Natural Resources Conservation Service

Idaho Water Supply Outlook Report
April 1, 2016

TFSWCD 65th Anniversary

62nd Annual Water Supply Forecast Meeting for Salmon Falls Tract
April 7, 2016

Ron Abramovich
Water Supply Specialist
Snow Survey
Boise, Idaho

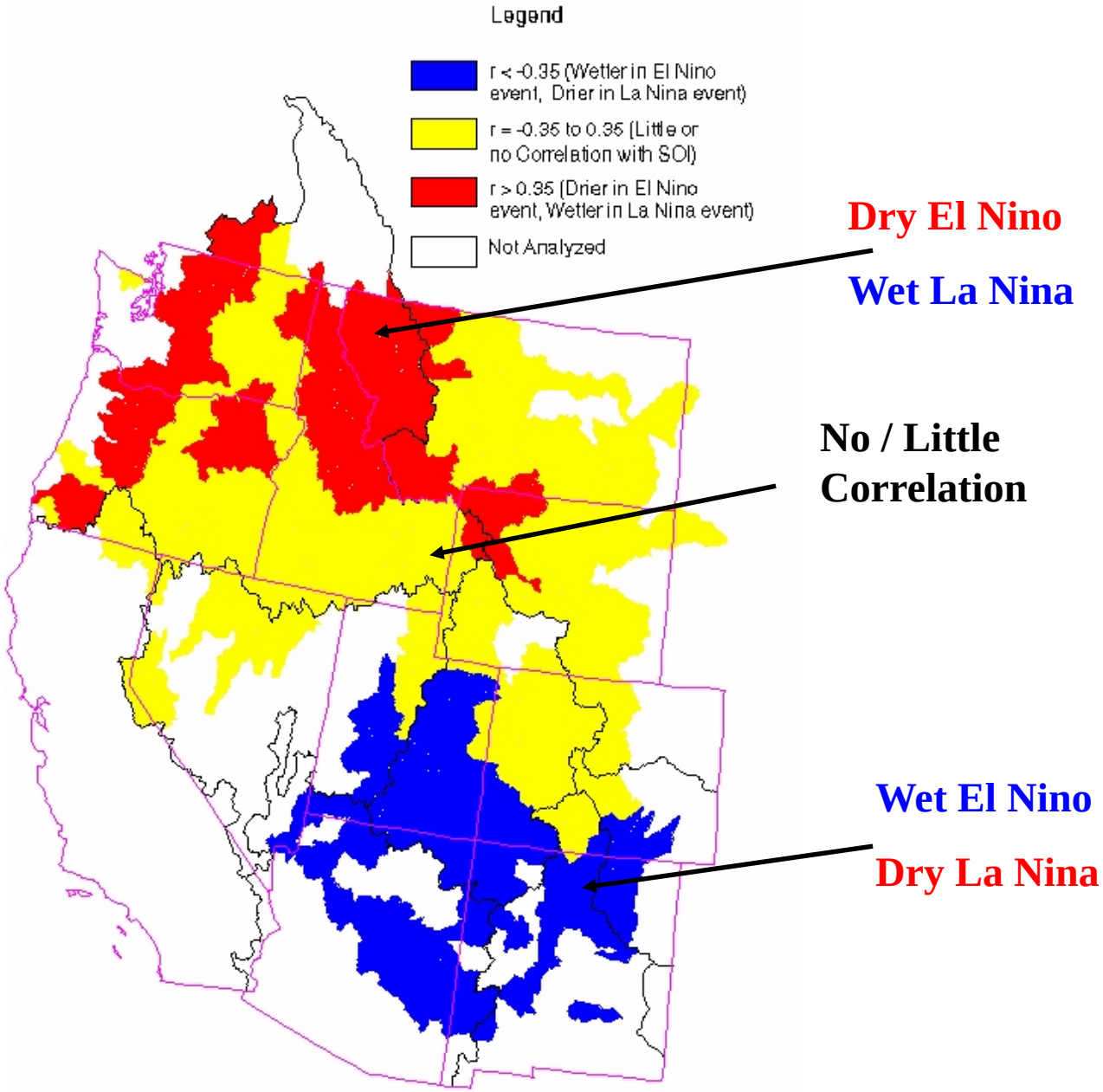
USDA

NRCS Natural Resources Conservation Service

Teleconnection Relationships

Correlation Map of the Southern Oscillation Index (SOI) with spring and summer streamflow

Key is what happens during the July – Nov period



Past few winters:
2014 Neutral
2015 Slight El Nino

Winter 2015/2016:
Strong El Nino!

La Nina and Pacific Decadal Oscillation (PDO) Cooling in the Pacific Ocean

Don J. Easterbrook, Dept. of Geology, Western Washington University, Bellingham, WA

The announcement by NASA's Jet Propulsion Laboratory that the Pacific Decadal Oscillation (PDO) had shifted to its cool phase (Fig. 1) is right on schedule as predicted by past climate and PDO changes (Easterbrook, 2001, 2006, 2007). It is *not* an oddity superimposed upon and masking the predicted severe warming by the IPCC.

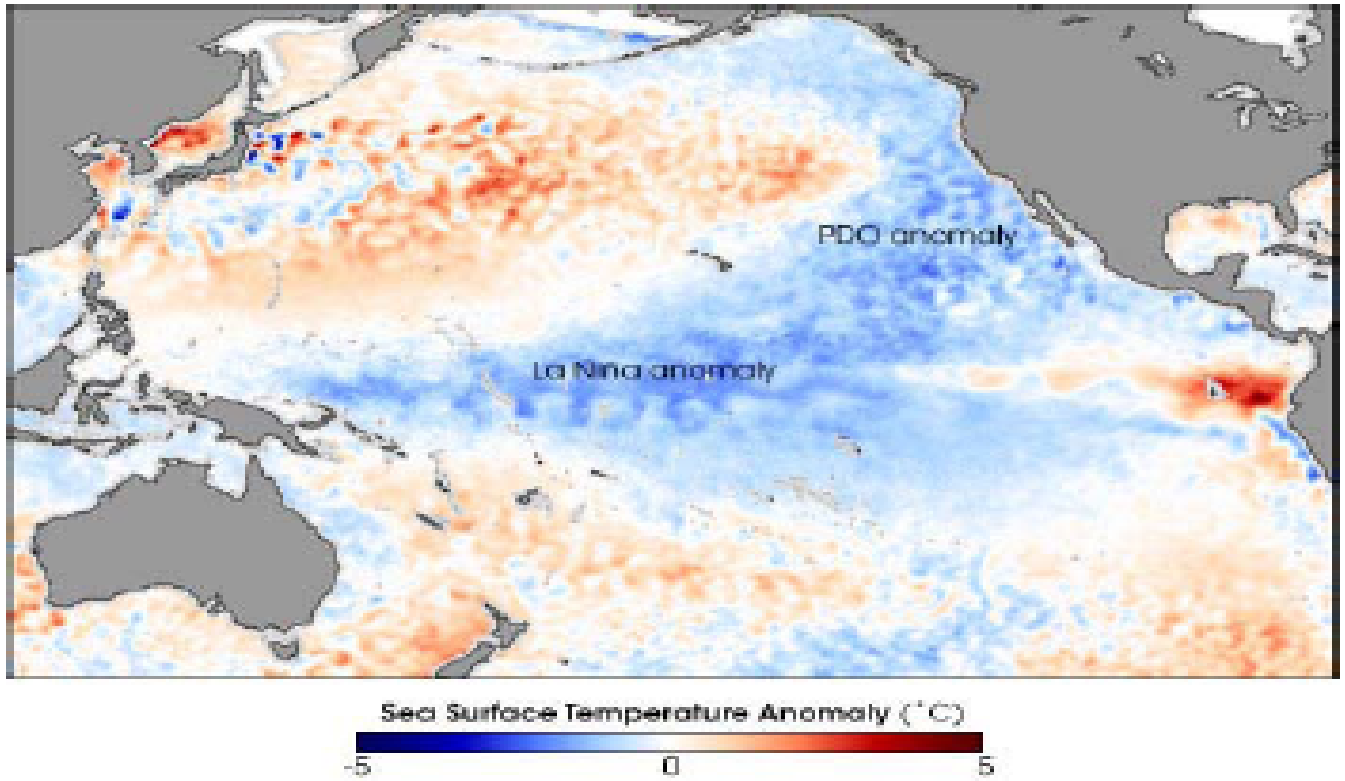
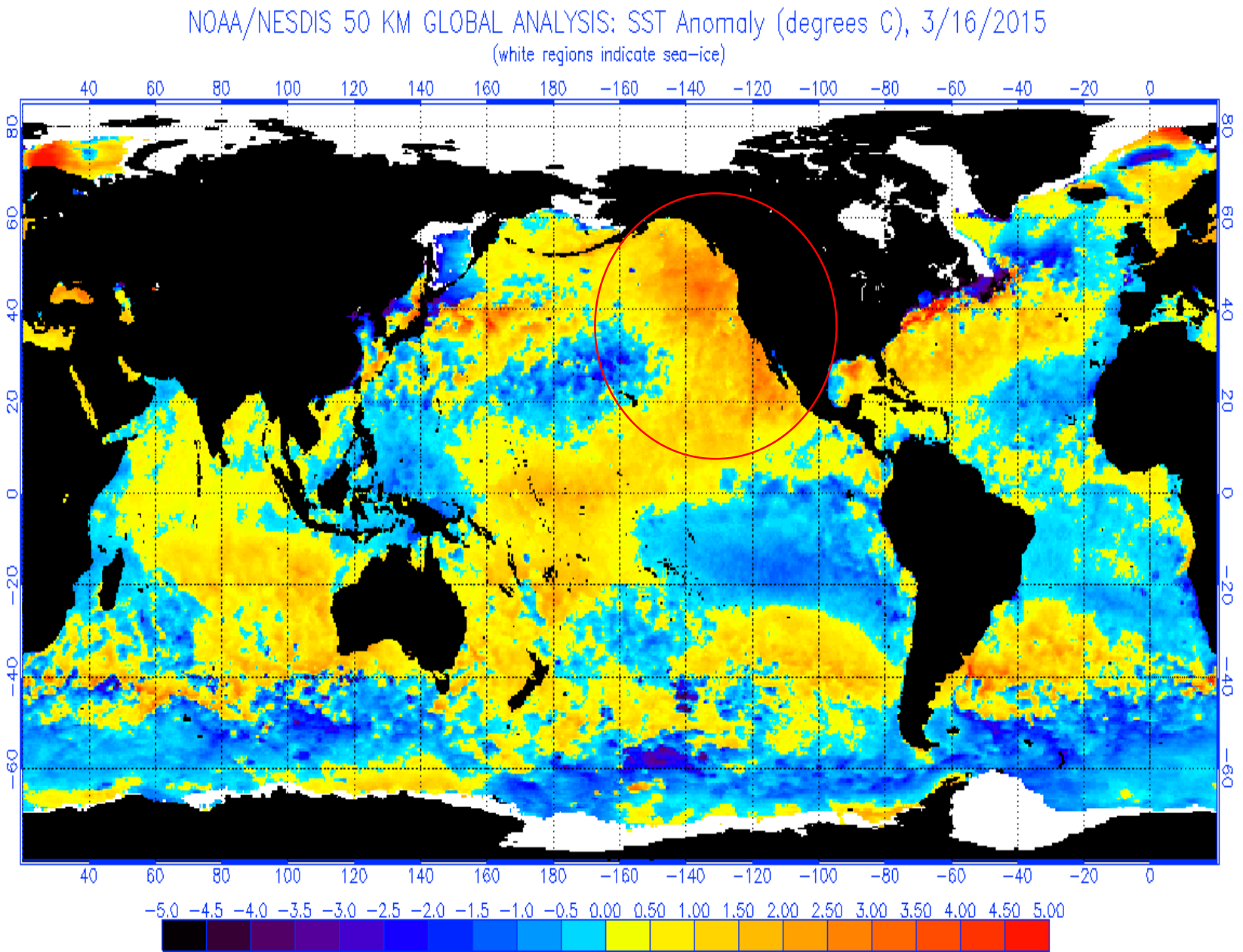
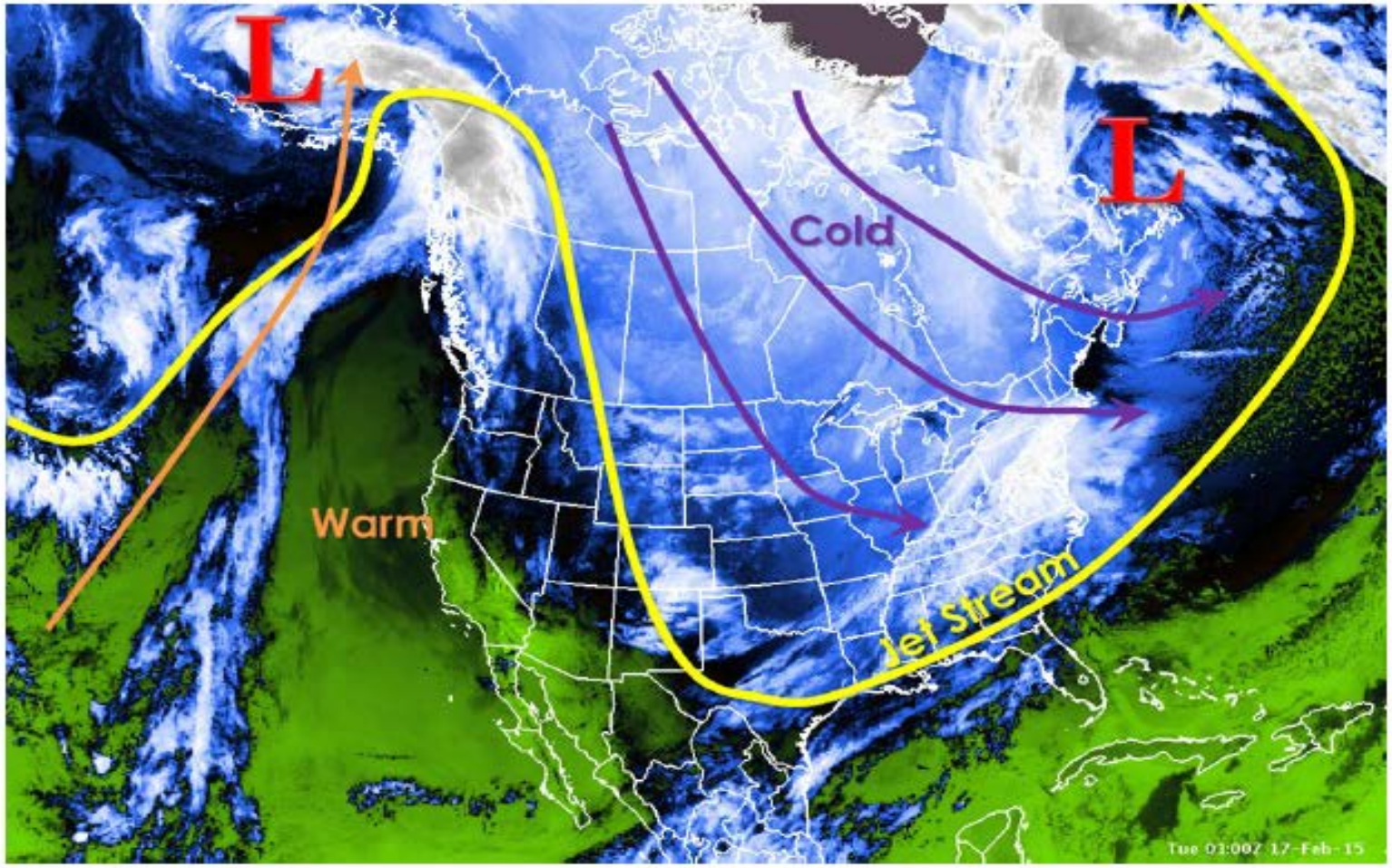


Figure 1. Cooling of the Pacific Ocean and setting up of the PDO. Sea surface temperature anomaly in the Pacific Ocean from April 14–21, 2008. The anomaly compares the recent temperatures measured by the Advanced Microwave Scanning Radiometer for EOS (AMSR-E) on NASA's Aqua satellite with

Sea Surface Temperatures March 16, 2015

- **Warm waters off west coast: warmest in 60-70 years**
- **PDO flipped to positive (warm) in January 2014, now back to slightly positive**
- **Temperatures were ~6 F above normal, similar to Seattle's 2015 winter temperatures**
- **NOAA mentioned warm waters have extended to depths of 60-100 meters**

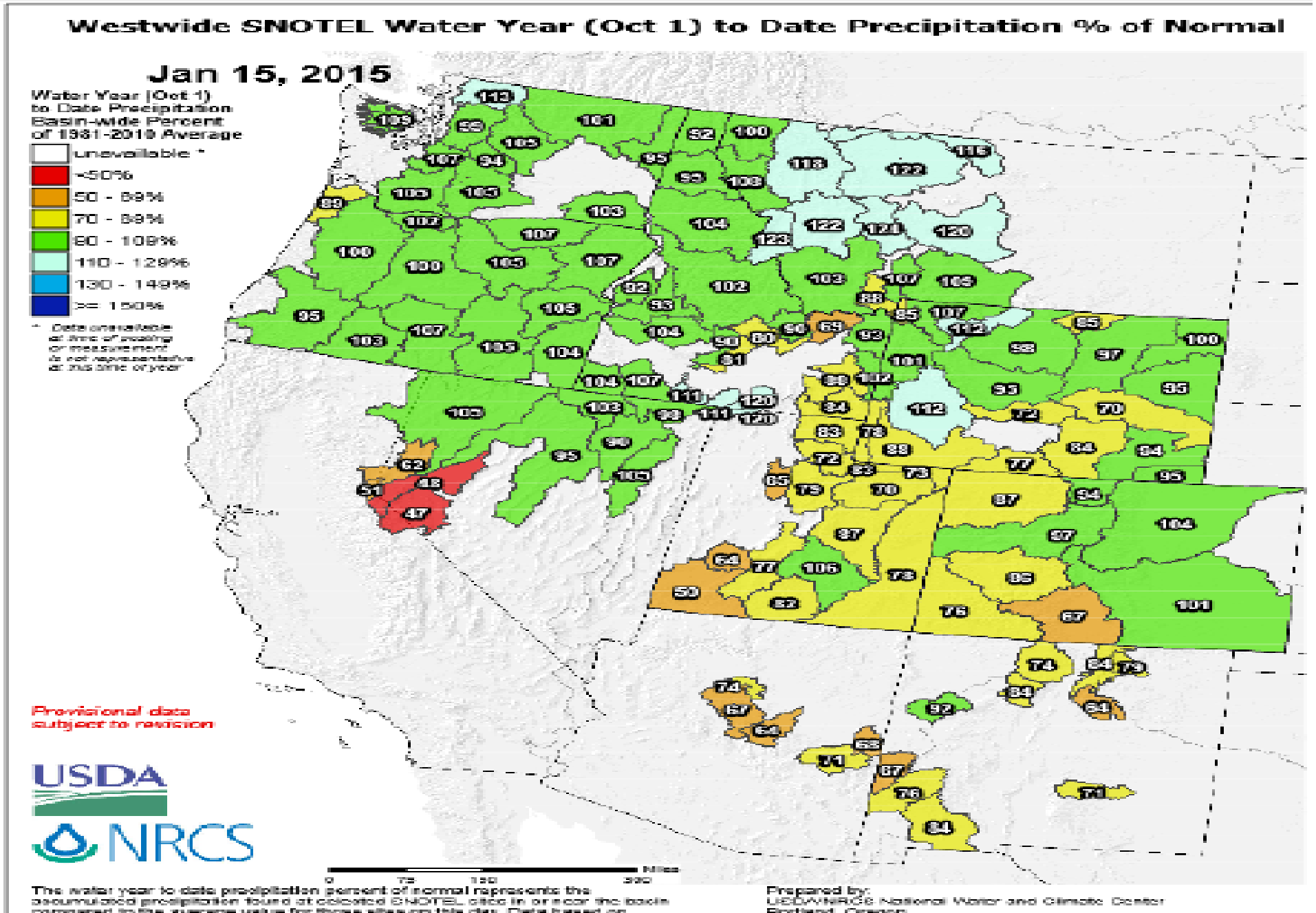




From NWS: Example of winter weather pattern for 2015 & most of 2014

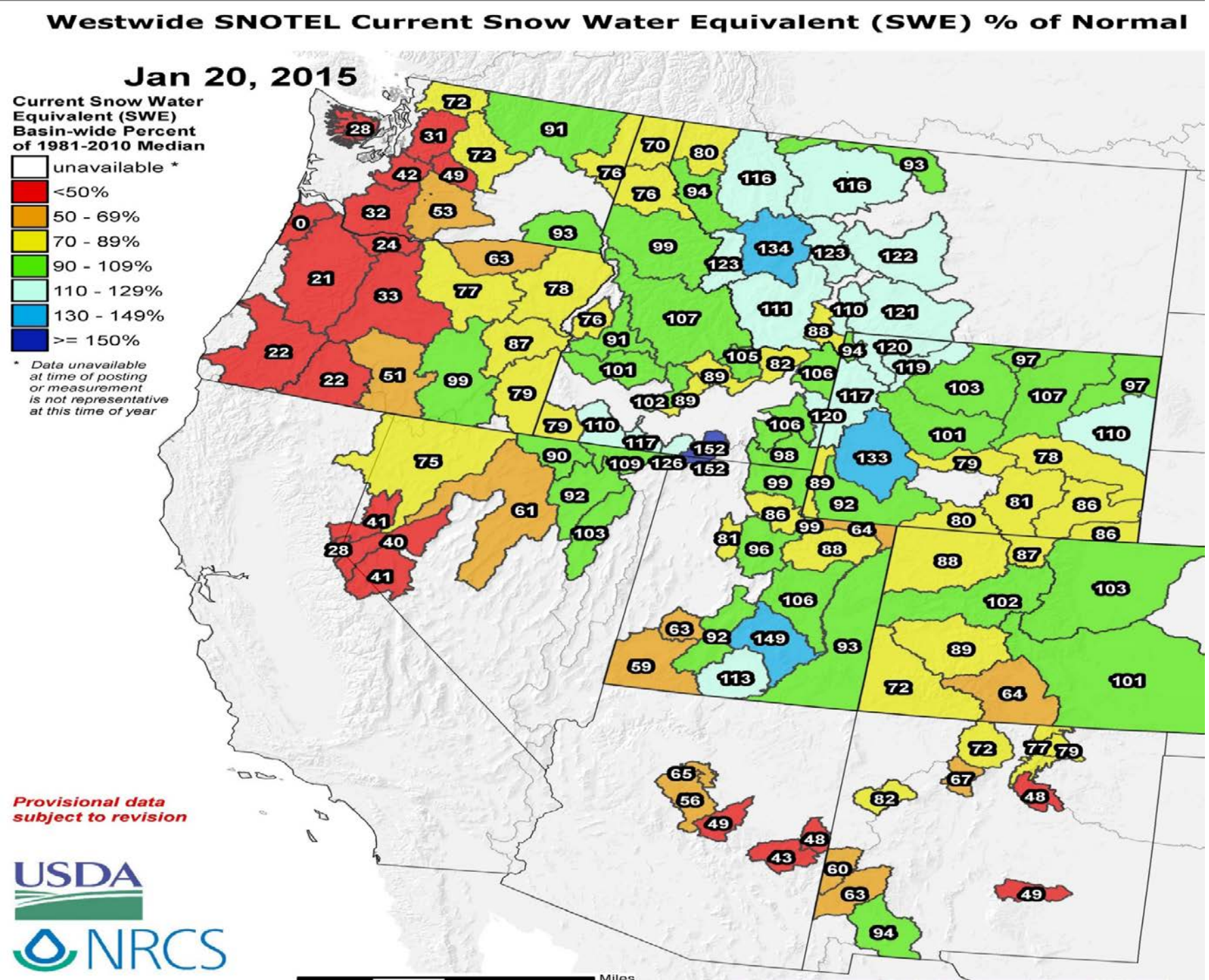
The ridge has kept our area unseasonably warm and relatively dry through early March. A few Pacific weather systems were able to punch through, but precipitation totals for January through the first part of March were less than 50% of normal across most of southwest Idaho and southeast Oregon, and less than 25% of normal in a few areas.

