

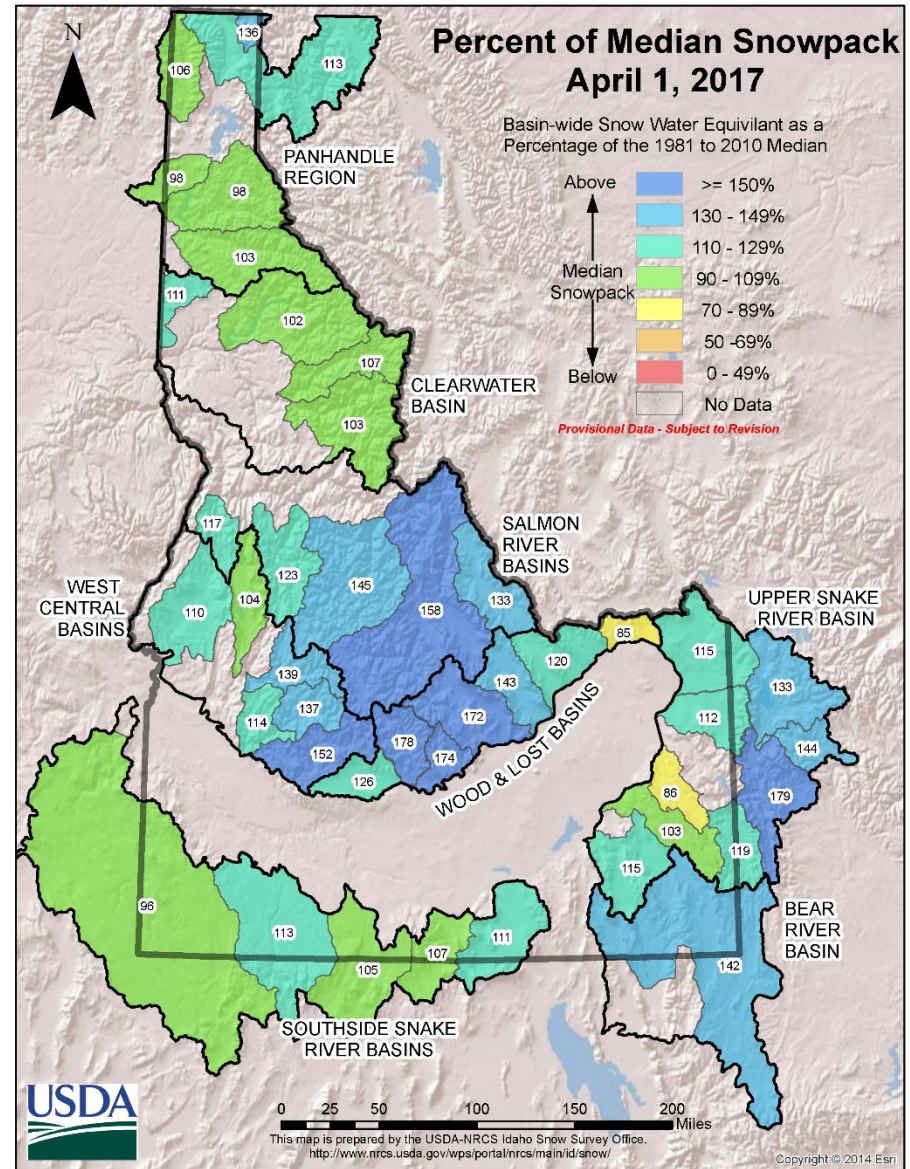
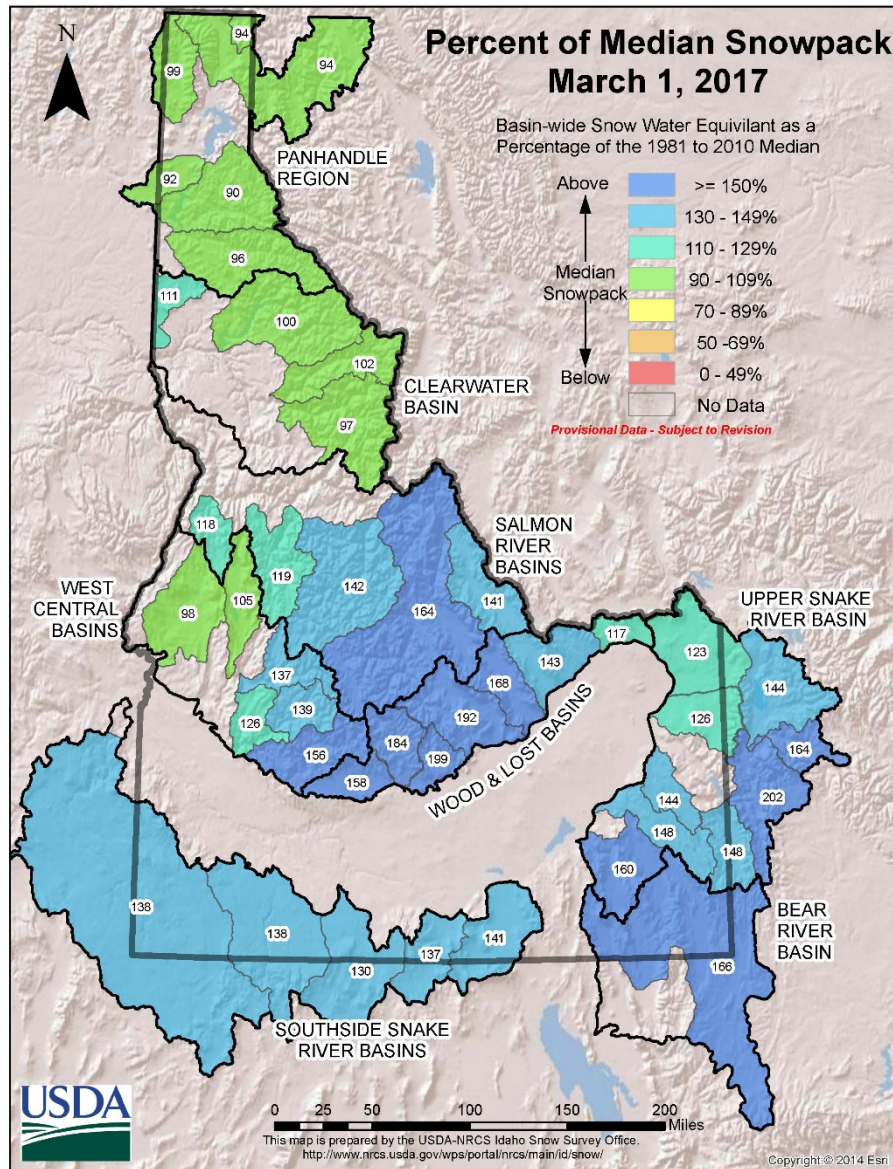
2017 Idaho Snowpack and Water Supply Outlook

NRCS - Idaho Snow Survey

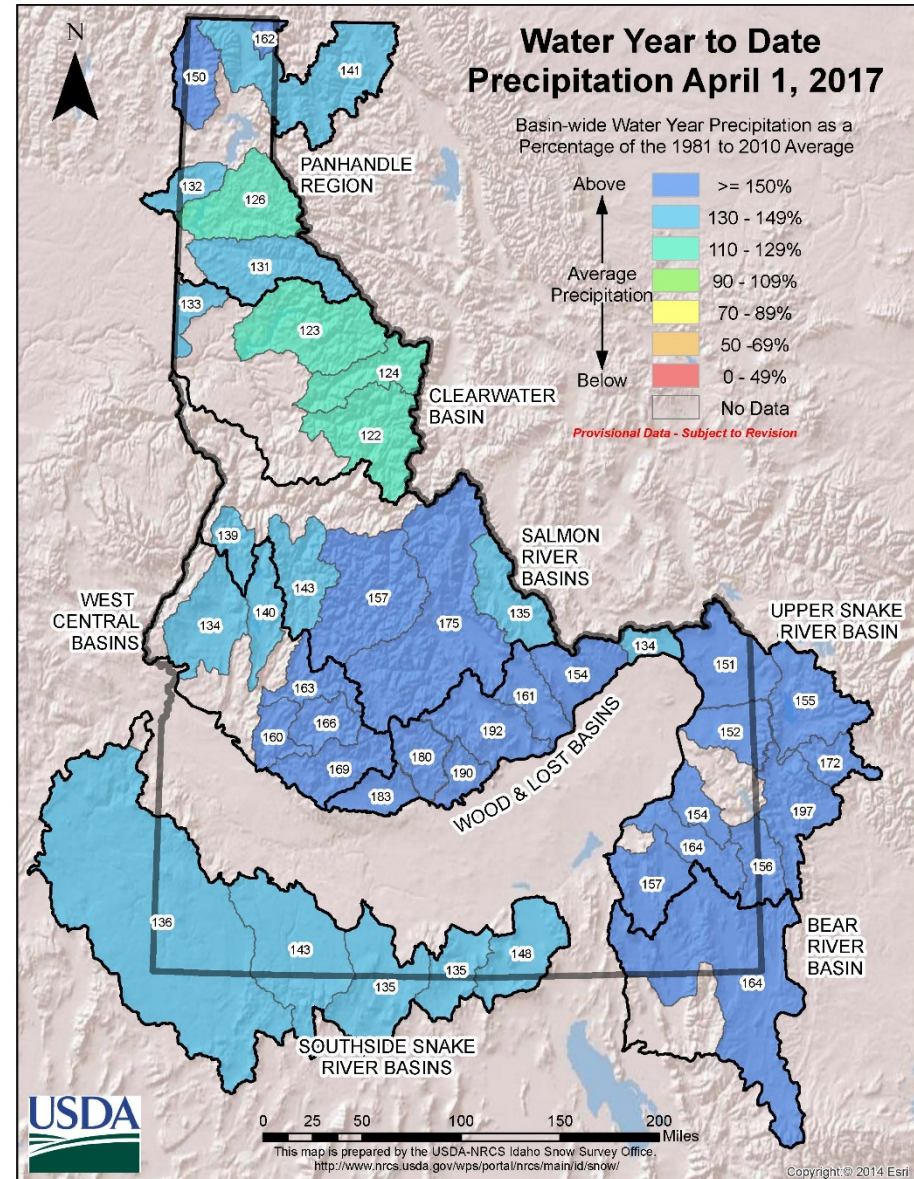
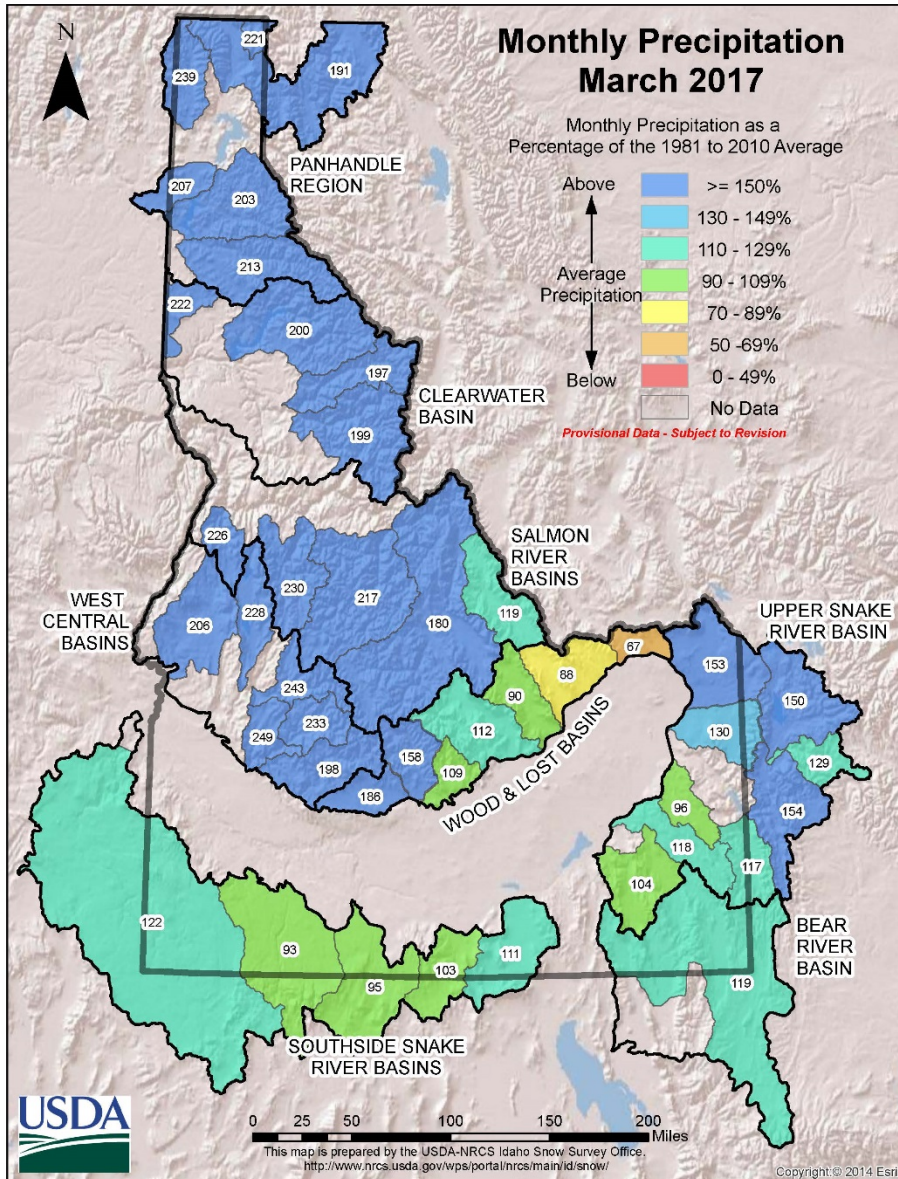
Danny Tappa & Ron Abramovich



