Characterizing Mechanisms of Mass Wasting at the Cotton Brook Landslide in Waterbury, Vermont Using Remote Sensing and Field Based Methods II

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INTRODUCTION

Why landslides?

- Damaging to infrastructure
- Threatening to community safety
- Instrumental in shaping the modern-day landscape

Our Motivation:

• Evaluate geomorphological change local to Vermont as mountainous regions become more vulnerable to slope failure.

- Determine geomorphological process driving landscape change at the Cotton Brook landslide and the surrounding watershed.
- Integrate high-quality remotely sensed elevation data with field observations to test hypothesis that there are heterogenous styles and scales of earthflow influencing mass wasting in our study region



South-facing view of the Cotton Brook landslide (July, 2023)

MATERIALS & METHODS

FIELD APPROACH

 Identify regions exhibiting geomorphological indicators of activity using hillshade DSM

- Terraces
- Irregular drainage structures
- Abrupt changes in slope
- Concave slopes

• Ground-truth indentification routine using StraboSpot and GPS instrumentation

• Develop detailed digital field database to integrate with remotely sensed data

- Evidence of elevated water table levels
- Bedrock exposure
- Incipient slumps





GEOSPATIAL DATA ANALYSIS

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Coordinate Syste lign mesh and point cloud datasets. It is important to note that raster dataset preparation has greater opportunity to introduce uncertainty through the alignment routine.

> FIGURE 3) Topographic differencing results using CloudCompare and ArcGIS Pro. subtraction methods to compare 2014 and 2021 LiDAR datasets. The rasterized product exhibits the highest degree of change estimation, while both Cloud* Compare products are more conservative. The visual discontinuities in the M3C2 model occur because it is a point-to-point comparison of discrete data values. The other representations are interpolated to create a continuous surface. The models are created such that positive values represent accumulation surfaces while nagative values represent



GEOMORPHOLOGICAL CHANGE RESULTS





