COLLEGE OF FORESTRY

TRACKING LANDSLIDE RATES IN FORESTED ENVIRONMENTS

A McIntire-Stennis supported project

Oregon State University

PROJECT

Landslides can have major environmental, societal, and economic impacts – and they often occur in conjunction with extreme events, like heavy precipitation, wildfires and earthquakes.

In mountainous, forested terrain across the West, like in Oregon, shallow landslides often remain a persistent hazard that can impact things like aquatic ecosystems and the structure of a forest. But despite the prevalence of this hazard, much remains unknown about the interplay between a landslide disturbance and the forest structure and events like heavy rainfall and wildfires.

Oregon State University Professor of Forest Engineering Ben Leshchinsky is leading a team to uncover more information about landslides in forested environments – which will help provide new insights into how the dynamics of a forest and its vegetation affects the size and rate of landslides. This group is developing models to predict the susceptibility of future slides in mountainous, forested regions – and to understand how the structure of a forest in these areas impacts the size and rate of landslides. Their model will evaluate the importance of forest vegetation on landslide size and rate.

The team is also creating an inventory of historic landslide activity, which will include data about how a range of conditions and triggering events have affected each slide. The researchers will use this data to better understand how factors like slope vegetation influence the likelihood of a slide and the amount of sediment transported in a landslide. Understanding more about slope stability and susceptibility will also provide valuable insights into how extreme events like wildfire and heavy rainfall might initiate slope failure – especially through their impact on the root strength of the vegetation that holds a slope together.

COLLABORATION

Oregon State University researchers are collaborating with a number of agencies on this project including the Oregon Department of Forestry, the United States Forest Service, the United States Geological Survey, Oregon Department of Geology and Mineral Industries, and Oregon Department of Transportation.

IMPACT

This research will provide valuable insights into how vegetation influences landslide hazard and sediment transport in forested environments, and how events like storms and wildfires may influence these rates.

- **The team is analyzing data from 7,000 landslides in Oregon to examine how the landslide was affected by rainfall conditions, topographic factors, and vegetation conditions.**
- **The new model will provide insights into when vegetation helps control the size of a landslide – and when it does not.**

About McIntire-Stennis

The McIntire-Stennis program, a unique federal-state partnership, cultivates and delivers forestry and natural resource innovations for a better future. By advancing research and education that increases the understanding of emerging challenges and fosters the development of relevant solutions, the McIntire-Stennis program has ensured healthy resilient forests and communities and an exceptional natural resources workforce since 1962.

USDA