

CBRFC  
June 2014  
Water Supply Webinar

June 5, 2014

Paul Miller

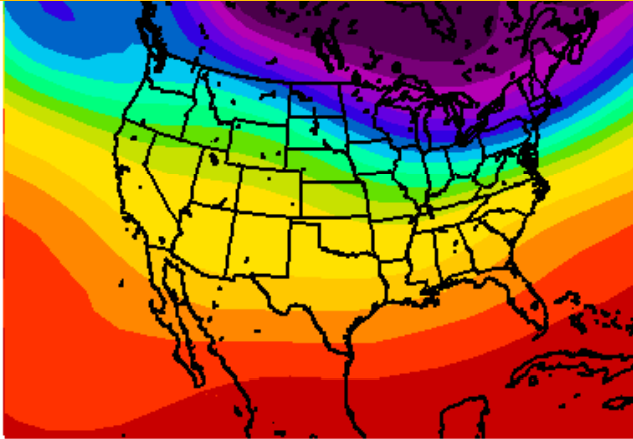
These slides: [www.cbrfc.noaa.gov/present/present.php](http://www.cbrfc.noaa.gov/present/present.php)

# June Water Supply Webinar

- May Weather & Streamflow
- Snow Situation
- Water supply forecasts
- Upcoming weather and climate

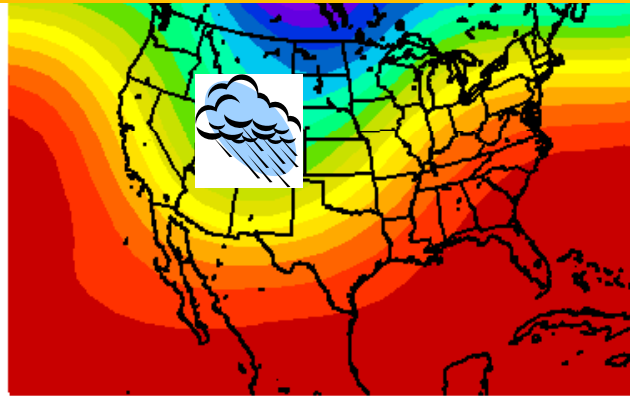
# May 2014 Upper Air Pattern

**WEEK-1: Calm weather and near average temps**



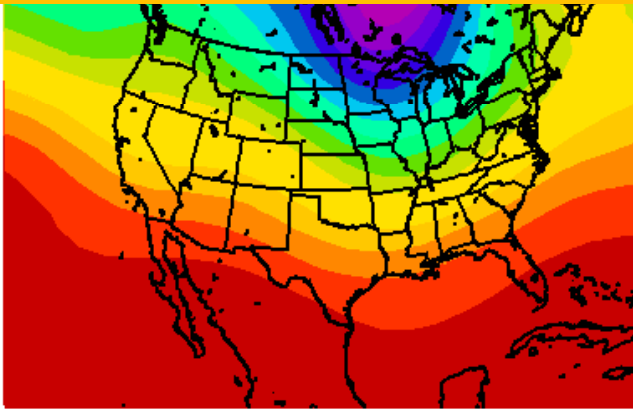
500mb Geopotential Height (m) Composite Mean  
5/1/14 to 5/7/14  
NCEP/NCAR Reanalysis

**WEEK-2: Colder weather and storm activity, particularly in GB and UC regions**



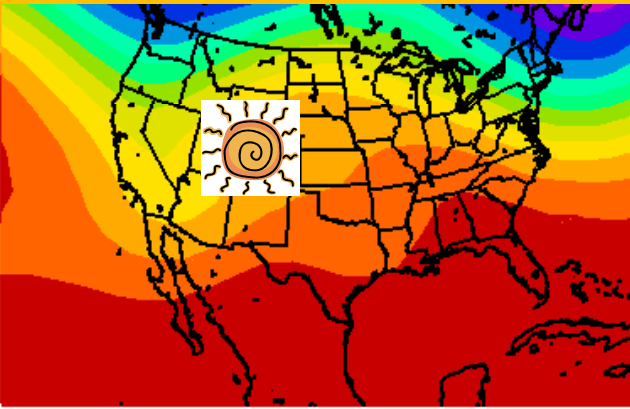
500mb Geopotential Height (m) Composite Mean  
5/7/14 to 5/14/14  
NCEP/NCAR Reanalysis

**WEEK-3: Warming temps in the north and less storm activity**



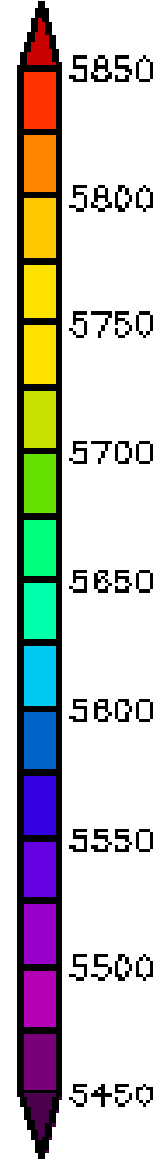
500mb Geopotential Height (m) Composite Mean  
5/14/14 to 5/21/14  
NCEP/NCAR Reanalysis

**WEEK-4: Well-above average temps drove increases to streamflow rates**



500mb Geopotential Height (m) Composite Mean  
5/21/14 to 5/31/14  
NCEP/NCAR Reanalysis

Inconsistent geopotential heights across latitudes can mean:



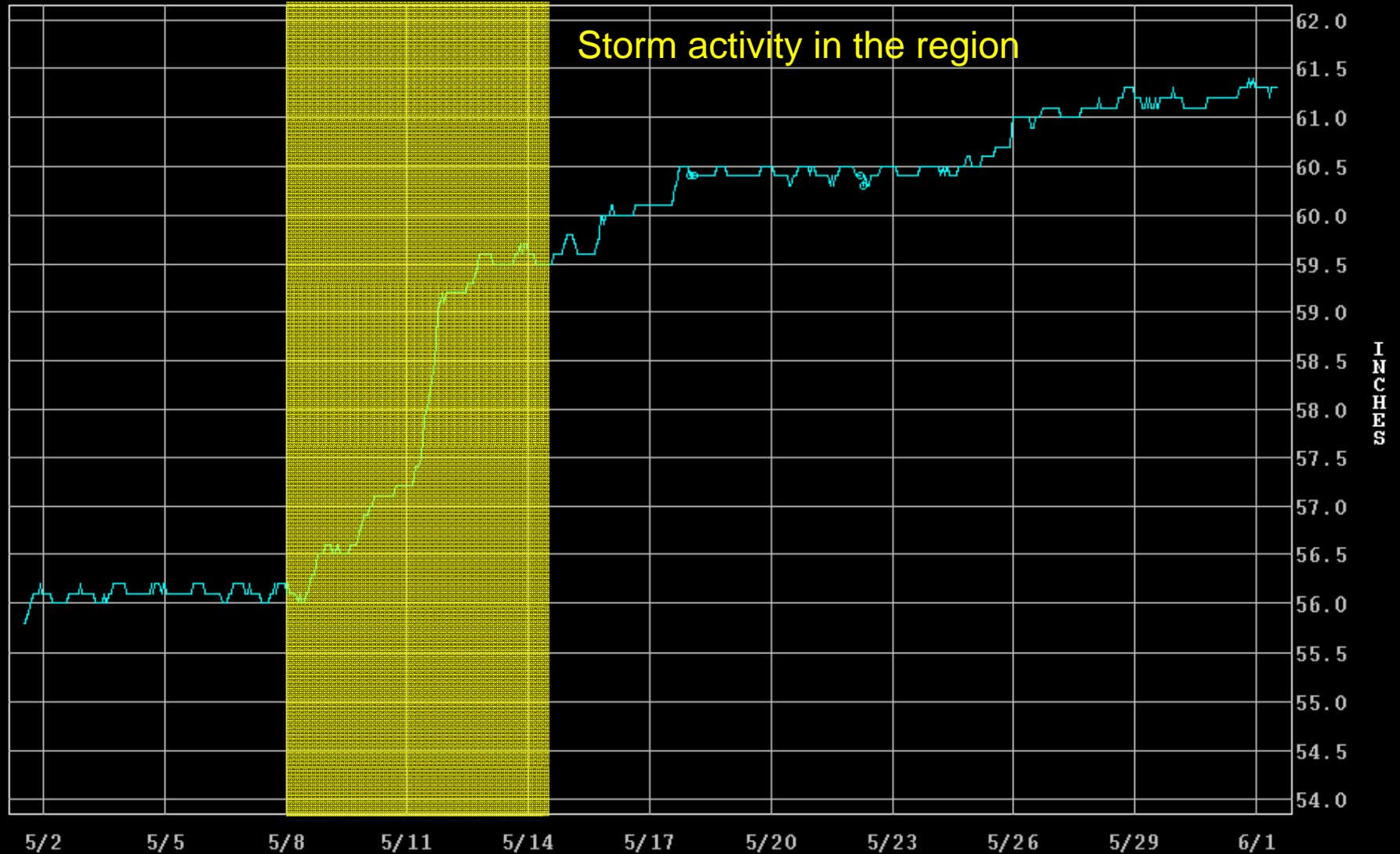
Generally warmer and less stormy

Generally cooler and more stormy

Plots available via:  
<http://www.esrl.noaa.gov/psd/data/composites/day/>

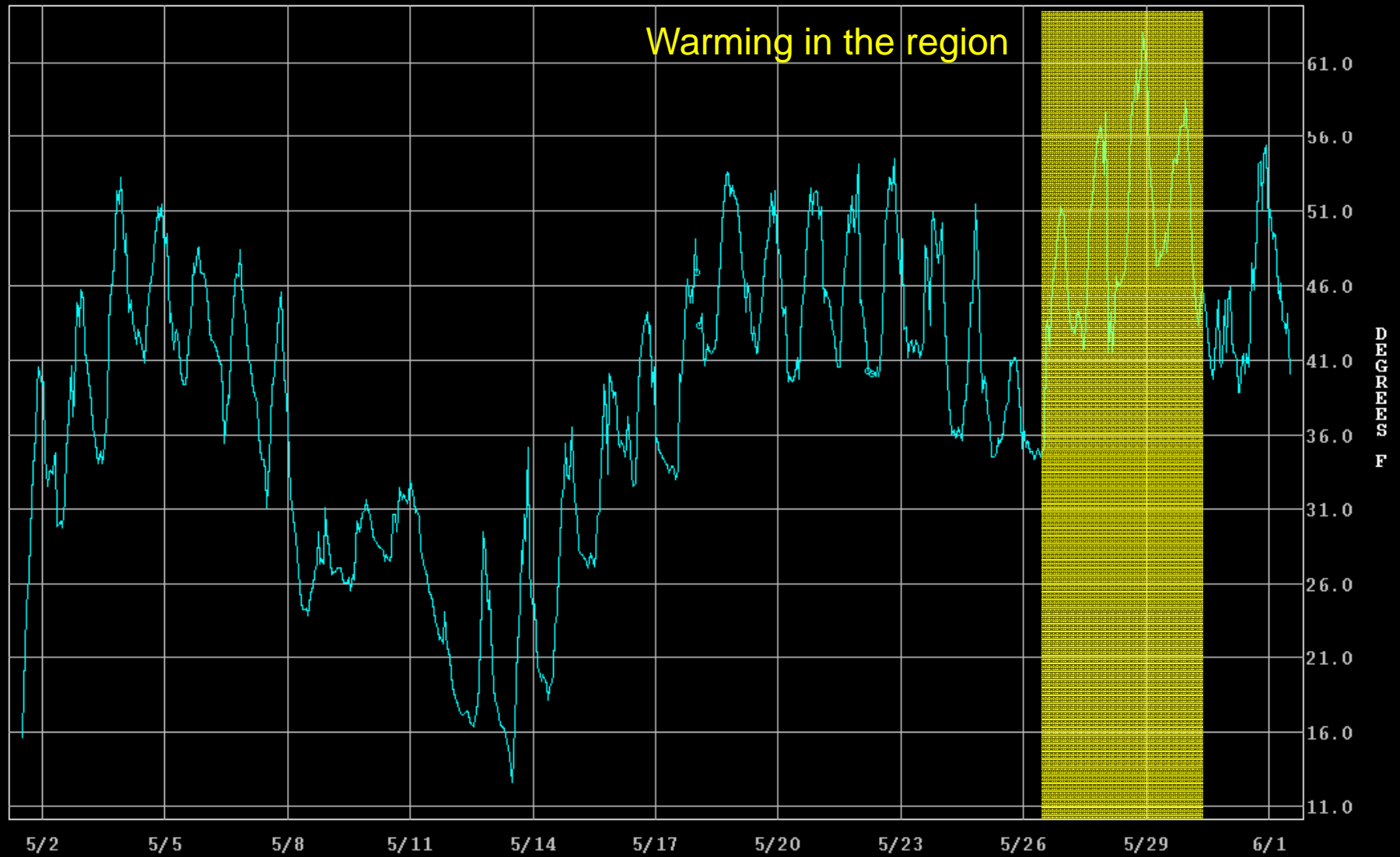
# Tower SNOTEL – May Accumulated Precipitation

TOWER  
TOWC2 PCIRMZZ PRECIPITATION ACCUMULATION, INSTANTANEOUS, OBSERVED, METEOR  
Max= 61.4 at 05/31/2014 22Z  
Min= 55.8 at 05/01/2014 13Z



# Tower SNOTEL – May Temperature

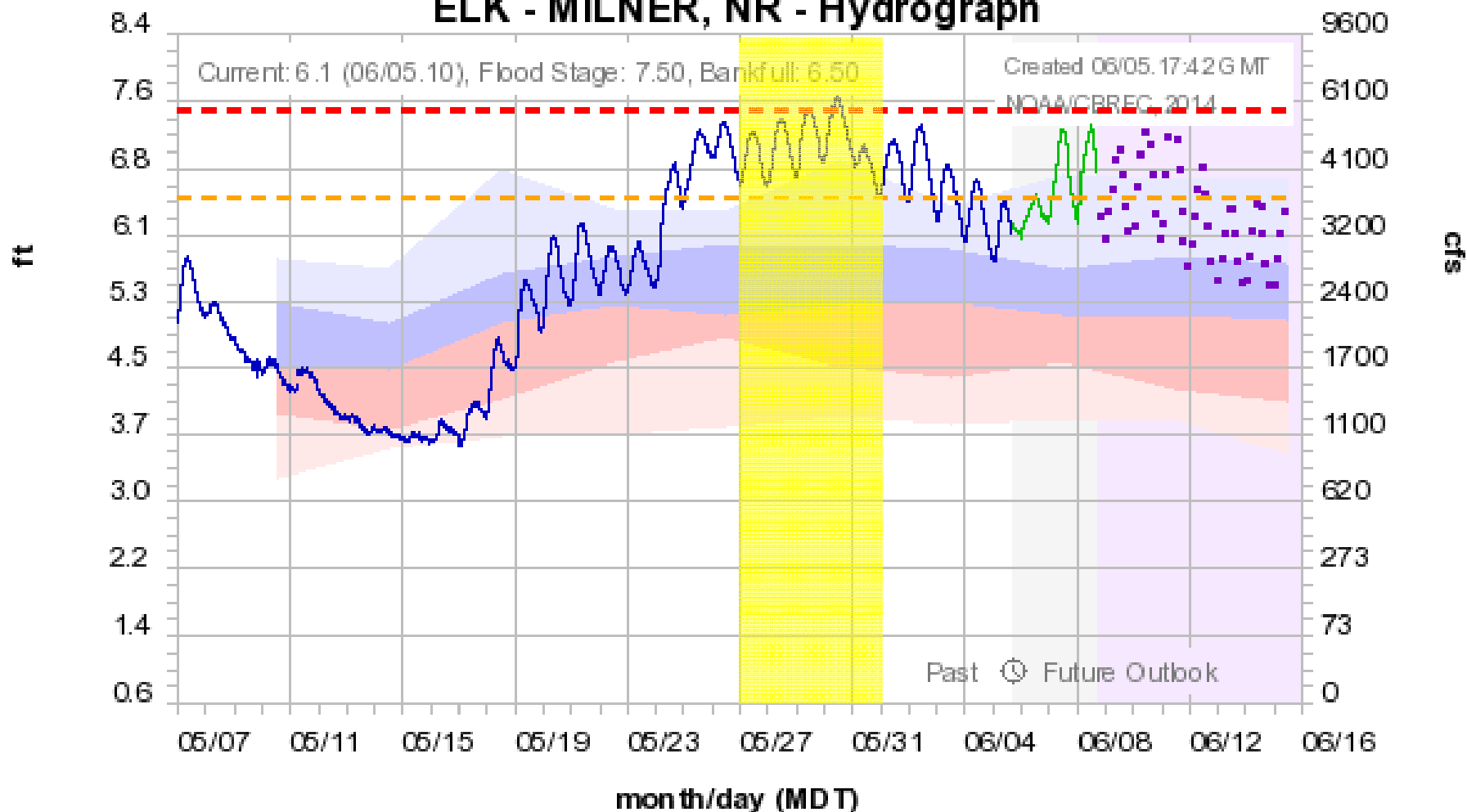
TOWER  
TOWC2 TAIRMZZ AIR TEMPERATURE, INSTANTANEOUS, OBSERVED, METEOR  
Max= 63.1 at 05/28/2014 22Z  
Min= 12.6 at 05/13/2014 12Z



