

OVERVIEW OF THE WGS LANDSLIDE MAPPING PROGRAM



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LANDSLIDE MAPPING AT WGS

- Target Audience: Planners, emergency managers, public works, and the public
- Landslide hazard mapping based on best available science
- Evaluate the potential hazard to people and property when considering development
 - Building codes and CAO
 - Types of the land uses and construction methods
- Results: Create a disaster-resistant population!



The Process

INVENTORY AND SUSCEPTIBILITY

PHASED LANDSLIDE MAPPING

- Phase 1 - detailed landslide inventory
 - Detailed landslide inventory with attributes
 - 1:4000-scale mapping
 - Mapping extent limited
- Phase 1a - Streamlined landslide inventory protocol (SLIP)
 - Simple landslide mapping in remote areas
- Phase 2 - deep and shallow landslide susceptibility
 - Where landslide might occur

DETAILED INVENTORY

PROTOCOL FOR LANDSLIDE INVENTORY MAPPING FROM LIDAR DATA IN WASHINGTON STATE

by Stephen L. Slaughter, L.G., L.E.G, William J. Burns, R.G., R.E.G., Katherine A. Mickelson, L.G., Trevor Contreras, L.G., L.E.G., Kara Jacobacci, and Alyssa Biel

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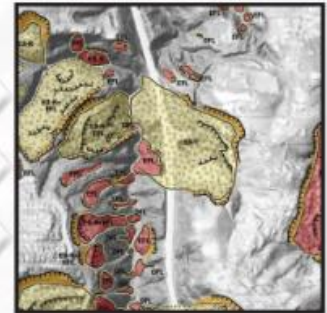
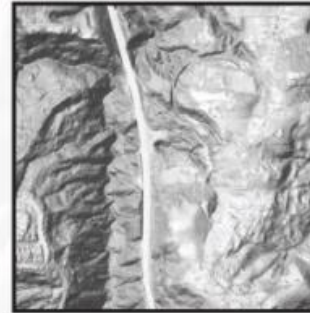
PEER REVIEWED



WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES
DIVISION OF GEOLOGY AND EARTH RESOURCES

PROTOCOL FOR INVENTORY MAPPING OF LANDSLIDE DEPOSITS FROM LIGHT DETECTION AND RANGING (LIDAR) IMAGERY

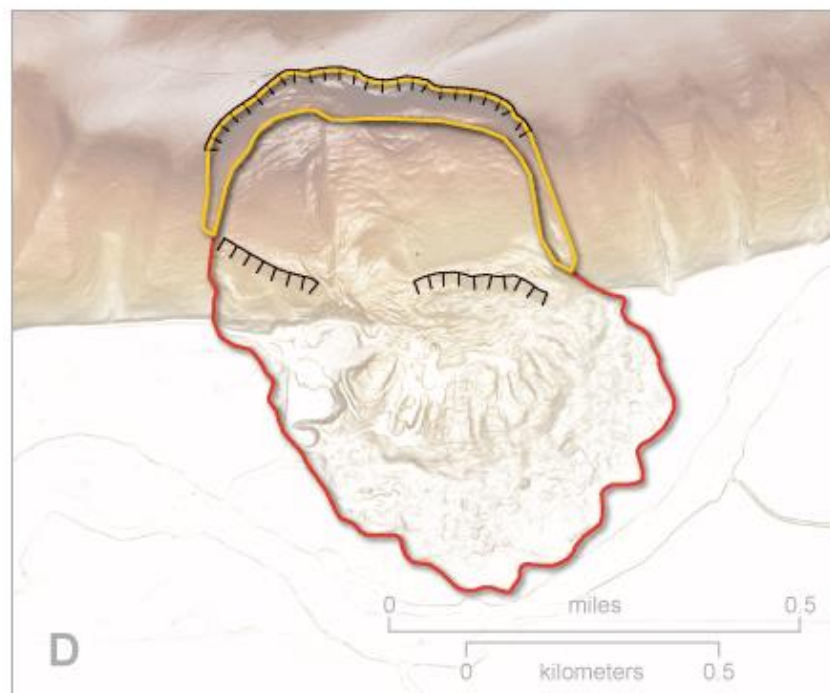
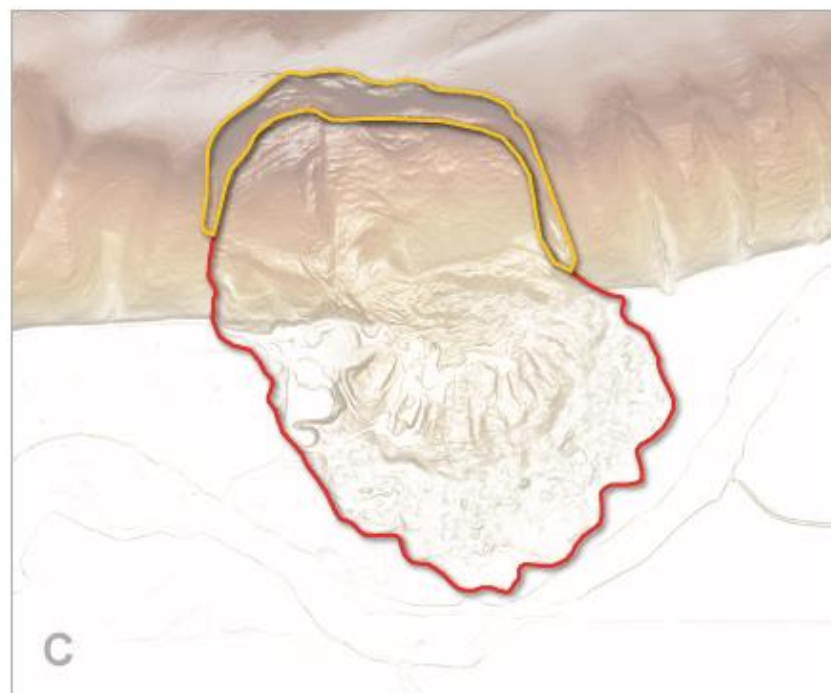
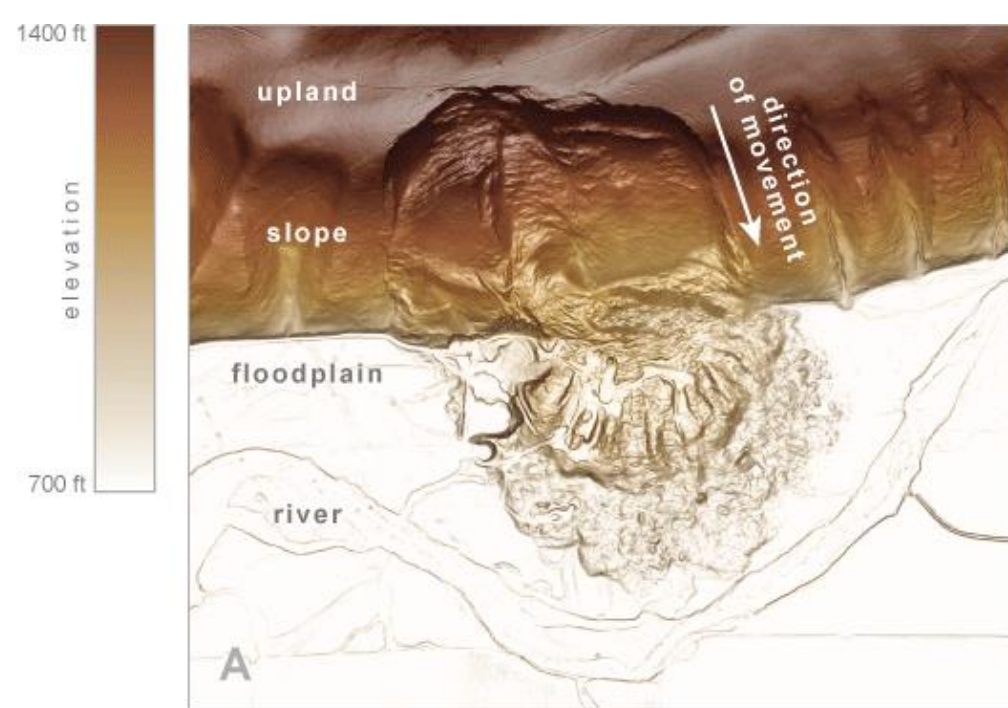
by William J. Burns and Ian P. Madin



