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March 4, 2014

MEMORANDUM

TO: Council members

FROM: Jim Ruff – Manager, Mainstem Passage and River Operations
John Fazio – Senior Power Systems Analyst

SUBJECT: March Runoff Forecasts and Regional Power Supply Outlook

At the March 11, 2014, Council meeting, we will provide the most current information about Northwest snowpack conditions and water supply forecasts for 2014. Specifically, we will report to the Council:

- 1) latest NOAA data on weather through March 1
- 2) NRCS data on snowpack conditions as of March 1
- 3) current NOAA water supply forecasts for March at selected sites in the Columbia River Basin;
- 4) long-range NOAA temperature and precipitation forecasts for the Pacific Northwest for the next three months; and
- 5) implications for the regional power supply, reservoir elevations and stream flows.

Some of the information needed for the presentation will become available later this week. As a result, we plan to provide copies of the presentation at the March 11th meeting.

Regional Hydro Outlook for this Water Year

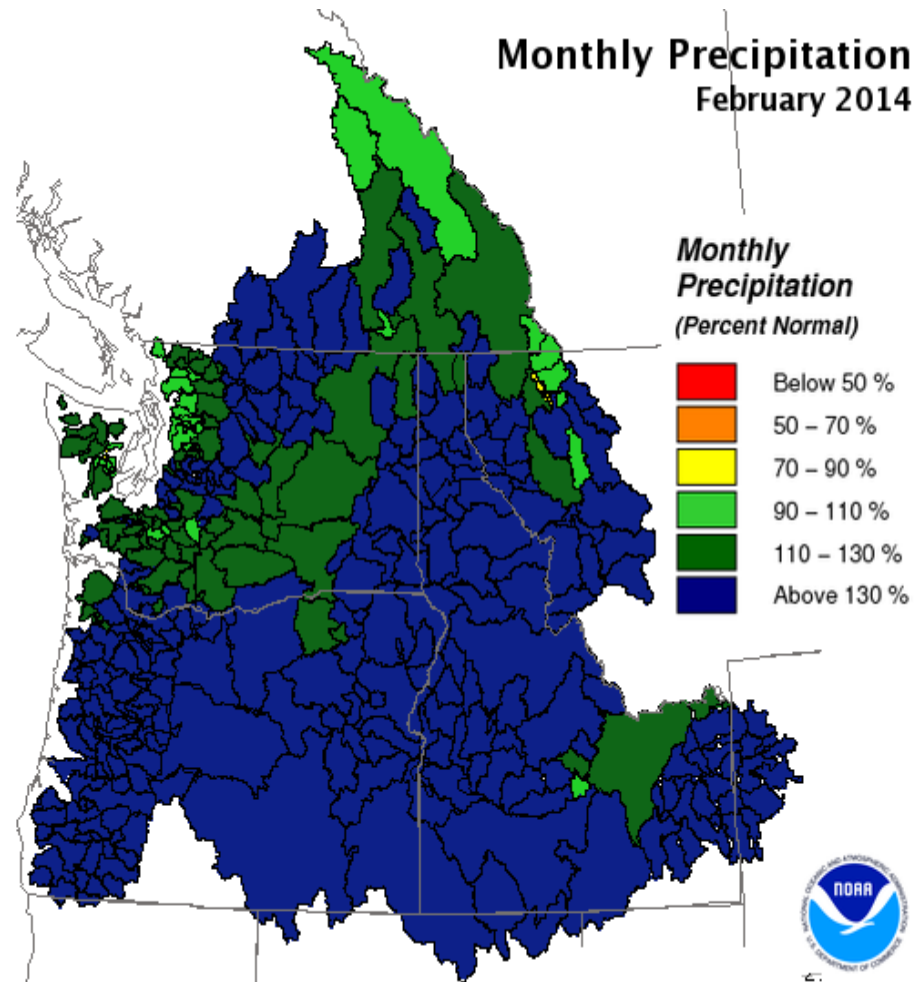
Jim Ruff and John Fazio

Northwest Power and Conservation Council Meeting

Portland, OR

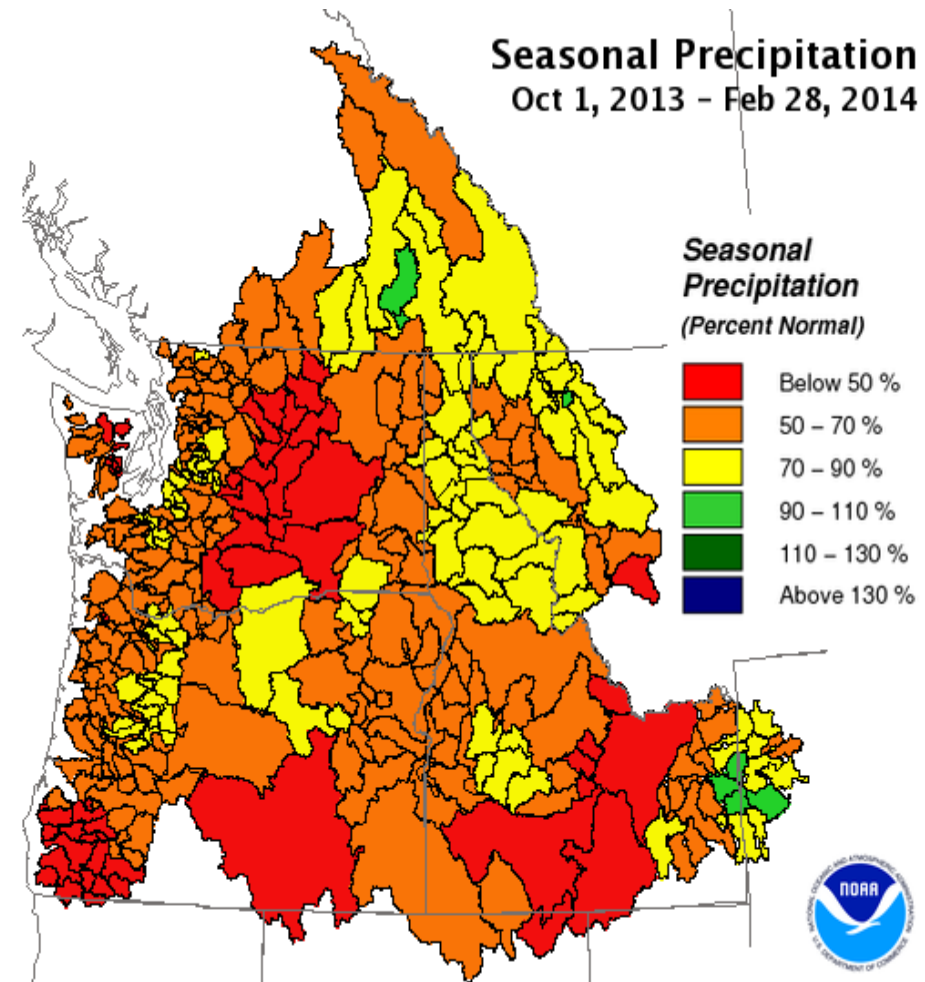
March 12, 2014

February and Seasonal Precipitation for Columbia Basin



