Northwest **Power** and **Conservation** Council

May 1, 2018

MEMORANDUM

TO: **Council Members**

FROM: **Shirley Lindstrom**

SUBJECT: **Briefing on 2018 snow and streamflow outlook – shortages, surplus, etc…**

<u>BACKGROUND:</u>

Presenter: Ron Abramovich, Natural Resource Conservation Service

Summary: Ron will brief the Council on how the 2017 runoff enhanced this year's runoff (soil moisture & baseflows); 2018 snow and streamflow outlook (shortages, surplus, etc.); Idaho's cloud seeding and aquifer recharge programs and the NRCS information used in these programs, and then discuss new tools being developed to assist water managers (snowmelt timing runoff and Day Of Allocation, and the cross roads we are at).

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Steve Crow
Executive Director

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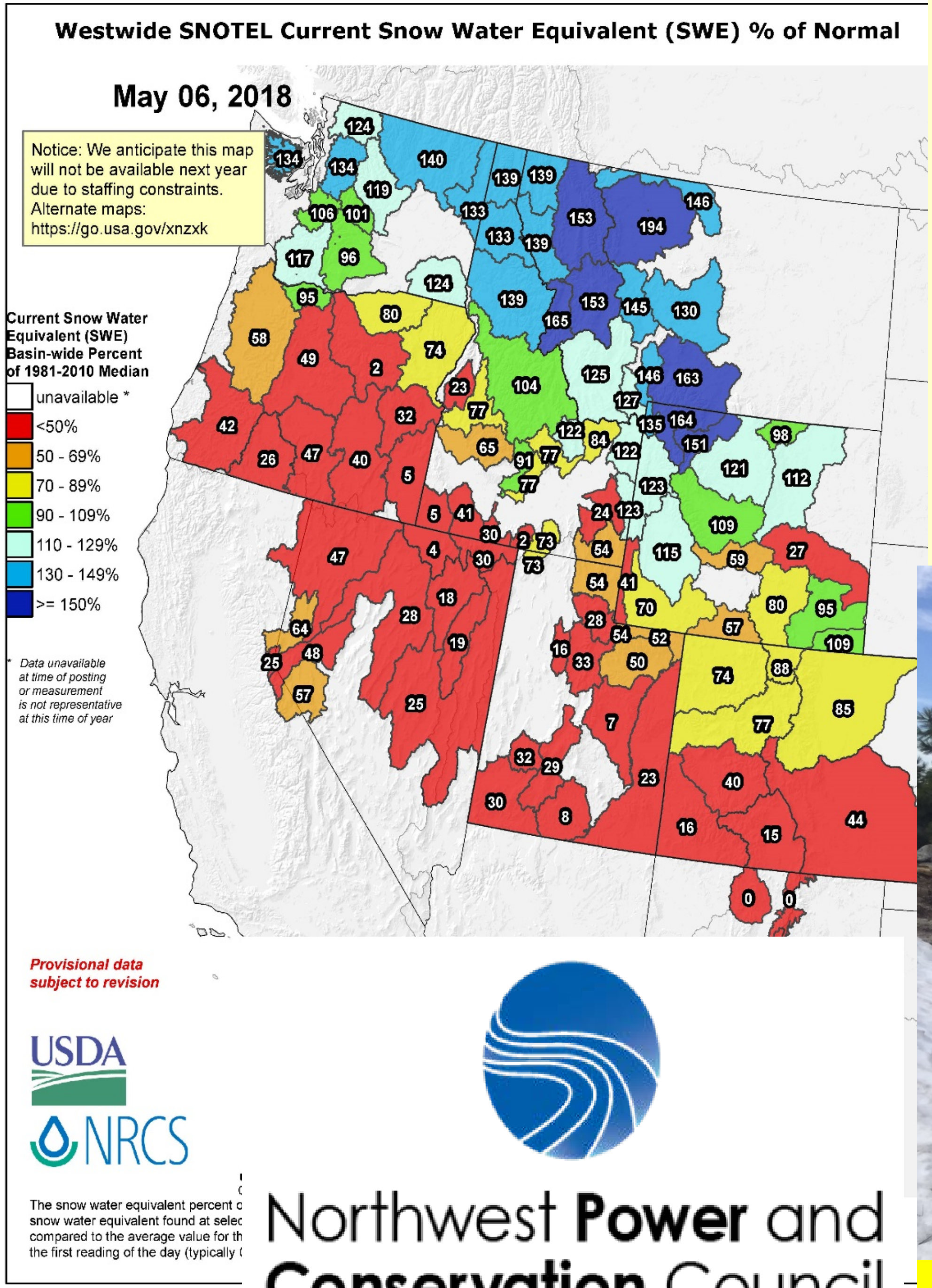


2018 Snow Survey & Water Supply Information for Idaho and Pacific Northwest

May 9, 2018
Boise, Idaho

Northwest **Power** and **Conservation** Council

Bogus Basin, Idaho April 21, 2018

Bogus Basin, Idaho May 6, 2018

Ron Abramovich
Water Supply Specialist
Snow Survey
Boise, Idaho

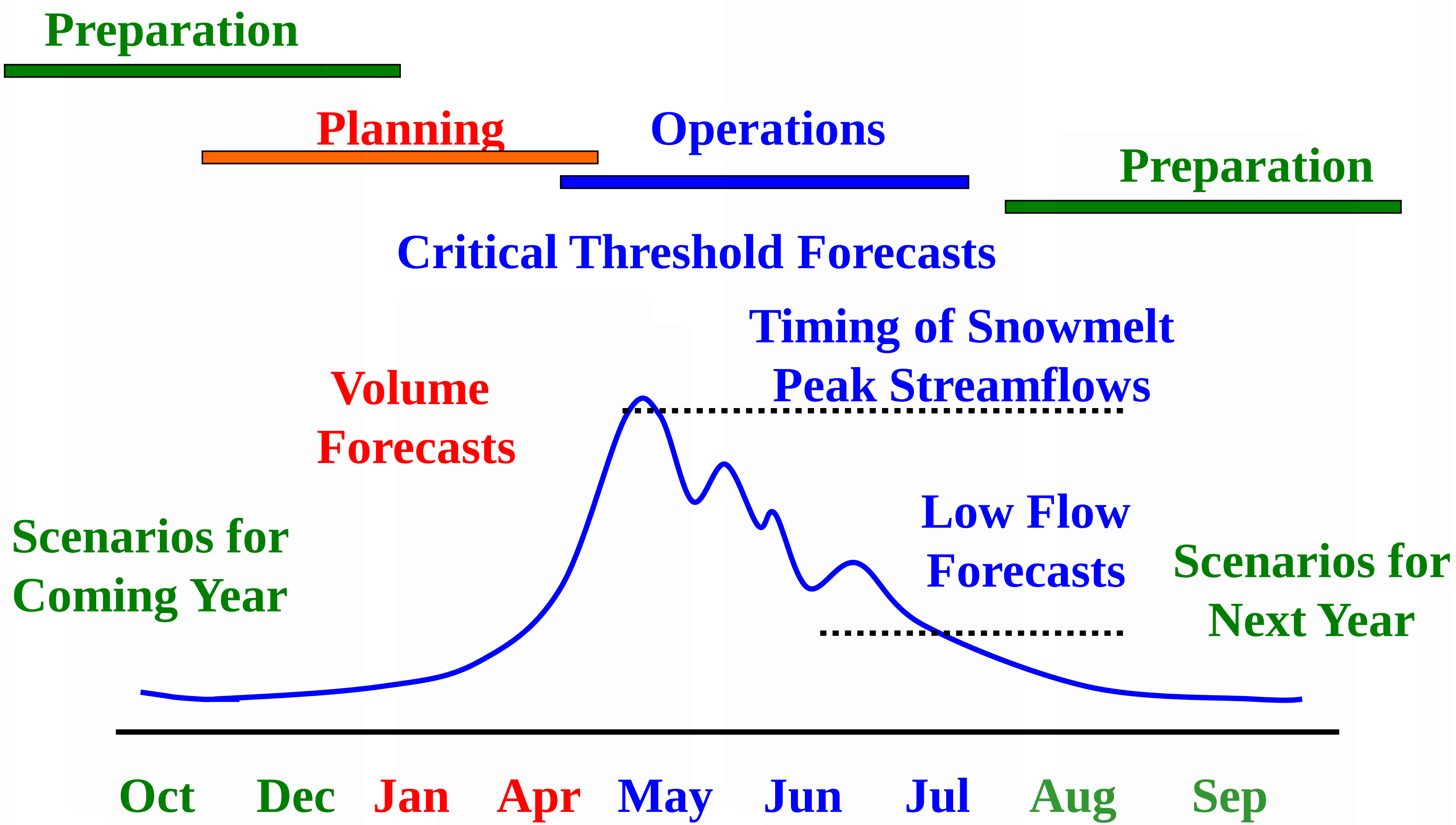
USDA

NRCS Natural Resources Conservation Service

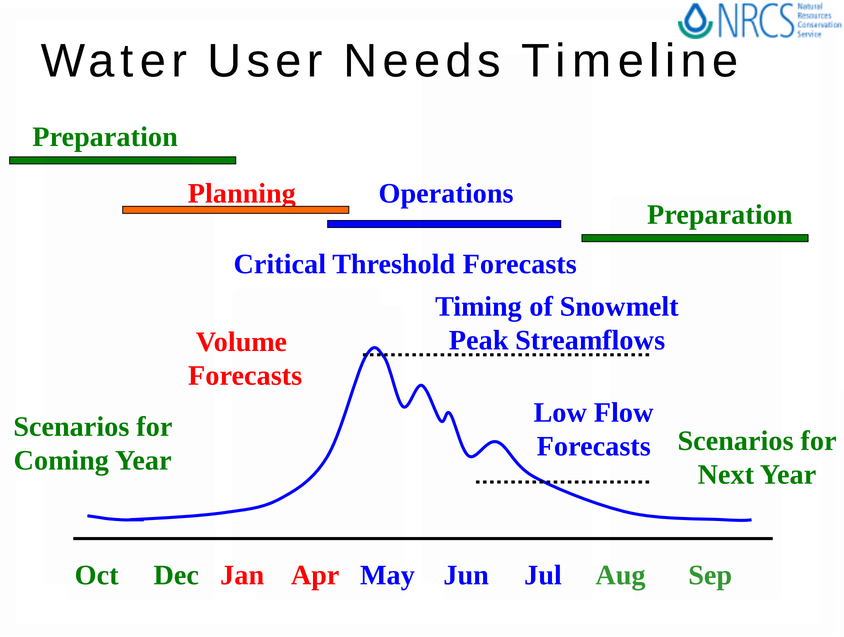
Topics:

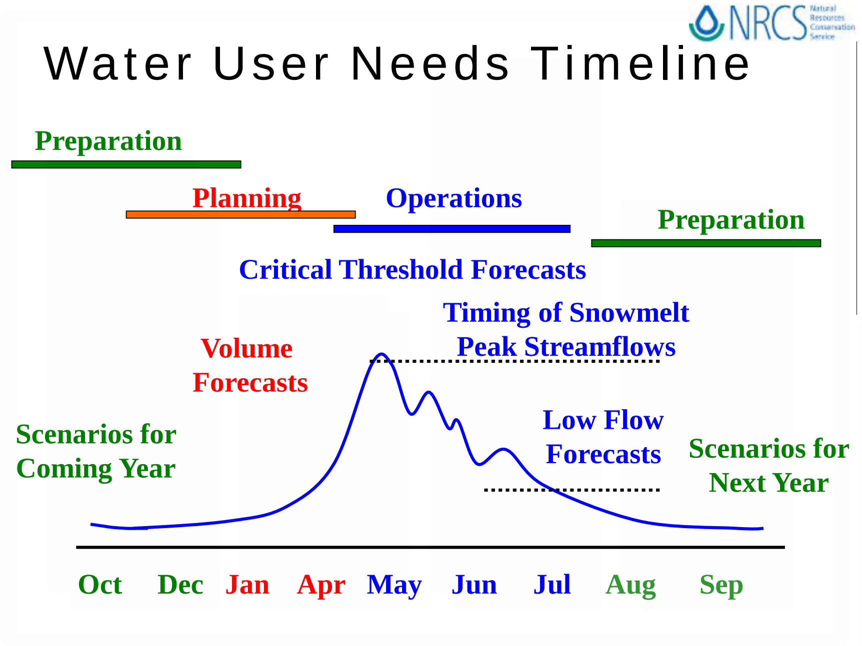
- How past years set the stage for 2018 water supply
  - boosted – reservoir storage, soil moisture & baseflows
- 2018 Snow and Water Supply Forecast Summary
  - snow and streamflow outlook – surplus & shortages
- Touch on Idaho's cloud seeding and aquifer recharge programs and the NRCS information used to run these programs which also help in drought mitigation.
- Spring Weather Outlooks – mixed / variable outlooks
- Old & new tools being developed to assist water managers – snowmelt timing runoff and Day Of Allocation, and the cross roads we are at.
- Wise management of water as a natural resource to mitigate impacts of floods & droughts and uses of this information to make the best decisions you can

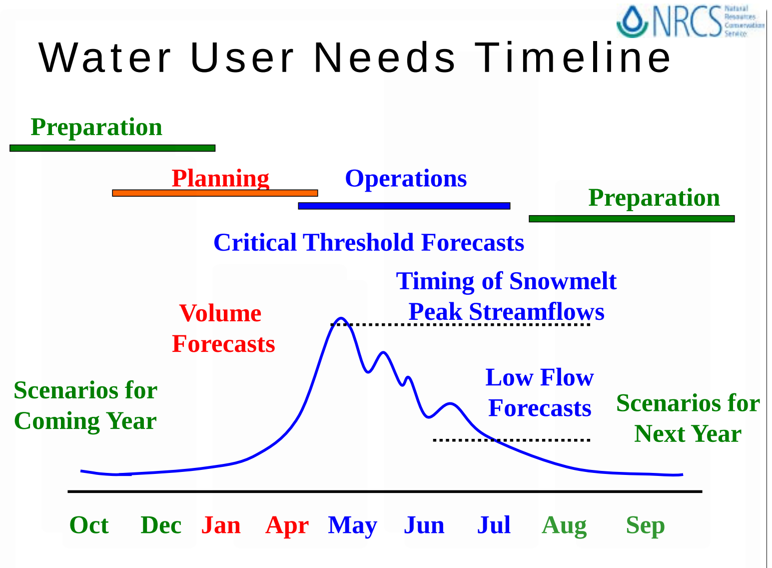
Water User Needs Timeline



Water Years: 2016 2017 2018



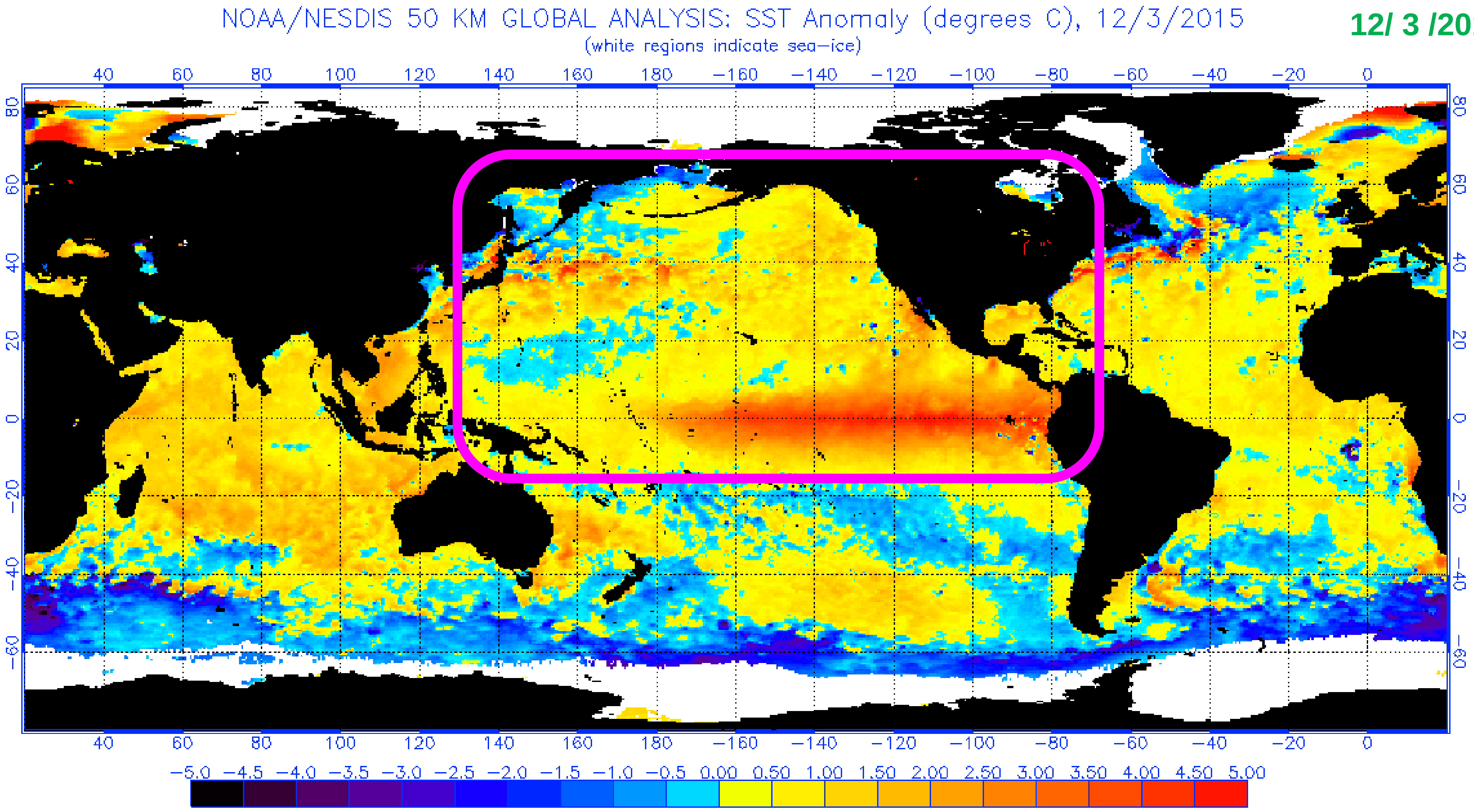




Weather patterns – winter 2015 / 2016 – strongest El Nino signal in years

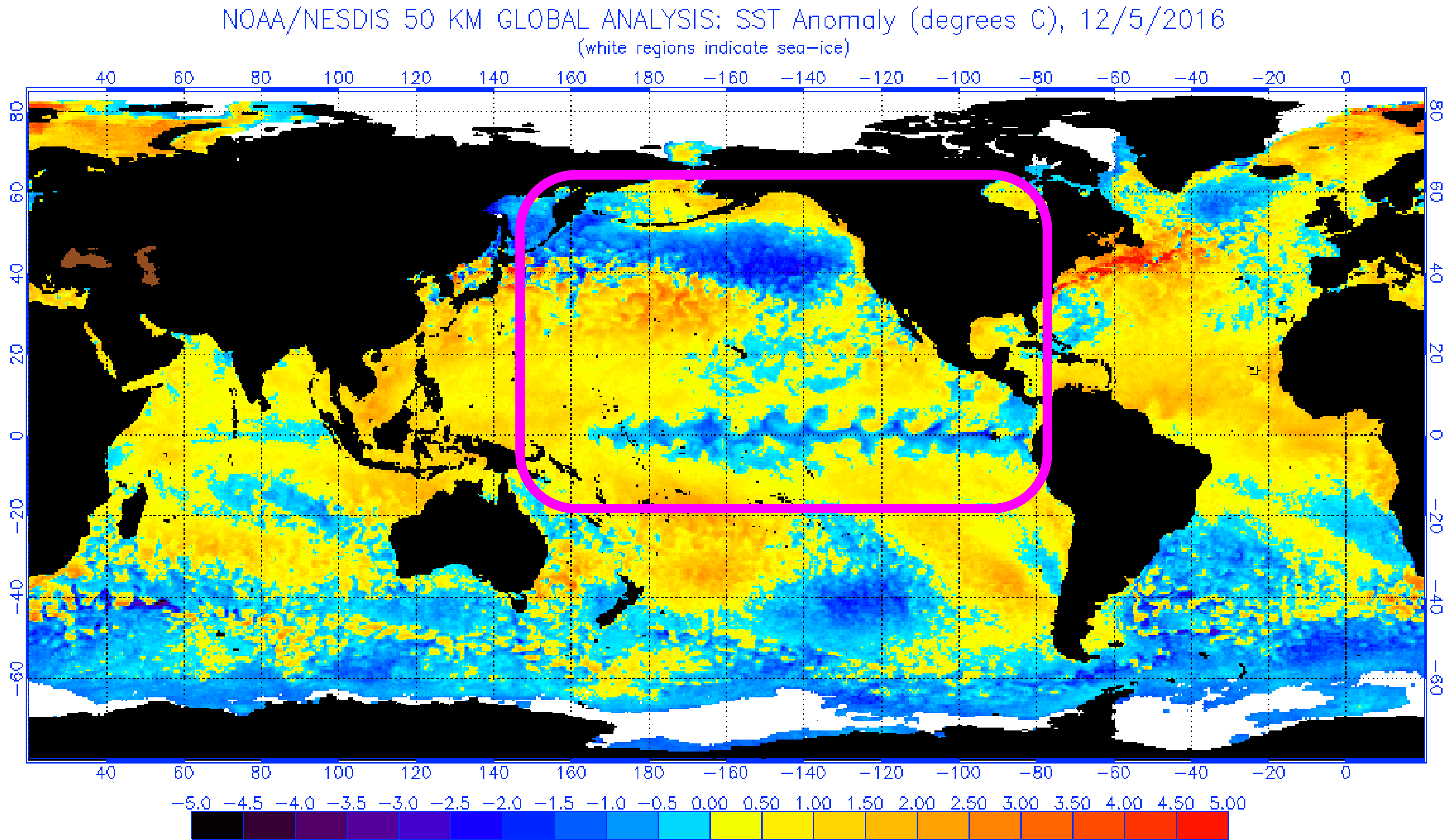
– warmer waters in north Pacific fading away