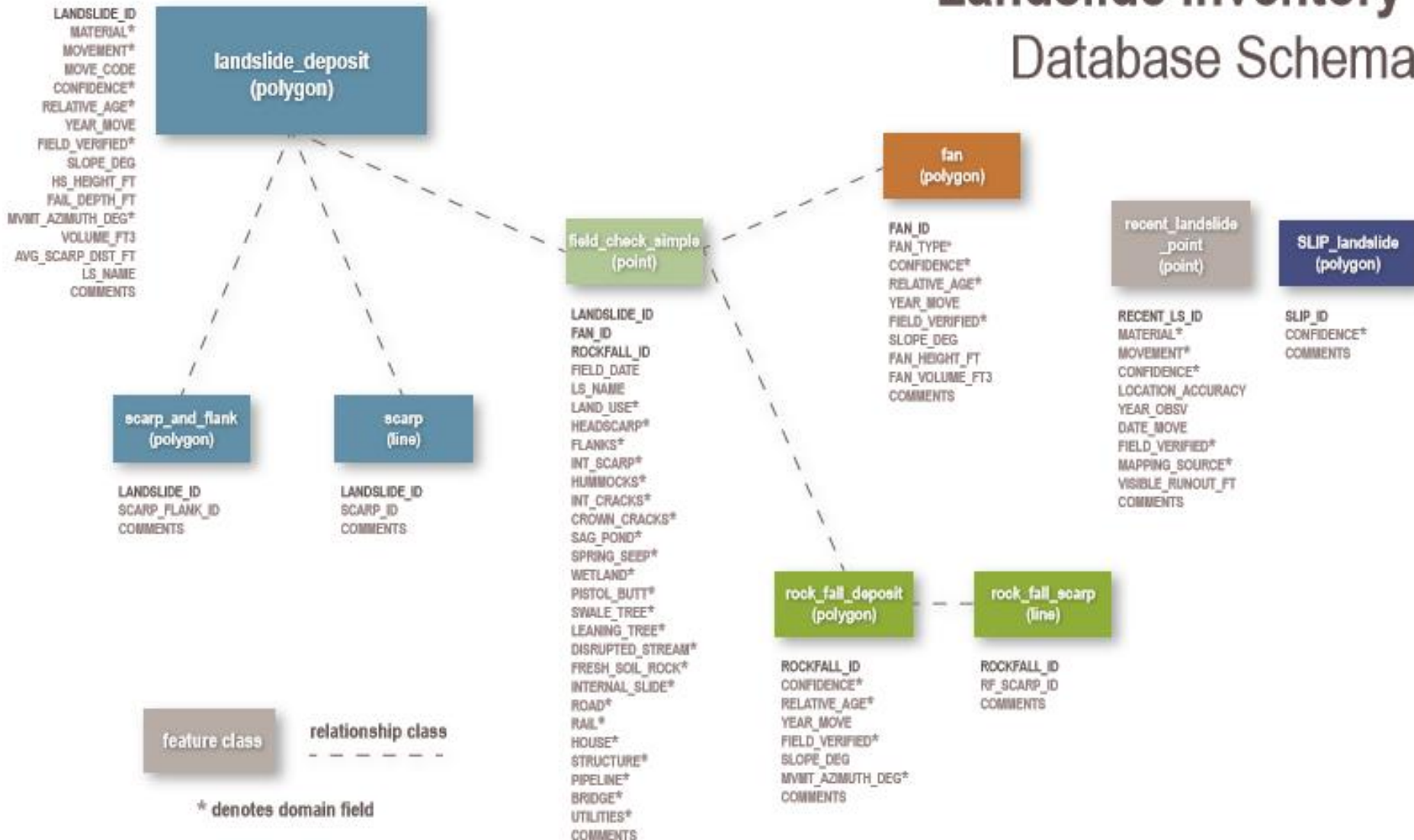
SPECIAL PAPER 42

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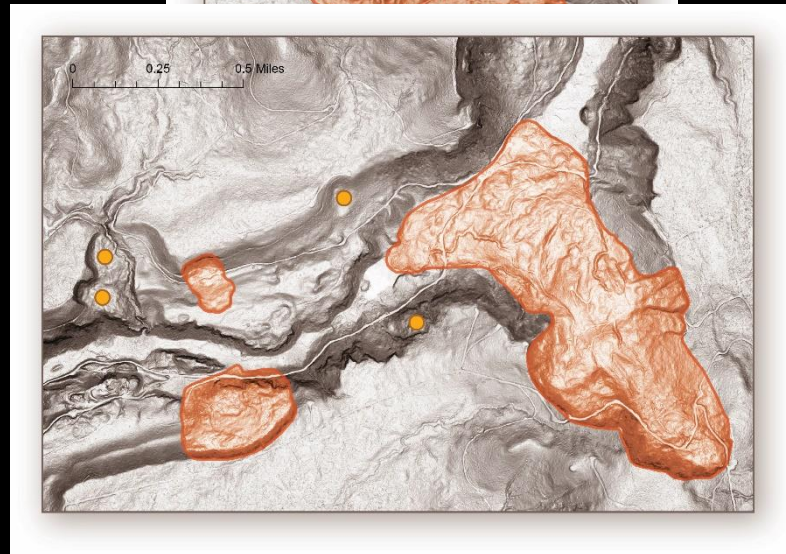
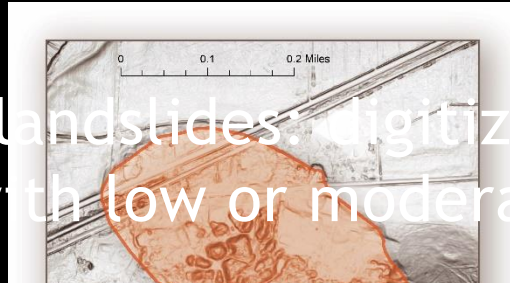


Landslide Inventory Database Schema



SLIP MAPPING

- High confidence landslides: digitized as a polygon
- Lower certainty landslides: digitized with a point and attributed with low or moderate confidence



