USDA United States Department of Agriculture

*Natural Resources Conservation Service*

## Idaho Water Supply Outlook Report

## February 1, 2017

How many tons of snow are on your roof? An estimated 228 tons of snow water was on this onion storage barn in Weiser, Idaho. These pictures were taken January 28 and 29 while clearing the snow off Vaughn Youngberg's family barn. The snow depth on the windblown side of the roof was measured at 30 inches deep with 9 inches of snow water. The natural snow measured on the ground on the east and west sides of Weiser on January 25 was 25 inches deep with 7.5 inches of snow water.

The flat roof on the left was cleared twice with a snow blower and had an estimated 88 tons of snow on it. Most of the snow on the right side of the roof was cleared with shovels and had an estimated 70 tons of snow. The middle section, with another 70 tons of snow has not been cleared. If you know the inches of water in the snowpack and multiply by 5.2 (the conversion factor as explained on this Snow Load Info page) you will know the pounds per square foot of snow on your roof. Hopefully, this barn was saved from collapsing, but there have been a number of roof failures in southwest Idaho and southeast Oregon and more storms forecast in early February.

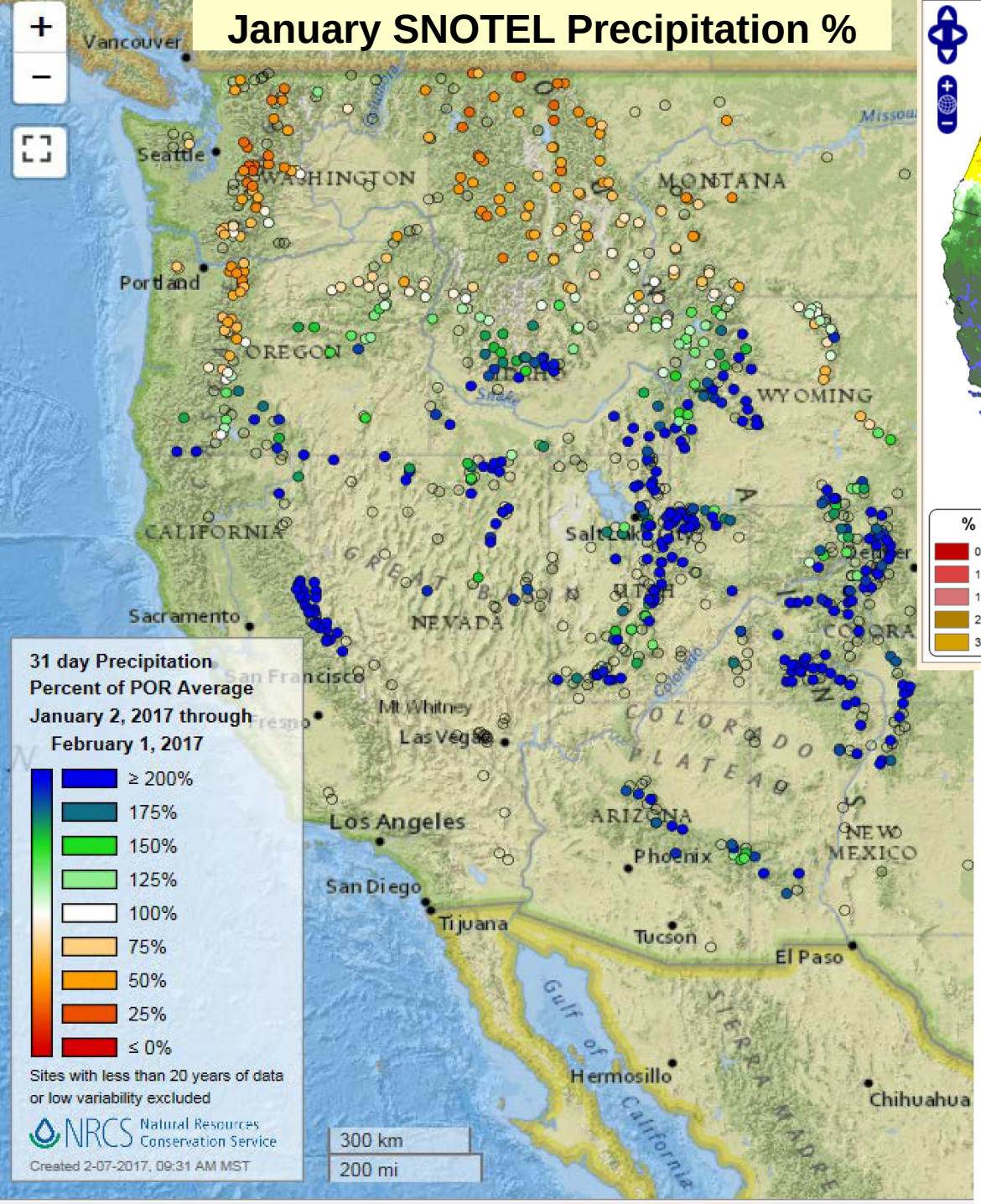
# IDWR
# State Water Supply Meeting
# February 8, 2017

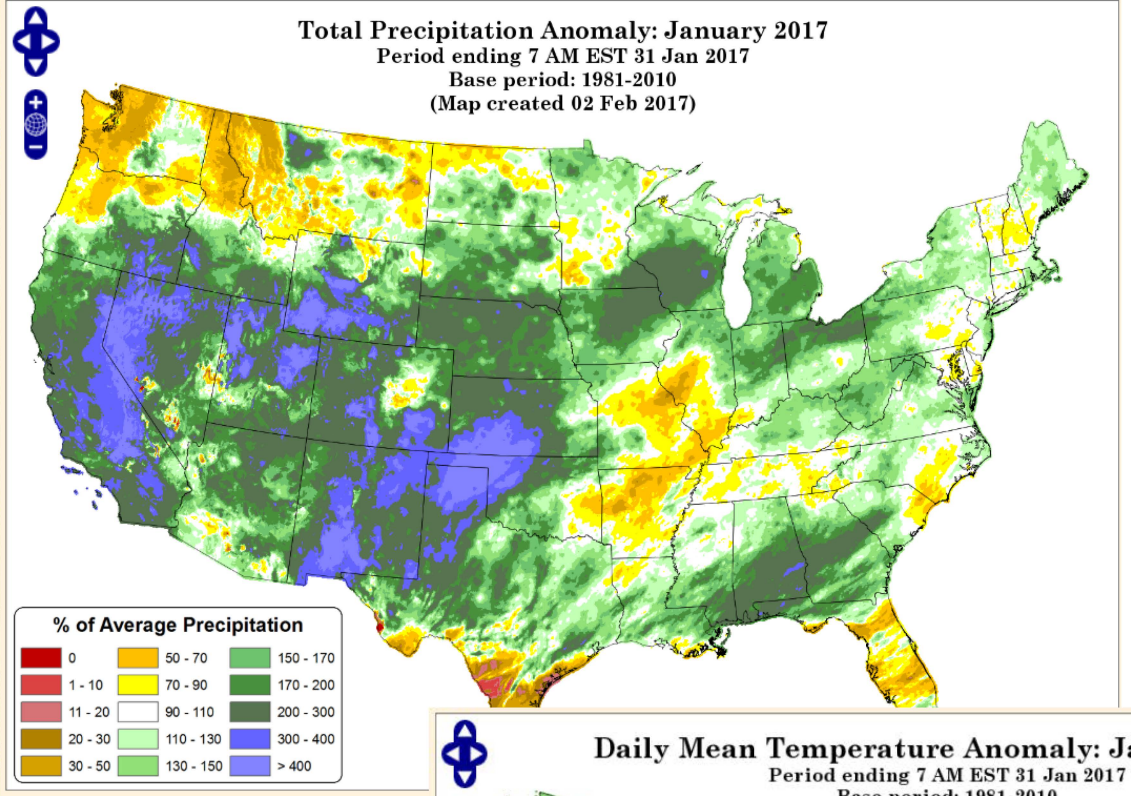

**Ron Abramovich**
**Water Supply Specialist**
**Snow Survey**
**Boise, Idaho**

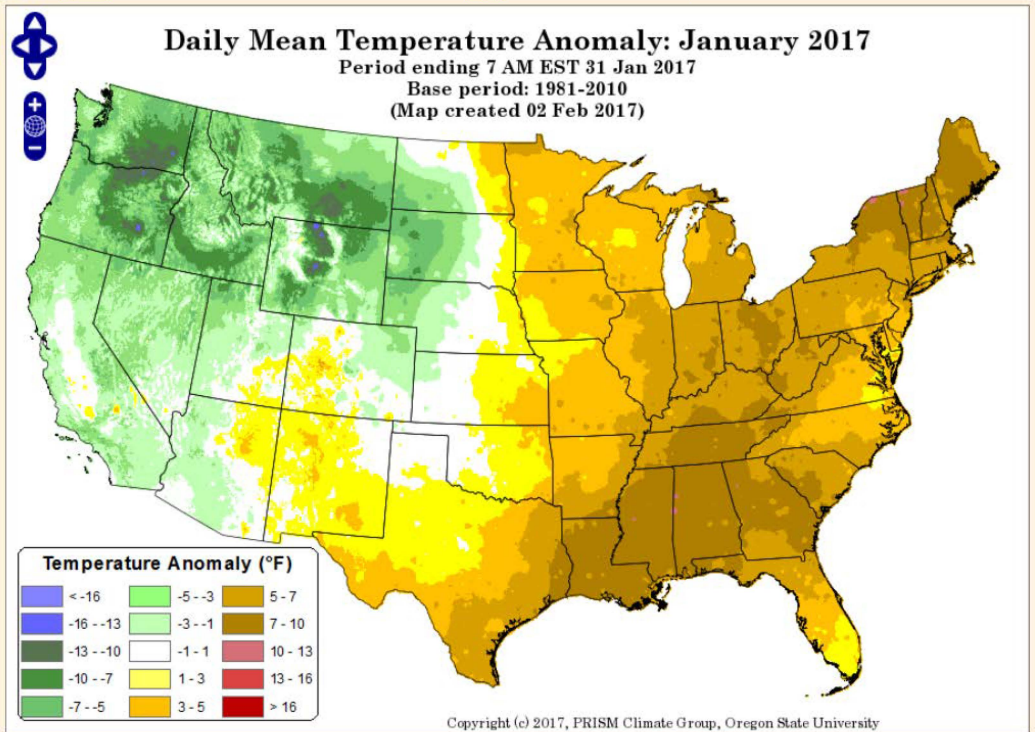

USDA

NRCS Natural Resources Conservation Service

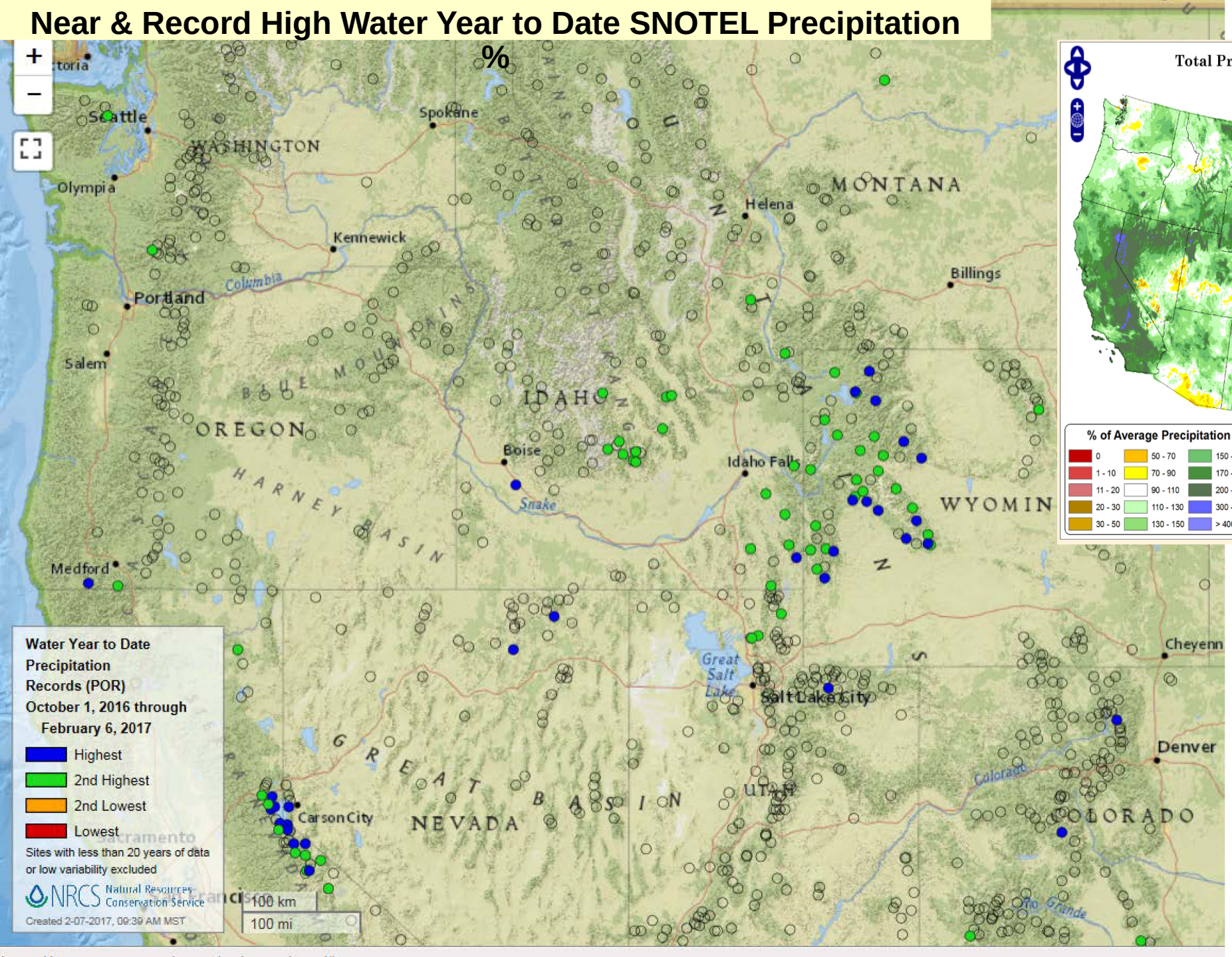
# January SNOTEL Precipitation %

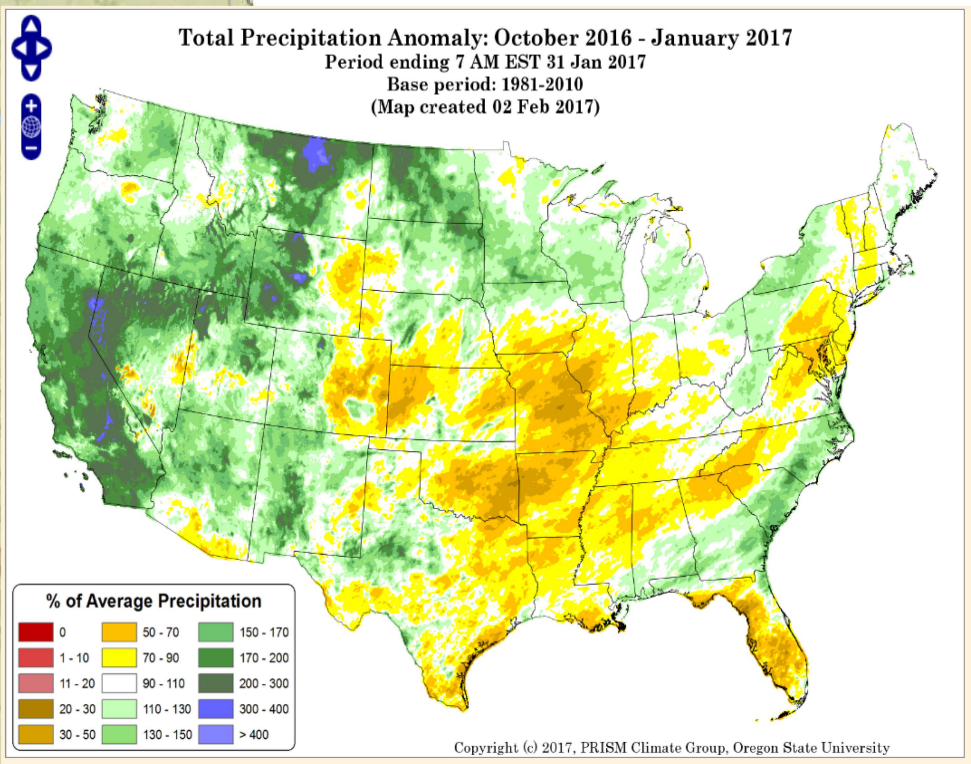


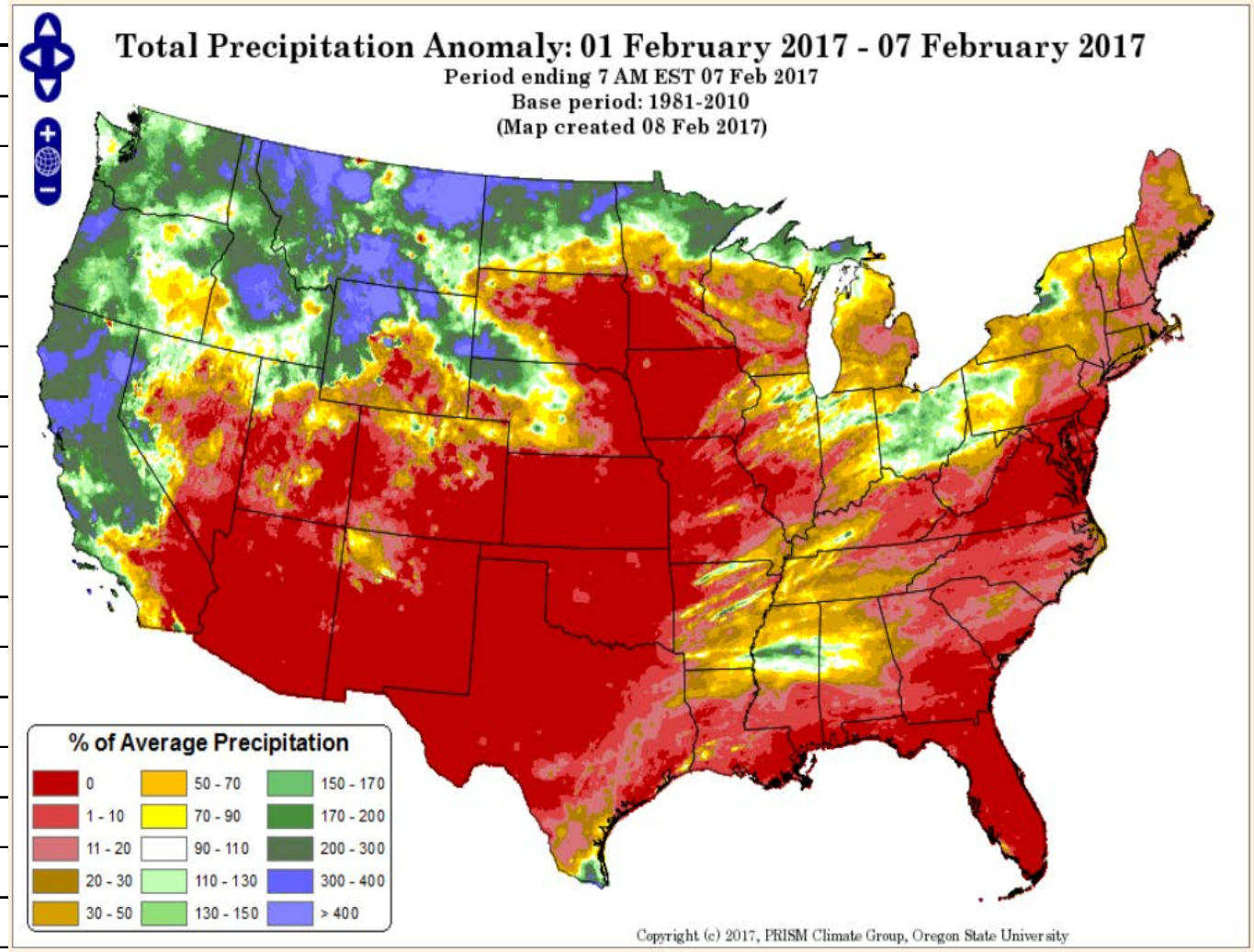
# Near & Record High Water Year to Date SNOTEL Precipitation