12/ 3 /2015

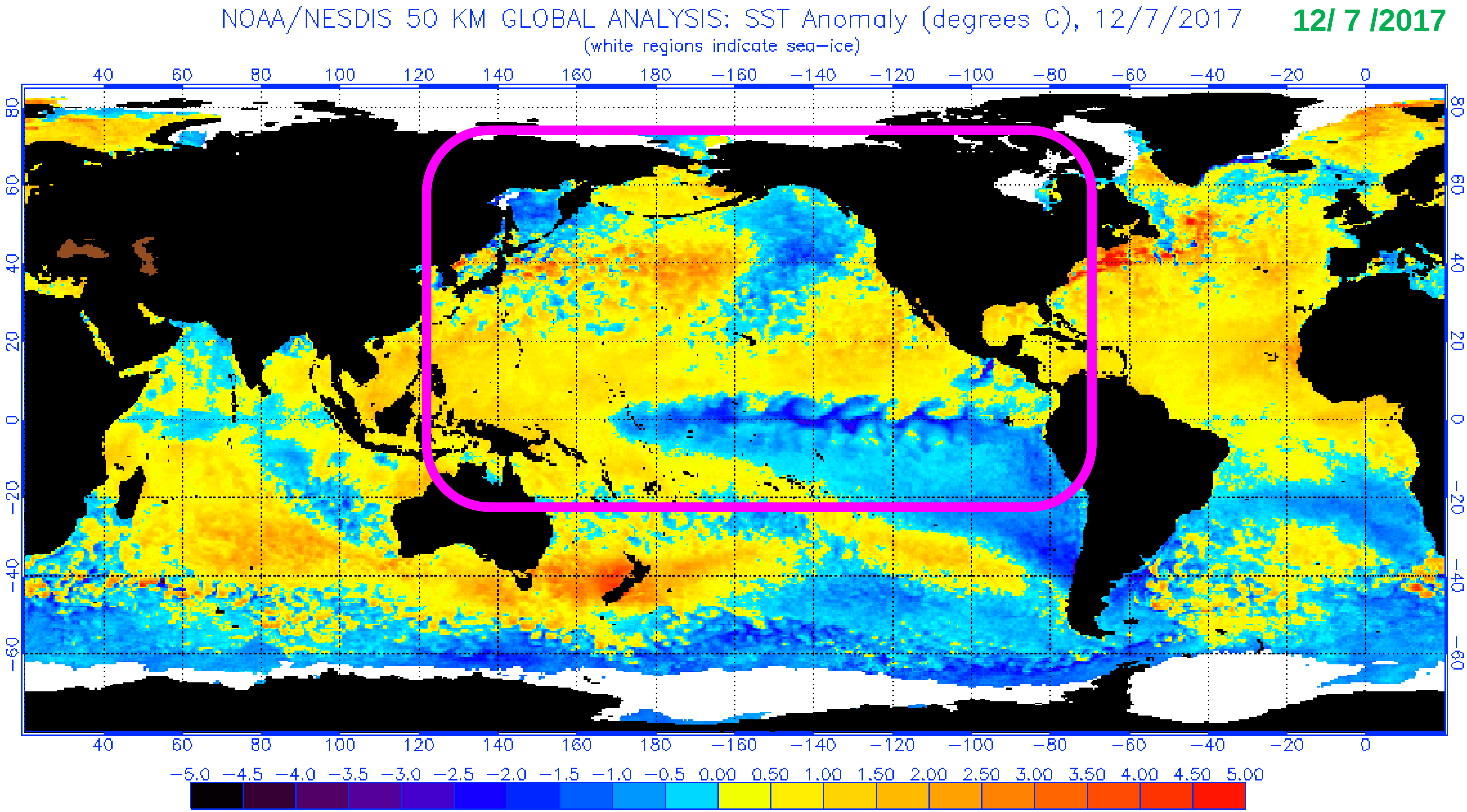


Weather patterns – winter 2016 / 2017 – slight La Nina ENSO signal – cooler waters in north Pacific

12/ 5 /2016



Weather patterns – winter 2017 / 2018 – stronger La Nina ENSO signal – cool waters in north Pacific



2016 / 2017 - 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**

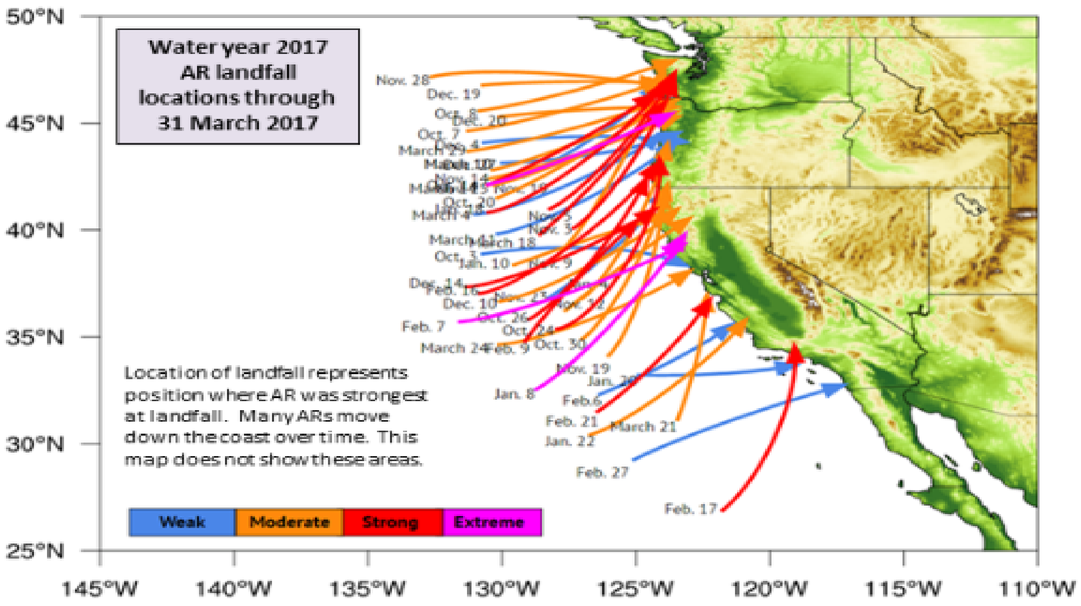
Distribution of Landfalling Atmospheric Rivers on the U.S. West Coast
(From 1 Oct 2016 to 31 March 2017)

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

	ENSO		ENSO	sorted					
				Streamflow as % of 1981-2010 Average					
				Feb-Sep	Apr-Sep	Apr-Sep	Apr-Sep	Apr-Sep	Apr-Sep
Year	SE Strong El Nino	Year Following a Strong El Nino		Owyhee River blw Dam	Salmon Falls Creek	Boise River nr Boise	Big Wood River blw Magic Dam	Snake River nr Heise	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

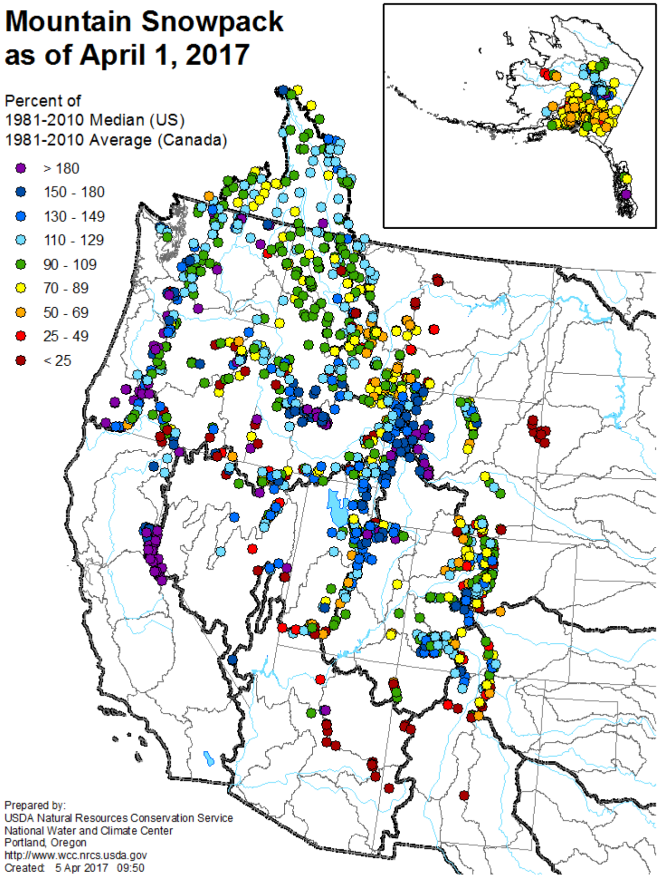
12 years

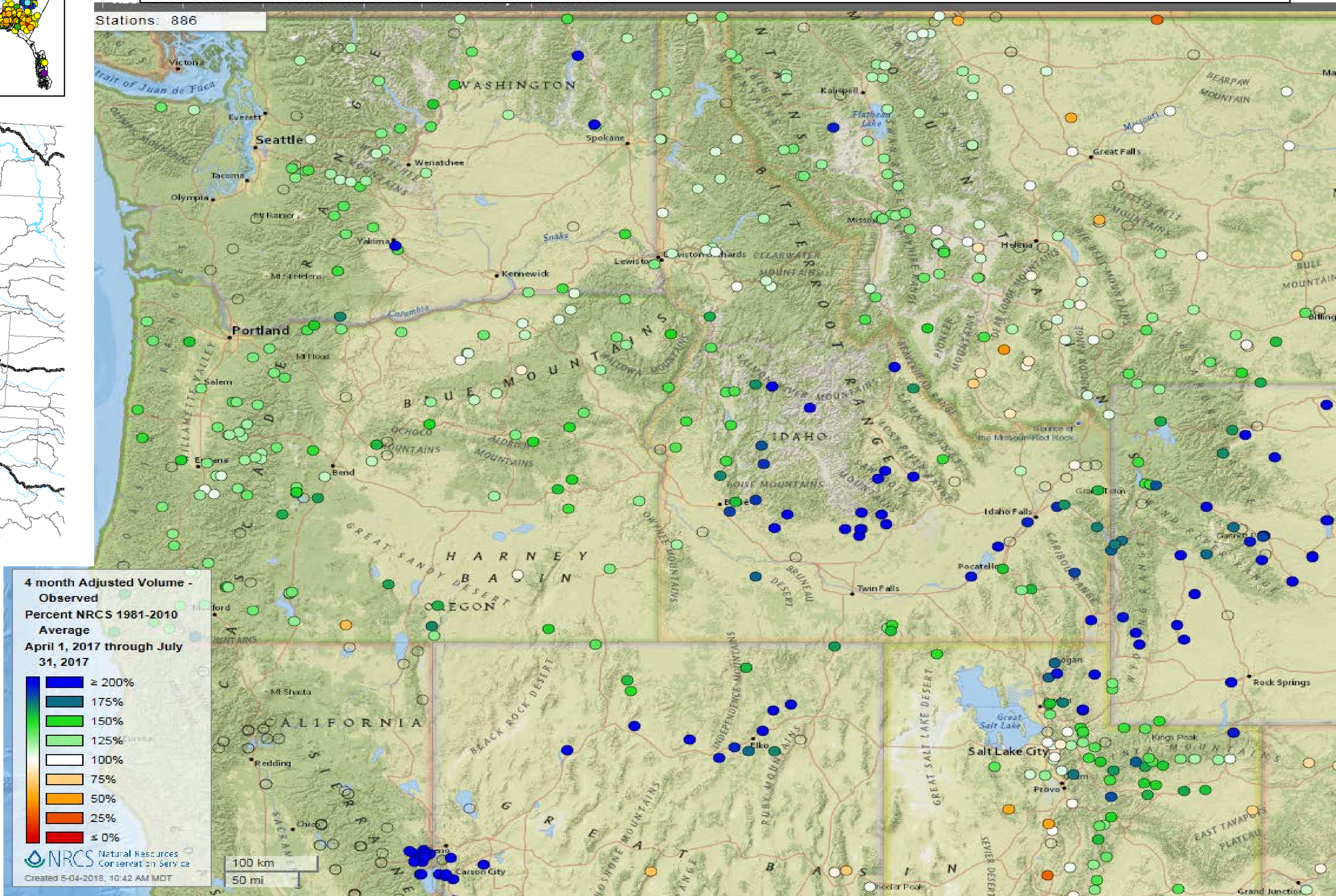
Color coded streamflow as % of average

<60
60-90
90-110
~111-130
>130

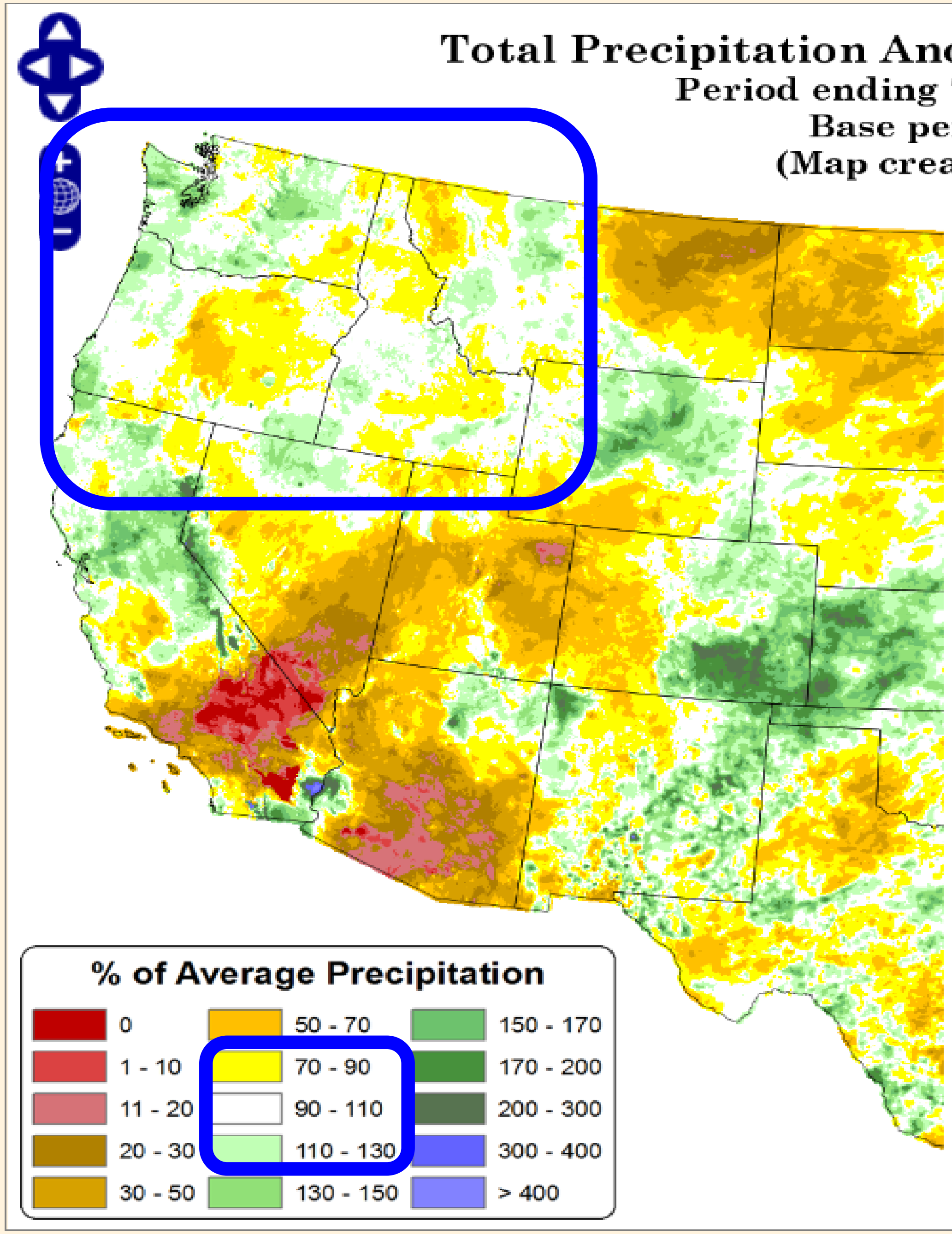
1998/1999 Mt Baker set word snowfall with 95 feet of snowfall

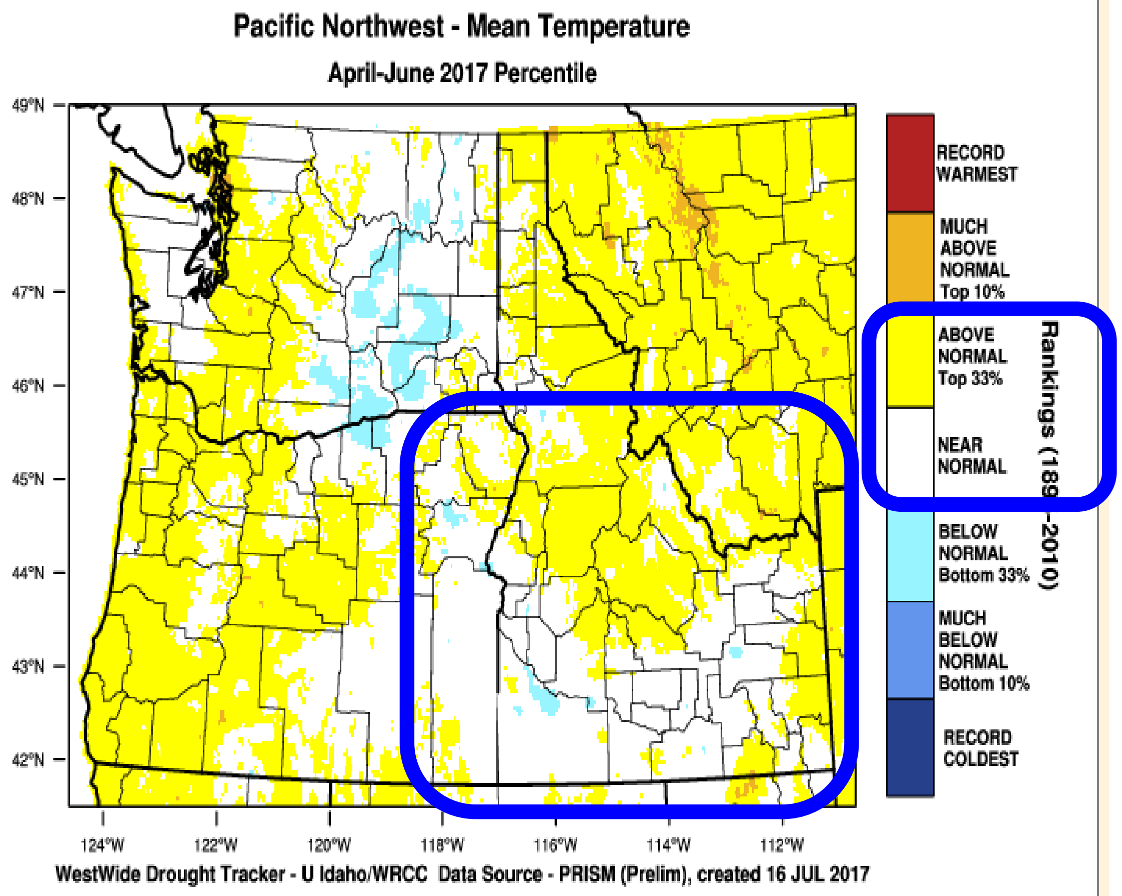
2017 April 1 Snow & April – July Runoff



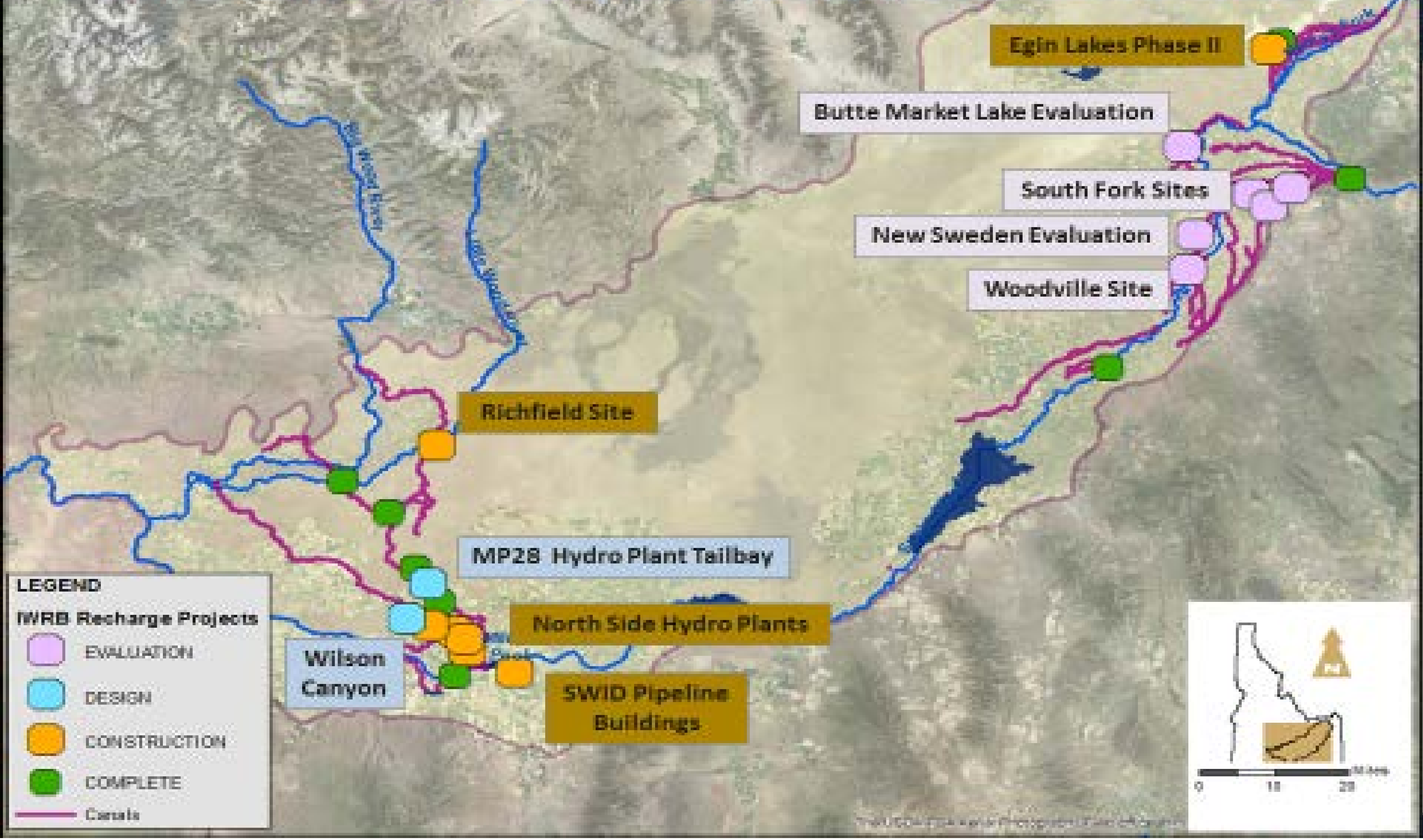


Apr-Jun Precipitation & Temperature – Near Normal !





