

*Natural Resources Conservation Service*

## **Idaho Water Supply Outlook Report January 1, 2017**



Combined, Phil Morrisey NRCS Idaho NRCS Snow Survey Data Collection Officer, and Mike Beus, USBR Water Operations Manager for the Upper Snake river and reservoir system, have nearly 60 years in the data collection of snow survey information and management of the Upper Snake reservoir system.

Phil retired at the end of December, 2016 while Mike is planning to retire in early 2017. Phil started his Snow Survey career in Boise in December 1988, while Mike first started his career working for the Twin Fall Canal Company in 1981 and then transitioned to the USBR in May 1986 in Burley. Phil became the Idaho Snow Survey Data Collection Officer around 1999. Mike has been in charge of the Upper Snake river and reservoir system since 1997.

The collaboration between the NRCS and USBR in the early years of collecting daily high elevation data in the 1970s helped to make the Idaho Snow Survey program the program that it is today. This collaboration and sharing of information is critical in the wise water management of the Bureau's reservoirs and delivery of water to Idaho's numerous water users. The measurement of high elevation snow and prediction of future weather and streamflow is no easy task. Their combined knowledge and information in the data collection and water management fields will be missed. Congratulations to Phil and Mike on their successful careers, now it is time to enjoy the snow and water in your retirement.

# **IDWR State Water Supply Meeting January 12, 2017**

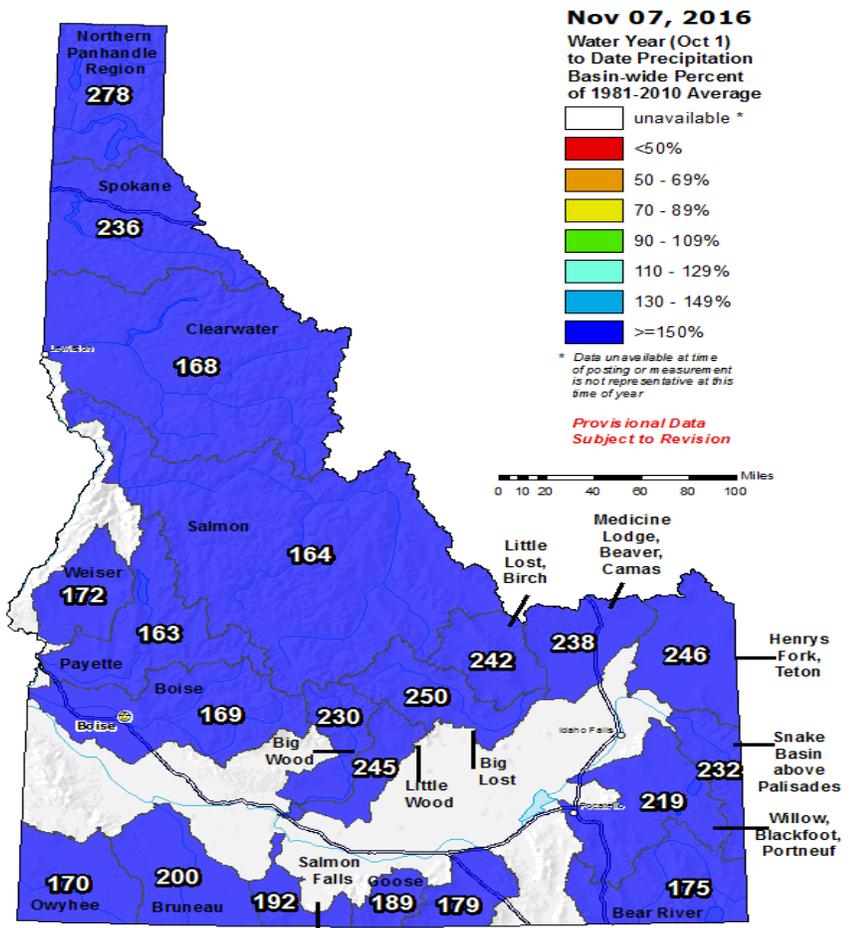
**Ron Abramovich  
Water Supply Specialist  
Snow Survey**

**Boise, Idaho**

**USDA**  
Natural Resources  
Conservation Service

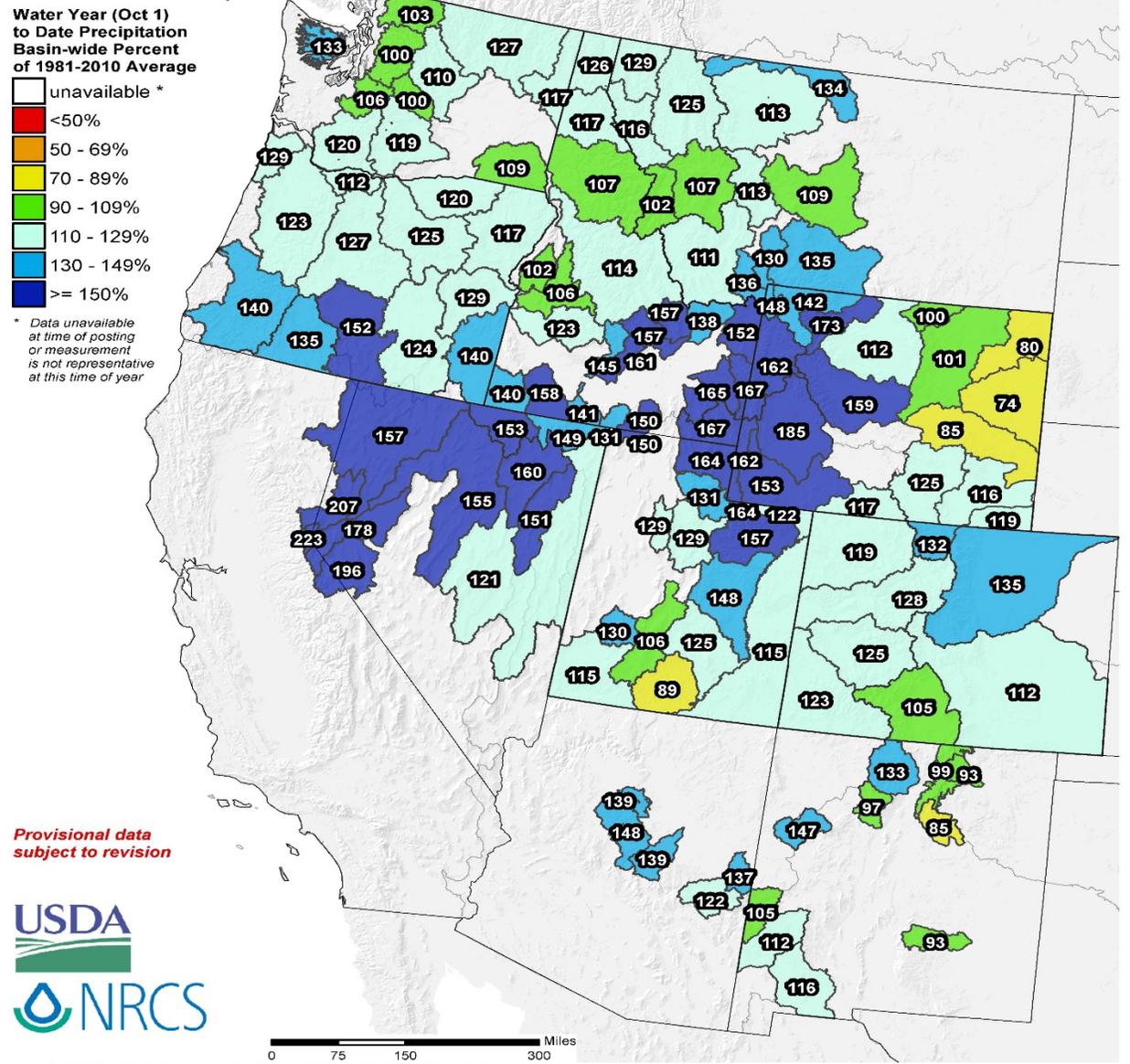
**October precipitation was record high in some areas. The precipitation improved soil moisture & streamflows. Question is how much remains in system or moved out of the basin.**

**Idaho SNOTEL Water Year (Oct 1) to Date Precipitation % of Normal**



**Westwide SNOTEL Water Year (Oct 1) to Date Precipitation % of Normal**

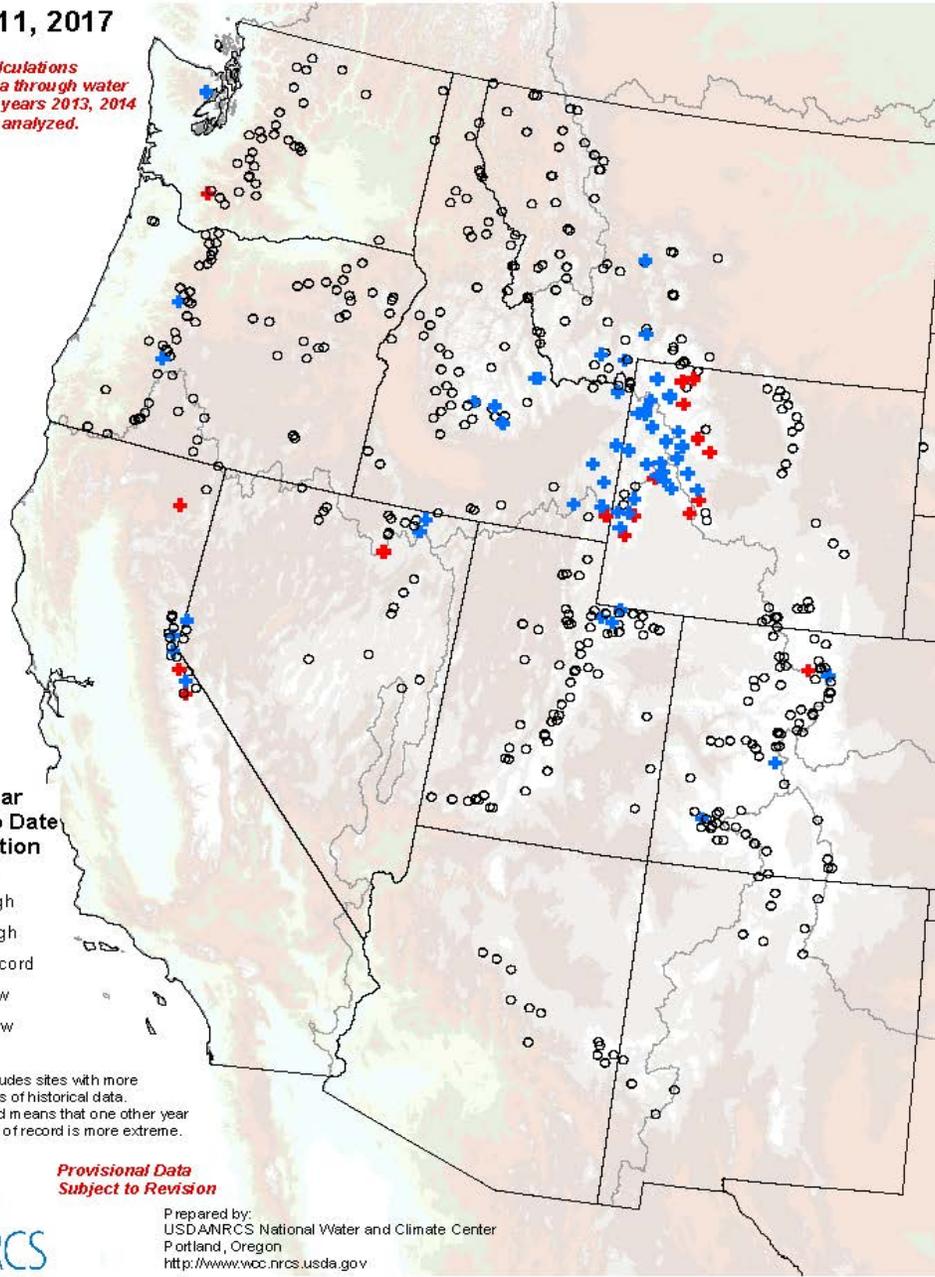
Jan 11, 2017



# SNOTEL Water Year (Oct 1) to Date Precipitation Records

Jan 11, 2017

*NOTE: record calculations are based on data through water year 2012; water years 2013, 2014 and 2015 are not analyzed.*



## Water Year (Oct 1) to Date Precipitation Records

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

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.

