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CAPE COD COMMISSION

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

Meeting Two
April 1, 2014 8:30 am – 12:30 pm
Cape Cod Commission, 3225 Main Street, Barnstable

Meeting Goals:

- **Understand the Triple Bottom Line analysis to evaluate scenario planning**
- **Identify key criteria for successful collaboration for shared watersheds and evaluate existing models against those criteria**
- **Clarify the scope and charge of the Ad Hoc Monitoring Committee to meet permitting requirements and water quality goals**
- **Visualize monitoring within an adaptive management approach**

8:30 Welcome & Review of 208 Goals
- *Introductions, Agenda Overview & Goals of Today's Meeting*

8:45 Scenario Planning
- *Overview of scenarios in all shared watersheds.*
- *Use TBL model to discuss various options for each watershed.*

9:15 Regulatory, Legal, and Institutional Interactions
- *Review challenges and opportunities for collaboration across shared watersheds*
- *Examine and evaluate tools for watershed collaboration from across the state*

10:45 Break

11:00 Implementation
- *Identify existing monitoring and proposed monitoring approaches for each of the technologies and monitoring in the water bodies for TMDL compliance.*

12:15 Public Comment

12:30 Adjourn

COUNTY OF BARNSTABLE MASSACHUSETTS

Mid Cape Sub Regional Group

MEETING 2

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

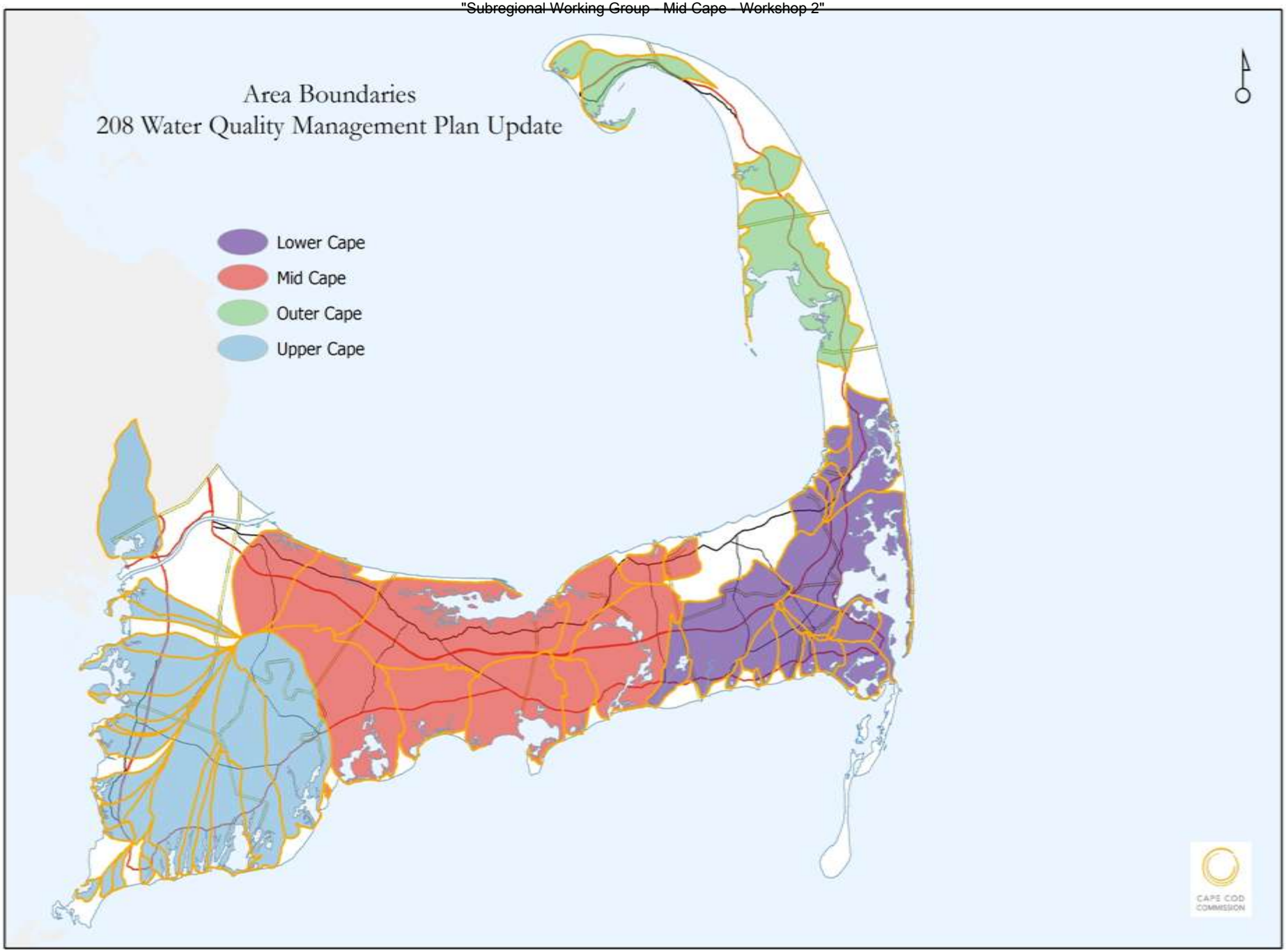
Implementation

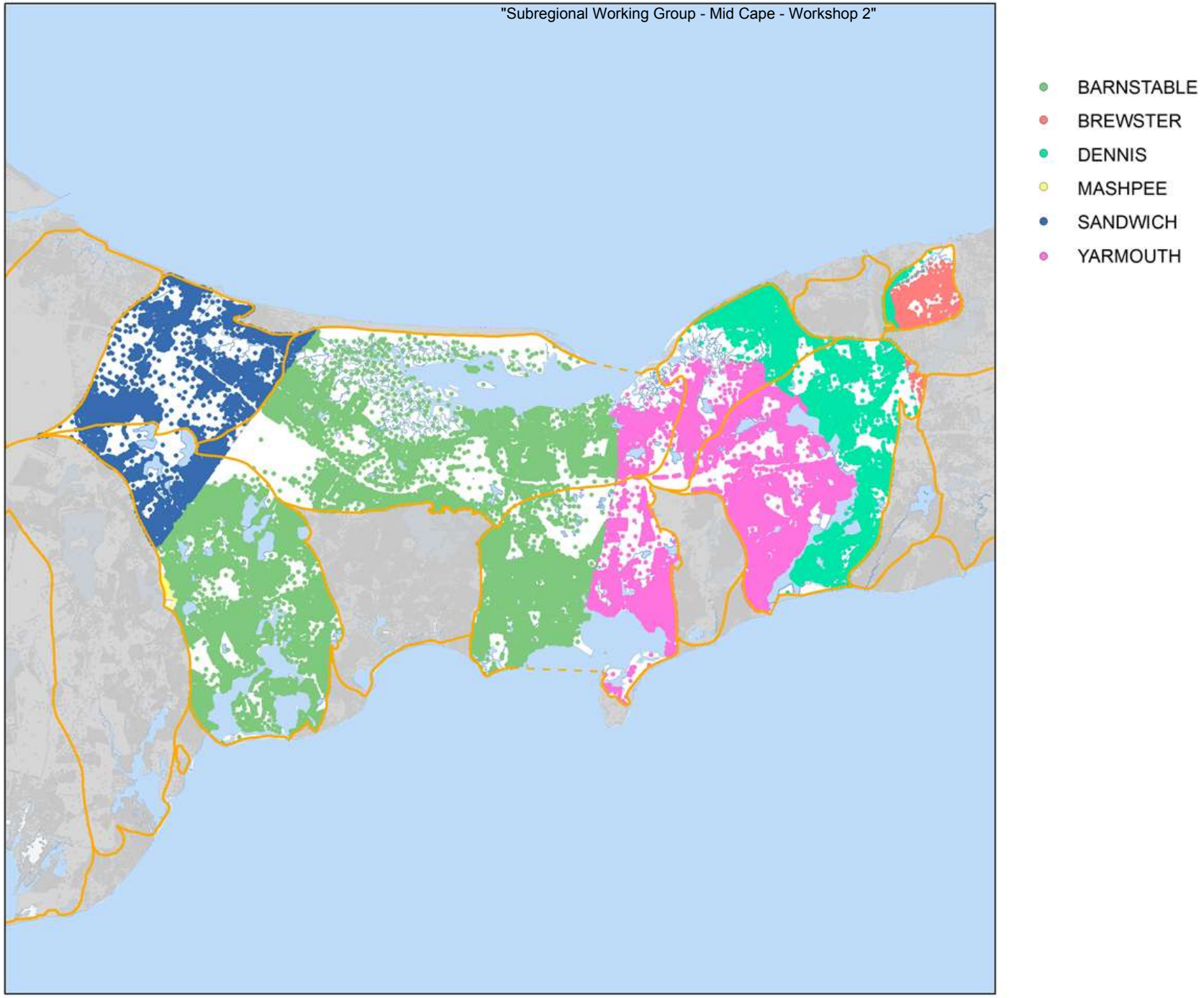
Meeting 2 Goals:

- Introduce the **Triple Bottom Line** analysis tool and its application to scenario planning
- Identify key criteria for **successful collaboration** for shared watersheds and evaluate existing models against the criteria
- Clarify the scope and charge of the **Ad Hoc Monitoring Committee** to meet permitting requirements and water quality goals
- Visualize **monitoring** within an adaptive management approach

