

Mapping the Geology of the Greater Seattle Area: Infiltration, Peat Bogs, and Volcanic Ash

The Pacific Northwest Center For Geologic Mapping Studies

Formerly “The Seattle-Area
Geologic Mapping Project”



Kathy Goetz Troost

UW
Dept. of Earth and
Space Sciences



Acknowledgments



- U S Geological Survey EQ and GD
- City of Seattle DPD and SPU
- King County WTD and DNR-GW
- City of Bainbridge Island
- City of Mercer Island
- City of Bothell
- Many consultants!!!!!!!





Overview of Talk

GeoMapNW

Geologic mapping

Findings

Data access

What is GeoMapNW?

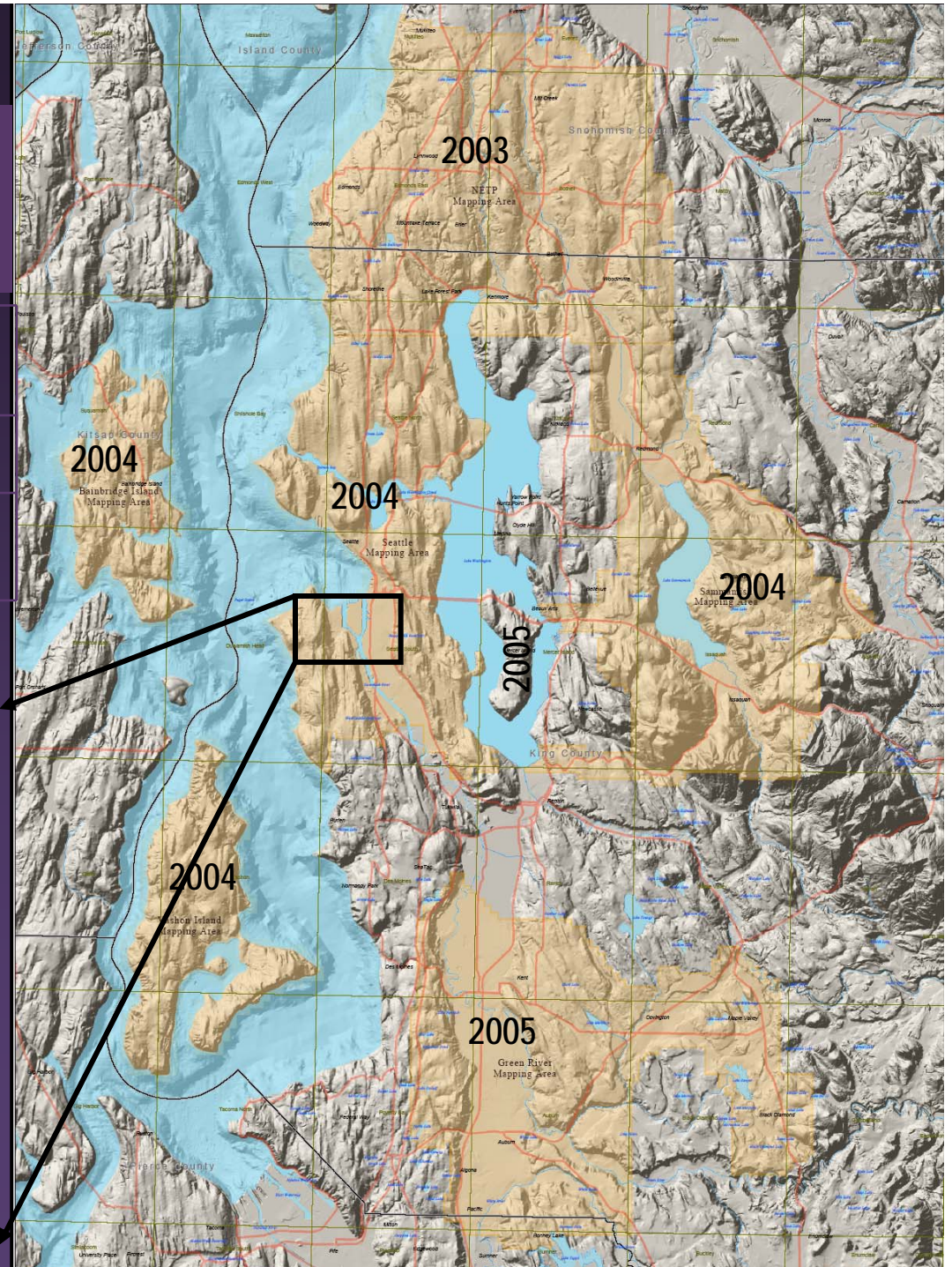
- Subsurface database
- New geologic maps
- Geologic research
- Web access to borehole data
- Outreach



GeoMapNW:

Database Progress (11/04)

Geotechnical Reports	>12,650
Boreholes	>65,600
Subsurface Layers	>267,900



Geologic Mapping

- Regional
- 1:24,000
- 1:12,000

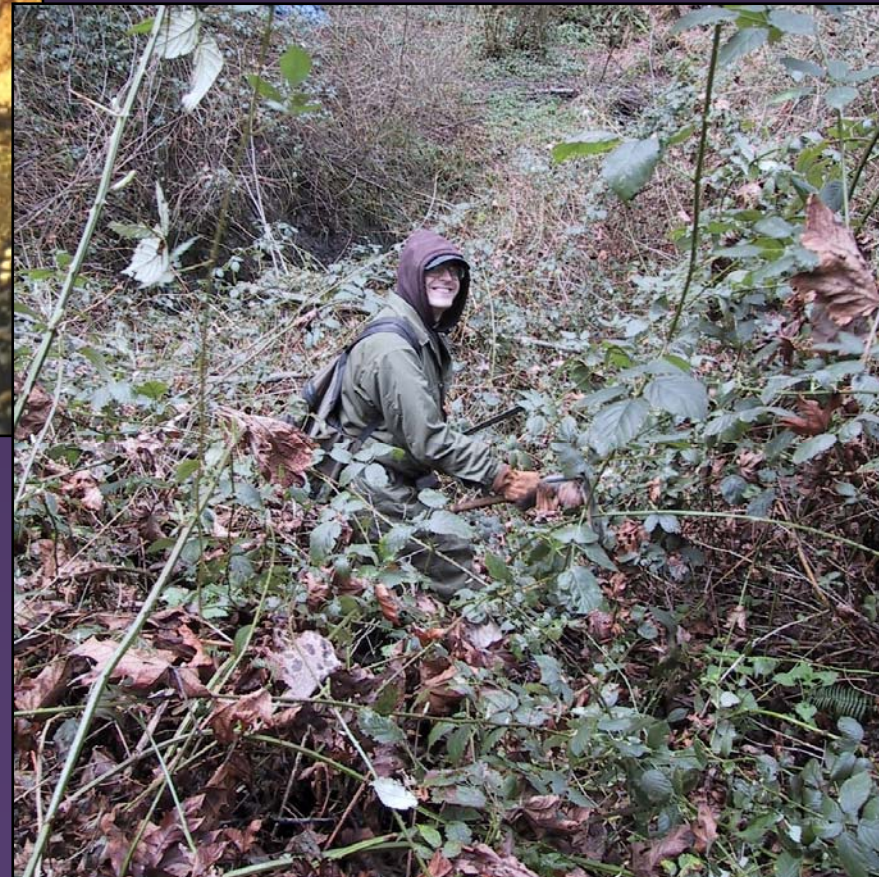


Geologic Mapping:

Challenges

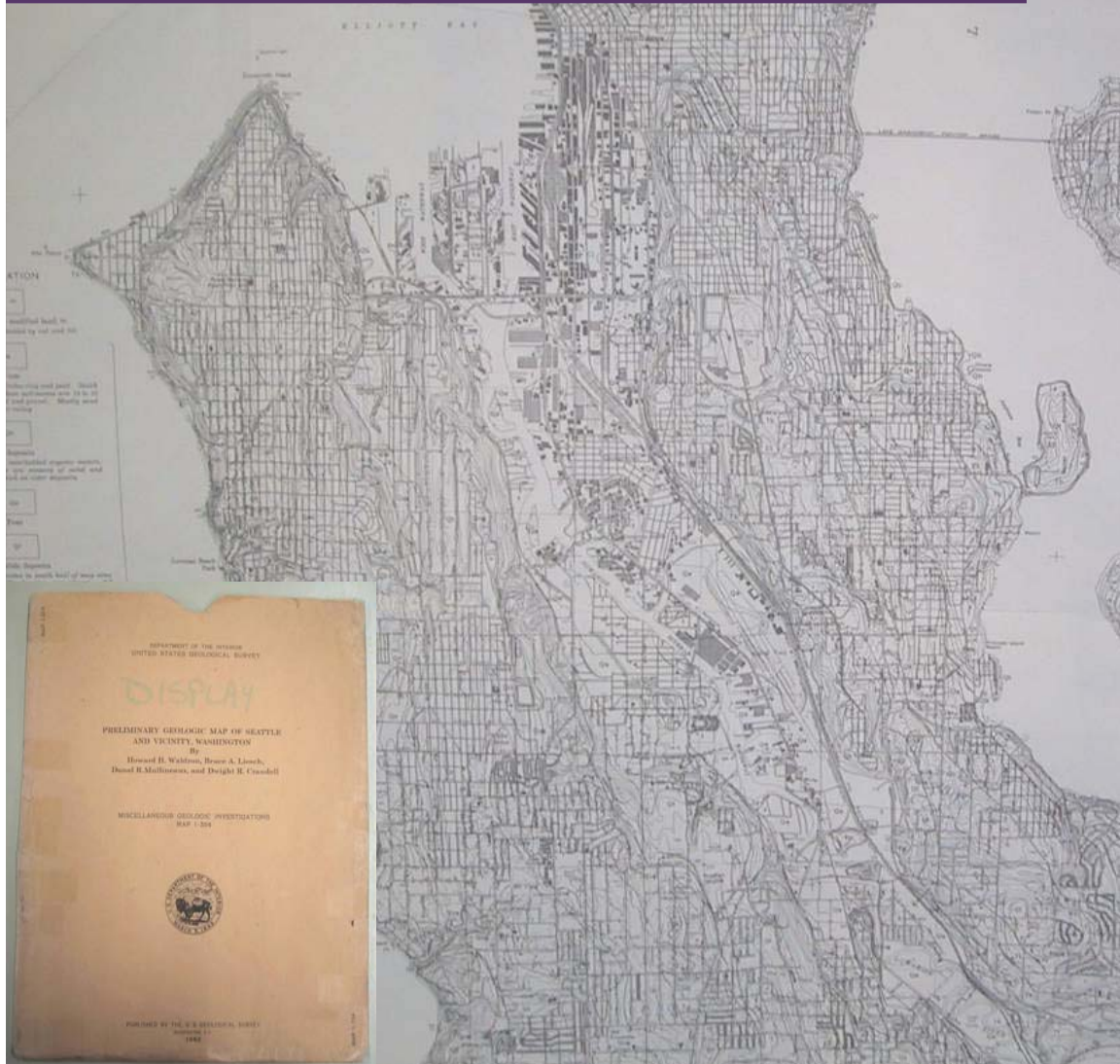


Deformed lake beds under I-5

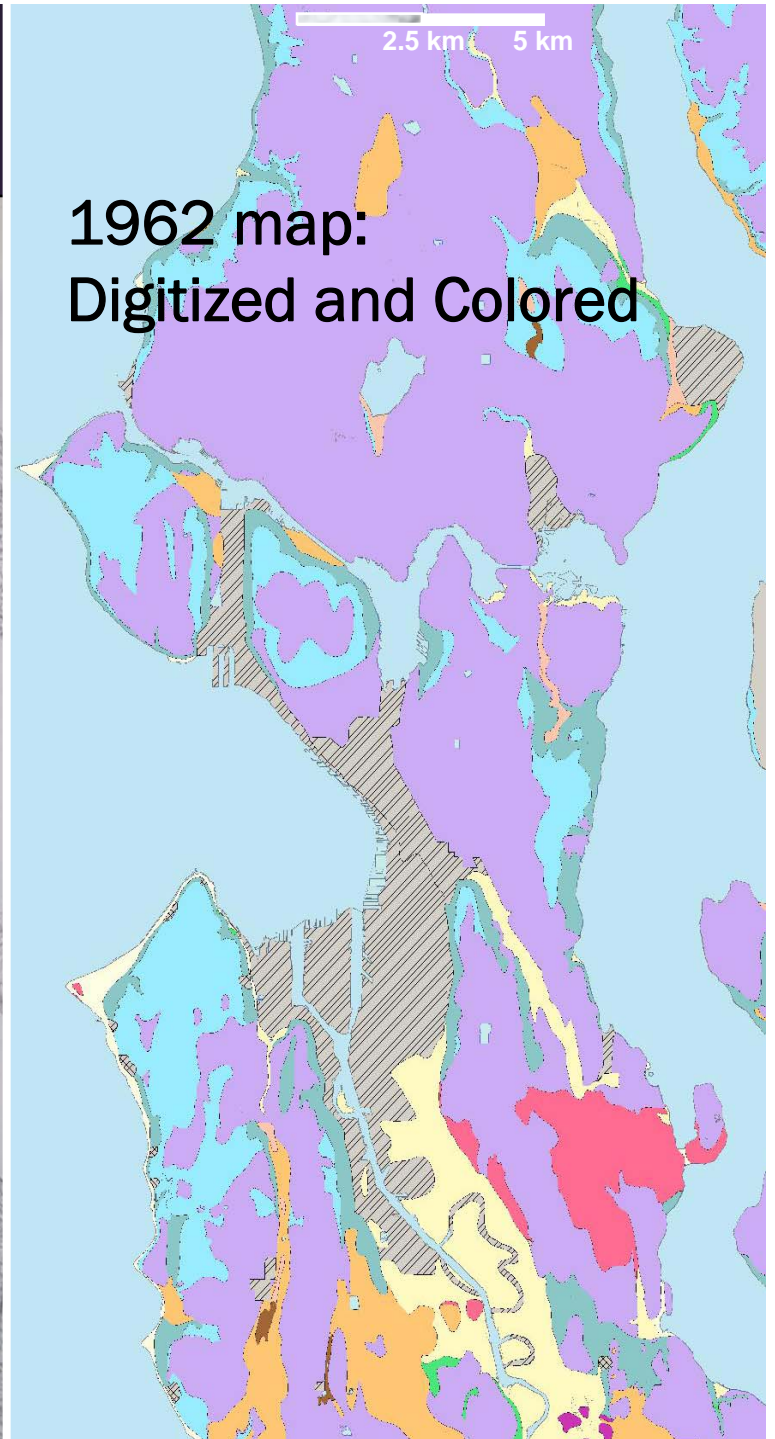


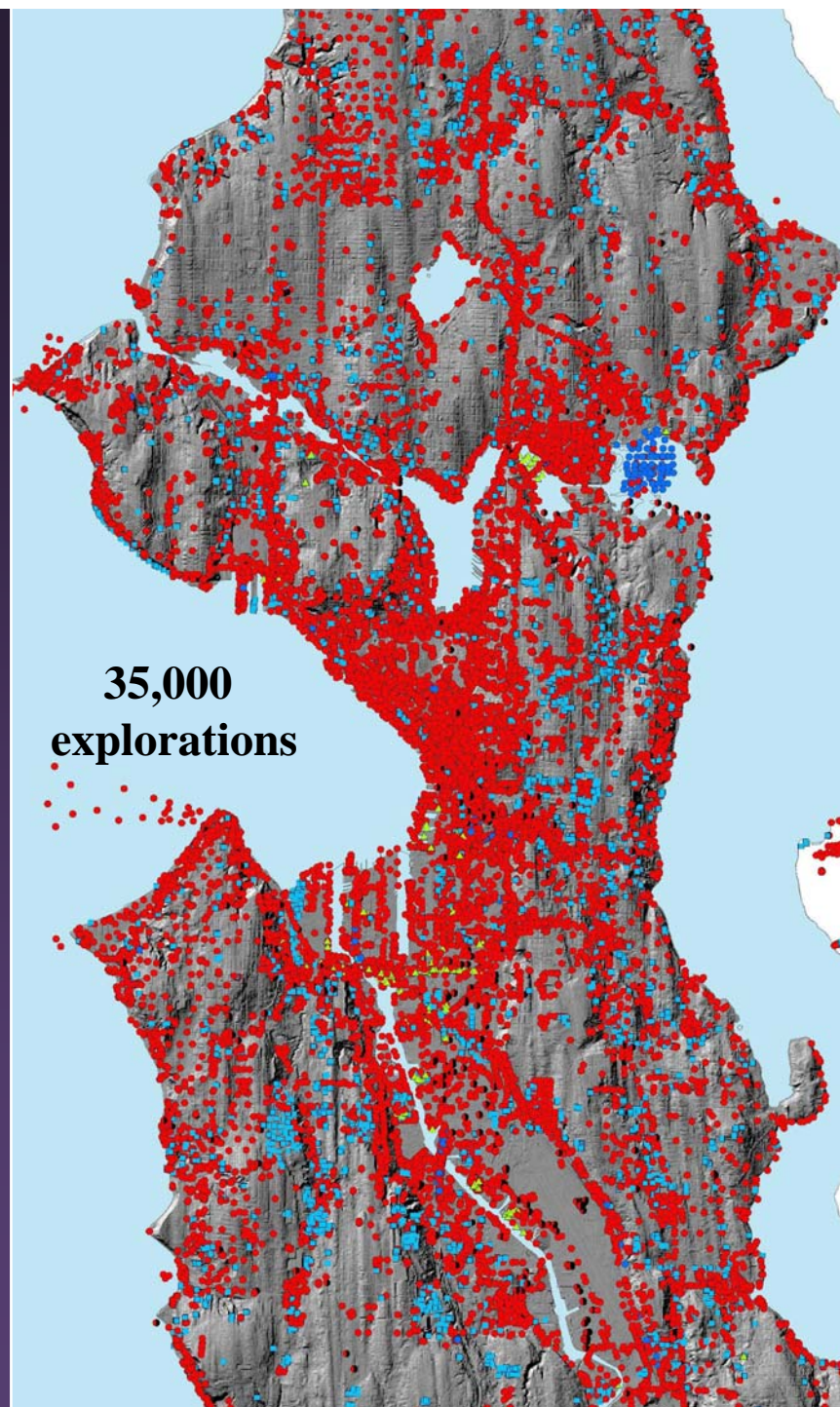
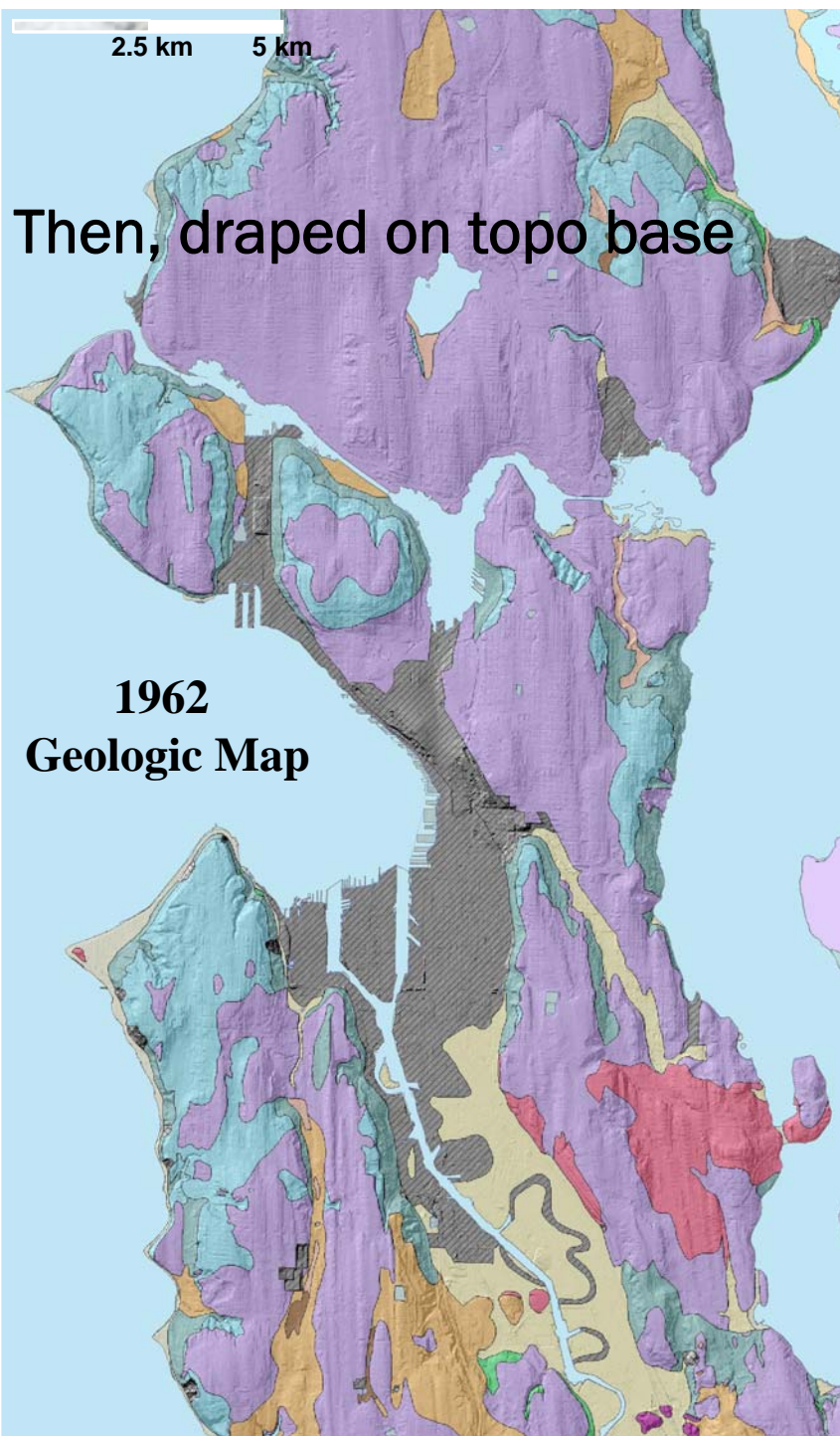
Geologic Mapping:

Prelim. Geologic Map of Seattle, Waldron and others, 1962



1962 map: Digitized and Colored





**1962
Geologic Map**

2.5 km 5 km

**2004
Geologic Map**

Gray-	modified land
Yellows-	young deposits
Purple-	till and till-like
Lt blue-	adv ow s&g
Greens-	older gl & ng
Red-	bedrock






