

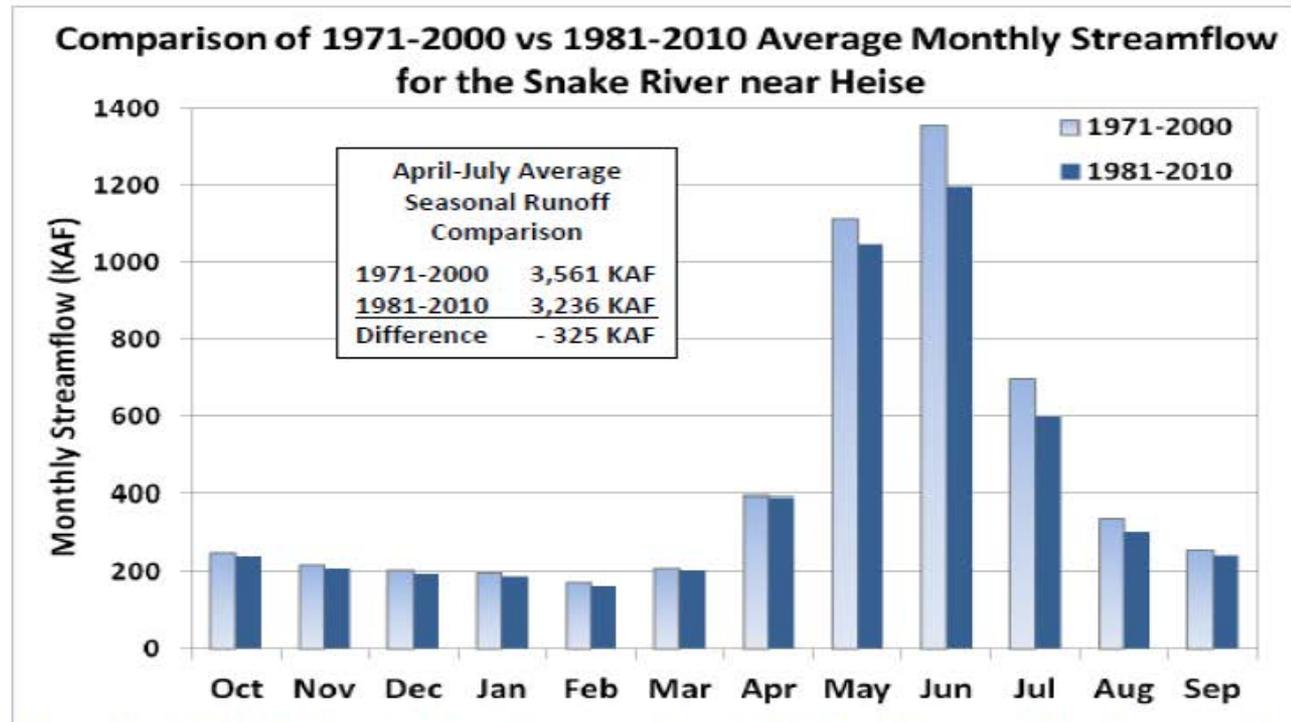
Idaho Water Supply Outlook

Idaho State
Water Supply
Meeting

March 15, 2013



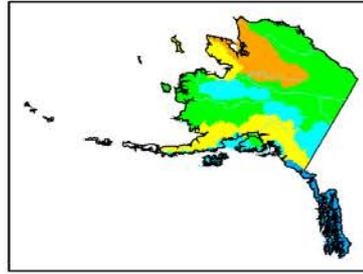
Idaho Water Supply Outlook Report March 1, 2013



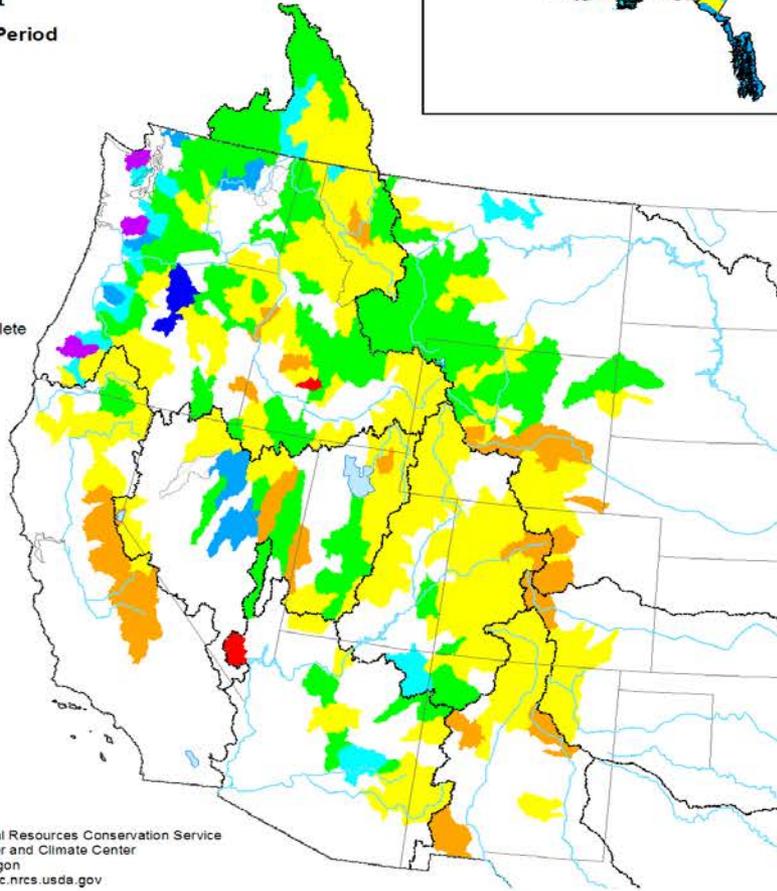
Streamflow in Idaho's rivers has decreased over the last 30 years. The above graph illustrates monthly changes in streamflow for the Snake River near Heise. Average April-July streamflow for the 1981-2010 reference period is 325,000 acre-feet less than the average for the 1971-2000 period. This represents a 9% less volume. Across Idaho, April-July volumes averaged an 11% drop from the 1971-2000 averages. One of the largest plunges was 22% for the Bear River below Stewart Dam. This point's new April-July average is 183,000 acre-feet or 51,000 acre-feet less than the 1971-2000 average of 234,000 acre-feet. The lower normals are a result of dropping the wet 1970s and adding the drier 2000s to the 30 year average calculation period. When making decisions using streamflow forecasts water users are encouraged to base their judgments on volumes rather than percentages since the new lower averages inflate percentages. For more information about the shift in streamflow averages see the Streamflow section of this report.

Mountain Snowpack as of March 1, 2013

Manual snow course data are no longer available in some regions due to program decisions to meet reduced budgets. As a result, this map may have additional unrepresented areas and some regions may not be directly comparable to previous years.

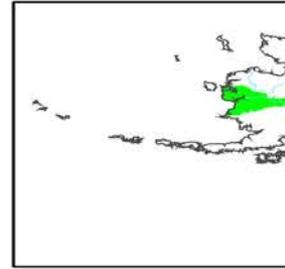


Percent
1981 to 2010 Period

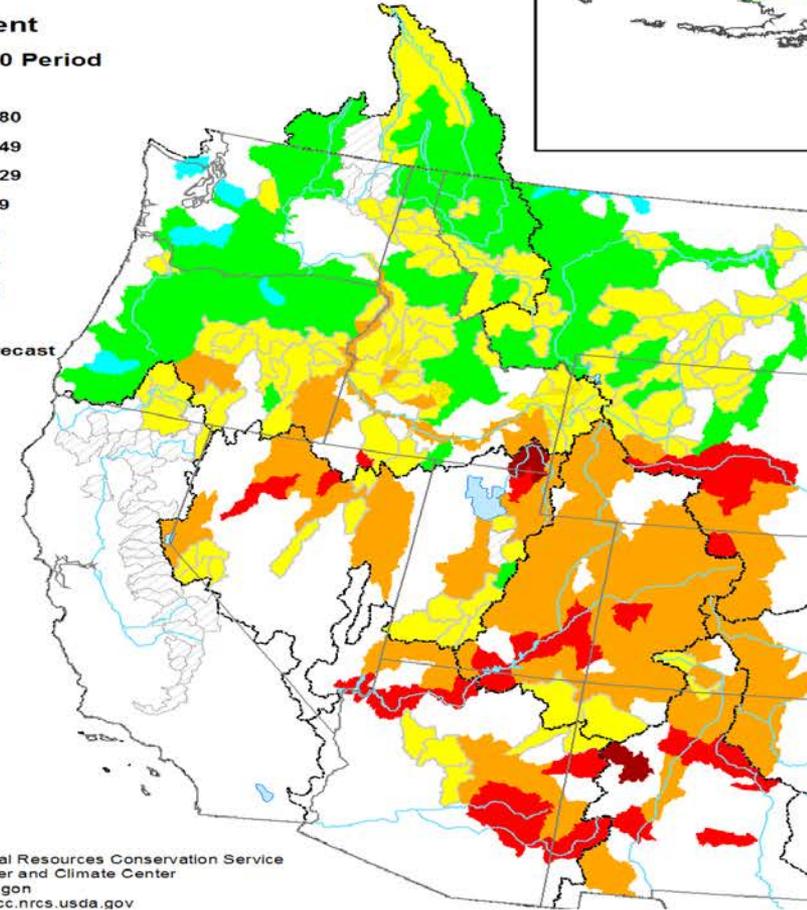


Prepared by
USDA, Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

Spring and Summer Streamflow Forecasts as of March 1, 2013



Percent
1981 to 2010 Period



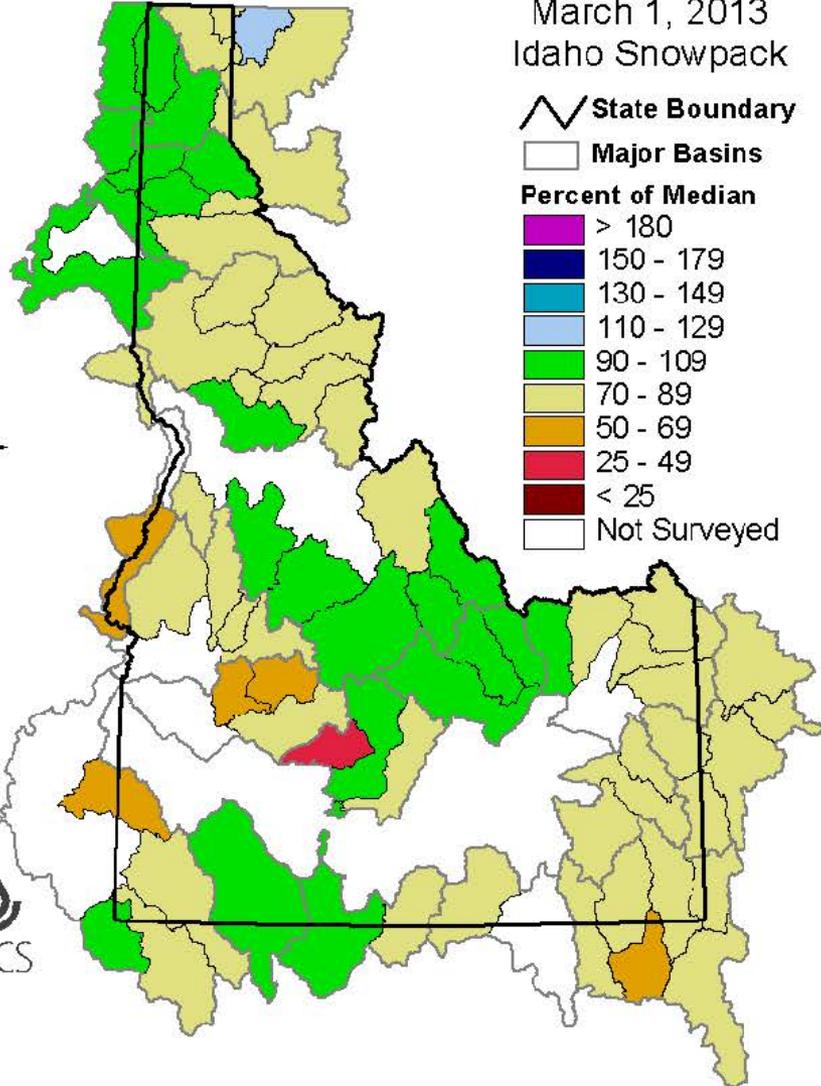
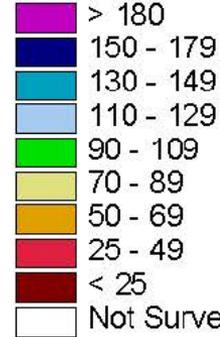
Prepared by
USDA, Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

