



May 2016 Water Supply Briefing

National Weather Service/Northwest River Forecast Center



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

2016 Briefing Dates:

May 5 - 10am PST

Presentation available after brief at:

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

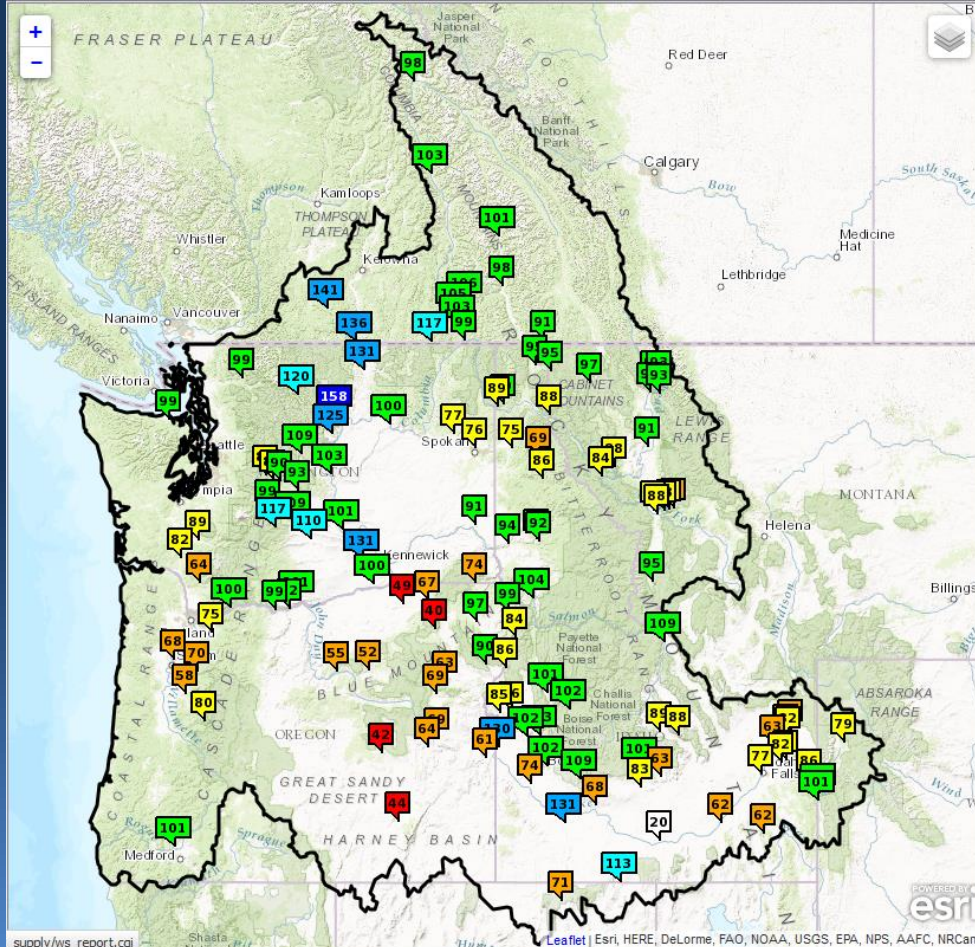
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(503)326-7291



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

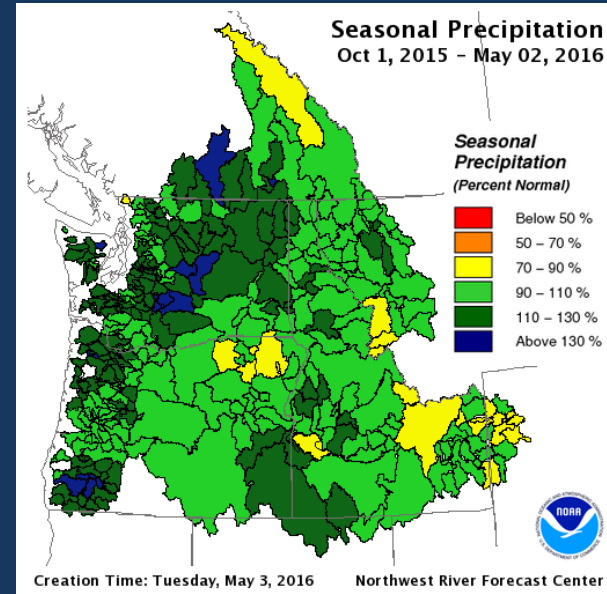
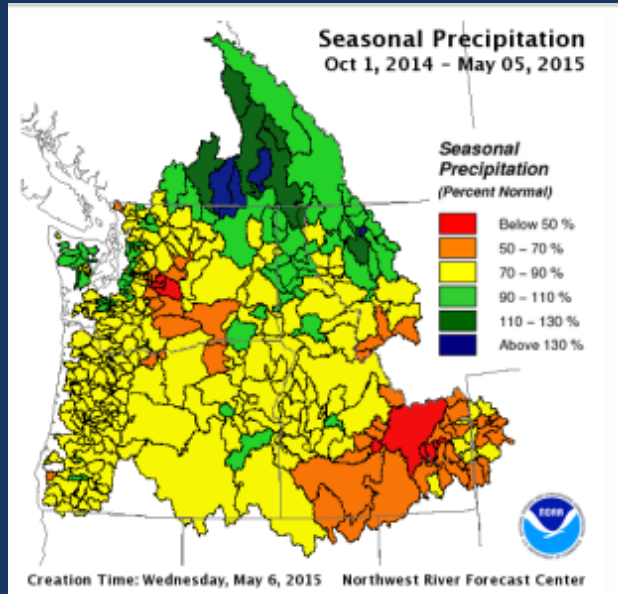
Climate
Forcings

- **Summary**



Observed Water Year Precipitation

www.nwrfc.noaa.gov/water_supply/wy_summary



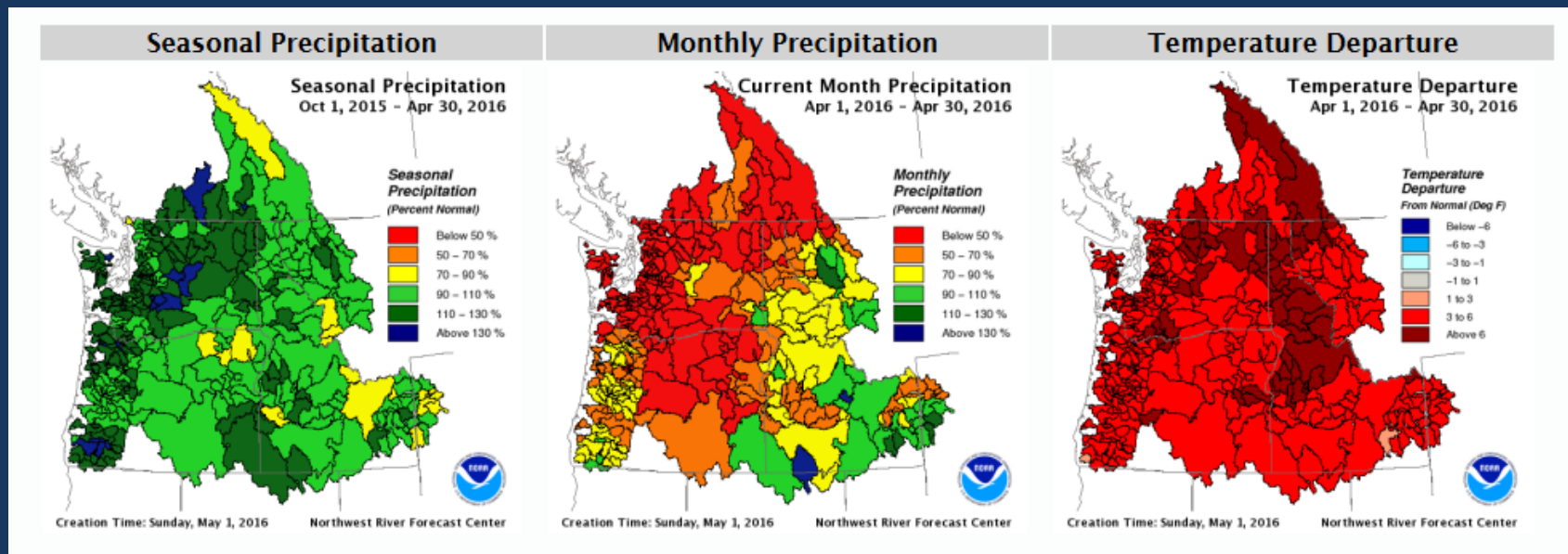
DIVISION NAME	WY 2015 % NORM	WY 2016 % NORM	WY 2016 OBS(in)
Columbia River Basin above Grand Coulee Dam	103	101	26.1
Snake River Basin above Ice Harbor Dam	75	101	16.2
Middle Columbia Lower Tributaries	77	104	19.0
Columbia River Basin above The Dalles Dam	86	103	20.2
*Western Washington	84	111	83.9
*Western Oregon	81	113	64.7