IWRB Managed Recharge Projects – Fall 2017



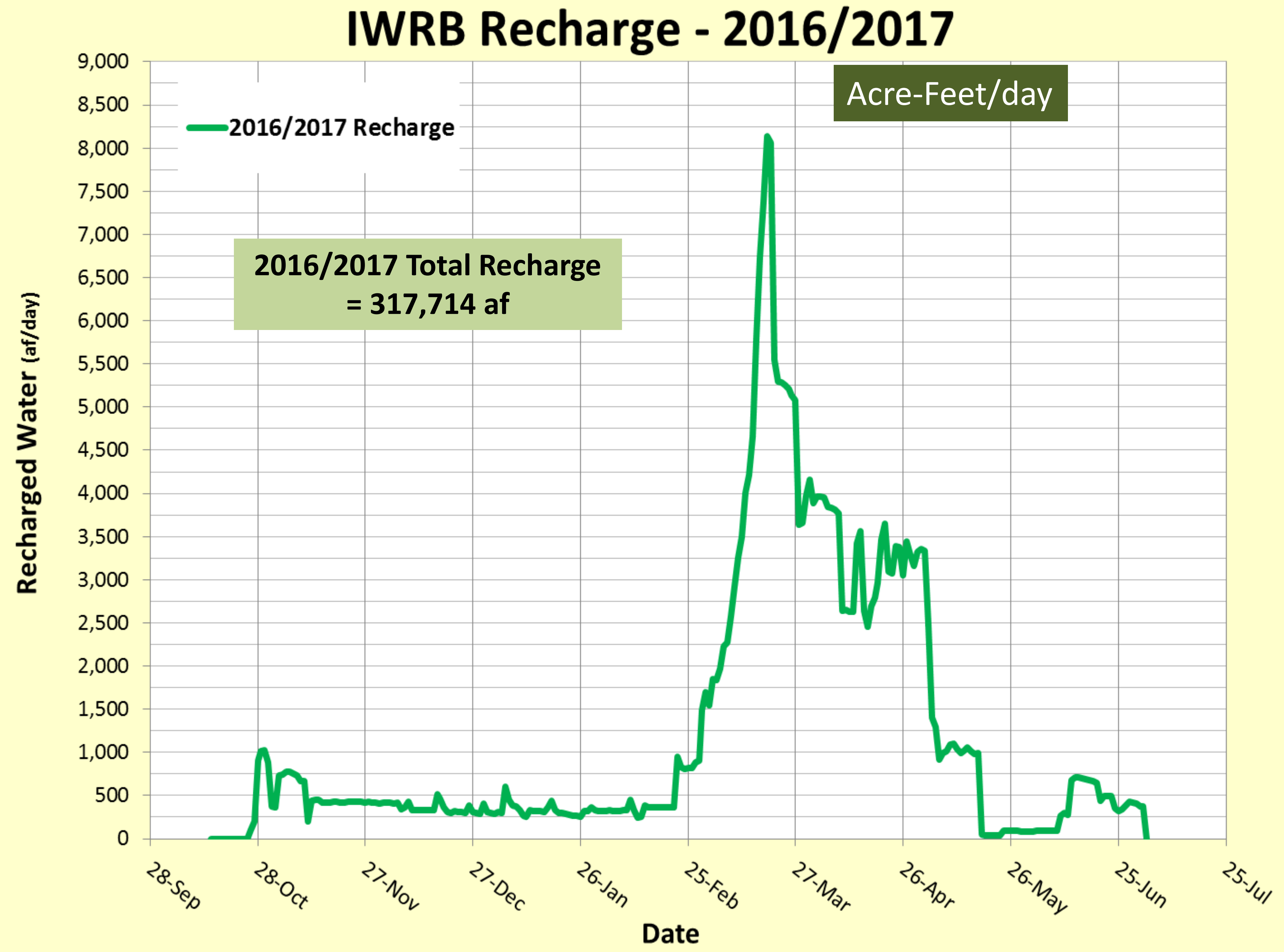
Water Resource Board

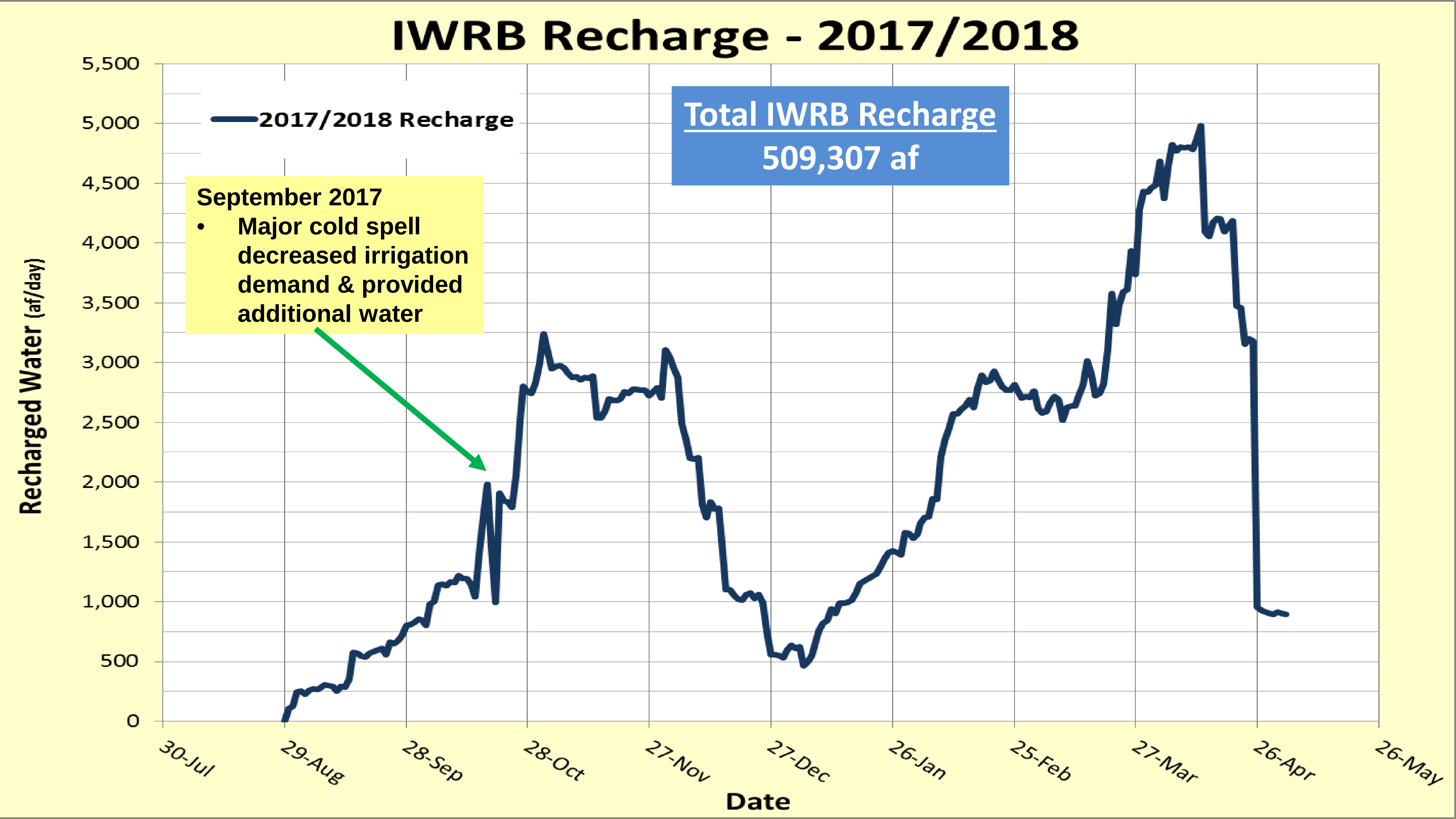
IWRB Managed Recharge Program

Upper Snake Advisory Committee

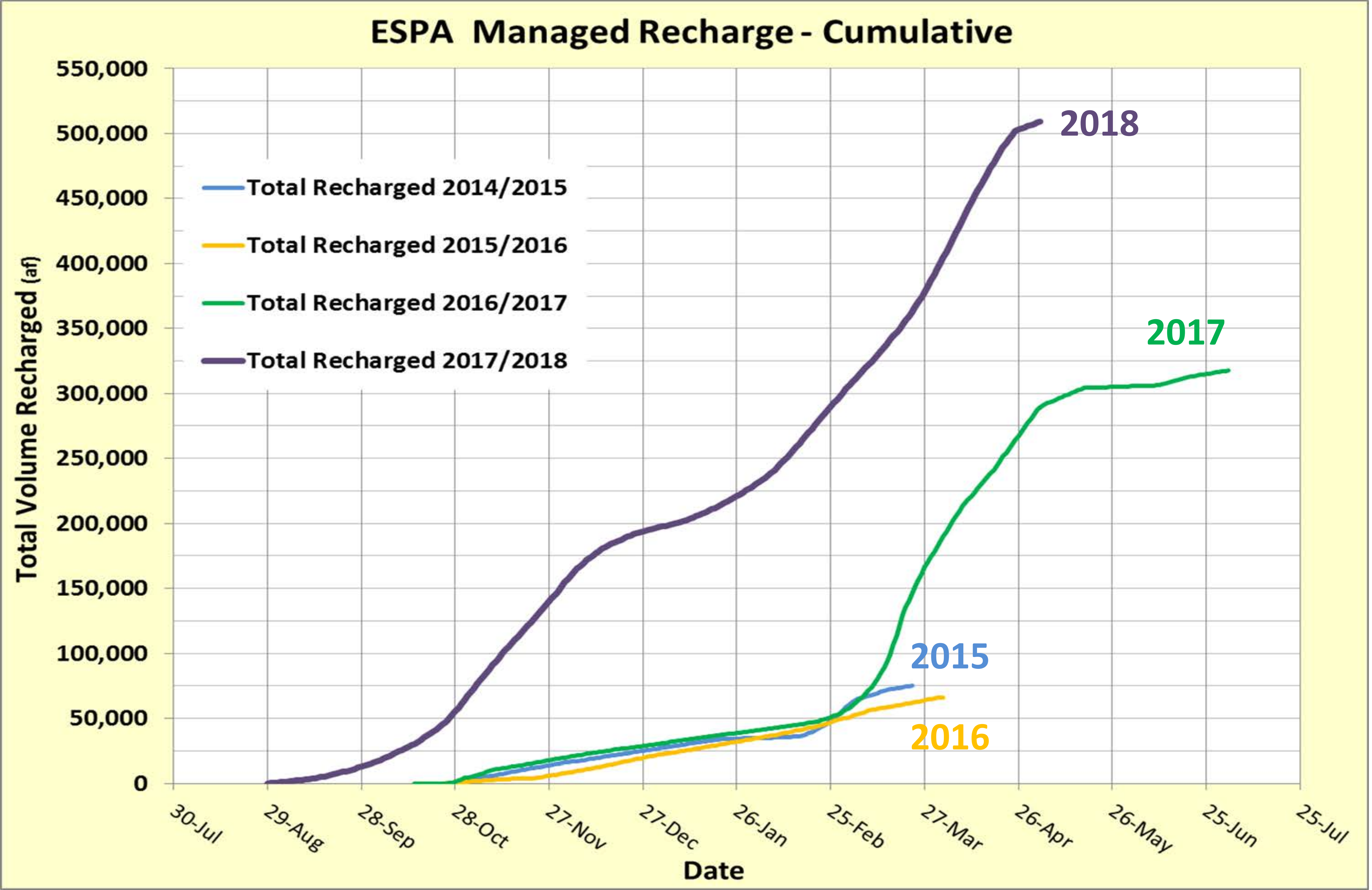
Wesley Hipke
IWRB Recharge Program Manager

August 23, 2017

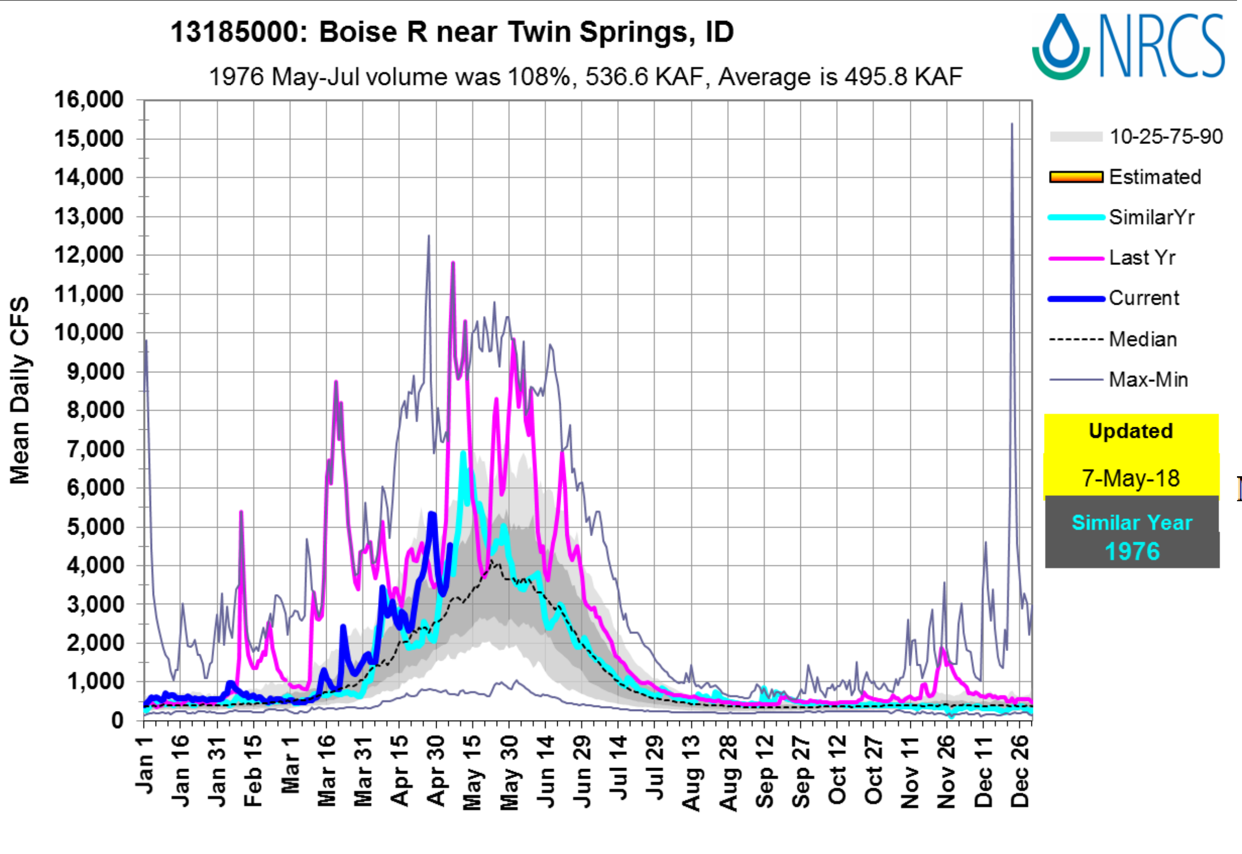




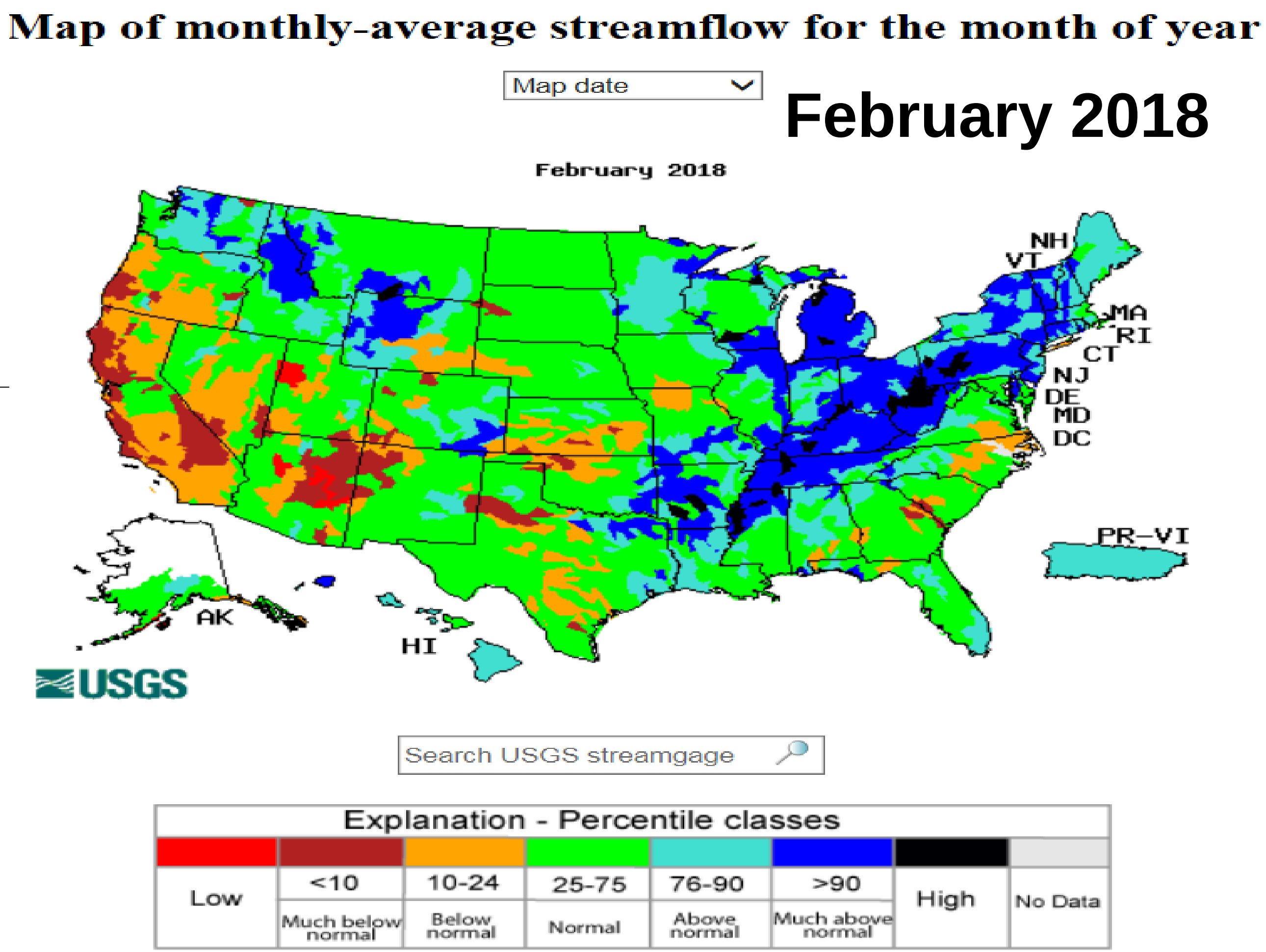
IWRB Recharge - 2017/2018
2017/2018 Recharge
Total IWRB Recharge
509,307 af
September 2017
• Major cold spell decreased irrigation demand & provided additional water
Recharged Water (af/day)
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
30-Jul
29-Aug
28-Sep
28-Oct
27-Nov
27-Dec
26-Jan
25-Feb
27-Mar
26-Apr
26-May
Date


ESPA Managed Recharge - Cumulative
Total Volume Recharged (af)
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Total Recharged 2014/2015
Total Recharged 2015/2016
Total Recharged 2016/2017
Total Recharged 2017/2018
2018
2017
2015
2016
30-Jul
29-Aug
28-Sep
28-Oct
27-Nov
27-Dec
26-Jan
25-Feb
27-Mar
26-Apr
26-May
25-Jun
25-Jul
Date

2017 & 2018 Streamflow Conditions

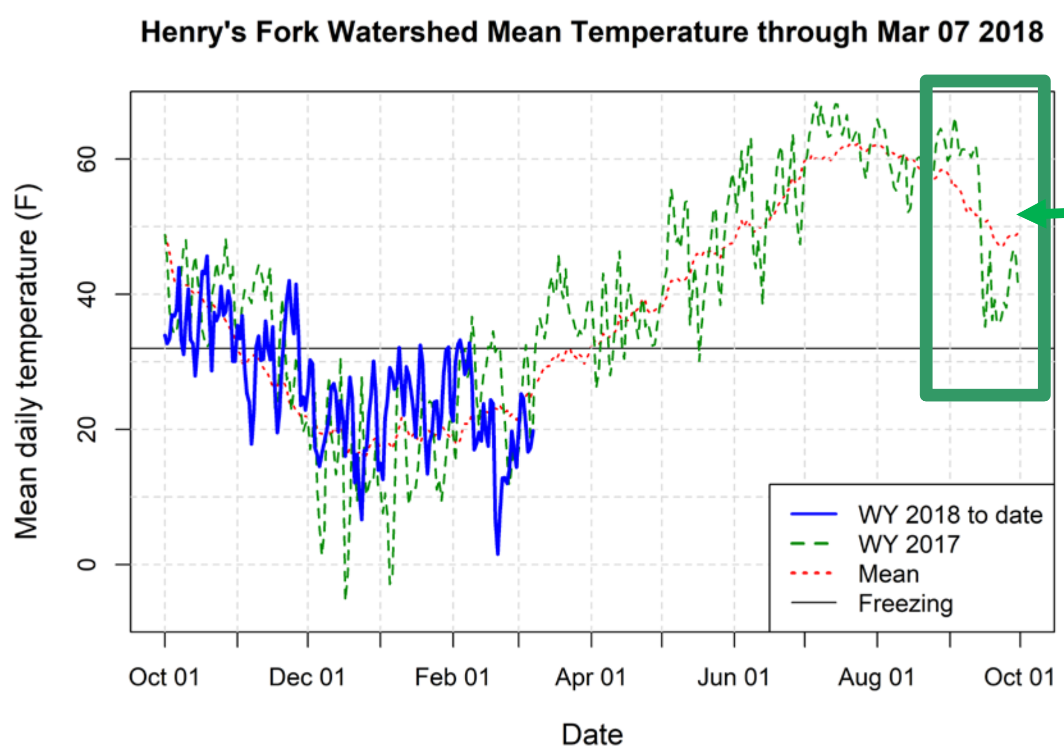


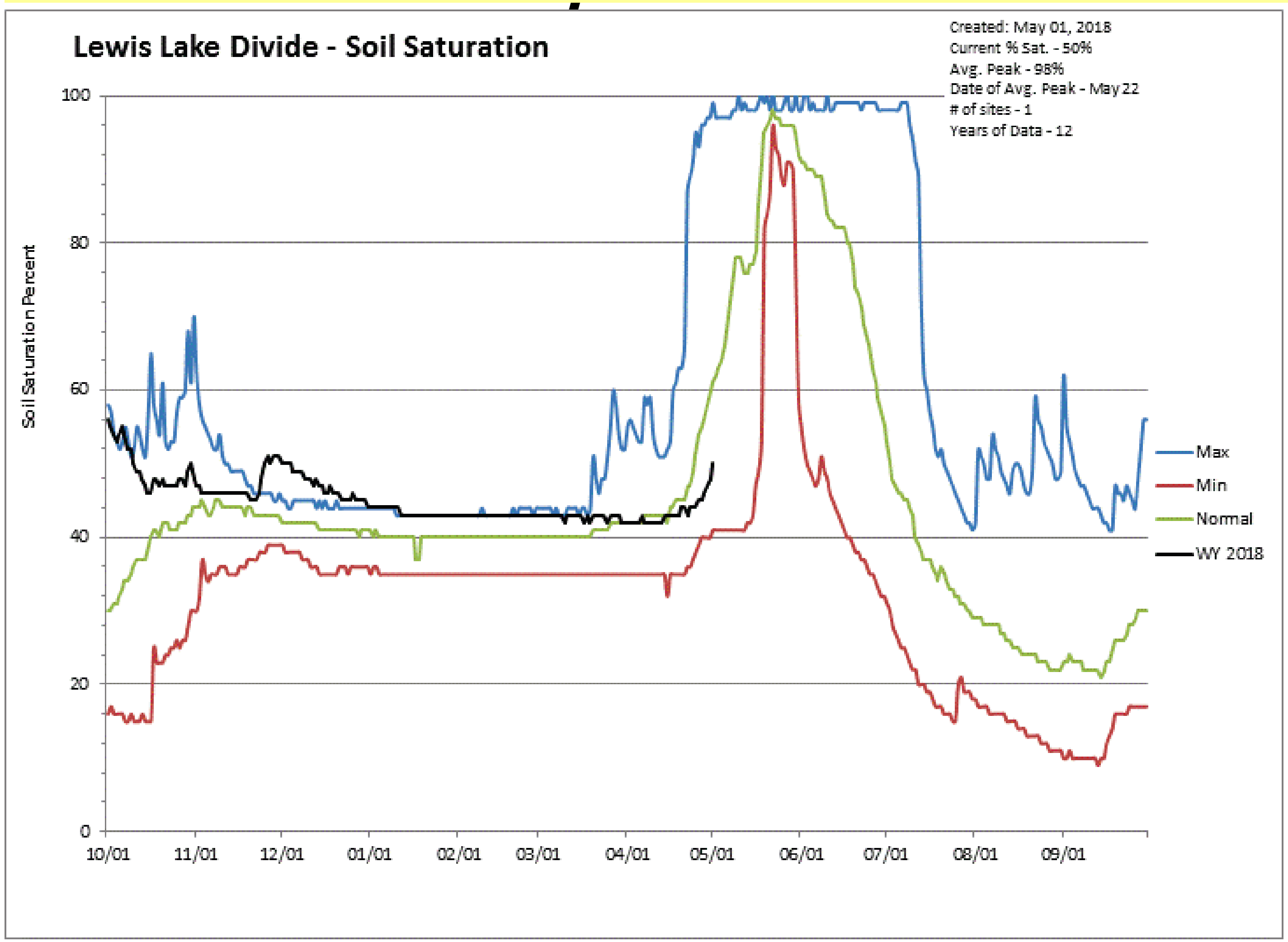
Streamflow above average across most of state and since February 2017 and near record high in Wyoming / Montana in the winter



