

# Washington Geological Survey's Landslide Hazard Program

## Thurston County Landslide Inventory

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WASHINGTON STATE DEPARTMENT OF  
**NATURAL RESOURCES**

Dave Upthegrove, Commissioner of Public Lands

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# WGS Landslide Hazard Program Functions

## RCW 43.92.025

### Seismic, landslide, and tsunami hazards—Assessment—Technical assistance

(1) In addition to the objectives stated in RCW 43.92.020, **the geological survey must conduct and maintain an assessment of seismic, landslide, and tsunami hazards in Washington.** This assessment **must apply the best practicable technology, including** light detection and ranging (**lidar**) **mapping, to identify and map** volcanic, seismic, **landslide**, and tsunami hazards, and estimate potential hazard consequences and the likelihood of a hazard occurring.

(2) The geological survey must:

(a) **Coordinate with state and local government agencies to compile existing data**, including geological hazard maps and geotechnical reports, tending to inform geological hazard planning decisions;

(b) **Acquire and process new data or update deficient data using the best practicable technology**, including lidar;

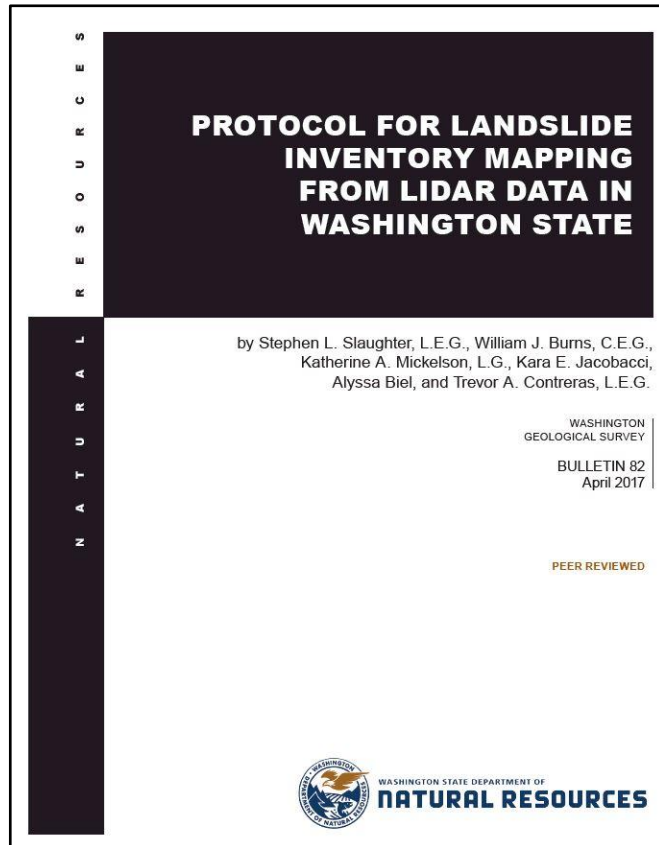
(c) **Create and maintain an efficient, publicly available database of lidar and geological hazard maps** and geotechnical reports collected under (a) and (b) of this subsection; and

(d) **Provide technical assistance to state and local government agencies on the proper interpretation and application of the results of the geological hazards assessment.**

