



Turnagain Pass Snow Temperature Array

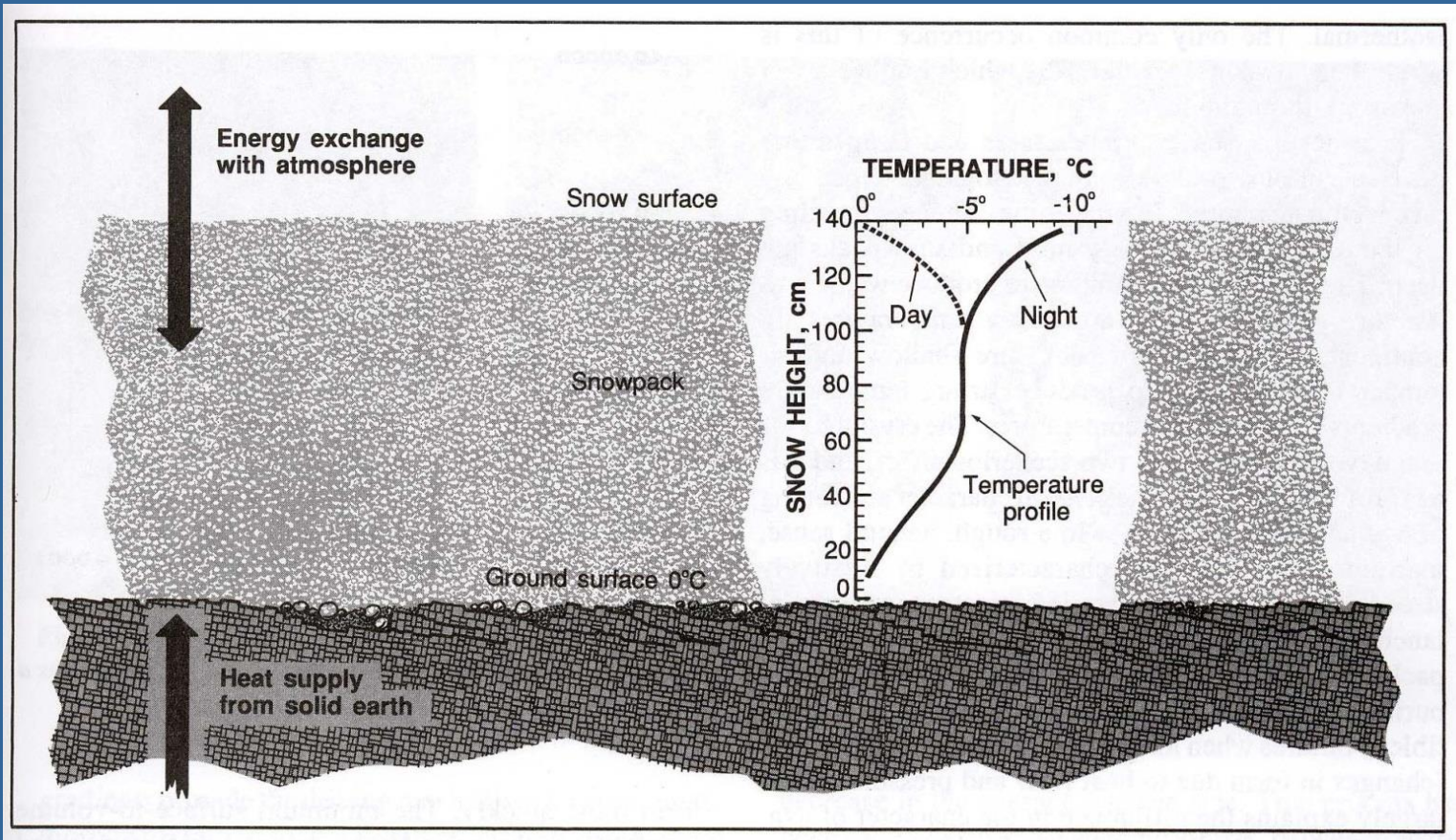
**Wendy Wagner
Chugach National Forest Avalanche Center**

