



April 2016 Water Supply Briefing

National Weather Service/Northwest River Forecast Center



Telephone Conference : 1-888-819-6075
Pass Code : 79838

2016 Briefing Dates:

April 7 - 10am PST
May 5 - 10am PST

Presentation available after brief at:

www.nwrfc.noaa.gov/presentations/presentations.cgi

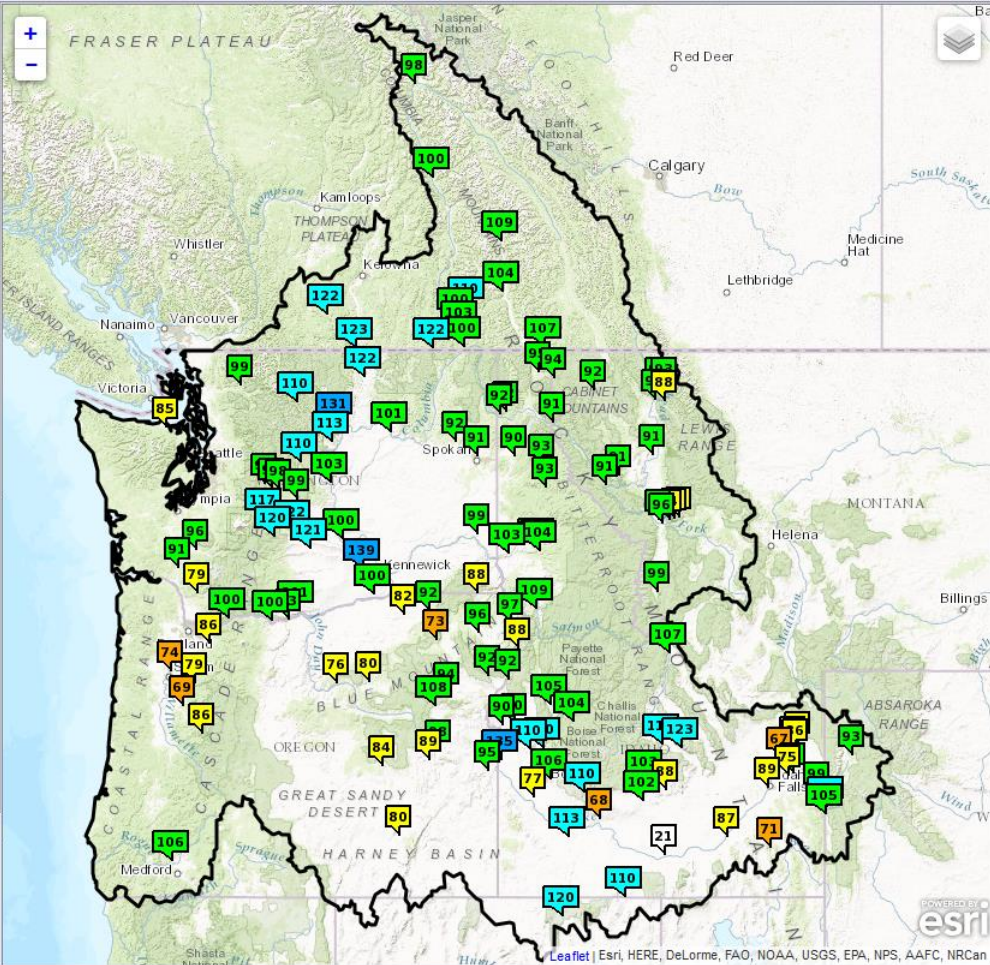
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(503)326-7291



Northwest River Forecast Center Water Supply Forecasts



River and Hydrology	Water Supply	Observations	Weather Forecasts	Climate	NWRFC
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- **ESP: Ensemble Streamflow Prediction**
- Official ESP water supply products include:
 - 10 days of quantitative precipitation forecast (QPF)
 - 10 days of quantitative temperature forecast (QTF)
 - Historical climate forcings appended thereafter
- NWRFC also offers 5 and 0 day QPF/QTF products
- Forecasts are updated daily
- Forecasts are compared to 30 year observed runoff normals (1981-2010)



Water Supply Forecast Briefing Outline



- **Observed Conditions WY2016:**

- Precipitation
- Temperature
- Snowpack
- Runoff

Hydrologic
model states

- **Future Conditions:**

- 10 days of quantitative forecast precipitation (QPF)
- 10 days of quantitative forecast temperature (QTF)
- Historical climate forcings appended thereafter
- Climate Outlook

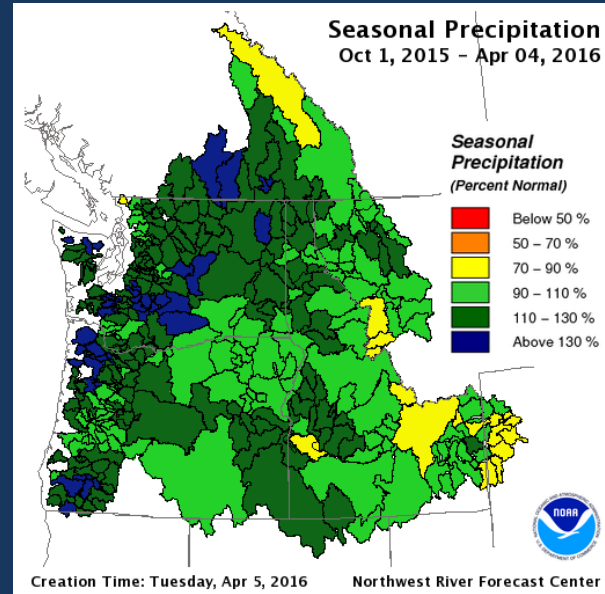
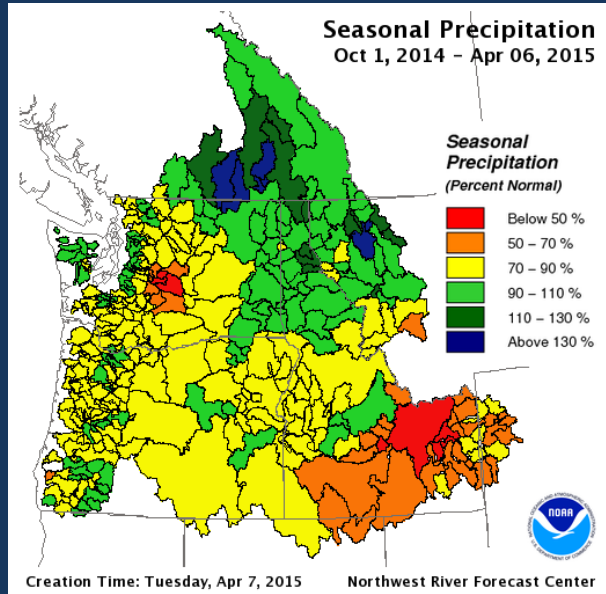
- **Summary**