March 1, 2013 Idaho Snowpack

State Boundary

Major Basins

Percent of Median

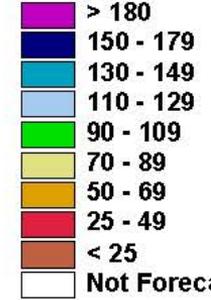


March 1, 2013 50% Exceedance Summer Streamflow Forecasts Idaho

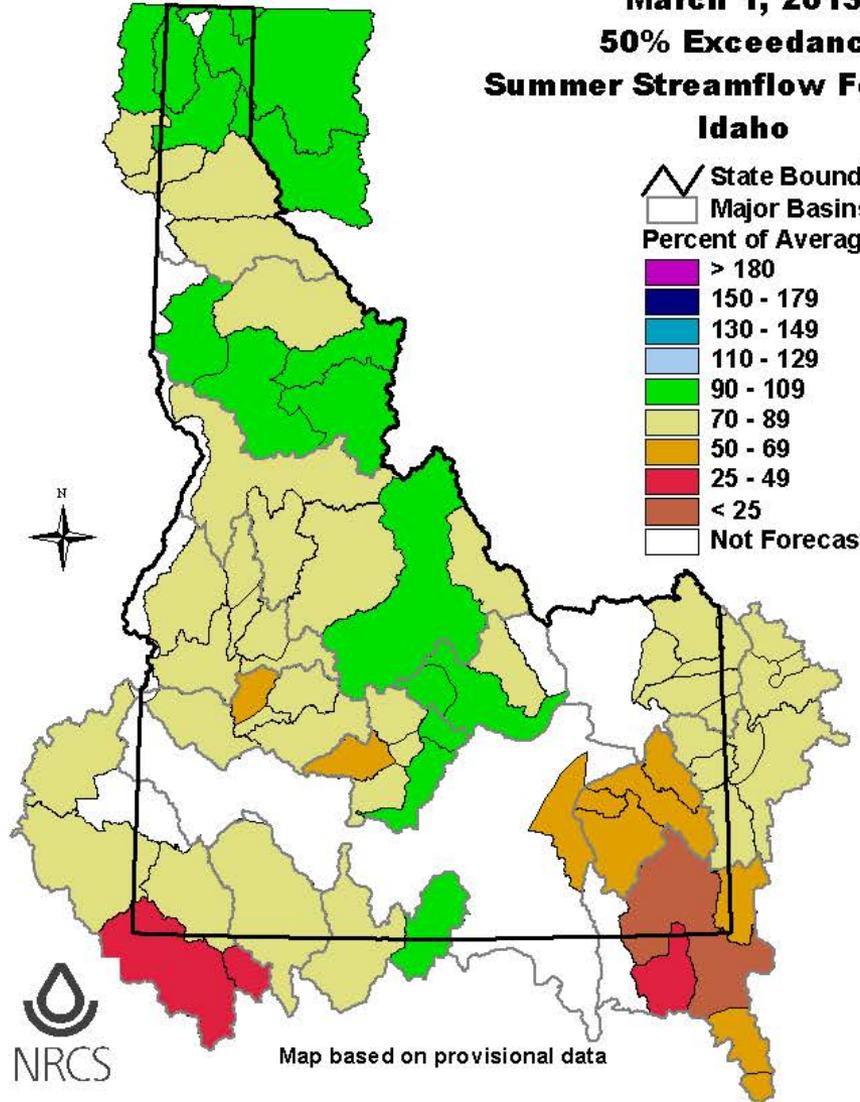
State Boundary

Major Basins

Percent of Average



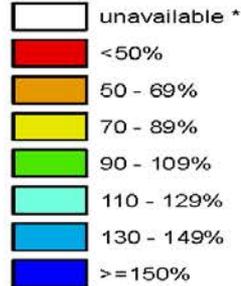
Map based on provisional data



Idaho SNOTEL Current Snow Water Equivalent (SWE) % of Normal

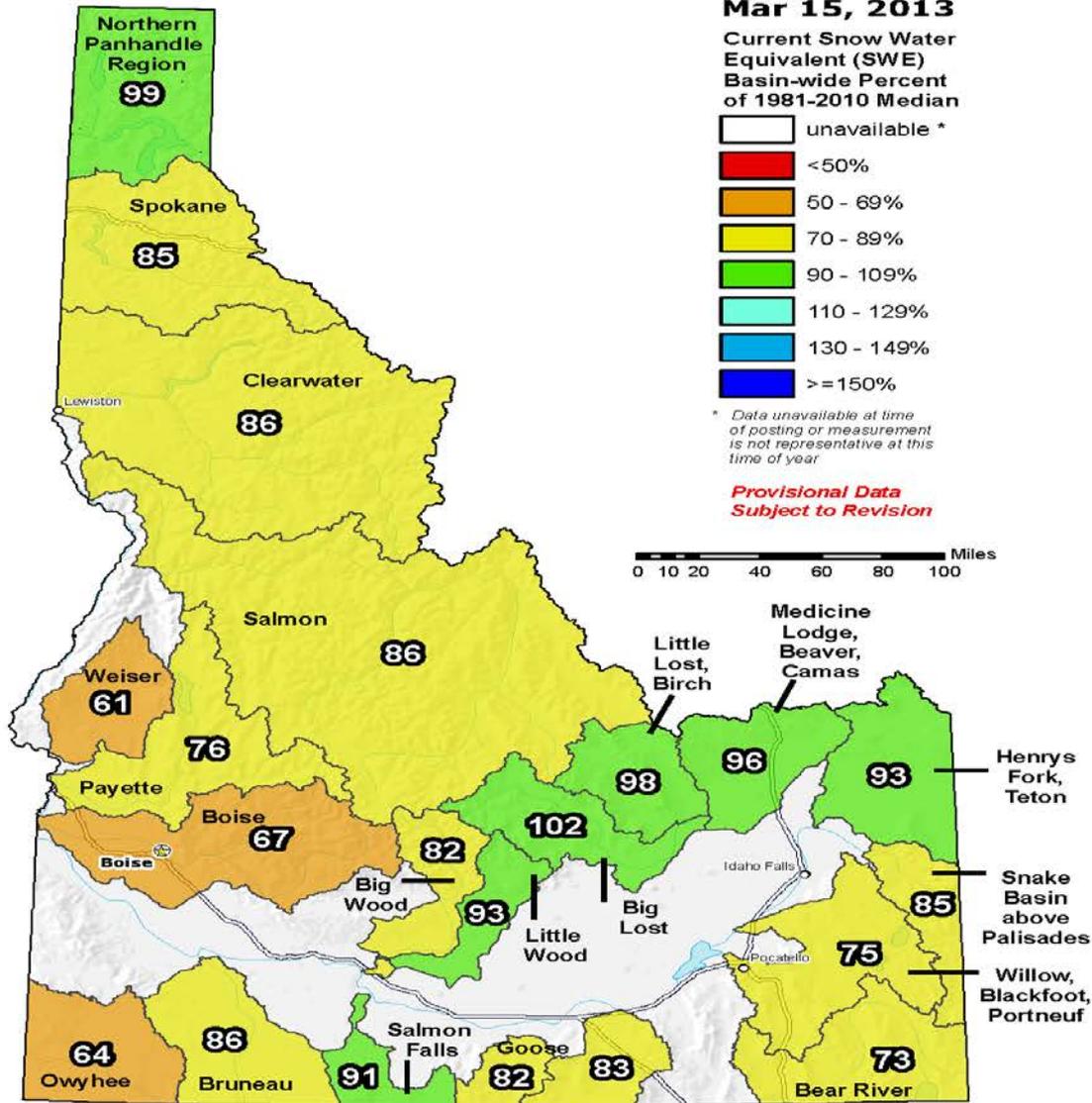
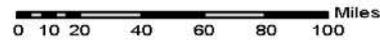
Mar 15, 2013

Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median



* Data unavailable at time of posting or measurement is not representative at this time of year

*Provisional Data
Subject to Revision*



The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by the USDA/NRCS National Water and Climate Center Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/> Based on data from <http://www.wcc.nrcs.usda.gov/reports/> Science contact: Jim.Marron@por.usda.gov 503 414 3047

SNOTEL Precipitation Summary Report

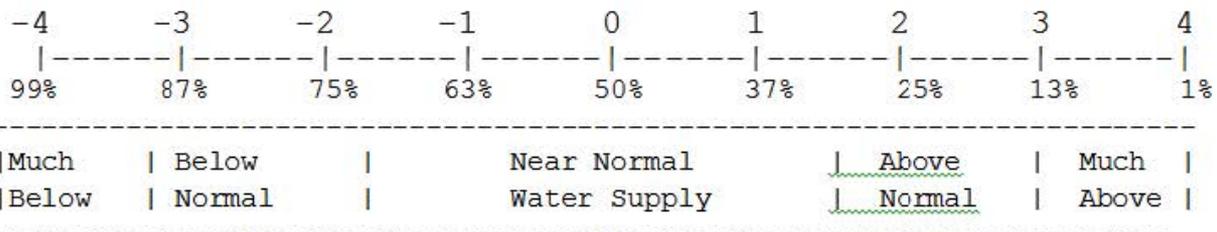
<u>Region or Basin</u>	<u>January 2013</u> Precipitation as % of Average	<u>February 2013</u> Precipitation as % of Average	<u>March 1 - 14</u> Precipitation as % of March Total
NORTHERN PANHANDLE REGION	61	74	44
SPOKANE	72	70	36
CLEARWATER	85	76	29
SALMON	71	47	22
WEISER	90	54	12
PAYETTE	64	39	17
BOISE	50	40	19
BIG WOOD	43	28	22
LITTLE WOOD	47	38	14
BIG LOST	51	32	24
LITTLE LOST & BIRCH	70	57	22
MEDICINE LODGE, BEAVER, CAMAS	82	65	23
HENRYS FORK, TETON	70	49	40
SNAKE BASIN ABOVE PALISADES	61	46	37
WILLOW, BLACKFOOT, PORTNEUF	74	61	23
SNAKE BASIN ABOVE AMERICAN FALLS	66	50	35
GOOSE CREEK	97	86	16
SALMON FALLS	108	114	14
BRUNEAU	107	109	14
OWYHEE	94	48	9
BEAR RIVER	64	50	25

<http://www.id.nrcs.usda.gov/snow/watersupply/swsi-main.html>. The table below illustrates the changes in the April-July average volume for 1971-2000 and 1981-2010 periods for various rivers across Idaho. Statewide the new averages are 11% lower than the old averages.

