

**What Backcountry Users
should know about
SNOTEL**

**Jeff Anderson
Hydrologist
NRCS Snow Survey
Boise, ID**

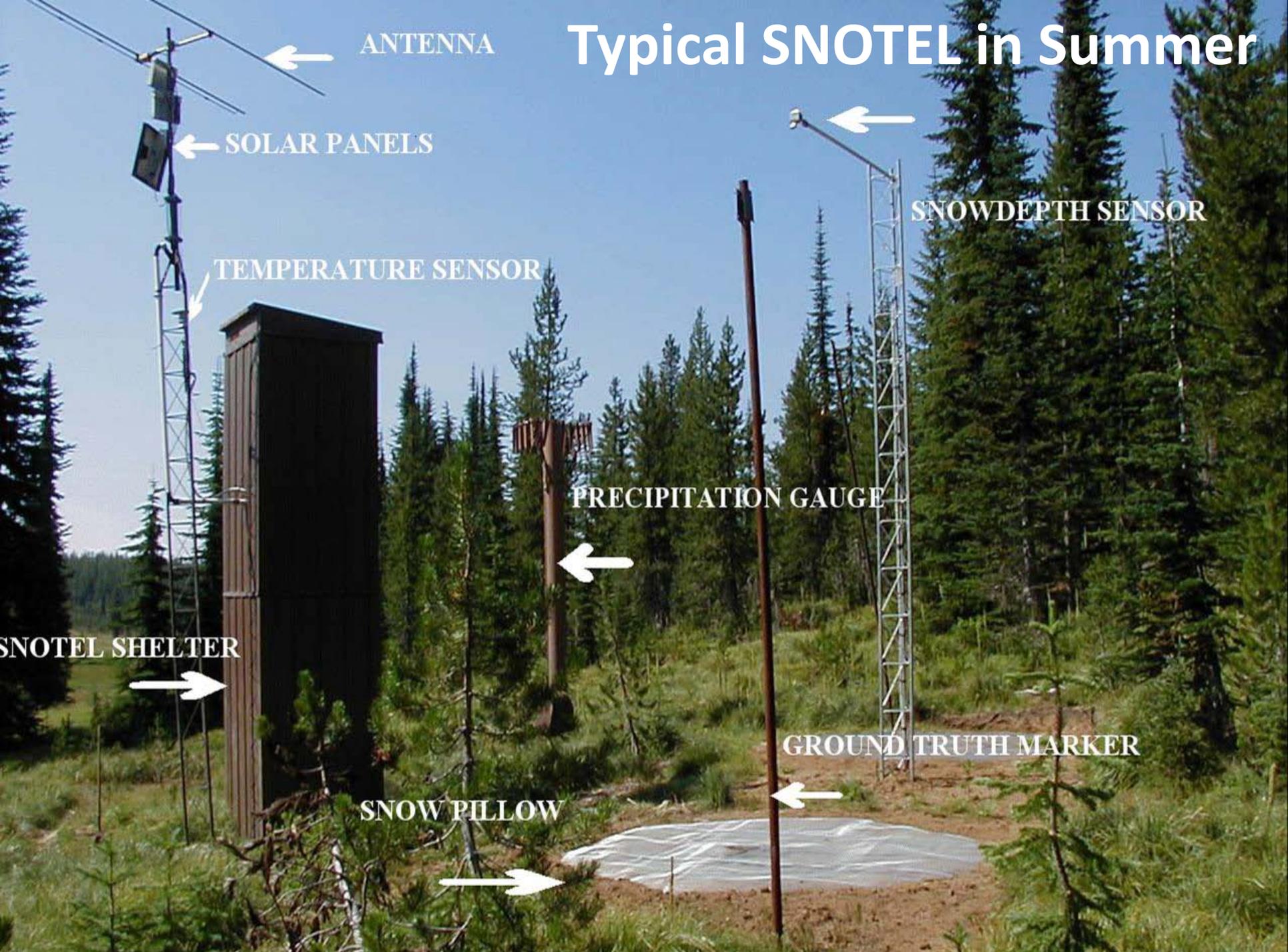


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Outline

- What is a SNOTEL?
- Snow Survey Background
- SNOTEL Data
 - Accessing Data
 - Tips for Interpreting Data
 - What's up with those -99.9's?

Typical SNOTEL in Summer



ANTENNA

SOLAR PANELS

TEMPERATURE SENSOR

SNOWDEPTH SENSOR

PRECIPITATION GAUGE

SNOTEL SHELTER

GROUND TRUTH MARKER

SNOW PILLOW

Same SNOTEL in Winter

16 ft gage

April 22, 2011

Crater Meadows SNOTEL, Clearwater Basin, Idaho

Why is the government interested in measuring snow?

In 1935, as a result of the dust bowl, Congress told the Department of Agriculture to...

“Conduct snow surveys for the purpose of forecasting irrigation water supplies, and to develop uniform equipment and methods for snow surveying and water supply forecasting.”



Glory Days...
Until the late 1970's
snow measurements
were done by hand once
a month at 1,600 snow
courses across the West.



Back then Snow Surveyors where in this category...

**OUR JOB IS
BETTER THAN
YOUR
VACATION**

GRAND TARGHEE



**PROFESSIONAL
SKI PATROL**

In the 1980s SNOTEL started collecting data automatically using Meteor Burst Communication

50 miles above the ground

METEOR

REGION

REMOTE SITE

MASTER COLLECTION STATION

Today, hourly SNOTEL data is on the internet but...



in reality most days we sit in a cubical looking at a computer just like everybody else.



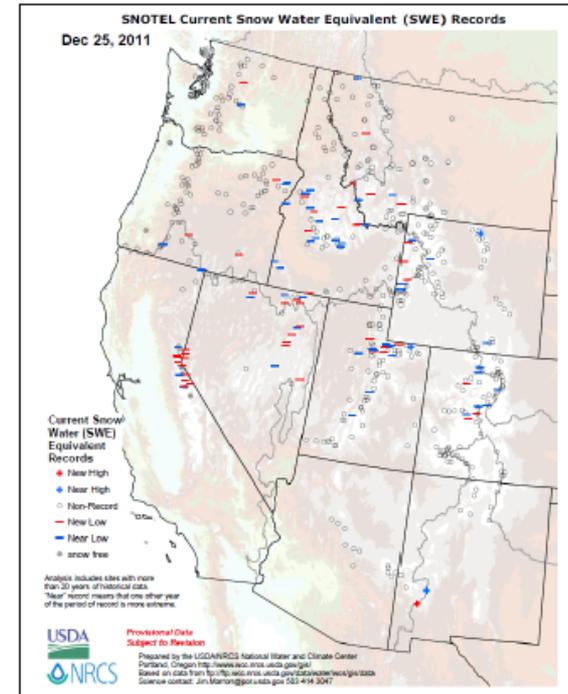
That's not true every day though...



As in the beginning the snow survey's main role is still predicting the water supply in reports like this one...

