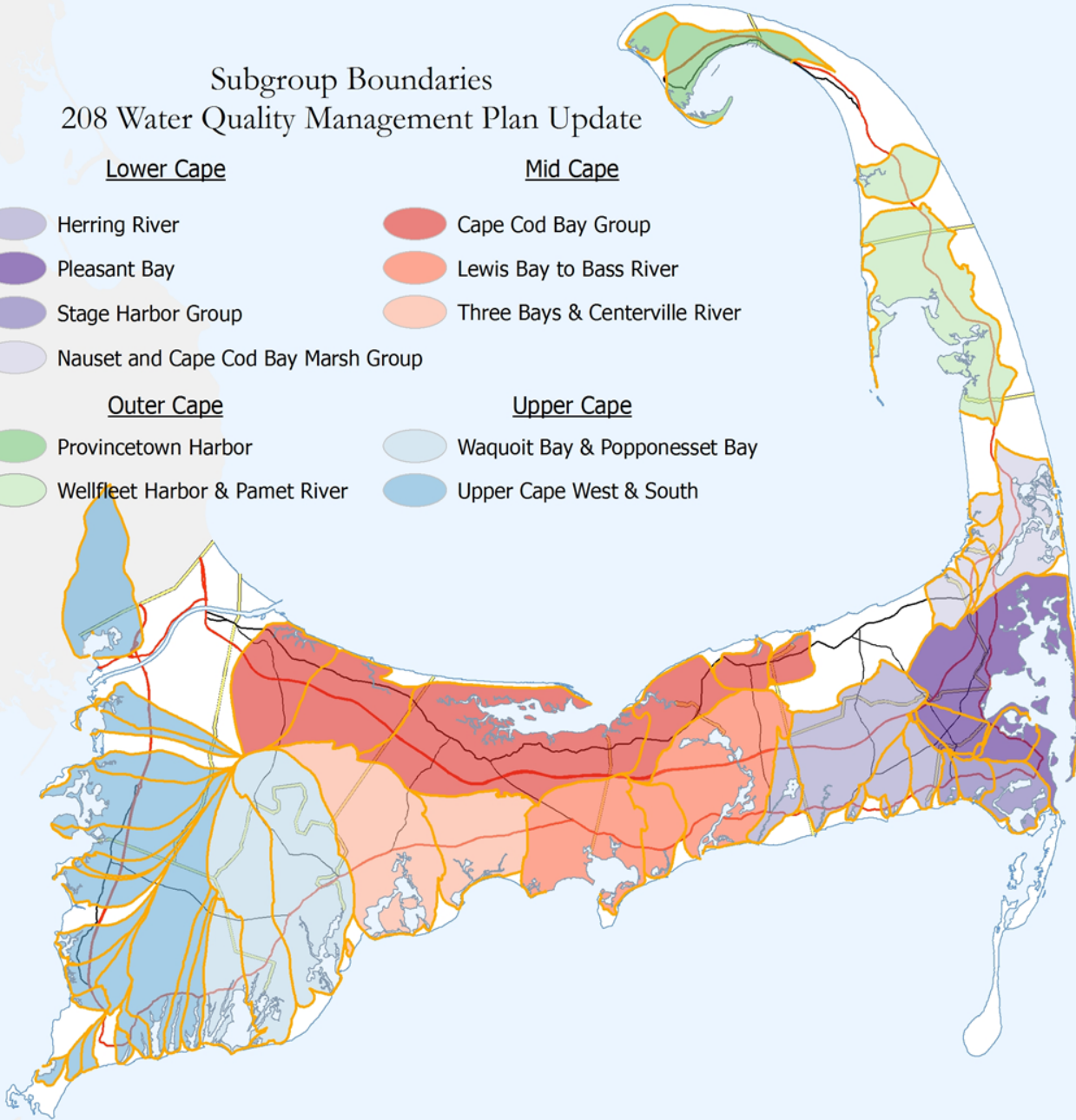
- Cape Cod Bay Group
- Lewis Bay to Bass River
- Three Bays & Centerville River

