6TH ANNUAL
CAPE COASTAL CONFERENCE
DECEMBER 4-5, 2018



Hatching a Watershed Permit: A Pleasant (Bay) Experience

Carole Ridley, Pleasant Bay Alliance
Brian Dudley, MassDEP
Mike Giggey, Wright-Pierce


Pleasant Bay
© Steve Dunwell

Why Hatch a New Type of Permit?

- Nonpoint sources of pollution don't stop at town boundaries – neither do solutions
- MEP reinforced notion of watershed planning
- 208 Update and Acts of 2014 called for MassDEP to develop watershed permit program
- Need a mechanism to address various implementation approaches
- Use economies-of-scale to reduce costs

What is a Watershed Permit?

- Overarching document for implementation on a watershed scale
  - Permits
  - Allocation of responsibility
  - Credit for non-traditional approaches
  - Allowance for enforcement forbearance

What is a Watershed Permit?

- Requires a TWMP and IMA
- Is a 20-yr renewable permit – 40-yr design and financing horizon
- Allows for adaptive management
- Provides traditional contingency plan
- Is voluntary

Implementation Schedule

			Brewster		Chatham		Harwich		Orleans		Total
Phase	Years		Activity	kgN/yr*	Activity	kgN/yr*	Activity	kgN/yr*	Activity	kgN/yr*	kgN/yr*
	up to 2018		Res. fertilizer control Capt GC fertigation Capt GC fert. reduction	121 230 930	Res. fertilizer control Muddy Creek Bridge	247	Muddy Creek Bridge		Res. fertilizer control	241	1,769
			All towns: develop TWMP; execute IMA; obtain Watershed Permit								
1 **	1 to 5	2019 to 2023	Develop denit plan Devel. conting. plan Strengthen GC plan		Harwich connection		Ph 2 sewers Res. fertilizer control	2,672 200	Amended CWMP Lonnie's Pond aqua. PRB evaluation	 273	3,145
			All towns: update monitoring data, re-model Bay, evaluate nitrogen trading options, prepare plan for next 5 yr								
2 ***	6 to 10	2024 to 2028	On-site denit systems	118			Ph 3 sewers	1,565	MtgHouse Pond sewers Other aquaculture On-site denit systems	2,014 1,516 674	5,887
3 ***	11 to 15	2029 to 2033	On-site denit systems	118	Frostfish Creek sewers Ryders Cove sewers	803 2,605			On-site denit systems Other aquaculture	675 906	5,107
4 ***	16 to 20	2034 to 2038	On-site denit systems	118	Muddy Creek sewers	1,597			On-site denit systems	675	2,390
	after year 20	after 2038	On-site denit systems	236	Crows Pond sewers Bassing Harbor sewers Pleasant Bay sewers Chatham Harbor sewers	1,214 511 901 5,181	Ph 8 sewers Harwich effl. disposal	970 (867)	 ****		8,146
			Total	**1,871**	**Total**	**13,059**	**Total**	**4,540**	**Total**	**6,974**	**26,444**

Pleasant Bay as a Pilot

Figure Credits: USGS, SMAST, Cape Cod Commission

MEP Findings

- Conditions ranging from Healthy to Severely Degraded
- Average is Significant to Moderate Impairment
- About 24% loss of eelgrass throughout Pleasant Bay since 1951
- Target goals:
  - Eelgrass restoration where historical presence
  - Healthy benthic habitat elsewhere

History of Watershed Collaboration

- 1987: ACEC established
- 1998: RMP adopted by Orleans, Chatham, Harwich and state; IMA establishes Alliance
- 2007: Brewster joins Alliance
- 2003, 2008, 2013, 2018 : Five-year RMP updates, IMA renewal approved by Town Meetings & state
- Visit: www.pleasantbay.org

Long-term Focus on N Pollution

- Nitrogen as key threat to Bay health
- Water quality monitoring - 20+ years data
- Bay-wide MEP Tech Report - 19 TMDLs
- Watershed Work Group
- Municipal plans progressed differently
- 2017 Composite Analysis & Resolution

