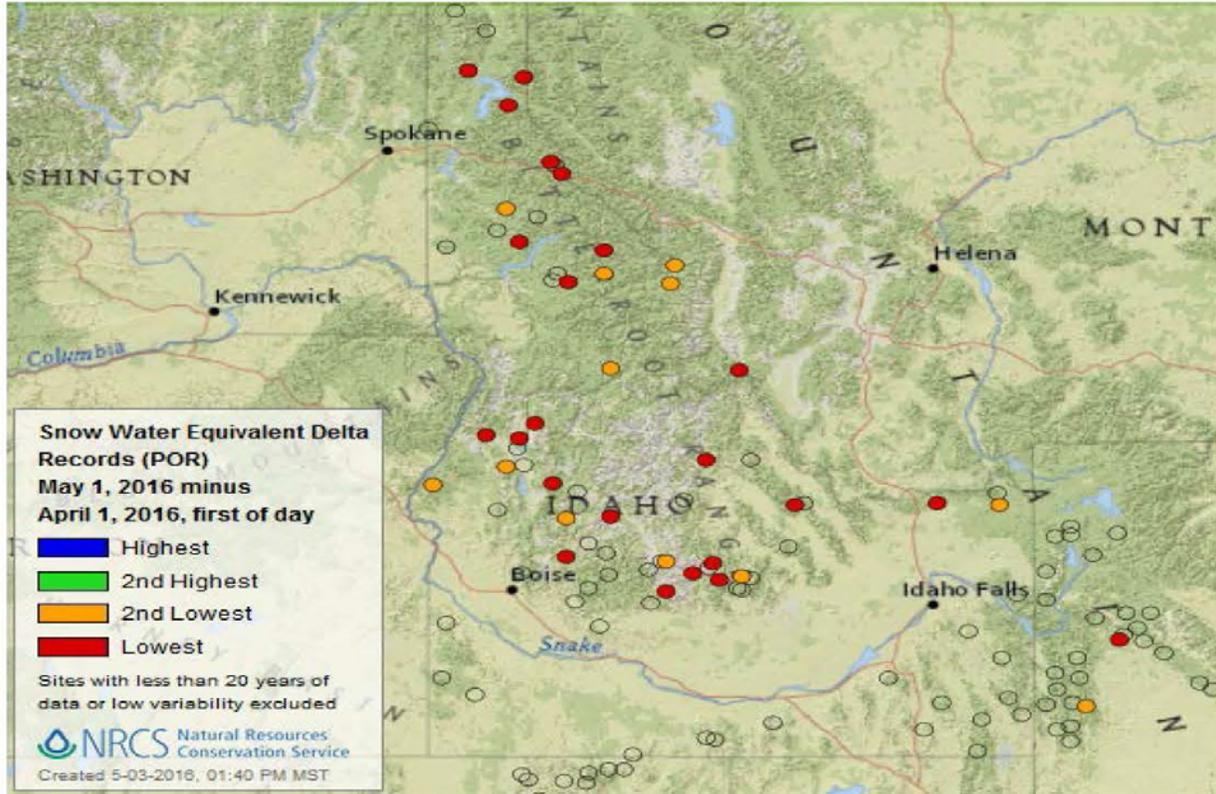


Idaho Water Supply Outlook Report

May 1, 2016



FSA

Farm Loan Meeting

May 20, 2016

Ron Abramovich

Water Supply Specialist

Snow Survey

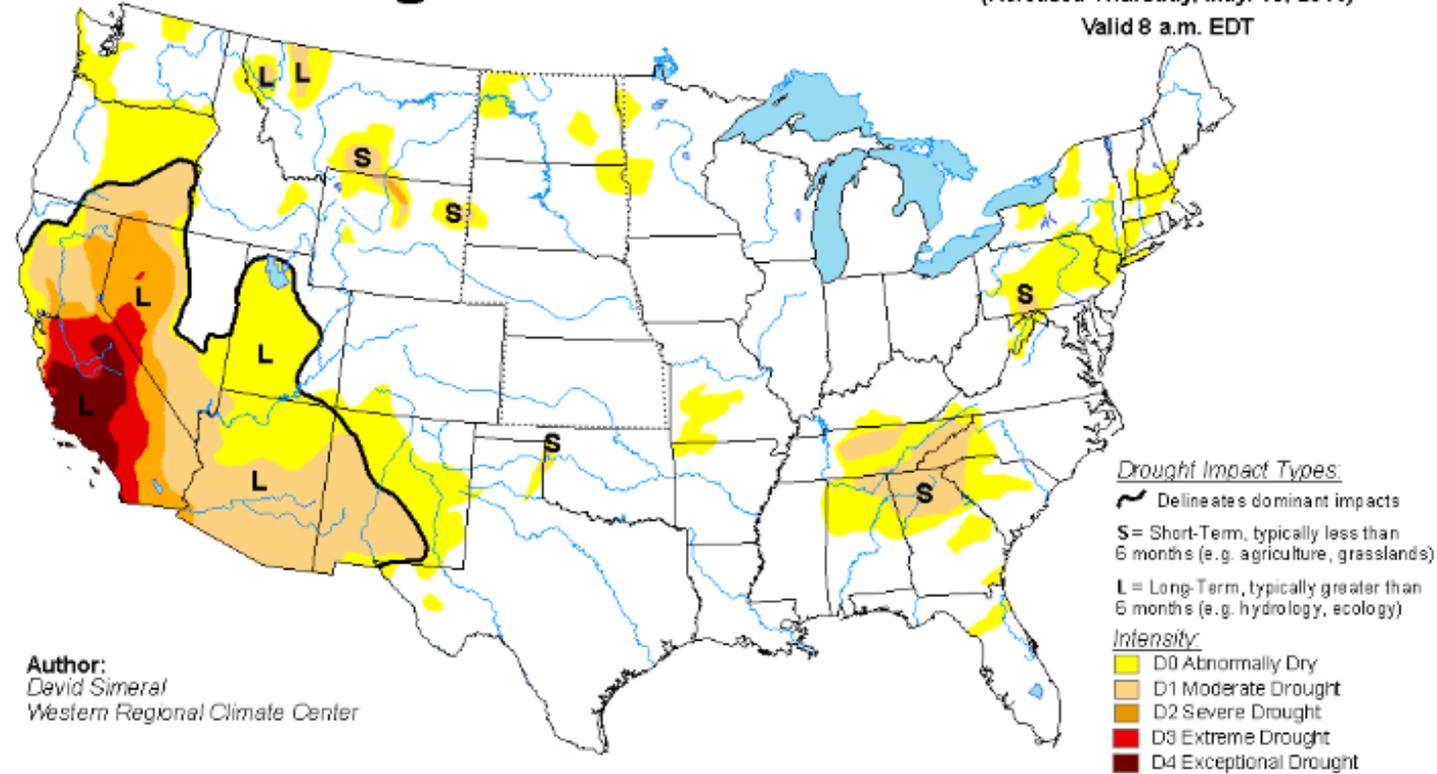
Boise, Idaho



The map above illustrates the effect of unusually warm temperatures and a lack of precipitation in April on the snowpack across Idaho last month. Record and near record declines in snow water equivalent were observed at most of the SNOTEL sites from the Snake River to the northern Panhandle. Sites that normally lose zero to five inches in April lost five to 15 inches or more this year! A major winter storm across Idaho's southern border in late April added to those snowpacks resulting in a more normal progression from winter to summer in that region. The early snow melt this year has streams running well above normal the last two months; and the seasonal peak flows and return to low summer levels are probably two to three weeks ahead of the typical pattern. The conditions vary widely across our region this year, continue reading the full report for more details about your favorite river basins.

U.S. Drought Monitor

May 17, 2016
(Released Thursday, May 19, 2016)
Valid 8 a.m. EDT

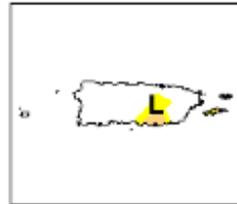
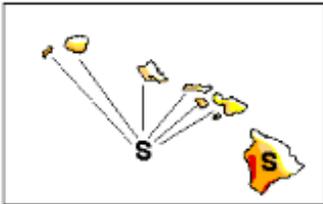
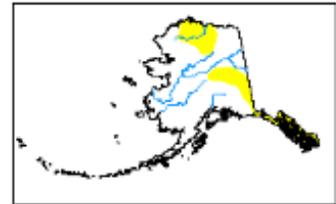


Can provide input / impacts to ensure map is correct to:

David.Hoekema@idwr.idaho.gov
Hydrologist, Technical Hydrology Section
Idaho Department of Water Resources
office: (208) 287-4830

Author:
David Simeral
Western Regional Climate Center

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



<http://drought.gov>

Idaho State Drought Plan

Authorizes an Idaho Water Supply Committee (Section 2.1):

“If it becomes apparent that a problem could occur, IDWR will alert the Governor’s Office and will organize a Water Supply Committee to coordinate all drought related activities in Idaho.”

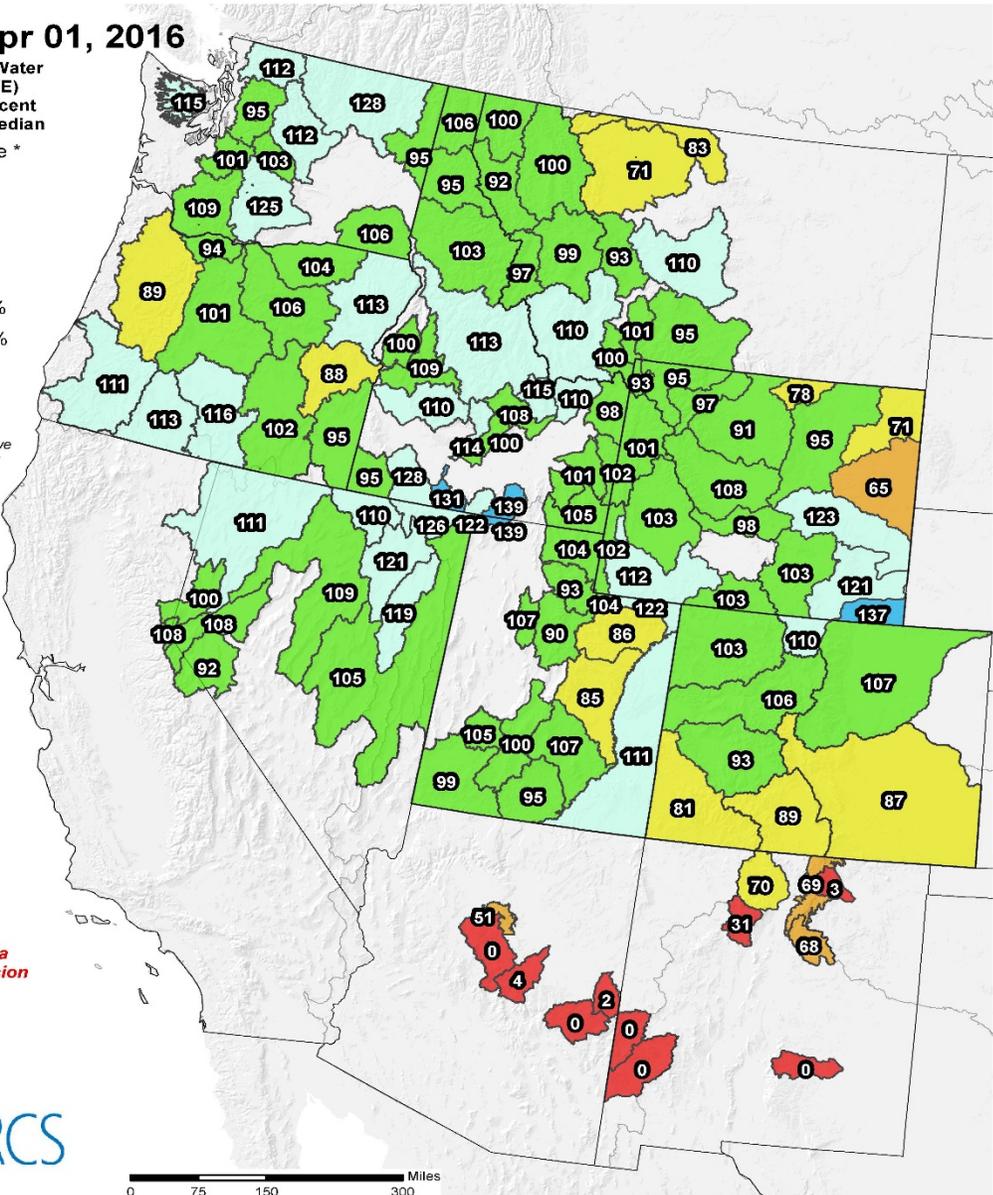
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Apr 01, 2016

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



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>

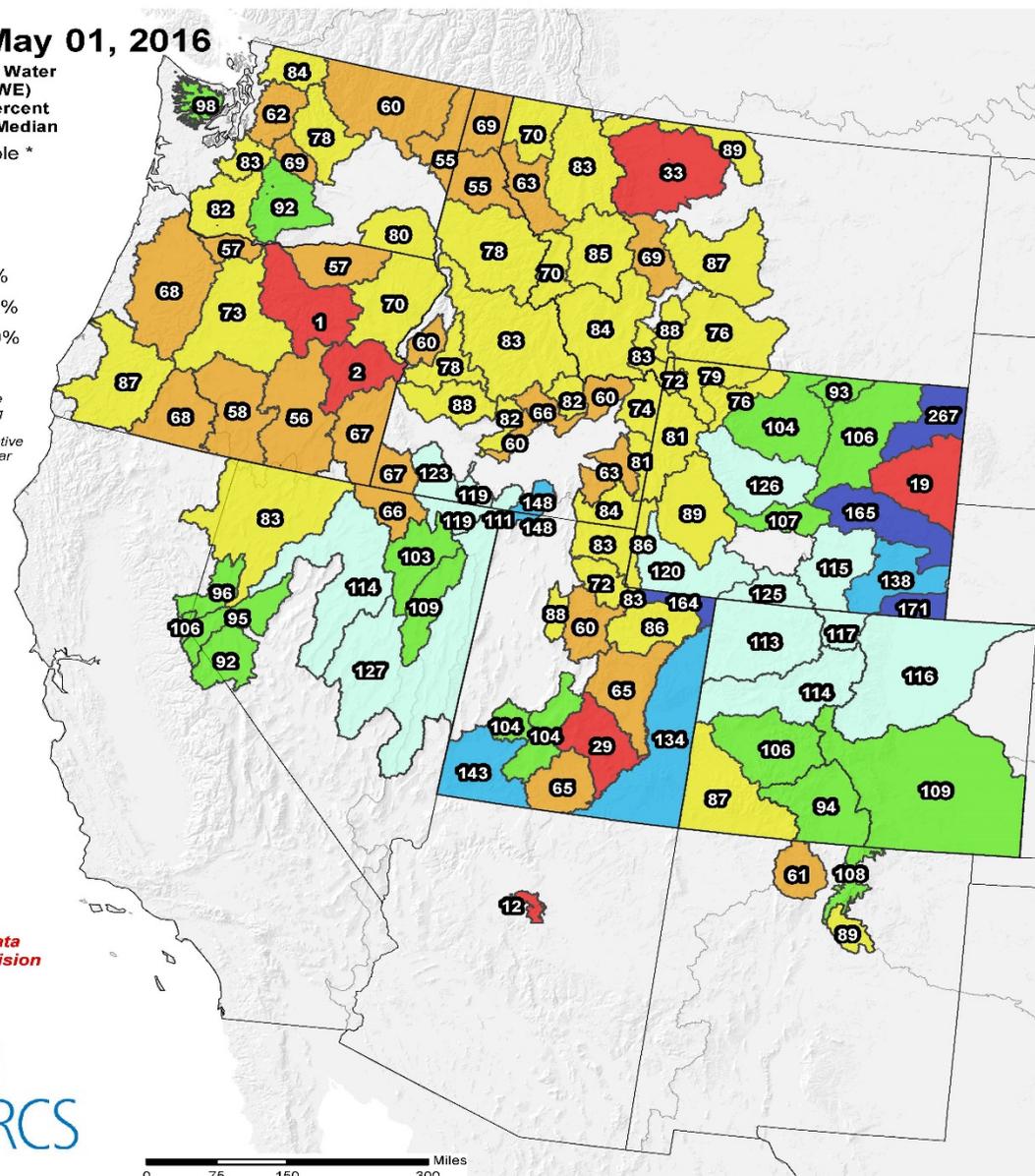
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

May 01, 2016

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



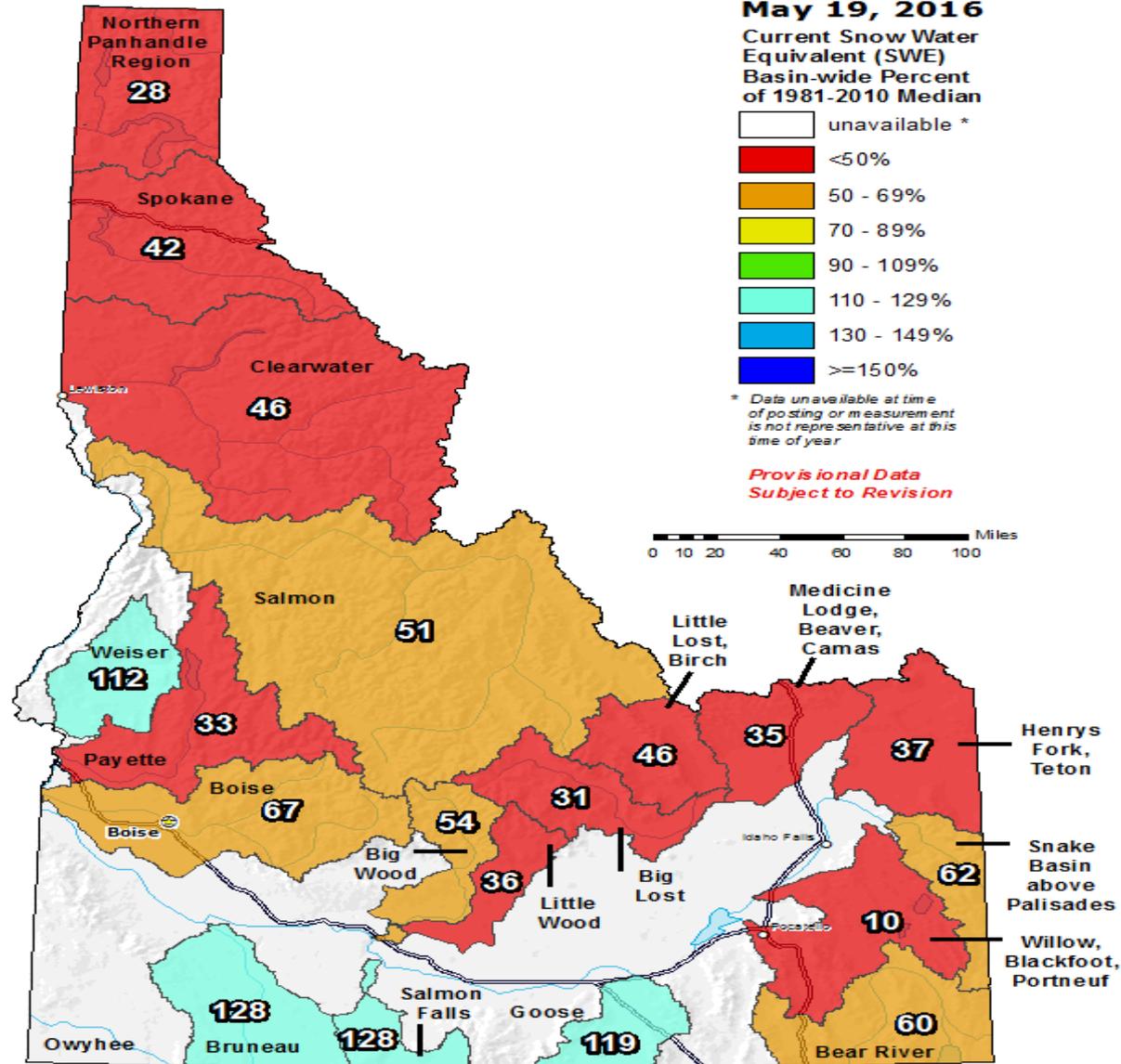
Provisional data subject to revision



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



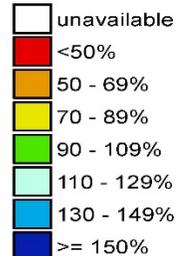
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

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

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

May 19, 2016

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



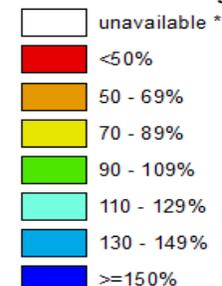
The water year to date precipitation percent of normal represents the accumulated precipitation found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

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

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

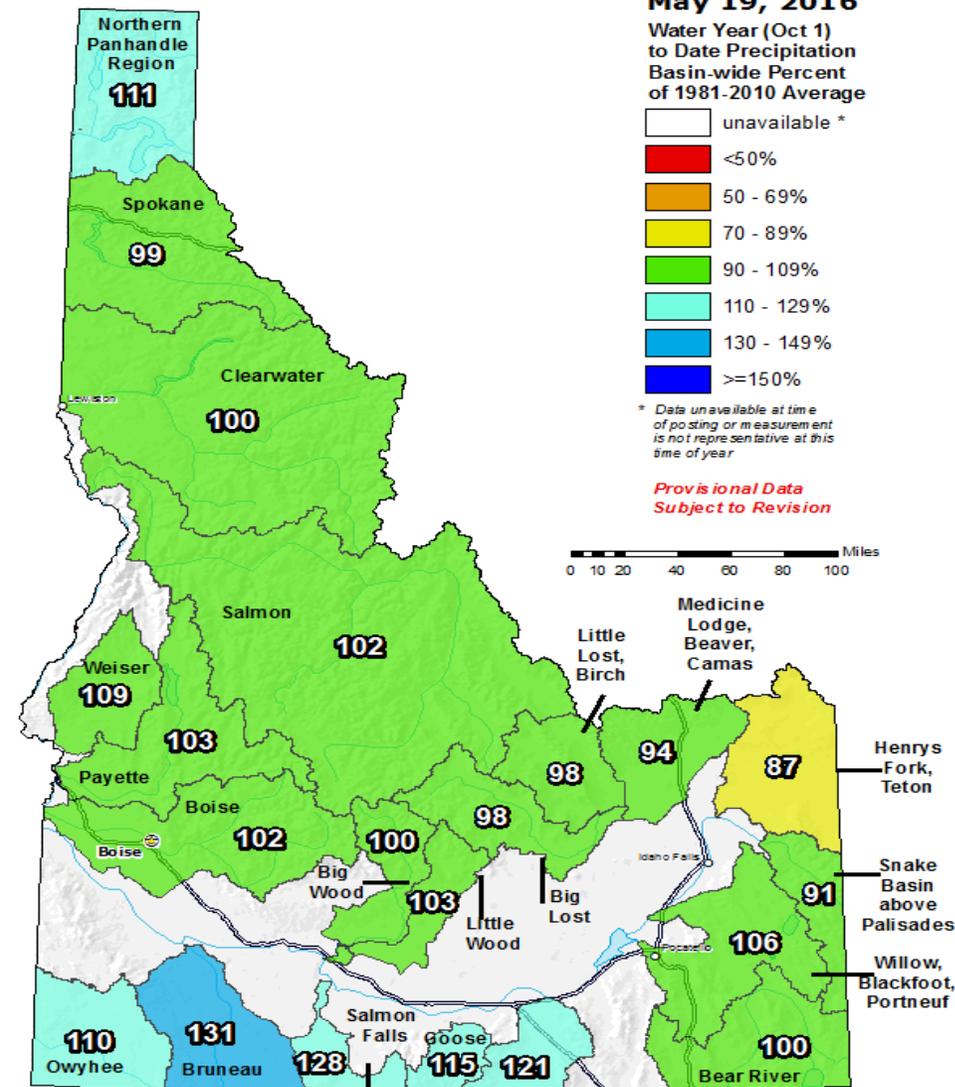
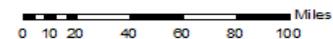
May 19, 2016

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



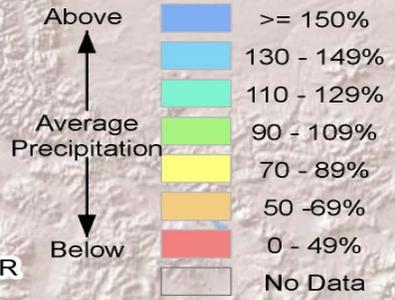
The water year to date precipitation percent of normal represents the accumulated precipitation found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

