

NERRS Science Collaborative Progress Report

Reporting Period: March 1, 2013 – August 30, 2013

Project Title: Green Infrastructure for Sustainable Coastal Communities

Principal Investigator(s): James J. Houle

Project start date: September 1, 2012

Report compiled by: James J. Houle

Contributing team members and their role in the project:

- Project Coordination and Fiscal Agent: James J. Houle; University of New Hampshire Stormwater Center (UNHSC).
- Collaboration Lead: Julie LaBranche, Rockingham Planning Commission with James Gruber, Antioch University as the collaborative expert.
- Applied Science Investigator: Robert Roseen; Geosyntec Consultants
- End-user Representative: Alison Watts; Southeast Watershed Alliance
- Additional project team members:
 - Tom Ballestero and Tim Puls; UNHSC
 - Paul Stacy, Steve Miller and Chris Keeley; Great Bay NERR

A. Progress overview:

The goal of this project is to build municipal capacity in coastal watershed communities for Green Infrastructure by engaging local and regional stakeholders in a planning and implementation process that is supported by technical resources and current relevant information. The project integrates the collaborative process to build trust, legitimacy and relevance for the intended-users. The goal of creating a collaborative process is to build community resilience and improve capacity for managing water resources and related ecosystem services.

Planned activities during this reporting period include: proper administration of the grant, meetings and coordination with the project team, development of implementation elements with select communities, production of project materials and resources and the continuance of the project advisory board (AB).

The GISCC project team via the UNHSC entered into 3 contracts with select communities (Exeter, Portsmouth and Stratham) to implement localized GI projects and methods.

Working with Intended Users:

During this six month period the project team continued a schedule of regular meetings and conference calls. The advisory board that has been guiding and grounding the project implementation has met 5 times and has directly led to changes in the approach the project team is currently using. The meetings have gone very well and are summarized briefly here, but for more detail, please see the complete meeting

summaries posted on basecamp. Likewise on basecamp is the complete advisory board membership.

Attendance at the AB meetings has been and remains strong. As mentioned in our previous report, the AB helped the project team identify a more focused approach to our implementation efforts, working in 3-5 municipalities within the coastal watershed, as opposed to more broadly in 8-12 communities. The goal is to focus efforts and implement more in targeted communities which are motivated and prepared. As our AB meetings continued there arose some division over the communities that should be targeted for implementation. On the one hand it was agreed that many communities are keen to explore innovative water resource management strategies as there are emergent permits and new water quality thresholds currently in development. For these communities GI implementation and improved water resource management are imminent. It was recognized by some that focus on these early adopters was a good way to increase awareness and bring more communities into the project. On the other hand there is representation from smaller un-permitted municipalities can't be left out and should be given the opportunity to take advantage of program benefits. Some feared that there may be a rush to work with communities ready to move forward and those communities not as well staffed might not be considered. The AB challenged the project team to develop and apply a 2-phase approach to selecting implementation communities – phase 1, working with “low hanging fruit” communities with proven success and commitment, then phase 2, providing opportunities to communities who are inspired by the “early adopters that may not be shovel ready, but able to do a small demonstration project”. From this input a clear, simple set of procedures, selection criteria and an implementation timeframe were prepared for the application and selection of implementation communities. This approach was not something included in the original proposal but was a modification that was directed by the AB and seemed to address some of the concerns.

C. Progress on project objectives for this reporting period:

Direction from the AB led directly to the initiation of an application process to select phase 1 implementation communities. The application and application criteria as well as the phase 1 results are all available on the GISCC basecamp site or by request. We received 7 well-rounded applications to our first request and three were selected as implementation projects. Phase 1 implementation communities and phase 1 project descriptions are provided in appendix A. Procedurally the application process was a very different approach and led to a fundamentally different result than originally conceived. When we asked the communities to come to us with ideas, they came to us with full ownership of those ideas. For me personally, having been doing this for a long time, this was very refreshing because communities were already committed to their projects. The business of trying to convince people of the merits of an idea or a particular concept is a lot of work. When a community comes to the table with an idea, they come with the enthusiasm to complete and replicate that idea as well. The

application process is not without limitations as it directly effects deliverables and some of the project team's (particularly the ASO) conception of specific project deliverables.

