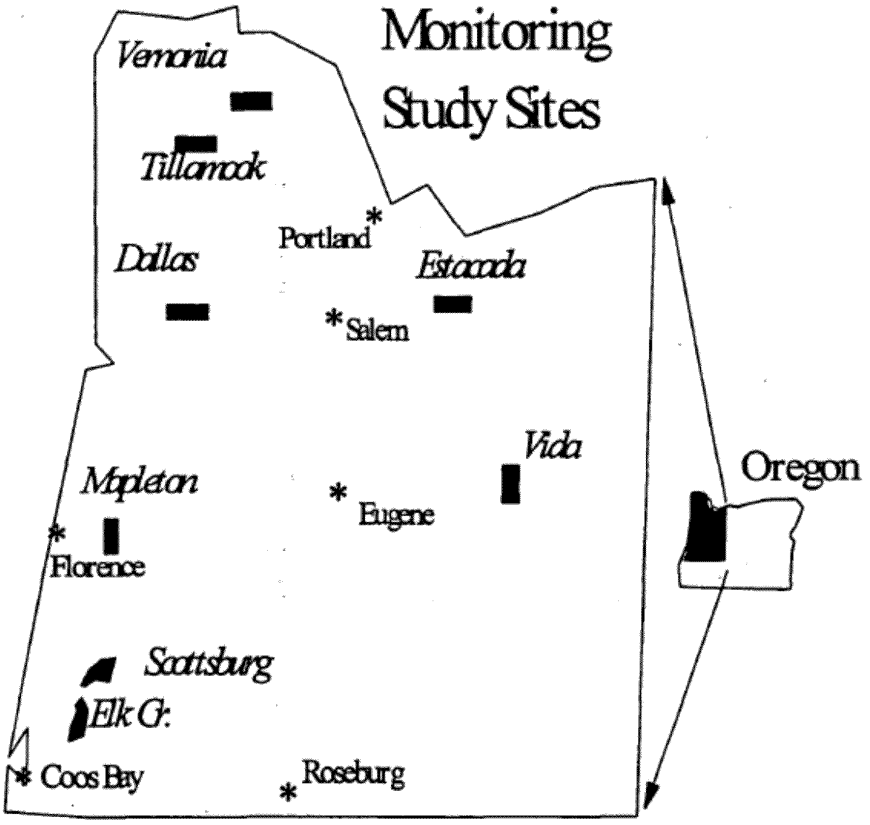
Shallow Landslide Analysis

1. Calibration
   - Inventory
   - Landform/Slope classification
2. Susceptibility Mapping
3. Stream Delivery

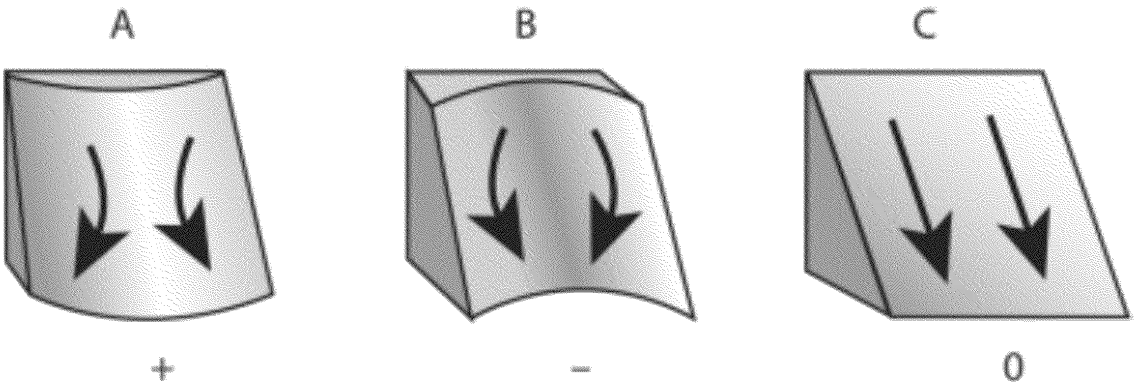

Monitoring
Study Sites
Vernonia
Tillamook
Portland
Dallas
Estacada
Salem
Vida
Mapleton
Eugene
Florence
Oregon
Scottsburg
Elk Cr.
Coos Bay
Roseburg