*Average of contributing divisions



Observed April Monthly Precipitation

www.nwrfc.noaa.gov/water_supply/wy_summary



DIVISION NAME

Columbia River Basin above Grand Coulee Dam

Snake River Basin above Ice Harbor Dam

Middle Columbia Lower Tributaries

Columbia River Basin above The Dalles Dam

*Western Washington

*Western Oregon

APR 2016
% NORM

WY 2016
OBS(in)

56

1.51

80

1.66

42

0.82

63

1.38

36

2.37

37

3.63

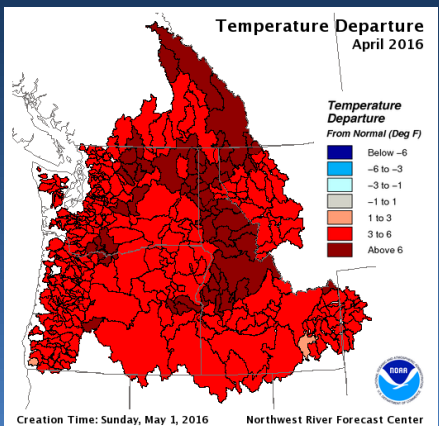
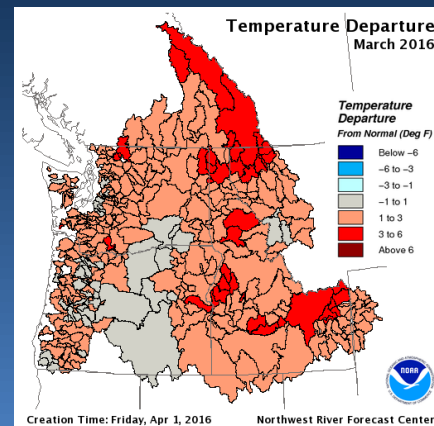
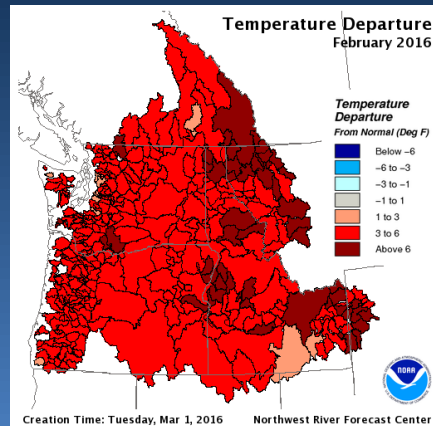
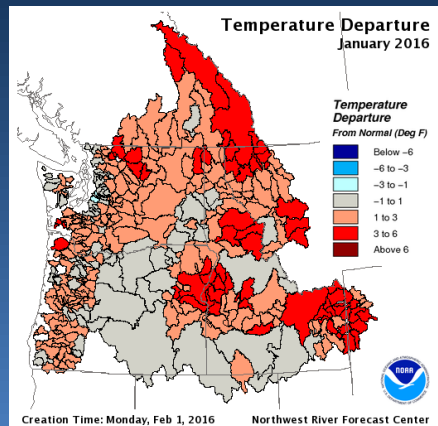
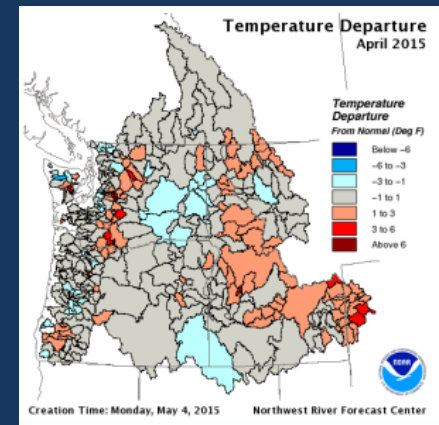
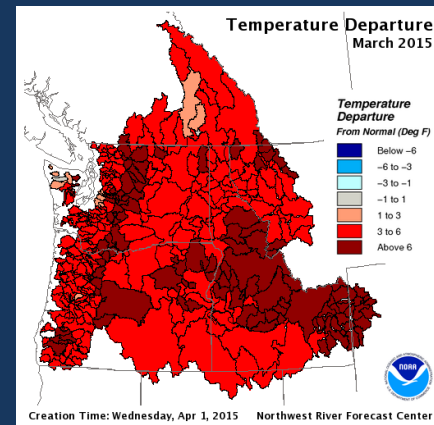
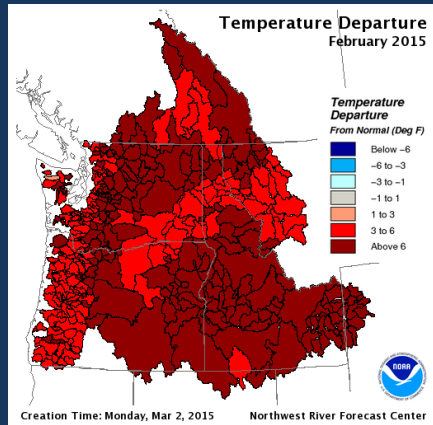
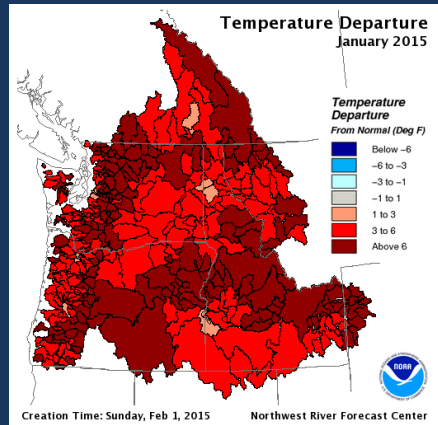
*Average of contributing divisions



