



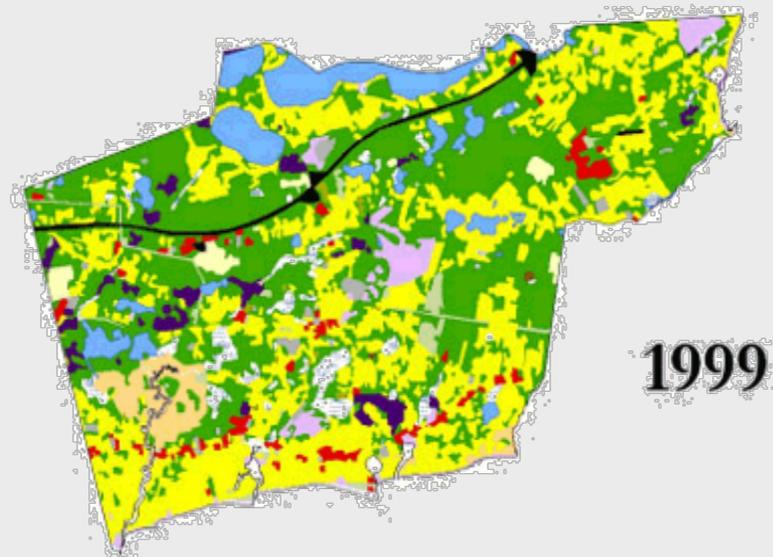
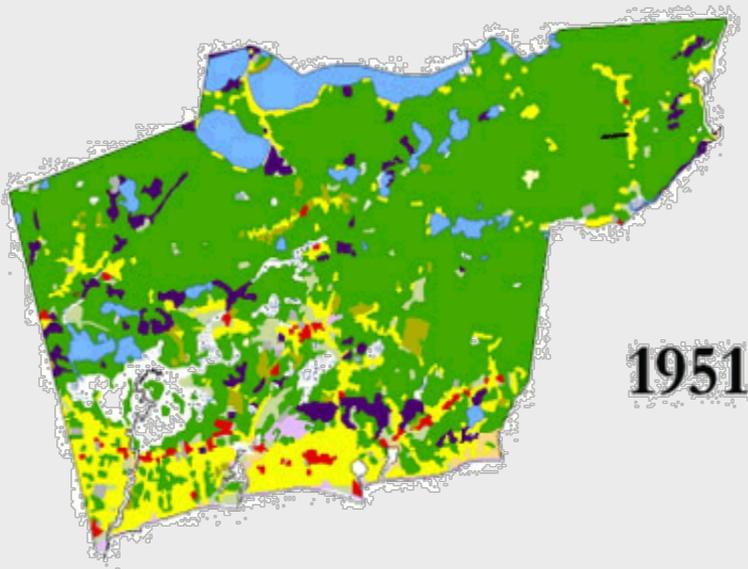
**Harwich, Massachusetts**  
**Comprehensive Wastewater Management Plan (CWMP)**