# Idaho SNOTEL Precipitation Summary Report as of Feb 8, 2017

| Basin or Region | Feb 1-8 Precipitation<br>Percent of Feb Total | | Oct 1 to Feb 8<br>Percent of Annual Total | |
|---|---|---|---|---|
| NORTHERN PANHANDLE | 78 | | 63 | |
| SPOKANE | 54 | | 58 | |
| CLEARWATER | 45 | | 51 | |
| SALMON | 74 | | 55 | |
| WEISER | 61 | | 54 | |
| PAYETTE | 82 | | 62 | |
| BOISE | 95 | | 72 | |
| BIG WOOD | 115 | | 78 | |
| LITTLE WOOD | 150 | | 75 | |
| BIG LOST | 156 | | 73 | |
| LITTLE LOST, BIRCH | 89 | | 60 | |
| MEDICINE LODGE, BEAVER, CAMAS | 56 | | 50 | |
| HENRYS FORK, TETON | 64 | | 69 | |
| SNAKE BASIN ABOVE PALISADES | 91 | | 73 | |
| WILLOW, BLACKFOOT, PORTNEUF | 58 | | 73 | |
| SNAKE BASIN ABOVE AMERICAN FALLS | 80 | | 71 | |
| GOOSE CREEK | 37 | | 60 | |
| SALMON FALLS | 38 | | 59 | |
| BRUNEAU | 38 | | 64 | |
| OWYHEE | 38 | | 64 | |
| BEAR RIVER | 68 | | 73 | |



# Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

## Feb 07, 2017

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

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >= 150%

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

***Provisional data subject to revision***

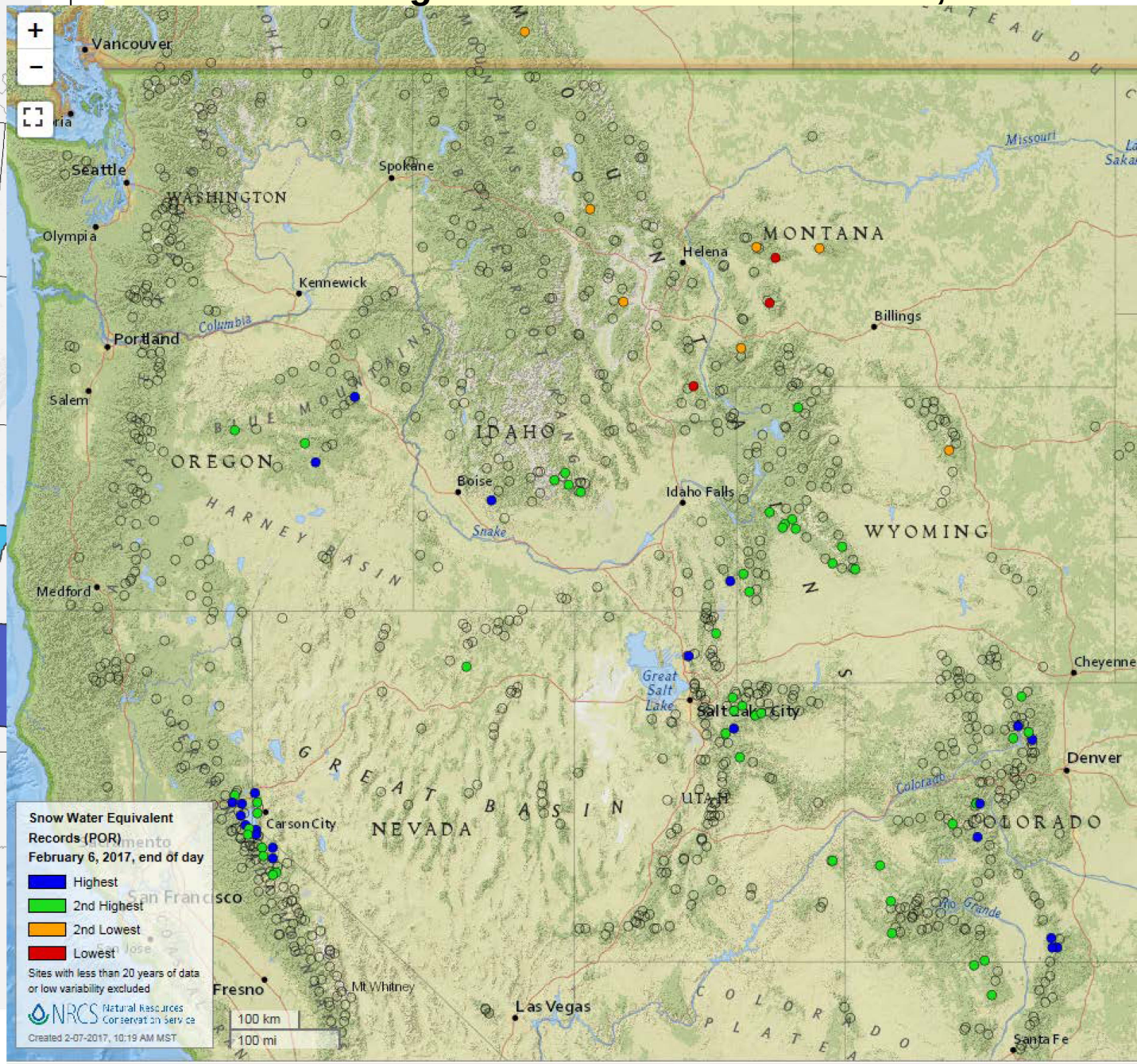
USDA NRCS

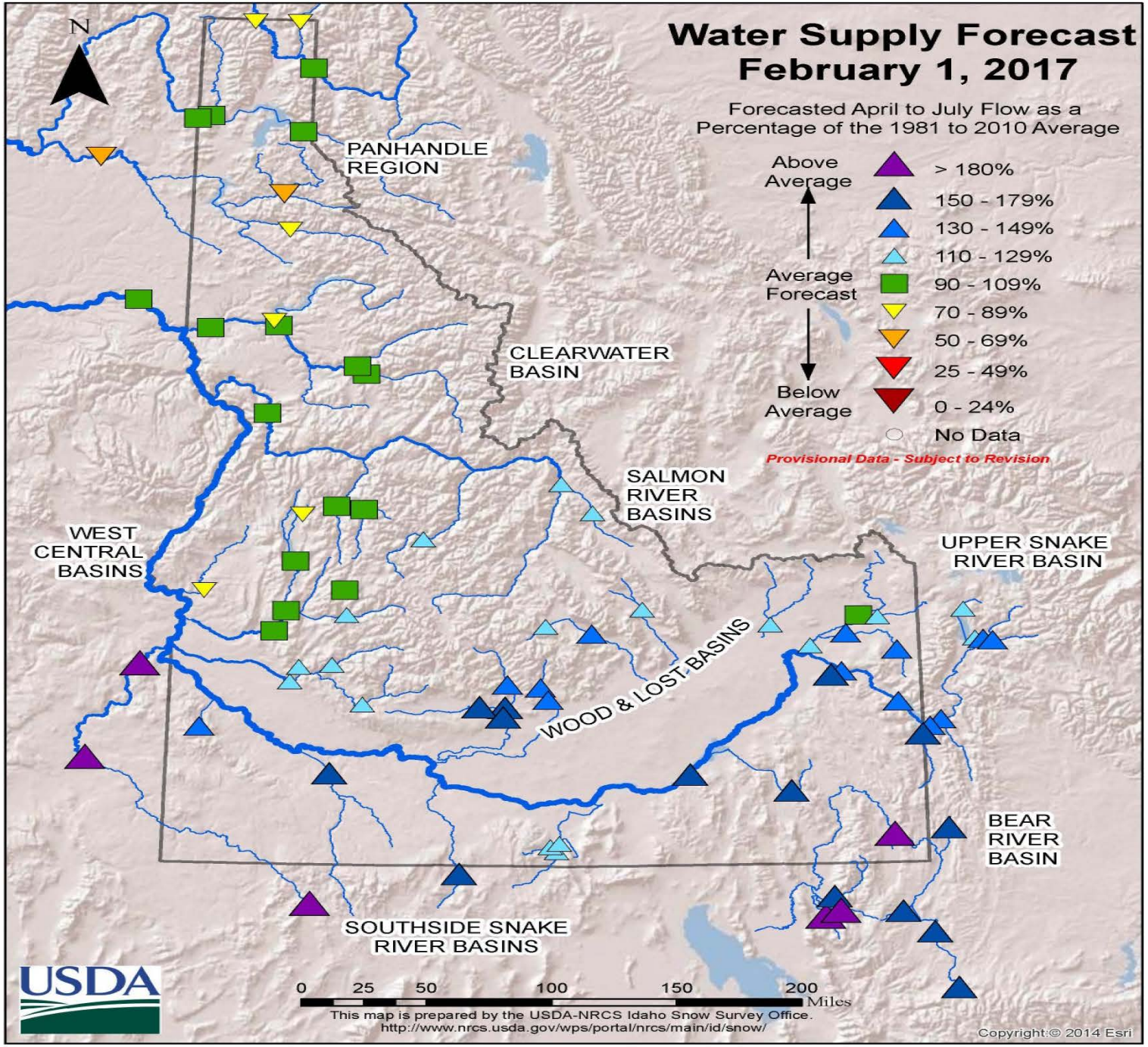
Miles
0 75 150 300

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:
USDA/NRCS National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov

# Near Record High / Low SNOTEL SWE Feb 6, 2017




Water Supply Forecast
February 1, 2017
Forecasted April to July Flow as a
Percentage of the 1981 to 2010 Average
Above Average
Average Forecast
Below Average
> 180%
150 - 179%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 - 69%
25 - 49%
0 - 24%
No Data
Provisional Data - Subject to Revision
N
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
UPPER SNAKE RIVER BASIN
WOOD & LOST BASINS
BEAR RIVER BASIN
SOUTHSIDE SNAKE RIVER BASINS
USDA
0 25 50 100 150 200
Miles
This map is prepared by the USDA-NRCS Idaho Snow Survey Office.
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/
Copyright © 2014 Esri

sorted

## IDAHO RESERVOIR STORAGE
### Usable Contents

| Reservoir (s) | Percent of Capacity December 31, 2016 | Percent of Average December 31, 2016 |
|---|---|---|
| Oakley | 21 | 80 |
| Salmon Falls | 22 | 97 |
| Coeur d' Alene | 23 | 59 |
| Owyhee | 30 | 68 |
| Bear Lake | 35 | 79 |
| Magic | 44 | 130 |
| Palisades & Jackson | 48 | 83 |
| Boise System | 49 | 99 |
| American Falls | 52 | 92 |
| Ririe | 57 | 127 |
| Payette System | 61 | 96 |
| Blackfoot | 62 | 122 |
| Little Wood | 67 | 147 |
| Dworshak | 71 | 103 |
| Mackay | 77 | 156 |

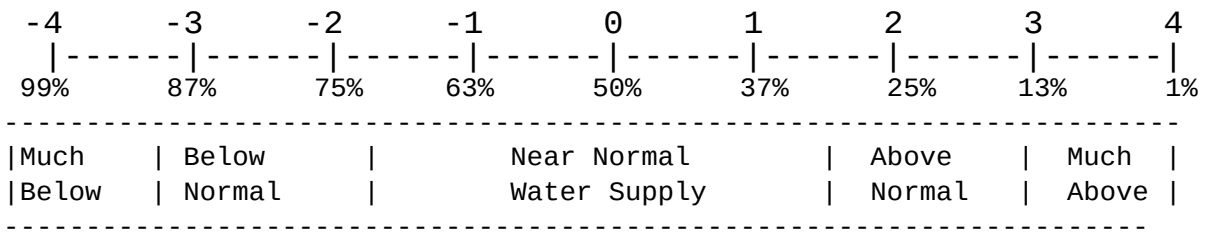
## IDAHO RESERVOIR STORAGE
### Usable Contents

| Reservoir (s) | Percent of Capacity January 31, 2017 | Percent of Average January 31, 2017 |
|---|---|---|
| Oakley | 24 | 81 |
| Salmon Falls | 24 | 100 |
| Coeur d' Alene | 19 | 48 |
| Owyhee | 35 | 71 |
| Bear Lake | 35 | 79 |
| Magic | 46 | 127 |
| Palisades & Jackson | 53 | 89 |
| Boise System | 54 | 102 |
| American Falls | 67 | 100 |
| Ririe | 60 | 125 |
| Payette System | 63 | 99 |
| Blackfoot | 65 | 125 |
| Little Wood | 79 | 145 |
| Dworshak | 66 | 98 |
| Mackay | 86 | 148 |

# IDAHO SURFACE WATER SUPPLY INDEX (SWSI) February 1, 2017

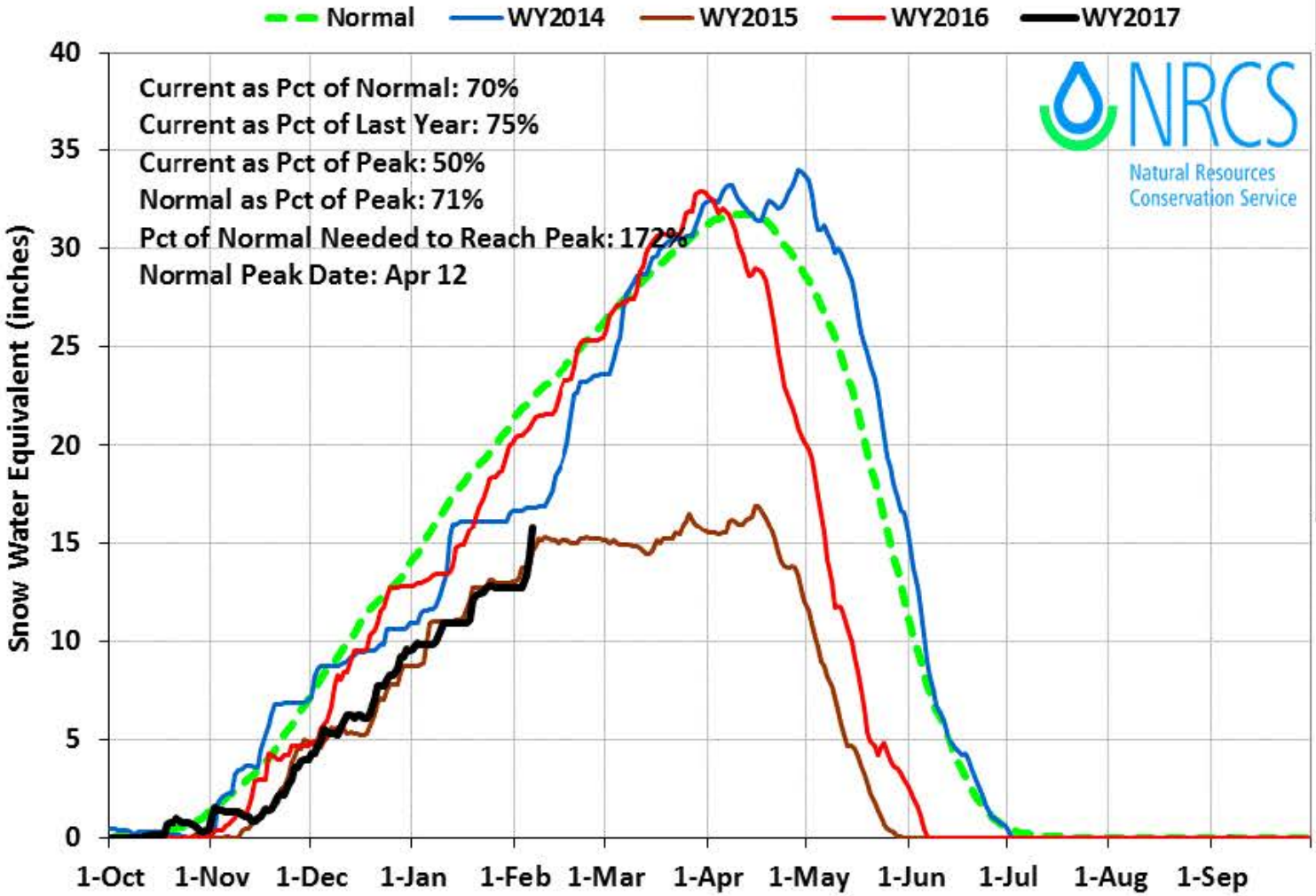
| *BASIN or REGION* | *SWSI Value* | *Most Recent Year With Similar SWSI Value* | *Agricultural Water Supply Shortage May Occur When SWSI is Less Than* |
|---|---|---|---|
| Spokane | -2.9 | 2005 | NA |
| Clearwater | -1.1 | 2013 | NA |
| Salmon | 0.5 | 2010 | NA |
| Weiser | -0.7 | 2016 | NA |
| Payette | 0.7 | 2010 | NA |
| Boise | 1.6 | 2012 | -1.5 |
| Big Wood | 2.0 | 1996 | 0.8 |
| Little Wood | 2.5 | 1998 | -1.2 |
| Big Lost | 2.5 | 2006 | 0.8 |
| Little Lost | 1.8 | 2011 | 1.5 |
| Teton | 2.0 | 1999 | -3.9 |
| Henrys Fork | 2.3 | 2008 | -1.7 |
| Snake (Heise) | 2.3 | 1998 | -1.7 |
| Oakley | 1.6 | 2007 | 0.6 |
| Salmon Falls | 2.0 | 2006 | -0.8 |
| Bruneau | 3.4 | 2006 | NA |
| Owyhee | 2.9 | 2011 | -2.6 |
| Bear River | 0.9 | 1988 | -3.7 |

