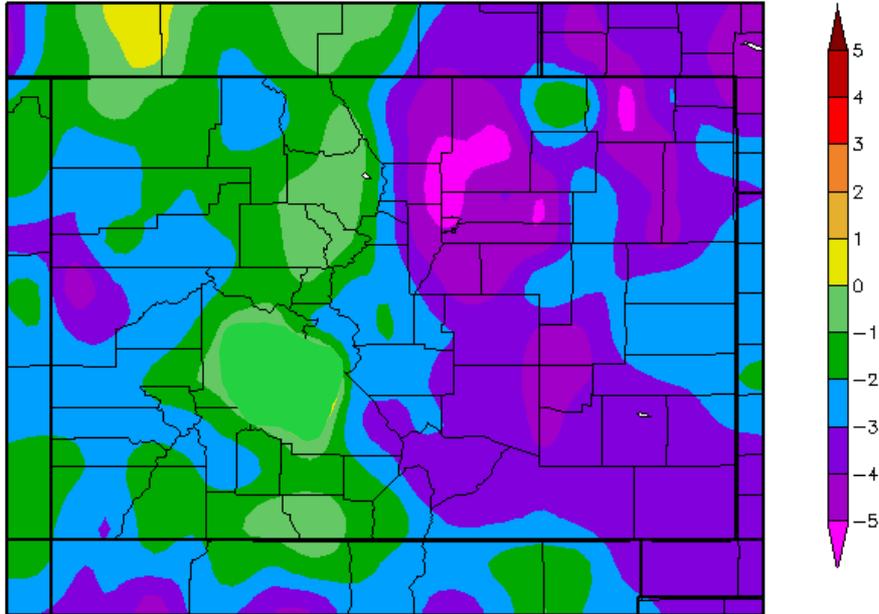


**Snowmelt Outlook**  
**North Central & Northeast Colorado**  
**May 29, 2015**

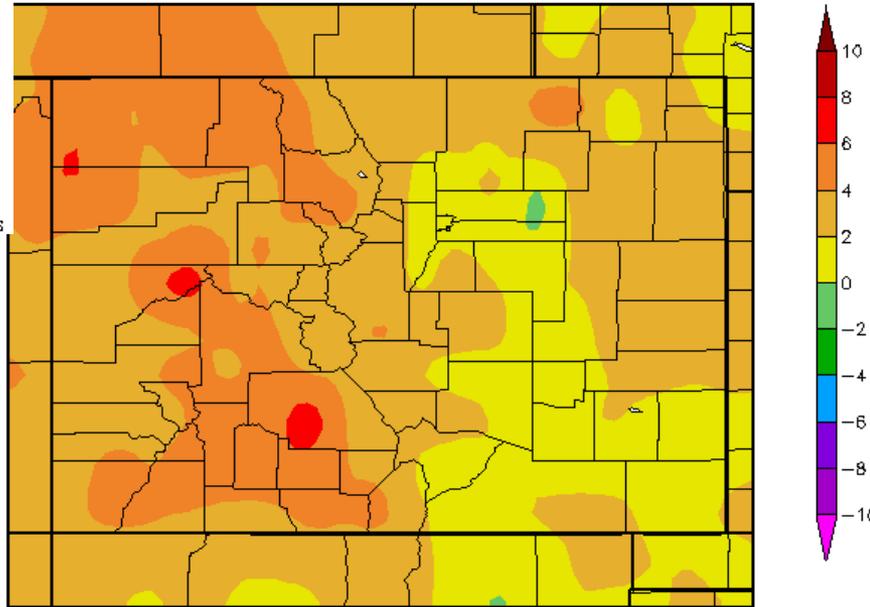
# May temperatures remained well below average especially east of the Continental Divide.

Departure from Normal Temperature (F)  
4/29/2015 - 5/28/2015



These High Plains Regional Climate Center (HPRCC) maps show temperature departures from normal in degrees.  
← The past 30 days temperatures have been below average across Colorado.

