



Seattle Landslides: What You Need to Know



Photo by John Skelton

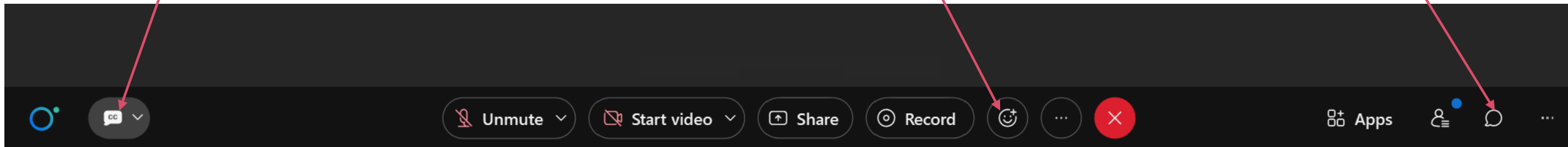


Seattle Department of
Construction & Inspections

Seattle Home Fair
Pao-Tsung Huang, Ph.D., P.E. & Manika Maharjan Ph.D., P.E.
October 14, 2023

Before Presentation

- Presentation is being recorded
- Closed Captioning and Translation is available
- Use Raise Hand function so we can unmute you for questions
- Use Chat function for questions



OUTLINE

- Why do landslides happen?
- Is my property in a landslide-prone area?
- Do's and don'ts in landslide-prone areas
- Who do I call to report a landslide?
- Do I need a permit for work in landslide-prone areas?



WHY DO LANDSLIDES HAPPEN?

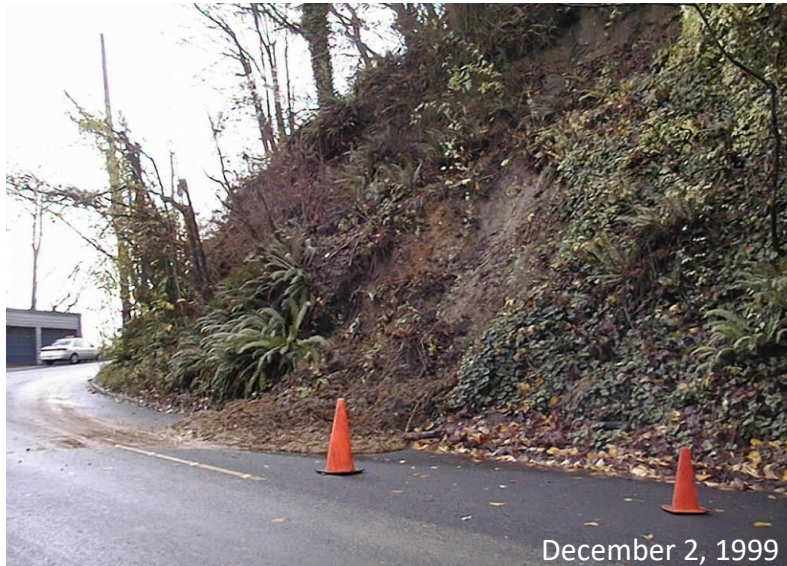
- Topography (slope of the ground surface)
- Geology (type of soil)
- Water
- Water
- Water
- Human Activities



TYPES OF SLIDES

Shallow Slide

Most landslides in Seattle (70%) are shallow slides and influenced by human activity such as stormwater.