Scenario Planning

MID CAPE


Area Boundaries
208 Water Quality Management Plan Update
Lower Cape
Mid Cape
Outer Cape
Upper Cape
CAPE COD COMMISSION


"Subregional Working Group - Mid Cape - Workshop 2"
BARNSTABLE
BREWSTER
DENNIS
MASHPEE
SANDWICH
YARMOUTH

MID CAPE SUB-REGIONAL
TRADITIONAL
CENTRALIZED – INSIDE WATERSHED SOLUTIONS

Collecting parcels: 14,798 parcels

Miles of collection: 443 miles

Flow: 2,654,129 gallons per day

MID CAPE SUB-REGIONAL TRADITIONAL

50% Fertilizer/Stormwater Reduction

Collecting parcels: 11,950 parcels

Miles of collection: 349 miles

Flow: 2,074,385 gallons per day

MID CAPE SUB-REGIONAL TRADITIONAL

25% Removal for Non MEP Watersheds

Collecting parcels:	4,350 parcels
Miles of collection:	142 miles
Flow:	750,548 gallons per day

THREE BAYS
TRADITIONAL
CENTRALIZED – INSIDE WATERSHED SOLUTIONS

Collecting parcels: 4,229 parcels

Miles of collection: 147 miles

Flow: 826,150 gallons per day

THREE BAYS
TRADITIONAL
50% Fertilizer/Stormwater Reduction

Collecting parcels: 2,741 parcels

Miles of collection: 95 miles

Flow: 526,473 gallons per day

THREE BAYS
NON-TRADITIONAL

4 PRBs

5 Constructed Wetlands

2 Fertigation Wells-Turf

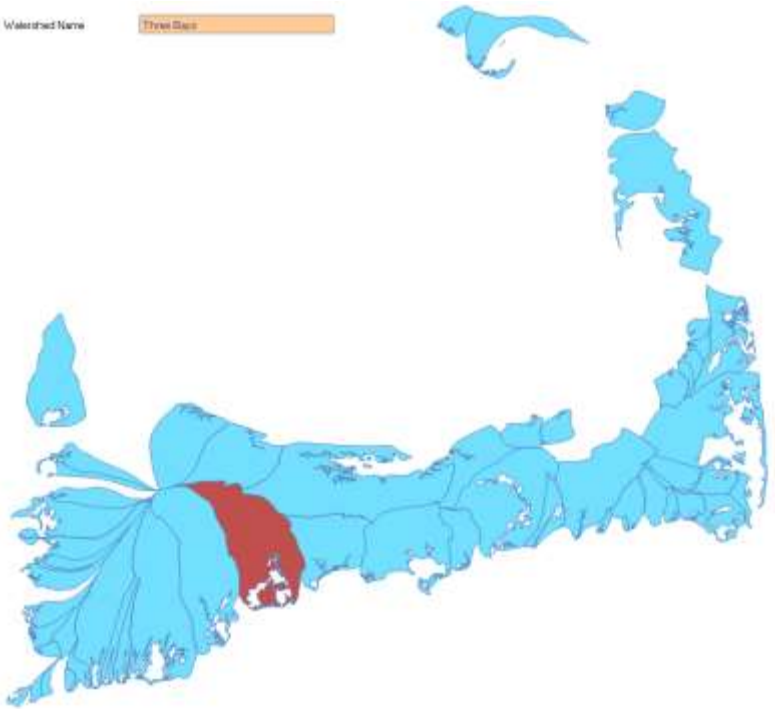
5 Shellfish/Aquaculture

458 Ecotoilets

700 Ecotoilets-Public (people)

THREE BAYS TRIPLE BOTTOM LINE ASSESSMENT

Watershed Name: Three Bays



Key Inputs	Update		
	%	Existing	Future
Present Controllable Load of Nitrogen (Kg/yr)			
Wastewater	90%	34,440	34,440
Fertilizer	6%	2,296	2,296
Stormwater	4%	1,531	1,531
Total	**100%**	**38,267**	**38,267**

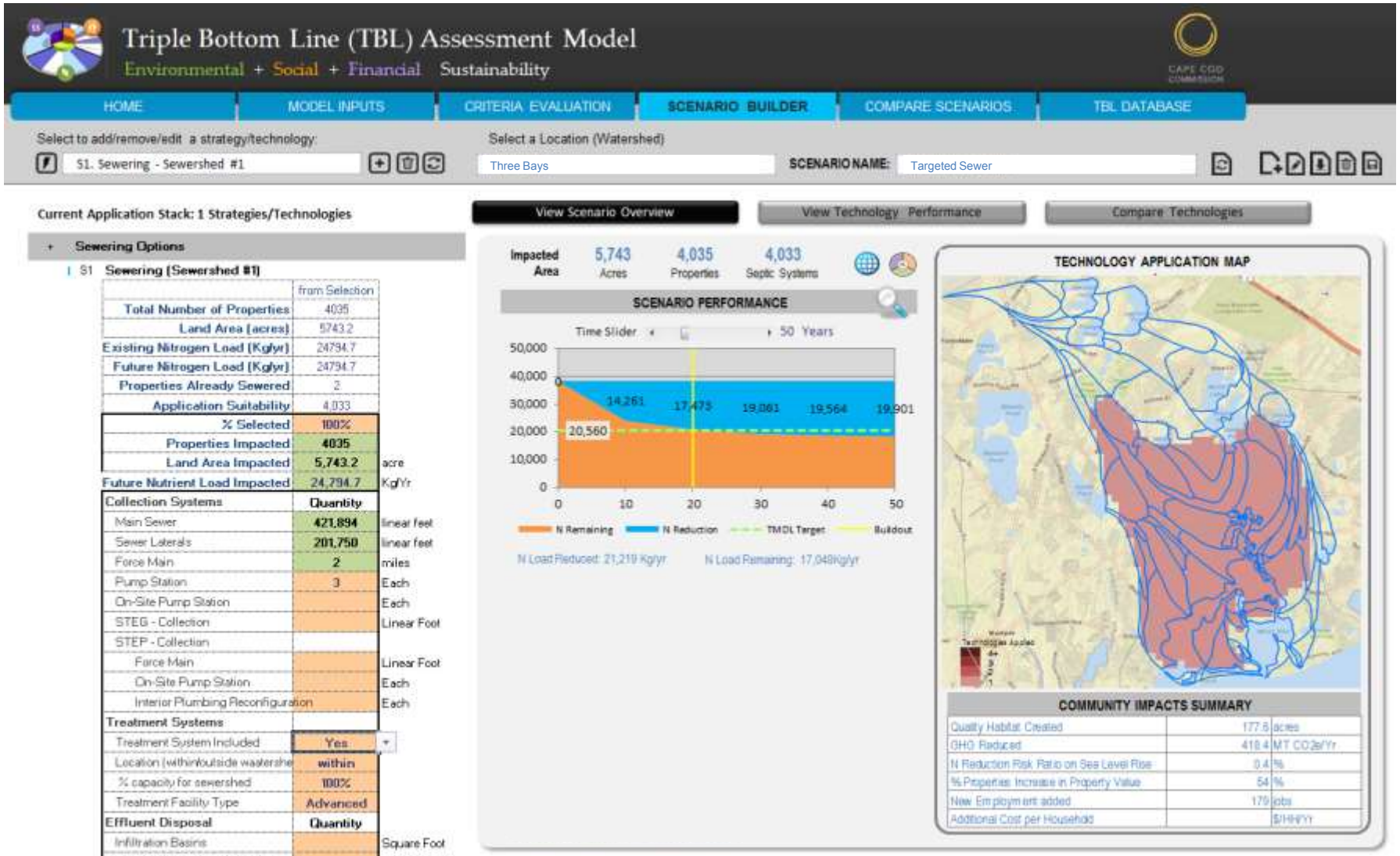
Target Setting	
Future Nitrogen Load (Kg/yr)	38,267
TMDL Target	46.3%
Target Nitrogen Load (Kg/yr)	20,560
Nitrogen Reduction Required (Kg/yr)	**17,707**

Community Goals

Please set watershed-wide thresholds for the performance factors below. All scenarios for the watershed will be scored against these thresholds.