Upper Snake September 2017

- Major cold spell decreased irrigation demand
- Brought snow to mountains
- Kept / sealed soil moisture thru the winter





Amount of Runoff Needed in 2018 for Adequate Irrigation Supply

10/ 30 /2017

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

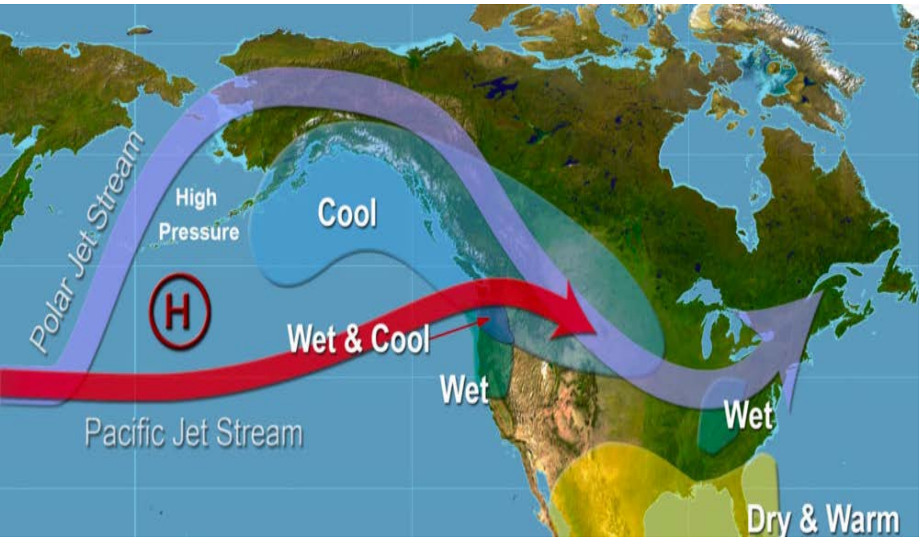
For complete summary see: Surface Water Supply Index (SWSI)
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/id/snow/waterproducts/?cid=stelprdb1240689

Created: October 30, 2017
Updated: December 1, 2017

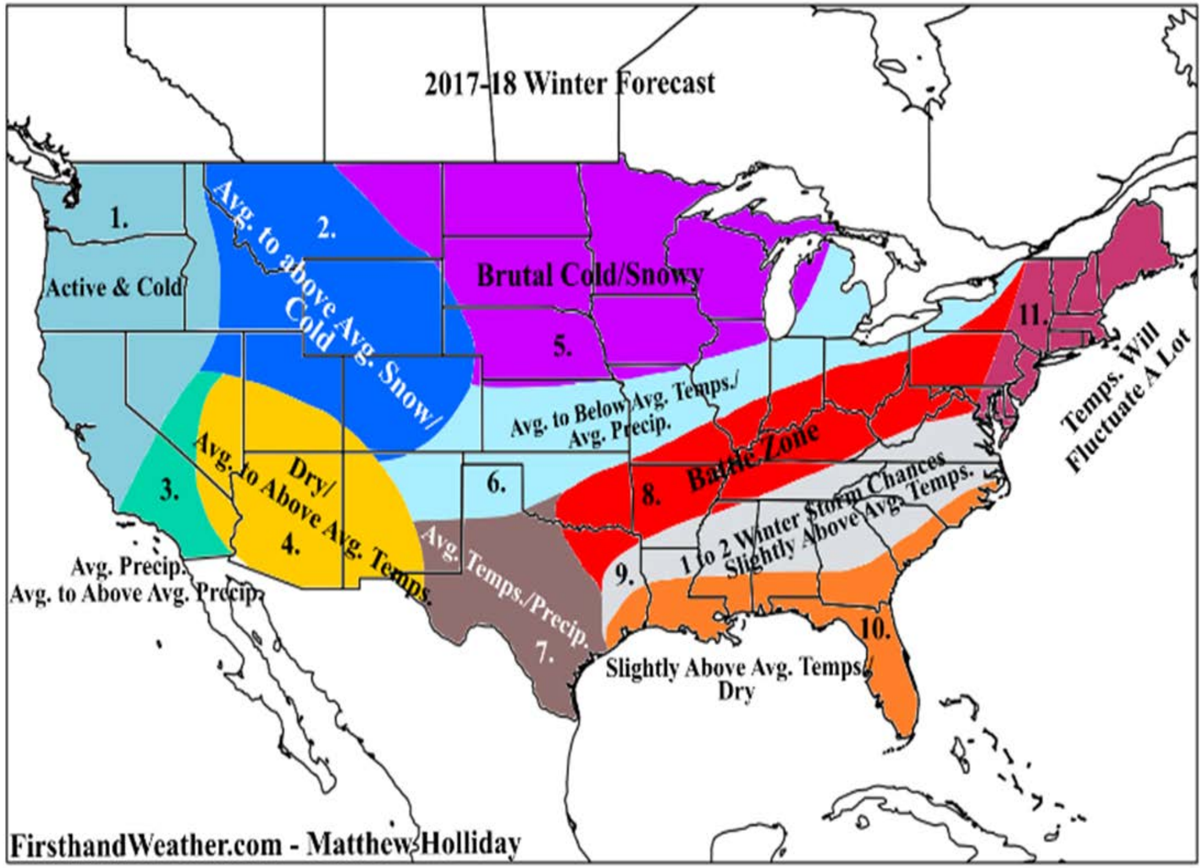
Fall reservoir carryover storage is used to project spring reservoir storage levels based on current conditions and recent trends. Then, by knowing the adequate irrigation water supply needed in your basin, the projected spring reservoir volumes are subtracted from the adequate irrigation supply to determine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

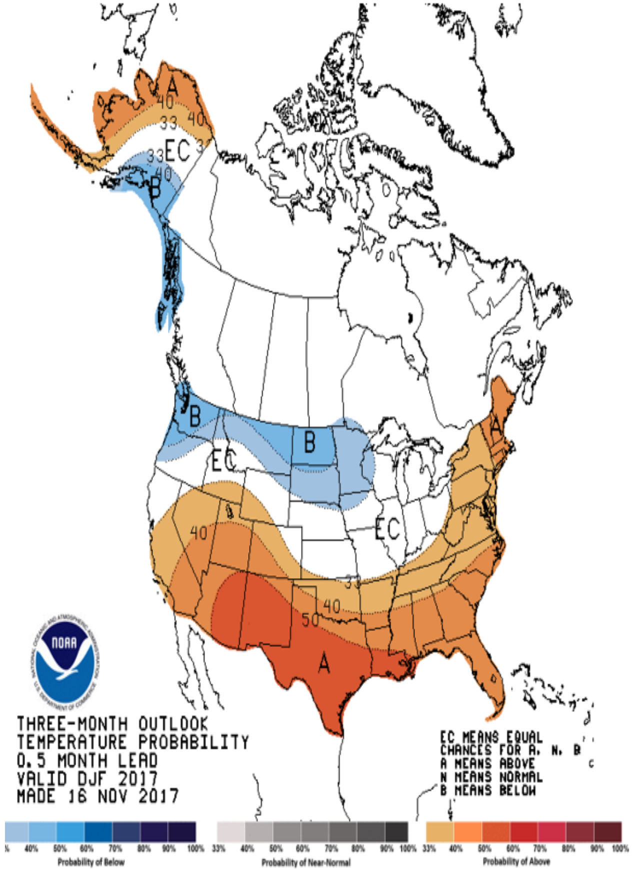
	Column 2 -	**Column 3 =**	**Column 4**	**Col4/Col6 X 100= Col 5**				
Column 1 **Basin**	2 Amount needed for adequate irrigation water supply KAF	3 Projected end of month reservoir storage (Jan, Feb or Mar) KAF	**4 2018 streamflow volume needed for adequate water supply KAF**	**5 % of average streamflow to meet adequate irrigation supply in 2018 KAF**	6 1981-2010 average streamflow KAF	7 Streamflow runoff period used in the analysis	9 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%

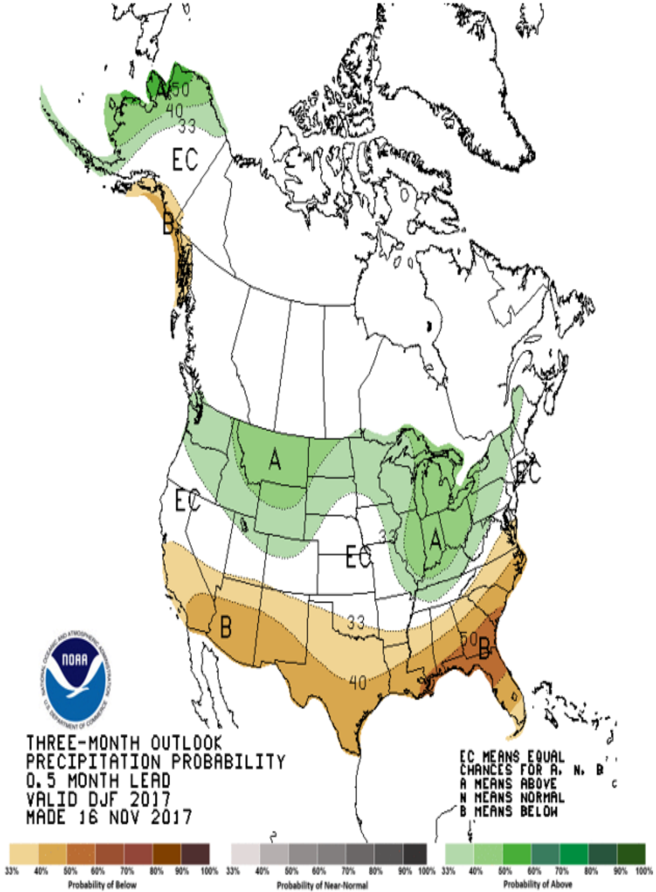
* Based on **Bear River** reservoir allocation: only 245 KAF in storage can be used in 2018 and remaining 35 KAF to meet adequate irrigation supply is from runoff.



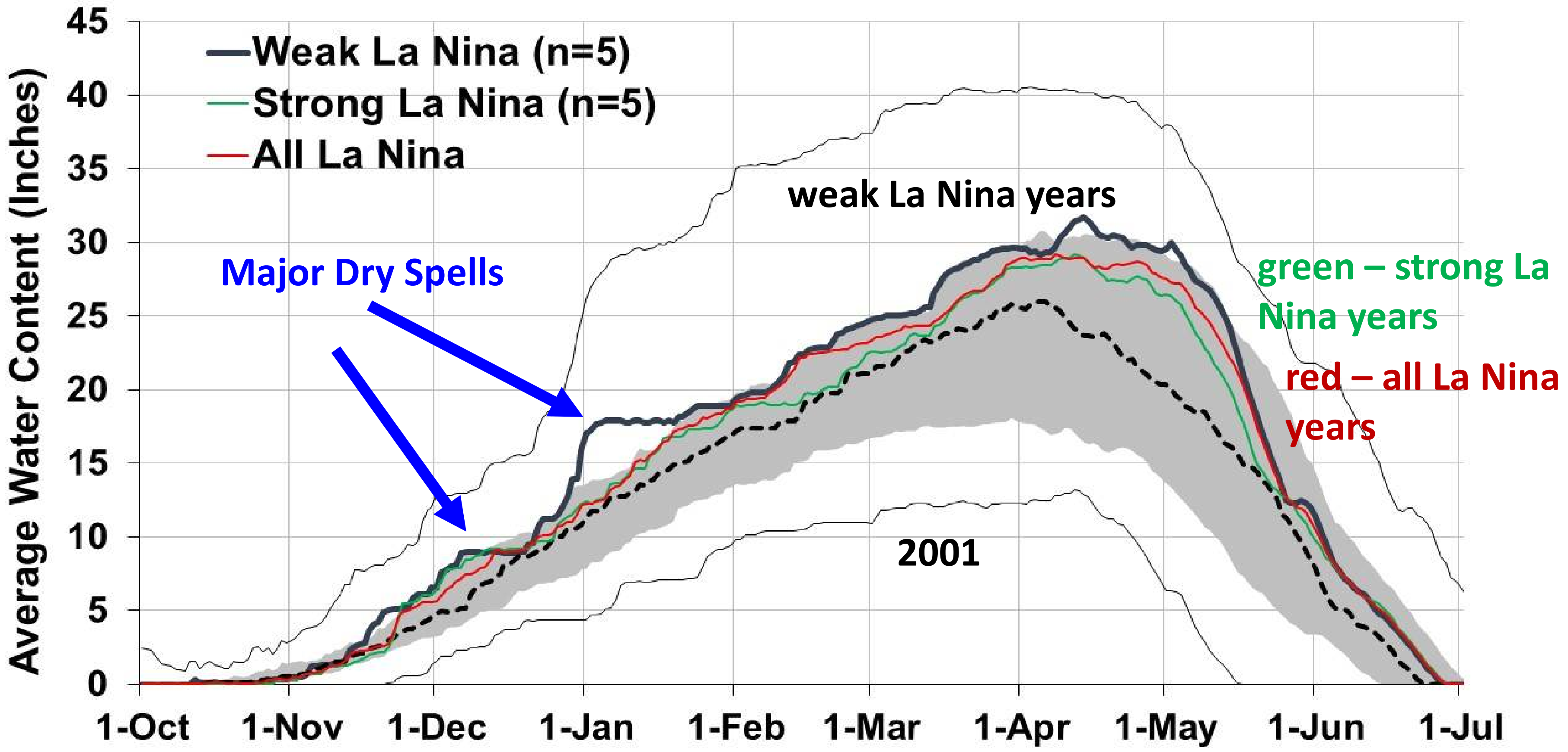
La Nina Conditions Expected for 2017 / 2018 & Winter Outlooks Generally Agree







Boise Basin Snowpack and Historic Range, 1982-2017

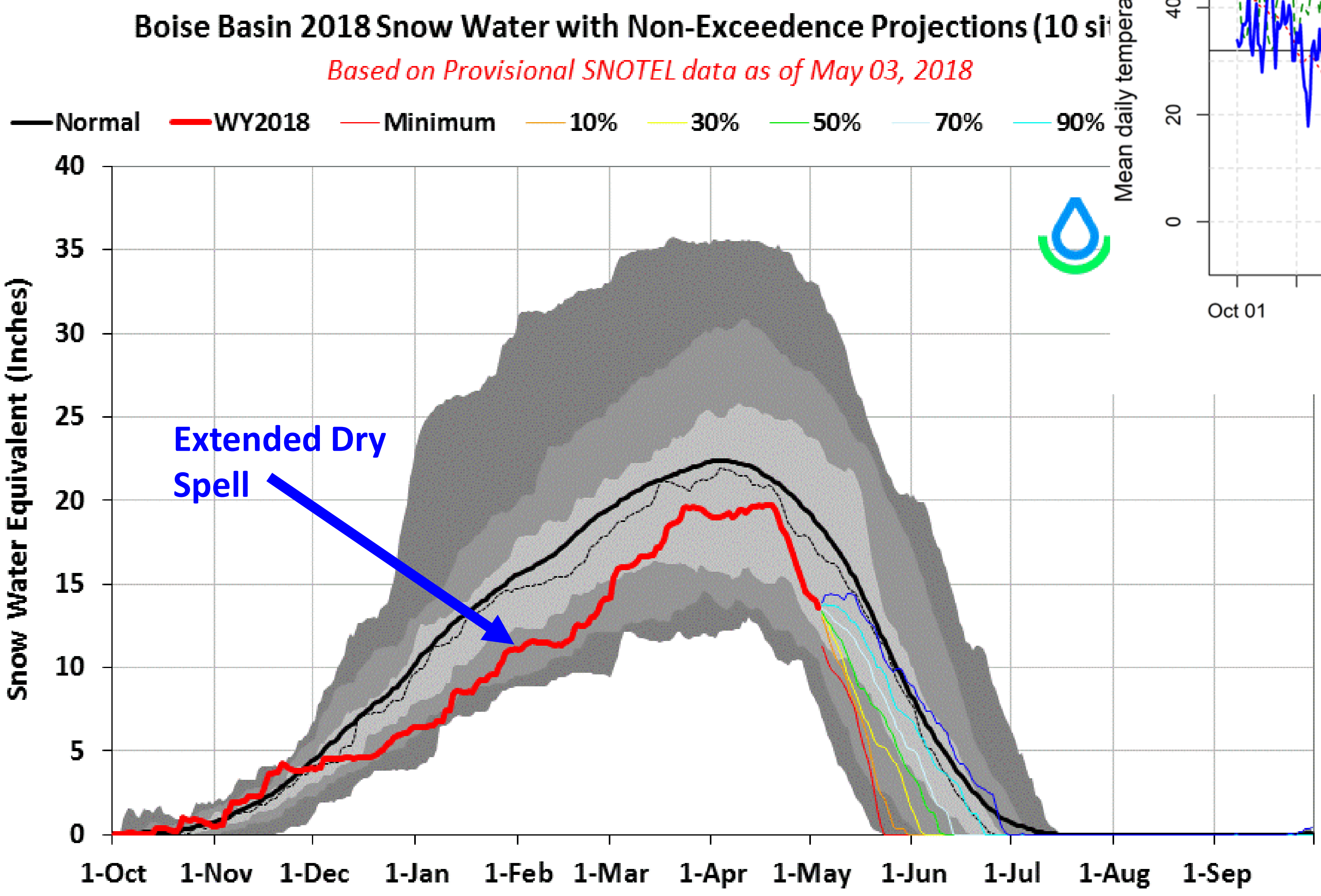


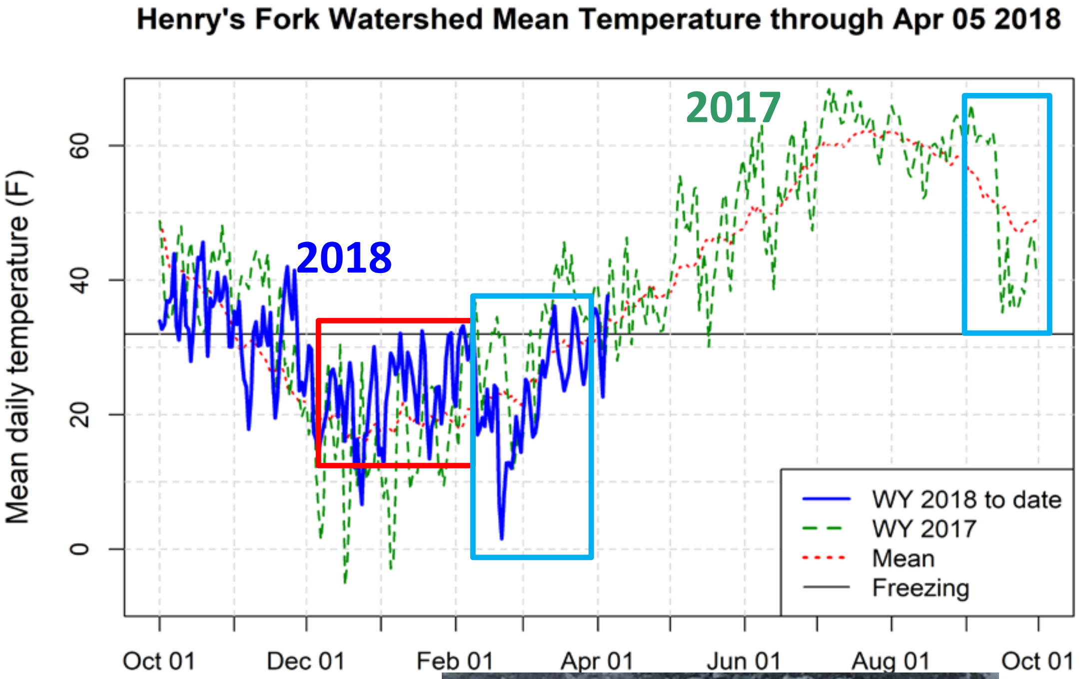
The black dashed line is a "normal snowpack", while **darker line represents weak La Nina years**, green – strong La Nina years, and **red – all La Nina years**.

