

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

January 1, 2018



2017 runoff is setting the stage for the 2018 runoff season. The picture of the Big Lost River near Arco (above) taken on December 21, 2017, illustrates the high streamflows going into this winter. Baseflows and springs are flowing above normal across most of the state. Resulting, reservoir storage is in good shape across the state. Magic Reservoir is pictured below on December 21, 2017, with ice at the confluence of the Big Wood River and Camas Creek.

High baseflows and reservoir carryover storage is good news for Idaho's numerous water users and provides a cushion for parts of the state if the current drier weather pattern persists. Current snowpacks range from near normal in the northern half of Idaho to only 40% of normal in the Weiser and Owyhee basins.



Idaho / Eastern Oregon

Winter Seed School

January 9, 2018



Ron Abramovich
Water Supply Specialist
United States Department of Agriculture

Natural Resources Conservation Service

We'll summarize the '*memorable*' winter of 2017 and runoff that set the stage for the 2018 water supply season :

- **2015/2016 strong El Nino set the stage for the winter of 2016/2017**
- **Reservoir projections for 2018 to determine the amount of runoff needed for adequate irrigation supplies**
- **Weather Outlooks**
- **January 1, 2018 Water Supply Conditions & Projections**

This talk will be posted on the Idaho Snow Survey web page in the 2018 water year talks directory :

<http://www.id.nrcs.usda.gov/snow/>

• [Water Supply Presentations by Year](#)

In the 2018 directory:

<https://www.wcc.nrcs.usda.gov/ftpref/states/id/webftp/talks/>

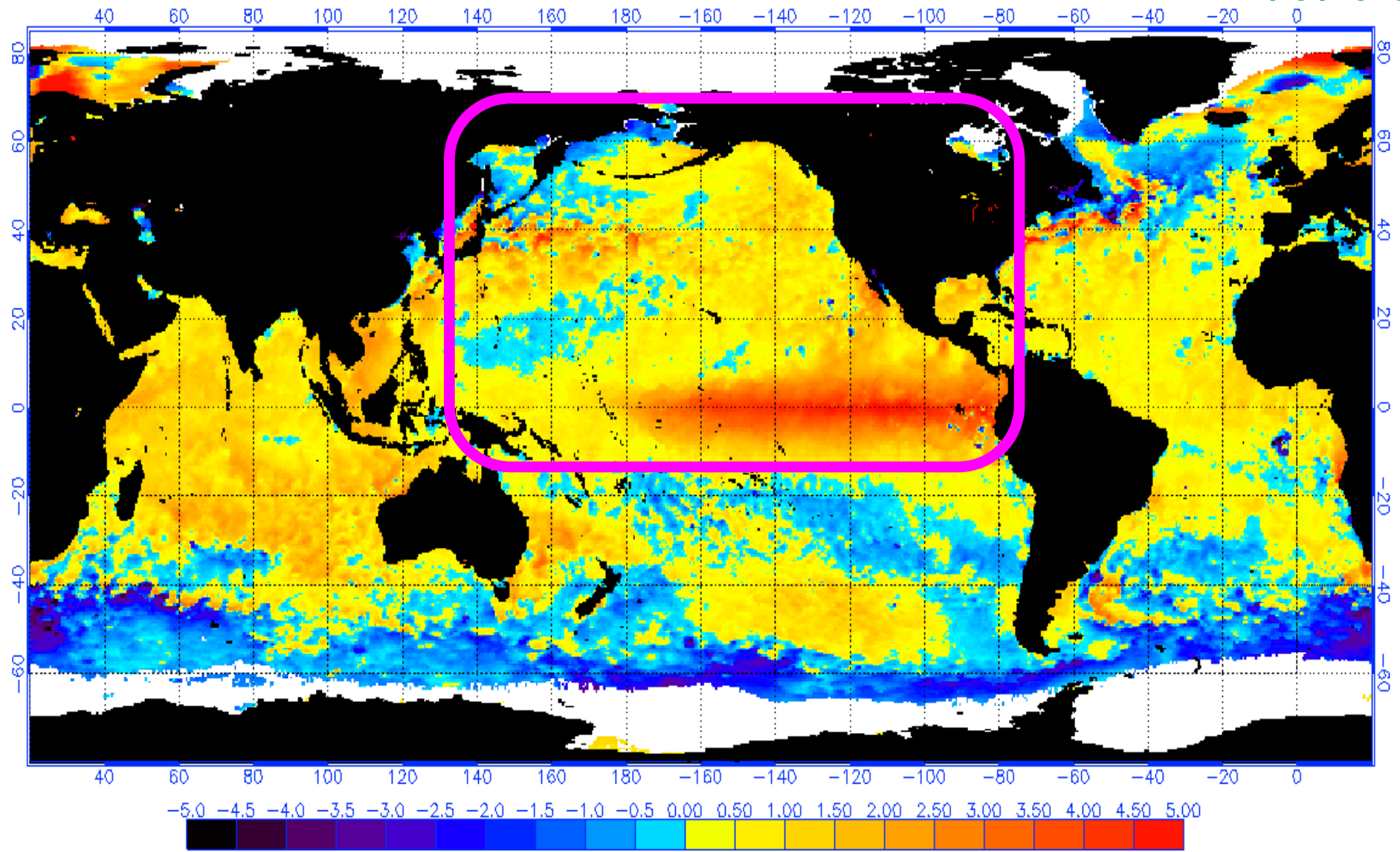
Idaho Snow Survey Program



Weather patterns – winter 2015/2016 – strongest El Nino signal in years
– warmer waters in north Pacific fading away

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 12/3/2015
(white regions indicate sea-ice)

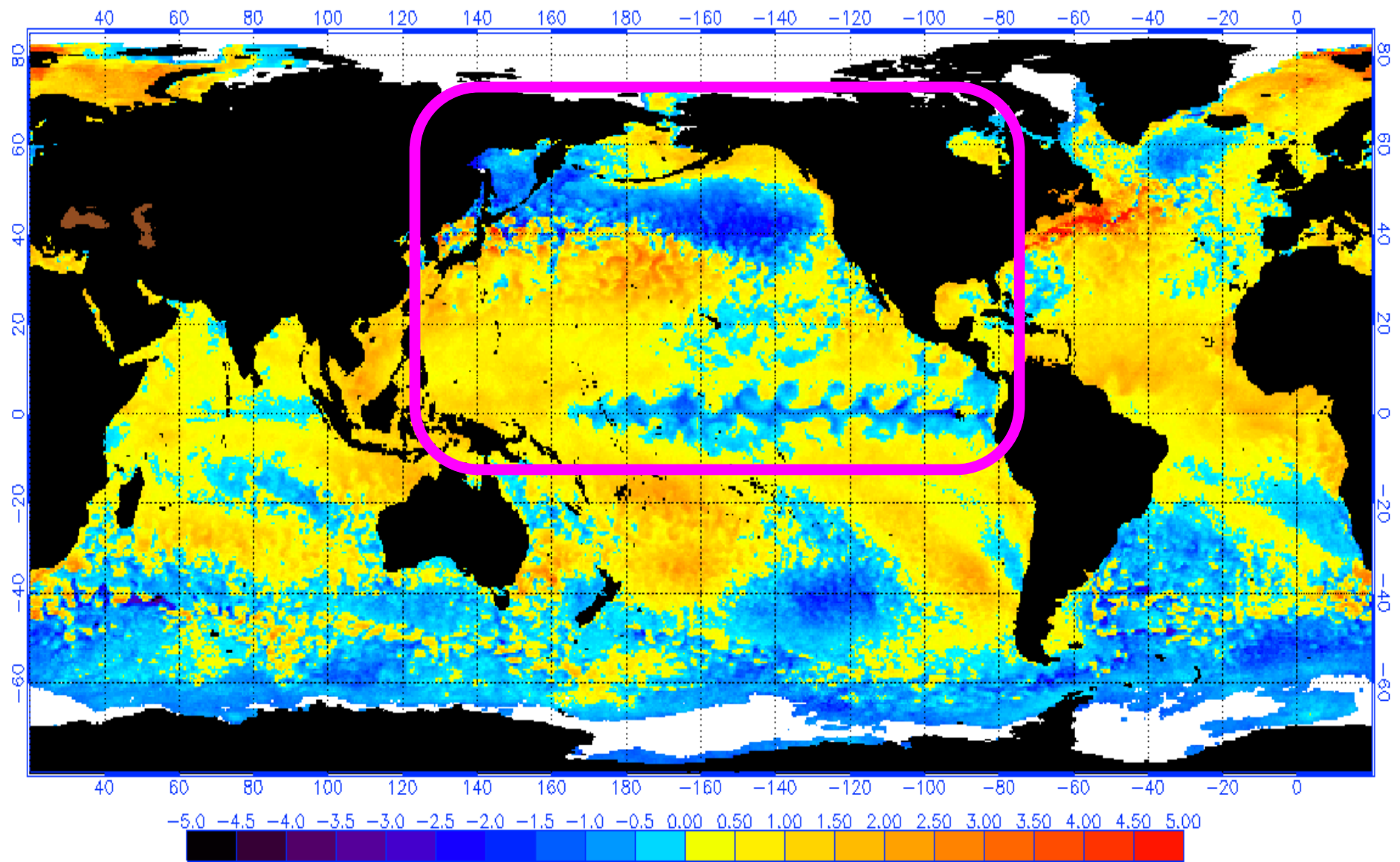
12/ 3 /2015



Weather patterns – winter 2016/2017 – slight La Nina ENSO signal
– cooler waters in north Pacific

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 12/5/2016
(white regions indicate sea-ice)

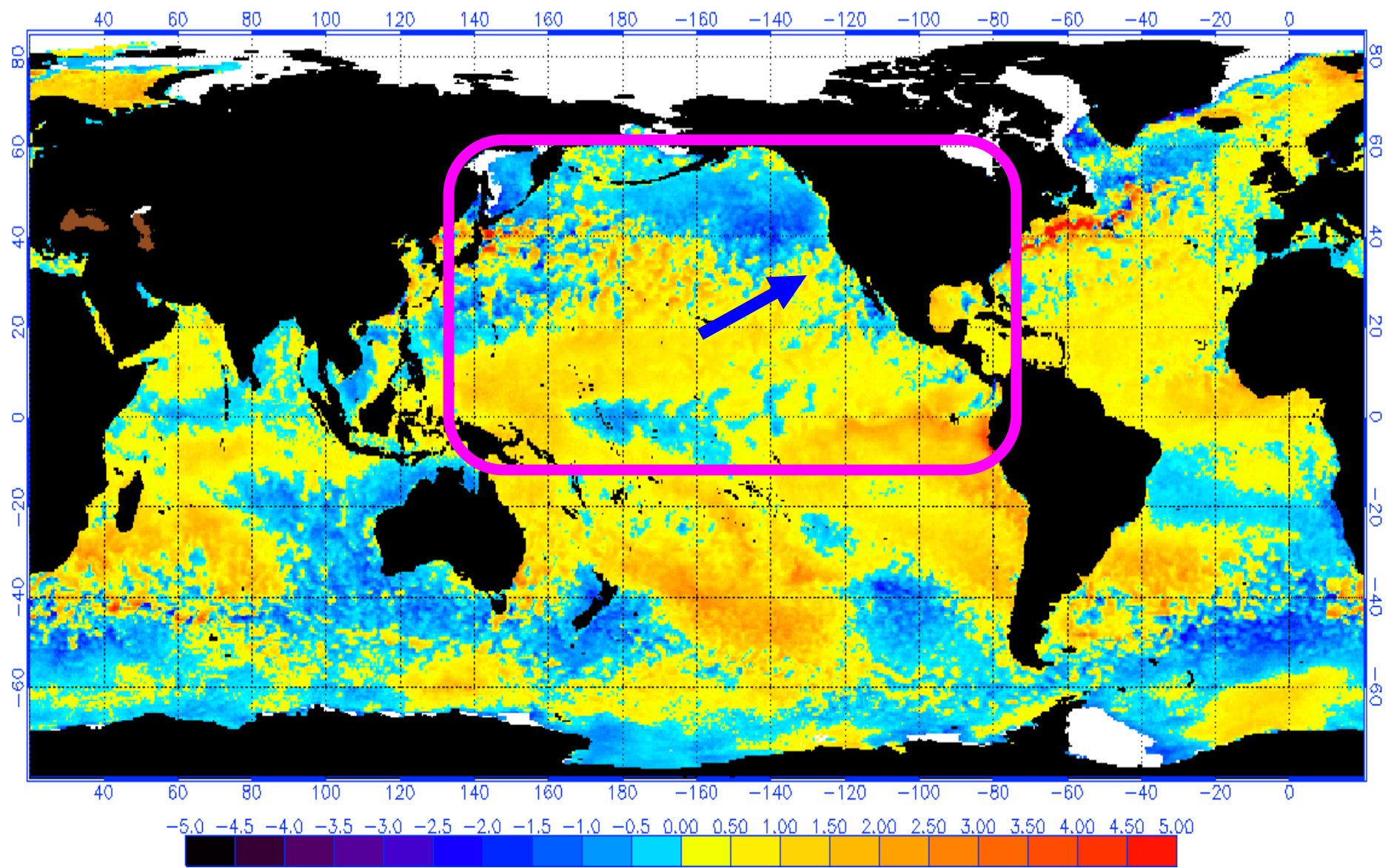
12/ 5 /2016



Weather patterns – winter storm track for 2016/2017

2/ 20 /2017

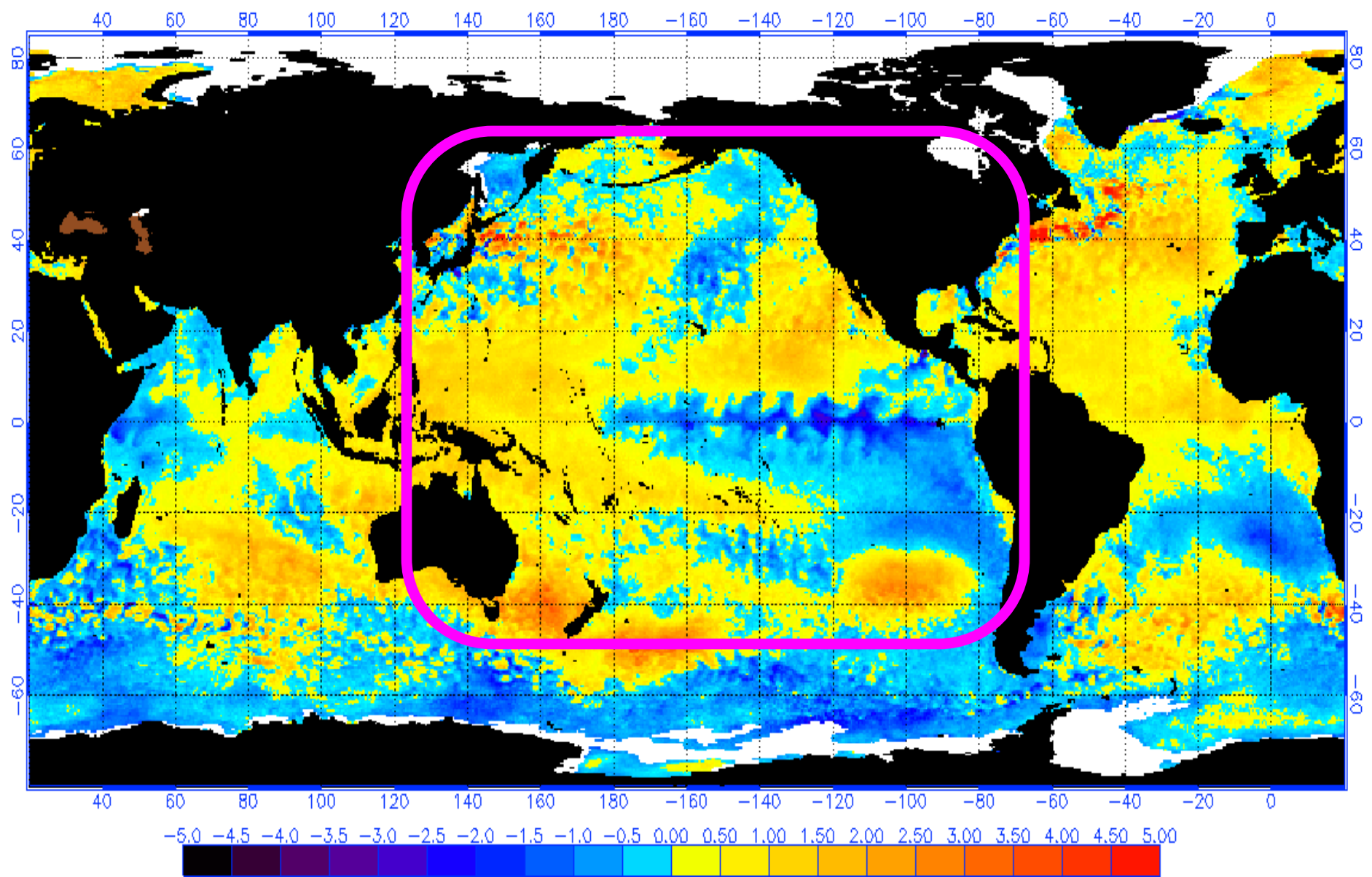
NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 2/20/2017
(white regions indicate sea-ice)



Current ocean temperatures for 2017/2018 winter

1/ 18 /2017

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 1/8/2018
(white regions indicate sea-ice)



Weather patterns - 45 Atmospheric Rivers made landfall on West Coast
The atmospheric river activity was unprecedented in the 70-year record

Take Home Point – Oceans & Atmosphere are very active following Strong El Nino
Years and have a lot of energy to get rid of... and that’s what happened

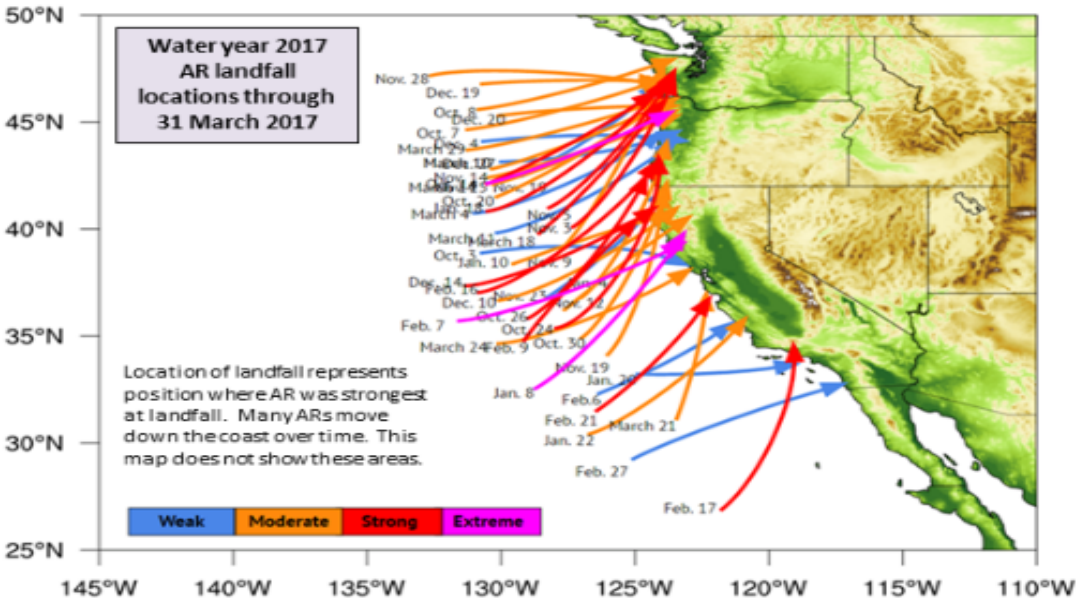
Distribution of Landfalling Atmospheric Rivers on the U.S. West Coast
(From 1 Oct 2016 to 31 March 2017)

AR Strength	AR Count*
Weak	11
Moderate	20
Strong	12
Extreme	3

Ralph/CW3E AR Strength Scale	
Weak	IVT=250–500 kg m ⁻¹ s ⁻¹
Moderate	IVT=500–750 kg m ⁻¹ s ⁻¹
Strong	IVT=750–1000 kg m ⁻¹ s ⁻¹
Extreme	IVT>1000 kg m ⁻¹ s ⁻¹

*Radiosondes at Bodega Bay, CA indicated the 10–11 Jan AR was strong (noted as moderate based on GFS analysis data) and 7–8 Feb AR was extreme (noted as strong)

- 45 Atmospheric Rivers have made landfall on the West Coast thus far during the 2017 water year (1 Oct. – 31 March 2017)
- This is much greater than normal
- 1/3 of the landfalling ARs have been “strong” or “extreme”



Center for Western Weather
and Water Extremes

SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

By F.M. Ralph, B. Kawzenuk, C. Hecht, J. Kalansky

Experimental

**Analysis of
Streamflow
for a year
like 2017
that follows
a Strong El
Nino Year
like 2016**

sorted									
Streamflow as % of 1981-2010 Average									
Year	ENSO	Year Following a Strong El Nino	ENSO	Feb-Sep Owyhee River blw Dam	Apr-Sep Salmon Falls Creek	Apr-Sep Boise River nr Boise	Apr-Sep Big Wood River blw Magic Dam	Apr-Sep Snake River nr Heise	Apr-Sep Spokane River nr Post Falls
1978	SE	1979	N	97	116	63	34	90	105
1941	SE	1942	SE	122	173	91	117	86	77
1988	SE	1989	SL	145	100	97	75	102	116
1966	SE	1967	N	69	88	105	151	109	113
1947	SE	1948	LN	58	86	105	66	97	176
1952	SE	1953	N	56	76	124	92	92	108
1998	SE	1999	SL	100	108	135	158	131	129
1994	SE	1995	SE	124	135	138	195	118	70
1995	SE	1996	N	124	115	152	132	148	116
1983	SE	1984	N	363	369	158	206	133	112
1973	SE	1974	SL	120	111	181	184	147	193
1942	SE	1943	N	137	150	209	259	144	150
2016	SE	2017	LN	155	161	180	266	163	112
12 years				Color coded streamflow as % of average					
				<60					
				60-90					
				90-110					
				~111-130					
				>130					

1998/1999 Mt Baker set word snowfall with 95 feet of snowfall

Reservoir Storage Projection for Spring 2018

As of October 30, 2017 -- Updated January 9, 2018 with end of month storage levels

Projected change in reservoir storage from Fall 2017 to start of runoff season in Spring 2018.

