

# **Examining Slope Instability Dynamics Along a Small Bank Slope Using Tree Ring Growth Anomalies in central New York State, USA**

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The Burtonsville landslide, located in central New York State, USA, is approximately a one-kilometer rotational block slide primarily comprised of glacial till. Although the initiation timing of the rotational slide is unknown, the fresh scarps and evidence of block rotation suggest that movement is active and likely initiated by incision from the adjacent Schoharie Creek. This research focused on reconstructing recent slope instability activity using 111 cored trees located on the bank slope, specifically looking at the frequency and magnitude of instability events based on growth anomalies observed in the tree ring records. The results indicated by reaction wood presence provide evidence of synchronous slope instability observed in the tree records, however the magnitude of observed instability events is quite variable as determined by the eccentric growth. Based on the results, it was hypothesized that macropore development during dry periods has influenced the rate at which water reached the subsurface failure planes, resulting in the variability in slope instability observed. This research proposes a different method to examine slope instability by taking into account eccentric growth and reaction wood presence, rather than focusing on identifying single failure events, which can be used for future research on examining slope instability to help implement best management practices.

## **Biography**

Matthew has completed his undergraduate degree in Geography and GIS from the University of Guelph followed by his Master's research in Geography, specializing in geomorphology also from the University of Guelph. Following his undergraduate and graduate degrees he has worked as a GIS Analyst at Niagara College with the precision agriculture department followed by his role as an Environmental Flows GIS Assistant with the Credit Valley Conservation Authority. Matthew has recently begun working with Credit Valley Conservation as a Geomorphology Technician, where he has focused on projects involving natural channel design and erosion mitigation.