

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 1

This month, the Newsreel continues with a trip to the Skokomish River at the Great Bend of Hood Canal. We will be driving up FS23 to the Kame Terrace at the top of the grade. The Kame Terrace area was logged around 2010 when the pictures were taken. Since then, replanting and natural seeding, has obscured the kettle features. Then a short visit to the Grisdale area (Camp Covey) and then follow FS2340 up to the High Steel Bridge for the views of the canyon.

Note: there is another high steel bridge to the south of Grisdale. It is, like the High Steel Bridge on FS2340, a remnant of the logging industry, and crosses over Vance Creek. There have been injuries climbing on it (ignoring safety concerns and common sense). So, don't!

From the High Steel Bridge for this chapter is the turnaround point. The Nov meeting will take us up to "Colonnade Hill" and the esker field south of Dennie Ahl Hill.

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 2

Below are some mileage and approximate driving time from the intersection of US101 and points of interest.

When you turn west off US101 at the bottom of Purdy Canyon (coming north from Shelton) or south on US101 at the George Adams Fish Hatchery (W. Skokomish Valley Road) you will be entering the Skokomish River Valley. The Skokomish River has two forks, the south and the north forks. Our travels will follow the South Fork (FS23). Interestingly, the current South Fork has been down cut since end of the Fraser Glaciation. The “original” south fork* has not been located. Mileage is from previous stop.

Mileage	Time	Elevation	Location	Comments
0	12:55pm	0	US101 at Great Bend (Skokomish Valley Road)	Turn west at Fish Hatchery
7.9	11 min	----	FS23 start	Turn right up paved road
1.7	----	526 ft	Kame Terrace	Look across the valley at sculpted landforms
1.3	----	695 ft	Gridale (Camp Govey)	Old Simpson lumber camp
Backtrack to FS 2340				
2.4	----	665 ft	High Steel bridge	Old logging railroad bridge
1.5	-----	682 ft	“Colonnade Hill”	Remnants of colonnades/pillow basalt

* See next page for what the paleochannel may look like.

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 3

On the sea cliffs west of the Dungeness Wildlife Sanctuary are found samples of paleo river or creek channels that were abandoned, filled with glacial till, and subsequently exposed during the Fraser Glaciations' Juan de Fuca Lobe recession.

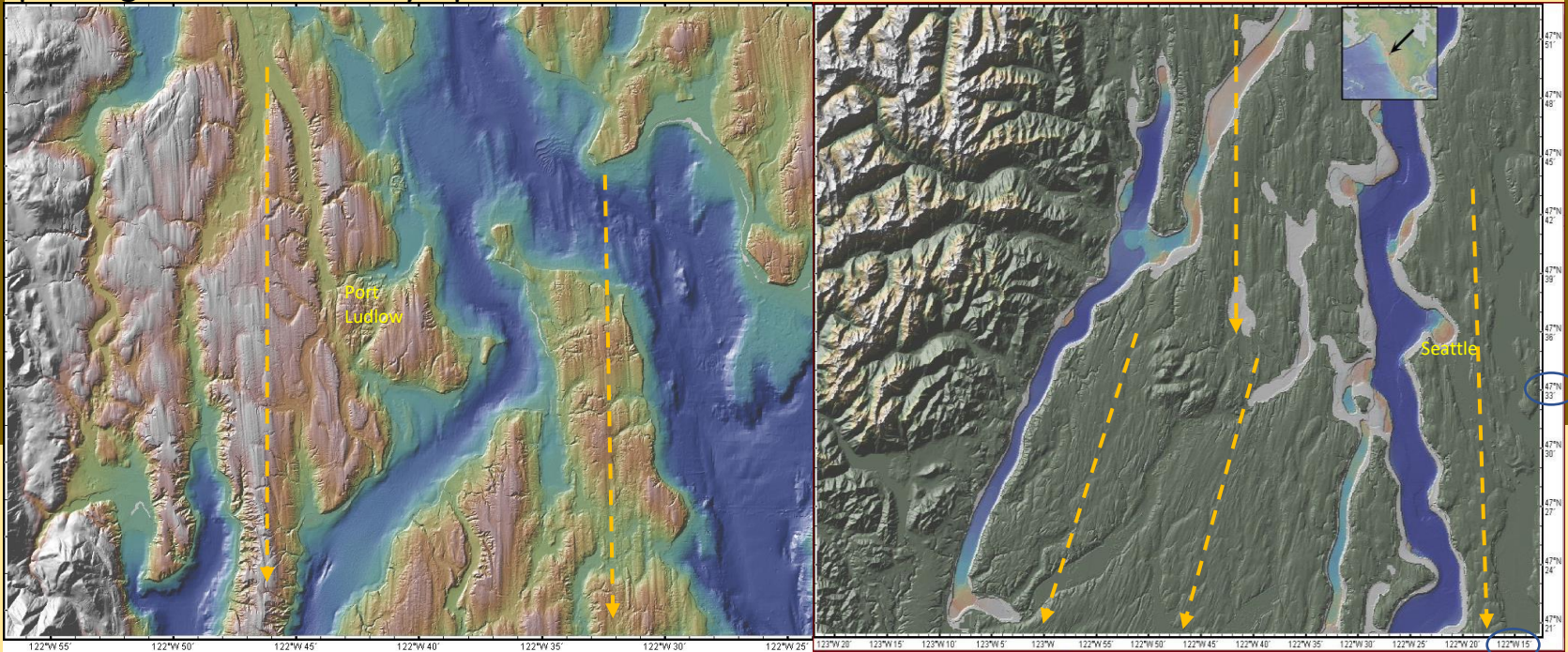
Note: on right side (arrow) is a separate bed that cut the original bed (meanders or oxbows?)