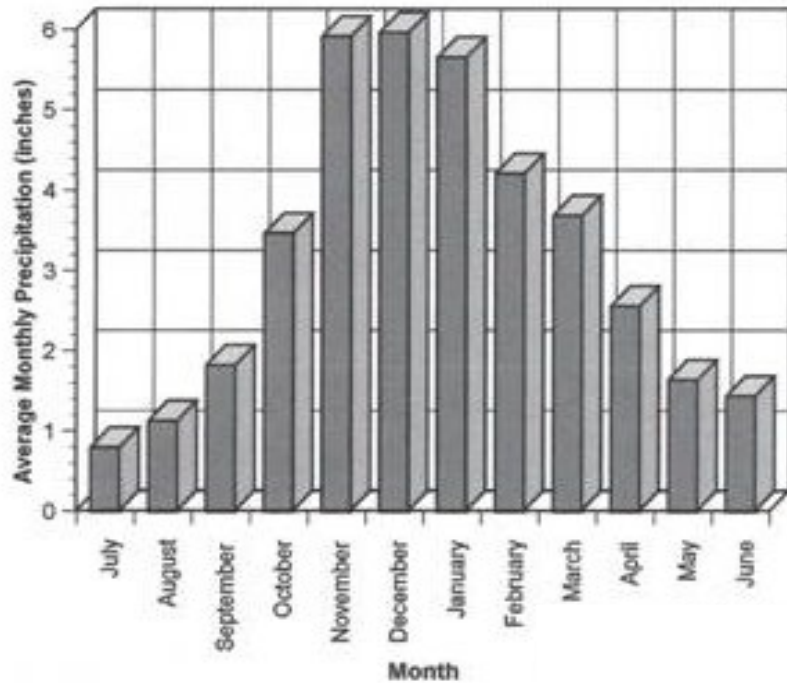
Deep-Seated Slide

About 20% of landslides in the historical record are deep-seated slides.