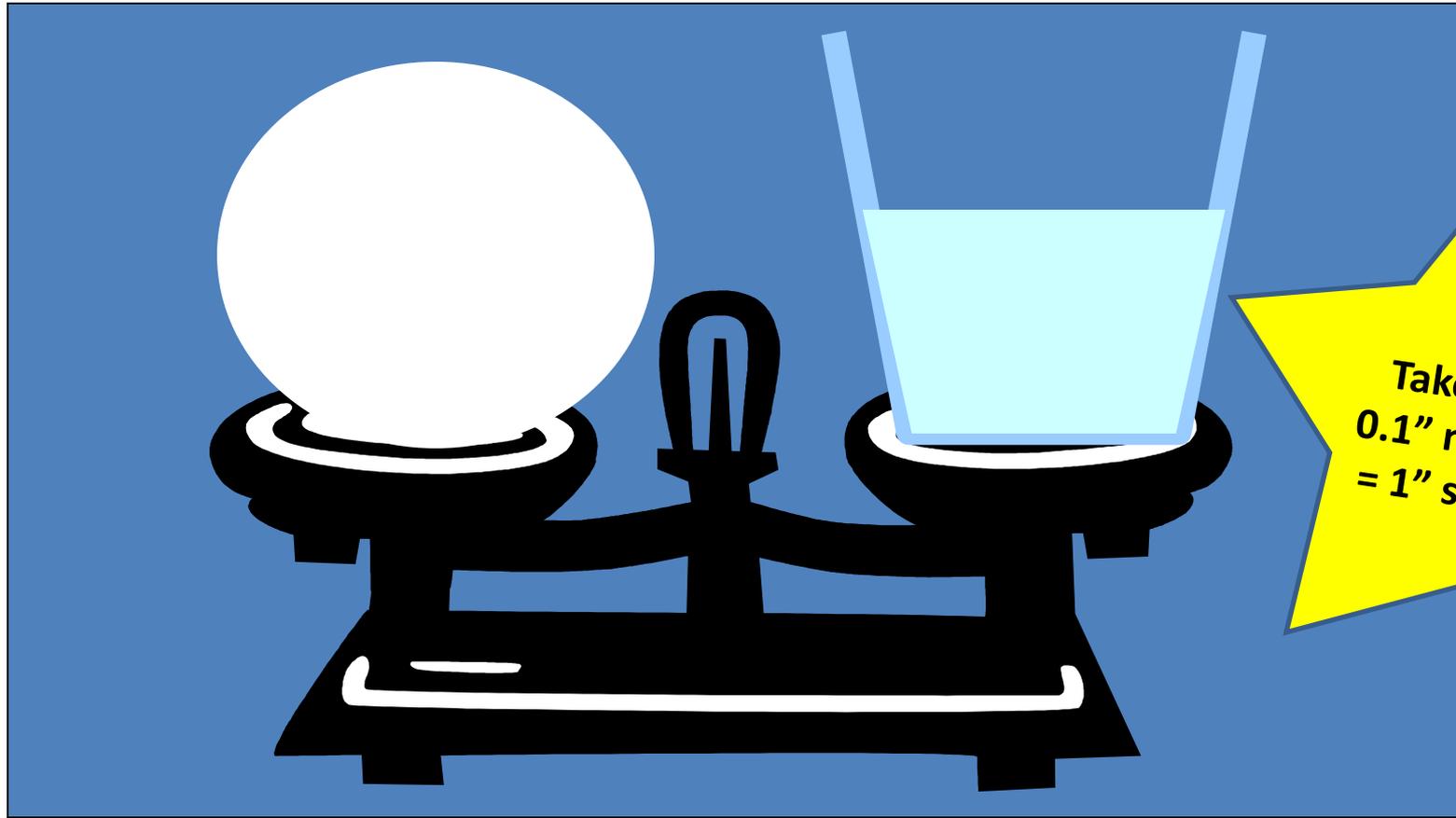


Idaho Water Supply Outlook Report January 1, 2012



The minus signs on this map represent the record or near record low Christmas snowpacks at many SNOTEL sites across Idaho and the West. Such dry conditions were surprising since cold ocean temperatures, that signal a La Nina, have been measured in the Pacific Ocean ever since last winter. La Nina conditions are often touted as producing cold and stormy winters in the Pacific Northwest. Last winter was a textbook example. While this year's La Nina is not as strong as last year, climate models are still predicting above average conditions in the coming months. The weather pattern shifted in late December bringing long anticipated snow to Idaho. Hopefully the snow will continue as a significant amount of catch-up is needed to get Idaho's snowpack back to above average amounts.

Snow Water Equivalent (SWE or WTEQ)

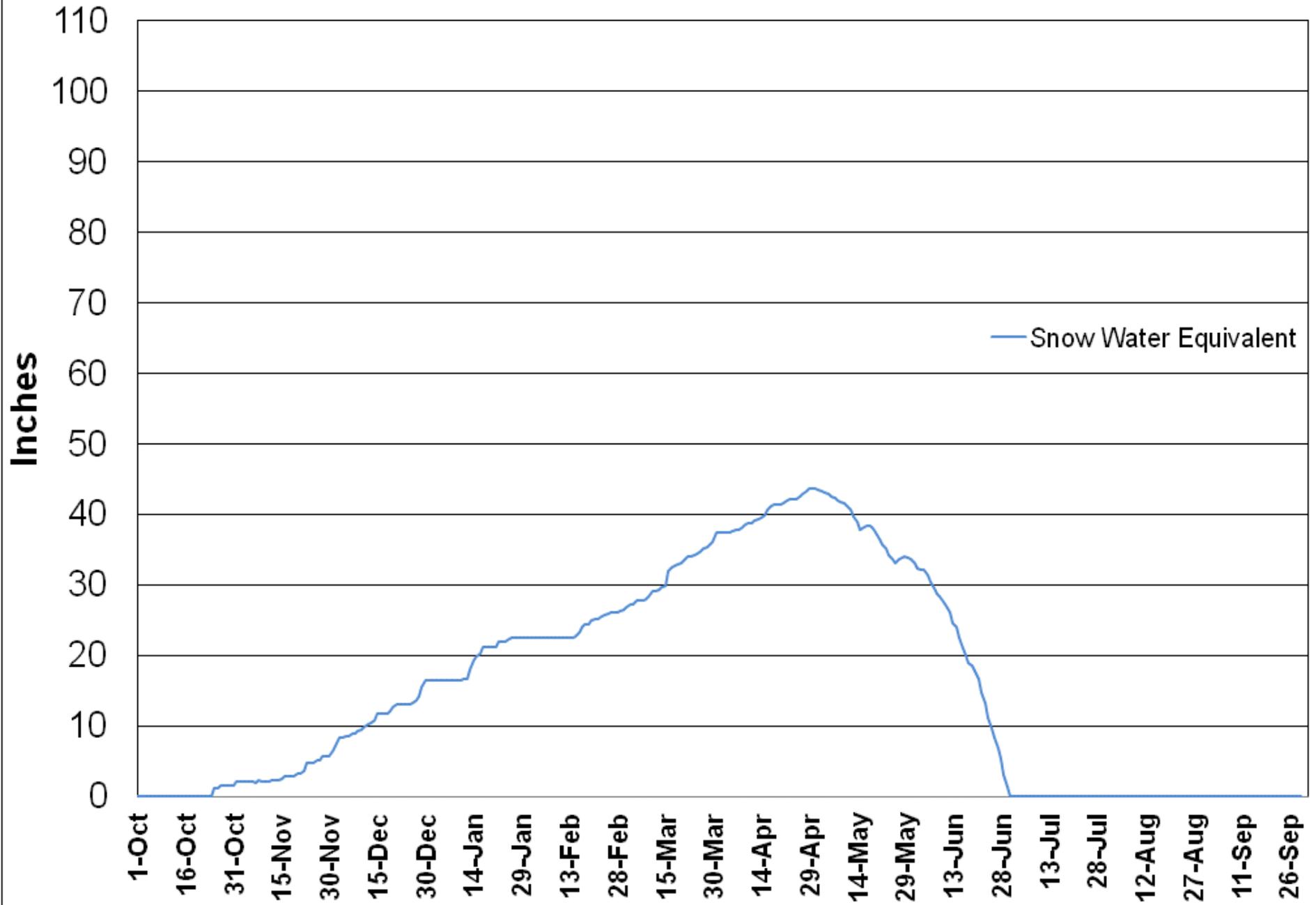


Weight of
frozen water
(Snow & Ice)

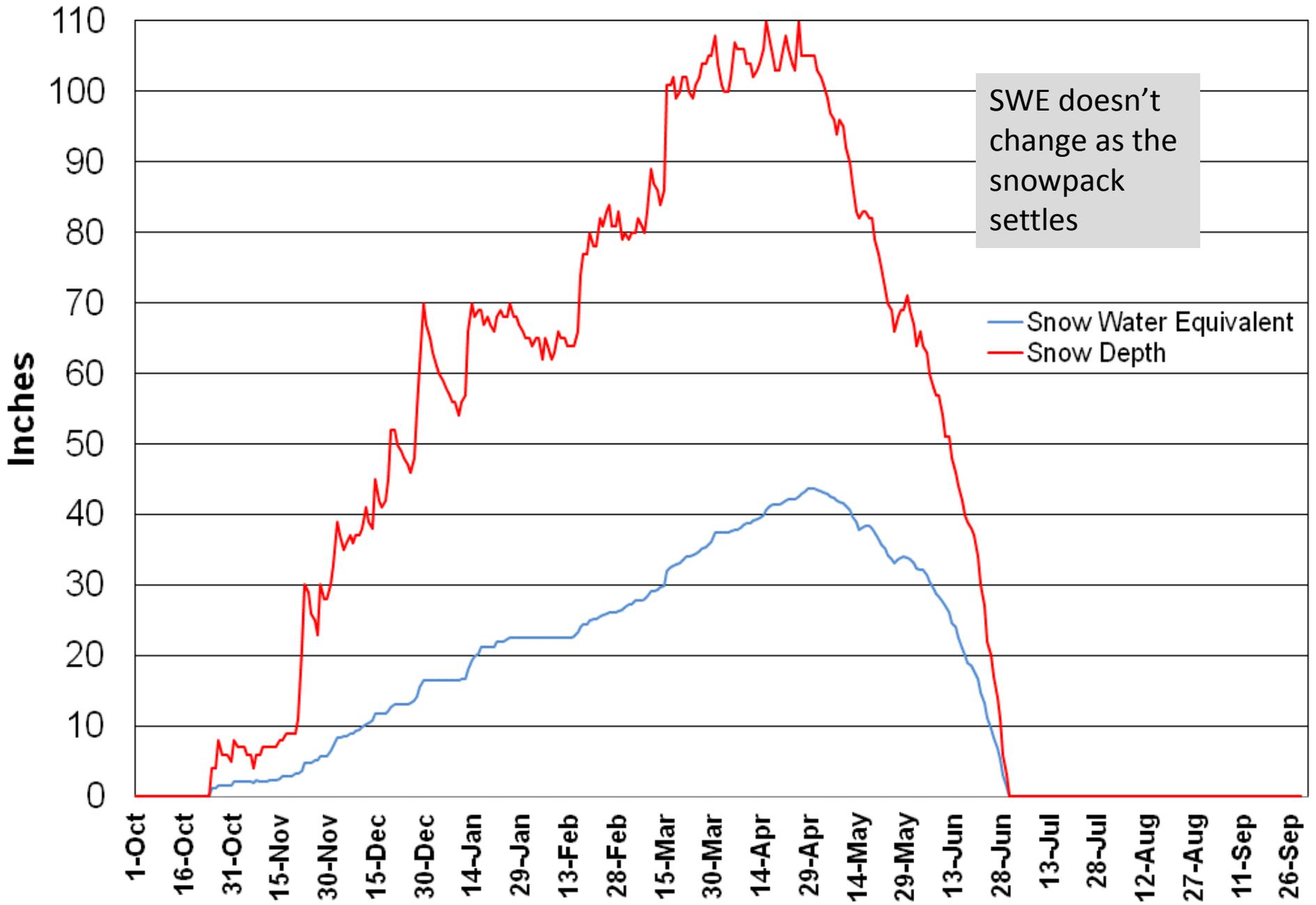


Weight of
liquid water

BIG CREEK SUMMIT SNOTEL



BIG CREEK SUMMIT SNOTEL



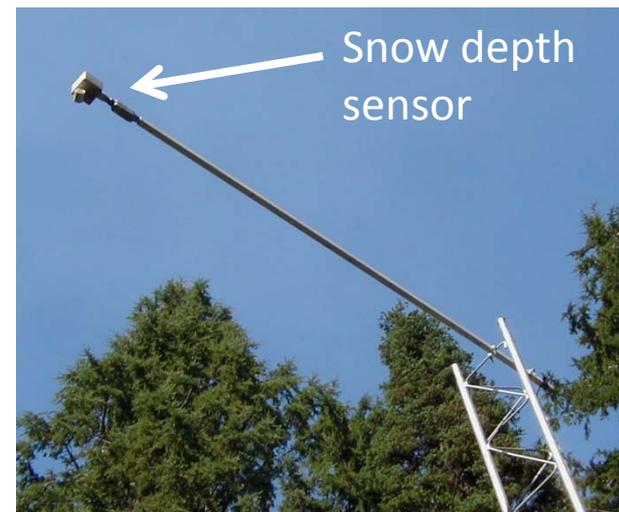
Please Respect the Data

If you discover a SNOTEL site in the backcountry...