# May Streamflow

Colorado Basin River Forecast Center

## ELK - MILNER, NR - Hydrograph



Observed — Forecast (06/05.14:00) — Outlook (increasing uncertainty) — Bankfull 6.50 — Flood 7.50 —

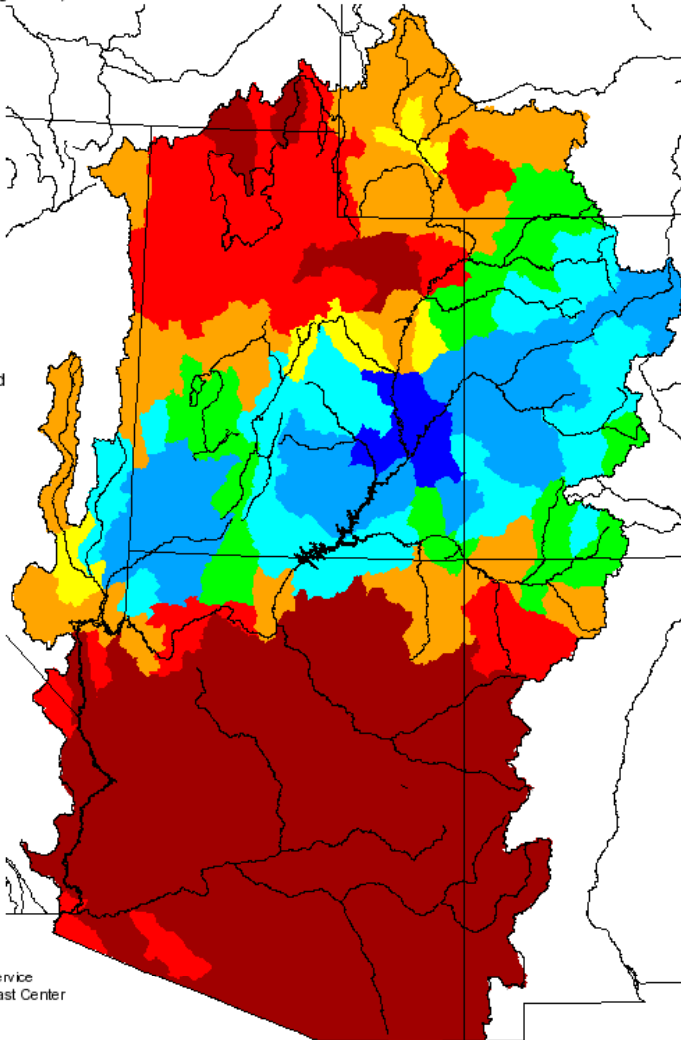
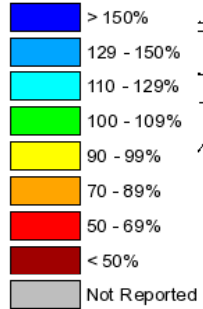
Historical Exceedance Probability (USGS): 90-75% 75-50% 50-25% 25-10%

# Precipitation

## Monthly Precipitation for May 2014

(Averaged by Hydrologic Unit)

### % Average

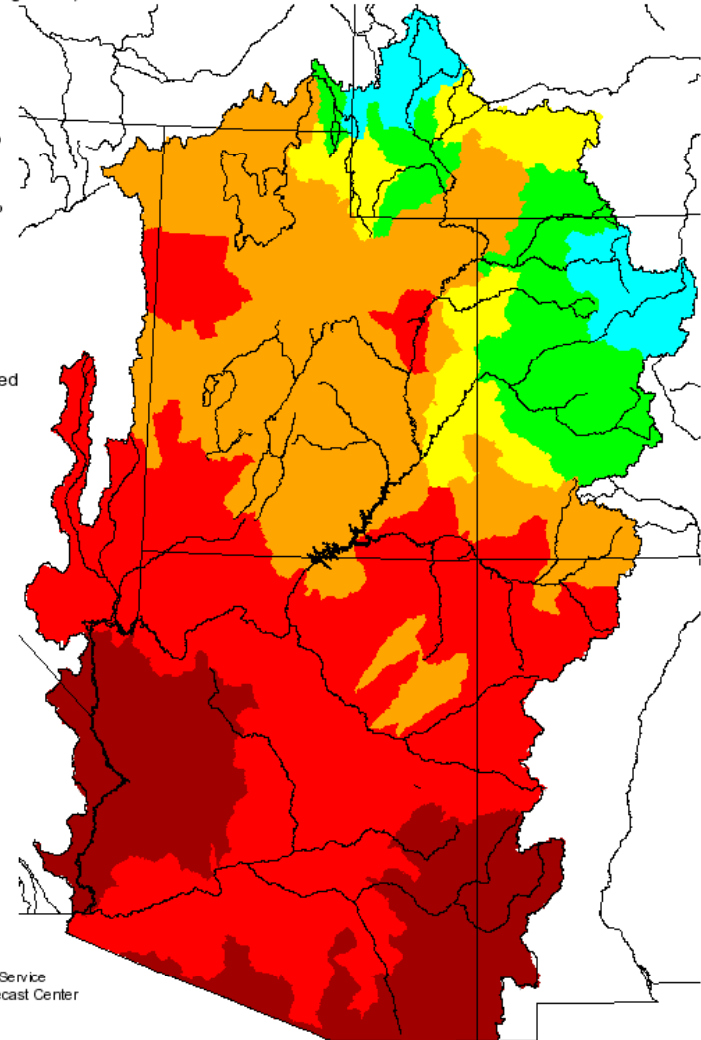
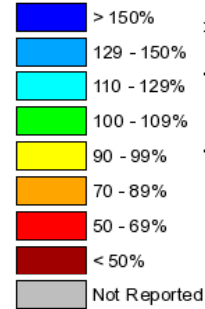


Prepared by  
NOAA, National Weather Service  
Colorado Basin River Forecast Center  
Salt Lake City, Utah  
[www.cbfc.noaa.gov](http://www.cbfc.noaa.gov)

## Seasonal Precipitation, October 2013 - May 2014

(Averaged by Hydrologic Unit)

### % Average



Prepared by  
NOAA, National Weather Service  
Colorado Basin River Forecast Center  
Salt Lake City, Utah  
[www.cbfc.noaa.gov](http://www.cbfc.noaa.gov)

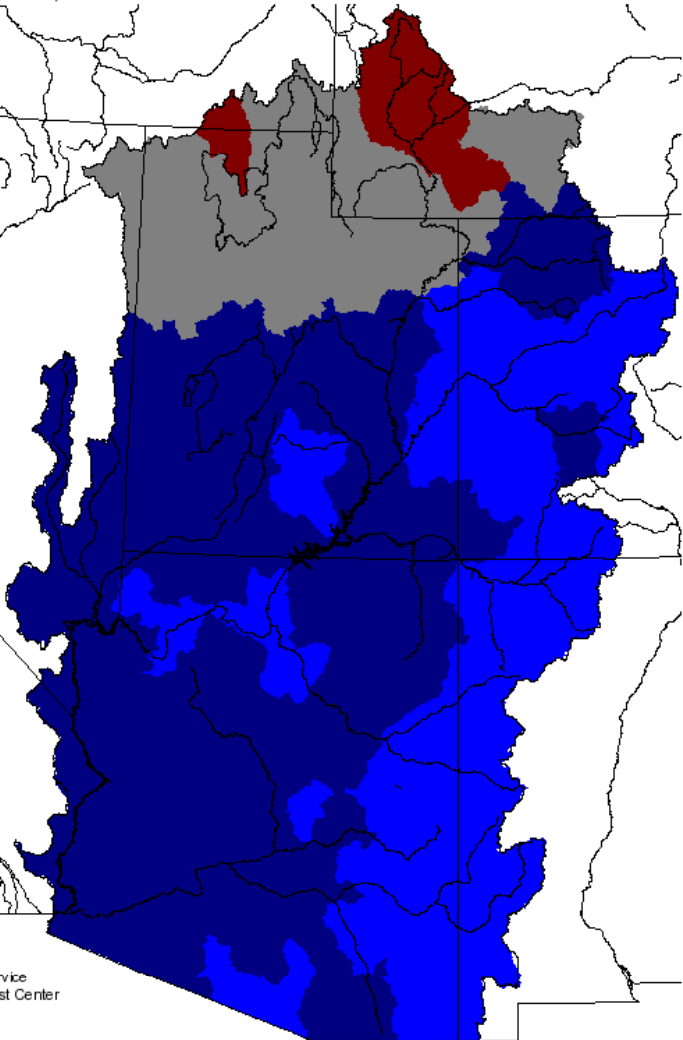
# Temperatures

### Monthly Max Temp Deviation for May 2014

(Averaged by Hydrologic Unit)

#### Degrees (F)

- Above 9
- 7-9 Above
- 5-7 Above
- 3-5 Above
- 1-3 Above
- Normal
- 1-3 Below
- 3-5 Below
- 5-7 Below
- 7-9 Below
- Below 9
- Not Reported



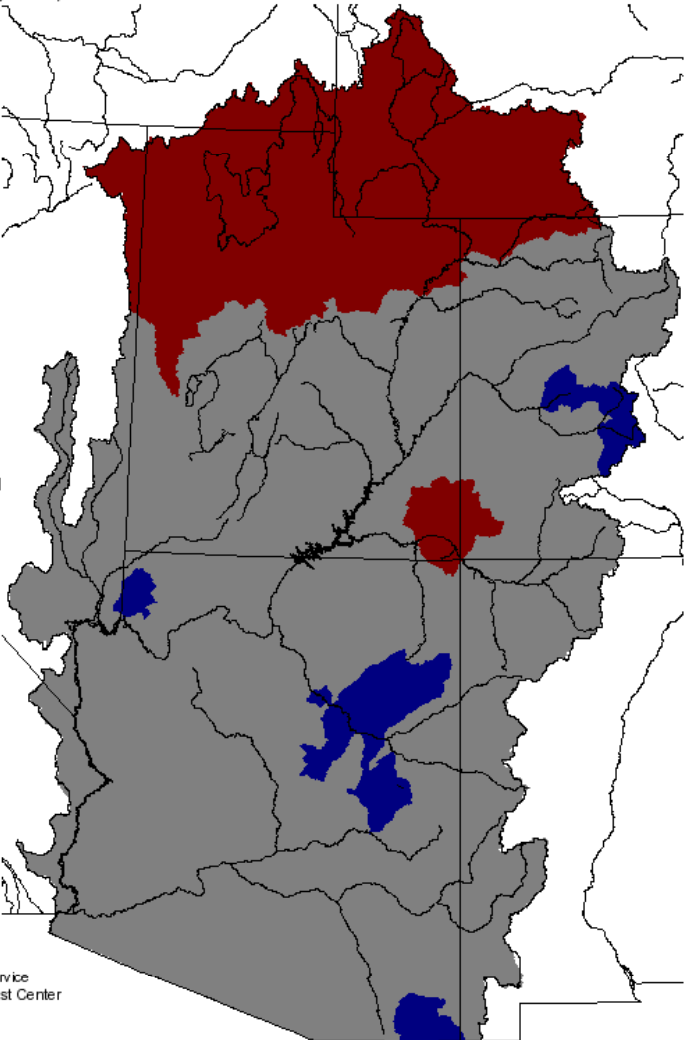
Prepared by  
NOAA, National Weather Service  
Colorado Basin River Forecast Center  
Salt Lake City, Utah  
[www.cbfc.noaa.gov](http://www.cbfc.noaa.gov)

### Monthly Min Temp Deviation for May 2014

(Averaged by Hydrologic Unit)