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

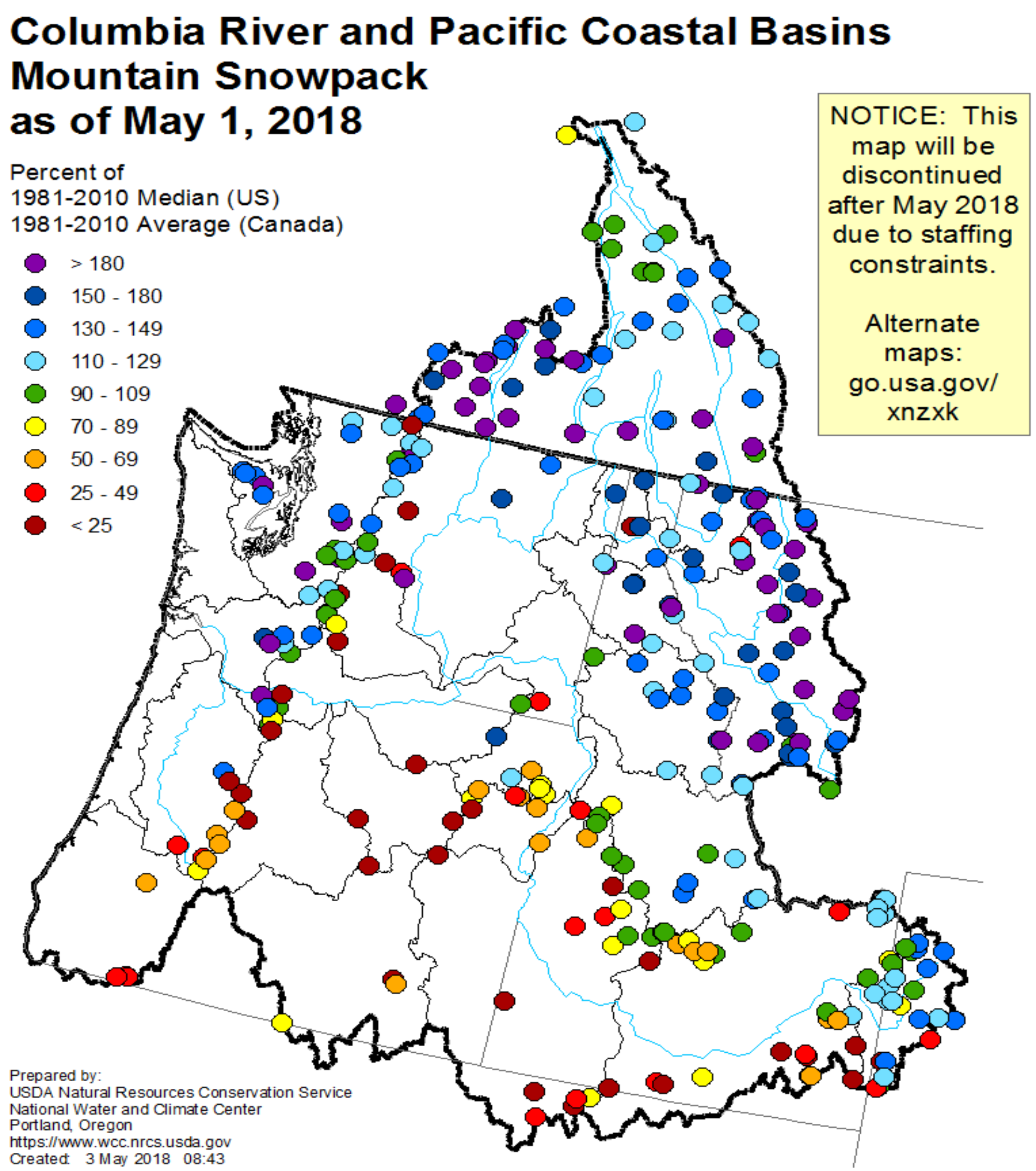
Weak La Nina's appear to produce the most snow, with the median snowpack during 5 La Nina events hovering around or above the 75th percentile. **Danny Tappa**

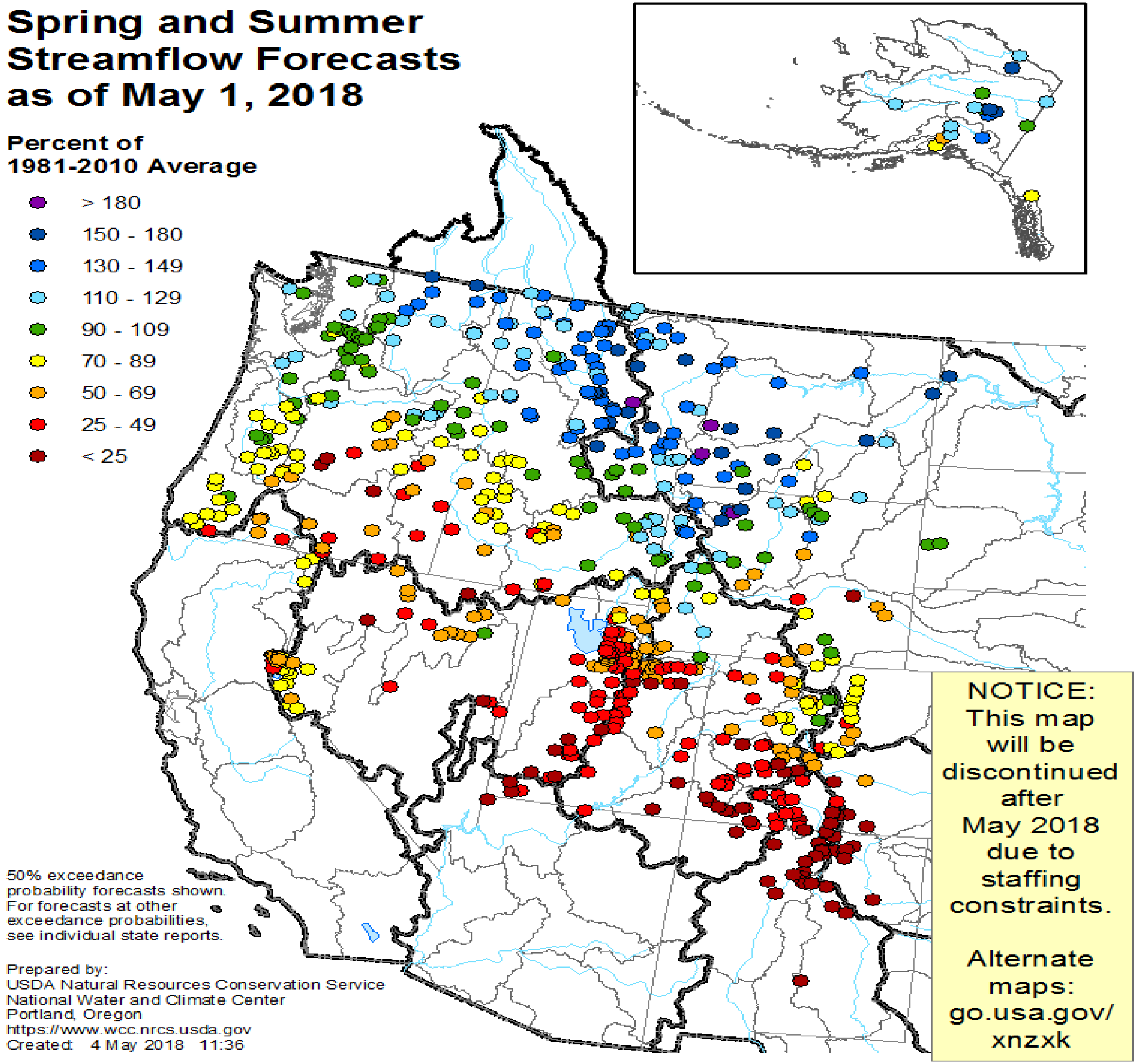
February Brought a Return to Winter with Cold Temperatures & Cold Smoke Snow with Densities at 4 - 6%

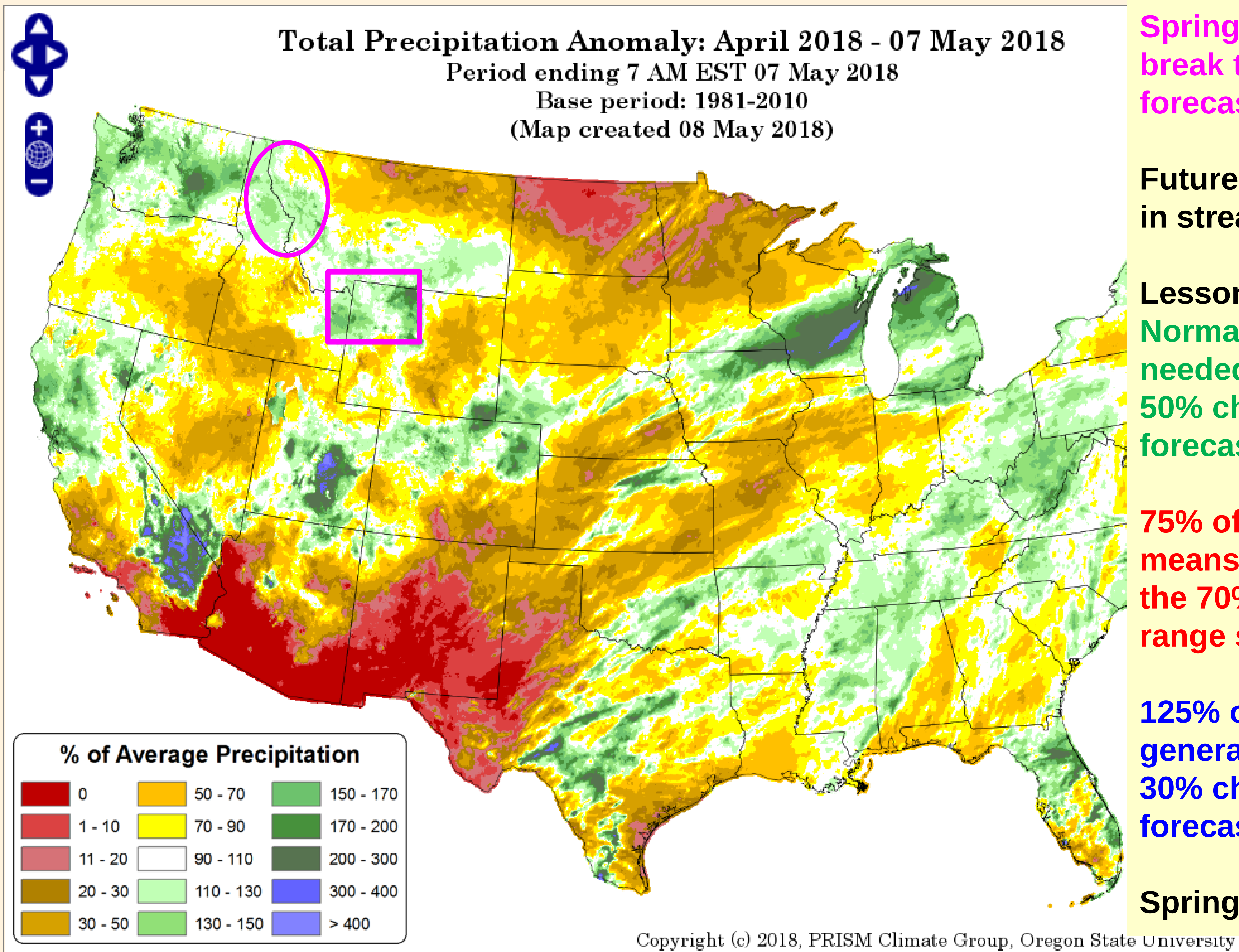




May 1 Snowpack & Streamflow Forecasts







Spring precipitation can make or break the volume streamflow forecasts.

Future precipitation is not included in streamflow forecast equations.

Lessons learned:

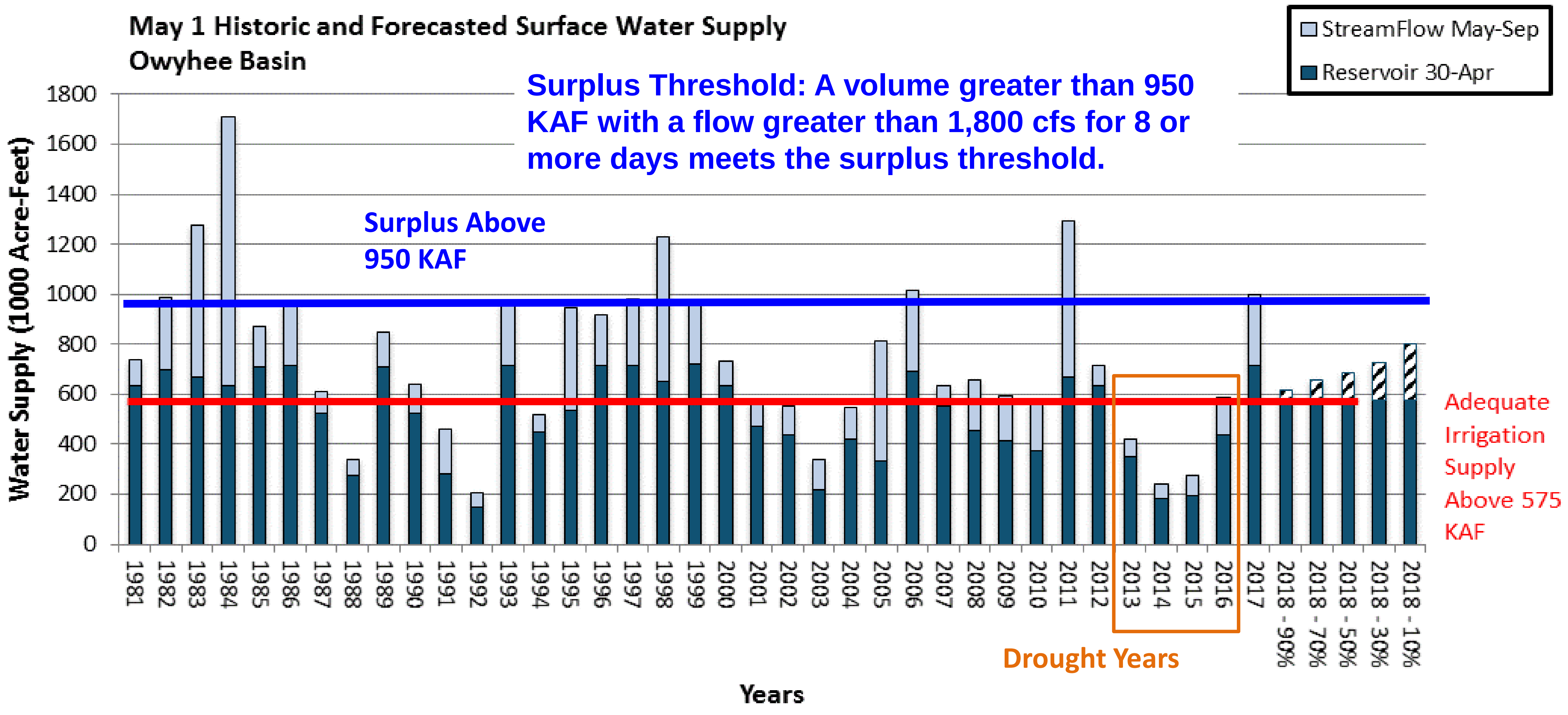
Normal Apr to Jun precipitation is needed for runoff to reach or the 50% chance of exceedance forecasts.

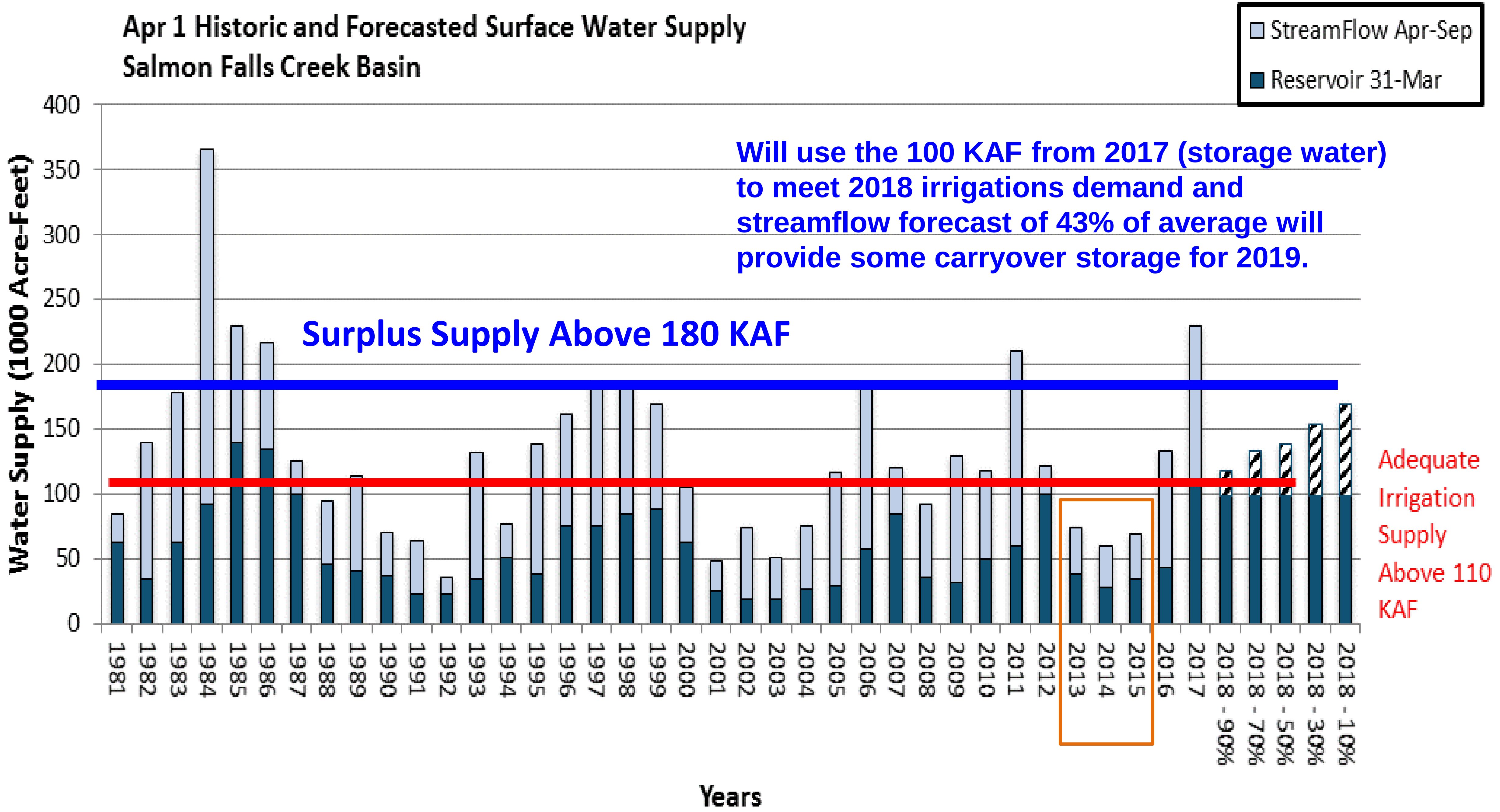
75% of normal Apr-Jul precipitation means runoff is more likely to be in the 70% chance of exceedance range southern Idaho.

125% of Apr-Jun precipitation will generally increased to closer to the 30% chance of exceedance forecasts.

Spring 2018 Precip Outlooks - mix

Water Supply Outlook in Key Basins across the State using the Surface Water Supply Index



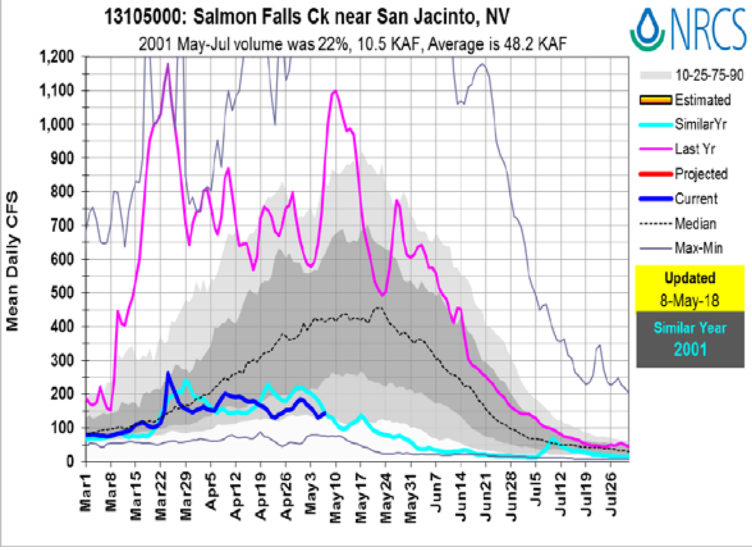

Apr 1 Historic and Forecasted Surface Water Supply
Salmon Falls Creek Basin
StreamFlow Apr-Sep
Reservoir 31-Mar
Will use the 100 KAF from 2017 (storage water) to meet 2018 irrigations demand and streamflow forecast of 43% of average will provide some carryover storage for 2019.
Surplus Supply Above 180 KAF
Adequate Irrigation Supply Above 110 KAF
Water Supply (1000 Acre-Feet)
0
50
100
150
200
250
300
350
400
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
2017
2018 - 90%
2018 - 70%
2018 - 50%
2018 - 30%
2018 - 10%
Years

65th Annual Water Supply Forecast Meeting for Salmon Falls Tract Hosted by Twin Falls SCD April 10, 2018

Allotment based on 55% Irrigation Efficiency

Twin Falls Soil & Water Conservation District Salmon Falls Reservoir Storage Allotment		Updated: April 10, 2018				
reservoir storage and April 1 - September 30 forecasts.		Based on NRCS April 1 Streamflow Forecasts				
		Chance of Exceedance Streamflow Forecasts				
April 1 Streamflow Forecasts		90%	70%	50%	30%	10%
Inflow Forecast, April 1-September 30, acre-feet		18700	34000	44000	55000	70000
Storage in Dam, March 31, acre-feet	98770	98770	98770	98770	98770	98770
Total Storage (Inflow Forecast + Storage)		117470	132770	142770	153770	168770
Less Dead Storage in Reservoir (5000 A-F)	5000	112470	127770	137770	148770	163770
Projected Reservoir Loss of 20%	0.20	22494	25554	27554	29754	32754
In Dam, Available for Delivery		89976	102216	110216	119016	131016
Projected Delivery Efficiency: 2016 60% Past Delivery Efficiency: 2015 47.0% 2014 48.0% 2013 53.0% 2012 58.8% 2011 63.9%	0.550	49487	56219	60619	65459	72059
Less Water for Callen	485	485	485	485	485	485
Less Individual Storage Carryover	18733	18733	18733	18733	18733	18733
Water to be Delivered Over the Weir		30269	37001	41401	46241	52841
Divided by Total Shares	60050.65	0.504	0.616	0.689	0.770	0.880
Allotment if 'Individual Storage Carryover' is not subtracted from 'In Dam, Available for Delivery'		0.816	0.928	1.001	1.082	1.192

Average Allotment		
1924-2006	0.761	2013 allotment 0.380 Runoff 42 KAF Apr-Sep
1971-2000	0.934	2014 allotment 0.332 Runoff 41 KAF Apr-Sep
2002-2006	0.616	2015 allotment 0.385 Runoff 42 KAF Apr-Sep
Full Allotment	1.167	2016 allotment 1.000 Runoff 90 KAF Apr-Sep



Allotment based on 60% Irrigation Efficiency

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

Updated: April 10, 2018

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

Based on NRCS April 1 Streamflow Forecasts

		Chance of Exceedance Streamflow Forecasts				
April 1 Streamflow Forecasts		90%	70%	50%	30%	10%
Inflow Forecast, April 1-September 30, acre-feet		18700	34000	44000	55000	70000
Storage in Dam, March 31, acre-feet	98770	98770	98770	98770	98770	98770
Total Storage (Inflow Forecast + Storage)		117470	132770	142770	153770	168770
Less Dead Storage in Reservoir (5000 A-F)	5000	112470	127770	137770	148770	163770
Projected Reservoir Loss of 20%	0.20	22494	25554	27554	29754	32754
In Dam, Available for Delivery		89976	102216	110216	119016	131016
Projected Delivery Efficiency: 2016 60% Past Delivery Efficiency: 2015 47.0% 2014 48.0% 2013 53.0% 2012 58.8% 2011 63.9%	0.600	53986	61330	66130	71410	78610
Less Water for Callen	485	485	485	485	485	485
Less Individual Storage Carryover	18733	18733	18733	18733	18733	18733
Water to be Delivered Over the Weir		34768	42112	46912	52192	59392
Divided by Total Shares	60050.65	0.579	0.701	0.781	0.869	0.989
Allotment if 'Individual Storage Carryover' is not subtracted from 'In Dam, Available for Delivery'		0.891	1.013	1.093	1.181	1.301

Average Allotment		
1924-2006	0.761	2013 allotment 0.380 Runoff 42 KAF Apr-Sep
1971-2000	0.934	2014 allotment 0.332 Runoff 41 KAF Apr-Sep
2002-2006	0.616	2015 allotment 0.385 Runoff 42 KAF Apr-Sep
Full Allotment	1.167	2016 allotment 1.000 Runoff 90 KAF Apr-Sep

Counting Water Use

Provided by Twin Falls Soil & Water Conservation District

Irrigation Measurement Conversion Guide — Gravity

Converting known flows to acre-inches used

Water Conversion Factors:

1 miner's inch does NOT equal 1 inch of water (rain).

