

SOUTHEAST NEW ENGLAND PROGRAM (SNEP) NETWORK FINAL REPORT (2019 – 2024)

THE NEW ENGLAND ENVIRONMENTAL FINANCE CENTER

DECEMBER 2024

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The SNEP Network is a project of the New England Environmental Finance Center

Southeast New England Program Network EPA Assistance Award

FINAL REPORT

EPA Agreement Number
SE 00A00655

Project Title
Technical Assistance Network for the Southeast New England Program (SNEP Network)

Recipient Organization Name
New England Environmental Finance Center (NEEFC)

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Project Start Date
2019-10-01

Project End Date
2024-09-30

Total Award Amount
$6,000,000.00

Project Description
The SNEP Network Project brings together 16 partner entities including local environmental organizations, academic institutions, regional planners, and consultants who work collaboratively to provide municipalities, tribes and organizations access to free training and technical assistance to advance stormwater management and ecological restoration goals across the region. The Network focuses on working collaboratively to strengthen and build capacity at the local level to move towards implementation, funding and financing, and the creation of sustainable revenue streams. The SNEP Network engages communities in facilitated planning, capacity building, community and stakeholder engagement, and peer to peer learning to achieve their climate resilience goals.



SNEP NETWORK PARTNERS

- Elizabeth Scott Consulting, Rhode Island Liaison
- Kimberly Groff Consulting, Massachusetts Liaison
- Audubon Society of Rhode Island
- Blackstone Watershed Collaborative
- Cape Cod Commission
- Environmental Finance Center at the University of North Carolina
- Environmental Finance Center at Syracuse University
- Groundwork Southcoast
- Mass Audubon
- Narragansett Bay National Estuarine Research Reserve
- Rhode Island School of Design
- Save the Bay
- Southeastern Regional Planning and Economic Development District
- The Nature Conservancy—Rhode Island
- The Nature Conservancy—Massachusetts
- Throwe Environmental
- University of New Hampshire Stormwater Center
- University of Rhode Island—Non-Point Education for Municipal Officials (NEMO)
- University of Rhode Island—MPA program



EXECUTIVE SUMMARY

On September 26, 2024, the SNEP Network held its year end celebration that recognized the Network's collaboration with over 75 municipalities, Tribes, and community organizations from the last 5 years. Together, Network Partners, communities, Tribes, and EPA came together to celebrate the achievements of the SNEP communities for their commitment to advancing collaboration on addressing regional climate resilience, stormwater/watershed management, ecological restoration, and sustainable financing challenges.

Since 2019, the Network has successfully navigated numerous challenges including the creation of the SNEP Network during a global pandemic, capacity issues within communities and partner organizations. Despite these challenges, the Network achieved significant milestones, including the completion of 35 community assistance projects, delivery of 43 webinars, facilitation of 3 leadership exchange events, and responses to over 120 technical assistance requests. The Network has helped SNEP communities secure over $5 million to advance their stormwater and climate resilience projects. The Network's adaptive approach to collaboration among local, state, federal, and Tribal partners was pivotal in elevating community practices to address regional environmental challenges through capacity-building, delivering targeted technical assistance, and promoting peer to peer learning.

The SNEP Network prioritized capacity-building through diverse training and webinars that empowered local governments and organizations, successfully delivering over 40 webinars on green infrastructure implementation, low-impact development and bylaw review, and financing 101. Through initiatives like the Stormwater Planning Series, communities gained the tools and expertise to design nature-based stormwater retrofits, enabling them to independently develop and implement effective solutions. The Bylaw Review Curriculum empowered municipalities to incorporate low-impact development and climate resilience measures into local regulations, enhancing their ability to manage land use sustainably. Additionally, peer-to-peer exchanges and regional workshops facilitated the sharing of best practices, ensuring communities could learn from successful approaches across the region. These efforts collectively built stronger local capacity, enabling communities to take ownership of solutions that address water quality, habitat restoration, and climate resilience.

A cornerstone of the SNEP Network's structure was its tailored technical assistance program, which supported municipalities, Tribes, and community organizations. The Pre-Approved Consultant Pool streamlined access to specialized expertise in areas such as engineering services, green infrastructure, stormwater management, and sustainable financing. The Network created a Call for Participants process that identified and supported community projects, with more than 30 municipalities and Tribal nations receiving direct assistance that advanced projects toward implementation.

Table 1: Total funds secured with Network assistance by state.

	Community Assistance Project	Funding Source	Total Leveraged
RHODE ISLAND	Westerly GI Demonstration Project	ARPA, RIDOT, NBEP, RIIB MRP, SOAR, SWIG, Wood Pawcatuck Wild & Scenic Stewardship Council, SRICD	$1,659,500
	South Kingstown – Indian Run Brook Restoration Project	Bay and Watershed Restoration Grant	$66,350
	Town of Coventry and Upper Dam Pond Conservation Association	SWIG	$87,500
	Town of Portsmouth	RI Infrastructure Bank MRP Action Grant and ARPA grants	$500,000
	Aquidneck Island Communities (Portsmouth, Newport, and Middletown)	NOAA's Climate Resilience Regional Challenge Grant	$2,000,000
	Bristol Town Commons Stormwater Improvements	Section 319 Grant	$84,650
	Middletown Climate Resilience: Paradise Valley Sewer Station Upgrades	RI Infrastructure Bank MRP Grant	$69,600
MASSACHUSETTS	Mendon – GSI Project Town Hall	MVP Action Grant	$170,000
	Town of Mashpee/ Mashpee Wampanoag Tribe – Santuit Pond	MVP Action Grant (FY22 + FY23)	$469,037 $131,691
	Wetland Restoration – Sam Wright Field	Budget Earmark	$100,000
	Town of Bourne Climate Resilience Fund	Budget Earmark	$150,000
	Upper Nemasket H&H Study	Department of Ecological Restoration	$249,967
	Cedar Swamp	Department of Ecological Restoration	$42,000

Technical assistance from the SNEP Network significantly enhanced communities' ability to leverage funds for project implementation by providing technical expertise, strategic planning support, and access to funding opportunities. By supporting communities in aligning their projects with funding criteria and providing hands-on assistance with applications, the SNEP Network helped secure over $5 million for climate resilience, water quality improvement, and infrastructure projects. The SNEP Network also implemented several region-wide initiatives to address shared regional challenges and promote sustainable practices. These efforts included developing resources such as the New England Stormwater Retrofit Manual, the Buffer Restoration Guide, and the Tree Trench Guide.

The SNEP Network has demonstrated the transformative power of collaboration, effectively channeling federal resources to address local and regional challenges. By convening a diverse group of partners with expertise in stormwater management, watershed planning, and financial resiliency, the Network has successfully supported municipalities and communities in building capacity and advancing critical projects.

The SNEP Network will continue to assist the region's cities, towns, and Tribes for another five years. With EPA Region 1 funding, the Network will continue to provide free assistance with watershed and stormwater management, regional tool development and application and training and assistance to pay for climate resilience projects. In this next phase, The Network will add programs to develop the workforce for septic maintenance and green infrastructure, which are much needed in the entire SNEP region.



IN THIS SECTION:

- Partner 5 Year Reflections
- Budget Status
- SNEP Network Challenges
- Comparison of Actual Accomplishments vs. Anticipated Outcomes

"You can't have good, resilient, nature-based strategies in the absence of resilient communities. Having this network to lean on for advice, strategy, and technical assistance has been key in moving the needle on some of our most important initiatives."



PARTNER 5-YEAR REFLECTIONS

In its final year, Network partners were asked to reflect on the Network's progress in addressing environmental challenges while recognizing the ongoing need for collaborative efforts. Many partners highlighted the success of the Network in facilitating a collaborative approach to tackling water quality issues, such as nutrient pollution, and advancing stormwater projects in the region. Partners also noted the crucial funding and technical support provided by the Network enabled communities to implement solutions and strengthen resilience to climate change. However, partners also recognized that there are still hurdles to overcome, particularly in terms of sustainable funding and financing and the limited capacity of municipalities, Tribes, and community organizations to implement projects. Despite these challenges, the collective achievements of the Network have reinforced the importance of continued partnership, innovative approaches, and community engagement to advance climate resilience and sustainable financing in the region.

Network Collaboration

The SNEP Network's collaborative model has been pivotal in uniting expertise in stormwater management, watershed planning, and financial resiliency. By connecting municipalities with technical experts and resources, the Network empowered communities to implement solutions tailored to their unique challenges. One partner noted, *"The Network's flexible model is ideal for quick, nimble responses to provide communities with technical services. Meeting communities where they are, through listening, has led to tailored solutions to advance their stormwater management programs."*

The Network's success was driven by its ability to effectively channel resources, deliver technical assistance, and facilitate innovation. Reflecting on the achievements, a partner stated, *"The last five years have underscored the power of regional collaboration. By bringing together diverse partners with expertise in stormwater, watershed planning, and financing, we've seen how collective strengths and shared resources can drive progress on complex climate resilience and water quality projects."*

The pre-approved consultant pool and the call for participants process have been key drivers of success, offering specialized support that enabled projects to move from concept to implementation. Network partners emphasized the value of collaboration, recognizing that *"The power of collaboration and the value of the consultant pool/partner pool model [helped] advance projects from idea to implementation."* Another partner added, *"A network of providers across many different areas of expertise is a very valuable thing to provide to the region."*

Even new partners of the Network recognized its value. One partner shared, *"While I only became a partner during the final year of the five-year award, I already consider the SNEP Network to be one of the most salient, organized, productive, and truly collaborative networks in which I've ever been involved."*

Capacity-Building and Regional Initiatives

The Network's efforts to build capacity among municipalities and communities were foundational to its impact. Through initiatives like the Stormwater Planning Series, communities were equipped with the tools and confidence to independently develop and sustain projects. One Network partner commented that, *"The SW planning series has helped communities in the beginning of program development to build capacity and the confidence to do the work on their own."*

Programs such as the EPA Holistic Watershed Initiative found practical application through the Network, ensuring that critical environmental goals were met in ways state governments could not achieve alone. One partner stated, *"The Network is well-positioned to take products like the EPA Holistic Watershed Initiative and support communities in the implementation of these resources."*

Over time, the Network also cultivated trust between subject matter experts, practitioners, and local governments. A partner explained that *"Building trust between subject matter experts, practitioners, regulators, and the regulated is a critical component for success."*

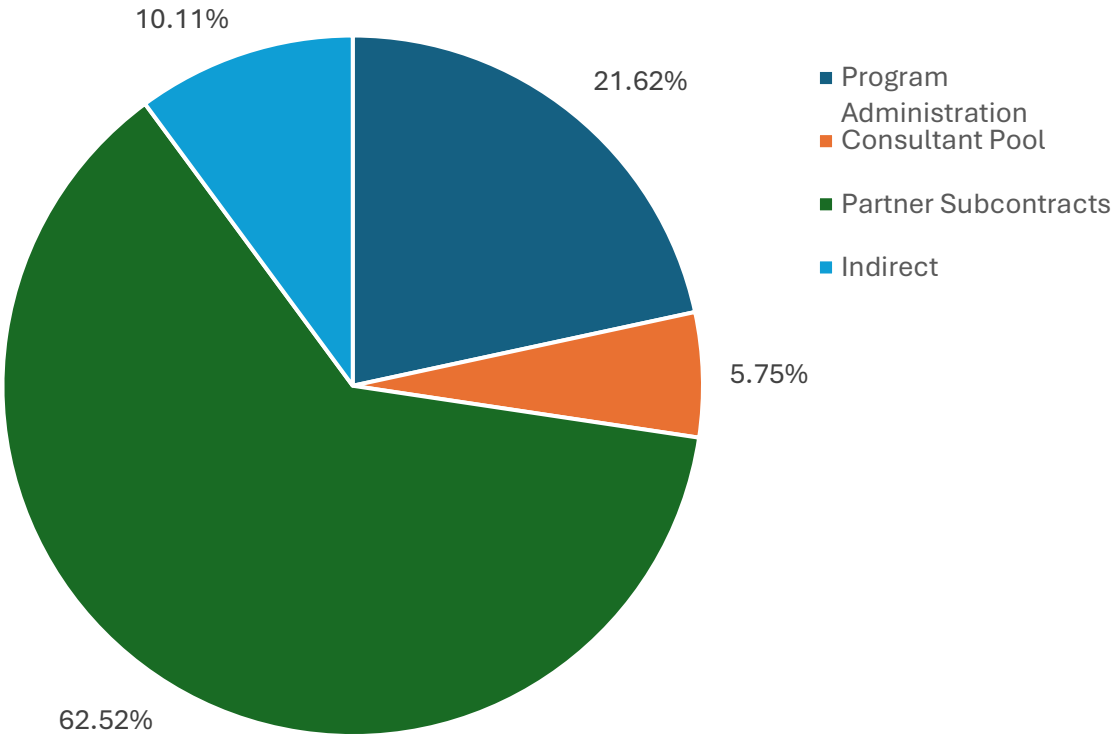
By addressing regional challenges with a collaborative and holistic approach, the SNEP Network has set a benchmark for achieving measurable environmental progress through partnership, capacity-building, and innovation. As one partner aptly summarized, *"Collaboration is the key to broadening our reach, achieving our mission, and advancing our work."*

BUDGET

This budget narrative provides an overview of the budget allocations of the Network from FY1-FY5. It outlines the allocation of funds across key categories, ensuring alignment with project goals, compliance with funding requirements, and efficient use of resources. This budget reflects a strategic allocation of resources to meet project objectives effectively and efficiently.

FY 1 Budget	$1,750,000
FY 2 Budget	$1,476,741
FY 3 Budget	$1,116,007
FY 4 Budget	$1,061,475
FY 5 Budget	$595,777
TOTAL	**$6,000,000**
Recipient Contribution	$572,667
Other Contribution (Partner Match)	$327,323
TOTAL + MATCH	**$6,900,000**

SNEP NETWORK BUDGET SUMMARY (2019-2024)



Program Administration

Program administration costs enabled the NEEFC to lead and administer the SNEP Network Program. This includes the personnel costs (including benefits coverage), travel and conference registrations, materials and supplies, and event costs. Personnel costs account for approximately 20% of the total budget. This covers salaries and benefits for 2.5 NEEFC staff members and 3 graduate assistants. Key positions include NEEFC Executive Director, SNEP Program Manager, and Policy Analyst II, whose responsibilities are critical to program implementation, oversight, and evaluation.

Partner Subawards

Funds for partner subawards accounted for 62.5%, more than half of the total budget.

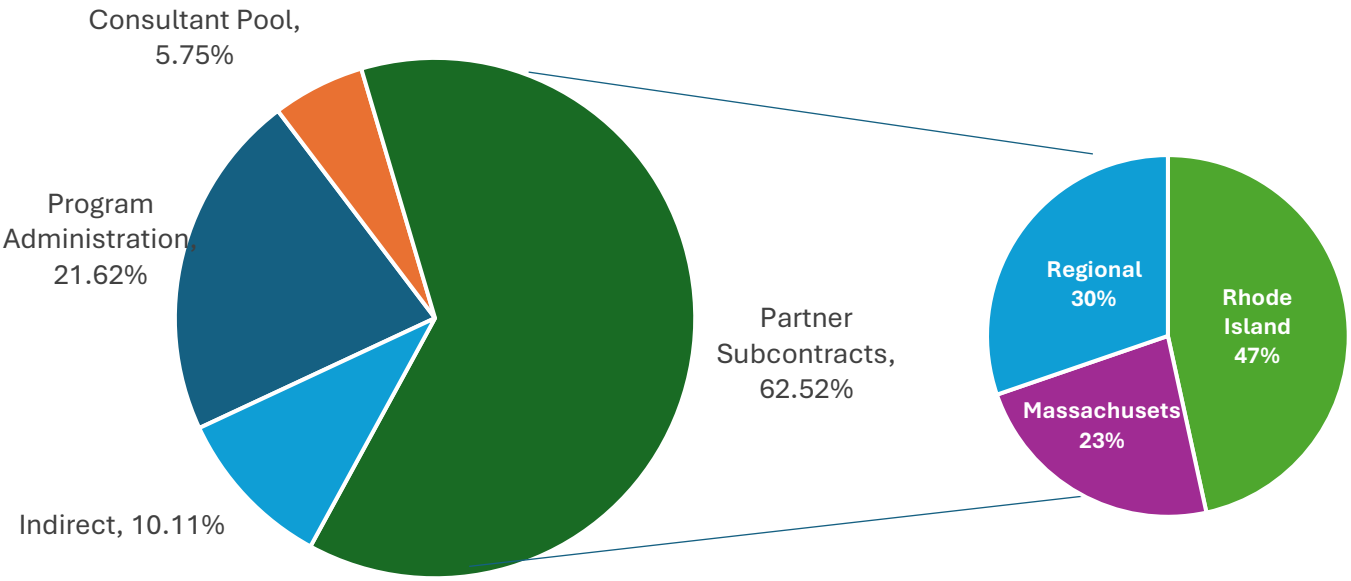
SNEP Network Consultant Pool

The SNEP Network pre-approved consultant pool is a curated group of experts available to assist municipalities, organizations, and communities. These consultants provided specialized technical assistance in areas such as water quality improvement, stormwater management, sustainable financing and climate resilience. 5% of the total budget (approximately $350k) was allocated to the consultant pool.

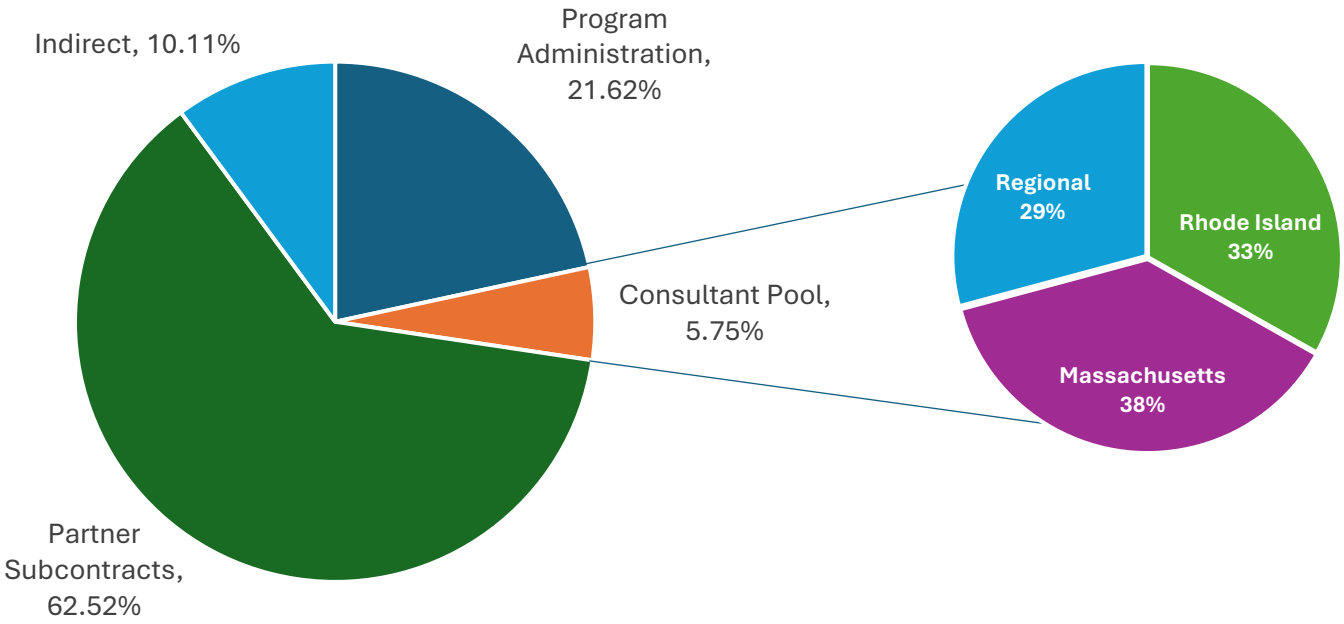
Indirect rate funds

Over the last 5 years, approximately 10% of the total budget went towards indirect funds for the University of Southern Maine. As a project that directly aligned with the University's priorities, the University of Southern Maine waived half of the EPA negotiated indirect rate of 32%, taking only approximately 16% from the total budget. This indirect is used to help offset expenses such as administrative support from a grants manager and a contracts manager, IT support, office space, utilities, equipment, and the infrastructure needed maintain the University's operations. The waived indirect rate by the University helped meet the 15% required match on the award amount. The rest of the match was met by contributions from subawarded partners. The total match contribution equaled $900,000.

Partner Subcontracts Amounts by State



Consultant Pool Allocations by State





SNEP NETWORK CHALLENGES

The original proposal submitted to EPA captured the intent of the services planned by Network partners to the SNEP area, however, a more collaborative program started to crystallize about halfway through the first year. Once the foundation was laid for systems and processes in the first six months, it paved the way for true collaboration among partners. Over the last 5 years, the Network faced pivotal moments both internally as partners created a new and better approach to delivering technical assistance to the SNEP region, and externally as they navigated how to collaborate and deliver services during a global pandemic. Despite these challenges, the Network adapted to the changing landscape. This adaptability enabled effective collaboration across varying local, state, federal and Tribal partners.

Challenge	Resolution
The pandemic forced a transition from in-person to virtual engagements.	The shift to online platforms was not originally planned but effectively met the goal of continuing to provide community engagement and technical support despite in-person restrictions. The NEEFC worked with partners to reimagine how to deliver services and transitioned to virtual formats, delivering 10 webinars and training sessions that reached over 600 participants within six months. This shift expanded the reach of the Network beyond the SNEP region and increased transferability of lessons learned, best practices, and tools and resources across New England.
Following the resignation of the original SNEP Network project manager in June 2020, interim support was provided by NEEFC staff until a new project manager was hired in October 2020.	With the support of the Network's management team and the NEEFC, the temporary gap in project management was managed without significant disruption to overall project administration, allowing continuity in work.
The COVID pandemic brought new national spotlight on the disproportionate negative effect of the pandemic on low-income, underserved and under resourced, and marginalized communities, paralleling the effects of climate change effects on those same communities.	The Network incorporated a focus on environmental justice communities and aligned with SNEP's 5-year strategic plan by focusing on developing this aspect of the program. Network partners worked together to develop our Network tenets of engagement and reached out to organizations that have expertise with frontline communities. The Network also created an Environmental Justice Team to provide valuable input on how to incorporate EJ into Network processes. Furthermore, the Network expanded its Consultant Pool List of

	Services to include environmental justice, translation, and community engagement services. In this effort, the Network developed relationships with Groundwork Southcoast and Woonasquatucket River Watershed Council (WRWC), two organizations that worked directly with frontline communities. The Network provided technical assistance to WRWC to provide Green Infrastructure installation training for their River Rangers program; Groundwork Southcoast and the City of New Bedford participated in the Network's stormwater planning series and the Network provided support in identifying stormwater retrofit sites at Brooklawn Park. In FY4 and FY5, Groundwork Southcoast became a subcontracted Network Partner. Moreover, the Network provided technical assistance to the Mashpee Wampanoag Tribe and the Wampanoag Tribe of Gay Head (Aquinnah) in FY2 and continued to provide support throughout the remaining three years on different projects based on their needs. For instance, the Network continued to support the MWT to set up their non-point source program by providing consultant services to develop watershed assessment and management plans. This program will enable the Tribe to receive Section 319 funding from EPA to address their stormwater and watershed management challenges.
Both municipalities/Tribes and Network partners faced capacity constraints with limited resources and staff shortages, affecting project progress.	To address capacity constraints experienced by SNEP communities, the Network provided more hand holding and support as SNEP municipalities and Tribes advanced their projects. For example, Elizabeth Scott, SNEP Network Rhode Island Liaison, has encountered this challenge when coordinating with the South Kingstown Planning Board chairperson to schedule the requested presentation to the Town Council on land use and water quality. Kim Groff, SNEP Network Massachusetts Liaison, has also encountered capacity constraints and states, *"Communities are stretched thin and often don't have the bandwidth to engage even when free services are offered. This requires more management than you can imagine because hand holding and numerous follow up is required to keep projects advancing as planned"*. Mass Audubon echoes this sentiment, writing *"Staff time and capacity - both for us and partners we work with".* The SNEP Network addressed these issues within municipalities and Tribes by adding capacity at the town level to assist with project management, when possible, and adjustments were made to project timelines to accommodate capacity issues experienced by municipalities and Tribes. As such, many of the Network projects spanned over one year.

	While this meant more time and support for the SNEP communities and tribes, this consistent support enabled the Network to build stronger relationships with these communities and Tribes.
Network partners also experienced capacity issues due to staff turnover and internal reorganization. During the 5 years, over one-third of the Network partners experienced staff turnover that stalled project progress.	To be mindful of the stresses of work/life balance and increased workloads of partners during the pandemic, the New England EFC checked in with partners and provided project extensions where needed to alleviate project deadline pressures. Additionally, in FY4, the NEEFC transitioned from requiring monthly reports from partners to quarterly reports from partners. This change alleviated the administrative burden on partners and allowed them to focus on providing technical support to SNEP communities.
Communication among partners became challenging as the Network grew and began to take on more projects. These communication challenges were exacerbated by the increased capacity issues due to staff turnover within partner organizations. Partners expressed that they did not have a good grasp on all the different projects of the Network.	To address communication challenges, the network introduced internal Network Monthly Updates that highlighted milestones on Network projects and upcoming training and events. Additionally, the NEEFC created time for partners to present their work at quarterly Network meetings.
Reduced funding in FY5 required scaling back on some projects and prioritizing core activities.	As a direct result of the limited funding in FY5, the Network did not release a call for projects for the last fiscal year, however, it did release a solicitation for participation in the stormwater planning series and selected four communities to participate. Through this solicitation, the Network also determined that we would not provide services to Millville, MA. This decision was based on the capacity of Network partner Blackstone Watershed Collaborative to take on the work. While funding was limited in FY5, the Network was able to utilize carryover funds from the previous budget cycle to lessen the funding gap and to keep up the momentum of the work. Moreover, partners were able to leverage their allocations with their organizational resources to continue to advance projects and initiatives.

COMPARISON OF ACTUAL ACCOMPLISHMENTS VS. ACTUAL OUTCOMES

The SNEP Network has navigated challenges effectively, with actual accomplishments aligning closely with the anticipated outcomes. Adjustments to project deliverables, timelines, and strategies have been made to address unforeseen issues and ensure continued progress, maintaining alignment with broader goals and enhancing the effectiveness of community assistance and regional initiatives.

Project	Actual Accomplishments
Canoe River Aquifer Project	The project prioritization plan for the Canoe River Aquifer Project shifted slightly based on the feedback received from the communities and steering committee. Instead of ranking the top 10 priority projects, the team compiled a final short list of 16 geographic clusters of projects and were able to secure funding for further assessment to advance projects into year 4. Due to the limited capacity of the participating communities in the Canoe River Aquifer Project, the team held fewer than anticipated Canoe River aquifer resilience regional meetings/workshops. In response to the limited capacity and the identified need to access and navigate the current funding landscape by the communities, partners pivoted their focus from facilitating steering committee meetings to planning a regional workshop that addressed a key need expressed by the communities. In March, the Canoe River Aquifer Team planned for and held a MA funding workshop at Bridgewater State University. The two-part event featured over 10 funders that represented over millions of dollars. Following the event, the team received positive feedback from both presenters and attendees. Due to the success of this event, the Network held a similar workshop for Rhode Island that assisted communities in navigating funding opportunities and provided RI communities with space to meet the funders and ask specific project questions. The funding workshops were repeated in year 5 for both states.
Wampanoag Tribe of Gay Head Aquinnah Climate Resilience strategy	In 2021, the Network awarded the WTGHA with services to assist with developing a climate resilience strategy that includes working with a core group of stakeholders to help assess and prioritize high priority projects and steps needed for implementation. After getting a better sense of the community's capacity, the deliverable for the WTGHA project has shifted from a final project report to a product that combines findings from the technical assistance project with a completed climate adaptation plan. The Tribe has found it difficult to move their climate adaptation plan towards completion in recent years, thus, the project team pivoted their approach and provided support to tribe to complete their climate adaptation plan. The team also developed a series of podcasts with the tribe.

Transferring NBS maps in MA to RI	The goal of transferring the Massachusetts NBE map layers to Rhode Island was to replicate the NBS maps that identified opportunities to implement NBS using a set of defined criteria and data layers developed by TNC-Mass to TNC-Rhode Island. Through this process, Network partners TNC-RI determined the best use case for the map layers developed at the current moment was to provide one-on-one technical support to specific RI communities, rather than allocating TNC-RI staff resources into building a tool that would not be fully utilized by communities.
Advisory Committee Phased Out	The SNEP Network Advisory Committee was conceptualized in the original NEEFC proposal designed to meet regularly to review special requests, discuss barriers to implementation, and promote the use of adaptive management principles among providers. While the Advisory Committee did meet regularly to discuss the Network's programming and strategic directions, it became clear that the technical assistance that partners provided to SNEP communities and Tribes, and the experiences/lessons learned from that technical assistance, provided a more on the ground perspective of the challenges that SNEP communities and Tribes were facing. Thus, the Network began to rely more on the management team and the Network partners to identify local and regional challenges. As a result, the NEEFC decreased the frequency in which the SNEP Network Advisory committee met to an annual meeting, with quarterly email updates. The Network implemented a structure for feedback from partners, using monthly reports and quarterly meetings to guide the Network's programming. NEEFC collected feedback from the advisory members and reported this feedback to partners during a quarterly meeting. This feedback from the advisory committee was incorporated into the strategic direction of the Network, that was ultimately agreed upon by the on-the ground Network partners. In FY4 and FY5, the frequency of the advisory committee meetings decreased to once a year, and the NEEFC provided quarterly email updates to the advisory committee members.



IN THIS SECTION:

- Task I: Network Cohesion
- Task II: Training and Webinars
- Task III: Technical Assistance



TASK I: NETWORK COHESION

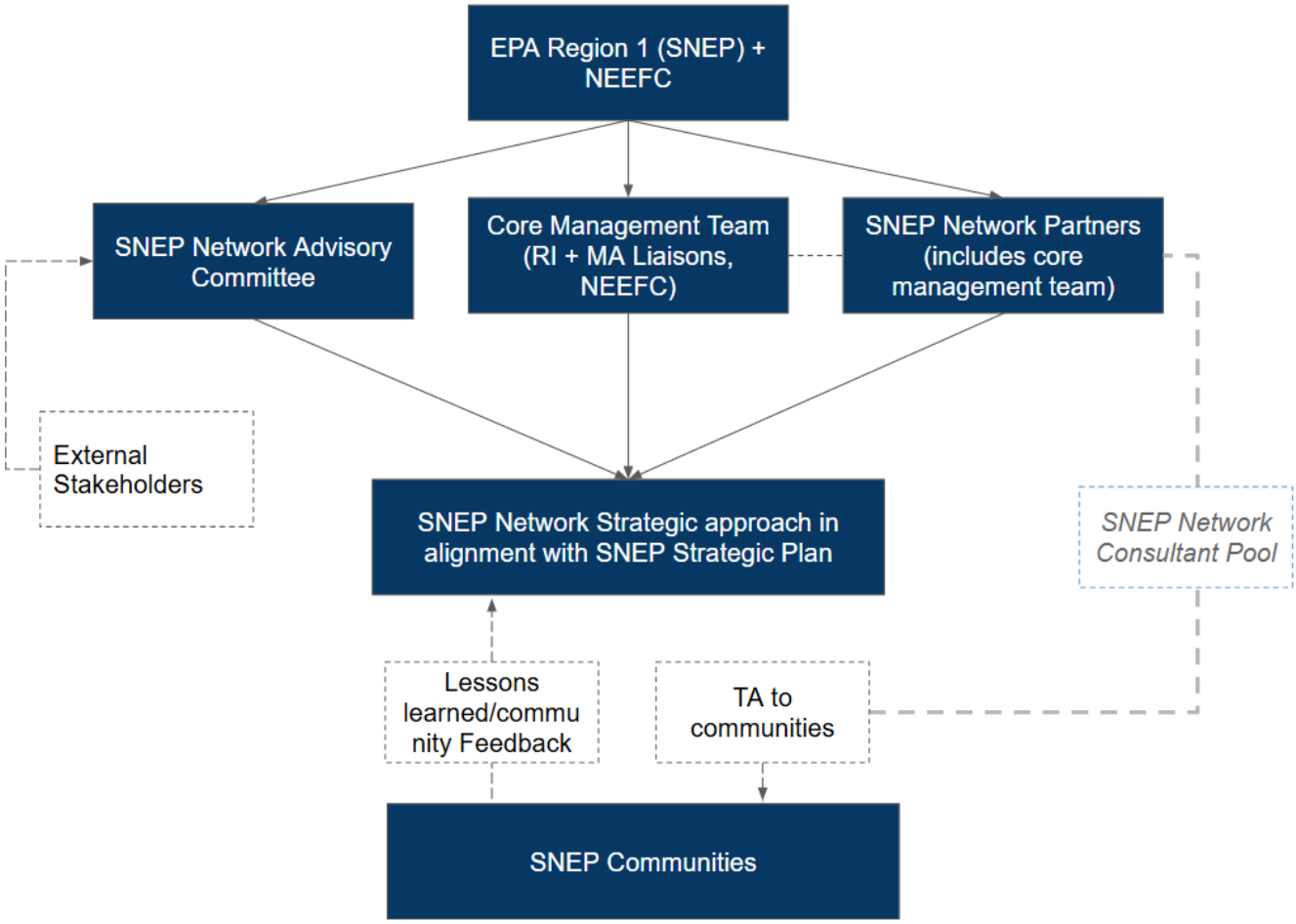
SNEP Network Fiscal Year 1 (October 1, 2019 - September 30,2020)

In it's first year, the Network focused on building its internal structures to support collaboration within the Network. A core Management Team was established to assist the NEEFC in coordinating regional initatives that address regional challenges and facilitate collaboration among local communities, stakeholders, and partners to implement effective strategies for sustainable financing, stormwater and watershed management, and ecological restoration efforts. The Management Team structure ensured that the NEEFC, an EPA designated Environmental Finance Center and techinical assistance provider for EPA Region 1, had in-state and on-the-ground representation through two project managers (the MA and RI "Liaisons") who are able to respond to local needs and who are both trusted and experieced second career water resource professionals.