Climate
Forcings



Observed Seasonal Precipitation

www.nwrfc.noaa.gov/water_supply/wy_summary



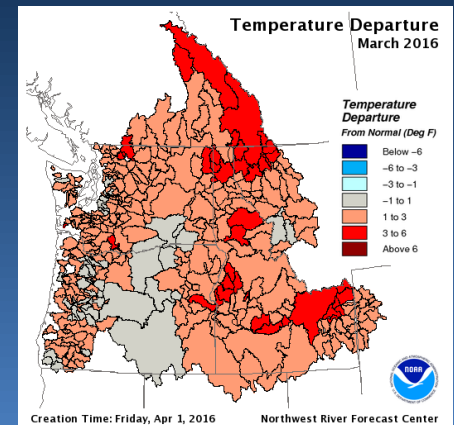
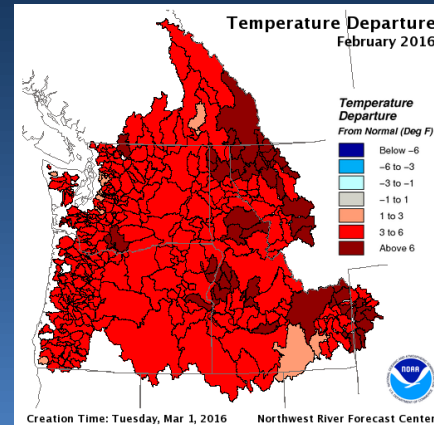
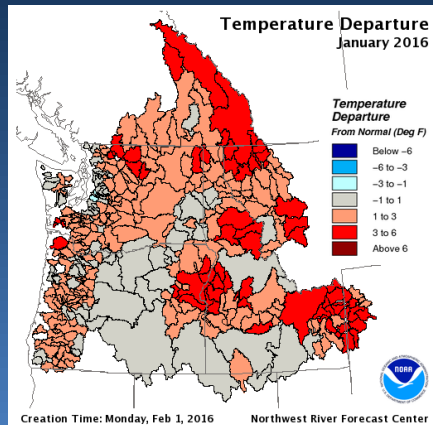
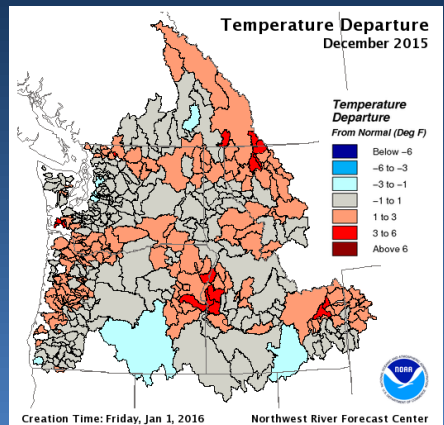
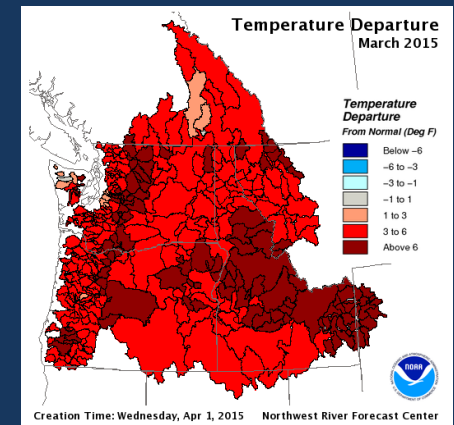
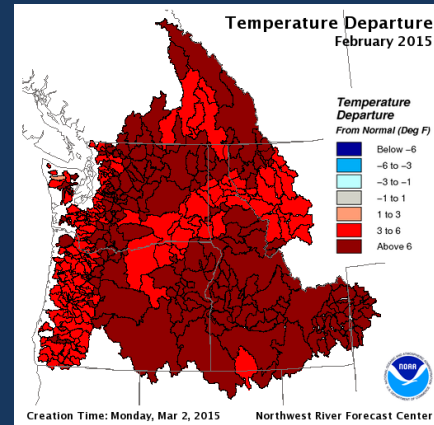
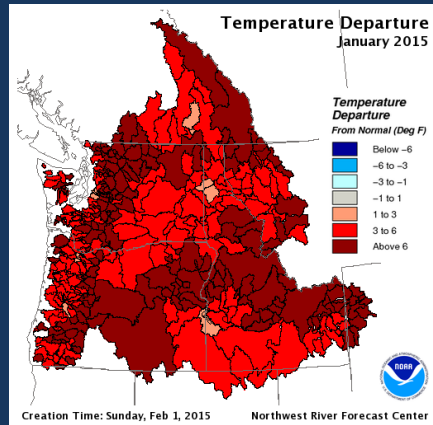
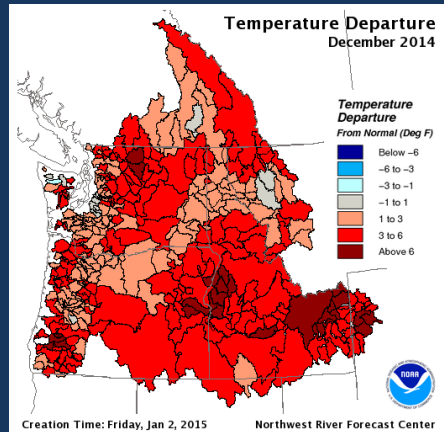
DIVISION NAME	WY 2015 % NORM	WY 2016 % NORM	WY 2016 OBS(in)
Columbia River Basin above Grand Coulee Dam	109	107	24.8
Snake River Basin above Ice Harbor Dam	80	103	14.6
Middle Columbia Lower Tributaries	82	111	18.3
Columbia River Basin above The Dalles Dam	88	108	18.9
*Western Washington	81	118	82.1
*Western Oregon	77	118	61.4
*Average of contributing divisions			