Motivation

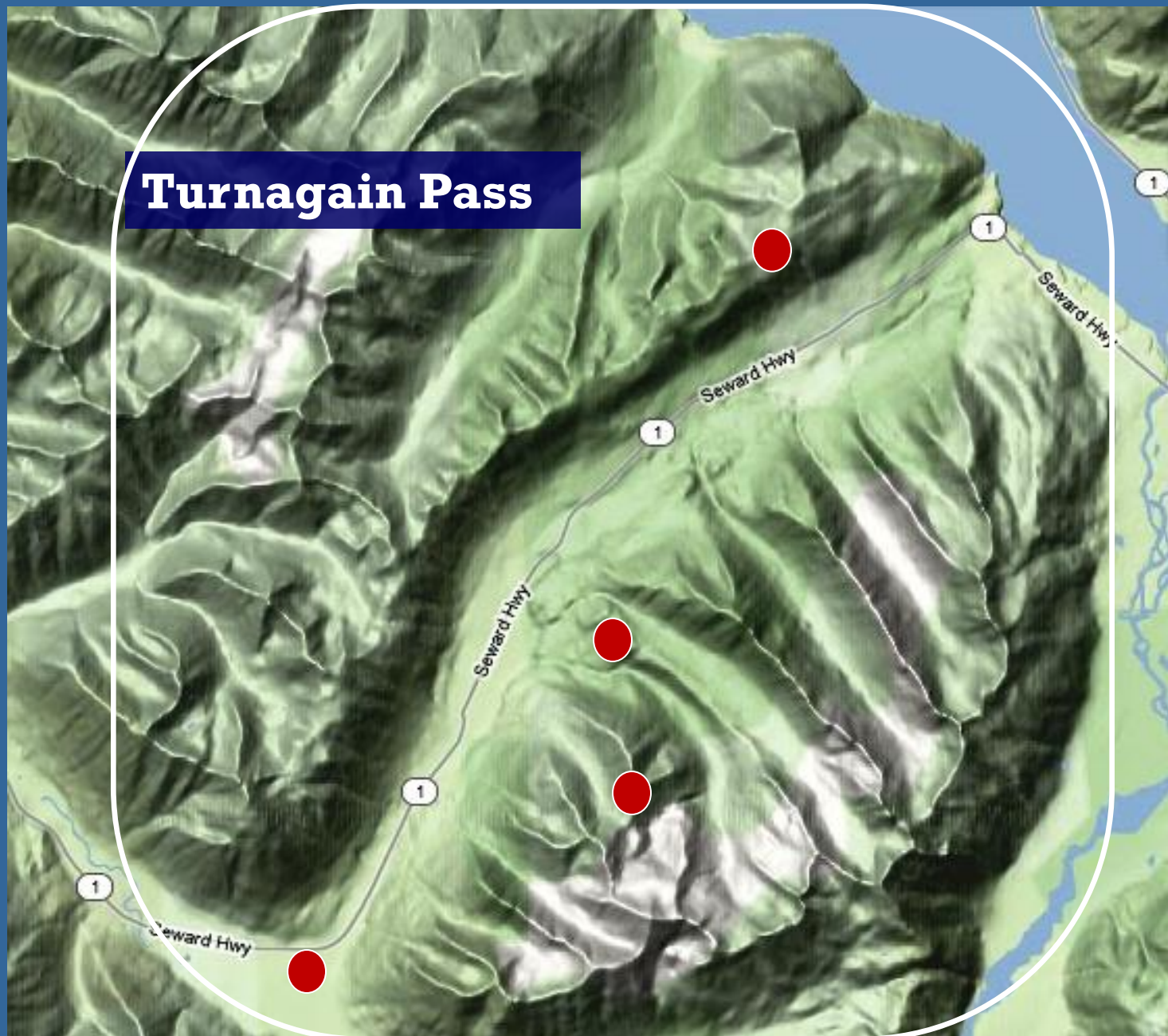


Motivation...

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!!