	Sep 30 storage KAF	Observed Oct 31 storage KAF	Observed Nov 30 storage KAF	Observed Dec 31 storage KAF	Projected Jan 31 Storage KAF	Projected Feb 28 storage KAF	Projected Mar 31 storage KAF	Estimated change in storage KAF
Boise Reservoir	603.3	584.9	663.5	719.5			800	197
Magic Reservoir	107.8	123.8	138.9	150.4			160	52
Little Wood Reservoir	12.7	12.4	17.5	21.4		22		9
Mackay Reservoir	38.1	38.1	37.6	33.6			20	-18
Jackson & Palisades Reservoir System	1909.8	1929.9	2016.0	2009.9			1900	-10
Oakley Reservoir	28.5	29.7	31.7	33.4		38		10
Salmon Falls Reservoir	92.8	92.1	92.7	93.1		97		4
Lake Owyhee	432.2	422.0	441.5	461.4	480			48
Bear Lake	1114.5	1090.7	1058.6	1035.5			1000	-115

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

Amount of Runoff Needed in 2018 for Adequate Irrigation Supply

Summary Table: Amount of streamflow needed in 2018 for adequate surface irrigation supplies.

For complete summary see: Surface Water Supply Index (SWSI)

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/id/snow/waterproducts/?cid=stelprdb1240689>

Created: October 30, 2017

Updated: December 1, 2017

Fall reservoir carryover storage is used to project spring reservoir storage levels based on current conditions and recent trends. Then, by knowing the adequate irrigation water supply needed in your basin, the projected spring reservoir volumes are subtracted from the adequate irrigation supply to determine the volume of streamflow to marginally meet adequate surface irrigation supplies in 2018.

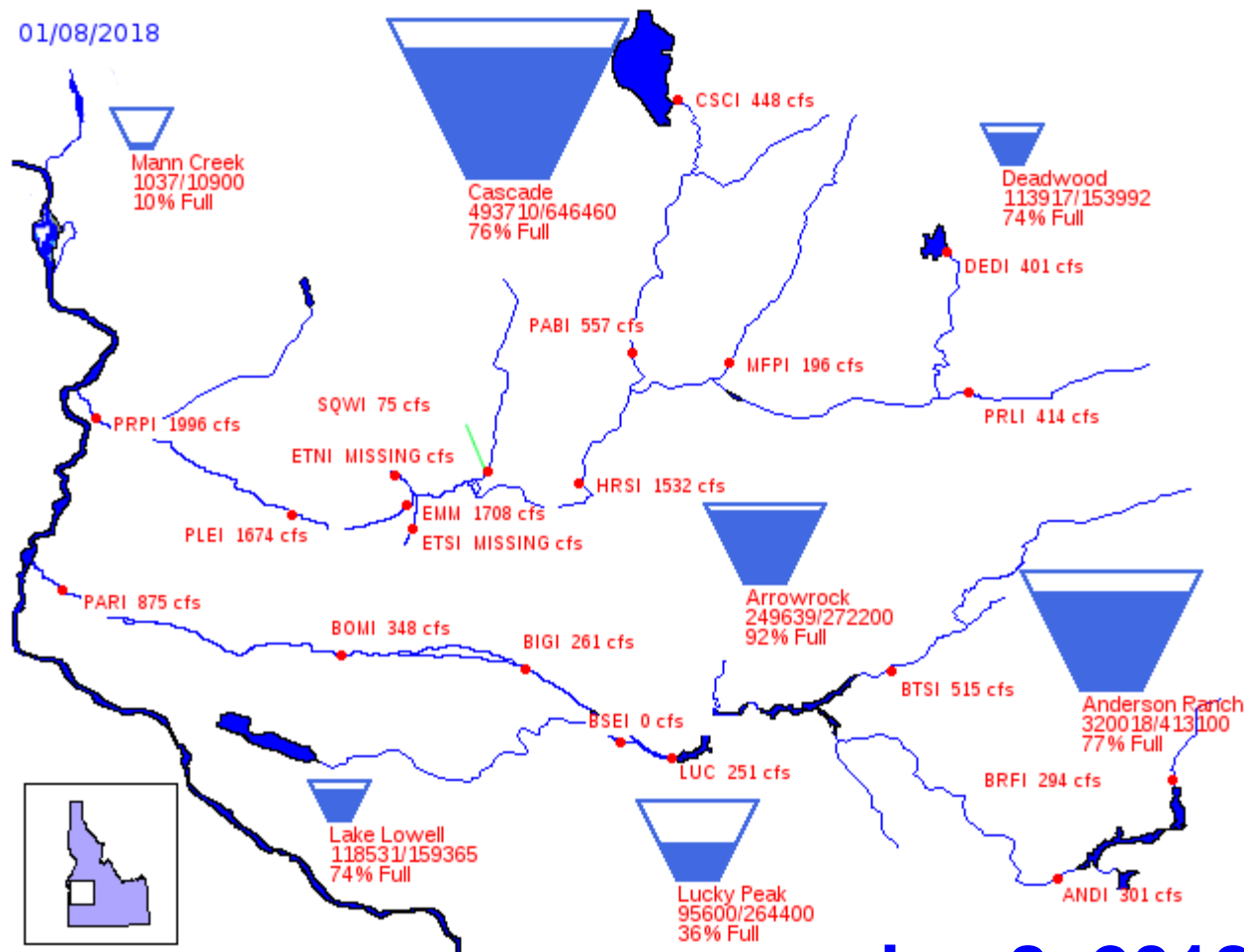
Column 2 - Column 3 = Column 4 Col4/Col6 X 100= Col 5									
Column 1	2	3	4	5	6	7	9		
Basin	Amount needed for adequate irrigation water supply KAF	Projected end of month reservoir storage (Jan, Feb or Mar) KAF	2018 streamflow volume needed for adequate water supply KAF	% of average streamflow to meet adequate irrigation supply in 2018 KAF	1981-2010 average streamflow KAF	Streamflow runoff period used in the analysis	2017 Streamflow Runoff KAF % of average		
Boise	1500	800	700	51%	1360	Apr-Sep	2460	181%	
Big Wood	275	160	115	43%	265	Apr-Sep	707	267%	
Little Wood	60	22	38	41%	92	Mar-Sep	250	272%	
Big Lost	180	20	160	107%	150	Apr-Sep	310	207%	
Little Lost	40	---	40	118%	34	Apr-Sep	48.5	143%	
Teton	85	---	85	44%	193	Apr-Sep	285	148%	
Snake (Heise)	4,400	1900	2500	66%	3,780	Apr-Sep	6116	162%	
Oakley	50	38	12	39%	31	Mar-Sep	48.6	157%	
Salmon Falls	110	97	13	15%	85	Mar-Sep	157	185%	
Owyhee	575	480	95	14%	665	Feb-Sep	1030	155%	
* Bear River	280	1000	35	17%	205	Apr-Sep	540	263%	

* Based on **Bear River** reservoir allocation: only 245 KAF in storage can be used in 2018 and remaining 35 KAF to meet adequate irrigation supply is from runoff.

Bureau of Reclamation, Pacific Northwest Region

Major Storage Reservoirs in the Boise & Payette River Basins

01/08/2018



PROVISIONAL DATA - Subject to change

Jan 8, 2018

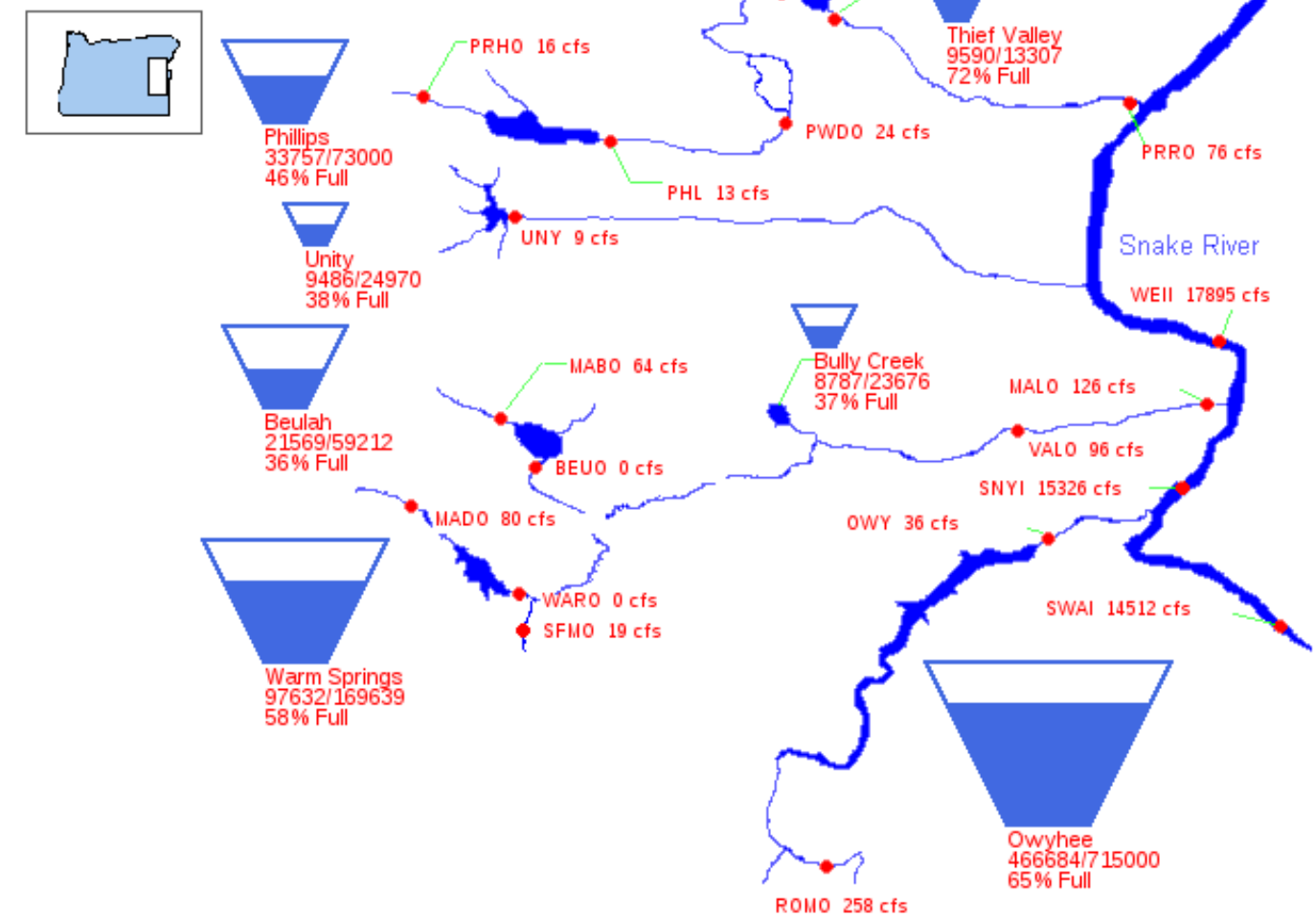
Boise 70% of capacity

Payette 76% of capacity

US Bureau of Reclamation, Pacific Northwest Region

Major Storage Reservoirs in Southeastern Oregon

01/08/2018

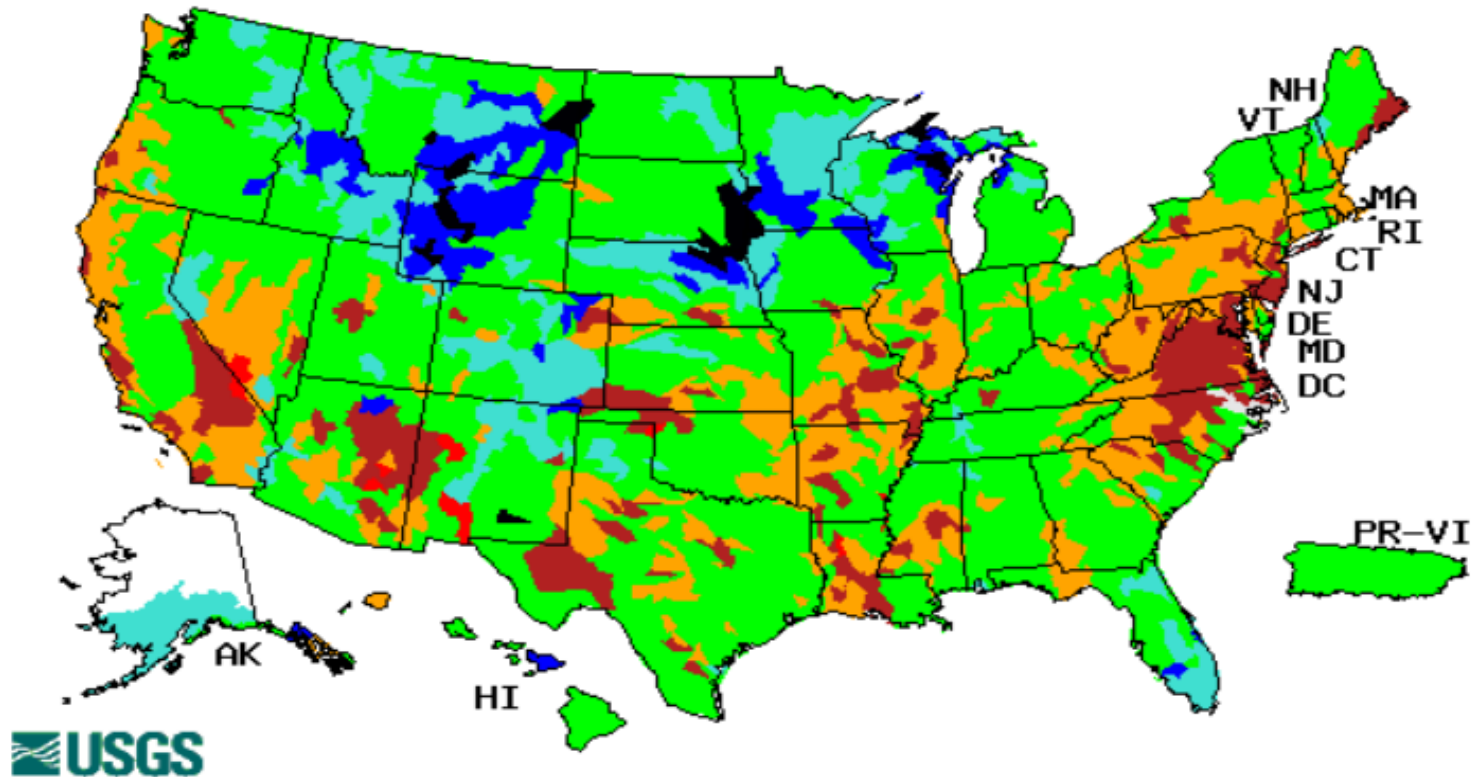


Jan 8, 2018
Owyhee 65% of capacity

Map of monthly-average streamflow for the month of year

December 2017 ▾

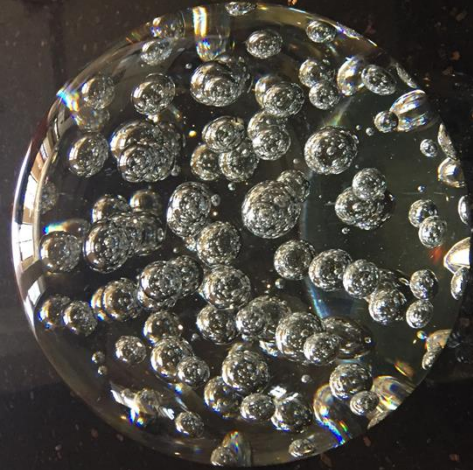
December 2017



Search USGS streamgage 🔍

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	No Data
	Much below normal	Below normal	Normal	Above normal	Much above normal		