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

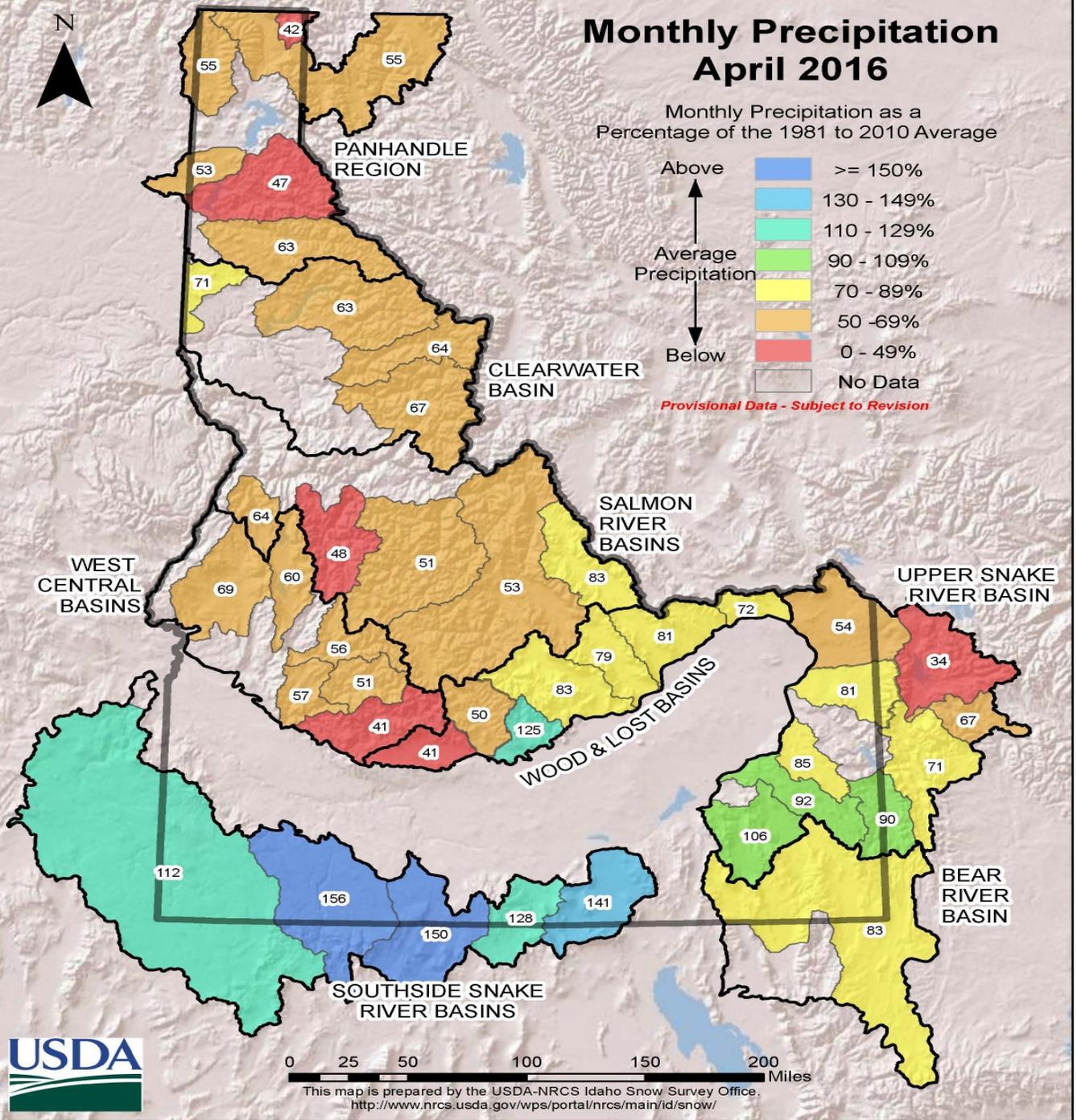
Monthly Precipitation April 2016



Monthly Precipitation as a Percentage of the 1981 to 2010 Average



Provisional Data - Subject to Revision



0 25 50 100 150 200 Miles

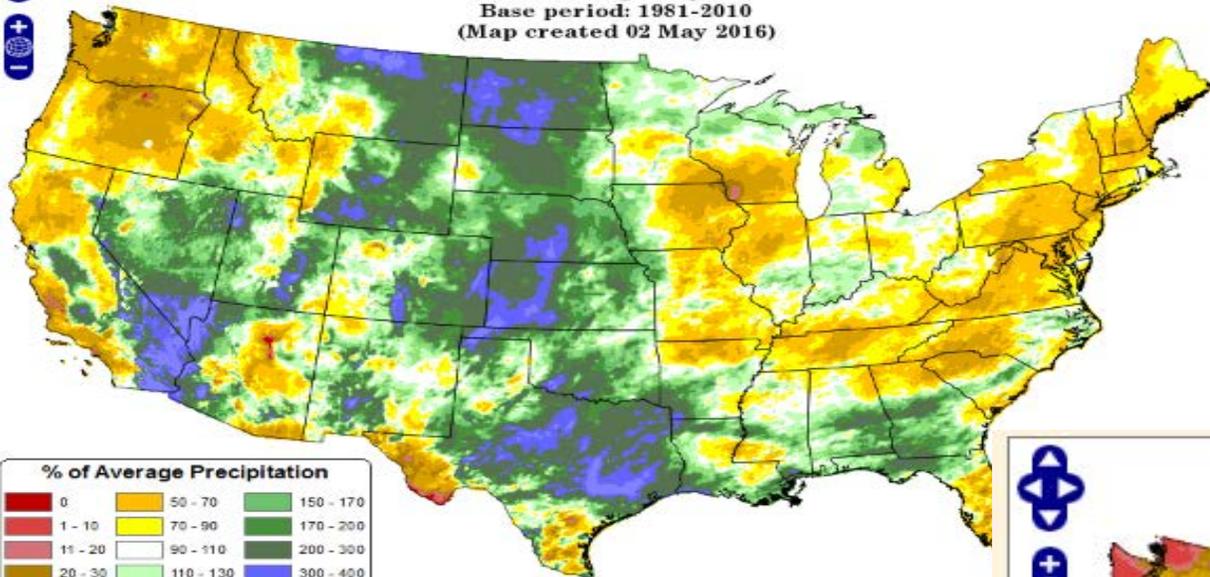
This map is prepared by the USDA-NRCS Idaho Snow Survey Office.
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

Total Precipitation Anomaly: April 2016

Period ending 30 Apr 2016

Base period: 1981-2010

(Map created 02 May 2016)



% of Average Precipitation		
0	50 - 70	150 - 170
1 - 10	70 - 90	170 - 200
11 - 20	90 - 110	200 - 300
20 - 30	110 - 130	300 - 400
30 - 50	130 - 150	> 400

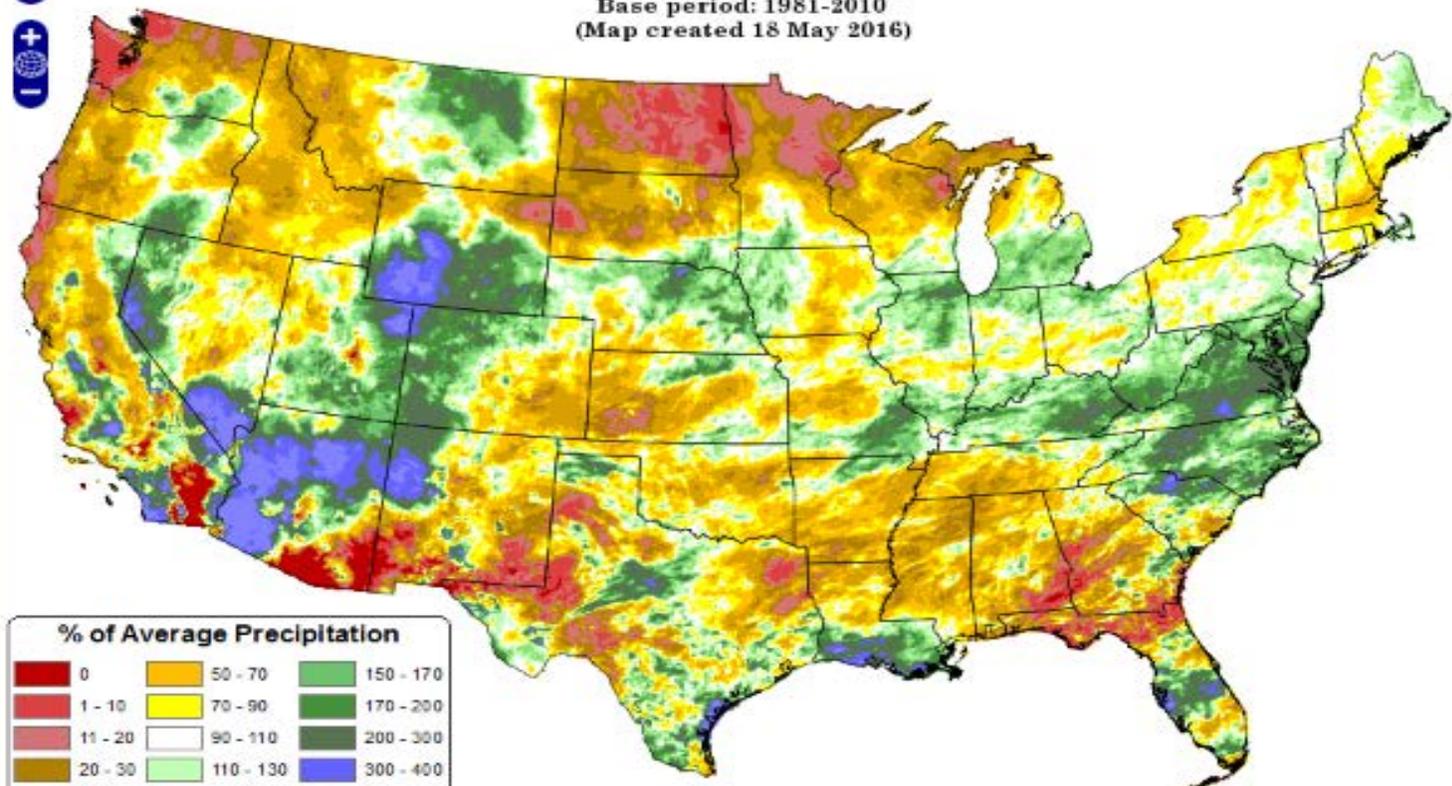
Copyright (c) 2016, PRISM Climate Group, Oregon State U

Total Precipitation Anomaly: 01 May 2016 - 17 May 2016

Period ending 7 AM EST 17 May 2016

Base period: 1981-2010

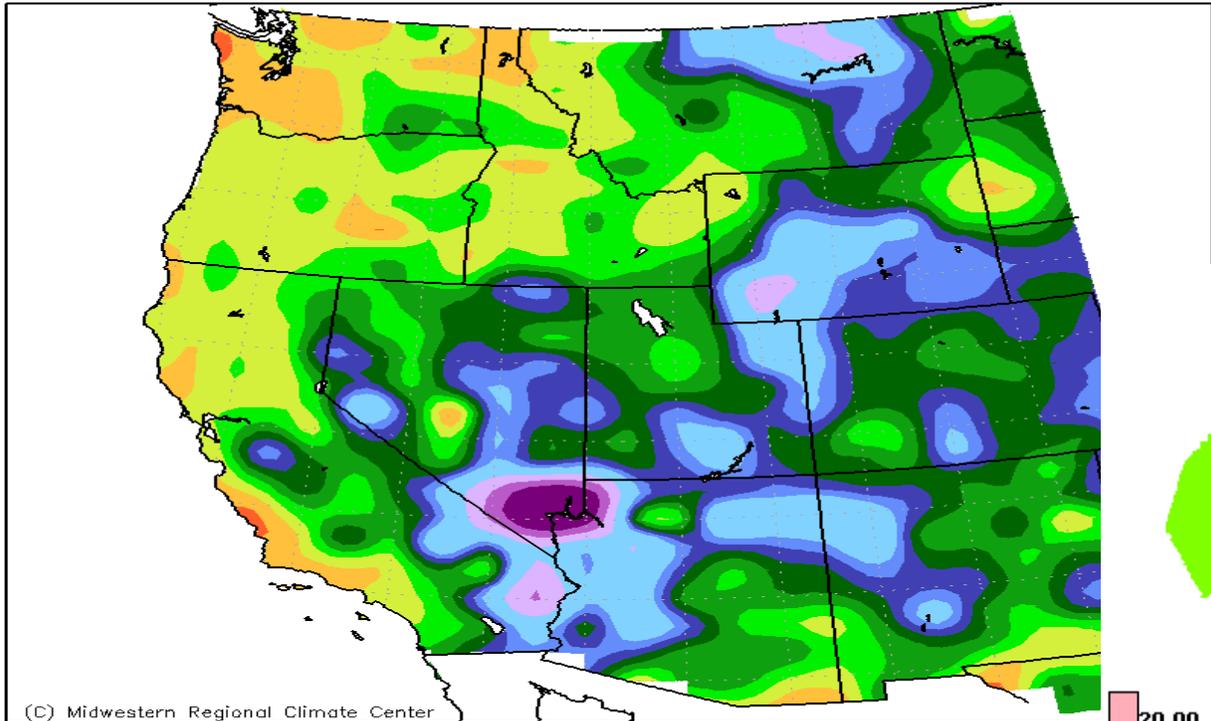
(Map created 18 May 2016)



% of Average Precipitation		
0	50 - 70	150 - 170
1 - 10	70 - 90	170 - 200
11 - 20	90 - 110	200 - 300
20 - 30	110 - 130	300 - 400
30 - 50	130 - 150	> 400

Copyright (c) 2016, PRISM Climate Group, Oregon State University

Accumulated Precipitation: Percent of Mean
 April 1, 2016 to May 19, 2016

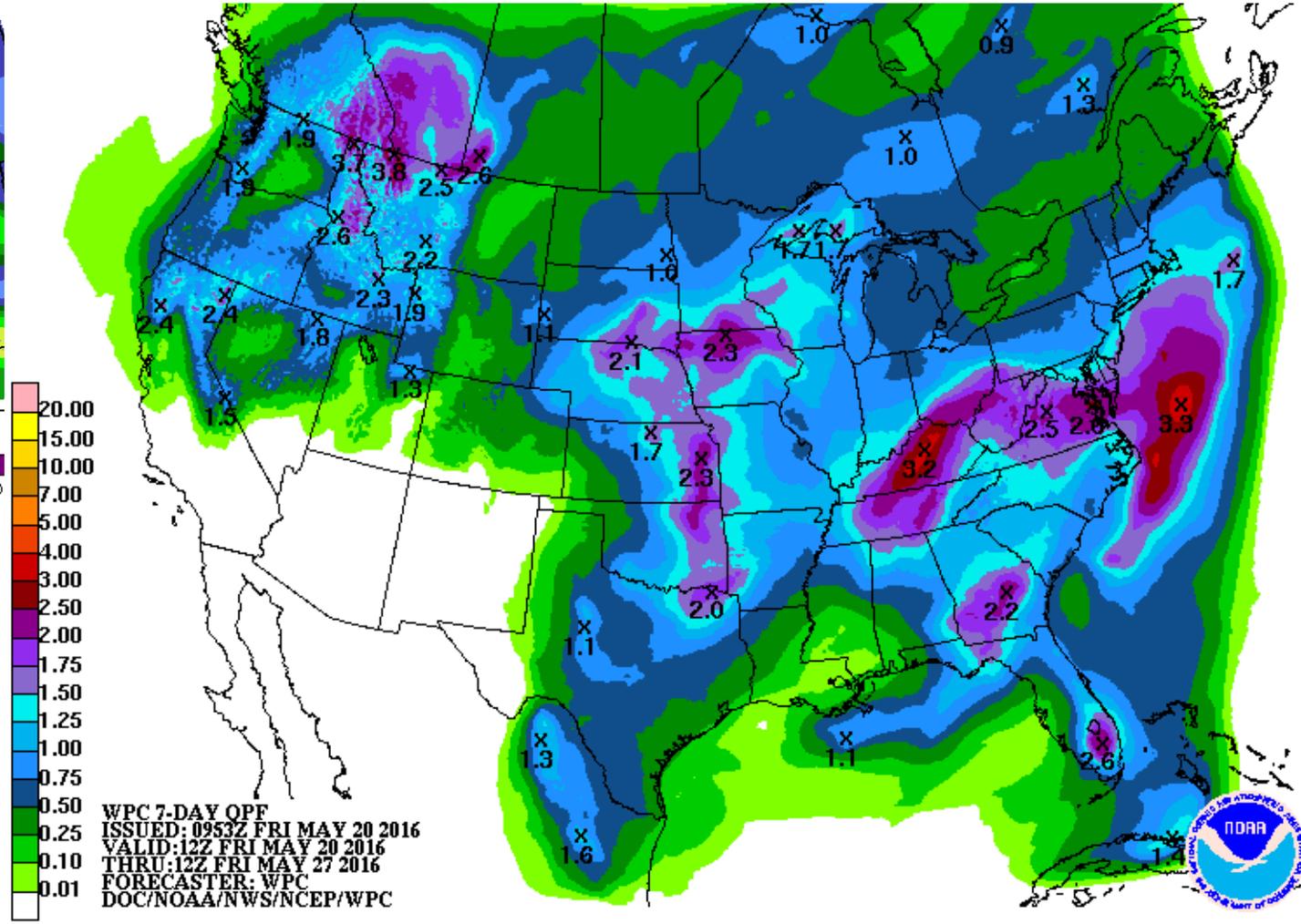


Mean period is 1981-2010.



Midwestern Regional Climate Center
 cli-MATE: MRCC Application Tools Environment
 Generated at: 5/19/2016 10:45:06 AM CDT

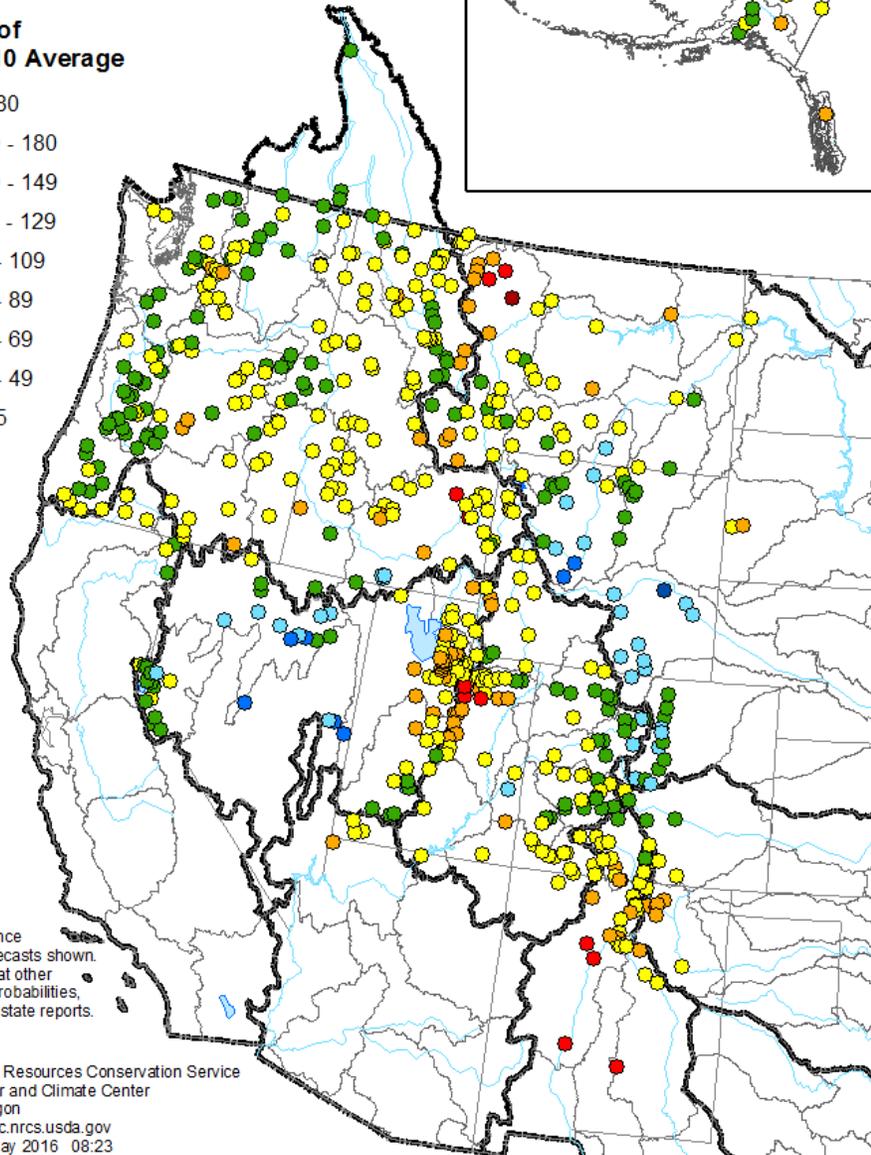
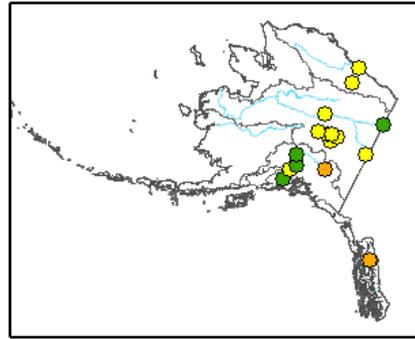
7 Day Total Precipitation May 20-27



Spring and Summer Streamflow Forecasts as of May 1, 2016

Percent of 1981-2010 Average

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



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

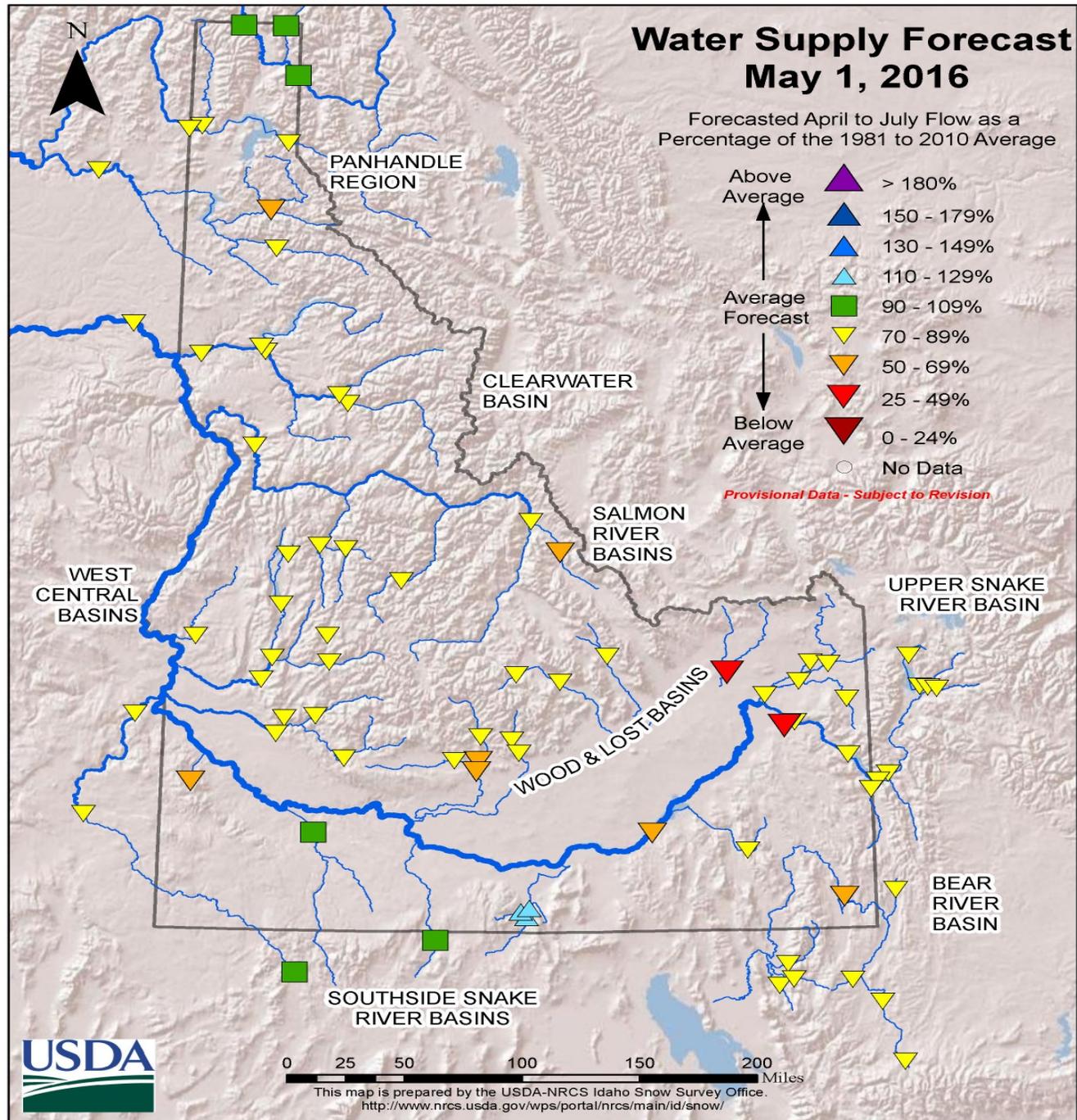
Prepared by:
 USDA Natural Resources Conservation Service
 National Water and Climate Center
 Portland, Oregon
<http://www.wcc.nrcs.usda.gov>
 Created: 6 May 2016 08:23