Station Name	71-00 Ave April-July Streamflow (KAF)	81-10 Ave April-July Streamflow (KAF)	Difference (KAF)	% Difference from 71-00 Ave
Bear R bl Stewart Dam	234	183	-51	-22%
Oakley Reservoir Inflow	29	24	-5	-17%
Big Wood R bl Magic Dam	292	250	-41	-14%
Big Lost R bl Mackay Res	141	123	-19	-13%
Salmon Falls nr San Jacinto	70	80	-10	-13%
Bruneau R nr Hot Spring	208	183	-25	-12%
Little Lost R nr Howe	31	28	-4	-12%
Little Wood R nr Carey	87	77	-10	-11%
Boise R nr Boise	1414	1261	-153	-11%
Teton R nr St Anthony	405	367	-38	-9%
Snake R nr Heise	3561	3236	-325	-9%
Payette R nr Horseshoe Bend	1618	1477	-141	-9%
Salmon R at White Bird	5851	5369	-481	-8%
Moyie R at Eastport	403	374	-30	-7%
Clearwater R at Spalding	7430	6890	-540	-7%
Teton R nr Driggs	165	154	-11	-7%
Spokane R nr Post Falls	2553	2389	-164	-6%
Weiser R nr Weiser	392	370	-21	-5%
Falls R nr Ashton	380	365	-15	-4%
Henrys Fk nr Ashton	544	532	-12	-2%

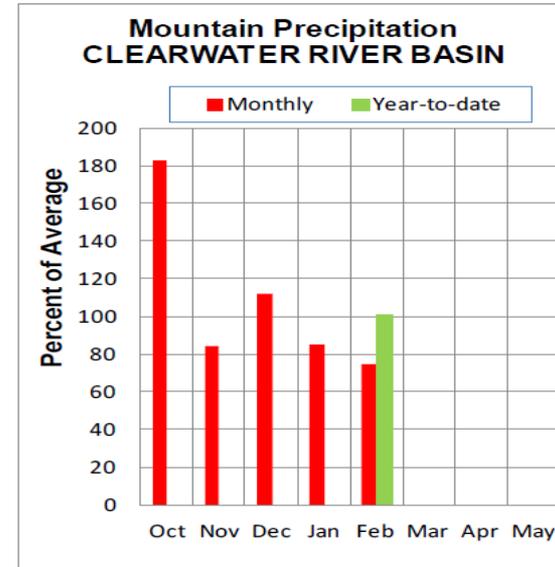
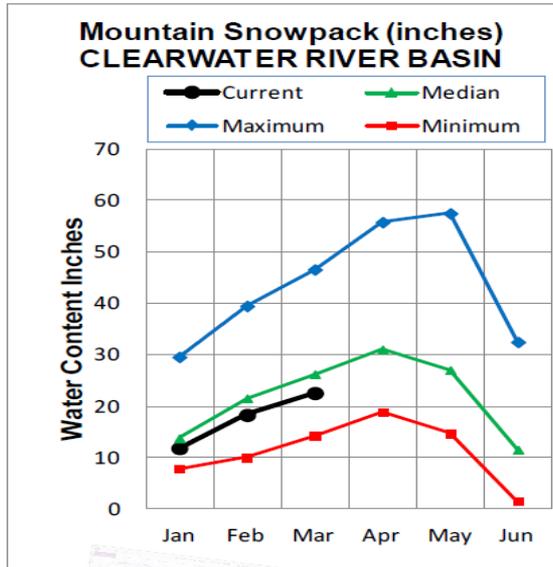
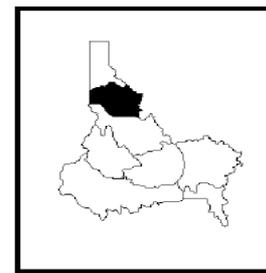
<i>BASIN or REGION</i>	<i>SWSI Value</i>	<i>Most Recent Year With Similar SWSI Value</i>	<i>Agricultural Water Supply Shortage May Occur When SWSI is Less Than</i>
Northern Panhandle	0.0	2007	NA
Spokane	-1.8	2007	NA
Clearwater	1.3	2004	NA
Salmon	-0.5	2003	NA
Weiser	-1.0	2005	NA
Payette	-0.5	2010	NA
Boise	-1.3	2002	-1.6
Big Wood	0.0	2010	-0.1
Little Wood	0.8	2012	-1.9
Big Lost	0.5	2009	0.4
Little Lost	-0.3	2012	1.1
Teton	-2.0	2002	-3.9
Henry's Fork	-0.8	2005	-3.2
Snake (Heise)	-1.8	2007	-1.6
Oakley	-0.3	2009	-0.4
Salmon Falls	-1.3	2000	-1.1
Bruneau	-0.3	2008	NA
Owyhee	-0.5	2012	-3.4
Bear River	0.5	2001	-3.3

SWSI SCALE, PERCENT CHANCE OF EXCEEDANCE, AND INTERPRETATION



CLEARWATER RIVER BASIN

MARCH 1, 2013



February precipitation was 75% of average.

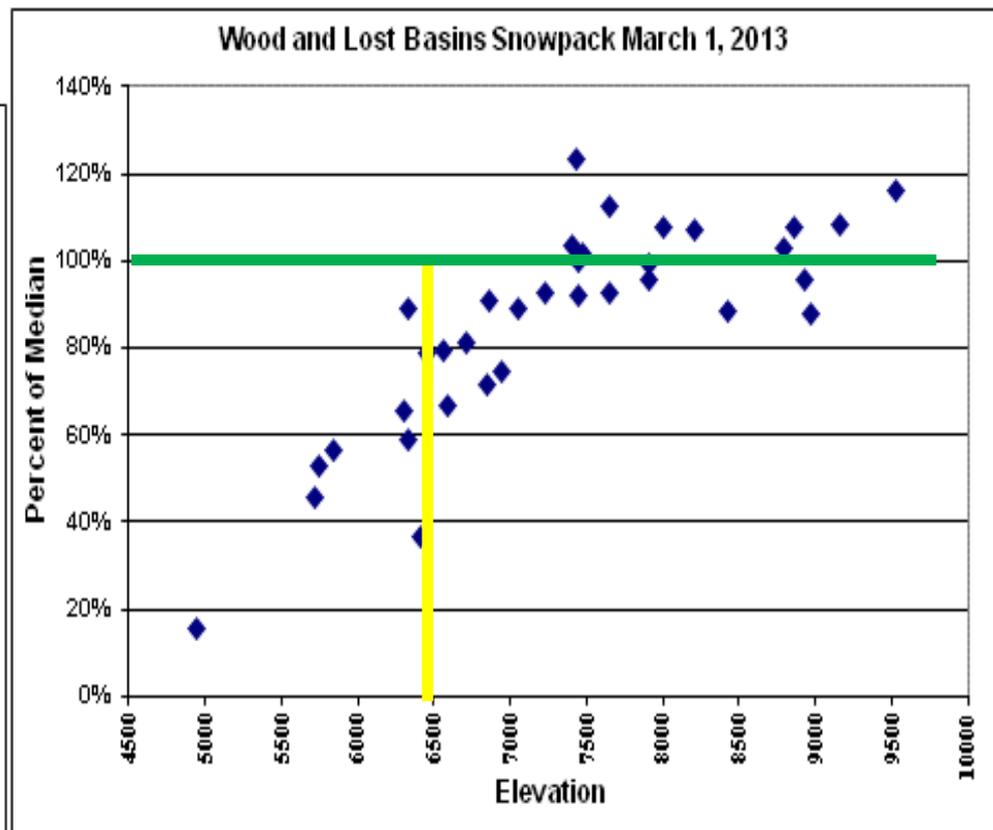
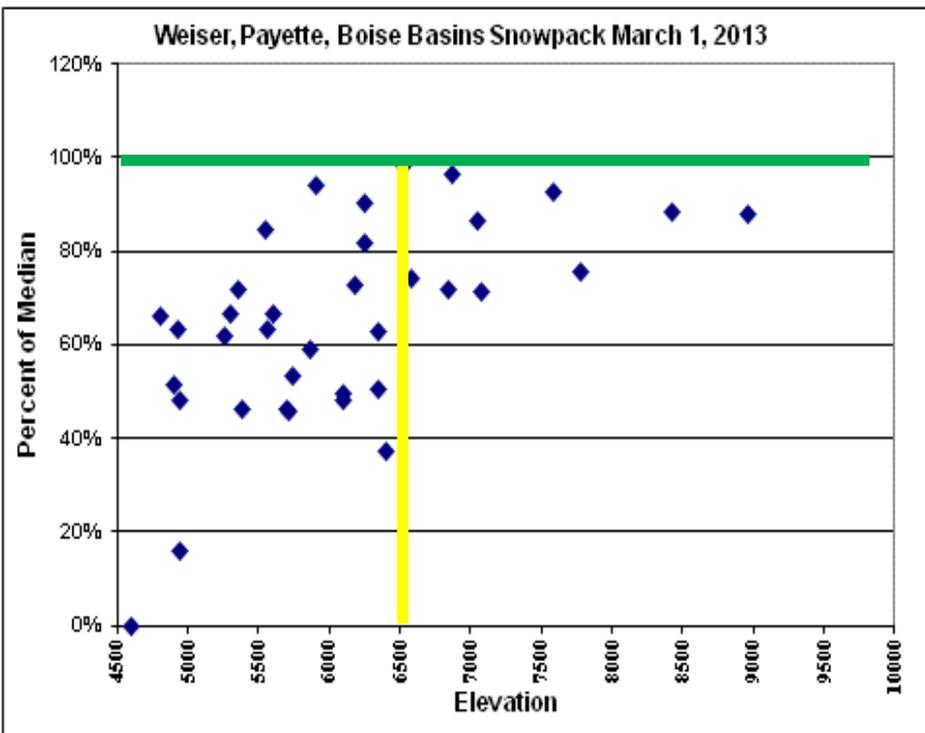
The Clearwater basin snowpack increased slightly from 85% of median on February 1 to 87% on March 1.

Precipitation totals are compared to the 1981-2010 AVERAGES while snow water equivalent is compared to the 1981-2010 MEDIANS.

This may help explain how the snowpack maintained steady percentages during March even with below normal precipitation amounts.

Trend of lack of snow below 6,500 to 7,000 feet is still present in central Idaho and other low elevation basins around state.