SUSCEPTIBILITY MAPPING

SHALLOW LANDSLIDE SUSCEPTIBILITY

- DOGAMI SP-45
- Soil properties
- Slope gradient
- Factor of safety formula

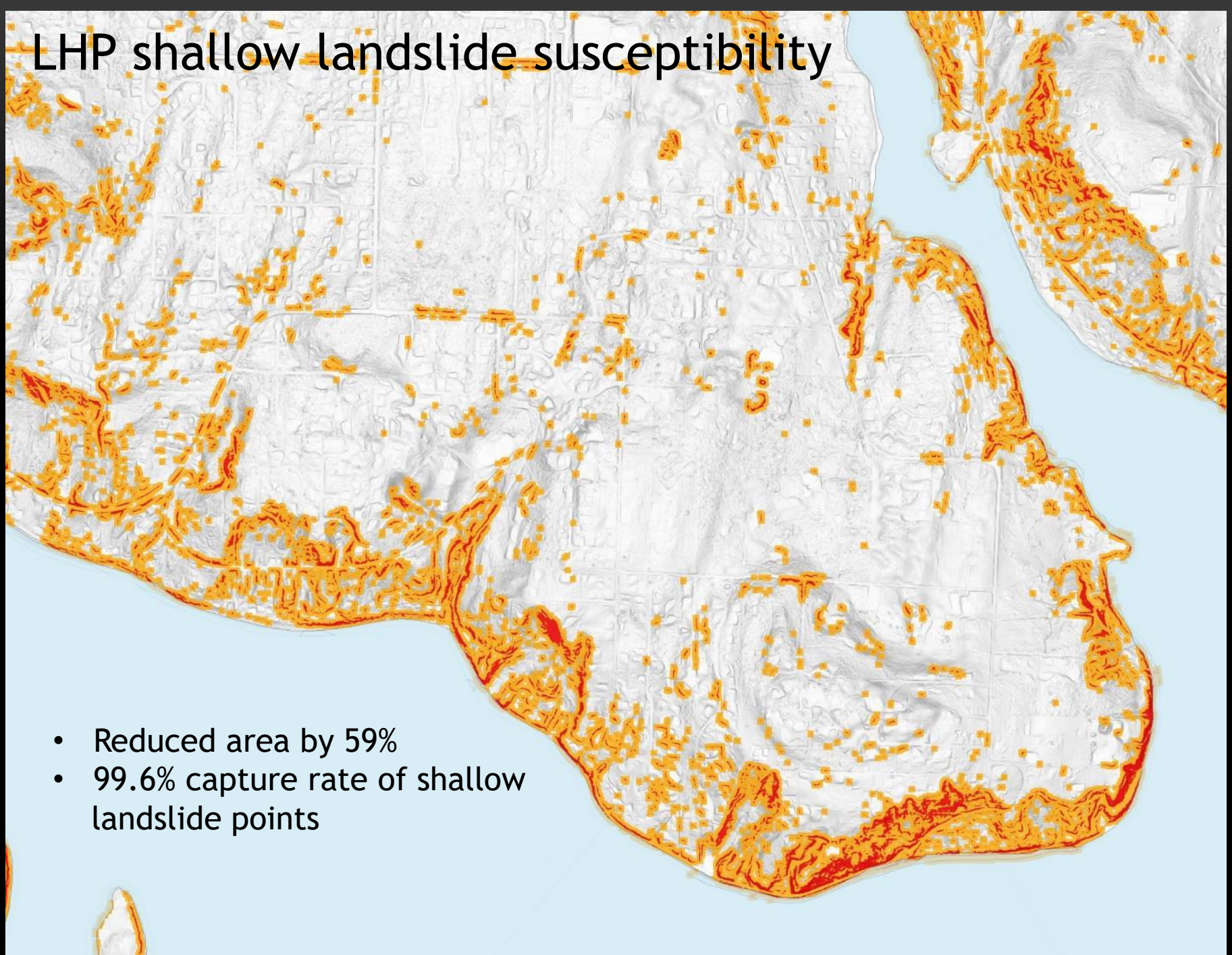
*** The landslide susceptibility data are not intended for use in assessing potentially unstable slopes for proposed forest management activities, such as logging and forest road construction. Potentially unstable slopes in managed forestlands are defined in WAC 222-16-050(1)(d) (Washington Administrative Code, 2013)



