

CBRFC
March 2014
Water Supply Webinar

March 6, 2014

Greg Smith

February Water Supply Webinar

- Soil Moisture
- February weather
- Current snow conditions
- Water supply forecasts
- Why is spring (Mar-Apr) so pivotal ?
- Upcoming weather

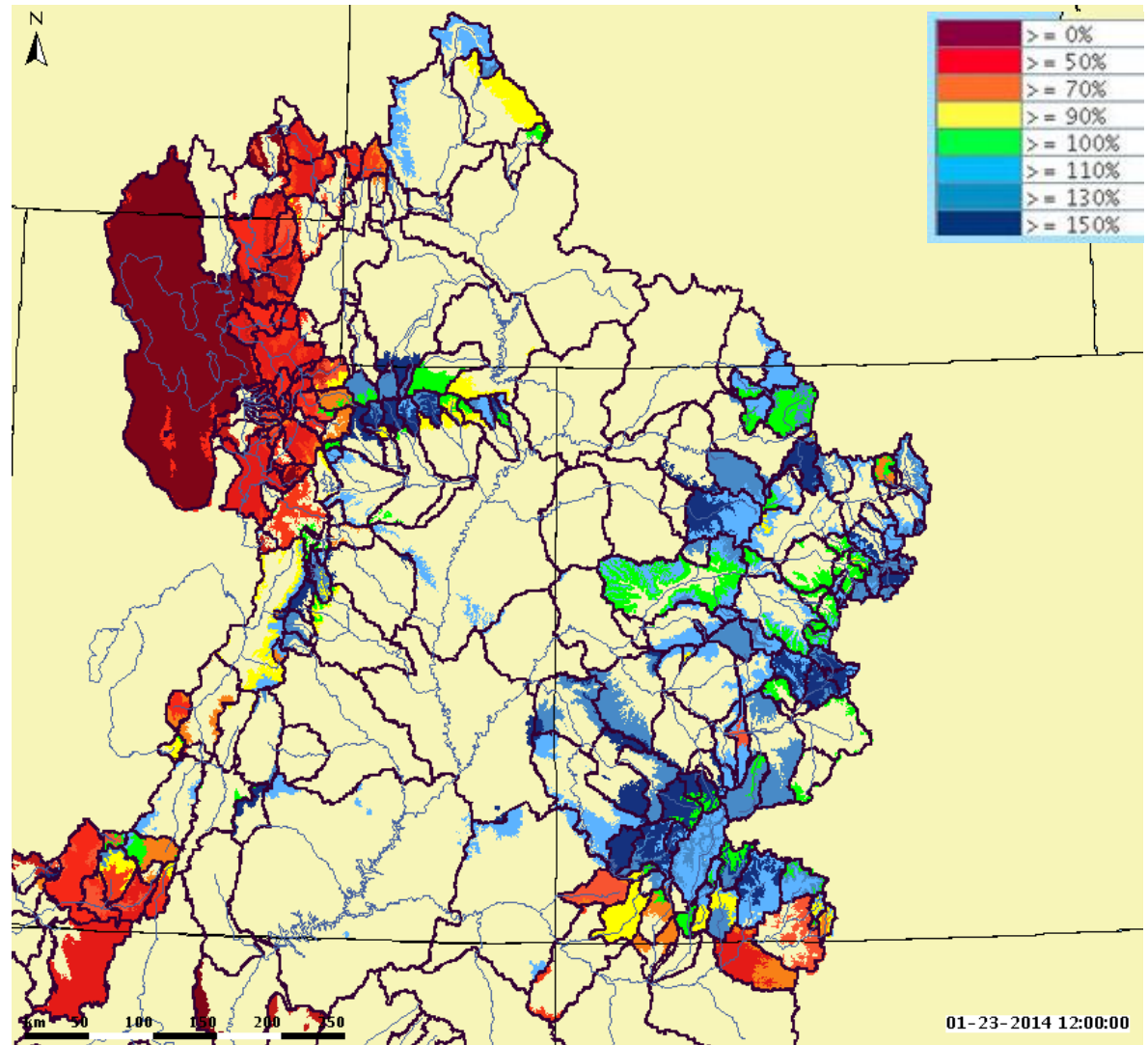
Modeled Soil Moisture

Well above Upper Colorado and well below Great Basin

How will this affect water supply forecasts?

Positive effect on the upper Colorado

Negative affect on the Great Basin and Lower Colorado

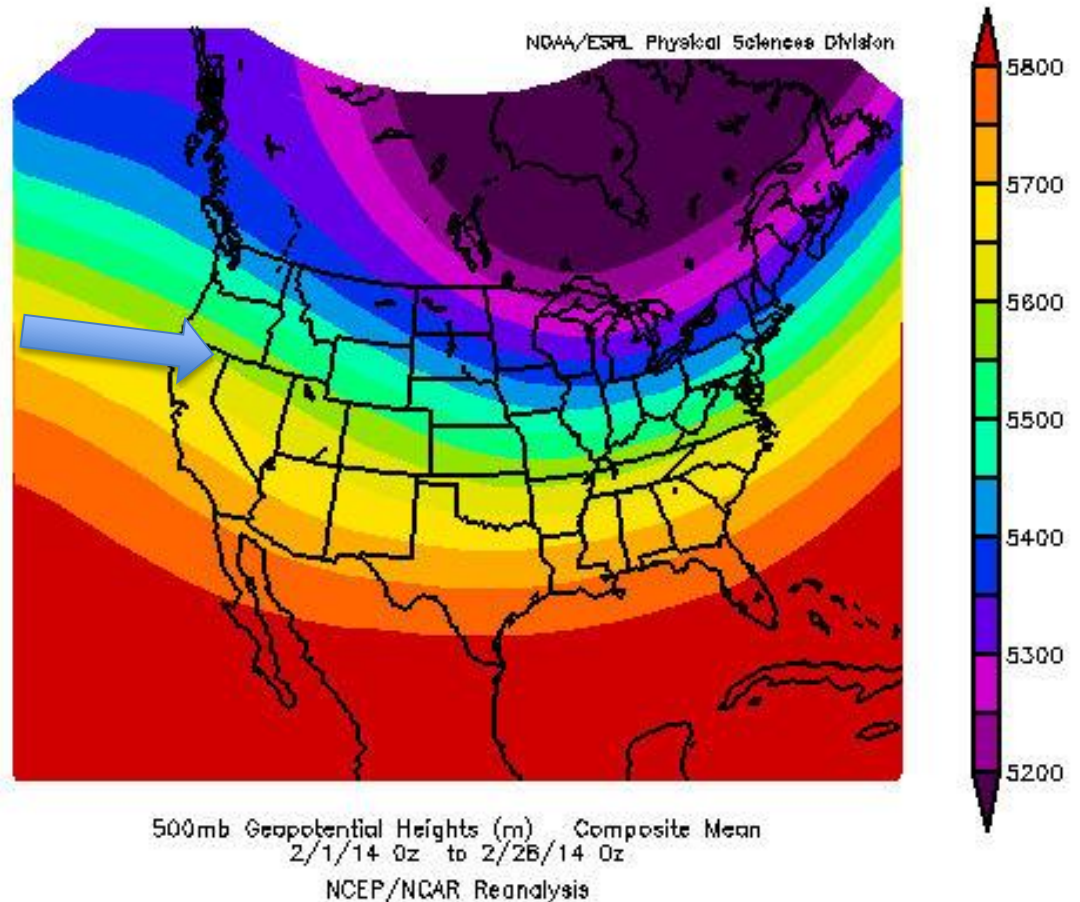


February 2014 Upper Air Pattern

Progressive weather pattern developed

Strong zonal (west to east) upper air flow pattern

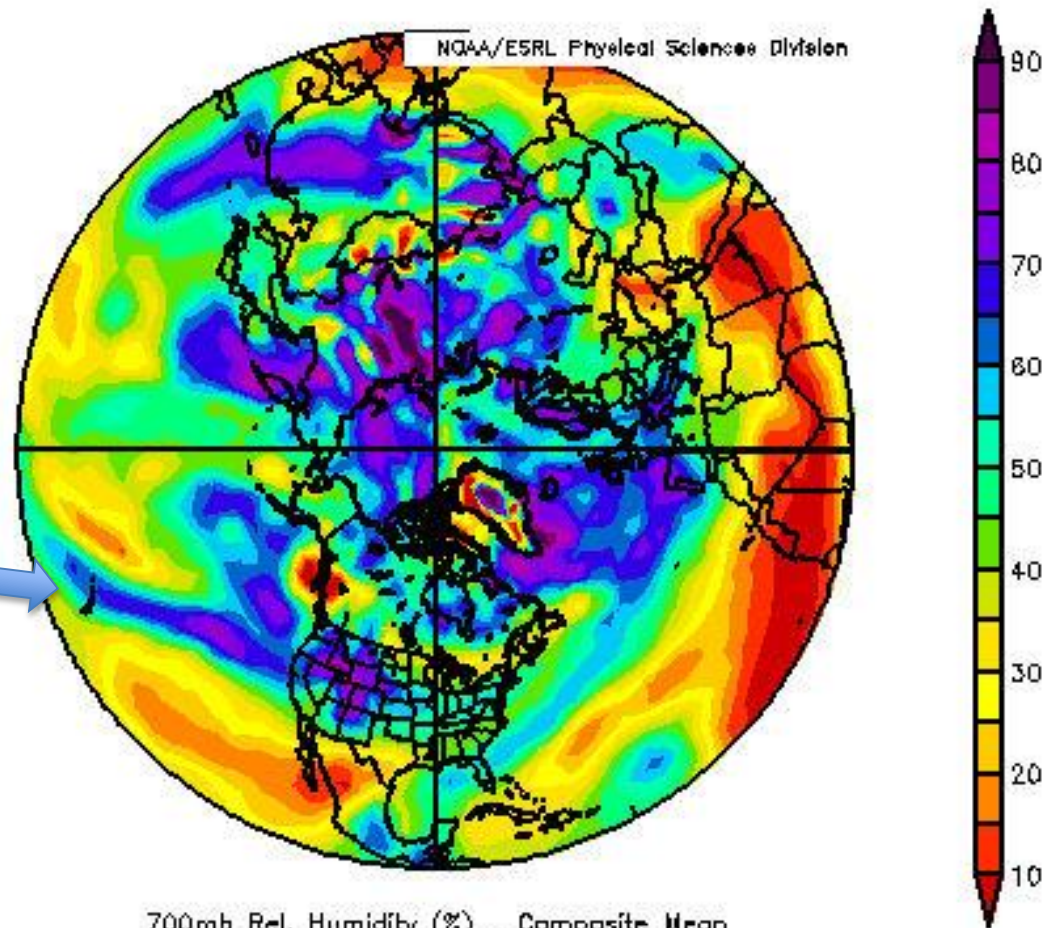
Very moist and mild air transported into the Western U.S.



February 2014 Upper Air Pattern

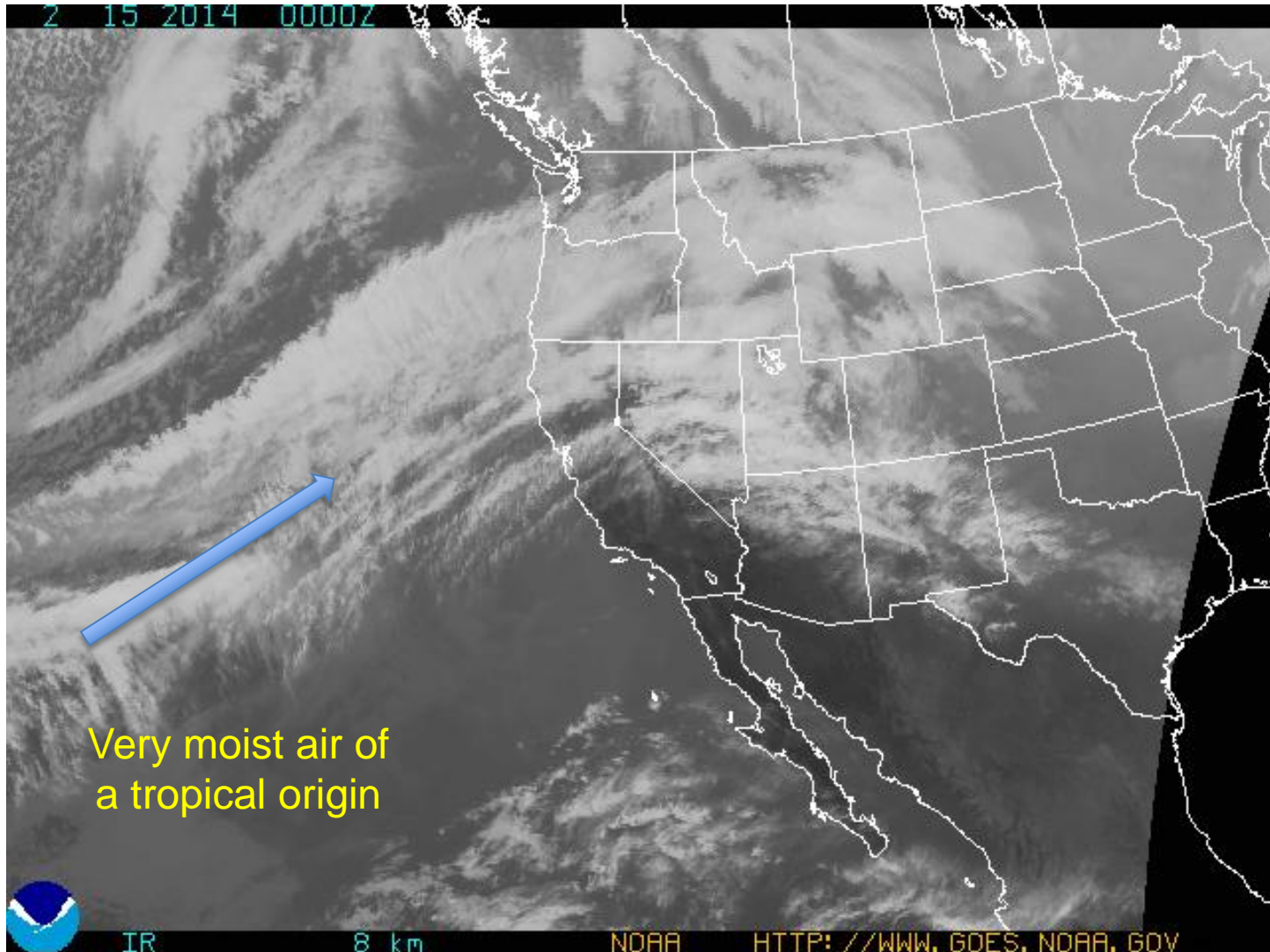
Very moist and mild air transported into the Western U.S. – “**atmospheric river**”

Significant precipitation in the Green River Basin of Wyoming and northern Bear River Basin