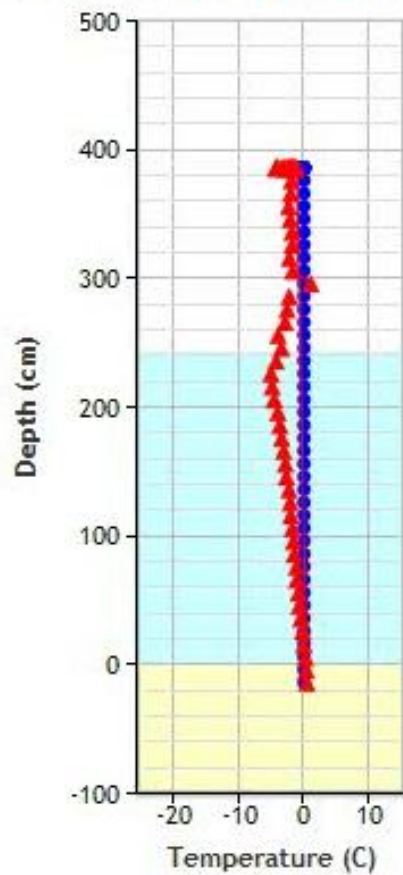


Temperature Acquisition Cable
Rated -55C to 125C
 $\pm .1$ C accuracy

Vertical Profile [Animate](#)



2013/04/18 04:00:00UTC

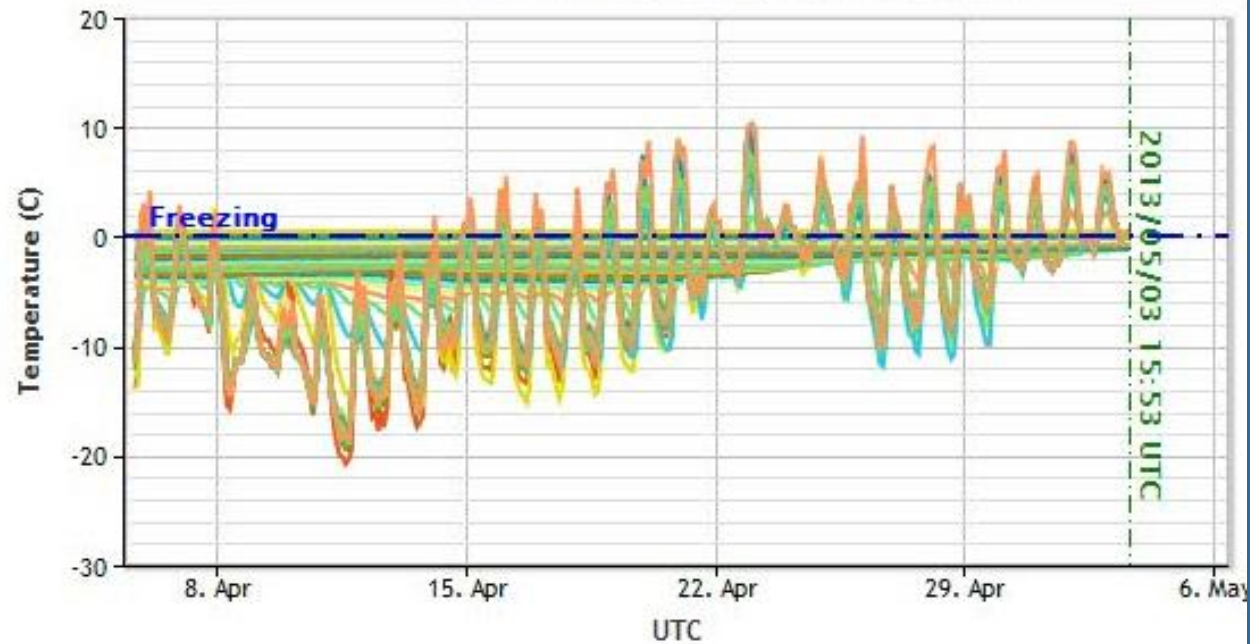


Min

Temperature vs. Time

Turnagain Pass

Click and drag in the plot area to zoom in



Start Date: 11/14/2012

End Date: Now

[Reload Data](#)

