

Monitoring of Landslides in Vermont Using Drone and Geologic Surveys

PROJECT TITLE

Monitoring of Landslides Using Drone and Geologic Surveys

STUDY TIMELINE

May 2019 – May 2022

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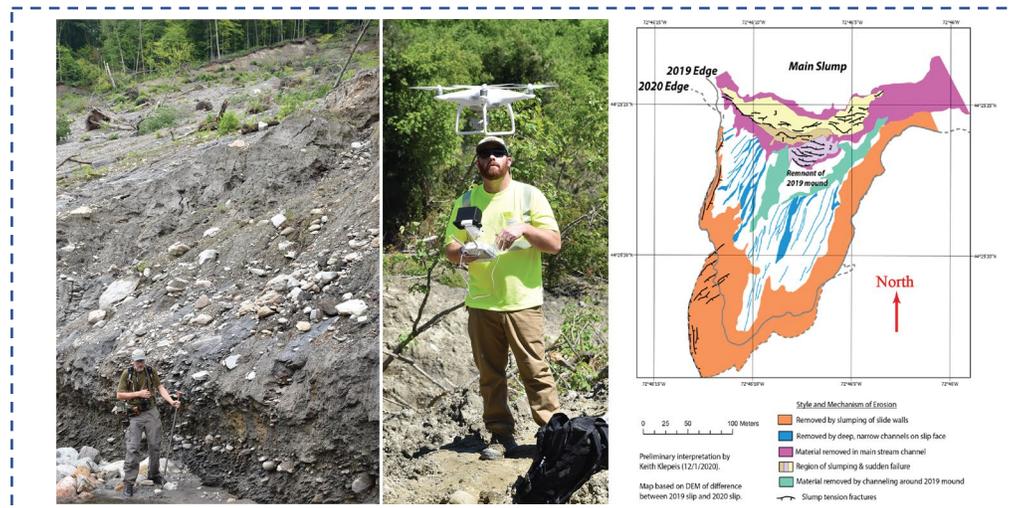
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KEYWORDS

Landslides, geology, drones, monitoring, photogrammetry

Introduction or Problem Statement

Landslides are a risk to human health and safety and property assets. Since 2019, geologists from the Vermont Geological Survey, Norwich University, and the University of Vermont have collaborated with the VTrans U.A.S Team on the monitoring of active landslide sites in north-central Vermont. The monitoring first involves ground-based surveys to map the underlying geologic framework beneath each slide, which are followed by optical drone surveys and photogrammetric analysis to assess the detailed aerial extent of each. Individual annual monitoring surveys for each landslide are compared from year to year to quantitatively assess changes. This study is useful for understanding the processes that cause and modify landslides and may lead to more predictive capability.



Methodology or Action Taken

Intensive field surveys (left photo) are integrated with drone surveys (middle photograph) and photogrammetry software to develop geologic maps (right photo) that show quantitative changes to the landslide and different mechanisms of failure and erosion between successive years, in this case from 2019 to 2020.

Conclusions or Next Steps

Monitoring of active landslides using geologic and drone surveys and analysis with photogrammetric software has detected subtle differences over a year at the Cotton Brook landslide (Waterbury) and Smugglers Notch rockslide(s) (Cambridge). Our landslide team would like to apply this methodology to assess other active landslide sites in Westmore (Lake Willoughby) and Buels Gore.

Potential Impacts and VTrans Benefits

Our prototype methodology is currently being used at the Cotton Brook and Smugglers Notch sites and we want to expand our work to include other active sites. We will refine this methodology, so it can be replicated at other places that are of direct interest to VTrans.

More information about the VTrans Research Program, including additional Fact Sheets, can be found at:
<http://vtrans.vermont.gov/planning/research>