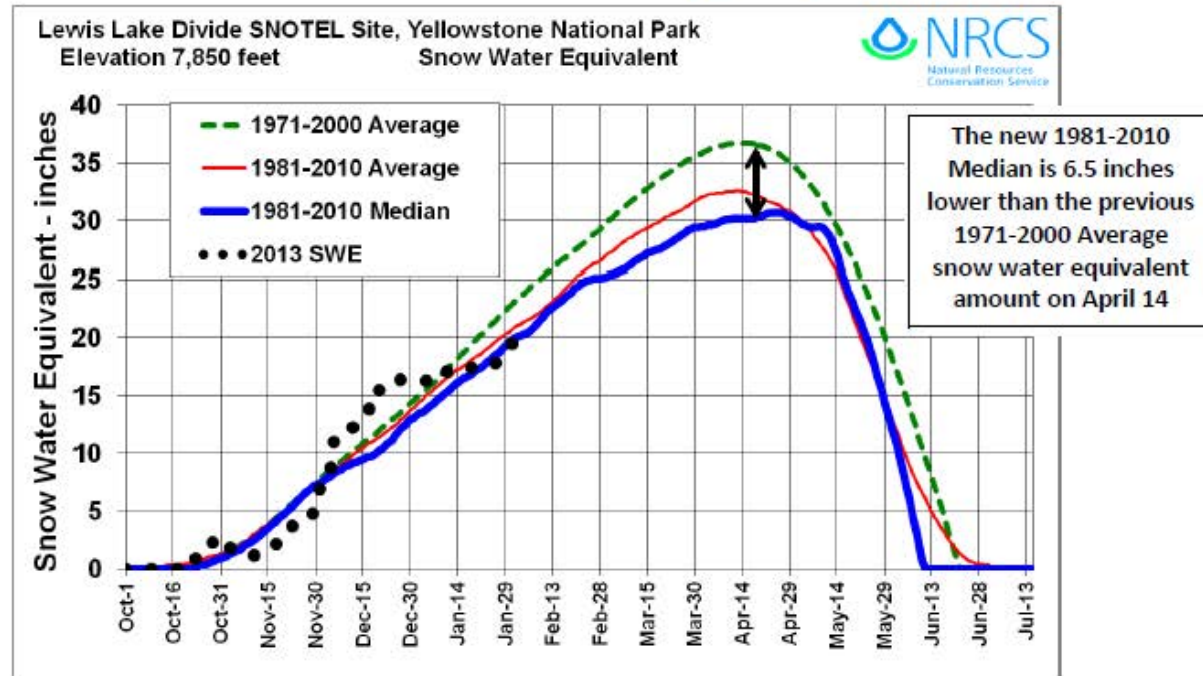


# Idaho Water Supply Outlook



# Idaho Water Supply Outlook Report February 1, 2013

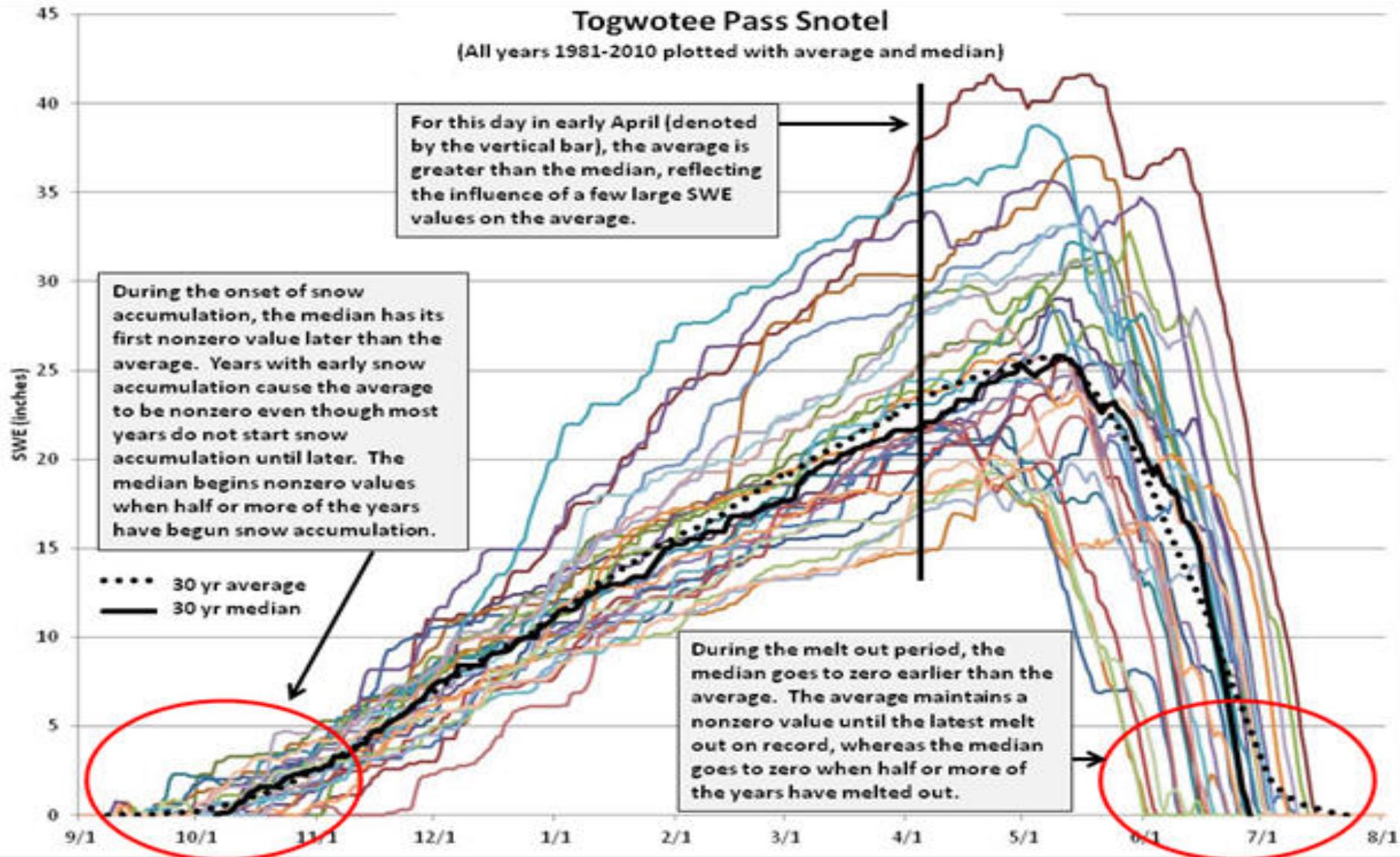
## IDWR State Water Supply Meeting February 14 2013



### Use of Median vs. Average to Compare Snow Water Content

Although *average* is a commonly-used and well understood statistic, *median* is also a common descriptor used to express a "middle" value in a set of data. This "middle" value is also known as the *central tendency*. Median is determined by ranking the data from largest to smallest, and then identifying the middle so that there are an equal number of data values larger and smaller than it is. While the average and median can be the same or nearly the same, they are different if more of the data values are clustered toward one end of their range and/or if there are a few extreme values. In statistical terminology, this is called *skewness*. In this case, the average can be significantly influenced by the few values, making it not very representative of the majority of the values in the data set. Under these circumstances, median gives a better representation of central tendency than average.

