



June 2019 Water Supply Briefing

National Weather Service / Northwest River Forecast Center (NWRFC)

Telephone Conference : (415) 655-0060

Pass Code : 217-076-304#

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Water Supply Forecast Briefing Outline



- Meteorological/Hydrological Observations WY2019
- NWRFC Water Supply Forecast Refresher
- Water Supply Components
 - Current Model States-Regional Overview
 - 10 Day Forecasts-Model Forcings
- Current Water Supply Forecasts
- Chalk Talk: Runoff timing of Apr-Sep Water Supply Forecast



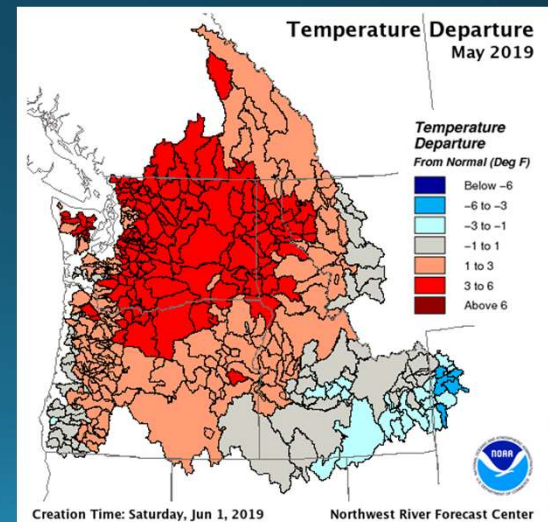
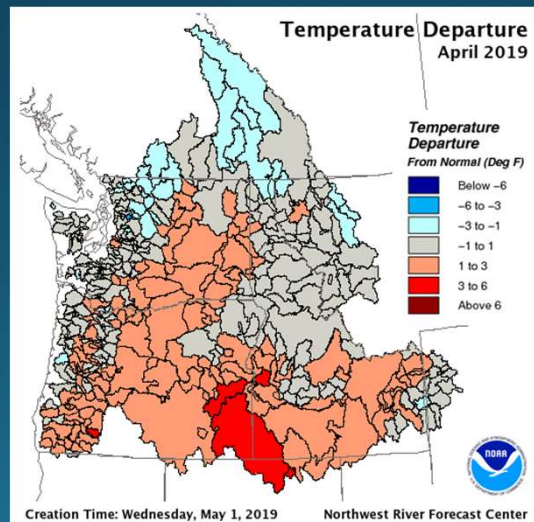
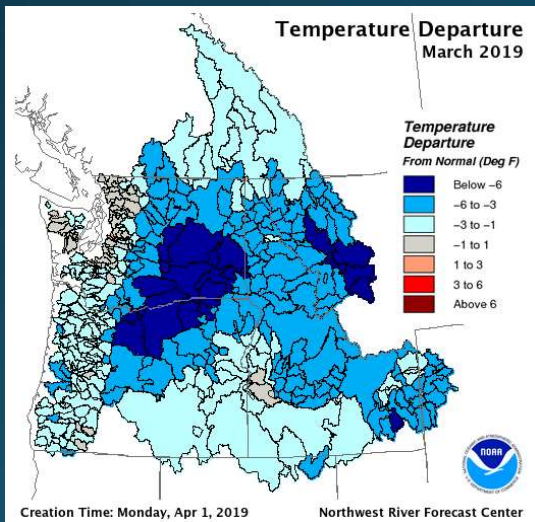
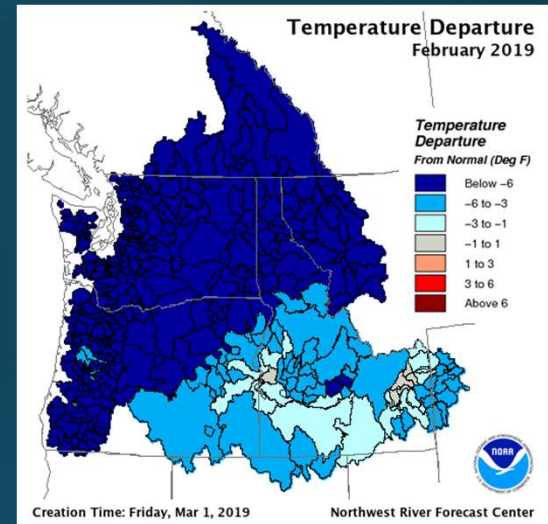
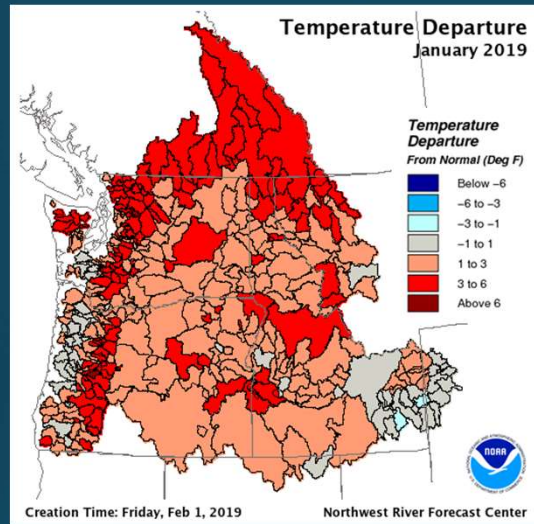
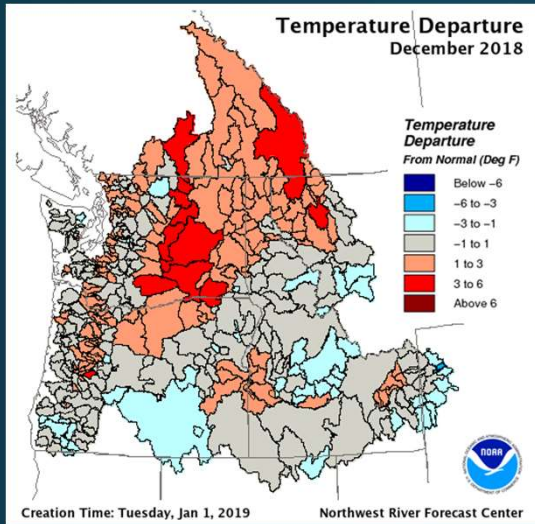
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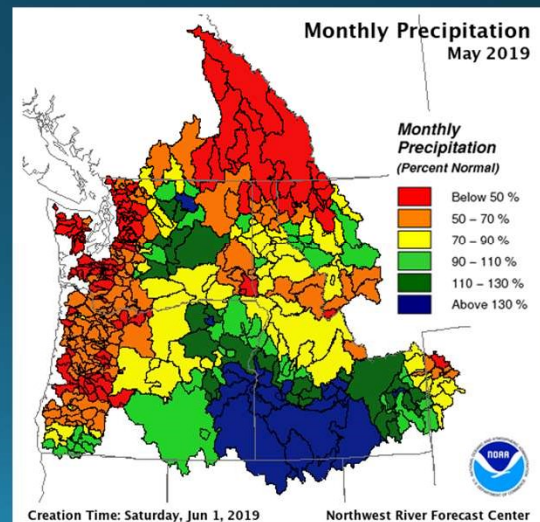
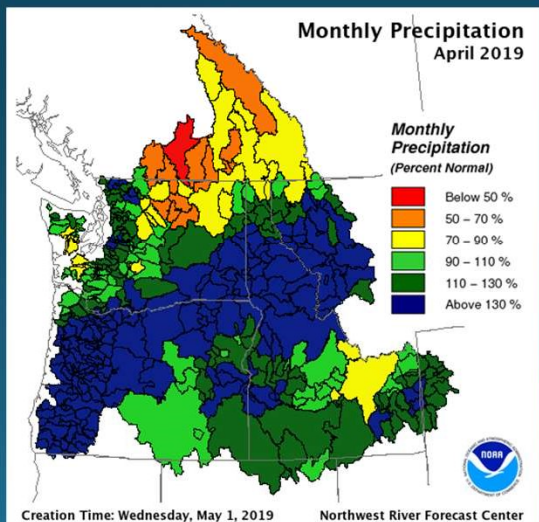
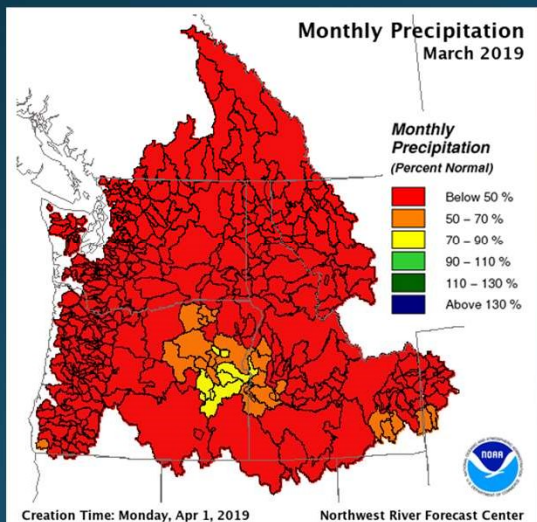
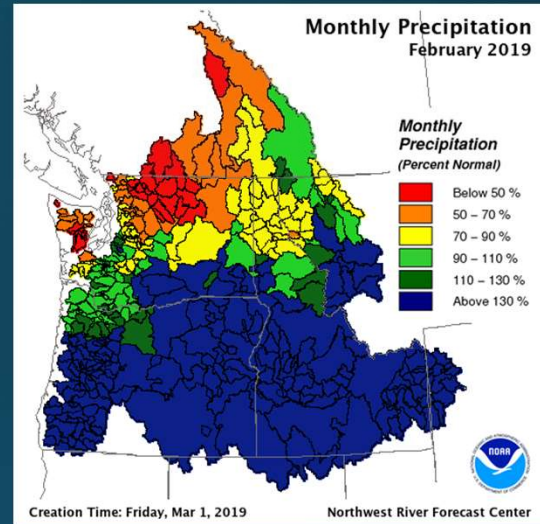
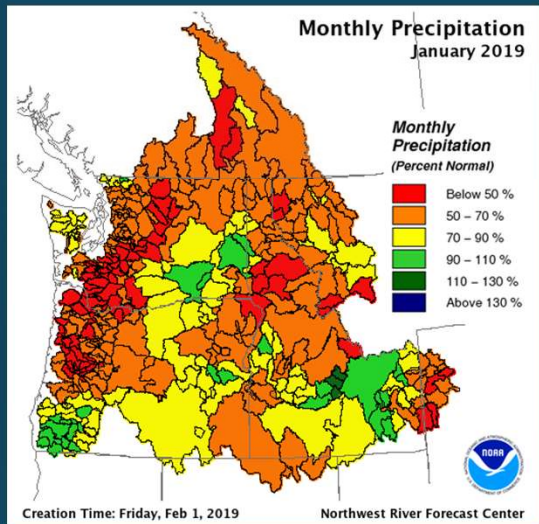
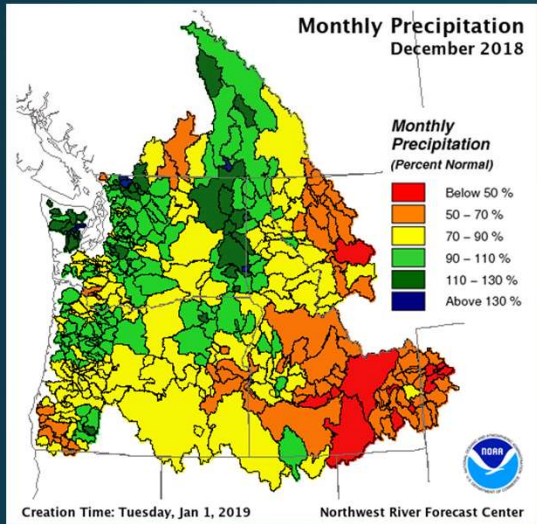


