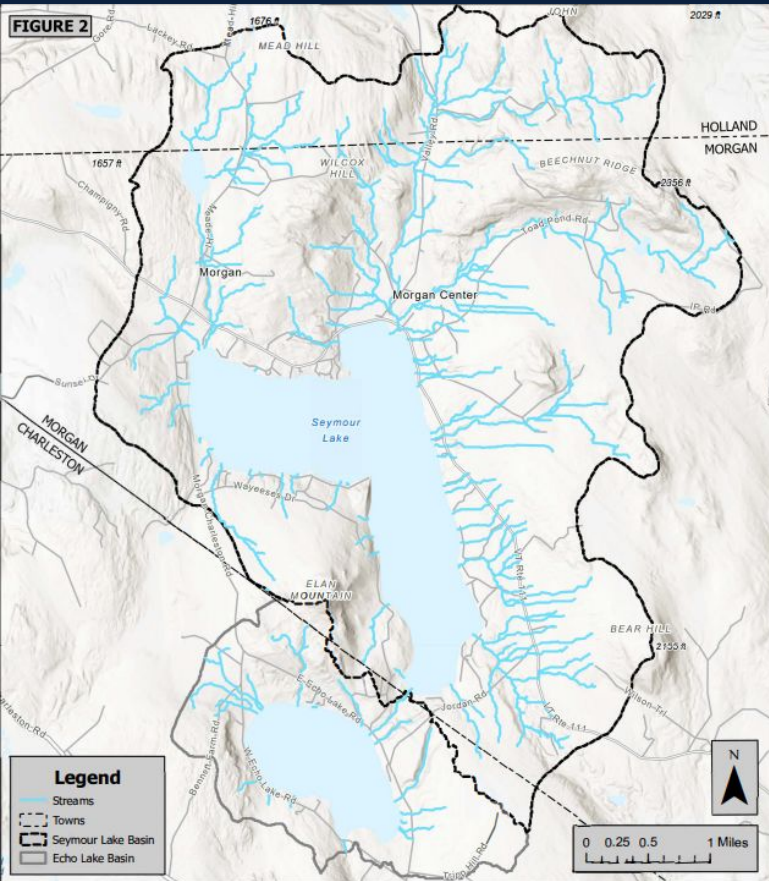


Echo & Seymour Lake Watersheds

Will Marlier

Lake Watershed Program Specialist



Notes: Map depicting the Echo and Seymour Lakes watershed in Morgan and Charleston, VT.
Drawn By: Patrick Hurley, MWA
Date: June 25, 2023

**Echo-Seymour
Lakes
Watershed**



What is a Watershed?

“Watershed” or “Drainage Basin”

“A watershed is an area of land that channels rainfall, snowmelt, and runoff into a common body of water. The term “watershed” is often used interchangeably with “drainage basin,” which may make the concept easier to visualize. The easiest way to envision a watershed is to think of a bowl.”

Lake Watershed Action Plan (LWAP)



“The purpose of this report is to summarize the results of desktop and field assessments, project prioritization efforts, and project development activities while providing an actionable plan for implementing meaningful water quality projects at both site-specific and watershed scales.”

- Echo/Seymour LWAP (2024)

Our Watersheds at a Glance

Total Drainage Area

Direct to Seymour **13,224 acres**

Direct to Echo **2,257 acres**

Total Acreage **15,481 acres**
or **24.2 miles^{^2}**

Land Type by Percentage

Forests **70%**

Grass & Shrubs **16%**

Open Water **13%**

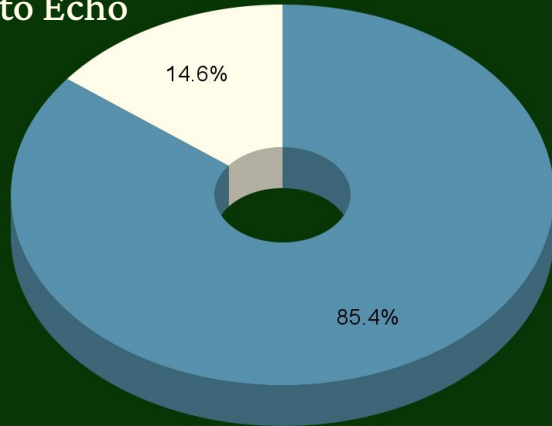
Impervious Surfaces* **1.4%**

*buildings, roads, parking lots & driveways

Our Watersheds at a Glance

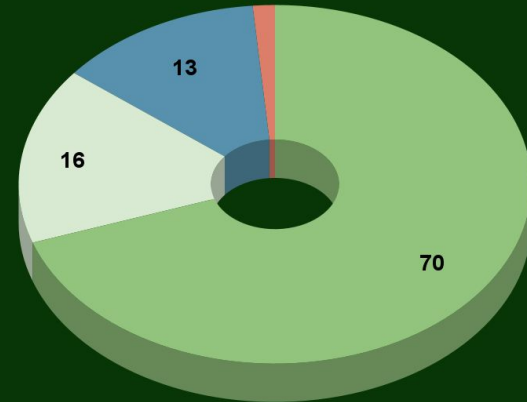
Total Drainage Area

Direct to Echo



Direct to Seymour

Land Type by Percentage



● Forest ● Grass/Shrubs ● Open Water ● Impervious

LWAP Priority Projects

Sucker-Valley Brook Confluence Floodplain Restoration

MWA is in the process of submitting an application for full design funding. State employee approval obtained.