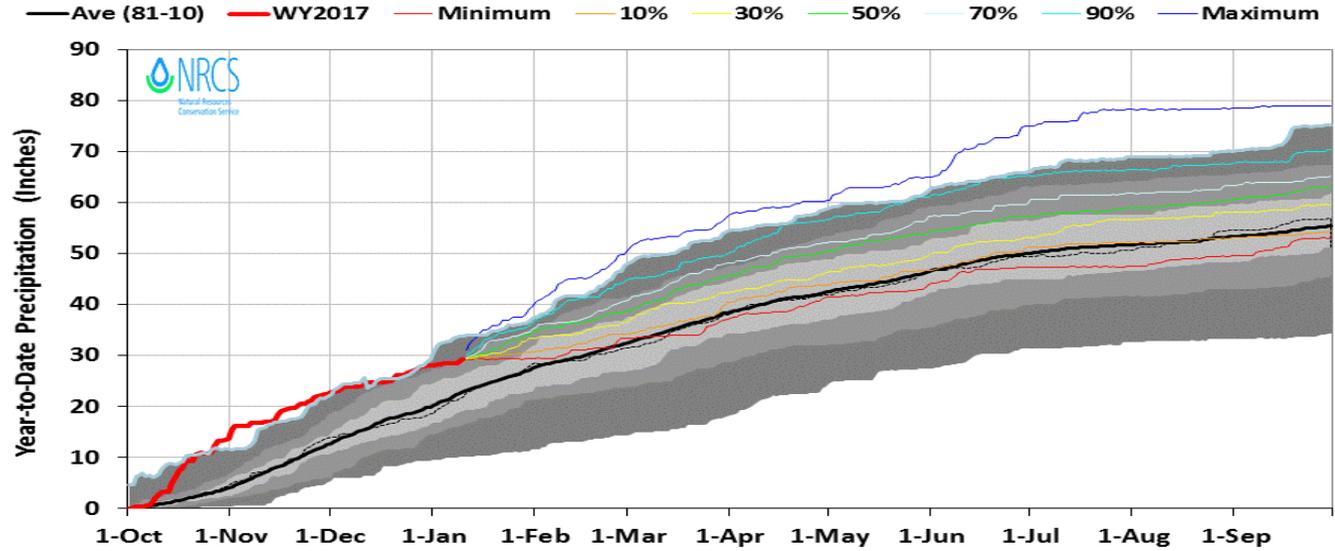


*Provisional Data  
Subject to Revision*

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

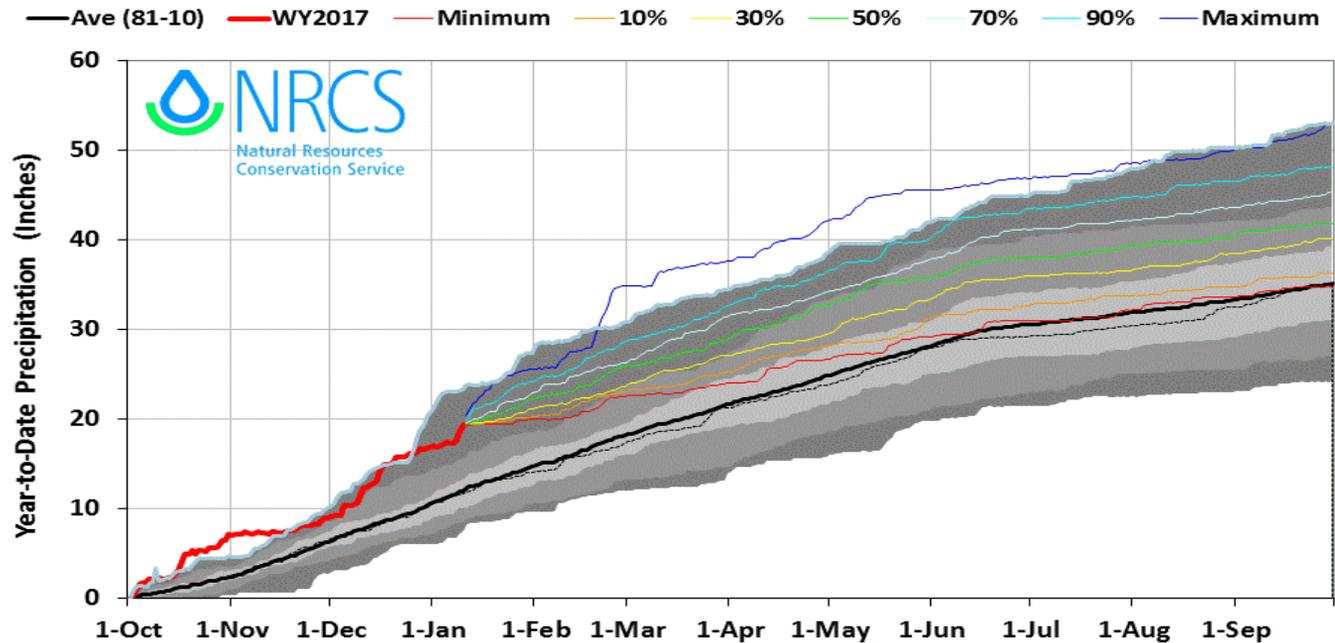
# Northern Panhandle Region 2017 Precipitation with Non-Exceedence Projections (8 sites)

*Based on Provisional SNOTEL data as of Jan 10, 2017*



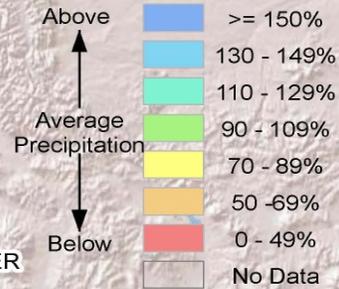
# Snake Basin above Palisades 2017 Precipitation with Non-Exceedence Projections (18 sites)

*Based on Provisional SNOTEL data as of Jan 10, 2017*

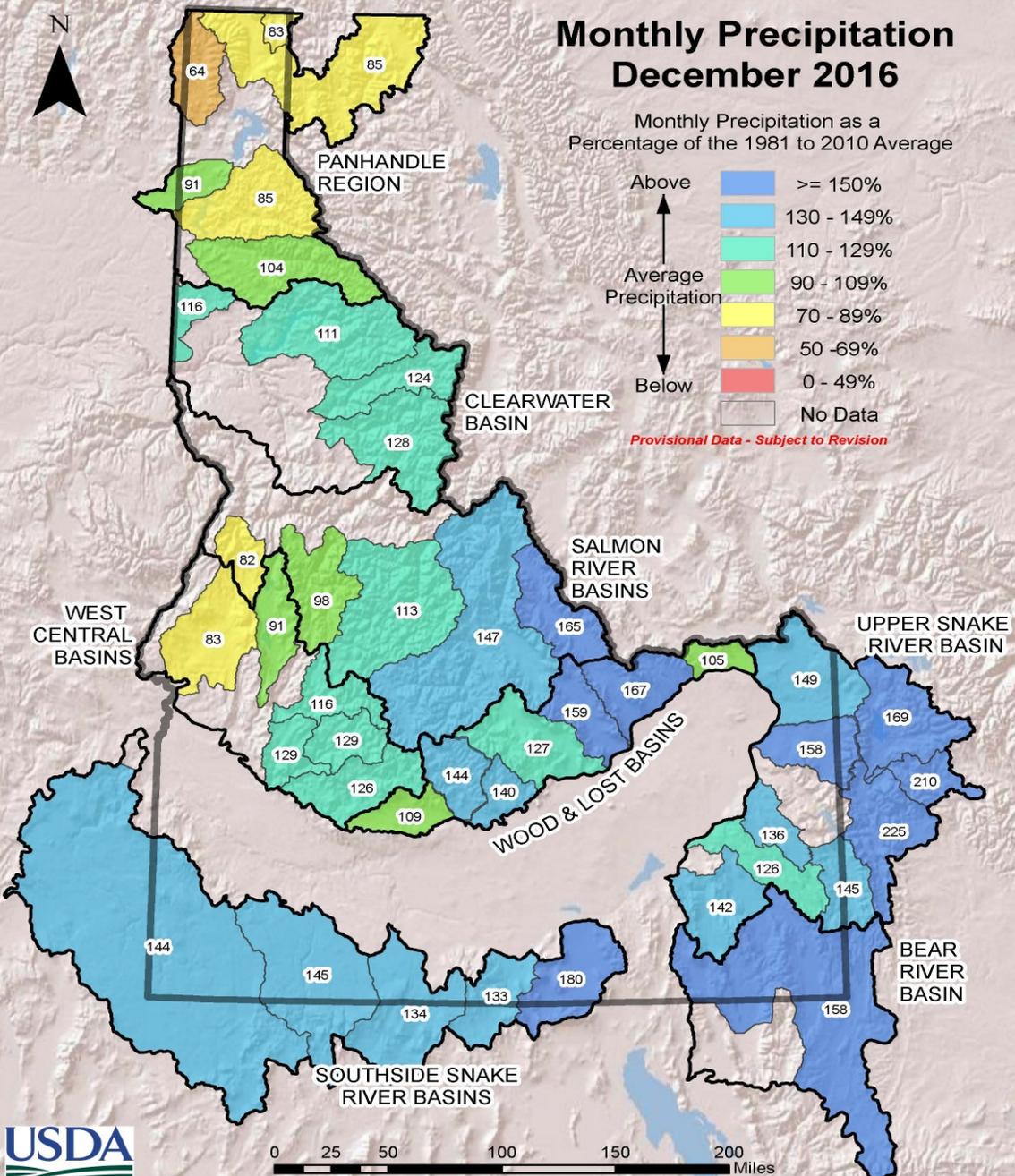


# Monthly Precipitation December 2016

Monthly Precipitation as a Percentage of the 1981 to 2010 Average



*Provisional Data - Subject to Revision*



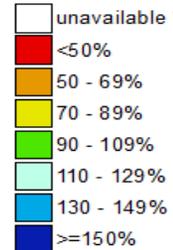
This map is prepared by the USDA-NRCS Idaho Snow Survey Office, <http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

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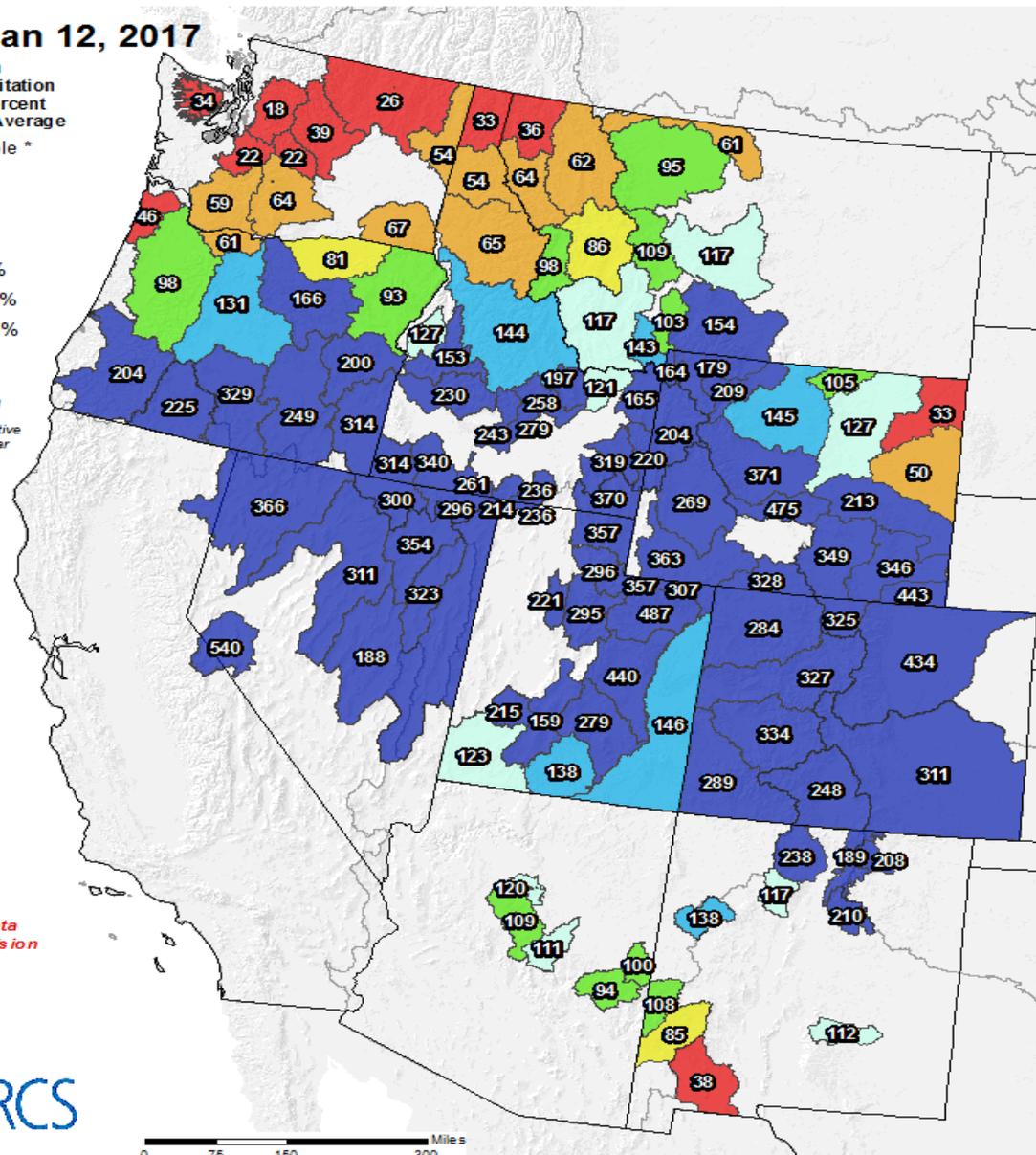
# Westwide SNOTEL Current Month to Date Precipitation % of Normal

Jan 12, 2017

Current Month to Date Precipitation Basin-wide Percent of 1981-2010 Average



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



*Provisional data subject to revision*



The current month to date precipitation percent of normal represents the accumulated precipitation 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>

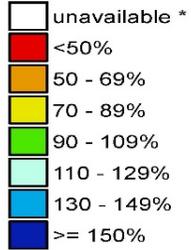
## Idaho SNOTEL Precipitation Summary Report as of Jan 12, 2017

