

CBRFC
May 2014
Water Supply Webinar

May 6, 2014

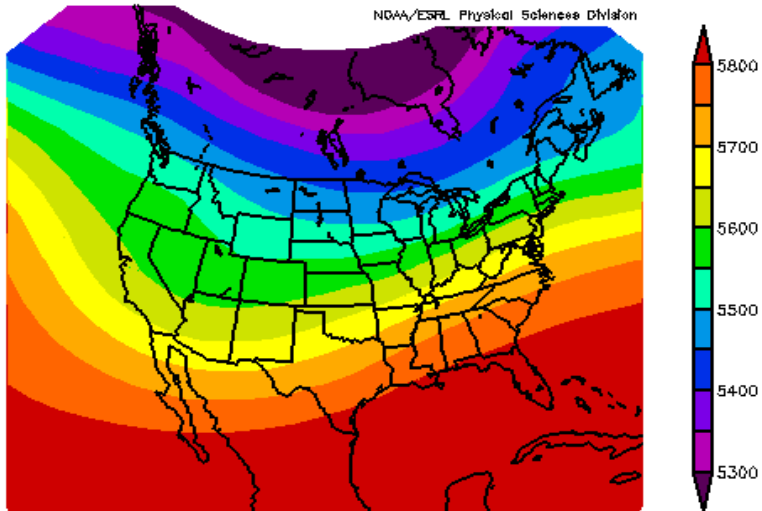
Greg Smith

April Water Supply Webinar

- April Weather & Streamflow
- Snow Situation
- Water supply forecasts
- Upcoming weather

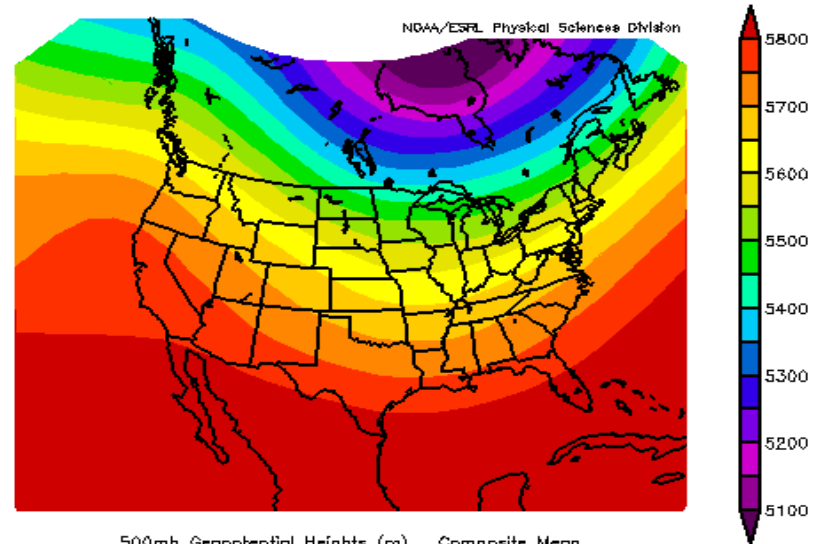
April 2014 Upper Air Pattern

WEEK-1: Started wet/cool



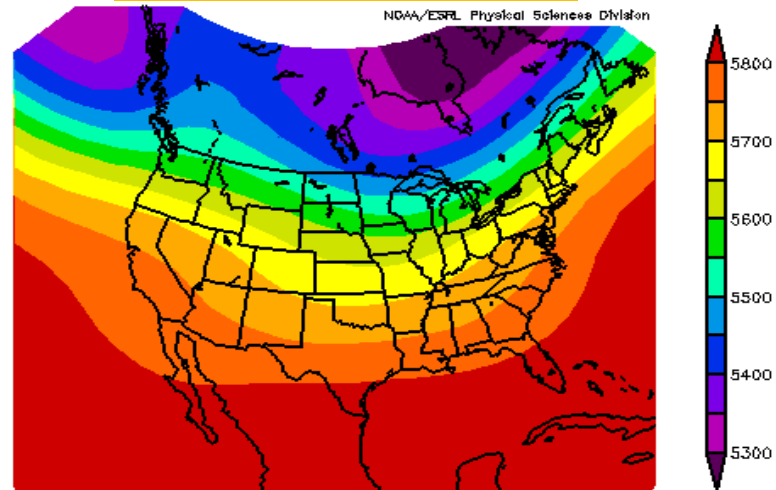
500mb Geopotential Heights (m) Composite Mean
4/1/14 06z to 4/7/14 12z
NCEP/NCAR Reanalysis

WEEK-2: transition to warmer/dryer



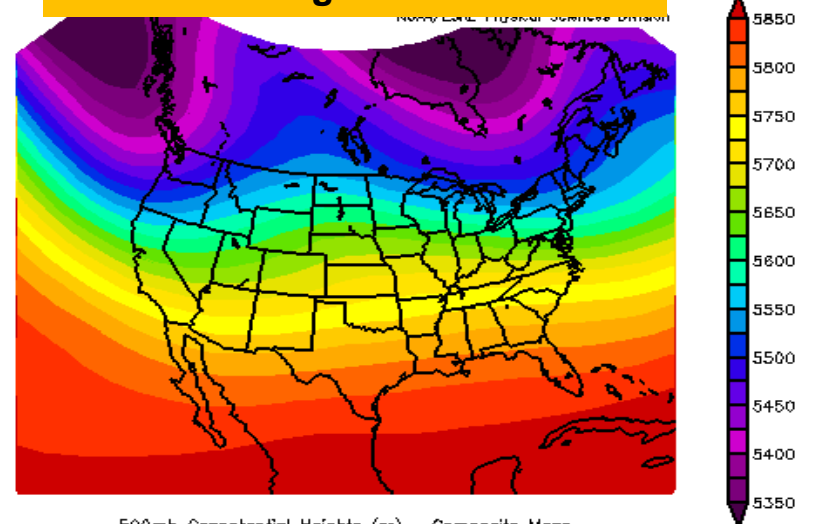
500mb Geopotential Heights (m) Composite Mean
4/7/14 06z to 4/14/14 12z
NCEP/NCAR Reanalysis

WEEK-3: Dryer / Mild



500mb Geopotential Heights (m) Composite Mean
4/14/14 06z to 4/21/14 12z
NCEP/NCAR Reanalysis

WEEK-4: Trough / wetter-cooler



500mb Geopotential Heights (m) Composite Mean
4/21/14 06z to 4/27/14 12z
NCEP/NCAR Reanalysis

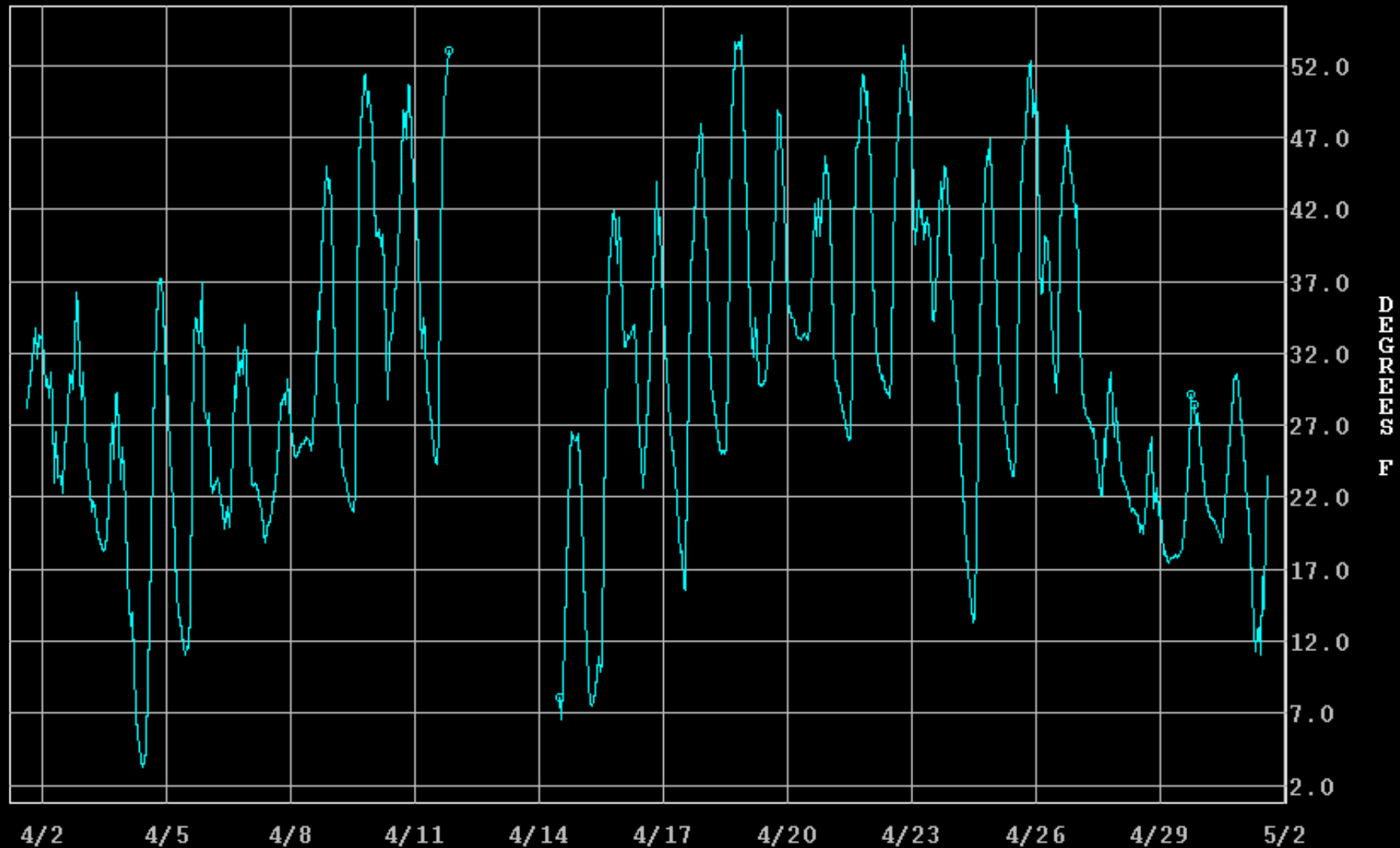
Copper Mountain SNOTEL – April Accumulated Precipitation

COPPER MOUNTAIN
CPMC2 PCIRMZZ PRECIPITATION ACCUMULATION, INSTANTANEOUS, OBSERVED, METEOR
Max= 24.6 at 05/01/2014 15Z
Min= 21.0 at 04/04/2014 16Z



Copper Mountain SNOTEL – April Temperature

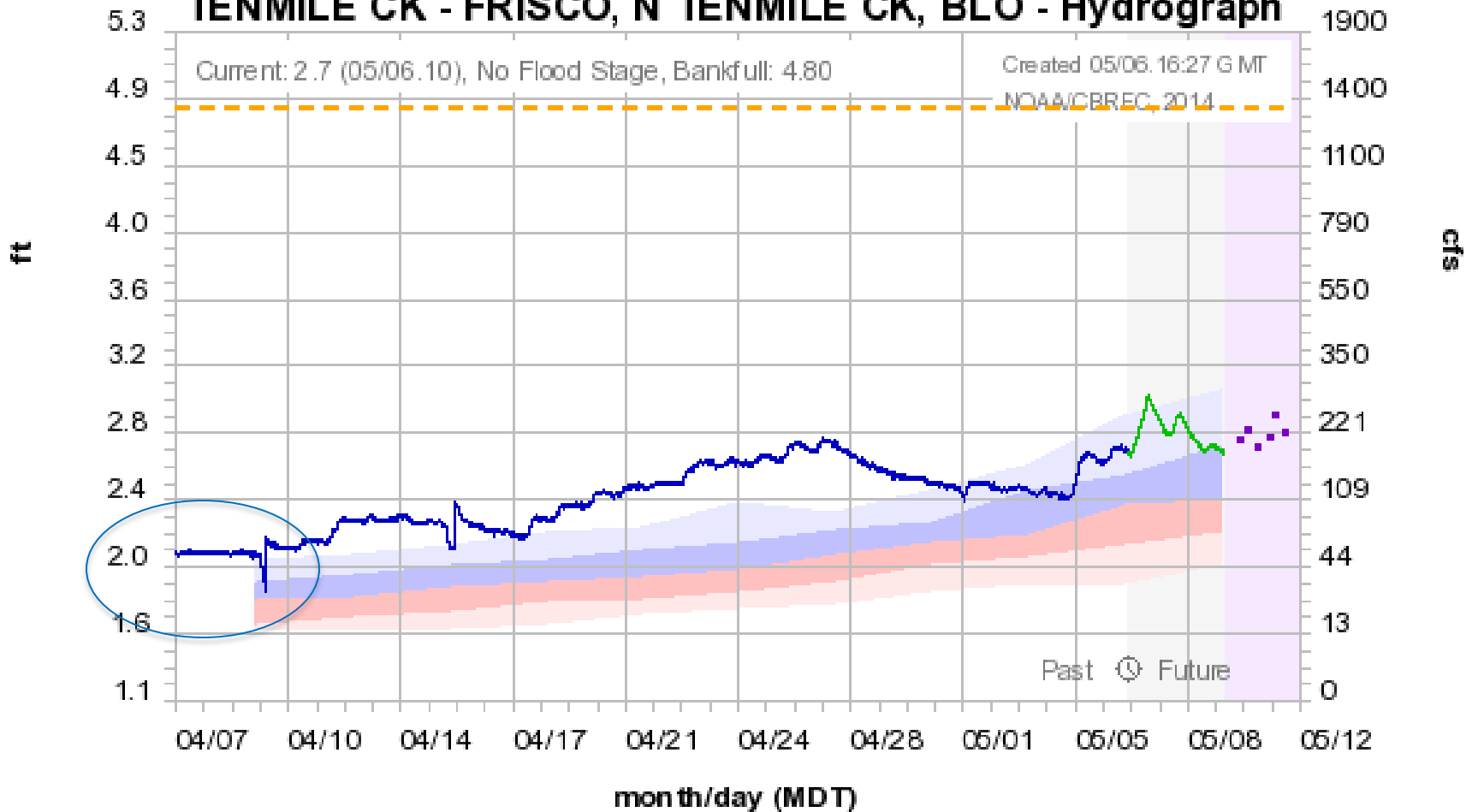
COPPER MOUNTAIN
CPMC2 TAIRMZZ AIR TEMPERATURE, INSTANTANEOUS, OBSERVED, METEOR
Max= 54.1 at 04/18/2014 22Z
Min= 3.2 at 04/04/2014 11Z