The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 4

Starting with a lidar the Puget Sound area that shows evidence of the path of the Puget Lobe straight down the Puget lowlands, until it gets past the confining influence of the Olympics. Note that the Cascades continues to be a barrier on the east side of the Puget Lobe; therefore, it cannot spread out like the west side of the lobe can as it spreads out towards the coast after passing the southern Olympics.

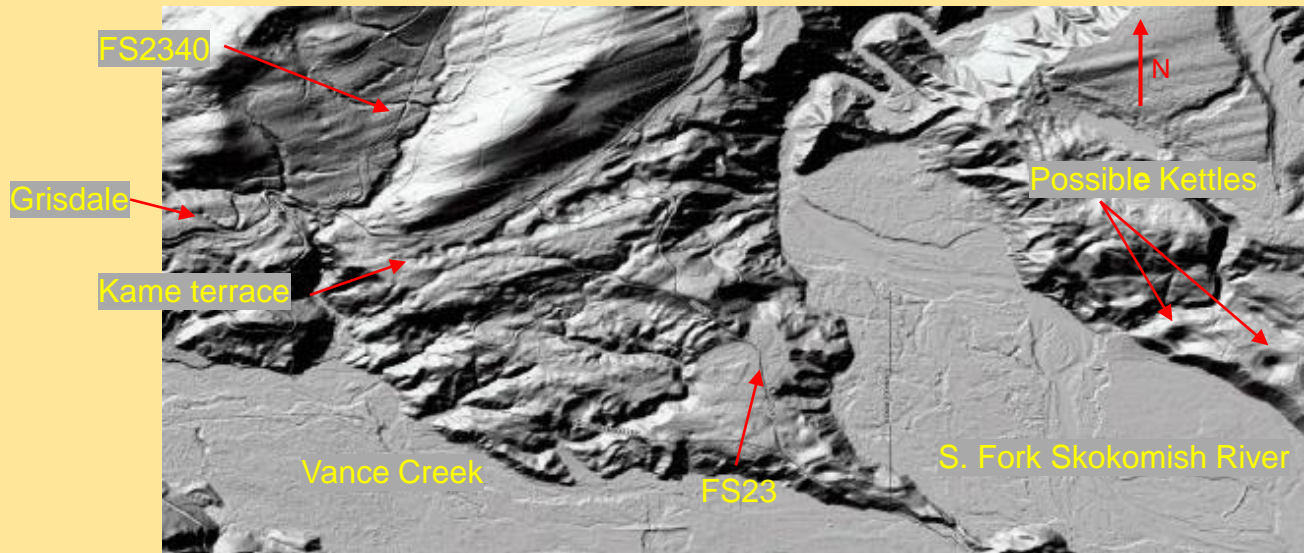


Landforms: North of Port Ludlow surface contours run N-S. Notice below 47° 33' that due to Crescent Formation "bending" towards the SW ice sheet expands to fill the available space. Compare to area east of 122° 15' which are still running N-S. See next slide for ice flow patterns in Skokomish River valley area.

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 5

An annotated Lidar graphic of the area where FS23 starts. It gives a good perspective of the impact of the Puget Lobe on the landscape. Surface topography shows fluting turning towards the southwest, indicating direction ice flow.



The IAFI Puget Lobe Chapter monthly newsreel:

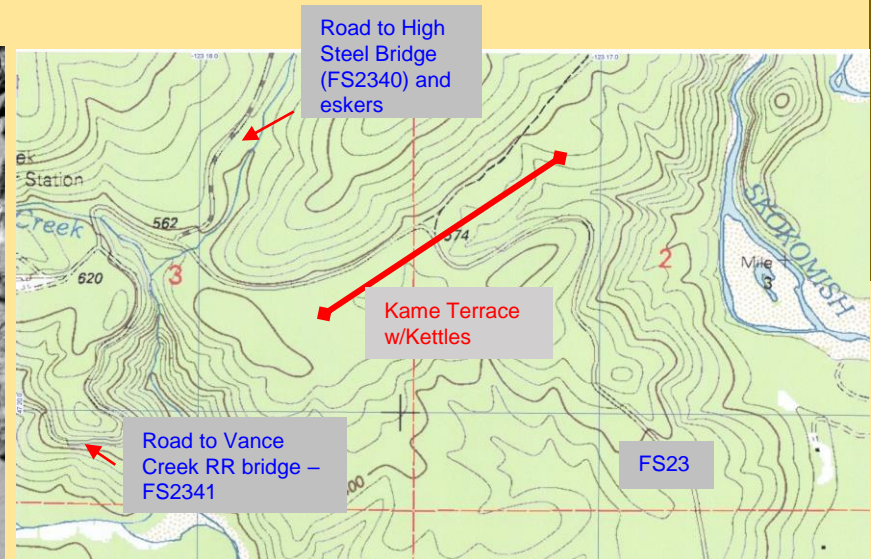
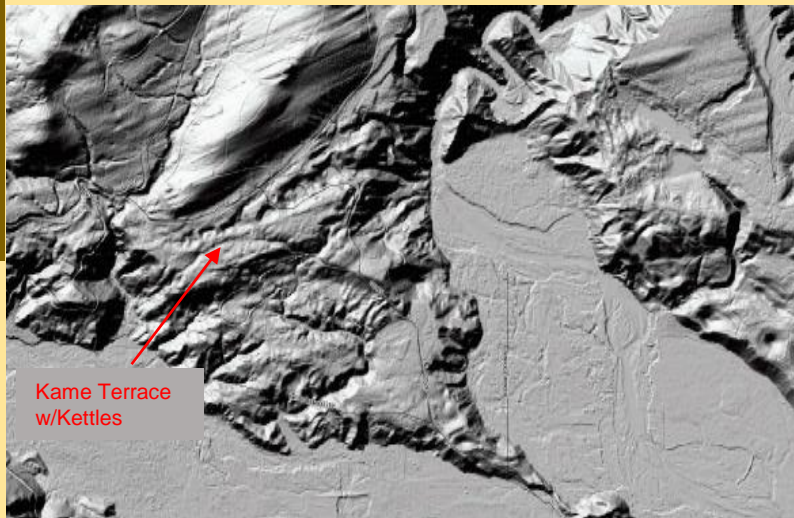
Introduction to the Milankovitch Theory, Ch 10, p. 6

Definition of Kame Terrace:

Benn: (ice-contact valley-side terraces) “are gently sloping depositional terraces perched on valley sides which are deposited by meltwater streams flowing between glacier margins and the adjacent valley wall.” (see Benn, 1998(2006) sections 11.4.3 – 11.4.5, p. 487 for complete discussion)

Flint: “an accumulation of stratified drift laid down chiefly by streams between a glacier and the side of a valley and left as a constructional terrace after disappearance of the glacier.” (Flint, p. 209)

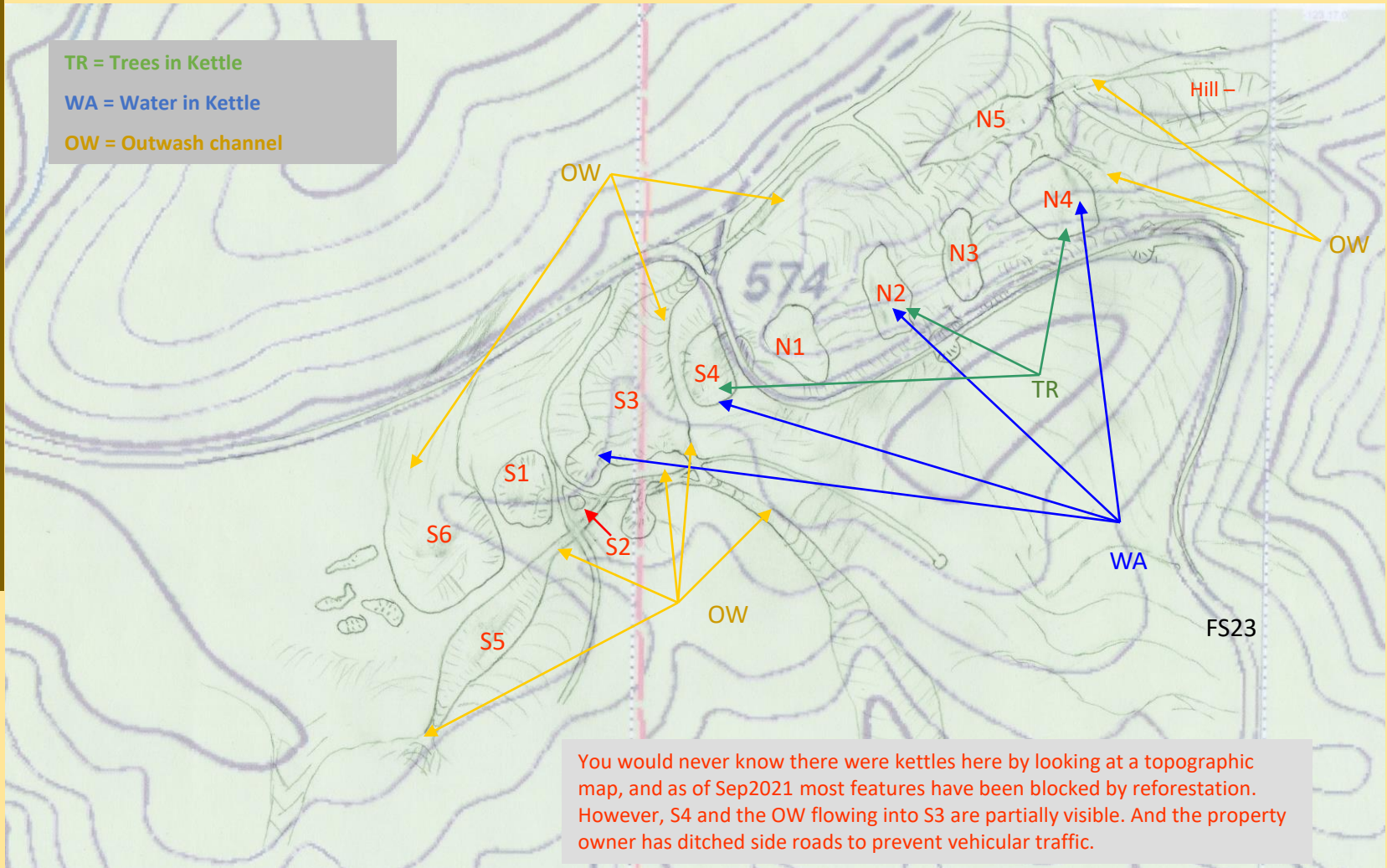
Lidar and topographic map of Kame Terrace:



The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 7

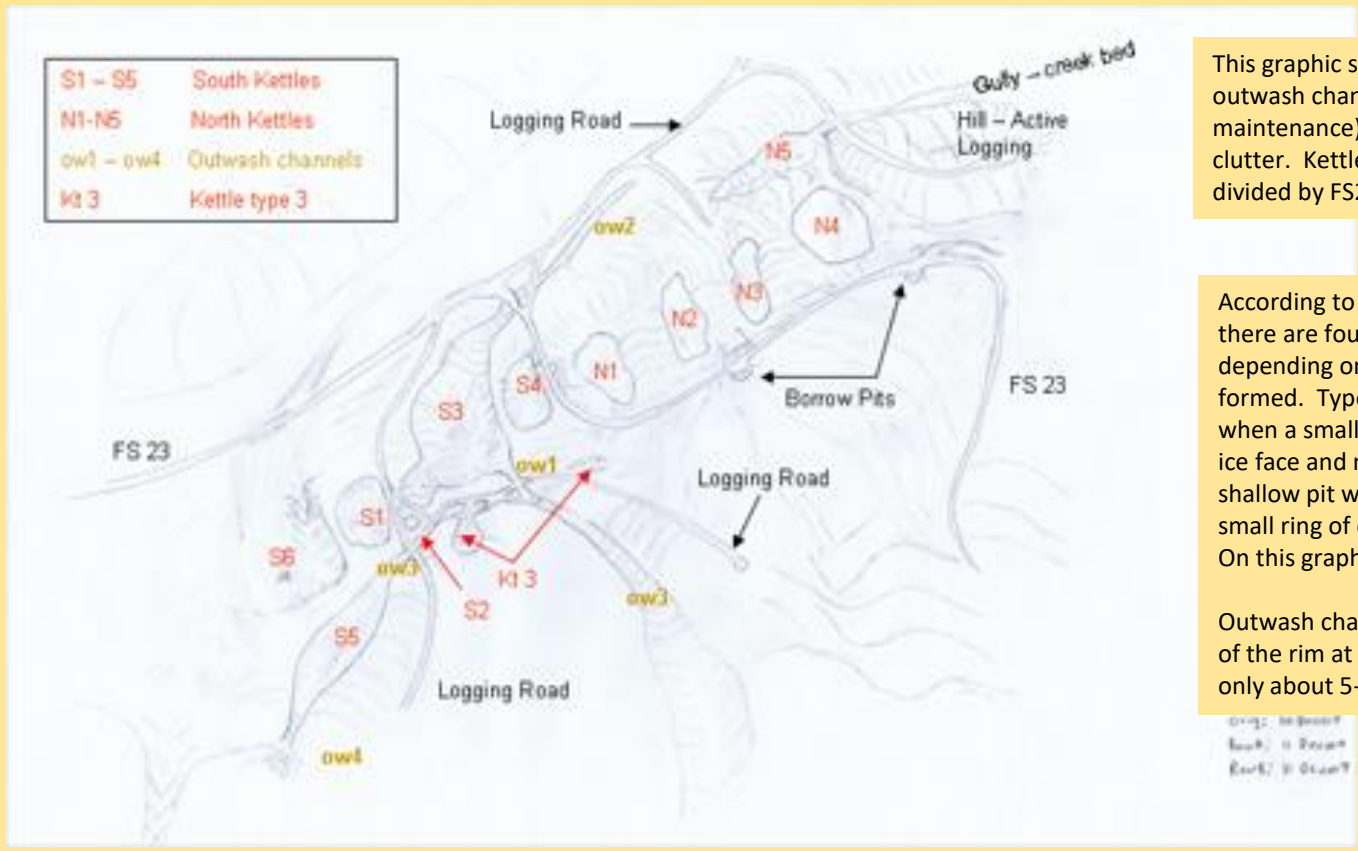
The Kame terrace along FS23 above Vance Creek w/graphic superimposed upon an area topographic map.