Observed Temperature Departures



Water Year 2015 / 2016 comparison



Observed Snowpack Conditions

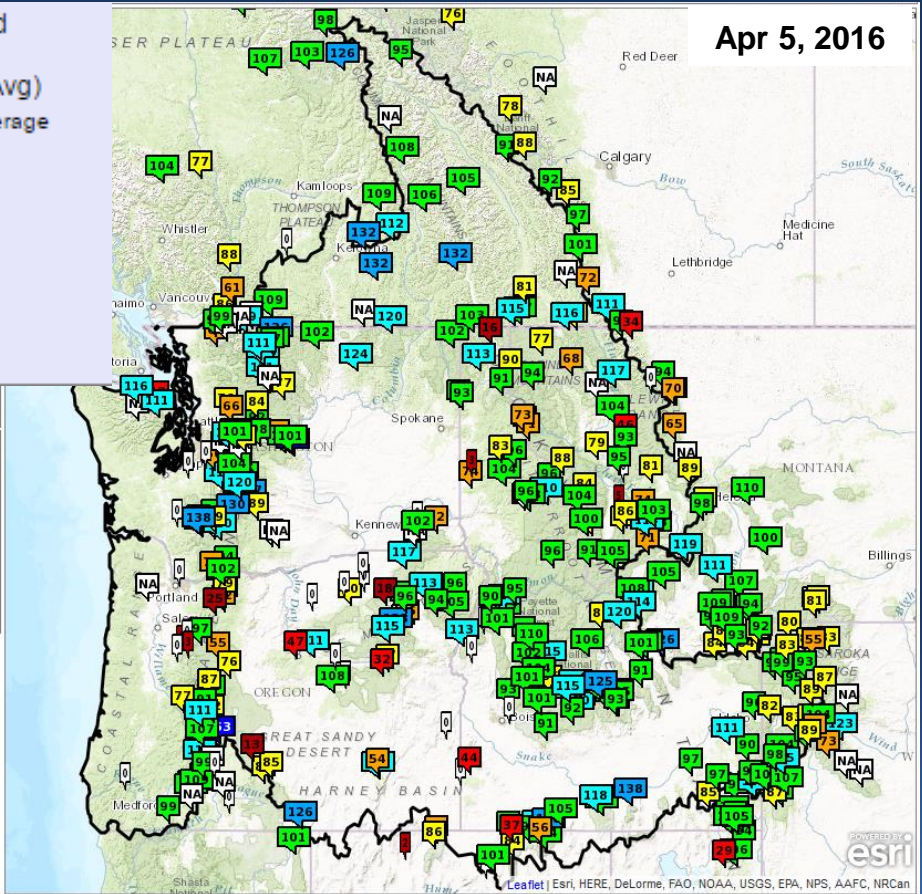
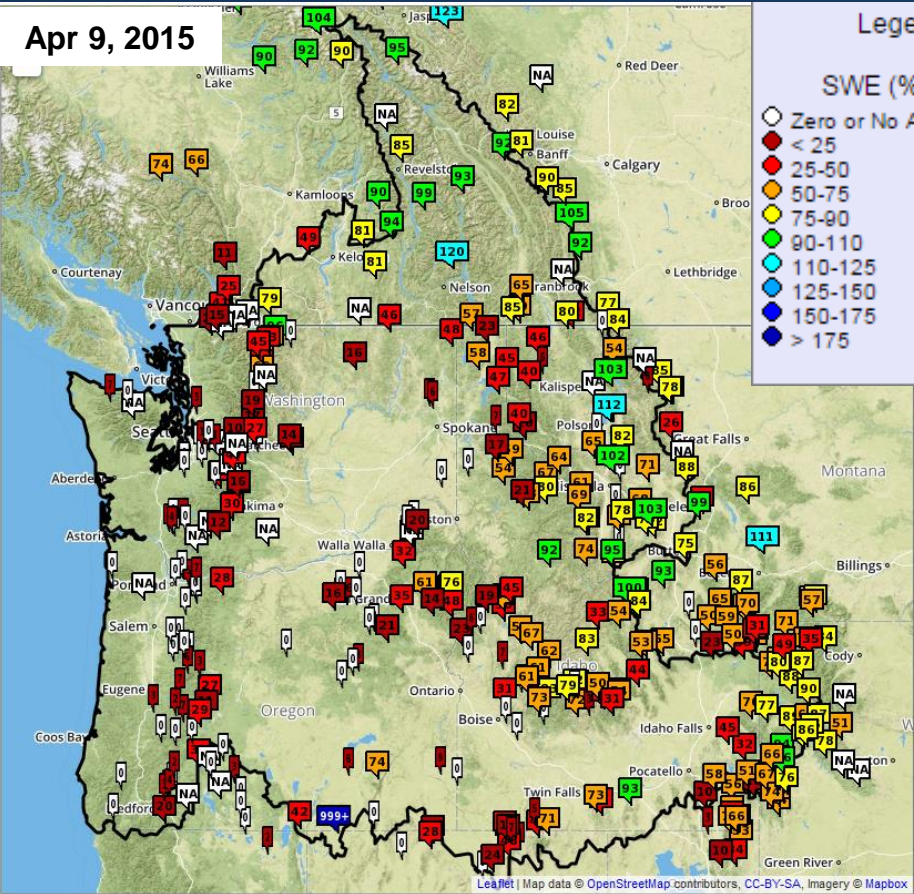
Apr 9, 2015

Apr 5, 2016

Legend

SWE (% Avg)

- Zero or No Average
- < 25
- 25-50
- 50-75
- 75-90
- 90-110
- 110-125
- 125-150
- 150-175
- > 175



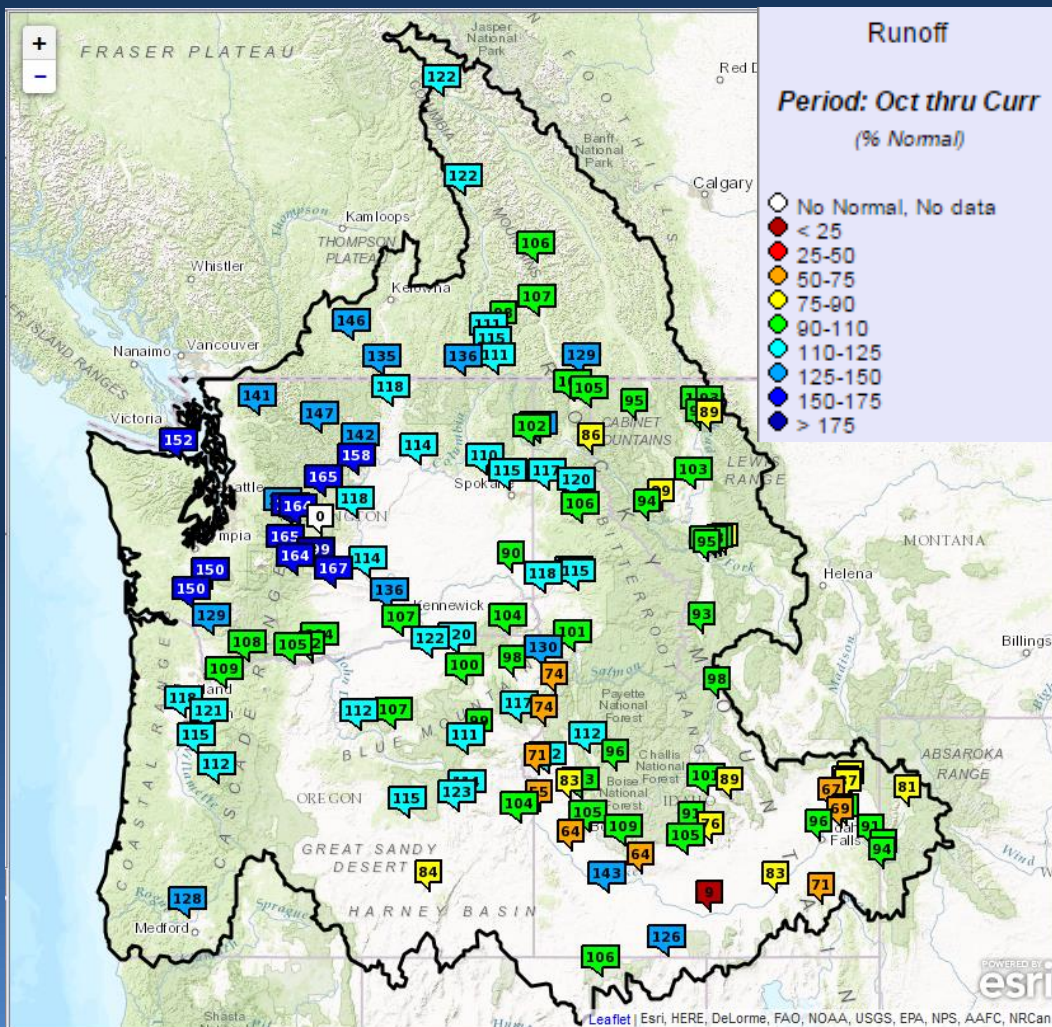
- Observed snow water equivalent (SWE) values provided by:
 - Natural Resources Conservation Service (NRCS) SNOTEL network
 - Environment Canada (EC) Automated Snow Pillow network

www.nwrfc.noaa.gov/snow



Current Observed Runoff Conditions

Adjusted for upstream storage



Percent of Normal

Oct 1– Apr 4

UPPER COLUMBIA BASIN

MICA	122
DUNCAN	106
QUEENS BAY	107
LIBBY	95
HUNGRY HORSE	89
GRAND COULEE	114

SNAKE RIVER BASIN

JACKSON LAKE	81
PALISADES	91
DWORSHAK	116
LOWER GRANITE	90

LOWER COLUMBIA BASIN

THE DALLES	105
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Water Supply Forecast Briefing Outline