Inventory Areas

Site	Robison et al 1999 Classification	DEQ Classification	Use
Big Elk Creek	-	Erodible	Validation
North Fork Siuslaw	-		
Elk Creek	Red Zone Tyee		Calibration
Mapleton			
Scottsburg			
Tillamook	Red Zone Igneous	Resistant	
Vida			
Dallas	Random Stratified		
Estacada			
Vernonia			

LiDAR available

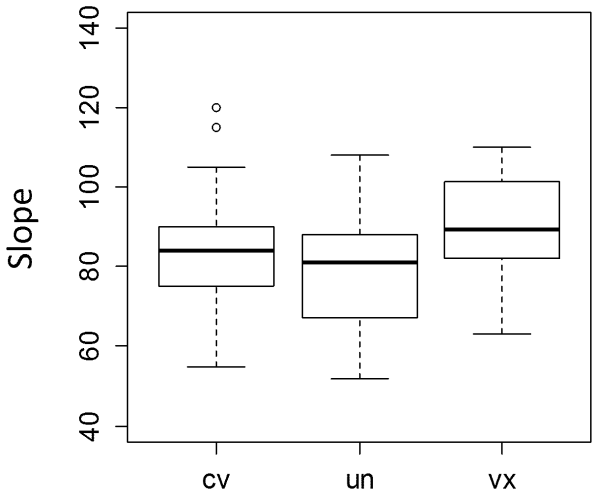
Landform Types



Convex (vx) Concave (cv) Uniform (un)

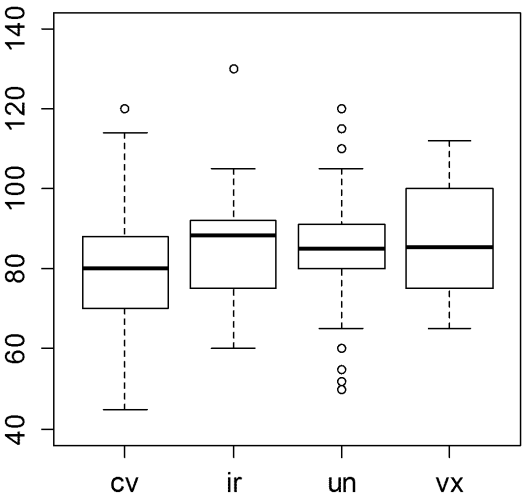
Upslope & In Channel Landslides Stratified by Landform Type

