

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

April 1, 2016



IDWR

State Water Supply Meeting

April 12, 2016

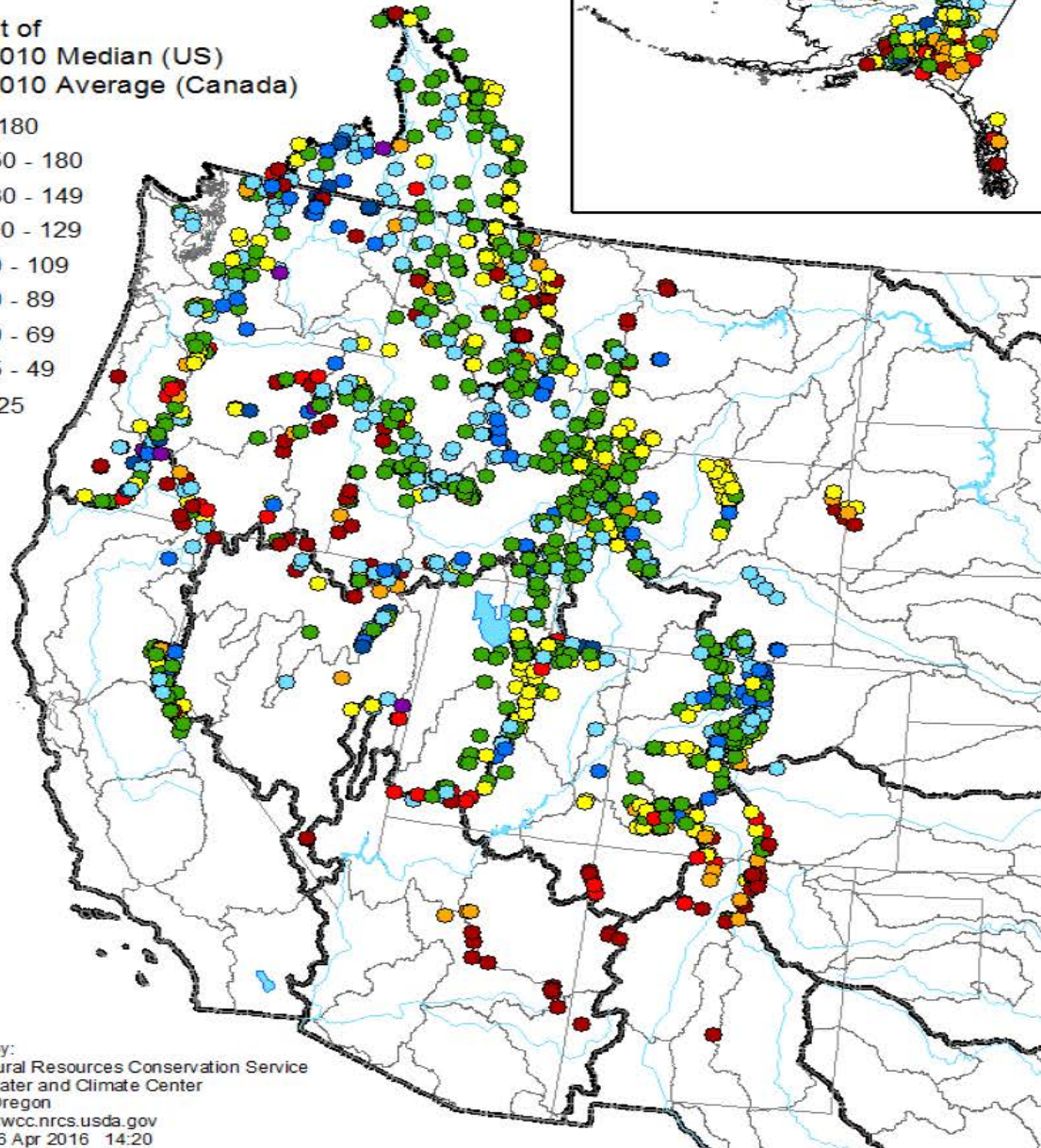
Ron Abramovich
Water Supply Specialist
Snow Survey
Boise, Idaho



Mountain Snowpack as of April 1, 2016

Percent of
1981-2010 Median (US)
1981-2010 Average (Canada)

- > 180
- 150 - 180
- 130 - 149
- 110 - 129
- 90 - 109
- 70 - 89
- 50 - 69
- 25 - 49
- < 25

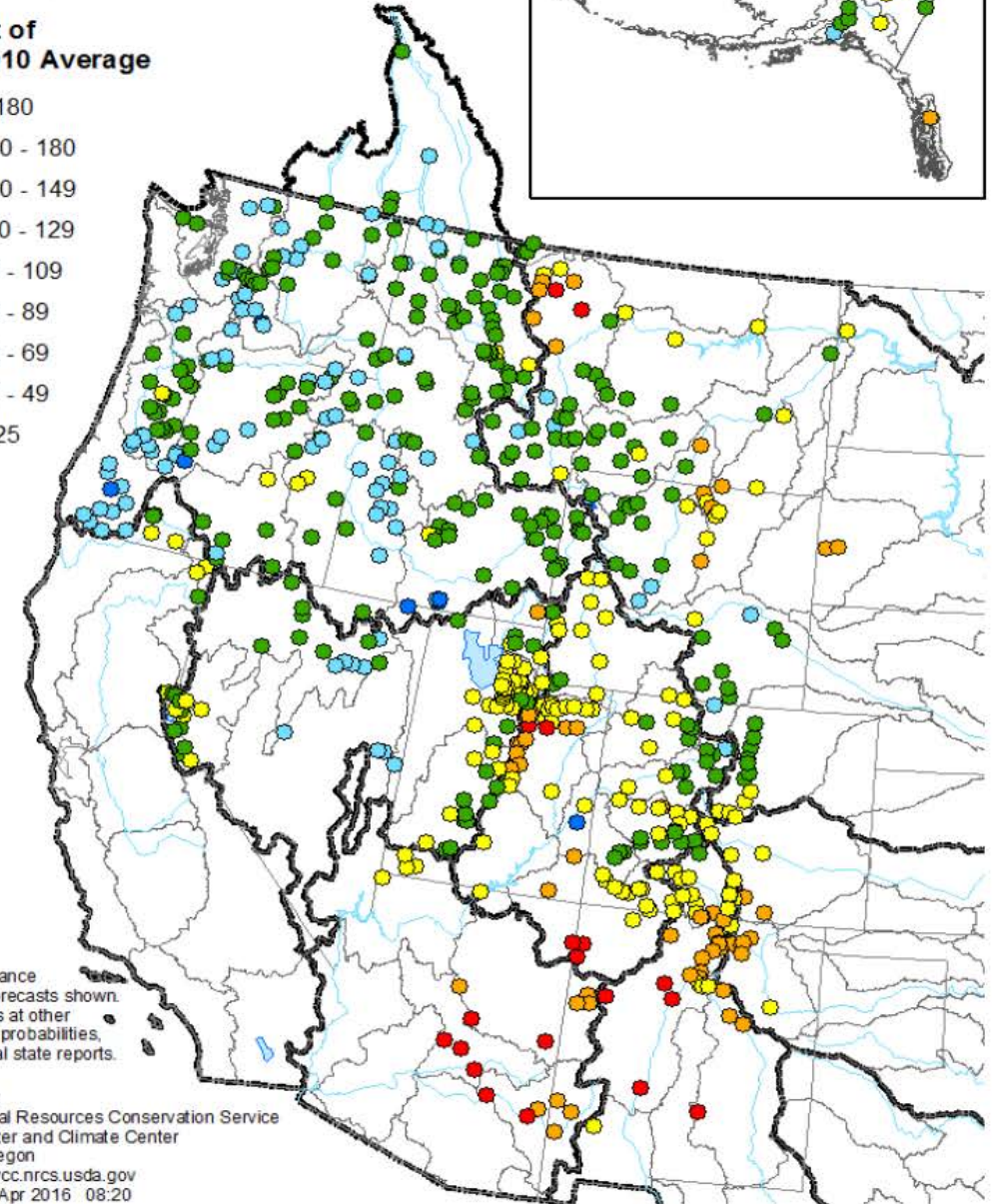


Prepared by:
USDA Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>
Created: 6 Apr 2016 14:20

Spring and Summer Streamflow Forecasts as of April 1, 2016

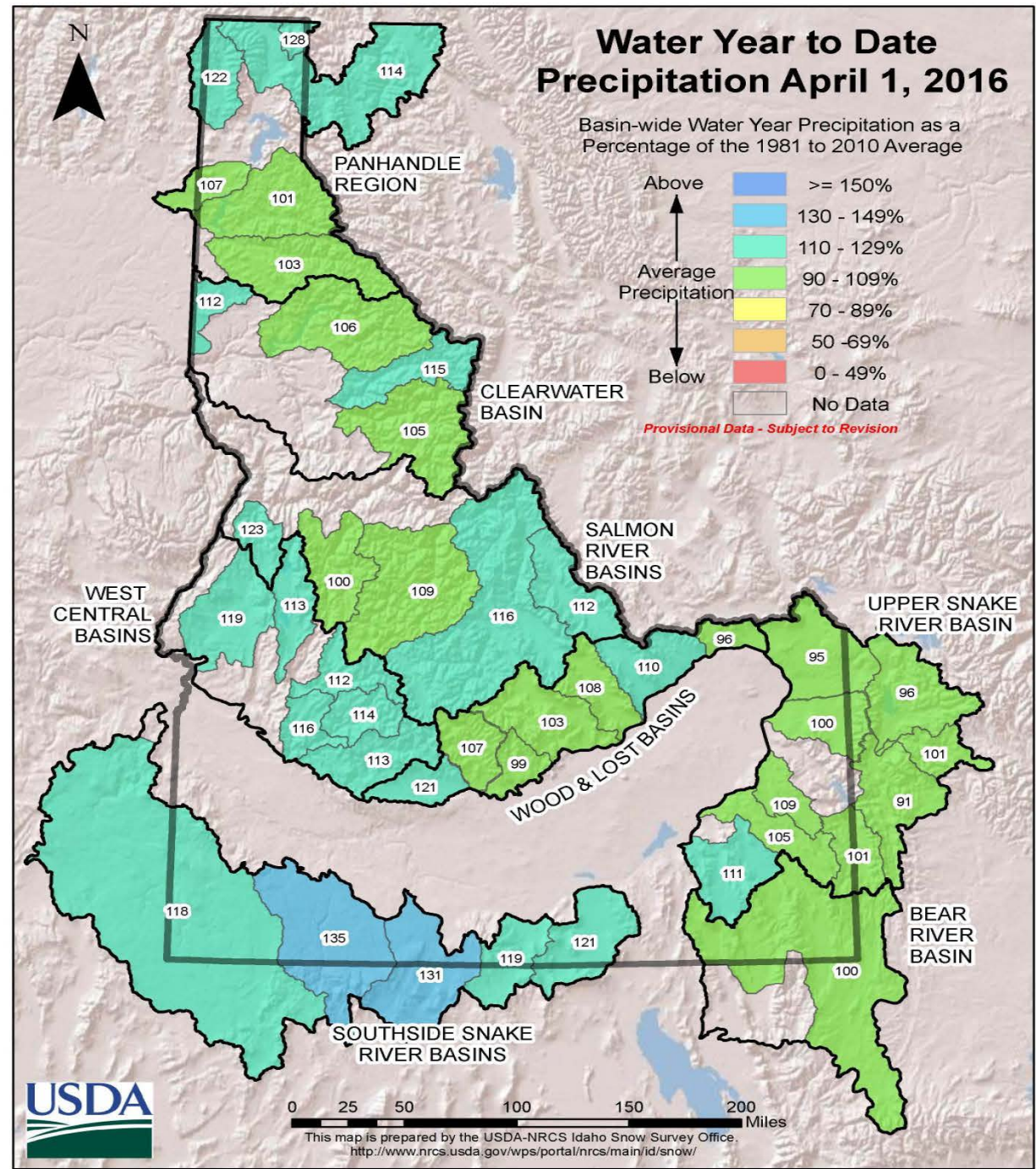
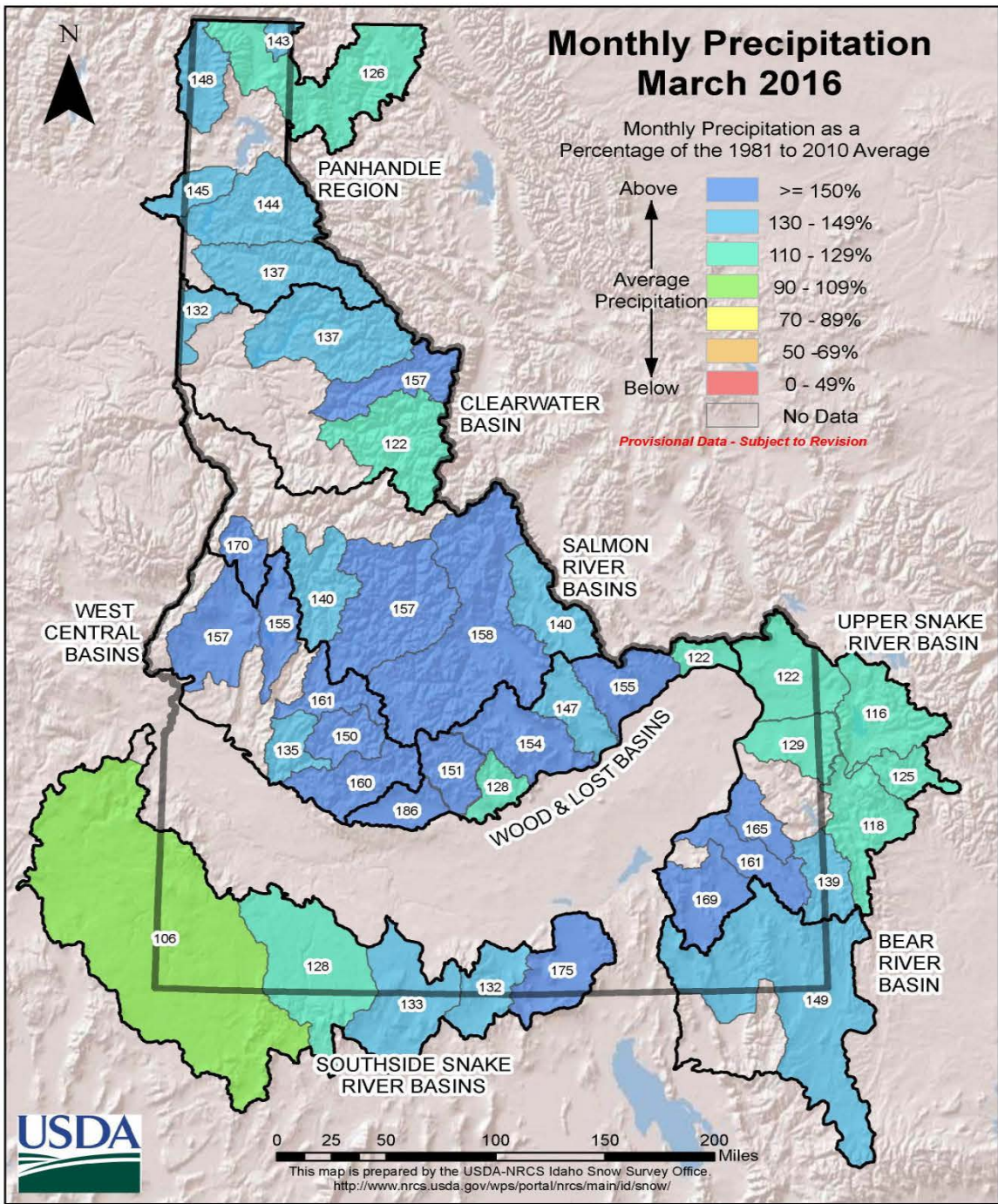
Percent of
1981-2010 Average