# Why use Median for SWE?

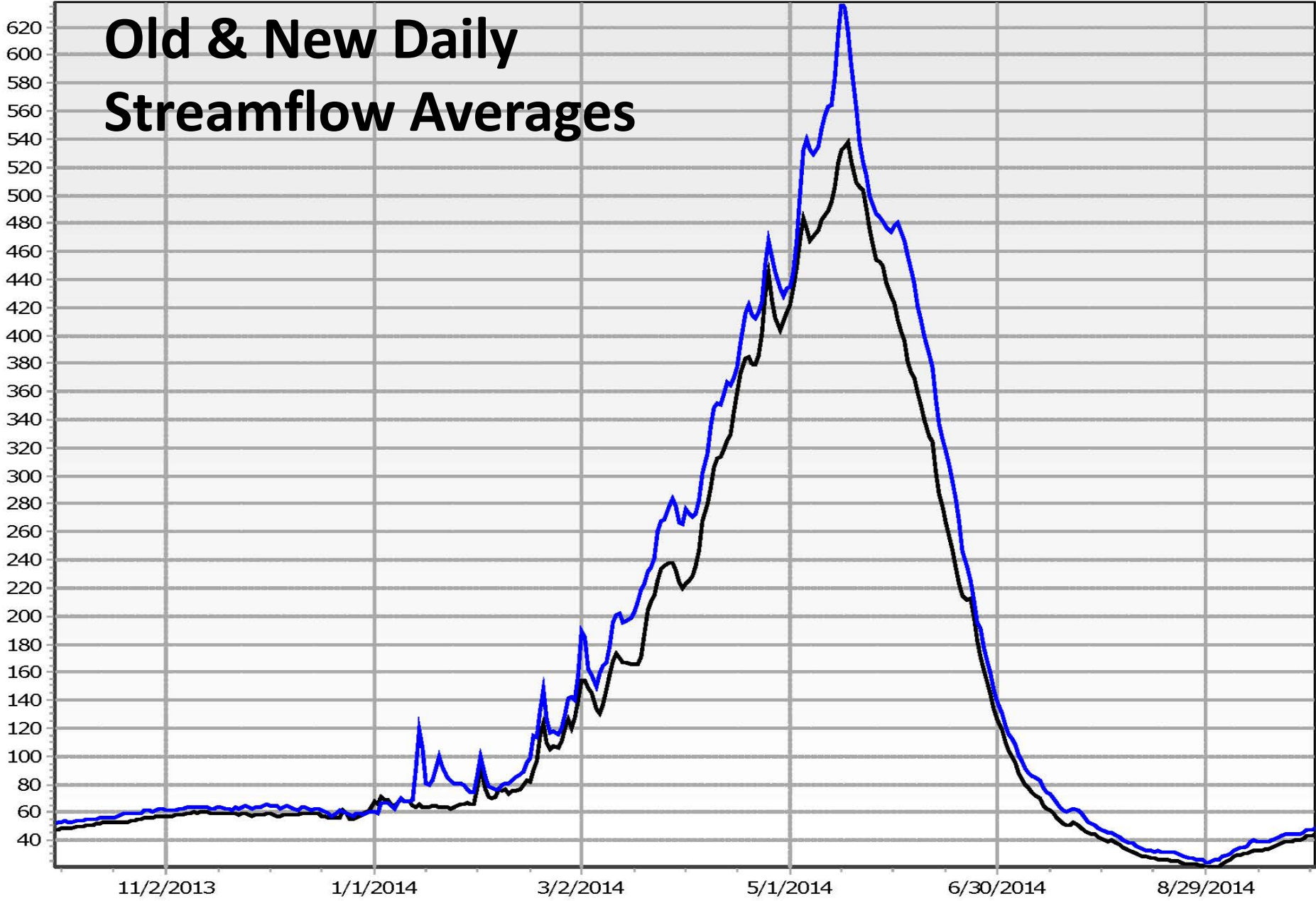




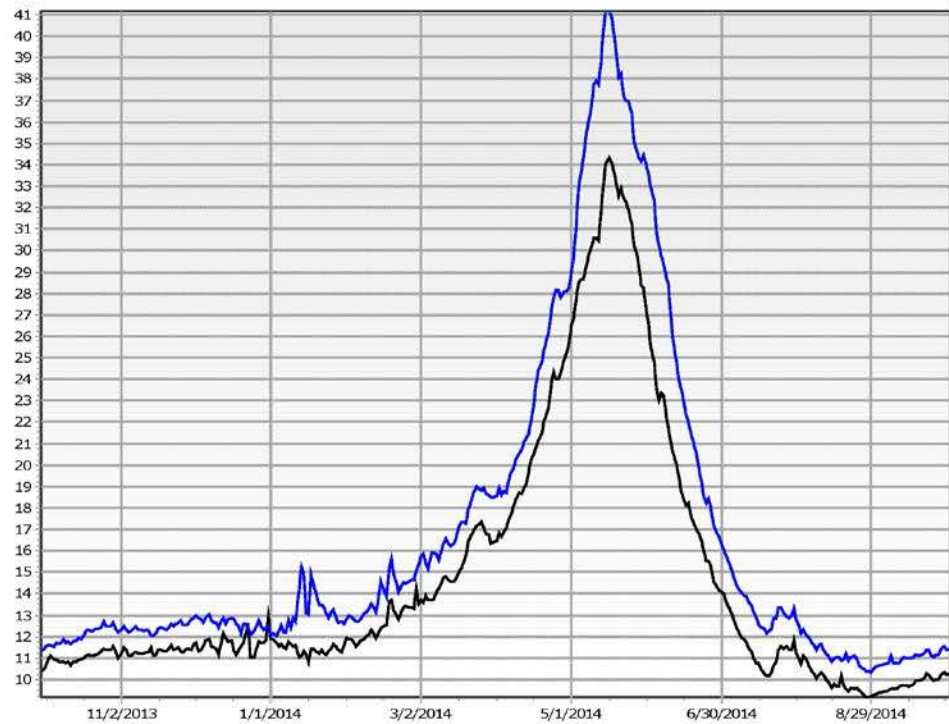
<b>Basin</b>	<b># Sites</b>	<b>February 1 SWE as % of 1971-2000 Average</b>	<b>February 1 SWE as % of 1981-2010 Median</b>	<b>Difference</b>
<b>Medicine Lodge, Beaver, Camas Basins</b>	<b>4</b>	<b>98%</b>	<b>113%</b>	<b>15%</b>
<b>Snake above Palisades</b>	<b>17</b>	<b>81%</b>	<b>95%</b>	<b>14%</b>
<b>Little Lost, Birch Basins</b>	<b>4</b>	<b>101%</b>	<b>115%</b>	<b>13%</b>
<b>Goose</b>	<b>2</b>	<b>77%</b>	<b>90%</b>	<b>13%</b>
<b>Snake Basin Above American Falls</b>	<b>27</b>	<b>82%</b>	<b>95%</b>	<b>13%</b>
<b>Bear River Basin</b>	<b>15</b>	<b>73%</b>	<b>85%</b>	<b>12%</b>
<b>Big Lost</b>	<b>4</b>	<b>118%</b>	<b>130%</b>	<b>12%</b>
<b>Henreys Fork, Teton Basins</b>	<b>7</b>	<b>90%</b>	<b>101%</b>	<b>12%</b>
<b>Willow, Blackfoot, Portneuf Basins</b>	<b>6</b>	<b>69%</b>	<b>80%</b>	<b>11%</b>
<b>Salmon</b>	<b>22</b>	<b>91%</b>	<b>101%</b>	<b>10%</b>
<b>Raft Basin</b>	<b>1</b>	<b>95%</b>	<b>104%</b>	<b>9%</b>
<b>Big Wood</b>	<b>9</b>	<b>93%</b>	<b>102%</b>	<b>9%</b>
<b>Spokane</b>	<b>9</b>	<b>74%</b>	<b>83%</b>	<b>9%</b>
<b>Payette</b>	<b>9</b>	<b>86%</b>	<b>94%</b>	<b>9%</b>
<b>Clearwater</b>	<b>14</b>	<b>78%</b>	<b>86%</b>	<b>8%</b>
<b>Salmon Falls Basins</b>	<b>5</b>	<b>76%</b>	<b>84%</b>	<b>8%</b>
<b>Bruneau Basin</b>	<b>5</b>	<b>88%</b>	<b>95%</b>	<b>8%</b>
<b>Boise</b>	<b>9</b>	<b>75%</b>	<b>82%</b>	<b>8%</b>
<b>Weiser</b>	<b>3</b>	<b>74%</b>	<b>82%</b>	<b>8%</b>
<b>Little Wood</b>	<b>4</b>	<b>108%</b>	<b>116%</b>	<b>7%</b>
<b>Owyhee Basin</b>	<b>7</b>	<b>76%</b>	<b>83%</b>	<b>7%</b>
<b>Northern Panhandle</b>	<b>7</b>	<b>97%</b>	<b>104%</b>	<b>6%</b>

SALMON FALLS Ck 81-10 SALMON FALLS Ck 71-00

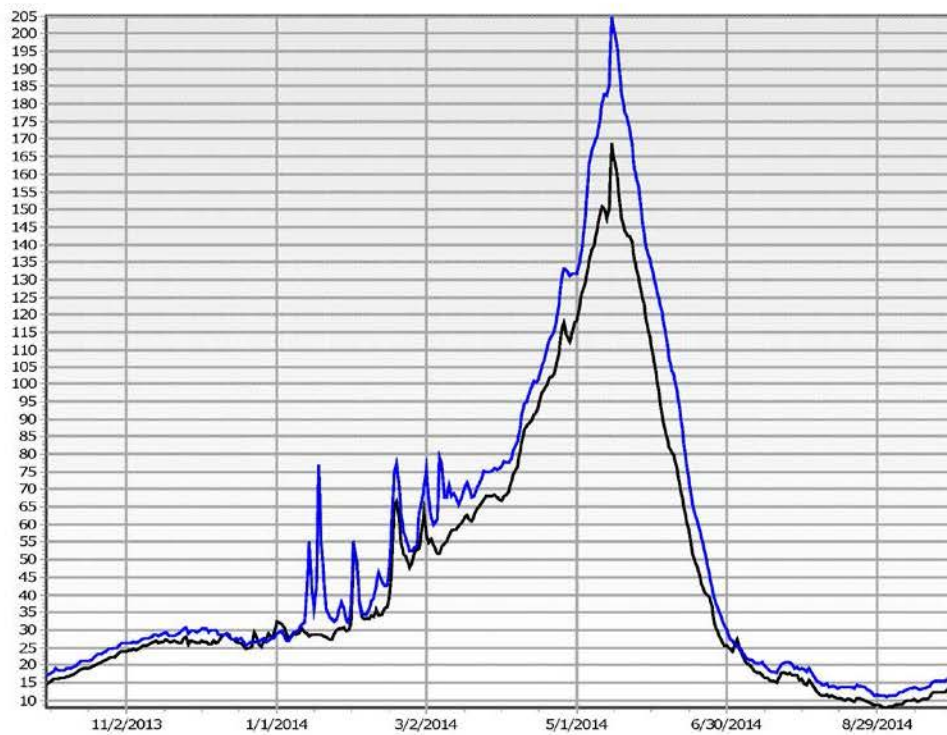
# Old & New Daily Streamflow Averages



— TRAPPER Ck 81-10 — TRAPPER Ck 71-00



— GOOSE Ck 81-10 — GOOSE Ck 71-00



Streamflow Average Comparison

Acre-feet

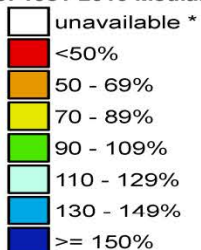
*Big Wood R ab Magic Reservoir			*Oakley Reservoir Inflow			*Salmon Falls Ck nr San Jacinto				
Month	81-10 Ave Big Wood*	71-00 Ave Big Wood*	% decrease from 71-00	81-10 Ave Oakley*	71-00 Ave Oakley*	% decrease from 71-00	81-10 Ave Salmon Falls*	71-00 Ave Salmon Falls*	% decrease from 71-00	Month
Oct	5676	6833	-17%	1838	2063	-11%	3216	3510	-8%	Oct
Nov	5718	6990	-18%	2217	2420	-8%	3509	3790	-7%	Nov
Dec	4012	5080	-21%	2371	2497	-5%	3574	3810	-6%	Dec
Jan	3872	4657	-17%	2509	3047	-18%	4068	4887	-17%	Jan
Feb	3694	4587	-19%	3242	3677	-12%	5223	5973	-13%	Feb
Mar	7790	9533	-18%	4675	5450	-14%	11160	13283	-16%	Mar
Apr	22400	24903	-10%	6782	7690	-12%	20304	22673	-10%	Apr
May	58032	62683	-7%	10382	12717	-18%	29455	33447	-12%	May
Jun	66439	73200	-9%	4647	6033	-23%	15958	19110	-16%	Jun
Jul	22793	29113	-22%	1861	2160	-14%	4053	4797	-16%	Jul
Aug	7010	7973	-12%	1266	1580	-20%	1721	2077	-17%	Aug
Sep	5114	6193	-17%	1218	1490	-18%	2034	2370	-14%	Sep
Period										Period
Apr-Jul	169663	189900	-11%	23672	28600	-17%	69769	80027	-13%	Apr-Jul
Apr-Sep	181787	204067	-11%	26156	31670	-17%	73524	84473	-13%	Apr-Sep



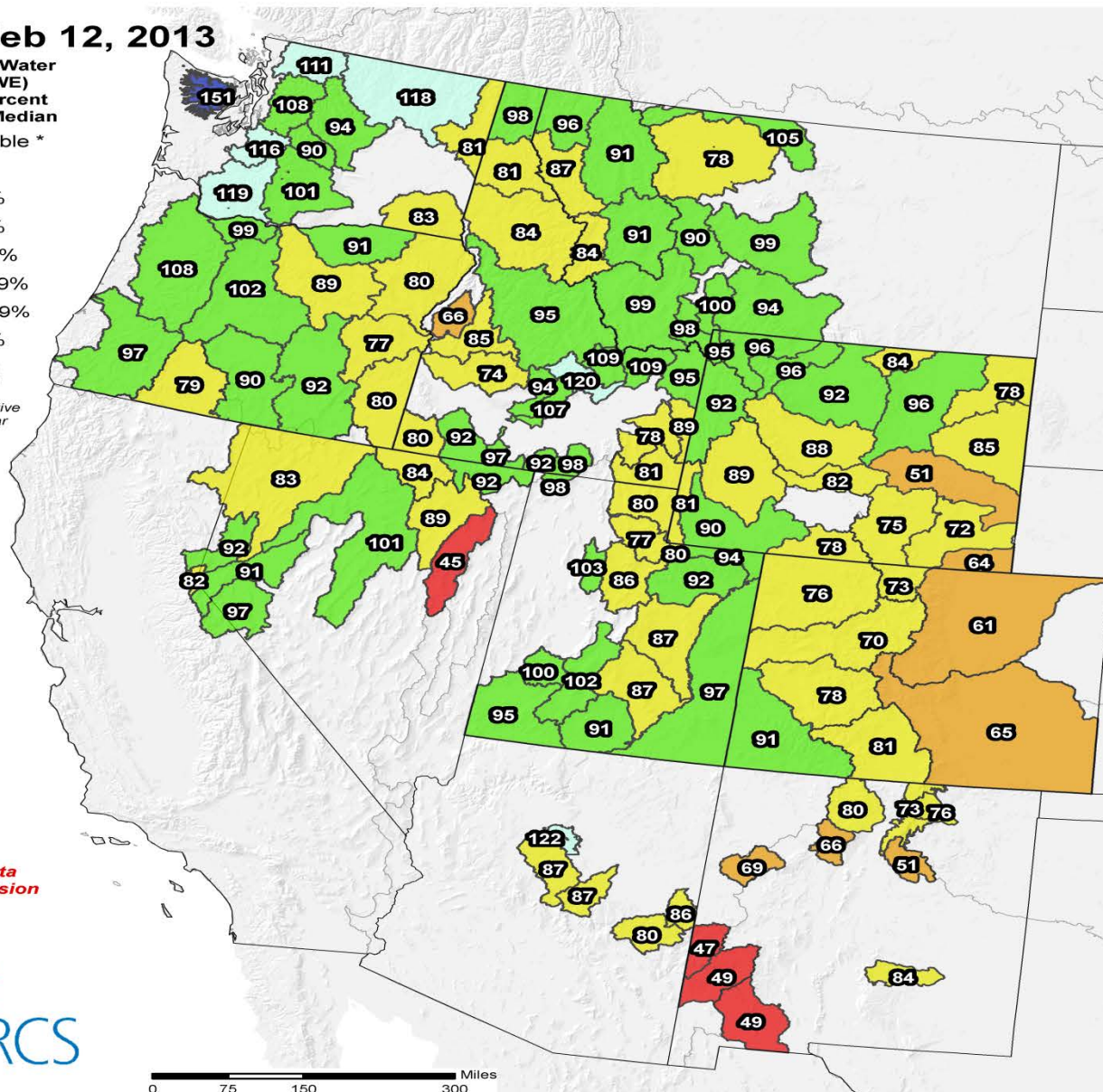
# Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Feb 12, 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