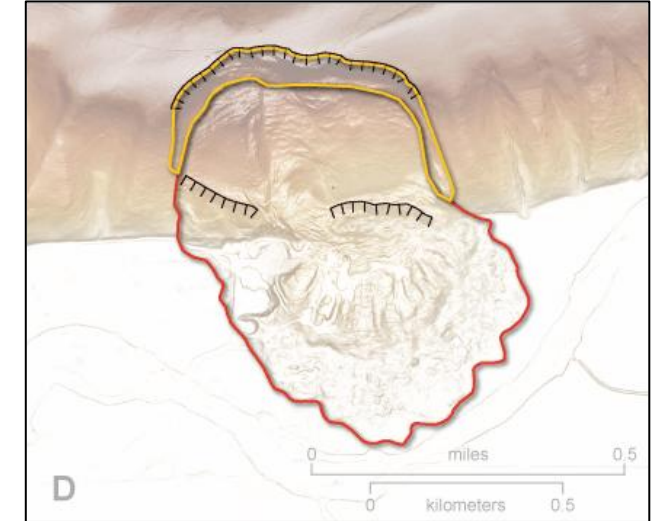
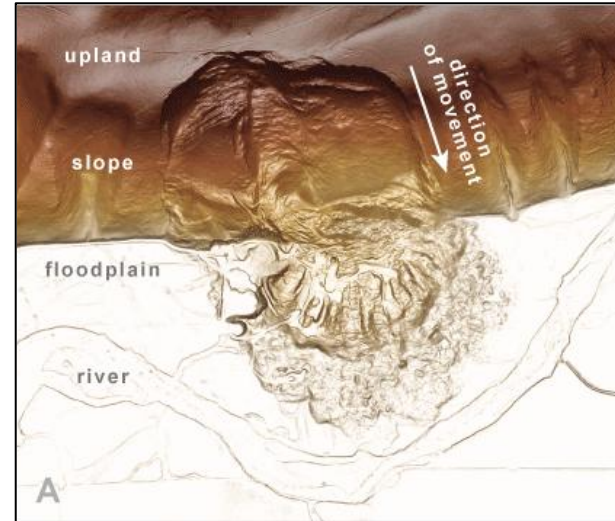


# Landslide Inventory Mapping

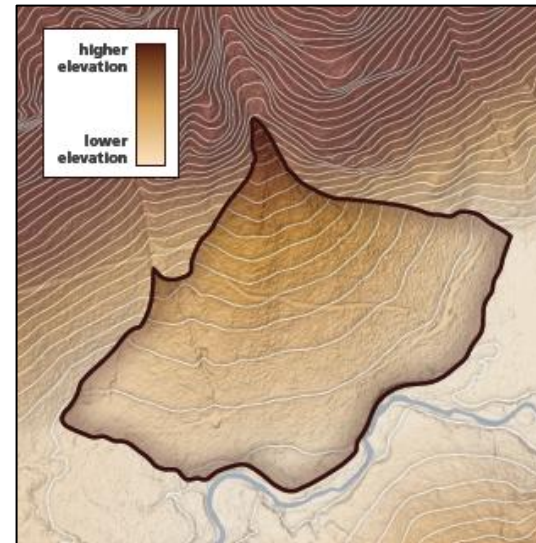
- Landslide geologists using best available science to identify landslide hazards
- Mapped landforms identify areas where landslides have occurred in the past and are therefore more likely to occur in the future.
- Used as a screening tool identifying areas where site-specific hazard assessments may be needed



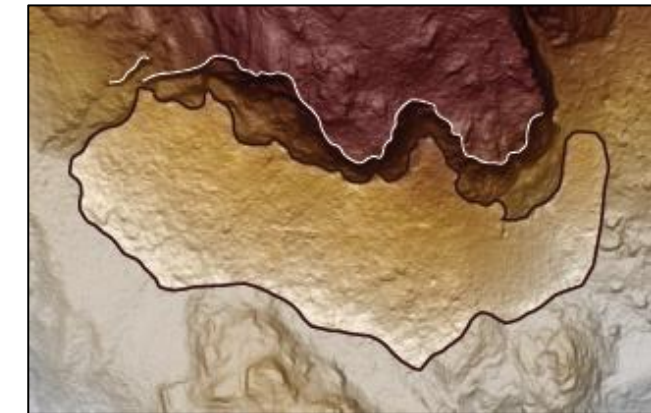
## What's Mapped in an Inventory?