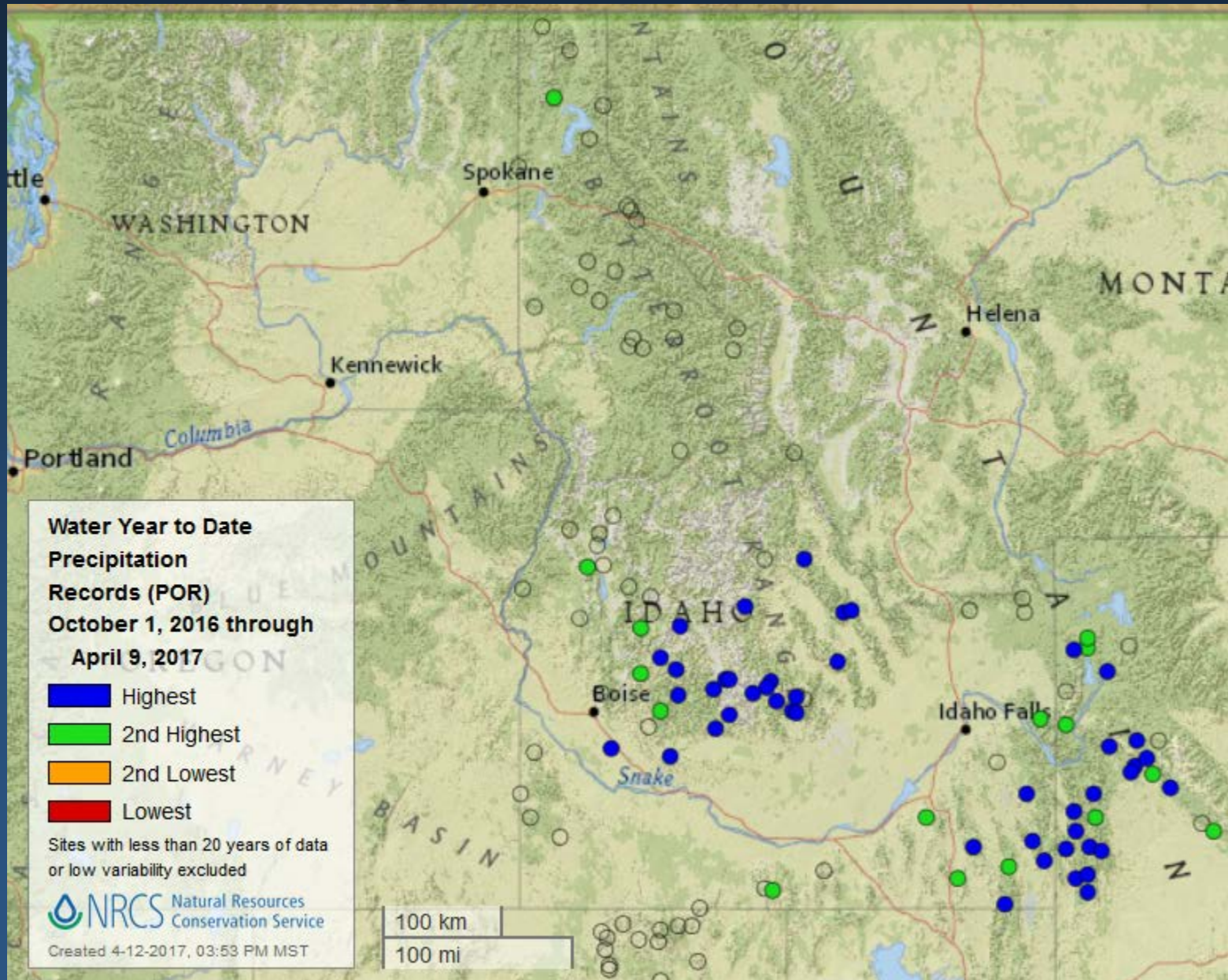
April 1 vs. March 1 Snowpack



Monthly & Water Year Precipitation



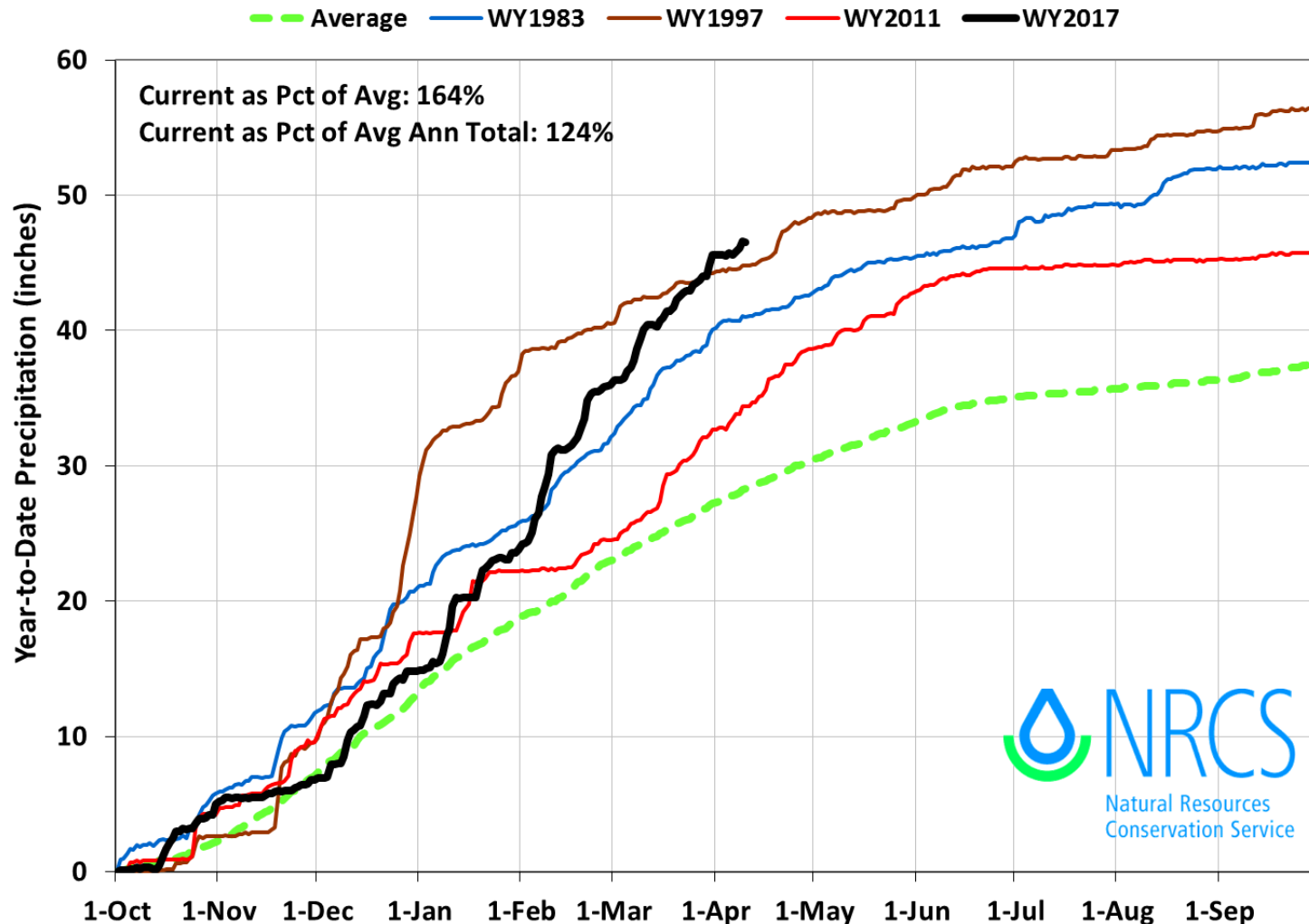
Precipitation Records



Boise WY Precipitation

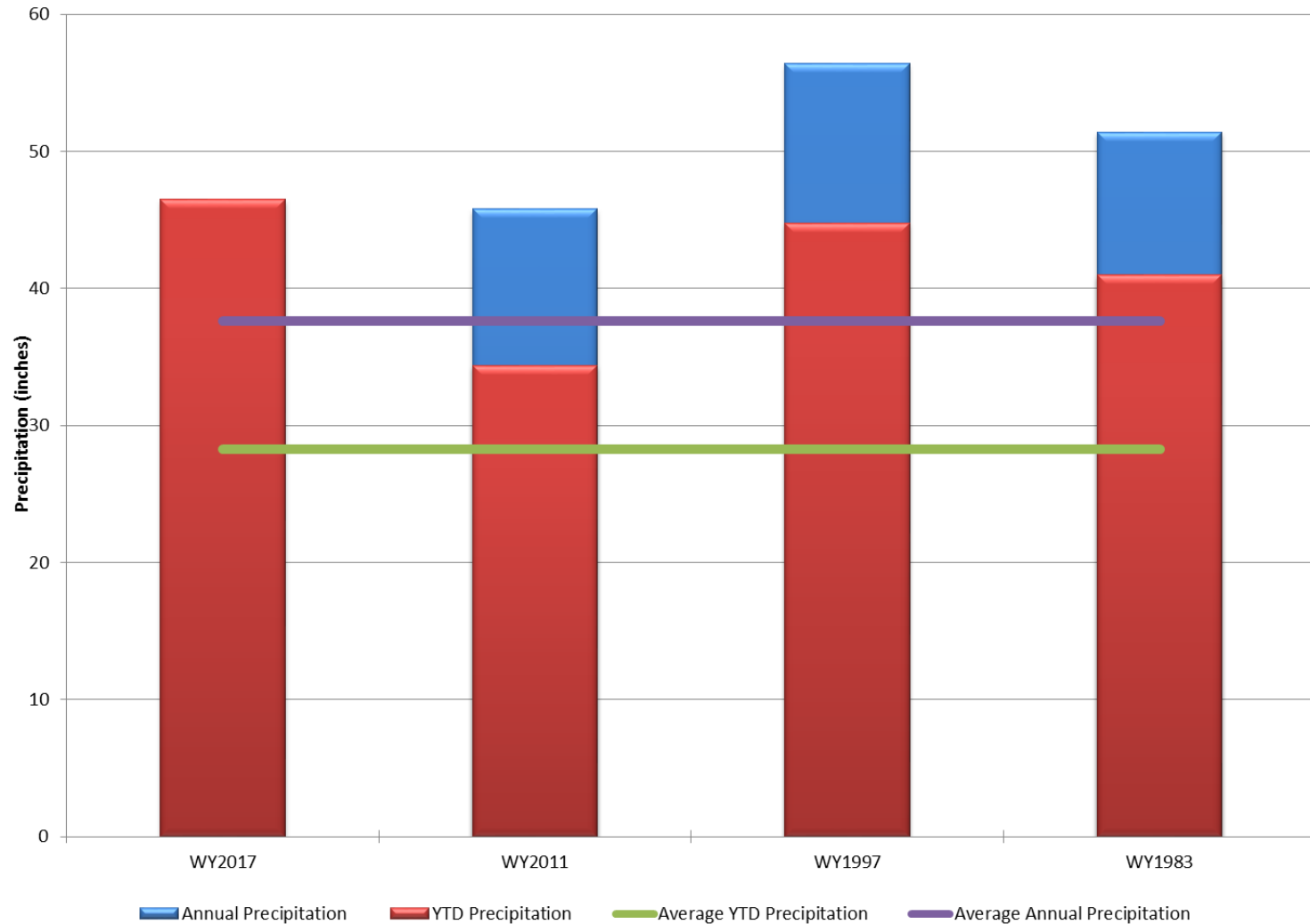
Boise Basin 2017 Precipitation Comparison Graph (8 sites)

Based on Provisional SNOTEL data as of Apr 10, 2017



Boise WY Precipitation

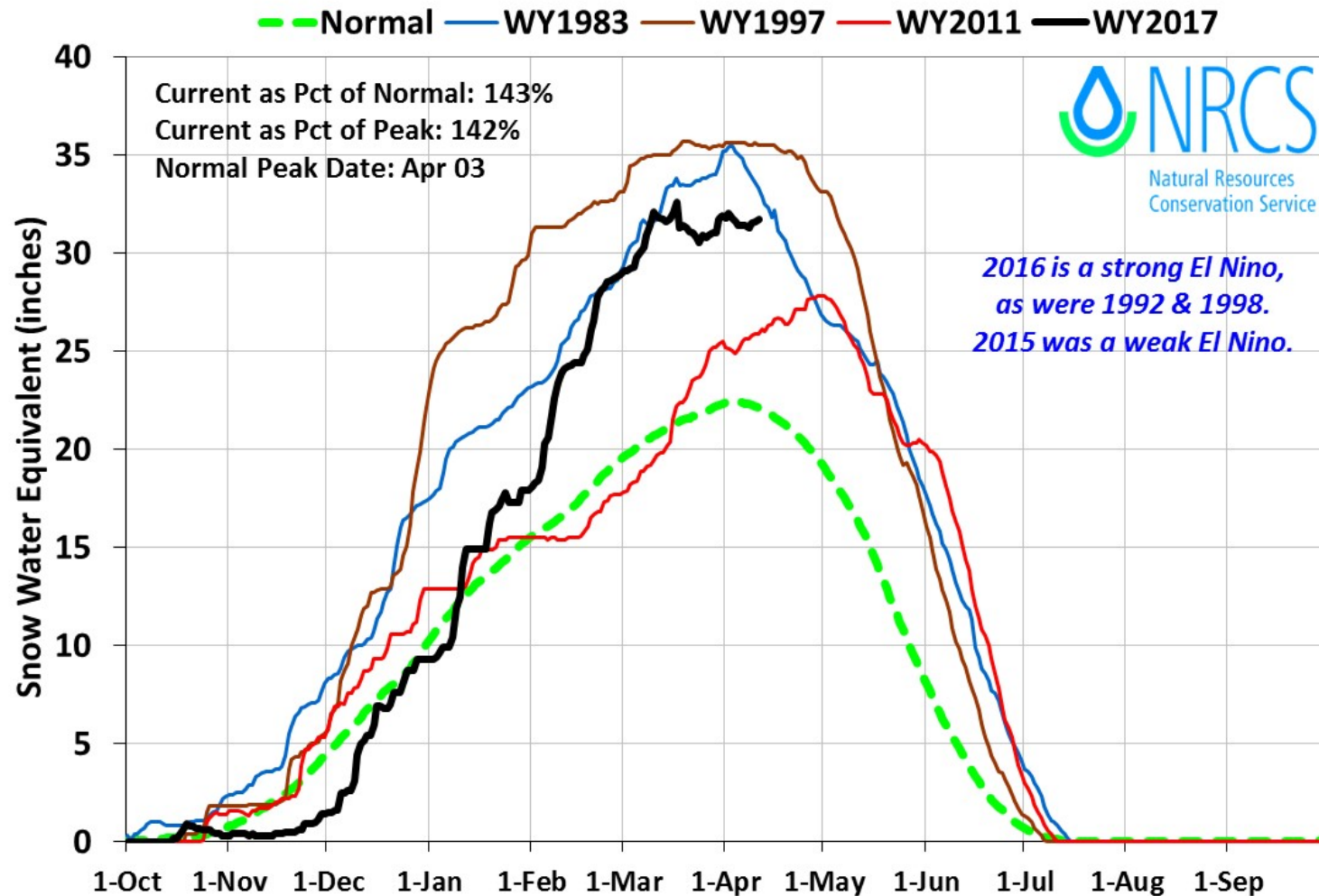
Boise Basin Annual Precipitation Summary
Based on Provisional SNOTEL data as of Apr 10, 2017



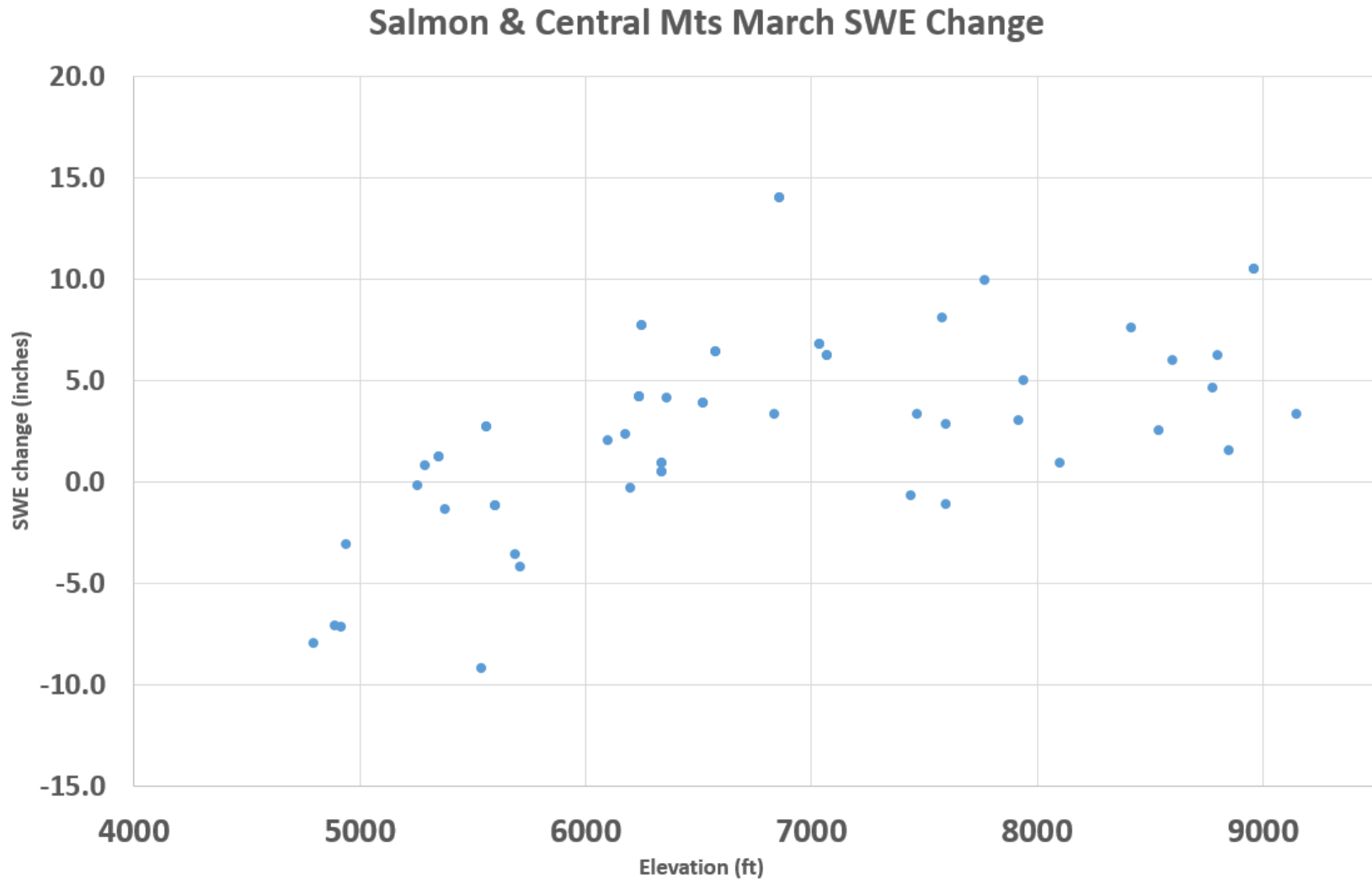
Boise Basin Snowpack

Boise Basin 2017 Snowpack Comparison Graph (10 sites)