Inches of rain is depth of water regardless of area or time.

A miner's inch measures flow rate.

CFS (cubic feet per second) measures flow rate.

1 CFS = 50 Miner's inches

1 CFS = 2 acre-feet/day

Acre-feet measures volume. An acre-foot = 12 inches.

1 acre-foot is enough water to cover 1-acre of land 1-foot deep.

Formulas:

$$\frac{\text{Miner's inches x days}}{25} = \text{acre-feet}$$

2 x CFS x days = acre-feet

$$\frac{\text{acre-feet x 12}}{\text{\# of acres}} = \text{inches applied}$$

Crop Water Use
Approximate Seasonal Totals*

Alfalfa — 26.5 to 28.5 ins.	Dry Beans — 16.5 to 17.5 ins.
Malt barley — 15 to 18 ins.	Corn Silage — 20 to 25 ins.
Grass pasture — 23.5to 26 ins.	Peas — 9 to 10 ins.
Potatoes — 21.5 to 23 ins.	Sugar beets — 25.5 to 27.5 ins.

* *Actual water use will depend on soil type and environmental conditions.*

EXAMPLE

Assumptions: 20-acre field irrigated using 1.2 cfs or 60 miner's inches. Takes 4 days to irrigate using 24-hour sets.

1 cfs/50 miner's inches for 4 days = 96 ins. (from chart) + 0.2 cfs/10 miner's inches for 4 days = 19 ins. (from chart) = 115 acre-inches.

(96 ins. + 19 ins. = 115 acre-inches)

115 acre-inches divided by 20 acres = 5.7 ins. applied

(acre-inches divided by number of acres = inches applied)

If you water 6 times during the season using the same amount each time, you will use 34.5 inches of water (6 x 5.7 ins. = 34.5)

Flow-rate cfs	Miner's inches	Volume (acre-inches) days irrigated 1	2	3	4	5	6	7
0.2	10	5	10	14	19	24	29	34
0.4	20	10	19	29	38	48	58	57
0.5	25	12	24	36	48	60	72	84
0.6	30	14	29	43	58	72	78	101
0.8	40	19	38	58	77	96	115	134
1	50	24	48	72	96	120	144	168
1.5	75	36	72	108	144	180	216	252
2	100	48	96	144	192	240	288	336
2.5	125	60	120	180	240	300	360	420

Divide acre-inches by number of acres in field to get inches applied.

Available water-holding capacity of soils

Soil texture	Inches of water per foot of depth Min.	Max.	Avg.
Very coarse sands	0.4	0.8	0.5
Sandy loam	1.3	1.8	1.5
Silt loam	1.5	2.3	2.0
Clay loam	1.8	2.5	2.2

Twin Falls Soil & Water Conservation District

1441 Fillmore #A • Twin Falls, ID • 83301

208-944-3736

Irrigation Measurement Conversion Guide — Pressurized

Converting known flows to acre-inches used

Water Conversion Factors:

1 miner's inch does NOT equal 1 inch of water (rain).

Inches of rain is depth of water regardless of area or time.

A miner's inch measures flow rate.

CFS (cubic feet per second) measures flow rate.

1 CFS = 50 Miner's inches

1 CFS = 2 acre-feet/day

1 CFS = 450 gpm (gallons per minute)

Acre-feet measures volume. An acre-foot = 12 inches.

1 acre-foot is enough water to cover 1-acre of land 1-foot deep.

Formulas:

$$\frac{\text{Miner's inches x days}}{25} = \text{acre-feet}$$

2 x CFS x days = acre-feet

$$\frac{\text{acre-feet x 12}}{\text{\# of acres}} = \text{inches applied}$$

EXAMPLE

Assumptions: 20-acre field

Takes 6.5 days to irrigate using nozzles putting on 4.5 gpm

(from chart 5/32 nozzle at 40 psi = 4.45 gpm)

32 birds per wheel lines

32 birds x 4.45 gpm = 142.4 gpm

142.4 gpm divided by 450 gpm (1 cfs) = 0.32 cfs

If 0.32 cfs is used in one day, the volume applied is 0.64 acre-feet (2 x cfs = acre-feet)

0.64 acre-feet/day x 6.5 days = 4.16 acre-feet

4.16 acre-feet x 12 inches/ft = 49.92 acre-inches

49.92 acre-inches divided by 20 acres = 2.5 inches/acre

If you irrigate 10 times for that crop, you will use 25 ins/acre.

If you are off 2 hours/day to change, you will only use 83 percent of the water in the line. If the water is bypassed, it should be accounted for.

Nozzle Discharge and Wetted Diameters

for typical 1/2- and 3/4-in. impact sprinklers with trajectory angles between 22 and 28 deg.

Sprinkler pressure psi	Nozzle diameter - inches 1/8 gpm	1/8 ft	9/64 gpm	9/64 ft	5/32 gpm	5/32 ft	3/16 gpm	3/16 ft
30	2.47	77	3.16	80	3.85	85	5.50	91
35	1.51	66	2.68	78	4.16	87	5.97	94
40	1.62	67	2.87	79	4.45	88	6.40	96
45	3.05	80	3.85	83	4.72	89	6.80	98
50	3.22	81	4.01	84	4.98	90	7.17	100
60	3.54	83	4.42	86	5.45	92	7.84	102
70	3.81	84	4.82	88	5.92	94	8.49	104

Flow-rate cfs	Miner's inches	Volume (acre-inches) days irrigated 1	2	3	4	5	6	7
0.2	10	5	10	14	19	24	29	34
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Divide acre-inches by number of acres in field to get inches applied.

Twin Falls Soil & Water Conservation District

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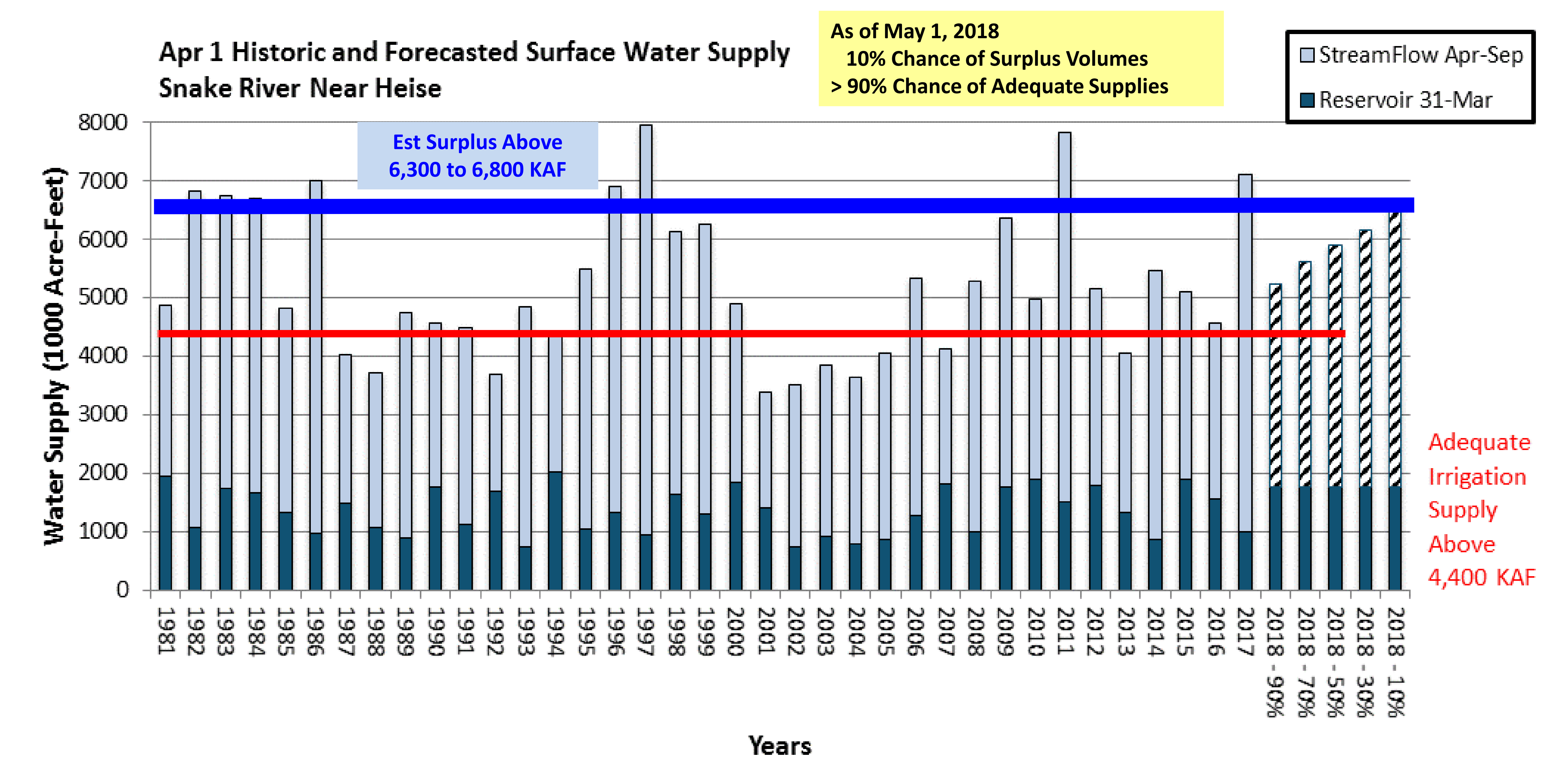
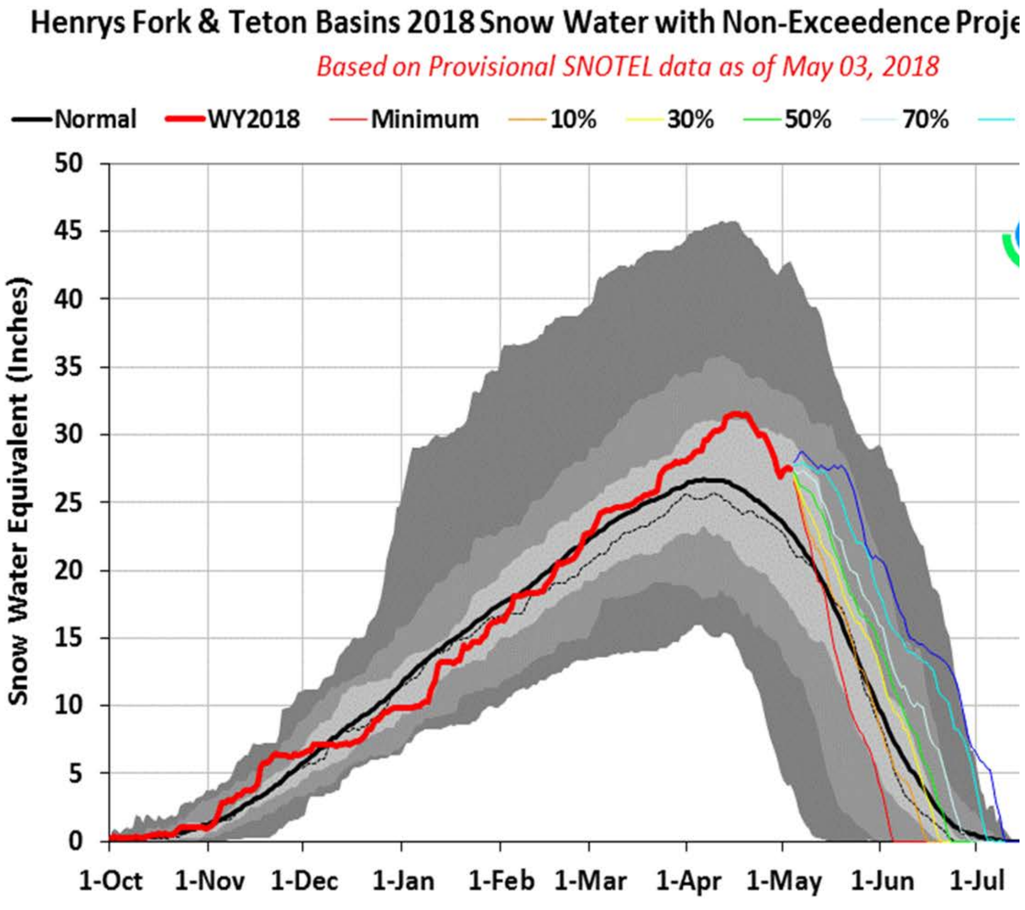
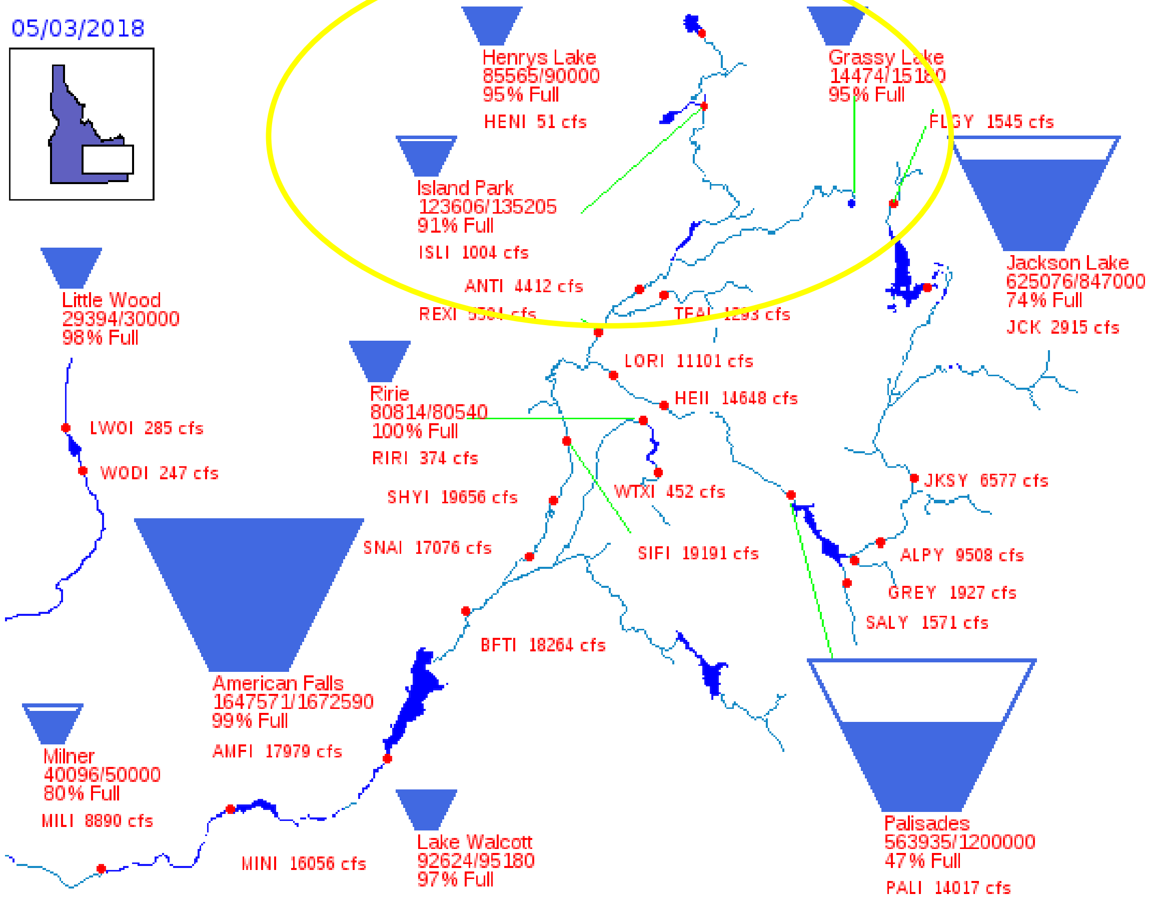
Snake Basin May 1 SWSI with
Adequate Irrigation Supply & Surplus Threshold



Bureau of Reclamation, Pacific Northwest Region
Major Storage Reservoirs in the Upper Snake River Basin

Cloud Seeding suspended in Henry Fork in early April with snow at 115 – 120% of median AND good reservoir storage.



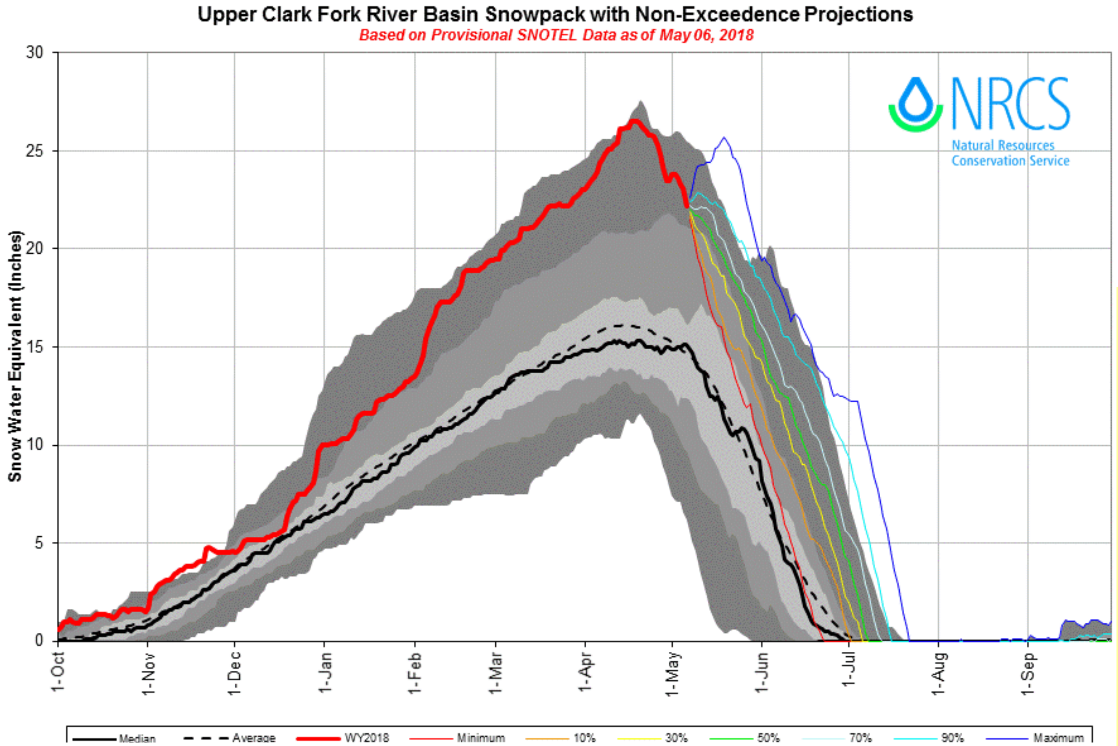


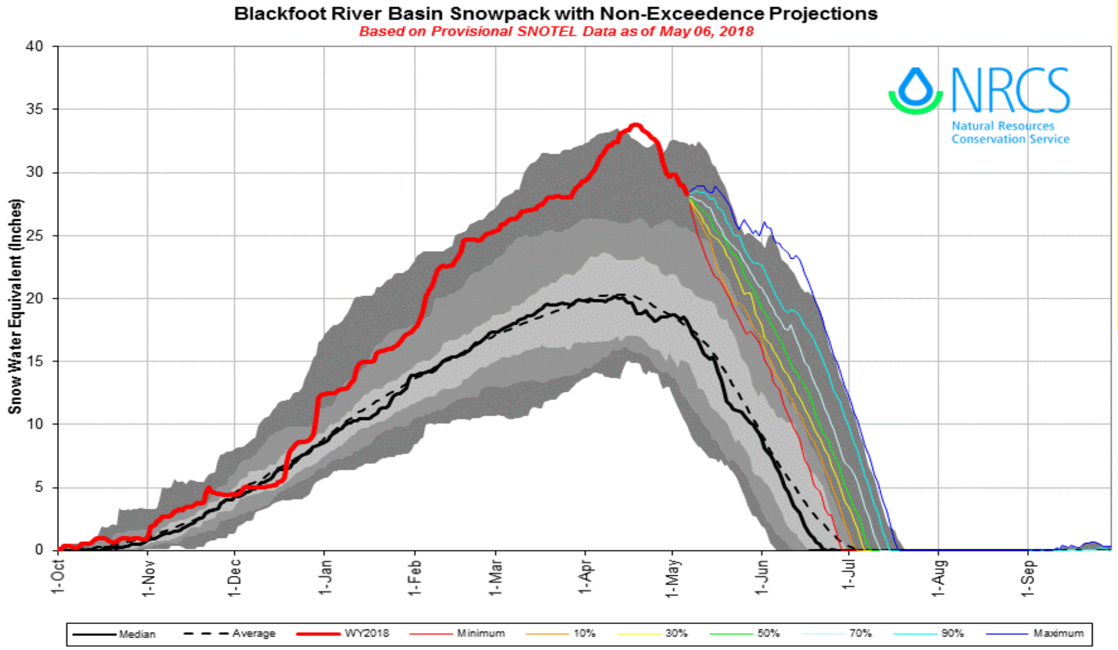
PROVISIONAL DATA - Subject to change

Average daily streamflows indicated in cubic feet per second.
Reservoir levels current as of midnight on date indicated.
Click on gaging stations (red dots) for streamflow hydrographs.

As of May 3, 2018 Upper Snake storage is 78% full

Upper Snake River system is at 78 % of capacity.