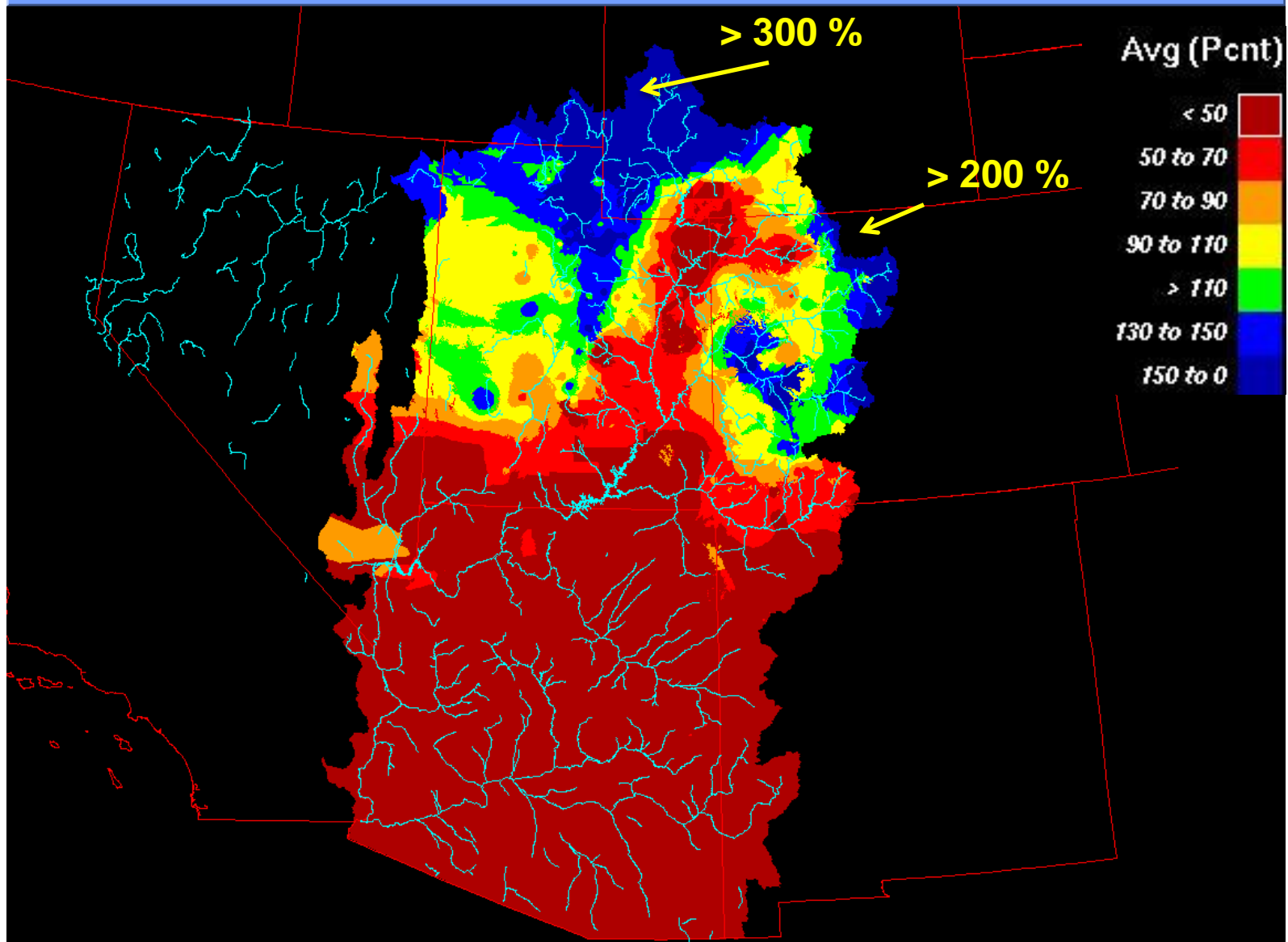
700mb Rel. Humidity (%) Composite Mean
2/3/14 0z to 2/10/14 0z
NCEP/NCAR Reanalysis

February 2014



February 2014 Precipitation Percent of Average

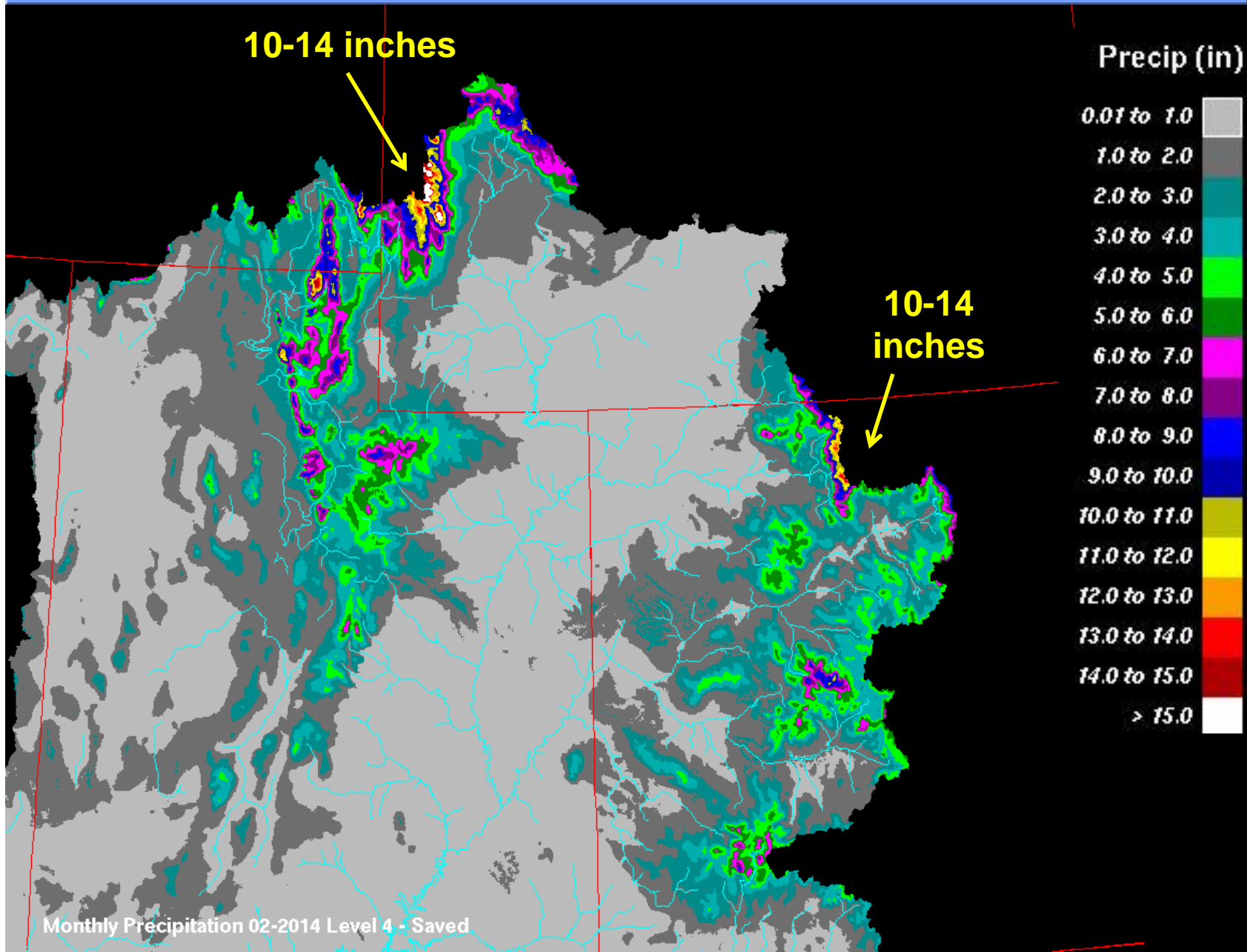
File Edit Backgrounds Options



Monthly Percent Average Precipitation 02-2014 Level 4 - Saved

February 2014 Precipitation Observed

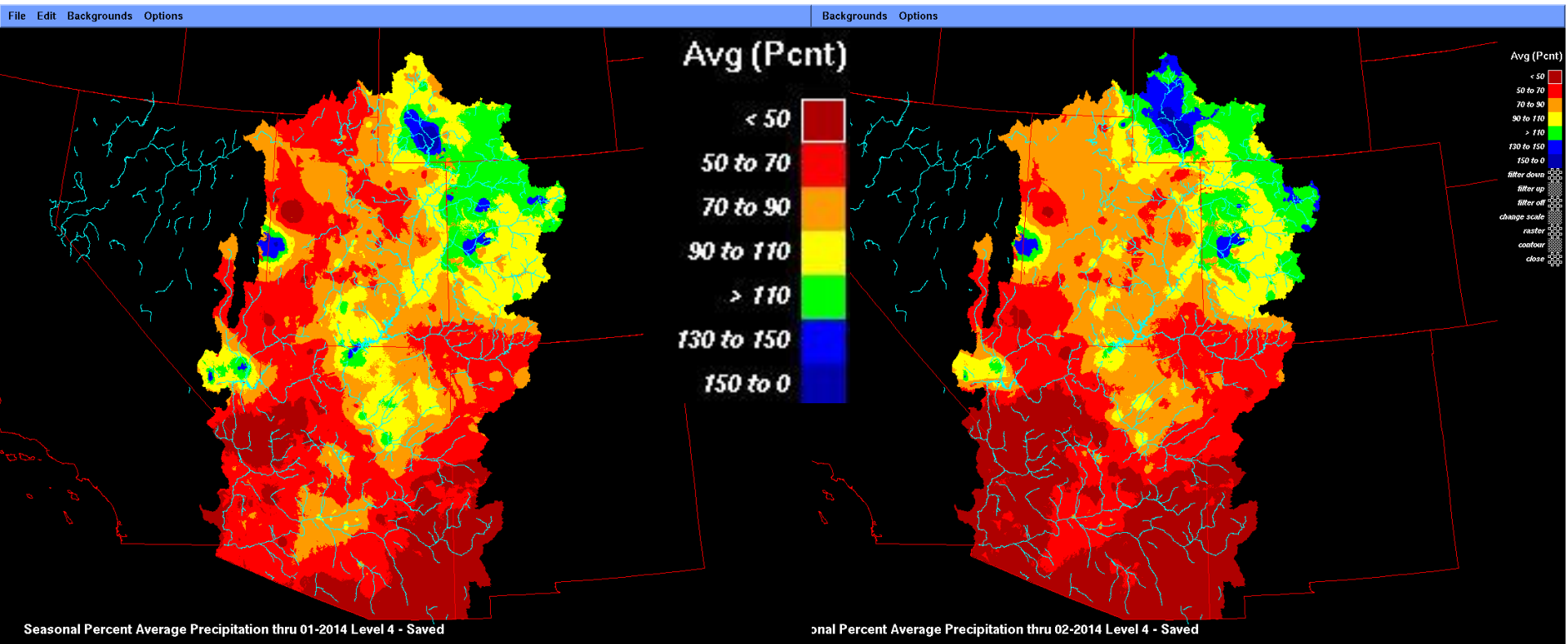
File Edit Backgrounds Options



Water Year Precipitation

Oct-Jan Precipitation % of Average

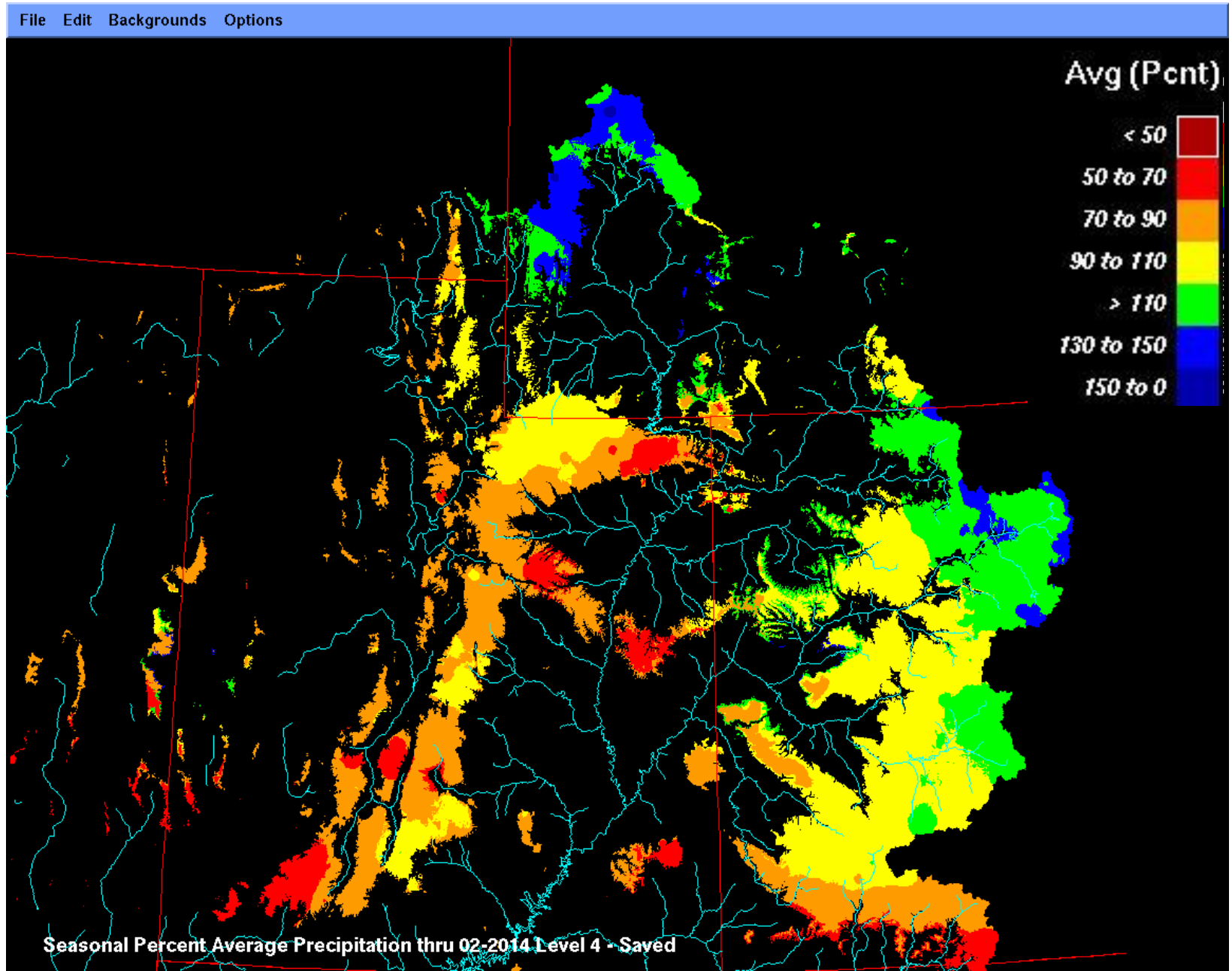
Oct-Feb Precipitation % of Average



Seasonal Percent Average Precipitation thru 01-2014 Level 4 - Saved

Seasonal Percent Average Precipitation thru 02-2014 Level 4 - Saved

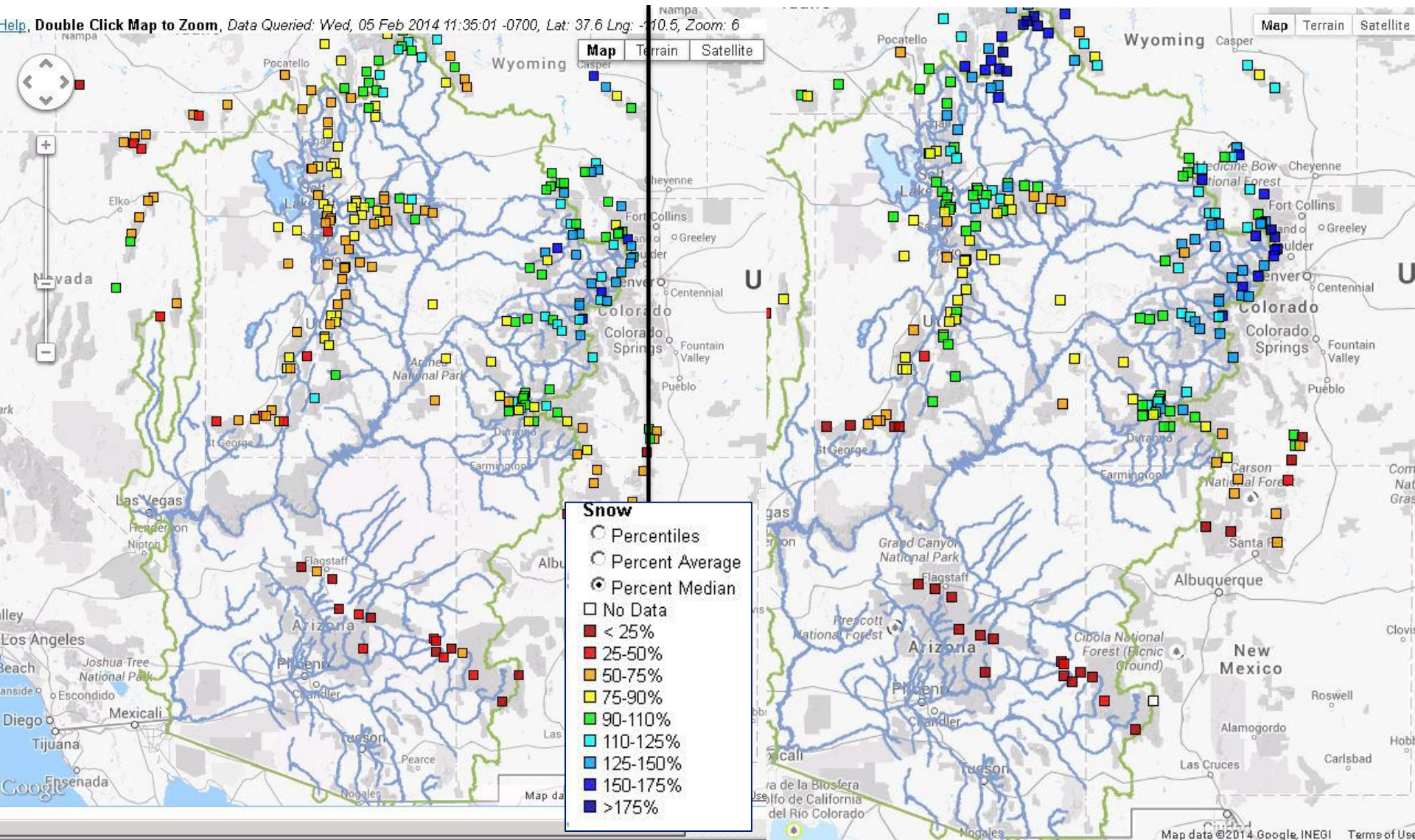
Oct-Feb Precipitation Areas Above 7500 Feet