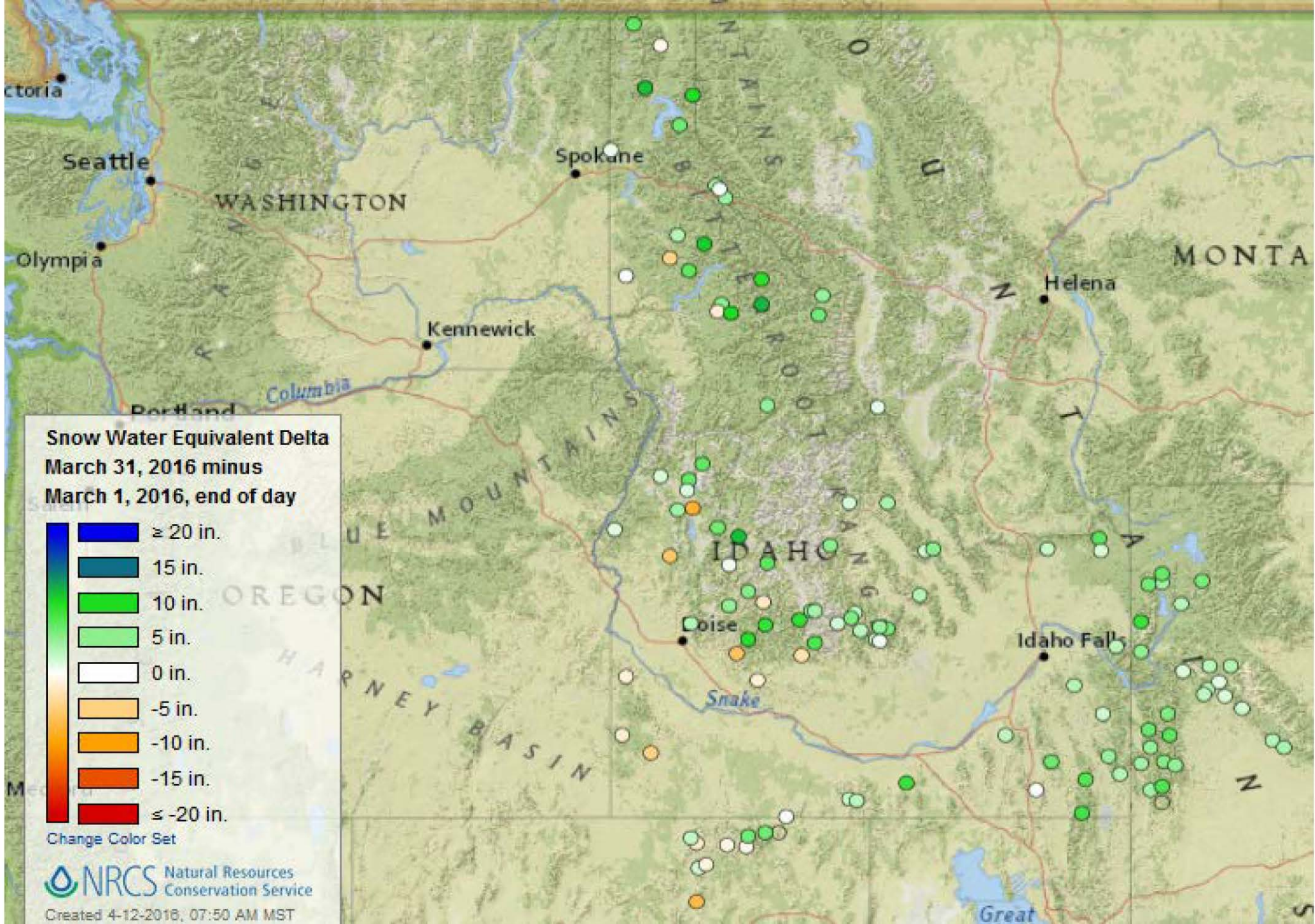
- > 180
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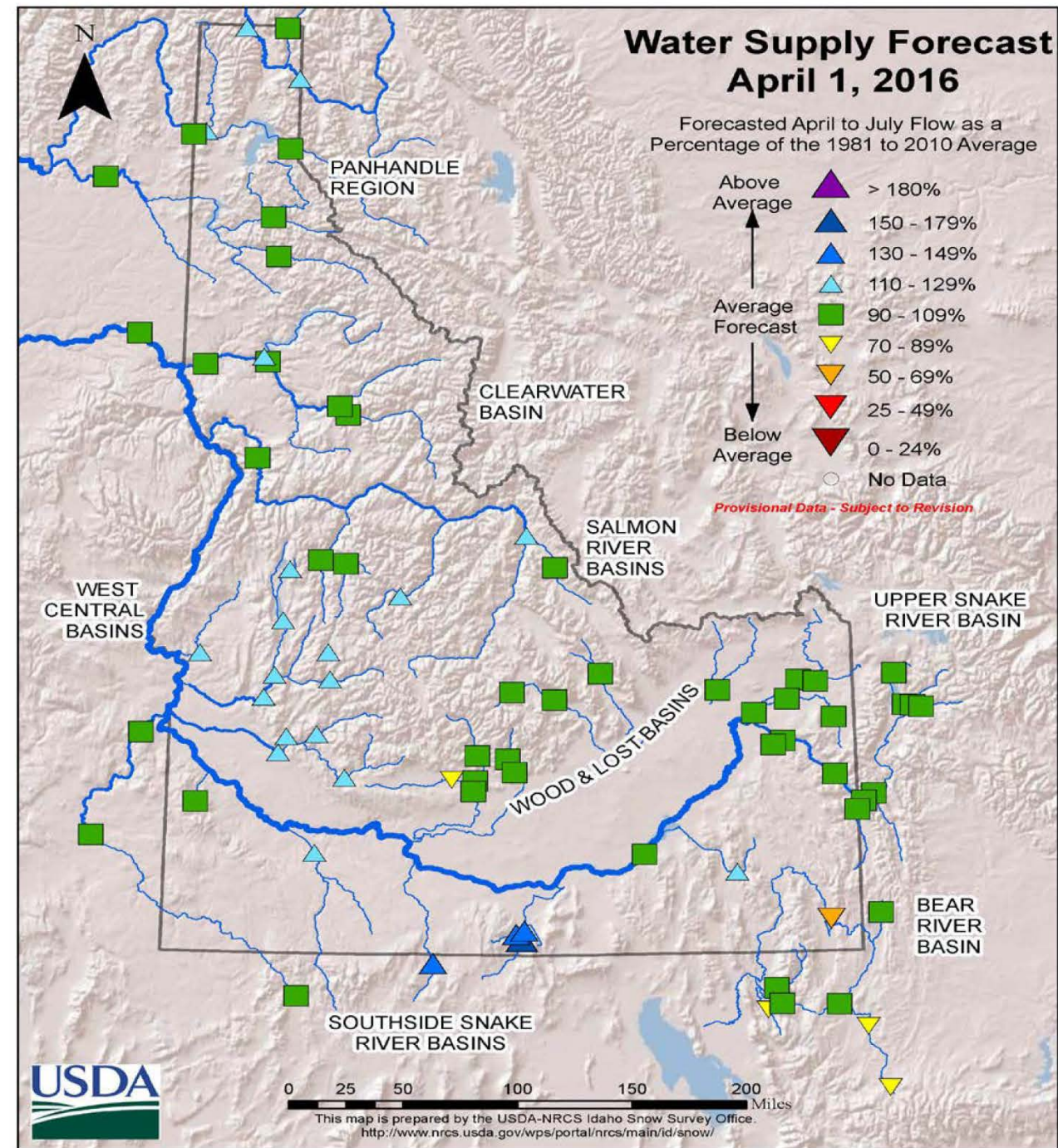
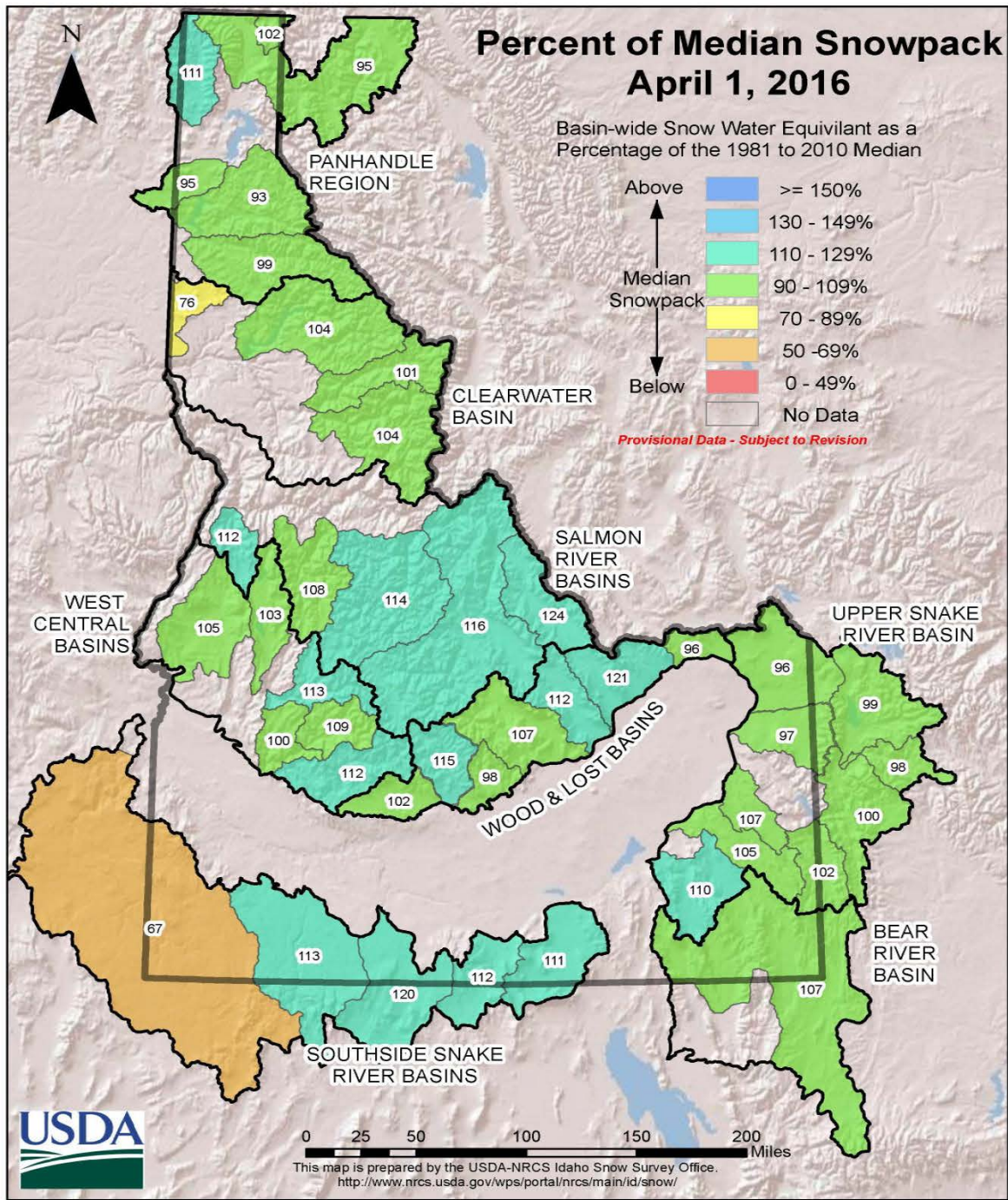


50% exceedance
probability forecasts shown.
For forecasts at other
exceedance probabilities,
see individual state reports.