Basin or Region	Jan 1-11 Precipitation Compared to Normal Jan Amount %	Water Year to Date Precipitation as % of Average	Water Year to Date Compared to Annual Precipitation %
NORTHERN PANHANDLE	14	126	53
SPOKANE	22	117	48
CLEARWATER	25	107	42
SALMON	62	114	42
WEISER	53	102	40
PAYETTE	66	106	44
BOISE	99	123	53
BIG WOOD	109	145	59
LITTLE WOOD	128	161	56
BIG LOST	116	157	54
LITTLE LOST, BIRCH	85	157	49
MEDICINE LODGE, BEAVER, CAMAS	53	138	42
HENRYS FORK, TETON	69	152	57
SNAKE BASIN ABOVE PALISADES	94	166	59
WILLOW, BLACKFOOT, PORTNEUF	132	165	59
SNAKE BASIN ABOVE AMERICAN FALLS	94	162	58
GOOSE CREEK	82	131	48
SALMON FALLS	102	141	48
BRUNEAU	133	158	54
OWYHEE	118	140	52
BEAR RIVER	163	166	60

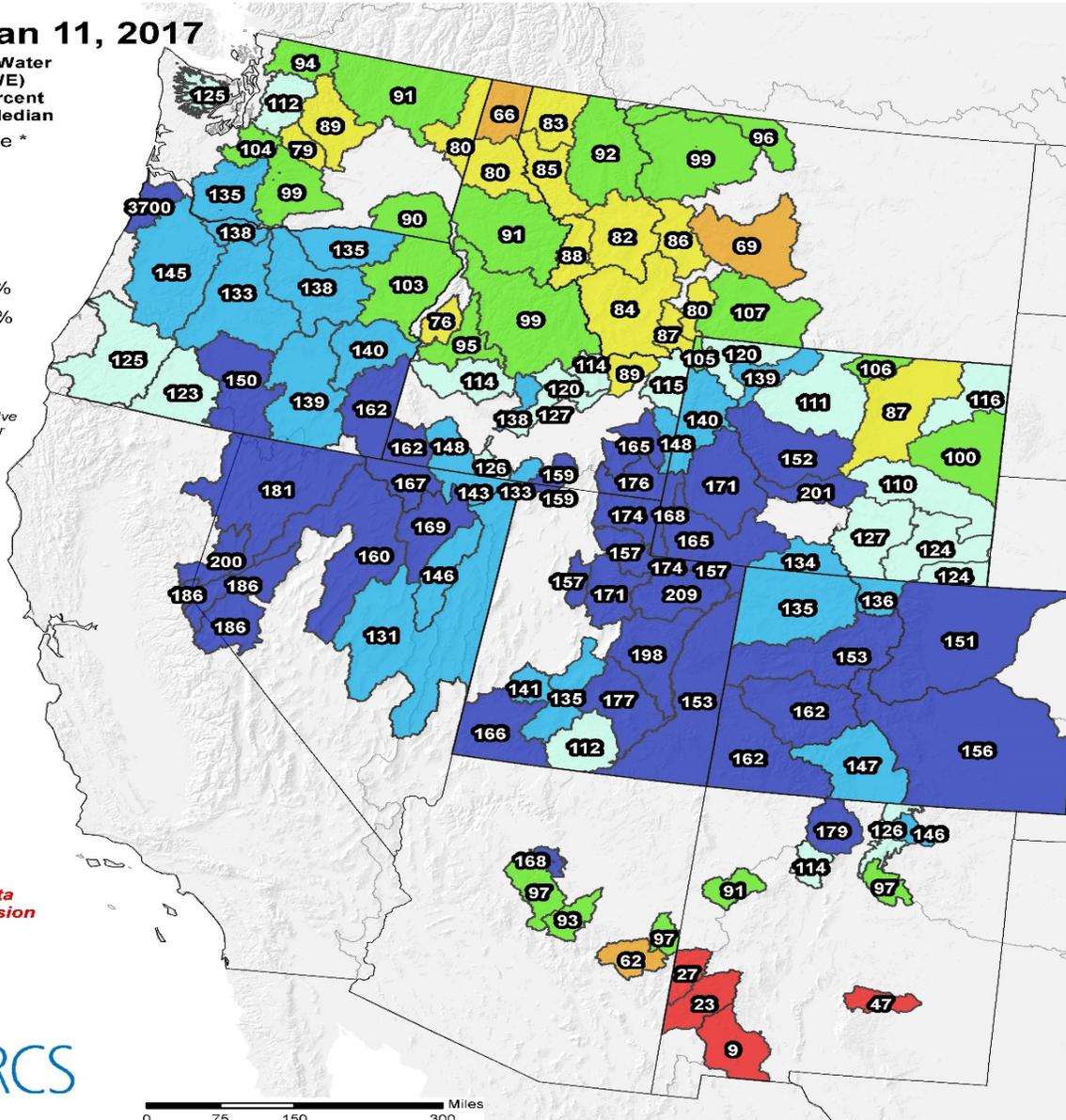
# Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Jan 11, 2017

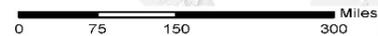
Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median



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



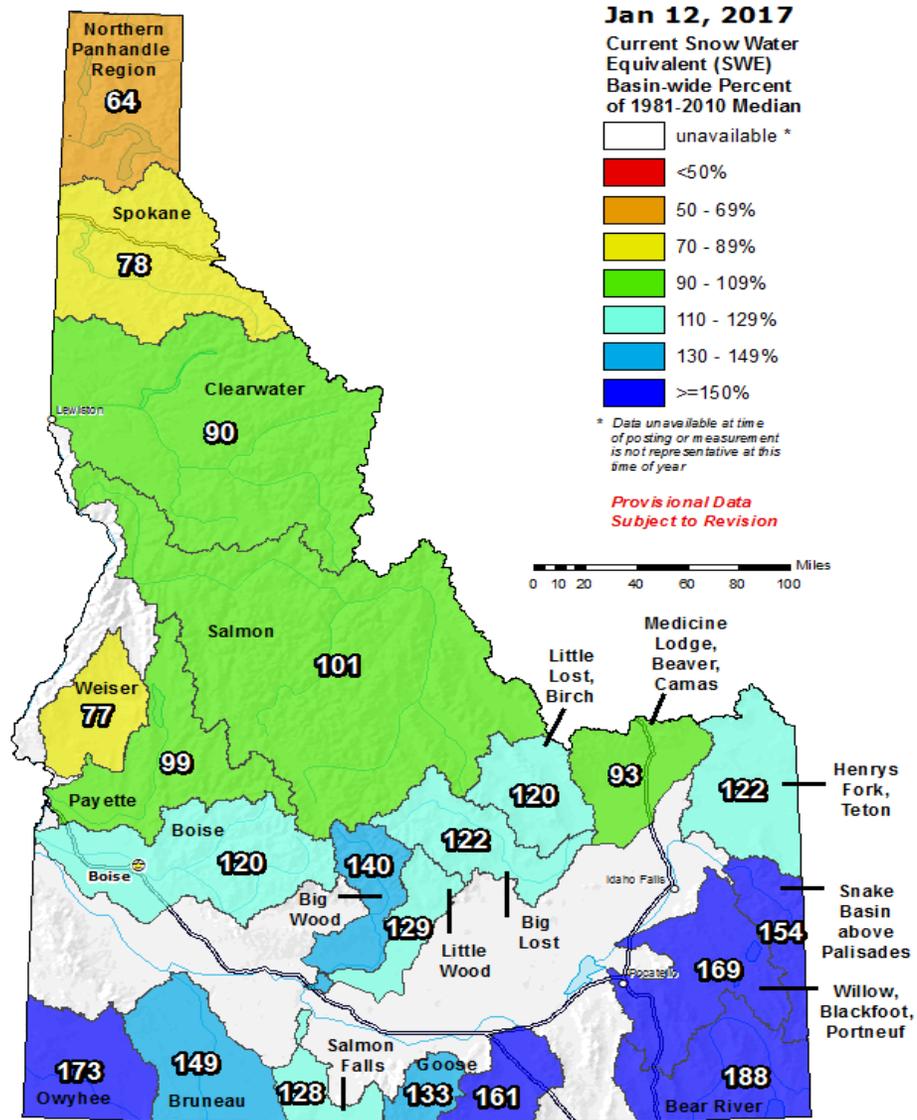
Provisional data subject to revision



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

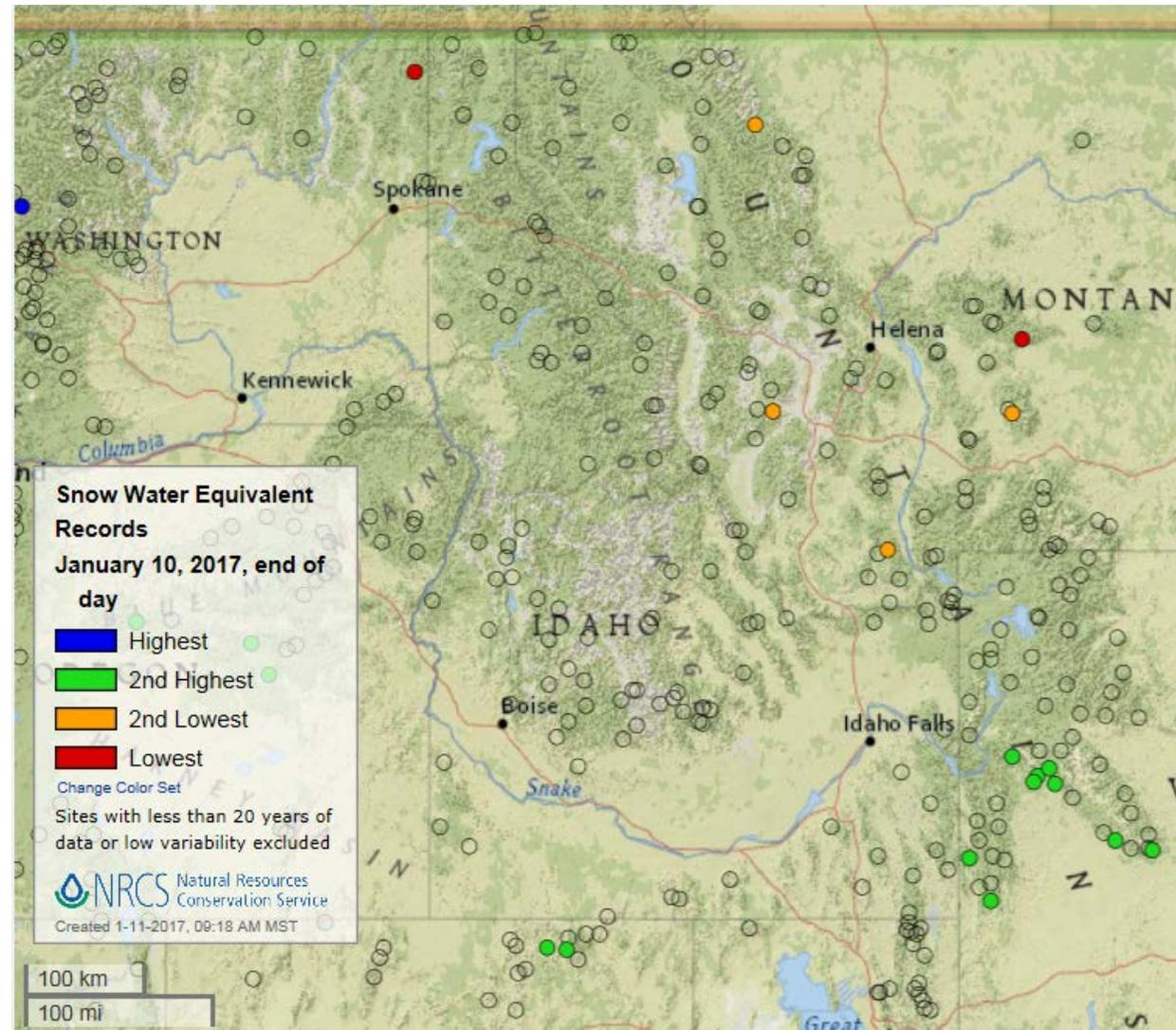
**Idaho SNOTEL Current Snow Water Equivalent (SWE) % of Normal**