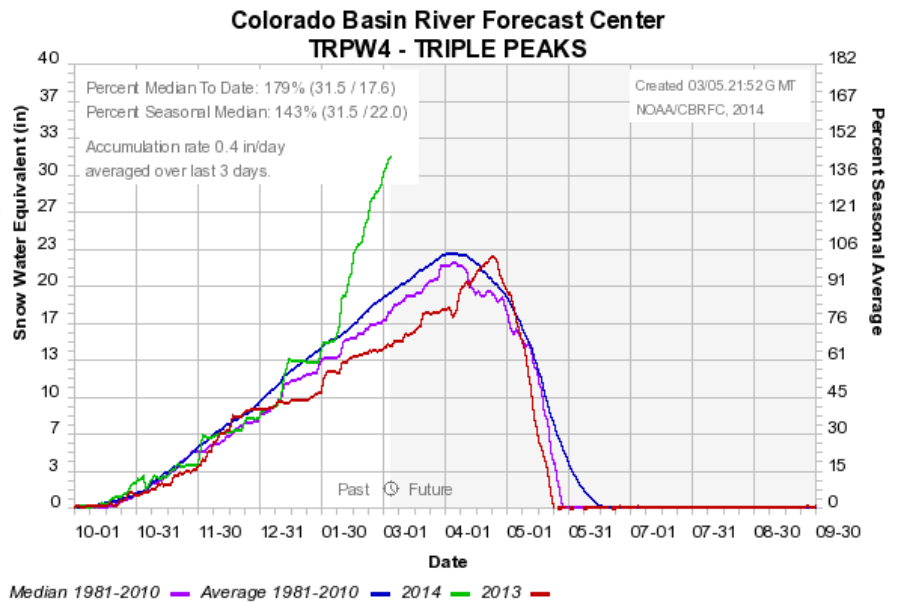
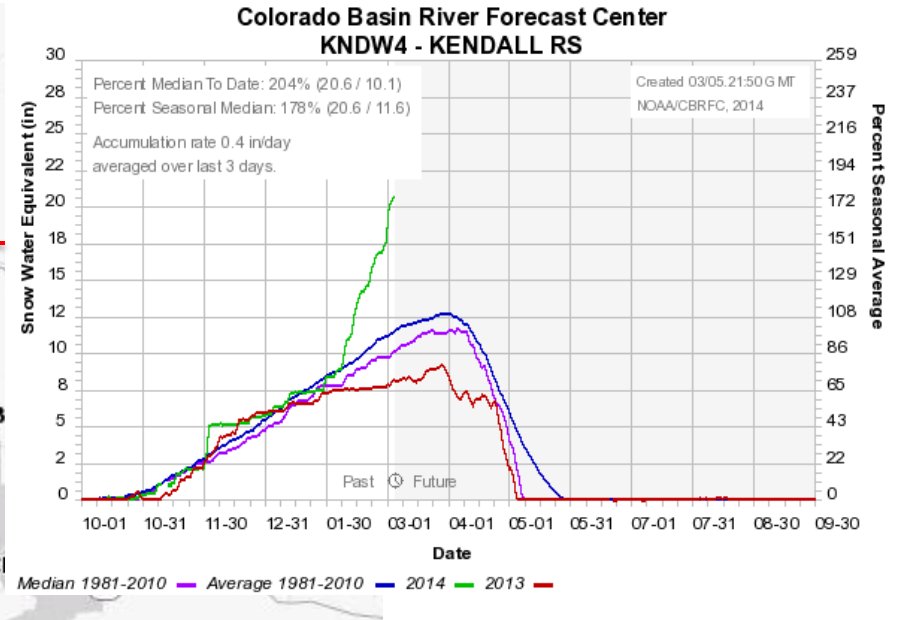
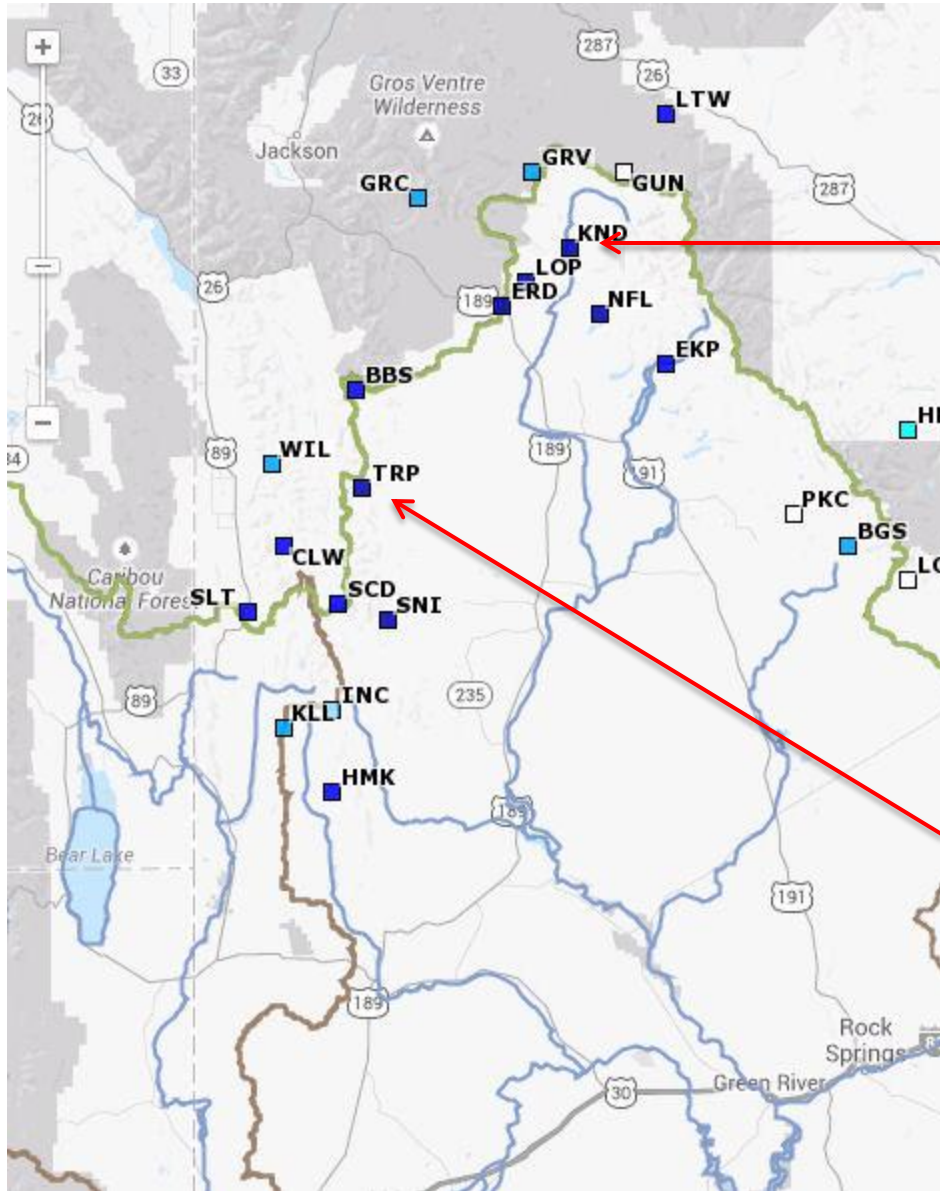
Snow

February 5th Snow

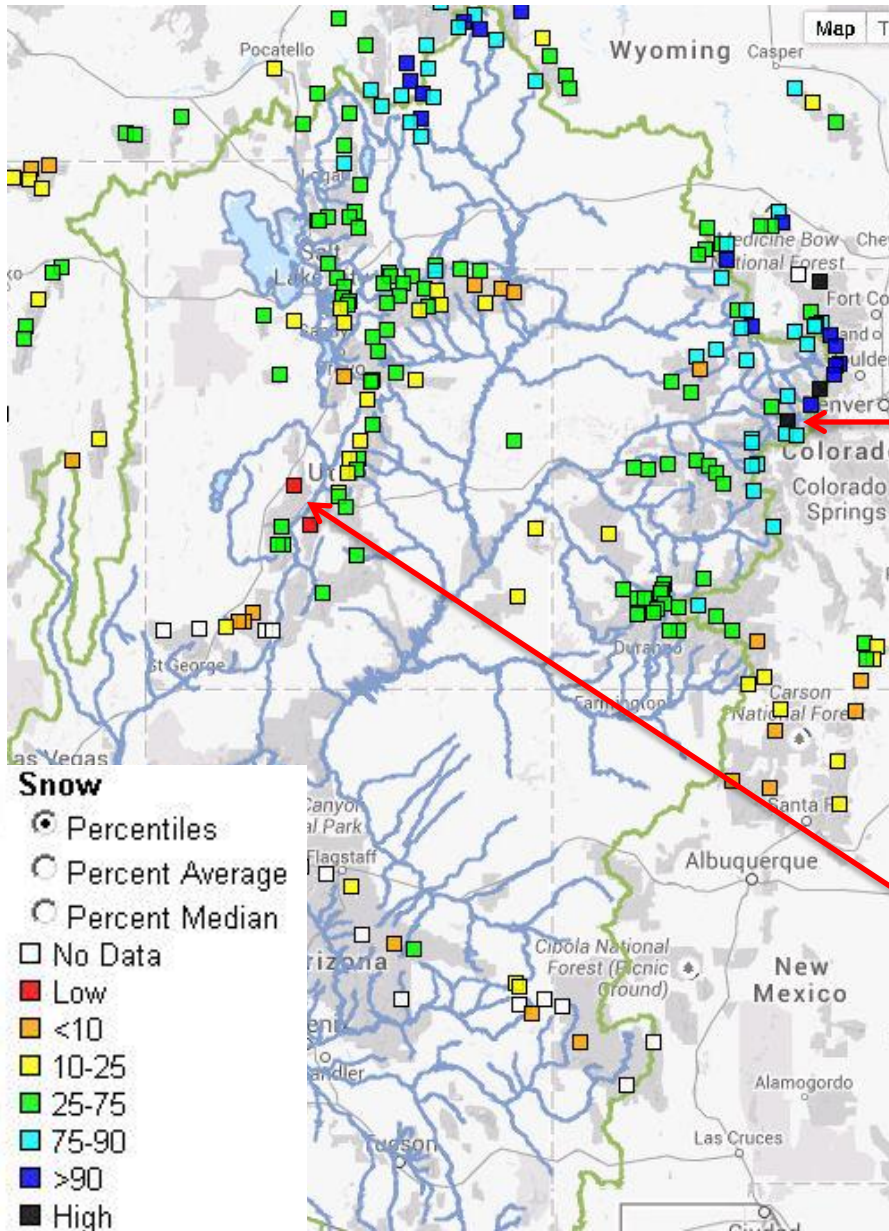
March 5th Snow



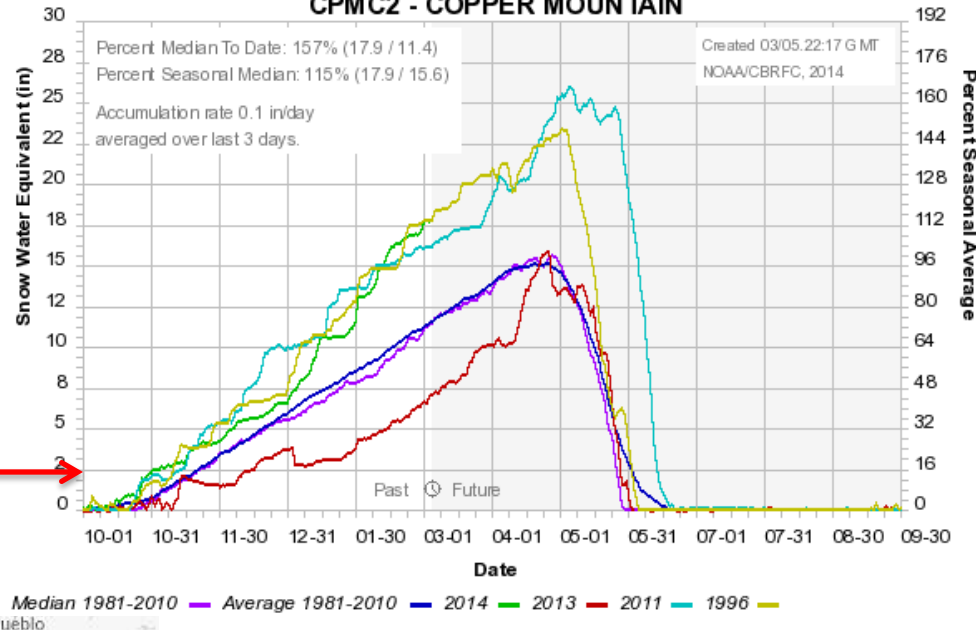
SNOW - Green River Basin (above Fontenelle)



