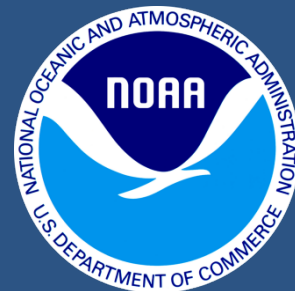


Inland Pacific Northwest 2017 Climate & Water Supply Outlook



Troy Lindquist
Service Hydrologist
NOAA/NWS
Boise, ID

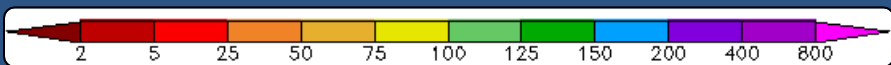
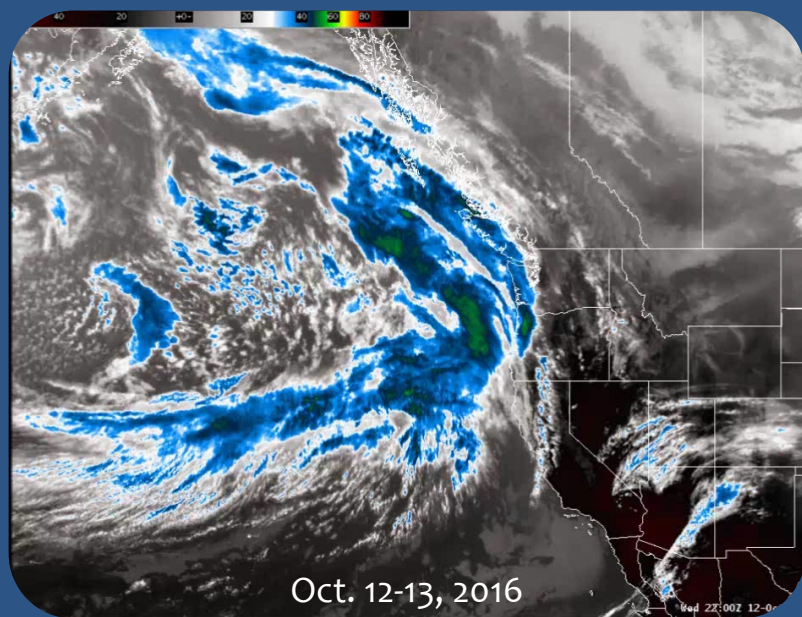
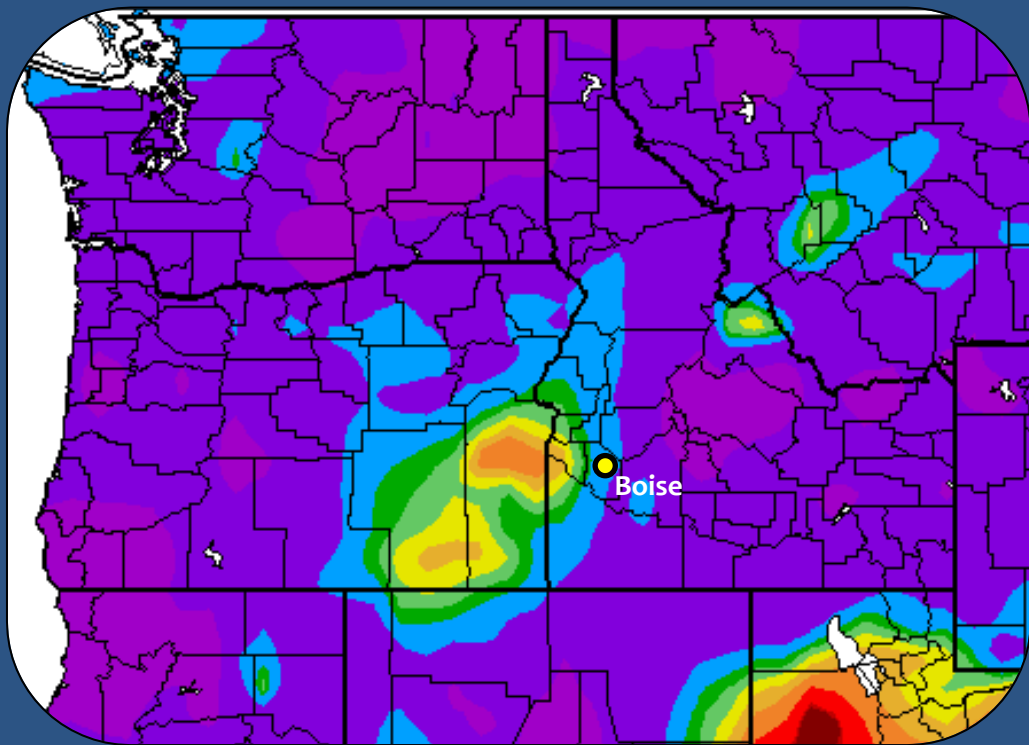


