

MAPS SHOWING LANDSLIDES AND RELATIVE SLOPE STABILITY OF QUATERNARY DEPOSITS OF THE LOWER SKAGIT AND BAKER VALLEYS, NORTH CASCADES, WASHINGTON

MAP SHOWING LOCATION OF RECENT LANDSLIDES IN QUATERNARY DEPOSITS OF THE LOWER SKAGIT AND BAKER VALLEYS, NORTH CASCADES, WASHINGTON

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Explanation

This map shows the location of 190 landslides recognized in the study area. Landslides were mapped on aerial photographs taken over the period 1956-1976. Data from lettered landslides appears in Appendix A. Not shown are reforested landslides and those too small to be seen on the photographs. However, the map gives a good indication of the type and distribution of recent landslides.

Landslide Types

Landslides that occur in the study area are here classified as

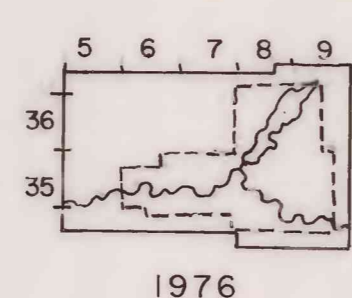
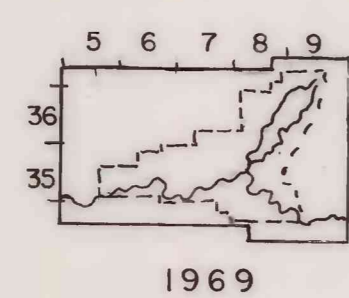
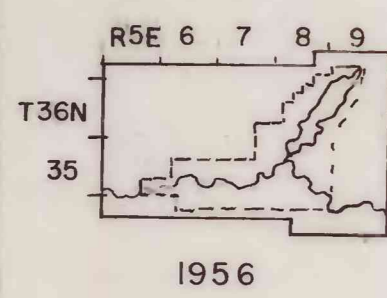
- 1) Debris slides
- 2) Debris flows
- 3) Slump/Flows

KEY TO SLIDE CATEGORIES:

- ⊕ DEBRIS SLIDE
- DEBRIS FLOW
- ▲ SLUMP/FLOW
- SLIDE, UNCLASSIFIED

AIR PHOTOS USED TO COLLECT LANDSLIDE DATA

YEAR FLOWN	FLIGHT SYMBOL	SCALE	OWNER
1956	CWD-R	1:20,000	Soil Conservation Service
1969	NW-69	1:12,000	Dept. of Natural Resources (WASHINGTON STATE)
1976	NW-C-76	1:24,000	Dept. of Natural Resources (WASHINGTON STATE)



This report is preliminary and has not been edited or revised for conformity with Geological Survey standards and nomenclature.