- **Observed Conditions WY2016:**

- Precipitation
- Temperature
- Snowpack
- Runoff

Hydrologic
model states

- **Future Conditions:**

- 10 days of quantitative forecast precipitation (QPF)
- 10 days of quantitative forecast temperature (QTF)
- Historical climate forcings appended thereafter
- Climate Outlook

Climate
Forcings

- **Summary**



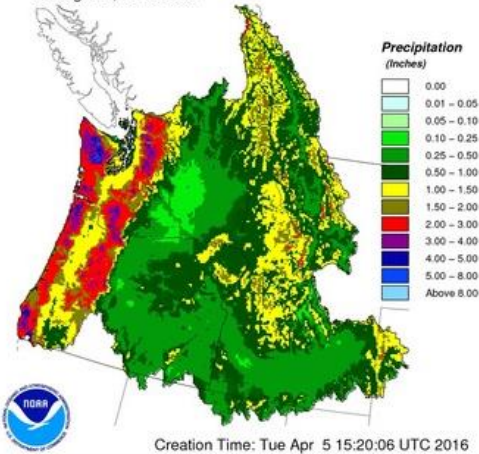
Short-Range Weather Forecasts

www.nwrfc.noaa.gov/water_supply/wy_summary



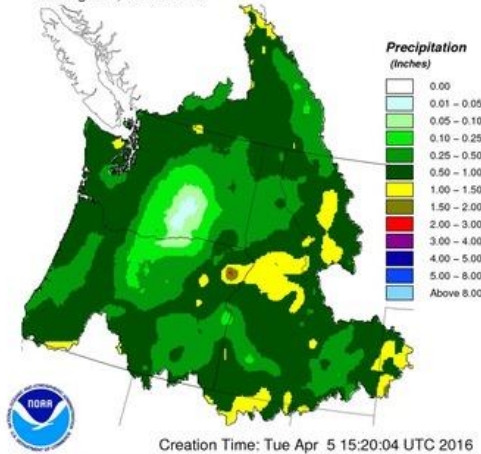
10 Day Forecast Precipitation: Volume Analysis

10 Day Precipitation Climatology
Ending 12Z, 04/15/2016



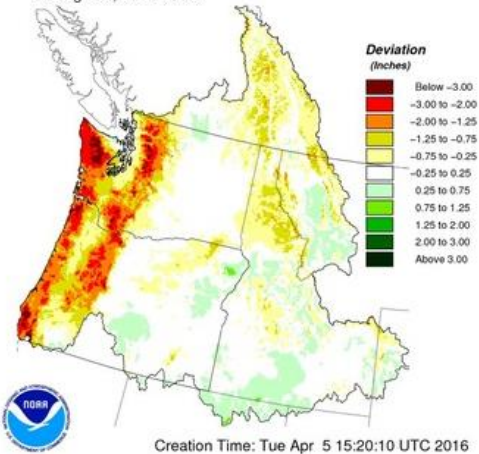
Creation Time: Tue Apr 5 15:20:06 UTC 2016

10 Day QPF
Ending 12Z, 04/15/2016



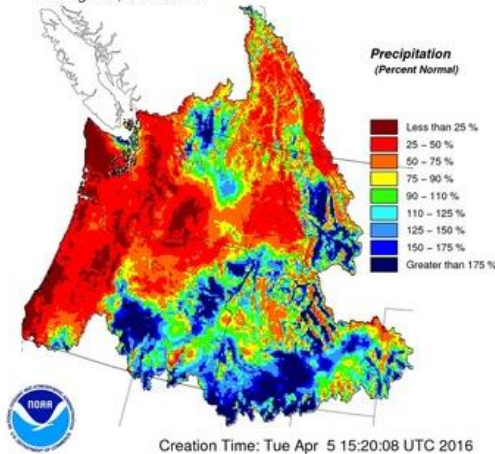
Creation Time: Tue Apr 5 15:20:04 UTC 2016

10 Day QPF (Deviation from Climatology)
Ending 12Z, 04/15/2016



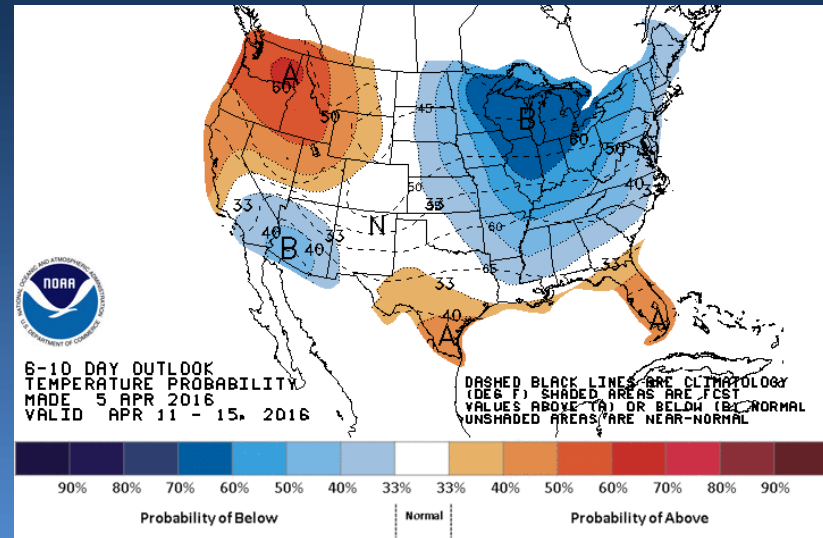
Creation Time: Tue Apr 5 15:20:10 UTC 2016

10 Day QPF (Percent of Climatology)
Ending 12Z, 04/15/2016



Creation Time: Tue Apr 5 15:20:08 UTC 2016

- Relatively dry conditions forecast over Cascades and Upper Columbia, wet conditions over Upper and Middle Snake area
- Increased chances of above normal temperatures across most of Pac NW in the 6 – 10 day outlook



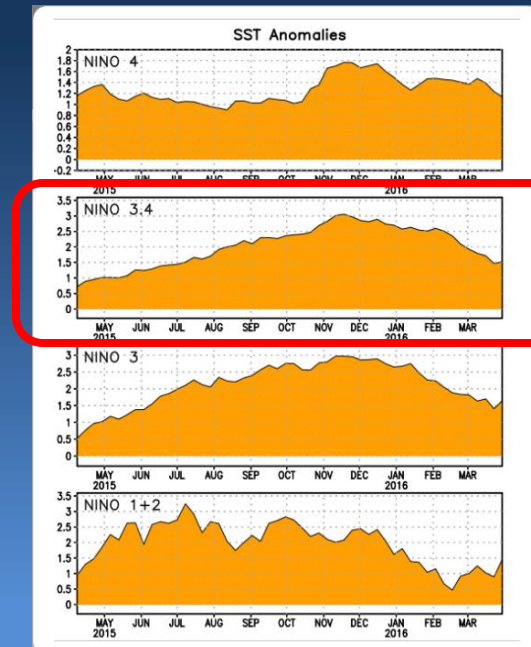
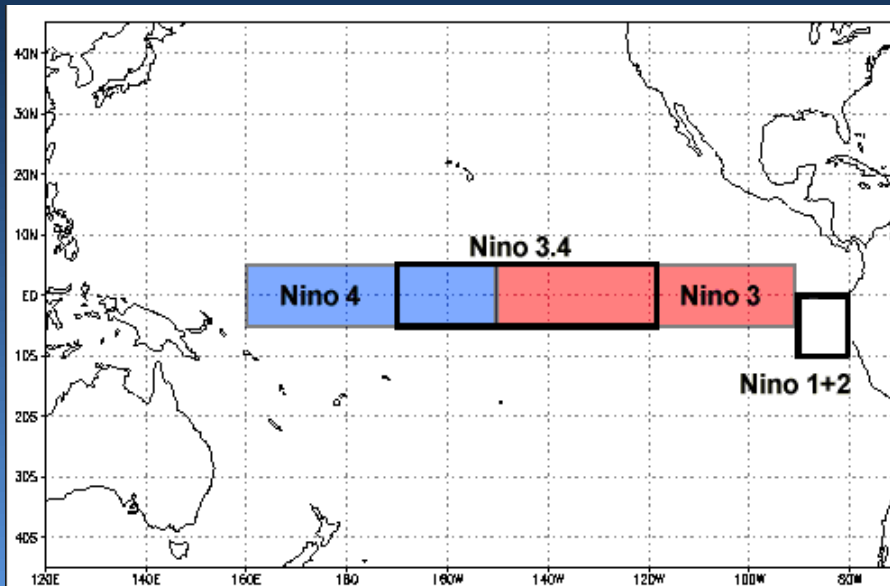
10 day cumulative QPF Apr 5-15 12Z

