

Regional Scale 2 Full profile and 2 test pits

20180211
Rich Rogers

What do I need to do??

Objectives: Understand concepts of spatial variability at the Regional Scale (<100 km). This assignment represents a "typical" field observation day scope for a regional Avalanche Forecaster.

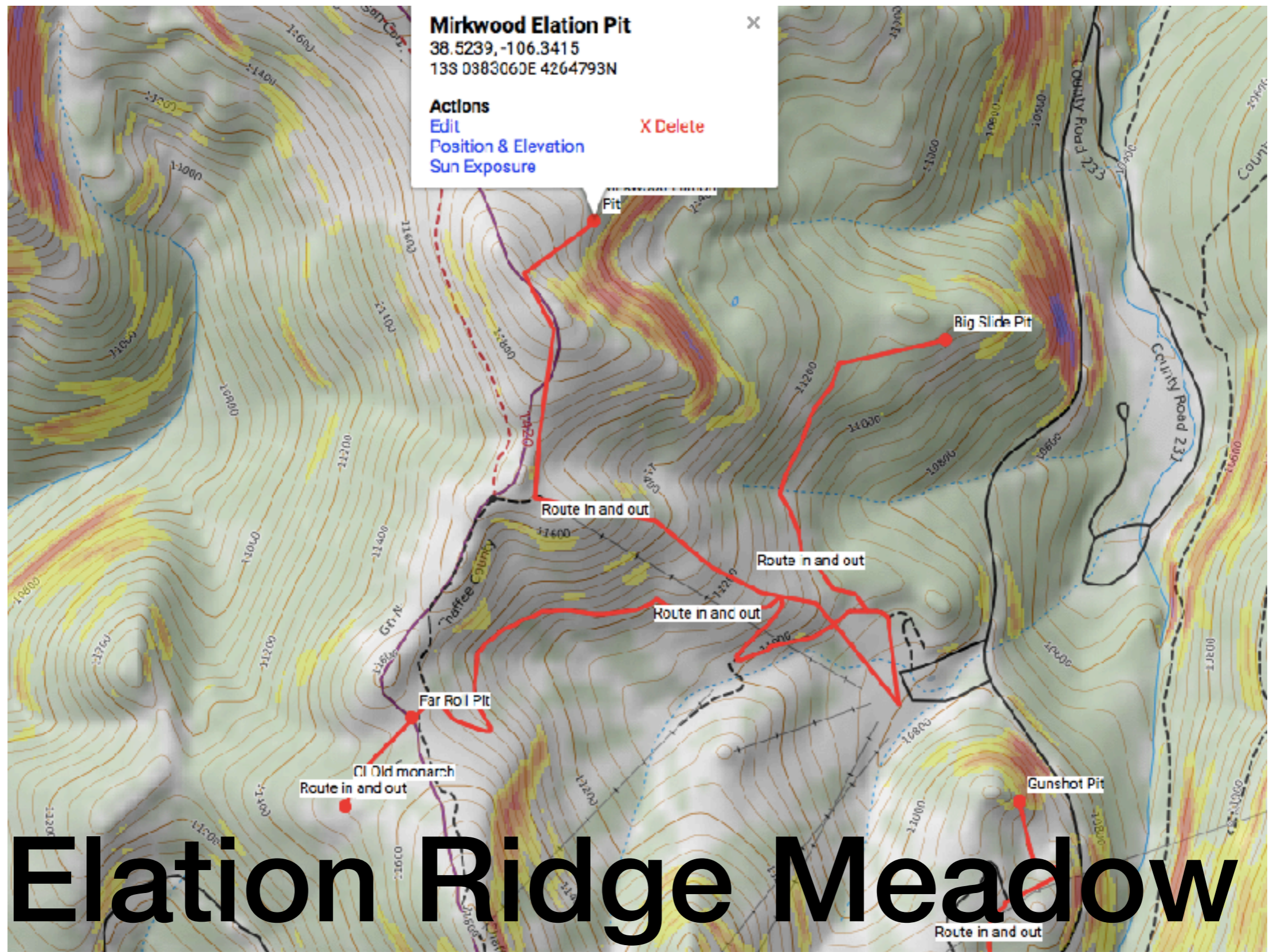
Collect data from four snowpits in four locations - distance between all sites > 10 km

Two full profile pits and two test profiles (maximum depth in test pits – 150 cm). Note: *"Test profiles are the most common type of snow profile. There is no Fixed rule about the type and amount of information collected in a test profile. Each observer must select, observe and record the parameters needed by their operation"* (SWAG, 2017). For this assignment, your Test Profiles will be limited to the following data set:

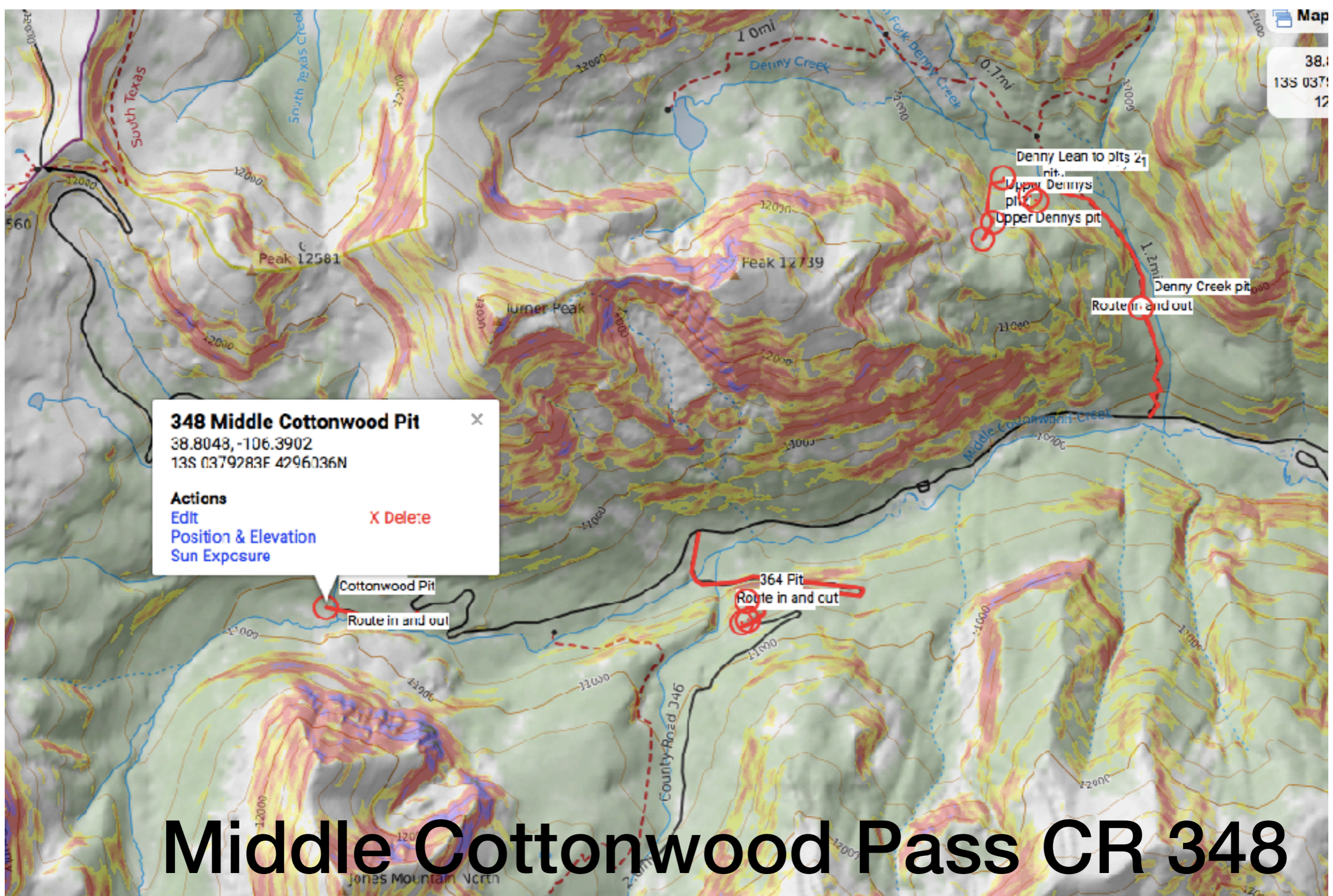
- 1 Basic Pit Header information: observer, location, date, time, elevation, aspect, slope angle, HS .
- 2 Basic Stratigraphy: Layer ID and height
- 3 Hand Hardness
- 4 Instability Tests: CT x1, ECTx1
- 5 Examination and characterization of problem interfaces / layers if present

Site info

- Elation ridge site
 - 11,740ft, E (100Deg), Slope angle 25Deg, HS 108cm, Treed/protected area within monarch ski area Mirkwood basin hike to terrain, Study Plot is roped off to deter ski traffic through area
- Middle Cottonwood Pass CR 348
 - 10,912ft, ESE (113Deg), Slope angle 4 Deg, HS 42cm, Open meadow near a marsh, Appears to be a windy area scree field approx. 200 yds S has wind deposits on E side of rocks making up scree



