

# The Greater Allen's Cove and Eastern Ninigret Pond Pilot Watershed Program

Town of Charlestown, Rhode Island

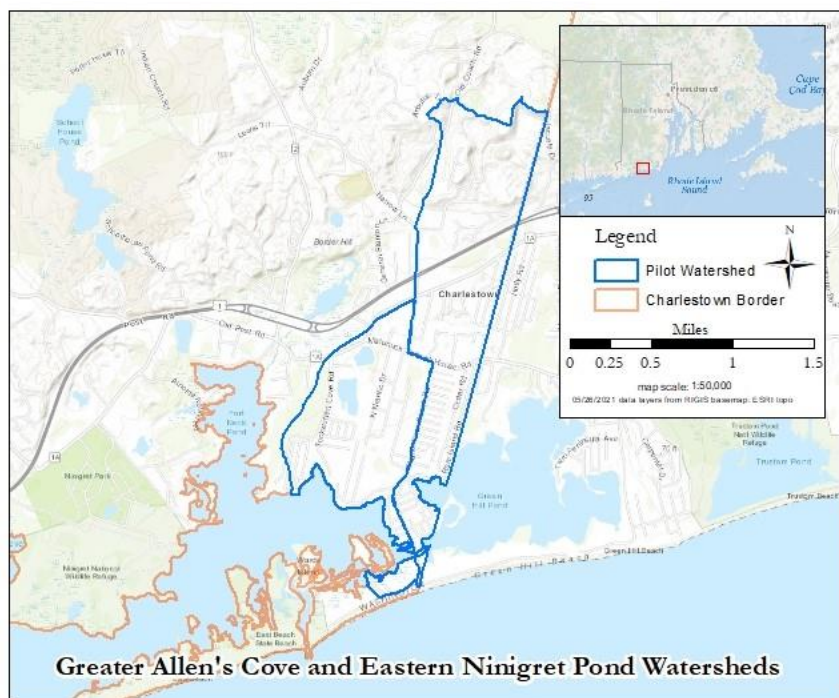
Office of Environmental Scientist and On-Site Wastewater Management

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**Project Overview.** The proposed pilot watershed initiative focuses on the Greater Allen's Cove and Eastern Ninigret Pond watershed in Charlestown, RI, which is part of the Greater Narragansett Bay watershed and drains to Block Island Sound. This program is a multi-pronged approach to comprehensive watershed management, and includes field-based installations of N-reducing onsite wastewater treatment (OWTS) technologies and stormwater management structures, as well as purposeful communication to share approaches and lessons learned, and a strategic combination of community engagement activities to inspire a wide range of stakeholders to appreciate and contribute to the watershed's health. Taken together, the proposed program's activities will address and mitigate nutrient pollution leading to documented harmful algal blooms in Ninigret Pond, as well as restore and protect natural system function in the watershed. By leveraging support from a variety of partners, both new and old, this program will address all three SNEP goals from the five-year strategic plan, and demonstrate ways to address common challenges in densely developed coastal watersheds. The project's efforts will result in an increase in local capacity to complete projects and adopt new policies, model and increase the current available solutions to address holistic watershed health, involve diverse stakeholders, and increase local communities' understanding of the benefits of protecting and restoring watersheds.

**Context.** The coastal Town of Charlestown, situated on the South Shore of Rhode Island (RI), contains land representative of the coastal morphology of the southern RI coastline: coastal headland bluffs spanned by a series of coastal barrier/lagoon complexes. Three poorly flushed coastal lagoons ("Salt Ponds") that connect to Block Island Sound by engineered breachways fall within the Town's jurisdiction. The southernmost 12.5 square miles of Charlestown fall within the RI Coastal Resources Management Council's (CRMC) Salt Ponds Region Special Area Management Plan (SAMP) and the RI Department of Environmental Management's (RIDEM) South Shore Salt Ponds Critical Resource Area (CRA). Though these 12.5 square miles represent only 33% of the Town, they contain over 63% of all dwellings, and are the Town's most densely developed area. There are 3.7 square miles (mi<sup>2</sup>) of very dense development classified by the CRMC as "Developed Beyond Carrying Capacity" which typically contain 2-8 dwellings per acre (CRMC, 1999). The easternmost portion of this area drains to Ninigret pond and Green Hill Pond, and contains the delineated subwatershed of Eastern Ninigret Pond and Greater Allen's Cove (see map). This proposal seeks to establish the Eastern Ninigret Pond and Greater Allen's Cove subwatershed as a SNEP Pilot Watershed, which is part of the Greater Narragansett Bay watershed.



**Pilot Watershed: Addressing Priority Environmental Challenges.** The Eastern Ninigret Pond and Greater Allen's Cove subwatershed contains the highest density residential land use in Charlestown, where density exceeds 10 dwelling units per acre. Most of these dwellings were constructed prior to formal municipal zoning so are considered pre-existing, non-

conforming to current zoning. Each dwelling in this area relies on a septic system to manage domestic wastewater and a private well for potable water, typically a shallow point driven or dug well. Further, the dense zones are typically situated less than 200 feet from the inland edge of Eastern Ninigret or Allen's Cove of Green Hill Pond where the land use / pond interface has resulted in substantial degradation of water quality of this estuary, including nutrient pollution and harmful algal blooms (Olsen and Lee, 1984; Ernst, 1996, CRMC, 1999; RIDEM, October 2006; RIDEM, February 2006; Nixon and Buckley, 2007). Many of the cottages that were once primarily used only during summer months are now utilized for year-round occupancy putting further strain on the watershed. Despite the proximity to the coast and favorable location, the population in this area remains largely working class, consisting of single families in middle income brackets.

The Town and others have documented nutrient pollution in the form of significantly elevated groundwater nitrate (NO<sub>3</sub>)-nitrogen (N) concentrations in its most densely developed coastal areas. Recent shallow potable well water sampling of small community water systems and shallow private wells in these areas indicates that groundwater NO<sub>3</sub>-N concentrations approach or exceed the EPA established maximum contaminant level (MCL) of 10 mg NO<sub>3</sub>-N/L. This N-enriched groundwater eventually discharges to Charlestown's Salt Ponds (Masterson et al., 2007), where it causes eutrophication and increases the risk of hypoxia. Green Hill and Eastern Ninigret Pond have been closed to shellfishing since 1994 by RIDEM based on significantly deteriorated water quality. RIDEM has established a total maximum daily load (TMDL) discharge regulation for bacteria to these ponds.

Reducing nutrient pollution from N loading is a major priority for this area to protect the watershed for public health, community safety, welfare and prosperity, as well as environmental quality. Human-derived nutrient inputs in the watershed are already impacting regional public health objectives, as well as water quality of the Salt Ponds, the health of which is directly related to the local tourism industry.

**Sources of Nitrogen.** In one of the first assessments of local land development impacts to the coastal watersheds, Lee (1980) examined the causes and impacts of land use development and relationships to the Salt Pond water quality. N loading to groundwater has long been known to be the main conduit for nutrients entering the Salt Ponds, since groundwater is the predominant source of input of fresh water to the ponds (Olsen & Lee, 1984, Masterson et al., 2007). Septic systems were identified as the major source of N entering most of the Salt Ponds as early as 1982 (Nixon et al. 1982, Lee & Olsen 1984). Today, OWTS remain the largest contributor of N to groundwater in the proposed pilot watershed.

Recent models developed by the URI Cooperative Extension (URICE) Nonpoint Education for Municipal Officials (NEMO) for Charlestown indicate that approximately 80% of groundwater N in the densely developed coastal areas of Charlestown is attributable to OWTS discharge (URI, 2014). The balance of N loading in these areas originates mainly from fertilizer use and stormwater runoff. A 2016 meta-analysis indicates that the average annual N influx to the Green Hill and Ninigret Ponds is approximately 46,903 pounds per year (lb/yr) and 44,794 lb/yr, respectively (Ernst, 1996; CRMC, 1999; URI CE, 2001; DEM, 2006; Donohue, 2013). The town of Charlestown has demonstrated that cumulative impacts of N loading are greatest in densely developed areas. Models of shallow groundwater samples flowing to the Town's Salt Ponds predict to show N concentrations from 6.8 mg/L to >10 mg/L (Donohue, 2013). Based on a recent Town of Charlestown analysis of NO<sub>3</sub>-N concentrations from 319 shallow private drinking water wells and their relationship to the density of OWTS, there is a statistically significant positive linear relationship between OWTS density and groundwater NO<sub>3</sub>-N concentration. The relationship derived from the regression analysis predicted NO<sub>3</sub>-N concentrations ranging from 2.0 mg/L to 7.5 mg/L across the watershed draining to Ninigret and Green Hill Ponds (mean: 2.37, standard deviation: 0.66). These findings support the concept that N reduction policies including the use of N reducing OWTS technology in these critical areas are warranted (Dowling, 2021).

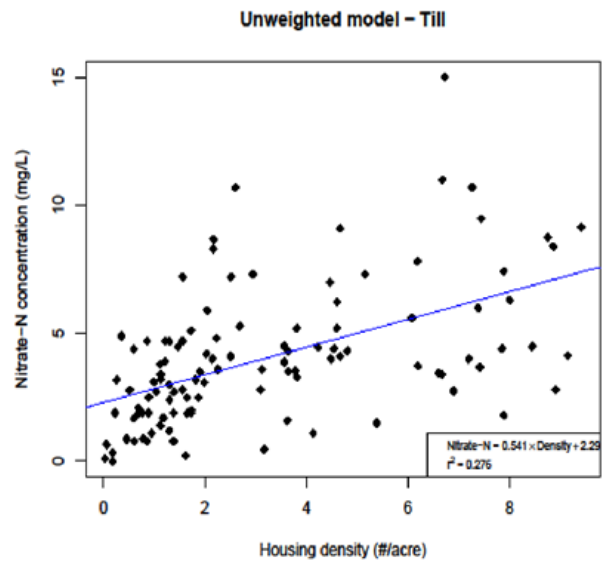
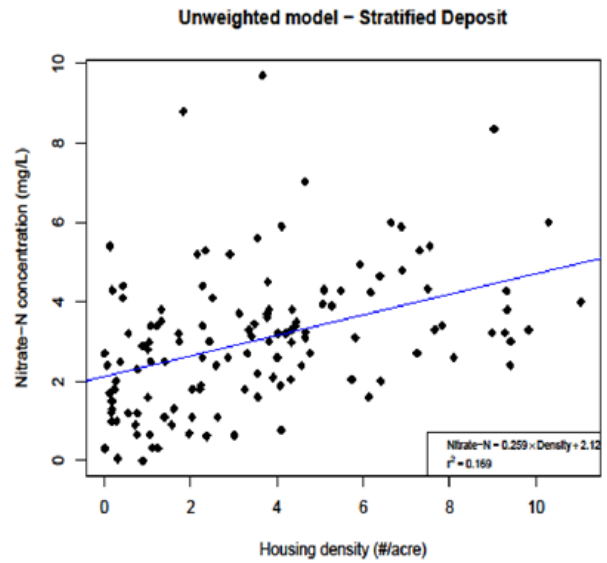
Nitrogen inputs or loading to the watershed from OWTS is a function of both total N (TN) concentration in wastewater effluent coupled with the total volumetric flow from each OWTS. Conventional OWTS typically have final effluent N concentrations of 74 milligrams per liter (mg/L) (Amador et al., 2018). Based on this concentration and a total daily flow of 115 gallons per bedroom, a three-bedroom conventional OWTS contributes approximately 78 pounds TN per year loading to the watershed. N-reducing OWTS are designed to lower the TN concentration in wastewater by at least 50%, meet final effluent TN concentrations of ≤19 mg TN/L and meet the NSF/ANSI Standard 245 N reduction, thereby significantly reducing N inputs.

Since January 2008, DEM has required the upgrade of all substandard and conventional OWTS to N-reducing technology for any new construction, altered building construction, or failing OWTS in the watersheds draining to the Salt Ponds, among other regions. In the last eight years, the Charlestown’s OWTS data indicate that approximately 35 OWTS per year have been upgraded to N-reducing technology in its coastal watersheds for a net N reduction of between approximately 350 to 700 lb/year. Given the existing concentration of groundwater N and annual loading, the current replacement rate is insufficient to address the problem and meet the N-loading reduction goals established in 2011.

In Charlestown, there are currently 3,061 OWTS located within the salt ponds watershed, 2,600 (85%) of which are located within the CRMC Lands Developed Beyond Carrying Capacity area. Of these systems, 40% (1,227), are located within the densely developed Greater Allen’s Cove and Eastern Ninigret Pond proposed pilot subwatershed. These include 860 older conventional systems (71%), 308 OWTS using N-reducing technology (25%) and 52 substandard systems (4.3%) (Charlestown, 2021). Modeling conducted by the Town in May of 2021 indicates that the associated N loading from OWTS to the salt ponds watershed as a whole is 30,984 pounds of N per year. Of these systems, 40% are within the proposed pilot subwatershed and contribute 12,494 pounds-N per year. Loading rates are based on 115 gal/bedroom RIDEM standard with average observed OWTS system concentrations, 10.16 pounds N/Conv.Syst./yr and 5.8 pounds N/N-Red. Syst./yr) (Charlestown, 2021). As the largest source of N to the salt pond watersheds, this pilot watershed initiative is designed to expedite upgrades of older conventional and sub-standard systems to N-reducing OWTS in the exceptionally densely developed areas of the Eastern Ninigret Pond Greater Allen’s Cove watershed to meet the goal.

**History of Mitigation Efforts.** Because of the exceptional housing density, OWTS are the major source of nutrient loading to the Eastern Ninigret Pond and Allens Cove watershed and a centralized community collection system has been determined to be technically and fiscally infeasible. If properly managed, OWTS are an effective means at recycling wastewater, however, the majority of the OWTS in the ground in this area are not designed to reduce N, resulting in substantial N loading.

Understanding the impact of OWTS to drinking water, groundwater and surface water resources, the Town of Charlestown received legislative approval in 1994 and established a Wastewater Management District to manage all septic systems in Charlestown. In 2008 the Town hired a full-time Environmental Scientist to operate in the capacity of On-site Wastewater Management Program Director. This role has enabled the Town to accurately track, manage and mitigate every OWTS in the Town’s jurisdiction, through the maintenance of an active database of the design, usage, solids accumulation rate, and inspection and pumping history of every OWTS. Further, the office employs proactive, science-based and comprehensive approaches to quantifying and managing water quality impacts to our watersheds. The office maintains strong working partnerships with some of the leading OWTS researchers and soil microbiologists in the country at URI and the Barnstable County Department Health and the Environment and routinely collaborates on existing research projects and publications. Any failing OWTS or cesspool is required to be replaced within one year of identification. Since 2008, of the original >1,000



cesspools identified, all but three have been upgraded to modern OWTS. In the coastal watersheds, most of these cesspools have been upgraded to N-reducing systems. The Town offers low interest loan funding for these systems and provides technical support and permitting assistance to all residents. Our program has also allowed the town to manage non-OWTS related impacts to our coastal watersheds by implementing efforts to manage nutrient runoff through the Charlestown Recommended Landscaper Program, pet waste management, resident Canada Goose population stabilization efforts, stormwater management and many others.