www.cpc.ncep.noaa.gov

Current ENSO Discussion

ENSO Alert Status: El Nino Advisory

- Positive equatorial sea surface temperature (SST) anomalies continue to weaken across most of the Pacific Ocean
- Transition to ENSO neutral is likely during Northern Hemisphere spring with possible transition to La Nina conditions during the fall





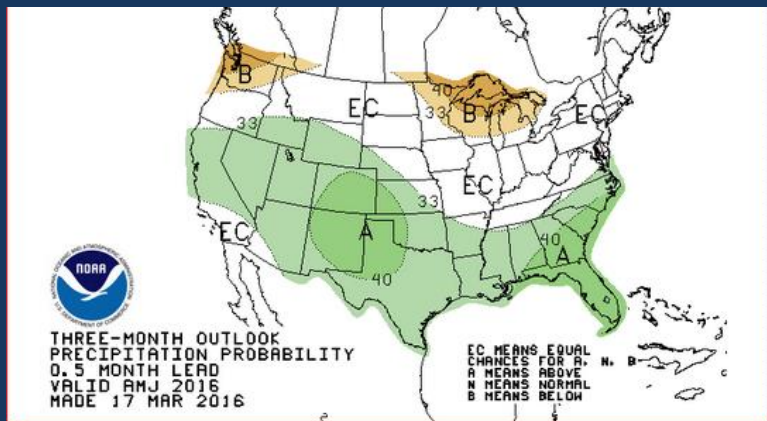
Climate Outlook

www.cpc.ncep.noaa.gov

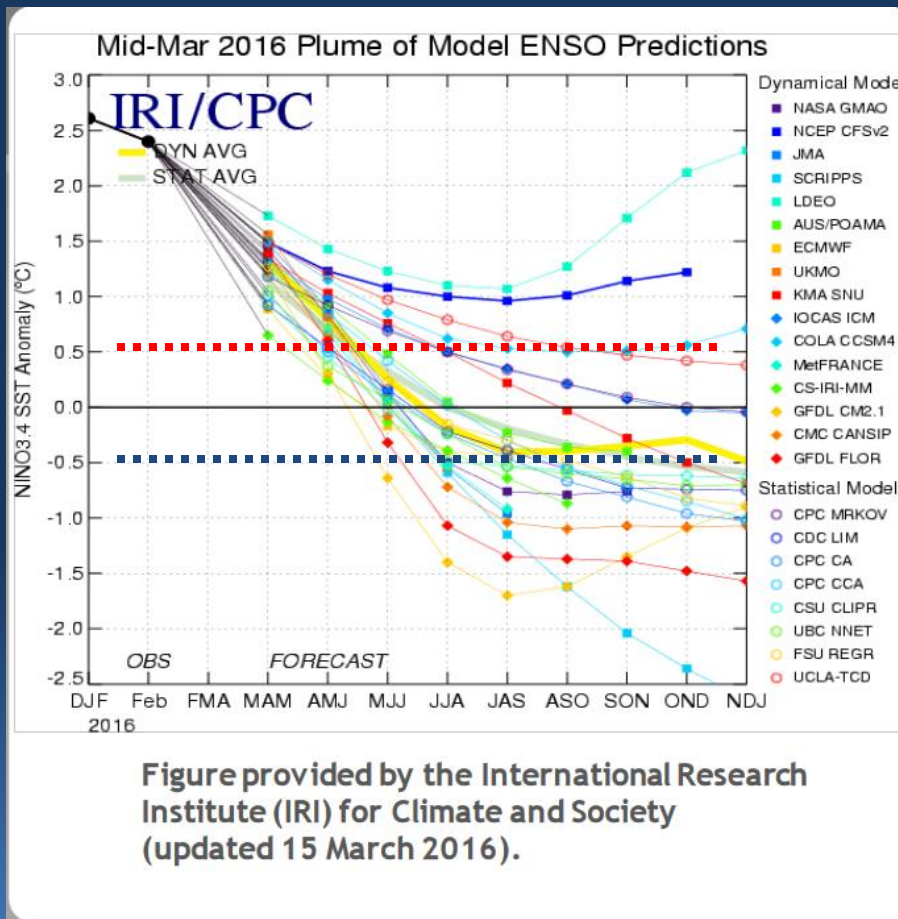
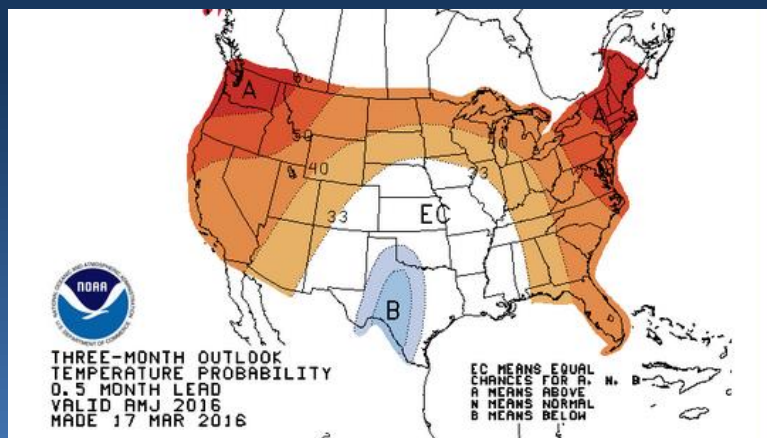