Applied Science Objectives (ASO):

Task 1: Watershed Analysis: Land Use, Impervious Cover, and Pollutant Loading

These analyses will allow decision makers to visualize and assess a range of development scenarios so as to be able to adapt and plan for areas ranked and prioritized based on load per unit area and cumulative load to have the greatest impact. These deliverables are somewhat altered as we are now working at specific locations within the implementation communities and not necessarily for the communities at large. A subwatershed analysis has been completed for the Brickyard pond watershed area in Exeter. No action has begun for Portsmouth as the project site has already been identified. A general watershed analysis has been performed for the town of Stratham and will be used, if necessary, during deliberations with administrative staff and board members in considering regulation updates.

Subtasks include:

- a. Watershed wide pollutant load analyses: started and preliminary results complete for phase 1 implementation communities if applicable.
- b. Identification of target hot spot locations for retrofit within the region of interest or subwatershed. This analysis is largely based on impervious area and land use classification.
- c. Development of a Stormwater Assessment Report and Fact Sheet to support proposed municipal MS4 permit requirements for tracking IC. This task will be discussed with phase 1 implementation community representatives and its utility assessed prior to production. The ASO team is considering this as part of the overall deliverables but currently efforts are more focused on the targeted implementation activities included in successful community applications.

Task 2: Collaborative Planning and Demonstration Project Implementation

While numerous high-impact high-visibility demonstration locations are planned they are largely directed by successful implementation community applicants. Applicants are encouraged to consider other strategies from the GI Toolbox and final determinations of GI implementation strategies is a collaborative decision between the project team and municipal partner representatives.

Additional subtasks include:

- a. Potential host communities contacted and planning sessions conducted
- b. Identification of GI Strategies to be incorporated
- c. Implementation plan developed and executed
- d. Educational signage

Task 3: Performance Monitoring

Verification of success will include assessment of volume reduction and monitoring for pollutant load reduction (Nitrogen, Phosphorus, or other water quality parameters) and

calculation of decreased IC for all installations or project watershed areas. To date monitoring strategies vary with respect to implementation strategies selected. For the Brickyard Pond project with the town of Exeter a real-time water quality sensor has been purchased and installed at one of the major outfalls. Local staff and volunteers have been trained on the operation and data collection methods associated with the sensor and are incorporating operations with ongoing grab sampling and spot monitoring ongoing in the watershed. While watershed scale improvements may take longer than the timeframe of this project the local “think blue crew” is developing additional skill sets and equipment to use in their ongoing monitoring efforts.

For the Peirce Island Municipal Snow Dump in Portsmouth NH, Monitoring plans are being developed to quantify pre-retrofit water quality this winter. This information will be useful as there are few local empirical studies quantifying pollutant load export rates from municipal snow dump facilities. Pre and post monitoring efforts will develop pollutant load export rates by which GI intervention activities can be accurately quantified.

For the stormwater management ordinance and land use regulation update project in Stratham no monitoring is expected.

Task 4: Web Resource Framework Development

A web resource is currently being developed to communicate information and transfer resources for GI planning and design to installation. The website is being hosted and maintained by the southeast watershed alliance and can be accessed through the following url: http://southeastwatershedalliance.org/wordpress/?page_id=447

The web resource concept is currently still in development with feedback from the project AB. A web designer will be selected to help with the next stages of development.

Task 5: Green Infrastructure Training and Municipal Capacity Building

Technical assistance is currently being provided successful implementation communities in the watershed. Training and capacity building projects vary and are commensurate with projects that are proposed by the applicant municipalities. Additional training will be provided under the collaborative science objectives but will largely focus on highlighting local initiatives and success stories.