**Landslides**



**Fans**

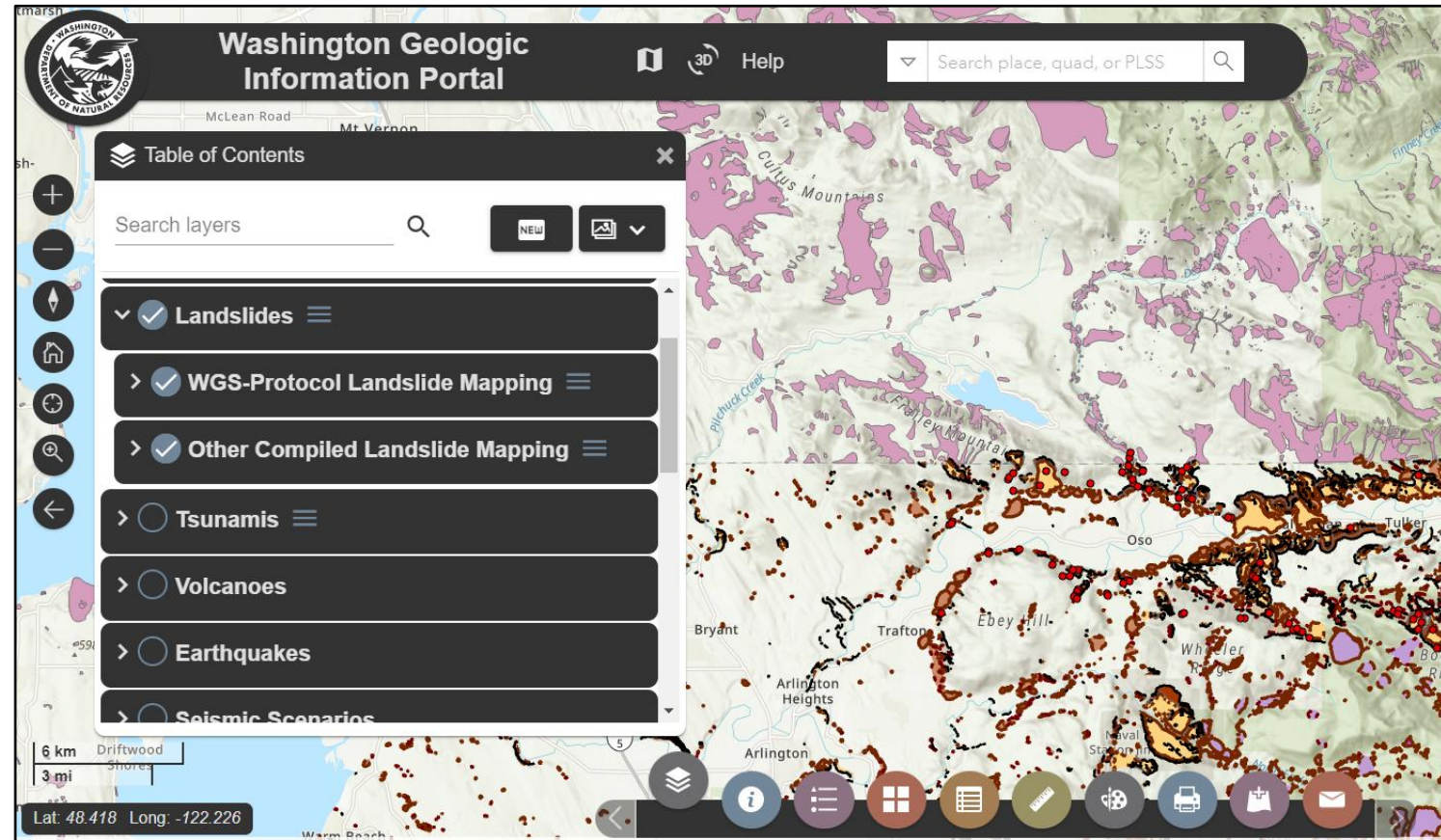
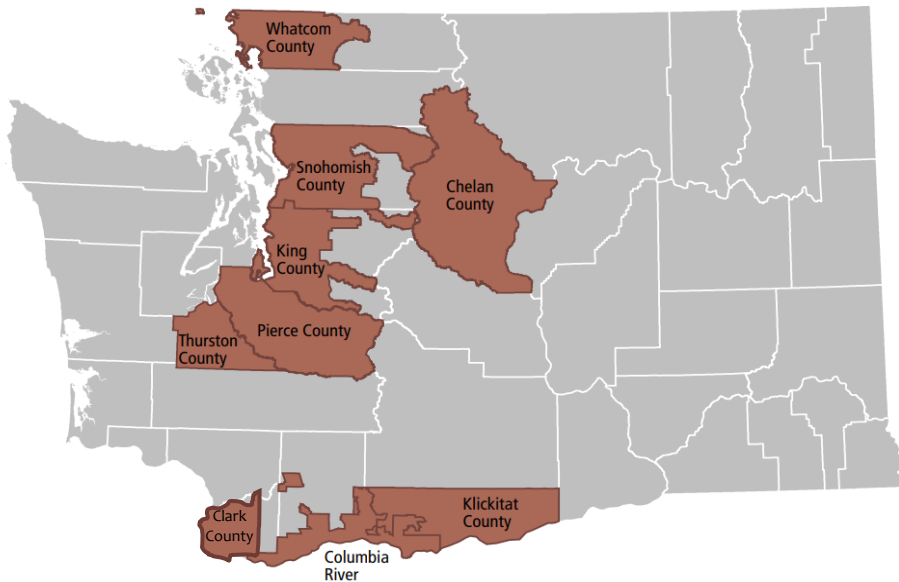