Creation Time: Saturday, Mar 1, 2014

Northwest River Forecast Center



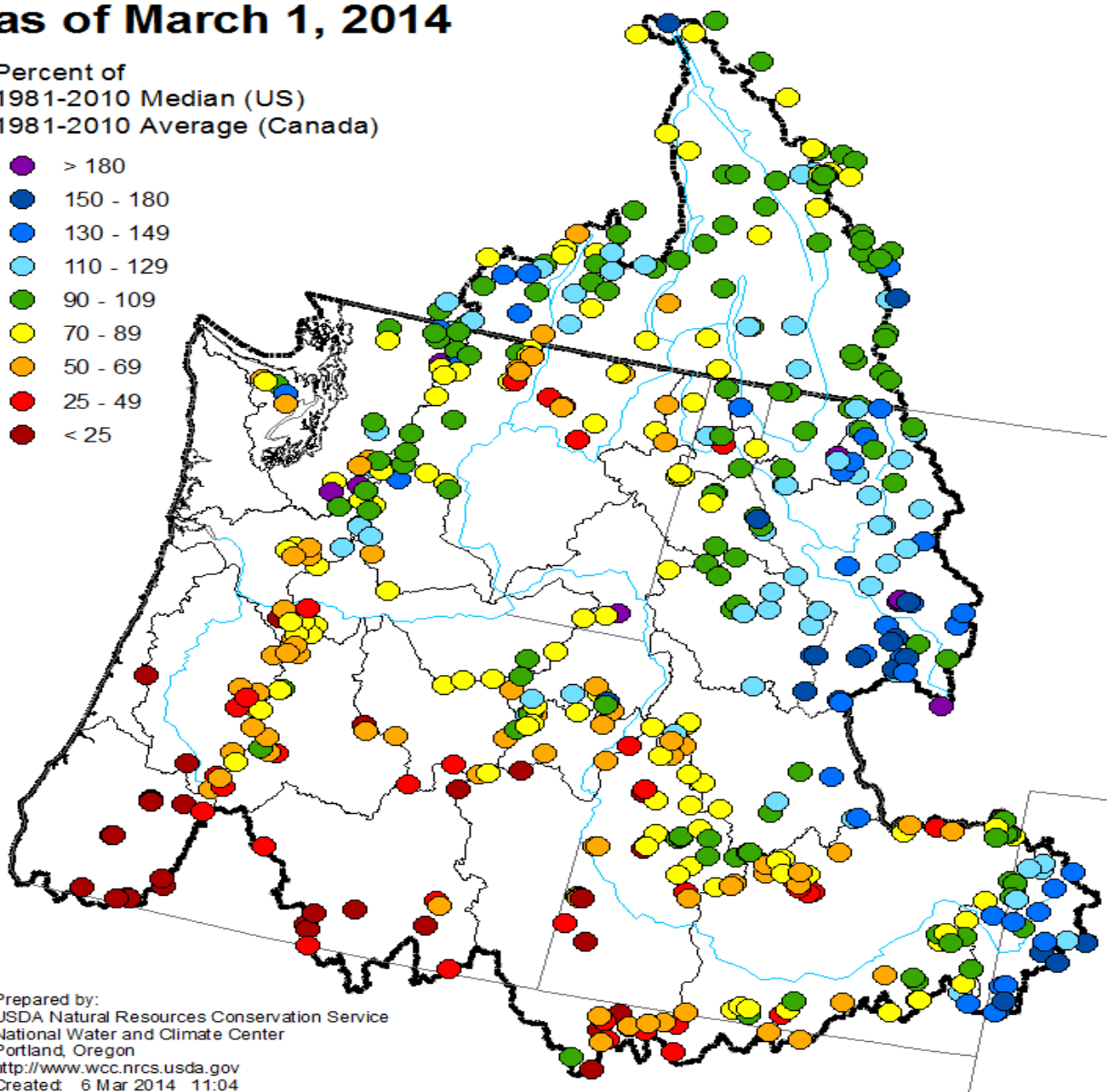
Creation Time: Saturday, Mar 1, 2014

Northwest River Forecast Center

Columbia River and Pacific Coastal Basins Mountain Snowpack as of March 1, 2014

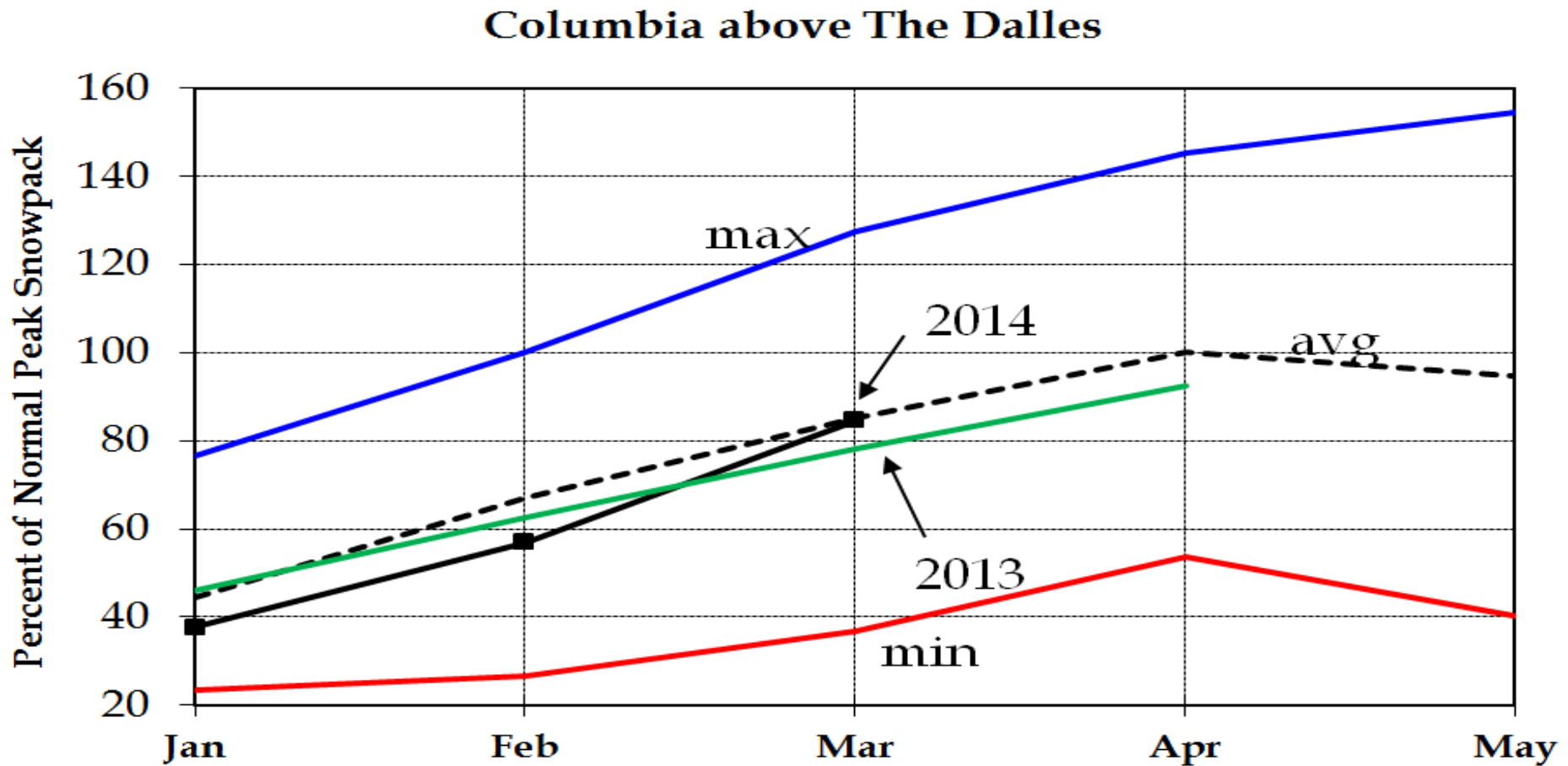
Percent of
1981-2010 Median (US)
1981-2010 Average (Canada)

- > 180
- 150 - 180
- 130 - 149
- 110 - 129
- 90 - 109
- 70 - 89
- 50 - 69
- 25 - 49
- < 25



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Created: 6 Mar 2014 11:04

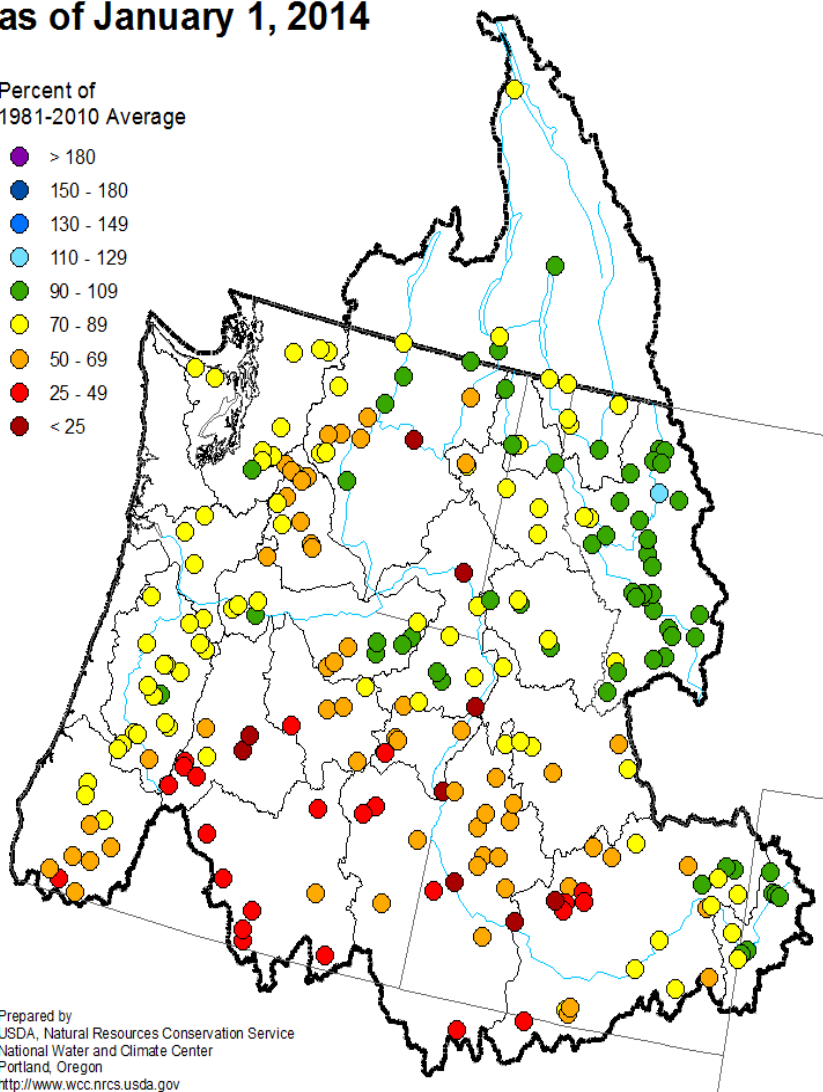
March 1 Snowpack for Columbia Basin above The Dalles, OR



