

# Lidar Derivative Maps

*Kathy Goetz Troost*

Troost Geosciences, Inc.

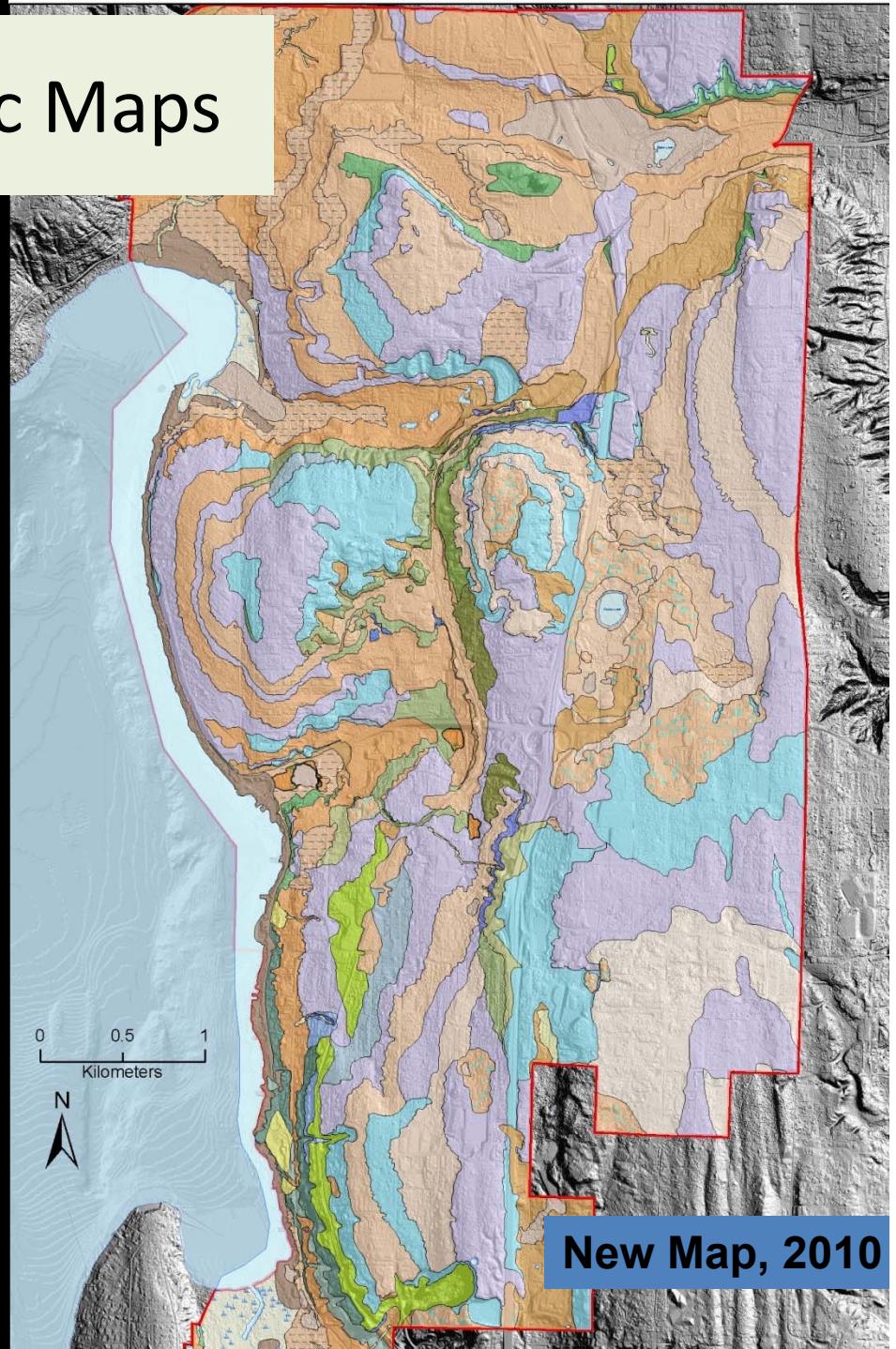
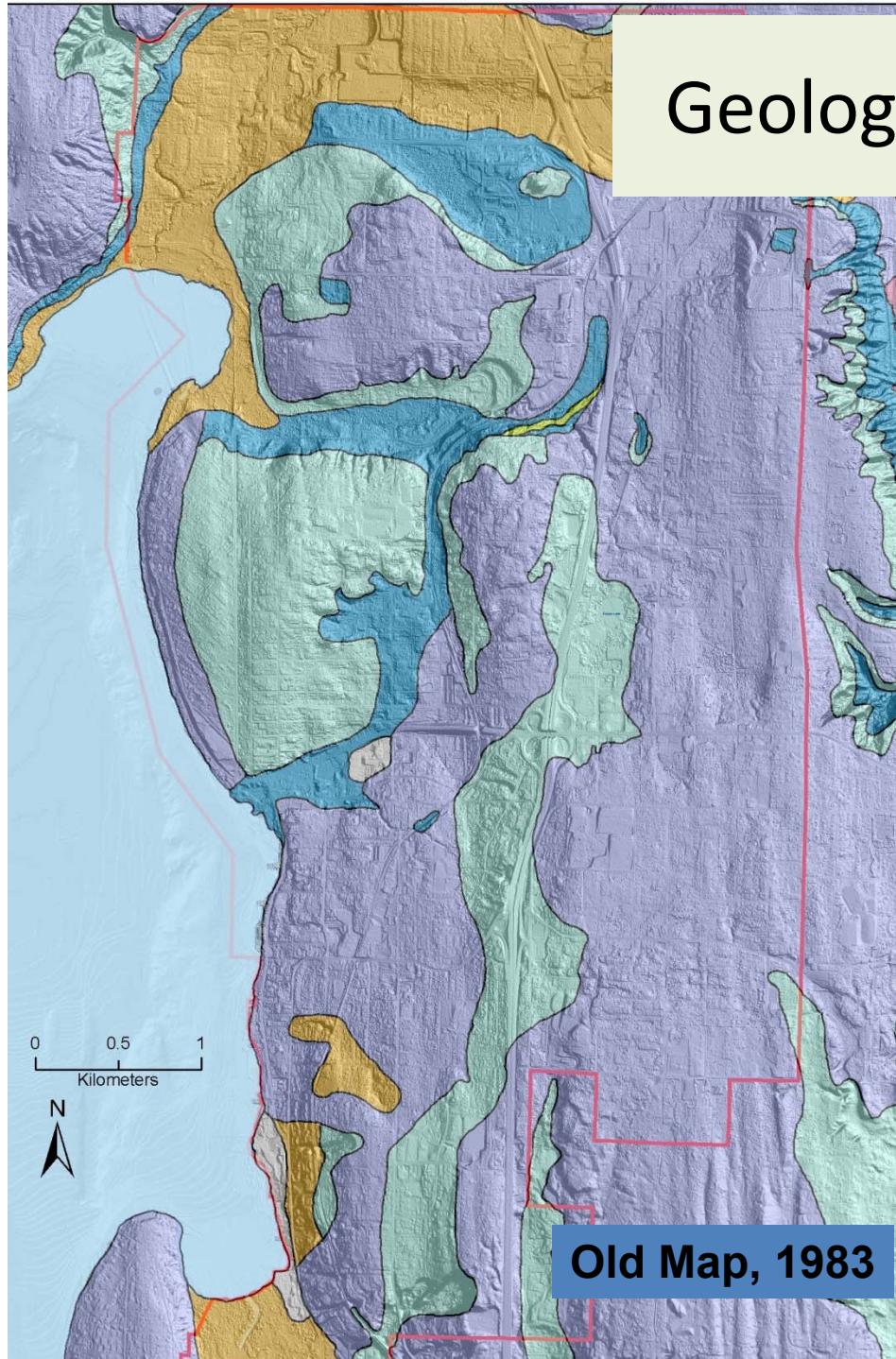
University of Washington