Water Supply Forecast May 1, 2016

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

- Above Average
 - ▲ > 180%
 - ▲ 150 - 179%
 - ▲ 130 - 149%
 - ▲ 110 - 129%
- Average Forecast
 - 90 - 109%
- Below Average
 - ▼ 70 - 89%
 - ▼ 50 - 69%
 - ▼ 25 - 49%
 - ▼ 0 - 24%
- No Data

Provisional Data - Subject to Revision



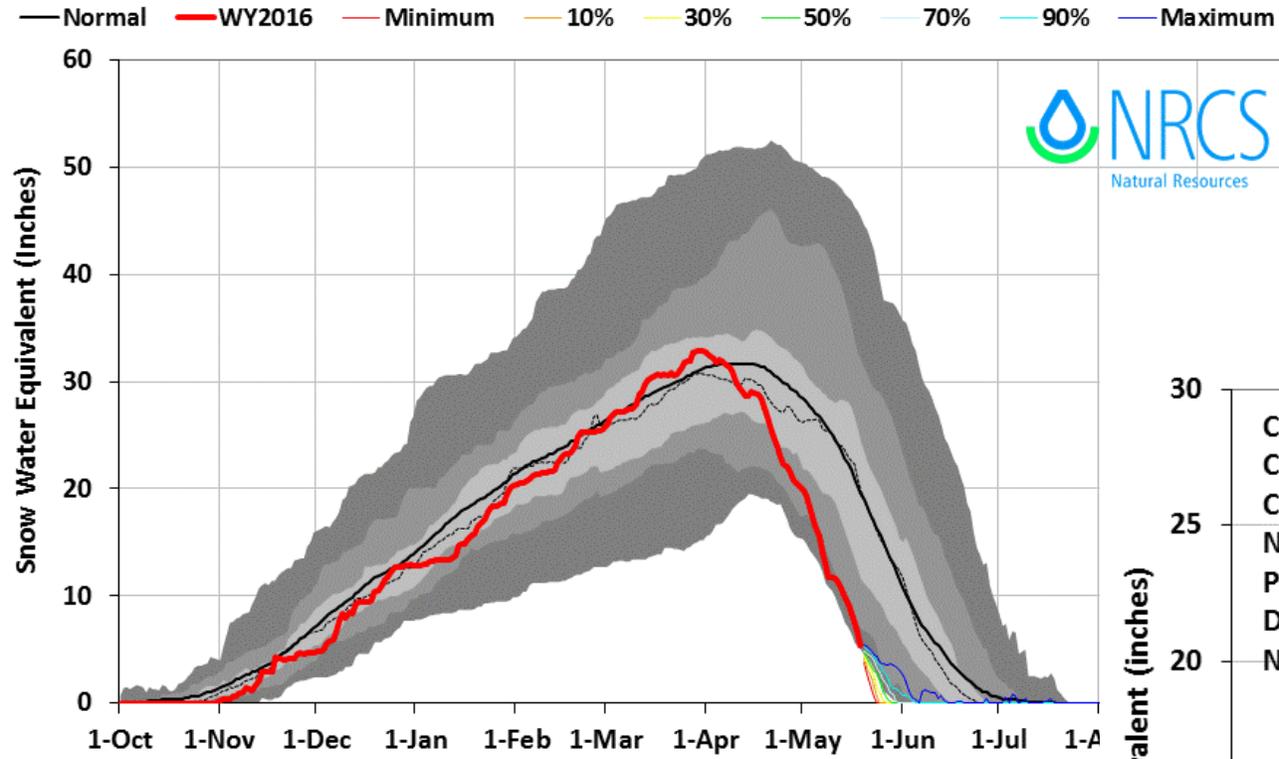
This map is prepared by the USDA-NRCS Idaho Snow Survey Office.
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

IDAHO SURFACE WATER SUPPLY INDEX (SWSI) MAY 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	-1.5	2013	NA
Clearwater	-2.2	2005	NA
Salmon	-0.4	2002	NA
Weiser	-0.1	2009	NA
Payette	-0.3	2014	NA
Boise	0.6	2010	-2.3
Big Wood	0.6	2000	0.2
Little Wood	0.1	2012	-1.6
Big Lost	-0.1	2008	0.0
Little Lost	-0.3	2012	1.4
Teton	-1.0	2004	-3.9
Henry's Fork	-1.3	2005	-3.4
Snake (Heise)	-0.6	2012	-1.6
Oakley	0.8	2009	0.0
Salmon Falls	1.0	2009	-0.7
Bruneau	0.6	2009	NA
Owyhee	-1.0	2009	-2.8
Bear River	-0.8	2015	-3.9

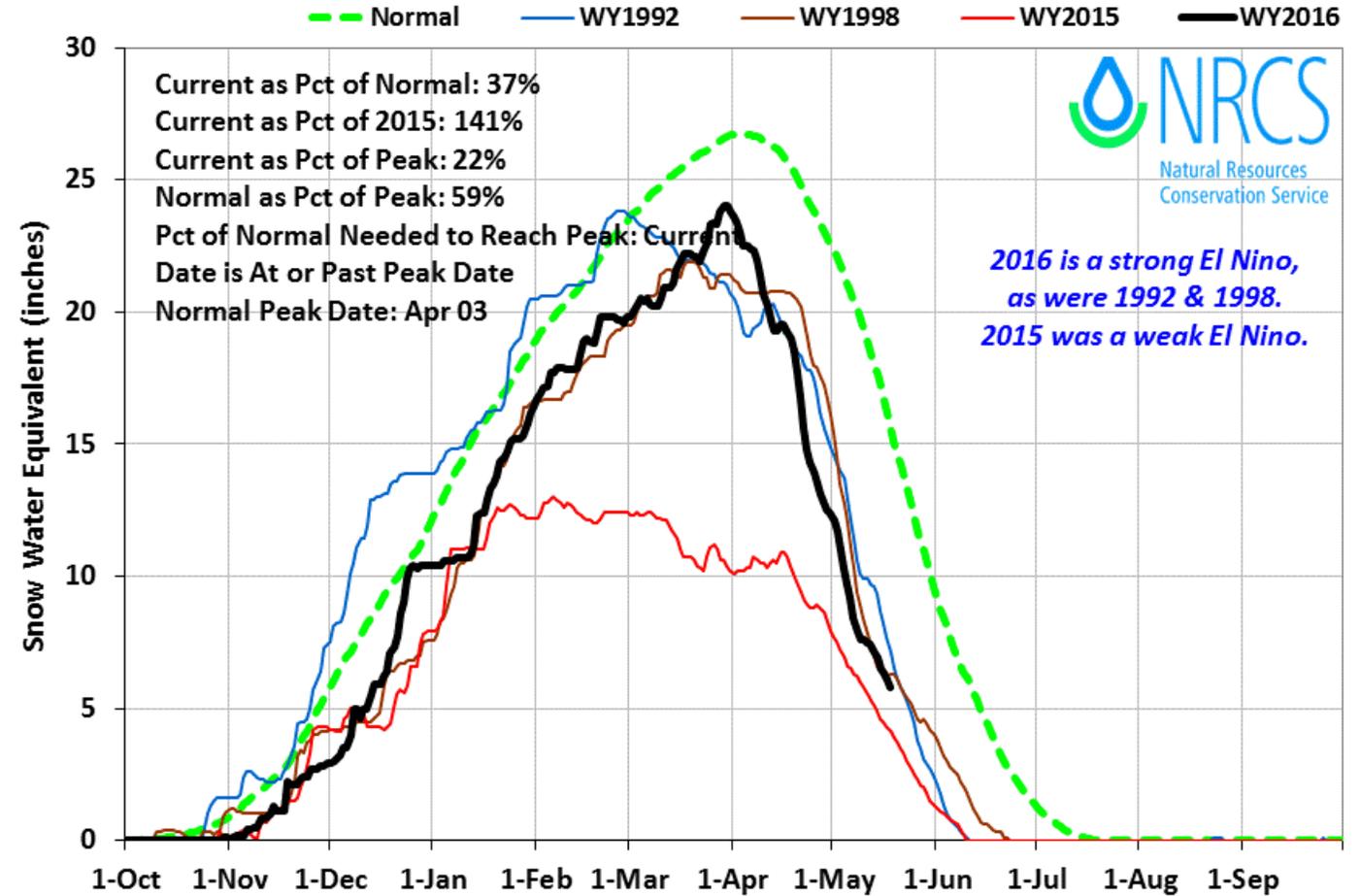
Northern Panhandle Region 2016 Snow Water with Non-Exceedence Projections (8 sites)

Based on Provisional SNOTEL data as of May 19, 2016



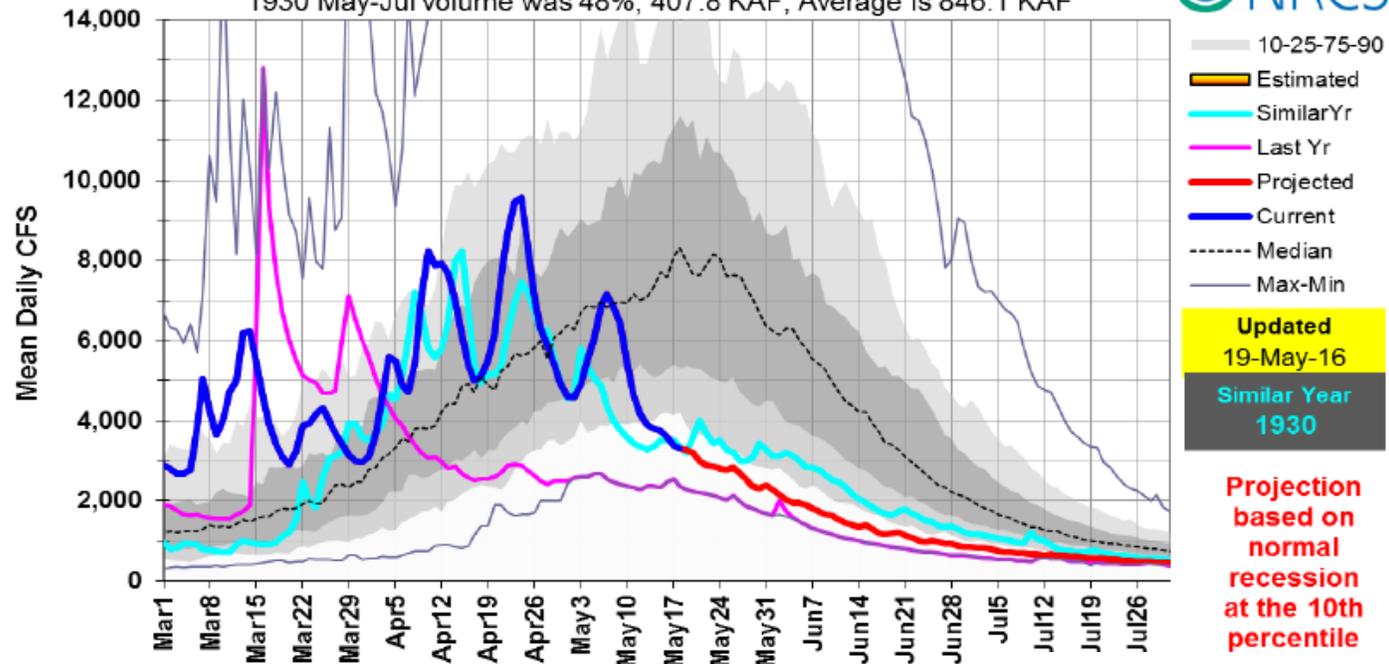
Spokane Basin 2016 Snowpack Comparison Graph (9 sites)

Based on Provisional SNOTEL data as of May 18, 2016



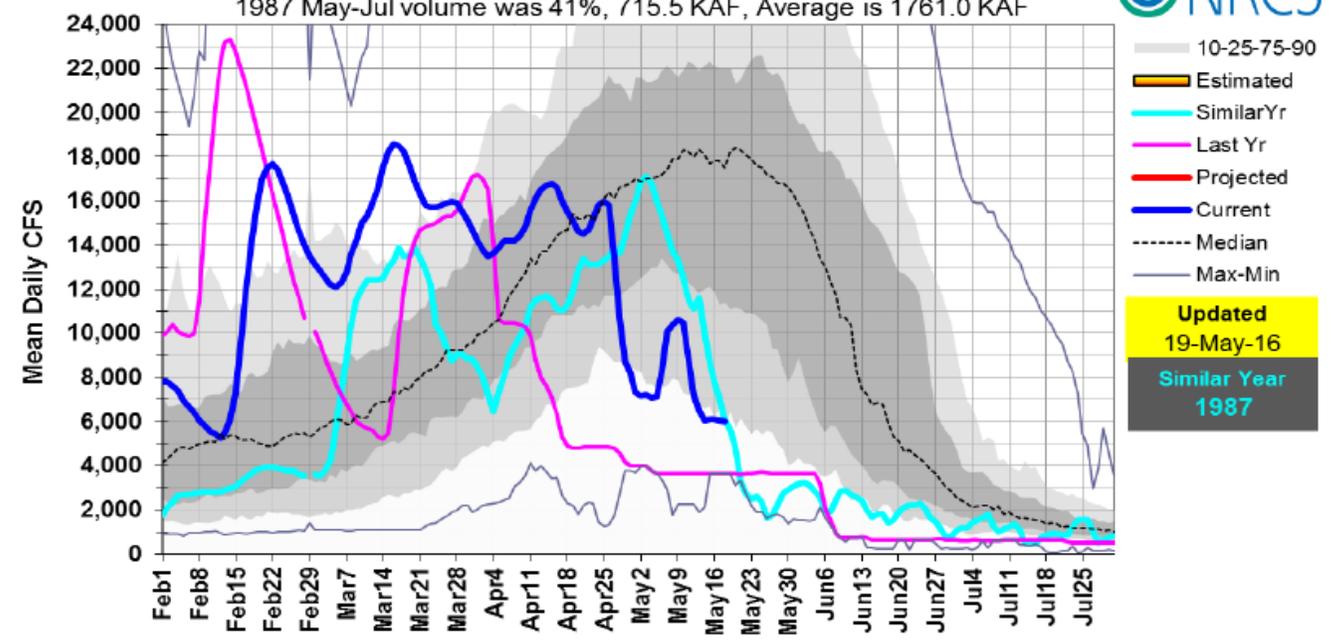
12414500: St. Joe R at Calder, ID

1930 May-Jul volume was 48%, 407.8 KAF, Average is 846.1 KAF



12419000: Spokane R near Post Falls, ID

1987 May-Jul volume was 41%, 715.5 KAF, Average is 1761.0 KAF



Clearwater Basin 2016 Snowpack Comparison Graph (15 sites)

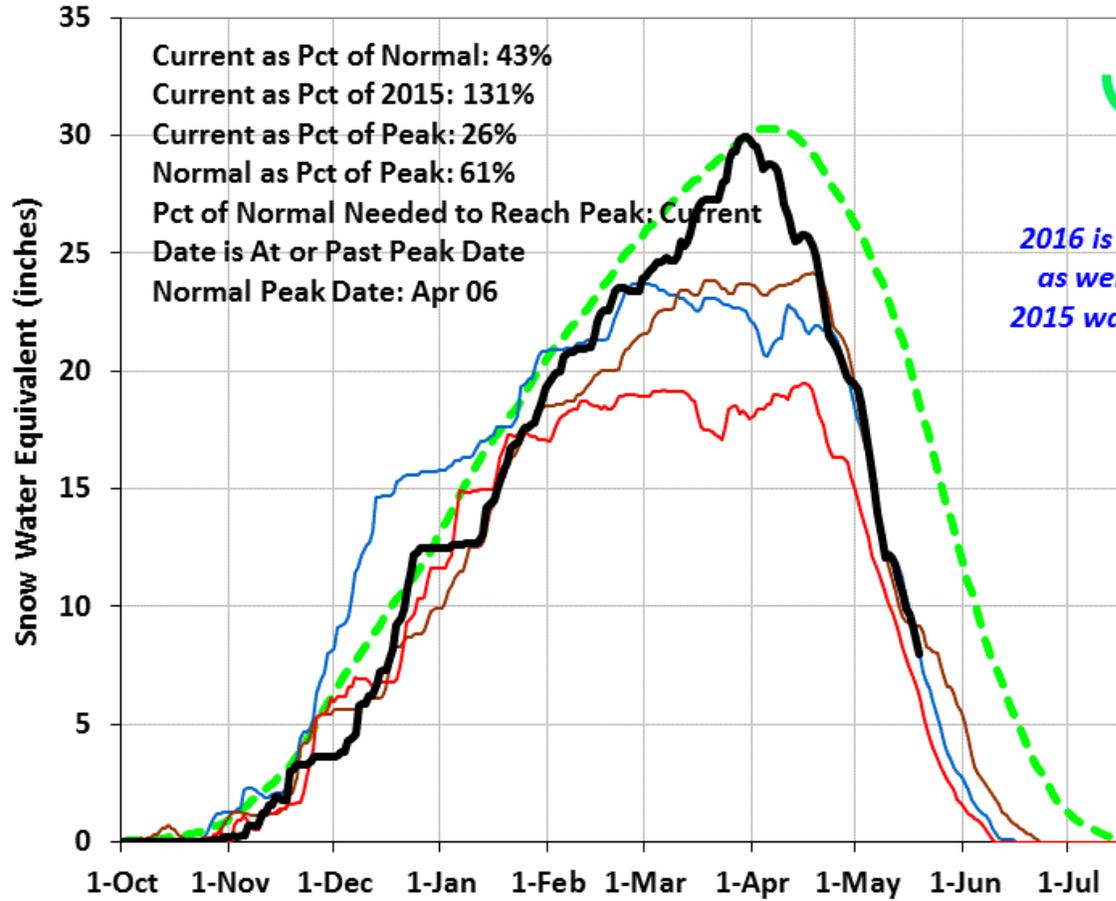
Based on Provisional SNOTEL data as of May 19, 2016

Normal WY1992 WY1998 WY2015 WY2016



Current as Pct of Normal: 43%
 Current as Pct of 2015: 131%
 Current as Pct of Peak: 26%
 Normal as Pct of Peak: 61%
 Pct of Normal Needed to Reach Peak: Current
 Date is At or Past Peak Date
 Normal Peak Date: Apr 06

2016 is
 as we
 2015 wa



Salmon Basin 2016 Snowpack Comparison Graph (22 sites)

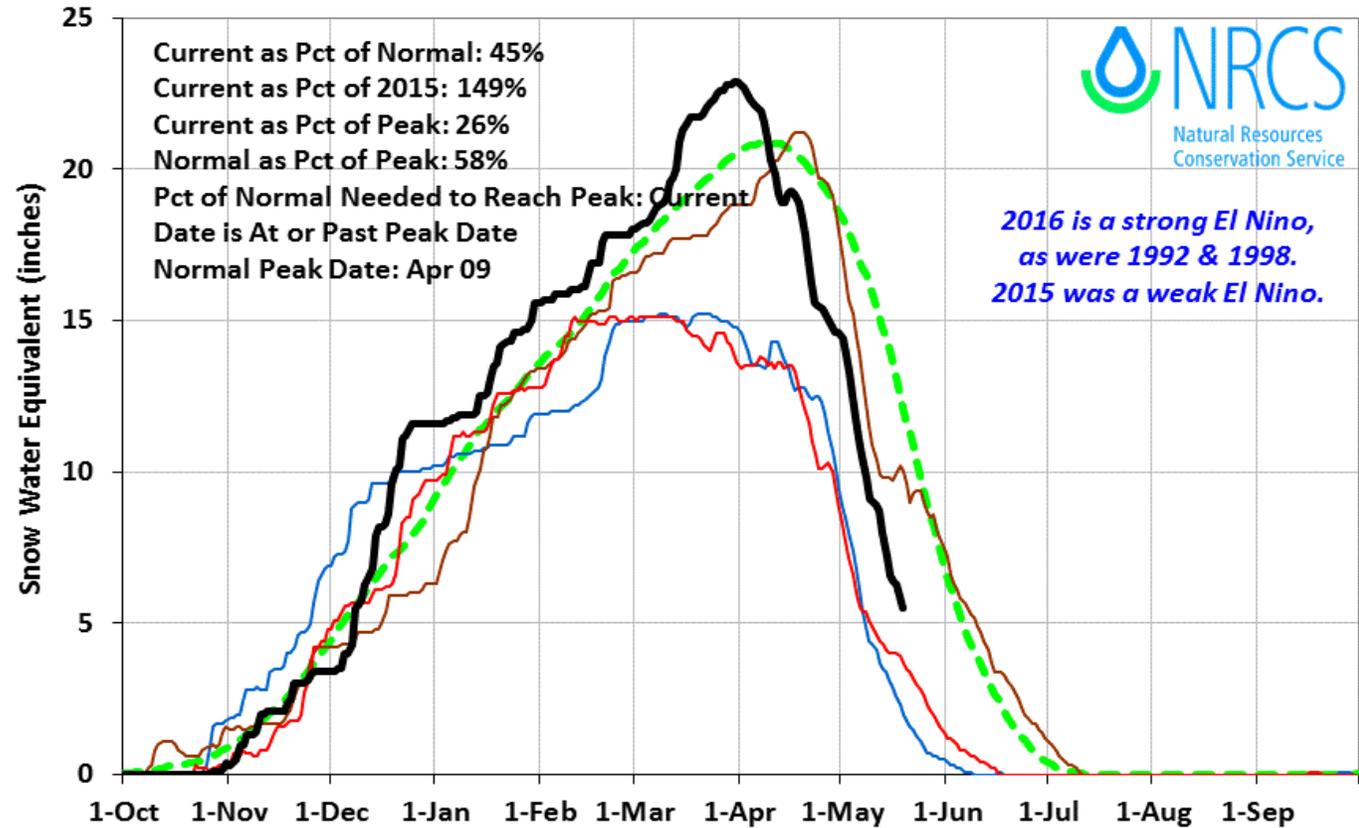
Based on Provisional SNOTEL data as of May 19, 2016

Normal WY1992 WY1998 WY2015 WY2016



Current as Pct of Normal: 45%
 Current as Pct of 2015: 149%
 Current as Pct of Peak: 26%
 Normal as Pct of Peak: 58%
 Pct of Normal Needed to Reach Peak: Current
 Date is At or Past Peak Date
 Normal Peak Date: Apr 09

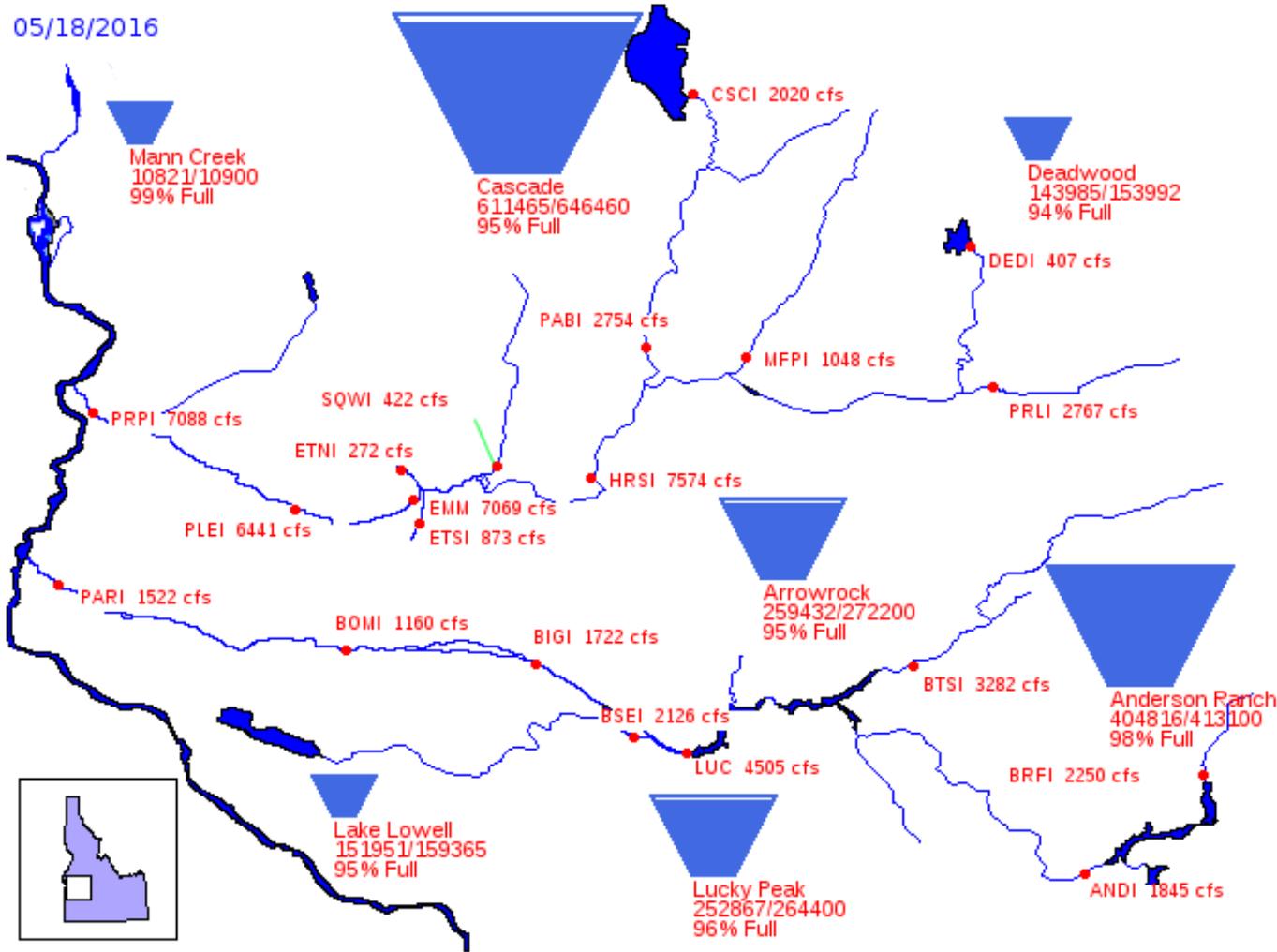
2016 is a strong El Nino,
 as were 1992 & 1998.
 2015 was a weak El Nino.



