

2019 Idaho and Oregon Alfalfa & Clover Seed Growers Association Winter Meeting January 8, 2019

Water Outlook

- 2018 Recap
- 2019 Amount of Runoff Needed for Surface Adequate Irrigation Supplies
- Winter OutlookS
- Current Conditions for the Owyhee & Boise Basins

This talk will be post on the Idaho Snow Survey home page, under Water Supply Presentations:

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

January 1, 2019



Ron Abramovich
Water Supply Specialist
United States Department of Agriculture

Natural Resources Conservation Service

Reservoir Storage Projection for Spring 2018

As of October 30, 2017 -- Updated Aug 30, 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		Projected storage KAF from early Nov EOM Feb, Mar or Apr KAF	Difference KAF
Boise Reservoir System	603.3	584.9		800.0	78
Magic Reservoir	107.8	123.8		160.0	25
Little Wood	12.7	12.4		22.0	6
Mackay Reservoir	38.1	38.1		20.0	18
Jackson & Palisades Reservoir System	1909.8	1929.9		1900.0	-135
Oakley Reservoir	28.5	29.7		38.0	-1
Salmon Falls	92.8	92.1		97.0	-4
Lake Owyhee	432.2	422.0		480.0	11
Bear Lake	1114.5	1090.7		1000.0	-6

Reservoir Storage Projection for Spring 2018

As of October 30, 2017 -- Updated Aug 30, 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	Actual Jan 31 Storage KAF	Actual Feb 28 storage KAF	Actual Mar 31 storage KAF	Projected storage KAF from early Nov EOM Feb, Mar or Apr KAF	Difference KAF
Boise Reservoir System	603.3	584.9	663.5	719.5	775.7	828.6	877.8	800.0	78
Magic Reservoir	107.8	123.8	138.9	150.4	160.0	171.6	184.9	160.0	25
Little Wood	12.7	12.4	17.5	21.4	25.1	28.1		22.0	6
Mackay Reservoir	38.1	38.1	37.6	33.6	34.0	37.5	37.5	20.0	18
Jackson & Palisades Reservoir System	1909.8	1929.9	2016.0	2009.9	2010.0	1991.4	1765.0	1900.0	-135
Oakley Reservoir	28.5	29.7	31.7	33.4	35.3	36.7		38.0	-1
Salmon Falls	92.8	92.1	92.7	93.1	94.1	93.5		97.0	-4
Lake Owyhee	432.2	422.0	441.5	461.4	490.6			480.0	11
Bear Lake	1114.5	1090.7	1058.6	1035.5	1011.7	991.5	994.3	1000.0	-6

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

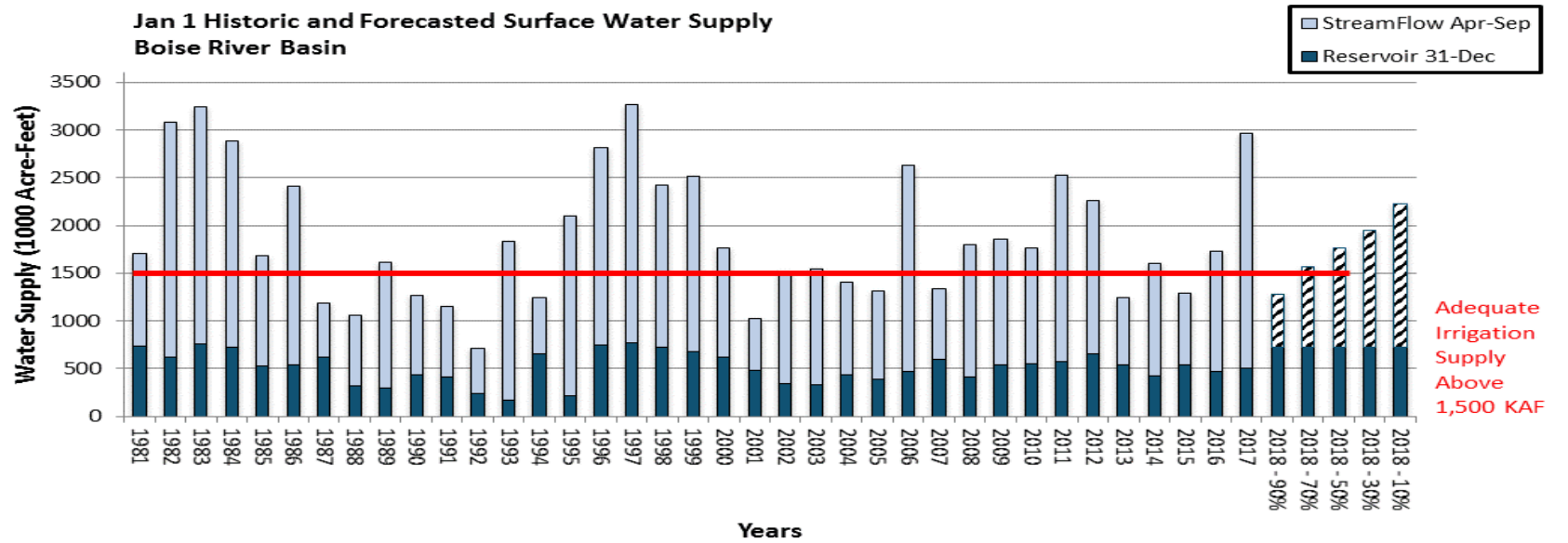
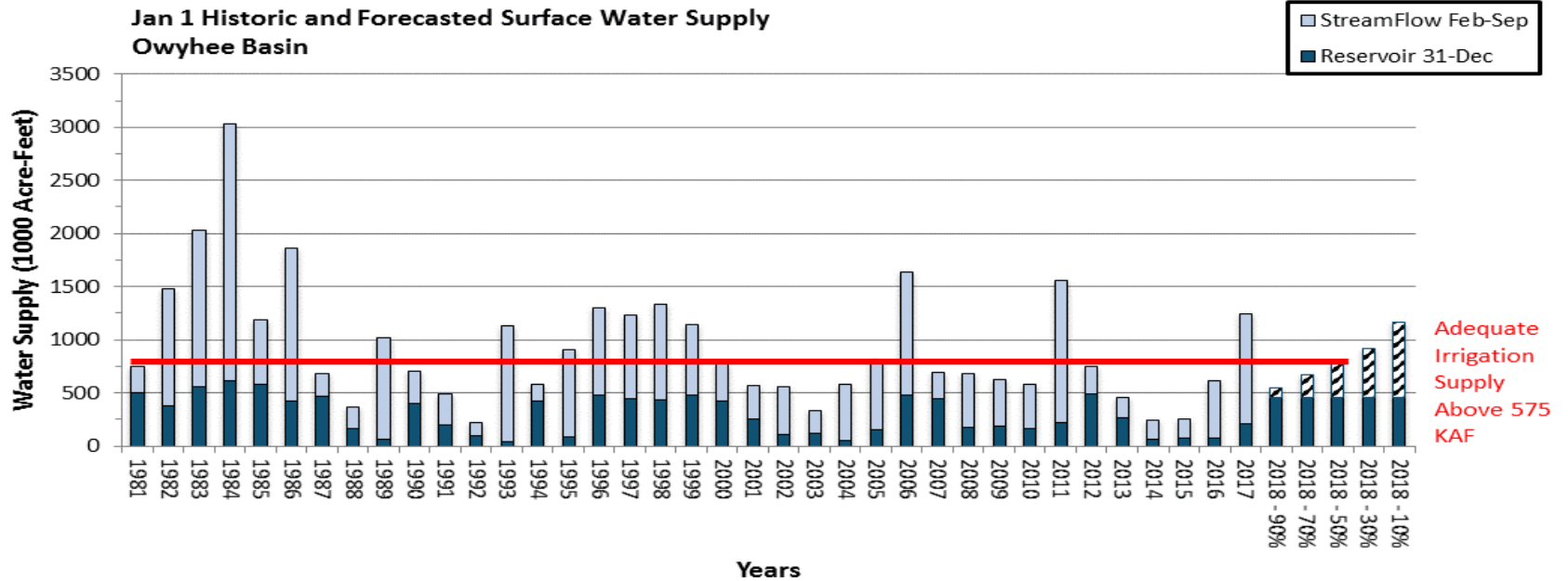
Fall reservoir carryover storage is used to project spring reservoir storage levels based on current conditions and recent trends. Then, by knowing the adequate irrigation water supply needed in your basin, the projected spring reservoir volumes are subtracted from the adequate irrigation supply to determine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

Column 1	Column 2 -	Column 3 =	Column 4	Col4/Col6 X 100=	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	2018 Apr - Sep Streamflow Runoff KAF % of average
Boise	1500	800	700	51%	1220 90%
Big Wood	275	160	115	43%	204 77%
Little Wood	60	22	38	41%	89 97%
Big Lost	180	20	160	107%	204 136%
Little Lost	40	---	40	118%	43 126%
Teton	85	---	85	44%	234 121%
Snake (Heise)	4,400	1900	2500	66%	4792 127%
Oakley	50	38	12	39%	14 44%
Salmon Falls	110	97	13	15%	38 45%
Owyhee	575	480	95	14%	225 34%
* Bear River	280	1000	35	17%	90 44%

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

As of **Jan 1, 2018** each basin was showing > 50% Chance of Adequate Supplies

Decisions in **2019** will not be as easy because of less reservoir carryover.



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

Apr 01, 2018

Notice: We anticipate this map will not be available next year due to staffing constraints. Alternate maps: <https://go.usa.gov/xnzxk>

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



0 75 150 300 Miles

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>

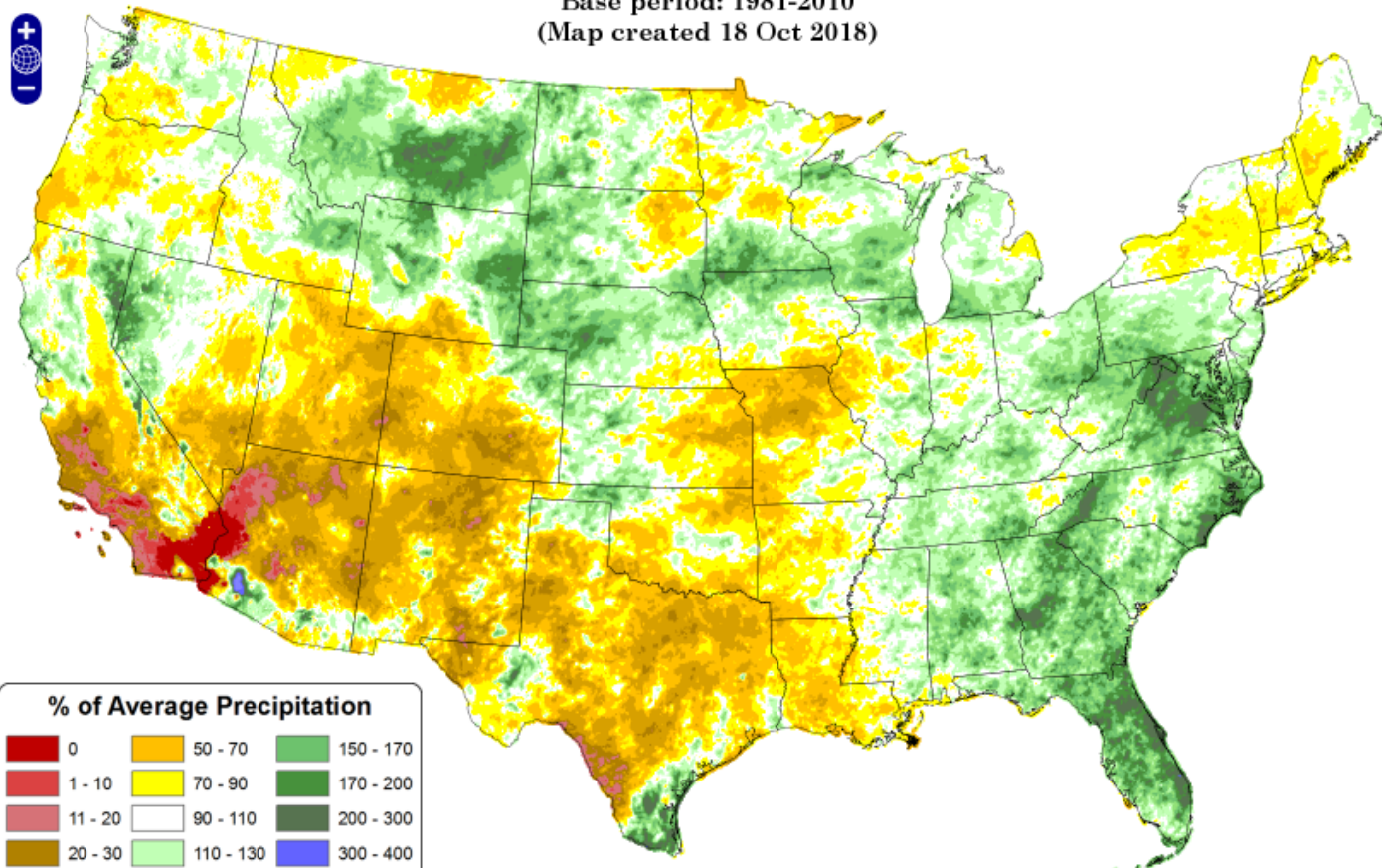
2018 Apr 1 Snowpack & Apr - Jun Precipitation

Total Precipitation Anomaly: Apr 2018 - Jun 2018

Period ending 7 AM EST 30 Jun 2018

Base period: 1981-2010

(Map created 18 Oct 2018)