Based on Provisional SNOTEL data as of Apr 11, 2017



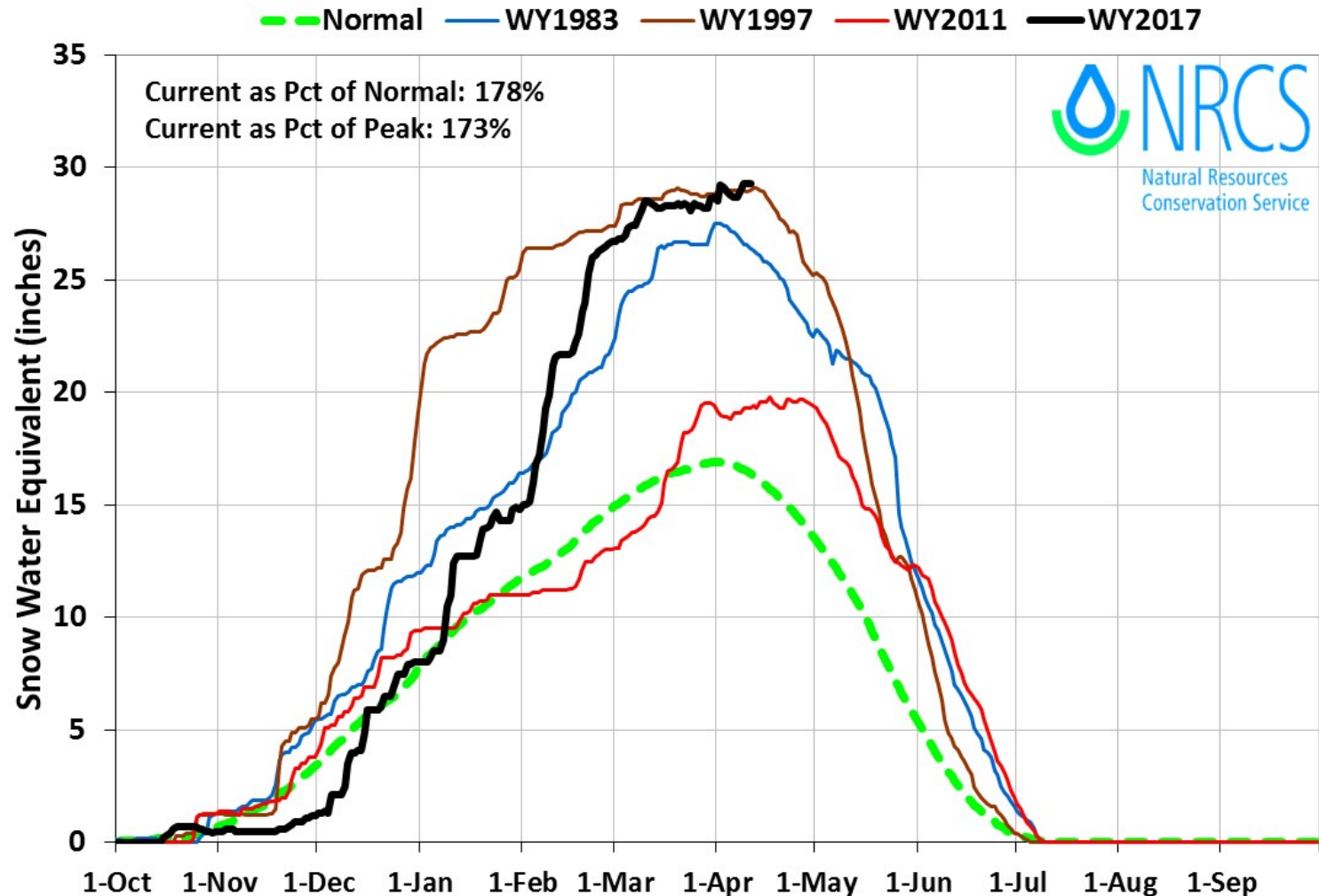
March SWE Change



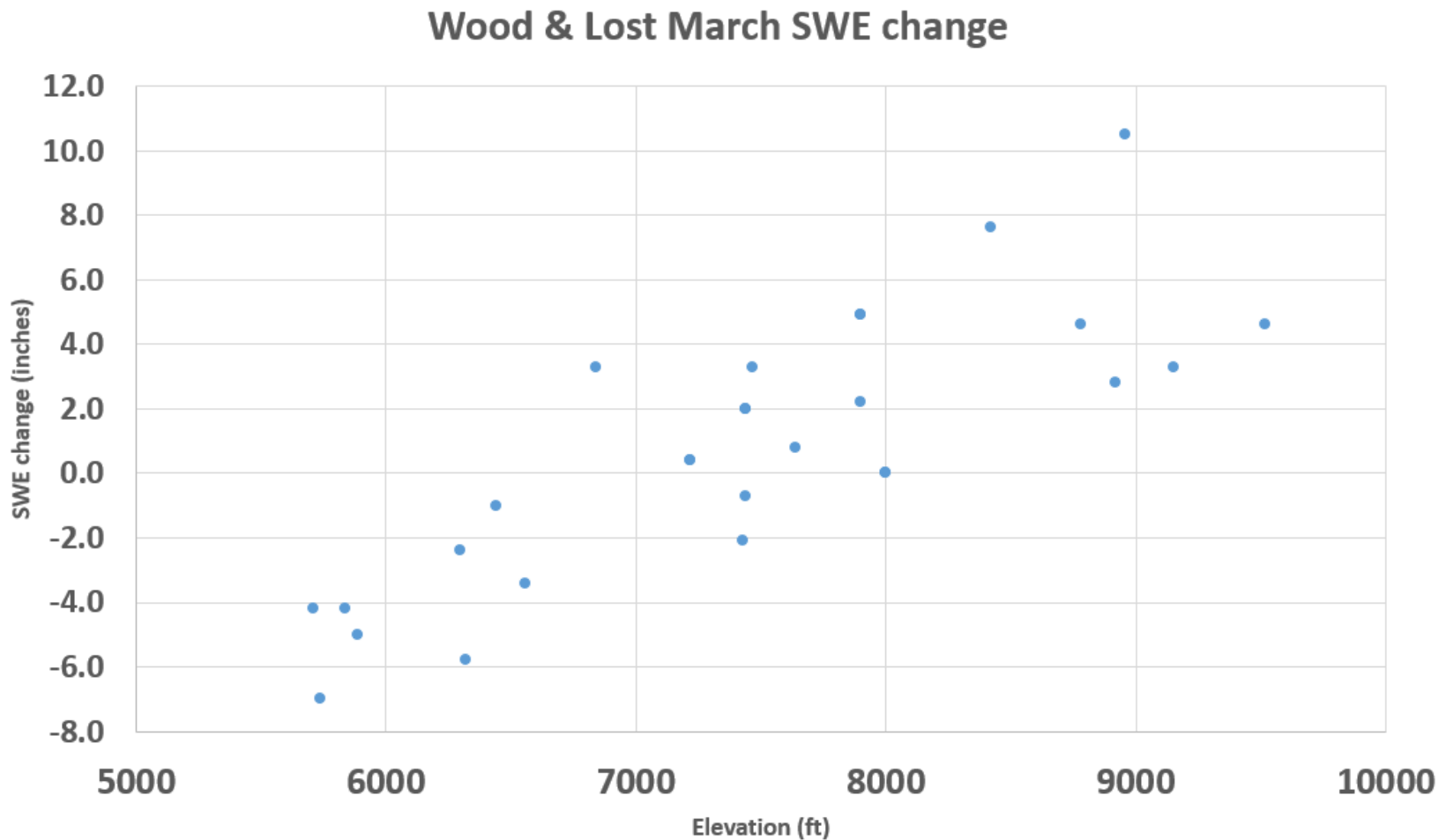
Wood Basin Snowpack

Big Wood Basin 2017 Snowpack Comparison Graph (9 sites)

Based on Provisional SNOTEL data as of Apr 11, 2017



Wood Basin Snowpack

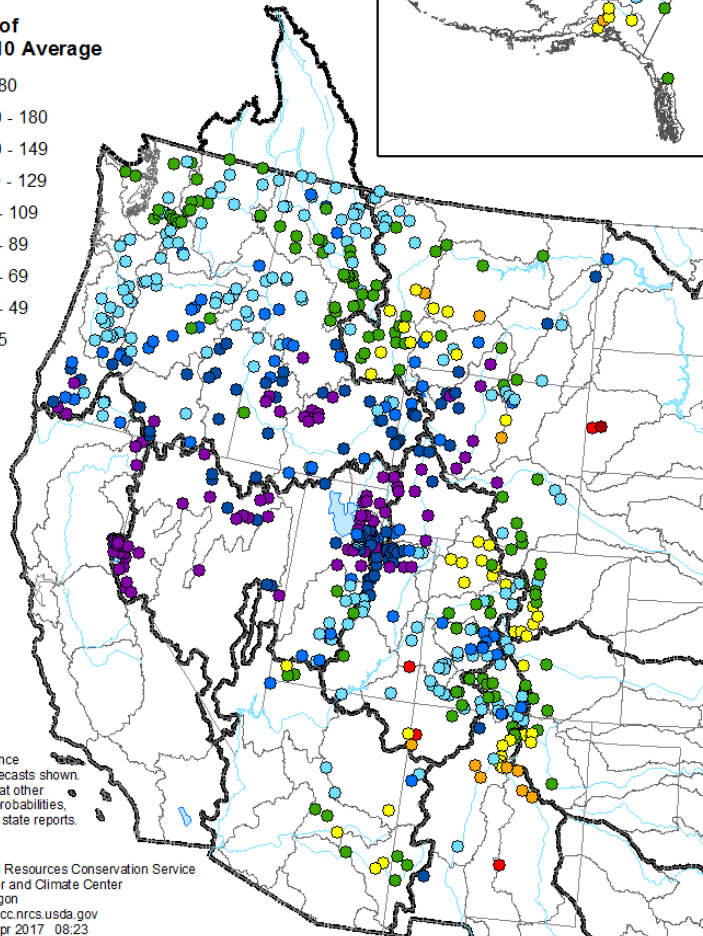
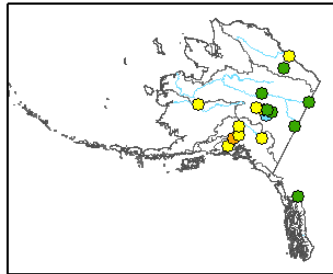


Water Supply Forecasts

Spring and Summer Streamflow Forecasts as of April 1, 2017

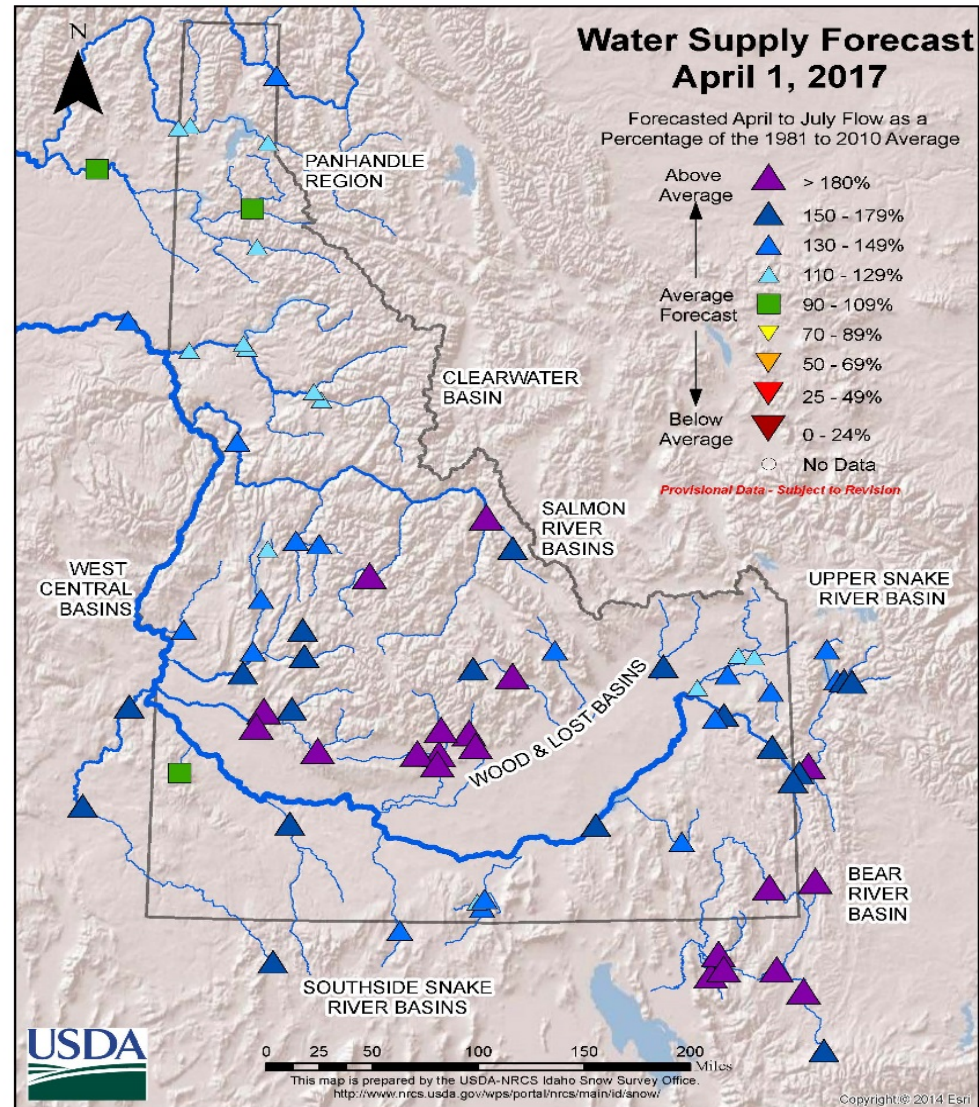
Percent of 1981-2010 Average

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



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

Prepared by:
USDA Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
<https://www.wcc.nrcs.usda.gov>
Created: 7 Apr 2017 08:23



Water Supply Forecasts

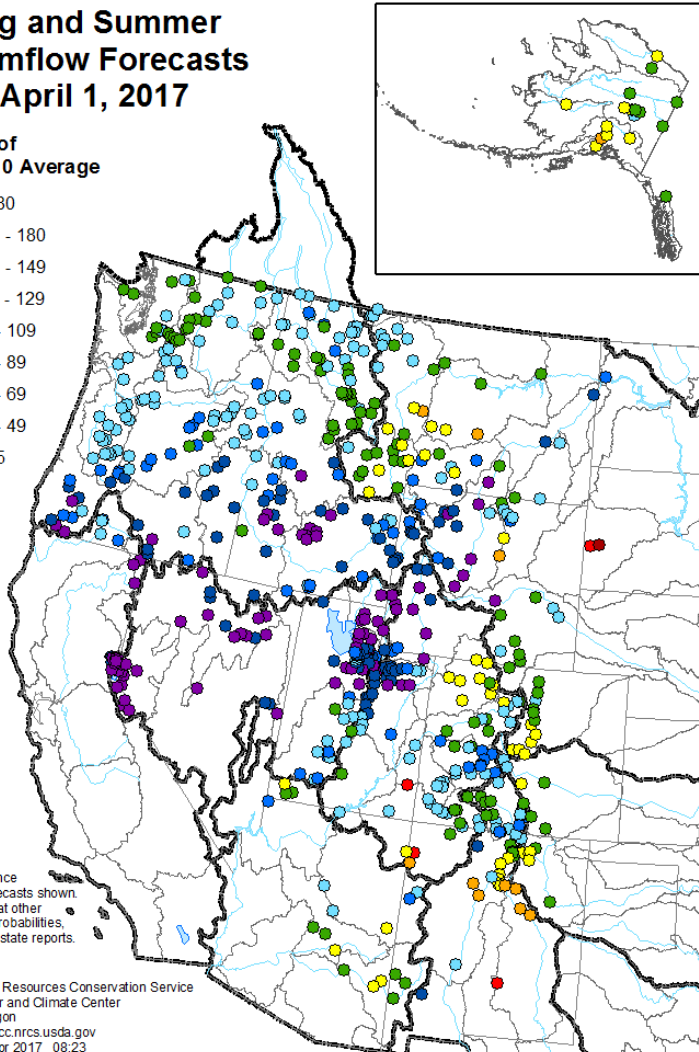
Spring and Summer Streamflow Forecasts as of April 1, 2017