Till	55	40
Qva	11	17
Older	3	12

**Potentially
Infiltrative
Soils
Using
1962 Map**

**Potentially
Infiltrative
Soils
Using
2004 Map**

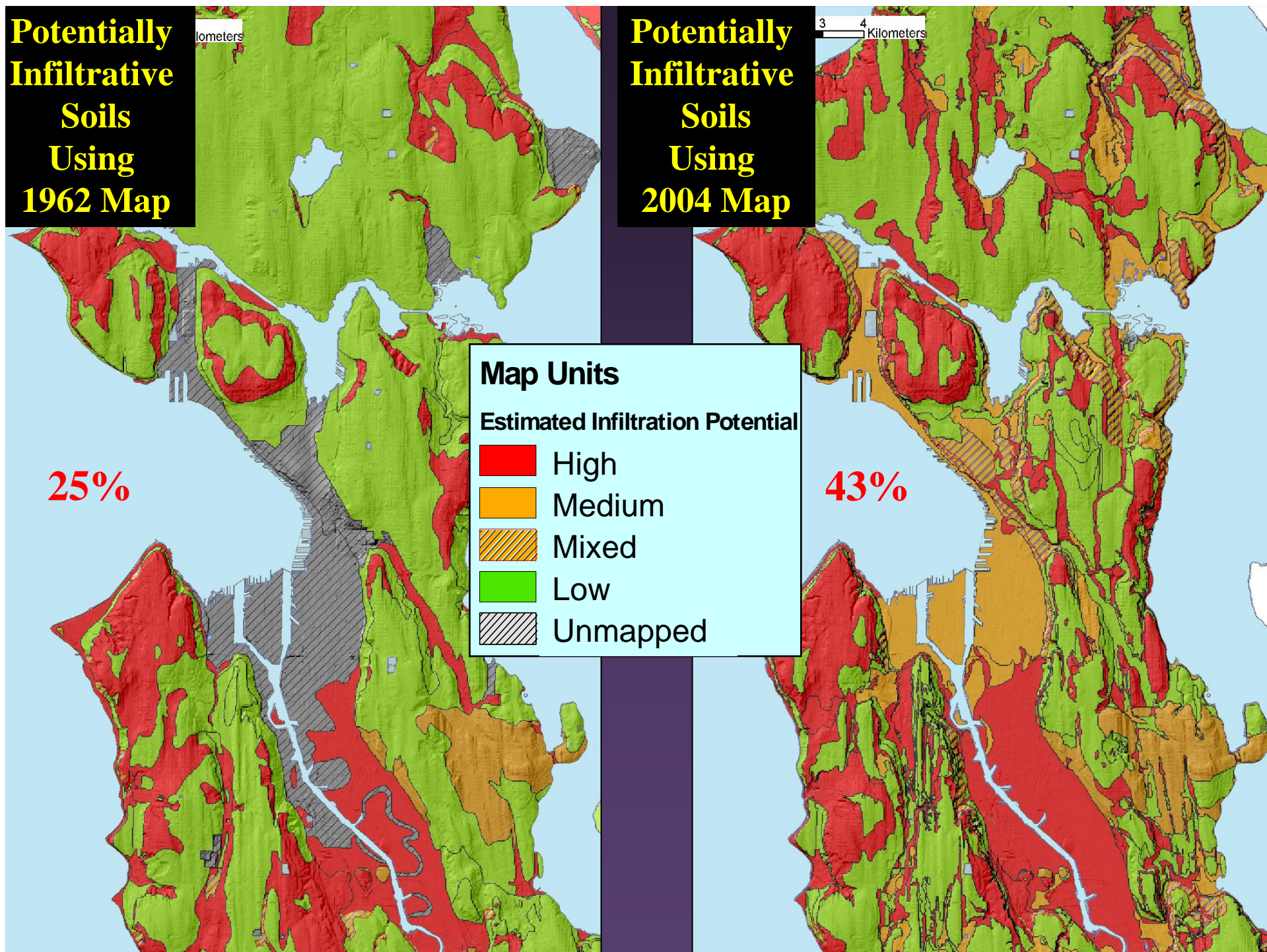
Map Units

Estimated Infiltration Potential

-  High
-  Medium
-  Mixed
-  Low
-  Unmapped

25%

43%





Esperance Sand

Lawton Clay

Olympia beds