The Town is considered a leader in Rhode Island and beyond and sets the bar for local municipal management of OWTS and water resource protection. We have aided multiple surrounding jurisdictions in both RI and in Massachusetts with implementing similar approaches to local OWTS management, which has made it clear that many other communities could benefit from this knowledge. One of the outcomes of our Pilot Watershed Program is the creation of a comprehensive Watershed Management Program Guidance Document that will provide land use managers, policy staff, legislators and local officials with interdisciplinary pathways toward implementing an effective and scalable OWTS Management Program across the nation.

The office has also created and implemented a robust educational interface with residents, property owners and visitors to the Town that includes ongoing targeted direct mailings, press releases, online resources, handouts, public meetings, presentations, and peer reviewed publications. In this project, we hope to build on these successes by expanding on these successful programs to incorporate more active community engagement and dialogue.

Recently, the town implemented the Charlestown Coastal Watershed Protection and Restoration Program, a comprehensive watershed-based assessment and mitigation strategy to quantify and reduce nutrient loading to our coastal ponds watersheds, funded by SNEP. The Town partnered with the University of Rhode Island (URI), Laboratory of Soil Ecology and Microbiology (LSEM) and the New England On-Site Wastewater Training Program (NEOWTP), Save The Bay (STB), and the Salt Ponds Coalition (SPC) for the successful implementation of this project which consisted of three primary tasks: (1) Comprehensive OWTS effluent quality monitoring from existing N-reducing systems to better understand the efficacy of these technologies and establish methods for enhanced management to further mitigate N loading to the salt ponds watershed; (2) implementation of the most efficient N reducing OWTS treatment trains available to reduce total N loading to these watersheds by at least 350 pounds per year; and (3) stormwater and fertilizer management to focus on non-OWTS related nutrient loading sources to the SPW through fostering onsite infiltration of stormwater, reduction of fertilizer use and developing citizen scientists to generate interest and involvement in community-based nutrient mitigation of our watersheds.

The project commenced in November 2016 and was finalized in January 2021. Plans were developed, implemented, and completed with overwhelming public support and community engagement and the results exceeded our expectations. We have developed methods to identify geographic areas of need, collect data, formulate and implement mitigation measures, manage and quantify results, findings and implications and are beginning to plan for continued implementation and replication of tasks outside of our jurisdictional area. This past successful program has established the necessary framework for developing new and enhancing existing programs to incorporate into this proposed SNEP Pilot Watershed Initiative.

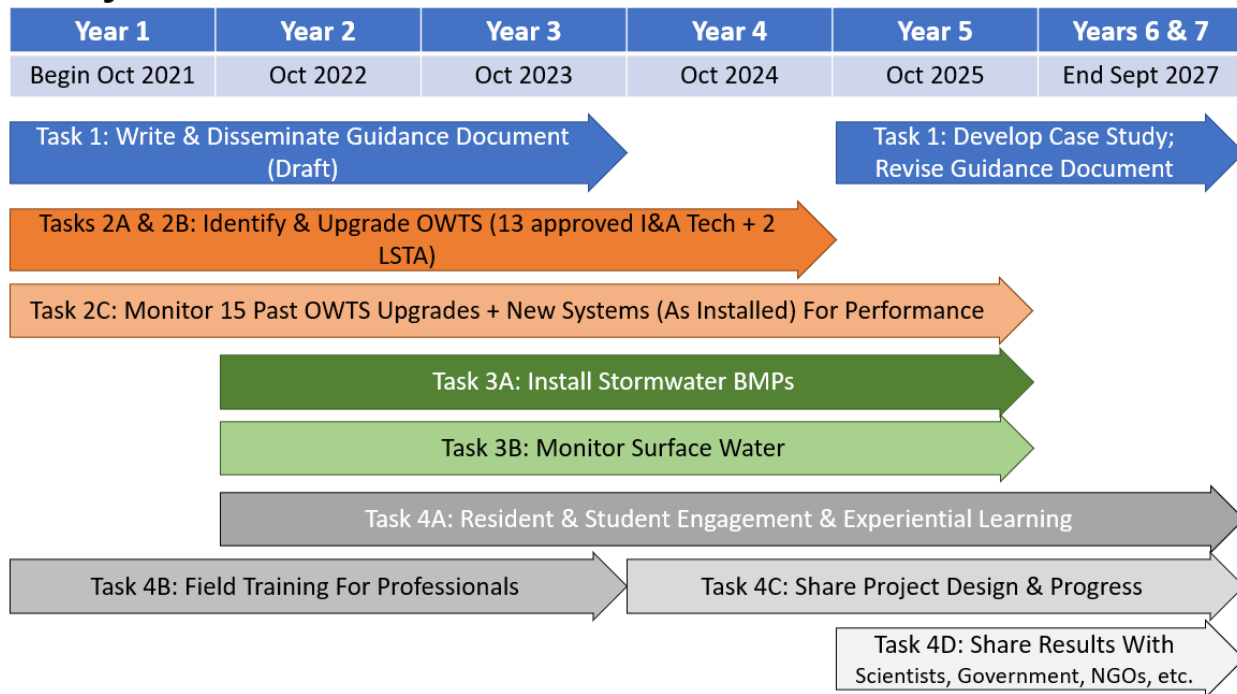
By leveraging this framework and the expertise of the Charlestown OWTS Management Program, URI LSEM, NEOWTP, Save the Bay, the Salt Ponds Coalition and other partners, we will implement the Eastern Ninigret Pond Greater Allen's Cove SNEP Pilot Watershed Program by conducting the tasks detailed below. A key component of our program will be the transferability of the programs developed to other coastal communities, as well as sharing the process, results and outcomes from the workplan. This will include regionally disseminating the OWTS Management Program guidance materials through educational seminars and online resources, planning for continued upgrades of older OWTS, ongoing N-reducing OWTS efficacy monitoring, surface water sampling, outreach and community engagement including developing a tour of key project outputs within the Watershed.

This project is designed to support SNEP's strategic goals in creating resilient ecosystems of safe & healthy waters, thriving waters and natural lands, as well as sustainable communities, by increasing available solutions to and demonstrating ways to address common challenges posed by nutrient pollution and harmful algal bloom mitigation, increasing local capacity to implement these solutions and complete projects and adopt new policies, ensuring diverse representation among stakeholders,

and increasing local communities’ (and their leaders’) understanding of the benefits of watershed protection and restoration projects.

## Proposed Pilot Watershed Plan

# Project Timeline



**Task 1 (Years 1-3, 5+): Create a structured guidance document designed to assist communities in developing a comprehensive watershed-based management plan and approach, including developing or expanding programs to manage and assess onsite wastewater treatment systems, stormwater mitigation measures, other nutrient or contaminant inputs to the watershed, and effective community engagement to support these efforts. (SNEP 2050 Goals 1, 2, 3) (TOC, NEOWTP)**

This comprehensive guidance document will include both description and justification of recommended approaches to develop robust management programs using 21st century technology, such as geospatial data and analysis methods. The goal for this guidance document or protocol is to serve all communities in developing or expanding programs to proactively manage common nutrient and contaminant inputs to the watershed (wastewater, stormwater). This protocol will be of use to communities or municipalities beginning to explore how to develop or establish programs, as well as to communities with existing programs they wish to enhance and/or expand in meaningful ways to address watershed quality issues more holistically and protect and improve public and environmental health. As an example, part of the protocol will address how to establish a wastewater management program, including how to create inventories of existing systems, implement ordinances to support proactive management of systems, approaches to analyzing geospatial data, and monitoring system maintenance and performance. Past Town of Charlestown successes in these areas will serve as a blueprint for this protocol, and will showcase effective components of past successful approaches, and lessons learned along the way. This initial draft based on past programmatic success will be shared with local coastal communities for their input, and revised in year 5 to incorporate findings, lessons and recommendations resulting from Tasks 2-4 below to be of use to coastal communities across the nation. The guidance document will be updated to conclude with a case study of the pilot watershed activities proposed in Tasks 2-4, which can serve as an illustrated example of this comprehensive approach to proactive watershed management and also function as a stand-alone output for other audiences and purposes.

**Task 2: Implement a program to replace substandard and conventional OWTS with N-reducing I&A technologies to reduce overall nutrient load to watershed by at least 350lbs N/ year. (SNEP 2050 Goals 1, 2, 3) (TOC, LSEM, NEOWTP)**

This task is designed to address nutrient pollution and harmful algal blooms in Ninigret and Green Hill Ponds and the local groundwater aquifer, by replacing current substandard or conventional OWTS that contribute significant N loading to the watershed with N-reducing technologies. These will include both approved proprietary I&A technologies (Subtask 2.A) and piloting experimental low-cost layered N-reducing drainfield systems under study in the Town (Subtask 2.B). The performance of these system upgrades will be monitored via quarterly (or monthly) sampling using established effective field methods (Subtask 2.C; as established by Ross et al., 2018, Ross et al., 2020 and Lancelloti et al. 2017). Together, this approach will serve as a model for managing and monitoring nutrient loading from I&A OWTS in coastal regions in practical and cost-effective ways, increasing available solutions.

Subtask 2.A (Years 1-4): Identify and implement a septic system upgrade program, replacing systems that put public and environmental health at risk with approved I/A OWTS technology using an objective ranking system of criteria developed by the Town of Charlestown as part of past SNEP-funded system upgrade programs. (TOC)

The total groundwater N input of OWTS into the Greater Allen’s Cove and Eastern Ninigret Pond subwatershed is 12,494 lb/yr based on 3-bedroom full time occupancy, 9,596 lb/yr from conventional OWTS, 1,134 lb/yr from substandard OWTS and 1,764 lb/yr from N-reducing OWTS. Upgrading 15 of the oldest OWTS in this area is expected to achieve a net N reduction of 350 lb/yr (~2.8%) to this subwatershed. These incremental mitigation measures compound over time, develop community and homeowner engagement and increase local awareness of watershed connectivity with land uses. Fostering these upgrades is a critical step in the right direction.

The program will provide funding of 75% (up to \$18,000 per system) of the cost of the engineering design, permitting, components and installation of 15 N-reducing OWTS to replace substandard and unpermitted OWTS in the Eastern Ninigret Pond Greater Allen’s Cove subwatershed. Remaining costs for the OWTS upgrades are incurred by the property owners. The Town will establish an application process based on specific property criteria such as ownership, drinking water source, and OWTS information. Properties which are owner-occupied, full time primary residences and whose owners meet the HUD Low Income Guidelines will be prioritized. The selected property owners will be required to enter a contract with the Town including a date specified for the upgrade, maintaining property ownership during the project period, maintaining a contract with an approved service provider, and allowing access for sampling during and following the grant program and release of performance data to the project partners and contracted O&M service provider.

Subtask 2.B (Years 1-4): Installation and piloting assessment of experimental layered nitrogen-reducing soil treatment areas, monitoring and evaluating their performance for approval for use in RI. (TOC, LSEM, NEOWTP)

Two systems identified by eligibility criteria established in Subtask 2.A will be replaced with experimental non-proprietary, low-cost N-reducing layered soil treatment areas for further assessment by Charlestown, LSEM and NEOWTP. This group has collaborated to receive experimental system approval from RIDEM for installation of up to 10 systems in RI, and pending acceptable performance results may receive Class 2 certification for wide-spread implementation in the state. This technology presents a promising, low-cost and passive alternative to the existing proprietary N-reducing OWTS, requiring only a septic tank, dosing pump and layered soil treatment area to reduce incoming N from wastewater before it is recharged to local groundwater.

Past research efforts in Barnstable County, MA have shown this to be a promising technology option. These data indicate that LSTA, when implemented as proposed here, is a highly effective means of TN reduction from residential strength STE by at least 50%. The MASSTC and Barnstable County Department Health and Environment (BCDHE) data indicate an average of 70% TN reduction from seven pilot sites in Barnstable over an operating period of two years. An approved lower cost, effective N-reducing OWTS technology will facilitate a higher upgrade rate of older substandard and conventional OWTS and reduce N loading in the critically impacted watersheds throughout RI and beyond, adding to the available solutions to mitigate OWTS-derived N loading.

Subtask 2.C (Years 1-7): Monitor performance of installed N-reducing OWTS (both proprietary and non-proprietary systems) with low-cost field-based methods and/or a sensor. (TOC, LSEM, NEOWTP)

Nitrogen reducing OWTS installed under this program, along with a subset of 15 recently installed N reducing OWTS (under past SNEP funding) within the Easter Ninigret Pond & Greater Allen’s Cove watershed will be field monitored for parameters including TN using the recommended field-based and cost-effective tools established in Ross et al. (2018), aka the “Ross Method”. Findings will be utilized to confirm and illustrate the effectiveness and practicality of the Ross Method in large scale N-Reducing OWTS field monitoring schemes that form a critical component of watershed management.

LSTA installed under Task 1B, will be sampled monthly and analyzed by both the Ross Method and standard lab analyses performed by LSEM. Additionally, once the technology from the EPA Advanced OWTS N-Sensor challenge is available at the end of 2021, a subset of the installed systems will be equipped with the sensor to demonstrate its feasibility and applicability in proactive monitoring and management of I&A OWTS technologies. Taken together, these approaches will demonstrate the feasibility of system monitoring in conjunction with standard operation and maintenance procedures, and will provide valuable opportunities for training for OWTS-related professionals (both industry and regulatory in nature) in the field.

These three subtasks will both facilitate and document the reduction in N loading to the watershed, and serve as models for other communities looking to implement similar programs. These projects will also serve as opportunities for community engagement, as laid out in Task 4.

**Task 3: Implement comprehensive stormwater, run-off & fertilizer management, including targeted installations of stormwater retention and treatment BMPs.** (SNEP 2050 Goals 1, 2, 3) (TOC, STB, SPC)

This task is designed to address nutrient pollution and harmful algal blooms in Ninigret and Green Hill Ponds, by creating vegetated coastal buffers and rain gardens to manage stormwater (Subtask 3.A), and measure the restoration or protection of natural system function by monitoring surface waters (Subtask 3.B).

Sub-Task 3.A: Stormwater Nutrient Reduction (Years 2 – 5) (STB, NEMO, TOC): The Town will partner with Save The Bay (STB) to encourage community members to adopt voluntary nutrient reduction efforts in their landscaping practices, and/or suggest that community members consider hiring landscapers who have been registered with the Town based on its successful “Charlestown Recommended Landscaper Program” established under a past SNEP grant, which trains professionals in BMPs in lawn care and landscaping. Members of the program commit to using fewer than 2 pounds of insoluble fertilizer per 1,000 ft<sup>2</sup> of lawn/yr, established by DEM as the recommended threshold usage in environmentally sensitive areas (DEM, 2015). The program is based on a technical training for management approaches and features a resident-accessible online list of recommended landscapers.