You would never know there were kettles here by looking at a topographic map, and as of Sep2021 most features have been blocked by reforestation. However, S4 and the OW flowing into S3 are partially visible. And the property owner has ditched side roads to prevent vehicular traffic.

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 8



This graphic shows the Kettles, outwash channels, borrow pits (road maintenance), and roads without clutter. Kettles are arbitrarily divided by FS23 (road).

According to Benn, and others, there are four types of Kettles, depending on how they were formed. Type 2 kettles are formed when a small chunk of ice falls off the ice face and melts resulting in a shallow pit with or without a large or small ring of debris surrounding it. On this graphic they are labeled Kt3

Outwash channel OW1 is at the top of the rim at S3 and extends down only about 5-6 feet from the top

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 9

View of North kettles.



Kettles N1 and N2 next to FS23 at milepost 1.7

Growth of vegetation has essentially blocked the views shown in the next 7 slides.

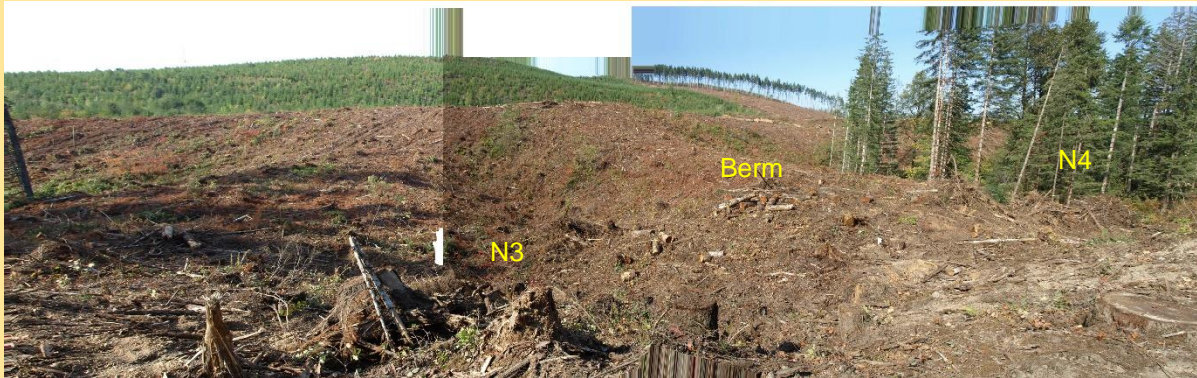
As with most geological features in western Washington, starting with Bretz, logging, road cuts, etc., give us the views necessary to document Ice Age features. And the use of Lidar has allowed us to locate many features covered by vegetation.

So, if you see features exposed by logging, etc., document them by pictures, drawings and other research and provide them to our IAFI Chapter (President).

For example, this Kame terrace will not be logged (or visible) for another 40 years. BUT our Puget Lobe Chapter has documented it.

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 10



There are a lot of photo artifacts; but that's ok.

Kettle N3 was logged in 2009 while N4 was not logged and has trees- see below figure



Kettle N5 between rear ridge line and front berm

Kettle N4 center with pond from winter 2009 rains

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 11

A look at the south kettle locations:



Kettles looking southwest from where Figure 1.c was taken (arrows show out-of-view kettles).

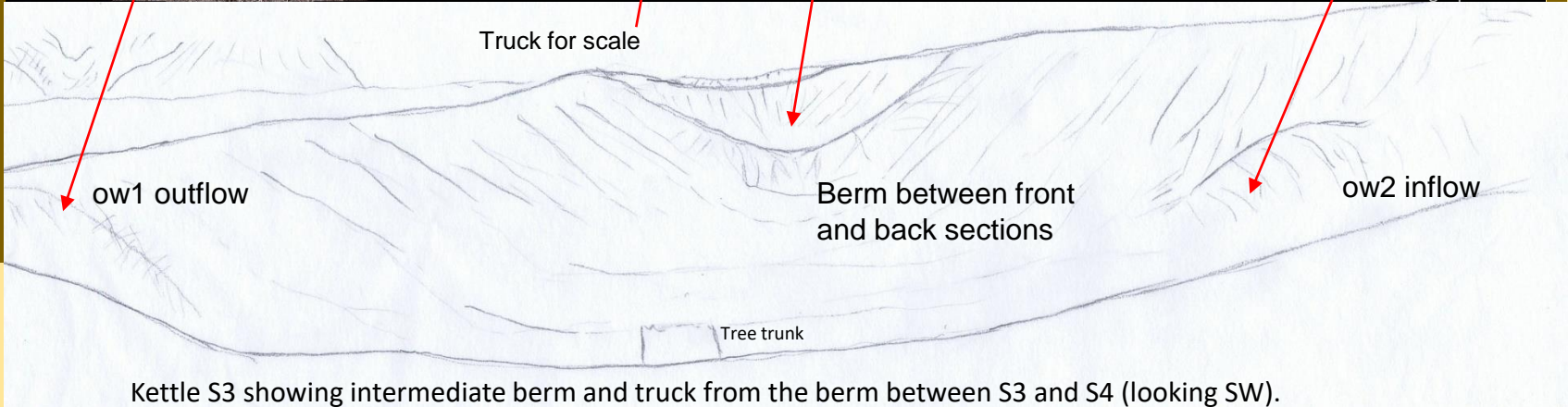
Taken from FS23 as it bisects the N/S kettles.