Monthly Temperature Departure



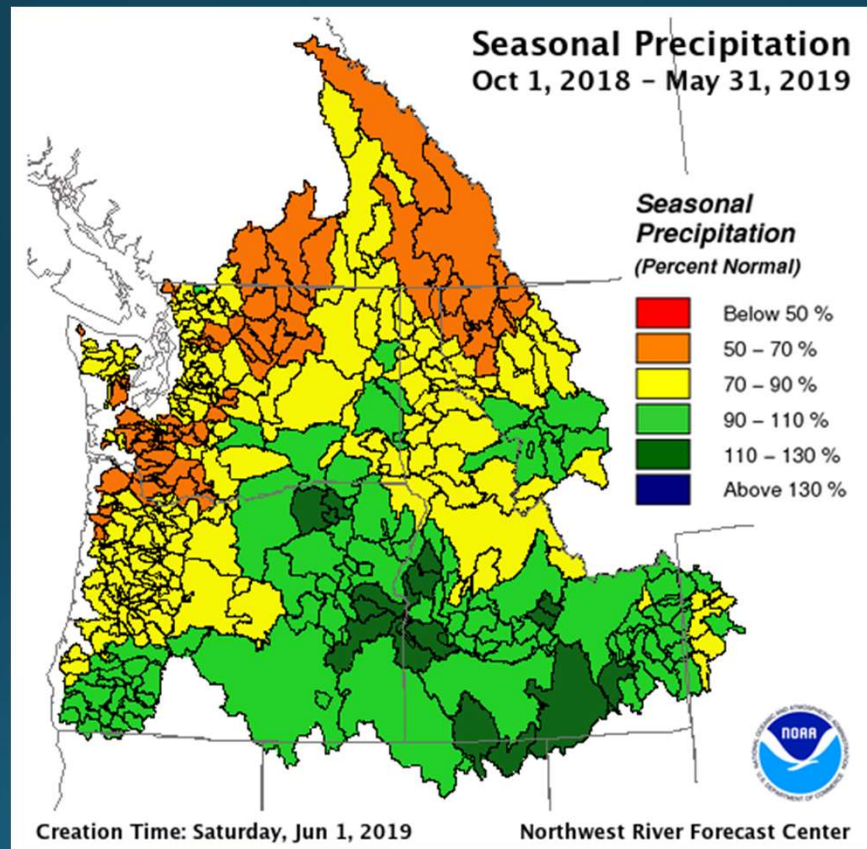


Monthly Precipitation % of Normal



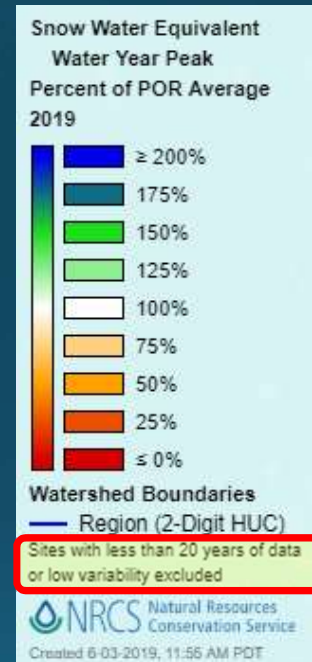
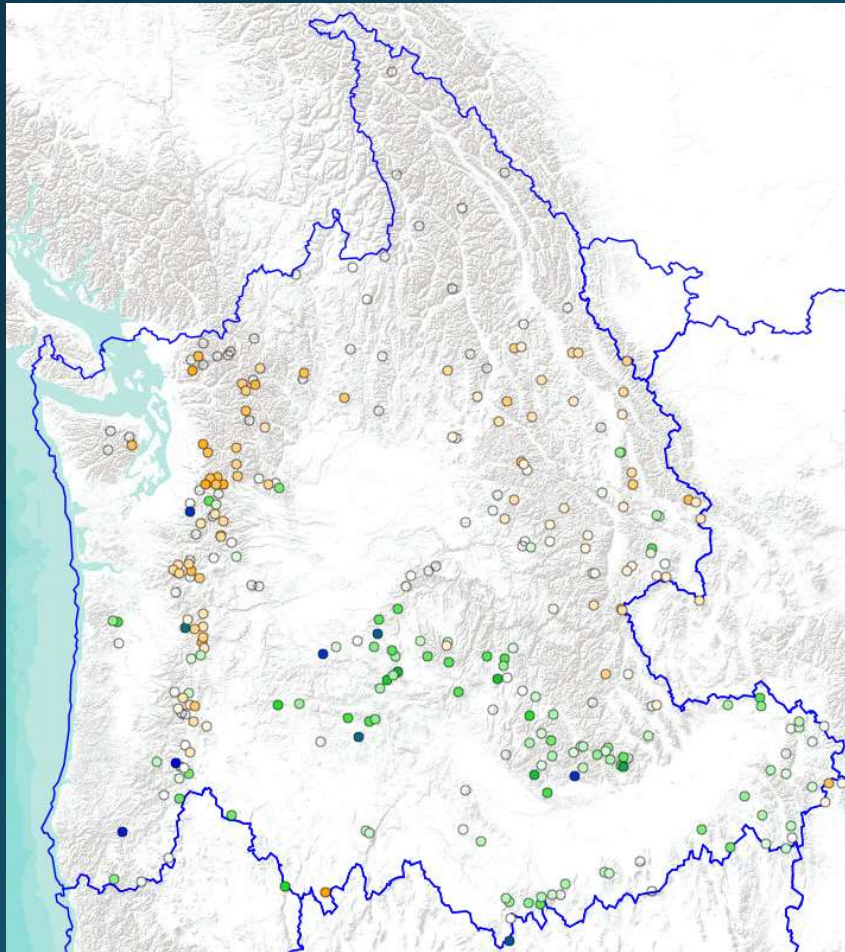


Observed % Normal Seasonal Precipitation





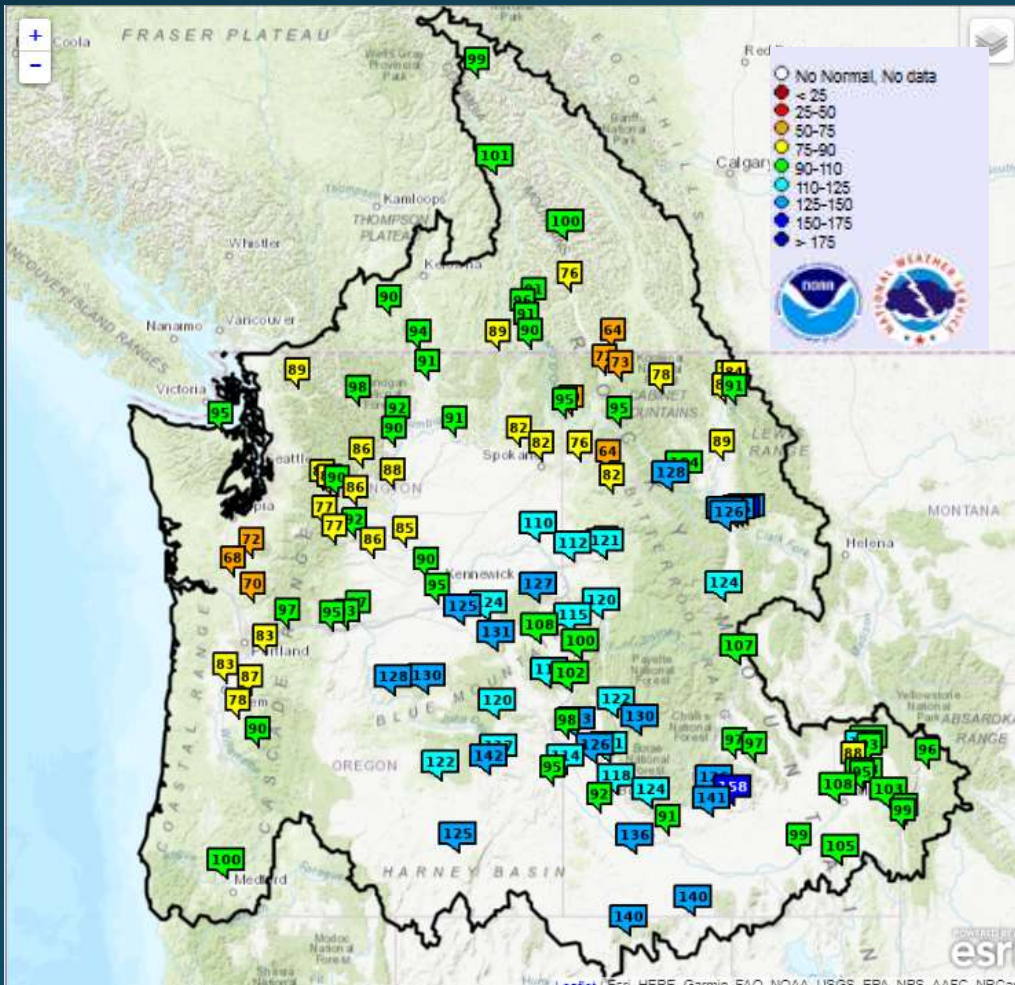
Observed Peak Snowpack (% of POR Norm)



Source: NRCS, Interactive Map (Beta)
Period of Record (POR)



Current Adjusted Runoff Conditions



% of Normal (Oct 1st– June 2nd)

Upper Columbia River

Columbia River - Mica Dam	89%
Kootenai River - Libby Dam	78%
Coeur d'Alene Lake	76%
SF Flathead River - Hungry Horse Dam	91%
Pend Oreille R-Albeni Falls Dam	95%

Snake River

American Falls	100%
Boise River - Lucky Peak Dam	118%
NF Clearwater River-Dworshak Dam	94%
Lower Snake River-Lower Granite Dam	110%
Lower Columbia - The Dalles Dam	95%



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NWRFC Water Supply Forecast Refresher



- ESP: Ensemble Streamflow Prediction
- Multiple Forecast Periods (Seasonal and Monthly)
- Driven By:
 - Hydrologic Model States
 - Meteorological Forecasts
 - Climatological Forcings (WY1949-2018)
- Issued Daily
- Two types of ESP Forecast:
 - Water Supply – Developed for Columbia River Treaty
 - ESP Natural – Anthropogenic Conditions Removed

COLUMBIA - THE DALLES DAM (TDAO3)
Forecasts for Water Year **2019**

Official Forecast

10 days QPF: Ensemble: 2019-04-02 Issued: 2019-04-02

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	76605	81843	88	90832	92704
APR-JUL	64272	69520	87	78959	79855
APR-AUG	71206	76424	87	85388	87532
JAN-SEP	92455	97693	86	106683	114216
JAN-JUL	80122	85370	84	94810	101368
OCT-SEP	105996	111234	85	120224	130518