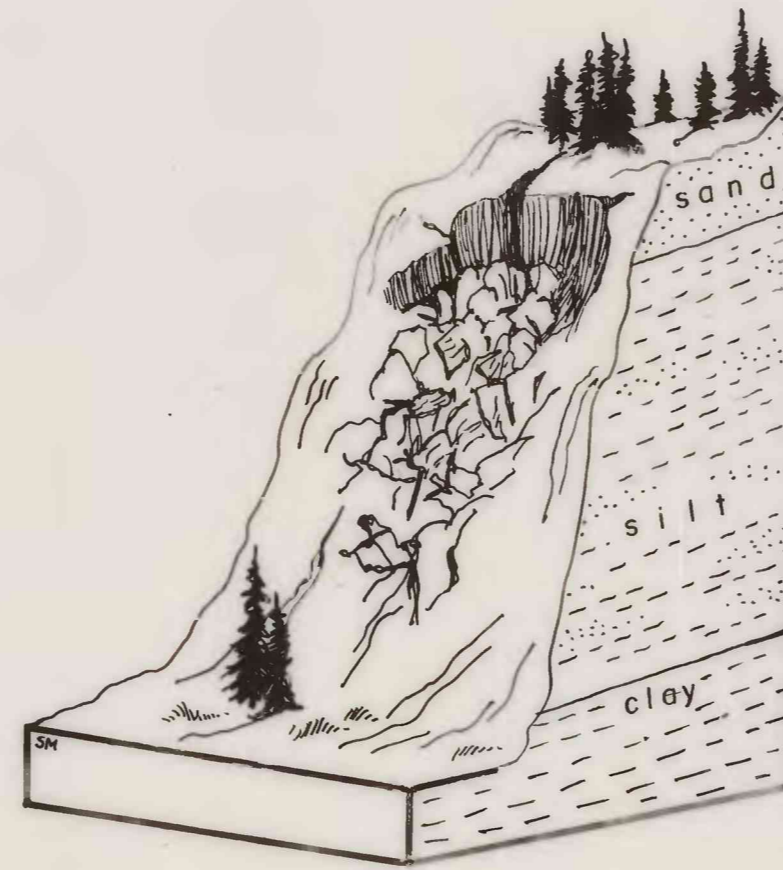


FIGURE 1. Debris slides are nearly dry, shallow mass movements that involve minimal flowage. These slides occur on very steep slopes, generally greater than 70%. Materials are composed of sand-sized or larger particles. If these dry sands enter stream gullies, they may become saturated and move downslope as debris flows. Debris slides commonly occur in sidecast or fill material along roads, on logged slopes, and at boundaries between permeable and impermeable strata.

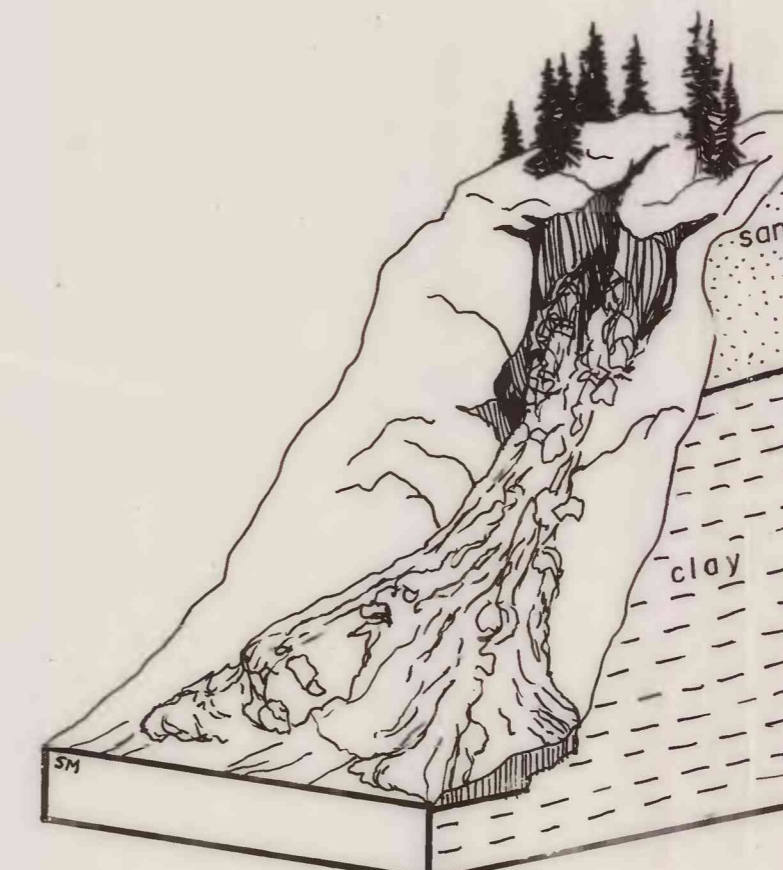


FIGURE 2. Debris flows are fluid mass movements that occur on moderate to steep slopes, generally greater than 50%, and may flow considerable distances from their source. Constituents range in size from clay to sand, but may include larger particles. Mudflows are considered debris flows, consisting mainly of clay and silt. Debris avalanches are flows less saturated with water, thus they flow less distance. Debris flows are often triggered by heavy rain and occur along the top of an impermeable layer.