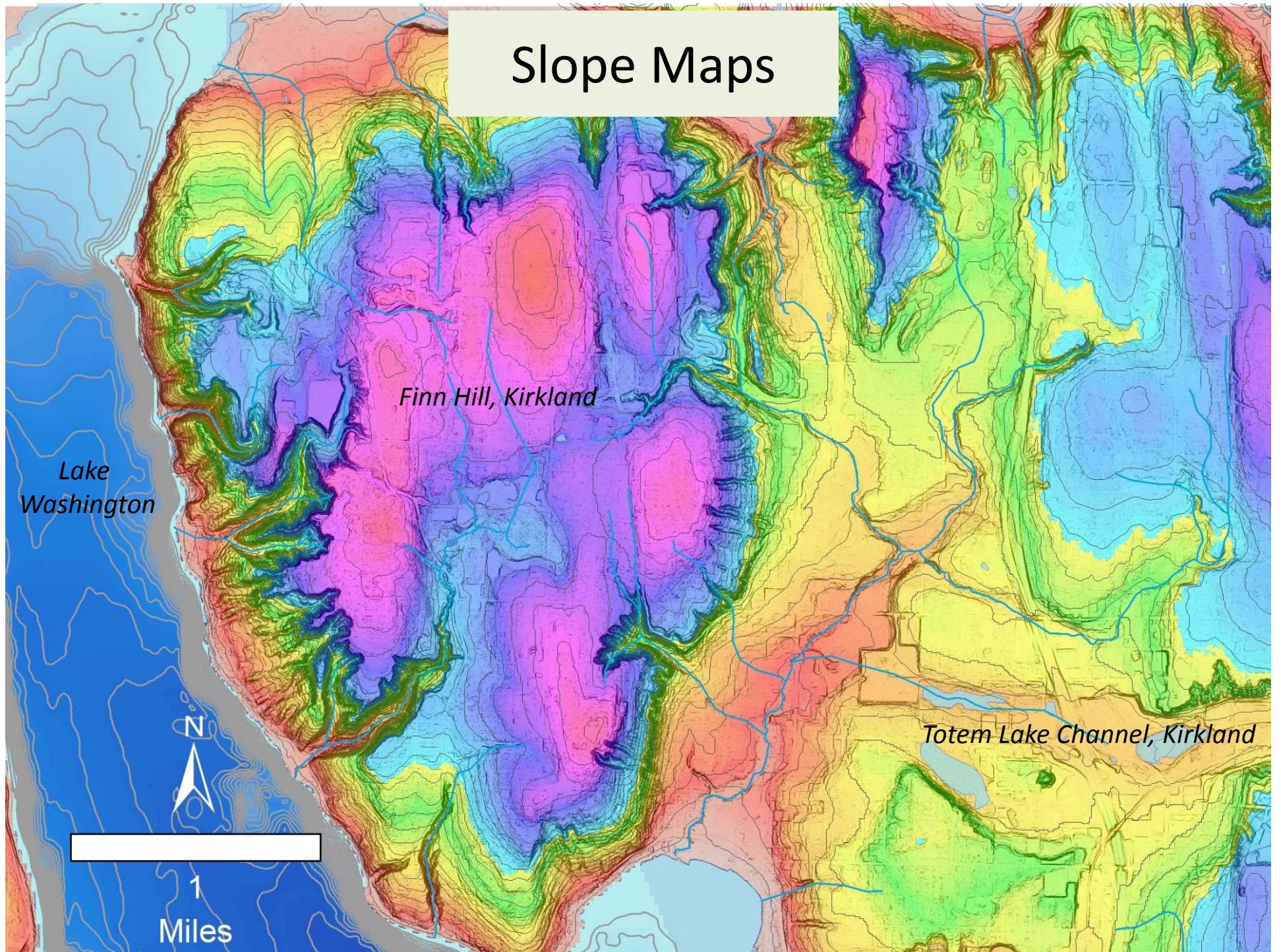
# Uses of Lidar

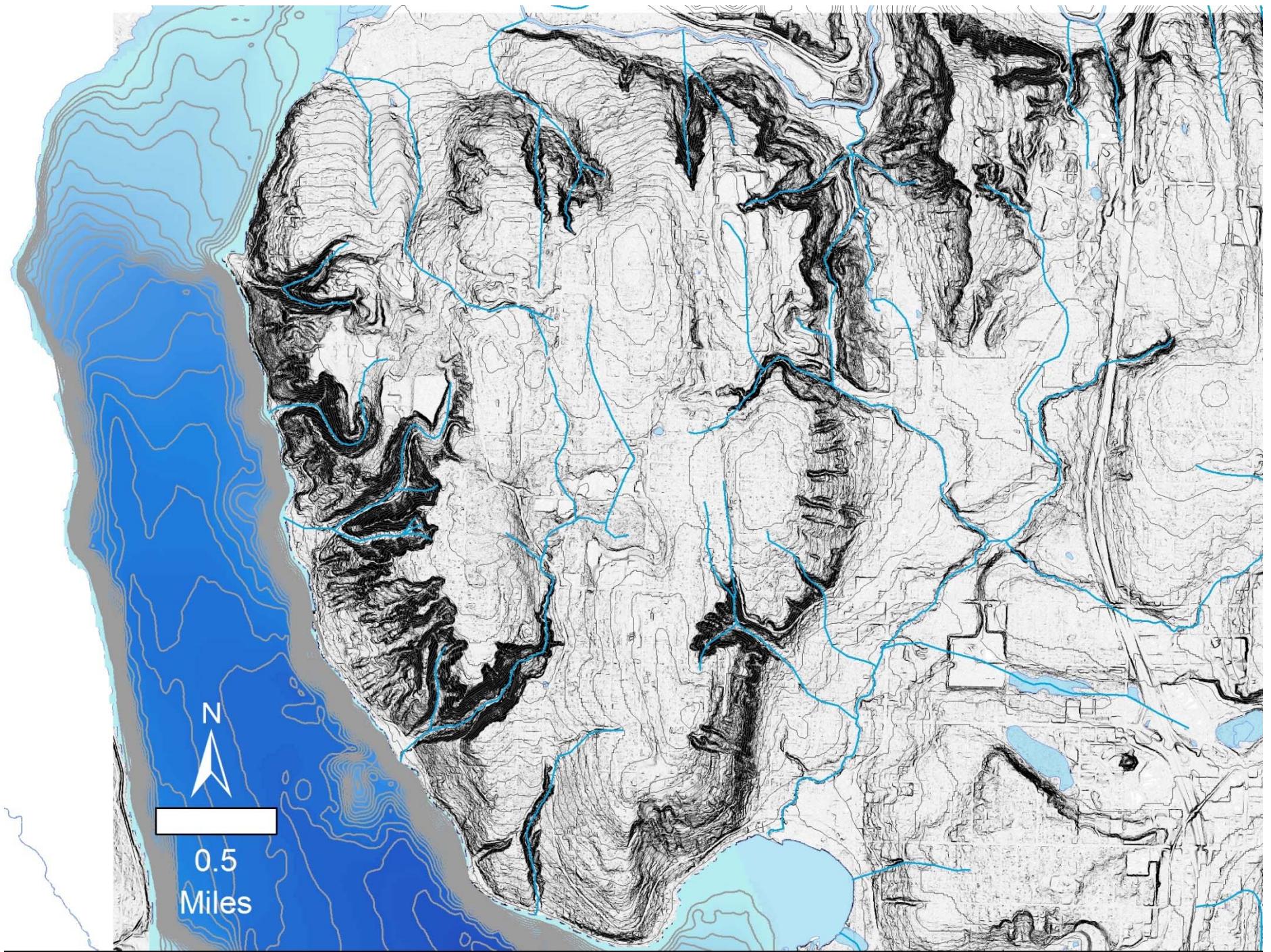
- Landform and Geologic Mapping
- Maps and Models of Geologic Hazards
- Locating active faults
- Groundwater Maps and Modeling
- Evaluating Geological History
- Resource Mapping and Management
- ...