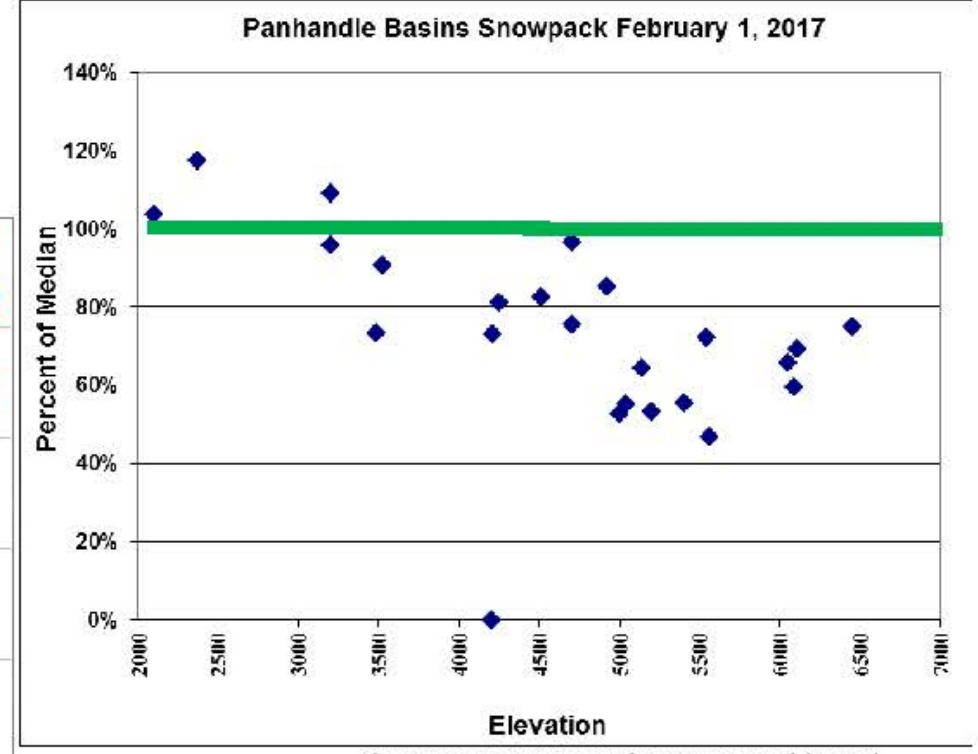
***SWSI SCALE, PERCENT CHANCE OF EXCEEDANCE, AND INTERPRETATION***



## Northern Panhandle Region 2017 Snowpack Comparison Graph (8 sites)

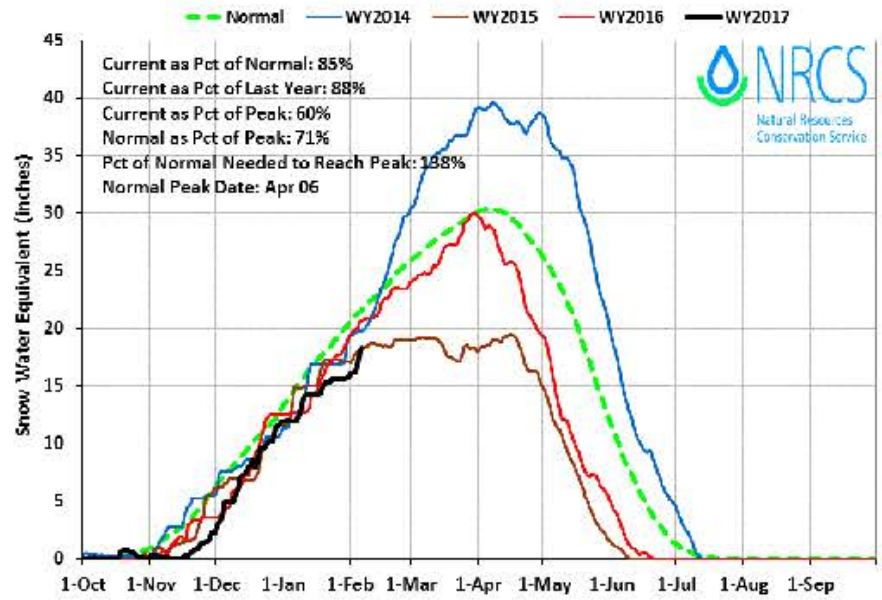
*Based on Provisional SNOTEL data as of Feb 06, 2017*



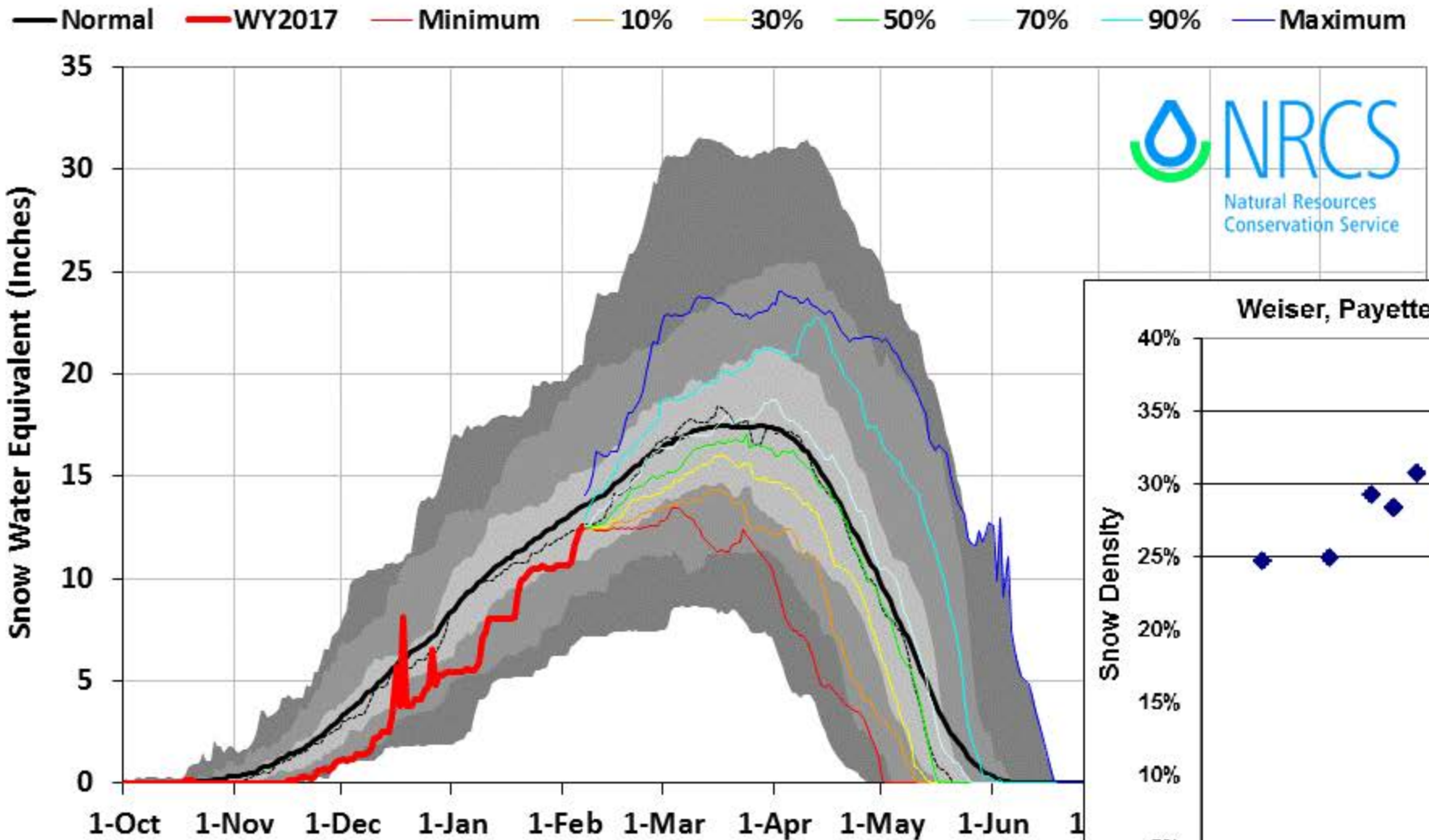

## Clearwater Basin 2017 Snowpack Comparison Graph (15 sites)

*Based on Provisional SNOTEL data as of Feb 06, 2017*

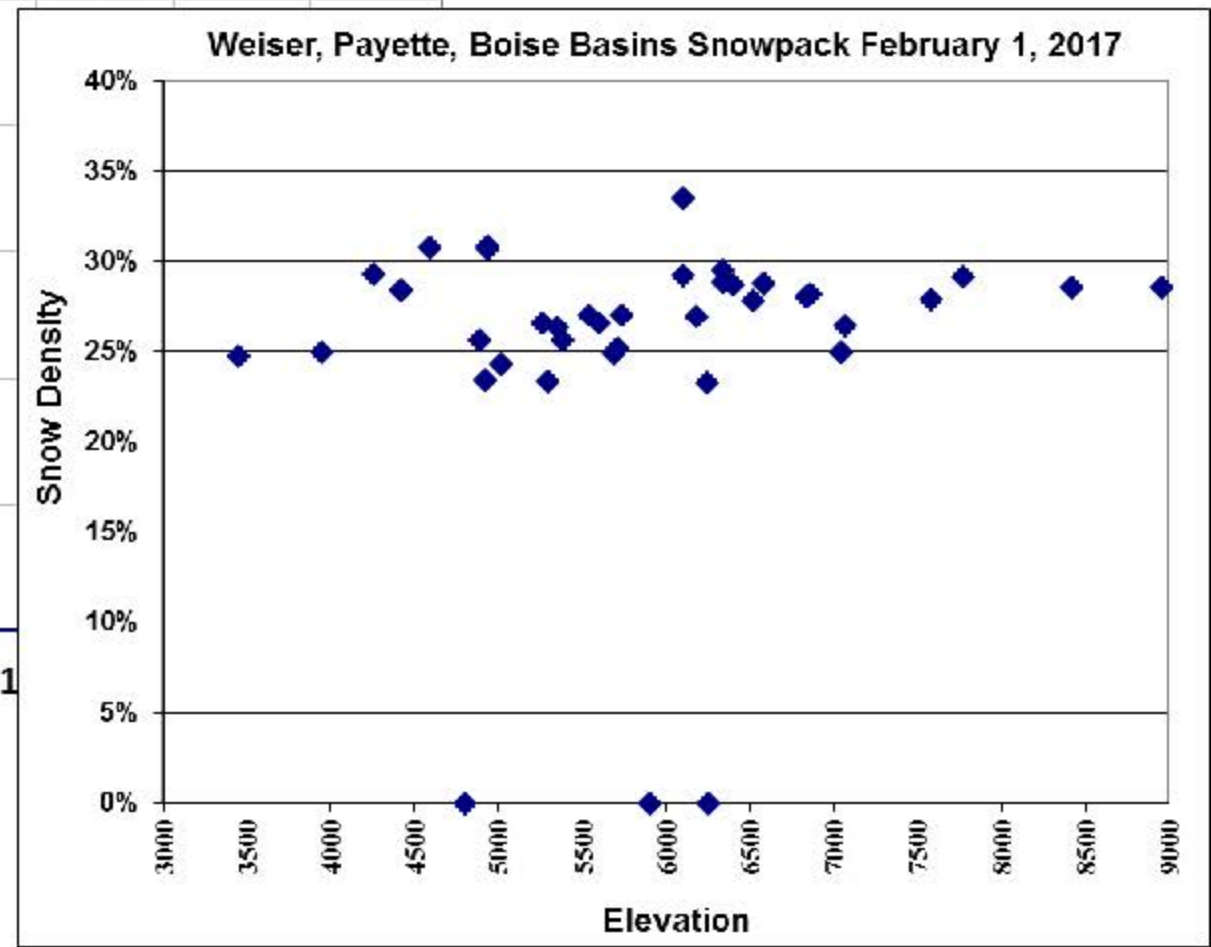


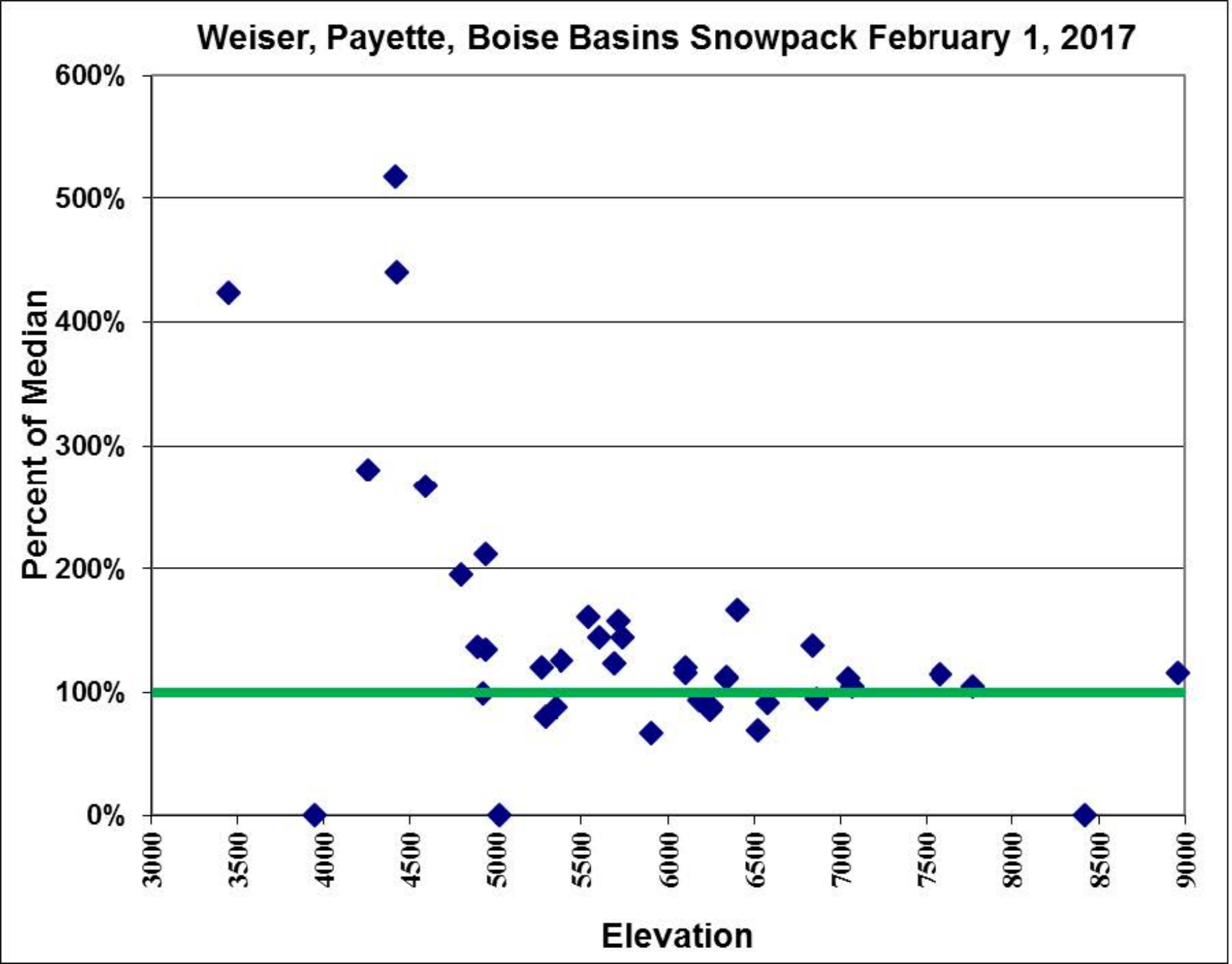
# Weiser Basin 2017 Snow Water with Non-Exceedence Projections (4 sites)

*Based on Provisional SNOTEL data as of Feb 06, 2017*




NRCS
Natural Resources Conservation Service




Weiser, Payette, Boise Basins Snowpack February 1, 2017
600%
500%
400%
300%
200%
100%
0%
Percent of Median
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
8500
9000
Elevation

## Using SNOTEL Data to Estimate Snow Load Amounts

Snow survey data can be used to help determine the weight the snowpack exerts on the ground at the site in that area or elevation zone. To determine the snow load, one needs to know how much the snowpack weighs. The weight of the snow varies with water content of the snowpack. The snow water equivalent (SWE) or water content of the snowpack, is the amount of water in the snowpack measured in inches if you were to melt the snowpack.

One could isolate a column of snow, melt it, and weigh it to determine the weight over that area. However, this is very difficult, especially if the snowpack is 5 feet deep and much more difficult if the snowpack is 10-15 feet deep. An easier method to determine snow loads (if you have a set of snow measuring tubes) is by measuring the snow water content and using the following formula. If you are concerned about the snow load in your area, many of the Natural Resources Conservation Service Field Offices, located in most counties, have snow tubes and can assist you in determining the current snow load information.

$$\frac{(62.418\ \text{lbs})}{(1\ \text{ft}^3\ \text{of water})} \times \frac{(1\ \text{ft})}{(12\ \text{inches})} \times \text{SWE (inches)} = \text{Snow Load (lbs/ft}^2\text{)}$$

***Or just remember the conversion factor of "5.2" (or rounded to 5) to multiply the SWE value to estimate the snow load.***