Please help us collect high quality data by not skiing or snowmobiling under the snow depth sensor.

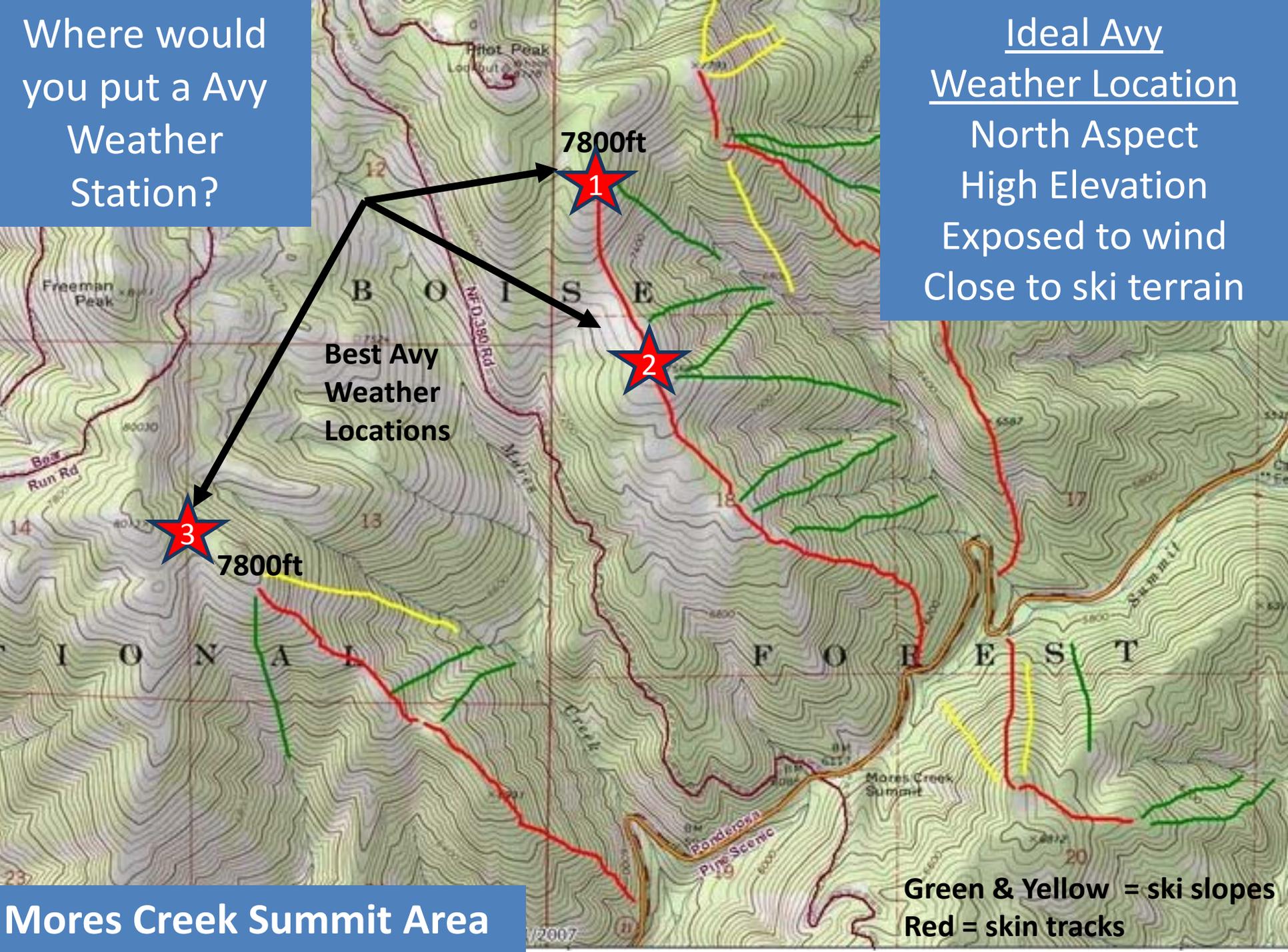
The snow depth sensor is mounted over the snow pillow. Skiing or snowmobiling under the snow depth sensor reduces the quality of our data. The information is not only important to other recreationists, but also for predicting water supplies, managing reservoirs and helping farmers choose what crops to plant next summer.

Enjoy the snow and have a great winter!



Where would you put a Avy Weather Station?

Ideal Avy Weather Location
North Aspect
High Elevation
Exposed to wind
Close to ski terrain



Best Avy Weather Locations

Mores Creek Summit Area

Green & Yellow = ski slopes
Red = skin tracks

Pilots Peak

January 22, 2011



Site 1 shown in previous map

Ideal SNOTEL Location

- North aspect to hold snow in spring
- Mid-elevation to represent more land area in watershed
- Not exposed to wind
- Close to road for vehicle access

Remember
SNOTELs are for
water supply
forecasting



Mores Ck Summit SNOTEL
(6100ft)

Accessing SNOTEL data

SWE, Snow Depth, Precipitation,
Temperature, Wind

Search

Water and Climate Information

Water Supply

- ▶ Water Supply
- ▶ Forecasts
- ▶ Reservoirs
- ▶ Surface Water
- ▶ Climate

Climate Monitoring

- ▶ SNOTEL Data
- ▶ SCAN Data
- ▶ Snow Course Data
- ▶ Data Search **NEW**
- ▶ Soil Search **NEW**

Climate Interpretation

- ▶ Climate Analysis
- ▶ PRISM
- ▶ Climate Data
- ▶ General Information

▶ Snow Survey Programs by State

▶ Find a Service Center

SNOTEL Data & Products



SNOTEL Map Interface

Map-based access to data from individual SNOTEL sites. Includes all available sensors.

Click on a state from the map or select from the list below:

[View real-time daily Snow and Precipitation data in Google Maps](#) - **NEW**
[Google Earth SNOTEL Data Layers](#)
[Snow and Precipitation Update Reports](#)

	About SNOTEL General SNOTEL information, site lists, fact sheets, and more...		Snow Depth* Products
	All Sensors Data Products Includes SWE, precipitation, temperature, snow depth* and soil moisture/temperature data*.		Precipitation Data Products
	Snow Water Equivalent Data Products		Temperature Data Products

Search

NWCC
Enter Keywords GO

Water and Climate Information

Water Supply

- Water Supply
- Forecasts
- Reservoirs
- Surface Water
- Climate

Climate Monitoring

- SNOTEL Data
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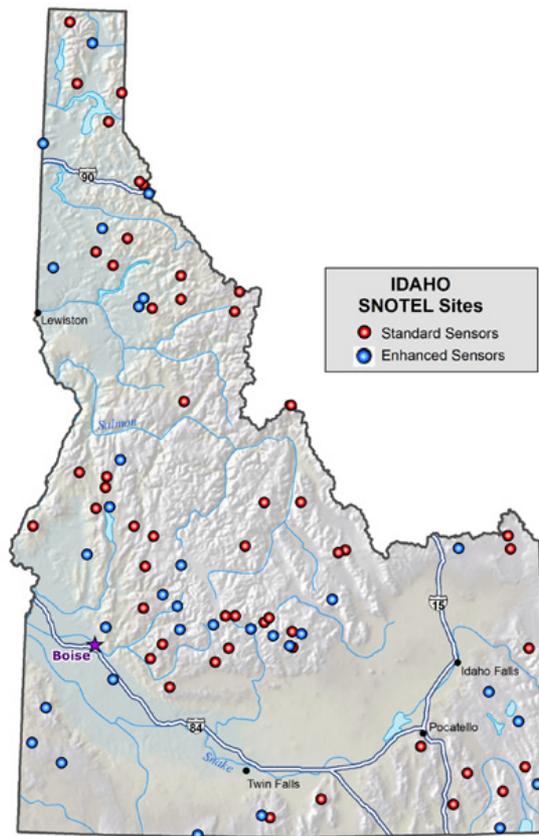
Climate Interpretation

- Climate Analysis
- PRISM
- Climate Data
- General Information
- Snow Survey Programs by State
- Find a Service Center
- States and Regions
- National Centers

Idaho SNOTEL Sites

For individual sites, choose from the list, or select from the map below.