Collaborative Science Objectives (CSO):

Task 1: Project Team kickoff. Set schedule and invite Advisory Board (AB) participants, invitations will go to 42 municipalities and 7 Rivers Advisory Committees – (Salmon Falls/Piscataqua, Cocheco, Isinglass, Oyster/Bellamy, Lamprey, Exeter/Squamscott, Winnicut). The AB has been established through e-mail solicitation. The project team and AB are currently developing outreach options. The CSO team is developing an outreach strategy that will focus on peer to peer education and training highlighting successful implementation projects.

Task 2: Initial meeting with Project Team and Advisory Board. Introduce project team and goals. Finalize plan for initial stakeholder workshop, review and initiate assessment

plan. The AB has been commissioned and to date 5 meetings have been held. The CSO team is currently developing an outreach strategy centered on phase 1 projects. It is expected that the CSO team will use river advisory committees in the watershed to target and direct outreach efforts. The AB will provide ongoing implementation feedback and guidance.

Task 3: Focused Sub-watershed Methods Workshops. Hold a workshop in each of the coastal sub-watersheds (four or five) to introduce GI concepts in more detail, get watershed specific feedback on requested tools, type of information. A draft of the meeting agenda has been developed. A collaborative outreach plan is currently in development and its implementation will be guided by the AB.

Additional sub-tasks include:

- Fact sheet development (examples include: development of local case studies from a local community identifying the situation, action taken, outcomes, and lessons learned; barriers to implementation in individual communities; power point slides; general overview information; specific information on technical areas of interest). This sub-task has been initiated and is being conducted by Christos Tsiamis, the TIDES intern to the project.
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Task 4: Project Team and Advisory Board meet and discuss results from workshops, finalize priorities for selecting communities, craft the invitation to participate, design of training or working sessions, and discuss communications methods. No workshops have yet been held although a collaborative outreach plan is currently in development. Initial workshop and outreach scheduling was questioned by the AB, they felt having success stories was critical to any workshop or outreach event and warned that the proposed “meetings do not differ from similar previous and ongoing initiatives in the watershed” and suggested that “perhaps we should hold these events after some implementation is completed as a way to publicize these early adopter successes.” This is the direction that the project team is now taking.

Task 5: Identify and start collaborations with selected implementation communities. This task overlaps with ASO task 2.

Task 6: Individual community applied science implementation. Meet with selected individual demonstration communities to develop scope of work. Project team and community agree on scope of work, budget, implementation timeline, etc. With input from the AB a phased application and implementation approach has been adopted. The phase 1 application process has been completed. Results are all available on the GISCC basecamp site or by request. We received 7 well-rounded applications to our first request and 3 were selected. Phase 1 implementation communities and phase 1 project descriptions are provided in appendix A. The phase 2 application process will begin in September 2013.

Task 7: Ongoing Assistance and Training. Workshops and training/field trips will be offered as identified by Advisory Board and in detailed in the Applied Science Methods. This ongoing contact provides opportunities for both demonstration and stakeholder communities to increase capacity and raise awareness through participation in

watershed-based training events with other communities. Training and ongoing technical assistance is being provided to implementation communities on as needed basis. Project staff has trained Exeter participants on the operation and data gathering methods associated with the real-time water quality sensor purchased for the project. Other training and assistance will be provided as the need arises.

Task 8: Ongoing communication. Electronic and printed newsletter, webpages photo-logs, project management website etc. A website has been developed and is being hosted and maintained by the southeast watershed alliance. The web resource concept is currently still in development with feedback from the project AB. A web designer will be selected to help with the next stages of development.

Task 9: Final Workshop. Format of the workshop will be based on feedback throughout the project, but a suggested model is a full Saturday, with a morning session of information and lectures, including presentations by demonstration communities; lunch for networking and discussion of the most effective ways to further the institutionalizing GI, an afternoon site tour of demonstration projects; and final evaluation/assessment of collaborative component. No progress on this task has occurred to date.

Task 10: Collaboration Assessment

A draft of the collaborative assessment methods has been created and is being refined by the CSO team. Once finalized the assessment methodology will be reviewed and commented on by the AB.