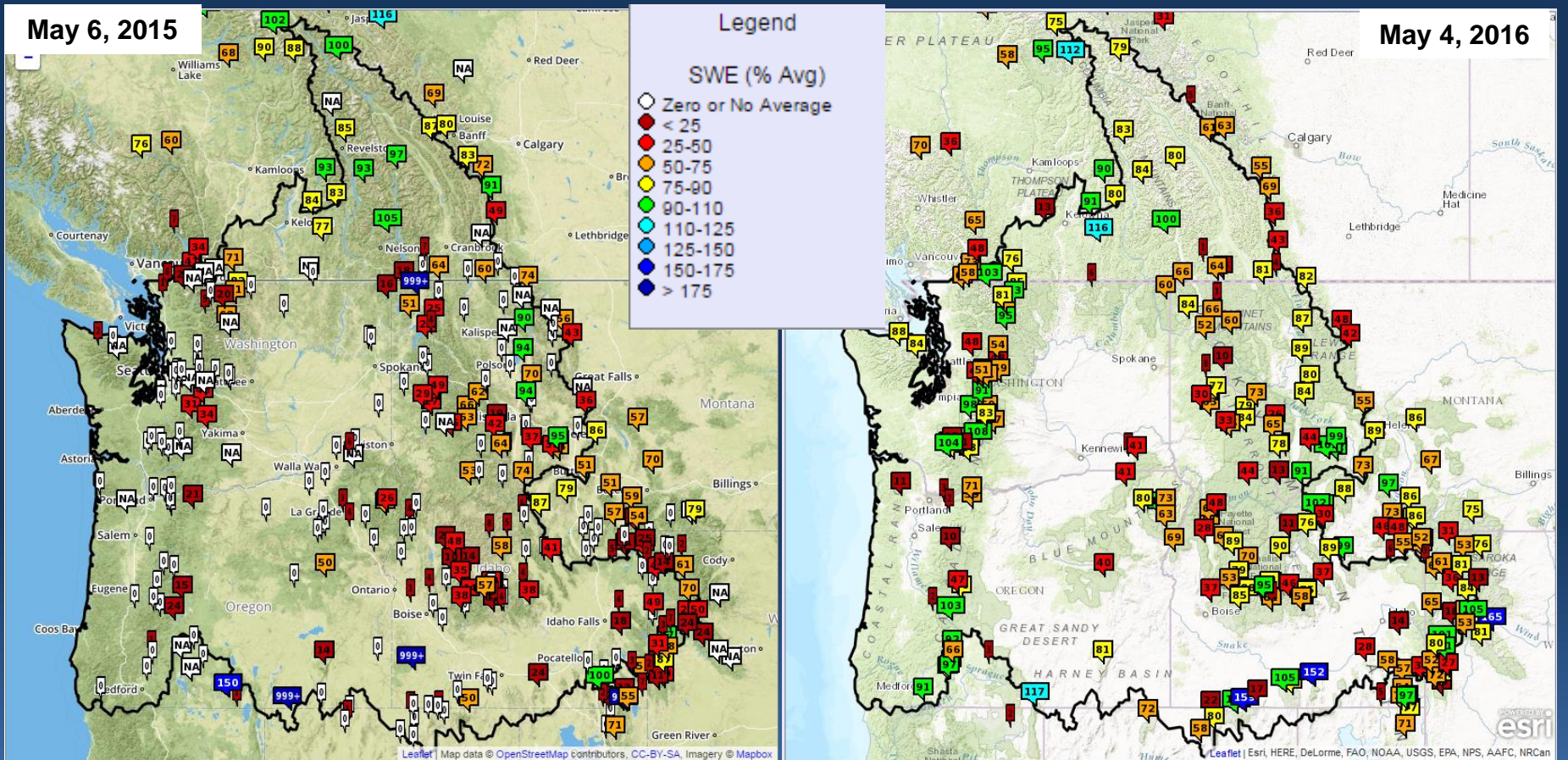
Observed Temperature Departures



Water Year 2015 / 2016 comparison



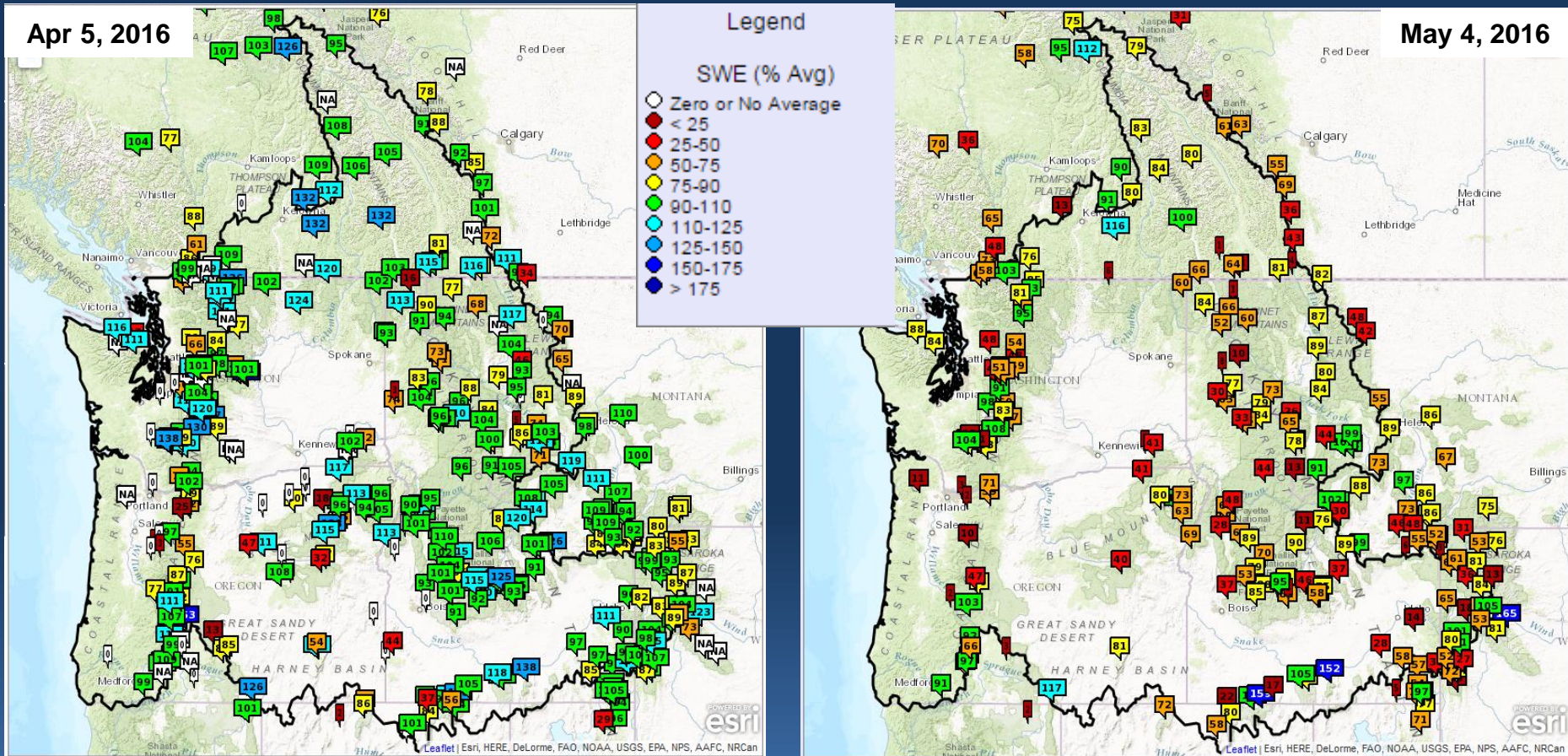
Observed Snowpack Conditions



- 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

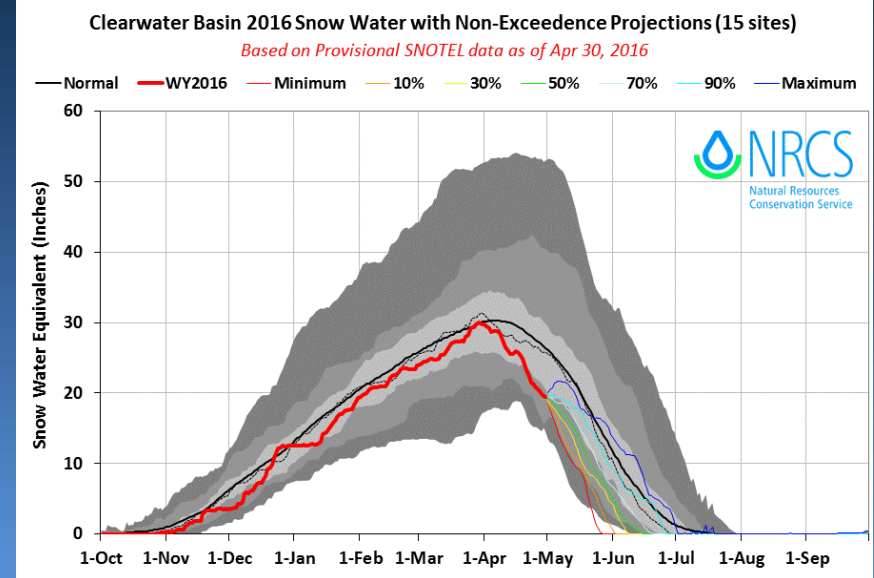
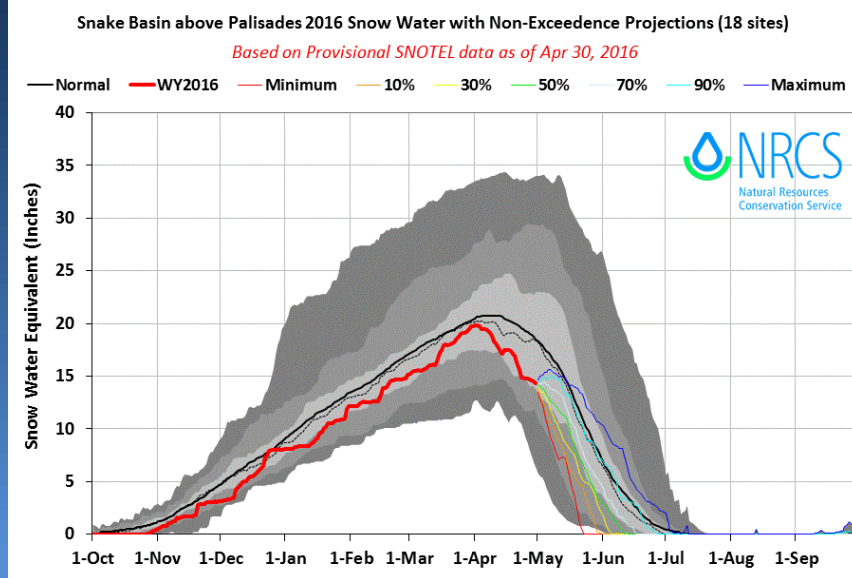
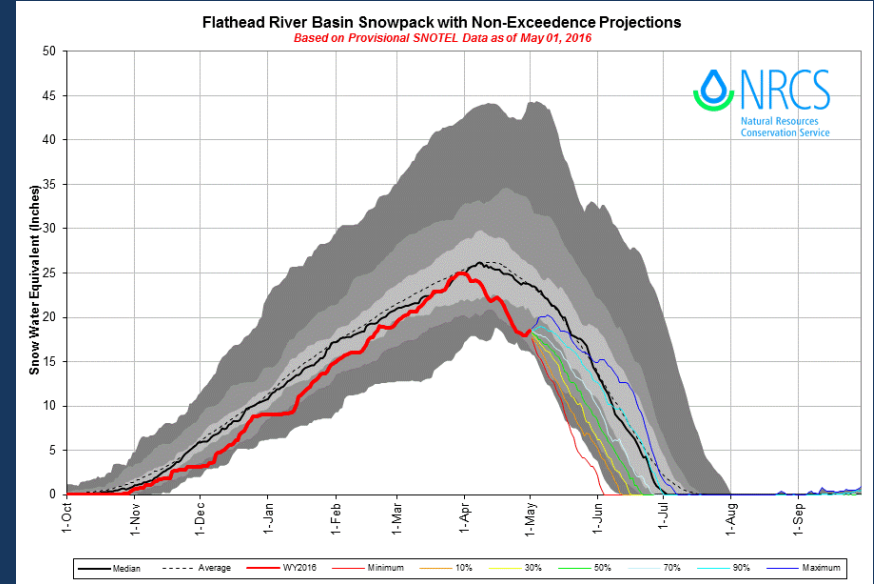
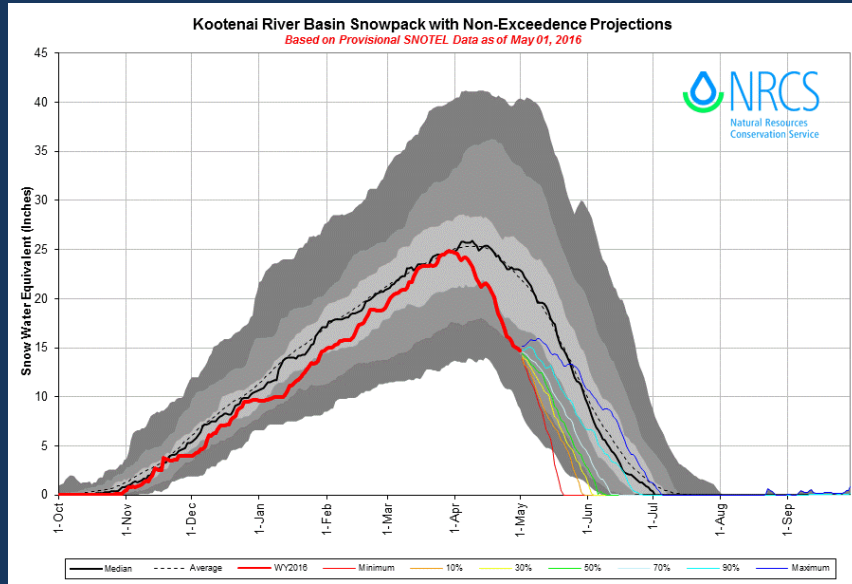
Observed Snowpack Conditions



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