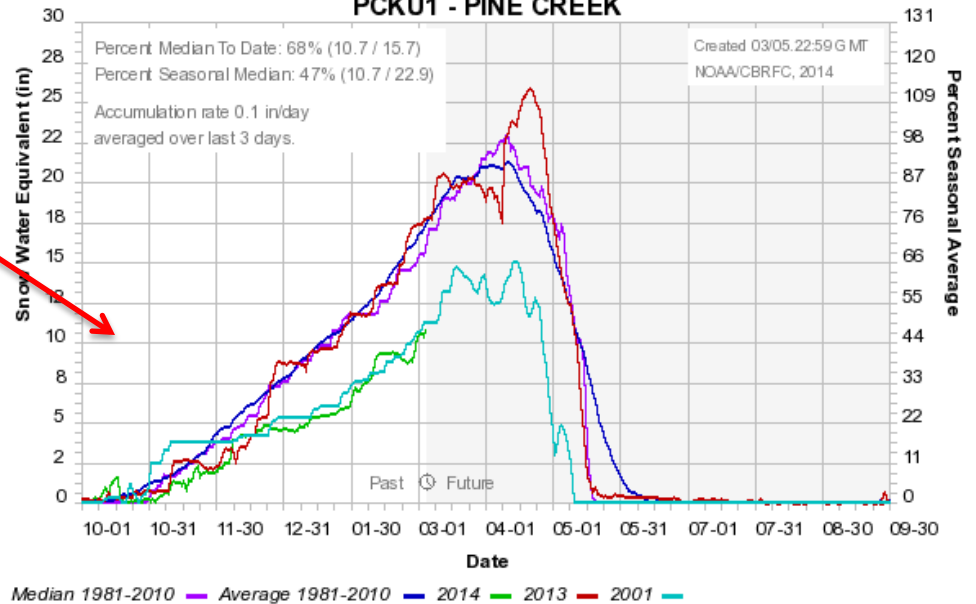
SNOW - Historical Ranking – March 5th



Colorado Basin River Forecast Center
CPMC2 - COPPER MOUNTAIN

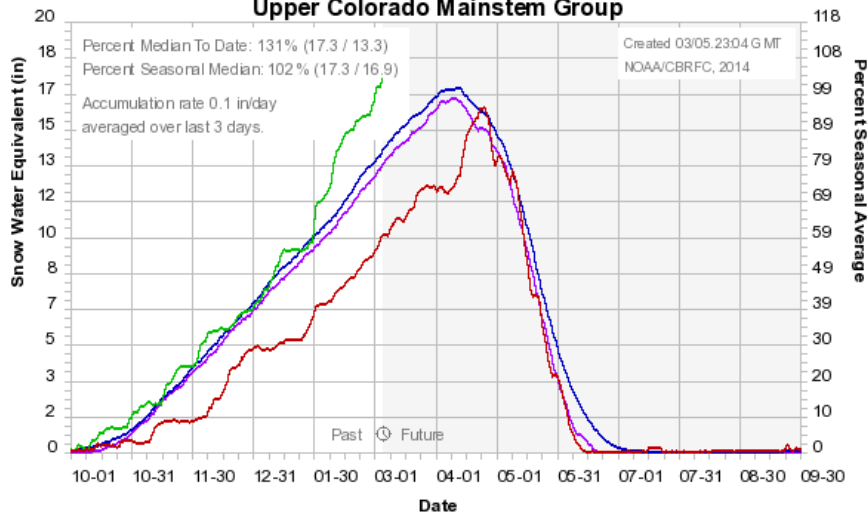


Colorado Basin River Forecast Center
PCKU1 - PINE CREEK



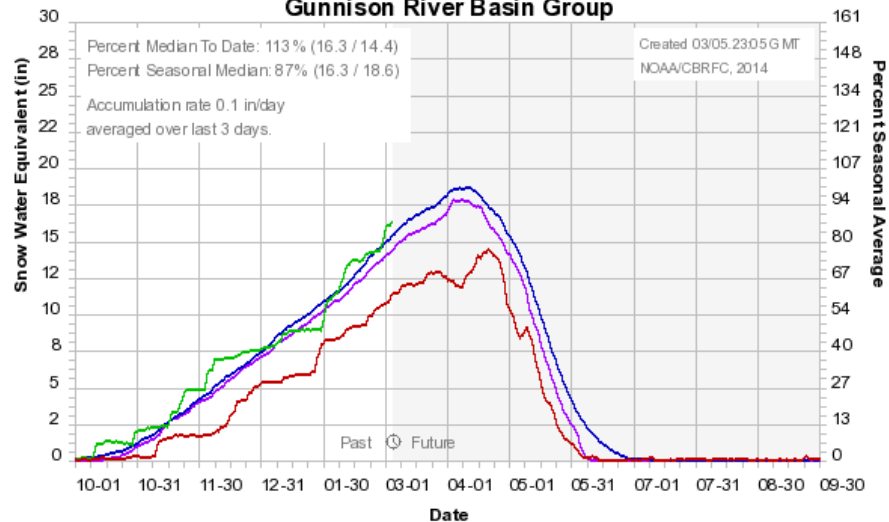
Basin Snow Groups:

Colorado Basin River Forecast Center
Upper Colorado Mainstem Group



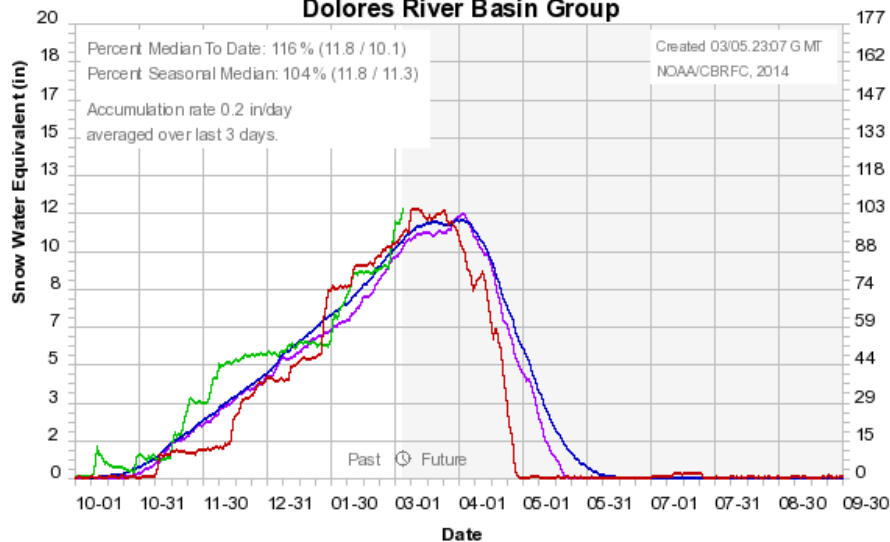
Median 1981-2010 — Average 1981-2010 — 2014 — 2013 —

Colorado Basin River Forecast Center
Gunnison River Basin Group



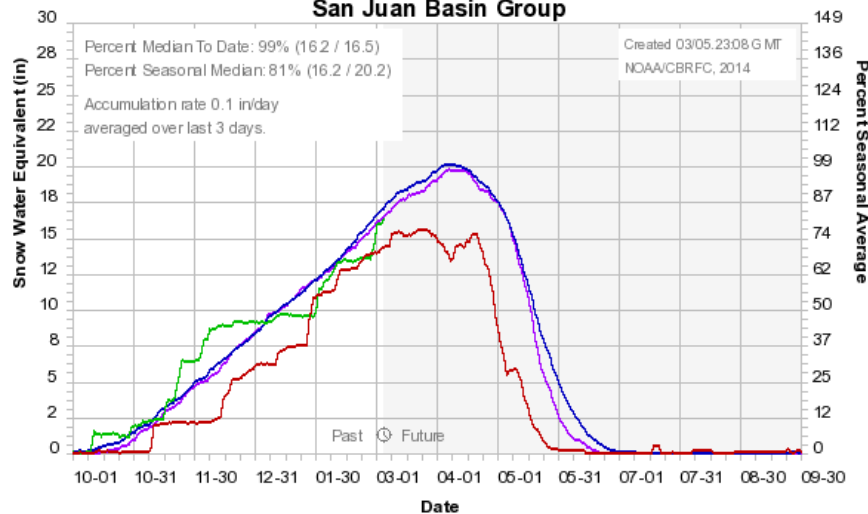
Median 1981-2010 — Average 1981-2010 — 2014 — 2013 —

Colorado Basin River Forecast Center
Dolores River Basin Group



Median 1981-2010 — Average 1981-2010 — 2014 — 2013 —

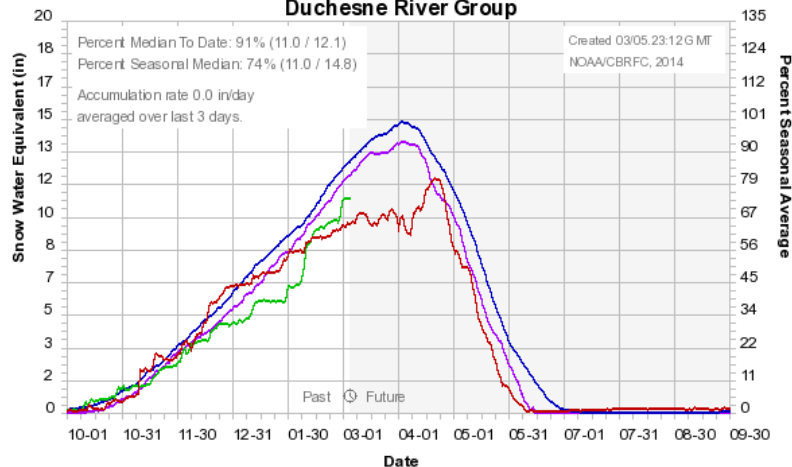
Colorado Basin River Forecast Center
San Juan Basin Group



Median 1981-2010 — Average 1981-2010 — 2014 — 2013 —

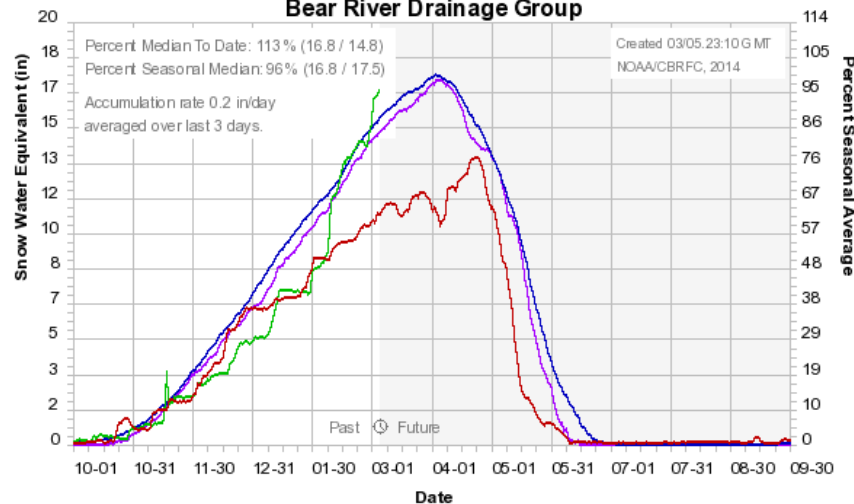
Basin Snow Groups:

Colorado Basin River Forecast Center
Duchesne River Group



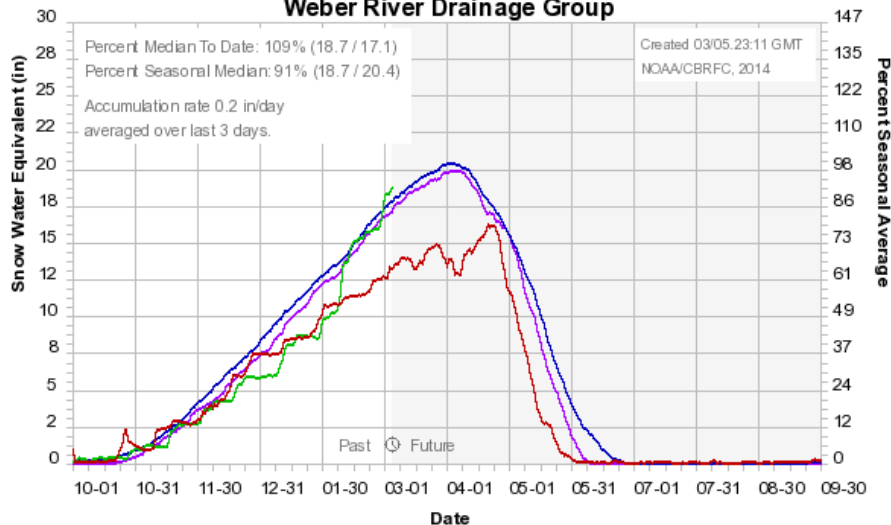
Median 1981-2010 Average 1981-2010 2014 2013 2012

Colorado Basin River Forecast Center
Bear River Drainage Group



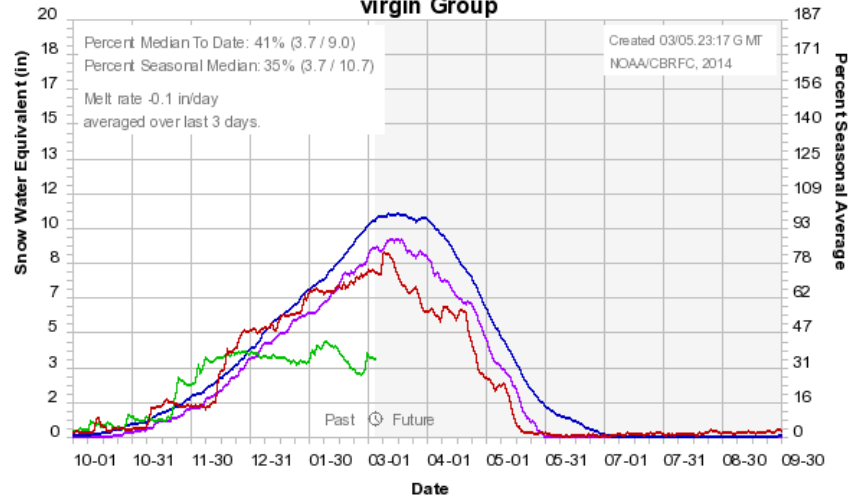
Median 1981-2010 Average 1981-2010 2014 2013 2012

Colorado Basin River Forecast Center
Weber River Drainage Group



Median 1981-2010 Average 1981-2010 2014 2013 2012

Colorado Basin River Forecast Center
virgin Group



Median 1981-2010 Average 1981-2010 2014 2013 2012

March 1st Water Supply Forecasts

Apr-Jul Volumes / % Average

Weber-Oakley:
99 KAF / 84%

Virgin-Virgin:
21 KAF / 36%

Flaming Gorge:
1430 KAF / 146%

Yampa-Deerlodge:
1600 KAF / 129%

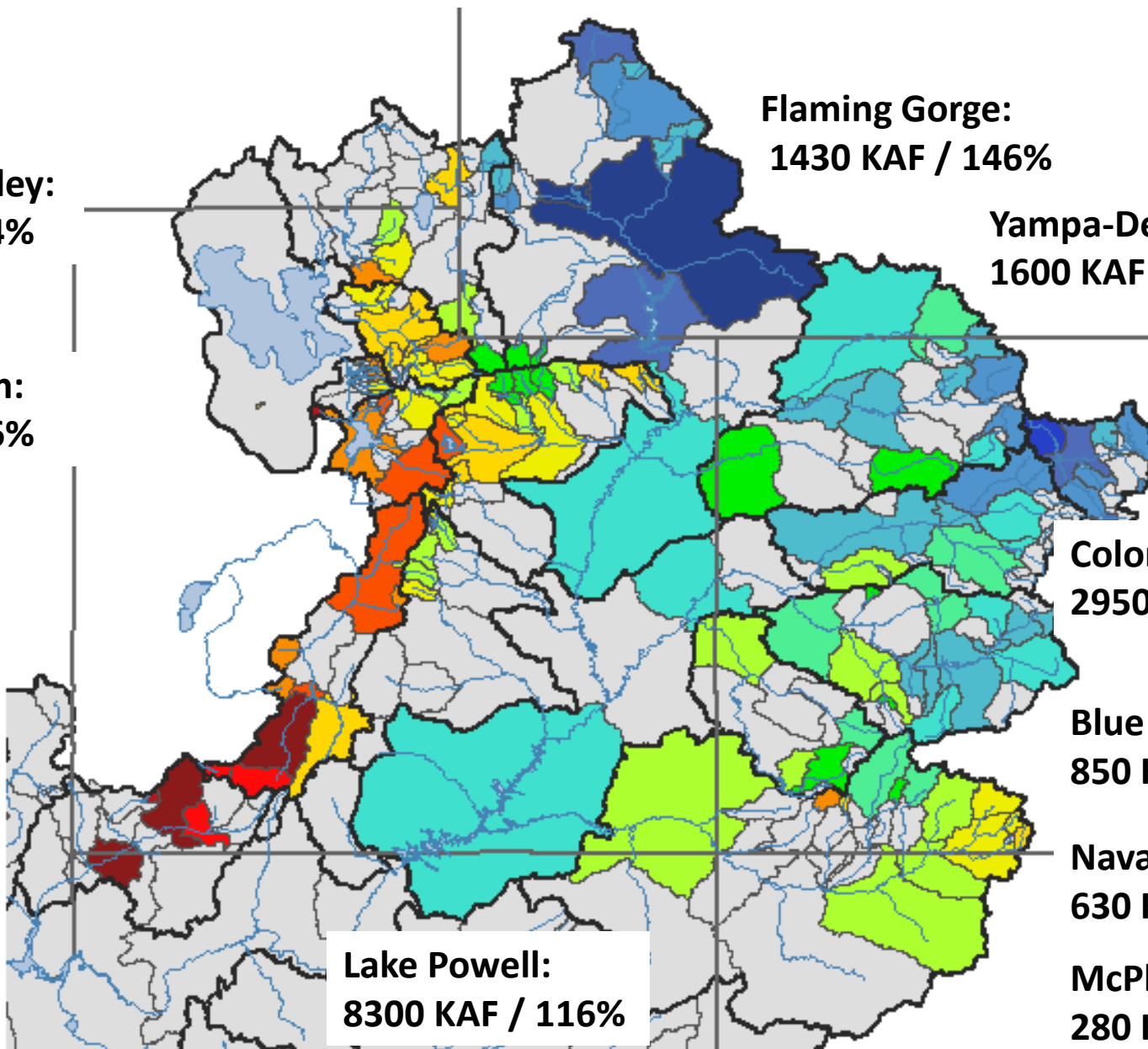
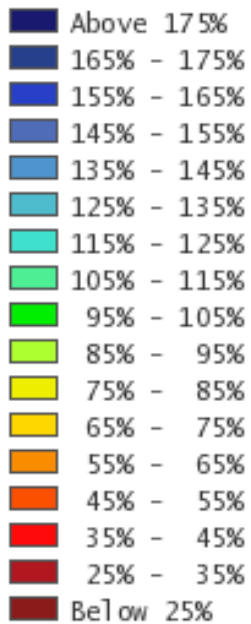
Colorado-Cameo:
2950 KAF / 125%