SNOTEL Mountain Precipitation Water Year to Date: Jan 15, 2015

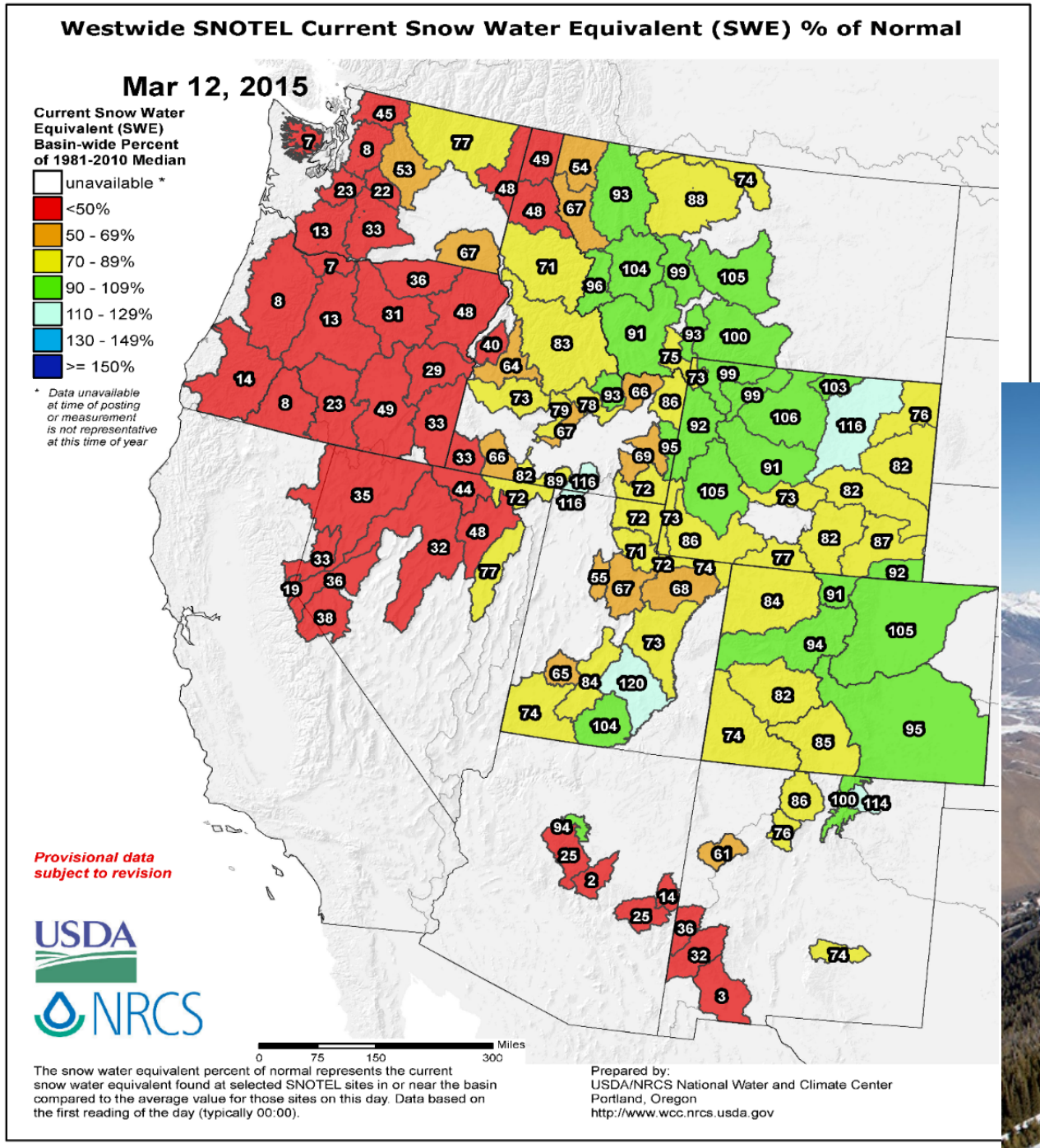


Normal or better across Pacific NW

NOT a Precipitation Drought



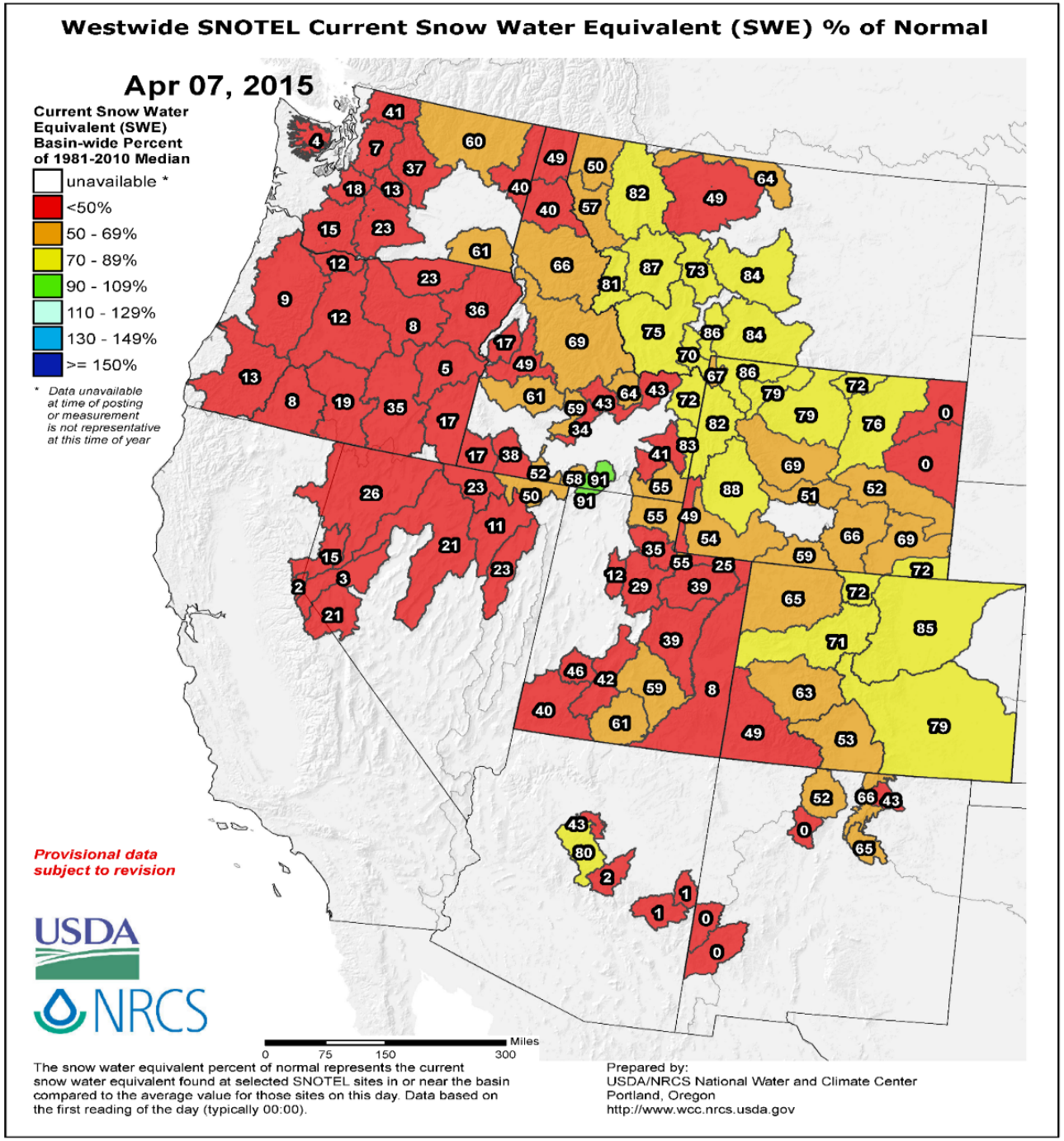
It's a Snow Drought

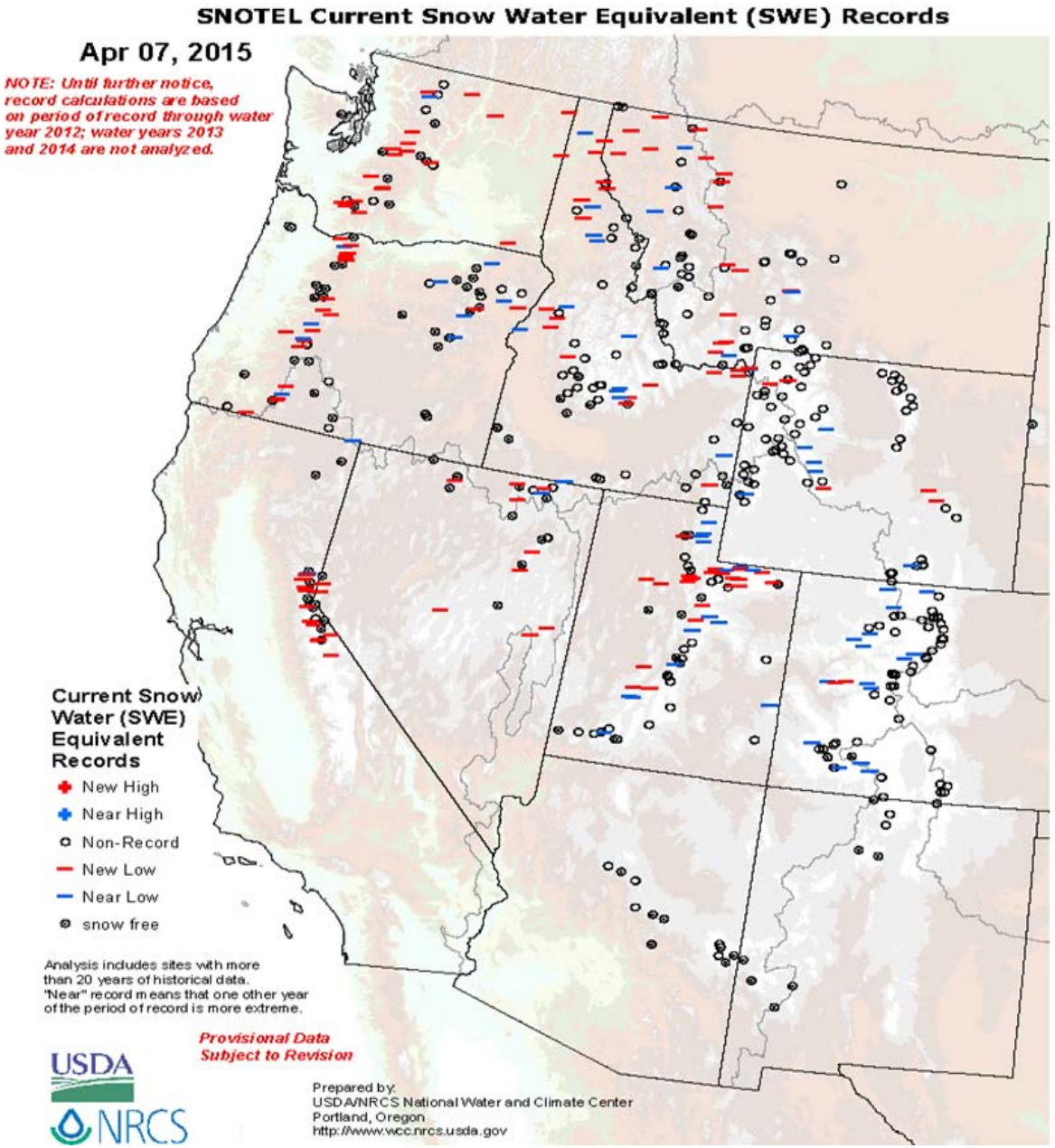


March 11, 2015 Looking east in the Big Wood Valley over Sun Valley Resort

Lack of mid – elevation snow for 2nd consecutive year

April 7, 2015 - - Record Low Snow



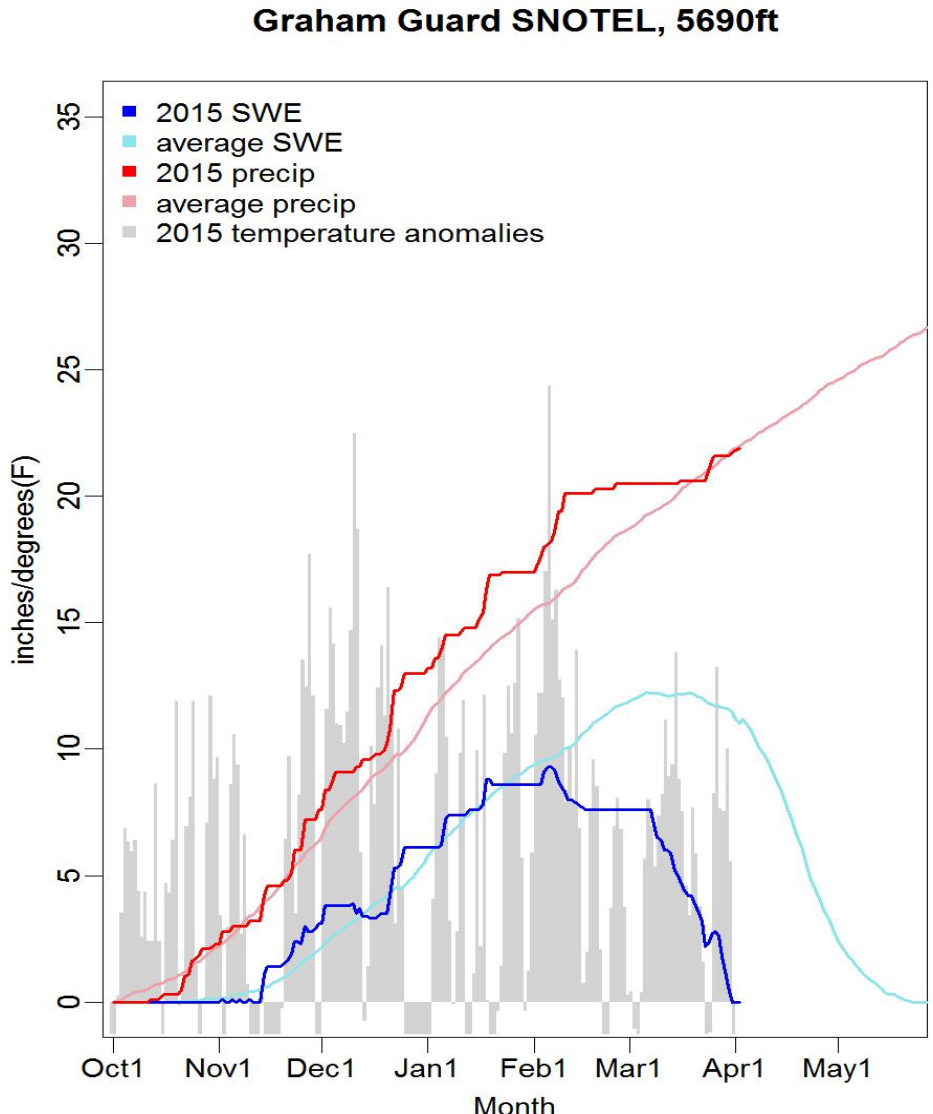


Idaho --- Mean temperature departure & precipitation falling normal Nov 1 – Mar 31:

Graham Guard: + 4.9 F

Normally 75% precip falls as snow

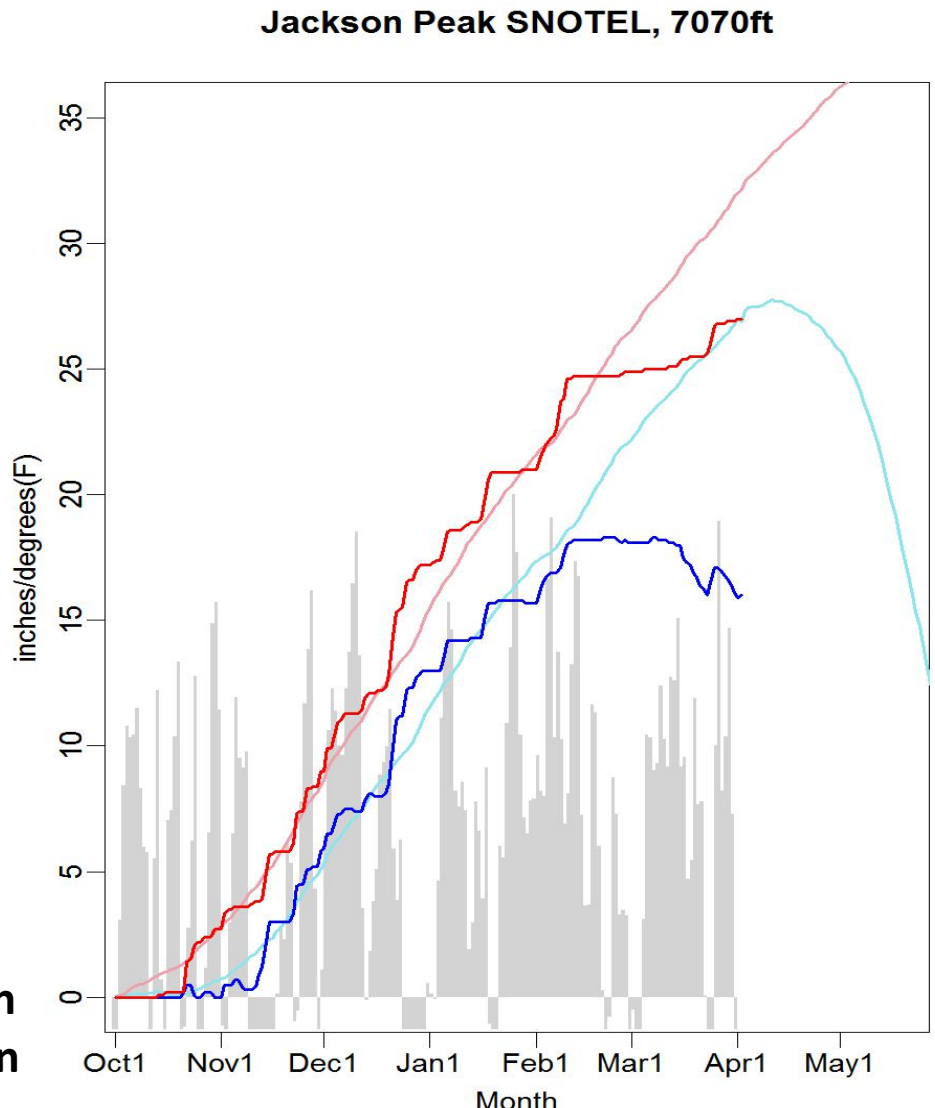
2015 60% fell as snow



Jackson Peak: + 5.1 F

Normally 92% precip falls as snow

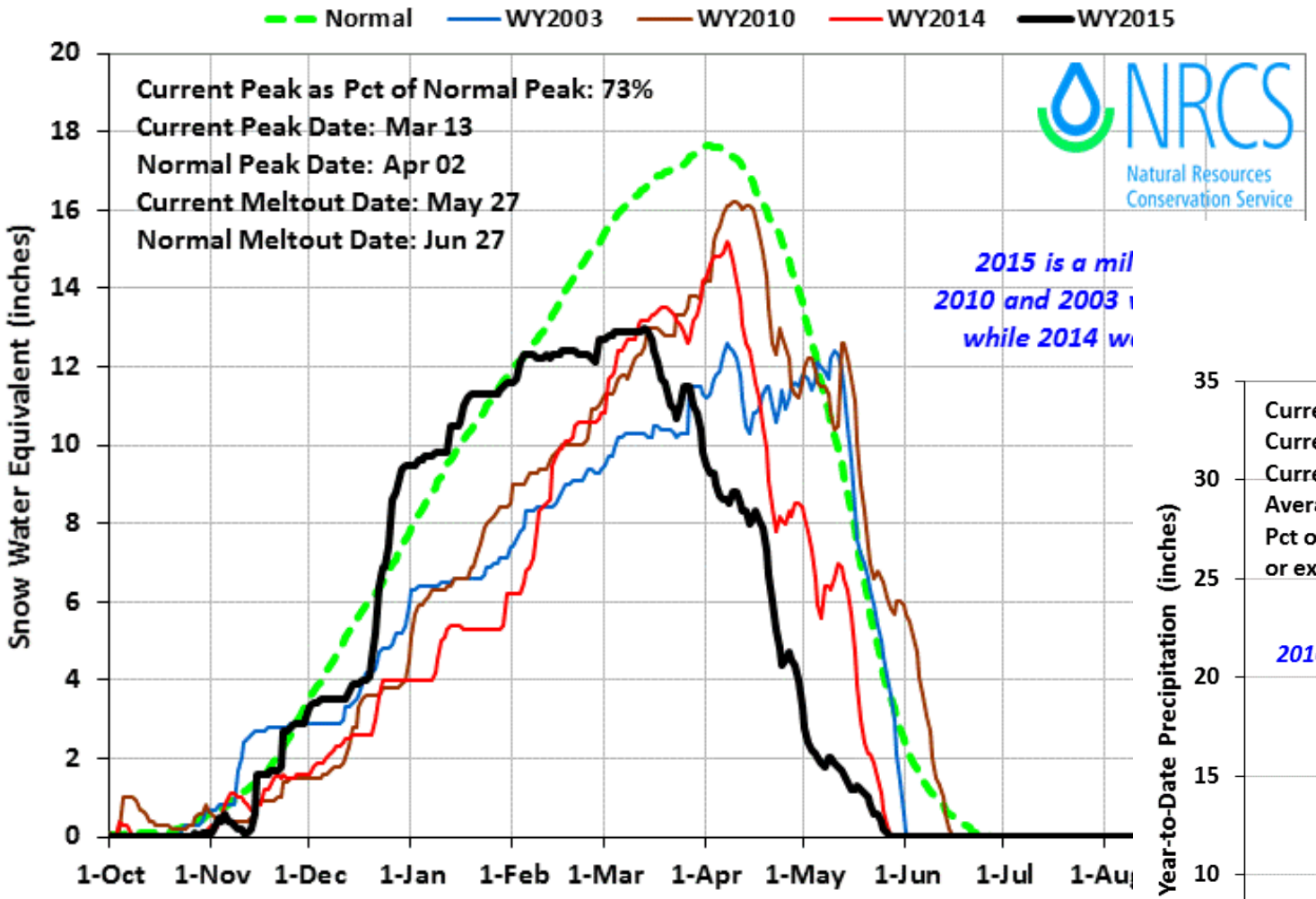
2015 84% fell as snow



From USFS Rocky Mountain Research Station

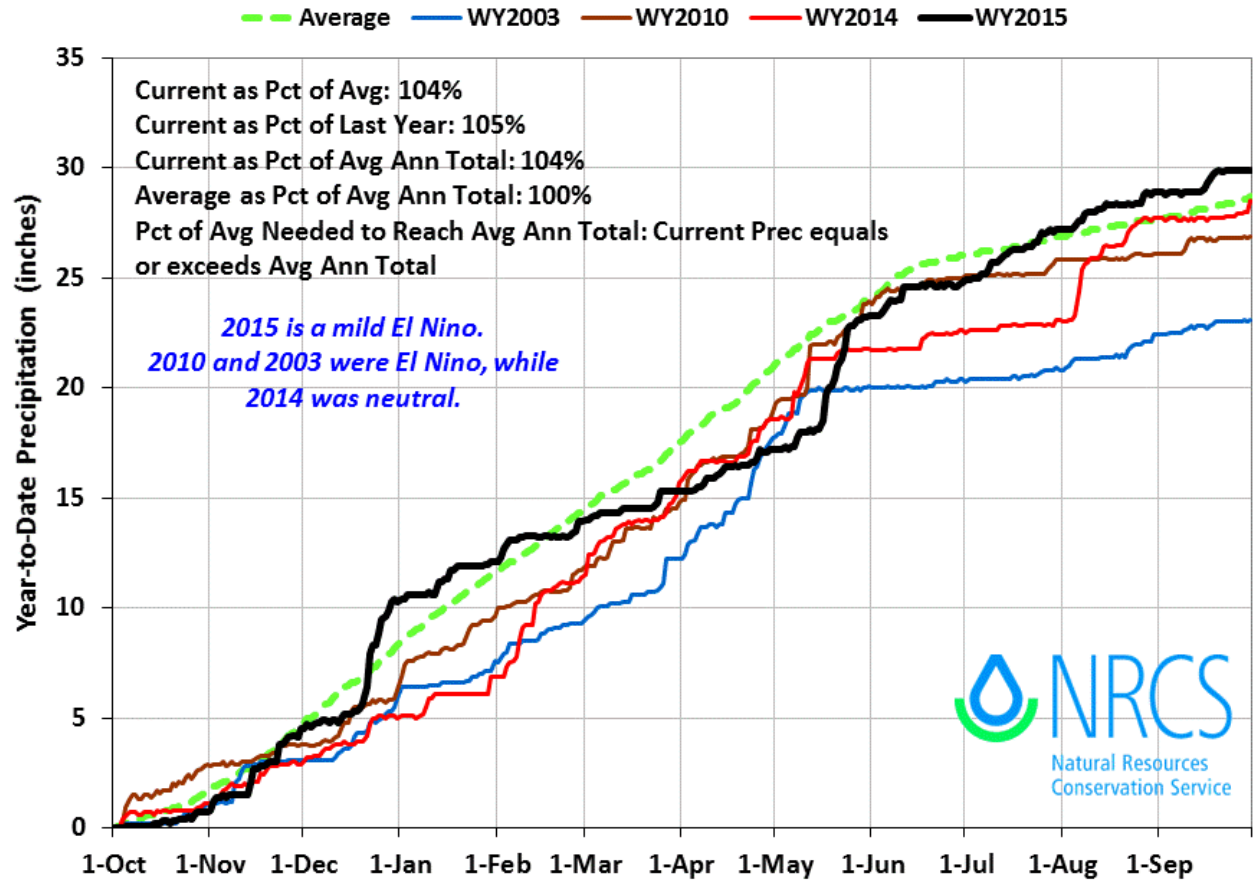
Salmon Falls Basin 2015 Snowpack Comparison Graph (5 sites)

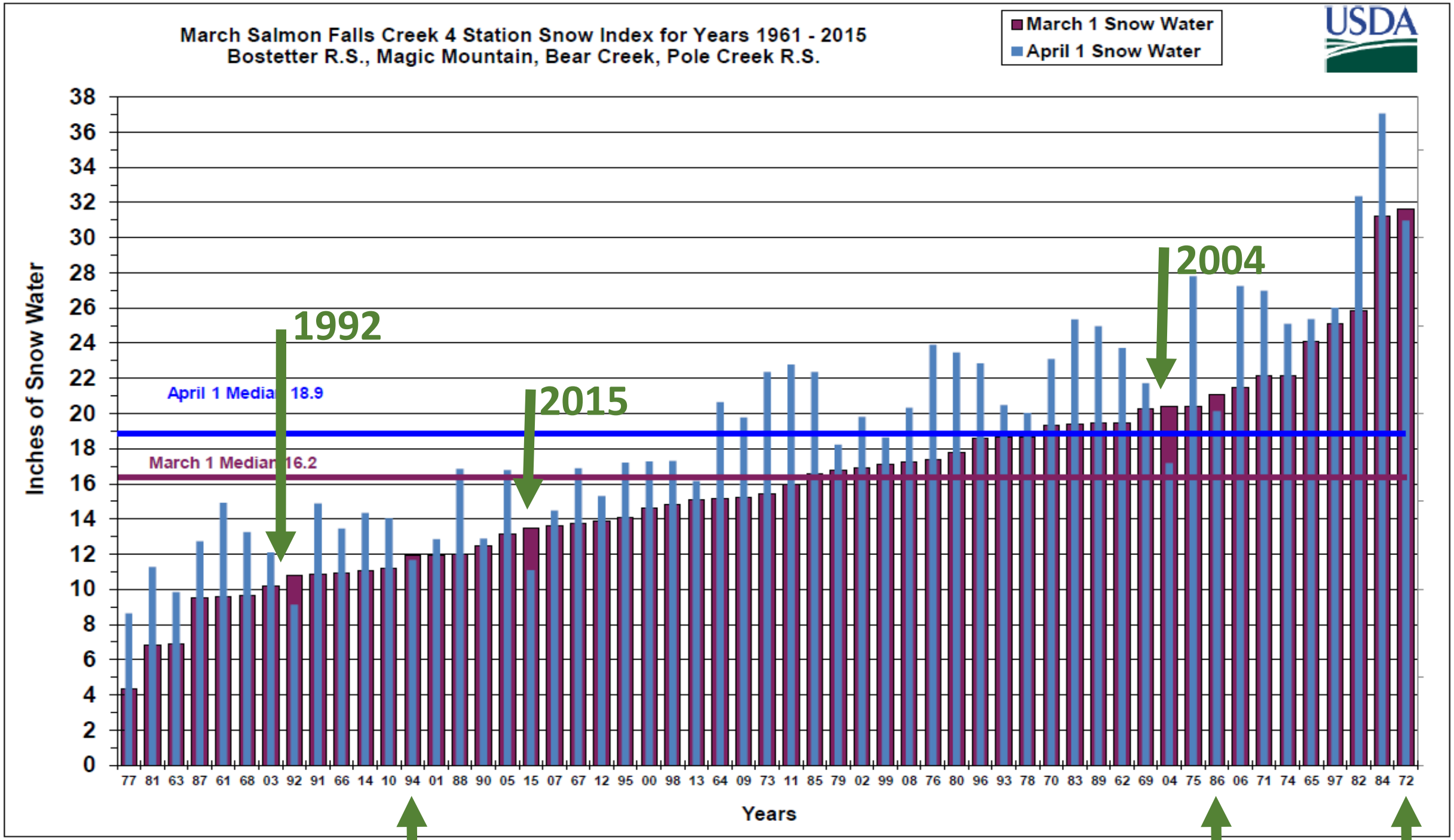
Based on Provisional SNOTEL data as of Sep 30, 2015

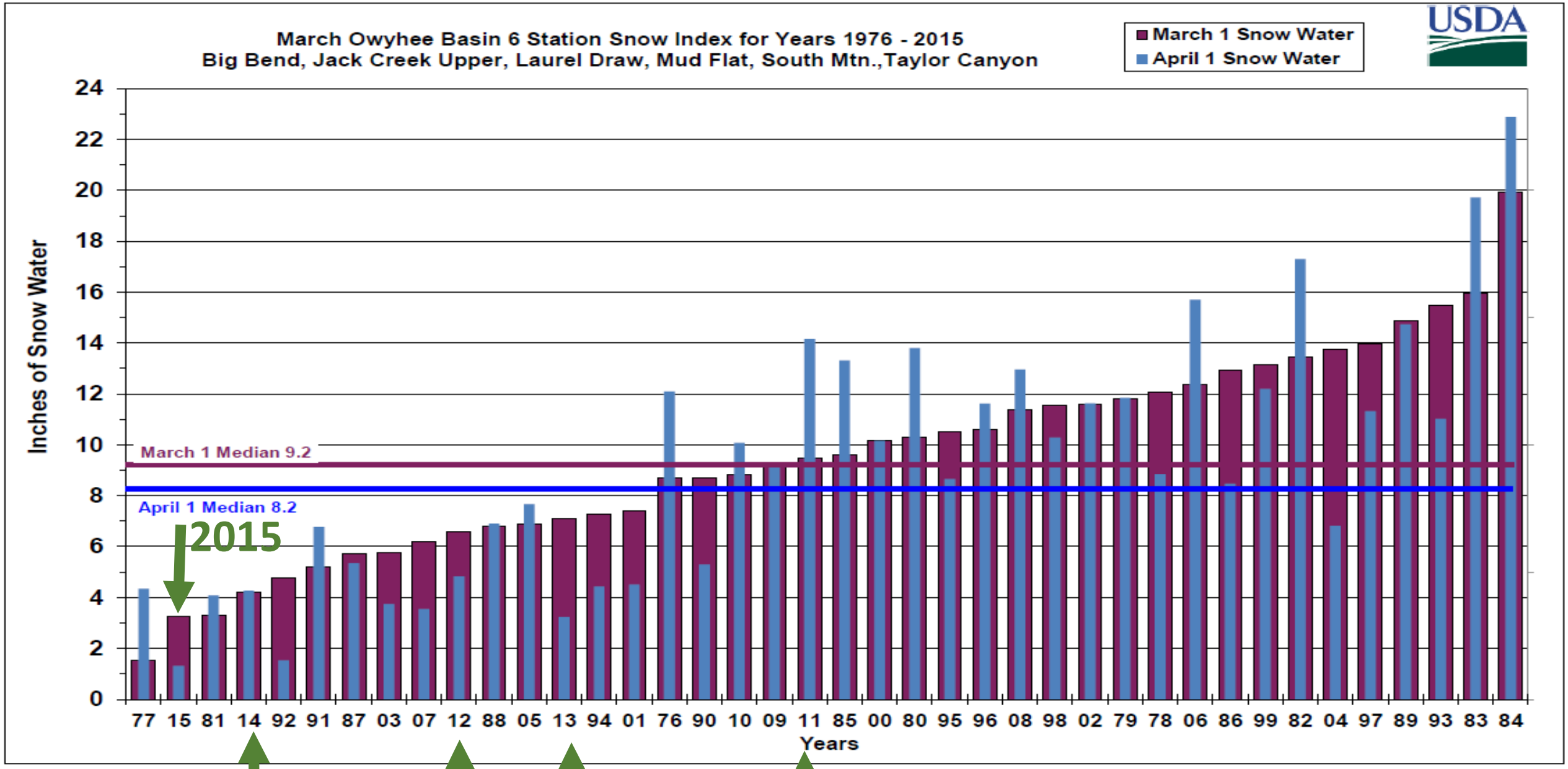


Salmon Falls Basin 2015 Precipitation Comparison Graph (5 sites)