Trained staff at STB will lead the installation of at least three site specific coastal vegetative buffers and/or rain gardens in proximity to the salt ponds, contiguous wetlands and tributaries within the pilot watershed to promote stormwater management, infiltration of runoff, and dilution of nutrient loaded groundwater. At least half of the gardens or vegetated buffers will be installed on public properties along with informational kiosks. Rain gardens will be installed in accordance with guidelines in Dietz and Filchak (2004) by staff trained by the RI Residential Rain Garden Training Program and volunteers. When site or surrounding conditions and property owners are amenable, small-scale rain gardens and/or rain barrels may also be installed at sites from Task 2, to serve as models for integrative low-impact development and environmental protection. Together, these projects will serve as engagement opportunities described in Task 4.

Sub-Task 3.B: Surface Water Sampling and Citizen Scientists to document Nutrient Reduction (Years 2 – 5) (SPC):

Following the past successful model of collaboration, the Town will continue to partner with the SPC, the Watershed Council for the Watershed and URI CE Watershed Watch to continue to monitor the established surface water sampling stations in the Eastern Ninigret Pond Greater Allen’s Cove watershed. Additional stations will be established in the downgradient areas of our pilot watershed in an effort to monitor surface water quality that is affected by groundwater outwelling from this densely developed watershed.

SPC will sample surface water from the stations for laboratory analysis of NO<sub>3</sub>-N, TN, NH<sub>4</sub><sup>+</sup>-N, and phosphate monthly and field analyze for observations of DO, pH, and temperature from May through October for a period of three years (2022 through 2025). Samples will be collected by trained volunteer citizen scientists and analyzed by the USEPA certified URI CE

Watershed Watch laboratories. Laboratory and field analytical results will be tabulated, summarized and posted on the SPC website. The SPC will publish a “Trends Analysis” for the sampling stations and will be available both on-line and in hard copy. The datasets will also be compared to preexisting baseline pond Aquatic Health Indices to measure the short- and long-term progress within the watershed.

**Task 4: Engage a variety of stakeholders to discuss pilot watershed project goals and their impacts on local communities and the wider southern New England community.** (SNEP 2050 Goals 2 & 3) (NEOWTP, TGS, LSEM, TOC, SPC, URIWW, NEMO, STB)

Community engagement is central to effective watershed management, and this task is designed to serve as a possible model for other communities can adapt and implement to get a wide range of stakeholders not just informed, but actively involved in advocating for and protecting watershed health. This project aims to leverage the project’s partners to engage residents (adults and students) in meaningful educational and service experiences to foster an informed and active citizenry that appreciates and contributes actively to the health of the watershed (Subtask 4.A). Our partners will also create field-based credit-bearing training opportunities for BMPs related to design, installation and management of OWTS and stormwater management structures (Subtask 4.B). Finally, the project’s approach, outcomes and implications will be shared with other communities, regulatory, state and federal agencies and NGOs (Subtask 4.C) and scientific and policy audiences (Subtask 4.D). Details of each subtask can be found below.

Subtask 4.A (Years 2-5+): Engage local residents and students in meaningful and embedded experiences related to the nutrient-mitigation aspects of the project, including OWTS upgrades, OWTS and surface water monitoring, and stormwater management strategies.

In partnership with STB, URI faculty, and local school communities (future partners), the Town will utilize existing and co-develop new curriculum enhancing experiential learning opportunities for K-12 students focused on the importance of protecting watershed health, by providing students with contextual learning in hands-on field experiences related to the project. These learning opportunities will include age-appropriate field experiences that explore watershed health, a student’s location and action within their local watershed, the function and design of the BMPs from Tasks 2 and 3, and service-learning components (installing and/or maintaining coastal buffers or other stormwater mitigation infrastructure in collaboration with STB). The programs will offer students an opportunity to get firsthand experience and context for the importance of environmental preservation. Projects for high school students may involve URI students, and will also include analyzing water quality datasets and/or geospatial datasets related to the pilot watershed and the project’s impact to date, in addition to a field component, and results will be shared with their families and communities, in a community-based celebration of learning. Undergraduate and graduate students at URI will also work with URI LSEM and URI NEOWTP to collect and analyze wastewater samples, and will be trained to help facilitate educational field experiences for younger students, serving as near-peer mentors and models while gaining valuable science communication skills.

SPC and Watershed Watch trained volunteers will work as citizen scientists to collect water quality samples from stations within the pilot watershed, and participate in student field experiences as outlined above as time and interest permits, as well as serving as guides for the field tour stations described below. SPC also routinely produces quarterly newsletters, conducts educational events, videos and seminars for citizens interested in the salt pond environment. For this project, the SPC will produce an on-line video resource pertaining to the Watershed and the Project to disseminate project information and results. A series of [similar videos](#) were prepared for the past SNEP grant in 2019.

In years 1-5, the Town and the NEOWTP will host targeted events (community listening sessions) to discuss homeowner concerns from within the watershed relating best practices for mitigating nutrient impacts to environment and protecting investments (i.e. N-reducing OWTS). These sessions will be designed to co-develop online and in-person resources, content and workshops of interest/priority to homeowners, and will inform efforts to disseminate best practices related to landscaping, septic system maintenance and environmental protection based on their interests and preferences. These community members may also choose to be involved in the Watershed Field Days described below.

In years 3-5+, once sufficient numbers of systems and BMPs have been implemented from Tasks 2 and 3, the Town and NEOWTP will organize annual Watershed Celebration Day celebrations which will be advertised to residents in southern RI

and beyond, as well as NGOs and conservation organizations, local and state officials, representatives from the press, and other stakeholders via social media and our partner organizations. These Watershed Celebration Days will be structured in ways similar to the popular URI Master Gardener “[Gardening with the Masters Tour](#)”, where members of the public sign up and receive a map marked with annotated points of interest, and individuals visit whichever stations interest them most. Tour stations will include OWTS upgrade sites, rain gardens and surface water sampling stations, and will be staffed by partners, trained landscapers, students and other engaged volunteers. Stations will be informational but conversational in nature, describing concepts and practices relevant to the different technologies or landscapes and soliciting visitor questions and dialogue, and include hands-on components whenever possible (e.g. involving visitors in demonstrations of sample collection and analysis, as well as maintenance of raingardens, coastal vegetated buffers or stormwater management structures, and discussing best practices for low-impact and environmentally friendly landscaping practices). The advantage of this focused pilot watershed project is that these stations will be in fairly close proximity to one another, rather than distributed around the state, which will facilitate creating an exciting and festive community celebration atmosphere. If possible, the goal will be to partner with or incorporate other cultural and community-based organizations and/or local performances to create a fun, family-friendly event that will draw folks from many backgrounds and ages to engage with environmental preservation in a fun and exciting manner. These events are anticipated to continue after the grant period ends.

Subtask 4.B (Years 1-3) (NEOWTP): Create field-based hands-on training opportunities for professionals in the OWTS, low-impact development and building-associated industries to increase the capacity among professionals to justify, design, implement and manage watershed protective BMPs, including N-reducing OWTS and stormwater management options. The URI NEOWTP will work with professionals in the OWTS industry to hold training events designed to improve the quality of N-reducing technology designs, installations and operation and maintenance, and host accredited workshops, field tours and field-based training courses for professionals in the greater New England region. When appropriate, these workshops may also be adapted into online self-paced modules with optional field-based components. The Town and its partners will work to offer training opportunities for landscapers and other professionals in low-impact and environmentally friendly landscaping practices, including fertilizer and water management, as well as designing, installing and maintaining stormwater management structures. Current members of the Charlestown Recommended Landscaper Program will be prioritized for training opportunities relating to raingardens and vegetated coastal buffers, to enhance their skillsets and marketability.

Subtask 4.C (Years 4-5+): Share project design, implementation and preliminary results and impacts with municipalities, other coastal communities, state regulators, federal organizations and other decision makers (NEOWTP, TOC). The Town and its partners will host webinars, workshops and field tours for representatives of interested communities and municipalities, counties, state and federal entities and other individuals to share the approach, progress and preliminary results of the Pilot Watershed project. Input on the protocol from Task 1 will also be sought from these parties, as time and interest allows, to improve clarity, scalability, applicability and incorporate effective alternatives, customizations and methodologies adopted by other communities in the comprehensive protocol. A possible long-term outcome of this project could be better local and regional coordination of approaches to watershed protection, OWTS management and community engagement, based on strong relationships forged as a part of these idea-sharing sessions.

Subtask 4.D (Years 5+): Share results of pilot watershed activities with scientific, government, NGO and policy-making audiences to inform future research, grant opportunities and regulatory frameworks (NEOWTP, LSEM). Partners will present project findings and watershed impacts at local, regional and national conferences, webinars and workshops. These will be tailored to appropriate audiences, and may include scientific information and/or be based on the final products from Task 1. Scientific analyses of N-reducing OWTS performance and potential or documented impacts on nearby surface waters will be published in peer-reviewed academic journals and student project summaries (theses, etc.). Community engagement efforts will also be documented and disseminated in appropriate conferences and publications.

## Partnerships & Leveraging

As described above and detailed below, the Town and its URI partners have been awarded RIDEM experimental certification to test N-reducing LSTA systems in Charlestown, RI. The Town has allocated \$250,000 to install and monitor the

performance of up to four systems, and funding obtained in collaboration with Suffolk County from the National Estuarine Program for \$250,000 will support the installation of up to two more systems. However, these funds must be divided and \$20,000 per system must be held in escrow to replace the LSTA with an approved I&A technology as part of the RIDEM experimental certification. Funds from this proposed project would allow an additional two systems to be installed, adding to the dataset that we expect will support certifying systems as effective Class II options, allowing more wide-spread implementation in RI.

Our partner, the SPC, is committed to educating the residents of the salt ponds region about the salt ponds value to the economy, and how residents can contribute to the well-being of the resource. SPC also acts as a conduit between the residents of the coastal communities and state and local governments for the flow of information regarding this resource. In 2003, the Salt Ponds Coalition was designated as the Watershed Council for the salt ponds region by the RI General Assembly. SPC collaborates with the URI Watershed Watch and has conducted region wide surface water sampling of the salt ponds for over 27 years. With a wide reaching community engagement program within the salt ponds region, the SPC is a valuable partner.

Save The Bay has been advocating for water quality in the Greater Narragansett Bay region since 1970. In 2007, STB established the South Coast Center to expand STB efforts along Rhode Island's southern coast. Their skilled environmental educators will facilitate community engagement and their professional field staff will provide technical expertise for stormwater BMP installations to function as effective mitigation measures and teaching tools within the pilot watershed.

The Town is also excited to continue and develop new partnerships with a variety of organizations in RI, and is committed to establishing new partnerships with schools (e.g. The Greene School, a charter school that specializes in experiential and service-based outdoor education) and other community-based organizations in the area. We have also recently begun to establish a relationship with the Narragansett Indian Tribe, with the goal of partnering with the tribe to amplify their voices and ways of knowing related to the cultural and indigenous history of the region and this watershed. As evidenced by the included partnership letters, and letter of support, this project will be made possible through strong collaborations with URI's Laboratory of Soil Ecology and Microbiology (LSEM) and New England Onsite Wastewater Training Program (NEOWTP), Save the Bay (STB) and the Salt Ponds Coalition (SPC). Each of these partners bring expertise and experience critical to the proposed project's success, and we are confident that other partner organizations will join our efforts to protect the pilot watershed.

## Programmatic Capability

The Town is uniquely positioned through its institutional organization and staffing to successfully manage not only complex day to day municipal functions but additional highly technical professional tasks. Municipal staff includes highly skilled professionals who also have project management experience. Technical staffing and Partner expertise consists of:

Matthew J. Dowling, Town of Charlestown OWTS Manager/Environmental Scientist: Lead technical expert and project manager, has over 21 years of project coordination experience in groundwater hydrogeology, groundwater remediation and watershed management. Under Municipal Code, he currently oversees the individual management of over 5,000 OWTS (and >600 N-Reducing OWTS) in town for protection of public health and the environment. The program has also recently removed 99% of cesspools from Charlestown. He developed policies, meta-analyses, datasets, publications and maps that quantify nutrient impacts to the Watershed.

Stephen J. McCandless, Town of Charlestown Coastal Geologist/GIS Specialist: Principal technical expert for the project is a leading expert specializing in the geologic processes of the coastal barrier lagoon complexes of Southern Rhode Island. He directs the Town's GIS Dept.

Irina M. Gorman, Town Finance Director: Has over 16 years of municipal finance experience and will provide fiscal management and financial grant reporting. She manages accounting of the General Fund and 45 additional grants and funds. Town annual audits are consistently "clean" with no findings.

Alissa H. Cox, PhD, Director URI New England On-Site Wastewater Training Program (NEOWTP): Research project and data analysis co-leader. Project field sampling and community engagement and training leader who will oversee a research assistant/field sampling coordinator. Dr. Cox will supervise graduate and undergraduate students in conducting field

sampling, laboratory and data analyses. Specializes in onsite wastewater treatment systems; groundwater modeling; climate change resilience; applied soil microbiology; general, secondary and post-secondary STEM formal and informal education. Jose A. Amador, PhD Soil Science, URI LSEM: Research project and data analysis co-leader. Dr. Amador will co-supervise students to conduct field sampling, laboratory and data analysis. Specializes in applied soil ecology and microbiology; biogeochemistry; biodegradation and bioremediation; onsite wastewater treatment systems; innovative n-reducing technology performance; source tracking of fecal contamination; watershed-level modeling of nutrient impacts and mitigation strategies. George Loomis, Senior Program Advisor URI New England On-Site Wastewater Training Program (NEOWTP): Support and advise project field sampling and community engagement and training activities. He is a research soil scientist and the director of the NEOWTC with over 31 years of experience in siting, design, O&M, and research in OWTS. He directed state and federally-funded OWTS projects installing nearly 60 N-removal technologies in RI. He is a member of the DEM TRC and OWTS Task Force and co-developed the RI sand filter guide and bottomless sand filter guide for DEM.

**Fiscal Management.** Charlestown has obtained over **\$6.6 million** in funding and has implemented over 25 Federal and State assistance awards since 2015 for a total award expenditure of over **\$6 million**. Projects are diverse and have been managed by Town of Charlestown staff. A summary of the largest and most applicable awards are:

Town of Charlestown Nitrogen Reducing Layered Soil Treatment Area Experimental OWTS Technology Assessment (Ongoing): FY 2021-2023, **\$250,000**. The Town of Charlestown allocated funding for development and assessment of new, low cost, passive and effective N-reducing OWTS technology. The Town partnered with LSEM and NEOWTP, developed experimental OWTS design, applied for and received RIDEM approval to assess this technology in field trials in Charlestown.