Resistant Sites



No significant difference between landforms
ANOVA ($p > 0.1$) $p = 0.13$

Erodible Sites

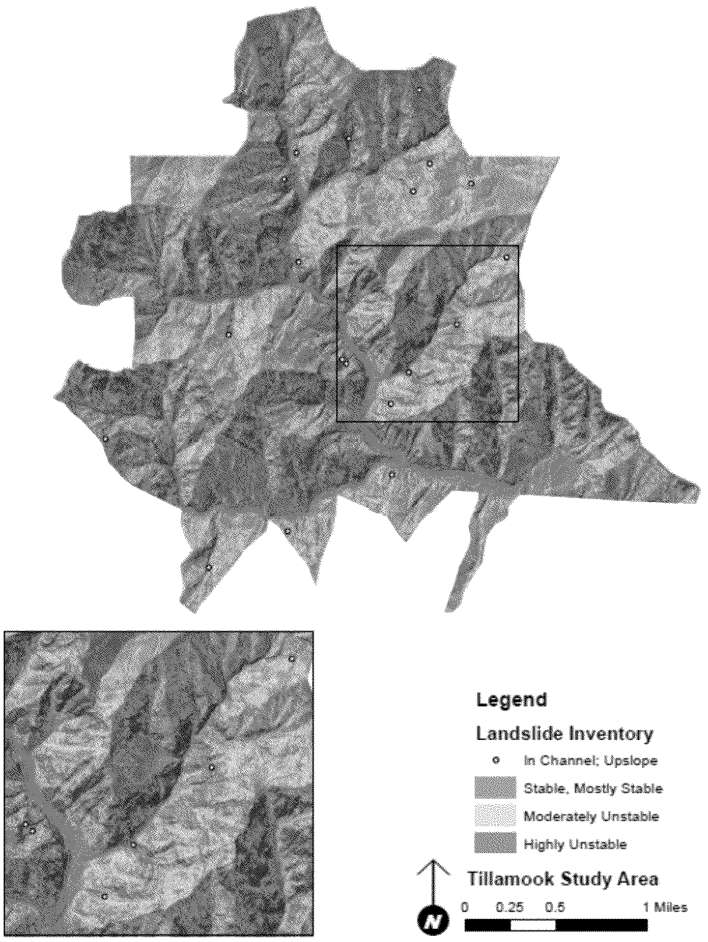


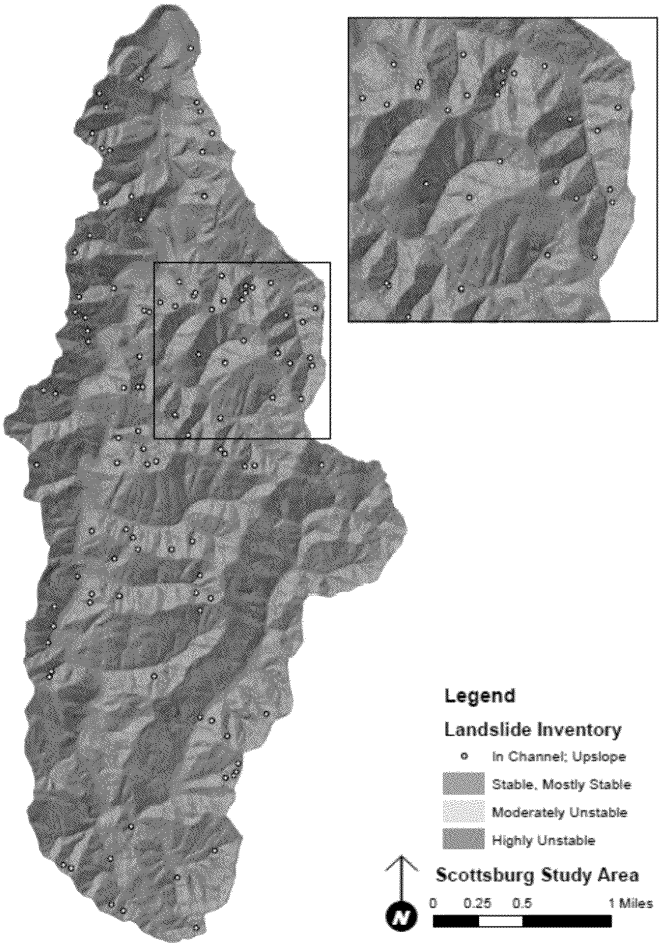
Concave is significantly different from other landforms
ANOVA/Tukey ($p < 0.10$) $p = 0.06$
w/o irregular (ir) $p = 0.03$

Legend
cv = concave un = uniform
vx = convex ir = irregular

Landform / Slope Classification

		Percent Slope Class		
		Erodible Lithologies		**Resistant Lithologies**
Susceptibility Classification	Percentile of Landslides	Convex & Uniform	Concave	All Landform Types
Stable	0%	0% -49%	0% -44%	0% -49%
Mostly stable	0% - 9%	50% -64%	45% -59%	50% -64%
Mostly stable	10%-24%	65% -79%	60% -69%	65% -74%
Moderately unstable	25% - 49%	80% -84%	70% -79%	75% -84%
Highly unstable	50%-100%	85% ≤	80% ≤	85% ≤


Legend
Landslide Inventory
In Channel; Upslope
Stable, Mostly Stable
Moderately Unstable
Highly Unstable
Tillamook Study Area
N
0 0.25 0.5 1 Miles


Legend
Landslide Inventory
In Channel; Upslope
Stable, Mostly Stable
Moderately Unstable
Highly Unstable
Scottsburg Study Area
N
0 0.25 0.5 1 Miles

Ground vs LiDAR Classification Comparison

			LIDAR Area Based Classification					
			Erosive Lithologies			Resistant Lithologies		
		Susceptibility Classification	Mostly stable	Moderately unstable	Highly unstable	Mostly stable	Moderately unstable	Highly unstable
	Susceptibility Classification	Percent of → ↓ Landslides	36%	12%	52%	24%	36%	40%
Ground Based Classification	Mostly stable	25%	16	6	16	0	0	0
	Moderately unstable	25%	9	4	18	6	5	2
	Highly unstable	50%	28	8	42	0	4	8