



Ahead of the Storm

Charlotte Congregational Church

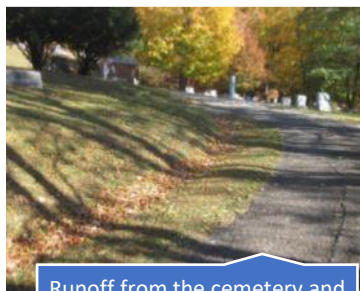
Church Hill Road, Charlotte

Introduction

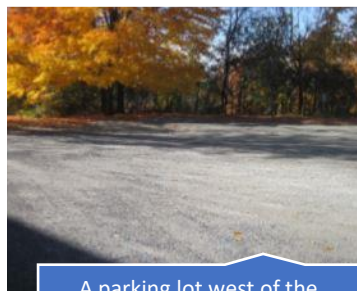
Ahead of the Storm (AOTS) grew out of a group of citizens from Charlotte, Hinesburg, and Shelburne who were concerned about the serious decline of Lake Champlain's health and water quality. Stormwater runoff from driveways, fields, parking areas, and lawns is a major factor in the deterioration of our 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?

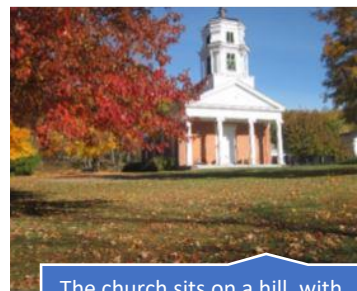
Surface water runoff from the Charlotte Congregational Church property contributes to either McCabe's Brook to the northeast or Thorp Brook to the southwest. Both McCabe's and Thorp Brooks have shown high levels of nutrients and sediment over the years, consistently exceeding the state standard for phosphorus. Runoff generated from buildings, driveways, and parking areas on the eastern portion of property concentrate in a series of swales that drain to a wetland area before crossing under Church Hill Road. On the western portion of the property, runoff generally sheet flows overland before collecting in a roadside swale along Church Hill Road. Runoff flowing over gravel surfaces generates sediment laden water and causes surface erosion and rill formation. This location presents an opportunity to address water quality in the headwaters of both streams, as well as engage the church community that helped to initially develop the AOTS program.



Runoff from the cemetery and hillside flows through the church property



A parking lot west of the church has erosion of the gravel surface during rain



The church sits on a hill, with runoff flowing south towards Church Hill Road



Design: how can we filter the water?

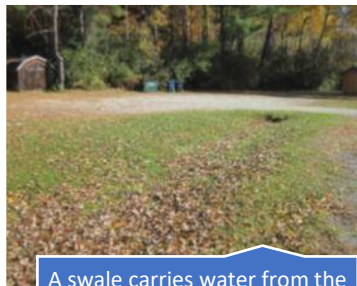
In order to address stormwater runoff issues from the entire church property, engineers at Milone & MacBroom developed designs for four locations to slow water and allow it to infiltrate into underlying soils rather than directly entering streams untreated. The designs propose a series of bio-retention areas downstream of existing impervious surfaces to slow runoff and retain water on-site. Swale enhancement and grading modifications are proposed to direct as much runoff from impervious surfaces to the bio-retention areas as possible maximizing the volume of water that would be able to be stored in treated in a large rain event. The areas selected for bio-retention are highly visible, unused portions of the property near parking areas and driveways to allow proposed improvements to function as educational tools.

Implementation

Implementation will likely occur in two phases: In Phase I, the east parking lot and west parking lot will receive final designs and implementation. When funding allows, Phase II will occur, which includes the historic pond and parsonage property to the east. This project is seeking funding from a grantor, with a partial match from the church.



A bio-retention area will be installed in the lawn adjacent to the gravel parking lot



A swale carries water from the parking lot and cemetery to the east into the wetland



A bio-retention area has been identified between the driveway and parking area

How much did it cost?

Funding for this project occurred in phases:

Concept Design \$8,400

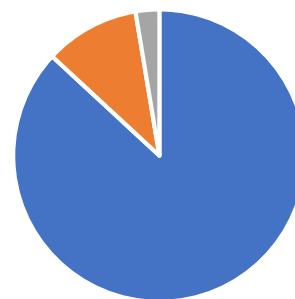
Planning and Design Phase II \$23,000

Implementation \$61,800 (has not occurred yet)

Total \$93,200



Funding Sources



■ Grants ■ Church ■ Lewis Creek Association