



Turnagain Pass Snow Temperature Array

Wendy Wagner
Chugach National Forest Avalanche Center



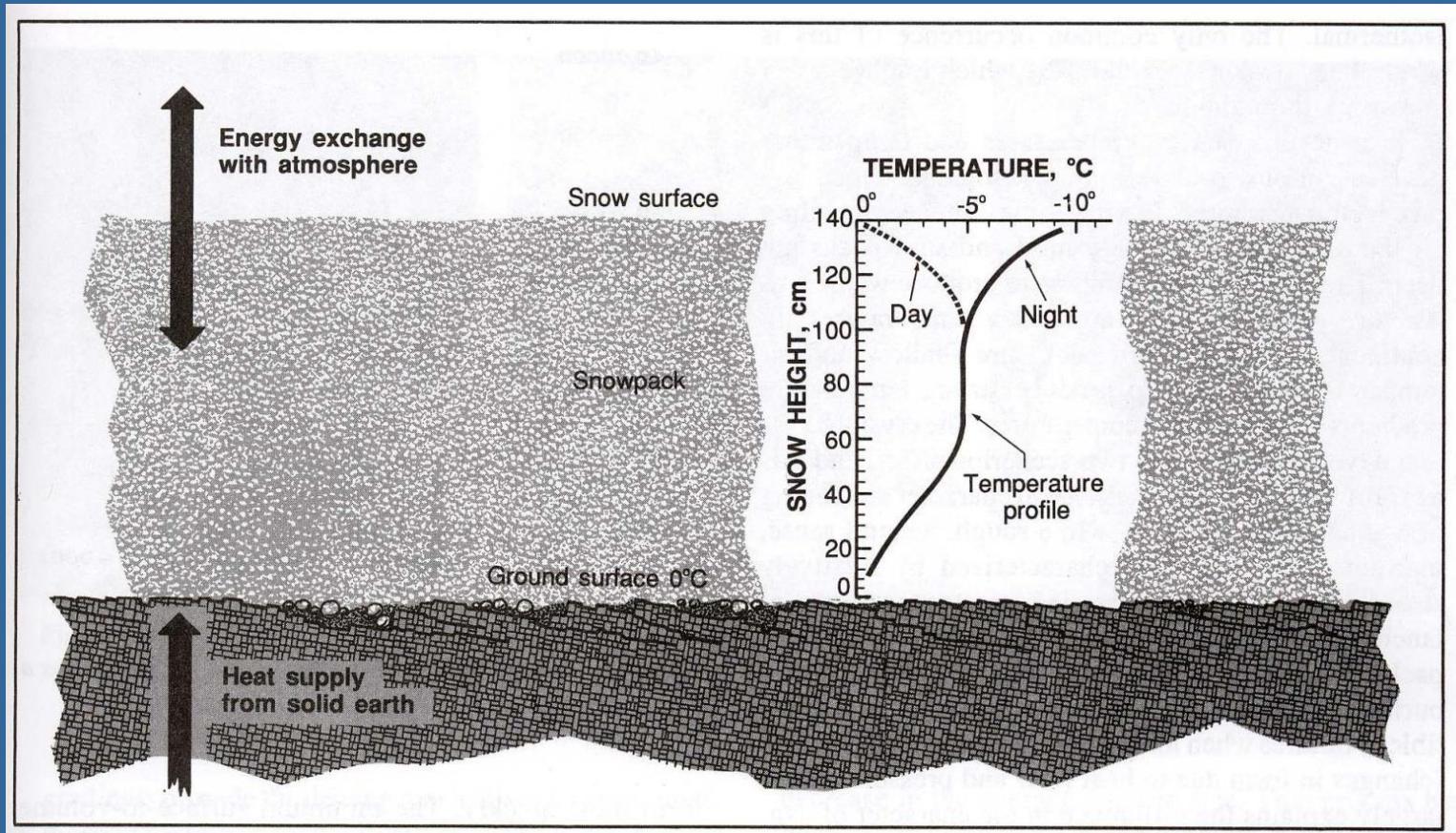
Sean Fallon

Motivation