April Streamflow

Colorado Basin River Forecast Center

TENMILE CK - FRISCO, N TENMILE CK, BLO - Hydrograph



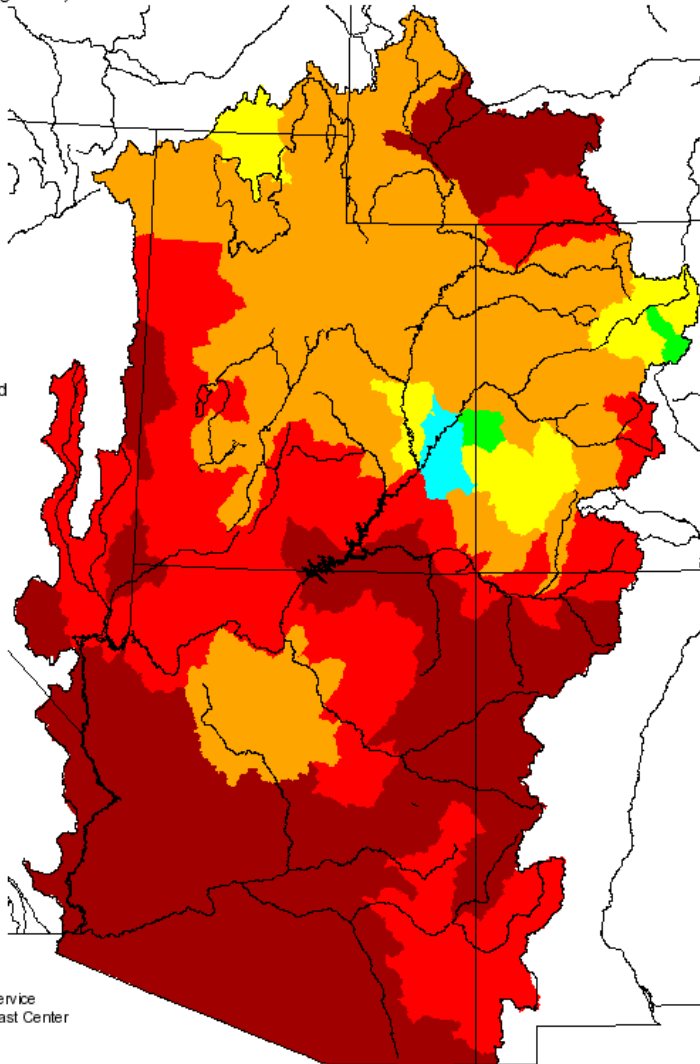
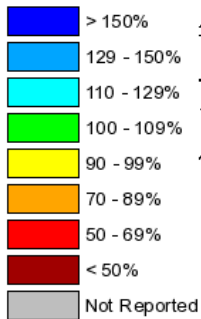
Observed **—** Forecast (05/06.14:00) **—** Outlook (increasing uncertainty) **—** Bankfull 4.80 **—**
Historical Exceedance Probability (USGS): 90-75% **—** 75-50% **—** 50-25% **—** 25-10% **—**

Precipitation

Monthly Precipitation for April 2014

(Averaged by Hydrologic Unit)

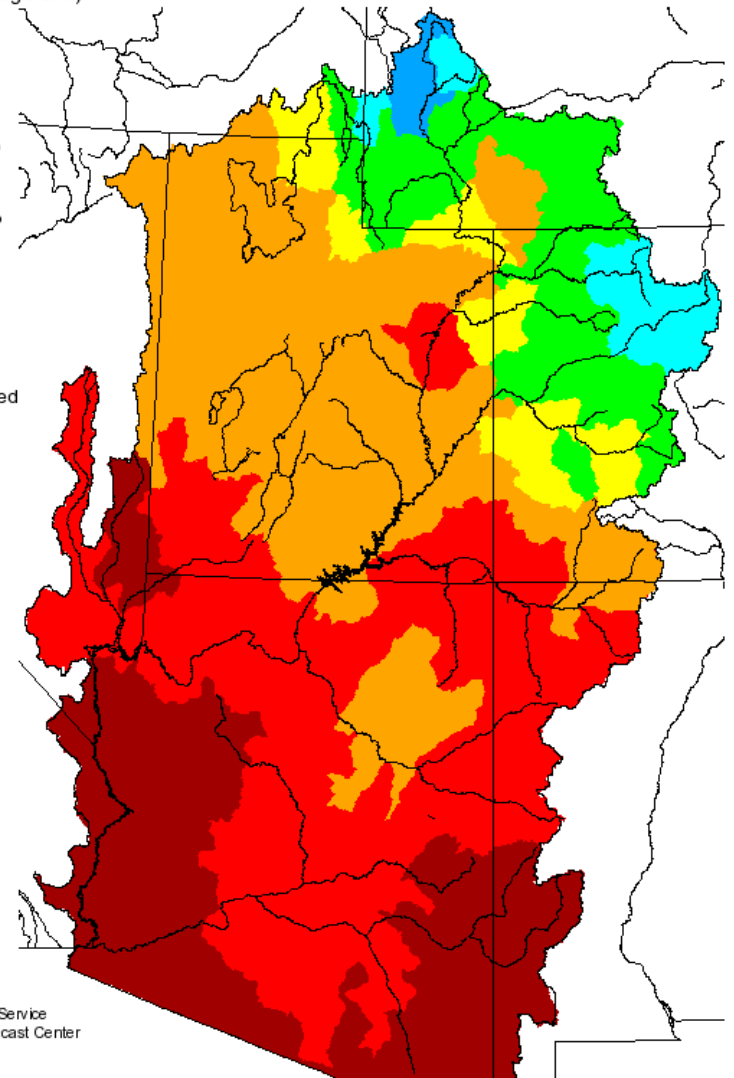
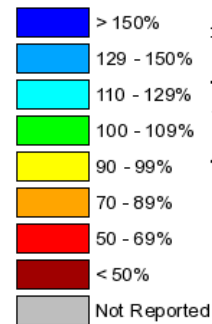
% Average



Seasonal Precipitation, October 2013 - April 2014

(Averaged by Hydrologic Unit)

% Average

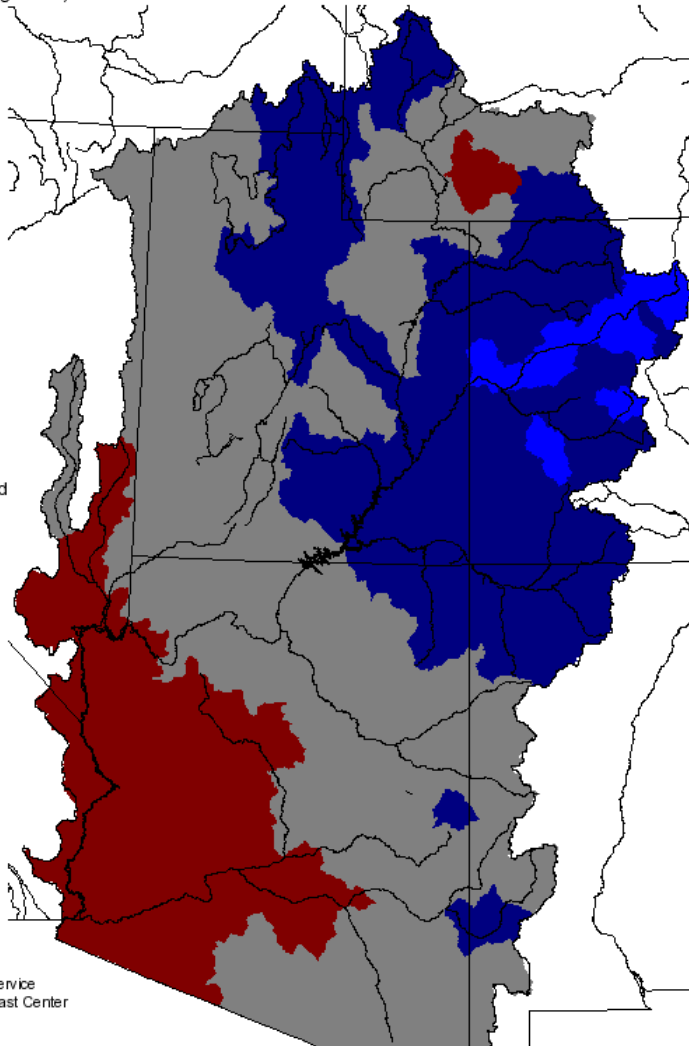
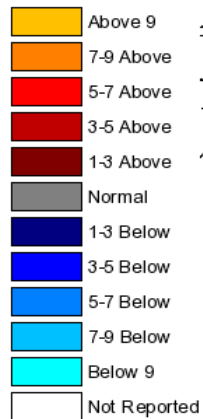


April Temperatures

Monthly Max Temp Deviation for April 2014

(Averaged by Hydrologic Unit)

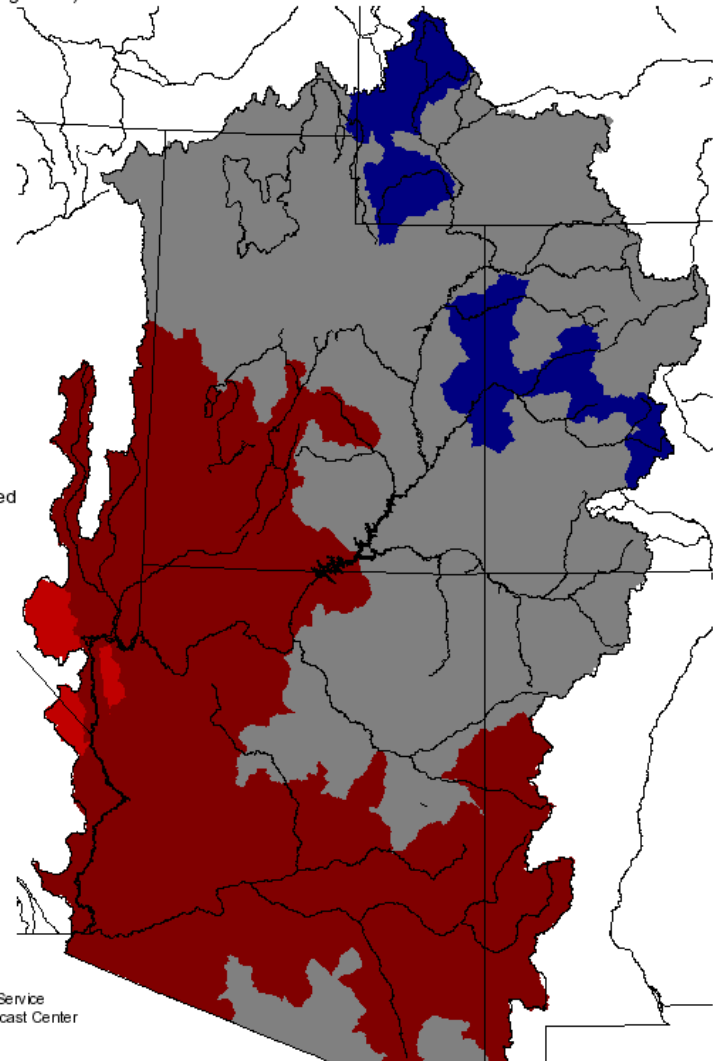
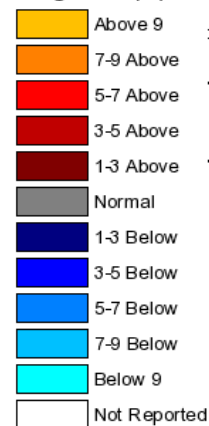
Degrees (F)



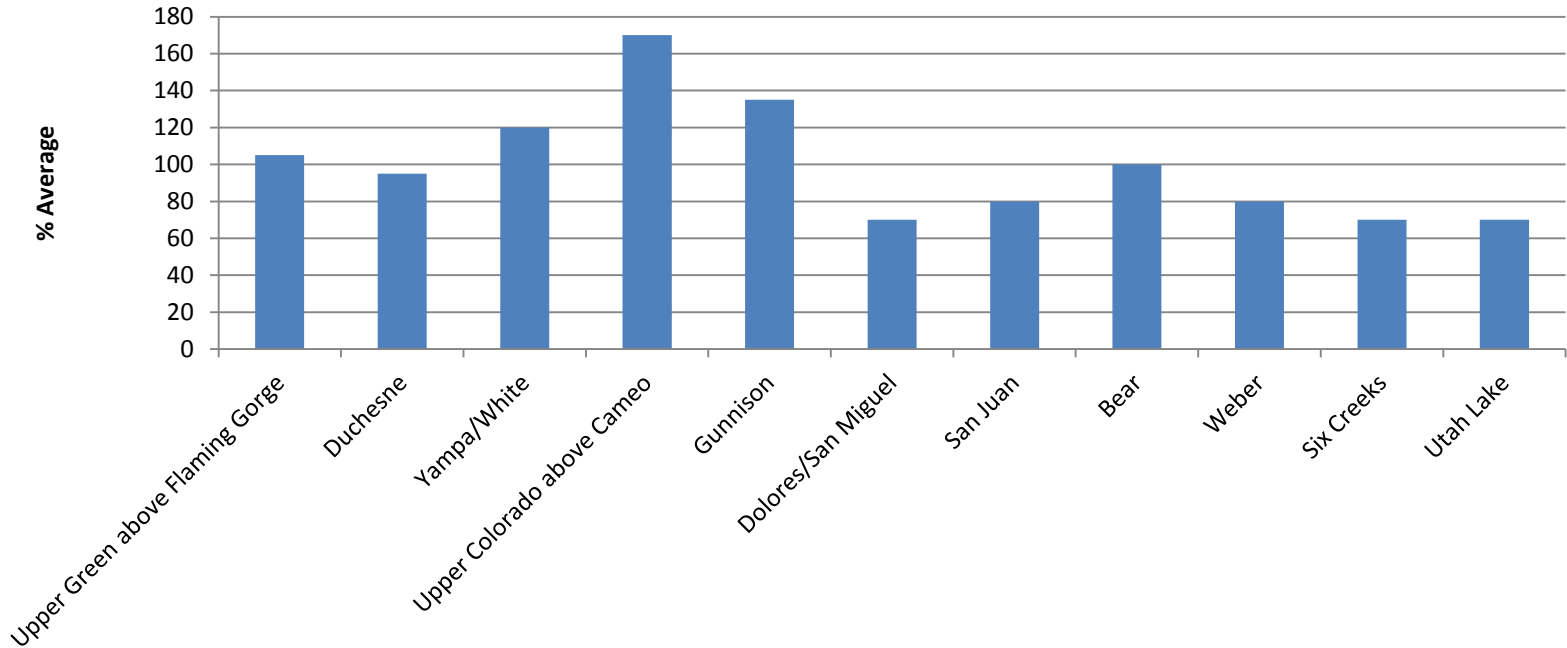
Monthly Min Temp Deviation for April 2014

(Averaged by Hydrologic Unit)

Degrees (F)



APRIL 2014 %AVERAGE UNREGULATED VOLUMES



SITE	Apr % avg	rank	period of record
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Upper Green:

New Fork nr Big Piney	133 %	12	60
Black For nr Robertson	188 %	3	42

Yampa:

Yampa – Steamboat	174 %	6	107
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Colorado above Cameo:

Blue – Dillon	182 %	1	55
Willow Creek Inflow	225 %	3	95

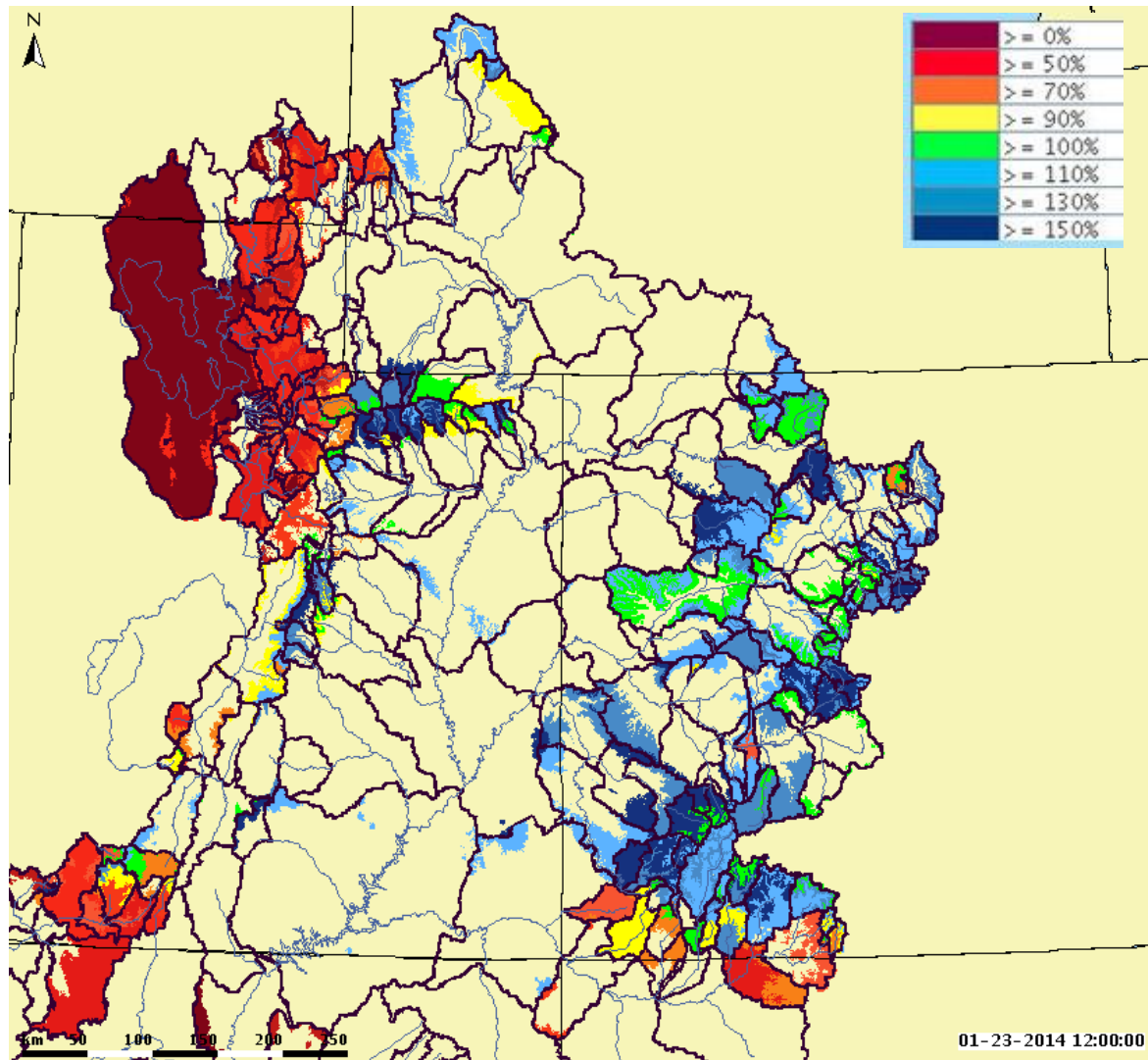
Gunnison:

Taylor Park Inflow	134 %	8	57
Blue Mesa Inflow	168%	2	46

Provisional Data

Modeled Soil Moisture – Entering Winter

Well above Upper Colorado and well below Great Basin



Still affecting water supply forecasts?

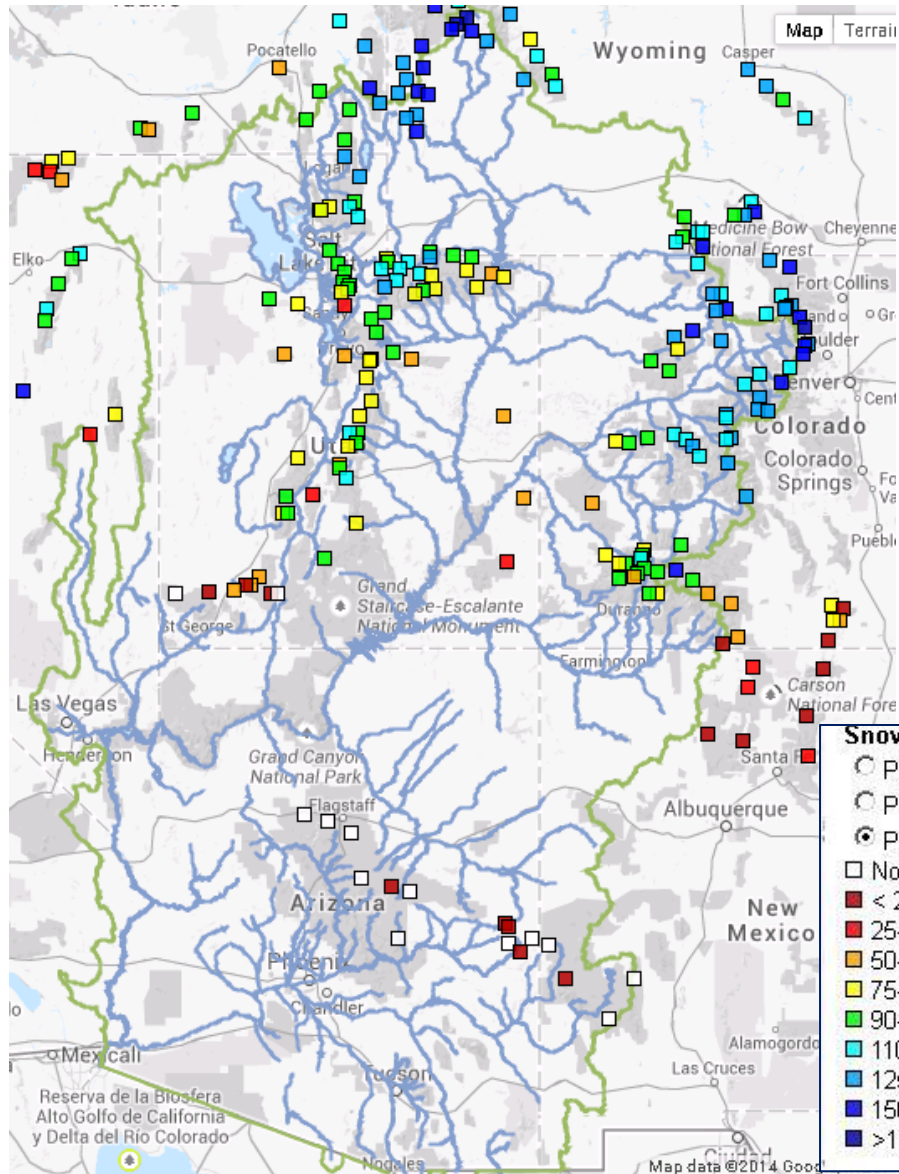
Positive affect on the upper Colorado, Yampa, Gunnison

Negative affect on the Great Basin

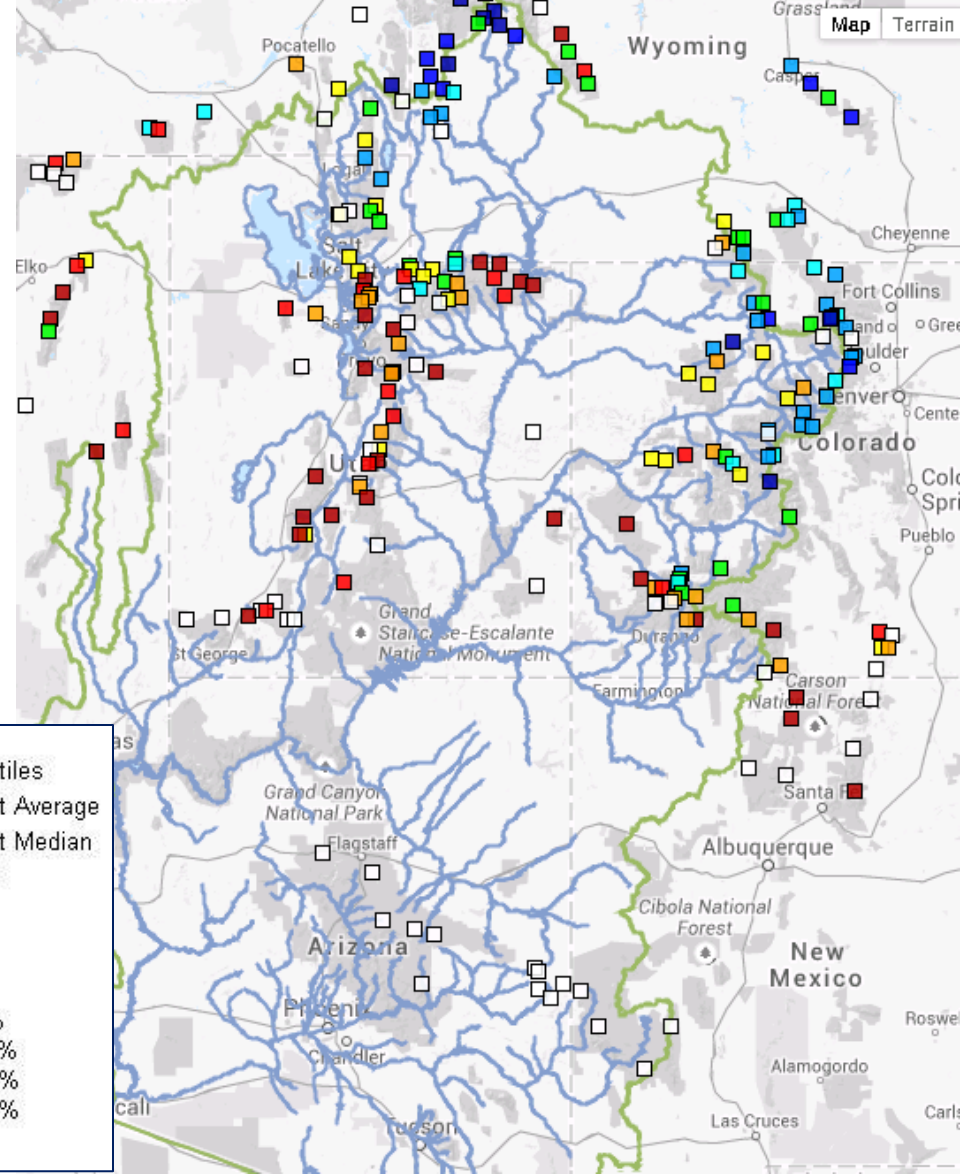
Persistent dry conditions & lack of snow primarily affecting San Juan

Snow

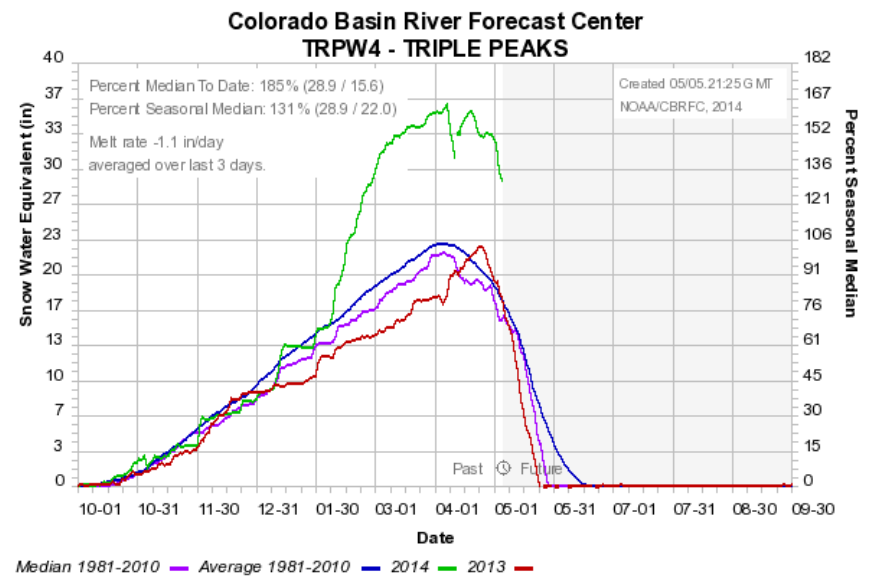
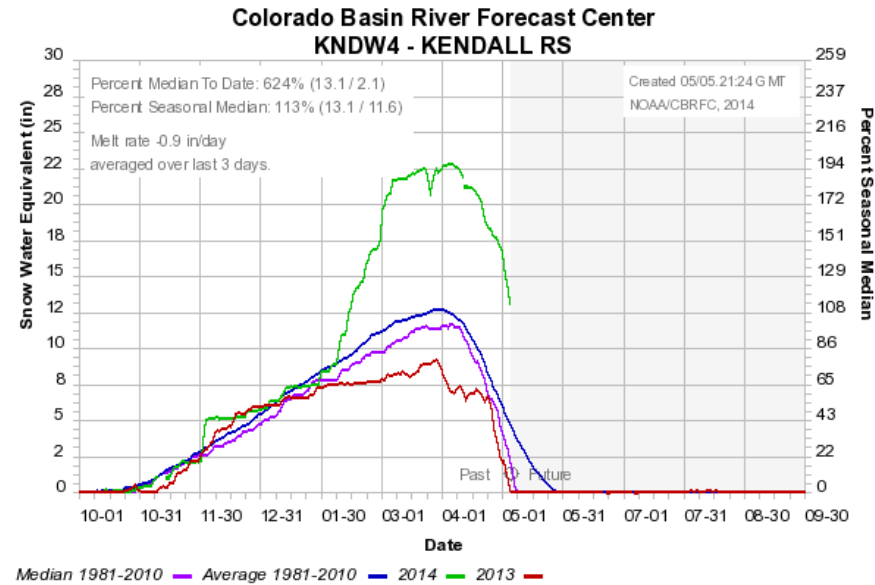
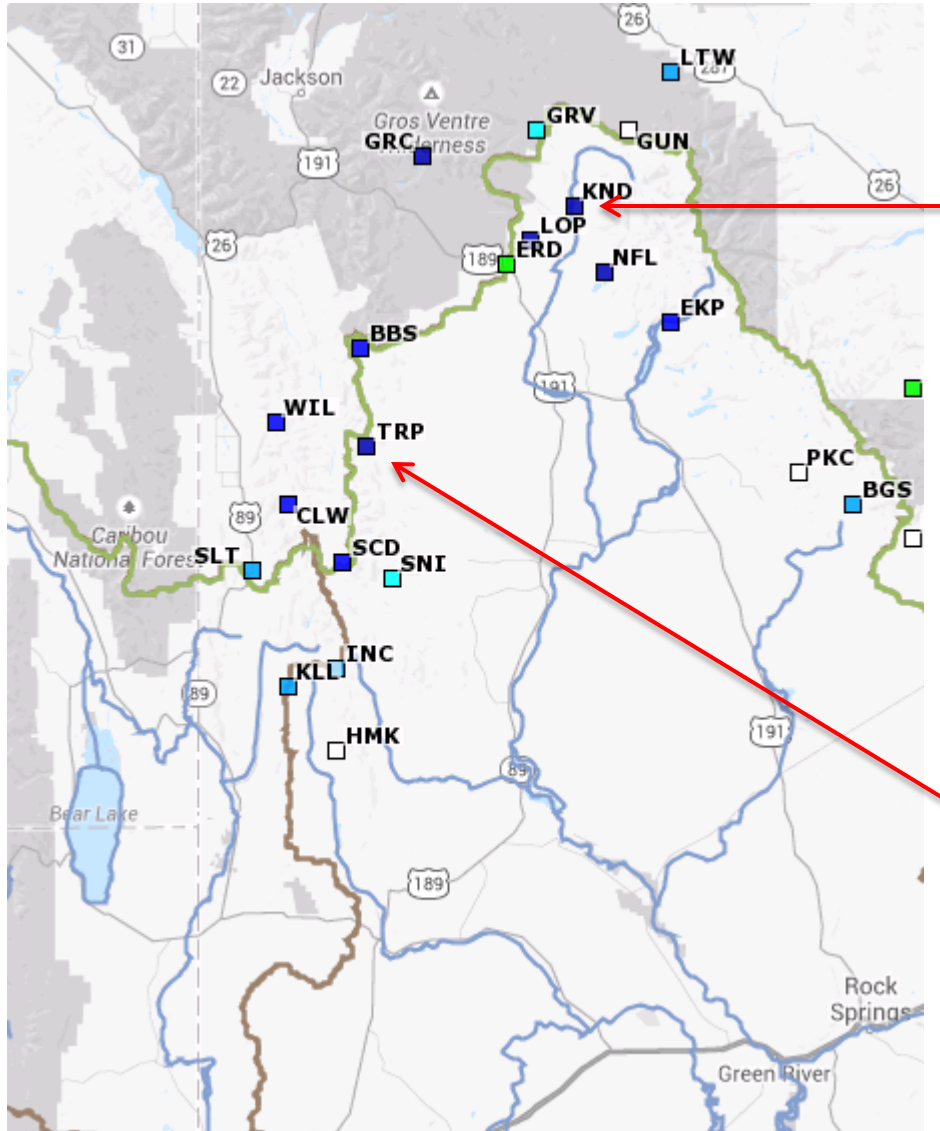
April 3rd Snow