Three Month Outlook

Precipitation



Temperature



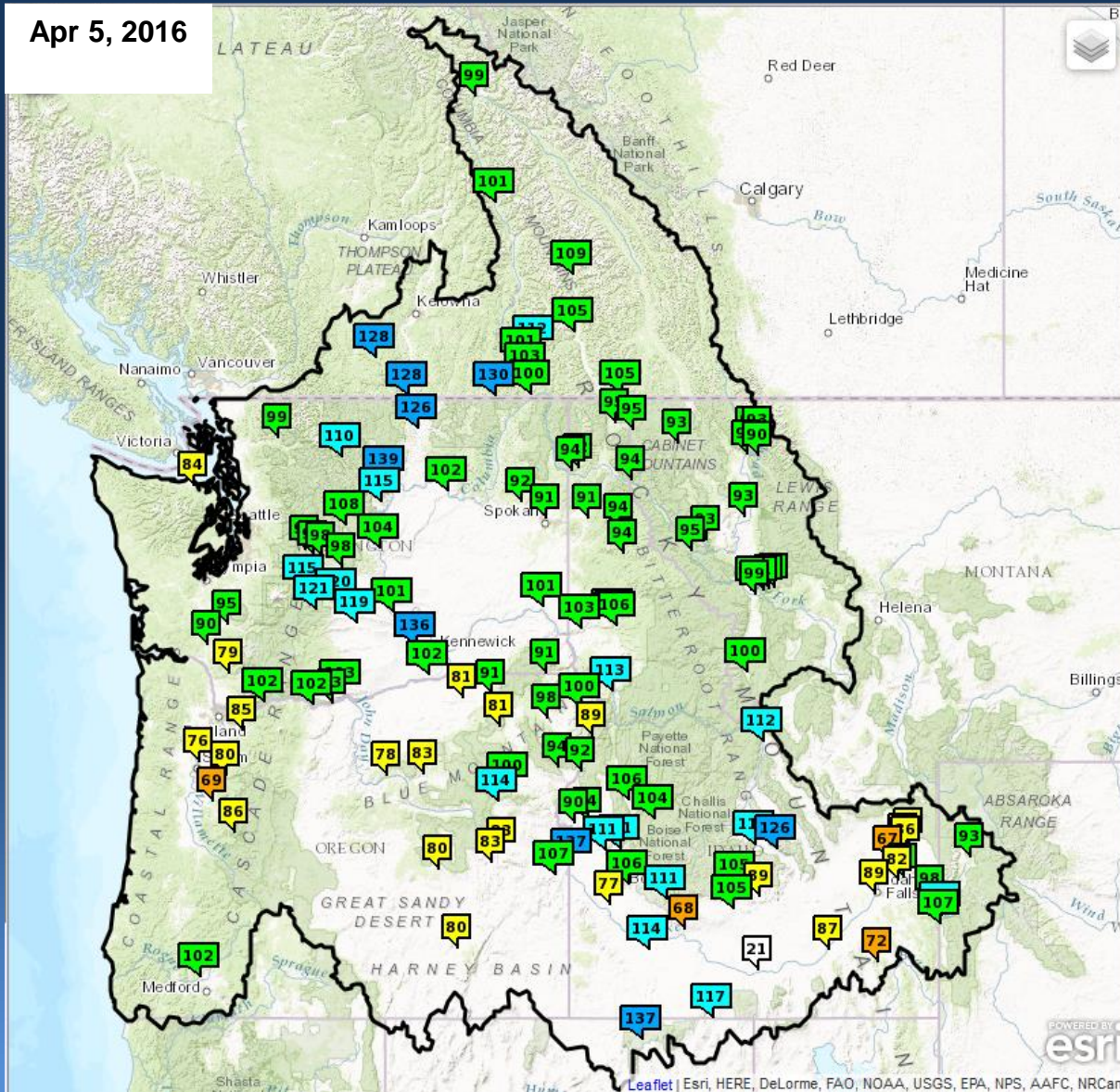
- Increased probability that warm temperatures will continue
- Slightly increased probability of above normal precip in Snake River Basin, below normal to the north
- Most models suggest transition to ENSO-neutral by MJJ with possibility of La Nina conditions during Northern Hemisphere fall



Official Apr-Sep Water Supply Forecasts



Apr 5, 2016



EAST-SIDE LOCATION

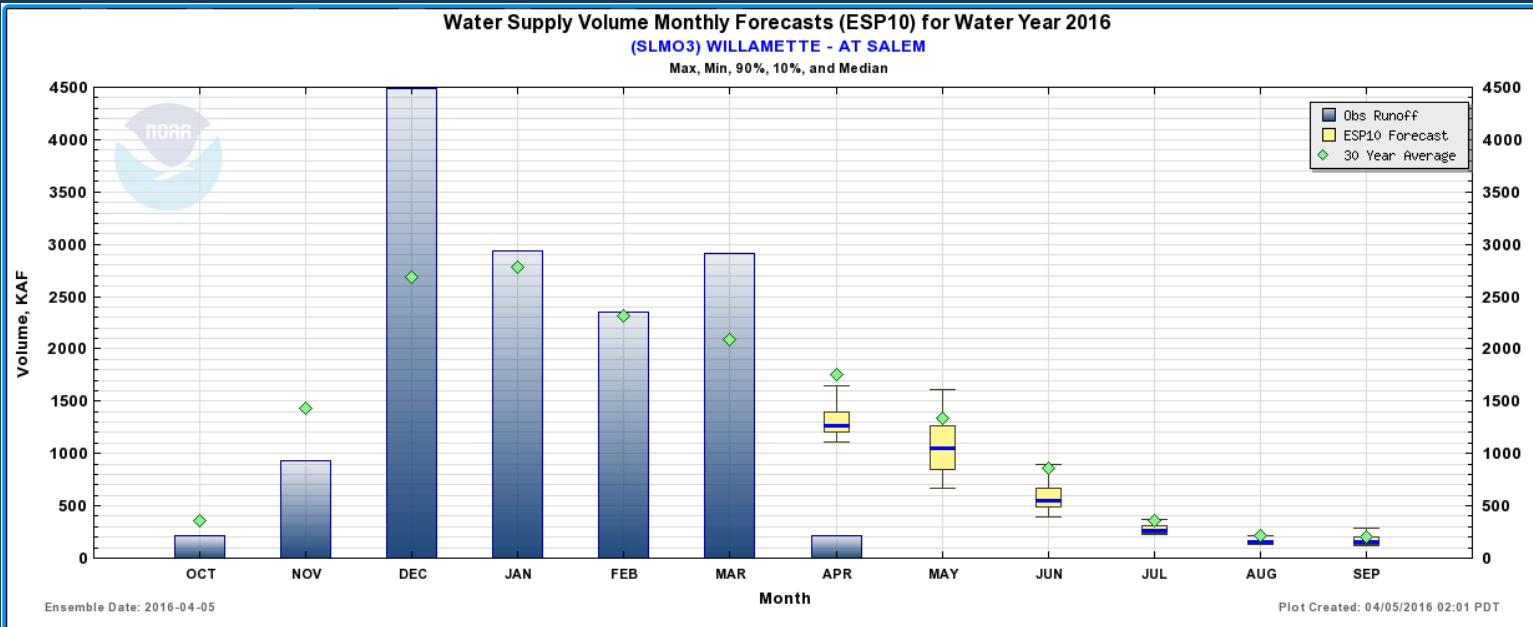
APR – SEP % NORM

Columbia River – Mica Dam	99
Kootenai River – Libby Dam	93
Flathead River– Hungry Horse Dam	90
Spokane River – Coeur D Alene Lake	91
Columbia River – Grand Coulee Dam	<u>102</u>
Snake River – Near Irwin	98
Snake River – American Falls	87
Clearwater River – Dworshak Dam	101
Snake River – Lower Granite Dam	<u>101</u>
Columbia River – The Dalles Dam	<u>102</u>

POWERED BY
esri



Water Supply Volume Monthly Forecasts



WILLAMETTE - AT SALEM
Forecasts For Water Year 2016

ESP Monthly Water Supply Forecast
 10 days QPF: Ensemble: **2016-04-05** Issued: 2016-04-05

Forecast Period	Forecasts Are in KAF				Obs Runoff (2016-04-05)	30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %		
OCT					217	363
NOV					937	1432
DEC					4485	2680
JAN					2931	2787
FEB					2354	2317
MAR					2912	2086
APR	1107	1264	72	1648	218*	1750
MAY	667	1050	79	1616		1337
JUN	399	552	64	898		861
JUL	229	261	73	370		358
AUG	126	155	71	217		219
SEP	119	152	75	288		203