**Rockfall**

# Washington State Landslide Inventory

- Public access via WA Geologic Information Portal
- Parts of Statewide Inventory
  1. WGS Protocol Mapping
  2. Other Compiled Landslide Mapping

## Where We've Mapped Landslides with Protocol



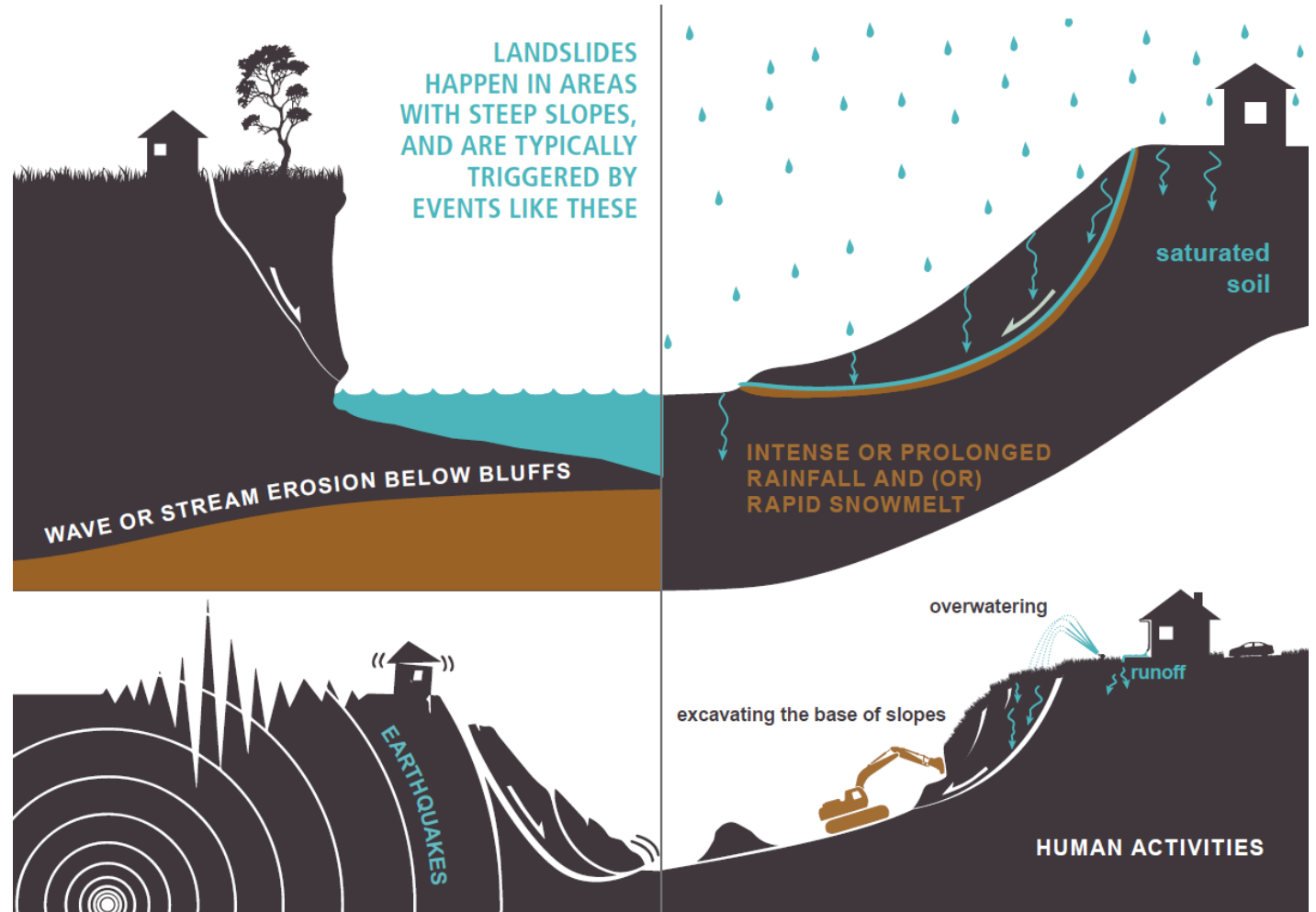
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# Why Thurston County?