Blue Mesa:
850 KAF / 126%

Navajo Res:
630 KAF / 86%

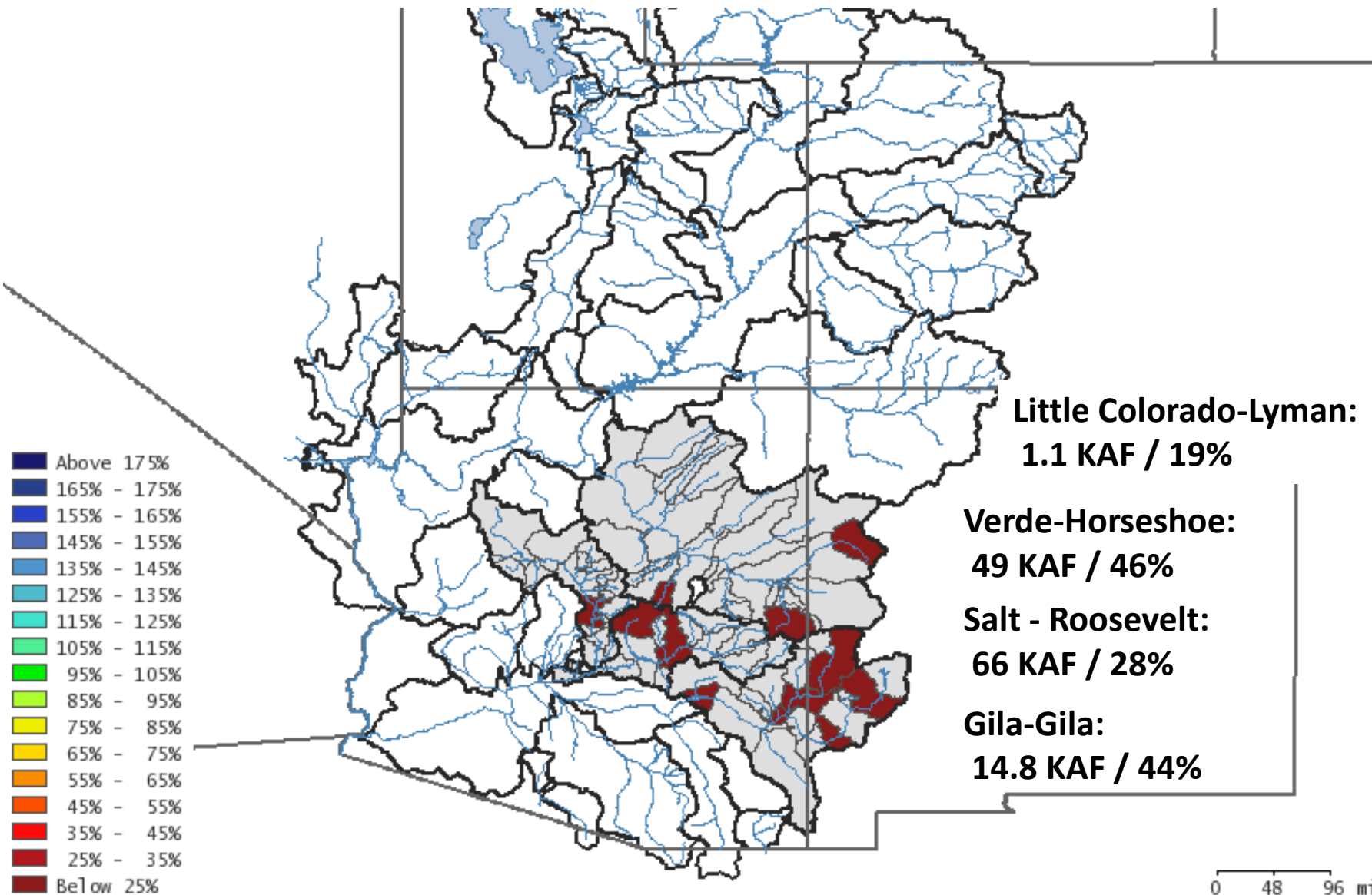
McPhee Res:
280 KAF / 95%

Lake Powell:
8300 KAF / 116%



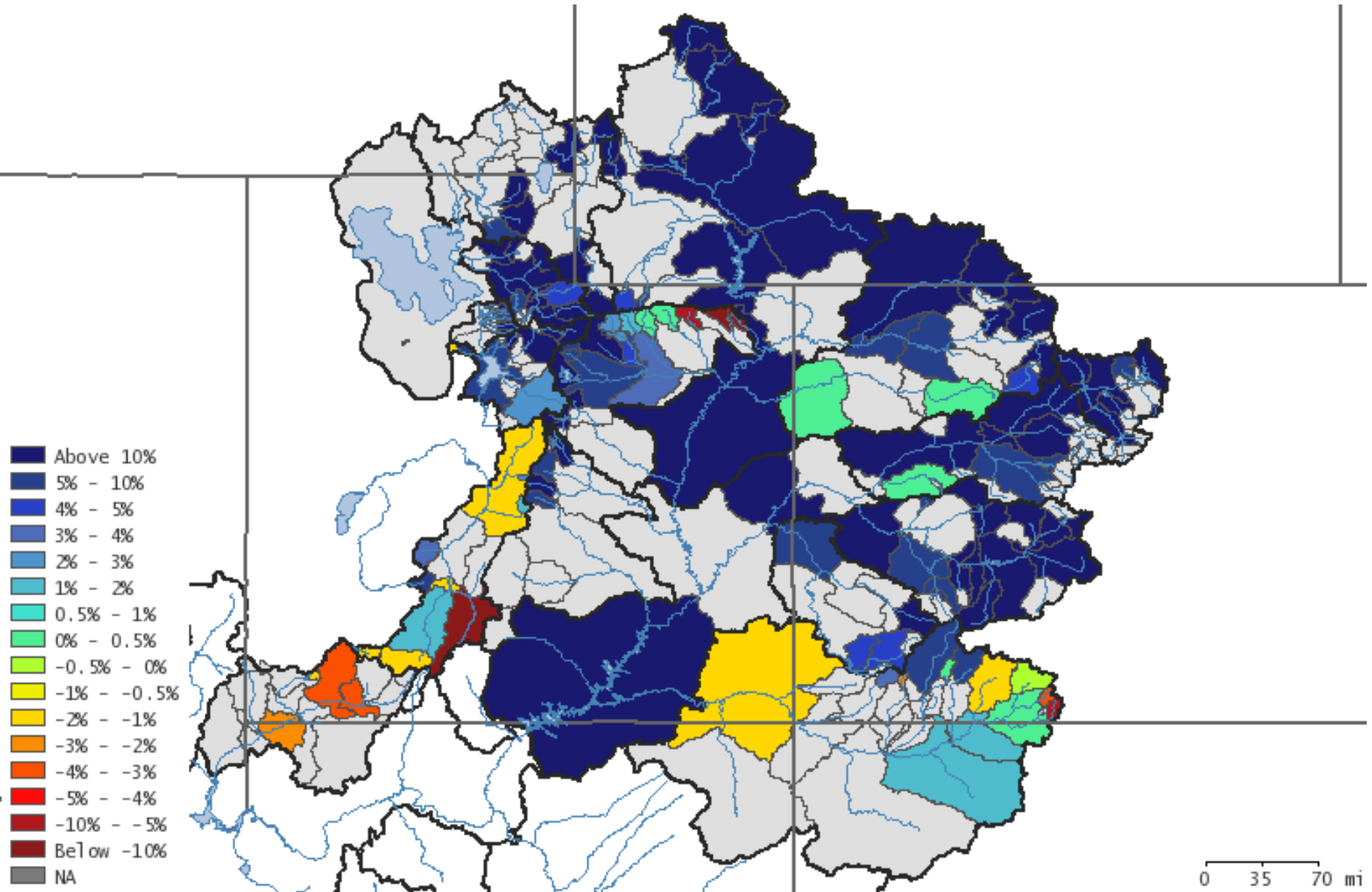
March 1st Water Supply Forecasts

Mar-May Volumes / % Median



Water Supply Forecast Trend

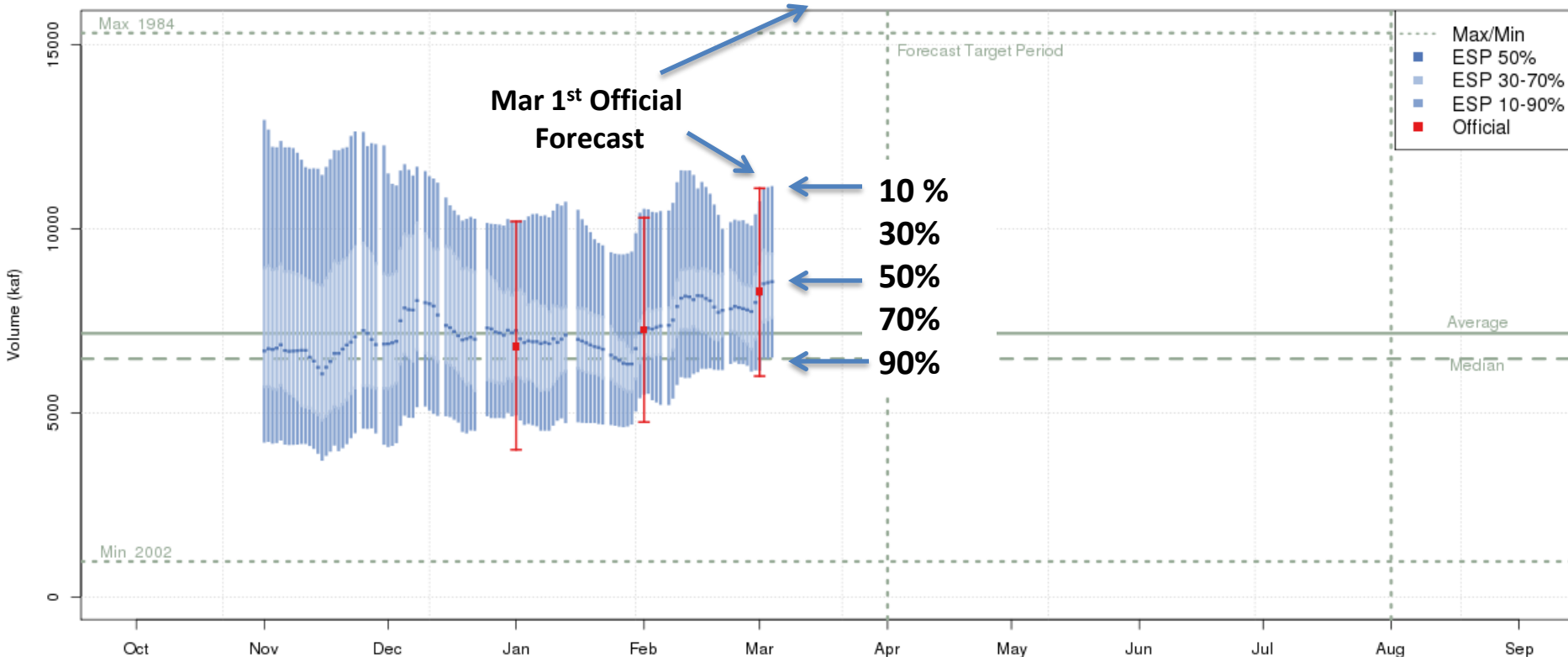
Change in the forecast % of average between Feb 1st and Mar 1st



Daily Ensemble Streamflow Prediction (ESP) Model Run & Official Forecast

Available at: www.cbrfc.noaa.gov Select: Water Supply Click: Point of Interest

Colorado - Lake Powell- Glen Cyn Dam- At (GLDA3) Apr-Jul 2014 Runoff Forecast
2014-03-01 Official 50% Forecast: 8300kaf (116% of average)

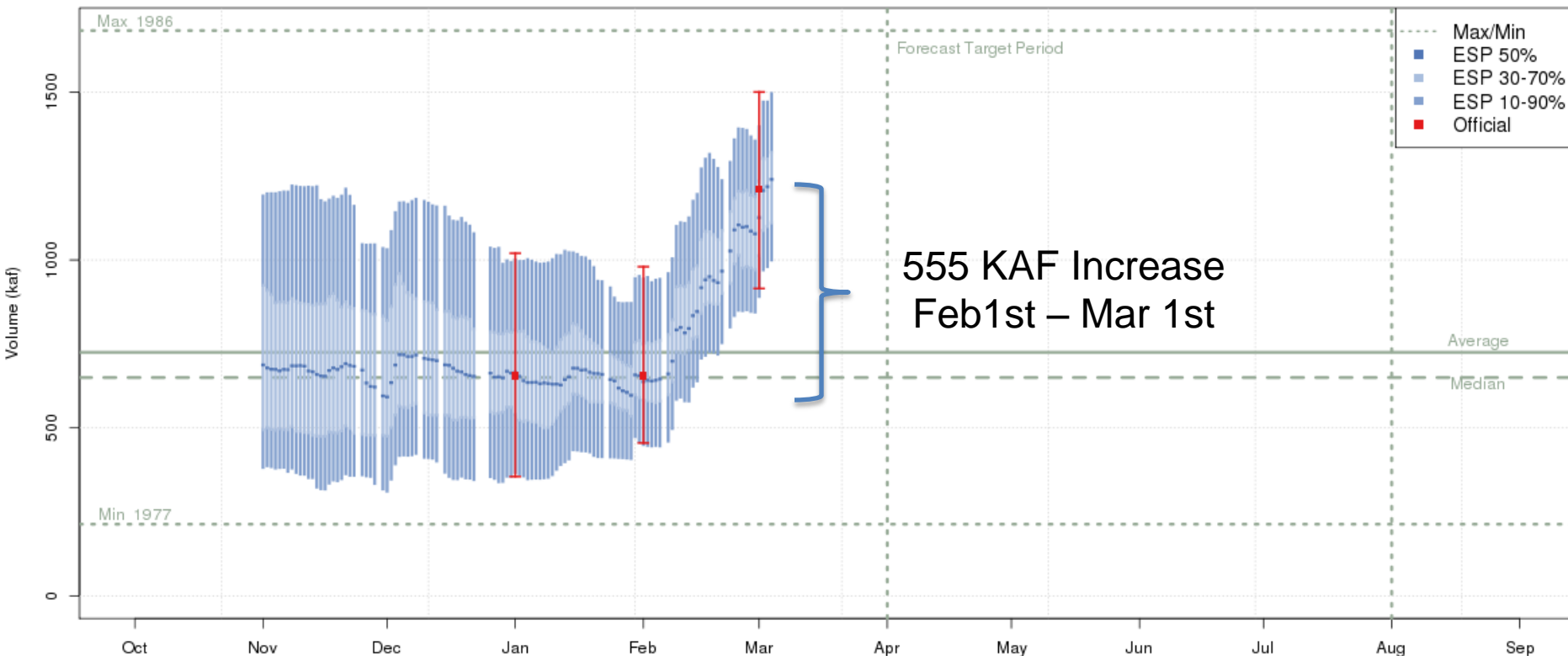


Plot Created 2014-03-05 13:01:28, Lastest ESP Run from 2014-03-05, NOAA / NWS / CBRFC
Today's 50% ESP forecast changed -0.5 % from yesterday and 3.8 % from March 1
Forecasts in the observed period include observed values.