Percent of 1981-2010 Average

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

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

Prepared by:
USDA Natural Resources Conservation Service
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Portland, Oregon
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Created: 7 Apr 2017 08:23

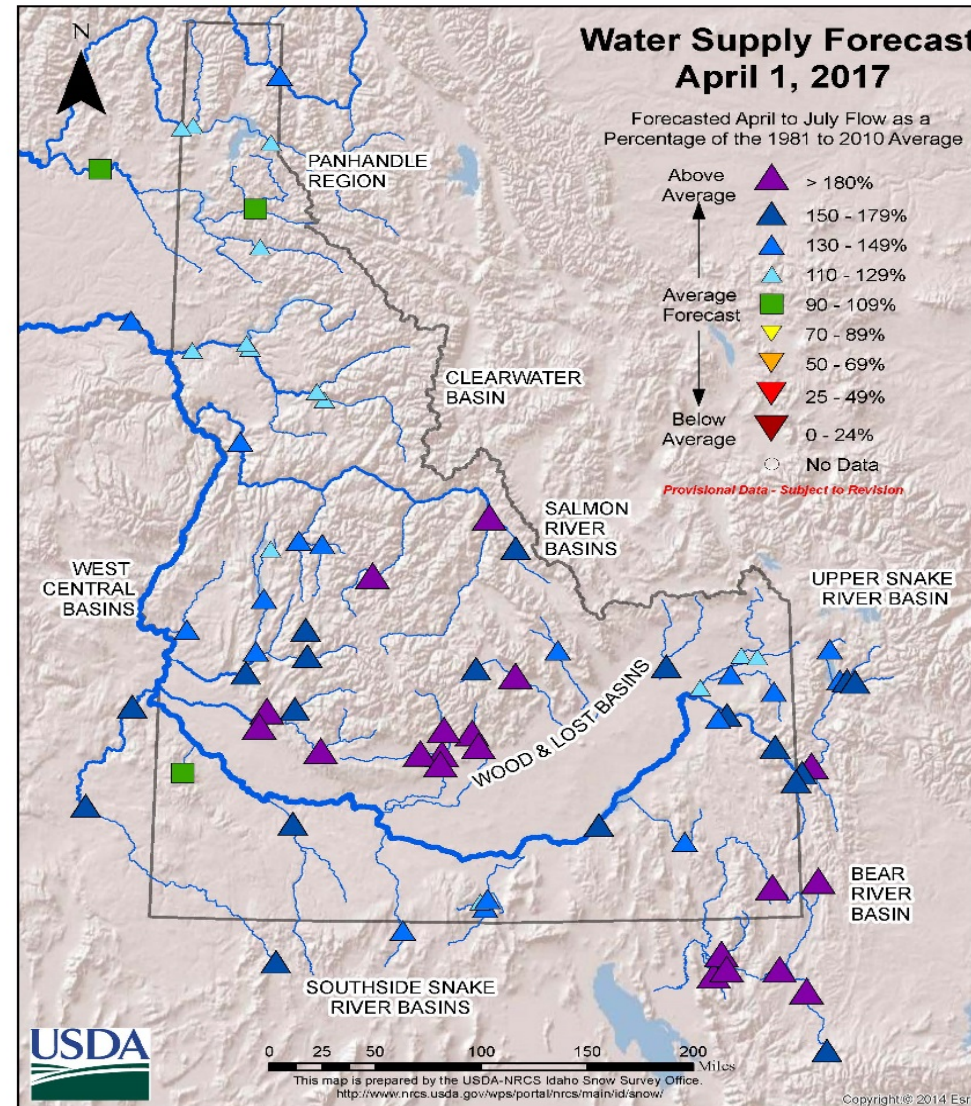


Water Supply Forecast April 1, 2017

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

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

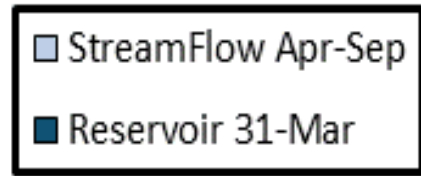
Provisional Data - Subject to Revision



IDAHO SURFACE WATER SUPPLY INDEX (SWSI) April 1, 2017

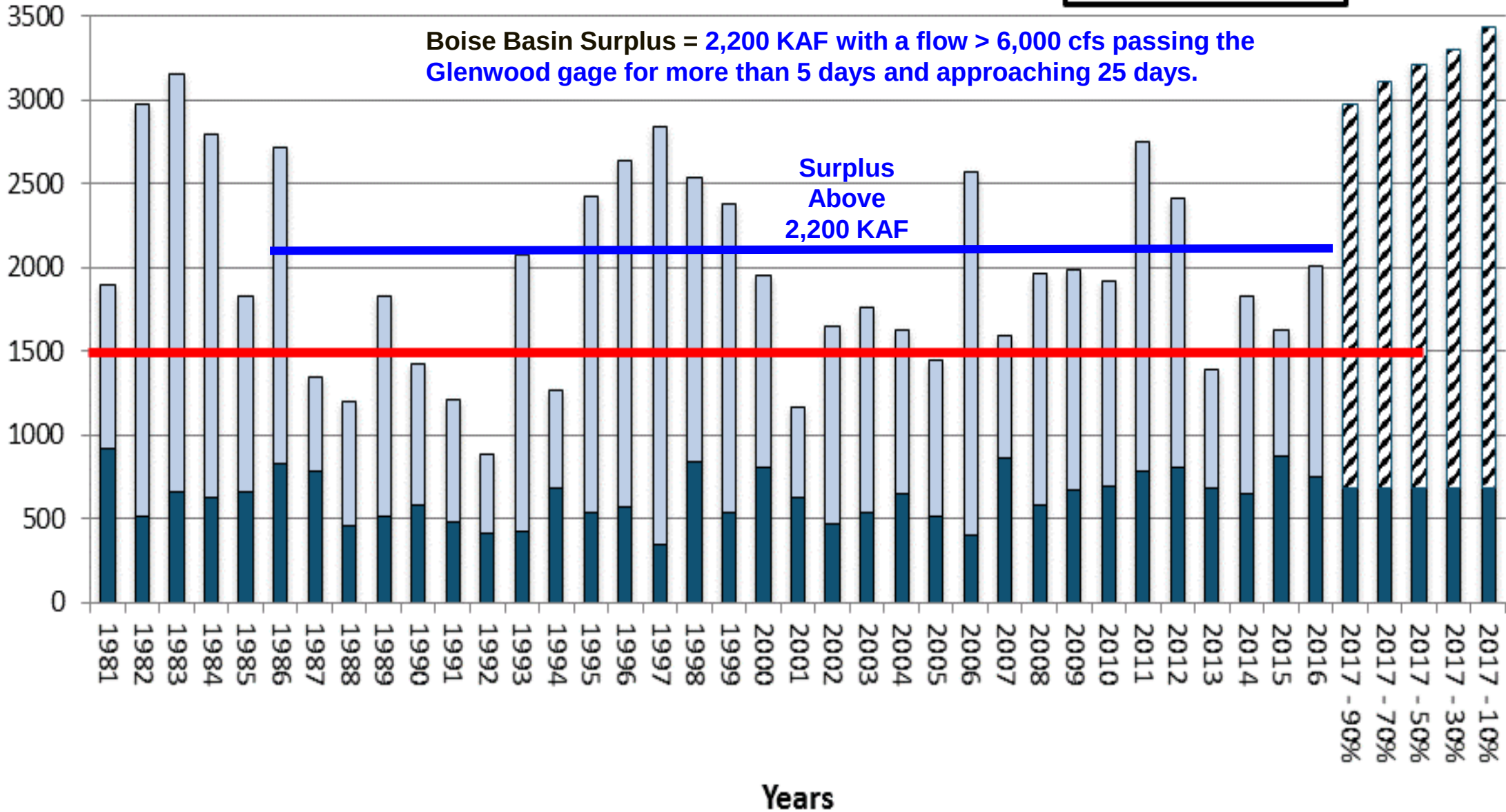
<i>BASIN or REGION</i>	<i>SWSI Value</i>	<i>Most Recent Year With Similar SWSI Value</i>	<i>Agricultural Water Supply Shortage May Occur When SWSI is Less Than</i>
Spokane	1.4	1996	NA
Clearwater	1.8	2009	NA
Salmon	3.0	1999	NA
Weiser	1.8	1995	NA
Payette	3.8	1996	NA
Boise	4.0	1983	-2.0
Big Wood	4.0	1983	0.3
Little Wood	3.9	1983	-1.5
Big Lost	3.2	1995	0.8
Little Lost	3.6	1995	1.5
Teton	2.7	1986	-3.9
Henrys Fork	2.7	1999	-1.7
Snake (Heise)	3.6	2011	-1.7
Oakley	3.2	2006	0.1
Salmon Falls	3.6	2011	-0.8
Bruneau	3.2	2006	NA
Owyhee	3.1	1998	-2.6
Bear River	2.4	2011	-3.9

Apr 1 Historic and Forecasted Surface Water Supply Boise River Basin



Boise Basin Surplus = 2,200 KAF with a flow > 6,000 cfs passing the Glenwood gage for more than 5 days and approaching 25 days.

Water Supply (1000 Acre-Feet)



Station ID	Station Name	Period	Data Type	Years	# of Years
13202000	BOISE RIVER NEAR BOISE, ID	Apr-Sep	strm	1981-2016	36 Units KAF
13201500	LUCKY PEAK	31-Mar	resv	1981-2016	36 Units KAF
13194000	ARROWROCK	31-Mar	resv	1981-2016	36 Units KAF
13190000	ANDERSON RANCH	31-Mar	resv	1981-2016	36 Units KAF

ENSO Classification

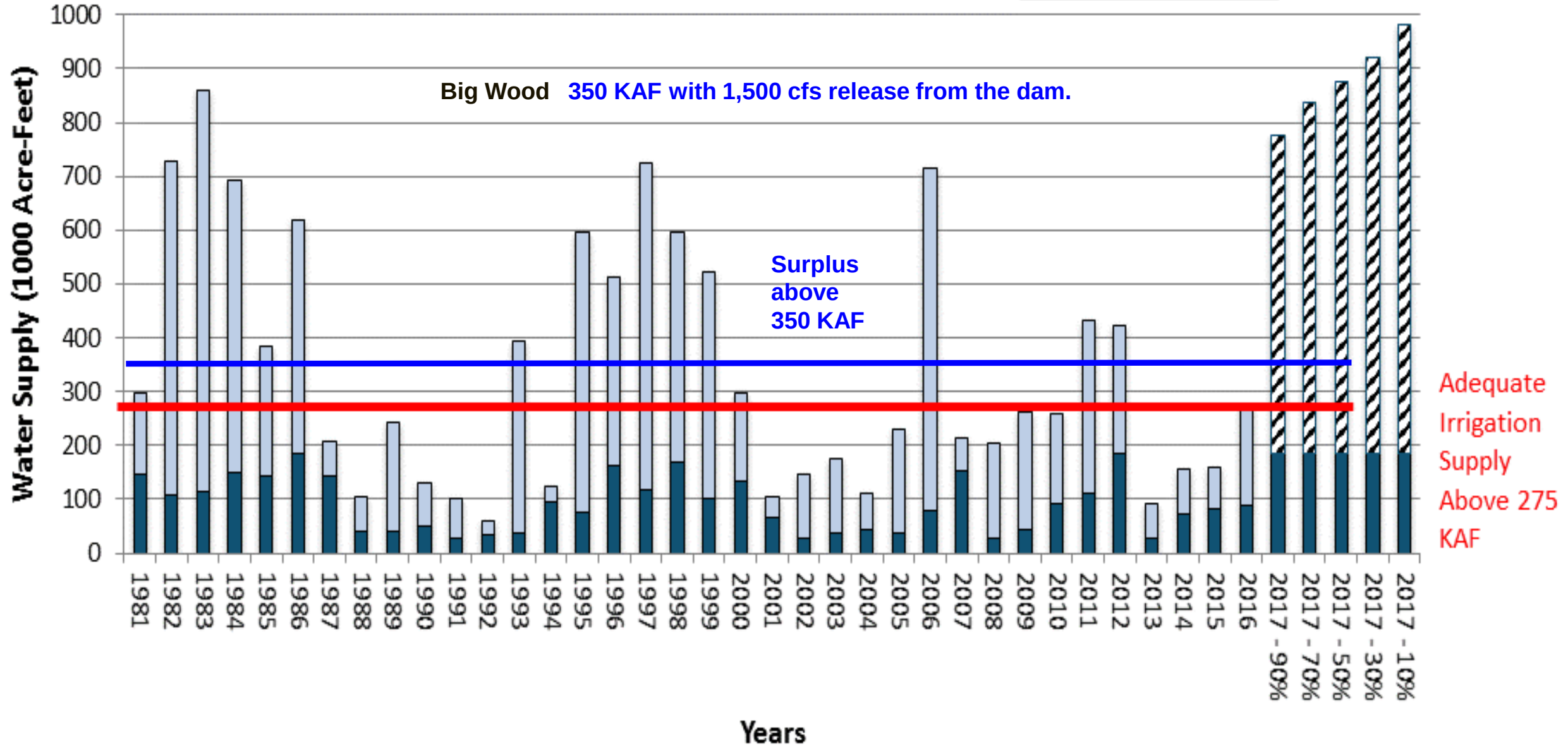
SE Strong El Nino - EN Mild El Nino - N Neutral - LN Mild La Nina - SL Strong La Nina

Rank	Year	Enso	Stream Flow Apr-Sep	Reservoir 31-Mar	Streamflow + Reservoir Sum	Non- Exceedance Probability	SWSI
	2017 10% Chance Exceedance Forecast		2760	676	3436	100%	4.1
	2017 30% Chance Exceedance Forecast		2620	676	3296	99%	4.1
	2017 50% Chance Exceedance Forecast		2530	676	3206	98%	4.0
1	1983	SE	2495	656	3150	97%	3.9
	2017 70% Chance Exceedance Forecast		2440	676	3116	96%	3.8
2	1982	N	2460	516	2976	95%	3.7
	2017 90% Chance Exceedance Forecast		2300	676	2976	93%	3.6
3	1997	N	2491	347	2837	92%	3.5
4	1984	N	2161	630	2791	89%	3.3
5	2011	SL	1965	785	2750	86%	3.0
6	1986	N	1881	831	2712	84%	2.8
7	1996	N	2066	574	2640	81%	2.6
8	2006	N	2162	404	2566	78%	2.4
9	1998	SE	1701	837	2538	76%	2.1
10	1995	SE	1887	536	2423	73%	1.9
11	2012	LN	1611	801	2412	70%	1.7
12	1999	SL	1838	538	2376	68%	1.5
13	1993	EN	1656	422	2078	65%	1.2

Surplus
Above
2,200
KAF

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

StreamFlow Apr-Sep
Reservoir 31-Mar



Station ID	Station Name	Period	Data Type	Years	# of Years
13142500	Big Wood R blw Magic Reservoir	Apr-Sep	strm	1981-2016	36 Units KAF
13142000	Magic Reservoir	31-Mar	resv	1981-2016	36 Units KAF