Rapid Snowpack Depletion



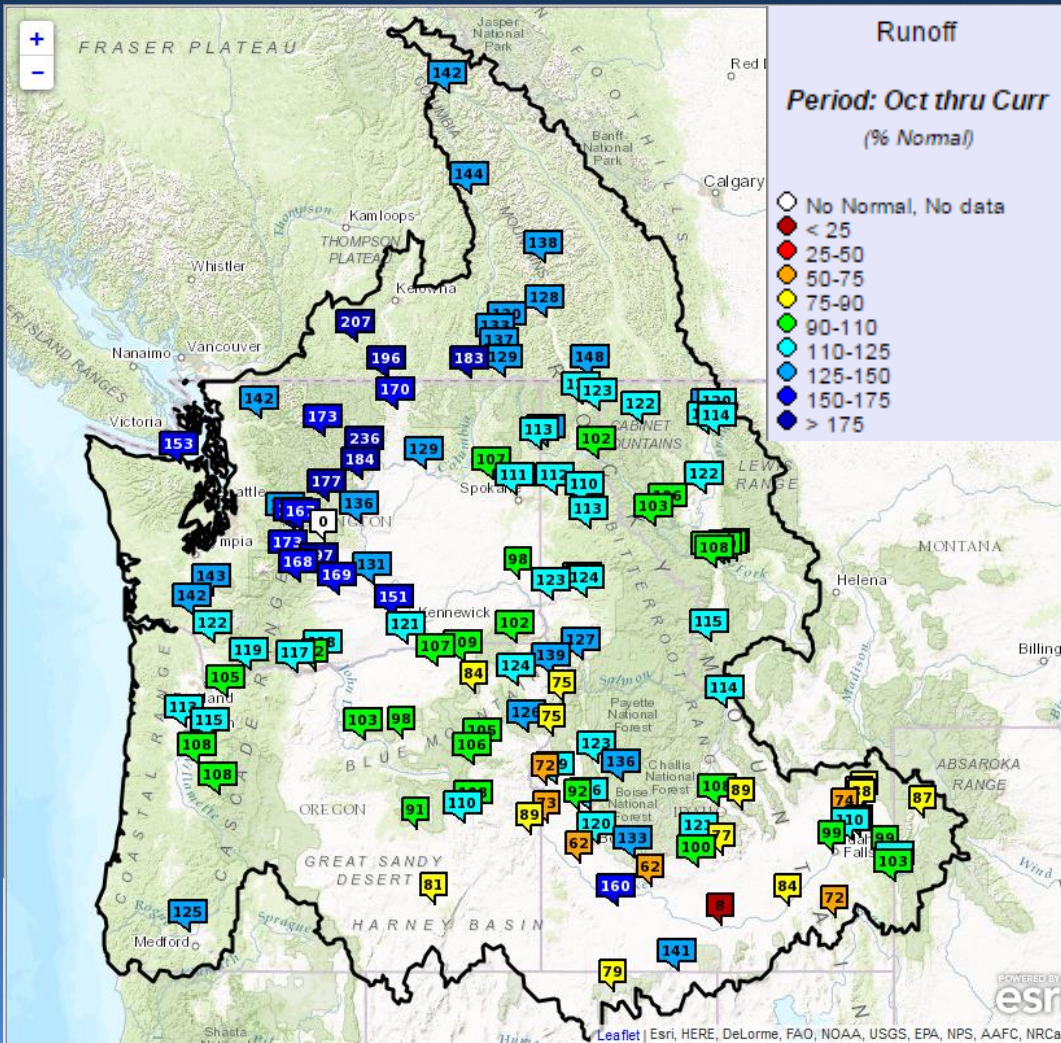


Current Observed Runoff Conditions

Adjusted for upstream storage



Percent of Normal
Oct 1– May 4



UPPER COLUMBIA BASIN

MICA	142
DUNCAN	138
QUEENS BAY	128
LIBBY	122
HUNGRY HORSE	114
GRAND COULEE	129

SNAKE RIVER BASIN

JACKSON LAKE	87
PALISADES	99
DWORSHAK	123
LOWER GRANITE	98

LOWER COLUMBIA BASIN

THE DALLES	117
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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**