May 5th Snow

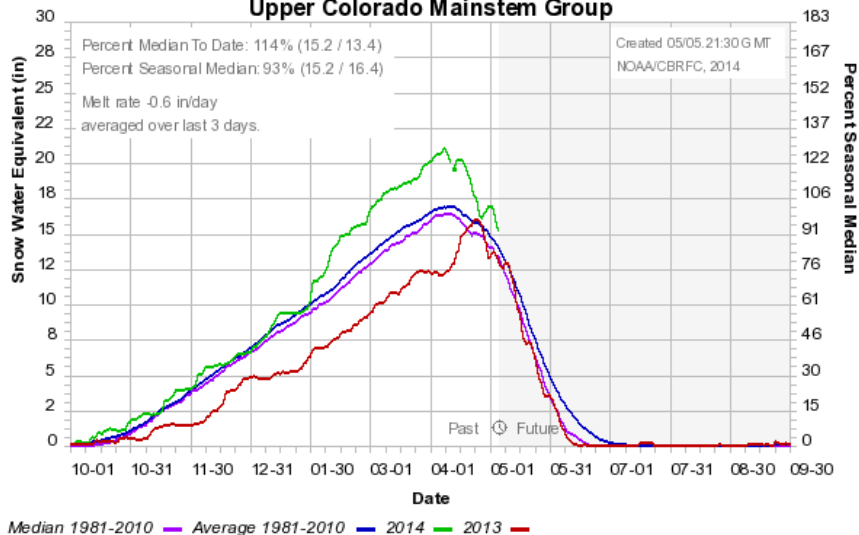


SNOW - Green River Basin (above Fontenelle)

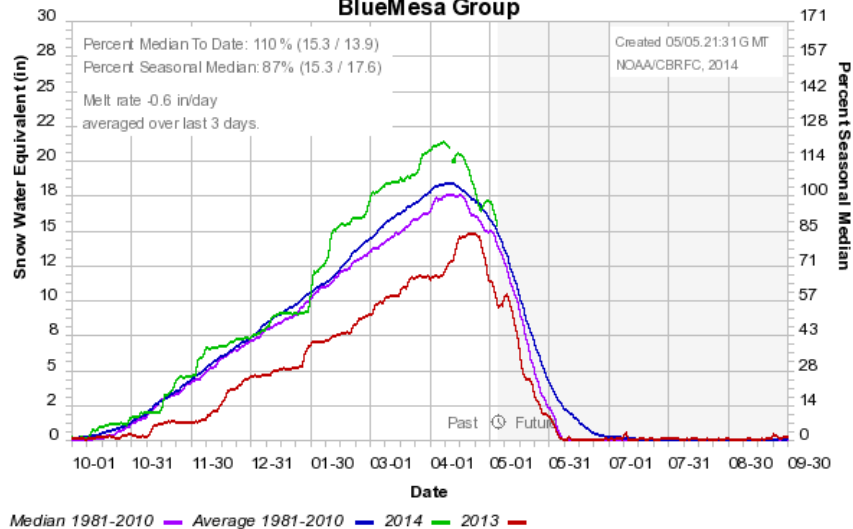


Basin Snow Groups:

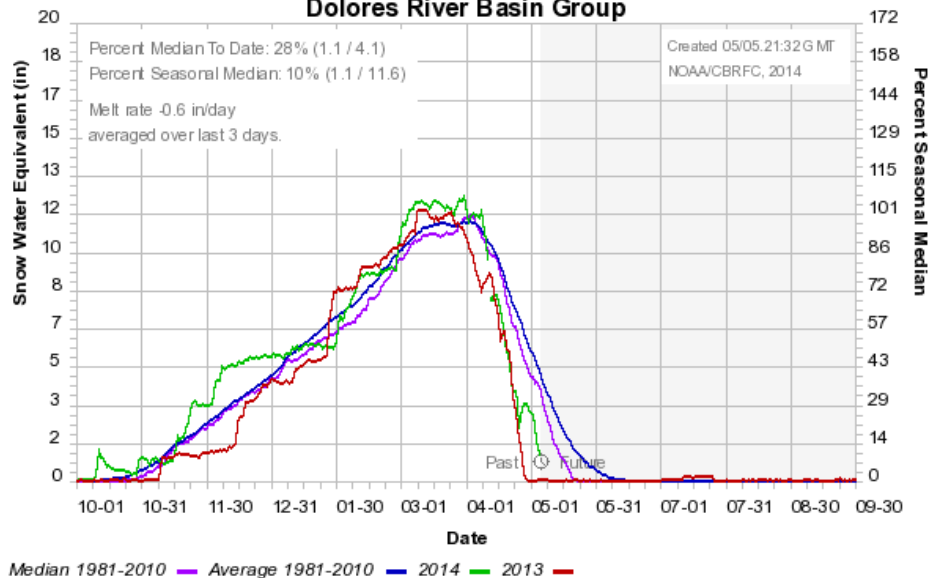
Colorado Basin River Forecast Center
Upper Colorado Mainstem Group



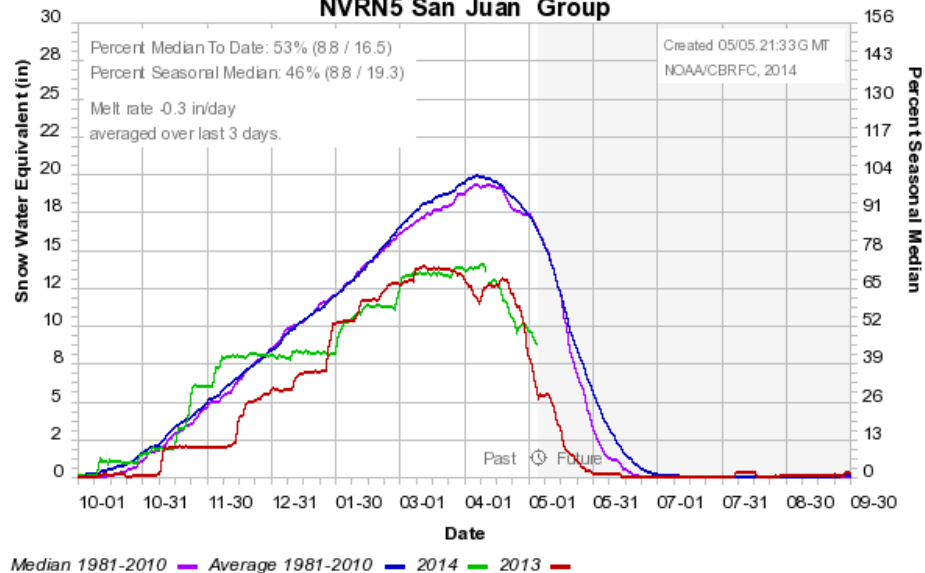
Colorado Basin River Forecast Center
BlueMesa Group



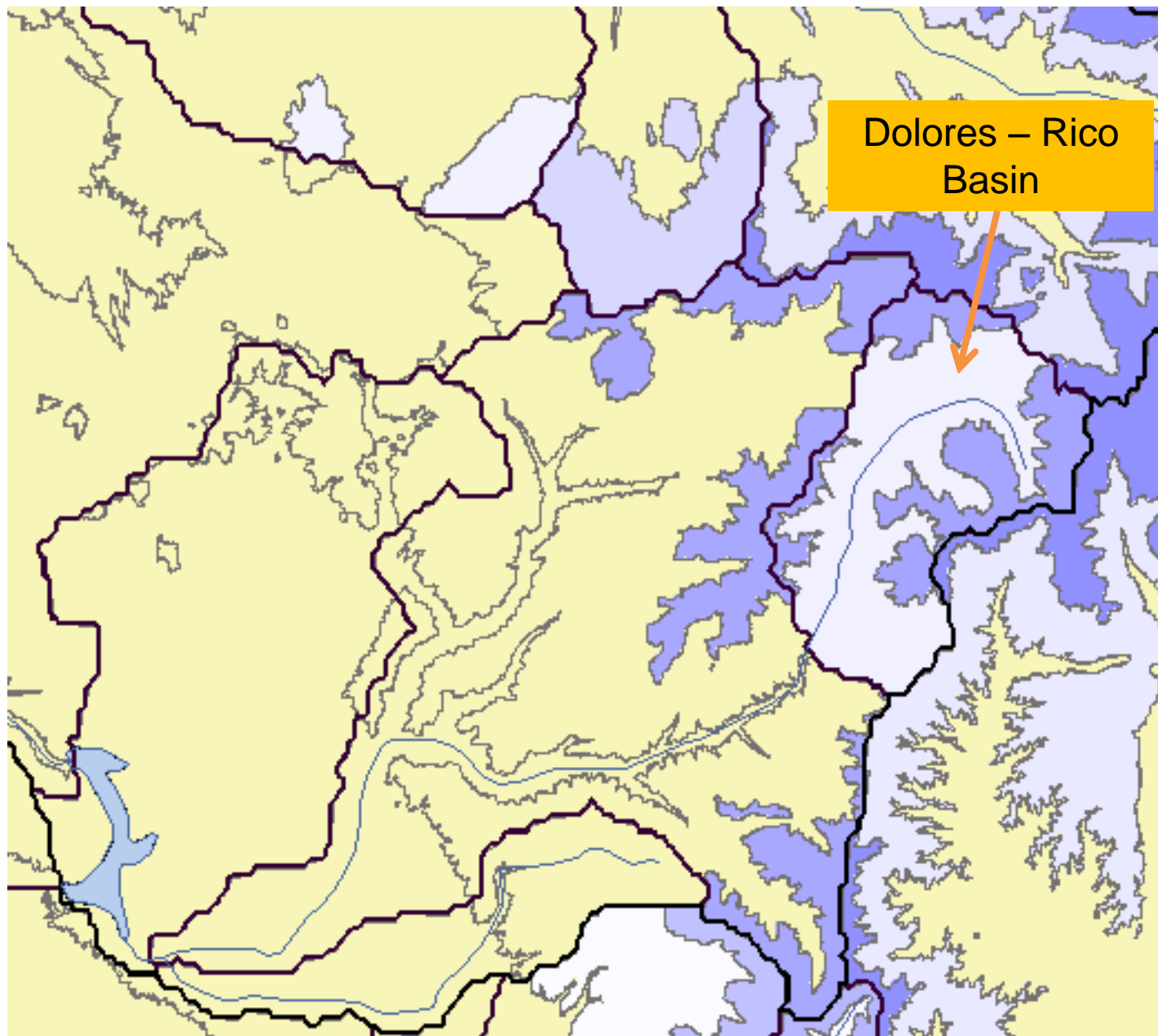
Colorado Basin River Forecast Center
Dolores River Basin Group



Colorado Basin River Forecast Center
NVRN5 San Juan Group

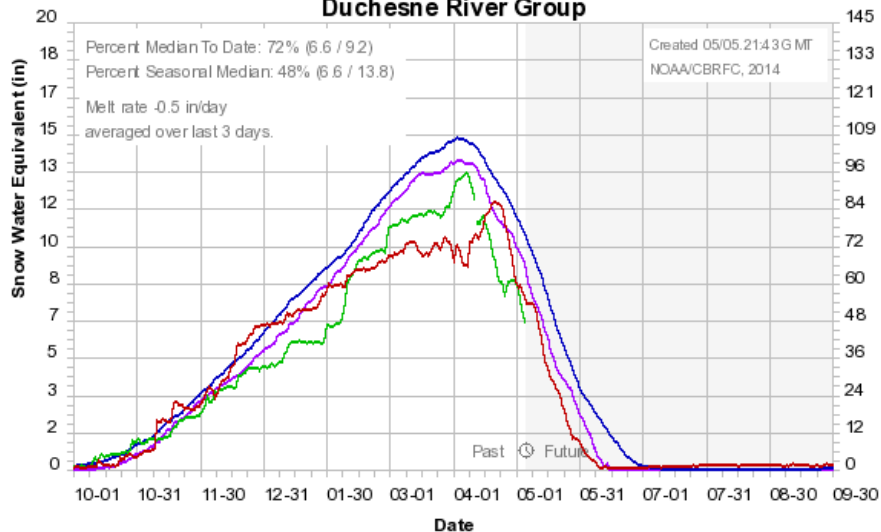


CBRFC Model Snow – Dolores River Basin – May 6 2014



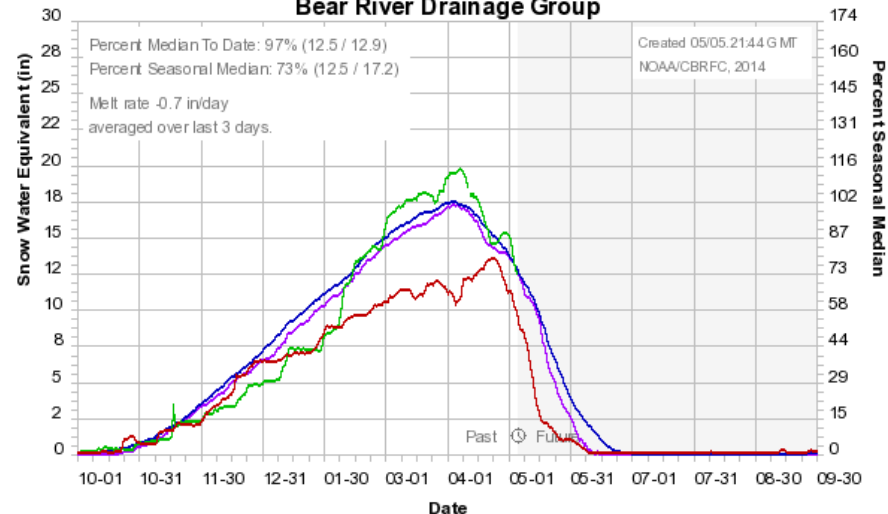
Basin Snow Groups:

Colorado Basin River Forecast Center
Duchesne River Group



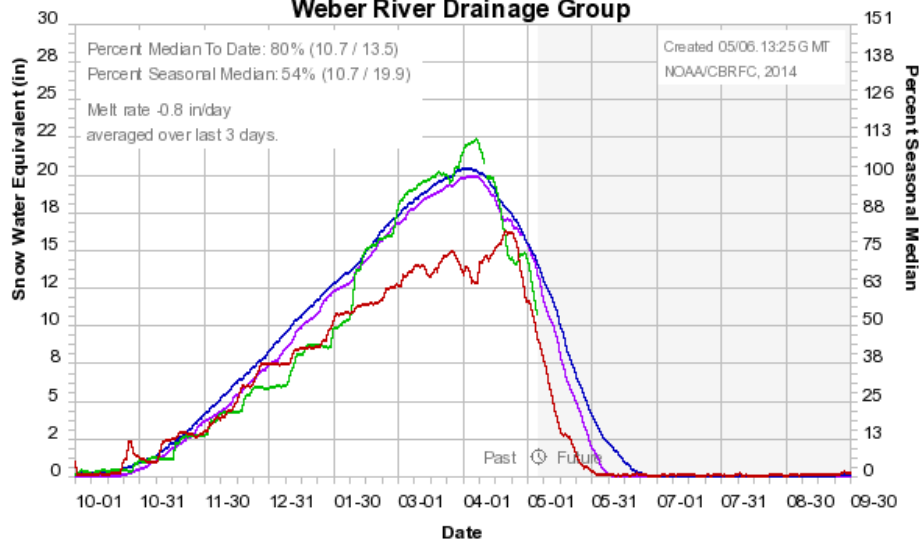
Median 1981-2010 Average 1981-2010 2014 2013 2012

Colorado Basin River Forecast Center
Bear River Drainage Group



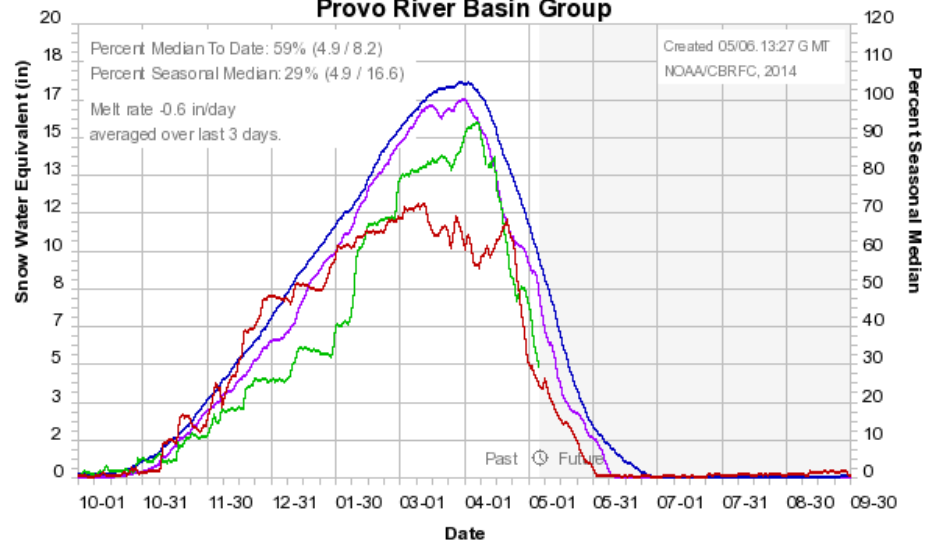
Median 1981-2010 Average 1981-2010 2014 2013 2012

Colorado Basin River Forecast Center
Weber River Drainage Group



Median 1981-2010 Average 1981-2010 2014 2013 2012

Colorado Basin River Forecast Center
Provo River Basin Group



Median 1981-2010 Average 1981-2010 2014 2013 2012

May 1st Water Supply Forecasts

Apr-Jul Volumes / % Average

Weber-Oakley:
92 KAF / 78%

Provo-Woodland:
86 KAF / 86%

Virgin-Virgin:
19 KAF / 33%

Flaming Gorge:
1320 KAF / 135%

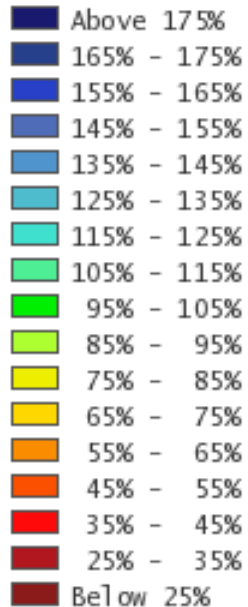
Yampa-Deerlodge:
1550 KAF / 125%

Colorado-Cameo:
2950 KAF / 125%

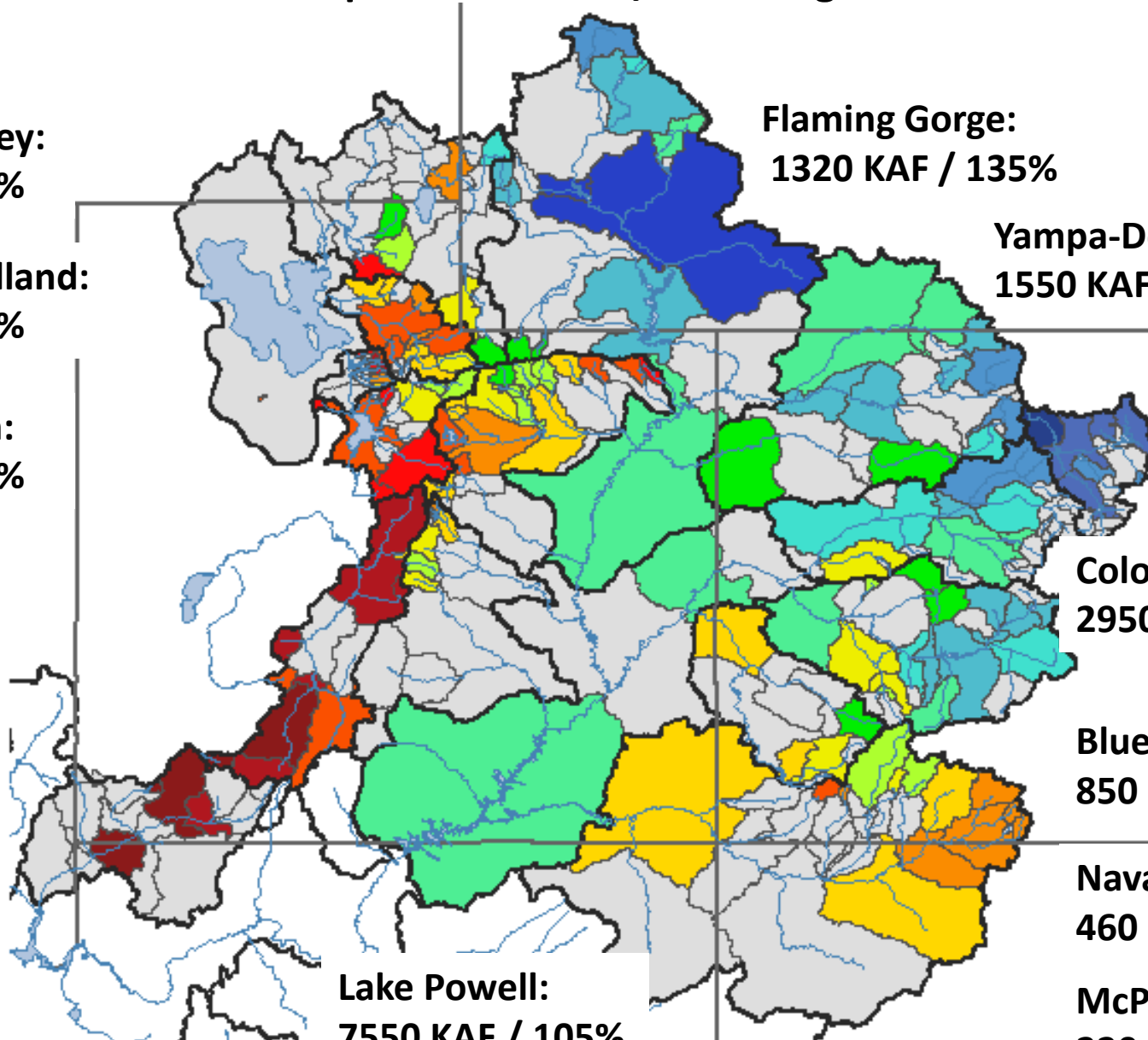
Blue Mesa:
850 KAF / 126%

Navajo Res:
460 KAF / 63%

McPhee Res:
220 KAF / 75%

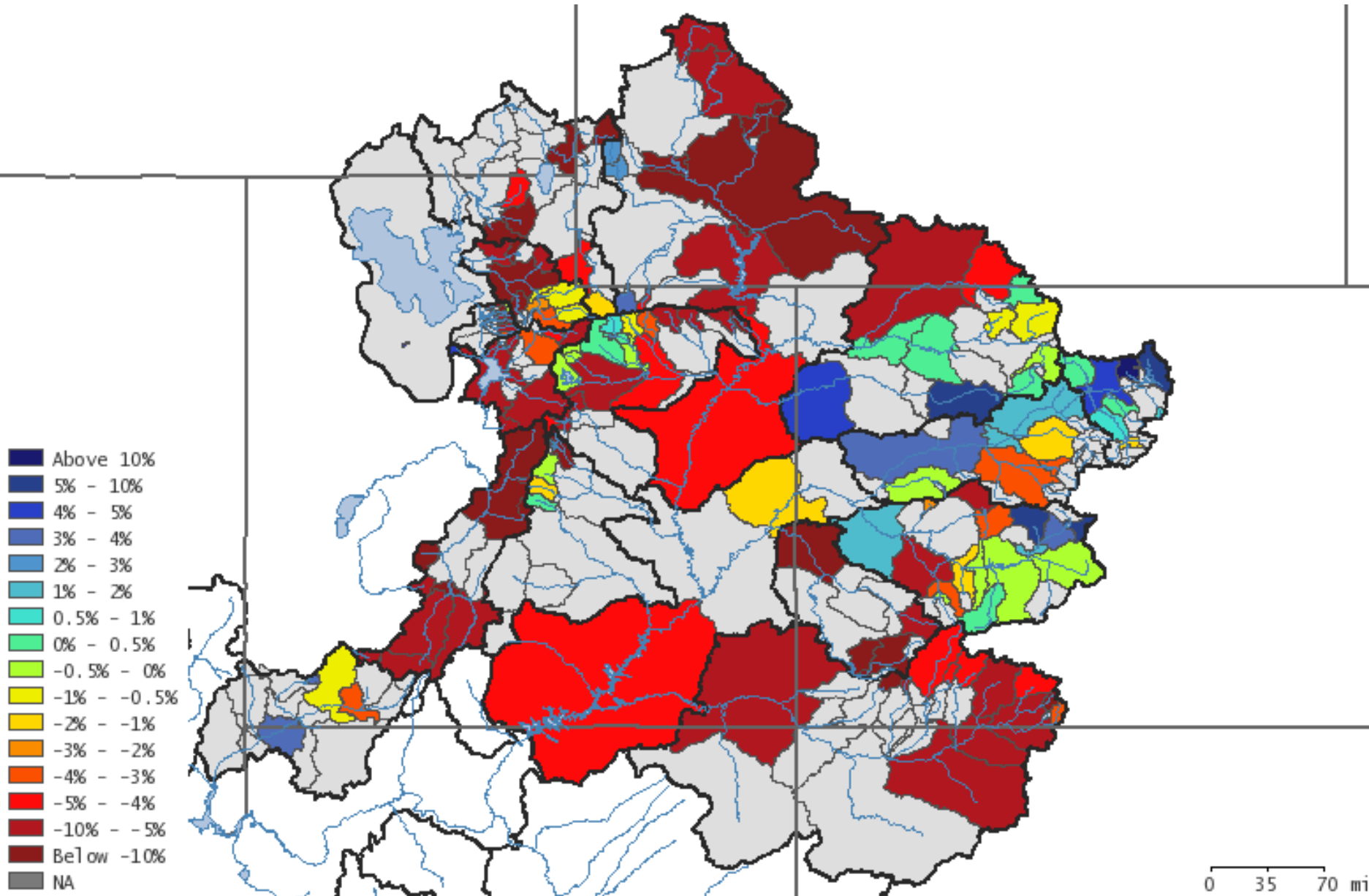


Lake Powell:
7550 KAF / 105%



Water Supply Forecast Trend

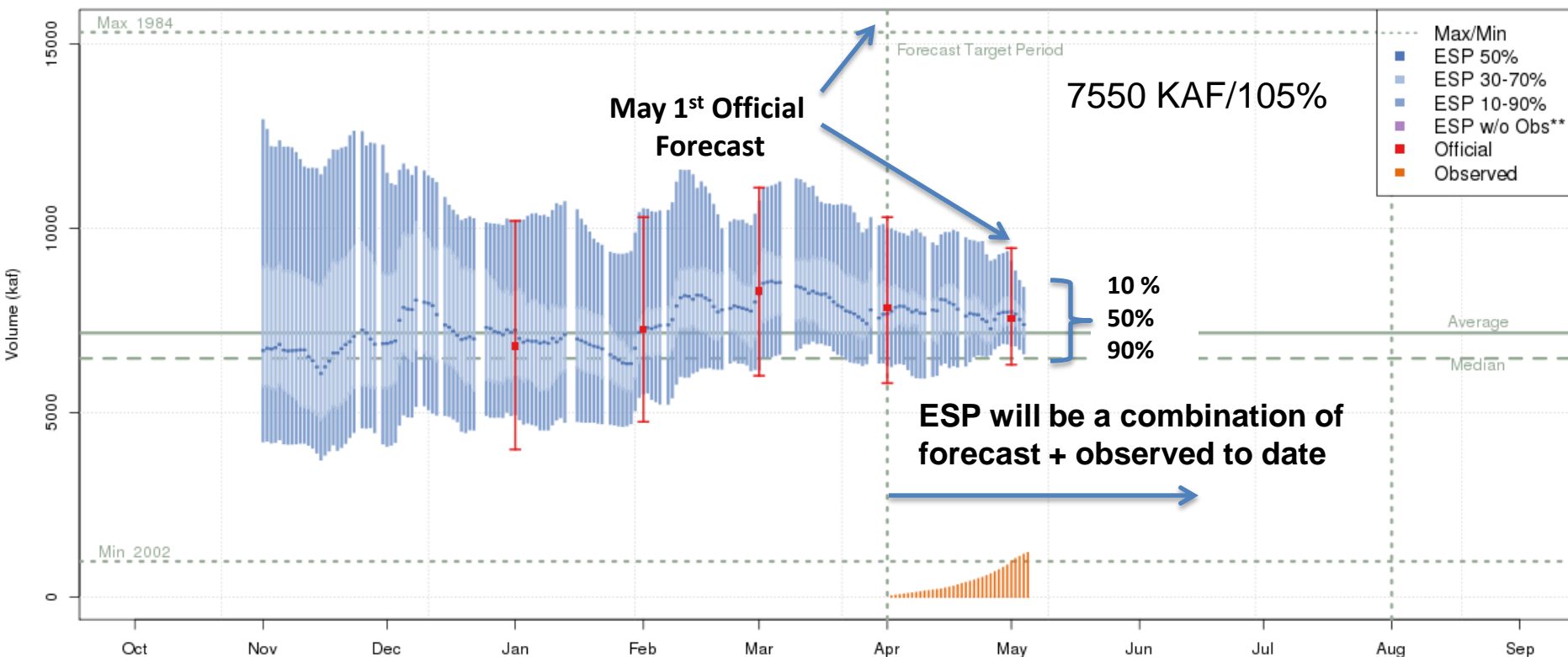
Change in the forecast % of average between Mar 1st and Apr 1st