- Thurston County staff asked for help to improve landslide awareness and public safety
- Recent high resolution lidar in 2021
- Limited landslide inventory from historic mapping (most recent: 2009)
- Several damaging deep-seated landslides
  - Carlyon Beach, Sunset Beach, and Sunrise Beach Landslides
- 2007 and 2009 rain-on-snow events triggered 100's of slides
- 1945, 1965, and 2001 earthquakes all triggered landslides in Thurston County
- Extensive steep and unstable shoreline bluffs and topographic uplands

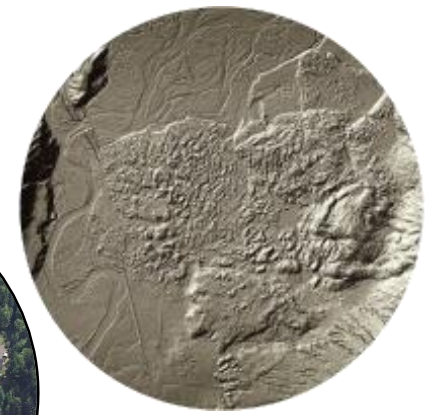
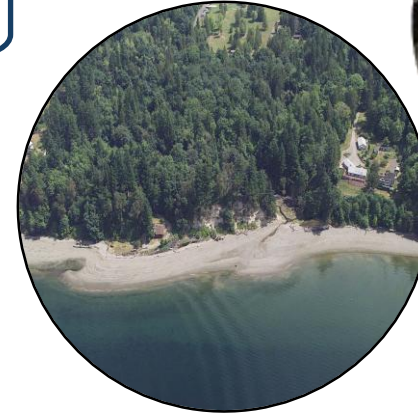
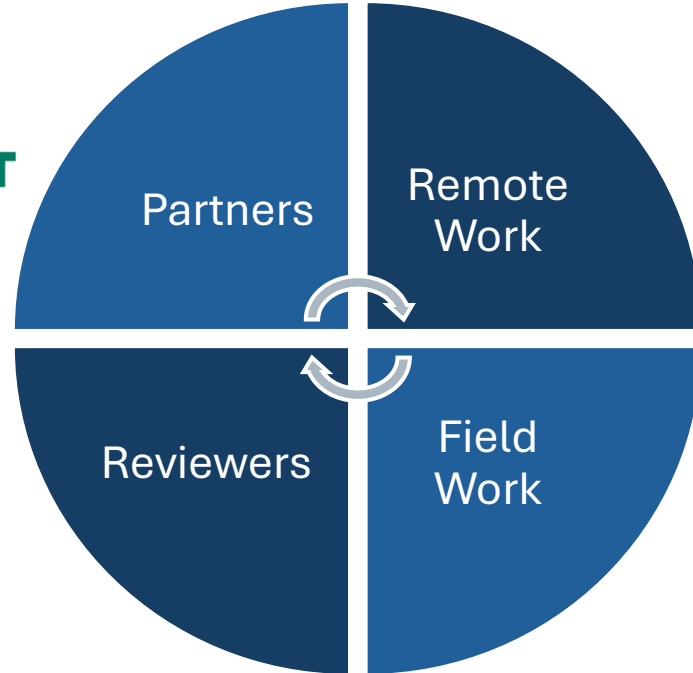


