NUTRIENT MANAGEMENT

Advanced Wastewater Treatment

STRATEGY SCALE

THREATS ADDRESSED

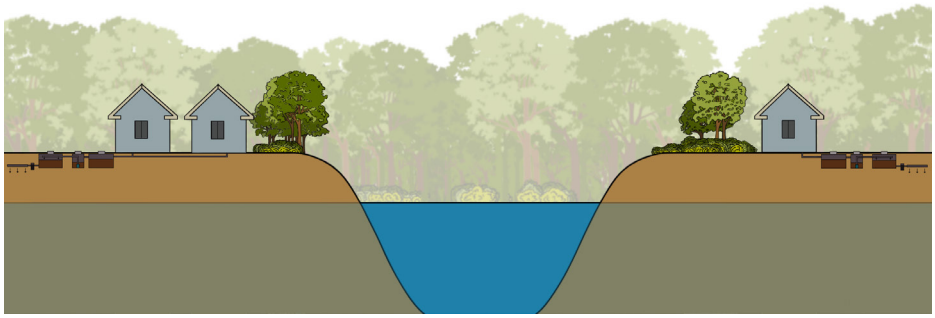
- ✓ Excess Nutrients
- ✓ Pollutant Inputs
- ✓ Algal Blooms
- ✗ Erosion
- ✗ Invasive/Nuisance Species

STRATEGY GOALS

- Protect ✓
- Manage ✓
- Rehabilitate ✓

STRATEGY CO-BENEFITS

- Habitat – Neutral
- Aesthetics – Neutral
- Recreation – Neutral



- ✓ **Permittable in Massachusetts**
  Local planning process. List of potential permits available here.
- ✓ **Implemented on Cape Cod**
  See examples of pond projects implemented on Cape Cod here.
- ✓ **Listed in 208 Plan Technologies Matrix**
  Learn more about the nutrient management strategies in the Tech Matrix here.
- ✗ **Can be Performed at Homeowner Scale**
- ✗ **Nature-based Solution**

DURATION OF BENEFITS

- Less than one month ○
- One season or year ○
- Multiple seasons or years ●

MAINTENANCE REQUIREMENTS

- Monthly ○
- Annually ○
- Infrequent ●

DESCRIPTION

Advanced wastewater treatment in relation to freshwater ponds refers to the prioritization and implementation of wastewater treatment with high nutrient removal rates, which can include sewering, package plants, and I/A systems designed for nutrient removal around ponds and/or within pond watersheds. The objective of advanced wastewater treatment is to expedite wastewater planning around freshwater ponds to protect pond water quality by removing or reducing wastewater nutrient load sources. It requires a recognition and prioritization of freshwater ponds through regulations, permits (e.g., NPDES, MS4, Title 5, Watershed Permit), and/or Watershed Management Plan, Comprehensive Wastewater Management Plan, or Targeted Watershed Plan.

ADVANTAGES

- Planning process promotes community acceptance
- I/A, cluster, or centralized sewer systems have higher treatment efficiency than individual systems
- Implementation may also benefit marine water quality, groundwater quality, and freshwater quality

CONSTRAINTS

- Changing priorities in a town's water resources planning has tradeoffs
- Wastewater treatment near ponds may be one of several objectives in a town's plan, and its prioritization relative to other concerns (drinking water quality, coastal waters) will vary
- Implementation of alternative systems may require the installation of a collection system
- I/A and cluster systems may have lower treatment efficiencies than conventional wastewater treatment facilities

Advanced Wastewater Treatment

CAPE COD COMMISSION

IMPLEMENTATION

POTENTIAL ACTORS

- **Towns:** Towns facilitate the planning process and may install systems
- **Pond Groups:** Pond groups may support and participate in the planning process and the installation of systems
- **Private Landowners:** Support and participate in the planning process and may install systems
- **Land Trusts:** Support and participate in the planning process

SITING REQUIREMENTS

- All ponds with upgradient development (particularly within 300 feet) on Title 5 or other non-nutrient treating septic systems

INFORMATION NEEDS

- Public planning process to identify appropriate locations for wastewater treatment infrastructure

IMPLEMENTATION EXAMPLES

Cluster septic systems were installed around Red Lily Pond, Barnstable to move effluents from defective septic systems to large, cluster soil absorption systems farther from the pond. Towns across Cape Cod have been planning for sewering near ponds as part of their wastewater planning processes. For example, the Town of Orleans is planning for the design, bidding, and construction of their sewer collection system to service their *"Lakes and Ponds" area* in Phase 3 of their wastewater management and sewering plan.

RESOURCES

- The U.S. Environmental Protection Agency has *Resources for Watershed Planning* to help communities develop and implement watershed plans to meet water quality standards and protect water resources.
- MassDEP also has *Watershed-Based Plan Information* to help communities develop plans to address water quality problems in impaired waters and protect water quality in healthy waters.
- The Massachusetts' Department of Conservation and Recreation's *Lakes and Ponds Program* provides related resources.

COST ESTIMATE

Variable

Varies depending on scope of project and technology pursued

ADDITIONAL FINANCIAL CONSIDERATIONS

Assessment: Planning, design, and permitting, including planning process and studies

Implementation: Equipment and supplies (depending on technology selected)

Maintenance: Annual monitoring, operations and maintenance depends on technology selected

POTENTIAL FUNDING SOURCES

- **Community Preservation Act**
- **Capital Budget**
- **Grants**
- **Private Funding**

Additional information regarding potential funding sources is available ***here***.