In order to ensure that the Network's strategic priorities reflected that of the SNEP region's, the Network's strategic process incorporated feedback from various groups including, EPA Region 1, the Network Advisory Committeee, the core Management Team, SNEP Network partners, and the SNEP communities and Tribes that received support from the Network.

Led by the NEEFC, the Manamement Team focused on incorporating partner feedback to set the strategic priorities and programming of the Network. The Management Team included the MA Liaision, Dr. Kimberly Groff and RI Liaison, Elizabeth Scott, Joanne Throwe (Throwe Environmental), and Khris Dodson and Tess Clark from the Environmental Finance Center at Syracuse University (SU EFC). SU EFC brought their years of experinece running a national network that provides assistance to small water utilites with managerial, financial and technical support. SU EFC provided assistance to the Network with tracking deliverables and contributing to the communications processes. The management team met bi-weekly to discuss the Network's programming to provide techanical assistance to SNEP communities and Tribes. Together with EPA Region 1, partners, and the Advisory Committee, the Network developed an approach to providing technical assistance through trainings and webinars, the pre-approved consultant pool, the call for participants process, and regional initiatives. As partners implemented this approach, they continually solicited feedback from the SNEP communities and Tribes that would inform the Network's strategic plan. This structure of continual feedback enabled the Network to continually adapt to the changing challenges of the SNEP communities and Tribes and tailor the technical assistance and programming to truly meet the local and regional needs of the region.

Figure 1: SNEP Network Structure for Determining the Network's Strategic Approach



The New England EFC had the ultimate responsibility for programmatic decisions and the administration of the partner subawards, contracts, budget, consultant pool allocation, representing the Network, and reporting to EPA. The NEEFC played a key role in organizing these efforts, issuing 15 subawards, developing a pre-approved consultant pool, and selecting 12 projects, while maintaining consistent communication with partners and the public. The NEEFC also managed administrative tasks, including partner agreements and budget oversight, and worked on enhancing engagement through updated communication strategies and the development of a targeted outreach plan for congressional delegations. In addition to the interal management of the Network, the NEEFC also created a website, a centralized metrics and reporting tracking system, an online portal for technical assistance, and initiated the Call for Participants process.

To ensure alignment with the SNEP mission and strategic priorities, the NEEFC participated in the SNEP Steering and Executive committees. During these SNEP organized meetings, the NEEFC provided updates to the committee members. Additinally, the NEEFC met monthly with the EPA SNEP project officer to provide updates, and address any emerging challenges with the Network Administration.

Despite the challenges of COVID-19, the Network effectively transitioned to virtual formats, delivering interactive training through webinars and a virtual forum, and providing vitual technical assistance. Network Liaisons for RI and MA implemented virtual "office hours" as a way to provide on-demand technical assistance. However, in the first year, the Network was not yet well known in the region and these office hourse had low attendance. In leiu of the office hours, the Network created a webpage for communities to request on demand technical assistance from the Network Liaisons. Additonally, the Network partners and the management team decided to pause office hours and instead issue a call for participants to provide tailored technical assistance. The Network sucessfully released the call for participants and received 16 applications, and awarded 12 projects, 6 in MA and 6 in RI.

SNEP Network Fiscal Year 2 (October 1, 2020 - September 30, 2021)

In Year 2, the SNEP Network continued to enhance its effectiveness through increased collaboration among partners and expanded training opportunities. On the ground project management was facilitated by the Network's management team, and the Network project leads. The management team met weekly to share project updates and discuss ways the Network could advance its mission and strategic goals. The NEEFC continued to attend and participate in the SNEP steering and executive committees.

Network activities that greatly contributed to effective Network administration and cohesion in FY2 included:

- Network Partners continued to meet quarterly and used the quarterly meeting venue to connect with other partners, share project updates, and discuss relevant topics such as environmental justice and community engagement
- Drafted Network outreach materials including: SNEP Network one-pager, SNEP Y1 Highlights document, and Partner branding responsibilities
- Continued to expand the mailing list and created an internal SNEP Network mailing list guide
- Developed SNEP Network interactive map identifying the locations of the Network CFP (community assistance projects) and pilot projects
- Created master spreadsheet to track SNEP Network metrics and EPA's SNEP Program metrics
- Expansion of the SNEP Network Consultant Pool services and providers to capture a broader set of needs and services within the SNEP region

- Released Round II Call for Participants for community assistance projects and selected 9 community projects; 5 Rhode Island Communities, 1 Massachusetts Community, and 2 Tribes.

As the Network began to receive more technical assistance requests from communities, and as the community assistance projects continuted to advance, the NEEFC identified a need to begin tracking outcomes and delieverables in earnst. In FY2, the NEEFC implementated tracking mechanisms to stay abreast of the administrative components of managing the Network, including the number of requests partners were receiving from communities, project outcomes and deliverables, budget allocations and spending, and program metrics. Thus, the NEEFC created the following trackers and dashboards to monitor the progress of the Network to ensure that funds were being allocated efficiently to areas that would yeild the greatest impact.

- EPA Metrics Tracker
- SNEP Network Technical Assistance Tracker
- Partner Subaward Tracker
- SNEP Network Consultant Pool Tracker
- SNEP Network Partner Monthly/Quarterly Report Tracker

The Network also bolstered efforts to build relationships with external partners. This included working with the SNEP Watershed Implemenation Grants (SWIG) program to coordinate communications and establish a process that allowed both programs to collect contracts and share program news. Adam Reilly from SNEP EPA covened the Network and SWIG meetings that met monthly to share news and coordinated outreach efforts.

Building upon the Network's momentum, at the end of FY2 the Network determined that the strategic focus in FY3 would be on environmental justice and climate resilience initiatives as aligned with the SNEP programs 5-year strategic Plan. The NEEFC worked with each partner to focus their workplans to support the Call for Participants (CFP) Round II community assistance projects, and Network Regional Initiatives.

SNEP Network Fiscal Year 3 (October 1, 2021 - September 30,2022)

The Network continued to build capacity on the organizational, community, and regional levels in Year 3. As the Network began to cultivate relationships across communities, municipal, state, and federal entities, it was clear that the Network needed to increase its internal capacity to better enable the region to work together to identify common roadblocks to advance regional stormwater management, climate resilience, and funding and financing goals. In FY3, the Network welcomed the Blackstone Watershed Collaborative as a SNEP Network partner. The Blackstone Watershed Collaborative is a partnership of municipalities, non-profits, and other stakeholders focused on preserving and improving the water quality and ecosystem health of the Blackstone River and its surrounding watershed. Through collaborative efforts, the group works on initiatives such as habitat restoration, water monitoring, and addressing pollution sources within the watershed.

The NEEFC faciliated partner collaboration through quarterly Network meetings, management team meetings and strategy team meetings. The administrative tasks increased in efficiency and productivity with a fast turnaround of a total of over 30+ partner subawards, consultant contracts, and memorandums of agreement (MOA's) with communities. The New England EFC continued to track all invoices and program metrics using an updated spreadsheet and dashboard. In this year, the Network saw an increase

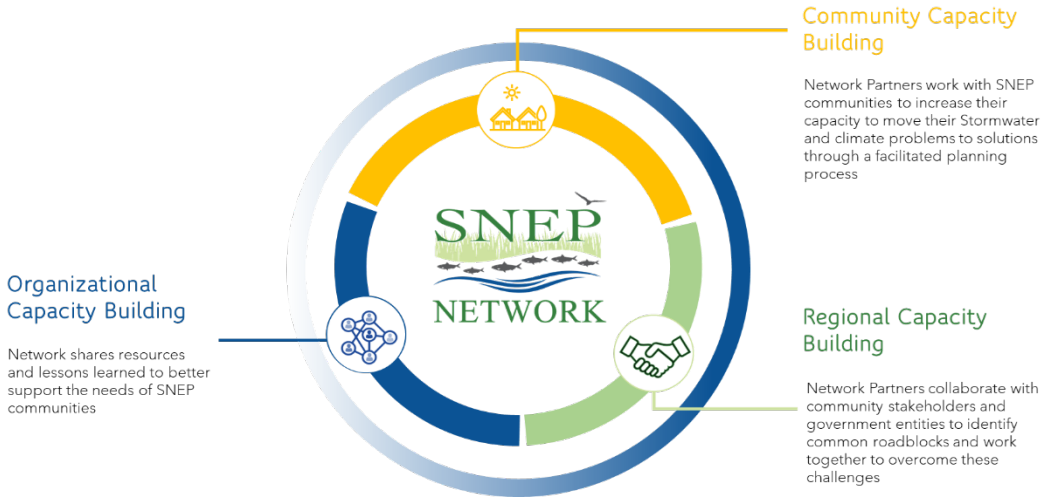
in the number of technical assistance requests from communities/organizations increase from 8 requests in year 1 to 48 requests in year 3. Additionally, the average number of participants in Network trainings and webinars increased over the years, from 52, 55, and 72, over the 3 years, respectively.

The SNEP Network has put a considerable amount of effort into strategic planning and developing an internal strategy for working with environmental justice communities. With the Network's focus on Environmental Justice in FY3, it was critical that the Network developed relationships with frontline communities and meet them where they are. The Network partners determined that the approach to meaningfully providing technical assistance to these communities without overburdenting them was to build upon the existing efforts in the areas and work directly with the grassroots organizations that were already supporting the environmental justice communities. The Network engaged Groundwork Southcoast and the City of New Bedford in identifying opportunities for stormwater retrofits at Brooklawn Park, and continued to provide as needed support to Groundwork RI on the green infrastructure installations. Moreover, to ensure accessibility on virtual platforms, the NEEFC procured CART (Communication Access Realtime Translation) services for every SNEP Network webinar.

The NEEFC continued to attend and participate in the SNEP steering and executive committees, and in this year, became a more active participant though providing support with planning the SNEP Symposium that included determining the symposium themes and scoring the abstracts received. Additionally, the SNEP Network worked to better coordinate with the SNEP Watershed Implementation Grants (SWIG) Program, specifically in planning the press release and announcments for the Network techanical assistance and SWIG awardees, and communications. During the year, the Network's director, project manager, and policy associate has met with the director of the SWIG program to coordinate efforts including communications, environmental justice initiatives, and project support to SNEP communities. As a result of the coordination, the respective communications teams meet regularly to discuss how each other's work can be amplified through their respective communication channels and developed a process referring environmental justice projects and contacts to each other's programs. The partnership between the Network and the SWIG program that creates a model that ensures SNEP communities, particularly EJ communities, are supported throughout their project's planning to implementation phases.

In FY3, the Network also focused on improving internal and external communications to increase sharing of information and lessons learned. With the creation of monthly "Network Updates" that collects and internally shares the highlights of partners monthly reports with partners and the Network Advisory Committee, and the development of "Network News" that is shared externally among the Network's mailing list, the Network has provided additional, easy to access platforms for information sharing. The Network continued to regularly produce Network Narratives, update the website, create project story maps, and worked on finalizing a a Network Case Studies template.

Fig. 2: Network approach to building capacity on organizational, community, and regional levels



SNEP Network Fiscal Year 4 (October 1, 2022 - September 30, 2023)

In year 4, partners continued to meet quarterly as a Network to discuss programmatic direction, provide updates, and engage in information sharing and strategic planning. The quarterly meetings allowed partners to learn about other partners' projects, discuss regional initiatives, and reach consensus about the Network's future programmatic direction. Network partners also shared their insights on SNEP community needs and discussed how these needs can be addressed through Network products and regional initiatives such as the New England Stormwater Retrofit Manual, the SNEP Network Buffer Restoration Guide, HRU Mapping, etc. Partners identified that communication was key to promoting the utilization of Network tools and resources. Based on their feedback, in FY4, the Network continued to develop case studies and deliver webinars to share lessons learned, improve, and reconfigure the SNEP website easily access these resources, and continue to promote tools/resources as partners work with communities.

The NEEFC worked with TNC-MA to provide partners with value-based communications training to build their capacity to better communicate with the communities they serve. During this training, partners examined a portion of the SNEP Network Tenets of Engagement and worked collaboratively to re-frame Network messages to reflect our values more accurately and authentically. Moreover, partners learned how to identify possible harmful narratives in our messages and stories using guiding questions and dialogue, shared diverse perspectives on narratives and messaging, and provided suggestions for ensuring that the tool is useful in our work.

The New England Environmental Finance Center continued to lead the management and administrative duties for the SNEP Network. The NEEFC worked with partners to administer 15 partner subaward agreements, 9 project MOAs, the FY4 workplan, the FY4 budget, and multiple contracts with the SNEP Network consultant pool. NEEFC staff also maintained best practices for reporting and tracking deliverables, approving invoices, and keeping budget records.

In this year, the NEEFC continued to actively participate in the EPA SNEP committees and initiatives and worked directly with EPA SNEP and SWIG program to plan a press release announcing the technical assistance recipients for the Network and the awardees for the SWIG. Moreover, the NEEFC met with Senator Whithouse and Senator Reed's aids to present of the impact of the Network on the SNEP Region.

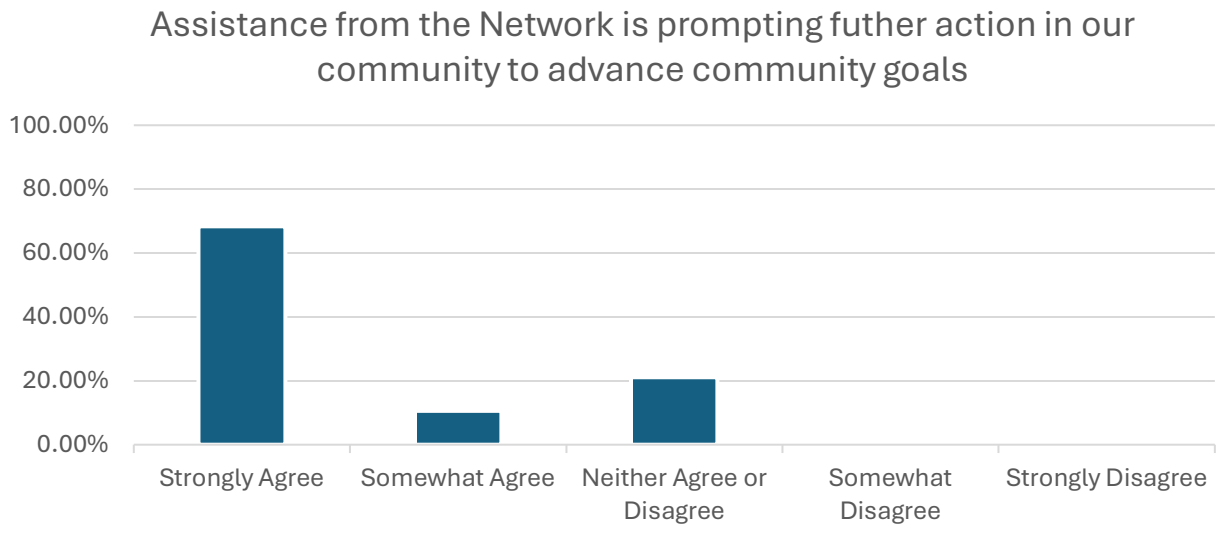
SNEP Network Fiscal Year 5 (October 1, 2023 - September 30, 2024)

As the Network grant came to a close in it's 5th year, the NEEFC and Network partners focused on transferring lessons learned and the impact of the Network throughout the SNEP region and beyond. Network partners attended and presented at conferences/press events including the Maine Stormwater Conference and NEWEA, To ensure the Network remained visible, the NEEFC updated multiple SNEP Network webpages such as the leadership exchange webpage, community assistance project webpage, and the Stew-Map webpage, sent 8 Mailchimp announcements for Network events and webinars, distributed the EPA SNEP newsletter and SNEP Network News and facilitated internal collaboration through meetings and internal email updates.

In FY5, the Network conducted a Community Impact Survey to assess the effectiveness of the Network's programming and identify opportunities to better provide assistance to the SNEP communities and Tribes. The NEEFC worked with EPA to get approval for the administration of the survey. The Network surveyed all of the Community Assistance Project (CAP) participants from 2020-2023 who had completed their projects. The survey took place in the Fall of 2021, administered by former NEEFC graduate assistant Kaitlyn Burch, and in the Spring of 2024 by Kate Enright, NEEFC graduate assistant. Questions included basic demographic information to categorize the community, as well as questions for each organization about the impact and implementation of their SNEP Community Assistance Project. Overall, the survey was taken by 19 communities out of the 30 communities who received technical assistance. There were 5 surveys administered in 2021 and 14 surveys administered in 2024.

The feedback about the SNEP Network's impact was extremely positive with communities expressing gratitude for the SNEP Network's ability to connect their organizations with tools and resources. Many communities were grateful for the Network's assistance as they felt understaffed and needed support from the Network to undertake specific projects. As a result of the SNEP Network's technical assistance, communities were able to connect and apply for other grants and funding opportunities. Additionally, communities found the access to the SNEP Network's pre-approved consultant pool to be valuable.

Figure 3: Community Impact Survey



The majority of communities (68%) or (13 out of 19) “strongly agree” that they were able to prompt further action and advance their communities goals through their involvement with the Network. 10% of communities “somewhat agree” and 21% of communities “neither agree nor disagree” that their work with the SNEP Network prompted further action.

NEEFC worked with the University of Maine System to support and advance community assistance projects by amending existing contracts with consultants from the Network consultant pool to ensure projects were fully supported and would position communities to advance their projects apply for funding. The NEEFC also made improvements to the technical assistance tracking spreadsheet. This tracking sheet was updated from an excel based tracker to a google sheets-based tracker to allow for an easy-to-use interface and enable partners to easily access the requests, filter and sort based on the fiscal year, state, community, and partners involved. At the end July, the NEEFC was awarded the second round of funding for the SNEP Network. To ensure the Network continued to build momentum in providing technical assistance to communities, the NEEFC worked closely with partners to set strategic priorities and develop a scope of work for the next 5 years.

As an end to the Network’s first 5 years, the NEEFC worked with Network partners to plan the 5-year Network event that highlighted SNEP communities that have worked with the Network to advance regional climate resilience.





TASK II: TRAININGS + WEBINARS

SNEP Network Fiscal Year 1 (October 1, 2019 - September 30, 2020)

In Year 1, the pandemic forced a transition from in-person to virtual trainings. Despite these challenges, the SNEP Network launched a successful series of webinars starting in April 2020, featuring 10 sessions with 7 partners. These webinars covered diverse topics such as climate resiliency, low impact development, green infrastructure, and stormwater management. The NEEFC and SU-EFC played a crucial role in organizing these events, offering leadership in technical services and finance training.

In addition to the trainings, the Network began the development of the Bylaw Training Curriculum. The training was intended to walk users throught how to evaluate local zoning, stie plan reivew, subdivision rules and regulations, stormwater or LID bylaw, and cluster or open space residential design bylaw. The curriculum was developed by SNEP Network Partners Mass Audubon, Cape Cod Commission, the Southeast Regional Planning and Economic Development District, and the Blackstone Watershed Collaborative in partnership with Mass Rivers Alliance and the Citizen Planner Training Collaborative.

Training/Webinars held this year included:

- Lunchtime webinar four-part series entitled COVID-19 Preparedness and Recovery
- Got LID? A municipal Self-Assessment Tool for Rhode Island Communities
- Mapping Nature Based Solutions for Climate Resilience
- Saving Land, Water, and Money with Smart Local Land Use Reguations
- Green Storwmater infrastructure 101 for New England Communities
- Designing Green Stormwater Infrastructure
- Building the Case for Green Infrastructure: The Value of Nature
- The Southeast New England Stew-Map Kickoff
- Incorporating Green Infrastructure for stormwater and other co-beinefits

SNEP Network Fiscal Year 2 (October 1, 2020 - September 30, 2021)

Despite the ongoing challenges from COVID, the SNEP Network

"I didn't typically sit down with the finance people to discuss financial planning...The SNEP Network helped us get here, and I can't say how grateful we are"

Timothy Lydon on the Network project with Bourne, MA. The project connected financial and regulatory staff to meet the community's challenges head on, a model that Lydon hopes will catch on in neighboring municipalities.

persistently advanced its training/webinar effort. The Network provided three Green Stormwater Infrastructure (GSI) training sessions through the Providence Stormwater Innovation Center and concluded the Wareham Leadership Exchange. The Network partnered with the Association of Climate Change Officers (ACCO) to offer SNEP communities the opportunity to take the Climate Change Professional (CC-P) course at no cost, using allocated carry-over funds from Year 1. 37 people registered and received scholarships to attend the training. Of those, 28 communities and organizations represented: 9 SNEP communities, 1 Tribe, 6 community organizations, 3 consultants, 7 Network Partners and 2 Government Agencies (US EPA and MA EEA)

The NE EFC worked with partners to develop and implement training resources, coordinate training activities among partners, post training events on the SNEP website, and provide outreach to communities to connect communities with relevant training opportunities.

Training highlights include:

- With technical support from the SNEP Network, The Providence Stormwater Innovation Center has successfully hosted 3 virtual training webinars: GSI construction oversight (Oct 23, 2020 and March 26, 2021), GSI Maintenance (March 5, 2021).
- The SNEP Network concluded the Climate Leadership Exchange with Town of Wareham. The project period included a 4- part webinar series, closed work sessions, 10 podcast episodes, and engagement of community leaders across the country.
- Mass Audubon outlined Bylaw review training curriculum and selected consultant to move forward with the curriculum design. Cape Cod Commission, URI NEMO and Mass Audubon meet bi-monthly to coordinate and discuss Bylaw/LID topics and share resources.
- URI MPA program identified 4 University of Rhode Island MPA students to participate in the public finance report.

SNEP Network Fiscal Year 3 (October 1, 2021 - September 30, 2022)

In Year 3, the Network significantly expanded its training and outreach efforts. The Network hosted over 20 workshops and webinars, engaging more than 300 participants on various topics. A notable achievement from FY3 was the development of a new, innovative initiative, known as the "SNEP Network's Stormwater Planning Series". In response to community projects solicited in 2021, The Network crafted a series of five trainings that guided communities through the process of designing stormwater retrofit plans for a specific stormwater drainage area. The series focused on building local capacity by having communities take ownership and complete their own stormwater conceptual design.

Furthermore, communities and SNEP Network Partners were able to use the approaches identified in the Stormwater Retrofit Manual to complete their designs. The success of the stormwater planning series speaks not only to the effectiveness of the curriculum, but also the effectiveness of the guidance identified in Stormwater Retrofit Manual.

The series was made possible through the collaborative expertise of Elizabeth Scott Consulting, UNH Stormwater Center, Save the Bay, Kimberly Groff Consulting, The Audubon Society of Rhode Island, and NBNERR.

The participating communities in the first cohort of the Stormwater Planning Series included the following:

- City of Providence, RI
- Town of Westerly, RI
- Town of South Kingstown, RI
- Town of Warren, RI
- The Mashpee Wampanoag Tribe and The Town of Mashpee, MA

The SNEP Network also participated in the SNEP Symposium by offering 8 SNEP Network Symposium Presentations. These projects showcase the wide-ranging expertise and services that are provided by the SNEP Network to build local capacity with communities in SNEP region. The presentations offered were:

- Canoe River Aquifer Protection Through Regional Application of Nature Based Solutions. Dr. Kimberly Groff, SNEP Network
- Partnerships and planning to address water quality in a Mashpee Wampanoag Tribe Ancestorial Pond. Jason Steiding, Mashpee Wampanoag Tribe
- Making Space for Resilience: An Organizational Capacity Assessment Framework for the Town of Mansfield, MA. Tess Clark, Syracuse University Environmental Finance Center
- A Partnership Approach to Restoring the Maidford River. Elizabeth Scott, SNEP Network
- The Stewardship Mapping and Assessment Project of Southeast New England (Stew-Map SNE): supporting environmental stewardship and justice in the region. Jesse Sayles, U.S Environmental Protection Agency Office of Research and Development.
- Sustainable Financing. Joanne Throwe, Throwe Environmental
- Poster Presentation: Self-reported Effects of Covid-19 pandemic on stewardship organizations and their activities in Southeast New England, USA- Casey Merkle, Rhode Island School of Design (RISD)
- Keynote Presentation: Stormwater Retrofit Manual (UNH Stormwater Center)

The LID/Bylaw Strategy team, a collaborative effort among Network Partners Mass Audubon, Blackstone Watershed Collaborative, Cape Cod Commission, and regional partners, held their first Bylaw Workshop in Worcester, MA on June 24th, 2022. The workshop was well received, and due to popular demand, the team will offer the workshop again in Middleborough, MA on October 27th, 2022.

SNEP Network Fiscal Year 4 (October 1, 2022 - September 30, 2023)

In Year 4, the second cohort of the Stormwater Planning Series graduated, with North Kingstown, Marion, Shrewsbury, and New Bedford participating in developing nature-based stormwater retrofit designs. Following the completion of the stormwater planning series, partners received feedback from the community participants that they wanted a follow session to better understand the existing Network resources to help move their conceptual designs forward. In response, the stormwater planning team added an optional 6th session to introduce the communities to existing resources including funding

opportunities, additional training on community engagement, and the bylaw review tool. Additionally, the Network hosted 11 educational events, including workshops and presentations, with over 450 participants.

Notable activities include:

- The SNEP Network continued the delivery of the Bylaw Review Curriculum and Stormwater Planning Series curriculum. On October 27th, the Bylaw Review Team hosted the bylaw workshop "Is Your Community Climate Resilient? – Bylaws and Best Practices – How-to Training". This in-depth training taught introduced the Bylaw Review Tool and prepared them to undertake a bylaw/ordinance review process with their municipalities.
- The SNEP Network organized two funding workshops that highlighted key federal, state, and regional funding opportunities. At each workshop, funders were invited to speak about their funding programs and help participants identify which funding programs could support their water quality and climate resilience projects. During the networking portion of the workshops, participants spoke directly with funders about their specific needs.
- The SNEP Network also completed its third Leadership Exchange during the reporting period. This year, the SNEP Network's Leadership Exchange took place on Aquidneck Island with the three island communities: Middletown, Portsmouth, and Newport. The SNEP Network Leadership Exchange Project Team, comprised of Network partners Throwe Environmental and Elizabeth Scott Consulting, worked with the Rhode Island Infrastructure Bank and the island's municipal resilience teams—these resilience teams are representatives from each of the three Aquidneck Island communities—hosted three workshops as part of the Aquidneck Island Climate Resilience Leadership Exchange in April, May, and June 2023.

SNEP Network Fiscal Year 5 (October 1, 2023 - September 30, 2024)

Year 5 continued the Network's commitment to training and community support with a variety of sessions and events. The Rhode Island and Massachusetts Funding Workshops featured over 15 representatives from various state, federal, and regional funding programs, including NFWF, SWIG, and MVP Action Grants. These workshops were well attended with 73 participants in Rhode Island and 100 in Massachusetts.

The SNEP Network hosted the 3rd cohort of SNEP Network communities participating in the Stormwater Planning Series. This year's cohort included Coventry, RI, Hopkinton, RI, Swansea, MA, and Westport, MA. Five sessions were held between November 2023-March 2023. Communities completed the workshop series with a conceptual design, estimated pollution reduction credits, and cost estimates. To advance their projects toward implementation, the SNEP Network provided consultant services to obtain the necessary site assessments to advance their conceptual designs to 30% design, thereby enabling communities to apply for implementation funding. The technical assistance included development of a QAPP, an existing conditions survey and plan, soil evaluation, and development of SCM design site plans.



Bylaw Review Curriculum Training

In a two year effort from FY1-FY2, the Network partners Mass Audubon, SPREDD, Cape Cod Commission, and the Blackstone Watershed Collaborative, in partnership with Mass Rivers Alliance and the Citizen Planner Training Collaborative worked together to develop the *"Building Community Resilience Through Local Regulations"* curriculum. This curriculum guides a user through different components of improving climate resilience through local regulations that support nature-based climate solutions, like low-impact development or LID. The curriculum comprises 8 modules, each of which provides guidance on different components of sustainable development and the Mass Audubon Bylaw Review Tool that assesses local regulations with a conservation lens. Each module includes a detailed participant guide to bylaws and best practices, and PowerPoint presentation with applicable speaker notes. The goal of the curriculum is to provide communities (planners, municipal staff, and interested members of the public) the tools and knowledge necessary to make LID more accessible in their land use regulations and bylaws.

Upon completing the curriculum, the Network created at Bylaw Review Tool Storymap to support and provide step by step guidance on how to use the tool. Additionally, the Network hosted two in person trainings.

On June 24th, the Network held an in-depth bylaw review training at Clark University in Worcester, Massachusetts with 27 attendees. The Network held a second bylaw review training in Middleboro, MA. The Bylaw Review workshop was well attended with 30 participants. share the tools and resources, the SNEP Network updated the Bylaw Review webpage to include a recording of the workshop presentations, a story map, and previous webinars.

- Bylaw Review Tool Storymap
- Building Community Resilience Through Local Regulations curriculum
- Bylaw Review Tool Factsheet

SNEP Network Stormwater Planning Series

In response to municipalities' requests for stormwater planning assistance, the SNEP Network developed the "Stormwater Training/Facilitated Planning Series" which collectively guides communities to develop to a conceptual design for a nature-based stormwater retrofit option in their selected drainage area. Through a series of training sessions and facilitated planning meetings with each municipality and Tribe (including an in-person site visit and/or virtual Google Earth visit of the selected drainage area), the SNEP Network Team assited each municipality/Tribe with identifying innovative and low-cost solutions to identified stormwater problems in their selected drainage area.

The SNEP Network took 13 SNEP communities and Tribes through the training. Full project descriptions for the community projects can be found in Appendix C and D.

The SNEP Network team included:

- Elizabeth Scott, Elizabeth Scott Consulting, Rhode Island Liaison for SNEP Network
- Jamie Houle, Director of the University of New Hampshire's Stormwater Center
- Wenley Ferguson, Director of Habitat Restoration, Save the Bay
- Ryan Kopp, Stormwater Coordinator, Audubon Society of Rhode Island (Providence Stormwater Innovation Center)

- Jen West, Coastal Training Coordinator, Narragansett Bay National Estuarine Research Reserve
- Kimberly Groff, Kimberly Groff Consulting, Massachusetts Liaison for SNEP Network
- Stefanie Covino, Blackstone Watershed Collaborative
- Danica Belknap, Southeastern Regional Planning and Economic Development District

Cohort 1:

- Mashpee Wampanoag Tribe | MWT Tribe worked with the Network to identify measures to reduce the internal loads of phosphorus and improve water quality in Santuit Pond.
- Providence, RI | Develop conceptual designs to address water quality, erosion, habitat, and flooding issues in the York Pond watershed and along the adjacent shoreline area of the tidal Seekonk River.
- South Kingstown, RI | The SNEP Network worked with the Town of South Kingstown to address flooding, water quality, and riparian habitat restoration needs along the Saugatucket River watershed.
- Warren, RI | The SNEP Network worked closely with the Town and Warren Land Trust to develop conceptual designs for retrofitting the basin's outlet and for infiltration trenches and other stormwater practices within the Warren Industrial Park
- Westerly, RI | The town developed conceptual designs for bioretention swales and a wet pond on a "catalyst" private property, proposed for redevelopment as an outdoor event space, to treat runoff from the property and the adjoining roadway.

Cohort 2:

- Groundwork Southcoast with New Bedford, MA | Identify stormwater retrofit opportunities which would aim to help reduce some of the observed flooding while also improving water quality in Brooklawn Park.
- Town of Marion, MA | Develop a conceptual design and cost estimate for Stormwater Control Measures (SCMs) for Sprague's Cove.
- Town of North Kingstown, RI | Developed conceptual designs to address the discharge of untreated runoff from the neighboring residential area and roads degrading the water quality in the vicinity of the Town Beach located on the lower Narragansett Bay.
- Town of Shrewsbury, MA | Jordan Pond in Shrewsbury, MA is impaired due to phosphorus and turbidity. The SNEP Network worked with the Town of Shrewsbury to develop a stormwater retrofit conceptual design at Jordan Pond.

Cohort 3:

- Coventry, RI | Develop long range stormwater management planning on a watershed level, specifically mediation of stormwater issues on Upper Dam Pond.
- Swansea, MA | Build capacity to learn how to improve the water quality of the Cole River estuary that is impacted in part by untreated stormwater runoff and nitrogen runoff from fertilizers.
- Hopkinton, RI | Develop conceptual designs and implement stormwater management practice that will address the flooding and erosions at the intersection of Maxson Hill Road and Route 3 and along residential properties.
- Westport, MA | Make improvements to an existing drainage ditch and eroded basin to enhance the existing system and remedy the continued stormwater flow beyond existing basins.