Columbia River and Pacific Coastal Basins Spring and Summer Streamflow Forecasts as of January 1, 2014

Percent of
1981-2010 Average

- > 180
- 150 - 180
- 130 - 149
- 110 - 129
- 90 - 109
- 70 - 89
- 50 - 69
- 25 - 49
- < 25

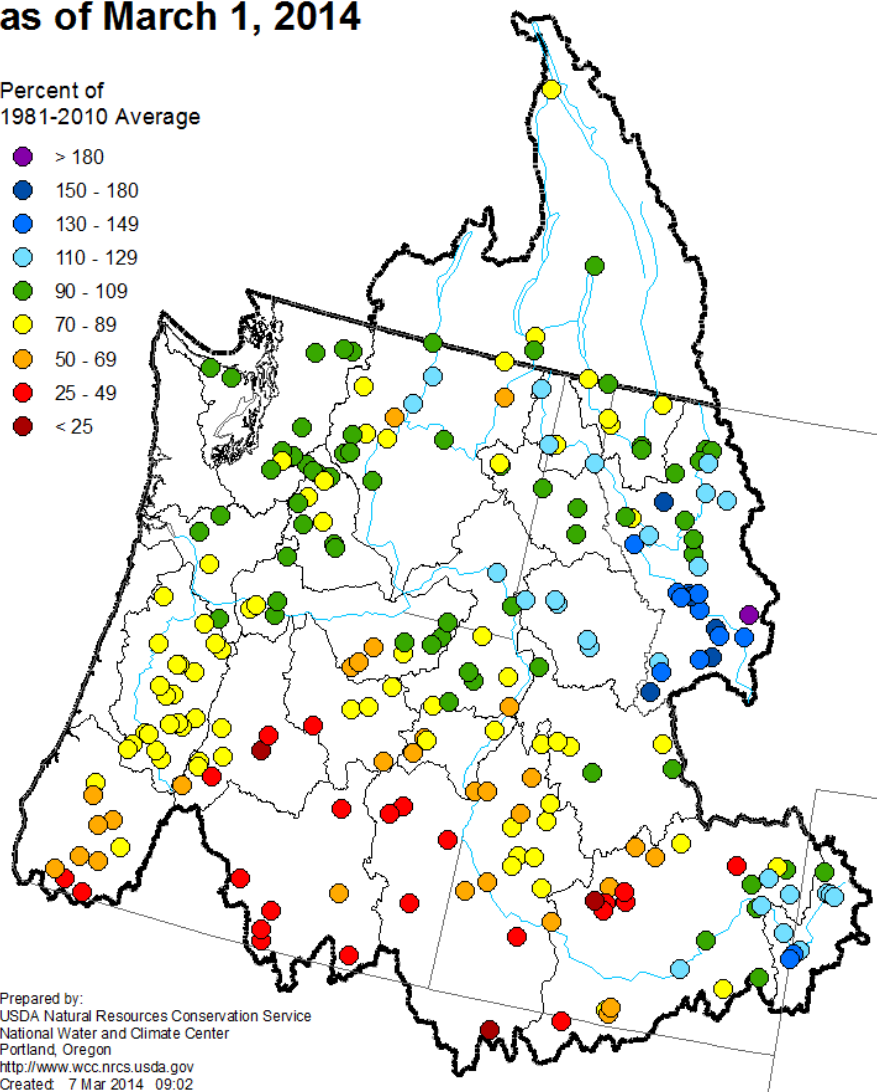


Prepared by:
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Columbia River and Pacific Coastal Basins Spring and Summer Streamflow Forecasts as of March 1, 2014