Expected information

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

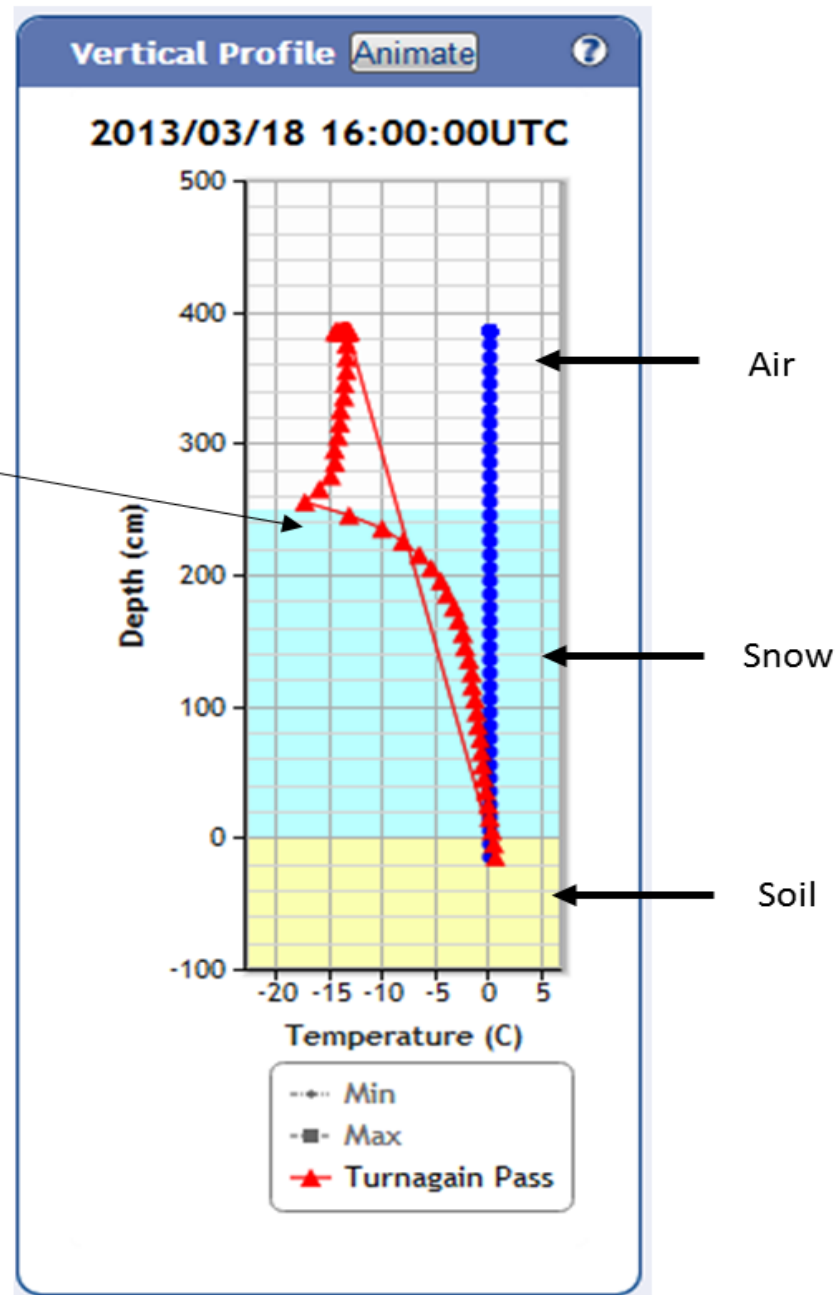
Unexpected Cool Stuff

- 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 OC mark for reference.



