



January 2018 Water Supply Briefing

National Weather Service/Northwest River Forecast Center

Telephone Conference : 1-914-614-3221

Pass Code : 619-465-763

2018 Briefing Dates:

Jan 4 – 10am Pacific Time

Feb 1 - 10am Pacific Time

March 1 - 10am Pacific Time

April 5 - 10am Daylight Savings Time

May 3 - 10am Daylight Savings Time

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Water Supply Forecast Briefing Outline



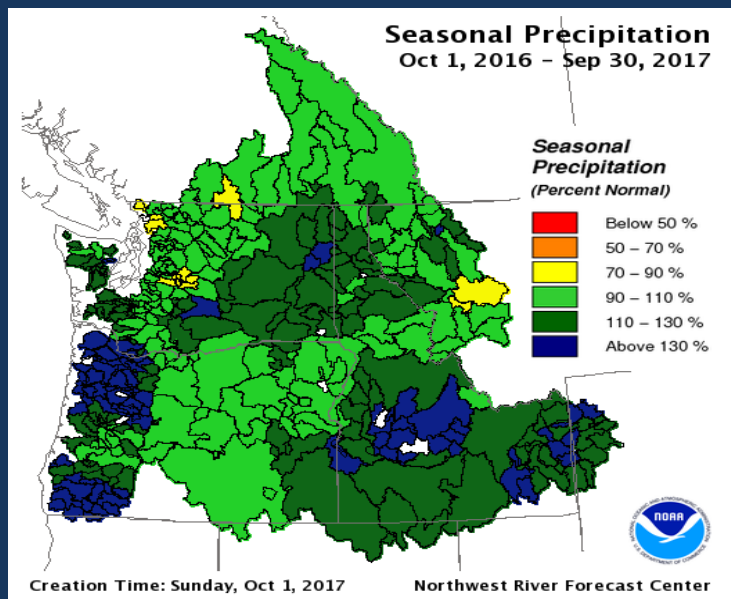
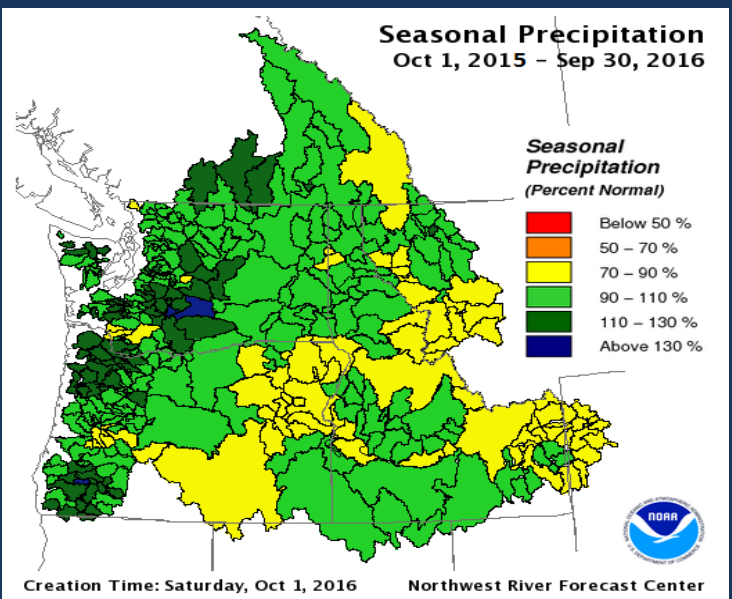
- Review of WY2017 Water Supply Season
- Observed Conditions WY2018:
 - Precipitation
 - Temperature
 - Snowpack
 - Runoff
- Future Conditions:
 - 10 days of quantitative forecast precipitation (QPF)
 - 10 days of quantitative forecast temperature (QTF)
 - Historical climate forcings appended thereafter
 - Climate Outlook
- Summary

Hydrologic
model states

Climate
Forcings



WY2017 Precipitation Summary



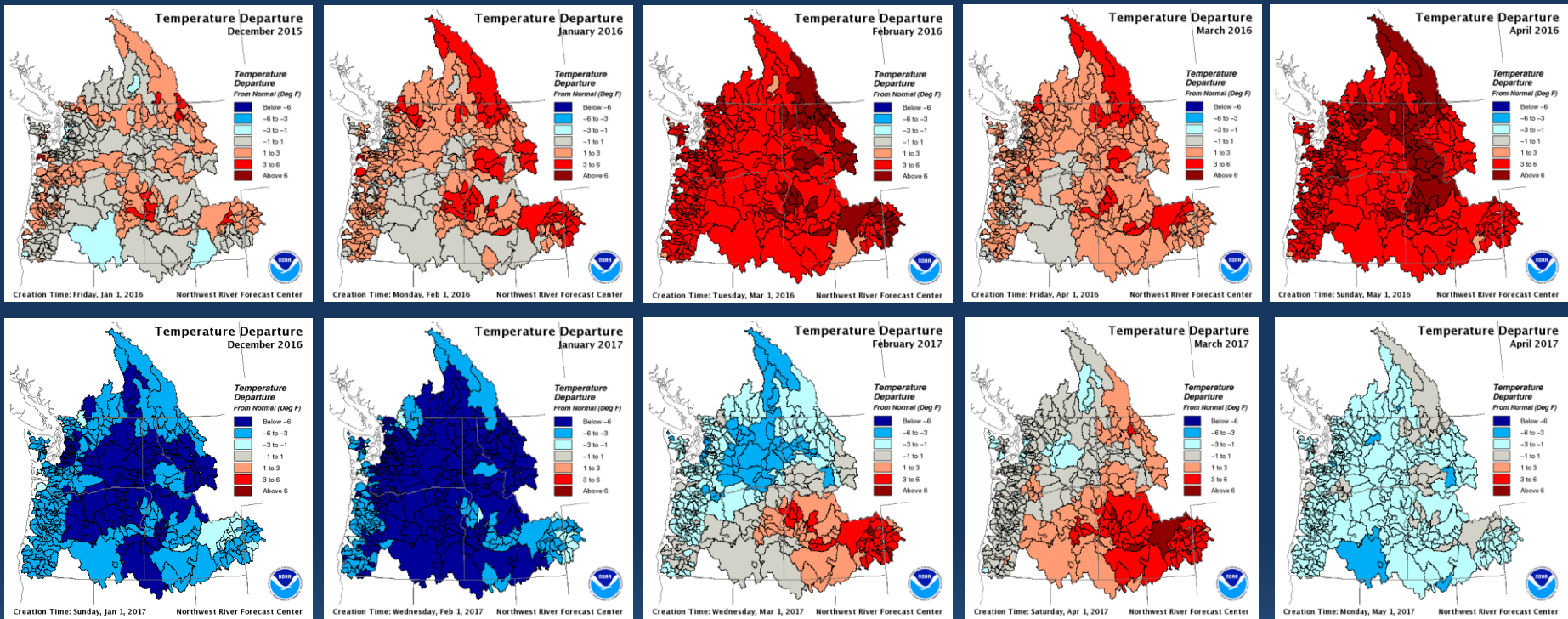
Upper Columbia Precip %Normal	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY2017
Clark Fork River Basin	201	31	95	56	203	190	82	72	105	20	7	94	97
Flathead River Basin	309	52	82	38	243	223	151	47	80	4	16	57	109
Kootenai River Basin	275	75	76	44	234	198	133	64	53	15	22	53	104
Spokane River Basin	323	61	52	41	213	250	117	67	65	6	5	148	115
Columbia River Basin abv Arrow Dam	166	94	78	44	130	190	148	103	77	19	25	76	96

Snake River Precip %Normal	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY2017
Henrys Fork River Basin	308	43	146	104	217	106	166	38	99	46	20	269	126
Upper Snake abv American Falls Dam	291	39	145	139	246	100	156	40	88	50	27	249	129
Middle Snake Tributaries	260	26	135	155	255	131	120	63	75	30	43	138	125
Payette River Basin	185	33	150	133	241	222	126	53	97	16	23	203	134
Clearwater River Basin	239	46	89	54	200	224	101	58	66	6	15	121	123
Snake Basin abv Hells Canyon Dam	240	31	144	157	220	137	136	48	94	35	36	180	118



