

Monitoring Farm Runoff to Evaluate Conservation Practices



Services / Expertise

Agricultural Conservation Practice and Design
Edge-of-Field Monitoring
Evaluation of BMPs
Phosphorus TMDL

Markets

State Government
Watershed Protection Organizations

Project Locations

Charlotte, Vermont
Ferrisburgh, Vermont
Franklin, Vermont
Pawlet, Vermont
Shelburne, Vermont
Shoreham, Vermont
Williston, Vermont

Date Completed

2018

Project Owner

2015-2017: The Lake Champlain Basin Program
2012-2015: Vermont Agency of Agriculture

Project ID#

11-2540 / 14-130



Edge-of-field monitoring stations help to evaluate agricultural runoff and its impacts to water quality.

AGRICULTURE has been identified as a major contributor of phosphorus (P) to Lake Champlain. Although federal and state programs, as well as landowners, have made unprecedented investments implementing agricultural best management practices (BMPs), these efforts have not yielded desired water quality results. There is an urgent need to evaluate and document the effectiveness of BMPs in the Lake Champlain Basin so that the most effective practices may be emphasized and reasonable assurance may be provided that plans to achieve phosphorus TMDL targets will be successful.

In 2012, the Vermont Agency of Agriculture, Food, and Markets (VAAFAM), in cooperation with USDA-NRCS, initiated an edge-of-field monitoring study to evaluate several innovative BMPs currently promoted by VAAFAM and USDA. Stone Environmental was selected to conduct the study. Study administration was transferred from AAFM to the Lake Champlain Basin Program in 2015 and new stations in Charlotte were added to the network.

A paired watershed study design is being used to test the effects of five different BMPs on event discharge and pollutant concentration and export in surface runoff from study fields. Seven farms in the Lake Champlain Basin, from Franklin south to Pawlet, are participating. Practices being evaluated include soil aeration on hayland prior to manure applications, cover cropping on silage corn, reduced tillage and manure injection on cornland, a water and sediment control basin treating cornfield runoff, and a grassed waterway.

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This study is yielding multiple benefits, including:

- Accurate estimates of pollutant reductions achievable by several conservation practices in Vermont
- Data that inform incentive program structure to ensure that the most effective practices are emphasized; and
- Identification of potential modifications to conservation practices that may improve performance.

Discharge, rainfall, and air temperature are being measured continuously. Event composite samples are collected using a flow-paced autosampler. Telemetry and telecommand capabilities of the monitoring systems enable efficient management of sampling teams, instruments, and data. A wealth of high quality edge-of-field monitoring data is being collected to allow us to draw conclusions concerning the effectiveness of several conservation practices gaining wider acceptance on Vermont farms.