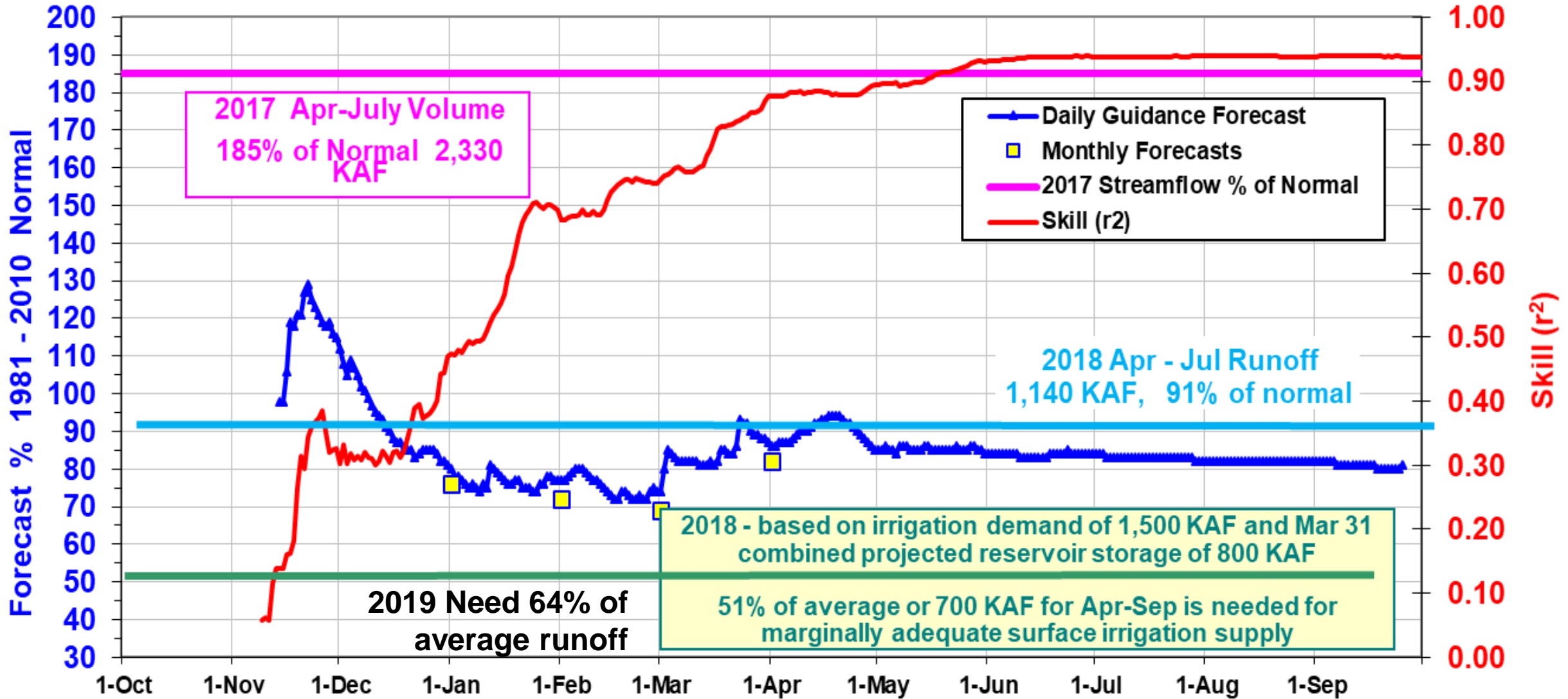
% of Average Precipitation

- | | | |
|-----------|-------------|-------------|
| ■ 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 |

2018 Boise River near Boise: Apr - Jul Volume

NRCS Monthly Forecasts are Squares

Updated
September 26, 2018



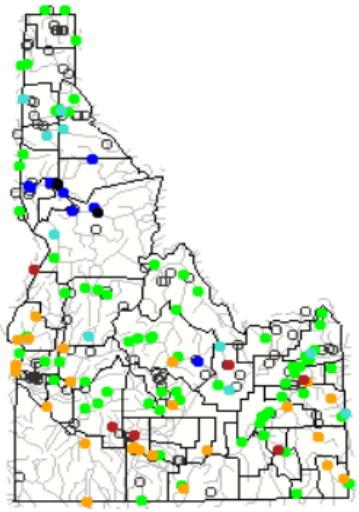
SNOTEL Sites used: Atlanta Summit, Trinity Mountain, Dollarhide Summit, Vienna Mine, Galena and Galena Summit

Projecting Spring Reservoir Storage

Lumper – multiple regression
Splitter – based on current conditions

Daily Streamflow Conditions

Select a site to retrieve data and station information.
Tuesday, November 06, 2018 14:30ET



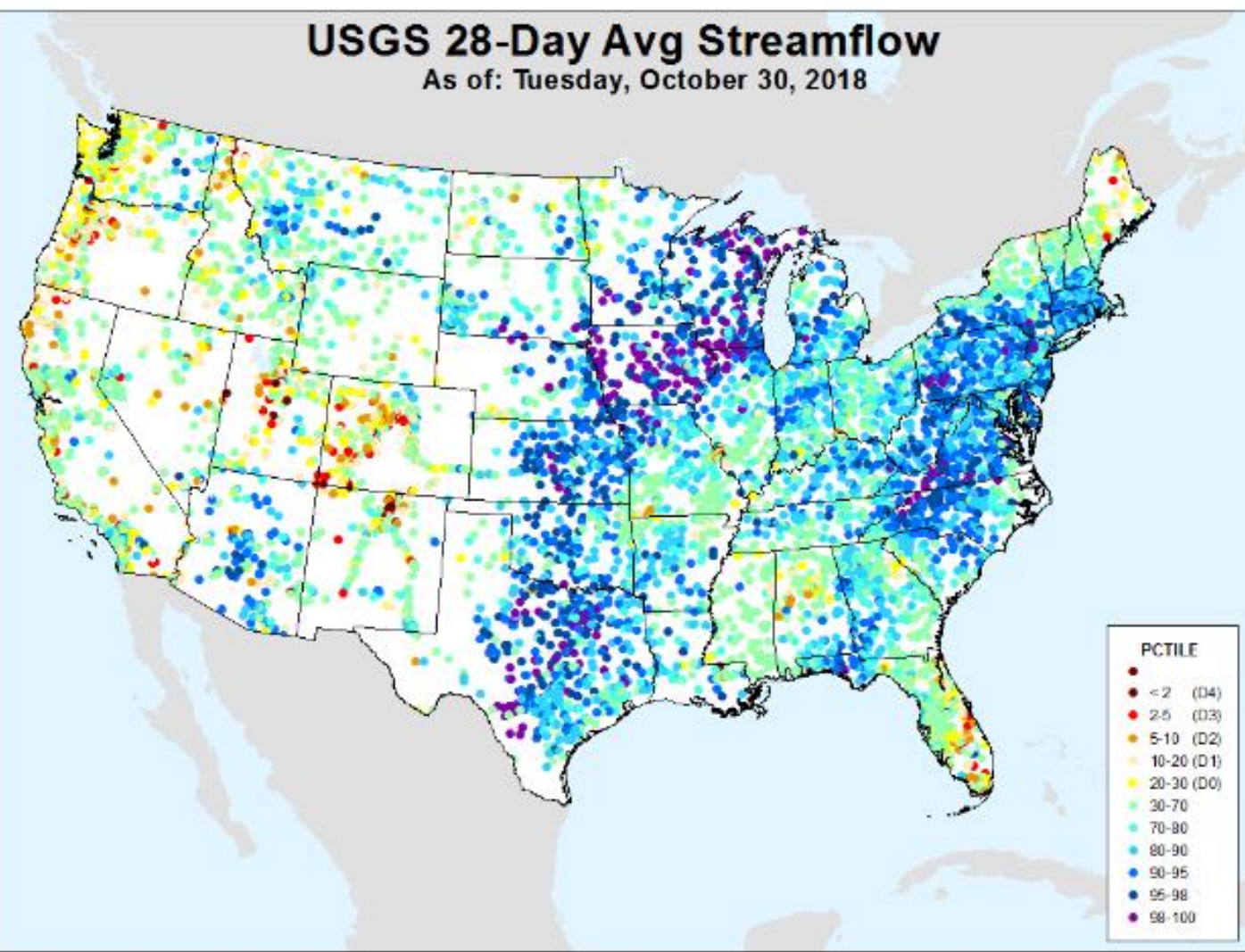
Explanation

- High
- > 90th percentile
- 76th - 90th percentile
- 25th - 75th percentile
- 10th - 24th percentile
- < 10th percentile
- Low
- Not ranked

The colored dots on this map depict streamflow conditions as a [percentile](#), which is computed from the period of record for the current day of the year. Only stations with at least 30 years of record are used. The **gray circles** indicate other stations that were not ranked in percentiles either because they have fewer than 30 years of record or because they report parameters other than streamflow. Some stations, for example, measure stage only.

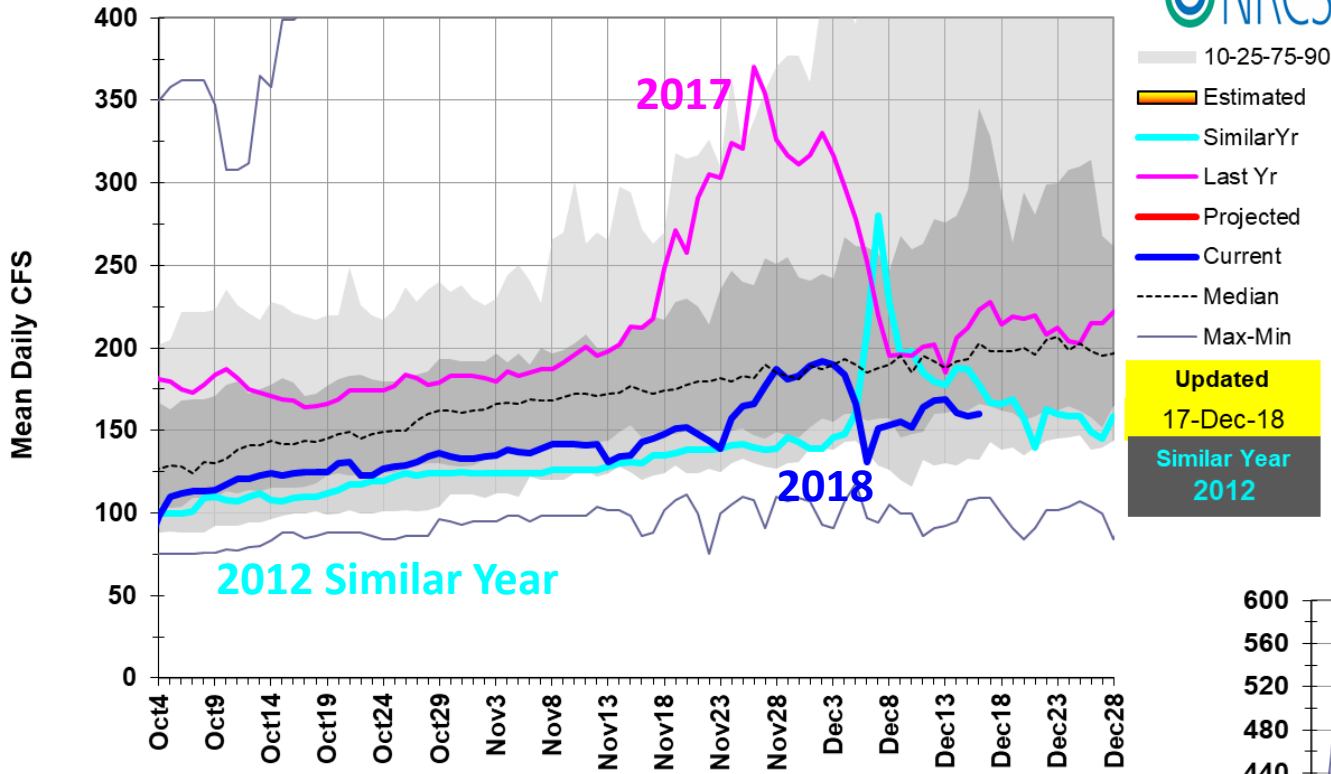
USGS 28-Day Avg Streamflow

As of: Tuesday, October 30, 2018



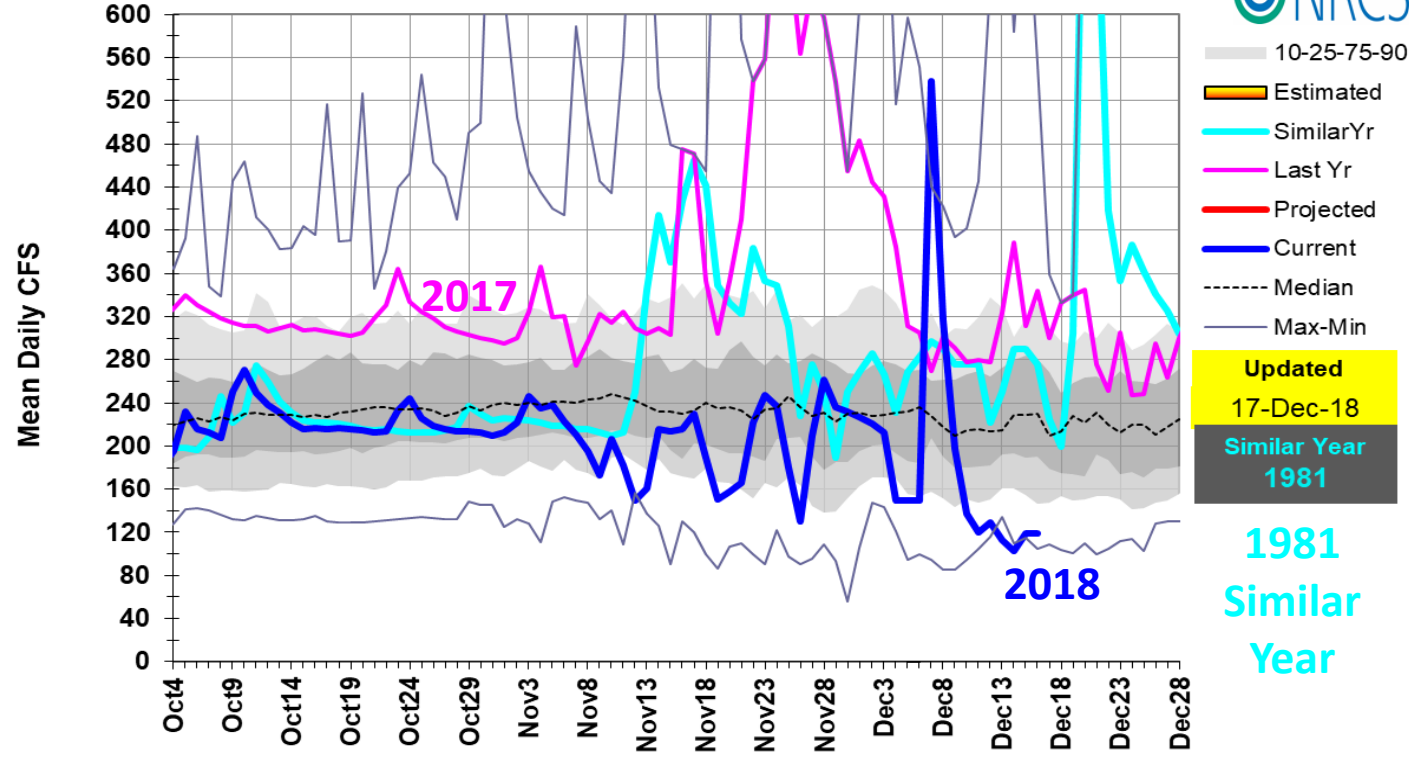
PCTILE	
●	< 2 (D4)
●	2-5 (D3)
●	5-10 (D2)
●	10-20 (D1)
●	20-30 (D0)
●	30-70
●	70-80
●	80-90
●	90-95
●	95-98
●	98-100