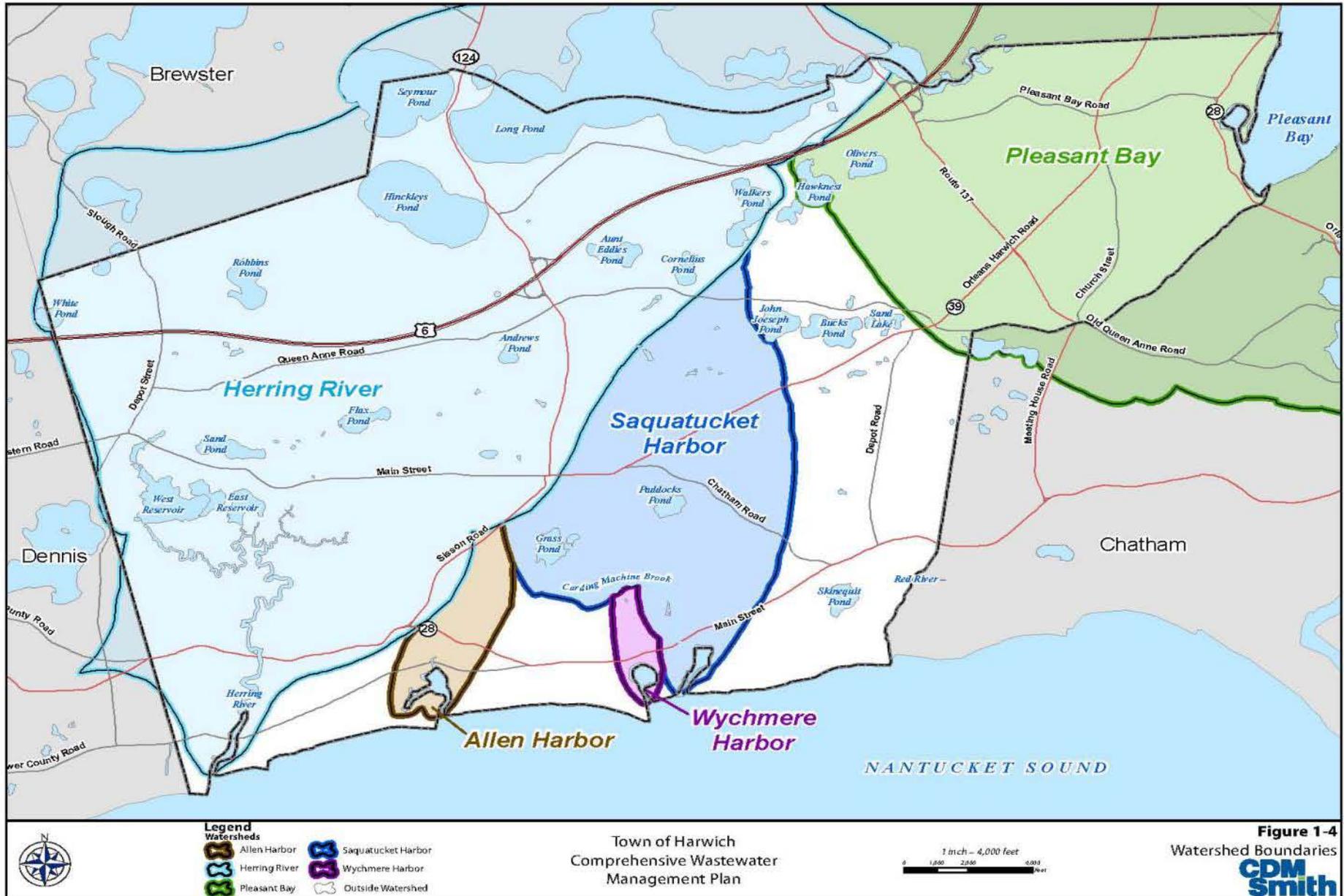
**Update to Board of Selectmen**

**November 19, 2012**

# Extent of Harwich Development



# Existing Conditions – MEP Watersheds Studied



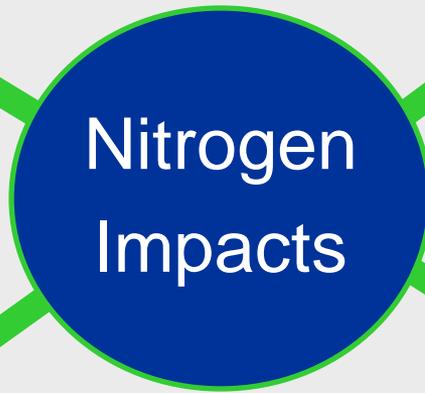
# Harwich Needs to Control Nitrogen



Water Quality



Drinking Water



Economic Development

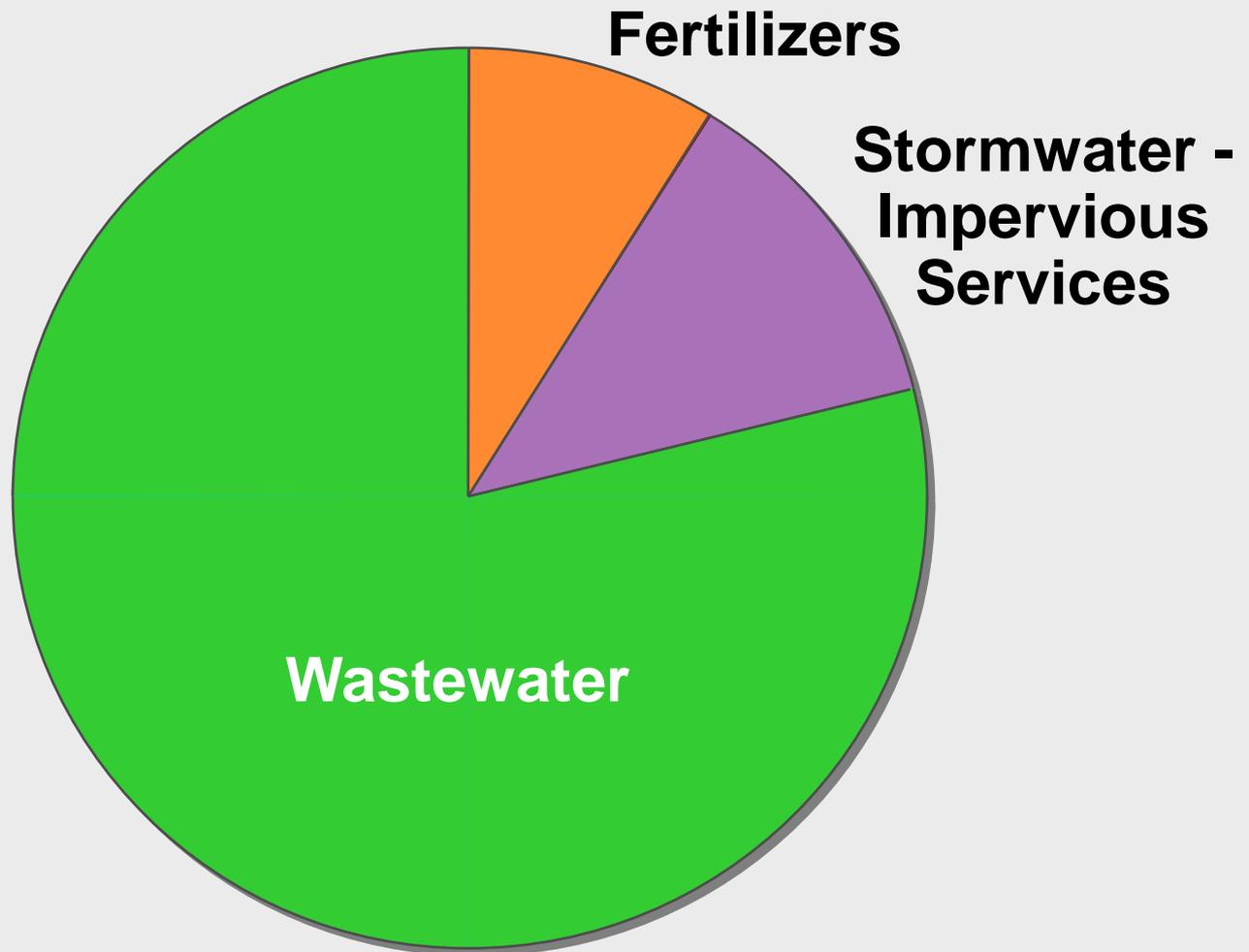


Beaches & Harbors

# Issues to Address in an Integrated Plan

- **Title 5 system issues**
- **Freshwater ponds water quality**
- **Drinking water wells water quality**
- **Future growth and desired economic development**
- **Regionalization opportunities**
- **Total Maximum Daily Load (TMDL) MEP issues**
- **Program capital and operating costs**