Daily Ensemble Streamflow Prediction (ESP) Model Run & Official Forecast

Available at: www.cbrfc.noaa.gov Select: Water Supply Click: Point of Interest

Green - Fontenelle Res- Fontenelle Nr (GBRW4) Apr-Jul 2014 Runoff Forecast
2014-03-01 Official 50% Forecast: 1210kaf (167% of average)

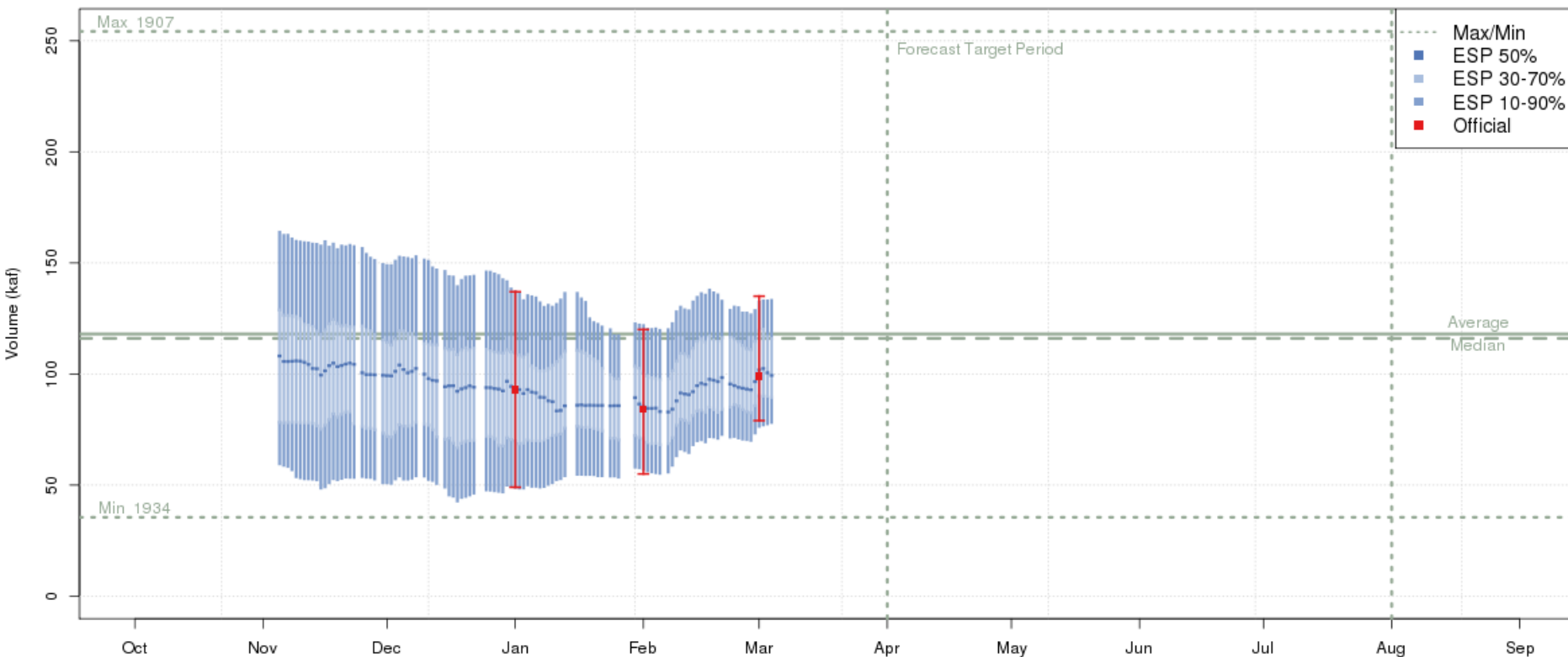


Plot Created 2014-03-05 13:00:13, Lastest ESP Run from 2014-03-05, NOAA / NWS / CBRFC
Today's 50% ESP forecast changed -0.9 % from yesterday and 9.1 % from March 1
Forecasts in the observed period include observed values.

Daily Ensemble Streamflow Prediction (ESP) Model Run & Official Forecast

Available at: www.cbrfc.noaa.gov Select: Water Supply Click: Point of Interest

Weber - Oakley- Nr (OAWU1) Apr-Jul 2014 Runoff Forecast
2014-03-01 Official 50% Forecast: 99kaf (84% of average)



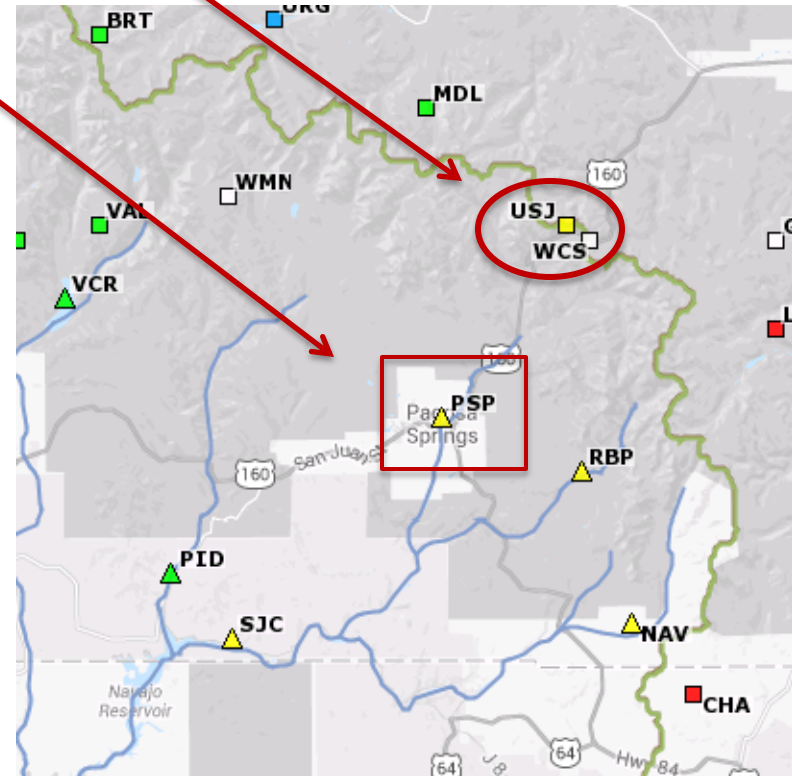
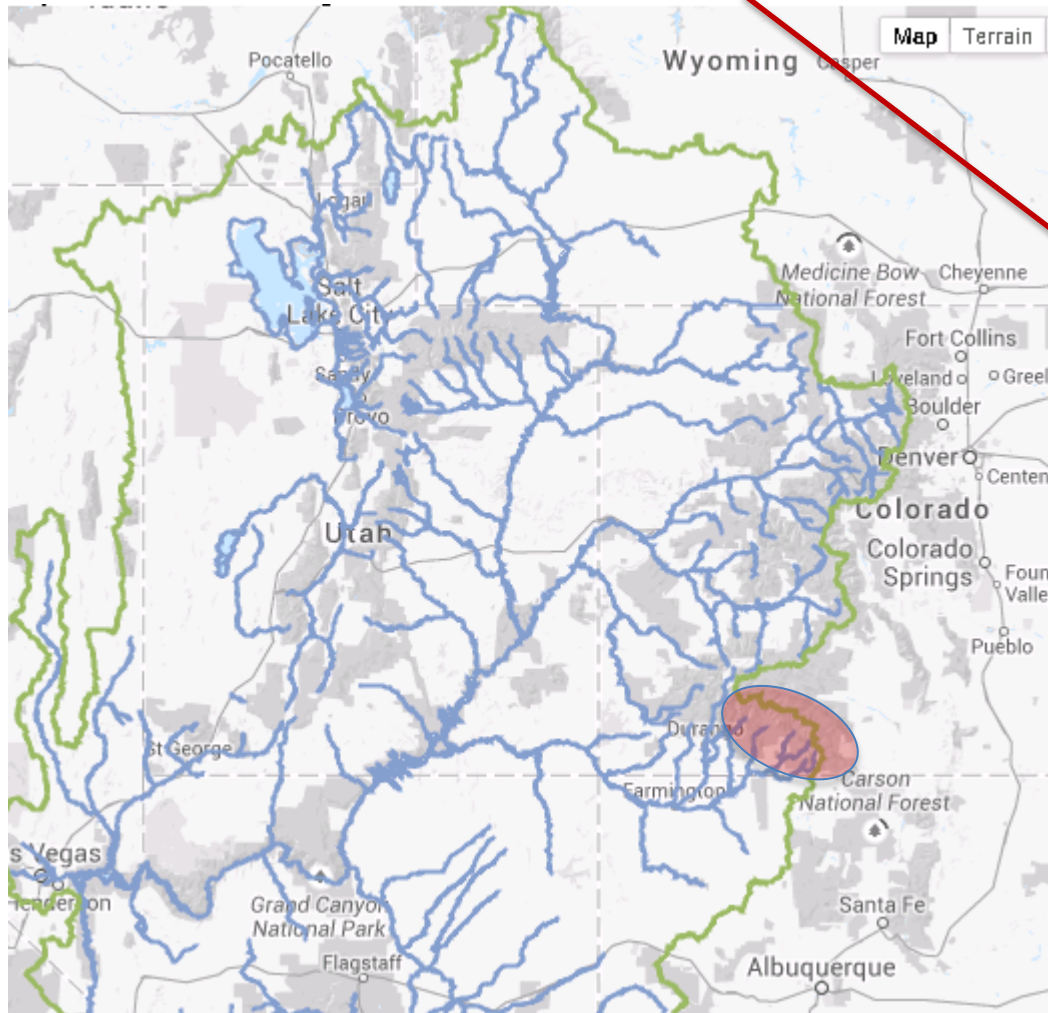
Plot Created 2014-03-05 13:11:15, Lastest ESP Run from 2014-03-05, NOAA / NWS / CBRFC
Today's 50% ESP forecast changed 0.5 % from yesterday and -1.9 % from March 1
Forecasts in the observed period include observed values.

The Impact of Spring Weather

Precipitation:	Average		2006		2008	
	Mar	Apr	Mar	Apr	Mar	Apr
USJ: Upper San Juan	6.1	4.3 (10.4)	10.2	4.8 (15.0)	0.8	1.8 (3.6)
WCS: Wolf Creek Summit	5.6	4.5 (10.1)	10.5	6.0 (16.5)	0.9	1.8 (2.7)

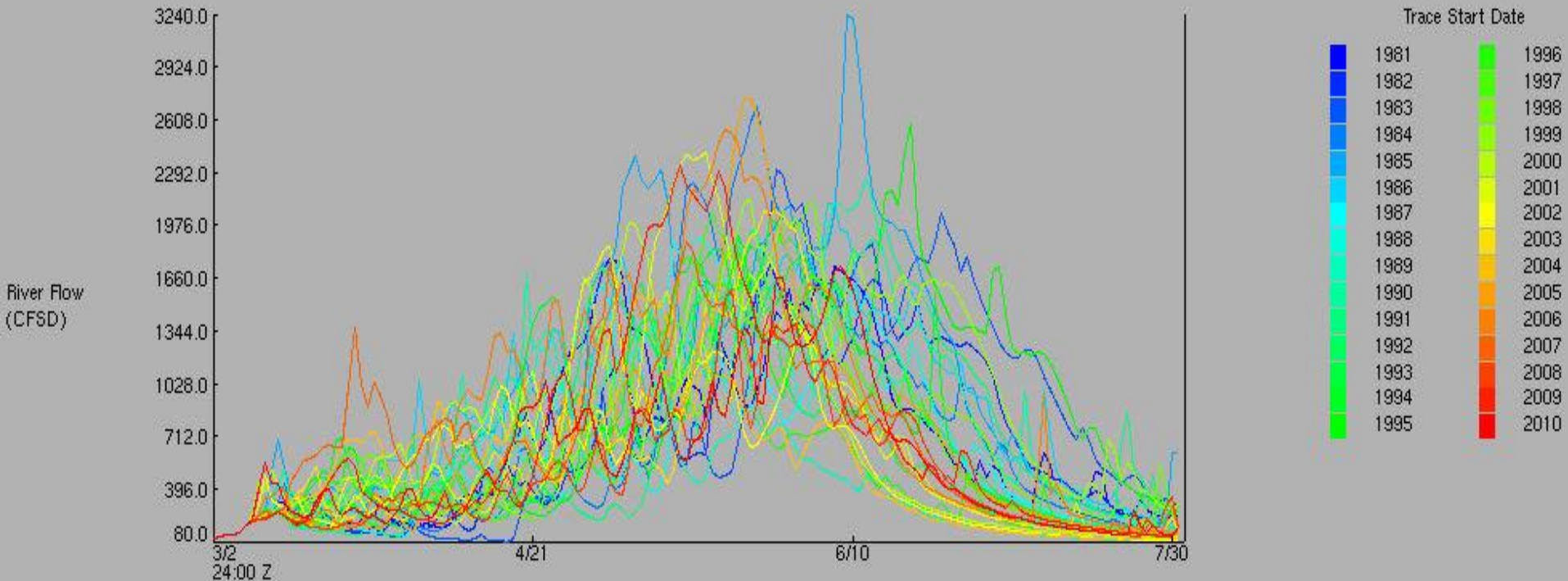
PSP: San Juan Pagosa Springs

Mar-Apr 2006 ~ 155 % of average
 Mar-Apr 2008 ~ 30 % of average

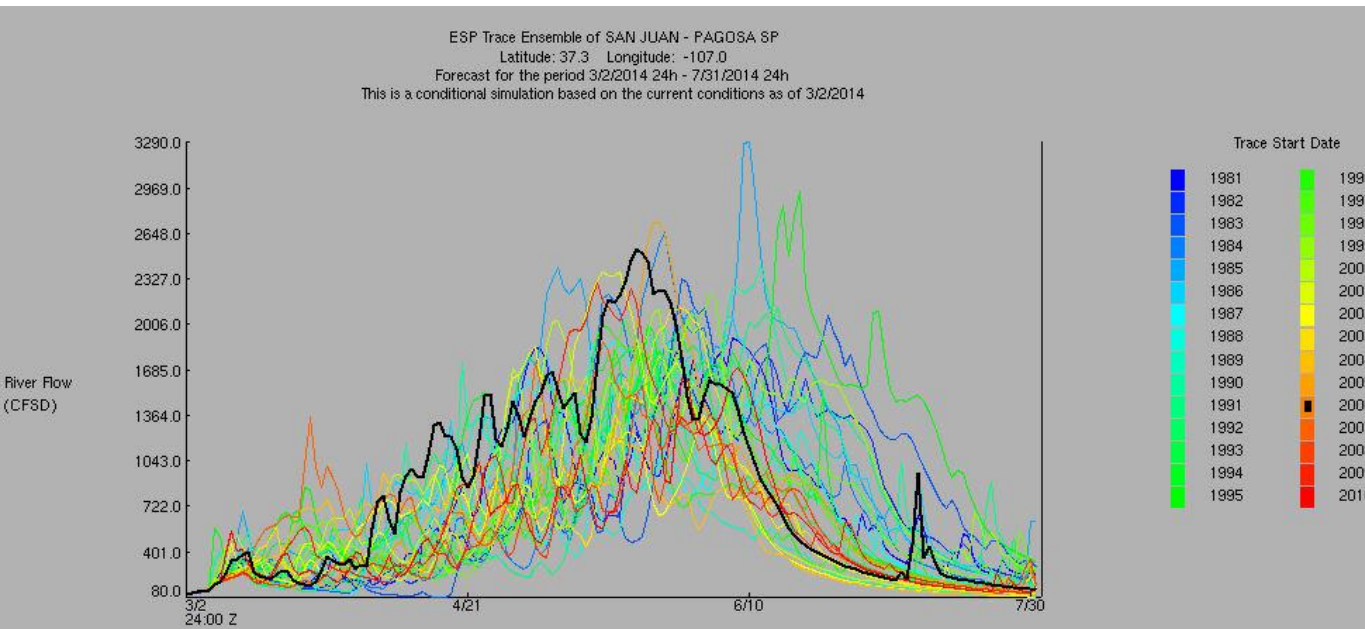


San Juan Pagosa Springs: Official Forecast 182 KAF / 85% of average

ESP Trace Ensemble of SAN JUAN - PAGOSA SP
Latitude: 37.3 Longitude: -107.0
Forecast for the period 3/2/2014 24h - 7/31/2014 24h
This is a conditional simulation based on the current conditions as of 3/2/2014