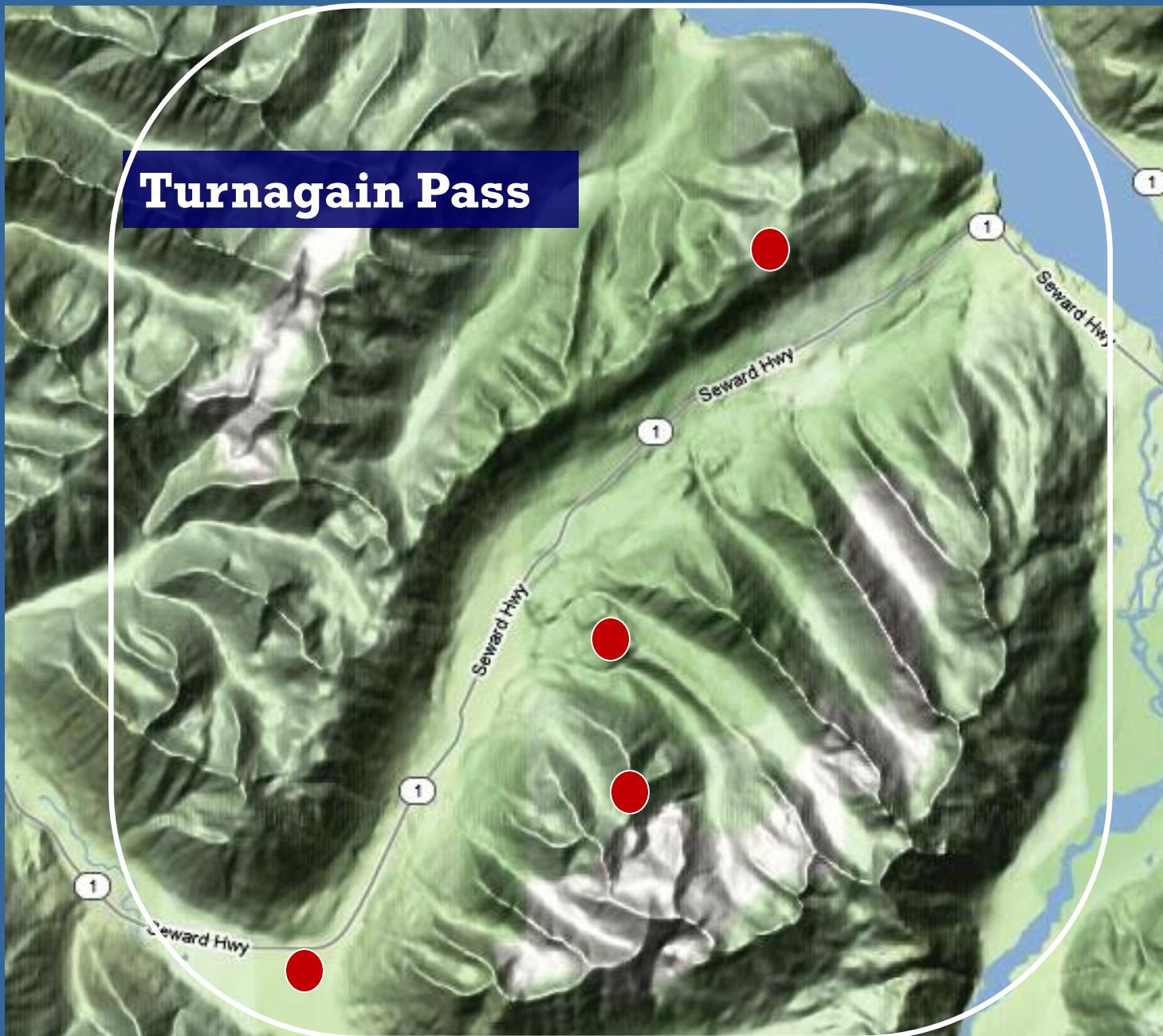


Motivation...

What's going on in the snowpack?



Turnagain Pass



“All
observations
are bad, but
some are
useful”