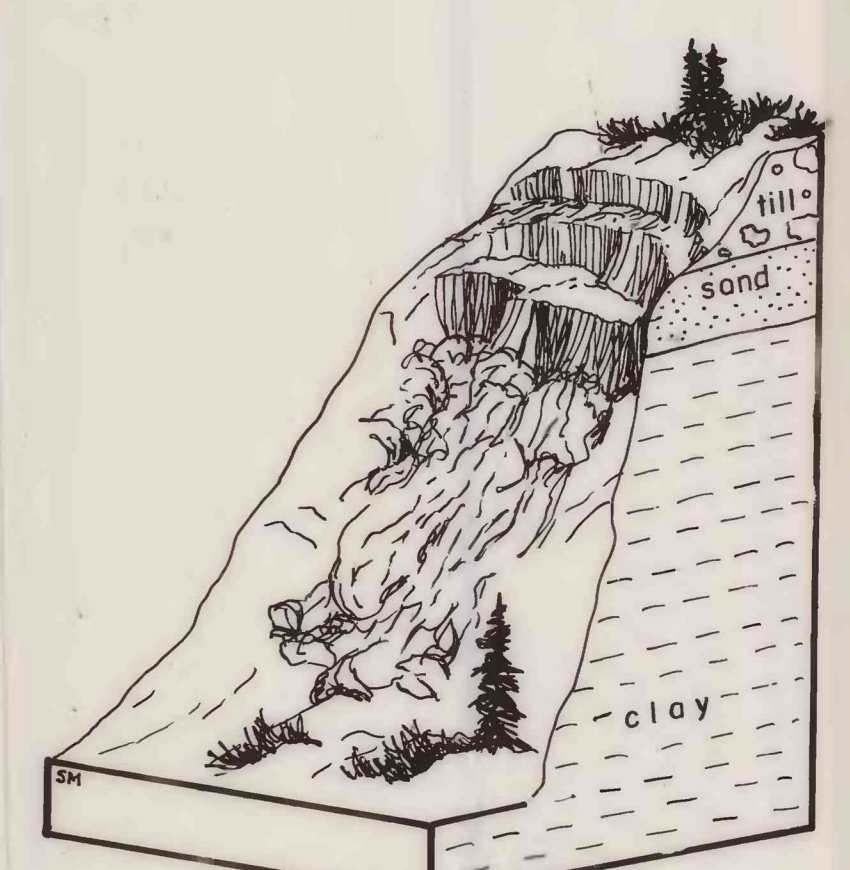
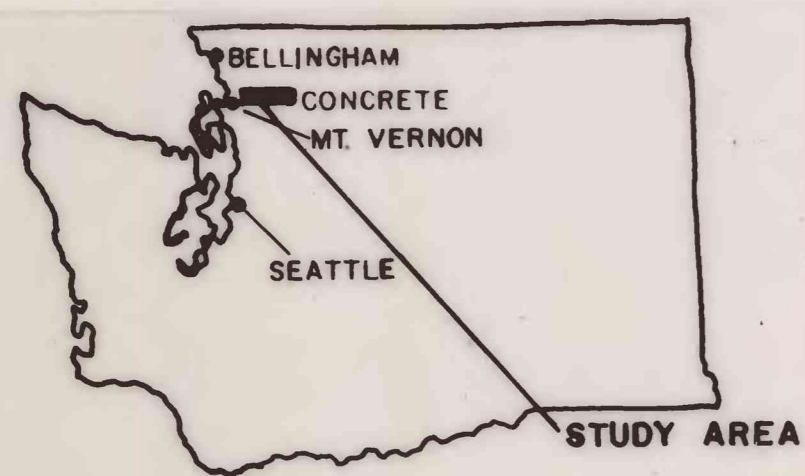
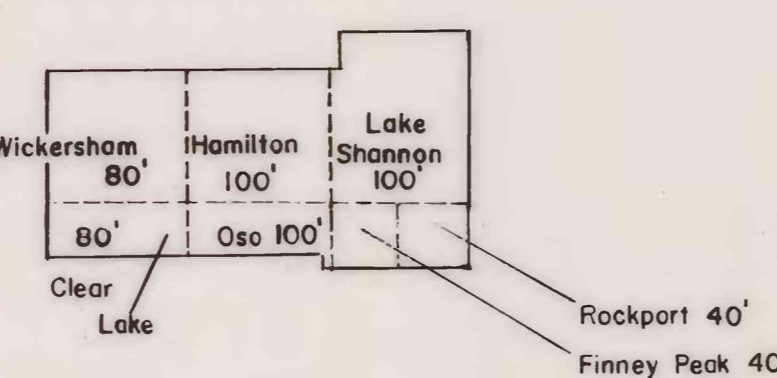


FIGURE 3. Slump/flows involve both slumping and flowage. Slumps occur when competent material fails by breaking into undeformed blocks which rotate in a downslope direction. Severely broken slump blocks will fail as debris flows. Slump/flows originate along interfaces between permeable and impermeable materials on moderate to steep slopes. Heavy rain is a causative factor.



USGS QUADRANGLES IN STUDY AREA AND CONTOUR INTERVAL



1 : 62,500