13181000: Owyhee R near Rome, OR



Fall Streamflow Conditions

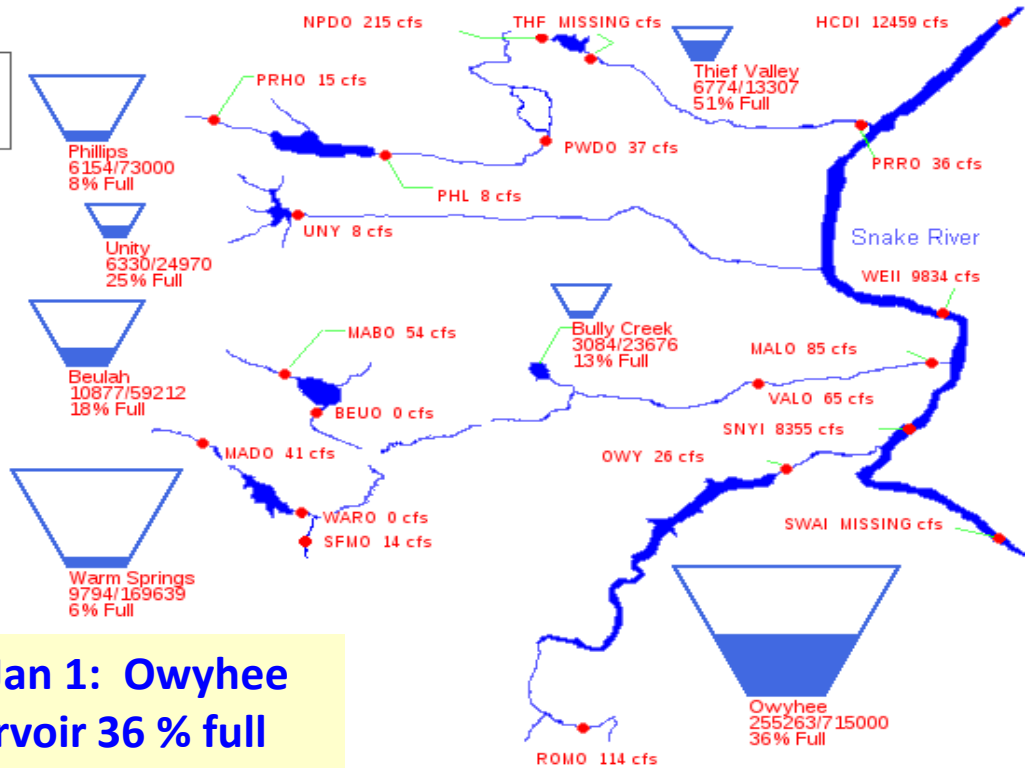
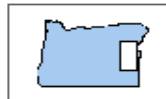
13186000: SF Boise R near Featherville, ID



Projecting Spring Reservoir Storage

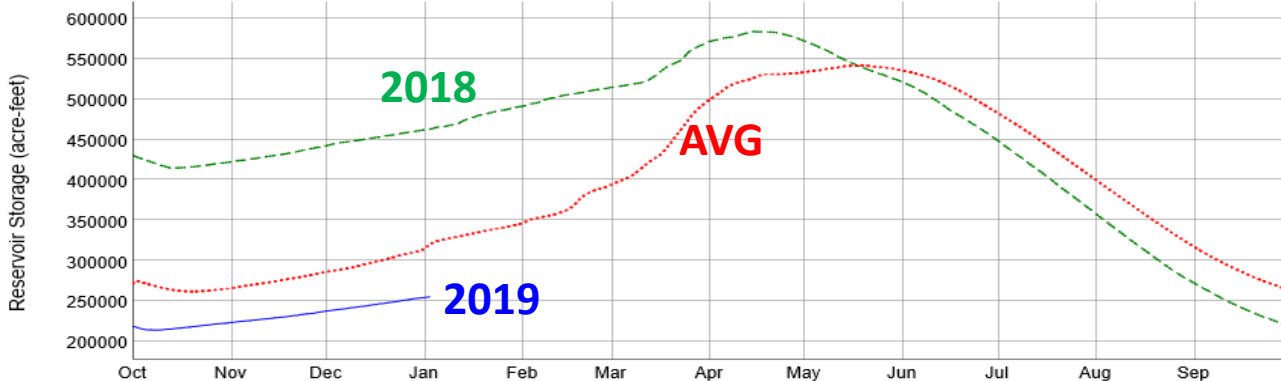
US Bureau of Reclamation, Pacific Northwest Region Major Storage Reservoirs in Southeastern Oregon

01/03/2019



As of Jan 1: Owyhee Reservoir 36 % full

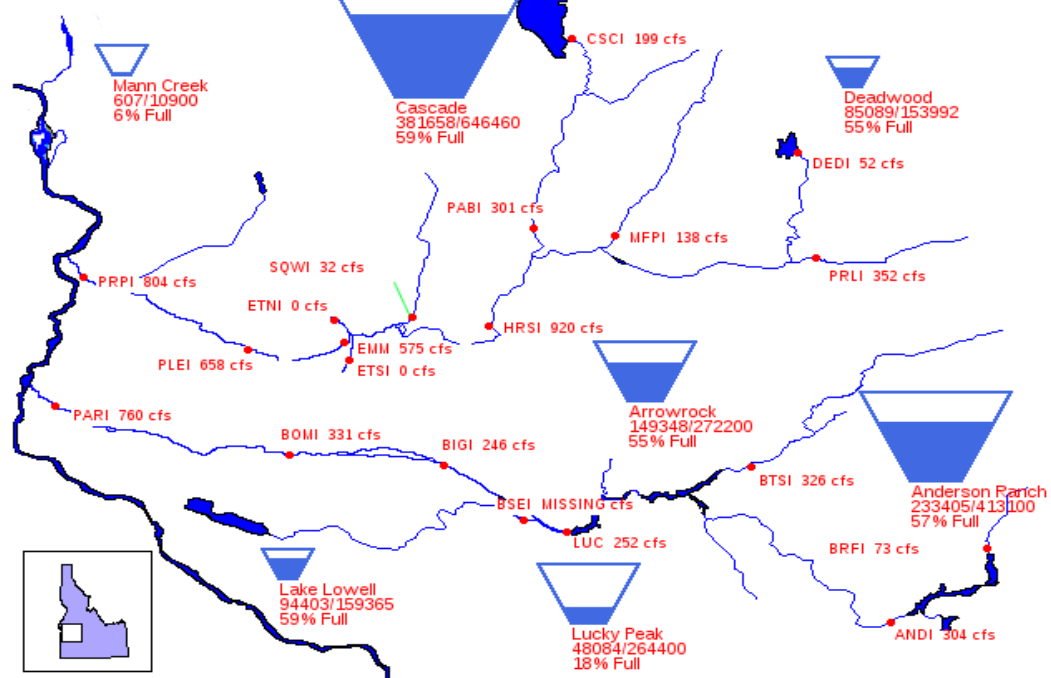
Lake Owyhee and Owyhee River near Nyssa, OR



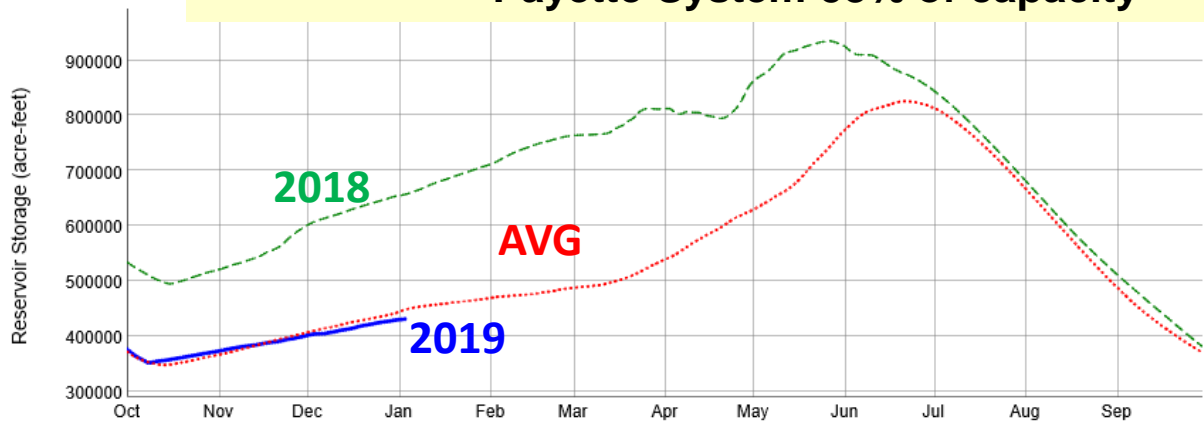
Bureau of Reclamation, Pacific Northwest Region

Storage Reservoirs in the Boise & Payette River Basins

01/03/2019



**As of Jan 1: Boise System 45 % of capacity
Payette System 58% of capacity**



Reservoir Storage Projection for Spring 2019

As of November 6, 2018

Projected change in reservoir storage from Oct 31, 2018 to start of runoff season in Spring 2019.

	Sep 30 storage KAF	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	Projected change in storage KAF
Boise Reservoir System	446.4	437.5	465.4	494.9			630	193
Magic Reservoir	61.1	69.0	76.7	79.9			120	51
Little Wood Reservoir	11.1	12.9	15.6	18.3		23		10
Mackay Reservoir	24.8	24.8	26.8	29.7			40	15
Jackson & Palisades Reservoir System	1476.7	1462.5	1582.4	1684.7			1800	338
Oakley Reservoir	12.1	13.5	14.4	17.3		23		10
Salmon Falls Reservoir	31.9	33.1	34.8	36.0		41		8
Lake Owyhee	220.5	222.7	237.0	254.0	280			57
Bear Lake	802.3	798.2	769.8	809.8			850	52

Other basins, Spokane, Clearwater, Salmon, Weiser, Payette and Bruneau basins, the surface agricultural irrigation demand is not known or relevant.

Amount of Runoff Needed in 2019 for Adequate Irrigation Supply

Summary Table: Amount of streamflow needed in 2019 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: November 6, 2018

Updated:

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Column 1	Column 2 -	Column 3 =	Column 4	Col4/Col6 X 100=	Col 5	7	9
Basin	Amount needed for adequate irrigation water supply KAF	Projected end of month reservoir storage (Jan, Feb or Mar) KAF	2019 streamflow volume needed for adequate water supply KAF	% of average streamflow needed for adequate 2019 irrigation supply KAF	1981-2010 Apr - Sep average streamflow KAF	Streamflow period used in analysis	2018 Apr - Sep Streamflow Runoff KAF % of average
Boise	1500	630	870	64%	1360	Apr-Sep	1220 90%
Big Wood above Hailey	135	---	135	51%	263	Apr-Sep	257 98%
Big Wood	275	120	155	58%	265	Apr-Sep	204 77%
Little Wood	60	23	37	40%	92	Mar-Sep	89 97%
Big Lost	180	40	140	93%	150	Apr-Sep	204 136%
Little Lost	40	---	40	118%	34	Apr-Sep	43 126%
Teton	85	---	85	44%	193	Apr-Sep	234 121%
Snake (Heise)	4,400	1800	2600	69%	3,780	Apr-Sep	4792 127%
Oakley	50	23	27	87%	31	Mar-Sep	14 44%
Salmon Falls	110	41	69	81%	85	Mar-Sep	38 45%
Owyhee	575	280	295	44%	665	Feb-Sep	225 34%
* Bear River	280	850	35	17%	205	Apr-Sep	90 44%

* Based on Bear River reservoir allocation: only 245 KAF in storage can be used in 2019, remaining 35 KAF to meet adequate irrigation supply is from runoff.

Surface Water Supply Index (SWSI)

A **Surface Water Supply Index (SWSI)** is a predictive indicator of the surface water available in a basin compared to historic supply. The SWSI is **calculated** by summing the two major sources of irrigation water supply; reservoir carryover and spring and summer streamflow runoff. These two sources are analyzed together when determining the total surface water supply available for the season.