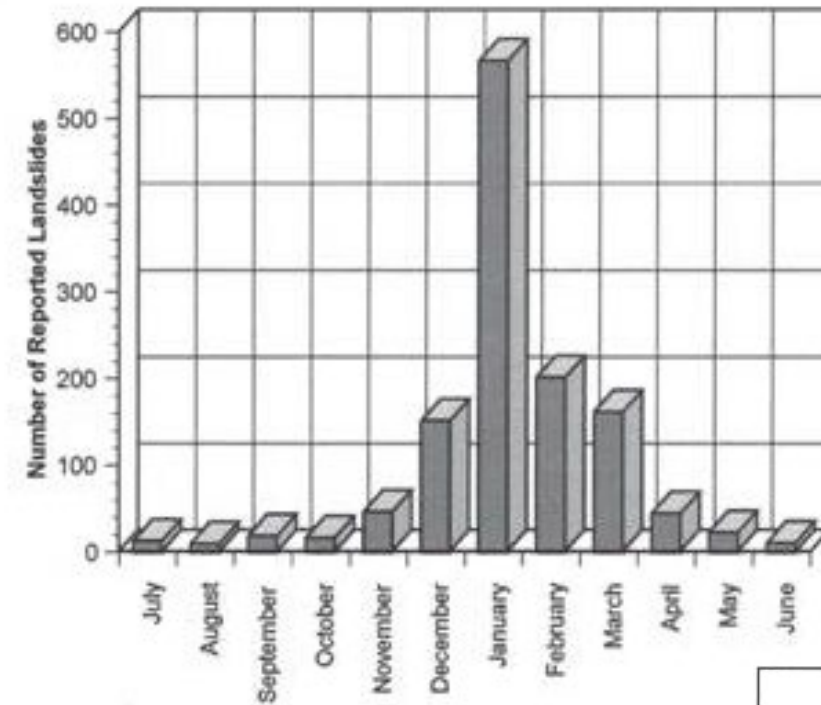
MONTHLY DISTRIBUTION OF LANDSLIDES

Rainfall by Month



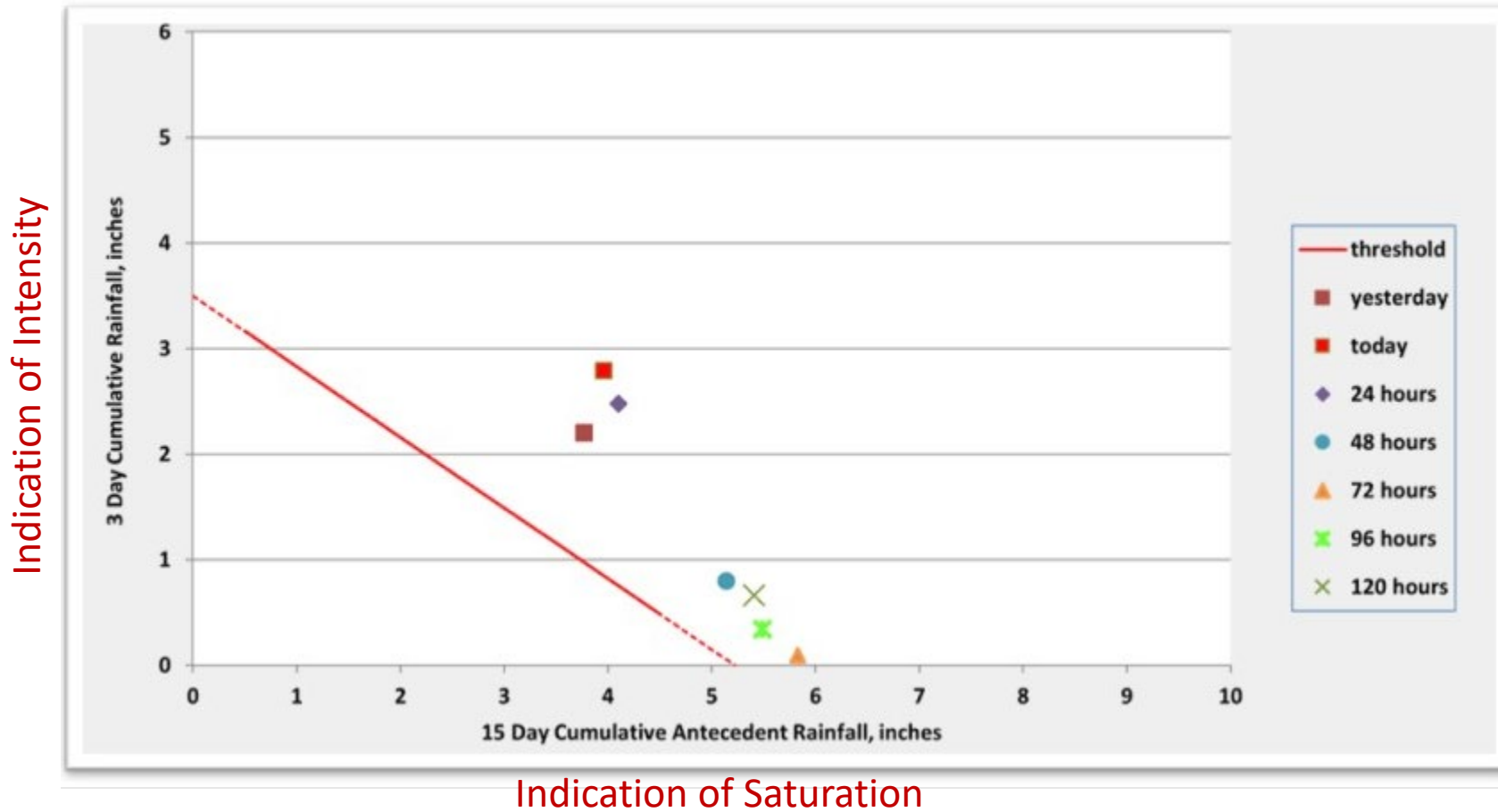
Reported average monthly precipitation is from the SeaTac station for the years of 1948 through 1997

Landslides by Month



Seattle Landslide Study Seattle Public Utilities Seattle, Washington	
MONTHLY DISTRIBUTION OF LANDSLIDES	
October 1998	W-7992-04
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants	FIG. 1-8 Sheet 1 of 2