#### Degrees (F)

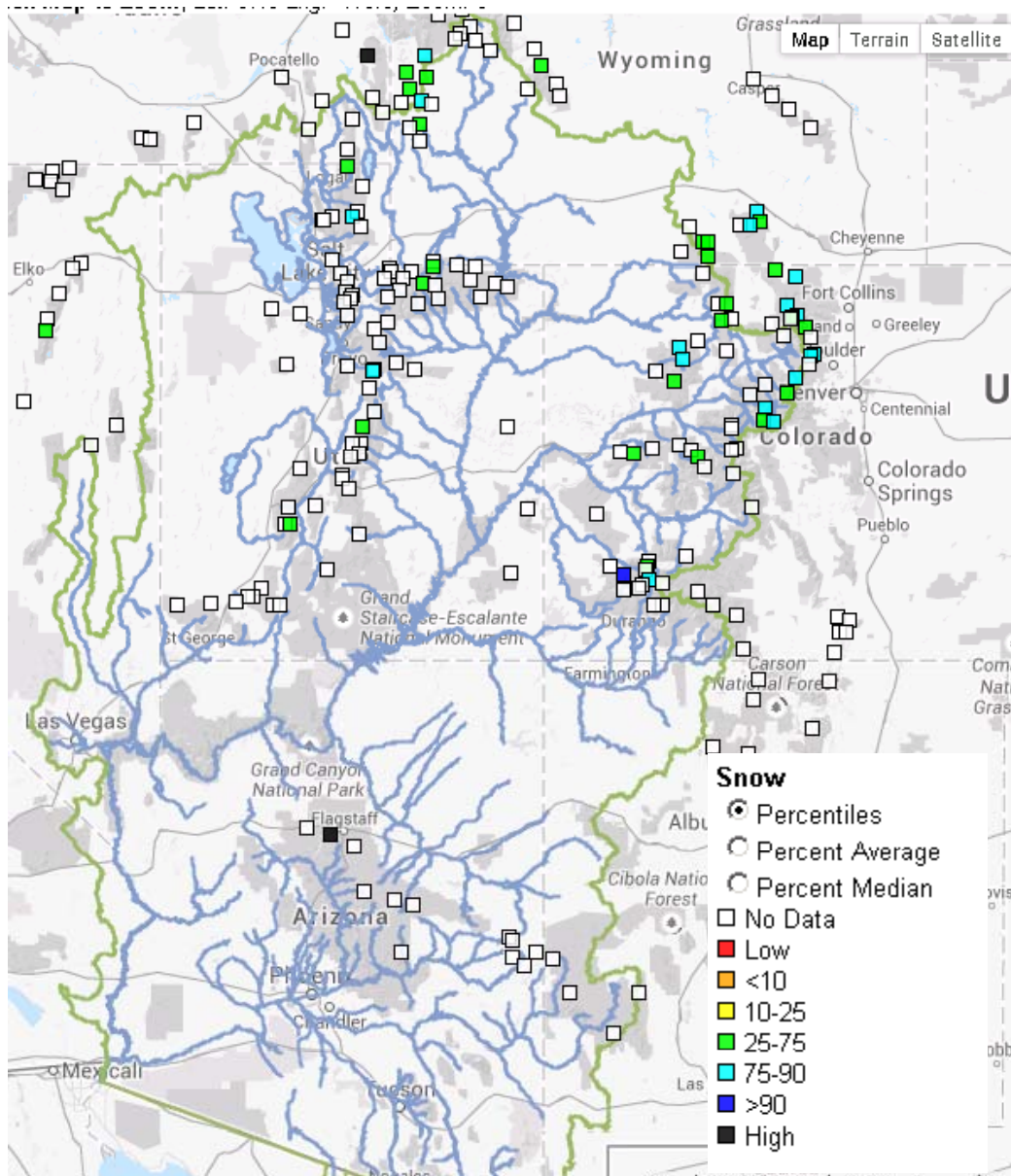
- Above 9
- 7-9 Above
- 5-7 Above
- 3-5 Above
- 1-3 Above
- Normal
- 1-3 Below
- 3-5 Below
- 5-7 Below
- 7-9 Below
- Below 9
- Not Reported



Prepared by  
NOAA, National Weather Service  
Colorado Basin River Forecast Center  
Salt Lake City, Utah  
[www.cbfc.noaa.gov](http://www.cbfc.noaa.gov)



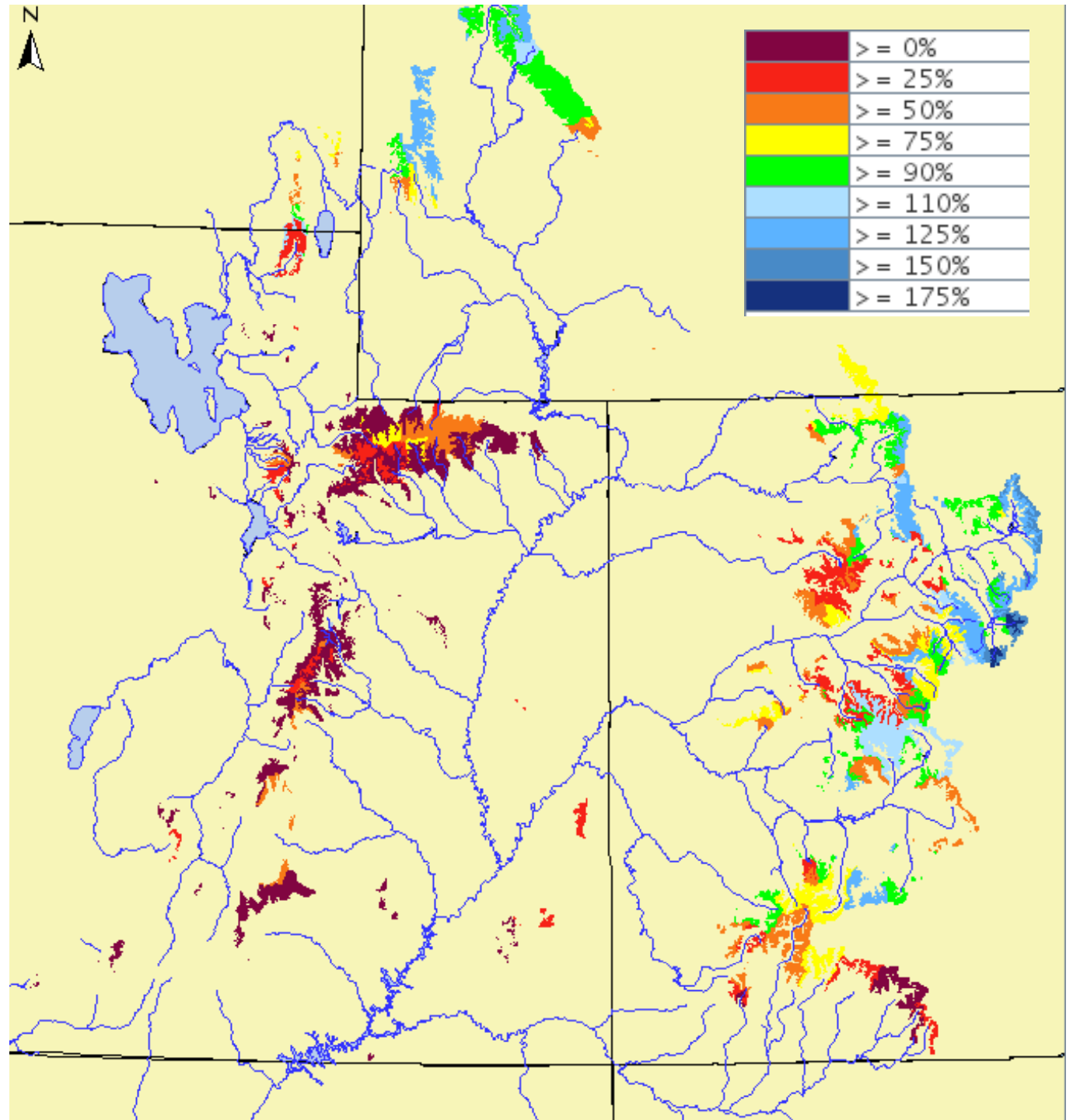
# June 3<sup>rd</sup> Snow



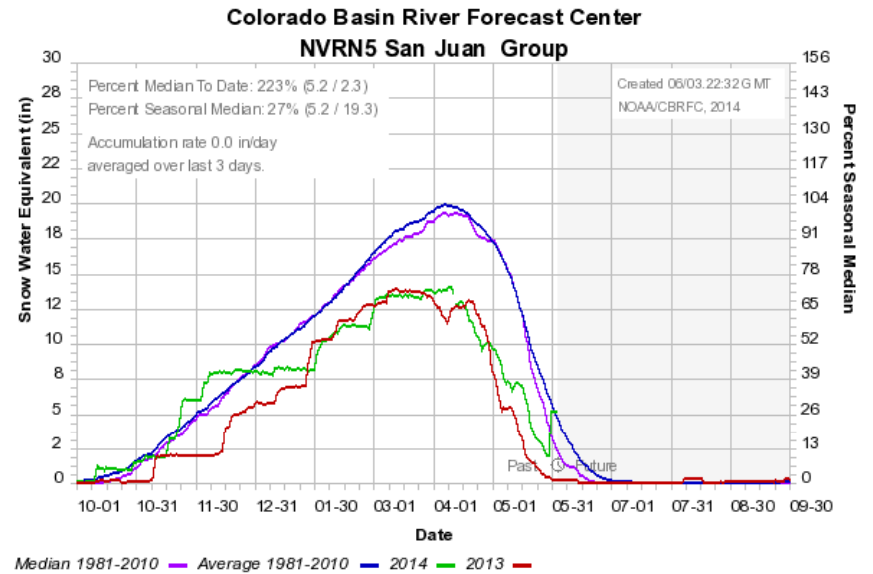
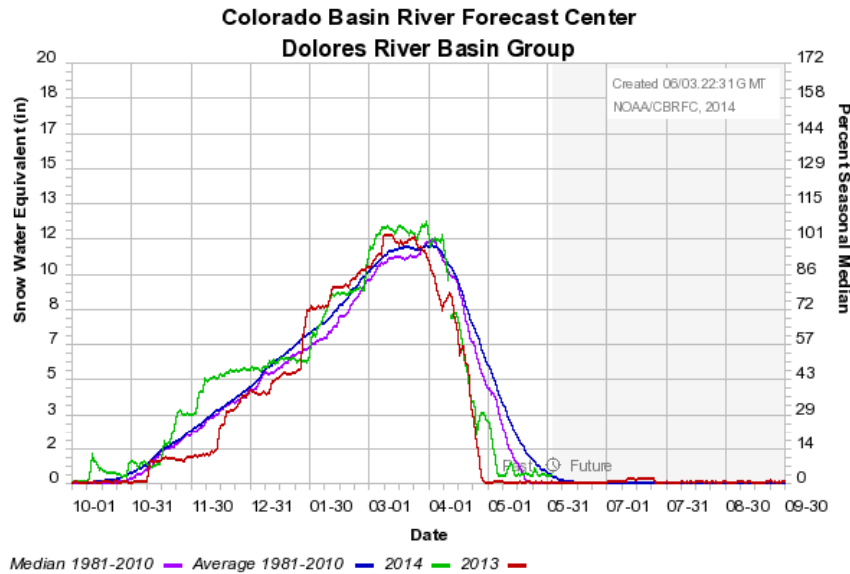
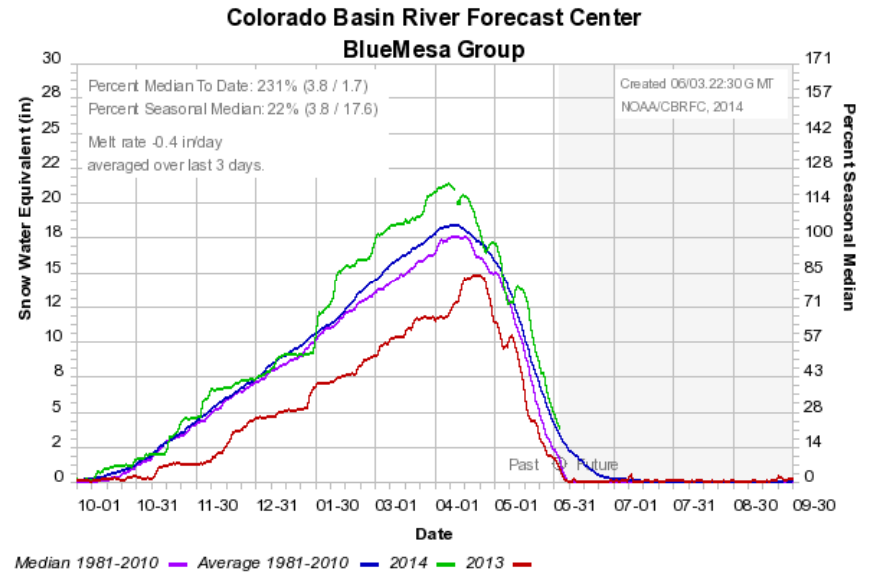
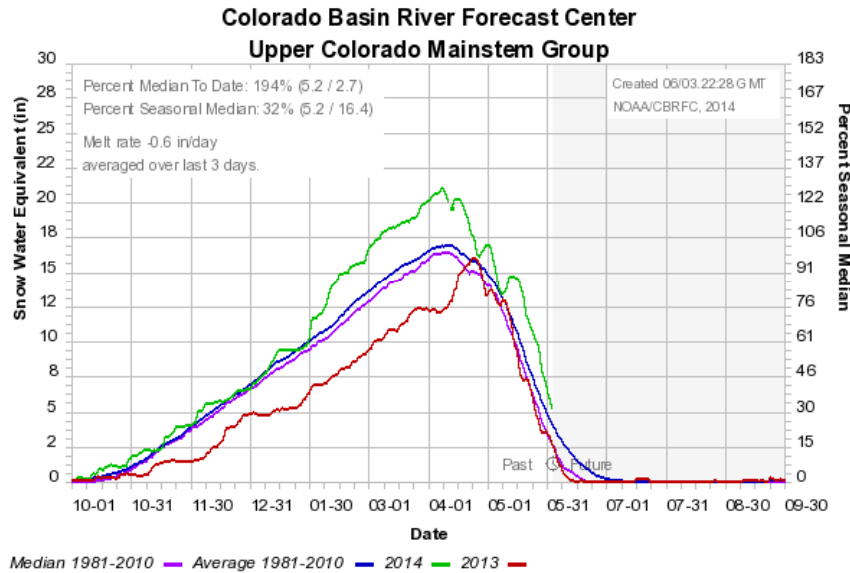
- Snow still prevalent in the Upper Colorado Headwater and Green River Basins
- Not much snow left in Eastern Great Basin or San Juan regions.