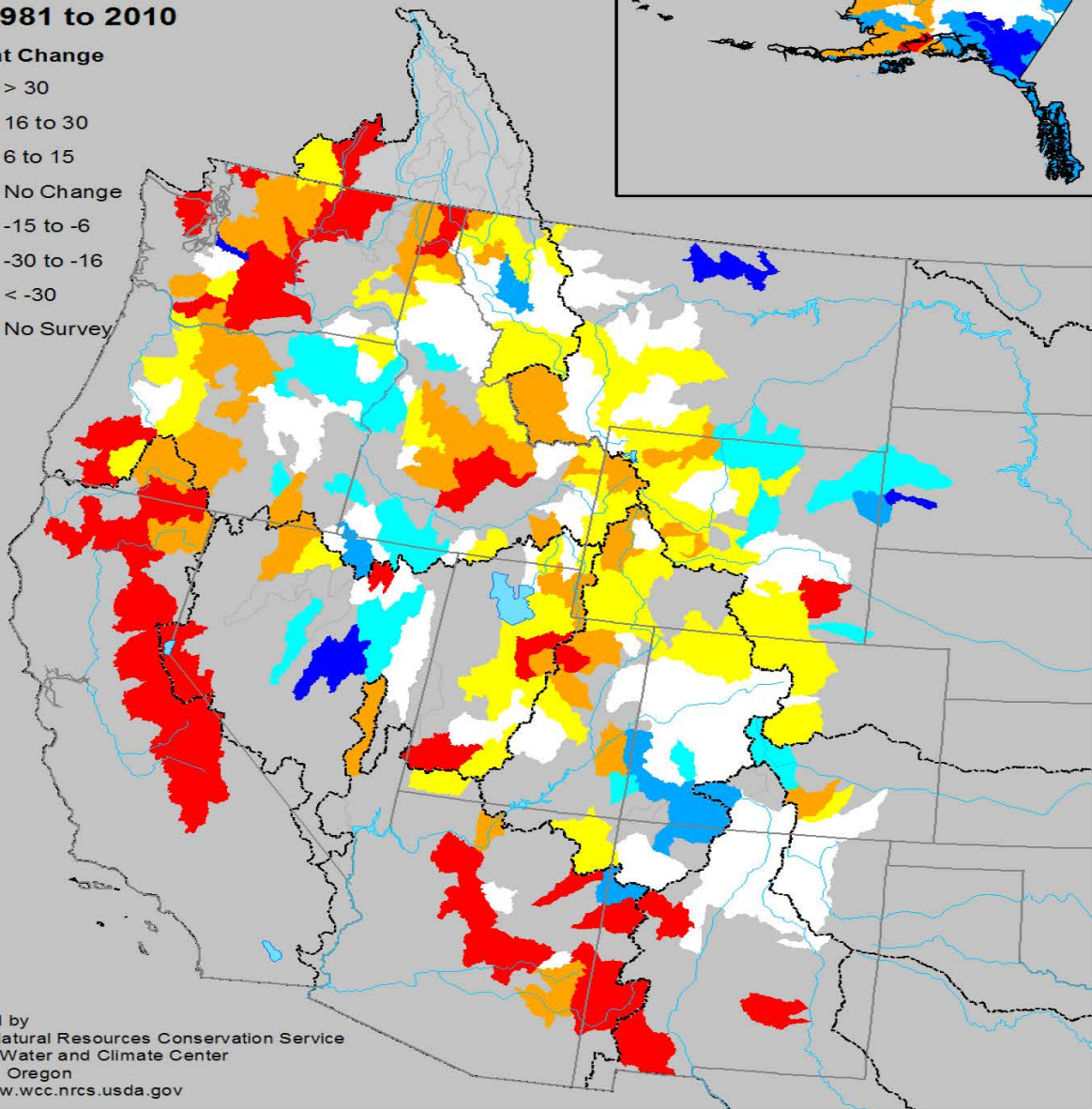
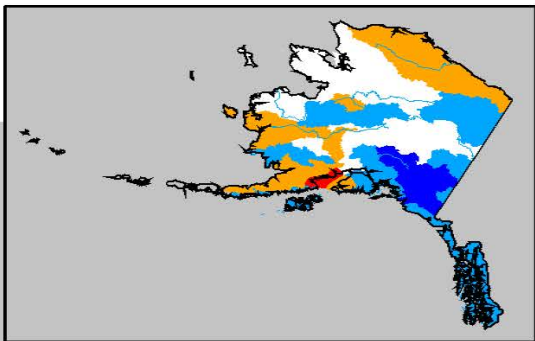
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

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](mailto:Jim.Marron@por.usda.gov) 503 414 3047

# 2013 Mountain Snowpack Change in percent between January 1 and February 1

Period 1981 to 2010

Percent Change





# SNOTEL Current Snow Water Equivalent (SWE) Records

Feb 12, 2013

## Current Snow Water Equivalent (SWE) Records

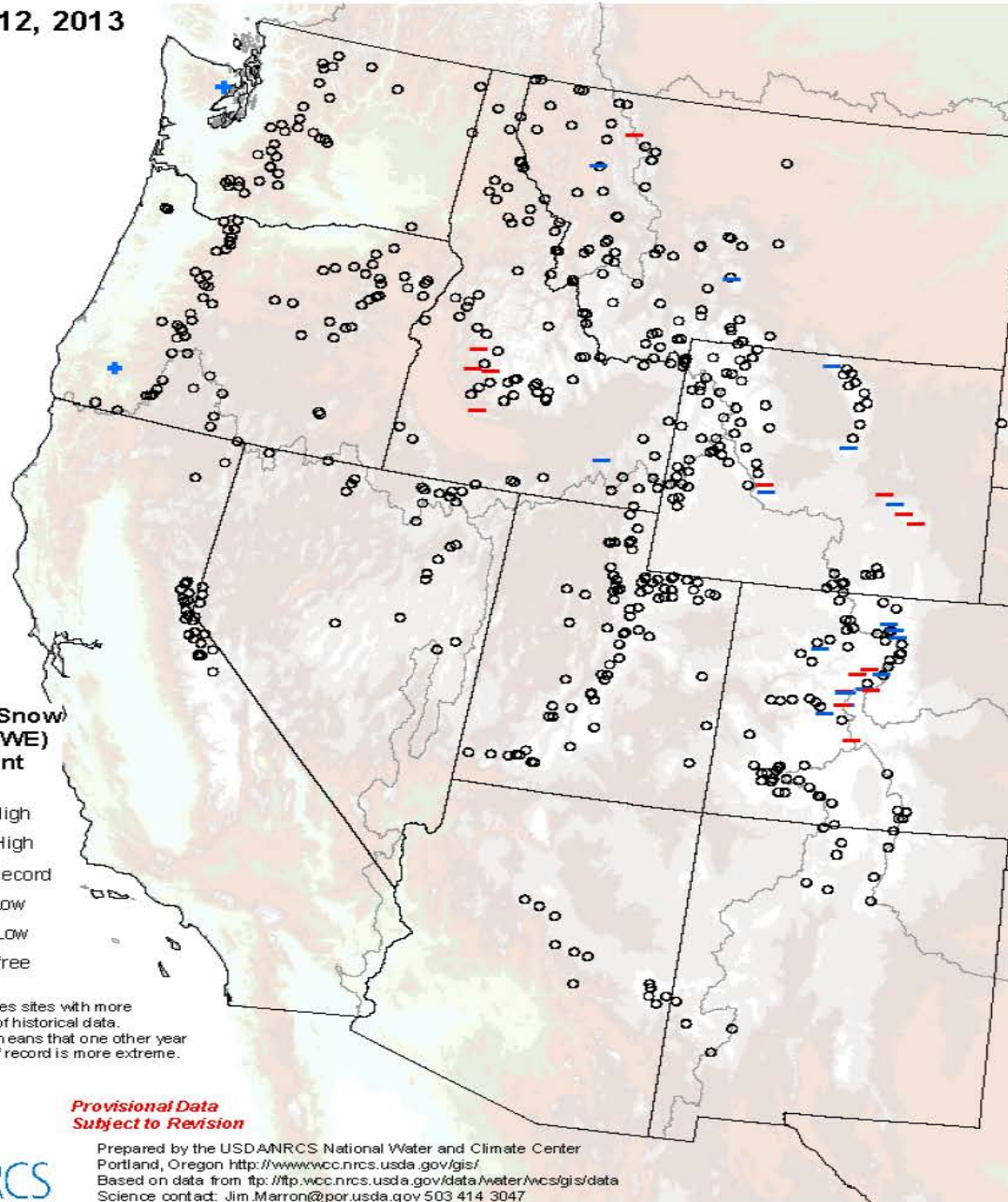
- + New High
- + Near High
- Non-Record
- New Low
- Near Low
- ⊙ snow free

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**

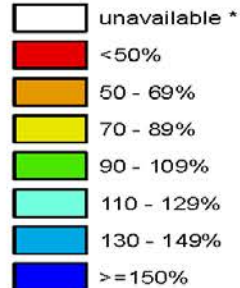
Prepared by the USDA/NRCS National Water and Climate Center  
Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>  
Based on data from <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/data>  
Science contact: [Jim.Marron@por.usda.gov](mailto:Jim.Marron@por.usda.gov) 503 414 3047