Road Erosion BMPs on W Echo Lake Rd

Designed in Oct. 2024. Currently ~10% implemented. Selectboard discussed next steps on Aug 14th.

Road Erosion BMPs on Toad Pond Rd

Designed in Sept. 2024. High % of culverts replaced, Town is awaiting FEMA funding & engineering for 3 more.

Echo Lake Access Area Stormwater Improvements

Final design and implementation grant secured. Designs are in process. Implementation is planned for the spring.

Private Drives on W Echo Lake Rd

Several projects have been identified for grant application bundling, landowners have been contacted.

A total of **94 individual projects**, including these ones, have been identified and are available for public viewing.

Check to see if your property is listed!

Streams & Storms

“The majority of stream miles in the Echo-Seymour Lakes watershed are intermittent or ephemeral flowing and run through high-gradient, forested catchments. While forest canopies help to intercept and infiltrate precipitation and reduce runoff compared to impervious surfaces, many of these catchments are underlain by heavy soils that have poor infiltration capacities and high runoff coefficients. As such, small streams that drain to each lake tend to be very ‘flashy’ during rain events – particularly during summer thunderstorms...”

Echo & Seymour Streams (cont'd)

From pages
34-36 of the
LWAP Report

Effects of Climate Change

“Climate change-driven shifts in precipitation patterns, expanding road networks, and increasing rates of land conversion/development strongly influence how small streams behave. These trends present major concerns for stream stability, flood risk, fluvial erosion, and water quality in the watershed.”

Impacts of Flooding

“MWA re-evaluated many small streams after the 2024 floods and frequently observed major channel adjustment. These changes include widening, downgrading/incision, sedimentation, headcutting, and lateral migration – all of which significantly affect habitat and water quality as sediment is mobilized, floodplains become disconnected, and barriers to aquatic organism passage form.”

What can we do?

“Of all the “things” that can be done to protect water quality and habitat in the watershed, letting nature take its course is one of the most important broad recommendations that can be provided to the community.”