SNEP Network Leadership Exchange

Wareham, Massachusetts Leadership Exchange

Located at the head of Buzzards Bay, the Town of Wareham is the primary gateway community to Cape Cod, one of New England's most popular vacation destinations. With a rising year-round population of approximately 22,000, a seasonal influx that doubles this population to approximately 44,000, and 54 miles of coastline, Wareham is committed to attracting economic activity beyond visitors traveling through the community to Cape Cod. Once an industrial and economic hub, Wareham faces the challenge of how to reinvent its economy for decades to come, while addressing the generational threats of climate change and sea-level rise that pose very real risks to the community.

In 2020-2021, the SNEP Network organized a leadership exchange with the Town of Wareham, MA that focused on climate resilience financing and sustainable development issues facing the town. SNEP Network Partner, Throwe Environmental, facilitated conversations between the Town of Wareham and 12 different communities from around the country including: Lancaseter City, PA, Annapolis, MD, New Bedford, MA, Chattanooga, TN, and Ranson, WV. Invited guests helped guide future redevelopment plans for Wareham Village by focusing on incorporating elements of climate resilience, stormwater management, and green infrastructure into design plans that are closely connected to economic development opportunities.

The Network developed a final Wareham Leadership Exchange and Sustainable Redevelopment Report that outlined key findings and recommendations that could be applied to Wareham's challenges, including incorporating green infrastructure of the redevelopment, community resilience planning to establish a holistice approach to infrastructure development and financing, and smart growth and strategic zoning that is consistent with broader community goals and priorities.

- Wareham Leadership Exchange and sustainable Redevelopment Report
- Wareham Leadership Exchange Storymap
- Webinar 1: *"Incorporating green infrastructure for stormwater and other co-benefits"*
  This webinar highlights communities that have employed green infrastructure best management practices (BMPs) and considers how these primary and co-benefits could be taken advantage of in Wareham.
  - The Leadership Exchange Podcast: S1 | E1: Green Infrastructure (ft. Lancaster City and Provincetown)
- Webinar 2: "Integrated action planning for climate, social, and economic resilience"
  This webinar highlights communities that have successfully incentivized multiple forms of investment and have embraced resilience in specific projects, as well as in broader forward-looking planning activities.
  - The Leadership Exchange Podcast
    - S1 | E2: Resilience Planning- Part 1 (ft. Annapolis, MD)
    - S1 | E3: Resilience Planning- Part 2 (ft. Hoboken, NJ)
    - S1 | E4: Resilience Planning- Part 3 (ft. New Bedford, MA)
- Webinar 3: "Revitalizing waterfront communities through comprehensive redevelopment"
  This webinar brings together three waterfront cities that have had similar redevelopment challenges as Wareham and showcases how they have successfully reinvented themselves, all while taking advantage of environmental, social, and economic opportunities.
  - The Leadership Exchange Podcast
    - S1 | E5: Waterfront Redevelopment- Part 1 (ft. Boston Harborkeepers)
    - S1 | E6: Waterfront Redevelopment- Part 2 (ft. ULI/City Dock Experts)
    - S1 | E7: Waterfront Redevelopment- Part 3 (ft. Tilghman Island, MD)
    - S1 | E8: Waterfront Redevelopment- Part 4 (ft. Chattanooga, TN)
- Webinar 4: "Smart growth and strategic zoning for livable communities"
  This webinar brings together communities that have employed principles of smart growth, form-based coding, and strategic zoning to create public spaces that further a broader vision of efficiency and vibrancy.
  - The Leadership Exchange Podcast
    - Podcast S1 | E9: Smart Growth (ft. Ranson, WV)
    - Podcast S1 | E10: Smart Growth (ft. Warwick, RI/RIPTA)

Wampanoag Tribe of Gay Head (Aquinnah) Leadership Exchange

Following the Wareham Leadership Exchange, the SNEP Network built on the leadership exchange format to focus on the experiences and stories of Tribal Elders, leaders, and members from The Wampanoag Tribe of Gay Head Aquinnah (WTGHA).

As part of the Leadership Exchange, the SNEP Network has produced Season 2 of The Leadership Exchange Podcast, hosted by SNEP Network Partner, Kyle Gray (Throwe Environmental. LLC). With a series of podcasts, the Wampanoag Tribe of Gay Head Aquinnah share the changes they have witnessed in their climate as well as potential actions to address the changes.

- The Leadership Exchange Podcast: Wampanoag Tribe of Gay Head (Aquinnah)
  - Episode 0: Trailer

- Episode 1: The Wampanoag Tribe and Climate Change
- Episode 2: Natural Resource Protection
- Episode 3: Housing and Economic Development
- Episode 4: Capacity and Investment

On May 4, 2022, Throwe Environmental hosted the Southeast New England Program (SNEP) Network's *Tribal Climate Leadership Exchange*. The event was hosted by the Wampanoag Tribe of Gay Head (Aquinnah) with sponsorship from the Environmental Protection Agency. EPA and the Aquinnah tribe invited Throwe Environmental to facilitate a special climate leadership session that was embedded into a two-day water quality training. Twelve Tribes and Nations from across EPA Regions 1 and 2 were in attendance at the event.

Throwe Environmental led a two-part peer-to-peer leadership exchange to facilitate conversations between the Tribes and Nations around the challenges, barriers, opportunities, and solutions associated with climate change funding and financing. During the first session, the team led a facilitated discussion with the Tribes and Nations to identify key challenges, barriers, and opportunities in regard to the access to and utilization of sustainable funding and financing for climate change and water resource projects and programs. The second session offered the opportunity for a broader conversation, where Throwe Environmental synthesized, shared, and solicited feedback on important takeaways from the morning session. A particular focus was given to potential solutions going forward.





Aquidneck Island Climate Resilience Leadership Exchange

Building upon the SNEP Network's climate resilience work with the City of Newport, Town of Middletown, and Town of Portsmouth in Rhode Island, SNEP Network partners, Throwe Environmental and Elizabeth Scott (Rhode Island SNEP Network Liaison), worked with the Rhode Island Infrastructure Bank's Aquidneck Island Resiliency Coordinator to organize an Aquidneck Island Leadership Exchange to foster peer-to-peer learning, collaboration, and regional coordination on high priority topics. As part of the technical assistance to the Aquidneck Island Communities, the SNEP Network conducted climate resilience prioritization and financing assessments for the communities of Aquidneck Island. As a result, these communities are better positioned to improve local climate resilience.

This leadership exchange reopened the lines of communication amongst island- wide leadership and an informal agreement between the municipalities and Naval Station Newport (NAVSTA Newport) to coordinate efforts to increase regional climate resilience. Since their work with the SNEP Network, the Aquidneck Island communities have capitalized on the momentum of these collaborative efforts, to secure nearly $2 million in capacity building funds from NOAA's Climate Resilience Regional Challenge.

With leadership of the Aquidneck Island Regional Resilience Coordinator and the Aquidneck Land Trust in partnership with the island municipalities and the Navy, and in collaboration with many local stakeholders, the "Growing Regional Resilience Coordination on Aquidneck Island" initiative will allow the partnership to grow their island-wide approach to resilience, offering technical assistance, capacity building, and actionable strategies for responding to climate change. They will work with their established network of partners to implement resilience projects that include nature-based solutions to address threats from flooding, sea level rise, and water pollution.

- Leadership Exchange Summary of Findings Memo
- Portsmouth Climate Resilience Planning and Financing Strategy
- Newport Climate Resilience and Financing Prioritization Report
- Middletown Climate Resilience Planning and Financing Strategy

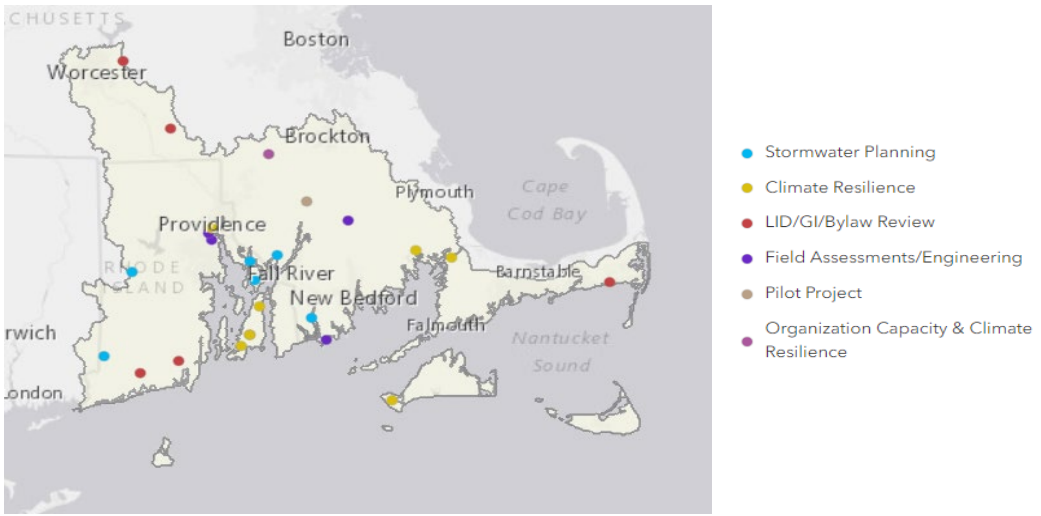
SNEP Network Webinars by Fiscal Year

YEAR 5	• **Combined Sewer Overflow, Oh no!: An Introduction to CSO and What it Means for the Blackstone River** • **Prioritizing Nature-based Stormwater Projects to Maximize Community Co-Benefits in the Buttonwood Brook Watershed** • **Communication Strategies for Water Quality Management Planning: Framework to Action** • **Emerging Stormwater Technologies in Rhode Island: Cultec Separator Row & StormTech Isolator Row PLUS** https://snepnetwork.org/2024/03/15/massachusetts-grant-funding-workshop-2024/ • **Massachusetts Grant Funding Workshop 2024** • **Rhode Island Grant Funding Workshop 2024**
YEAR 4	• **Demystifying Floodplain Management: What you need to know**https://snepnetwork.org/2023/03/16/funding-water-quality-restoration-and-climate-resilience-projects-in-rhode-island/ • **Funding Water Quality Restoration and Climate Resilience Projects in Rhode Island (2023)** • **Balancing Housing Needs with Clean Water** • **Funding Nature Based Community Resilience in Southeastern Massachusetts (2023)** • **Emerging Stormwater Technologies in Rhode Island: Focalpoint** • **Conservation Development: A technique to help communities meet their land preservation, climate change and water quality goals**
YEAR 3	• **Stormwater Financing 101** • **The Stewardship Mapping and Assessment Project of Southeast New England: Learn About Organizations and Find New Collaborations Across SNEP Watersheds** • **Hydrologic Response Units – A recipe for more uniform stormwater planning** • **Nitrogen Trading Opportunities under Massachusetts' First Watershed Permit** • **Challenges and Opportunities for Green Infrastructure, Stormwater, and Resilience Financing in Rhode Island** • **Emerging Stormwater Technologies in Rhode Island: Jellyfish Filter** • **Get to Know Emerging Drinking Water Contaminants: Per- and Polyfluoroalkyl Substances (PFAS):** • **Is Your Community Climate Resilient? – Bylaws and Best Practices** • **Stormwater Tree Trench Design Options Guide Training**https://snepnetwork.org/2021/09/27/funding-basics-for-new-england-communities-a-beginners-guide-to-developing-successful-proposals-for-resiliency/

YEAR 2	• Funding Basics for New England Communities: A Beginner's Guide to Developing Successful Proposals for Resiliency • Cognitive and Perceptual Barriers to Green Infrastructure: Local Decision-Making in Rhode Island • No Resilience Without Social Resilience: Highlighting and Expanding on Environmental Justice in the SNEP Climate Leadership Exchange • A Residential Guide to Stormwater • Green Stormwater Project Construction Oversight Spring 2021 • Funding Opportunities for Rhode Island: National Coastal Resilience Fund 2021 • Maintaining Green Stormwater Infrastructure • Webinar 4: Smart Growth and Strategic Zoning for Livable Communities • Webinar 3: Revitalizing Waterfront Communities through Comprehensive Redevelopment • Green Stormwater Project Construction Oversight • Webinar 2: Integrated Action Planning for Climate, Social, and Economic Resilience • Webinar 1: Incorporating Green Infrastructure for Stormwater and other Co-Benefits
YEAR 1	• The Southeast New England Stew-Map Kickoff • Building the Case for Green Infrastructure the Value of Nature • Designing Green Stormwater Infrastructure • Green Stormwater Infrastructure (GSI) 101 for New England Communities • Saving Land, Water, and Money With Smart Local Land Use Regulations • Mapping Nature Based-Solutions for Climate Resilience: Developing Potential Implementation Actions • Got LID? A Municipal Self-Assessment Tool for Rhode Island Communities • Prioritizing and Valuing Investments in Resilience • The Intersection between Pandemic Preparedness and Recovery and Climate Preparation Disaster and Recovery • Comparing Lessons Learned from COVID-19 and Climate Change Messaging

TASK III: TECHNICAL ASSISTANCE

The SNEP Network excelled in delivering technical assistance by employing a flexible, responsive model tailored to meet the unique needs of municipalities, Tribal nations, and community organizations. Through its **pre-approved consultant pool**, the Network quickly connected communities with experts in stormwater management, environmental justice, and watershed planning, ensuring access to specialized skills without administrative delays. This approach enabled the swift advancement of projects, from conceptual design to implementation.



SNEP Network Fiscal Year 1 (October 1, 2019 - September 30, 2020)

As the Network began to build its internal collaborative structures and implement administrative processes in FY1, it also began to create the programmatic infrastructre needed to provide technical assistance to SNEP communities. Two cruicial components of successfully delivering technical assistance were the pre-approved consultant pool and the call for participants process.

To meet the varied technical assistance needs of the SNEP communities and expand its capacity to provide a comprehensive suite of services, the Network developed the pre-approved consultant pool. The pre-approved consultant pool was designed to streamline the process of connecting participants with the right expertise by alleviating the administrative burdens of procuring and managing consultant services from already overburdened and underesourced communities. The SNEP Network's pre-approved consultant pool is comprised of consultants with experience and expertise in areas critical to environmental restoration, water quality improvement, habitat conservation, and climate resilience in Southeastern Massachusetts and Rhode Island. These consultants were vetted by the Network partners for their expertise, experience, and ability to deliver high-quality technical assistance to community projects. The pre-approved consultant pool provides immediate access to a diverse range of expertise without the need for an extensive search or vetting process, saving time and resources of the municipality, Tribe, and/or community organizations.

The Network developed the call for participants process to identify community projects that align with the SNEP's mission of restoring water quality, enhancing habitat, and increasing climate resilience. The Network evaluated and selected twelve projects from a field of sixteen applications that fit the SNEP Network's expertise and mission. In FY1, there were eight applicants that also received funding from the Consultant Pool to support and leverage the work implemented by the Network. The NEEFC completed Memorandums of Agreement (MOA) for all 12 awardees and established eight contracts between the University of Maine and pre-qualified consultant.

The Network partners worked closely and collaboratively with the municipality, tribe, and/or community organization to not only advance projects, but concurrently build their capacity to address their climate challenges by taking them through the planning to implementation phases of a project.

Additionally, the SNEP Network advanced the following projects in FY1:

- The Audubon Society of RI, TNC RI, and UNH Stormwater Center officially launched the Stormwater Innovation Center which creates a hub for learning, training and public engagement focused on stormwater practices.
- The Stew-Map team of RISD and Brown University developed an extensive database of stewardship organizations for SNEP Region, launched the Stew-Map project survey and trained research assistants in social science methods.
- The Stormwater Retrofit Manual, led by UNH Stormwater Center, established an advisory committee, drafted the tables of contents and the first four chapters.
- The Taunton and Maidford project teams advanced significantly by establishing consistent team meetings. The Taunton Pilot team selected the Canoe River Aquifer as the project, and they secured permission from property owners for floodplain restoration site evaluation.

SNEP Network Fiscal Year 2 (October 1, 2020 - September 30, 2021)

In the second year, the Network went through a comprehensive process of collecting feedback from Network partners and the SNEP Network's Environmental Justice Team to expand its pre-approved consultant pool list of services to largely include environmental justice and community engagement services. The Phase II of the Consultant Pool RFQ was successfully released in March 2021. This RFQ resulted in the addition of 7 new consultants to the consultant pool.

New services offered through the consultant pool included:

- Development of Sampling and Analysis Plans and Quality Assurance Project Plans (QAPP) for environmental monitoring;
- Forestry management services including conservation, scoping and planning for the management of vegetation, restoration of ecosystems, reduction of hazards and maintenance of forest health;
- Diversity, Equity, and Inclusion training to address and enhance organizational leadership skills necessary to develop successful network practices, with a preference for organizations that have local expertise in equity issues;
- Public and workgroup meeting facilitation services with experience in, but not limited to, engaging diverse audiences and cultures, adaptive engagement strategies, and virtual engagement strategies;
- Translation services to facilitate communication with non-English speaking populations who may be stakeholders or otherwise affected by a project supported by the SNEP Network, and;
- Curriculum development, training development and design, and Bylaw Curriculum Development services.

In fiscal year two, the Network engaged with 104 SNEP municipalities through the Call for Participants process, webinars/trainings, and web portal requests. The Network offered 21 professional development opportunities that were made available to municipalities, tribes, and NGOs. Furthermore, Partners worked with 7 communities to complete a LID Checklist/Bylaw review and continued meetings as a Network Strategy team to coordinate LID/Bylaw Review efforts and share lessons learned. Network Partners also engaged 77 volunteers (total of 814 hours) through Save the Bay's storm drain marking initiative to mark 4,266 storm drains in the following RI communities: Barrington, Cranston, East Greenwich, East Providence, Jamestown, Narragansett, Seekonk, South Kingstown, and Westerly.

Following the release of the Round II Call for participants in late June 2021 that included an evaluation process by Network Partners, nine community assistance projects were awarded 5 RI, 1 MA, and 2 Tribal Nations.

Network Project and Technical Assistance highlights include:

- The Pleasant Bay Alliance Project Team finalized the PBA Bylaw Report for the four PBA communities (Orleans, Brewster, Harwich, and Chatham) thereby completing the Pleasant Bay Alliance Project;
- The two SNEP Network Pilot Projects, Canoe River Project and Maidford River Project, submitted their QAPP for baseline monitoring to EPA and were approved with minor edits;
- The Canoe River Aquifer Project Team updated the project's webpage and developed an interactive storymap of the project and will begin the community outreach component of the project's Public Participation Plan;
- Maidford River Project Team developed a conceptual river and floodplain restoration project plan addressing flood mitigation, and water quality and habitat improvement project goals. Additionally,

the team has cultivated support from property owners within the project area to advance the project at 30% design. The Maidford River Team supported Town of Middletown's application for a SNEP Watershed Grant which was awarded in Sept 2021 to advance the river restoration project to 60% design & to prepare necessary permit applications;

- Throwe Environmental finalized the Climate Prioritization Tool through working directly with Bourne, MA and Portsmouth, RI, and presented the tool during an EPA sponsored *Soak up the Rain* webinar;
- The final draft of the Conservation Development Zoning Ordinance for the Town of Charleston was completed and presented at the Charleston Planning Board Meeting;
- The Stormwater Innovation Center team established two working monitoring locations at the inlet and outlet of the Roger Williams Park, installed monitoring equipment that was sponsored by the SNEP Network, and surveyed three additional structural BMPs;
- The Stormwater Innovation Center team developed the final draft of the Tree Trench Options Guide;
- The StewMap team conducted a qualitative analysis and completed white paper on the COVID-19 pandemic impacts on organizations; the paper was submitted for final peer review and New England EFC review;
- The Stormwater Retrofit Manual team finalized the first three chapters and drafted the final chapters;
- Save the Bay engaged 77 volunteers to complete 4,266 storm drain markings;
- Cape Cod Commission refined their HRU classification script and drafted the maps for runoff, nitrogen, and phosphorus loads.
- The SNEP Network inventoried of over 250 potential nature based solutions projects in the Canoe River Project area was created and georeferenced in GIS.
- The SNEP Network developed a long term flood mitigation plan for the Town of Warren, RI.



SNEP Network Fiscal Year 3 (October 1, 2021 - September 30, 2022)

In FY3, Network partners continued to provide direct technical assistance to communities focusing on specific goals related to the Call for Participants community projects, regional initiatives, and technical assistance requests. Working collaboratively with consultants, community stakeholders, and decision-makers on all levels of governance, the Network has made strides toward advancing the project goals of the 2021 community assistance projects, Network Pilot project, and Network products.

Notable Network milestones include:

- Maidford River Restoration Project: the project team completed the Floodplain and River Restoration 30% designs, completed a Maidford River Restoration Project Storymap, and revised the project webpage
- Santuit Pond Restoration project with the Mashpee Wampanoag Tribe and the Town of Mashpee: project team has a clear path forward to implementation efforts that are necessary to improve water quality. The Santuit Pond Watershed Based Plan positions the Town and Tribe for 604b and 319 NPS grant funding to advance implementation of stormwater retrofits and Alum treatment.
- Canoe River Aquifer Resilience project: working with the communities and steering committee, the project team has developed a short list of 12 projects--from 300 climate hazard projects identified through a previously awarded MVP grant--NBS focus areas in 5 communities. Three of the shortlisted projects are now being submitted to grant programs for funding. State agency staff have also responded positively, and these projects offer opportunities as demo projects for others.
- WTGHA community assistance project: Team is working with the Tribe, EPA, and the Network to prepare materials that are expected to lead to a very productive in-person event. The project team also anticipate doing podcasts.
- LID/Bylaw Review: With additional Network funding, URI-NEMO received a part time graduate student to work on LID assessment. They were completed an LID Assessment for Richmond, RI (URI Grad Intern) and sent LID Assessment for Town of Richmond for review, in addition to presenting to the Richmond Planning Board on local groundwater resources and protection issues, focusing on LID stormwater management. Additionally, the LID/Bylaw review strategy team successfully delivered a webinar on how to use the Bylaw Review Tool and anticipate delivering an in-person training this summer.
- Charlestown, RI community assistance project: Project team completed the final draft of the conservation development subdivision regulations and zoning ordinance. Currently waiting for the ordinance to go up for a vote at the city council meeting.
- Providence Stormwater Innovation Center: Working with the UNH Stormwater Center, the team published two monitoring reports: Roger Williams Park BMP Monitoring Report and Real-Time Monitoring Report
- StewMap: the team published a paper on COVID-19 pandemic impacts on organizations in Southeast New England, USA. They also finalized interviews, complete qualitative analysis, and mental sketch map analysis.
- The New England Stormwater Retrofit Manual: On July 26th, the SNEP Network released the Stormwater Retrofit Manual which is available to download on the SNEP Network website. The Stormwater Retrofit Guidance Manual is a key tool for improving the use of green infrastructure retrofits in tight urban areas to manage stormwater volume and reduce pollutants entering local water bodies.

- Tree Trench Design Guide: the project team consisting of the Providence Parks department, Horsley Witten Group, the Providence Stormwater Innovation Center and the SNEP Network finalized the Tree Trench Design Guide to help municipalities design and maintain greener, healthier, and more resilient tree trenches. The SNEP Network developed and launched the Buffer Restoration provides updated guidance on buffer restoration and highlights the SNEP communities that received landscape renderings of restored buffers.
- Town of Charleston: For the past two years, the SNEP Network has assisted the Town of Charlestown with drafting a conservation development ordinance for new subdivisions that incorporates stormwater management and low impact development (LID) standards. After working closely with the Town and revising the ordinance to address concerns, the Town of Charlestown adopted the conservation development ordinance on August 31st, 2022. With the adoption of the ordinance, conservation development standards for zoning will enhance the protection of open space in Charlestown. The ordinance serves as a model with updated elements for other communities.
- Town of Mansfield: On September 7th, 2022, Katelyn Gonyer, Conservation Planner at the Town of Mansfield, MA presented recommendations for advancing resiliency efforts and internal capacity to the Mansfield Select Board. The recommendations stemmed from organizational capacity assessment process undertaken by the Town in partnership with the SNEP Network and Syracuse University Environmental Finance Center, following five years of growing stormwater, climate preparedness, and open space planning programs at the Town. As a result of the analysis, the Town is making efforts to mainstream resiliency efforts led by the Conservation Department, expand staff resources, and use the Town's successful "Discover Mansfield" campaign to share news and messages related to conservation and climate resilience.
- The Mashpee Wampanoag and the Town of Mashpee: The Mashpee Wampanoag Tribe and the Town of Mashpee participated in the SNEP Network's stormwater planning series, working with SNEP Network partners to develop conceptual designs for stormwater retrofits. The Tribe received a second Municipal Vulnerability Preparedness (MVP) Action Grant Award for $469,037 to start the construction of the Stormwater Retrofits this fall along the road at the Town Landing. In addition, the Town of Mashpee's consultant, Fuss and O'Neill, will work with the project team to seek funding to carry out stormwater Retrofit Design Work at the Town Landing.
- The University of Rhode Island's MPA Program--"Financing Climate Resilience, Stormwater Management, and Green Infrastructure in Rhode Island" report: The University of Rhode Island's MPA Program, a SNEP Network Partner, completed a financing study which involved interviews with over 40+public, nonprofit, and private stakeholders that are part of the green infrastructure, stormwater management, and climate resilience network in Rhode Island. The report looked at the challenges and benefits of stormwater/climate resilience financing and describes a variety of financing mechanisms available to communities.
- Town of Portsmouth: The SNEP Portsmouth project team, led by Throwe Environmental and Elizabeth Scott, published the "Climate Resilience Planning and Financing Strategy Report" which details findings and recommendations after a series of multiple assessments and planning exercises with the Town of Portsmouth, Rhode Island.

In addition to the project milestones, in September, the SNEP Network selected 10 community assistance projects, awarding free technical assistance to 8 communities and 1 tribe.



SNEP Network Fiscal Year 4 (October 1, 2022 - September 30, 2023)

The Network continued to build upon the momentum of ongoing regional initiatives and community assistance projects. Network milestones in FY4 included:

- In Year 4, the "Building Community Resilience Through Local Regulations" curriculum by SNEP Network Partners, Mass Audubon, Cape Cod Commission, SRPEDD, and the Blackstone Watershed Collaborative along with partnering organizations, including Mass Rivers Alliance was completed. This curriculum guides users through different components of improving climate resilience by using local regulations that support nature-based climate solutions, like low-impact development or LID. Bylaw Review/LID Ordinance development has been a regional initiative since FY1.
- This year, SNEP Network Partner, Cape Cod Commission (CCC) has continued to work on the HRU Mapping Layer enhancements, and they are currently working to troubleshoot the crosswalk / pollutant loading math in the interactive viewer. Building upon the work Cape Cod Commission has done as part of the HRU mapping efforts, CCC will coordinate work with SNEP partners to adapt and transfer their HRU calculations for entire SNEP Region.
- SNEP Network partners completed their work with the Town of Middletown, Rhode Island, and the Aquidneck Land Trust on the Network's Maidford River Pilot Project. The project involved planning and designing nature-based solutions to reduce flooding and improve water quality of the Maidford River and downstream receiving waters which include two sources of Aquidneck Island's water supply, Nelson, and Gardiners Ponds. After this project's completion, the team developed a case study highlighting project accomplishments, key findings, and lessons learned. This case study is now available on the Network website here.
- Following the completion of the Stormwater Retrofit Manual, the Network has moved forward with developing training for state regulators to better understand utilization of the manual and how it can be incorporated in their stormwater regulations.
- South Kingstown, a community that participated in the Network's first Stormwater Planning Series cohort, and Network partners worked with the Town staff on a stormwater retrofit conceptual design for a new project and tested what they learned as a team during last year's training series. Instead of hiring an engineering firm to do the conceptual design, the project partners worked together to develop an idea that the Town's engineer further developed and designed. This design is now being engineered by a consultant. Thanks to the 2021-2022 Stormwater Planning Series, South Kingstown was able to move this project to engineering since the conceptual design process was done by Town staff and project partners.
- The Stewardship Mapping and Assessment Project of Southeast New England (Stew-MAP SNE) published their results including the interactive dashboard that enables users to gain a better understanding of the stewardship groups and stewardship activities that take place throughout the SNEP region. The project has been highlighted in newsletters, a SNEP Network Narrative, and the SNEP Network website.
- The SNEP Network continued work with the Mashpee Wampanoag and the Town of Mashpee to improve water quality in Santuit Pond. The SNEP Network has gained support for nutrient inactivation through community outreach and presentations. Since the initial outreach and development of the Santuit Pond Learning Hub, the project team set up a briefing with the Chairwomen of the Tribe to discuss nutrient inactivation and has worked with project consultant, TRC, to develop updated scope of services to assist in 319 NPS grant development. The Network also assisted with the submission of the Santuit Pond Watershed Based Plan.
- The SNEP Network worked with the Tribe and project partners to assist with the development of a draft policy to enhance and protect sustenance species on the Wampanoag Tribe Gay Head

Aquinnah Lands. the Network completed the technical assistance project which resulted in the following deliverables (1) Draft final Written Policy (2) Request for Approval of Disturbance Project Form (3) Final Policy Flow Chart (4) Final Tribal Governance Flow chart, and (5) Inventory of Sustenance Species. This work will help the Tribe achieve their goals of supporting the management of the valuable natural resources.

SNEP Network Fiscal Year 5 (October 1, 2023 - September 30, 2024)

In Year 5, the Network responded to 45 technical assistance requests, including developing the Clean Water Non-Point Source Pollution Assessment for the Mashpee Wampanoag Tribe and securing funding for the Sam Wright Field Wetland Restoration Project. Additional regional initiatives included creating green infrastructure signage, updating Providence's stormwater management financing, and supporting stormwater utility development in Seekonk, reflecting a sustained commitment to improving water quality and climate resilience across the region.

As part of a SNEP Network regional initiative, the Low Impact Development (LID)/Bylaw Strategy Team, comprised of partners Mass Audubon, SRPEDD, Cape Cod Commission, Kimberly Groff Consulting, Elizabeth Scott Consulting, and the Blackstone Watershed Collaborative worked collaboratively to develop an outreach strategy to disseminate the results of EPA's Holistic Watershed Management Initiative. The study evaluated a range of new development and redevelopment practices to better understand and communicate the future impact upon watersheds and the potential for enhanced site design. The LID/Bylaw team found the results compelling but identified a need to translate the results in digestible terms to SNEP communities.

Key project milestones in FY5 included:

- Great Cedar Swamp Project in Sharon, MA: As part of the Network's Canoe River Aquifer Pilot Project in the Taunton River Watershed, the SNEP Network supported the ongoing hydrologic and hydraulic (H&H) evaluations of the Great Cedar Swamp. In February 2024, the Network received the memorandum from consultant, Horsley Witten Group, summarizing the groundwater modeling conducted this past summer and fall. With site monitoring, modeling and concept designs complete, the Town of Sharon and its partners at SNEP Network, MassDER and Horsley Witten Group have begun to develop detailed designs to address the long-standing dewatering concerns for the Great Cedar Swamp.
- Sam Wright Field Wetland Restoration Project in Easton, MA: As part of the Network's Canoe River Aquifer Pilot Project in the Taunton River Watershed, SNEP Network Partner, TNC-MA, has secured $150K of TNC donor raised funding for Phase II Implementation of Sam Wright wetland restoration and Mulberry Meadow Brook culvert removal (Easton). The SNEP Network will continue to provide support through September 2024.
- PVD Trees + Infrastructure Guide: In December of 2023, the SNEP Network's Providence Tree and Infrastructure Conflict Avoidance Guide was published and made available to the public. SNEP Network partner, TNC-RI, and consultants Fuss & O'Neill developed this guide as a supplement to the equity focused Providence Tree Plan –a collaborative project to develop a vision and action plan for creating a just, resilient, and equitably distributed urban forest in Providence. The guide highlights solutions to plant and retain healthy trees and provides accessible, walkable surfaces throughout the City of Providence. While the guide was developed as part of the Providence Tree Plan, the guidance providing recommendations on how to determine solutions for reducing conflicts between tree roots and infrastructure can be applied broadly to other communities facing

similar issues. To promote the Tree and Infrastructure Conflict Avoidance Guide, the Network will work with Fuss & O'Neill to schedule a webinar on utilization of this guide during the next quarter.

- Property Owner Guide for Managing Stormwater: The SNEP Network was asked by the City of Providence to support the development of a Property Owner Guide for Managing Stormwater on Commercial and Industrial properties in support of the Mashapaug Pond RDA in Rhode Island. The guide will be developed by a consultant supported through the SNEP Network consultant pool and will be transferrable to other New England states as well to promote site improvements across the region.
- Town of Seekonk, RI: The NEEFC and Network partner, Anna Patterson from the University of North Carolina Environmental Finance Center (UNC-EFC), and Martha Sheils from the NEEFC are currently working with the Town of Seekonk to assist them with getting buy-in for implementing a stormwater utility. During the reporting period, the NEEFC and UNC-EFC presented at two planning board meetings on the need for financing to accommodate the increasing demands of addressing stormwater issues, what a stormwater utility is and how it can be equitably implemented. Additionally, the SNEP Network is providing consultant services to Seekonk to help develop a Stormwater Assessment including current and future financing needs. The Network anticipates issuing a request for proposals from consultants in the pre-approved consultant pool in the next quarter.