Select a SNOTEL Site



Select Small Text

Search
 NWCC
 Enter Keywords

Water and Climate Information

- Water Supply**
- Water Supply
 - Forecasts
 - Reservoirs
 - Surface Water
 - Climate

Climate Monitoring

- SNOTEL Data
- SCAN Data
- Snow Course Data
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- Soil Search **NEW**

Climate Interpretation

- Climate Analysis
- PRISM
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- National Centers

SNOTEL Site: Jackson Peak
State: Idaho
Site Number: 550
County: Boise
Latitude: 44 deg; 3 min N
Longitude: 115 deg; 27 min W
Elevation: 7070 feet
Reporting since: 1979-10-01



Site notes:

- Data is provisional and subject to change
- [More site notes.](#)
- Photograph is of the Jackson Peak
- 2011-November-15 National Water Center

- [Questions about this site.](#)
- [View Soils Pedon Report](#)
 - [View Daily Sensor Descriptions](#)
 - [View Hourly Sensor Descriptions](#)
 - [View Sensor History](#)

Site Reports:

Report Type	Daily	Current Water Year*	Historical	Hourly
Standard Sensors† (Most Current Data)	Last 7 Days	Daily Readings	Daily (Tab Formatted)	Last 7 Days
Precipitation, Accumulated	Last 7 Days	Daily Table	Daily Table	Last 7 Days
Snow Depth	Last 7 Days	Daily Readings		Last 7 Days
Snow Water Equivalent	Last 7 Days	Daily Table • Daily Graph	Daily • Monthly	Last 7 Days
Temperature	Last 7 Days	Max • Min • Avg	Max • Min • Avg	Last 7 Days
Soil Moisture/Temperature				Select # of Days ▾

Element Reports:

NEW Check to view temperatures in degrees Fahrenheit. Default is degrees Centigrade.

Select Report Content	Select Time Series	Select Format	<input type="button" value="View Current"/>	<input type="button" value="View Historic"/>
Standard SNOTEL (1979-10-01)	Daily	table	Last 30 days	1980
All Sensors (no chart)	Hourly	csv	Last 7 days	1981
Soil Moisture & Temperature (1997-02-11)	12 AM	chart	Last 24 hours	1982
Soil Moisture & Precipitation (1997-02-11)	3 AM		Water Year	1983
Soil & Air Temperature (1997-02-11)	6 AM		Calendar Year	1984
Accumulated Precipitation (1979-10-01)	9 AM			1985
Accumulated Precipitation & Snow (1979-10-01)	12 PM			1986
Wind (1996-10-17)	3 PM			1987
Solar (1997-02-26)	6 PM			1988
===Individual elements===	9 PM			1989
				January
				February
				March
				April
				May
				June
				July
				August
				September
				October
				All days
				01
				02
				03
				04
				05
				06
				07
				08
				09



Daily Data

JACKSON PEAK SNOTEL Data Report - Daily Readings

Basin: North and Middle Forks Boise (HUC 17050111) Elevation: 7070.00

(As of: Tue Nov 15 10:04:06 PST 2011)

Date	Time (PST)	Snow Water Equivalent (inches)	Snow Depth (inches)	Year-to-Date Precipitation (inches)	Current Temp (degrees F)	Previous Day's Temp (degrees F)		
						Max	Min	Avg
2011-11-09	0000	0.6	3.0	5.3	18.9	29.7	15.4	21.2
2011-11-10	0000	0.7	5.0	5.4	27.1	38.5	18.9	27.5
2011-11-11	0000	0.7	3.0	5.4	28.4	42.8	25.7	31.8
2011-11-12	0000	1.1	7.0	5.8	31.8	41.9	28.2	34.3
2011-11-13	0000	1.7	13.0	6.4	23.0	31.8	18.1	23.5
2011-11-14	0000	2.0	11.0	6.7	25.0	30.6	23.0	26.2
2011-11-15	0000	2.1	-99.9	6.8	25.3	29.5	23.0	26.4
Date	Time (PST)	Snow Water Equivalent (inches)	Snow Depth (inches)	Year-to-Date Precipitation (inches)	Current Temp (degrees F)	Max	Min	Avg
						Previous Day's Temp (degrees F)		

Provisional data, subject to revision

- *Precip(YTD) = Precipitation from October 1 to current date.
- *-99.9 indicates invalid data received.
- *M = Missing data for the selected day.
- *A blank field indicates a missing sensor or problems with the sensor.



Daily Data

JACKSON PEAK SNOTEL Data Report - Daily Readings

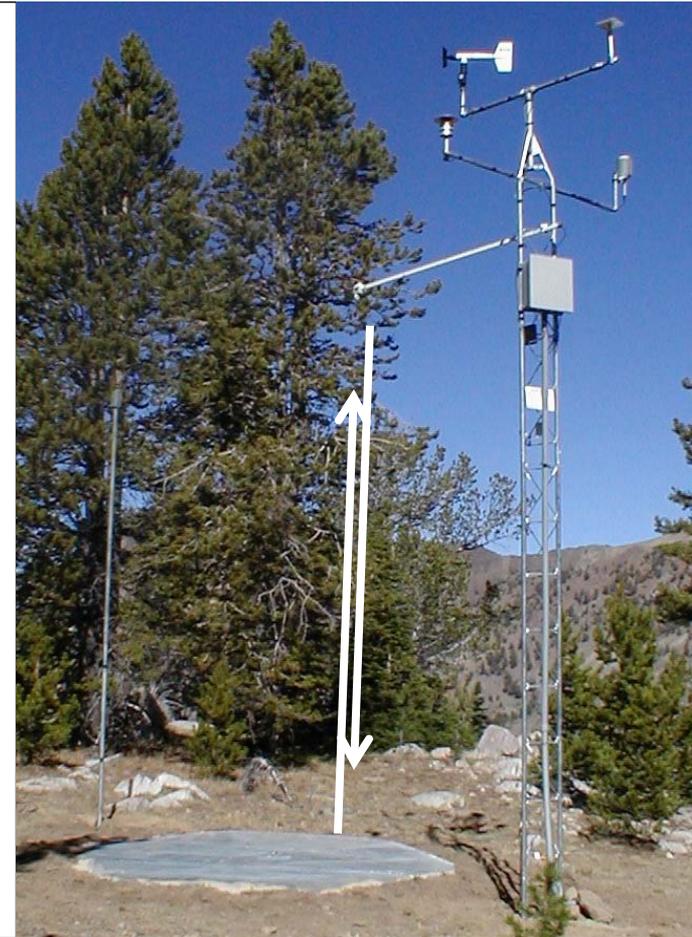
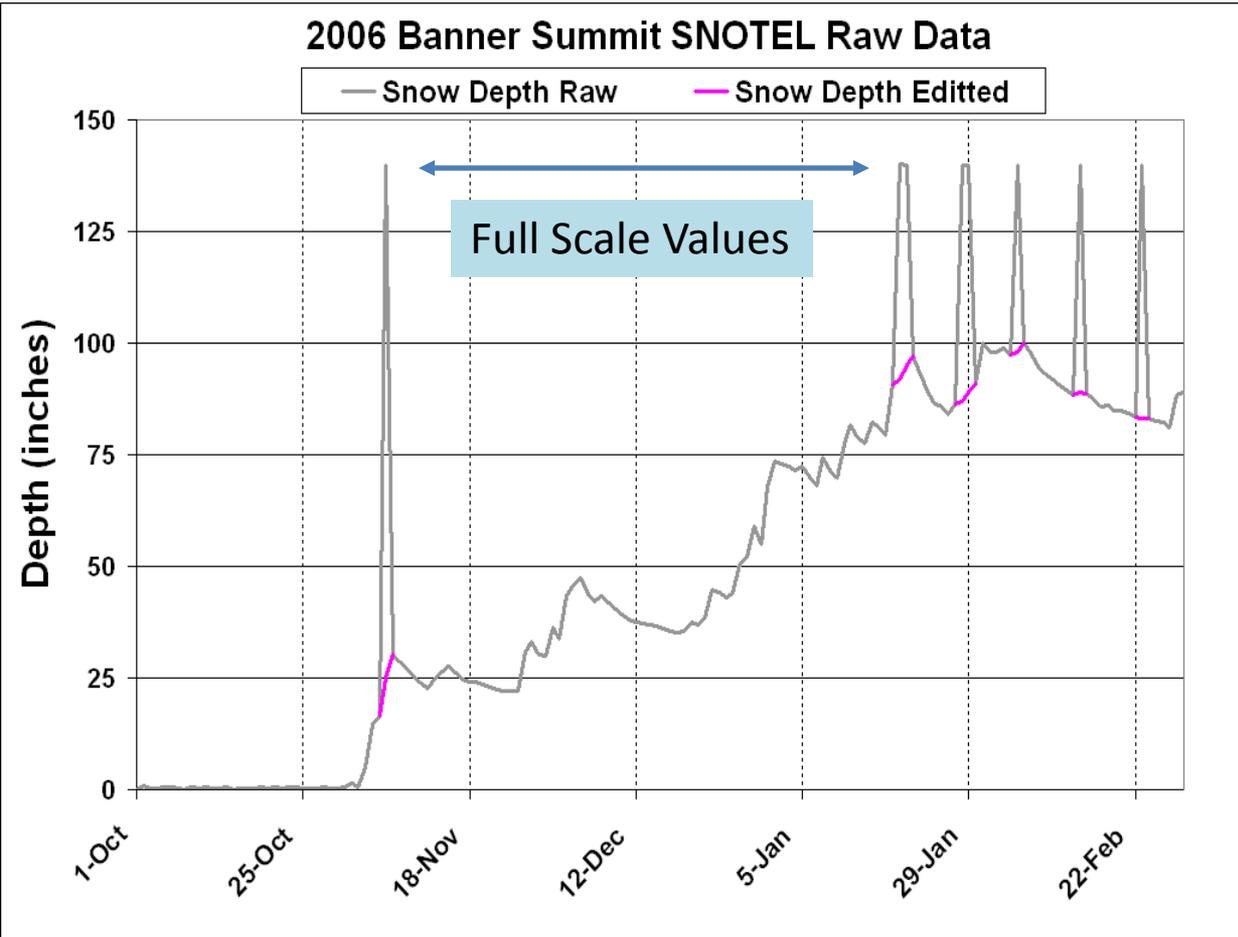
Basin: North and Middle Forks Boise (HUC 17050111) Elevation: 7070.00