Move the mouse over the desired "Forecast Table" to update graph.
 * Partial Monthly Total

[CSV Download](#)
 [ESP10](#)
 [Forecast Ensemble](#)

WILLAMETTE - AT SALEM
Forecasts For Water Year 2016

ESP Monthly Water Supply Forecast
 5 days QPF: Ensemble: 2016-04-05 Issued: 2016-04-05

Forecast Period	Forecasts Are in KAF				Obs Runoff (2016-04-05)	30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %		
OCT					217	363
NOV					937	1432
DEC					4485	2680
JAN					2931	2787
FEB					2354	2317
MAR					2912	2086
APR	1162	1347	77	1804	218*	1750
MAY	688	1066	80	1671		1337
JUN	406	557	65	888		861
JUL	231	264	74	380		358
AUG	127	158	72	220		219
SEP	119	150	74	289		203

Move the mouse over the desired "Forecast Table" to update graph.
 * Partial Monthly Total

[CSV Download](#)
 [ESP5](#)
 [Forecast Ensemble](#)

WILLAMETTE - AT SALEM
Forecasts For Water Year 2016

ESP Monthly Water Supply Forecast
 0 days QPF: Ensemble: 2016-04-05 Issued: 2016-04-05

Forecast Period	Forecasts Are in KAF				Obs Runoff (2016-04-05)	30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %		
OCT					217	363
NOV					937	1432
DEC					4485	2680
JAN					2931	2787
FEB					2354	2317
MAR					2912	2086
APR	1184	1580	90	2190	218*	1750
MAY	736	1085	81	1821		1337
JUN	432	586	68	900		861
JUL	240	279	78	407		358
AUG	133	164	75	226		219
SEP	126	154	76	302		203

Move the mouse over the desired "Forecast Table" to update graph.
 * Partial Monthly Total

[CSV Download](#)
 [ESP0](#)
 [Forecast Ensemble](#)



Water Supply Forecast Comparison AprSep 2015 – AprSep 2016



Apr 9, 2015

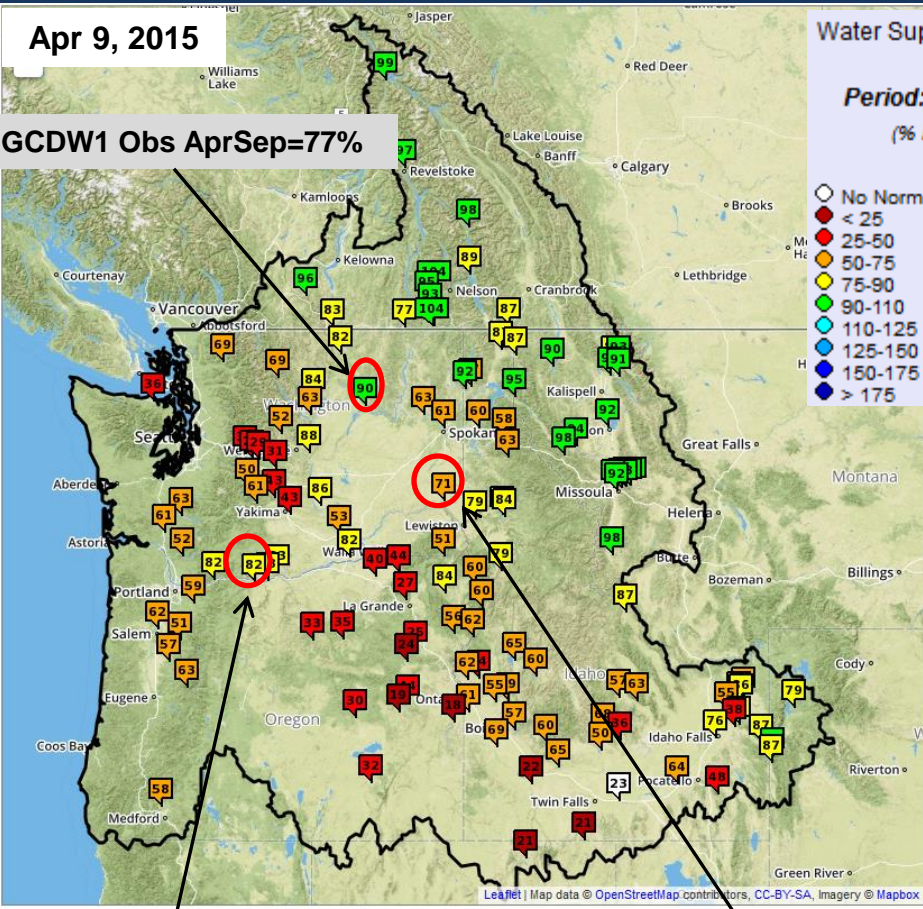
Water Supply Forecast

Apr 5, 2016

Period: APR-SEP
(% Normal)

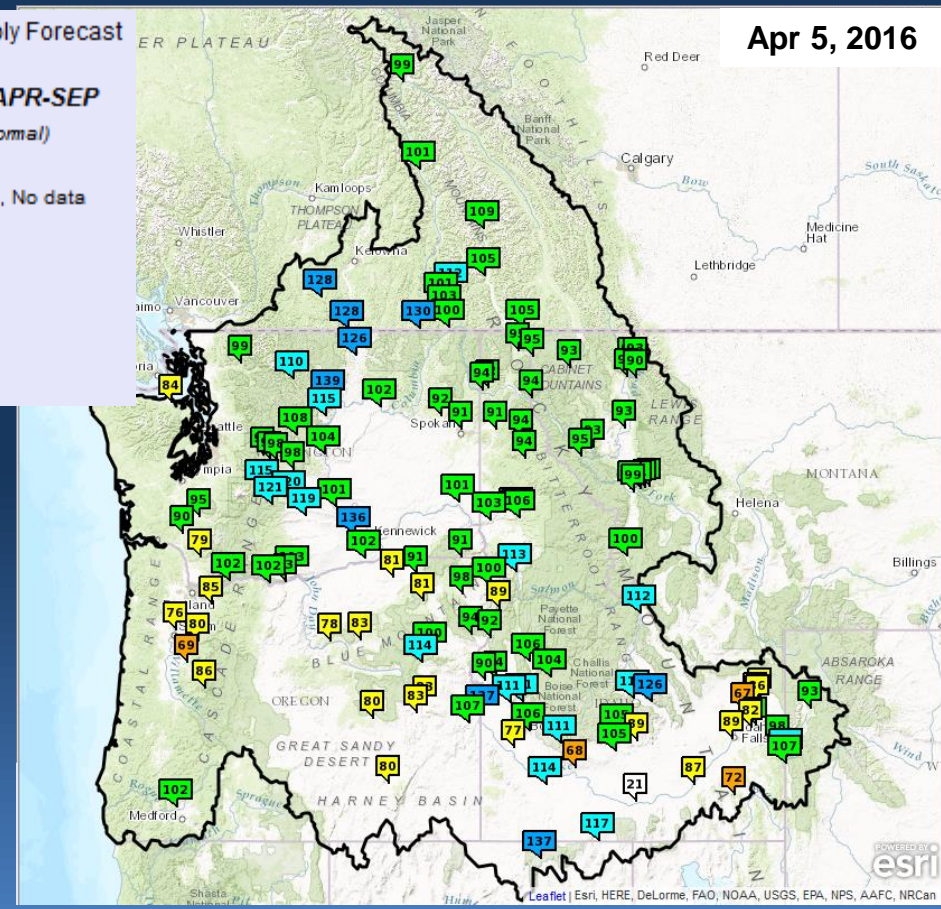
- No Normal, No data
- < 25
- 25-50
- 50-75
- 75-90
- 90-110
- 110-125
- 125-150
- 150-175
- > 175