Map of Organic-Bearing Deposits Using 1962 Map

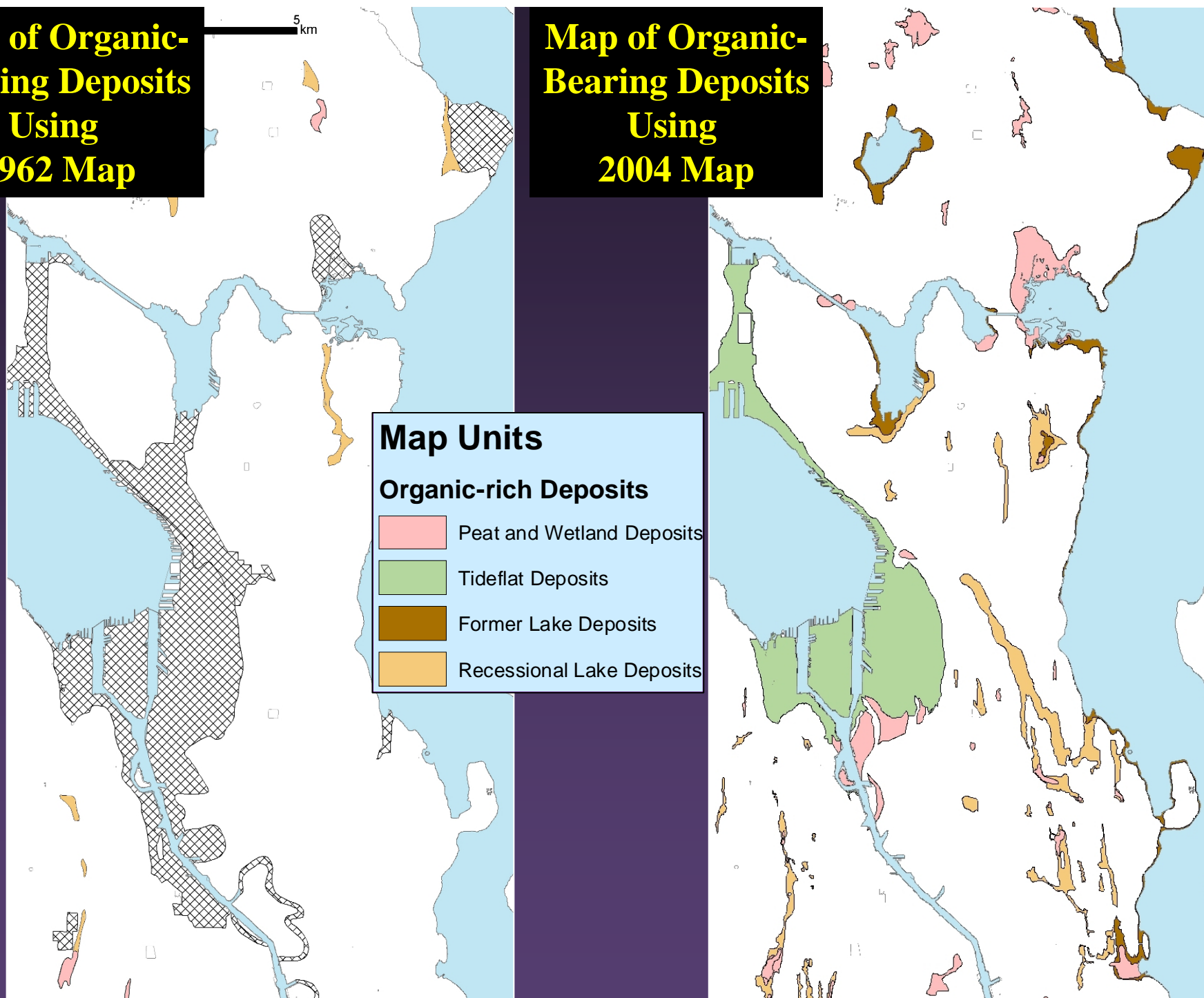
Map of Organic-Bearing Deposits Using 2004 Map

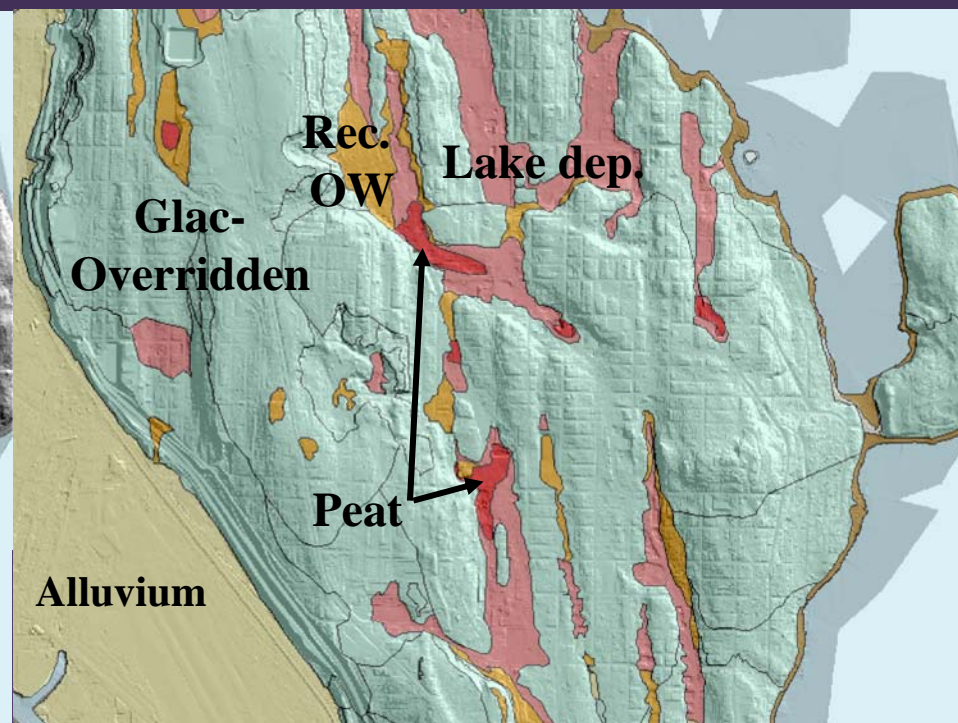
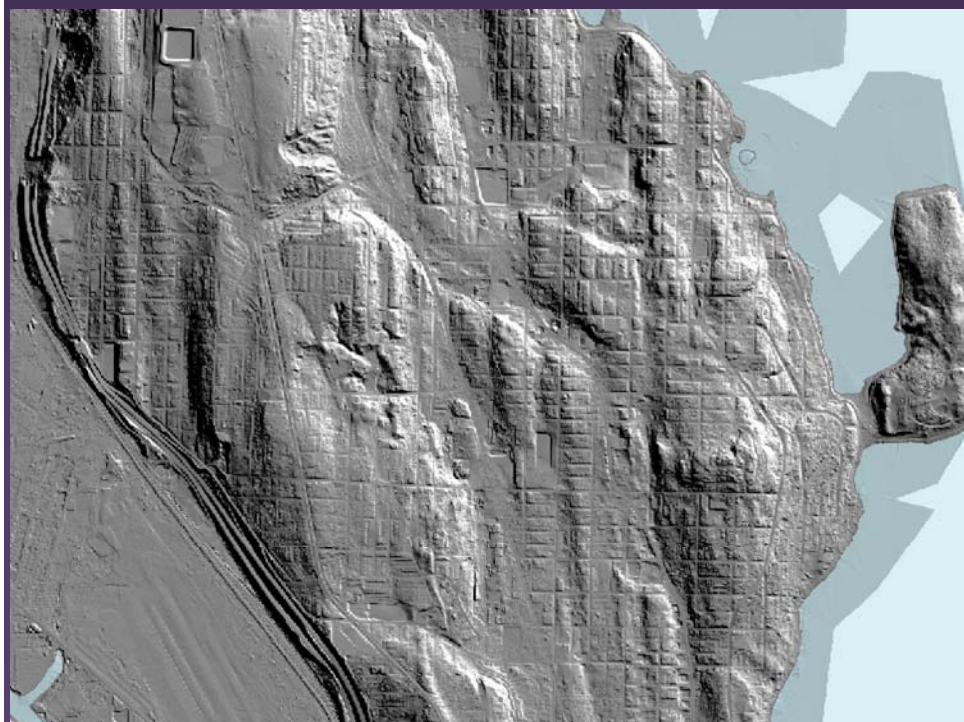
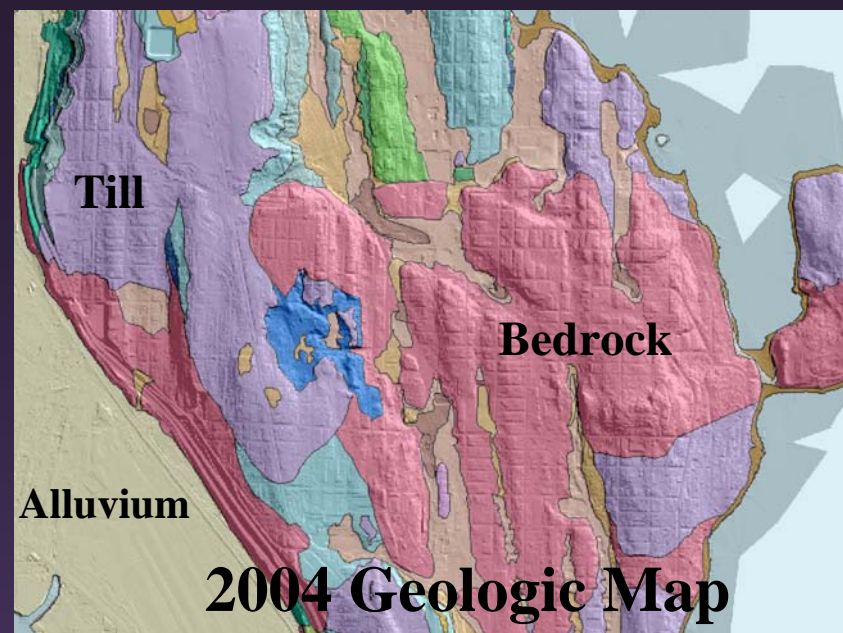
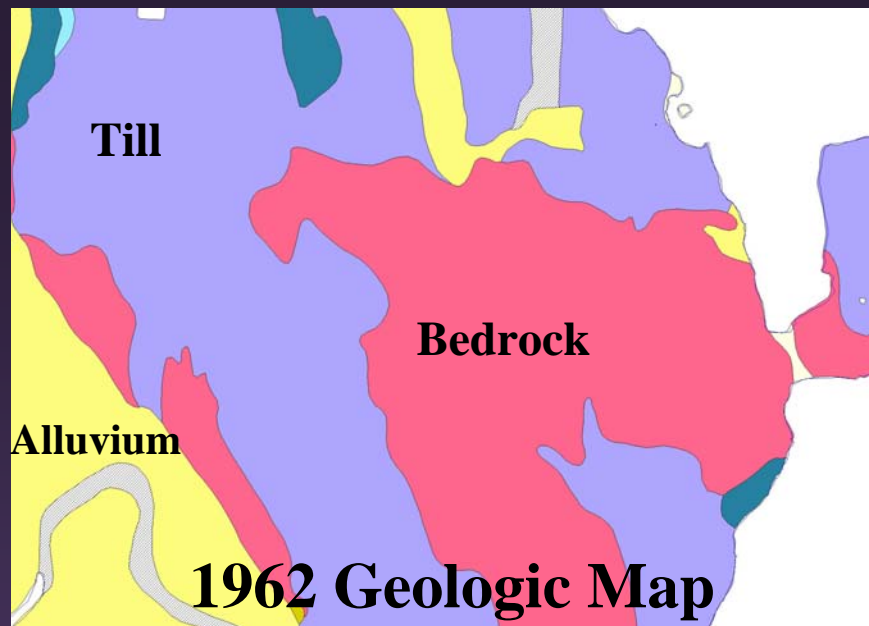
Map Units

