



# Brentwood Goes Green

## Background

In November of 2013, the Green Infrastructure for Sustainable Coastal Communities (GISCC) provided funding to the Town of Brentwood to assist with projects that apply green infrastructure (GI) and low impact development (LID) methods on municipally-owned lands, and would include various components, including an outreach and education campaign.

To identify these projects, the GISCC project team agreed to complete the following tasks:

1. Evaluate municipal sites including the town shed, town office, library and school.
2. Develop a stormwater management plan for each site that incorporates LID projects.
3. Make presentations to town boards of these stormwater management plans to educate and improve understanding and benefits of LID (the Selectboard, Highway Department, Planning Board and Conservation Commission).
  - Representatives from these town boards would then meet and pick two to three projects to implement.
5. Implement improvement projects on town-owned lands by September 2014.
6. Conduct follow-up meetings with town boards after completion.

This hands-on approach, including implementation of direct improvements and education in the understanding of LID, has led to increased awareness of LID strategies and how to incorporate them into development and redevelopment activities in the town.

The management plans will provide an invaluable resource and roadmap for the town for future implementation of LID strategies at municipal sites, which will lead to continued improvement in the water quality in the Exeter River.

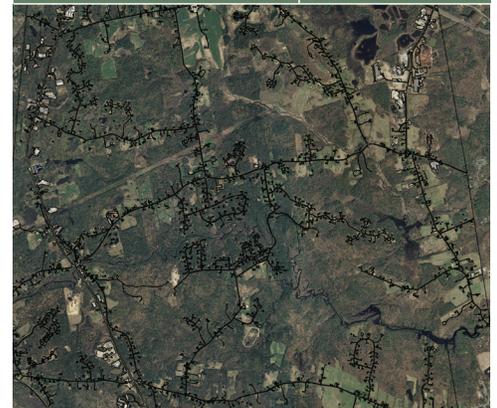
## Project Results and Future Considerations

The project included optimization modeling of updated, watershed-wide impervious area data used to target pollution hotspots based on land use, zoning, soils, proximity to a water body, and other common GIS data layers.

Stormwater-derived loadings were modeled and classified to identify municipally-owned hotspot locations for installation of cost-effective stormwater solutions that maximize pollutant load reductions.

Attribute tables generated by the modeling effort were then used to sort and filter results based on specific town official interests. Municipally owned lands were ranked by final modeling point total and then in descending order according to total parcel acreage. Final points indicate the pollutant potential of any parcel area with higher numbers indicating

LAND COVER	ACRES
Impervious	10,256
Pervious	607
Total	10,863
<b>% IMPERVIOUS COVER</b>	<b>5.6%</b>



*Impervious and pervious land cover statistics for the town of Brentwood.*

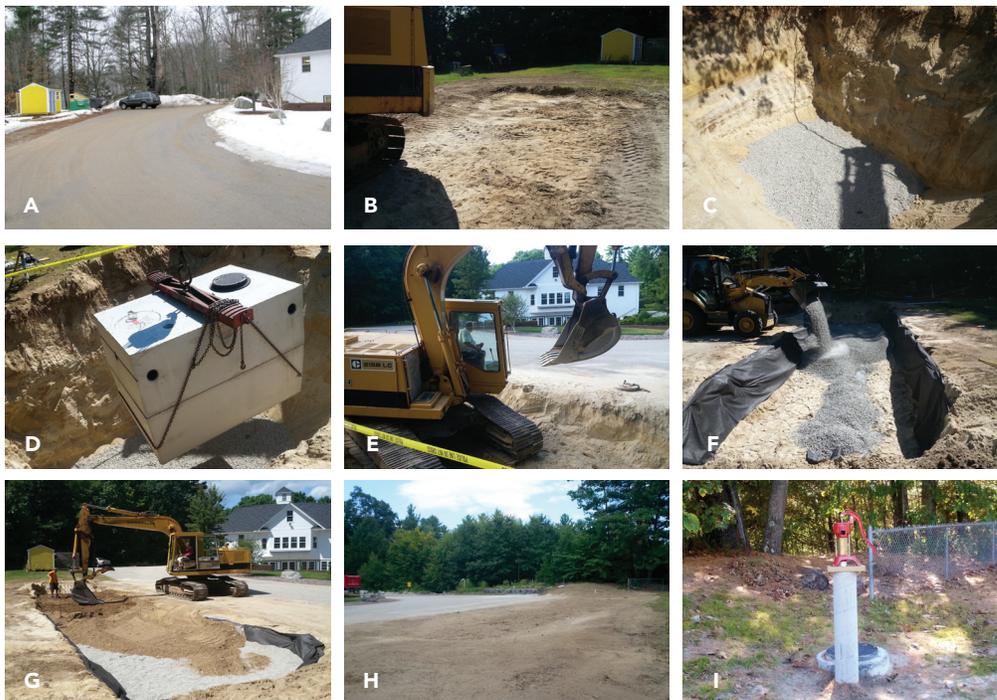
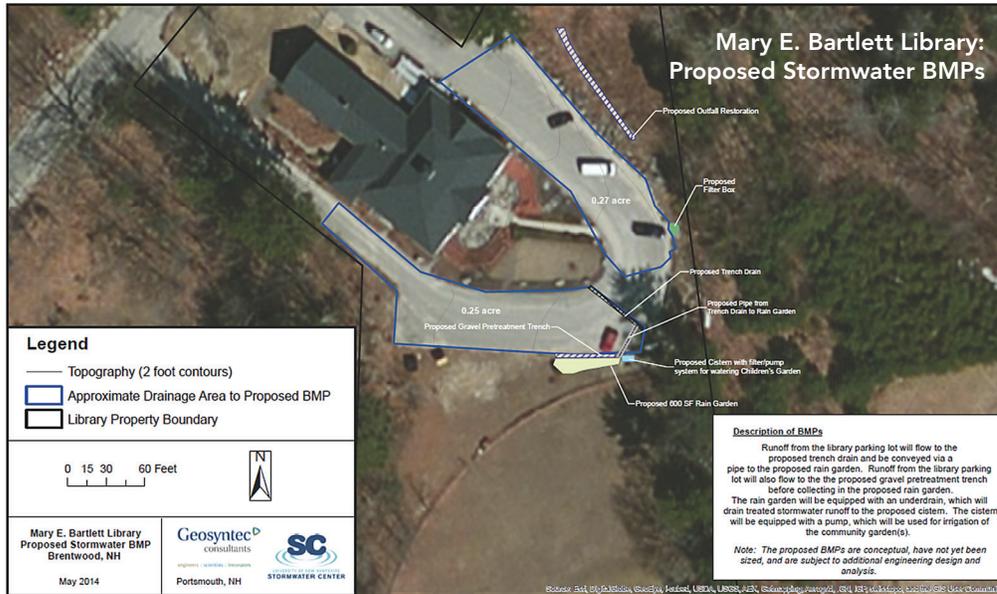
larger pollution threats. Secondary sorting by parcel size indicates opportunities where more can be done, as larger parcels with higher potential for pollution indicate larger benefits from retrofit activities. This is a quick screening method to further investigate potential implementation sites.