BeadedStream LLC temperature array







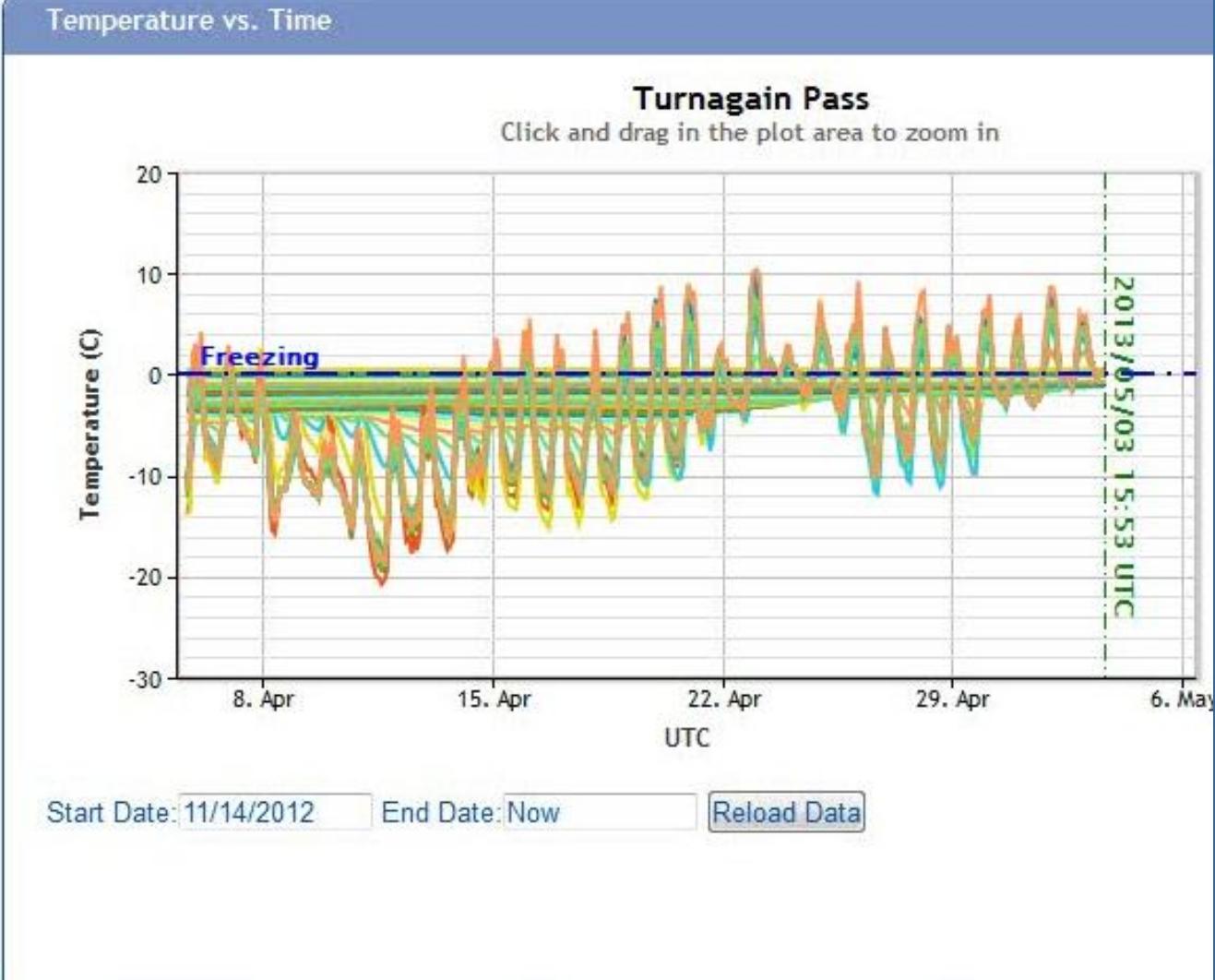
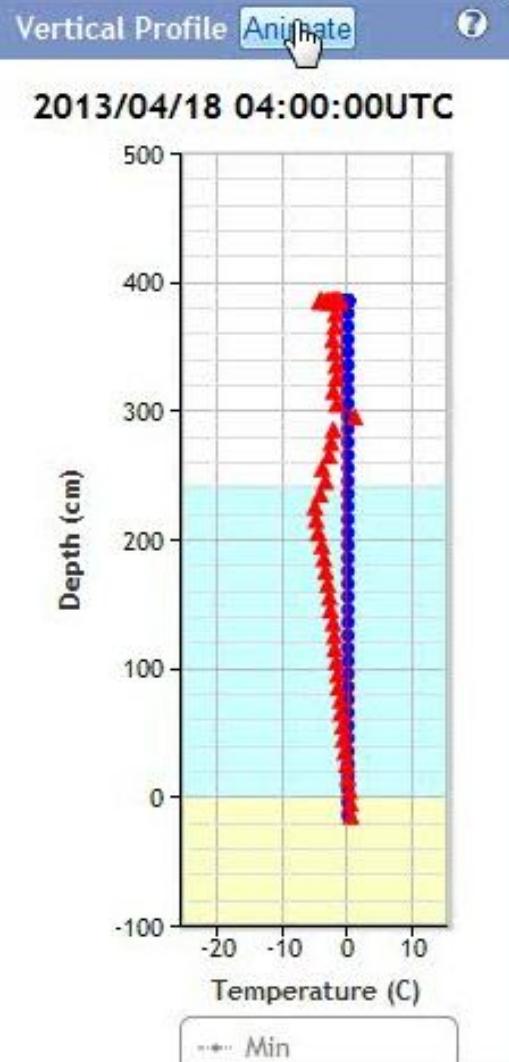
Instrumentation includes:

- ❖ Temperature sensors
 - ❖ Every 10cm in a 3m long “string”
- ❖ Snow depth sensor
- ❖ Datalogger
- ❖ Satellite modem

Updated every 5 minutes all winter!!