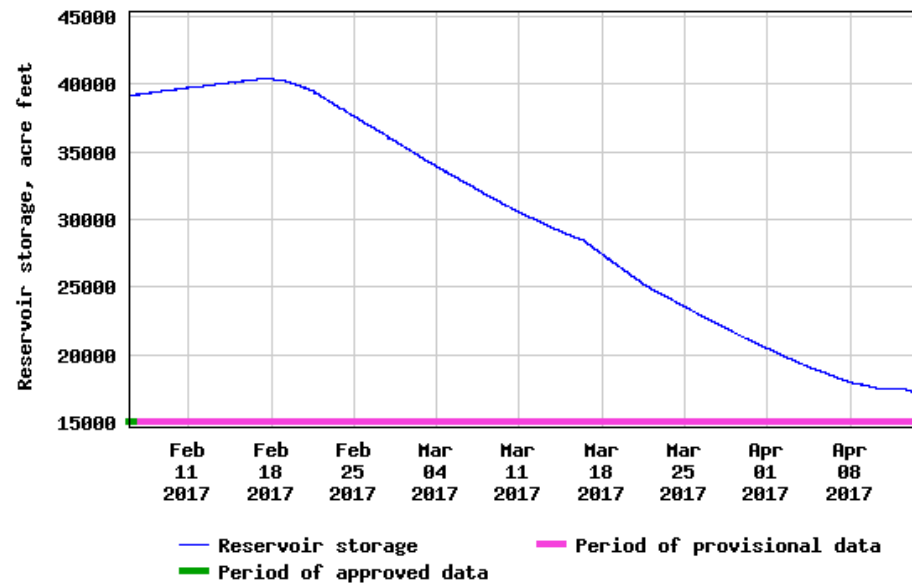
ENSO Classification

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

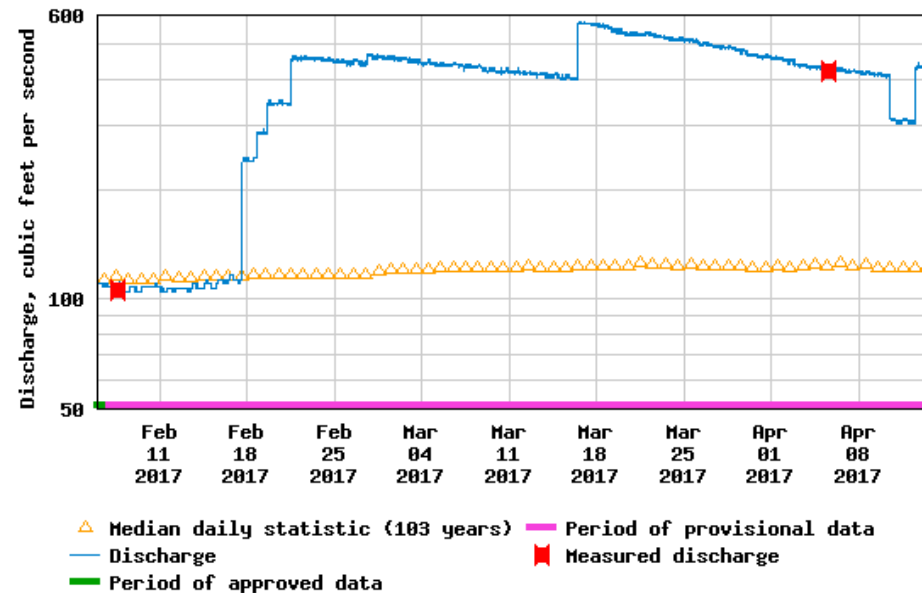
Rank	Year	Enso	Stream Flow Apr-Sep	Reservoir 31-Mar	Streamflow + Reservoir Sum	Non- Exceedance Probability	SWSI
		2017 10% Chance Exceedance Forecast	795	186	981	100%	4.1
		2017 30% Chance Exceedance Forecast	735	186	921	99%	4.1
		2017 50% Chance Exceedance Forecast	690	186	876	98%	4.0
1	1983	SE	747	114	861	97%	3.9
		2017 70% Chance Exceedance Forecast	650	186	836	97%	3.9
		2017 90% Chance Exceedance Forecast	590	186	776	95%	3.8
2	1982	N	622	108	729	95%	3.7
3	1997	N	605	118	724	92%	3.5
4	2006	N	636	78	714	89%	3.3
5	1984	N	545	149	694	86%	3.0
6	1986	N	432	186	618	84%	2.8
7	1998	SE	427	170	597	81%	2.6
8	1995	SE	518	77	595	78%	2.4
9	1999	SL	420	102	522	76%	2.1
10	1996	N	351	161	512	73%	1.9
11	2011	SL	322	111	433	70%	1.7
12	2012	LN	238	185	423	68%	1.5
13	1993	EN	355	38	393	65%	1.2
14	1985	N	242	144	386	62%	1.0
15	1981	N	153	146	299	59%	0.8
16	2000	N	165	132	298	57%	0.6

**Surplus
above
350 KAF**

USGS 13126000 MACKAY RES NR MACKAY ID

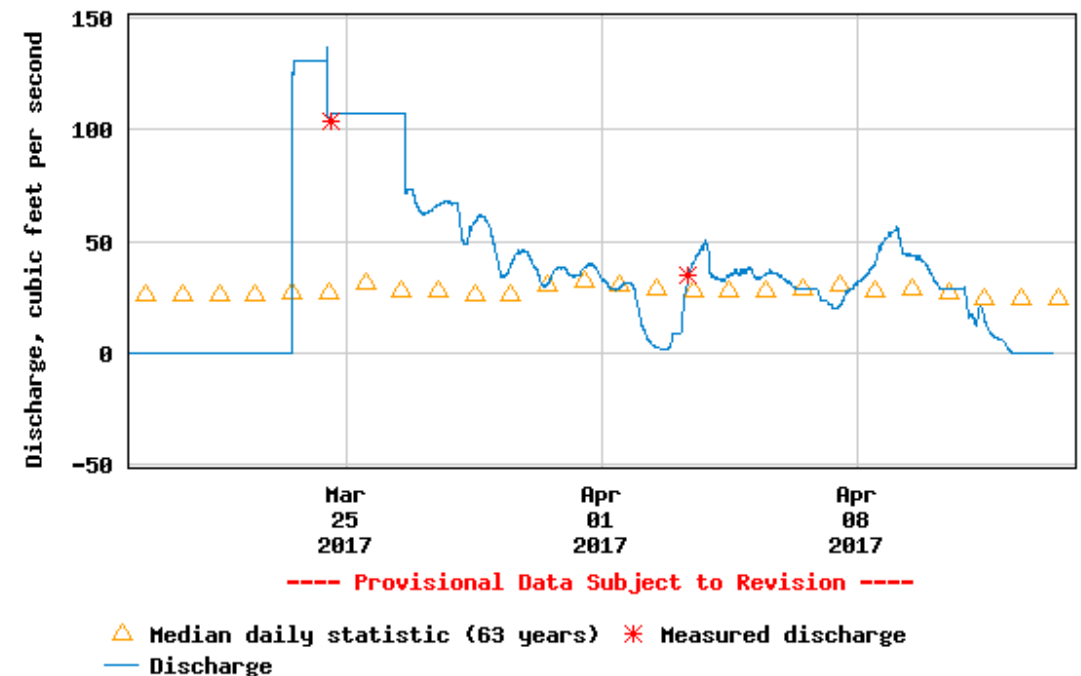


USGS 13127000 BIG LOST RIVER BL MACKAY RES NR MACKAY ID



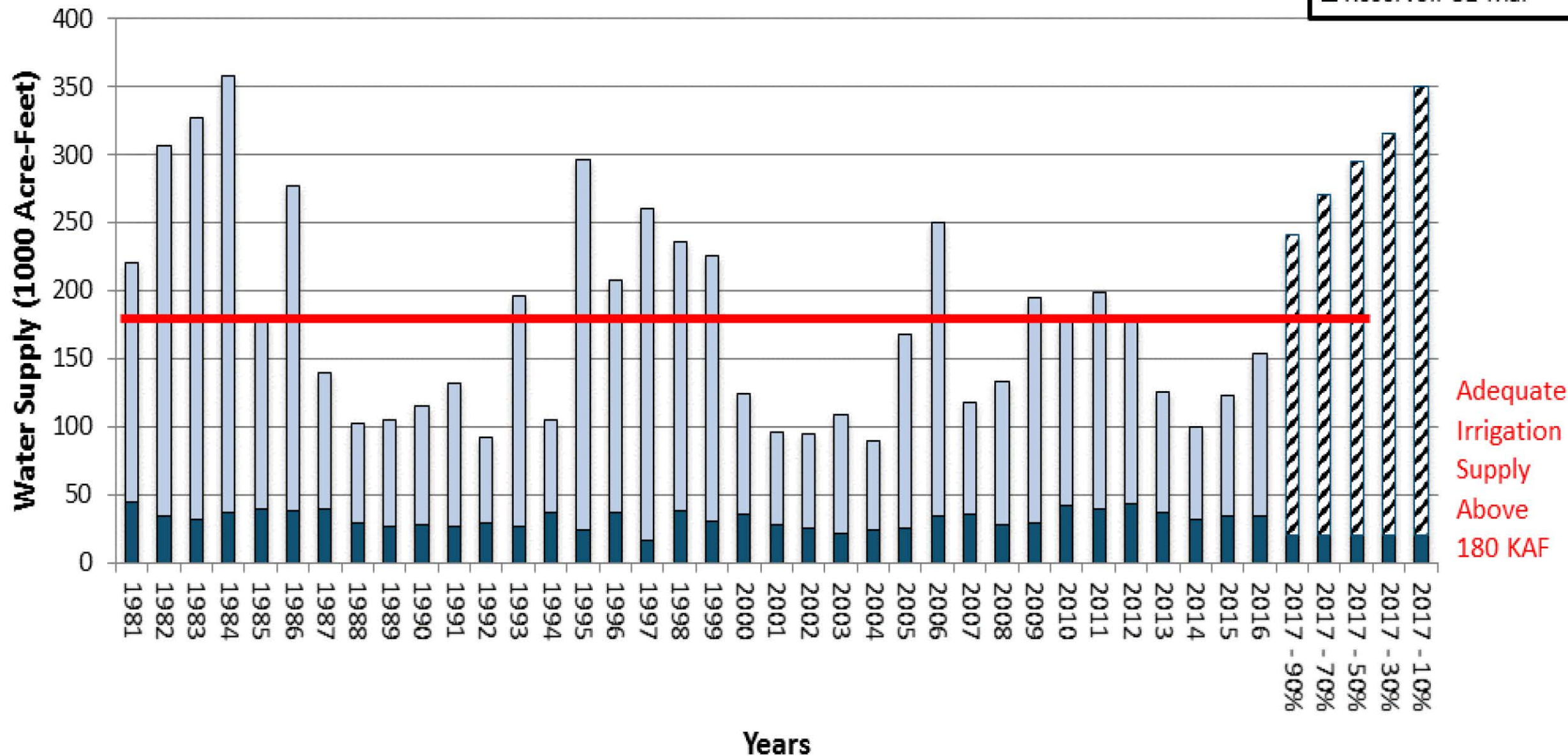
Big Lost Basin

USGS 13132500 BIG LOST RIVER NR ARCO ID



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

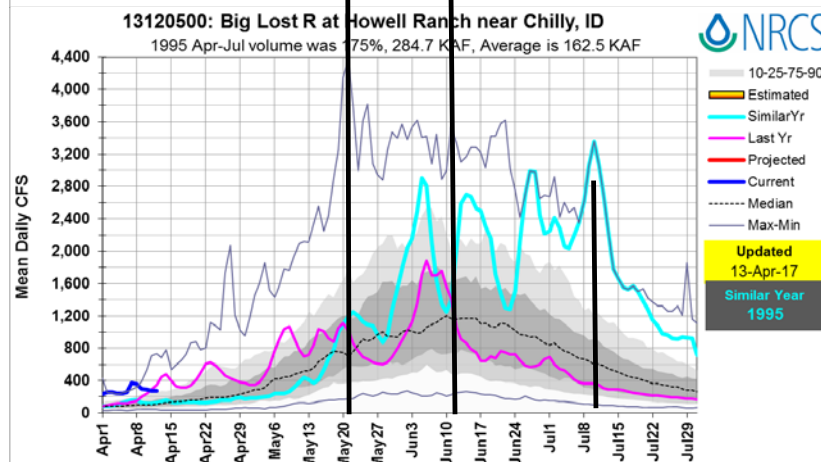
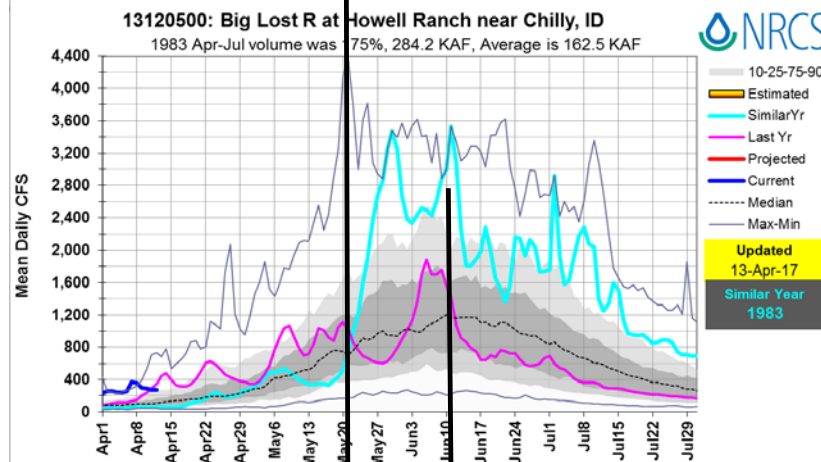
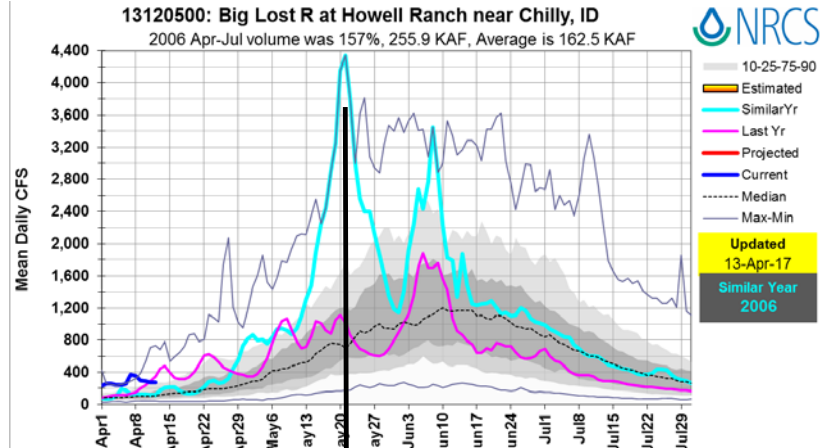
StreamFlow Apr-Sep
Reservoir 31-Mar



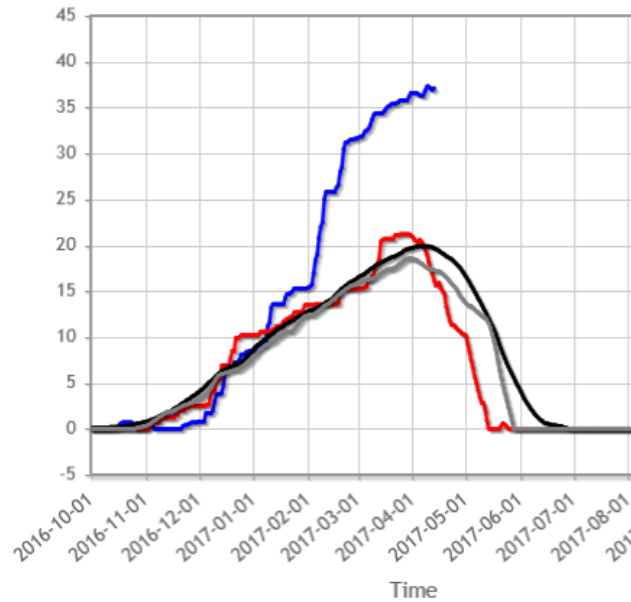
Station ID	Station Name	Period	Data Type	Years	# of Years
13127000	Big Lost R blw Mackay Reservoir	Apr-Sep	strm	1981-2016	36 Units KAF
13126000	Mackay Reservoir	31-Mar	resv	1981-2016	36 Units KAF
ENSO Classification SE Strong El Nino - EN Mild El Nino - N Neutral - LN Mild La Nina - SL Strong La Nina					

Rank	Year	Enso	Stream Flow Apr-Sep	Reservoir 31-Mar	Streamflow + Reservoir Sum	Non- Exceedance Probability	SWSI	Surplus Above ???
1	1984	N	321	37	358	97%	3.9	
	2017 10% Chance Exceedance Forecast		330	20	350	96%	3.8	
2	1983	SE	296	31	327	95%	3.7	
	2017 30% Chance Exceedance Forecast		295	20	315	93%	3.6	
3	1982	N	272	35	307	92%	3.5	
4	1995	SE	272	24	296	89%	3.3	
	2017 50% Chance Exceedance Forecast		275	20	295	88%	3.2	
5	1986	N	239	38	277	86%	3.0	
	2017 70% Chance Exceedance Forecast		250	20	270	85%	2.9	
6	1997	N	244	16	260	84%	2.8	
7	2006	N	216	34	249	81%	2.6	
	2017 90% Chance Exceedance Forecast		220	20	240	80%	2.5	
8	1998	SE	198	38	236	78%	2.4	
9	1999	SL	196	30	226	76%	2.1	
10	1981	N	176	44	220	73%	1.9	
11	1996	N	171	37	208	70%	1.7	
12	2011	SL	160	39	199	68%	1.5	
13	1993	EN	169	27	196	65%	1.2	
14	2009	N	166	29	195	62%	1.0	

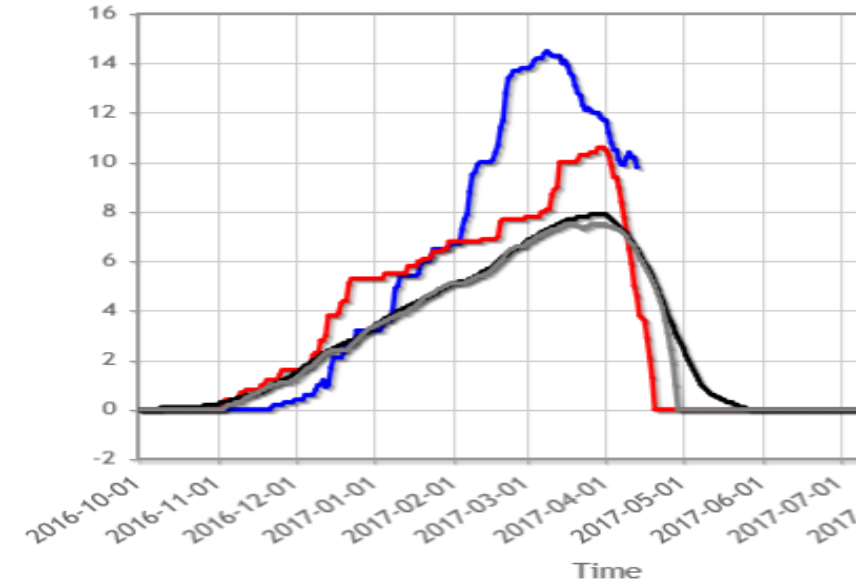
Big Lost Basin Timing of Snowmelt Runoff



Lost-wood Divide (601) Idaho SNOTEL Site - 7900 ft



Stickney Mill (792) Idaho SNOTEL Site - 7430 ft



BIG LOST BASIN SUMMARY USING HOWELL RANCH NR CHILLY STREAMGAGE AND LOST-WOOD SNOTEL SITE

22 of 33 years' peak streamflow occurred after Lost Wood had completely melted out.