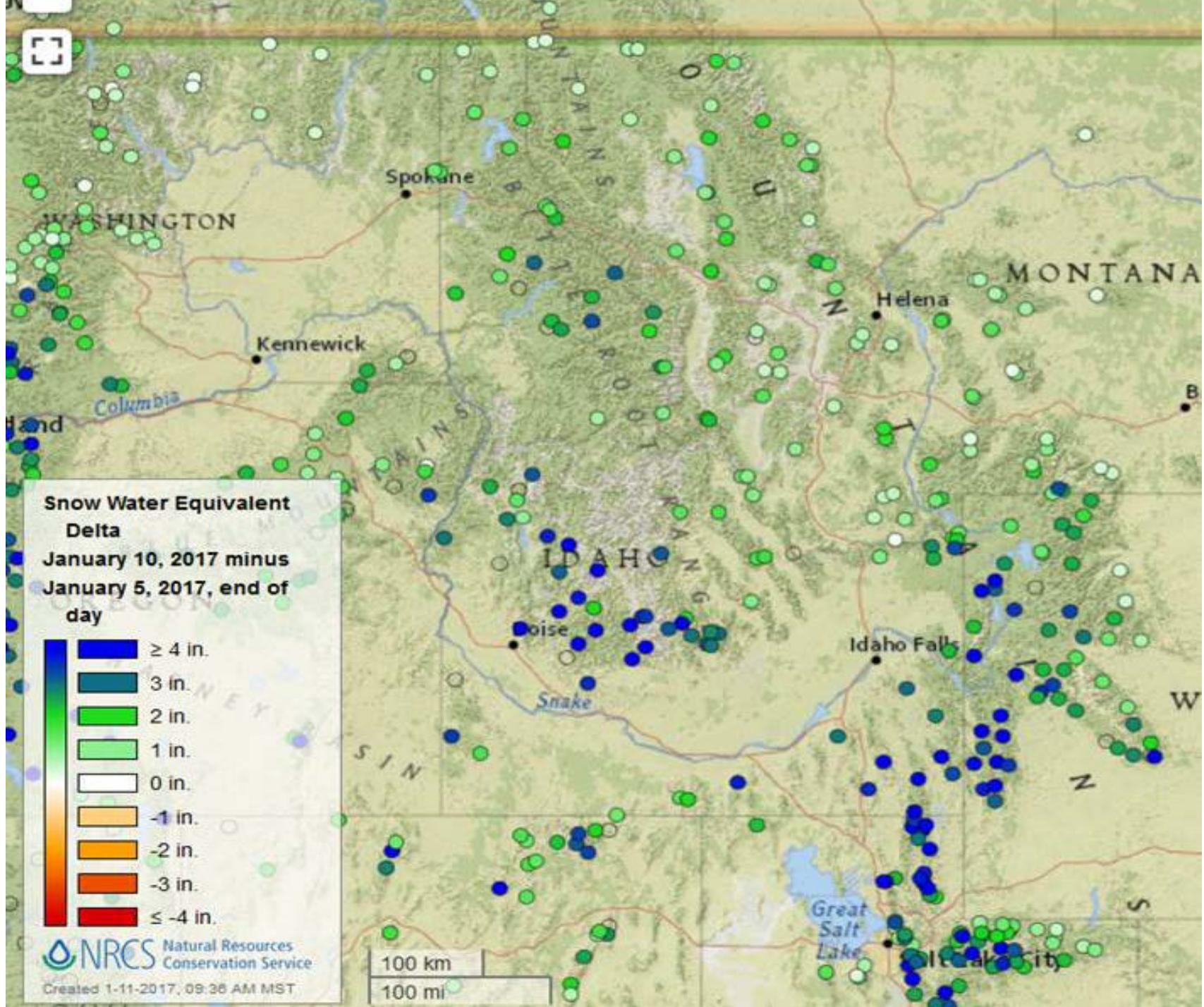


The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

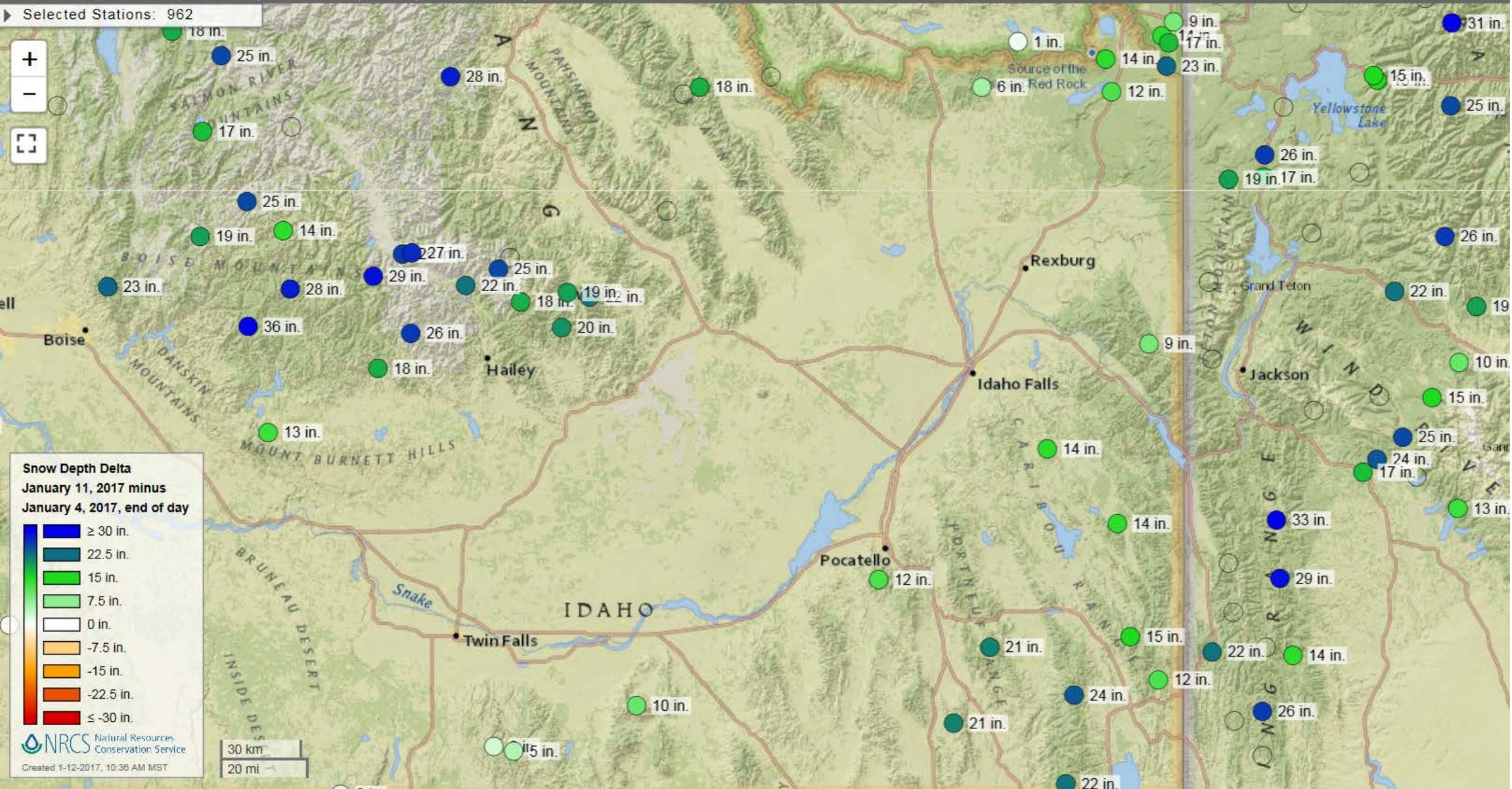
Prepared by:  
USDA/NRCS National Water and Climate Center  
Portland, Oregon  
<http://www.wcc.nrcs.usda.gov>

**As of Jan 11, snowpack as a Percent of Peak**  
**35-50% of Peak – Panhandle, Clearwater, Salmon, Weiser, Payette, & Mud Lake**  
**70-78% of Peak – Bear, Owyhee, Bruneau, Willow, Blackfoot, Snake abv Palisades & Big Wood**





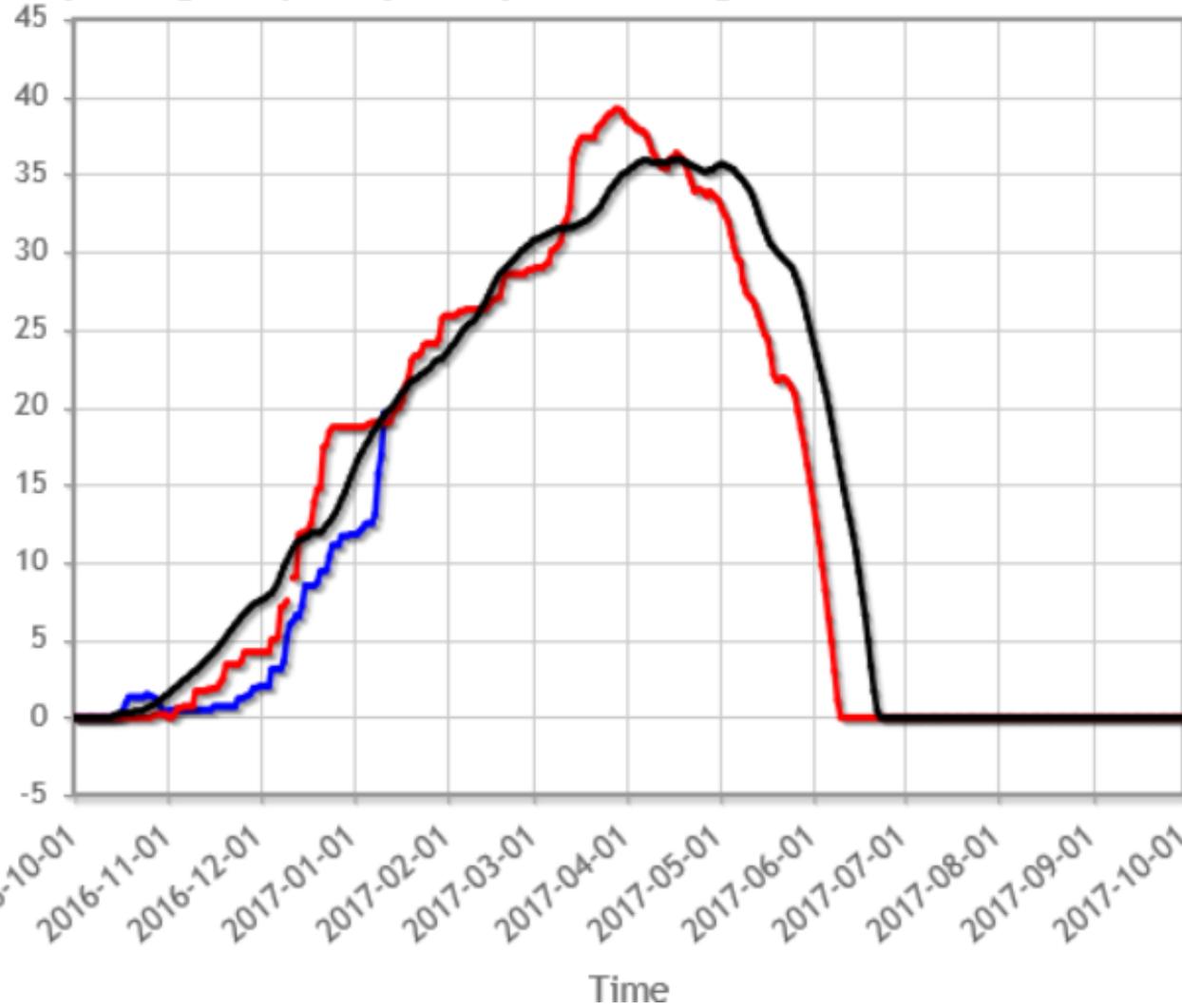
Selected Stations: 962



# Trinity Mtn. (830) Idaho SNOTEL Site - 7770 ft

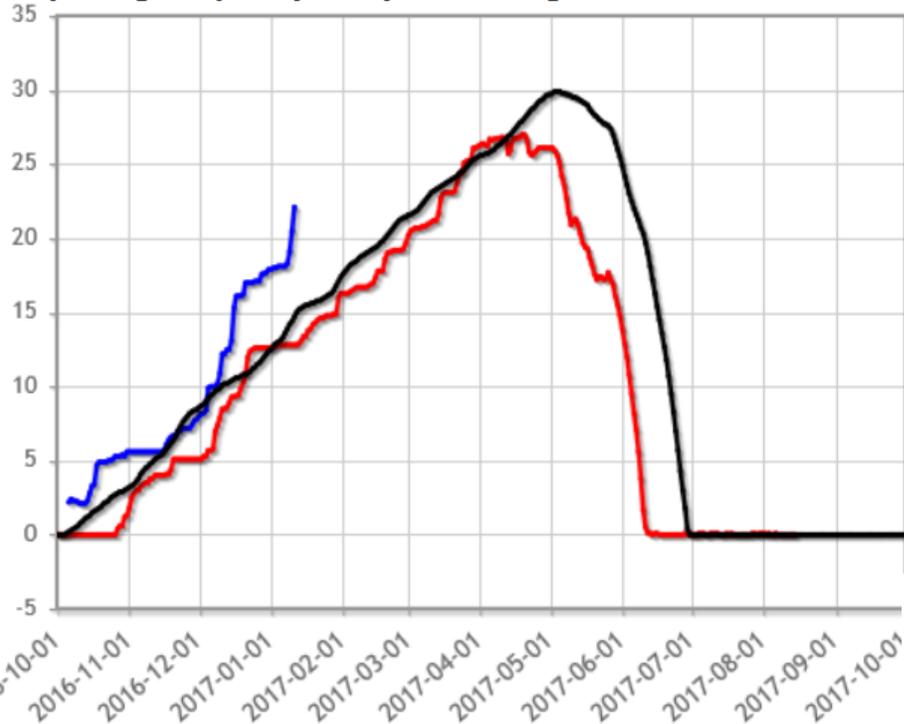
Reporting Frequency: Daily; Date Range: 2016-10-01 to 2017-09-30

Boise Basin SNOTEL sites.