National Estuary Program, A Regional Collaboration to Install Innovative Low Tech Layered Soil Treatment Area Septic Systems to Quantifiably Reduce Nitrogen Load within Three NEP Nutrient Impacted Coastal Estuarine Watersheds (Ongoing): FY 2021-2023, **\$250,000**. Town of Charlestown partnered with Suffolk County Department of Health Services (NY), Stony Brook University Center for Clean Water Technology, LSEM and NEOWTP to install and research LSTA as developed by Charlestown within three NEP Watersheds with the expectation of seeking future regulatory approval for general use in the two states.

Environmental Protection Agency (EPA) Region 1 Southeast New England Program (SNEP) Coastal Watershed Restoration Grant: FY 2017 - 2021, **\$878,857** to implement a comprehensive coastal watershed protection and restoration program, conducting assessments and activities to simultaneously better understand nutrient loading impacts and quantifiably reduce and mitigate those impacts to groundwater and surface water bodies located within Charlestown's South Shore Salt Ponds Watershed (the "Watershed") of Green Hill, Ninigret and Quonochontaug Salt Ponds.

The US Department of Health Medical Emergency Distribution System (MEDS): FY 2021, **\$12,572** The Town recently implemented its federally funded MEDS program for mass distribution of COVID-19 vaccinations through its joint regional Point of Distribution (POD).

RI Department of Environmental Management: FY2020-FY2021, **\$568,031** To develop new fitness spaces within the town's largest municipal park, Ninigret Park and for open space acquisition for Tucker Woods preserve.

Federal Emergency Management Agency (FEMA): FY2020, **\$43,309**, The town managed federal funding for COVID-19 for emergency management and municipal operations.

The United States Department of Housing and Urban Development (HUD): FY 2015 through 2021 **\$287,036** to implement the CDBG program for housing development, rehab, support for shelters and public service organizations.

The United States Department of Housing and Urban Development (HUD): FY 2015 through 2021, **\$4,275,824** - Disaster Relief assistance for Winter Storm NEMO and Super Storm Sandy. Reports submitted to HUD and FEMA. Combined HUD CDBG funding was also utilized from 2015 through 2021 for the following additional projects:

1. Church Woods Community Housing - **\$4,091,673**: Church Woods senior housing project (\$251,040 currently 67% expended), a 24 unit housing development for low/moderate income seniors An additional \$4.1 million has been approved. To date, the Town has provided copies of the invoices and has been reimbursed for \$248,132.

2. Charlestown Municipal Community Center - **\$83,385** for improvements including emergency generator, parking lot lighting and a software system.

The RI Office of Healthy Aging: FY2017-FY2021, **\$32,683** To improve senior community engagement programs.

All the above-mentioned grants have been audited on an annual basis by Town auditors. There have been no irregularities or findings. All filing reports have been consistently filed on time and the Town has received reimbursements in a timely

manner. The Town documents in-kind services, manages budgetary and technical aspects of each project and copies of all submittals are retained by the Town.

## Cost Effectiveness & Match

The proposed project will require \$1,406,903 in total funding. We are requesting \$749,999 in SNEP Pilot Watershed Initiative funding, which will be matched by \$34,290 in non-federal match funding (TOC & NEOWTP) and \$622,614 in in-kind match from partners. The attached budget detail lays out a detailed breakdown of each task's costs incurred over the 5-year period, organized by partner organization. Below is a summary of how the funds will be spent, based on the tasks outlined above and the attached budget detail.

- Task 1: Request \$0, In-Kind Match \$58,102, Total \$58,102.
- Task 2: Request \$471,319, In-Kind/Fiscal Match \$207,109, Total \$400,928.
- Task 3: Request \$750,188, In-Kind Match \$129,178, Total \$204,196.
- Task 4: Request \$203,662, In-Kind Match \$228,226, Total \$400,231.

## Monitoring, Tracking and Measuring of Environmental Results

The proposed pilot watershed initiative will result in the reduction of 350 lbs N to the watershed each year, as a result of the outputs of Tasks 2 and 3. OWTs upgrades and vegetative buffers and raingardens will be installed by the end of year 4 of the project. Monitoring of OWTS, a requirement homeowners will agree to as part of the subsidized upgrade process and are already incorporated into the town's wastewater management ordinances, will commence as individual systems go into use, and continue for the duration of the grant period. N-reducing OWTS performance monitoring will help establish the nutrient reduction from the >30 total upgraded OWTS (>15 past upgrades and 15 currently proposed upgrades), and SPC's surface water monitoring efforts will document contaminant concentrations in the receiving water body, which can be compared to past datasets to establish how the proposed nutrient mitigation strategies are impacting the waters in the area. Ultimately, project findings will be analyzed and published in peer-reviewed scientific journals, and presented at local, regional and national conferences and workshops.

Effectiveness of partnerships and community engagement efforts will be measured by the number of successful partnerships established and maintained by the end of the grant's reporting period. Informal interviews, surveys and the nature and quality of partner interactions and co-created outputs will be used as metrics to assess both partnerships and the resulting community engagement activities. Informal assessments and follow-up surveys of participants on the watershed celebration days will be used to assess program impacts and effectiveness, and inform adaptations in future years.

## Transferability of Results

Tasks 1 and 4 will produce reports and materials for presentations to share approaches and lessons learned with a wide range of stakeholders, both as the project is implemented in its various stages, and after the project has been completed. Within two years of the project closing, major findings will be reported to SNEP and its partners, as well as shared with other communities and stakeholders as laid out in Tasks 1 and 4. We hope to document and describe the efforts in this project, and believe that the project will serve as a demonstration watershed for other communities.

## Timely Expenditure of Funds

Each task and subtask has been given a priority, project outlook and expected completion date. The attached budget detail has expenditures broken down by task and partner, and also shows anticipated expenditures by year. All tasks will be entered into a matrix for internal tracking purposes and to ensure schedules are met. The existing infrastructure and organizational structure of the OWTS Management Office and Finance Department put into place under the past SNEP agreement will easily allow for seamless transition into each task

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<b>Grant Request Total</b>	<b>\$749,999.11</b>
<b>Fiscal Match Total</b>	<b>\$34,289.84</b>
<b>+ In-kind Match Total</b>	<b>\$622,614.52</b>
<b>Project Total</b>	<b>\$1,406,903.47</b>

year:	<b>YEAR 1</b>	<b>YEAR 2</b>	<b>YEAR 3</b>	<b>YEAR 4</b>	<b>YEAR 5</b>
	<b>\$140,834</b>	<b>\$171,479</b>	<b>\$161,940</b>	<b>\$160,373</b>	<b>\$115,374</b>
					<b>\$749,999</b>

**Breakdown by Task**

**Task 1 - Watershed Management Program Protocol**

<i>Compile comprehensive protocol describing how to establish comprehensive watershed management plan</i>				
	<b>Town of Charlestown</b>	<b>Request</b>	<b>In-kind</b>	<b>Total</b>
<b>PERSONNEL</b>				
Environmental Scientist, 5% time over 3 years		\$0.00	\$13,149.80	\$13,149.80
GIS Specialist/Coastal Geologist, 7.5% time over 3 years		\$0.00	\$19,817.32	\$19,817.32
<b>TOTAL PERSONNEL COSTS</b>		<b>\$0.00</b>	<b>\$32,967.12</b>	<b>\$32,967.12</b>
<b>FRINGE</b>				
Environmental Scientist		\$0.00	\$6,274.21	\$6,274.21
GIS Specialist/Coastal Geologist		\$0.00	\$9,435.69	\$9,435.69
<b>TOTAL FRINGE BENEFITS</b>			<b>\$15,709.90</b>	<b>\$15,709.90</b>
<b>TOTAL DIRECT COSTS</b>		<b>\$0.00</b>	<b>\$48,677.02</b>	<b>\$48,677.02</b>
<b>TOTAL REQUESTED FROM AGENCY</b>		<b>\$0.00</b>	<b>\$48,677.02</b>	<b>\$48,677.02</b>

<b>University of Rhode Island</b>				
<b>New England Onsite Wastewater Training Program</b>				
		<b>Request</b>	<b>In-kind</b>	<b>Total</b>
<b>PERSONNEL</b>				
Alissa Cox, 3% Academic year over 3 years		\$0.00	\$6,300.00	\$6,300.00
<b>TOTAL PERSONNEL COSTS</b>		<b>\$0.00</b>	<b>\$6,300.00</b>	<b>\$6,300.00</b>
<b>FRINGE</b>				
Alissa Cox (Fringe - 36%)		\$0.00	\$2,268.00	\$2,268.00
<b>TOTAL FRINGE BENEFITS</b>		<b>\$0.00</b>	<b>\$2,268.00</b>	<b>\$2,268.00</b>
<b>TOTAL DIRECT COSTS</b>		<b>\$0.00</b>	<b>\$8,568.00</b>	<b>\$8,568.00</b>
<b>TOTAL MODIFIED DIRECT COSTS</b>		<b>\$0.00</b>	<b>\$8,568.00</b>	<b>\$8,568.00</b>
<b>FACILITIES AND ADMINISTRATIVE COSTS 10% MTDC</b>		<b>\$0.00</b>	<b>\$856.80</b>	<b>\$856.80</b>
<b>TOTAL REQUESTED FROM AGENCY</b>		<b>\$0.00</b>	<b>\$9,424.80</b>	<b>\$9,424.80</b>

<b>TASK 1 TOTAL</b>	<b>\$0.00</b>	<b>\$58,101.82</b>	<b>\$58,101.82</b>
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<b>YEAR 1</b>	<b>YEAR 2</b>	<b>YEAR 3</b>	<b>YEAR 4</b>	<b>YEAR 5</b>
<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

**Task 2 - OWTS Upgrades & Effluent Sampling and Optimization**

University of Rhode Island				
Laboratory of Soil Ecology and Microbiology				
	Request	In-kind	Total	
<b>PERSONNEL</b>				
Jose Amador, 2% time over 5 years	\$0.00	\$14,545.00	\$14,545.00	
Alissa Cox, 5% Academic Year time over 5 years	\$0.00	\$17,500.00	\$17,500.00	
Research Assistant , 2000 hours over 5 years @ \$20/hr	\$40,000.00	\$4,360.00	\$44,360.00	
Graduate Assistant - 1 Academic Year	\$20,700.00	\$20,000.00	\$40,700.00	
Graduate Assistant - 1 Summer (20 hrs/week)	\$9,300.00	\$9,000.00	\$18,300.00	
Undergraduate Students 1000 hours over 5 years @ \$15/hour	\$15,000.00	\$5,000.00	\$20,000.00	
<b>TOTAL PERSONNEL COSTS</b>	<b>\$85,000.00</b>	<b>\$55,860.00</b>	<b>\$140,860.00</b>	
<b>FRINGE</b>				
Jose Amador (Fringe - 36%)	\$0.00	\$5,236.20	\$5,236.20	
Alissa Cox (Fringe - 36%)	\$0.00	\$6,300.00	\$6,300.00	
Research Assistant (Fringe - 7.65%)	\$3,060.00	\$333.54	\$3,393.54	
GRA - AY - Fringe Benefits	\$2,635.00	\$5,270.00	\$7,905.00	
GRA - Summer FICA	\$711.45	\$688.50	\$1,399.95	
<b>TOTAL FRINGE BENEFITS</b>	<b>\$6,406.45</b>	<b>\$12,592.04</b>	<b>\$18,998.49</b>	
<b>TRAVEL</b>				
Domestic	\$3,700.00	\$288.00	\$3,988.00	
<b>TOTAL TRAVEL</b>	<b>\$3,700.00</b>	<b>\$288.00</b>	<b>\$3,988.00</b>	
<b>SUPPLIES</b>				
Lab Supplies	\$10,000.00	\$2,000.00	\$12,000.00	
<b>TOTAL SUPPLIES</b>	<b>\$10,000.00</b>	<b>\$2,000.00</b>	<b>\$12,000.00</b>	
<b>OTHER COSTS</b>				
Graduate Assistant In-State Tuition (1 year)	\$16,322.00	\$16,322.00	\$32,644.00	
<b>TOTAL OTHER COSTS</b>	<b>\$16,322.00</b>	<b>\$16,322.00</b>	<b>\$32,644.00</b>	
<b>TOTAL DIRECT COSTS</b>	<b>\$105,106.45</b>	<b>\$70,740.04</b>	<b>\$175,846.49</b>	
<b>TOTAL MODIFIED DIRECT COSTS</b>	<b>\$105,106.45</b>	<b>\$70,740.04</b>	<b>\$175,846.49</b>	
<b>FACILITIES AND ADMINISTRATIVE COSTS 57% MTDC</b>	<b>\$59,910.68</b>	<b>\$40,321.82</b>	<b>\$100,232.50</b>	
Town of Charlestown Fiscal Match	\$0.00	\$24,289.84	\$24,289.84	
<b>TOTAL REQUESTED FROM AGENCY</b>	<b>\$181,339.13</b>	<b>\$127,383.86</b>	<b>\$308,722.99</b>	

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
\$0	\$0	\$0	\$0	\$0
\$0	\$0	\$0	\$0	\$0
\$8,000	\$8,000	\$8,000	\$8,000	\$8,000
\$10,350	\$10,350	\$0	\$0	\$0
\$9,300	\$0	\$0	\$0	\$0
\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
\$0	\$0	\$0	\$0	\$0
\$0	\$0	\$0	\$0	\$0
\$612	\$612	\$612	\$612	\$612
\$1,318	\$1,318	\$0	\$0	\$0
\$711	\$0	\$0	\$0	\$0
\$200	\$200	\$500	\$1,400	\$1,400
\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
\$8,161	\$8,161	\$0	\$0	\$0
\$43,652	\$33,641	\$14,112	\$15,012	\$15,012
\$20,230	\$14,523	\$8,044	\$8,557	\$8,557
YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
<b>\$63,882</b>	<b>\$48,164</b>	<b>\$22,156</b>	<b>\$23,569</b>	<b>\$23,569</b>
				\$181,339