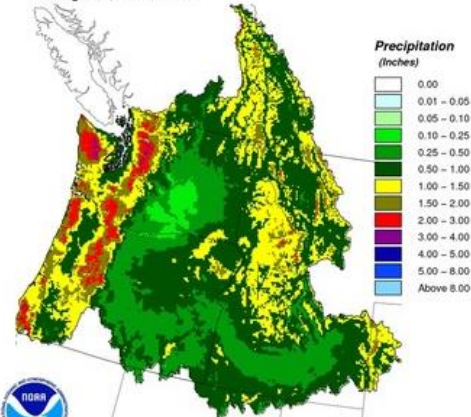
Short-Range Weather Forecasts

www.nwrfc.noaa.gov/water_supply/wy_summary



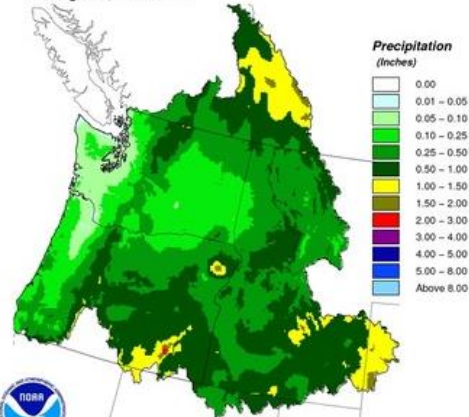
10 Day Forecast Precipitation: Volume Analysis

10 Day Precipitation Climatology
Ending 12Z, 05/14/2016



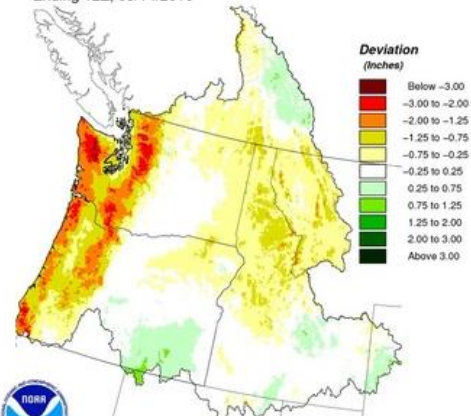
Creation Time: Wed May 4 14:17:39 UTC 2016

10 Day QPF
Ending 12Z, 05/14/2016



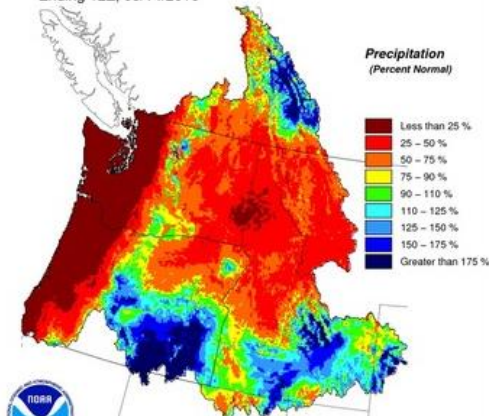
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10 Day QPF (Deviation from Climatology)
Ending 12Z, 05/14/2016



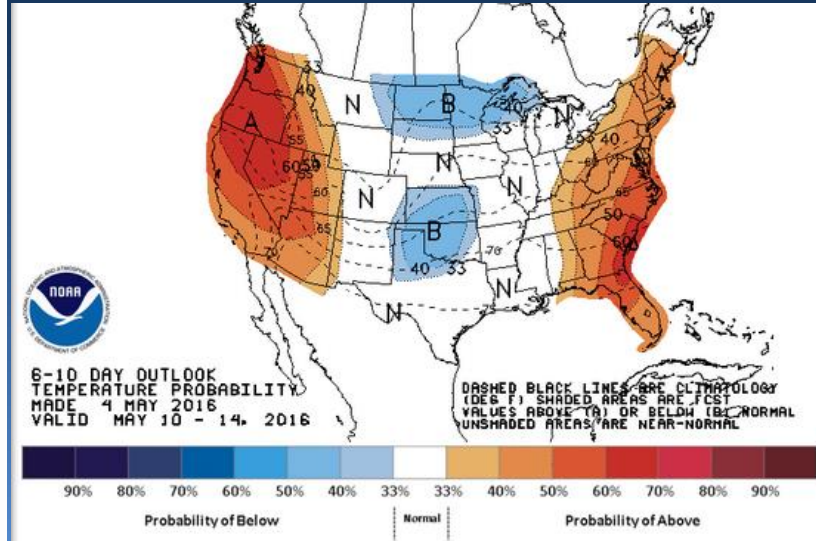
Creation Time: Wed May 4 14:17:44 UTC 2016

10 Day QPF (Percent of Climatology)
Ending 12Z, 05/14/2016



Creation Time: Wed May 4 14:17:41 UTC 2016

- Drier than normal cumulative precip amounts over most of the Upper Columbia and Cascades, near or slightly above normal in the Snake River Basin
- Increased chances of above normal temperatures across the Western US in the 6 – 10 day outlook



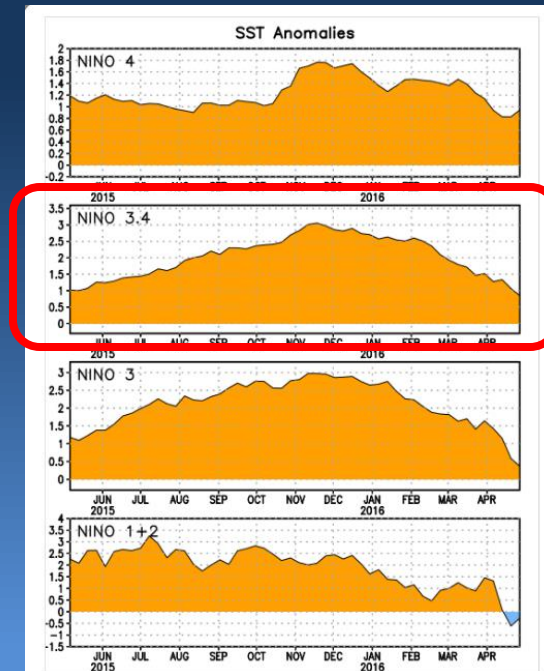
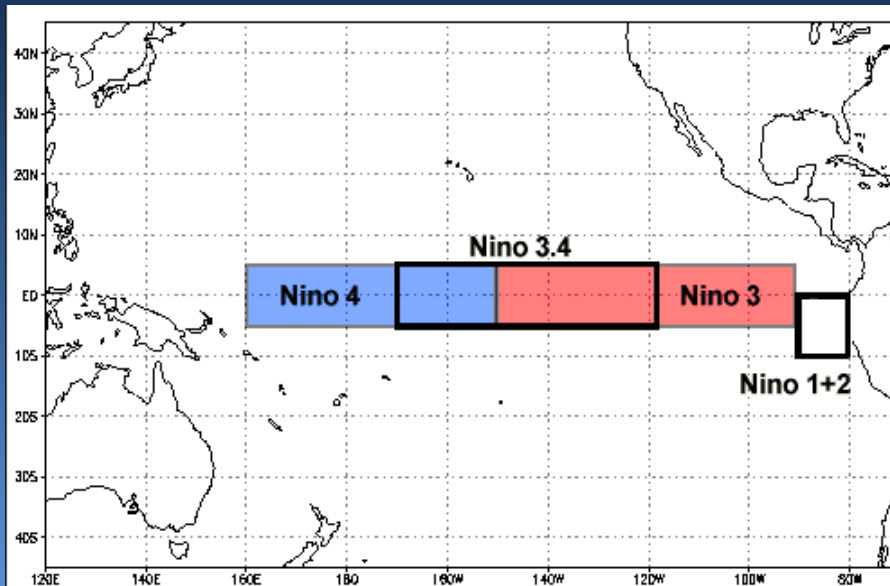
10 day cumulative QPF May 4-14 12Z

www.cpc.ncep.noaa.gov

Current ENSO Discussion

ENSO Alert Status: El Nino Advisory/La Nina Watch

- El Nino is present and continues to weaken
- Positive equatorial SST anomalies continue across most of the Pacific Ocean