Departure from Normal Temperature (F)  
2/1/2015 - 4/30/2015



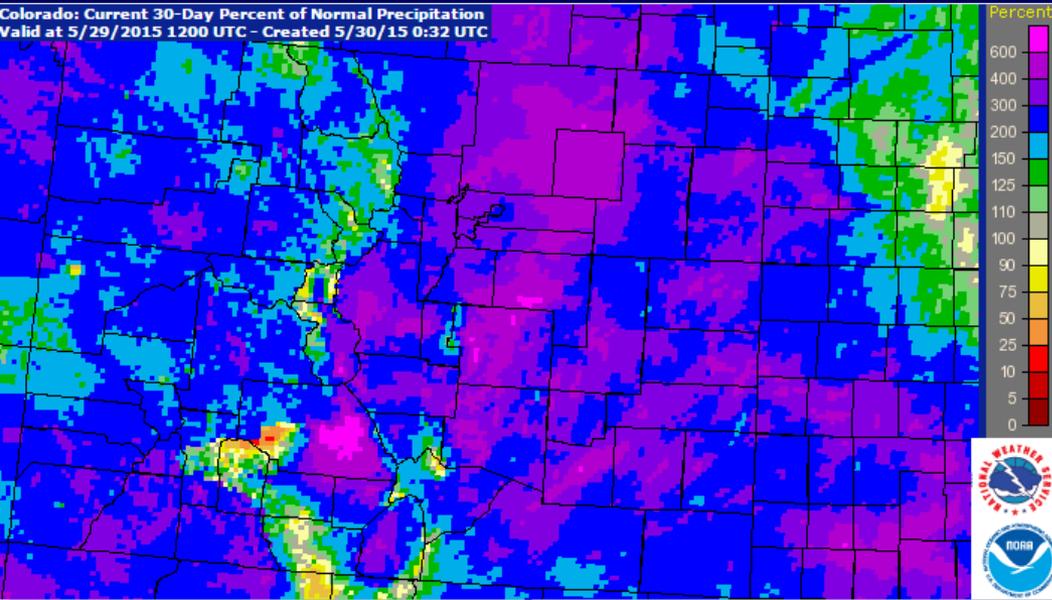
Before that (February through April 2015) temperatures were generally near to above average.



For additional Regional Climate Center climate maps go to:

[http://www.hprcc.unl.edu/maps/current/index.php?action=update\\_daterange&daterange=30d](http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=30d)

# Precipitation the past month has been much above average especially east of the Divide.



These maps depict the % of average precipitation.

← Precipitation the past 30 days has been much above average especially in the South Platte and Arkansas River Basins east of the Divide.

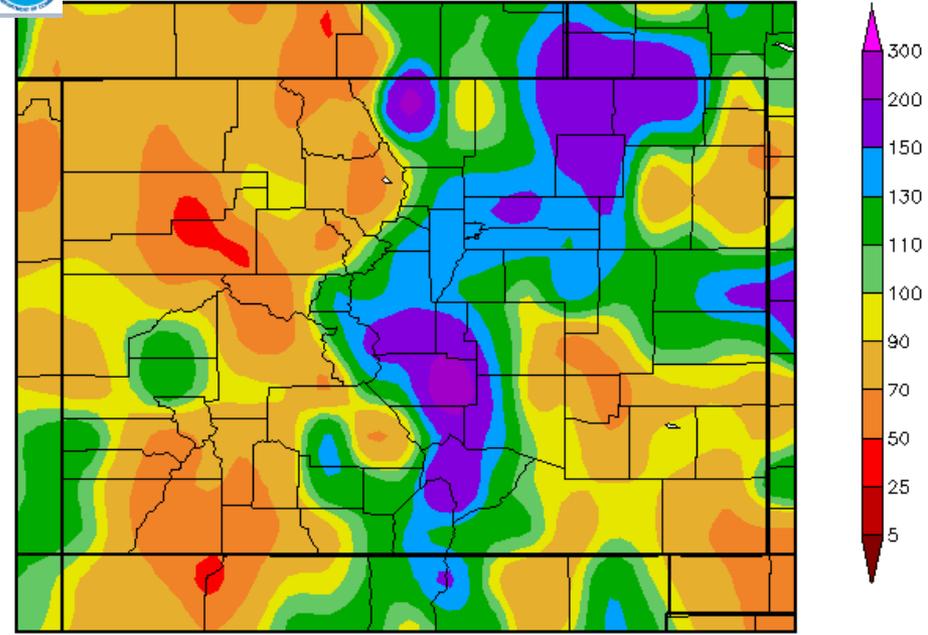
Percent of Normal Precipitation (%)  
2/1/2015 - 4/30/2015