On average, peak streamflow for the Big Lost River at Howell Ranch nr Chilly, Idaho occurs -1 to 7 days after Lost-Wood SNOTEL is completely melted out.

All year's average, **2 days after** Lost-Wood SNOTEL has completely melted.

Max SWE Category	Max SWE Magnitude (inches)	Number of Years in Analysis	Average number of days from melt-out peak streamflow occurs
Below average	<13.9	8	7 DAYS AFTER
Average	13.9 - 26	17	0 DAYS
Above average	>26	8	1 DAY BEFORE

Snake River nr Heise SWSI

Snake River Near Heise SWSI

Adequate Water Supply Greater than -1.7 SWSI or 4,400 KAF

Station ID	Station Name	Period	Data Type	Years	# of Years
13037500	Snake River near Heise	Apr-Sep	strm	1981-2016	36 Units KAF
13010500	Jackson Lake	31-Mar	resv	1981-2016	36 Units KAF
13032450	Palisades Reservoir	31-Mar	resv	1981-2016	36 Units KAF

ENSO Classification

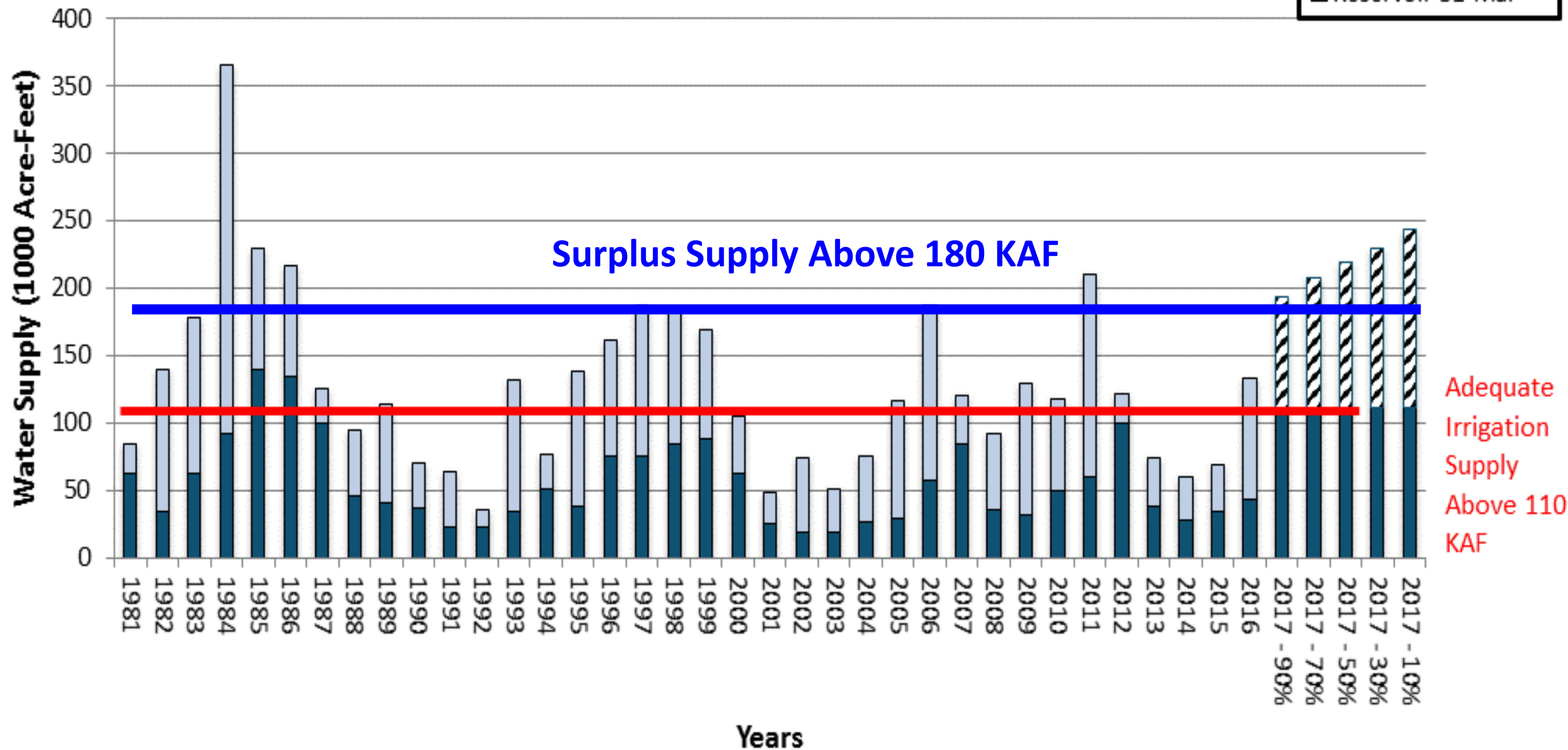
SE Strong El Nino - EN Mild El Nino - N Neutral - LN Mild La Nina - SL Strong La Nina

Rank	Year	Enso	Stream Flow Apr-Sep	Reservoir 31-Mar	Streamflow + Reservoir Sum	Non- Exceedance Probability	SWSI
1	1997	N	7009	949	7958	97%	3.9
2017 10% Chance Exceedance Forecast		LA	6920	999	7919	96%	3.8
2	2011	SL	6343	1493	7836	95%	3.7
2017 30% Chance Exceedance Forecast		LA	6530	999	7529	93%	3.6
2017 50% Chance Exceedance Forecast		LA	6260	999	7259	93%	3.6
3	1986	N	6054	962	7016	92%	3.5
2017 70% Chance Exceedance Forecast		LA	5990	999	6989	91%	3.4
4	1996	N	5584	1314	6898	89%	3.3
5	1982	N	5772	1064	6836	86%	3.0
6	1983	SE	5008	1740	6748	84%	2.8
7	1984	N	5046	1654	6700	81%	2.6
2017 90% Chance Exceedance Forecast		LA	5600	999	6599	80%	2.5
8	2009	N	4610	1759	6368	78%	2.4
9	1999	SL	4947	1311	6258	76%	2.1
10	1998	SE	4495	1632	6127	73%	1.9
11	1995	SE	4442	1041	5483	70%	1.7
12	2014	N	4594	864	5458	68%	1.5
13	2006	N	4076	1264	5340	65%	1.2

Estimated Surplus above
6,800 KAF based on flow
> 21,000 @ Blackfoot

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

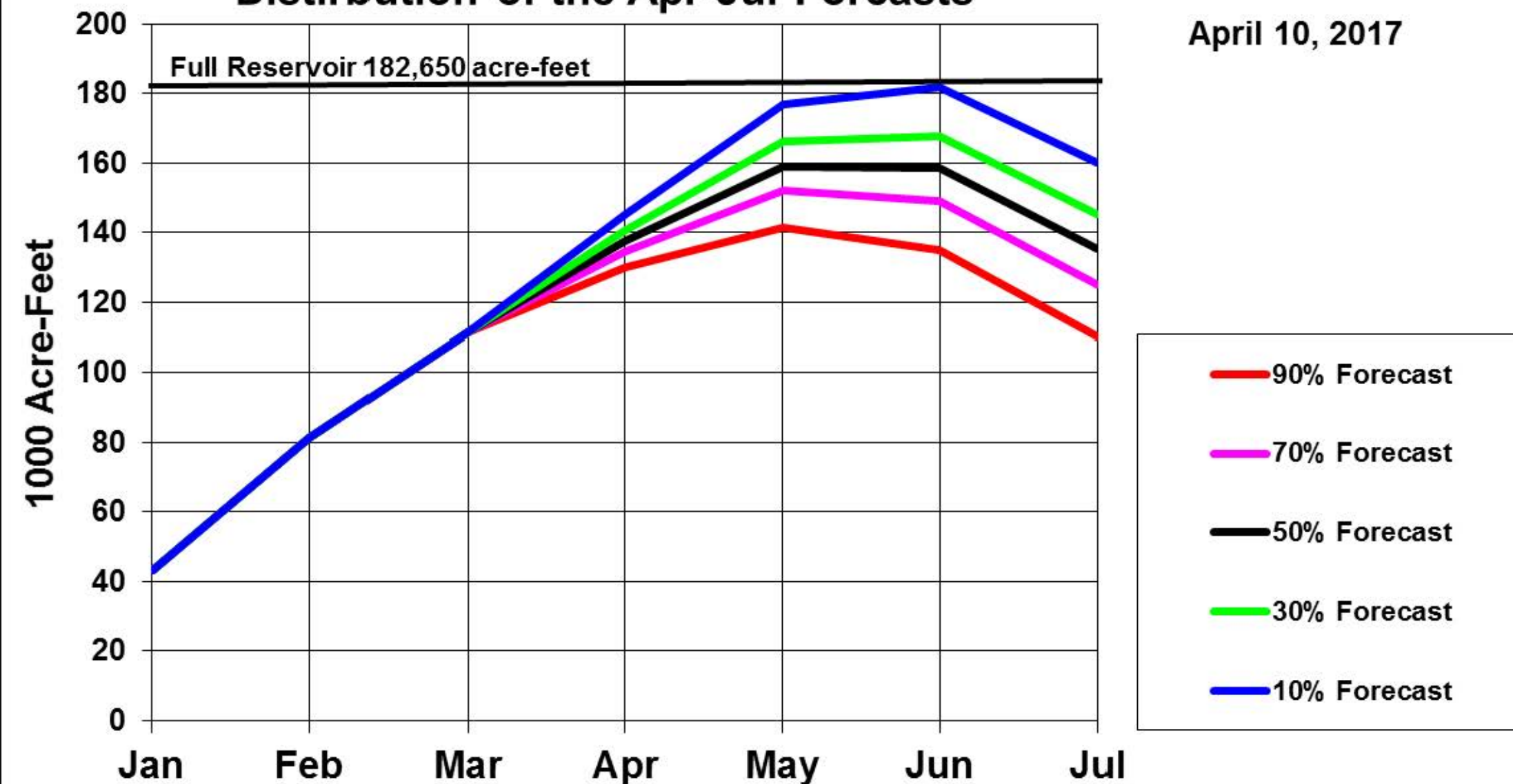
StreamFlow Apr-Sep
Reservoir 31-Mar



Salmon Falls Reservoir

End Of Month Storage Projection Based on Average Distribution of the Apr-Jul Forecasts

April 10, 2017



Salmon Falls Reservoir

End Of Month Storage Projection Based on Average Distribution of the Apr-Jul Forecasts



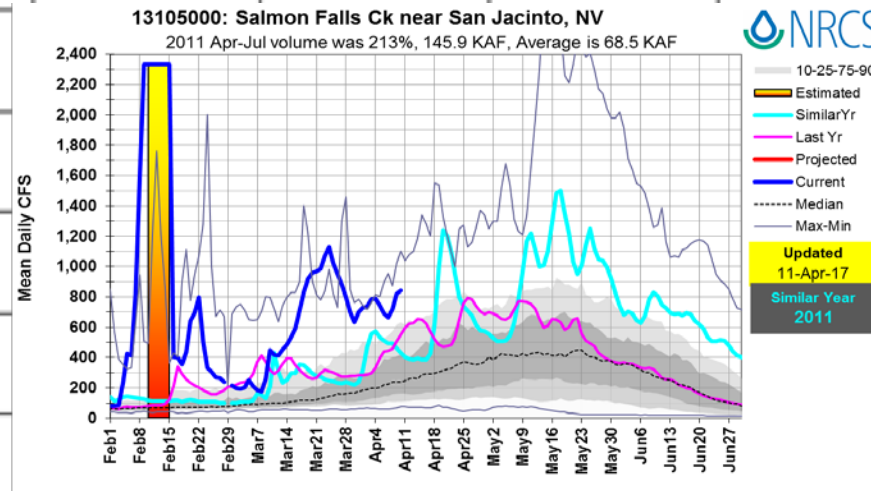
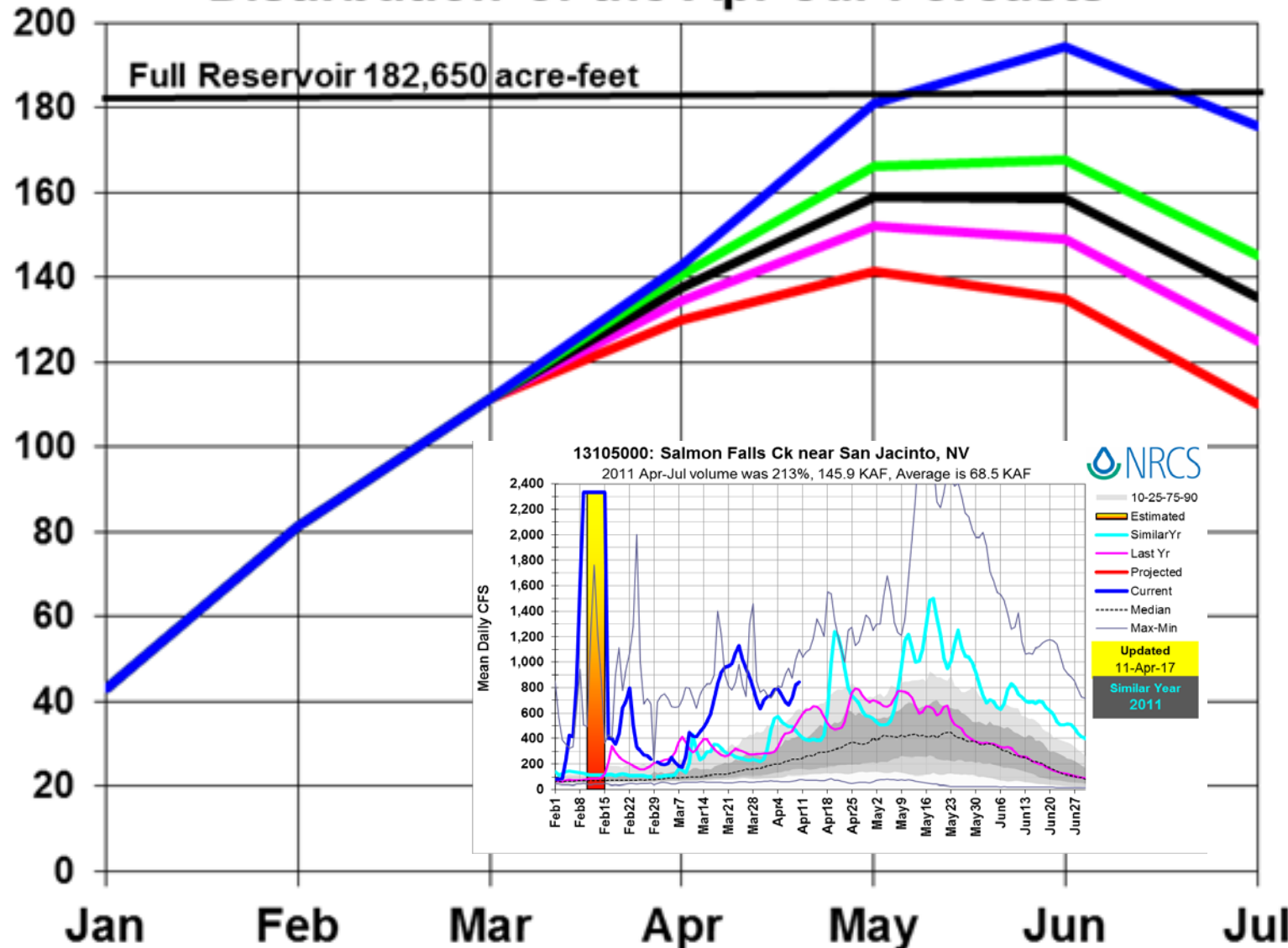
April 10, 2017