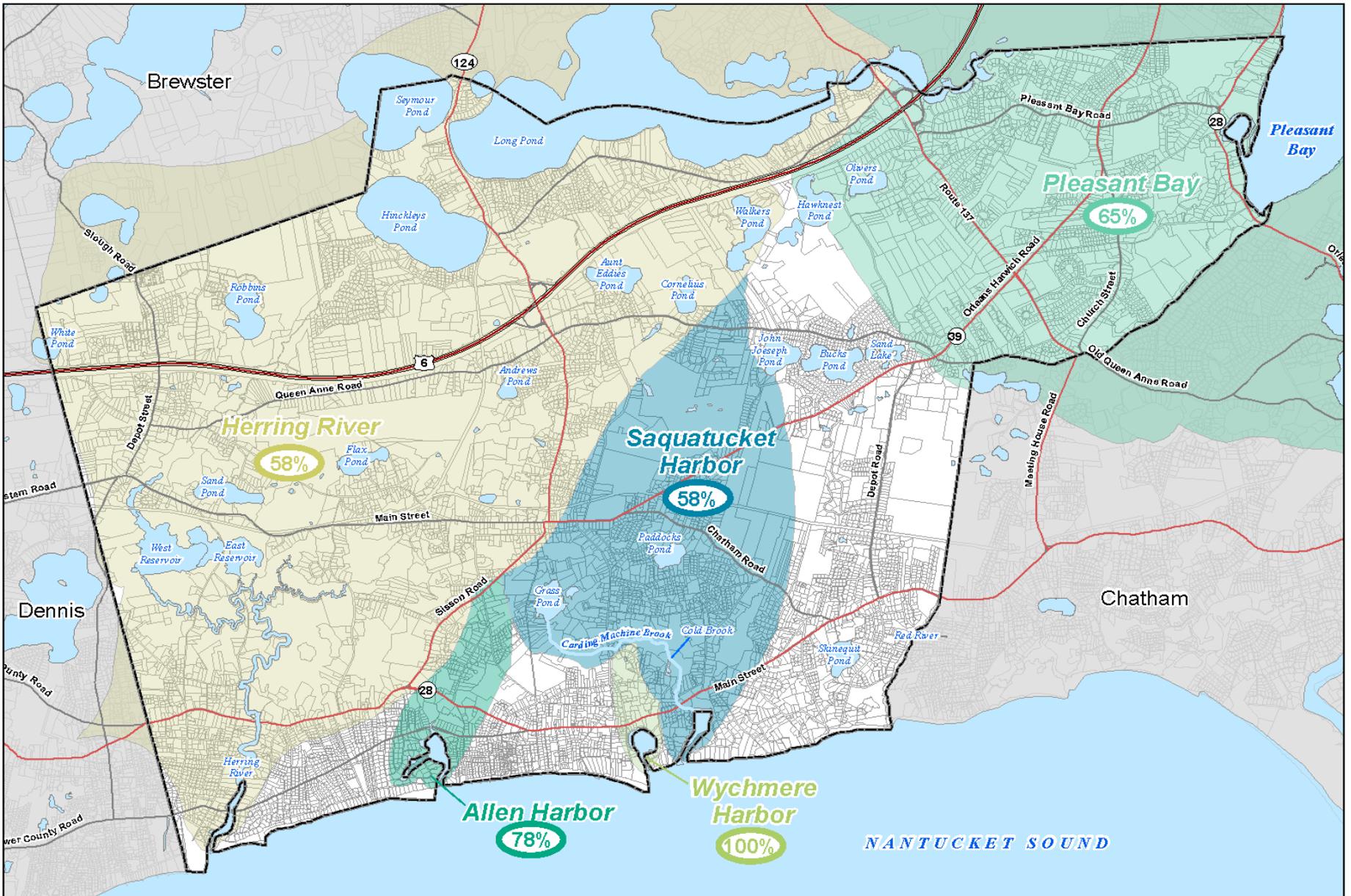
# Nitrogen Management



**Local Control - Typical**

# MEP Nitrogen Removal

<b><i>Harwich MEP Watershed</i></b>	<b><i>Septic Nitrogen (“N”) Removal Rates from Wastewater to Meet TMDL at Buildout</i></b>
<b>Herring River</b>	<b>58%</b>
<b>Allen Harbor</b>	<b>78%</b>
<b>Wychmere Harbor</b>	<b>100%</b>
<b>Saquatucket Harbor</b>	<b>58%</b>
<b>Pleasant Bay</b>	<b>65%</b>

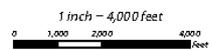


**Legend**

**Watersheds**

- Allens Harbor
- Herring River
- Pleasant Bay
- Saquatucket Harbor
- Wychmere Harbor
- Septic Load Decrease to Meet Threshold