**SWE (inches) X 5.2 = Snow Load (pounds/square-foot)**

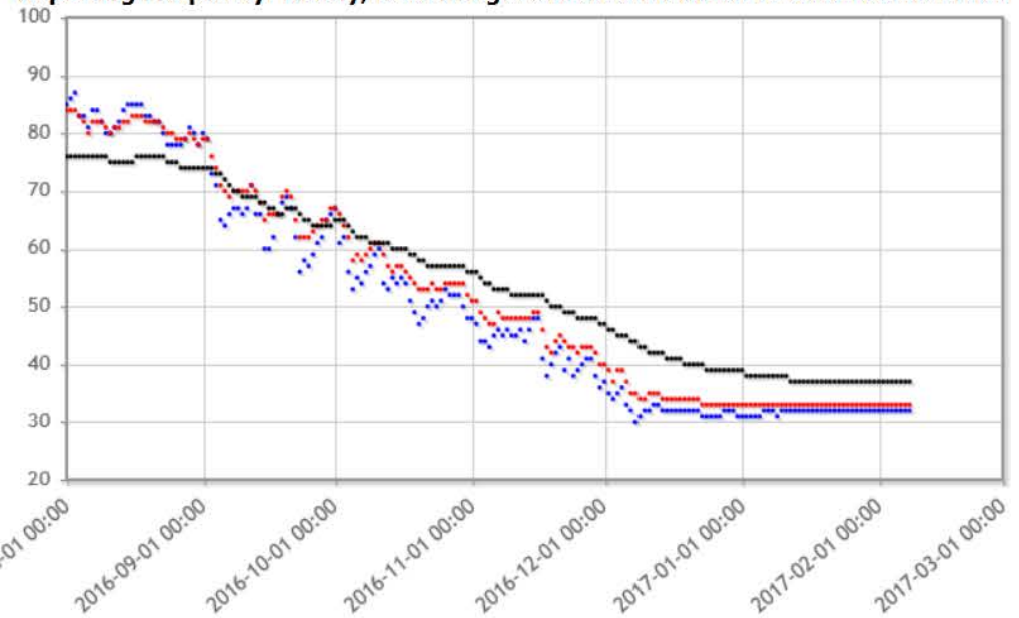
**Pictures from January 25, 2017**

**Weiser & Boise Foothills**

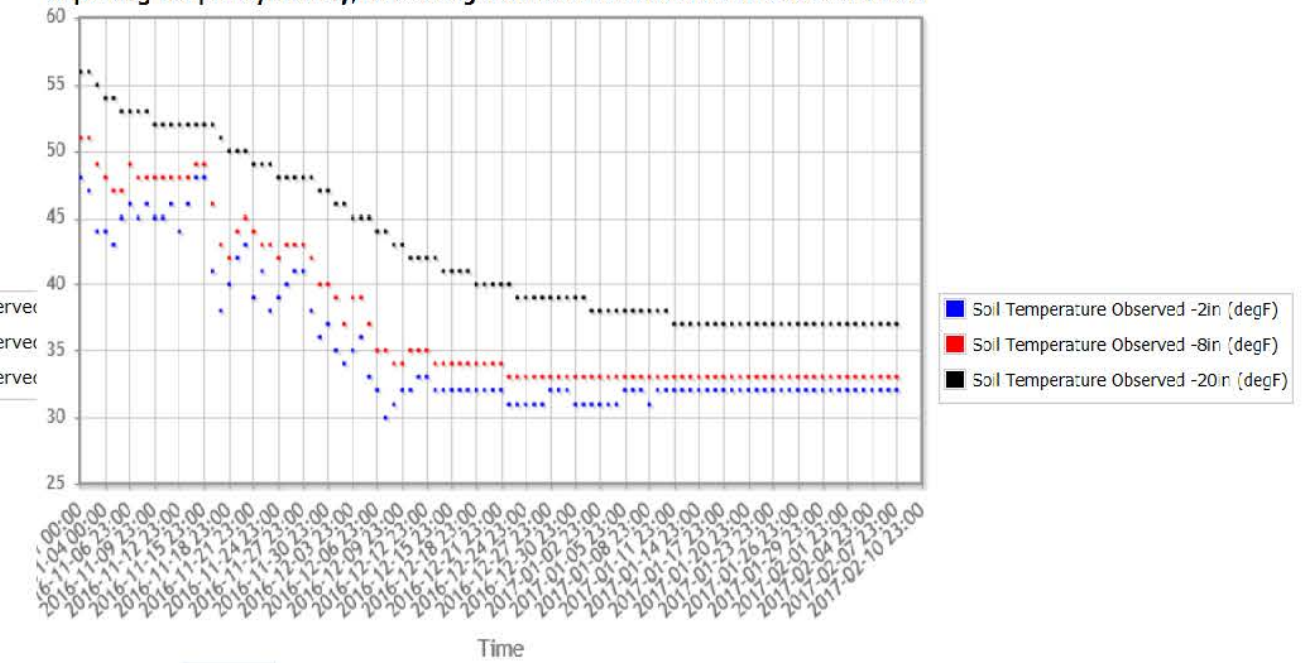
**Other Concerns:**

- **Calving season and foothills are covered with 20+ inches of snow**
- **Level fields will minimize draining – fields are leveled at 2/10s of a foot of slope for every 100 feet**
- **Drainage around houses**
- **Partially frozen soils**

**Orchard Range Site (674) Idaho SCAN Site - 3200 ft**
**Reporting Frequency: Hourly; Date Range: 2016-08-01 00:00 to 2017-02-08 11:00**

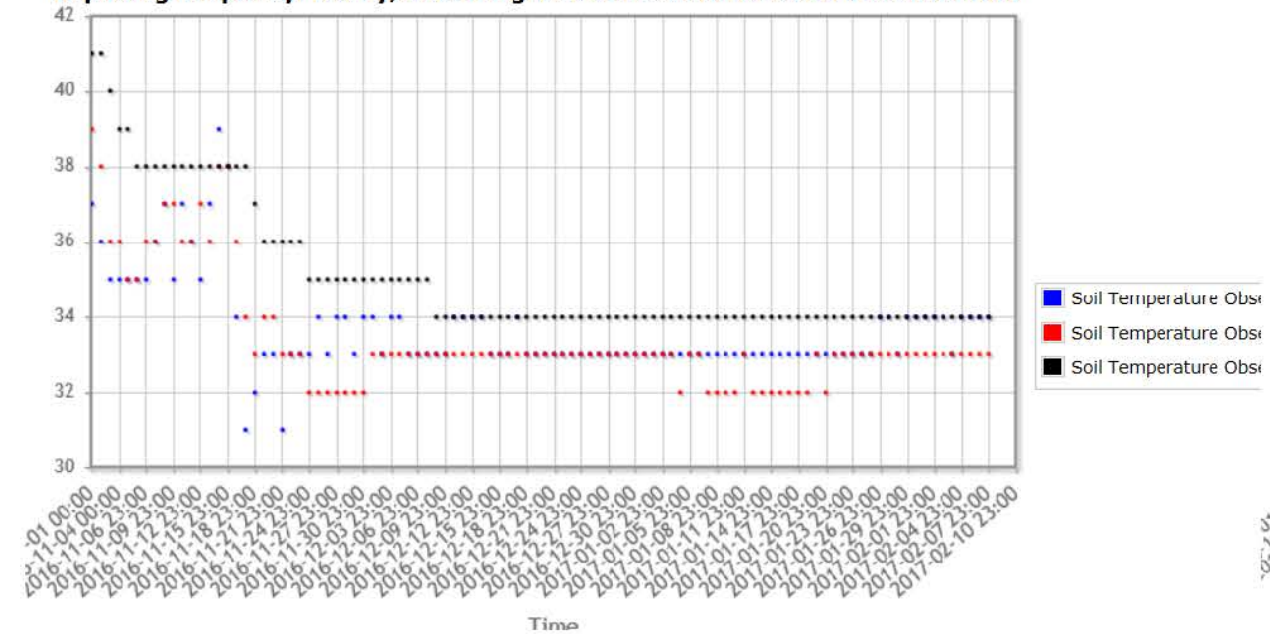



**Orchard Range Site (674) Idaho SCAN Site - 3200 ft**
**Reporting Frequency: Hourly; Date Range: 2016-11-01 00:00 to 2017-02-08 11:00**

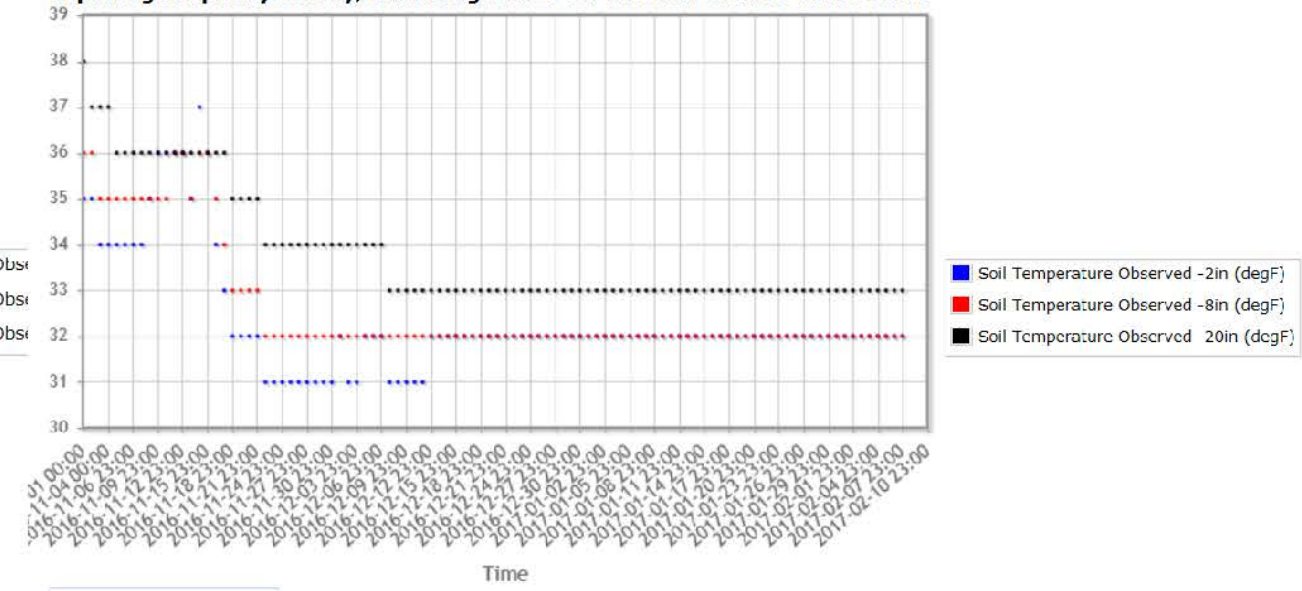



As Image

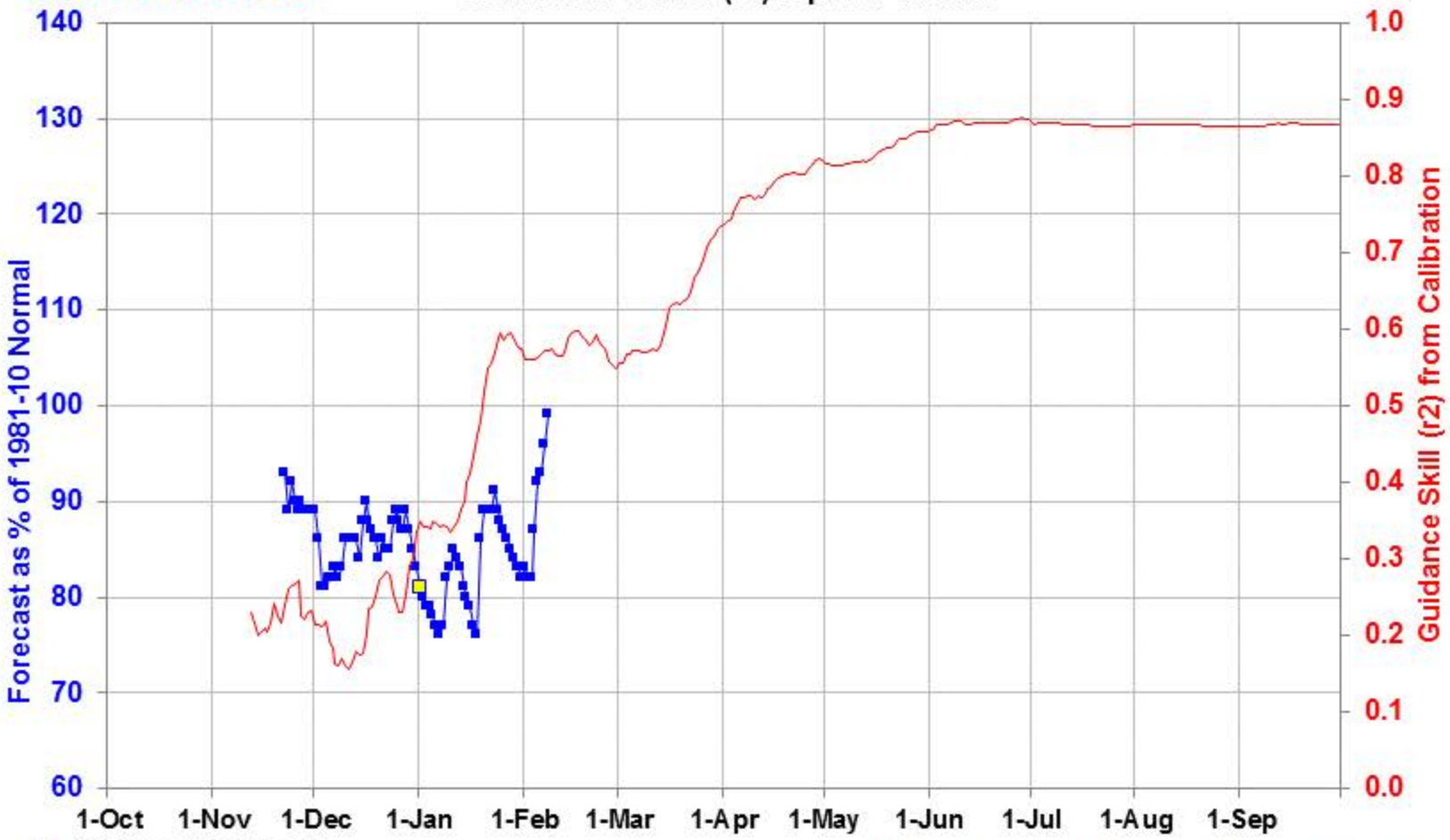
**Bogus Basin (978) Idaho SNOTEL Site - 6340 ft**
**Reporting Frequency: Hourly; Date Range: 2016-11-01 00:00 to 2017-02-08 11:00**




**Atlanta Summit (306) Idaho SNOTEL Site - 7580 ft**
**Reporting Frequency: Hourly; Date Range: 2016-11-01 00:00 to 2017-02-08 11:00**



Created 8:15 Feb 8 2017



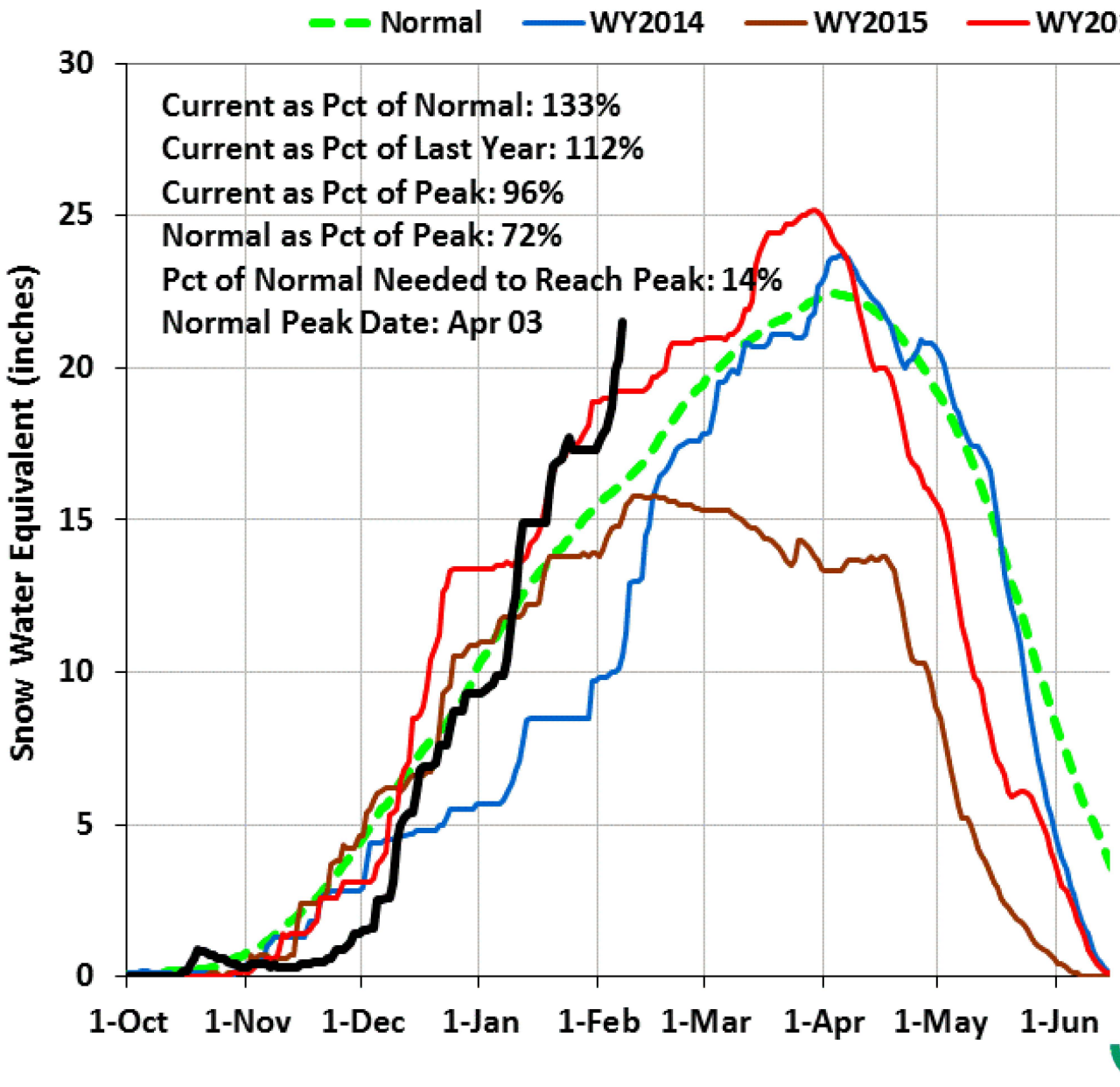

NRCS

## West Central Basins Streamflow Forecasts - February 1, 2017

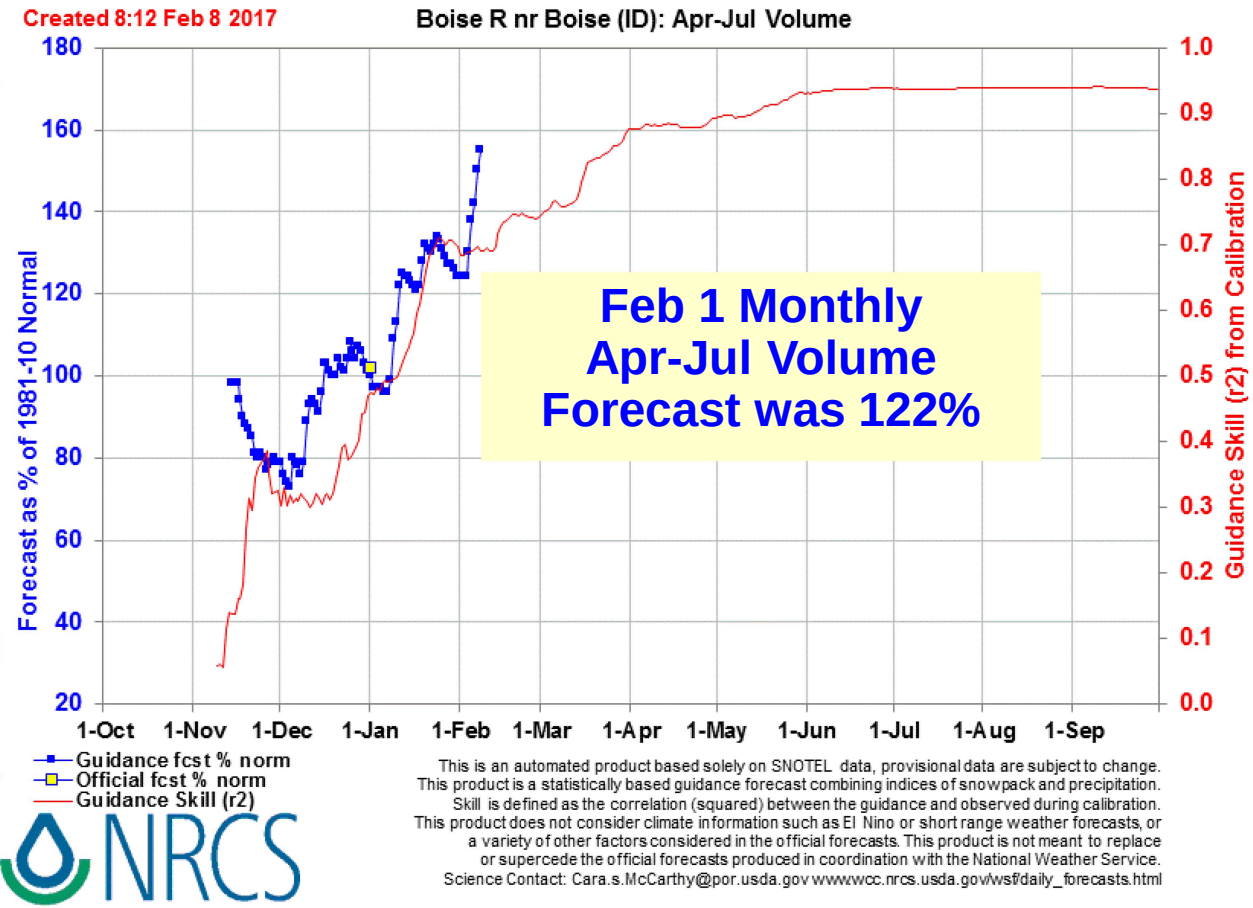
| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <--Drier Projected Volume Wetter--> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| Weiser R nr Weiser | FEB-JUL | 260 | 390 | 495 | 80% | 610 | 800 | 615 |
| | APR-JUL | 151 | 230 | 290 | 78% | 360 | 480 | 370 |
| | APR-SEP | 167 | 250 | 315 | 79% | 390 | 510 | 400 |