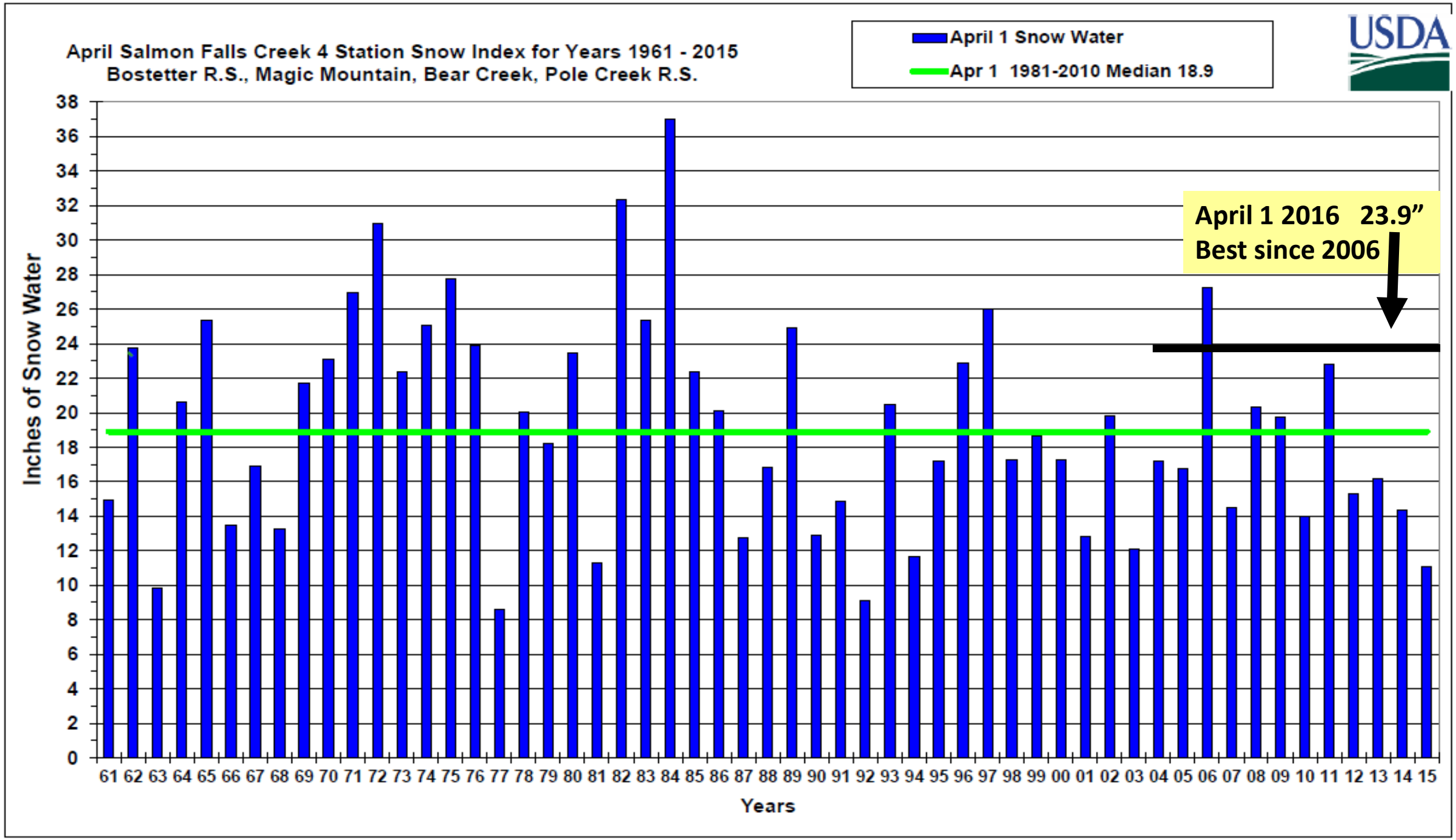
Based on Provisional SNOTEL data as of Sep 30, 2015




March Salmon Falls Creek 4 Station Snow Index for Years 1961 - 2015
Bostetter R.S., Magic Mountain, Bear Creek, Pole Creek R.S.
March 1 Snow Water
April 1 Snow Water
USDA
Inches of Snow Water
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
April 1 Median 18.9
March 1 Median 16.2
1992
2015
2004
77 81 63 87 61 68 03 92 91 66 14 10 94 01 88 90 05 15 07 67 12 95 00 98 13 64 09 73 11 85 79 02 99 08 76 80 96 93 78 70 83 89 62 69 04 75 86 06 71 74 65 97 82 84 72
Years

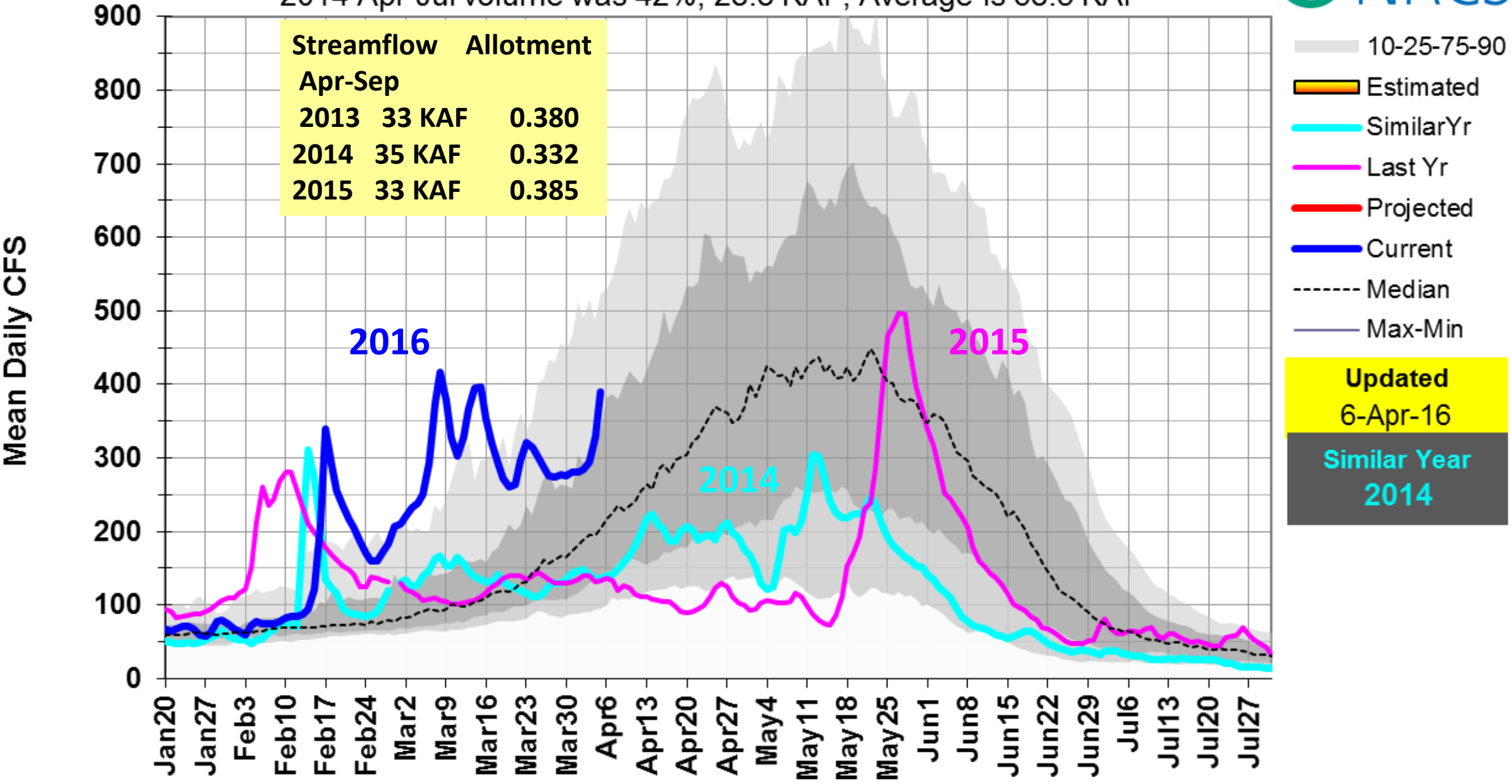


2014 2012 2013 2011


April Salmon Falls Creek 4 Station Snow Index for Years 1961 - 2015
Bostetter R.S., Magic Mountain, Bear Creek, Pole Creek R.S.
April 1 Snow Water
Apr 1 1981-2010 Median 18.9
USDA
April 1 2016 23.9"
Best since 2006
Inches of Snow Water
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38
61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
Years

13105000: Salmon Falls Ck near San Jacinto, NV

2014 Apr-Jul volume was 42%, 28.8 KAF, Average is 68.3 KAF



Streamflow Apr-Sep	Allotment	
2013	33 KAF	0.380
2014	35 KAF	0.332
2015	33 KAF	0.385

Twin Falls Soil & Water Conservation District
Salmon Falls Reservoir Storage Allotment

Updated April 8, 2015

Based on NRCS April 1 Streamflow Forecasts

Note: Allotment formula is based on March 31 reservoir storage and April 1 - September 30 forecasts.

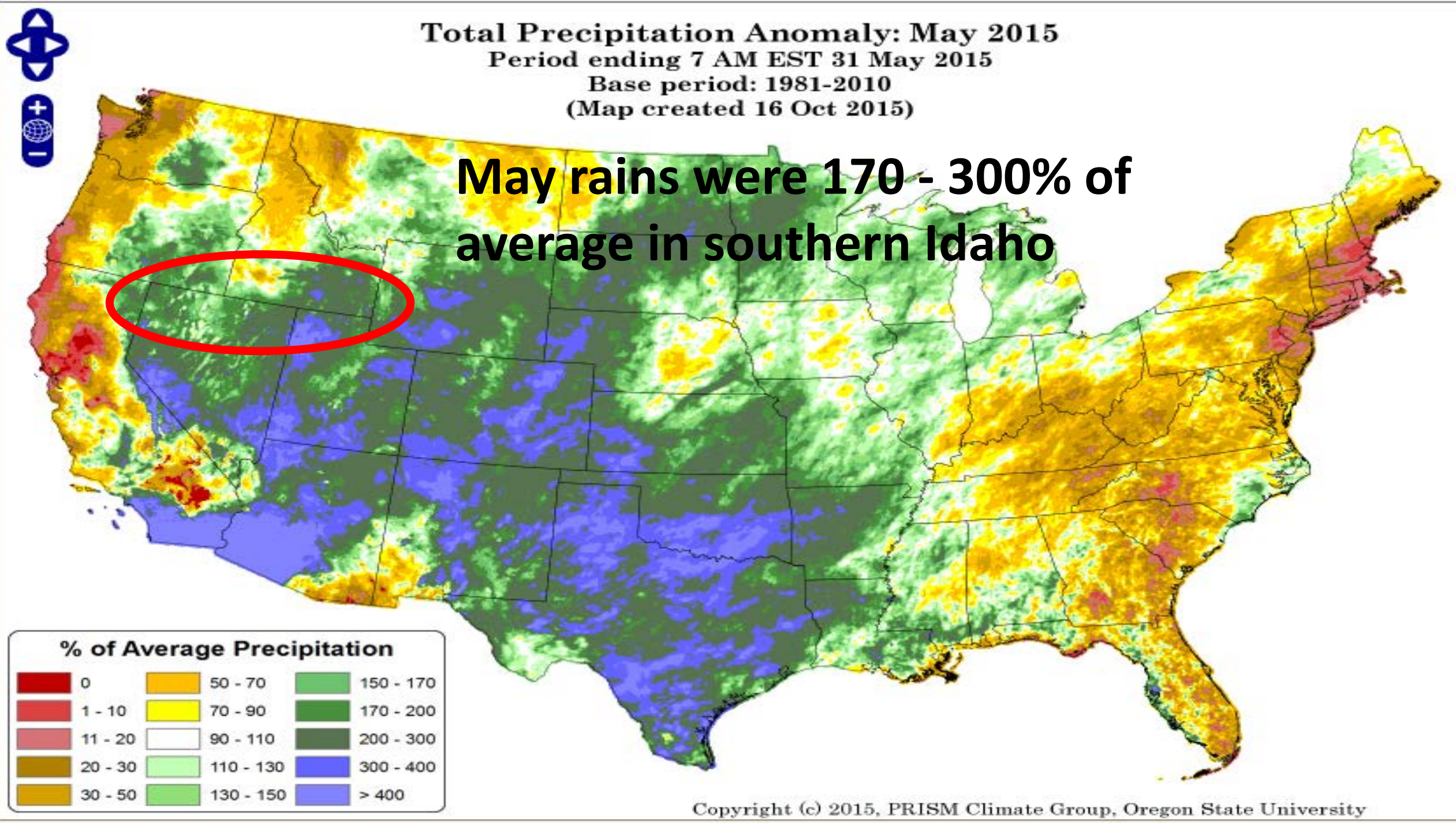
2015 Runoff was 33 KAF Allocation was 0.385

		Chance of Exceedance Streamflow Forecasts				
		90%	70%	50%	30%	10%
Inflow Forecast, April 1-September 30, acre-feet		13600	21000	28000	35000	0
Storage in Dam, March 31, acre-feet	34100	34100	34100	34100	34100	34100
Total Storage (Inflow Forecast + Storage)		47700	55100	62100	69100	34100
Less Dead Storage in Reservoir (5000 A-F)	5000	42700	50100	57100	64100	29100
Projected Reservoir Loss of 20%	0.20	8540	10020	11420	12820	5820
In Dam, Available for Delivery		34160	40080	45680	51280	23280
Projected Delivery Efficiency: 2010 56.0% 2009 59.8% 2008 55% 2007 59.4% 2006 65.3% 2005 59.4% 2013 53% 2014 48%	0.48	16397	19238	21926	24614	11174
Less Water for Callen	485	485	485	485	485	485
Less Individual Storage Carryover	988	988	988	988	988	988
Water to be Delivered Over the Weir		14924	17765	20453	23141	9701
Divided by Total Shares	60050.65	0.249	0.296	0.341	0.385	0.162
Allotment if 'Individual Storage Carryover' is not subtracted from 'In Dam, Available for Delivery'		0.265	0.312	0.357	0.402	0.178

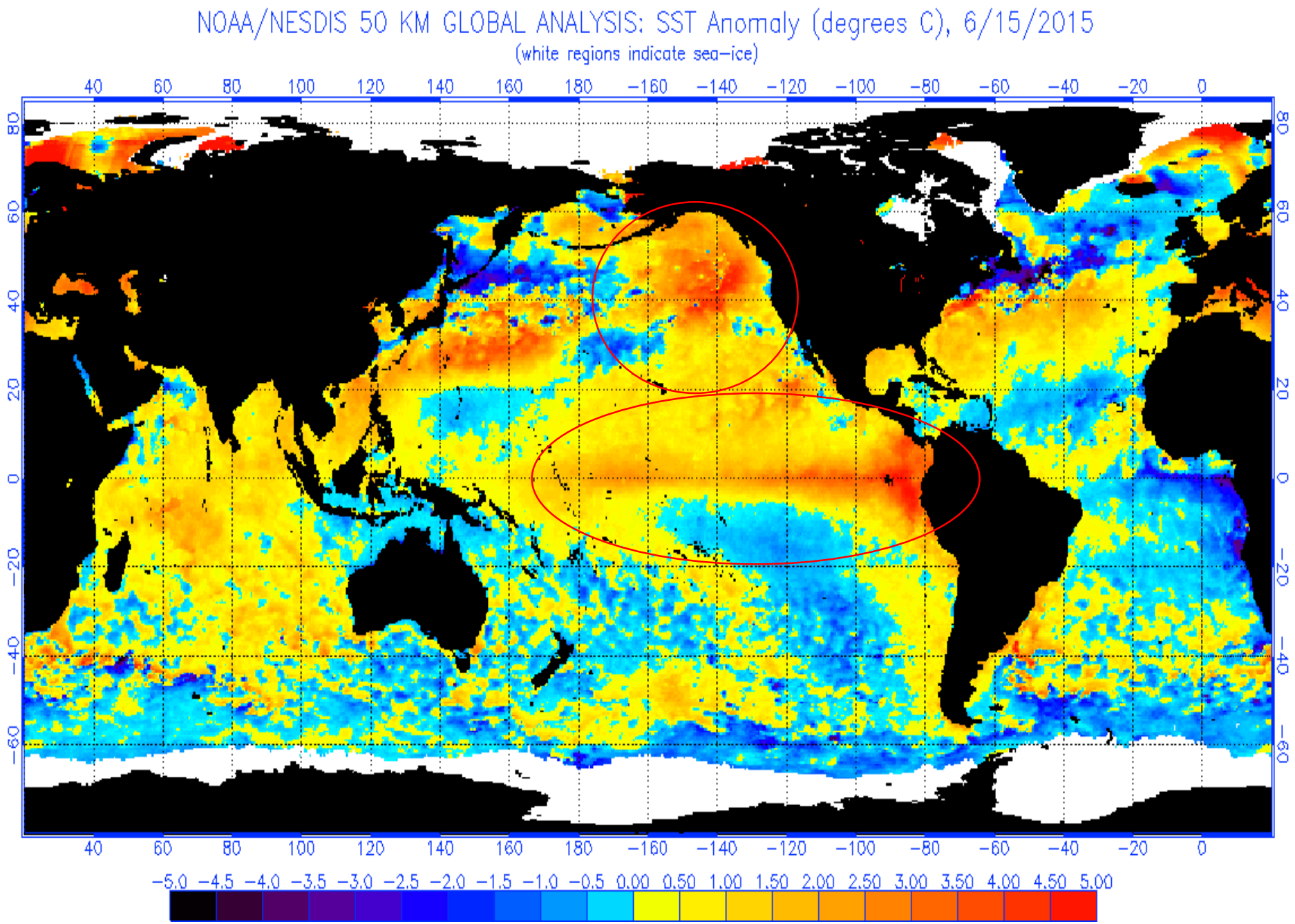
Average Allotment	
1924-2006	0.761
1971-2000	0.934
2002-2006	0.616
Full Allotment	1.167

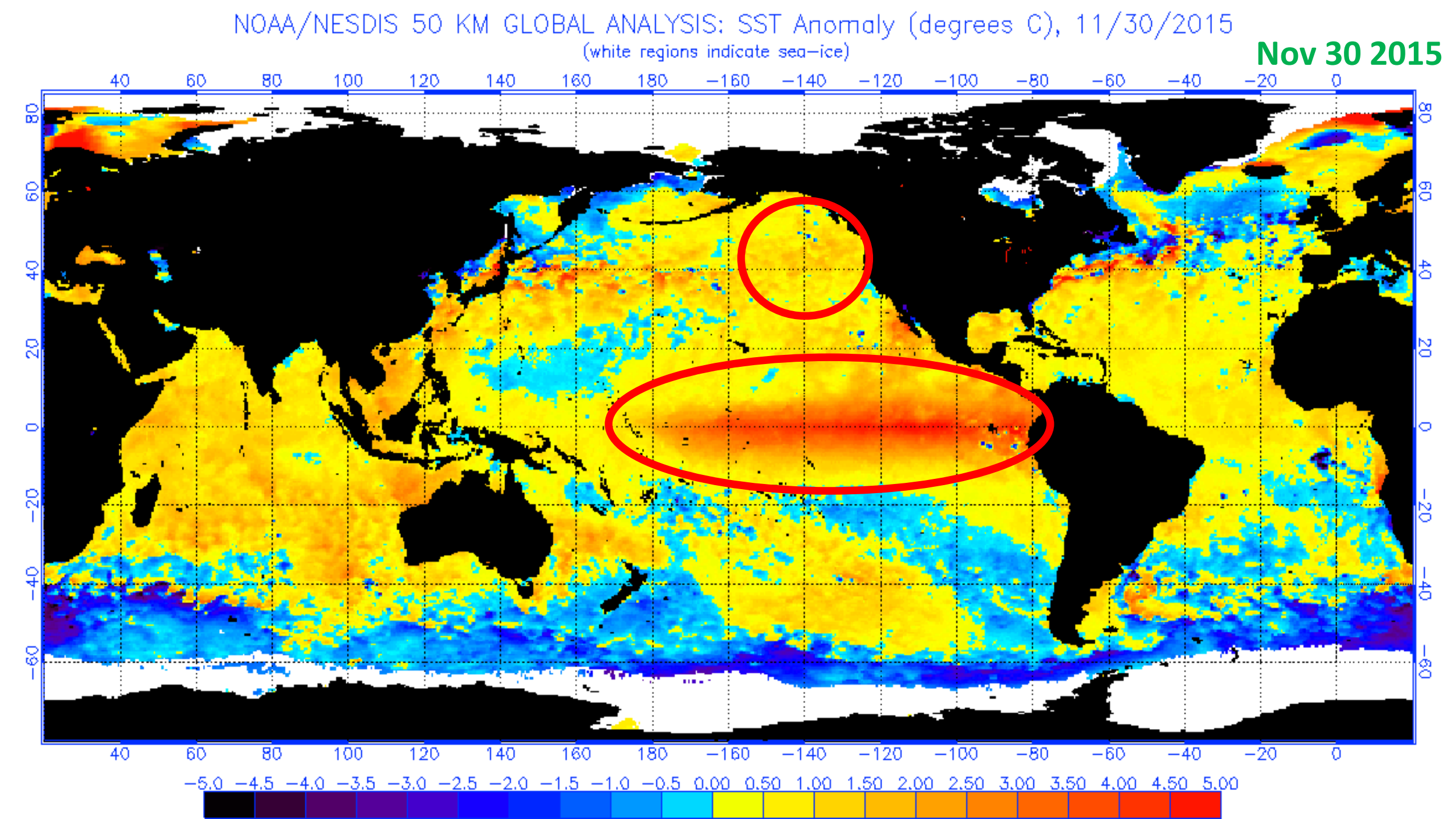
2013 allotment 0.380 Runoff 35 KAF Apr-Sep

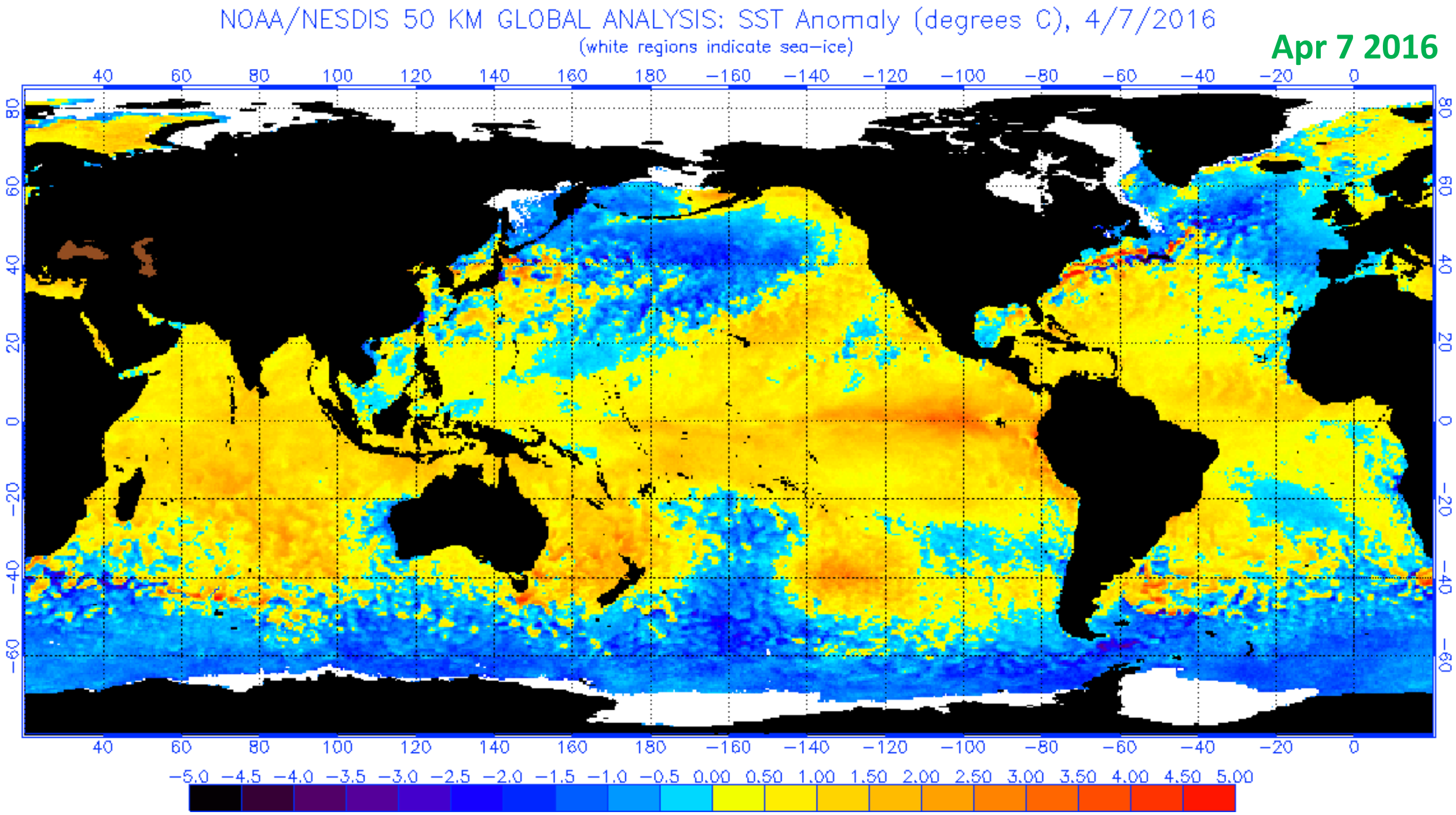
2014 allotment 0.332 Runoff 33 KAF Apr-Sep


Total Precipitation Anomaly: May 2015
Period ending 7 AM EST 31 May 2015
Base period: 1981-2010
(Map created 16 Oct 2015)
May rains were 170 - 300% of average in southern Idaho
% of Average Precipitation
0
1 - 10
11 - 20
20 - 30
30 - 50
50 - 70
70 - 90
90 - 110
110 - 130
130 - 150
150 - 170
170 - 200
200 - 300
300 - 400
> 400
Copyright (c) 2015, PRISM Climate Group, Oregon State University

Sea Surface Temperatures June 15, 2015 – Strong El Nino Building




NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 11/30/2015
(white regions indicate sea-ice)
Nov 30 2015
40 60 80 100 120 140 160 180 −160 −140 −120 −100 −80 −60 −40 −20 0
80 60 40 20 0 −20 −40 −60
−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), 4/7/2016
(white regions indicate sea-ice)
Apr 7 2016
40 60 80 100 120 140 160 180 −160 −140 −120 −100 −80 −60 −40 −20 0
80 60 40 20 0 −20 −40 −60
−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