San Juan Pagosa Springs: Official Forecast 182 KAF / 85% of average



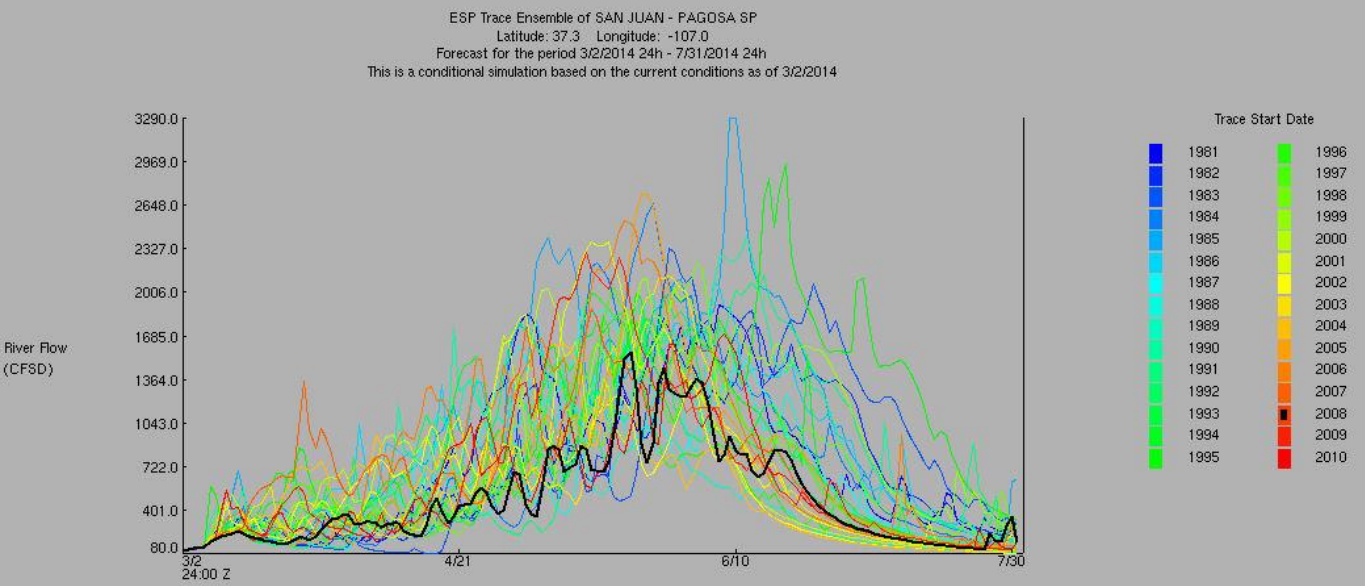
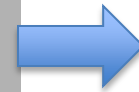
2006 Scenario

237 KAF
16% chance of exceeding



Climatology

188 KAF
50% chance of exceeding



2008 Scenario

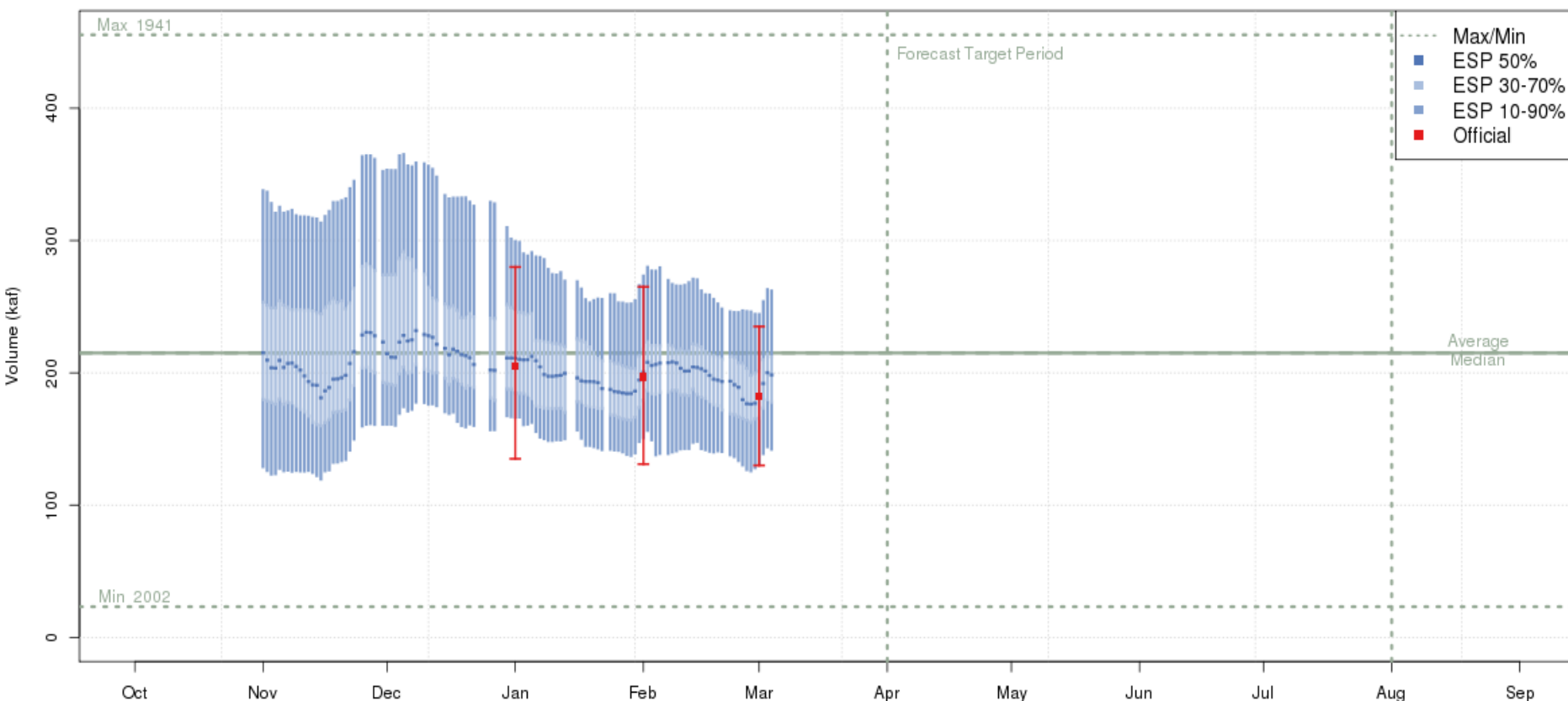
136 KAF
94% chance of exceeding



Daily Ensemble Streamflow Prediction (ESP) Model Run & Official Forecast

Available at: www.cbrfc.noaa.gov Select: Water Supply Click: Point of Interest

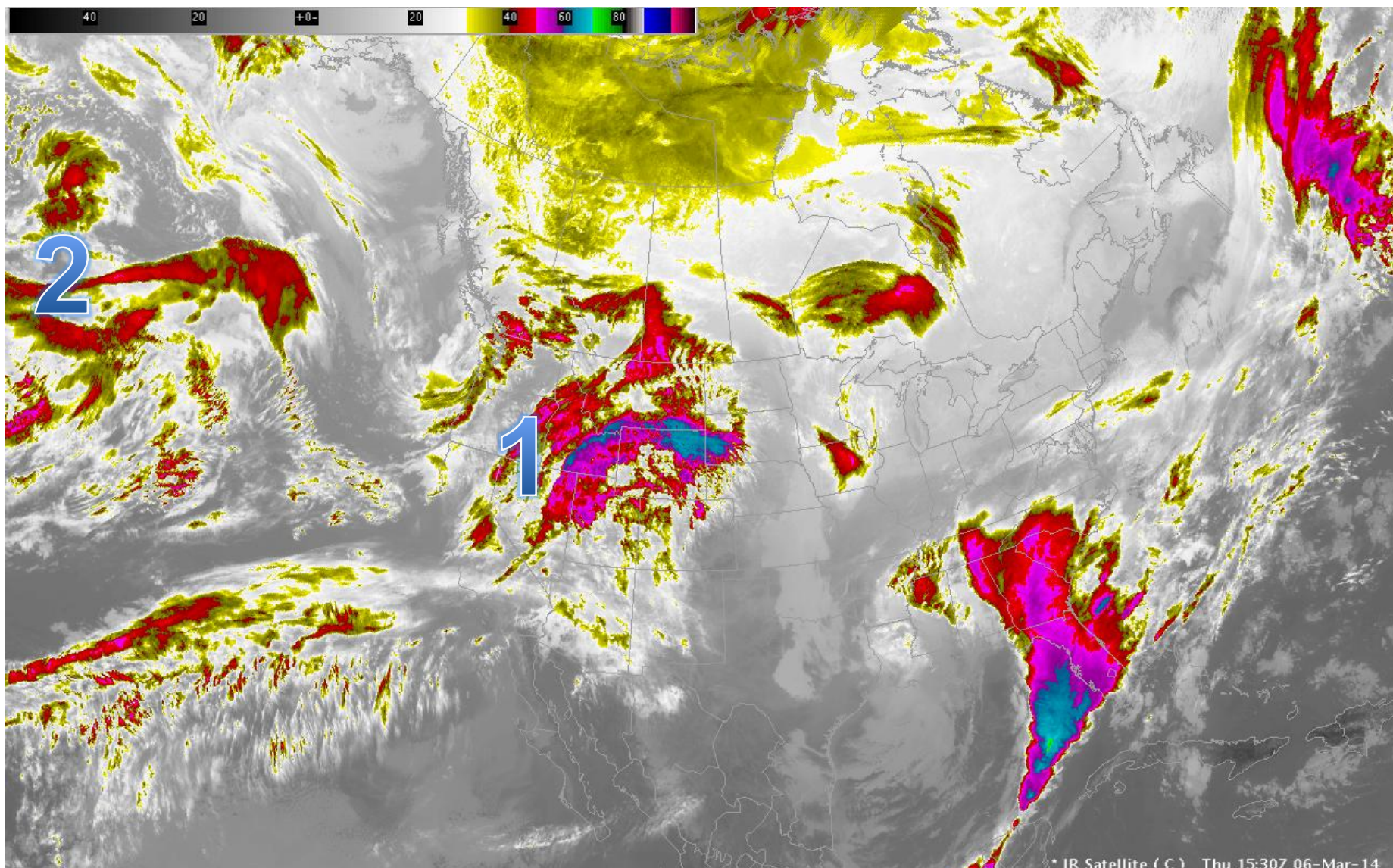
San Juan - Pagosa Springs (PSPC2) Apr-Jul 2014 Runoff Forecast
2014-03-01 Official 50% Forecast: 182kaf (85% of average)



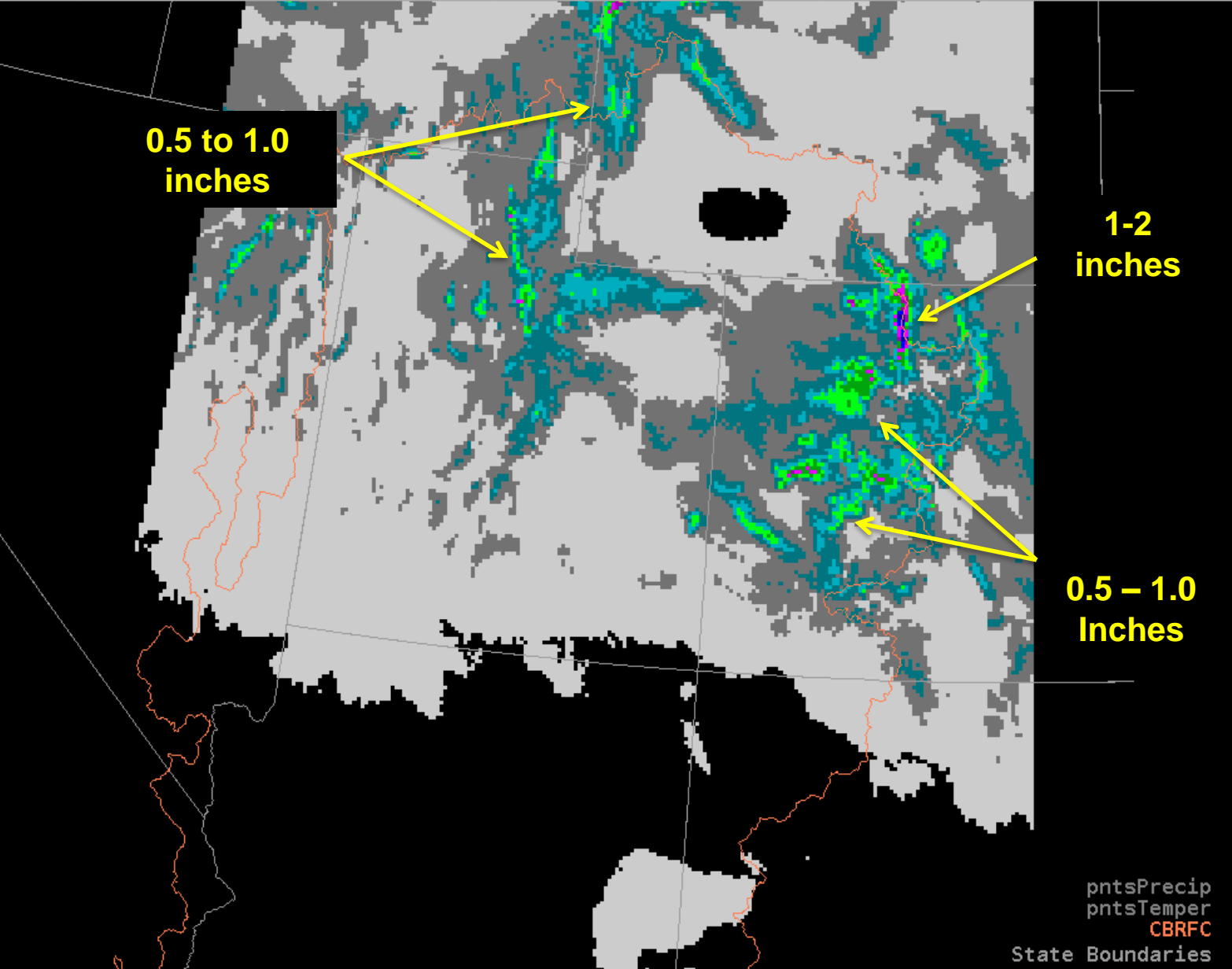
Plot Created 2014-03-05 13:13:46, Lastest ESP Run from 2014-03-05, NOAA / NWS / CBRFC
Today's 50% ESP forecast changed -1.6 % from yesterday and 8 % from March 1
Forecasts in the observed period include observed values.