Outer Cape

- Provincetown Harbor
- Wellfleet Harbor & Pamet River

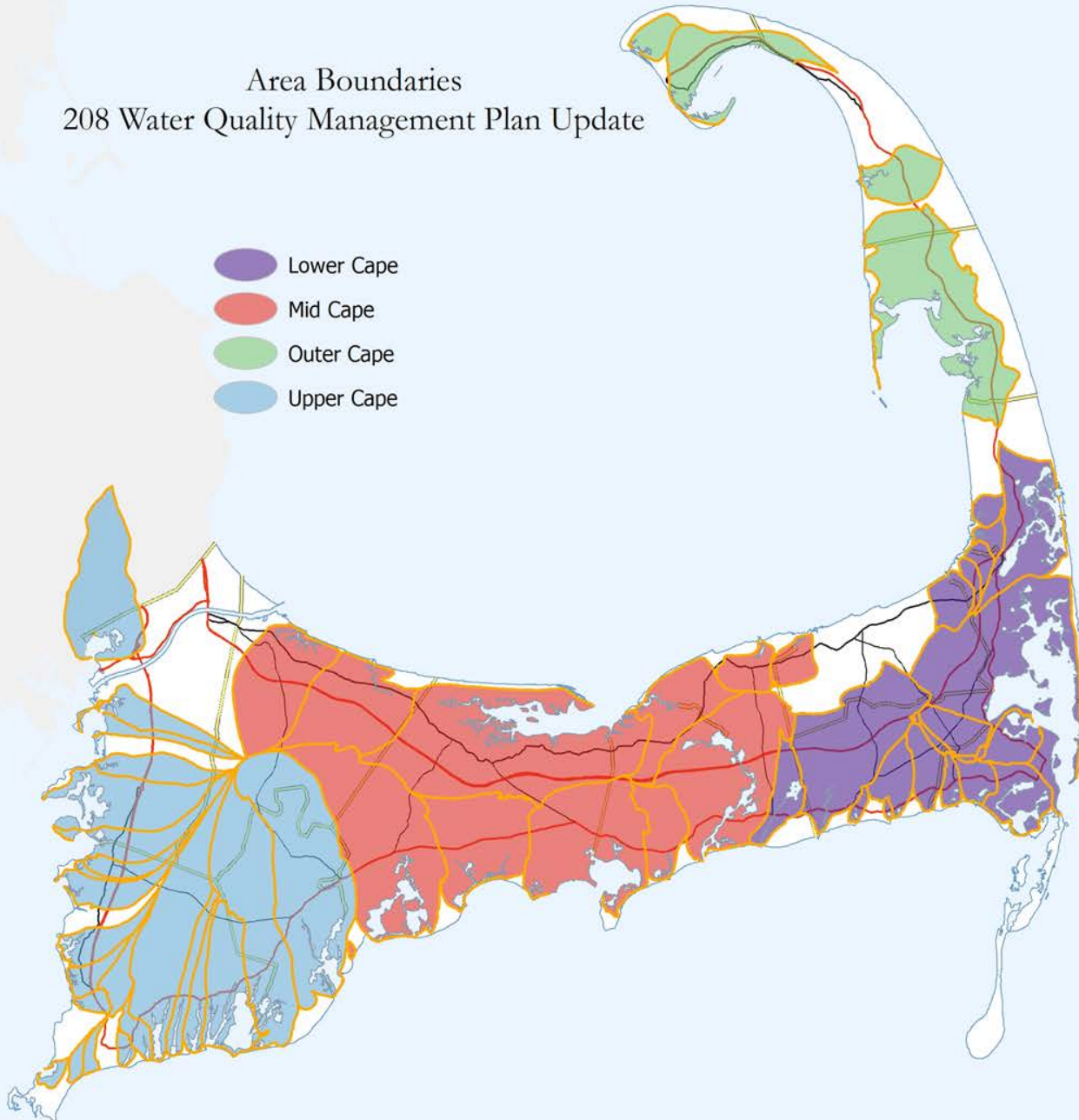
Upper Cape

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



Area Boundaries 208 Water Quality Management Plan Update

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



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

**Meeting Three
Tuesday, December 3, 2013
8:30 AM – 12:30 PM
Provincetown Town Hall**

Revised Meeting Summary Prepared by the Consensus Building Institute

I. ACTION ITEMS

Working Group

- Provide any additional feedback on the meeting summary from Meeting #2 and, when it is circulated, Meeting #3.