Winter 2010 - 2011

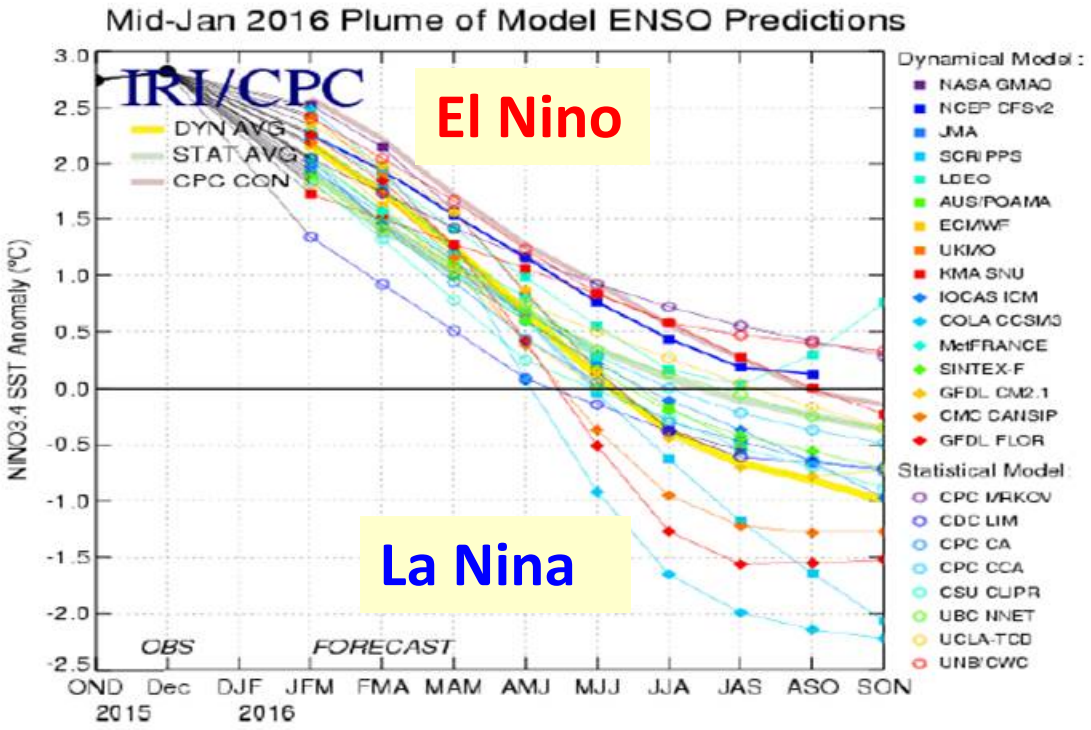
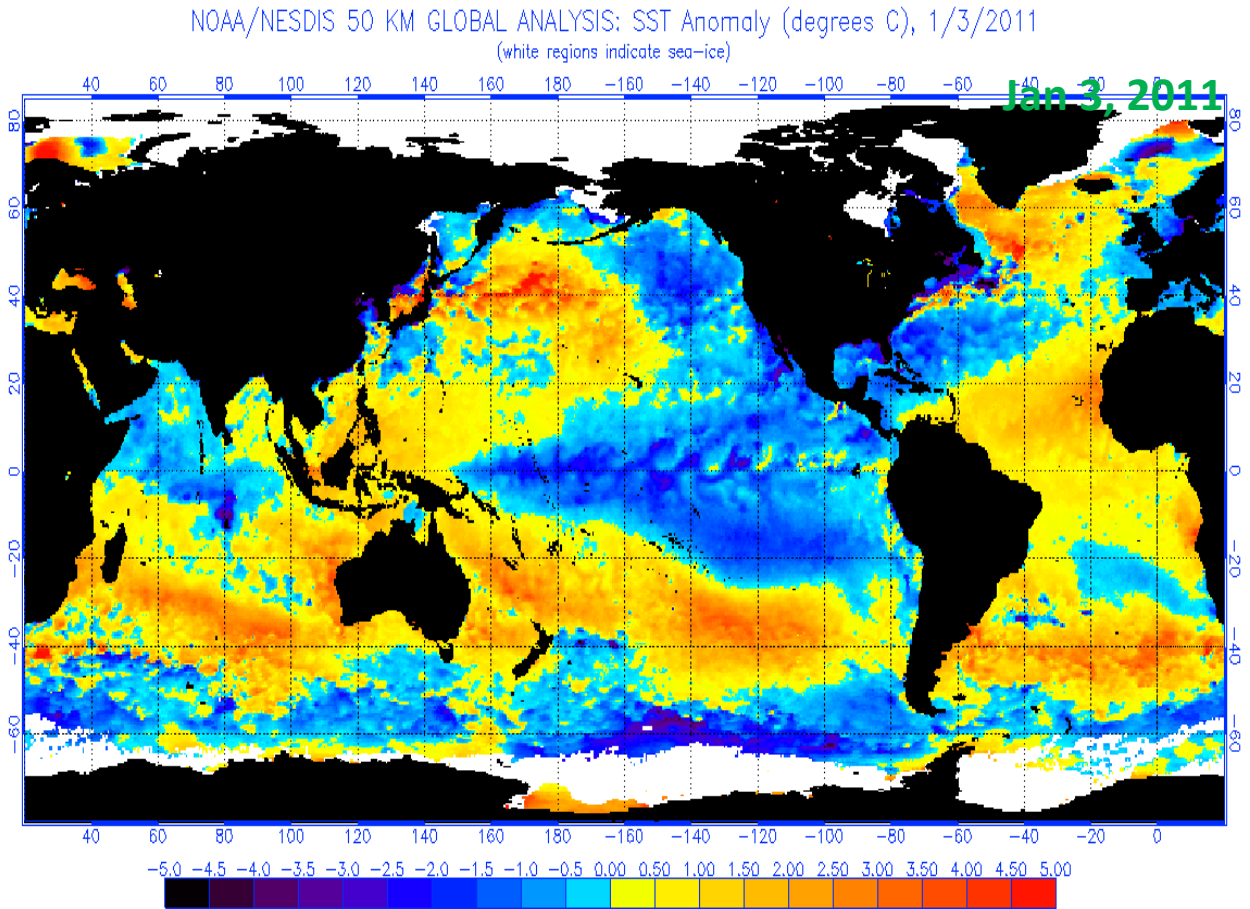
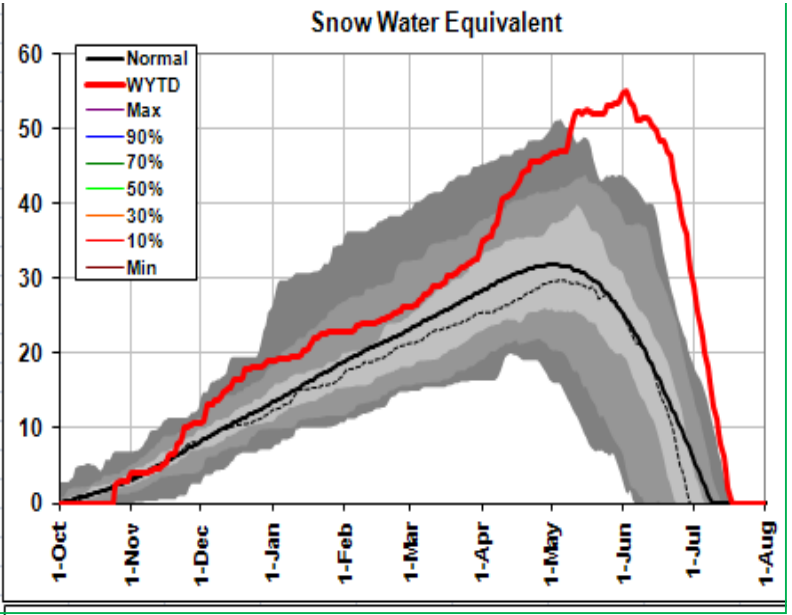


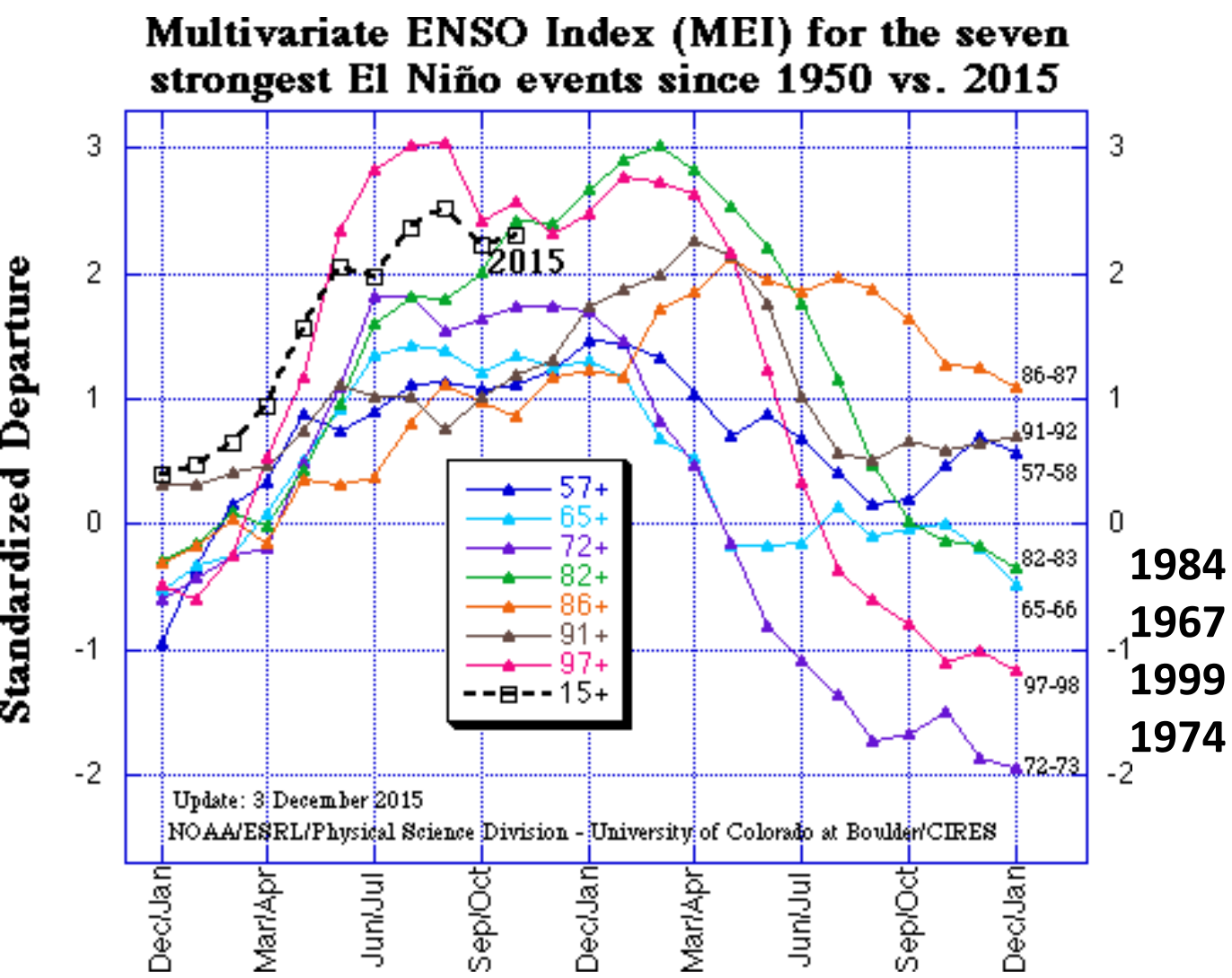
Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 19 January 2016.

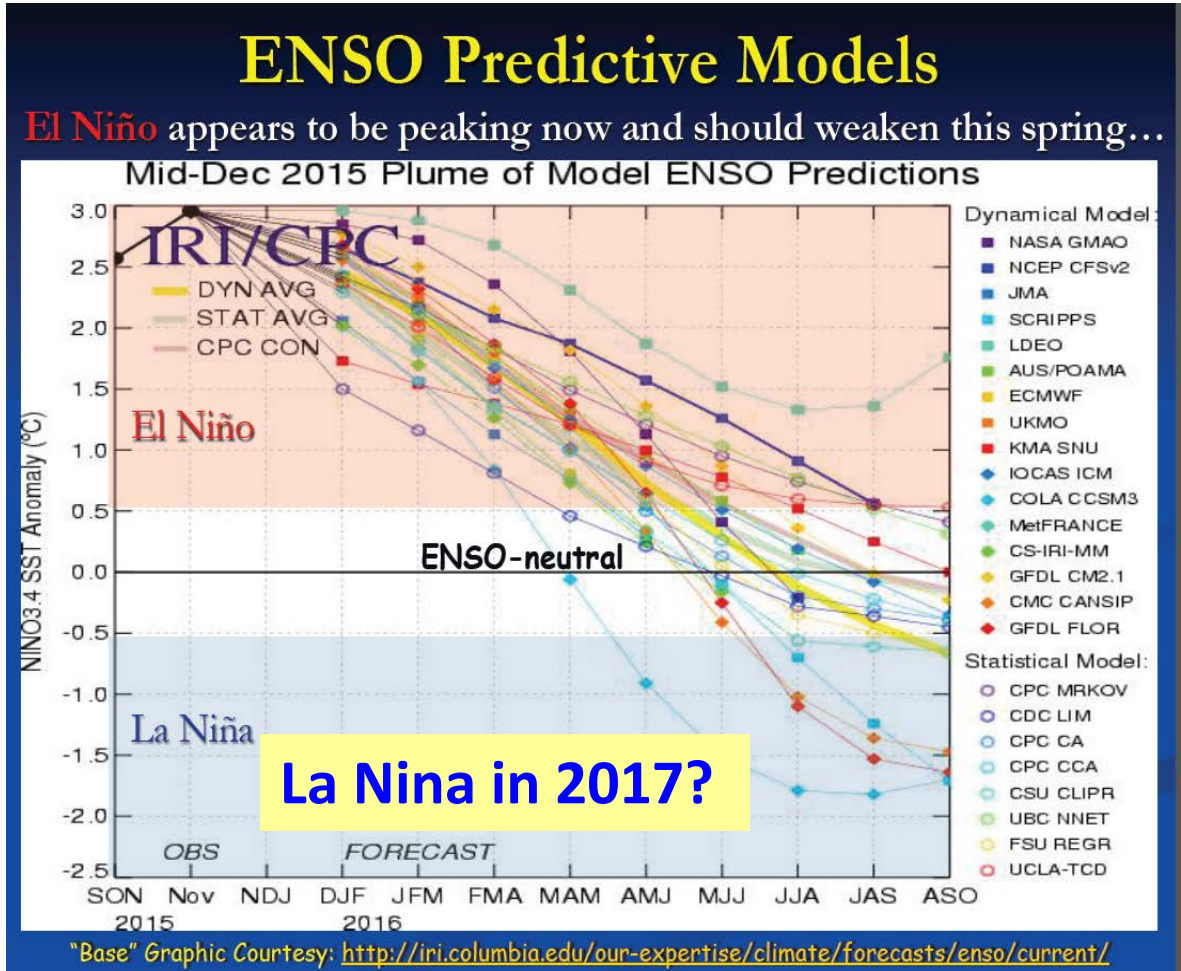
Sea Surface Temperatures
Cool PDO & Strongest
La Nina since 1974





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

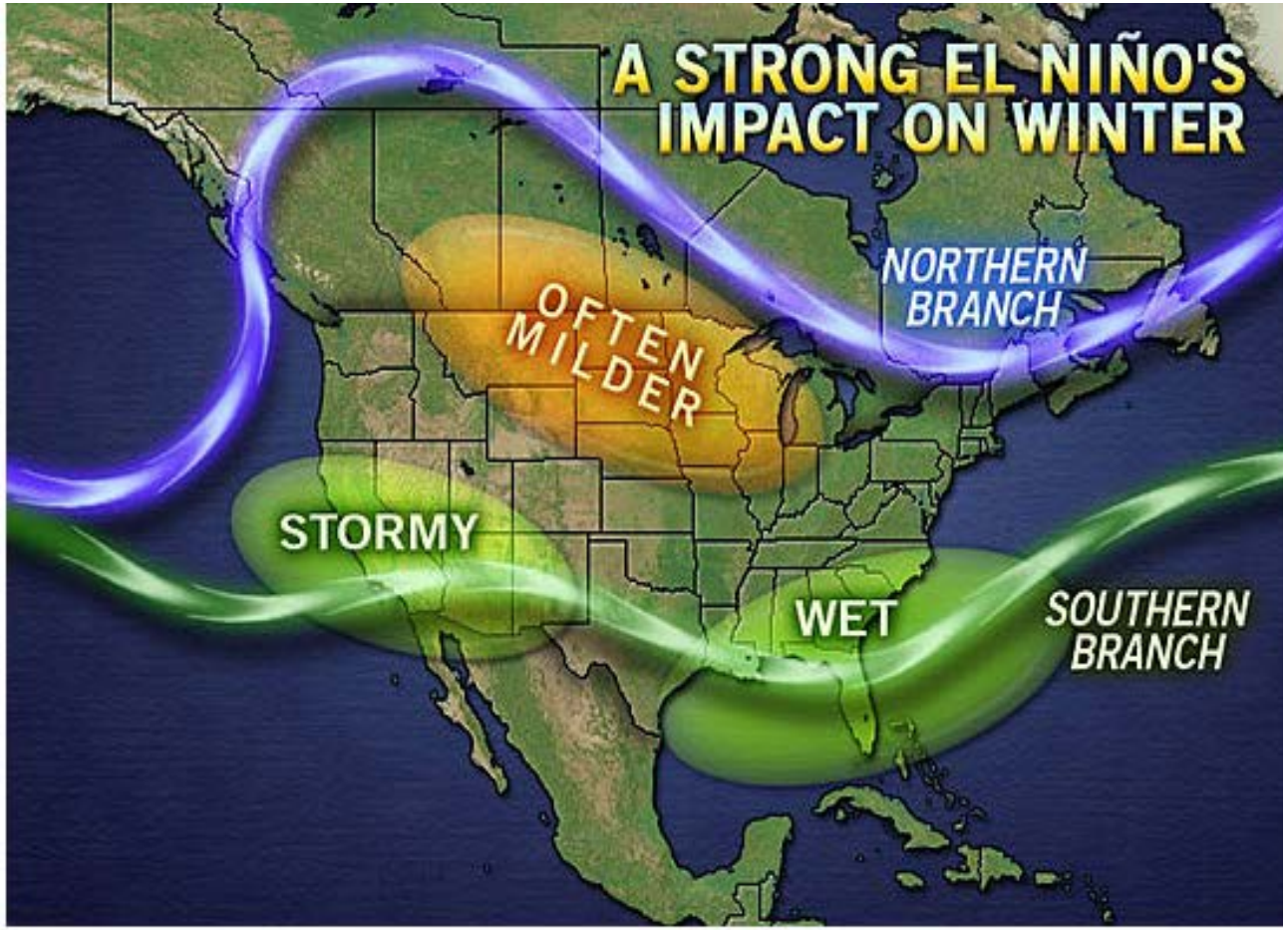

Multivariate ENSO Index (MEI) for the seven strongest El Niño events since 1950 vs. 2015
Standardized Departure
3
2
1
0
-1
-2
2015
57+
65+
72+
82+
86+
91+
97+
15+
86-87
91-92
57-58
82-83
65-66
97-98
72-73
1984
1967
1999
1974
Update: 3 December 2015
NOAA/ESRL/Physical Science Division - University of Colorado at Boulder/CIRES
Dec/Jan
Mar/Apr
Jun/Jul
Sep/Oct
Dec/Jan
Mar/Apr
Jun/Jul
Sep/Oct
Dec/Jan

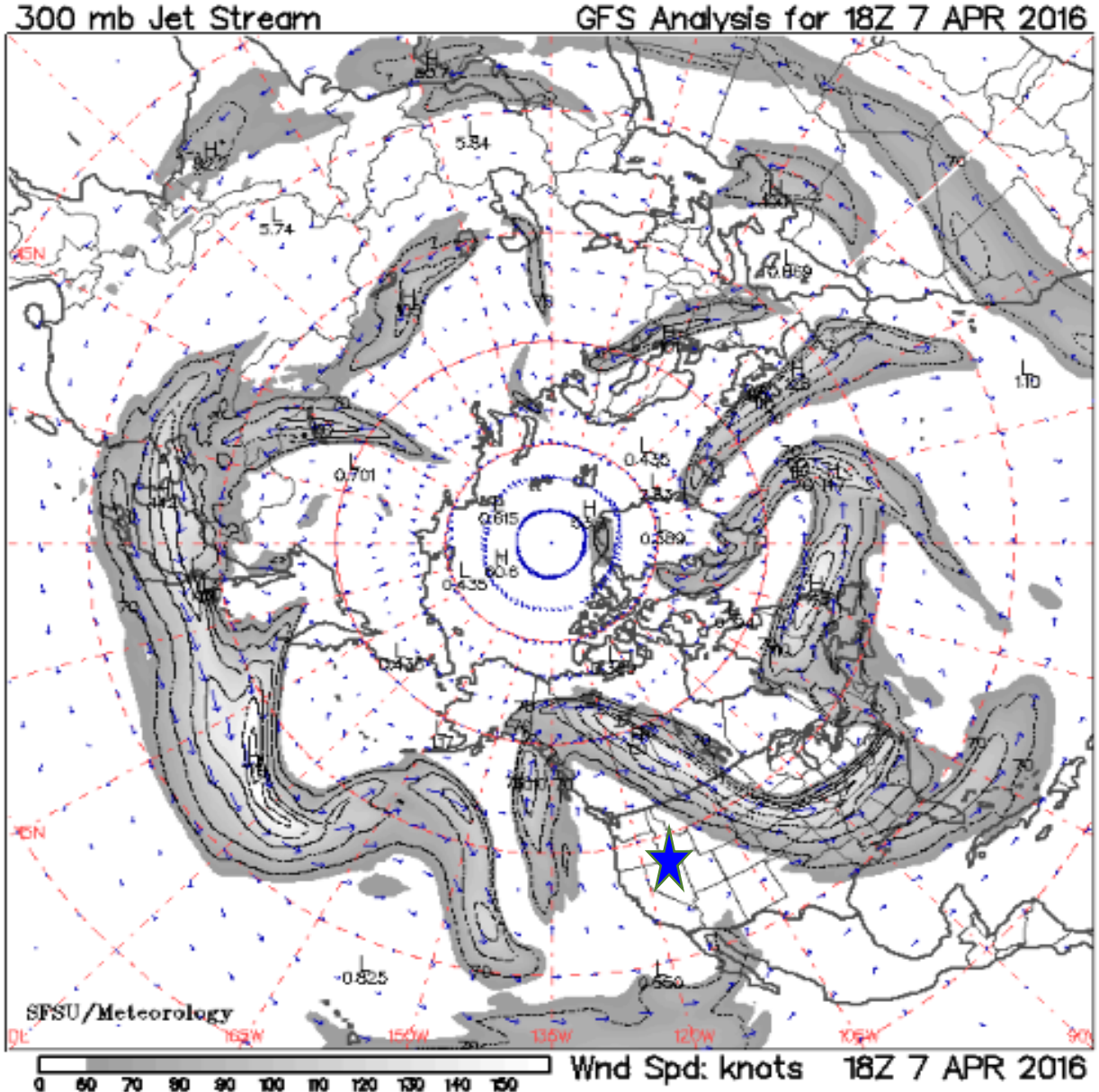

ENSO Predictive Models
El Niño appears to be peaking now and should weaken this spring…
Mid-Dec 2015 Plume of Model ENSO Predictions
IRI/CPC
DYN AVG
STAT AVG
CPC CON
El Niño
ENSO-neutral
La Niña
La Nina in 2017?
OBS
FORECAST
NINO3.4 SST Anomaly (°C)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
SON
Nov
NDJ
DJF
JFM
FMA
MAM
AMJ
MJJ
JJA
JAS
ASO
2015
2016
Dynamical Model:
NASA GMAO
NCEP CFSv2
JMA
SCRIPPS
LDEO
AUS/POAMA
ECMWF
UKMO
KMA SNU
IOCAS ICM
COLA CCSM3
MetFRANCE
CS-IRI-MM
GFDL CM2.1
CMC CANSIP
GFDL FLOR
Statistical Model:
CPC MRKOV
CDC LIM
CPC CA
CPC CCA
CSU CLIPR
UBC NNET
FSU REGR
UCLA-TCD
"Base" Graphic Courtesy: http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/

This pattern resembles a modified Strong El Nino pattern, and could stick around for the winter months.
From Andrew at The Weather Centre

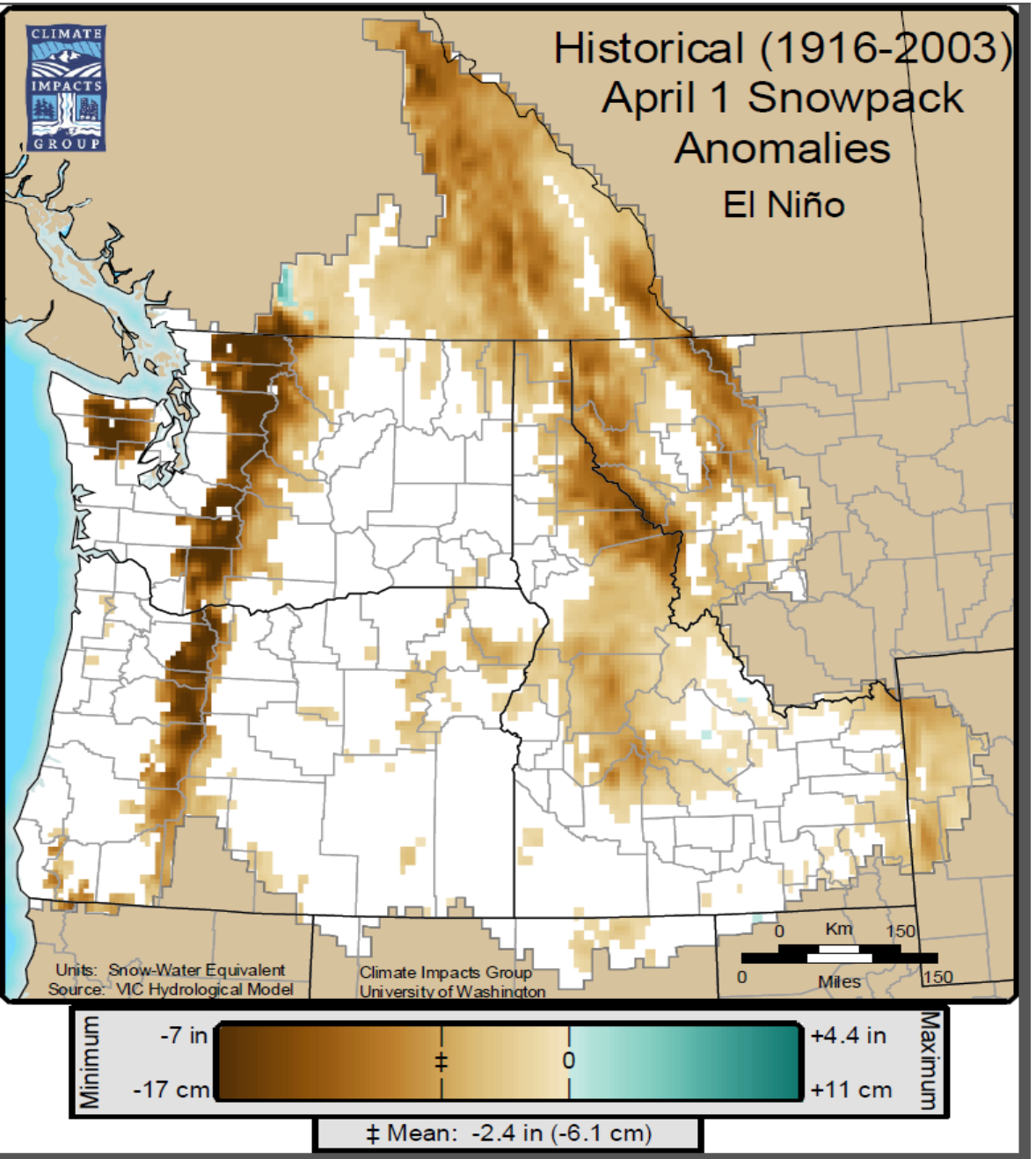
http://theweathercentre.blogspot.com/#sthash.SoE5xzjO.dpuf