	Town of Charlestown		Request	In-kind	Total
<b>PERSONNEL</b>					
Environmental Scientist, 5% time over 5 years			\$0.00	\$17,809.03	\$17,809.03
GIS Specialist/Coastal Geologist, 7.5% time over 5 years			\$0.00	\$26,841.95	\$26,841.95
Administrative Assistant, 7.5% time over 5 years			\$0.00	\$13,760.37	\$13,760.37
Environmental Science Intern, \$15/Hour 1387 hours over 5 years			\$12,480.00	\$0.00	\$12,480.00
<b>TOTAL PERSONNEL COSTS</b>			<b>\$12,480.00</b>	\$58,411.34	\$70,891.34
<b>FRINGE</b>					
Environmental Scientist			\$0.00	\$6,274.21	\$6,274.21
GIS Specialist/Coastal Geologist			\$0.00	\$9,435.69	\$9,435.69
Administrative Assistant			\$0.00	\$5,604.18	\$5,604.18
<b>TOTAL FRINGE BENEFITS</b>			<b>\$0.00</b>	\$21,314.08	\$21,314.08
<b>OPERATING COSTS</b>					
Funds for design, permitting, installation, and supplies			\$270,000.00	\$0.00	\$270,000.00
15 systems @ \$18,000 per system					\$0.00
5 N-sensors (estimated \$1,500 each)			\$7,500.00	\$0.00	\$7,500.00
<b>TOTAL OPERATING COSTS</b>			<b>\$277,500.00</b>	\$0.00	<b>\$277,500.00</b>
<b>TOTAL DIRECT COSTS</b>			<b>\$289,980.00</b>	\$79,725.42	<b>\$92,205.42</b>
<b>TOTAL REQUESTED FROM AGENCY</b>			<b>\$289,980.00</b>	<b>\$79,725.42</b>	<b>\$92,205.42</b>
<b>TASK 2 TOTAL</b>			<b>\$471,319.13</b>	<b>\$207,109.28</b>	<b>\$400,928.41</b>

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
	\$2,496	\$2,496	\$2,496	\$2,496	\$2,496	\$2,496
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
	\$67,500	\$67,500	\$67,500	\$67,500	\$67,500	\$0
	\$0	\$0	\$7,500.00	\$0	\$0	\$0
	\$69,996	\$69,996	\$77,496	\$69,996	\$2,496	\$289,980
	<b>\$133,878</b>	<b>\$118,160</b>	<b>\$99,652</b>	<b>\$93,565</b>	<b>\$26,065</b>	<b>\$471,319</b>

### Task 3 – Stormwater, runoff & fertilizer management

	Town of Charlestown		Request	In-kind	Total
<b>PERSONNEL</b>					
Environmental Scientist, 10% time over 3 years			\$0.00	\$26,299.60	\$26,299.60
GIS Specialist/Coastal Geologist, 7.5% time over 3 years			\$0.00	\$19,817.32	\$19,817.32
Administrative Assistant, 10% time over 3 years			\$0.00	\$15,613.48	\$15,613.48
Environmental Science Intern, \$15/Hour 300 hours over 3 years			\$4,500.00	\$0.00	\$4,500.00
<b>TOTAL PERSONNEL COSTS</b>			<b>\$4,500.00</b>	\$61,730.40	\$66,230.40
<b>FRINGE</b>					
Environmental Scientist			\$0.00	\$12,548.42	\$12,548.42
GIS Specialist/Coastal Geologist			\$0.00	\$9,435.69	\$9,435.69
Administrative Assistant			\$0.00	\$7,472.24	\$7,472.24
<b>TOTAL FRINGE BENEFITS</b>			<b>\$0.00</b>	\$29,456.35	\$29,456.35
<b>OPERATING COSTS</b>					
Letterhead, envelopes, ink, etc			\$420.00	\$0.00	\$420.00
<b>TOTAL OPERATING COSTS</b>			<b>\$420.00</b>	\$0.00	<b>\$420.00</b>
<b>TOTAL DIRECT COSTS</b>			<b>\$4,920.00</b>	\$91,186.75	<b>\$96,106.75</b>
<b>TOTAL REQUESTED FROM AGENCY</b>			<b>\$4,920.00</b>	\$91,186.75	<b>\$96,106.75</b>

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$1,500	\$1,500	\$1,500	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$140	\$140	\$140	\$0	\$0
	<b>\$0</b>	<b>\$1,640</b>	<b>\$1,640</b>	<b>\$1,640</b>	<b>\$0</b>	<b>\$4,920</b>



### Task 4 - Community Engagement

<i>Produce on-line video resources &amp; facilitate community engagement activities in the Watershed</i>					
	Salt Ponds Coalition		Request	In-kind	Total
<b>PERSONNEL</b>					
SPC Executive Director, 4% time over 4 years (7hr/mo @ \$35/hr)			\$11,760.00	\$0.00	\$11,760.00
SPC Staff - Video/Photo/Graphic Content Producer (~20hr/mo @ \$20/hr)			\$19,200.00	\$0.00	\$19,200.00
<b>TOTAL PERSONNEL COSTS</b>			<b>\$30,960.00</b>	\$0.00	\$30,960.00
<b>OPERATING COSTS</b>					
Video Production			\$5,000.00	\$0.00	\$5,000.00
Marketing & Print Materials			\$3,500.00	\$0.00	\$3,500.00
<b>TOTAL OPERATING COSTS</b>			<b>\$8,500.00</b>	\$0.00	\$8,500.00
<b>TOTAL DIRECT COSTS</b>			<b>\$39,460.00</b>	\$0.00	\$39,460.00
<b>TOTAL REQUESTED FROM AGENCY</b>			<b>\$39,460.00</b>	\$0.00	\$39,460.00

<i>Engage local school students in vegetated buffer/raingarden installation as a service learning tool</i>					
	Save the Bay		Request	In-kind	Total
<b>PERSONNEL</b>					
Director of Education (\$52/hr)			\$10,301.00	\$0.00	\$10,301.00
Education Program Manager (\$28/hr)			\$4,010.00	\$0.00	\$4,010.00
Director of Habitat Restoration			\$0.00	\$1,577.00	\$1,577.00
South County Coast Keeper			\$8,247.00	\$0.00	\$8,247.00
Advocacy Coordinator (\$28/hr)			\$2,406.00	\$3,322.00	\$5,728.00
Education Specialists (3 @ \$26/hr)			\$12,763.80	\$6,644.00	\$19,407.80
Volunteers			\$0.00	\$10,880.00	\$10,880.00
<b>TOTAL PERSONNEL COSTS</b>			<b>\$37,727.80</b>	\$22,423.00	\$60,150.80
<b>FRINGE</b>					
Fringe			\$9,431.95	\$378.48	\$9,810.43
<b>OPERATING COSTS</b>					
Planting & Educational Materials			\$10,500.00	\$0.00	\$10,500.00
<b>TOTAL OPERATING COSTS</b>			<b>\$10,500.00</b>	\$0.00	\$10,500.00
<b>TRAVEL</b>					
Mileage, 909 miles per year of driving @ \$0.56/mile			\$2,021.62	\$0.00	\$2,021.62
Student bus transportation (\$1200/yr)			\$4,800.00	\$0.00	\$4,800.00
<b>TOTAL TRAVEL</b>			<b>\$6,821.62</b>	\$0.00	\$6,821.62
<b>TOTAL DIRECT COSTS</b>			<b>\$64,481.37</b>	\$22,423.00	\$77,472.42
<b>INDIRECT COSTS (10% De Minimis)</b>			\$6,448.14	\$2,242.30	\$8,690.44
<b>TOTAL REQUESTED FROM AGENCY</b>			<b>\$70,929.50</b>	<b>\$24,665.30</b>	<b>\$86,162.85</b>

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
\$0	\$2,940	\$2,940	\$2,940	\$2,940	\$2,940
\$0	\$4,800	\$4,800	\$4,800	\$4,800	\$4,800
\$0	\$0	\$0	\$2,500	\$2,500	\$2,500
\$0	\$0	\$0	\$1,750	\$1,750	\$1,750
YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
<b>\$0</b>	<b>\$7,740</b>	<b>\$7,740</b>	<b>\$11,990</b>	<b>\$11,990</b>	<b>\$39,460</b>
\$0	\$3,640	\$2,127	\$2,250	\$2,284	\$10,301
\$0	\$980	\$995	\$1,010	\$1,025	\$4,010
\$0	\$0	\$0	\$0	\$0	\$0
\$0	\$2,016	\$2,046	\$2,077	\$2,108	\$8,247
\$0	\$588	\$597	\$606	\$615	\$2,406
\$0	\$3,191	\$3,191	\$3,191	\$3,191	\$12,764
\$0	\$2,604	\$2,239	\$2,283	\$2,306	\$9,432
\$0	\$3,000	\$2,500	\$2,500	\$2,500	\$10,500
\$0	\$505	\$505	\$505	\$505	\$2,022
\$0	\$1,200	\$1,200	\$1,200	\$1,200	\$4,800
YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
\$0	\$1,772	\$1,540	\$1,562	\$1,573	\$6,448
<b>\$0</b>	<b>\$19,497</b>	<b>\$16,940</b>	<b>\$17,185</b>	<b>\$17,308</b>	<b>\$70,930</b>

<i>Develop &amp; deliver field-based training for OWTS professionals; coordinate &amp; co-develop community engagement activities with schools; co-develop &amp; coordinate watershed celebration days for the public; present &amp; communicate findings with scientists, regulators &amp; other stakeholders</i>					
<b>New England Onsite Wastewater Training Program</b>			<b>Request</b>	<b>In-kind</b>	<b>Total</b>
<b>PERSONNEL</b>					
Alissa Cox - 10% Summer Salary for years 1-4, Full for year 5			\$27,300.00	\$60,000.00	\$87,300.00
Alissa Cox - 10% Academic Year over 5 years			\$0.00	\$35,000.00	\$17,500.00
Administrative Assistant - 500 hours over 5 years @ \$29/hr			\$14,500.00	\$36,250.00	\$50,750.00
<b>TOTAL PERSONNEL COSTS</b>			<b>\$41,800.00</b>	<b>\$131,250.00</b>	<b>\$155,550.00</b>
<b>FRINGE</b>					
Alissa Cox - Summer FICA (7.65%) for 5 years			\$2,088.45	\$4,590.00	\$6,678.45
Alissa Cox - 10% Academic Year Fringe (36%) over 5 years			\$0.00	\$12,600.00	\$12,600.00
Administrative Assistant - FICA over 5 years @ \$29/hr			\$1,109.25	\$2,773.13	\$3,882.38
<b>TOTAL FRINGE BENEFITS</b>			<b>\$3,197.70</b>	<b>\$19,963.13</b>	<b>\$23,160.83</b>
<b>OPERATING COSTS</b>					
Copies, poster/signage printing, mailing CEU certificates			\$1,000.00	\$500.00	\$1,500.00
Mileage, 500 miles of driving @\$0.56/mile			\$280.00	\$0.00	\$280.00
<b>TOTAL OPERATING COSTS</b>			<b>\$1,280.00</b>	<b>\$500.00</b>	<b>\$1,780.00</b>
<b>TOTAL DIRECT COSTS</b>			<b>\$46,277.70</b>	<b>\$151,713.13</b>	<b>\$180,490.83</b>
<b>FACILITIES AND ADMINISTRATIVE COSTS 27% MTDC</b>			<b>\$12,494.98</b>	<b>\$40,962.54</b>	<b>\$48,732.52</b>
Training Center Program Income from Training Class Fees (Fiscal Ma			\$0.00	\$10,000.00	\$10,000.00
<b>TOTAL REQUESTED FROM AGENCY</b>			<b>\$58,772.68</b>	<b>\$192,675.67</b>	<b>\$229,223.35</b>

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
\$1,950	\$1,950	\$1,950	\$1,950	\$19,500	\$27,300
\$0	\$0	\$0	\$0	\$0	
\$2,900	\$2,900	\$2,900	\$2,900	\$2,900	\$14,500
\$149	\$149	\$149	\$149	\$1,492	\$2,088
\$0	\$0	\$0	\$0	\$0	
\$222	\$222	\$222	\$222	\$222	\$1,109
\$200	\$200	\$200	\$200	\$200	\$1,000
\$56	\$56	\$56	\$56	\$56	\$280
\$1,479	\$1,479	\$1,479	\$1,479	\$6,580	
\$6,956	\$6,956	\$6,956	\$6,956	\$30,949	\$58,773

<i>Share Task 1 output with communities, municipalities, counties, regulators, NGOs and other organizations; co-develop and co-coordinate watershed celebration days</i>					
<b>Town of Charlestown</b>			<b>Request</b>	<b>In-kind</b>	<b>Total</b>
<b>PERSONNEL</b>					
Environmental Scientist, 1% time over 3 years			\$0.00	\$2,629.96	\$2,629.96
<b>TOTAL PERSONNEL COSTS</b>			<b>\$0.00</b>	<b>\$2,629.96</b>	<b>\$2,629.96</b>
<b>FRINGE</b>					
Environmental Scientist			\$0.00	\$1,254.84	\$1,254.84
<b>TOTAL FRINGE BENEFITS</b>				<b>\$1,254.84</b>	<b>\$1,254.84</b>
<b>TOTAL DIRECT COSTS</b>			<b>\$0.00</b>	<b>\$3,884.80</b>	<b>\$3,884.80</b>
<b>TOTAL REQUESTED FROM AGENCY</b>			<b>\$0.00</b>	<b>\$3,884.80</b>	<b>\$3,884.80</b>

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
\$0	\$0	\$0	\$0	\$0	\$0
\$0	\$0	\$0	\$0	\$0	\$0
\$0	\$0	\$0	\$0	\$0	\$0
\$0	\$0	\$0	\$0	\$0	\$0

<i>Establish new partnerships with local cultural and community-based organizations; Enhance community engagement and watershed celebration activities</i>						
	TBD			Request	In-kind	Total
<b>PERSONNEL</b>						
Partner 1				\$10,000.00	\$2,000.00	\$12,000.00
Partner 2				\$10,000.00	\$2,000.00	\$12,000.00
Partner 3				\$10,000.00	\$2,000.00	\$12,000.00
<b>TOTAL PERSONNEL COSTS</b>				<b>\$30,000.00</b>	<b>\$6,000.00</b>	<b>\$36,000.00</b>
<b>OPERATING COSTS</b>						
Copies, poster/signage printing, educational resources				\$3,000.00	\$500.00	\$3,500.00
Advertising				\$1,500.00	\$500.00	\$2,000.00
<b>TOTAL OPERATING COSTS</b>				<b>\$4,500.00</b>	<b>\$1,000.00</b>	<b>\$5,500.00</b>
<b>TOTAL DIRECT COSTS</b>				<b>\$34,500.00</b>	<b>\$7,000.00</b>	<b>\$41,500.00</b>
<b>TOTAL REQUESTED FROM AGENCY</b>				<b>\$34,500.00</b>	<b>\$7,000.00</b>	<b>\$41,500.00</b>

	\$0	\$0	\$3,333	\$3,333	\$3,333	
	\$0	\$0	\$3,333	\$3,333	\$3,333	
	\$0	\$0	\$3,333	\$3,333	\$3,333	
	\$0	\$0	\$1,000	\$1,000	\$1,000	
	\$0	\$0	\$500	\$500	\$500	
<b>YEAR 1</b>	<b>YEAR 2</b>	<b>YEAR 3</b>	<b>YEAR 4</b>	<b>YEAR 5</b>		
\$0	\$0	\$11,500	\$11,500	\$11,500	\$34,500	

**TASK 4 TOTAL** **\$203,662.18** **\$228,225.77** **\$400,231.00**

**YEAR 1** **YEAR 2** **YEAR 3** **YEAR 4** **YEAR 5**  
**\$6,955.82** **\$34,192.32** **\$43,136.20** **\$47,630.95** **\$71,746.89** #####

**Matthew J. Dowling**  
**4540 South County Trail, Charlestown Town Hall**  
**Charlestown, Rhode Island 02813**

(401) 364-5030

[mdowling@charlestownri.gov](mailto:mdowling@charlestownri.gov)

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**Watershed Management / Environmental Scientist**

*Environmental Science*

*Hydrogeology*

*Watershed Management*

**Profile:**

Education                      B.S., Geosciences, University of Rhode Island, 2000  
Minor in Natural Resource Science and GIS

**Pertinent Employment History:**

Town of Charlestown, Rhode Island, (January 2008 – Present)  
Environmental Scientist / On-Site Wastewater Manager  
Public Works Department, Town Hall  
4540 South County Trail  
Charlestown, Rhode Island  
(401) 364-5030  
<http://www.charlestownri.gov/>

The Town of Charlestown, Rhode Island relies solely on groundwater for potable water supply and exclusively on on-site wastewater treatment systems (OWTS) for treatment of wastewater. The most densely developed areas of the Town lie within the critically impacted “South Shore Salt Ponds Watershed”, where bacteria and nutrient loading have significantly impaired groundwater and surface water resources.