1	Development Buildout Timeframe The estimated time when Development in the watershed will reach capacity as planned by current zoning	2033
2	Min. % of TMDL Goal achieved in 20 years The acceptable level of Nitrogen reduction for a viable scenario within a reasonable timeframe	50%
3	Max. % of MHI as 208 Plan Wastewater Management Fee The acceptable burden on households measured as a % of Median Household Income (MHI)	7%
4	Max. average Capital Cost of On-Site Improvement per HH The acceptable burden on households investing in 208 plan related on-site improvements	$14,000
5	Min. % of Properties in Watershed improving in Value The minimum % of properties expected to gain in value due to 208 plan improvements	20%
6	Min. % of High Quality Habitat Created in Watershed The minimum % of high quality habitat being added to the existing habitat areas with the watershed	3%
7	Min. % of GHG Emission Reduction from Wastewater sector The minimum % reduction of GHG comapared to 2002 levels from wastewater sector	4%
8	Min. % New Jobs Created in Watershed The minimum % of new jobs created in the construction, maintenance and rate-payer sectors	2%
9	Min. Concentration Reduction of Phosphorous The minimum amount of phrosphorous concentration reduction in fresh water ponds (Kg/Acre/Yr)	18 Kg/SF
10	Min. % of TMDL Target Achievement 20 Years The minimum extent to which a scenario achieves TMDL target in a specific time frame	50%
11	Min. % Number of Property Gains Property Value The minimum % of number of properties estimated to be increase in property value with the watershed	7%
12	Min. % Value of Property Gain Property Value The minimum % of total property values of properties estimated to be increase in property value with the	6%
13	Min Extent of Development Areas Best Suited For Growth The minimum extent to which a Scenario guides development to areas best suited for growth	90%

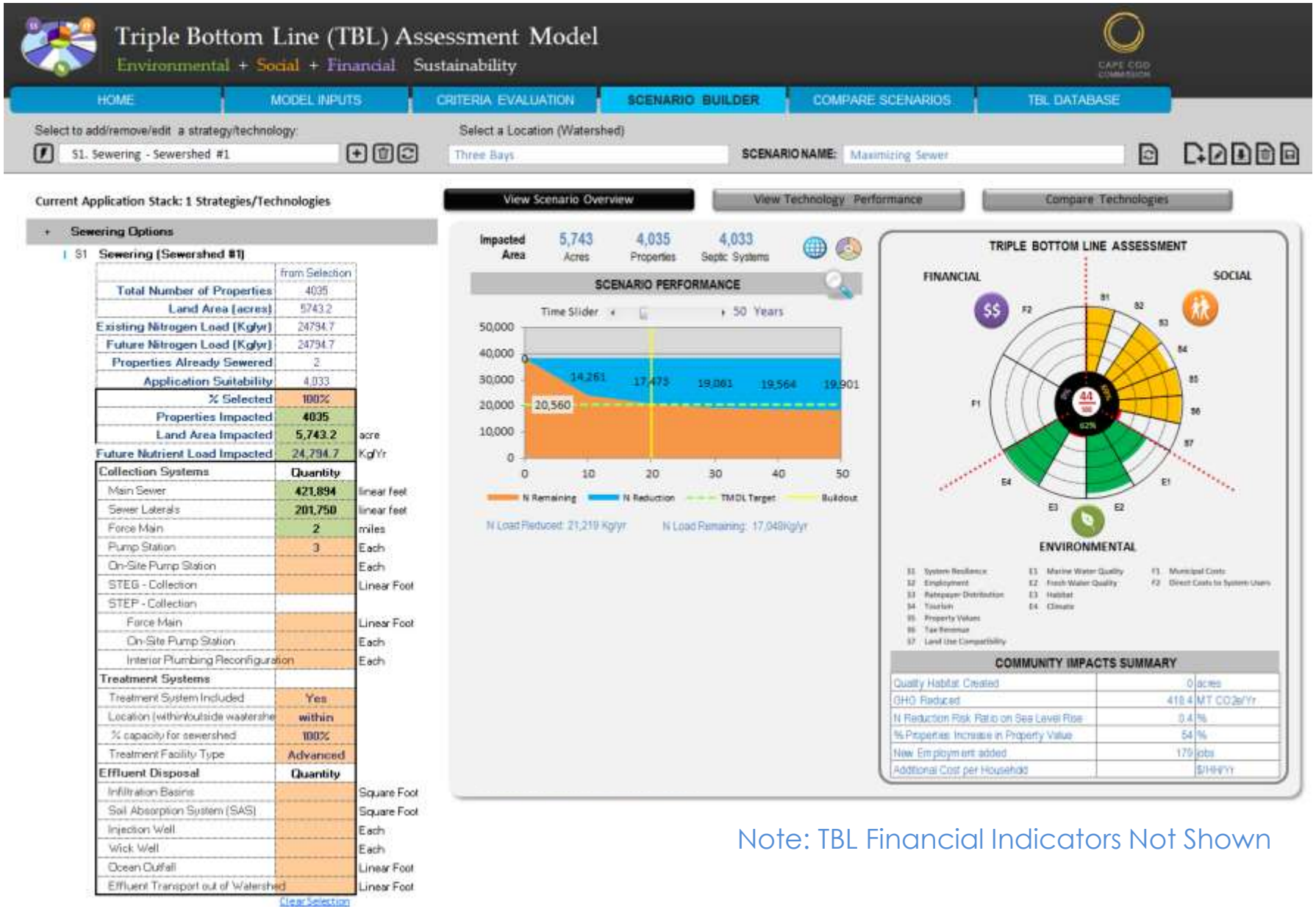
SCENARIO 1 : Maximizing Sewer Option



	from Selection	
Total Number of Properties	4035	
Land Area (acres)	5743.2	
Existing Nitrogen Load (Kg/yr)	24794.7	
Future Nitrogen Load (Kg/yr)	24794.7	
Properties Already Sewered	2	
Application Suitability	4,033	
% Selected	100%	
Properties Impacted	4035	
Land Area Impacted	5,743.2	acre
Future Nutrient Load Impacted	24,794.7	Kg/Yr
Collection Systems	**Quantity**	
Main Sewer	421,894	linear feet
Sewer Laterals	201,750	linear feet
Force Main	2	miles
Pump Station	3	Each
On-Site Pump Station		Each
STEG - Collection		Linear Foot
STEP - Collection		
Force Main		Linear Foot
On-Site Pump Station		Each
Interior Plumbing Reconfiguration		Each
Treatment Systems		
Treatment System Included	Yes	
Location (within/outside wastershe	within	
% capacity for sewershed	100%	
Treatment Facility Type	Advanced	
Effluent Disposal	**Quantity**	
Infiltration Basins		Square Foot
Soil Absorption System (SAS)		Square Foot
Injection Well		Each
Wick Well		Each
Ocean Outfall		Linear Foot
Effluent Transport out of Watershed		Linear Foot

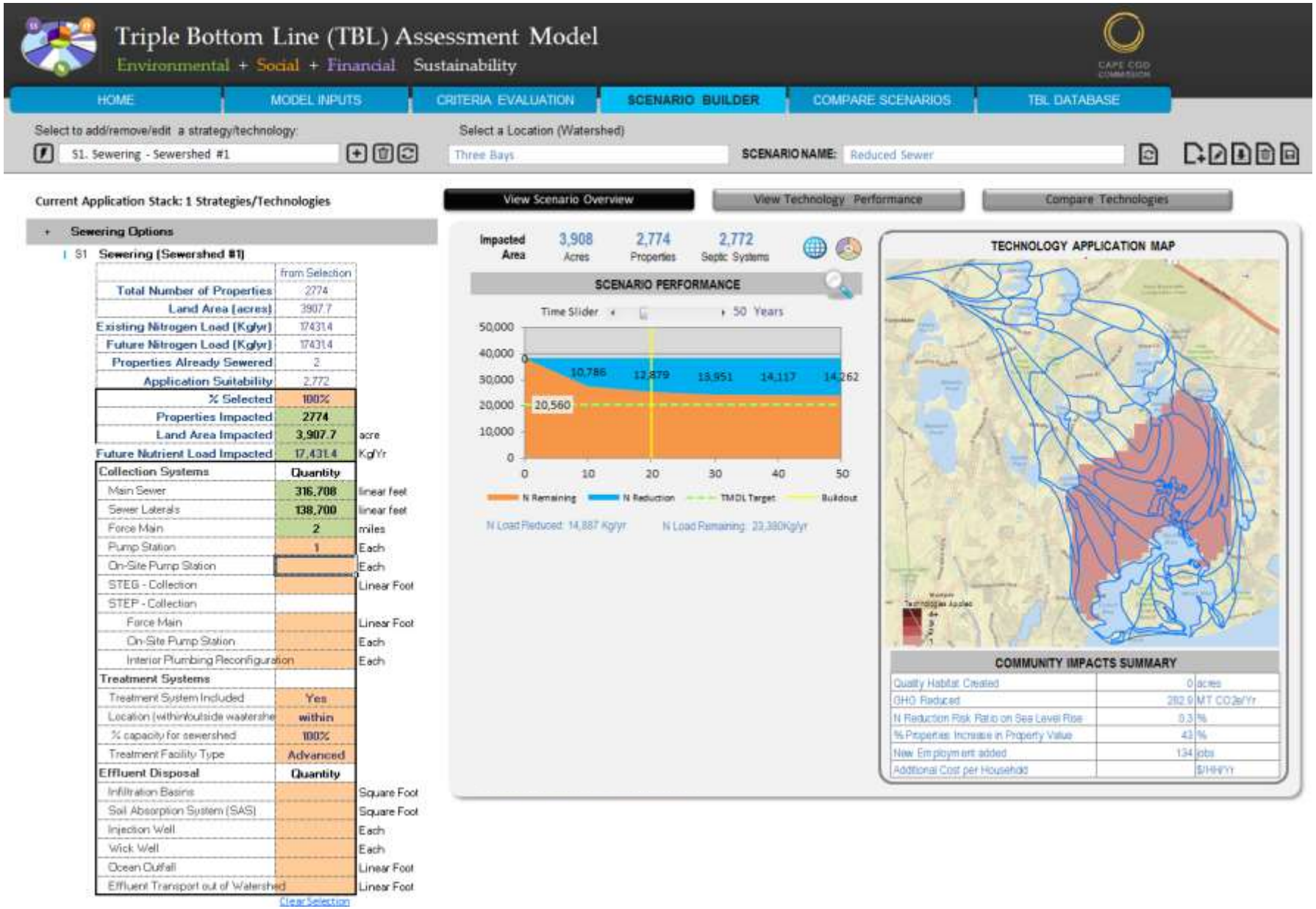
Clear Selection

SCENARIO 1 : Maximizing Sewer Option



Note: TBL Financial Indicators Not Shown

SCENARIO 2 : Reduced Sewershed



SCENARIO 2 : Reduced Sewershed

Triple Bottom Line (TBL) Assessment Model

Environmental + Social + Financial Sustainability

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HOME | MODEL INPUTS | CRITERIA EVALUATION | SCENARIO BUILDER | COMPARE SCENARIOS | TBL DATABASE