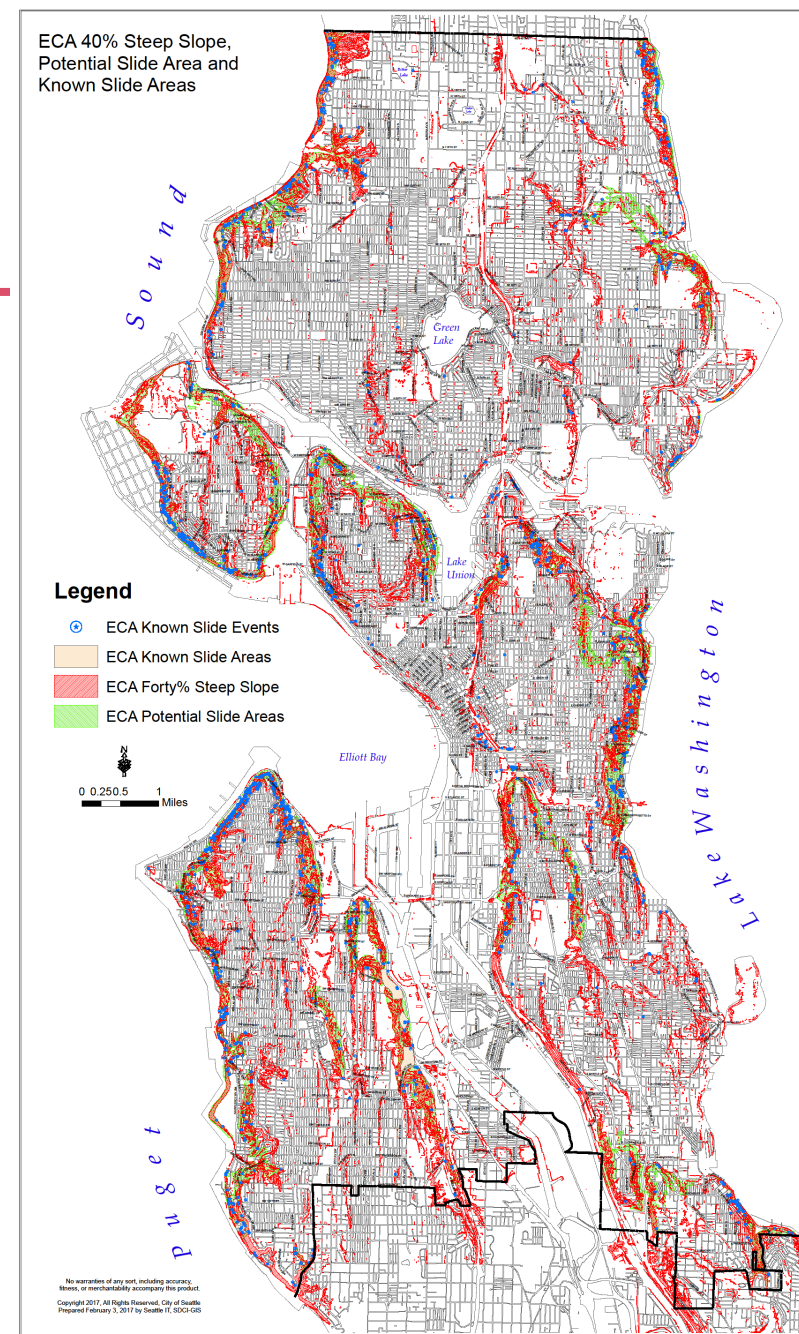
USGS LANDSLIDE/PRECIPITATION THRESHOLD



<https://www.usgs.gov/programs/landslide-hazards/science/seattle-washington-landslide-monitoring-site>