SNEP NETWORK TECHNICAL ASSISTANCE: Pilot Projects

Canoe River Aquifer Pilot Project

Partners: Kimberly Groff Consulting, Mass Audubon, SRPEDD, The Nature Conservancy of Massachusetts

Consultant: Horsley Witten Group

The Canoe River Aquifer is a sole-source aquifer co-located within the Towns of Easton, Foxborough, Mansfield, Norton, and Sharon, Massachusetts. For more than 50,000 people across these five communities, it is the only viable source of drinking water. To protect this natural resource, SNEP Network partners teamed up with the Resilient Taunton Watershed Network and representatives from the five aquifer communities to identify nature-based solutions projects that would reduce local flooding, restore habitat, protect drinking water quality, and improve ground water supply and community resilience to climate change impacts. Based on public input and working with individual towns, hundreds of projects that were previously identified through various planning processes were narrowed down to 16 clusters of projects that optimize co-benefits. The projects were summarized and geo-located in a web-based interactive map and story board. Currently, three of these projects, the Restoration of Great Cedar Swamp in Sharon, MA, the Rumford River Knotweed Management project in Mansfield, MA, and the Mulberry Meadow Brook Wetland Restoration Project in Easton, MA are being advanced toward implementation.

For more information on the Canoe River Aquifer Pilot Project, see Appendix B.



Maidford River Watershed Pilot Project

Partners: Elizabeth Scott Consulting, Save The Bay
Consultant: Fuss and O'Neill
Additional Partners: Aquidneck Land Trust, Eastern Rhode Island Conservation District

The Maidford River is a highly altered river in need of water quality and hydrologic restoration. Located in the town of Middletown, RI, the Maidford River may appear small and insignificant, but it serves as the primary water source for two of Aquidneck Island's water reservoirs, Nelson Pond and Gardiner Pond. Land uses in the watershed are predominantly agricultural and residential, which contribute to flooding, poor water quality, and elimination of natural river buffer habitat. SNEP Network partners assisted the Town of Middletown and Aquidneck Land Trust with planning and design for nature-based solutions to reduce flooding and improve water quality. This project builds on the recommendations of local watershed plans to increase the river's flood storage capacity by creating meanders and floodplain storage and replacing culverts that restrict flow and contribute to flooding. In addition to the floodplain restoration project, the SNEP Network assisted with a public education initiative with all property owners living along the Maidford River to promote restoration of buffers on their land to a naturally vegetated condition.

For more information on the Maidford Pilot Project, see Appendix B.



On-Demand Technical Assistance

In FY1, the Network launched a portal on the SNEP Network website to streamline requests for technical assistance. Over the last 5 years, in addition to the Network's community assistance projects and the projects described below, the Network has responded to 147 technical assistance requests from SNEP communities. These requests were tracked in the SNEP Network Technical Assistance Tracker.

City of Providence, RI:

The City of Providence, Rhode Island has an extensive stormwater system comprised largely of aging gray infrastructure. This infrastructure requires significant maintenance and reconstruction, with more frequent intense rainstorms and flooding events regularly overwhelming system capacity. Designated and predictable funding for system maintenance and expansion is needed to properly address stormwater needs. In 2016, Providence participated in a regional study to assess the stormwater management systems of several communities in upper Narragansett Bay. The NEEFC and several SNEP Network worked to build from that earlier analysis to develop a stormwater management financing system along with Providence, RI city staff.

A Stormwater Task Force was formed in collaboration with the City Sustainability officer and the Office of the Mayor. The Task Force utilized findings from a Stormwater Assessment Plan to make an informed recommendation to the Providence City Council on how to pay for stormwater management in 2025 Elizabeth Scott, RI Liaison, worked closely with Sheila Dormady, City of Providence Chief of Resiliency and Policy and Priscilla De La Cruz, City of Providence Director of Sustainability. Also working on this effort are NEEFC (Martha Sheils) and Jen West from NBNERR as facilitator of the Task Force meetings, and Anna Patterson from UNC EFC. The City of Providence chose Rafetelis to develop a stormwater assessment. Recommendations of the Taks Force will likely be a version of an enterprise fund.

On a parallel track, the NEEFC through its New England Water Infrastructure Network (NEWIN), worked to assess Providence RI's sewer and combined sewer infrastructure priorities and costs. This two-pronged approach that NEEFC designed will result in an enhanced, coordinated, and time efficient process that will allow Providence RI to have a plan and design in place more efficiently, resulting in a quicker and more comprehensive solution to its stormwater and combined sewer challenges. Consultant services were consolidated in Spring of 2024 to Raftelis Group, and NEEFC subawarded Raftelis to finish the stormwater and sewer financial assessment.

Town of Seekonk, MA

The NEEFC and Network partner, Anna Patterson from the University of North Carolina Environmental Finance Center (UNC-EFC), and Martha Sheils from the NEEFC worked with the Town of Seekonk to assist them with getting buy-in for implementing a stormwater utility. During the reporting period, the NEEFC and UNC-EFC presented at two Board of Selectmen meetings on the need for financing to accommodate the increasing demands of addressing stormwater issues, what a stormwater utility is and how it can be equitably implemented. The SNEP Network will continue working with Seekonk MA in 2025.

Mashpee Wampanoag Tribe: Tribal Nonpoint Source Pollution Assessment and Management Plan

The Mashpee Wampanoag Tribe is one of two federally recognized Tribes of Wampanoag people in Massachusetts. Within the town of Mashpee, 170 acres of Tribal trust lands are distributed over 11 independent parcels. The Wampanoag have a goal of protecting, preserving, and restoring freshwater

resources to ensure quality habitat for wildlife, fish, shellfish, and safe drinking water and uncontaminated resources for Tribal members to engage in subsistence, recreational, and commercial activities.

The SNEP Network is currently assisting the Mashpee Wampanoag Tribe's Natural Resources Department with the development of a Tribal nonpoint source pollution assessment and management plan which will enable the Tribe to be eligible for EPA Clean Water Act Section 319 program funds to address the impacts of nonpoint source pollution. The two primary tasks associated with this project are the development of a nonpoint source assessment report and a companion nonpoint source management program plan. The program plan will rely heavily on partnerships because the purpose of nonpoint source management plans is to address nonpoint source pollution impacting streams or lakes at the watershed level and multiple non-Tribal stakeholders exist within that context.

Community Assistance Projects

The "Call for Participants" process was a cornerstone of the Network's success in providing technical assistance to communities by ensuring that a collaborative approach allowed for tailored solutions that were more effective and responsive to local priorities. Through this process, the SNEP Network solicited community needs through email contacts, newsletter, and via the SNEP Netowk website that described the free services being offered by the Network. The Call for Participants process identified the Community Assistance Projects by evaluating the applications that were received and identifying communities that would benefit the most from the support. Community Assistance Projects were identified each year and brought together a diverse range of participants, including local government officials, environmental organizations, and community leaders. Community Asssistance Projects helped create a sense of ownership and commitment among the communities, ensuring the sustainability of initiatives and enhancing the likelihood of long-term environmental improvements.

Over the last 5 years, the SNEP Network completed over 30 community assistance projects working on 18 Rhode Island projects, 15 Massachusetts projects and 2 projects with Tribes. Projects ranged from bylaw reviews and organizational capacity assesments to developing stromwater retrofit designs.

For full summary of Community Assistance Projects, see Appendix C and D.

FY 2020 – 2021

Rhode Island	
Audubon Society of Rhode Island & Providence Stormwater Innovation Center	Appendix C, pg. 18
Bristol, RI	Appendix C, pg. 23
Charlestown, RI	Appendix C, pg. 22
Portsmouth, RI	Appendix C, pg. 20
Warren, RI	Appendix C, pg. 17
Woonasquatucket River Watershed Council (WRWC)	Appendix C, pg. 15
Massachusetts	
Assawompset Pond Complex and SRPEDD	Appendix D, pg. 39

Bourne, MA	Appendix D, pg. 45
Pleasant Bay Alliance	Appendix D, pg. 41
Mass Audubon's Allens Pond Wildlife Sanctuary	Appendix D, pg. 46
Mendon, MA	Appendix D, pg. 43
Wareham, MA	See Leadership Exchange on pg. 30

FY 2021 – 2022

Rhode Island	
Newport, RI	Appendix C, pg. 24
Providence, RI & Seekonk River Alliance	Appendix C, pg. 25
Providence, RI & Providence Neighborhood Planting Program	Appendix C, pg. 26
South Kingstown, RI	Appendix C, pg. 29
Westerly, RI & Southern RI Conservation District	Appendix C, pg. 31
Warren, RI & Warren land Trust	Appendix C, pg. 28
Massachusetts	
Mansfield, MA	Appendix D, pg. 47
Federally Recognized Tribes	
Mashpee Wampanoag Tribe & Town of Mashpee	Appendix D, pg. 48
Wampanoag Tribe of Gay Head (Aquinnah)	Appendix D, pg. 50

FY 2022 – 2023

Rhode Island	
Aquidneck Island Communities (Newport, Charlestown, Portsmouth) Leadership Exchanges	See Leadership Exchange on pg. 33
Burrillville Land Trust	Appendix C, pg. 35
North Kingstown, RI	Appendix C, pg. 33
Middletown, RI	Appendix C, pg. 34
South Kingstown, RI Buffer Restoration Plan	Appendix C, pg. 29
Massachusetts	
Buzzards Bay Coalition	Appendix D, pg. 57
Groundwork Southcoast & New Bedford, MA	Appendix D, pg. 55
Marion, MA	Appendix D, pg. 53
Shrewsbury, MA	Appendix D, pg. 54

FY 2023 – 2024

Rhode Island	
Coventry, RI & Upper Dam Pond Conservation Association	Appendix C, pg. 37
Hopkinton, RI	Appendix C, pg. 36
Providence, RI	On-demand assistance, pg. 48
Massachusetts	
Swansea, MA	Appendix D, pg. 59
Westport, MA	Appendix D, pg. 60
Federally Recognized Tribes	
Mashpee Wampanoag Tribe & Town of Mashpee	Appendix D, pg. 61

LID/Bylaw Review Technical Assistance

Rhode Island Low Impact Development (LID) Checklist Technical Assistance

Charlestown, Exeter, Hopkinton, North Kingstown, Richmond, South Kingstown, Westerly

Partners: URI- NEMO

Over the last five years, SNEP Network Partner, the University of Rhode Island Nonpoint Education for Municipal Officials (URI- NEMO) assisted municipalities in reviewing existing local development rules against model development principles designed to reduce runoff and other impacts from new construction and redevelopment. The technical assistance helped guide communities through URI-NEMO's Low Impact Development Checklist. Communities that completed the checklist through SNEP Network technical assistance include Charlestown, RI, Exeter, RI, Hopkinton, RI, North Kingstown, RI Richmond, RI, South Kingstown, RI and Westerly, RI.

Tiverton, RI

Partners: URI-NEMO

SNEP Network Partner, URI-NEMO, assisted the Town of Tiverton in developing a conservation development ordinance ensuring that new subdivisions incorporate Low Impact Development designs and enhanced stormwater management. Since then, the Town of Tiverton has adopted a Conservation Development ordinance.





Massachusetts Low Impact Development (LID)/Bylaw Review

Pleasant Bay Alliance (PBA)

Communities: Brewer, Chatham, Harwich, Orleans, Shrewsbury

Partners: Cape Cod Commission

In FY1, the SNEP Network provided technical assistance to the Pleasant Bay Alliance and its four member Towns, to guide further action related to the implementation of the watershed permit. SNEP Network Partner, the Cape Cod Commission (CCC), completed the bylaw review for each Town using the guiding principles of 1) conserving resources that already exist to preserve existing function(s), 2) integrating Green Infrastructure (GI) and Low Impact Development (LID) strategies into all development, and 3) working within existing development patterns to restore functions that are lost, including natural hydrology. The by-law reviews were performed using Mass Audubon's tool which was later updated to include CCC's findings. The ability of the towns to regulate stormwater management was assessed based on existing bylaws and regulations with the goals of highlighting areas that already promote enhanced stormwater management and developing recommendations to further streamline or strengthen existing regulations in each Town.

Town of Shrewsbury

Partners: Blackstone Watershed Collaborative

Integrating low impact design controls into the Town's land use documents to revise to the current Rules and Regulations Governing the Subdivision of Land, Governing Special Permits and Site Plan Review, and the Shrewsbury Zoning Bylaw help to mitigate the impact of these extreme weather events on Shrewsbury's built and natural environment. Making these updates were crucial because land use requirements are one of the most powerful tools a community can use to shape the built environment and foster greater resiliency.

In FY4, Blackstone Watershed Collaborative (BWC) worked with the Town of Shrewsbury Planning Department to conduct an in-depth review of their existing rules and regulations governing special permits and site plan review, subdivision of land, and zoning bylaws. Using the Bylaw Review Tool, the SNEP Network looked at how the by-laws address low impact development and green infrastructure and identified target by-laws to integrate LID/green infrastructure standards. Following the review, BWC completed a bylaw review assessment to incorporate climate resilience and low impact development and stormwater management in Shrewsbury that identified opportunities for updating Shrewsbury's subdivision rules and regulations.

TASK IV: REGIONAL INITIATIVES

The SNEP Network's regional initiatives are collaborative efforts from Network partners, communities, federal, state and local government agencies, nonprofits, and other stakeholders designed to address critical environmental challenges across the region. By addressing common challenges at a regional scale, the SNEP Network's initiatives aim to create lasting positive impacts that benefit multiple communities, ecosystems, and economies throughout the region. Over the past five years, the SNEP Network has developed transferrable tools and resources, and undertaken regional initiatives aimed at raising the level of practice of stormwater/watershed management, ecological restoration, and sustainable financing within the SNEP region.

IN THIS SECTION:

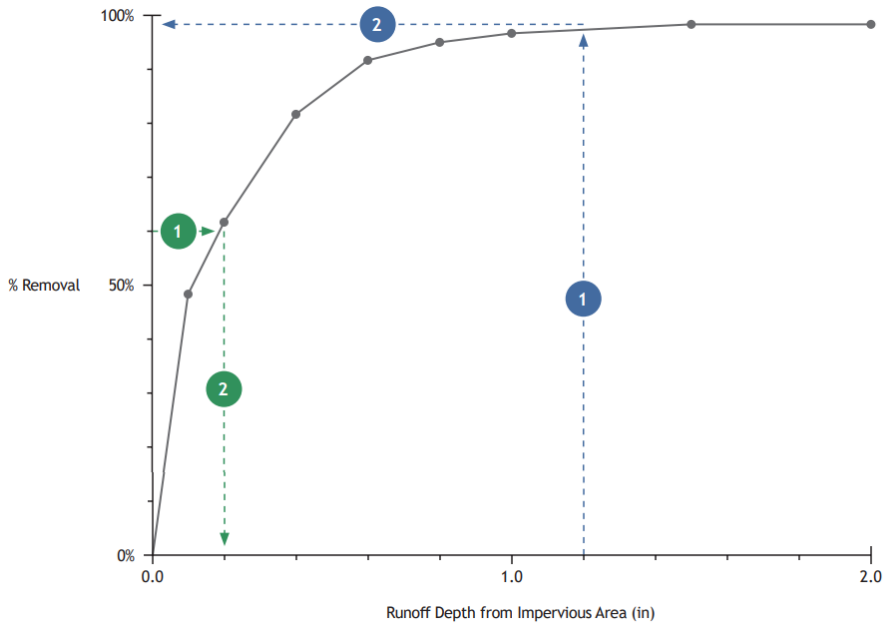
- New England Stormwater Retrofit Manual
- StewMAP
- BMP Tracking and Accounting
- Prioritization for Action Climate Tool (PACT)
- Financing Report
- HRU Mapping
- NBS Mapping
- Buffer Restoration Guide
- Next Generation Holistic Watershed Management
- GWSC Pocket Maintenance Guides
- Property Owner Guide to Managing Stormwater

Stormwater Retrofit Manual (FY1-FY5)

In retrofit scenarios, it is often challenging to determine the stormwater control measures (SCM) that are best suited for the site. However, incorporating some stormwater treatment for developed sites is better than omitting them all together, even if prescribed engineering design standards cannot be fully met due to the landscape or restricted areas in urban settings. To address this challenge, the SNEP Network brought together representatives from New England to form a technical advisory committee (TAC) on the development of a manual that provides guidance on how to approach the management of stormwater through installation of SCMs in existing or reconstructed development situations (retrofits) where regulatory requirements do not dictate prescribed SCMs. Network partner, UNH-Stormwater Center, lead the development of the Stormwater Retrofit Manual, with the Massachusetts and Rhode Island Liaisons, Kimberly Groff and Elizabeth Scott. Additionally, the Network team worked collaboratively with Mark Voorhees from EPA Region 1. The TAC included at least one representative from each New England state, as well as EPA Region 1. Members included: Tom Ballestero and Daniel Macadam (UNH-SC), Padraic Monks and Michale Sadler (VTDEC), Nick Pisani and Eric Beck (RIDEM), Alisa Richardson (RIDOT), Henry Barbaro (MassDOT), Laura Schiffman (MADEP), Katheleen Knight (CTDEEP), and Ian Dombrowski, Mark Voorhees, and Newt Tedder (EPA Region 1).

The Network used the pre-approved consultant pool to hire VHB Consultants to assist with the development of the manual. This work started in FY1 and was completed in FY3. The New England Stormwater Retrofit Manual was finalized and launched in July 2022. The manual guides users to develop SCMs based on their core functional and treatment components and encourages the user to piece components together in configurations that best fit project and site-specific needs. The range of sites and scales where this guidance can be applied varies from watershed scale planning to the design of small-scale measures inserted into reconstruction projects. The manual presents the US EPA (Environmental Protection Agency) SCM Performance Curves as a tool to quantify water quality benefit (i.e. pollutant removal credit) for a range of sizes and types of SCMs to aid in the selection process and justify the retrofit.

1. If a designer is working on a site where a pollutant reduction of 60% is desired ...
2. ... the designer would use the curves to determine that a Runoff Depth from Impervious Area of approximately 0.2 inches achieves the desired reduction
1. If a designer determines that their SCM provides a DSV equivalent to 1.2 inches from the Impervious Area ...
2. ... the designer would use the curves to determine a 98% pollutant reduction from this SCM



In order for the New England Stormwater Retrofit Manual (the Retrofit Manual) to be a useful tool to stormwater practitioners in New England, it is crucial that state and federal regulators are aware of and in support of the manual and its contents. The Network continued to support the Manual's rollout within the SNEP geography as well as to other EPA Region 1 states and focused on educating and supporting state regulators on understanding and using of the Retrofit Manual and EPA's SCM Performance Curves (the curves).

VHB facilitated two workshops/discussions with federal and state regulators and performed targeted outreach to each individual New England state to discuss the Retrofit Manual, the curves, and the potential to formally adopt/reference the Retrofit Manual in state stormwater rules. The first workshop was held on June 1st, 2023, and was attended by approximately 40 people representing each of the New England state environmental agencies, as well as some representatives from the New York Department of Environmental Conservation, and EPA. This workshop focused broadly on the Retrofit Manual, its development, its contents, and its applicability to state stormwater rules and regulations. VHB held a second workshop on September 13th, 2023, which was attended by approximately 40 people representing each of the New England state environmental agencies and EPA. The purpose of this workshop was to present more detail on the curves with state and federal regulators.

Massachusetts

The SNEP Network held a meeting on September 27th, 2023, with the Massachusetts Department of Environmental Protection (MADEP) to discuss the potential incorporation of the manual and the curves into the updated standard. The proposed changes will include the water quality standard requiring 90% Total Suspended Solids (TSS), 60% Total Phosphorus (TP) reduction for new development and 80% TSS and 50% TP reduction for redevelopment, for consistency with the Massachusetts Municipal Separate Storm Sewer System (MS4) permit providing the curves as an option for demonstrating compliance.

With the help of VHB and Network Partners including UNH-SC, Mass Audubon, and MA Network Liaison, the NEEFC drafted and submitted comments on the updated Massachusetts DEP Stormwater Regulations. The comments addressed stormwater standards, Environmentally Sensitive Site Design and Low Impact Development credits, and the crediting approach that would be consistent with the guidance within the New England Stormwater Retrofit Manual.

Rhode Island

VHB held an initial meeting with the Rhode Island Department of Environmental Management (RIDEM) and Rhode Island Coastal Resources Management Council (CRMC) on June 12th, 2023, to discuss the potential use of the Retrofit Manual and curves in its guidance. RIDEM indicated it is not planning to update its stormwater rules and regulations in the near future. VHB along with Elizabeth Scott on behalf of the SNEP Network developed draft language for RIDEM to use as potential public communication, providing clear and concise guidance to designers on when it is appropriate to use the curves for sizing structural stormwater control measures, addressing redevelopment and retrofit scenarios. VHB and RIDEM Groundwater & Freshwater Wetlands Protection and CRMC staff held a second meeting on September 19th, 2023, to discuss and revise the draft language and discuss a plan for release.

Connecticut

Connecticut has recently updated its stormwater rules and regulations and issued the Connecticut Stormwater Quality Manual as a draft. The manual aligns project-based stormwater permitting with the state's MS4 requirements. The Retrofit Manual is explicitly referenced in the updated standards and CTDEEP manual. The CT guidance allows for the design practices documented in the Retrofit Manual to be

used for retrofit projects. Connecticut's incorporation of the Retrofit Manual and curves into their regulations and guidance materials is the most comprehensive of any of the New England states to date.

Vermont

VHB met with the Vermont Department of Environmental Conservation (VTDEC) on May 23rd, 2023, to discuss the potential for alignment of the Retrofit Manual and the curves with the state's stormwater rules and regulations. VTDEC indicated that Vermont is not planning to update its stormwater rules and regulations in the near future and therefore there was not an immediate desire for formal adoption/reference for new/redevelopment and large impervious area permitting under the Operational Stormwater Permits. However, Vermont does currently use the curves as part of their MS4, Transportation Separate Storm Sewer System (TS4), and Municipal Roads General Permit.

New Hampshire

VHB held a meeting on October 11th, 2023, with Dr. James Houle from the University of New Hampshire Stormwater Center (Dr Houle leads the Retrofit Manual SNEP Network team) and the New Hampshire Department of Environmental Services (NHDES) regarding the update of their state stormwater guide and to discuss the state's stormwater regulations and opportunities to incorporate the retrofit manual. The updated guide is being developed as a handbook lead by the UNH Stormwater Center and referenced by the state. Similar to CTDEEP's revised handbook, the NH handbook plans to directly reference the Retrofit Manual as guidance for retrofit scenarios. Additionally, the NHDES Watershed Assistance Section 319 and 604b Grants program has formally adopted the curves as a tool in their Quality Assurance Project Plans (QAPP) to show water quality impacts.

Maine

VHB did not hold a state-specific meeting with Maine Department of Environmental Protection (MEDEP) but did have email correspondence. MEDEP in the process of updating their Chapter 500 stormwater rules (new and redevelopment regulations) and specifically had interest in learning more about the curves. MEDEP expressed preliminary interest in the curves and creating crosswalks linking their list of stormwater SCMs to the SCMs presented in the Retrofit Manual.

Table 1. New England States Regulatory Agency Summary of Curves Adoption

	Curves used in New/Redevelopment Water Quality Standard	Curves used in Impaired Waters/TMDL Programs (via NPDES/MS4)
Massachusetts Department of Environmental Protection (MADEP)	Yes - with pollutant reduction target for water quality standard. Although, more stringent recharge and peak rate control standards may govern ultimate SCM sizing.	Yes – MS4 Permit, MassDOT IWP, likely in upcoming EPA RDA
Rhode Island Department of Environmental Management (RIDEM)	No - working to formally allow for select permitting scenarios	Yes – Upcoming MS4, RIDOT/Municipal Consent Decrees
New Hampshire Department of Environmental Services (NHDES)	Yes - to show MEP if water quality volume requirement cannot be met.	Yes –MS4 Permit, likely in upcoming EPA RDA
Vermont Department of Environmental Conservation (VTDEC)	No – not currently referenced. Manual is currently being updated but reference to curves for dynamic sizing did not come up.	Yes – MS4, TS4, Municipal Roads General Permit
Connecticut Department of Energy and Environmental Protection (CTDEEP)	Yes - to show MEP if water quality volume requirement cannot be met.	No
Maine Department of Environmental Protection (MEDEP)	No - updating Chapter 500 requirements now	No

The manual served as a key resource in the SNEP Network Stormwater Planning Series, providing practical guidance and best practices for designing and implementing stormwater retrofits to improve water quality and manage stormwater runoff in their selected catchment areas.

STORMWATER RETROFIT MANUAL DELIVERABLES:

- New England Stormwater Retrofit Manual
- New England Stormwater Retrofit Manual Decisions Basis Memo
- Performance Curves Overview
- Introducing the Stormwater Retrofit Manual Symposium Presentation
- Webinar: The New England Stormwater Retrofit Manual: Upgrading the performance of your stormwater management system for better watershed health

Southeast New England StewMAP (FY1-FY4)

As we work to address complex challenges with strategies that link land use to water quality, prioritize community-based restoration, adapt to decreasing regulatory oversight, and strengthen social-ecological resilience, it is crucial to understand the network of existing non-governmental stewardship organizations in the region. The Stewardship Mapping and Assessment Project (Stew-MAP) was conducted on the Southeast New England Program (SNEP) region as part of the broader stormwater and habitat restoration initiatives led by the Network. Leading this project was Bryce DuBois (RISD), Curt Spalding (Brown), and Jesse Sayles (ORISE Fellow) and Lynn Carlson (RISD). RISD research assistants included Shreya Kaipa, Casey Merkle, and Ben Meyers.

To better understand these organizational dynamics, the team utilized the Stew-MAP methodology (Svendsen et al. 2016) to develop a survey and public database to map the range of stewardship activities and networks, with the goal of strengthening community capacity for stewardship in this region. Data were collected from 2020 to 2021 in the SNEP region, with final deliverables completed in FY23-FY24. Completed responses from 149 groups were used to establish a southeastern New England stewardship network that reported a total of 740 network partners that includes sub- programs or regional organizational chapters. For analytical reasons any sub-programs or regional chapters were aggregated to their largest organizational unit resulting in a final network of 638 organizations.

Based on the data collected, the team identified the following network patterns in the region:

- The knowledge network is much larger than the funding and other key collaborator networks.
- The networks were decentralized, meaning no single group acts as a central unifying actor. They had a relatively low density, meaning that the existing number of relationships are a small fraction of the total possible relationships.
- The knowledge network was contiguous, meaning that in theory, information can travel throughout the network, i.e., it was not fragmented. The funding network was fragmented.
- The data illustrate opportunities for enhancing collaboration in the region, including several specifically stated desires to work more closely with tribes in a meaningful way and to support environmental justice initiatives.

In addition to collecting networking data, the team also examined the effects of COVID-19 on stewardship organizations in the SNEP region. The team published a journal article *Self-Reported Effects of the Covid-19*

Pandemic on Stewardship Organizations and Their Activities in Southeast New England, USA in Frontiers in Sustainable Cities in FY3.

Using the data, the team created network visualizations and the StewMAP dashboard to use as tools to discover new partners in the region to better increase capacity. The team developed interactive visualizations for the combined aggregated network, aggregated knowledge source network, aggregated funding source network, and aggregated other key collaborator network to better understand these networks. The team also delivered three webinars that focused on the highlights and milestones of the StewMAP project and submitted one poster presentation to the SNEP symposium.

In Spring of 2022, the StewMAP project dashboard became live on the US Forest Service website. To assist practitioners in using the dashboard, the team created an introductory video to using the StewMAP. Since its launch, the video has been viewed over 120 times and the team has responded to questions from Save the Bay and the Providence Resilience Partnership on using the dashboard for planning and engagement purposes.

STEWMAP DELIVERABLES:

- StewMAP Project Dashboard
- StewMAP Final Report
- StewMAP Factsheet
- The StewMAP SNEP Kickoff event (9.16.2020)
- 2022 SNEP Symposium Presentation
- Self-reported effects of the COVID-19 pandemic on stewardship organizations and their activities in the southeast New England, USA – Casey Merkle, RISD
- The Stewardship Mapping and Assessment Project of Southeast New England: Learn About Organizations and Find New Collaborations Across SNEP Watersheds

BMP Tracking and Accounting (FY1-FY3)

Rhode Island and Massachusetts surface waters have significantly suffered from development and urbanization. In both states, many water bodies are impaired and/or have Total Maximum Daily Load (TMDL) plans. For many TMDLs, water quality improvements are expected as communities and developers install stormwater retrofits and incorporate stormwater management systems into new developments and redevelopments as part of MS4 permitting. In FY2, the SNEP Network led effort to better understand tracking and accounting tools that can be used by municipalities to track the pollutant removals realized through various structural and nonstructural stormwater controls in order to meet the pollutant reduction targets in the applicable Municipal Separate Storm Sewer System (MS4) General Permits.

In January of 2020, the SNEP Network convened the United States Environmental Protection Agency Region 1 (Newt Tedder), Massachusetts Department of Environmental Protection (Laura Schiffman), and the Rhode Island Department of Environmental Management (Margarita Chatterton), to launch a pilot project that aimed to build capacity for implementation of stormwater management strategies as well as the tracking and accounting of pollutant reductions. The objective of the work is to 1) create a collaborative environment between a total of up to two municipalities from each state that allow for capacity building around tracking and accounting of stormwater management strategies, 2) allow for information exchange on what metrics are required to build a consistent and reliable regional approach to tracking and

accounting mechanisms, and 3) create a sharable tracking and accounting model that can be applied to additional watersheds and states.

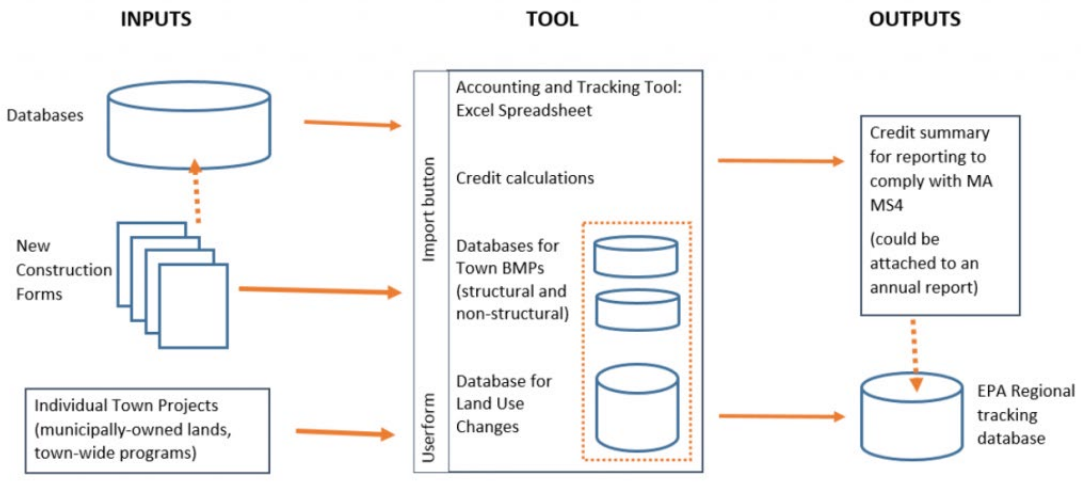
The Network released a solicitation for Interstate MS4 Stormwater Crediting and Technical Assistance. In March 2021, the Network received 6 applications and selected 4 communities from MA and RI: Attleboro, MA, Holden, MA, East Providence, MA and North Smithfield, MA. The Network also procured consultant services from the Consensus Building Institute and Paradigm to assist with meeting facilitation and technical assistance. Five meetings were held with the selected communities. In the first meeting, the Network team facilitated introductions and provided an overview of the objectives of the project. During the second meeting, the team heard context from communities around their current BMP implementation and tracking methods, followed by presentations from UNH-SC on developing rigorous and workable method of gathering data and BMP Green Infrastructure design considerations and credibility. In the third meeting, the four communities discussed permitting and site plan review around development/redevelopment in their communities, and UNH-SC provided assistance around what to track for their BMPs, both structural and non-structural. With a better understanding of the communities' tracking and accounting methods, the team shared methods to measure, track, and credit operations and management on nonstructural controls, and the process for validating pollution reduction requirements.

Through this effort, it was clear that communities needed additional support to better understand and utilize tracking and accounting tools. Led by UNH SC, EPA Region 1, Paradigm, and the Consensus Building Institute, the team worked together to develop training tutorials to help support municipalities in using EPA's BMP Accounting and Tracking Tool (BATT). The team developed three training videos on the History and Application of the BATT (Part 1), Understanding the Data Entry, Mechanics, and Reporting (Part 2), and Real-World Application (Part 3). Since the videos were posted, they received over 140 views.

TRACKING AND ACCOUNTING DELIVERABLES:

- Solicitation for Interstate MS4 Stormwater Crediting Technical Assistance (PDF)
- Tracking and Accounting Overview
- Q&A Solicitation Document (PDF)
- Tracking and Accounting Meeting Summaries
- BMP Accounting and Tracking: History and Application (Part 1 of 3)
- BMP Accounting and Tracking: Data entry, Mechanics, and Reporting (Part 2 of 3)
- BMP Accounting and Tracking: Real World Application (Part 3 of 3)

Fig. 3: Inputs and outputs diagram for the EPA's BMP Accounting and Tracking Tool.



Climate prioritization: Planning to Action Climate Tool (FY1-FY3)

In FY1-FY2, Network partner, Throwe Environmental, adapted and expanded the existing US Climate Toolkit to better support SNEP communities. The Planning to Action Climate Tool (PACT) guides communities through the process of turning climate planning into sustainable financing of projects. The tool ensures that the necessary community engagement and resilience priorities are in place to support meaningful change.