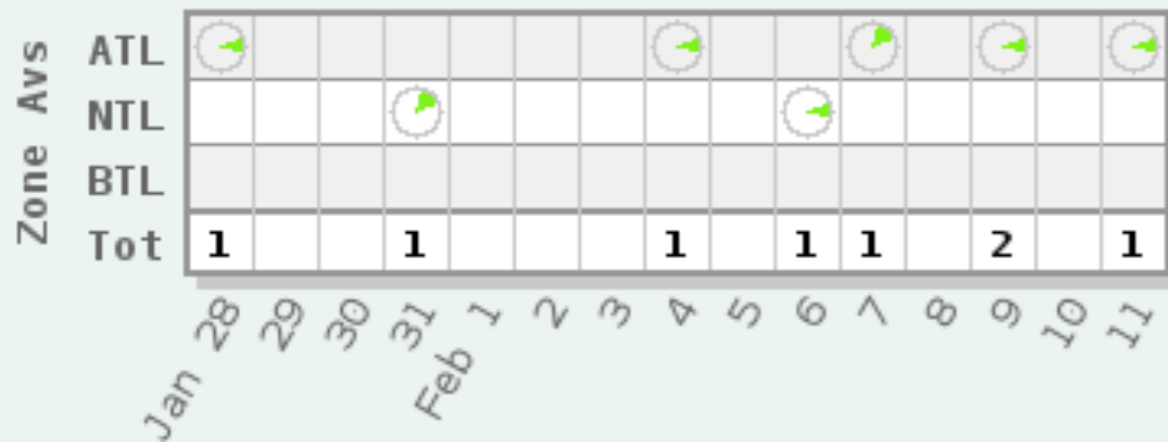
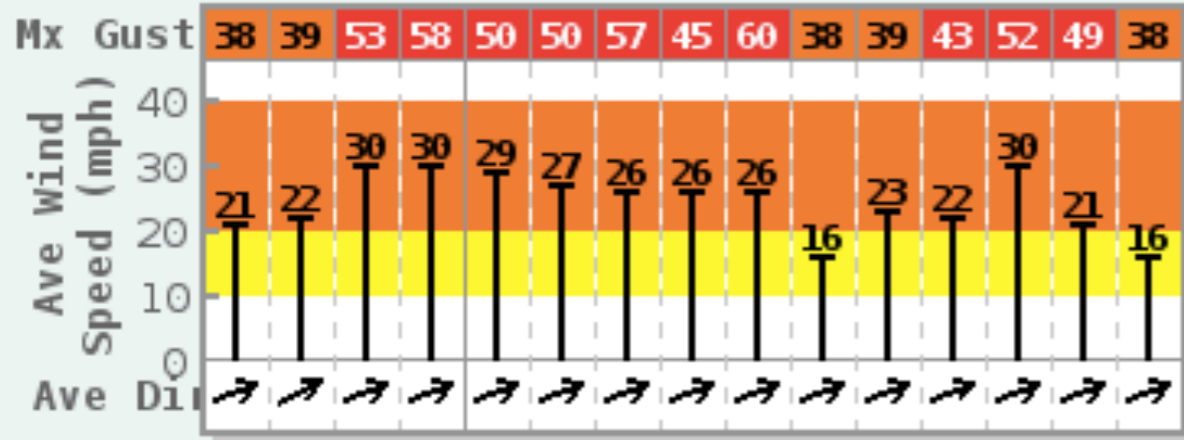
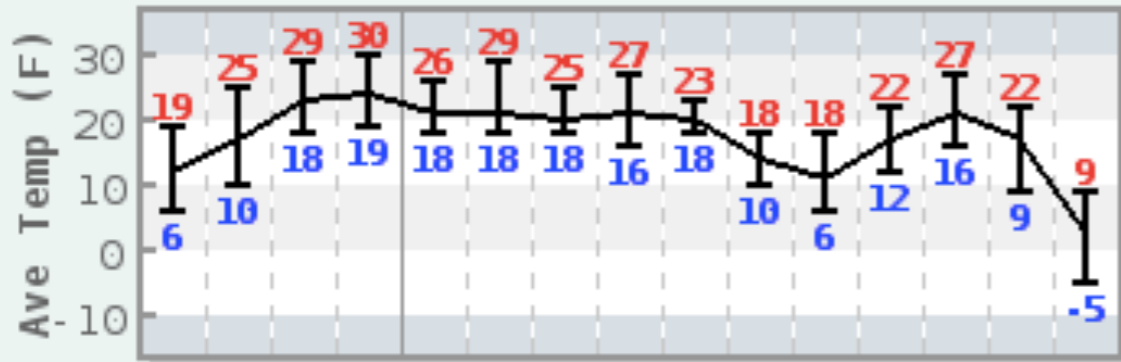
First site visited on 20180204
Within Monarch Ski Area