5 days QPF: Ensemble: 2019-04-02 Issued: 2019-04-02

APR-SEP	73770	80033	86	88407	92704
APR-JUL	61708	67095	84	76501	79855
APR-AUG	68717	74320	85	83524	87532
JAN-SEP	89620	95883	84	104257	114216
JAN-JUL	77559	82946	82	92352	101368
OCT-SEP	103161	109424	84	117798	130518

0 days QPF: Ensemble: 2019-04-02 Issued: 2019-04-02

APR-SEP	70604	77580	84	86642	92704
APR-JUL	59572	65420	82	73922	79855
APR-AUG	65455	72488	83	81698	87532
JAN-SEP	86455	93430	82	102493	114216
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OCT-SEP	99996	106971	82	116034	130518

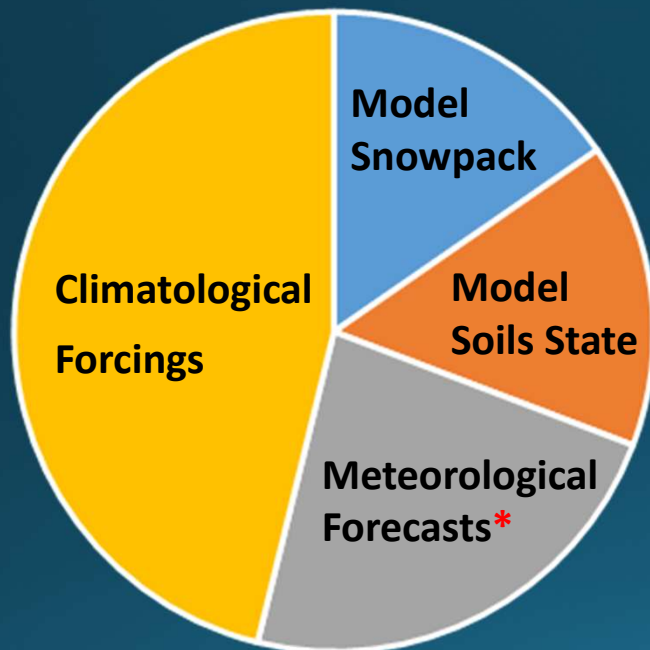
Move the mouse over the desired "Forecast Period" to display a graph.



NWRFC Water Supply Forecast Refresher



Components of Water Supply Forecasts



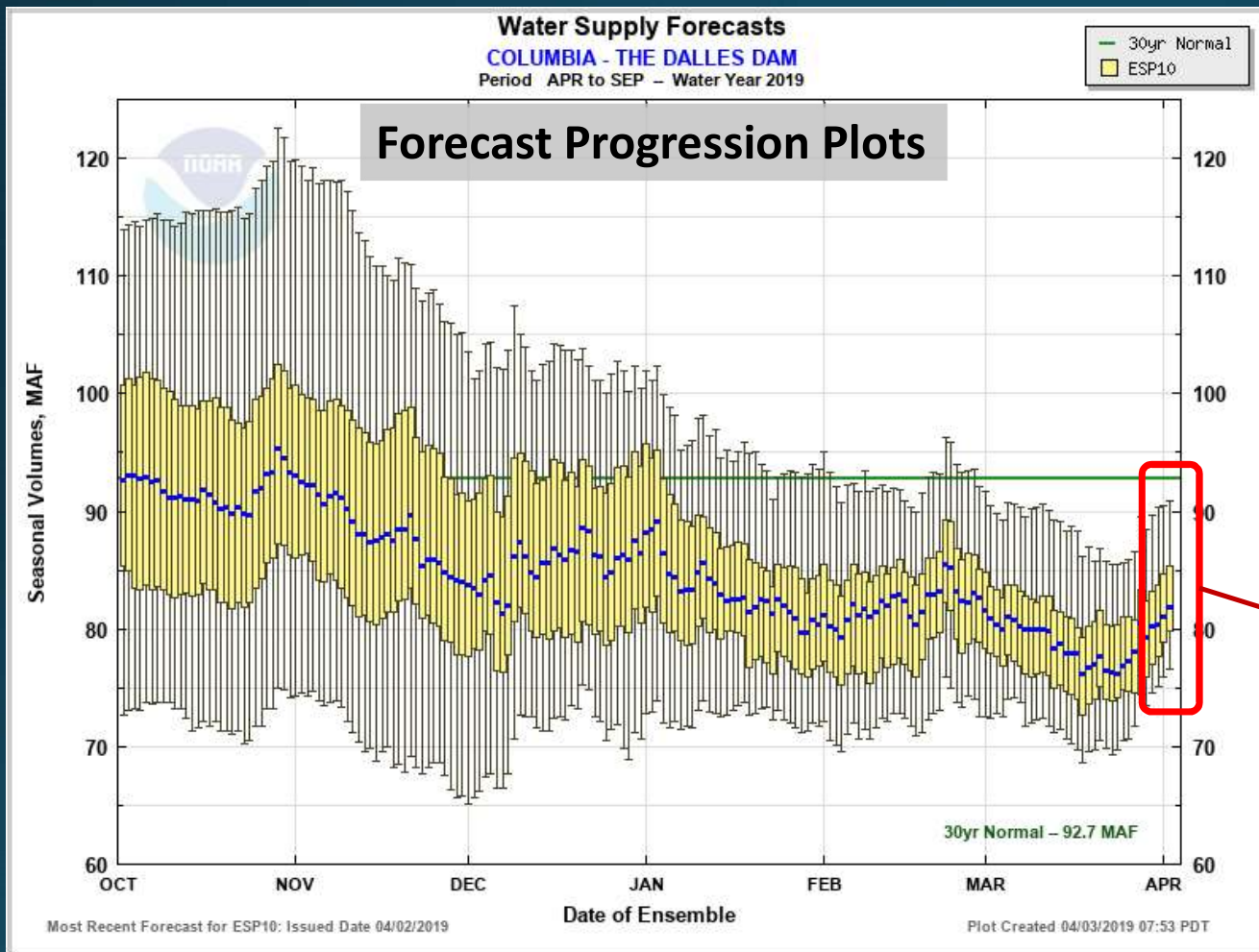
*Meteorological Forecast Component Includes Three Versions:
0, 5, and 10 day QPF/QTF

COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for Water Year 2019					
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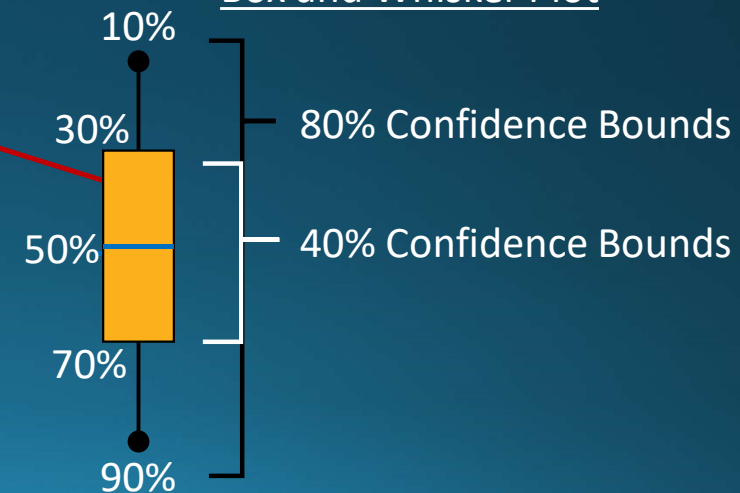