(As of: Tue Nov 15 10:04:06 PST 2011)

Date	Time (PST)	Snow Water Equivalent (inches)	Snow Depth (inches)	Year-to-Date Precipitation (inches)	Current Temp (degrees F)	Previous Day's Temp (degrees F)		
						Max	Min	Avg
2011-11-09	0000	0.6	3.0	5.3	18.9	29.7	15.4	21.2
2011-11-10	0000	0.7	5.0	5.4	27.1	38.5	18.9	27.5
2011-11-11	0000	0.7	3.0	5.4	28.4	42.8	25.7	31.8
2011-11-12	0000	1.1	7.0	5.8	31.8	41.9	28.2	34.3
2011-11-13	0000	1.7	13.0	6.4	23.0	31.8	18.1	23.5
2011-11-14	0000	2.0	11.0	6.7	25.0	30.6	23.0	26.2
2011-11-15	0000	2.1	-99.9	6.8	25.3	29.5	23.0	26.4

- Did it snow? How do you know?
- SNOTEL measures total snow depth not snowfall – VERY IMPORTANT
- How many inches of new snow fell in this 7 day period? It depends how you count...
 - 8" increase between 11/9 and 11/14,
 - 10" from 11/9-11/13, 11" total
 - 12" if you include the extra tenth on 11/15
- What happened between 11/9 and 11/11 did it really snow?
 - Yes 2", followed by a high of 43F and 2" of settling.
 - 0.1" gain in SWE and 2" gain in depth = 5% snow
- Notice the -99.9 in snow depth – that means the sensor was unable to get a reading, see next slide for explanation.

-99.9 = Full Scale = it's probably snowing



The snow depth sensor uses a sound pulse to measure the distance to the ground (or snow). Anything that stops that sound pulse from making a return trip from sensor to the ground (snow) and back can cause a full scale value which is replaced by a -99.9 in SNOTEL reports. Wind, new low density snow, falling or blowing snow, fog, rime on sensor, etc... are common reasons the sensor fails to make a reading.

FAQ

Idaho Snow Depth FAQ | Idaho NRCS - Windows Internet Explorer

File Edit View Favorites Tools Help

http://www.id.nrcs.usda.gov/snow/faq/

Idaho Snow Depth FAQ | Idaho NRCS

United States Department of Agriculture
NRCS Natural Resources Conservation Service
Idaho

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Idaho Snow Survey Program

- Quick Links - New
- About Snow Surveys
- SNOTEL Data
- Snow & Precipitation
 - Current Year
 - Historic
- Water Supply
 - SWSI
 - Peakflow
- Climate /Soil Moisture
- Winter Recreation
- Site Information
 - FAQ
 - Contact Snow Survey
- WEB SITE MAP

Other Resources

- NRCS Snow Survey Programs by State
- NRCS National Water & Climate Center
- NRCS SCAN Data
- Related Links

Snow Depth Data Frequently Asked Questions

- [Q1. How does a snow depth sensor work?](#)
- [Q2. What does ultrasonic mean?](#)
- [Q3. Does the depth sensor have limitations?](#)
- [Q4. How do I know if a particular snow depth value in a report is valid?](#)
- [Q5. The depth sensor from my favorite site is not giving reliable data \(-99.9\), when do you plan to fix it?](#)
- [Q6. Why does the depth decrease after a storm?](#)
- [Q7. Can the snow depth sensor tell me how much new snow has fallen?](#)
- [Q8. If a site doesn't have a depth sensor, how can I estimate how much snow is on the ground? Or has fallen in a recent storm?](#)
- [Q9. How can I learn more about the Judd Communications Depth Sensor?](#)
- [Q10. What if I have another question that is not answered here?](#)

Q1. How does a snow depth sensor work?

The NRCS uses Judd Communications Ultrasonic Depth Sensors to measure snow depth. The key component of the system is the ultrasonic transducer. The transducer is first used as a speaker to transmit an ultrasonic series of "clicks" down at the snow surface. The transducer then is used as a microphone to listen for clicks reflected back from the snow. By measuring the amount of time that it takes the clicks to travel from the transducer to the snow surface and back again, the distance to the snow can be calculated based on the speed of sound. Since the speed of sound is faster in warm air and slower in cold air, the depth sensor also measures temperature with a thermocouple and adjusts the depth reading based on the speed of sound and current temperature to calculate the distance to the snow. By subtracting the distance to the snow from the height of the sensor above the ground the depth of snow is determined.

Local intranet 100%

Hourly Data

SNOTEL Data Report - All Readings per Day - Windows Internet Explorer

File Edit View Favorites Tools Help

http://www.wcc.nrcs.usda.gov/nwcc/sntnl-datarpt.jsp?site=

United States Department of Agriculture
NRCS Natural Resources Conservation Service National Water and Climate Center

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JACKSON PEAK SNOTEL Data Report - All Readings

Basin: North and Middle Forks Boise (HUC 17050111) Elevation: 7070.00

(As of: Tue Nov 15 09:09:43 PST 2011)

Date	Time (PST)	Snow Water Equivalent (inches)	Snow Depth (inches)	Year-to-Date Precipitation (inches)	Current Temp (degrees F)	Previous Day's Temp (degrees F)		
						Max	Min	Avg
2011-11-11	2200	0.9	5.0	5.4	32.9	42.8	25.7	31.8
2011-11-11	2300	1.0	-99.9	5.5	31.6	42.8	25.7	31.8
2011-11-12	0000	1.1	7.0	5.8	31.8	41.9	28.2	34.3
2011-11-12	0100	1.2	-99.9	5.8	31.3	41.9	28.2	34.3
2011-11-12	0200	1.3	-99.9	5.9	30.7	41.9	28.2	34.3
2011-11-12	0300	1.4	-99.9	6.0	30.6	41.9	28.2	34.3
2011-11-12	0400	1.5	-99.9	6.1	24.4	41.9	28.2	34.3
2011-11-12	0500	1.5	12.0	6.2	21.0	41.9	28.2	34.3
2011-11-12	0600	1.5	12.0	6.2	18.5	41.9	28.2	34.3



Hourly Data

JACKSON PEAK SNOTEL Data Report - All Readings

Basin: North and Middle Forks Boise (HUC 17050111) Elevation: 7070.00

(As of: Tue Nov 15 09:09:43 PST 2011)

Date	Time (PST)	Snow Water Equivalent (inches)	Snow Depth (inches)	Year-to-Date Precipitation (inches)	Current Temp (degrees F)	Previous Day's Temp (degrees F)		
						Max	Min	Avg
2011-11-11	2200	0.9	5.0	5.4	32.9	42.8	25.7	31.8
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2011-11-12	0000	1.1	7.0	5.8	31.8	41.9	28.2	34.3
2011-11-12	0100	1.2	-99.9	5.8	31.3	41.9	28.2	34.3
2011-11-12	0200	1.3	-99.9	5.9	30.7	41.9	28.2	34.3
2011-11-12	0300	1.4	-99.9	6.0	30.6	41.9	28.2	34.3
2011-11-12	0400	1.5	-99.9	6.1	24.4	41.9	28.2	34.3
2011-11-12	0500	1.5	12.0	6.2	21.0	41.9	28.2	34.3
2011-11-12	0600	1.5	12.0	6.2	18.5	41.9	28.2	34.3

- How much did it snow?
7 inches (not 12 inches) remember total snow depth not snowfall
- How good was the snow?
0.6" snow water / 7" depth = 9% density, Look at observed temperature pretty cold and getting colder.
- Can you estimate how many inches of new snow were present at 2:00?
9" because two tenths of new swe 0.1" swe=1" snowfall

Daily vs Hourly

	Characteristics	Pro/Con
Daily Data	<ol style="list-style-type: none">1. Daily values are recorded at midnight2. Less “flutter”3. Daily data gets human QA each Monday	<p>Pro- gives good weekly overview</p> <p>Con- You miss early morning data after midnight on your ski day</p>
Hourly Data	<ol style="list-style-type: none">1. New measurements every hour2. Doesn't get human quality checks3. More effected by “flutter” and snow depth “settling”	<p>Pro- Source of real-time storm data</p> <p>Pro- Can fill in gaps when midnight value is missed</p> <p>Con- Flutter is confusing</p>

Search
 NWCC
 Enter Keywords

Water and Climate Information

- Water Supply**
- Water Supply
 - Forecasts
 - Reservoirs
 - Surface Water
 - Climate

- Climate Monitoring**
- SNOTEL Data
 - SCAN Data
 - Snow Course Data
 - Data Search **NEW**
 - Soil Search **NEW**

- Climate Interpretation**
- Climate Analysis
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- National Centers

SNOTEL Site: Jackson Peak
State: Idaho
Site Number: 550
County: Boise
Latitude: 44 deg; 3 min N
Longitude: 115 deg; 27 min W
Elevation: 7070 feet
Reporting since: 1979-10-01



Site notes:

- Data is provisional and subject to revision.
- [More site notes.](#)
- Photograph is of the Jackson Peak SNOTEL site.
- 2011-November-15 National Water and Climate Center

- [Questions about this site.](#)
- -
 -
 -

Site Reports:

Report Type	Daily	Current Water Year*	Historical	Hourly
Standard Sensors† (Most Current Data)	Last 7 Days	Daily Readings	Daily (Tab Formatted)	Last 7 Days
Precipitation, Accumulated	Last 7 Days	Daily Table	Daily Table	Last 7 Days
Snow Depth	Last 7 Days	Daily Readings		Last 7 Days
Snow Water Equivalent	Last 7 Days	Daily Table • Daily Graph	Daily • Monthly	Last 7 Days
Temperature	Last 7 Days	Max • Min • Avg	Max • Min • Avg	Last 7 Days
Soil Moisture/Temperature				<input type="button" value="Select # of Days"/>

Element Reports:

NEW Check to view temperatures in degrees Farenheit. Default is degrees Centigrade.