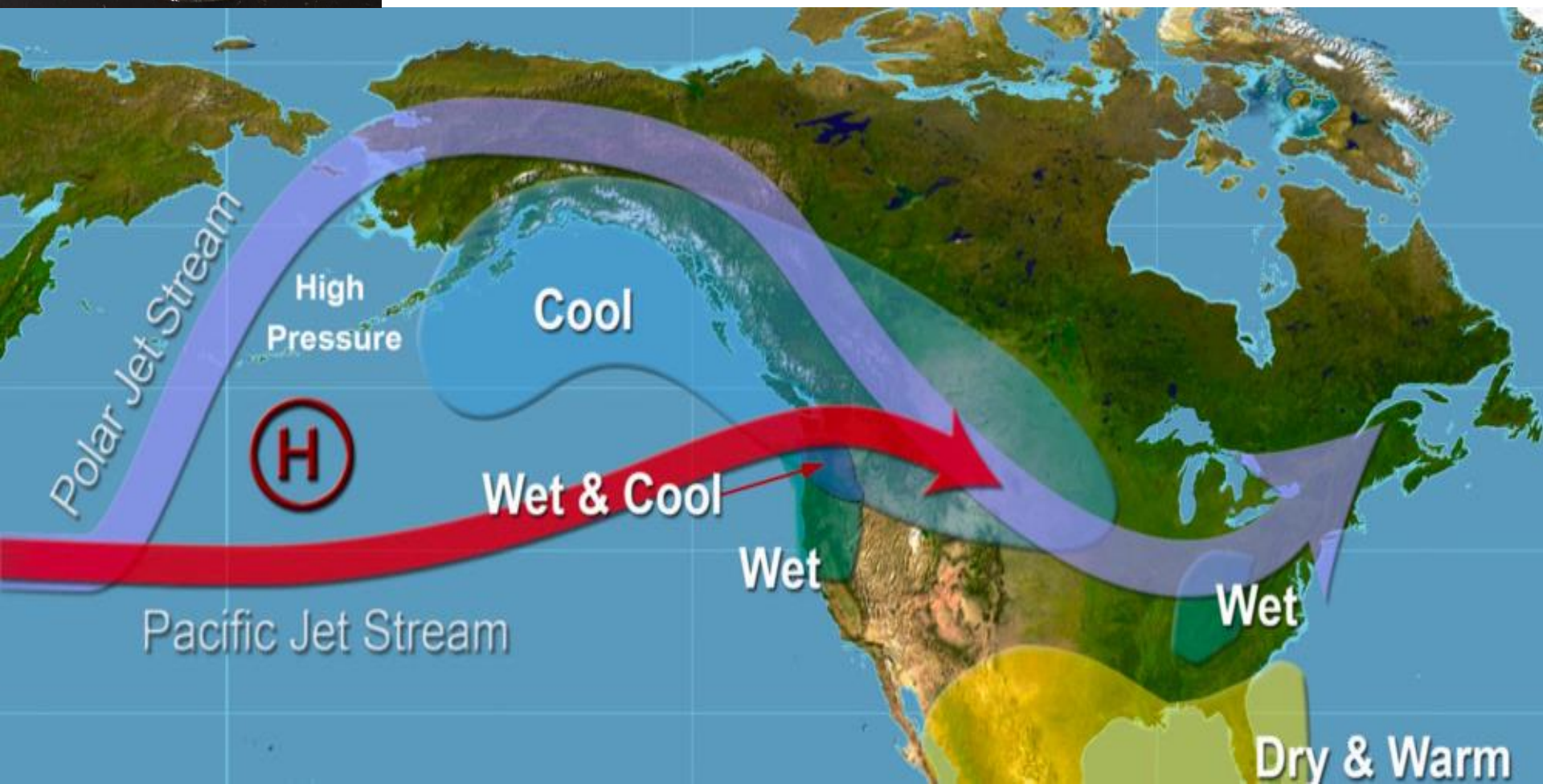




**2018 Winter
Weather OutlookS
&
Crystal Balls**

**La Niña – Weaker is Favorable
for Idaho Precipitation**

**Pete Parsons from Oregon
analog years
1962/63, 1967/68, 2005/06**



NOAA Outlook J F M

Temperature

Made 21 Dec 2017

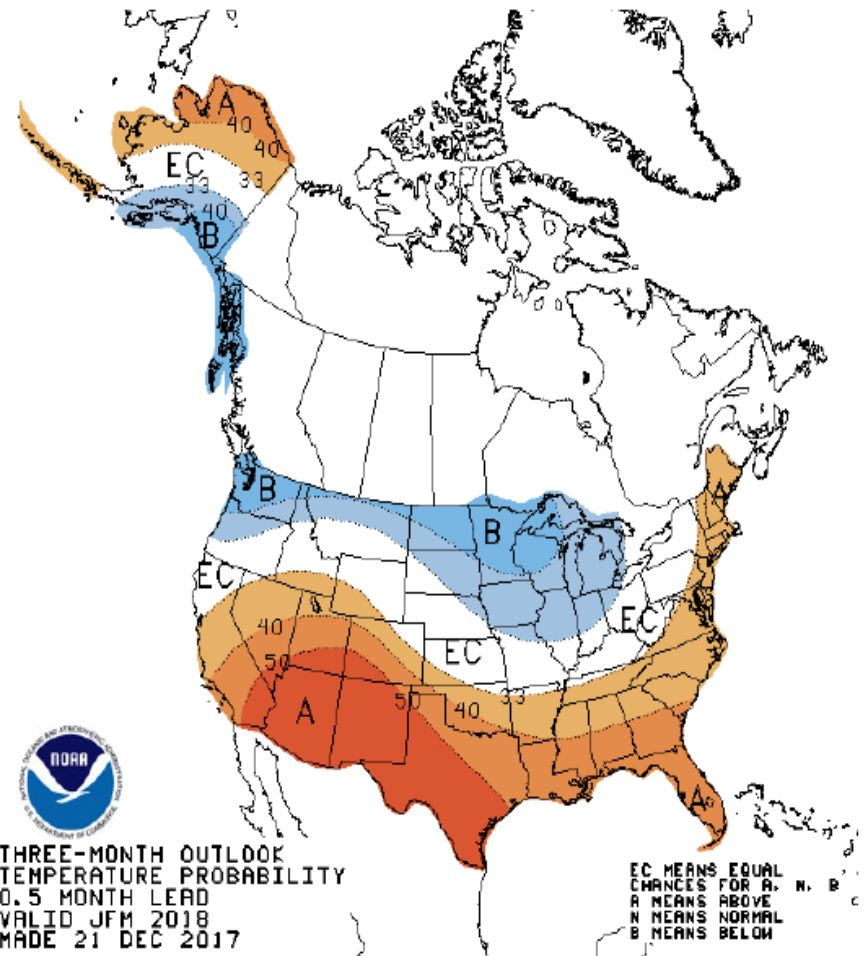
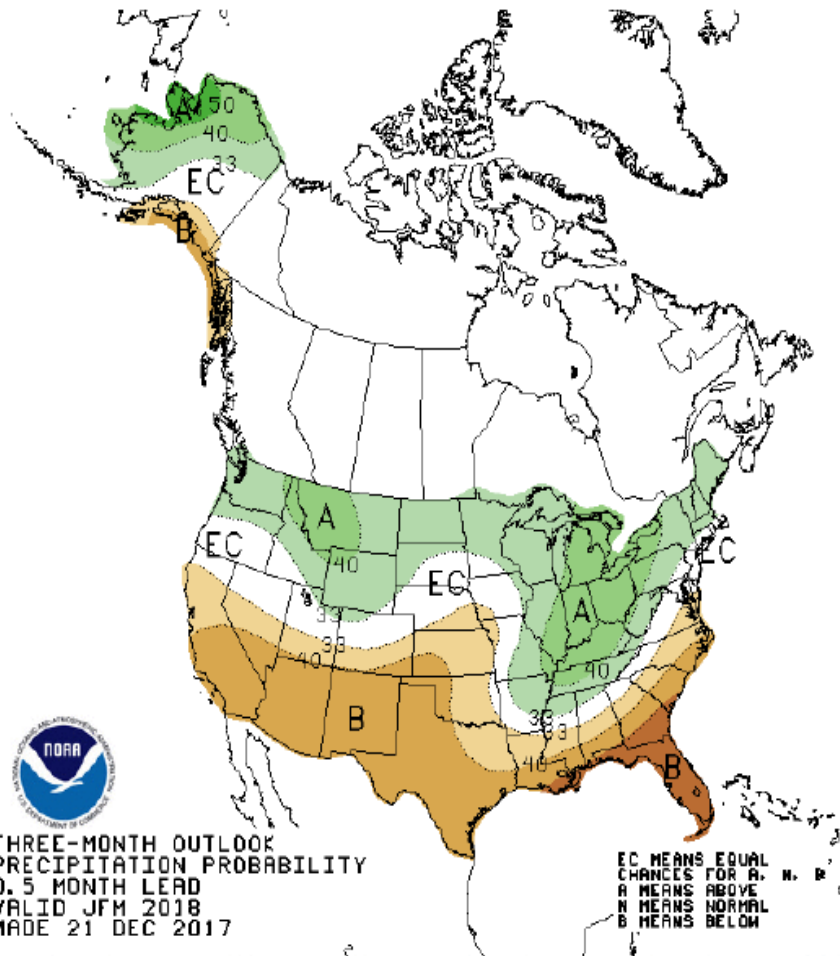
Precipitation

Climate Prediction Center 3-Month Outlook

Source: National Weather Service

Precipitation

Temperature



2017-18 Winter Outlook [Matthew Holliday](#) | November 12, 2017 |

Brief Forecast Discussion:

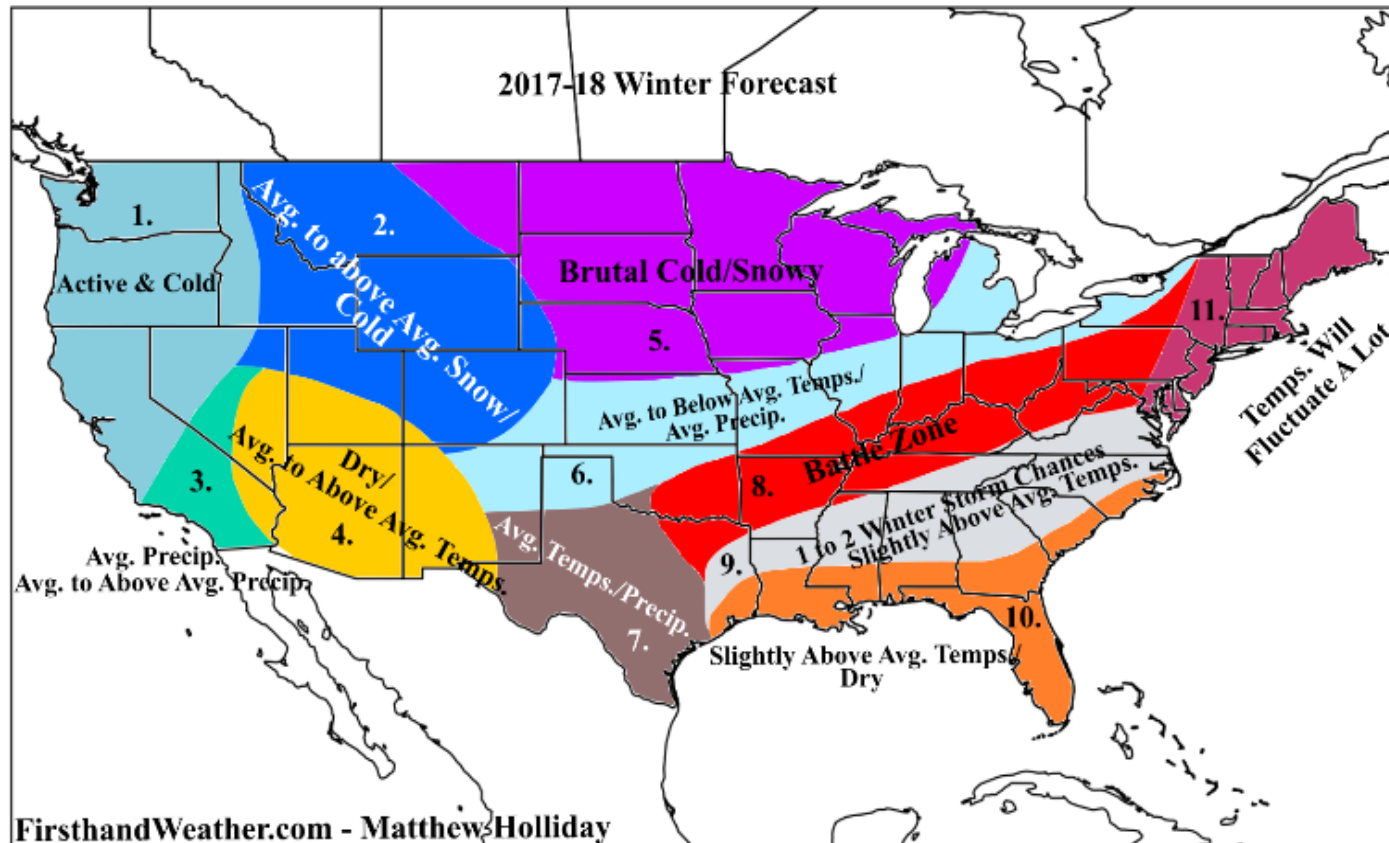
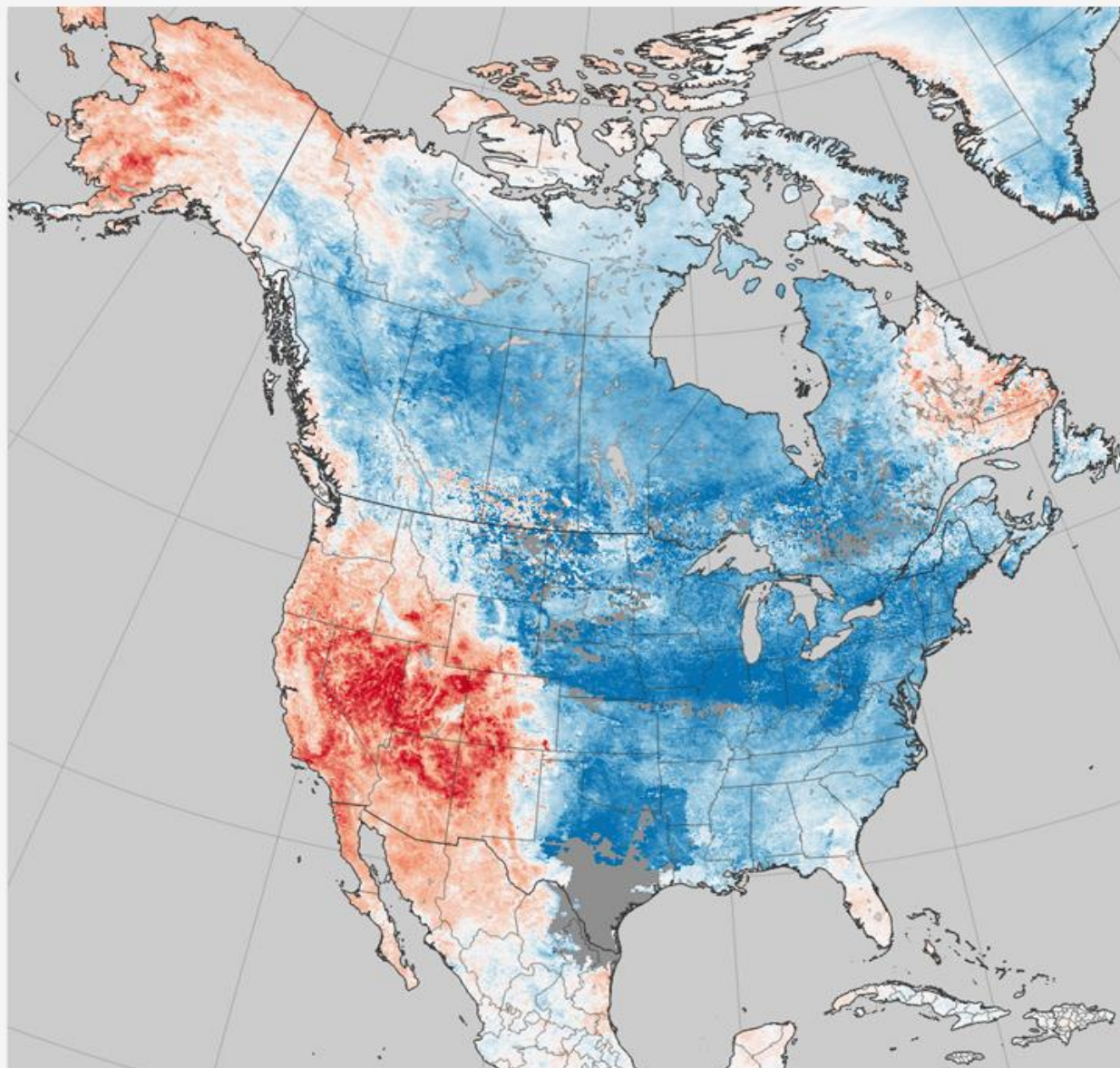


Figure 3: Firsthand Weather's official 2017-18 Winter Outlook

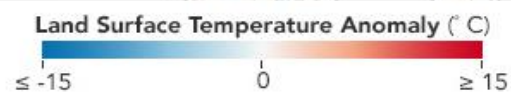
This winter is probably going to be characterized by a lot of volatility in the pattern, particularly in regions 8, 9, and 11. We've already seen quite a bit of that this month (November). If you happen to



It's Cold—And
Hot—in North
America

Land Surface Temperatures

Dec 26 2017 to Jan 2
2018



acquired December 26, 2017 - January 2, 2018

Figure 1: Dipole pattern from one extreme to the other.

From

California from drought to deluge

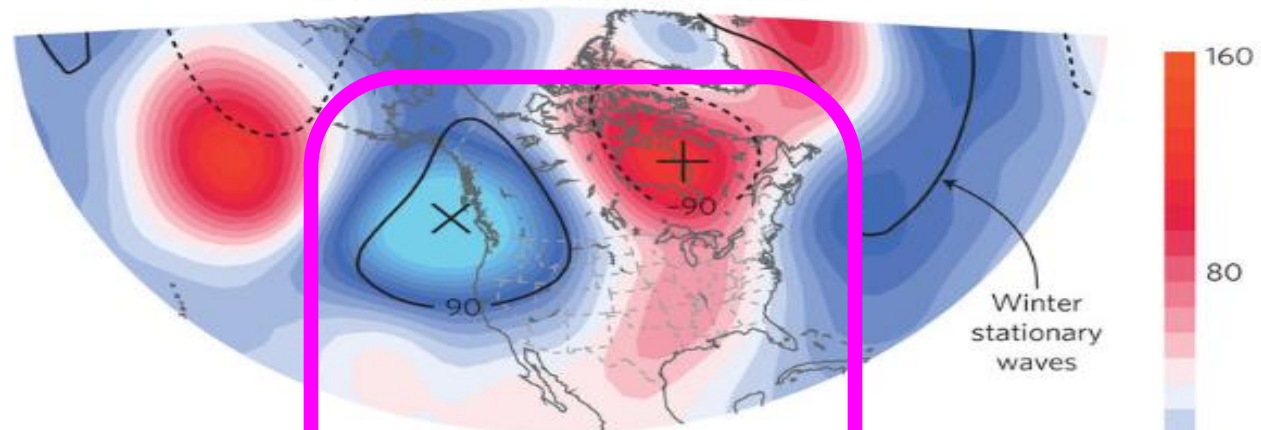
S.-Y. Simon Wang, Jin-Ho Yoon, Emily Becker & Robert Gillies

Nature Climate Change 7, 465–468 (2017) | doi:10.1038/nclimate3330

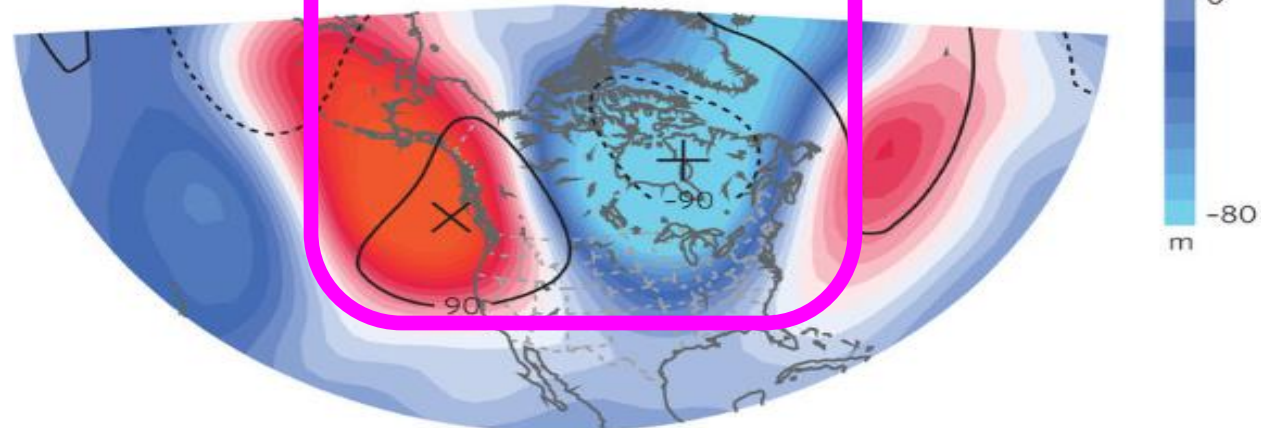
Published online 30 June 2017

a 2016–2017 flooding in California

250-hPa geopotential height anomalies



b 2013–2014 drought in California





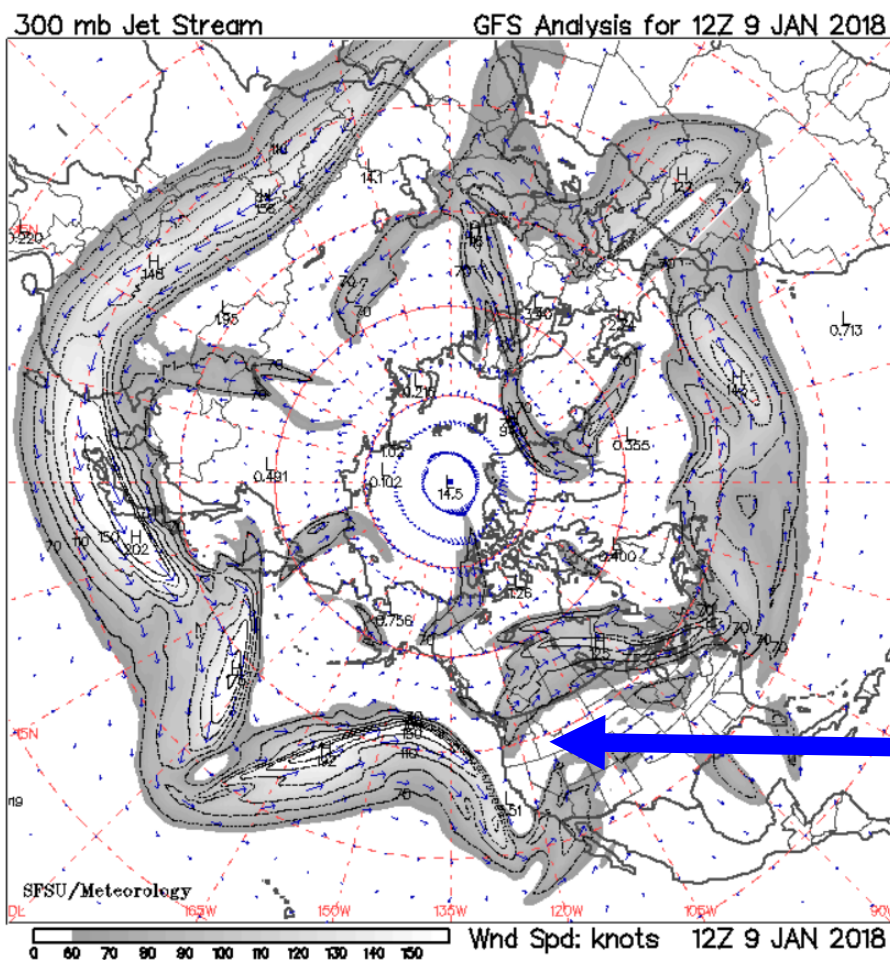
SV Avalanche Report Jan 9, 2018

Yesterday was the last day of uneventful weather before entering a more active weather pattern.