# Boise Basin 2017 Snowpack Comparison Graph (10 sites)

*Based on Provisional SNOTEL data as of Feb 07, 2017*

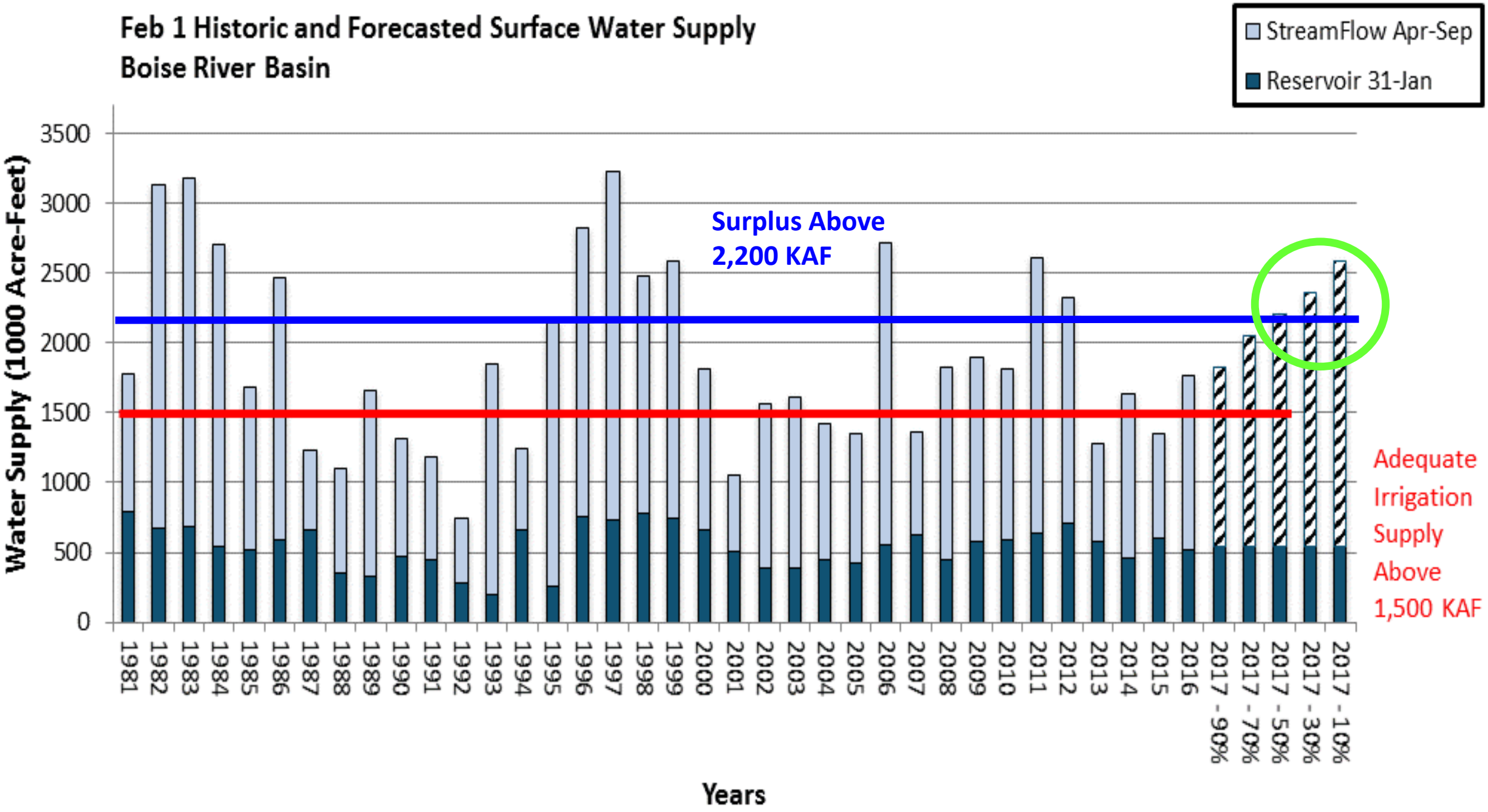



NRCS
Natural Resources Conservation Service



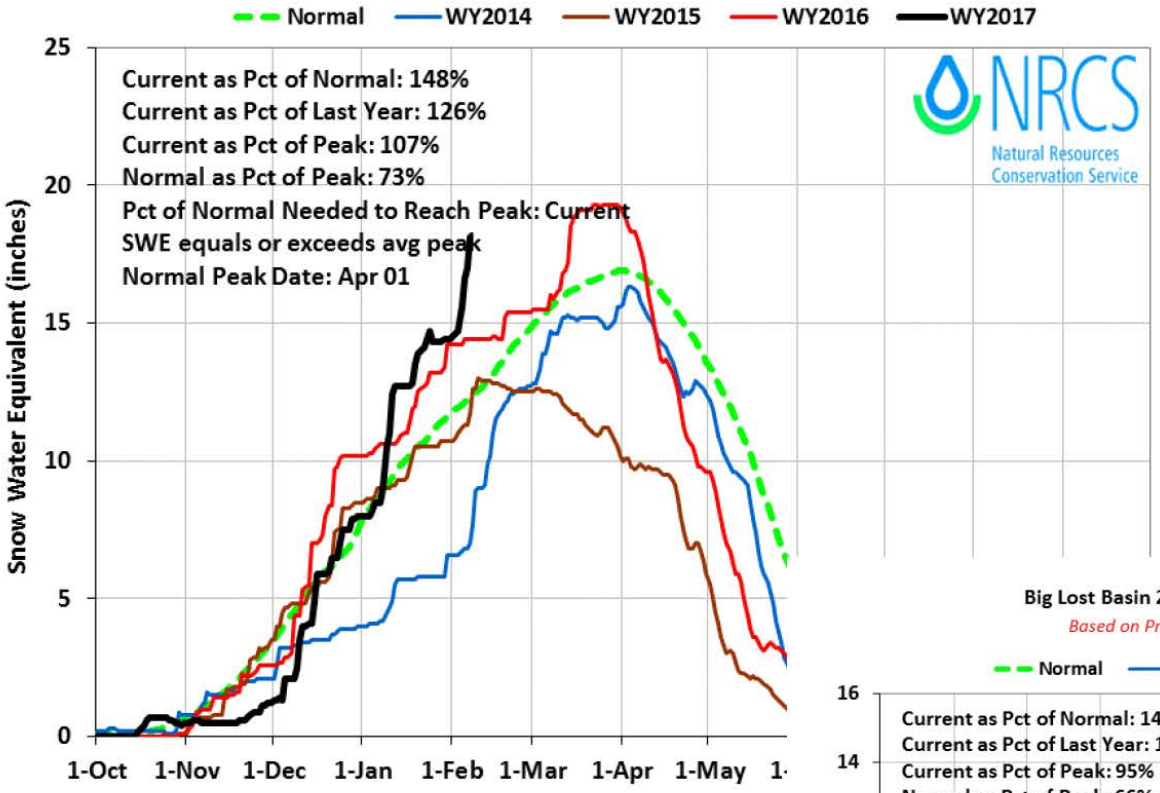

NRCS

This is an automated product based solely on SNOTEL data, provisional data are subject to change. This product is a statistically based guidance forecast combining indices of snowpack and precipitation. Skill is defined as the correlation (squared) between the guidance and observed during calibration. This product does not consider climate information such as El Nino or short range weather forecasts, or a variety of other factors considered in the official forecasts. This product is not meant to replace or supercede the official forecasts produced in coordination with the National Weather Service.
Science Contact: Cara.s.McCarthy@por.usda.gov wwwwcc.nrcs.usda.gov/wsf/daily_forecasts.html

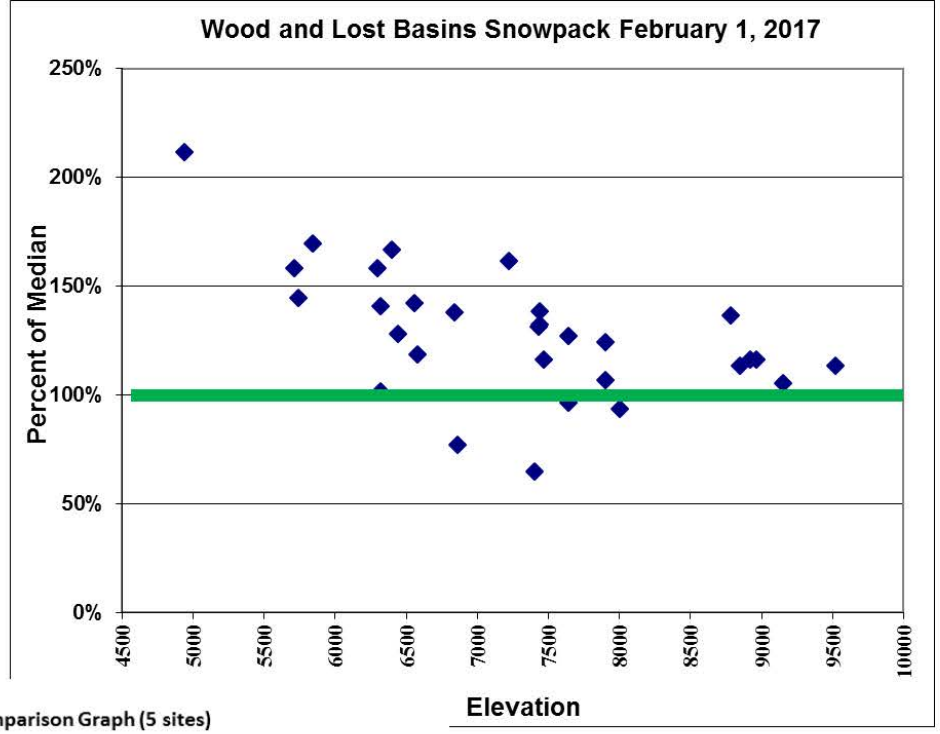

Feb 1 Historic and Forecasted Surface Water Supply
Boise River Basin
StreamFlow Apr-Sep
Reservoir 31-Jan
Water Supply (1000 Acre-Feet)
3500
3000
2500
2000
1500
1000
500
0
Surplus Above
2,200 KAF
Adequate
Irrigation
Supply
Above
1,500 KAF
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017 - 90%
2017 - 70%
2017 - 50%
2017 - 30%
2017 - 10%
Years