Following the development of PACT, Throwe Environmental used this tool as a framework to assist five communities (Wareham, MA, Bourne, MA, Portsmouth, RI, Charlestown, RI, and Newport RI), and the Wampanoag Tribe of Gay Head (Aquinnah) with identifying priority assets and infrastructure and support the exploration of sustainable financing recommendations and overall project implementation. More information on these projects can be found under the Leadership Exchange.

The NEEFC transferred the use of the PACT beyond the SNEP region to assist Westport, WA, with using the tool to inventory its physical assets, assign risk tolerance to identified hazards, and to prioritize critical actions to pursue. NEEFC presented the results to the Westport Town Board and opened the opportunity for further assistance with implementation of identified climate action plan projects. The NEEFC also modified and used the tool in a pilot project for the Maine Governor's Office for Policy and Innovation for the Future with five Maine coastal communities. NEEFC helped these communities fill in the tool's required inputs and analyzed the resulting prioritized climate resilience actions with each community. As a result, NEEFC helped pursue a grant from the state of Maine to pay for a consultant design to raise three critical and vulnerable landing piers.

- Planning to Action: Climate Toolkit (PACT)

Financing Report with URI-MPA *(FY1-FY3)*

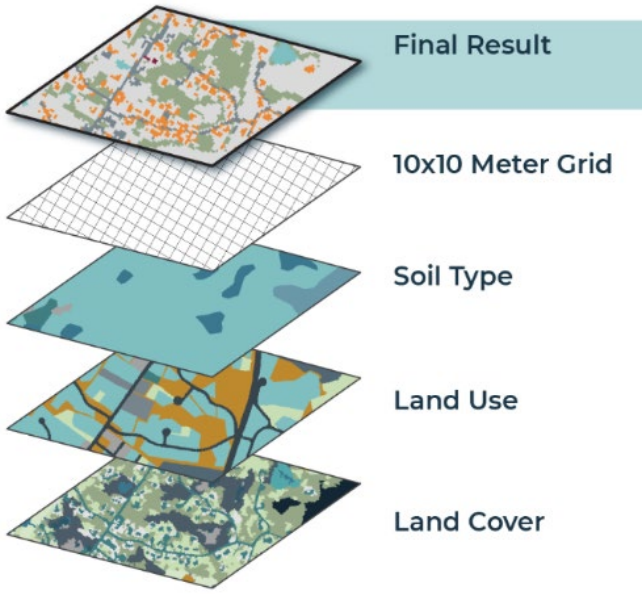
In the Network's first year of operations, it was critical that the Network understood the financing landscape of the region to identify sustainable financing needs and provide support accordingly. In FY1, the Network partnered with the University of Rhode Island's MPA program to assess the financing climate resilience, stormwater management, and green infrastructure landscape in Rhode Island.

URI-MPA graduate students interviewed over forty members of a broader network of climate resilience, stormwater management, and green infrastructure professionals. They were asked about the challenges and benefits of traditional financing mechanisms, as well as their views about the best way to organize decision-making (e.g., local, regional, state). What the team discovered was that of all the financing tools that were available to towns and municipalities, participants were most knowledgeable about grants, bonding, and stormwater utility fees. Additionally, the most preferred locus of decision-making among interview participants was at the state and regional level, while fewer participants preferred a local approach. The report was completed on June 2022 and the team presented their findings April 2022.

- Financing Climate Resilience, Stormwater Management, and Green Infrastructure in Rhode Island
- Financing Climate Resilience, Stormwater Management, and Green Infrastructure in Webinar

HRU Mapping *(FY1-FY4)*

Hydrological Response Unit (HRU) Mapping has been a Network regional initiative since FY1, led by SNEP Network Partner, Cape Cod Commission (CCC). In FY2, CCC developed a methodology that used state-wide publicly available GIS layers for land use, land over, and soil type to determine HRU's for Barnstable County. Since the development of the initial methodology, CCC continued to work on mapping layer enhancements and troubleshooting the crosswalk/pollutant loading math in the interactive viewer. Building upon the work Cape Cod Commission has done as part of the HRU mapping efforts, CCC coordinated work with SNEP partners to adapt and transfer their HRU calculations for entire SNEP Region. This work will continue in the next round of the SNEP Network.



HRU MAPPING REGIONAL INITIATIVE DELIVERABLES:

- HRU Mapping Storymap
- Hydrologic Response Units – A recipe for more uniform stormwater planning webinar

Nature Based Solutions Mapping *(FY1-FY5)*

The Massachusetts Chapter of The Nature Conservancy (MA-TNC) collaborated with the Charles River Watershed Association (CRWA) and the Massachusetts Executive Office of Environmental Affairs (EEA) to develop a spatial tool to help with preliminary siting of nature-based solutions (NBS) for hazard reduction as impacted by climate change. The tool is a series of maps based on statewide data indicating how hazards (likelihood of climate altered inland flooding, drought, and coastal flooding), opportunities for NBS (conservation, restoration, and management opportunities), and biodiversity co-benefits overlap spatially across MA. These maps were developed to support implementation of the MA Municipal Vulnerability Preparedness Program (MVP) priority action statements.

Together with Elizabeth Scott, TNC MA and RI worked to explore the technical feasibility of transferring the sitting NBS maps from MA to RI. To this end, TNC MA created a summary of data-layers, and cross walked them against available data in RI. This crosswalk found that most of the data layers are available in both states. In consultation with RI partners and experts, it was determined that suitable substitutions are available in RI.

The Network explored the utility of transferring the maps to RI. Through conversations with partners, including Sean O'Rourke at RIIB, the project team determined that the maps would be useful in RI to advance project plans from general priorities to site specific concepts based on potential future hazards, and opportunities for NBS. The maps could support action items with RIIB, the Woonasquatucket Watershed, and potentially with RI DOT as all these groups look for NBS opportunities to increase climate

resilience and could help leverage other funds. The team decided to explore the ultimate goals of the project in MA with key partners in RI to see if any methodological tweaks are required.

Through this process, Network partners TNC-RI determined the best use case for the map layers that are currently developed was to provide one-on-one technical support to specific RI communities, rather than allocating TNC-RI staff resources into building a tool that would not be fully utilized by communities.

NBS MAPPING INITIATIVE DELIVERABLES:

- NBS Mapping in Massachusetts Tool
- Mapping Nature Based-Solutions for Climate Resilience: Developing Potential Implementation Actions



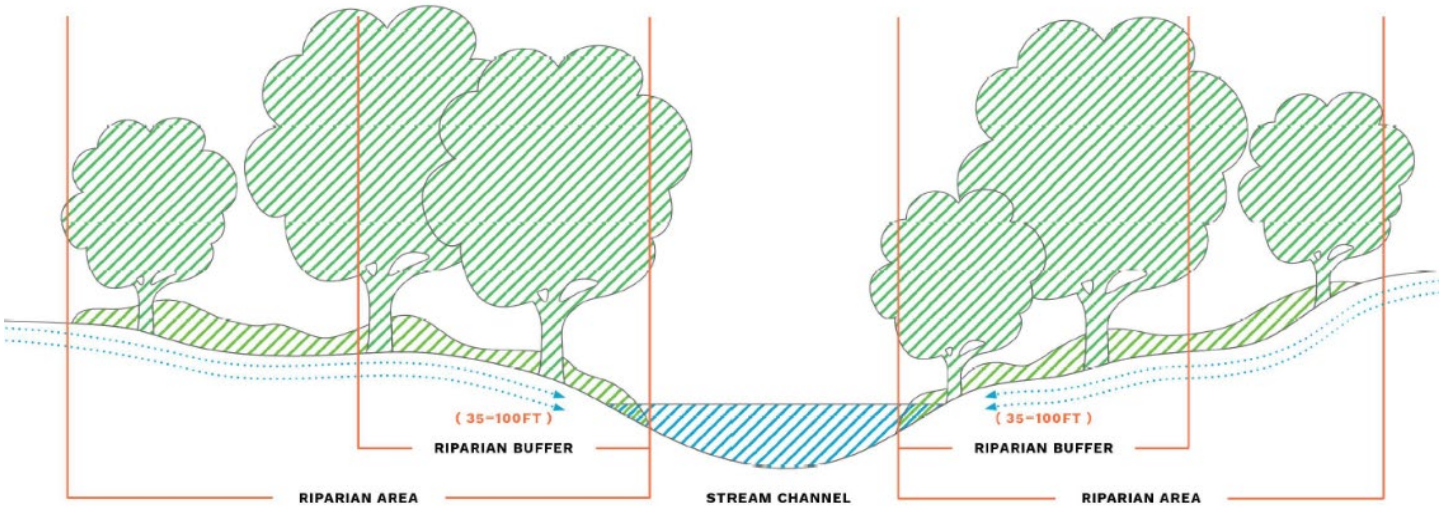
Buffer Restoration Guide (FY3-FY4)

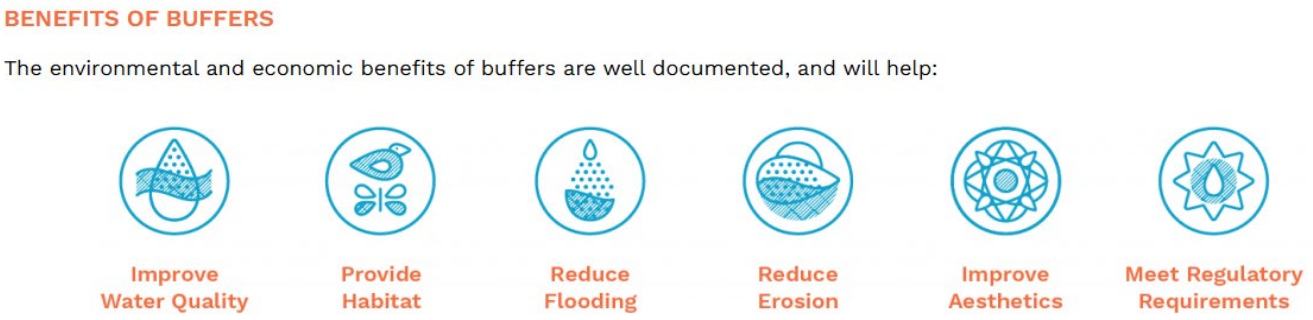
Through the work on the Maidford River Restoration Pilot project, it became clear that the buy-in from property owners was integral to restoring the floodplain along the Maidford River. Through the engagement of the property owners, the team identified a need for property owners to better understand their role and the actions that they could take to contribute to the overall health of the river. In response to this need, the Network determined that a buffer restoration guide would be a critical resource for property owners. Led by the Network RI Liaison, and Save the Bay, the Network procured consultant services from A TON Consultants to support the development of this guide by developing site renderings for Middleborough, MA and South Kingstown, RI, and to create illustrations, diagrams / infographics, and graphic elements for project themes, including ecological and stormwater benefits, buffer restoration options, and buffer maintenance.

In January 2023, the Buffer Restoration Guide was launched. The purpose of the guide is to assist public and private property owners in RI and southeast MA who are interested in restoring and improving buffers along a river, pond, lake or the coast. It is intended to give buffer property owners enough information and resources to design and implement their own restoration project. Since then, the website has had over 9,500 unique visitors, with over 16,000 page views.

BUFFER RESTORATION DELIVERABLES:

- Buffer Restoration Guide
- Site renderings for Middleborough, MA and South Kingstown, RI





Next Generation Holistic Watershed Management *(FY4-FY5)*

The Holistic Watershed Management project was initiated by EPA Region 1 staff to envision a different future of watershed management. The project evaluated a range of new and redevelopment (nD/rD) approaches to better understand and communicate the future impact upon watersheds and the potential for enhanced site design and management for optimal sustainability, resilience, and cost savings. The project also developed the Watershed Protection Standard (WPS) that specifies levels of stormwater management control to maintain average annual predevelopment groundwater recharge and stormwater runoff nutrient loading.

The sound scientific foundation for the findings and recommendations established in the EPA *Holistic Watershed Management* effort provide a solid foundation to build on. SNEP Network and its partners were ideally positioned to promote the key takeaways across the region and encourage the widespread adoption of policy/regulation/ordinance that codifies the use of low impact development, environmentally sensitive design and stormwater standards to replicate predevelopment groundwater recharge into practice across the SNEP region.

SNEP Network and our partners have already been working with communities to encourage the adoption of bylaws that incorporate low impact development and environmentally sensitive design practices. In 2022, the SNEP Network formed the Bylaw Strategy Team to provide a forum for Network members to collaborate more closely and communicate more frequently about work they are implementing together. The Team has been meeting monthly over the last 2 years and works collaboratively on key regional initiatives that promote the review of bylaws and local ordinance, and the adoption of these by communities in RI and MA. The strategy team has assigned a *Best Practices for Building Community Resilience and Cost Savings* Task Force and identified Network Regional Technical Assistance Partners with expertise in bylaw review as follows:

- Kimberly Groff, MA Liaison
- Stephanie Covino - Blackstone Collaborative
- Heidi Ricci - MassAudubon
- Tim Pasakarnis Cape Cod Commission
- Danica Belknap – SRPEDD
- Lorraine Joubert – URI-NEMO

The purpose of this effort was to communicate the benefits of watershed-based standards for new development and redevelopment *to the SNEP region communities and related audiences. To promote the widespread adoption and implementation of these practices in the SNEP region including* policy/regulation/ordinance that codifies the use of low impact development, environmentally sensitive design and stormwater standards to replicate predevelopment groundwater recharge and runoff-related nutrient loading into practice across the SNEP region.

Together, the team developed a draft presentaion to provide a basis for the impportance of adopting conservation practices and enhanced watershed procuection stormwater standards.

NEXT GEN HOLISTIC WATERSHED MANAGEMENT DELIVERABLES:

- Best Practices for Building Resilience, Protecting Valued Community Resources, and Saving Money (DRAFT)

Property Owner Guide to Managing Stormwater *(FY4-FY5)*

In April 2024, the SNEP Network released a request for proposal to develop a property owner guide for managing stormwater on commercial and industrial properties. This guide was intended to build upon the New England Stormwater Retrofit Manual by providing illustrative case examples of options for managing stormwater on commercial and industrial properties. The anticipated audience for the guide were property owners and managers of commercial and industrial properties who may be subject to Residual Designation Authority (RDA) stormwater permit and/or otherwise responsible for making decisions regarding site improvements to manage stormwater. The Network selected VHB as the consultants to develop the guide.

Lead by Elizabeth Scott, RI Liaison and supported by Network partners UNH Stormwater Center, ASRI, and NEEFC, and state partner RIDEM, the team worked with VHB to develop a guide that can be easily understood by a non-technical reader and provides a high-level explanation of the problems associated with uncontrolled stormwater and what private property owners can do to reduce these impacts by improving site operations and making simple changes to the physical layout of their sites to reduce stormwater volume and pollutants. The guide was completed in September 2024.

PROPERTY OWNER GUIDE TO MANAGING STORMWATER DELIVERABLES:

- Property Owner Guide to Managing Stormwater
- Introducing the Property Owner Guide to Managing Stormwater Webinar

GWSC Pocket Maintenance Guides *(FY5)*

In FY5, Groundworks Southcoast (GWSC) completed the development of urban farm maintenance plan pocket guides, tailored for the summer, fall, winter, and spring seasons. These guides provide detailed instructions for maintaining community gardens and urban farms, ensuring consistent care throughout the year. The creation of these maintenance plans has been a long-term goal for GWSC, realized with the support of the SNEP Network.

The completed pocket guides serve as practical tools for members of the Green Team and Green Corps, offering clear instructions and integration with digital tools such as a community garden observation form. This form enables users to document plant health, pest activity, and other concerns, and to upload photos for troubleshooting by the Climate Resilience Manager. The guides are complemented by a comprehensive stewardship training curriculum, equipping participants with the necessary skills for urban farm maintenance.

All related digital assets are organized within GWSC's internal Google Site, referred to as the "Hub," which includes a dedicated Stewardship page. The formalization of urban farming and community garden maintenance activities into a structured curriculum has been a key objective for GWSC, and achieved through the support of the SNEP Network.

APPENDICES

Appendix A: EPA Metrics

Appendix B: SNEP Network Pilot Projects

Appendix C: SNEP Network Community Assistance Projects in Rhode Island

Appendix D: SNEP Network Community Assistance Projects in Massachusetts

APPENDIX A

EPA SNEP Network Metrics

SNEP EPA METRICS

As part of the SNEP 5-year strategic plan, the SNEP Network tracked metrics defined by EPA-SNEP to better understand the impact of the Southeast New England Program. Based on these metrics, the Network selected relevant metrics to track throughout FY2-FY5.

Project Activity	Metric	#	Notes
Conduct targeted outreach to raise public awareness of issues	# people targeted by education efforts	2600	▪ SNEP Network mailing list primarily used to promote trainings/webinars ▪ Mailing list composed of state/local representatives, NGO's, practitioners, etc.
Conduct targeted outreach to raise public awareness	# people demonstrating a minimum level of knowledge or attitude	23 out of 27	▪ # of people who responded with a 6 or higher to the evaluation question administered following the webinar "How likely are you to use the information delivered in the webinar?" (Scale 1-10, 'minimum level' defined as 6 or higher rating) following the Emerging Stormwater Technologies Webinar held on March 27th 2024 ▪ From FY1-FY4, 483 people responded with a 6 or higher to the evaluation question administered following training/webinar "How likely are you to use the information delivered in the webinar?" (Scale 1-10, 'minimum level' defined as 6 or higher rating) ▪ **FY5 did not ask follow up questions due to switch from GotoWebinar to Zoom Webinar*
Increase local implementation	# of municipalities, tribes, and NGOs that go on to successfully implement projects/policies after assistance from a SNEP funded entity.	12	Projects: ▪ Woonasquatucket River Watershed Council: Installed Green Infrastructure Retrofits ▪ Bourne, MA: Implemented a Climate Resilience Fund ▪ Mendon: Received MVP grant to implement concept level site plan ▪ Maidford River Project: SWIG ▪ Upper Nemasket H&H Modeling: DER grant ▪ North Kingstown adopted updated groundwater protection overlay in zoning

SNEP EPA METRICS

			▪ Charleston adopted and updated conservation development Ordinance ▪ MWT and Town of Mashpee received MVP action grant for project on town landing on Santuit Pond ▪ Town of Mansfield: Created new town position to support existing staff based on Network organizational capacity assessment ▪ Town of Easton: Economic Development Bill Earmark for 100K advance to implementation for wetland restoration of Sam Wright Field ▪ Town of Coventry: received grant to implement the stormwater retrofit designs ▪ South Kingstown: implement the Indian Run Brook Restoration project which includes riparian buffer plantings and retrofits to the Neighborhood Guild parking lot
Increase direct technical assistance to cities and towns, tribes and NGOs	# of requests from municipalities, tribes, and NGOs that receive direct community assistance.	181	▪ SNEP Network Community Assistance Projects via the Call for Participants (35) AND ▪ Communities requesting technical assistance through partners and/or Network web-portal (146 requests)
Provide technical assistance to cities and towns	# of requests from municipalities in the SNEP region that have engaged with the SNEP funded entity through direct assistance or training.	181	▪ SNEP Network Community Assistance Projects via the Call for Participants (35 communities) AND ▪ Communities requesting technical assistance through partners and/or Network web-portal (146 requests)
Increase training opportunities for cities	# of professional development opportunities made available to	54	▪ Trainings and webinars offered to communities *(45 to date)* ▪ Association for Climate Change Officers Climate Change Professional (CC-P) Training *(6 Cohorts)* ▪ Stormwater planning series *(3 Cohorts)*

SNEP EPA METRICS

and towns, tribes and NGOs	municipalities, tribes, and NGOs.		
Provide peer-to-peer training	# of peer-to-peer exchanges to share successful approaches to addressing regional challenges.	27	▪ 5 Facilitated Stormwater Planning Series Trainings that included peer-to-peer learning (3 cohorts) ▪ Wareham Leadership Exchange *(4 closed sessions with participating communities; 4 open sessions open to the public)* ▪ 3 Aquidneck Island Leadership Exchange Sessions ▪ 1 Additional (6th) Session of the Stormwater Planning Series
Increase knowledge of best management practices	# of municipalities, tribes, and NGOs receiving training, outreach and education to share and promote best practices across southeast New England.		*We asked communities: To what extent do you agree or disagree with the following statement: Assistance from the SNEP Network increased my community's ability to address stormwater or watershed management challenges? Out of 19 respondents, 12 strongly agreed* *7 somewhat agreed. 0 disagreed.*
Increase understanding of financing options	# of enhanced training opportunities made available to municipalities, tribes, and NGOs on traditional and innovative financing for environmental projects.	3	▪ # webinars delivered on sustainable financing
Increase development of financing plans	# of municipalities and tribes that, with Network assistance, complete a finance plan including analysis of needs and priorities as well as	5	▪ Bourne ▪ Portsmouth ▪ Newport ▪ Wampanoag Tribe of Gay Head Aquinnah (WTGHA) ▪ Middletown

SNEP EPA METRICS

	potential funding mechanisms.		
Increase knowledge of new stormwater practices	# of enhanced training opportunities made available to municipalities, tribes, and NGOs on innovative stormwater practices.	13	▪ Trainings and webinars offered on innovative stormwater practices through the Providence Stormwater Innovation Center ▪ Stormwater Planning Series
Increased planning to use nature-based stormwater practices	# of municipalities and tribes that, with SNEP funded entity assistance, update and incorporate nature-based stormwater management programs and/or site plans	7	▪ Town of Mendon: Received MVP grant to implement concept level site plan ▪ Town of North Kingstown adopted updated groundwater protection overlay in zoning ▪ Town of Charleston adopted and updated conservation development Ordinance ▪ Town of Mansfield: Created new town position to support existing staff based on Network organizational capacity assessment ▪ Town of Easton: Economic Development Bill Earmark for 100K advance to implementation for wetland restoration of Sam Wright Field ▪ Town of Coventry: received grant to implement the stormwater retrofit designs ▪ South Kingstown: implement the Indian Run Brook Restoration project which includes riparian buffer plantings and retrofits to the Neighborhood Guild parking lot
Adoption of holistic planning regulations	# of municipalities and tribes that adopt low impact development, open space, or green infrastructure ordinances.	2	▪ The town of North Kingstown adopted the updated Groundwater Protection Overlay District in Zoning. ▪ Charlestown CD ordinance-pending town council approval
Increased knowledge and use of holistic planning	# of municipalities and tribes that complete Bylaw Review Tool/Low	14	▪ 4 Pleasant Bay Alliance Communities: Orleans, Harwich, Chatham, and Brewster

SNEP EPA METRICS

	Impact Development Checklist trainings and/or use the Bylaw Review Tool/ Low Impact Development Checklist.		▪ 7 RI Communities: East Providence, Lincoln, Richmond, West Greenwich, North Kingston, North Smithfield, Westerly ▪ 3 Additional MA Community: Plympton, Hopkinton, Shrewsbury
Provide training to the public or stakeholders	% people demonstrating a minimum level of knowledge, attitudes or skills after a training/event/workshop /webinar etc.	85%	▪ % of people (23 out of 27 responses) who responded with a 6 or higher to the evaluation question administered following the webinar "How likely are you to use the information delivered in the webinar?" (Scale 1-10, 'minimum level' defined as 6 or higher rating) following the Emerging Stormwater Technologies Webinar held on March 27th 2024 ▪ *FY5 did not ask follow up questions due to switch from GotoWebinar to Zoom Webinar*
Educate local government entities	# times that government entities participated	173	▪ Includes local government entities, state/federal agencies participating in CFP projects/receiving technical assistance to date.
Educate the public	# workshops, webinars, stakeholder meetings	192	▪ # workshops, webinars, stakeholder meetings held. This includes webinars hosted by SNEP Network, event presentations, stakeholder, and public meetings to date.
Engage volunteers	# volunteers participating	115	▪ 77 Volunteers marked a total of 4,266 storm drains in the following RI communities: Barrington, Cranston, East Greenwich, East Providence, Jamestown, Narragansett, Seekonk, South Kingstown, and Westerly ▪ 9 volunteers contributed 140 stormwater/GI monitoring video ▪ COMPLETED several phases of Warwick storm drain marking project: 29 volunteers
Increase partner collaboration	# partner organizations on the project	16	▪ 15 Network Partners

APPENDIX B

SNEP Network Pilot Projects

- Maidford River Watershed Pilot Project
- Taunton River (Canoe River Aquifer) Watershed Pilot Project

RHODE ISLAND

The Maidford River Watershed Pilot Project

The Maidford River's water quality is considered poor. It is impacted by bacteria, nitrogen, phosphorus, and suspended solids. Nitrogen and phosphorus pollution contribute to algal blooms, including potentially toxic cyanobacteria blooms. Both Nelson and Gardiner Ponds experience algal and cyanobacteria blooms, and the Maidford River is a major contributor to pollution causing the problem.

The frequent flooding of roads, lawns, and fields is a problem due to increased runoff from development, straightening of the river, and culverts (which carry the river under roads) that are no longer big enough to carry the river's flow. Adding to the problem is the more frequent intense rainstorms and reduced natural floodplain to absorb the water. Flooding of roads, fields, and lawns is a public health and safety concern; it also causes erosion and significantly increases pollution in the river.

NETWORK ASSISTANCE

SNEP Network partners assisted the Town of Middletown and Aquidneck Land Trust with planning and design for nature-based solutions to reduce flooding and improve water quality of the Maidford River and downstream receiving waters which included two sources of Aquidneck Island's water supply, Nelson and Gardiners Ponds. This project implemented the recommendations of local watershed plans to increase the river's flood storage capacity by creating meanders and floodplain storage and replacing culverts that restrict flow and contribute to flooding.

NETWORK PARTNERS

- Elizabeth Scott, Rhode Island Liaison
- Save the Bay
- NEEFC

Project Consultant

- Fuss and O'Neill
- Interfluve

LOCAL PARTNERS

- Town of Middletown
- Aquidneck land trust
- Eastern RI Conservation District

PROJECT TIMEFRAME

- FY1-FY5

LOCATION

- Middletown, RI

Nature Based Solutions on their own were not sufficient to mitigate road flooding due to the small size of the restoration project and the relatively small flood storage provided as compared to the volume of flood waters from the upstream watershed. To reduce road flooding and improve water quality and habitat, the floodplain restoration project proposed moving the river away from roads, adding meanders, recreating floodplain storage, and re-establishing naturally vegetated and protected buffers along the river.



To advance the project, the SNEP Network provided consultant services in support of the design and engineering of the river and floodplain restoration project, and partner services to support project management, funding/financing assistance, communications, and community engagement (including direct outreach to riparian property owners) from Summer 2020 through Winter 2022.

Since the entirety of the project takes place on privately owned property, a key element of the project was effective communication and community engagement to win the support of property owners as well as the broader community. Trusted local partners identified property owners willing to participate. The project team communicated with cooperating property owners via email and in person briefings at project milestones. The engagement with the property owners led to written approvals from property owners at critical steps, for example to access properties for site assessments and to submit preliminary permit applications on their behalf.

Project partners worked with property owners to restore the river's riparian buffer by allowing the land adjacent to the river to return to a more natural condition. These efforts complement ongoing work to improve the river's water quality including construction of controls to treat runoff from roads and improved agricultural practices.

Finally, through this collaboration with the property owners, the Network identified a need for a buffer restoration guide to assist property owners to help protect their drinking water source by taking steps to re-establish or improve natural buffers. Based on the lessons learned through this project, the Network developed a regional guide to give buffer property owners enough information and resources to design their own restoration project.

OUTCOMES AND DELIVERABLES

- The Maidfor River Watershed Pilot Project Webpage
- Maidford River Pilot Project Storymap
- Maidford River Restoration Case Study
- Maidford River Project Presentation

Floodplain Restoration

- Maidford River Pilot Project Factsheet
- Preliminary Floodplain Restoration Design
- Project Update Public Meeting
- Alternatives – Phase 2 Report
- 30% Design Report
- 30% Design Plan

Buffer Restoration

- Buffer Restoration Guide Website

Baseline Monitoring

- Maidford River Baseline Monitoring Report
- Maidford River Baseline Conditions Report
- Maidford River Restoration Monitoring QAPP



The Taunton River Watershed Pilot Project

The Canoe River Aquifer was designated an Area of Critical Environmental Concern (ACEC) by the State of Massachusetts more than 20 years ago, but protecting the watershed heavily relies on local policies and enforcement. Significant development pressures in the surrounding region, compounded by climate change, impact both the function of ecosystems and the vulnerability of local communities to a variety of environmental hazards. SNEP Network partners teamed up with the RTWN and representatives from the five aquifer communities to identify and advance local projects with the greatest potential to provide multiple co-benefits, such as protecting drinking water resources, improving wildlife habitat and protecting people and infrastructure from extreme weather.

NETWORK ASSISTANCE

The goal of the Canoe River Aquifer Resilience Project was to identify high priority projects to advance towards implementation. The five communities participated in an 18-month facilitated planning process hosted by SNEP Network partners. This community-driven endeavor identified NBS projects that would reduce local flooding, restore habitat, protect drinking water quality, and improve ground water supply and community resilience to climate change impacts. More than 300 potential projects were initially identified from previous local and regional planning efforts. These projects were screened and evaluated for opportunities where NBS could provide multiple co-benefits to the surrounding communities. Projects were further vetted through an extensive public engagement process designed to learn more about local vulnerabilities and educate people about the importance of NBS to address these vulnerabilities.

NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- SRPEDD
- TNC-MA
- NEEFC

Project Consultant

- Horsley Witton Group
- Walberg Consulting

LOCAL PARTNERS

- Town of Easton
- Town of Foxborough
- Town of Norton
- Town of Sharon
- Resilient Taunton Watershed Network (RTWN)

PROJECT TIMEFRAME

- FY1-FY5

LOCATION

- Canoe River Watershed

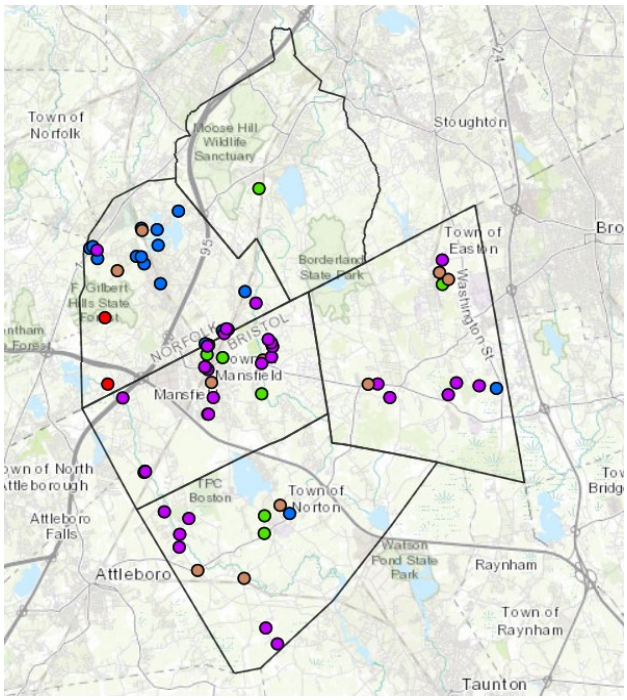
The project team and community representatives classified the identified projects into one of four project categories: 1. Water Supply and Drought Resilience; 2. Flooding, Stormwater, Dams, and Culverts; 3. Forests, Habitats, and Invasive Species; and 4. Public Health and Emergency Preparedness. The communities selected projects in Categories 1 and 2 as the highest priorities to move forward with during this planning effort. Mapping analyses helped identify project clusters along connected stream networks. Through this process, the towns were able to narrow the 300+ potential project sites down to 16 priority clusters.

OUTCOMES AND DELIVERABLES

The SNEP Network's sustained direct assistance enabled the advancement of priority projects. The SNEP Network's created a project website, educational Story Map, and interactive map showcasing the 16 priority project clusters was an effective tool to communicate the results to the public.

SNEP Network assistance helped communities advance projects toward implementation.

- Sharon: renewed project engagement helped reconnect the Great Cedar Swamp project with previously allocated implementation funding from the MA Division of Ecological Restoration following years of project planning and a period of staff turnover. The site monitoring and concept designs are complete and the project is advancing to detailed design.
- Easton: the Mulberry Meadow Brook wetland restoration project was advanced to the next phase with State support using a more holistic watershed approach that incorporates stream restoration. The project is advancing to preliminary design.
- Mansfield: the Rumford River knotweed management project cluster was advanced to an MVP Action grant application with a more holistic watershed restoration approach.