NWRFC Water Supply Forecast Refresher



Exceedance probabilities
ONLY quantify uncertainty
 in climatological forcings

Box and Whisker Plot





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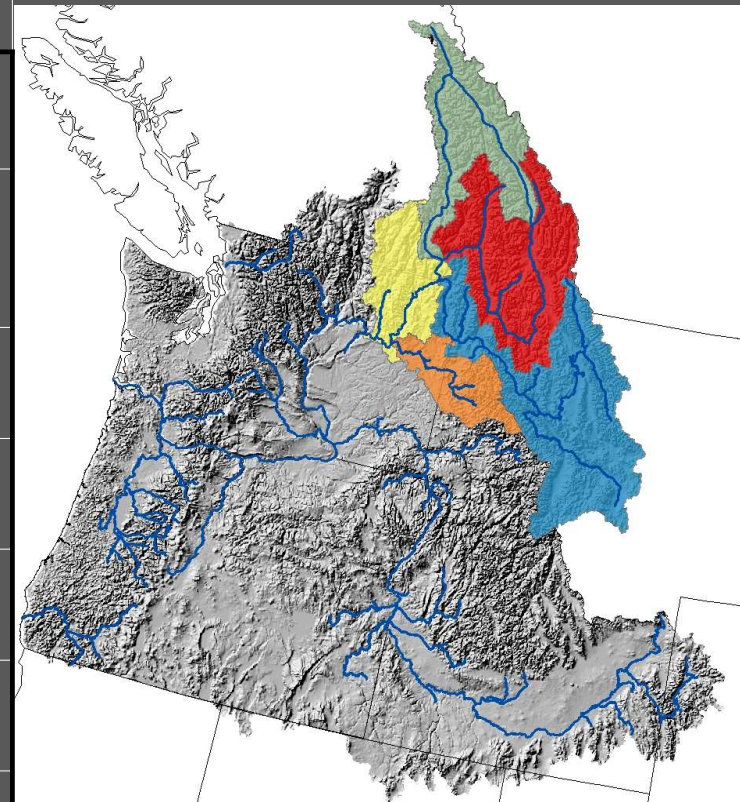


Current Model States-Regional Overview



UPPER COLUMBIA RIVER

Subregion	Model Forcing (WY 2019)		Observed Runoff	Current Model States (6/1)	
	Precip. % Norm	Temp. Departure DegF	April-May % Norm	SWE Avg. Depth (in)	Soil % Norm
Above Arrow Dam	71	-0.6	102	4.7	102
Kootenai	65	-0.6	70	5.4	97
Pend Oreille	80	-1.7	82	4.3	95
Spokane	80	-0.5	96	0.2	91
Above Grand Coulee	72	-0.9	83	4.5	98



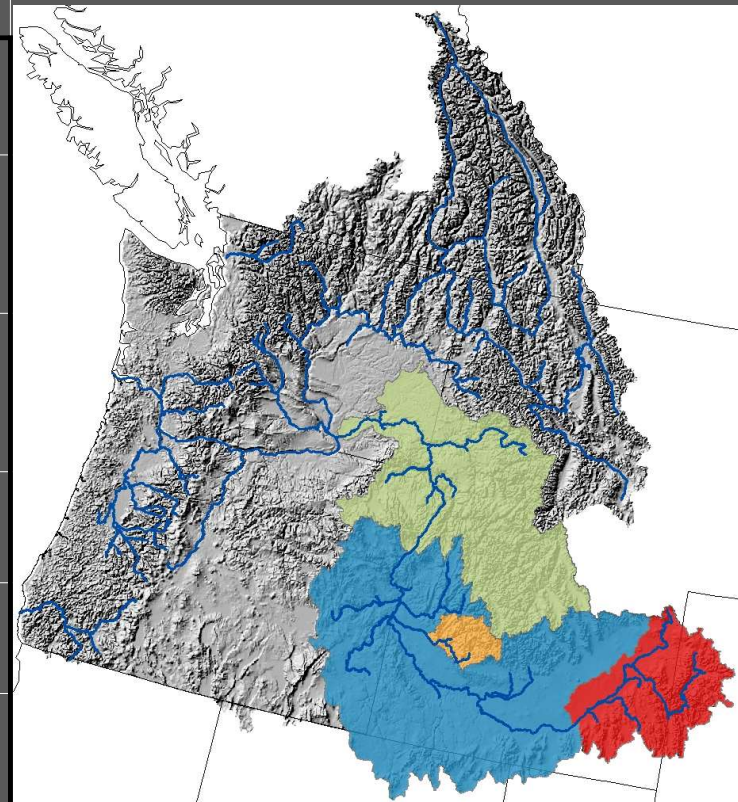


Current Model States-Regional Overview



SNAKE RIVER

Subregion	Model Forcing (WY 2019)		Observed Runoff	Current Model States (6/1)	
	Precip. % Norm	Temp. Departure DegF	April-May % Norm	SWE Avg. Depth (in)	Soil % Norm
Above American Falls Dam	98	-1.3	105	4.8	106
Boise	102	-0.6	142	5.1	109
Above Brownlee Dam	101	-0.7	138	3.8	113
Above Ice Harbor Dam	94	-0.8	144	2.7	110



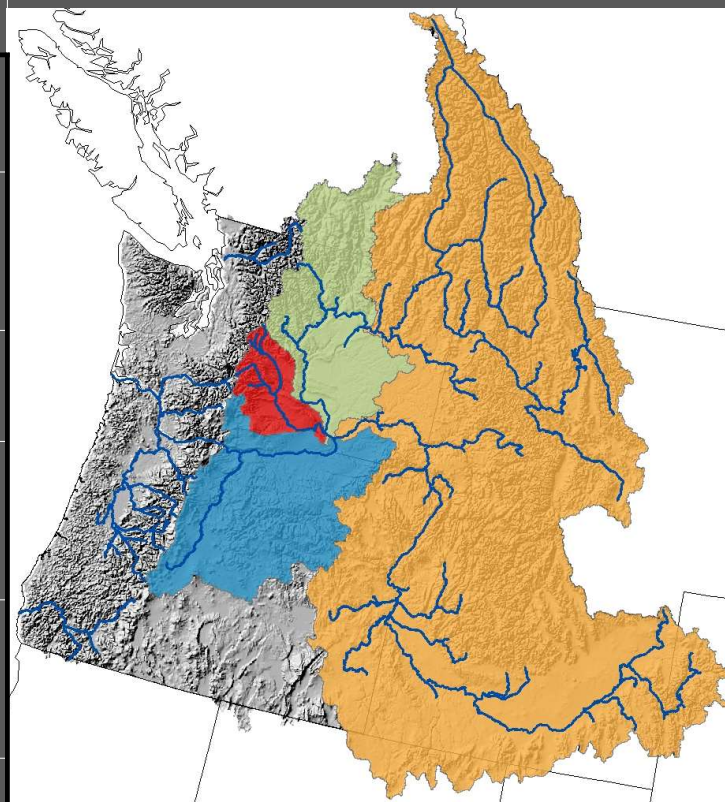


Current Model States-Regional Overview



COLUMBIA RIVER MAINSTEM

Subregion	Model Forcing (WY 2019)		Observed Runoff	Current Model States (6/1)	
	Precip. % Norm	Temp. Departure DegF	April-May % Norm	SWE Avg. Depth (in)	Soil % Norm
Yakima	76	-0.4	109	3.5	96
Upper Mid-Columbia Tribs	66	-0.3	102	3.6	89
Lower Mid-Columbia Tribs	89	-0.7	178	0.2	116
Above The Dalles Dam	82	-0.8	112	3.8	101