Select to add/remove/edit a strategy/technology: S1. Sewering - Sewershed #1

Select a Location (Watershed): Three Bays

SCENARIO NAME: Reduced Sewer

Current Application Stack: 1 Strategies/Technologies

View Scenario Overview | View Technology Performance | Compare Technologies

+ Sewering Options

S1 Sewering (Sewershed #1)

	from Selection	
Total Number of Properties	2774	
Land Area (acres)	3907.7	
Existing Nitrogen Load (Kg/yr)	17431.4	
Future Nitrogen Load (Kg/yr)	17431.4	
Properties Already Sewered	2	
Application Suitability	2,772	
% Selected	100%	
Properties Impacted	2774	
Land Area Impacted	3,907.7	acre
Future Nutrient Load Impacted	17,431.4	Kg/Yr
Collection Systems	**Quantity**	
Main Sewer	316,708	linear feet
Sewer Laterals	138,700	linear feet
Force Main	2	miles
Pump Station	1	Each
On-Site Pump Station		Each
STEG - Collection		Linear Foot
STEP - Collection		
Force Main		Linear Foot
On-Site Pump Station		Each
Interior Plumbing Reconfiguration		Each
Treatment Systems		
Treatment System Included	Yes	
Location (within/outside wastershe	within	
% capacity for sewershed	100%	
Treatment Facility Type	Advanced	
Effluent Disposal	**Quantity**	
Infiltration Basins		Square Foot
Soil Absorption System (SAS)		Square Foot
Injection Well		Each
Wick Well		Each
Ocean Outfall		Linear Foot
Effluent Transport out of Watershed		Linear Foot

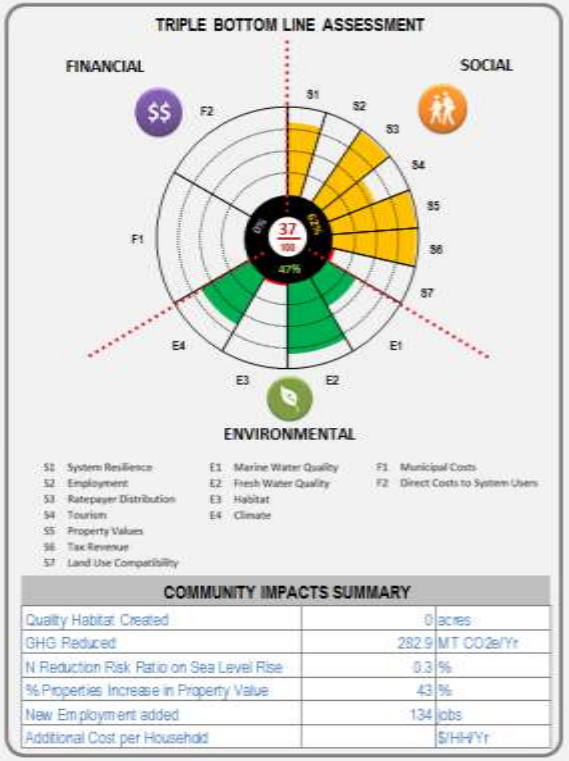
Clear Selection

Impacted Area: 3,908 Acres | 2,774 Properties | 2,772 Septic Systems

SCENARIO PERFORMANCE

N Load Reduced: 14,887 Kg/yr

N Load Remaining: 23,380Kg/yr



COMMUNITY IMPACTS SUMMARY

Quality Habitat Created	0	acres
GHG Reduced	282.9	MT CO2e/Yr
N Reduction Risk Ratio on Sea Level Rise	0.3	%
% Properties Increase in Property Value	43	%
New Employment added	134	jobs
Additional Cost per Household		$/HH/Yr

Note: TBL Financial Indicators Not Shown

SCENARIO 3 : Alternate Technology

Triple Bottom Line (TBL) Assessment Model

Environmental + Social + Financial Sustainability

CAPE COD COMMISSION

HOME | MODEL INPUTS | CRITERIA EVALUATION | SCENARIO BUILDER | COMPARE SCENARIOS | TBL DATABASE

Select to add/remove/edit a strategy/technology: A1. Toilets: Composting

Select a Location (Watershed): Three Bays

SCENARIO NAME: Alternative Technologies

Current Application Stack: 6 Strategies/Technologies

- **Watershed Options**
  - W1 Permeable Reactive Barriers (PRBs)
  - W2 Constructed Wetlands - Surface Flow
  - W7 Aquaculture/Shellfish
  - W9 Fertigation Wells
  - W13 Pond and Estuary Dredging
- **Alternative On-Site Options**
  - A1 **Toilets: Composting**

	from Selection
Total Number of Properties	121
Land Area (acres)	110.5
Existing Nitrogen Load (Kg/yr)	869.2
Future Nitrogen Load (Kg/yr)	869.2
Properties Already Sewered	0
Application Suitability	121
% Selected	80%
Properties Impacted	93
Land Area Impacted	86.7
Future Nutrient Load Impacted	792.8 Kg/Yr

Clear Selection

View Scenario Overview | View Technology Performance | Compare Technologies

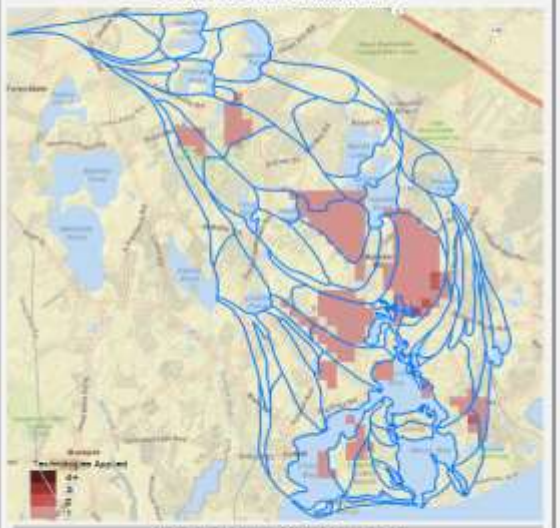
Impacted: 1,797 Acres; 1,203 Properties; 1,203 Septic Systems