- Canoe River Aquifer Webpage
- Canor River Aquifer Project Storymap
- 2022 SNEP Symposium Presentation (Canoe River)
- Canoe River Aquifer Network Narrative
- Final Prioritized Projects
- Cluster Descriptions for Final Prioritized Projects
    - Birch and Meadow Brooks
    - Canoe River Culverts
    - Great Cedar Swamp Restoration
      (Final Memo)
      (Basis of Design: Flow Control Structure in Great Cedar Swamp)
    - Chestnut Street Area Flooding
    - Cocasset Street Railroad Underpass Flooding
    - Cocasset Street Flooding at Maple Place Railroad Crossing
    - Invasive Knotweed Management
    - Morse Street/Glue Factory Pond
    - Mulberry Brook
    - Neponset Reservoir

- Prospect & Purchase Streets
- Queset Brook
- Route 123/140
- Rumford River
- Wading and Cocasset Rivers
- Washington Street

Photo: Farm structure at Sam Wright Field in Sharon, MA



APPENDIX C

SNEP Network Community Assistance Projects in Rhode Island

- Woonasquatucket River Watershed Council
- Town of Warren
- Providence Stormwater Innovation Center
- Town of Portsmouth
- Town of Charlestown
- Town of Bristol
- City of Newport
- City of Providence
- City of Providence: Tree Equity Plan
- Town of South Kingstown
- Town of Warren
- Town of South Kingstown Buffer Restoration Plan
- Town of Westerly
- Town of North Kingstown
- Town of Middletown
- Burrillville Land Trust
- Town of Hopkinton
- Town of Coventry

Woonasquatucket River Watershed Council

RHODE ISLAND

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- Save the Bay

Project Consultant

- Fuss and O'Neill

LOCAL PARTNERS

- Woonasquatucket Watershed Council

PROJECT TIMEFRAME

- FY1-FY2

LOCATION

- Olneyville neighborhood in Providence *(Door of Refuge Church--Iglesia Puerta De Refugio)*

The Woonasquatucket Watershed has a nexus of water quality pollution, flooding issues and front-line urban populations within environmental justice zones. The Door of Refuge Church parking lots are adjacent to a public park and is in an area that drains directly into the Woonasquatucket River with no stormwater treatment.

NETWORK ASSISTANCE

WRWC worked closely with the SNEP Network on designing green infrastructure retrofits to treat stormwater runoff from two parking lots at the Door of Refuge Church in Providence, Rhode Island. The retrofit is part of the "Greening the Woonasquatucket River Greenway" project centered around building green infrastructure that will be visible from the 7-mile Woonasquatucket River Greenway and treat stormwater that would otherwise discharge directly into the Woonasquatucket River.

The WRWC received technical assistance with:

- Developing a funding proposal (conceptual designs and cost estimates) for green infrastructure retrofits to treat runoff from two parking lots at the Door of Refuge Church.
- Completing engineering/landscape design for the green infrastructure retrofits, bid development and construction oversight for the project.
- Training for implementation/oversight for WRWC's field River Ranger team to install the project.

OUTCOMES AND DELIVERABLES

The Woonasquatucket River Watershed Council's River Rangers successfully completed the installation for parking lot retrofits at Door of Refuge Church (Iglesia Puerta De Refugio) in the Olneyville neighborhood of Providence in February 2022.

- WRWC: Green Infrastructure Retrofits
- Greening the Woonasquatucket River Gateway

Iglesia Puerta De Refugio
247 Valley Street Providence, RI

Main parking lot pre-construction

View from the corner of Tuxedo and Amherst Street



Main Parking Lot Post-Construction

Asphalt removed, swale created, irrigation installed, wildlife habitat landscape install, chain link fence replaced with wooden guard rail.



View from corner of Tuxedo & Amherst Street



View from Amherst to corner of Valley Street

Town of Warren, RI

RHODE ISLAND

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- Save the Bay
- UNH Stormwater Center

Project Consultant

- Fuss and O'Neill

LOCAL PARTNERS

- Town of Warren

PROJECT TIMEFRAME

- FY1-FY2

LOCATION

- Warren Boulevard Neighborhood *(Warren Boulevard/Central Ave/Vernon Street)*

The Warren Boulevard Neighborhood is prone to flooding on a regular basis. The flooding impacts a residential area and presents both property damage and safety issues. The source of the flooding is a natural stream that flows south to north and flows under Warren Boulevard to a rock lined culvert and terminates in the Warren River. There are no stormwater drains in the immediate area and there are no plans to install storm drains.

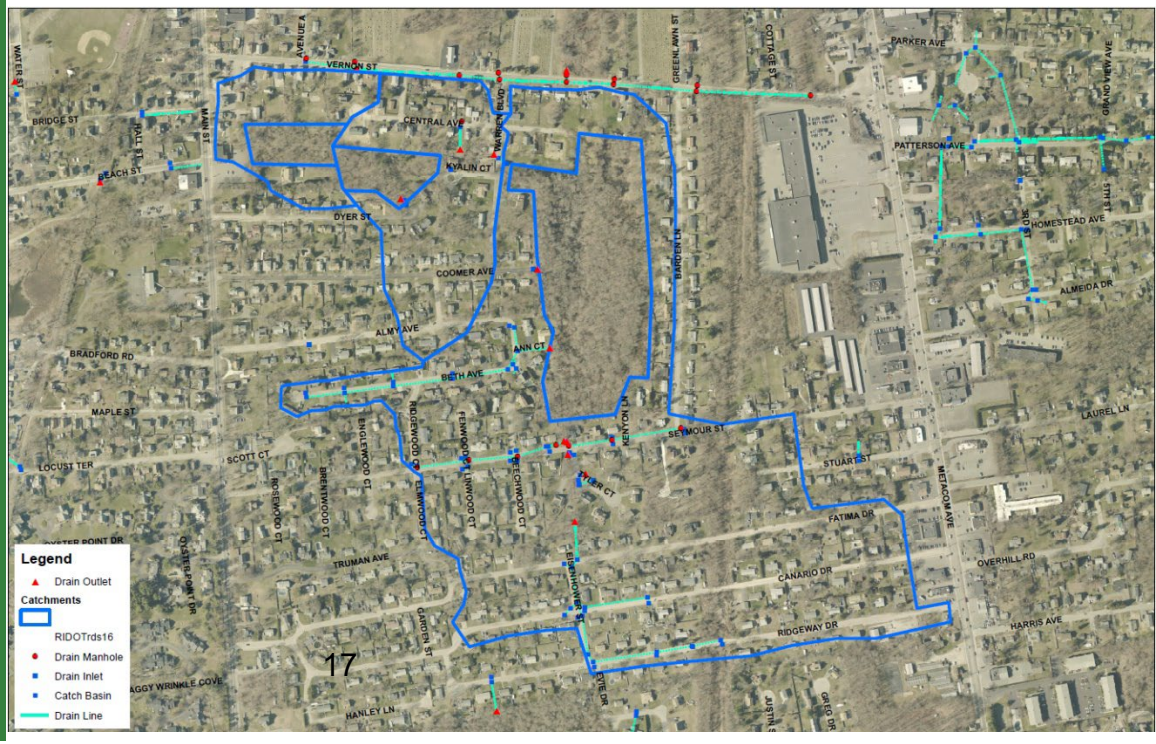
NETWORK ASSISTANCE

The Network used consultant services to undertake hydrologic and hydraulic (H&H) analyses of existing conditions in the Warren Boulevard Neighborhood. Fuss & O'Neil worked with the Network to conduct an existing conditions assessment, evaluate three alternatives for mitigating flooding in the Warren Boulevard Neighborhood, prepare order of magnitude costs, and conduct meetings with the SNEP Network and the Town of Warren to present concepts and collect feedback.

OUTCOMES AND DELIVERABLES

The SNEP Network evaluated alternatives to mitigate inland flooding of the Warren Boulevard neighborhood. The final conceptual plans were completed and the Network conducted engagement with affected property owners, and presented recommended actions.

Photo: Warren Boulevard Neighborhood catchment areas



Providence Stormwater Innovation Center

RHODE ISLAND

SNEP NETWORK PARTNERS

- Audubon Society of RI
- UNH Stormwater Center

Project Consultant

- Fuss and O'Neill

LOCAL PARTNERS

- Providence Stormwater Innovation Center

PROJECT TIMEFRAME

- FY1-FY2

LOCATION

- Roger Williams Park, Providence RI

Roger Williams Park is a 435-acre park in Providence, Rhode Island. Created in 1871, the park includes an extensive system of ponds most of which were artificially created by dredging and damming Mashapaug Brook in the late 19th century. Over the years, increasing development and urbanization in the watershed surrounding the park ponds has impaired the ponds' water quality, resulting in frequent algae blooms in warmer months.

In 2020 the Providence Stormwater Innovation Center (PSIC), a collaboration between the City of Providence Parks Department, the University of Rhode Island, Restore America's Estuaries, the Rhode Island Department of Transportation, the SNEP Network, the Robbins-de Beaumont Foundation and the University of New Hampshire Stormwater Center was formed to take advantage of the abundance of BMPs in the park and the experience gained from their installation and maintenance to advance stormwater treatment in the region. In 2020 and 2021 the PSIC also undertook several monitoring efforts to determine whether some of the installed BMPs were working as designed, as well as to get a sense of the current water quality in the park ponds.

NETWORK ASSISTANCE

The SNEP Network provided the PSIC support with a number of initiatives, including real-time monitoring at Roger Williams Park, developing a Stormwater Tree Trench Options guide, and the development of stormwater educational displays.

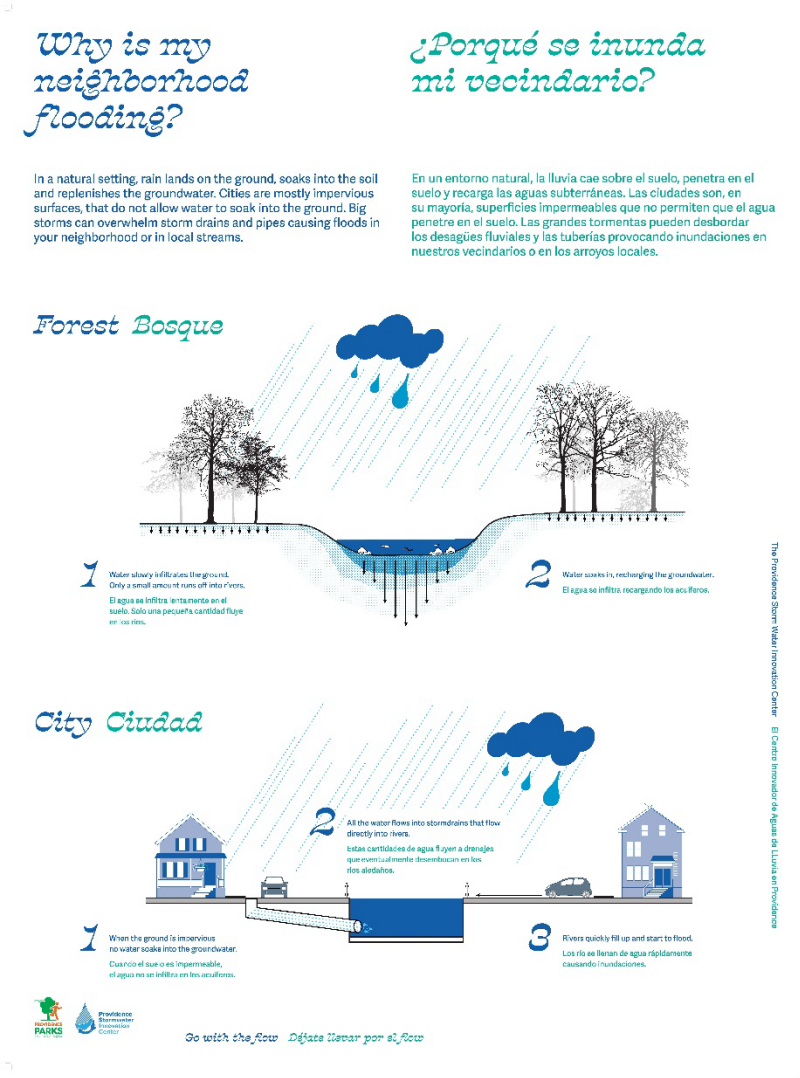
In 2021, the Network partners UNH Stormwater Center and the Audubon Society of RI conducted a study to attain real-time water quality information and hydraulic data over an extended range of time. A new monitoring plan and instrumentation installation were implemented to obtain hydraulic performance. While it was difficult to compare continuous monitoring data to limited grab sample data, the data indicated that the total phosphorus concentrations at the outlet of the Roger Williams Park ponds have decreased in comparison to historical data. The full results and conclusion of the monitoring can be found here: Real-time Monitoring Report.

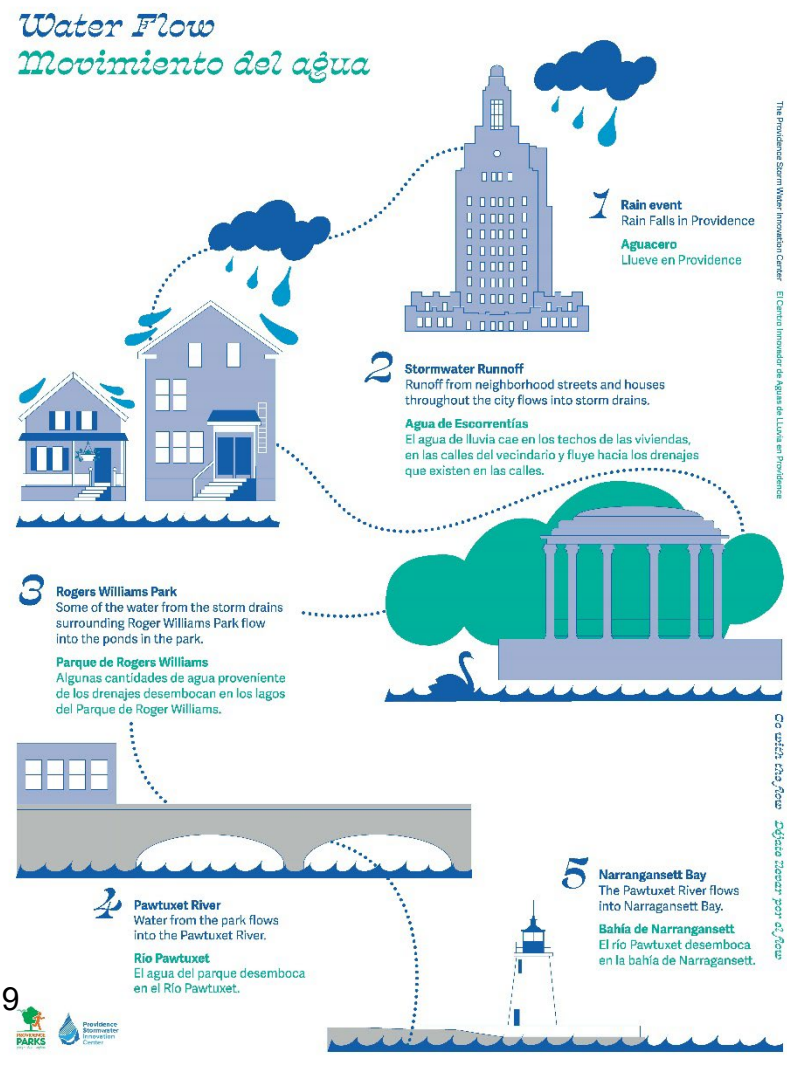
SNEP Network assistance also facilitated the creation of non-proprietary, “plug-and-play” designs, including a tree filter (no storage) and a tree trench (with storage). The SNEP Network provided consultant services to develop a Stormwater Tree Trench Options Guide, produced by Horsley Witten Group, that provides a basic understanding of the different components of a Tree Trench and information to assist design decisions specific to each project’s location and objectives. Designs were installed Roger Williams Park, with plans for research, training, and education.

Finally, the Network supported a partnership with RISD interns to create designs for Stormwater and Green Infrastructure displays. These educational displays were placed at Roger Williams Park to educate the public about the importance of stormwater management. These displays were also translated into Spanish.

OUTCOMES AND DELIVERABLES

- Stormwater Tree Trench Design Options Guide
- Providence Stormwater Innovation Center
- Real-time Monitoring Report
  Roger Williams Park BMP Monitoring Report
- Tree Trench Webinar





Town of Portsmouth

Located on the north end of Aquidneck Island, the Town of Portsmouth's geographical location makes it vulnerable to climate-driven sea level rise and storm events having the potential to not only disrupt daily life but also impact the surrounding water resources that are closely tied to the town's quality of life and economy. In the spring/summer of 2019, the Town of Portsmouth held a local Community Resilience Building Workshop to assess current natural hazard and climate change impacts and to identify projects, plans, and policies for improved community resilience. There was universal recognition that Portsmouth needed to be better prepared through long-term, community-based, comprehensive resiliency planning.

NETWORK ASSISTANCE

SNEP Network assistance for climate resiliency planning and financing in Portsmouth included town council leadership development, prioritizing and estimating costs for capital needs, and creating a financing strategy including a 5-year Climate Resiliency Capital Improvement Plan. Using the Resilience Financing Framework laid out in the Planning to Action: Climate Toolkit, Network Partners, Throwe Environmental and Elizabeth Scott Consulting worked with the Town's Climate Resilience Work Group made up of representatives from the Town's departments as well as members of the public. The group's goal was to prioritize climate resilience capital infrastructure and programmatic needs identified in the Town's prior planning efforts including its Municipal Resilience Plan and Hazard Mitigation Plan, and with support from Pare Corp to provide scoping and/or cost estimates for the town's priority actions.

OUTCOMES AND DELIVERABLES

The Town is implementing multiple actions to address priorities identified in their resilience plan: including the development of a consolidated regional, multi-jurisdictional Hazard Mitigation Plan (HMP) for the three island communities to address regional natural hazards and strategies for resilience in the face of natural disasters and climate change. The product will be a consolidated regional, multijurisdictional HMP to be adopted by each Aquidneck Island municipality and approved by Rhode Island Emergency Management and the Federal Emergency Management Agency (FEMA). This effort is being funded through a FEMA Building Resilient Infrastructure and Communities (BRIC) award, which was secured with the support of RIIB's Aquidneck Island Resilience Coordinator.

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- Throwe Environmental

Project Consultant

- Pare Corp

LOCAL PARTNERS

- Town of Portsmouth
- Rhode Island Infrastructure Bank

PROJECT TIMEFRAME

- FY1-FY2

LOCATION

- Town of Portsmouth

The Town of Portsmouth has secured approximately $500,000 in funding from a RI Infrastructure Bank MRP Action Grant and ARPA funds to implement high priority drainage improvements in Island Park, Portsmouth Park and Riverside Drive. This project makes necessary upgrades to failing drainage infrastructure and will eliminate illicit connections and prevent adjacent septic flows from seeping into damaged pipe joints or drainage structures.

- Portsmouth, RI Climate Resilience Planning and Financing Strategy Report



One meter of sea level rise by the year 2050 with no action. *(Source: RISDI/Town of Portsmouth Visualization Study prepared by Dr. Peter Stempel, January 2020)*

Town of Charlestown

RHODE ISLAND

SNEP NETWORK PARTNERS

- URI-NEMO

Project Consultant

- Growsmart, RI

LOCAL PARTNERS

- Town of Charleston

PROJECT TIMEFRAME

- FY1-FY2

LOCATION

- Town of Charlestown

Development pressures in the coastal region affect groundwater quality (from septic systems and run-off from impervious surfaces). There have been several issues regarding the construction and management of private roads that resulted in the town limiting the use of these regulations to smaller subdivisions with no road extensions. While the Town had a "residential compound" ordinance, they needed regulations in place to allow better designed conservation developments for subdivisions of five or more lots, as a replacement for the residential compound regulations.

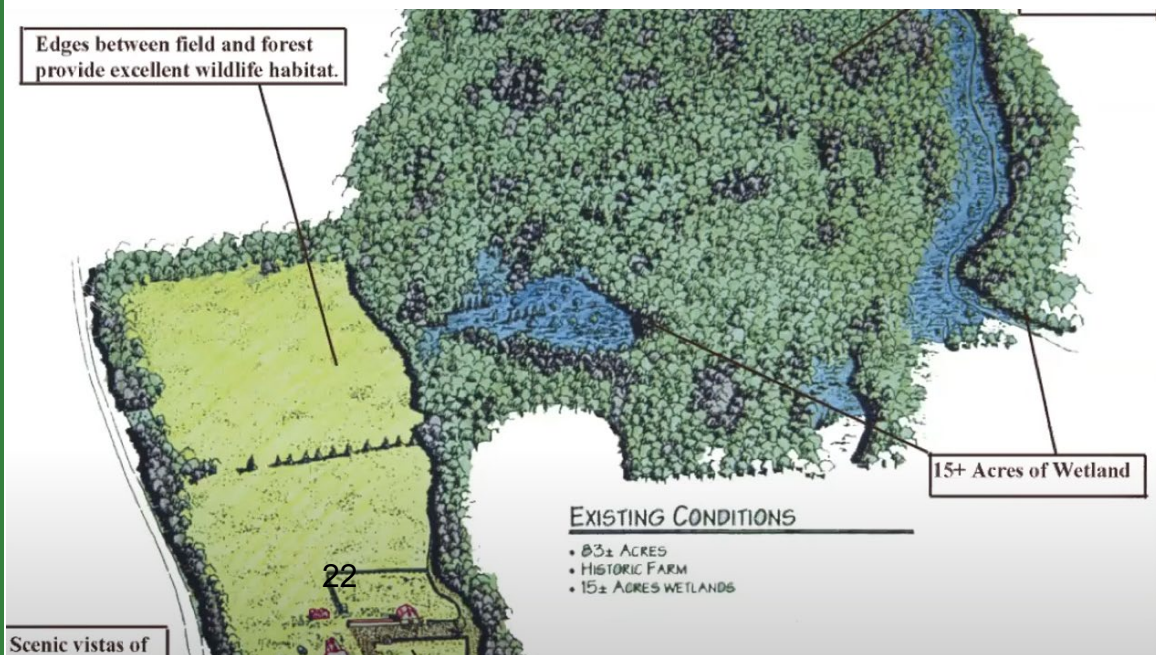
NETWORK ASSISTANCE

The Network supported the Town in developing a conservation development ordinance ensuring that new subdivisions incorporate Low Impact Development designs and enhanced stormwater management. This support included training and educational material to support adoption. The SNEP Network worked closely with the Town of Charlestown and its Planning Board to address concerns leading to adoption of the conservation development ordinance by the Charlestown Town Council.

OUTCOMES AND DELIVERABLES

The Town of Charlestown adopted the conservation development ordinance which development standards for zoning will enhance the protection of open space in Charlestown. The ordinance serves as a model with updated elements for other communities.

- Conservation Development Webinar
- Amendment to Subdivision Regulations
- Amendment to Zoning Ordinance



Town of Bristol

RHODE ISLAND

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- URI-NEMO
- ASRI
- TNC-RI

Project Consultant

- Fuss and O'Neill

LOCAL PARTNERS

- Town of Bristol

PROJECT TIMEFRAME

- FY1-FY2

LOCATION

- Bristol Town Common

As one of the oldest such public landscapes in Rhode Island, the eight-acre Town Common has served the Bristol community in a variety of ways since it was created in 1680. The Common contains a central gazebo, flagpole, public parking lot, recreational uses such as tennis courts, a basketball court, baseball field, and playground, as well as concrete walkways, decorative lighting, perimeter sidewalks, rows of trees and other landscape features. Creation of the master plan would allow the Town to make informed coordinated decisions regarding future improvements and amenities at this culturally and historically important landscape and will limit runoff from untreated surfaces that discharges to street drains and into nearby Bristol Harbor and Narragansett Bay.

NETWORK ASSISTANCE

The SNEP Network assisted the Town of Bristol with the creation of a Bristol Town Common Master Plan to enhance park elements while addressing stormwater and erosion issues. The Master Plan serves as a guide for the Town in making informed decisions regarding use of this culturally and historically important town park as an event space as well as future improvements to limit runoff from untreated surfaces that discharge to street drains and into nearby Bristol Harbor.

OUTCOMES AND DELIVERABLES

The Town was awarded $84,650 Section 19 grant to begin implementing the plan's recommendations by making stormwater improvements in the North parking lot on State Street.

- Bristol Town Common Master Plan

City of Newport

RHODE ISLAND

SNEP NETWORK PARTNERS

- Throwe Environmental
- Elizabeth Scott, RI Liasion
- Save the Bay
- EFC-SU
- EFC-UNC

LOCAL PARTNERS

- City of Newport

PROJECT TIMEFRAME

- FY2-FY3

LOCATION

- City of Newport

The City of Newport faces numerous environmental and climate challenges, particularly those related to stormwater and flooding. While the City is acutely aware of its climate hazards, a more thorough analysis of the results of previous hazard inventories and their subsequent recommendations was required to position the city for long-term climate action.

NETWORK ASSISTANCE

The SNEP Network assisted the City of Newport with developing a climate resilience strategy that included working with a core group of stakeholders to help assess and prioritize high priority projects and steps needed for implementation. Using the Resilience Financing Framework laid out in the Planning to Action: Climate Toolkit (PACT), SNEP Network Partner, Throwe Environmental, completed an assessment of Newport's capacity to address its climate concerns through engaged leadership and community action.

The SNEP Network created a working group consisting of over 25+ City staff and community stakeholders to analyze relevant climate hazards and identify at-risk assets and populations. The SNEP Network explored potential action to address Newport's climate vulnerabilities, developed a list of priority actions by aggregating action items from various City planning documents and from the stakeholder workgroup meetings, and provided recommendations to implement the priority actions through sustainable funding, financing, and investment.

OUTCOMES AND DELIVERABLES

Momentum built through this process has carried over into the City's work to address flooding issues in the North End and to daylight and create a linear park along a portion of Elizabeth Brook. It also led to ongoing conversations with the other Aquidneck Island communities to advance island-wide climate resilience planning leading to the award of an approximately $2 million NOAA Climate Resilience Regional Challenge Grant to the Aquidneck Land Trust to work with its established network of partners to implement resilience projects that include nature-based solutions to address threats from flooding, sea level rise, and water pollution.

- Final Report: Newport, RI Climate Resilience and Financing Prioritization Report

RHODE ISLAND

City of Providence

Stormwater Planning Series: Retrofit Options for York Pond Watershed

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- Save the Bay
- ASRI
- UNH Stormwater Center
- NBNERR

LOCAL PARTNERS

- Seekonk River Alliance
- City of Providence

PROJECT TIMEFRAME

- FY2-FY3

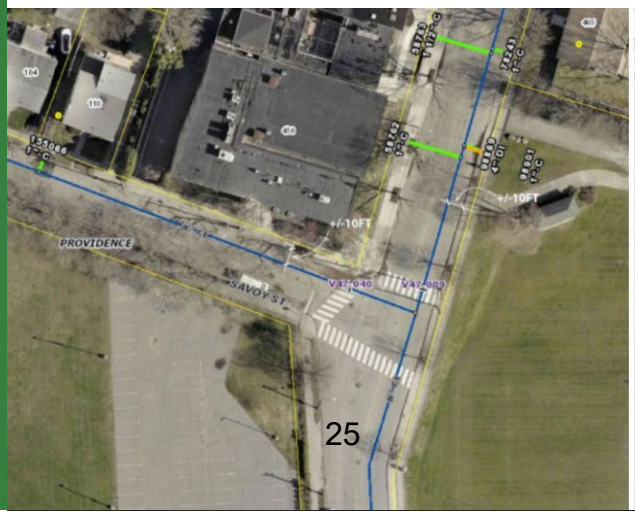
Approx. 380 acres in area, the York Pond Watershed extends well to the west at higher elevations and drains into York Pond and the Seekonk River as point and non-point stormwater runoff. Many of the east-west streets (the avenues) are excessively wide and generally slope towards the river. Aging infrastructure, including drainage sluices that convey stormwater directly from roadways into the river after every rainfall, is inefficient and in many cases should be replaced by systems that filter drainage through planted areas. Conditions are exacerbated by sea level rise, higher tides, and increasingly intense storms. Blackstone Boulevard currently provides a horizontal band of green space and some infiltration, but there are opportunities to capture and filter much more stormwater.

NETWORK ASSISTANCE

The City of Providence, in partnership with the Seekonk River Alliance, participated in the SNEP Network's Stormwater Planning Series to address water quality, erosion, habitat, and flooding issues in the York Pond watershed and along the adjacent shoreline area of the tidal Seekonk River in Providence, Rhode Island.

OUTCOMES AND DELIVERABLES

Working collaboratively with the City of Providence and the Seekonk River Alliance, SNEP Network partners assisted them with developing a conceptual design for a pocket park at the intersection of Savoy Street and Elmgrove Avenue, that features a bioretention area to capture and treat runoff from the adjacent parking lot and roadways. The design has a secondary benefit of improving the safety of the road crossing in this area of Providence having many recreational and cultural amenities frequented by students and other pedestrian visitors.





City of Providence

Providence Tree Equity Plan

RHODE ISLAND

SNEP NETWORK PARTNERS

- The Nature Conservancy—RI

Project Consultant

- Fuss and O'Neill

LOCAL PARTNERS

- Providence Neighborhood Planting Program
- City of Providence Forestry Division

PROJECT TIMEFRAME

- FY2-FY4

LOCATION

- City of Providence

Though 27% of Providence is covered by tree canopy, it is unevenly distributed across the City and is strongly correlated with race and income. Preserving and growing the urban tree canopy is a critical tool to help manage stormwater in Providence. Right-of-way street trees are the primary component of the urban forest resource that the City manages, but these trees often clash with the immediately surrounding infrastructure, e.g., sidewalks, utilities, and curbing. The conflicts between tree roots and sidewalks in Providence are widespread, resulting in recurring expenses for repair, misinformed practices injuring trees, and premature tree removals.

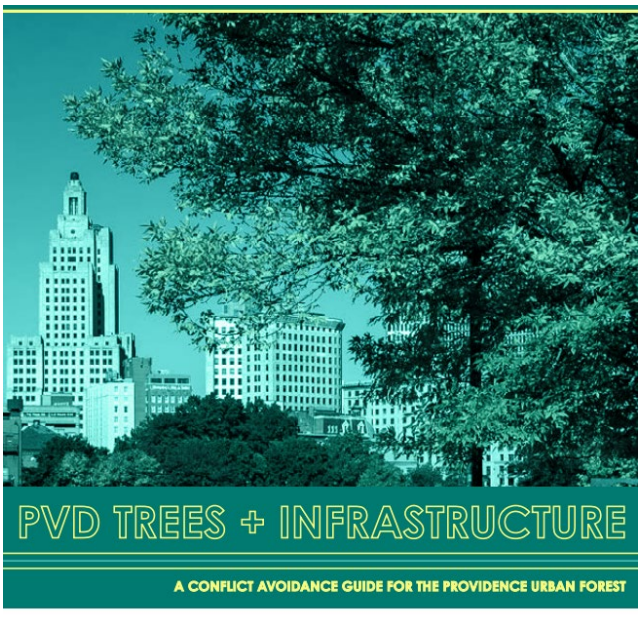
NETWORK ASSISTANCE

The SNEP Network worked with the Providence's (PVD) Planting Program to develop a Tree and Infrastructure Conflict Avoidance Guide that would highlight solutions to plant and retain healthy trees and provide accessible, walkable surfaces throughout the City of Providence as part of the PVD Tree Plan–a collaborative project to develop a vision and action plan for creating a just, resilient, and equitably distributed urban forest in Providence.

The Nature Conservancy of Rhode Island, and consultants Fuss & O'Neill, developed this guide as a supplement to the equity focused Providence Tree Plan. This guide highlights solutions to plant and retain healthy trees and provide accessible, walkable surfaces throughout the City of Providence

OUTCOMES AND DELIVERABLES

- PVD Trees + Infrastructure: A conflict Avoidance Guide for the Providence Urban Forest



Town of South Kingstown

Stormwater Planning Series: Saugatucket River Watershed

RHODE ISLAND

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- Save the Bay

Project Consultant

- Fuss and O'Neill
- Horsley Witten Group

LOCAL PARTNERS

- Town of South Kingstown

PROJECT TIMEFRAME

- FY2-FY5

LOCATION

- The southernmost end Saugatucket River in South Kingstown from Peace Dale through Wakefield

The Saugatucket River, located in South Kingstown from Peace Dale through Wakefield, the southernmost end of the watershed, experiences flooding events due to increased annual precipitation, rising average annual temperatures, along with the number of days that are 90 degrees or hotter amplify existing natural hazards. Extreme weather will continue to plague the properties that abut the river and continue to compromise the river's health. Implementing nature-based solutions will help to reduce flooding, treat runoff from roads and parking lots, improve water quality, enhance the functionality and aesthetics of the banks, and restore riparian wildlife habitat.

NETWORK ASSISTANCE

The SNEP Network worked with the Town of South Kingstown to address flooding, water quality, and riparian habitat restoration needs along the Saugatucket River watershed. Through participation in the SNEP Network Stormwater Planning Series, the Town of South Kingstown developed a conceptual design for a stormwater retrofit of the parking lot located behind the Main Street business district along the Saugatucket River. The concept for a linear bioswale along the length of the parking lot and adjacent to an existing river walkway would create a more park-like experience for pedestrians while also treating runoff.

The SNEP Network also provided assistance to the Town, as part of its work with ATON consultants, to develop the Buffer Restoration Guide including a "usable" example, in developing conceptualized landscape architectural drawings of buffer restoration along Indian Run Brook at the Peace Dale Village Green.

OUTCOMES AND DELIVERABLES

In a two-year effort that built upon their original conceptual designs, South Kingstown worked with the SNEP Network and Network consultants Horsley Witten Group to successfully advance their conceptual design to 30%. With this advanced design and cost estimates, South Kingstown can now apply for and secure implementation funding for their stormwater retrofit.

RHODE ISLAND

Town of Warren

Stormwater Planning Series: Warren Land Trust

A detention basin constructed in the early 1990's accentuates runoff from an adjacent industrial park and residential area. This detention basin is formed by earthen berms and located along the edge of a red maple swamp bordering a brackish and salt marsh on the east side of the Palmer River. Failure of the berm and poorly functioning outlet were observed to be contributing to the salt marsh's vulnerability to the impacts of climate change and sea level rise.