## Big Wood Basin 2017 Snowpack Comparison Graph (9 sites)

*Based on Provisional SNOTEL data as of Feb 07, 2017*

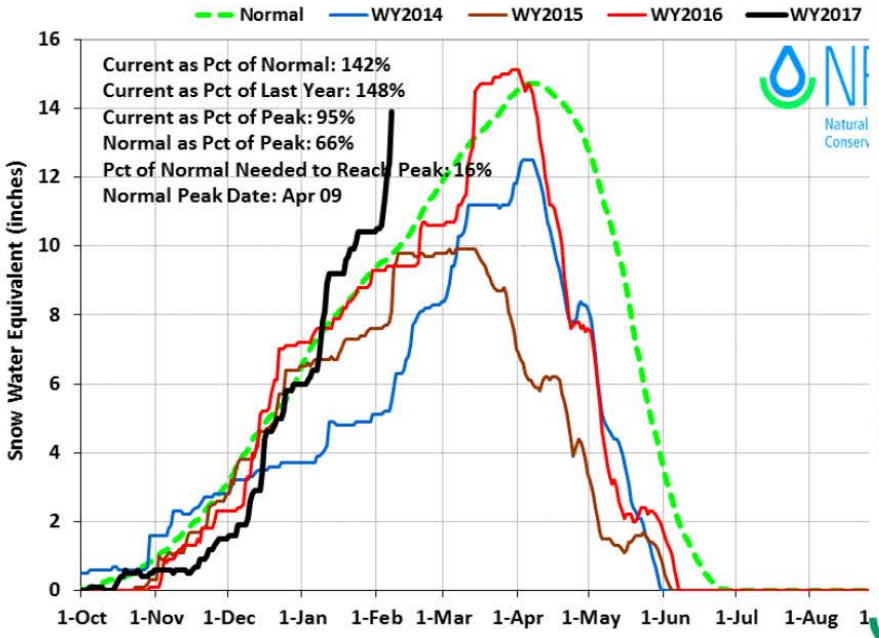


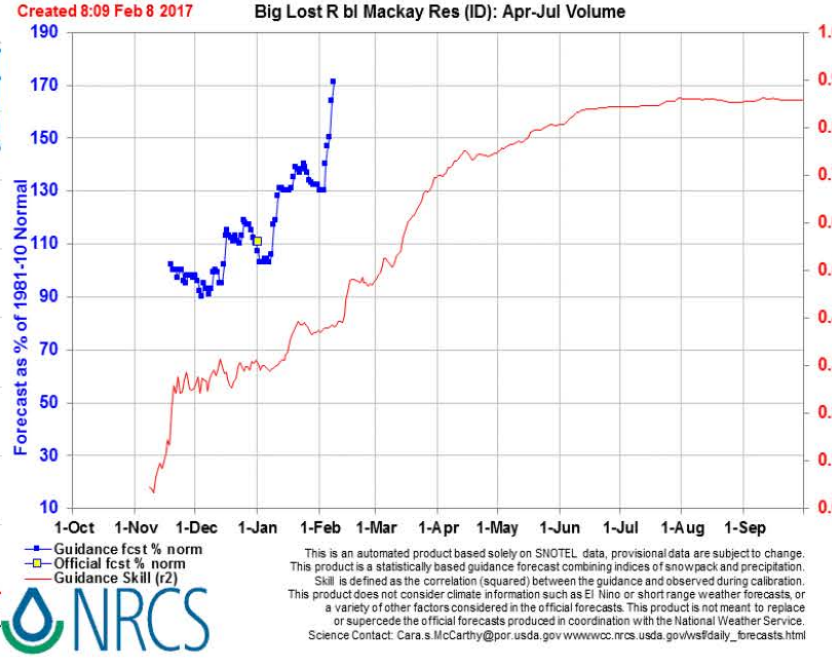

## Wood and Lost Basins Snowpack February 1, 2017

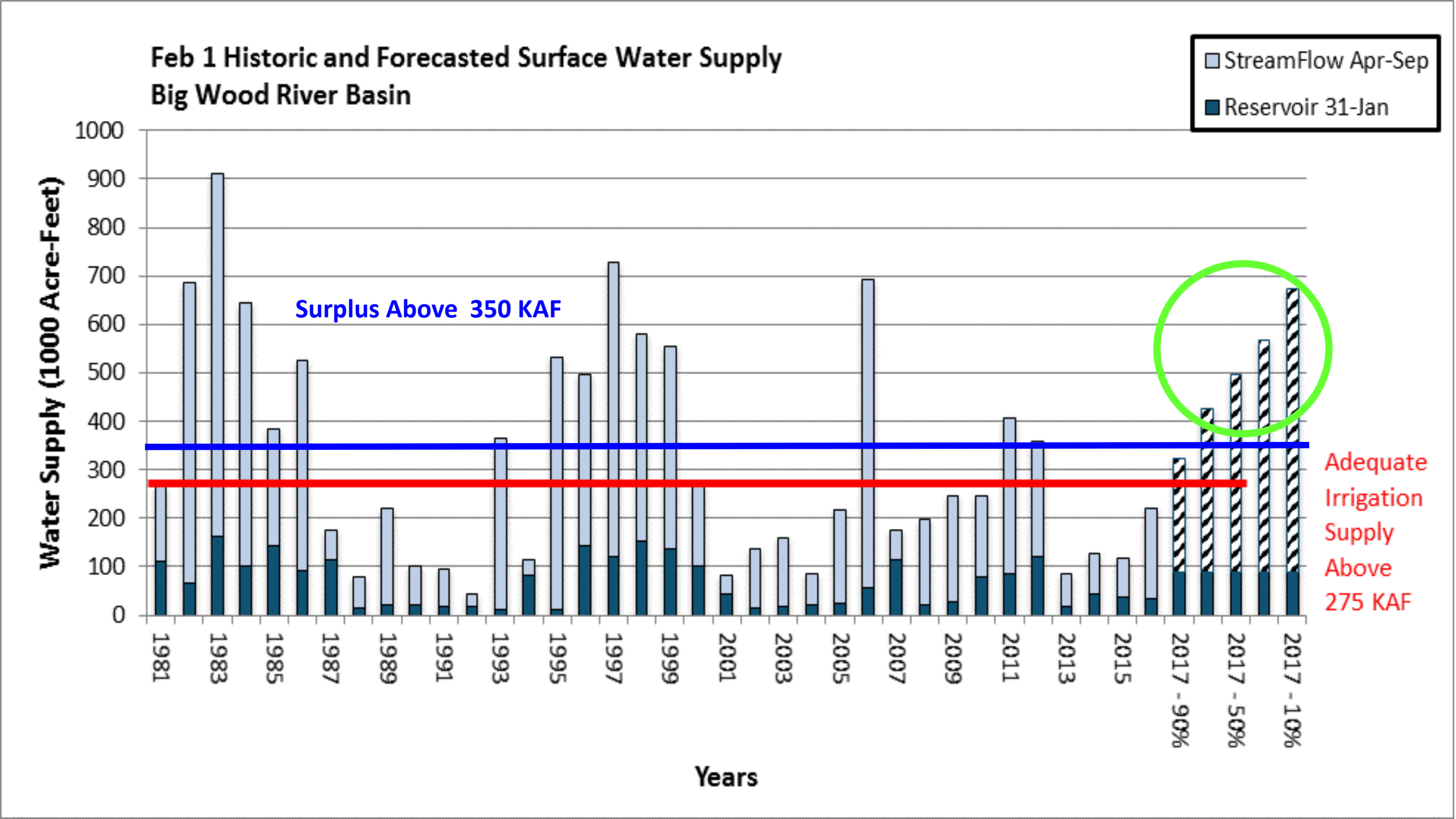



## Big Lost Basin 2017 Snowpack Comparison Graph (5 sites)

*Based on Provisional SNOTEL data as of Feb 07, 2017*



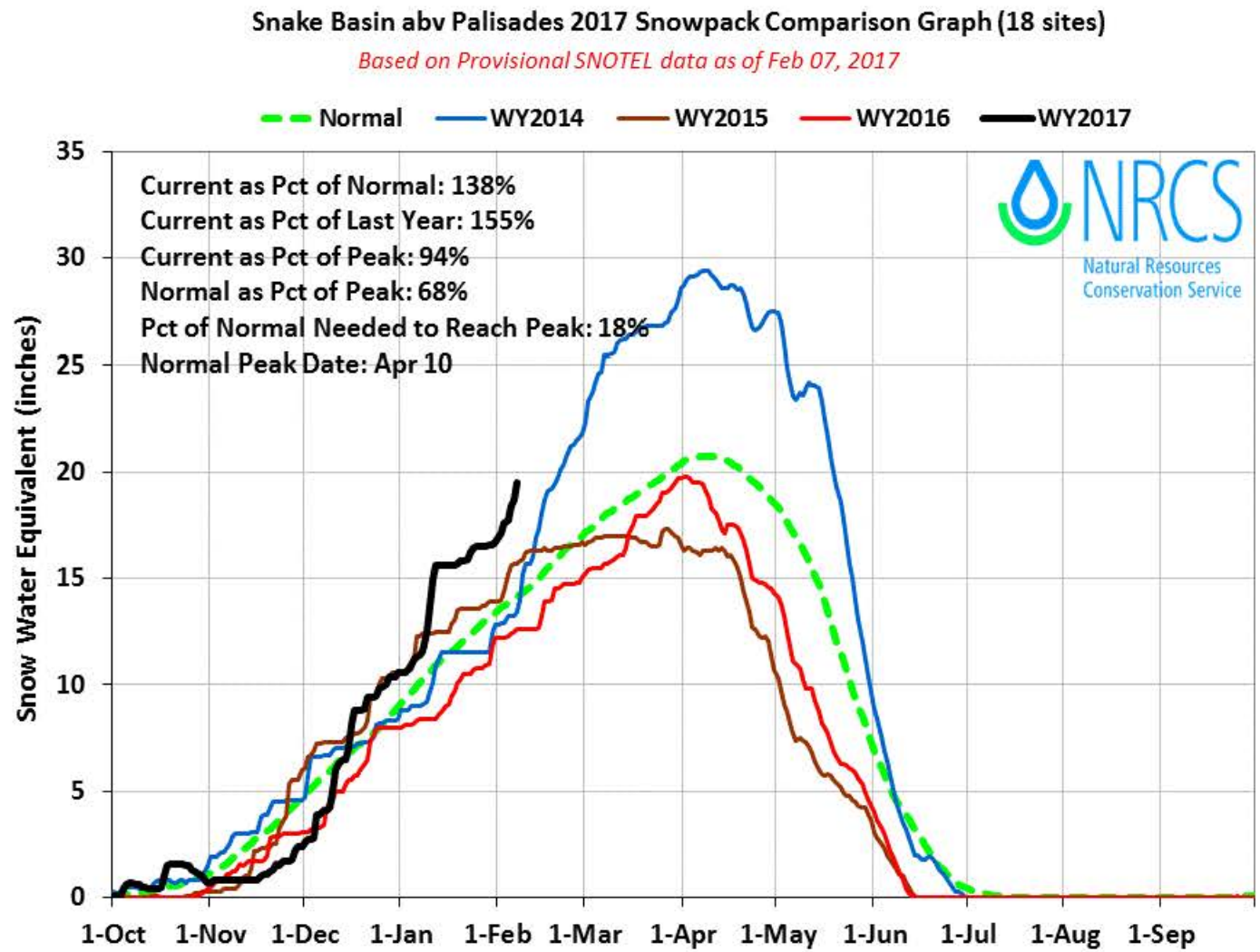



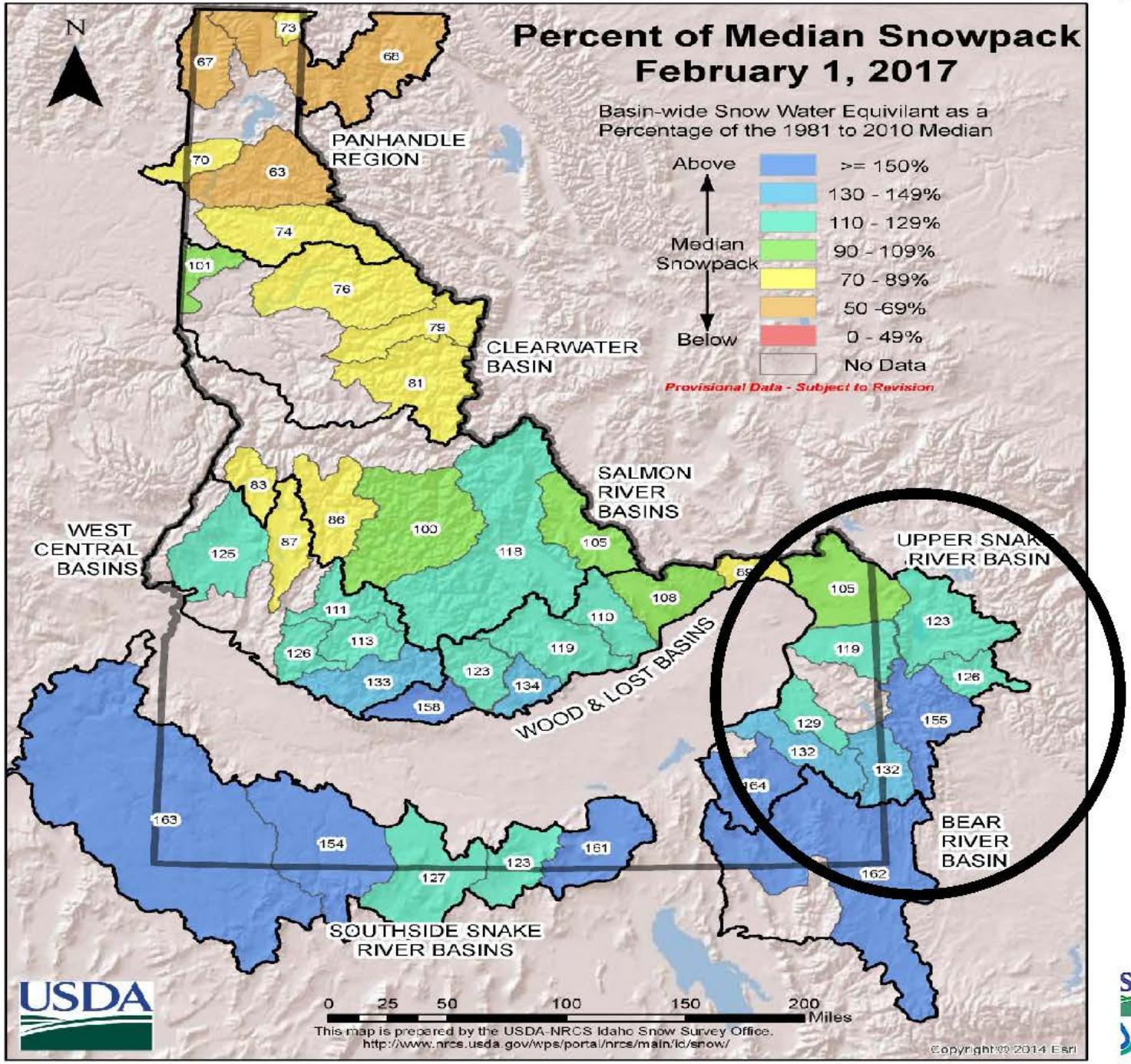

Feb 1 Historic and Forecasted Surface Water Supply
Big Wood River Basin
StreamFlow Apr-Sep
Reservoir 31-Jan
Water Supply (1000 Acre-Feet)
1000
900
800
700
600
500
400
300
200
100
0
Surplus Above 350 KAF
Adequate Irrigation Supply Above 275 KAF
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017 - 90%
2017 - 50%
2017 - 10%
Years

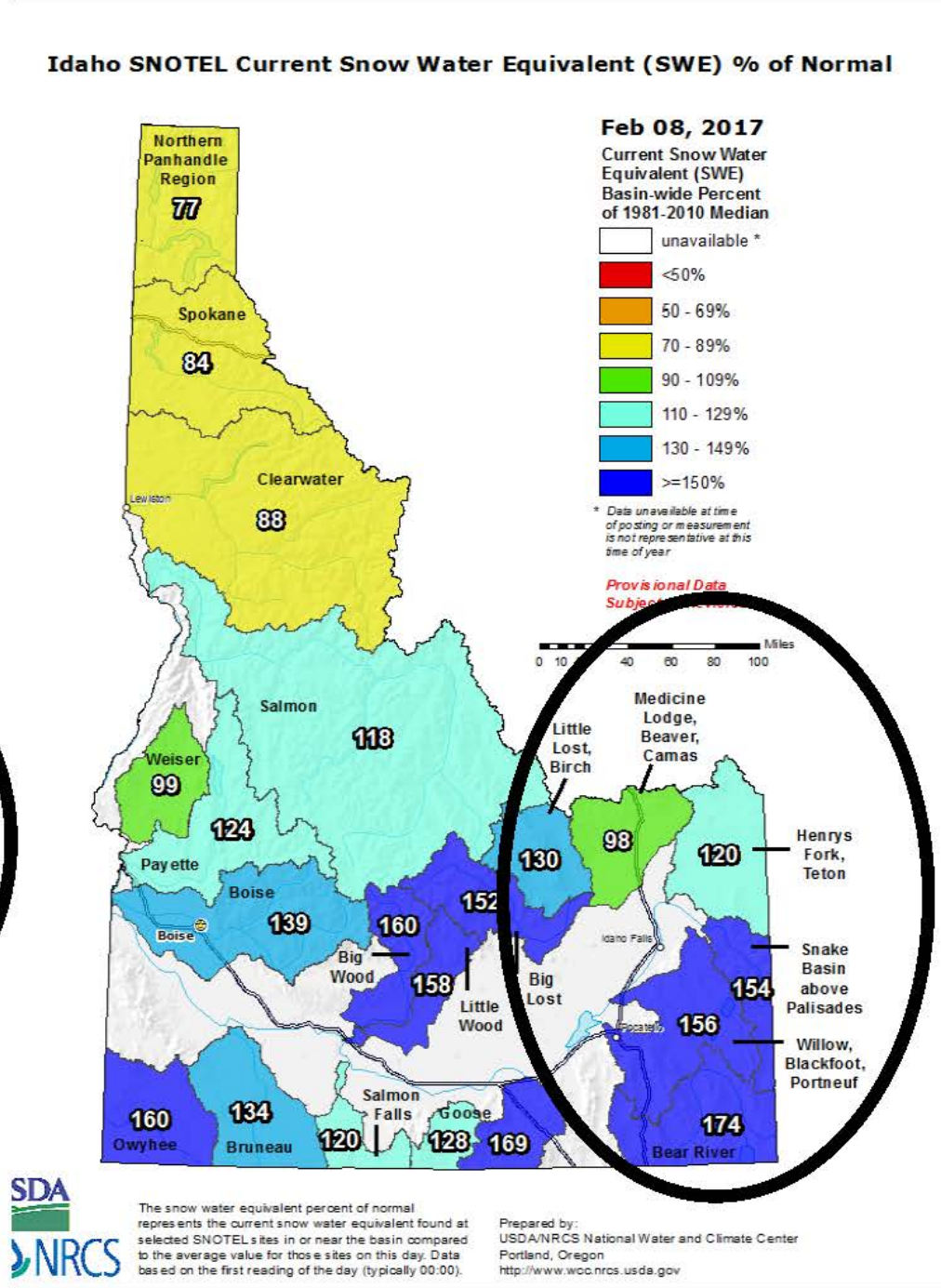
# Idaho Surface Water Supply Index Ag Shortage & Surplus Thresholds

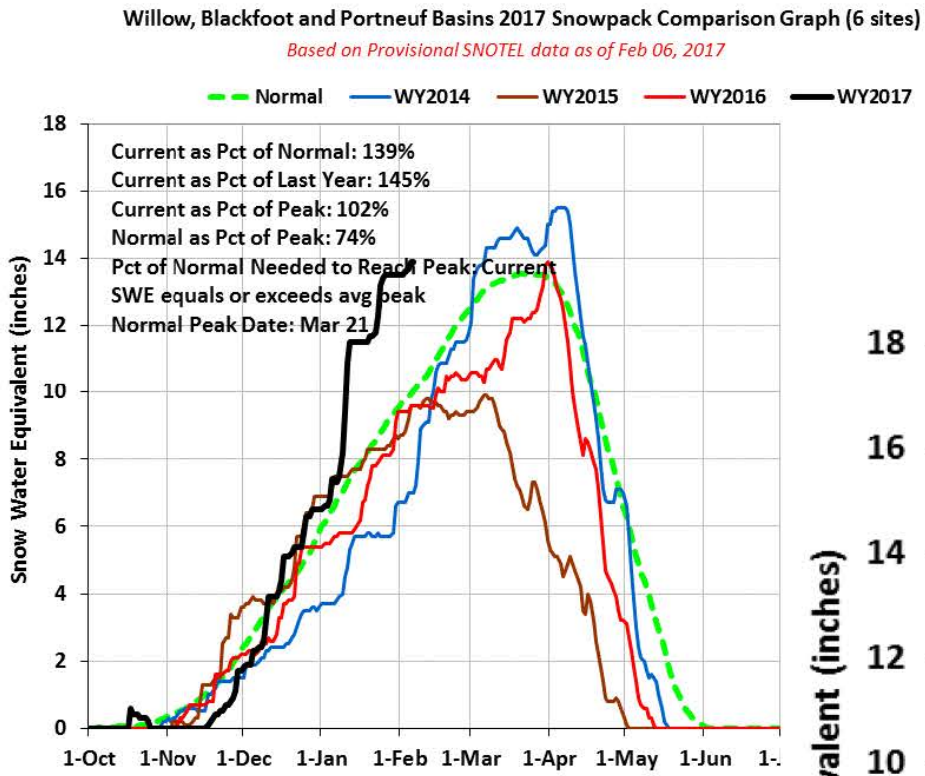
| Basin | Ag Shortage Threshold | Surplus Threshold |
|---|---|---|
| Big Wood | 275 KAF | 350 KAF with 1,500 cfs release from the dam. |
| Boise Basin | 1,500 KAF | 2,200 KAF with a flow > 6,000 cfs passing the Glenwood gage for more than 5 days and approaching 25 days is considered the surplus threshold. |
| Little Wood | 50-60 KAF | 70 KAF was determined as the surplus volume based on the reservoir capacity of 30.0 KAF and potential to fill the reservoir. |
| Owyhee | 575 KAF (updated value) | 950 KAF with a flow greater than 1,800 cfs for 8 or more days meets the surplus threshold. |
| Oakley | 50 KAF | 60 KAF was determined as the surplus volume based primarily on the reservoir capacity of 76.6 KAF and the ability to rent water when volumes are above 60 KAF. |
| Salmon Falls | 110 KAF | 180 KAF was determined as the surplus volume based primarily on reservoir capacity of 182.65 KAF and potential to fill the reservoir. |
| Payette | Shortages not common | 1,400 KAF based primarily on 2015 total water supply. |

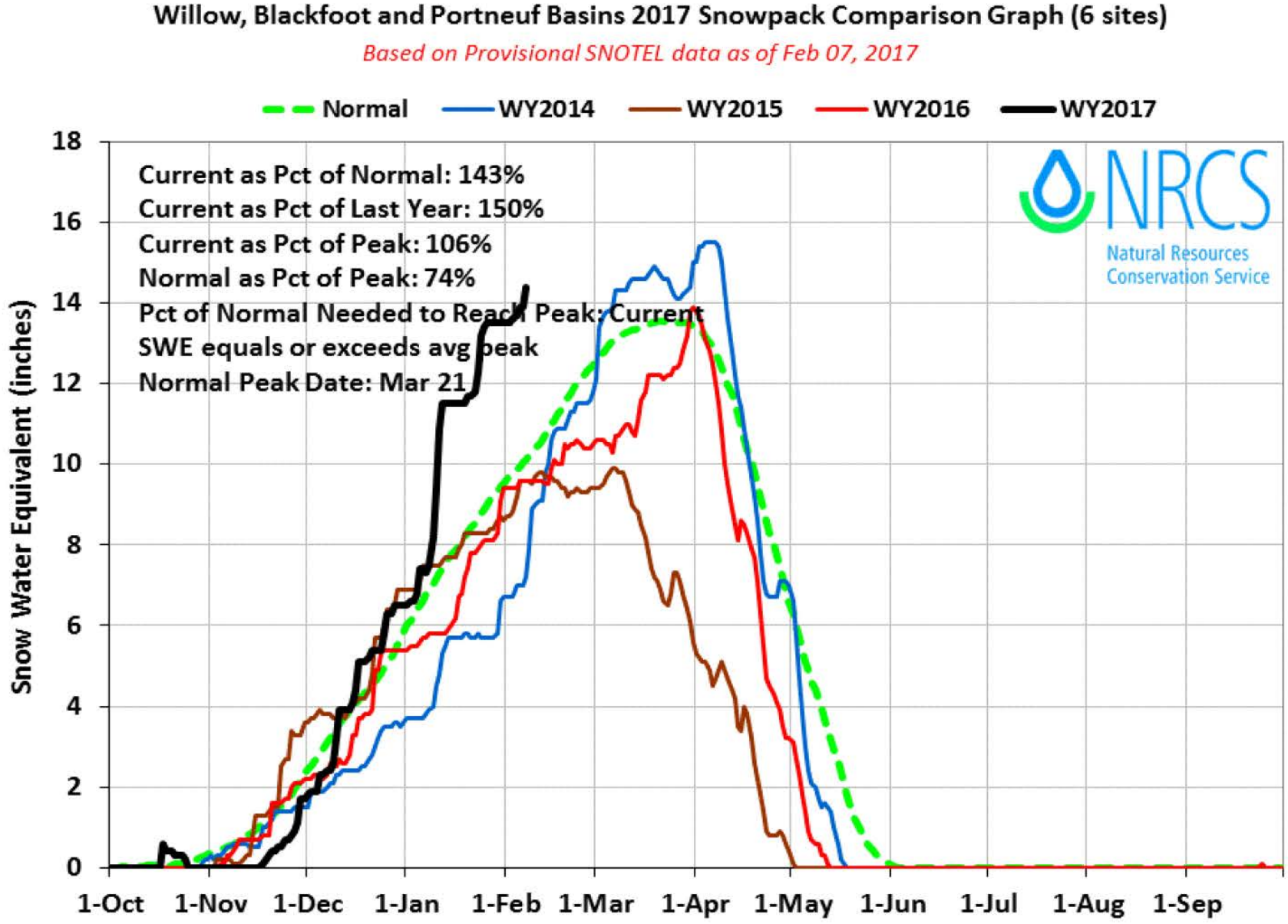
Not completed: Snake at Heise, Teton, Big Lost, Little Lost, Bear