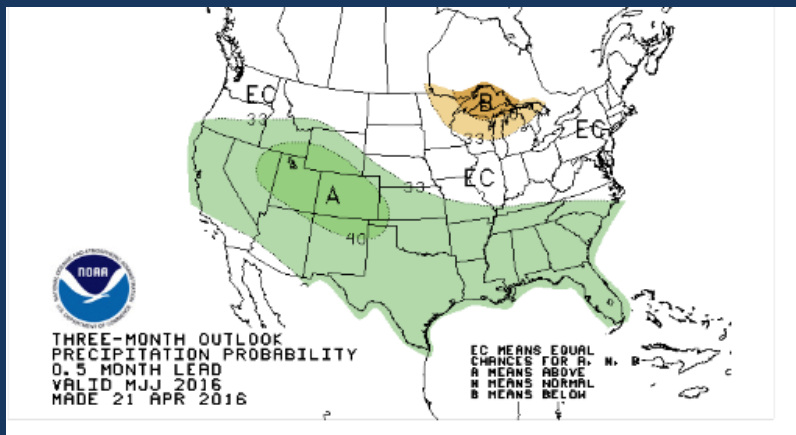
Climate Outlook

www.cpc.ncep.noaa.gov



Three Month Outlook

Precipitation



Temperature

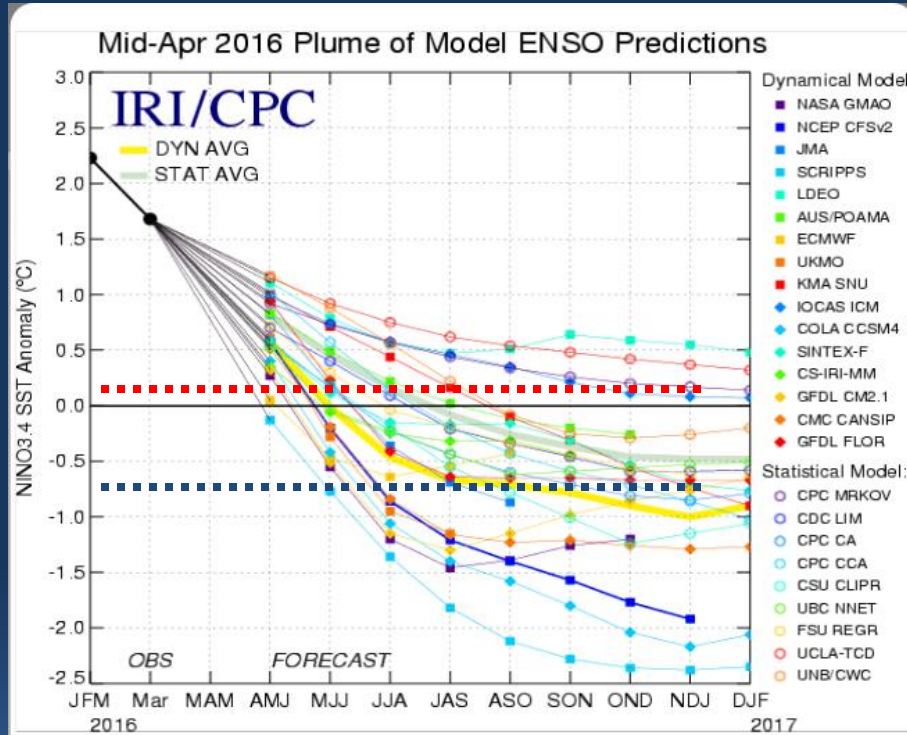
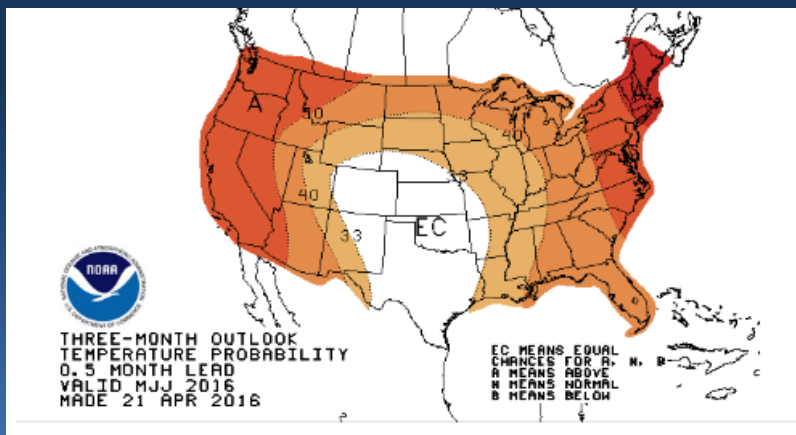


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 19 April 2016).

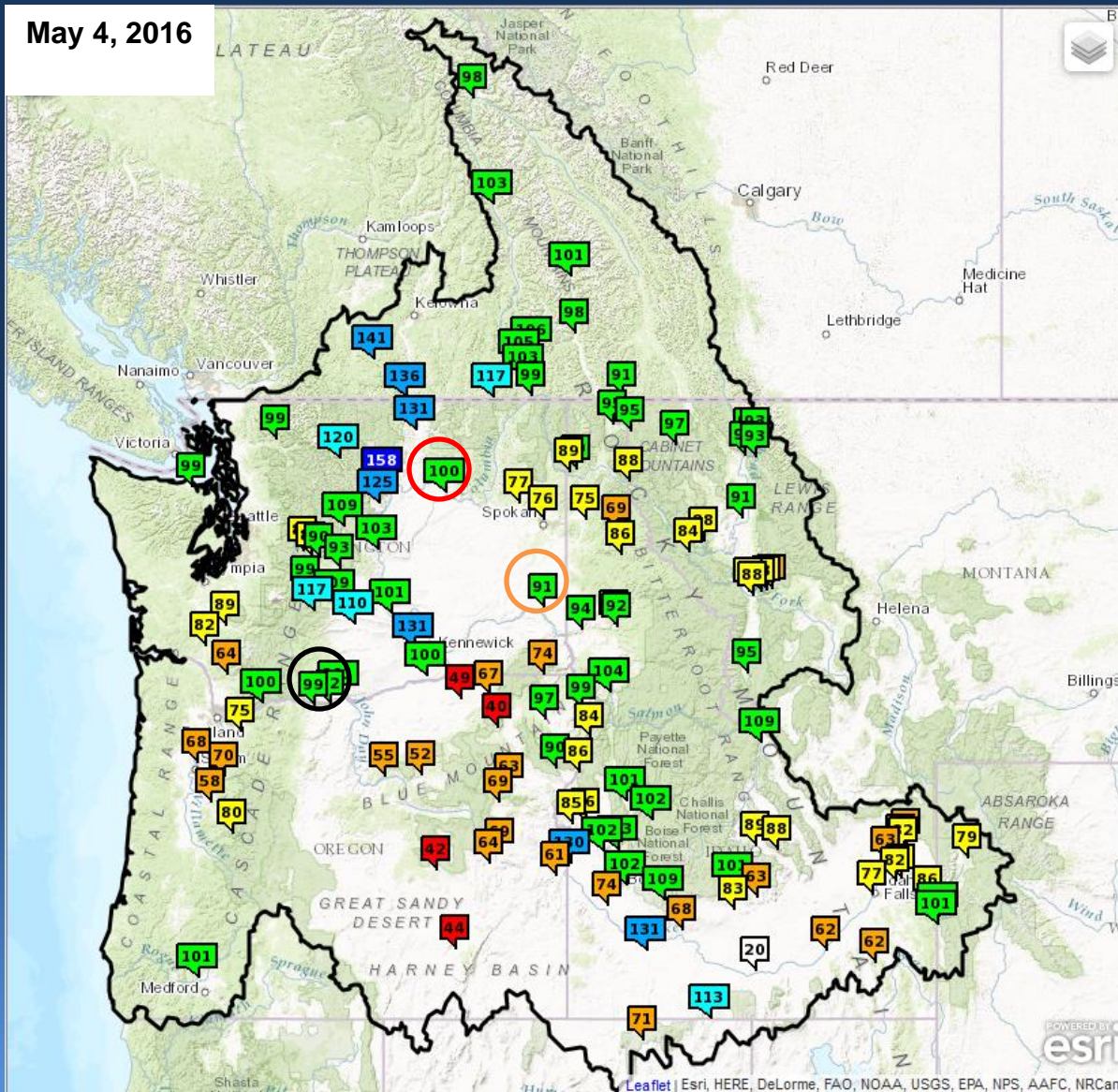
- Increased probability that warm temperatures will continue across most of continental US
- Slightly increased probability of above normal precip in Snake River Basin
- Most models suggest transition to ENSO-neutral by MJJ with possibility of La Nina conditions during Northern Hemisphere fall



