MILONE & MACBROOM

LEWIS CREEK ASSOCIATION

Lake Champlain Basin Program

AHEAD OF THE STORM
Stormwater Resilience Demonstration Site
lewiscreek.org

Ahead of the Storm

Education and Outreach

AOTS Program Background

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Funded by the Lake Champlain Basin Program - L-2019-032 EO AOTS Project

Overview

- Learn about:
  - What is Ahead of the Storm?
  - Water Quality Sampling
  - Scorecard map
  - Optimal Conservation Practices

- Complete:
  - Visit LCA website to view resources

Ahead of the Storm

- Water Quality stewardship program
- Improving flood resiliency and water quality
- Prevent and reduce speed, volume, and pollution associated with stormwater runoff
- Incorporate effects of climate change – look to future

- Watershed wide:
  - LaPlatte River
  - Thorp Brook
  - Kimball Brook
- Multi-Town:
  - Hinesburg
  - Charlotte
  - Shelburne

2014 members of the Charlotte Congregational Church and LCA joined to discuss serious decline of Lake Champlain's health and water quality

Committed to helping communities change the way stormwater is managed

Reduce water pollution

Be more prepared for extreme weather events

Ahead of the Storm Partners

- Lewis Creek Association
- Milone & MacBroom
- Charlotte Congregational Church
- Town of Shelburne
- Town of Hinesburg
- Town of Charlotte
- South Chittenden River Watch
- LaPlatte Watershed Partnership
- Place Creative Company
- AOTS Demonstration Site Property Owners
- Kelsey Trust, Vermont Community Foundation
- Vermont Agency of Natural Resources
- Winooski Natural Resources Conservation District
- Lake Champlain Basin Program
- VTrans Better Roads Program
- UVM Lake Champlain Sea Grant
- The Nature Conservancy, Vermont Chapter
- CVSD School District

Many Many Partners

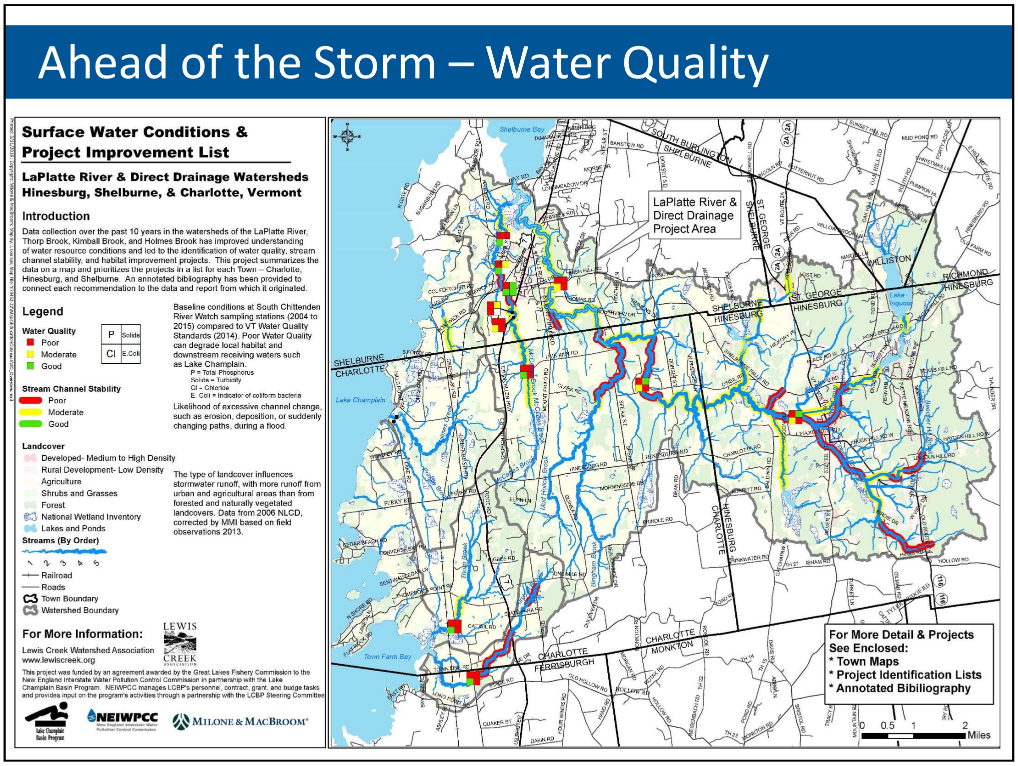
Without participating landowners there is no project

Does anyone know what is tested during water quality monitoring?

Volunteers complete it

Why would we want to have this data? – to understand the problems and guide how to fix them

Phosphorus, Chloride, E.Coli, Solids, Nitrogen



Describe water quality sampling locations.