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

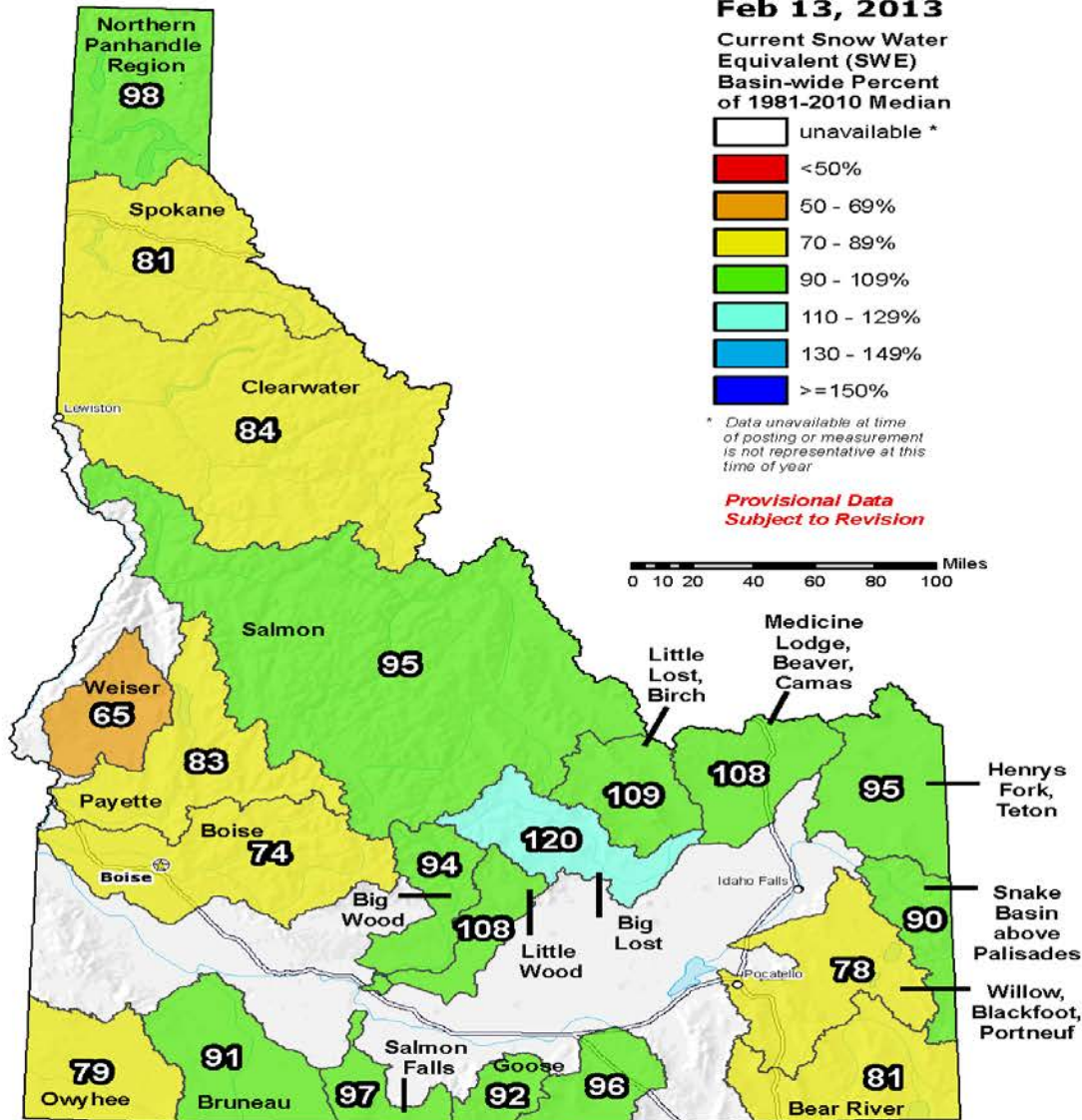
**Feb 13, 2013**

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*



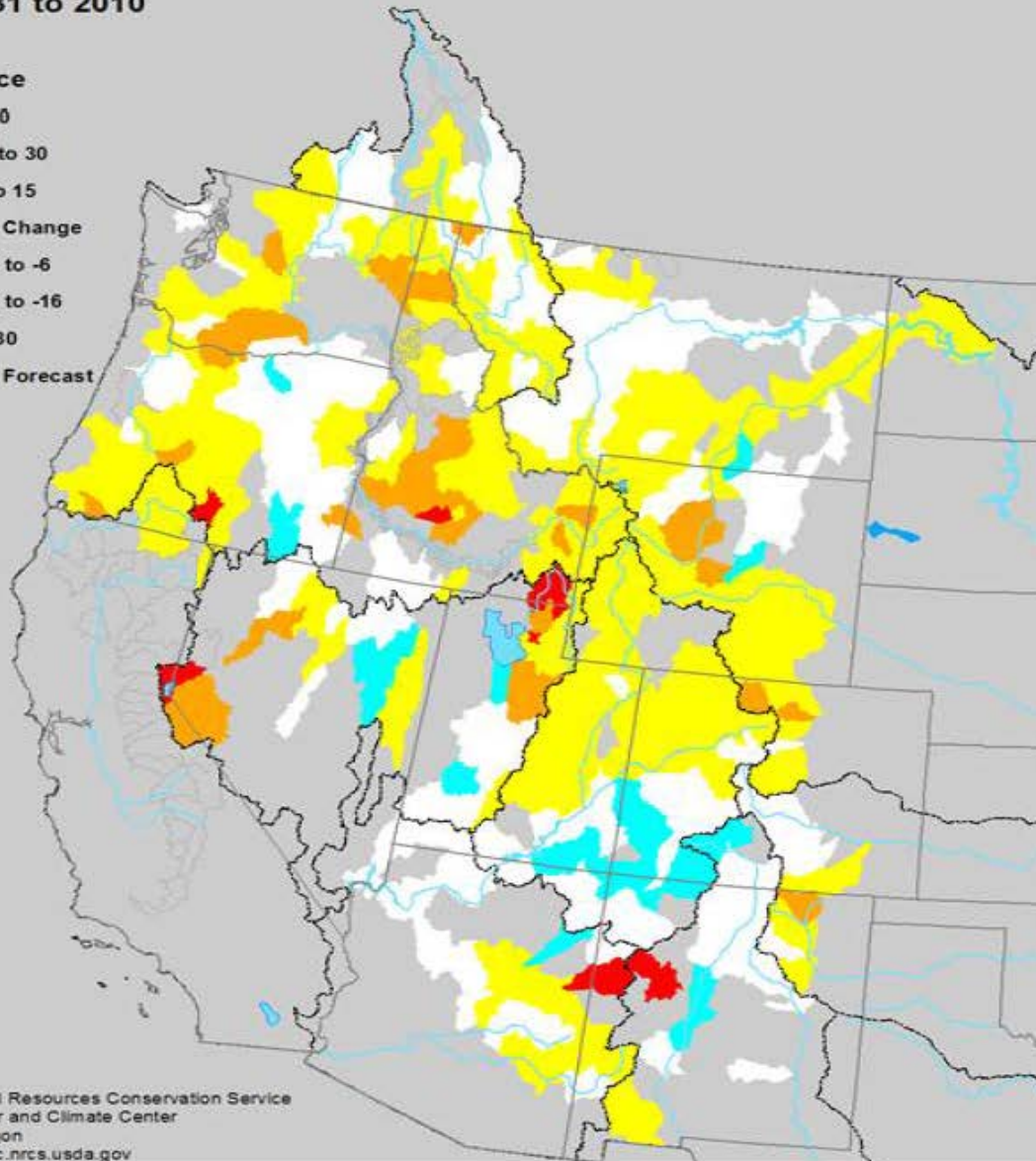
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

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](mailto:Jim.Marron@por.usda.gov) 503 414 3047



# Change in Spring and Summer Streamflow Forecasts from January 1 to February 1, 2013

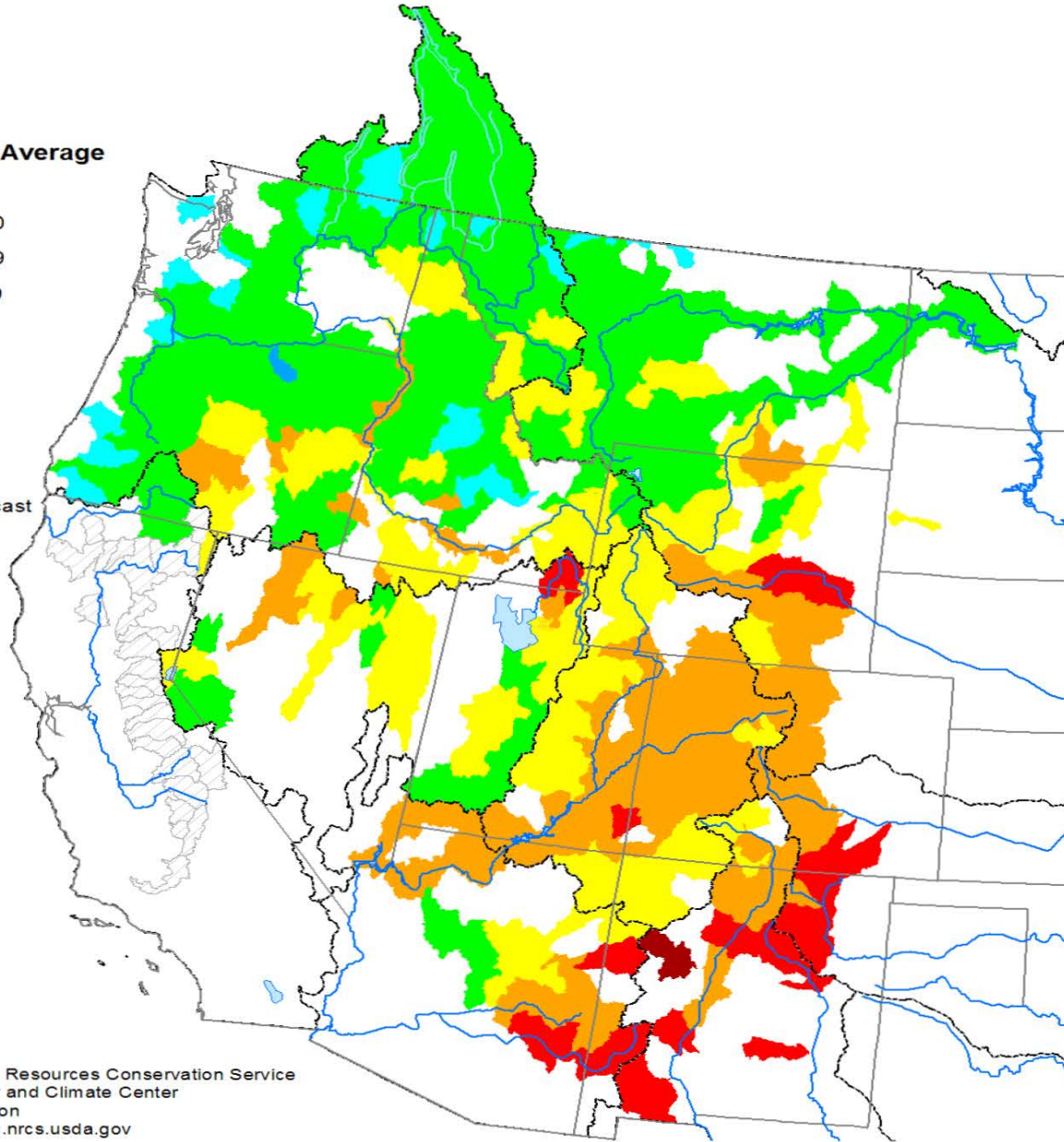
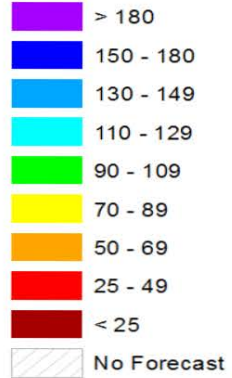
Period 1981 to 2010



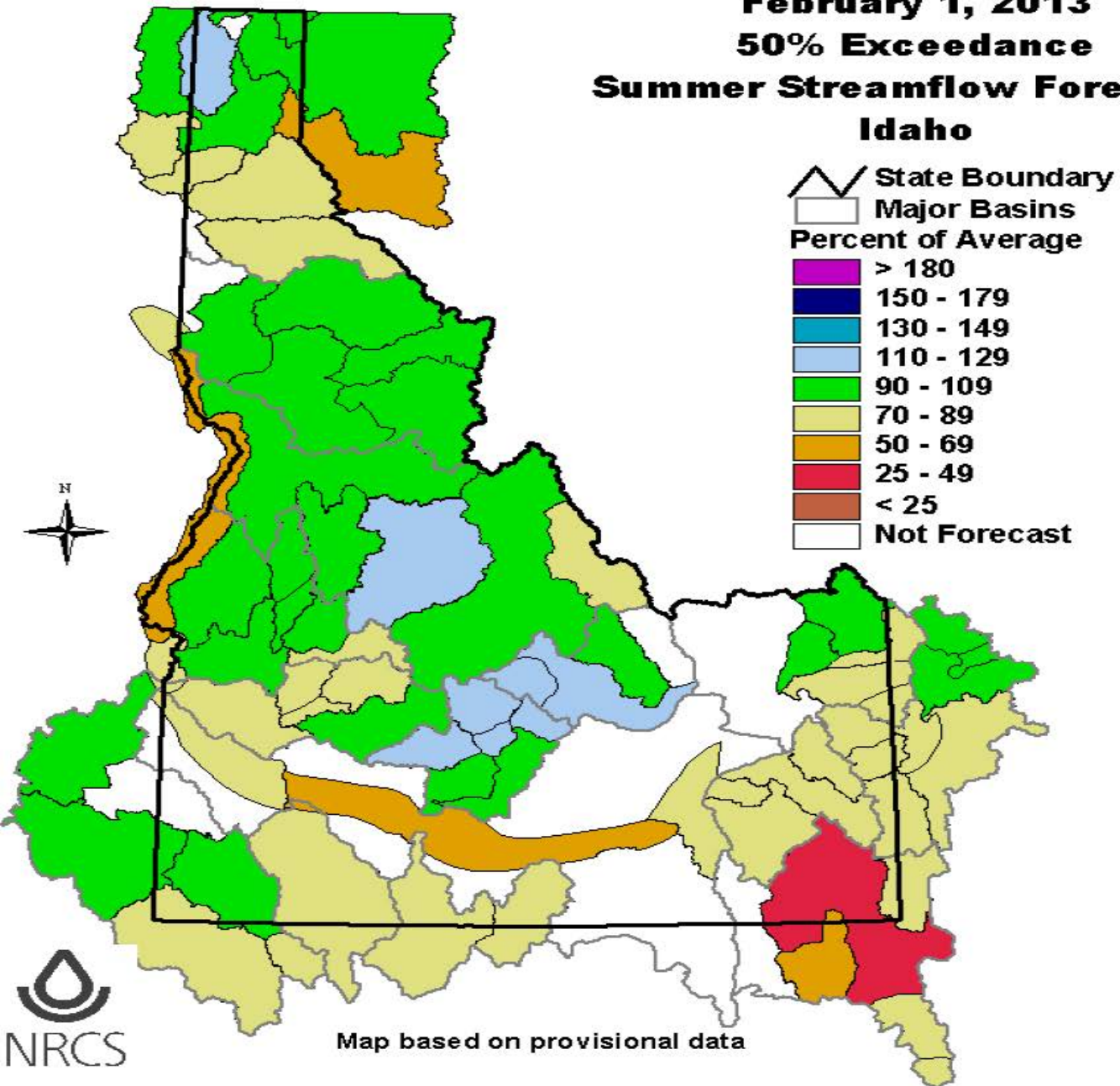


# Spring and Summer Streamflow Forecasts as of February 1, 2013

Percent  
1981 to 2010 Average



**February 1, 2013**  
**50% Exceedance**  
**Summer Streamflow Forecasts**  
**Idaho**





## NRCS AND NWS COLLABORATIVE FORECAST RELATIONSHIP

For years, NRCS and NWS Northwest River Forecast Center (NWRFC) used statistically-based water supply forecast models to predict seasonal runoff volumes. The models were run on the first of each month and grew into production of mid-month forecasts. Forecasters would share information to come up with a single forecast value. These final coordinated forecast values became the “official” forecasts published by both agencies.