These reports are available on the SWSI page

Station ID	Station Name	Period	Data Type	Years	# of Years		
13183000	Owyhee R blw Owyhee Dam	Feb-Sep	strm	1981-2018	38 Units KAF		
13182500	Lake Owyhee nr Nyssa	31-Dec	resv	1981-2018	38 Units KAF		
ENSO Classification SE Strong El Nino - EN Mild El Nino - N Neutral - LN Mild La Nina - SL Strong La Nina							
Rank	Year	Enso	Stream Flow Feb-Sep	Reservoir 31-Dec	Streamflow + Reservoir Sum	Non-Exceedance Probability	SWSI
1	1984	N	2416	616	3032	97%	4.0
2	1983	SE	1468	558	2026	95%	3.7
3	1986	N	1442	422	1865	92%	3.5
4	2006	N	1161	474	1635	90%	3.3
5	2011	SL	1347	215	1561	87%	3.1
6	1982	N	1095	382	1477	85%	2.9
7	1998	SE	897	438	1336	82%	2.7
8	1996	N	825	479	1304	79%	2.5
9	2017	LN	1024	213	1236	77%	2.2
10	1997	N	784	443	1227	74%	2.0
2019 10% Chance Exceedance Forecast		EN	955	254	1209	73%	1.9
11	1985	N	605	583	1189	72%	1.8
12	1999	SL	662	480	1142	69%	1.6
13	1993	EN	1097	37	1134	67%	1.4
14	1989	SL	962	59	1020	64%	1.2
2019 30% Chance Exceedance Forecast		EN	665	254	919	63%	1.1
15	1995	SE	825	85	910	62%	1.0
16	2005	EN	660	152	813	59%	0.7
17	2000	N	349	426	775	56%	0.5
18	2012	LN	257	492	749	54%	0.3
2019 50% Chance Exceedance Forecast		EN	495	254	749	53%	0.2
19	1981	N	243	502	745	51%	0.1
20	1990	N	304	396	700	49%	-0.1
21	2007	EN	241	448	689	46%	-0.3
22	2018	EN	226	461	687	44%	-0.5
23	2008	N	504	174	678	41%	-0.7
24	1987	N	209	468	677	38%	-1.0
25	2009	N	442	186	628	36%	-1.2
26	2016	SE	545	70	614	33%	-1.4
2019 70% Chance Exceedance Forecast		EN	355	254	609	32%	-1.5
27	2010	EN	425	160	585	31%	-1.6
28	2004	N	524	56	580	28%	-1.8
29	1994	SE	152	423	575	26%	-2.0
30	2001	LN	316	251	567	23%	-2.2
31	2002	N	459	103	562	21%	-2.5
32	1991	N	291	201	491	18%	-2.7
33	2013	N	198	264	462	15%	-2.9
2019 90% Chance Exceedance Forecast		EN	187	254	441	14%	-3.0
34	1988	SE	198	167	365	13%	-3.1
35	2003	EN	220	113	334	10%	-3.3
36	2015	EN	179	75	254	8%	-3.5
37	2014	N	185	61	246	5%	-3.7
38	1992	EN	129	94	223	3%	-4.0

Surplus ↑

Adequate Supplies ↑

Shortages Likely ↓

2018

Monthly SWSI Products

Statewide Summary Table:

Individual Basin Tables:

Select Month Select Basin

Retrieve Table

1981 to Present Streamflow and Reservoir Graphs:

Select Month Select Basin

Retrieve Graph

Period of Record Streamflow and Reservoir Graphs:

Select Month Select Basin

Retrieve Graph

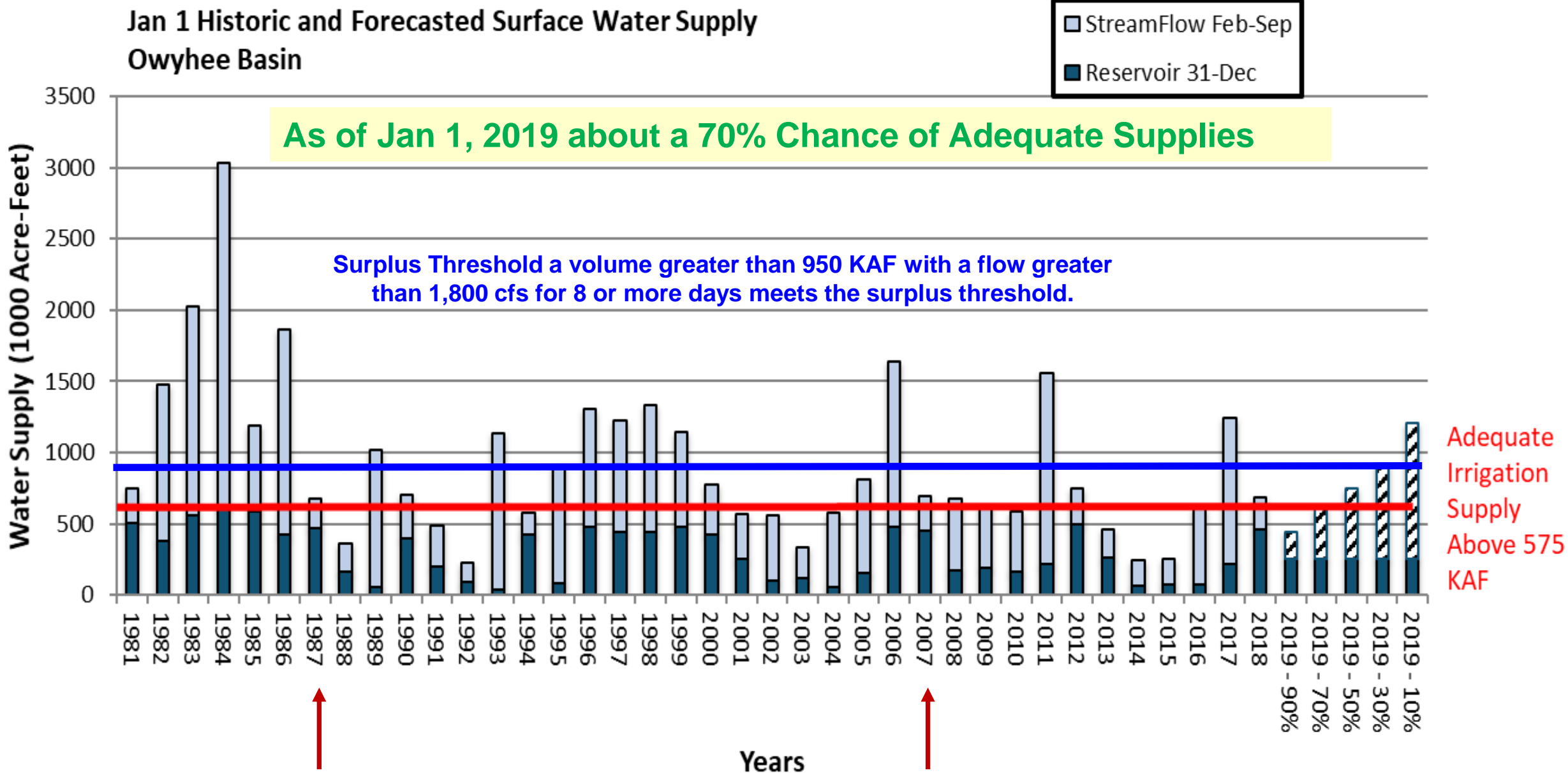
Flow Trend Graphs

Individual Flow Trend Graphs:

Surface Water Irrigation Outlook

- > 2019 Streamflow Needed for Adequate Irrigation Supply
- > 2018 Salmon Falls Reservoir Storage Allotment: [Jan](#) | [Feb](#) | [Mar](#) | [Apr](#) | [May](#)

Owyhee Basin Jan 1 2019 Surface Water Supply Index



Jan 1 2018 Surface Water Supply Index Boise River nr Heise

Surplus Above
2,200 KAF



Adequate
Supplies



Shortages
Likely

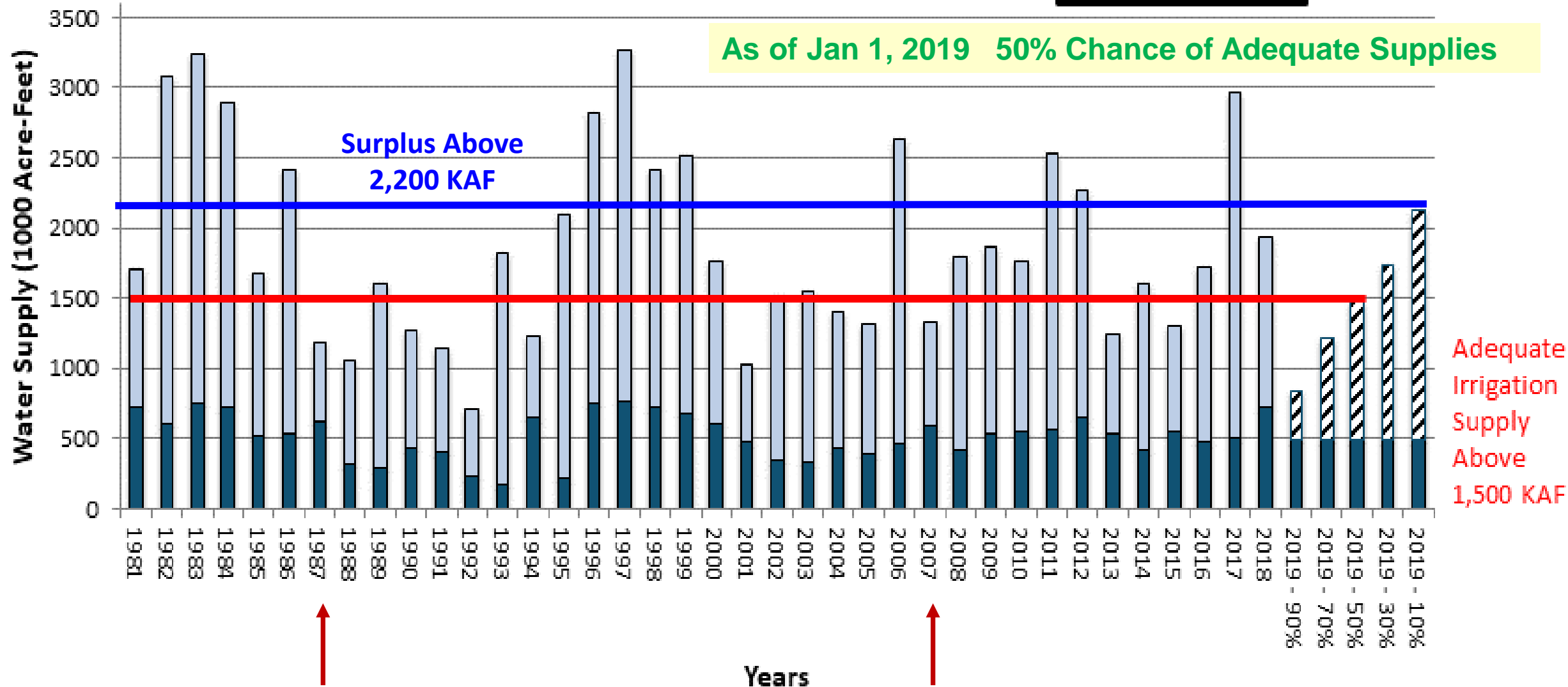


Station ID		Station Name	Period	Data Type	Years	# of Years	
13202000	BOISE RIVER NEAR BOISE, ID		Apr-Sep	strm	1981-2018	38 Units KAF	
13201500	LUCKY PEAK		31-Dec	resv	1981-2018	38 Units KAF	
13194000	ARROWROCK		31-Dec	resv	1981-2018	38 Units KAF	
13190000	ANDERSON RANCH		31-Dec	resv	1981-2018	38 Units KAF	
ENSO Classification SE Strong El Nino - EN Mild El Nino - N Neutral - LN Mild La Nina - SL Strong La Nina							
Rank	Year	Enso	Stream Flow Apr-Sep	Reservoir 31- Dec	Streamflow + Reservoir Sum	Non- Exceedance Probability	SWSI
1	1997	N	2491	771	3262	97%	4.0
2	1983	SE	2493	749	3243	95%	3.7
3	1982	N	2463	613	3076	92%	3.5
4	2017	LN	2463	501	2964	90%	3.3
5	1984	N	2161	724	2885	87%	3.1
6	1996	N	2066	748	2813	85%	2.9
7	2006	N	2162	469	2631	82%	2.7
8	2011	SL	1965	568	2533	79%	2.5
9	1999	SL	1838	677	2515	77%	2.2
10	1998	SE	1701	717	2418	74%	2.0
11	1986	N	1882	531	2413	72%	1.8
12	2012	LN	1611	654	2265	69%	1.6
2019 10% Chance Exceedance Forecast		EN	1630	495	2125	68%	1.5
13	1995	SE	1883	210	2094	67%	1.4
14	2018	EN	1221	720	1941	64%	1.2
15	2009	N	1323	535	1858	62%	1.0
16	1993	EN	1656	169	1826	59%	0.7
17	2008	N	1382	412	1794	56%	0.5
18	2010	EN	1224	547	1770	54%	0.3
19	2000	N	1154	610	1765	51%	0.1
2019 30% Chance Exceedance Forecast		EN	1240	495	1735	50%	0.0
20	2016	SE	1254	471	1725	49%	-0.1
21	1981	N	980	726	1706	46%	-0.3
22	1985	N	1166	518	1684	44%	-0.5
23	1989	SL	1325	286	1611	41%	-0.7
24	2014	N	1178	425	1603	38%	-1.0
25	2003	EN	1219	328	1546	36%	-1.2
26	2002	N	1178	344	1522	33%	-1.4
2019 50% Chance Exceedance Forecast		EN	985	495	1480	32%	-1.5
27	2004	N	974	431	1405	31%	-1.6
28	2007	EN	739	594	1333	28%	-1.8
29	2005	EN	931	388	1319	26%	-2.0
30	2015	EN	750	544	1294	23%	-2.2
31	1990	N	839	428	1267	21%	-2.5
32	2013	N	704	537	1241	18%	-2.7
33	1994	SE	590	646	1236	15%	-2.9
2019 70% Chance Exceedance Forecast		EN	725	495	1220	14%	-3.0
34	1987	N	561	618	1179	13%	-3.1
35	1991	N	734	408	1142	10%	-3.3
36	1988	SE	747	312	1059	8%	-3.5
37	2001	LN	546	473	1019	5%	-3.7
2019 90% Chance Exceedance Forecast		EN	340	495	835	4%	-3.8
38	1992	EN	471	238	708	3%	-4.0