Observers reported scattered clouds, calm to light winds, and temperatures that reached around 30 degrees. **The only thing of note was a trace of new snow observed yesterday morning that slipped under the radar of remote weather stations.**

Overnight, winds have increased out of the south and snow has begun to fall as a significant weather system moves into our region. Given how today's avalanche conditions will be closely tied with the weather forecast, **I wish there was more certainty in what this storm will produce. The split-flow pattern makes forecasting difficult, and predicting snowfall amounts is like playing darts blindfolded.**

What seems fairly certain is that the bulk of our area should pick up around 4-8 inches of new snow by tomorrow morning. I wouldn't be surprised if we received locally heavier amounts in a few areas. Snow levels are expected to climb as high as 6500-7000 feet during the day, so valley locations could see rain.



THE IDAHO DAILY SNOW



by Meteorologist Coleen Haskell

Coleen has 30 years of weather forecasting experience as a meteorologist with the Air National Guard, the National Weather Service, and the Bureau of Land Management. She currently lives in Boise, Idaho and spends as much time as possible skiing (alpine and nordic) as well as biking and hiking.

**From
Dec 12 2017**

Groundhog Day...Not Much Longer



by Meteorologist Coleen Haskell

1 hour ago

Summary

Although we will see a few high clouds streaming in on Wednesday, there's no significant change in the weather pattern until late Friday. Basically, it's deja-vu until this weekend when a weak storm system will arrive from the Gulf of Alaska. After that, we will start to open the gate for the snow train that will be pushing in for an epic January. Details to come later this week.

After that, we will start to open the gate for the snow train that will be pushing in for an epic January.

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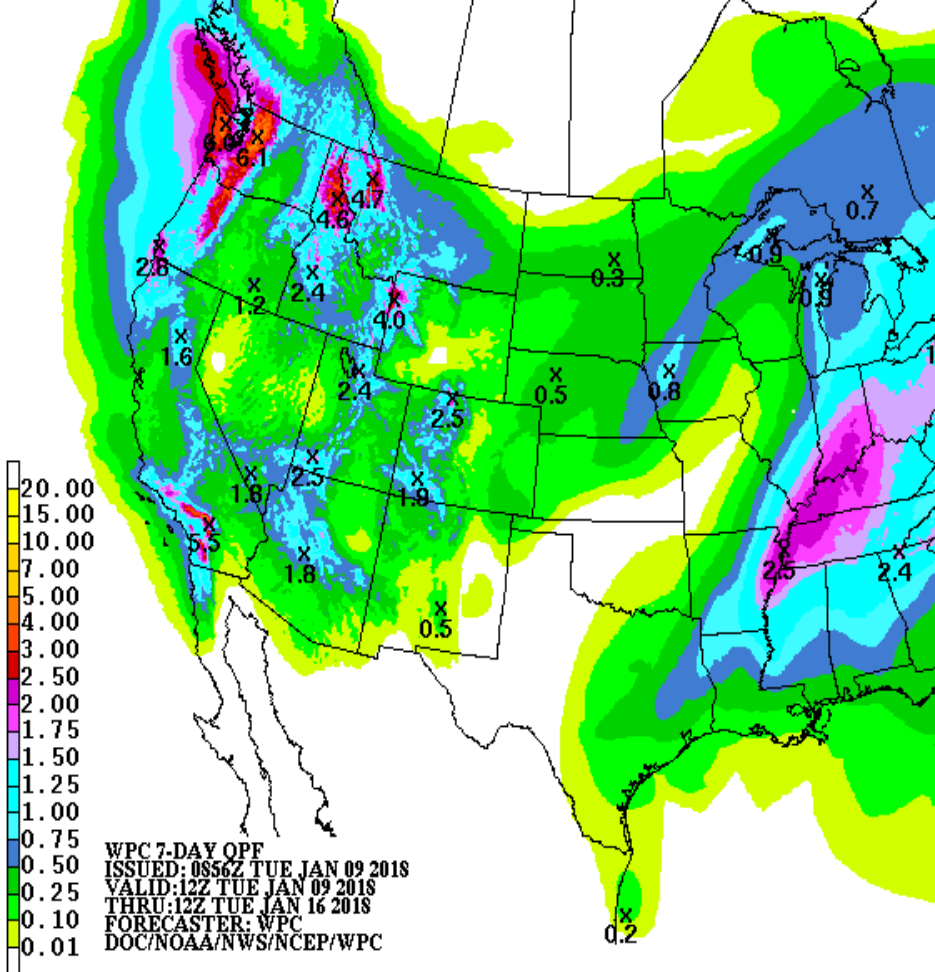


ANDROID APP ON
Google Play

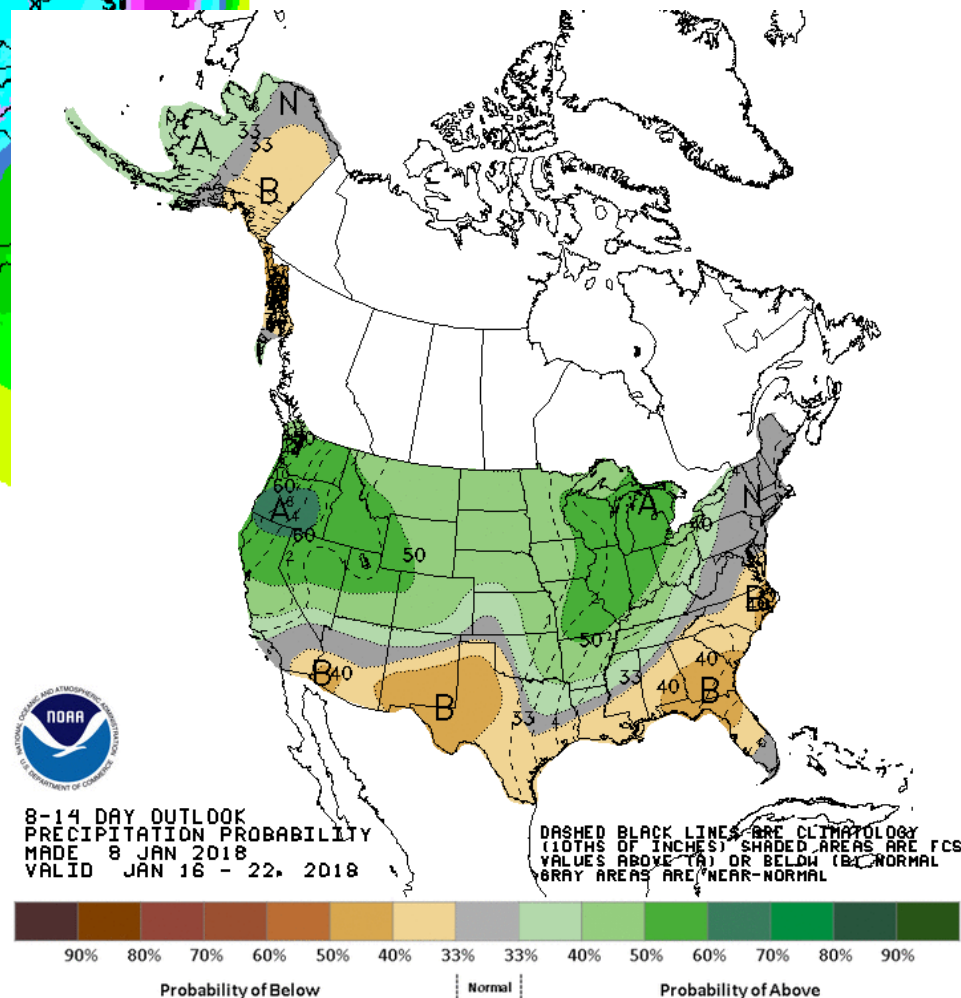


RECOMMENDED RESORTS

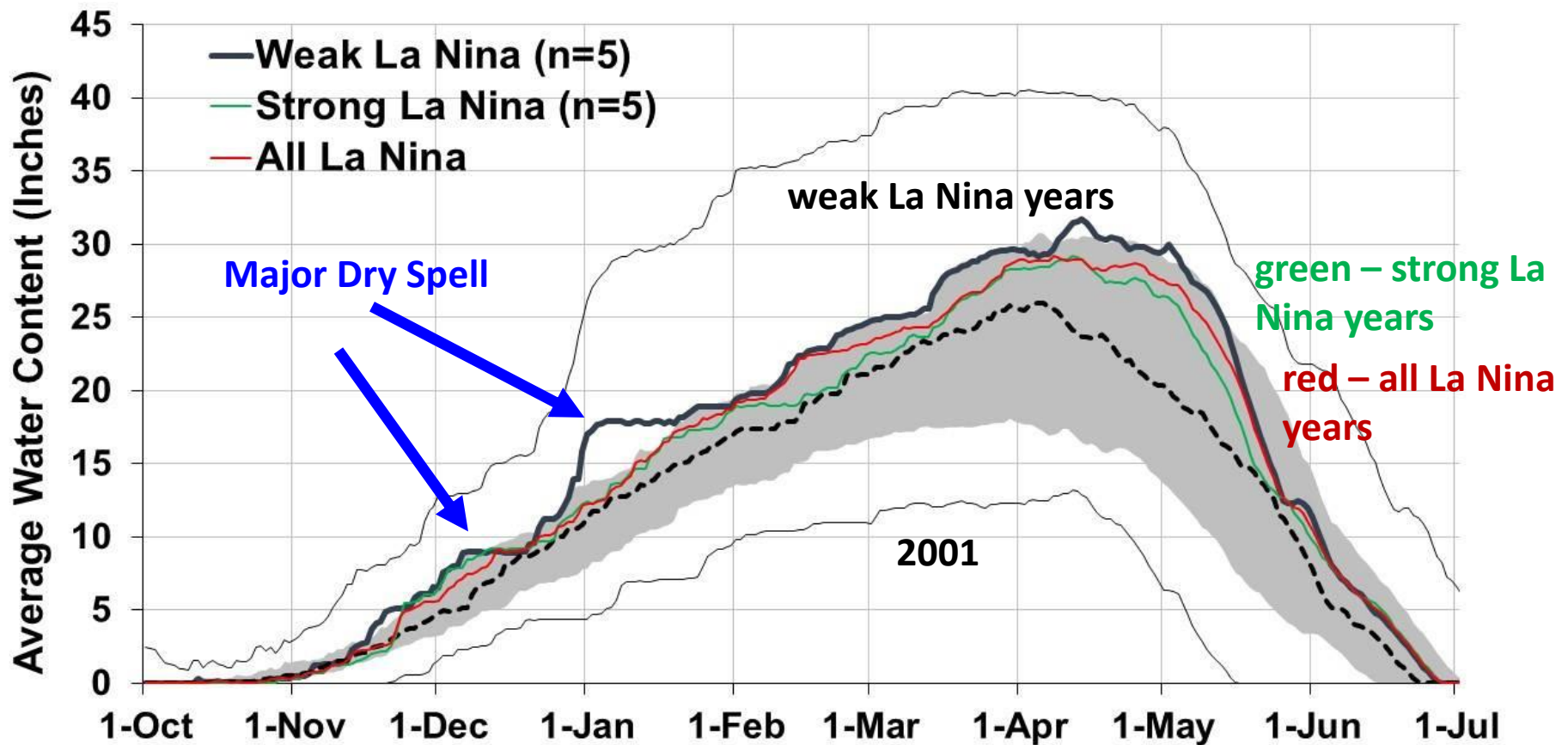
Jan 16-22 Precipitation Forecast



7 Day Total Precipitation Forecast Jan 9-16



Boise Basin Snowpack and Historic Range, 1982-2017



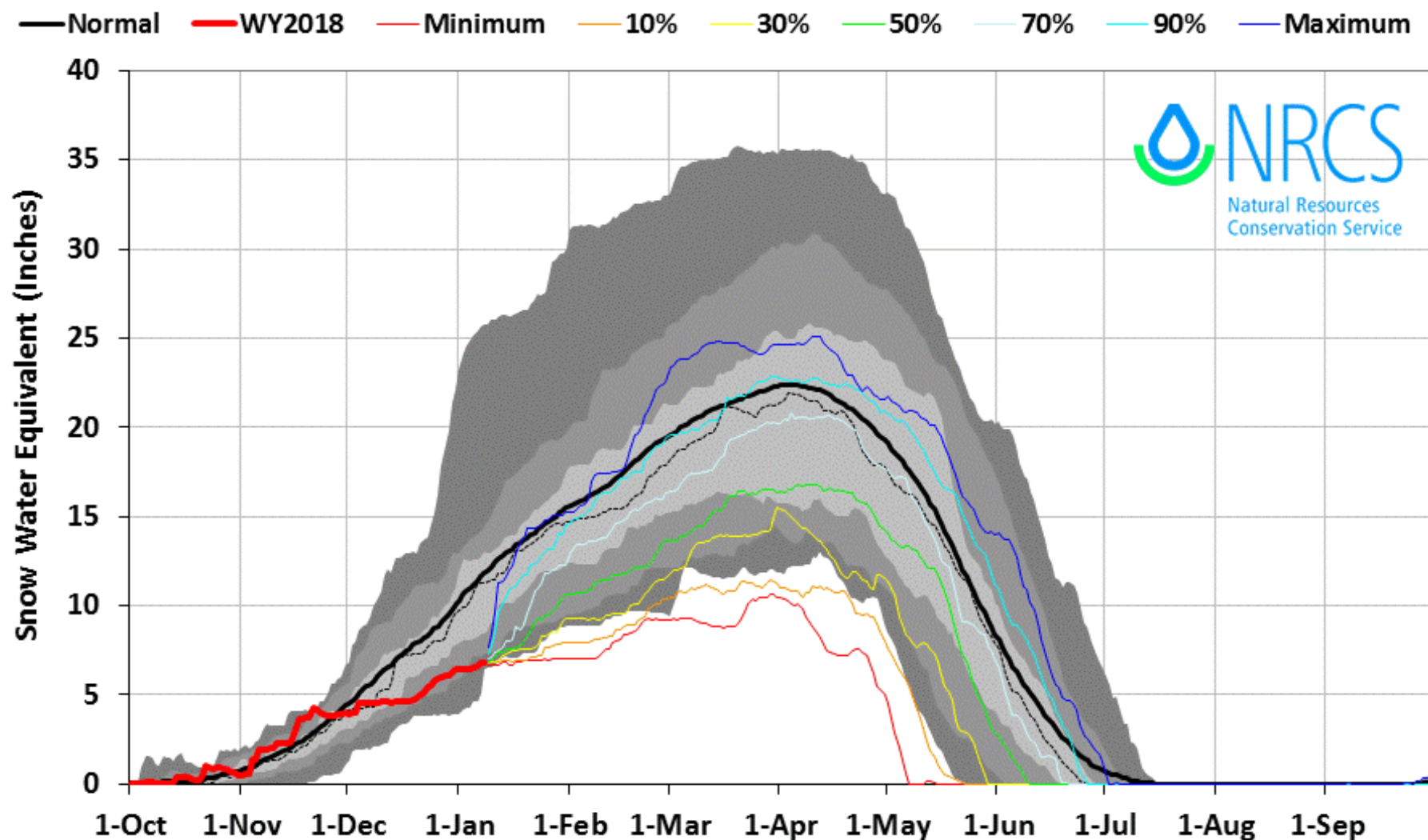
The black dashed line is a “normal snowpack”, while **darker line represents weak La Nina years**, **green – strong La Nina years**, and **red – all La Nina years**.

13 total La Nina events since 1982 - snowpack was above normal 12 of those 13 years in the Boise River basin.

Weak La Nina's appear to produce the most snow, with the median snowpack during 5 La Nina events hovering around or above the 75th percentile.