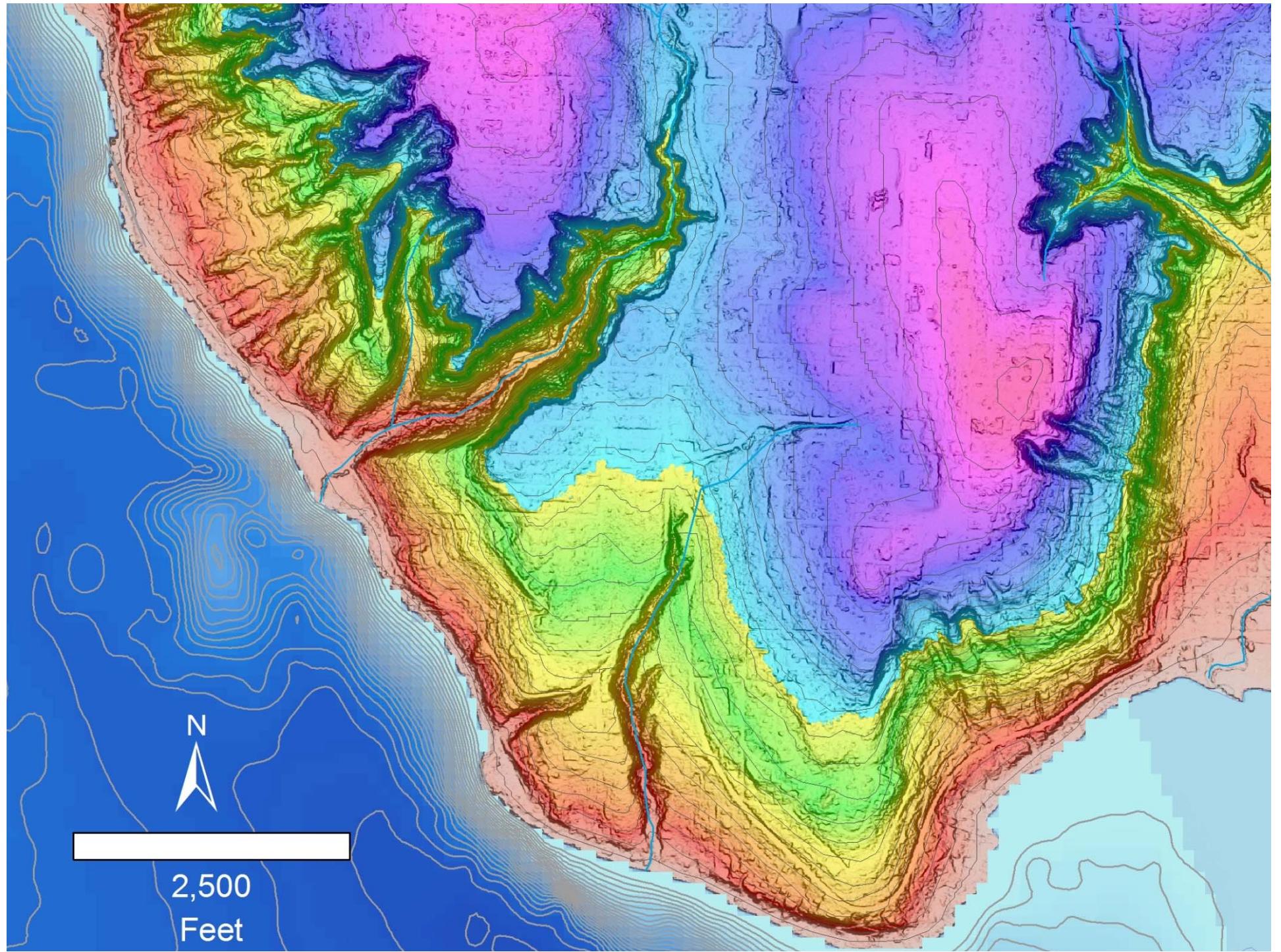
# Geologic Maps

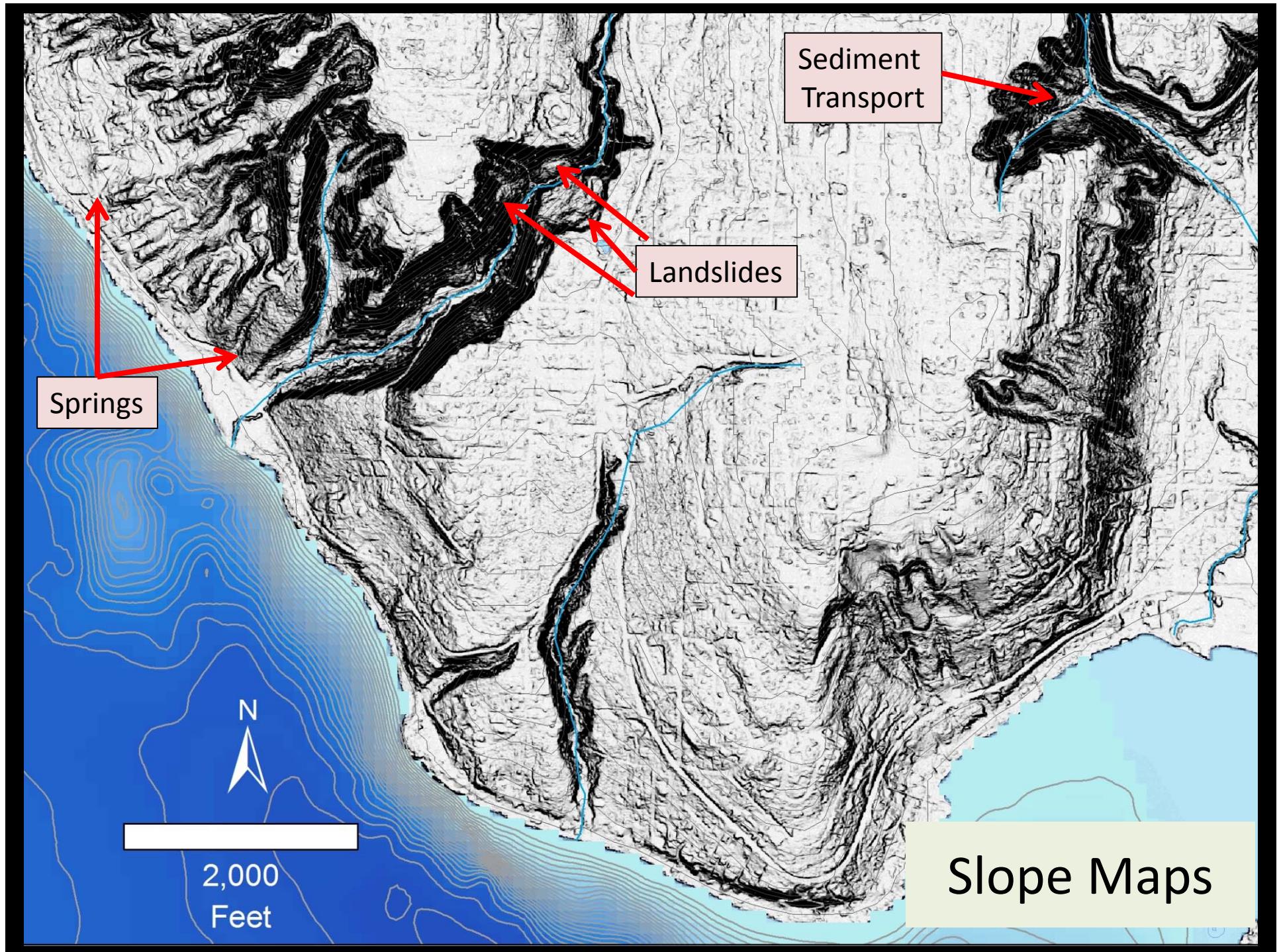


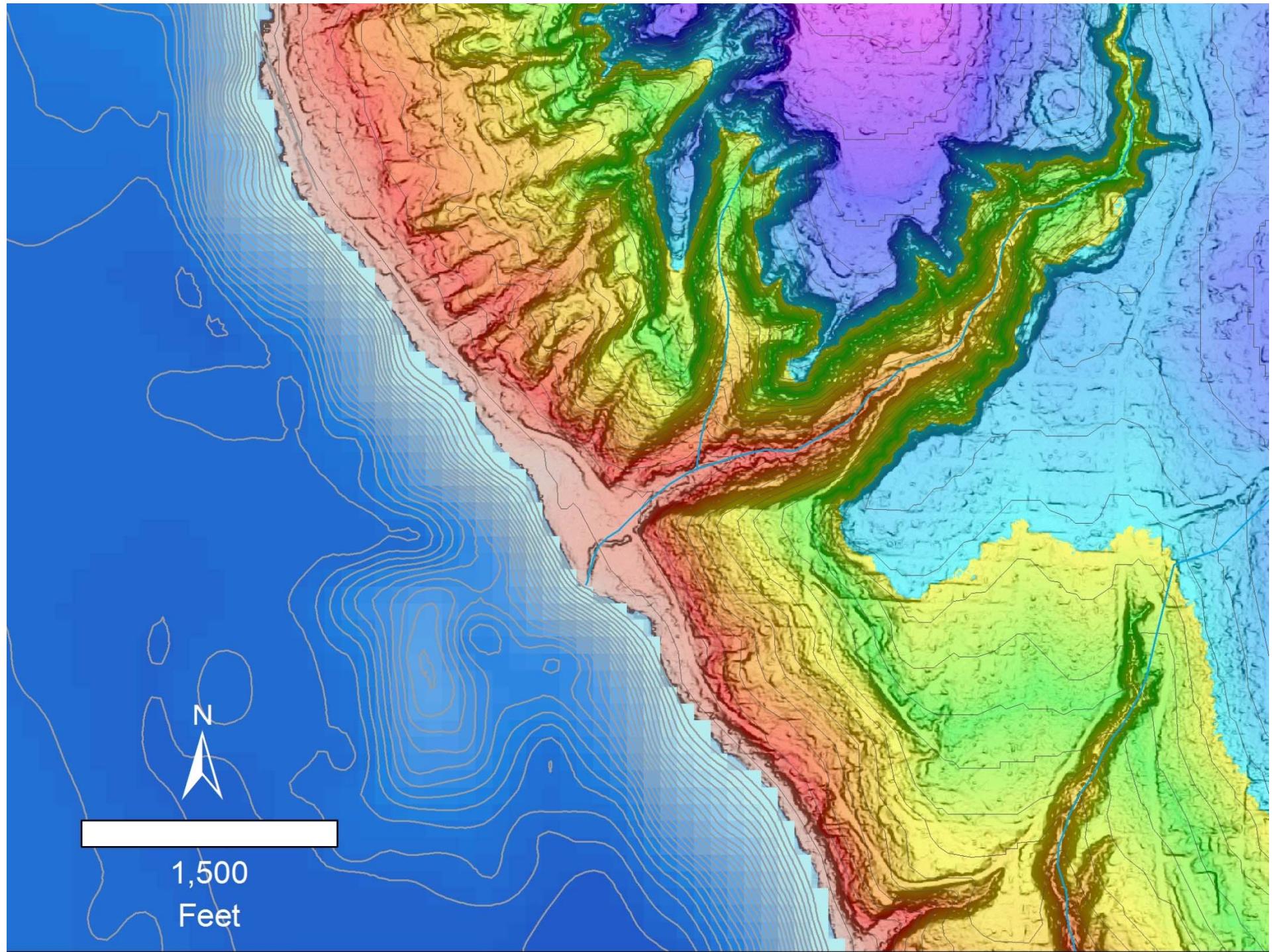
# Slope Maps









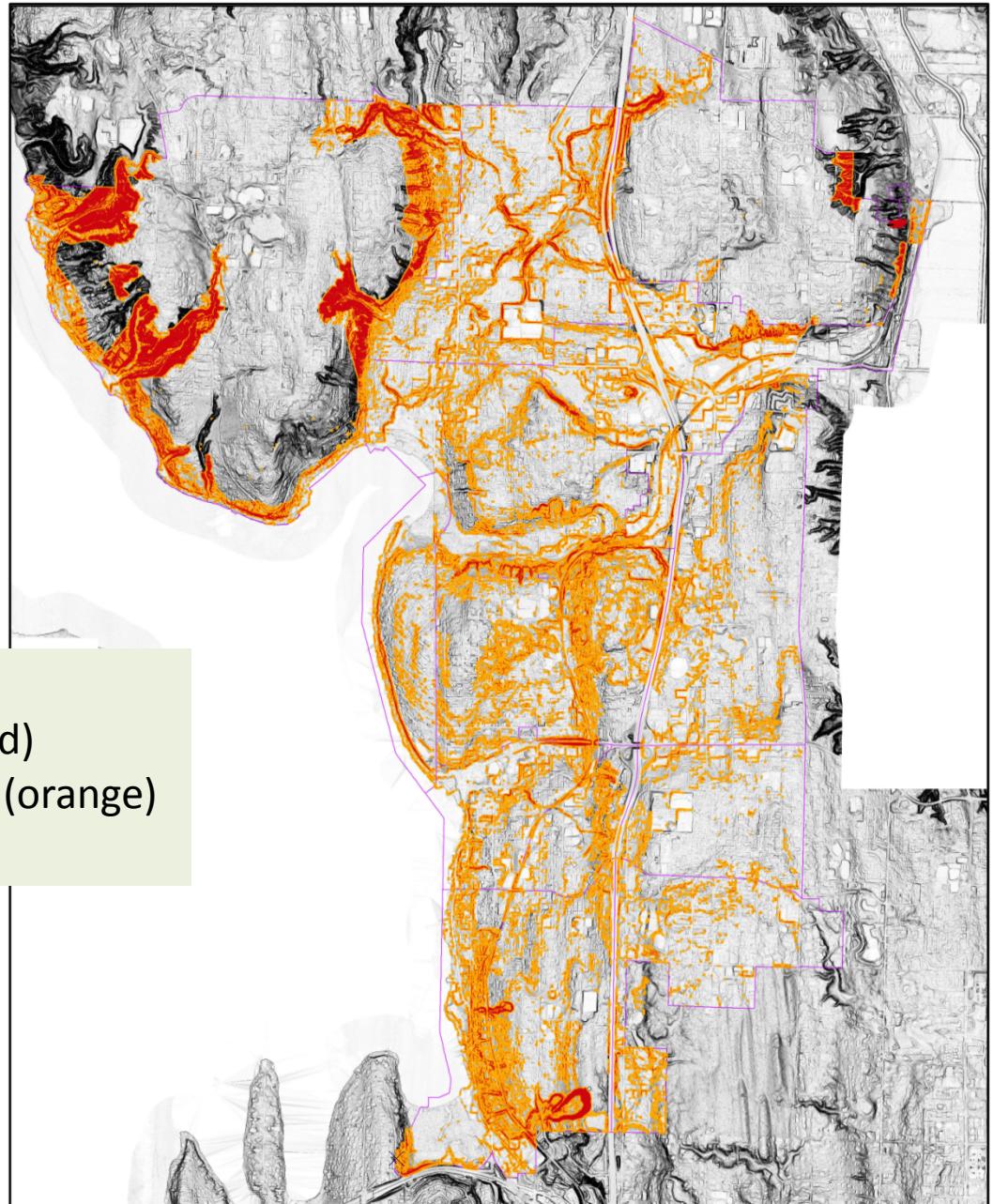


# Draft Shallow Landslide Susceptibility Modeling, Kirkland

FOS of Slopes:  
<1.25 are considered highly hazardous (red)  
>1.25 and <1.5 are moderately hazardous (orange)  
>1.5 are low hazards (no color)