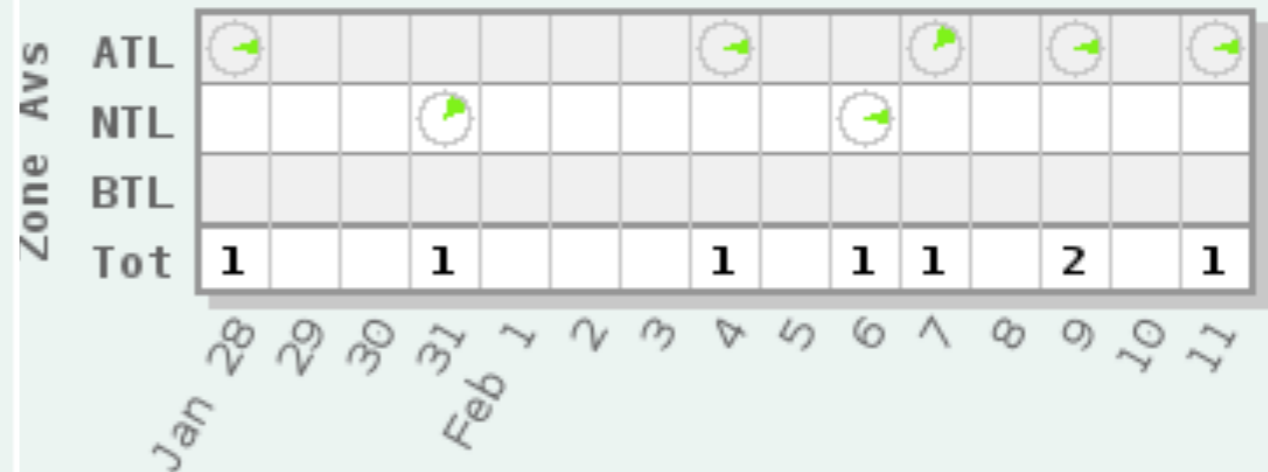
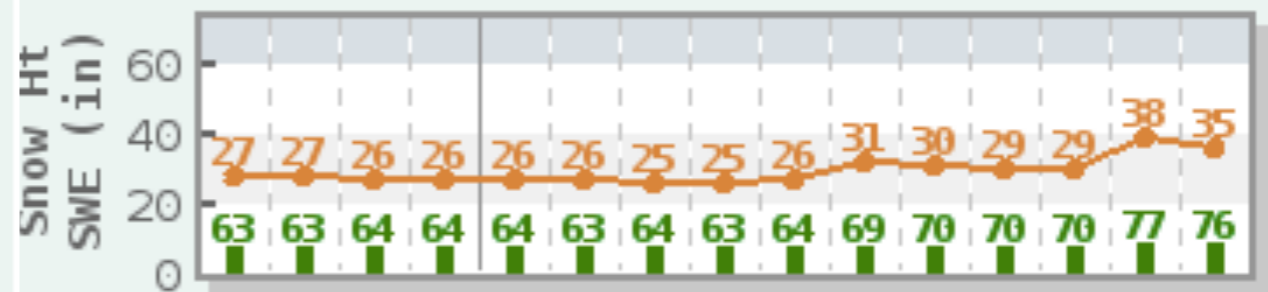
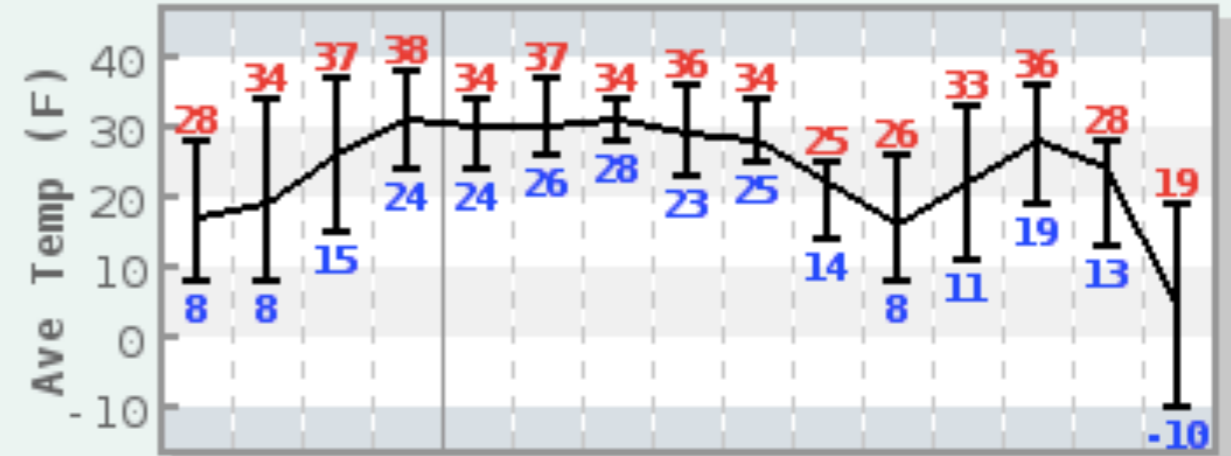
Second Site visited on 20180212