Danny Tappa

Based on Provisional SNOTEL data as of Jan 08, 2018

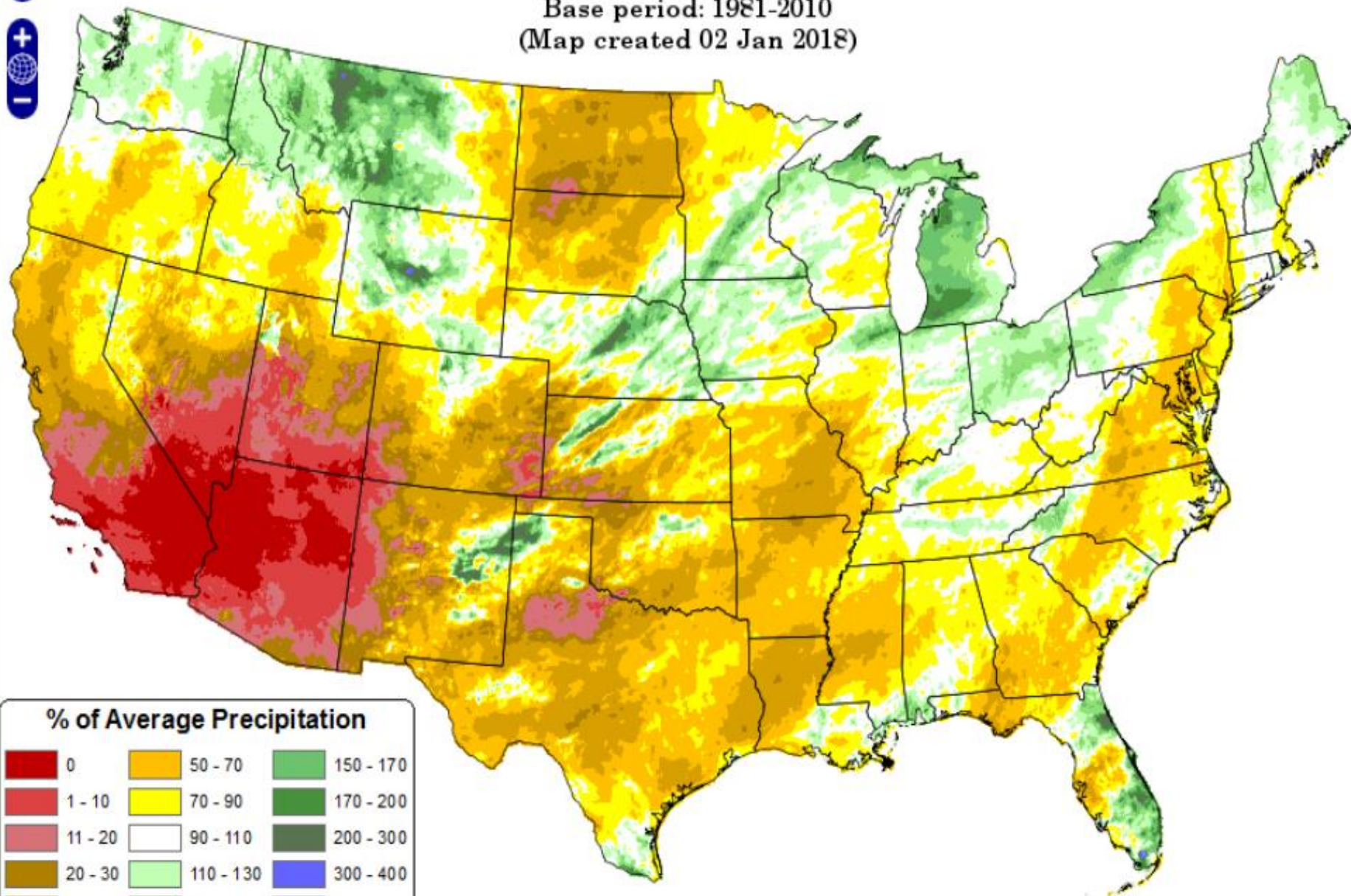


Total Precipitation Anomaly: October 2017 - December 2017

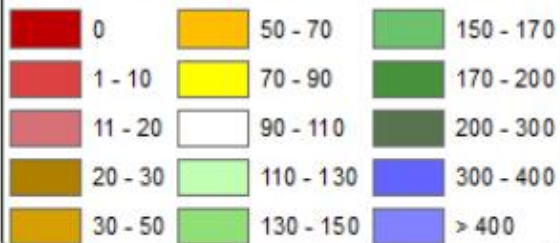
Period ending 7 AM EST 31 Dec 2017

Base period: 1981-2010

(Map created 02 Jan 2018)



% of Average Precipitation

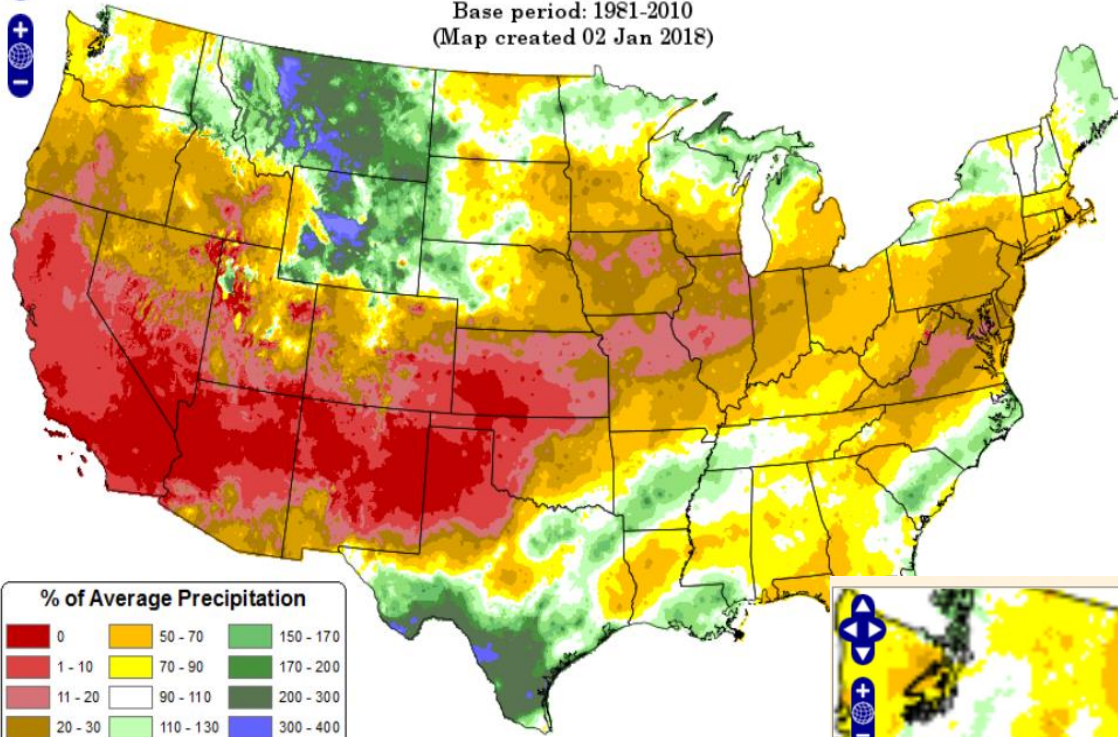


Total Precipitation Anomaly: December 2017

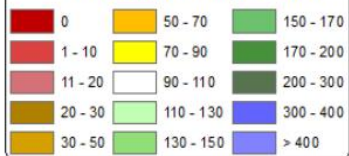
Period ending 31 Dec 2017

Base period: 1981-2010

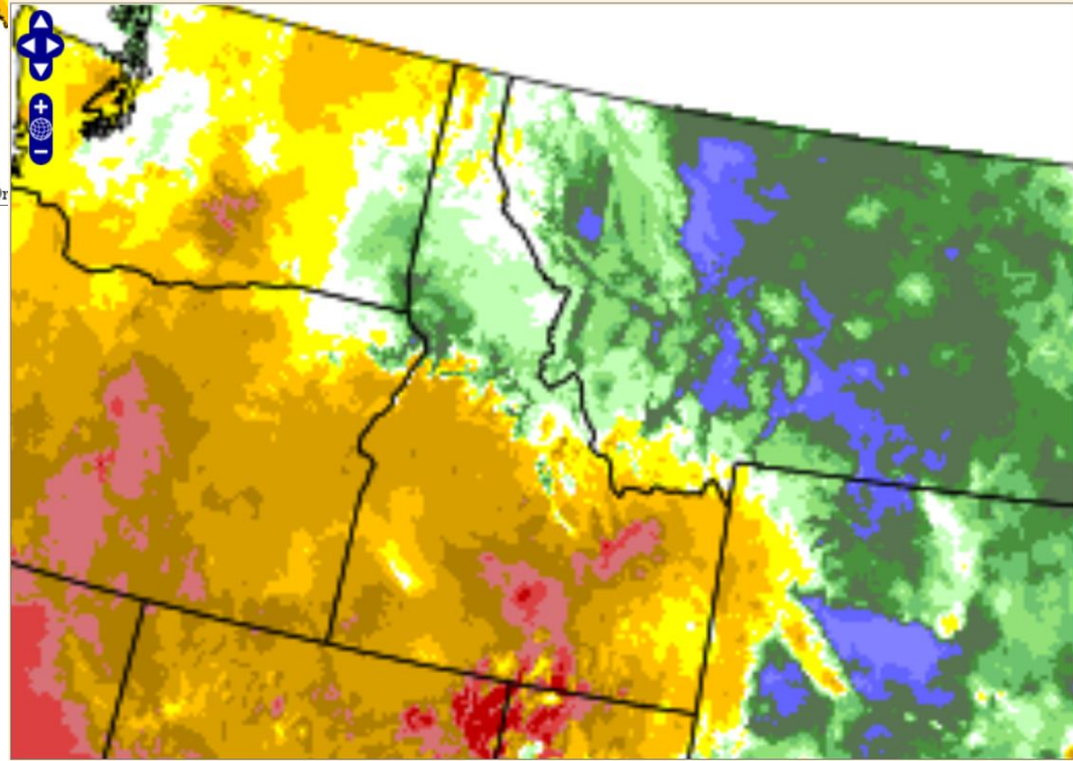
(Map created 02 Jan 2018)



% of Average Precipitation



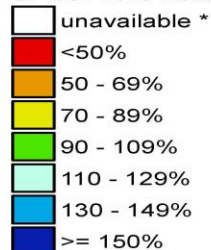
Copyright (c) 2018, PRISM Climate Group, Or



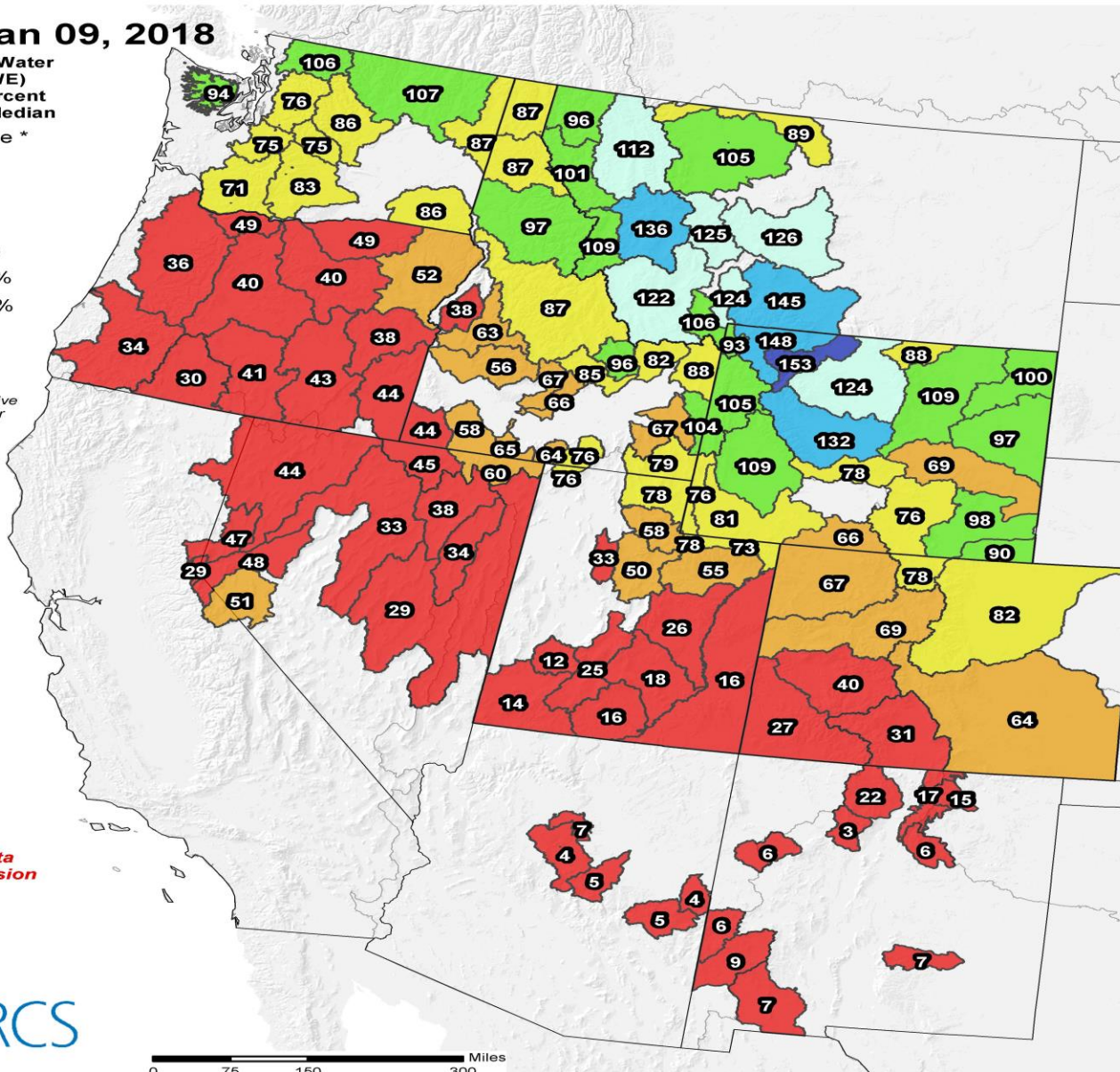
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Jan 09, 2018

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



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



Provisional data
subject to revision



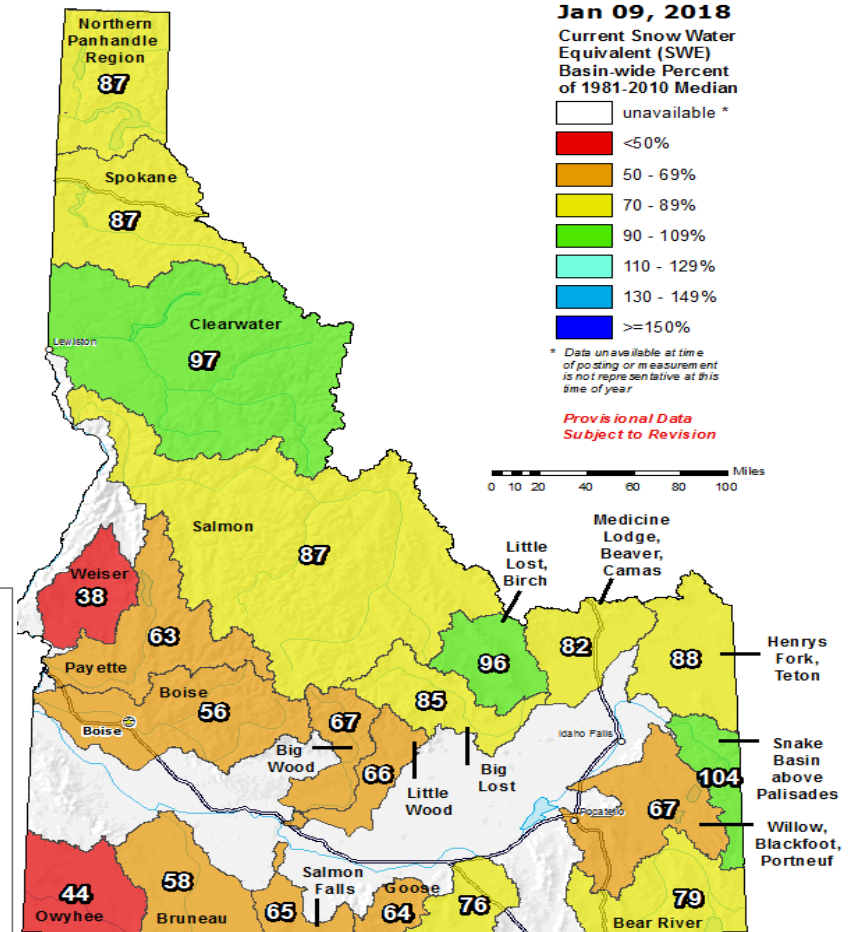
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

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

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



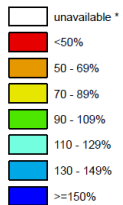
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

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

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

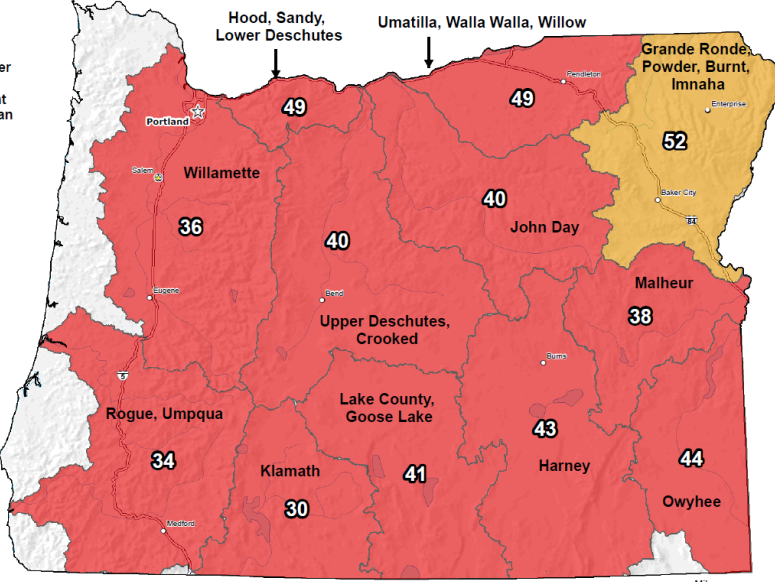
Jan 09, 2018

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



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

*Provisional Data
Subject to Revision*

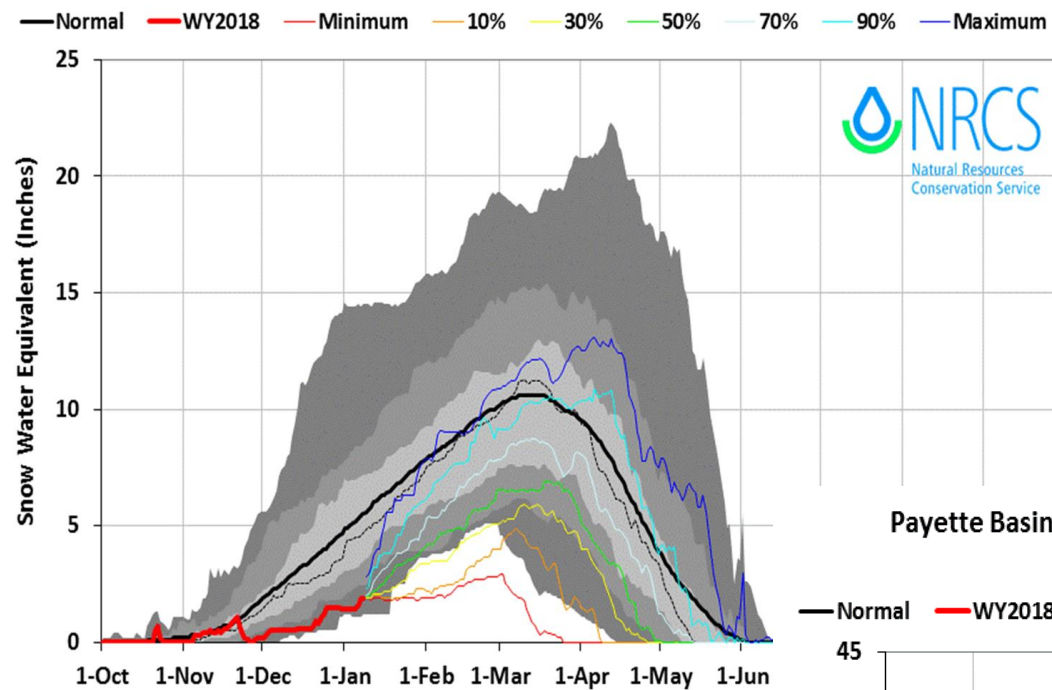


The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:
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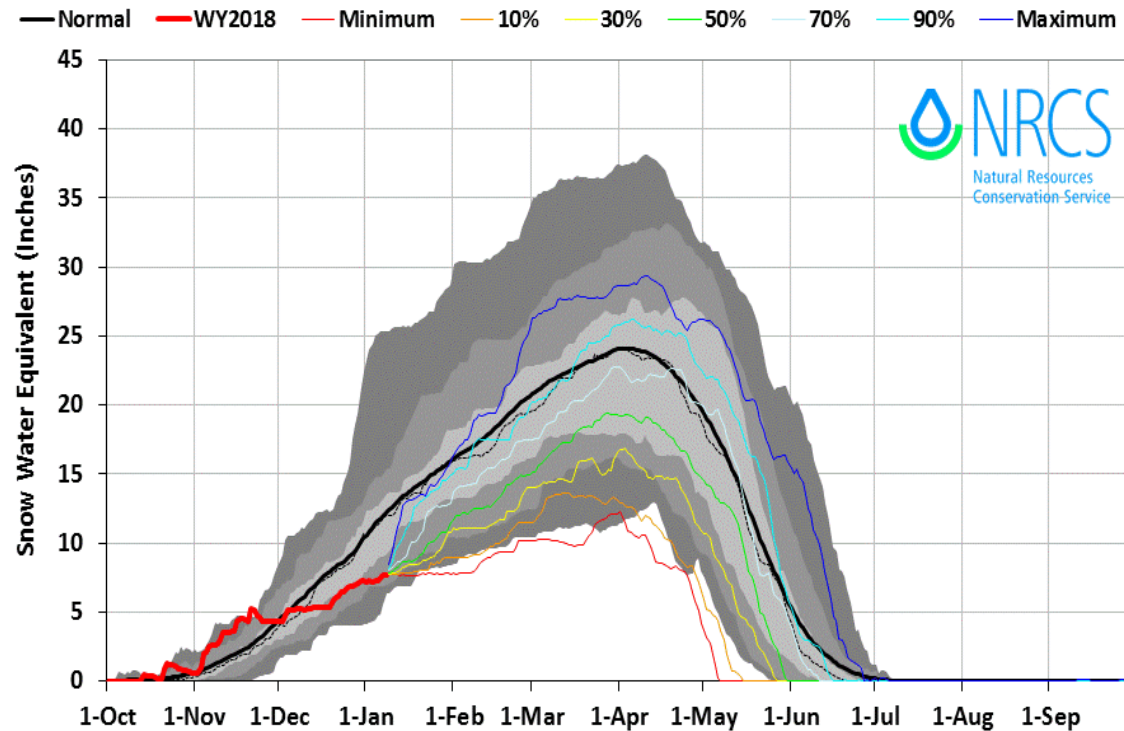
Owyhee Basin 2018 Snow Water with Non-Exceedence Projections (7 sites)