Result - low runoff in Owyhee, Weiser, Mores, Camas, and eastern Idaho basins: Portneuf, Blackfoot, Grays Lake, Bear



SNOTEL Current Snow Water Equivalent (SWE) Records

Mar 13, 2013

Current Snow Water (SWE) Equivalent Records

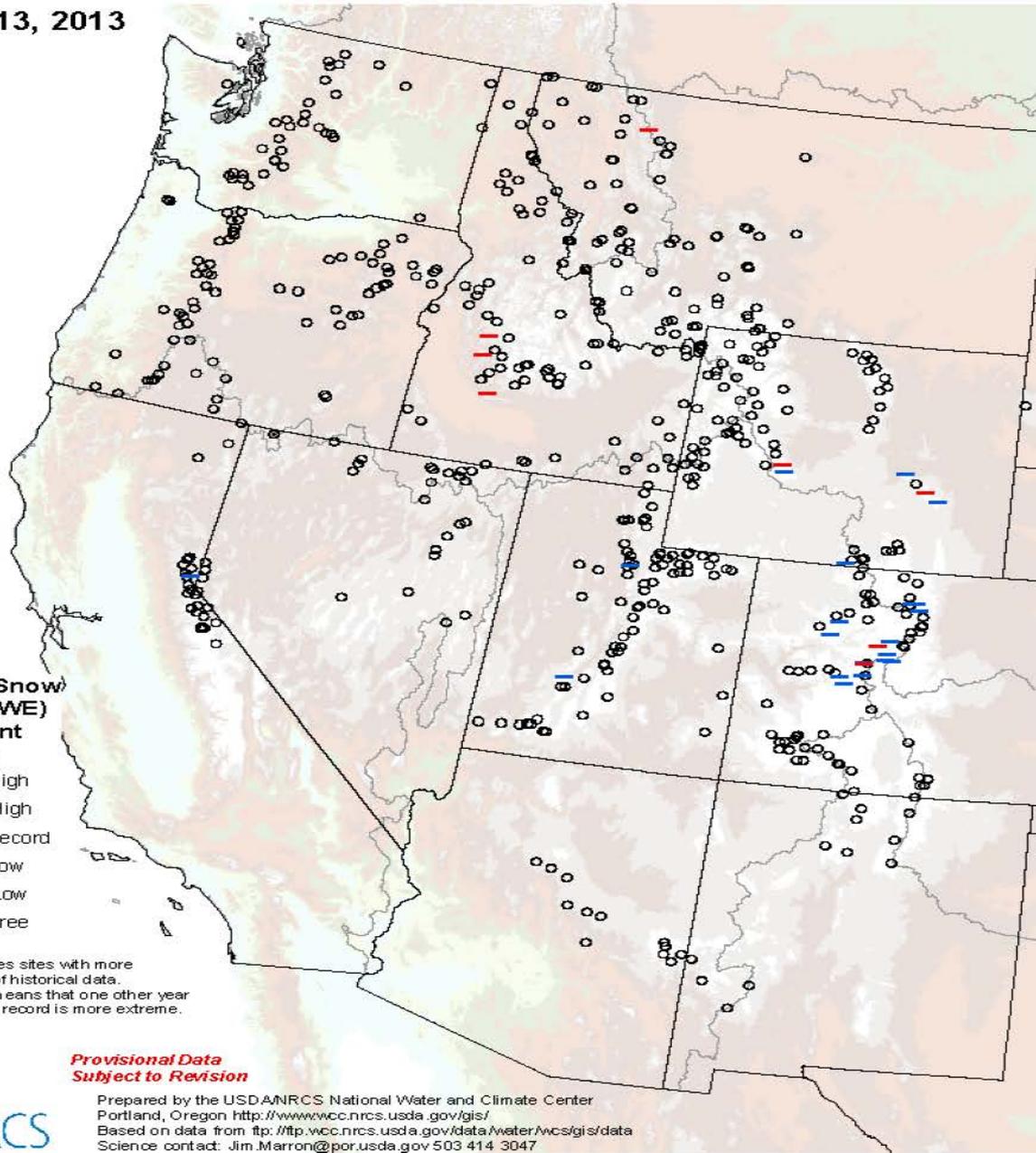
- + New High
- + Near High
- Non-Record
- New Low
- Near Low
- snow free

Analysis includes sites with more than 20 years of historical data.
"Near" record means that one other year of the period of record is more extreme.



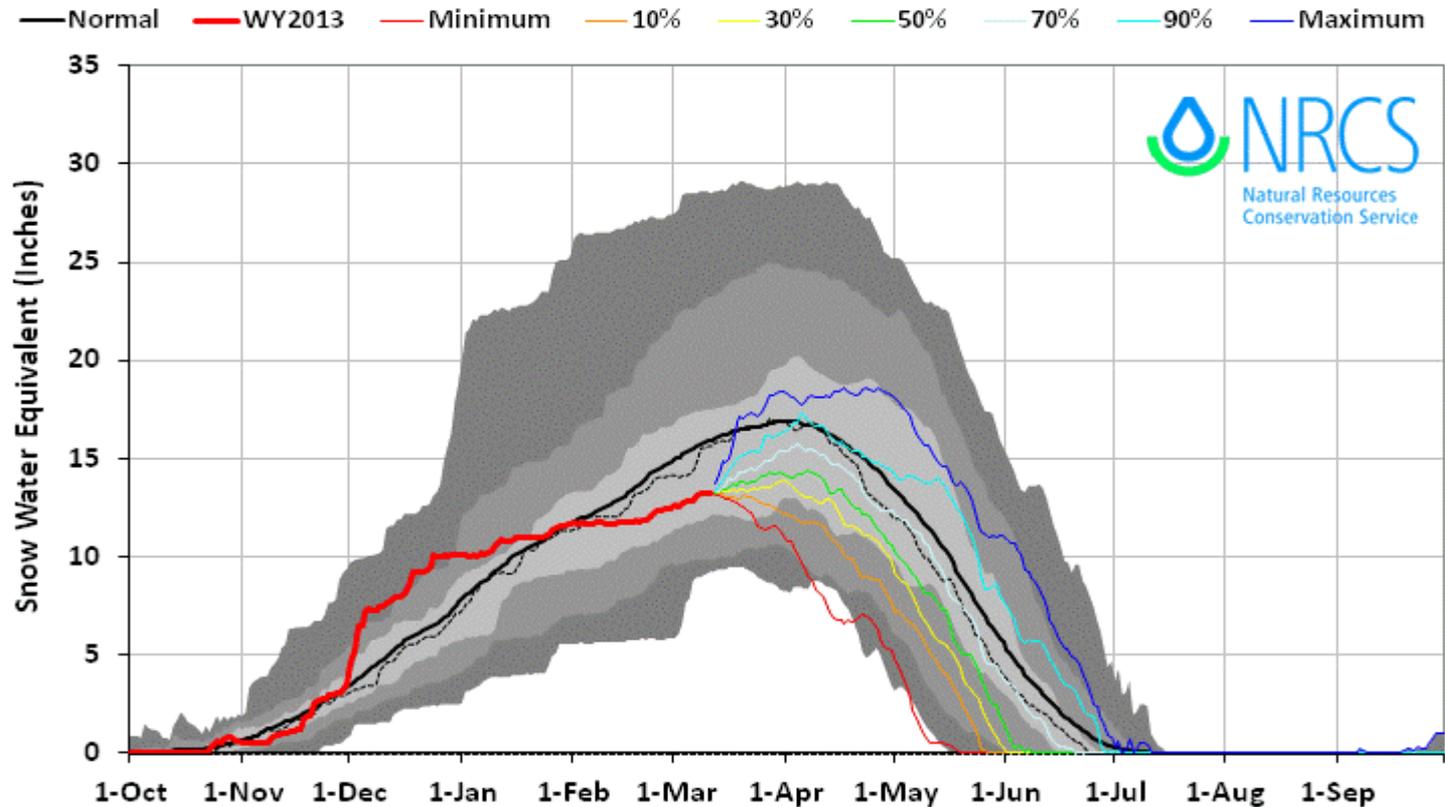
**Provisional Data
Subject to Revision**

Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>
Based on data from <ftp://ftp.wcc.nrcs.usda.gov/data/water/wccs/gis/data>
Science contact: Jim.Marron@por.usda.gov 503 414 3047



Big Wood Basin 2013 Snow Water with Non-Exceedence Projections (9 sites)

Based on Provisional SNOTEL data as of Mar 11, 2013



From Sawtooth National Forest Avalanche Advisory

March 14, 2013 - [Spring is here, and our snowpack has warmed dramatically in the last 48 hours](#). Yesterday there was a cycle of small wet loose avalanches on steep sunny slopes throughout the advisory area.

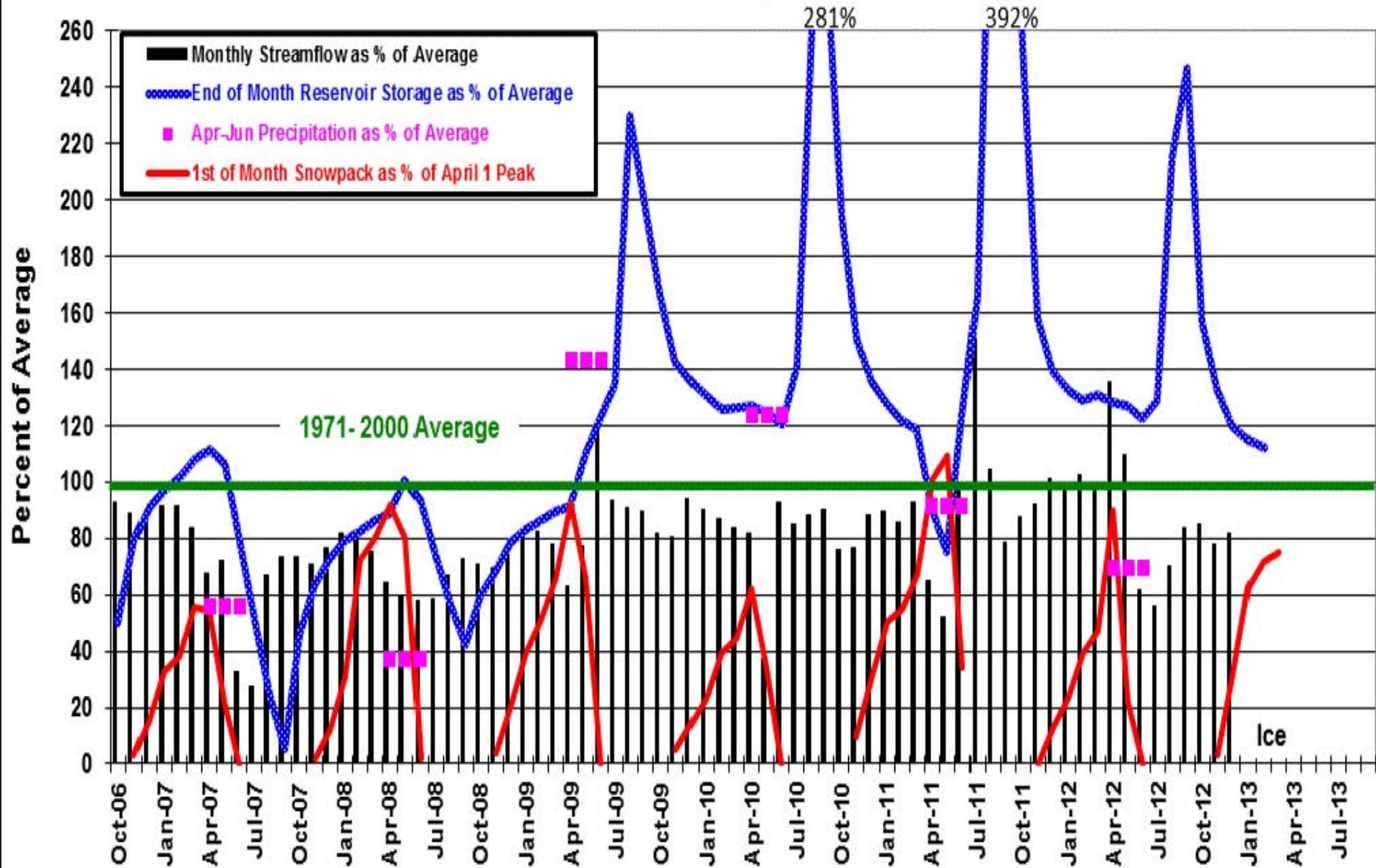
March 13 - Fully shaded upper elevation slopes are still cold, dry and wintery, marginal slopes that get morning/afternoon sun [are melting at the surface \(but still dry at depth\)](#), solar slopes are wet and losing their winter stratigraphy, and [sunny, lower elevation slopes have lost a significant amount of snow](#).