Wx window for Monarch Pass

Monarch Mountain (MonarchSA) 11951

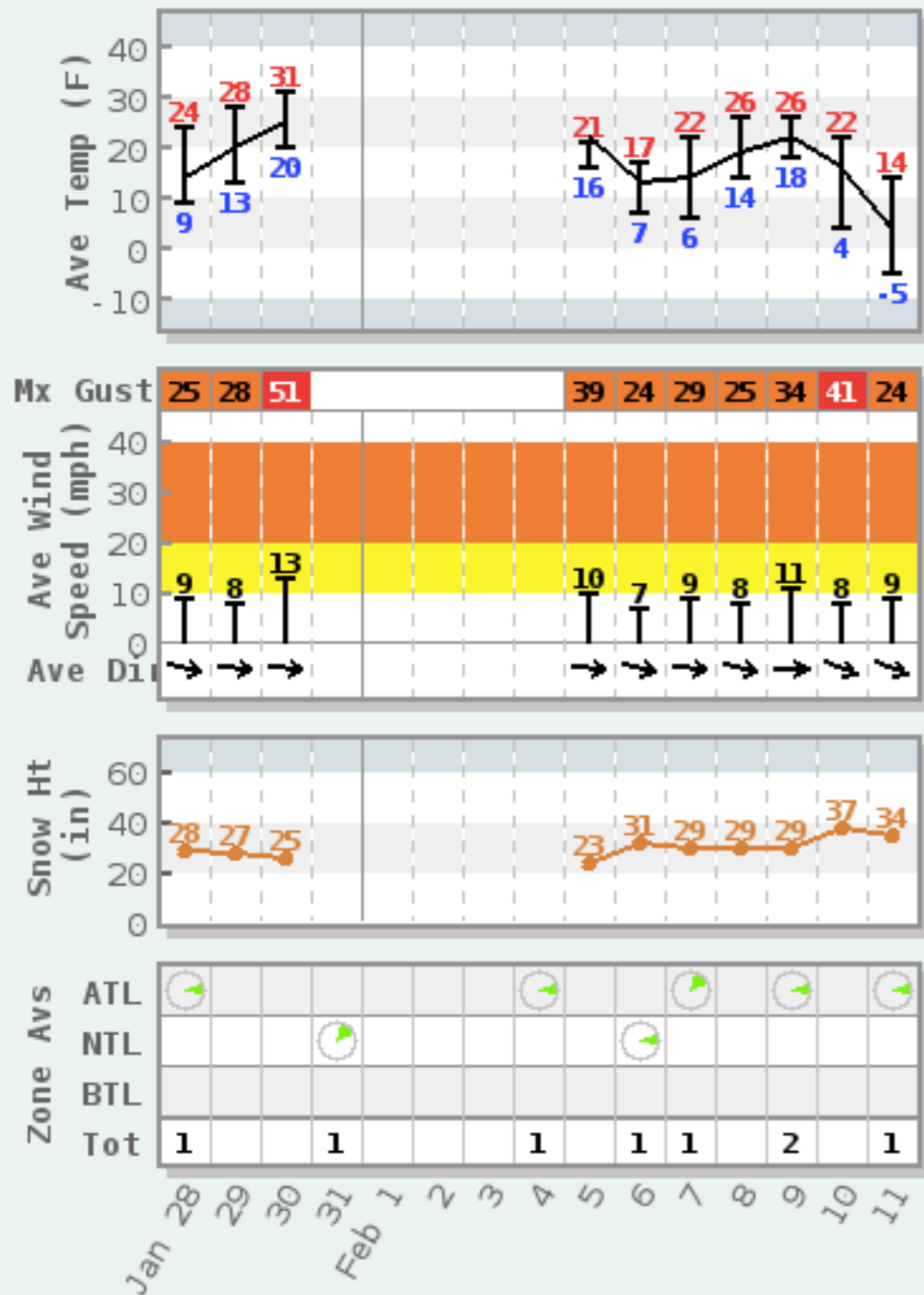


PORPHYRY CREEK (SNOTEL) 10761 ft

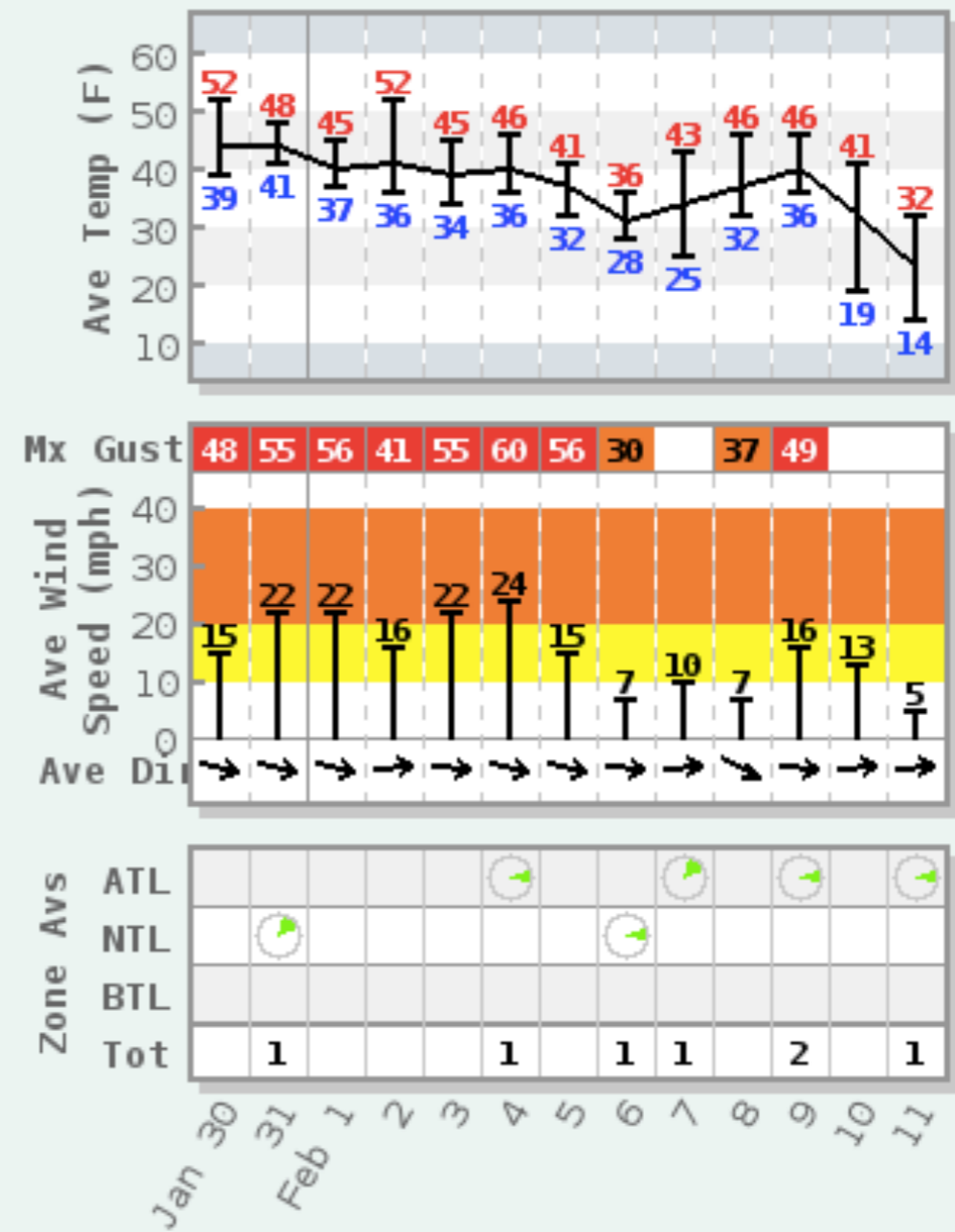


Wx window for Cottonwood Pass

COTTONWOOD PASS (CAIC) 11802 ft



COTTONWOOD PASS (METAR) 9827 ft



Elation 1 meadow
Pit craftsmanship
20180204



**Elation 1 Meadow
Stratigraphy/Hardness