Based on Provisional SNOTEL data as of Jan 08, 2018

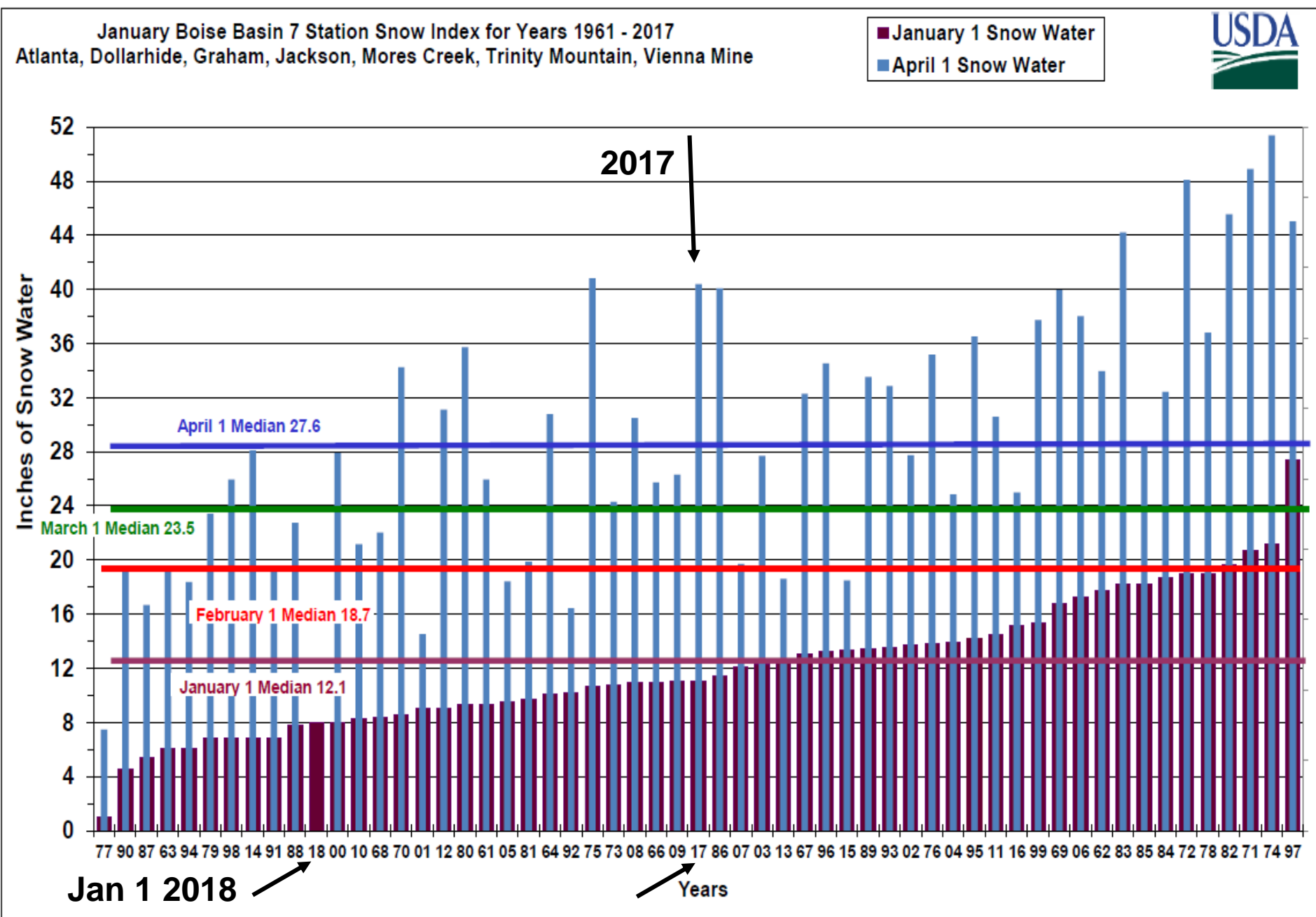


Payette Basin 2018 Snow Water with Non-Exceedence Projections (11 sites)

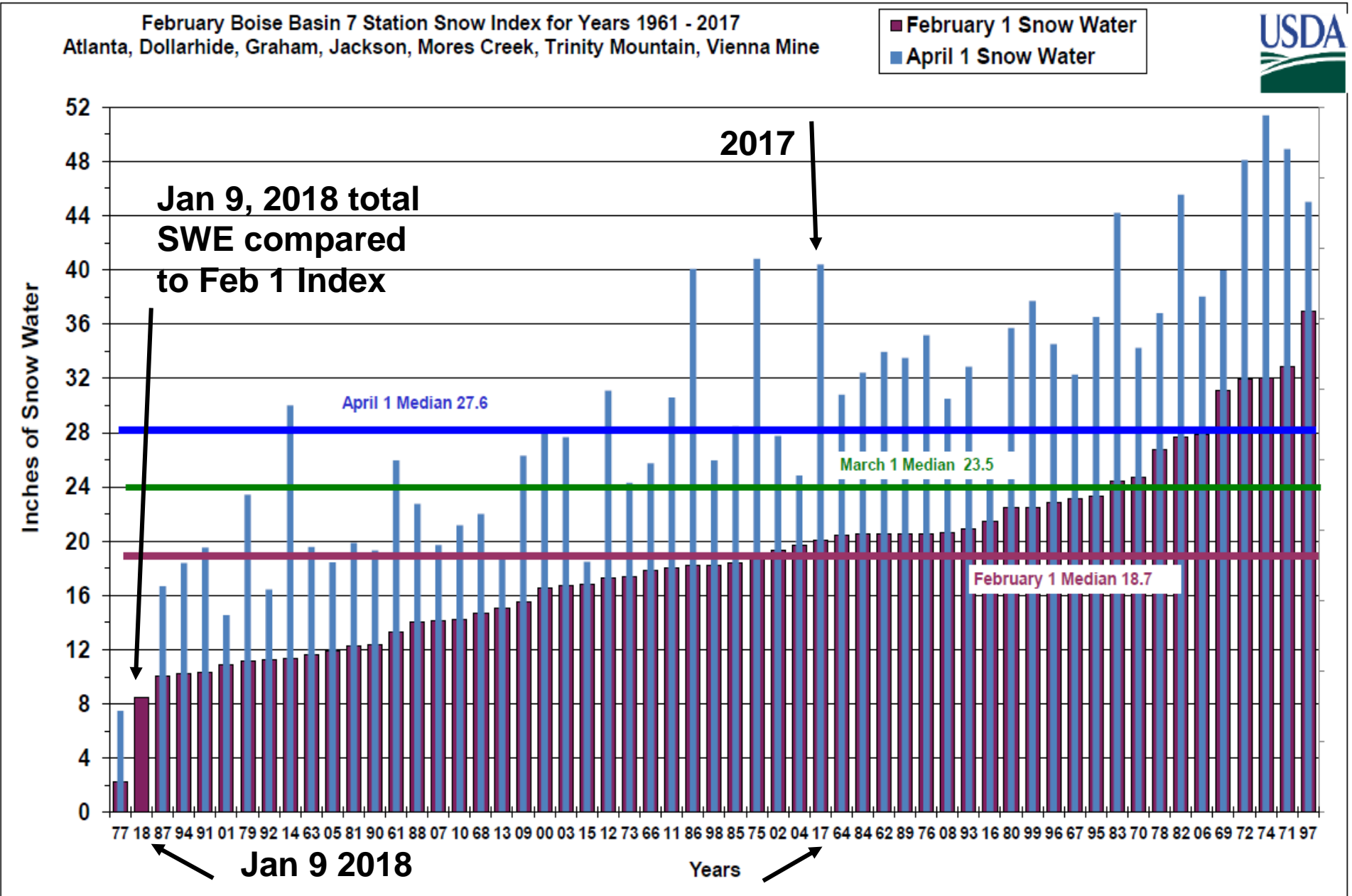
Based on Provisional SNOTEL data as of Jan 08, 2018



January 1 Boise Basin Snow Index 7 Stations



Jan 9 SWE Compared to Feb 1 Boise Basin Snow Index 7 Stations

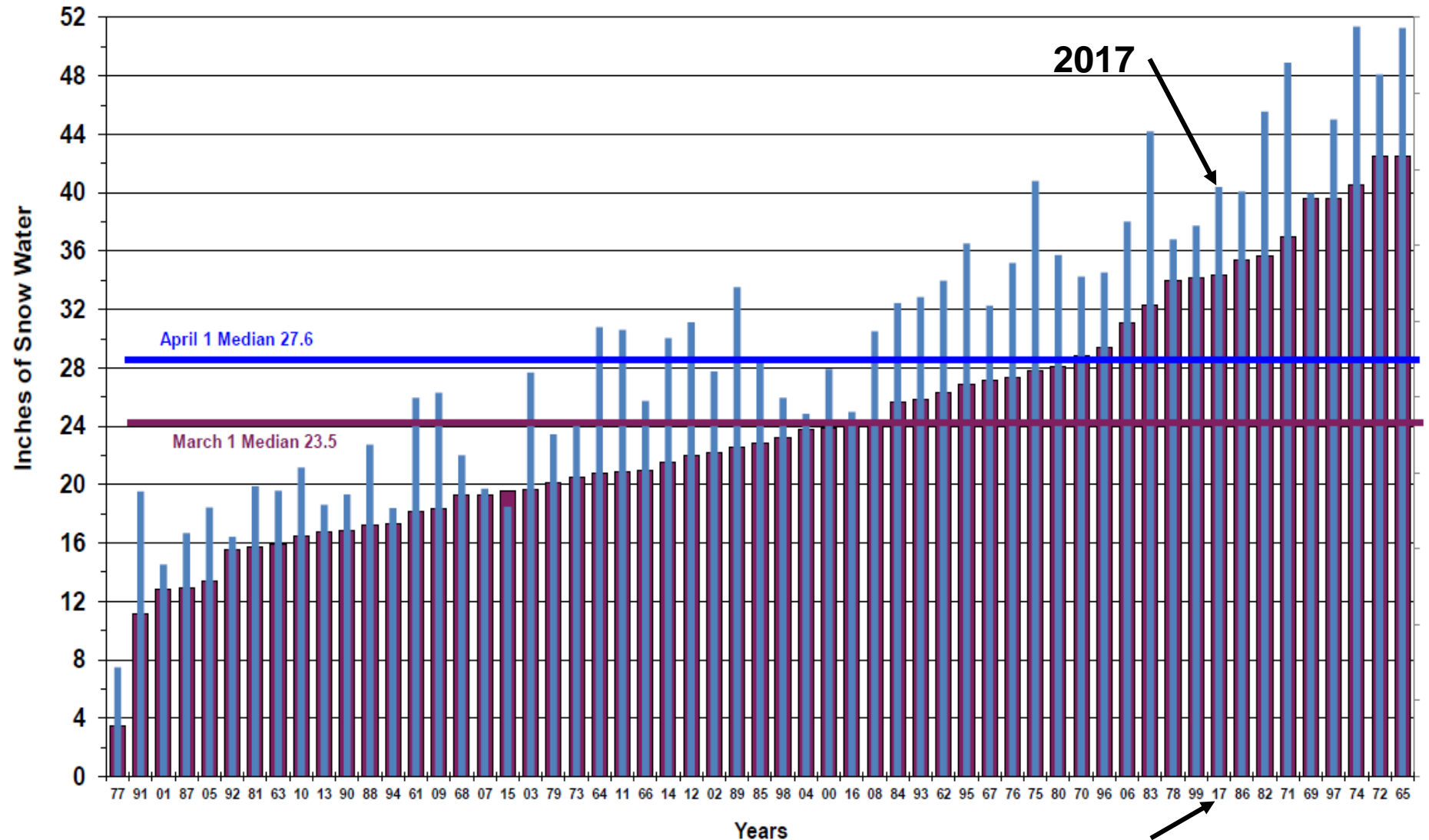


March 1 Boise Basin Snow Index 7 Stations

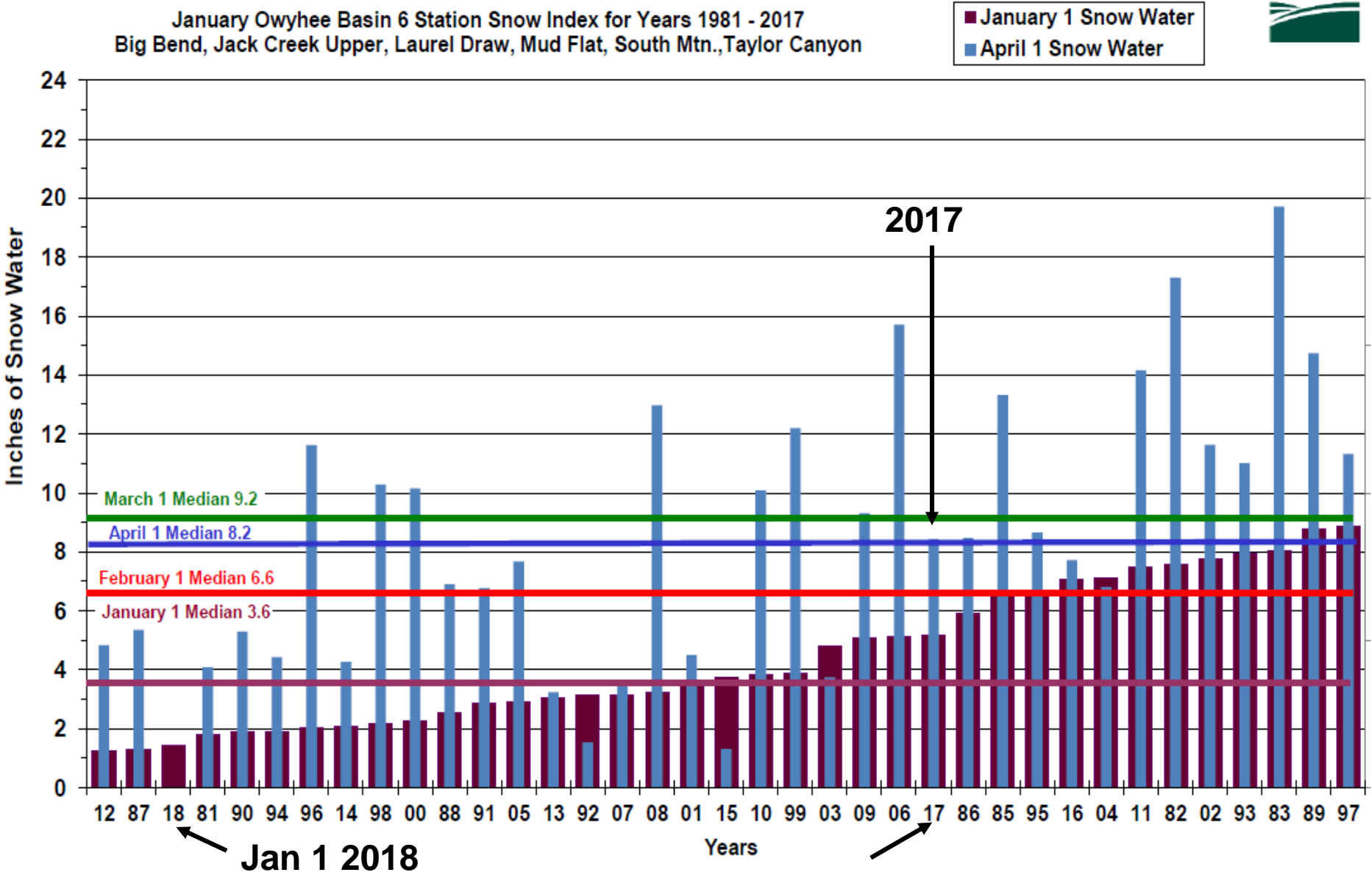


March Boise Basin 7 Station Snow Index for Years 1961 - 2017
Atlanta, Dollarhide, Graham, Jackson, Mores Creek, Trinity Mountain, Vienna Mine

■ March 1 Snow Water
■ April 1 Snow Water



January 1 Owyhee Basin Snow Index 6 Stations

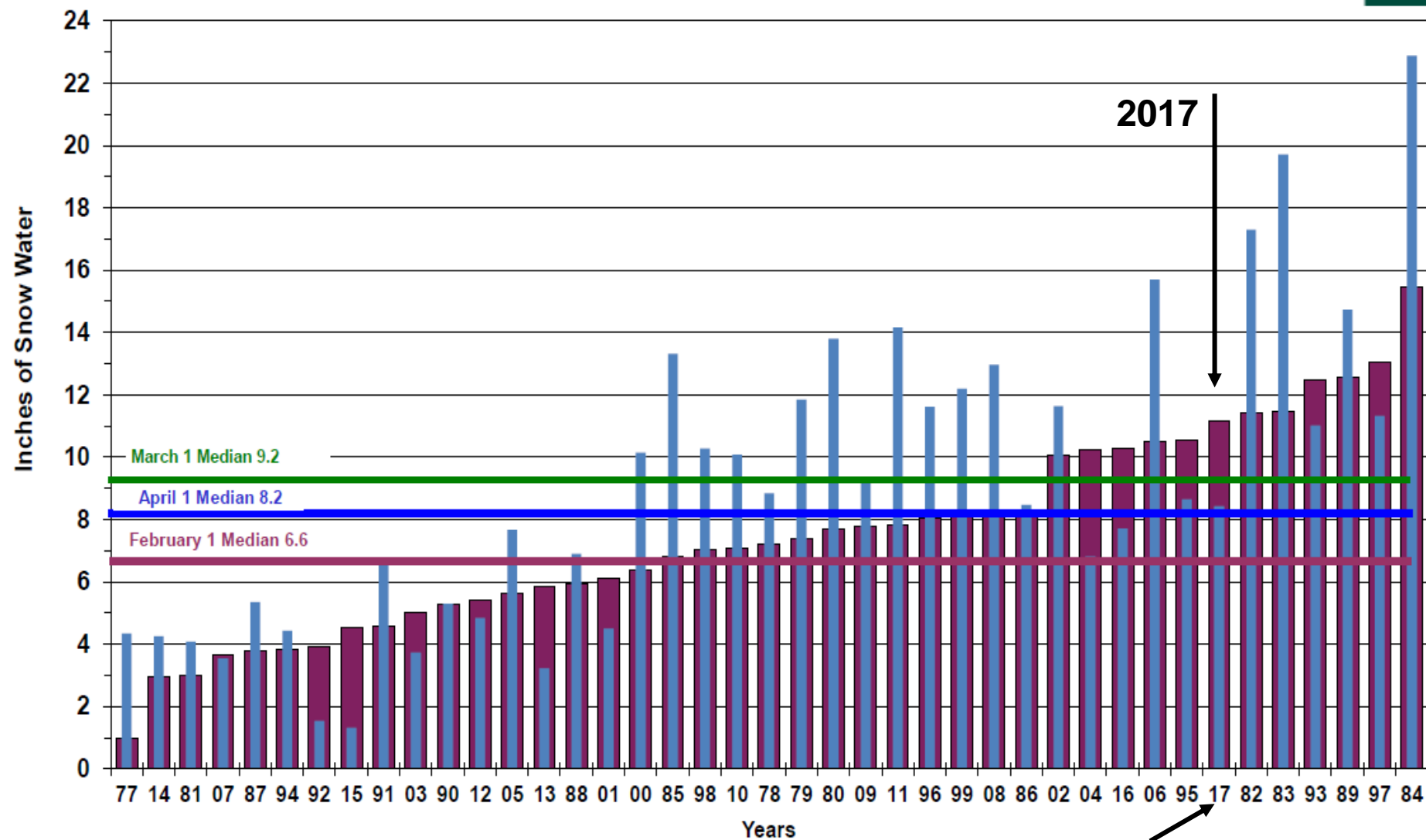


February 1 Owyhee Basin Snow Index 6 Stations



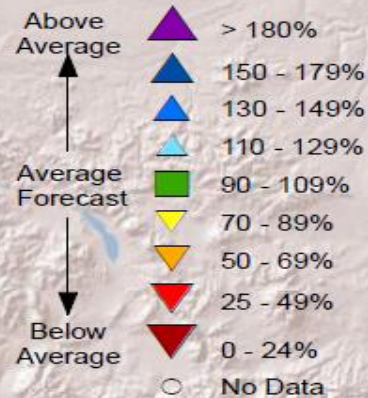
February Owyhee Basin 6 Station Snow Index for Years 1977 - 2017
Big Bend, Jack Creek Upper, Laurel Draw, Mud Flat, South Mtn., Taylor Canyon