Boise Basin Jan 1 2019 Surface Water Supply Index

Jan 1 Historic and Forecasted Surface Water Supply
Boise River Basin

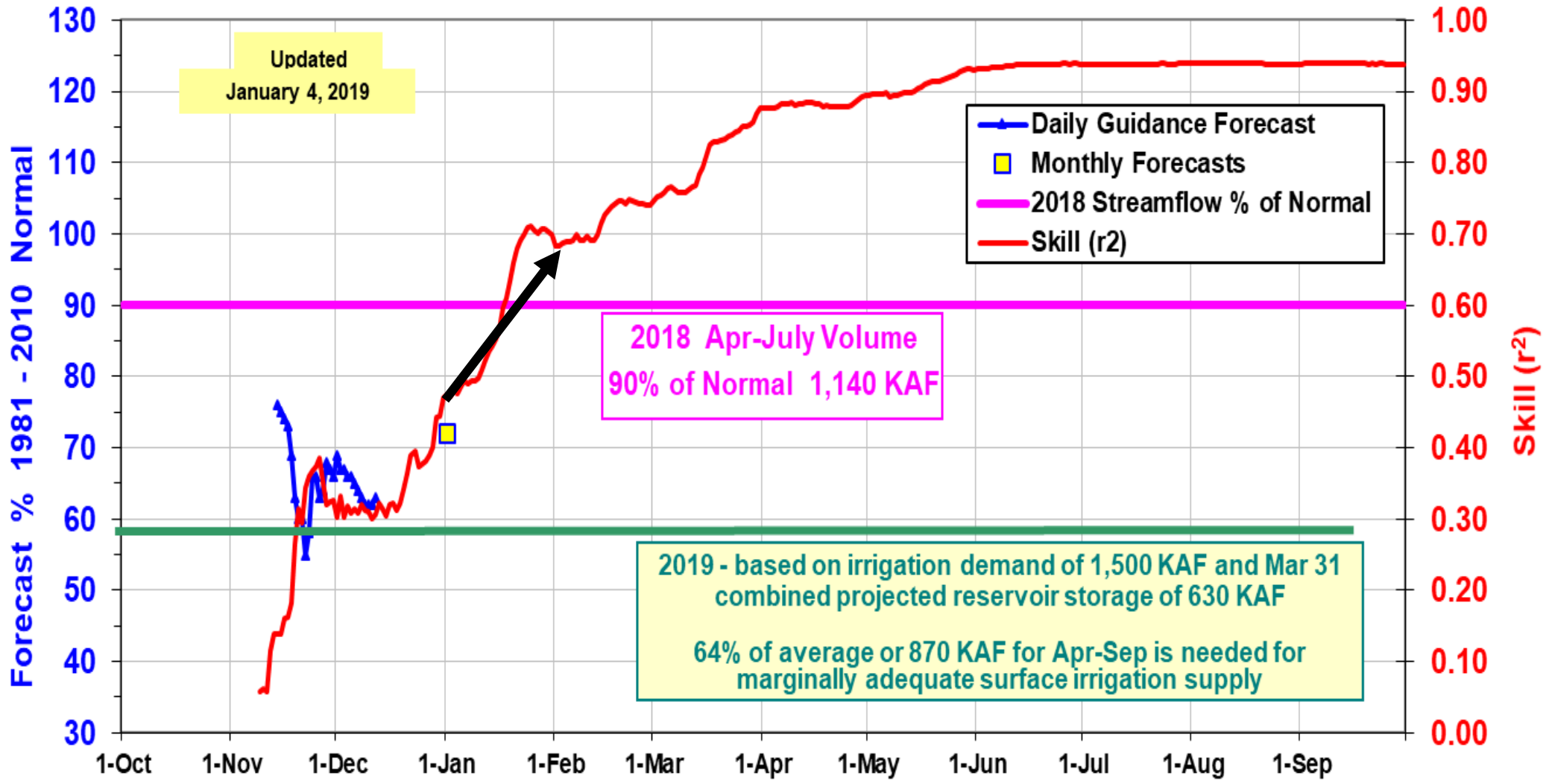
Stream Flow Apr-Sep
Reservoir 31-Dec



2019 Boise River nr Boise Daily Water Supply Forecast



2019 Boise River near Boise: Apr - Jul Volume NRCS Monthly Forecasts are Squares

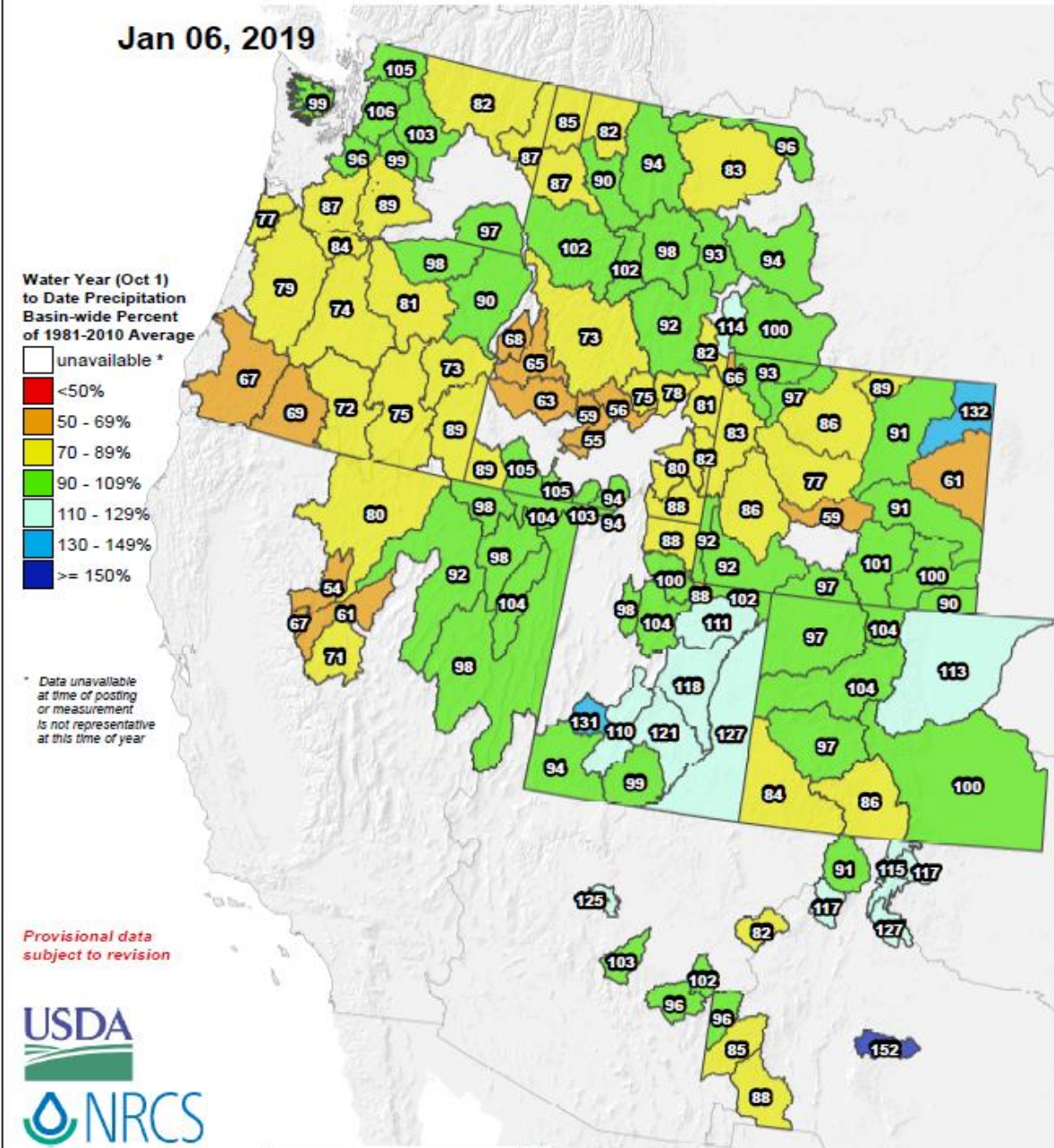


Note increase in forecast skill level during January as we progress from being 40% of the way thru winter on Jan 1 to 60% on Feb 1.

SNOTEL Sites used: Atlanta Summit, Trinity Mountain, Dollarhide Summit, Vienna Mine, Galena and Galena Summit

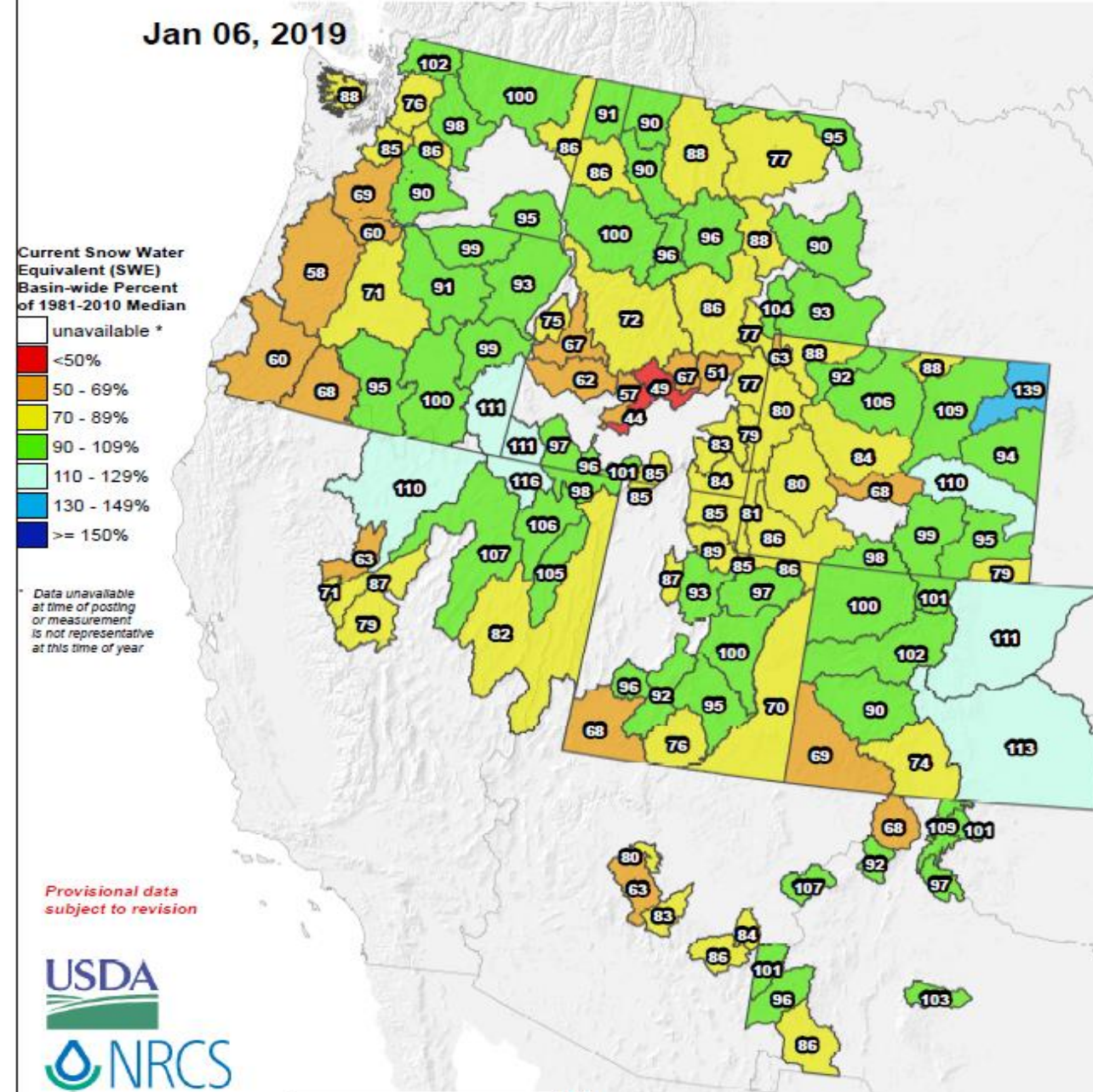
Westwide SNOTEL Water Year (Oct 1) to Date Precipitation % of Normal

Jan 06, 2019



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

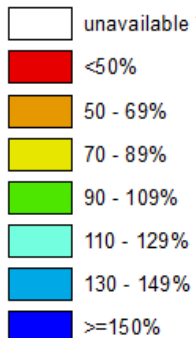
Jan 06, 2019



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

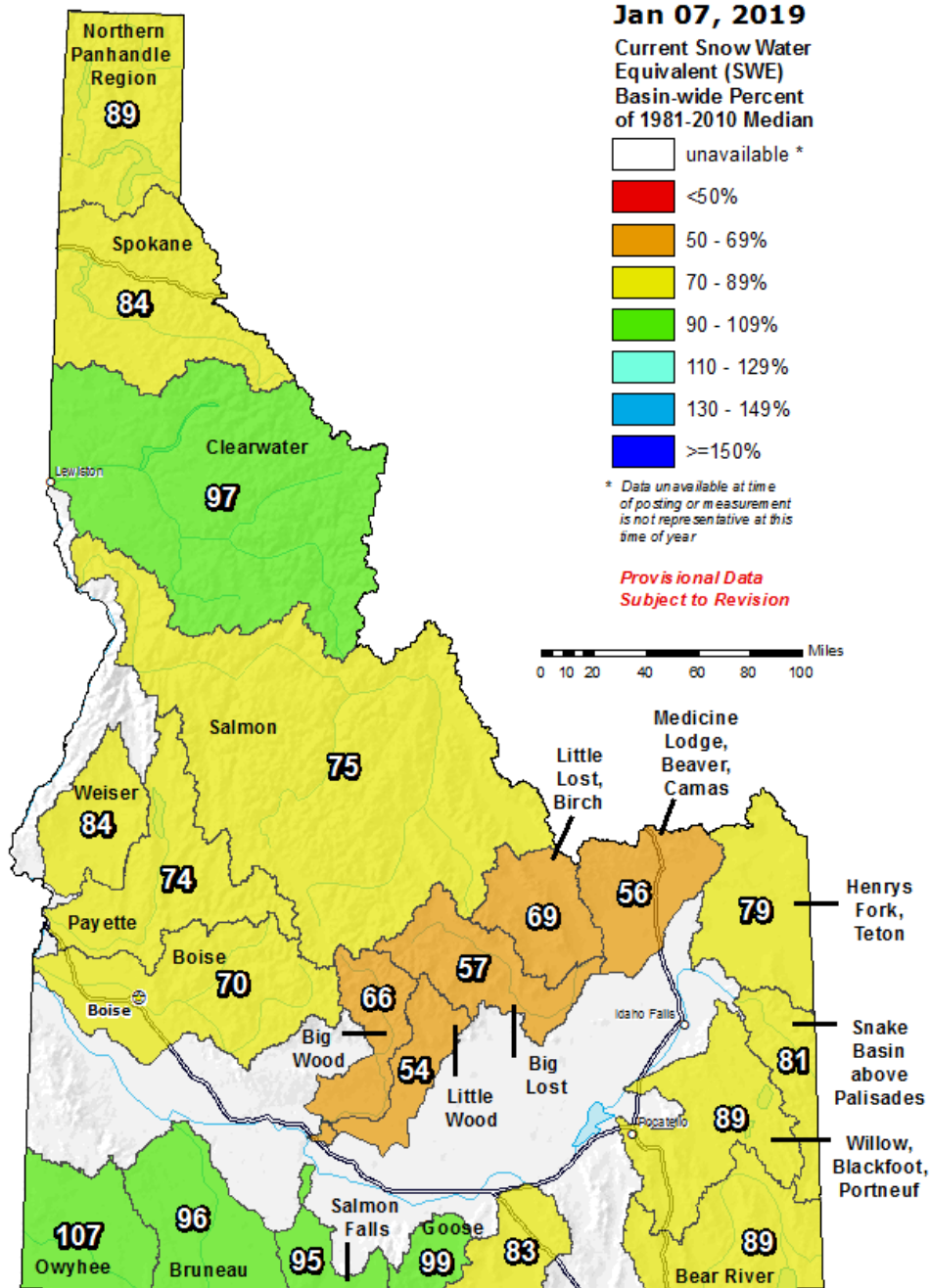
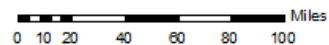
Jan 07, 2019