# How its Made



- Share knowledge and information
- Mapping review
- Land access

- Lidar mapping
- Aerial imagery
- Previous mapping

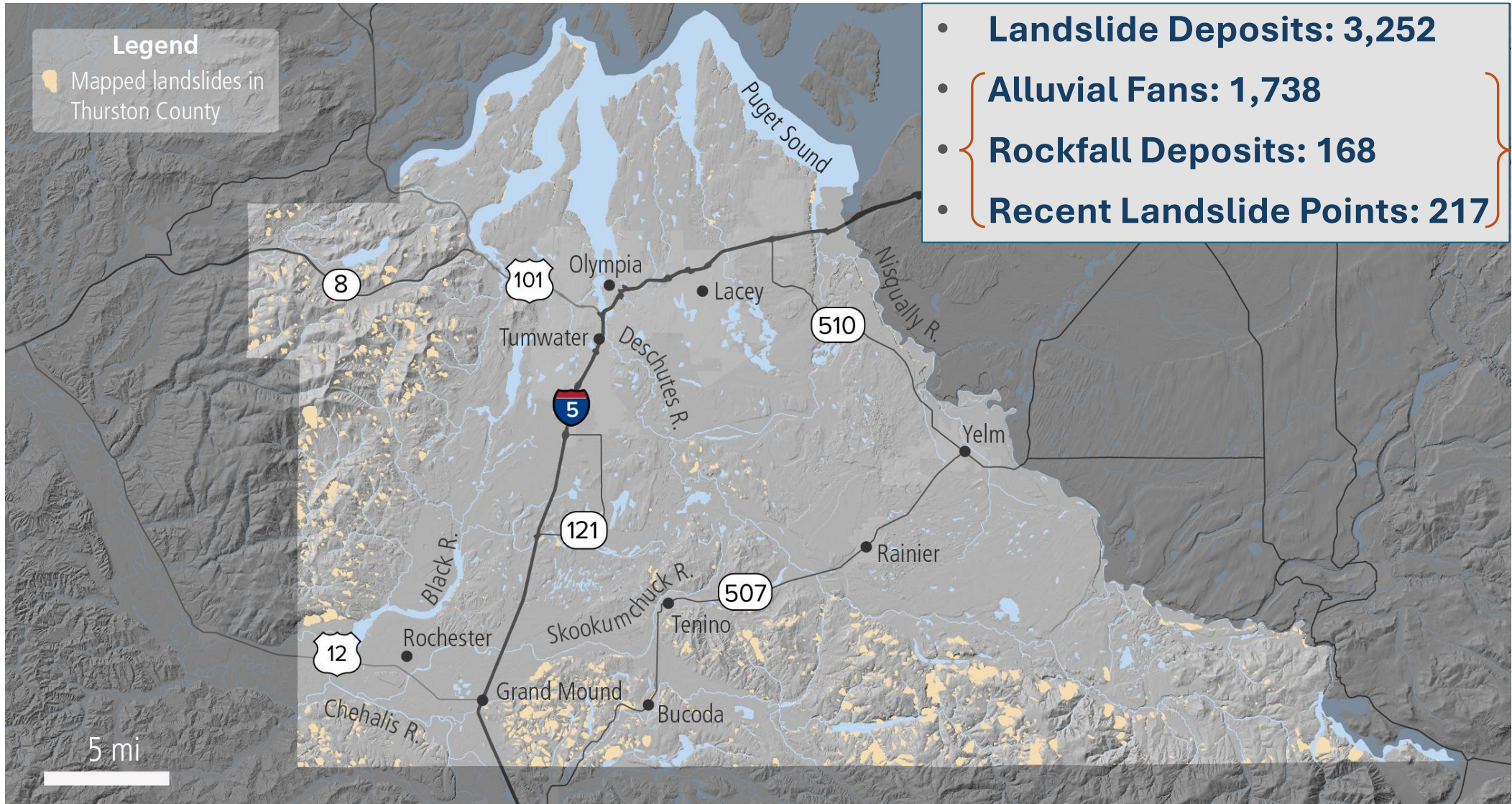


- Licensed engineering geologists
- External partners
- Internal WGS staff

- Visit ~10% of mapped features
- Informs remote work
- By land and sea



# What We Found



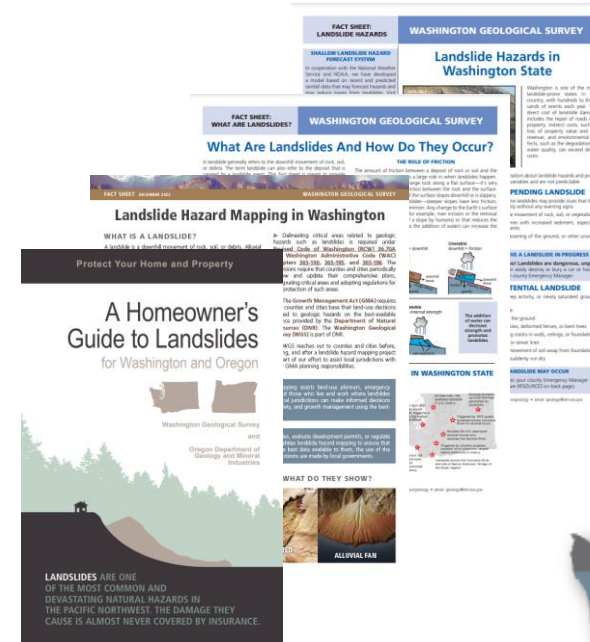
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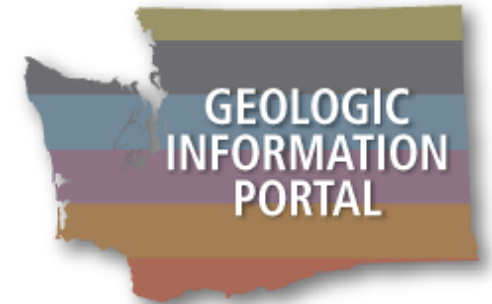
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# How can WGS Help?

- Provide the best available science for many geologic hazards.
- Discuss the appropriate uses of our data and maps.
- Provide assistance with communication for local outreach about WGS science.
- Provide examples of land-use codes, outreach, and tools used by other jurisdictions.
- Review land-use codes related to geologic hazards.
- Assist with GMA periodic updates. For example:
  - Identifying the best available science for geologically hazardous areas.
  - Reviewing proposed comprehensive plan language
  - Providing tools for integration of scientific information into implementation provisions.



Maps and Education



# Landslide Resources

- **WGS Landslides Webpage**

<https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/landslides>

Landslides information, pamphlets, and fact sheets

- **Washington Geologic Information Portal**

<https://www.dnr.wa.gov/geologyportal>

Landslide Inventories, Geologic Mapping, & Much More...

- **Washington Lidar Portal**

<https://lidarportal.dnr.wa.gov/>

- **WGS Recently Reported landslides**

<https://wadnr.maps.arcgis.com/apps/webappviewer/index.html?id=ef7ea514f7e54dde8cf1e8eefd2037b4>

- **WGS Geologic Planning Webpage**

<https://www.dnr.wa.gov/programs-and-services/geology/geologic-planning>