# Snow in the CBRFC Hydrologic Model

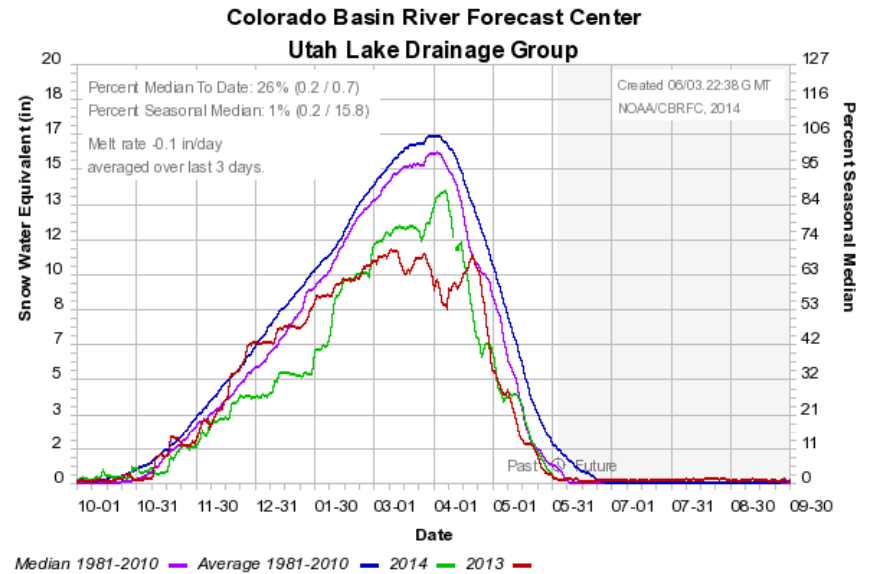
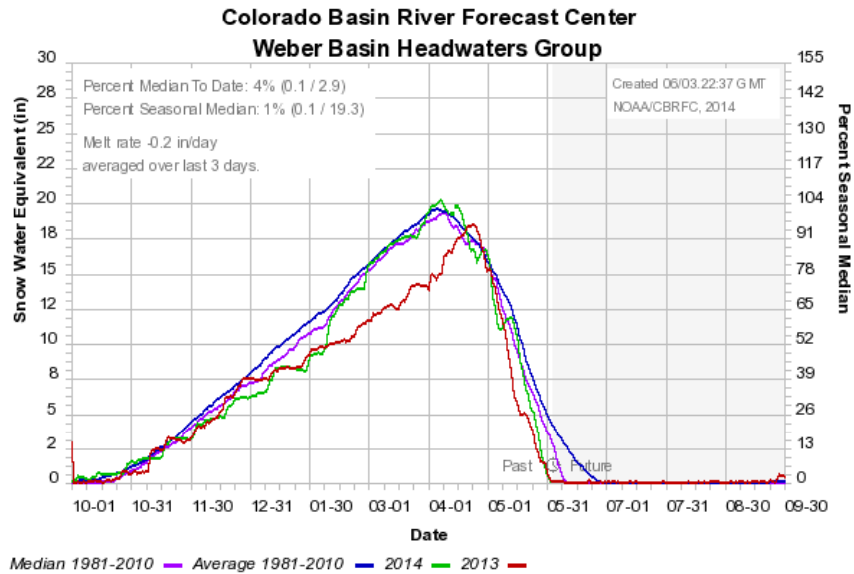
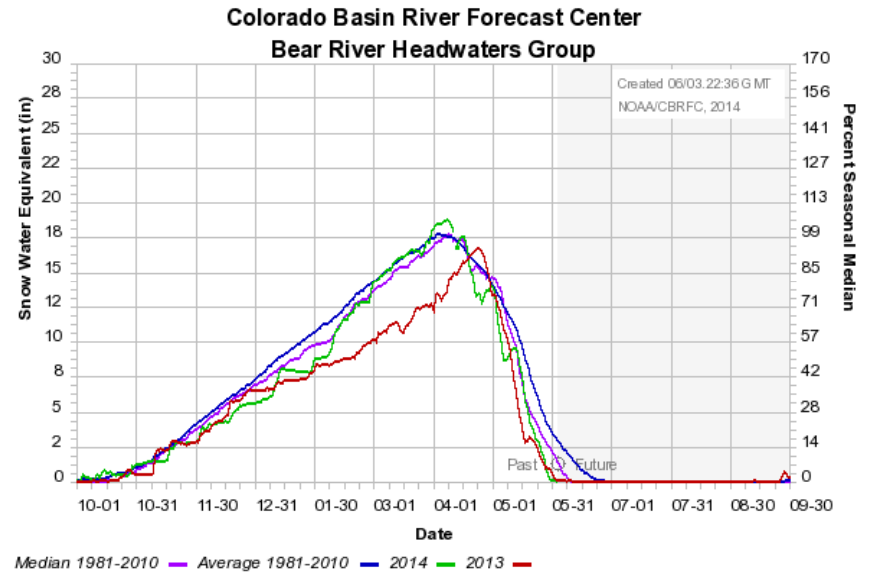
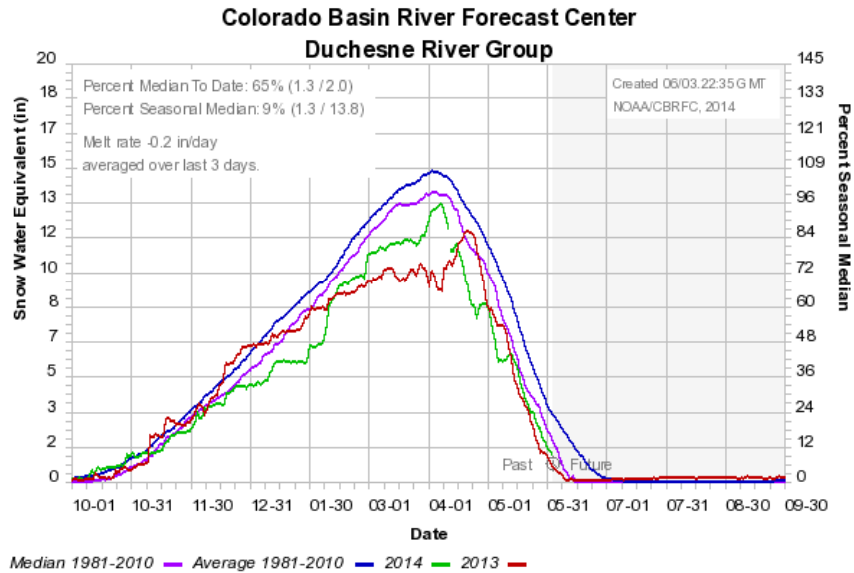
SWE as a percent of  
the model average



# Basin Snow Groups:

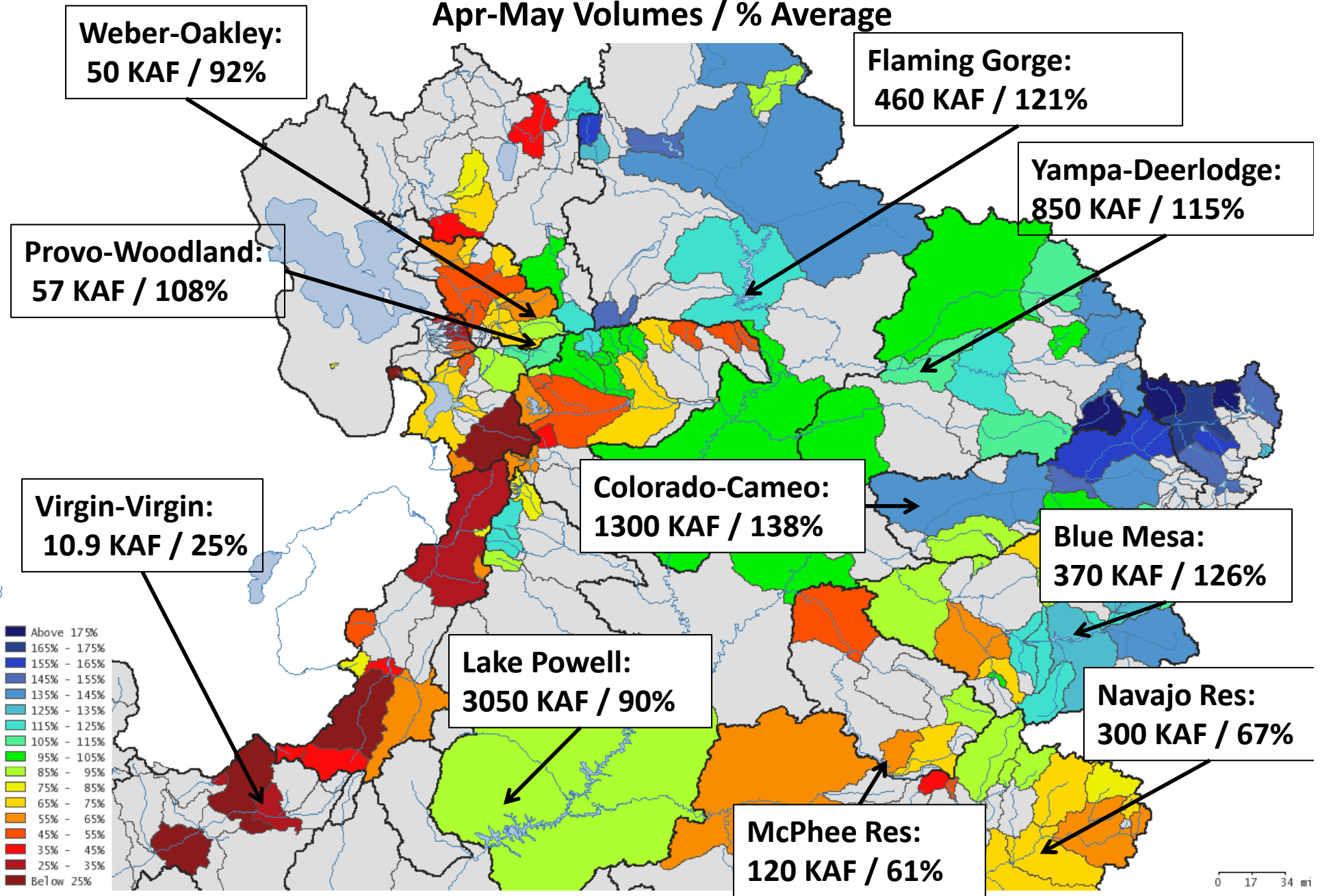


# Basin Snow Groups:



# April – May Observations

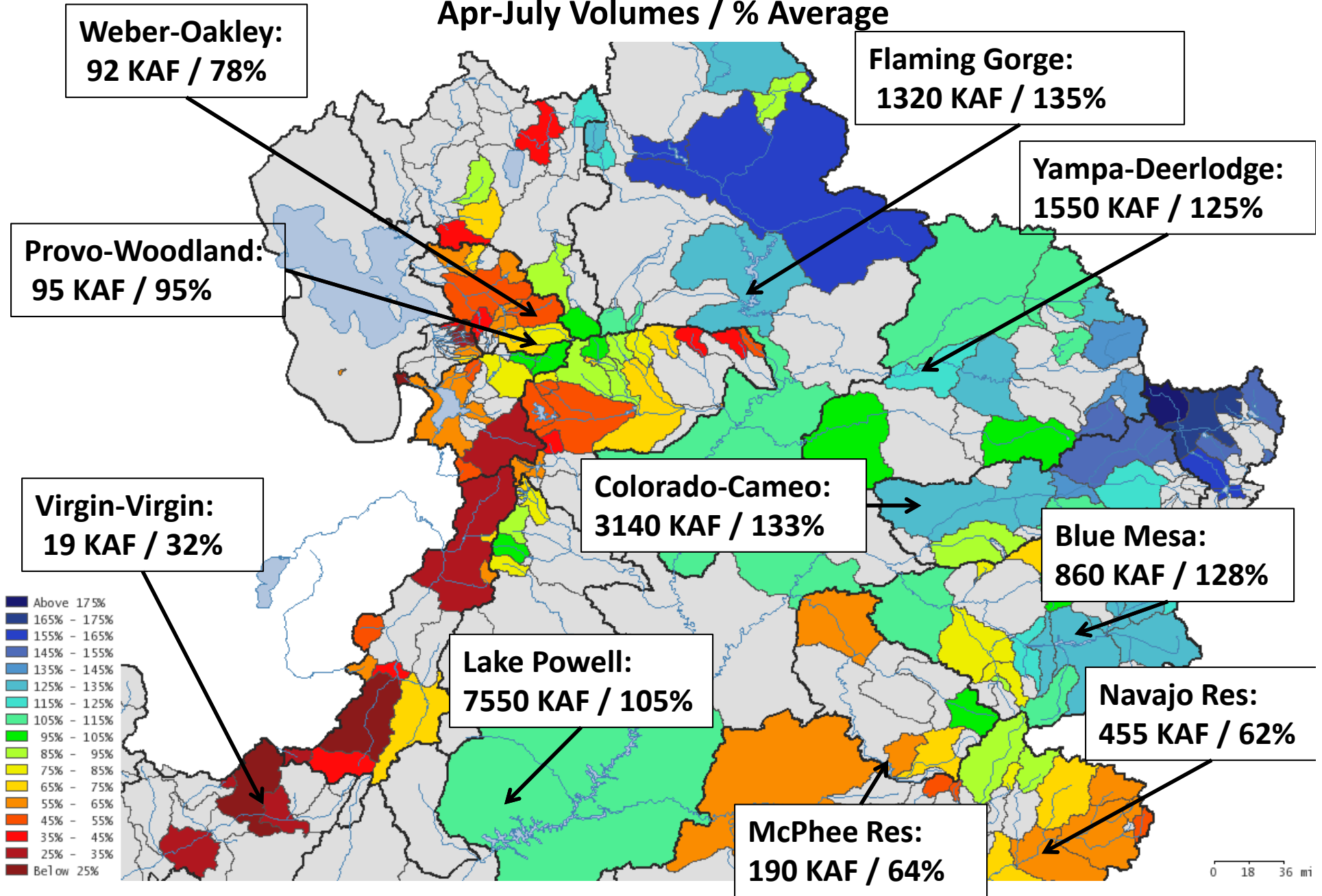
Apr-May Volumes / % Average





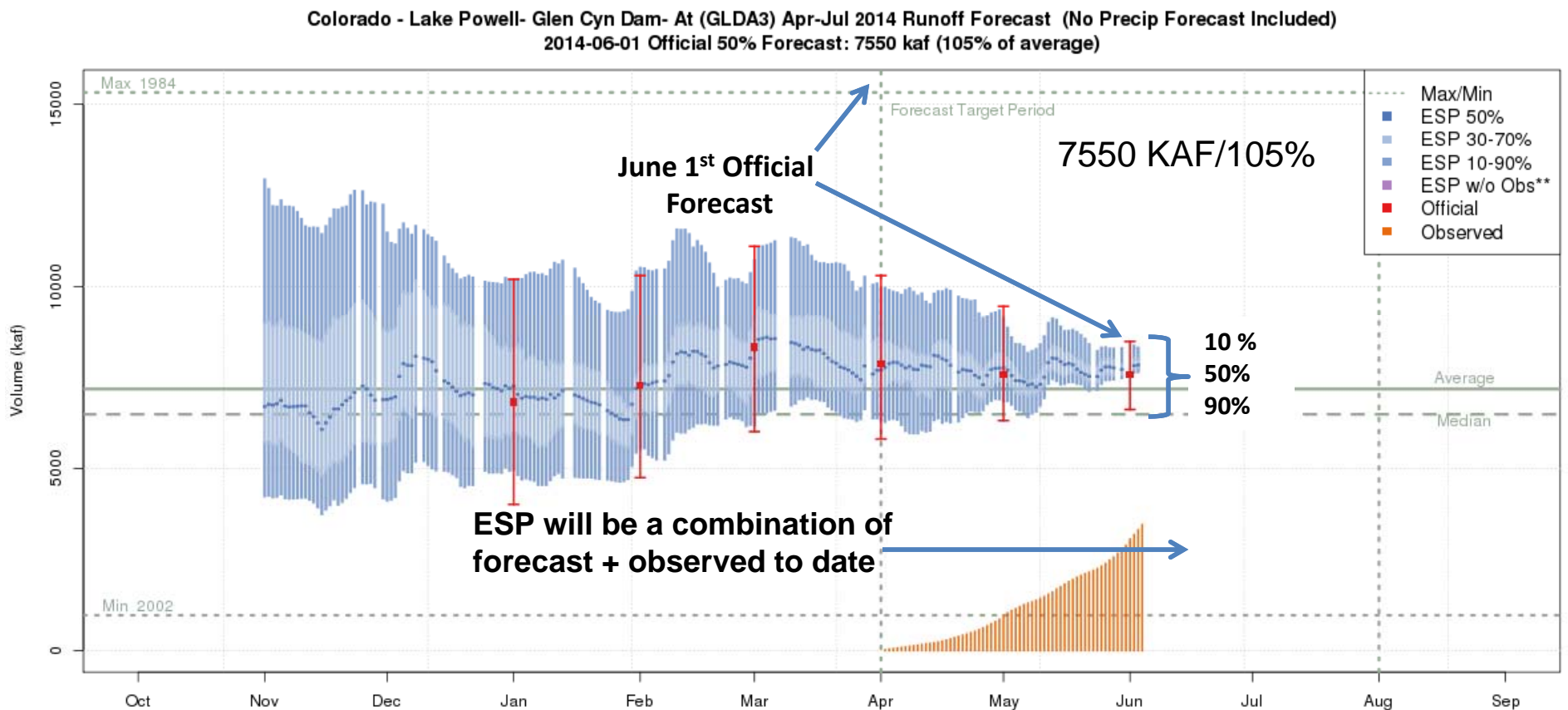
# April – July Forecasts

Apr-July Volumes / % Average



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

Available at: [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov) Select: Water Supply Click: Point of Interest