This year and similar to last year, the NWRFC is using their hydrologic simulation models to produce volume forecasts. Because NWRFC models are so different from NRCS statistical models, a new paradigm was needed to replace the coordination process. The new approach is a collaborative process where information is still shared. However, a single unified forecast value is not produced. NRCS will publish forecasts from the NWRFC for the following points; these will usually reflect the forecast value on the first working day of the month. The rest of the forecasts published in the Idaho Water Supply Report are provided by NRCS. Daily NRCS Water Supply Forecasts are available from here to monitor changes between the first of month forecasts:

[http://www.id.nrcs.usda.gov/snow/watersupply/daily\\_guidance.html](http://www.id.nrcs.usda.gov/snow/watersupply/daily_guidance.html)

Snake River at King Hill

Snake River nr Murphy

Snake River at Weiser

Snake River at Hells Canyon

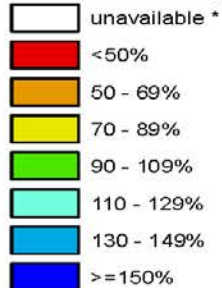
Snake River at Lower Granite



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

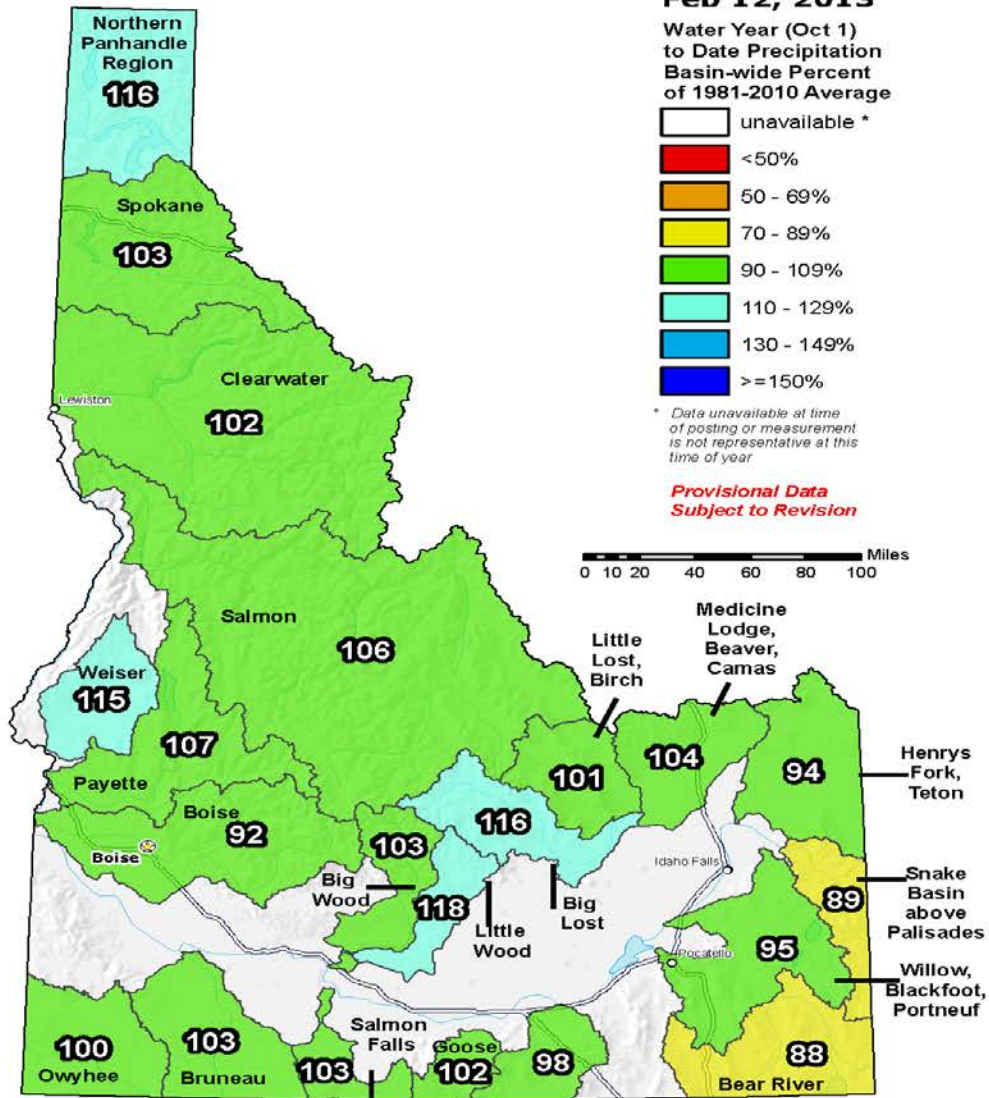
**Feb 12, 2013**

Water Year (Oct 1)  
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*

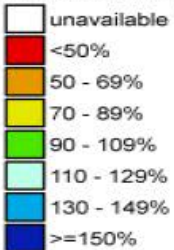


The water year to date precipitation percent of normal represents the accumulated precipitation found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

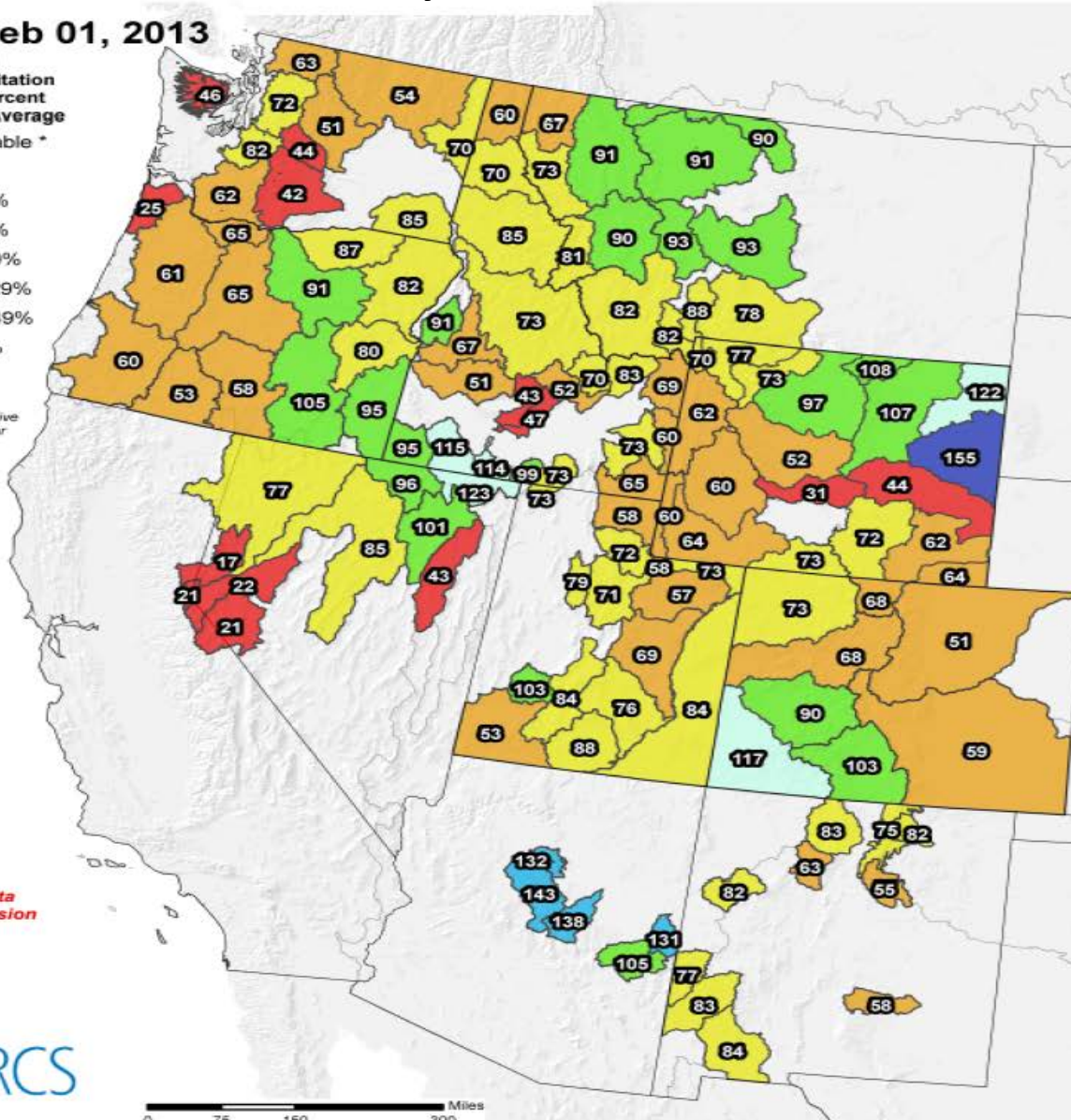
Prepared by the USDA/NRCS National Water and Climate Center  
Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>  
Based on data from <http://www.wcc.nrcs.usda.gov/reports/>  
Science contact: [Jim.Marron@por.usda.gov](mailto:Jim.Marron@por.usda.gov) 503 414 3047

Feb 01, 2013

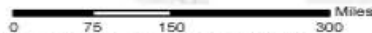
Current Month to Date Precipitation Basin-wide Percent of 1981-2010 Average



\* 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 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](mailto:Jim.Marron@por.usda.gov) 503 414 3047