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USDA Natural Resources Conservation Service
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Portland, Oregon
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Created: 7 Apr 2016 08:20







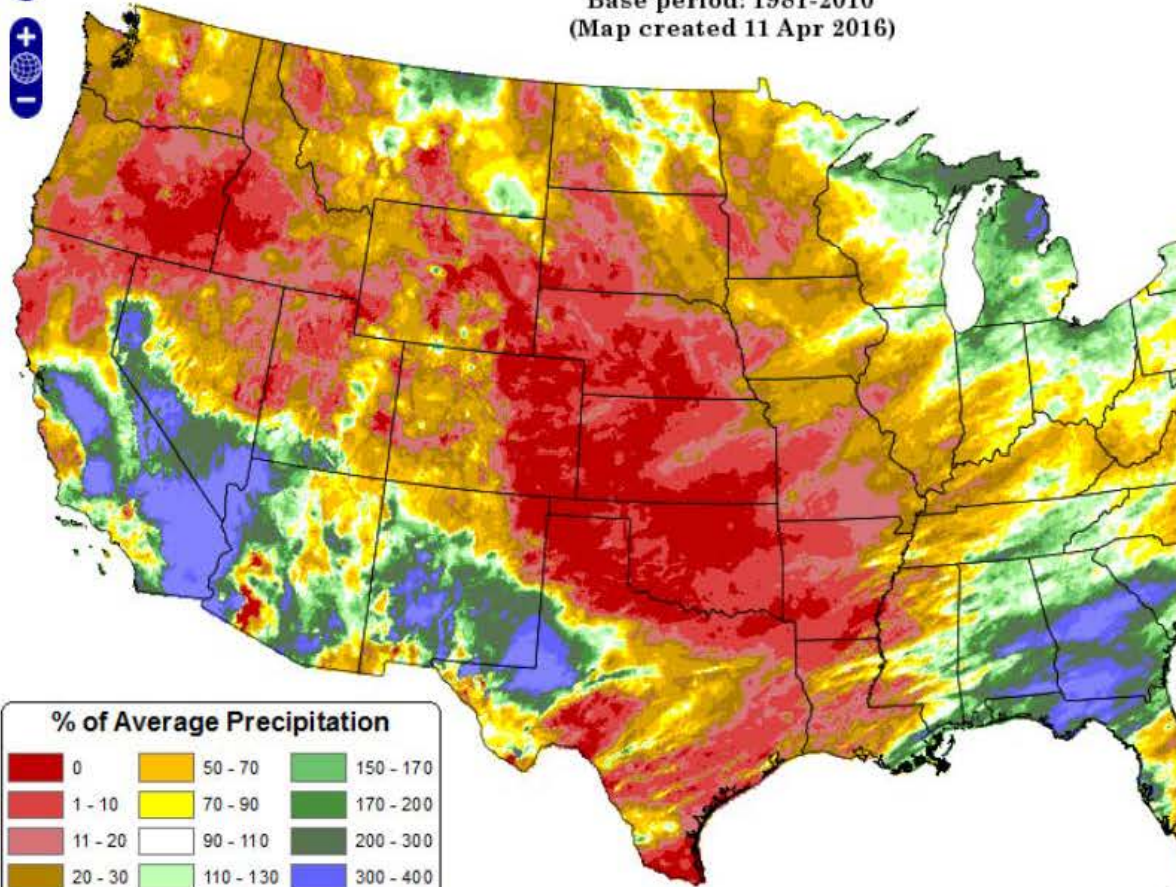
April 1 -10 Precipitation & Temperatures

Total Precipitation Anomaly: 01 April 2016 - 10 April 2016

Period ending 7 AM EST 10 Apr 2016

Base period: 1981-2010

(Map created 11 Apr 2016)



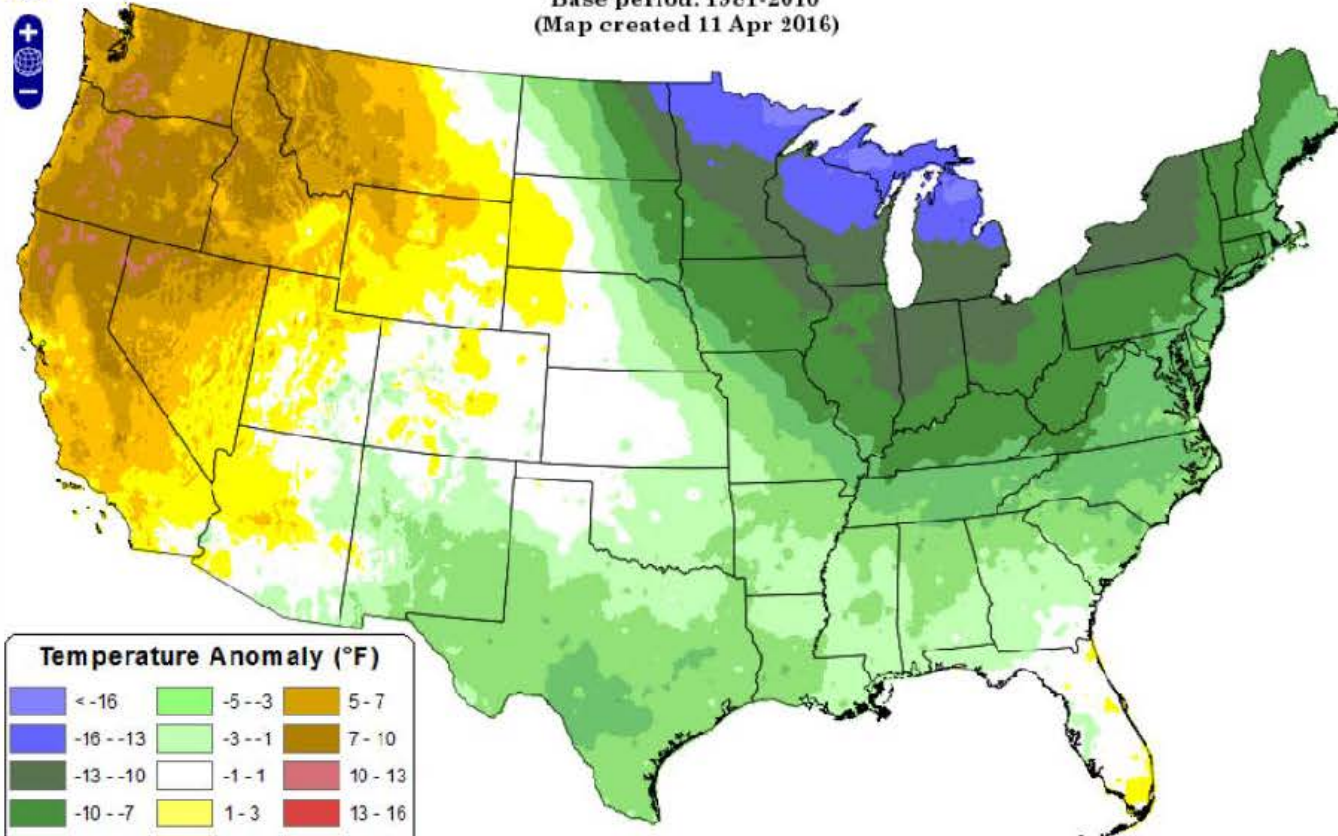
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Daily Mean Temperature Anomaly: 01 April 2016 - 10 April 2016

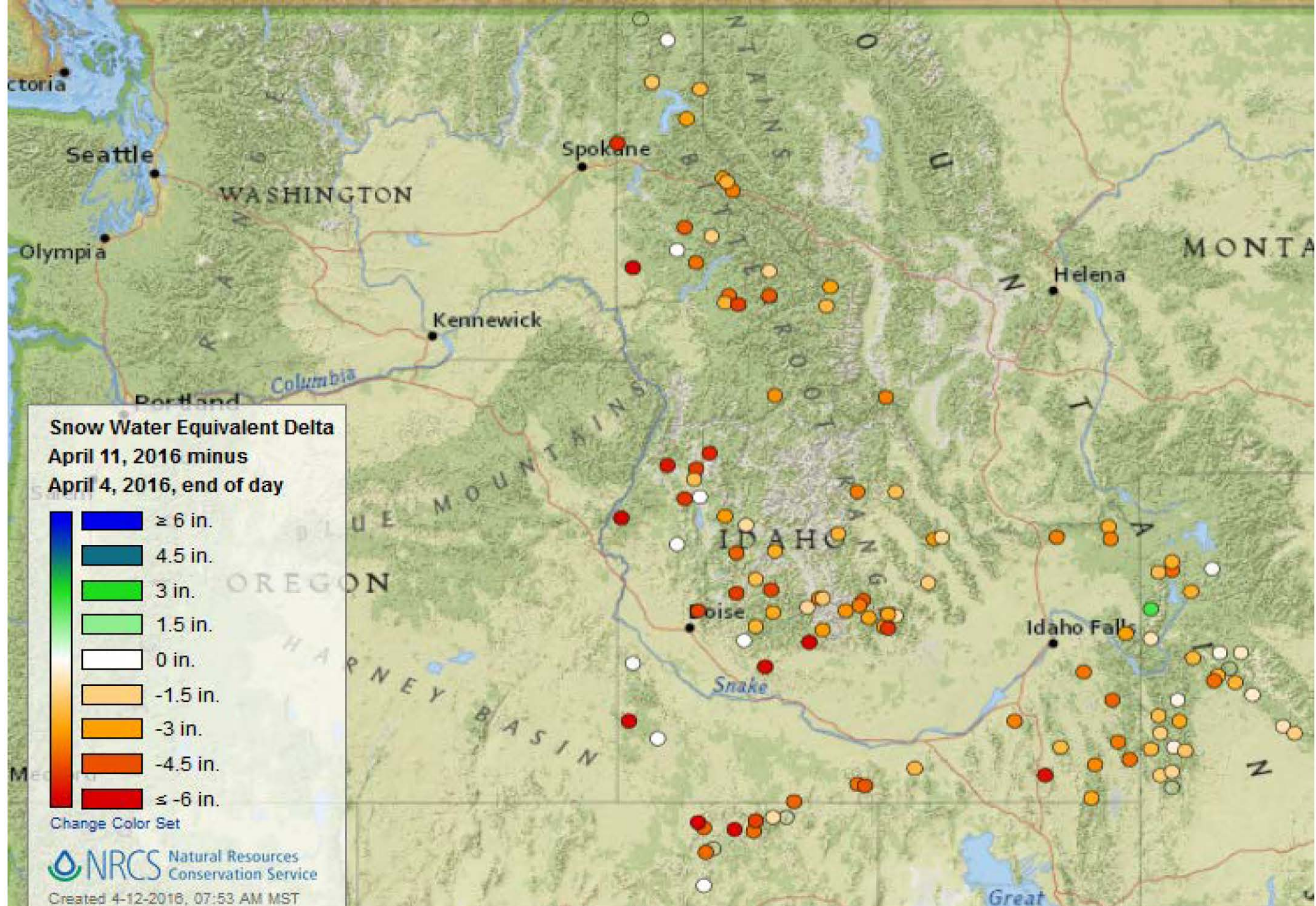
Period ending 7 AM EST 10 Apr 2016

Base period: 1981-2010

(Map created 11 Apr 2016)

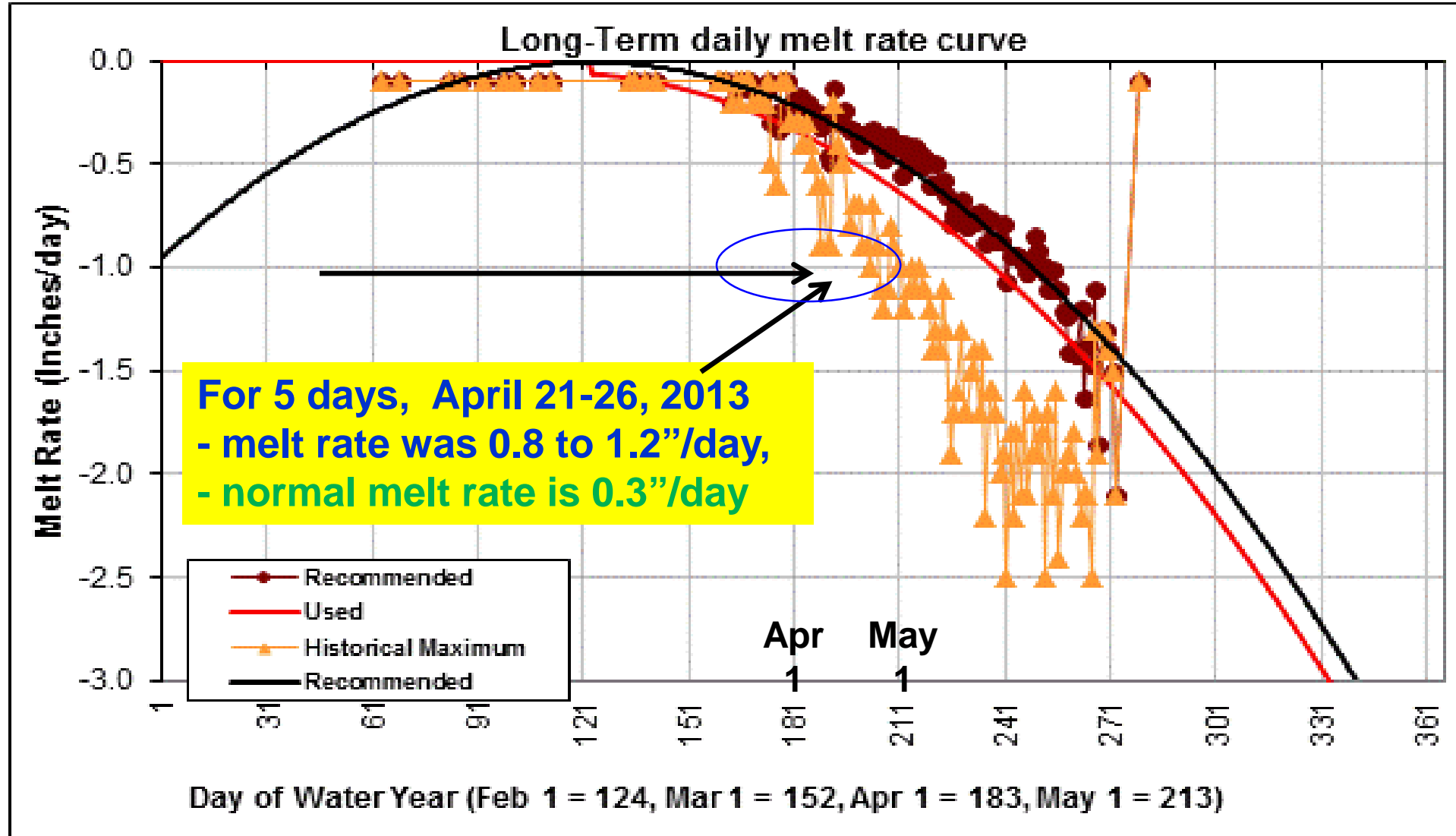


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**Jackson Peak and other west central sites are melting
0.5 to 1.0 inches / day since April 9**

Jackson Peak SNOTEL Boise Basin 7070 feet



SNOTEL Yesterday's Maximum Temperature Records

Apr 12, 2016

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

Yesterday's Maximum Temperature Records

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

Analysis includes sites with at least 15 years of historical data. "Near" record means that one other year of the period of record is more extreme. Temperature is measured from midnight to midnight.