RANK	LANDUSE DE	HSG	FINAL POINT	PARCEL ADDRESS	LOCATION	FINAL ACRES	NOTES
1	Government	A	1200	22 Dalton Rd	Brentwood Library	0.71	Managed through GISCC
2	Educational	B	1100	355 Middle Rd	Swasey School	3.02	Partially Managed Proposed
3	Government	B	1100	1 Dalton Rd	Town Hall	0.81	No Management Proposed
4	Government	C	1000	207 Middle Rd	Brentwood Highway Shed	0.76	No Management Proposed
<b>TOTAL</b>						<b>5.30</b>	

## Project Conditions

The selected property was the town-owned Mary E. Bartlett Library. The property consists of a 3.4-acre parcel with 0.71 acres of impervious cover.

As a result of this project, 90% of the Mary E. Bartlett Library impervious cover has been disconnected via treatment through green infrastructure practices. Two GI stormwater control measures have been installed that treat 0.64 acres of drainage area and annually reduce 413 lbs of TSS, 1.6 lbs of phosphorus and 9.1 lbs of nitrogen on an annual basis.



A. Western perimeter drive and parking area; B: re-graded site; C: excavated hole for cistern; D: installed cistern; E: excavated bioretention area; F: placed stone; G: backfilled with BSM; H: finished grade; I: installed cistern pump.

2014 BMPS	ANNUAL LOAD 'L <sub>i</sub> ' #/YEAR	EFFLUENT LOAD 'L <sub>e</sub> ' #/YEAR	ANNUAL PL REMOVED #/YEAR
TSS #/year	456	42	413
TP #/year	1.95	0.35	1.61
TN #/year	17.6	8.5	9.1

Summary of annual pollutant load reductions estimated for the retrofits at the Library.

## The Impervious Cover Model and Future Permit Compliance

Numerous watershed studies throughout the country have correlated the percentage of IC to the overall health of a watershed and its ability to meet designated uses. According to studies, it is reasonable to rely on the surrogate measure of percent IC to represent the combination of pollutants that can contribute to aquatic life impacts. Without a total maximum daily load assessment for a watershed, a general target related to the ICM is 10% Effective Impervious Cover (EIC). That is, if IC in a watershed can be disconnected through treatment through an appropriately sized BMP, it can be removed from the EIC.

This approach can serve as a surrogate for water quality criteria in the absence of any other governing regulatory limits.

The analyses performed in this project constitute major elements of any required WQRP and include the following elements:

1. Preliminary source assessment with respect to potential stormwater sources
2. Implementation of programs leading to the disconnection of DCIA
3. Structural BMP retrofits

While additional analyses and comprehensive assessment of illicit discharge detection and elimination (IDDE) programs and revision of good housekeeping and pollution practices (such as catch basin cleaning frequency and leaf litter collection programs) may be required, the analyses and action items embodied in this report represent a major contribution to any future WQRP or SWMP permit submission.



This project is funded by the **NERRs Science Collaborative** to a project team led by the **University of New Hampshire Stormwater Center** and the **Great Bay National Estuarine Research Reserve**.

It supports Green Infrastructure implementation with local municipal, non-profit and private sector partners.

For more information please visit [southeastwatershedalliance.org/green-infrastructure](http://southeastwatershedalliance.org/green-infrastructure)