SCENARIO PERFORMANCE

N Load Reduced: 16,556 Kg/yr

N Load Remaining: 19,711 Kg/yr

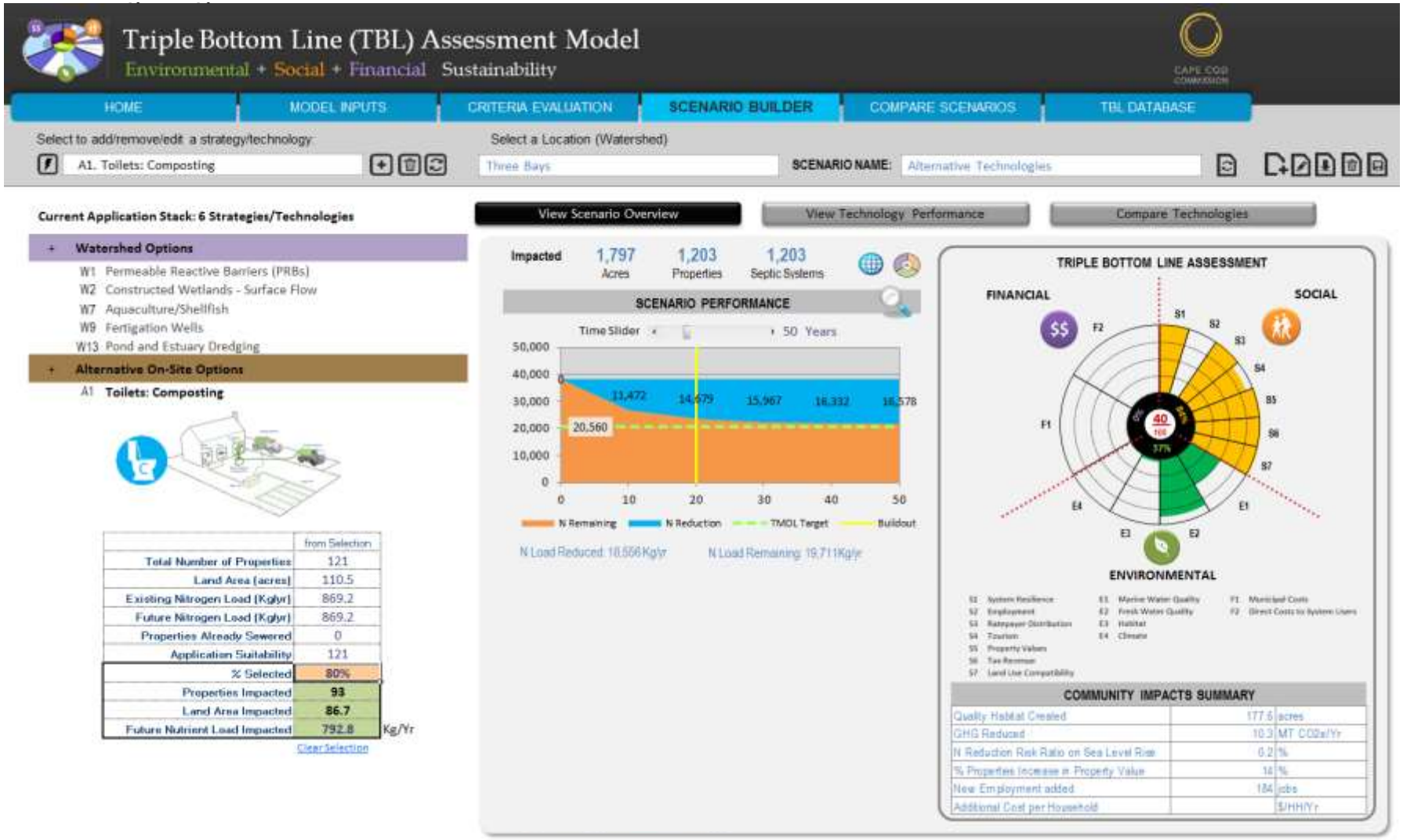
TECHNOLOGY APPLICATION MAP



COMMUNITY IMPACTS SUMMARY

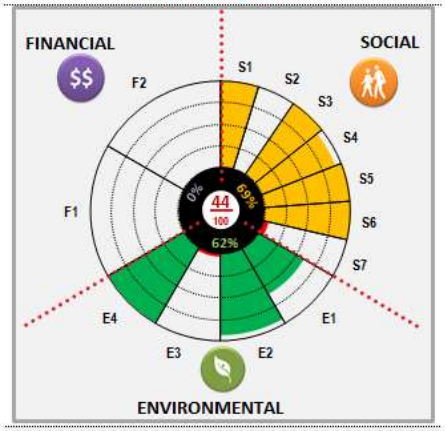
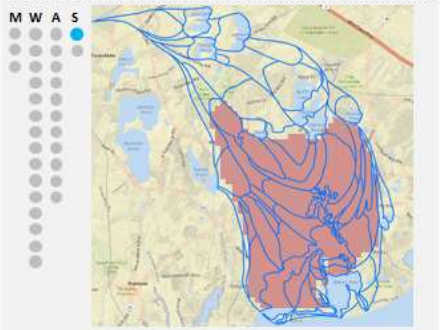
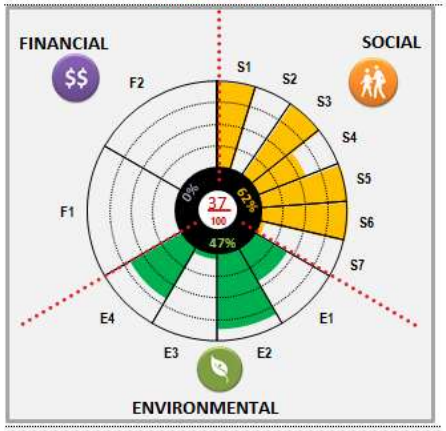
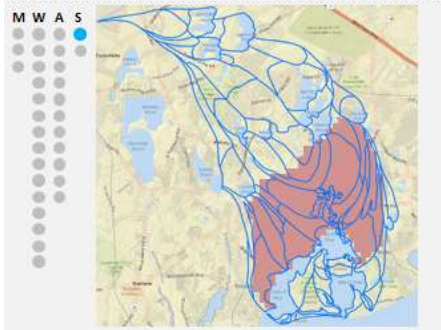
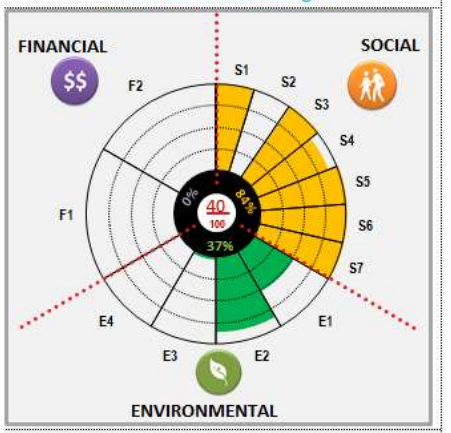
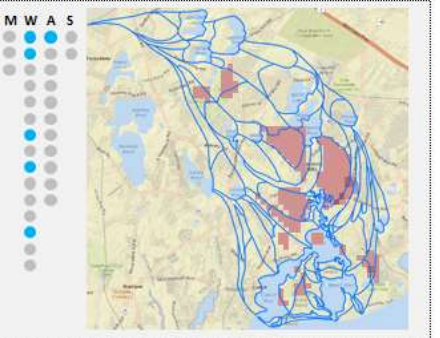
Quality Habitat Created	177.6	acres
GHG Reduced	10.3	MT CO2e/Yr
N Reduction Risk Ratio on Sea Level Rise	0.2	%
% Properties Increase in Property Value	14	%
New Employment added	184	jobs
Additional Cost per Household		$/HH/Yr

SCENARIO 3 : Alternate Technology



Note: TBL Financial Indicators Not Shown

SCENARIO COMPARISANS

Criterion		Scenario 1	Scenario 2	Scenario 3
		Maximizing Sewer	Reduced Sewer	Alternative Technologies
SOCIAL				
System Resilience	S1			
Employment	S2			
Ratepayer Distribution	S3			
Tourism	S4			
Property Values	S5			
Tax Revenue	S6			
Land Use Compatibility	S7			
ENVIRONMENTAL				
Marine Water Quality	E1			
Fresh Water Quality	E2			
Habitat	E3			
Climate	E4			
FINANCIAL				
Municipal Costs	F1			
Direct Costs to System Users	F2			
Strategy/Technology Distribution		 	 	 
COST & PERFORMANCE				
Nitrogen Reduction %		55%	39%	48%
Time to Reduce (years)		21.9	18.3	27.7
Cost ($M)				
COMMUNITY BENEFITS				
Quality Habitat Created (acres)		0.0	0.0	177.6
GHG Reduced (MT CO2e/Yr)		418.4	282.9	10.3
N Reduction Risk Ratio on Sea Level Rise (%)		0.4	0.3	0.2
Properties Increase in Property Value (%)		54	43	14
New Employment added (Jobs)		179	134	184
Additional Cost per Household ($/HH)		$0	$0	$0

Note: TBL Financial Indicators Not Shown

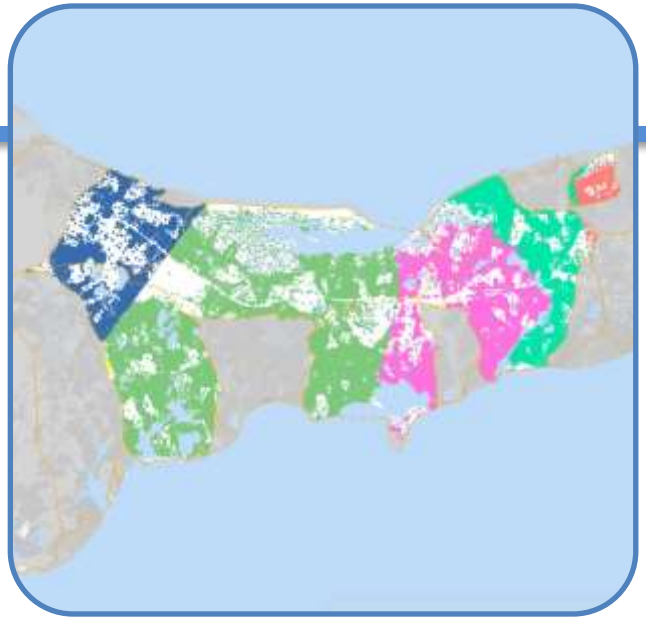
Regulatory, Legal, Institutional

COLLABORATION MODELS

JURISDICTION OF THE PROBLEM

Nitrogen:
- Does not follow town boundaries

Watershed based approach:
- Look across entire watershed
- Identify cost-effective, environmentally effective plan to restore estuary



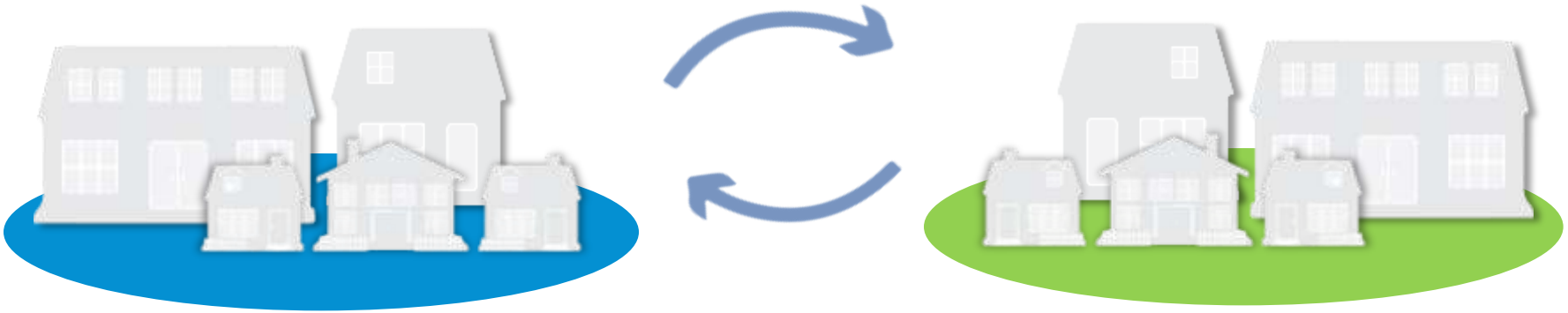
JURISDICTION OF THE SOLUTION

Multi-town collaboration

Shared actions by towns

Collaborative relationships

- Build successful intermunicipal relationships
- Begin with existing watersheds



REQUIREMENTS OF CLEAN WATER ACT / EPA

208 plan requirement:

- State must designate one or more waste management agency (WMA)

WMA must be able to:

- Carry out plan
- Manage waste treatment
- Design & construct new, existing works
- Accept/utilize grants
- Raise revenues
- Incur indebtedness
- Assure each town pays its costs

COLLABORATION CHALLENGES

FROM SUB-REGIONAL MEETING 1

Who decides?