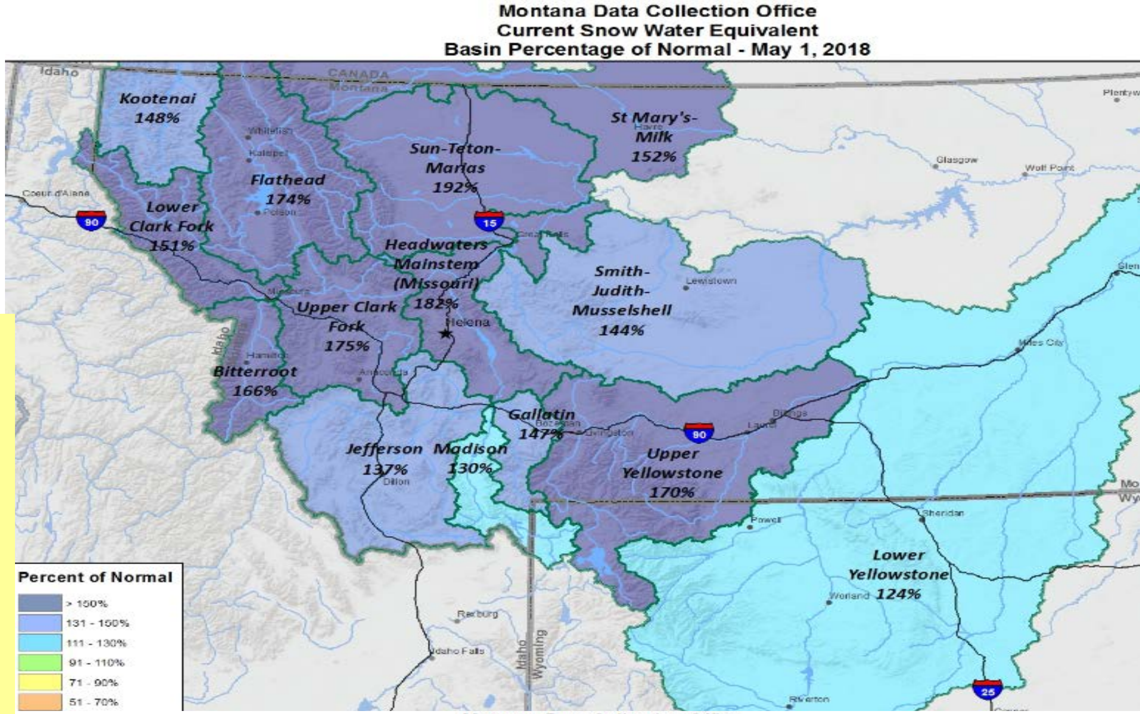


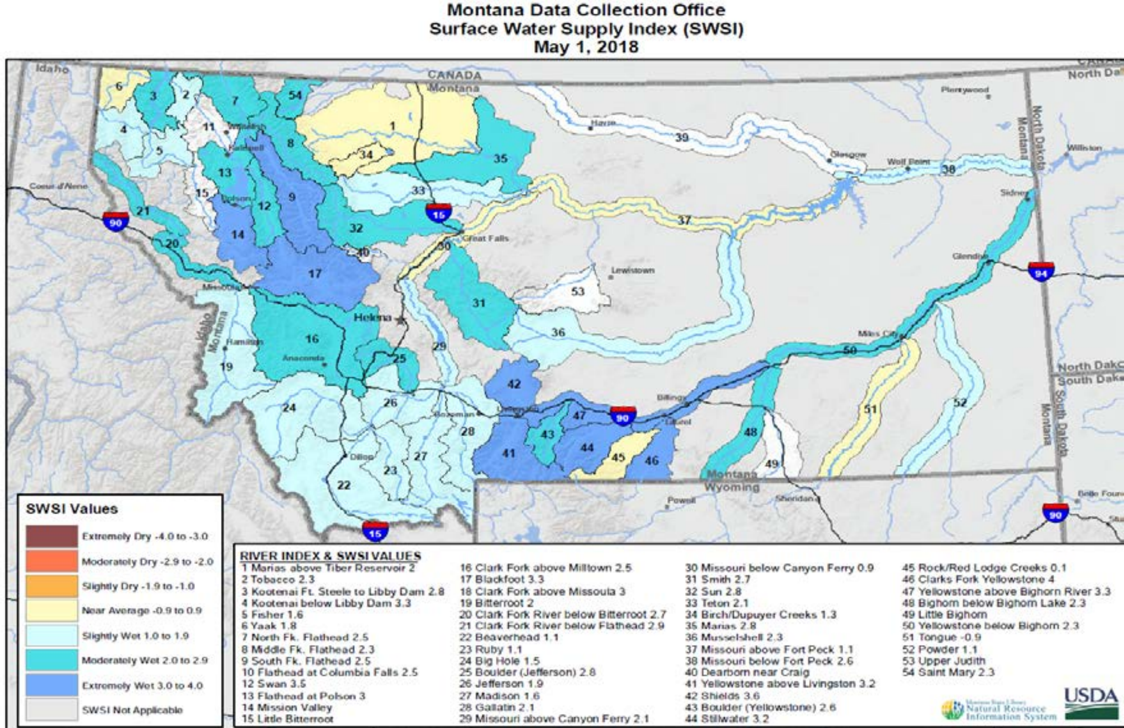


Snow Water as % of Median

&

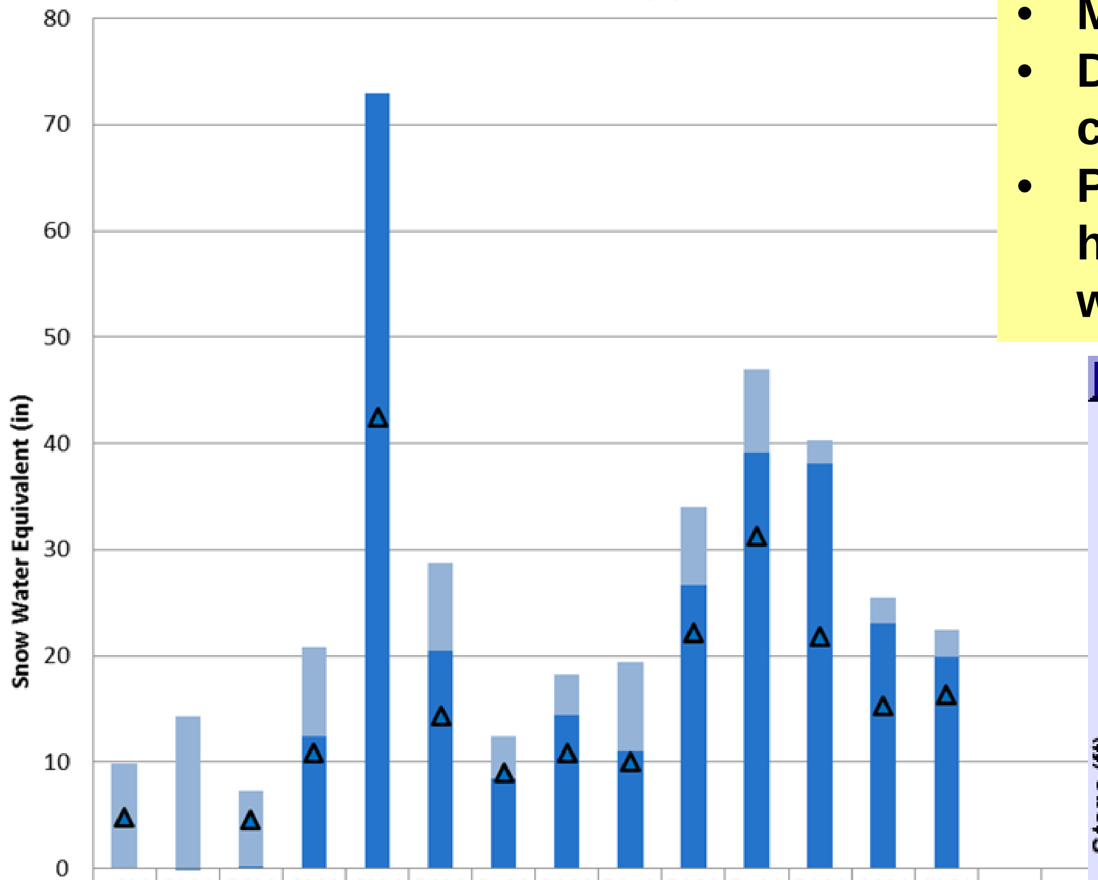
May 1 Montana SWSI





United States Department of Agriculture
NRCS Natural Resources Conservation Service

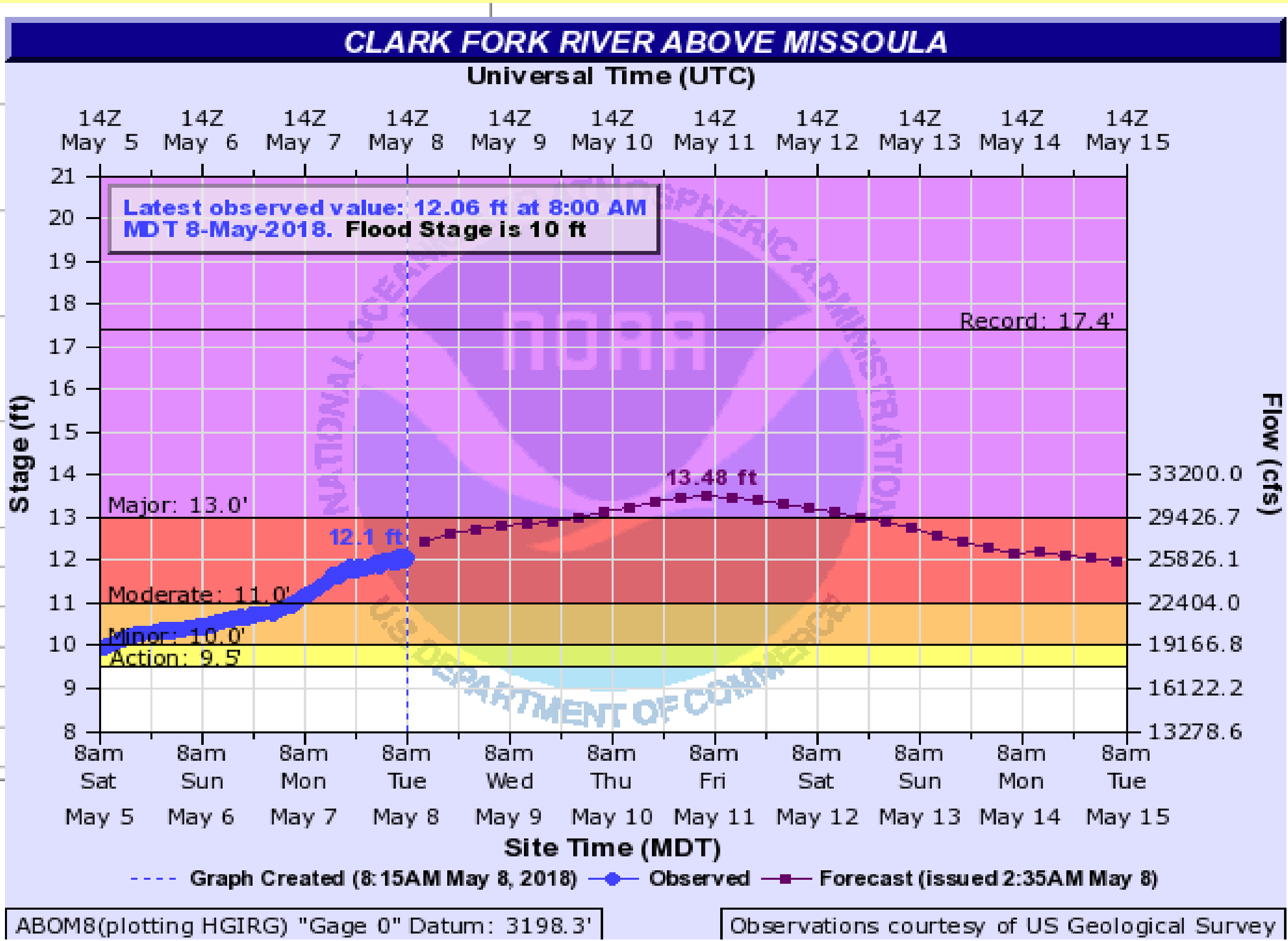
Upper Clark Fork Basin
Percent Remaining Snowpack
5/8/2018



	4680	5200	5600	6250	6330	7020	7180	7200	7210	7250	7400	7800	8000	8250
Peak SWE	9.8	14.3	7.3	20.8	73	28.7	12.4	18.2	19.4	34	46.9	40.3	25.5	22.4
Current SWE	0	-0.1	0.2	12.4	73	20.5	8.5	14.4	11	26.7	39.1	38.1	23	19.9
Normal Peak	4.8		4.5	10.8	42.5	14.3	9.0	10.9	10.0	22.2	31.2	21.8	15.3	16.3
Percent Remaining	0%	-1%	3%	60%	100%	71%	69%	79%	57%	79%	83%	95%	90%	89%
Percent of Normal				248%	191%	180%	96%	140%	157%	125%	127%	175%	151%	128%

Montana:

- **Initial flows from valley snowpack**
- **Mid / high elevation snow now melting**
- **Deep snowpack continue to stay in place & will continue feeding streams**
- **Primary flood impacts look to be in the Missoula area, however long-duration high water is anticipated all the way downstream to the Idaho border.**



Recent Partnerships

Two Recently Completed CESU Agreements with BSU

1. **Estimating timing of peak streamflow using SNOTEL data**

   (Kara Ferguson & Dr. Jim McNamara)

2. **Estimating critical flow levels using SNOTEL data**

   (Becca Garst & Dr. Jim McNamara)

BOISE STATE UNIVERSITY

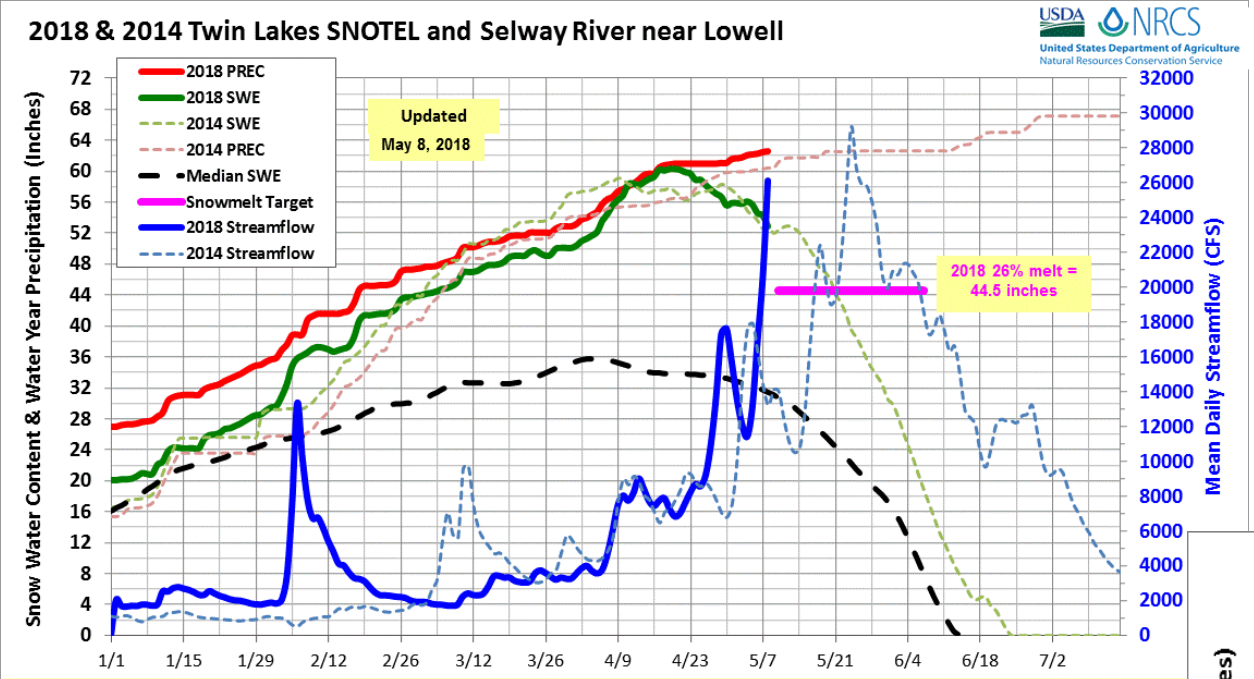
Newer agreement with Idaho Water Resource Board

3. **IWRB project to investigate need for additional SNOTEL sites**

   (Contractor from IACSD)

New Partnership with ID Association of Conservation Districts

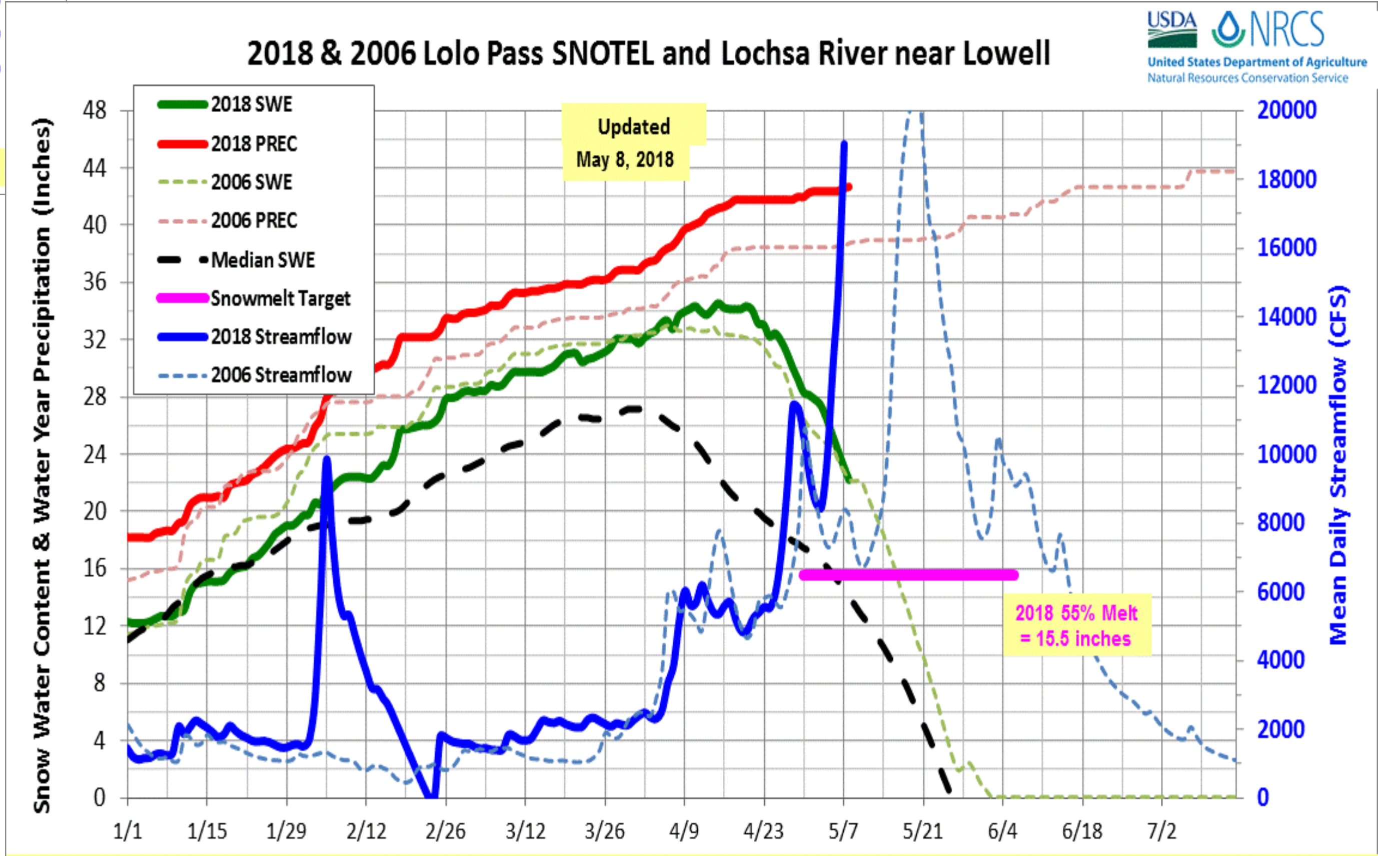
4. **IASCD Resolution – task force to look at funding FTE position to accomplish items # 1 & 2**



In ABOVE AVERAGE snow years, the Selway River has the snowmelt streamflow peak or increases when Twin Lakes is about 26% melted (2017).

Rivers are going big in Idaho's northern basins and parts of Montana

Primarily along the Continental Divide.



In ABOVE AVERAGE snow years, the Lochsa River has the snowmelt streamflow peak or increases when Lolo Pass is 55% melted (2017).

May 4, 2018 -- DOA Projections

2018 Day of Allocation (DOA) predictions for – Boise, Payette and Upper Snake

Predicting critical flow levels using peak SNOTEL data, also useful for predicting water right cut off date for water masters & irrigators.

Boise River

June 20, 2018 Average DOA = June 20

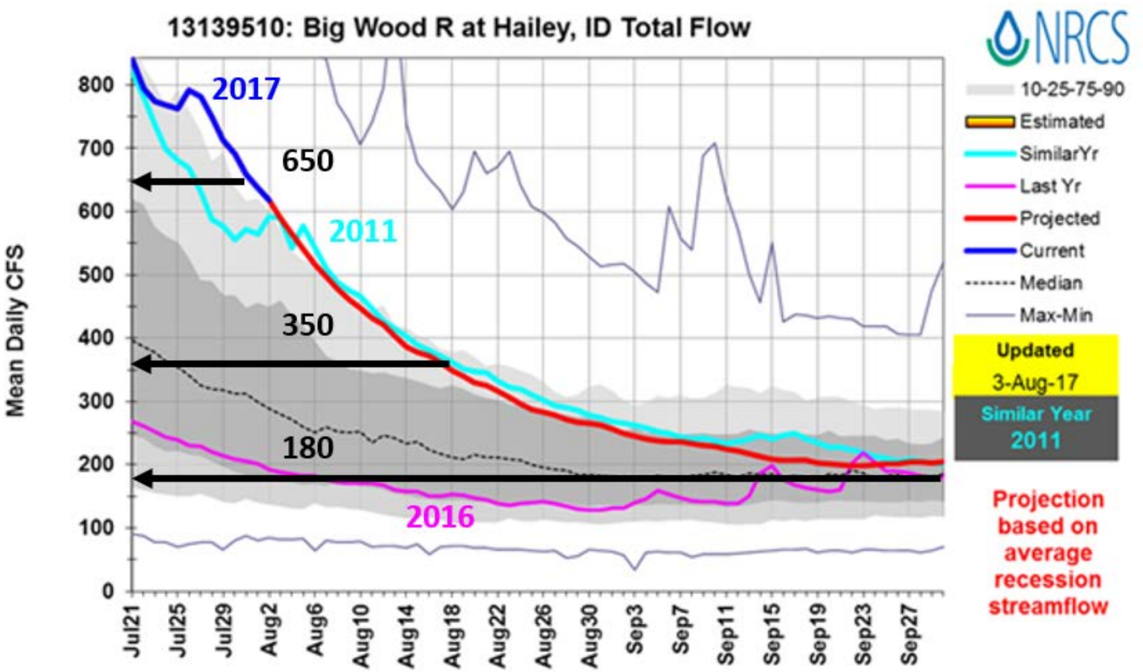
Payette River

July 10, 2018 Average DOA = July 10

Upper Snake

June 27, 2018 Average DOA = June 27

Flow Projections for Water Right Cutoff Dates



Idaho Association of Soil Conservation Districts
Committee Resolutions

Resolution No.: R-17-1

Resolution Subject/Title: Stream Flow Runoff Timing Products and Diminishing Staffing of Full Time Equivalent (FTE) Employees by USDA/NRCS Water Supply and Snow Survey Forecasting Program

Sponsoring District: Canyon SCD
Date Submitted: August 25, 2017
District Contact: Mike Somerville
Phone Number: (208) 401-5145

New Partnership

Committee to Review Resolution:

Resolutions Subcommittee Determination:		☐ Accepted	☐ Rejected
Standing Committee Determination:	☐ Pass	☐ Do Not Pass	☐ No Recommendation
IASCD Action:	☐ Passed	☐ Failed	☐ Tabled

Whereas: The NRCS Snow Survey and Water Supply Forecast Program has provided Idaho's Agricultural users and other water management groups with timely water supply stream flow forecasts since the 1940s.

Whereas: Stream flow forecasts data, originally provided for farmers, is now widely used throughout Idaho for efficient and wise water management in flood and drought mitigation.

Whereas: The Automated SNOTEL sites collect hourly high elevation climatic data increasing the use of this data by numerous users and agencies to much more than just volume forecasts. Recent years have brought extremes in climatic events, from drought of droughts to record high winter snow pack in some basins. For example: during 2014 and 2015 Idaho lacked snow in the mid-elevation ranges followed by 2017 which brought record snow levels at the lower, middle and higher elevations. These are the extremes we are living in today.