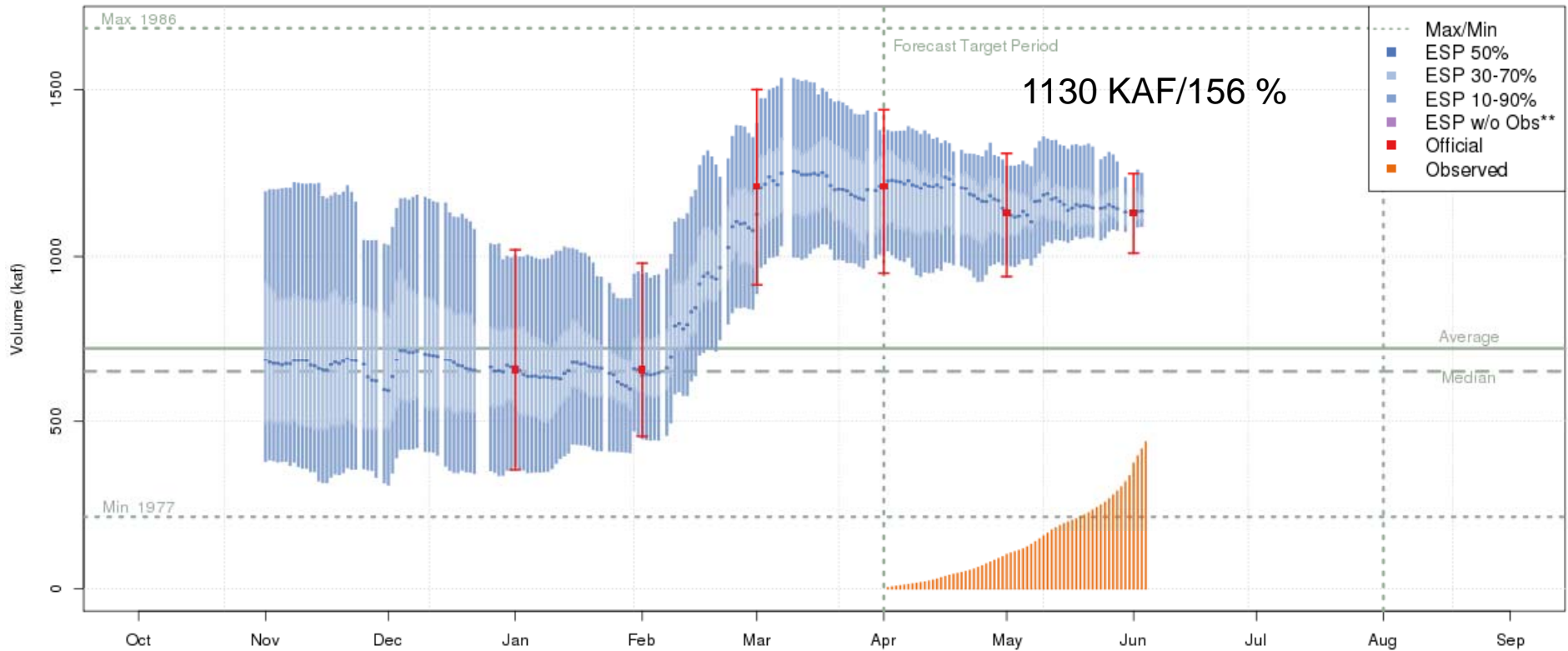


Plot Created 2014-06-04 14:55:11, Latest ESP Run from 2014-06-03, NOAA / NWS / CBRFC  
The latest (2014-06-03) 50% ESP forecast (7812 kaf) changed 0.2% from previous day and 1.6% from June 1  
\*\*These ESP forecasts do not include observed and are not total runoff.

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

Available at: [www.cbrfc.noaa.gov](http://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)  
2014-06-01 Official 50% Forecast: 1130 kaf (156% of average)



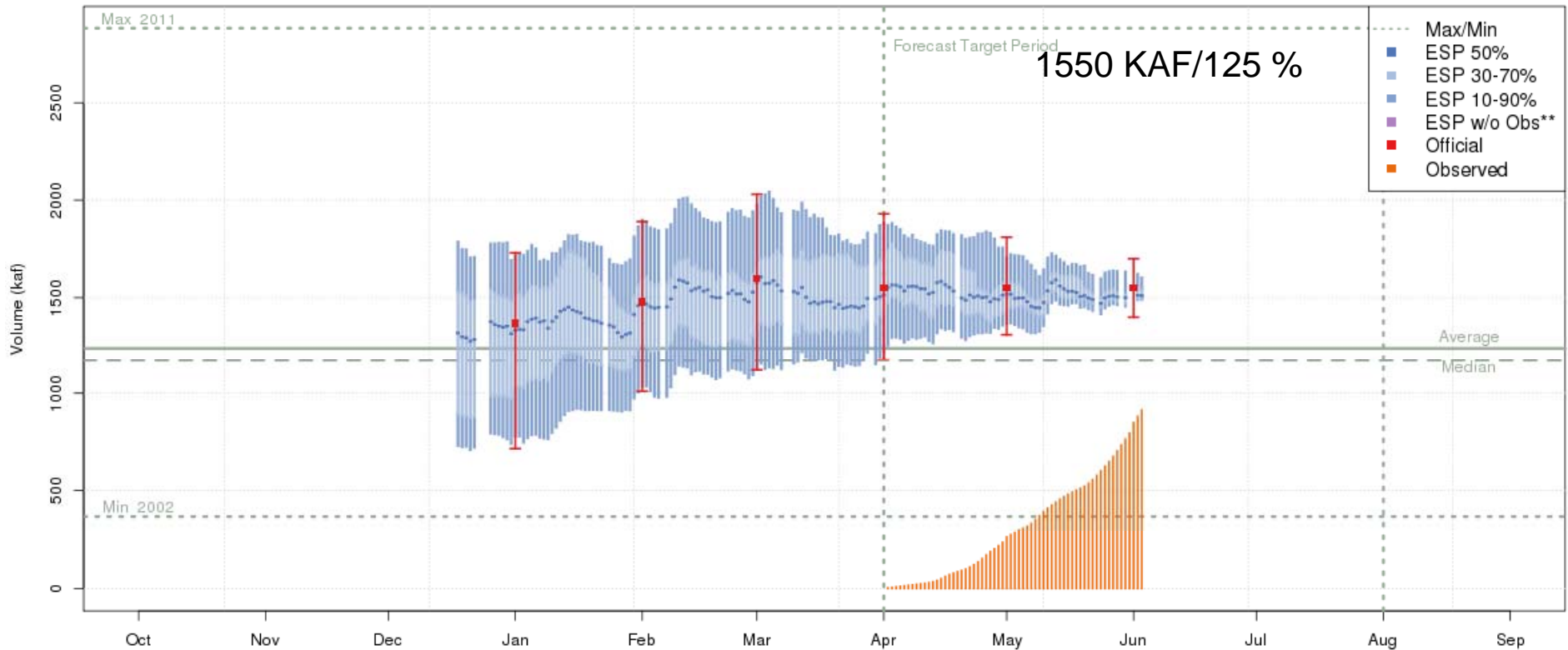
Plot Created 2014-06-04 14:53:50, Lastest ESP Run from 2014-06-03, NOAA / NWS / CBRFC  
The latest ( 2014-06-03 ) 50% ESP forecast ( 1136 kaf) changed 0.1 % from previous day and 0.3 % from June 1  
\*\*These ESP forecasts do not include observed and are not total runoff.



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

Available at: [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov) Select: Water Supply Click: Point of Interest

Yampa - Deerlodge Park (YDLC2) Apr-Jul 2014 Runoff Forecast (No Precip Forecast Included)  
2014-06-01 Official 50% Forecast: 1550 kaf (125% of average)

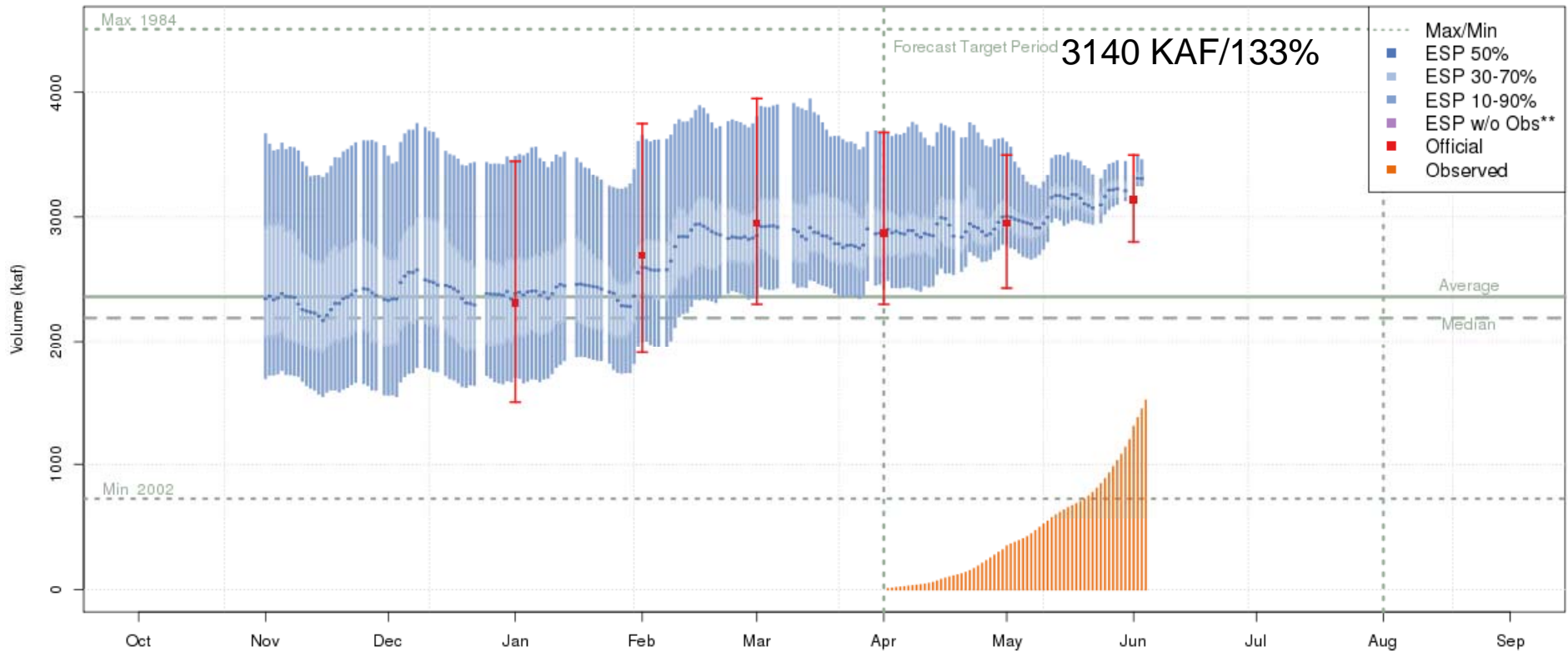


Plot Created 2014-06-04 14:07:51, Lastest ESP Run from 2014-06-03, NOAA / NWS / CBRFC  
The latest ( 2014-06-03 ) 50% ESP forecast ( 1511 kaf) changed -0.1 % from previous day and 0.7 % from June 1  
\*\*These ESP forecasts do not include observed and are not total runoff.

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

Available at: [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov) Select: Water Supply Click: Point of Interest

Colorado - Cameo- Nr (CAMC2) Apr-Jul 2014 Runoff Forecast (No Precip Forecast Included)  
2014-06-01 Official 50% Forecast: 3140 kaf (133% of average)

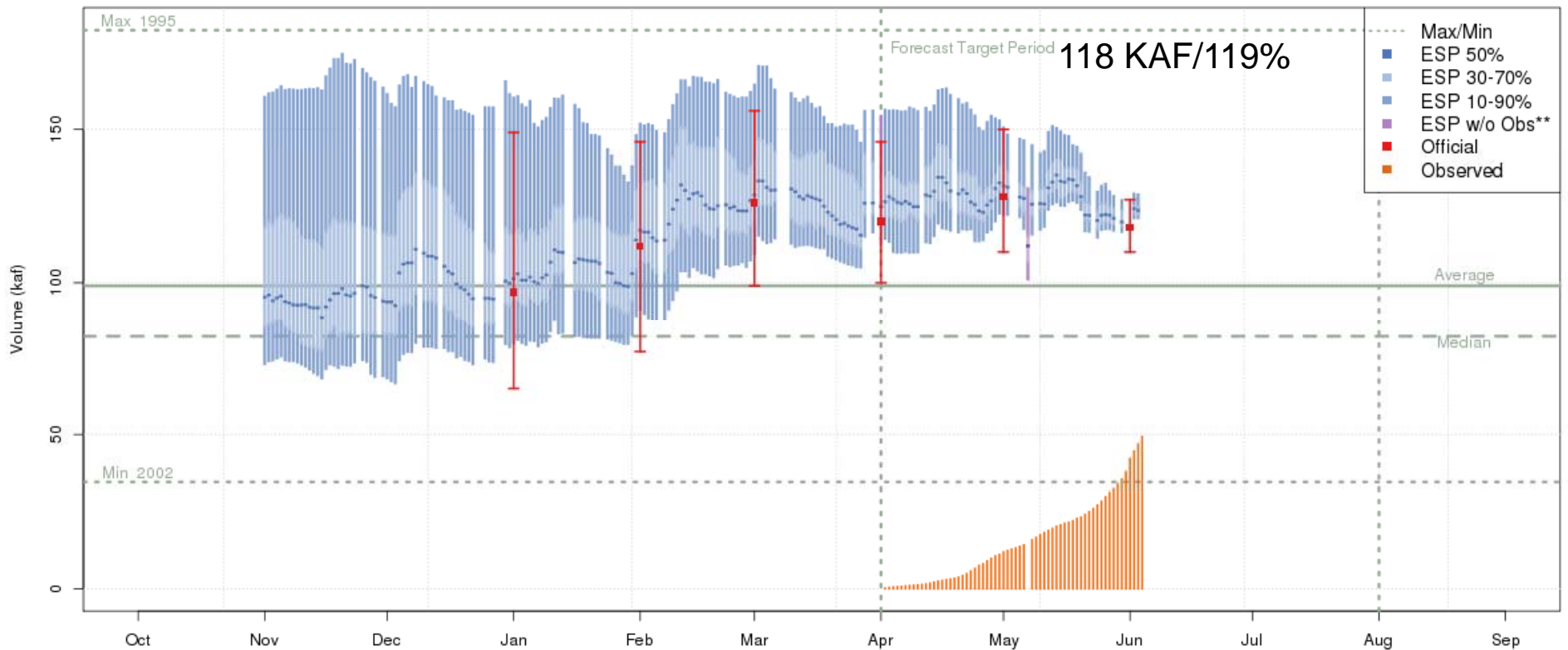


Plot Created 2014-06-04 14:44:08, Latest ESP Run from 2014-06-03, NOAA / NWS / CBRFC  
The latest ( 2014-06-03 ) 50% ESP forecast ( 3307 kaf) changed -0.1 % from previous day and 3.1 % from June 1  
\*\*These ESP forecasts do not include observed and are not total runoff.