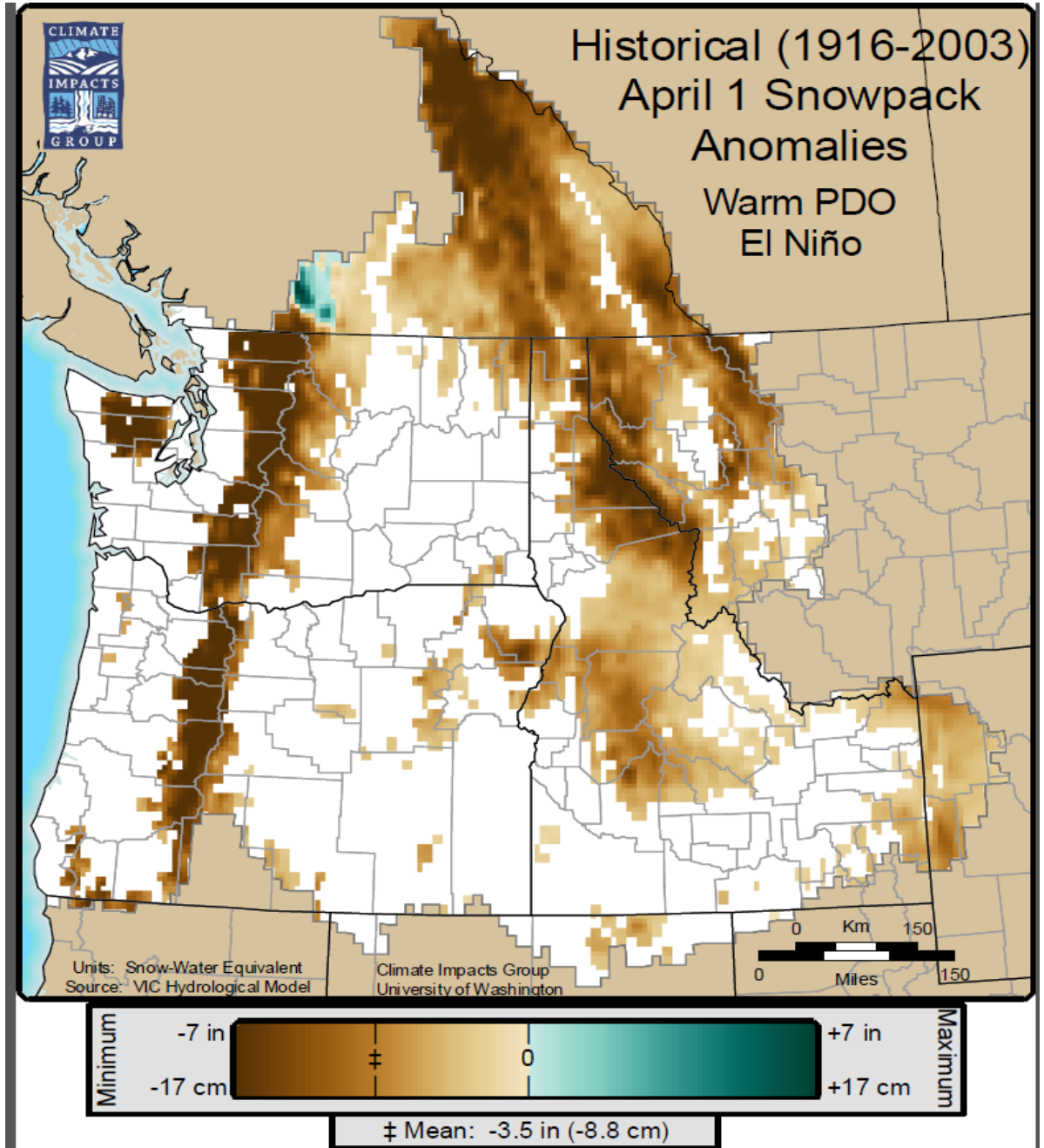
Jet Stream April 7, 2016





April 1 Snowpack Anomalies based on El Nino (left) and El Nino + warm PDO (right)



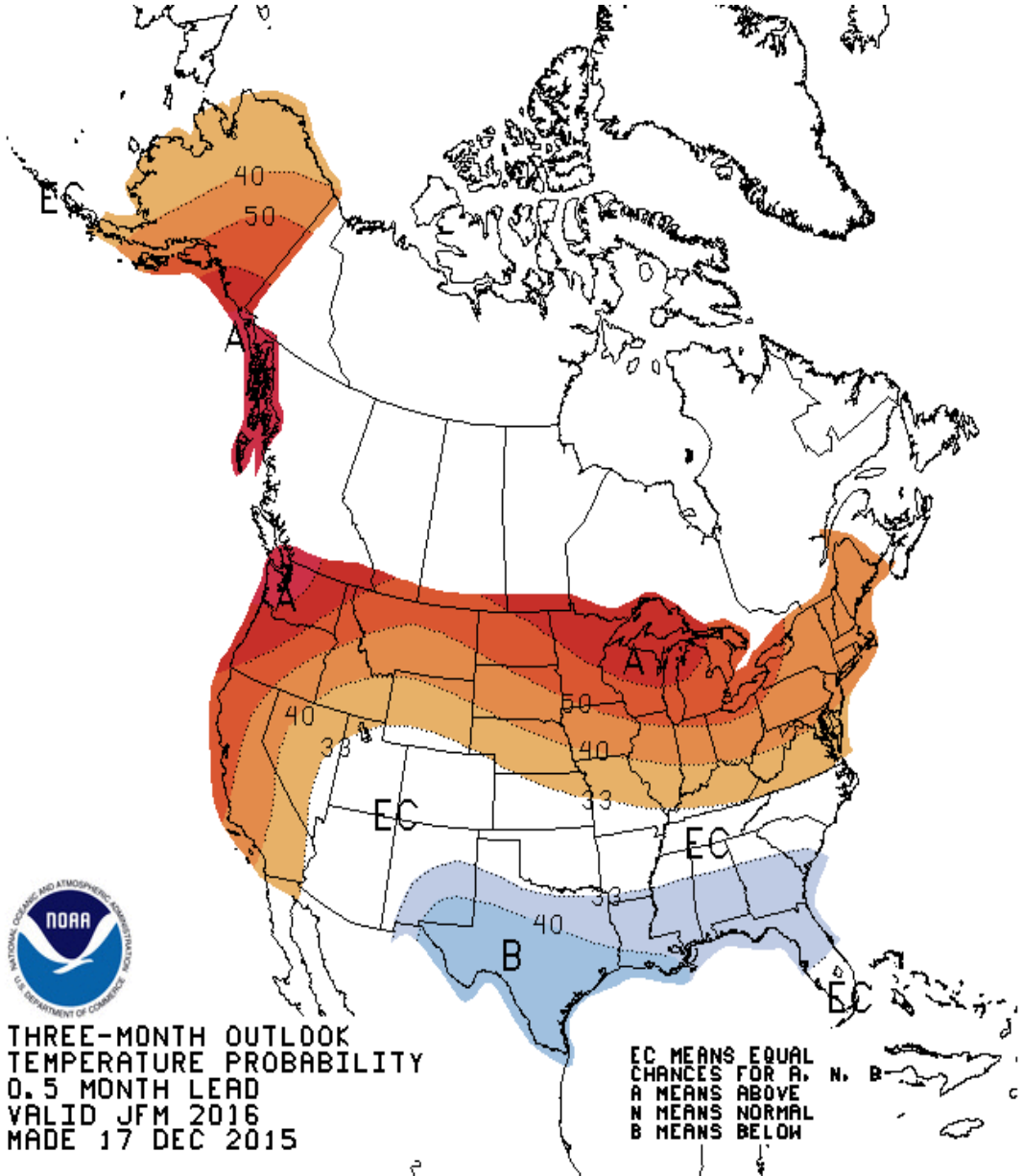


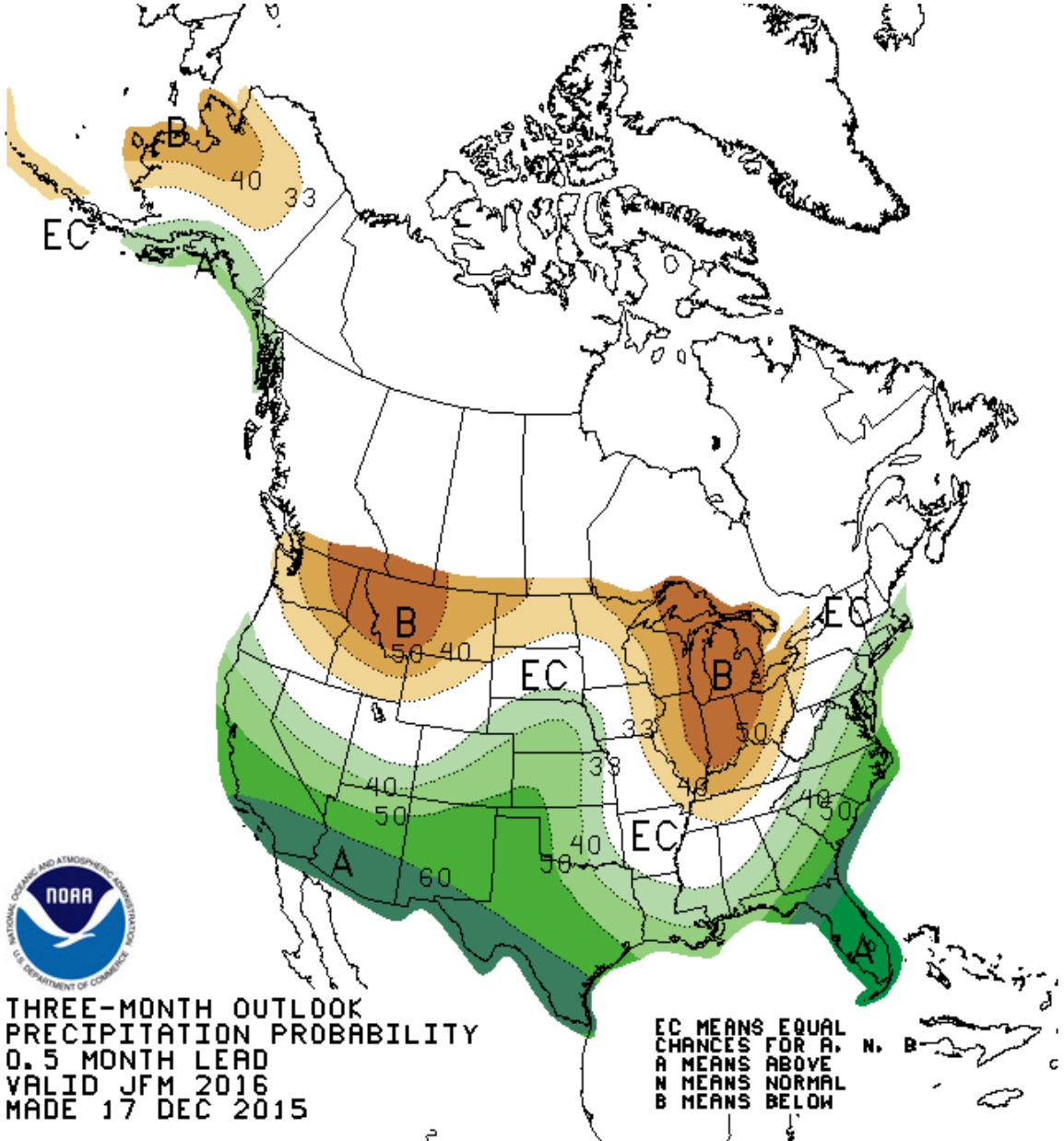
			Streamflow as % of 1981-2010 Average				
	ENSO	PDO	Feb-Sep	Apr-Sep	Apr-Sep	Apr-Sep	Apr-Sep
Year	SE Strong El Nino	pos or neg	Owyhee River blw Dam	Salmon Falls Creek	Big Wood River blw Magic Dam	Snake River nr Heise	Spokane River nr Post Falls
1994	SE	pos	23	36	12	61	51
1966	SE	neg	28	39	51	78	90
1988	SE	pos	30	65	24	70	71
1947	SE	pos / neg	44	50	59	108	90
1973	SE	pos / neg	61	114	51	79	45
1941	SE	pos	83	53	69	73	45
1978	SE	pos	110	112	140	133	99
1942	SE	pos	122	173	117	86	77
1995	SE	pos	124	135	195	118	70
1998	SE	pos	135	138	161	119	82
1983	SE	pos	221	157	282	132	91
1952	SE	neg	246	178	263	116	123
			sorted				
2016	SE	pos ?	?	?	?	?	?

As of Jan 19, 2016

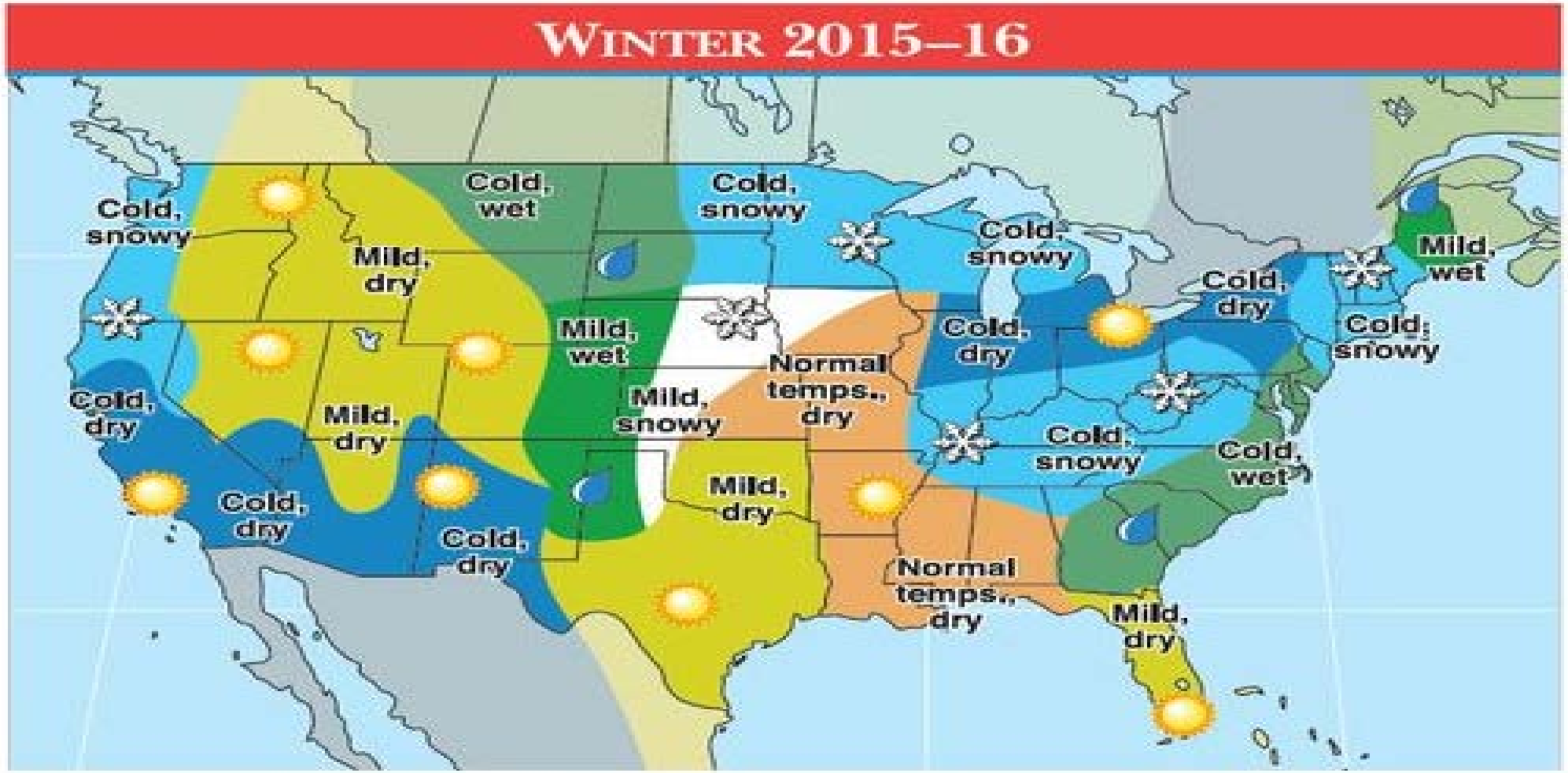
	ENSO			ENSO	Streamflow as % of 1981-2010 Average				
					Feb-Sep	Apr-Sep	Apr-Sep	Apr-Sep	Apr-Sep
Current Year	SE Strong El Nino	Year Folowing a Strong El Nino		SE Strong El Nino	Owyhee River blw Dam	Salmon Falls Creek	Big Wood River blw Magic Dam	Snake River nr Heise	Spokane River nr Post Falls
1952	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		????	?	?	?	?	?

From Dec 17,2015:
Jan Feb & Mar 3 Month Temperature & Precipitation Forecast





The Old Farmer's Almanac uses a "secret" formula for forecasting that includes sunspots, tides, planetary positions, climatology and meteorology, according to its website.

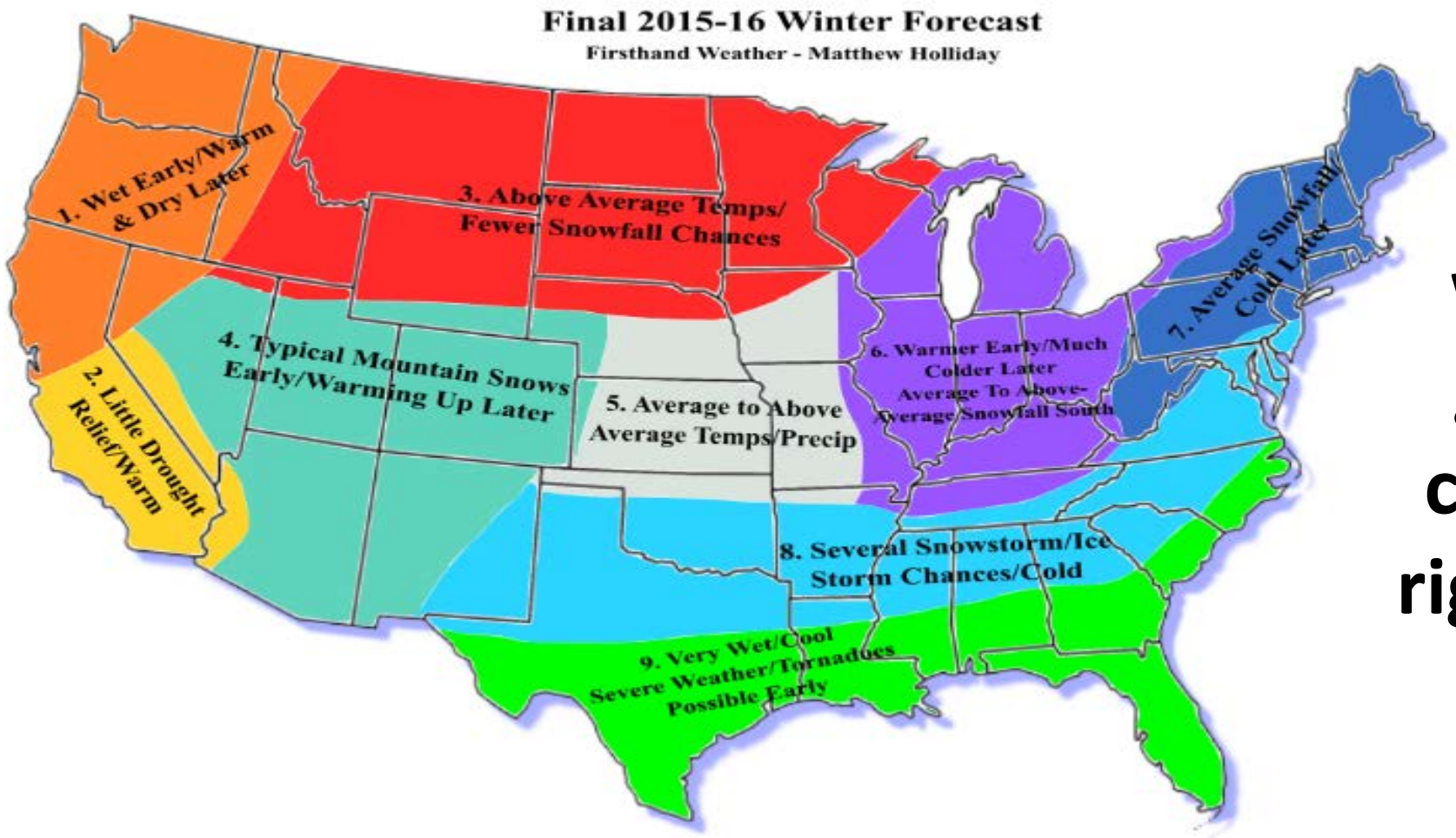


The Old Farmers Almanac's winter weather prediction for the USA. *(Photo: Old Farmers Almanac)*

Firsthand Weather's Final 2015-16 Winter Forecast

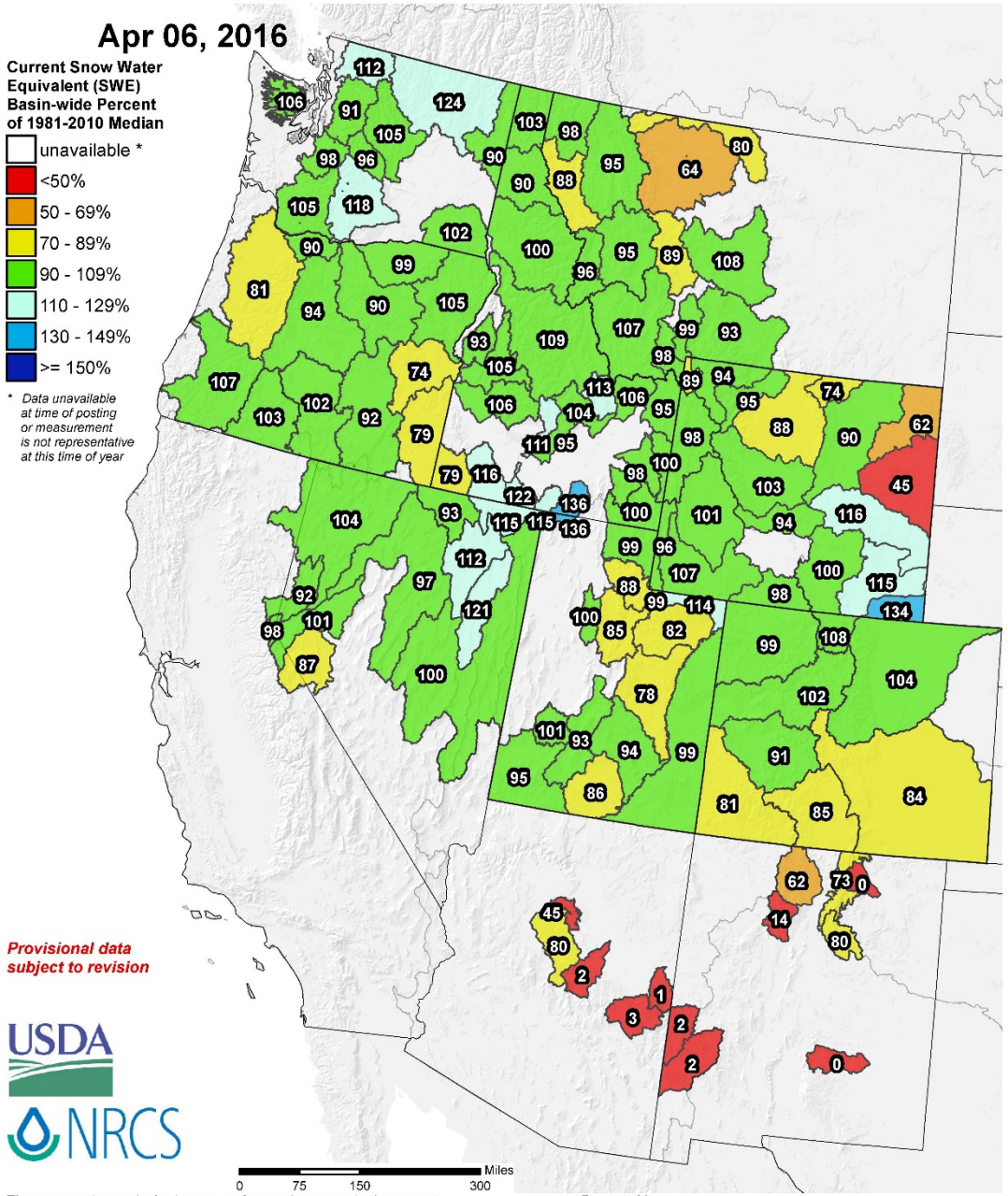
Matthew Holliday | November 8, 2015

Firsthand Weather's Final 2015-16 Winter Forecast:



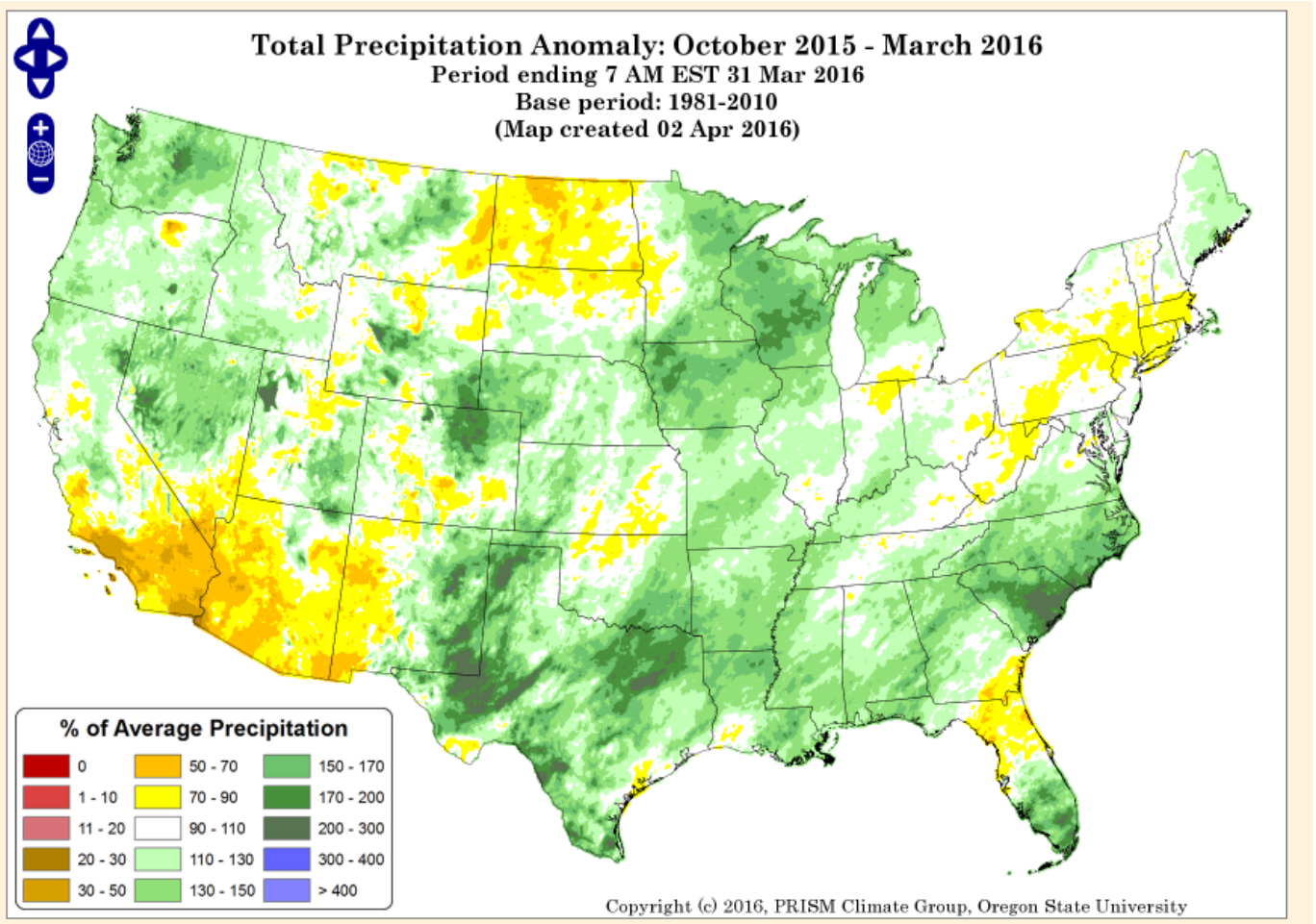
… this upcoming winter forecast is going to be more challenging to "get right" than the prior two winter forecasts.