Consensus Building Institute

- Draft and solicit feedback from Working Group on Meeting Three summary.
- Conduct further outreach to working group members regarding the process moving forward and possible ongoing involvement, for example in the area working groups.

Cape Cod Commission

- Further develop scenarios for different areas within the Provincetown Harbor and Hatches Harbor study area.

II. WELCOME AND OVERVIEW

Scott Horsley, Area Manager and Consultant to the Cape Cod Commission, welcomed participants and offered an overview of the 208 Update stakeholder process.¹ In July, public meetings were held across the Cape to present the 208 Plan Update goals, work plan, and participant roles. Public meetings were also held in August to present information on the affordability and financing of the updated comprehensive 208 Plan. The first meetings of the eleven Watershed Working Groups were held in September and focused on baseline conditions in each of the watersheds. The second meetings of the Watershed Working Groups were held in October and early November and were focused on exploring technology options and approaches. The third meetings of the Watershed Working Groups, held in December, focused on evaluating watershed scenarios. These scenarios were informed by Working Groups' discussions at previous meetings about baseline conditions, priority areas, and technology options/approaches. Mr. Horsley noted that the Provincetown meeting is unique as the watershed has already installed a successful sewer system and has no (Total Maximum Daily Load) TMDL, but the presentation will help in exploring future options and fine-tuning existing systems.

¹ The PowerPoint Presentation made at this meeting is available at:
<http://watersheds.capecodcommission.org/index.php/watersheds/outer-cape/provincetown-harbor>

Mr. Horsley reviewed the goal of the meeting:

- To discuss the approach for developing watershed scenarios that will remediate water quality impairments in your watersheds;
- To identify preferences, advantages and disadvantages of a set of scenarios of different technologies and approaches;
- To develop a set of adaptive management principles to guide subregional groups in refining scenarios for the 208 Plan.

Kate Harvey, the facilitator from the Consensus Building Institute, reviewed the agenda and led introductions. A participant list can be found in Appendix A. She explained that the Working Group would be asked to provide input on possible approaches/scenarios for wastewater management in the watershed study area but would not be asked to “vote” on a specific approach. She also reviewed the completed action items from the last meeting including:

- Updating the town’s chronology;
- Posting meeting summaries;
- Uploading information to the Cape Cod Commission’s website.

III. INITIAL SCENARIOS FOR THE WELFLEET HARBOR AND PAMET RIVER WATERSHED

Scott Horsley explained the Commission’s process for developing watershed scenarios. Two teams were formed: one team is exploring “conventional” technologies and approaches (e.g. sewerage and I/A systems) and another team is exploring “alternative” technologies and approaches. The teams are both working under the assumption that fertilizer and stormwater reductions will be incorporated into all of the scenarios.

Conventional Scenarios

James Sherrard, Hydrologist in the Water Resources Department at the Cape Cod Commission, led the discussion of “conventional” technologies and approaches. He explained that the scenarios were developed using the Commission’s Watershed MVP Tool. This tool allows the Commission to examine how implementing traditional technologies would affect nitrogen levels in particular areas and shows general costs. It will eventually include alternative technologies as well, but they are more difficult to model. Mr. Sherrard offered three scenarios:

- Watershed-Wide Innovative/Alternative (I/A) Onsite Systems
 - In this hypothetical scenario, Provincetown has I/A systems instead of sewerage. There was a smaller reduction in nitrogen levels, so sewerage was the right and more effective choice.
- Watershed-Wide Centralized Treatment with Disposal Inside the Watershed
 - In this hypothetical scenario, Provincetown seweraged the whole watershed, costing an estimated annual costs of \$495 to remove a pound of nitrogen and an estimated \$134 million total.