Percent of
1981-2010 Average

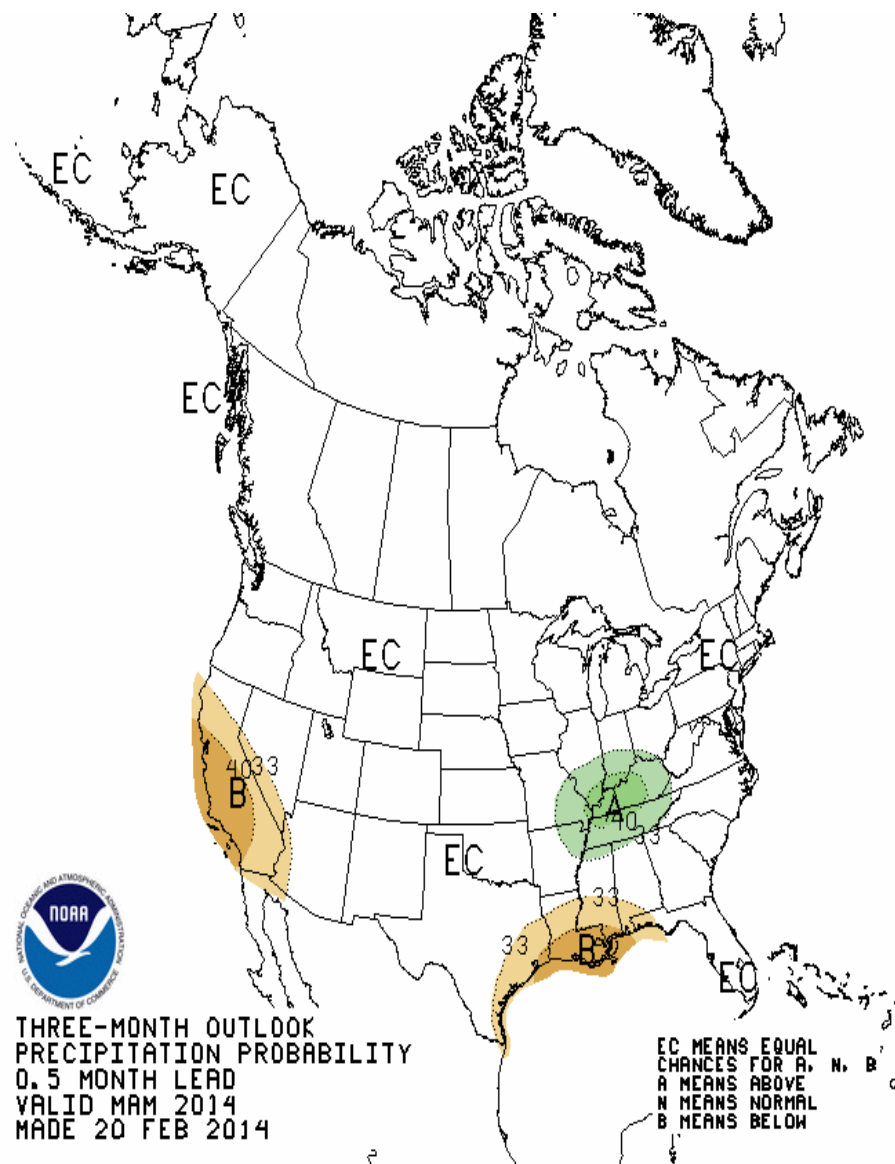
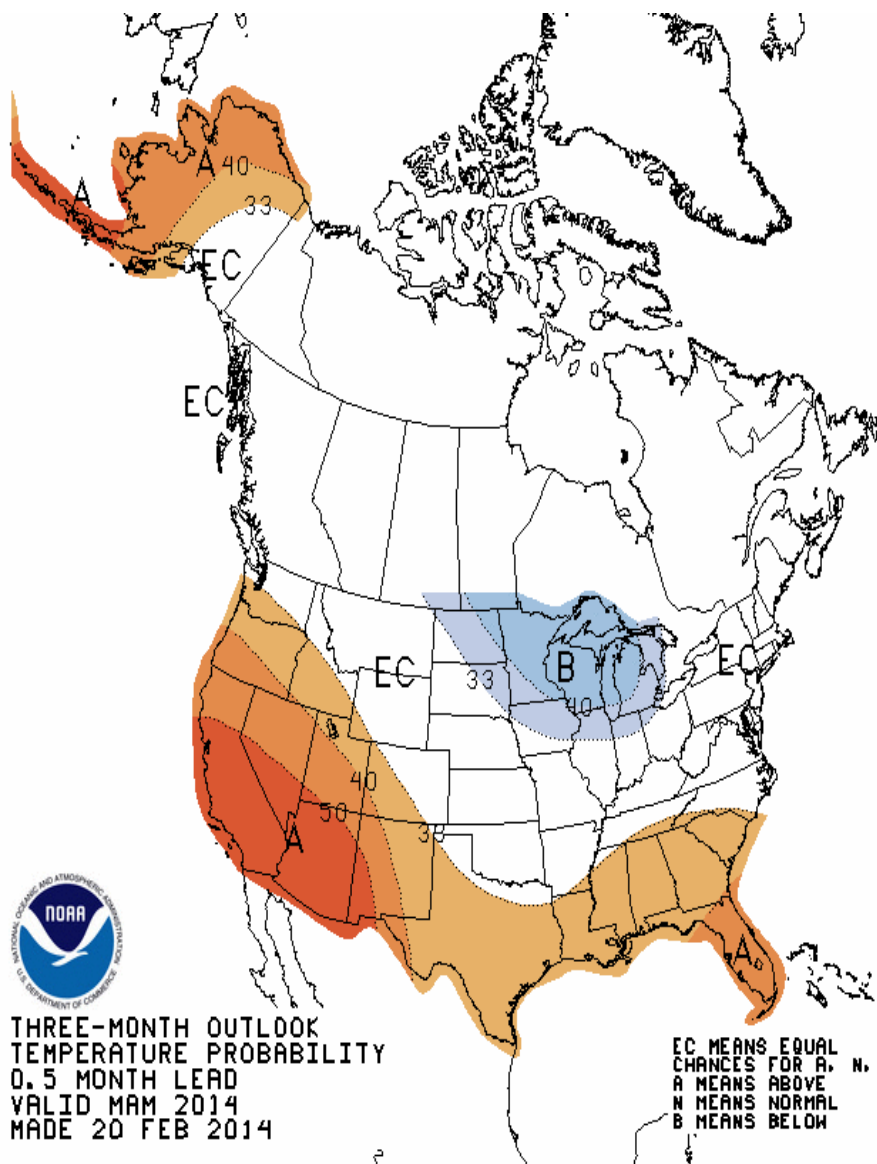
- > 180
- 150 - 180
- 130 - 149
- 110 - 129
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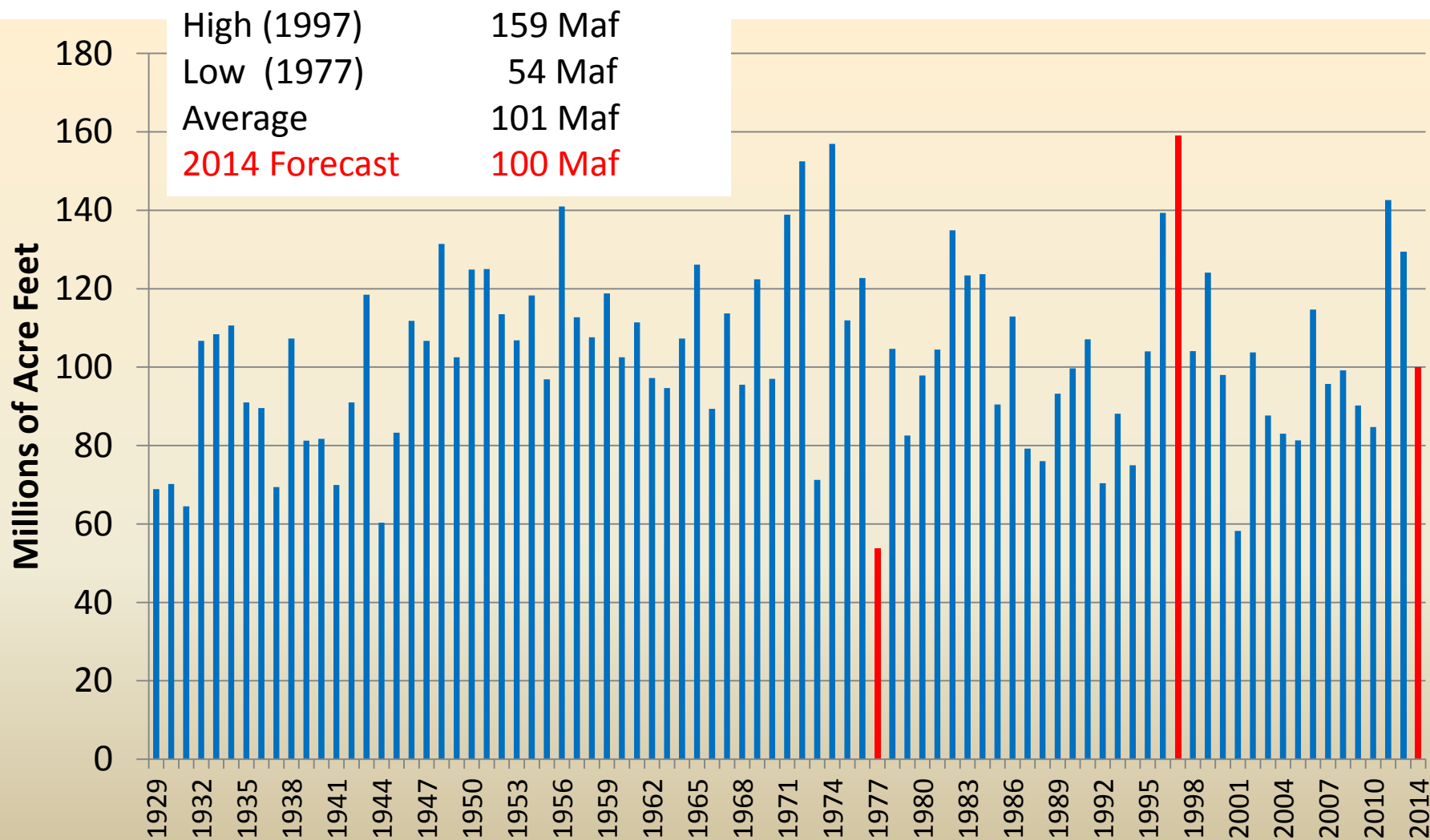
Forecast Site	Apr-Aug Runoff Forecast, in MAF	Forecast Percent of 30-year Average	2013 Runoff, in MAF
Columbia R. at Arrow Lakes	20.45	93%	22.98
Kootenai R. at Libby Dam	5.93	101%	7.17
SF Flathead R. at Hungry Horse Dam	1.97	102%	2.13
Columbia R. at Grand Coulee Dam	57.41	101%	61.04
Wenatchee R. at Peshastin	1.59	110%	1.47
Yakima R. near Parker	2.06	118%	1.86
Boise R. at Lucky Peak Dam	1.06	80%	0.67
Snake R. at Brownlee Dam	4.32	71%	3.07