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

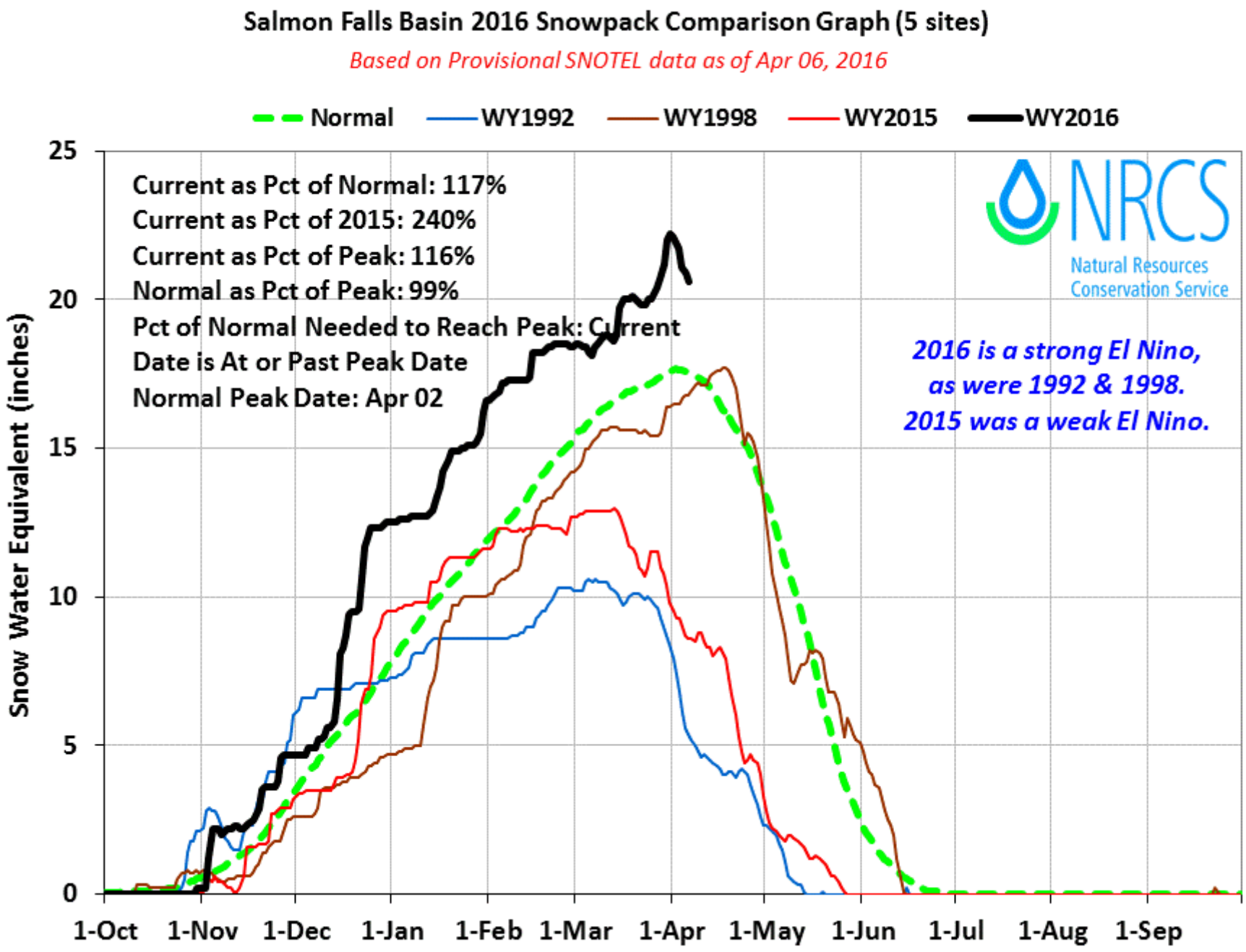


The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

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



To change the window on the slider, use the dropdown lists or drag the scale handles.


Salmon Falls Basin 2016 Snowpack Comparison Graph (5 sites)
Based on Provisional SNOTEL data as of Apr 06, 2016
Normal
WY1992
WY1998
WY2015
WY2016
Current as Pct of Normal: 117%
Current as Pct of 2015: 240%
Current as Pct of Peak: 116%
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 02
NRCS
Natural Resources Conservation Service
2016 is a strong El Nino, as were 1992 & 1998. 2015 was a weak El Nino.
Snow Water Equivalent (inches)
25
20
15
10
5
0
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep

Report Created: 4/7/2016 8:10:50 AM

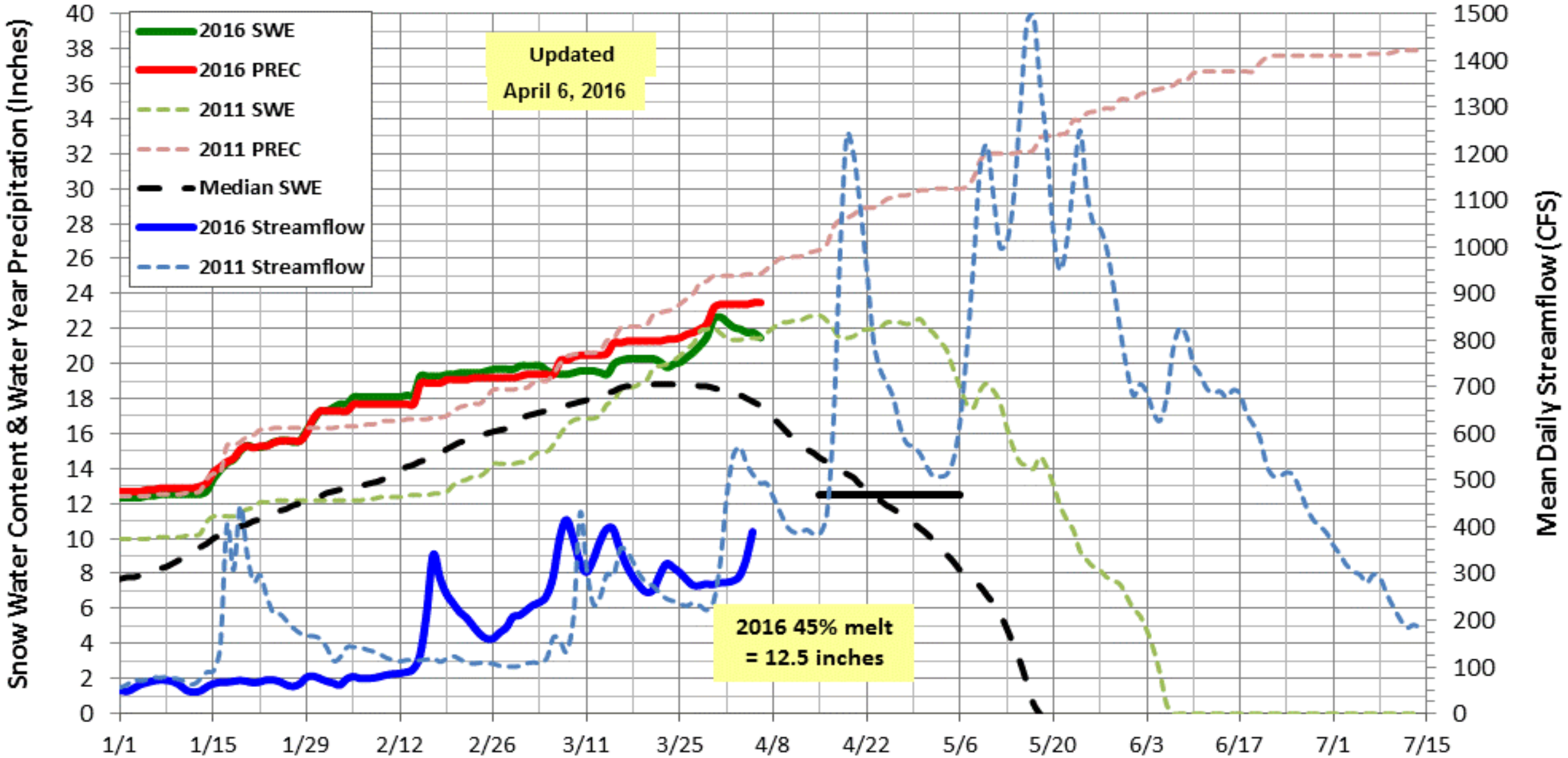
Basinwide Summary: April 1, 2016
(Averages/Medians based on 1981-2010 reference period)

Snowpack Summary for April 1, 2016

Salmon Falls Creek	Network	Elevation (ft)	Depth (in)	SWE (in)	Median (in)	% Median	Last Year SWE (in)	Last Year % Median
Bear Creek	SNOTEL	8040	63	24.9	18.5	135%	9.0	49%
Bostetter R.S.	SNOTEL	7500	48	19.3	15.7	123%	8.0	51%
Jakes Creek - Aerial Marker	SC	7000	12	2.6	4.8	54%	0.0	0%
Langford Flat Creek	SC	5980	1	0.5	2.2	23%	0.0	0%
Magic Mountain	SNOTEL	6880	56	22.4	18.5	121%	13.0	70%
O'Neil Creek	SC	6480	0	0.0	2.8	0%	0.0	0%
Pole Creek R.S.	SNOTEL	8330	83	29.0	19.3	150%	14.3	74%
Wilson Creek	SNOTEL	7120	36	14.7	12.5	118%	3.0	24%
Basin Index						**120%**		**50%**
# of sites						8		8

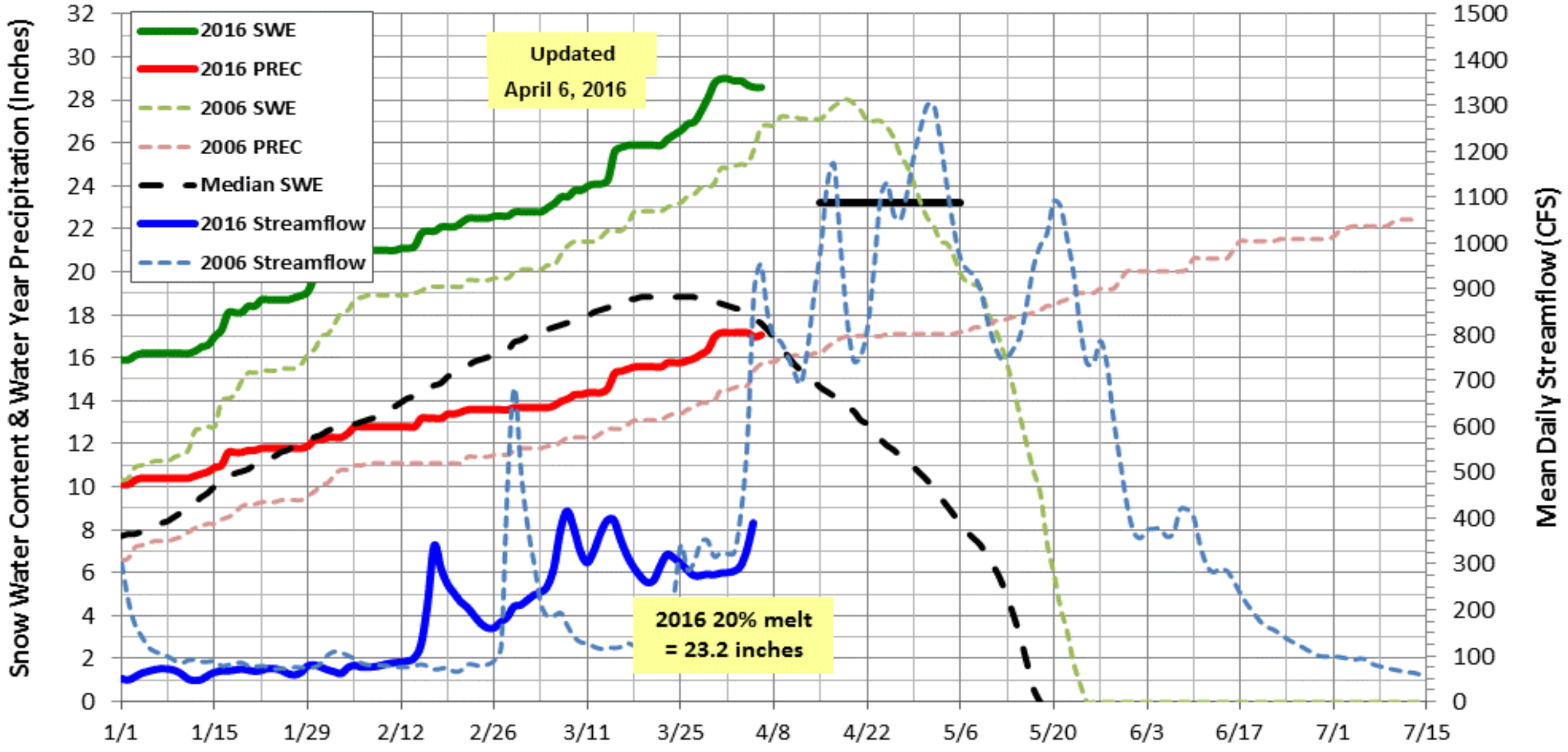
2016 & 2011 Magic Mountain SNOTEL and Salmon Falls Creek near San Jacinto

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

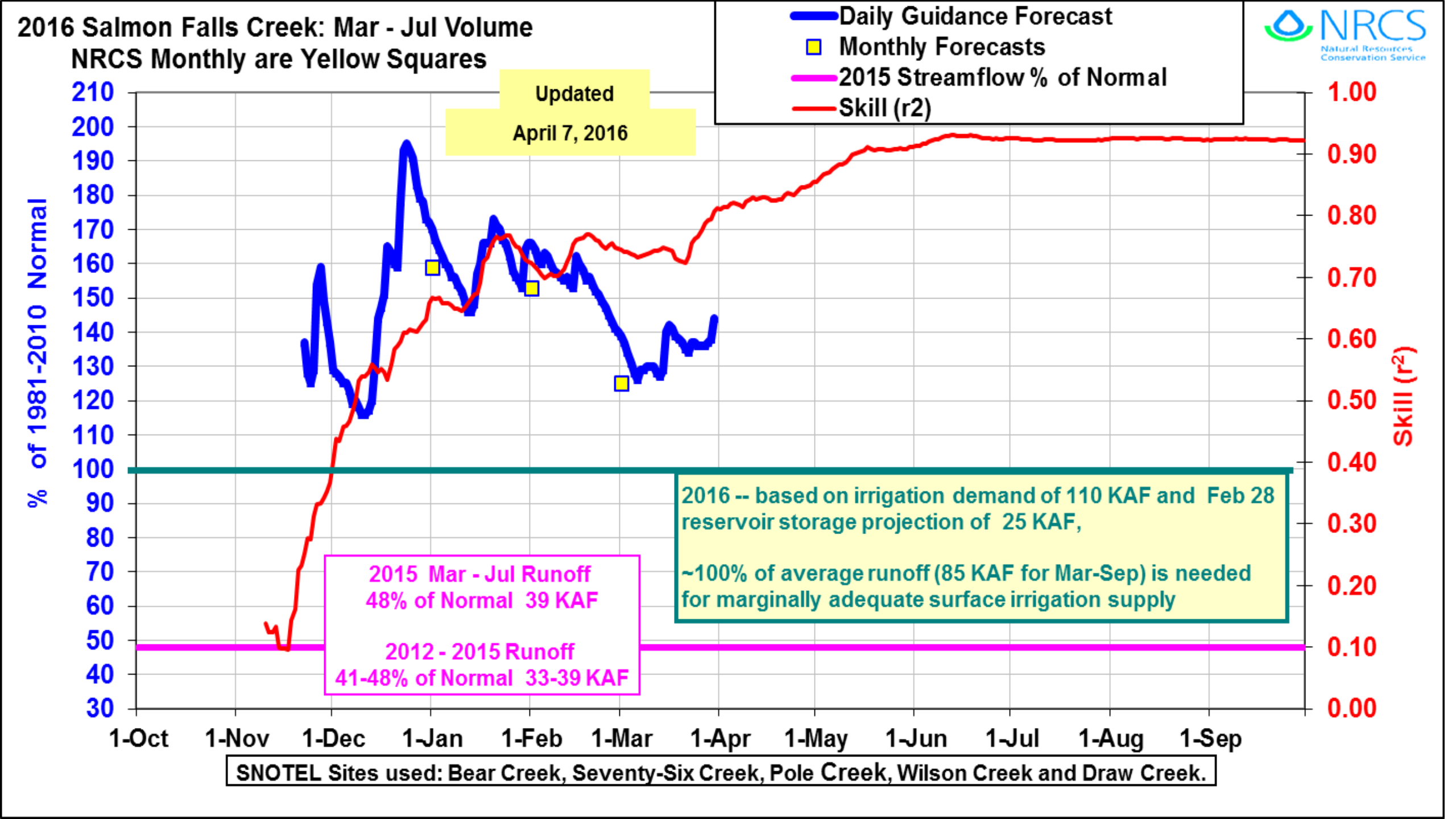


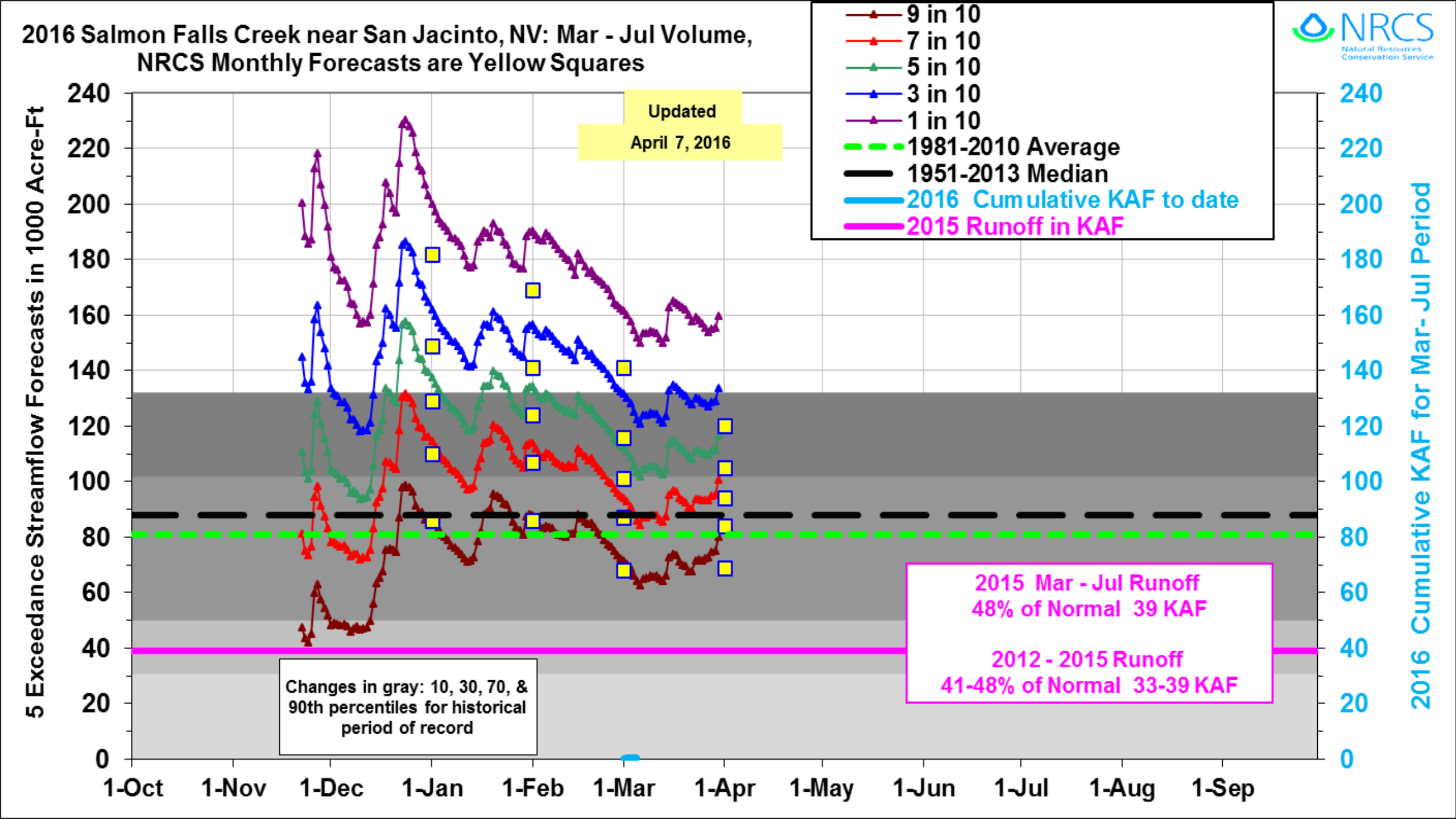
Salmon Fall Creek usually peaks or has an increase when Magic Mtn SNOTEL is about 60 -70% melted

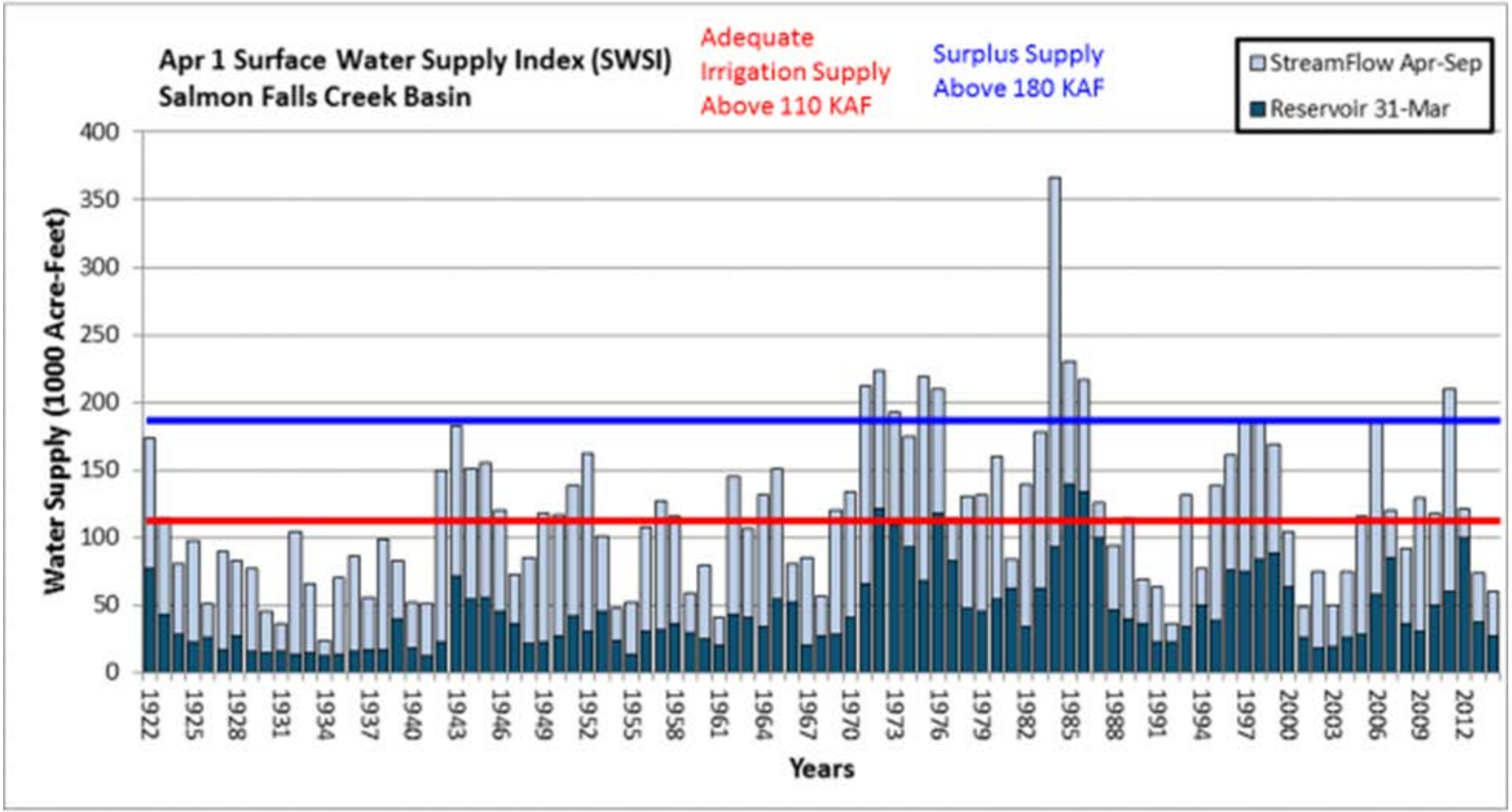
2016 & 2006 Pole Creek SNOTEL and Salmon Falls Creek near San Jacinto

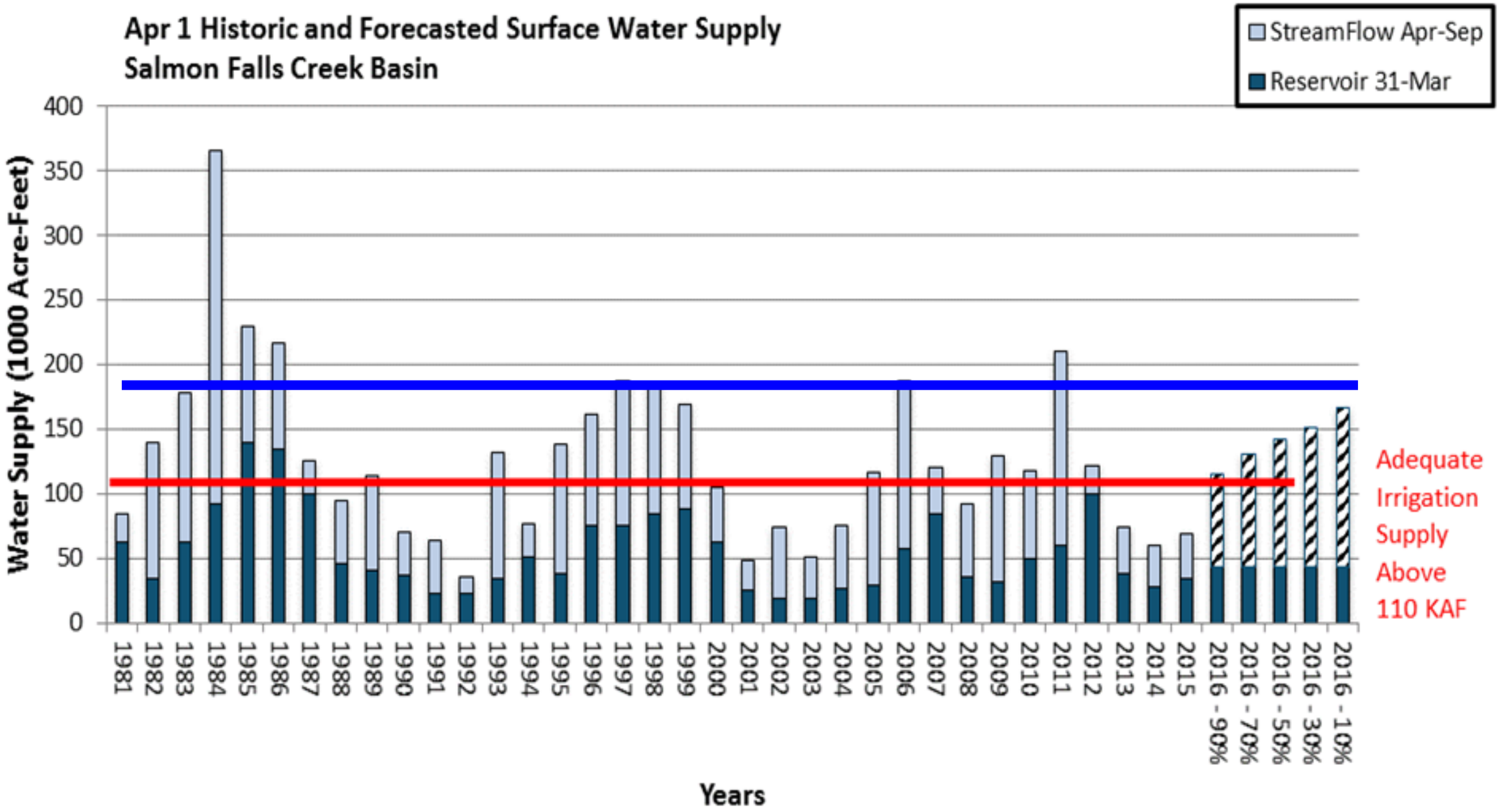


Salmon Fall Creek usually peaks or has an increase when Pole Creek SNOTEL is about 20% melted


2016 Salmon Falls Creek: Mar - Jul Volume
NRCS Monthly are Yellow Squares
Daily Guidance Forecast
Monthly Forecasts
2015 Streamflow % of Normal
Skill (r2)
NRCS
Natural Resources Conservation Service
Updated
April 7, 2016
% of 1981-2010 Normal
Skill (r2)
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
2016 -- based on irrigation demand of 110 KAF and Feb 28 reservoir storage projection of 25 KAF,
~100% of average runoff (85 KAF for Mar-Sep) is needed for marginally adequate surface irrigation supply
2015 Mar - Jul Runoff
48% of Normal 39 KAF
2012 - 2015 Runoff
41-48% of Normal 33-39 KAF
SNOTEL Sites used: Bear Creek, Seventy-Six Creek, Pole Creek, Wilson Creek and Draw Creek.