Temperature Acquisition Cable
Rated -55C to 125C
 $\pm .1C$ accuracy



Expected information

- Near surface snow gradients
- Mid and full pack snow gradients
 - Springtime changes
- Soil temperature fluctuations
 - Snow depth

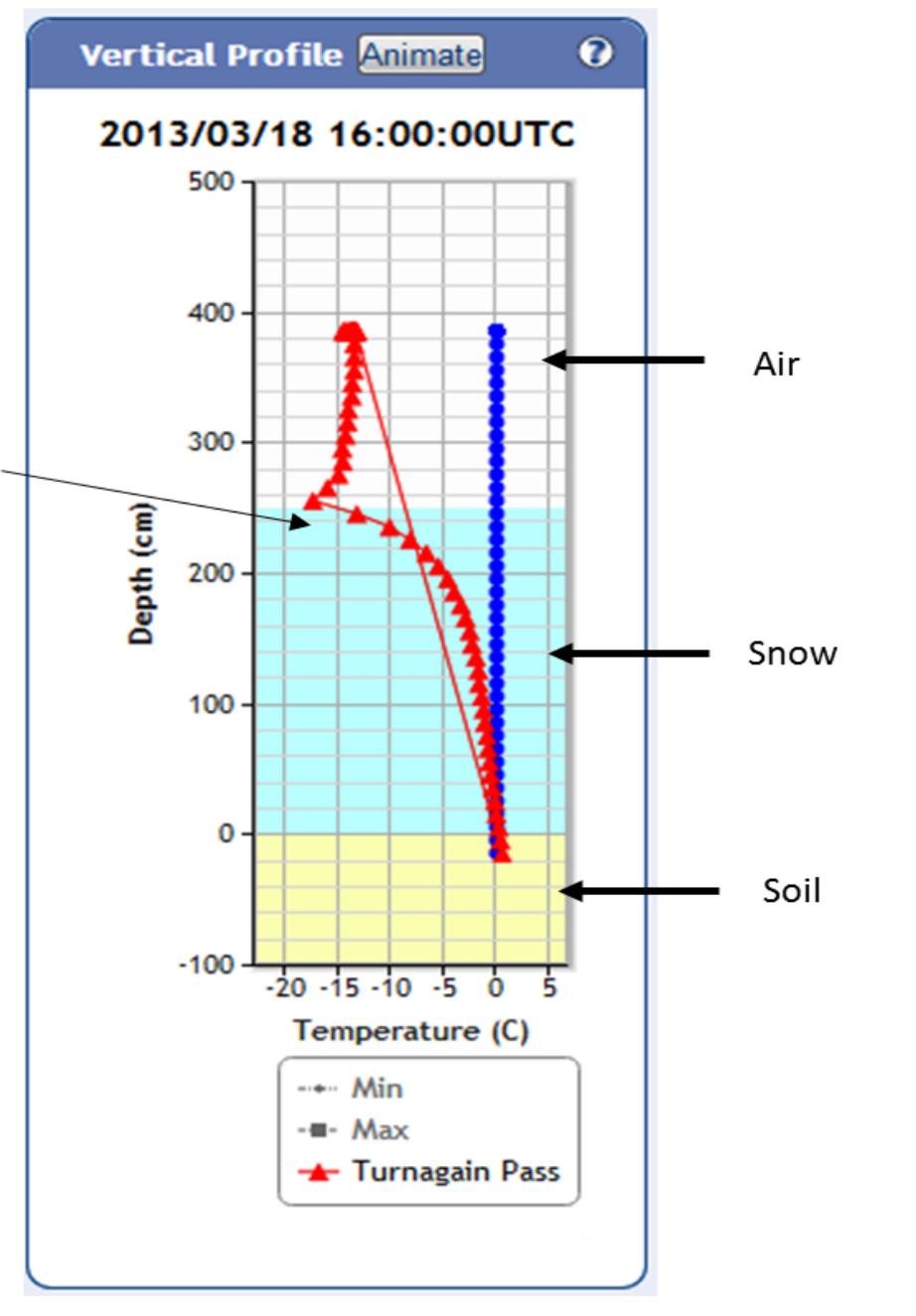
Unexpected Cool Stuff

- Near surface air gradients!
- Sky cover information!
- Settlement rates!
- Surface snow conditions!!

Large change in temperature in the top 50 cm (20 inches) of the snowpack. As much as 40C per meter.

Red line shows temperature of the ground all the way through the snowpack and into the air every 10cm.

Blue line shows the 0C mark for reference.