20180204**

F

F

4F

4F

F

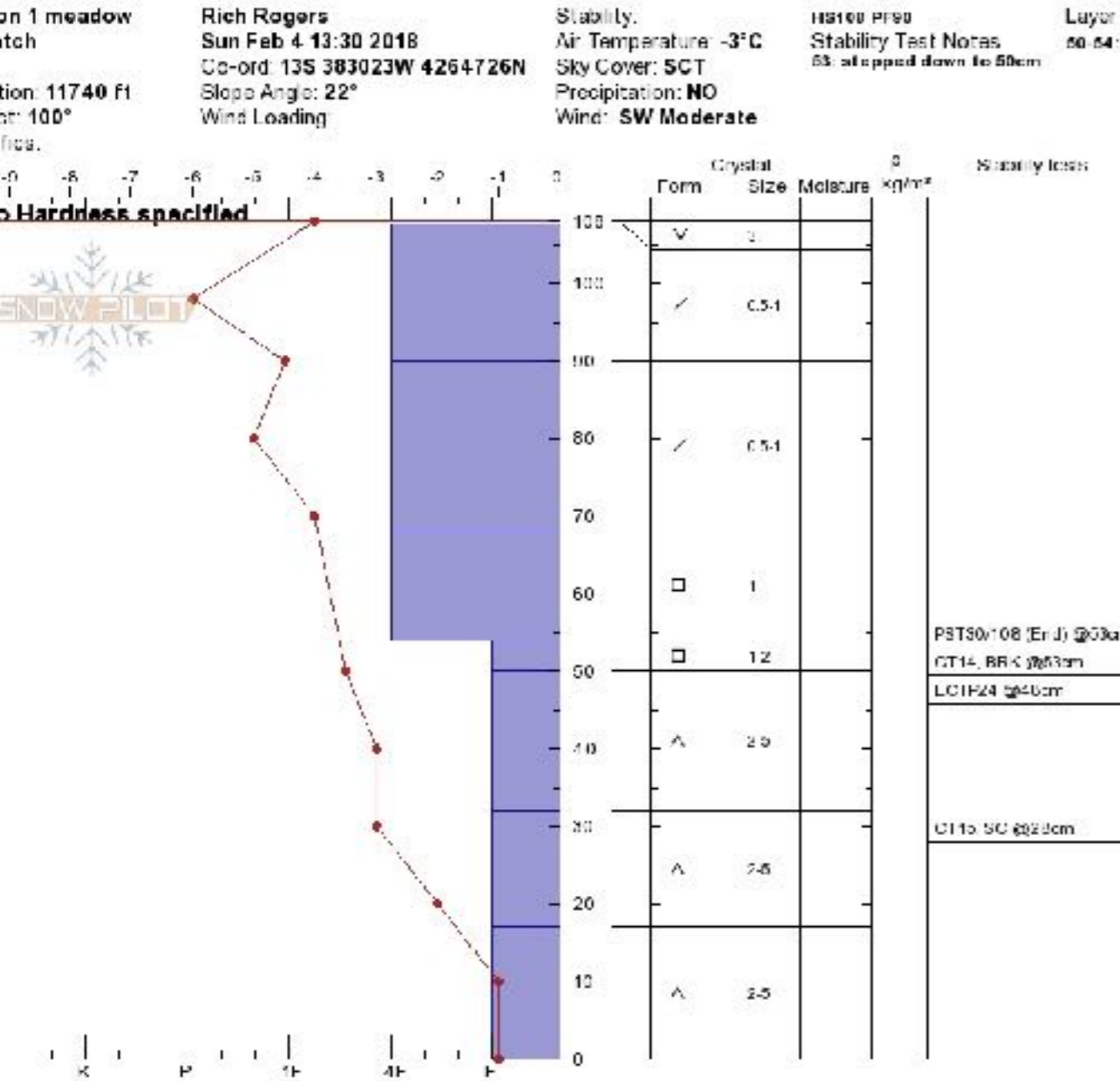
F

F

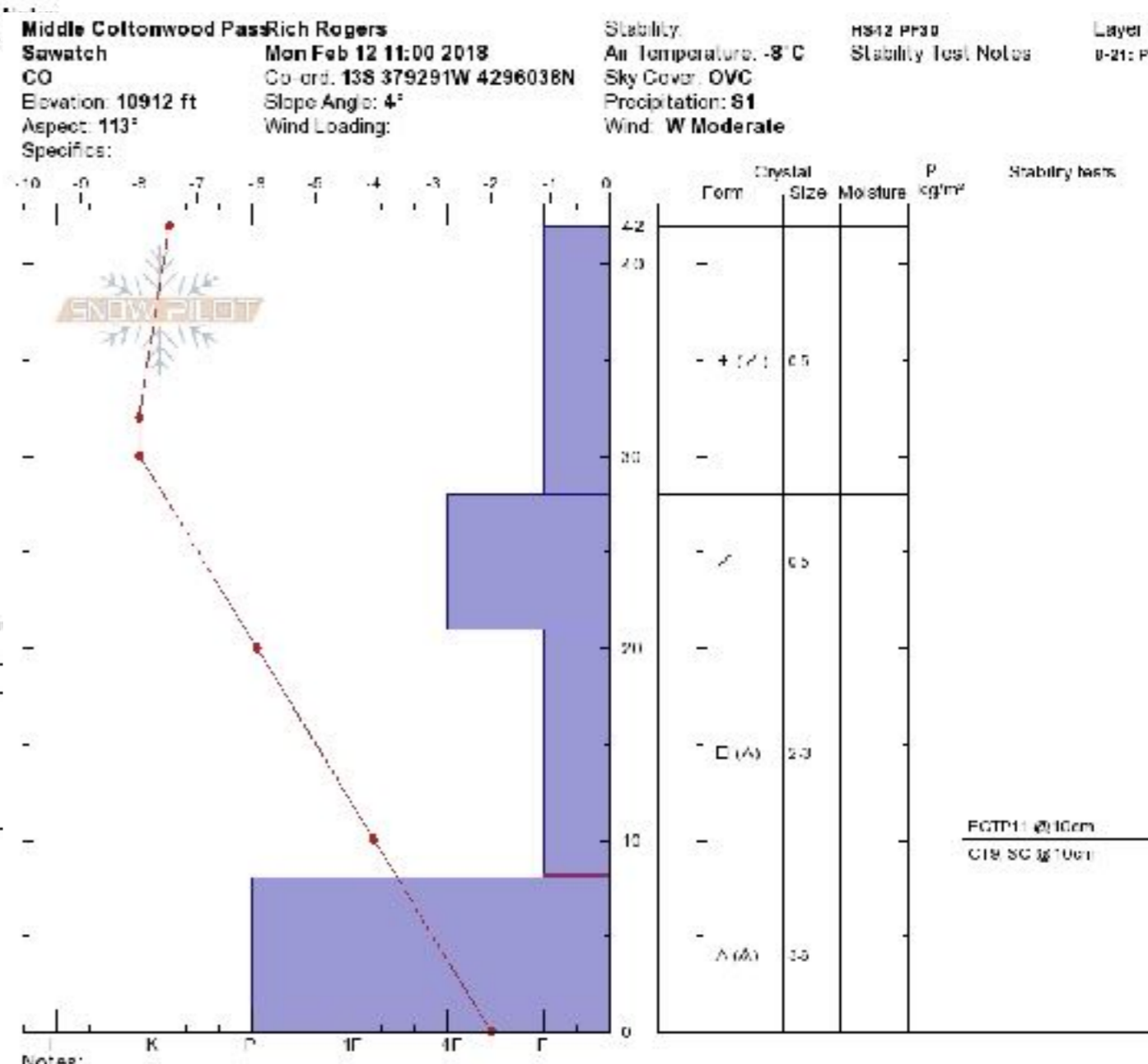


**Middle cottonwood Pass
Site overview/ hardness
20180212**

Two full profiles



Elation 1 Meadow
20180204



Middle Cottonwood Pass
20180212

Location: Elation 1 meadow
 Date: 20180204 Time: 13:30 Obsrv: R. Rogers, Z. Moore, K. Jusoff