Provisional Data
Subject to Revision



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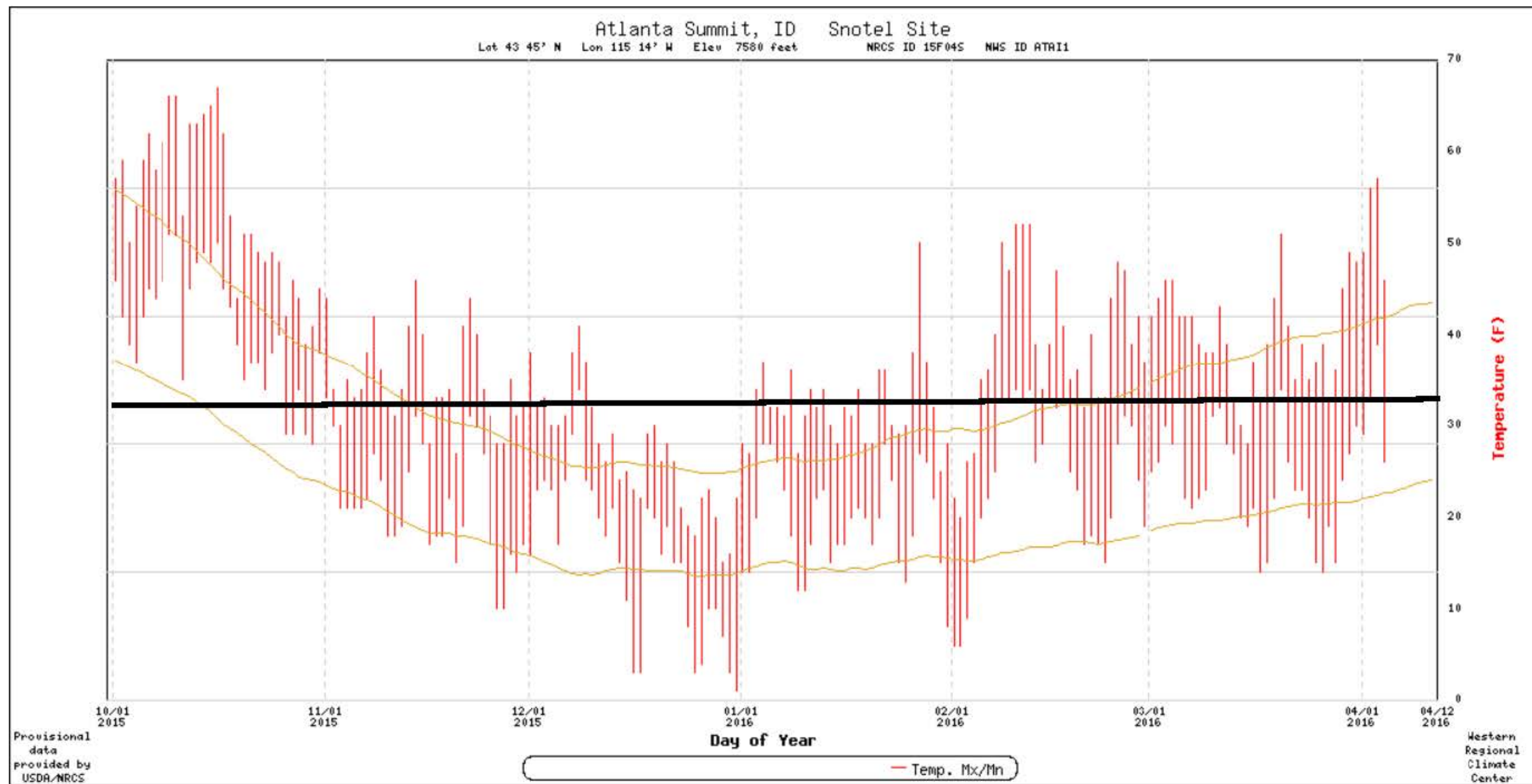
Analysis includes sites with at least 15 years of historical data. "Near" record means that one other year of the period of record is more extreme. Temperature is measured from midnight to midnight.

Provisional Data
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Snotel Graph



SNOTEL Yesterday's Average Temperature Records

Apr 12, 2016

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

Yesterday's Average Temperature Records

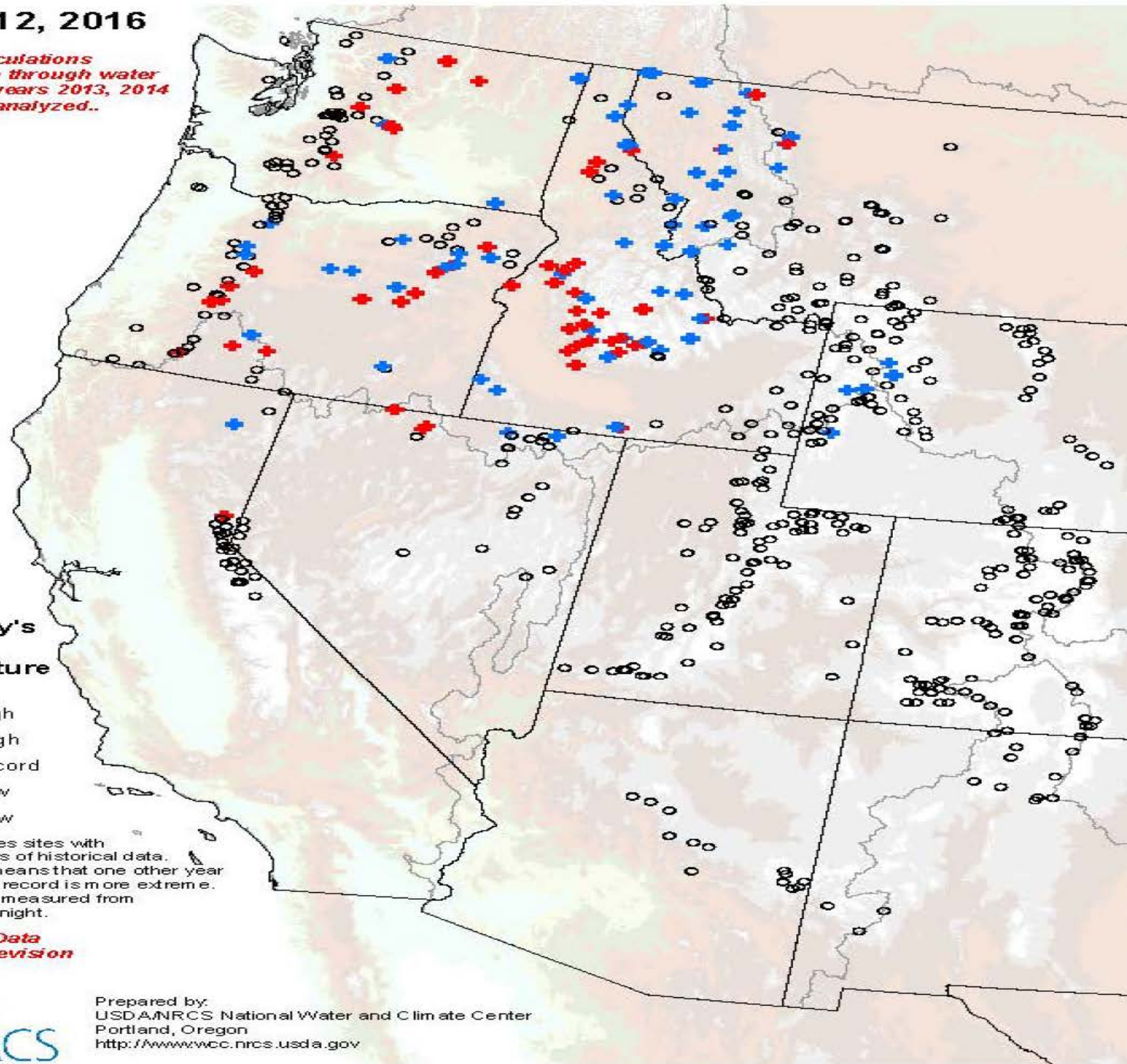
- + New High
- + Near High
- Non Record
- New Low
- Near Low

Analysis includes sites with at least 15 years of historical data. "Near" record means that one other year of the period of record is more extreme. Temperature is measured from midnight to midnight.

*Provisional Data
Subject to Revision*

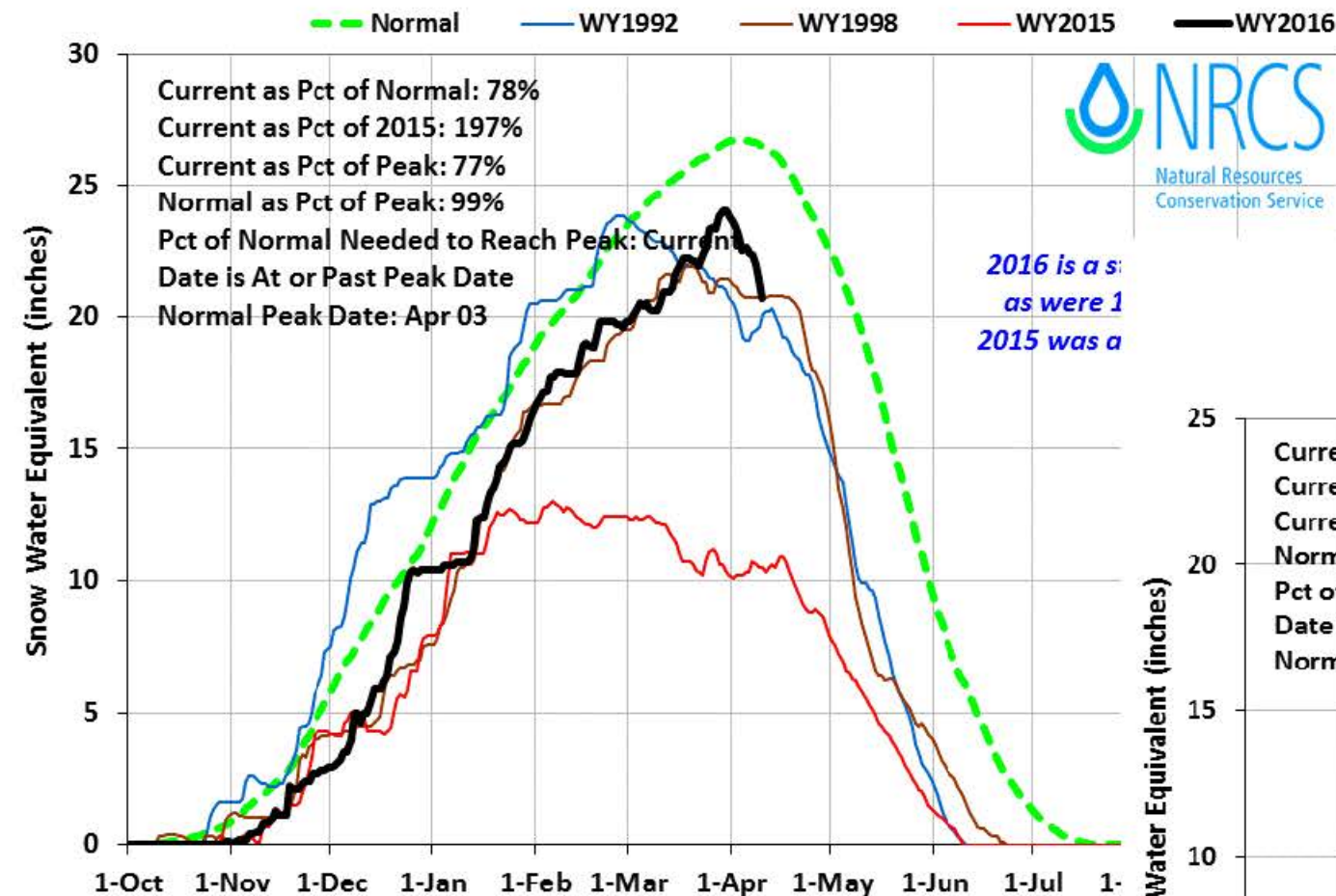


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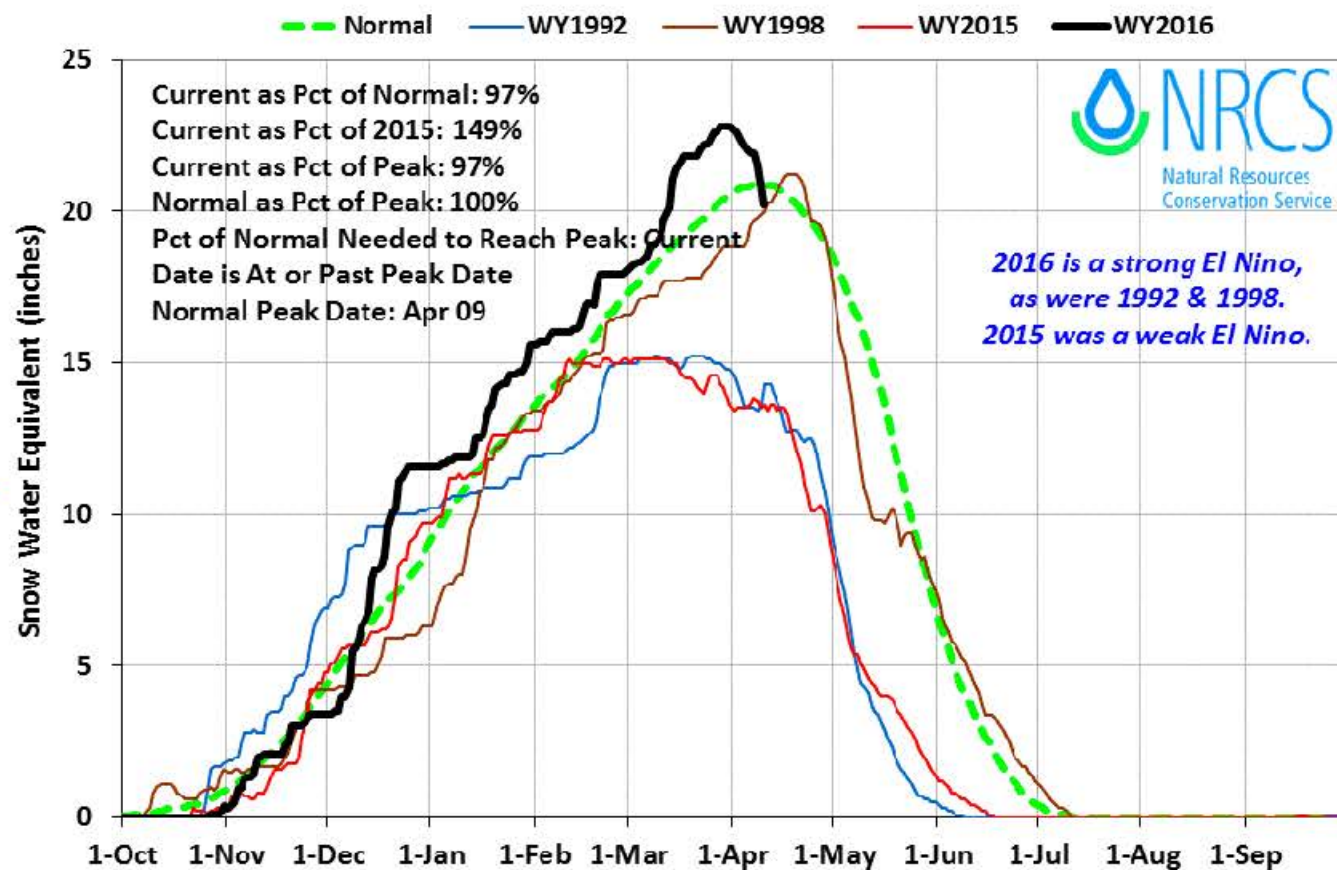
Spokane Basin 2016 Snowpack Comparison Graph (9 sites)