Observed Temperature Departures

Water Year 2016 / 2017 Comparison

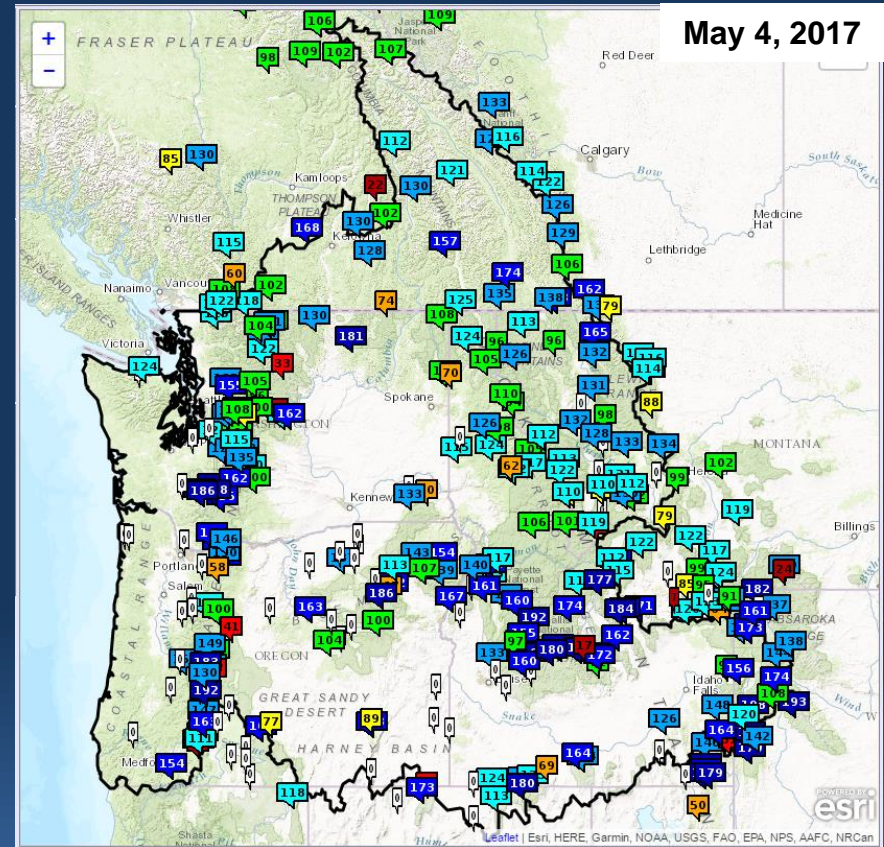
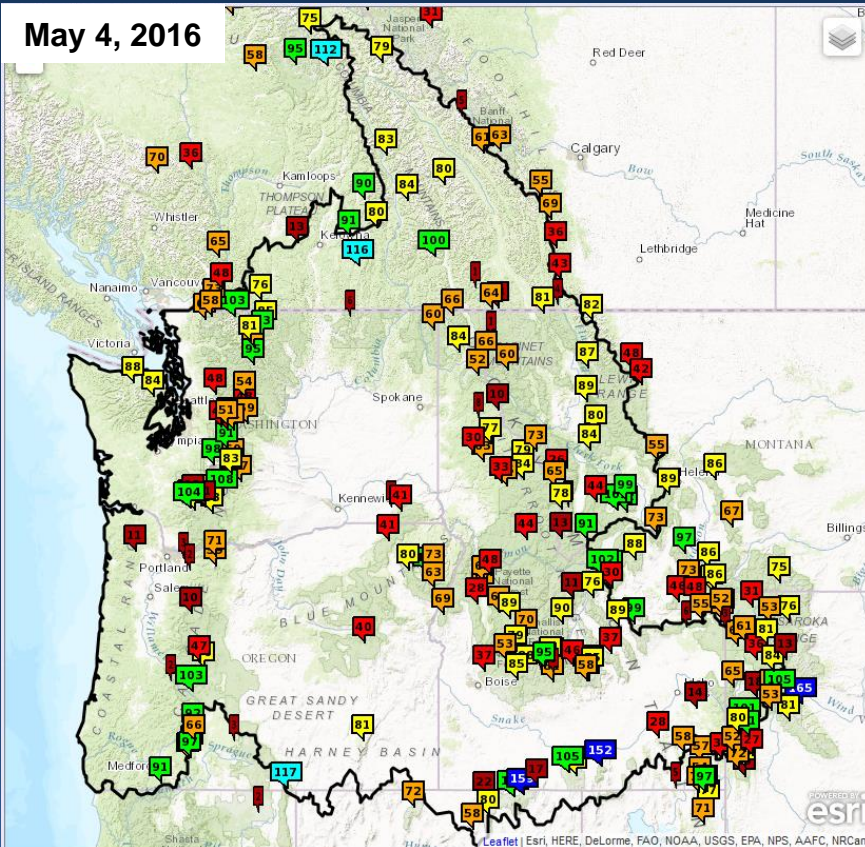


WY2017 Monthly Temperature Departure from Normal - DegF

DIVISION NAME	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Columbia R abv Arrow Dam	0.3	7.5	-5.7	-5.5	-3.7	-1.0	-1.3	3.9	-0.3	3.0	4.5	3.3
Kootenai River Basin	0.8	7.1	-5.1	-6.3	-2.1	1.0	-1.0	1.9	1.4	4.5	5.6	3.3
Flathead River Basin	-0.2	5.7	-5.9	-8.0	-1.6	1.9	-1.4	1.3	1.3	4.1	4.7	1.8
Columbia R Basin abv Grand Coulee	0.2	6.6	-5.9	-6.9	-2.5	0.6	-1.4	3.6	0.9	3.8	5.1	2.3
Upper Snake River Basin abv Amer Falls Dam	1.2	6.1	-3.9	-5	3.6	4.4	-1.6	0.1	1.3	4	1.5	-0.9
Middle Snake Tributaries	1.5	6.4	-4.1	-4.6	3.5	4.5	-1.4	0.7	2.2	5.3	4.5	0.5
Snake River Basin abv Ice Harbor Dam	1	5.8	-5.5	-6.6	1.8	3.3	-1.7	0.5	1.5	4.8	4.1	0.6

WY2017 Observed Snowpack Conditions

% of Normal



- **May 2016 Snowpack**

- Warm temperatures in April – Record SWE loss throughout region

- **May 2017 Snowpack**

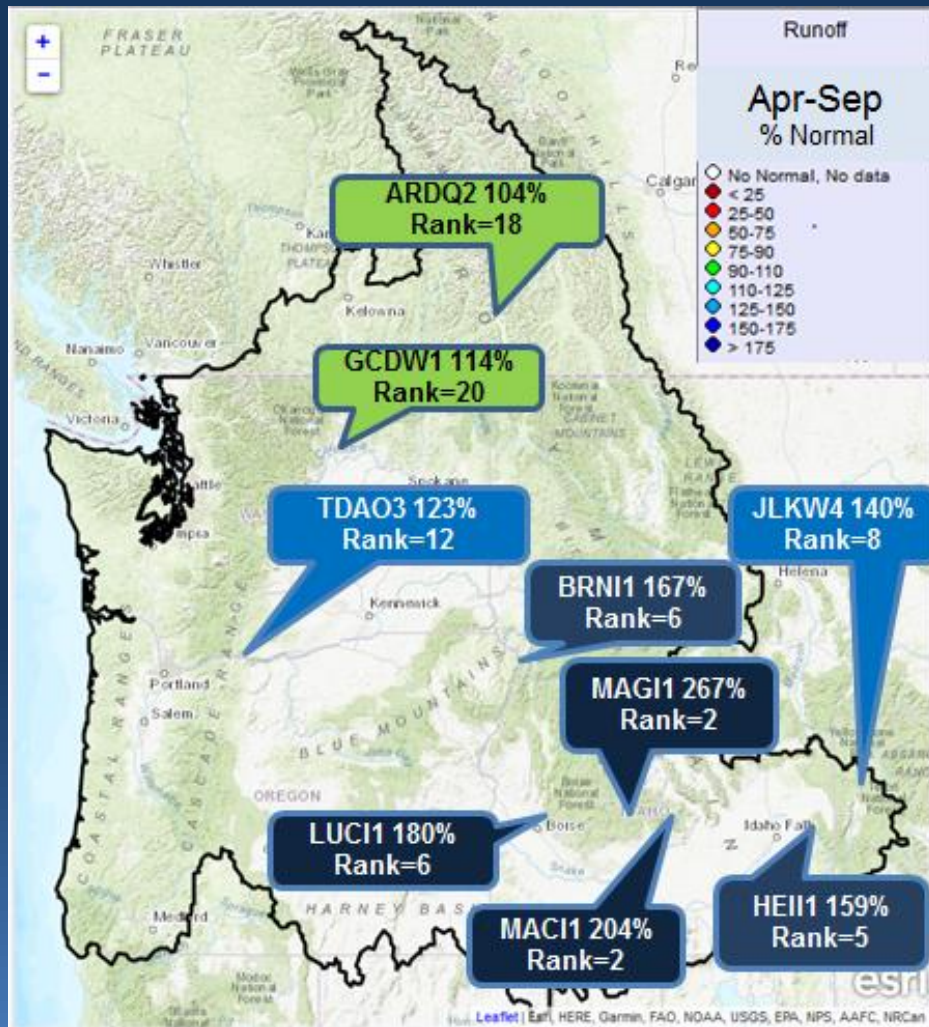
- Near record SWE in Snake – well above average in Upper Columbia