Outline

- 2017 WY...so far...
- Climate Outlook
- Water Supply Forecasts

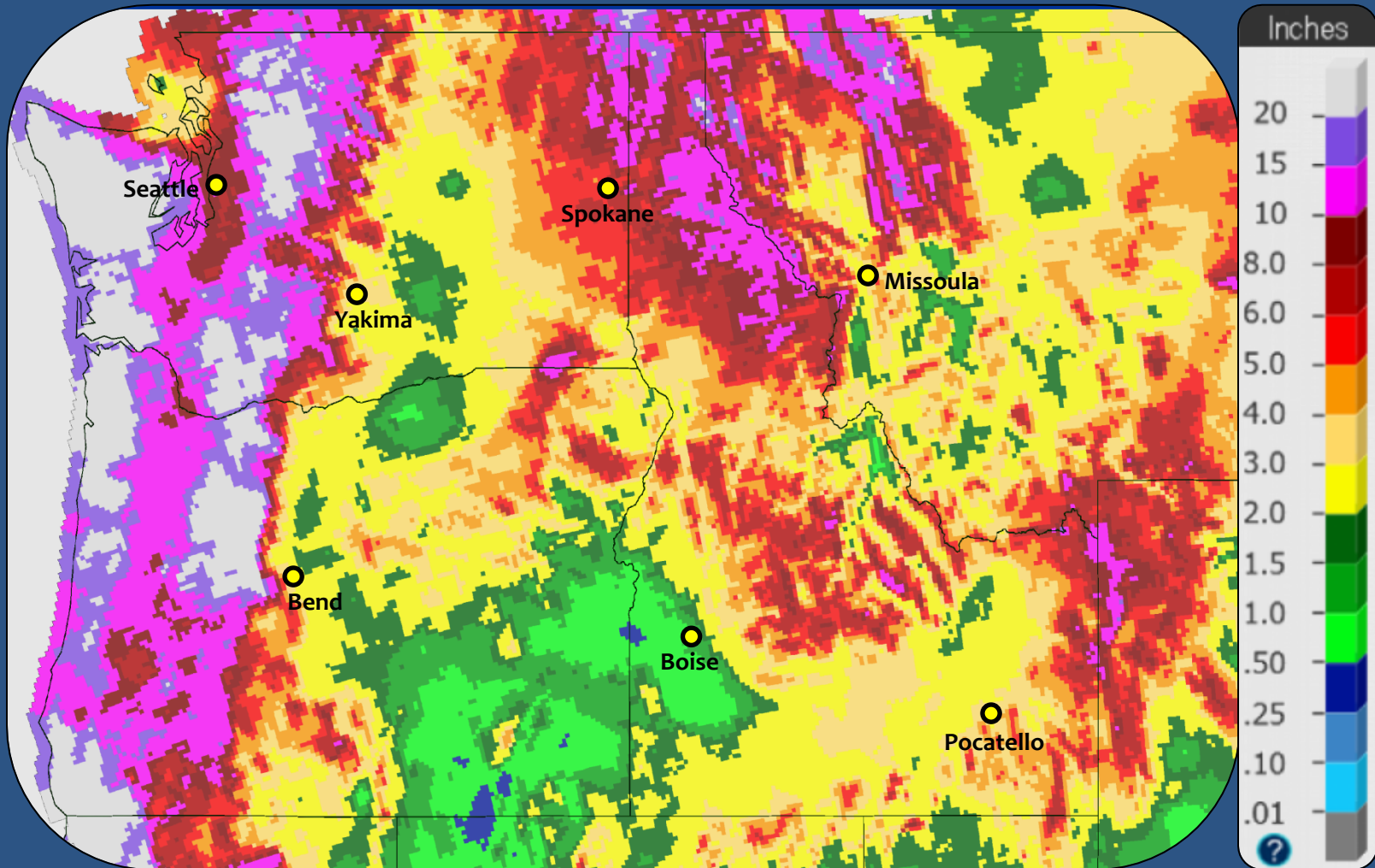
Precipitation - Percent of Normal

October, 2016



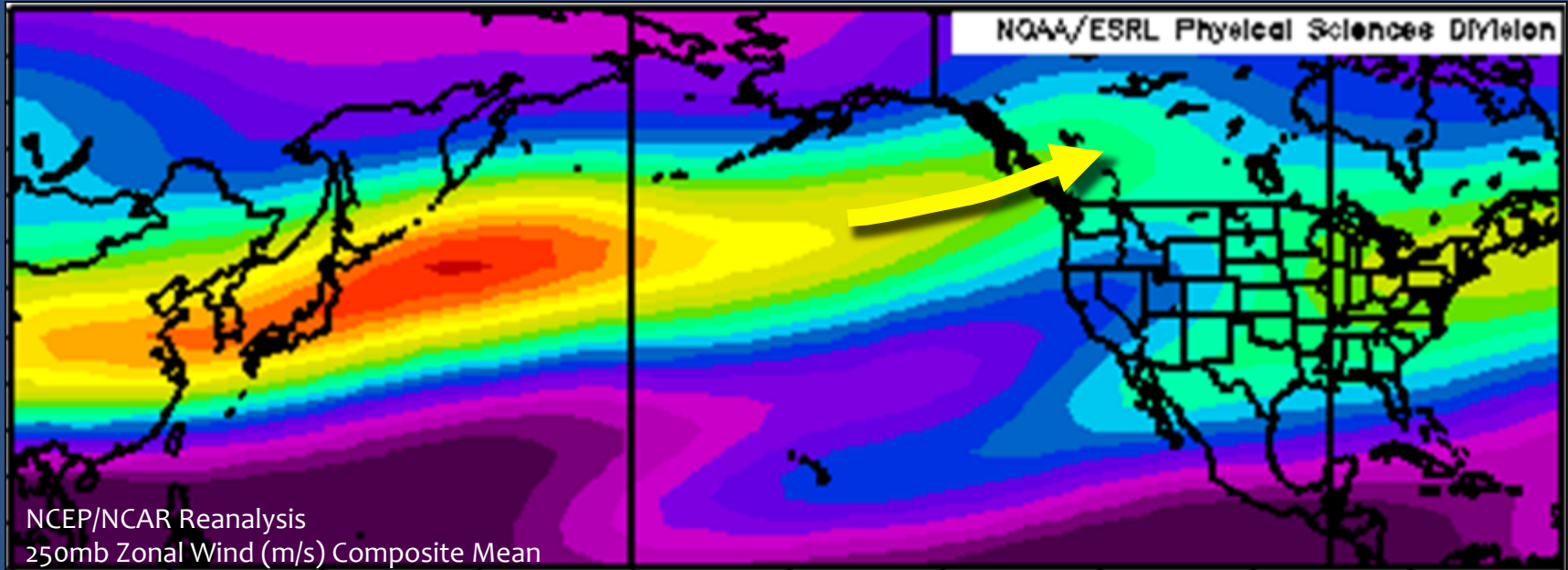
Precipitation - Observed

October, 2016



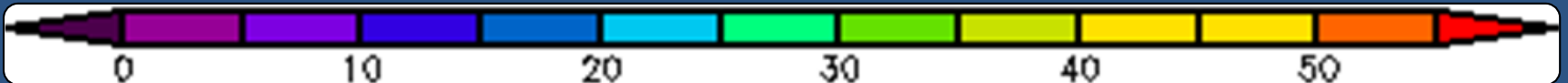
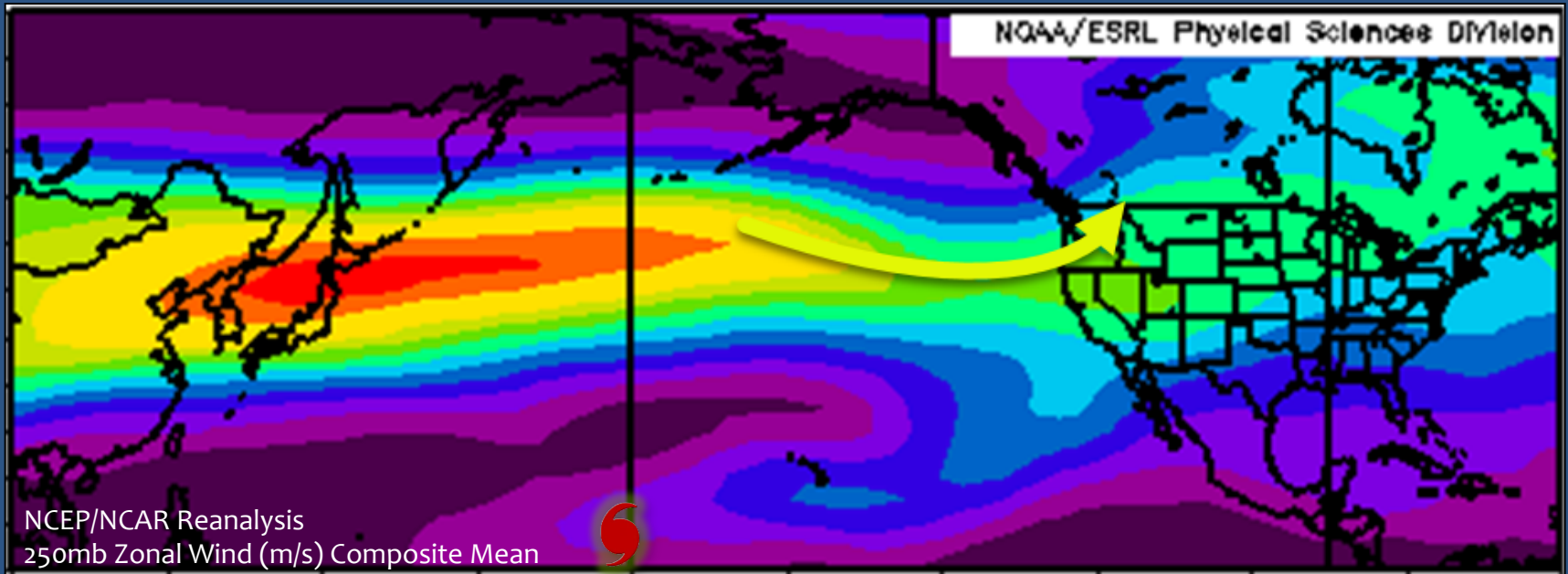
Typical October Jetstream

1981 - 2010



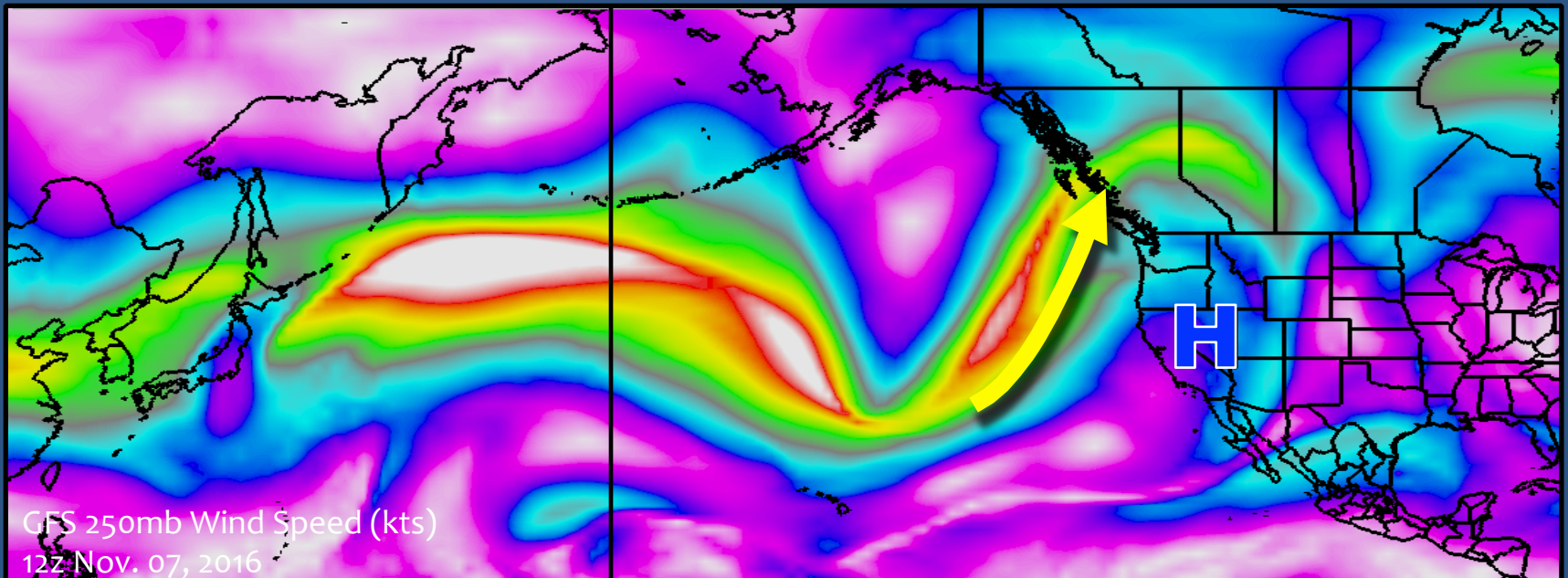
October Jetstream

2016



November Jetstream

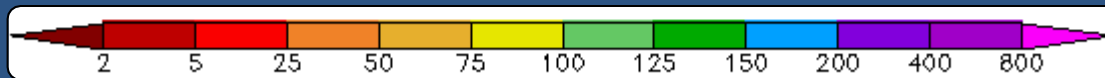
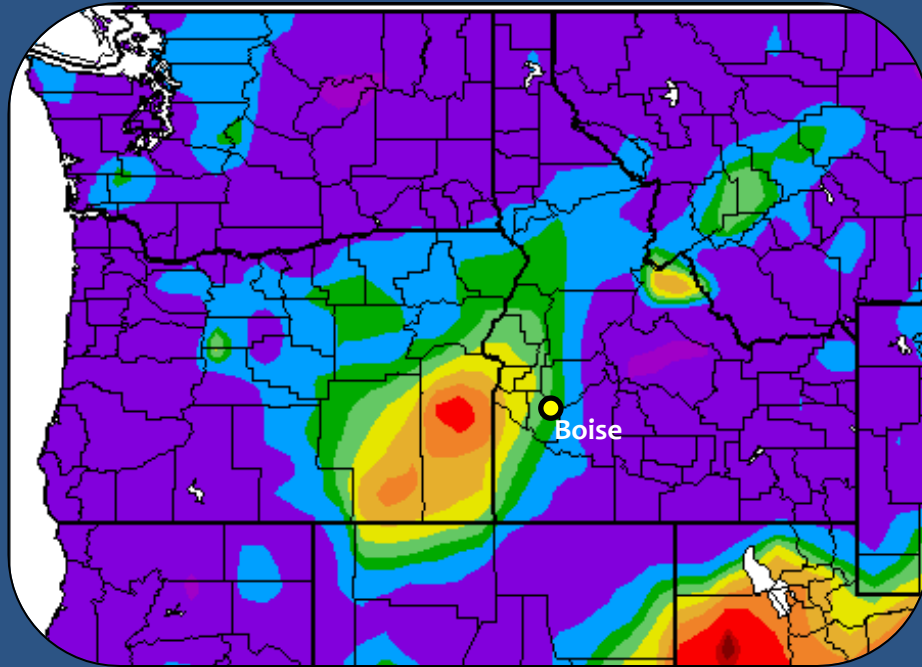
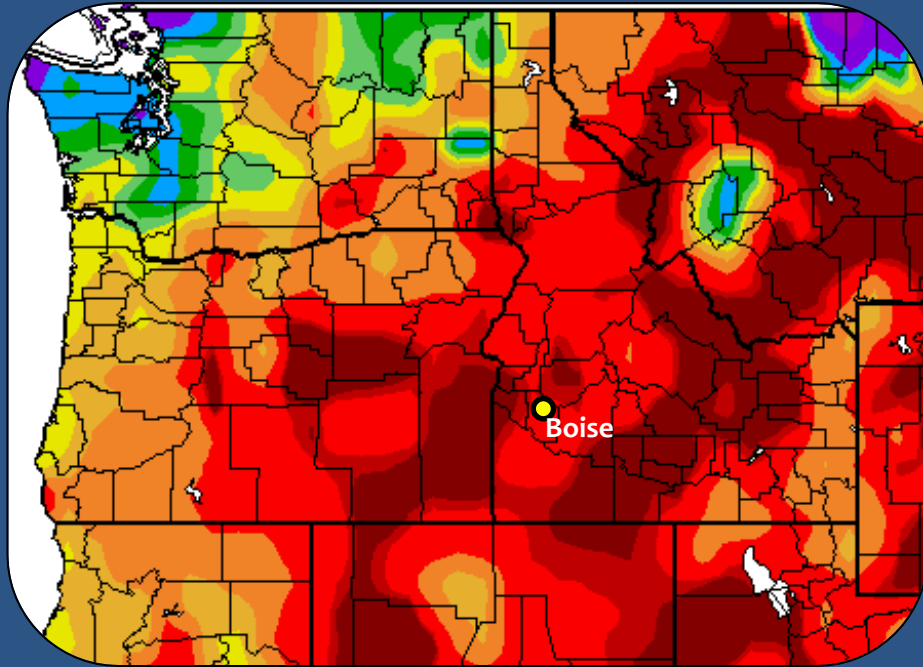
2016