Nov. 30th 2012 6pm

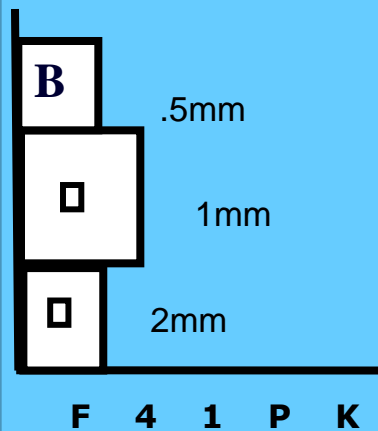
22" of snow

Average snowpack

~36C/m

Near surface

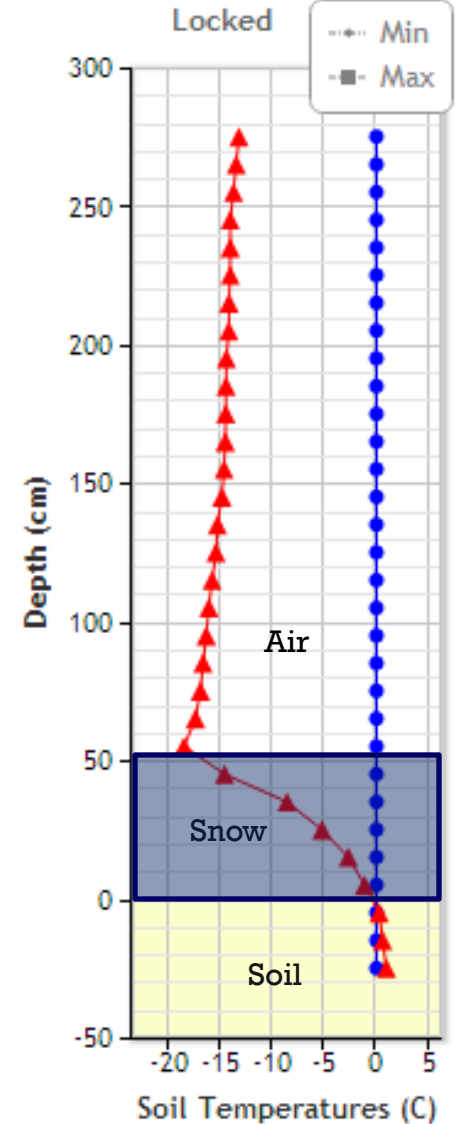
~60C/m



Temperature Profile Graph

2012/11/30 02:00:00UTC

Locked

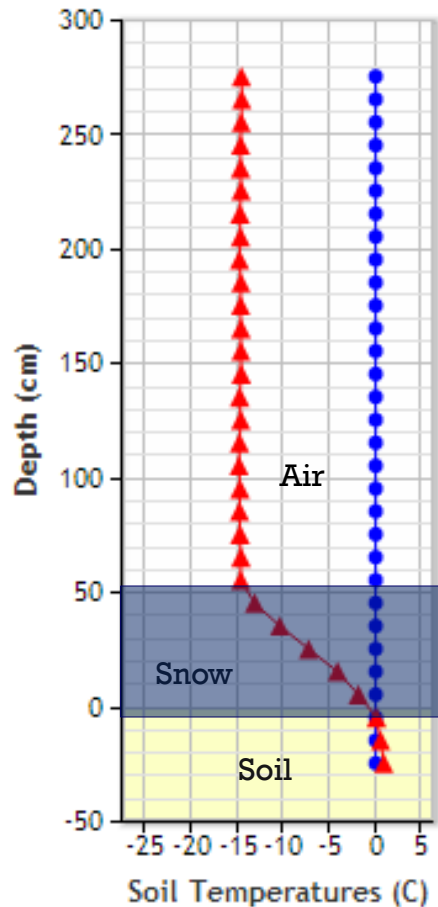


Animate

Temperature Profile Graph ?