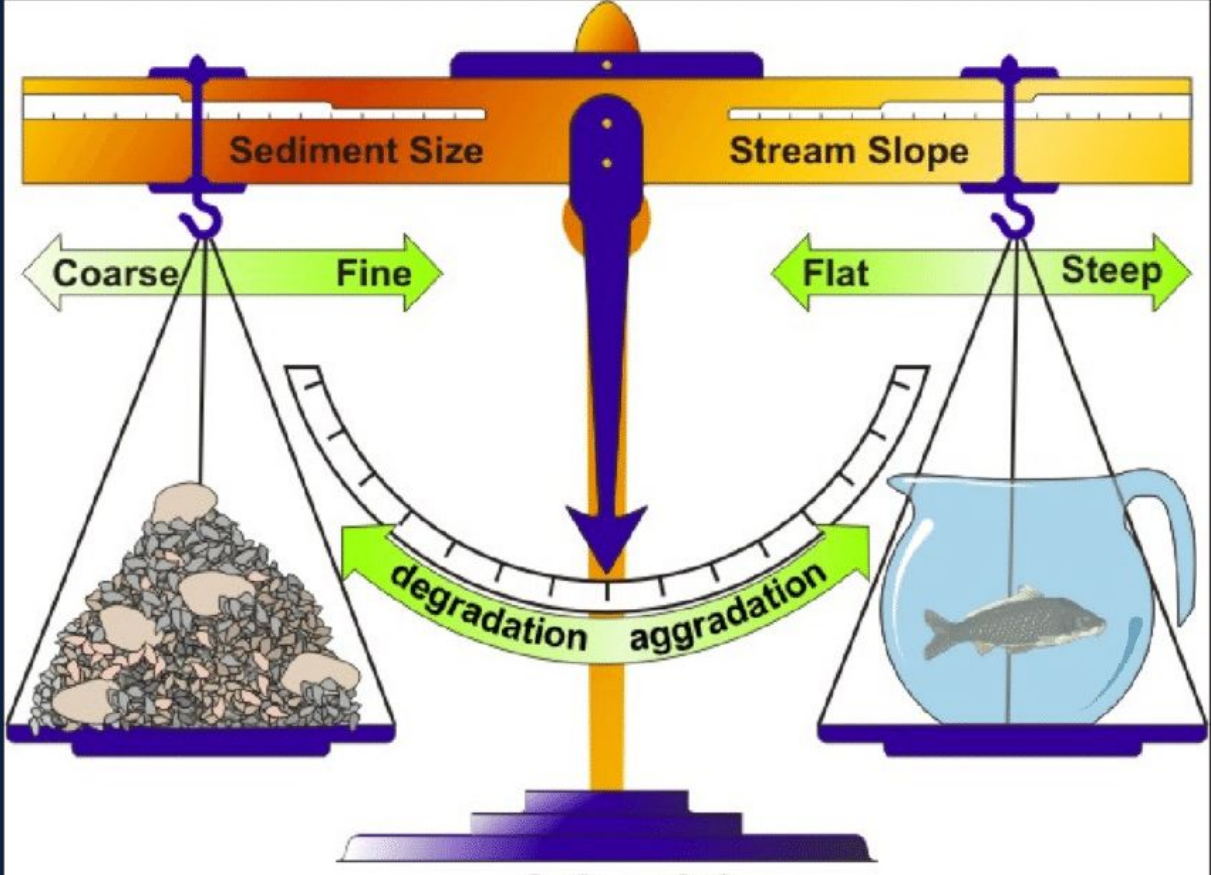
Slow the Flow



Only moving water
causes erosion.

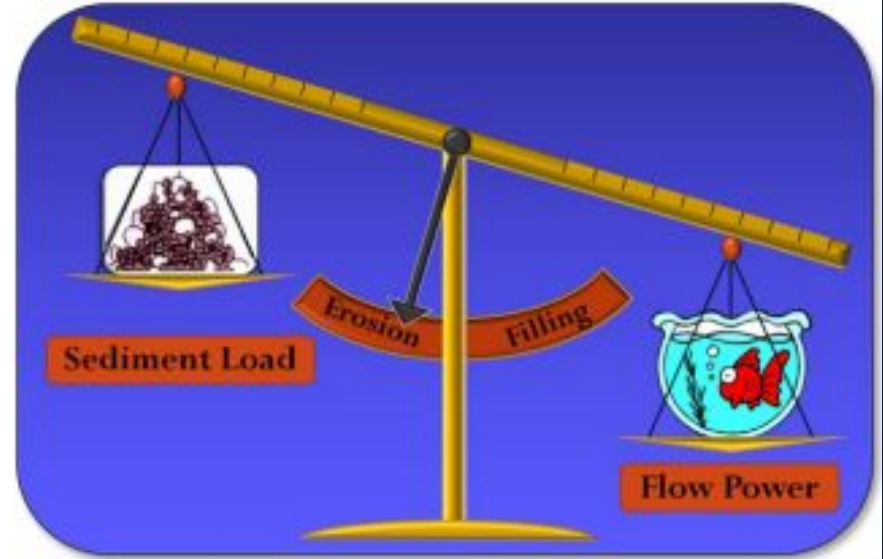
Lane's Balance Model

Resistance



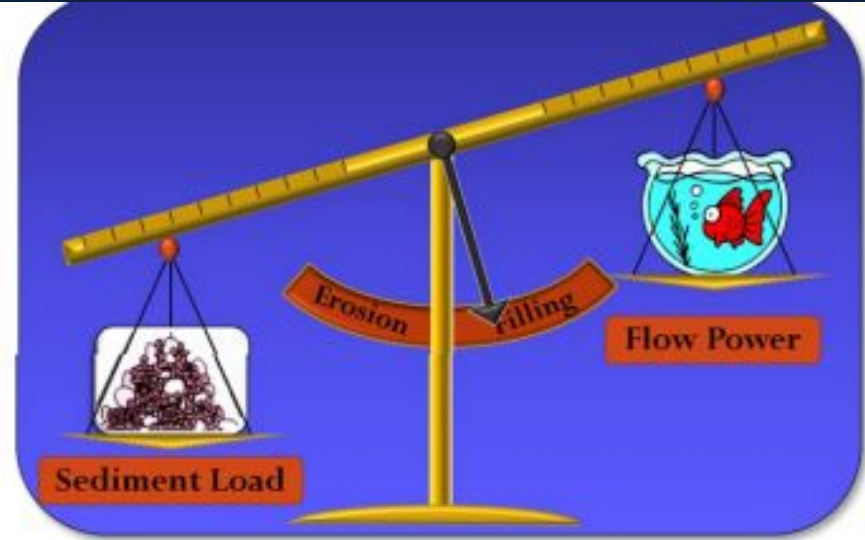
Force

Erosion (Degradation)