- Existing Centralized Treatment
 - This scenario modeled the existing, targeted sewerage systems where nitrogen costs \$273 per pound to remove and \$31 million total.
 - Mr. Sherrard noted that some sewer systems can take advantage of natural attenuation of nitrogen in water bodies by focusing on the collection of downstream nitrogen sources, but this watershed's soil is too sandy to take advantage of this.

Working Group members had the following questions and comments about the conventional scenarios (Working Group questions and comments in italics; responses are from Mr. Sherrard unless otherwise noted):

- *Truro does not have a sewer system, so we need to be able to consider alternative technologies with the MVP.* Yes, the MVP will be updated, allowing towns to compare alternative approaches against sewerage.
- *Does that dark line in the National Seashore indicate possible sewerage? And if so, why would we want to go through the expense of sewerage there if there are no houses?* We understand that sewerage will likely not happen there. This model just gives you an idea of the difference in cost between I/A systems and sewer system expansion.
- *What is the final nitrogen reduction goal for the Cape?* I do not have a firm answer. This depends on the individual watersheds, which have specific reduction targets. *I think it is important for everyone to know this.* Yes, the MEP reports are useful in that they give specific reduction levels for septic nitrogen.
- *I understand that ponds can help attenuate nitrogen, but phosphorous in ponds is also a problem.* Yes, the MEP reports specifically target nitrogen, but the 208 Plan will also consider phosphorous mitigation.
- *Are you going to use ponds to reduce nitrogen?* Analysis still needs to be done to make sure that this would not make the ponds more eutrophic. Mr. Horsley added that the Commission can make pond protection a focus if it hears this is a priority, and also commented that sewer expansions serve other purposes apart from the mitigation of nitrogen, including economic growth and health protection.
- *Phosphorous control was addressed at the state level. It cannot be applied without a soil test, proving that it is needed. Make sure you buy low phosphorous fertilizers.*
- *Barnstable County has asked for \$80,000 for fertilizer education.*

Alternative Technology and Approaches

Scott Horsley, Area Manager, led the discussion of "alternative" technologies and approaches. He explained that the scenarios were developed for discussion purposes and encouraged Working Group members to offer their own modifications and suggestions. The scenarios follow the whole watershed 7-step process, which targets fertilizer and stormwater reductions first, then explores watershed/embayment options, and then alternative on-site options. He noted that the 7-step process is less relevant for the Provincetown Harbor Watershed, given

the existing sewer system, but added that the Commission still generated a few ideas to address the priorities of the Working Group.

He offered the following technology ideas for Provincetown Harbor Watershed:

- Constructed wetlands:
 - If added to the treatment facility, the treatment efficiency and capacity of the facility could be increased;
 - Could be a potential solution for emerging contaminants.
- Urine diversion systems in public restrooms:
 - Adding public two restrooms could help deal with the high volume of tourists during the summer;
 - Could capture 90% of septic nitrogen;
 - Could help deal with the strain that the influx of summer visitors puts on the treatment facility's capacity by storing urine until the off season;
 - Reduce disruption to businesses associated with tourists using private restrooms (as non-customers);
 - Preliminary analysis indicates that there are at least 30,000 visitors per day during the peak summer season that generates approximately 1.95 million gals/day. This peak demand generates significant costs to local businesses and the town. The analysis suggests that adding two additional public rest room facilities along Commercial Street and fitting these with urine diversion systems could reduce water and sewer demand by approximately one million gallons of water a day, saving an estimated \$151,000 in wastewater bills that are currently paid by business owners to accommodate walk-in tourists over the course of the season;
 - This would provide additional capacity at the Wastewater Treatment Facility and an opportunity to service additional areas without expansion of the treatment works.
- Restoration projects by Pilgrim Lake and East Bay
 - Could include a permeable reactive barrier (PRB) along a road adjacent Pilgrim Lake (East Harbor).