Organic-rich Deposits

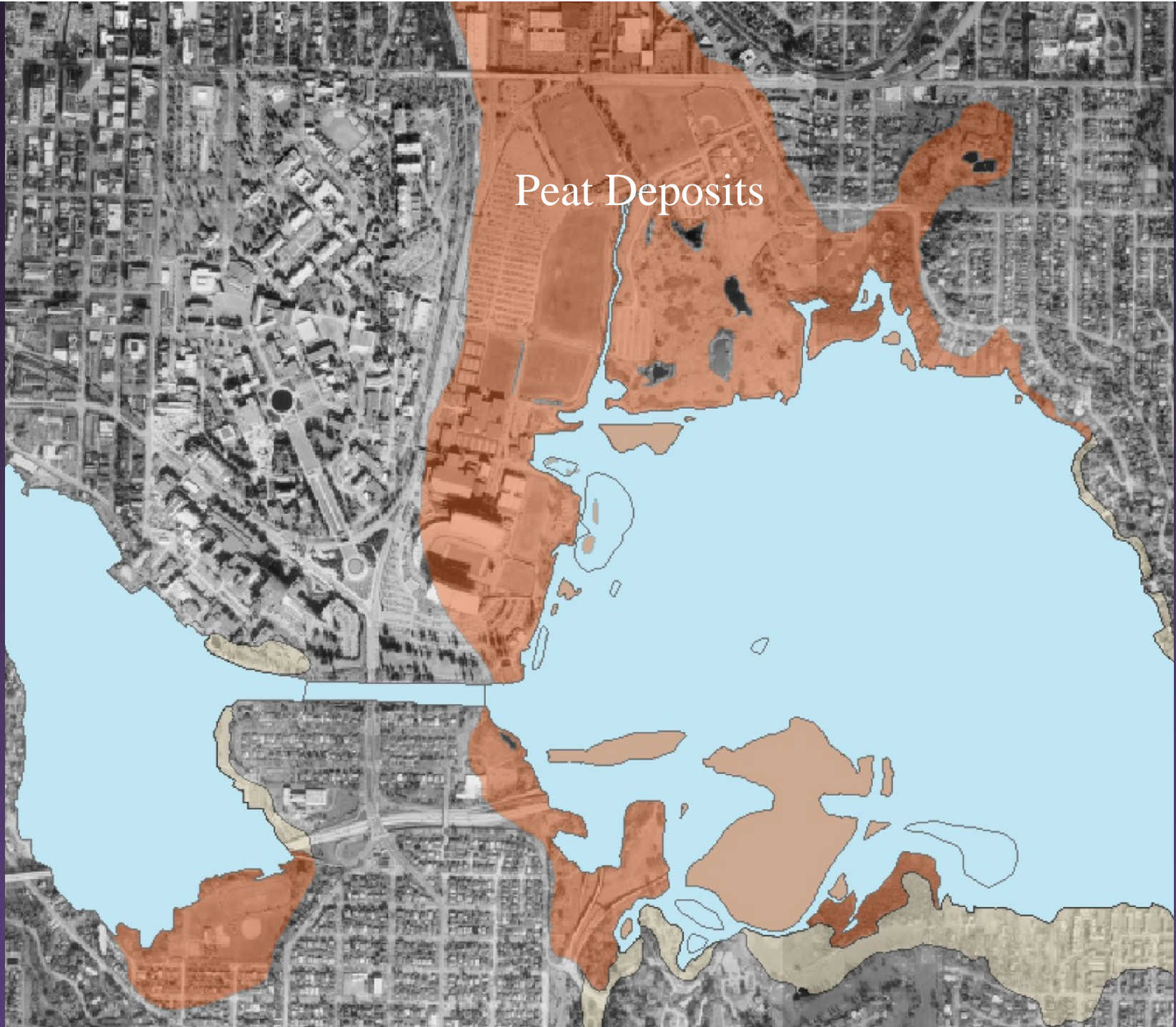
-  Peat and Wetland Deposits
-  Tideflat Deposits
-  Former Lake Deposits
-  Recessional Lake Deposits