D. Benefit to NERRS and NOAA

Preliminary discussions have taken place with at least two other reserves and NSC projects regarding regularities associated with implementation of green infrastructure. Discussions will continue laying the groundwork for future collaborations or information sharing between the projects and the larger NERRs community that may be interested in similar stormwater implementation projects. The project coordinator has also participated in a transfer situation analysis of all Science Collaborative funded stormwater projects.

E. Additional activities, products, accomplishments, or obstacles

Project implementation timeframes continue to be the largest obstacle. Admittedly this work is inherently slow and takes longer than expected as it is important that all project partners are brought along. There have been dividends however, the implementation projects are progressing well and the communities are enthusiastic and in the driver's seat because they initiated the project and developed the concept. The project team adds technical expertise and knowledge of how to get the project done, but the energy comes from the community. In the end the product doesn't look like anything any one person envisioned because it is truly a collaboration of efforts. I think that is a mark of success.

APPENDIX A

MUNICIPALITY: TOWN OF EXETER

Address: 10 Front Street, Exeter NH

Primary Contact - Name: Kristen Murphy, Environmental Planner

Primary Contact – Phone and Email: (603) 418-6452, kmurphy@exeternh.gov

Proposed Project Description: Residential watershed improvements for Brickyard Pond.

Brickyard Pond, a small pond along Kingston Road in Exeter, has long been a community icon. In the past there were maintained trails that encircled the perimeter, scouts used to hold an annual fishing derby there, and residents living nearby or using the adjacent park would enjoy the aesthetic and recreational opportunities that the pond provided. Over the past several years, the condition of the pond has significantly deteriorated. Now instead of a pleasant destination, each summer the pond is covered with excessive algae growth and has an unpleasant odor. In June 2012 the residents of the Marshall Farms Crossing neighborhood expressed concerns about the ponds condition and were interested in knowing what they could do to determine the cause of the problem and improve the ponds condition. Upon inspection, it was evident that the nearby neighborhood has a variety of opportunities for implementation of Green Infrastructure that would directly contribute to a tangible result for water quality improvement. The neighborhood itself contains a number of storm drains that outfall directly to Brickyard Pond. In addition there are several areas where stormwater runs directly into the pond through a small neighborhood stream. Most homes in the area have long driveways and large lush lawns. Several roof gutters drain to the driveways or other paved surfaces.

The town proposes to initiate a neighborhood-wide stormwater education program followed by implementation of several green infrastructure “toolbox” items. The intent is to share the message of how stormwater runoff across our homes, lawns and streets and into storm drains and pipes and ultimately their receiving water body all connects and contributes to local water quality. Through this process we will explain the benefits of a few simple changes we all can make to improve water quality. Using staff and members from volunteer boards and the local Think Blue “crew” with guidance from the GISCC team, the Town will establish an “evaluation team” to visit willing homeowner’s properties in this neighborhood and provide guidance on what stormwater management opportunities may be appropriate for their individual circumstances. This would be followed by implementation of a variety of green infrastructure practices with preference to those homes with a more direct connection to Brickyard Pond.

- **LAWN CARE** - We would establish a Think Blue Exeter environmentally friendly lawn care sign such as Green Lawns-Blue Waters where owners who have committed to

adopt water quality friendly lawn care practices can display small signs in their yards as a testament to this commitment.

- RAIN BARRELS - We would offer residents the opportunity to purchase rain barrels at reduced rates and demonstrate their installation at one or two residence.
- DOWNSPOUT REDIRECTION - We would demonstrate simple changes such as how to re-direct downspouts to vegetated areas and away from driveways or other impervious surfaces.
- RAINGARDEN INSTALLATION - Lastly we would install two demonstration rain gardens at key locations with willing homeowners. Design will be lead by the GISCC team and the Think Blue Exeter team. Prior to installation we will provide an overview of the design process. This would be followed by installation with guidance from this team, neighbors and other interested volunteers designed as a way for others to gain hands-on experience installing similar infiltration measures on their properties.
- WATER QUALITY MONITORING - This series of educational and implementation events would be dovetailed with a water quality monitoring program that monitors the water quality (turbidity, nitrogen, phosphorus, and chloride, chlorophyll-a) of Brickyard Pond itself before implementation during the Spring of 2013 and after implementation in the Fall of 2013 and spring of 2014 as a way to document the effectiveness of the program.