**Duties**

1. Manage and implement all aspects of the Town’s [On-Site Wastewater Management Program](#) to protect human health, groundwater for potability purposes and surface water quality.
  - Coordinate ongoing ordinance required inspection and pumping schedules for over 6,000 OWTS.
  - Review all state OWTS permits for compliance with town specific criteria.
  - Effectively managed the required removal and replacement of 99.9% of all cesspools town-wide (approximately 900) under the cesspool phase-out program.
  
2. Develop programs to sample, quantify and delineate impacts to surface water and groundwater resources from nutrient and bacterial loading using statistical modeling and GIS.
  - Monitor and sample surface water quality and review laboratory analytical results for the three coastal lagoons (salt ponds) and their freshwater tributaries, including maintaining TMDL compliance.

- Establish sampling protocols and programs to develop a large scale groundwater quality analytical dataset and implement various modeling methods to quantify groundwater nutrient loading impacts and identify source areas.
  - Identified a statistically significant relationship between density of OWTS and shallow groundwater aquifer nitrate nitrogen concentrations within the coastal zone of Charlestown.
  - Develop policy recommendations based on analytical trends of impacts to groundwater and surface water for the Wastewater Management Commission, Zoning Board, Town Council, state regulators and legislative committees.
  - Coordinate local and regional policy issues with legislative delegations and testify at Rhode Island House hearings.
3. Coordinate the Town's Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4) Program.
- Maintain compliance with the Town's Rhode Island Pollutant Discharge Elimination System (RIPDES) permit.
  - Established and manage the town's Resident Canada Goose Population Management Program to manage water quality impacts from nuisance wildlife under a US Fish and Wildlife Service Permit.
  - Established the Charlestown Recommended Landscaper Program to mitigate watershed impacts from lawncare professionals.
4. Manage the Town's environmental and coastal permitting and compliance for construction projects.
- Coordinate compliance for several municipal construction activities including two large capacity public beach pavilions and composting restrooms, public park composting restroom installations and stormwater infrastructure projects.
5. Serve as the Town's Enforcement Officer for ordinance violations.
- Manage municipal, district and superior court matters with Town Solicitor.
  - Testify as expert witness at hearings and Municipal and Superior Court trials.

### **Accomplishments**

Recent departmental [Annual Report](#) submitted to Charlestown Town Council, January 2021.

Successfully obtained, implemented, and managed \$880,000 EPA Watershed Restoration Grant funding to mitigate nutrient loading in a critically impacted coastal watershed entitled "*Charlestown Coastal Watershed Protection and Restoration Program (2016)*". [Final technical report](#) submitted March 24, 2021.

Worked to develop innovative, new, low cost and passive experimental nitrogen reducing septic system technology, [Nitrogen Reducing Layered Soil Treatment Area \(LSTA\) OWTS](#).

[Applied for](#) and successfully obtained a RIDEM [Certificate of Approval](#) for Experimental Technology Approval for LSTA.

Obtained and disseminated over \$2.1 million in RI State Revolving Fund low interest loan funding for septic system upgrades to protect public health, safety, welfare and the environment.

Recognized statewide as a leader in watershed management. Work closely with town departments, public water supply boards, local and national private non-profit land preservation entities, residents and local business community leaders. Served on several town, regional and legislative working groups. Oversee administrative staff, advanced degree environmental science interns, and staff scientists and policy analysts. Prepare and publicly present annual operating budget and has familiarity with Capital Improvement Plans. Prepare requests for proposals, bid specs and oversee purchasing.

Corporate Environmental Advisors, (CEA), Inc., (April 2003 – January 2008)

Senior Hydrogeologist / Project Manager

127 Hartwell Street

West Boylston, Massachusetts

(508) 835-8822

**Duties**

1. Maintain regulatory compliance for state listed hazardous waste sites in Massachusetts, Connecticut and Rhode Island.
  - Coordinate and supervise subsurface investigation and assessment activities relating to underground storage tank (UST) hazardous material releases and surface spills including but not limited to petroleum hydrocarbons such as gasoline, fuel oil, waste oil, hydraulic oil, PCBs and number 2 and number 6 heating oil.
  - Undertake soil boring advancement and soil sampling using both direct push technology (Geoprobe) and hollow stem augers (truck mounted drill rigs); soil and groundwater sampling; installation of overburden and bedrock groundwater monitoring wells; aquifer testing; soil gas surveys and air sampling; UST removal; contaminated soil excavation; and remediation system pilot testing.
  - Design and oversee installation of groundwater/soil remediation systems (high vacuum extraction, recovery wells, sparge and vent systems, potable well point of entry treatment systems, etc.) and manage optimization and maintenance of system operation.
2. Conduct sampling of groundwater monitoring wells, surface water bodies and potable water sources.
  - Submit samples for applicable EPA and/or state analysis under chain of custody protocol.
  - Review, tabulate and analyze laboratory analytical data for comparison to applicable groundwater or surface water standards (federal and/or state).
  - Observe data trends and determine appropriate mitigation methods.
3. Coordinate approval, transport and disposal of impacted media and hazardous materials at state approved recycling facilities.
  - Familiar with the State of Rhode Island, Connecticut and Massachusetts, the United States Environmental Protection (EPA), and the American Society for Testing and Materials (ASTM) laboratory analytical methods and analytes.

4. Responsible for the preparation and submittal of regulatory reports to state agencies.
  - Obtain property access agreements for off-site assessment/remediation activities.
  - Maintain client and state regulator relationships.
  - Supervise staff of environmental technicians for site sampling and remediation system operation and maintenance.

### **Certifications and Licenses**

State of Rhode Island Licensed Class 1 Septic System Designer  
State of Rhode Island Licensed Class IV Soil Evaluator  
State of Rhode Island Licensed Septic System Installer  
Rhode Island Department of Health Licensed Private Well Sampler  
Rhode Island Department of Health Licensed Interpreter  
University of Rhode Island - New England On-site Wastewater Training Center (NEOWTC) - Registered Conventional Septic System Inspector, NEOWTC - Registered Innovative and Alternative Operations and Maintenance Service Provider

### **Other Professional Training**

Board Member, Wood Pawcatuck Watershed Association  
Board of Engineers Member (Elected), Charlestown Fire District  
Executive Board Member, Charlestown Richmond Volunteer Fire Association  
Contributing Member, Shannock Water District  
Fire Captain and Station Training Officer, Charlestown Fire District, RI  
Continued Completion of Required Professional Development per RIDEM Designer Standards  
OHSA Hazardous Materials Technician Certified  
40-Hour OSHA (HAZWOPER) Trained, 8-Hour OSHA Supervisor Trained  
FEMA IS-700 National Incident Management System (NIMS) Trained  
NFPA Firefighter II Certified

# ALISSA H. COX

1685 Kingstown Rd. | Wakefield, RI 02879 | 401.368.6026 | alibba@uri.edu

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## EDUCATION & TRAINING

- Ph. D. – Biological & Environmental Sciences** 2020  
University of Rhode Island, Kingston, RI  
Specialization in Environmental and Earth Sciences  
Dissertation: [Coastal New England septic system drainfields: groundwater table and greenhouse gas cycling dynamics](#)
- Rhode Island Teaching Fellow**, Providence, RI 2013 – 2014  
Trained & certified to teach Secondary Grades Biology, General Science & Special Education (Mild/Moderate) in RI, through TNTP (The New Teacher Project) Academy  
Student Teaching Experience at Central High School (NECAP Math preparation)
- M. Sc. – Biological & Environmental Sciences** 2013  
University of Rhode Island, Kingston, RI  
Specialization in Sustainable Agriculture and Food systems  
Thesis: [Soil quality in Rhode Island pastures grazed by different types of livestock](#)
- B. S. – Biological Sciences** 2010  
University of Rhode Island, Kingston, RI  
Minor in Animal Veterinary Science  
Honor: *Summa Cum Laude*

## TEACHING EXPERIENCE

- Clinical Assistant Professor of Sustainable Ecological Design** 2020 – Present  
Dept. of Natural Resources Science, URI, Kingston, RI
- Redesigned course and taught 150 undergraduate students online (NRS 100 – Natural resource conservation)
  - Co-taught graduate course on public engagement with science (NRS 543) with Dr. Sunshine Menezes
  - Adapted existing graduate course on ecohydrology (NRS518) to incorporate green design
  - Co-developing an online course on soil-based wastewater treatment with Dr. Jose Amador
  - Participated in trainings to expand knowledge in inclusive pedagogy, online learning, and earned Social Justice and Inclusion Microcredential
- Instructor / Course Developer / Program Manager** 2017 – Present  
New England Onsite Wastewater Training Program, URI, Kingston, RI
- Taught courses on onsite wastewater treatment system function, processes, logistics, performance and design for professionals in the field fulfilling continuing education requirements
  - Updated course content to reflect current knowledge, regulations and best teaching practices
  - Developed new course content related to recent scientific research advances and conclusions related to onsite wastewater treatment systems
  - Managed the migration of course content to online delivery via WebEx Trainings, enabling participants to access continuing education while promoting high levels of engagement
  - Created content to support training program participants in accessing training sessions presented online via WebEx Trainings
  - Presented research findings to municipal and industry stakeholders to improve septic system design, inspection and maintenance outcomes

**Teaching Assistant** 2017 - 2019

*Ecohydrology (NRS 518) and Seminar in Natural Resources Science (NRS 200)*

Natural Resources Science Department, URI, Kingston, RI

- Presented biogeochemical concepts and applied research to graduate and undergraduate students
- Supported students in reading and analyzing scientific literature related to ecohydrology
- Supported students in exploring future career options and planning for these opportunities
- Created assessment rubrics; graded and supplied feedback on student writing assignments

**Tutor (Biology, Chemistry, Geometry, Algebra, Pre-Algebra)** 2015 - 2018

Math Advantage, Wakefield, RI

- Tutored upper elementary, middle and high school students individually and in groups, in Pre-algebra, Algebra 1 & 2, Geometry and Financial Algebra to deepen conceptual understanding and enhance problem-solving skills
- Tutored high school and college students in Biology and Chemistry to improve concept mastery and strengthen applied math and problem-solving skills
- Provided specialized math literacy support for an adult with learning disabilities
- Worked with parents and teachers to keep everyone informed of students' progress

**Long-term Special Education Substitute** 2015

*Math & English Language Arts*

Coventry High School, Coventry, RI

- Taught High School Common Core-Aligned English and Math courses in a self-contained behavioral program
- Managed a caseload of 11 students with emotional and behavioral disturbances
- Scheduled meetings for stakeholders, completed relevant special education legal paperwork

**Farm Manager** 2015

Coggeshall Farm Museum, Bristol, RI

- Interpreted 18<sup>th</sup> century farming practices for the general public and school groups (K-12)
- Connected with relevant community, state and federal programs and resources to improve state of fields, museum grounds and animal health
- Monitored and maintained animal health, training and well-being; developed protocols and training materials for staff related to daily animal care
- Maintained and updated animal health records; created policies and procedures related to the acquisition, culling, veterinary care and training of animals
- Oversaw cultivation and maintenance of heirloom 18<sup>th</sup> century kitchen garden
- Improved, maintained and repaired grounds, including buildings, facilities and fences

**Science Teacher / Special Educator** 2013 - 2015

Sheila "Skip" Nowell Leadership Academy, Providence, RI

- Designed, created and delivered blended-learning and NGSS-aligned science curricula to High School students in: Biology, Earth Science, Ecology, Anatomy & Physiology, Chemistry, and Physics
- Advised and assisted seniors in completing Capstone Projects (required for graduation)
- Created, maintained and updated records related to Students with Exceptional Learning needs
- Developed Individualized Education Programs and participated in IEP meetings for students; provided direct services to students with exceptional learning needs

**Teaching Assistant, Lab Coordinator**

2011 - 2013

Biological Sciences Department, URI, Kingston, RI

- Taught 3-4 sections of Human Anatomy Labs (BIO 121) each semester
- Developed quizzes and teaching materials for laboratory sections; received ratings of good/excellent from at least 75% students over 4 semesters
- Created lab schedules and determined Teaching Assistant assignments for 18-19 sections per semester
- Delivered lectures in Human Anatomy course during instructor's absences
- Performed dissections to enable students to visualize anatomical structures in animal specimens

**RHODE ISLAND TEACHING CERTIFICATIONS**

- |   |              |
|---|--------------|
| • Secondary Grades Biology Teacher, Grades 7-12, HQ         | Exp. 08/2017 |
| • Secondary Grades General Science Teacher, Grades 7-12, HQ | Exp. 08/2017 |
| • Middle/Secondary Special Education Teacher, Grades 7-12   | Exp. 08/2017 |