Select Report Content	Select Time Series	Select Format	<input type="button" value="View Current"/>	<input type="button" value="View Historic"/>
<ul style="list-style-type: none"> Diagnostics (2011-03-28) Precipitation Accumulation (1979-10-01) Relative Humidity (1992-10-01) Snow Depth (1996-07-15) Snow Water Equivalent (1979-10-01) Soil Moisture Percent (1997-02-11) Soil Temperature (1992-10-01) Solar Radiation - Total (1997-02-26) Wind Direction (1996-10-17) Wind Speed (1996-10-17) 	<ul style="list-style-type: none"> Daily Hourly 12 AM 3 AM 6 AM 9 AM 12 PM 3 PM 6 PM 9 PM 	<ul style="list-style-type: none"> table csv chart 	<ul style="list-style-type: none"> Last 30 days Last 7 days Last 24 hours Water Year Calendar Year 	<ul style="list-style-type: none"> 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989

Daily data

Idaho SNOTEL Site Big Creek Summit (338) - Daily series for week=2011-11-08 (PST)

2011-November-15 NRCS National Water and Climate Center - Provisional Data - subject to revision

[Describe headers](#)

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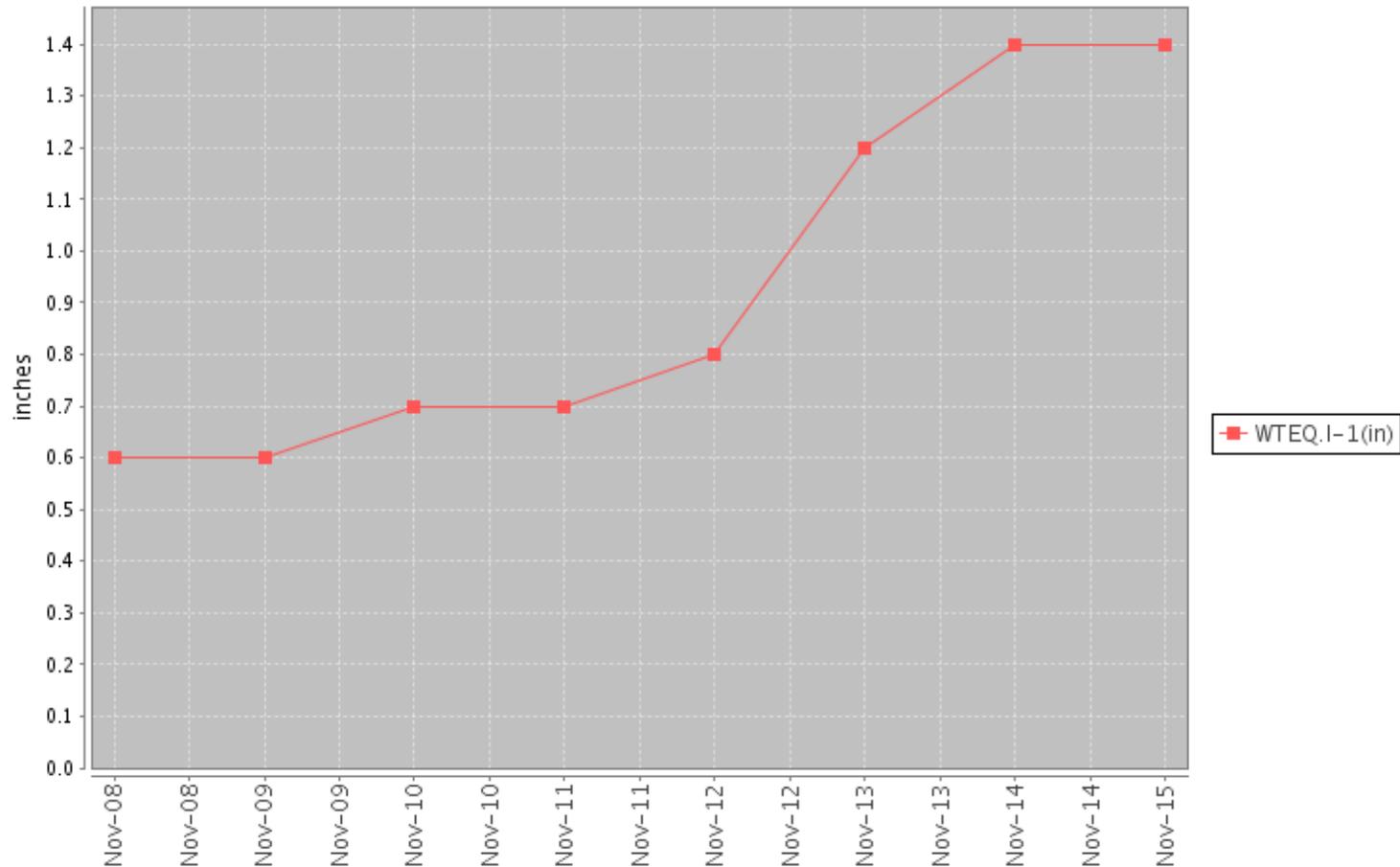
[Next](#)

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[Fixedscale](#)

[Legend below](#)

Station (338) WEEK=2011-11-08 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision Tue Nov 15 09:44:29 PST 2011



“Flutter” makes hourly data confusing

Idaho SNOTEL Site Big Creek Summit (338) - Hourly series for week=2011-11-08 (PST)

2011-November-15 NRCS National Water and Climate Center - Provisional Data - subject to revision

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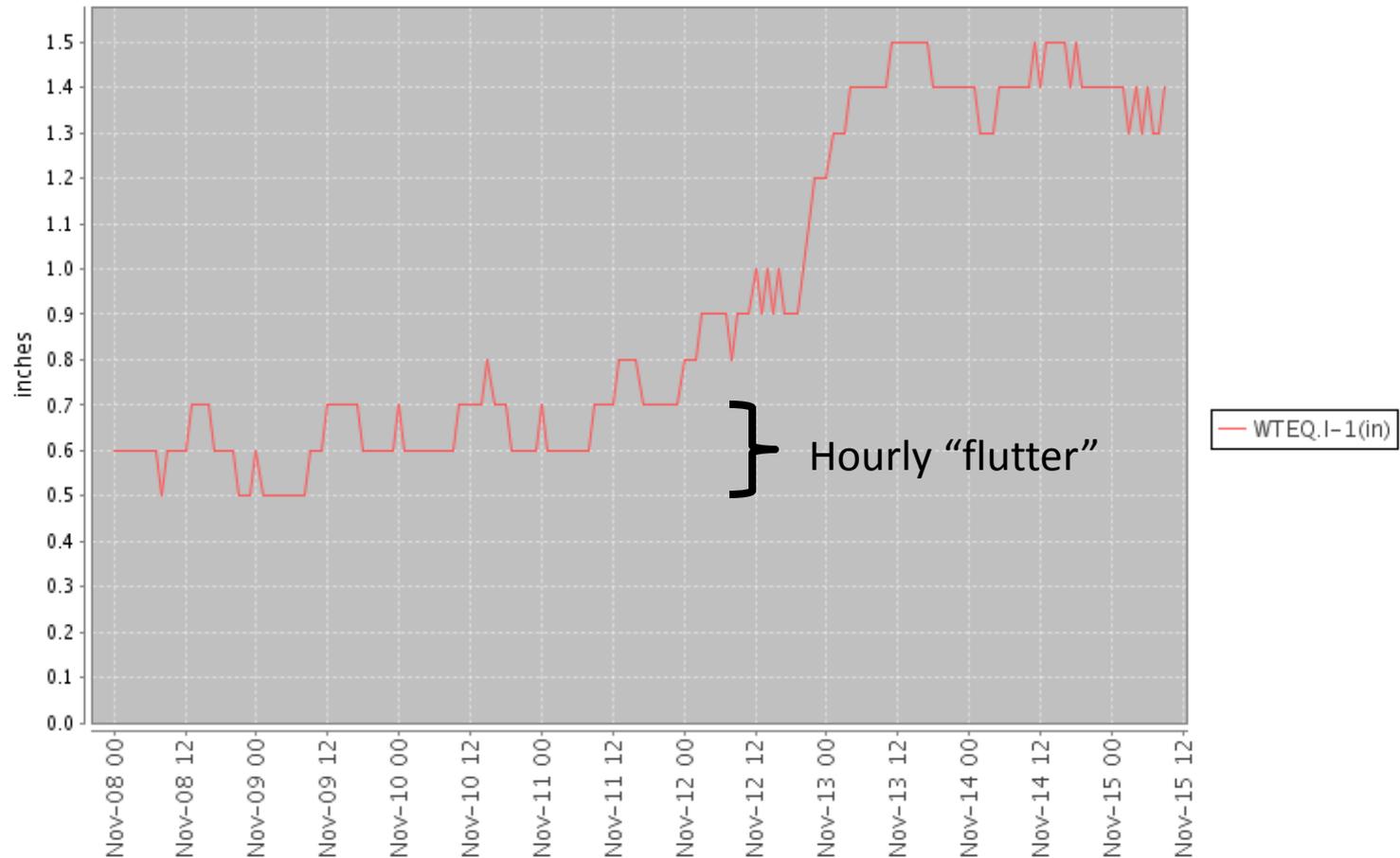
[Next](#)

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[Legend below](#)

Station (338) WEEK=2011-11-08 (Hourly) NRCS National Water and Climate Center - Provisional Data - subject to revision Tue Nov 15 09:43:59 PST 2011



My watch says 7:20am why is current SNOTEL data from 6:00am?