[National Weather Service precipitation analysis website:](http://water.weather.gov/precip/)  
[water.weather.gov/precip/](http://water.weather.gov/precip/)

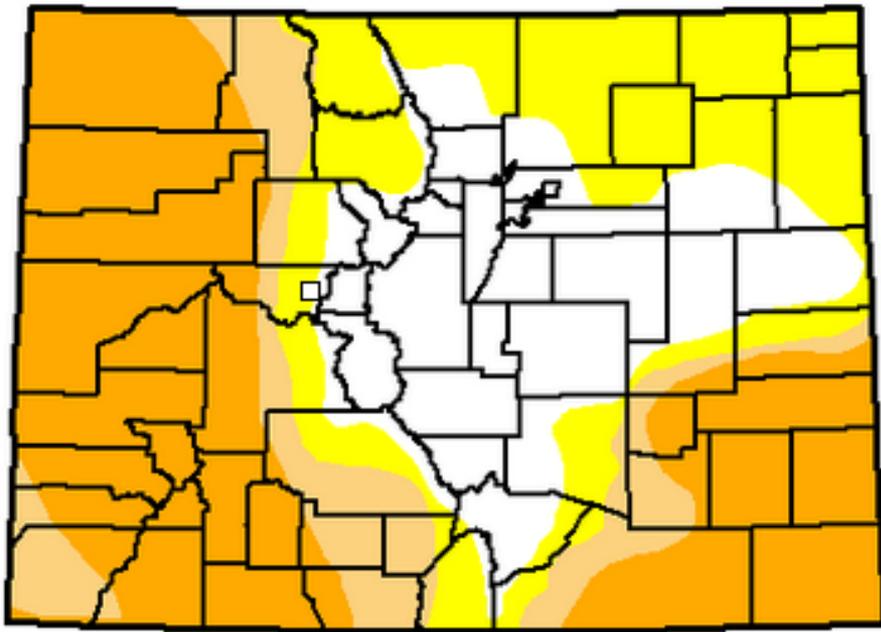
February through April Regional Climate Center precipitation map ->

Many areas in the South Platte Basin were wet earlier this year, while dry conditions persisted west of the Divide and the North Platte Basin.

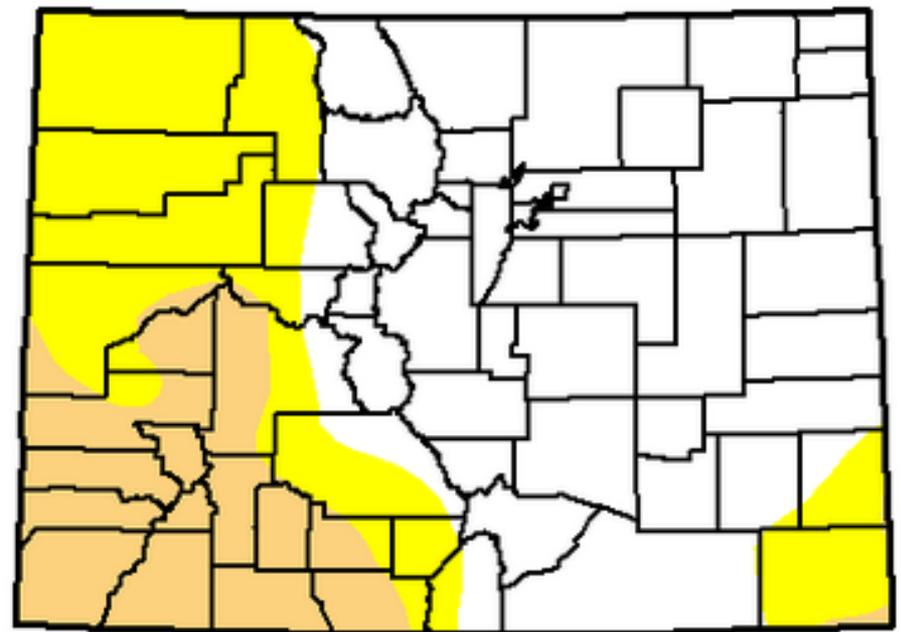


The latest U.S. Drought Monitor compared to a month and a half ago. The precipitation in latter April and May brought an end to the drought east of the Divide.