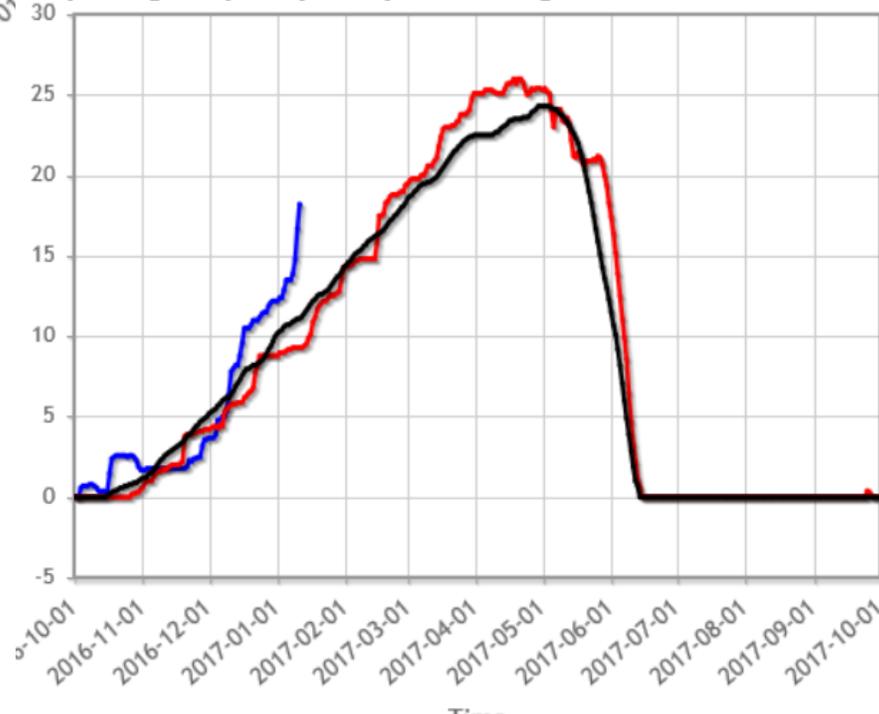
- Snow Water Equivalent (in) Start of Day Values
- Snow Water Equivalent (in) Start of Day Values
- Median Snow Water Equivalent (1981-2010) (in) Start of Day Values

**Two Ocean Plateau (837) Wyoming SNOTEL Site - 9240 ft**  
Reporting Frequency: Daily; Date Range: 2016-10-01 to 2017-09-30



Upper Snake in Wyoming SNOTEL sites.

**Spring Creek Divide (779) Wyoming SNOTEL Site - 9000 ft**  
Reporting Frequency: Daily; Date Range: 2016-10-01 to 2017-09-30



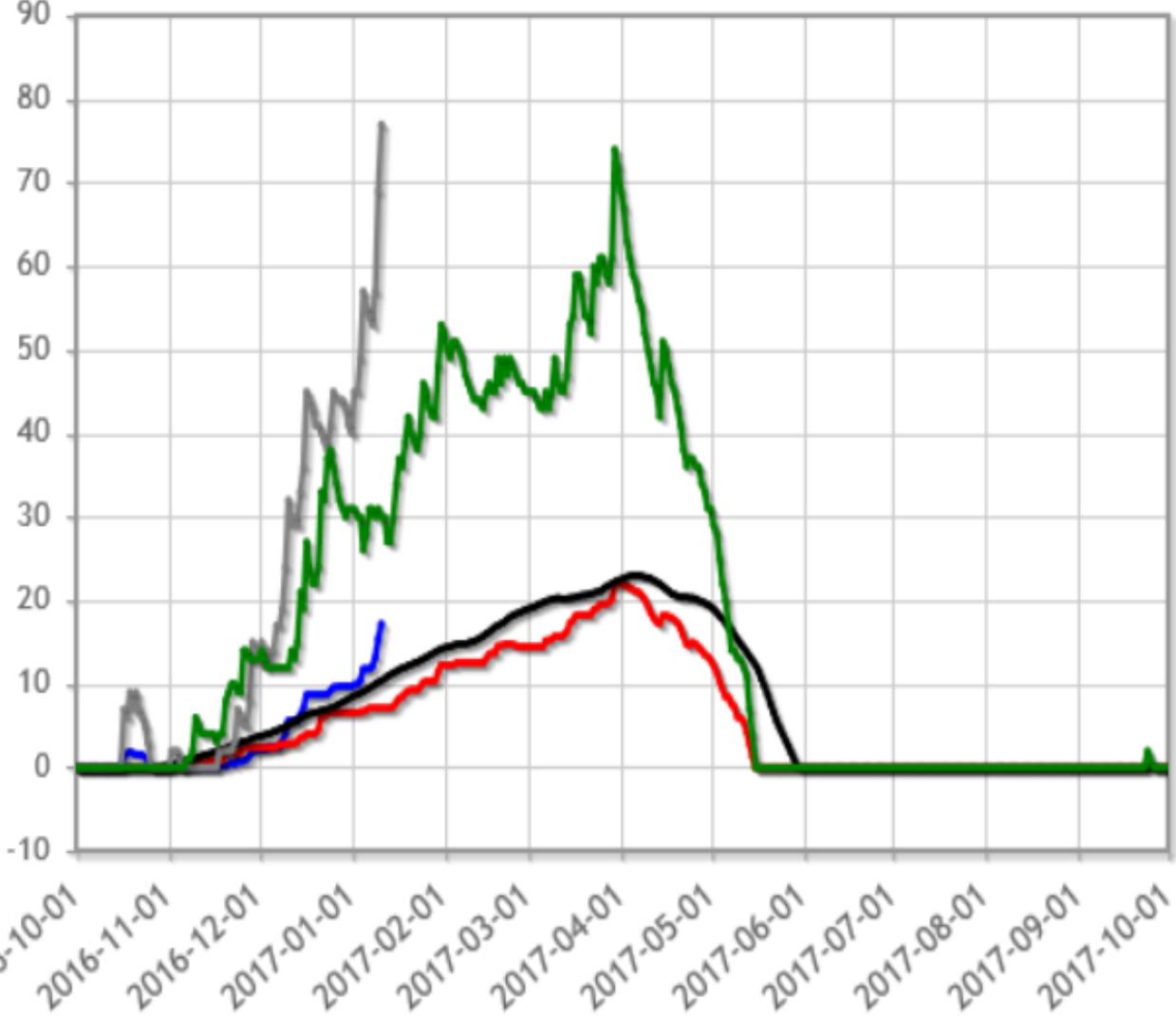
- Snow Water Equivalent (in) Start of Day Values
- Snow Water Equivalent (in) Start of Day Values
- Median Snow Water Equivalent (1981-2010) (in) Start of Day Values

# Southeast Idaho – Bear River Basin

## Emigrant Summit is between Montpelier and Preston

- 2017 SWE & Snow depth are about to exceed 2016 peaks.
- This is the earliest date we've seen Emigrant Summit SNOTEL exceed 80" of snow depth,
- Depth sensor installed 2002.
- We've exceeded 80" depth 3 times (2006, 2008, and 2010), but never this early.
- If next week's forecast and the extended forecasts ends up being wet, we might have some depth sensors buried in SE Idaho.

**Emigrant Summit (471) Idaho SNOTEL Site - 7390 ft**  
**Reporting Frequency: Daily; Date Range: 2016-10-01 to 2017-09-30**





**Where's the snow?**

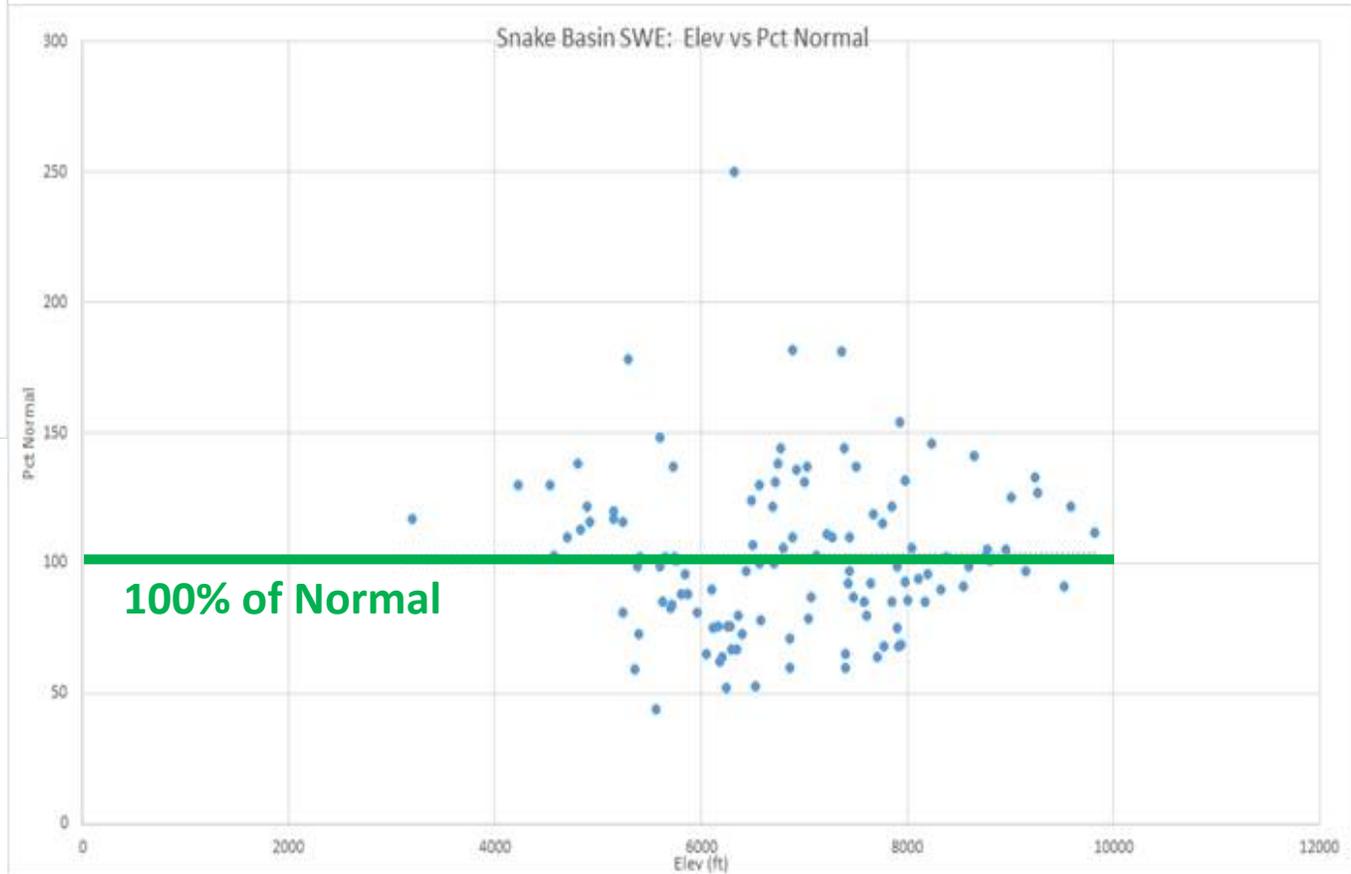
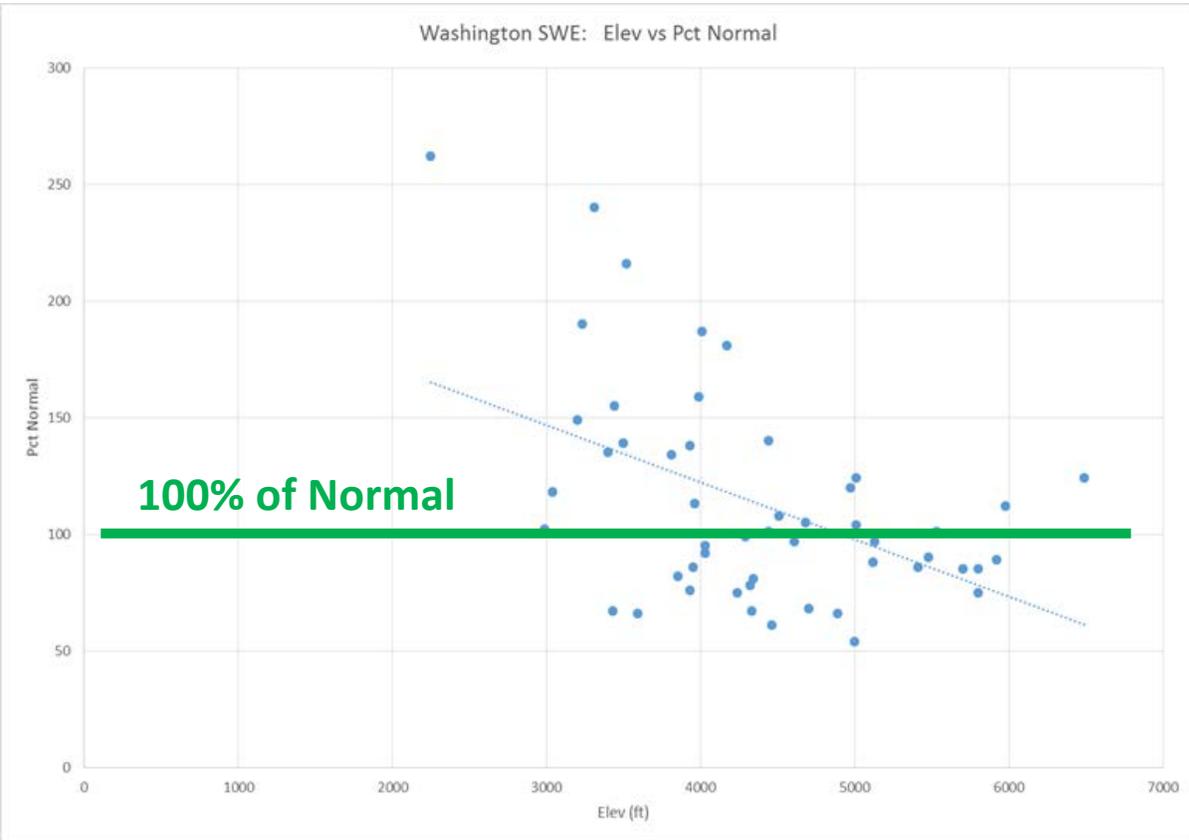
**Picture taken Jan 7, 2017 half way up Bogus Basin Road looking at the mid-elevations around 5,000 feet.**