Bureau of Reclamation, Pacific Northwest Region

Major Storage Reservoirs in the Boise & Payette River Basins

05/18/2016



**Payette River system
(Cascade, Deadwood) is at
94 % of capacity.**

**Boise River system
(Anderson Ranch, Arrowrock,
Lucky Peak) is at 97 % of capacity.**

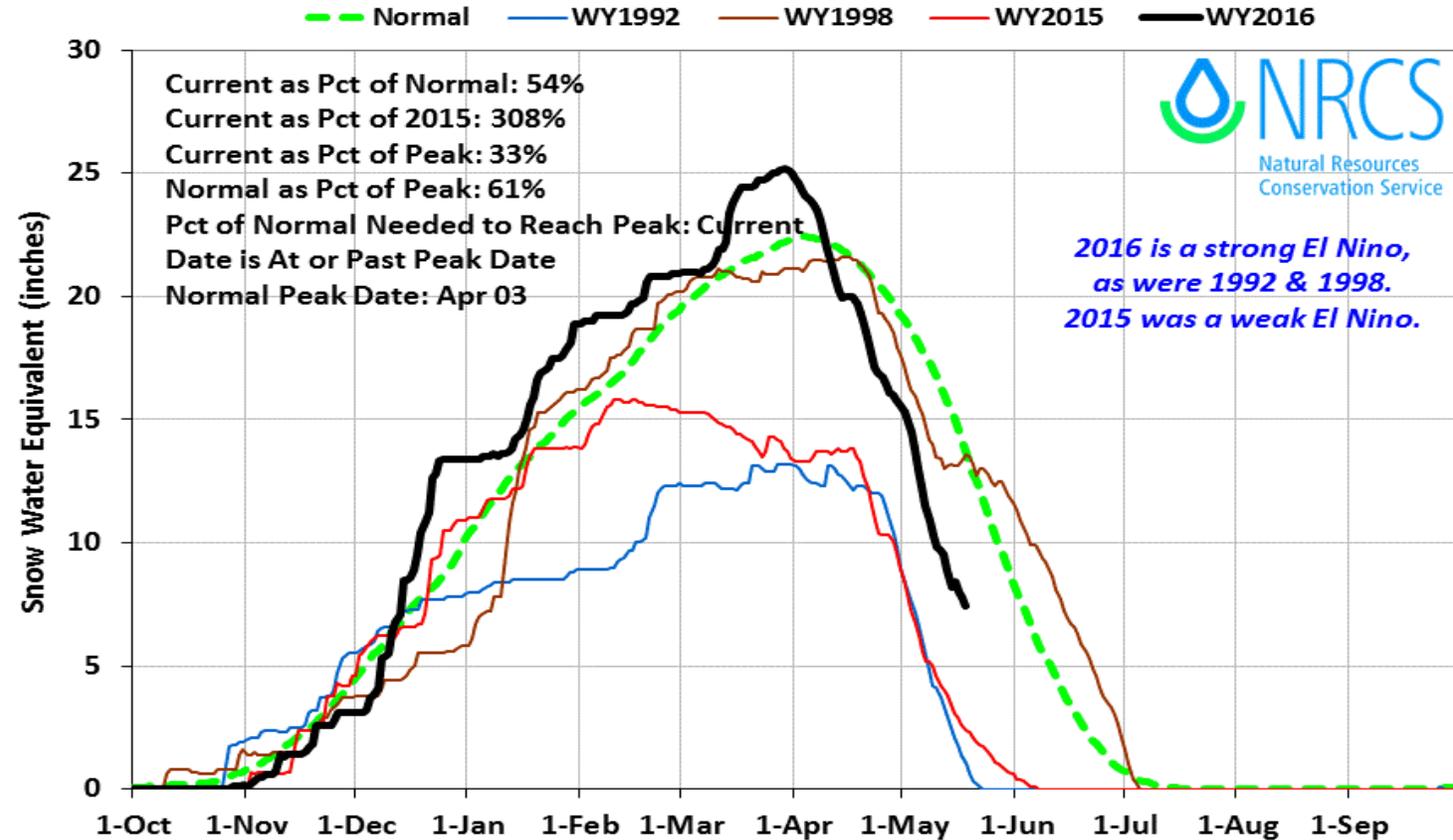
PROVISIONAL DATA - Subject to change



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

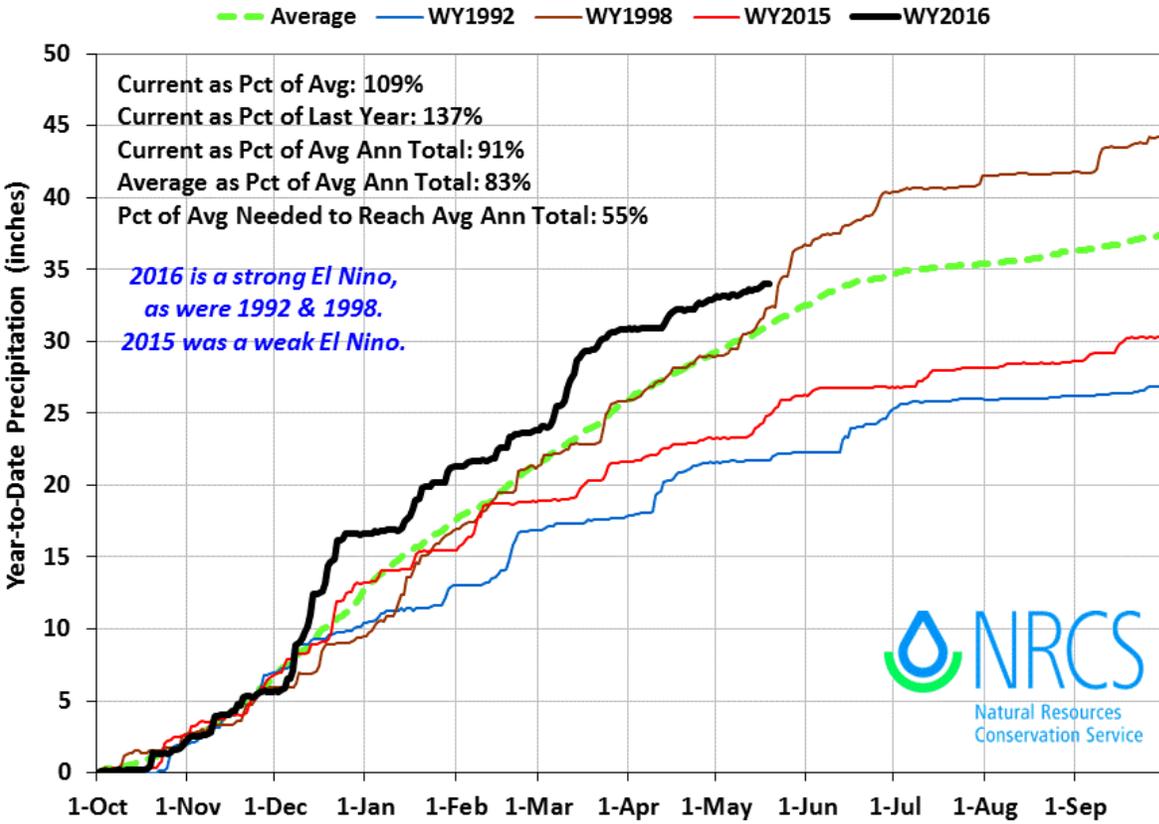
Boise Basin 2016 Snowpack Comparison Graph (10 sites)

Based on Provisional SNOTEL data as of May 18, 2016



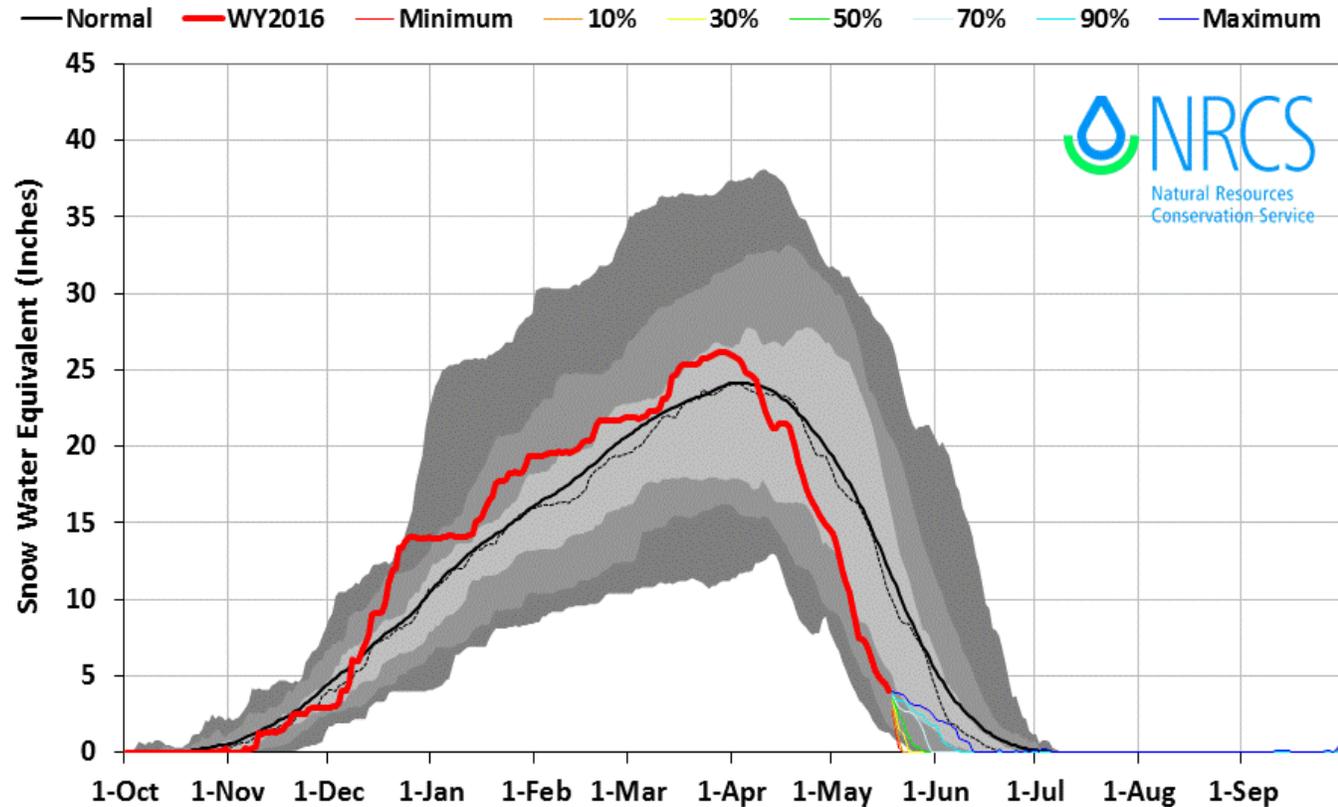
Weiser Basin 2016 Precipitation Comparison Graph (4 sites)

Based on Provisional SNOTEL data as of May 19, 2016



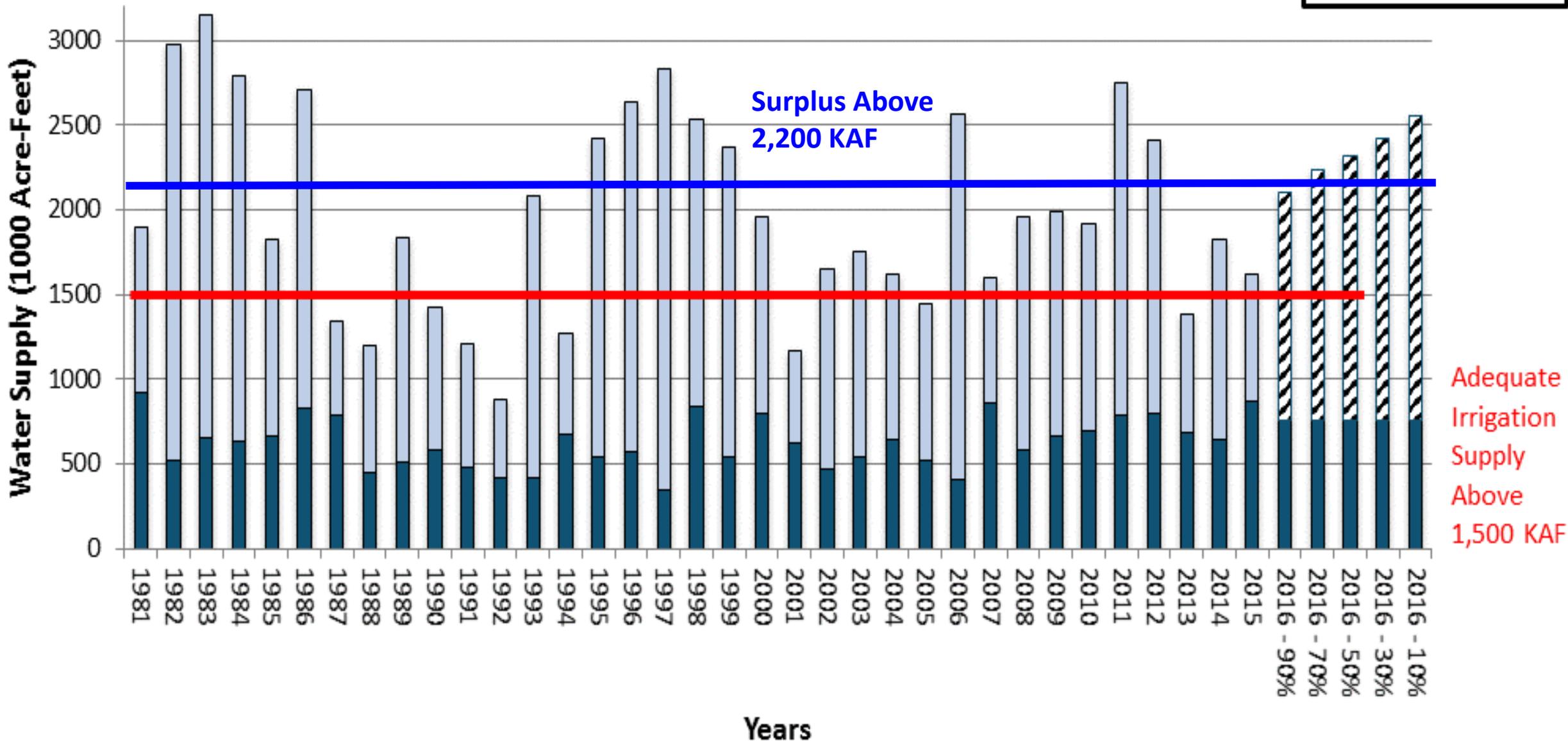
Payette Basin 2016 Snow Water with Non-Exceedence Projections (11 sites)

Based on Provisional SNOTEL data as of May 18, 2016



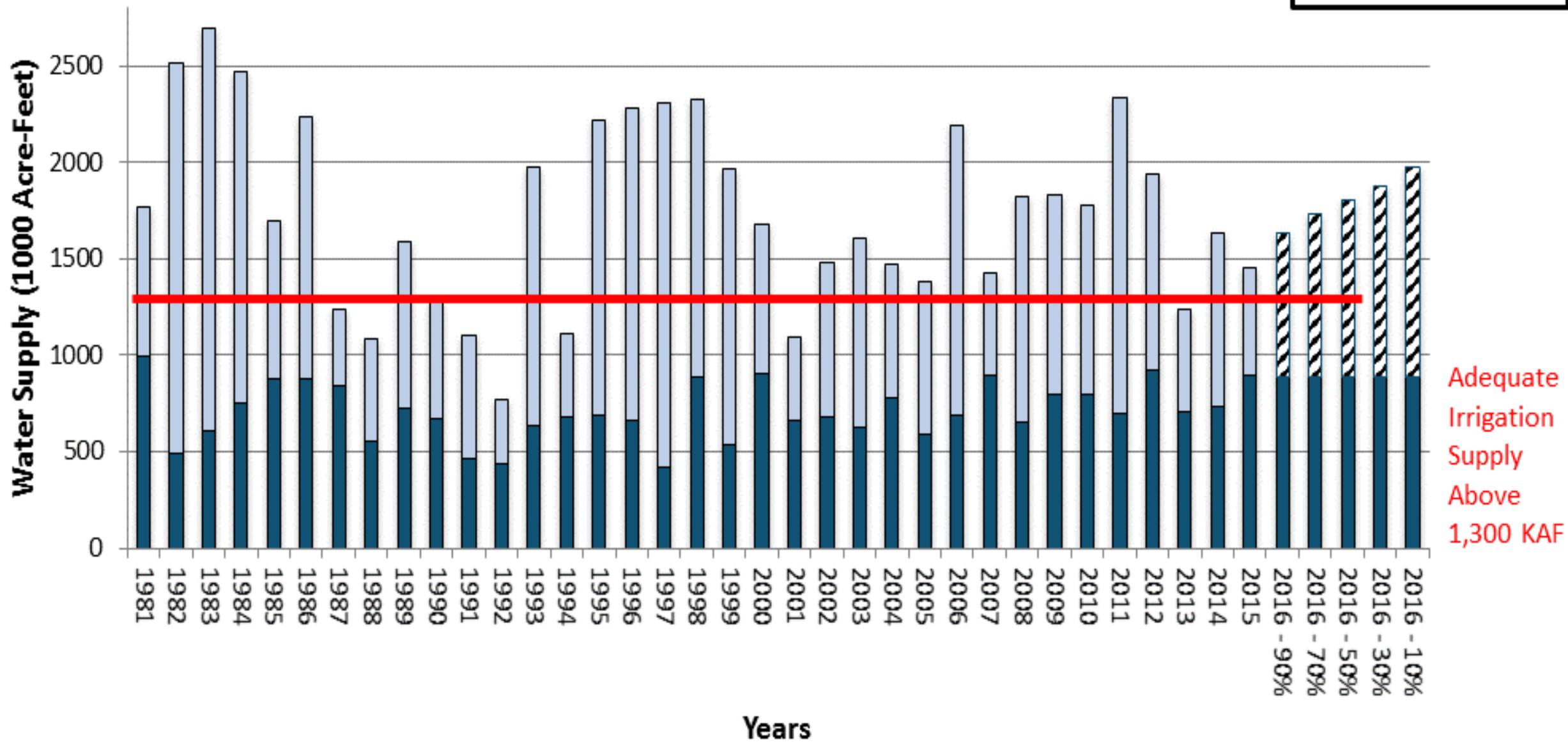
Apr 1 Historic and Forecasted Surface Water Supply Boise River Basin

- StreamFlow Apr-Sep
- Reservoir 31-Mar



May 1 Historic and Forecasted Surface Water Supply Boise River Basin

- StreamFlow May-Sep
- Reservoir 30-Apr



Adequate
Irrigation
Supply
Above
1,300 KAF

Big Wood Basin 2016 Snowpack Comparison Graph (9 sites)

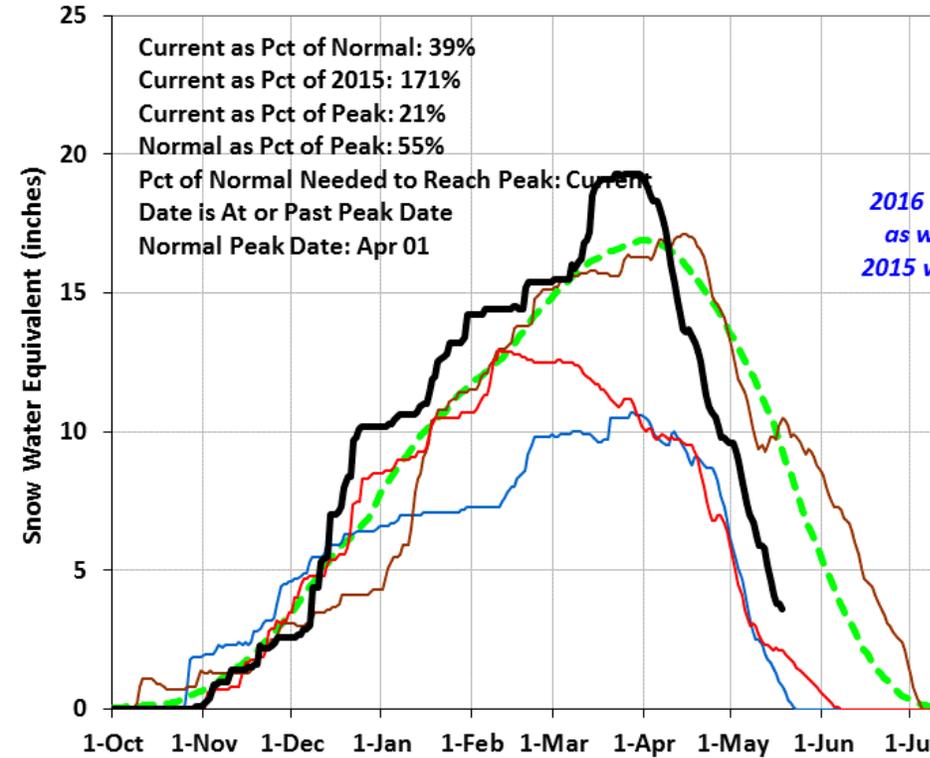
Based on Provisional SNOTEL data as of May 18, 2016