2012/12/03 23:00:00UTC

Unlocked

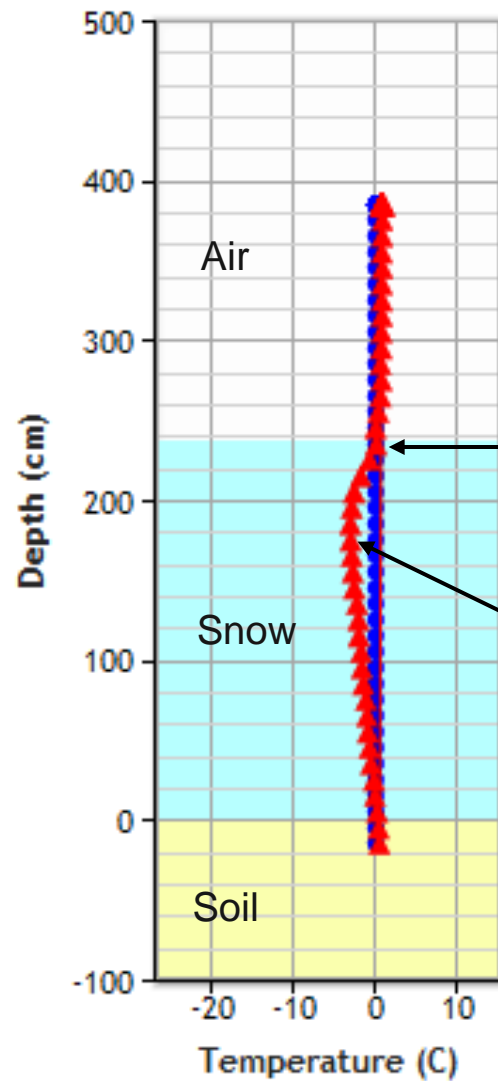


Animate

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

Like

Follow

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

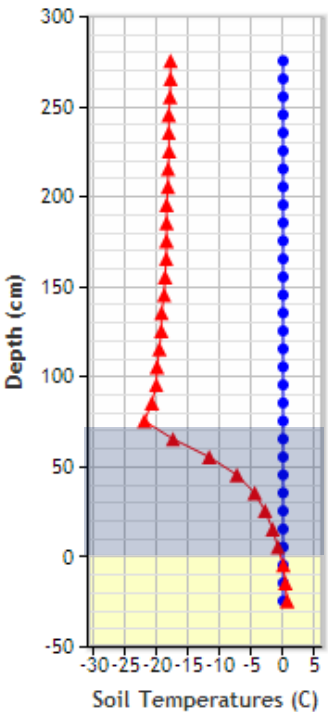
Turnagain Area Advisory

Southcentral Alaska Snow

Wednesday, May 1st 2013

Vertical Profile [Animate](#) ?

2012/12/21 09:00:00UTC

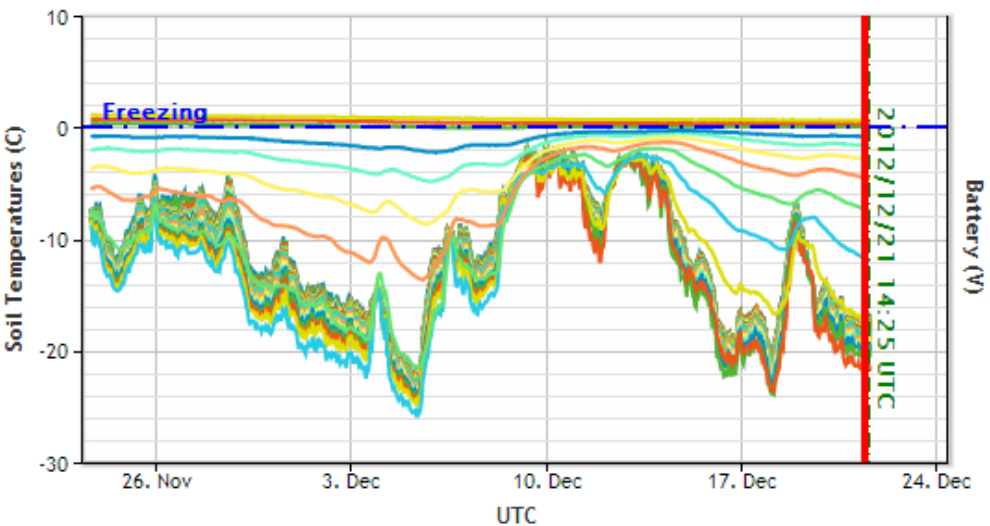


Temperature vs. Time

[Export](#) [Print](#) ?

