

What's Next in Nitrogen Reduction & Septic Solutions

Findings from Collaborators' Summit, Dec. 2024

In December 2024, a group of partners met to share developments and status updates on activities to advance nitrogen reduction technologies on Cape Cod, with a specific focus on advanced septic systems.

Clean water is a cornerstone of life on Cape Cod and beyond. Everything from our drinking water and food to recreation and the economy depends on healthy, clean water. Unfortunately, waters on the Cape are becoming over-polluted by nutrients like nitrogen which lead to harmful algal blooms and widespread ecosystem destruction which threatens nature and coastal ways of life. About 80% of this nitrogen pollution comes from septic systems, which were not designed to remove nutrients from wastewater.

Enhanced Innovative and Alternative septic systems (EIAs) are an important tool in the nitrogen reduction toolbox, and there are currently many organizations, agencies, and individuals working to bring together the science, technology, policy, communications and management tools needed for successful implementation of EIA septic systems across Cape Cod.

Over the last several years, there have been many developments supporting the implementation of nitrogen-reduction tools in the region, including regulatory updates, successful pilot projects and funding and organization around a septic utility program. Each of these has moved the needle forward toward solving the nitrogen crisis, and each has relied on collaboration across stakeholders.



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This report summarizes the discussions about the next set of challenges and opportunities in implementing EIA projects and identifies preliminary next steps to address those challenges. The group identified three priority challenges and associated solutions as the top priorities for action:

- Expand workforce development programs to build a strong pipeline of qualified wastewater professionals who can work on EIA systems. Demonstrate that working in wastewater is a good career path with strong earning potential.
- Strategically engage with existing and potential allies & ambassadors at all levels of government to continue making the case for action in support of the full suite of wastewater remediation tools, including sewer, enhanced septic and nature-based solutions.
- Continue expanding **funding and financing** tools available to reduce burdens on homeowners and access additional funding to get to cleaner water faster by upgrading wastewater treatment systems.

A Shared Goal: Cleaner Water Faster, Cheaper

In addition to the baseline goal of cleaner water on Cape Cod, the group identified the following goals and objectives for work on wastewater and EIA systems:

Healthy coastal ecosystems which support habitats, fisheries, recreation and resilience in the face of climate change

Safe and sufficient drinking water.

Clean water without breaking the bank: Sourcing funding for EIA and other wastewater projects in ways that support financial security and housing affordability for Cape Cod families. This includes a recognition that addressing wastewater pollution provides broad public benefits and that the costs of upgrading wastewater systems-whether centralized sewer systems or onsite septic systems-should not be disproportionately borne by individual homeowners.



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A thriving clean water workforce with wellpaying jobs supported by working class housing.

Efficient scientific monitoring and technology adoption: High performing wastewater treatment systems should have a clear, efficient pathway to approval using all available data. An appropriate amount of good data is collected to ensure installed systems are operating properly and receive needed maintenance in a timely fashion.



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Despite Progress, Challenges Persist in Several Key Areas

Though the group agreed that significant progress has been made toward these goals in recent years, they identified the challenges listed below. The group recognized that one overarching challenge is that wastewater pollution and infrastructure are complex systems which require many moving parts, partners and funding sources to solve.

Funding and financing are limited and all infrastructure upgrades (septic or sewer) remain expensive. Additional funding is needed so more affordable systems are available at scale.

Permitting is currently a slow, expensive and opaque process, and the financial and logistical risks and liabilities fall primarily on homeowners and small companies. The group also noted that the perception of "failure points" or underperformance for EIAs tends to be seen as worse or more problematic than equivalent failures of sewer systems (ex. combined sewer overflows), even though the magnitude and frequency of failure points for sewer systems tends to be much larger.

Permitting support or incentives are needed to bring new players into the market, increasing availability of systems and installers while reducing costs. **Installation capacity is limited** by the workforce for design and installation, limited system availability (which also keeps costs high) and municipal capacity for planning and implementation is spread thin.

This is exacerbated by the pace of vendor permitting, which makes it very expensive and slow for new systems to enter the market, even when they have proven performance in other places.

Communications challenges abound. There is misinformation, disinformation and lack of information which makes it harder for homeowners, members of municipal select boards and boards of health and others to understand why action is needed now and what actions are needed. There is a general lack of urgency and ownership over the problem.

Opposition exists from some sectors,

though there may be progress in this arena.

Massachusetts' home rule governance

system means that each individual Board of Health must adopt separate regulations. This slows the pace of town-scale regulatory triggers that can drive wastewater system upgrades (ex. upgrades required on property transfer).

Sea level rise and other impacts of climate change are exacerbating challenges faster than we are addressing them.

Solutions & Next Steps

Summit participants identified three top priorities for the next phase of action to address the challenges above: Workforce development, engagement with elected and appointed officials and funding and financing.

The group also identified the need for further multi-partner meetings to advance solutions in this space, including meetings on each of the priority areas, meetings with municipalities and larger charrettes for multi-partner discussion.