Normal WY1992 WY1998 WY2015 WY2016

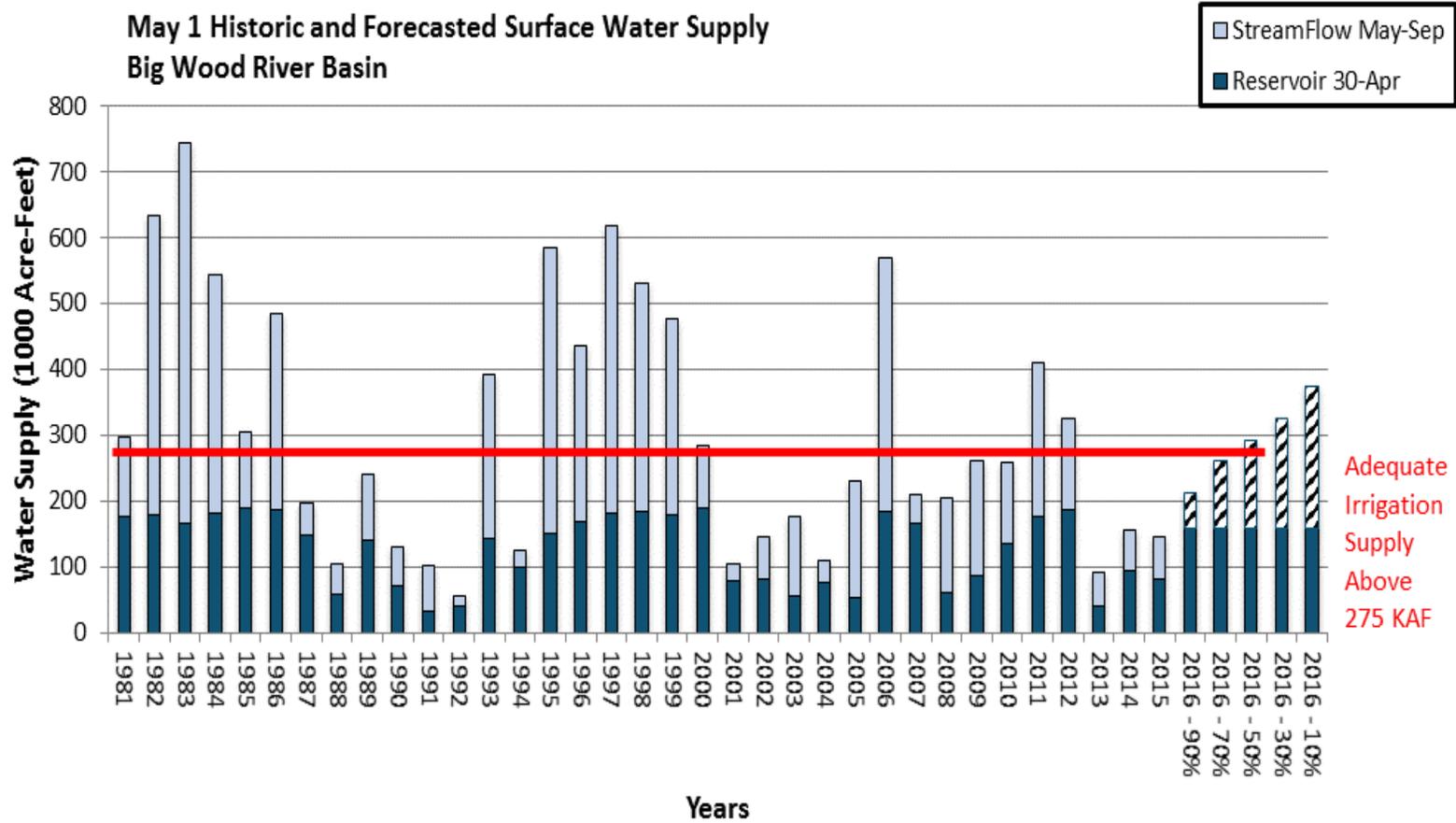


Current as Pct of Normal: 39%
 Current as Pct of 2015: 171%
 Current as Pct of Peak: 21%
 Normal as Pct of Peak: 55%
 Pct of Normal Needed to Reach Peak: Current
 Date is At or Past Peak Date
 Normal Peak Date: Apr 01

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



May 1 Historic and Forecasted Surface Water Supply Big Wood River Basin



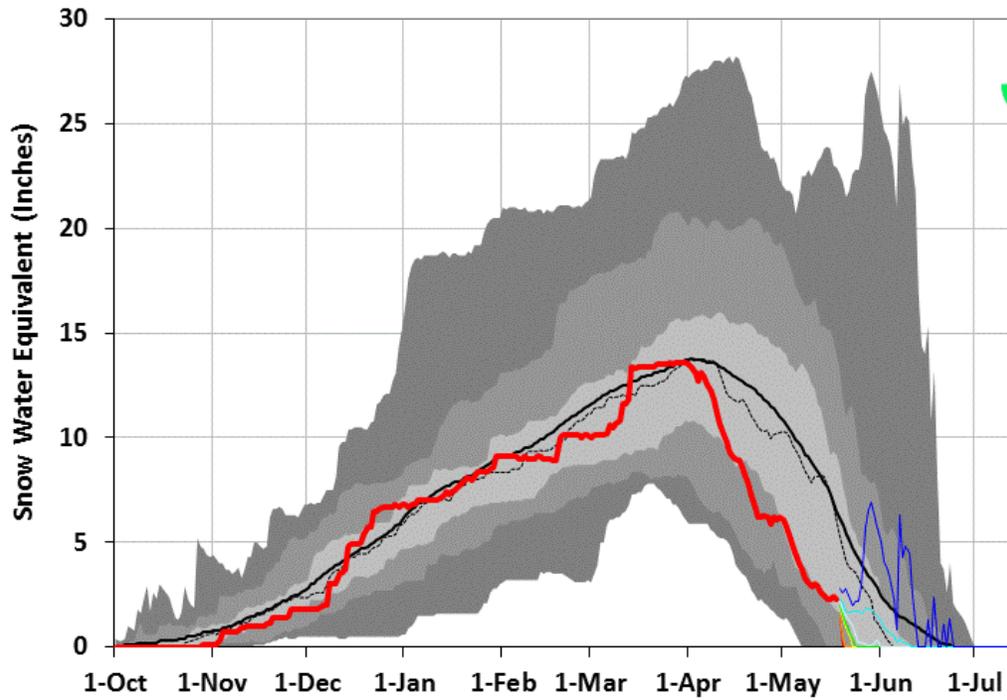
Adequate
Irrigation
Supply
Above
275 KAF

Little Wood Basin 2016 Snow Water with Non-Exceedence Projections (5 sites)

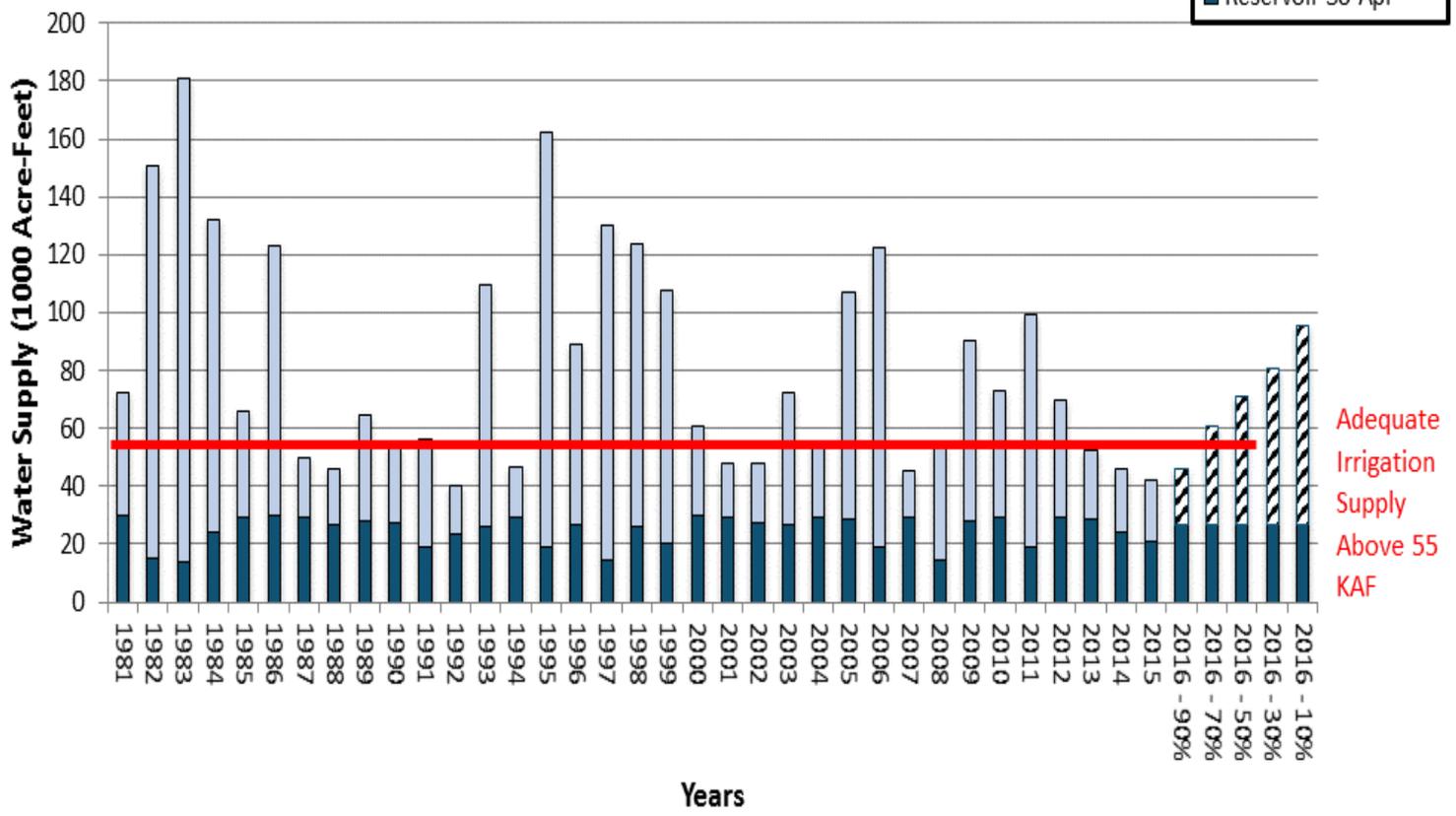
Based on Provisional SNOTEL data as of May 18, 2016



— Normal — WY2016 — Minimum — 10% — 30% — 50% — 70% — 90% — Maximum



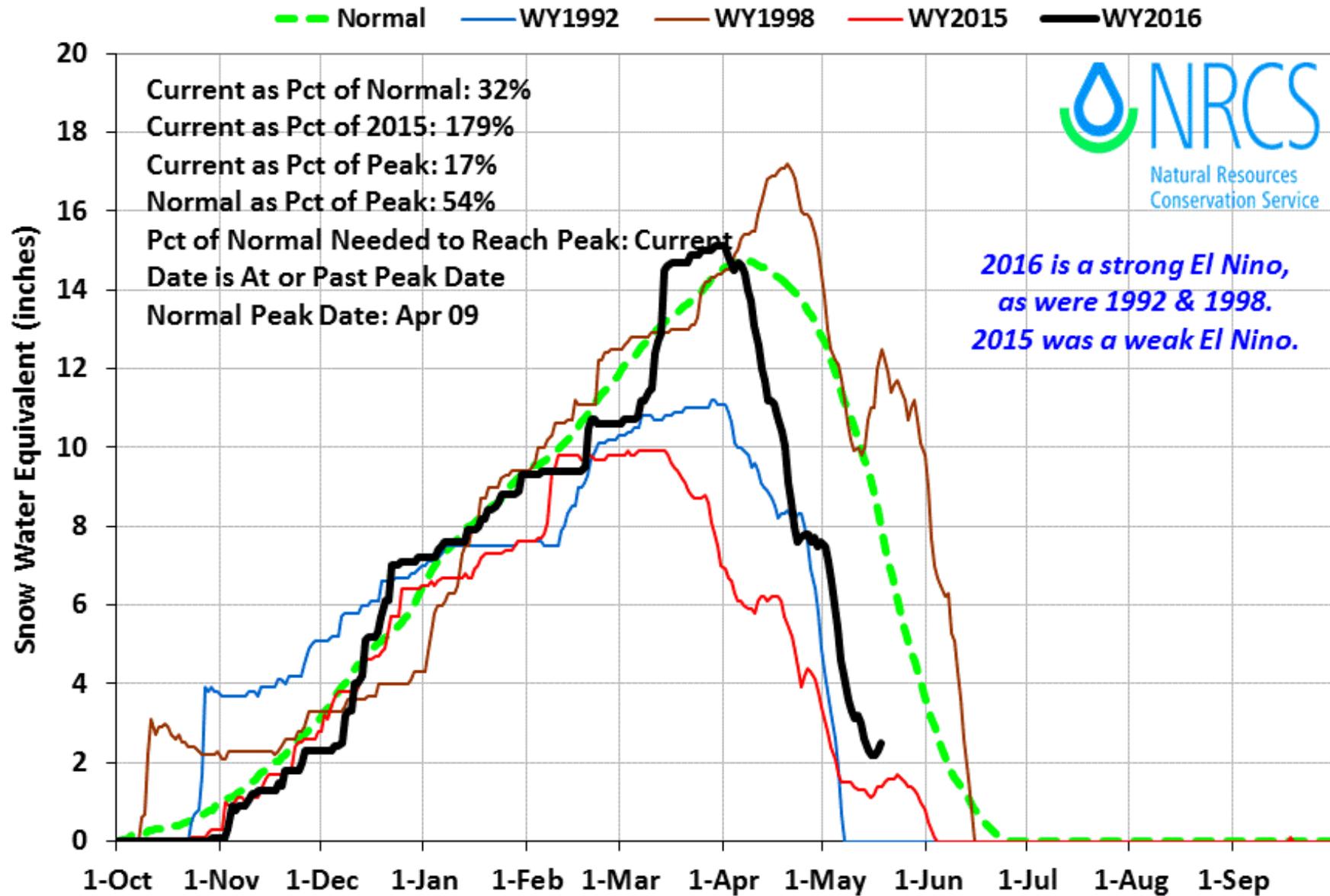
May 1 Historic and Forecasted Surface Water Supply Little Wood River Basin



Adequate
Irrigation
Supply
Above 55
KAF

Big Lost Basin 2016 Snowpack Comparison Graph (5 sites)

Based on Provisional SNOTEL data as of May 18, 2016



It All About Relationships

What do you see in the snow?



It's the Big Lost White Stallion

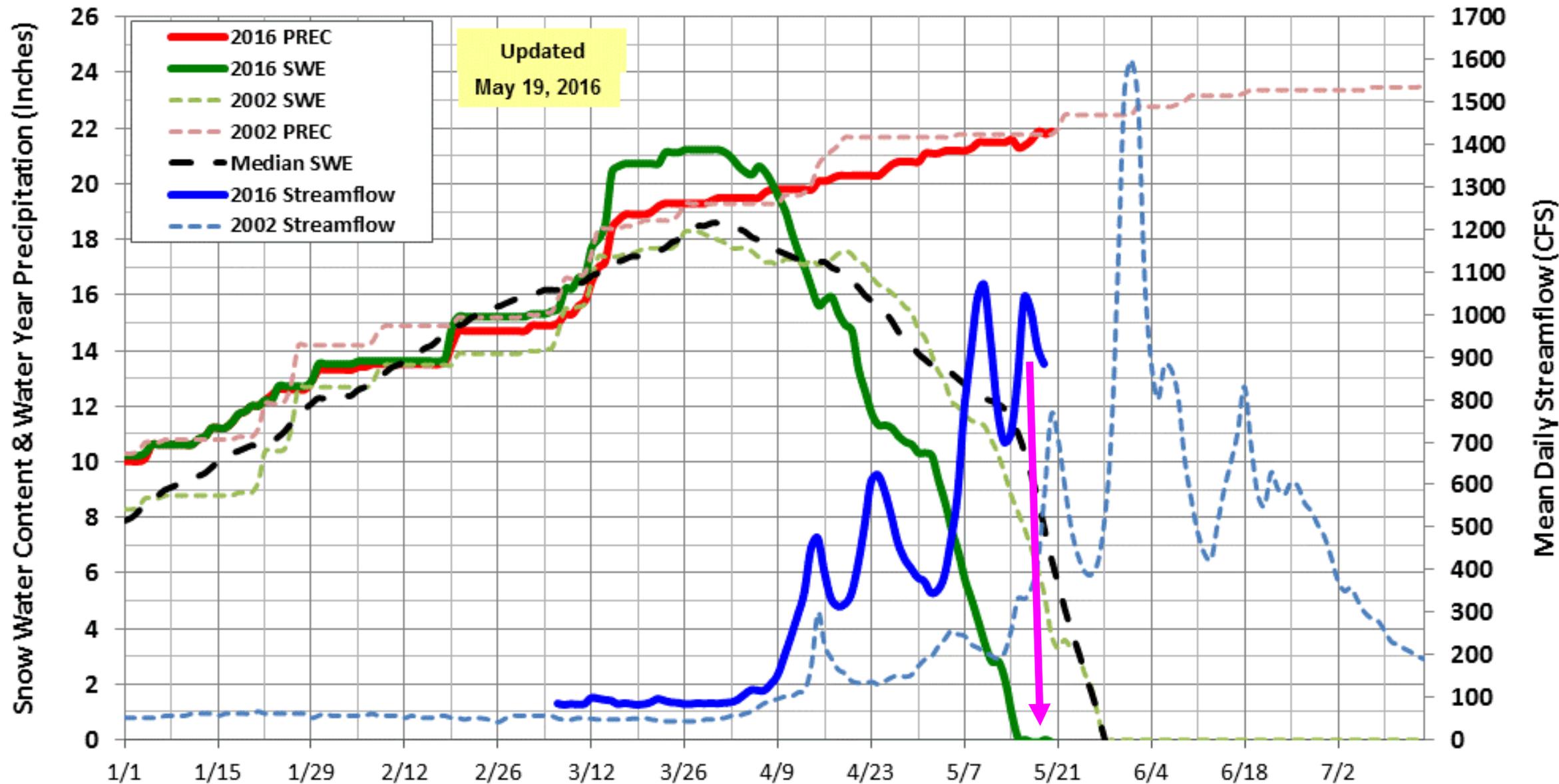
And when you see it, means the peak flow has occurred.

Picture taken June 8, 2006

- **Lost-Wood Divide had SWE of 0.0" – first day melted out**
- **SNOTEL analysis shows Big Lost peak flow occurs about 4 days after melt out**



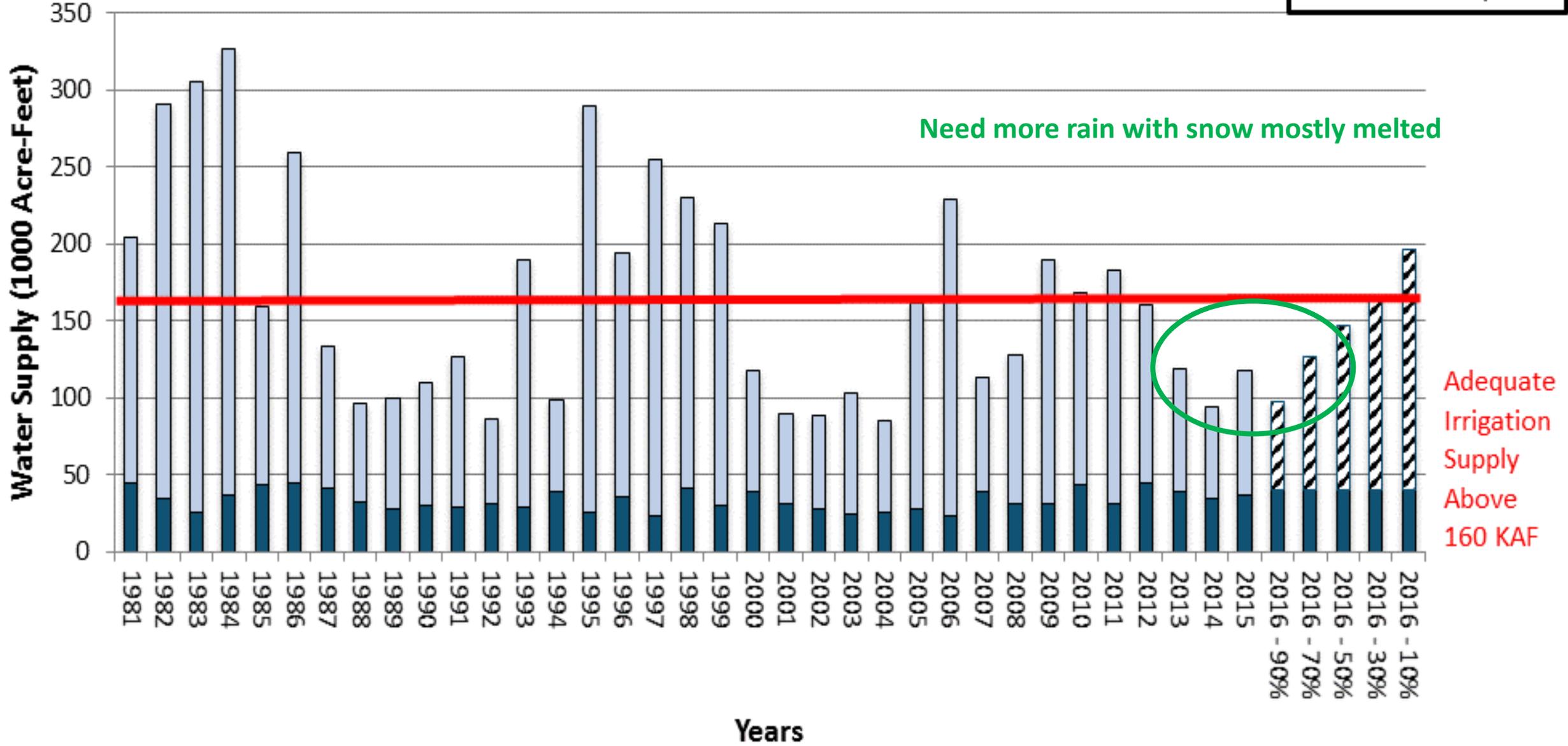
2016 & 2002 Lost Wood Divide SNOTEL and Big Lost River at Howell Ranch



On average, Big Lost R at Howell Ranch increases in flow or has its snowmelt peak 4 days after Lost-Wood Divide melts out.

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

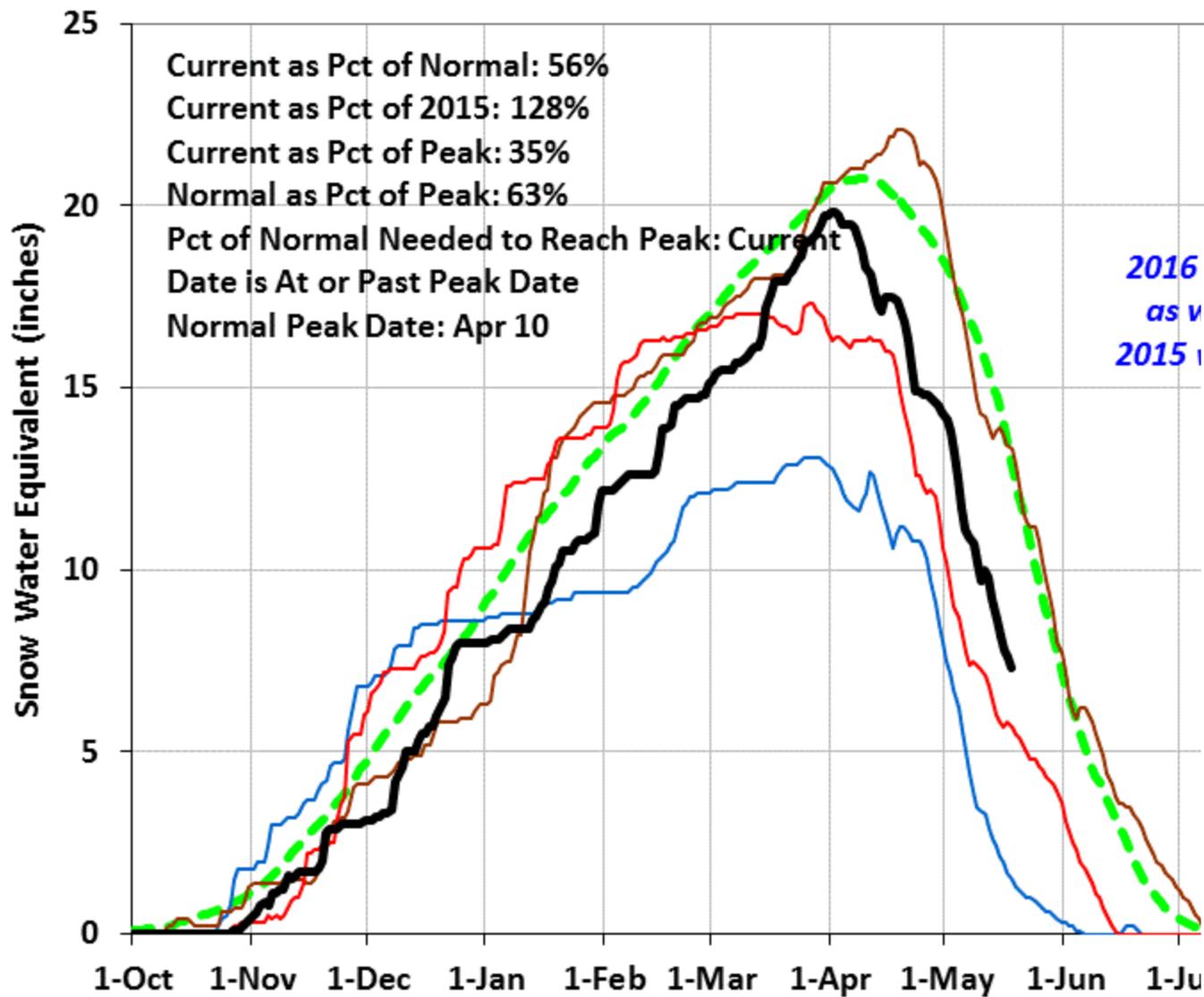
■ StreamFlow May-Sep
■ Reservoir 30-Apr



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

Based on Provisional SNOTEL data as of May 18, 2016

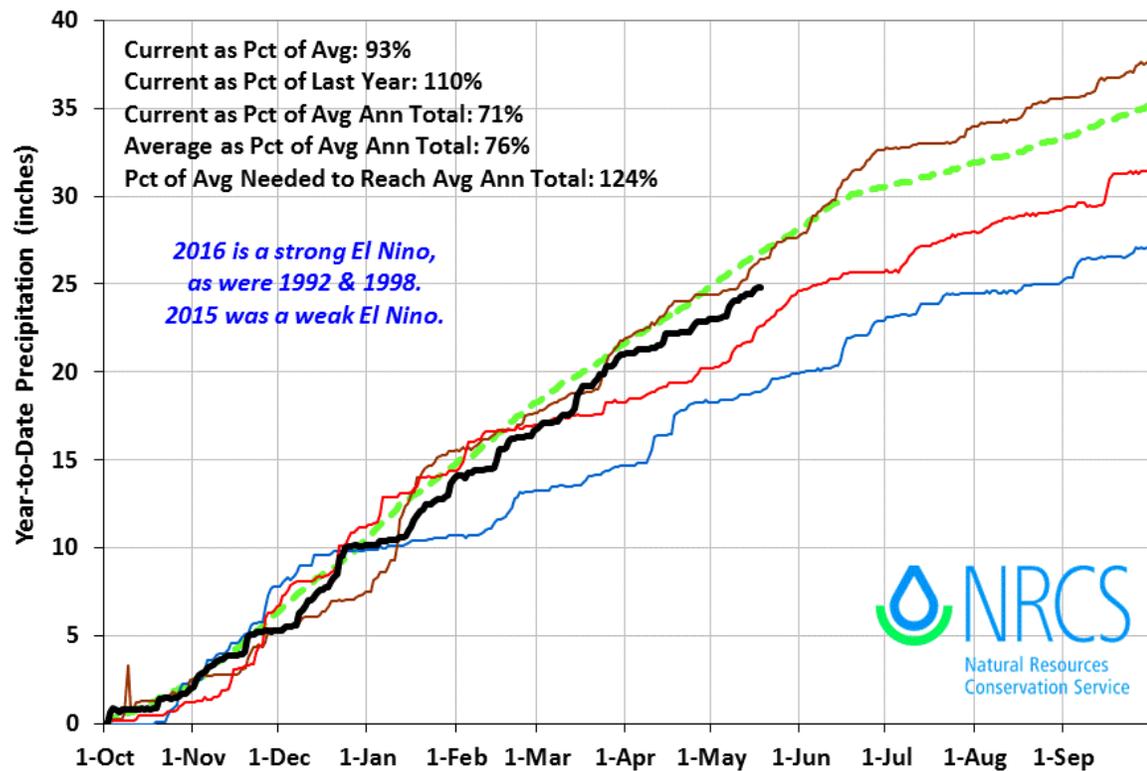
Normal WY1992 WY1998 WY2015 WY2016



Snake Basin above Palisades 2016 Precipitation Comparison Graph (18 sites)