Based on Provisional SNOTEL data as of Apr 10, 2016



Salmon Basin 2016 Snowpack Comparison Graph (22 sites)

Based on Provisional SNOTEL data as of Apr 10, 2016

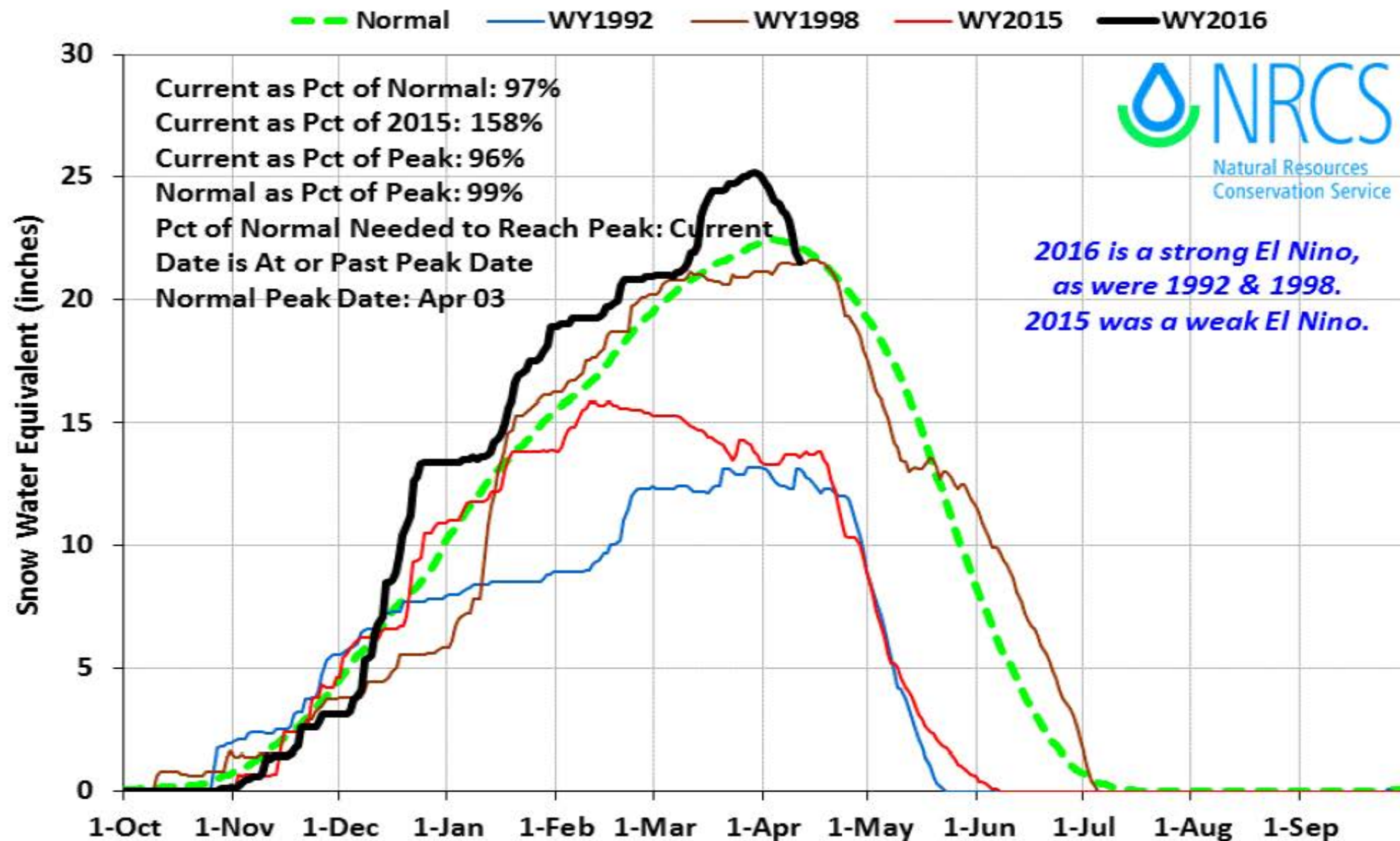


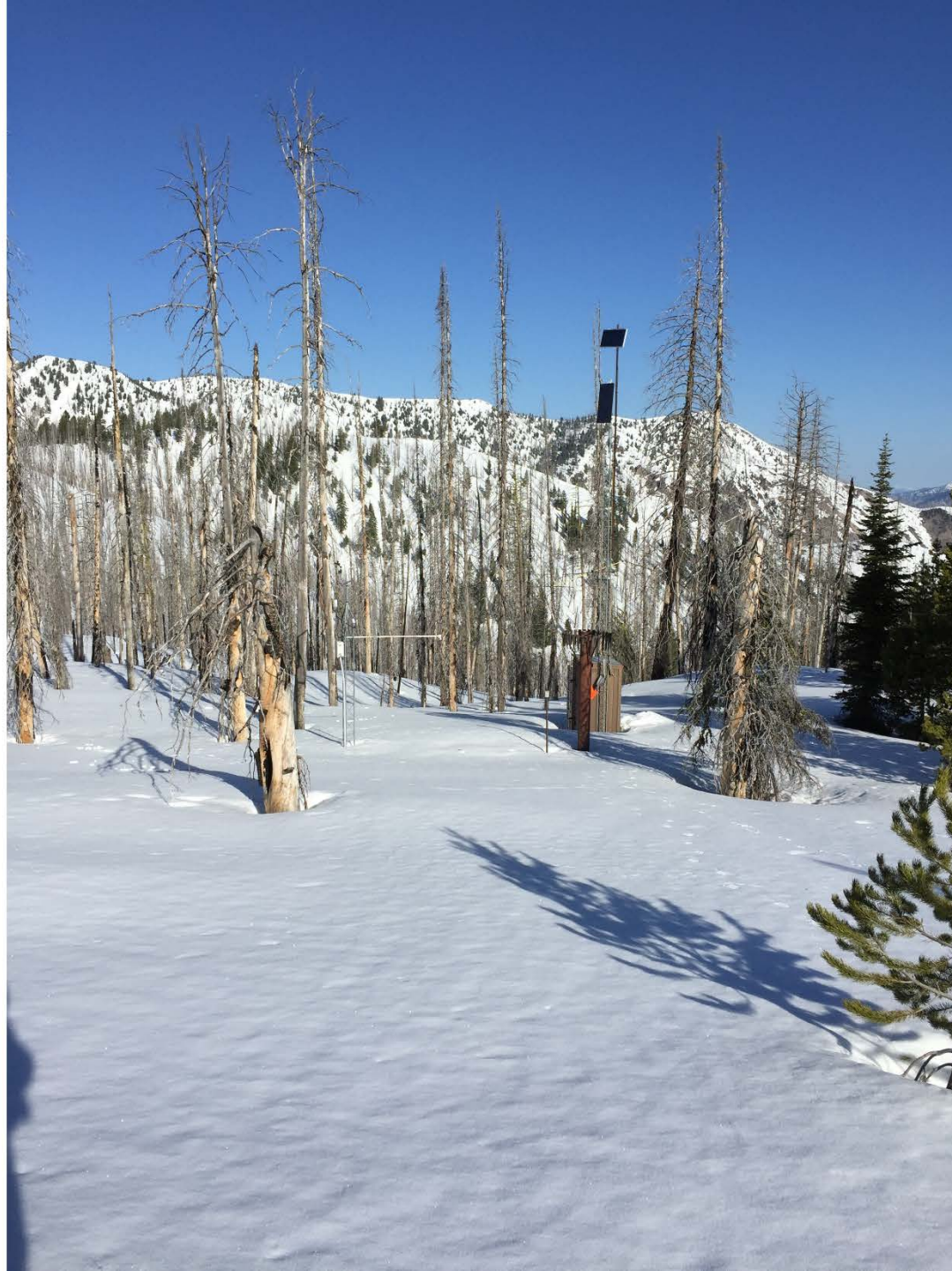
IDAHO SURFACE WATER SUPPLY INDEX (SWSI) APRIL 1, 2016

<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	-0.1	1981	NA
Clearwater	1.7	2009	NA
Salmon	0.3	2010	NA
Weiser	1.3	2010	NA
Payette	1.0	2008	NA
Boise	1.3	2012	-2.1
Big Wood	0.8	1985	0.2
Little Wood	1.0	2009	-1.2
Big Lost	0.8	2009	0.7
Little Lost	0.8	2012	1.4
Teton	0.1	2010	-3.9
Henrys Fork	-0.3	2000	-3.7
Snake (Heise)	0.8	2012	-1.6
Oakley	1.5	2007	0.0
Salmon Falls	1.7	1995/1996	-0.7
Bruneau	2.0	1997	NA
Owyhee	0.6	2005	-3.0
Bear River	-0.6	2015	-3.9

Boise Basin 2016 Snowpack Comparison Graph (10 sites)

Based on Provisional SNOTEL data as of Apr 11, 2016

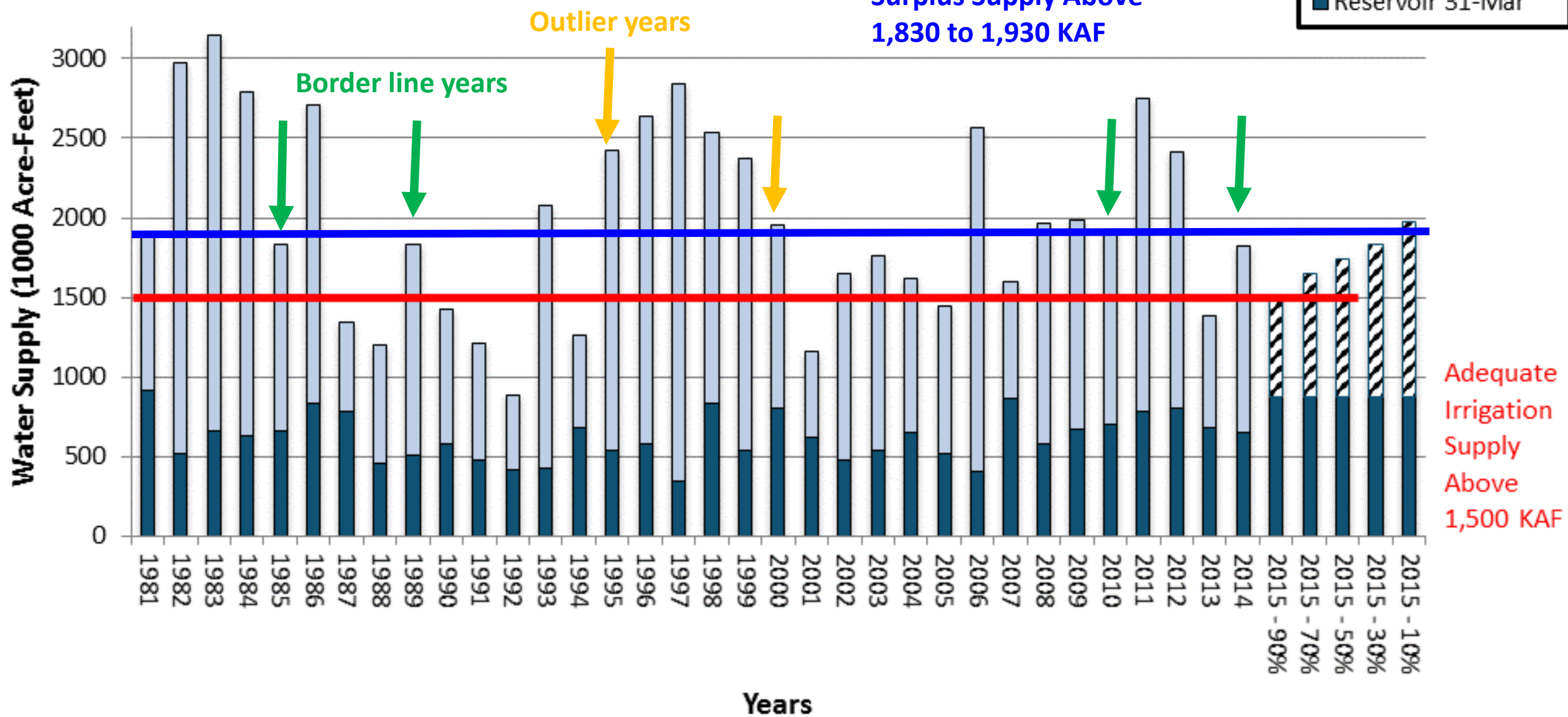




April 11, 2016
Atlanta Summit SNOTEL,
measured 36.0" of water
with an average density of 48%!