Nov. 30th 2012 6pm

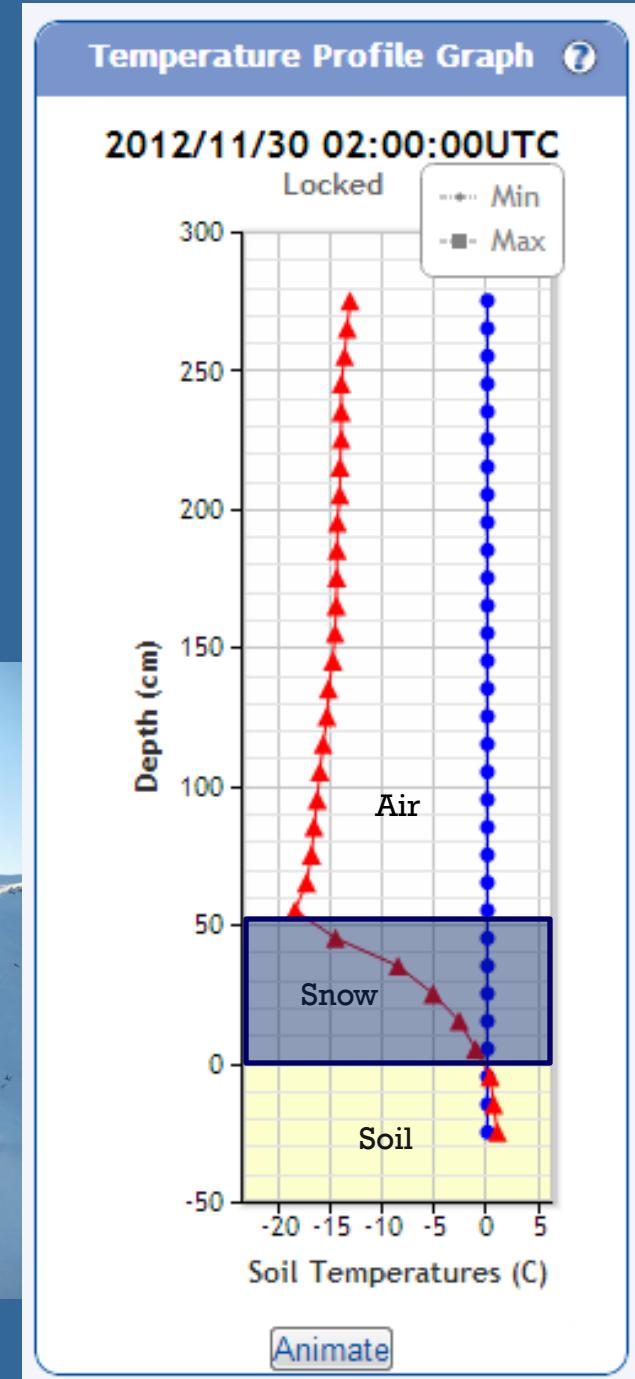
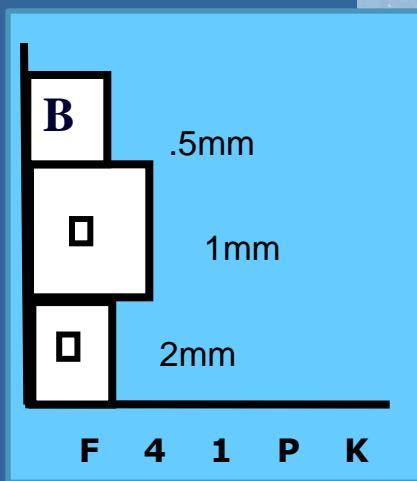
22" of snow