Working Group members had the following questions and comments about the Provincetown Harbor scenario (Working Group questions and comments in italics; responses are from Mr. Horsley unless otherwise noted):

Sewering and Treatment Plant

- *We have expanded the treatment capacity of the treatment plant.*
- *We have the actual data that could be used to calculate savings from urine diversion. If this is of interest, I could fine-tune these numbers with you.*
- *The DPW mandated the towns deal with stormwater runoff into the bay. We installed stormwater and sewer systems at the same time, only digging once to save money.*

- *Our major issue is that many areas by ponds are economic development sites that will become denser.* We could look at expanding the sewer into these areas as well.

Urine Diversion

- *Aren't men already using urinals?* Yes, but it is not stored separately from other waste at the moment, but it could be stored and processed at the end of the season.
- *How much do the urine storage tanks cost?* We can provide cost estimates once we refine the analysis.

Baseline

- *This watershed does not have a baseline, so where do we go from here?* Later, we will talk about the idea of a triple bottom line to understand how some of these technologies could be beneficial outside of just nitrogen control. We would also appreciate hearing your ideas about this. Mr. Sherrard added that a possible baseline was the condition of the Cape without development, so efforts that push Cape Cod back to its natural state are beneficial.
- *We still need to know how big of an impact a project will make, so people can understand what their funding will go to.* Ms. Harvey noted that the Working Group had talked about the baseline at every meeting and acknowledged it as a factor that needs to be considered as the Working Group evaluates different options.

Other Comments

- *We know we need to do something to protect East Harbor, but we are not sure what to do.* The Commission is looking into PRBs for this area.
- *We have some concerns with stormwater runoff to ponds in the area.* We could look at additional stormwater projects.
- Mr. Horsley asked the Working Group whom the Commission should talk to get additional information about its stormwater remediation projects. *The DPW would be a good source.*

Discussion of technology ideas for Truro.

Kate Harvey, Facilitator, reminded participants of the priorities and concerns that they had raised at past Working Group meetings including: cost, efficiency, and pond protection. She asked if given these priorities and concerns, they had suggestions on additional technologies or approaches that might be appropriate for this watershed, including in Truro. Stakeholders offered the following recommendations for additional projects (Working Group questions and comments in italics; responses are from Mr. Sherrard unless otherwise noted):

Sewering

- *The towns should consider demonstrating alternative technology, but also sewerage Beach Point.*
- *Yes, expanding the sewer to Beach Point and Shore Road could help protect East Harbor.*

Mr. Horsley and Mr. Sherrard discussed possible expansions of the sewer with the group.

- *There is an unused leaching field in the town that could deal with future development.*

Stormwater

- *There needs to be more stormwater remediation along Route 6.*
- *The lanes also flood sometimes.*
- *I agree; we should look at environmentally friendly approaches.* It is so shallow by Route 6 that it limits certain options but could possibly be brought to the state as a safety concern or tied into beach closure as a volume control and water quality issue. He urged the group to push the state to deal with the stormwater runoff from Route 6, as it is the state's responsibility.
- *We could consider installing retention basins along Commercial Street or Shore Road.* They have a large footprint, are difficult to make aesthetically pleasing, and could be damaged by storm spillovers. The area could also consider subsurface storage or bioretention as a different option.

Aquaculture

- *I wish we could do aquaculture in East Harbor.*
- *We could not do it commercially, but it could be done recreationally.*

IV. ADAPTIVE MANAGEMENT

Scott Horsley explained the concept of adaptive management as:

- A structured approach for addressing uncertainties by linking science and monitoring to decision-making and adjusting implementation, as necessary, to increase the probability of meeting water quality goals in a cost effective and efficient ways.