Town of Harwich  
Comprehensive Wastewater  
Management Plan



**Figure 13-2**  
Watershed Septic Load Reductions



# Nitrogen Reduction via Increased Flushing - Muddy Creek

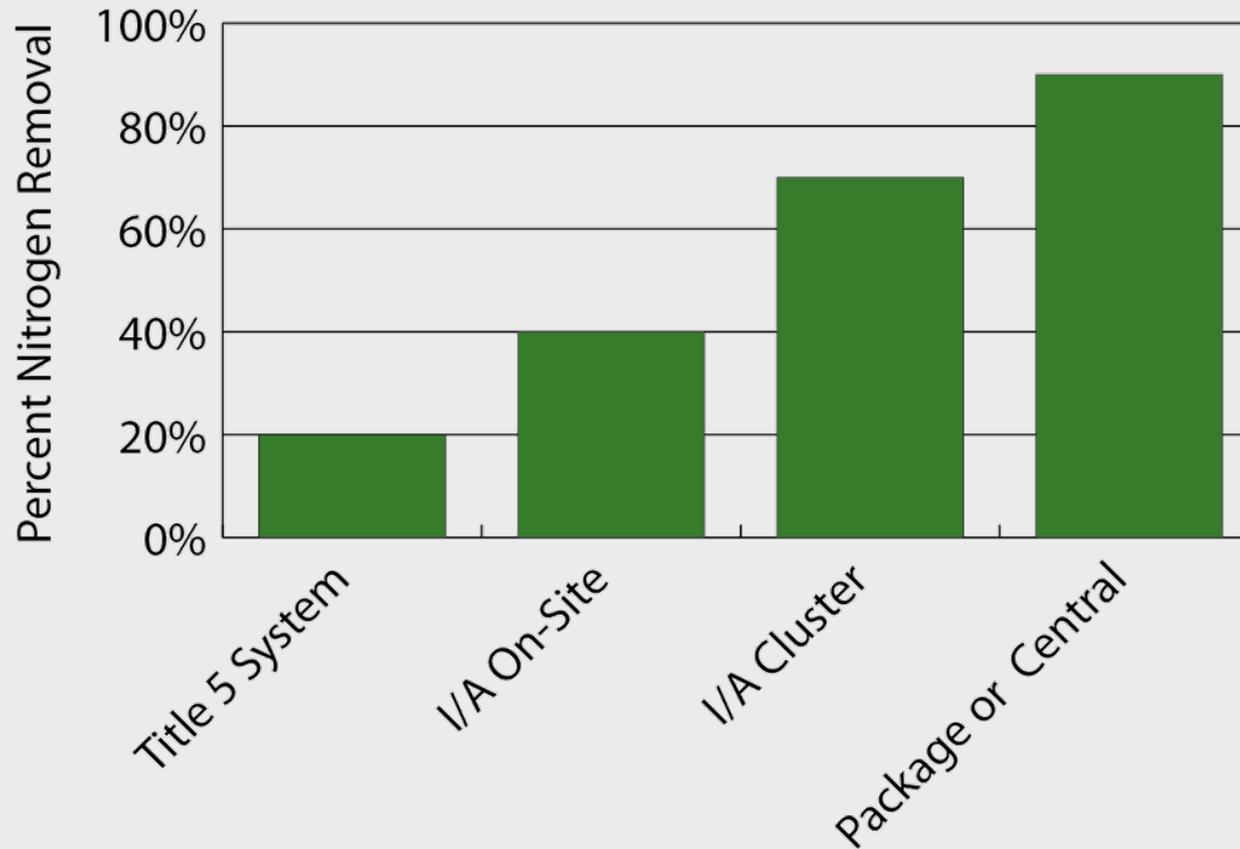


# Nitrogen Reduction by Natural Attenuation at Cold Brook Bogs – Bank Street



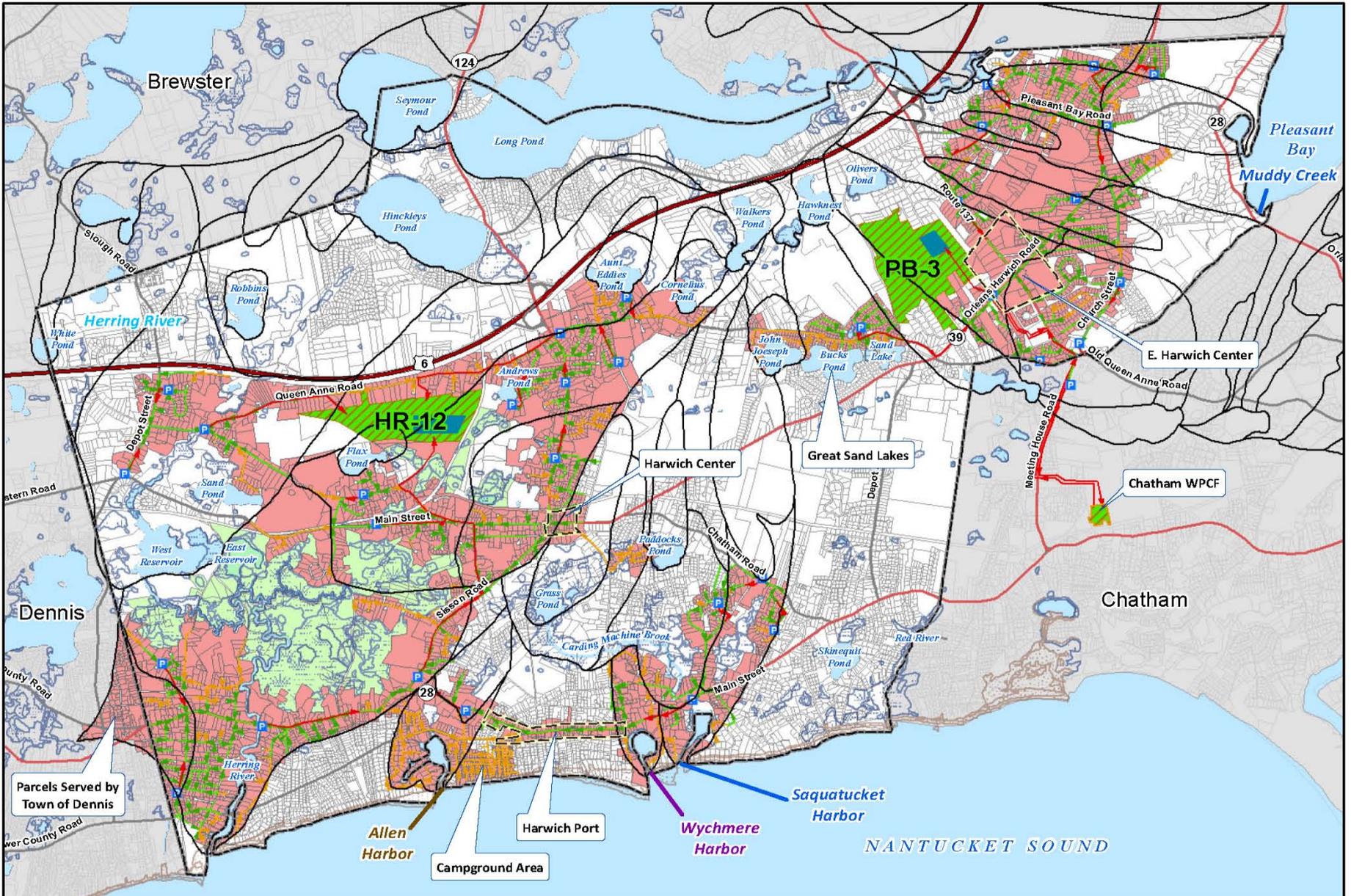
# Nitrogen Removal By Technology

## Effluent Nitrogen Levels of Treatment



# Summary of Wastewater Scenarios and Effluent Recharge Sites

<i>Wastewater Service</i>	<i>Herring River Recharge Site</i>	<i>Saquatucket Harbor Recharge Site</i>	<i>Pleasant Bay Recharge Site</i>	<i>Outside MEP Watershed Recharge Site</i>	<i>Treatment Only At HR-18 : Ocean Used for Recharge</i>
<i>Scenario</i>	<i>HR-12</i>	<i>SH-2</i>	<i>PB-3</i>	<i>OW-2</i>	<i>Outfall</i>
<b>1A</b>	X	X	X		
<b>2A</b>	X	X	X		
<b>3A</b>	X				
<b>4A</b>	X		X		
<b>5A</b>	X		X		
<b>6A</b>	X	X	X	X	
<b>7A</b>	X	X	X	X	
<b>8A</b>					X



	<b>Legend</b>			
	Harwich Town Boundary	Pump Station		Area to be Sewered