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



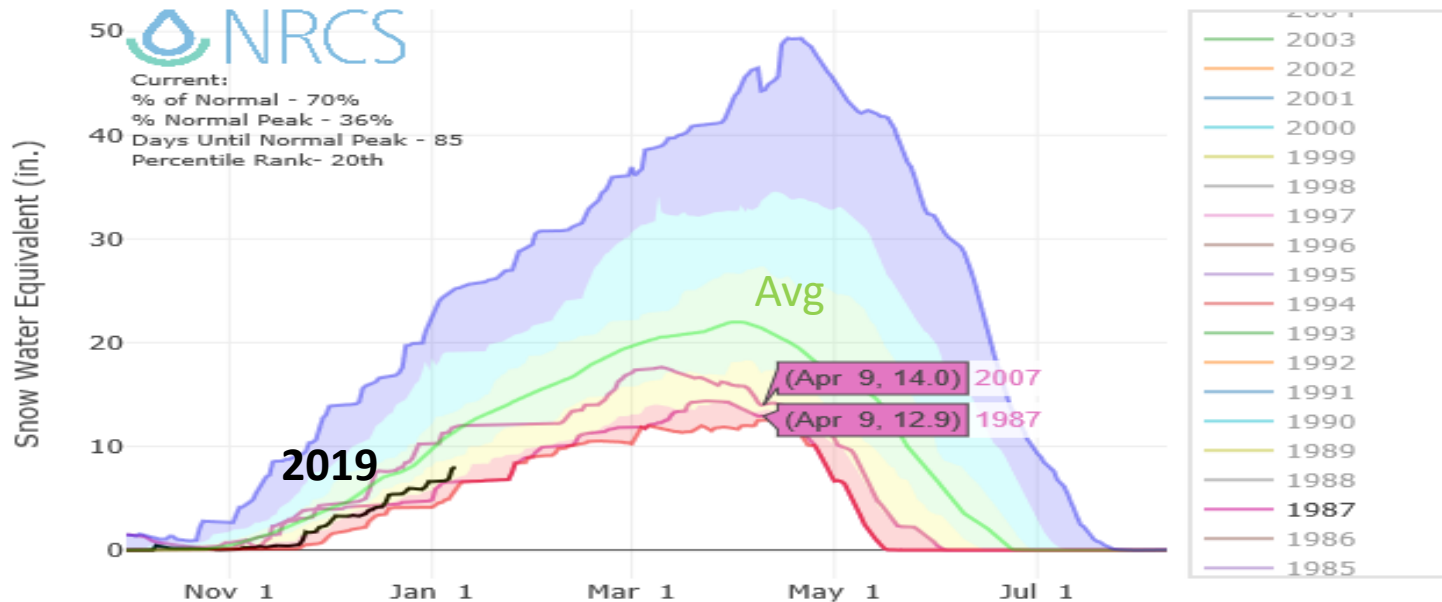
* Data unavailable at time of posting or measurement is not representative at this time of year

*Provisional Data
Subject to Revision*



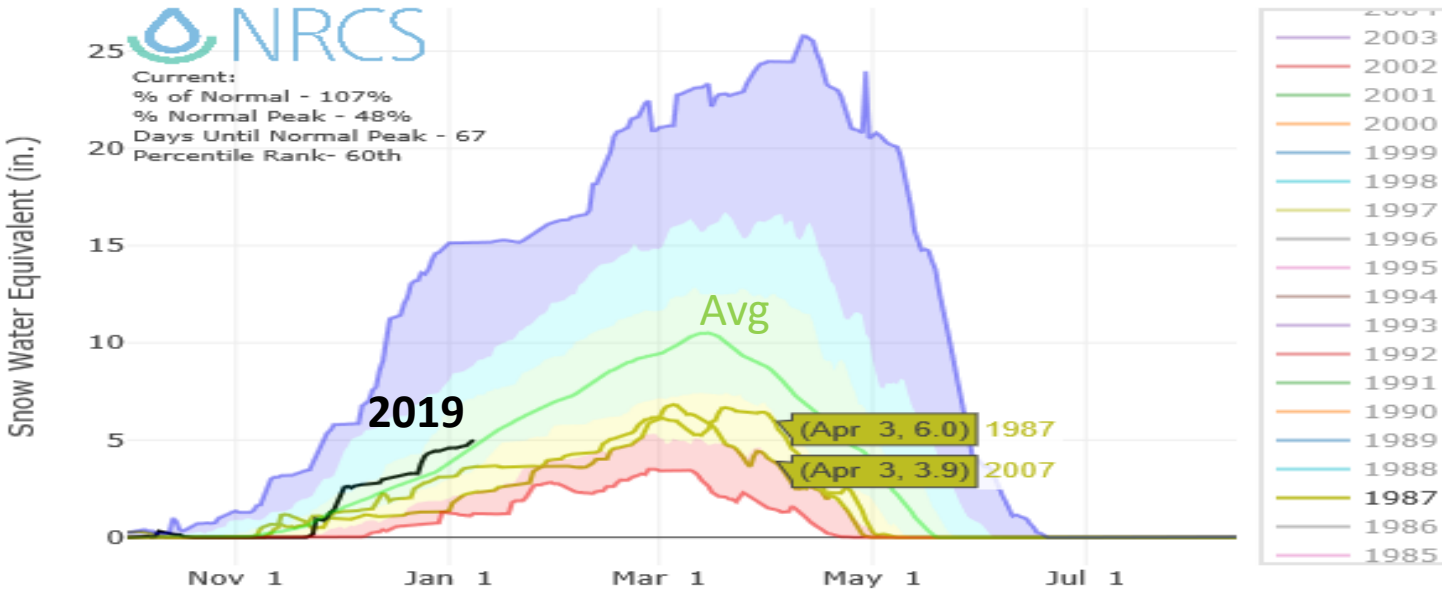
Snow Water Equivalent in Boise Basin Total

Jan Apr July WY



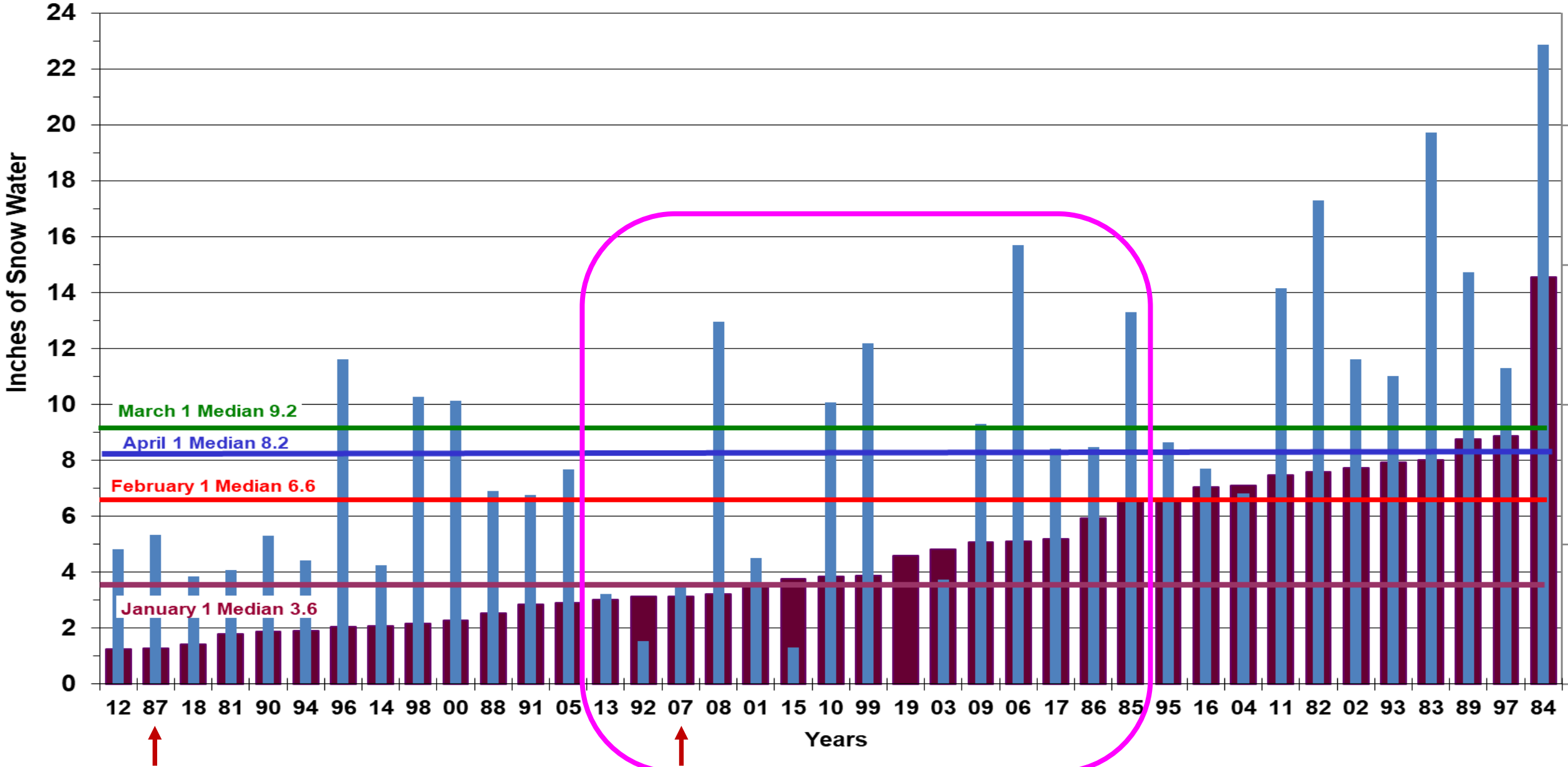
Snow Water Equivalent in Owyhee Basin Total

Jan Apr July WY



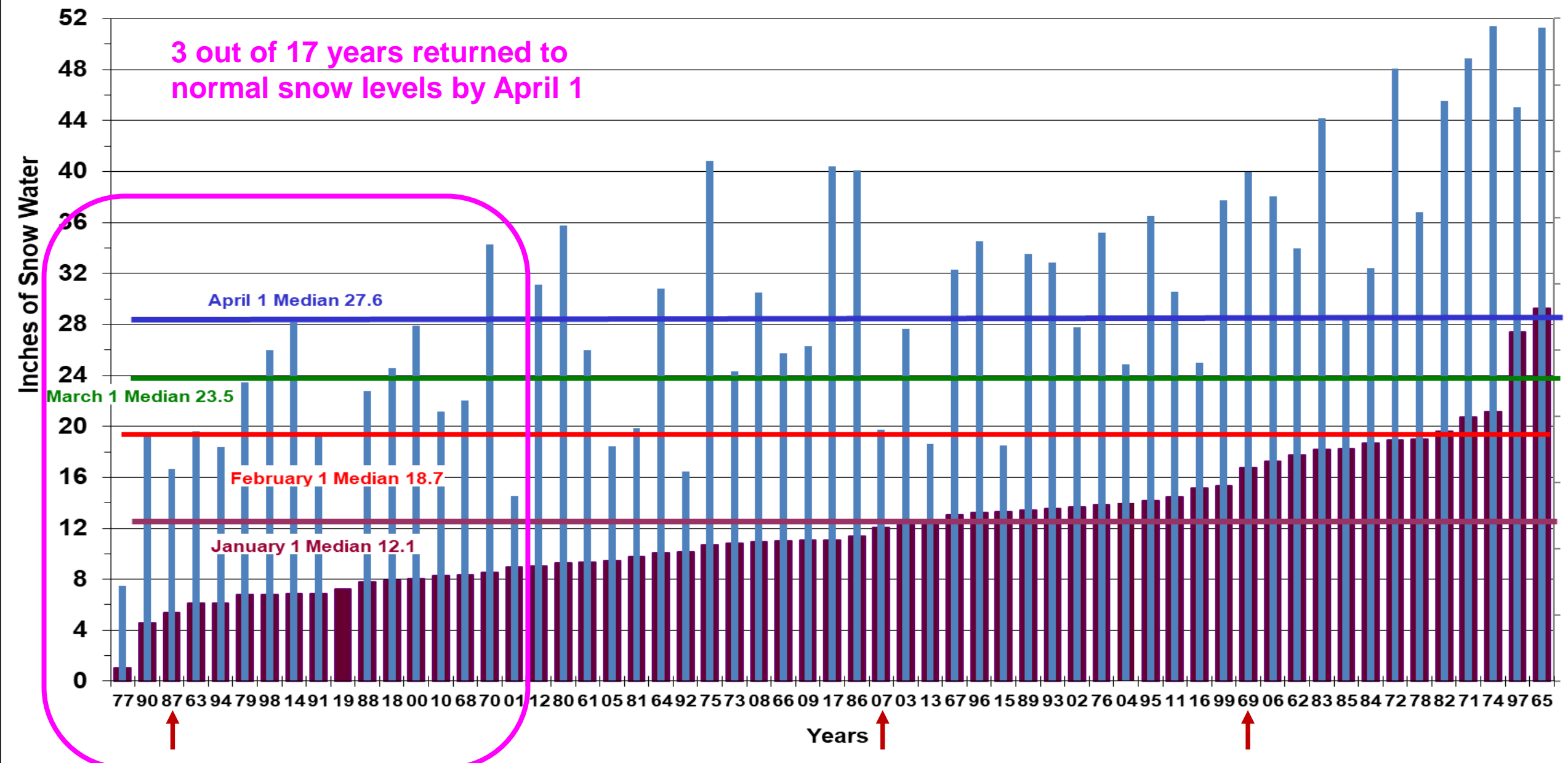
January Owyhee Basin 6 Station Snow Index for Years 1981 - 2018
Big Bend, Jack Creek Upper, Laurel Draw, Mud Flat, South Mtn., Taylor Canyon