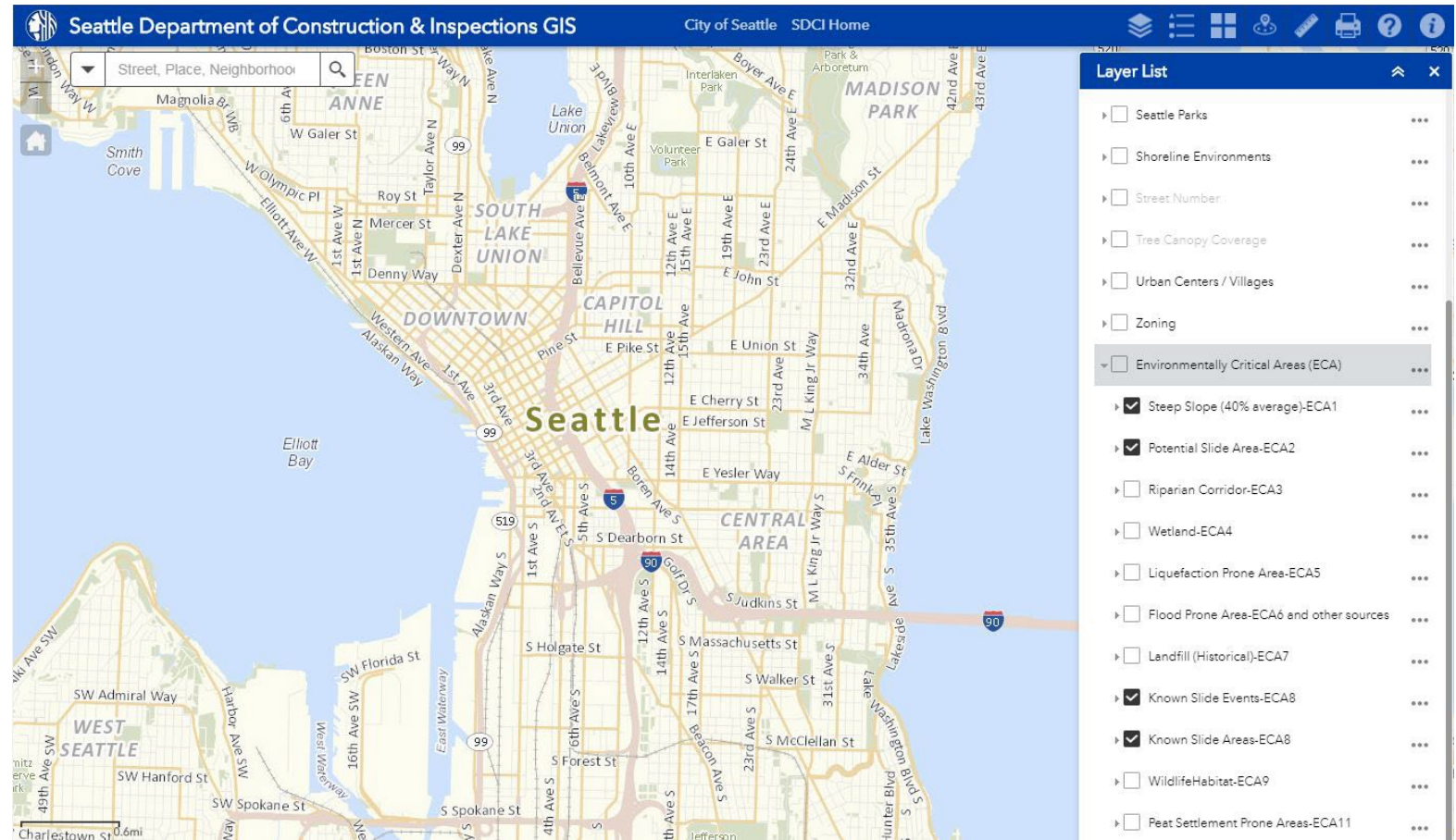
LANDSLIDE PRONE AREAS

- Steep slope erosion hazard areas:
at least 10 feet high, 40% grade or steeper. For example: height of 10 feet or more over a horizontal distance of 25 feet
- Known slide areas
- Potential landslide area due to geologic conditions:
areas identified by the Seattle Landslide Study (2000), may include areas of landslide runout