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 (No Precip Forecast Included)
2014-05-01 Official 50% Forecast: 7550 kaf (105% of average)



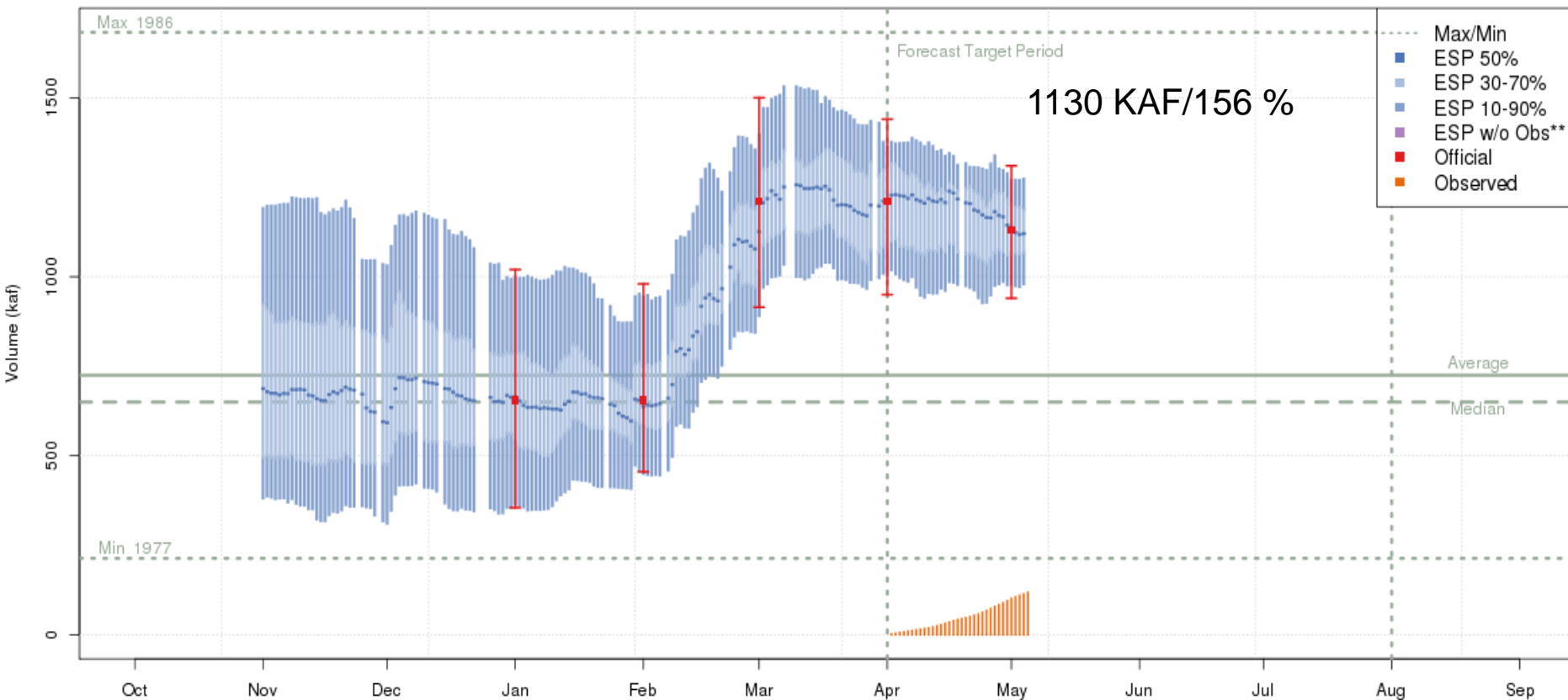
ESP will be a combination of forecast + observed to date

Plot Created 2014-05-05 14:27:35, Lastest ESP Run from 2014-05-04, NOAA / NWS / CBRFC
The latest (2014-05-04) 50% ESP forecast (7387 kaf) changed -1.8% from previous day and -4.5% from May 1
**These ESP forecasts do not include observed and are not total runoff.

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 (No Precip Forecast Included)
2014-05-01 Official 50% Forecast: 1130 kaf (156% of average)



Plot Created 2014-05-05 14:26:16, Lastest ESP Run from 2014-05-04, NOAA / NWS / CBRFC
The latest (2014-05-04) 50% ESP forecast (1121 kaf) changed 0.2% from previous day and -1.5% from May 1
**These ESP forecasts do not include observed and are not total runoff.

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

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

Yampa - Deerlodge Park (YDLC2) Apr-Jul 2014 Runoff Forecast (No Precip Forecast Included)
2014-05-01 Official 50% Forecast: 1550 kaf (125% of average)

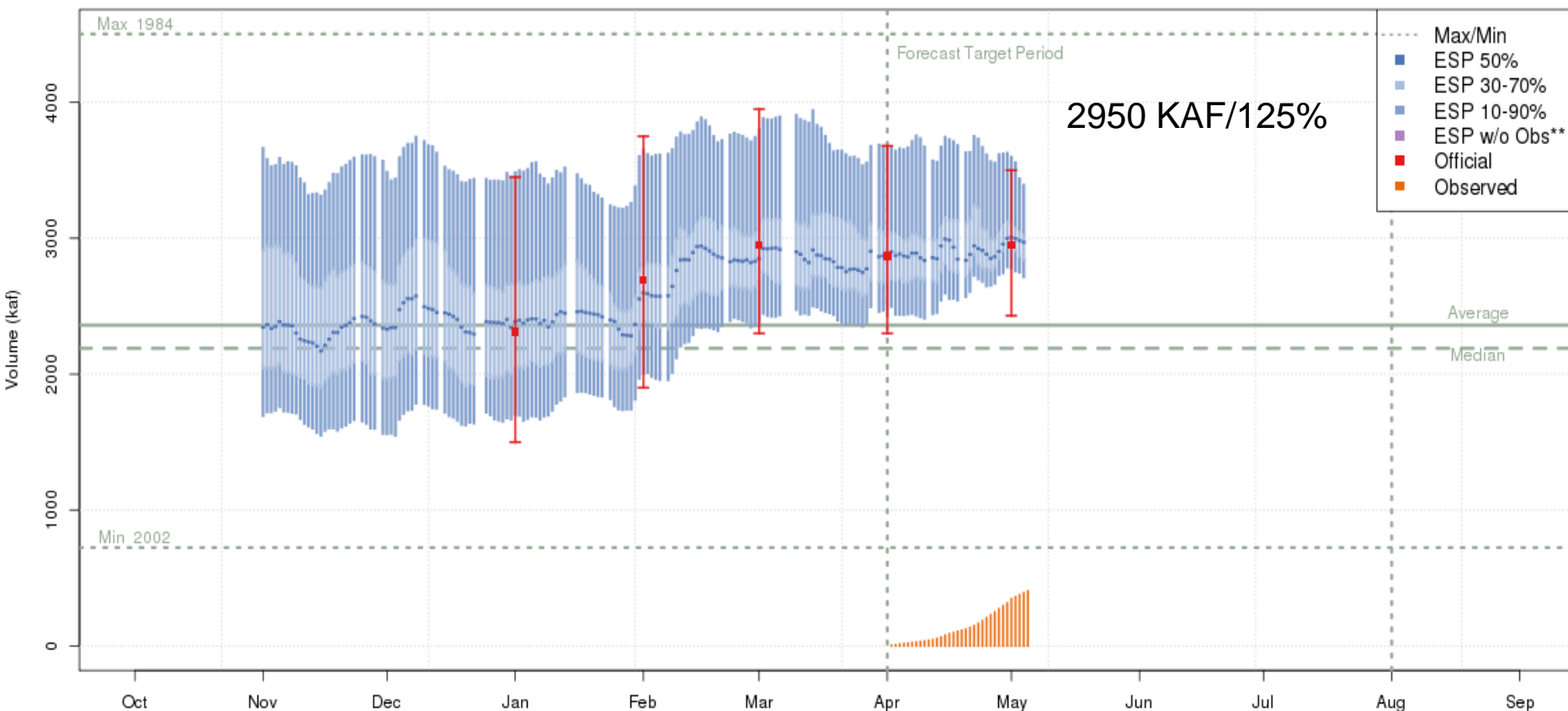


Plot Created 2014-05-05 14:53:56, Lastest ESP Run from 2014-05-04, NOAA / NWS / CBRFC
The latest (2014-05-04) 50% ESP forecast (1496 kaf) changed 0.2 % from previous day and -1.3 % from May 1
**These ESP forecasts do not include observed and are not total runoff.

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

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

Colorado - Cameo- Nr (CAMC2) Apr-Jul 2014 Runoff Forecast (No Precip Forecast Included)
2014-05-01 Official 50% Forecast: 2950 kaf (125% of average)

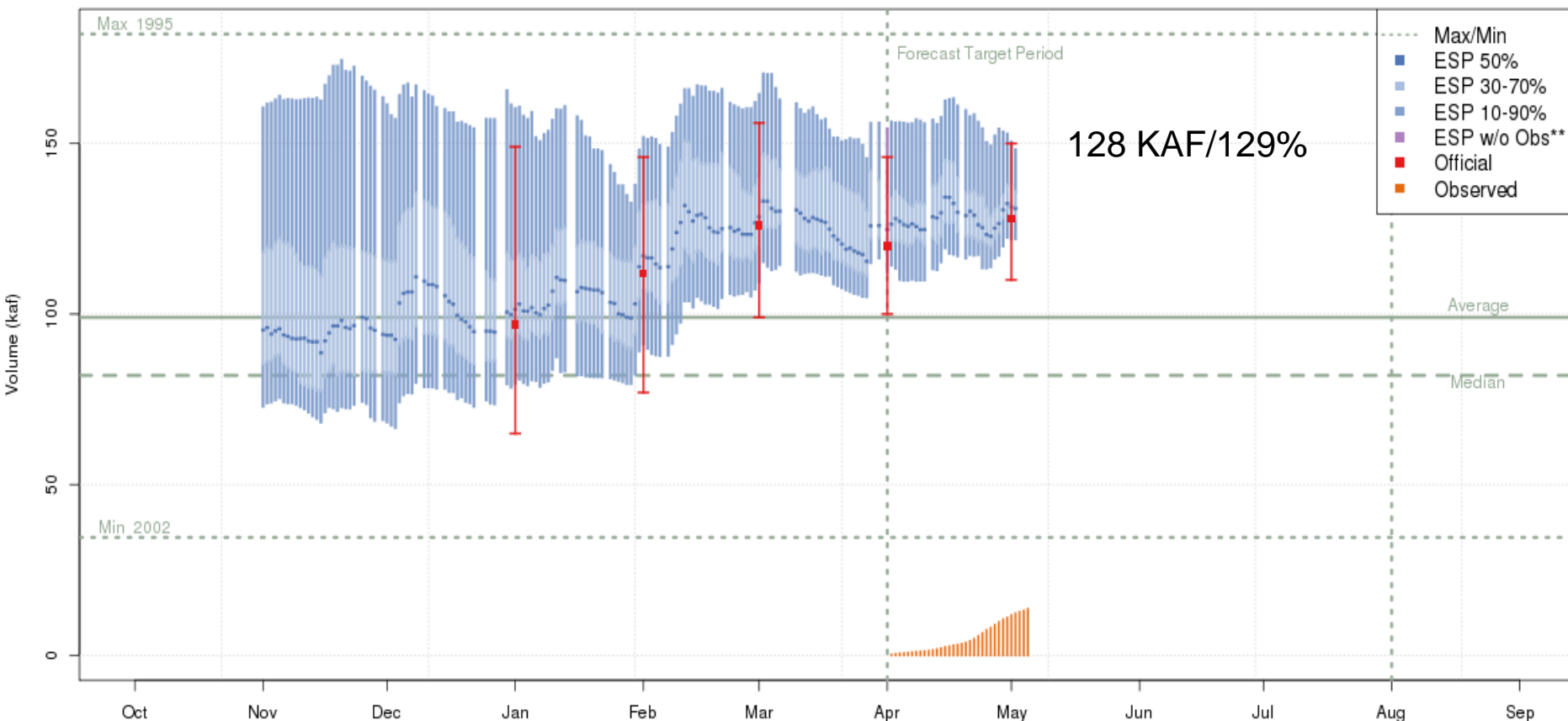


Plot Created 2014-05-05 14:16:43, Lastest ESP Run from 2014-05-04, NOAA / NWS / CBRFC
The latest (2014-05-04) 50% ESP forecast (2971 kaf) changed -0.4 % from previous day and -1.2 % from May 1
**These ESP forecasts do not include observed and are not total runoff.

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

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

Taylor - Taylor Park Res (TPIC2) Apr-Jul 2014 Runoff Forecast (No Precip Forecast Included)
2014-05-01 Official 50% Forecast: 128 kaf (129% of average)

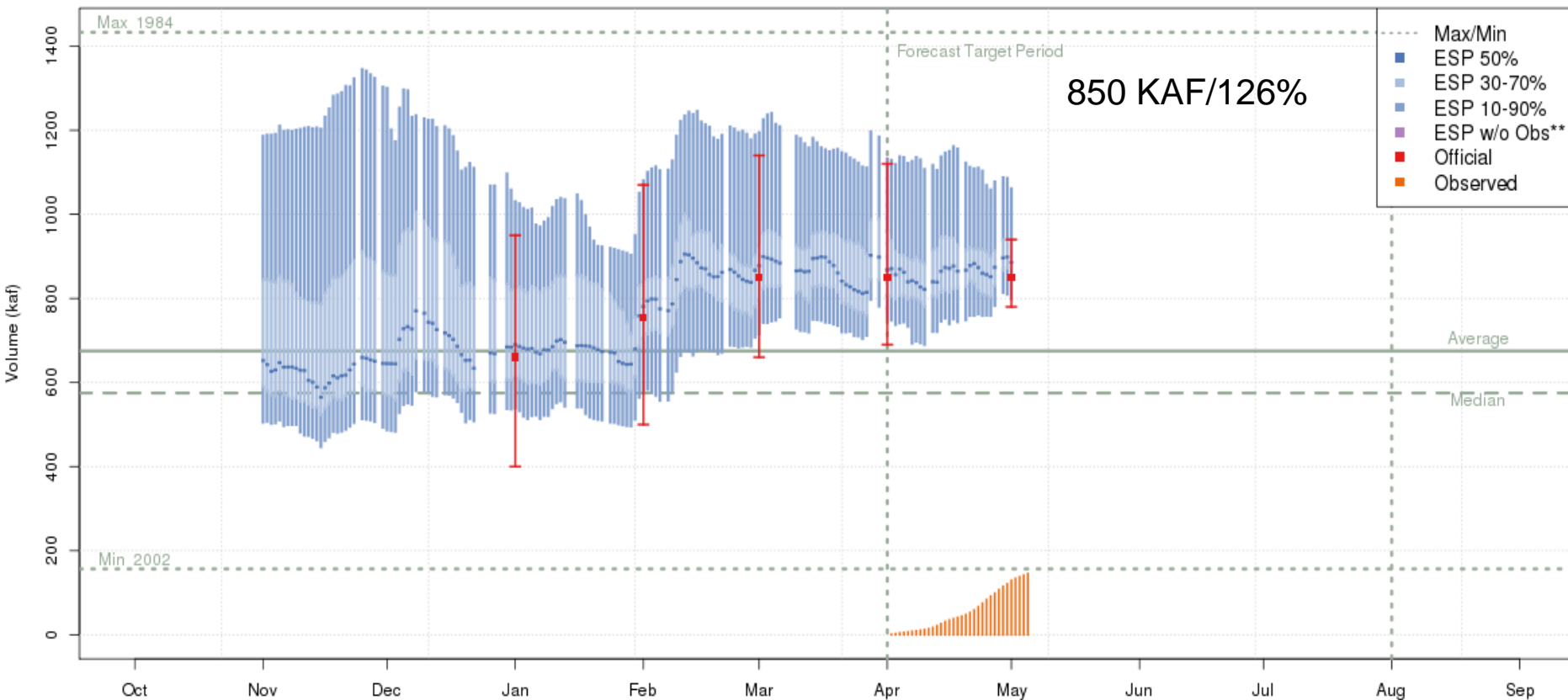


Plot Created 2014-05-05 14:48:26, Lastest ESP Run from 2014-05-02, NOAA / NWS / CBRFC
The latest (2014-05-02) 50% ESP forecast (131 kaf) changed -0.3% from previous day and -0.3% from May 1
**These ESP forecasts do not include observed and are not total runoff.

