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## Introduction

Transportation networks have been recognized as contributors to water quality impairment by discharging stormwater, sediment, and nutrients to receiving waters. Prior research in Vermont has documented the role of unpaved roads on water quality impairment (Wemple, 2013; Wemple, 2016).

This project aims to expand this work by focusing on gully erosion on Vermont's roads and quantifying effectiveness of erosion control measures to mitigate gullying at concentrated road discharge points.



Figure 1. Gully feature at discharge point in Colchester, Vermont.

## Study Site Selection

Our site selection is guided by inventories conducted under the Municipal Roads General Permit (MRGP) and in consultation with VTRANS staff who regularly assess outfalls on the state and interstate system. We aim to select a set of gully sites to study that span road class, feature size and projected remediation costs.

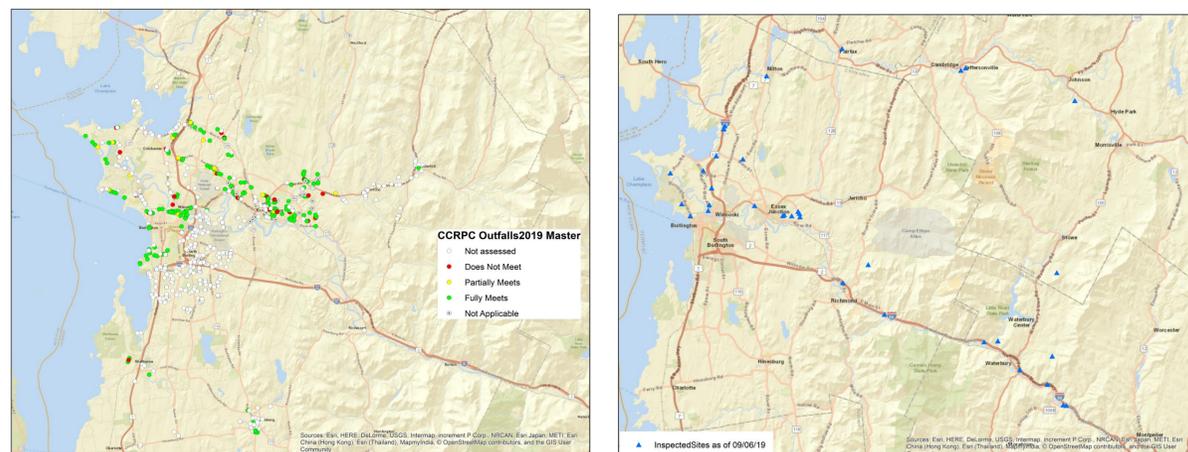


Figure 2. Left panel: Map of road outfalls and MRGP inventoried sites in Chittenden County (data courtesy Chris Dubin, CCRPC). Right panel: Inspected sites with gullies identified as candidates for study.

## Objective 1: Quantify rates of sediment and phosphorus (P) production associated with erosion at concentrated road drainage points on unpaved and paved roads

- Task 1.1: Survey Existing Data (to inform site selection, to leverage data for model in Task 1.4 and blueprint development in Task 3.1)
- Task 1.2: Measure rates of sediment and P production at select gully erosion sites
- Task 1.3: Assess feasibility of using high resolution topographic data and imagery to quantify temporal dimensions of road erosion
- Task 1.4: Develop a statistical model to predict gully erosion based on field data

## Objective 2: Assess the effectiveness of intervention measures in reducing sediment and P mobility from roads.

- Task 2.1: Install selected erosion control measures and monitor
- Task 2.2: Assess effectiveness of selected erosion control sites previously installed

## Objective 3: Develop a framework for providing credits for erosion mitigation measures that can be implemented under the Lake Champlain Phosphorus TMDL.

- Task 3.1: Develop report of research results and their application (a.k.a. "framework")
- Task 3.2: Provide information transfer to project partners and interested parties

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Chris Dubin, CCRPC

Rob Moore, LVPC

## References

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