WORKFORCE DEVELOPMENT

Expand workforce development programs to build a strong pipeline of qualified wastewater professionals who can work on EIA systems. Demonstrate that working in wastewater is a good career path with strong earning potential.

- Reinvigorate the MASSTC workforce committee.
- Work with technical schools and community colleges to develop programs for their students.
- Partner with entities that train operators and boards of health.
- Reduce the barriers to certification for septic installers and ensure septic installers have better access to EIA education (ex. Treatment Plant Operator certification is required for septic operators).



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- Work with existing construction training programs and companies to expand EIA divisions and training by framing expansion into EIA as a promising business opportunity.
- Potential targets for wastewater workforce training: High school students, veterans and active servicemembers, and mid-career shifts.

FUNDING & FINANCING

Reduce financial burden on homeowners

- Subsidize to equalize: Fund septic upgrades so homeowners' costs are equal (and low) regardless of whether they are upgrading to sewer or EIAs
- Make funding for EIAs a refundable tax credit so homeowners benefit even if they don't owe enough taxes to benefit from a standard tax credit

Increase available government funding to provide alternatives and supplements to State Revolving Funds

- Federal: EPA funding, including community change grants and funds to USGS.
- State funding from the environmental bond and state budget.
- Money for towns and MassDEP for oversight and permitting.
- Frame EIA as water infrastructure to fund septic upgrades in a sewer/water. infrastructure bill for favorable rates from investment banks
- Explore opportunities for novel funding sources for wastewater upgrades

Expand the market of companies that build EIA systems

- Support companies in scaling to increase system availability.
- Offset permitting costs, reduce risks of entering the market.
- Increase state capacity to review and expedite system permitting to general use approval when appropriate scientific data is available.

POLICY

Engage strategically with existing and potential allies and ambassadors at all levels of government to continue making the case for action.

Educate and engage with municipal governments, including select boards and boards of health, so they have a clearer understanding of the nutrient pollution problem and the full suite of solutions possible to address it.



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Expand the wastewater conversation from primarily pathogen-focused to include nutrients

- Draw a clearer line from the problem to regulatory solutions within the power of municipal boards, like those which encourage and incentivize wastewater treatment upgrades.
- Share that we can save towns money and clarify the financial implications of various planning decisions
- Tie-in with housing and ADU laws
- Increase support and buy-in for Septic Utility Program

Next Steps & Opportunities: Explore regulatory solutions that could give developers confidence to invest in scaling EIA technology and making it more affordable



 $\textcircled{\mbox{\sc c}}$ Loren Dowd/ TNC

SCIENCE & RESEARCH NEEDS

- Speed up vendor permitting: Bring together data scientists, lawyers and regulators to develop a statistically and scientifically rigorous method to validate system performance more efficiently. This includes clarifying how and when data collected in appropriate out-of-state locations is used in system approvals.
- Hydrologic models to better prioritize homes to upgrade. For example, update the USGS MEP model, develop a travel time model to track the impacts of wastewater upgrades on water quality at time scales.
- Study and monitor pollutants beyond nitrogen, including EIA system impacts on contaminants of emerging concern (ex. pharmaceuticals, PFAS) and phosphorus.

COMMUNICATIONS

- Create a Cape Cod-wide communication and engagement strategy which creates a compelling story that helps people understand the public benefits of action on wastewater and helps residents understand where they fit into the solution.
 - Develop a "One Water" approach that draws clearer lines between drinking water, public health, wastewater and environmental health.

What if we created a program equivalent to Mass Save but for water?

Provide support agents to help homeowners understand their options and needs for upgrades. Support an expanded workforce of contractors who do the audits, install upgrades and more.

- Strategic media engagement.
- Support homeowners with information and financial support *(see related bullet under Funding & Financing and in "What if..." box).*

ADDITIONAL RESOURCES:

- The Nature Conservancy: <u>nature.org/macleancoastalwaters</u>
- The Massachusetts Alternative Septic System Test Center <u>www.masstc.org/rme</u>
- The New England Water Environment Association's Innovative/Alternative Onsite Wastewater Treatment Systems Task Force: <u>www.newea.org/resources/innovation/resources/</u>
- Barnstable Clean Water Coalition: <u>bcleanwater.org/shubael-pond-project/</u>
- The U.S. Environmental Protection Agency: <u>www.epa.gov/water-research/innovativealternative-septic-systems</u>

SUMMIT ATTENDEES

- Barnstable Clean Water Coalition: Zee Crocker
- U.S. Environmental Protection Agency: Matt Stamas
- Horsley Consulting: Scott Horsley
- Massachusetts Alternative Septic System Test Center: Brian Baumgaertel, David Iorio Izzo, and Allie Nicolosi
- The Nature Conservancy in Massachusetts: Alison Bowden, Emma Gildesgame, and Daniel Goulart, John Stinehour* (*TNC Contractor)
- New England Water Environment Association: Bruce Walton