All SNOTEL time stamps are Pacific Standard Time.

That means...

During most of winter Southern Idaho is 1 hour behind your watch.

During daylight savings time Southern Idaho is 2 hours behind.



The exception is that some SNOTEL sites aren't good reporters due to topography and can be multiple hours behind.

Other Reports

Wind

Rate of Change

Other hourly report

SNOTEL Wind Data*



Vienna Mine SNOTEL
Sawtooths (above Smiley Creek Lodge)
In cirque 8960ft

Ideal SNOTEL Location

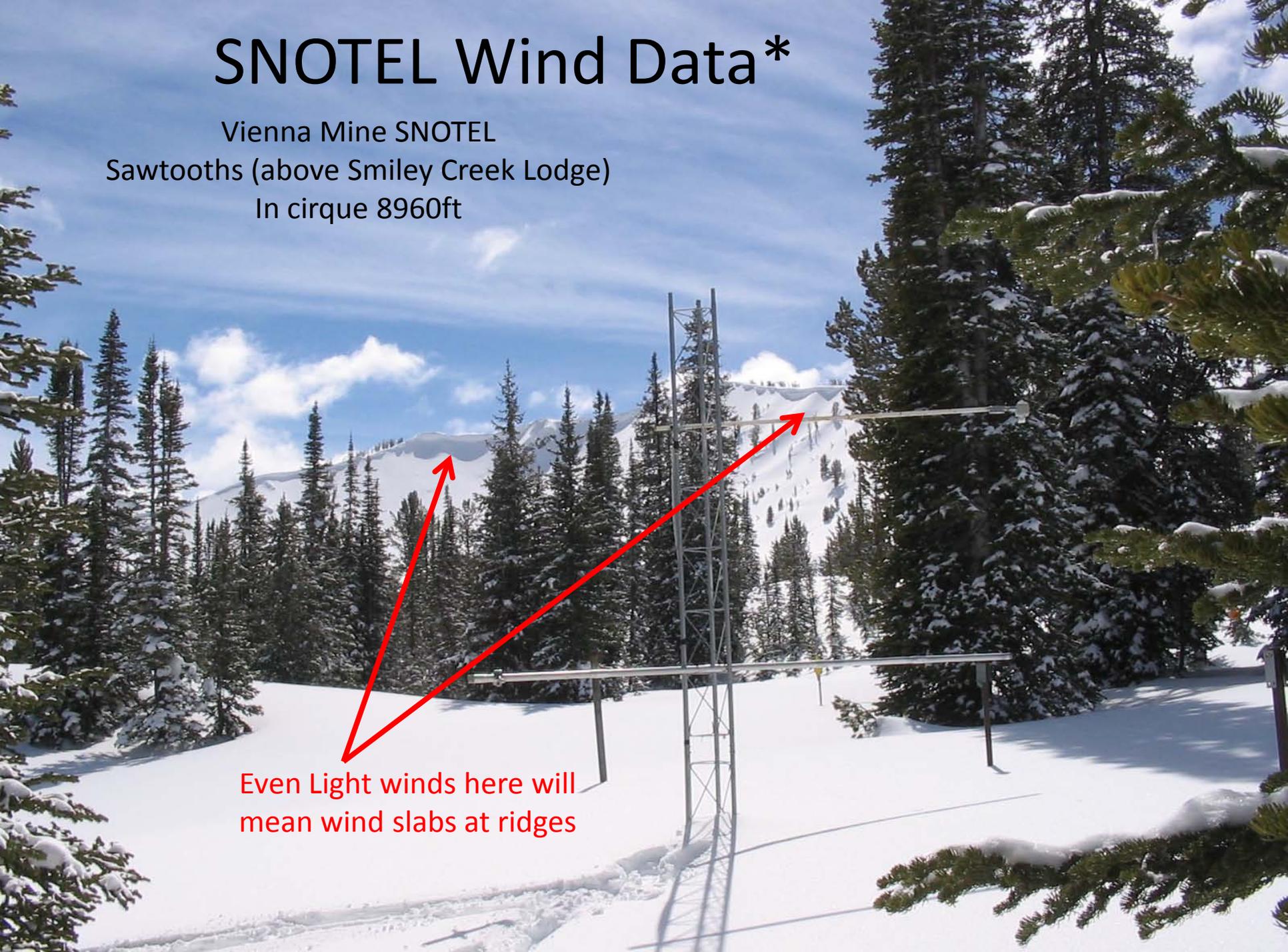
North Aspect
Mid-Elevation
Not exposed
Vehicle access

SNOTEL Wind Data*

Vienna Mine SNOTEL

Sawtooths (above Smiley Creek Lodge)

In cirque 8960ft



Even Light winds here will
mean wind slabs at ridges

Wind Products

Check to view temperatures in degrees Fahrenheit, click to degrees Celsius.

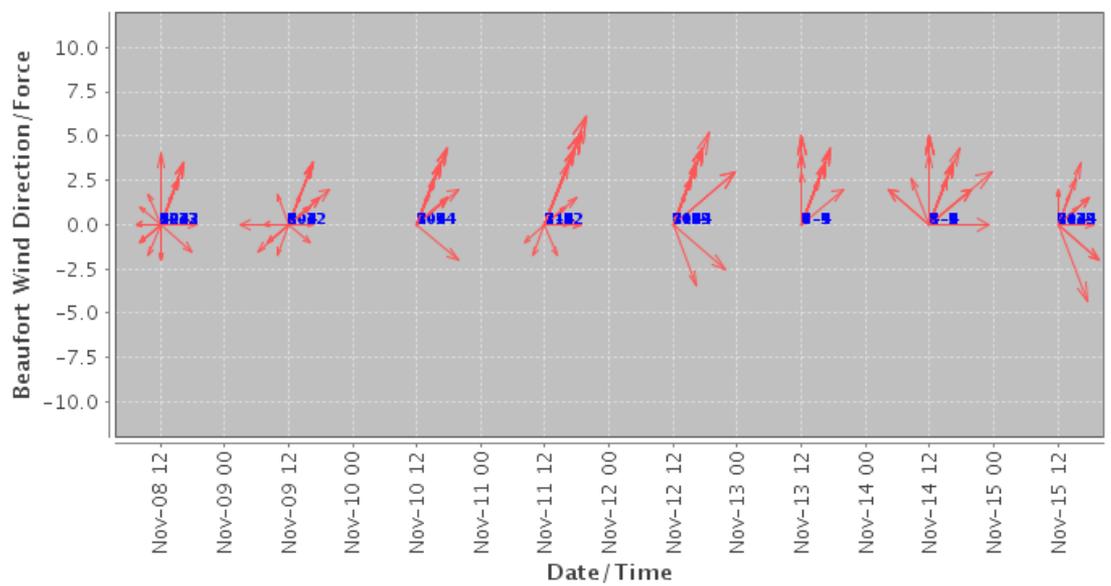
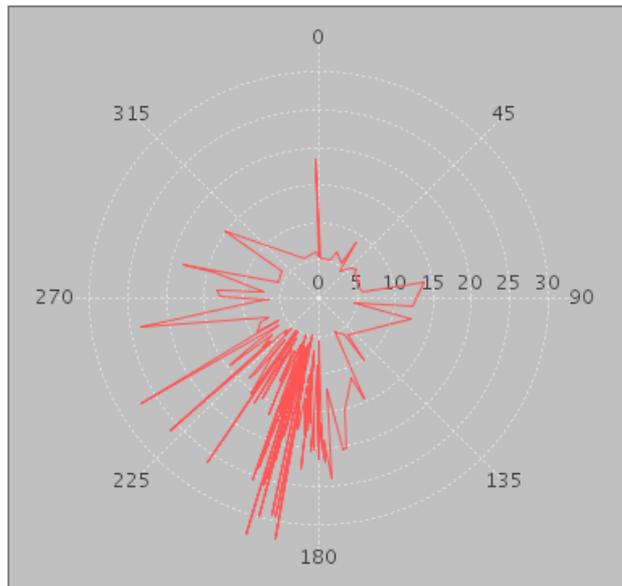
Select Report Content	Select Time Series	Select Format	View Current	View Historic
Standard SNOTEL (1999-09-21) All Sensors (no chart) Soil Moisture & Temperature (1999-09-30) Soil Moisture & Precipitation (1999-09-30) Soil & Air Temperature (1999-09-30) Accumulated Precipitation (1999-09-21) Accumulated Precipitation & Snow (1999-09-21) Wind (1999-09-28) Solar (1999-09-28) ===Individual elements===	Daily Hourly 12 AM 3 AM 6 AM 9 AM 12 PM 3 PM 6 PM 9 PM	table csv chart	Last 30 days Last 7 days Last 24 hours Water Year Calendar Year	2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 March April May June July August September October November December All days 01 02 03 04 05 06 07 08 09

Idaho SNOTEL Site Secesh Summit (740) - Wind Direction / Force Hourly series for week=2011-11-08 (PST)

2011-November-15 NRCS National Water and Climate Center - Provisional Data - subject to revision

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Click [here](#) for description of the Beaufort Indices used in this plot.