■ February 1 Snow Water
■ April 1 Snow Water

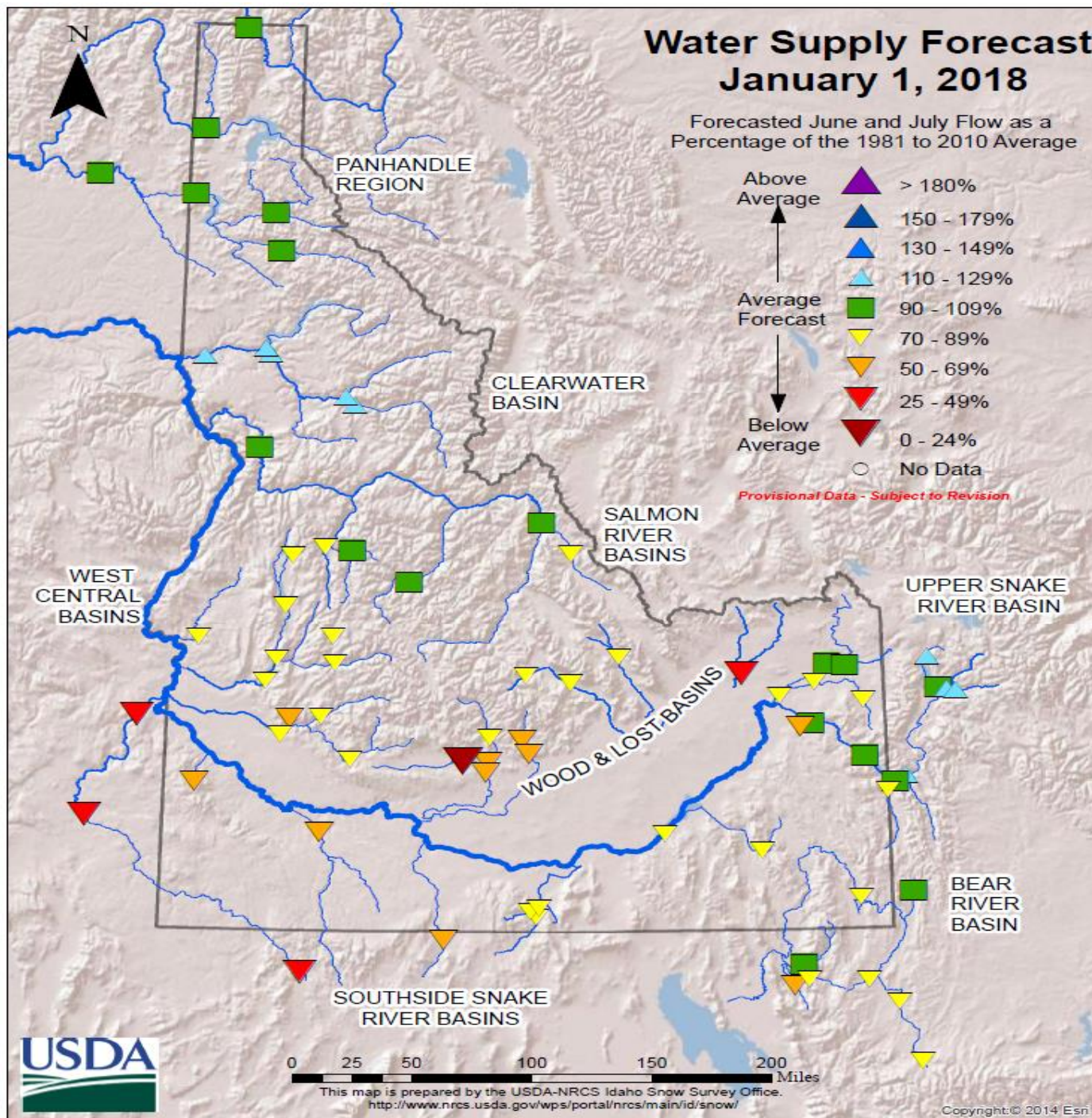


Water Supply Forecast January 1, 2018

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



Provisional Data - Subject to Revision



0 25 50 100 150 200 Miles

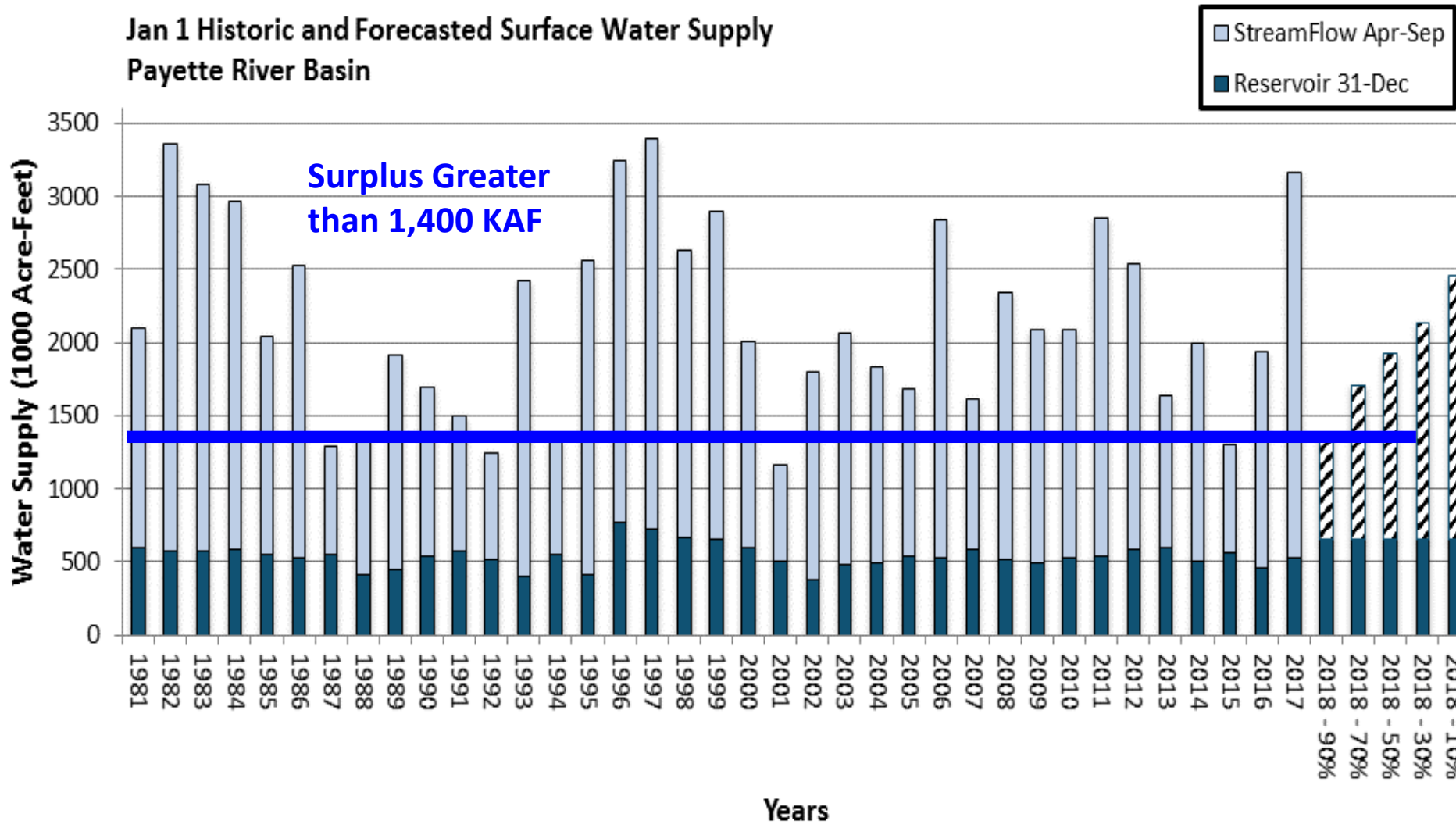
This map is prepared by the USDA-NRCS Idaho Snow Survey Office.
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

Copyright © 2014 Esri

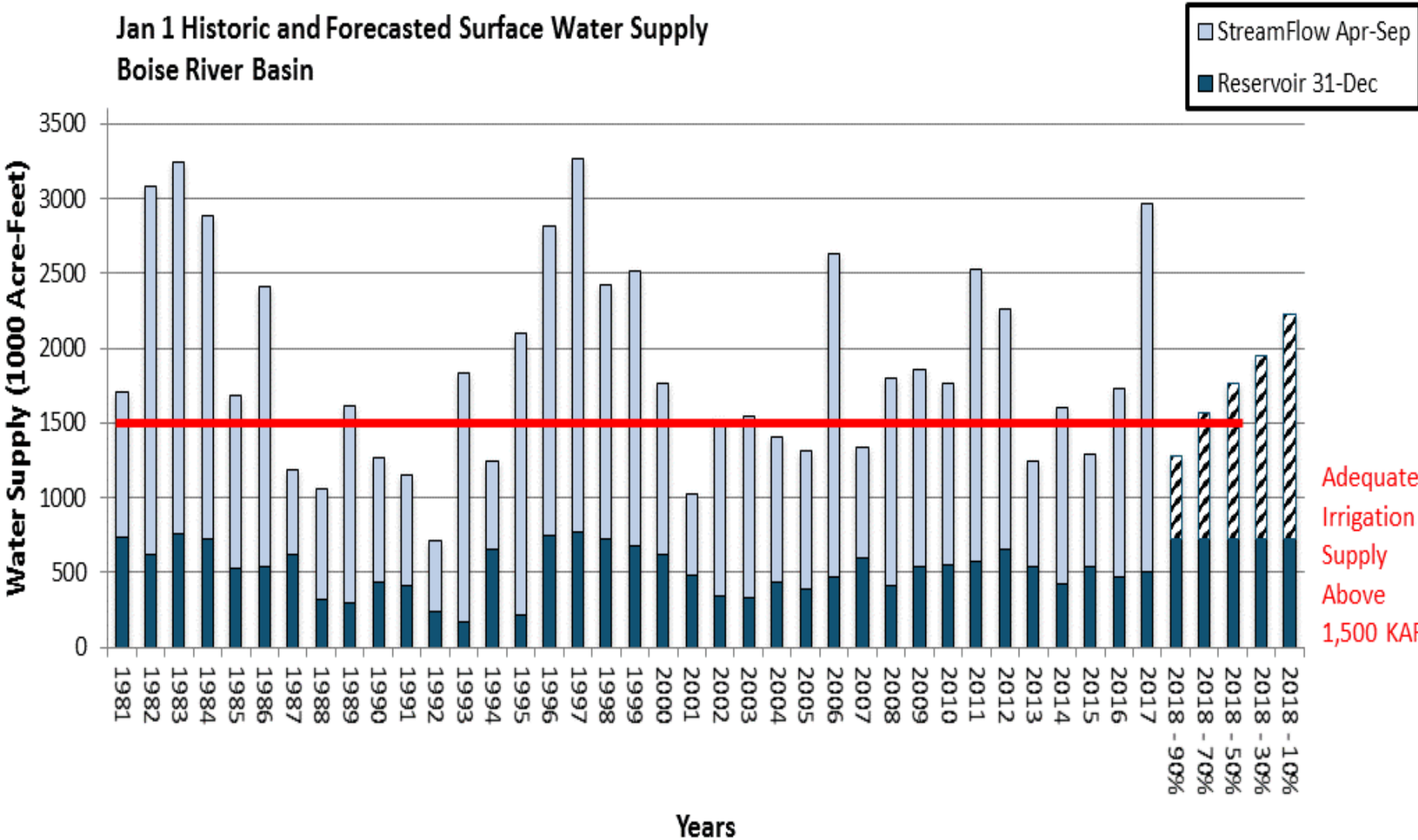
Surface Water Supply Index (SWSI) Payette Basin

The Payette basin does not typically have Ag shortages

1,400 KAF was determined as the surplus volume based primarily on the recent low water year of 2015.