SDCI GIS MAP

- Go to <https://www.seattle.gov/sdci/resources> and select GIS
- Search for Address
- Click on ECAs – Note some of the known slides in GIS may have more information



DO LIST

- Maintain drainage system (pipes, ditches, etc., on your property)
- Keep street drains free of leaves and debris
- If you have a sprinkler system, shut it off and check it out seasonally
- Direct stormwater away from steep slopes



DO LIST

- Perform periodic inspections of property before winter and during storms
- Check weep holes on walls and keep them open
- Keep fill and yard waste off slopes
- Leave stumps in the ground on slopes
- Call a professional if you have questions or see a problem



DON'T LIST

- Don't direct storm or other water onto a slope
- Don't remove vegetation on slope without a re-vegetation plan
- Don't put fill or yard debris on a steep slope
- Don't remove tree stumps from slopes
- Don't install a permanent irrigation system in landslide-prone areas
- Don't cut into the toe (or bottom) of a slope
- Don't build walls or rockeries without a permit



WHO DO I CALL IN CASE OF A LANDSLIDE?

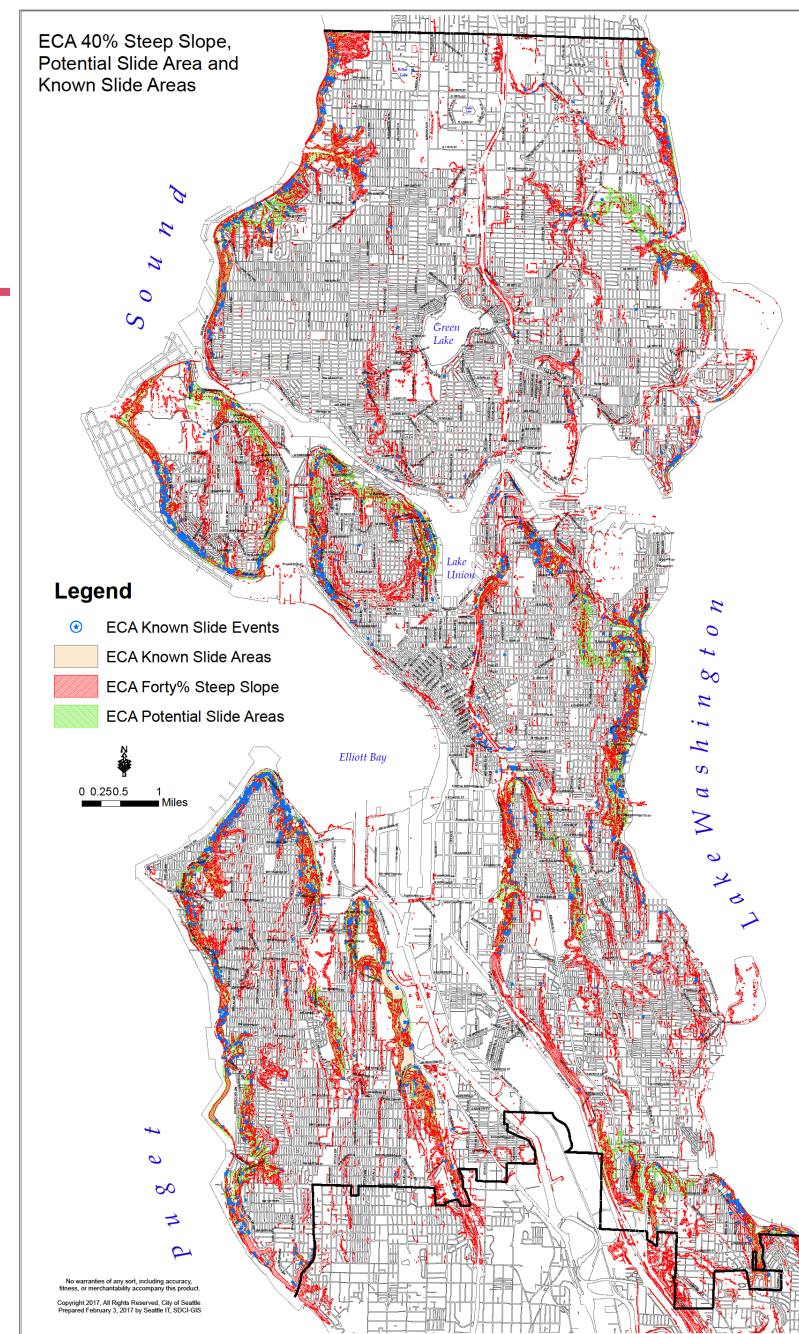
- **Call 911** if there is a threat to life or safety
- Call Seattle Public Utilities if a utility is impacted: 206-386-1800 (staffed 24/7)
- Call Seattle Department of Transportation if a road is impacted: 206-684-ROAD (staffed 24/7)
- Call Seattle Department of Construction and Inspections if a building is impacted: 206-615-0808
- Call Seattle Parks Department if the slide is in a park: 206-684-4250
- You may need to call a private geotechnical engineer and structural engineer for evaluation/repair