Station ID	Station Name	Period	Data Type	Years	# of Years		
13142500	Big Wood R blw Magic Reservoir	Apr-Sep	strm	1981-2012	32 Units KAF		
13142000	Magic Reservoir	28-Feb	resv	1981-2012	32 Units KAF		
ENSO Classification SE Strong El Nino - EN Mild El Nino - N Neutral - LN Mild La Nina - SL Strong La Nina							
Rank	Year	Enso	Stream Flow Apr-Sep	Reservoir 28-Feb	Streamflow + Reservoir Sum	Non- Exceedance Probability	SWSI
1	1983	SE	747	160	906	97%	3.9
2	2006	N	636	62	699	94%	3.7
3	1982	N	622	74	696	91%	3.4
4	1997	N	605	78	683	88%	3.2
5	1984	N	545	119	664	85%	2.9
6	1998	SE	427	163	590	82%	2.7
7	1986	N	432	131	563	79%	2.4
8	1999	SL	420	120	540	76%	2.1
9	1995	SE	518	16	534	73%	1.9
10	1996	N	351	127	478	70%	1.6
11	2011	SL	322	91	412	67%	1.4
12	1985	N	242	149	391	64%	1.1
2013 10% Chance Exceedance Forecast		N	360	27	387	62%	1.0
13	1993	EN	355	14	369	61%	0.9
14	2012	N	236	128	364	58%	0.6
2013 30% Chance Exceedance Forecast		N	280	27	307	56%	0.5
15	1981	N	153	126	279	55%	0.4
2013 50% Chance Exceedance Forecast		N	230	27	257	50%	0.0
17	2010	EN	167	83	250	48%	-0.1
18	2009	N	219	30	249	45%	-0.4
19	1989	SL	200	23	223	42%	-0.6
20	2005	EN	194	26	219	39%	-0.9
2013 70% Chance Exceedance Forecast		N	178	27	205	36%	-1.0
21	2008	N	178	24	202	36%	-1.1
22	2007	EN	60	125	185	33%	-1.4
23	1987	N	61	120	181	30%	-1.6
24	2003	EN	140	23	163	27%	-1.9
25	2002	N	120	19	139	24%	-2.1
2013 90% Chance Exceedance Forecast		N	102	27	129	23%	-2.3
26	1994	SE	31	86	117	21%	-2.4
27	1990	N	79	25	104	18%	-2.7
28	1991	N	76	22	98	15%	-2.9
29	2004	N	66	23	89	12%	-3.2
30	2001	LN	38	48	87	9%	-3.4
31	1988	SE	64	22	86	6%	-3.7
32	1992	EN	24	27	51	3%	-3.9

Big Lost Basin: Big Lost River b/w Mackay Resv Monthly Streamflow

End of Month Mackay Reservoir Storage

4 Station SNOTEL Site Snow Index and Precipitation Index

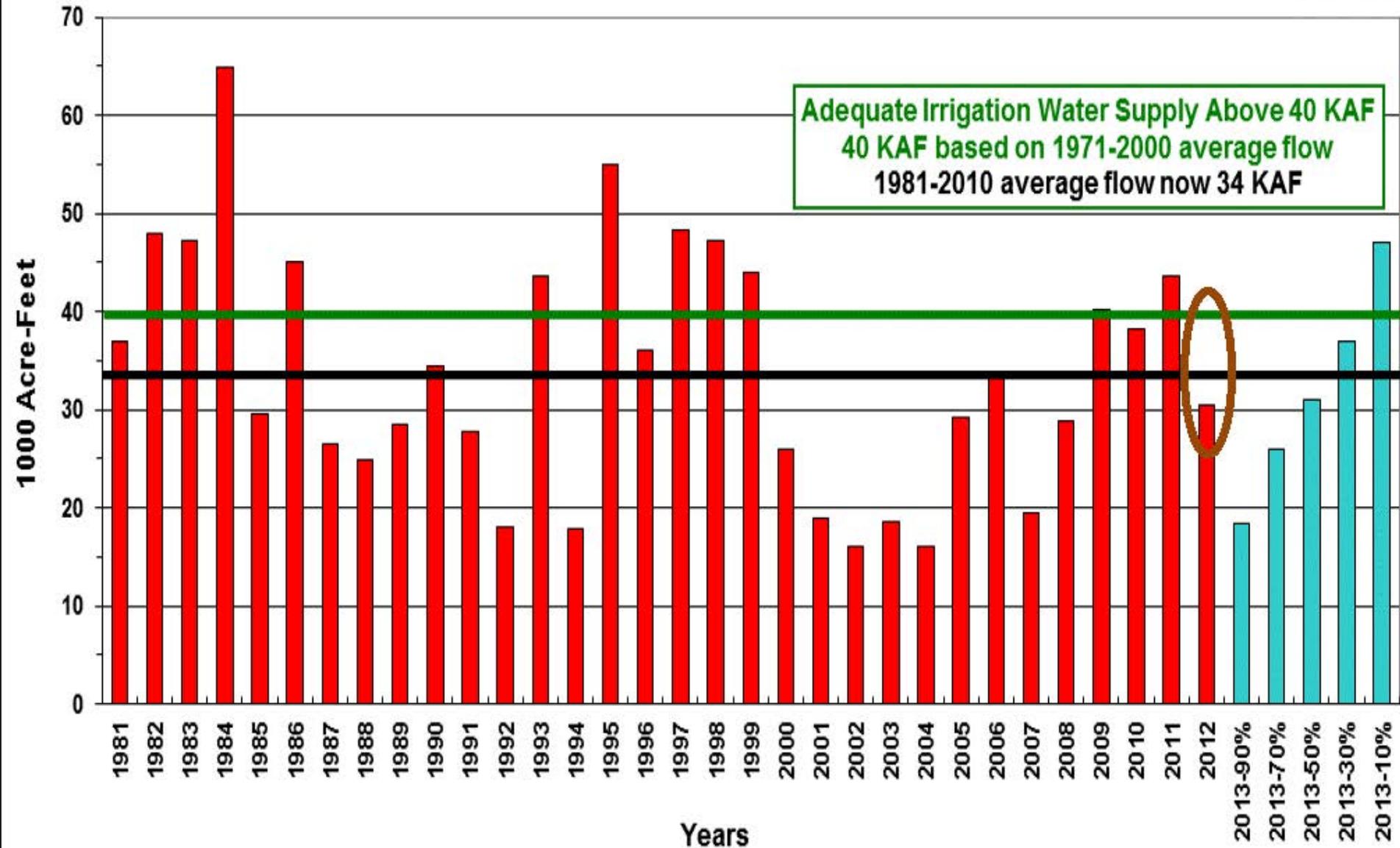


March 1 Surface Water Supply Index (SWSI) Little Lost River below Wet Creek

■ Streamflow Apr-Sep



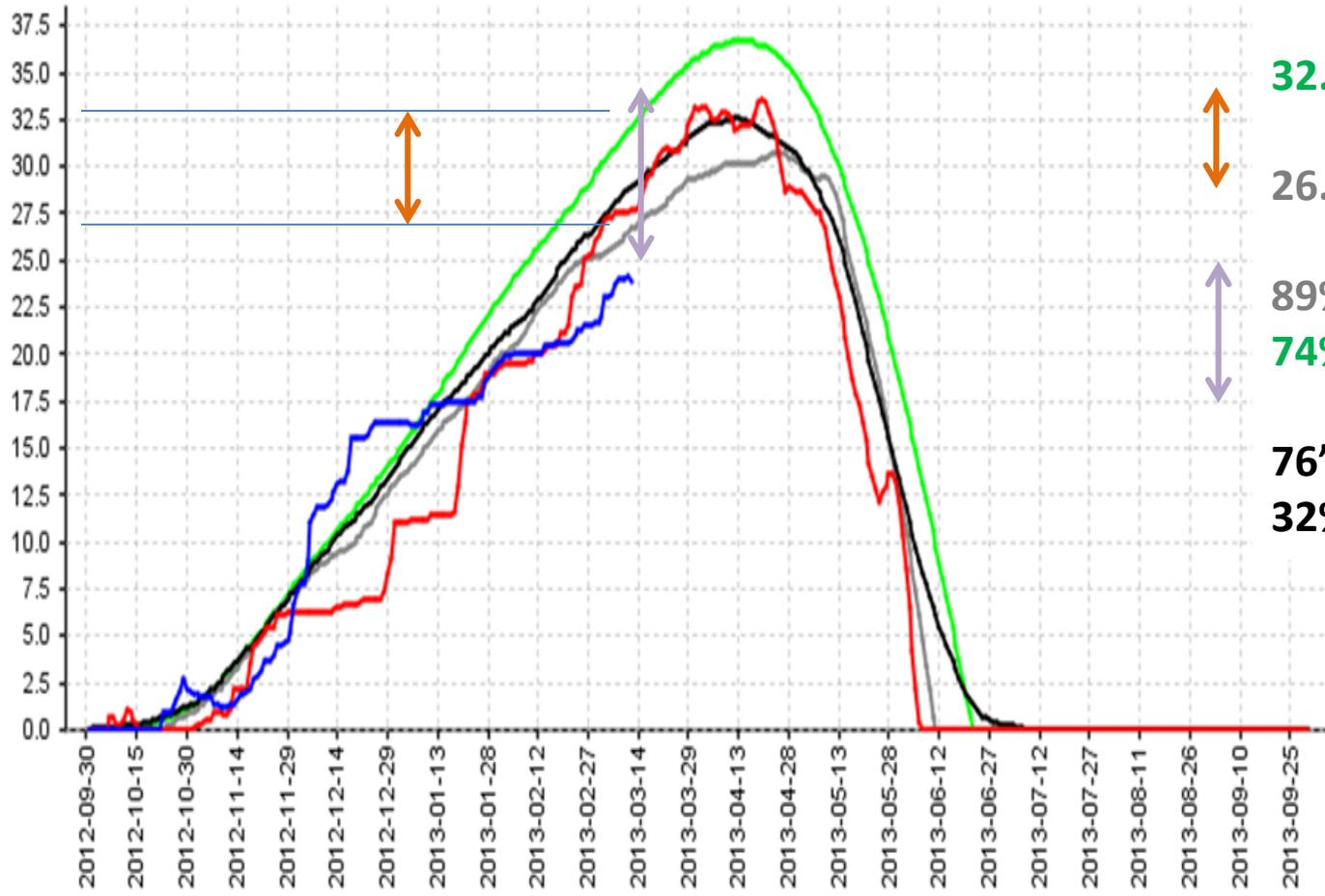
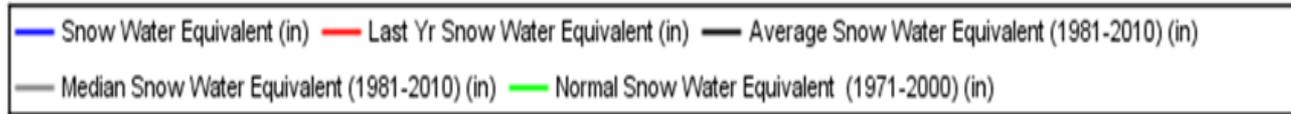
Adequate Irrigation Water Supply Above 40 KAF
40 KAF based on 1971-2000 average flow
1981-2010 average flow now 34 KAF