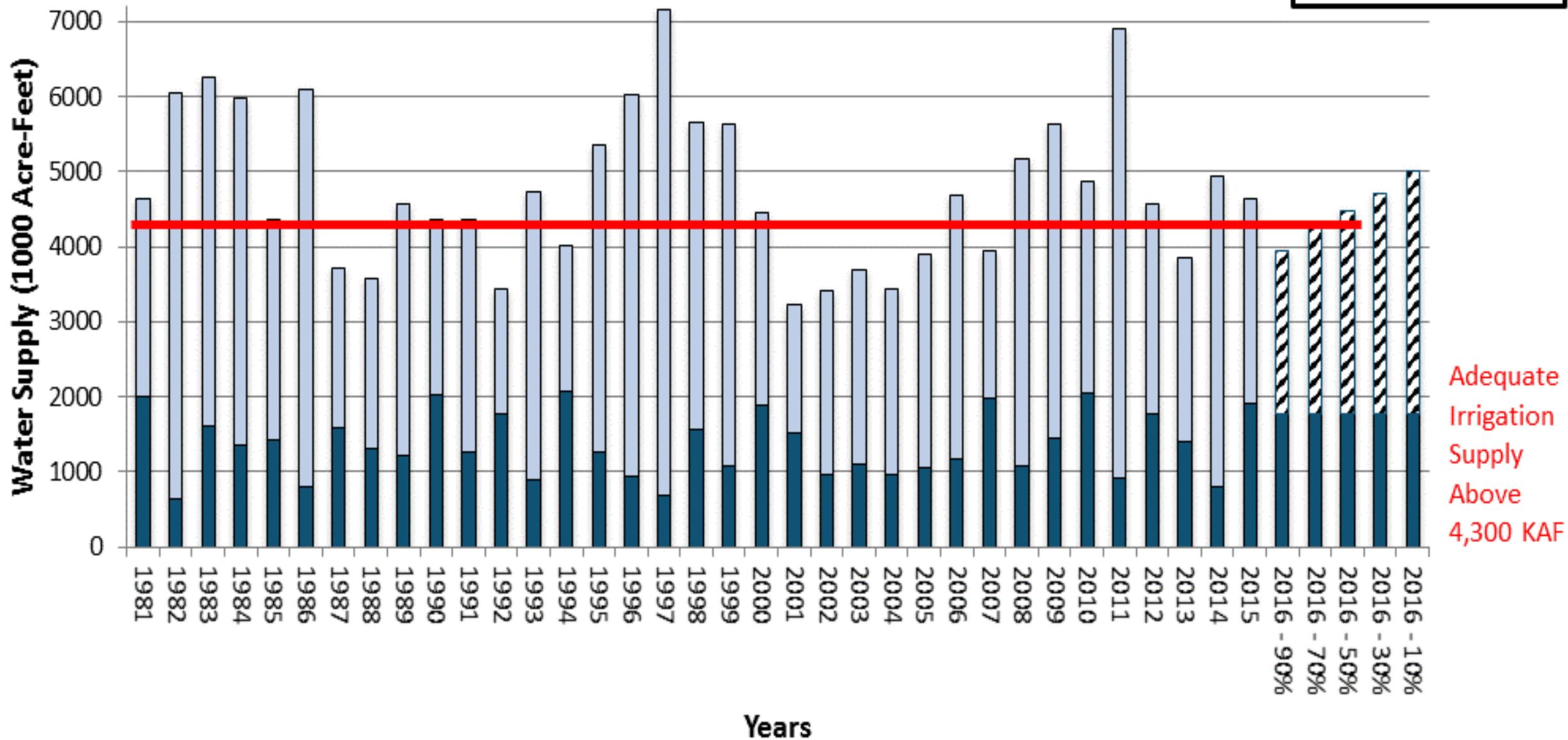
Based on Provisional SNOTEL data as of May 18, 2016

Average WY1992 WY1998 WY2015 WY2016



May 1 Historic and Forecasted Surface Water Supply Snake River Near Heise

StreamFlow May-Sep
 Reservoir 30-Apr

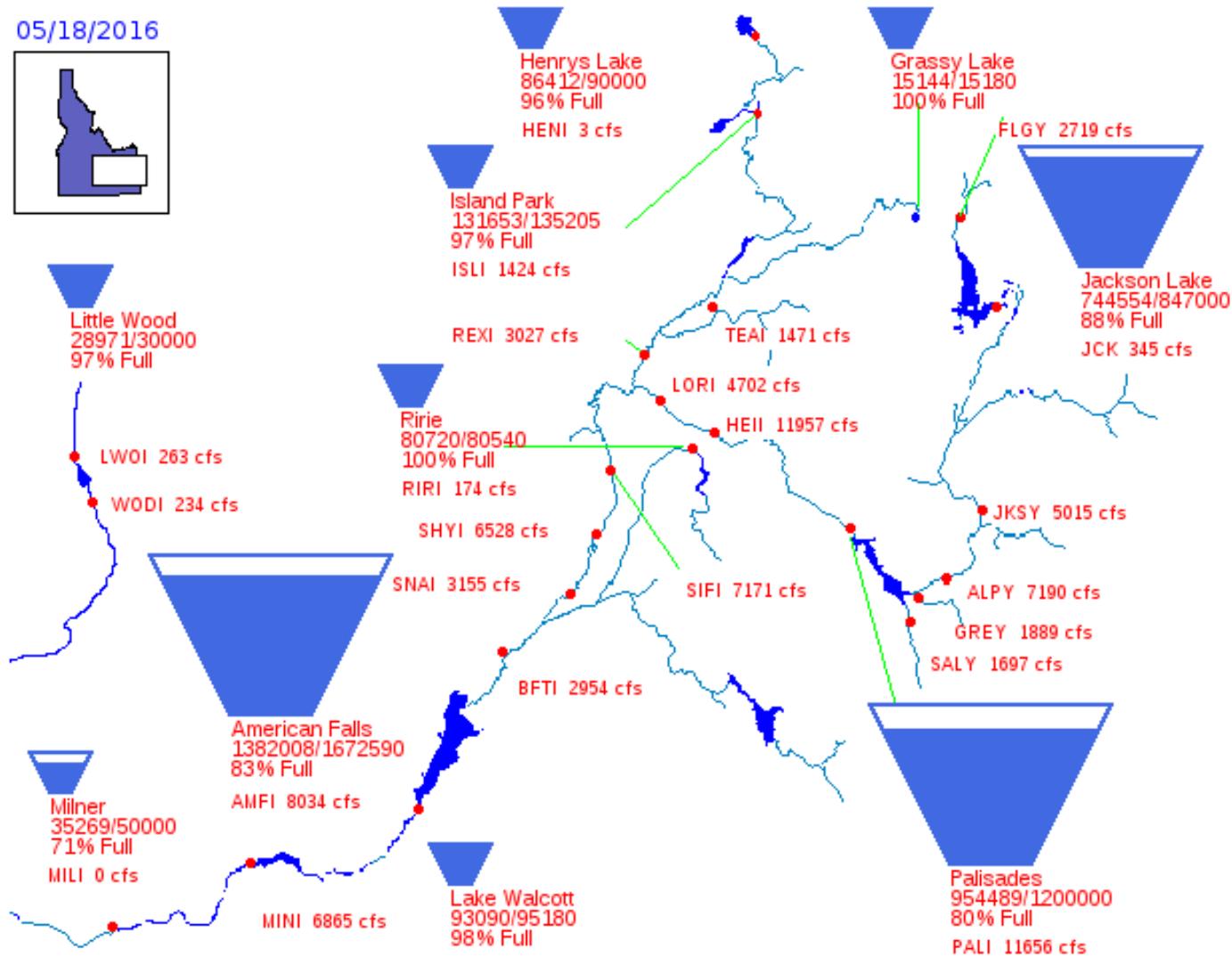


Adequate
 Irrigation
 Supply
 Above
 4,300 KAF

Bureau of Reclamation, Pacific Northwest Region

Major Storage Reservoirs in the Upper Snake River Basin

05/18/2016

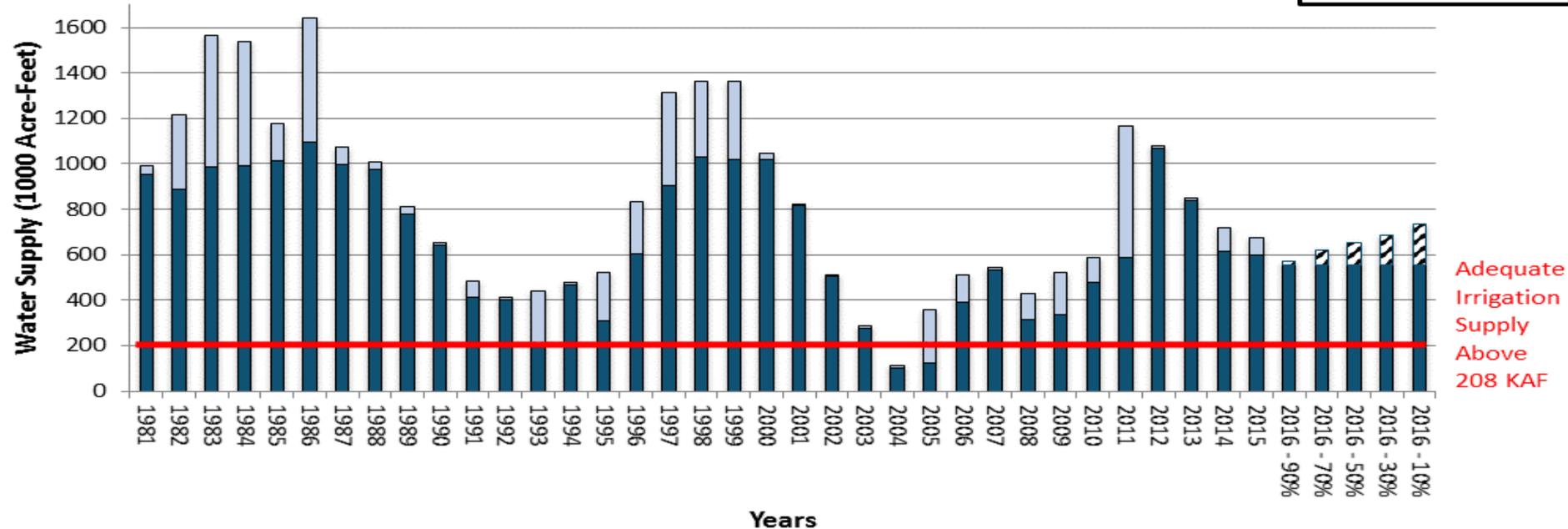


Upper Snake River system is at 84 % of capacity.

PROVISIONAL DATA - Subject to change

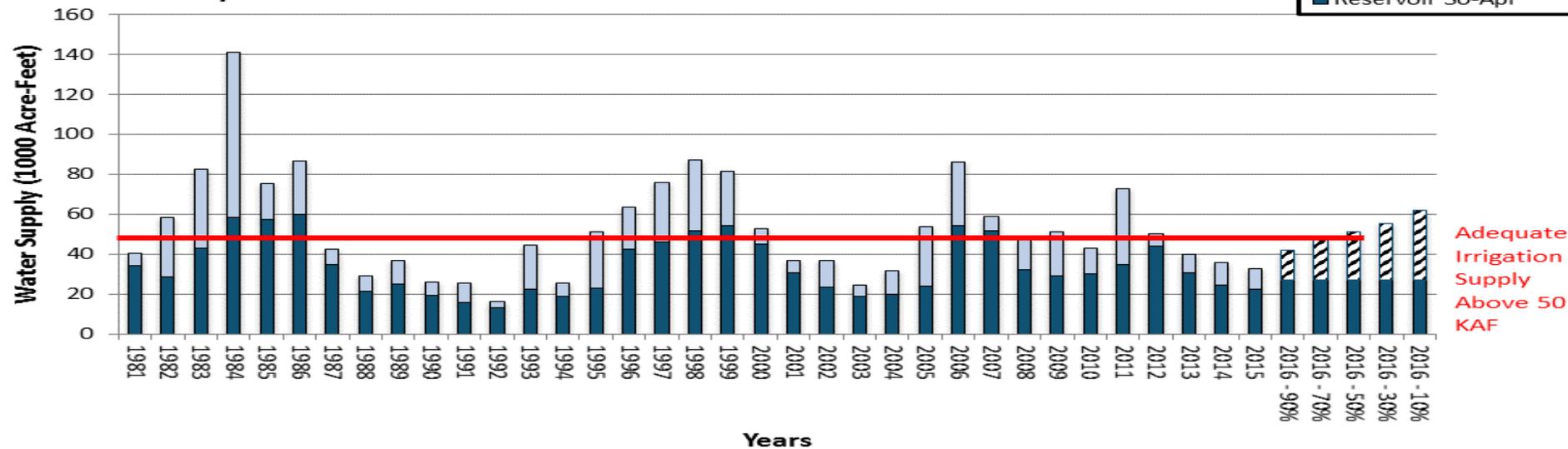
**May 1 Historic and Forecasted Surface Water Supply
Bear River Basin**

StreamFlow May-Sep
Reservoir 30-Apr



**May 1 Historic and Forecasted Surface Water Supply
Oakley Basin**

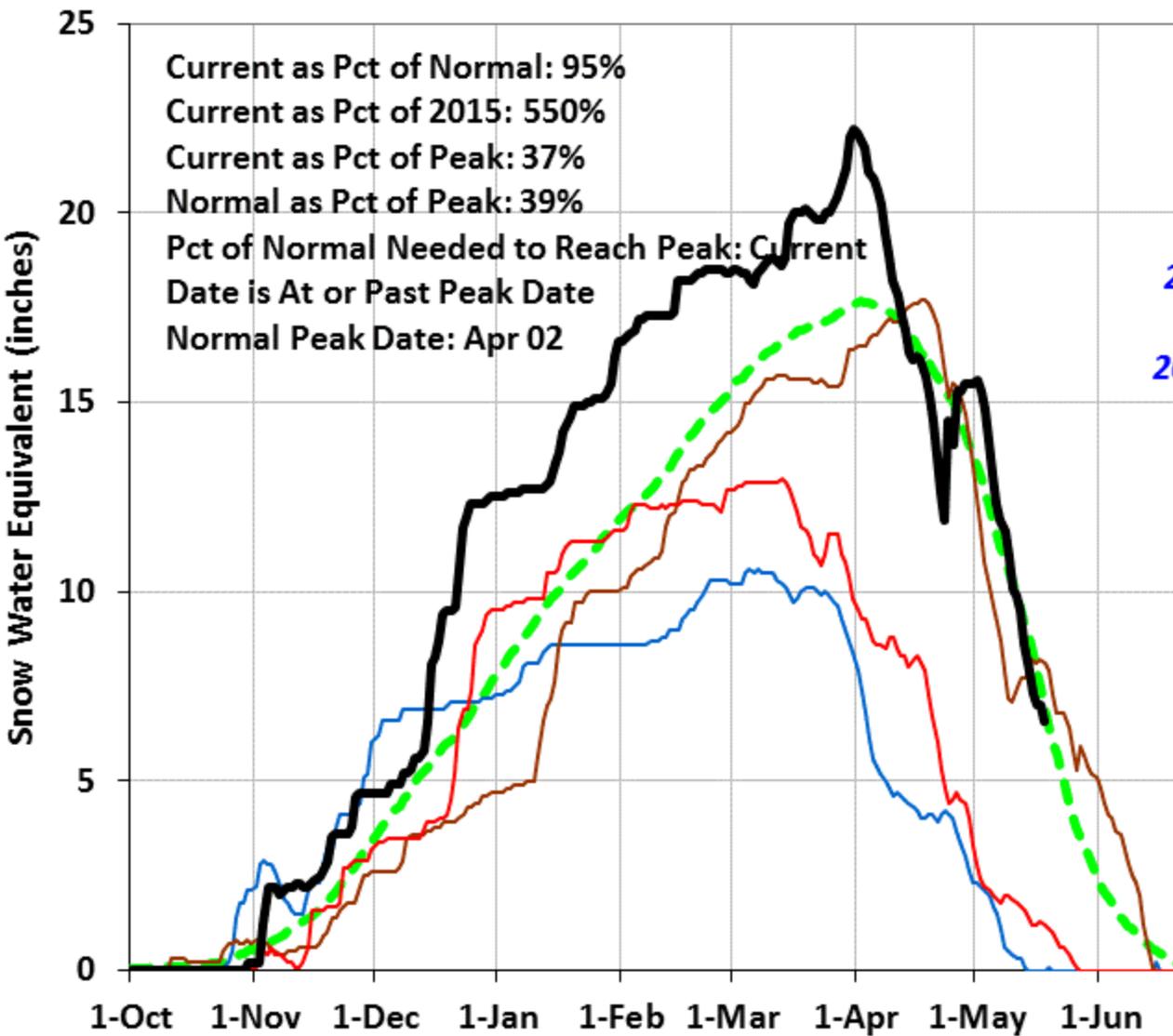
StreamFlow May-Sep
Reservoir 30-Apr



Salmon Falls Basin 2016 Snowpack Comparison Graph (5 sites)

Based on Provisional SNOTEL data as of May 18, 2016

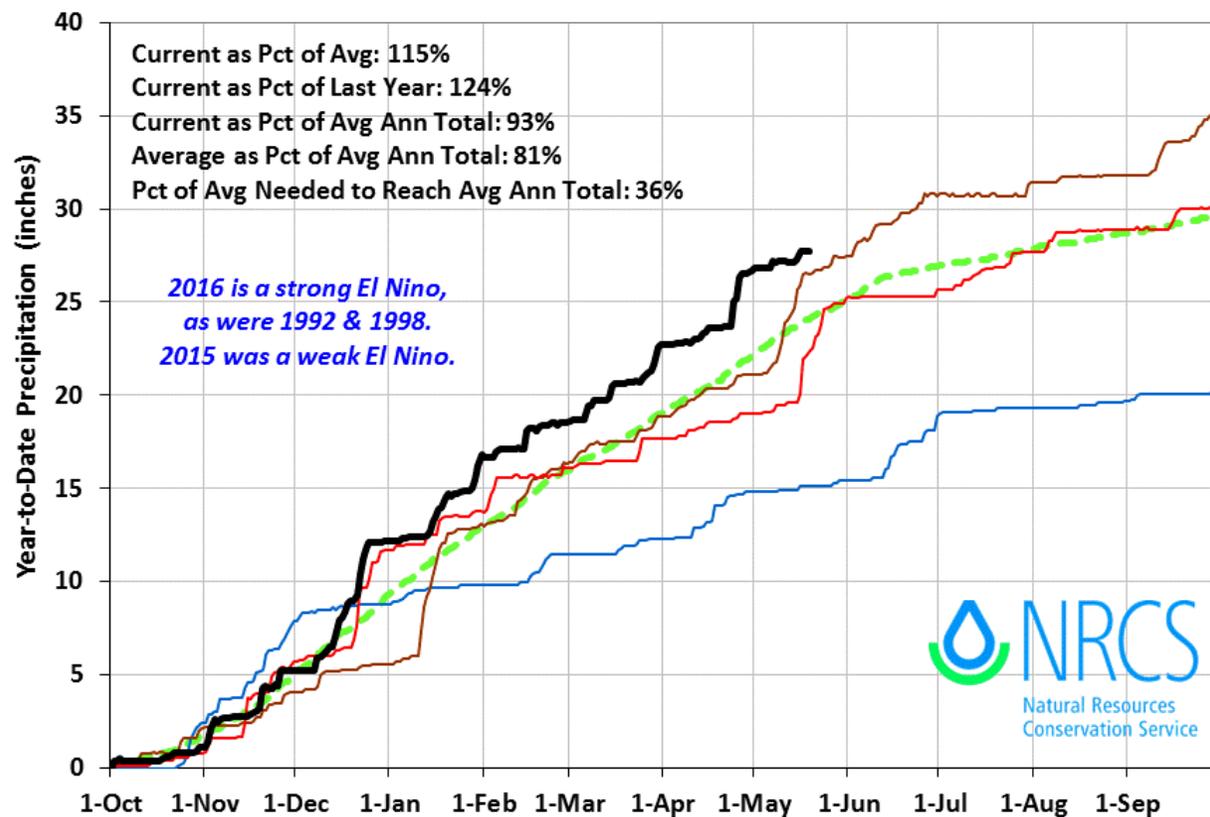
Normal WY1992 WY1998 WY2015 WY2016



Goose Creek Basin 2016 Precipitation Comparison Graph (2 sites)

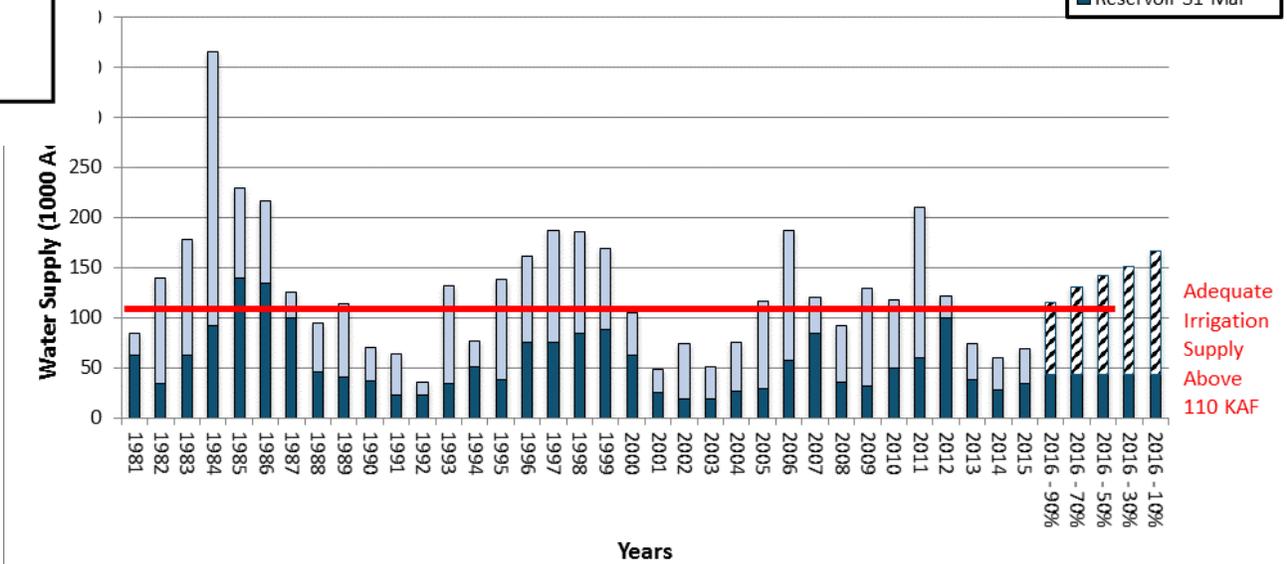
Based on Provisional SNOTEL data as of May 19, 2016