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 12



Photo artifacts are result of stitching 4 photos

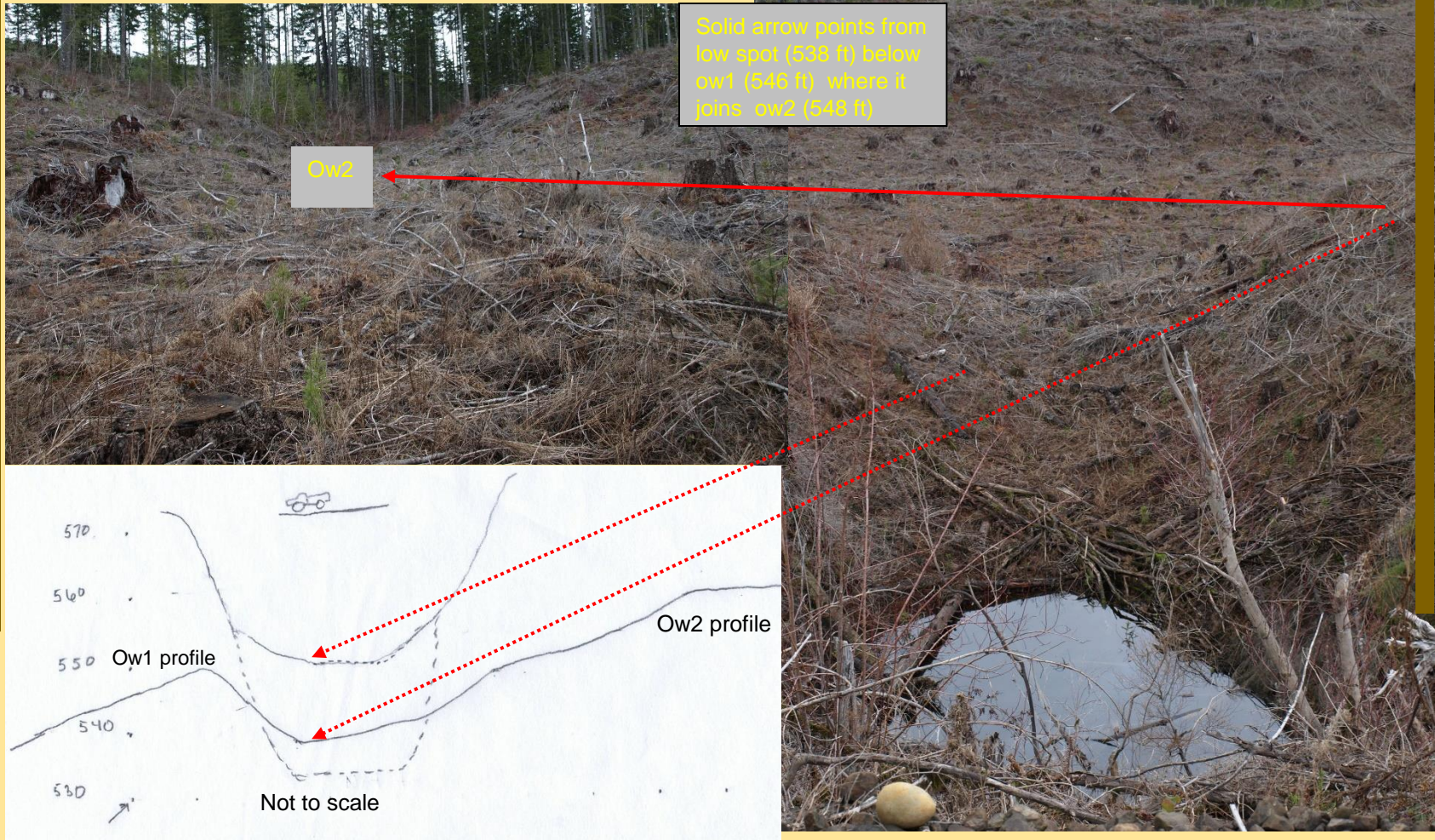


Kettle S3 showing intermediate berm and truck from the berm between S3 and S4 (looking SW).