Wyoming Site - Lewis Lake Divide (577)

(As of: Tue Mar 12 15:36:42 PDT 2013)

Provisional data, subject to revision



March 13, 2013
Lewis Lake Divide
24" SWE

32.5" 71-00 Avg

26.8" 81-10 Median

89% of 81-10 Median

74% of 71-00 Avg

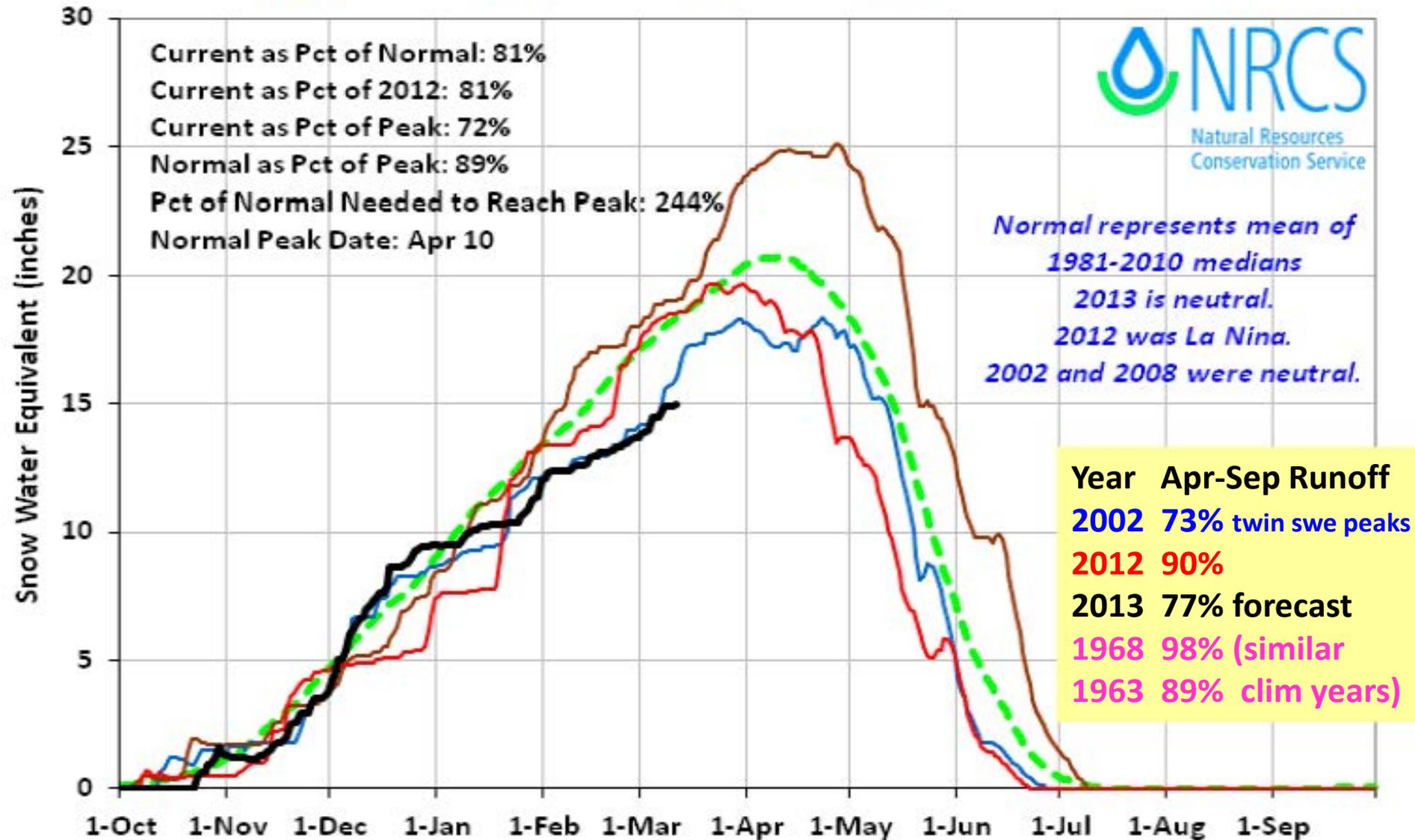
76" Depth

32% Density

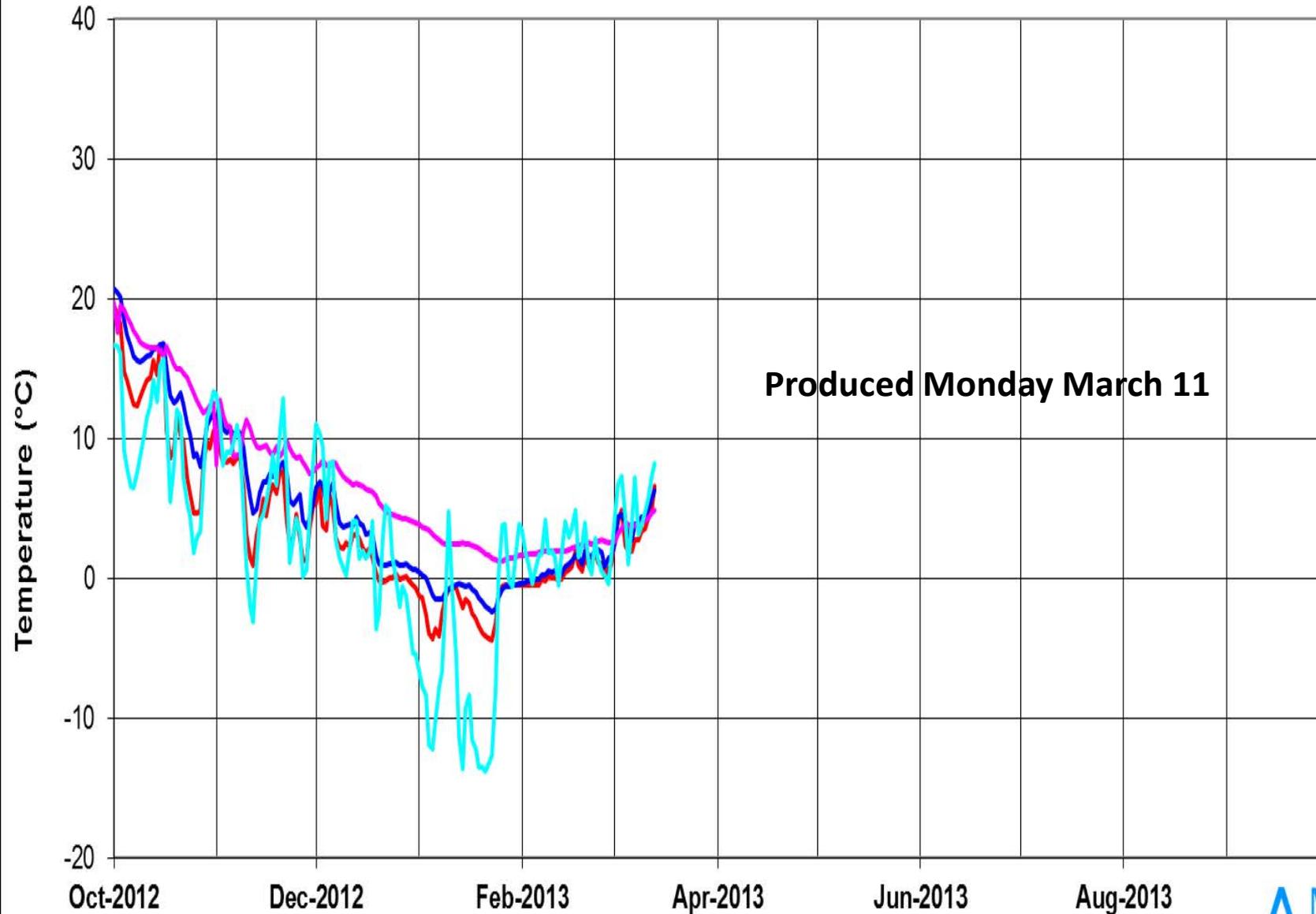
Snake Basin above Palisades 2013 Snowpack Comparison Graph (18 sites)

Based on Provisional SNOTEL data as of Mar 11, 2013

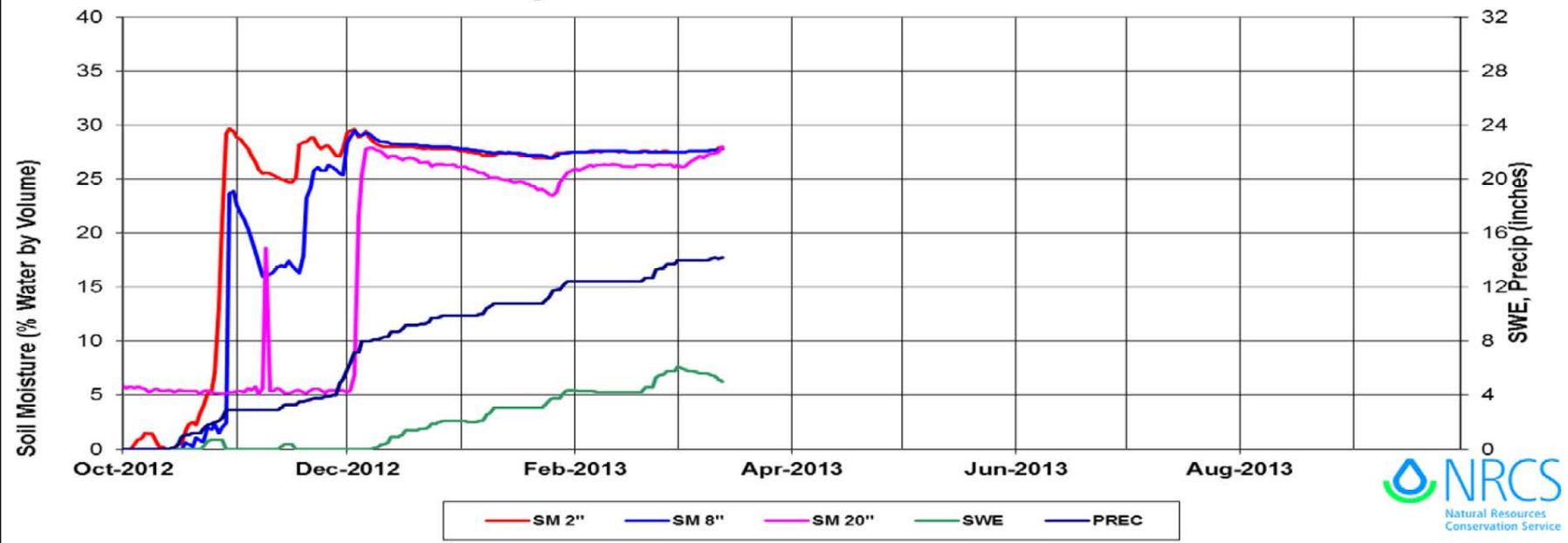
— Normal
 — WY2002
 — WY2008
 — WY2012
 — WY2013