Precipitation – Percent of Normal

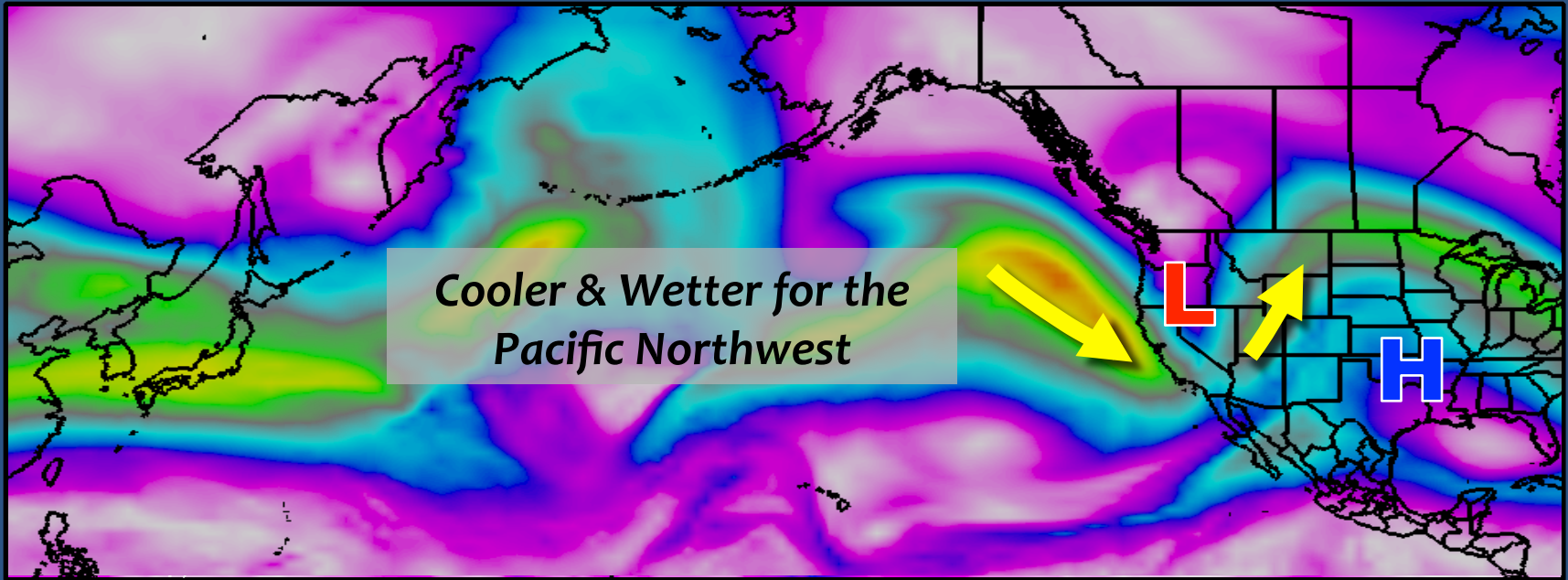
Nov 1 - 8, 2016

Oct 1 – Nov 8, 2016

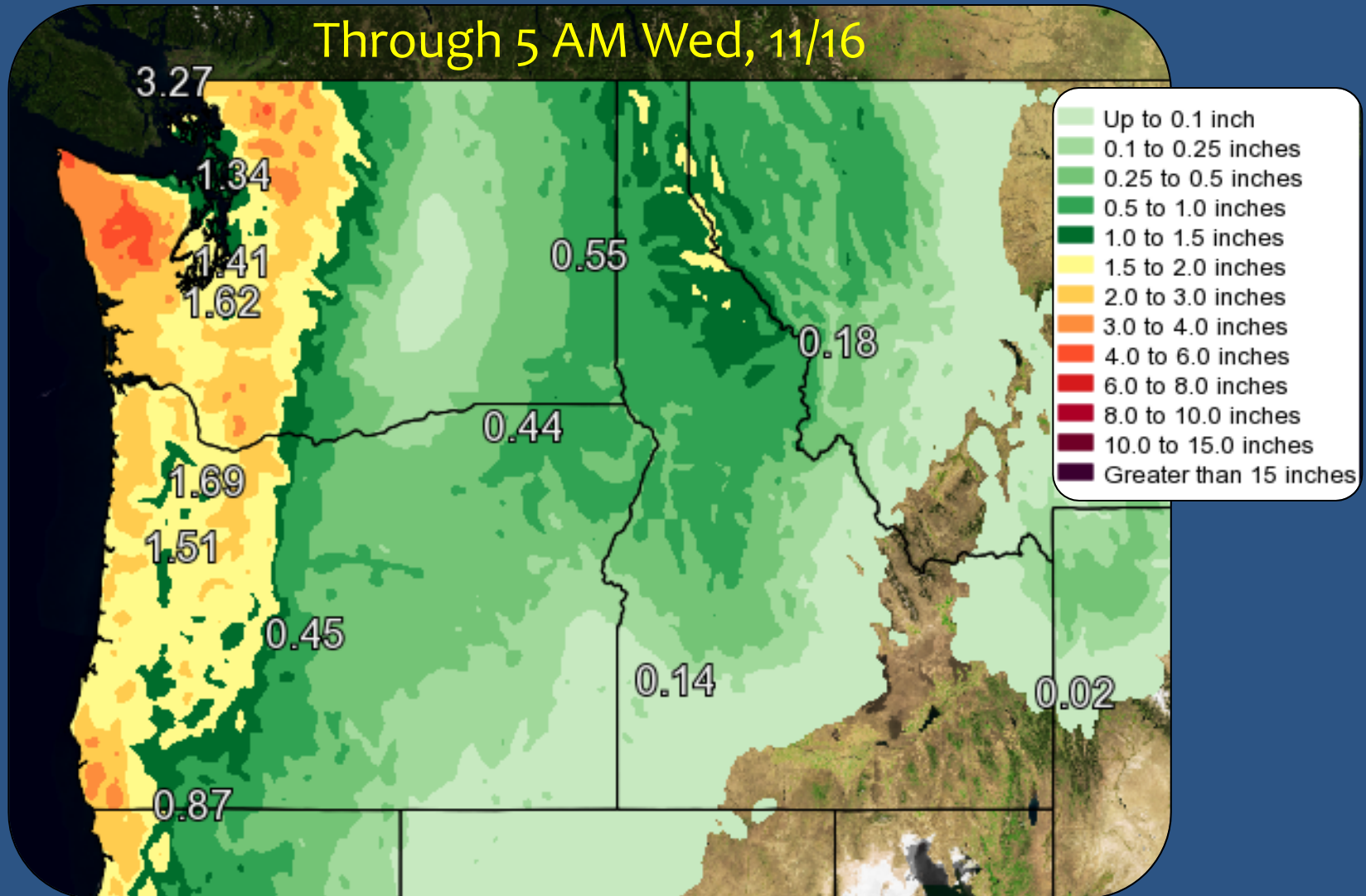


Jet Stream Pattern Change

Wednesday, Nov 16

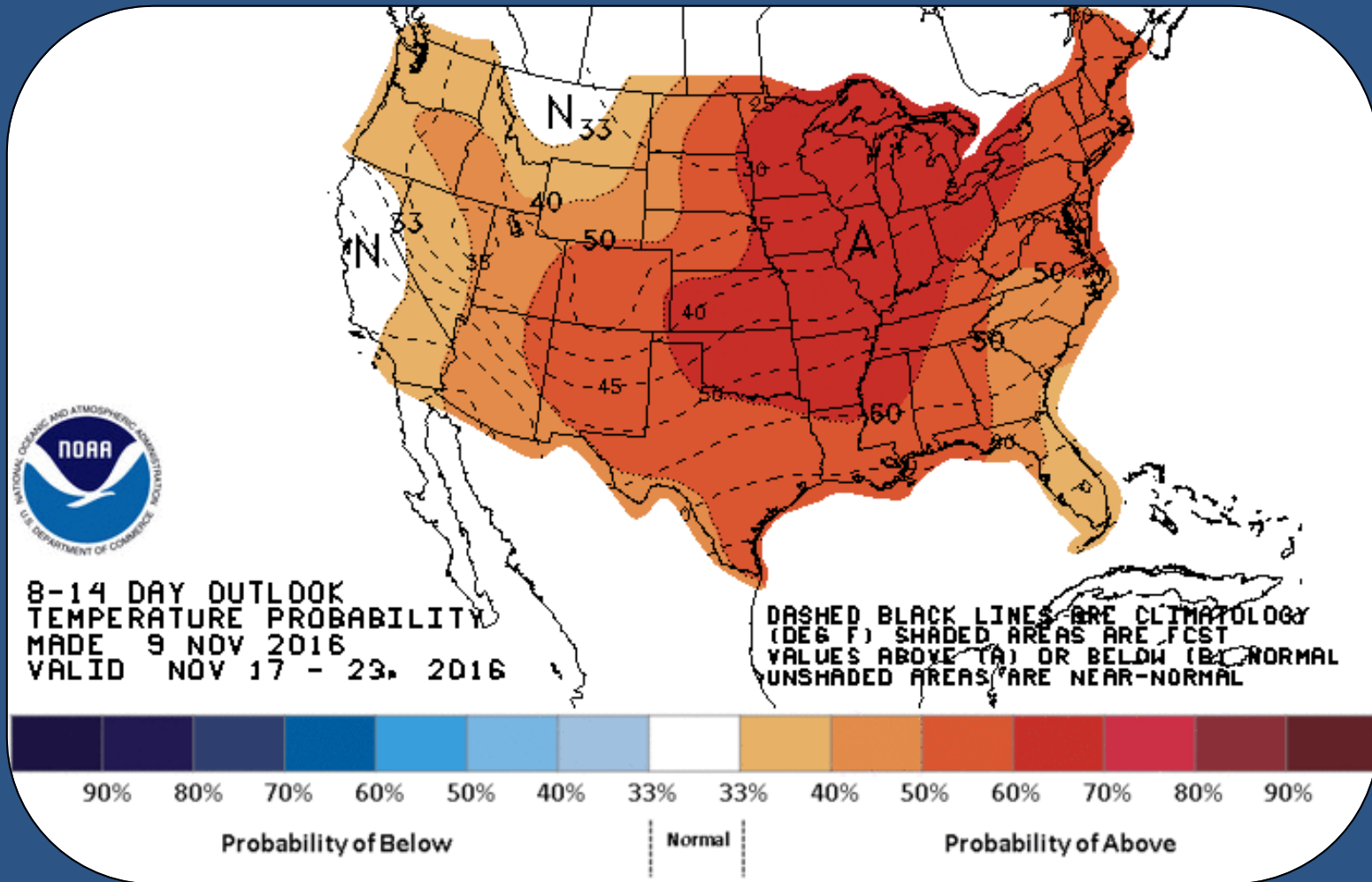


Forecast Precipitation – 6 Day Total



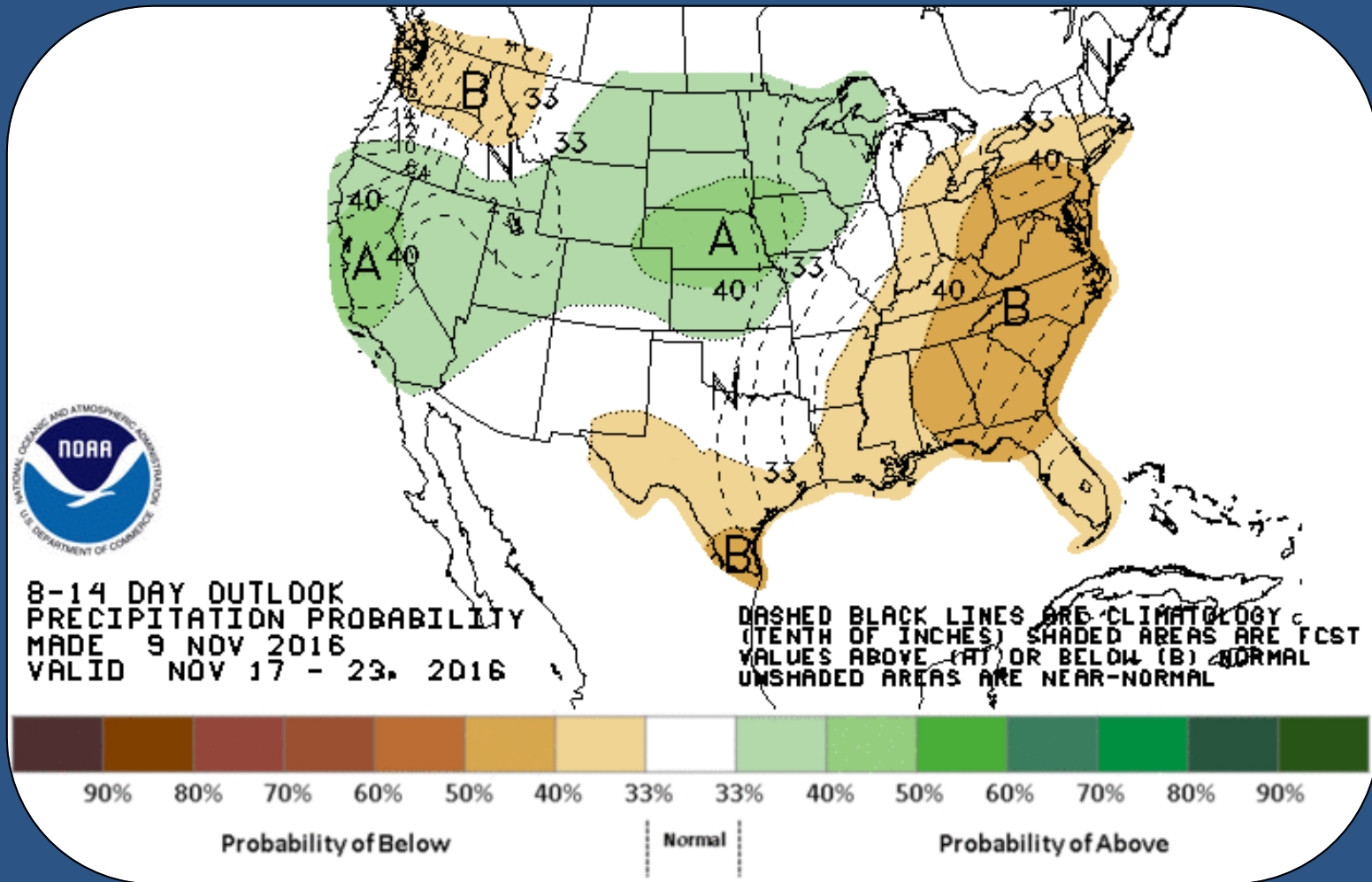
8-14 Day Temperature Outlook