- Observed snow water equivalent (SWE) values provided by:

- Natural Resources Conservation Service (NRCS) SNOTEL network, and Environment Canada (EC) Automated Snow Pillow network



WY2017 Observed Runoff Conditions



LOCATION	Oct1 - Sep30 % NORM	Jan - Jul % NORM	Apr - Sep % NORM
	Rank / POR	Rank / POR	Rank / POR
Columbia River - Arrow Lakes - ARDQ2	108 12 / 47	110 9 / 47	104 18 / 47
Columbia River - Grand Coulee - GCDW1	126 8 / 57	126 8 / 57	114 20 / 57
Snake River - Jackson Lake - JLKW4	144 5 / 47	146 4 / 47	140 8 / 47
Snake River - Heise HEI11	156 2 / 47	165 2 / 47	159 5 / 47
Boise River - Lucky Peak LUC11	184 2 / 47	197 1 / 47	180 6 / 47
Big Wood - Magic Dam MAG11	280 1 / 47	299 1 / 47	267 2 / 47
Big Lost - Mackay MAC11	175 2 / 47	197 2 / 47	204 2 / 47
Snake River - Brownlee BRN11	144 8 / 47	171 6 / 47	167 6 / 47
Columbia River - The Dalles - TDAO3	130 6 / 57	135 7 / 57	123 12 / 57



Water Supply Forecast Briefing Outline

- Review of WY2017 Water Supply Season

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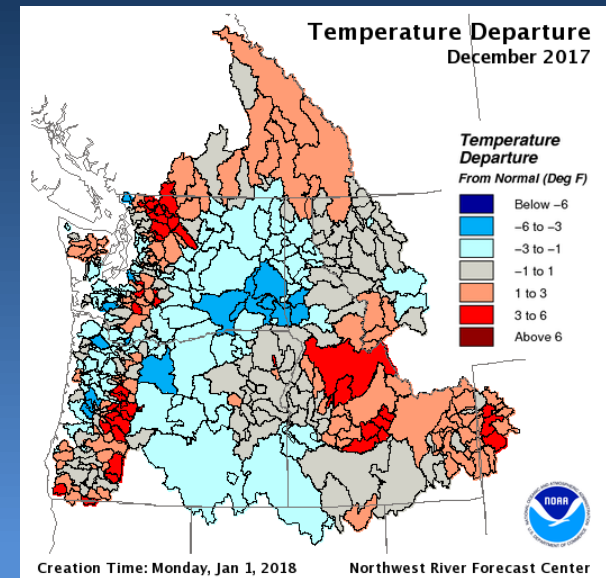
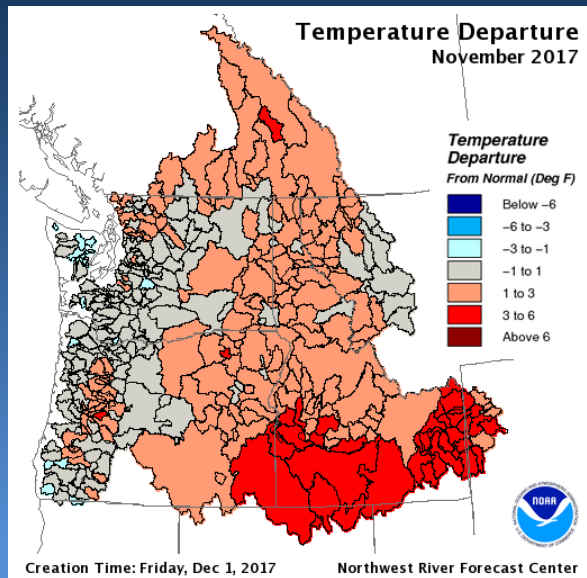
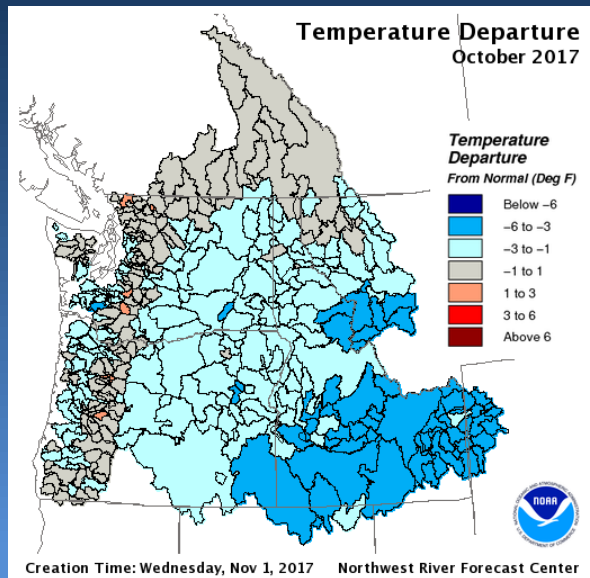
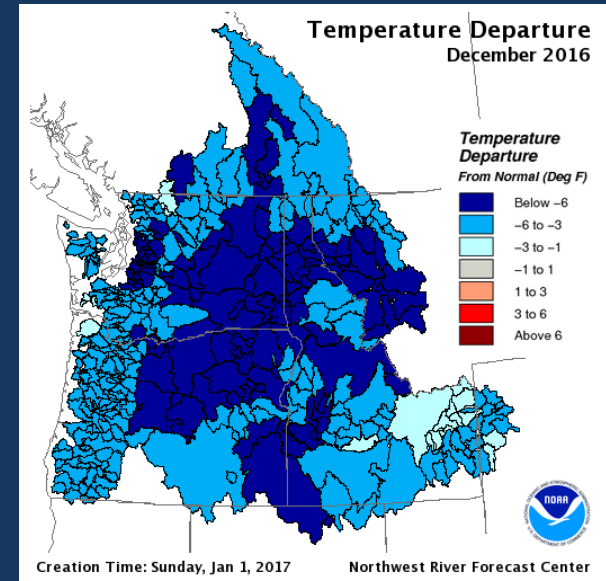
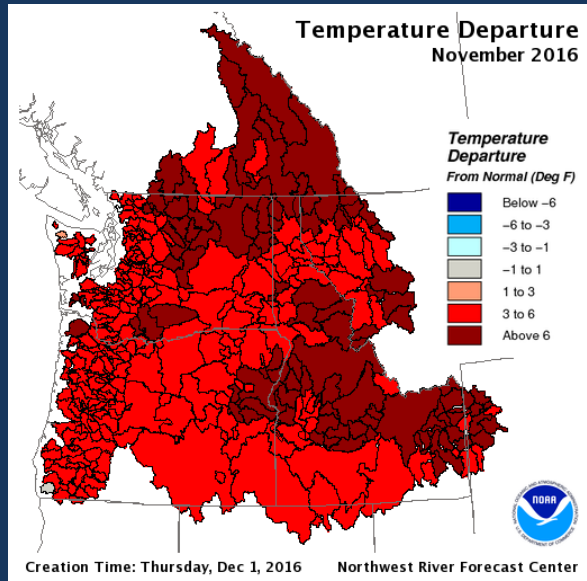
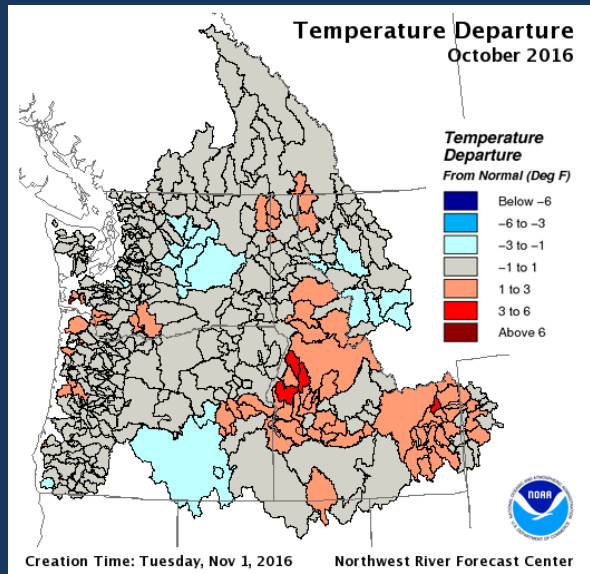
Climate
Forcings