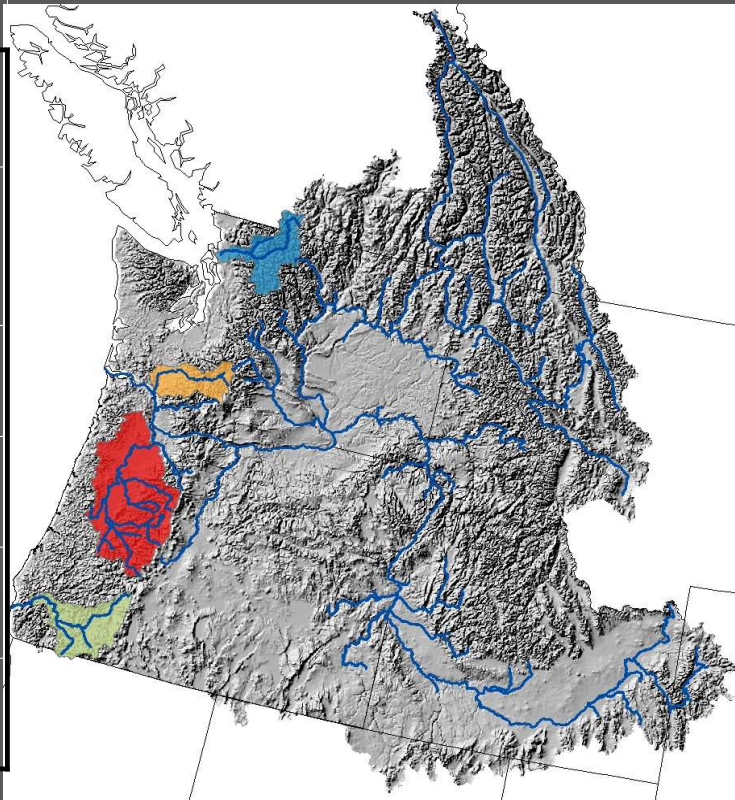


Current Model States-Regional Overview



WESTSIDE

Subregion	Model Forcing (WY 2019)		Observed Runoff	Current Model States (6/1)	
	Precip. % Norm	Temp. Departure DegF	April-May % Norm	SWE Avg. Depth (in)	Soil % Norm
Willamette	82	0.1	142	2.7	79
Rogue	95	-0.1	159	1.2	98
Skagit	75	0.8	106	3.2	93
Cowlitz	68	0.3	98	3.3	81





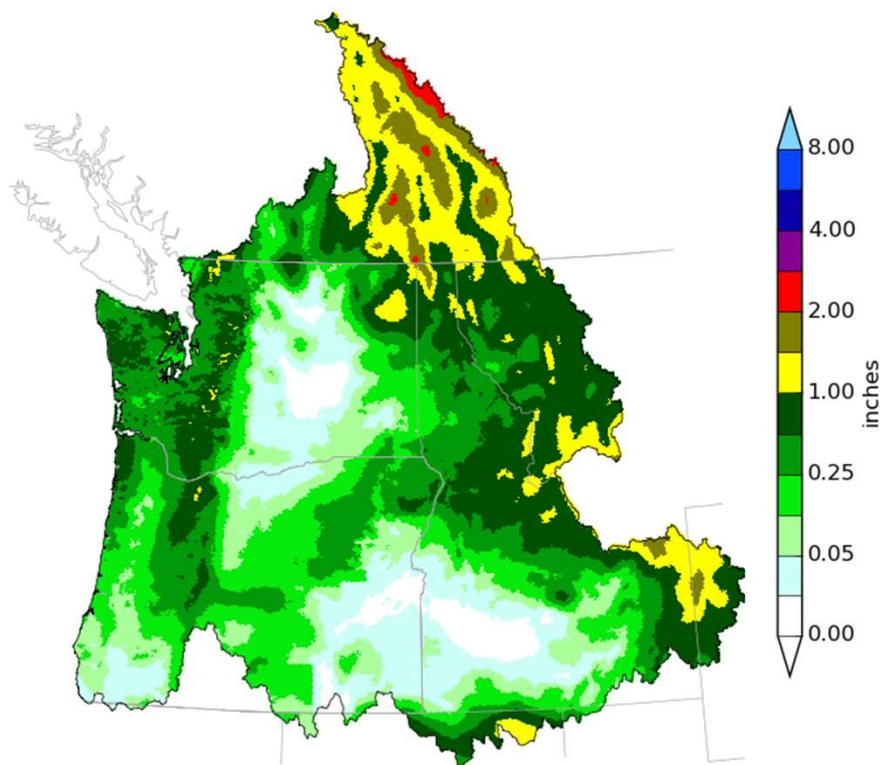
Cumulative 10 Day Precipitation Forecast



June 5-15, 2019



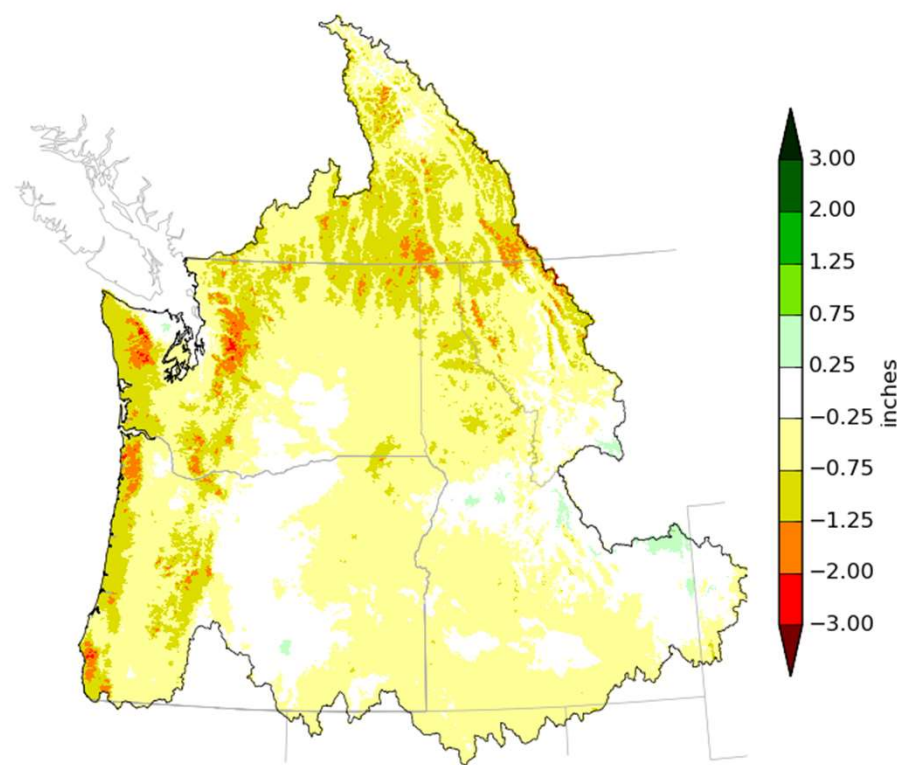
Northwest River Forecast Center
10 Day QPF, Ending 12Z, 06/15/19



Creation Time: Wed Jun 5 14:53:11 UTC 2019



Northwest River Forecast Center
10 Day QPF (Deviation from Climatology), Ending 12Z, 06/13/19