Who pays?

Who manages?

COLLABORATION CHALLENGES

Who decides?

Who pays?

Who manages?

- Which solutions to implement and when and how to re-assess?
- Different levels of planning across towns (including approved CWMPs)
- Different town decision-making processes and publics
- Timeline required for building agreement
- Managing disagreement

COLLABORATION CHALLENGES

Who decides? | **Who pays?** | **Who manages?**

- Coordinating multiple town funding approval processes
- Applying for and allocating off-Cape funding opportunities
- Differences in willingness/abilities to pay
- Assigning financial responsibility for: capital funding, operation and maintenance, monitoring, data management, reporting
- Managing disagreement

COLLABORATION CHALLENGES

Who decides?

Who pays?

Who manages?

- Preparing the watershed plan for permitting
- Building, operating, maintaining, monitoring, and reporting
- Ultimate responsibility for water quality outcomes
- Managing disagreement

WHAT ARE WE MISSING?

WHAT ARE THE CHARACTERISTICS/CRITERIA OF A SUCCESSFUL COLLABORATION?

COLLABORATION MODELS

INTERMUNICIPAL AGREEMENTS

What is it?

Written agreement between municipalities to perform services or activities

Authority:

M.G.L. c. 40 § 4A

What it does:

Allows towns to contract with each other/other government units (RPA, water/sewer com)

Types:

1. Formal contract
2. Joint service agreement
3. Service exchange arrangements

Key Considerations:

- Modified authority enables Board of Selectmen rather than Town Mtg.
- Max. 25 years
- Establishes maximum financial liability of parties
- Components:
  - Purpose, term of agreement
  - Method of financing
  - Responsibilities
  - Costs of services
  - Indemnification
  - Insurance
  - Alternative dispute resolution
  - Personnel property

ATTLEBORO - NORTH ATTLEBOROUGH

The Situation:

- Town and City have common borders
- Sewer services could be more efficiently provided by connecting neighborhoods in the Town to the City's existing treatment facility and City neighborhoods to the Town's facility

Why the solution was chosen:

- Mutually beneficial
- Allows the towns to contract with each other for specific geographic areas

ATTLEBORO - NORTH ATTLEBOROUGH

Who decides?

- Town of North Attleborough through its Board of Public Works
- City of Attleboro through its Mayor and Municipal Council

Who pays?

- Apportioned to the ratepayers in the City and Town on basis of their contributions

Who manages?

- Each town manages their treatment facility independently
- Both entities can review and reject proposed changes to the other's infrastructure

FEDERAL/MUNICIPAL PUBLIC-PUBLIC PARTNERSHIPS

What is it?

Shared service agreement

Authority:

Section 331 National Defense Authorization Act - United States Code 10, c. 137 §1226

What it does:

Authorizes DoD Secretary to enter into intergovermental support agreements with state/local governments

Examples:

Towns may seek to utilize capacity from wastewater facility on Joint Base Cape Cod

Key considerations:

- Must serve best interest of the state/local government and military
- Provides mutual benefits not achieved on own
- Benefit may be monetary or in- kind
- May be entered into on sole source basis
- May be for a term not to exceed 5 years
- Towns enter into partnership agreement with JBCC

NELLIS AIR FORCE BASE

Situation:

- Air Force was seeking to exchange underutilized assets in excess land
- City of North Las Vegas needed land to build a Water Reclamation Facility
- In exchange for leasing property, the Air Force received in-kind consideration in the form of a fitness center and water supply infrastructure

Why the solution was chosen:

- Mutual benefit to both Air Force and city
- Achieved a common purpose
- Enabled the city to build a 25 million gallon/day facility with ability to expand (double size) for future growth

NELLIS AIR FORCE BASE

Who decides?

- Strategic Asset Utilization Division, or CIU for Air Force negotiates agreement for Air Force
- Mayor of City of North Las Vegas for the city

Who pays?

- No money was exchanged
- In-kind benefit
- Exchange of Air Force's excess land for receipt of use of fitness center and onsite infrastructure

Who manages?

- City of North Las Vegas built facilities in accordance with the lease agreement

INDEPENDENT WATER AND SEWER DISTRICTS

What is it?

Independent public instrumentality for establishing shared water/sewer systems

Authority:

M.G.L. c. 40N§§ 1-25

What it does:

One or more municipalities may join to form a regional water and sewer district

Requirement:

Town meeting vote required to establish/operate

Key considerations:

- Special unpaid district planning board for two or more towns forms to study advisability, construction and operating costs, methods of financing, issues report
- May submit proposed agreement for town meeting vote which shows:
  - Number, composition method of selection of members of board
  - Municipalities to be within district
  - Method of apportioning expenses
  - Terms by which town is admitted or separated from district
  - Detailed procedure for preparation/adoption of budget

GREATER LAWRENCE SANITARY DISTRICT

The Situation:

- A 1963 report on Merrimack River pollution called for several facilities in key areas, including one for these four communities

Why the solution was chosen:

- A sewer district was among the recommendations in the 1963 report

GREATER LAWRENCE SANITARY DISTRICT

Who decides?

- Approved by Town Meeting and City Councils in each community

Who pays?

- Annual assessment to member communities, not users
- Full bonding powers

Who manages?

- 7-member commission appointed on a population basis by member communities

WATER POLLUTION ABATEMENT DISTRICTS

What is it?

District designated by Mass DEP for one or more towns (or designated parts) established for the "prompt and efficient abatement of water pollution"

Authority:

Massachusetts Clean Waters Act (M.G.L. c. 21, §§28-30, 32, 35, 36).

What it does:

Creates district responsible for abatement plan

Types:

1. Town voted district
2. DEP voted district

Key considerations:

- Adopt bylaws/regulations
- Acquire, dispose of and encumber real/personal property
- Construct, operate and maintain water pollution abatement facilities
- Apportion assessments on the member municipalities
- Issue bonds and notes, raise revenues to carry out the purposes of the district
- Member municipalities may then impose assessments on residents, corporations and other users in the district
- If town fails to pay its share, state may pay it for them out of other funds appropriated to that town

UPPER BLACKSTONE WATER POLLUTION ABATEMENT DISTRICT

The Situation:

- Blackstone River was the recipient of industry toxins
- In 1968, the Legislature passed an emergency law for the immediate preservation of the public safety and welfare to create the Upper Blackstone Water Pollution Abatement District

Why the solution was chosen:

To enable the City of Worcester and the Towns of Auburn, Boylston, Holden, Leister, Millbury, Oxford, Paxton, Rutland, Shrewsbury and West Boylston to create a sewer district

UPPER BLACKSTONE WATER POLLUTION ABATEMENT DISTRICT

Who decides?

- City of Worcester by its City Council
- Towns of Auburn, Boylston, Holden, Leister, Millbury, Oxford, Paxton, Rutland, Shrewsbury and West Boylston by Town Meeting

Who pays?

- Apportioned among the city/towns on basis of their contributions to the flow entering the district's facilities

Who manages?

- The District, which is governed by a Board comprised of one member from each district

INDEPENDENT PUBLIC AUTHORITY

What is it?

Could create separate legislative entity

Authority:

Mass. Legislature

What it could do:

Create construct that provides for funding mechanisms outside town meeting

What it could potentially do:

- Plan, build, finance, own and operate certain wastewater collection treatment, disposal and septage management assets and programs
- Research, develop, own and operate non-traditional wastewater treatment assets and programs
- Provide services for residential WW systems
- Plan and protect drinking water resources on Cape Cod through protection plans and policies
- Develop and enforce policies and procedures governing customer metering, billing and collection systems

MASSACHUSETTS WATER RESOURCES AUTHORITY (MWRA)

The Situation:

- Federal District Court in Massachusetts ruled that wastewater discharged into the Boston Harbor was in violation of the 1972 Federal Clean Water Act requirements
- Court ordered MWRA to develop and implement a program to provide treatment of its wastewater as required by that law

Why the solution was chosen:

In accordance with the court-ordered schedule, MWRA undertook a program of improvements to the wastewater collection and treatment facilities serving the metropolitan Boston area.

MASSACHUSETTS WATER RESOURCES AUTHORITY (MWRA)

Who decides?

- The Massachusetts Water Resources Authority (MWRA) was established by Chapter 372 of the Acts of 1984 to assume the duties and responsibilities of the Metropolitan District Commission's Water and Sewer Division

Who pays?

- The Authority has its own powers to issue bonds and assessments to pay expenses

Who manages?

- Board of Directors, consisting of 11 members, who are deemed to act on behalf of the independent authority to perform "an essential public function"

REGIONAL HEALTH DISTRICT

What is it?