With students this would be good to have as a handout blown up big so they can find areas themselves

Where is your school

What do the 4 squares mean? – volunteers do the water quality monitoring and this is a summary of the results

Where is there the highest Phosphorus = in LaPlatte River and direct lake watersheds

Optimal Conservation Practice

SLOW IT DOWN

Increase Roughness of Land Surfaces

Decrease Slopes

Dissipate Energy

SPREAD IT OUT

Disperse Flow Paths

Interrupt Flow Paths

Direct to Infiltration

SOAK IT IN

Increase Infiltration

Minimize Disturbance

Minimize Impervious

Surfaces & Soil Compaction

GUIDING PRINCIPLES IN DESIGNING OCPS FOR WATER QUALITY PROTECTION & FLOOD RESILIENCY

- ✓ Slow the rate of water flow
- ✓ Increase the amount of infiltration
- ✓ Reduce soil movement and erosion
- ✓ Enhance the capacity of naturally vegetated land to trap sediment
- ✓ Maintain water quality even during storm events
- ✓ Consider stream stability and water quality of the greater river system
- ✓ Reverse cumulative impacts from multiple problem areas
- ✓ Use practices known to reduce phosphorus-rich runoff
- ✓ Use practices that are cost-effective and feasible for landowners
- ✓ Go beyond the minimum design requirements to achieve OCPs

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Stormwater Resilience Demonstration Site

This list is included in the AOTS intro packet – a great resource – along with examples, references, glossary

Bring up Intro Packet to show what the document is.

Ahead of the Storm

- 15 locations designed
- Optimal Conservation Practices
- www.lewiscreek.org

Go to webpage and look at an example location with documentation

Have SCS or other packet on hand in case web link doesn't work.

AOTS OUTREACH MATERIALS

Ahead of the Storm

Shelburne Community School Rain Garden

345 Harbor Road, Shelburne

Introduction

Ahead of the Storm (AOTS) grew out of a group of citizens from Charlotte, Hinesburg, and Shelburne who were concerned about the serious decline of Lake Champlain's health and water quality. Stormwater runoff from driveways, fields, parking areas, and lawns is a major factor in the deterioration of our water quality. Most impervious surfaces were created before regulations requiring water quality treatments were in place or fall below regulatory thresholds. Therefore, runoff is not managed to remove pollutants or slow flows and soils and phosphorus are mobilized and end up in Lake Champlain. AOTS helps communities change the way stormwater is managed on properties to reduce water pollution and be more prepared for extreme weather events and impacts of climate change. Fifteen municipal, educational, and private properties have been selected to become demonstration sites to showcase more optimal conservation practices in a variety of landscape settings. Monitoring and stewardship over time is crucial to successfully addressing water quality issues.

Why here?

Stormwater runoff from Shelburne Community School flows into McCabe's Brook, which drains to Shelburne Bay. Water quality sampling results note very high phosphorus, turbidity, and E. coli in this watershed. Currently runoff from the roof, parking lots, driveways, playgrounds, and fields is collected in a series of swales, catch basins, and pipes that drains to the west and into McCabe's Brook. Three Optimal Conservation Practices (OCPs) are recommended to treat runoff from a portion of the existing impervious cover to improve water quality protection and flood resiliency by slowing runoff, reducing erosion, and enhancing vegetation. The treatment will take place in the front entrance island of the school which is highly visible to students and visitors. Students are directly involved in this project, and the rain garden will continue to be used as an educational tool for years to come.

Students gather to inspect catchbasin in front entrance island of school

Front entrance island (future rain garden site), which drains parts of the parking lot and roof

Catchbasin which drains directly to McCabe's Brook, untreated

Take a tour of the AOTS locations at lewiscreek.org!

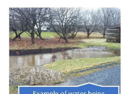
Design: how can we filter the water?

In order to treat the water running off the roof, sidewalks, and parking lot, a bio-retention area, or rain garden, was designed by engineers at Milone & MacBroom. The rain garden will be depressed so water around it will drain to it. Once in the rain garden, the water and nutrients will be either soaked up by the plants in the garden, or percolate through well-drained soil, gravel, and sand where it will be naturally filtered. Then, the clean water will enter pipes to drain into McCabe's Brook. During a large rain or snow melt event, the rain garden will be able to hold a lot of water and act as a pond, allowing pollutants to settle out before running off to the Brook.

Implementation

Implementation is set to occur in Spring 2019. An excavator will remove approximately 2 feet of soil in the front entrance island, and replace it with well-draining soils, gravel, and perforated pipes at the bottom. Native water-loving plants will be planted in the new garden by the SCS fifth-grade class. The garden will be planted and managed by students and teachers at Shelburne Community School.

Students learn about water movement through an interactive activity



Example of water being contained in a bio-retentioned area after rain event

Water-loving plants such as lilies and witch hazel will be planted

How much did it cost?

Funding for this project occurred in phases:

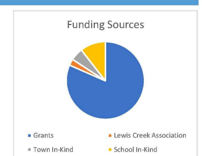
Concept Design $7,500

Final Design $5,000

Implementation $24,500

Outreach $1,000

Total $38,000



Summaries of each site area available at the Charlotte Library and on the LCA website

Giver overview of the project, the need, the design, and costs