**And my house at 2,880.5 feet**

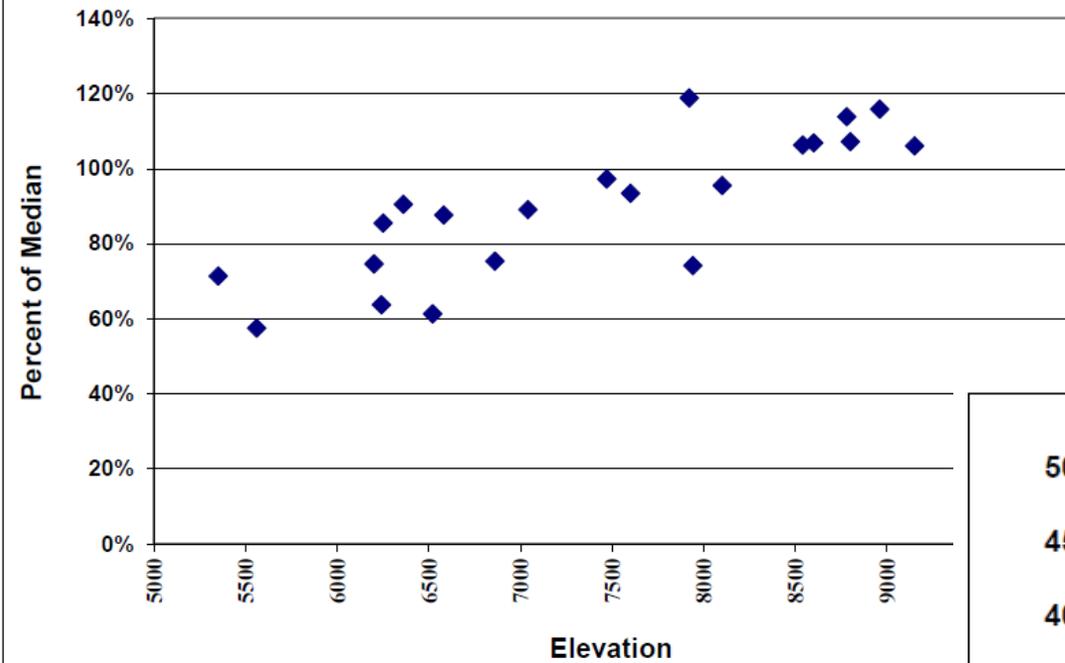


# Snow water Equivalent (SWE): Elevation vs Percent of Normal - Jan 9, 2017

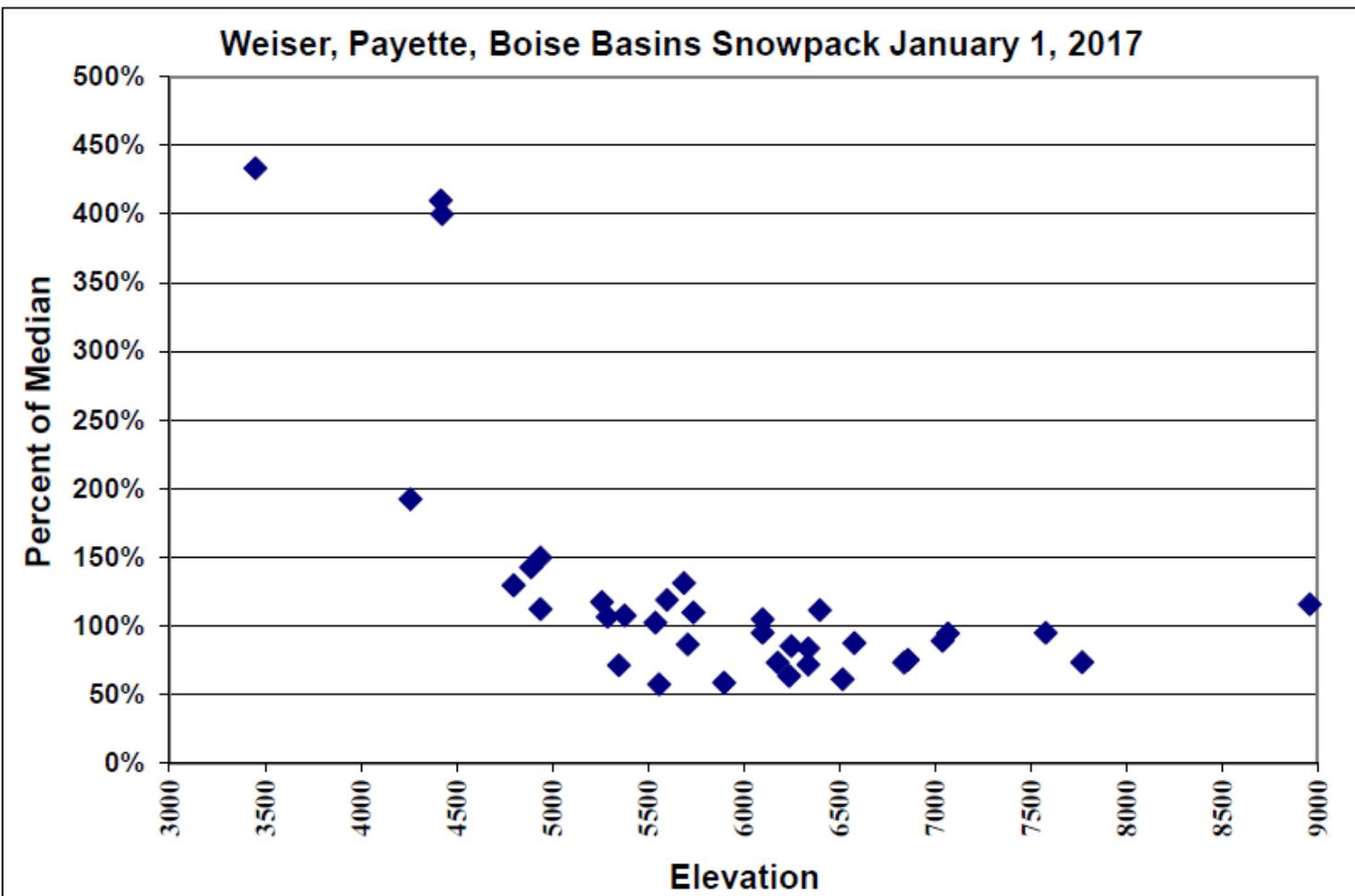
Based on SNOTEL Only



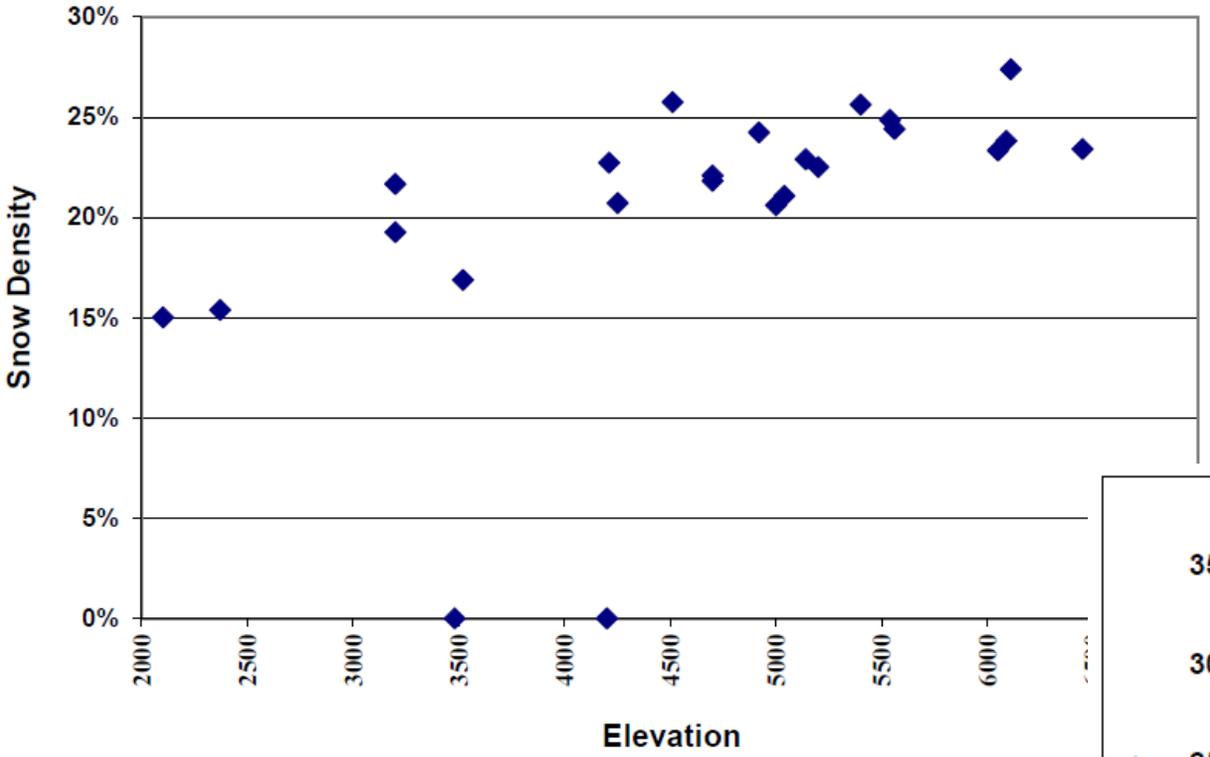
Salmon Basin Snowpack January 1, 2017



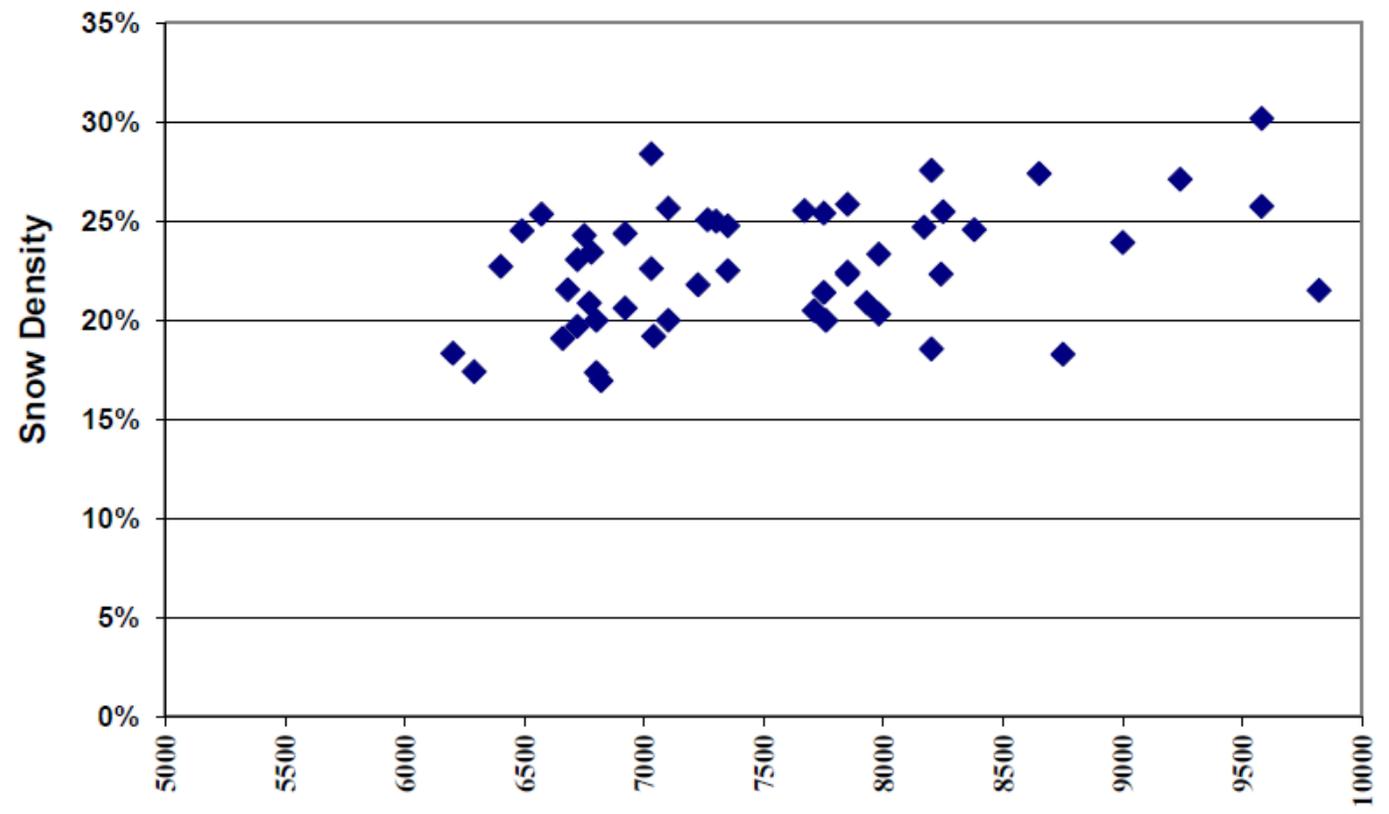
Weiser, Payette, Boise Basins Snowpack January 1, 2017