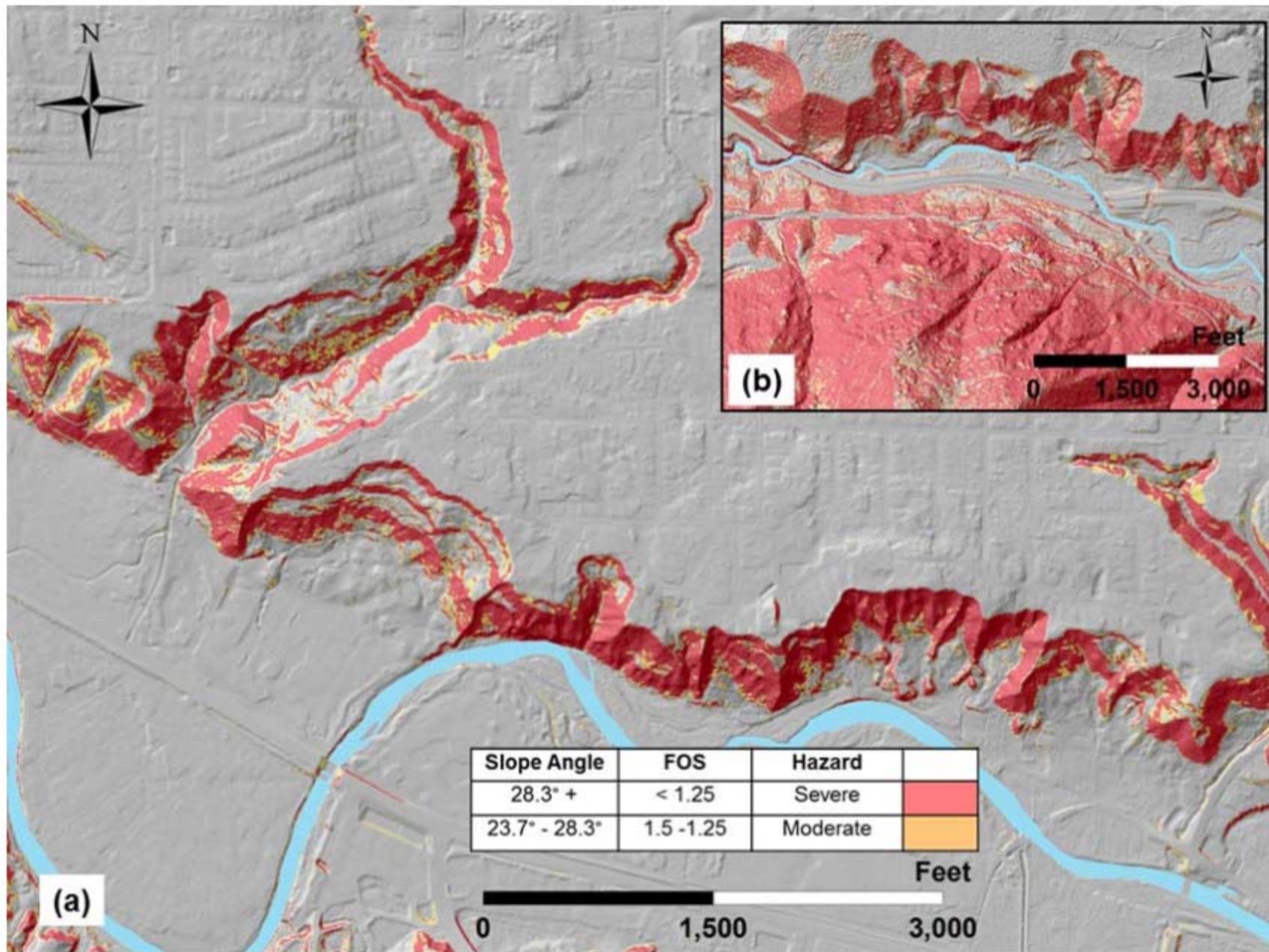
Burns, Madin, and Mickelson, 2012

Katie Teague, 2016



0 0.225 0.45 0.9 1.35 1.8  
Miles

# Shallow Landslide Hazard Map, King County



# Cedar River Flow Slides

WADNR, DGER, GIS

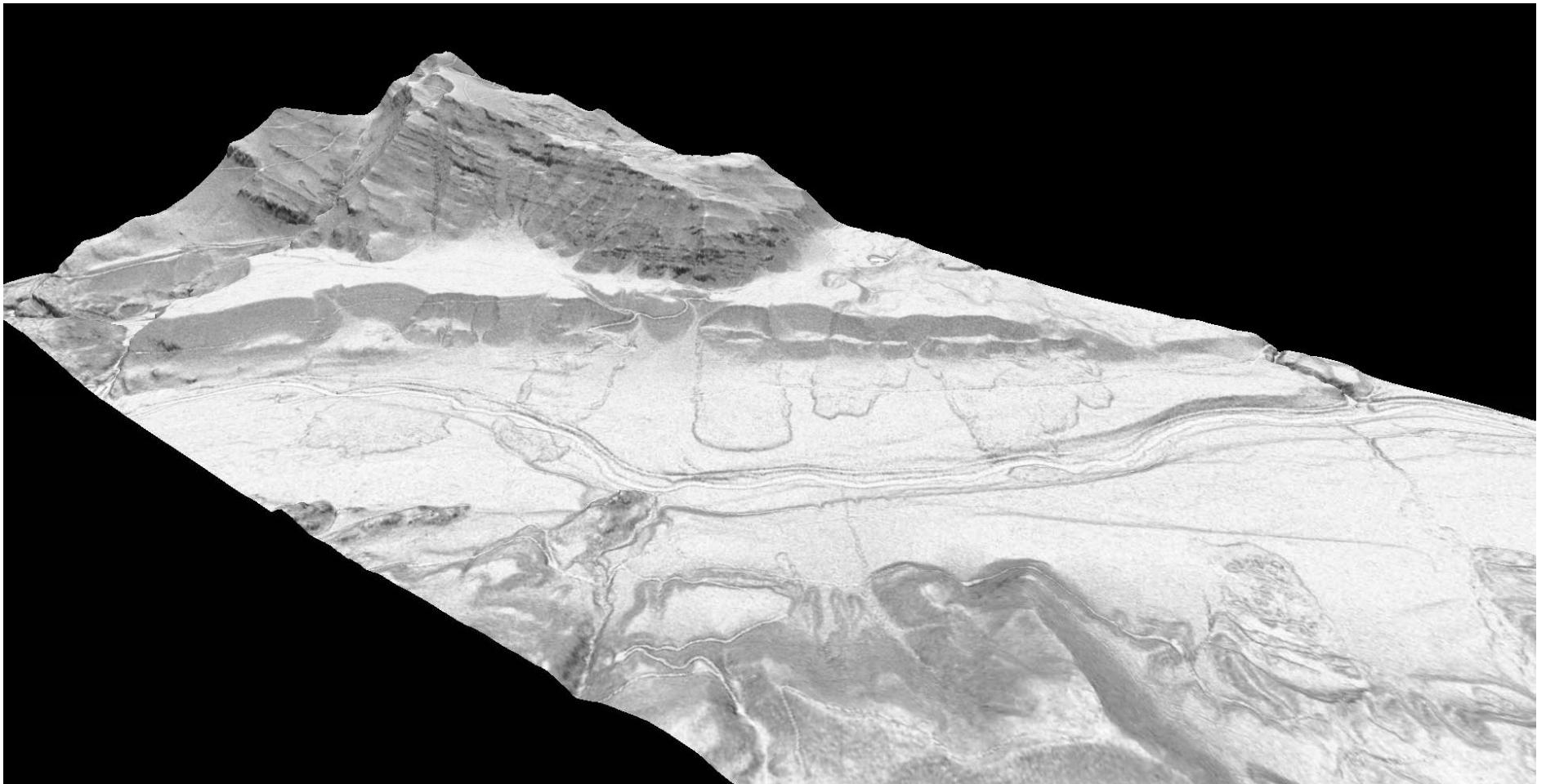


# 3-D Imaging, Cedar River



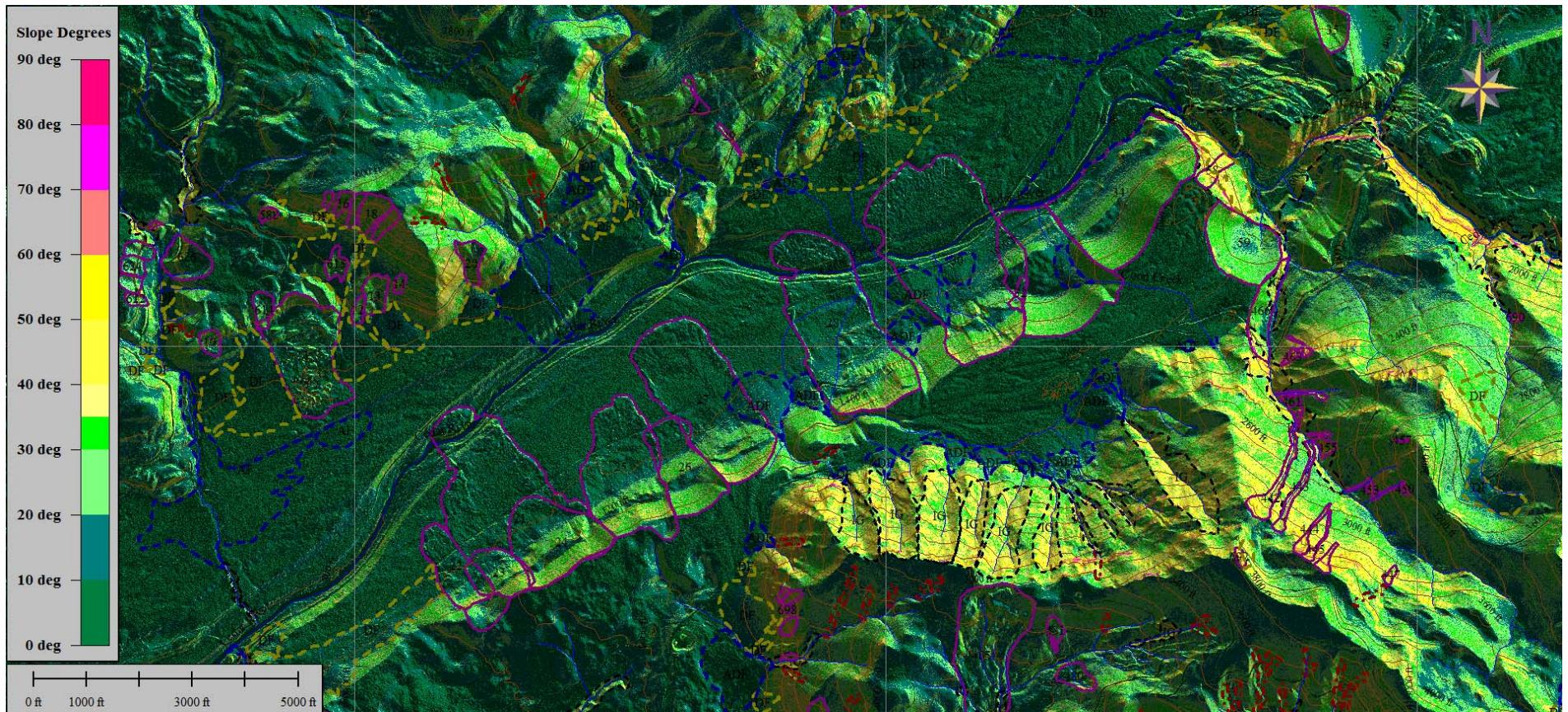