- **Summary**



Monthly Temperature Departures from Normal

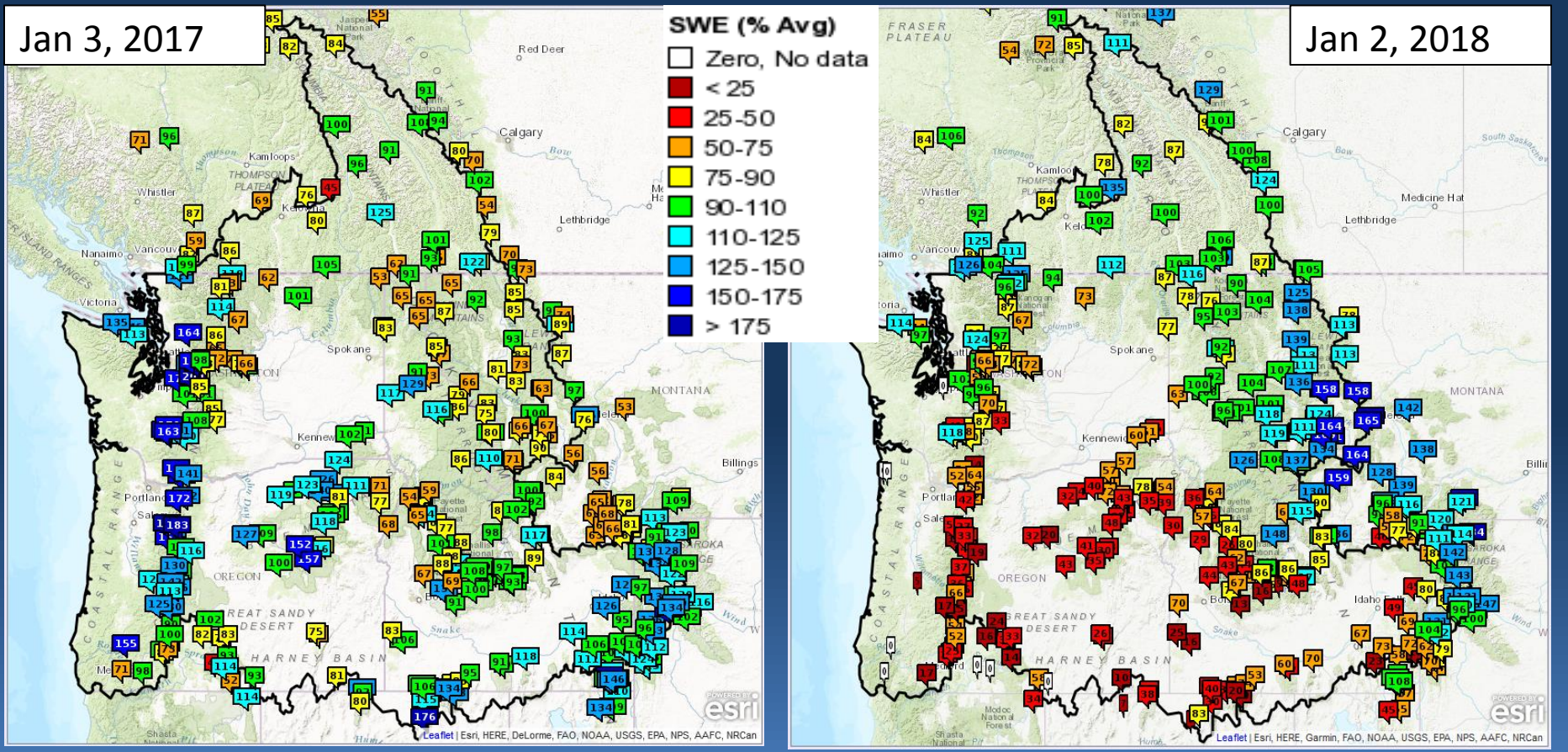
Water Year 2017 / 2018 comparison





Snowpack Summary

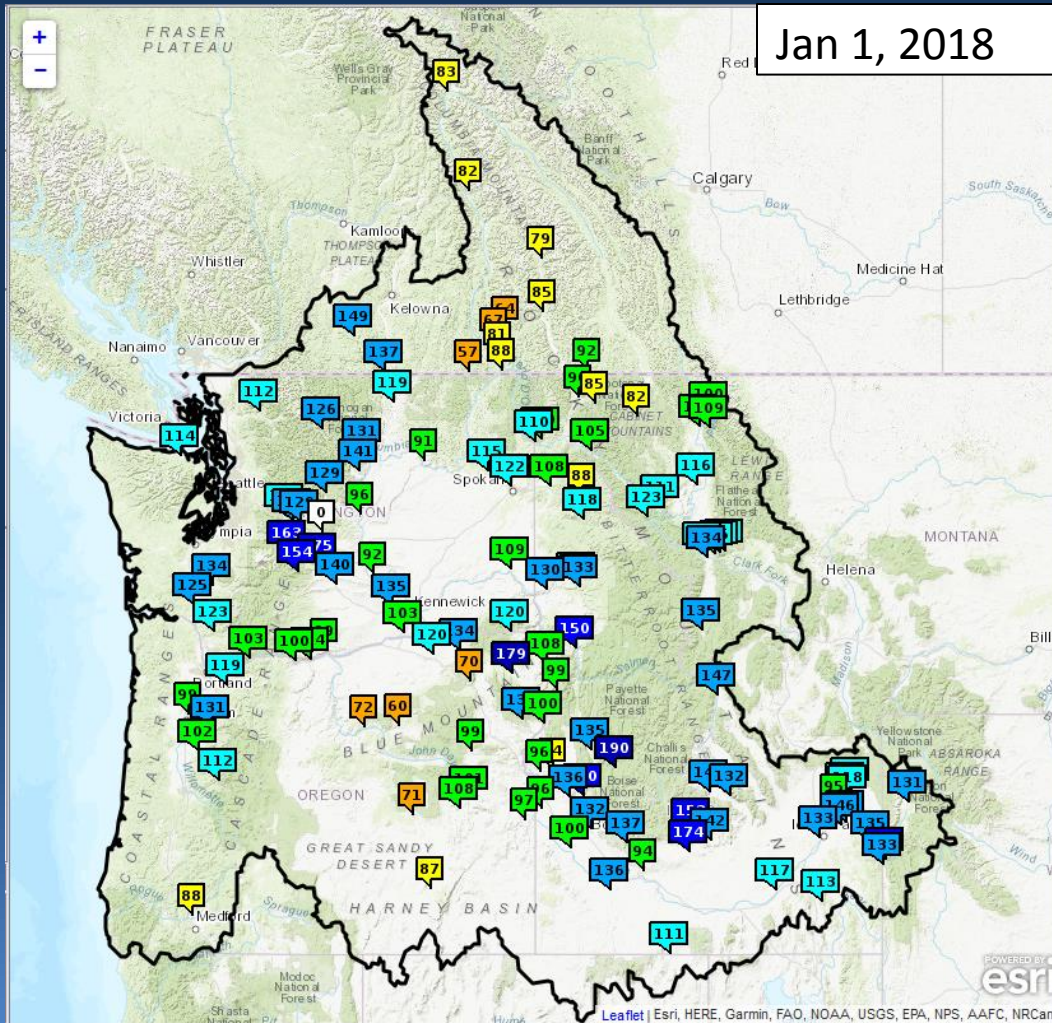
Water Year 2017 / 2018 January Comparison - % of Normal