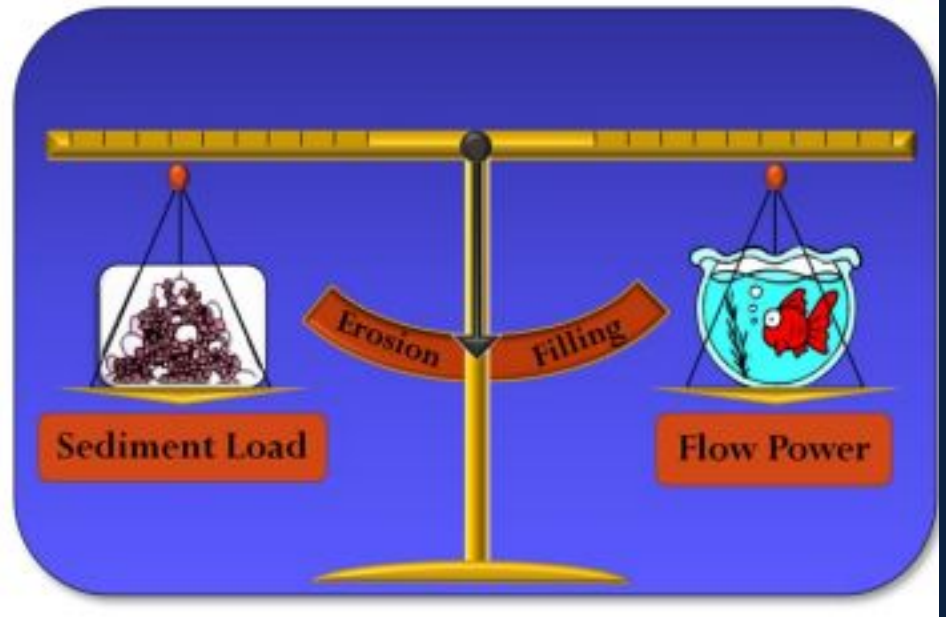


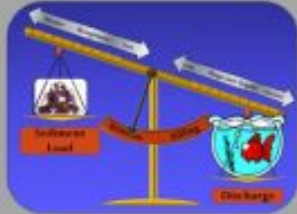

*graphic from DEC's [Vermont Rivers and Roads Field Manual](#)

Filling (Aggradation)



Equilibrium



Activity	Resulting Change to Equilibrium Factors	Channel Response
<p>Over Dredging → Increased Depth</p> <p>Over Dredging → Decreased Resistance & Sediment Volume</p> <p>Channel Narrowing → Increased Depth</p> <p>Channel Berming → Increased Depth</p> <p>Channel Straightening → Increased Slope</p> <p>Increased Runoff Rate → Increased Depth & Slope</p>		<p style="text-align: center;">Erosion</p> 
<p>Undersized Culvert → Decreased Slope Upstream</p> <p>Channel Widening → Decreased Depth</p> <p>Upstream Landslides → Increased Sediment Volume</p>		<p style="text-align: center;">Filling</p> 

Best Management Practices (BMP's)



Vegetated Buffer

Lakeshore buffers act as a protective barrier for the lake from upland stormwater runoff, erosion, and impacts from storms, wave action, and ice push. A buffer area extending at least 15 feet from the top of the bank is recommended to stabilize a shoreland.



Rain Gardens

Rain gardens are designed to capture and filter stormwater from developed areas. They collect water in bowl-shaped vegetated areas and allow it to slowly soak into the ground while native plants and soils filter out pollutants such as sediments and nutrients.



Infiltration Steps

Infiltration steps can be built in place of a path or traditional steps to stabilize areas with significant foot traffic. This will prevent erosion of the slope, and allow stormwater to infiltrate through the gravel.



Open-top Culverts

Open-top culverts prevent the volume and velocity of stormwater flow from increasing and eroding the surface of unpaved roads, driveways, or pathways by regularly directing runoff to stable areas for absorption and preventing sediment from entering the lake.

Lake Wise



This program, offered by the VT Department of Environmental Conservation (DEC), provides landowners with free technical assessments of their property.

Learn to protect your property from flooding, improve water quality, and build better habitat for wildlife.

**Everyone can
do their part.**

Summary - What Can We Do?

Learn More

● Read your LWAP.

Learn where the identified projects are, and what challenges face your watershed.

● Lake Wise Assessments.

Sign up to have your property reviewed. Change starts at home!

Implement

● Install BMP's.

Make sure culverts are properly sized and clear of debris. Mow less, plant more. Prevent erosion at home.

● Maintain Infrastructure.

Don't wait until a driveway or drain system fails before you repair it.

Communicate

● Have conversations with neighbors.

Share personal stories and provide timely feedback. Advocate for best management practices.

● Hold representatives accountable.

Let elected officials know these issues are important to you.

Contact Me

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Questions?