2016 Salmon Falls Creek near San Jacinto, NV: Mar - Jul Volume,
NRCS Monthly Forecasts are Yellow Squares
Updated
April 7, 2016
9 in 10
7 in 10
5 in 10
3 in 10
1 in 10
1981-2010 Average
1951-2013 Median
2016 Cumulative KAF to date
2015 Runoff in KAF
NRCS
Natural Resources Conservation Service
5 Exceedance Streamflow Forecasts in 1000 Acre-Ft
2016 Cumulative KAF for Mar- Jul Period
0
20
40
60
80
100
120
140
160
180
200
220
240
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
Changes in gray: 10, 30, 70, & 90th percentiles for historical period of record
2015 Mar - Jul Runoff
48% of Normal 39 KAF
2012 - 2015 Runoff
41-48% of Normal 33-39 KAF


Apr 1 Surface Water Supply Index (SWSI)
Salmon Falls Creek Basin
Adequate
Irrigation Supply
Above 110 KAF
Surplus Supply
Above 180 KAF
StreamFlow Apr-Sep
Reservoir 31-Mar
Water Supply (1000 Acre-Feet)
400
350
300
250
200
150
100
50
0
1922
1925
1928
1931
1934
1937
1940
1943
1946
1949
1952
1955
1958
1961
1964
1967
1970
1973
1976
1979
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
Years


Apr 1 Historic and Forecasted Surface Water Supply
Salmon Falls Creek Basin
StreamFlow Apr-Sep
Reservoir 31-Mar
Water Supply (1000 Acre-Feet)
400
350
300
250
200
150
100
50
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016 - 90%
2016 - 70%
2016 - 50%
2016 - 30%
2016 - 10%
Years
Adequate Irrigation Supply Above 110 KAF

Salmon Falls Basin Surplus Threshold

The surplus threshold of 180 KAF for the Salmon Falls Basin was investigated using the period of record from 1922 – 2015.

180 KAF was determined as the surplus volume based primarily on the reservoir capacity of 182.65 KAF and potential to fill the reservoir.

The surplus threshold uses the SWSI volume, which is the combination of March 31 reservoir storage and the April to September volume. These SWSI values were sorted from high to low.

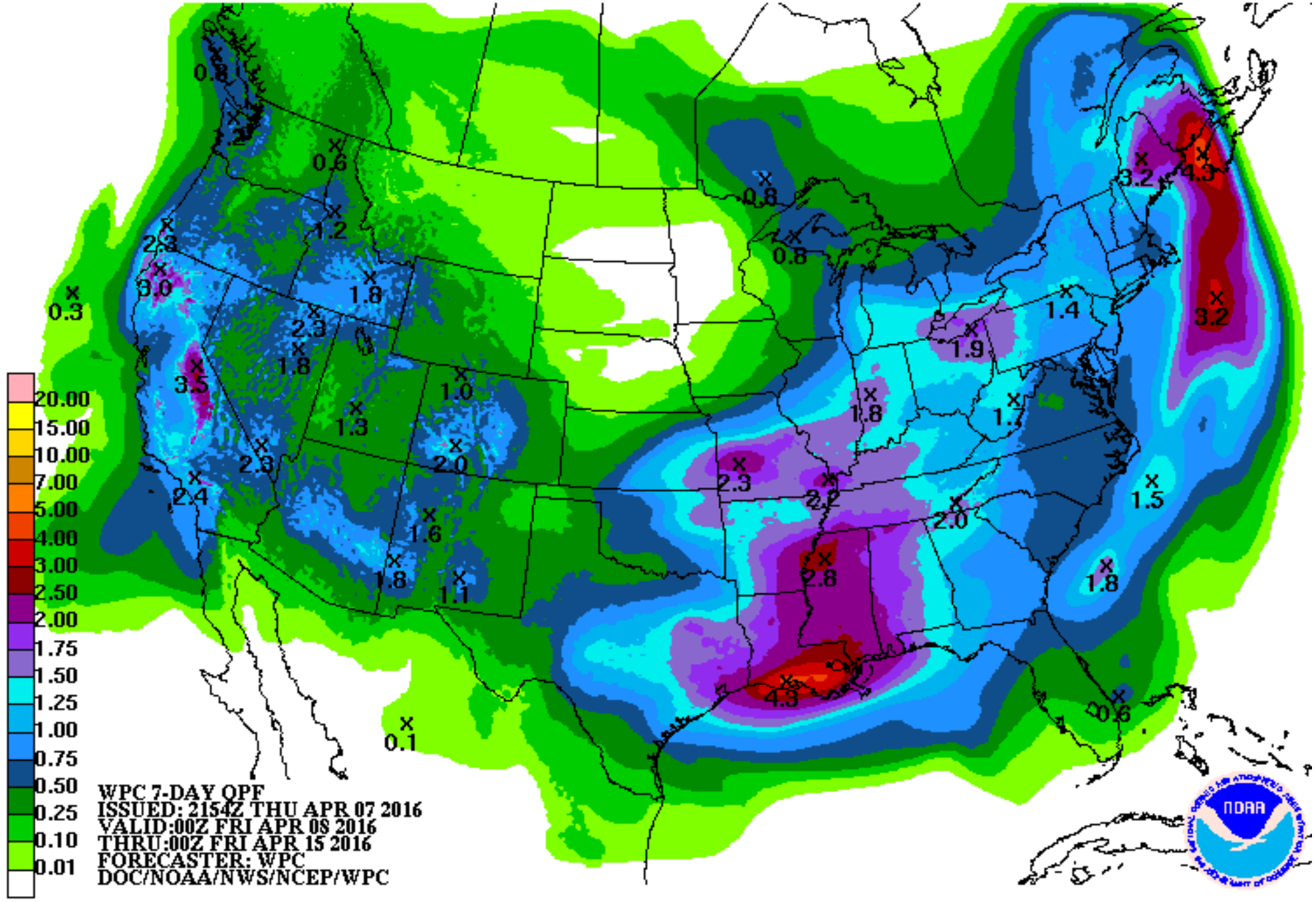
The top 50 out of 93 years are shown according to their SWSI value. Highlighted in blue are the years with more than 180 KAF, which is surplus.

Salmon Falls Reservoir storage:

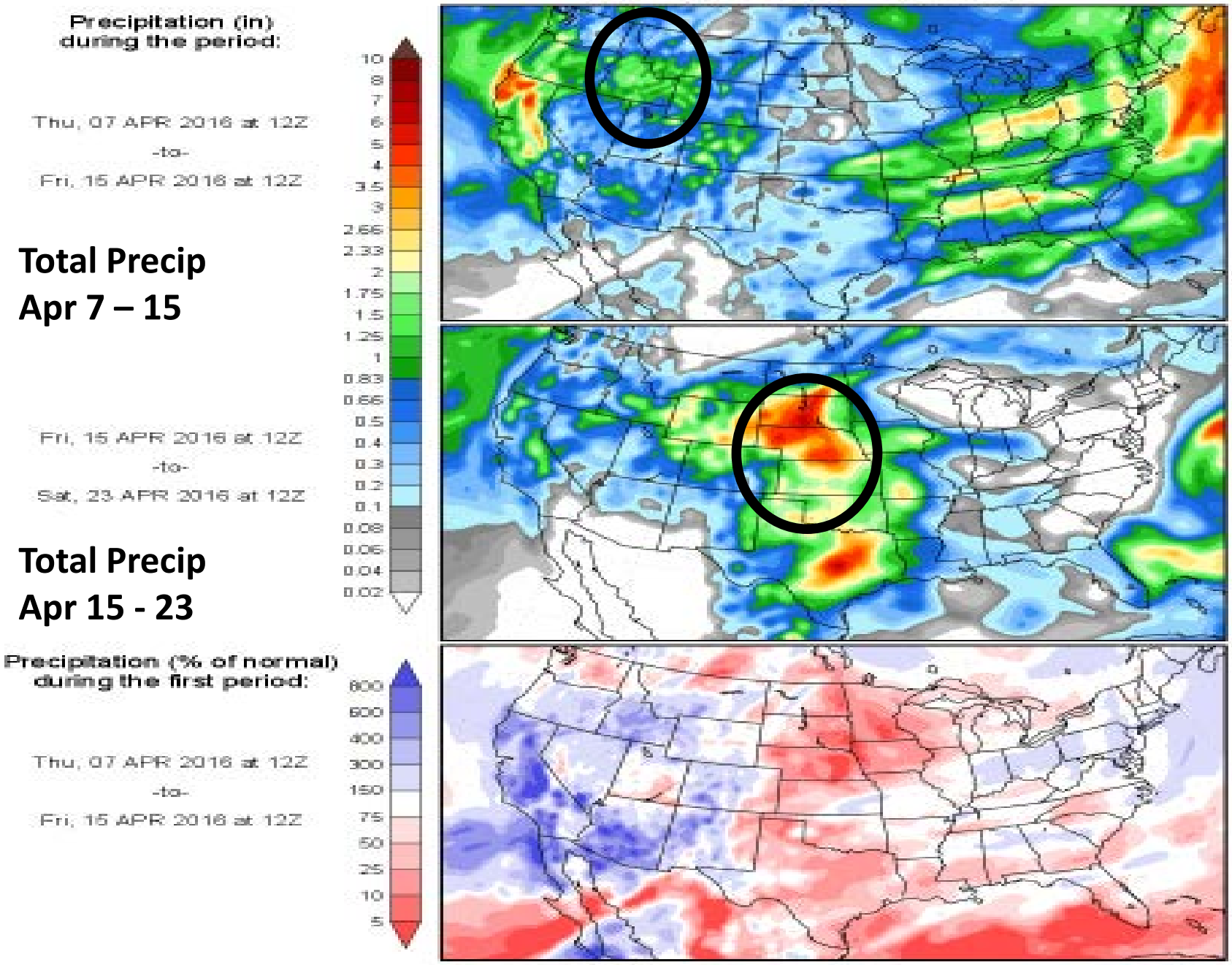
Storage type	KAF	
Dead	48.00	amount of storage below the lowest gate that is remains in the reservoir
Inactive	5.00	amount at the lowest gate that is a challenge to release
Active	182.65	total active storage that includes the 5.0 KAF of inactive storage

Usable / Active storage for Salmon Falls is 182.65 KAF

7 Day Total Precipitation Forecast Apr 8 – 15



Precipitation Forecasts



Total Precip
Apr 7 – 15

Total Precip
Apr 15 - 23

Precipitation forecasts from the National Centers for Environmental Prediction

Temperature Forecasts

Mean Surface Temperature (°F) during the period:

Thu, 07 APR 2016 at 12Z
-to-
Fri, 15 APR 2016 at 12Z

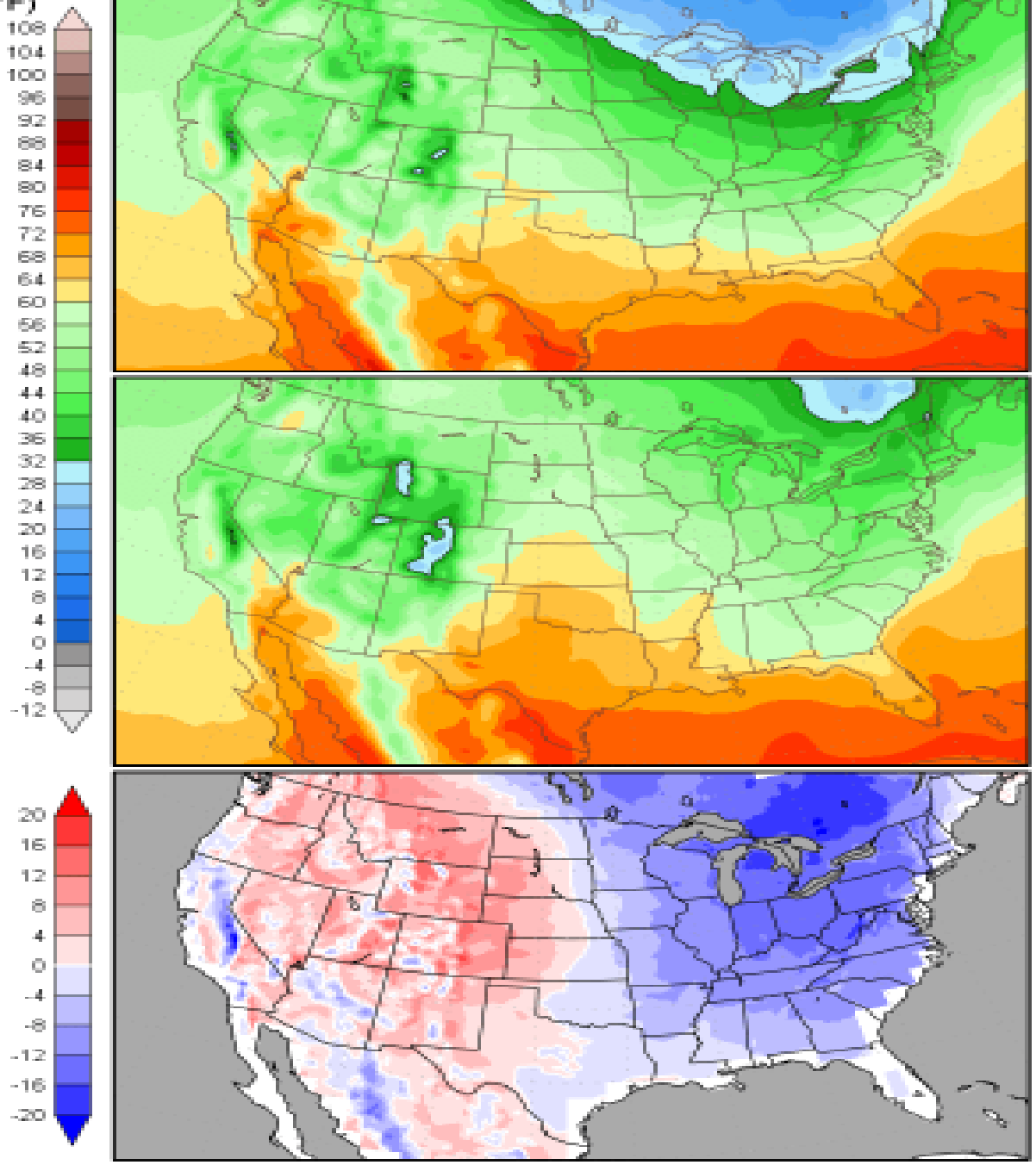
Mean Temps
Apr 7 – 15

Fri, 15 APR 2016 at 12Z
-to-
Sat, 23 APR 2016 at 12Z

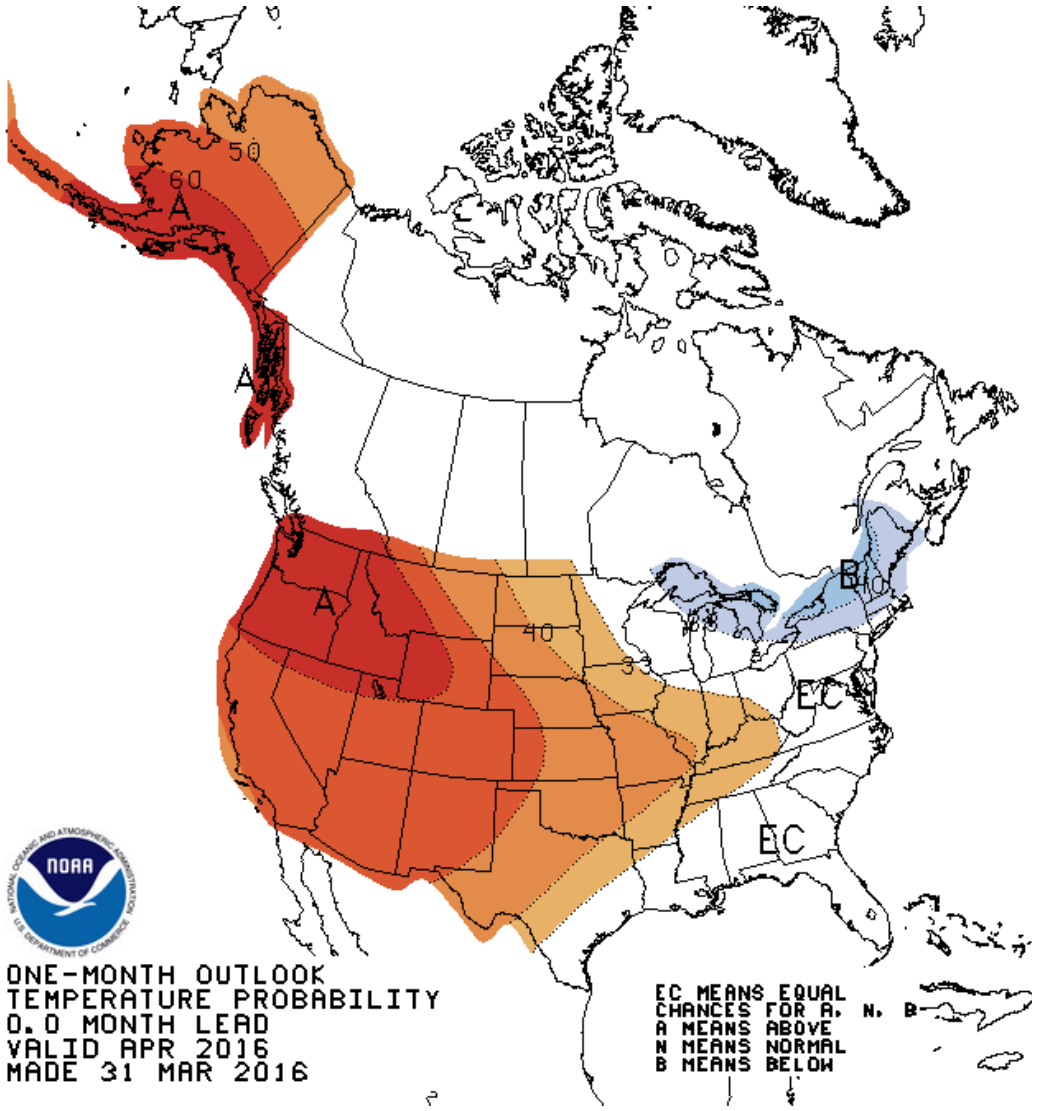
Mean Temps
Apr 15 - 23

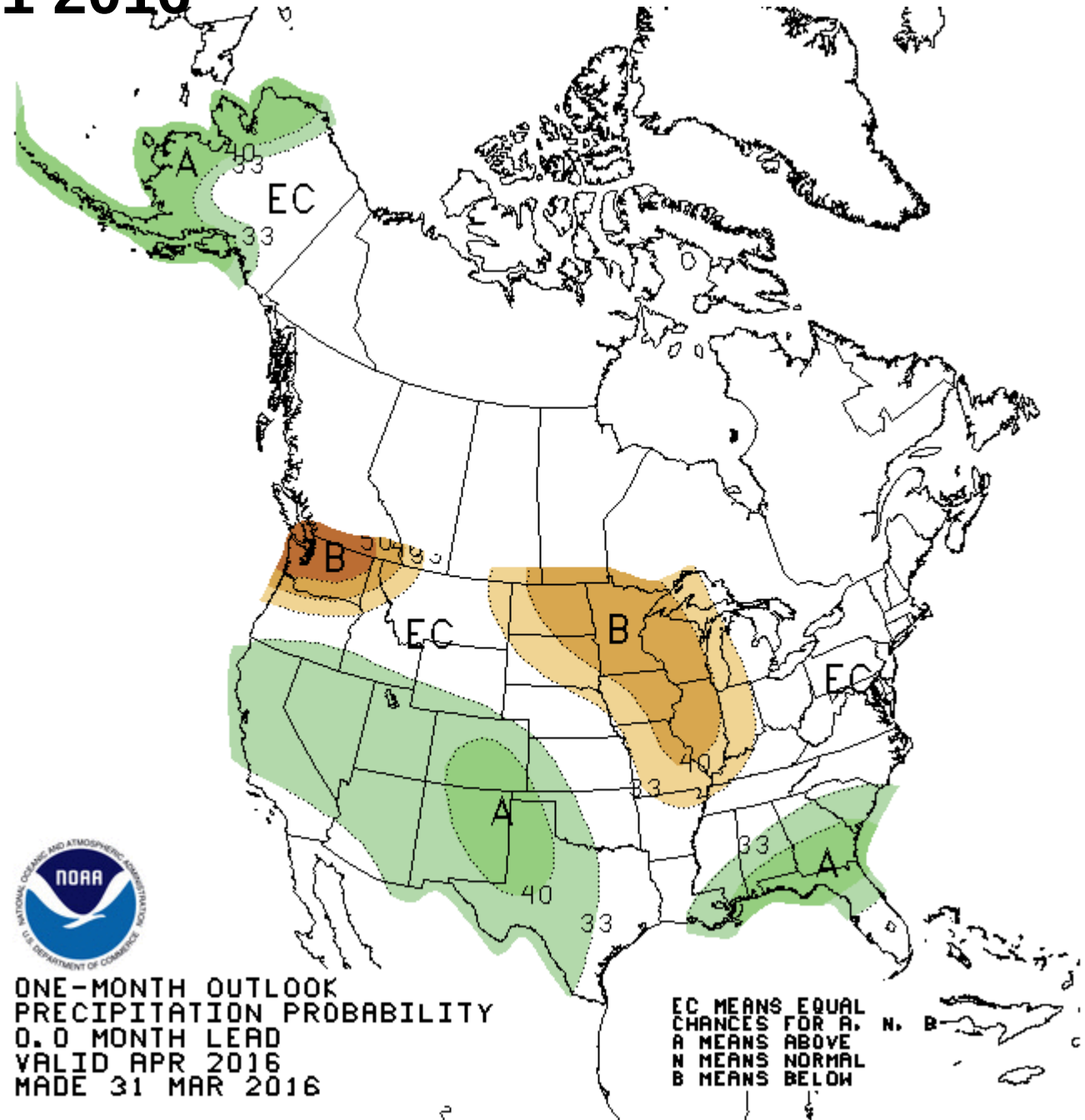
Temperature Anomaly during the first period:

Thu, 07 APR 2016 at 12Z
-to-
Fri, 15 APR 2016 at 12Z

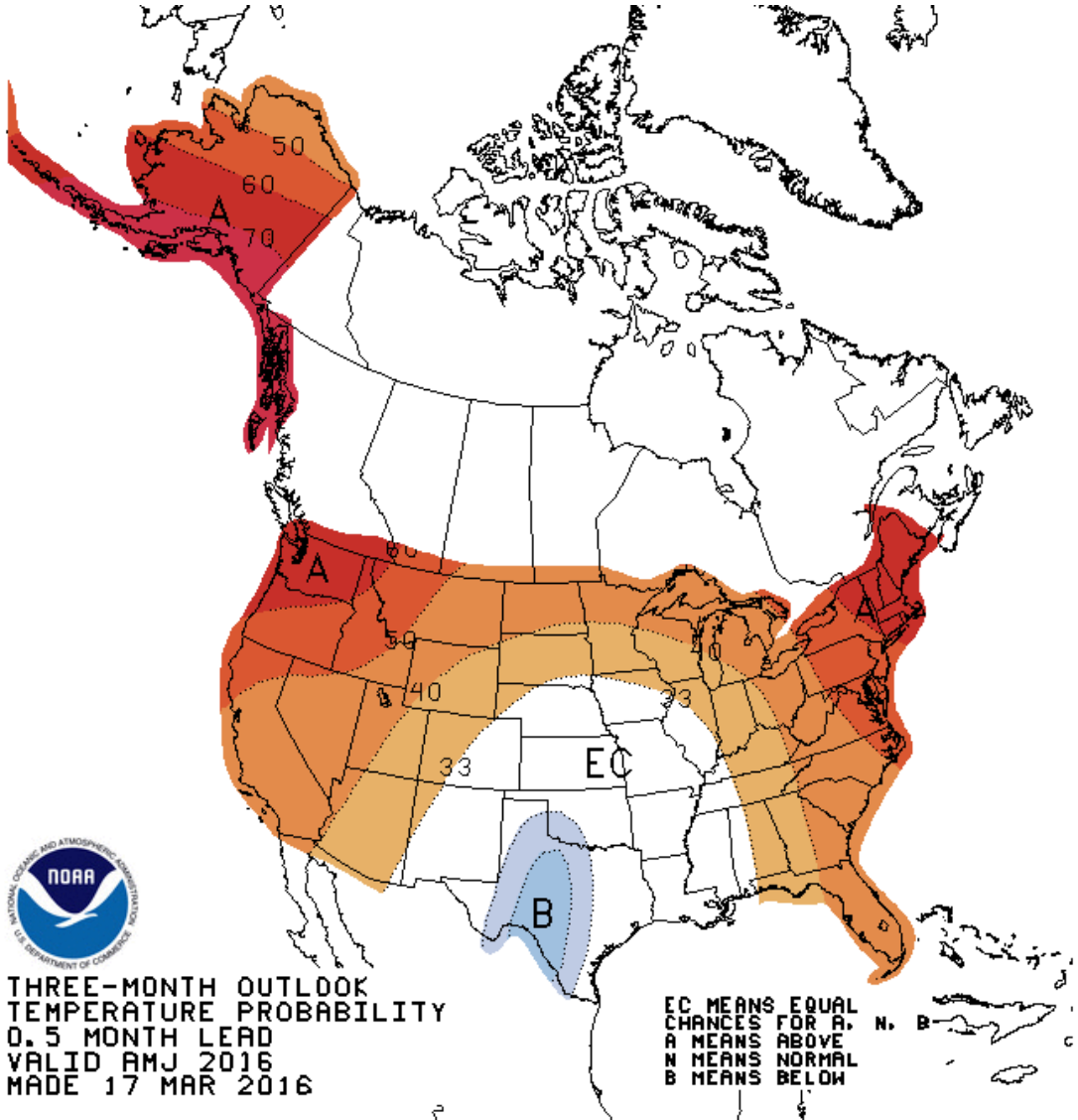


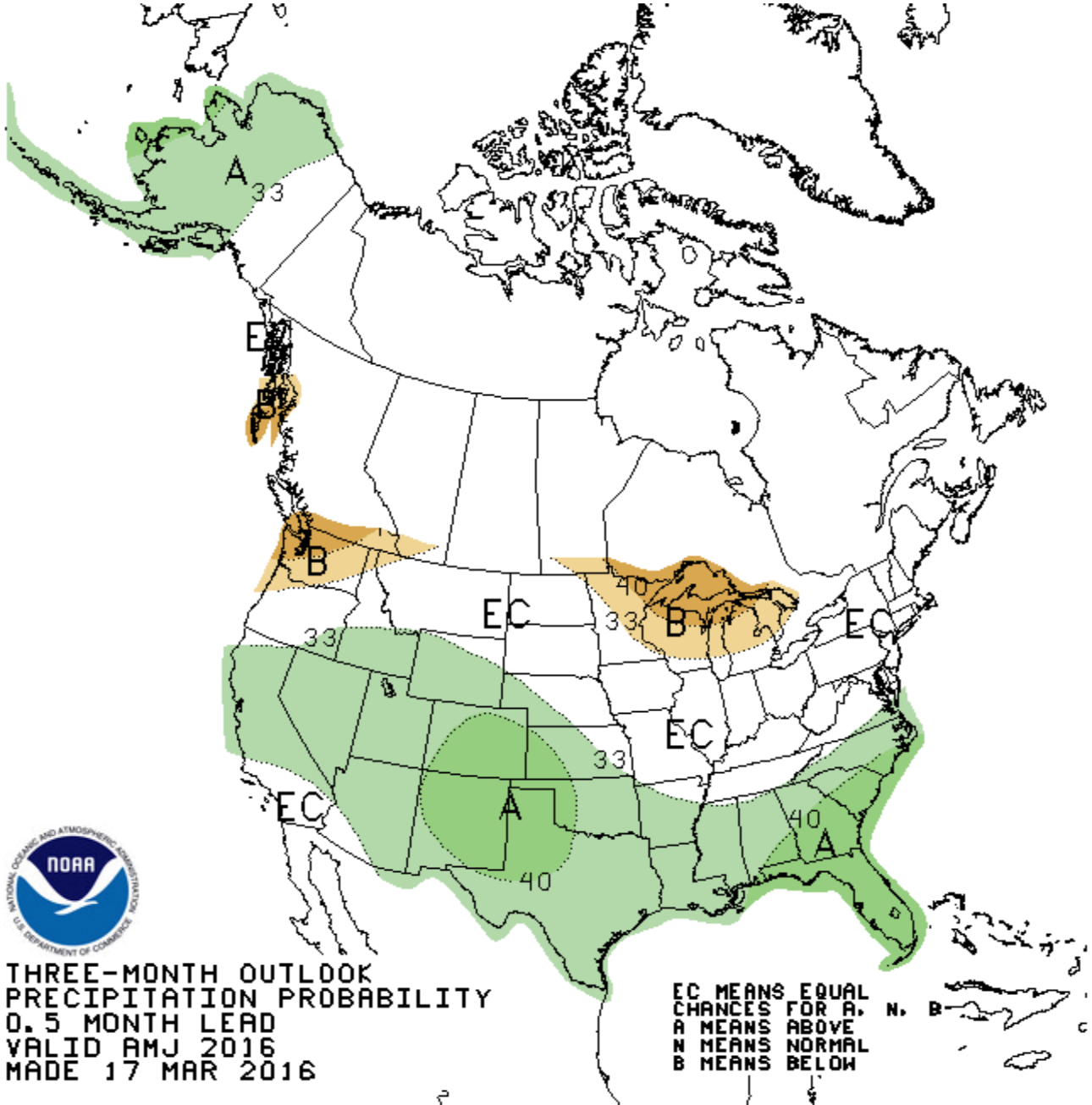
April Outlook Produced Mar 31 2016





April May Jun Outlook Produced Mar 17 2016





1	Twin Falls Soil & Water Conservation District Salmon Falls Reservoir Storage Allotment		Updated April 7, 2016				
2	Note: Allotment formula is based on March 31 reservoir storage and April 1 - September 30		Based on NRCS April 1 Streamflow Forecasts				
3			Chance of Exceedance Streamflow Forecasts				
4			90%	70%	50%	30%	10%
5	Inflow Forecast, April 1-September 30, acre-feet		73000	88000	99000	109000	124000
6	Storage in Dam, March 31, acre-feet	42700	42700	42700	42700	42700	42700
7	Total Storage (Inflow Forecast + Storage)		115700	130700	141700	151700	166700
8	Less Dead Storage in Reservoir (5000 A-F)	5000	110700	125700	136700	146700	161700
9	Projected Reservoir Loss of 20%	0.20	22140	25140	27340	29340	32340
0	In Dam, Available for Delivery		88560	100560	109360	117360	129360