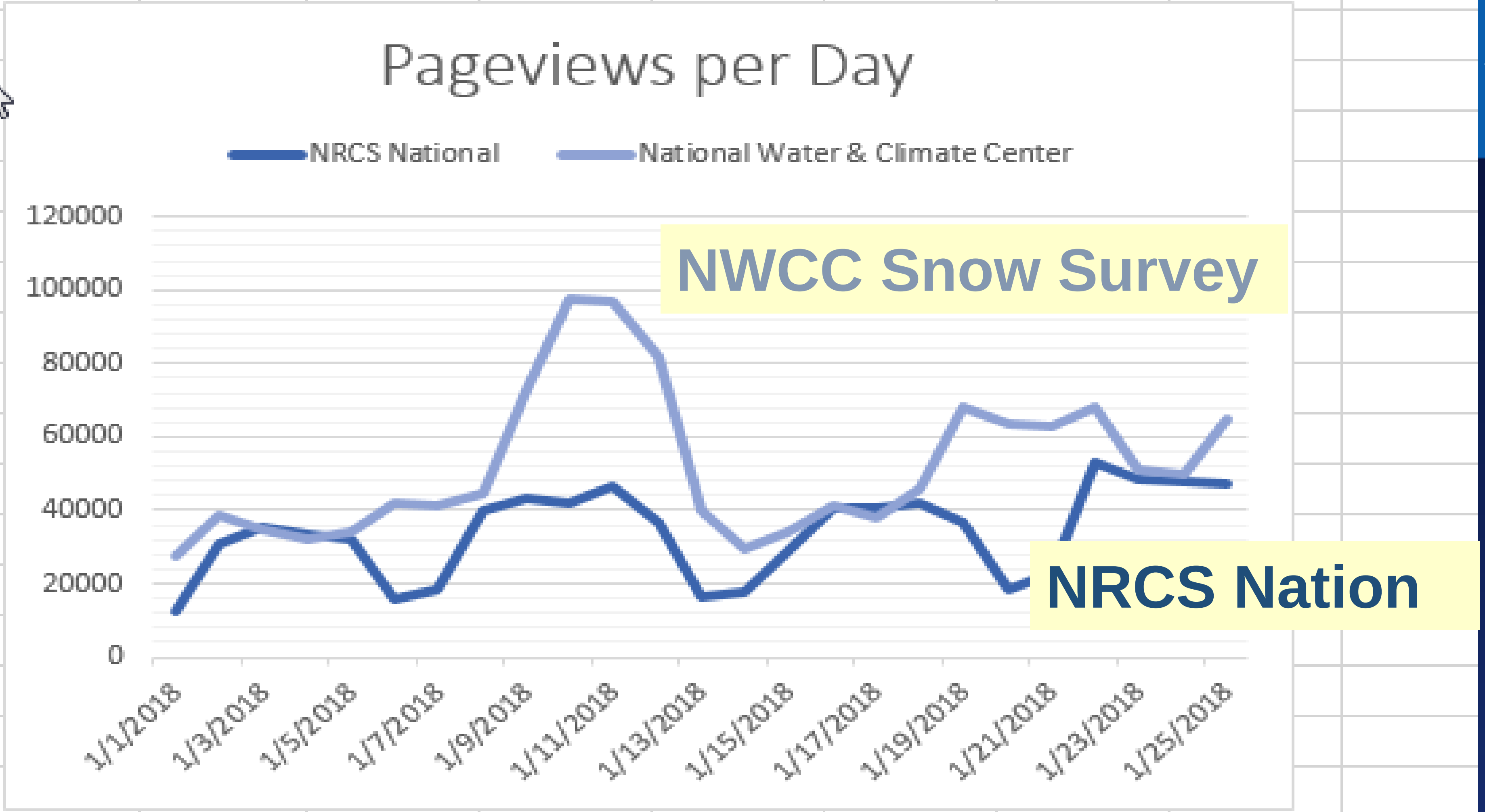
Whereas: Snow and water are critical for Idaho's economy, agricultural supply, winter and summer recreation, fish and wildlife and hydropower production.

Whereas: The program has provided a diversified group of snow and water data users with an increased understanding of snowmelt and stream flow relationships along with an increase in climate variability. The increased variability has increased the need for snowmelt runoff timing tools and surplus thresholds for efficient water management.

Whereas: The USDA/NRCS Water Supply Forecast and Snow Survey Program Staffing Levels (FTEs) is at critically low levels making it impossible to meet the needs of the important farm community and other customers. Current 4 FTEs vs 7 FTES in the past.

Be It Resolved: The Idaho Association of Soil Conservation Districts and its member Districts to communicate their support and increased Staffing needs for this program to the Idaho Congressional Delegation.

Be It Resolved: The Idaho Association of Soil Conservation Districts establish a Task Force to implement funding mechanisms that will establish a permanent full-time position, housed with the NRCS Water Supply Forecasting Staff. ~~The position will enhance the Water Supply Forecast Partnership and ensure Soil Conservation Districts receive~~ continued support.



Total Pageviews	
NRCS	849,570
NWCC	1,302,181

No. Users	
NRCS	248,683
NWCC	111,745

No. Sessions	
NRCS	350,213
NWCC	266,816

Source: Google Analytics 1/26/2018

Idaho

Staff Directory

Program Manager and Staff Supervisor

Name	Position	Phone	Email
Shawn Nield	State Soil Scientist	208-378-5728	Shawn Nield

Office Staff

Office Staff

	Name	Position	Phone
*	Ron Abramovich	Water Supply Specialist	208-378-5741
	Earl Adsley	Pathways Student Trainee (Hydrologist)	208-378-6921
	Tina Andry	Pathways Student Trainee (Hydrologist)	208-378-6983
*	Danny Tappa	Hydrologist/Acting Data Collection Officer	208-378-5740
	Vacant	Data Collection Officer/Senior Hydrologist	
	Vacant	Hydrologist	

Field Staff

	Name	Position	Phone	Email
* Soon to be vacant	John Wilford	Electronics Technician	208-685-6943	John Wilford
	Tom Beers	Field Hydrologist	208-685-6942	Tom Beers
	Vacant	Hydrologic Technician		

Idaho Snow Survey Office
As of May 2018

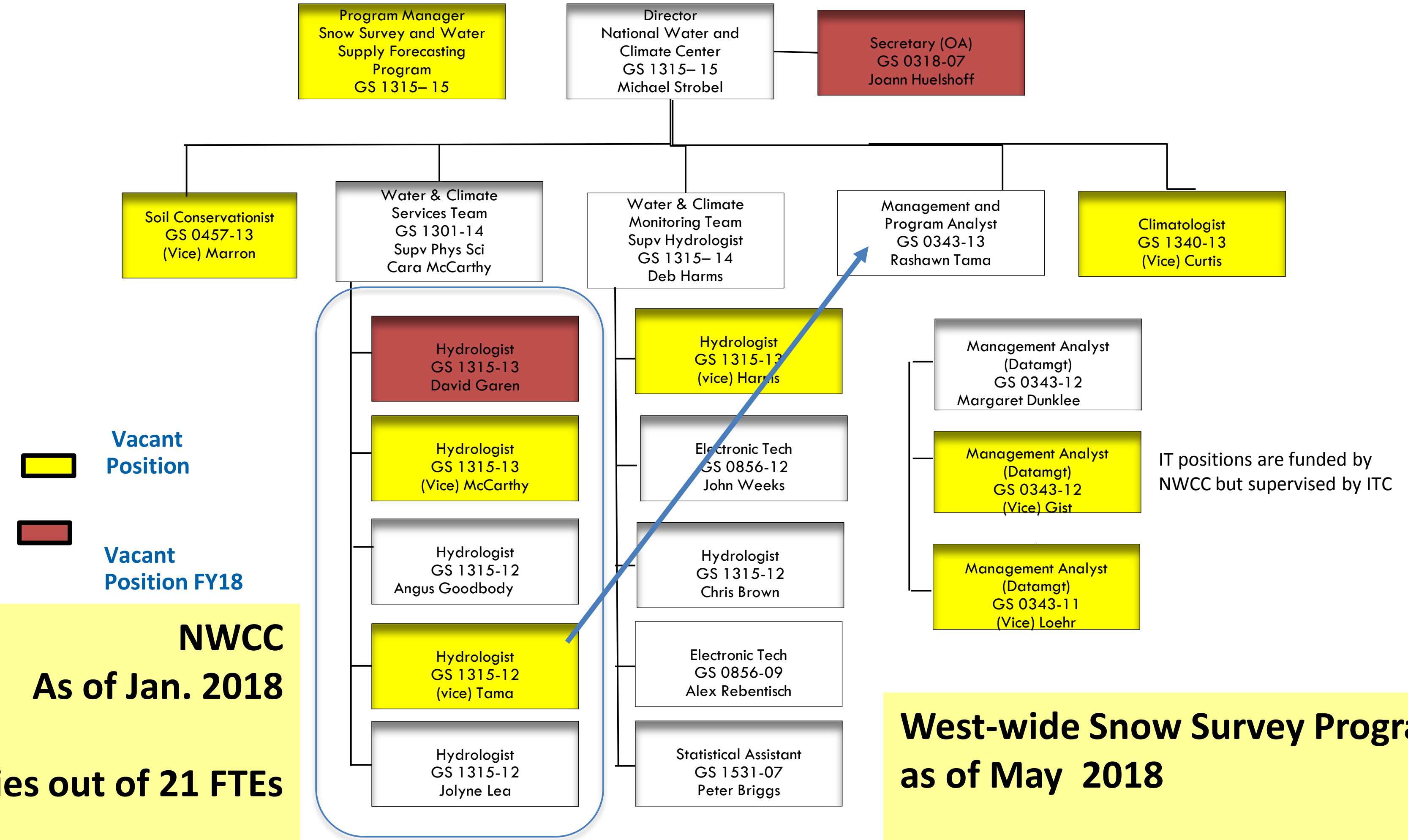
3 full time FTEs out of 6/7 *

4 vacancies out of 6/7

3 Pathways Trainee Hydrologists

1 U of I IWRRI summer hire for 2018

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



NWCC
As of Jan. 2018

8 vacancies out of 21 FTEs

Summer 2018
will increase to 9 or 10 vacancies

West-wide Snow Survey Program
as of May 2018

About 1/3 vacancies of the 71 FTEs

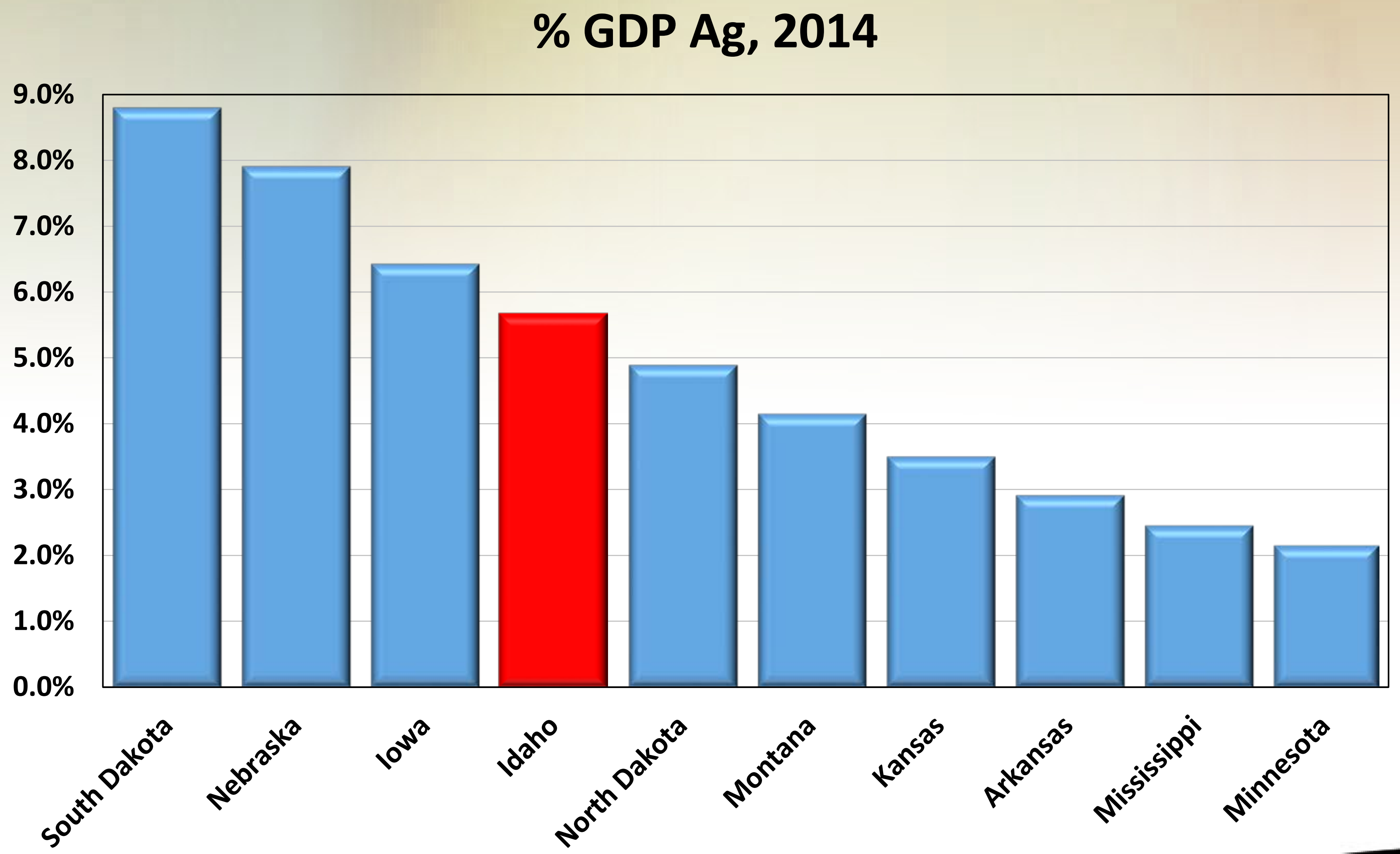
Questions/Comments/ Corrections

Our weather is always changing to produce our climate.

Key is understanding the driving forces & relationships to manage water as a natural resource in wet years to mitigate impacts in dry years.

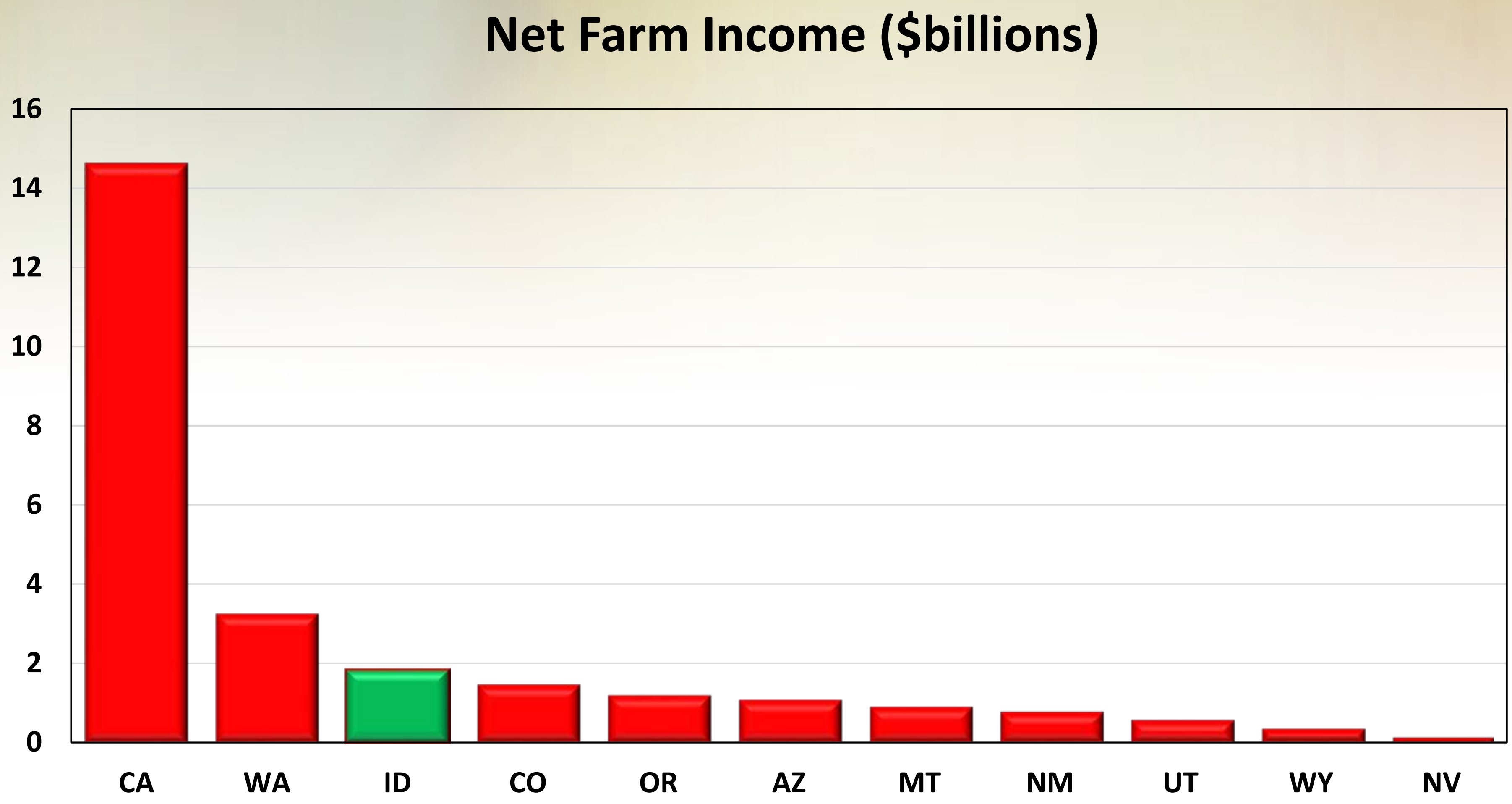
- **Today – Northwest Power and Conservation Council meeting**
- **Tomorrow – NIDIS (National Integrated Drought and Information System) & Upper Snake Water Management discussions**

Idaho has the 4th largest Ag state economy



University of Idaho
College of Agricultural and Life Sciences

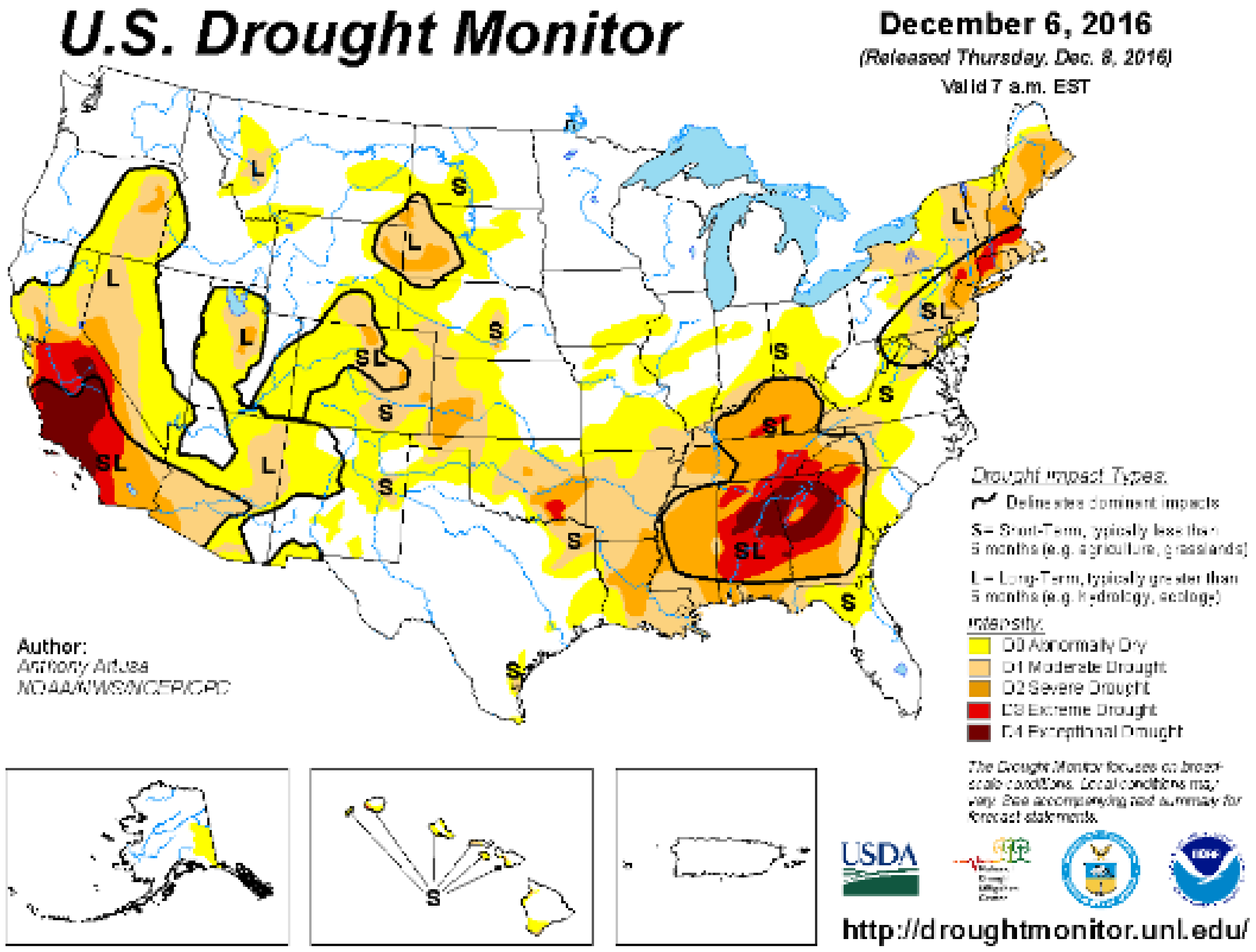
Idaho ranks 3rd in net farm income Western States



Importance of Measuring & Monitoring Snow to Provide Water Supply Forecasts in the Western US

Information Learned at the 2018 Western Snow Conference in Albuquerque, New Mexico April 2018

- **Based on natural precipitation alone, Los Angles could only support a population of 600,000.**
- **75% of our annual precipitation in the West falls as snow and because of our ability to capture, store and deliver water to cities like LA. LA is able to support a population of 3.8 million people, and 18 million people in southern CA.**
- **This along with agriculture and hydropower production in the West are the main reasons, but not only, that measuring & monitoring mountain snowfall to predict streamflow runoff volumes is so critical to life in the West.**
- **Western North America – 85 million people are reliant on storage and transportation of snow and water.**



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

The data cutoff for Drought Monitor maps is each Tuesday at 7 a.m. EST. The maps, which are based on analysis of the data, are released each Thursday at 8:30 a.m. Eastern Time.

Drought driven by demand, timing and ability to meet water demand.

US Drought Monitor Map responsible for $1 billion / year in aid.

IRS uses USDM to monitor cattle sales in drought areas.

Idaho funds obligated under drought recovery:

2014 $290,000
2015 $690,000
2016 $420,000

Snow Survey & Water Supply Information is critical and used to ensure western state's maps are correct.