Average WY1992 WY1998 WY2015 WY2016



Twin Falls Soil & Water Conservation District Salmon Falls Reservoir Storage Allotment		Updated April 7, 2016				
Note: Allotment formula is based on March 31 reservoir storage and April 1 - September 30 forecasts.		Based on NRCS April 1 Streamflow Forecasts				
		Chance of Exceedance Streamflow Forecasts				
		90%	70%	50%	30%	10%
Inflow Forecast, April 1-September 30, acre-feet		73000	88000	99000	109000	124000
Storage in Dam, March 31, acre-feet	42700	42700	42700	42700	42700	42700
Total Storage (Inflow Forecast + Storage)		115700	130700	141700	151700	166700
Less Dead Storage in Reservoir (5000 A-F)	5000	110700	125700	136700	146700	161700
Projected Reservoir Loss of 20%	0.20	22140	25140	27340	29340	32340
In Dam, Available for Delivery		88560	100560	109360	117360	129360
Projected Delivery Efficiency: 2016 50%						
Past Delivery Efficiency: 2015 47.0% 2014 48.0% 2013 53.0% 2012 58.8% 2011 63.9%	0.535	47380	53800	58508	62788	69208
Less Water for Callen	485	485	485	485	485	485
Less Individual Storage Carryover	1685	1685	1685	1685	1685	1685
Water to be Delivered Over the Weir		45210	51630	56338	60618	67038
Divided by Total Shares	60050.65	0.753	0.860	0.938	1.009	1.116
Allotment if 'Individual Storage Carryover' is not subtracted from 'In Dam, Available for Delivery'		0.781	0.888	0.966	1.038	1.144
Average Allotment						
1924-2006 0.761						
1971-2000 0.934		2013 allotment 0.380 Runoff 42 KAF Apr-Sep				
2002-2006 0.616		2014 allotment 0.332 Runoff 41 KAF Apr-Sep				
Full Allotment 1.167		2015 allotment 0.385 Runoff 42 KAF Apr-Sep				

Apr 1 Historic and Forecasted Surface Water Supply
Salmon Falls Creek Basin



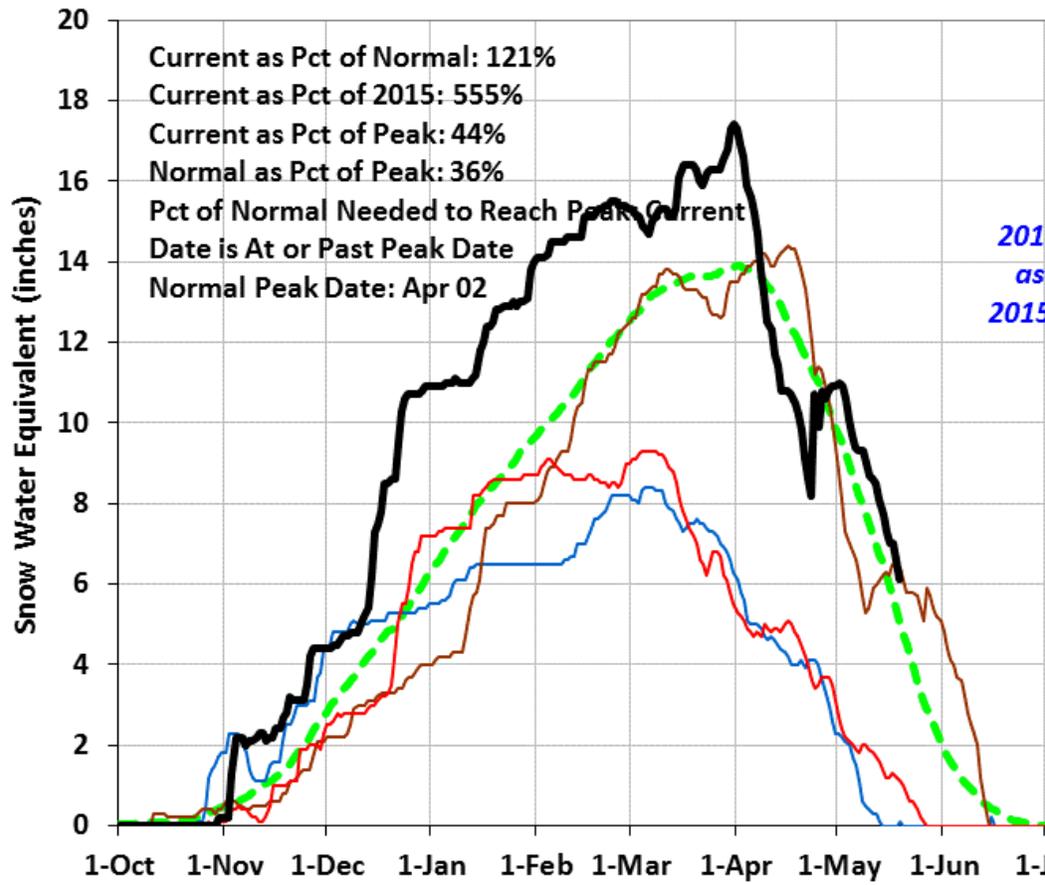
Bruneau Basin 2016 Snowpack Comparison Graph (5 sites)

Based on Provisional SNOTEL data as of May 19, 2016

— Normal
 — WY1992
 — WY1998
 — WY2015
 — WY2016

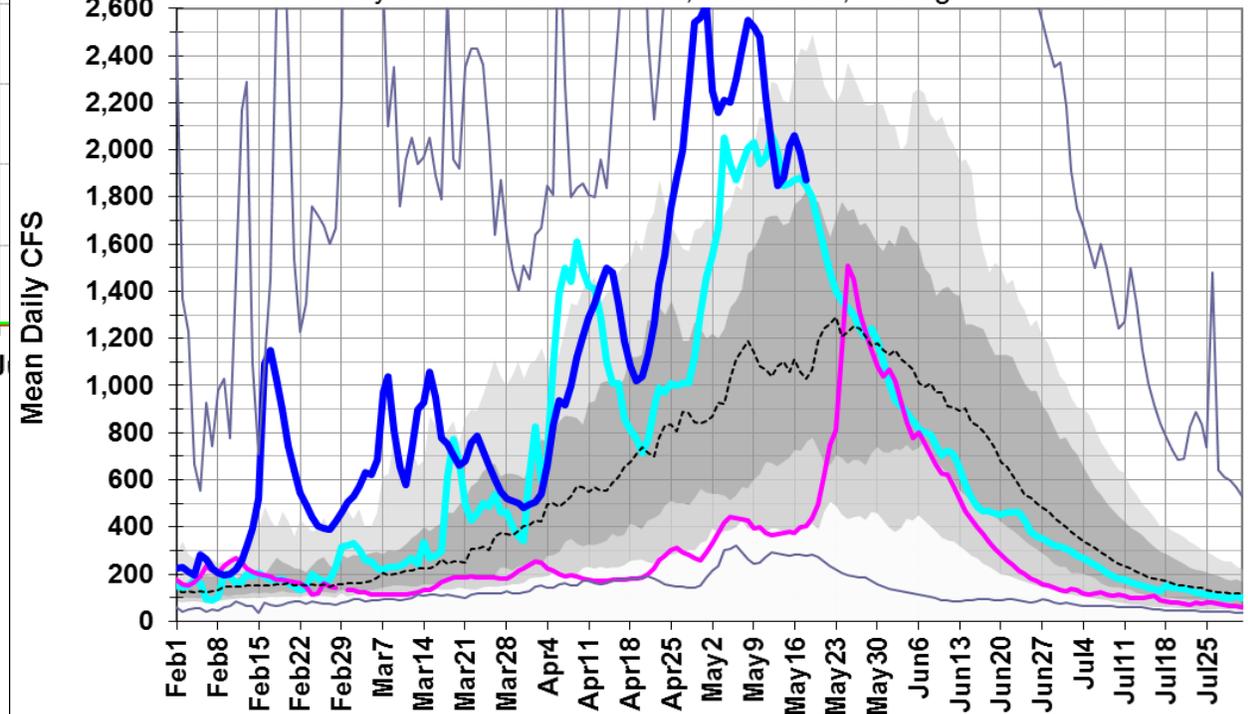


2016 is a strong El Nino,
 as were 1992 & 1998.
 2015 was a weak El Nino.



13168500: Bruneau R near Hot Spring, ID

1976 May-Jul volume was 100%, 148.2 KAF, Average is 148.1 KAF



- 10-25-75-90
- Estimated
- SimilarYr
- Last Yr
- Projected
- Current
- - - Median
- Max-Min

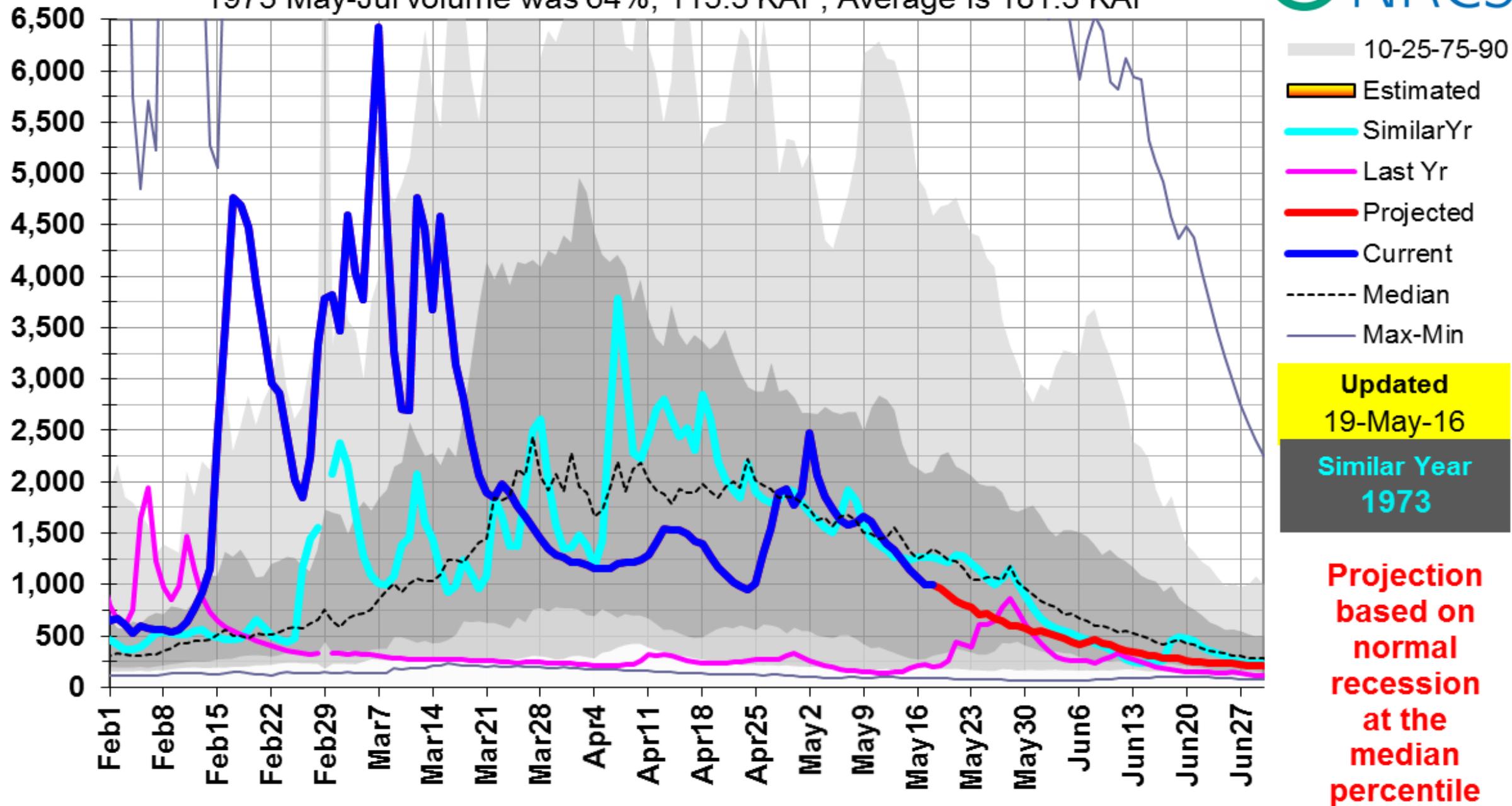
Updated
 19-May-16
 Similar Year
 1976

13181000: Owyhee R near Rome, OR

1973 May-Jul volume was 64%, 115.3 KAF, Average is 181.3 KAF

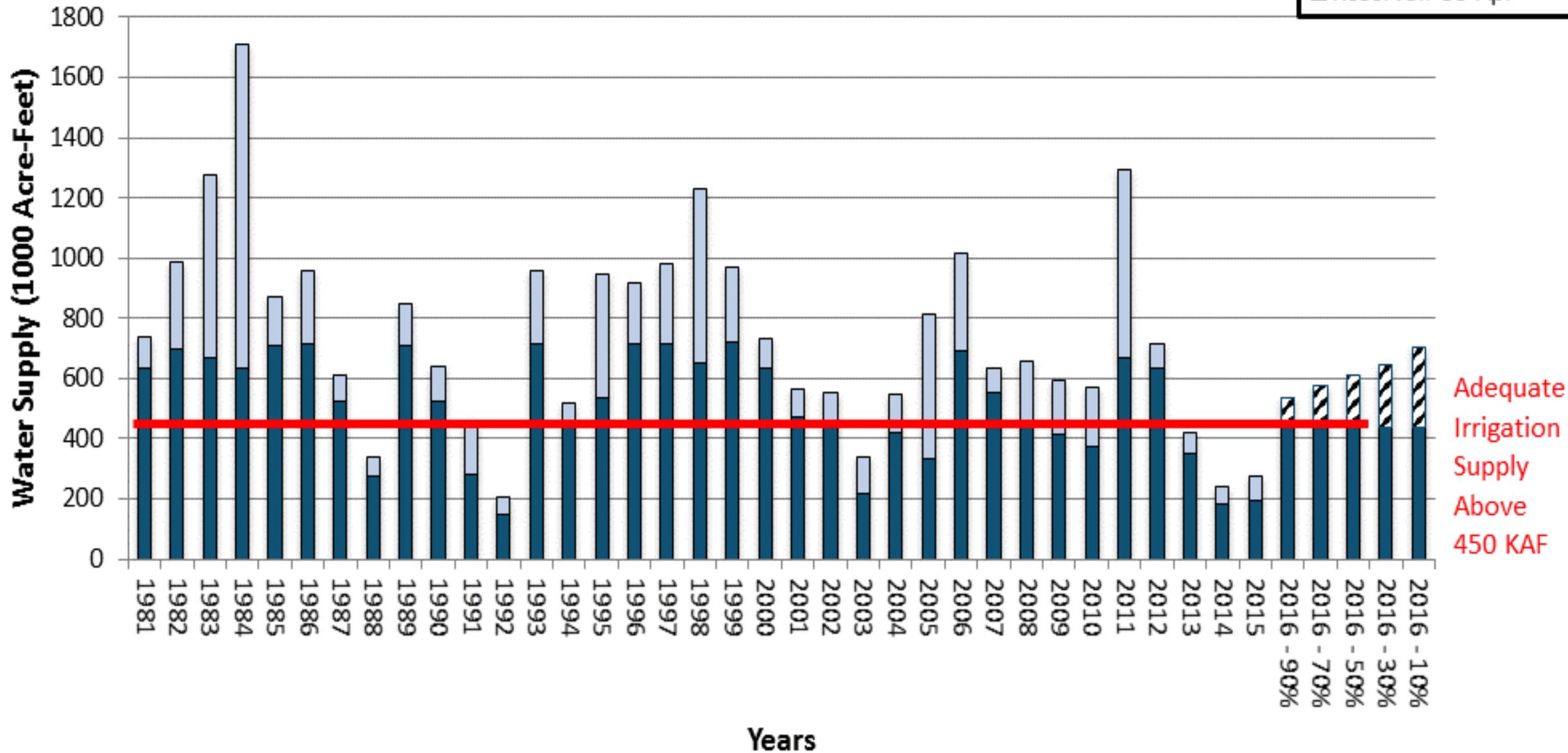


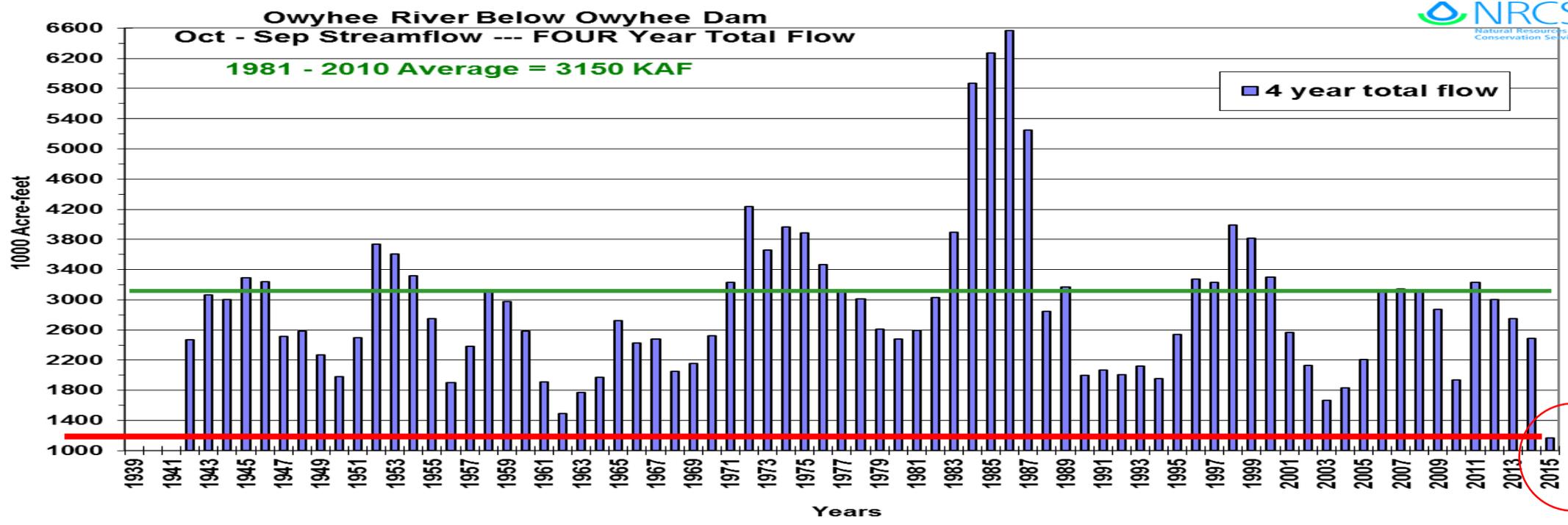
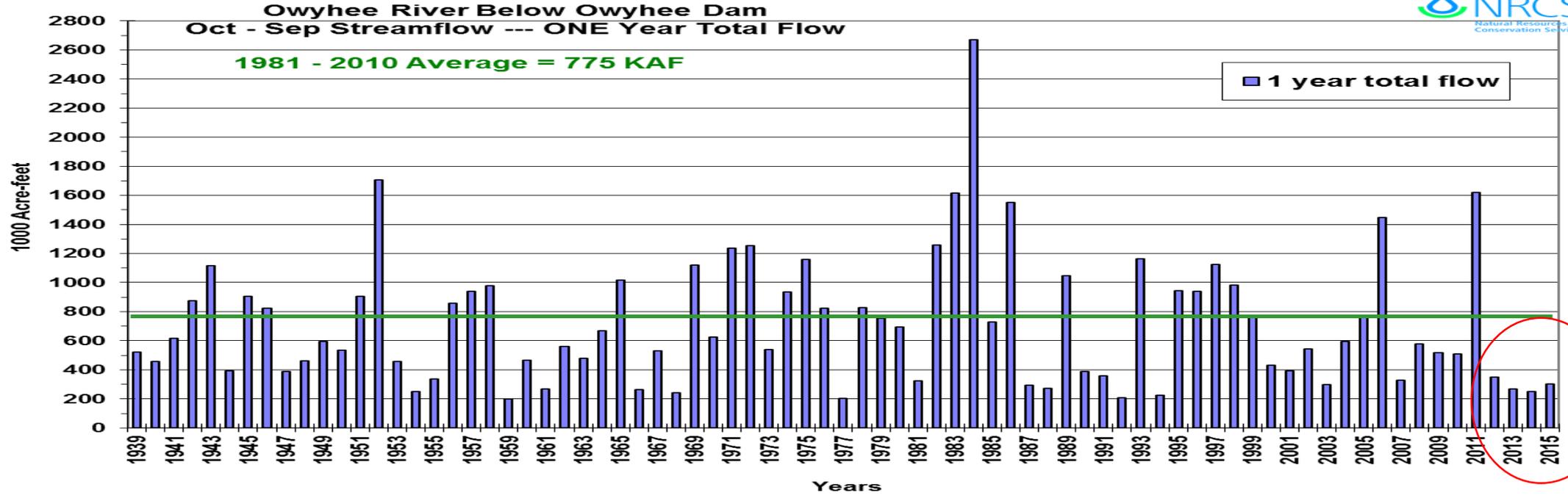
Mean Daily CFS

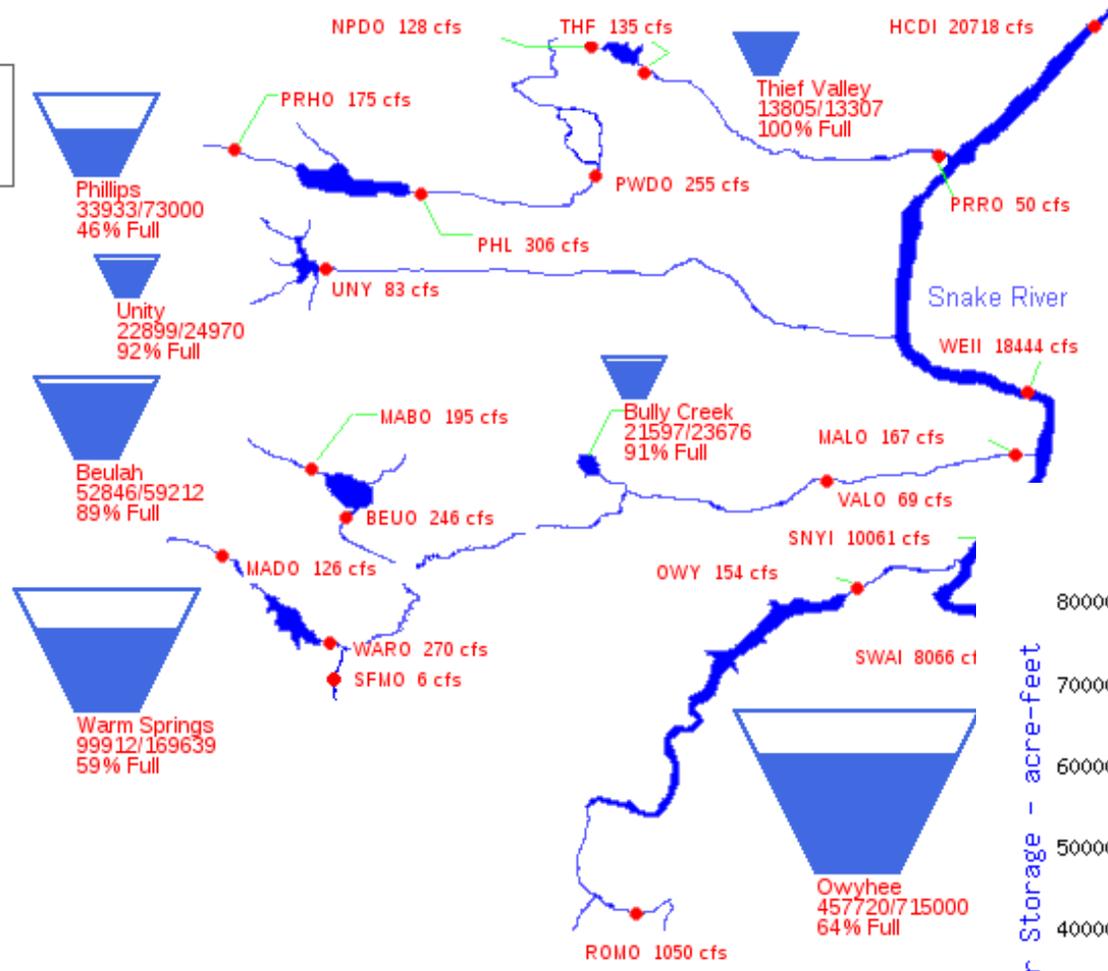
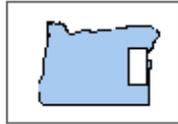