Current Adjusted Runoff Conditions

Water Year 2018



Percent of Normal

Oct 1–Jan 1

UPPER COLUMBIA BASIN

MICA	83
DUNCAN	78
QUEENS BAY	85
LIBBY	82
HUNGRY HORSE	109
GRAND COULEE	91

SNAKE RIVER BASIN

JACKSON LAKE	132
PALISADES	135
DWORSHAK	113
LOWER GRANITE	109

LOWER COLUMBIA BASIN

THE DALLES	100
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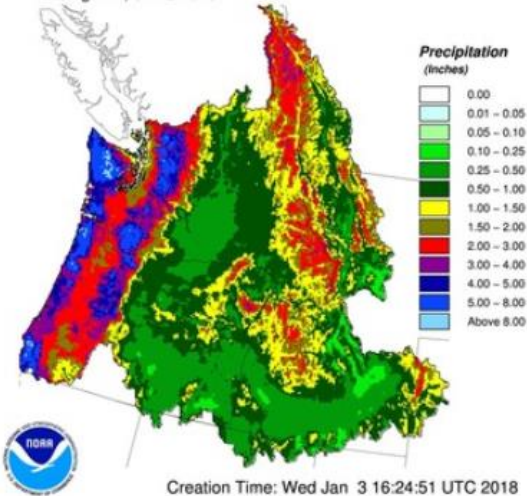
Cumulative 10 Day Precipitation

01/03/2018 – 1/13/2018

10 Day Forecast Precipitation: Volume Analysis

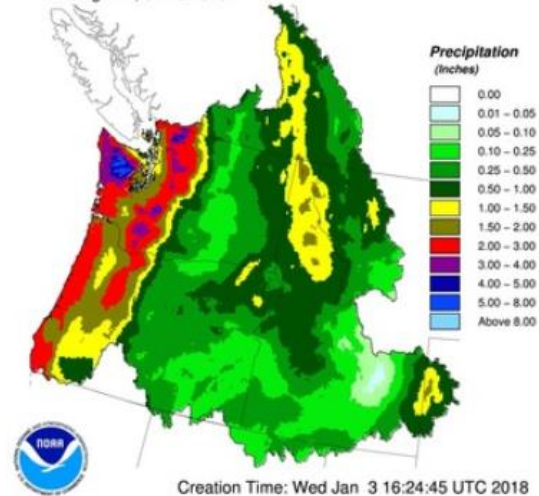
10 Day Precipitation Climatology

Ending 12Z, 01/13/2018



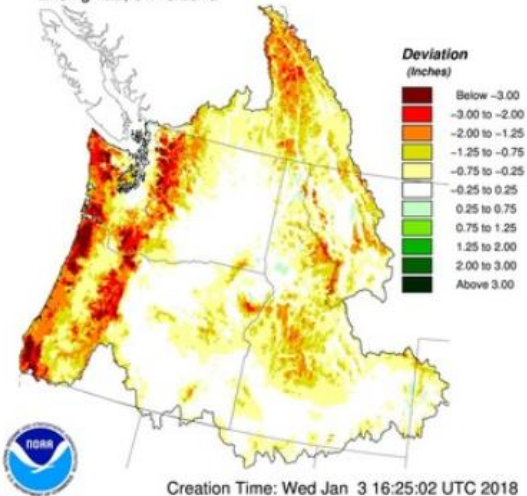
10 Day QPF

Ending 12Z, 01/13/2018



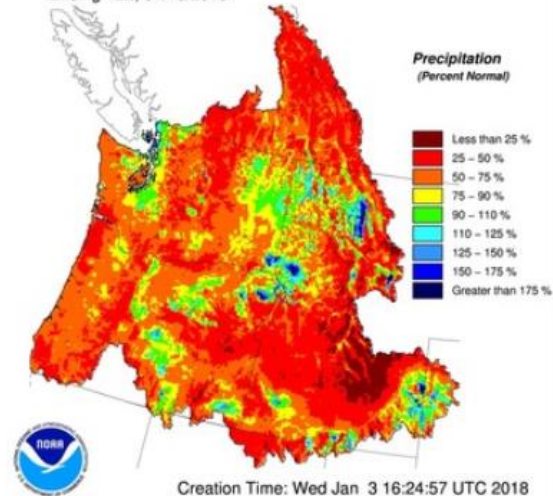
10 Day QPF (Deviation from Climatology)

Ending 12Z, 01/13/2018



10 Day QPF (Percent of Climatology)

Ending 12Z, 01/13/2018

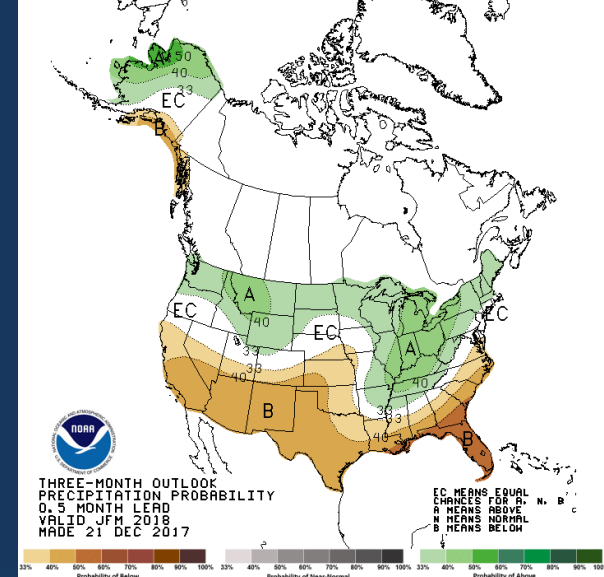
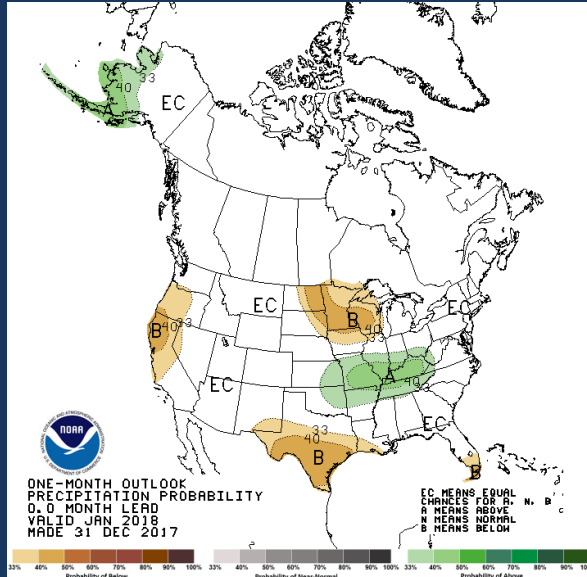