Note: It's about 471 feet to the truck from where this picture was taken. (A to G = 471 ft)

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 13

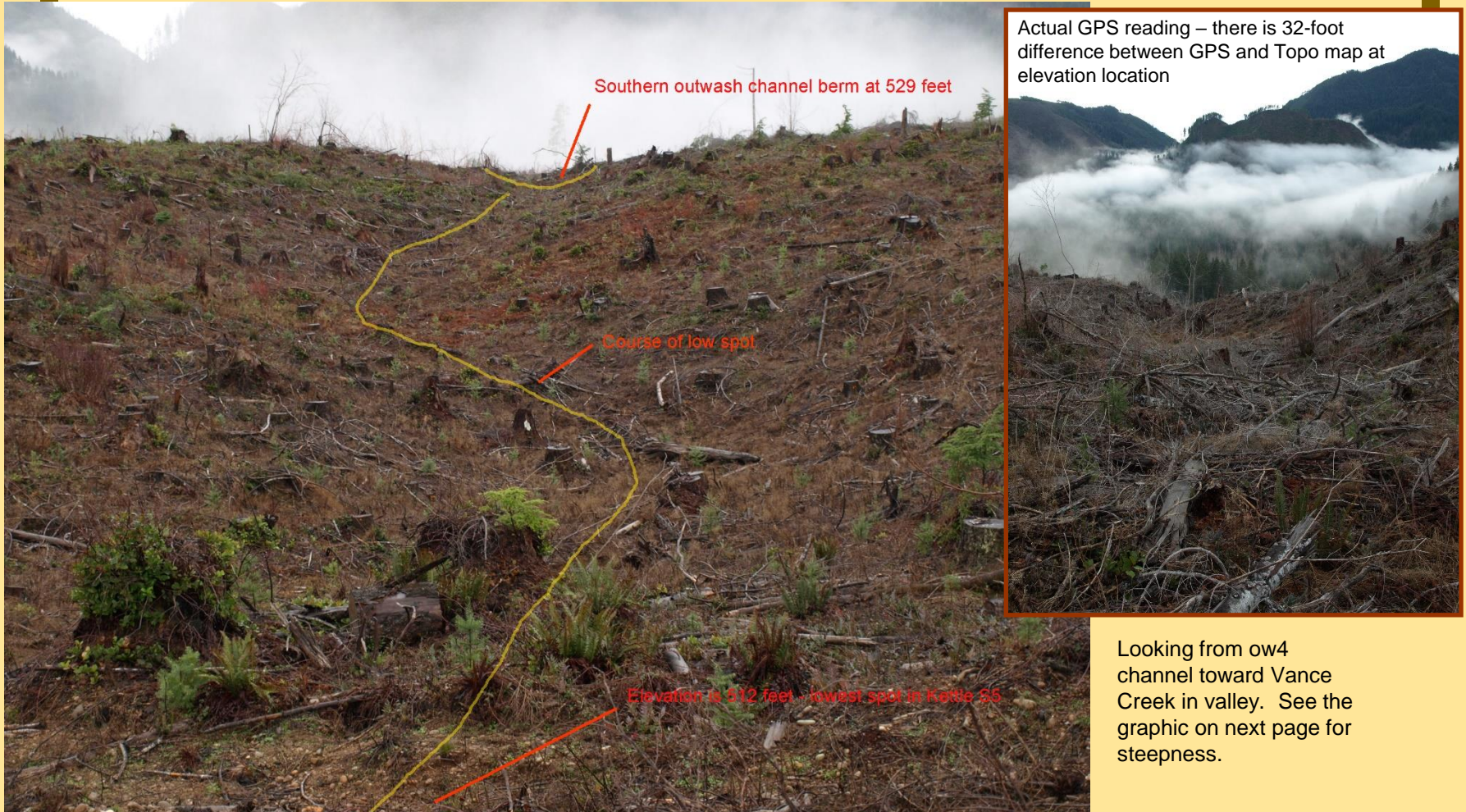


Kettle S3 looking east towards S4.

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 14

Now we want to look at S5 which is perched on the bluff above Vance Creek.