■ January 1 Snow Water
 ■ April 1 Snow Water

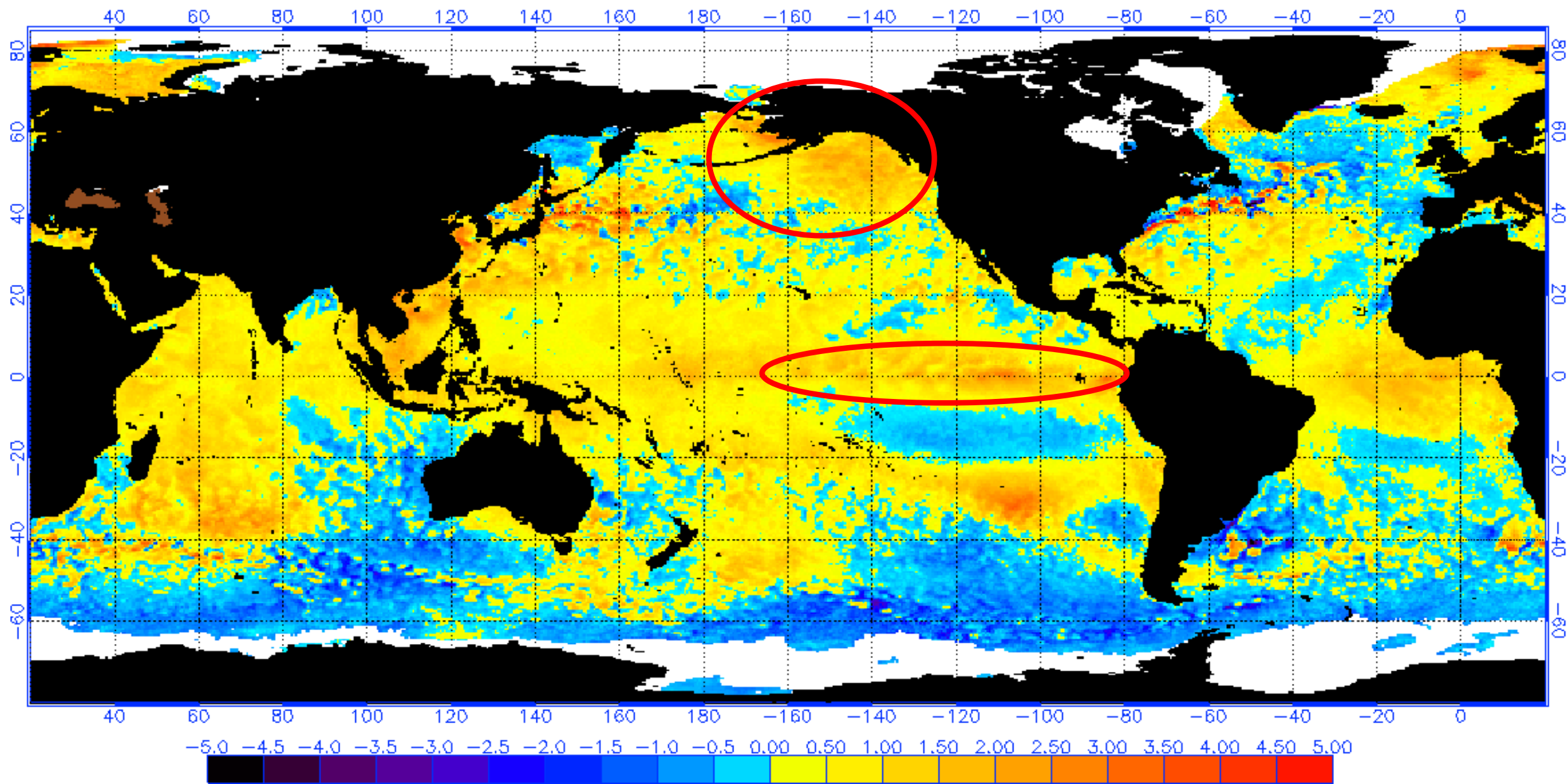




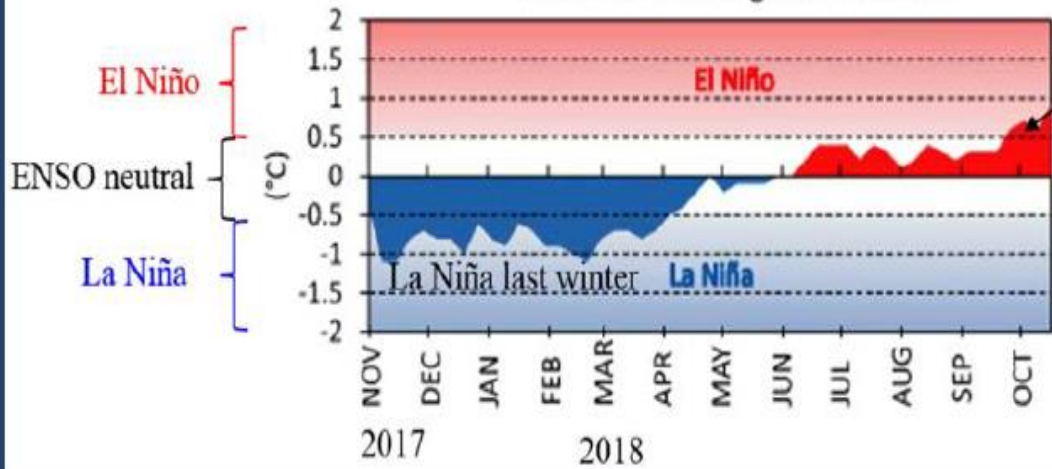
■ January 1 Snow Water
■ April 1 Snow Water



NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 12/10/2018
(white regions indicate sea-ice)



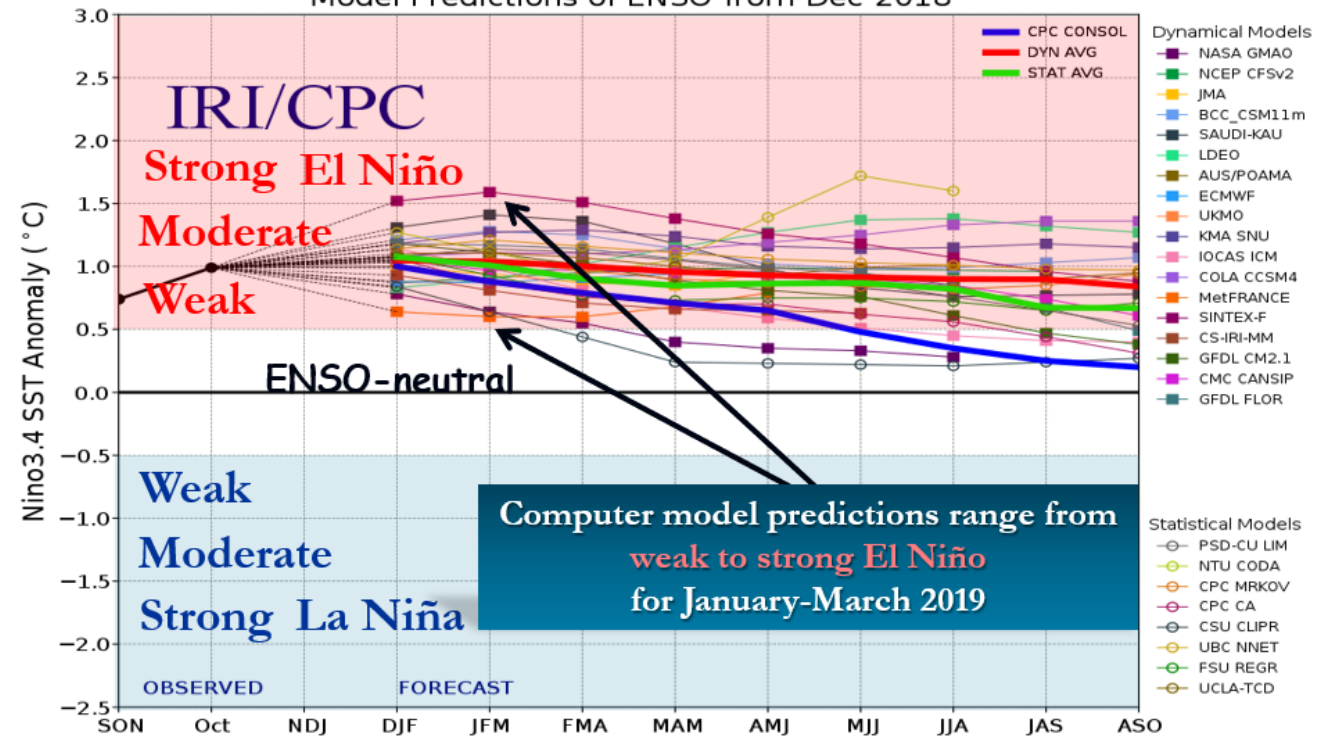
Weekly Niño 3.4 Index (°C)
1 Nov. 2017 through 17 Oct. 2018



ENSO Predictive Models

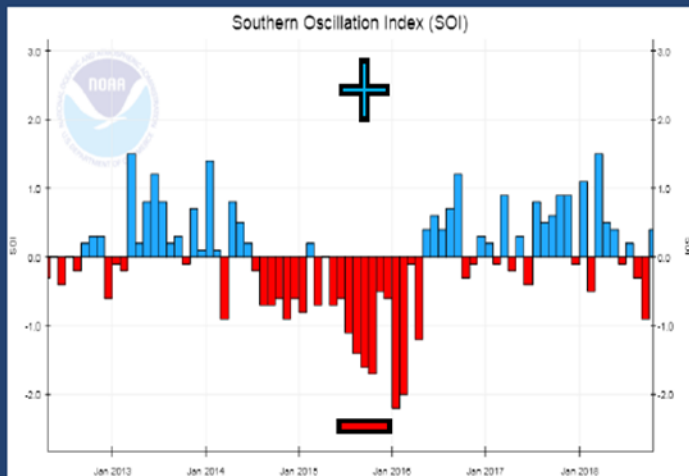
Includes both dynamic and statistical model predictions

Model Predictions of ENSO from Dec 2018



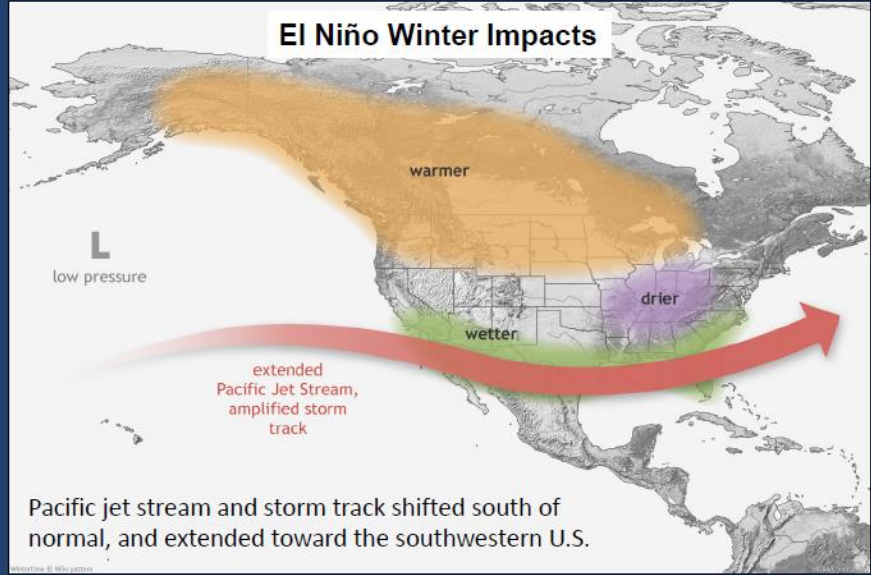
SOI - Southern Oscillation Index

Southern Oscillation Index (SOI)



Winter Outlook

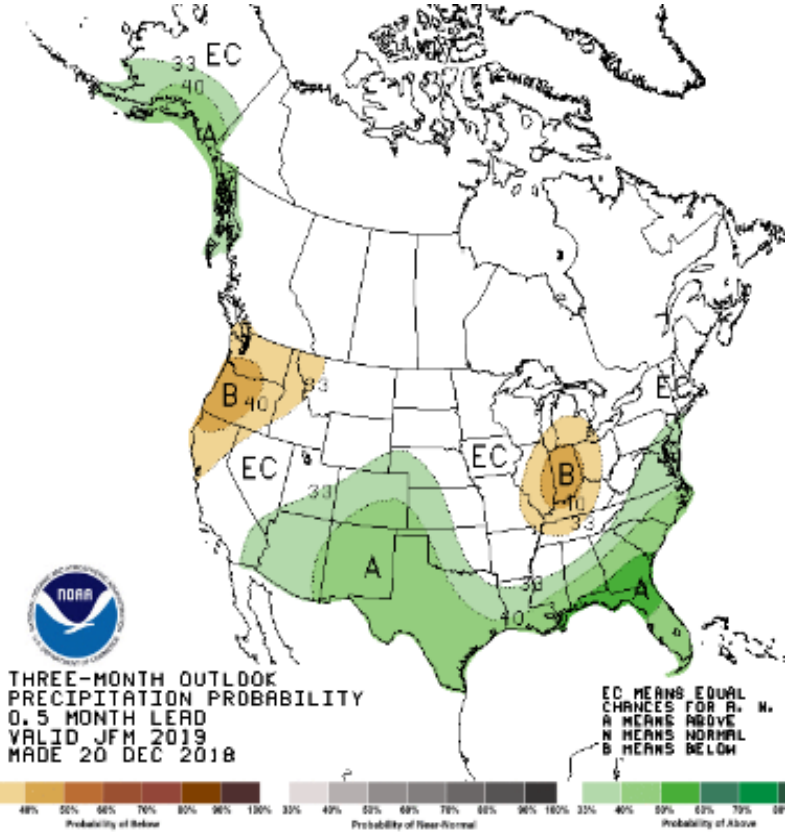
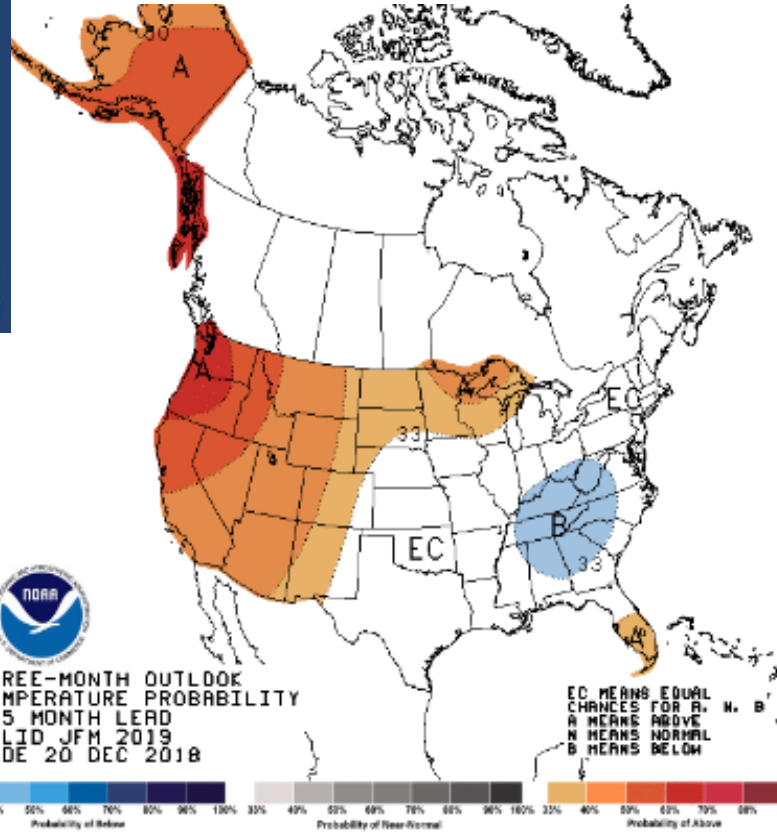
El Niño Winter Impacts