Forecast Site	Apr-Aug Runoff Forecast, in MAF	Forecast Percent of 30-year Average	2013 Runoff, in MAF
Salmon R. at Whitebird	6.13	108%	4.63
Grande Ronde R. at Troy	1.45	114%	0.98
Snake R. at Lower Granite Dam	22.32	106%	14.72
NF Clearwater R. at Dworshak Dam	2.93	117%	2.16
Umatilla R. at Pendleton	0.13	85%	0.13
John Day R. at Service Creek	0.52	83%	0.51
Columbia R. at The Dalles	88.09	101%	87.05
Willamette R. at Salem	3.96	88%	3.96

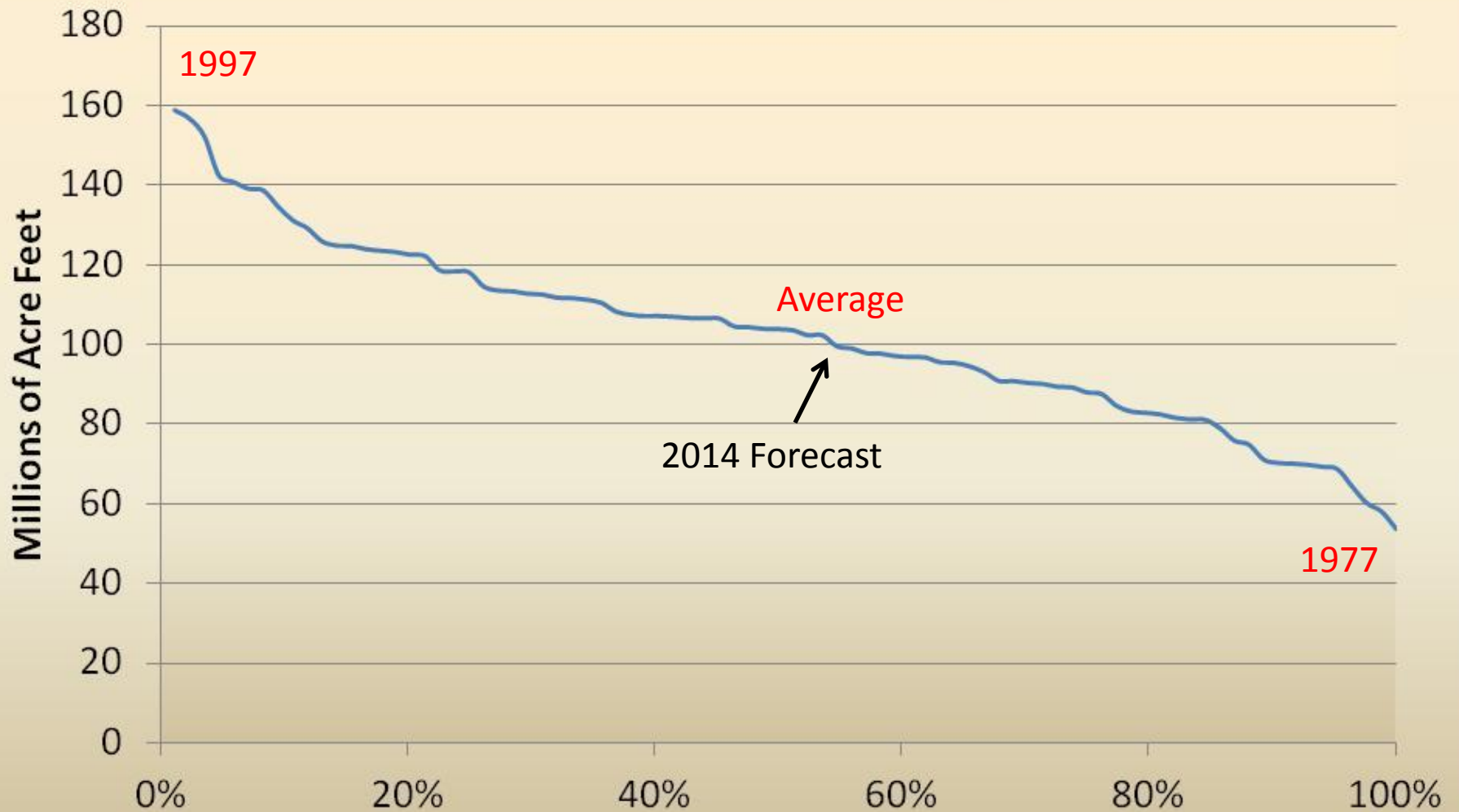


Recent Runoff Volumes

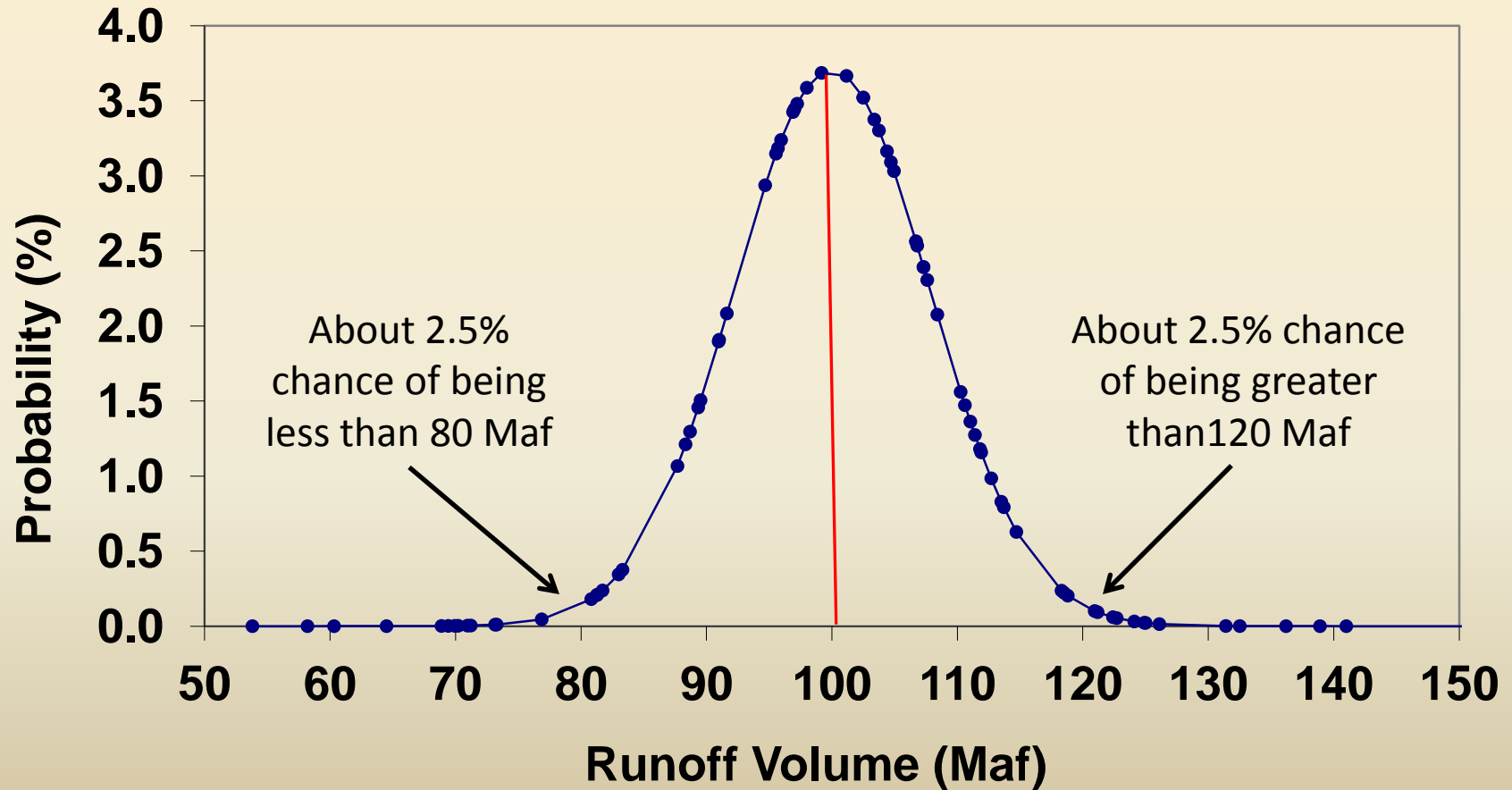
(January-July Volume at The Dalles)



