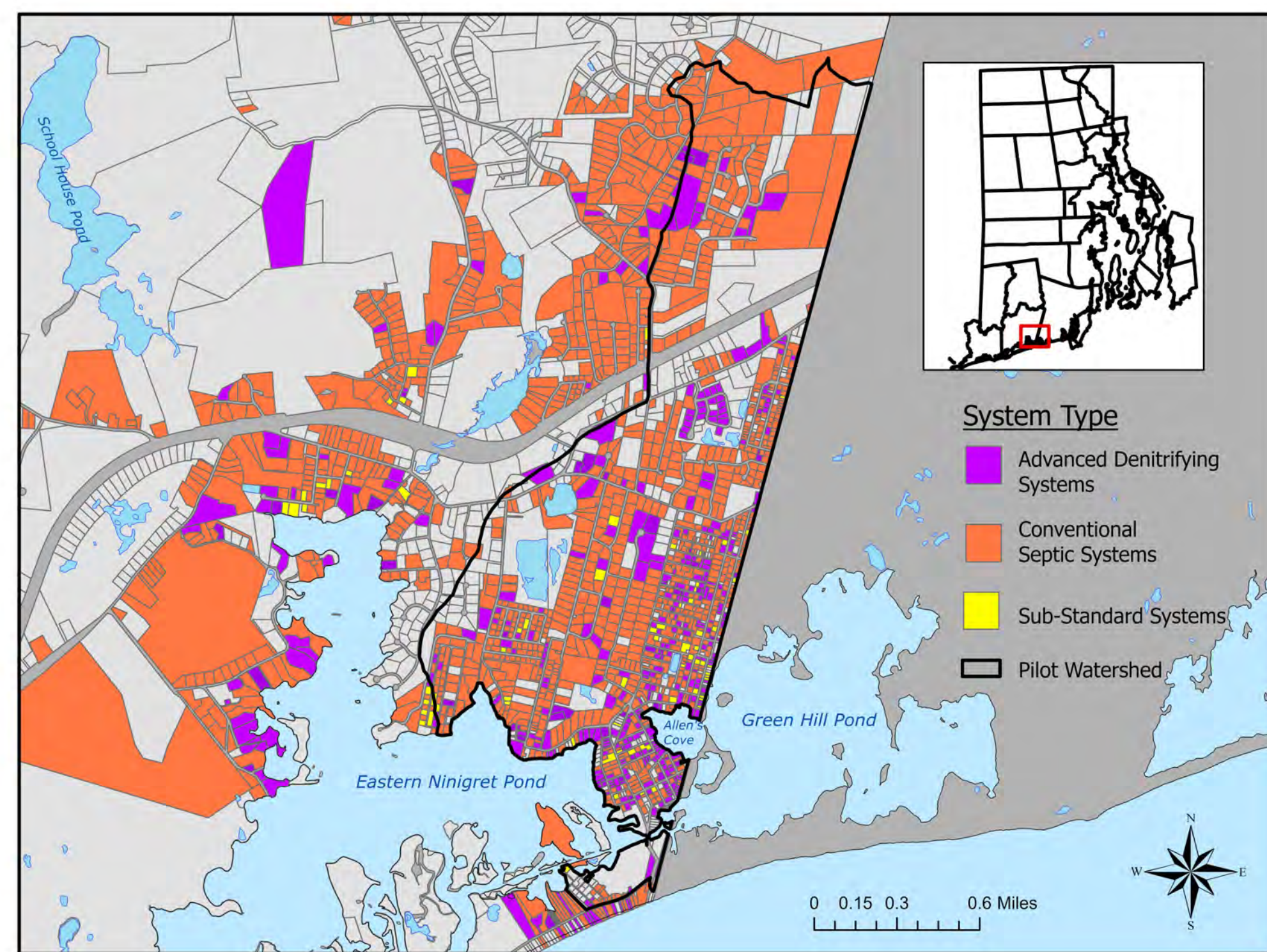


NOTES FROM A PILOT WATERSHED: PROTECTING WATER QUALITY IN AND AROUND SOUTHERN RI COASTAL PONDS

Alissa Cox¹, Owen Placido¹, Kristen Hemphill^{1,2} & Matthew Dowling²

¹University of Rhode Island—Natural Resources Science; ²Town of Charlestown, RI

PROJECT OVERVIEW



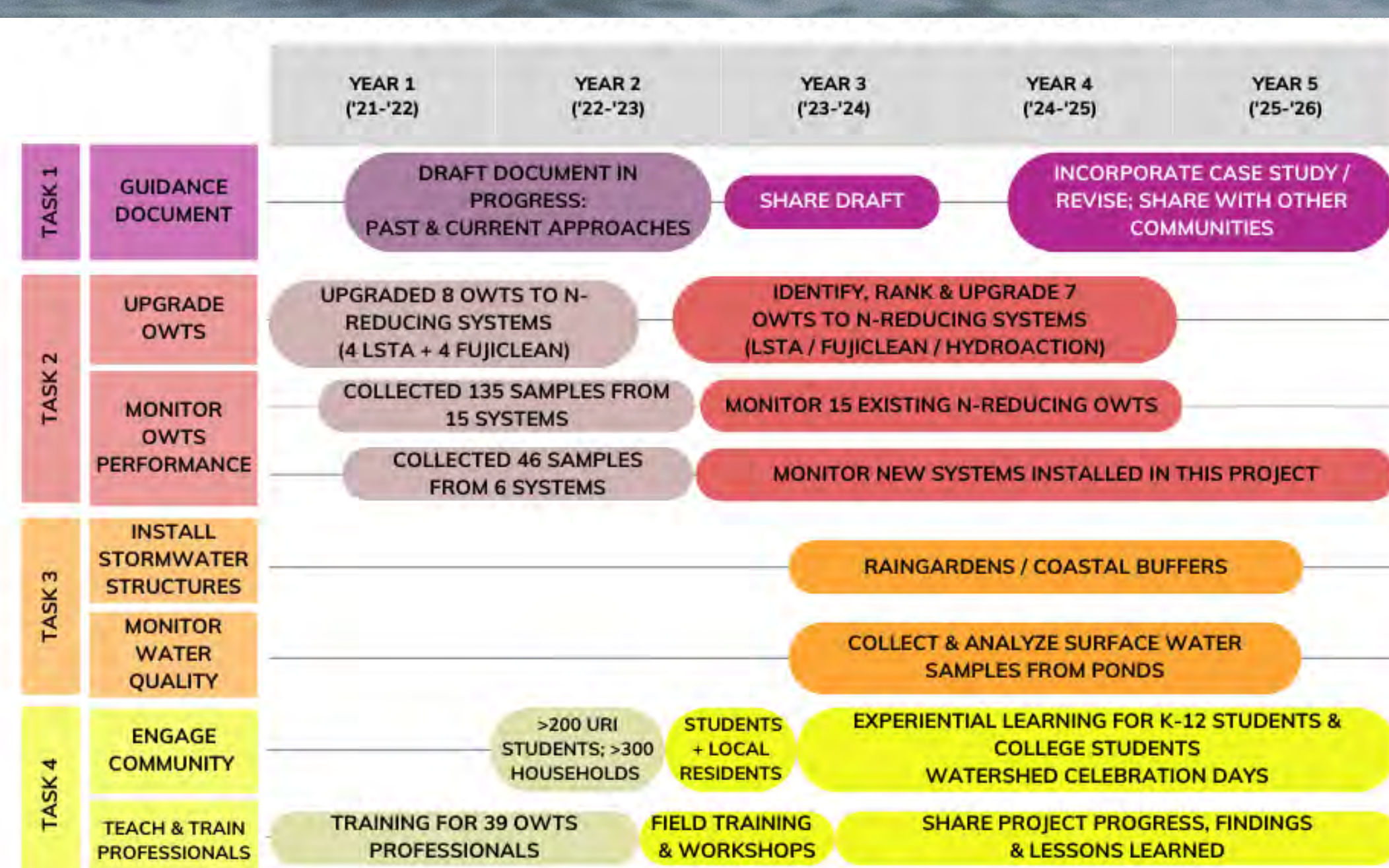
Project Goals

Implement and document nutrient reduction measures to ground and surface waters in the pilot watershed (eastern Ninigret Pond and Greater Allen's Cove)

- Develop guidance document: Holistic and integrated approach to manage water quality
- Identify and upgrade substandard septic systems to Nitrogen-reducing systems
- Monitor installed Nitrogen-reducing systems for performance and compliance
- Install stormwater management structures to treat surface runoff
- Monitor local water quality in eastern Ninigret Pond and Allen's Cove

Engage local community members in protecting shared water resources

- Technical training and workshops for septic system professionals
- Educate and incentivize local landscapers and land owners to manage fertilizer application responsibly
- Involve residents and youth to value and support adoption of best practices to protect ground and surface water quality in the community



WHAT WE'VE LEARNED SO FAR

Upgrading Substandard Septic Systems to Nitrogen-Reducing Technologies is Getting More Expensive