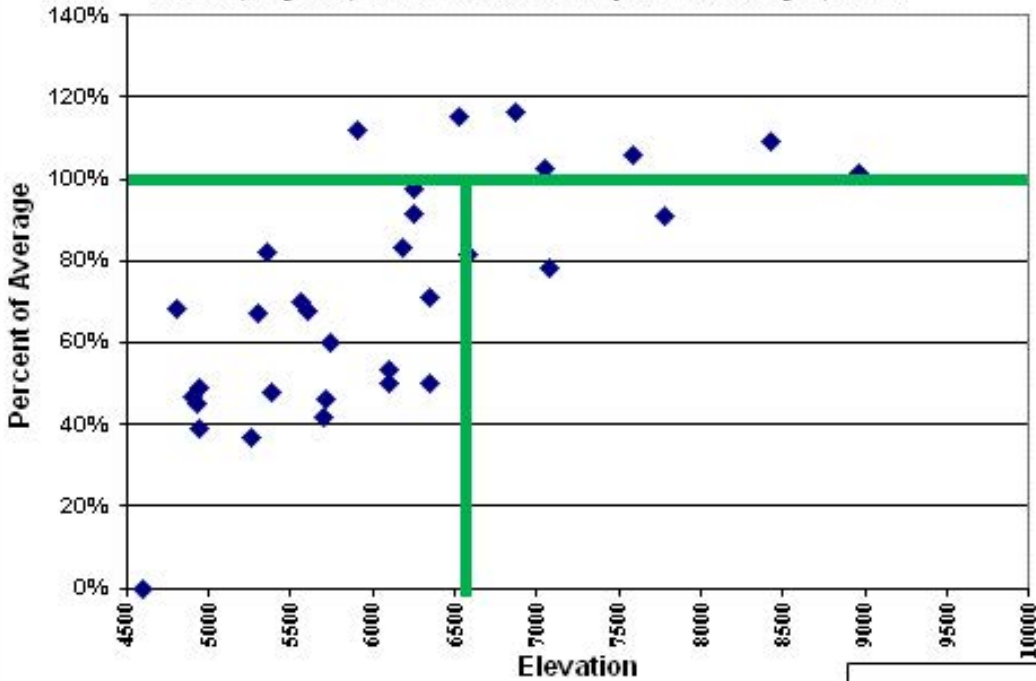


<u>Region or Basin</u>	<u>January 2013 Precipitation as % of Average</u>	<u>February 1 - 13 Precipitation as % Feb Total</u>
NORTHERN PANHANDLE REGION	61	10
SPOKANE	72	13
CLEARWATER	85	13
SALMON	71	8
WEISER	90	1
PAYETTE	64	0
BOISE	50	1
BIG WOOD	43	1
LITTLE WOOD	47	8
BIG LOST	51	11
LITTLE LOST & BIRCH	70	13
MEDICINE LODGE, BEAVER, CAMAS	82	15
HENRYS FORK, TETON	70	6
SNAKE BASIN ABOVE PALISADES	61	11
WILLOW, BLACKFOOT, PORTNEUF	74	15
SNAKE BASIN ABOVE AMERICAN FALLS	66	11
GOOSE CREEK	97	34
SALMON FALLS	108	42
BRUNEAU	107	37
OWYHEE	94	7
BEAR RIVER	64	15





**Weiser, Payette, Boise Basins Snowpack February 1, 2013**



**Signs of Lack of Low Snow:**

**Lack of snow under trees at Bogus Basin, large brown patches or melt rings are getting larger in the 6000 ft elevation band. They never had much snow and probably wont this year with warmer temperatures.**

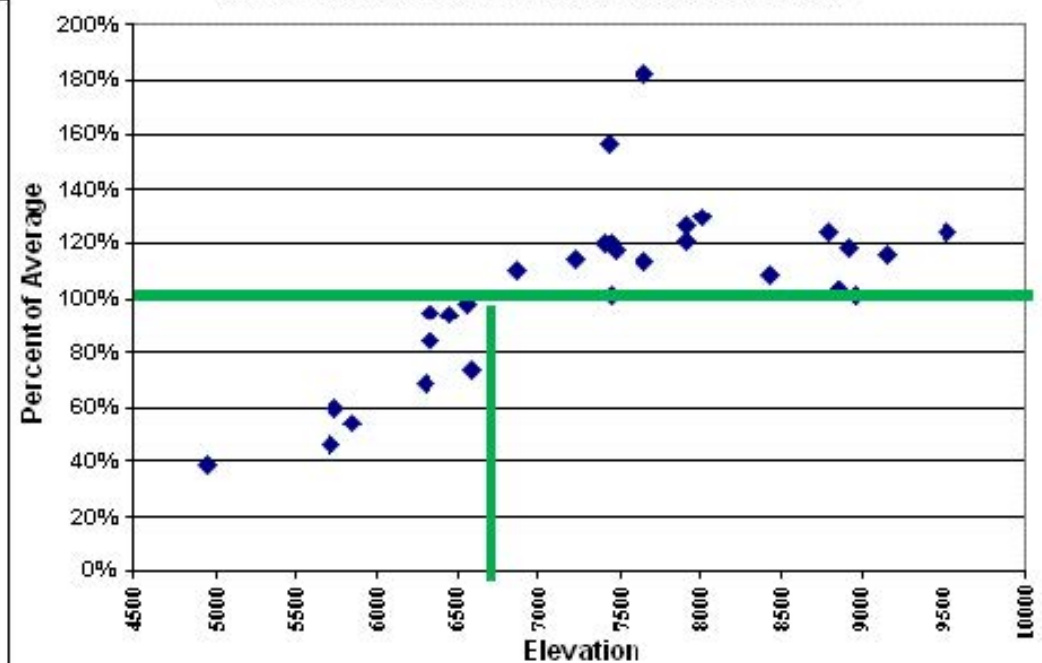
**Mores Creek forecast at 72% of avg.  
SF Boise River forecast at 97%**

**Signs in the Big Wood:**

**Big Wood River at Hailey forecast at 111% of avg.**

**Camas Creek forecast at 63%**

**Wood and Lost Basins Snowpack February 1, 2013**





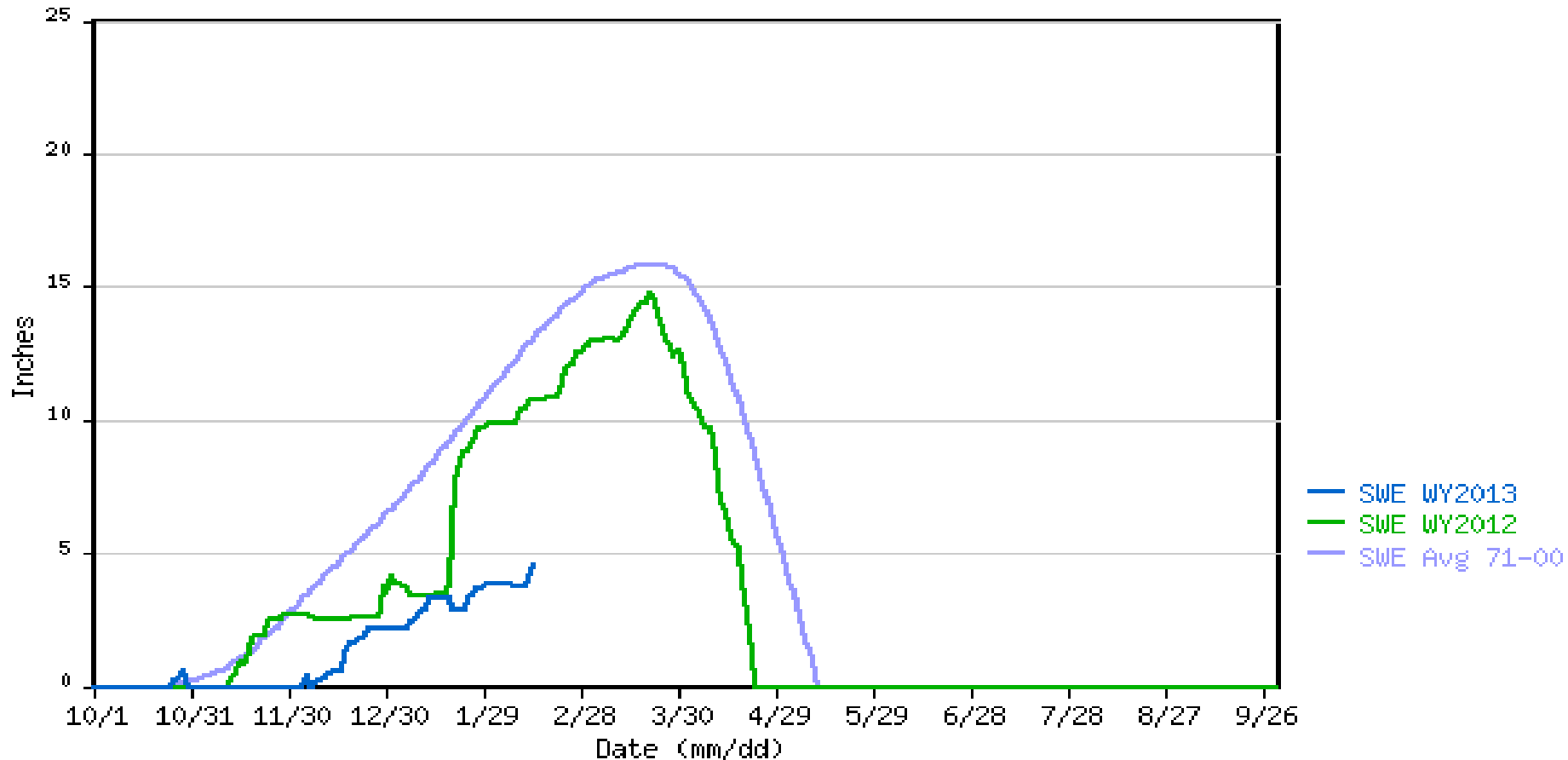
# Graham GS 5690 feet Boise Basin

Feb 1 3.9" SWE 4<sup>th</sup> lowest since 1961 when records start

Feb 13 4.6" SWE 2<sup>nd</sup> lowest since 1975 when MID-Month records start, 1977 had 0.5"