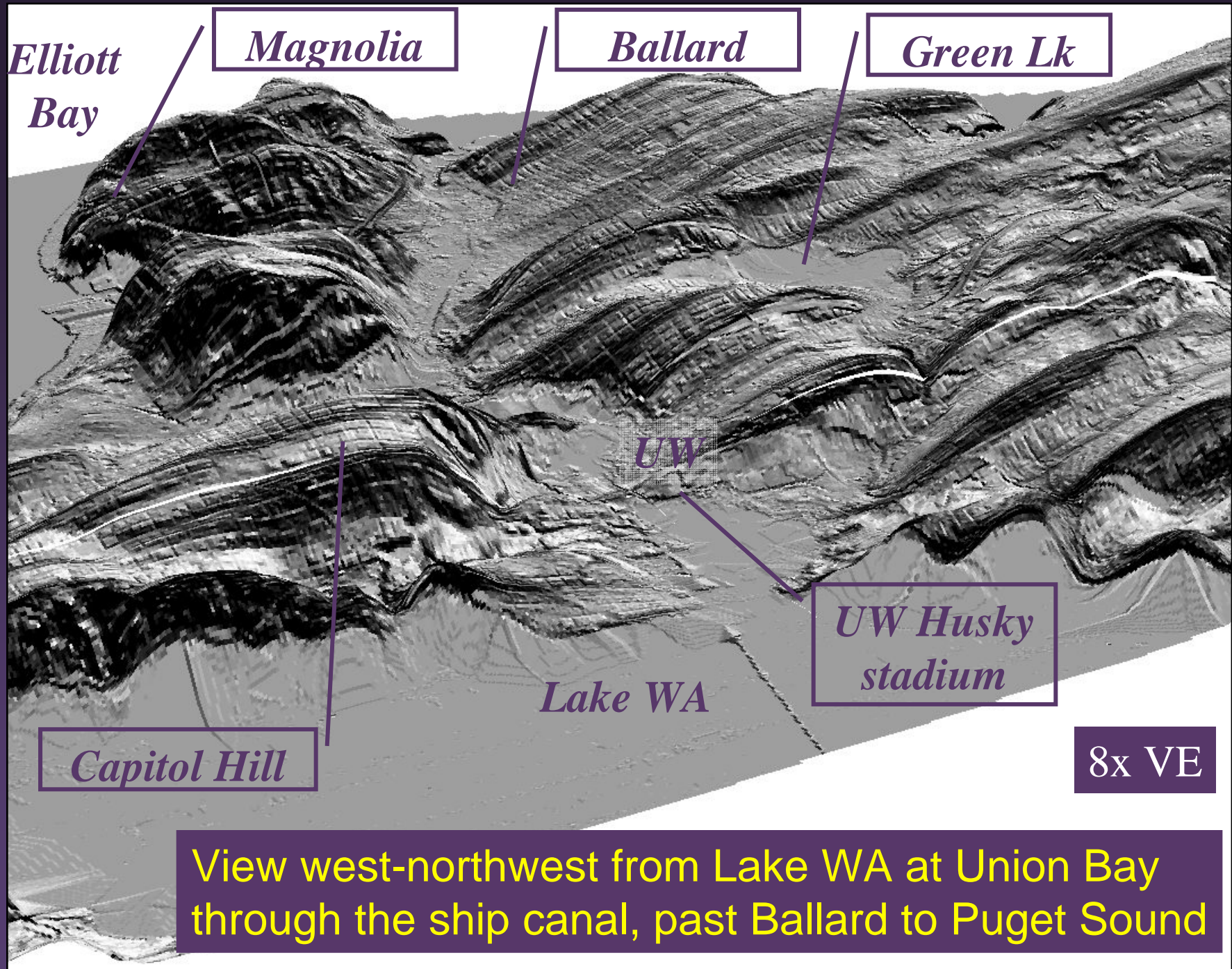
5 km



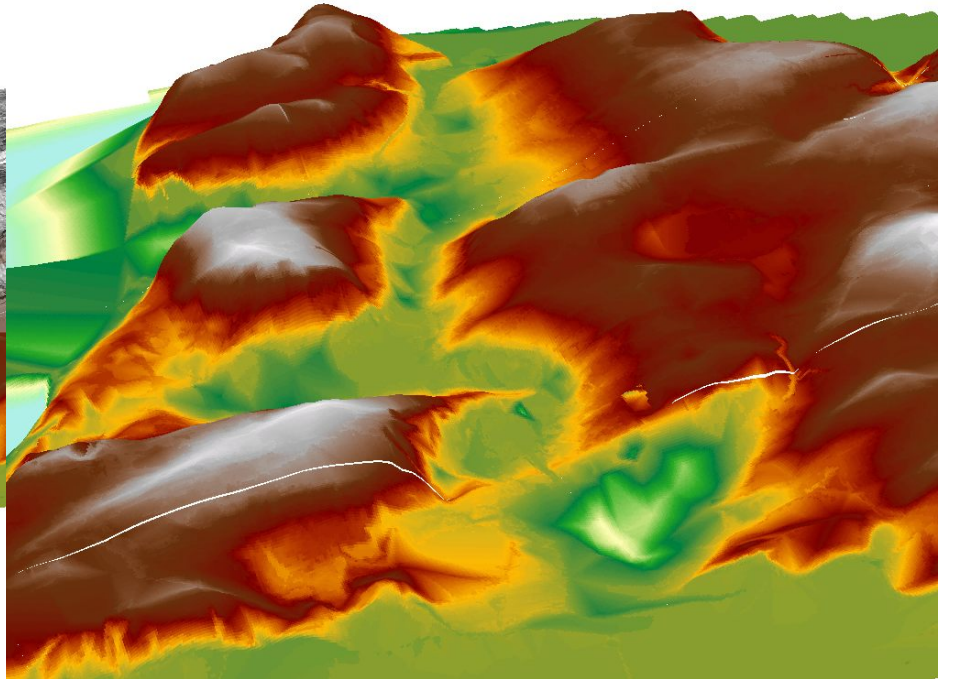
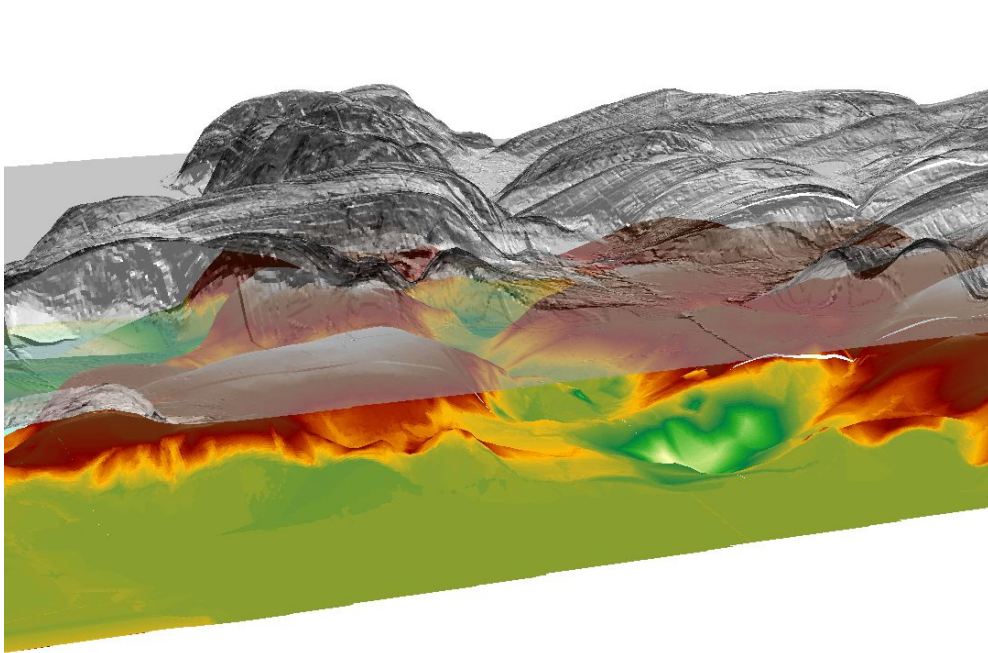