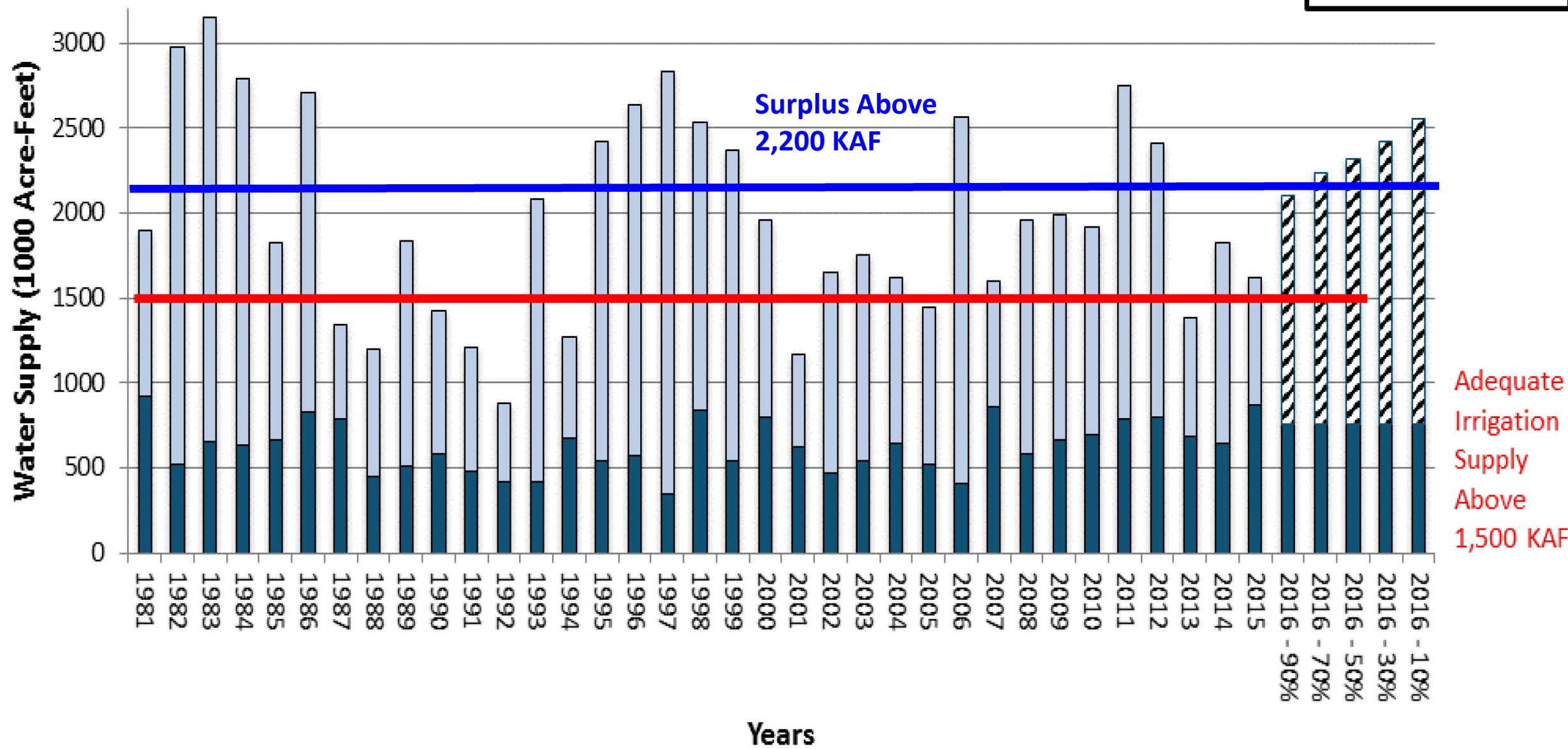
MARCH 1, 2016 SWSI Stacked Graph

Apr 1 Historic and Forecasted Surface Water Supply
Boise River Basin



Apr 1 Historic and Forecasted Surface Water Supply Boise River Basin

- StreamFlow Apr-Sep
- Reservoir 31-Mar



Boise Basin		Based on Glenwood Gauge Data 1982 - 2014					
Year	Apr - Sep Volume [KAF]	March 31 Res Storage [KAF]	Sum Volume + Storage [KAF]	Max Q at Glenwood [cfs]	Days > 6000 cfs @ Glenwood	Max Q Unreg @ LUC [cfs]	
1983	2494.7	655.5	3150.2	9560	95	24255	
1982	2460.5	515.9	2976.4	7410	75	19020	
1997	2490.6	346.5	2837.1	7160	117	24052	
1984	2160.6	630.0	2790.6	6900	42	22541	
2011	1965.4	785.0	2750.4	7130	61	18787	
1986	1881.1	831.3	2712.4	7960	79	17992	
1996	2065.5	574.1	2639.6	6690	67	20570	
2006	2162.4	403.7	2566.1	7050	39	22066	
1998	1700.6	837.0	2537.6	8350	28	14186	
1995	1887.1	535.8	2422.9	4970	0	13350	Outlier
2012	1610.9	801.3	2412.1	8050	45	22787	
1999	1838.1	537.5	2375.6	6770	36	16445	
Surplus above 2200 KAF							
1993	1656.5	421.7	2078.2	6560	5	16339	Borderline Surplus
2009	1323.0	666.6	1989.6	6040	1	10973	
2008	1382.1	577.9	1960.0	6860	5	17201	
2000	1154.6	801.5	1956.1	3330	0	8867	Outlier
2010	1223.8	697.0	1920.8	6000	0	17686	Borderline Surplus
1989	1324.2	507.5	1831.7	6130	5	13151	
1985	1165.6	664.0	1829.6	2360	0	9842	Peak Flows below 6000 cfs
2014	1178.3	645.1	1823.4	1880	0	9776	
2003	1218.6	538.4	1757.0	1480	0	16023	
2002	1178.4	471.8	1650.2	1340	0	14216	
2004	973.5	647.1	1620.6	1320	0	7247	
2007	736.4	859.9	1596.3	1480	0	6441	
Shortages below 1500 KAF							
2005	931.1	517.2	1448.3	1230	0	13233	
1990	840.6	579.3	1419.9	875	0	7881	
2013	703.8	681.6	1385.3	1440	0	7517	
1987	561.8	784.6	1346.4	1470	0	5625	
1994	588.4	677.9	1266.3	1280	0	5573	
1991	734.4	477.5	1211.9	968	0	6308	
1988	745.6	451.3	1196.9	939	0	6234	
2001	544.9	619.5	1164.4	947	0	6209	
1992	470.8	412.3	883.1	830	0	4317	

Boise Basin:

Determination of the 2,200 KAF Surplus Level: The surplus threshold of 2200 KAF for the Boise Basin was determined based the following analysis for years 1982-2014. The Boise River at Glenwood Bridge gage was installed in 1982.

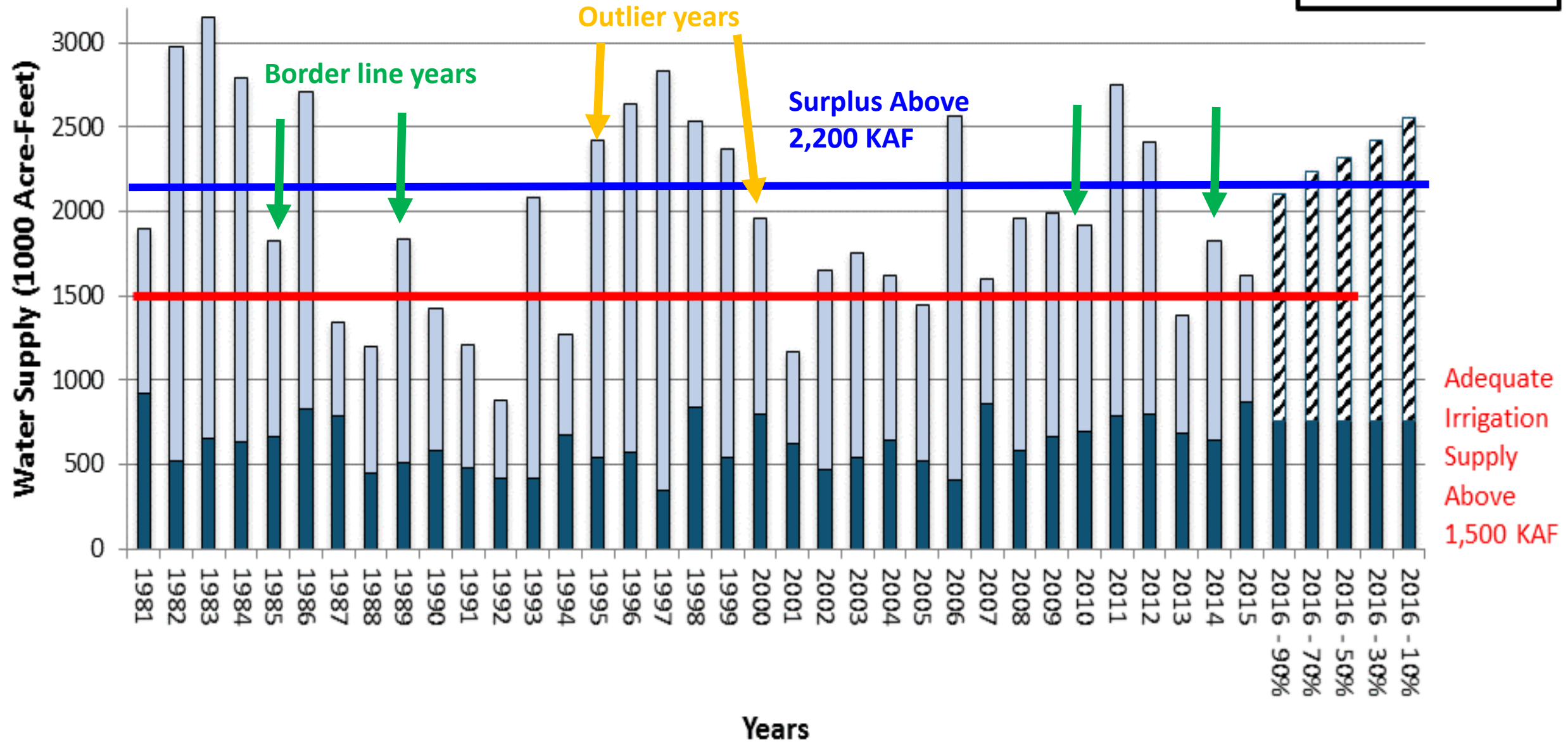
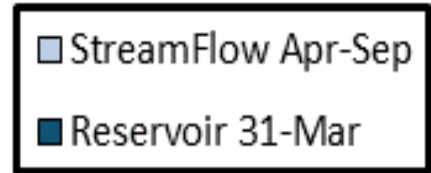
SWSI volumes greater than 2,200 KAF, which is the summation of the Mar 31 combined reservoir storage plus Apr-Sep runoff volume, was sorted high to low.

Peak flows at the Glenwood gage were determined along with the number of days above 6000 cfs. There seems to be a distinct cutoff in the maximum flow at Glenwood. **Only one year, 1995, had a maximum discharge between 3330 to 6000 cfs.**

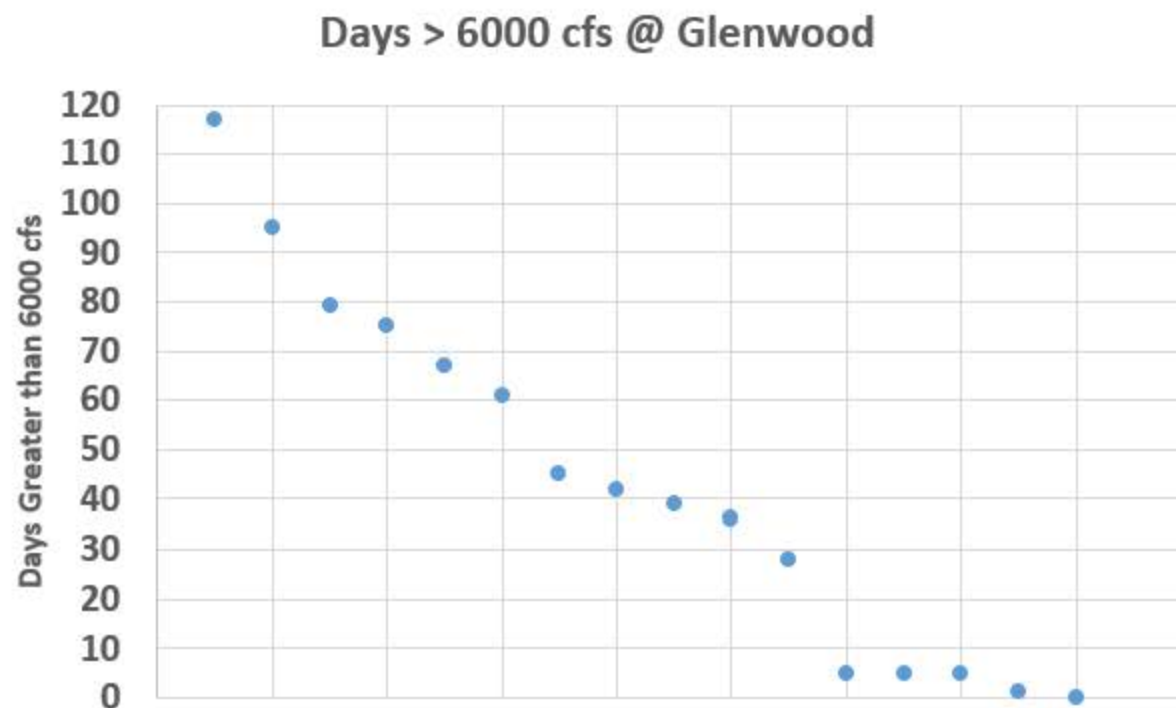
Natural inflow peaks were used as a guide but the amount released from the reservoir is primarily a function of the storage in the reservoir system. **The total volume is then compared to the Glenwood maximum flow and duration of high flows.**

A volume greater than 2,200 KAF with a flow greater 6,000 cfs passing through the Boise River at Glenwood gage for generally more than 25 days meets the surplus threshold.

Apr 1 Historic and Forecasted Surface Water Supply Boise River Basin



Year	Days > 6000 cfs @ Glenwood
1997	117
1983	95
1986	79
1982	75
1996	67
2011	61
2012	45
1984	42
2006	39
1999	36
1998	28
1993	5
2008	5
1989	5
2009	1
1995	0
2000	0
2010	0
1985	0
2014	0
2003	0
2002	0
2004	0
2007	0
2005	0
1990	0



The years with days above 6000 cfs on the Boise River at Glenwood Bridge are plotted. In the table, the years are in bold. The years in blue are surplus, and the years in green are borderline (defined above). The red years correspond to years of water supply shortage.

