

# Landslide Hazard Mapping in Washington

## WHAT IS A LANDSLIDE?

A landslide is a downhill movement of rock, soil, or debris. Alluvial fans and rockfalls are also landslides. Hundreds to thousands of landslides occur each year in Washington State, and they can be devastating when they occur, potentially impacting people, property, and infrastructure. Understanding these hazards and where they are located is critical to minimizing risk and mitigating impacts.



Image of the 2009 Nile Valley Landslide covering State Route 410

▶ Delineating critical areas related to geologic hazards such as landslides is required under **Revised Code of Washington (RCW) 36.70A** and **Washington Administrative Code (WAC) Chapters 365-190, 365-195, and 365-196**. The provisions require that counties and cities periodically review and update their comprehensive plans, designating critical areas and adopting regulations for the protection of such areas.

▶ The **Growth Management Act (GMA)** requires that counties and cities base their land-use decisions related to geologic hazards on the best-available science provided by the **Department of Natural Resources (DNR)**. The **Washington Geological Survey (WGS)** is part of DNR.

▶ WGS reaches out to counties and cities before, during, and after a landslide hazard mapping project as part of our effort to assist local jurisdictions with their GMA planning responsibilities.

## What is WGS's landslide hazard mapping and how can it help your jurisdiction's land-use planning?

Lidar-based landslide hazard mapping assists land-use planners, emergency managers, public works staff, and those who live and work where landslides could impact their daily lives. Local jurisdictions can make informed decisions about their assets, community safety, and growth management using the best-available science.

## What does landslide hazard mapping NOT do?

WGS does not revise building codes, evaluate development permits, or regulate land-use planning. While WGS updates landslide hazard mapping to ensure that city and county planners have the best data available to them, the use of the information and the regulatory decisions are made by local governments.

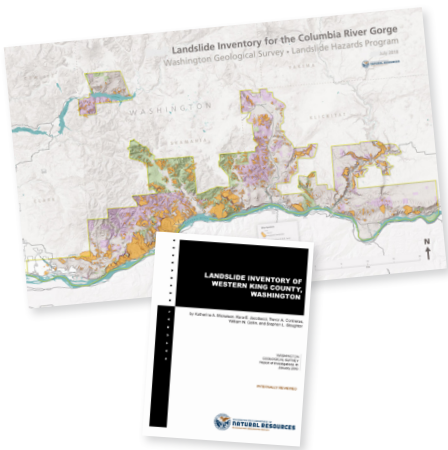
## HOW ARE LANDSLIDE HAZARD MAPS MADE? WHAT DO THEY SHOW?

WGS geologists use lidar to identify and map the extent of landslide hazard areas. With lidar, a geologist can examine large tracts of land to find landslides quickly and more accurately than by using aerial photographs or older topographic maps alone. Using a standardized mapping protocol, WGS identifies landslides, maps their extent, and documents useful informations about their features. WGS assigns a confidence rating for all mapped features, and a percentage of the detailed landforms are field-checked. All mapped features are reviewed by a licensed engineering geologist.



## PRODUCTS WGS CAN OFFER YOUR COUNTY

WGS will work with your community to develop the most useful products for your needs, including GIS data in a variety of formats. We will provide a pamphlet of methods and findings. Landslide information is displayed and available for download on the Washington Geologic Information Portal. We are also available to meet with the public and local jurisdictions to explain the data and our mapping process.



GIS DATA

TRAINING

## GMA RESOURCES

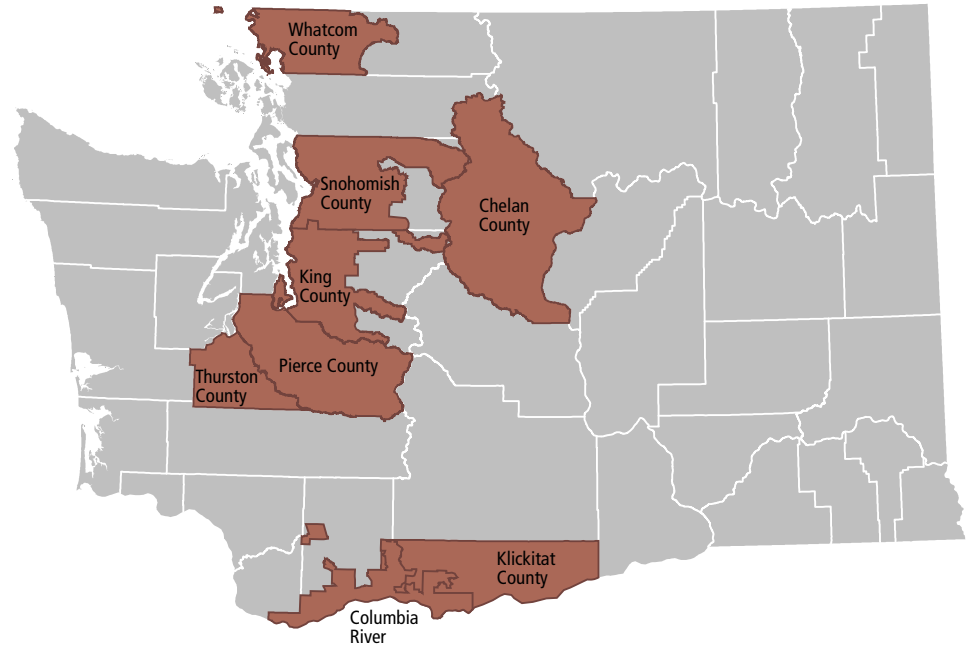
Department of Commerce Growth Management Services Periodic Update. [<https://www.commerce.wa.gov/serving-communities/growth-management/periodic-update/>]

Department of Commerce Growth Management Resources. [<https://www.commerce.wa.gov/serving-communities/growth-management/>]

Growth Management Act Best Available Science WAC 365-195. [<https://apps.leg.wa.gov/wac/default.aspx?cite=365-195>]

## WHAT LANDSLIDE HAZARD MAPS ARE ALREADY AVAILABLE?

WGS aims to produce landslide hazard mapping statewide. WGS prioritizes landslide mapping in areas with high population density, infrastructure, and that are covered by high-quality lidar. Most managed timberlands, federally managed lands, and large areas with poor-quality lidar are often excluded from the study areas.



Locations where landslide mapping is either completed or in progress

## LINKS TO MORE WGS RESOURCES

- ▶ [WGS Landslides webpage](#)
- ▶ [Washington Geologic Information Portal](#)
- ▶ [Landslide Inventory Mapping Protocol](#)
- ▶ [WGS Lidar webpage](#)
- ▶ [WGS Geologic Planning webpage](#)

### CONTACT

Tricia R. Sears  
Geologic Planning Liaison  
tricia.sears@dnr.wa.gov  
(360) 628-2867

Kate Mickelson, L.E.G.  
Landslide Hazards Program Manager  
kate.mickelson@dnr.wa.gov  
(360) 810-0006



WASHINGTON STATE DEPT OF  
**NATURAL RESOURCES**  
WASHINGTON  
GEOLOGICAL SURVEY

▶ LEARN MORE AT OUR WEBSITE

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