CPC Climate Outlook

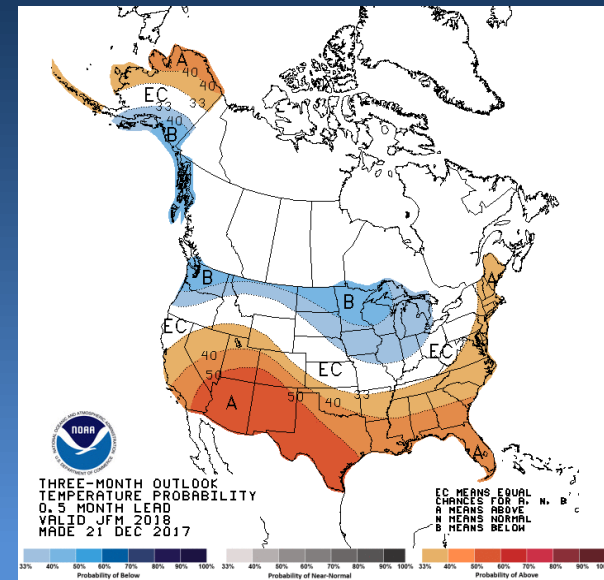
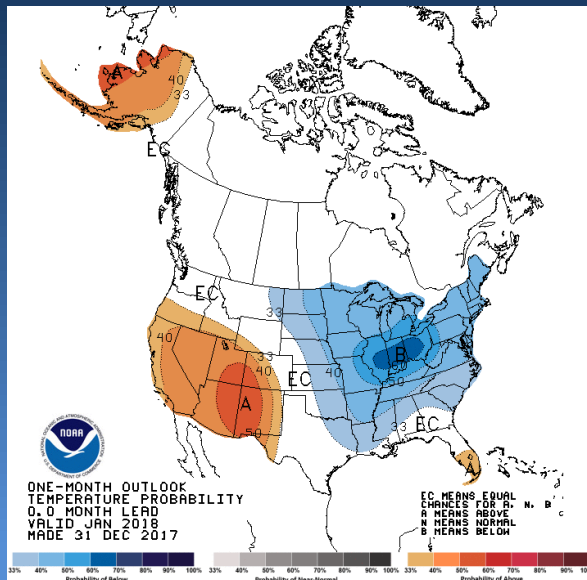
Current Month Outlook

Three Month Outlook - JFM

Precipitation



Temperature



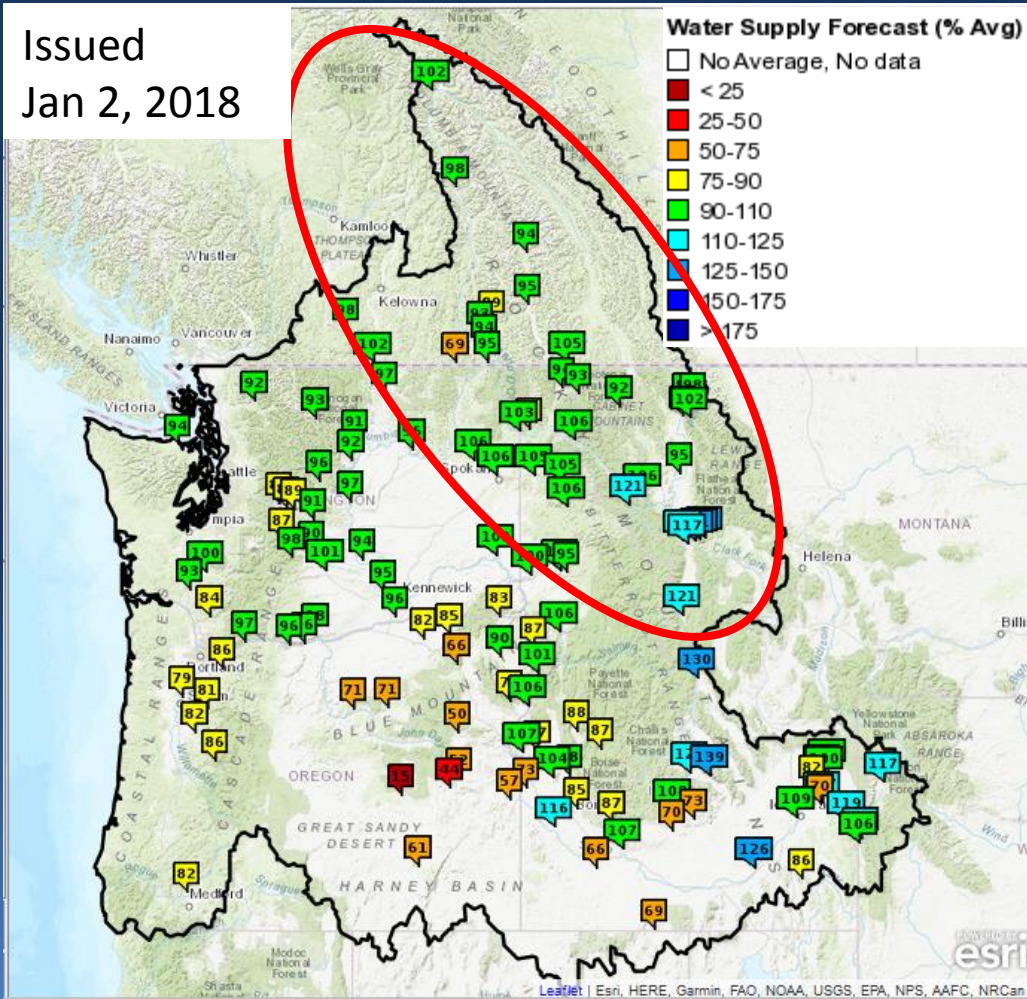


ESP Apr-Sep Water Supply Forecasts

Upper Columbia Basin



Issued
Jan 2, 2018



Jan 2018 Apr – Sep Forecast

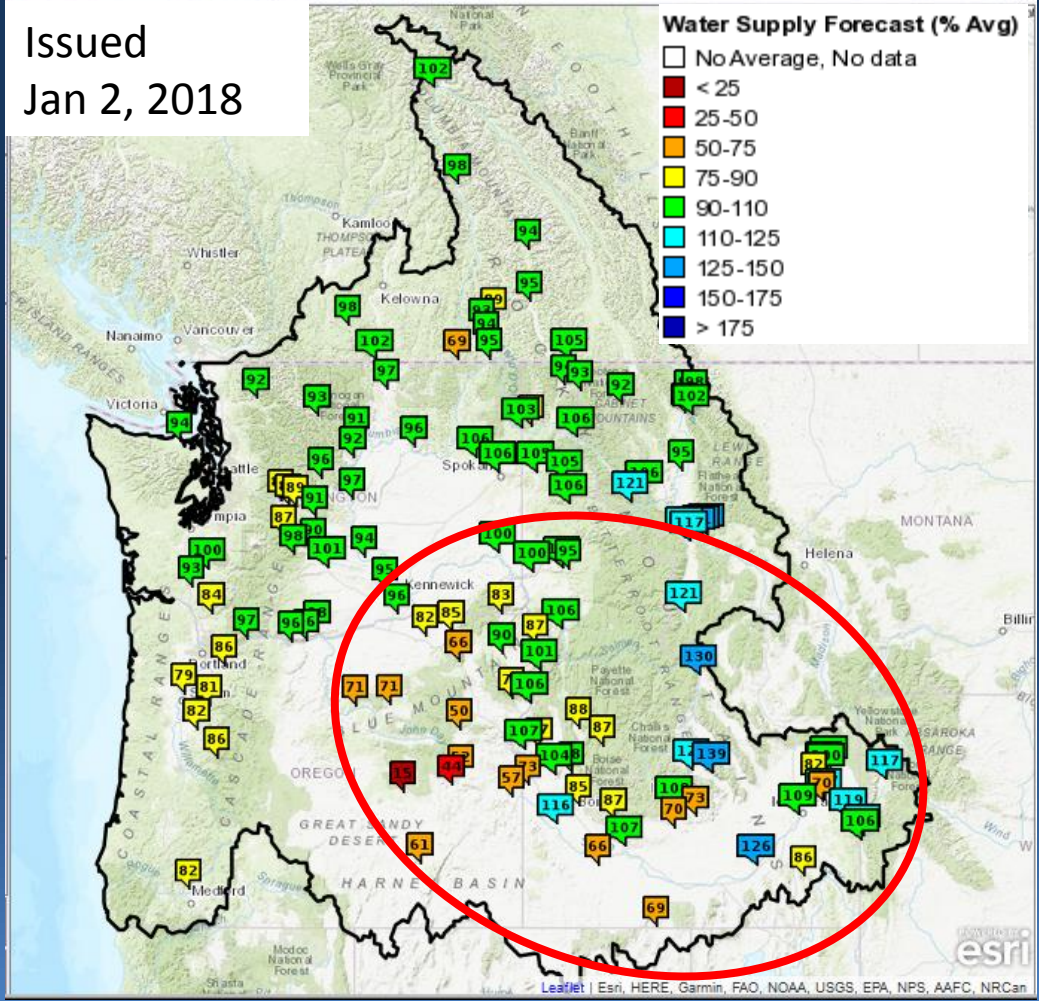
- Columbia River - Mica Dam 102%
- Kootenai River - Libby Dam 92%
- Coeur d’Alene River - Coeur d’Alene Lake 105%
- SF Flathead River - Hungry Horse Dam 102%
- Pend Oreille River - Albeni Falls Dam 103%
- Columbia River - Grand Coulee Dam 96%