Regional Board of Health

Authority:

M.G.L. c. 111 §27B

What it does:

Has all the powers and duties of boards of health/health department of a town
Includes wastewater regulatory powers of Board of Health

Who may belong:

One or more towns

Key considerations:

- Can form by votes of two or more boards of health and their respective town meeting to delegate some/all of its legal authority to regional board
- Estimate budget each December, assessor then includes this amount in the tax levies each Board may order treasurer to pay town's share of cost/expense of the district
- Reimbursement from Commonwealth for "initial capital outlays"
- Subj. to appropriation – Requires matching funds from town
- HB 3822 – proposes removal of town meeting requirement

Quabbin Regional Health District

The Situation

- Quabbin Health District formed in response to issues occurring in Belchertown, Ware, and Pelham.
- Issues included a hazardous landfill, lack of oversight and consistency in providing required public health services, citizen complaints, septic issues, and concerns from MDPH and DEP around the communities' inability to address state mandates.

Why the solution was chosen:

Joint effort by the towns to provide their town with quality public health professionals and services in response to problems.

Quabbin Regional Health District

Who decides?	Who pays?	Who manages?
• Established by town meeting vote by the towns of Belchertown, Ware and Pelham	• Towns of Belchertown, Ware and Pelham jointly	• Towns of Belchertown, Ware and Pelham jointly

HOW WELL DO EACH OF THESE MODELS MEET THE CRITERIA FOR EFFECTIVE COLLABORATION?

HOW WELL WOULD EACH OF THESE MODELS ADDRESS THE SITUATION ON THE MID CAPE AND CAPE COD?

COLLABORATION CHALLENGES

FROM SUB-REGIONAL MEETING 1

Who decides?

- Which solutions to implement and when and how to re-assess?
- Different levels of planning across towns (including approved CWMPs)
- Different town decision-making processes and publics
- Timeline required for building agreement
- Managing disagreement

Who pays?

- Coordinating multiple town funding approval processes
- Applying for and allocating off-Cape funding opportunities
- Differences in ability & willingness to pay
- Assigning responsibility for: capital funding, operation and maint., monitoring, data mgt., reporting
- Managing disagreement

Who manages?

- Preparing the watershed plan for permitting
- Building, operating, maintaining, monitoring, and reporting
- Ultimate responsibility for water quality outcomes
- Managing disagreement

Implementation

MONITORING

SECTION 208 AREA WIDE WATER QUALITY MANAGEMENT PLAN

MONITORING SUBCOMMITTEE

Mission:
To provide advice and guidance on appropriate monitoring protocols for technology efficiency and total maximum daily loads, while identifying a process for consolidating all available monitoring data in a central location and format.

SECTION 208 AREA WIDE WATER QUALITY MANAGEMENT PLAN

MONITORING SUBCOMMITTEE

Roles and Responsibilities:

- Establish performance monitoring protocols for technologies that may be a part of watershed permits in the future
- Establish compliance monitoring protocols for meeting total maximum daily loads (TMDLs) in the water body
- Establish process and structure for consolidating and cooperation of existing monitoring programs and data in to a centralized location
- Identify region-wide monitoring needs and develop proposals

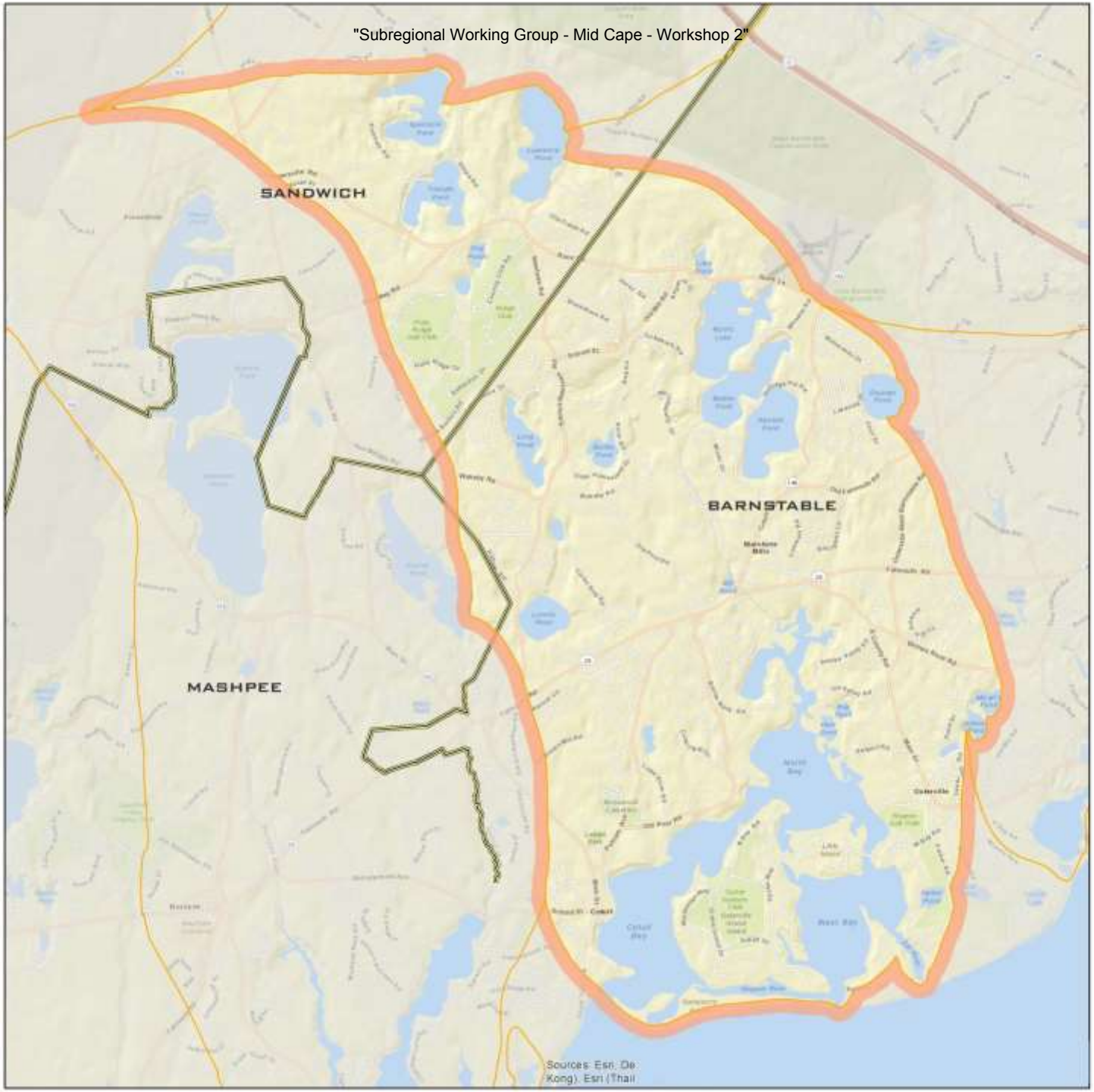
SECTION 208 AREA WIDE WATER QUALITY MANAGEMENT PLAN

MONITORING SUBCOMMITTEE

Invited Members:
DEP, EPA, Provincetown Center, WBNERR, Town Rep, Academics, SMAST, CCC, Institution/Agency

TRADITIONAL TECHNOLOGY MONITORING FRAMEWORK

Technology	Monitoring	Frequency
Conventional Treatment	GWDP Influent/ Effluent WQ + quantity	Quarterly - three down & one up gradient
SatelliteTreatment Systems	GWDP Influent/ Effluent WQ + quantity	Quarterly - three down & one up gradient
Cluster Treatment Systems	Board of Health performance monitoring similar but less rigorous than GWDP - varries based on conditions, groundwater monitoring may not be required	Varries
I/A Title 5 Systems	Influent/ Effluent WQ + quantity	Quarterly


"Subregional Working Group - Mid Cape - Workshop 2"
SANDWICH
BARNSTABLE
MASHPEE
Sources: Esri, De
Kong), Esri (Thail