Pilot Project Coordination

- History of collaboration – key to success of pilot
- Convened local, regional, state, federal partners to develop:
  - Inter-municipal agreement
  - TWMP (technical support)
  - Permit conditions & application procedures
- Communications with Select Boards
- Town Meeting authorizations

Pilot Project Coordination

- Inter-municipal Agreement:
  - Towns' shares of attenuated nitrogen load
  - Towns' commitment to fund measures for mitigating load share
  - Benefits to towns for coordinated action
  - Cooperation for data sharing, securing funding
  - Alliance as coordinating entity

Pilot Project Coordination

- Watershed Permit
  - General and special conditions
  - Relationship to MEPA
  - Application Procedures
- TWMP
  - Backbone of permit
  - Demonstrate consistency with 208 plan

Watershed Permit Implementation

- Supported by $250,000 Southeast New England Program (SNEP) Watershed Grant.
- SNEP grants funded by U.S. EPA through a collaboration with Restore America's Estuaries.
- www.snepgrants.org

Watershed Permit Implementation

- Implementation plans for NT technologies:
  - on-site de-nitrification systems
  - shellfish aquaculture demonstration
- Nitrogen trading pilot project
- Update water quality-nitrogen loading model
- Public outreach

Elements of Watershed Permit

- Three basic documents:
  - Permit itself—12 pages
  - TWMP—
    - Text—40 pages
    - Appendices—42 pages
  - IMA—8 pages

- Most of technical detail is in TWMP

TWMP = Compilation of Town Plans

- Individual Town Plans
  - Completed in 2009 to 2013
  - Orleans now involved in CWMP update
- Pleasant Bay Composite Analysis
  - March 2017
- Targeted Watershed Management Plan
  - May 2018
- Composite Analysis and TWMP are not new plans

Key Elements of TWMP

1. Document each town's share of N removal responsibilities (TMDLs)
2. Document each town's planned N removals
3. Identify gaps and overlaps
4. Document intended reliance on non-traditional technologies (NT)
5. Designate "Core Areas" of traditional technology

Key Elements of TWMP

5. Establish contingency plans to address possible less-than-expected NT performance
6. Document expected N growth in each town
7. Identity all projects planned to reduce N
8. Set forth an implementation schedule

Key Elements of TWMP

10. Summarize towns' adaptive management plans
11. Document consistency with 208 Plan Update
12. Set forth permitting considerations for NT technologies
    - Fertilizer reduction (res. and comm.)
    - Fertigation
    - Aquaculture
    - On-site denitrification
    - Inlet widening

N Removal Responsibility

- Attenuated N load removal requirement

  = 17,700 kg/yr (100%)

- Requirement by Town:
  - Brewster— 2,300 kg/yr *(13%)*
  - Chatham— 4,100 kg/yr *(23%)*
  - Harwich— 4,400 kg/yr *(25%)*
  - Orleans— 6,900 kg/yr *(39%)*

Approaches to N Management

- Sewering
- Shellfish harvesting
- Fertigation
- Enhanced on-site septic systems
- Fertilizer reduction
- Nitrogen trading
- Inlet restoration

Implementation Plan Elements

	No. elements	T vs NT	Up to Yr 5	Yr 6 to 20	After Yr 20
Res. fertilizer regs.	4	NT	4		
Capt. GC fertilizer	2	T/NT	1 + 1		
Muddy Creek bridge	1	NT	1		
Sewer projects	11	T	1	5	5
Shellfish harvesting	3	NT	1	1	1
On-site denit. systems	2	NT		1	1
Total	**23**		**9**	**7**	**7**
N removal, % of TMDL					
In time segment			28	75	46
Cumulative			28	103	149

Load Removal Commitments, kg/yr

	Brewster	Chatham	Harwich	Orleans	Total
Years 1 to 5	1,281	247	2,872	514	4,914
Years 6 to 10	118		1,565	4,204	5,887
Years 11 to 15	118	3,408		1,581	5,107
Years 16 to 20	118	1,597		675	2,390
After Year 20	236	7,807	103		
Total	**1,871**	**13,059**	**4,540**	**6,974**	**26,444**