Nov. 17 - 23



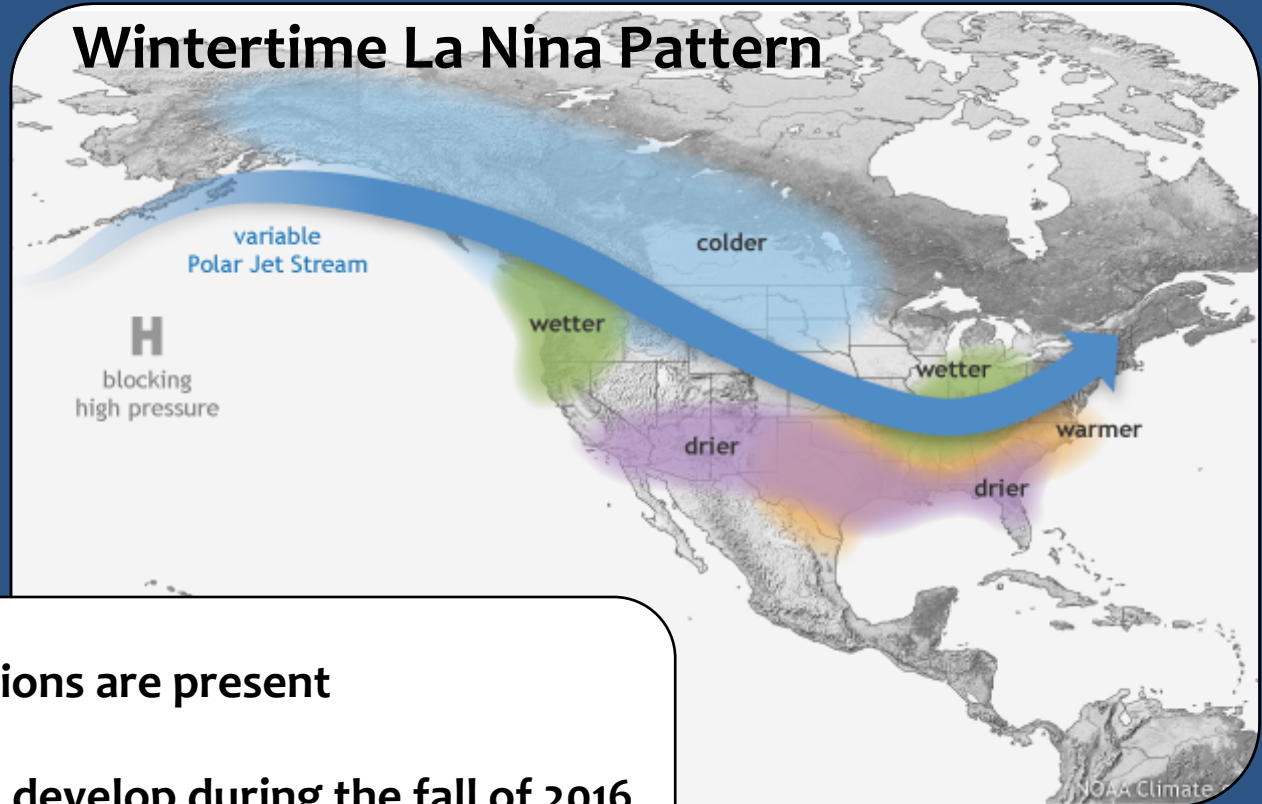
8-14 Day Precipitation Outlook

Nov. 17 - 23



ENSO Status & Winter Outlook

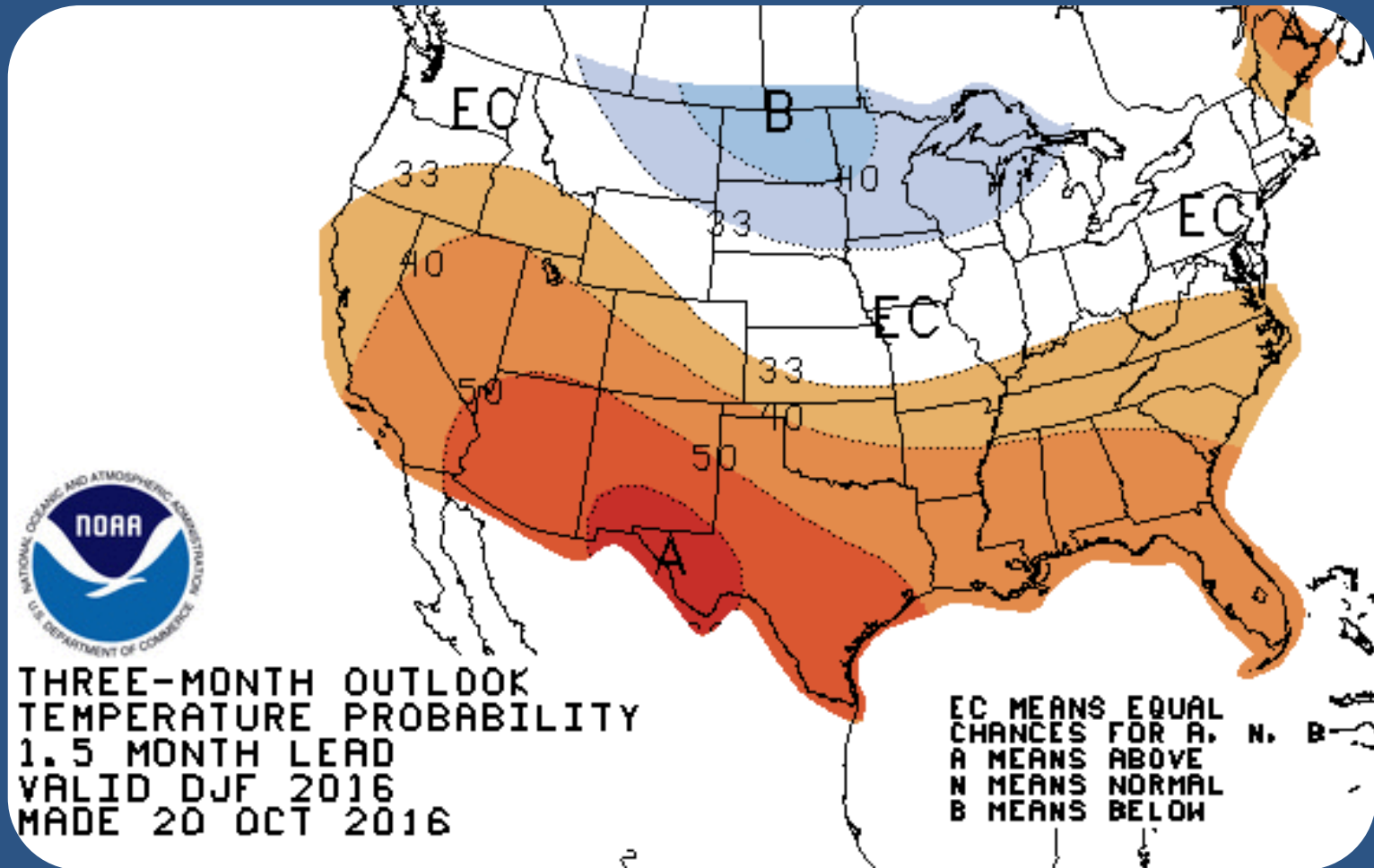
Wintertime La Nina Pattern



- ENSO-neutral conditions are present
- La Niña is favored to develop during the fall of 2016
- Slightly favored to persist during winter 2016-17