**RESEARCH EXPERIENCE****Graduate Research Assistant**

2016 - Present

Laboratory of Soil Ecology and Microbiology, URI, Kingston, RI

- Analyzed soil microbial community structure and function using next-generation sequencing of functional genes
- Installed shallow groundwater table monitoring wells with data loggers and analyzed long-term groundwater elevation patterns
- Created geo-referenced maps of southern Rhode Island septic systems to assess risk from storm events
- Coordinated with personnel from USDA NRCS and the Town of Charlestown to organize field activities investigating septic system leachfield components in relation to groundwater tables
- Integrated research findings and associated publications related to the impacts of climate change on coastal onsite wastewater systems and translated these into accessible course material and presentations to wastewater professionals, municipalities, regulators and the general public
- Designed plant experiments to identify native plants for use in applied wastewater improvement strategies
- Supervised and directed undergraduate research assistants in field and lab-based research practices and techniques, supported development of effective scientific communication

**Research Assistant**

2012 - 2013

Laboratory of Soil Ecology and Microbiology, URI, Kingston, RI

- Assisted in set-up of twenty mesocosms replicating diverse onsite wastewater treatment system leach fields to assess the impacts of climate change and sea level rise
- Designed and installed modified wastewater application technologies for mesocosms; trouble-shot, calibrated, and installed mesocosm instrumentation
- Collected soil and water samples, analyzed soil characteristics, ran laboratory tests to assess nutrient concentrations and other measures of soil and water quality and health

**Research Assistant I**

2010 - 2011

Robinson Lab, URI GSO, Narragansett, RI

- Prepared and ran deep ocean sediment samples for Ultra Performance Liquid Chromatography and stable Isotope Ratio Mass Spectrometry
- Cleaned and processed diatom samples to assess stable Nitrogen isotope ratios as a proxy for

- ocean foodweb activity in the early Pleistocene
- Cultivated and maintained denitrifying bacterial populations for lab sample digestion
- In charge of routine laboratory tasks, including preparing lab equipment for use in trace isotope analysis, material and lab safety protocols, chemical inventories and data entry
- Assisted in 2<sup>nd</sup> grade science demonstrations

**Research Assistant**

2010 - 2011

Meyerson Lab, URI, Kingston, RI

- Processed and prepared seaweed and small fish samples for stable isotope ratio Mass Spectrometry
- Dissected small fish and analyzed otoliths to determine age
- Completed routine laboratory tasks, including lab clean-up, inventory and data entry

**Center for Vector-Borne Disease at URI, Kingston, RI**

2008

*Undergraduate Research Fellow*

- Collected nymphal deer ticks throughout Rhode Island to create a database of relative tick densities in RI; helped maintain white-footed mouse colonies and tick populations
- Extracted and amplified DNA from deer ticks through PCR and ran electrophoresis gels to assess distribution of tick-borne diseases in the state

**PUBLICATIONS****Published:**

Bianca N. Ross, Sara K. Wigginton, **Alissa H. Cox**, George W. Loomis, & José A. Amador. (2020). "Influence of season, occupancy pattern, and technology on structure and composition of nitrifying and denitrifying bacterial communities in advanced nitrogen-removal onsite wastewater treatment systems." *Water*. 12(9):2413. DOI: 10.3390/w12092413

**Alissa H. Cox**, Sara K. Wigginton & José A. Amador. 2020. "Structure of greenhouse gas-consuming microbial communities in surface soils of a nitrogen-removing experimental drainfield." *Science in the Total Environment*. 739:140362. DOI: 10.1016/j.scitotenv.2020.140362

**Alissa H. Cox**, Matthew Dowling, George W. Loomis, Simon E. Engelhart & José A. Amador. 2020. "Geospatial modeling suggests threats from stormy seas to Rhode Island's coastal septic systems." *Journal of Sustainable Water in the Built Environment*. 6(3):04020012. DOI: 10.1061/JSWBAY.0000917

**Alissa H. Cox**, Deborah Surabian, George W. Loomis, Jim D. Turenne & José A. Amador. 2020. "Temporal Variability in the Vertical Separation Distance of Septic System Drainfields Along the Southern Rhode Island Coast." *Water Air & Soil Pollution*. 231(107). DOI: 10.1007/s11270-020-04488-z

Sara K. Wigginton, Elizabeth Q. Brannon, Patrick J. Kearns, Brittany V. Lancellotti, **Alissa H. Cox**, Serena Moseman-Valtierra, George W. Loomis, and José A. Amador. 2020. "Microbial Communities in Centralized and Decentralized Biological Nitrogen Removing Wastewater Treatment Systems." *Water*. 12(6):1688. DOI: 10.3390/w12061688

**Alissa H. Cox**, George W. Loomis & José A. Amador. 2019. "Preliminary evidence that rising groundwater tables are threatening coastal septic systems." *Journal of Sustainable Water in the Built Environment*. 5(4):04019007. DOI: 10.1061/JSWBAY.0000887

Sara K. Wigginton, Elizabeth Brannon, Patrick Kearns, Brittany V. Lancellotti, **Alissa H. Cox**, George W. Loomis & José A. Amador. 2018. "Nitrifying and denitrifying bacterial communities in advanced N-removal onsite wastewater treatment systems." *Journal of Environmental Quality*. 47(5):1163-1171. DOI: 10.2134/jeq2018.03.0116

**Alissa H. Cox** & José A. Amador. 2018. "How grazing affects soil quality of soils formed in the glaciated northeastern United States." *Environmental Monitoring and Assessment*. 190(159). DOI: 10.1007/s10661-018-6550-5

***In Review:***

**Alissa H. Cox** & George W. Loomis. (2021). "silver linings of the COVID era: structured rotating small-group approach improved engagement in outdoor technical education." Manuscript submitted to *Journal of Extension*.

***In Preparation:***

**Alissa H. Cox**, Bianca R. Ross, Sara K. Wigginton. (2021). "Anatomy of an 8-hour workshop for continuing education of adult professionals." Manuscript in preparation.

**PRESENTATIONS**

- Alissa H. Cox.** 2021. "Septic Systems Basics – protecting public and environmental health" *invited* speaker for URI Master Gardener Learn at Home Webinar Series. June 27, 2021. Virtual.
- Alissa H. Cox.** 2021. "Non-proprietary passive N-reducing Layered Soil Treatment Areas piloted in RI" *invited* speaker for EPA Region 1 Developing & Evaluating Promising Technologies: Pushing the Ball Forward on I/A Septic Systems Webinar Series. June 3, 2021. Virtual.
- Alissa H. Cox.** 2021. *Invited* science coach at Metcalf Institute's Annual Science Immersion Workshop for Journalists. May 27-28, 2021. Virtual.
- Alissa H. Cox.** 2021. "Septic Systems 101 – protecting public and environmental health on Nantucket" *invited* speaker for Nantucket Land Conservation Clean Water Webinar Series. May 13, 2021. Virtual.
- Alissa H. Cox.** 2021. "The Tide is High But I'm Holding On" *invited* speaker for Natick, MA board of Health. March 31, 2021. Virtual.
- Alissa H. Cox.** 2021. "Septic Systems 101" *invited* instructor for URI's Osher Lifelong Learning Institute. February 22, 2021. Virtual.
- Alissa H. Cox.** 2021. "A story from the littlest state: Septic systems along the coast threatened by climate change" *invited* speaker at NC State Effects of Sea Level Rise webinar. February 10, 2021. Virtual.
- Alissa H. Cox.** 2020. "The Latest Developments in Advances Septic System Research: Dual threats to septic systems along the coast: Rising groundwater & storms" *invited* speaker at Salt Ponds Coalition webinar. December 7, 2020. Virtual.
- Alissa H. Cox.** 2020. "Coastal community woes: septic system drainfields are threatened by elevated groundwater tables" *invited* presentation at the Geological Society of America Connects Online Conference. October 28, 2020. Virtual.
- Alissa H. Cox.** 2020. "Septic systems: Preserving Green Hill Pond" *invited* speaker at Friends of Green Hill Pond's annual meeting. June 20, 2020. Virtual.
- Alissa H. Cox.** 2020. *Invited* panelist at Metcalf Institute's Annual Science Immersion Workshop for Journalists. June 16, 2020. Virtual.
- Alissa H. Cox.** 2020. "Dual threats to septic systems along the coast: Rising groundwater & storms" *invited* presentation at [EPA SNEP Innovative and Alternative Septic Systems webinar](#). May 28, 2020. Virtual.
- Alissa H. Cox.** 2020. "Microbial composition of greenhouse gas cycling communities in soils above septic system drainfields" oral presentation at the RI Microbiome Symposium, January 17, 2020. Kingston, RI.
- Alissa H. Cox.** 2019. "Anatomy of an 8-hour workshop: promoting engagement and learning among adult professionals" oral presentation at the Soil Science Society of America International meeting, November 12, 2019. San Antonio, TX.
- Alissa H. Cox.** 2019. "A peek below the ground surface: Ground-Penetrating Radar and long-term monitoring wells suggest coastal septic systems are threatened by elevated groundwater tables"

oral presentation at the Soil Science Society of America International meeting, November 12, 2019. San Antonio, TX. *Awarded 2<sup>nd</sup> best presentation in Soil & Environmental Quality division.*

**Alissa H. Cox.** 2019. *Invited* panelist at “Turning the Tide” Reclaim Our Water’s Advancing Wastewater Treatment SepticSmart Week 2019 conference, September 17, 2019. Stony Brook, NY.

**Alissa H. Cox.** 2019. “Peering below the ground surface: ground-penetrating radar and long-term monitoring wells suggest coastal septic systems are threatened by elevated groundwater tables” oral presentation at the New England Graduate Student Water Symposium, September 8, 2019. Amherst, MA. *Awarded best presentation*

**Alissa H. Cox.** 2019. “Quantifying threats to coastal septic systems posed by rising groundwater tables.” *Invited* presentation at the National Cooperative Soil Survey 2019 Conference Field Tour, June 12, 2019. Narragansett, RI.

**Alissa H. Cox.** 2019. *Invited* panelist and speaker at Metcalf Institute’s Annual Science Immersion Workshop for Journalists. June 3-5, 2019. Narragansett, RI.

**Alissa H. Cox.** 2019. “A look at underground mysteries: coastal septic systems.” *Invited* presentation at the US EPA Narragansett Bay Laboratory, May 28, 2019. Narragansett, RI.

**Alissa H. Cox,** Bianca N. Ross, Sara K. Wigginton, George W. Loomis & José A. Amador. 2019. “Onsite wastewater treatment systems in southern New England: Nitrogen removal performance, greenhouse gas emissions and climate change woes” oral presentation at the New England Interstate Water Pollution Control Commission 2019 Onsite Short Course, April 3, 2019. Mystic, CT.

**Alissa H. Cox,** Matthew Dowling, Simon E. Engelhart, George W. Loomis & José A. Amador. 2019. “Stormy Seas Spell Doom for Coastal Septic Systems” oral presentation at the Soil Science Society of America International meeting, January 7, 2019. San Diego, CA.

**Alissa H. Cox,** George W. Loomis & José A. Amador. 2019. “Water, Water Everywhere - Drowning Coastal Septic Systems” scientific poster presented at the Soil Science Society of America International meeting, January 7, 2019. San Diego, CA. *Awarded best poster presentation*

**Alissa H. Cox,** George W. Loomis & José A. Amador. 2018. “Rising groundwater tables threaten coastal septic systems” oral presentation at the New England Estuarine Research Society Meeting, October 26, 2018. Dartmouth, MA.

**Alissa H. Cox,** Matthew Dowling, George W. Loomis, Simon E. Engelhart & José A. Amador. 2018. “Coastal storms present serious threat to septic systems” oral presentation at the New England Graduate Student Water Symposium, September 10, 2018. Amherst, MA.

**Alissa H. Cox,** George W. Loomis & José A. Amador. 2018. “Historic changes in groundwater table heights along the southern Rhode Island coast” scientific poster presented at the New England Estuarine Research Society Meeting, April 27, 2018. Portsmouth, NH.

**Alissa H. Cox,** A. Boucher, J. Ludovico, G. Loomis and José A. Amador. “Septic systems in coastal RI: impacts of sea level rise and vegetation-based mitigation strategies” oral presentation at the Coastal & Estuarine Research Federation Biennial Conference, November 8, 2017. Providence, RI.

**Alissa H. Cox,** A. Boucher, J. Ludovico, G. Loomis and José A. Amador. “Evaluating the impacts of sea level rise on RI’s coastal septic systems and the effectiveness of vegetation-based mitigation

strategies” oral presentation at the Soil Science Society of America Annual Meeting, October 24, 2017. Tampa, FL.

**Alissa H. Cox**, G. Loomis, J. Turrene, D. Surabian, J. Ludovico and José A. Amador. “Changes in Groundwater Tables along the Southern Rhode Island Coast – Implications for Onsite Wastewater Treatment Systems” oral presentation at the New England Graduate Student Water Symposium, September 9, 2017. Amherst, MA.

**Alissa H. Cox**. March 2017. “Septic systems in coastal RI: impacts of sea level rise and vegetation-based mitigation strategies” oral presentation at Natural Resources Science Department Graduate Seminar Series, University of Rhode Island, Kingston, RI.

**Alissa H. Becker** & José A. Amador. “Soil quality in Rhode Island pastures grazed by different types of livestock” scientific poster presented at the Soil Science Society of America Annual Meeting, October 24, 2012. Cincinnati, OH.

**Alissa H. Becker** & José A. Amador. “Soil quality in Rhode Island pastures grazed by different types of livestock” scientific poster presented at the Soil Science Society of America Annual Meeting, October 24, 2012. Cincinnati, OH.

**Alissa H. Becker**. March 2013. “Soil quality in Rhode Island pastures – does livestock grazing matter?” presentation at Natural Resources Science Department Graduate Seminar Series, University of Rhode Island, Kingston, RI.

**Alissa H. Becker**. April 2012. “Soil quality in Rhode Island pastures grazed by sheep, cattle and horses” presentation at Natural Resources Science Department Graduate Seminar Series, University of Rhode Island, Kingston, RI.

**Alissa Becker**, M. Dyer, W. Frost, T. McBurney, E. Rainone and Thomas Mather. “Assessing and Characterizing Tick Density and Tick-Borne Diseases in RI” scientific poster presented at the University of Rhode Island Coastal Fellows Poster Presentation, December 10, 2008. Kingston, RI.