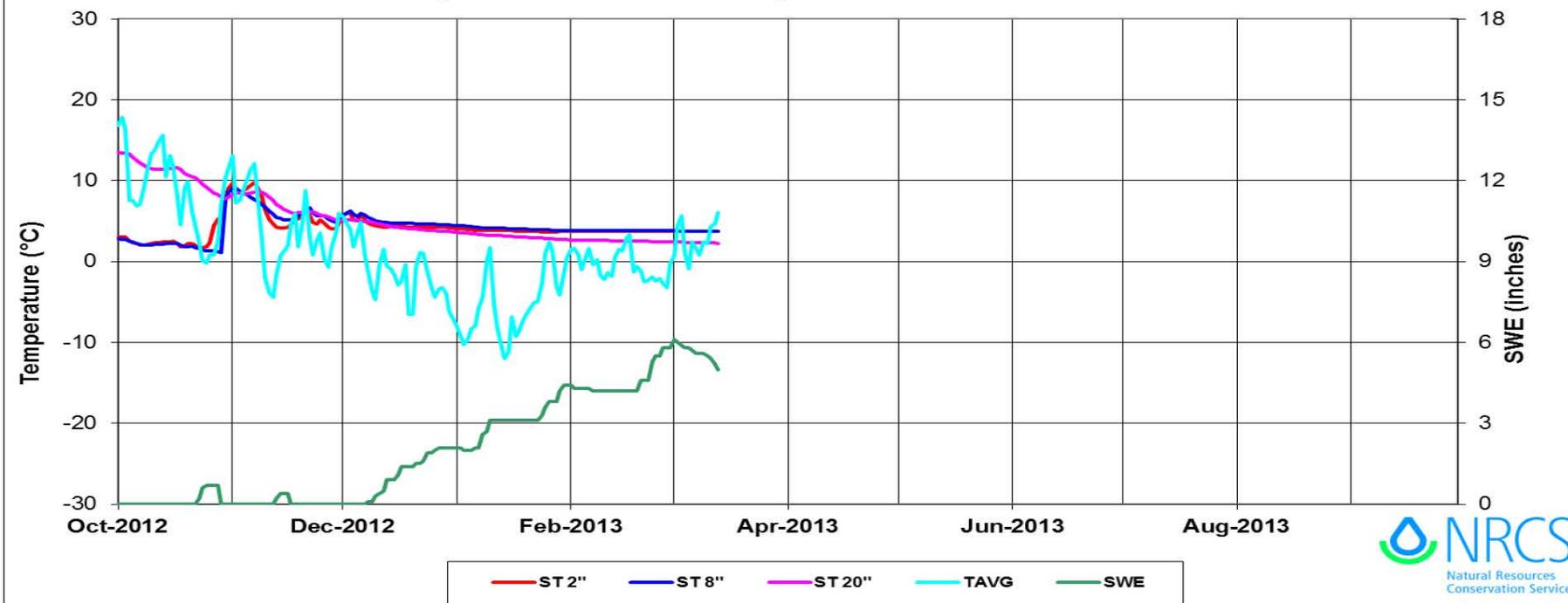
Orchard Range Soil and Air Temperature - Water Year 2013



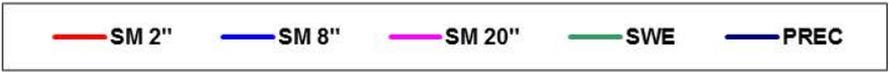
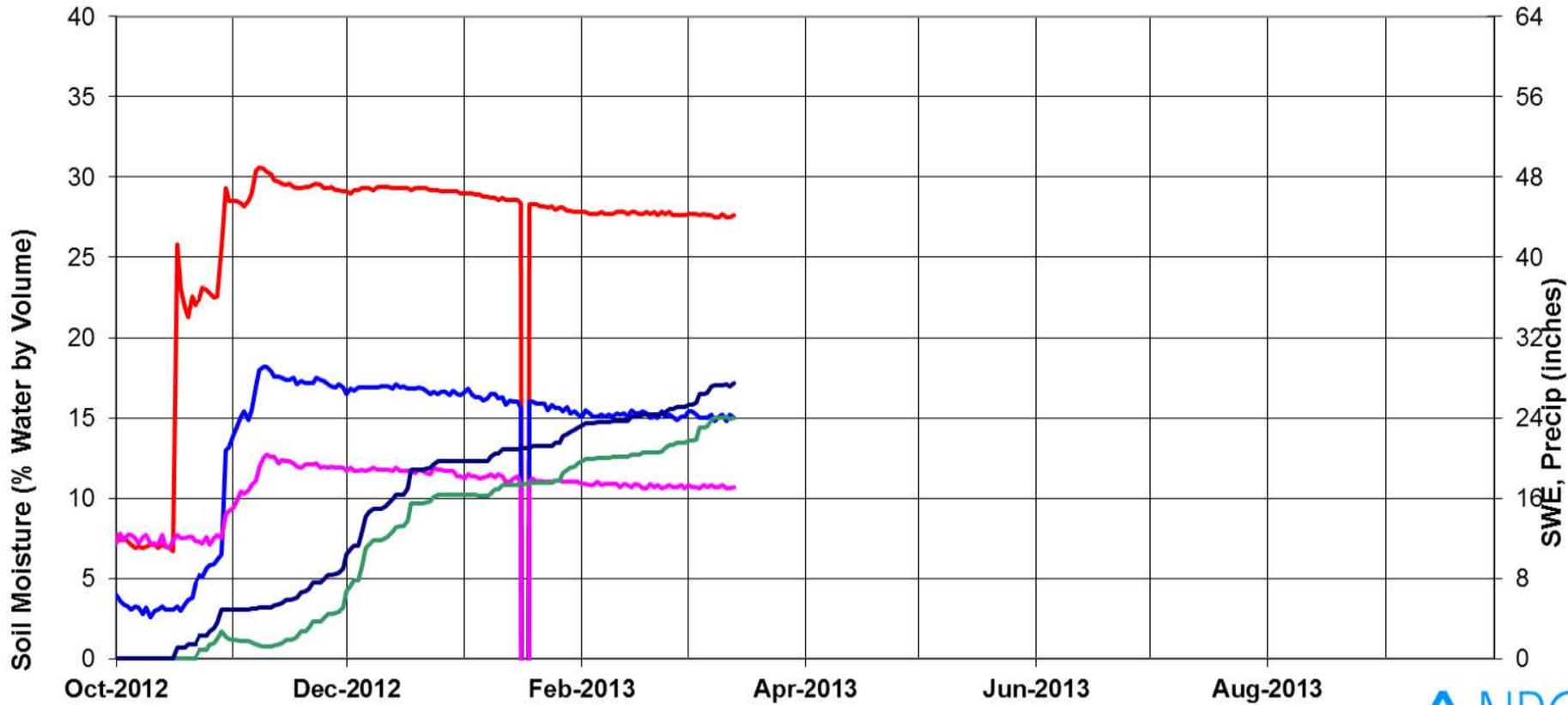
Van Wyck Soil Moisture - Water Year 2013



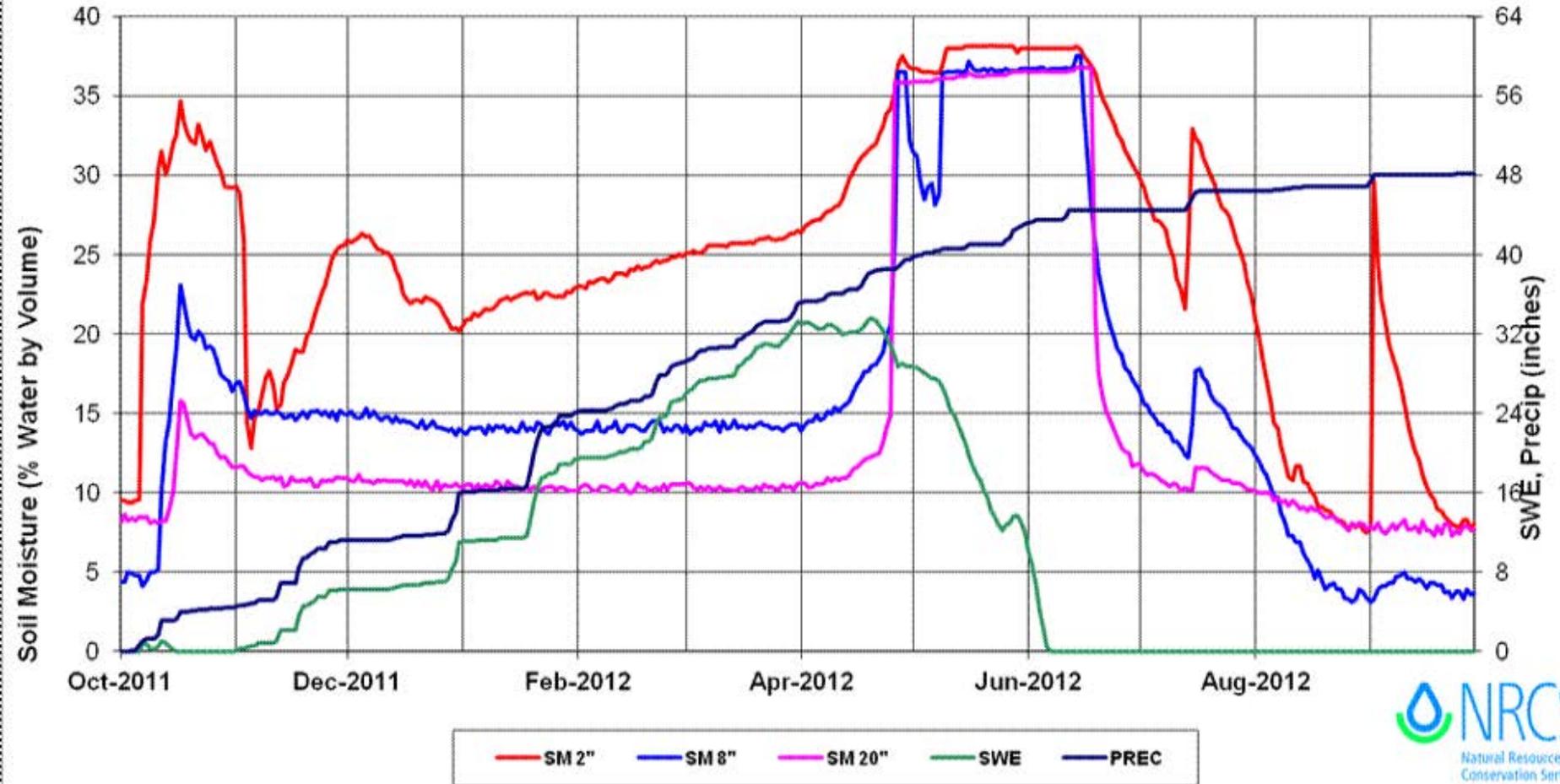
Van Wyck Soil and Air Temperature - Water Year 2013