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

Available at: [www.cbrfc.noaa.gov](http://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)  
2014-06-01 Official 50% Forecast: 118 kaf (119% of average)

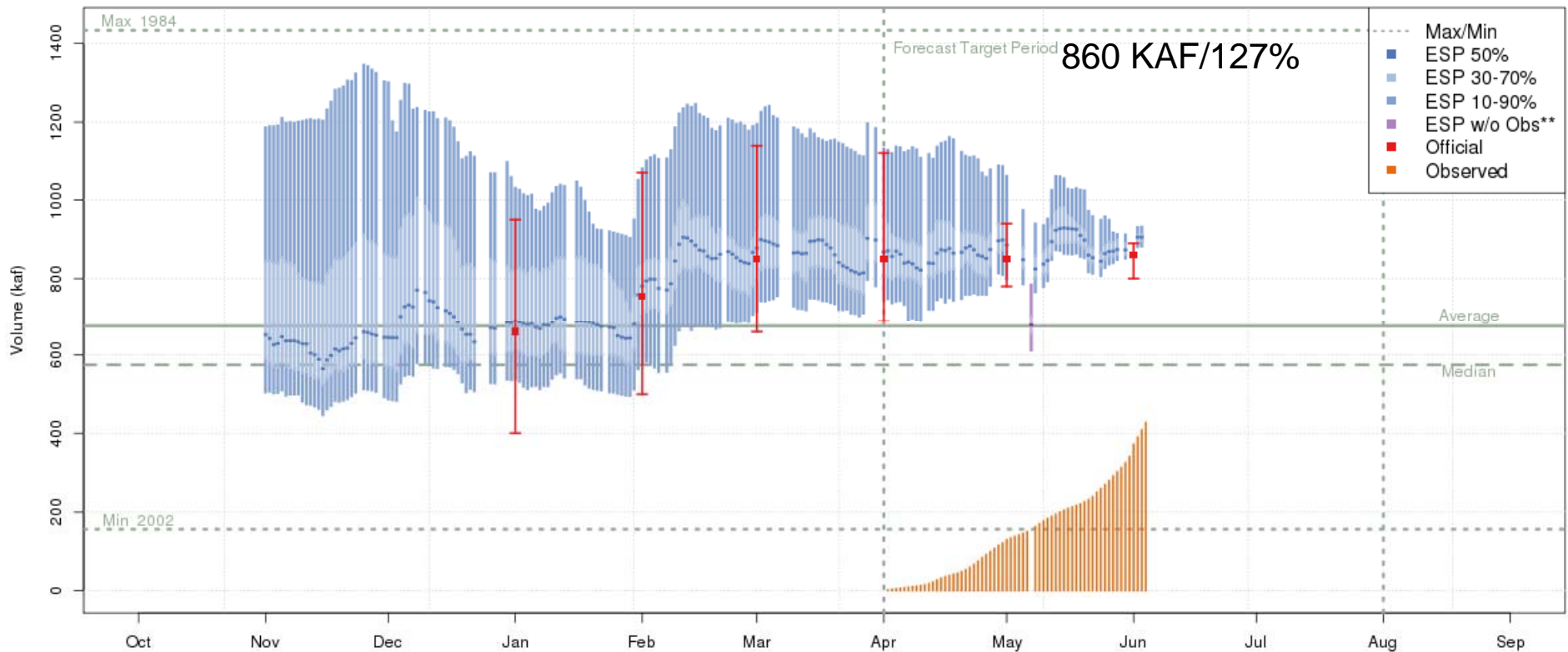


Plot Created 2014-06-04 15:16:31, Latest ESP Run from 2014-06-03, NOAA / NWS / CBRFC  
The latest ( 2014-06-03 ) 50% ESP forecast ( 123 kaf) changed -0.4% from previous day and 3.1% from June 1  
\*\*These ESP forecasts do not include observed and are not total runoff.

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

Available at: [www.cbrfc.noaa.gov](http://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)  
2014-06-01 Official 50% Forecast: 860 kaf (127% of average)

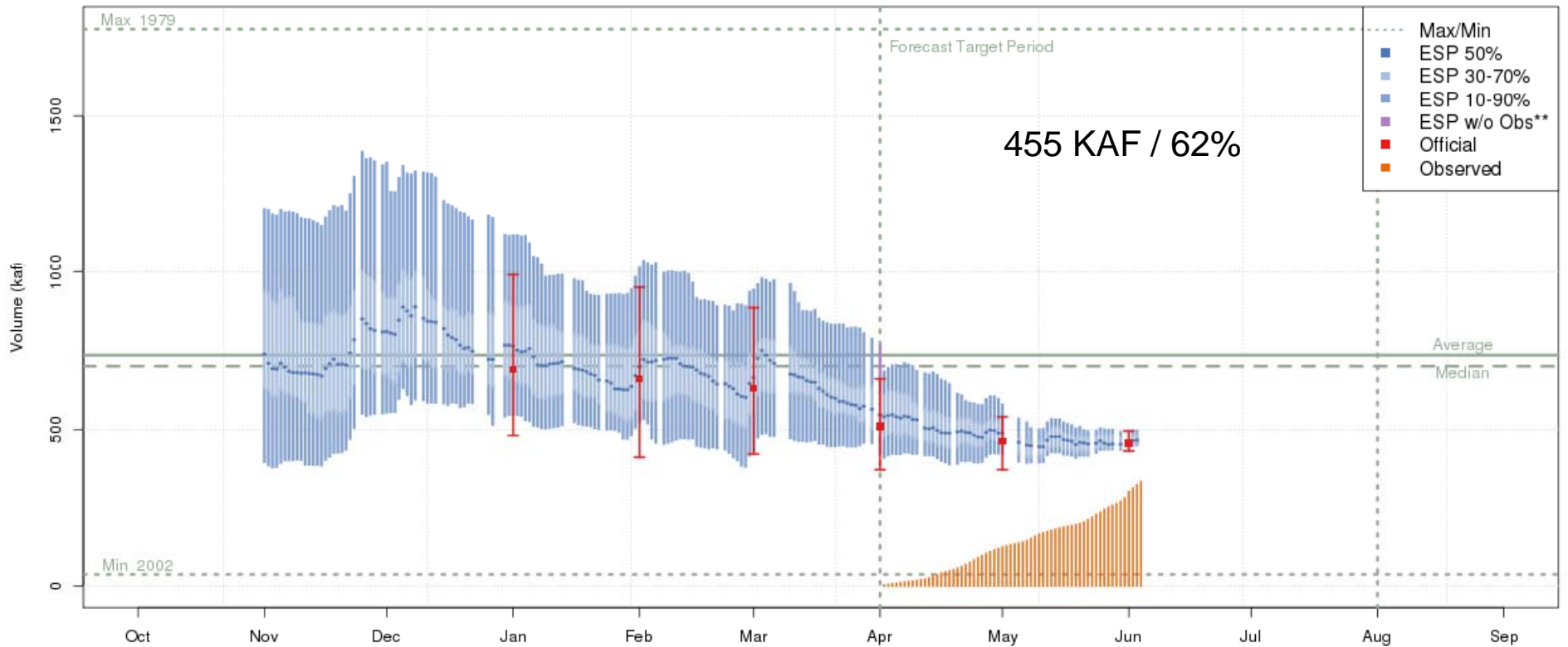


Plot Created 2014-06-04 14:42:32, Lastest ESP Run from 2014-06-03, NOAA / NWS / CBRFC  
The latest ( 2014-06-03 ) 50% ESP forecast ( 905 kaf ) changed 0 % from previous day and 3.7 % from June 1  
\*\*These ESP forecasts do not include observed and are not total runoff.

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

Available at: [www.cbrfc.noaa.gov](http://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)  
2014-06-01 Official 50% Forecast: 455 kaf (62% of average)

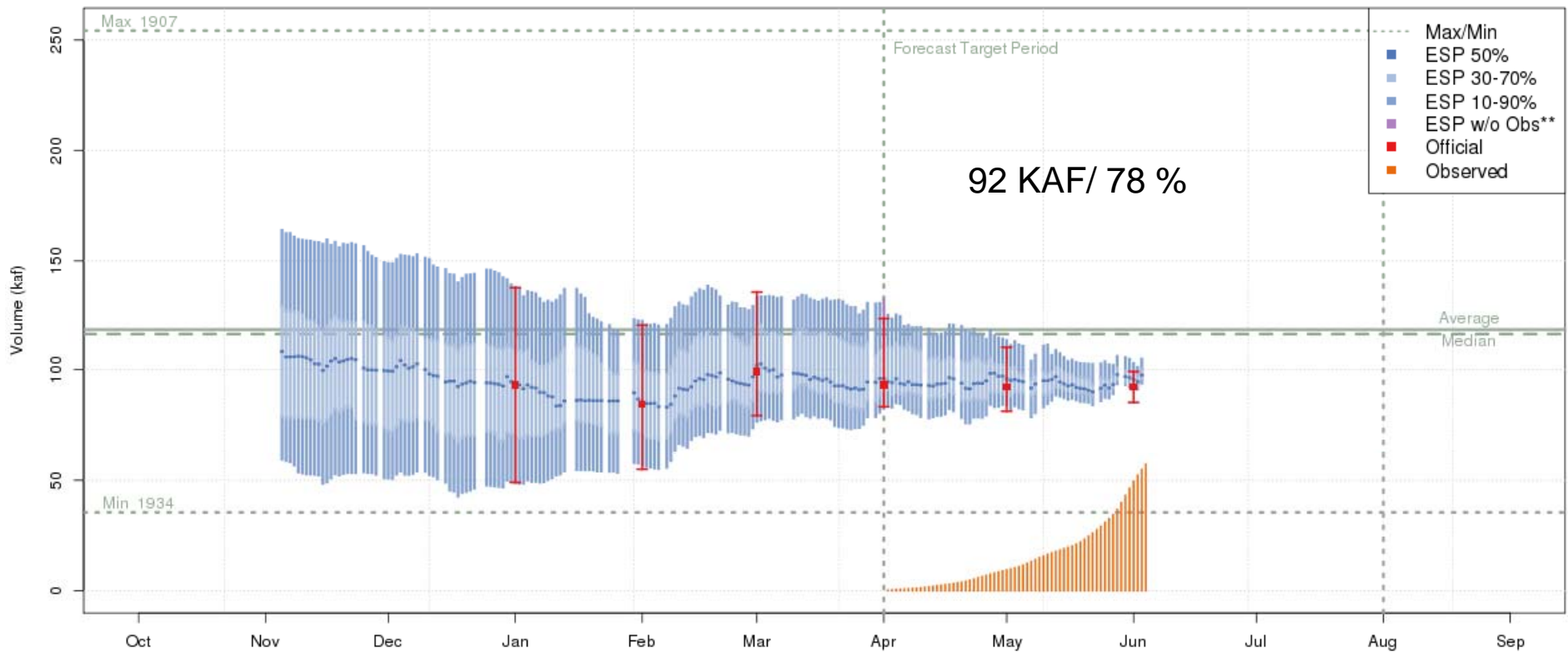


Plot Created 2014-06-04 15:05:41, Latest ESP Run from 2014-06-03, NOAA / NWS / CBRFC  
The latest ( 2014-06-03 ) 50% ESP forecast ( 465 kaf) changed 0.3% from previous day and 2.9% from June 1  
\*\*These ESP forecasts do not include observed and are not total runoff.

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

Available at: [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov) Select: Water Supply Click: Point of Interest

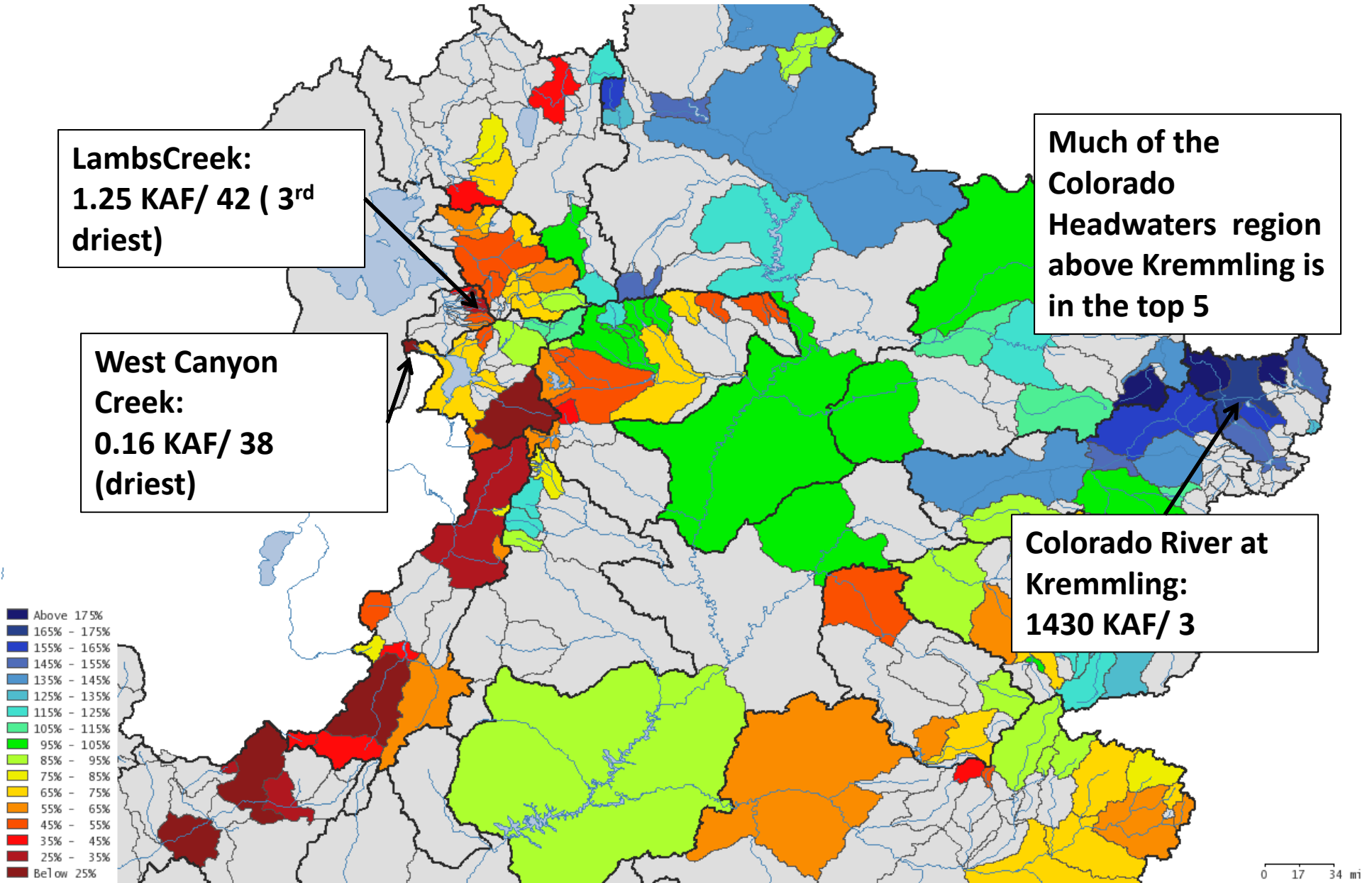
Weber - Oakley- Nr (OAWU1) Apr-Jul 2014 Runoff Forecast (No Precip Forecast Included)  
2014-06-01 Official 50% Forecast: 92 kaf (78% of average)



Plot Created 2014-06-04 15:05:57, Lastest ESP Run from 2014-06-03, NOAA / NWS / CBRFC  
The latest ( 2014-06-03 ) 50% ESP forecast ( 97 kaf ) changed 3.2 % from previous day and 2.2 % from June 1  
\*\*These ESP forecasts do not include observed and are not total runoff.