Official Apr-Sep Water Supply Forecasts



May 4, 2016



EAST-SIDE LOCATION

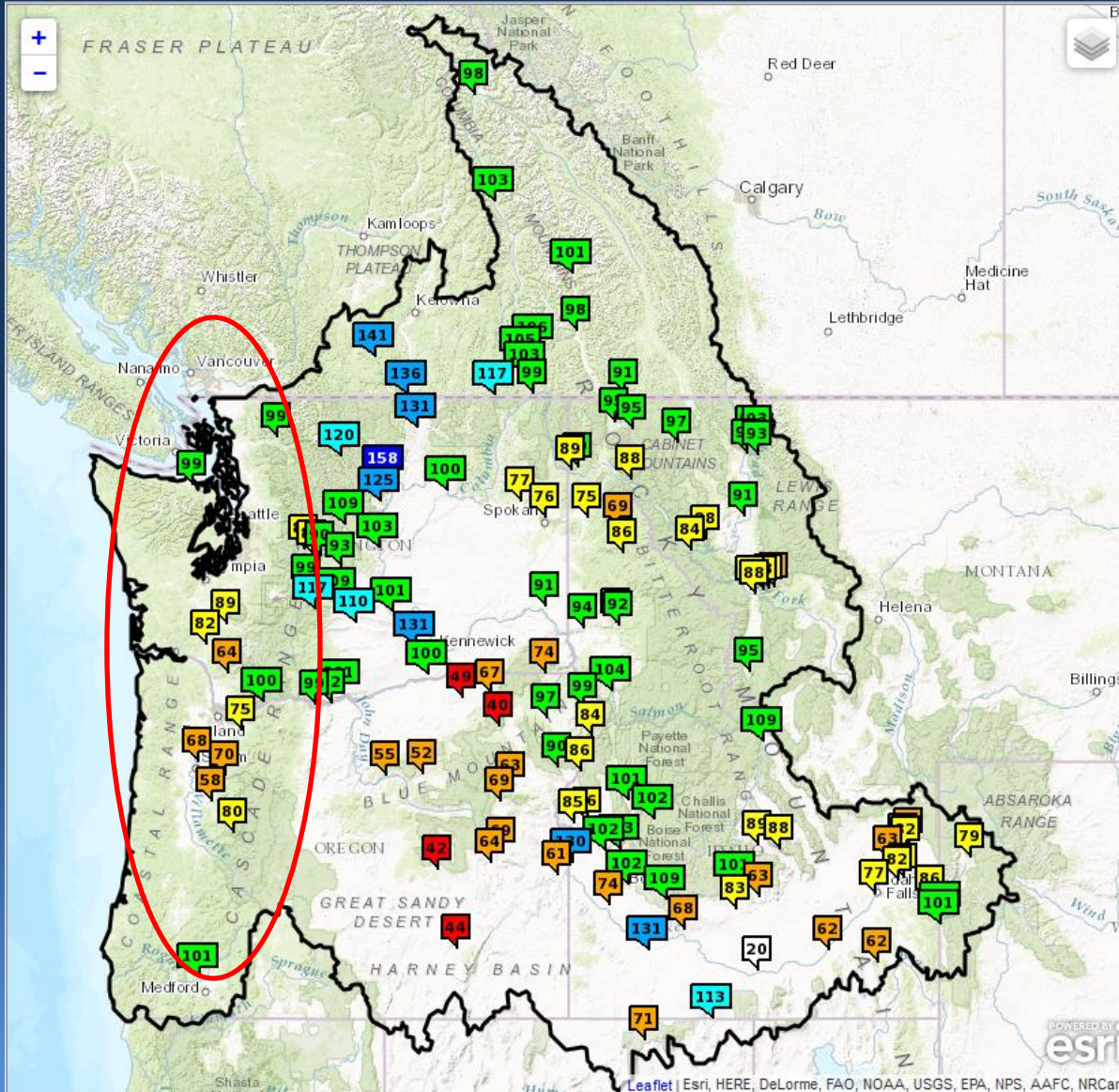
Apr-Sep % NORM

Columbia River – Mica Dam	98
Kootenai River – Libby Dam	97
Flathead River– Hungry Horse Dam	93
Spokane River – Coeur D Alene Lake	75
Columbia River – Grand Coulee Dam	100
Snake River – Near Irwin	86
Snake River – American Falls	62
Clearwater River – Dworshak Dam	97
Snake River – Lower Granite Dam	91
Columbia River – The Dalles Dam	99

POWERED BY
esri



Official Water Supply Forecasts Western Washington and Oregon

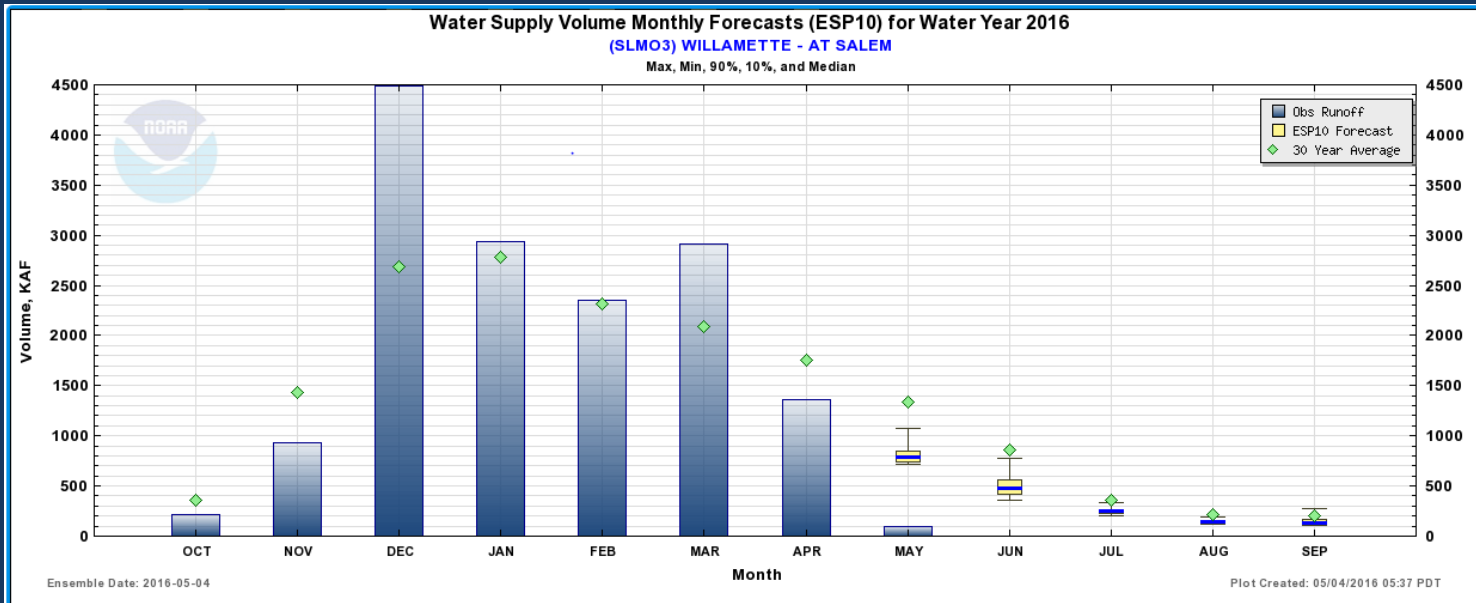


2016 Forecast Apr-Sep / Jan-Sep

- Skagit River
- near Concrete 99 / 113%
- Cowlitz River
- Mayfield Reservoir 89 / 111%
- North Santiam
- At Mehama 70 / 97%
- McKenzie River
- Near Vida 80 / 96%
- Willamette River
- At Salem 68 / 96%
- Roque River
- At Raygold 101 / 100%