Drifting Snow occurs when BFF (BeauFort Force) > 4 or windspeed >15mph

http://www.id.nrcs.usda.gov/snow



Idaho Snow Survey Program



The [NRCS Snow Survey Program](#) provides mountain snowpack data and streamflow forecasts for the western United States. Common applications of snow survey products include water supply management, flood control, climate modeling, recreation, and conservation planning.

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Other Resources

- NRCS Snow Survey Programs by State
- NRCS National Water & Climate Center
- NRCS SCAN Data
- Related Links



Snow Survey News

[Google News Link: Get the latest Idaho Snow and Water Supply Information](#)

September 20, 2011 - New Educational Video "The Boise River: From Snow to River to You"

Click on frame to the left to watch this 9 minute video which seeks to educate 4th-6th graders about the Boise watershed, where their water comes from, and the many uses of that water in the Treasure Valley. Produced in partnership with the Idaho State University's Boise Center Aerospace Lab (BCAL), NRCS Snow Survey, Boise WaterShed Environmental Education Center, and Bogus Basin Snow School. Uses LiDAR, GIS data, Google Earth, photography, diagrams, narration, and musical composition. To link to other BCAL products [click here](#).

July 27, 2011 - Winter 2011 Idaho Snow Summary:

As we head towards the dog days of summer you may find it interesting to know some of our SNOTEL sites still have snow or have just melted out. The picture shown at left was taken on July 19th at Togwotee Pass, WY in the Upper Snake Basin. That day the site was still measuring a few inches of snow water while Jeff Graham and Adam Birken did summer maintenance work on the towers. In North Idaho, Cool Creek SNOTEL in the Clearwater basin, is still is measuring snow today. This makes 2011 the longest snow season on record at Cool Creek with this year beating the July 24, 1997 melt-out by a few days. [Read more...](#)

Snow Survey Data, Products, and Reports



Snow & Precipitation

- [Current Water Year](#)
- [Historic Data](#)
- [30-Year Averages](#)



SNOTEL Data & Products

Updated information specific to SNOTEL sites. i.e. SWE, snow depth, temperature, precipitation, soil moisture, etc...



Water Supply

Streamflow forecasts, reservoir storage, water supply outlook reports

- [Drought & Surface Water Supply Index \(SWSI\)](#)
- [Peak Streamflow Information](#)



Winter Recreation

Snow depth reports and graphs, wind data, ski area reports, etc...



Climate

Climate summaries by county
Soil Moisture and Soil Temperature Graphs

[Soil Moisture and Soil Temperature Graphs](#)



Site Information

Data site locations, maps, descriptions, etc...

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Winter Recreation Information

- Snow Depth: [Maps](#) | [Reports](#) | [Graphs](#) | [FAQ](#)
- [Wind](#)
- [Temperature](#)
- [Ski Area Reports and Links](#)

Snow Depth Reports

Frequently asked questions about snow depth data - [click here](#).

- **Hourly Data Regional Reports** - Snow Depth, SWE, PREC, and air temperature past two days for all sites with a snow depth sensor. - Updated at 35 minutes past the hour.
 - [Eastern Washington and Panhandle](#)
 - [Wood and Lost](#)
 - [Clearwater](#)
 - [Southern Idaho](#)
 - [Weiser, Pavette, Boise](#)
 - [Eastern Idaho and Wyoming](#)
- **Idaho Daily Snow Depth** - Updated daily*
 - [Today's Snow Depth for All Sites](#) | [Last 6 Days SWE, Snow Depth, Max and Min Temperatures](#)
- **Idaho Snow Depth Change Reports** - Updated daily*
 - [1 Day](#) | [2 Day](#) | [5 Day with SWE change](#) | [7 Day](#)
- **Idaho Regional SWE and Snow Depth Rate of Change Reports (4 days)** - Updated daily
 - [North Idaho](#)
 - [Central Idaho](#)
 - [Southern Idaho](#)
 - [Eastern Idaho & Western Wyoming \(Upper Snake Basins\)](#)

Rate of Change Reports

MORES CREEK SUMMIT ID IDDCO 637.1 Elev. 6100 Lat. 4356 Long. 11540

Date, PST time	SWE	dlt	tot	PREC	dlt	tot	DEPTH	dlt	tot
11-11-11 00:00	0.4V	0.0	0.0	4.7V	0.0	0.0	2.0E	0.0	0.0
11-11-12 00:00	0.6V	0.2	0.2	4.9V	0.2	0.2	4.0E	2.0	2.0
11-11-13 00:00	1.2V	0.6	0.8	5.4E	0.5	0.7	8.0V	4.0	6.0
11-11-14 00:00	1.5V	0.3	1.1	5.7V	0.3	1.0	9.0V	1.0	7.0
11-11-15 00:00	1.5V	0.0	1.1	5.8V	0.1	1.1	8.0V	-1.0	6.0

BOGUS BASIN ID IDDCO 978.1 Elev. 6340 Lat. 4346 Long. 11606

Date, PST time	SWE	dlt	tot	PREC	dlt	tot	DEPTH	dlt	tot
11-11-11 00:00	0.5V	0.0	0.0	4.9V	0.0	0.0	2.0V	0.0	0.0
11-11-12 00:00	0.7V	0.2	0.2	5.0V	0.1	0.1	3.0E	1.0	1.0
11-11-13 00:00	0.9V	0.2	0.4	5.0V	0.0	0.1	7.0V	4.0	5.0
11-11-14 00:00	1.0V	0.1	0.5	5.1V	0.1	0.2	6.0V	-1.0	4.0
11-11-15 00:00	1.0V	0.0	0.5	5.1V	0.0	0.2	6.0V	0.0	4.0

ATLANTA SUMMIT ID IDDCO 306.1 Elev. 7580 Lat. 4345 Long. 11514

Date, PST time	SWE	dlt	tot	PREC	dlt	tot	DEPTH	dlt	tot
11-11-11 00:00	0.6V	0.0	0.0	5.7V	0.0	0.0	4.0V	0.0	0.0
11-11-12 00:00	1.0E	0.4	0.4	6.1V	0.4	0.4	8.0E	4.0	4.0
11-11-13 00:00	1.6V	0.6	1.0	6.6V	0.5	0.9	13.0V	5.0	9.0
11-11-14 00:00	1.8V	0.2	1.2	6.8V	0.2	1.1	12.0V	-1.0	8.0
11-11-15 00:00	1.8V	0.0	1.2	6.9V	0.1	1.2	12.0V	0.0	8.0

TRINITY MTN. ID IDDCO 830.1 Elev. 7770 Lat. 4338 Long. 11526

Date, PST time	SWE	dlt	tot	PREC	dlt	tot	DEPTH	dlt	tot
11-11-11 00:00	1.3V	0.0	0.0	6.2V	0.0	0.0	4.0V	0.0	0.0
11-11-12 00:00	1.7V	0.4	0.4	6.6V	0.4	0.4	5.0V	1.0	1.0
11-11-13 00:00	2.5V	0.8	1.2	7.3V	0.7	1.1	13.0V	8.0	9.0
11-11-14 00:00	2.7V	0.2	1.4	7.6V	0.3	1.4	12.0V	-1.0	8.0
11-11-15 00:00	2.8V	0.1	1.5	7.6V	0.0	1.4	12.0V	0.0	8.0

Regional Hourly Reports

BIG CREEK SUMMIT		ID	IDDCO	338.1	Elev. 6580	Lat. 44
*****		SNOW		AIR TEMP	SNOW	
Date, PST time	WATER	PREC	Deg.C	DEPTH		
11-11-13 00:00	1.2	4.6	-3.8	6.0		
11-11-13 01:00	1.3	4.6	-3.6	4.0		
11-11-13 02:00	1.3	4.6	-3.5	4.0		
11-11-13 03:00	1.3	4.7	-3.2	188.0S		
11-11-13 04:00	1.4	4.7	-3.0	7.0		
11-11-13 05:00	1.4	4.7	-2.7	4.0		
11-11-13 06:00	1.4	4.7	-2.6	5.0		
11-11-13 07:00	1.4	4.7	-2.5	6.0		
11-11-13 08:00	1.4	4.7	-2.4	4.0		
11-11-13 09:00	1.4	4.7	-2.2	4.0		
11-11-13 10:00	1.4	4.7	-2.0	6.0		
11-11-13 11:00	1.5	4.7	-1.6	6.0		
11-11-13 12:00	1.5	4.7	-1.7	6.0		
11-11-13 13:00	1.5	4.7	-1.2	6.0		
11-11-13 14:00	1.5	4.7	-0.8	5.0		
11-11-13 15:00	1.5	4.8	-1.7	5.0		
11-11-13 16:00	1.5	4.7	-2.0	5.0		
11-11-13 17:00	1.5	4.7	-2.5	5.0		
11-11-13 18:00	1.4	4.7	-2.6	5.0		
11-11-13 19:00	1.4	4.7	-3.4	5.0		
11-11-13 20:00	1.4	4.7	-4.1	6.0		
11-11-13 21:00	1.4	4.7	-4.1	5.0		
11-11-13 22:00	1.4	4.7	-3.8	5.0		

Conclusions

- SNOTEL is largest mountain weather monitoring system in the world
- SNOTEL network set up for water resource needs, not avalanche forecasting
- Daily data gets human QC, often less confusing
- SWE data often more reliable than snow depth data, or can be used in lieu of snow depth data
- Use SWE, Prec, Depth and Temp data together for more information.
- Beware of sensor “flutter”
- The good news is -99.9 probably means its snowing
- SNOTEL wind data is not measuring ridge top wind

There are no face-shots on the internet. Go ski!