# April – July Rankings

Projected Apr-Jul Volumes / Rank (1-Wettest)

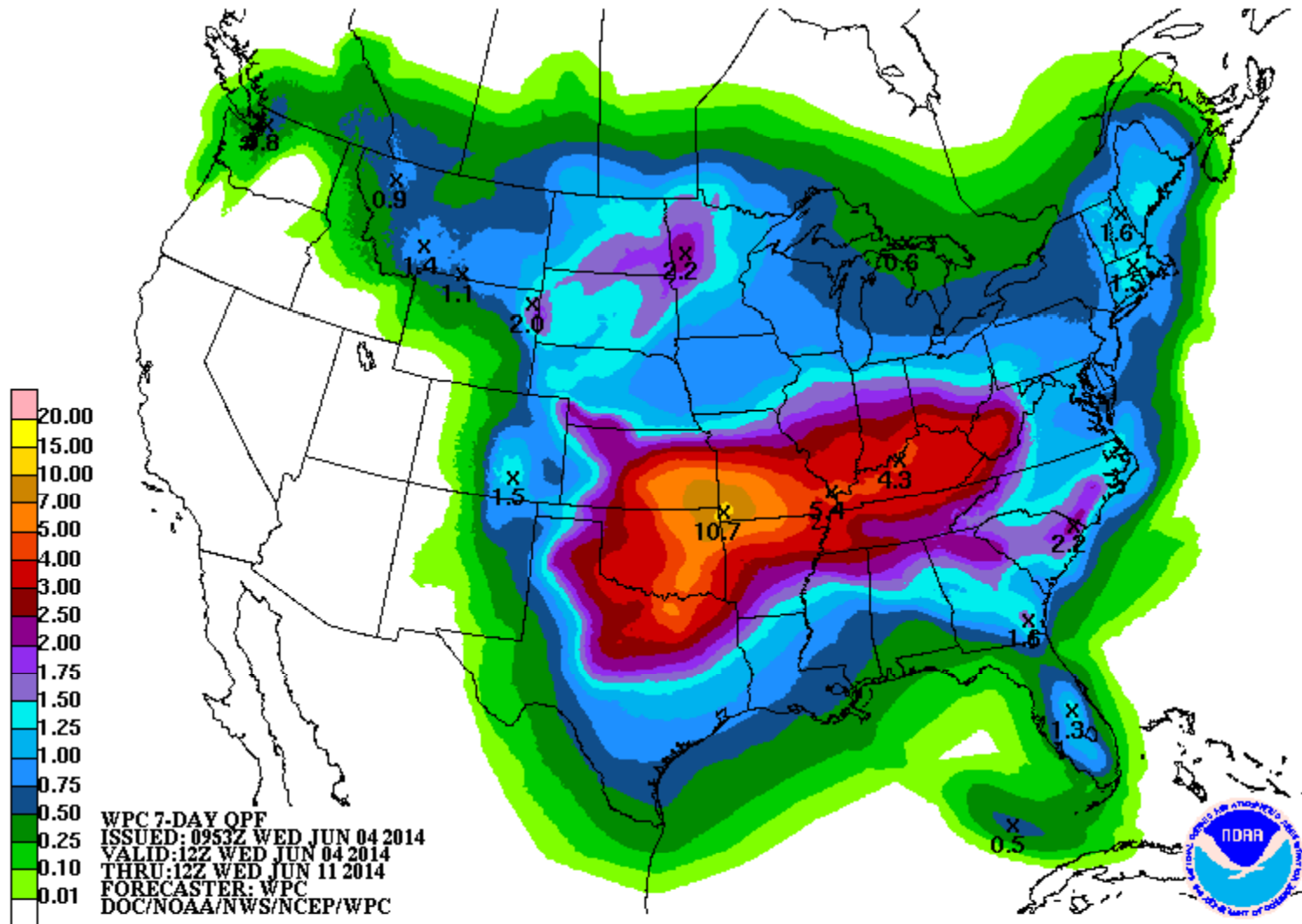




# Quantitative Precipitation Forecast

Weather Prediction Center

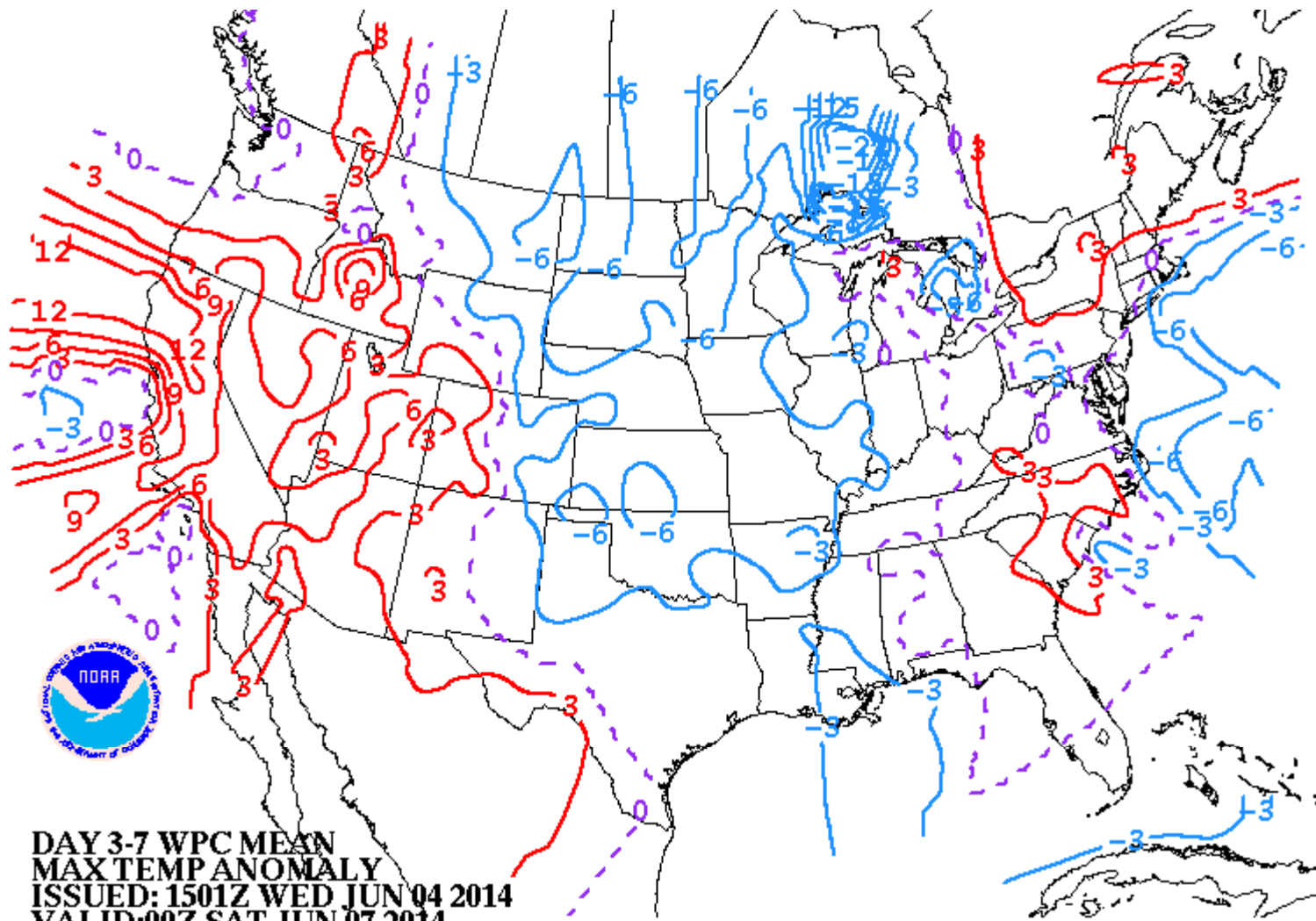
June 4 – 11



[www.hpc.ncep.noaa.gov](http://www.hpc.ncep.noaa.gov)



# Maximum Temperature Anomaly: June 7 – 11



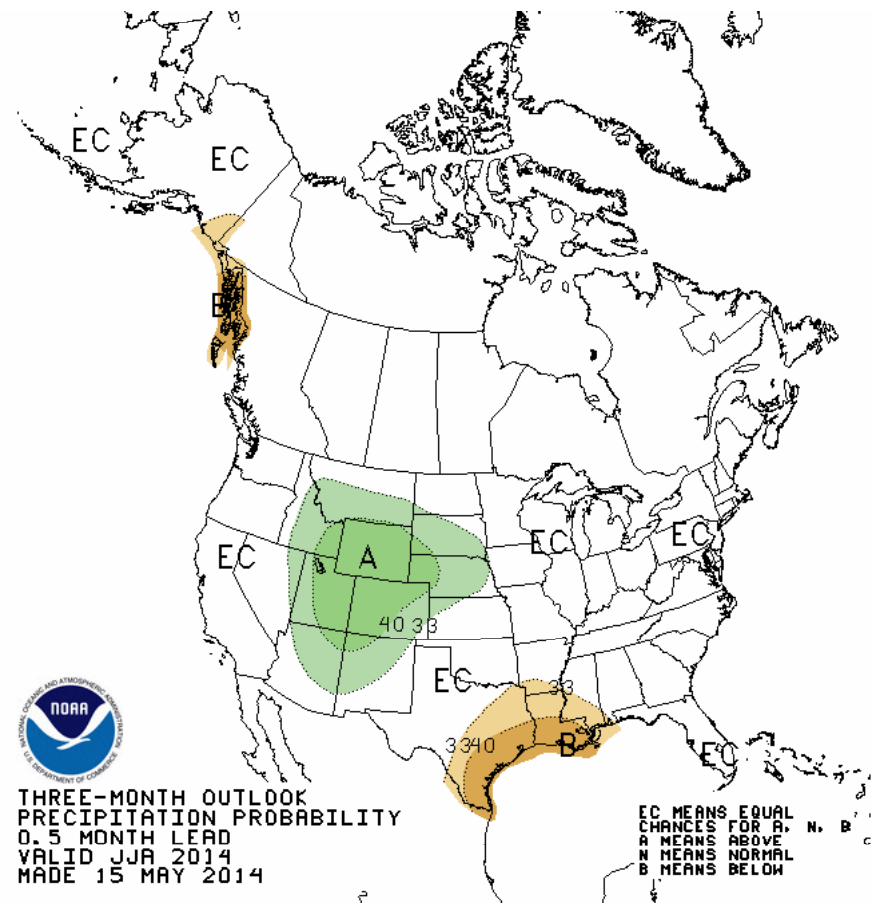
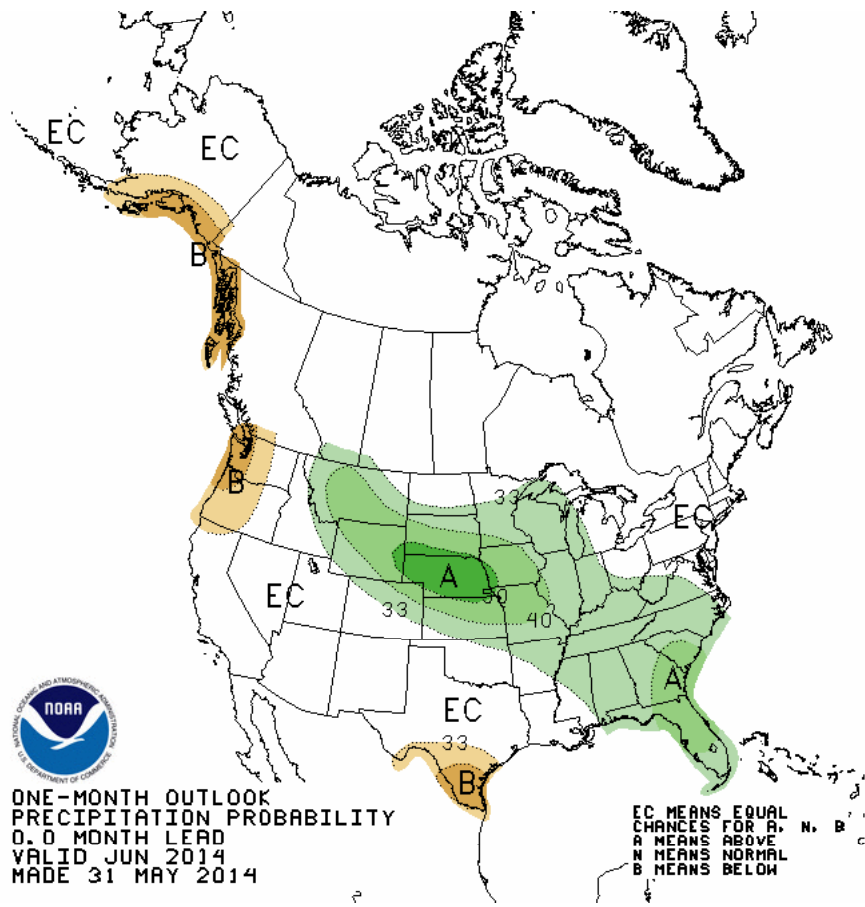
**DAY 3-7 WPC MEAN  
MAX TEMP ANOMALY  
ISSUED: 1501Z WED JUN 04 2014  
VALID:00Z SAT JUN 07 2014  
THRU:00Z THU JUN 12 2014  
DOC/NOAA/NWS/NCEP/WPC**

# Long Term Precipitation Outlook

Climate Prediction Center

Jun 2014

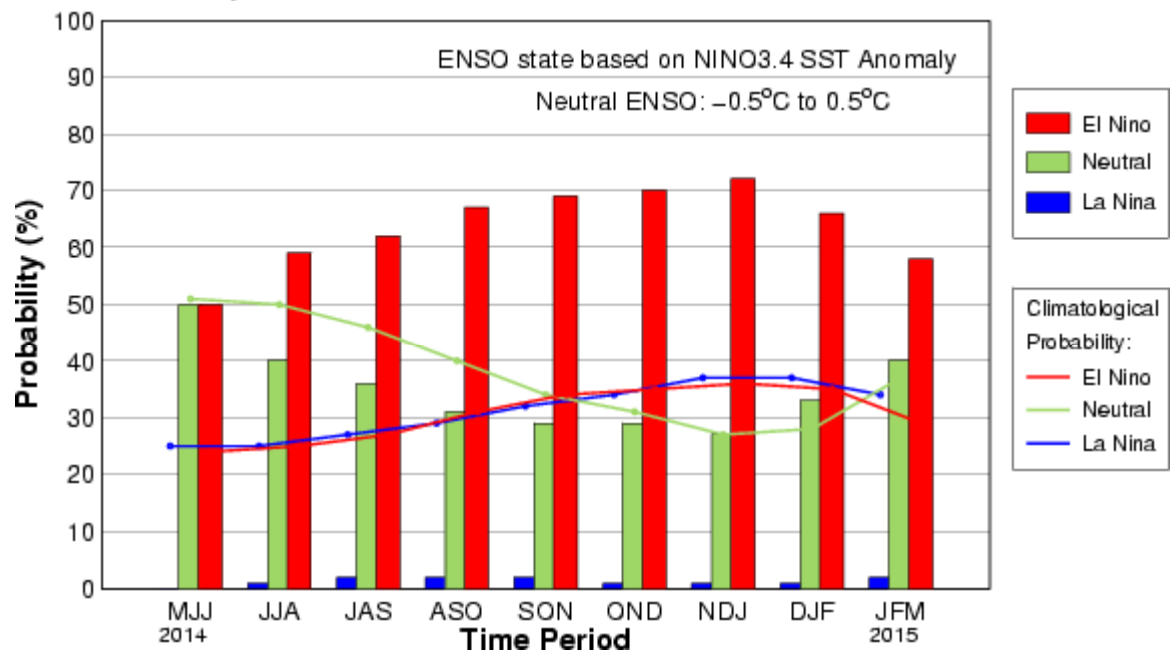
Jun – Aug 2014



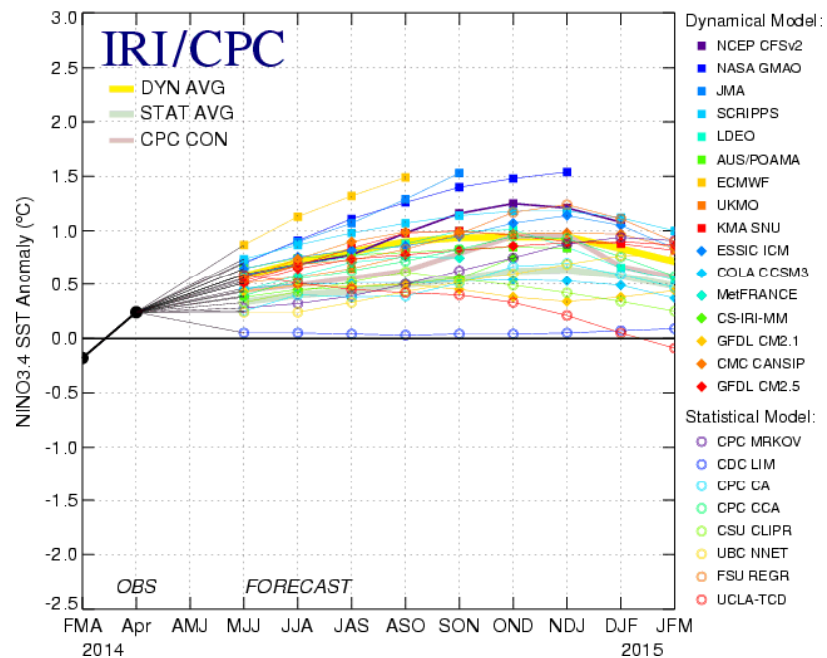
# Looking ahead

- El Niño conditions expected to develop by summer
  - Correlation is not particularly strong over the Upper Colorado River Basin
  - Correlation is with precipitation and temperatures, which is not always directly reflected in streamflows
- Climate in our region is influenced by other teleconnections
- <http://www.climate.gov/news-features/departments/8443/all>