Peat Deposits

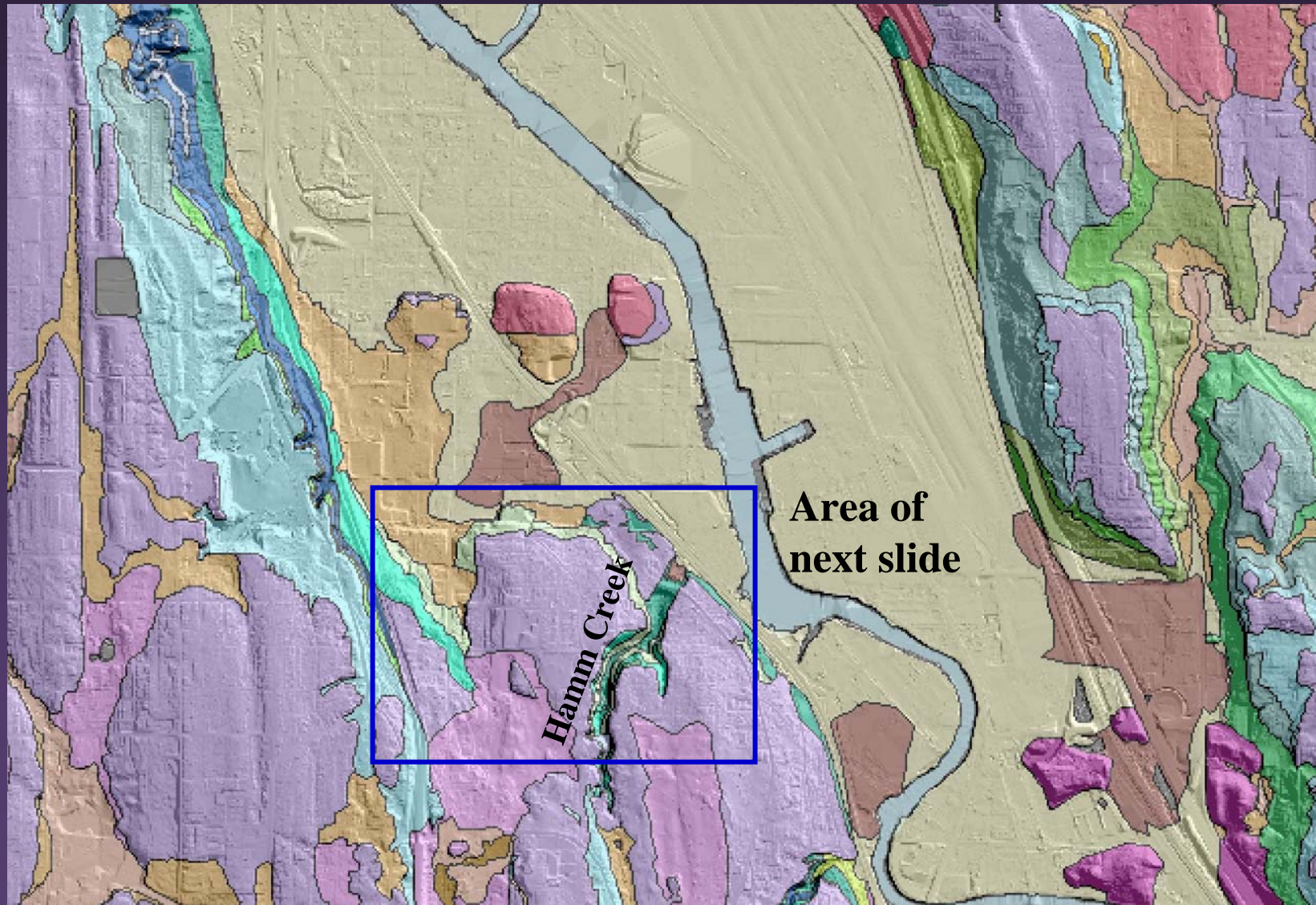




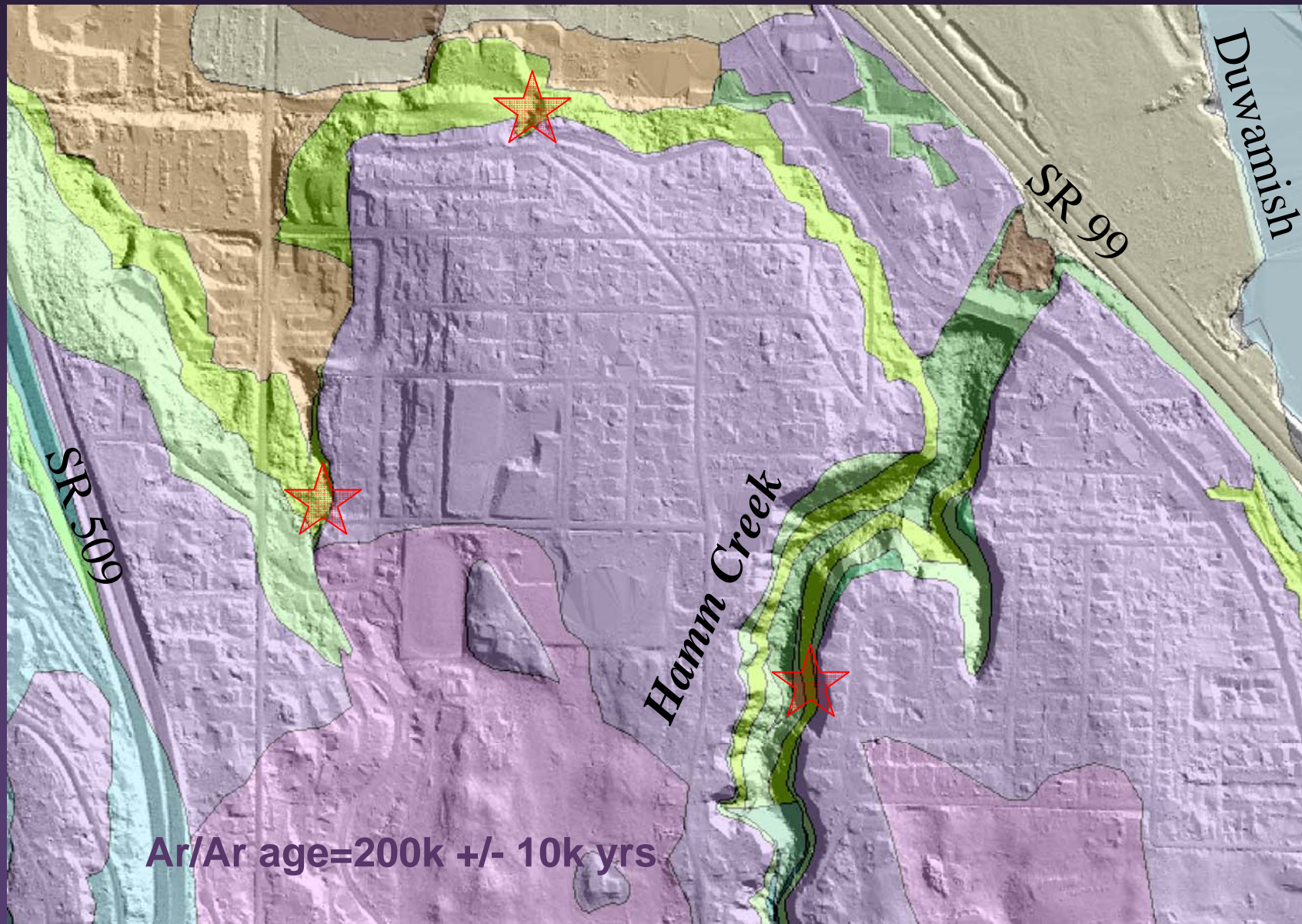
View west-northwest from Lake WA at Union Bay
through the ship canal, past Ballard to Puget Sound



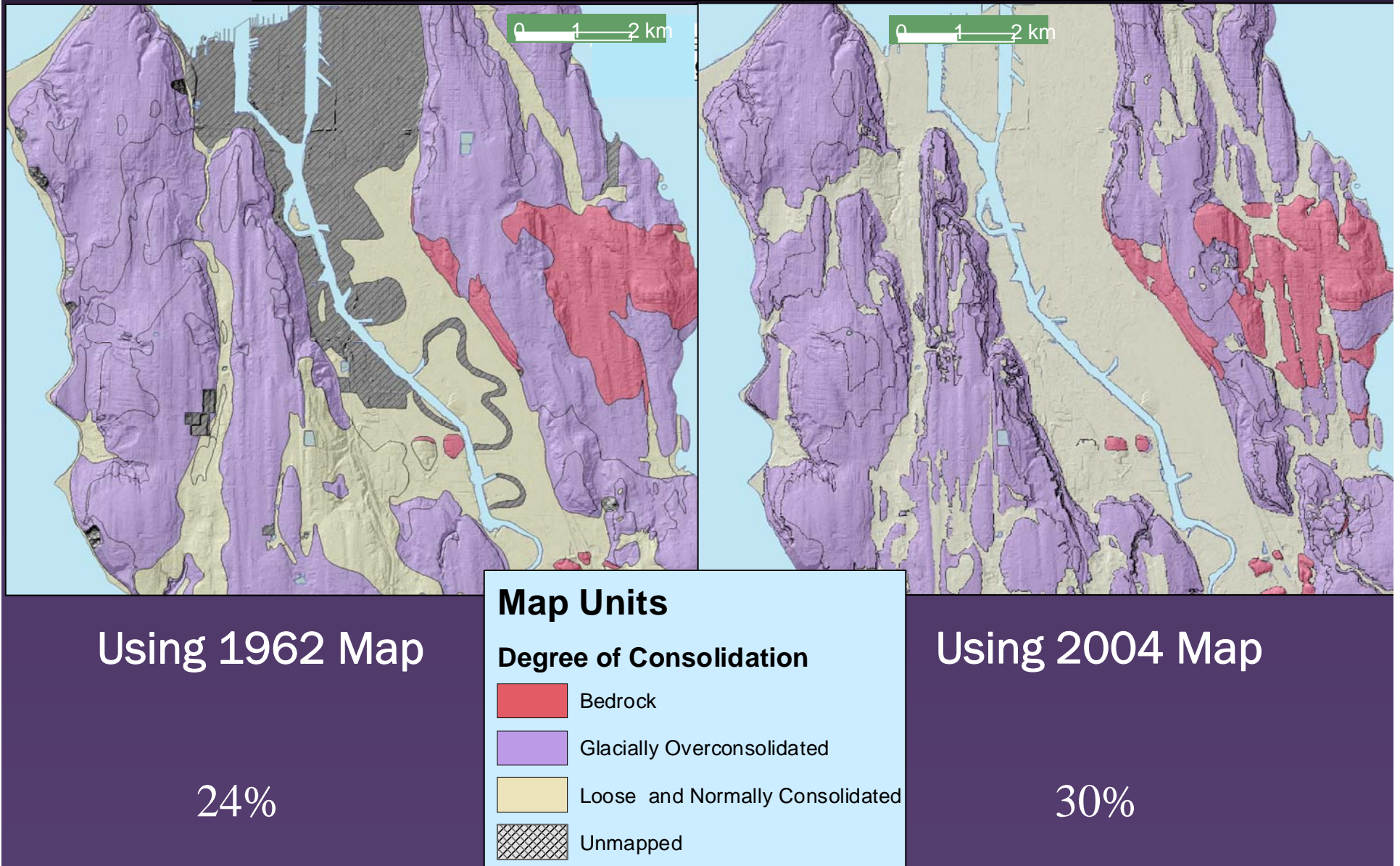
New geologic map of the south Seattle area