Blue 10% Forecast based on 2011 actual runoff amounts, still assumes average irrigation releases

	April	May	June	July	Apr-Jul
2011	36.3	58.6	37.7	10.9	143.5
1975	11.8	63.7	52.3	14.9	142.6

Avg 20 30

1000 Acre-Feet



90% Forecast

70% Forecast

50% Forecast

30% Forecast

10% Forecast

Salmon Falls Reservoir

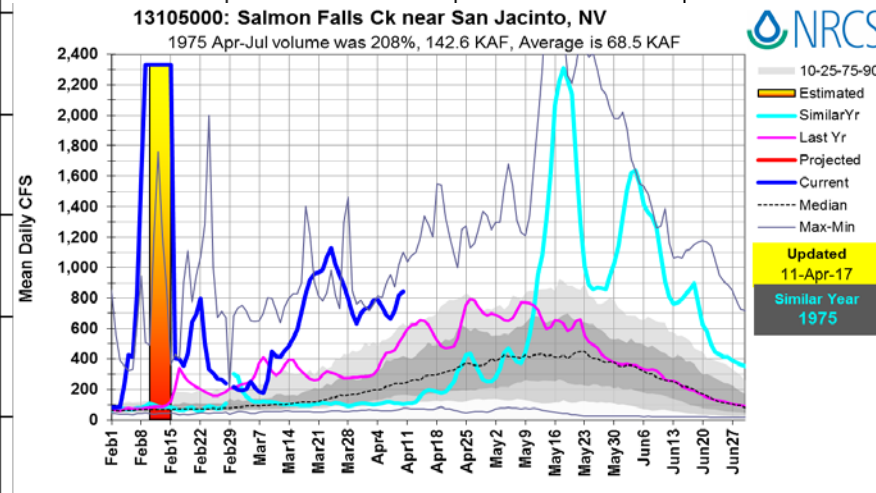
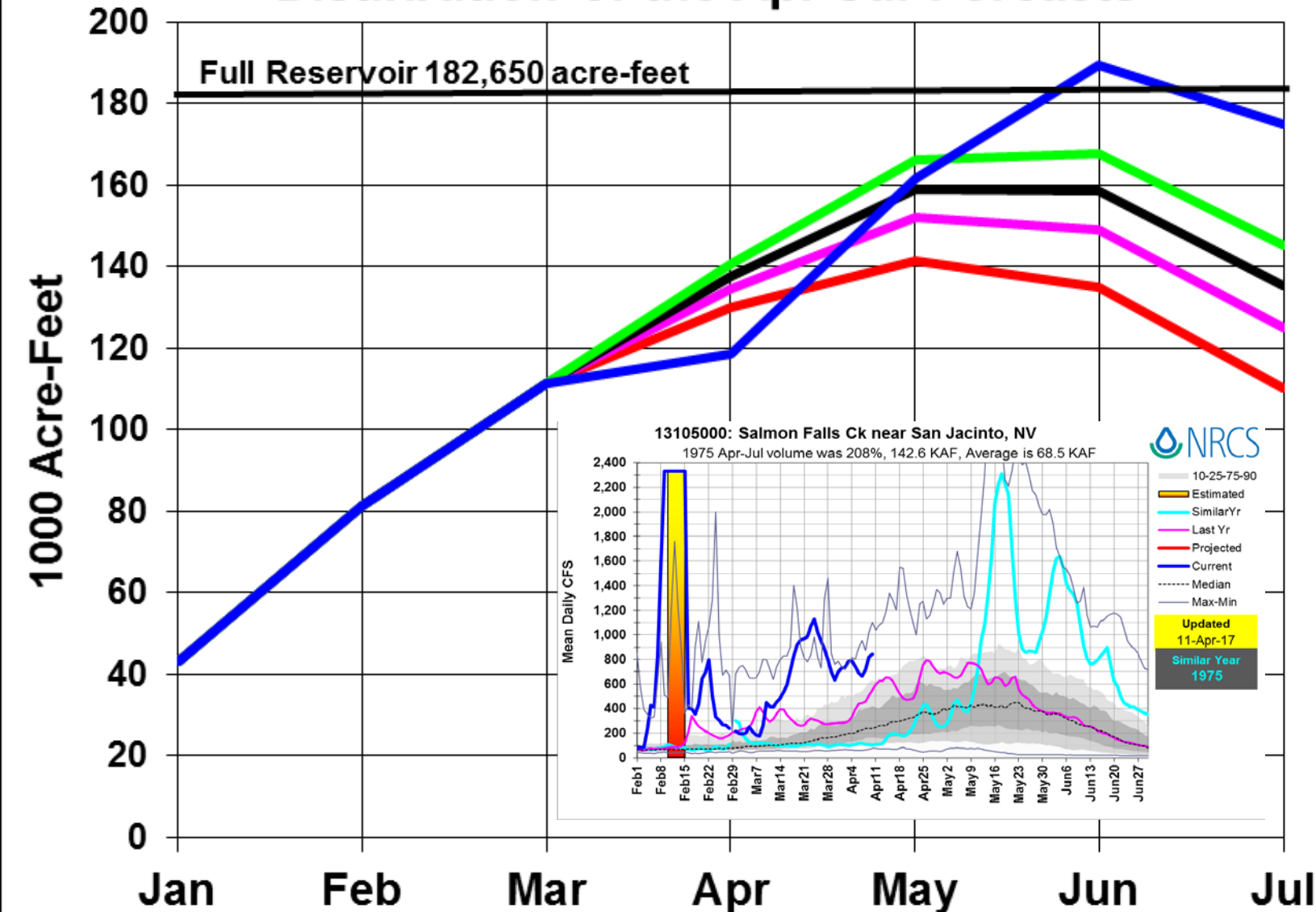
End Of Month Storage Projection Based on Average Distirbution of the Apr-Jul Forecasts



April 10, 2017

Blue 10% Forecast based on 1975 actual runoff amounts, still assumes average irrigation releases

	April	May	June	July	Apr-Jul
2011	36.3	58.6	37.7	10.9	143.5
1975	11.8	63.7	52.3	14.9	142.6