Lewis Lake Divide Soil Moisture - Water Year 2013



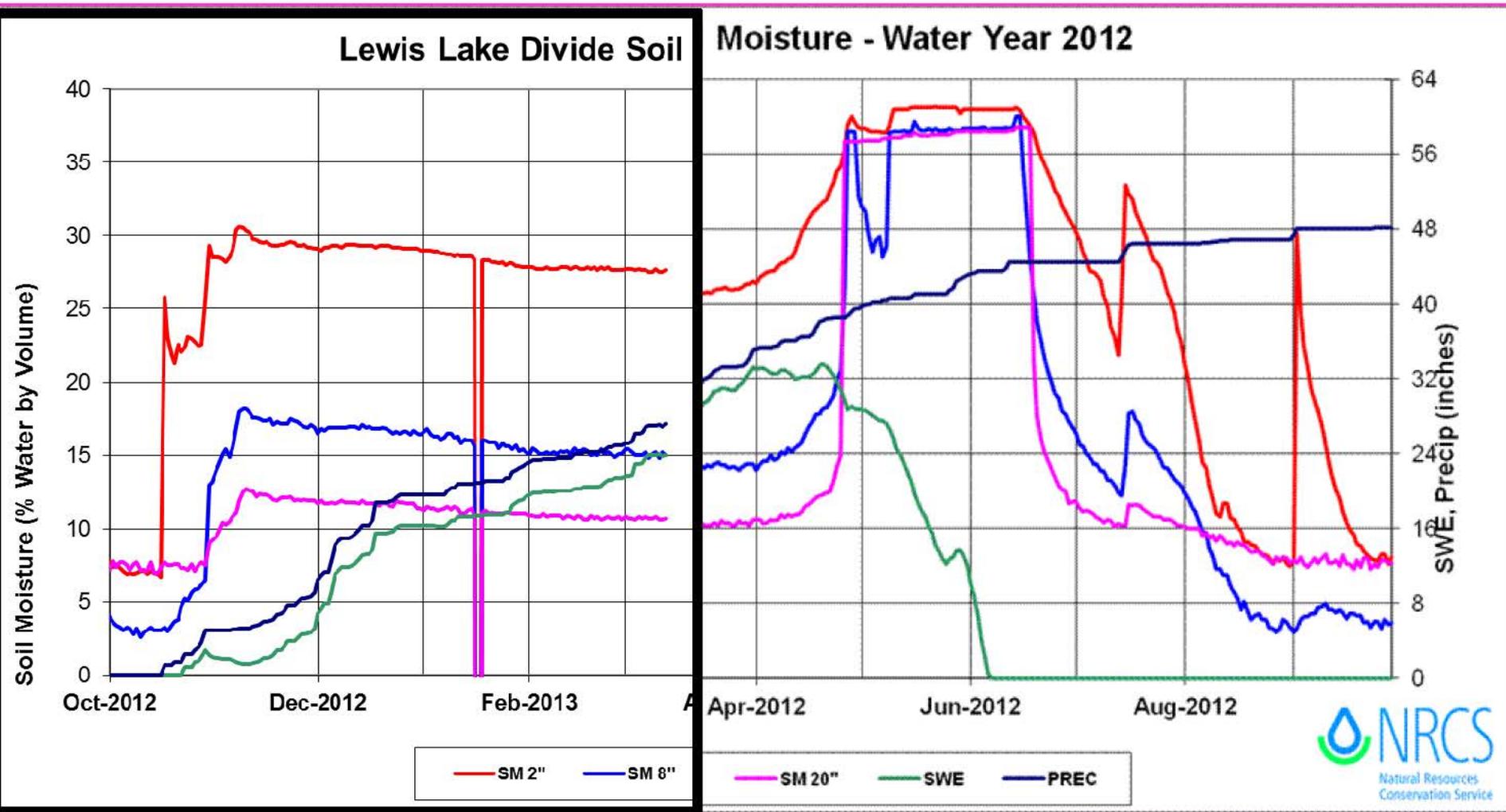
Lewis Lake Divide Soil Moisture - Water Year 2012



Lewis Lake Divide - Snow Water, Precipitation and Soil Moisture very similar to 2012

2013 left side

2012 right side and rest of season





March 12, 2013 Snowpack around Silver City after wind events in early March



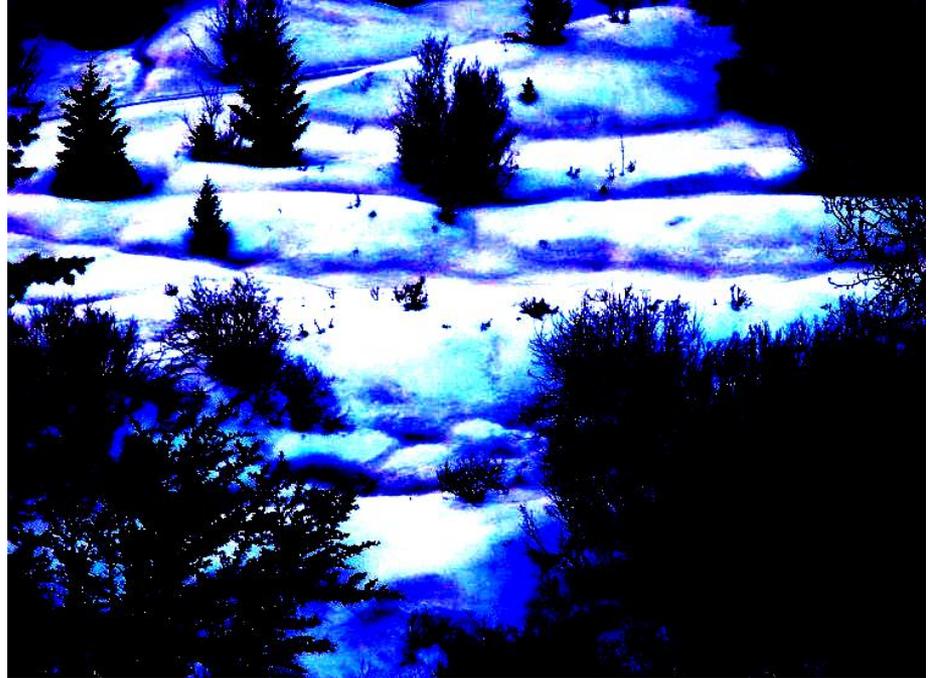
One earth plug in a snow tube...

Summer image.... Oops, went to deep with the snow tube....



Leads to large melt rings in the snow in the spring....





March 12, 2013 Snowpack around Silver City after wind events in early March

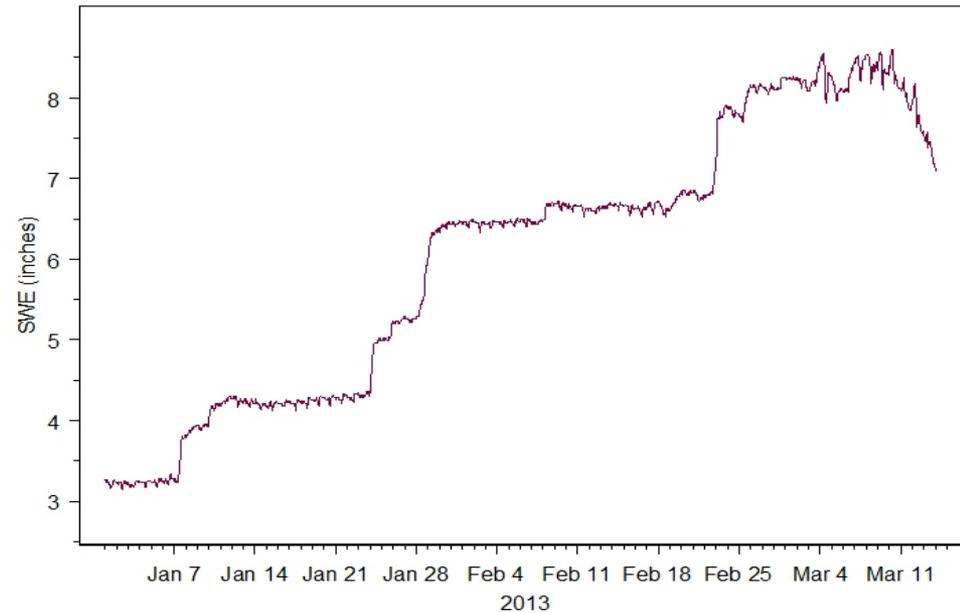


The photos were taken, March 12, in and around Silver City. I also traveled the Reynolds Creek ridge paralleling Jordan Creek and found the dirt or ash everywhere. It is causing the snow pack to drop like a rock, but tributaries not increasing.

On the west side of Reynolds Creek, ARS crews are observing widespread dust-on-snow. Our long-term field crew member described what he has seen as “unprecedented”. Dust seems to be especially prevalent in high-accumulation zones like the large drifts, which makes perfect sense (wind-loaded snow = wind-loaded dust).

SWE is dropping fast over the last couple of days. ...and yes it has been warm and was quite humid a few days ago adding to the heat fluxes – but the drop in SWE over the last several days looks more April-like than March-like.

Reynold Mountain Snow Pillow

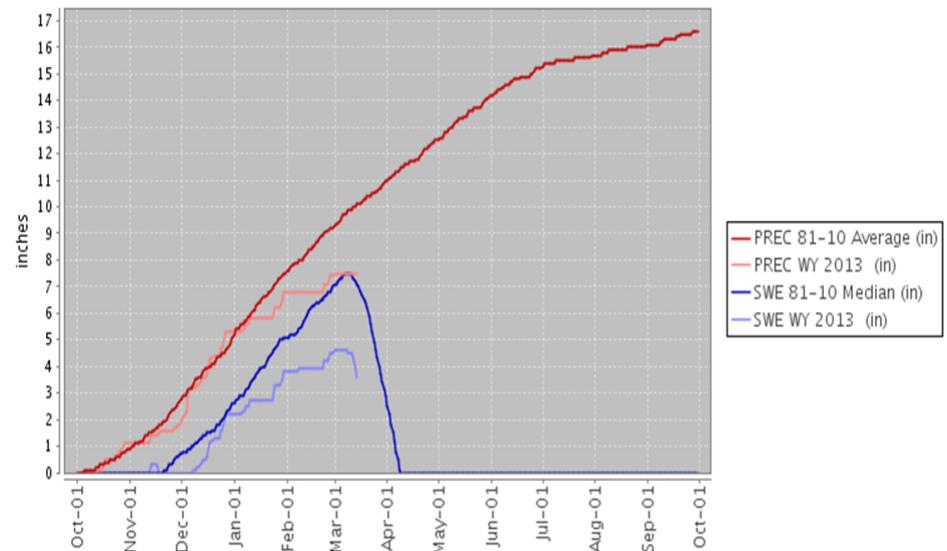


Idaho (PST) SNOTEL Site MUD FLAT (654) (16G07S) Daily series for wateryear=2013

2013-March-14 NRCS National Water and Climate Center - Provisional Data - subject to revision

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Station (654) WATERYEAR=2013 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision Thu Mar 14 12:19:41 PDT 2013



Owyhee River snowmelt peak flow this weekend ??? Mar 14 peak of ~2600 cfs Spring rain will produce additional peaks like in 2001

