Water Quality in Chathans How Water Quality Monitoring Results Have Been Used in Making Local Decisions

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- What is the problem not always evident/may not always be agreement/may be multiple problems.
- Identify goal(s)/objective(s)
- Develop the data some may exist/some may have to be developed.





Water Quality Monitoring Objectives





- Provide comprehensive background data on water quality;
- Monitor nitrogen-loading trends;
- Provide data for use in policy, regulatory and educational applications;
- Provide data for WQ modeling (MEP);
- Provide measure of efficacy of mitigation measures;
- Document impacts of morphological changes.

Keep the target audience in mind!



"Existing" and Target N Concentrations

Embayment And Sub-embayments	Existing N Concentration (mg/L)	System Target N Concentration (mg/L)
Stage Harbor system		
Oyster Pond	0.53 - 0.71	0.38 (near sta CM1-A)
Oyster River	0.37	
Stage Harbor	0.34 - 0.40	
Mitchell river	0.44	0.38 (near sta CM5-A)
Mill Pond	0.47	
Little Mill Pond	0.67	





Nantucket Sound (CM-7)









Sample Date







Year



Paw Wah Pond (PBA-11)

Sample Date





Hydrogeologic and Site Evaluations

- Hydraulic load testing and groundwater modeling
 - Where
 - How much
 - Mounding







- Environmental Sensitivity
- Project Coordination
- Maximize Impact
- Community Input
- Funding
- NIMBY
- BANANA



\$92 M appropriated since 2010 for construction.







Muddy Creek **Restoration Bridge** Project

A joint project of Chatham, Harwich and MA DER

RAIL (TYP

38

4. TIDE=-0.58



Nutrient Retention Implications





Increasing incidence of phytoplankton blooms.

Lovers Lake Temperature and DO Profiles



Alum Treatment in October 2010

- Determination of sediment phosphorus
- Calculation of aluminum dosage
 - 100 g AL/m2 (two applications of 50 g AL/m2 for each pond)
- Bioassay testing
- Application took place over a two week period with waiting periods between applications to check water chemistry and observe pond biota (fish)
- No adverse impacts
- Post-application monitoring
- until August 2012





Trophic State Summary

2001-2006 TSI Values					Mean TSI	Trophic
	SDT (m)	TP (ug/L)	TSI-SDT	TSI-TP	Value	State
Lovers Lake	1.1	32.2	58	54	56	Eutrophic
Stillwater Pond	1.6	27.5	53	52	53	Eutrophic

2007 TSI Values					Mean TSI	Trophic
	SDT (m)	TP (ug/L)	TSI-SDT	TSI-TP	Value	State
Lovers Lake North Basin	0.9	42.5	61	58	60	Eutrophic
Lovers Lake South Basin	1.0	36.5	60	56	58	Eutrophic
Stillwater Pond	1.0	35.5	61	56	58	Eutrophic

2011-2012 TSI Values					Mean TSI	Trophic
	SDT (m)	TP (ug/L)	TSI-SDT	TSI-TP	Value	State
Lovers Lake North Basin	3.7	10.5	41	38	40	Mesotrophic
Lovers Lake South Basin	4.0	12.5	40	41	40	Mesotrophic
Stillwater Pond	3.8	6	41	30	35	Oligo-Mesotrophic

Questions?



"How many times must I tell you, the sea is not one vast, inexhaustible refuse dump."