May 1 Historic and Forecasted Surface Water Supply Owyhee Basin

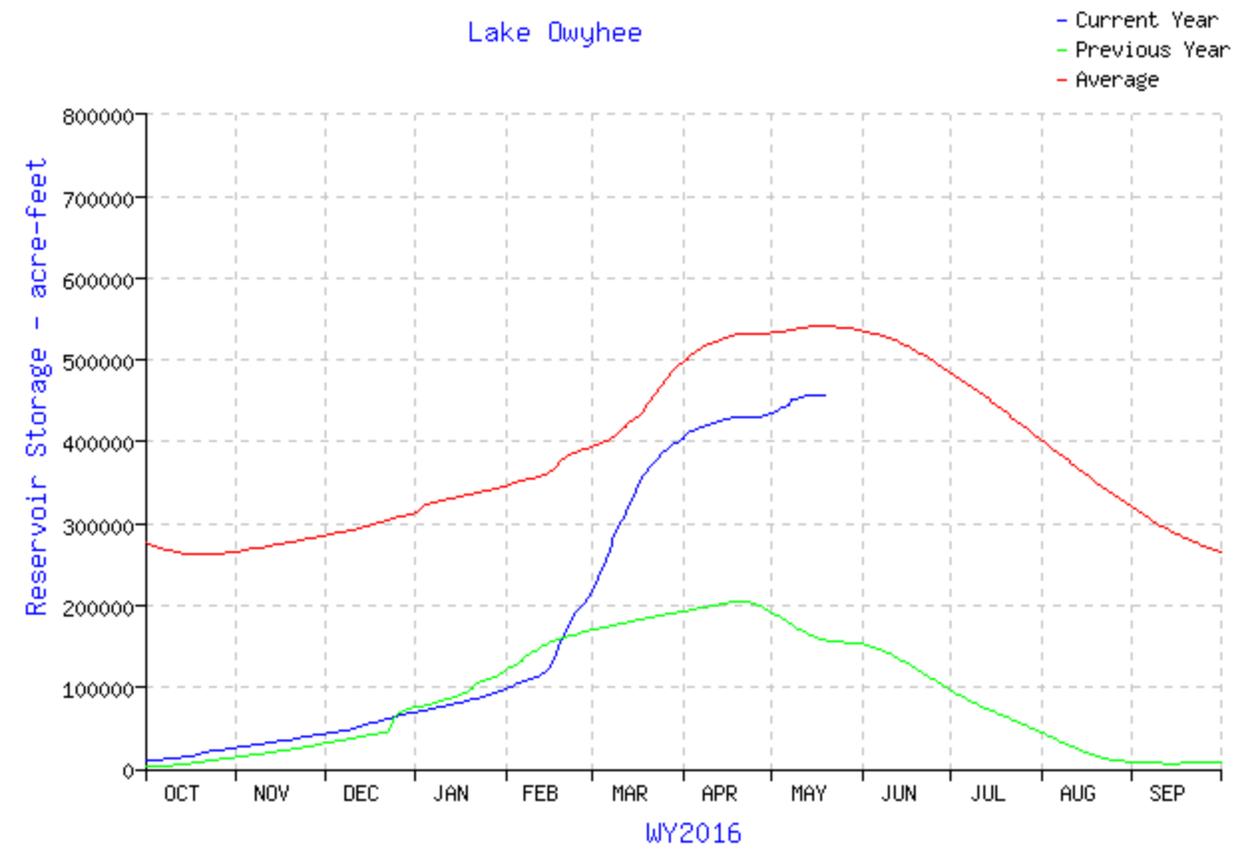
StreamFlow May-Sep
 Reservoir 30-Apr







Lake Owyhee



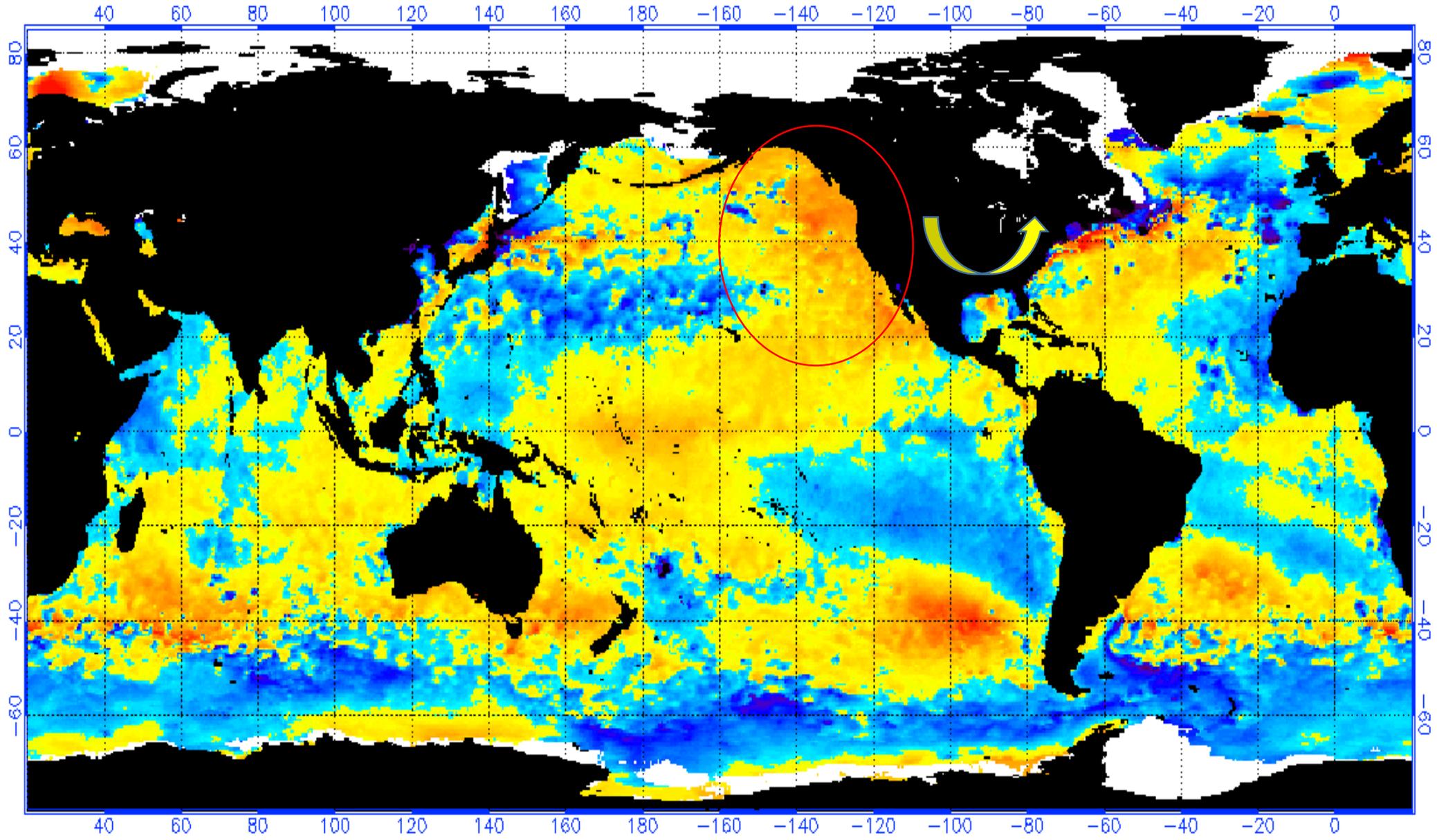


The Sawtooths April 11, 2016

**Questions,
Comments,
Solutions
or time for a
few slides about
the La Nina
Brewing**

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 3/2/2015

(white regions indicate sea-ice)



March 2, 2015

Winter 2014-15

ENSO Ocean Conditions:
- Neutral to slight El Nino

-- Warm Pacific Decadal Oscillation (PDO)

-5.0 -4.5 -4.0 -3.5 -3.0 -2.5 -2.0 -1.5 -1.0 -0.5 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00



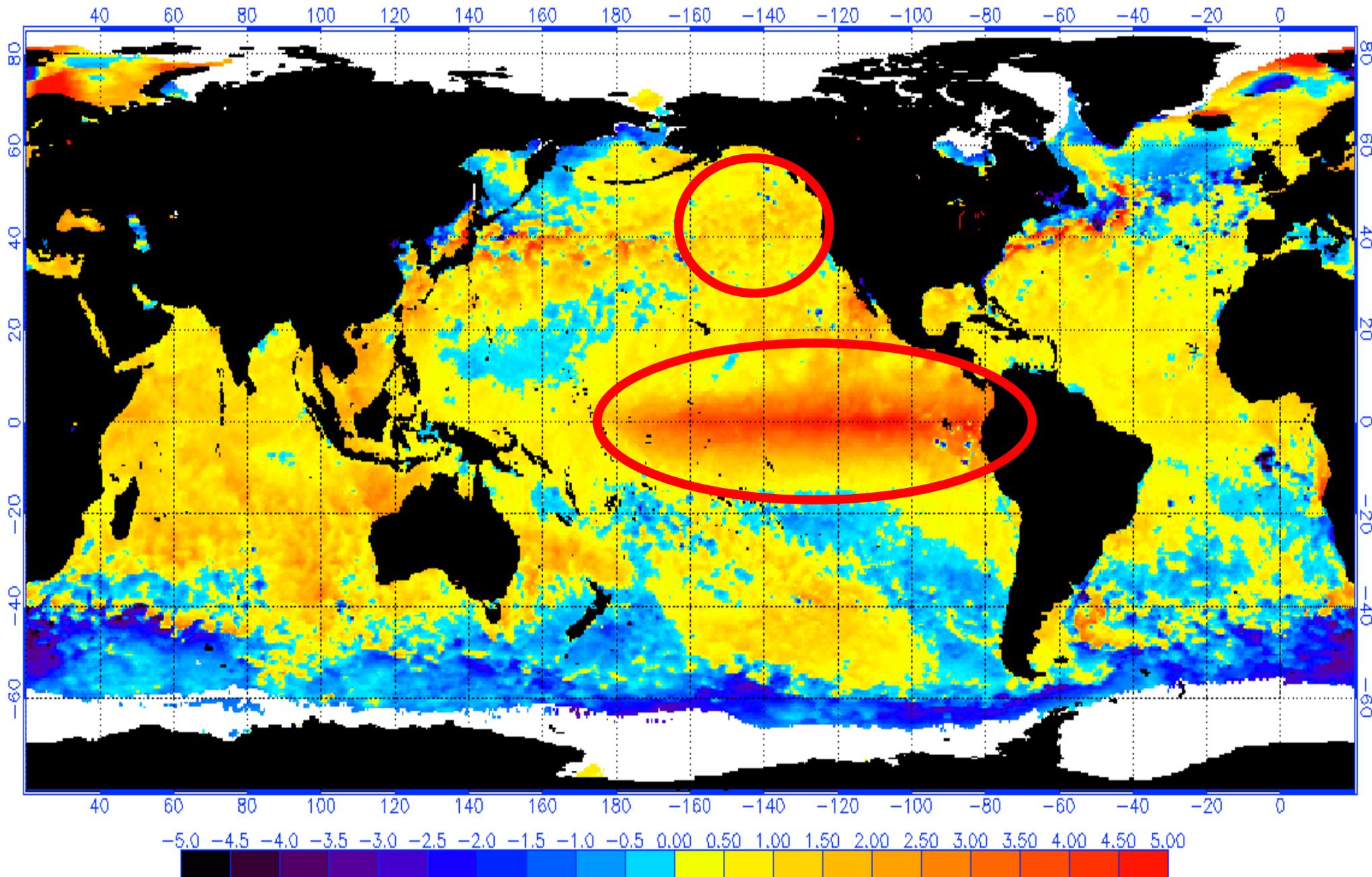
NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 11/30/2015
(white regions indicate sea-ice)

Nov 30, 2015

Winter 2015 - 2016

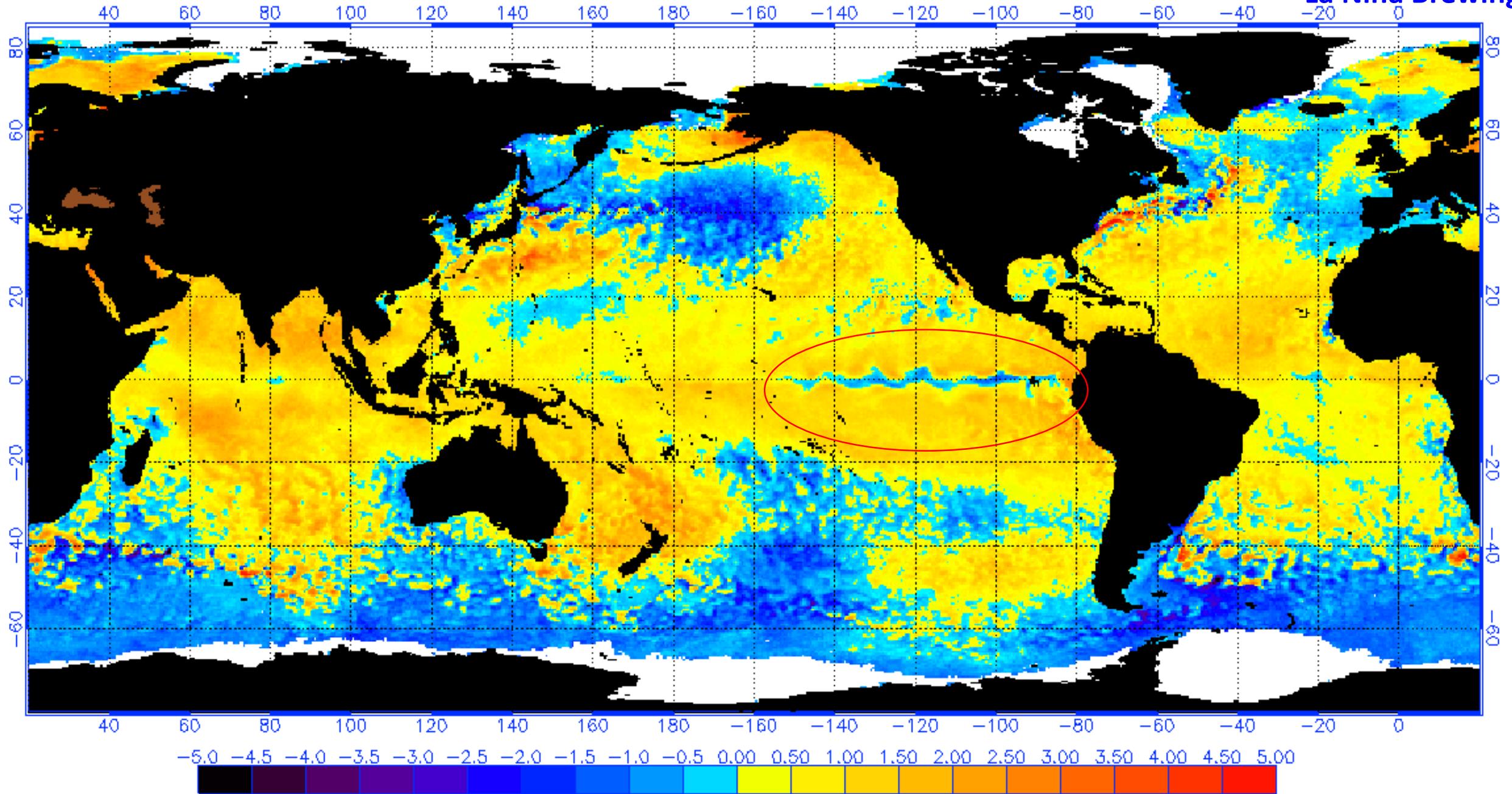
**ENSO Ocean
Conditions:**

Strong El Nino



(white regions indicate sea-ice)

La Nina Brewing

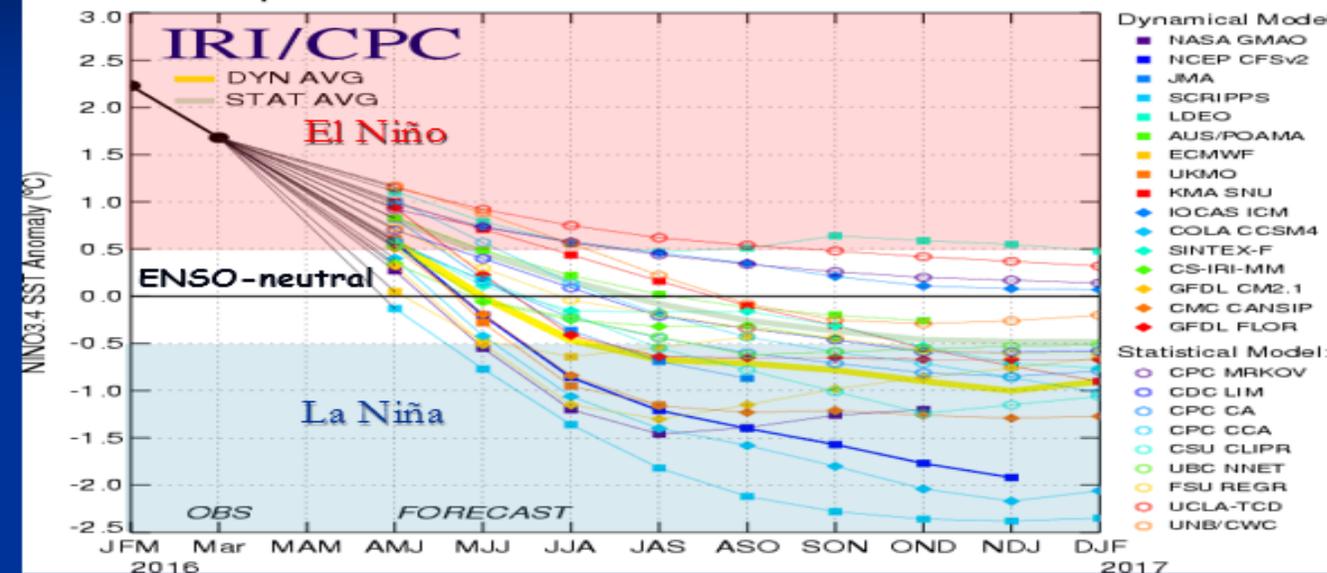


ENSO Predictive Models

SSTs are expected cool to ENSO-neutral by this summer

High potential for La Niña development by this autumn

Mid-Apr 2016 Plume of Model ENSO Predictions

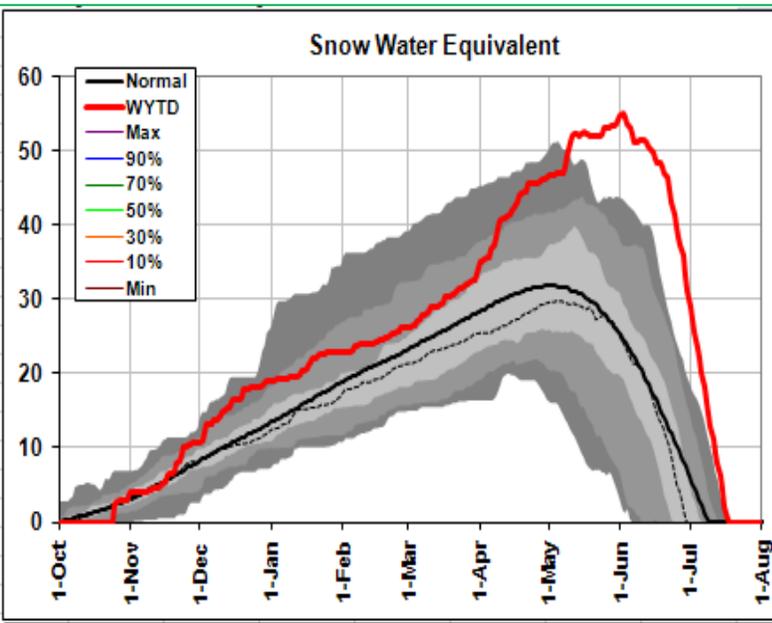
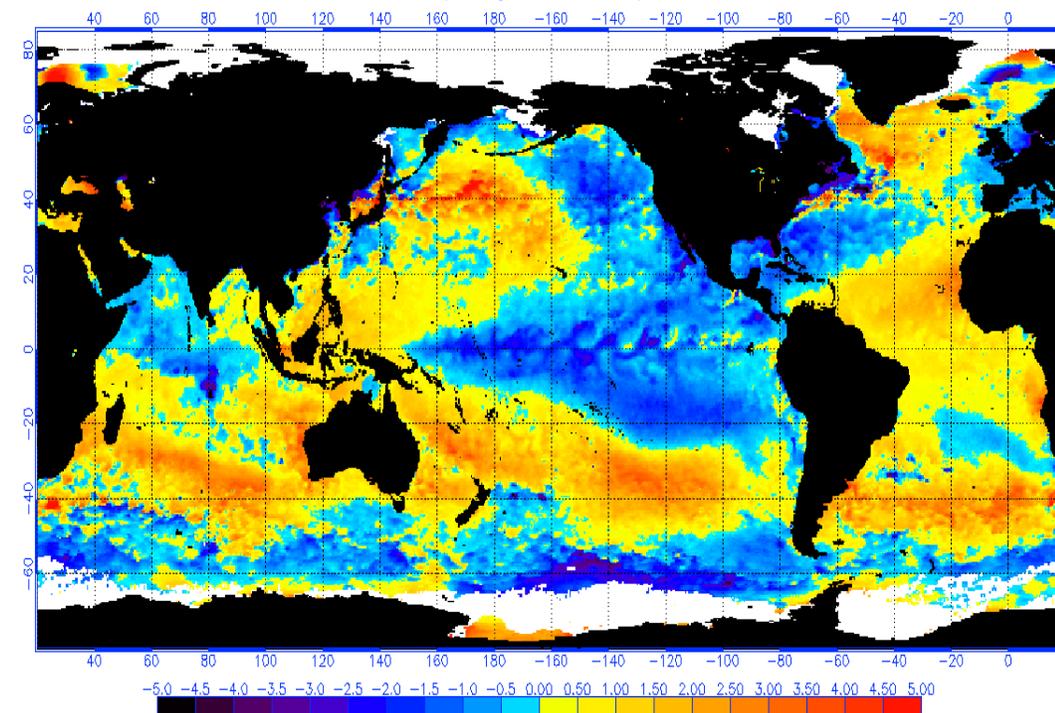


"Base" Graphic Courtesy: <http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>

Winter 2010 - 2011

Sea Surface Temperatures
 Cool PDO & Strongest
 La Niña since 1974

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 1/3/2011
 (white regions indicate sea-ice)



**2011: Snow
 Water
 Equivalent at
 Two Ocean
 Plateau
 SNOTEL Site
 Yellowstone
 N.P. 9,240 feet**

			Streamflow as % of 1981-2010 Average					
ENSO		ENSO	Feb-Sep	Apr-Sep	Apr-Sep	Apr-Sep	Apr-Sep	
Year	Year Following a Strong El Nino	Year	Owyhee River blw Dam	Salmon Falls Creek	Big Wood River blw Magic Dam	Snake River nr Heise	Spokane River nr Post Falls	
1952	SE	1953	N	56	76	92	92	108
1947	SE	1948	LN	58	86	66	97	176
1966	SE	1967	N	69	88	151	109	113
1978	SE	1979	N	97	116	34	90	105
1998	SE	1999 *	SL	100	108	158	131	129
1973	SE	1974	SL	120	111	184	147	193
1941	SE	1942	SE	122	173	117	86	77
1995	SE	1996	N	124	115	132	148	116
1994	SE	1995	SE	124	135	195	118	70
1942	SE	1943	N	137	150	259	144	150
1988	SE	1989	SL	145	100	75	102	116
1983	SE	1984 *	N	363	369	206	133	91
				sorted				
2016	SE	2017	????	?	?	?	?	?