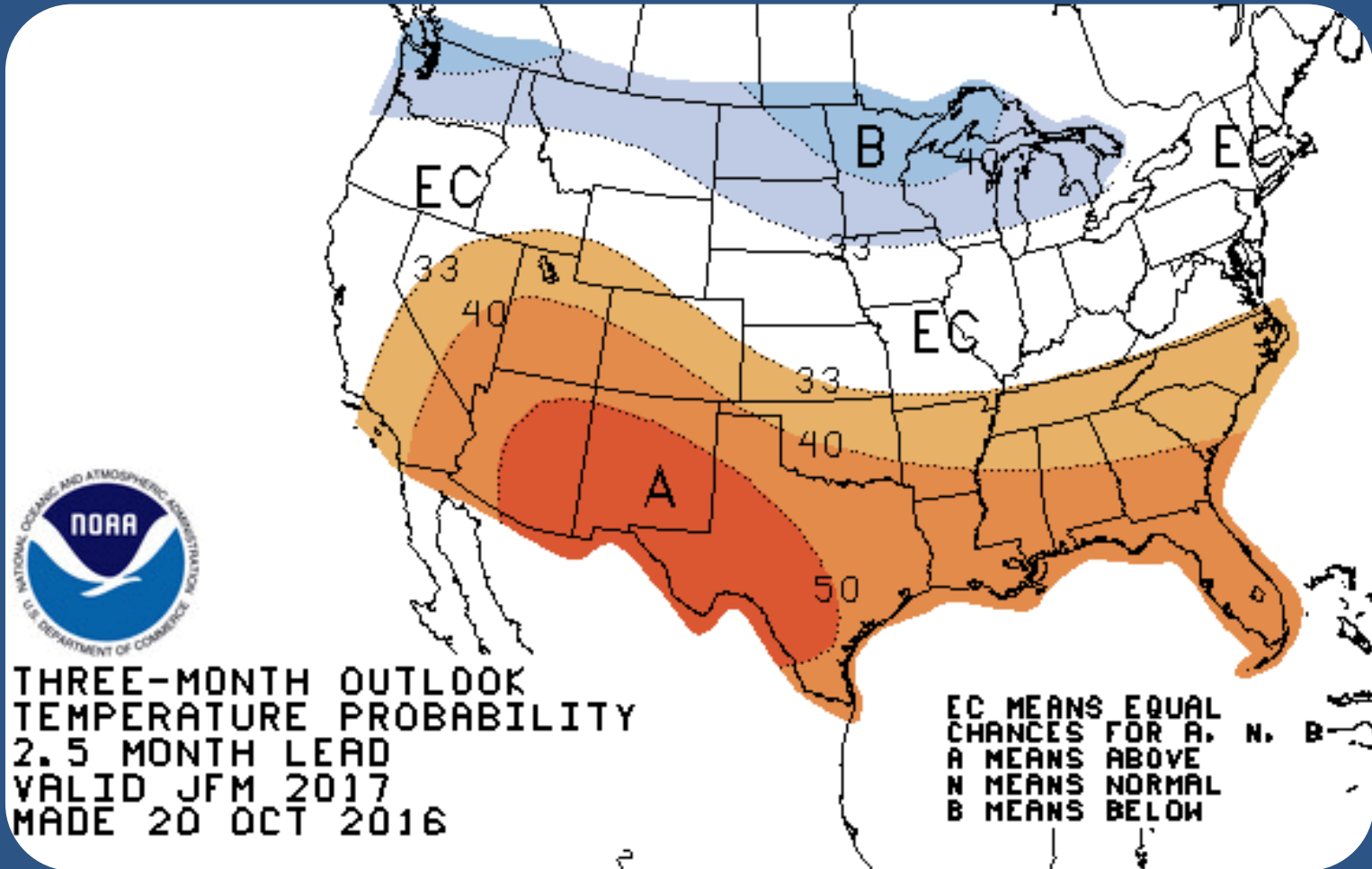
Temperature Outlook

Dec. – Jan. – Feb.



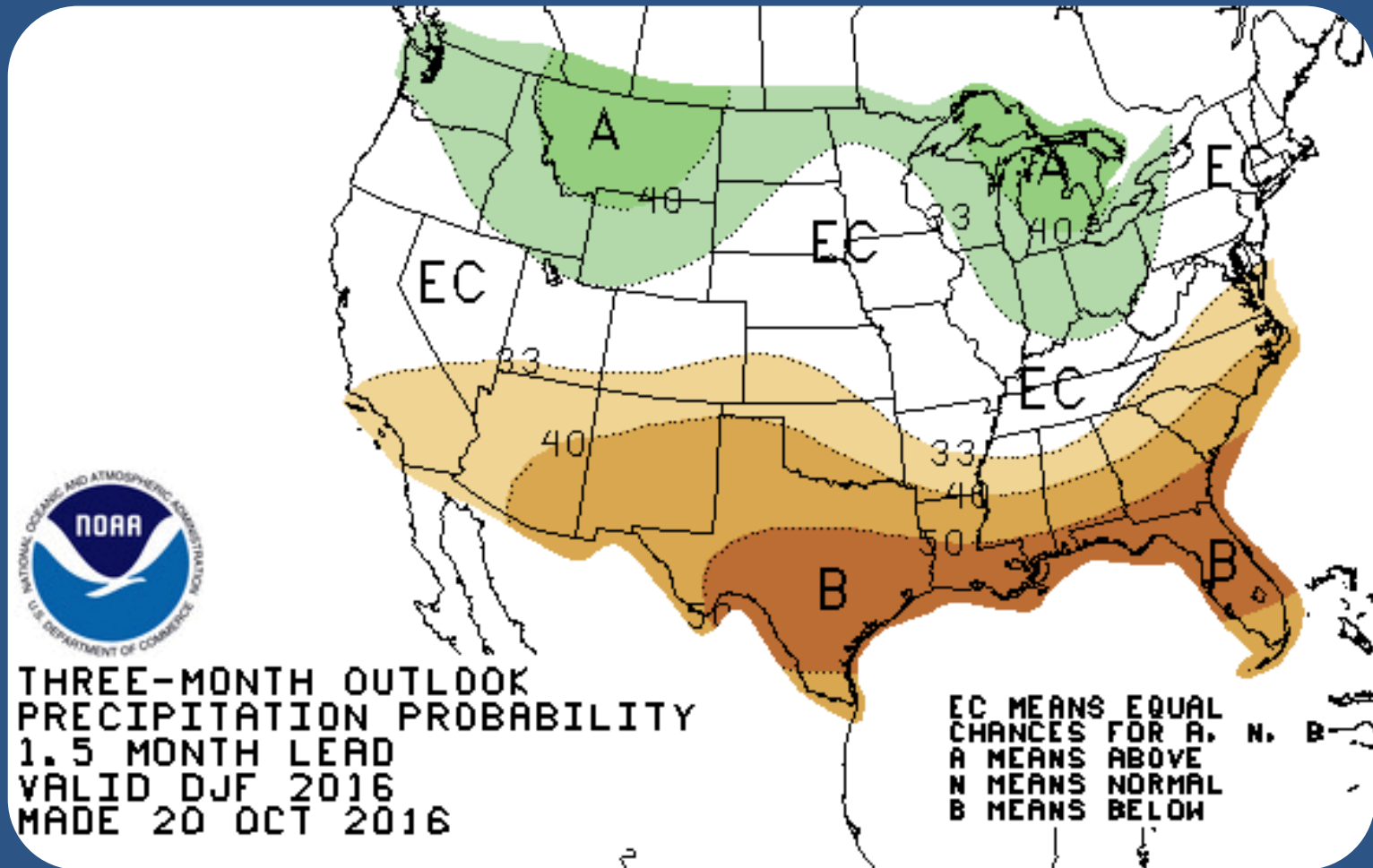
Temperature Outlook

Jan. – Feb. – Mar.



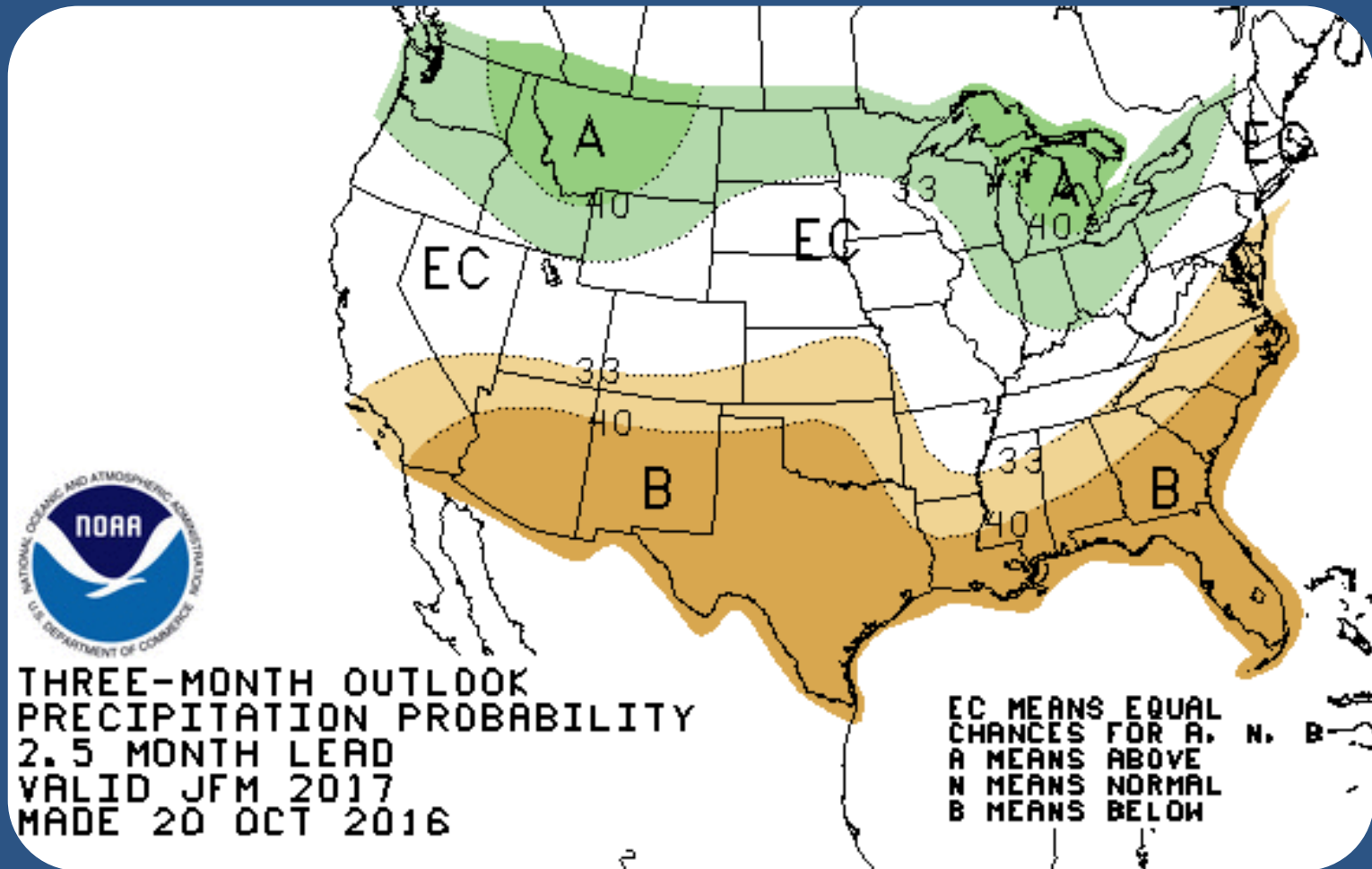
Precipitation Outlook

Dec. – Jan. – Feb.



Precipitation Outlook

Jan. – Feb. – Mar.