DO I NEED A PERMIT?

Do I need a permit to work in landslide prone areas?

- In most cases, yes
- Environmentally Critical Areas Ordinance
 - Known landslide areas
 - Potential landslide areas
 - Steep slopes erosion hazard areas



DEVELOPMENT REGULATIONS

- Environmentally Critical Areas Ordinance:
No grading/disturbance of steep slope areas is allowed. Limited exceptions include:
 - Proposed development is located where existing lawfully constructed structure and paved area are located
 - Proposed development is located on steep slope areas created by previous legal grading
 - Proposed development is in an isolated steep slope less than 20 feet in height and more than 30 feet from other steep slopes
 - Proposed development is necessary to stabilize the slope
 - See Tip 327A



DEVELOPMENT REGULATIONS

A permit is required for:

- Grading over 25 cubic yards
- All retaining walls
- All drainage installations

Remember, ECA Code requires that all development has to stay out of ECA Steep Slopes and their buffers, without ECA exemption/relief. Also, vegetation management requires approval of the vegetation management plan.



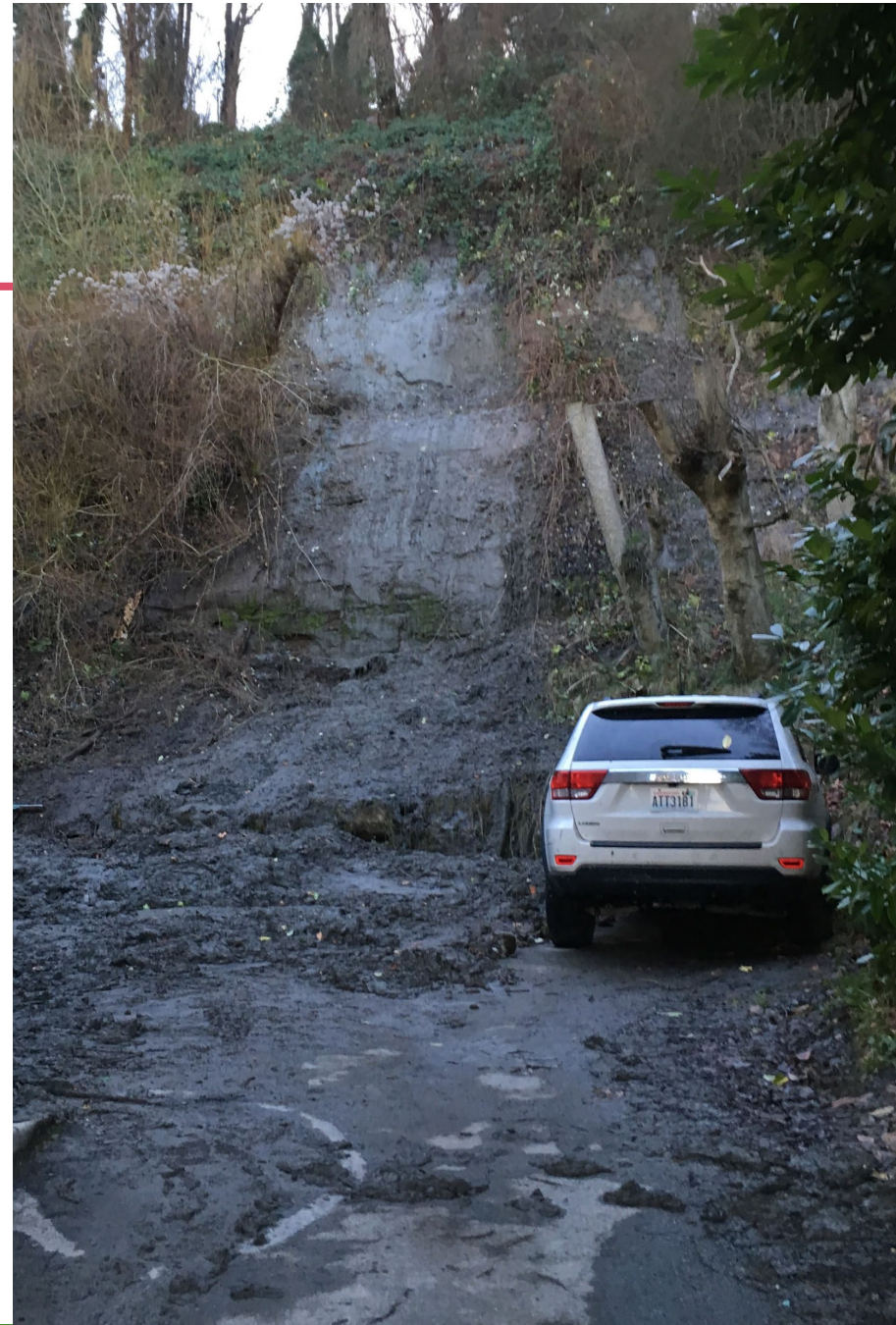
QUESTIONS?

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www.seattle.gov/sdci



QUESTIONS?

Virtual Applicant Service Center

<https://www.seattle.gov/sdci/about-us/who-we-are/applicant-services-center>

Seattle | English

Search Pay or Apply Menu

- Determine your project development site with a permit specialist

Your virtual assistance options:

- Chat directly with staff:**