Snake Basin abv Palisades 2017 Snowpack Comparison Graph (18 sites)
Based on Provisional SNOTEL data as of Feb 07, 2017
Normal
WY2014
WY2015
WY2016
WY2017
Current as Pct of Normal: 138%
Current as Pct of Last Year: 155%
Current as Pct of Peak: 94%
Normal as Pct of Peak: 68%
Pct of Normal Needed to Reach Peak: 18%
Normal Peak Date: Apr 10
NRCS
Natural Resources Conservation Service
Snow Water Equivalent (inches)
35
30
25
20
15
10
5
0
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep


Percent of Median Snowpack
February 1, 2017
Basin-wide Snow Water Equivilant as a Percentage of the 1981 to 2010 Median
Above
Median Snowpack
Below
>= 150%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 -69%
0 - 49%
No Data
Provisional Data - Subject to Revision
N
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
WOOD & LOST BASINS
UPPER SNAKE RIVER BASIN
BEAR RIVER BASIN
SOUTHSIDE SNAKE RIVER BASINS
67
73
68
70
63
74
101
76
79
81
83
86
87
125
100
118
105
108
111
113
126
110
119
133
123
134
158
105
123
119
126
129
155
132
132
164
163
154
123
161
127
162
0 25 50 100 150 200 Miles
This map is prepared by the USDA-NRCS Idaho Snow Survey Office.
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/
Copyright © 2014 Esri
USDA

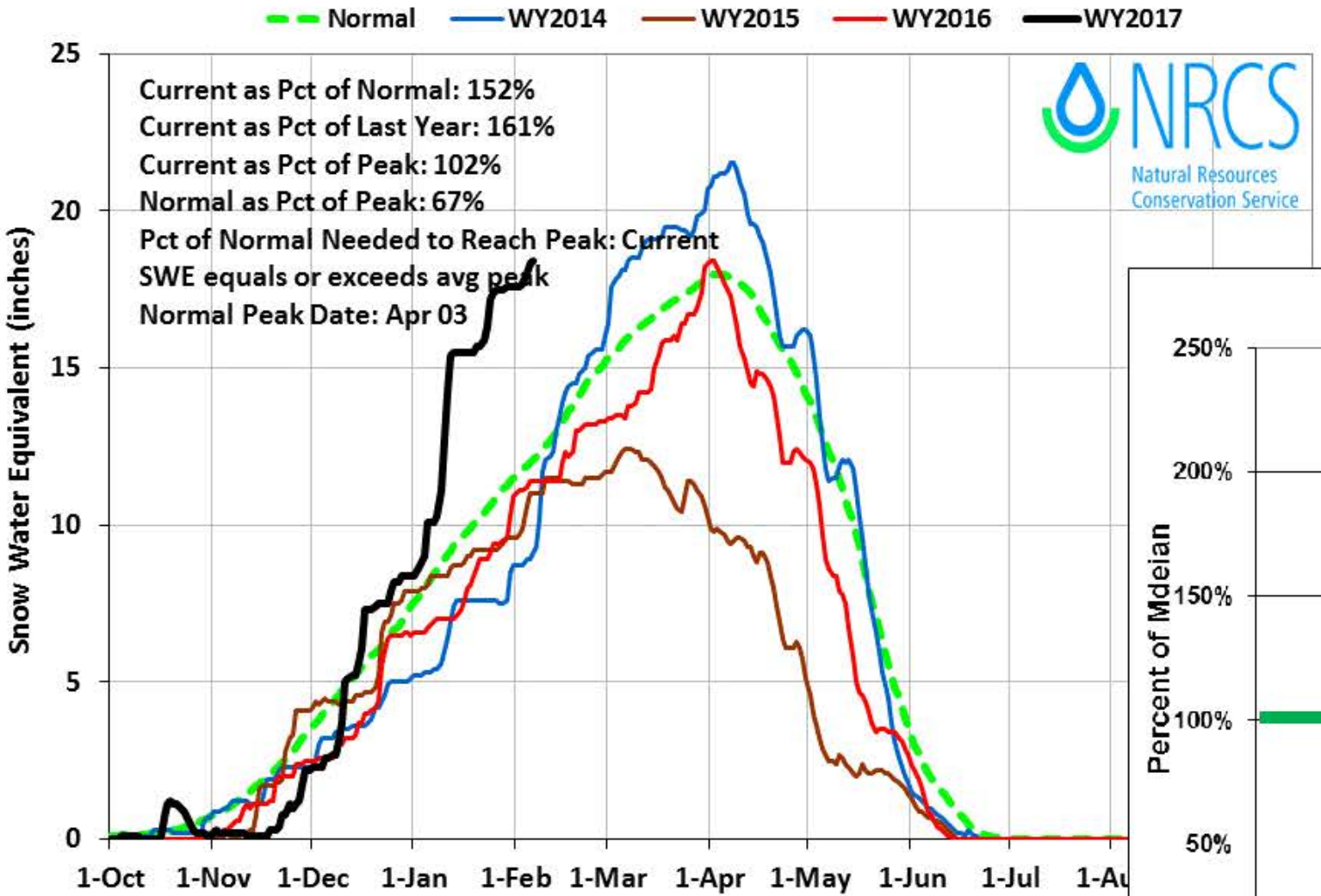

Idaho SNOTEL Current Snow Water Equivalent (SWE) % of Normal
Feb 08, 2017
Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median
unavailable *
<50%
50 - 69%
70 - 89%
90 - 109%
110 - 129%
130 - 149%
>=150%
* Data unavailable at time of posting or measurement is not representative at this time of year
Provisional Data
Subject to Revision
Miles
0 10 40 60 80 100
Northern Panhandle Region
77
Spokane
84
Clearwater
88
Lewiston
Salmon
118
Weiser
99
124
Payette
Boise
139
Boise
160
Big Wood
158
Little Wood
152
Big Lost
Idaho Falls
Little Lost, Birch
130
Medicine Lodge, Beaver, Camas
98
120
Henrys Fork, Teton
154
Snake Basin above Palisades
156
Willow, Blackfoot, Portneuf
174
Bear River
Pocatello
160
Owyhee
134
Bruneau
120
Salmon Falls
128
Goose
169
SDA
NRCS
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:
USDA/NRCS National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov


Willow, Blackfoot and Portneuf Basins 2017 Snowpack Comparison Graph (6 sites)
Based on Provisional SNOTEL data as of Feb 06, 2017
Normal
WY2014
WY2015
WY2016
WY2017
Current as Pct of Normal: 139%
Current as Pct of Last Year: 145%
Current as Pct of Peak: 102%
Normal as Pct of Peak: 74%
Pct of Normal Needed to Reach Peak: Current
SWE equals or exceeds avg peak
Normal Peak Date: Mar 21
Snow Water Equivalent (inches)
0
2
4
6
8
10
12
14
16
18
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun

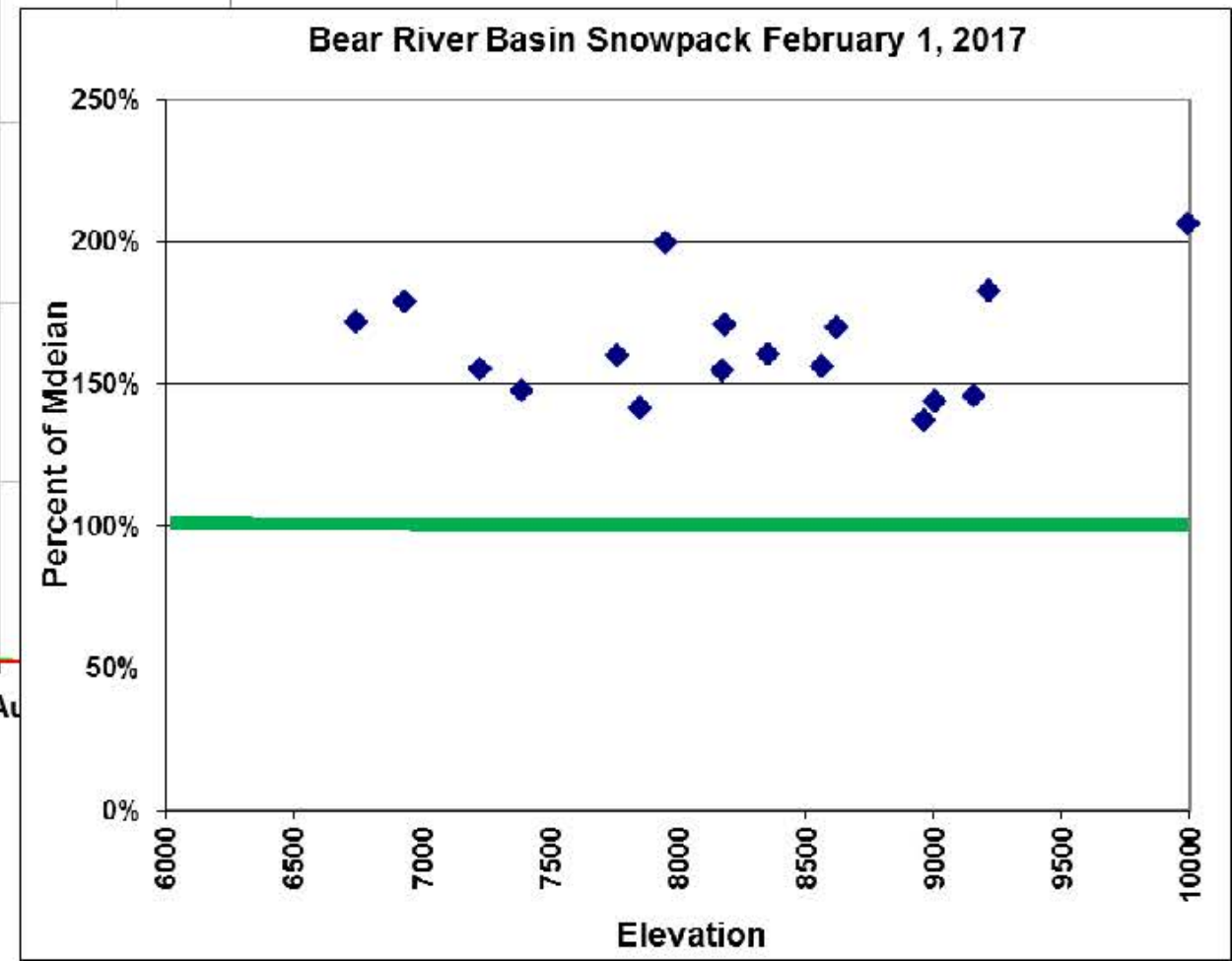

Willow, Blackfoot and Portneuf Basins 2017 Snowpack Comparison Graph (6 sites)
Based on Provisional SNOTEL data as of Feb 07, 2017
Normal
WY2014
WY2015
WY2016
WY2017
Current as Pct of Normal: 143%
Current as Pct of Last Year: 150%
Current as Pct of Peak: 106%
Normal as Pct of Peak: 74%
Pct of Normal Needed to Reach Peak: Current
SWE equals or exceeds avg peak
Normal Peak Date: Mar 21
NRCS
Natural Resources Conservation Service
Snow Water Equivalent (inches)
0
2
4
6
8
10
12
14
16
18
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep

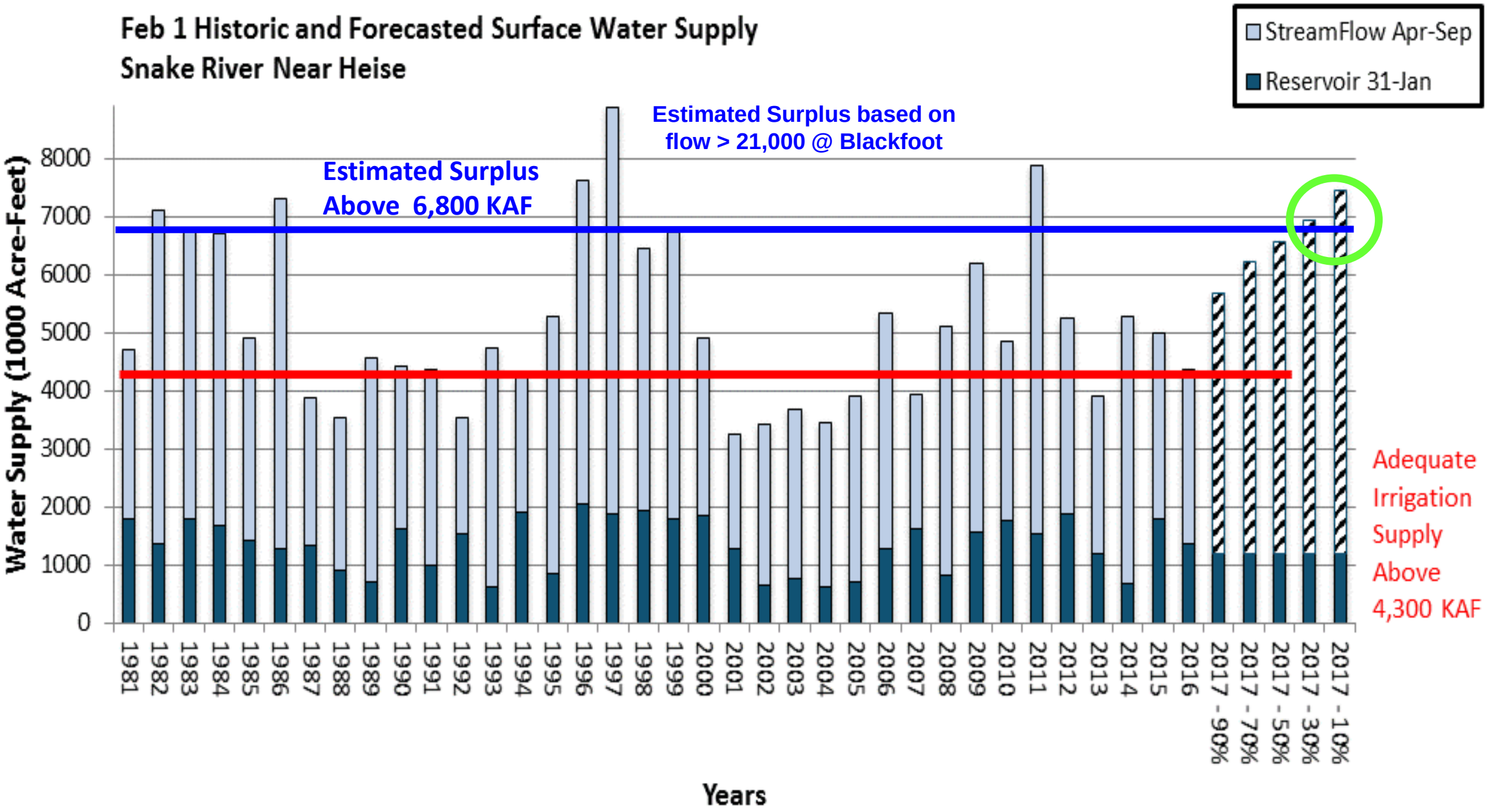
## Bear Basin 2017 Snowpack Comparison Graph (15 sites)

*Based on Provisional SNOTEL data as of Feb 06, 2017*

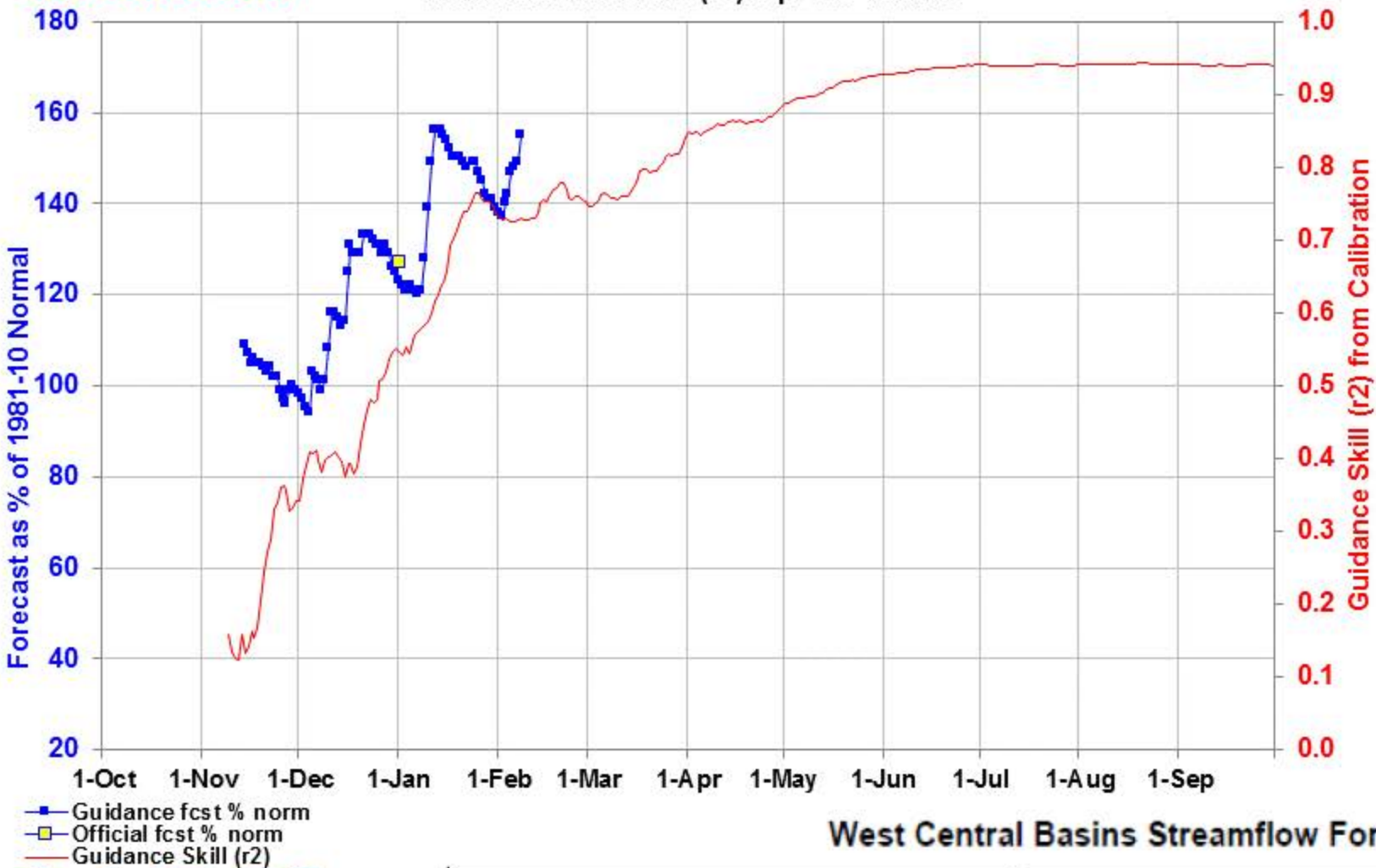



NRCS
Natural Resources Conservation Service




Feb 1 Historic and Forecasted Surface Water Supply
Snake River Near Heise
StreamFlow Apr-Sep
Reservoir 31-Jan
Estimated Surplus based on flow > 21,000 @ Blackfoot
Estimated Surplus Above 6,800 KAF
Adequate Irrigation Supply Above 4,300 KAF
Water Supply (1000 Acre-Feet)
0
1000
2000
3000
4000
5000
6000
7000
8000
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017 - 90%
2017 - 70%
2017 - 50%
2017 - 30%
2017 - 10%
Years