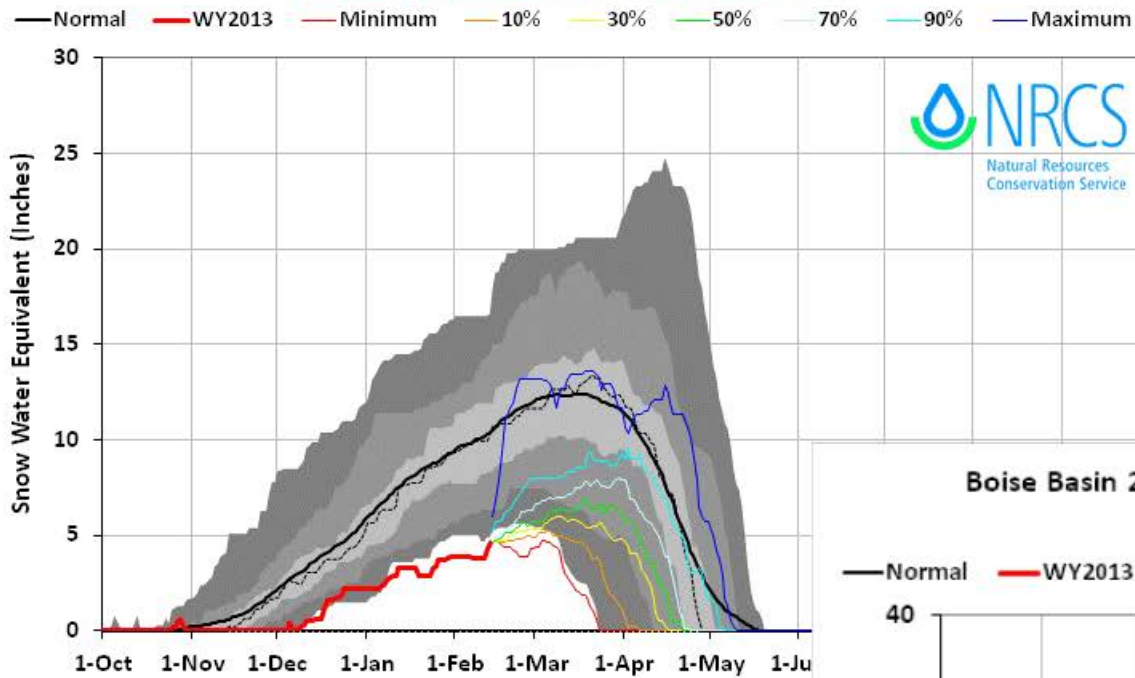
15F14S SNOTEL as of 02/13/2013

\*\*\* Provisional Data, Subject to Change \*\*\*



### Graham GS 2013 Snow Water with Non-Exceedence Projections (1 sites)

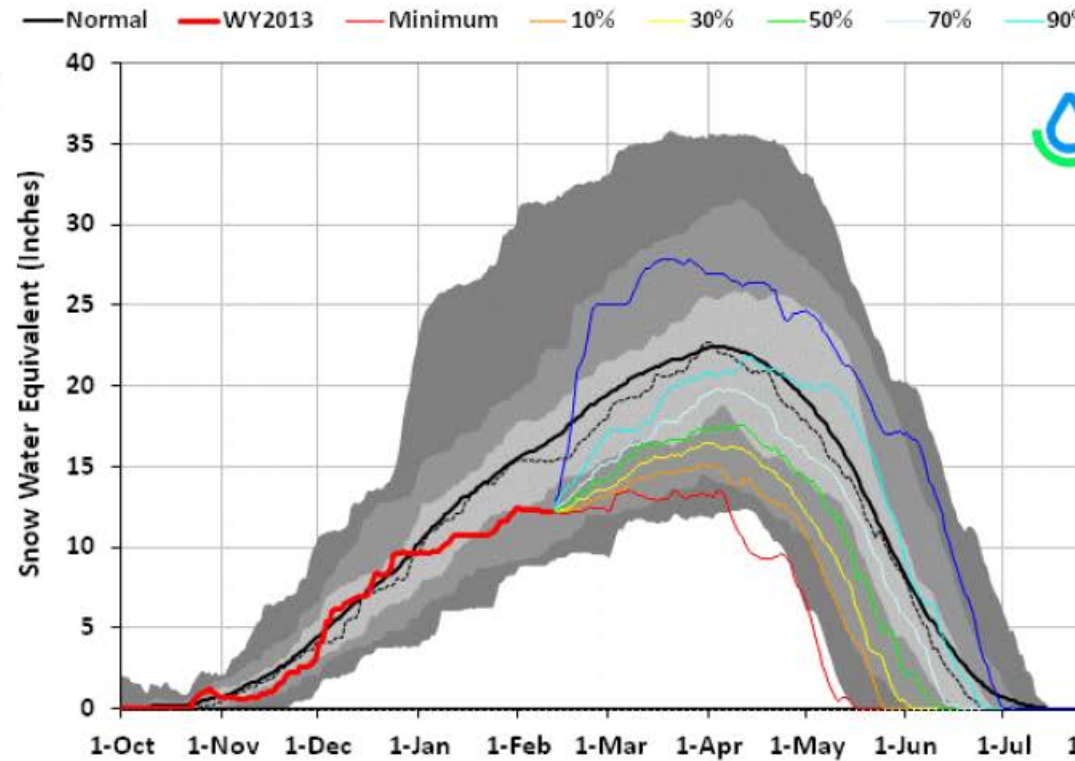
Based on Provisional SNOTEL data as of Feb 13, 2013



Daily SWE data starts in 1981

### Boise Basin 2013 Snow Water with Non-Exceedence Projections (10 sites)

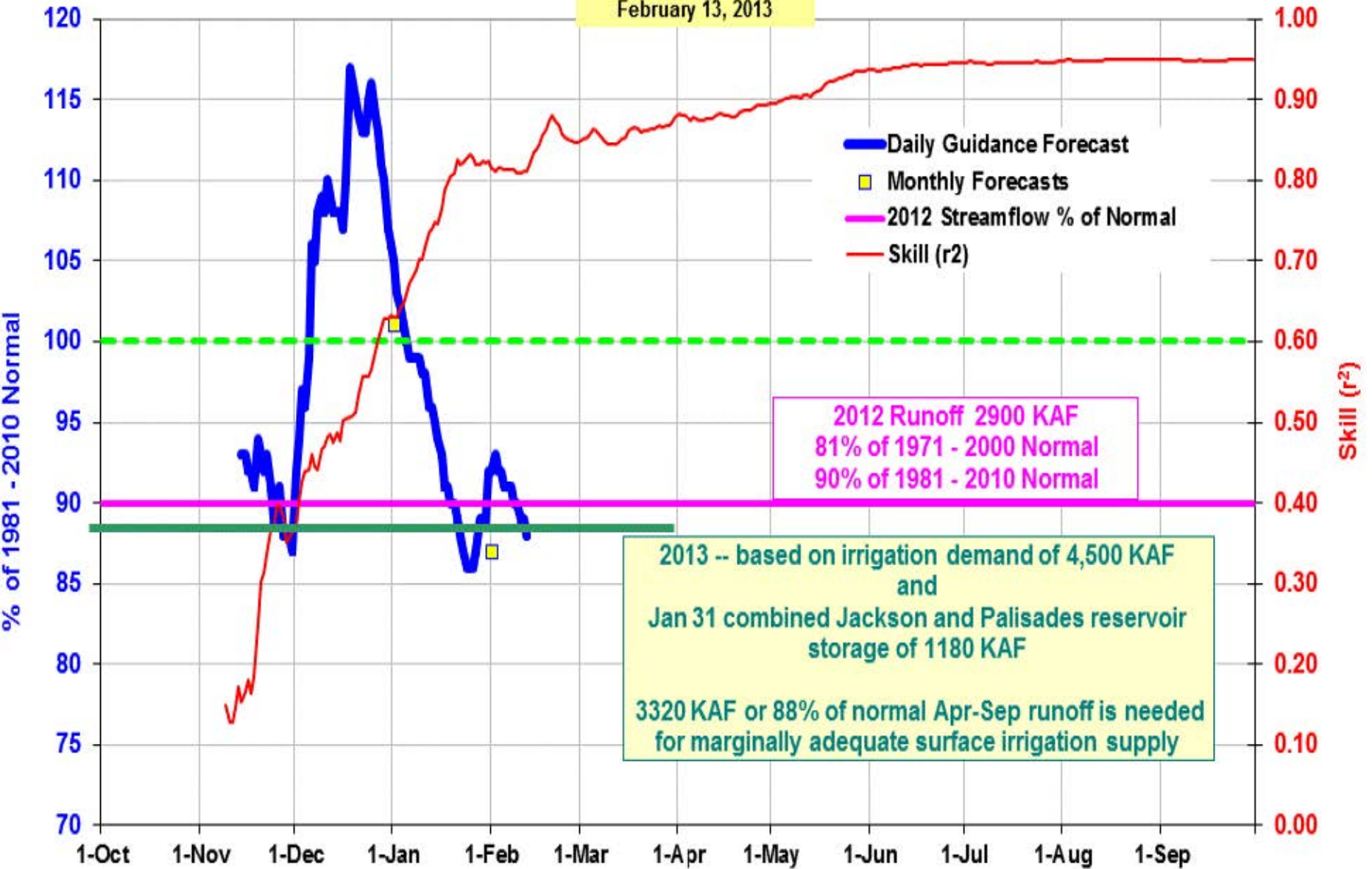
Based on Provisional SNOTEL data as of Feb 11, 2013





2013 Snake River near Heise: Apr - Jul Volume  
 NRCS Monthly Forecasts are Yellow Squares

Updated  
 February 13, 2013



2012 Runoff 2900 KAF  
 81% of 1971 - 2000 Normal  
 90% of 1981 - 2010 Normal

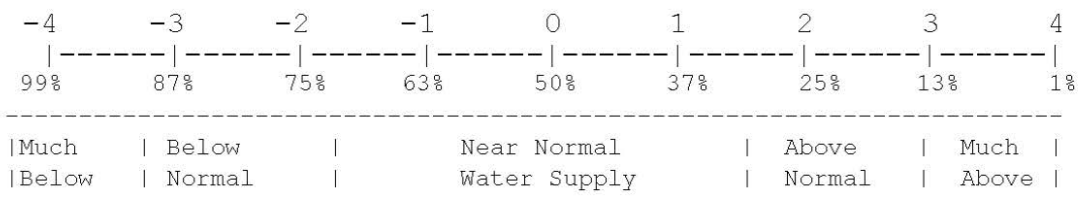
2013 -- based on irrigation demand of 4,500 KAF and Jan 31 combined Jackson and Palisades reservoir storage of 1180 KAF  
 3320 KAF or 88% of normal Apr-Sep runoff is needed for marginally adequate surface irrigation supply

IDAHO SURFACE WATER SUPPLY INDEX (SWSI)

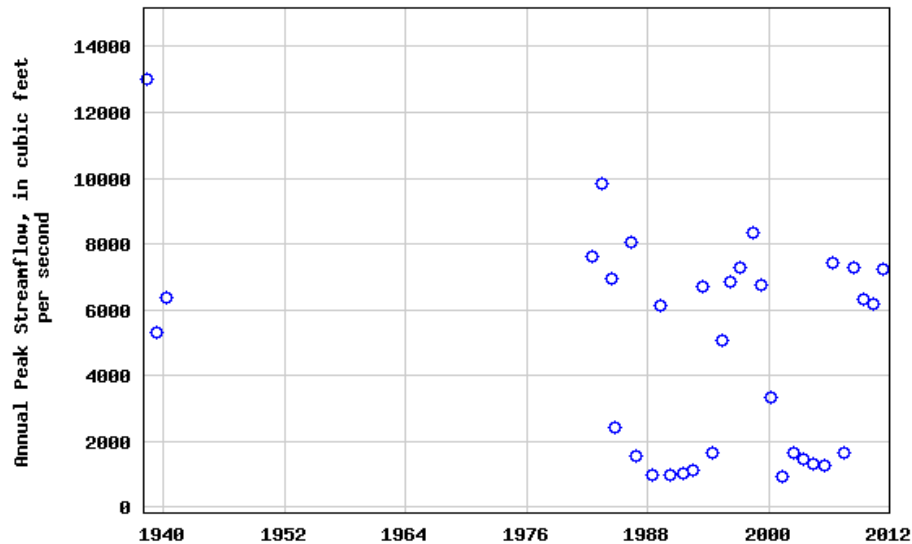
February 1, 2013

<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	1.0	2008	NA
Spokane	-1.5	1995/1998	NA
Clearwater	0.0	2000	NA
Salmon	-0.3	2010	NA
Weiser	-0.5	2000/2003	NA
Payette	0.5	2008	NA
Boise	-0.3	2010	-1.6
Big Wood	0.5	2012	0.4
Little Wood	0.8	2012	-1.5
Big Lost	1.5	2011	0.5
Little Lost	0.3	2006	1.3
Teton	-0.8	2005	-3.8
Henrys Fork	-0.3	2011	-3.0
Snake (Heise)	-1.0	1989/1990	-1.5
Oakley	-1.3	1981/1987	0.1
Salmon Falls	-1.3	2000/2008	-1.0
Bruneau	-0.3	2010	NA
Owyhee	0.5	2005	-3.3
Bear River	0.5	2001	-3.5

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







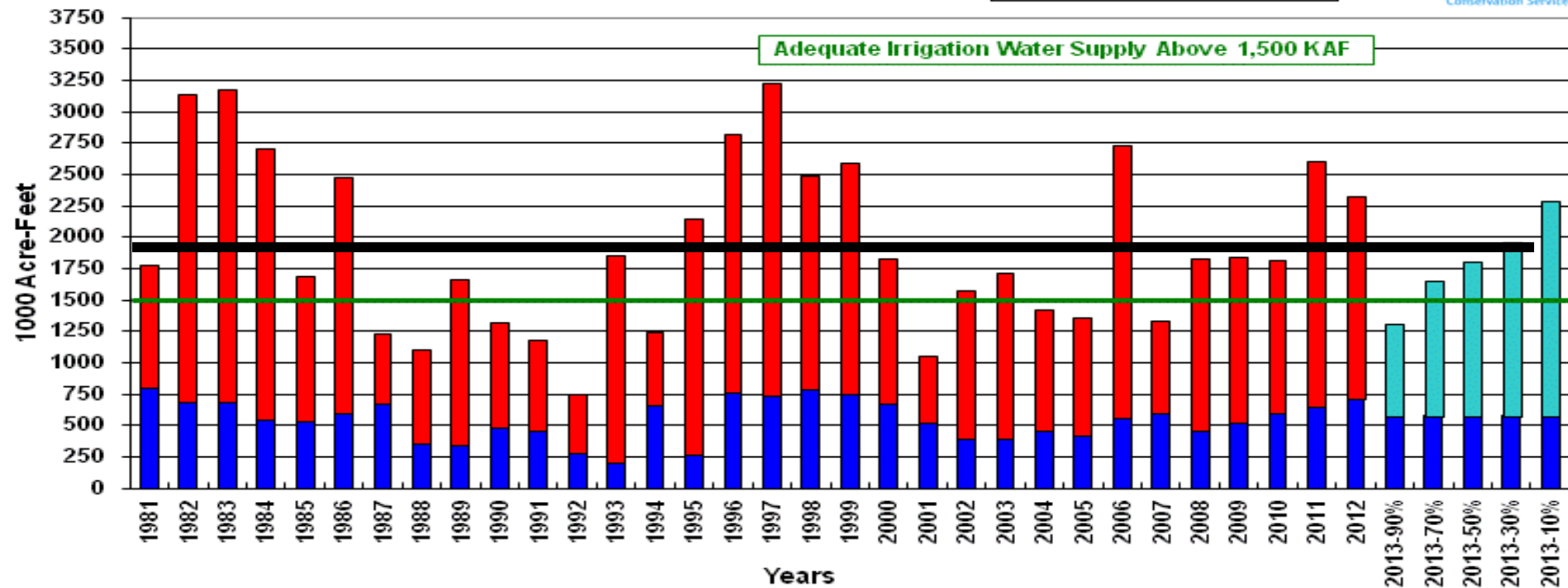
**Boise R @ Glenwood flow > 6700 cfs  
13 years since 1982**

