December 3rd Landslide Reconnaissance

Division of Geology and Earth Resources
Washington Geological Survey
Dave Norman
February 13 2008
• Gathering geologic data after an event
• Our reconnaissance covered the Puget Sound and Willapa Hills
• Rainfall was highest in the Stillman Creek and Chehalis Basin and most of the slides occurred where it rained the most
• We mapped over 1000 landslides
• Most of the slides are debris flow type
• Geology matters
Reconnaissance Area

Highest Density of Landslides
Landslides – Where did they occur and why?

- Hardest hit counties – Lewis, Thurston and Mason
- Correlates with storm rainfall intensity
- Almost all landslides were translational and had a slide plane of impenetrable substrate (bedrock)
Characteristic Landslide

- Spring
- Thin Soils
- Bedrock (aquitard)
- Soil and organics
Highway 101 – Holiday Beach

Run out
Damage Report - Landslides

- Over 1000 landslides mapped (~50% entered into GIS)
- At least 20 houses damaged or destroyed
- 1 death
- At least 23 sections of highways and roads blocked or damaged
Of the ~500 slope failures entered in GIS
260 debris slides
160 debris flows – debris torrents
45 shallow undifferentiated landslides
Usually the debris slides transformed into debris flows.
Of the first 177 landslides inventoried:
62 either initiated in clear cuts or initiated at a road in a clear cut 0 to 5 years old
15 initiated in timber aged 5 to 15 years or at roads in timber 5 to 15 years old
96 initiated in timber 15 to 50 years old or at roads in timber 15 to 50 years old
Geologic Component

Bedrock and shallow soils key components of landslides in this event.

Geologic mapping is a key component in understanding the basin and potentially best forest management practices.
More Information?

- [www.dnr.wa.gov/geology](http://www.dnr.wa.gov/geology)