## VOLUNTEER & SERVICE EXPERIENCE

- **The Greene School Board Member**, Chair of Academic Standards Committee, Member of Head of School Evaluation Committee 2017 – 2020
- **Reviewer for *Journal of Sustainable Water in the Built Environment*** 2019 - Present
- **Graduate Student Representative** for EVES Specialization at URI 2016 – 2018
- **URI Master Gardener** 2015 - Present
- **Reviewer for *Journal of Tropical Ecology*** 2011 - 2014
- **South Kingstown CARES**, Mentor to 2<sup>nd</sup>-3<sup>rd</sup> grader 2009 – 2010

## AWARDS

- Best Oral Presentation (NEGSWS, 2019)
- Best Poster Presentation (SSSA, San Diego 2019)
- Enhancement of Graduate Research Award (2017)
- Recognition of Excellence for Praxis II Biology & General Science Scores (2013)
- URI Dean's Office Travel Fund Recipient (2012, 2017, 2018)
- Dean's List (18 semesters at URI)
- Robert A. DeWolf Scholarship (2009)
- R. & C. Soderberg Scholarship (2009)
- URI Coastal Fellowship (Summer and Fall 2008)
- University Fund Grant (Fall 2007 – Spring 2010)
- Centennial Scholarship (Fall 2006 – Spring 2010)
- Golden Key National Honours Society (2006-2010)

## TECHNICAL SKILLS

- Fluent in Microsoft Office tools (Word, Excel, Powerpoint, Publisher)
- Fluent in collaborations using Google Suite applications (Docs, Sheets, Presentations, Forms, Drive)
- Experienced in Microsoft Windows (7, 8, 10) and Linux (Ubuntu) operating systems
- Experienced coordinating online delivery of content via Cisco WebEx Trainings and Meetings
- Comfortable trouble-shooting operating system and program errors
- Intermediate R coding and analysis skills
- Intermediate genetic sequencing pipeline analysis skills using QIIME (versions 1.8+ & 2) and R
- Basic skills in spatial data analysis using ArcGIS and ArcMap
- Basic experience creating WordPress websites and posting content
- Experienced in basic Sakai site maintenance (managing content, creating announcements, setting up gradebook, entering grades)

27 May 2021

TO WHOM IT MAY CONCERN:

This is to indicate my support for the project entitled “The Greater Allen’s Cove and Eastern Ninigret Pond Pilot Watershed Program”, which seeks support from the SNEP Pilot Watershed Initiative. I will provide support in the form of laboratory facilities for preparation and analysis of wastewater samples, data processing and interpretation of results, as well as serve in a general advisory capacity on the technical and policy aspects of the project.

Sincerely,

Jose A. Amador, Ph.D.  
Professor of Soil Science and Microbial Ecology



**RHODE ISLAND**  
**DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**  
OFFICE OF WATER RESOURCES  
235 Promenade Street, Providence, Rhode Island 02908-5767

5/28/2021

Southeast New England Program  
Attn: Ian Dombroski  
US EPA Region 1  
Mail Code: 06-1  
5 Post Office Square, Suite 100  
Boston, MA 02109

**RE: SNEP Pilot Watershed Grant Application**  
**"The Greater Allen's Cove and Eastern Ninigret Pond Pilot Watershed Program"**

The RI Dept. of Environmental Management is pleased to support the collaboration between the Town of Charlestown, University of Rhode Island, and other partners in its submittal of a US Environmental Protection Agency (EPA) Region 1 Southeast New England Program's Pilot Watershed Initiative 2021 Grant Proposal Application entitled "*The Greater Allen's Cove and Eastern Ninigret Pond Pilot Watershed Program*".

The Town of Charlestown is a coastal community situated on the South Shore of Rhode Island, and is the only municipality in Rhode Island that is located within a designated Salt Pond's Critical Resource Area that relies 100% on groundwater for drinking through private and public wells and 100% on soil and groundwater for the on-site disposal of sewage. The Town has been actively developing and implementing Wastewater Management plans and ordinances since 2002. In that time, the Charlestown Wastewater Management Program has made significant progress in protecting public health, welfare and the environment by implementing an active program to assure the management of all on-site wastewater treatment systems (OWTS) within the Town. This program, which is the most active in the State of Rhode Island, has partnered and collaborated on and been awarded several federal grants in past years, enabling it to subsidize upgrades to substandard and failing systems with nitrogen reducing technologies, significantly reducing nutrient loading to its sensitive Salt Ponds. The program has established an effective and comprehensive approach to watershed management in the past 19 years to protect its groundwater and coastal resources.

Managing nutrient loading to improve groundwater and surface water quality is a major priority for coastal Rhode Island communities to protect public health, safety and welfare, and to protect the Coastal Watershed. The Town and others have documented significantly elevated groundwater nitrate-nitrogen ( $\text{NO}_3^-$ ) concentrations in its most densely developed coastal areas, which include Greater Allen's Cove and Eastern Ninigret Pond watersheds. Recent well water sampling of small community water systems and private shallow wells in these areas indicates that groundwater nitrate concentrations approach or exceed the EPA's maximum contaminant level (MCL) of 10 mg  $\text{NO}_3^-$ -N/L. This nitrogen-enriched groundwater eventually recharges to all three salt ponds located in Charlestown, where it causes eutrophication and increases the risk of hypoxia. The proposed project has a robust community engagement plan, which will help community members and other stakeholders appreciate and contribute to the health of the watershed.

We are proud to support the Town of Charlestown and its partners in this effort to establish a comprehensive Pilot Watershed Program to manage nutrient loading to these sensitive coastal areas and engage the wider community in these efforts. The expertise represented by the partners in this proposal will enable the program to efficiently demonstrate a successful approach to watershed management that can serve as a model to coastal communities across the nation. The community engagement component is an important aspect that has not been a major focus of past nutrient reduction efforts in the state. We look forward to the project's findings and implications for effective approaches and changes to regulations pertaining to coastal watershed management.

Please feel free to contact me at 1-401-479-1781 or [eric.beck@dem.ri.gov](mailto:eric.beck@dem.ri.gov) and thank you for considering this application.

Sincerely,

Eric A. Beck, P.E. Administrator  
Rhode Island Department of Environmental Management  
Bureau of Environmental Protection  
Groundwater and Freshwater Wetlands Permitting  
Office of Water Resources



New England Onsite Wastewater Training Program @ URI  
College of the Environment and Life Sciences

THE  
UNIVERSITY  
OF RHODE ISLAND  
COOPERATIVE  
EXTENSION

Southeast New England Program  
Attn: Ian Dombroski  
US EPA Region 1  
Mail Code: 06-1  
5 Post Office Square, Suite 100  
Boston, MA 02109

May 27, 2021

Dear Review Committee,

The New England Onsite Wastewater Training Program (NEOWTP) at the University of Rhode Island is pleased to commit to partnering with the Town of Charlestown and supporting the research and community engagement efforts described in the Southeast New England Program's Pilot Watershed Initiative 2021 Grant Proposal Application submitted by the Town of Charlestown titled "The Greater Allen's Cove and Eastern Ninigret Pond Pilot Watershed Program".

The NEOWTP is proud to collaborate with the Town of Charlestown, RI, URI's Laboratory of Soil Ecology and Microbiology, Save the Bay, Salt Ponds Coalition and other future partners in an effort to model a holistic approach to watershed management. We will coordinate with our URI colleagues in the Laboratory of Soil Ecology and Microbiology to coordinate and conduct the sampling and monitoring of the N-reducing onsite wastewater treatment systems for the duration of the grant, in line with our extensive experience overseeing the design and installation, as well as conducting monitoring of experimental onsite wastewater technologies in RI. Through its association with URI's Cooperative Extension, our program is also uniquely positioned to leverage the experience of designing and installing these systems to develop training courses combining the underlying the scientific and engineering principles with field-based training opportunities for professionals in the southern New England area. As extension professionals, we also have significant expertise in science communication and look forward to co-developing community engagement activities with the partners on this grant. Finally, our robust history of peer-reviewed publications position the NEOWTP and the Laboratory of Soil Ecology and Microbiology well to share the findings from this research with the broader scientific and regulatory community during workshops, conferences and in peer-reviewed publications.

The NEOWTP is excited to work with our partners on this project. If you have any questions, please feel free to reach out to me at [alibba@uri.edu](mailto:alibba@uri.edu) or at 401.874.5707.

With kind regards,

Alissa Cox, PhD  
Director of the New England Onsite Wastewater Training Program

---

University of Rhode Island  
Cooperative Extension  
Natural Resources Science  
Coastal Institute Building  
1 Greenhouse Road  
Kingston, RI 02881  
<https://web.uri.edu/owt/>

THE  
UNIVERSITY  
OF RHODE ISLAND  
COLLEGE OF  
THE ENVIRONMENT  
AND LIFE SCIENCES

Alissa Cox [alibba@uri.edu](mailto:alibba@uri.edu)  
Phone: 401.874.5707  
George Loomis [Gloomis@uri.edu](mailto:Gloomis@uri.edu)  
Phone: 401.874.4558  
Lisa Hollister [NEOWTP@uri.edu](mailto:NEOWTP@uri.edu)  
Phone: 401.874.5050  
Fax: 401.874.4561

27 May 2021

TO WHOM IT MAY CONCERN:

This is to indicate my support for the project entitled “The Greater Allen’s Cove and Eastern Ninigret Pond Pilot Watershed Program”, which seeks support from the SNEP Pilot Watershed Initiative. I will provide support in the form of laboratory facilities for preparation and analysis of wastewater samples, data processing and interpretation of results, as well as serve in a general advisory capacity on the technical and policy aspects of the project.

Sincerely,

Jose A. Amador, Ph.D.  
Professor of Soil Science and Microbial Ecology

May 27, 2021

Mr. Matthew J. Dowling  
On-Site Wastewater Program Manager/Environmental Scientist  
Town of Charlestown  
4540 South County Trail  
Charlestown, RI 02813

Dear Mr. Dowling,

Save The Bay is excited to partner with the Town of Charlestown and its application titled, **The Greater Allen's Cove and Eastern Ninigret Pond Pilot Watershed Program.**

We are pleased that this project would build upon the Town's previous SNEP grant and our work to address the many environmental and stormwater challenges and issues within the town. Our local waters are plagued with increased nitrogen levels and for over 15 years, we have worked diligently with municipal and private partners in the region to restore water quality to our local coastal waters through on-the-ground mitigation efforts, public outreach, education, and advocating for stronger regulations, reductions in fertilizer use, and upgrades to onsite wastewater treatment systems.

Save The Bay prides itself on working collaboratively with other organizations to bring about real change to our local environment. The opportunity to continue working with the Town, as well as local environmental and education partners, will help us not only ensure we can continue to support healthy water quality, but inspire environmental stewardship of students and residents in the region.

As part of this grant, Save The Bay will:

1. Provide on-the-ground investigation of municipal-owned property to determine the feasibility of expanding and enhancing coastal buffers and/or rain gardens to support improved water quality.
2. Through outreach and education, encourage community members to adopt voluntary nutrient reduction efforts in their landscaping practices
3. Lead the installation of at least three site-specific coastal vegetative buffers and/or rain gardens in proximity to the coastal ponds, contiguous wetlands and tributaries within the ENPGAC watershed to promote stormwater management, infiltration of runoff, and dilution of nutrient loaded groundwater.
4. Recruit in year 1, and engage in years 2-5, K-12 schools in our watersheds with educational programming. These nationally recognized programs engage students in standards-based meaningful watershed education and hands-on field experiences planting coastal buffers or rain gardens.

We look forward to participating in the Eastern Ninigret Pond Greater Allen's Cove SNEP Pilot Watershed Program and building upon our successful work to date in Charlestown.

Sincerely,



Jonathan Stone, Executive Director  
[jstone@savebay.org](mailto:jstone@savebay.org)



David Prescott, Coastkeeper  
[dprescott@savebay.org](mailto:dprescott@savebay.org)



## Salt Ponds Coalition

50 Bend Road, P.O. Box 875  
Charlestown, RI 02813  
(401)-322-3068  
saltpondscoalition.org

### Board of Directors

Art Ganz  
*PRESIDENT*

Richard Sartor  
*VICE PRESIDENT*

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*TREASURER*

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Susan Carr-Sparkman  
John Crandall  
Lawrence Dunn  
Barbara Engel  
William Lester  
Leo Mainelli  
Ann Manion  
Chris Randall  
Ted See

### Staff Members

Alicia Schaffner  
*EXECUTIVE DIRECTOR*

Liz Garofalo  
*ADMINISTRATOR*

Claire Hodson  
*SOCIAL MEDIA SPECIALIST*

Matt Dowling  
On-Site Wastewater Program Manager  
Town of Charlestown  
4540 South County Trail  
Charlestown, RI 02813

May 26, 2021

Dear Matt,

The Salt Ponds Coalition (SPC) is fully committed to participating in the *Greater Allen's Cove/Eastern Ninigret Pond Pilot Watershed Program*. Reducing nutrients in this fragile intersection of Green Hill and Ninigret Ponds is crucial for improving water quality in the area.

SPC is the official watershed council for the south western Rhode Island coastal ponds region, and has been conducting water quality monitoring since its inception in 1985. We are also firmly committed to educating the public about the impact of on-site waste water treatment systems on the health of the ponds, as well as new developments in technology and the benefits of upgrading systems that can result in a healthier environment. We will do both under this program.

We have partnered before with the Town of Charlestown, and look forward to doing so again to help improve and protect this vital resource.

Sincerely,

Alicia Schaffner  
SPC Executive Director

Via email  
May 26, 2021

TOWN OF CHARLESTOWN  
Via Electronic Mail & USPS  
CN-21-021



TOWN OF CHARLESTOWN

4540 SO. COUNTY TRAIL  
CHARLESTOWN,  
RHODE ISLAND

Tel (401) 364-5030  
Fax (401) 364-1238

Southeast New England Program  
US EPA Region 1  
Mail Code: 06-1  
5 Post Office Square, Suite 100  
Boston, MA 02109

**RE: SNEP Pilot Watershed Grant Application – ACCESS TO PROPERTIES  
“The Greater Allen’s Cove and Eastern Ninigret Pond Pilot Watershed Program”**

EPA Region 1 - SNEP Program:

The Town of Charlestown is pleased to provide its support and commitment for the US EPA Region 1 Southeast New England Program (SNEP) Pilot Watershed, for *The Greater Allen’s Cove and Eastern Ninigret Pond Pilot Watershed Program*.

Project tasks under the Pilot Watershed program are proposed on both private and public properties. There are three categories of site access applicable to this project.

1. Municipally or publicly owned properties where BMP installations will be implemented or where educational and community experiences are to be held are accessible to all public, project staff, visitors and educators and are classified as public spaces. If activities are proposed on public spaces not owned by the Town of Charlestown, access and indemnification agreements will be obtained,
2. Under Charlestown Town, Code 210-7 of the Charlestown Wastewater Management District, Town of Charlestown authorized representatives, staff or designees are authorized passage onto private property for OWTS related activities, and
3. Signed affidavit for access to private properties shall be required any private property owner entering into agreement with the town for installation of any BMP on said private property. The Town has successfully implemented the homeowner access agreement under previous funding opportunities.

Charlestown is committed to working with its partners, property owners and public to implement this program. Please contact me with any questions or comments regarding this application.

Sincerely,  
*Town of Charlestown*

A handwritten signature in blue ink, appearing to read "Mark Stankiewicz" with a circled "FOR" at the end.

P.P. Mark Stankiewicz  
Town Administrator

CC: The Honorable Charlestown Town Council  
Charlestown Wastewater Management Commission