## Mid-May IRI/CPC Plume-Based Probabilistic ENSO Forecast



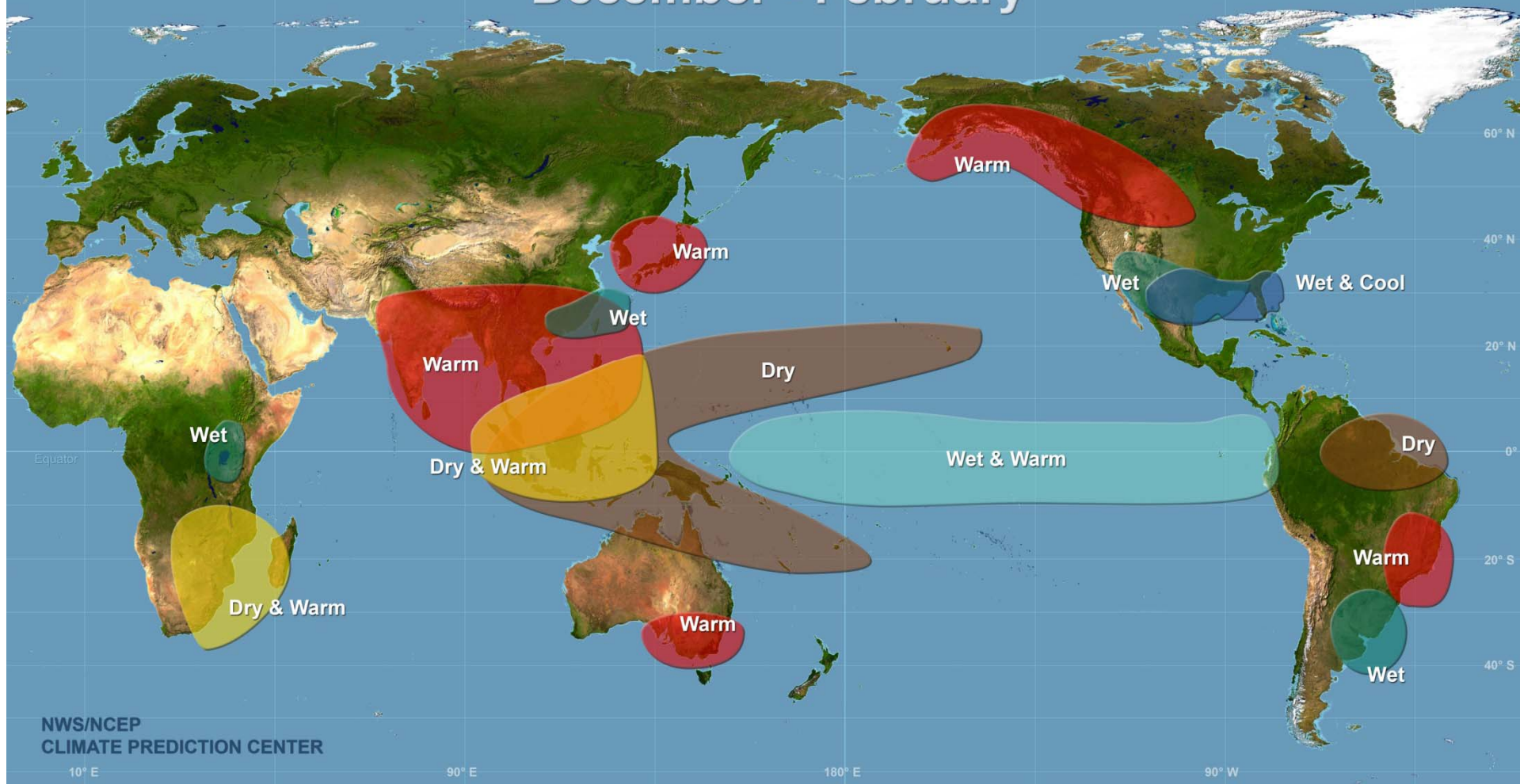
## Mid-May 2014 Plume of Model ENSO Predictions



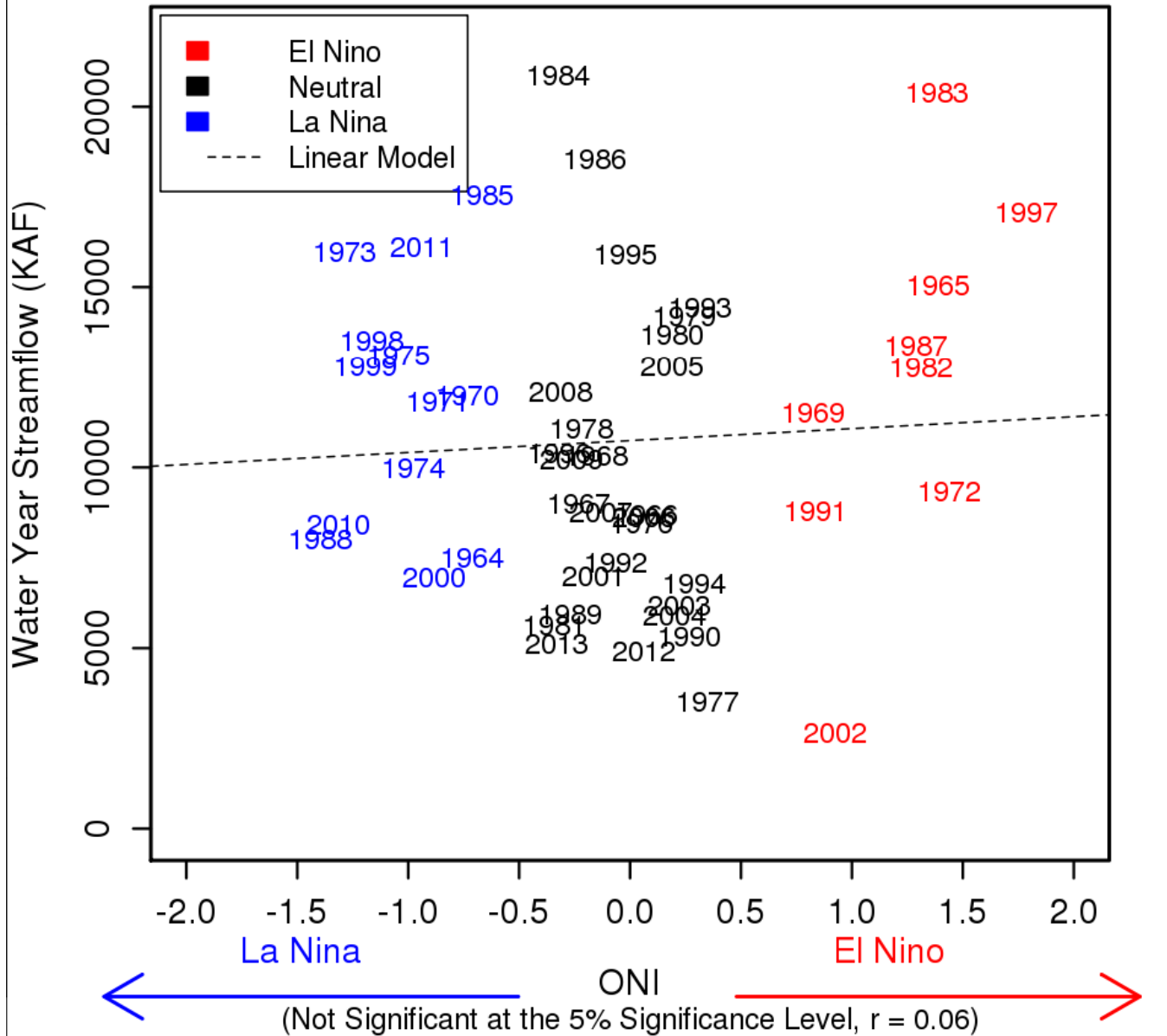


# Warm Episode Relationships

## December - February



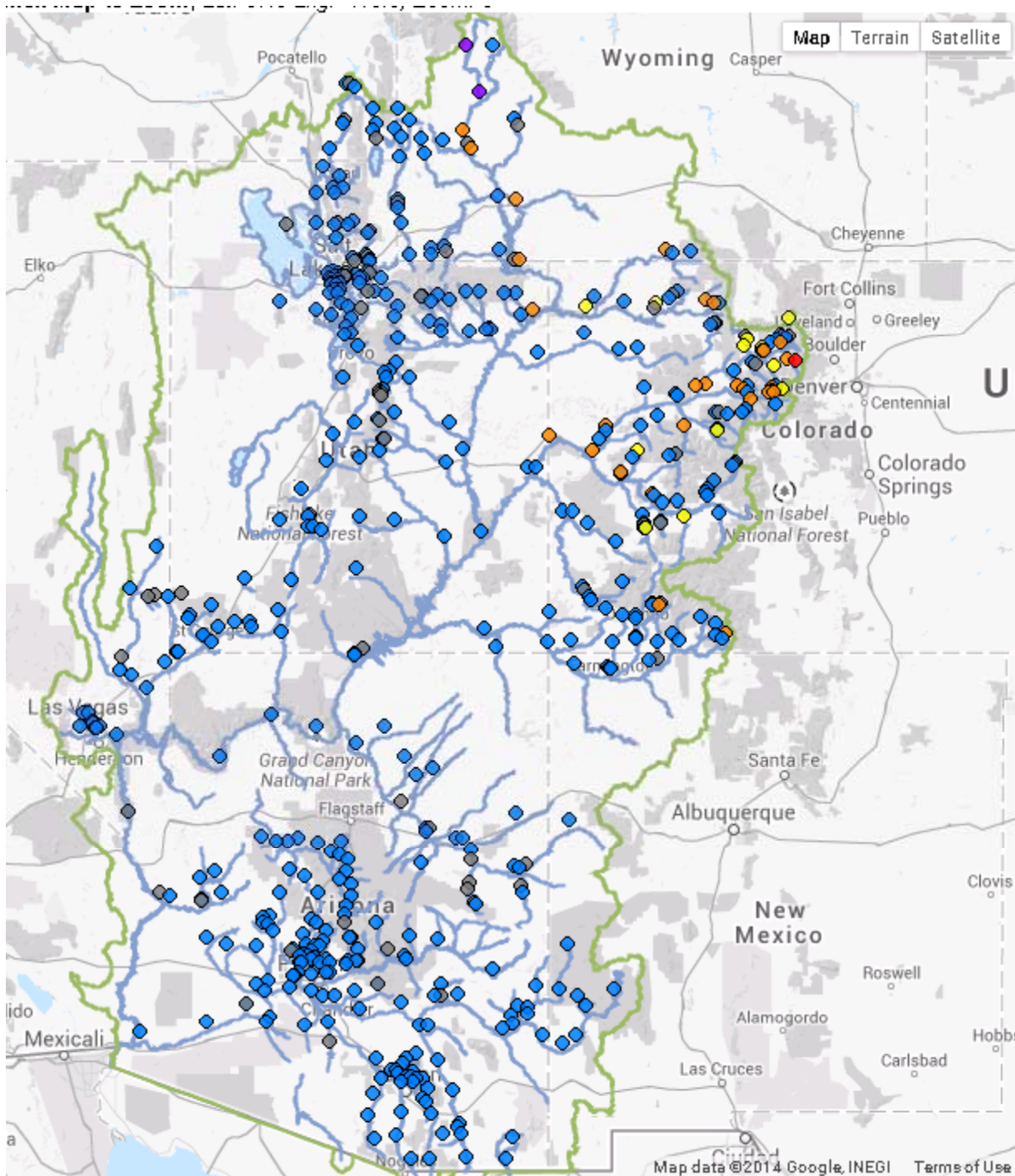
# GLDA3 and Oceanic Nino Index



# Peak Flows

- Many sites are peaking this time of year
- When sites are near peak do NOT check the peak flow page
  - Daily forecasts updated more frequently
  - More responsive to changes in regulation and weather conditions
  - Peak forecast page will not be updated again this year





### River

- No Data
- Normal
- Significant Rise
- Near Bankfull
- Above Bankfull
- Above Flood Stage
- Outlook (> 3 days)

### Snow

- Percentiles
- Percent Average
- Percent Median
- No Data
- < 25%
- 25-50%
- 50-75%
- 75-90%
- 90-110%
- 110-125%
- 125-150%
- 150-175%
- >175%



# Please contact us with any specific questions

- Key Water Supply Contacts:
  - Michelle Stokes ([michelle.stokes@noaa.gov](mailto:michelle.stokes@noaa.gov)) (Hydrologist in Charge)
  - Brenda Alcorn ([brenda.alcorn@noaa.gov](mailto:brenda.alcorn@noaa.gov)) (Upper Colorado)
  - Ashley Nielson ([ashley.nielson@noaa.gov](mailto:ashley.nielson@noaa.gov)) (Green + Yampa / White)
  - Greg Smith ([greg.smith@noaa.gov](mailto:greg.smith@noaa.gov)) (San Juan + Gunnison + Dolores)
  - Paul Miller ([paul.miller@noaa.gov](mailto:paul.miller@noaa.gov)) (Great Basin)
  - Tracy Cox ([tracy.cox@noaa.gov](mailto:tracy.cox@noaa.gov)) (Lower Colorado + Virgin + Sevier)