90% Forecast

70% Forecast

50% Forecast

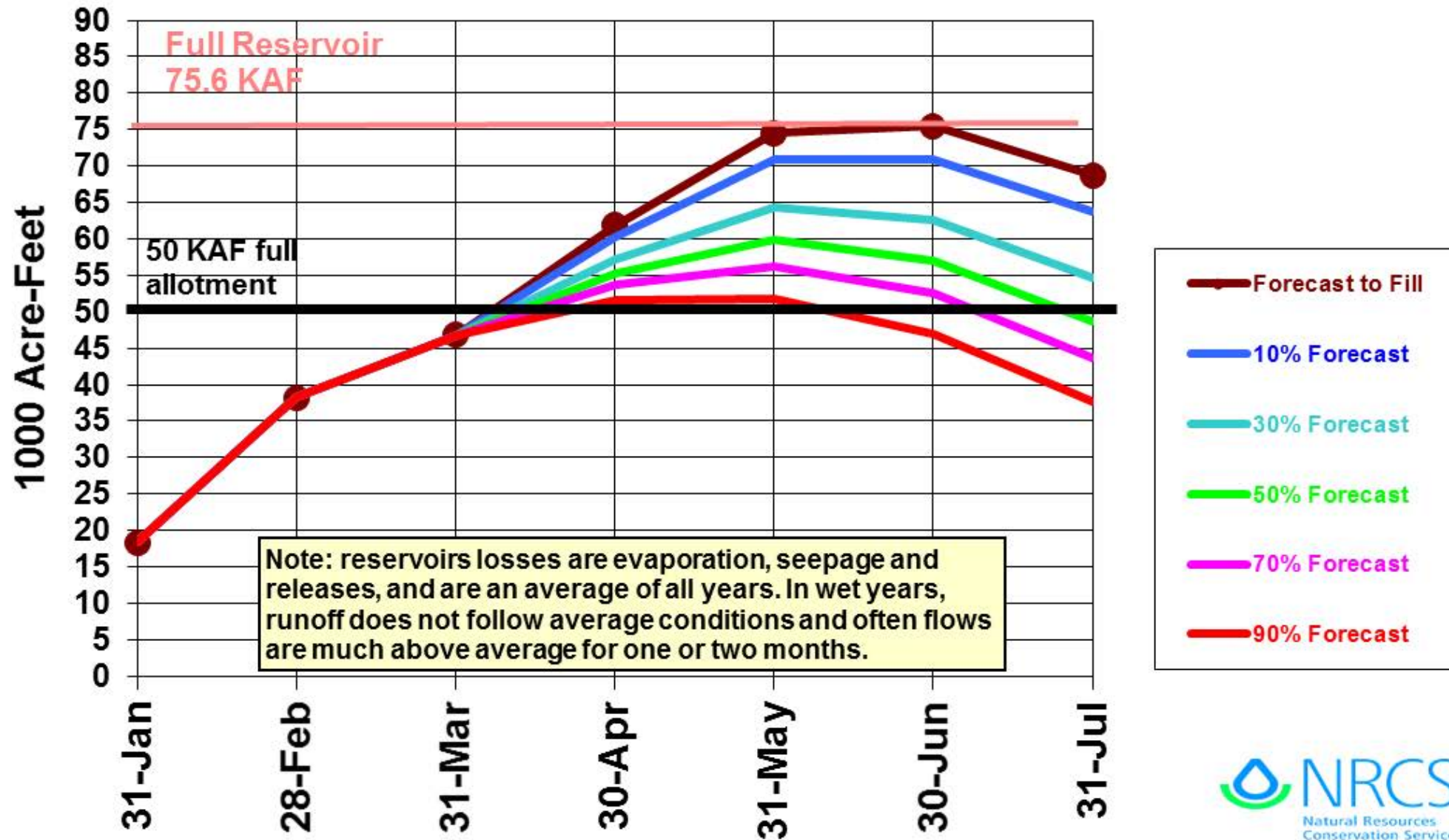
30% Forecast

10% Forecast

Oakley Reservoir

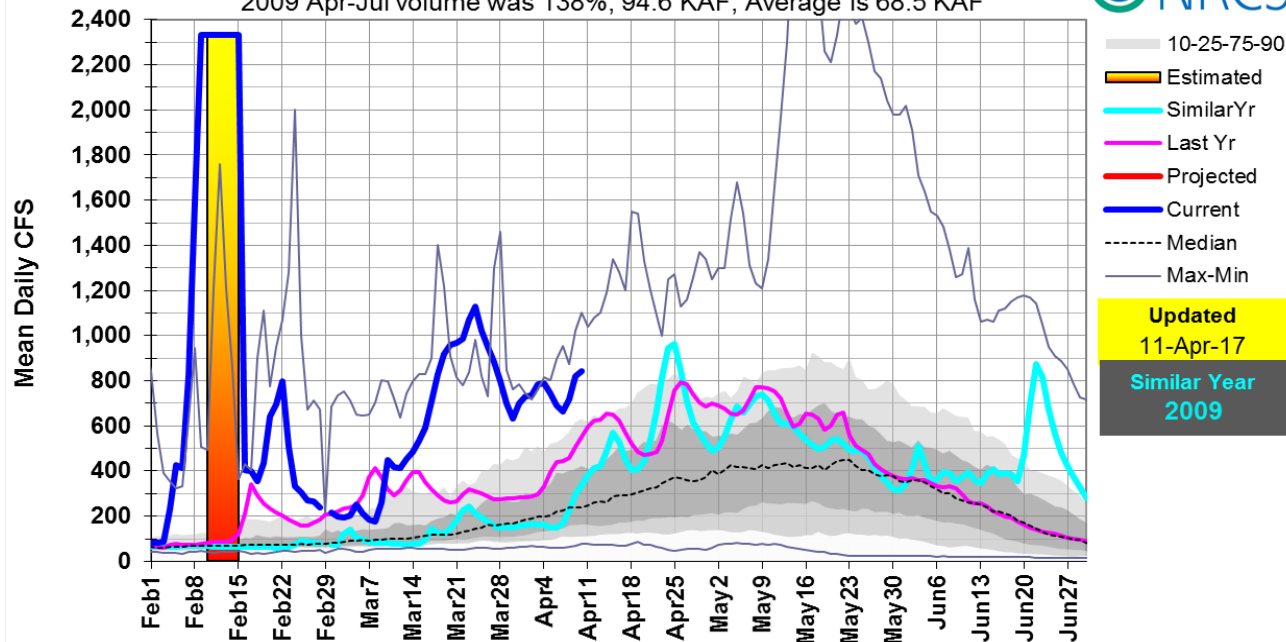
End of Month Storage Projection

April 10, 2017

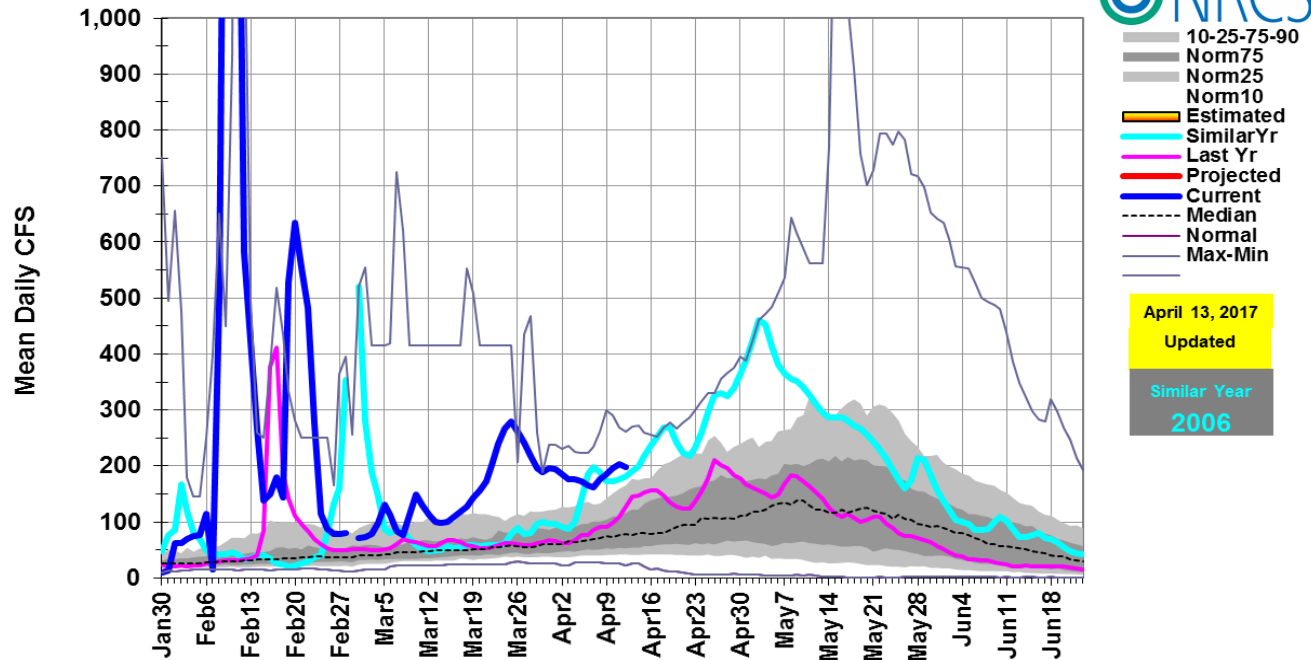


13105000: Salmon Falls Ck near San Jacinto, NV

2009 Apr-Jul volume was 138%, 94.6 KAF, Average is 68.5 KAF

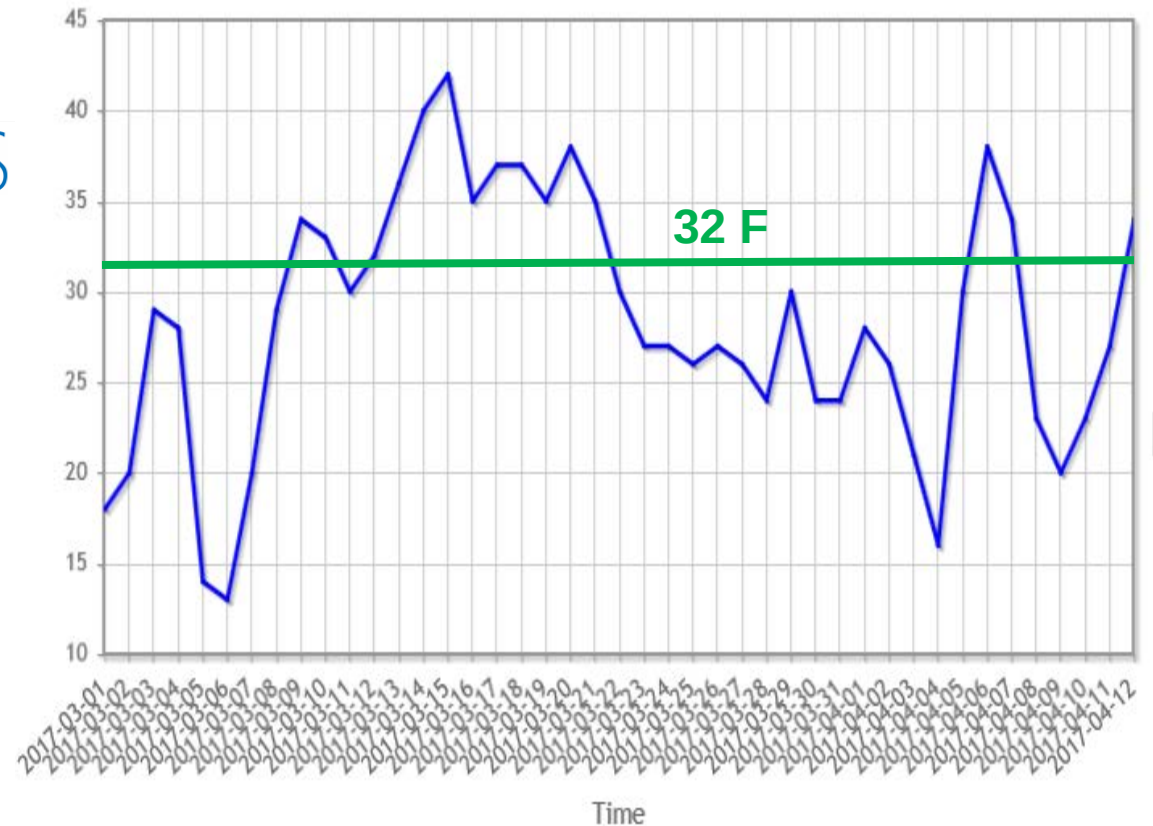


13082500 id: goose creek ab trapper creek nr oakley id



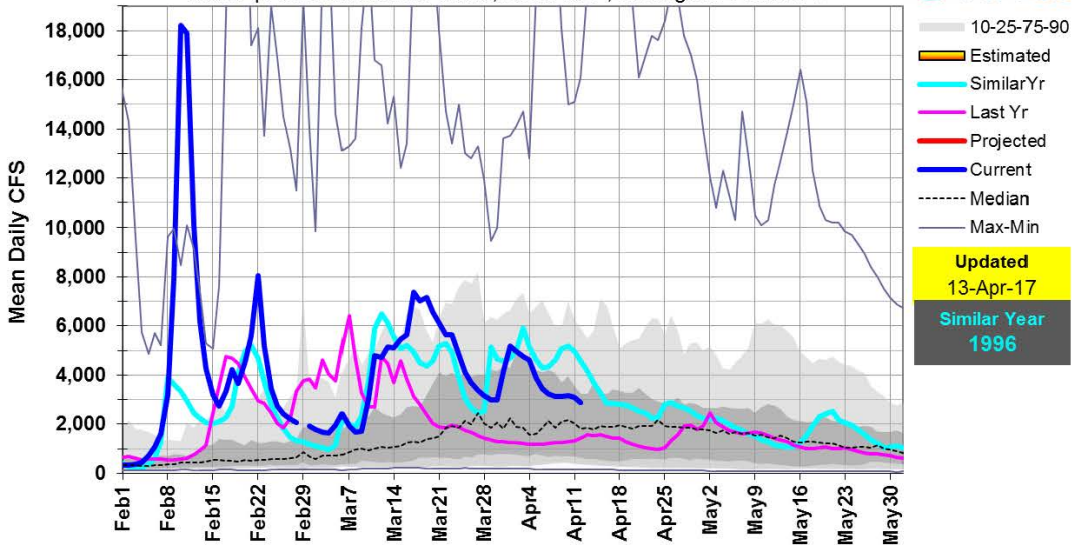
Bostetter RS SNOTEL 7,500 ft Daily Minimum Temperature Mar 1 to Apr 12, 2017

Bostetter R.s. (359) Idaho SNOTEL Site - 7500 ft Reporting Frequency: Daily; Date Range:



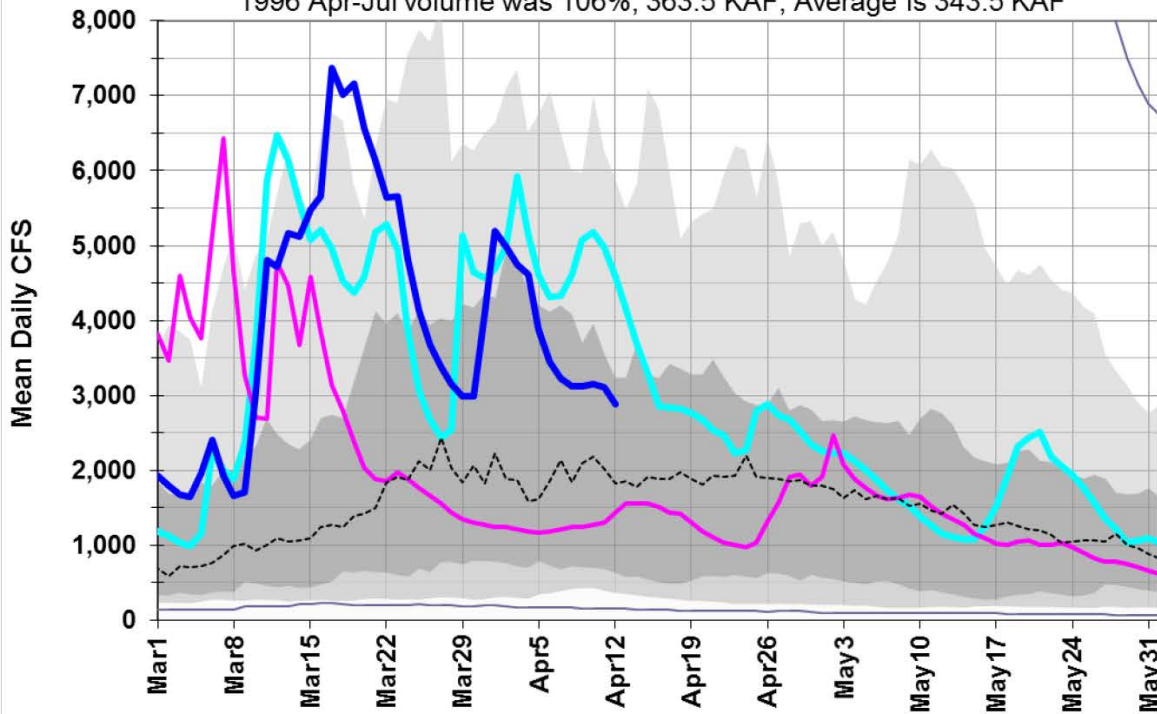
13181000: Owyhee R near Rome, OR

1996 Apr-Jul volume was 106%, 363.5 KAF, Average is 343.5 KAF

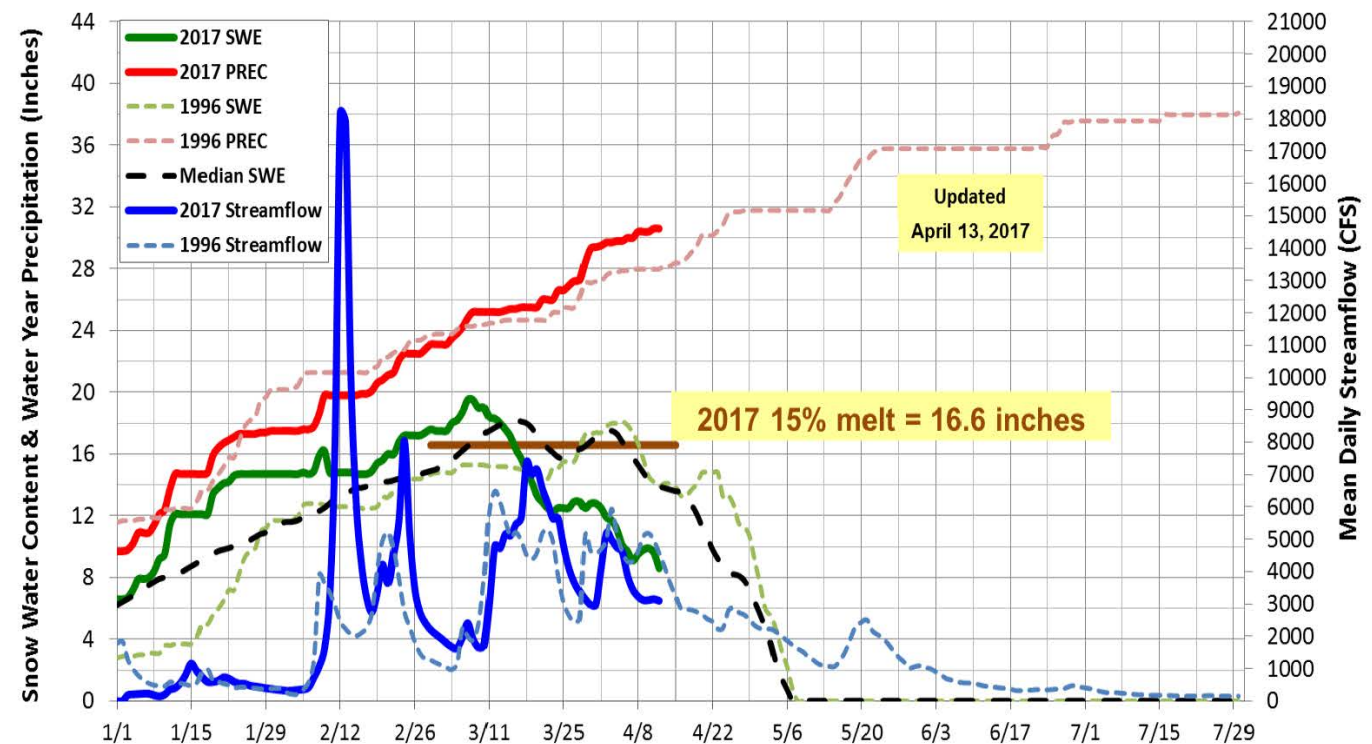


13181000: Owyhee R near Rome, OR

1996 Apr-Jul volume was 106%, 363.5 KAF, Average is 343.5 KAF



2017 & 1996 South Mtn. SNOTEL and Owyhee River nr Rome, OR



Owyhee River has an increase or the snowmelt peak occurs when South Mtn. SNOTEL site is about 15% melted.

Max-Min

Updated

13-Apr-17

Similar Year

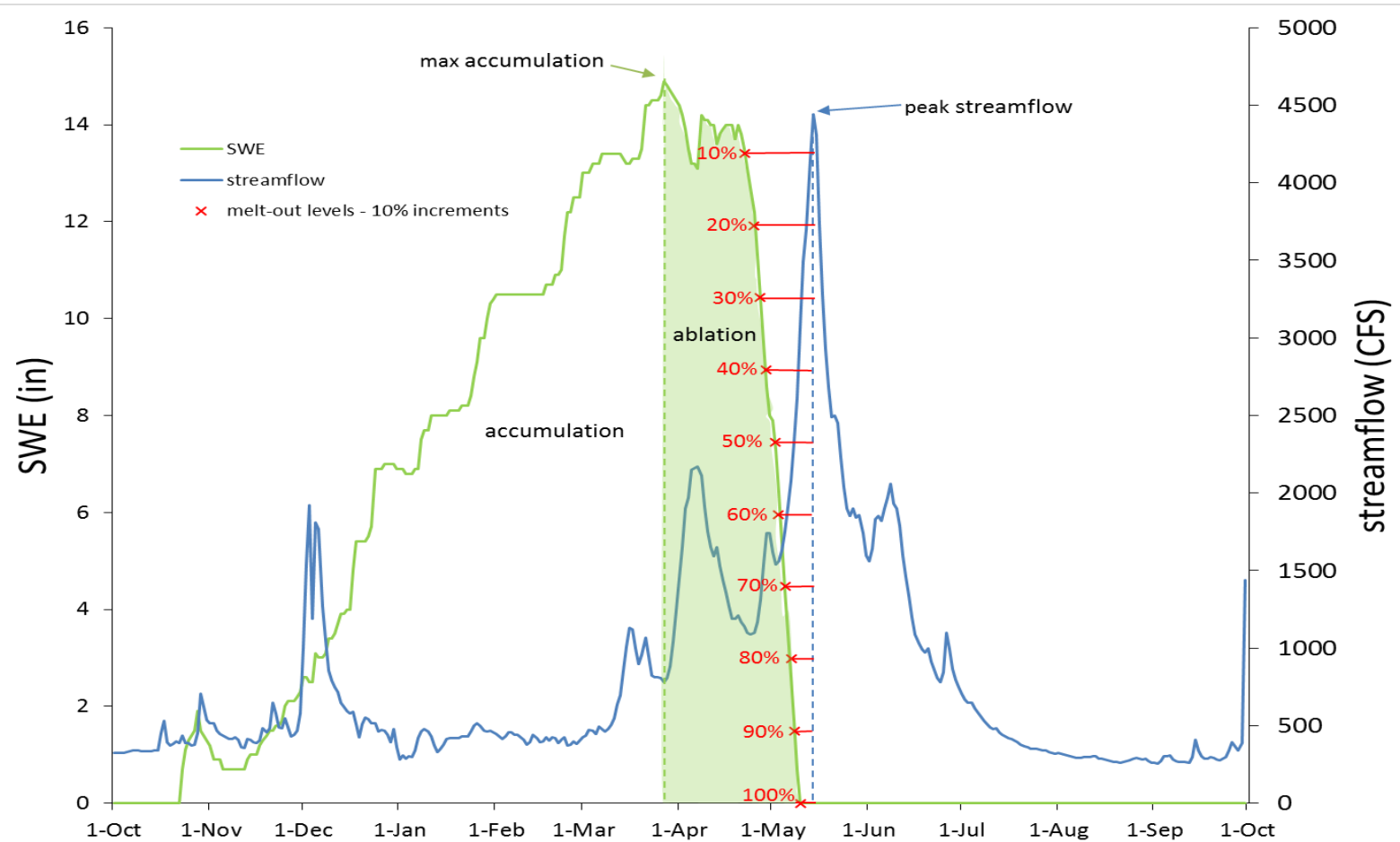
1996

Partnerships between NRCS & BSU



BOISE STATE UNIVERSITY

Snow to Flow Relationships that should be Operational in 2017



- Moyie River at Eastport ID
- Lochsa River nr Lowell ID
- Selway River nr Lowell ID
- MF Salmon River at MF Lodge ID
- Boise River nr Twin Springs ID
- SF Boise River nr Featherville ID
- Big Lost River at Howell Ranch ID
- Bruneau River nr Hot Springs ID
- Owyhee River nr Rome ID
- Salmon Falls Creek nr San Jacinto
- Teton River nr Driggs ID
- Snake River at Flagg Ranch WY