Pierce Counties unstable slopes layer



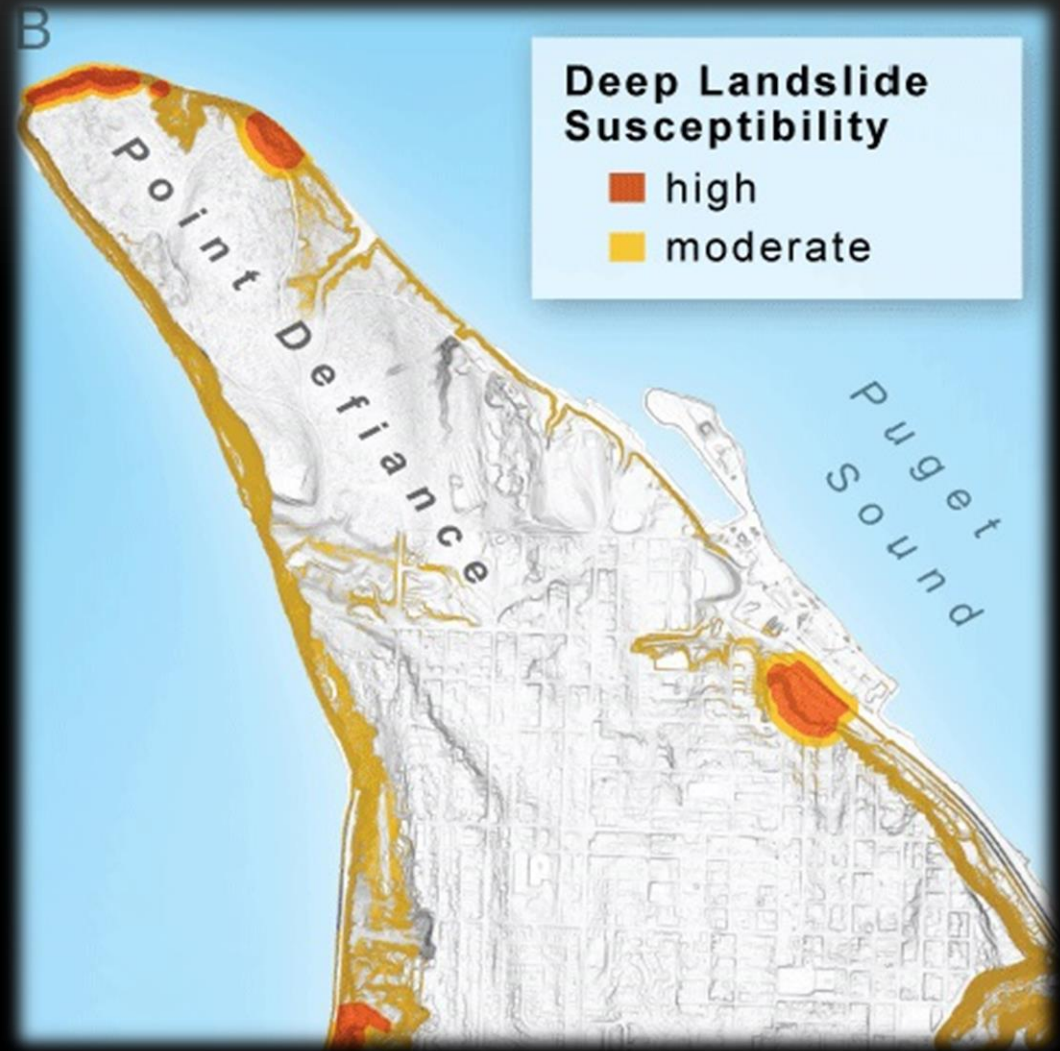
LHP shallow landslide susceptibility



- Reduced area by 59%
- 99.6% capture rate of shallow landslide points

DEEP LANDSLIDE SUSCEPTIBILITY

- DOGAMI SP-48
- Susceptible geologic units
- Susceptible geologic contacts
- Slope
- Preferred direction of movement