Creation Time: Tue Jun 4 00:18:53 UTC 2019



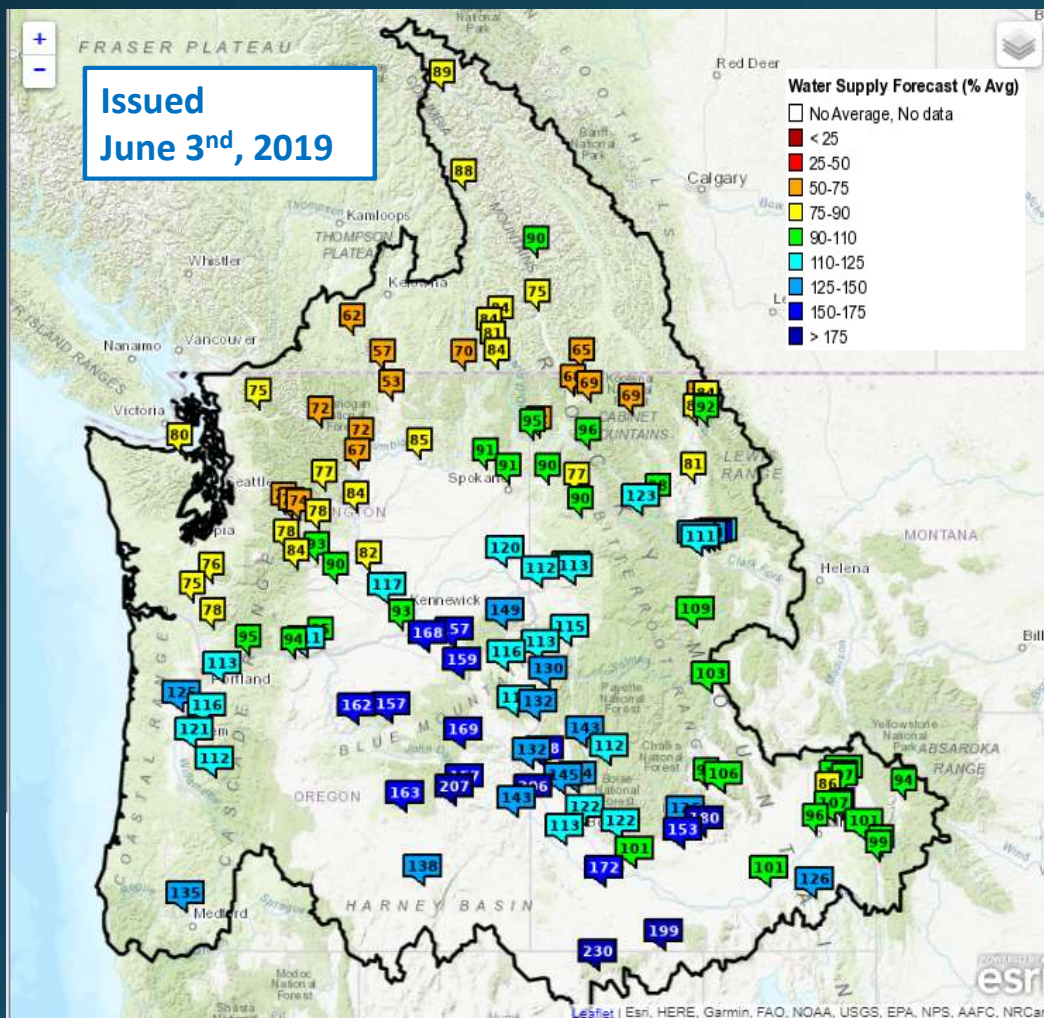
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ESP10 Apr-Sep Water Supply Forecasts



Basins

% (30yr Norm)

Upper Columbia River

Columbia River - Mica Dam	89% (-)
Kootenai River - Libby Dam	69% (-5)
Coeur d'Alene Lake	96% (+2)
SF Flathead River - Hungry Horse Dam	92% (+1)
Pend Oreille R-Albeni Falls Dam	95% (+1)

Snake River

American Falls	101% (-5)
Boise River - Lucky Peak Dam	122% (-1)
NF Clearwater River-Dworshak Dam	100% (+1)
Lower Snake River-Lower Granite Dam	120% (+5)
Lower Columbia - The Dalles Dam	94% (-)
<i>% Change from May 2nd WS Briefing in Parenthesis (--)</i>	



ESP10 Natural Apr-Sep Forecasts

ESP Natural - Western Oregon and Washington



Issued
June 2nd, 2019



Basin	% (30yr Norm)
Skagit River near Concrete	77% (-1)
Green River-Howard Hanson Res	75% (-9)
Cowlitz River-Mossyrock Reservoir	80% (-9)
Willamette River at Salem	117% (-8)
Rogue River-Applegate Reservoir	138% (-7)
<i>% Change from May 2nd WS Briefing in Parenthesis (--)</i>	



Water Supply Forecast Briefing Outline



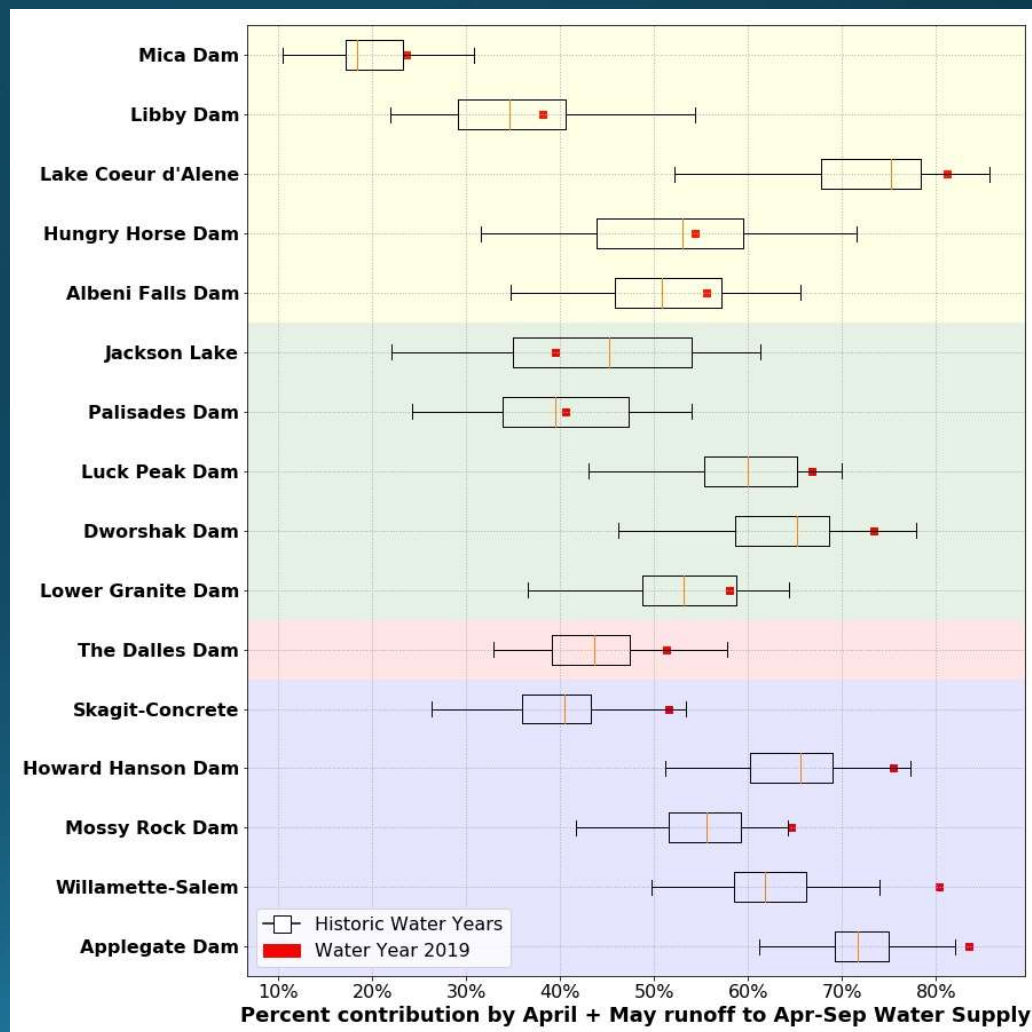
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Apr-Sep Water Supply Forecast Timing