Oldrich Hungr, 2016

# 3-D Imaging, Cedar River



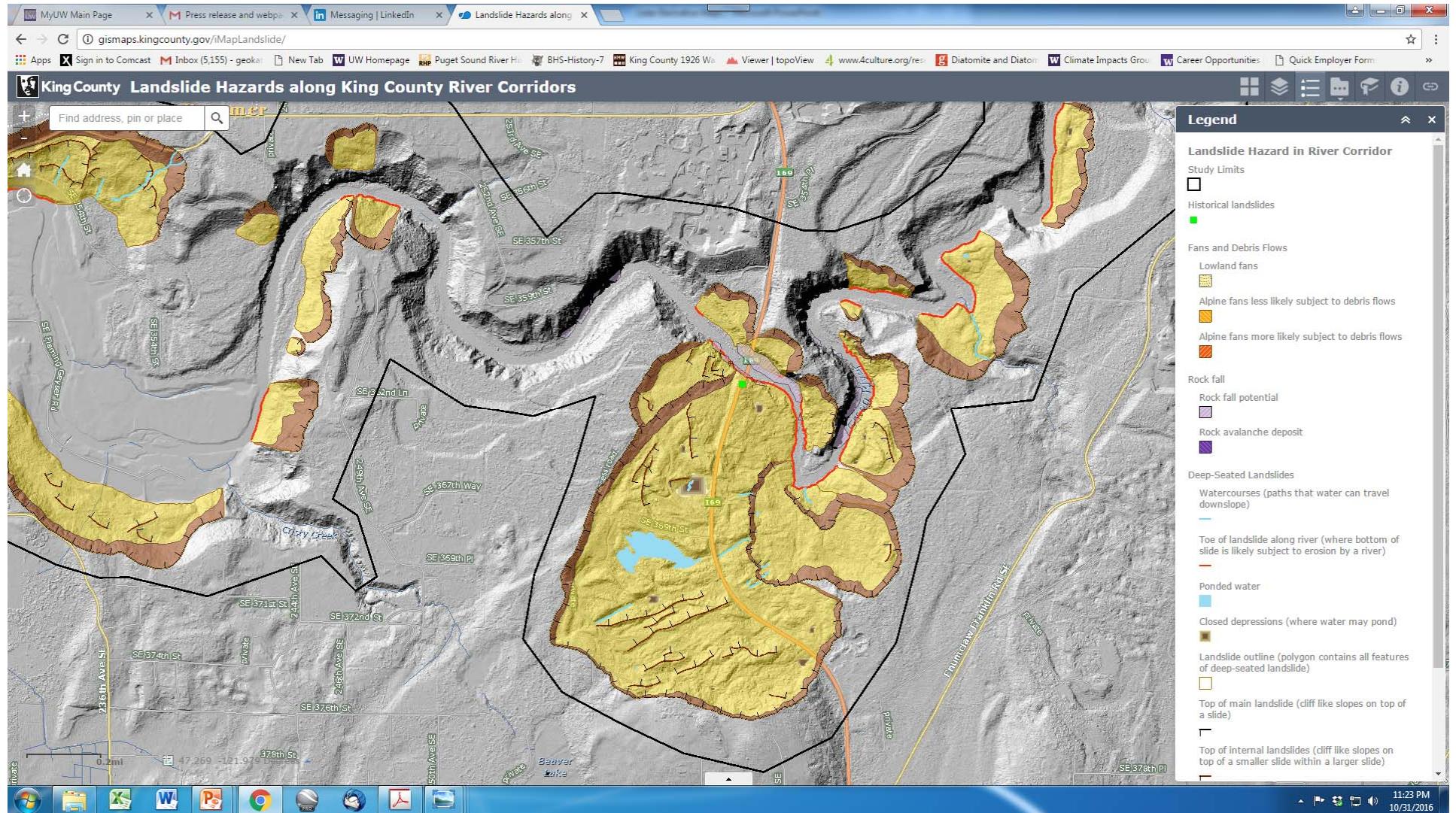
Oldrich Hungr, 2016

# Cedar River Watershed, Slope Map



Unstable Landforms Mapping, by Bruce Stoker, 2016

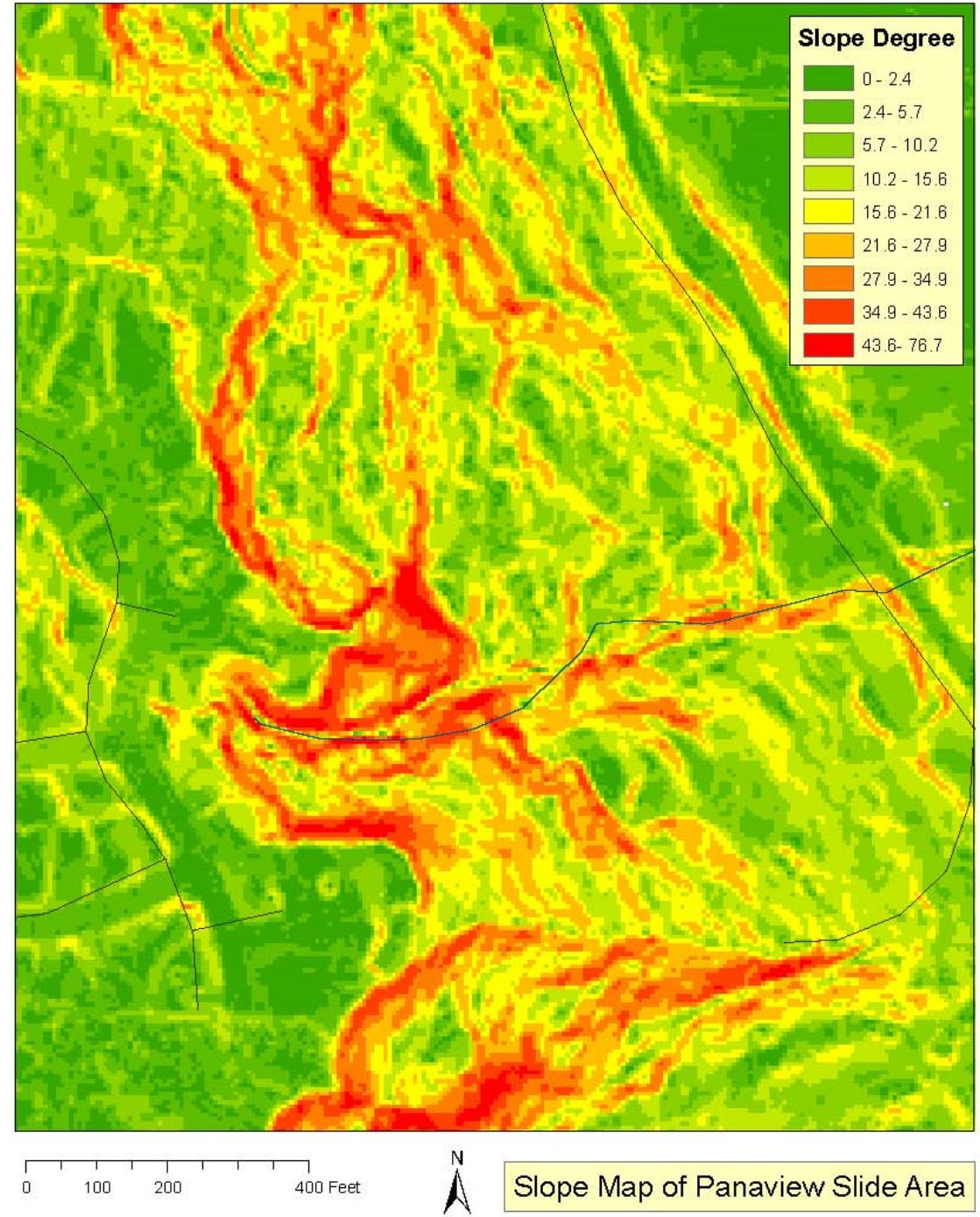
# Deep-Seated Landslides - Maps and Inventory



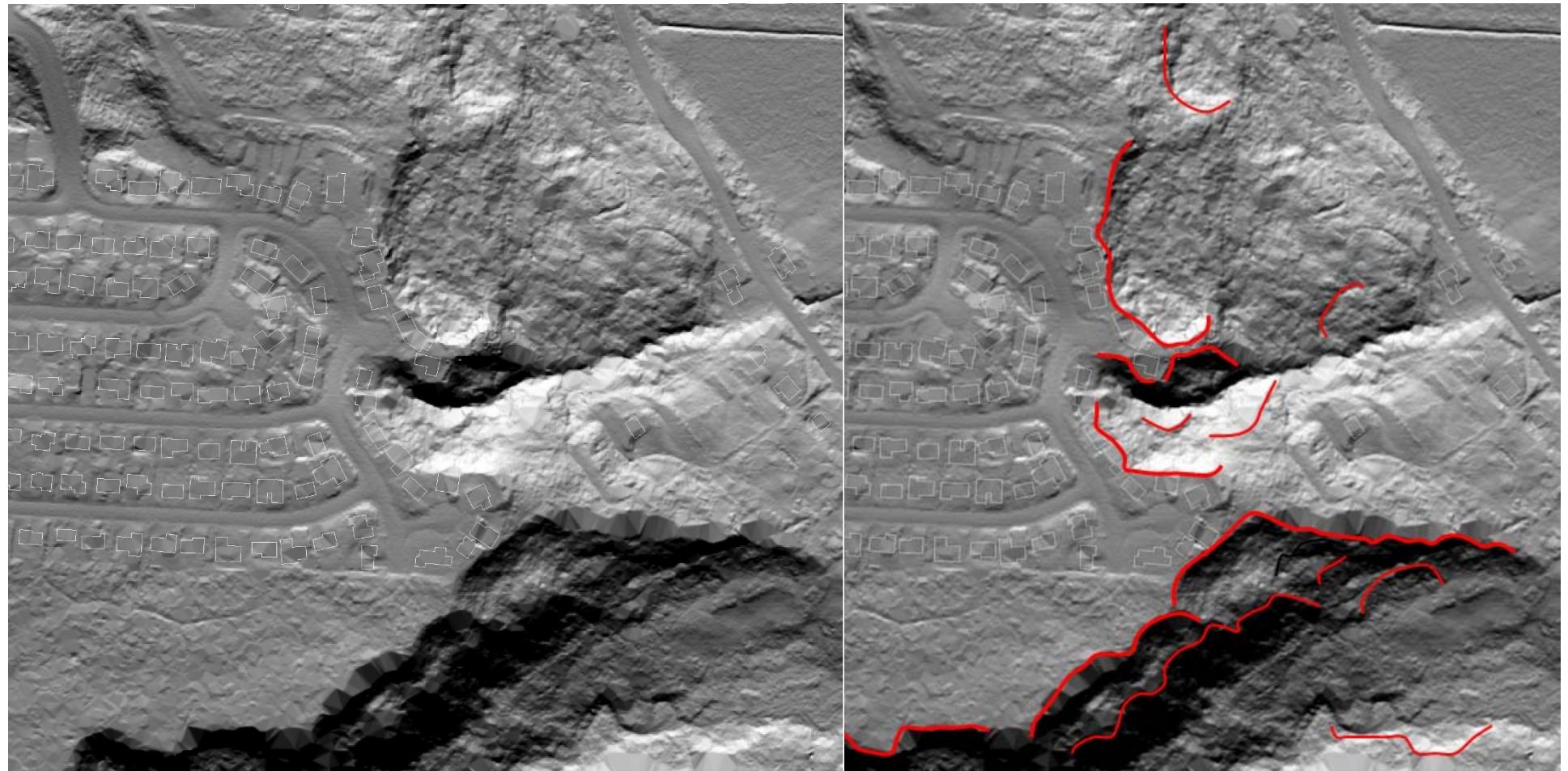
## King County

Note:

- Scarps
- Flat areas
- Abrupt end to gully



# Panaview Area



# Surface Water Infiltration Potential

Based on geology: grain size, density, saturation

Red = High

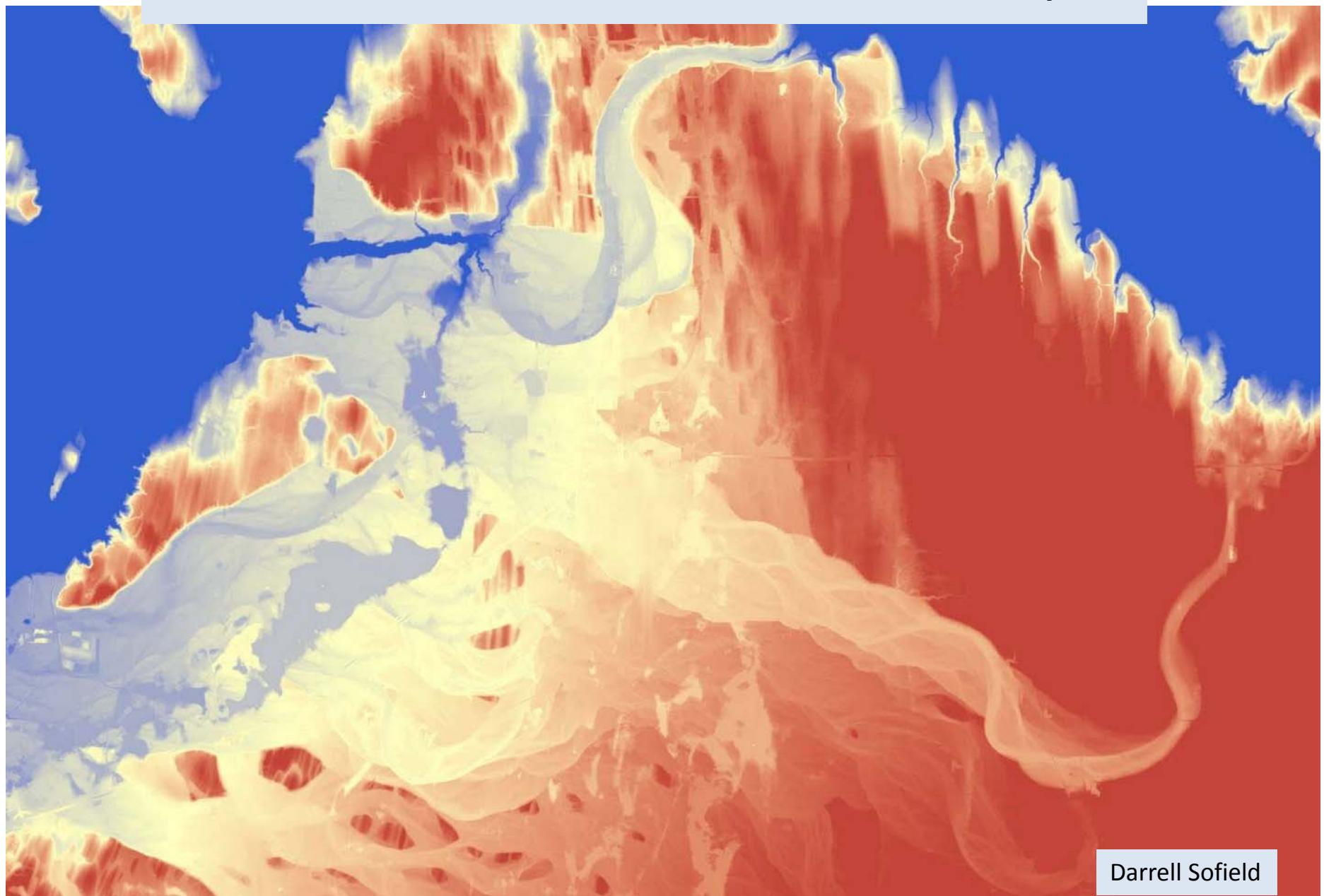
Orange = Medium

Yellow = Mixed

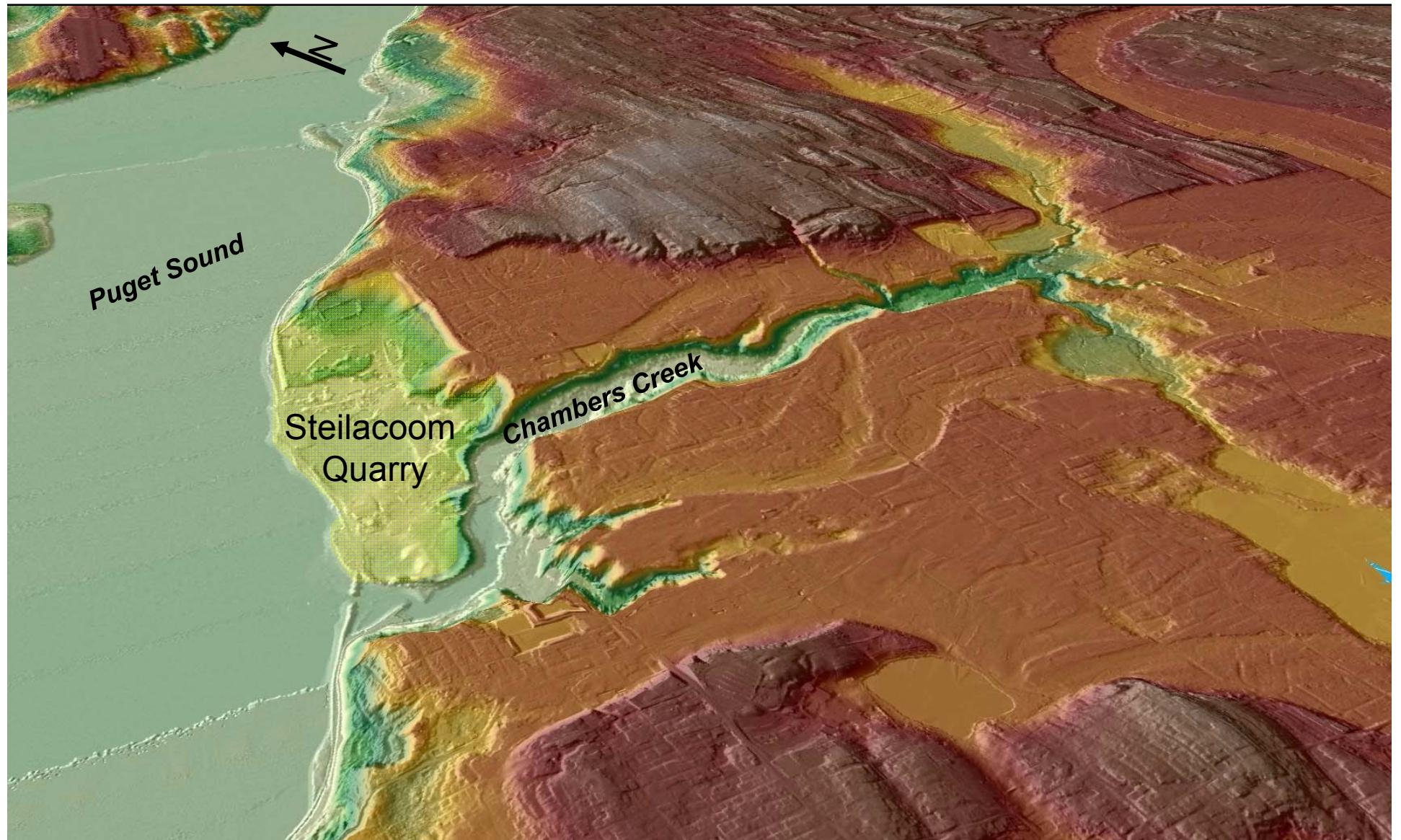
Green = Low



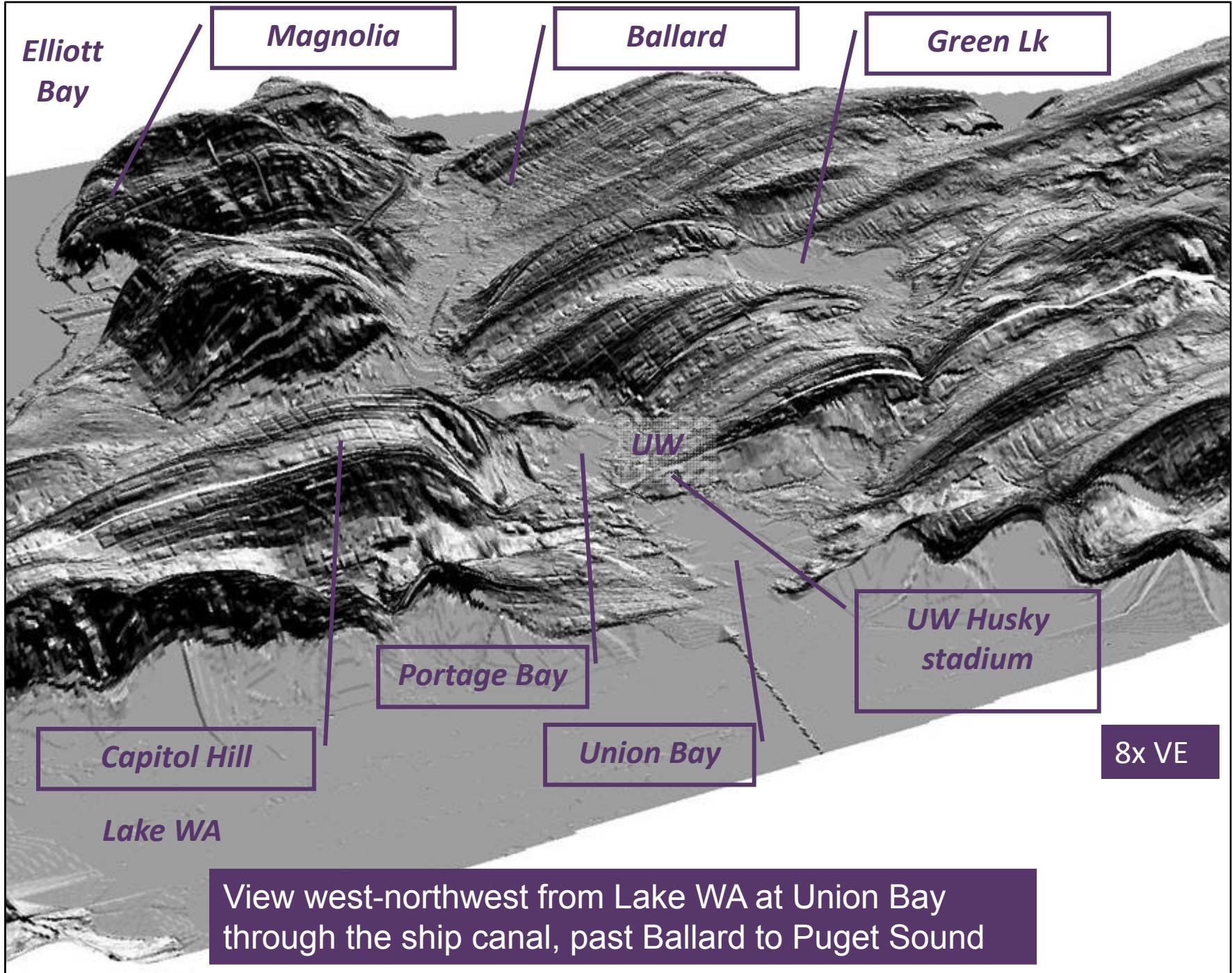