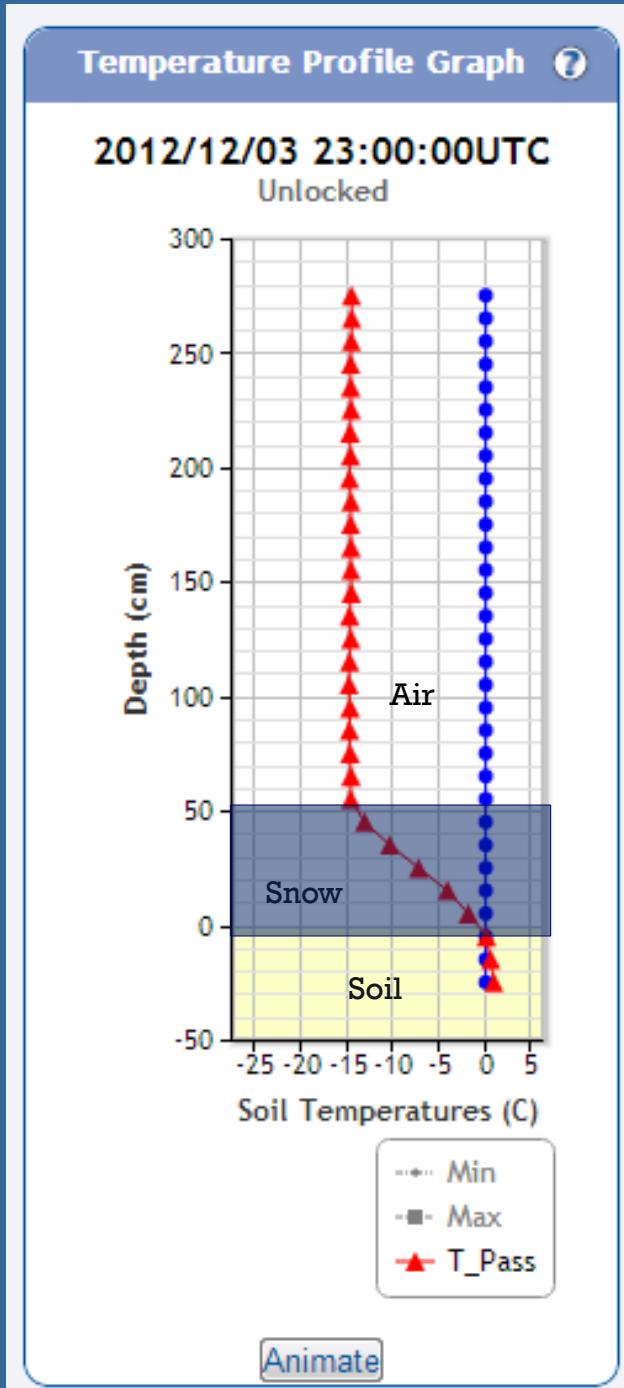
Average snowpack

~36C/m

Near surface

~60C/m



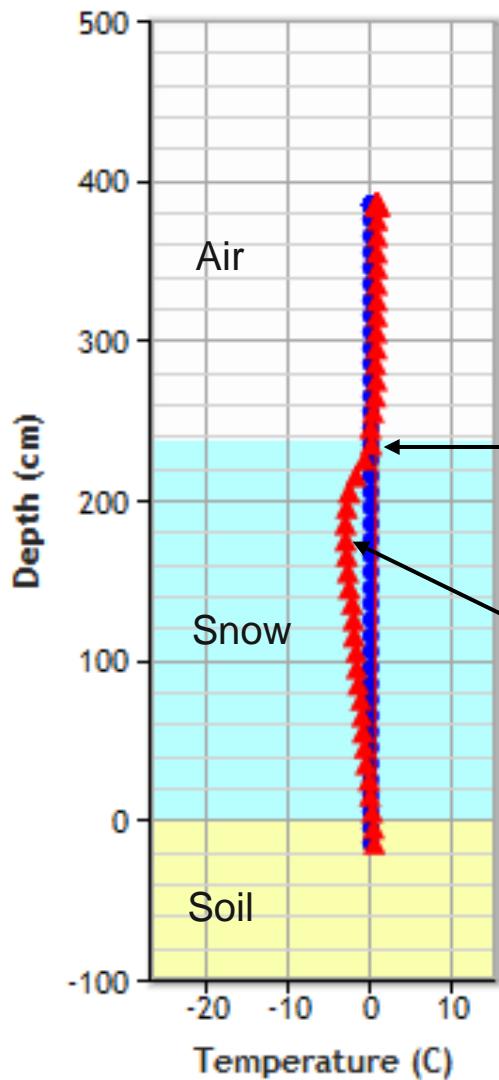


Dec. 3rd 2012 3pm

21" of snow

Example of a cloudy sky

2013/04/23 12:00 UTC



Turnagain Pass (2,000')
April 23rd at 4AM

Red line - snow temperature

Blue line – 0C (32F) for reference

Top 10cm warm (no refreeze)

Mid-pack is between -1 and -4C.

Pack still contains cold snow

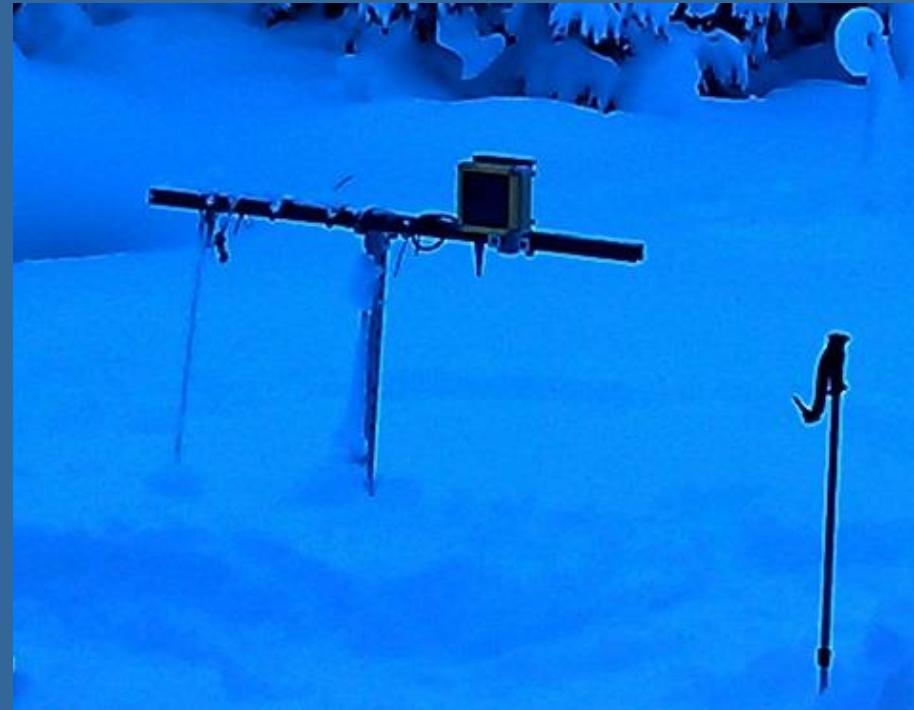
Limitations

Low resolution

Wind drift

Settlement cones

Solar radiation (springtime)