- Analysis of the 2019 WS runoff timing
 - *Larger percentage=bigger contribution from early spring runoff to Apr-Sep WS*
- Box-Whisker Plots provide historic context (POR WY1980-2018)
- Red squares are projected contribution for current water year
 - *Jun-Sep volumes are forecasted*
- Data suggests Apr-Sep 2019 WS runoff is occurring earlier





Summary

Observed conditions for May

- Temperatures were above normal through most of the region
- Precipitation was **below** normal in the north and **above** normal in the Snake River Basin
- Snow and soil moisture are changing rapidly due to the spring melt off

Current water supply forecasts

- During spring melt, %norm of model states not good analog for WS forecasts

Current water supply forecasts

- Little change from May Water Supply Briefing
- Well below normal in North Central WA and Upper Kootenai
- Near normal (94%) at The Dalles

Runoff timing of Apr-Sep Water Supply Forecast

- Runoff timing earlier than normal for most basins

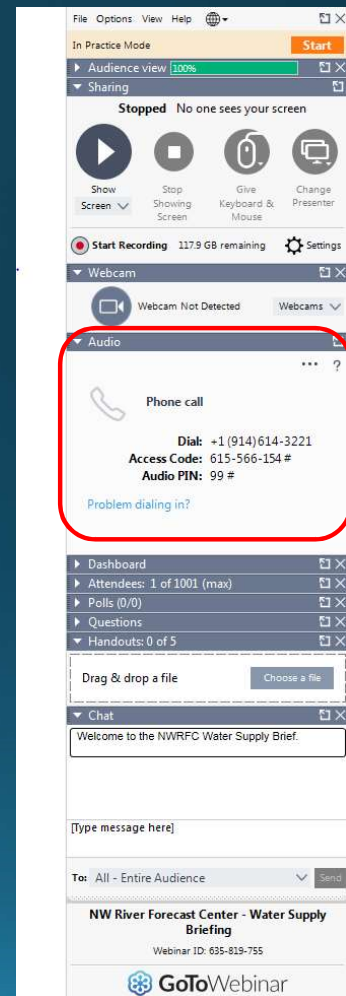


Questions?

In order to ask questions using your phone, you will need to enter the **AUDIO PIN** followed by the **#** sign using your phone keypad. The **AUDIO PIN** was provided when you logged into the webinar.

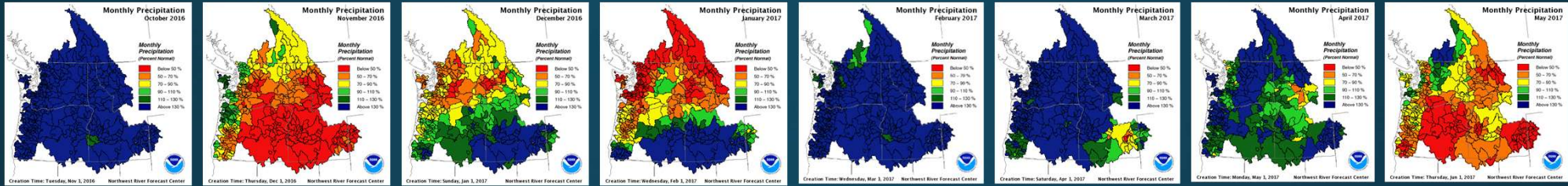
You will be muted until the presenter unmutes you. If you have a question, use the 'Raise Hand' function to let us know to unmute your phone.

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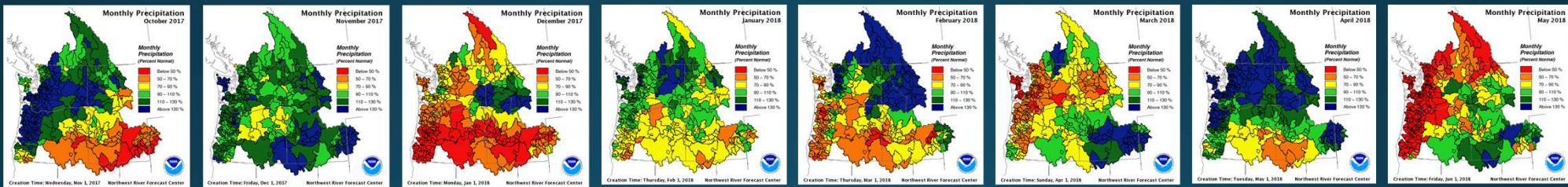


Observed Monthly Precipitation

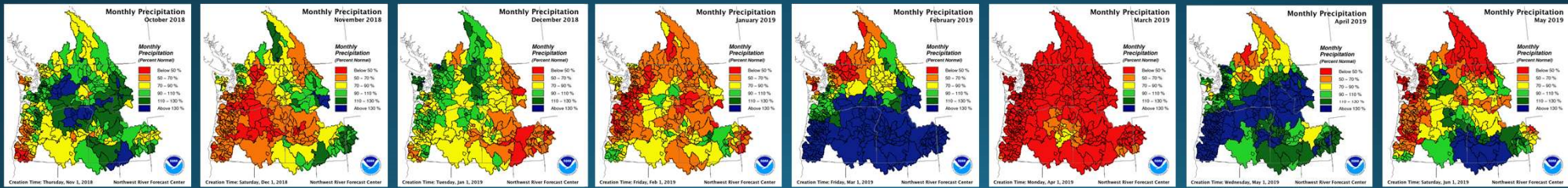
WY2017



WY2018

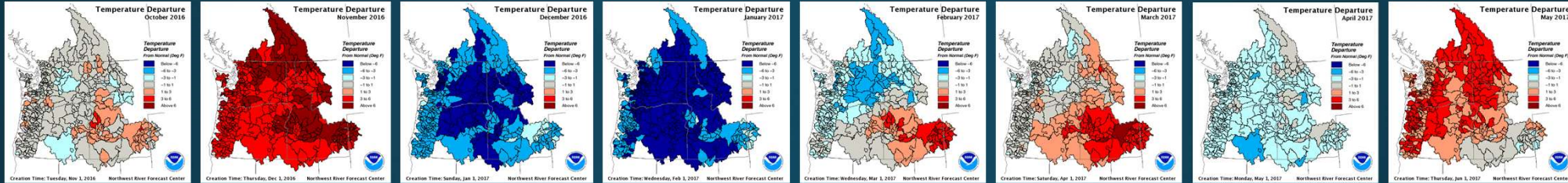


WY2019

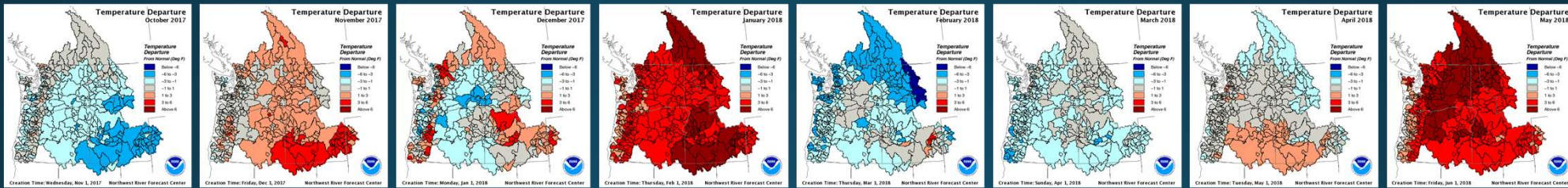


Monthly Temperature Departure from Normal

WY2017



WY2018



WY2019