Southern outwash channel berm at 529 feet

Course of low spot

Elevation is 412 feet - lowest spot in Kettle S5

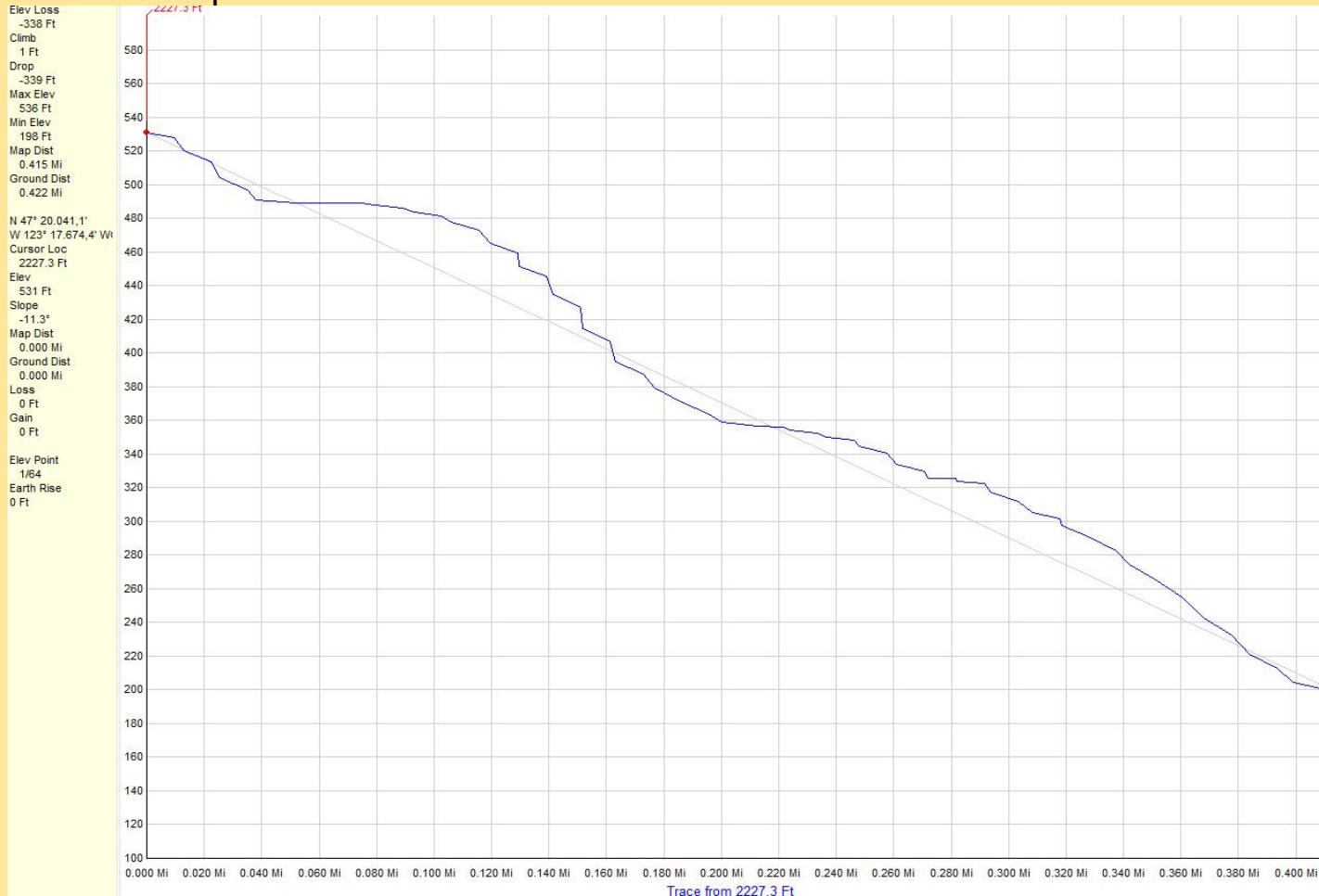
Actual GPS reading – there is 32-foot difference between GPS and Topo map at elevation location

Looking from ow4 channel toward Vance Creek in valley. See the graphic on next page for steepness.

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 15

Gradient of slope into Vance Creek from S5:



Enlarged profile of valley wall from south end at ow4 of kettle S5 into the Vance Creek valley floor.

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 16

Gridsale is our next stop. A former Simpson Lumber Company Camp. The lumber railroad originated at Shelton (the roundhouse still exists) and ran up to Gridsale and beyond – the High Steel Bridge on FS2340 was part of that line.



Purported picture of Gridsale (undated)



The steel bridge at Gridsale over Vance Creek looking north

The IAFI Puget Lobe Chapter monthly newsreel:

Introduction to the Milankovitch Theory, Ch 10, p. 17

Well, we ran out of time and will continue with Chapter 11 in November when we look at the features exposed in the borrow pit on the north side of “Colonnade Hill”; and the eskers below Dennie Ahl, particularly Esker 4 (on the side of Dennie Ahl) and Esker 5 (going over a high spot).

And then wander up to view the Frigid Creek Fault up close.

On our way back to FS23 we will look at the outwash channel diverting outwash from the glacial snout to the east side of “Colonnade Hill” and flowing south until the South Fork of the Skokomish river bisected it at the High Steel Bridge. Both followed the outwash channel (only remnants of the outwash channel remain) with the South Fork carving the canyon to its delta near the start of FS23. Lidar provides us with this opportunity.

While the South Fork bisected the outwash channel near the High Steel Bridge and the South Fork “followed” the outwash channel. You will also see another outwash channel that formed a present-day steep sided creek. Stay tuned!

Enjoy tonight’s feature presentation and come back for the Nov lecture.