ESP Apr-Sep Water Supply Forecasts Snake River Basin and Columbia Mainstem



Issued
Jan 2, 2018



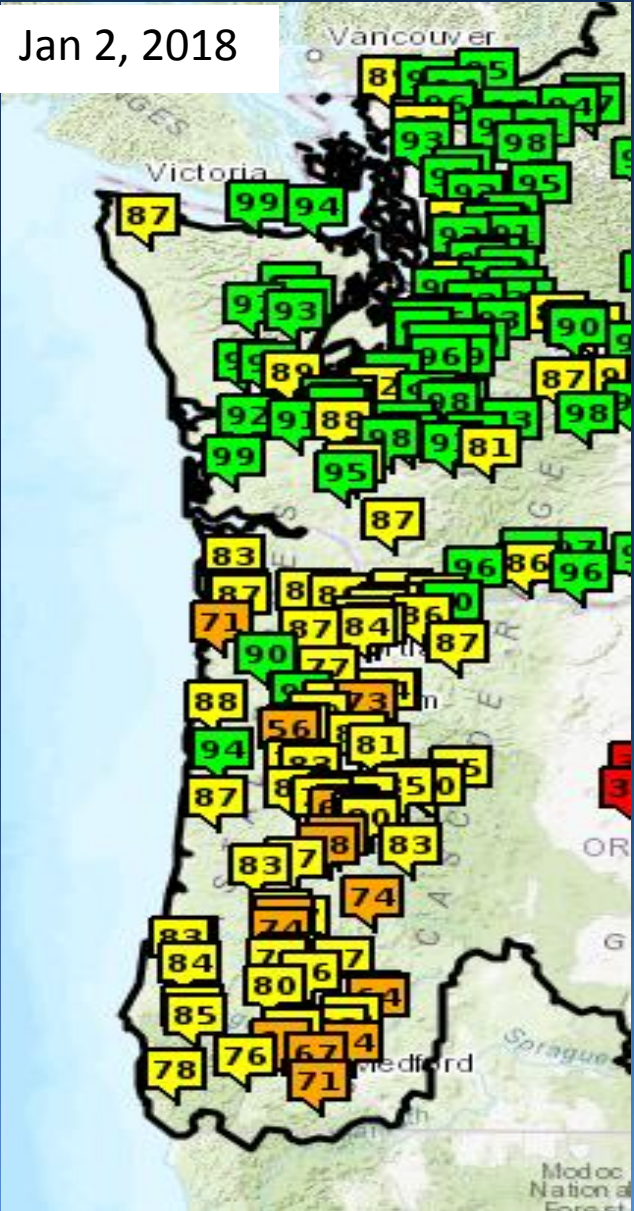
Jan 2018 Apr – Sep Forecast

- Upper Snake River
 - Jackson Lake Dam 117%
 - Palisades Dam 119%
 - at Heise 117%
- Boise River
 - Lucky Peak Dam 85%
- NF Clearwater River
 - Dworshak Dam 101%
- Lower Snake River
 - Lower Granite Dam 100%
- Lower Columbia
 - The Dalles Dam 96%



ESP Apr-Sep Water Supply Forecasts

ESP Natural - Western Oregon and Washington Cascades



Jan 2018 Apr – Sep Forecast

- Skagit River
 - near Concrete 94%
- Green River
 - Howard Hanson Res 93%
- Cowlitz River
 - Mossyrock Reservoir 97%
 - Mayfield Reservoir 98%
- North Santiam
 - At Mehama 84%
- Willamette River
 - At Salem 77%
- Rogue River
 - Applegate Reservoir 71%



ESP Volume Forecast Products



Northwest River Forecast Center Water Supply Forecasts

- Close
- Data/Normals
- Rankings
- ENSO / Runoff**
- Adjustments
- Verification
- Verify All Years
- Archive
- Monthly Water Supply Forecasts
- Help

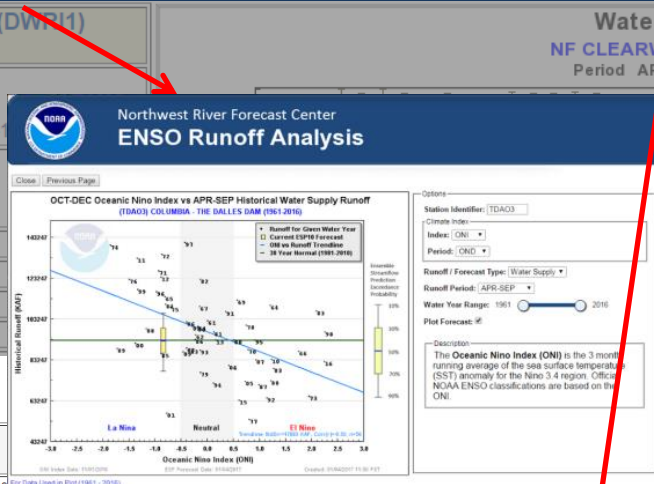
NF CLEARWATER - DWORSHAK DAM (DWR11)
Forecasts for Water Year 2016

Official Forecast

10 days QPF: Ensemble: 2015-10-19 Issued: 2015-10-19

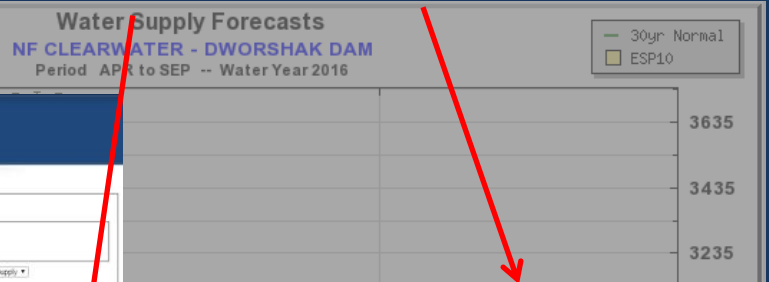
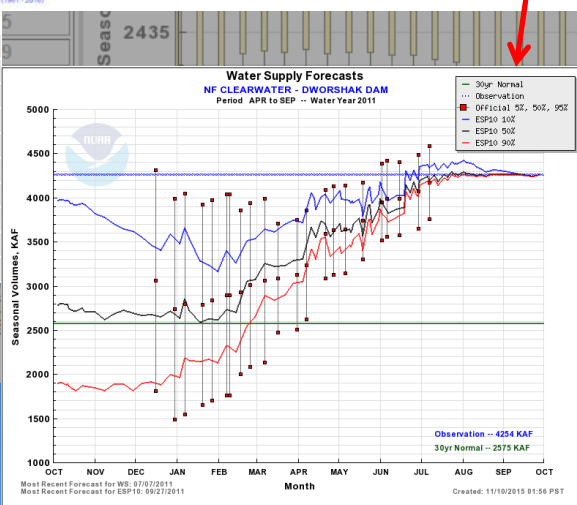
Forecasts Are in KAF

Forecast Period	90 %	50 %	Average	10 %
APR-SEP	1658	2537	100	3711
APR-JUL	1534	2418	100	3513
JAN-SEP	2187	3222	94	4465
JAN-JUL	2079	3071	93	4293



NF CLEARWATER - DWORSHAK DAM (DWR11)
Period Rankings - 1960 to 2016
APR-SEP Normal - 2575 (KAF)

Rank	Year	Period Volume (KAF)	Percent of Normal	Exceedance Probability
23	1989	2740.00	106	46.000 %
24	2009	2711.00	105	48.000 %
25	1991	2658.00	103	50.000 %
26	2004	2647.00	103	52.000 %
27	2016	2641.23	103	54.000 %
28	1978	2537.00	99	56.000 %
29	1981	2432.00	94	58.000 %
30	1993	2424.00	94	60.000 %
31	1983	2386.00	93	62.000 %
32	1980	2333.00	91	64.000 %