Sample Commitment by Town

	Chatham	Harwich
Years 1 to 5	Harwich connection (0)	Phase 2 sewers (2,672) Res. fertilizer controls (200)
Years 6 to 10	None	Phase 3 sewers (1,565)
Years 11 to 15	Frostfish Ck. sewers (803) Ryders Cove sewers (2,605)	None

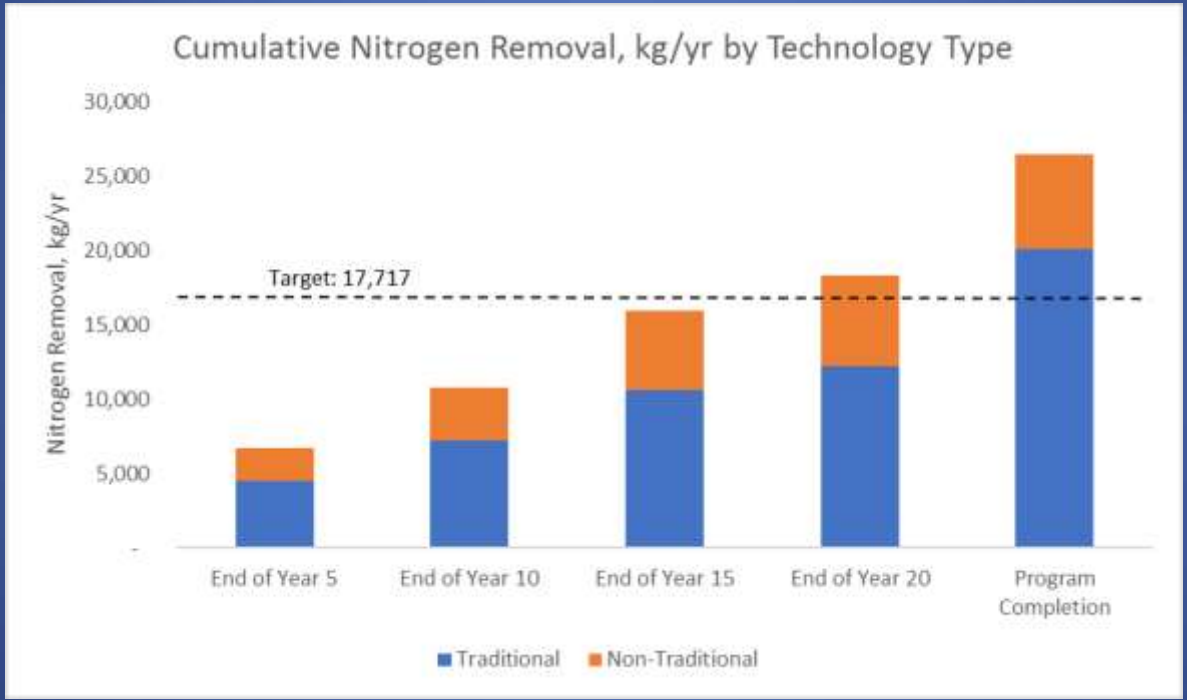
When will TMDLs be Met?

Based on current loads, no growth:

- End of Year 5 28%
- End of Year 10 62%
- End of Year 15 90%
- End of Year 20 103%
- Full program 149%

Aggregate removals, not specific to sub-embayments

Implementation Progress



When will TMDLs be Met?

Impacts of growth assumptions:

	No Growth	With Growth
• End of Year 5	28%	
• End of Year 10	62%	
• End of Year 15	90%	
• End of Year 20	103%	75%-80%

Growth could slow compliance by 25% to 30%

Permit Considerations for Non-Traditional Technologies

- Nitrogen removal mechanisms
- Basis for effectiveness
- Outline of formal program
- Monitoring requirements
- Basis for credit
- Sample calculations

Conclusion

- Permit issued in August 2018
- First of its kind in Massachusetts
- Culmination of efforts of many partners
- Aggressive goals set and completed in record time

Questions?