NOAA Jan – Feb – Mar Outlook from 20 Dec 2018

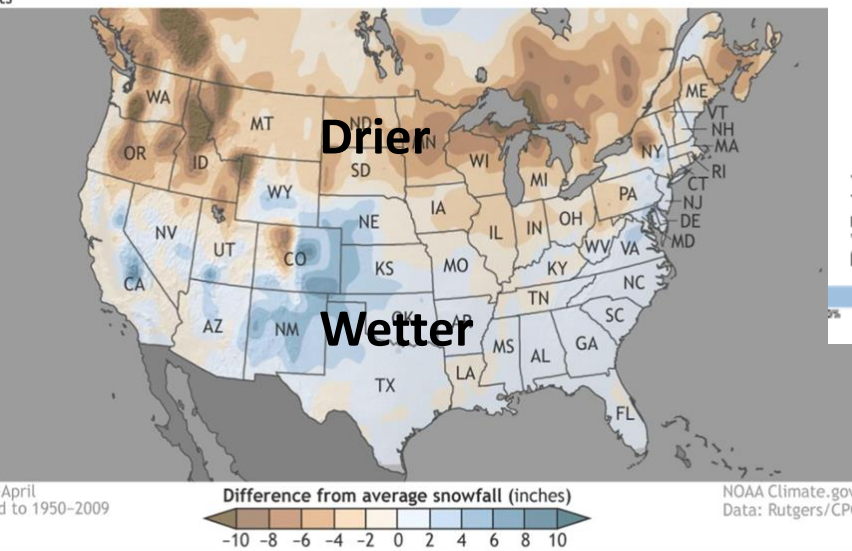
Temperature

Precipitation



Snowfall Anomalies: El Niño years

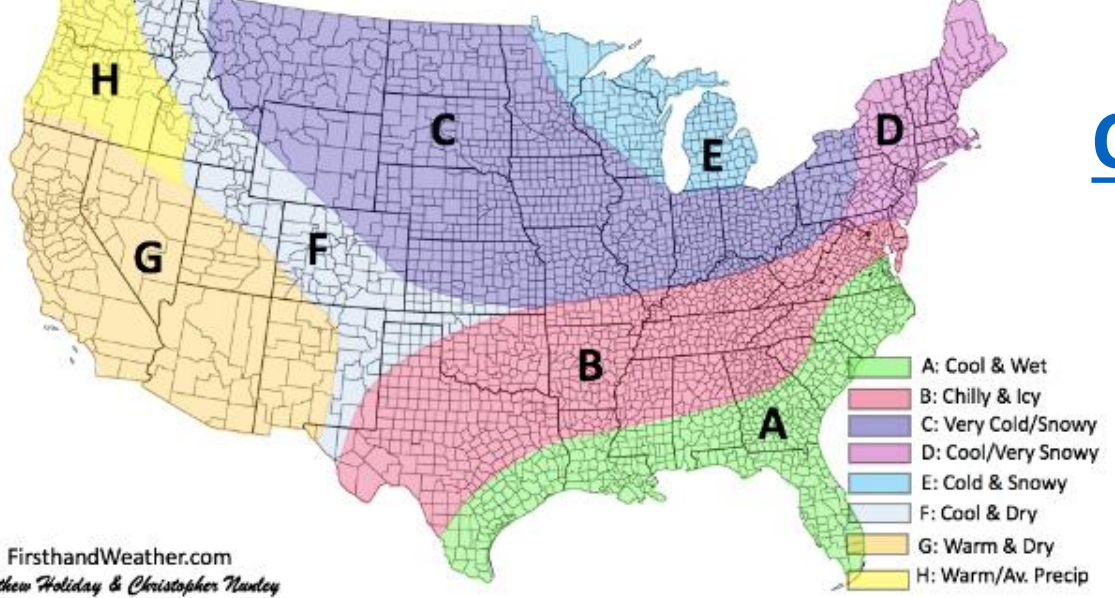
All (21) years



Firsthand Weather

Christopher Nunley | October 29, 2018

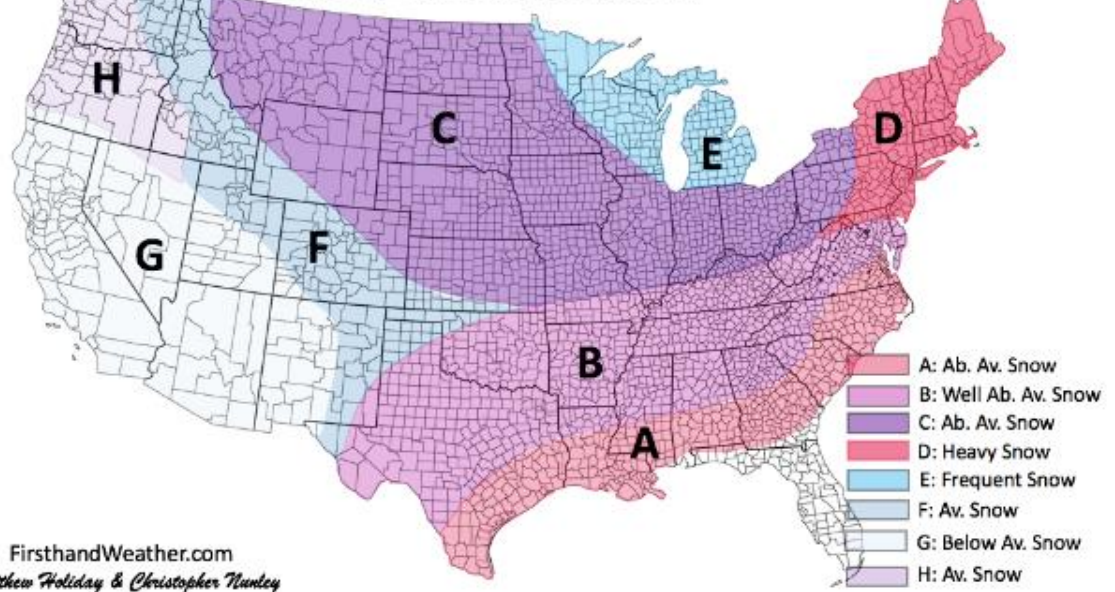
2018-2019 Winter Outlook



C (Kansas City, KS; Omaha, NE; Rapid City, SD; Casper, WY; Billings, MT; Fargo, ND; Des Moines, IA; Chicago, IL; Columbus, OH): This region will be characterized by temperatures well below normal and snowy conditions. Several winter storms and brutal cold are possible.

F (Denver, CO; Salt Lake City, UT; Twin Falls, ID; Spokane, WA): This region will be characterized by temperatures slightly below average and near normal precipitation. A few winter storms moving in from the Pacific Northwest are possible in this region.

2018-2019 Snow Outlook



H (Portland, OR; Seattle, WA; Boise ID): This region will be characterized by temperatures above average and precipitation near average to slightly below average. There will be a few winter storms that move in from the northern Pacific, thus, providing beneficial snow to ski resorts in the region.

Forecast Overview

Seasonal Climate Forecast
Dec 2018 – Feb 2019
Issued: Dec 19, 2018

ODF Meteorologist Pete Parsons

Analog years 1987 2007 2013

- The evolution of warmer-than-average tropical Pacific SSTs prompted the replacement of the 2012-13 analog year with 1968-69. The 1986-87 and 2006-07 analogs remain the same from last month. All of the analog years reflect “late-developing” **El Niño winters**.
- A “**split-flow**” jet stream pattern, typical of **El Niño**, should eventually develop, which typically produces stretches of mild and wet weather, along with cool (not excessively cold) and dry periods. However...
- Late-forming **El Niño** events, like this one, are rare and may or may not produce weather patterns normally associated with **El Niño**, especially early in the winter. For instance, January 1969 was quite cold and one of the snowiest months on record! On the flip side, 1987 and 2007 had some cold stretches but nothing too extreme (more typical of **El Niño**). That said, quite stormy periods and/or cold-&-snowy weather, especially in January, can't be ruled out!
- **Bottom line:** The current SST pattern in the tropical Pacific Ocean is rare and has been associated with both benign and extreme weather for Oregon, with the greatest chances for “extreme” weather in January. To temper the impact of the anomalously-cold temperatures of January 1969, progressively-greater “weight” was given to the more-recent analog years.

IMPORTANT NOTE: This forecast is based on past and current weather data and is not associated with CPC predictions (see “Forecasting Methods...” at: <https://oda.direct/Weather>) nor the official CPC “Three-Month Outlooks,” which are available here: http://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1



Slide 1

Adequate Supplies

Reservoir Storage

Money in the bank

Snake River Near Heise SWSI

Adequate Water Supply Greater than -1.8 SWSI or 4,200 KAF

on ID	Station Name	Period	Data Type	Years	# of Years
7500	Snake River near Heise	Apr-Sep	strm	1981-2017	37 Units KAF
0500	Jackson Lake	31-Dec	resv	1981-2017	37 Units KAF
2450	Palisades Reservoir	31-Dec	resv	1981-2017	37 Units KAF

ENSO Classification
SE Strong El Nino - EN Mild El Nino - N Neutral - LN Mild La Nina - SL Strong La Nina

Rank	Year	Enso	Stream Flow Apr-Sep	Reservoir 31-Dec	Streamflow + Reservoir Sum	Non-Exceedance Probability	SWSI
1	1997	N	7008	1925	8933	97%	3.9
2	2011	SL	6343	1469	7813	95%	3.7
3	1996	N	5584	2044	7627	92%	3.5
4	1986	N	6054	1259	7313	89%	3.3
5	2017	LN	6140	1087	7227	87%	3.1
6	1982	N	5773	1269	7042	84%	2.9
2018 10% Chance Exceedance Forecast		LN	4990	2011	7001	83%	2.7
7	1983	SE	5007	1868	6875	82%	2.6
8	1984	N	5046	1798	6844	79%	2.4
9	1999	SL	4949	1797	6746	76%	2.2
10	1998	SE	4495	1953	6448	74%	2.0
2018 30% Chance Exceedance Forecast		LN	4330	2011	6341	72%	1.9
11	2009	N	4610	1469	6078	71%	1.8
2018 50% Chance Exceedance Forecast		LN	3880	2011	5891	70%	1.7
2018 70% Chance Exceedance Forecast		LN	3440	2011	5451	69%	1.6
12	2012	LN	3384	1868	5252	68%	1.5
13	2006	N	4076	1161	5237	66%	1.3
14	1995	SE	4443	785	5228	63%	1.1
15	2014	N	4594	624	5218	61%	0.9
16	1985	N	3490	1549	5040	58%	0.7
17	2008	N	4286	734	5020	55%	0.4
18	2015	EN	3204	1671	4875	53%	0.2
19	2000	N	3057	1805	4862	50%	0.0
20	2010	EN	3106	1695	4801	47%	-0.2
2018 90% Chance Exceedance Forecast		LN	2780	2011	4791	46%	-0.3
21	1993	EN	4113	570	4684	45%	-0.4
22	1981	N	2909	1716	4625	42%	-0.7
23	1989	SL	3867	600	4467	39%	-0.9
24	1990	N	2806	1546	4352	37%	-1.1
25	1991	N	3354	930	4283	34%	-1.3
26	2016	SE	3010	1260	4270	32%	-1.5
27	1994	SE	2317	1858	4174	29%	-1.8
28	1987	N	2547	1391	3938	26%	-2.0
29	2007	EN	2316	1569	3885	24%	-2.2
30	2013	N	2719	1104	3823	21%	-2.4
31	2005	EN	3193	616	3808	18%	-2.6
32	2003	EN	2924	609	3613	16%	-2.9
33	1992	EN	1998	1458	3456	13%	-3.1
34	1988	SE	2647	809	3456	11%	-3.3
35	2004	N	2833	542	3375	8%	-3.5
36	2002	N	2774	577	3351	5%	-3.7
37	2001	LN	1964	1213	3177	3%	-3.9

2018 Observed Runoff + Storage

Questions
Comments
Discussions

Ron's Retirement Date Forecast



Surplus

Dec 2019 <10% Chance that I'll still be here

Apr 26 80% Chance I'll be gone

Mar 29 50% Chance I'll be here

Jan 31 90% Chance I'll be here

Adequate Supplies



Money in the bank – reservoir storage

Snake River Near Heise SWSI

Adequate Water Supply Greater than -1.8 SWSI or 4,200 KAF

Station ID	Station Name	Period	Data Type	Years	# of Years
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