Northwest River Forecast Center
ESP Monthly Natural Volumes

Monthly Natural Forecasts Beta

Natural Volume Monthly Forecasts (ESP10) for Water Year 2015
(TDA03) COLUMBIA - THE DALLES DAM

Month	Obs Runoff (KAF)	ESP10 Forecast (KAF)
OCT	9345	9345
NOV	9345	9345
DEC	9345	9345
JAN	9345	9345
FEB	9345	9345
MAR	9345	9345
APR	9345	9345
MAY	9345	9345
JUN	9345	9345
JUL	9345	9345
AUG	9345	9345
SEP	9345	9345

COLUMBIA - THE DALLES DAM ESP Natural Forecast 10 days QPF: Ensemble: 2015-04-08 Issued: 2015-04-08					COLUMBIA - THE DALLES DAM ESP Natural Forecast 5 days QPF: Ensemble: 2015-04-08 Issued: 2015-04-08					COLUMBIA - THE DALLES DAM ESP Natural Forecast 0 days QPF: Ensemble: 2015-04-08 Issued: 2015-04-08								
Forecast Period	90 %	50 %	Average	10 %	Obs Runoff (2015-04-08)	Forecast Period	90 %	50 %	Average	10 %	Obs Runoff (2015-04-08)	Forecast Period	90 %	50 %	Average	10 %	Obs Runoff (1961-2010)	30 Year Average (1961-2010)
OCT	626	486	626	486	626	OCT	626	486	626	486	626	OCT	626	486	626	486	626	626
NOV	626	486	626	486	626	NOV	626	486	626	486	626	NOV	626	486	626	486	626	626
DEC	626	486	626	486	626	DEC	626	486	626	486	626	DEC	626	486	626	486	626	626
JAN	626	486	626	486	626	JAN	626	486	626	486	626	JAN	626	486	626	486	626	626
FEB	626	486	626	486	626	FEB	626	486	626	486	626	FEB	626	486	626	486	626	626
MAR	626	486	626	486	626	MAR	626	486	626	486	626	MAR	626	486	626	486	626	626
APR	626	486	626	486	626	APR	626	486	626	486	626	APR	626	486	626	486	626	626
MAY	626	486	626	486	626	MAY	626	486	626	486	626	MAY	626	486	626	486	626	626
JUN	626	486	626	486	626	JUN	626	486	626	486	626	JUN	626	486	626	486	626	626
JUL	626	486	626	486	626	JUL	626	486	626	486	626	JUL	626	486	626	486	626	626
AUG	626	486	626	486	626	AUG	626	486	626	486	626	AUG	626	486	626	486	626	626
SEP	626	486	626	486	626	SEP	626	486	626	486	626	SEP	626	486	626	486	626	626

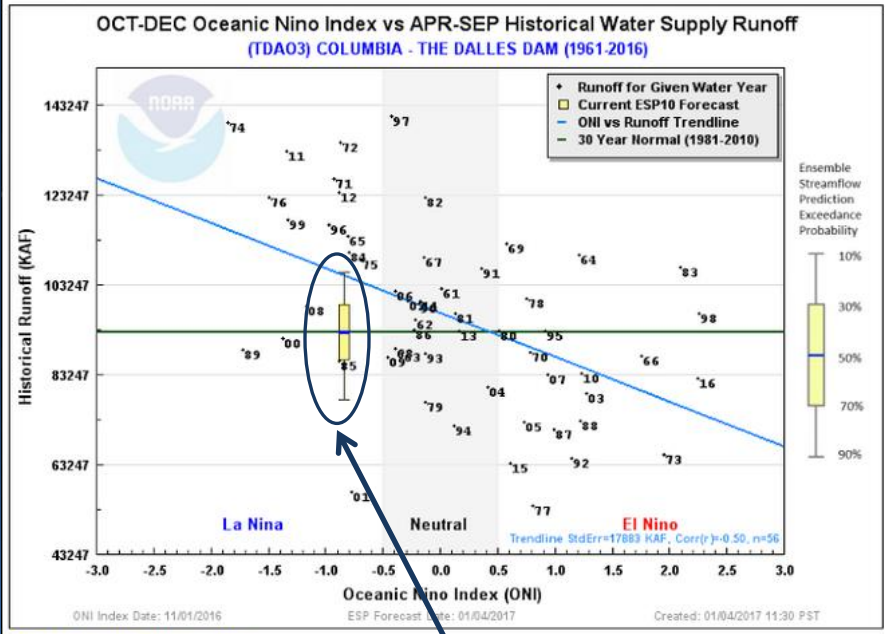


ENSO Climate Index Display



Northwest River Forecast Center ENSO Runoff Analysis

Close Previous Page



Current ESP volume forecast

Climate Index Description

The **Multivariate ENSO Index (MEI)** is determined as the first principal component of six different parameters: sea level pressure, zonal and meridional components of the surface wind, sea surface temperature, surface air temperature and cloudiness.

The **North Atlantic Oscillation (NAO)** is a large scale fluctuation in atmospheric mass between the subtropical high and the polar low. The corresponding index varies from year to year, but also exhibits a tendency to remain in one phase for multi-year periods.

The **Oceanic Nino Index (ONI)** is the 3 month running average of the sea surface temperature (SST) anomaly for the Nino 3.4 region. Official NOAA ENSO classifications are based on the ONI.

The **Pacific Decadal Oscillation (PDO)** is a measure of surface water temperature in the Pacific Ocean north of 20° N. During a positive (warm) phase, the west Pacific becomes cooler and part of the eastern ocean warms; the opposite pattern occurs during a negative (cool) phase.

The **Southern Oscillation Index (SOI)** is based on observed sea level pressure differences between Tahiti and Darwin, Australia. The SOI is expressed as an departure from the 1981-2010 base period.

3 Month Average

- OND: Oct - Dec
- NDJ: Nov - Jan
- DJP: Dec - Feb
- JFM: Jan - Mar
- FMA: Feb - Apr
- MAM: Mar - May
- AMJ: Apr - Jun
- MJJ: May - Jul
- JJA: Jun - Aug
- JAS: Jul - Sep

Options

Station Identifier: TDA03

Climate Index:
 Index: ONI
 Period: OND

Runoff / Forecast Type: Water Supply

Runoff Period: APR-SEP

Water Year Range: 1961 - 2016

Plot Forecast:

Description:
 The **Oceanic Nino Index (ONI)** is the 3 month running average of the sea surface temperature (SST) anomaly for the Nino 3.4 region. Official NOAA ENSO classifications are based on the ONI.

Forecast Type

Water Supply Network: Volumes are adjusted for significant upstream reservoir storage, as described in the adjustment section of the NWRFC water supply webpage.

Natural Volume Network: Volumes are adjusted for all man-made upstream activity, including storage, consumptive use, and diversion activity.

- APR-SEP
- APR-JUL
- APR-AUG
- JAN-SEP
- JAN-JUL
- OCT-SEP



Summary



Water Year 2017 Review Summary

- Near normal precip in Upper Columbia...well above normal in the Snake
- Below normal Dec-Apr temperatures in Upper Columbia...much warmer Feb-Mar in Snake basin
- SWE well above average in Upper Columbia...near record in Snake basin
- Apr-Sep observed runoff above normal in Upper Columbia...well above to near record in Snake basin

Water Year 2018 Summary

- Generally above normal precipitation in Upper Columbia...below normal in the Snake River basin
- SWE near to above normal in the Upper Columbia...well below normal in OR, Lower and Mid Snake basin tributaries
- Upper Columbia and Upper Snake Apr-Sep ESP forecast at or above normal, well below normal in OR, Lower and Mid Snake basin tributaries



NWRFC 2017 Water Supply Briefing Schedule



2018 Schedule for Live Water Supply Briefings					
Jan	Feb	Mar	Apr	May	June
4	1	1	5	3	TBD
<i>All presentations held at 10:00am PDT/PST, unless noted otherwise</i>					
Click here for Registration Information					

Telephone Conference Call Number (same for each month's brief):
(914) 614-3221
Pass Code:
619-465-763

<https://register.gotowebinar.com/rt/7651951505041247747>



Northwest River Forecast Center

Water Supply Forecasts



River and Hydrology

Water Supply

Observations

Weather Forecasts

Climate

NWRFC

Questions?

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