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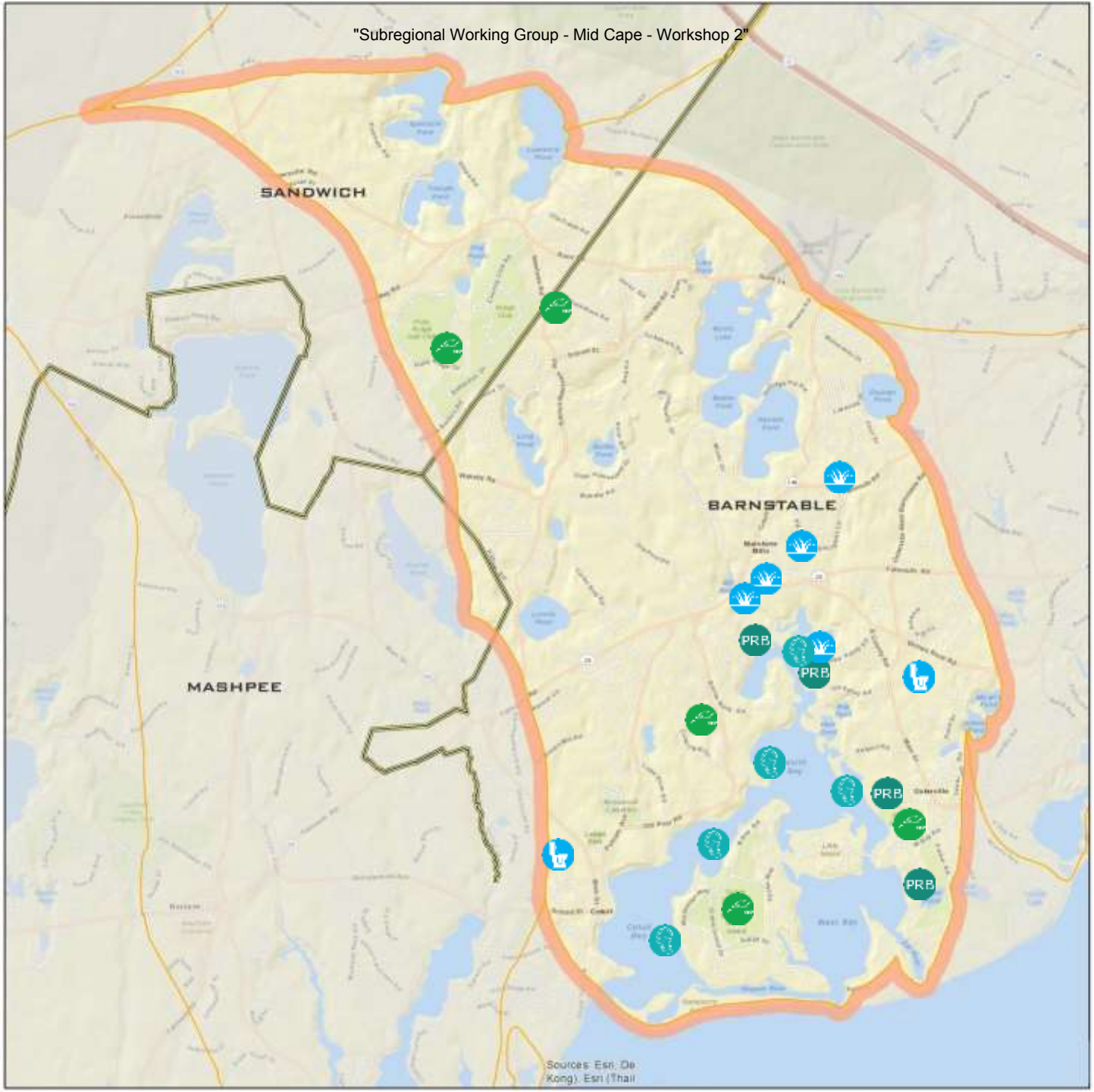
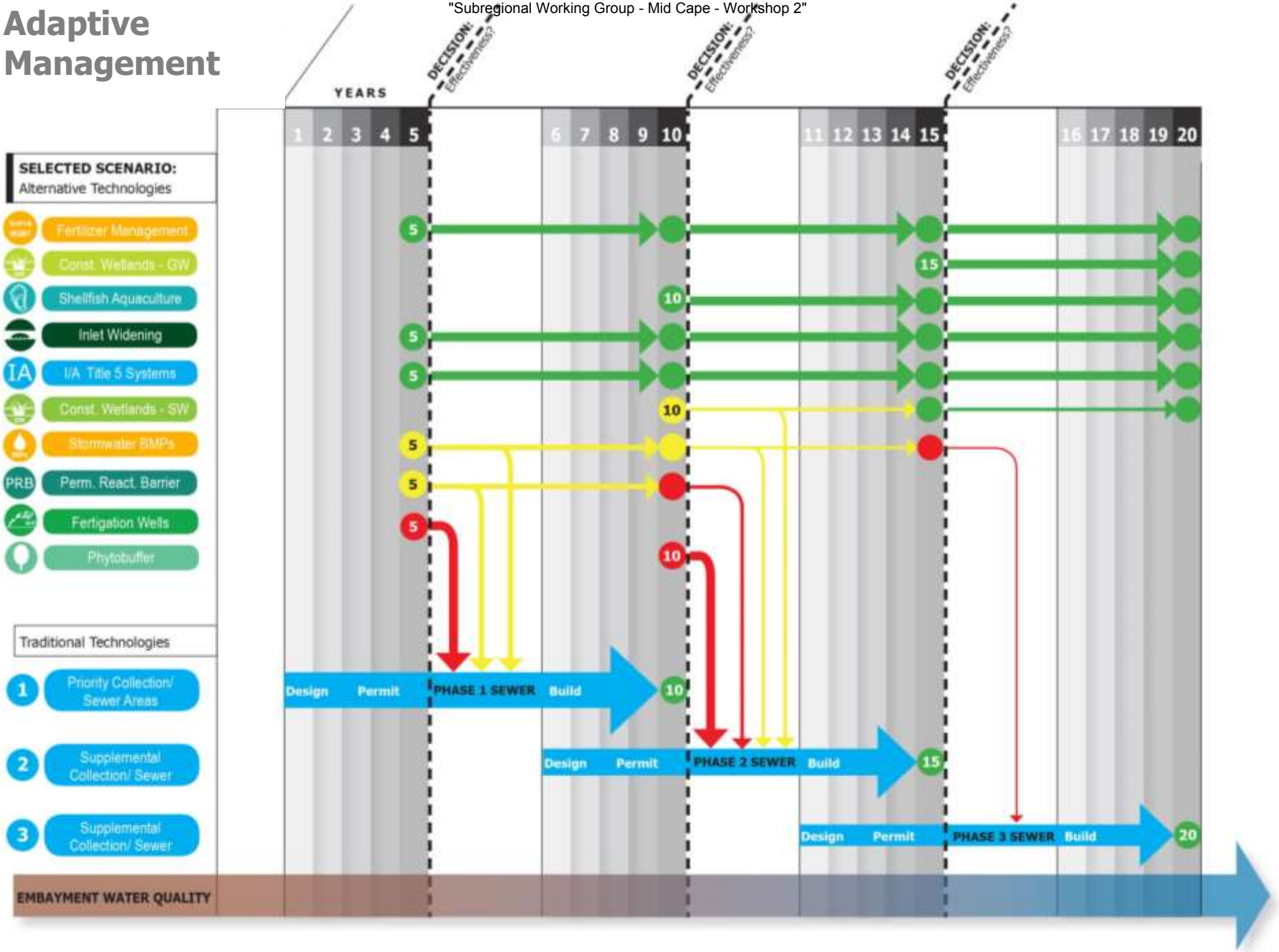


NON-TRADITIONAL TECHNOLOGY MONITORING FRAMEWORK FOR PILOT PROJECTS (PRELIMINARY)

Technology	Monitoring	Frequency
Constructed Wetlands	WQ samples inlet/outlet (N)	Monthly during growing season
Pond Dredging	WQ samples inlet/outlet of pond (N/P)	Quarterly
Salt Marsh Restoration	Area of restoration, wetland types (GIS and field confirmation)	Annually
Shellfish Bed Restoration	Area of restoration/density of shellfish/landings N content of shellfish Denitrification in benthic (N,DO) WQ samples (N)	Annually Annually - composite 20 animals Annually - three locations Monthly during summer -three locations
Phytobuffer	WQ samples inlet/outlet (N)	Monthly during growing season
Fertigation Wells	Pumping volume/rate WQ samples (N)	Monthly Monthly during summer
Shellfish Aquaculture	Annual landings from each grant N content in shellfish	Annually Annually - composite 20 animals
Perm. React. Barrier	2 upgradient/2 downgradient wells – WQ samples (N, DO) Well in media - WQ samples (N, DO, N gas)	Quarterly Quarterly
Inlet Widening	Salinity measurements to confirm model WQ samples at sentinel station	Two tidal cycles Two tidal cycles
Eco Toilet Systems	Numbers/locations/types of installations WQ samples (N/P) - grey water	Running database Quarterly - three locations per watershed

Adaptive Management



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

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

Mid Cape Sub Regional Group

MEETING 2

COLLABORATION CHALLENGES

FROM SUB-REGIONAL MEETING 1

Who decides?

- Which solutions to implement and when and how to re-assess?
- Different levels of planning across towns (including approved CWMPs)
- Different town decision-making processes and publics
- Timeline required for building agreement
- Managing disagreement

Who pays?

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Who manages?

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Intermunicipal Agreements

Federal/Municipal public-public partnerships

Independent Water and Sewer Districts

Water Pollution Abatement Districts

Independent Authority

Regional Health District

AGREEMENT MODEL	LENGTH OF AGREEMENT	ENABLING BODIES	REQUIRES TOWN MEETING
Intermunicipal Agreements	25 years	Boards of Selectmen	No* But agreement can be made subject to vote approval
Federal/Municipal Public-Public	5 years	Boards of Selectmen	No*
Independent Water and Sewer Districts	No limit	Town Meeting	Yes
Water Pollution Abatement Districts	Dissolved by act of Legislature	Boards of Selectmen	No*
Independent Authority	Based on enabling legislation	Requires new legislation	No*
Regional Health District	No limit Unless specified in the agreement	Town Boards of Health and Town Meeting	Yes

* Town Meeting may be required appropriation of funds

"Subregional Working Group - Mid Cape - Workshop 2"

CURRENT WATER RESOURCE MONITORING

- Groundwater Discharge Permits
- Center for Coastal Studies Stations
- Pleasant Bay Alliance Stations
- Massachusetts Estuaries Project Stations
- Coalition for Buzzards Bay Stations
- DEP Water Management Group Stations
- Ponds & Lakes Stewardship Ponds

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