Community Outreach and Engagement

Through this project we envision four opportunities for community outreach and engagement.

- NEIGHBORHOOD - Initially the neighborhood would be engaged through the education presentation and hands on demonstration workshops for rain barrel installation, downspout redirection, and rain garden installation.
- TRAIN THE TRAINER - This program would provide a good opportunity to serve as a “train the trainer” type educational opportunity. Guidance will be provided by an experienced contractor to provide the Think Blue Exeter crew with hands on experience with site evaluation and implementation of green infrastructure practices.
- TOWN-WIDE - This crew would then have hands-on experience with a variety of methods for management of stormwater and could then serve as a local resource for identification of stormwater management opportunities for other homeowner in town.

Next Steps: The GISCC project team will engage with the City of Exeter and work collaboratively to develop an implementation plan supported by the technical resources of the project partners to help build capacity at the municipal level and support sustainable and timely management strategies in the Brickyard pond watershed.

MUNICIPALITY: CITY OF PORTSMOUTH

Address: 1 Junkins Avenue Portsmouth, NH 03801

Primary Contact - Name: Peter Britz, Environmental Planner

Primary Contact – Phone and Email: 610-7215 plbritz@cityofportsmouth.com

Proposed Project Description: BMP Installation at Peirce Island Municipal Snow Dump

The proposed project will implement a Low Impact Development/Green Infrastructure project to mitigate water quality impacts from a municipal snow dump site on Peirce Island, a known high load contribution site or pollution “hot spots”. The Peirce Island snow dump is filled with silt, debris and salt accumulated from years of stockpiling snow during the winter months. While efforts are made to try and filter the water using silt fence and hay bales there is large quantity of material that remains. Installation of a more effective best management practice at the site would do a better job of improving water quality before it outlets to the Piscataqua River. Initial discussions over what could be done on the site include the installation of some type of settling unit which would drain to a rain garden or bioretention area. It appears there is adequate space for that type of configuration however only conceptual discussions have taken place so we anticipate working with the GISCC team to prepare a more detailed final design. This project would provide an excellent opportunity for water quality improvements and an ideal area for a highly visible LID demonstration project. The project is proposed to begin this summer work could begin in the fall of 2013.

Community Outreach and Engagement

The City of Portsmouth is interested in developing outreach materials or signage to describe the project and explain how it fits into citywide improvements that are being put in place to protect water quality. The City will continue to participate with the GISCC and will develop and post information to its website regarding this project.

MUNICIPALITY: TOWN OF STRATHAM

Address: 10 Bunker Hill Avenue, Stratham NH 03885

Primary Contact Name: Lincoln Daley, Town Planner

Primary Contact - Phone: (603) 772-7691 ext. 147 Email:

Ldaley@strathamnh.gov

Proposed Project Description: Incorporate Updates to Stormwater Management in Zoning Ordinance and Land Use Regulations

The Town of Stratham seeks technical assistance to strengthen the Town's local regulations to incorporate up-to-date stormwater management controls and address their new MS4 permit requirements. The goal of the project will be to develop site plan regulations, subdivision regulations, or a zoning ordinance that provides the Town with the regulatory tools needed to mitigate the impacts of stormwater runoff from impervious surfaces in Stratham's residential, commercial, and industrial zones and the incorporation of standards, techniques, and designs of Low Impact Development and Green Infrastructure (both structural and non-structural). The regulations shall address both new development and redevelopment of properties that require site plan and/or subdivision approval from the Planning Board.

Community Outreach and Engagement

Stratham is fully committed and available to share the Town's experiences with other watershed communities through assistance with the development of case-studies, interviews, participation in future outreach activities and willingness to continue work with the GISCC project team. The Town recently updated its website which will be featured as a primary tool to provide outreach about the proposed project.