Panhandle Basins Snowpack January 1, 2017



Upper Snake Basins Snowpack January 1, 2017



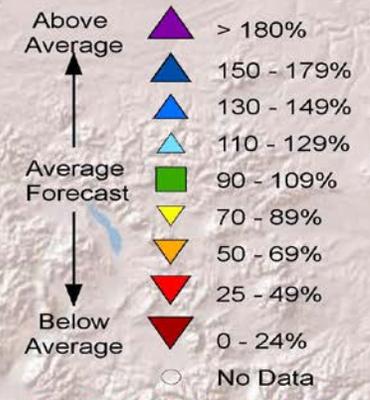
# IDAHO RESERVOIR STORAGE

## Usable Contents

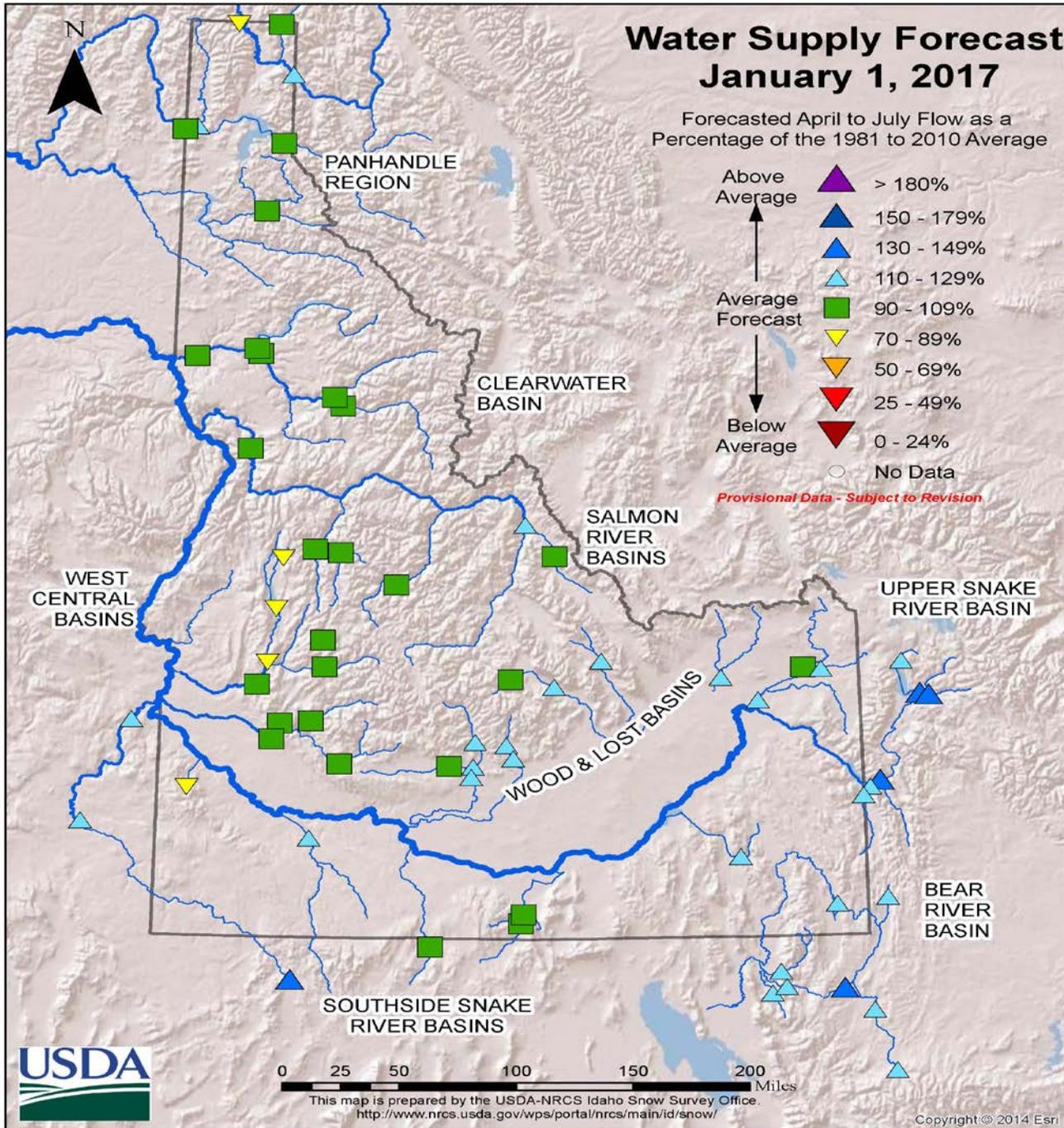
<b>Reservoir (s)</b>	<b>Percent of Capacity December 31, 2016</b>	<b>Percent of Average December 31, 2016</b>
<b>Oakley</b>	<b>21</b>	<b>80</b>
<b>Salmon Falls</b>	<b>22</b>	<b>97</b>
<b>Coeur d' Alene</b>	<b>23</b>	<b>59</b>
<b>Owyhee</b>	<b>30</b>	<b>68</b>
<b>Bear Lake</b>	<b>35</b>	<b>79</b>
<b>Magic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

# Water Supply Forecast January 1, 2017

Forecasted April to July Flow as a Percentage of the 1981 to 2010 Average



*Provisional Data - Subject to Revision*



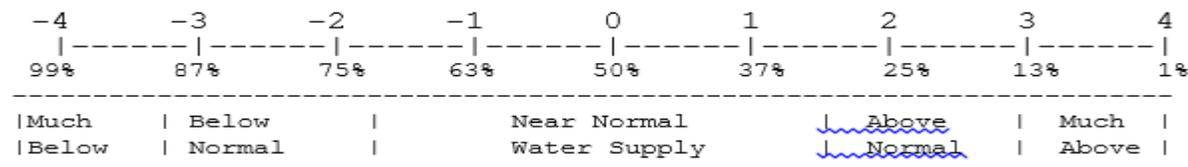
0 25 50 100 150 200 Miles  
This map is prepared by the USDA-NRCS Idaho Snow Survey Office.  
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

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IDAHO SURFACE WATER SUPPLY INDEX (SWSI) January 1, 2017

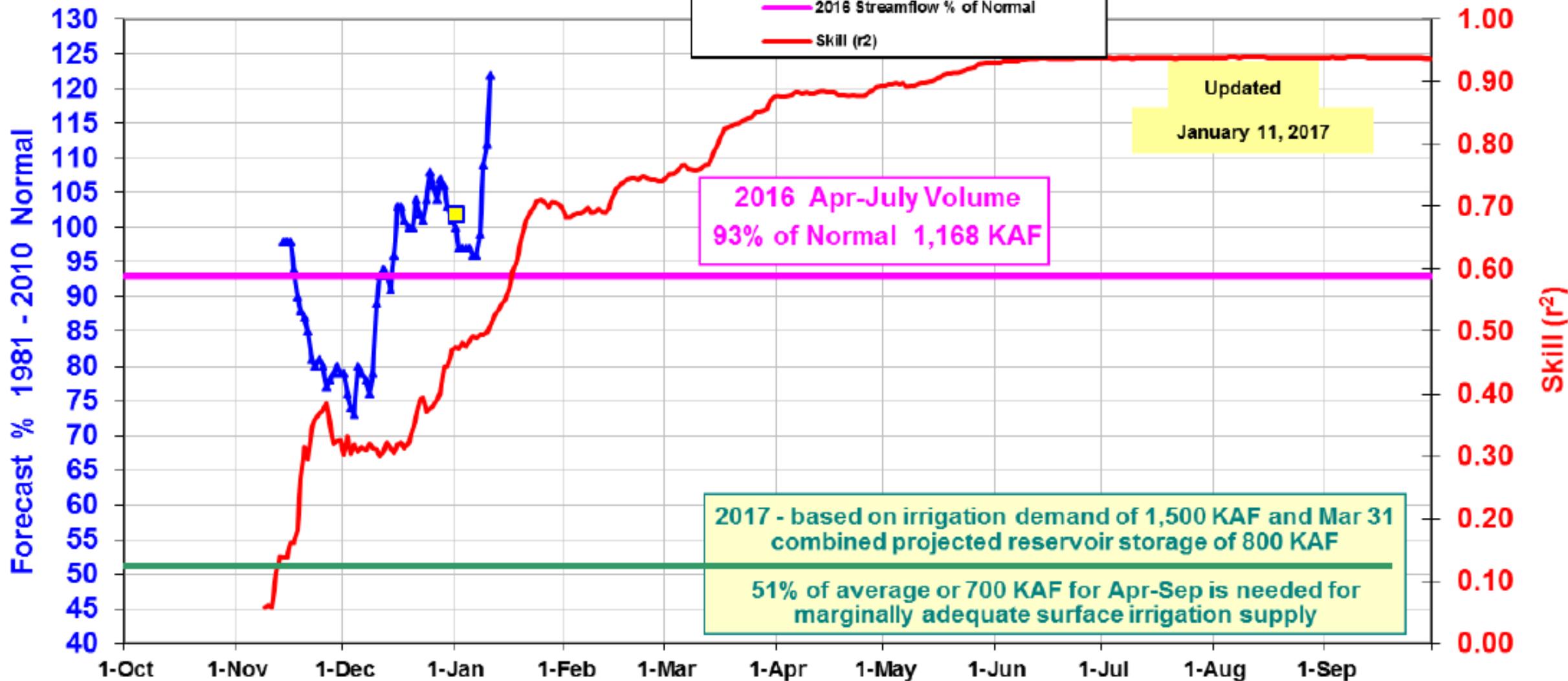
<i>BASIN or REGION</i>	<i>SWSI Value</i>	<i>Most Recent Year With Similar SWSI Value</i>	<i>Agricultural Water Supply Shortage May Occur When SWSI is Less Than</i>
Spokane	-0.5	2013	NA
Clearwater	1.1	1990	NA
Salmon	0.0	2016	NA
Weiser	-0.7	2016	NA
Payette	-0.2	2000	NA
Boise	1.3	2009	-1.5
Big Wood	1.8	2011	0.8
Little Wood	1.8	2011	-1.2
Big Lost	1.6	2011	0.8
Little Lost	1.8	2011	1.5
Teton	1.1	2009	-3.9
Henrys Fork	0.2	2007	-1.7
Snake (Heise)	1.8	2009	-1.7
Oakley	0.5	2012	0.8
Salmon Falls	1.8	1996	-0.6
Bruneau	1.1	2005	NA
Owyhee	1.4	1993	-2.1
Bear River	0.0	2014	-3.7

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



# 2017 Boise River near Boise: Apr - Jul Volume

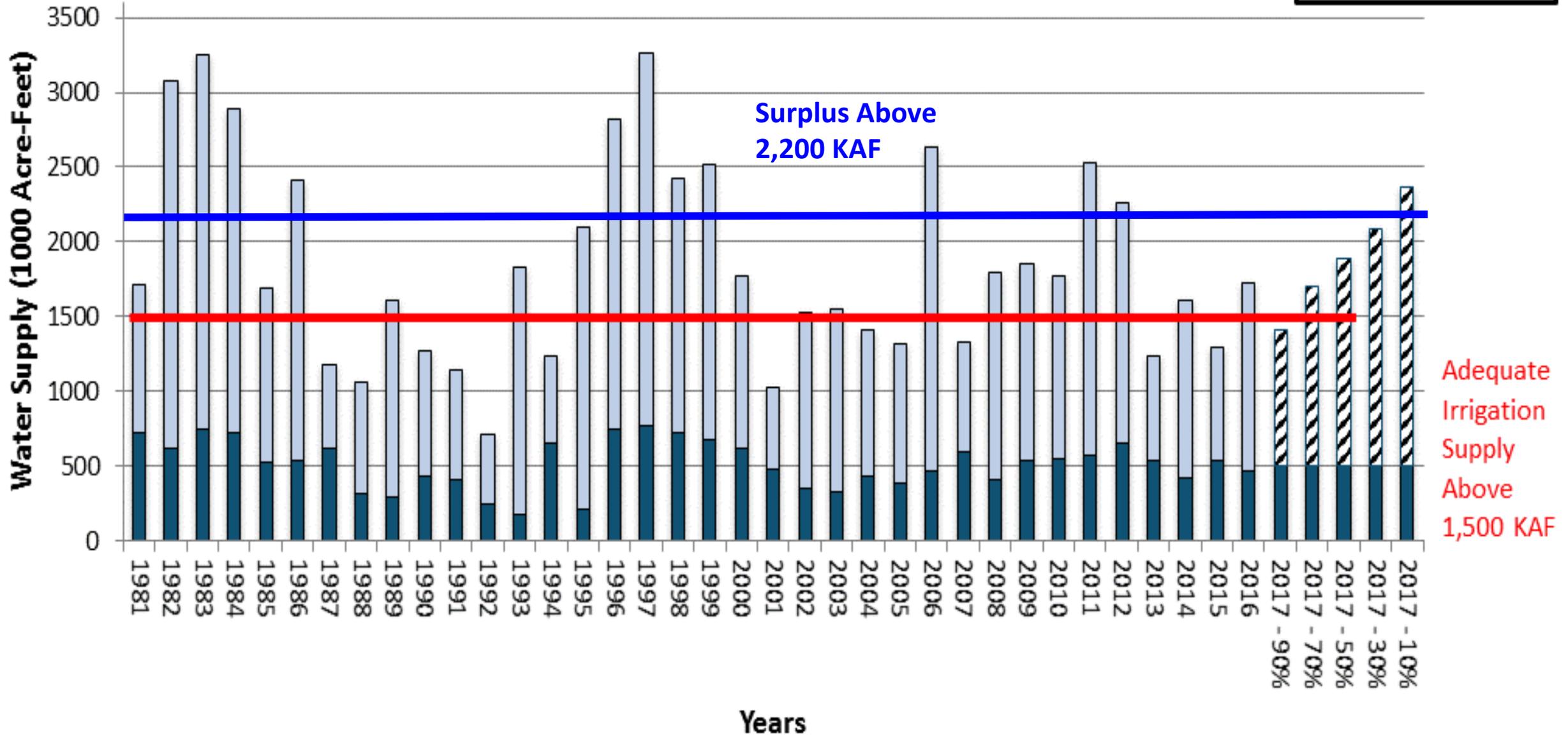
## NRCS Monthly Forecasts are Squares



SNOTEL Sites used: Atlanta Summit, Trinity Mountain, Dollarhide Summit, Vienna Mine, Galena and Galena Summit