Northwest River Forecast Center Water Supply Forecasts



River and Hydrology

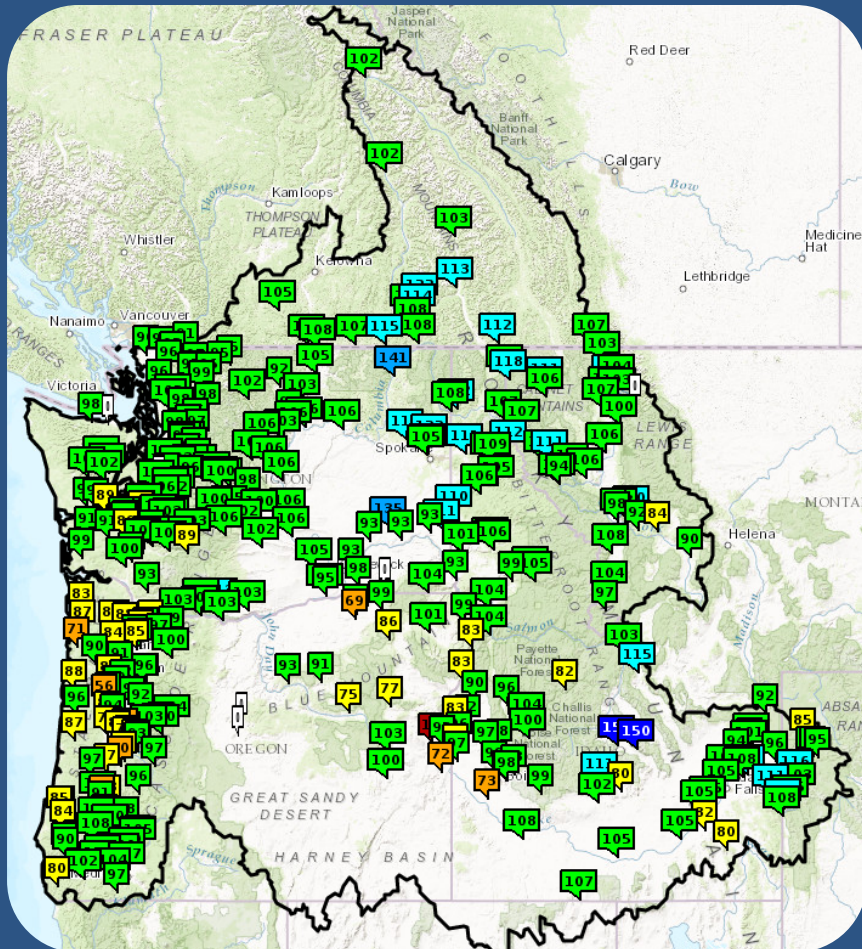
Water Supply

Observations

Weather Forecasts

Climate

NWRFC



Ensemble Streamflow Prediction

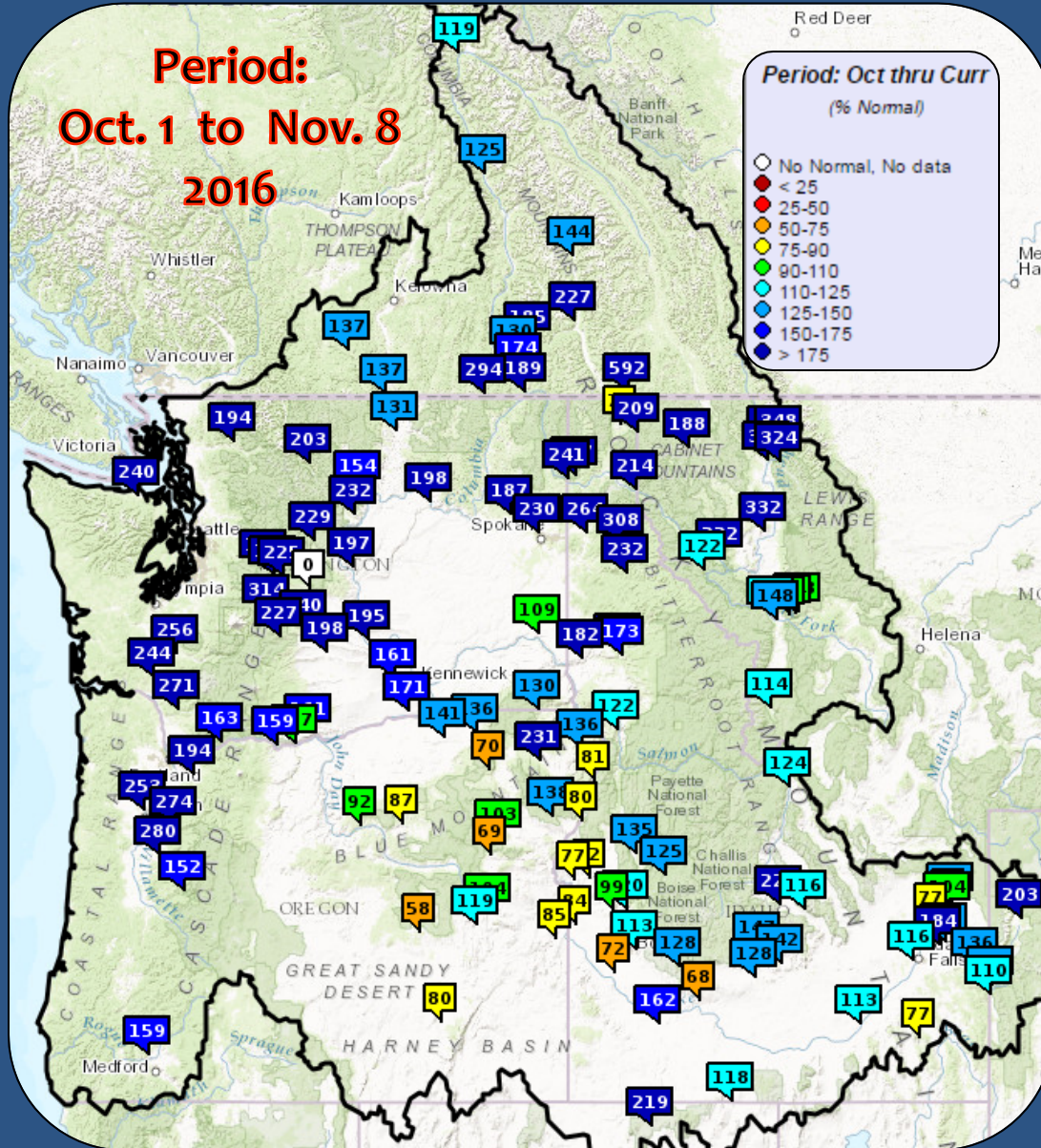
- Official ESP water supply products
 - 10 day precipitation and temperature forecasts (QPF/QTF)
 - Historical climate forcings appended thereafter
- Also 5 and 0 day QPF/QTF products
- Forecasts updated daily
- Forecasts compared to 30 year observed runoff normals (1981-2010)

Observed Runoff

Period:
Oct. 1 to Nov. 8
2016

Period: Oct thru Curr
(% Normal)

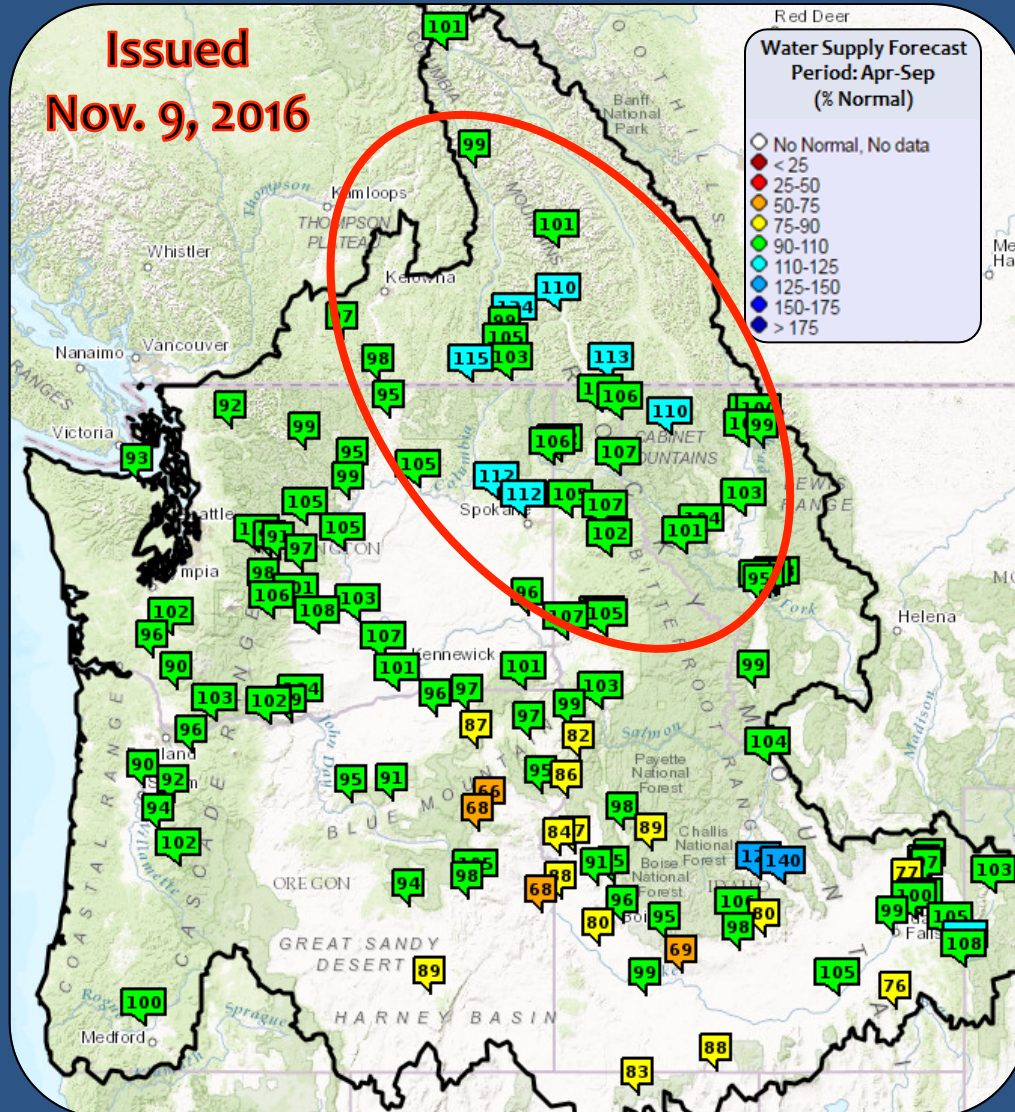
- No Normal, No data
- < 25
- 25-50
- 50-75
- 75-90
- 90-110
- 110-125
- 125-150
- 150-175
- > 175