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

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

Gunnison - Blue Mesa Res (BMDC2) Apr-Jul 2014 Runoff Forecast (No Precip Forecast Included)
2014-05-01 Official 50% Forecast: 850 kaf (126% of average)

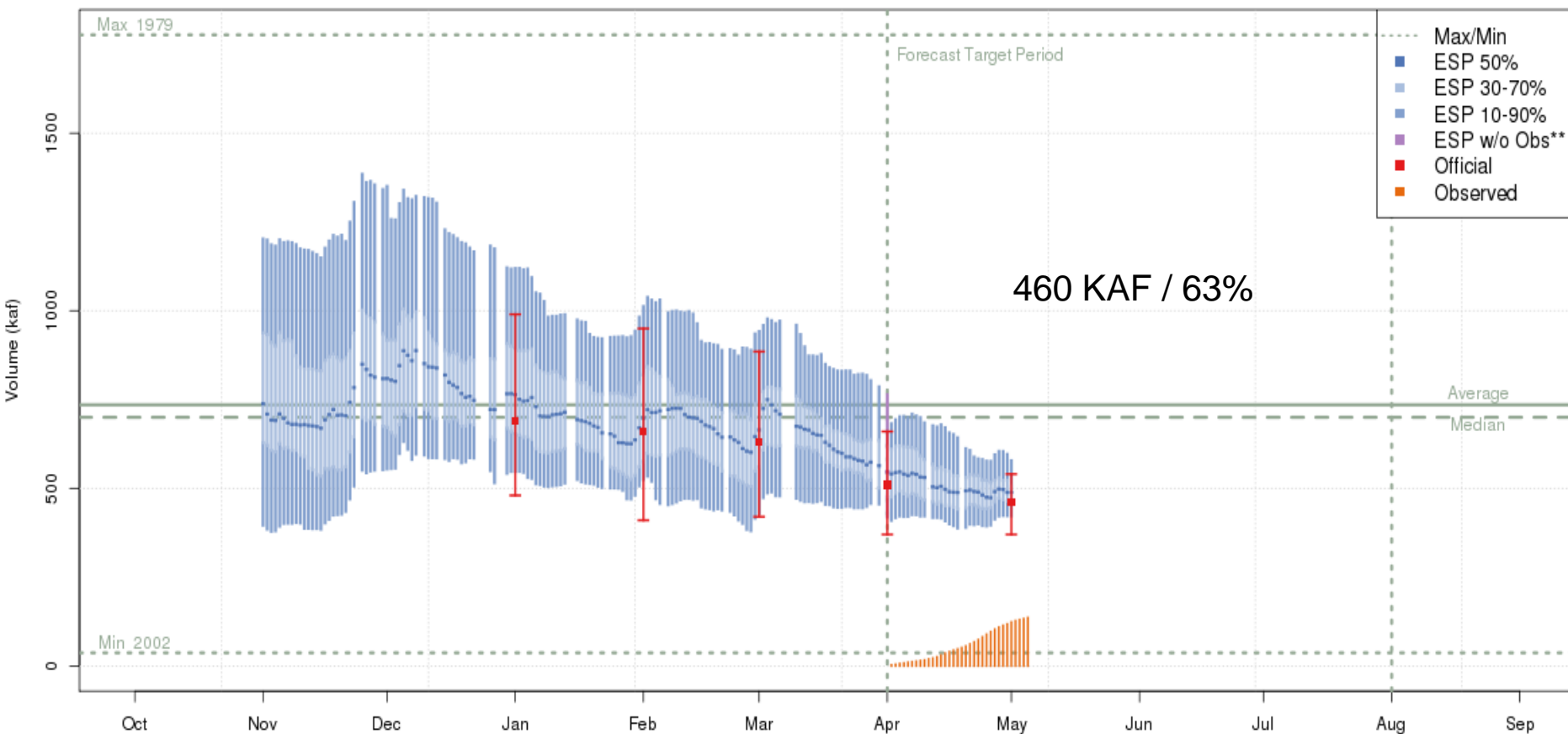


Plot Created 2014-05-05 14:15:07, Lastest ESP Run from 2014-05-01, NOAA / NWS / CBRFC
The latest (2014-05-01) 50% ESP forecast (886 kaf) changed -1.4% from previous day and 0% from May 1
**These ESP forecasts do not include observed and are not total runoff.

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

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

San Juan - Navajo Res- Archuleta- Nr (NVRN5) Apr-Jul 2014 Runoff Forecast (No Precip Forecast Included)
2014-05-01 Official 50% Forecast: 460 kaf (63% of average)

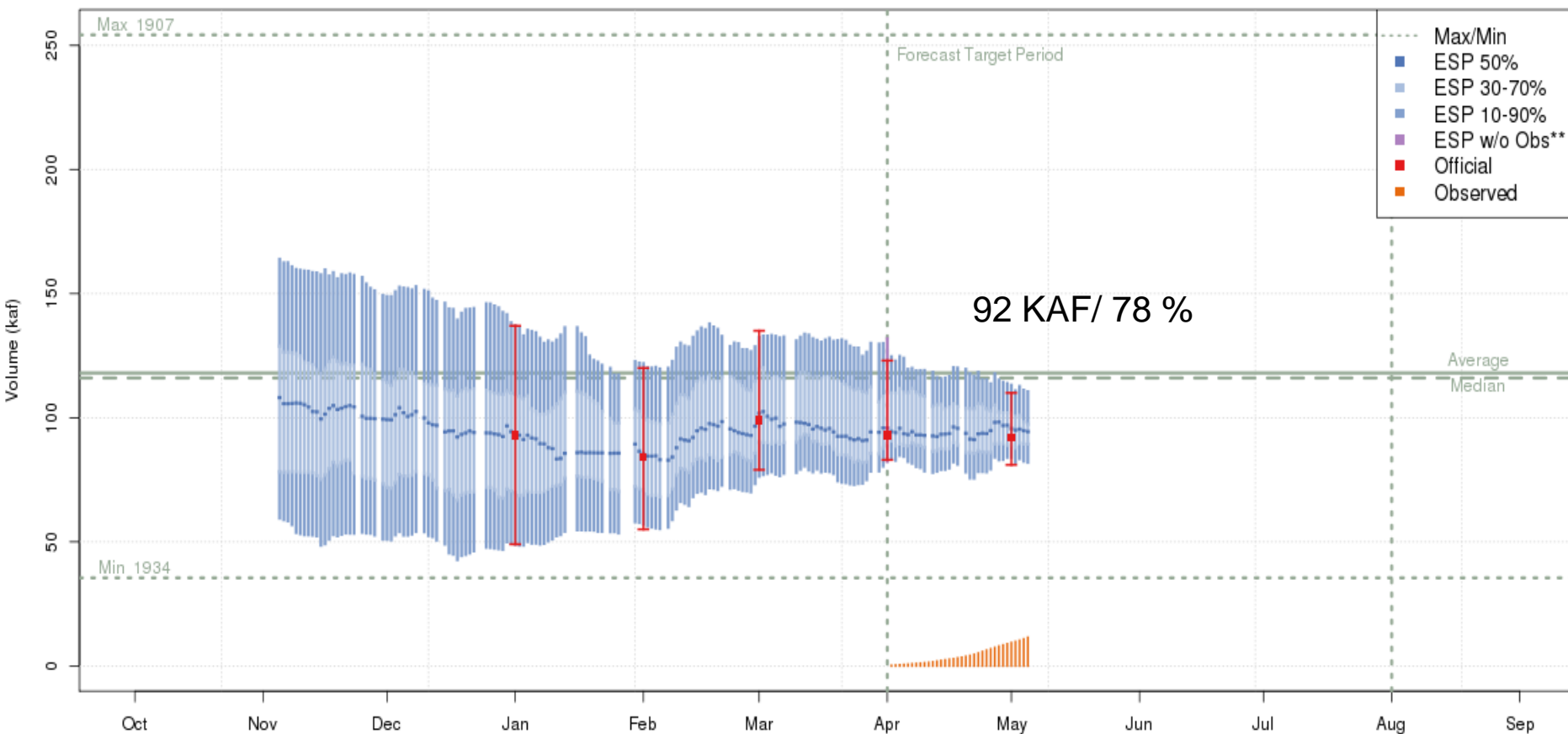


Plot Created 2014-05-05 14:37:52, Lastest ESP Run from 2014-05-01, NOAA / NWS / CBRFC
The latest (2014-05-01) 50% ESP forecast (489 kaf) changed 0.1 % from previous day and 0 % from May 1
**These ESP forecasts do not include observed and are not total runoff.

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

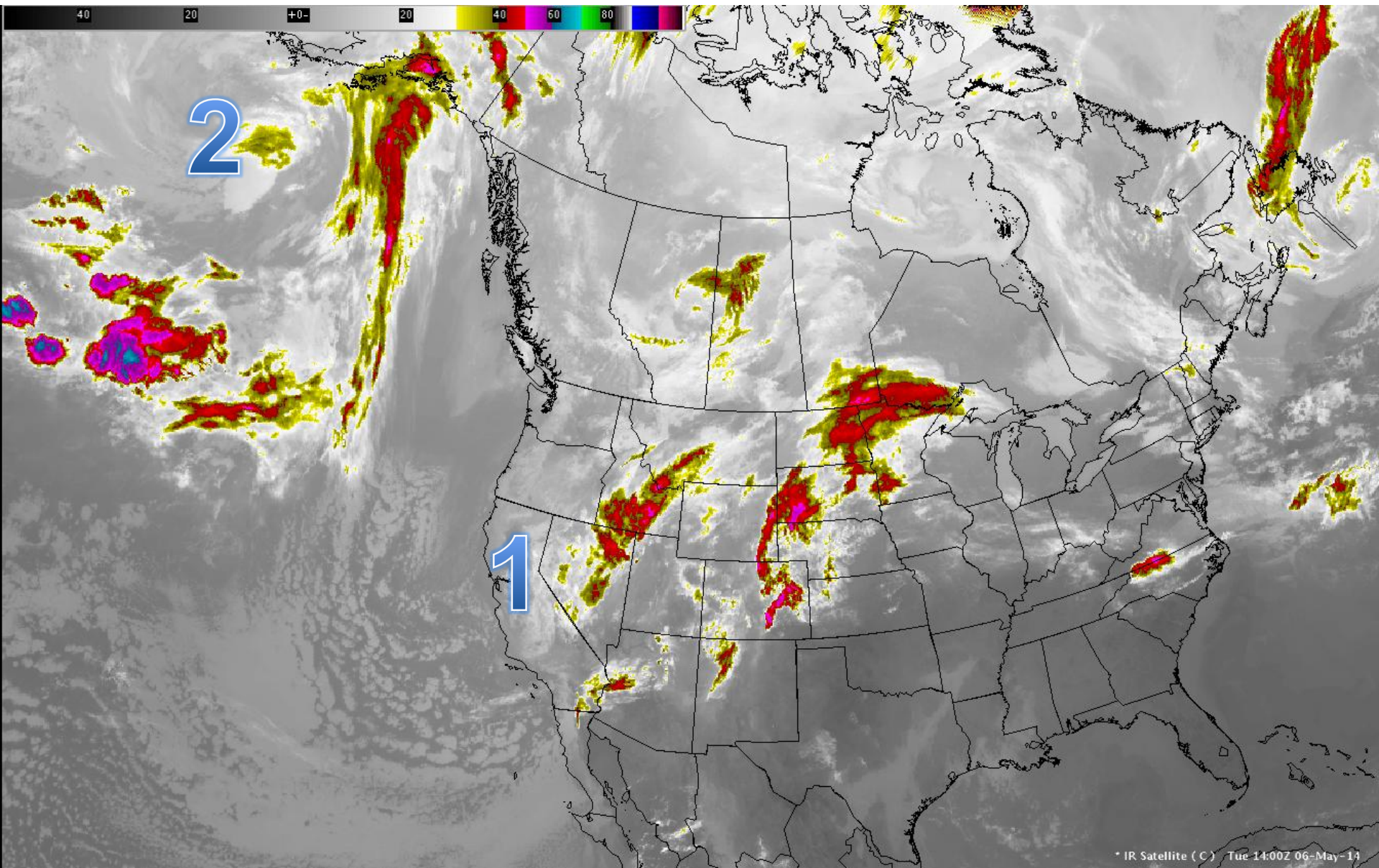
Available at: www.cbrfc.noaa.gov Select: Water Supply Click: Point of Interest

Weber - Oakley- Nr (OAWU1) Apr-Jul 2014 Runoff Forecast (No Precip Forecast Included)
2014-05-01 Official 50% Forecast: 92 kaf (78% of average)



Plot Created 2014-05-05 15:18:41, Lastest ESP Run from 2014-05-05, NOAA / NWS / CBRFC
The latest (2014-05-05) 50% ESP forecast (94 kaf) changed -0.4 % from previous day and -1.3 % from May 1
**These ESP forecasts do not include observed and are not total runoff.