Textile Filter to Pressurized Drainfield

2017 – 2018 (15 sites)
Orengo AdvanTex® AX-20 to Geomatrix Systems LLC GeoMat™ / Bottomless Sand Filter



Average: \$27,169*
Range: \$23,200 – \$31,963*

Non-proprietary N-reducing Drainfield

2021 – 2022 (4 sites)
Conventional septic tank to (experimental) pressurized Layered Soil Treatment Area (RI)



Average: \$27,525*^
*Includes \$4,750 engineering cost; reasonable future estimate ~\$1,000

Aerobic Treatment Unit to Pressurized Drainfield

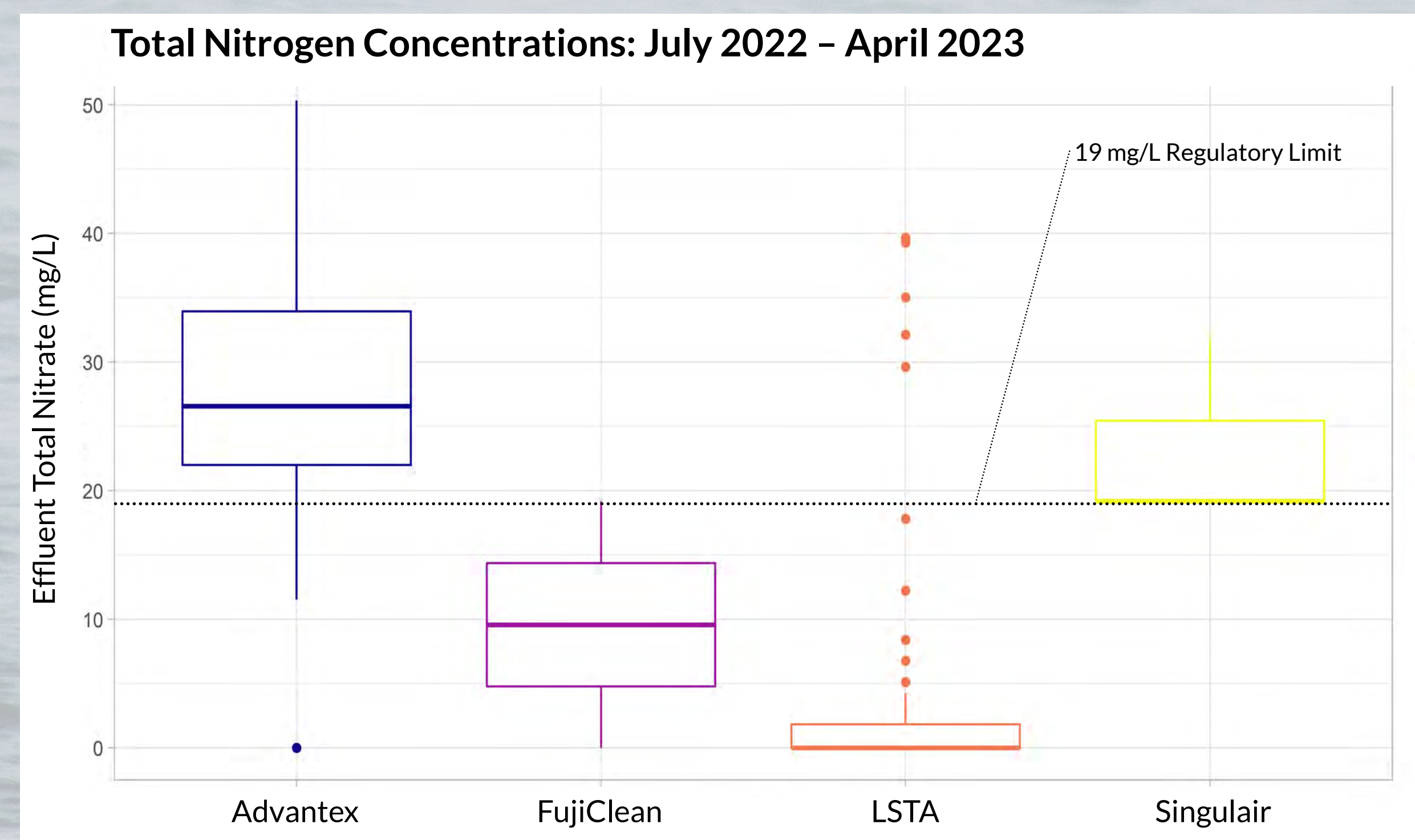
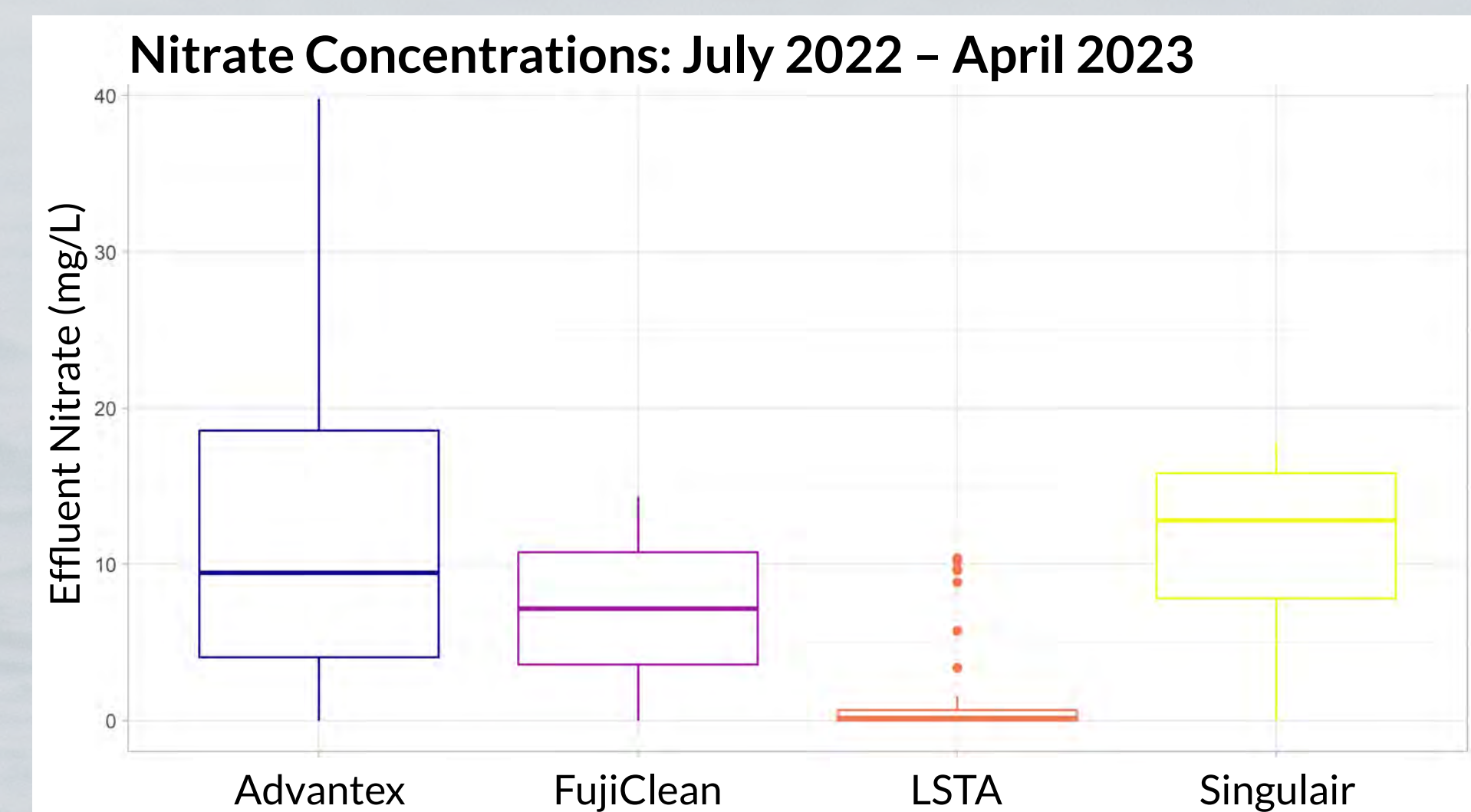
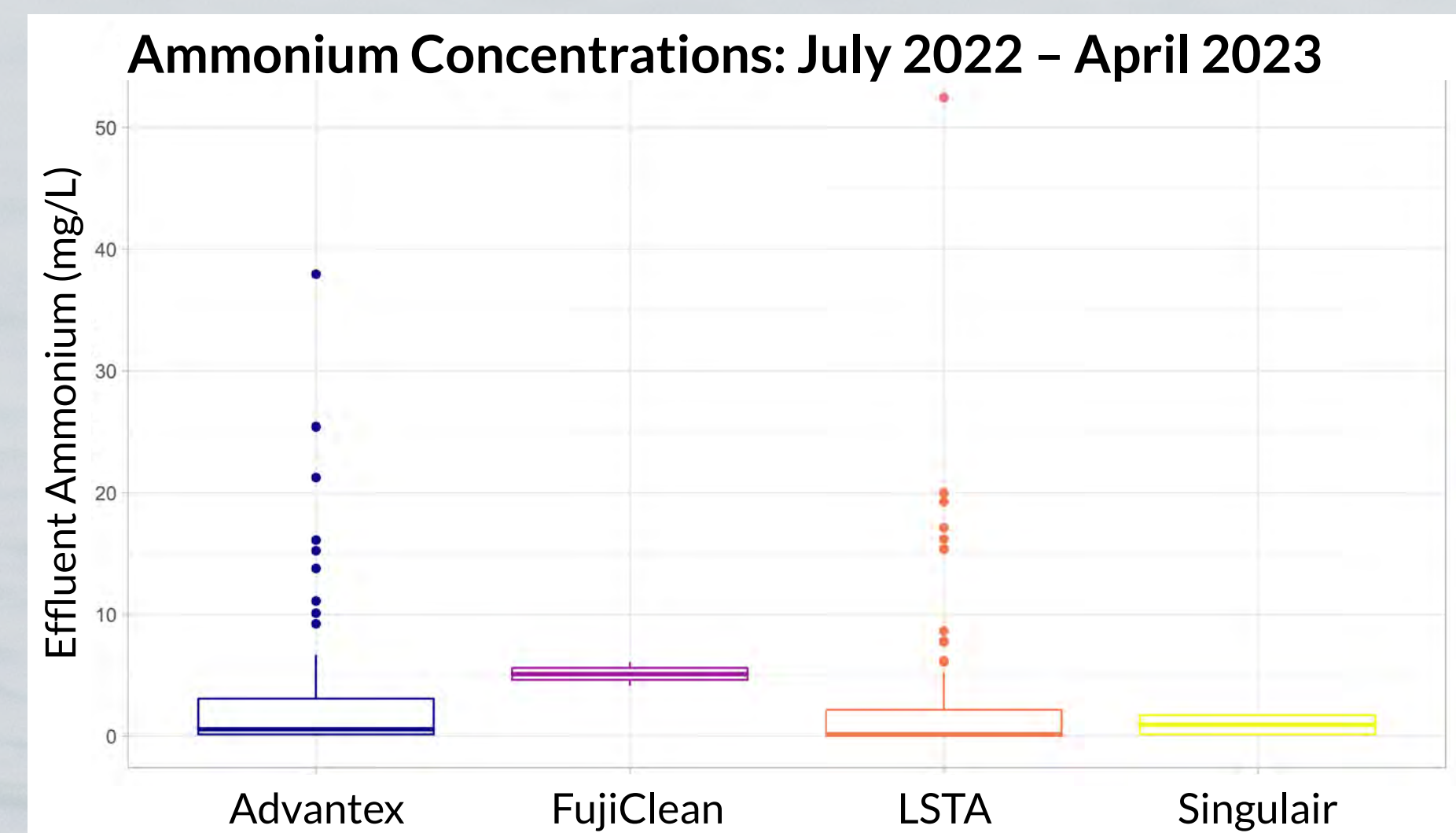
2021 – 2023 (6 sites / 9 quotes)