Water Supply Forecasts

Upper Columbia Basin

Apr – Sep 2017 Forecast



Kootenai River

- Libby Dam

110%

Coeur d'Alene River

- Coeur d'Alene Lake

105%

SF Flathead River

- Hungry Horse Dam

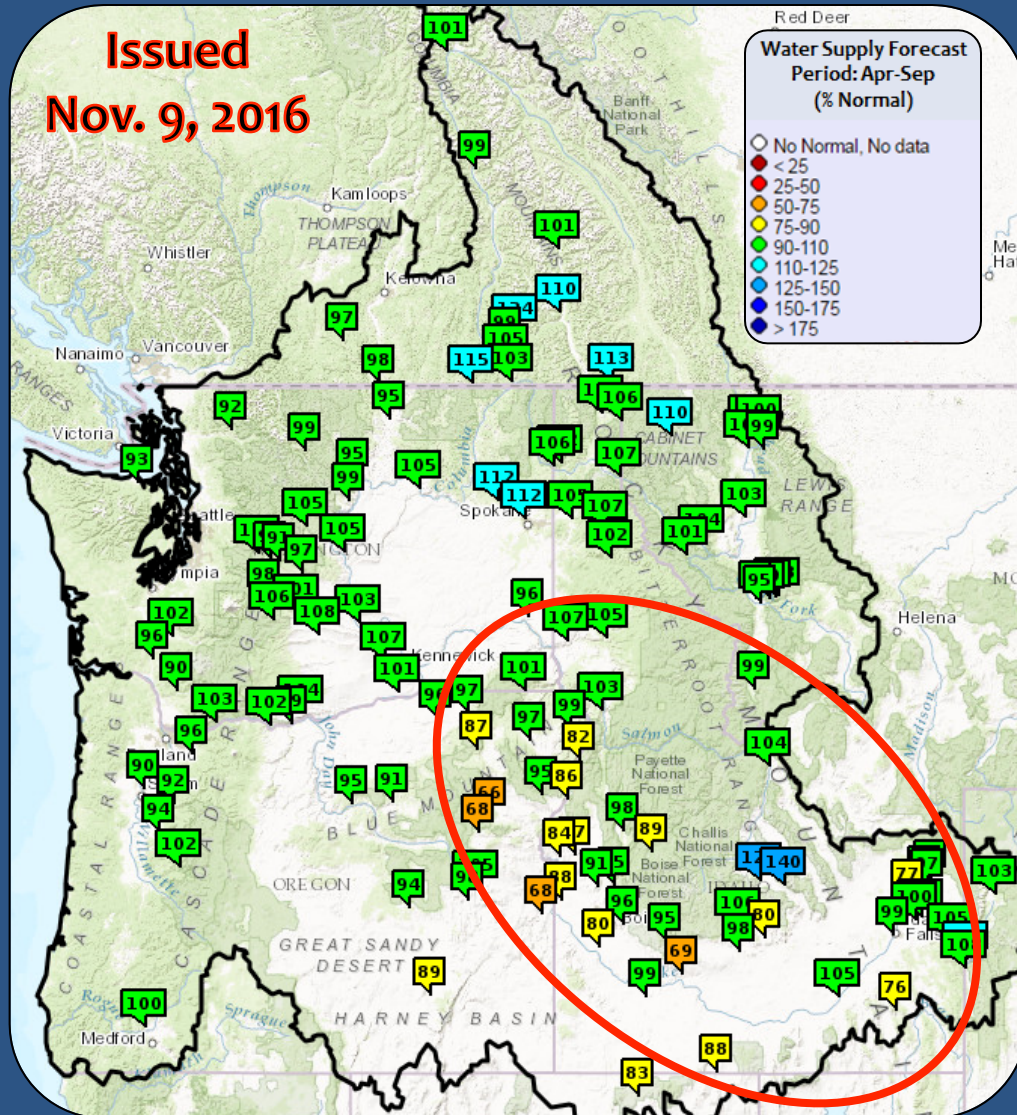
99%

Columbia River

- Grand Coulee Dam

105%

Water Supply Forecasts

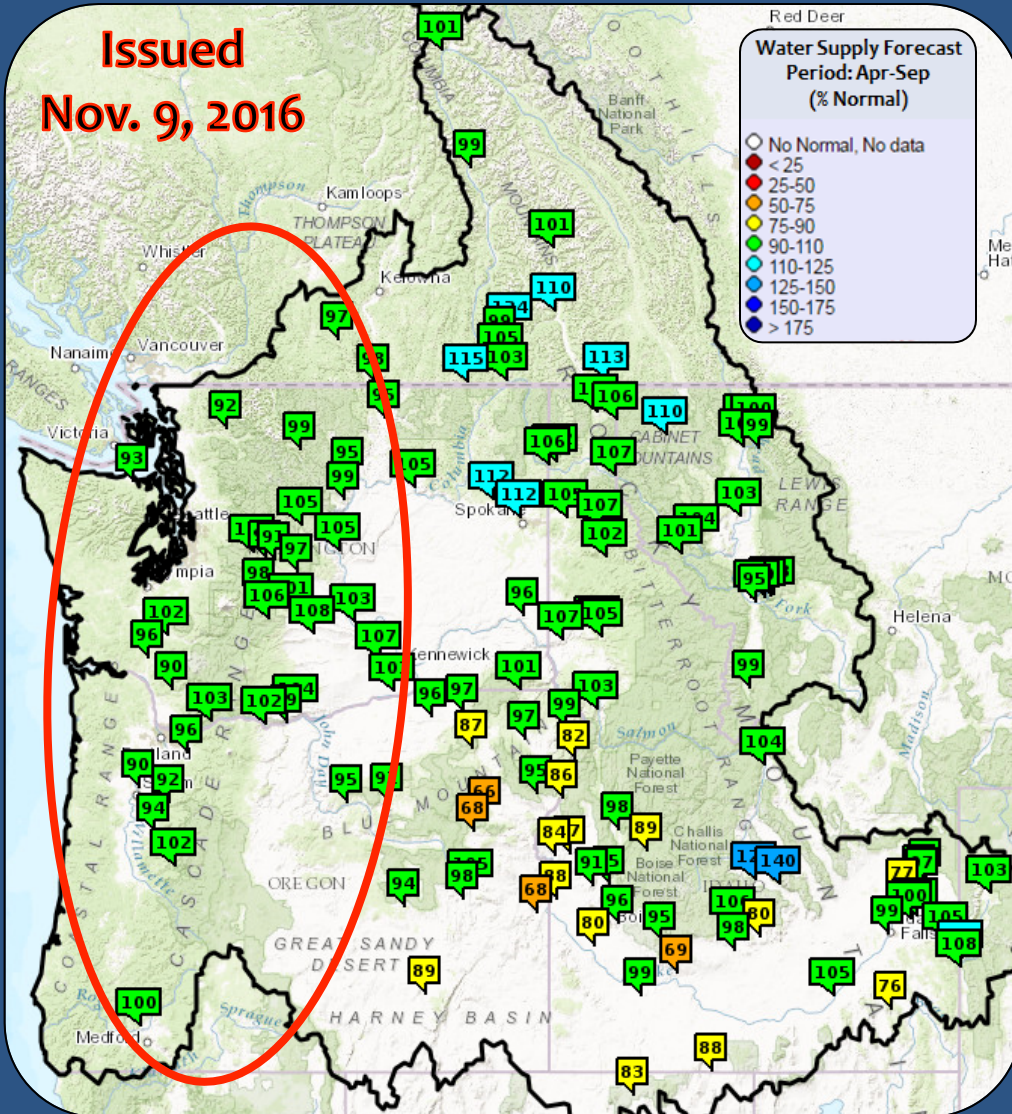


Snake River Basin

Apr – Sep 2017 Forecast

- Upper Snake River - Jackson Lake Dam 103%
- Upper Snake River - near Shelley 99%
- NF Clearwater River - Dworshak Dam 106%
- Lower Snake River - Lower Granite Dam 96%

Water Supply Forecasts



Western Oregon & Washington Cascades

Apr – Sep 2017 Forecast

- Skagit River
- near Concrete 92%
- Cowlitz River
- Mayfield Reservoir 102%
- John Day
- at Service Creek 95%
- Willamette River
- at Salem 90%

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 (DWR1)
Forecasts for Water Year 2017

Official Forecast

10 days QPF: Ensemble: 2016-11-09 Issued: 2016-11-09

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	1715	2722	106	3841	2575
APR-JUL	1603	2579	107	3584	2419
JAN-SEP	2752	3612	105	4858	3445
JAN-JUL	2649	3470	106	4622	3289
OCT-SEP	3390	4221	108	5787	3891

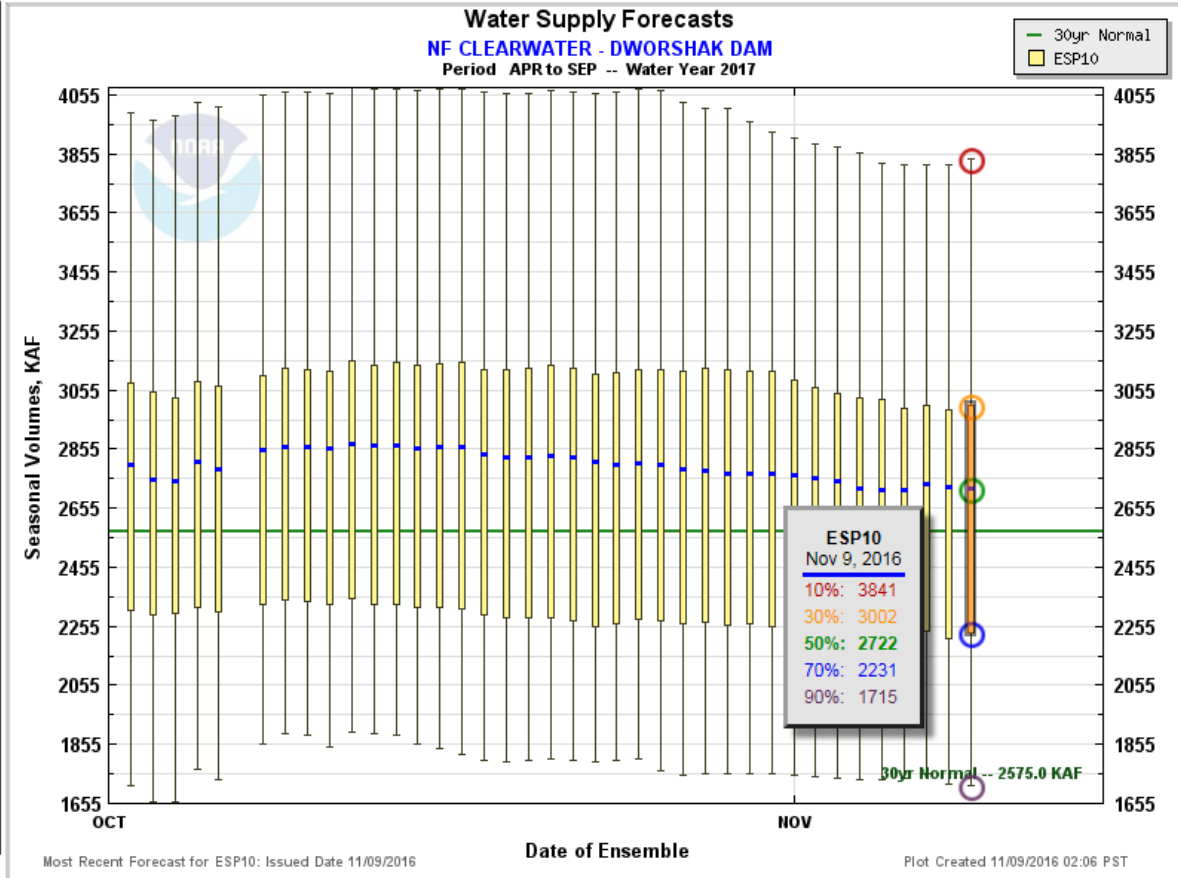
5 days QPF: Ensemble: 2016-11-09 Issued: 2016-11-09

APR-SEP	1753	2739	106	3870	2575
APR-JUL	1646	2600	107	3694	2419
JAN-SEP	2698	3586	104	4919	3445
JAN-JUL	2596	3450	105	4741	3289
OCT-SEP	3299	4129	106	5616	3891

0 days QPF: Ensemble: 2016-11-09 Issued: 2016-11-09

APR-SEP	1769	2799	109	3975	2575
APR-JUL	1655	2649	109	3795	2419
JAN-SEP	2743	3675	107	5043	3445
JAN-JUL	2632	3539	108	4838	3289
OCT-SEP	3353	4277	110	5763	3891

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



Max Scale Scale To Data Scale To Last 45 Days



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 (DWRI1)
Forecasts for Water Year 2017

Official Forecast

10 days QPF: Ensemble: 2016-11-09 Forecast: 2016-11-09

Forecast Period	90 %	50 %	Ave
APR-SEP	1715	2722	1
APR-JUL	1603	2579	1
JAN-SEP	2752	3612	1
JAN-JUL	2649	3470	1
OCT-SEP	3390	4221	1

5 days QPF: Ensemble: 2016-11-09

APR-SEP	1753	2739	1
APR-JUL	1646	2600	1
JAN-SEP	2698	3586	1
JAN-JUL	2596	3450	1
OCT-SEP	3299	4129	1

0 days QPF: Ensemble: 2016-11-09

APR-SEP	1769	2799	1
APR-JUL	1655	2649	1
JAN-SEP	2743	3675	1
JAN-JUL	2632	3539	1
OCT-SEP	3353	4277	1

Move the mouse over the desired "Forecast Period" to view the forecast details.