He noted that adaptive management does not mean waiting longer to implement a plan. He noted that given several uncertainties with technology and the environment, including the baseline, credible science and monitoring would be important. He emphasized that an adaptive management plan needs to meet the set water quality goals, while being cost effective and time sensitive. The Commission will talk to the MA Department of Environmental Protection (DEP) in the near future about an adaptive management plan based on the technologies developed by the Working Group. He further noted that the DEP would likely make the towns have a plan B with less alternative technologies, which the towns should consider. Ms. Harvey asked the Working Group about what it considers to be the important elements of an adaptive management plan that need to be addressed (Working Group questions and comments in italics; responses are from Mr. Horsley unless otherwise noted).

Time frame for monitoring:

- *Monitoring our plan A for about ten years before implementing plan B seems reasonable*
- *Mr. Horsley commented that it might take twenty years, as regulatory agencies will want that long to monitor what is happening.*

Additional projects (or Plan B):

- *After the watershed has completed ongoing stormwater projects, it should look at expanding aquaculture. A stakeholder commented that some people have concerns about aquacultures effect on whales.*
- *Expanding the sewer is also an obvious choice.*
- *The expansion of Provincetown's sewer depends on whether Truro wants to connect with it.*
- *We could consider land use and zoning regulations to limit the density of development.*
- *Constructed wetlands seem like a reasonable technology to consider.*

Suggestions for how to prioritize projects:

- *In Provincetown, we should continue with existing projects, including culverts and remediating outfall pipes, and tackle existing problems, like stormwater runoff.*
- *For Truro, we should also continue with stormwater remediation, as it is cost efficient.*
- *Impact and immediate results are also important.*

V. PREPARING FOR 2014 JAN-JUNE

Scott Horsley and Erin Perry shared the Commission's plans for continuing stakeholder engagement into 2014.

Triple Bottom Line approach

Ms. Perry explained that the Cape Cod Commission would present triple bottom line approach models at future meetings that considers the economic, social, and environmental downstream impacts of each scenario, including a 'no action' plan to help the groups illustrate the pros and cons of the various scenarios. She walked the group through sample triple bottom line diagrams².

Stakeholder Process: Summit and Working Groups

Ms. Perry explained that, going forward, the eleven Working Groups will be combined into four subregional groups after a meeting tentatively scheduled for January 31st to which all stakeholders are invited to discuss some of the bigger issues of financing, growth management, and implementation.

Ms. Harvey added that the subregional groups would have approximately three meetings

² See presentation for diagrams:

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

between February and June to discuss issues, including triple bottom line analysis, watershed permitting ideas, and regulatory institutions. The Cape Cod Commission is looking for about twenty people for each group with a range of interests to balance them and would like to be contacted by Working Group members interested in participating in these subregional groups, which will also be open to the public, which the Commission is trying to bring more into the process. Ms. Perry added that, following these meetings, the Cape Cod Commission is planning on sending a draft of the 208 Plan to the DEP on June 1st 2014 and finalizing it by January 2015.

A Working Group member noted that the Cape Cod Commission could engage the selectmen by going to their breakfast event and encouraging them to write a letter of support for the 208 Plan.

VI. PUBLIC COMMENTS

No public comments were made.

APPENDIX ONE: MEETING PARTICIPANTS

**Appendix A
Attendance**

Name	Affiliation
Elaine Anderson	Provincetown Board of Selectmen
Joe Buteau	Energy Committee, Truro
Amy Costa	Provincetown Center for Coastal Studies
Laurie Demolino	Board of Health, Provincetown
Charleen Greenhalgh	Town Planner, Truro
Jerry Irmer	Provincetown Harbor Committee
Gloria McPherson	Planner, Provincetown
Laura Kelly	Owner, Littlefield Landscapes, North Eastham
Pat Pajaron	Health Agent, Truro
<i>Staff and Consultants</i>	
Scott Horsley	Cape Cod Commission
Erin Perry	Cape Cod Commission
Anne McGuire	Cape Cod Commission
James Sherrard	Cape Cod Commission
Kate Harvey	Facilitator, Consensus Building Institute
Griffin Smith	Facilitator, Consensus Building Institute
<i>Public</i>	
Ed Nash	Golf Course Superintendents of Cape Cod
Dan Milz	PhD Candidate, University of Chicago