 Elev: 11,740 Aspect: 100 Slope: 22 Pit Type: Full

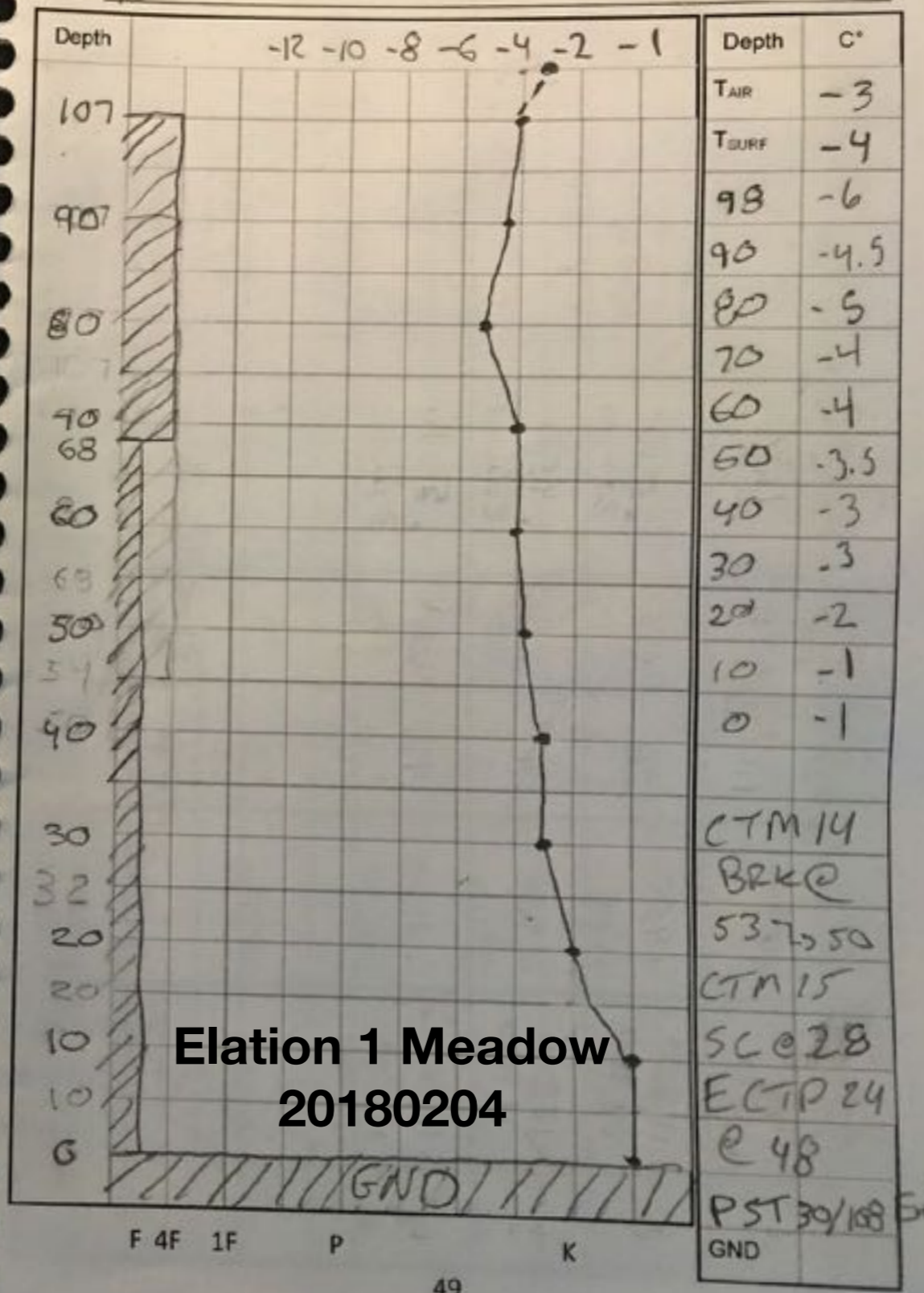
Sky: ① Precip: NONE Wind Dir: SW Wind Spd: M
 Blowing Snow: Ext N/A Dir N/A Loc N/A Pen (Foot/Ski) 80/1 HS: 108 T_{air}: -3
 Notes: Ø

Yellow Flag Criteria
 Count of 5 or 6 Flags
 Indication of
 Instability

Layer Properties:
 Avg Grain Size > 1mm
 Hardness < 1F
 Persistent Grain Type (SH, FC, DH)