	Village Centers	Force Main		Effluent Recharge Beds
	Watershed Boundaries	Pressure Sewer		Areas with significant wetlands
	Gravity Sewer	Treatment / Effluent Recharge	Wetlands Coastal Wetlands Inland Wetlands Waterbodies	

Town of Harwich  
Comprehensive Wastewater  
Management Plan

Figure 13-1  
Recommended Areas to be Sewered  
**CDM Smith**

# Recommended Program – Scenario 5A

## ■ Two Treatment Plants

- First phases utilize regional solution by using Chatham wastewater plant to treat Harwich flows from Pleasant Bay watershed

- Future phases utilize Harwich treatment plant built at landfill site to treat and recharge wastewater from other four watersheds

- Program built in eight phases over 40 years

- Includes 23 % growth at build-out

- Capital costs range \$180 to \$230 Million



# Recommended Program – Scenario 5A

- **Non-infrastructure Components**
  - **Public Outreach**
  - **Fertilizer Management Education**
  - **Stormwater Best Management Practices**
  - **Freshwater Pond Evaluations and Restoration**
  - **Land Use Planning/ Zoning/ Acquisition**
  - **Other**
- **Adaptive Management Process**

# CWMP Schedule

- **November 2012 – WQMTF Wastewater Management Subcommittee endorsed recommended program**
- **November 2012 - Board of Selectmen endorse filing of recommended Draft CWMP program - ?**
- **November/ December 2012 - Begin year long State and County permitting review of Draft CWMP**
- **Spring 2013 Town Meeting actions**
  - **Fund remainder of CWMP**
  - **Fund Phase 1 of recommended program**

# Summary

- **This is a complex planning process – one that will continue indefinitely – as things will change – adaptive management process**
- **The CWMP is intended to be a living document that will adapt depending on results of earlier implementation phases**
- **Most properties in town contribute to the problem – not just those along a water body or those proposed for sewerage**
- **All benefit from improved water quality**

# Questions and Comments