Future Weather: Progressive Weather Pattern into mid March

- (1) Storm system moving through now through Saturday
 - (2) Another Storm System early next week
- } Impacting northern areas

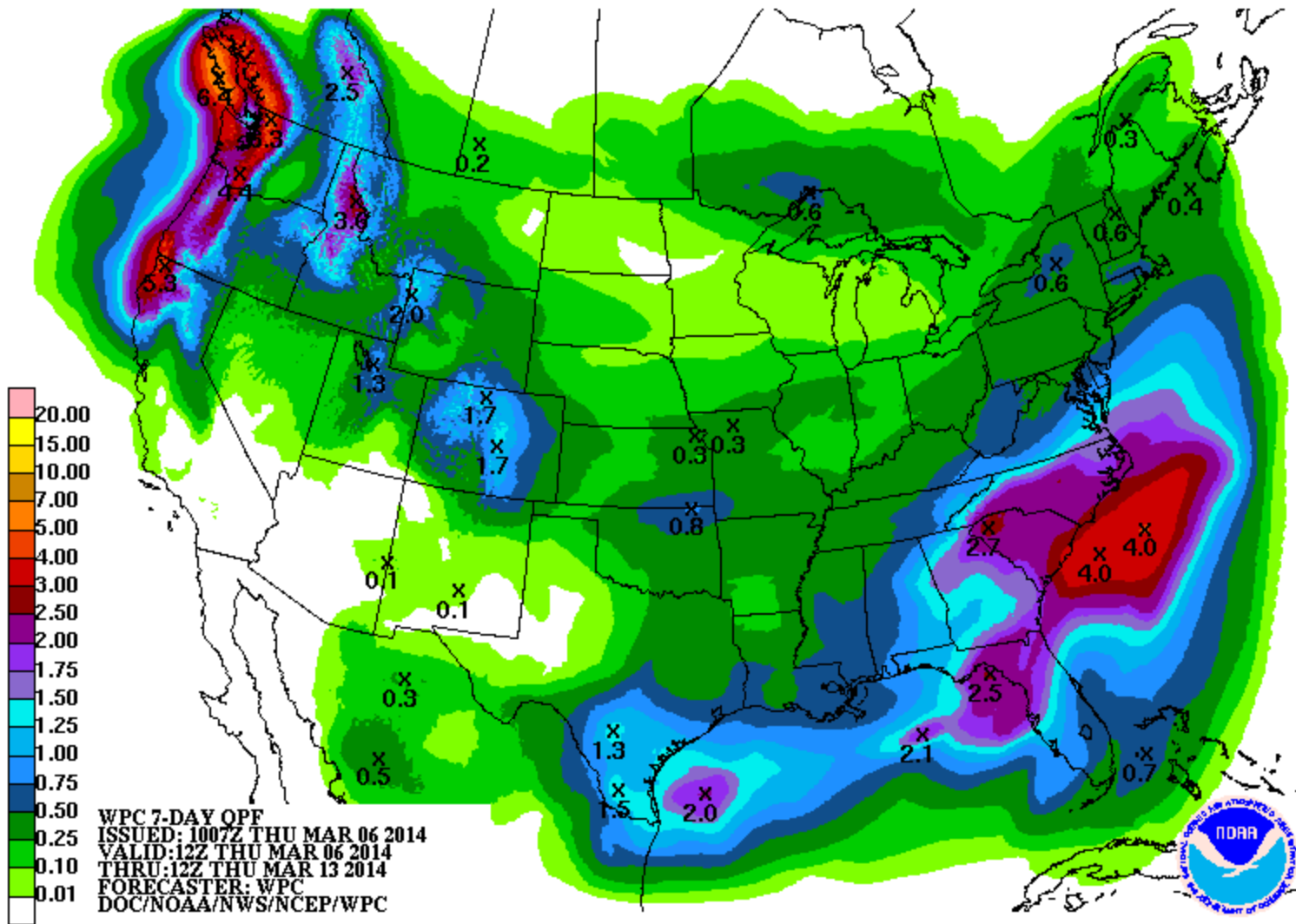


Precipitation Forecast: Now through Saturday Morning



Quantitative Precipitation Forecast

Weather Prediction Center

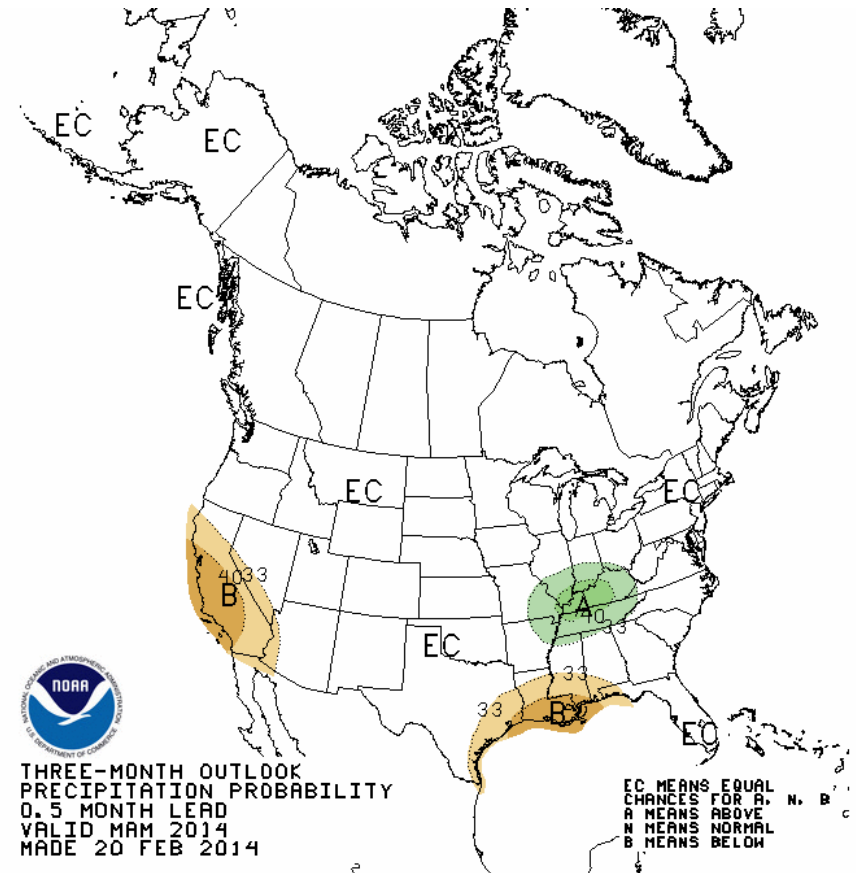
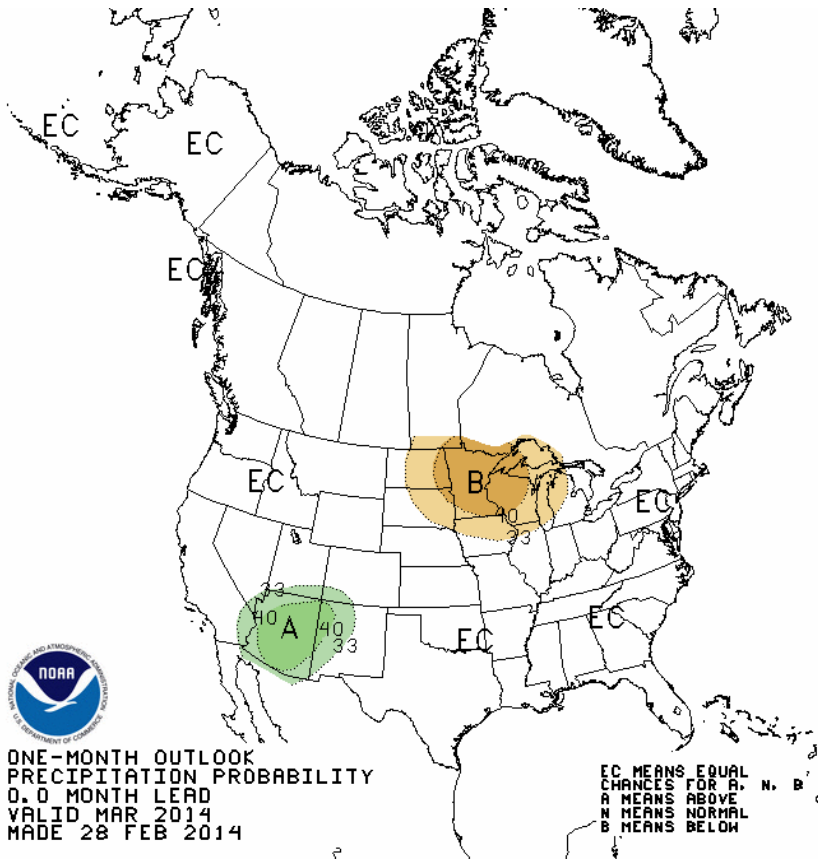


Long Term Precipitation Outlook

Climate Prediction Center

March 2014

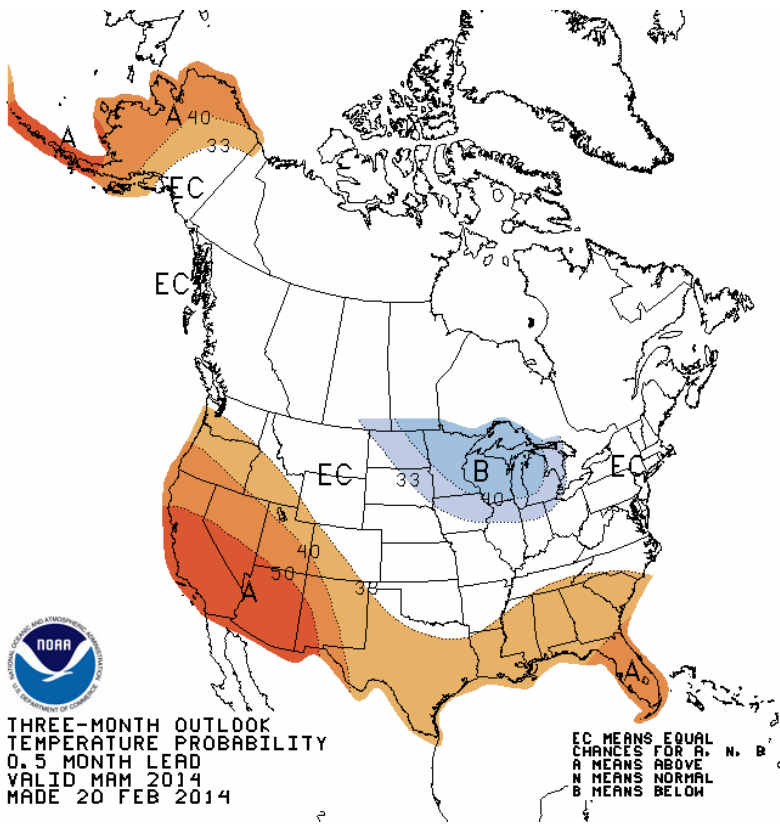
March-May 2014



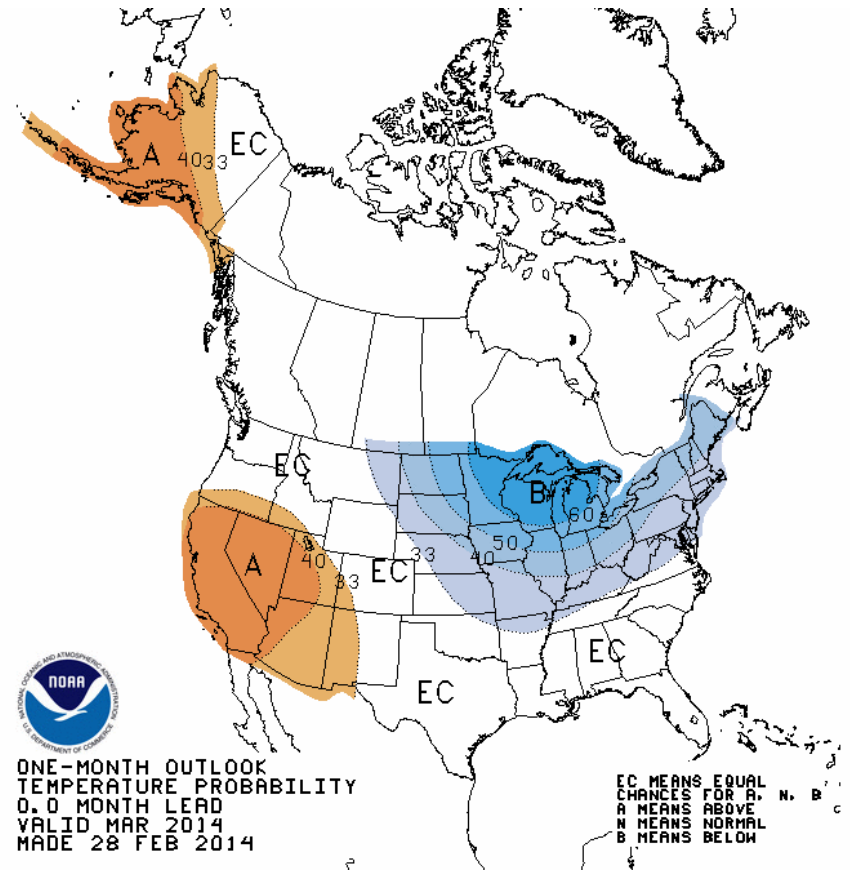
Spring Temperature Outlook

Climate Prediction Center

March 2014



March-May 2014



Summary

- **Soil Moisture Impacts**

- Positive in much of the Upper Colorado
- Negative in the Great Basin / Lower Colorado

- **Snow**

- Significant Green Basin (Wyoming), Yampa, Colorado-abv Cameo, Gunnison above Blue Mesa, parts of Bear River Basin

- **Forecasts**

- Much Above average Yampa, Colorado above Cameo, Gunnison
- Improved in the Weber, Provo, Six Creeks, Bear
- Below average San Juan, concern about dry spring weather
- Below average Sevier, Virgin, and Lower Colorado Basins

- **Weather: Still active into mid March**

- Periods of showers and warm/dry but precip favors northern areas (central Utah / Gunnison Basin North)
- Hint of an El Nino developing late summer or fall

2014 Forecast Webinar Schedule

* March 11 at 11 am MDT – Peak Flow (new)

April 7 at 1pm MDT

May 6 at 1pm MDT

June 5 at 1pm MDT

Registration available:

www.cbrfc.noaa.gov/news/wswebinar2014.html

Please contact us with any specific questions

- Key Water Supply Contacts:
 - Michelle Stokes (Hydrologist in Charge)
 - Brenda Alcorn (Upper Colorado)
 - Ashley Nielson (Green + Yampa / White)
 - Greg Smith (San Juan + Gunnison + Dolores)
 - Paul Miller (Great Basin – Bear, Weber, Provo, Six-Creeks/Jordan)
 - Tracy Cox (Lower Colorado + Virgin + Sevier)

Good Luck Kevin Werner

Western Region Climate Services Director

National Climatic Data Center (NESDIS)