Turnagain Pass

Click and drag in the plot area to zoom in

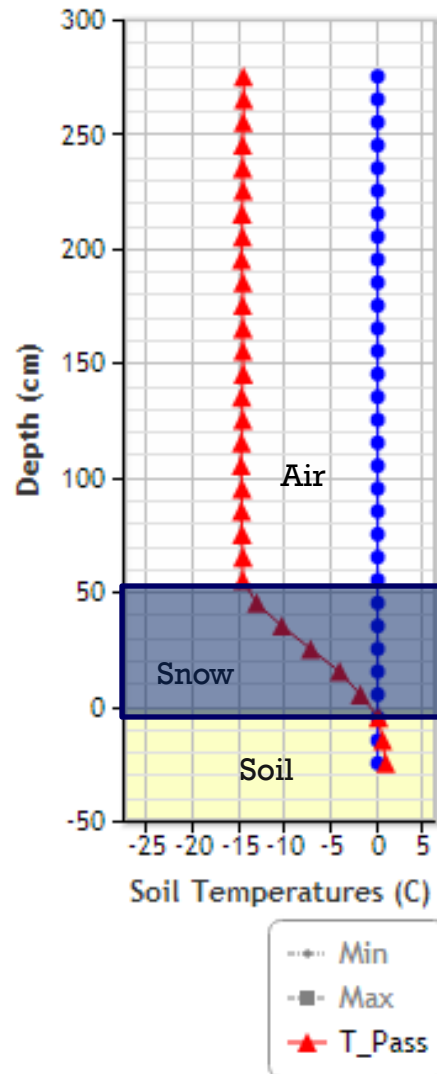


Start Date: End Date: [Reload Data](#)

Temperature Profile Graph ?

2012/12/03 23:00:00UTC

Unlocked



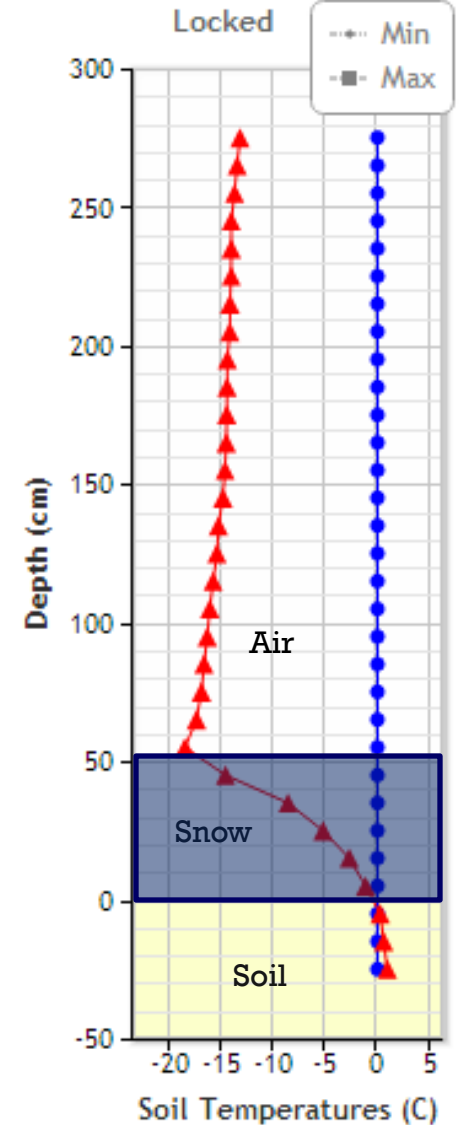
Animate

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

Temperature Profile Graph ?

2012/11/30 02:00:00UTC

Locked



Animate

Thank You

QUESTIONS?