WASHINGTON GEOLOGIC INFORMATION PORTAL

Washington Geologic Information Portal 2D 3D Help Find address or place

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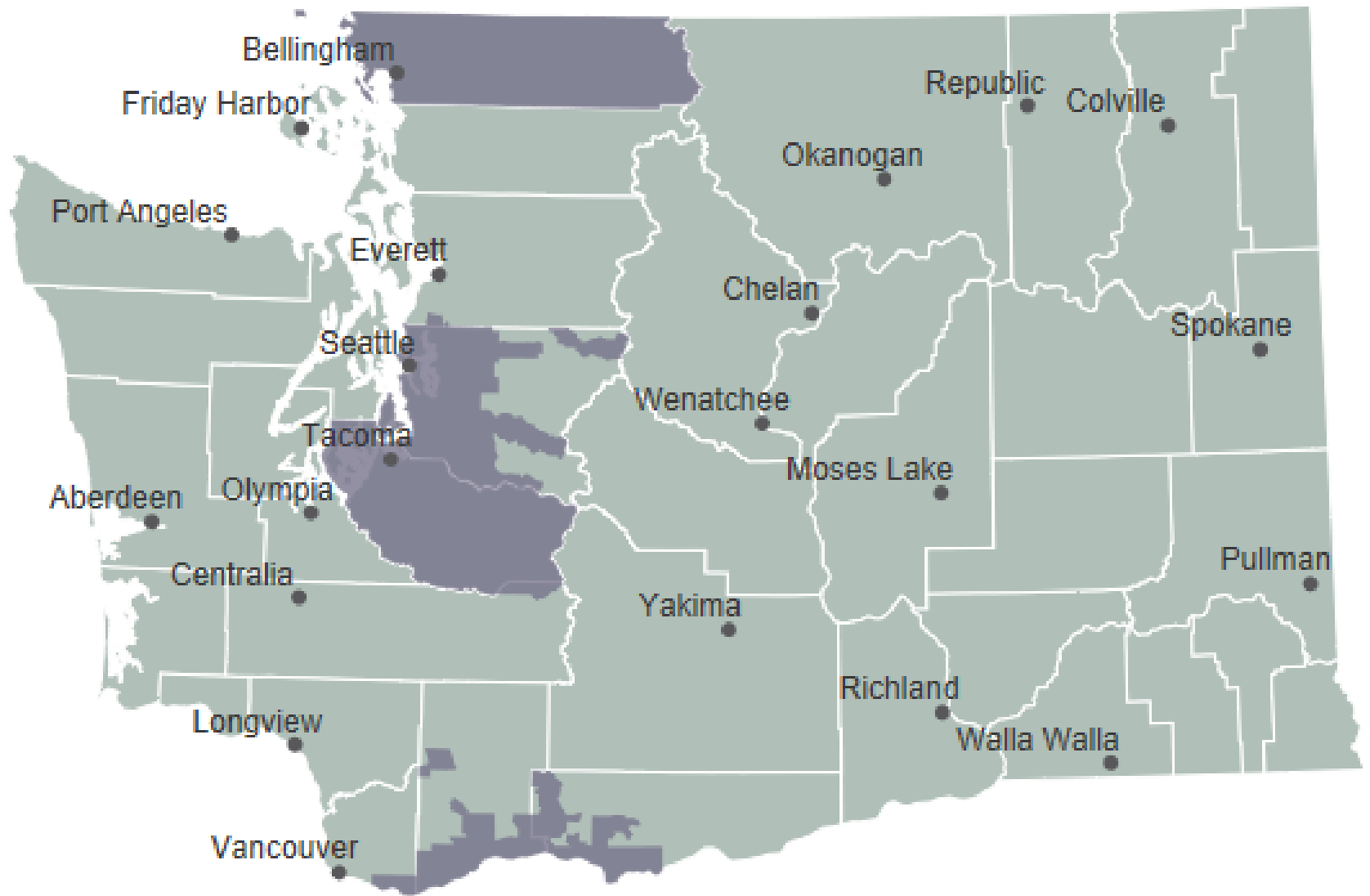
Search layers: Search by name and tags Clear

- Geologic Mapping
- Earthquake Data
- Landslide Data
 - Landslide Inventory (beginning 2017)
 - Landslide Compilations
- Tsunami
- Volcanoes
- Subsurface Data
- Earth Resources Permit Locations
- Geothermal Data

Scale: 1:36,112

Lat: 47.1474 Long: -122.0907

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THANK YOU!



WASHINGTON STATE
Natural Resources



kilometers