Big Lost Basin 2016 Snowpack Comparison Graph (5 sites)

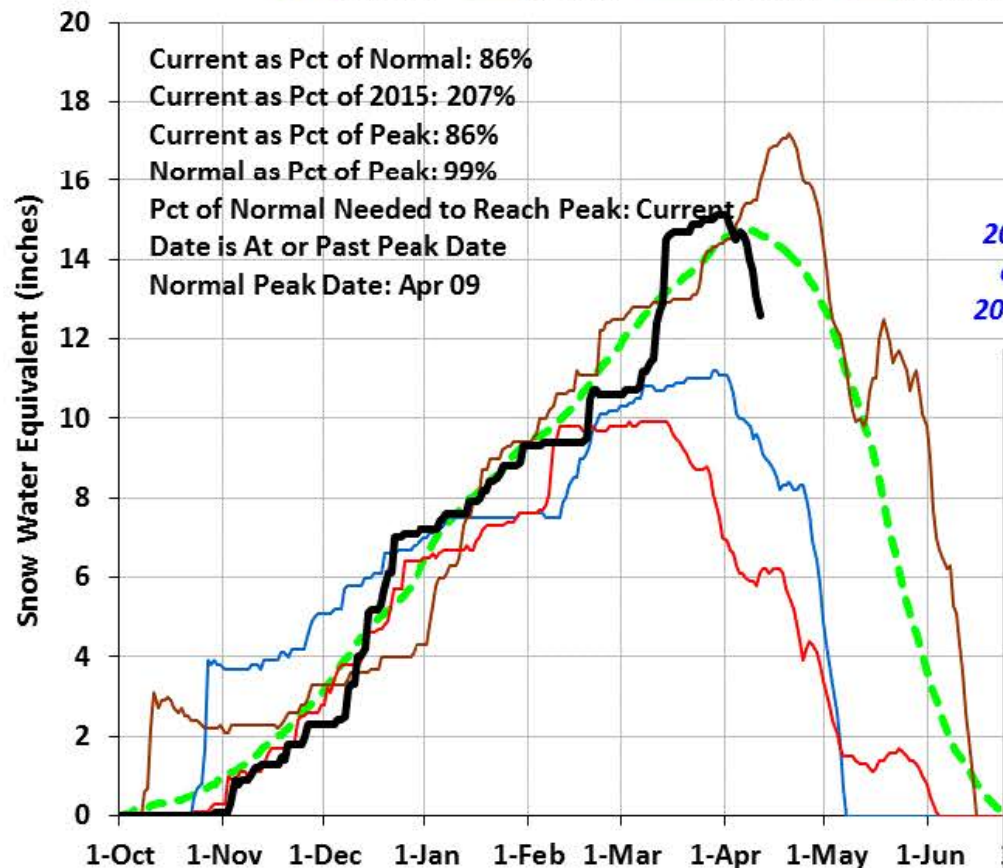
Based on Provisional SNOTEL data as of Apr 11, 2016

Normal WY1992 WY1998 WY2015 WY2016

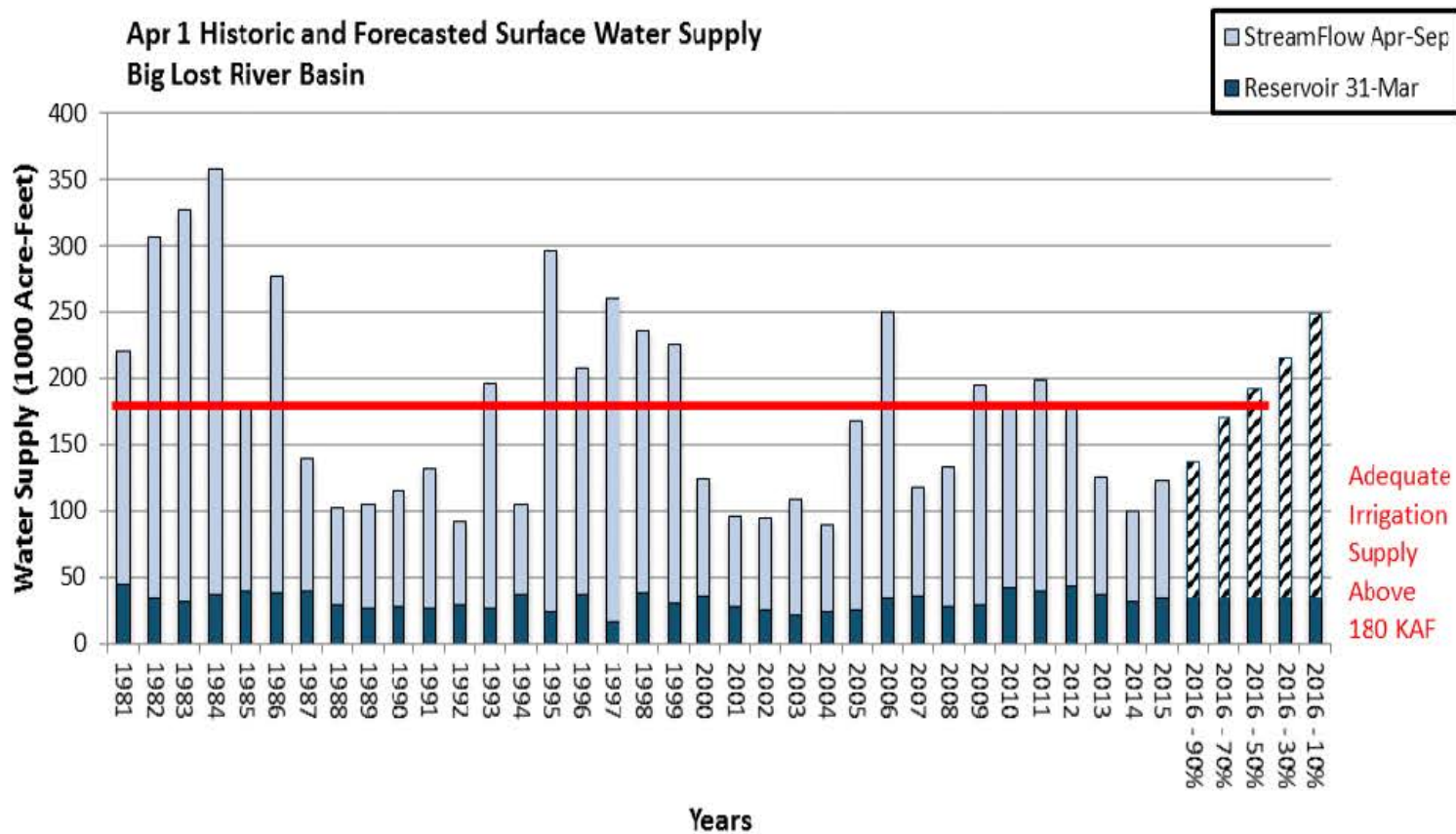


Current as Pct of Normal: 86%
 Current as Pct of 2015: 207%
 Current as Pct of Peak: 86%
 Normal as Pct of Peak: 99%
 Pct of Normal Needed to Reach Peak: Current
 Date is At or Past Peak Date
 Normal Peak Date: Apr 09

2016 is a strong El Nino,
 as were 1992 & 1998.
 2015 was a weak El Nino.



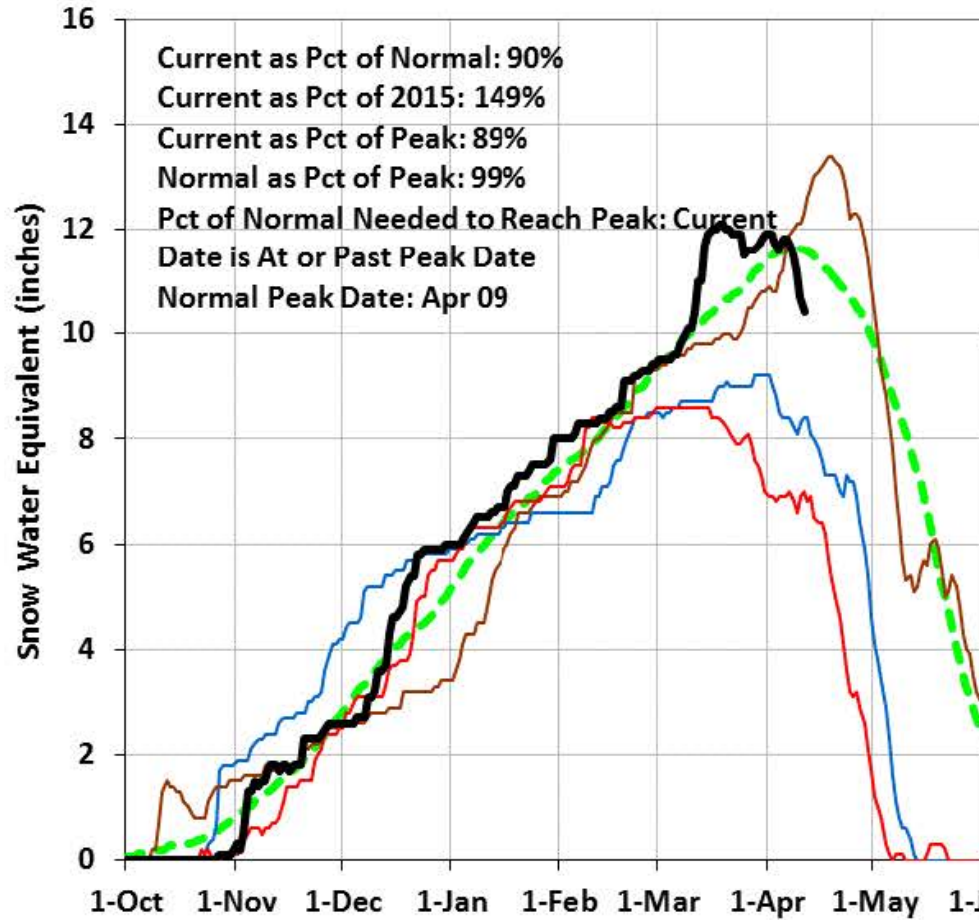
Apr 1 Historic and Forecasted Surface Water Supply Big Lost River Basin



Little Lost and Birch Basins 2016 Snowpack Comparison Graph (4 sites)

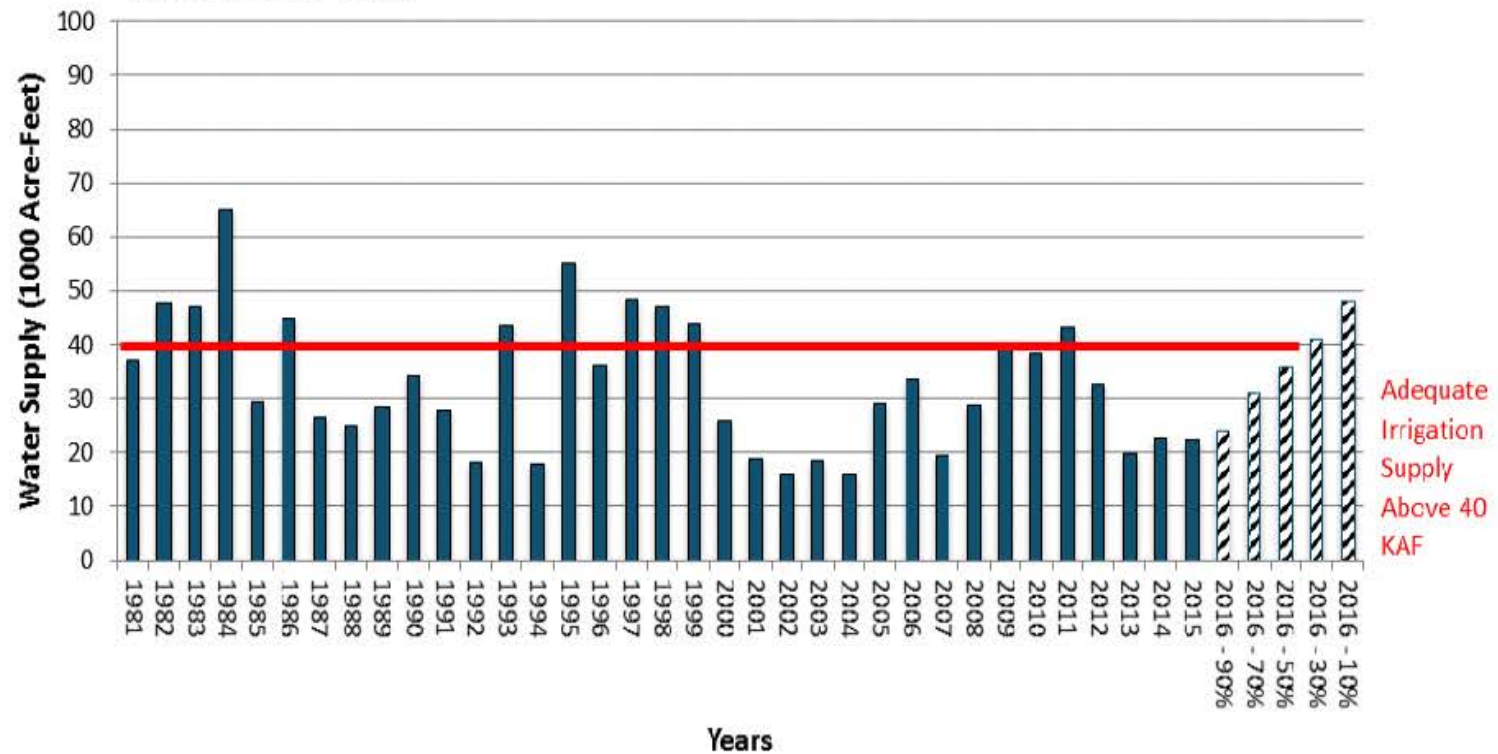
Based on Provisional SNOTEL data as of Apr 11, 2016

Normal WY1992 WY1998 WY2015 WY2016



2016 is a strong El Niño,
 as were 1992 & 1998.
 2015 was a weak El Niño.