Where to get the info:



ADVISORIES OBSERVATIONS

WEATHER

CALENDAR

RESOURCES

ABOUT

FRIENDS



- Current Weather
- Weather History
- Seattle Wx Station
- Sunburst Wx Station
- Fresno Wx Station
- Marmot Wx Station
- Arctic Valley Wx Station
- Penguin Wx Station
- Glen Alps Wx Station
- [BeadedStream Turnagain Temp Array](#)

Dec 28th, 2012 Kevin Wright

Natural avalanche activity [Click for details.](#)

1 2 3 4 5

F-CNFAIC needs your
DONATIONS

If you think a public avalanche center is important then we urge you to become a member & donate

Donate now with...
PayPal

Announcements

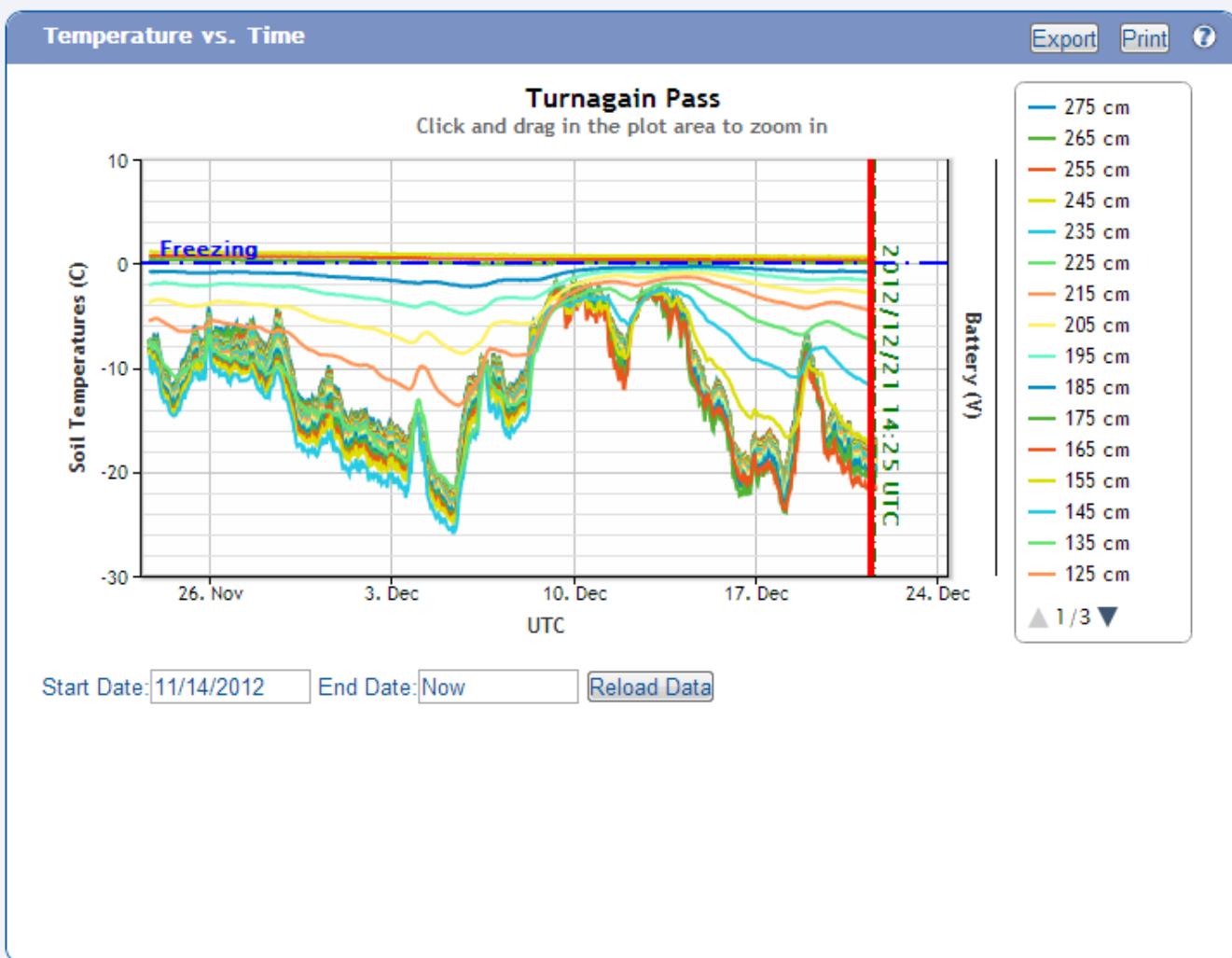
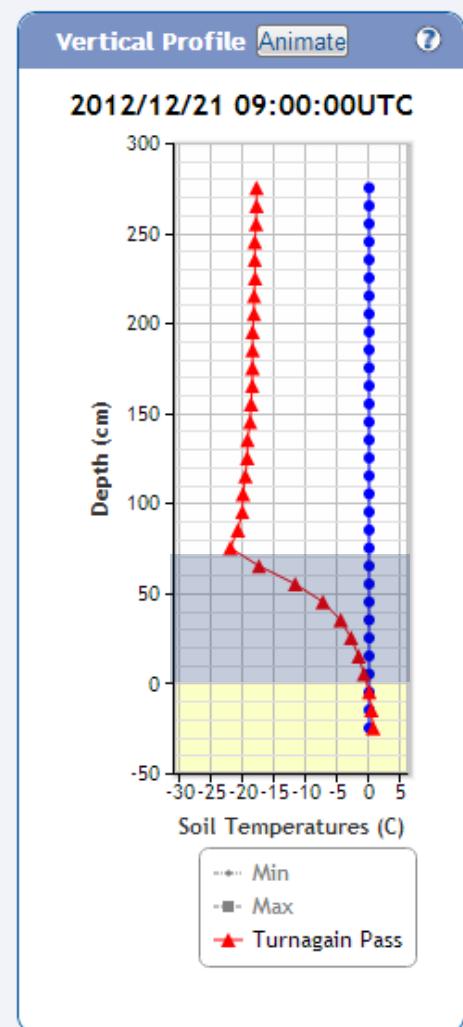
Turnagain Area Advisory