Water Supply Forecasts
NF CLEARWATER - DWORSHAK DAM
Period: APR to SEP -- Water Year 2017

30yr Normal: 2575.0 KAF

ESP10: 2722 KAF

Ensemble Streamflow Prediction Exceedance Probability

Plot Created 11/09/2016 02:06 PST

OCT-DEC Oceanic Nino Index vs APR-SEP Historical Water Supply Runoff (DWRI1) NF CLEARWATER - DWORSHAK DAM

Legend:
 ◆ Runoff for Given Water Year
 — ONI vs Runoff Trendline
 — 30 Year Normal (1981-2010)

Historical Runoff (KAF) vs Oceanic Nino Index (ONI)

La Nina | Neutral | El Nino

Trendline StdErr=715 KAF, Corr(r)=-0.58

Created: 11/09/2016 02:10 PST



ESP Volume Forecast Products



Northwest River Forecast Center Water Supply Forecasts

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

NF CLEARWATER - DWORSHAK DAM (DWR1)
Forecasts for Water Year 2016

Official Forecast

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

Forecasts Are in KAF

Select Period:
APR-SEP Select

NF CLEARWATER - DWORSHAK DAM (DWR1) Period Rankings - 1960 to 2016 APR-SEP Normal -- 2575 (KAF)

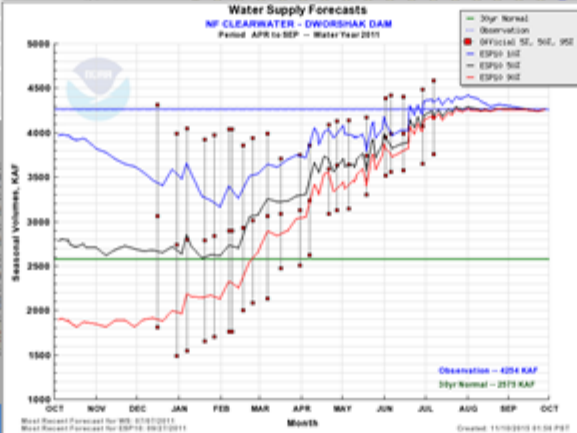
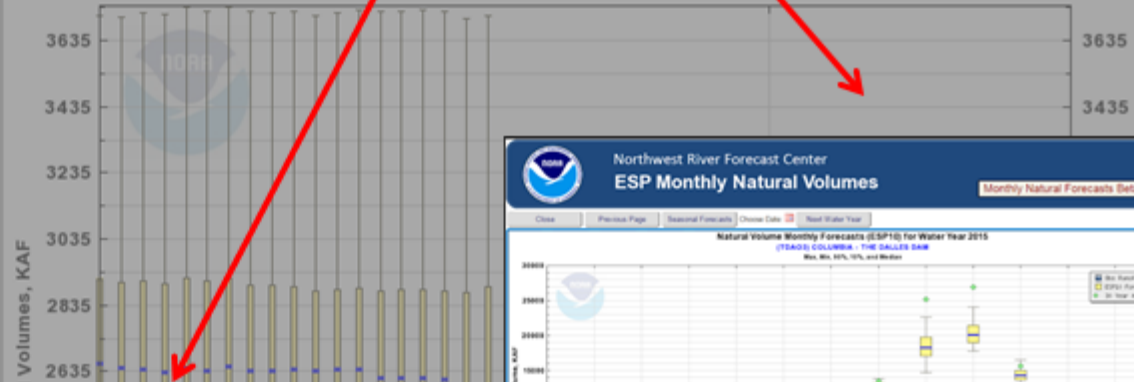
Rank	Year	Period Volume (KAF)	Percent of Normal	Exceedance Probability*
23	1989	2740.00	106	46.000 %
24	2009	2711.00	105	48.000 %
25	1991	2658.00	103	50.000 %
26	2004	2647.00	103	52.000 %
27	2016	2641.23	103	54.000 %
28	1978	2537.00	99	56.000 %
29	1981	2432.00	94	58.000 %
30	1993	2424.00	94	60.000 %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

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

APR-SEP	1706	2634	102	3706	21
APR-JUL	1590	2486	103	3509	21
JAN-SEP	2145	3249	94	4551	34
JAN-JUL	2037	3100	94	4379	33
OCT-SEP	2288	3488	90	4831	31

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

Water Supply Forecasts NF CLEARWATER - DWORSHAK DAM Period APR to SEP -- Water Year 2016



Northwest River Forecast Center ESP Monthly Natural Volumes

Monthly Natural Forecasts Beta

Close Previous Page Seasonal Forecasts Choose Date: 2015-10-19

Natural Volume Monthly Forecasts (ESP10) for Water Year 2015
(STAKS) COLUMBIA - THE DALLES DAM
Max. Min. 50%, 10% and Mean

Forecast Period	50%	10%	Max	Min	Average	30 Year Average
OCT	5000	3000	7000	1000	4000	4000
NOV	5000	3000	7000	1000	4000	4000
DEC	5000	3000	7000	1000	4000	4000
JAN	5000	3000	7000	1000	4000	4000
FEB	5000	3000	7000	1000	4000	4000
MAR	5000	3000	7000	1000	4000	4000
APR	5000	3000	7000	1000	4000	4000
MAY	5000	3000	7000	1000	4000	4000
JUN	5000	3000	7000	1000	4000	4000
JUL	5000	3000	7000	1000	4000	4000
AUG	5000	3000	7000	1000	4000	4000
SEP	5000	3000	7000	1000	4000	4000



Monthly Briefing Schedule



Northwest River Forecast Center Water Supply Forecasts



- River and Hydrology
- Water Supply
- Observations
- Weather Forecasts
- Climate
- NWRFC

Home

- Forecast Map
- Forecast Listing
- Forecast Report
- Forecast Text Product
- Live Briefing Schedule**
- Precipitation/Temperature
- Snow
- Runoff
- Runoff Text Product
- ESP Natural Forecast
- ESP Interactive
- Documentation
- Downloads **NEW**

Search
Enter NWS ID:

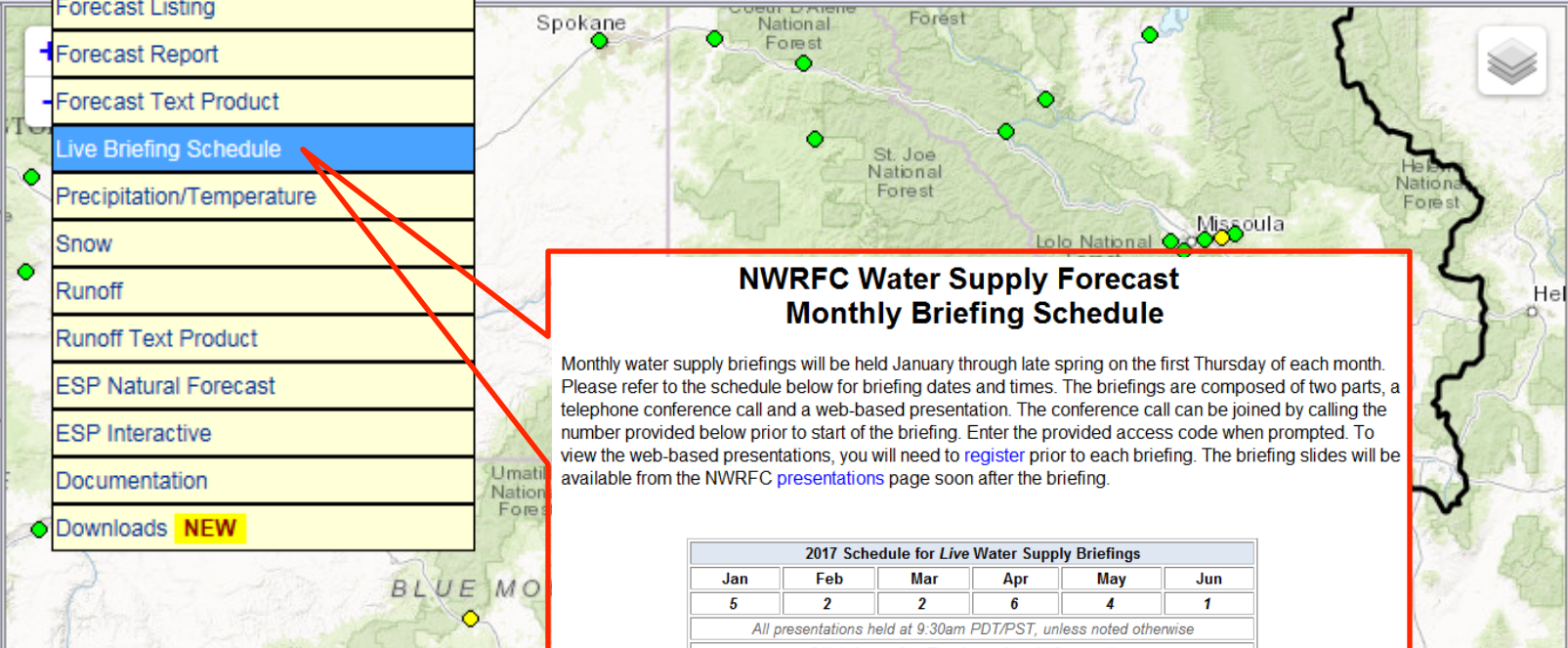
GO

Map Overlays

- NWRFC Boundary
- NWRFC Basins
- NWS HSAs
- Counties

ESP WS Volumes

- Status
- Percent of Normal
- Rank (ASC)
- Rank (DESC)
- Exceedance (%)



Permalink

NWRFC Water Supply Forecast Monthly Briefing Schedule

Monthly water supply briefings will be held January through late spring on the first Thursday of each month. Please refer to the schedule below for briefing dates and times. The briefings are composed of two parts, a telephone conference call and a web-based presentation. The conference call can be joined by calling the number provided below prior to start of the briefing. Enter the provided access code when prompted. To view the web-based presentations, you will need to [register](#) prior to each briefing. The briefing slides will be available from the NWRFC [presentations](#) page soon after the briefing.

2017 Schedule for Live Water Supply Briefings					
Jan	Feb	Mar	Apr	May	Jun
5	2	2	6	4	1
All presentations held at 9:30am PDT/PST, unless noted otherwise					
Click here for Registration Information					

Telephone Conference Call Number (same for each month's brief):
1-888-677-0012
Pass Code: 91999



Contact Info:

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Service Hydrologist
National Weather Service - Boise, ID



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troy.lindquist@noaa.gov



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