# Post Glacial Erosion, Pierce County



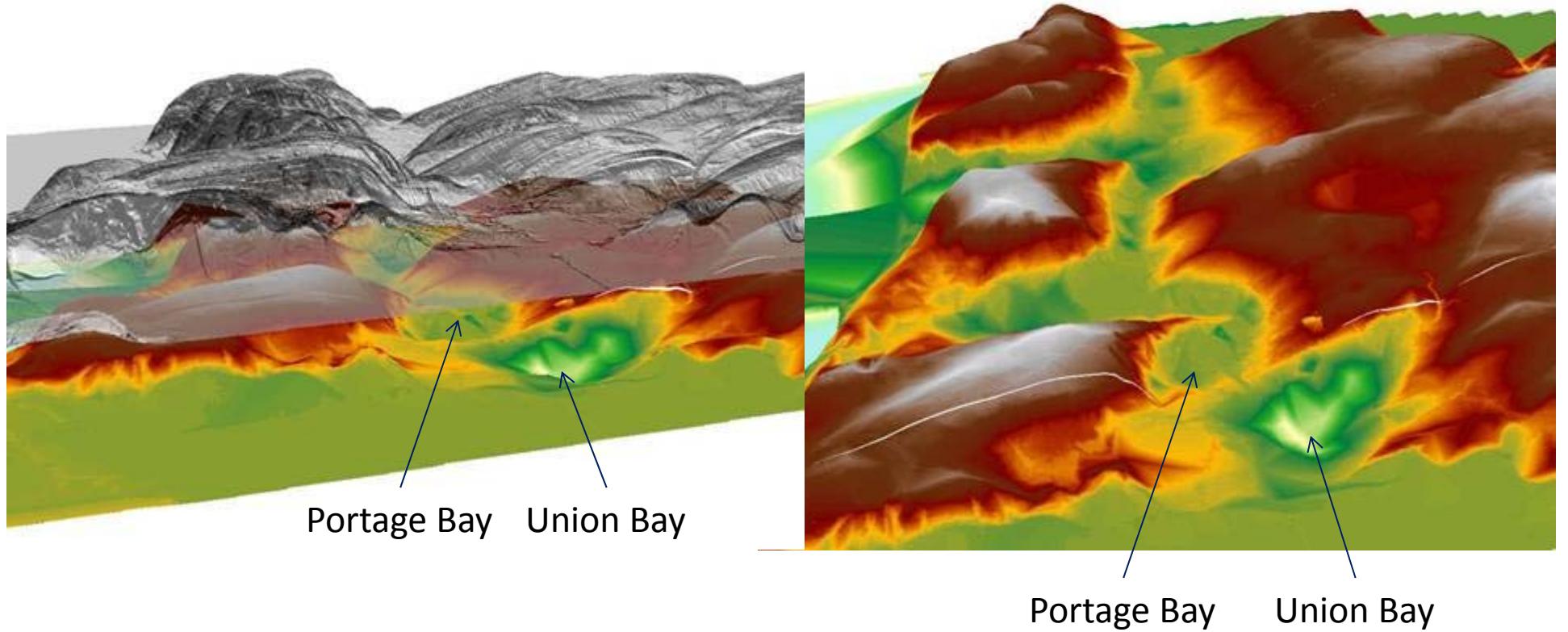
Darrell Sofield



Aaron Wisher



## “Chain of potholes”

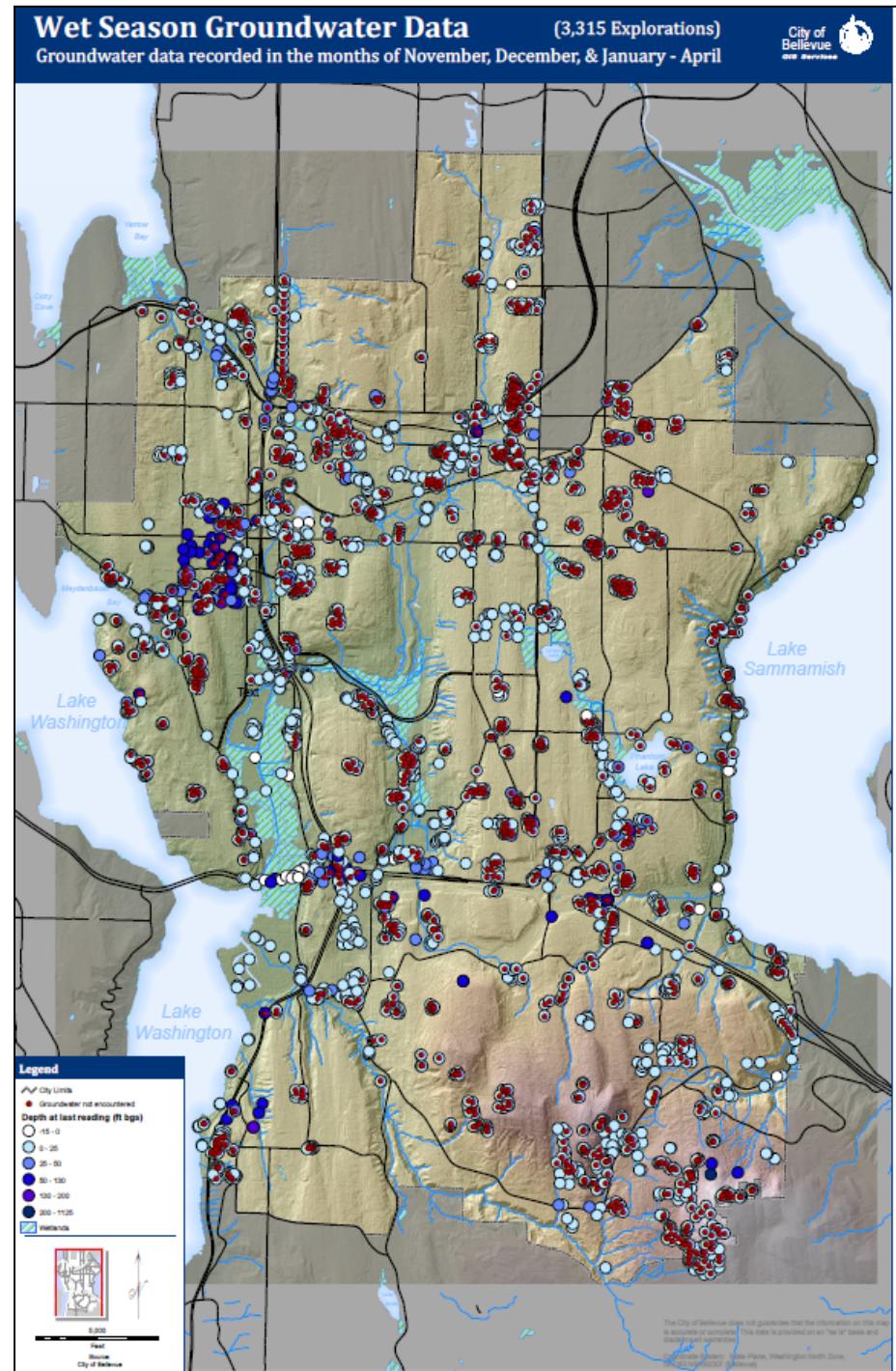


View west-northwest from Lake WA at Union Bay  
through the ship canal, past Ballard to Puget Sound

# Groundwater Applications

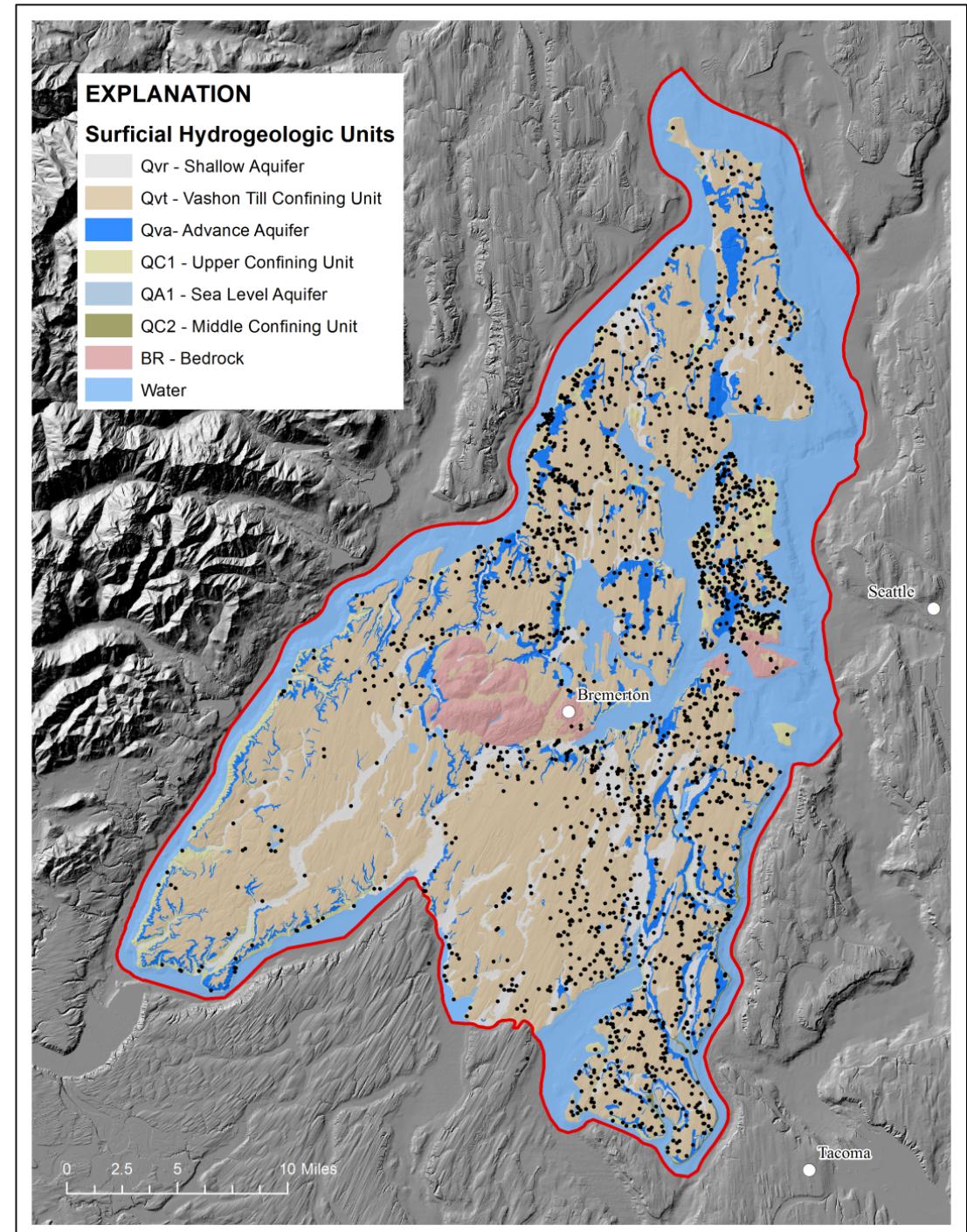
Lidar provides:

- Elevation control
- Geomorphology
- Stream channels
- Spring lines

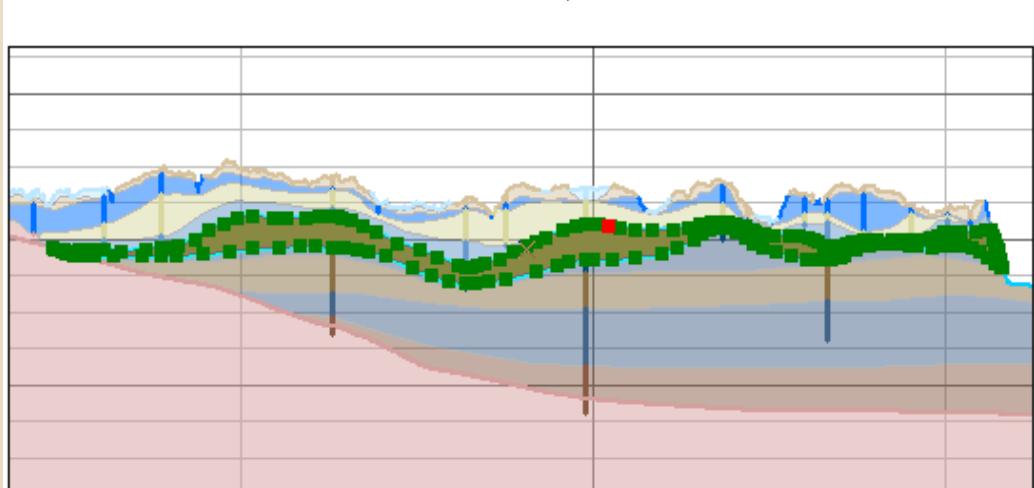
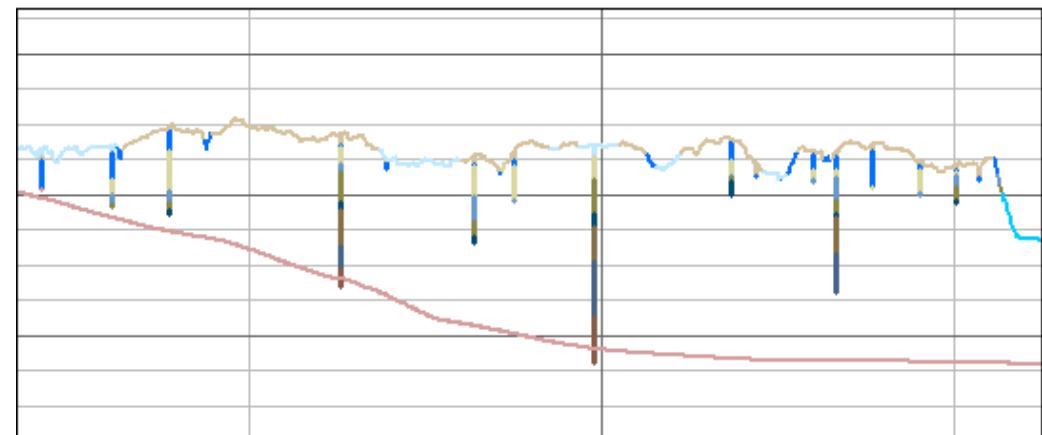
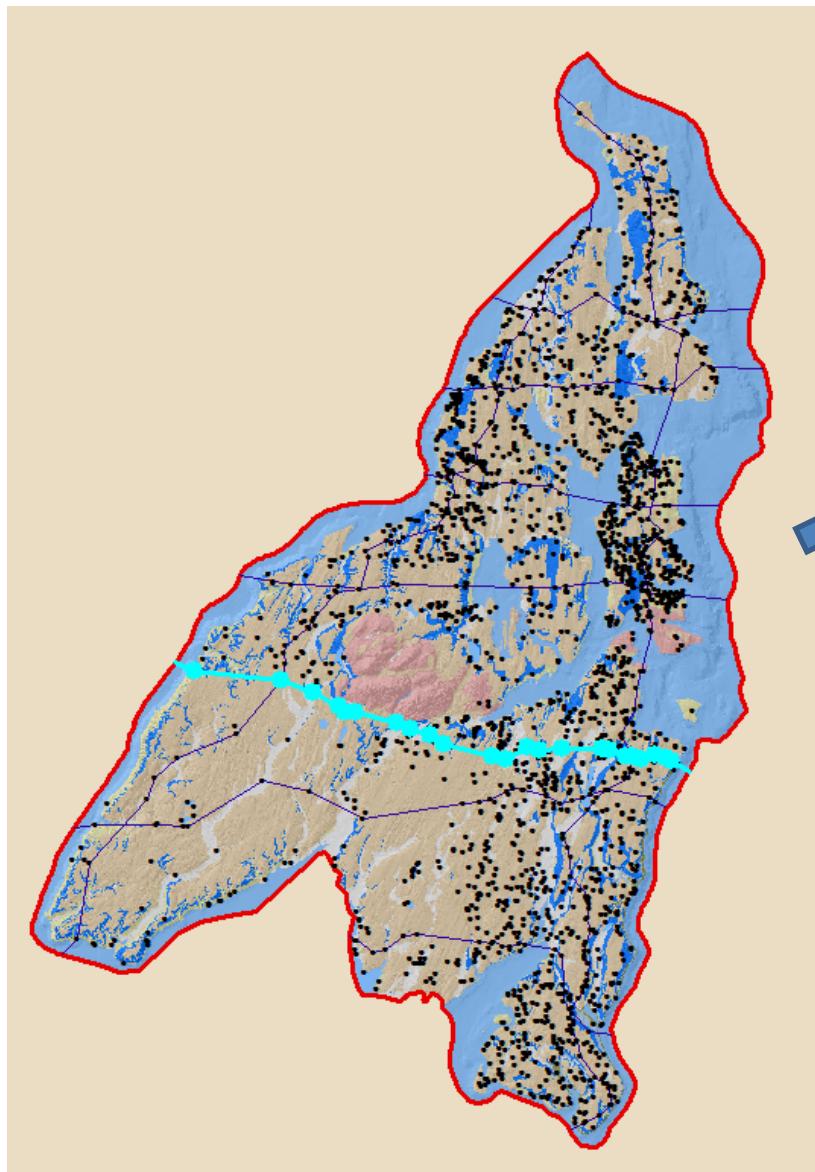


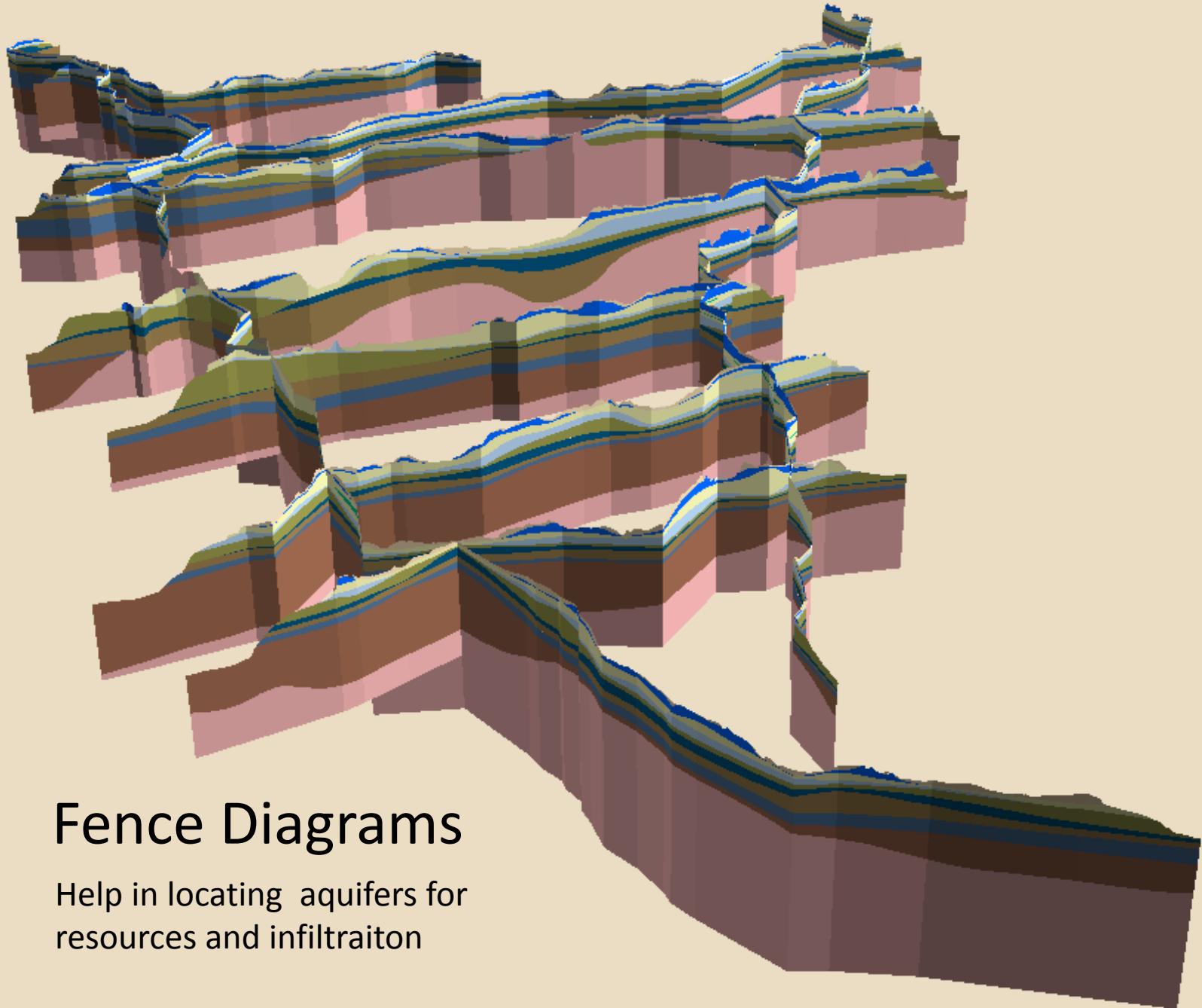
# Arc Hydro Data Model and Tools, Hydrogeologic Framework for the Kitsap Peninsula

- Wendy Welch, USGS
- Strassberg and others, 2011



# Cross Sections





## Fence Diagrams

Help in locating aquifers for resources and infiltration

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