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- Save the Bay
- ASRI
- UNH Stormwater Center
- NBNERR

LOCAL PARTNERS

- Town of Warren
- Warren Land Trust

PROJECT TIMEFRAME

- FY2-FY3

LOCATION

- Town of Warren

NETWORK ASSISTANCE

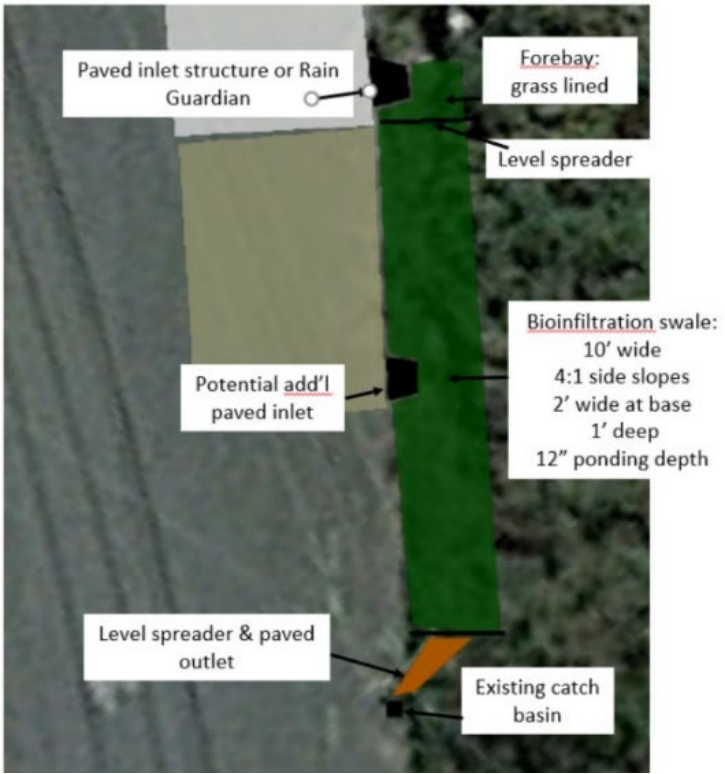
The SNEP Network worked closely with the Town and Warren Land Trust, whose property the detention basin is located on, to develop conceptual designs for retrofitting the basin's outlet and for infiltration trenches and other stormwater practices within the Warren Industrial Park to reduce the volume (and pollutant load) of runoff entering the basin.

OUTCOMES AND DELIVERABLES

To reduce the stormwater entering a failed retention pond in Warren, the town and the land trust developed conceptual designs to install infiltration trenches and bioretention swales.

Image: conceptual design developed by Warren during the stormwater planning series.





Town of South Kingstown

Buffer Restoration Plan

RHODE ISLAND

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- Save the Bay

Project Consultant

- Horsely Witten Group

LOCAL PARTNERS

- Town of South Kingstown

PROJECT TIMEFRAME

- FY3-FY4

LOCATION

- South Kingstown

South Kingstown experiences wetland buffer issues along Indian Run Brook as it flows through the "Town Green" at its "Neighborhood Guild" public recreation facility in Peace Dale. This segment of the Saugatucket River Watershed suffers from listed impairments for invasive vegetation and fecal coliform, as well as a TMDL for fecal coliform. This stretch of Indian Run Brook also suffers from sedimentation that restricts the stream channel and exacerbates flooding. Implementing wetland buffer improvements at this location would remove invasive species, increase in vegetative uptake of fecal coliform, stabilize the stream banks to reduce sedimentation and, possibly, support limited removal of sediment from the stream channel to promote healthy water flows.

NETWORK ASSISTANCE

Building upon the conceptualized landscape architectural drawings of buffer restoration along Indian Run Brook and the Town's prior participation in the stormwater planning series, the SNEP Network worked with the Town to develop a planting plan to restore Indian Run Brook's riparian area and help stabilize its bank as it flows through the Peace Dale Village Green, and to develop a conceptual plan for retrofits to the Town's Neighborhood Guild parking lot to reduce and treat runoff before it discharges into Indian Run Brook.

The team then worked with SNEP Network consultants, Horsely Witten Group, to advance the conceptual design of the parking lot retrofits. This phase of the project entailed completion of site assessments (existing site survey and soil evaluation), 30% design plans and then final Construction Plans including cost estimates.

OUTCOMES AND DELIVERABLES

In 2024, South Kingstown was awarded a $66,350 Bay and Watershed Restoration Grant to implement the Indian Run Brook Restoration project which includes riparian buffer plantings and stormwater retrofits at the Neighborhood Guild parking lot.

- Site Renderings for Peace Dale Village Green
- Buffer Restoration Guide

The park is located downstream of a highly urbanized area of town with little opportunity for rain and stormwater to be absorbed into the soils. As a result, high volumes of runoff are discharged into the river which has resulted in streambank erosion and sediment deposits along its length including in the reach through the park. Indian Run Brook is a tributary to the Saugatucket River which flows into Point Judith Pond; all of which are identified as impaired by RIDEM.

Site renderings illustrate:

- Stabilized streambank by planting shrubs, trees and other deep rooting vegetation within the buffer area
- Treatment of a portion of the runoff from adjacent parking lots and grassed areas
- Maintained pockets of mowed areas to allow continued access to the river
- Established low-maintenance buffer plantings

Town of Westerly

Stormwater Planning Series

RHODE ISLAND

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- Save the Bay
- ASRI
- UNH Stormwater Center
- NBNERR

LOCAL PARTNERS

- Town of Westerly
- Southern RI Conservation District

PROJECT TIMEFRAME

- FY2-FY3

LOCATION

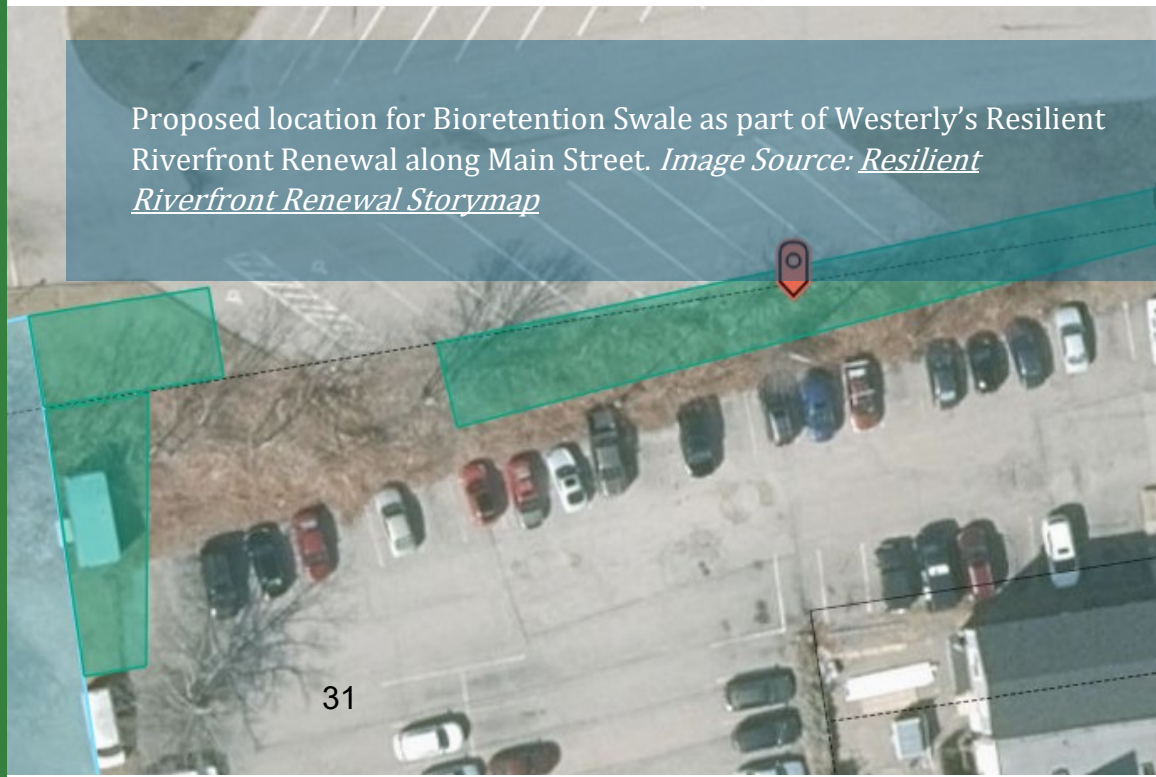
- Town of Westerly

Westerly faces issues of water quality (in the Pawcatuck River and Little Narragansett Bay) and quantity (flooding, particularly adjacent to the river and along the coast) primarily due to a lack of sufficient stormwater management planning in the past and aging and deterioration of stormwater management infrastructure that does exist. Westerly is at the bottom of the Wood-Pawcatuck Watershed, allowing water quality problems upstream to accumulate as they reach the Town. The Pawcatuck River and Little Narragansett Bay are listed on the 303(d) List of Impaired Waters due to high bacteria counts (Enterococcus in inland reaches of the Pawcatuck River and fecal coliform in tidal reaches of the Pawcatuck River and Little Narragansett Bay).

Additionally, portions of Downtown Westerly are located within the FEMA 100- and 500-year floodplains, exacerbating the issues surrounding inadequate stormwater management infrastructure.

NETWORK ASSISTANCE

The Town of Westerly, in partnership with the Southern Rhode Island Conservation District, participated in the SNEP Network's Stormwater Planning Series. Working with the SNEP Network, the town developed conceptual designs for bioretention swales and a wet pond on a "catalyst" private property, proposed for redevelopment as an outdoor event space, to treat runoff from the property and the adjoining roadway.



Proposed location for Bioretention Swale as part of Westerly's Resilient Riverfront Renewal along Main Street. *Image Source: Resilient Riverfront Renewal Storymap*

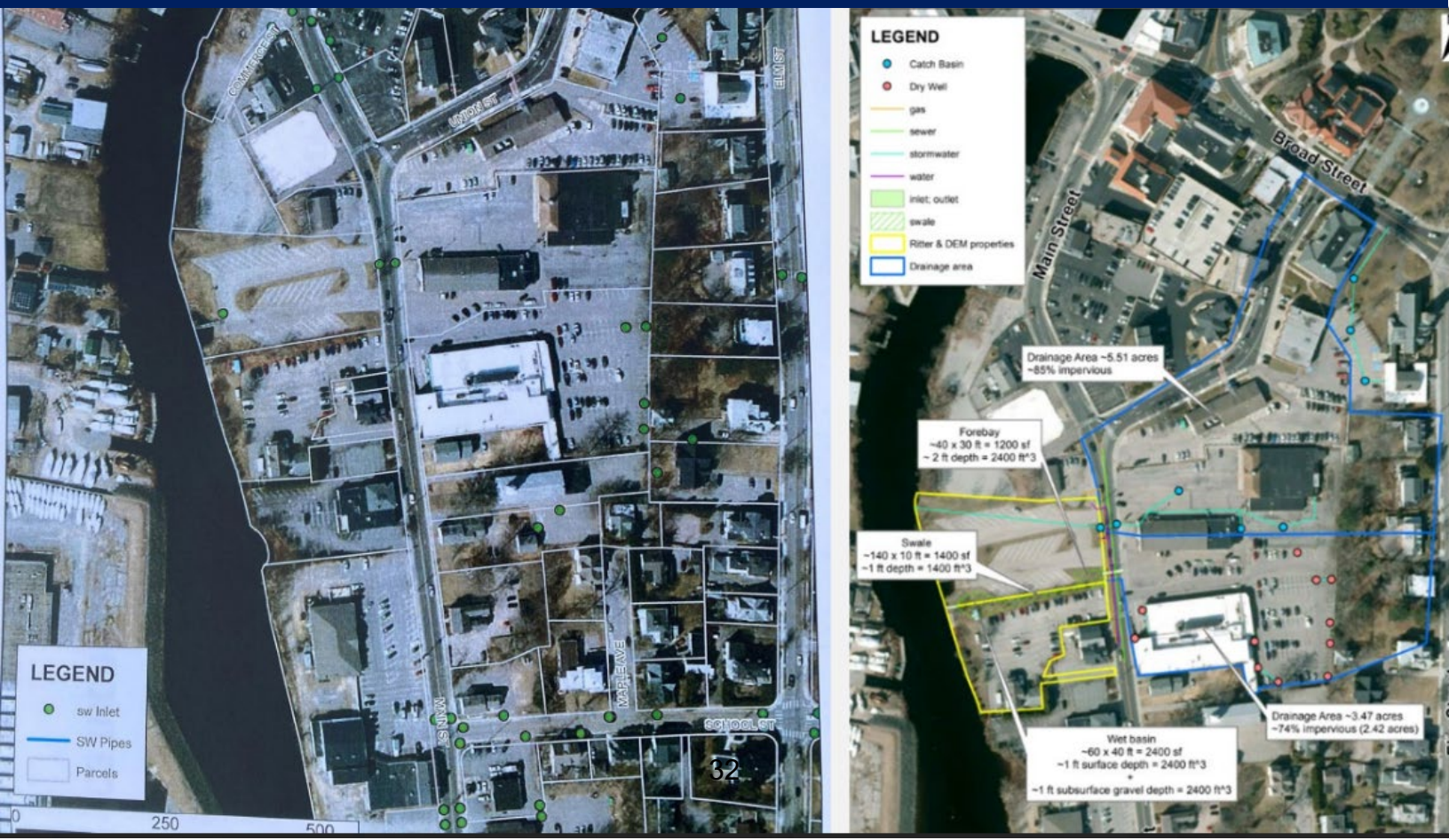
OUTCOMES AND DELIVERABLES

Building on the momentum of previous planning efforts and team building achieved as part of the Stormwater Planning Series, the Town has been able to not only finalize designs and construct the proposed stormwater solution at the "catalyst" site (in 2024) but also advance stormwater planning along Main Street along the Pawcatuck River.

To date the team has secured over $1,659,500 in grant awards and in-kind funds from a number of sources including SNEP, RIIB, RI Dept of Transportation (RIDOT), Narragansett Bay Estuary Program, SOAR, SWIG, Wood Pawcatuck Wild and Scenic Stewardship Council, Westerly, and Southern Rhode Island Conservation District to complete a Stormwater Master Plan and Streetscape design as well as install the green infrastructure stormwater retrofits on 6-8 properties.

Robust public engagement has resulted in additional property owners joining, making the total number of properties involved twelve (12). The team is currently developing a master plan for the street, finishing design on 8 properties and continues to apply for grant funds to complete the entire project by 2026.

The town determined through the stormwater planning series, that to mitigate localized flooding in Westerly and improve the water quality in the Pawcautck River, the would need to create a linear green infrastructure treatment train that included a sediment forebay > Bioretention swale > wet pond.



Town of North Kingstown

Stormwater Planning Series

RHODE ISLAND

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- Save the Bay
- ASRI
- UNH Stormwater Center
- NBNERR

LOCAL PARTNERS

- Town of North Kingstown

PROJECT TIMEFRAME

- FY3-FY4

LOCATION

- Town of North Kingstown

The presence of impervious cover in the coastal buffer zone diminishes the natural treatment capability of shoreline buffers and presents a risk of direct pollutant discharge. Nonpoint sources of pollution like sediment from erosion and road runoff have been identified as one set of contributors to this poorer water quality. Stormwater control measures are needed to address the discharge of untreated runoff from the neighboring residential area and roads degrading the water quality in the vicinity of the Town Beach located on the lower Narragansett Bay.

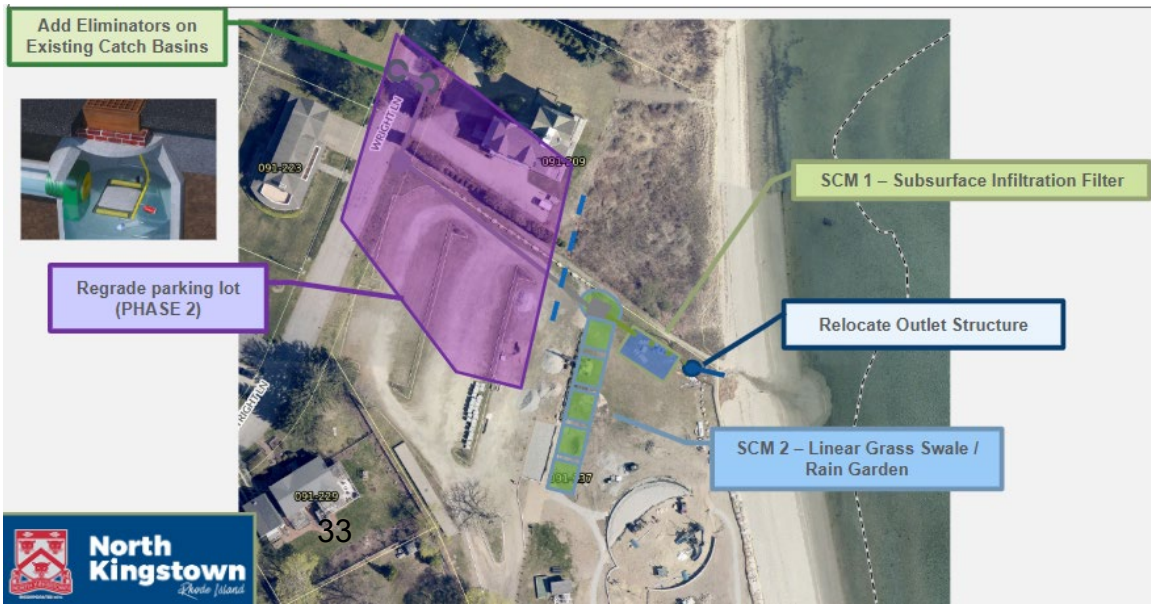
NETWORK ASSISTANCE

The SNEP Network provided technical assistance to the Town of North Kingstown to address the discharge of untreated runoff from the neighboring residential area and roads degrading the water quality in the vicinity of the Town Beach located on the lower Narragansett Bay. To reduce the discharge of untreated runoff from a neighborhood road to the Town Beach and Narragansett Bay, the town proposed to install eliminators on existing catch basins, a linear grass swale/rain garden, and a subsurface infiltration filter.

OUTCOMES AND DELIVERABLES

Through participation in the SNEP Network's Stormwater Planning Series, the Town developed conceptual designs for multi-phase improvements to treat stormwater runoff and build resilience to include installation of eliminators on existing catch basins, a linear grass swale / rain garden, and subsurface infiltration filter, regrading of the parking lot and re-location of the existing outfall.

Image: conceptual design developed by North Kingstown during the stormwater planning series



Town of Middletown

RHODE ISLAND

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- Save the Bay

Project Consultant

- Fuss and O'Neill

LOCAL PARTNERS

- Woonasquatucket Watershed Council

PROJECT TIMEFRAME

- FY1-FY2

LOCATION

- Town on Middletown

Middletown is frequently exposed to the impacts of climate change, including sea level rise, storm surge, and increased frequency and intensity of severe weather events. While the Town has proactively worked to plan for climate change and mitigate impacts, more comprehensive resilience planning with a focus on sustainable funding, financing, and investment was needed to secure funding and move projects forward towards implementation.

NETWORK ASSISTANCE

SNEP Network provided technical assistance to develop a sustainable climate action strategy that will effectively build on the Town's Municipal Resilience Plan and other planning efforts to date. With similar projects completed in Newport and Portsmouth in 2021 and 2022, this project with Middletown completed their next level of climate resilience planning.

SNEP Network Partners, Throwe Environmental and Elizabeth Scott (Rhode Island SNEP Network Liaison) conducted multiple resilience assessment and planning exercises with a Middletown community project workgroup to better understand the resilience challenges and opportunities facing the Town. The SNEP Network used these activities, and the Resilience Financing Framework laid out in the Planning to Action: Climate Toolkit (PACT) to compile and refine a priority list of resilience-focused capital infrastructure projects and associated programs in the Town. Additionally, the SNEP Network developed a list of recommendations for sustainable funding, financing, and investment in climate resilience capital projects.

OUTCOMES AND DELIVERABLES

With the development of their climate resilience strategy, list of prioritized recommendations, and cost estimates for their highest priority resilience capital projects, the Town of Middletown was successful in receiving a RIIB Municipal Resilience Action Grant to construct resiliency upgrades to the Wave Avenue pump station and is positioned to advance other climate resilience goals.

Burrillville Land Trust

RHODE ISLAND

SNEP NETWORK PARTNERS

- Blackstone Watershed Collaborative
- EFC-SU

LOCAL PARTNERS

- Burrillville Land Trust

PROJECT TIMEFRAME

- FY3-FY4

LOCATION

- Town of Burrillville, RI

Through town meetings, the Burrillville Land Trust identified an opportunity to educate the town's planning board and charter review committee on the benefits of Low Impact Design and the impacts of nutrient runoff from lawns discharging in nearby lakes and ponds.

NETWORK ASSISTANCE

The SNEP Network awarded technical services to the Burrillville Land Trust to develop education materials focused on land use and watershed protection. In partnership with the Burrillville Land Trust, the Network partners the Blackstone Watershed Collaborative and SU-EFC presented to the town's planning board on nature-based solutions and ecosystem services, how to manage land use and balance environmental protection and housing, and resources and funding opportunities for climate challenges.

OUTCOMES AND DELIVERABLES

SNEP Network partners the Blackstone Watershed Collaborative and SU-EFC presented to the Burrillville Planning Board.

- Enhancing Climate Resilience in Burrillville Presentation
- Helping Burrillville be More Climate Resilient One-pager



An aerial view of the Sloan Preserve, a 34.5 parcel of land owned by the land trust. This heavily wooded parcel is part of the land trust's plan to acquire properties or place conservation easements on property to produce a "green conservation corridor" from Jackson Schoolhouse Road to the West to Eagle Peak Road to the East.

Source: Burrillville Land Trust

Town of Hopkinton

Stormwater Planning Series

RHODE ISLAND

NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- ASRI
- Save the Bay
- UNH Stormwater Center
- NBNERR

Project Consultant

- Fuss and O'Neill

LOCAL PARTNERS

- Town of Hopkinton

PROJECT TIMEFRAME

- FY1-FY2

LOCATION

- Town of Hopkinton

The Town of Hopkinton values the ecosystem services provided by the Wood-Pawcatuck Wild and Scenic River and is eager to learn more about how to protect them. The Town has worked address several issues related to stormwater management, flooding, and erosion within the Mile Brook watershed, as summarized in their 2023 Hazard Mitigation Plan. This includes managing the volume of stormwater runoff and addressing flooding and erosion. An additional stormwater challenge for the Town is mitigating the flooding from stormwater around the Crandall Field parking lot, which needs updates.

NETWORK ASSISTANCE

The SNEP Network provided technical assistance to the Town of Hopkinton to address issues identified in the Town's 2023 Hazard Mitigation Plan related to uncontrolled runoff creating flooding conditions and erosion along a local roadway and eventually discharging untreated into Mile Brook, a tributary of the Pawcatuck River.

OUTCOMES AND DELIVERABLES

Through participation in the SNEP Network's Stormwater Planning Series, the Town developed conceptual designs for easily maintained and low-cost solutions to manage the runoff and to prevent erosion.

Town of Coventry

Stormwater Planning Series

RHODE ISLAND

SNEP NETWORK PARTNERS

- Elizabeth Scott, RI Liaison
- ASRI
- Save the Bay
- UNH Stormwater Center
- NBNERR

Project Consultant

- Fuss and O'Neill

LOCAL PARTNERS

- Town of Coventry
- Upper Dam Pond Conservation Association

PROJECT TIMEFRAME

- FY4-FY5

LOCATION

- Town of Coventry

The Town has several critical stormwater issues related to flooding, infrastructure damage and pollution problems. Within the Town of Coventry is the Pawtuxet River and many ponds and dams; there is a need for watershed level planning for stormwater management issues. The Town also has a need to educate staff and the community about cost effective nature-based issues, education on why these options are preferred, resiliency to climate change, and a need for community participation in stormwater planning and pollution prevention programs.

NETWORK ASSISTANCE

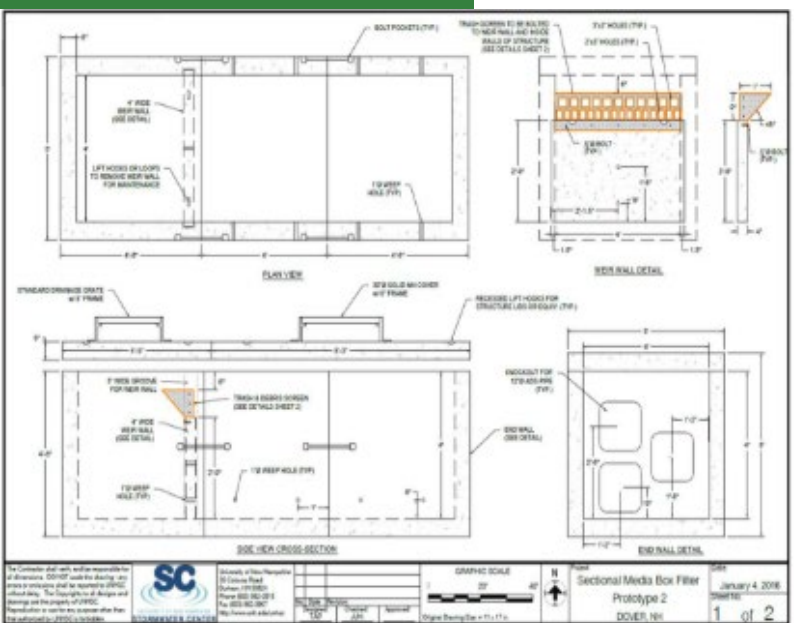
The Town of Coventry, in partnership with the Upper Dam Pond Conservation Association, participated in the SNEP Network's Stormwater Planning Series to address one of many discharges of untreated stormwater runoff into Upper Dam Pond.

OUTCOMES AND DELIVERABLES

As part of the planning series, the Town's team developed an innovative and low-cost conceptual design for a non-proprietary stormwater filter to treat runoff before being discharged into Upper Dam Pond - overcoming site constraints that had previously led the Town to select a more traditional but less effective treatment option.

The Town received SNEP Network consultant services to advance the design of the stormwater treatment to 30% design and has been awarded a SWIG grant for $87,500 to implement the selected practices, which they hope to replicate in other areas of Town.

Image: 30% conceptual design for a stormwater filter to treat runoff





APPENDIX D

SNEP Network Community Assistance Projects in Massachusetts

- Assawompset Ponds Complex/Upper Nemasket
- Pleasant Bay Alliance
- Town of Mendon
- Town of Bourne
- Allen's Pond Sancturary
- Town of Mansfield
- Mashpee Wampanoag Tribe and the Town of Mashpee
- Wampanoag Tribe of Gayhead Aquinnah
- Town of Marion
- Town of Shrewsbury
- Groundwork Southcoast and the City of New Bedford
- Buzzard's Bay Coalition
- Town of Swansea
- Town of Westport
- Mashpee Wampanoag Tribe: Non-point Source Pollution and Management Plans

Assawompset Ponds Complex/Upper Nemasket

MASSACHUSETTS

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- Mass Audubon
- TNC-MA
- SRPEDD
- *Horsely Witten Group*

LOCAL PARTNERS

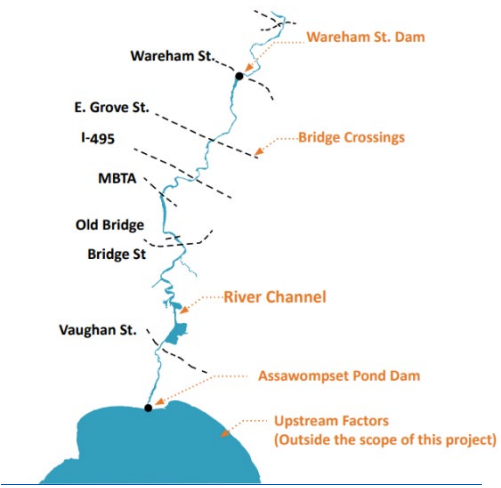
- Middleborough, MA
- Assamwompset Ponds Complex (APC) Working Group

PROJECT TIMEFRAME

- FY1-FY3

LOCATION

- Upper Nemasket River, downstream of the Wareham Street Dam



The Assawompset Pond Complex (APC) is the state's largest natural pond system and is the drinking water source for people in the cities of New Bedford, Taunton and 11 neighboring towns. For decades, the area around the Assawompset Ponds Complex (headwaters of the Nemasket River) has suffered deleterious environmental impacts related to the inherent conflicts between natural climatic and hydrologic processes and variability and human uses of, management of and encroachment on those aquatic systems. Such conflicts likely date back over a century to the construction of the dam at the outlet of the pond and the dredging of a straightened Nemasket River channel below the dam.

Many of the proposed projects over the last 40 years are located along the Upper Nemasket within the first half mile below the dam (e.g. dam reconstruction/repair, improved fish passage, wetlands restoration, river channel dredging, sediment trap construction, and culvert replacement). Some of those projects complement each other, others may conflict, and others may not be either appropriate or permittable in the light of current environmental understanding and/or regulation. To evaluate which potential projects may have the greatest environmental and human use benefits, which will interact best with each other to produce desirable outcomes, and how to best prioritize, design, and implement them, a comprehensive H&H evaluation of the Upper Nemasket system is needed.

NETWORK ASSISTANCE

In 2020, the SNEP Network provided technical assistance to SRPEDD on behalf of the Assawompset Pond Complex working group to conduct a Hydrology and Hydraulics (H&H) Modeling Study to assess current flow conditions and predicted conditions under potential management actions. Using the Network's consultant pool funds, the Network contracted with Horsley Witten to conduct hydrologic and hydraulic (H&H) modeling on the upper portion of the Nemasket River that drains from the Assawompset Pond Complex. The H&H modeling took place along the Nemasket River from the APC in Lakeville to just downstream of the Wareham Street Dam in Middleborough. The H&H Study provided the technical foundation for assessing the impacts of the various management strategies on flow conditions. The modeling was critical to fill information and data gaps for the Assawompset Pond Management team to prioritize management actions to take.

OUTCOMES AND DELIVERABLES

With the Network's support to conduct the Hydrologic and Hydraulic (H&H) modeling on the upper Nemasket River in Massachusetts, the team was able to secure additional funding from the Department of Fish and Game's (DFG) Division of Ecological Restoration (DER) to further advance the H&H modeling in the Assawompset Ponds Complex and the Nemasket River Watersheds.

- Upper Nemasket River Hydrology and Hydraulics Modeling Study (Page 127)
- Upper-Nemasket-River-Enhancement-Final-Reports-2023



Pleasant Bay Alliance

MASSACHUSETTS

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- Throwe Environmental
- Cape Cod Commission

LOCAL PARTNERS

- Town of Brewer
- Town of Chatham
- Town of Harwich
- Town of Orleans

PROJECT TIMEFRAME

- FY1-FY2

LOCATION

- Pleasant Bay Watershed

Pleasant Bay Alliance (PBA)is a municipal organization formed over 20 years ago and comprised of the four member towns: Orleans, Chatham, Harwich and Brewster, MA. Pleasant Bay is the largest Estuary on Cape Cod the first watershed in Massachusetts to be issued a watershed permit by MassDEP. PBA coordinates water resources management for the Pleasant Bay Area of Critical Environment Concern.

While all four towns in the Pleasant Bay Watershed have undertaken measures to control stormwater impacts many layers of federal, state and local regulations govern stormwater discharges. As a result, local stormwater management often is not coordinated, and regulations and standards are not always applied in a consistent or comprehensive manner. Technical assistance was needed to enhance the disparate stormwater management plans of the four towns with the goal of achieving a coordinated sustainable watershed-wide approach that is cost effective and sensitive to the significant funding demands of TMDL compliance.

NETWORK ASSISTANCE

The SNEP Network provided technical assistance to the Alliance and its four member Towns, to guide further action related to the implementation of the watershed permit. SNEP Network Partner, the Cape Cod Commission (CCC), completed the bylaw review for each Town using the guiding principles of 1) conserving resources that already exist to preserve existing function(s), 2) integrating Green Infrastructure (GI) and Low Impact Development (LID) strategies into all development, and 3) working within existing development patterns to restore functions that are lost, including natural hydrology. The by-law reviews were performed using Mass Audubon's tool which was later updated to include CCC's findings. The ability of the towns to regulate stormwater management was assessed based on existing bylaws and regulations with the goals of highlighting areas that already promote enhanced stormwater management and developing recommendations to further streamline or strengthen existing regulations in each Town.

In addition, the SNEP Network, led by partner Throwe Environmental, developed a set of sustainable and scalable stormwater management and financing systems and processes, with a specific focus on expanding local capacity and infrastructure investment, that were detailed in the funding and financing strategy report.

MA Liaison, Kimberly Groff facilitated discussions with representatives of the Alliance, Environmental Protection Agency, MassDEP and UNH Stormwater Center, to quantify pollutant removal from stormwater activities that apply to both completed activities and those required by new development guidelines.

OUTCOMES AND DELIVERABLES

The project expanded the collaborative capacity of Pleasant Bay Alliance communities (Brewer, Chatham, Harwich, & Orleans, MA) for stormwater management efficiencies, including an interjurisdictional approach to capital projects.