Created 8:04 Feb 8 2017



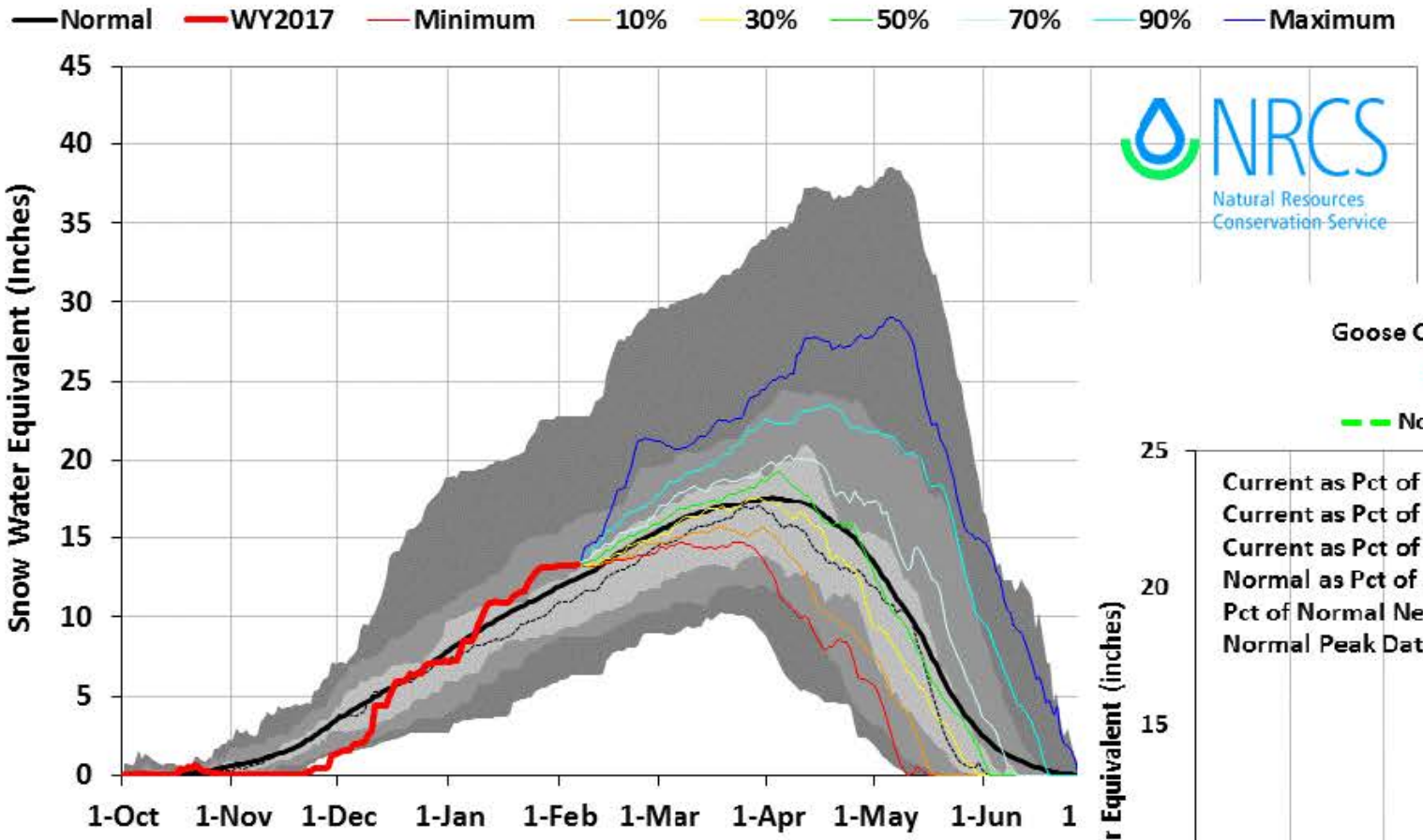

NRCS

## West Central Basins Streamflow Forecasts - February 1, 2017

| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <--Drier----Projected Volume----Wetter--> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| Snake R nr Heise 2 | APR-JUL | 3890 | 4340 | 4650 | 144% | 4960 | 5410 | 3240 |
| | APR-SEP | 4490 | 5020 | 5380 | 142% | 5740 | 6270 | 3780 |

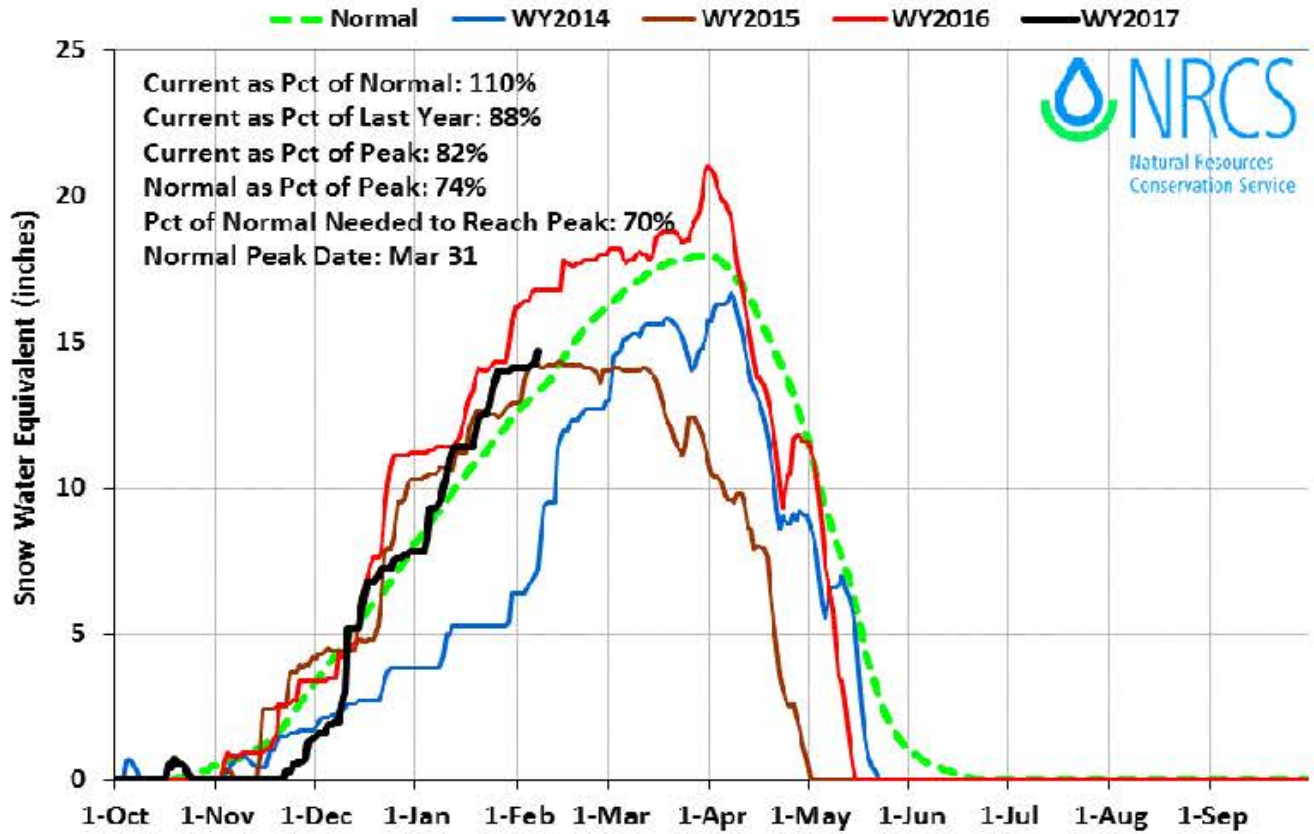
## Salmon Falls Basin 2017 Snow Water with Non-Exceedence Projections (5 sites)

*Based on Provisional SNOTEL data as of Feb 06, 2017*



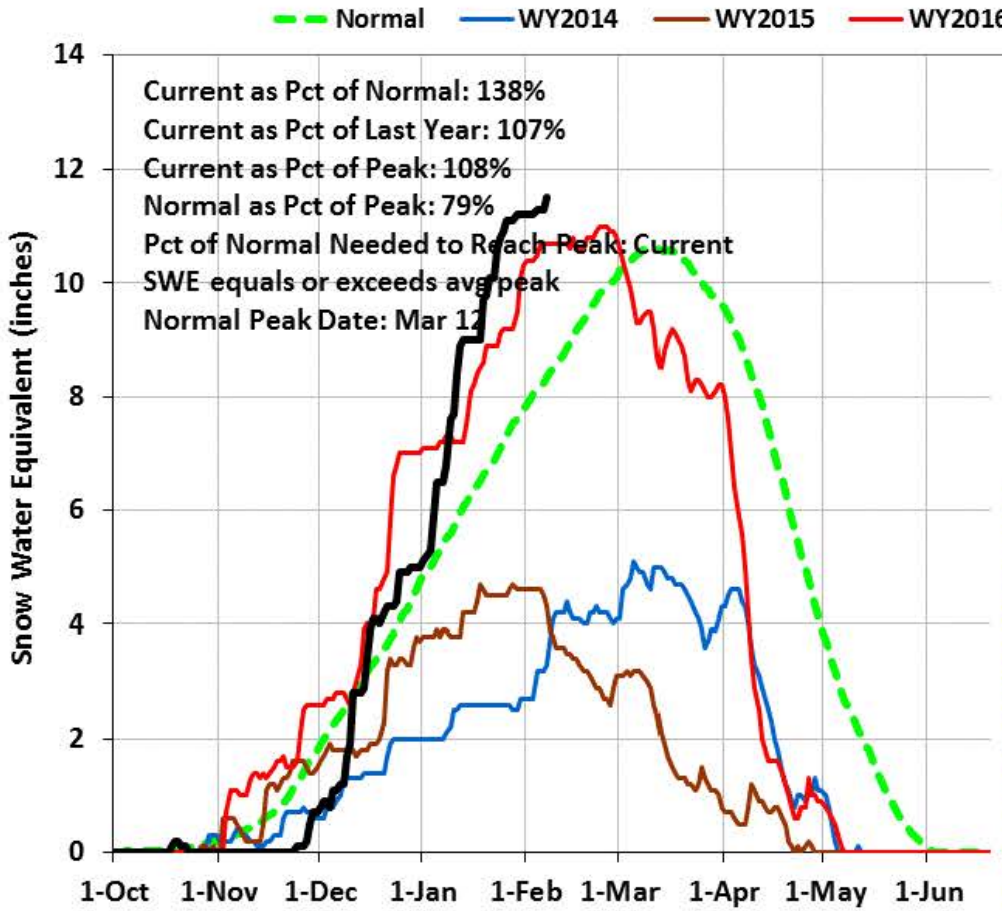

## Goose Creek Basin 2017 Snowpack Comparison Graph (2 sites)

*Based on Provisional SNOTEL data as of Feb 07, 2017*



## Owyhee Basin 2017 Snowpack Comparison Graph (7 sites)

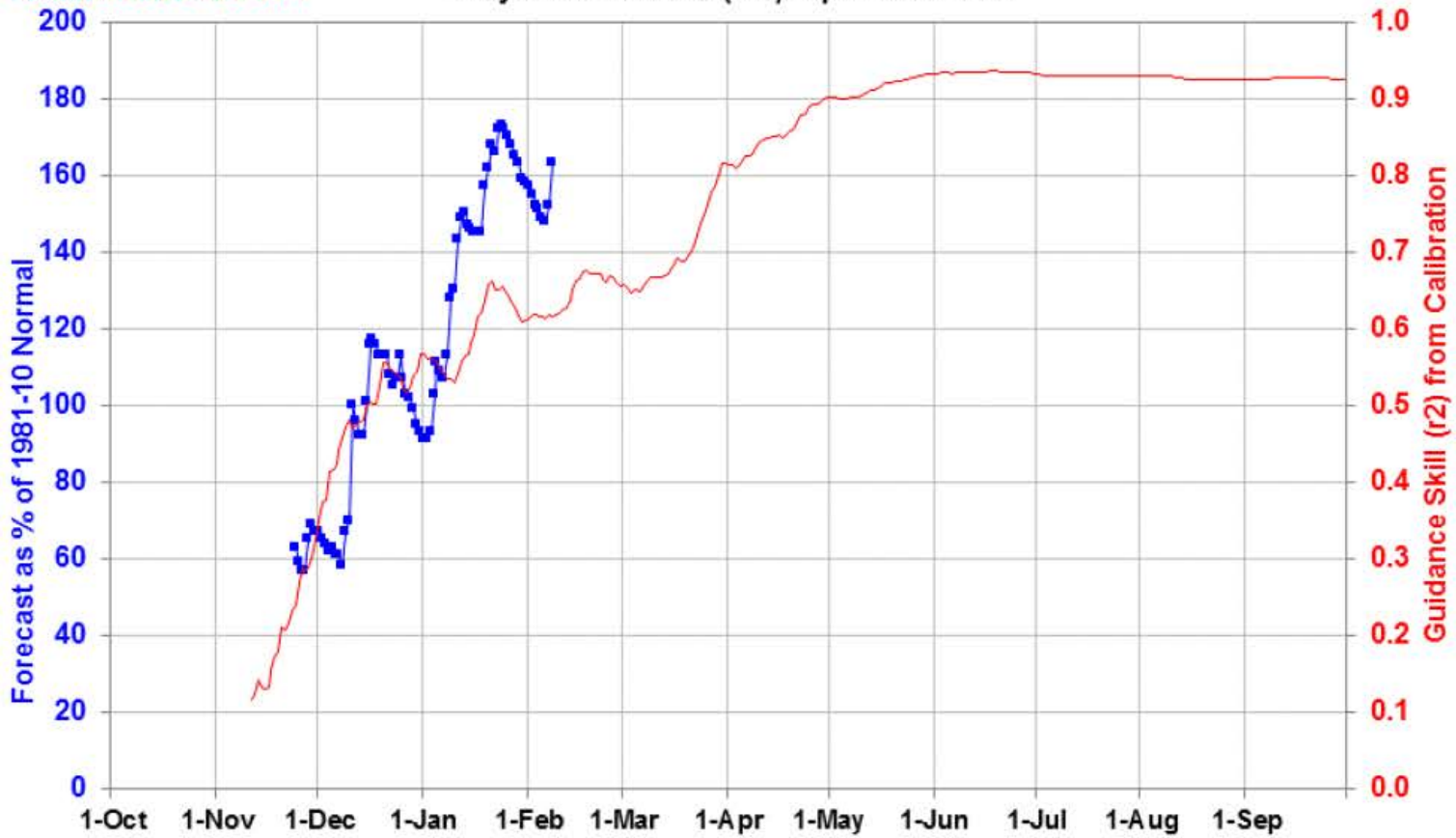
*Based on Provisional SNOTEL data as of Feb 07, 2017*




NRCS

Created 8:12 Feb 8 2017

## Owyhee R nr Rome (OR): Apr-Jul Volume



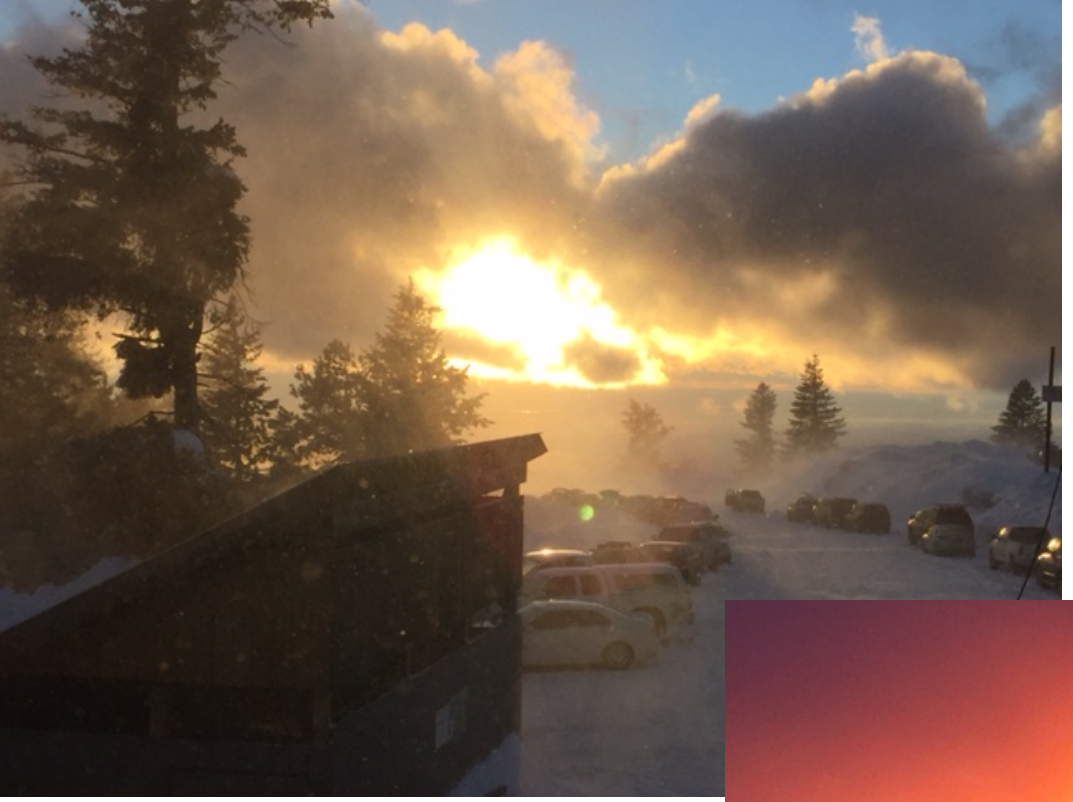

Guidance fcst % norm

Guidance Skill (r2)

NRCS

This is an automated product based solely on SNOTEL data, provisional data are subject to change. This product is a statistically based guidance forecast combining indices of snowpack and precipitation. Skill is defined as the correlation (squared) between the guidance and observed during calibration. This product does not consider climate information such as El Nino or short range weather forecasts, or a variety of other factors considered in the official forecasts. This product is not meant to replace or supercede the official forecasts produced in coordination with the National Weather Service.

Science Contact: Cara.s.McCarthy@por.usda.gov wwwwcc.nrcs.usda.gov/wsf/daily_forecasts.html



**Questions, Comments, Discussions**

**Bogus Basin Sunset Feb 7, 2017**