**Using SWSI - only 1995 was a false positive when peak flow was 5086 cfs @ Glenwood**

**Similar analysis could be completed elsewhere to determine Surplus Threshold Level**

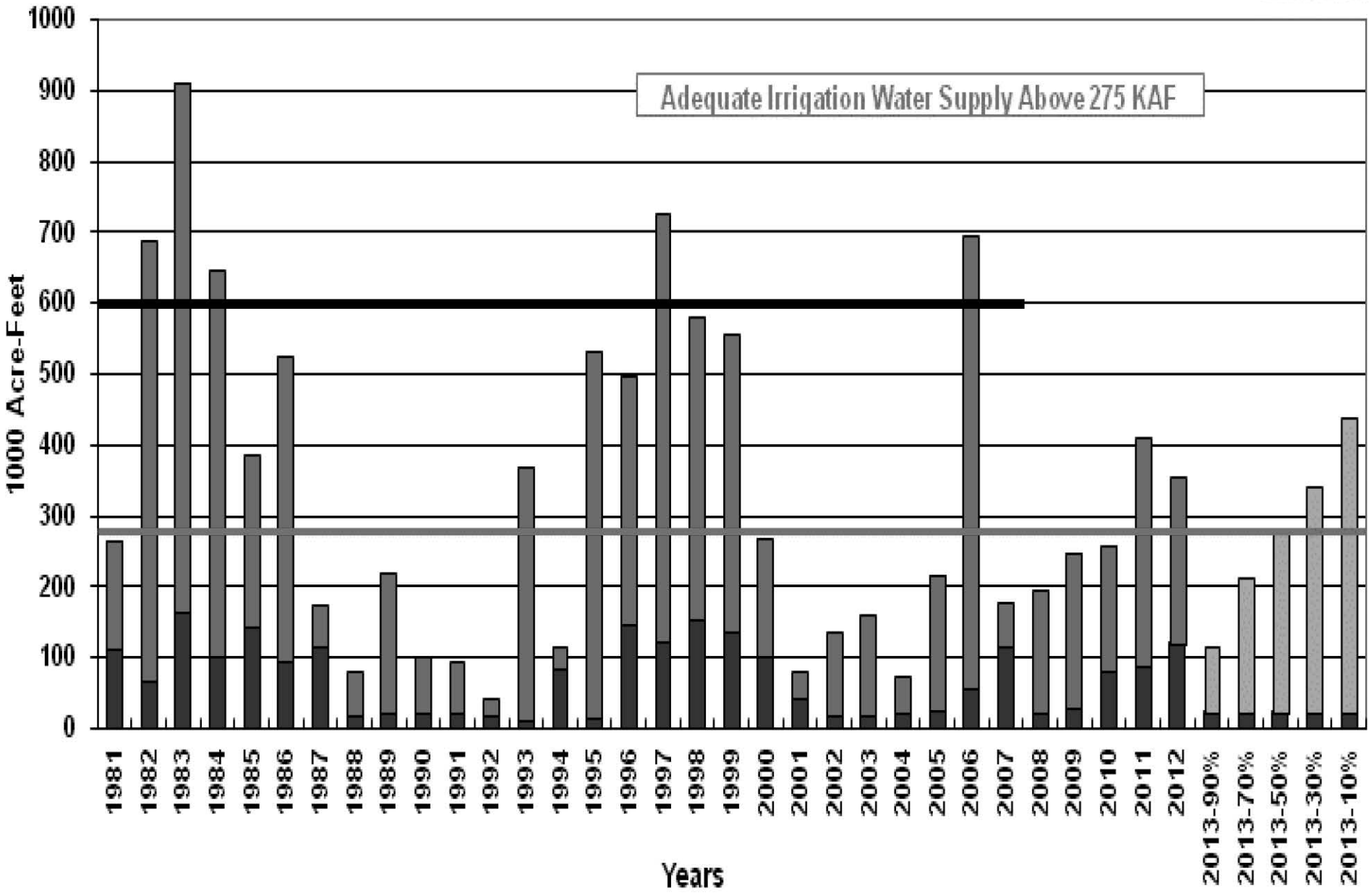
**February 1 Boise Basin Surface Water Supply Index (SWSI)  
Boise River near Boise & Anderson, Arrowrock, Lucky Peak**

■ Streamflow Apr-Sep  
■ Reservoir 31-Jan



# February 1 Big Wood Surface Water Supply Index (SWSI) Big Wood River below Magic & Magic Reservoir

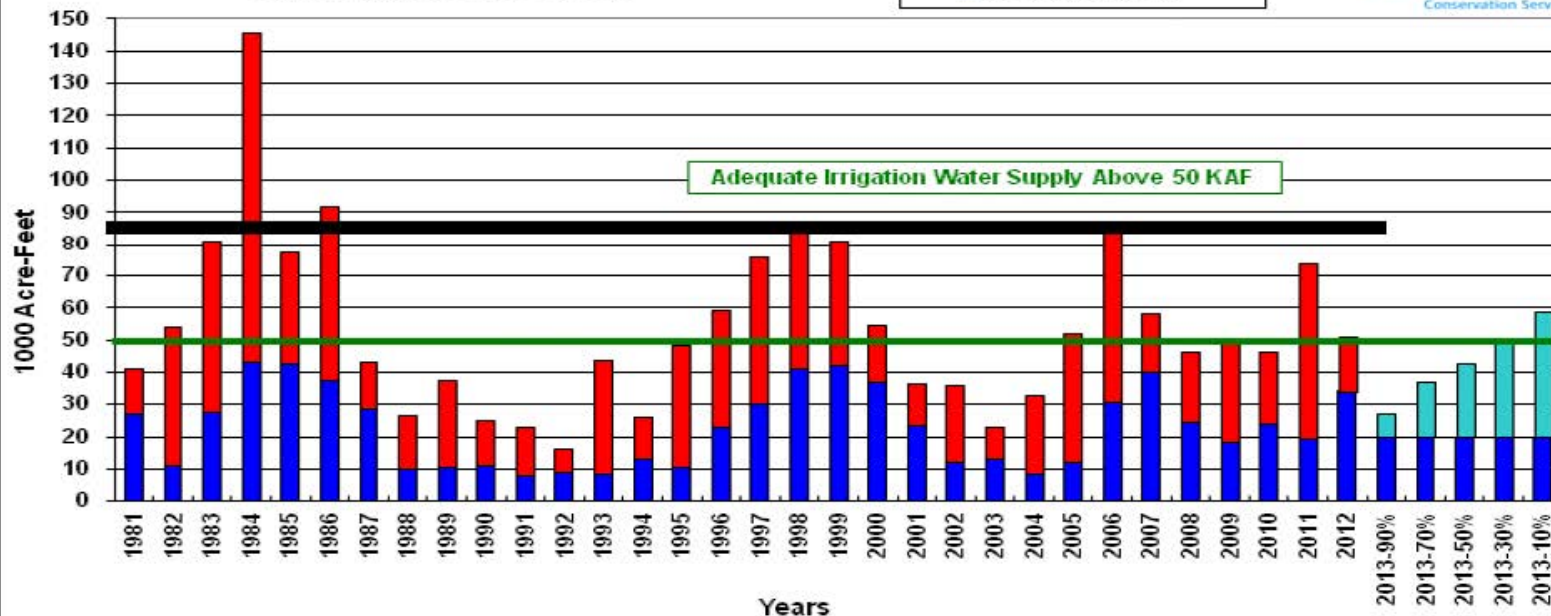
Streamflow Apr-Sep  
 Reservoir 31-Jan





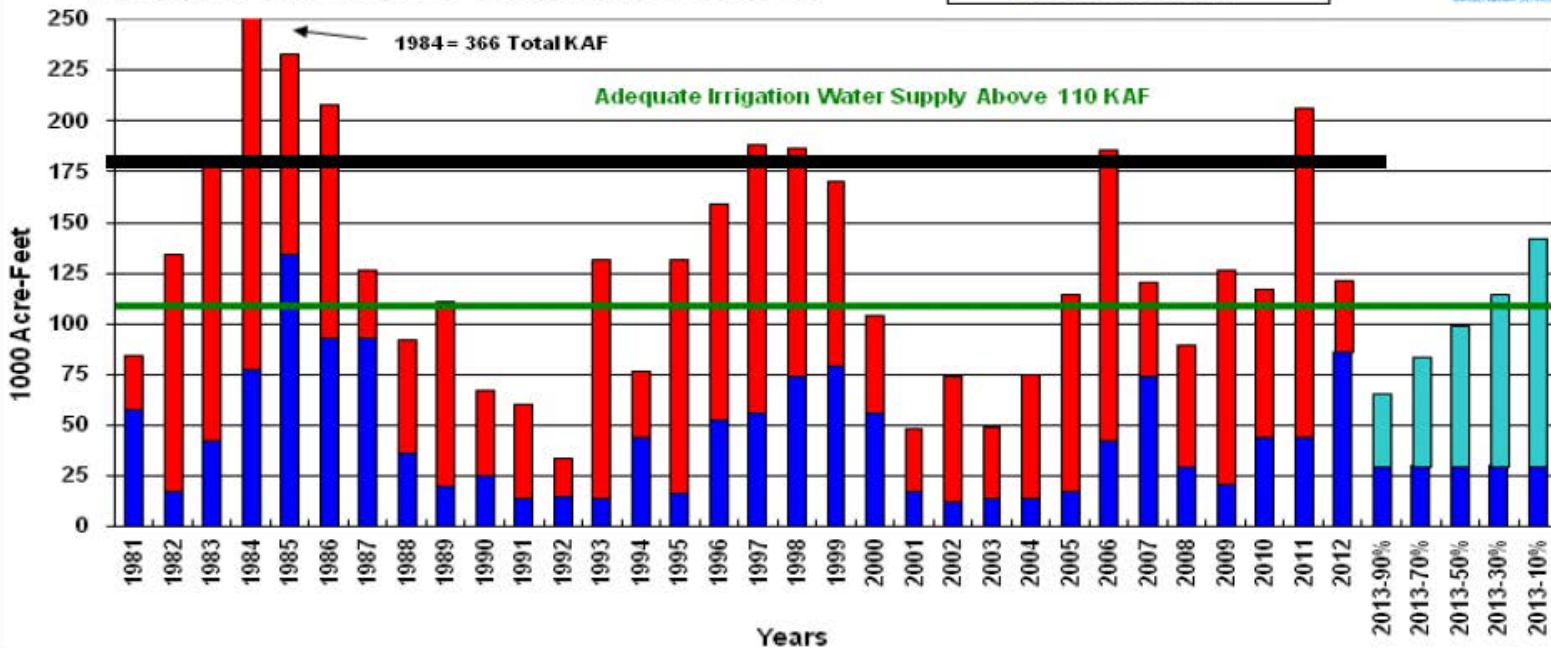
**February 1 Oakley Surface Water Supply Index (SWSI)  
Oakley Inflow & Reservoir**

■ Streamflow Mar-Sep  
■ Reservoir 31-Jan



**February 1 Surface Water Supply Index (SWSI) Salmon Falls  
Creek near San Jacinto & Salmon Falls Reservoir**

■ Streamflow Mar-Sep  
■ Reservoir 31-Jan



Lewis Lake Divide SNOTEL Site  
Yellowstone NP January 16, 2013



Questions / Comments