[Southcentral Alaska Snow](#)

[com/projects/turnagain_sd/tacdata.php?webid=FOGR66V8C5M1UH3Y2KVAA](#)

Wednesday, May 1st 2013

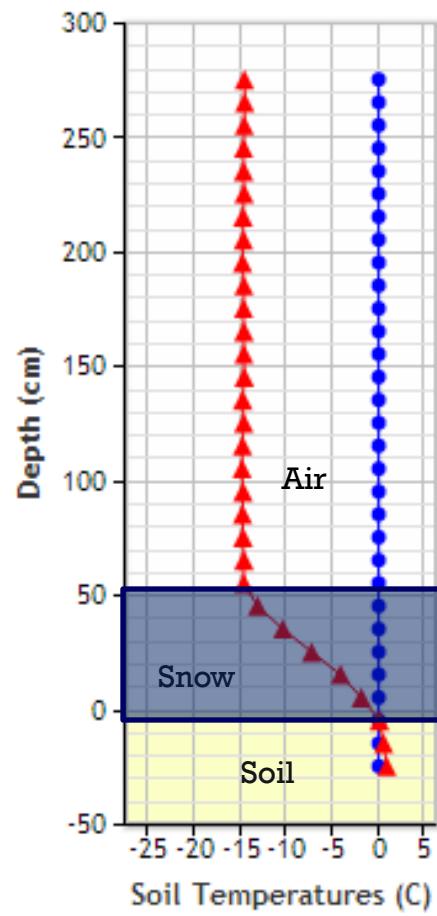
All Sites: Turnagain Pass



Temperature Profile Graph ?

2012/12/03 23:00:00UTC

Unlocked

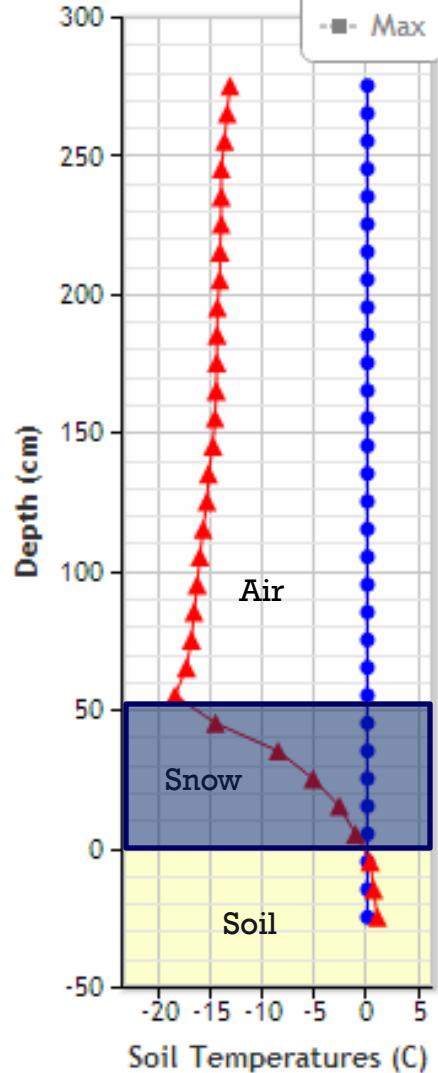


Animate

Temperature Profile Graph ?

2012/11/30 02:00:00UTC

Locked



Animate

Quiz:
What profile shows a cloudy sky and what a clear sky?

Thank You



QUESTIONS?