Locations of 2-m thick ash and pumice



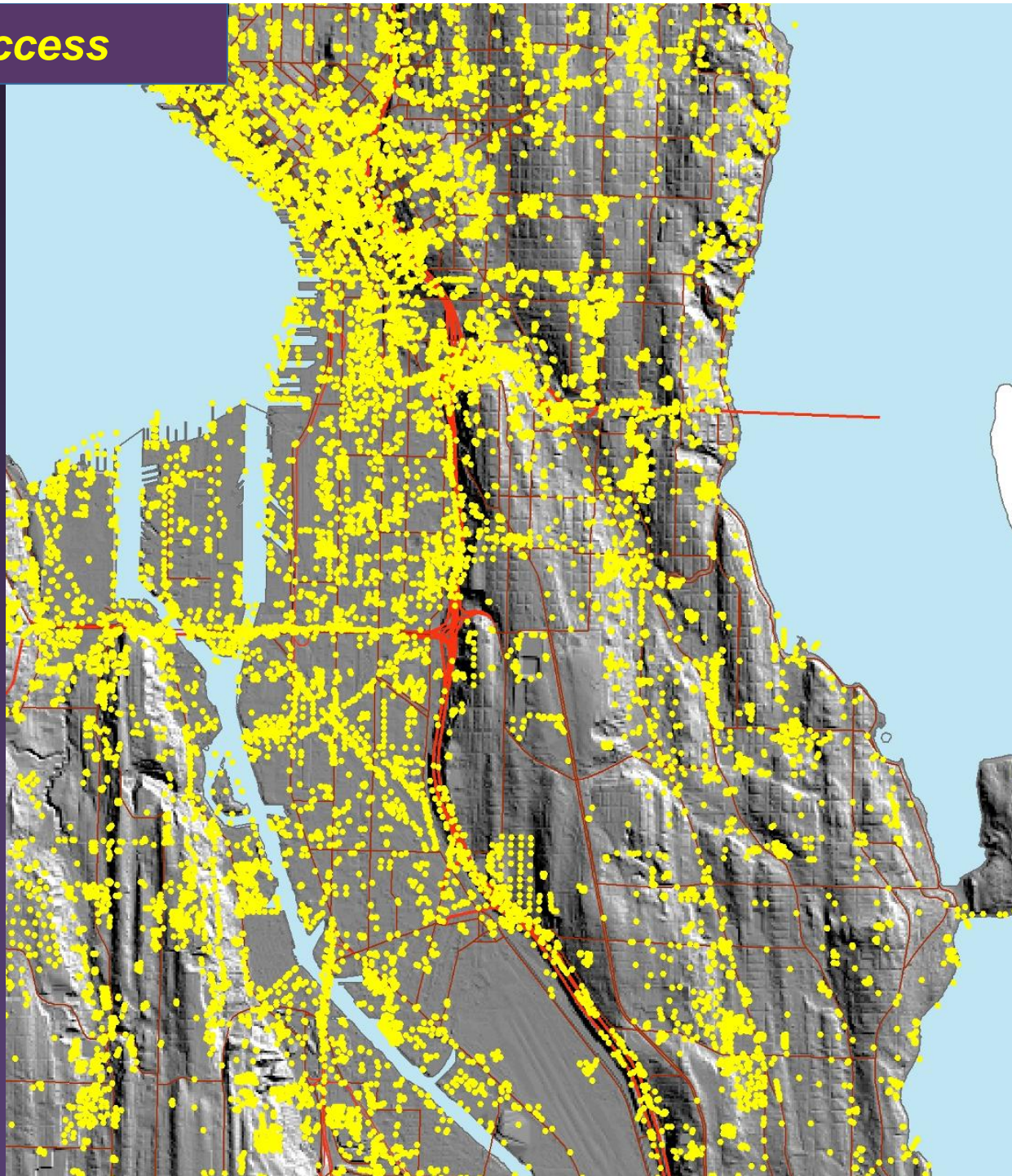
Geologic Proxy for Degree of Consolidation



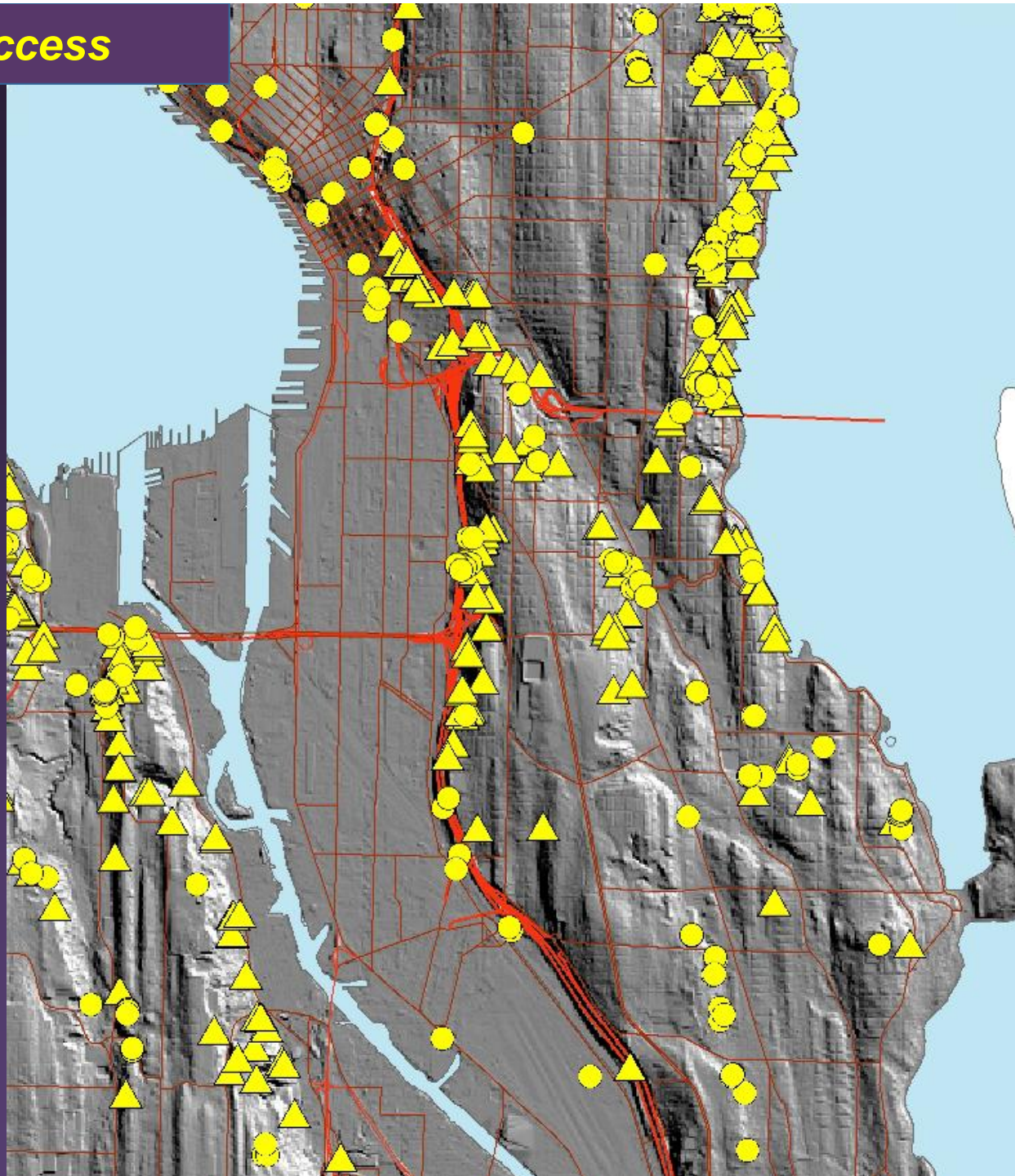
Other Recent Findings

- Evidence for faults and deformation
- More extensive landslides
- Unrecorded filled gullies
- Less till at the ground surface
- More geologic units

Data Access



Data Access



<http://GeoMapNW.ess.washington.edu>



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this is not
the end