FujiClean USA™ CEN5® to Geomatrix Systems LLC GeoMat™ / Bottomless Sand Filter



Average: \$32,362*
Range: \$25,413 – \$36,680*

*Total cost for engineering, design, components, materials, and installation to replace an existing failed / substandard system. Note that this does not represent an endorsement for or against a particular technology.

Installed Nitrogen-Reducing Technology Performance is Variable



System performance over the past 9 months:

Wastewater leaving the Orengo Advantex AX-20 (n=14) and the Norweco Singlair (n=1) systems is **not** currently meeting the regulatory 19mg/L total Nitrogen limit in most cases

Wastewater leaving the non-proprietary Layered Soil Treatment Areas (LSTA; n=4) and the FujiClean CEN5 (n=4) systems is **meeting** the total N limit fairly consistently

NEXT STEPS

Engage with the Community



Continue to Monitor N-Reducing Systems



Monitor Surface Water Quality



Install Stormwater Management Structures



This project is funded by an EPA SNEP Pilot Watershed Grant [00A00962] and the Town of Charlestown [AWD08519]. Background photo by Enrique Hoyos (via Pexels), map created by K. Hemphill, performance plots generated by O. Placido; all other photos and graphics courtesy of Town of Charlestown and URI Onsite Wastewater Resource Center staff.