Interface Properties:
 Diff in Grain Size > .5mm
 Diff in Hardness > 1
 Interface Depth 20-85cm

Depth	Hardness	Grain Type	Grain Size	Avg. Grain Size	Hardness	Grain Type	Grain Size diff	Hardness diff	Interface Depth	Sum
108	4F	V	3mm	Δ		Δ				
							Δ		Δ	4
107	4F	X	5-6mm		Δ					
									Δ	2
90	4F	/	5-1		Δ					
									Δ	3
68	4F	□	1		Δ	Δ				
							Δ		Δ	5
54	F	□	1-2	Δ	Δ	Δ			Δ	5
							Δ		Δ	5
50	F	Λ	2-5	Δ	Δ	Δ				
									Δ	4
32	F	Λ	2-5	Δ	Δ	Δ				
									Δ	4
17	F	Λ	2-5	Δ	Δ	Δ				
										3
0	F	Λ	2-5	Δ	Δ	Δ				



**Elation 1 Meadow
20180204**

F 4F 1F P K

R. Rogers, B. Bosand

10,912 113[°] ESE

Bottom: 30cm Skippn: 16cm Hg: 42cm T AIR - 8[°]C

T surf - 7.5

42	F	+	.5mm	Wspd: M	32	-8
28	4F	/	.5mm	W Dir: W	30	-8
21	4F	/	.5mm	SKy: ⊕	20	-6
	F	Λ	2-3mm	Precip: SN	10	-4
8	P	Λ	2-3	Rate: SI	0	-2
	P	Λ	2-4			
0	P	Λ	2-4			

CTE SC 10
ECTP II @ 10

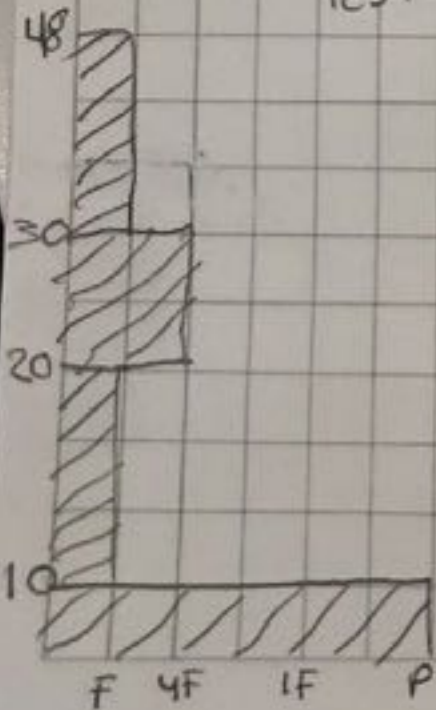
Test Pit m. Cottonwood

CTE SC 13 @ 10 cm

ECTP II @ 10 cm

Similar to Full Profile

New snow over DH



Middle Cottonwood Pass 20180212

Full pit and test pit approx. 10ft apart
Yellow flags would indicate @ 8cm
Layer of concern/problem layer

CT, ECT, and PST videos

Taking a very long time for videos to load on to YouTube. Will email other videos

- <https://youtu.be/5hZLPSNeDtQ> CT M. Cottonwood Pass
- <https://youtu.be/rnUdiDVx0Es> CT Elation 1 Meadow
- <https://youtu.be/LHmAD-72f0k> ECT M. Cottonwood Pass
- <https://youtu.be/0aZzxGKjBX4> ECT Elation 1 Meadow
- <https://youtu.be/IOKFSDhiPK8> PST Elation 1 Meadow

Summarize key observations and comparisons:

- What were the differences in the pits, layers, tests?
- What were the similarities in the pits, layers, tests?
- What is causing these similarities or differences?
 - Terrain differences?
 - Weather differences?
 - Internal snowpack differences?
- Differences
 - 64cm diff. in HS (Wx Diff). Middle Cottonwood Pass site see a lot of wind through the open meadow/marsh that formed along side of Middle Cottonwood Creek. A scree field to the South, of pit site, held snow on leeward side of rocks through scree. Scree still very visible. Coverage is pretty thin even 1500 vert. Ft. On Jones Pk(13,000+), which faces North. Just west of scree field is a slightly higher ridge that developed cornice between pods of trees along said ridge. Elation 1 Meadow site is approx. 250 ft below (leeward) Cont. Divide in a gladed area.
 - HST roughly 10-15cm diff. With one storm between 2/4-2/12 (Wx and Terrain Diff)
 - Thickness of DH 30cm diff. (Wx Diff)
 - Approx. 800 ft diff in Elev. (Terrain diff)
 - 4Deg. and 22Deg. Slope angles (Terrain diff)
 - ECTP11 @10cm above P hard DH(M. Cottonwood)/ ECTP20 @ 52cm(Elation1 Meadow).(Internal Snowpack diff)
 - P hard layer at bottom of cottonwood pit, this may have been a MF crust that has faceted or heavily chained DH. Did not find the same in the elation meadow pit. Elation one meadow pit had F hard DH from ground up to 50cm. (Terrain, Wx, Internal Snowpack diff)
 - Cottonwood site also see relatively more sun too. Which has limited the HS. This site must have melted out in OCT-Nov. I don't see as many layers that would indicate a full history of snowfall thus far over the winter. First time visiting this site in the winter.
- Similarities
 - Aspect 100Deg./ 113Deg.
 - Test results
 - CT9 SC @ N/O interface, CT12 SC @ N/O interface. Interface height was different but I'm pointing out that CTs were reactive at the same interface between both sites.
 - Both in Sawatch Range but 19-20 miles part as the crow flies.
- Hazard increased during time frame between visits. MOD-CON. Mainly from increased load with new snow falling on 20180210 also on 20180212.