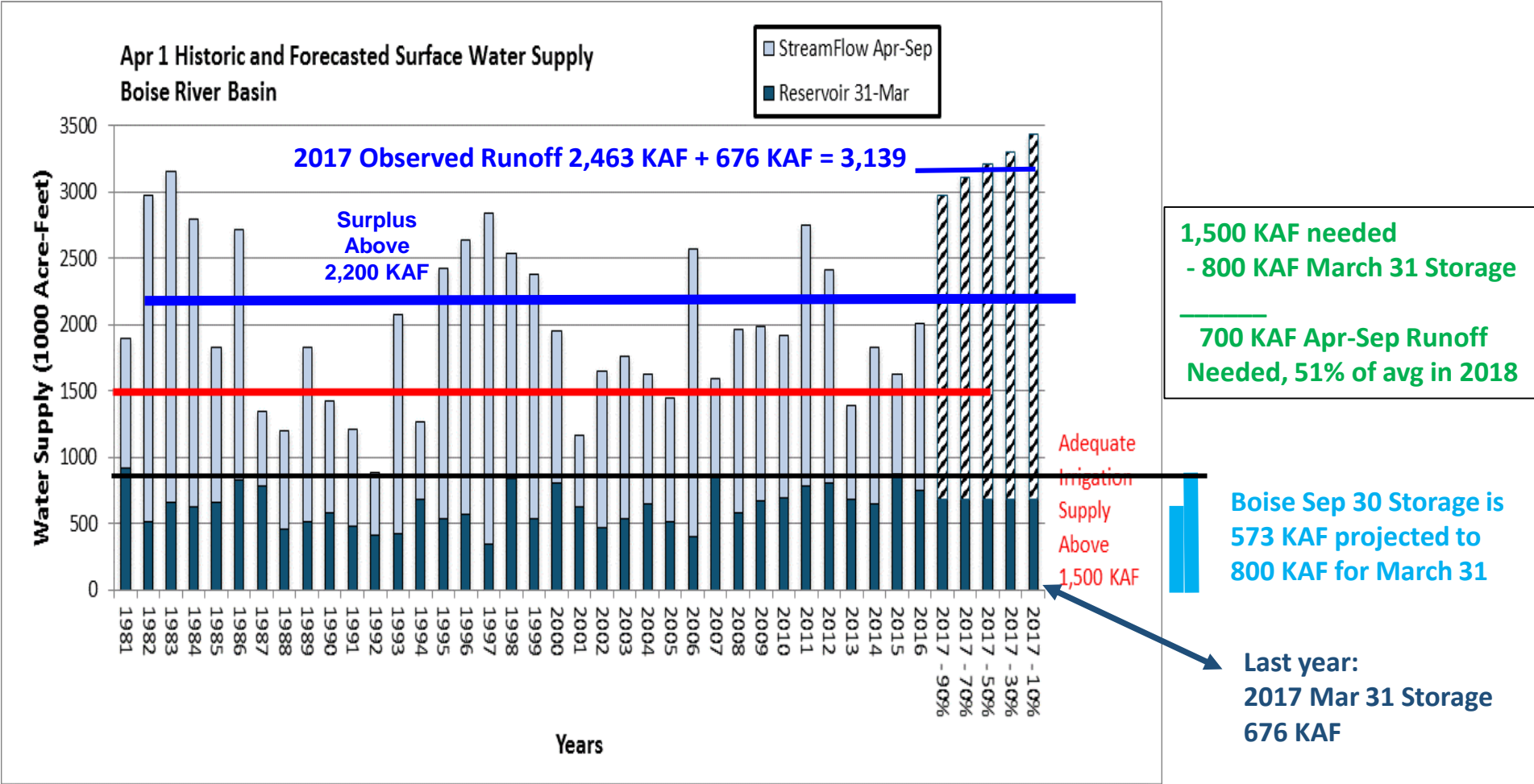


Surface Water Supply Index (SWSI) Boise Basin

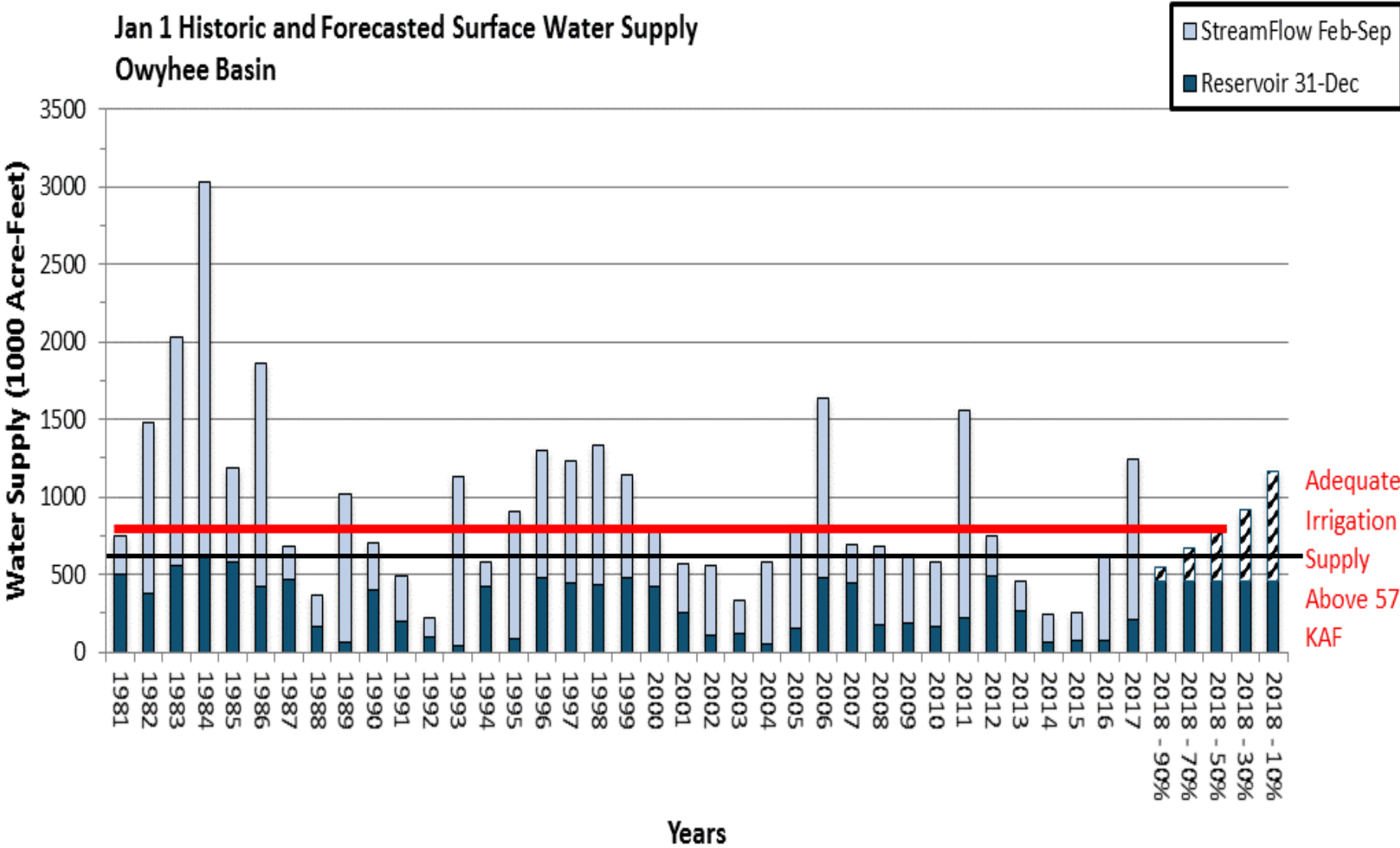


Boise Basin April 1 SWSI

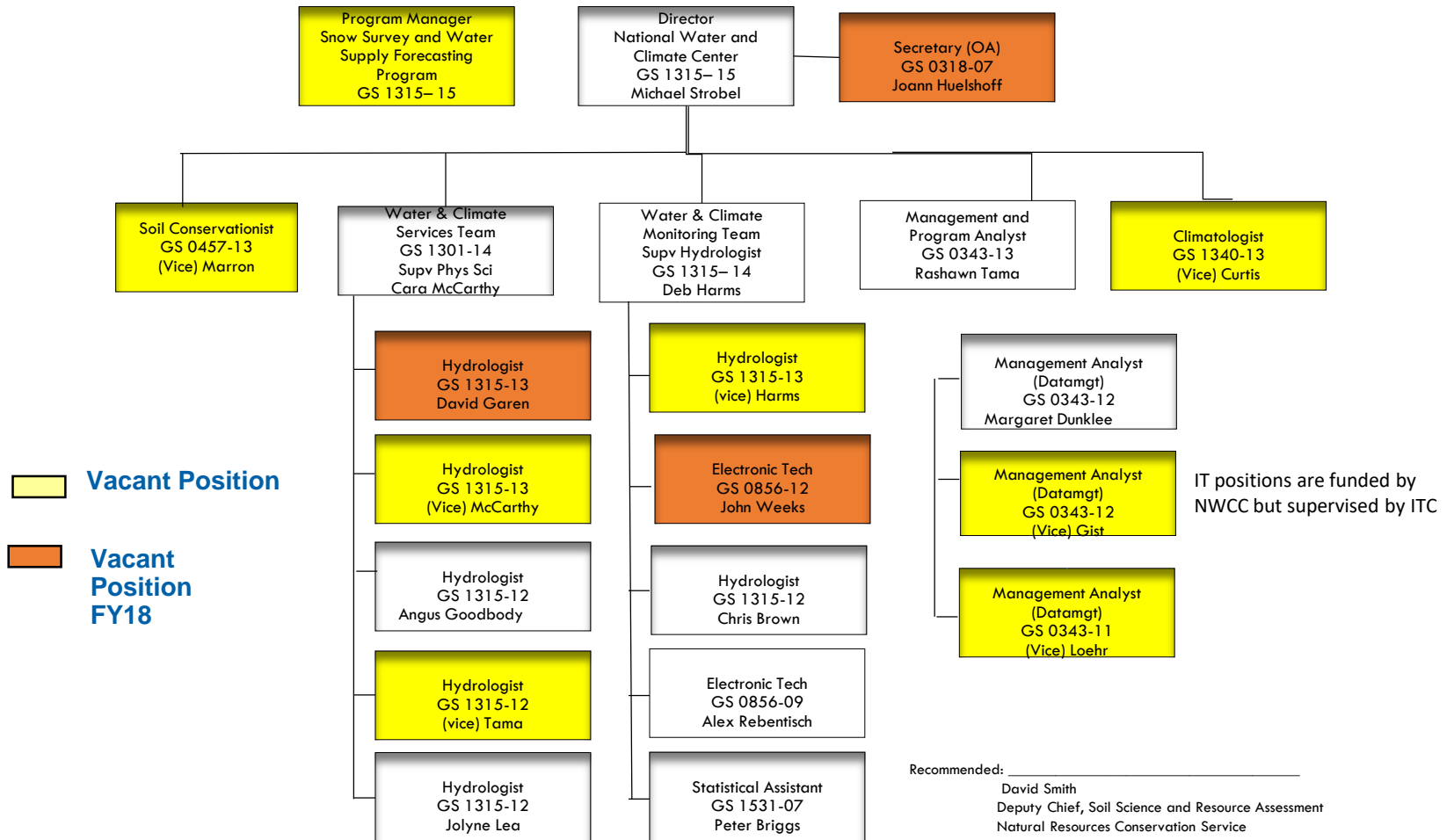
with Adequate Irrigation Supply & Surplus Threshold



Surface Water Supply Index (SWSI) Owyhee Basin

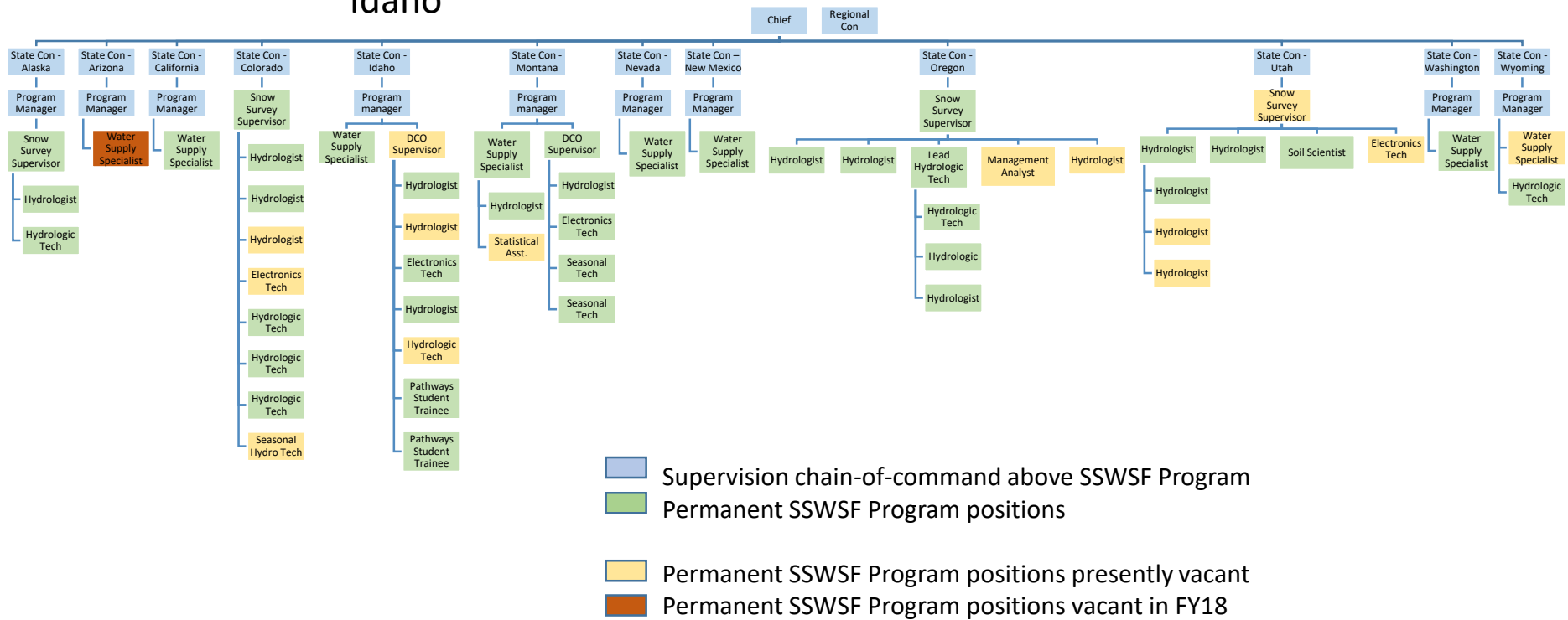


Resources Inventory Division (National Water and Climate Center) – Working Org Chart



Snow Survey Program State Structure

Idaho





Questions
Comments
Corrections

From a friend, January 2, 2018...

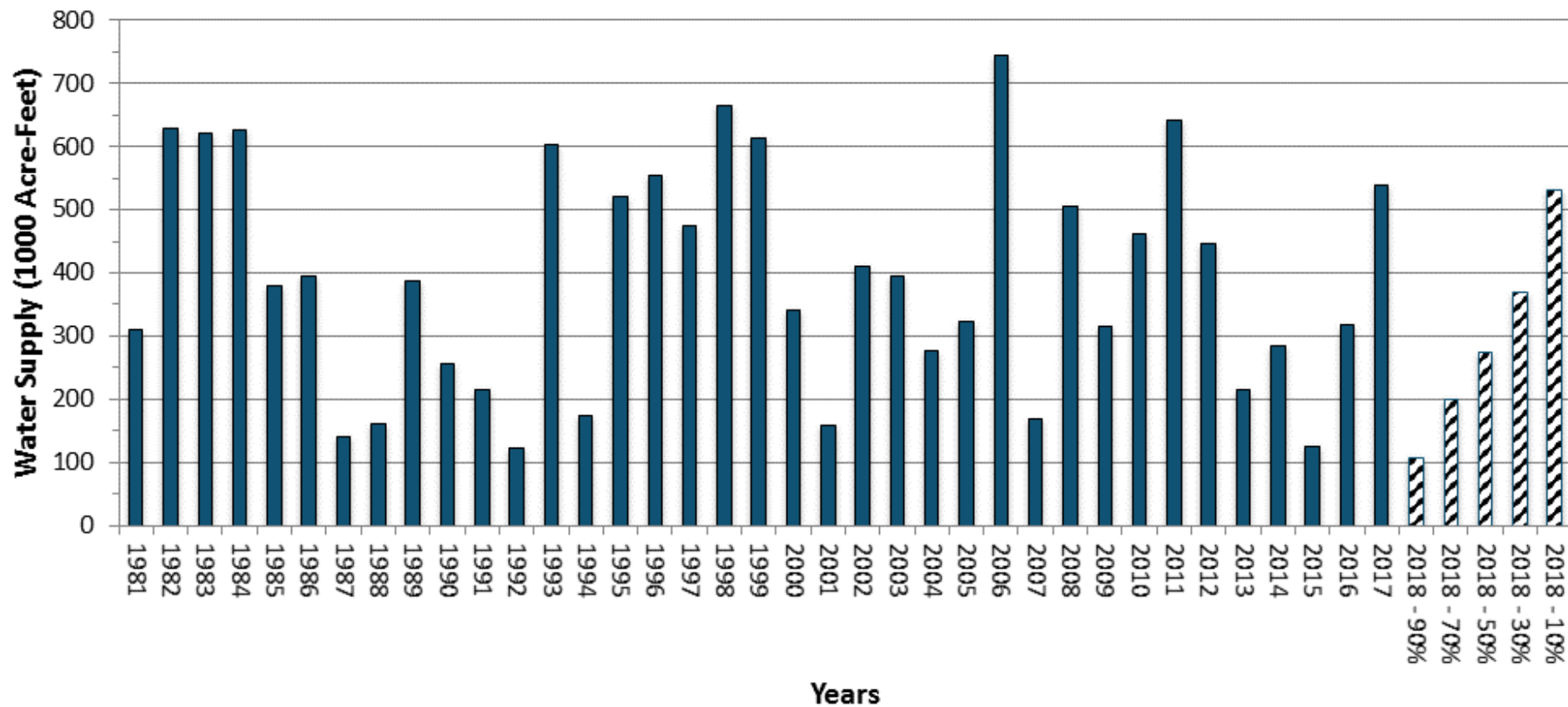
Darn it, my Mom's horse is still eating grass in the pasture in Council. Never ever have I seen that before on January 1.

Hope big storms coming. Our whole winter can take shape after one strong storm series.

Saw grass all over in McCall this weekend too.

Jan 1 Historic and Forecasted Surface Water Supply Weiser River Basin

■ Weiser River Weiser

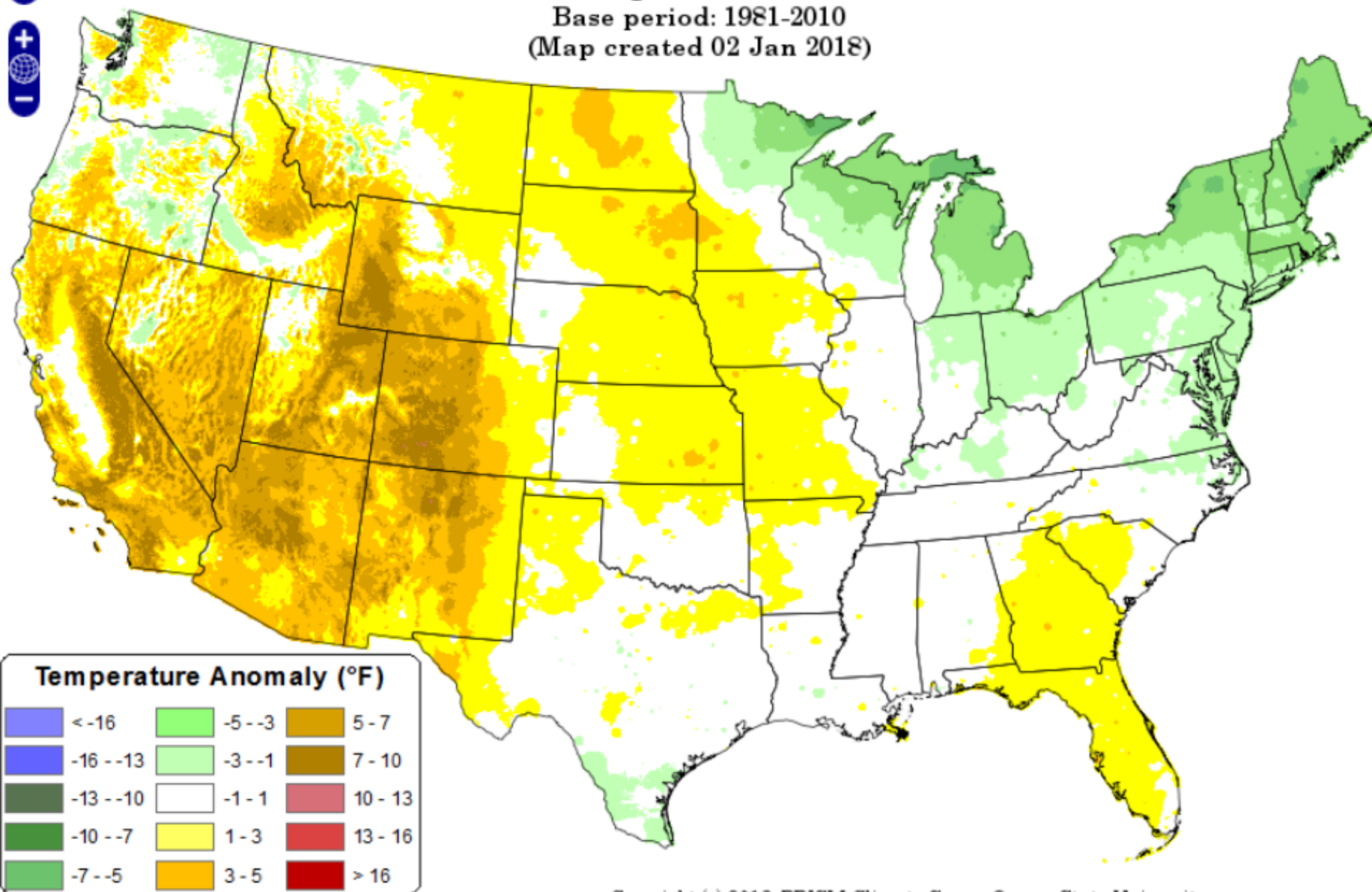


Daily Mean Temperature Anomaly: December 2017

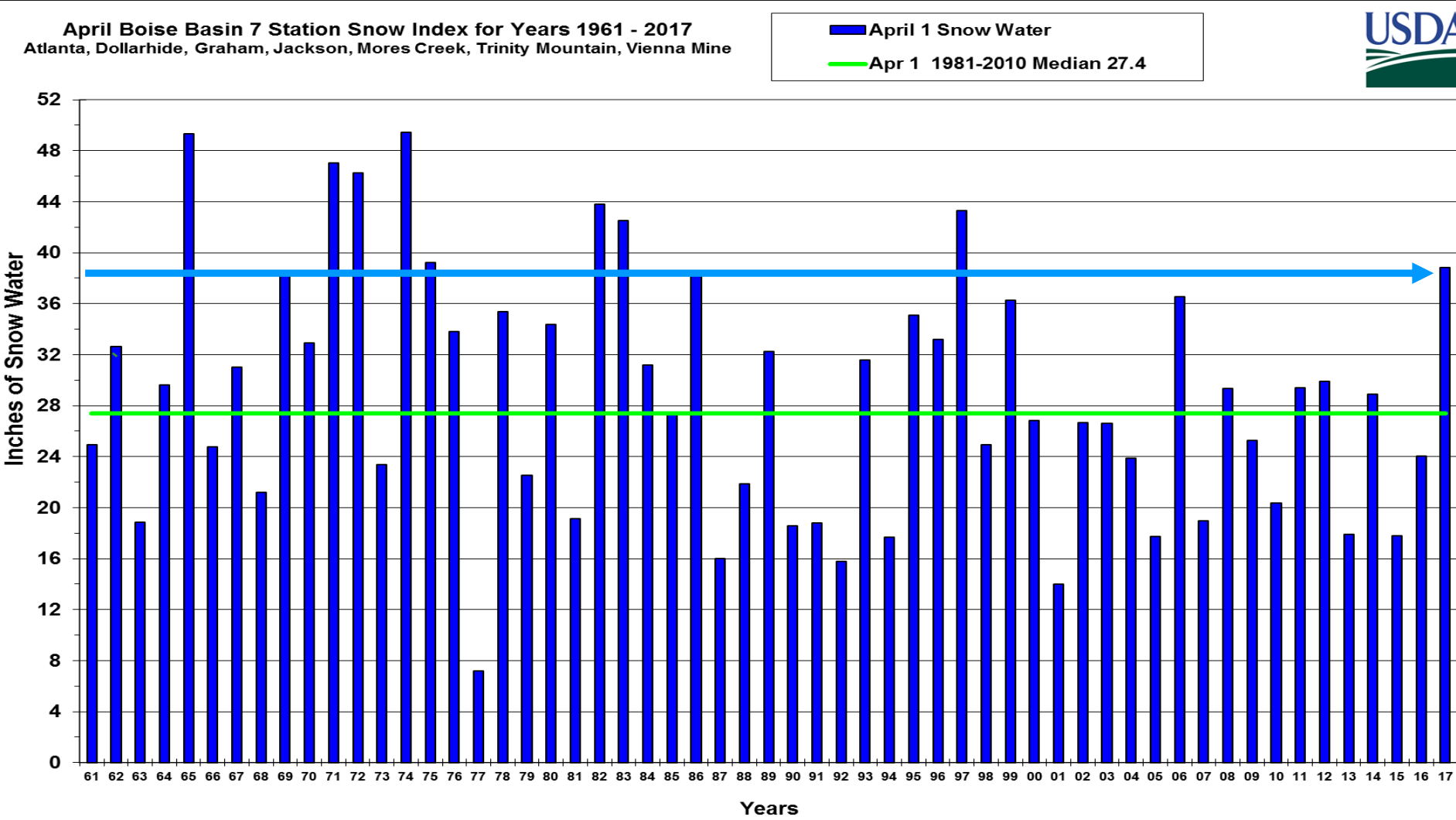
Period ending 7 AM EST 31 Dec 2017

Base period: 1981-2010

(Map created 02 Jan 2018)



Apr 1 Boise snowpack is 8th highest based on 7 long-term sites that start in 1961.



Apr 1, 2017 Owyhee snowpack near the 30 year median based on 6 long-term sites that start in 1961.