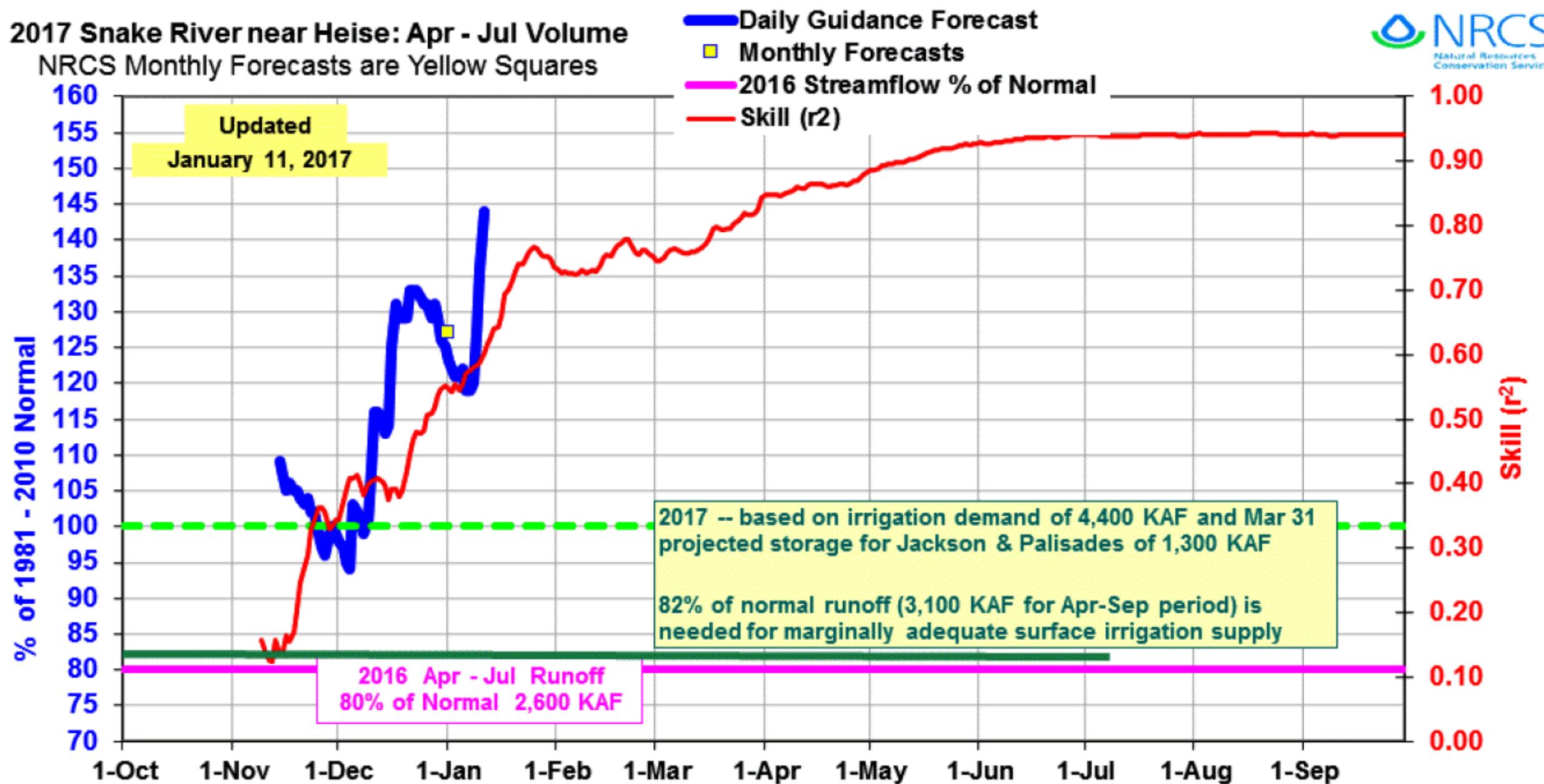
# Jan 1 Historic and Forecasted Surface Water Supply Boise River Basin

StreamFlow Apr-Sep  
 Reservoir 31-Dec



# 2017 Snake River near Heise: Apr - Jul Volume

NRCS Monthly Forecasts are Yellow Squares

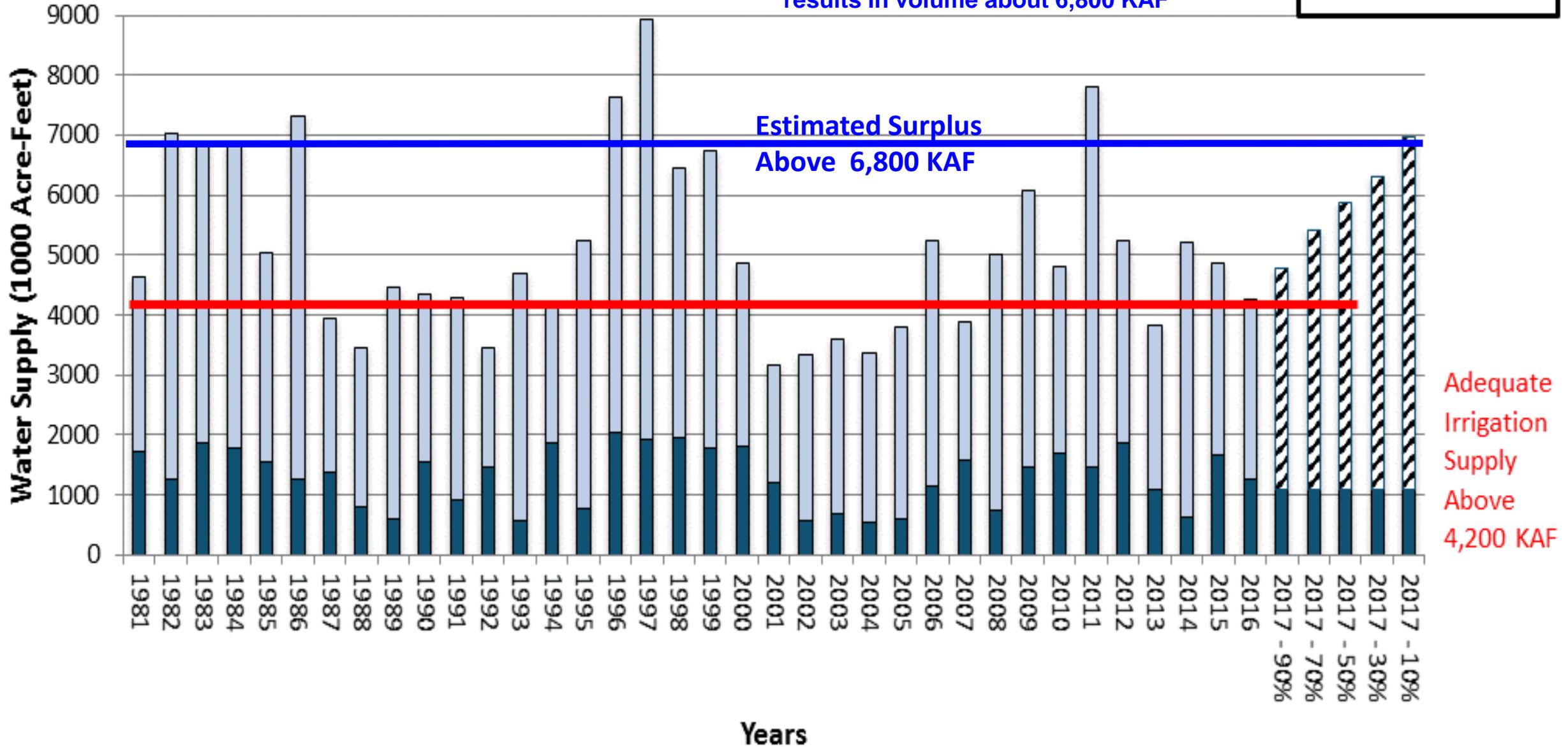


SNOTELs used: Base Camp, Blind Bull, Cottonwood Ck, Lewis Lake, Snake River Station, Slug Ck, Thumb Div, Willow Ck

# Jan 1 Historic and Forecasted Surface Water Supply Snake River Near Heise

Estimated Surplus based on flow > 21,000 @ Blackfoot  
results in volume about 6,800 KAF

StreamFlow Apr-Sep  
 Reservoir 31-Dec





# Questions, Comments, Corrections

Full moon  
Rising  
Jan 11, 2017





**Summary Table: Amount of streamflow needed in 2017 for adequate surface irrigation supplies.**

Created November 8, 2016

Fall reservoir carryover storage is used to project spring reservoir storage levels based on current conditions and recent trends. Then, by knowing the adequate irrigation water supply needed in your basin, the projected spring reservoir volumes are subtracted from the adequate irrigation supply to determine the volume of streamflow to marginally meet adequate surface irrigation supplies in 2017.

**As of November 8, 2016: Projected change in reservoir storage from Fall 2016 to target levels in Spring 2017 which is when the runoff period starts for the streamflow forecasts.**

	Oct 31 storage KAF	Observed Nov 30 storage KAF	Observed Dec 31 storage KAF	Projected Jan 31 Storage KAF	Projected Feb 28 storage KAF	Projected Mar 31 storage KAF	Estimated change in storage KAF
Boise Reservoir System	422.0	466.0	501.2	---	---	800	378
Magic Reservoir	65.0	78.2	83.5	---	---	105	40
Little Wood Reservoir	12.4	17.2	20.2	---	24	---	12
Mackay Reservoir	14.7	28.2	34.0	---	---	40	25
Jackson & Palisades Reservoir System	800.0	976.0	1086.7	---	---	1300	500
Oakley Reservoir	11.5	13.8	16.2	---	22	---	11
Salmon Falls Reservoir	35.0	36.8	39.3	---	50	---	15
Lake Owyhee	179.0	193.9	212.9	260	---	---	81
Bear Lake	440.0	446.8	459.1	---	---	500	60

**Fall reservoir storage was used to project spring storage levels, so far still on track.**

Other basins, Spokane, Clearwater, Salmon, Weiser, Payette and Bruneau basins, the surface agricultural irrigation demand is not known or relevant. For the Henrys Fork basin, recent diversion data has not been loaded in our AWDB streamflow database.

**Summary Table: Amount of streamflow needed in 2017 for adequate surface irrigation supplies.**

Created November 8, 2016

Fall reservoir carryover storage is used to project spring reservoir storage levels based on current conditions and recent trends. Then, by knowing the adequate irrigation water supply needed in your basin, the projected spring reservoir volumes are subtracted from the adequate irrigation supply to determine the volume of streamflow to marginally meet adequate surface irrigation supplies in 2017.

Column 1 Basin	Column 2 - Amount needed for adequate irrigation water supply KAF	Column 3 = Projected end of month reservoir storage (Jan, Feb or Mar) KAF	Column 4 2017 streamflow volume needed for adequate water supply KAF	Col4/Col6 X 100= Col 5 % of average streamflow to meet adequate irrigation supply in 2017 KAF	6 1981-2010 average streamflow KAF	7 Streamflow runoff period used in the analysis	9 2016 Streamflow Runoff  KAF / % of average	
<b>Boise</b>	1500	800	700	51%	1360	Apr-Sep	1255	92%
<b>Big Wood</b>	275	105	170	64%	265	Apr-Sep	186	70%
<b>Little Wood</b>	60	24	36	39%	92	<b>Mar-Sep</b>	66.4	72%
<b>Big Lost</b>	180	40	140	93%	150	Apr-Sep	119.4	80%
<b>Little Lost</b>	40	---	40	118%	34	Apr-Sep	26.9	79%
<b>Teton</b>	85	---	85	44%	193	Apr-Sep	140	73%
<b>Snake (Heise)</b>	4,400	1300	3100	82%	3,780	Apr-Sep	3000	79%
<b>Oakley</b>	50	22	28	90%	31	<b>Mar-Sep</b>	27.4	88%
<b>Salmon Falls</b>	110	50	60	71%	85	<b>Mar-Sep</b>	109	128%
<b>Owyhee</b>	575	260	315	47%	665	<b>Feb-Sep</b>	545	82%
<b>Bear River</b>	280	500	0	0%	205	Apr-Sep	145.5	71%