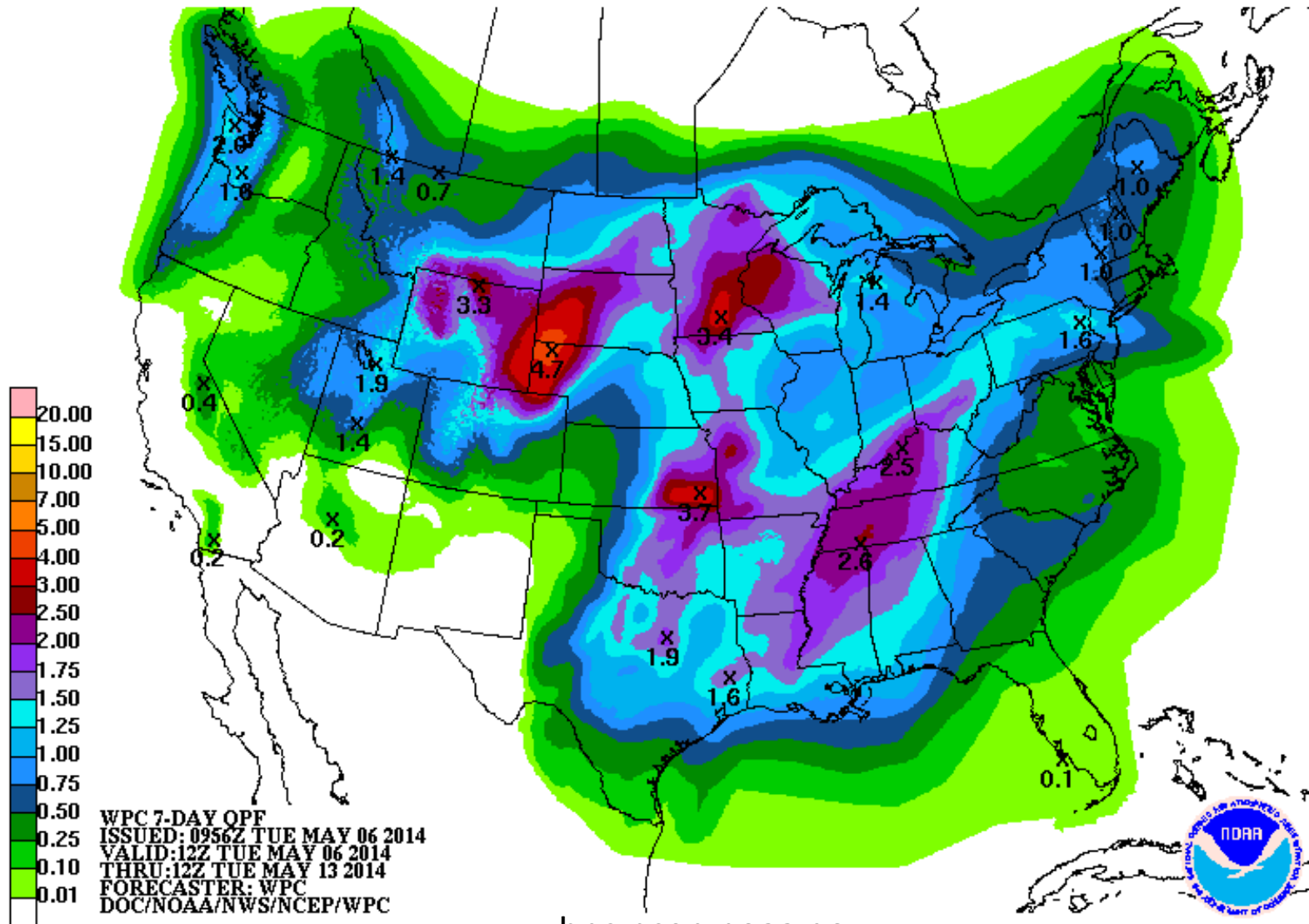
- Upcoming Weather: 1 – Storm system moving through Tue-Thu of this week
2 – Storm system possible Sun-Mon (models disagree)



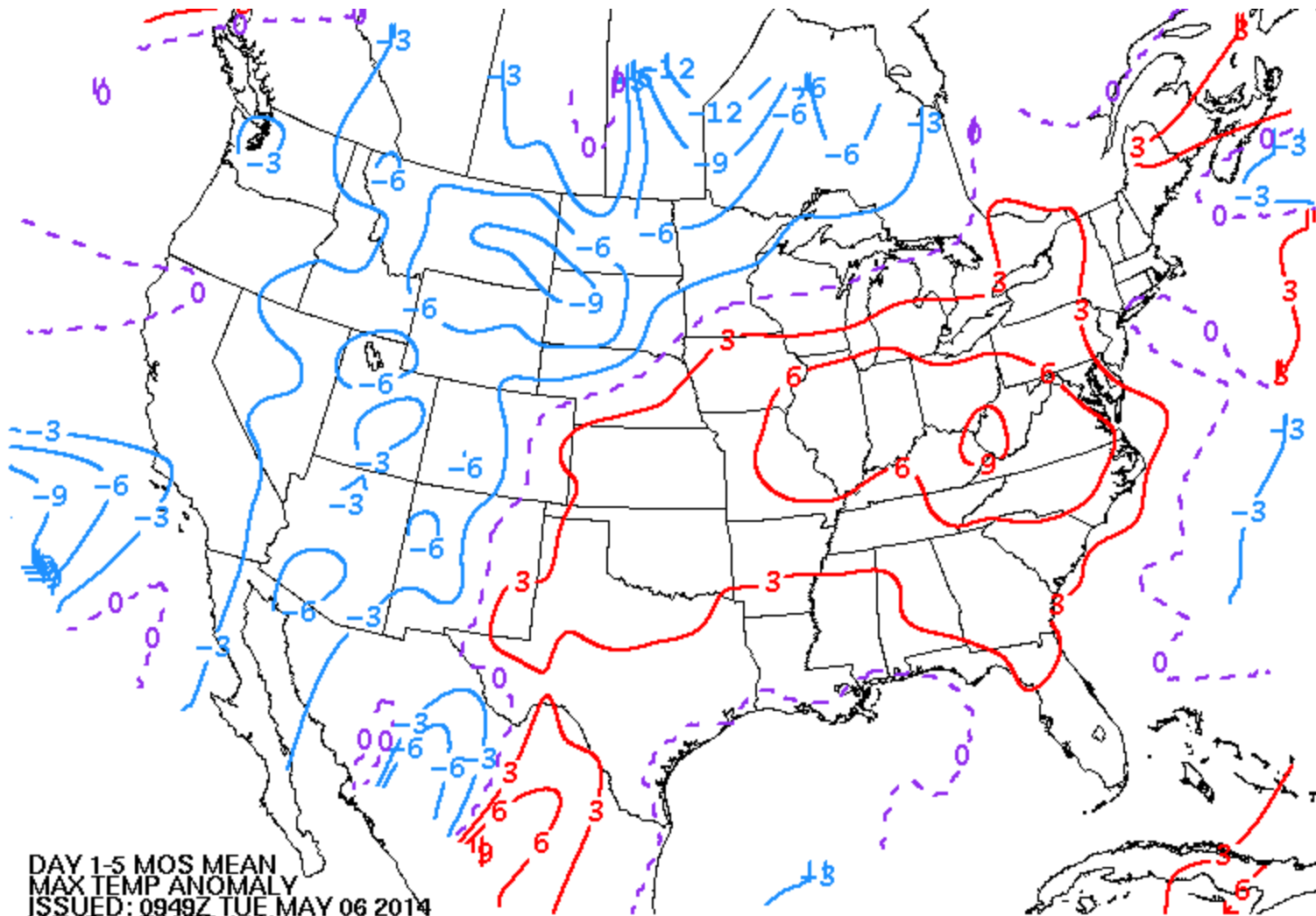
Quantitative Precipitation Forecast

Weather Prediction Center

May 6 - 13

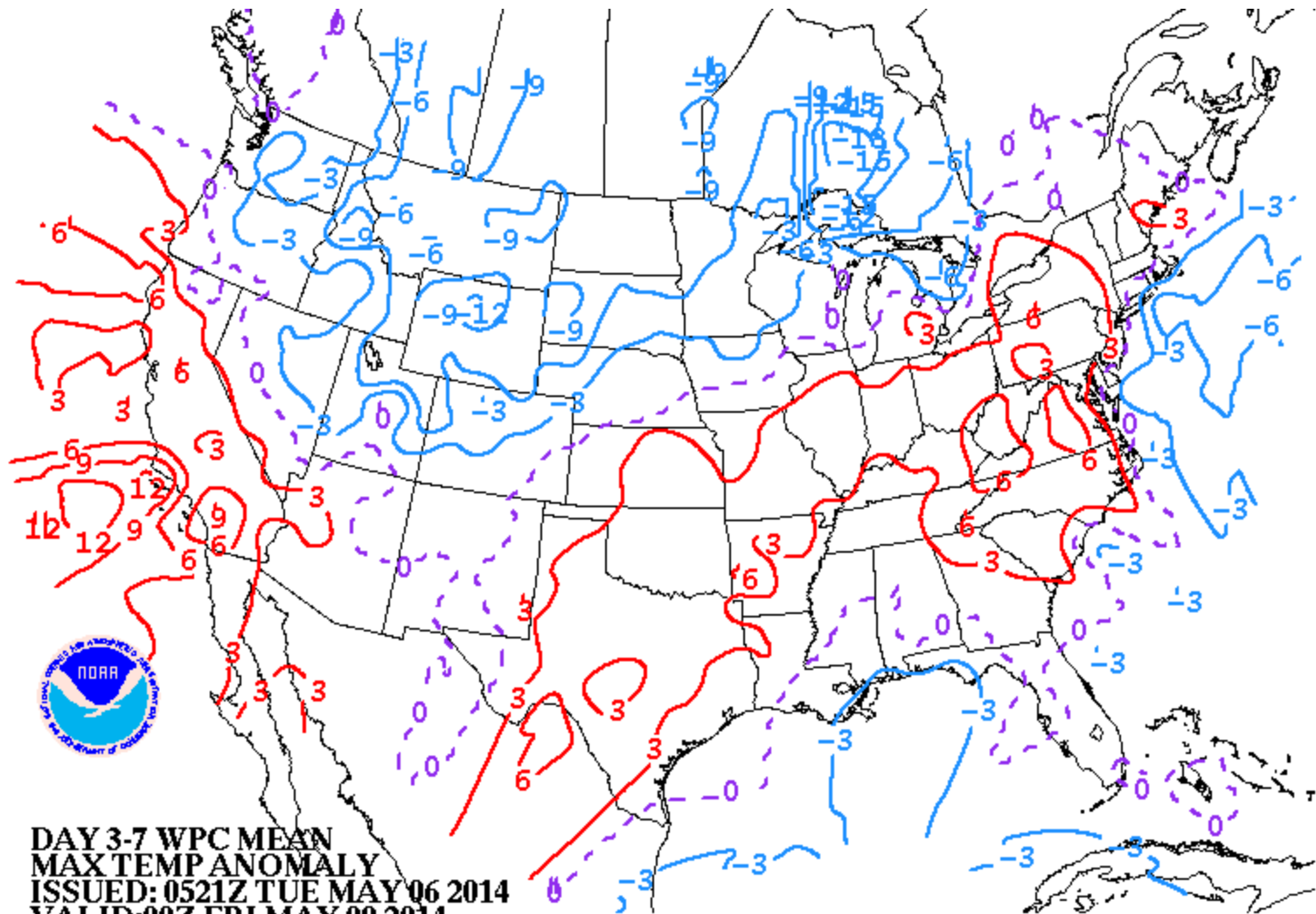


Maximum Temperature Anomaly: May 7 - 12



DAY 1-5 MOS MEAN
MAX TEMP ANOMALY
ISSUED: 0949Z TUE MAY 06 2014
VALID:00Z WED MAY 07 2014
THRU:00Z MON MAY 12 2014
DOC/NOAA/NWS/NCEP/WPC

Maximum Temperature Anomaly: May 9 - 14

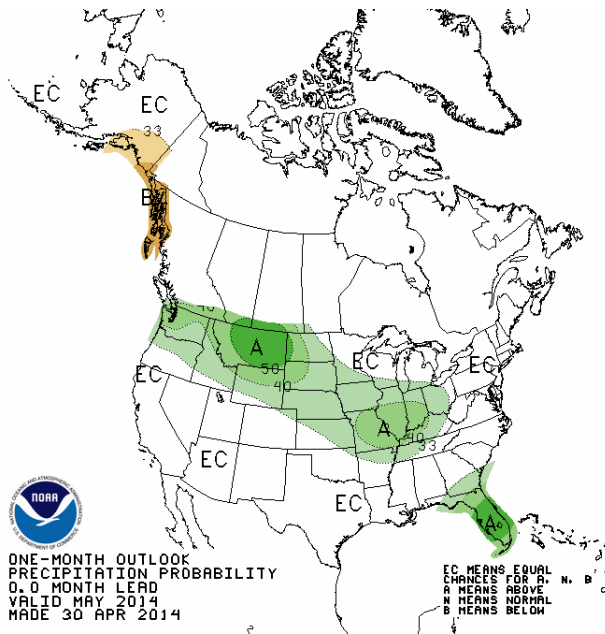


**DAY 3-7 WPC MEAN
MAX TEMP ANOMALY
ISSUED: 0521Z TUE MAY 06 2014
VALID: 00Z FRI MAY 09 2014
THRU: 00Z WED MAY 14 2014
DOC/NOAA/NWS/NCEP/WPC**

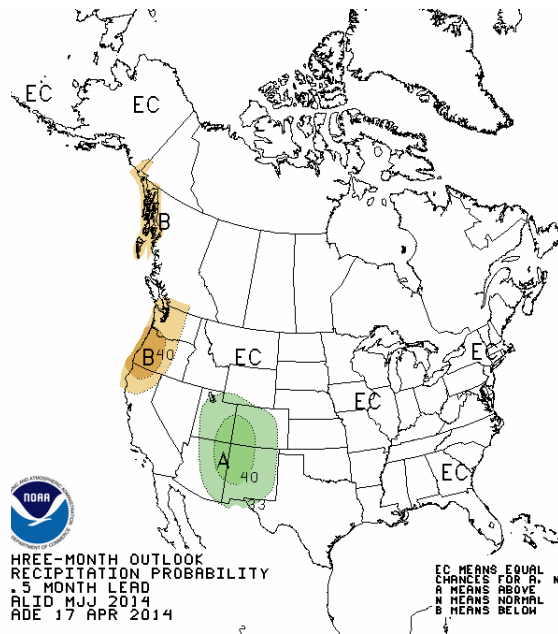
Long Term Precipitation Outlook

Climate Prediction Center

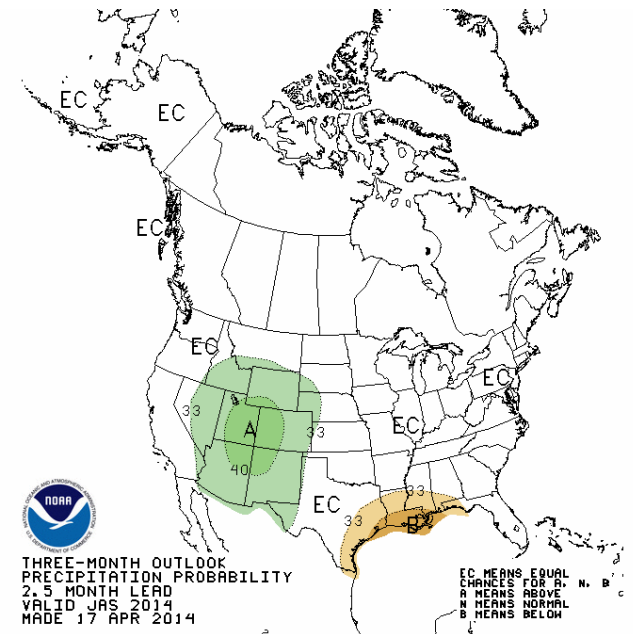
May 2014



May-July 2014



July-September 2014



Summary

- **Soil Moisture Impacts**

- Positive in much of the Upper Colorado / Negative Great Basin
- May be seeing this affect in the April observed streamflow
- Dry conditions & Lack of snow now primary influence in the San Juan/Virgin

- **Snow**

- Near to much above average parts of Green Basin (Wyoming), Yampa, Colorado-abv Cameo, Gunnison above Blue Mesa, parts of Bear River Basin.
- Melting out at lower elevations

- **Forecasts**

- Much Above average Yampa, Colorado abv Cameo, Gunnison abv Blue Mesa
- Below to much below average San Juan, Sevier, Virgin and Great Basin

- **Weather:**

- Active pattern, possibly into mid-month.
- Increased chances for above average precipitation late summer
- El Nino increasingly likely, possibly by late spring or summer

2014 Forecast Webinar Schedule

June 5 at 1pm MDT

Peak Flows

Spring peak flow forecasts updated by tomorrow

Pay attention to daily forecasts (rapidly change)

Best to communicate directly

We are available to participate in any calls

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)