Runoff Excedence Probability



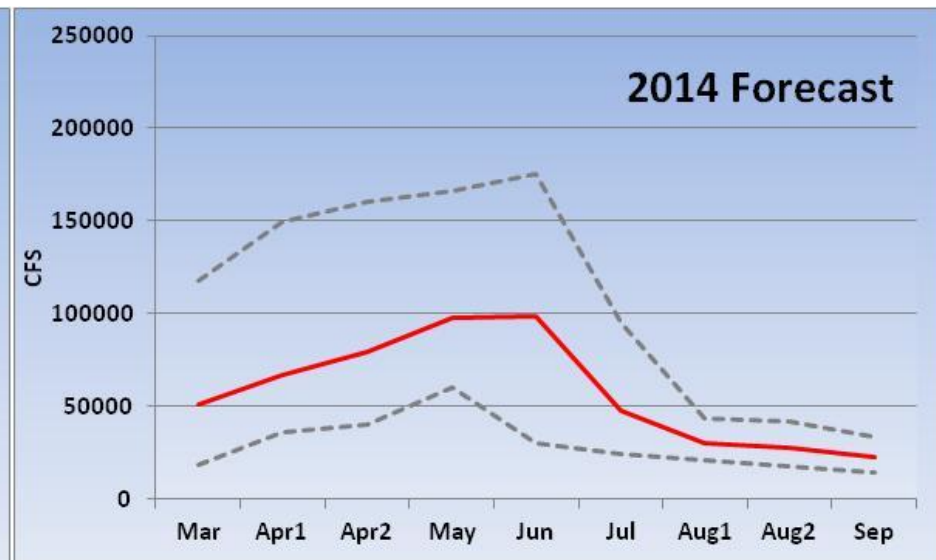
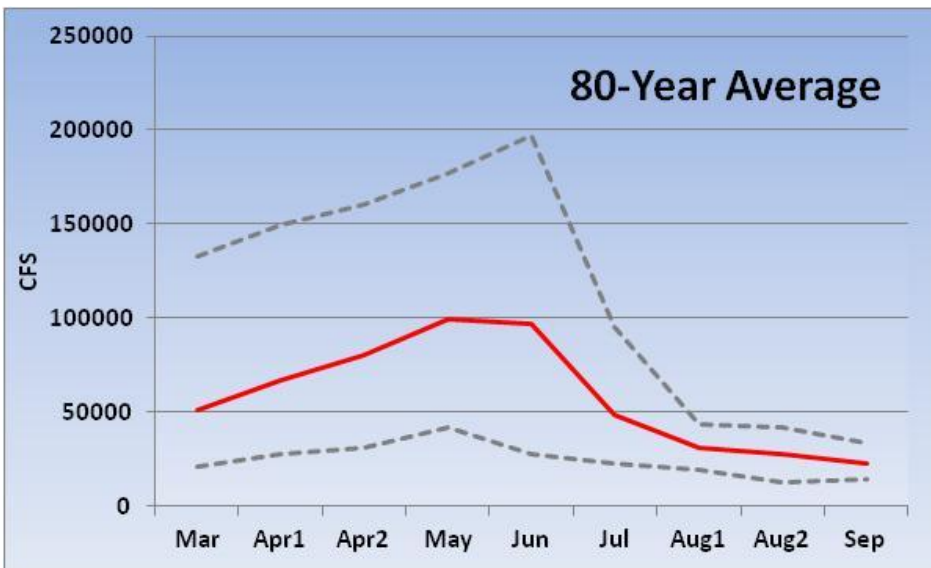
Jan-Jul Runoff Volume Distribution @TDL for March 1st, 2014 Forecast (Median 100 Maf, Sigma 7.8)



Projections for Mar-Sep 2014

- Not very interesting, but that's OK
- Preliminary Mar-Sep simulation shows:
 - Power supply adequacy – OK
 - River flows – close to average
 - Reservoir elevations – close to average
 - Hydro generation – close to average
 - Hydro revenues – close to average
- Range of potential outcomes narrows as we approach September

Forecast Flows at Lower Granite



Forecast Flows at McNary