Apr 1 Historic and Forecasted Surface Water Supply Little Lost River Basin



Snake Basin abv Palisades 2016 Snowpack Comparison Graph (18 sites)

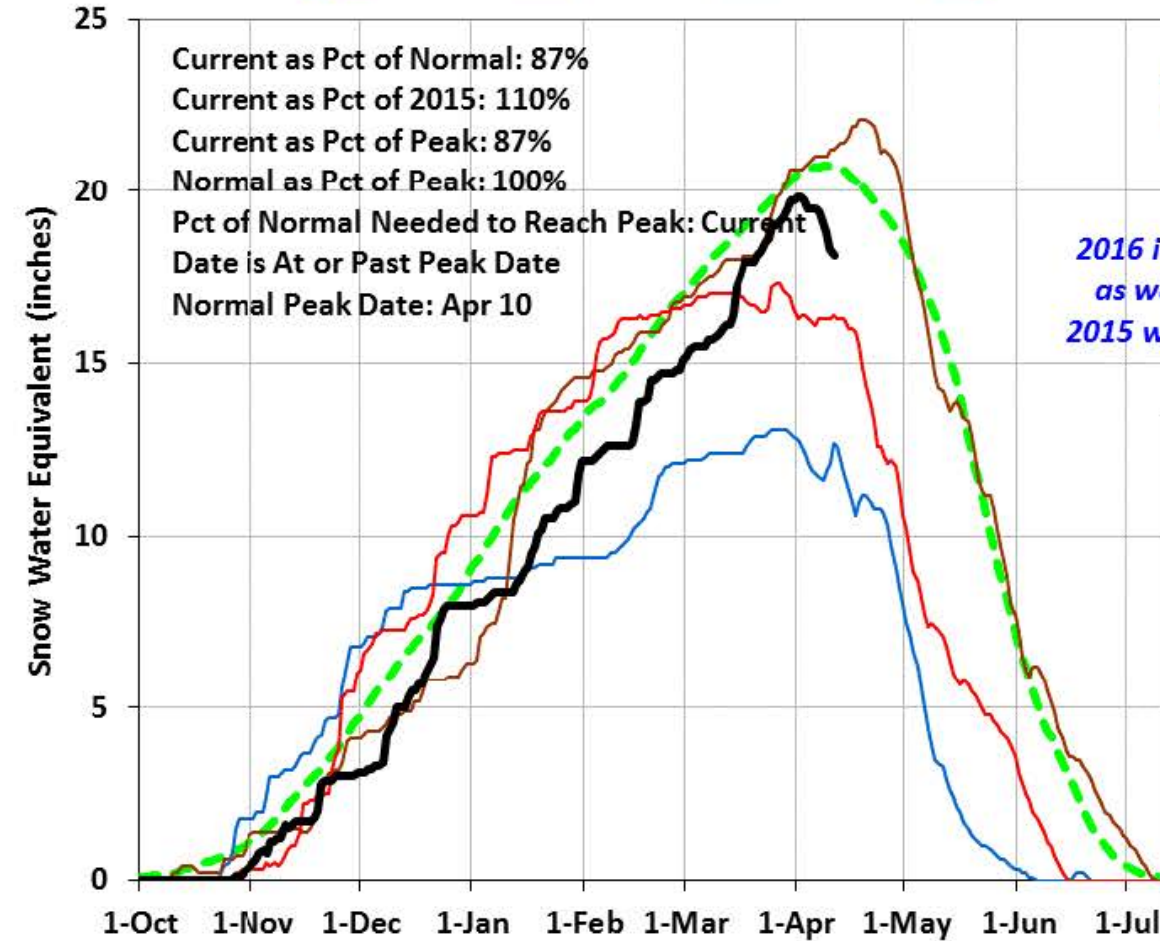
Based on Provisional SNOTEL data as of Apr 11, 2016

Normal WY1992 WY1998 WY2015 WY2016

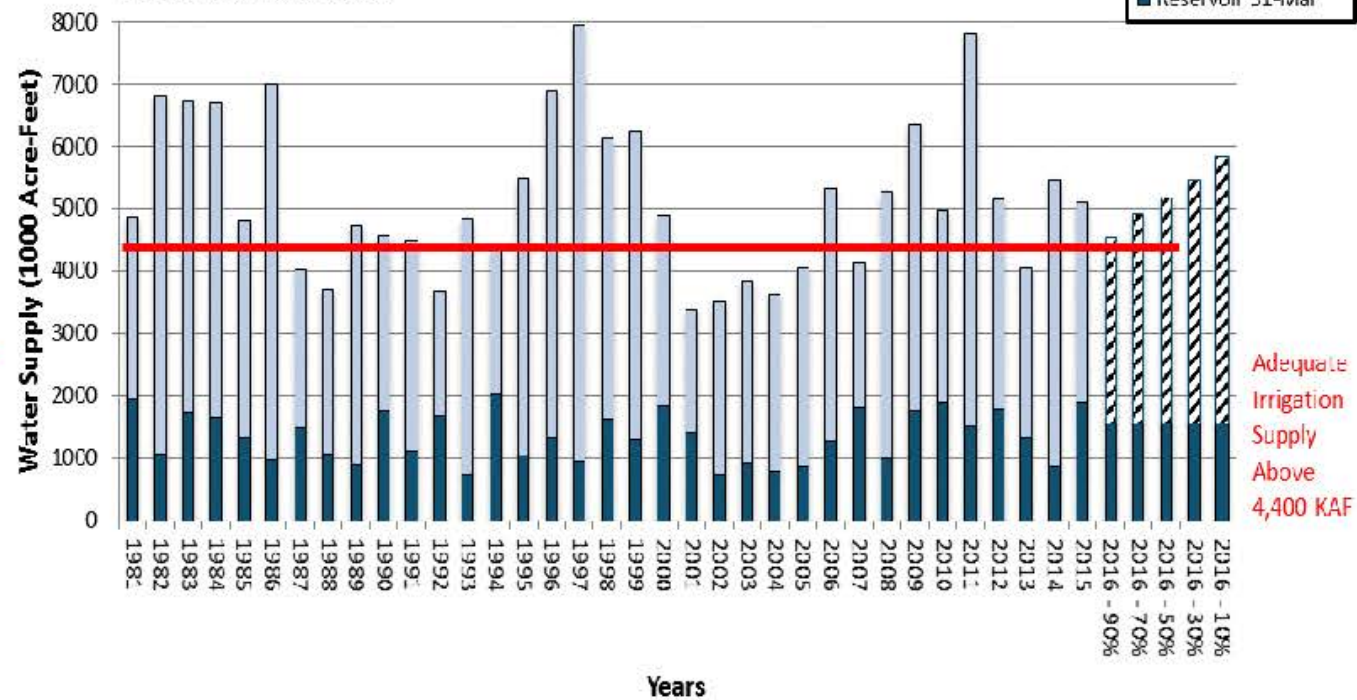


Current as Pct of Normal: 87%
 Current as Pct of 2015: 110%
 Current as Pct of Peak: 87%
 Normal as Pct of Peak: 100%
 Pct of Normal Needed to Reach Peak: Current
 Date is At or Past Peak Date
 Normal Peak Date: Apr 10

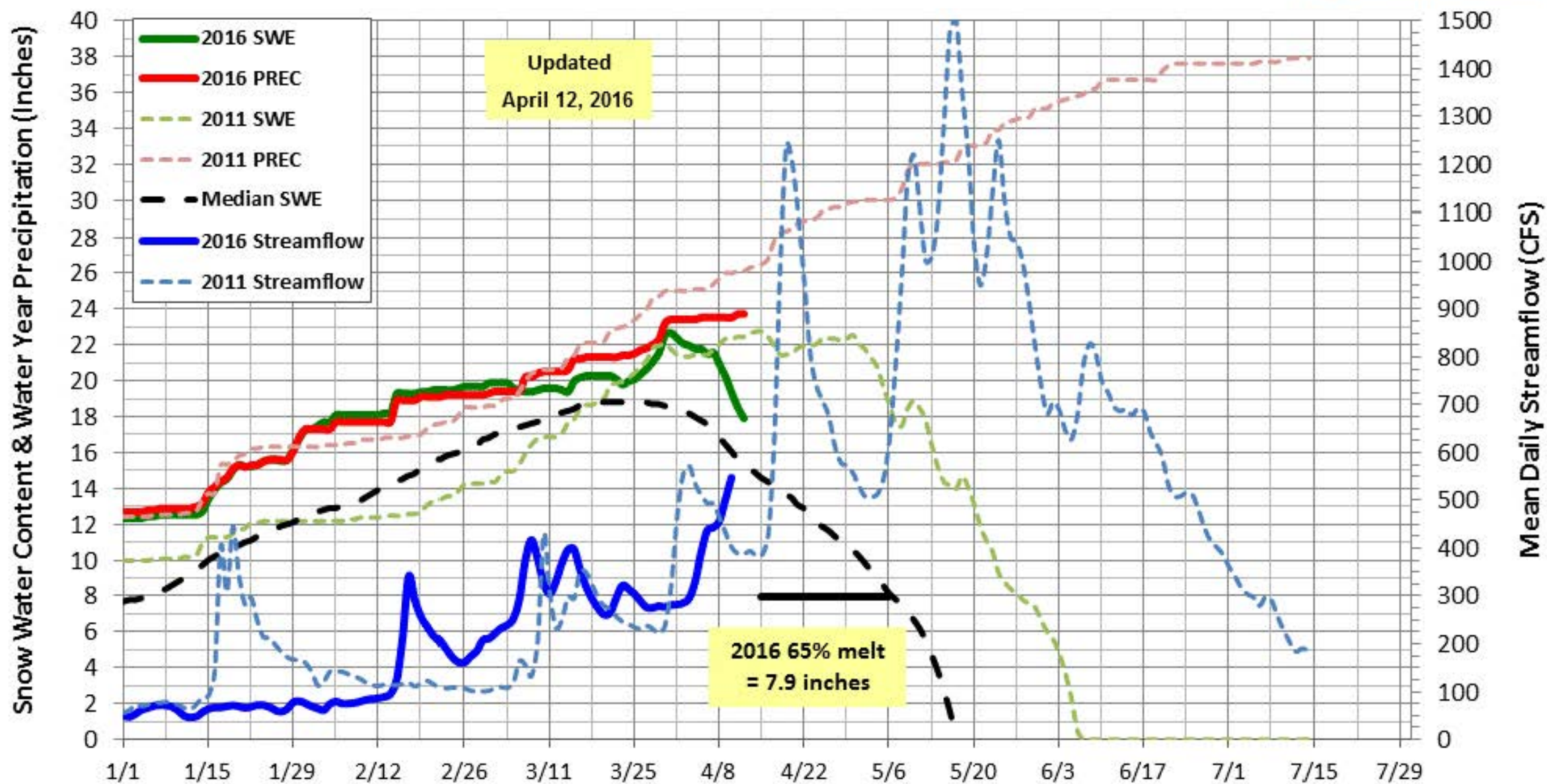
2016 is a strong El Nino,
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Apr 1 Historic and Forecasted Surface Water Supply Snake River Near Heise

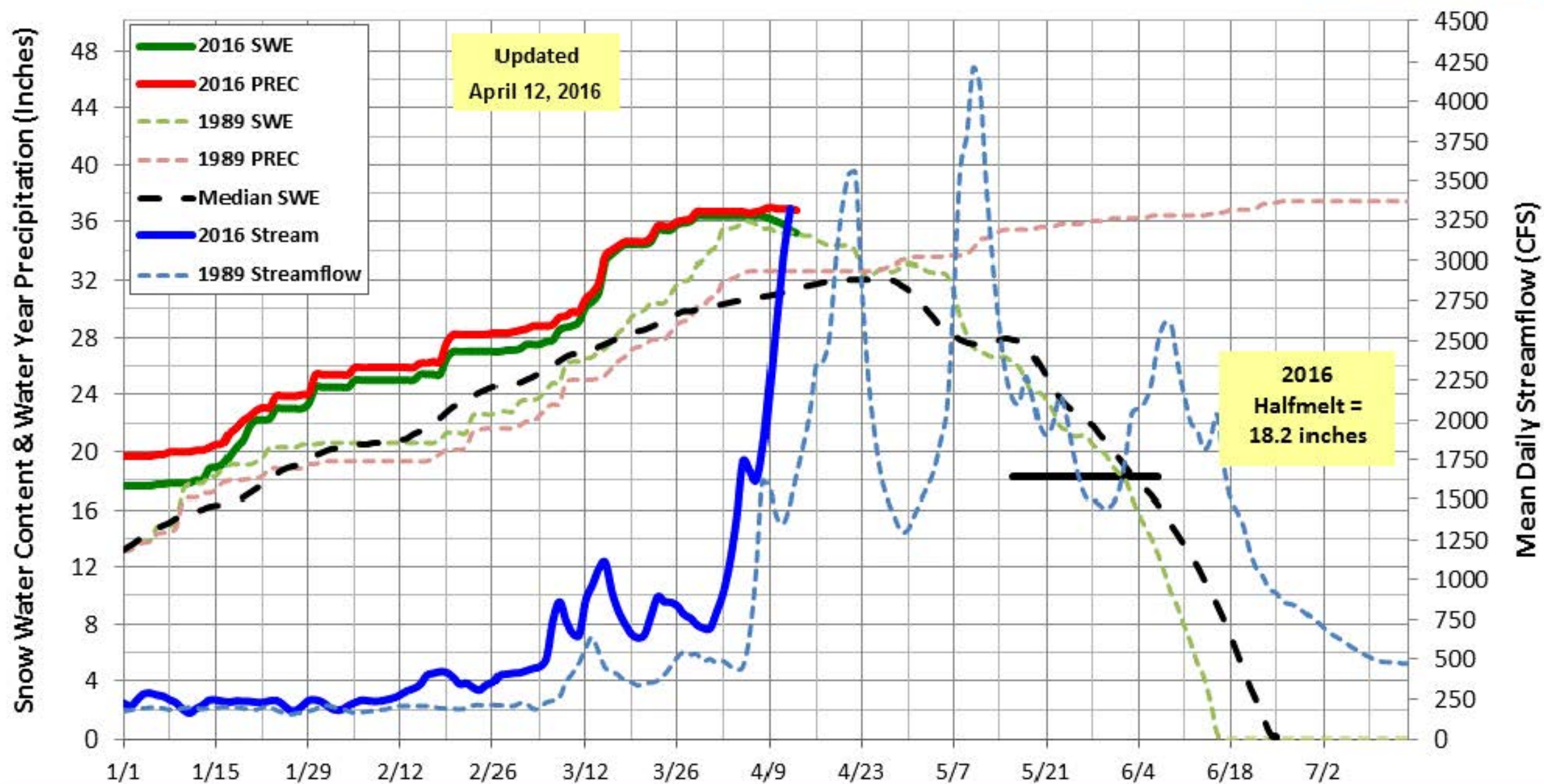


2016 & 2011 Magic Mountain SNOTEL and Salmon Falls Creek near San Jacinto



Salmon Fall Creek usually peaks or has an increase when Magic Mtn SNOTEL is about 65% melted

2016 & 1989 Vienna Mine SNOTEL and SF Boise River near Featherville



SF Boise River near Featherville, on average, peaks or has another increase 3 days after half melt at Vienna Mine



The Sawtooths

April 11, 2016