- Pleasant Bay Alliance Regional Stormwater Management Bylaw Review Report
- Pleasant Bay Alliance Stormwater and Community Resilience Funding and Financing Strategy



Town of Mendon, MA

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- Mass Audubon
- TNC-MA
- ASRI
- *Horsely Witten Group*

LOCAL PARTNERS

- Town of Mendon

PROJECT TIMEFRAME

- FY1

LOCATION

- Town of Mendon

The Town of Mendon's Town Hall Campus includes a historic town hall, a historic library building that is now a town hall annex and new police station, that will have a much larger footprint than its current building. The areas between the buildings are currently asphalt with minimal landscaping. The area is at the bottom of a hill and tends to flood, creating runoff and making the town hall basement extremely damp. Additionally, the public water supply aquifer for the Mendon Town Hall Campus is located directly under the parking lot, which is currently an impermeable surface.

NETWORK ASSISTANCE

The Town of Mendon requested Network technical assistance to create a stormwater management demonstration project at their Town Hall Campus after updating their Town bylaw to promote environmentally sensitive site design (ESD) that included low impact development and green infrastructure. The purpose of the project was to construct green stormwater infrastructure (GSI) controls using a suite of nature-based solutions to manage, treat, and infiltrate stormwater runoff using practices such as rooftop runoff capturing planters, bioretention, previous pavers, infiltration systems, and de-paving a portion of the existing driveway and parking lot northwest of Town Hall.

The Network utilized its consultant pool funds to contract with Horsley Witten Group to assist with the technical analysis and cost estimate that was needed for the Town to apply for a Massachusetts Municipal Vulnerability Preparedness (MVP) Action Grant. The MVP Action Grant would fund the design and permitting effort.

OUTCOMES AND DELIVERABLES

Mendon was awarded an MVP grant in the amount of $170,000 that enabled the design work to advance. The Town also funded and implemented the construction of the suite of GSI controls. The Mendon Town Hall Campus now serves as a green guide to Mendon and the surrounding communities.





① PERVIOUS PAVERS



② PLANTER BOX WITH UNDERDRAIN



③ BIORETENTION

KEY:

③ INFILTRATING BIORETENTION

③ BIORETENTION WITH UNDERDRAIN

① INFILTRATING PERVIOUS PAVERS (NO UNDERDRAIN)

① PERVIOUS PAVERS WITH UNDERDRAIN

NOTES:

Drawing is conceptual and may adjust with further design.

PRELIMINARY CONCEPT DESIGN

MENDON TOWNHALL CAMPUS
MENDON, MA
JUNE, 2020

NORTH

0 20 40
SCALE: 1" = 40'

Horsley Witten Group
Sustainable Environmental Solutions
90 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-6600 • horsleywitten.com

Town of Bourne

MASSACHUSETTS

SNEP NETWORK PARTNERS

- Throwe Environmental

LOCAL PARTNERS

- Town of Bourne

PROJECT TIMEFRAME

- FY1-FY3

LOCATION

- Town of Bourne

Coastal resiliency and water quality improvement projects are a priority for the Town of Bourne. The major threats are water quality impairment from non-point source runoff, impaired wetlands, coastal flooding, and sea level rise. Nearly 50 bodies of water in Bourne have been identified as impaired by the Environmental Protection Agency.

Water quality issues have also significantly impaired shellfish habitats with state and/or seasonal shellfish closing in every major coastal waterway. Most closures around Buzzards Bay are the result of "non-point" land-based sources, often conveyed by stormwater runoff. Significant work has been done to identify specific water quality and climate resilience issues, establish support from leadership, develop a team-based approach, and in some cases identify solutions. At a high level, what was needed was a comprehensive ecosystem-based approach, timeline for implementation and a financing strategy.

NETWORK ASSISTANCE

The Network worked in direct partnership with leaders from the Town of Bourne to address stormwater impacts within the context of a changing climate. Together with local leaders, the Network developed a Coastal Resilience Action Strategy and financing plan of action to address civic and stormwater infrastructure needs into the future. The Coastal Resilience Financing Assessment, prepared by SNEP Network partner, Throwe Environmental, enabled the Town of Bourne to identify the conditions necessary for effectively financing critical infrastructure needs.

OUTCOMES AND DELIVERABLES

With broad support from community residents, the Town of Bourne approved a $150,000 Climate Resiliency and Infrastructure Stabilization Fund to mitigate and/or adapt to the risks posed by climate change.

- Network Narratives: Coastal Resilience and Climate Finance
- Planning to Action Climate Toolkit (Throwe Environmental)
- Coastal Resilience Financing Assessment (SNEP Network)
- Bourne Final Project Overview Slides
- "Bourne turns to Feds for help with Cleanup of Estuaries," The Enterprise
- Bourne Phase II Final Report: Climate Resilience Investment System & Implementation Plan

Allen's Pond Sanctuary
(Town of Dartmouth)

MASSACHUSETTS

SNEP NETWORK PARTNERS

- Save the Bay
- Mass Audubon
- TNC – MA
- *BSC Group*

LOCAL PARTNERS

- Dartmouth Natural Resources Trust

PROJECT TIMEFRAME

- FY1

LOCATION

- Mass Audubon's Allen's Pond Sanctuary *(Town of Dartmouth)*

The Allens Pond Wildlife Sanctuary, located along the coast of Dartmouth, MA and Westport, MA, is expected to lose 80% of salt marshes by 2070 based on the 1.4 sea level rise scenario. The upland areas of the sanctuary, along with the neighboring Dartmouth Natural Resources Trust, provide undeveloped, preserved land that serves as valuable habitat for potential salt marsh migration.

NETWORK ASSISTANCE

The SNEP Network provided technical assistance to monitor, model, and map salt marsh migration, and supplied engineering guidance for infrastructure removal. The SNEP Network procured consultant services through the pre-approved consultant pool and worked with BSC Group to help determine the best locations to facilitate marsh migration, as well as provided training for staff to better understand the process of marsh migration.

The project team assessed potential salt marsh migration facilitation strategies that can be planned and implemented at Allens Pond Wildlife Sanctuary. Through the assessment, the team found an infrastructure impediment that would need to be removed and identified costs and next steps for removal of the structure. The Network assisted with the permitting application for removal of the structure.

OUTCOMES AND DELIVERABLES

The Network successfully submitted the permit application to Dartmouth Conservation Commission for removal of the structures (boards/linear/rebar) that creates the tidal restriction and has impounded water in brackish impoundment. The Dartmouth Conservation Commission allowed the removal of structures and will implement a phased approach to drainage so that the unconsolidated sediment dewaters and has a chance to stabilize with vegetation this growing season.

The project supported the development of conceptual plans, an assessment of long-term maintenance plans and adaptive management strategies to facilitate salt marsh migration. The project was leveraged to secure additional funding and Mass Audubon later received additional funding from the SNEP Watershed Implementation Grants (SWIG) program to expand the project.

Town of Mansfield

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- Syracuse University Environmental Finance Center

LOCAL PARTNERS

- Town of Mansfield

PROJECT TIMEFRAME

- FY2

LOCATION

- Town of Mansfield

The demands on the Conservation Department have increased with the expanded need to address the changing of federal and state regulations, stormwater management, MS4 permit compliance, and open space and trail management as described the 2016 Open Space and Recreation Plan and 2021 Annual Trail Maintenance Plan. Currently, the Conservation Department consists of one full-time Environmental and Conservation Planner (the Conservation Planner) and a full-time administrative clerk.

Due to the increase in responsibilities, there has been limited time for outreach to help increase public understanding and education on climate change issues. An Organizational Capacity Assessment (OCA) provided guidance to the Town on the most effective way to expand the Department and increase the available resources. The OCA helped to define, prioritize and incorporate these new duties and responsibilities into the existing day-to-day workflow of the Conservation Department.

NETWORK ASSISTANCE

SNEP Network worked with the town to conduct a municipal organizational capacity assessment to address critical environmental needs and assess staffing requirements to fully build out the program overtime to support the planning, stormwater management and resiliency needs. The organizational capacity assessment identified what initiatives had already been implemented and what efforts needed immediate action, while also providing a reflective process for Town staff and officials to think about how resilience and climate change are embedded in the Town's existing plans. By working closely with SNEP Network partners, Syracuse University Environmental Finance Center (SU-EFC) and Kimberly Groff Consulting, the Town of Mansfield completed the assessment and developed an inventory of stormwater and resilience planning initiatives.

OUTCOMES AND DELIVERABLES

By undergoing the organizational capacity assessment process, town staff were able to make small changes that helped mainstream resiliency efforts, including increasing the communication between the Conservation Department and other committees. Mansfield staff provided positive feedback about the project and expressed that the process itself provided valuable opportunities to discuss resiliency in an organized way without introducing a higher burden of information gathering.

The OCA provided the town with a clear understanding of the breadth of existing work, reinforced the need to communicate, and sparked dialogue, excitement and confidence in pursuing resiliency planning within the municipality.

- Making Space for Climate Resilience- A Capacity Assessment for the Town of Mansfield, MA
- OCA Selectboard Presentation PDF September 2022
- SNEP Network Narrative: Mansfield, MA



Mashpee Wampanoag Tribe + Town of Mashpee

MASSACHUSETTS

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- UNH Stormwater Center
- TNC – MA
- SU-EFC
- *Fuss and O'Neill*
- *TRC Group*

LOCAL PARTNERS

- Mashpee Wampanoag Tribe
- Town of Mashpee

PROJECT TIMEFRAME

- FY2-FY5

Santuit Pond forms the headwaters of the Santuit River that flows to Popponesset Bay, providing habitat for River Herring, Alewives, Brook Trout and American Eel. The name "Santuit" originates from the Wampanoag word "Sachem" meaning spiritual leader and the land and water resources have been home to the Mashpee Wampanoag Tribe (MWT) for 12,000 years.

The Mashpee Wampanoag Natural Resources Department has served in a critical role leading efforts to protect and enhance water quality. Santuit Pond is experiencing the impacts of excessive phosphorus pollution caused by decades of watershed source inputs, including septic systems, stormwater runoff and agriculture, which has led to the build-up of bottom sediment. Watershed or external sources of phosphorus account for 21% of the controllable load while sediment cycling (internal load) accounts for 76% of the controllable load. This nutrient pollution is the primary cause of repeated harmful algae blooms and other water quality problems.

NETWORK ASSISTANCE

The SNEP Network provided technical assistance to the MWT Tribe to identify measures to reduce the internal loads of phosphorus and improve water quality in Santuit Pond. Technical assistance has included:

- A feasibility study to evaluate measures to address internal loads of nutrient pollution
- A Phosphorus Watershed Based Plan for Santuit Pond
- Participation in the Network's stormwater planning series
- Development of a Baseline Monitoring and Alum Dosing Study
- Support for public education and the creation of a web-based Santuit Pond Learning Hub



OUTCOMES AND DELIVERABLES

The SNEP Network's technical assistance has enabled the Tribe to be the lead applicant on a 319 NPS Grant to implement Nutrient Inactivation Treatment (e.g., Alum). The grant request in the amount of $700,000 is currently pending MassDEP review.

- Santuit Pond Learning Hub
- Santuit Pond Watershed Based Plan
- SNEP Symposium Santuit Pond Presentation
- Nutrient Inactivation Treatment FAQ
- Santuit Pond Focused Feasibility Study
- Santuit Pond Sediment Inactivation Dosing Report
- Santuit_ST_Report_2020_Final
- Quality Assurance and Quality Control Project Plan for Santuit Pond
- NALMS Symposium "Watershed Planning, Partnerships, and Public Education to Address Excessive Nutrients in a Mashpee Wampanoag Tribe Ancestral Pond



Wampanoag Tribe of Gay Head (Aquinnah)

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- Throwe Environmental
- UNH Stormwater Center
- *Normandeau*

LOCAL PARTNERS

- Town of Wareham

PROJECT TIMEFRAME

- FY2-FY4

LOCATION

The Wampanoag Tribe of Gay Head Aquinnah (WTGHA) has inhabited the coastal island of Noepe (Martha's Vineyard) for over thirteen thousand years. Originally inhabiting circular, bark-covered wigwams called wetus, the Tribe's ancestral lands have always been on the southwestern end of the island. The WTGHA is the steward of 500 acres of Tribal lands on Martha's Vineyard, the vast majority of which is undeveloped. The Tribe and its members rely on tribal lands and waters for cultural and spiritual nurturing, as well as for basic food and medicine sustenance. These Lands are culturally essential to the Tribe, and as such the environmental health of these lands is critical. Increased precipitation, sea level rise, extreme storms, erosion, and rising temperatures are anticipated to be the Tribe's most challenging hazards. These hazards will likely impact every priority area the Tribe has identified, including natural resources, tribal lands, housing, water resources, emergency management, and social concerns and community amenities.

NETWORK ASSISTANCE

The WTGHA needed Climate Resilience Strategy that assisted in prioritizing short-term, mid-term and long-term hazards that establishes a pathway toward funding and financing to address these hazards. To position the Tribe to access funding, the SNEP Network assisted the Wampanoag Tribe of Gay Head Aquinnah (WTGHA) with the finalization of their Tribal Climate Adaptation Plan. Tribal staff held several bi-weekly meetings with SNEP Network Partner, Throwe Environmental, who facilitated discussions on several issues related to climate change and adaptation.

The SNEP Network worked with Tribal staff to analyze relevant climate hazards and identify at-risk assets and populations using SNEP Network's Planning to Action Climate Toolkit (PACT). Together, the group explored potential actions, as well as associated options to fund and implement priority projects. Fast-track stormwater design assistance was provided by UNH Stormwater Center to help address chronic flooding at the reservation housing development. During the project, the Tribe's Natural Resources Department (NRD) requested additional Network assistance to address emerging concerns related to the protection of sustenance species on Tribal Lands.

The Network partners worked with Normandeau to develop Tribal guidance and policy to ensure the continued opportunity for Tribal members to engage in cultural practices relating to harvesting of naturally growing plants for sustenance, medicinal, and spiritual purposes. The policy allows the NRD to review disturbance activities on Reservation and Trust Lands and provides a basis for preventing undue harm to Culturally Significant Species (CSS).

OUTCOMES AND DELIVERABLES

The WTGHA and SNEP Network partner organization Throwe Environmental, LLC, worked together to build off existing efforts to develop a tribal Climate Adaptation Plan. Throwe Environmental worked with Tribal staff to analyze relevant climate hazards and identify at-risk assets and populations. Together, the group explored potential actions and identified associated options to fund and implement priority projects. The Climate Adaptation Plan serves as the culmination of the SNEP technical assistance project, as well as several years of tribal climate adaptation planning.

To expand the climate adaptation conversation, the SNEP Network attended a two-day water quality monitoring workshop that was hosted on Martha's Vineyard by WTGHA in partnership with the U.S Environmental Protection Agency, where twelve Tribes and Nations from across EPA Regions 1 and 2 were in attendance. A special *Tribal Climate Leadership Exchange* was embedded in the workshop and hosted by SNEP Network partner Throwe Environmental. (See Final Report pg. 33 for more information on the Leadership Exchange Outcomes)



2012, Superstorm Sandy devastated Aquinnah's Northern Shore. Lobsterville Road was severely damaged when the dune was compromised and the main culvert draining a nearby wetland was damaged and clogged.

Town of Marion

Stormwater Planning Series

MASSACHUSETTS

A large stormwater detention structure discharges to Sprague's Cove that has not been maintained in many years. The detention structure is overgrown by invasive species, and the berms need structural repair. Restoration of the detention structure would improve storm water quality discharge and flow to Sprague's Cove.

NETWORK ASSISTANCE

While working to meet the requirement of their MS4 permit, the Town of Marion, MA participated in the SNEP Network's Stormwater Planning Series. Marion selected Sprague's Cove as their stormwater site to develop a conceptual design and cost estimate for Stormwater Control Measures (SCMs). During the site visit, an existing large stormwater detention structure that has been unmaintained and in need of repair was identified. By focusing efforts on this site, the Town of Marion aims to improve water quality discharge and flow into Sprague's Cove.

OUTCOMES AND DELIVERABLES

Since the completion of the series, The Town of Marion has been engaging with various coastal agencies to scope and explore potential funding sources for additional water quality sampling to understand the basin's contribution to local water quality issues. This will help inform further design and secure funding for implementation of construction.

- Storymap of the project

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- UNH Stormwater Center
- SRPEDD
- NBNERR
- Save the Bay

LOCAL PARTNERS

- Town of Marion

PROJECT TIMEFRAME

- FY3-FY4

LOCATION

- Town of Marion



Photo: Spragues Cove, MarionCredit: Buzzards Bay National Estuary Program

Town of Shrewsbury

Stormwater Planning Series

MASSACHUSETTS

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- UNH Stormwater Center
- SRPEDD
- NBNERR
- Save the Bay
- BWC

LOCAL PARTNERS

- Town of Shrewsbury

PROJECT TIMEFRAME

- FY3-FY4

LOCATION

- Town of Shrewsbury, Jordan's Pond

Extreme weather events, including intense rainstorms and extreme heat, have become increasingly common in Shrewsbury due to the changing climate. The resulting deluge from rainstorms can overwhelm existing systems, creating issues like increased pollutants in the local water supply, improper drainage, and instability of local ecosystems. Already high temperatures are being amplified by dense development and impervious surfaces, creating health emergencies, increasing energy costs, and contributing to pollution.

Jordan Pond in Shrewsbury, MA is impaired due to phosphorus and turbidity, which is causing algae blooms that pose public health risks and limit recreational opportunities.

NETWORK ASSISTANCE

The SNEP Network worked with the Town of Shrewsbury to develop a stormwater retrofit conceptual design at Jordan Pond through the Town's participation in the Stormwater Planning Series. The series focused on improvements on the Jordan Pond phosphorus reduction plan.

OUTCOMES AND DELIVERABLES

By working with the SNEP Network, Shrewsbury developed their conceptual design of subsurface infrastructure and has continued to look for opportunities to address water quality in Jordan Pond. The Town is working through a Conservation-led initiative to redo the pathway around Jordan Pond itself, including planting a diversity of species and higher plants that would discourage the geese that contributed to the bacteria concerns.

Groundwork Southcoast + City of New Bedford

Stormwater Planning Series

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- UNH Stormwater Center
- SRPEDD
- NBNERR
- Save the Bay
- BWC
- *VHB*

LOCAL PARTNERS

- City of New Bedford
- Groundwork Southcoast

PROJECT TIMEFRAME

- FY3

LOCATION

Brooklawn Park is an 82-acre park situated on a drained tidal swamp. The park is densely vegetated on the western portion while the eastern portion features numerous recreation fields, tennis courts, a playground, and a community center, in addition to large patches of green space with no specific purpose, all connected by paved service roads. The park experiences significant flooding issues at multiple locations throughout the park. There are multiple parking lots within the park as well as ample street parking on the roads surrounding the park.

NETWORK ASSISTANCE

Groundwork Southcoast and its partner, the City of New Bedford, participated in the SNEP Network's stormwater planning series. During the training, the SNEP Network evaluated two locations in need of stormwater retrofits. The first location was at the junction of Belleville Ave. and Washburn Street in the City of New Bedford and was bordered by the I-95 off-ramp. The property suffered from frequent flooding and included a MassDOT stormwater detention basin on the eastern extent of the property. While conceptual designs were prepared, the team was later directed that the project would not advance because MassDOT was already slated to address a retrofit at this property.

The second retrofit opportunity was located at Brooklawn Park in the City of New Bedford. VHB assisted the SNEP Network in a site visit to discuss potential stormwater retrofit opportunities which would aim to help reduce some of the observed flooding while also improving water quality.

OUTCOMES AND DELIVERABLES

VHB's technical memo findings are being integrated into future plans for improvement.



Image: Locations of the four potential sites at Brooklawn park for stormwater retrofit improvements. (Credit: VHB)

Buzzard's Bay Coalition

SNEP NETWORK PARTNERS

- UNH Stormwater Center
- SRPEDD
- Paradigm

LOCAL PARTNERS

- Buzzards Bay Coalition

PROJECT TIMEFRAME

- FY3-FY4

LOCATION

- Buttonwood Brook

Buttonwood Brook is a nutrient and pathogen-impaired, highly modified, urban stream that runs from its headwaters in New Bedford, MA to its mouth at Apponagansett Bay in Dartmouth, MA where water quality consistently ranks in the bottom 10% of all 30 major harbors and coves in the Buzzards Bay watershed. Stormwater entering the brook carries with it a variety of harmful pollutants including bacteria, nutrients, hydrocarbon residues, sediments, and road salt.

Urban development and land-use changes have fundamentally altered the hydrology and recharge-runoff balance within the Buttonwood Brook watershed. Stormwater infrastructure currently in place drains large areas of impervious surface often overriding topography that would normally be used to delineate watersheds and sub-catchment areas. Urban watershed mapping is a specialized skill that requires the integration of multiple datasets to accurately delineate sub-catchments within an urban watershed, identify terminal drainage locations, and calculate discharge volumes for a specified storm event. The data derived from urban watershed mapping is critical to achieve a more complete understanding of the urban watershed and enable tailored stormwater management solutions.

NETWORK ASSISTANCE

The SNEP Network provided consultant services from Paradigm to assist the BBC to develop an "urban watershed" mapping project that integrated GIS datasets with on-the-ground stormwater infrastructure mapping and water quality data to accurately delineate drainage areas for each of the outfalls contributing stormwater runoff to Buttonwood Brook. Pollutant loading modeling helped to identify which outfall drainage areas were contributing larger amounts of pollutants, so that BBC could better prioritize where to focus stormwater management efforts.

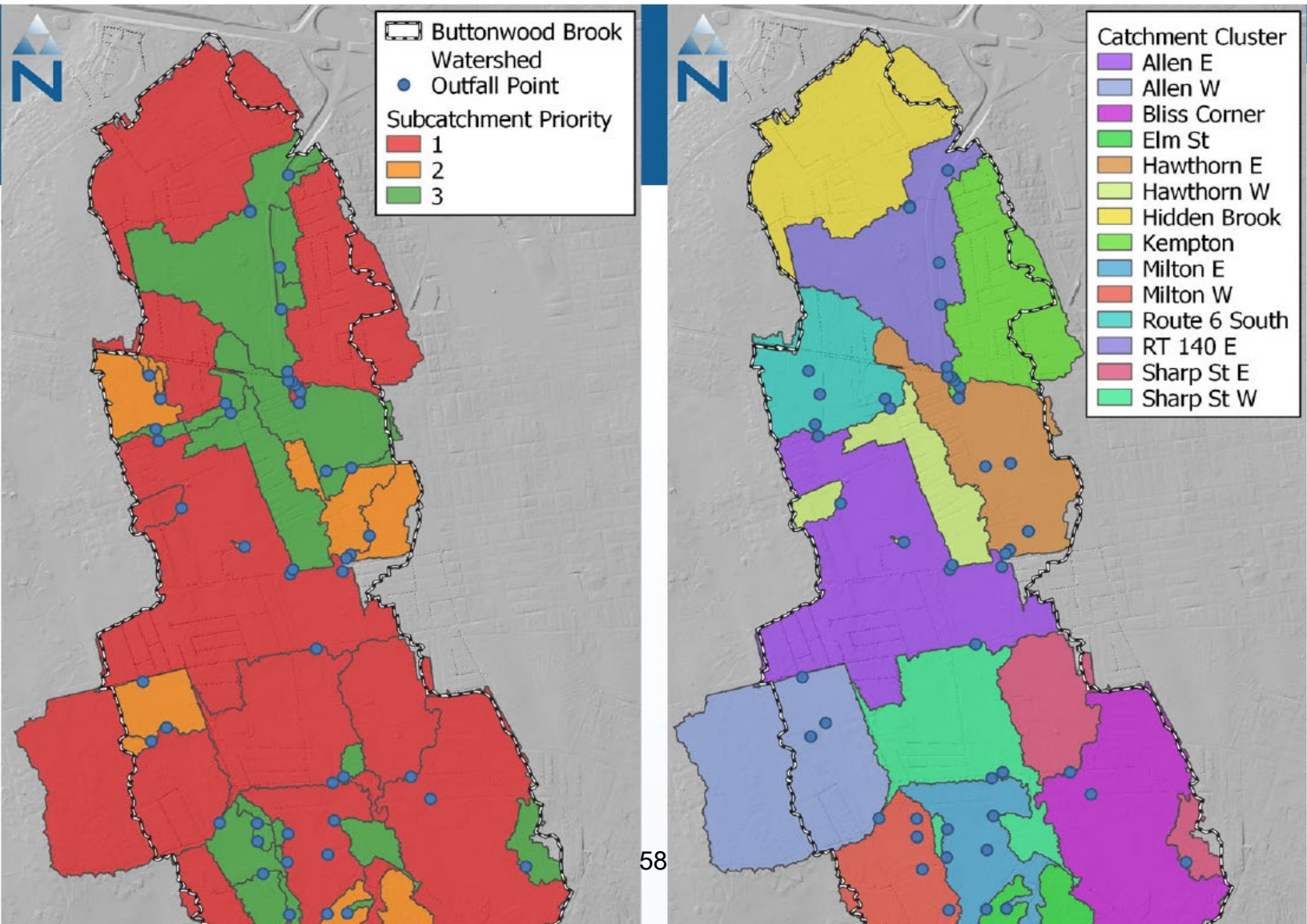
SNEP Network developed a site ranking prioritization framework to select the top priority stormwater management projects that would not only reduce stormwater and pollutants from entering Buttonwood Brook, but also utilize natural infrastructure to provide co-benefits to the surrounding community.

OUTCOMES AND DELIVERABLES

BBC utilized the sub-watershed mapping, modeling and prioritization framework to select 10 priority stormwater mitigation projects throughout the watershed that would provide the greatest benefits to water quality, wildlife and the community, alike. The site selection prioritization matrix and the Paradigm study were turned over to BBC's consultant. BBC and their consultant used the work developed by the Network, along with additional data to further vet and rank sites. The Network assistance enabled BBC to leverage separate funding to advance these 10 priority projects to conceptual design. Based on public and stakeholder input the top 3 sites were selected to advance to final design and permitting. The remaining concept designs will be pursued using other funding opportunities.

- Buttonwood Brook Watershed Loading Analysis
- Buttonwood Brook Stormwater Site Prioritization
- Stormwater Site Prioritization Excel Tool
- BBC case study
- Webinar "Prioritizing Nature-based Stormwater Projects to Maximize Community Co-Benefits in the Buttonwood Brook Watershed

Image: Initial delineation results conducted by paradigm based on clusters provided by BBC.



Town of Swansea

Stormwater Planning Series

MASSACHUSETTS

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- UNH SC
- SRPEDD
- NBNERR
- Save the Bay
- BWC
- *Horsley Witten Group*

LOCAL PARTNERS

- Town of Swansea

PROJECT TIMEFRAME

- FY4-FY5

LOCATION

- Town of Swansea

Mount Hope Bay receives untreated stormwater from a series of outfalls located at Compton's Corner in the Ocean Grove neighborhood in southern Swansea, MA. Polluted runoff and an aging stormwater infrastructure system are contributing to water quality impairments that prevent shell fishing and threaten public safety at the Town Beach. Heavy rainfall is also causing flood impacts to roadways and properties along Anthony Ave.

NETWORK ASSISTANCE

To address the nutrient pollution, The Town of Swansea participated in the SNEP Network Stormwater Planning Series and learned how to use the latest stormwater tools and techniques to develop conceptual designs, cost estimates and expected pollutant removal. With consulting support from SNEP Network consultant Horsley Witten Group, Swansea is now working to advance stormwater retrofit designs at Anthony Ave to 30% design.

OUTCOMES AND DELIVERABLES

CZM Grant funding is being utilized to prioritize Compton's Corner upstream stormwater designs/sites that will improve water quality and reduce flooding. The Harbor Advisory Committee implemented a water quality monitoring program for the Cole's River to better understand the water quality health in the estuary and inform improvement planning. It is anticipated that once the design and permitting phase is completed the designs will be advanced to implementation.



Town of Westport

Stormwater Planning Series

MASSACHUSETTS

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- UNH SC
- SRPEDD
- NBNERR
- Save the Bay
- BWC
- *Horsley Witten Group*

LOCAL PARTNERS

- Town of Westport

PROJECT TIMEFRAME

- FY4-FY5

LOCATION

- Town of Westport

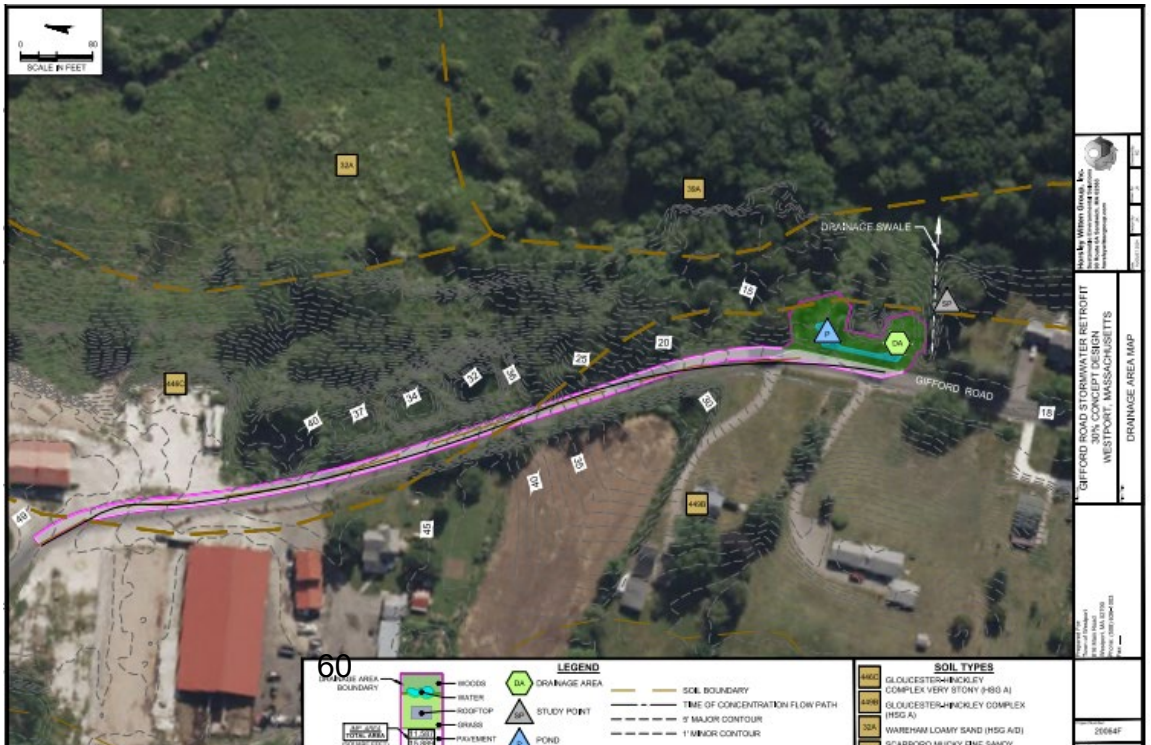
The East Branch of the Westport River is being impaired by polluted runoff in the Town of Westport, MA, negatively impacting the ability of fish to live and reproduce and humans to enjoy the recreational benefits such as swimming and shellfishing. The Westport River has an approved TMDL for Nitrogen that includes a goal to reduce loads attributed to stormwater runoff.

NETWORK ASSISTANCE

The Westport Conservation Land Trust in partnership with the Town of Westport were provided training by SNEP Network through the Stormwater Planning Series. The partners selected the Gifford Road site as the locus for their project because of the blend of land use, agricultural and impervious cover. It was determined during a site visit that stormwater runoff from Gifford could be intercepted and treated to reduce volume and pollutant load by installing a stormwater control measure. The selected stormwater control measure was a bioswale with an at grade inlet (overland flow) and high flow bypass into maintained culvert swale. Numerous other opportunities to improve the site were identified during the site visit. With consulting support from SNEP Network consultant Horsley Witten Group, Westport is now working to advance stormwater retrofit designs at Gifford Road to 30% design.

OUTCOMES AND DELIVERABLES

Upon completion of the design the partners will pursue funding opportunities to advance the project toward implementation. Lessons learned from the project will be transferred to other locations in Westport.



MWT Non-Point Source Assessment and Management Plan

SNEP NETWORK PARTNERS

- Kimberly Groff, MA Liaison
- *Normandeau*

LOCAL PARTNERS

- Mashpee Wampanoag Tribe

PROJECT TIMEFRAME

- FY4-FY5

The Mashpee Wampanoag Tribe is one of two federally recognized Tribes of Wampanoag people in Massachusetts. Within the town of Mashpee, 170 acres of Tribal trust lands are distributed over 11 independent parcels. The Wampanoag have a goal of protecting, preserving, and restoring freshwater resources to ensure quality habitat for wildlife, fish, shellfish, and safe drinking water and uncontaminated resources for Tribal members to engage in subsistence, recreational, and commercial activities. Development of a Tribal and non-point source pollution assessment and management plan will enable the MWT to apply for EPA Clean Water Act Section 319 funding to address the impacts of nonpoint source pollution.

NETWORK ASSISTANCE

The SNEP Network is currently assisting the Mashpee Wampanoag Tribe's Natural Resources Department with the development of a Tribal nonpoint source pollution assessment and management plan. The two primary tasks associated with this project are the development of a nonpoint source assessment report and a companion nonpoint source management program plan. The program plan will rely heavily on partnerships because the purpose of nonpoint source management plans is to address nonpoint source pollution impacting streams or lakes at the watershed level and multiple non-Tribal stakeholders exist within that context.

OUTCOMES AND DELIVERABLES

Upon completion of the Tribe's nonpoint source assessment and management plan, as well as EPA approval for Treatment in a Manner Similar to States, the Mashpee Wampanoag Tribe will be eligible to apply for EPA Clean Water Act Section 319 program funding to continue addressing nonpoint impacts in perpetuity.