GCDW1 Obs AprSep=77%



TDAO3 Obs AprSep=69%

LGDW1 Obs AprSep=56%



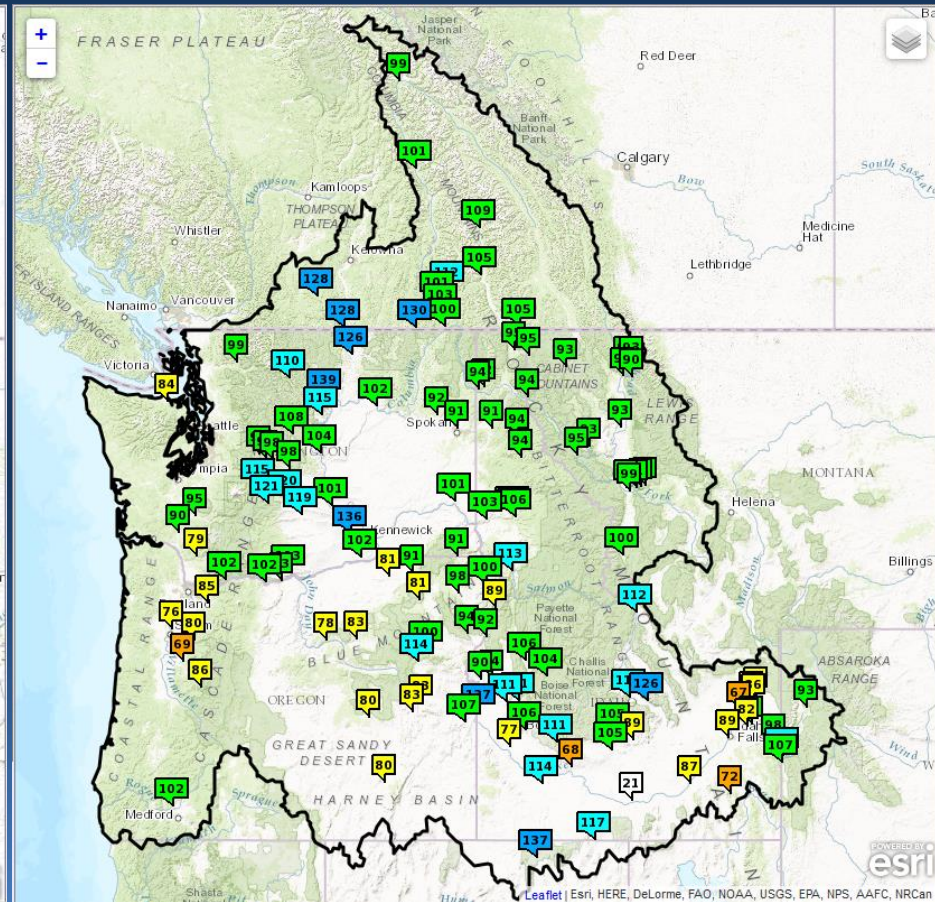
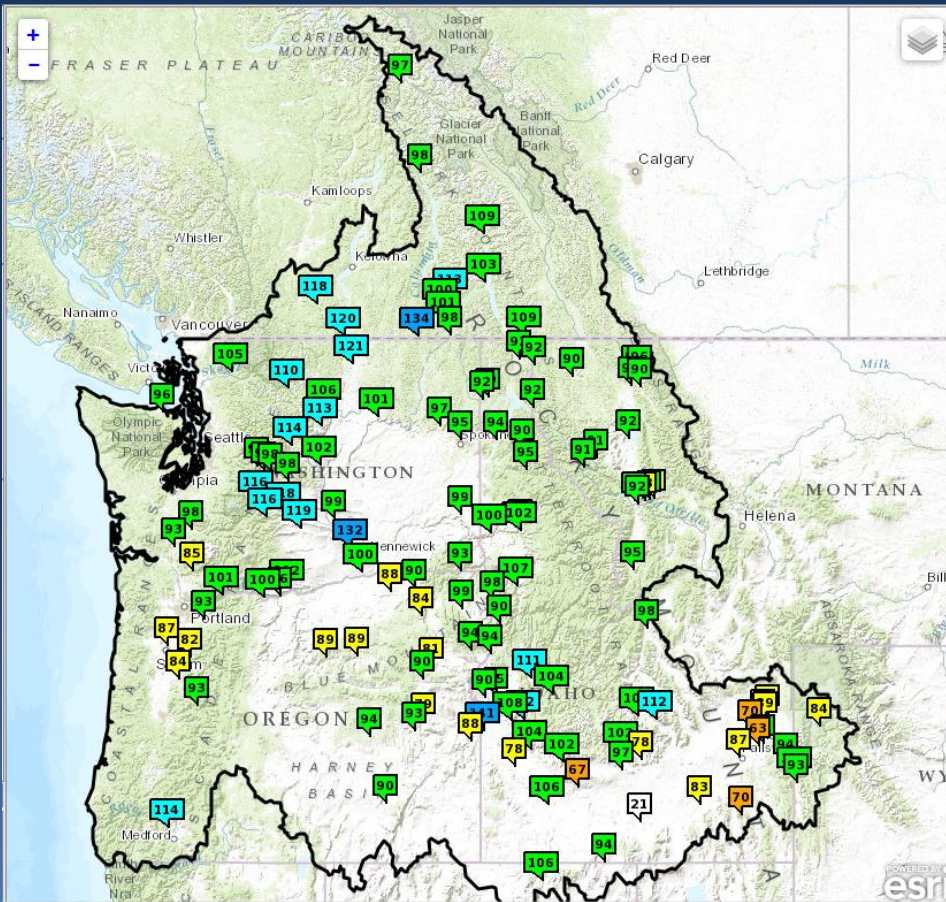


Water Supply Forecast Comparison



Apr-Sep Forecast issued Mar 2, 2016

Apr-Sep Forecast issued Apr 5, 2016





Columbia/Snake River Basins Water Supply Summary



- **Observed Precipitation WY 2016**
 - Above normal Upper Columbia, Snake River Basin
 - Well above normal for Washington/Oregon Cascades
- **Observed Temperatures**
 - Above normal Dec-Mar, especially Feb
- **Snowpack**
 - Below normal areas in:
 - SW Wyoming
 - Western Montana/Northern Idaho
 - Oregon Cascades
- **Extended Climate Outlook**
 - Increased probability that warm temperatures will continue
 - Slightly increased probability of above normal precip in Snake River Basin
 - Most models suggest transition to ENSO-neutral by MJJ with possibility of La Nina conditions during Northern Hemisphere fall
- **Water Supply Forecast**
 - Overall near normal conditions throughout basin



NWRFC Water Supply Webpage

http://www.nwrfc.noaa.gov/water_supply/ws_schd.cgi?version=20160107v1



2016 Schedule for <i>Live Water Supply Briefings</i>					
Jan	Feb	Mar	Apr	May	Jun
7	4	3	7	5	TBD
<i>All presentations held at 10am PDT/PST, unless noted otherwise</i>					
Click here for Registration Information					

<http://www.nwrfc.noaa.gov/presentations/presentations.cgi>

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Northwest River Forecast Center Water Supply Forecasts



River and Hydrology

Water Supply

Observations

Weather Forecasts

Climate

NWRFC

www.nwrfc.noaa.gov

Questions?

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Snowpack Density