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0	In Dam, Available for Delivery		88560	100560	109360	117360	129360
1	Projected Delivery Efficiency: 2016 50% Past Delivery Efficiency: 2015 47.0% 2014 48.0% 2013 53.0% 2012	0.535	47380	53800	58508	62788	69208
2	Less Water for Callen	485	485	485	485	485	485
3	Less Individual Storage Carryover	1685	1685	1685	1685	1685	1685
4	Water to be Delivered Over the Weir		45210	51630	56338	60618	67038

1	Twin Falls Soil & Water Conservation District Salmon Falls Reservoir Storage Allotment		Updated April 7, 2016				
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3	Less Individual Storage Carryover	1685	1685	1685	1685	1685	1685
4	Water to be Delivered Over the Weir		45210	51630	56338	60618	67038
5	Divided by Total Shares	60050.65	0.753	0.860	0.938	1.009	1.116
6							
8	Allotment if 'Individual Storage Carryover' is not subtracted from 'In Dam, Available for Delivery'		0.781	0.888	0.966	1.038	1.144
9	Average Allotment						
0	1924-2006	0.761					
1	1971-2000	0.934	2013 allotment 0.380 Runoff 42 KAF Apr-Sep				
2	2002-2006	0.616	2014 allotment 0.332 Runoff 41 KAF Apr-Sep				
3	Full Allotment	1.167	2015 allotment 0.385 Runoff 42 KAF Apr-Sep				

Think Snow!!

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."

Idaho Drought Committee

contact: David Hoekema (208) 287-4830

United States Drought Monitor (USDM):

http://droughtmonitor.unl.edu/Home.aspx

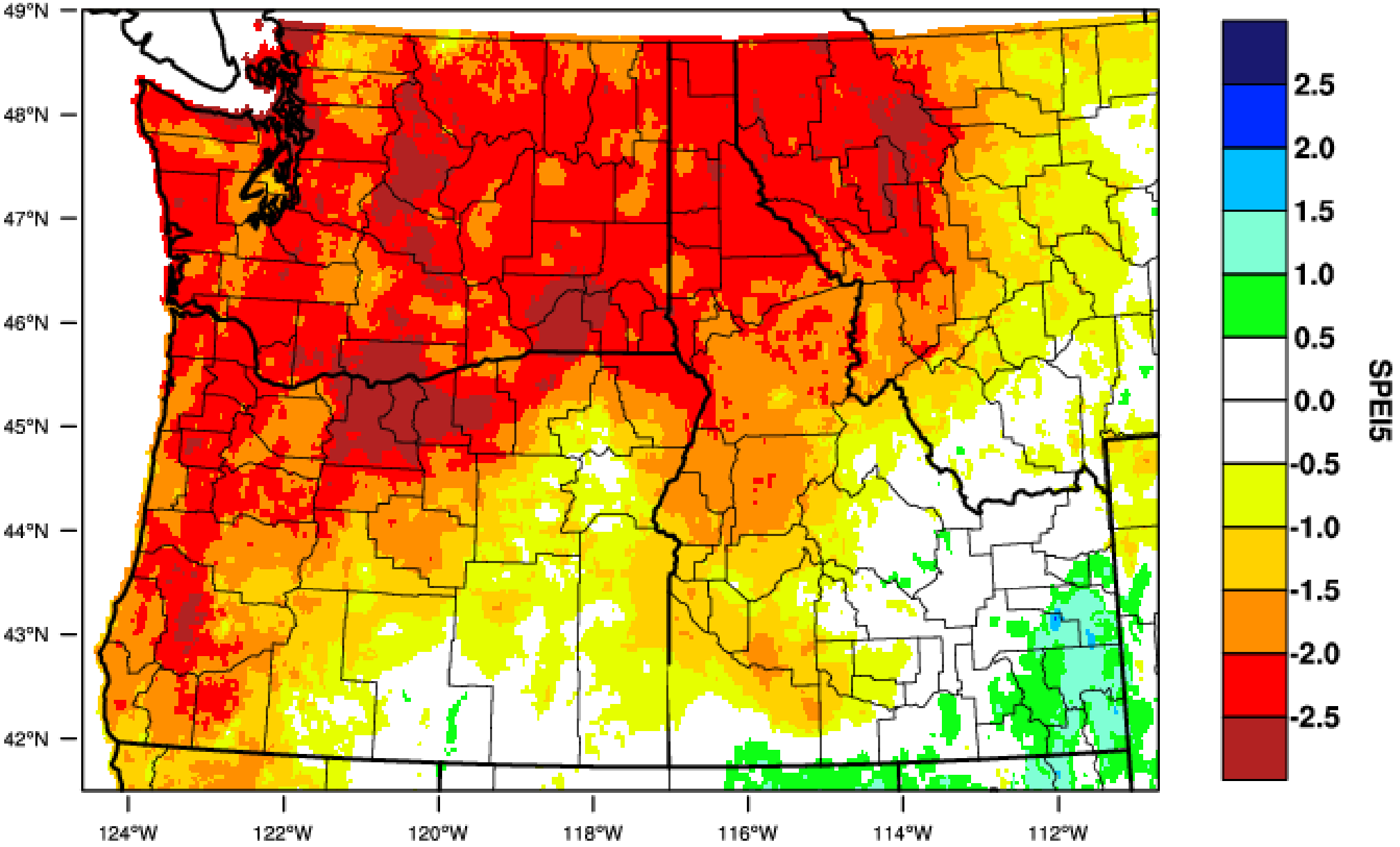
NDMC USDA NOAA

Drought Reporter Site

http://droughtreporter.unl.edu

Pacific Northwest - 5 month SPEI

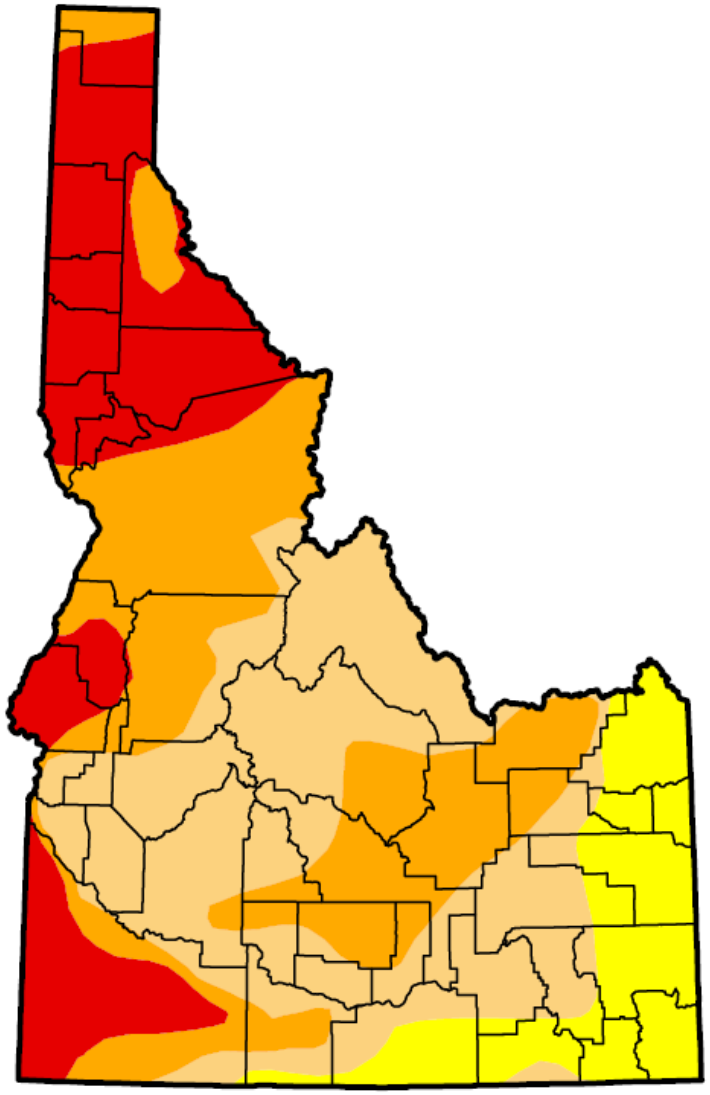
August 2015



WestWide Drought Tracker - U Idaho/WRCC Data Source - PRISM (Prelim), created 16 MAR 2016

U.S. Drought Monitor

Idaho



August 4, 2015

(Released Thursday, Aug. 6, 2015)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	86.63	51.71	22.20	0.00
Last Week *7/28/2015*	0.00	100.00	86.63	51.71	22.20	0.00
3 Months Ago *5/5/2015*	0.02	99.98	61.33	21.96	8.18	0.00
Start of Calendar Year *12/30/2014*	23.76	76.24	41.73	18.49	3.40	0.00
Start of Water Year *9/30/2014*	13.19	86.81	52.39	26.35	3.53	0.00
One Year Ago *8/5/2014*	15.80	84.20	43.76	28.95	2.09	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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

Author:
Mark Svoboda
National Drought Mitigation Center

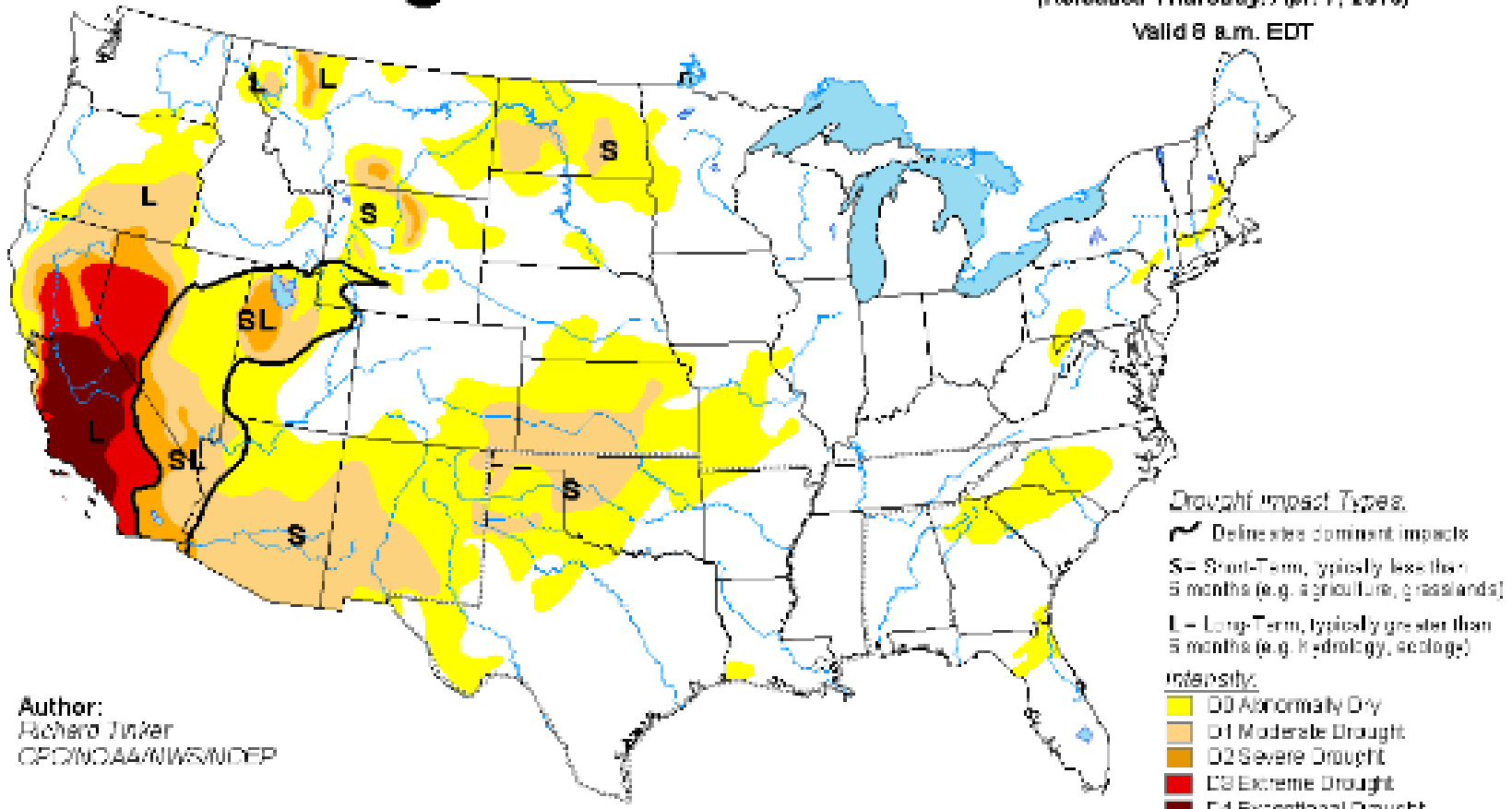
http://droughtmonitor.unl.edu/

U.S. Drought Monitor

April 5, 2016

(Released Thursday, Apr. 7, 2016)

Valid 8 a.m. EDT



Drought Impact Types:

Delineates dominant impacts

S= Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

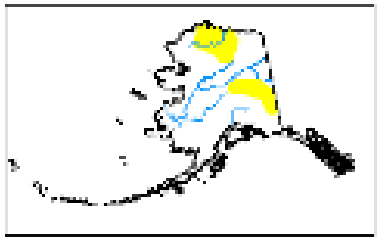
L= Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

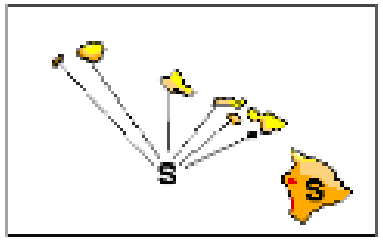
Intensity:

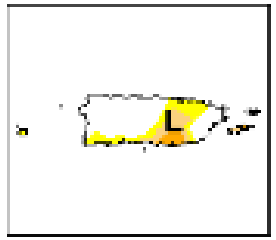
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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

Author:
Richard Tinker
CPC/NOAA/NWS/NCEP







USDA

http://droughtmonitor.unl.edu/

NOTE: To view regional drought conditions, click on map above. State maps can be accessed from regional maps.

Timeline of Personnel for the Salmon Falls Canal Company Annual Water Supply Meeting

Hosted by the Twin Falls Soil and Water Conservation District

Year	SCS / NRCS Snow Survey Office		SCS / NRCS District Conservationist		Streamflow Forecast Hydrologist		Apr-Sep Flow (KAF)	Apr-Sep as % of Average	Allotment
1955	Morley Nelson		Clarence Hedrick		Morley Nelson		38.9	46	0.340
1956	Morley Nelson		Clarence Hedrick		Morley Nelson		76.7	91	0.800
1957	Morley Nelson		Clarence Hedrick		Morley Nelson		95.6	114	0.950
1958	Morley Nelson		Clarence Hedrick		Morley Nelson		79.3	94	0.800
1959	Morley Nelson		Clarence Hedrick		Morley Nelson		29.6	35	0.335
1960	Morley Nelson		Clarence Hedrick		Morley Nelson		54.8	65	0.555
1961	Morley Nelson		Clarence Hedrick		Morley Nelson		20.5	24	0.210
1962	Morley Nelson	0.72	Clarence Hedrick		Morley Nelson	0.72	102.3	122	1.025
1963	Morley Nelson		Clarence Hedrick		Morley Nelson		66.6	79	0.650
1964	Morley Nelson		Clarence Hedrick	0.82	Morley Nelson		97.5	116	0.890
1965	Morley Nelson		Clarence Hedrick		Morley Nelson		96.4	115	1.167
1966	Morley Nelson		Clarence Hedrick		Morley Nelson		29.2	35	0.420
1967	Morley Nelson		Clarence Hedrick		Morley Nelson		64.8	77	0.640
1968	Morley Nelson		Clarence Hedrick		Morley Nelson		30.0	36	0.320
1969	Morley Nelson		Clarence Hedrick		Morley Nelson		91.6	109	1.000
1970	Morley Nelson		Clarence Hedrick		Morley Nelson		92.9	111	1.010
1971	Morley Nelson		Clarence Hedrick		Morley Nelson		145.9	174	1.167
1972	Jack Wilson		Clarence Hedrick		Jack Wilson		102.7	122	1.167
1973	Jack Wilson		Clarence Hedrick		Jack Wilson		84.1	100	1.167
1974	Jack Wilson		Clarence Hedrick		Jack Wilson		82.4	98	1.167
1975	Jack Wilson	1.09	Clarence Hedrick		Jack Wilson		150.2	179	1.167
1976	Jack Wilson		Clarence Hedrick		Jack Wilson		91.8	109	1.167
1977	Jack Wilson		Rich Yankey		Jack Wilson	1.03	30.8	37	0.820
1978	Jerry / Jack		Rich Yankey		Jack Wilson		82.6	98	0.940
1979	Jerry Beard		Rich Yankey		Jack Wilson		85.8	102	1.050
1980	Jerry Beard		Rich Yankey		Jack Wilson		105.7	126	1.167
1981	Jerry Beard		Rich Yankey		Jack Wilson		22.0	26	0.520

Timeline of Personnel for the
Salmon Falls Canal Company Annual Water Supply Meeting
Hosted by the Twin Falls Soil and Water Conservation District

Year	SCS / NRCS Snow Survey Office		SCS / NRCS District Conservationist		Streamflow Forecast Hydrologist		Apr-Sep Flow (KAF)	Apr-Sep as % of Average	Allotment
1976	Jack Wilson		Clarence Hedrick		Jack Wilson		91.8	109	1.167
1977	Jack Wilson		Rich Yankey		Jack Wilson	1.03	30.8	37	0.820
1978	Jerry / Jack		Rich Yankey		Jack Wilson		82.6	98	0.940
1979	Jerry Beard		Rich Yankey		Jack Wilson		85.8	102	1.050
1980	Jerry Beard		Rich Yankey		Jack Wilson		105.7	126	1.167
1981	Jerry Beard		Rich Yankey		Jack Wilson		22.0	26	0.520
1982	Jerry Beard		Rich Yankey		Jerry Beard	1.17	105.2	125	1.167
1983	Jerry Beard	1.00	Rich Yankey		Jerry Beard		116.2	138	1.167
1984	Jerry Beard		Rich Yankey		Jim Marron/Jon		273.7	326	1.167
1985	Jerry Beard		Rich Yankey		Jon Lea	1.17	90.3	107	1.167
1986	Jerry Beard		Rich Yankey		Jon Lea		83.0	99	1.167
1987	Jerry Beard		Rich Yankey		Barb Sarentitas	0.76	25.9	31	0.940
1988	Peter / Jerry		Rich Yankey		Barb Sarentitas		48.2	57	0.570
1989	Peter Palmer		Rich Yankey	0.81	Dave Garen		74.1	88	0.890
1990	Peter Palmer		Rich Yankey		Dave Garen	0.55	32.8	39	0.405
1991	Peter Palmer		Rich Yankey		Dave Garen		40.8	49	0.360
1992	Peter Palmer	0.71	Rich Yankey		Dan Moore		13.7	16	0.150
1993	Peter Palmer		Rich Yankey		Dan Moore		97.7	116	1.050
1994	Peter Palmer		Rich Yankey		Dan Moore		26.7	32	0.330
1995	Peter Palmer		Rich Yankey		Dan Moore		99.9	119	1.000
1996	Peter Palmer		Rich Yankey		Dan Moore	0.78	85.3	102	1.167
1997	Ron / Peter		Rich Yankey		Dan Moore		112.4	134	1.167
1998	Ron Abramovich		Rich Yankey		Dan Moore		102.1	122	1.167
1999	Ron Abramovich		Rich Yankey		Dan Moore		80.3	96	1.020
2000	Ron Abramovich		Rich Yankey		Dan Moore		41.3	49	0.481
2001	Ron Abramovich		Rich Yankey		Dan Moore		23.3	28	0.227
2002	Ron Abramovich		Rich Yankey		Phil Pasteris	0.44	56.0	67	0.436
2003	Ron Abramovich		Rich Yankey		Tom Perkins		31.0	37	0.214
2004	Ron Abramovich		Steve Schuyler		Tom Perkins	0.66	48.7	58	0.425

Timeline of Personnel for the
Salmon Falls Canal Company Annual Water Supply Meeting
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Year	SCS / NRCS Snow Survey Office		SCS / NRCS District Conservationist		Streamflow Forecast Hydrologist		Apr-Sep Flow (KAF)	Apr-Sep as % of Average	Allotment
1990	Peter Palmer		Rich Yankey		Dave Garen	0.55	32.8	39	0.405
1991	Peter Palmer		Rich Yankey		Dave Garen		40.8	49	0.360
1992	Peter Palmer	0.71	Rich Yankey		Dan Moore		13.7	16	0.150
1993	Peter Palmer		Rich Yankey		Dan Moore		97.7	116	1.050
1994	Peter Palmer		Rich Yankey		Dan Moore		26.7	32	0.330
1995	Peter Palmer		Rich Yankey		Dan Moore		99.9	119	1.000
1996	Peter Palmer		Rich Yankey		Dan Moore	0.78	85.3	102	1.167
1997	Ron / Peter		Rich Yankey		Dan Moore		112.4	134	1.167
1998	Ron Abramovich		Rich Yankey		Dan Moore		102.1	122	1.167
1999	Ron Abramovich		Rich Yankey		Dan Moore		80.3	96	1.020
2000	Ron Abramovich		Rich Yankey		Dan Moore		41.3	49	0.481
2001	Ron Abramovich		Rich Yankey		Dan Moore		23.3	28	0.227
2002	Ron Abramovich		Rich Yankey		Phil Pasteris	0.44	56.0	67	0.436
2003	Ron Abramovich		Rich Yankey		Tom Perkins		31.0	37	0.214
2004	Ron Abramovich		Steve Schuyler		Tom Perkins	0.66	48.7	58	0.425
2005	Ron Abramovich		Steve Schuyler		Tom Perkins		87.7	104	0.840
2006	Ron Abramovich		Steve Schuyler		Tom Perkins		129.8	155	1.167
2007	Ron Abramovich		Steve Schuyler		Jolyne Lee		35.6	42	0.655
2008	Ron Abramovich		Steve Schuyler	0.69	Jolyne Lee	0.73	55.6	66	0.579
2009	Ron Abramovich	0.68	Steve Schuyler		Jolyne Lee		98.4	117	1.000
2010	Ron Abramovich		Steve Schuyler		Jolyne Lee		68.0	81	0.680
2011	Ron Abramovich		Steve Schuyler		Rashawn Tama		150.2	179	1.167
2012	Ron Abramovich		Steve Schuyler		Rashawn Tama		21.9	26	0.685
2013	Ron Abramovich		Steve Schuyler		Rashawn Tama	0.59	35.6	42	0.380
2014	Ron Abramovich		Steve Schuyler		Rashawn Tama		32.9	39	0.332
2015	Ron Abramovich		Steve Schuyler		Rashawn Tama		34.5	41	0.385
2016	Ron Abramovich		Steve Schuyler		Rashawn Tama				
2017									

1	Twin Falls Soil & Water Conservation District Salmon Falls Reservoir Storage Allotment		Updated April 7, 2016				
2	Note: Allotment formula is based on March 31 reservoir storage and April 1 - September 30		Based on NRCS April 1 Streamflow Forecasts				
3			Chance of Exceedance Streamflow Forecasts				
4			90%	70%	50%	30%	10%
5	Inflow Forecast, April 1-September 30, acre-feet		73000	88000	99000	109000	124000
6	Storage in Dam, March 31, acre-feet	42700	42700	42700	42700	42700	42700
7	Total Storage (Inflow Forecast + Storage)		115700	130700	141700	151700	166700
8	Less Dead Storage in Reservoir (5000 A-F)	5000	110700	125700	136700	146700	161700
9	Projected Reservoir Loss of 20%	0.20	22140	25140	27340	29340	32340
0	In Dam, Available for Delivery		88560	100560	109360	117360	129360
1	Projected Delivery Efficiency: 2016 50% Past Delivery Efficiency: 2015 47.0% 2014 48.0% 2013 53.0% 2012	0.535	47380	53800	58508	62788	69208
2	Less Water for Callen	485	485	485	485	485	485
3	Less Individual Storage Carryover	1685	1685	1685	1685	1685	1685
4	Water to be Delivered Over the Weir		45210	51630	56338	60618	67038
5	Divided by Total Shares	60050.65	0.753	0.860	0.938	1.009	1.116
6							
8	Allotment if 'Individual Storage Carryover' is not subtracted from 'In Dam, Available for Delivery'		0.781	0.888	0.966	1.038	1.144
9	Average Allotment						
0	1924-2006	0.761					
1	1971-2000	0.934	2013 allotment 0.380 Runoff 42 KAF Apr-Sep				
2	2002-2006	0.616	2014 allotment 0.332 Runoff 41 KAF Apr-Sep				
3	Full Allotment	1.167	2015 allotment 0.385 Runoff 42 KAF Apr-Sep				