 - Click the "Hi. Need help?" circle in the lower right to get started. Answer a few questions and we'll connect you with the expert who can best help you.
 - Available Mondays, Wednesdays, and Fridays, 9:00 a.m. - 3:00 p.m. and Tuesdays and Thursdays, 10:30 a.m. - 3:00 p.m.
 - Depending on the complexity of your topic, we may convert your live chat into a video coaching session to better answer your question.
 - See the [chat tips and instructions](#) to get the most out of your chat session.
- Submit a question at any time. Staff will respond to your inquiries by email within 2 business days.**
 - [Building & Land Use Questions](#)
 - [Rental Registration & Inspection Questions](#)

We serve chat and coaching requests on a first-come, first-served basis for each topic. Wait times can be up to an hour. If you can't wait, close the chat and it will automatically be converted to an email request for assistance. We'll respond to those within 2 business days.

Other ASC services available online:

- Submit your [subject-to-field-inspection construction permit](#) through the [Seattle Services Portal](#). See [How to Submit a Construction Subject-to-Field-Inspection Application](#) for instructions.
- Attend a virtual [construction pre-submittal conference](#), [land use pre-submittal conference](#), or [paid coaching session](#).

Hi. Need help?

Survey

Survey Link: <https://www.surveymonkey.com/r/T2F3K98>

Attendees will automatically be redirected to this survey.

You will see a weird screen from Webex first, it is basically letting you know you are being redirected to an external site. It is okay to click “continue” and proceed to the survey.