Water Supply Volume Monthly Forecasts



WILLAMETTE - AT SALEM
Forecasts For Water Year 2016

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

Forecast Period	Forecasts Are in KAF				Obs Runoff (2016-05-04)	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					1365	1750
MAY	721	790	59	1072	96*	1337
JUN	362	477	55	771		861
JUL	198	245	68	332		358
AUG	115	142	65	192		219
SEP	108	133	65	272		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: 2016-05-04 Issued: 2016-05-04

Forecast Period	Forecasts Are in KAF				Obs Runoff (2016-05-04)	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					1365	1750
MAY	728	837	63	1167	96*	1337
JUN	364	502	58	818		861
JUL	206	259	72	338		358
AUG	117	145	66	196		219
SEP	111	135	67	273		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: 2016-05-04 Issued: 2016-05-04

Forecast Period	Forecasts Are in KAF				Obs Runoff (2016-05-04)	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					1365	1750
MAY	680	884	66	1391	96*	1337
JUN	371	530	62	826		861
JUL	219	264	74	352		358
AUG	118	149	68	209		219
SEP	112	137	67	273		203

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

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

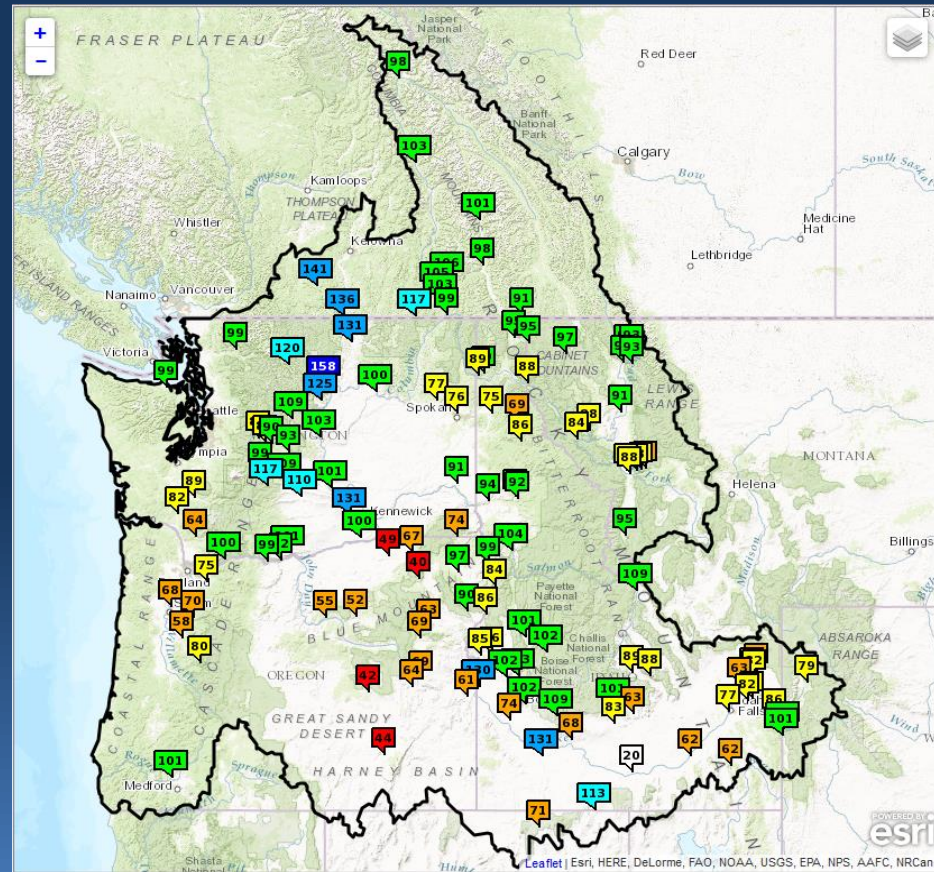
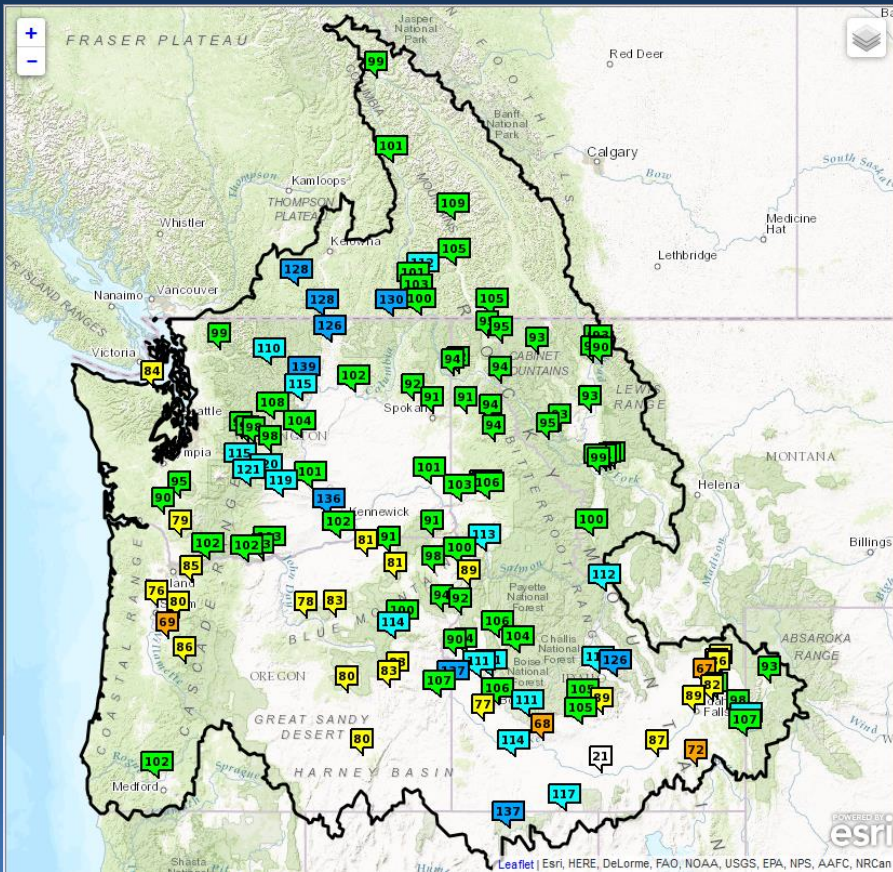


Water Supply Forecast Comparison



Apr-Sep Forecast issued Apr 5, 2016

Apr-Sep Forecast issued May 4, 2016





Columbia/Snake River Basins Water Supply Summary



- **Observed Precipitation WY 2016**
 - Water Year - Above normal for most of Columbia/Snake River Basin as well as Washington/Oregon Cascades
 - April – Most of Columbia/Snake River Basin substantially below normal, upper Snake above normal
- **Observed Temperatures**
 - Above normal Dec-Apr, especially Feb and Apr
- **Snowpack**
 - Depleting very rapidly:
 - Substantial decrease in relative %normal since early April
 - Many Snotel sites likely to be depleted of SWE 2 – 4 weeks ahead of normal
- **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 and winter
- **Water Supply Forecast**
 - Overall near normal conditions throughout basin
 - Monthly distribution of runoff volume heavier in early months



NWRFC Water Supply Webpage

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



2016 Schedule for <i>Live</i> Water Supply Briefings					
Jan	Feb	Mar	Apr	May	May
7	4	3	7	5	18
<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>

Water Supply Forecast / ESP Description Webinar
May 18, 2016 12:45pm – 2:00pm

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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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