## ***U.S. Drought Monitor***



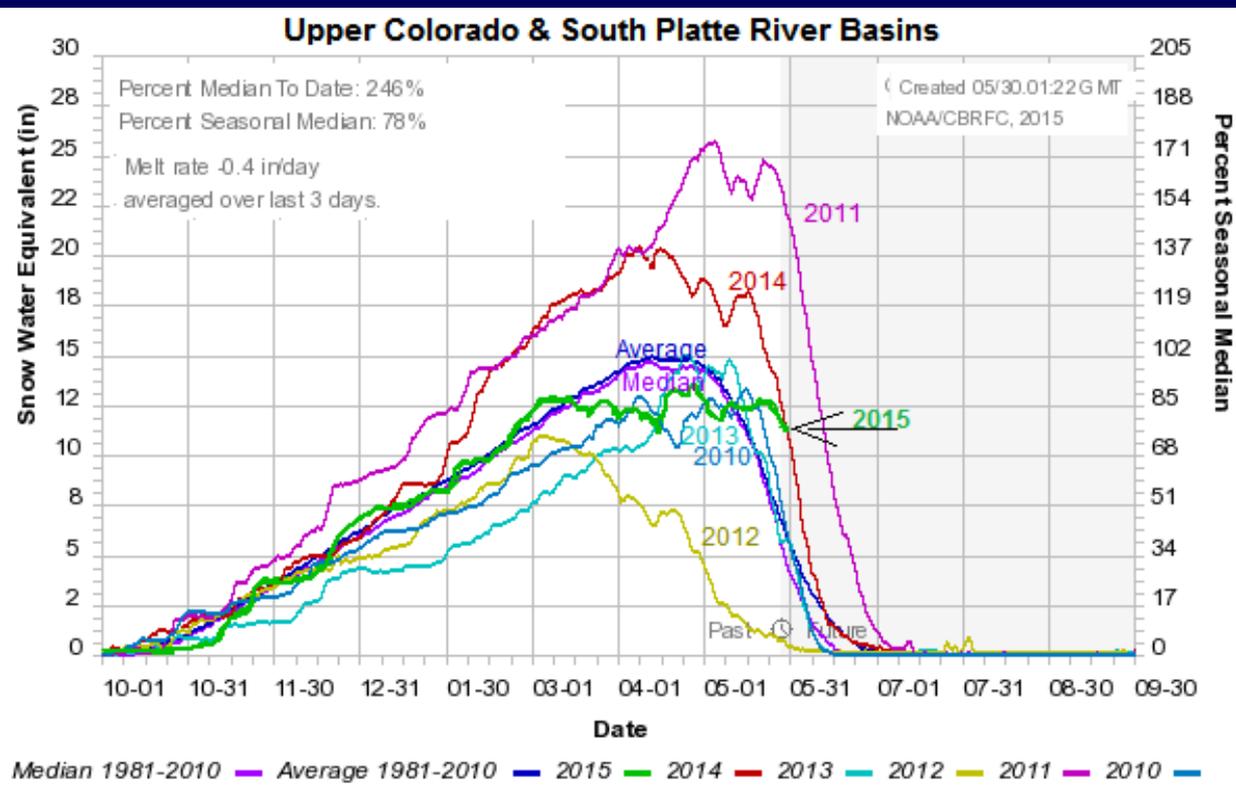
April 14, 2015



May 26, 2015

The U.S. Drought Monitor is available at: <http://droughtmonitor.unl.edu/>

# Mountain Snowpack Time Series Graph through May 29<sup>th</sup>, 2015 (each line is a year of mountain snowpack)

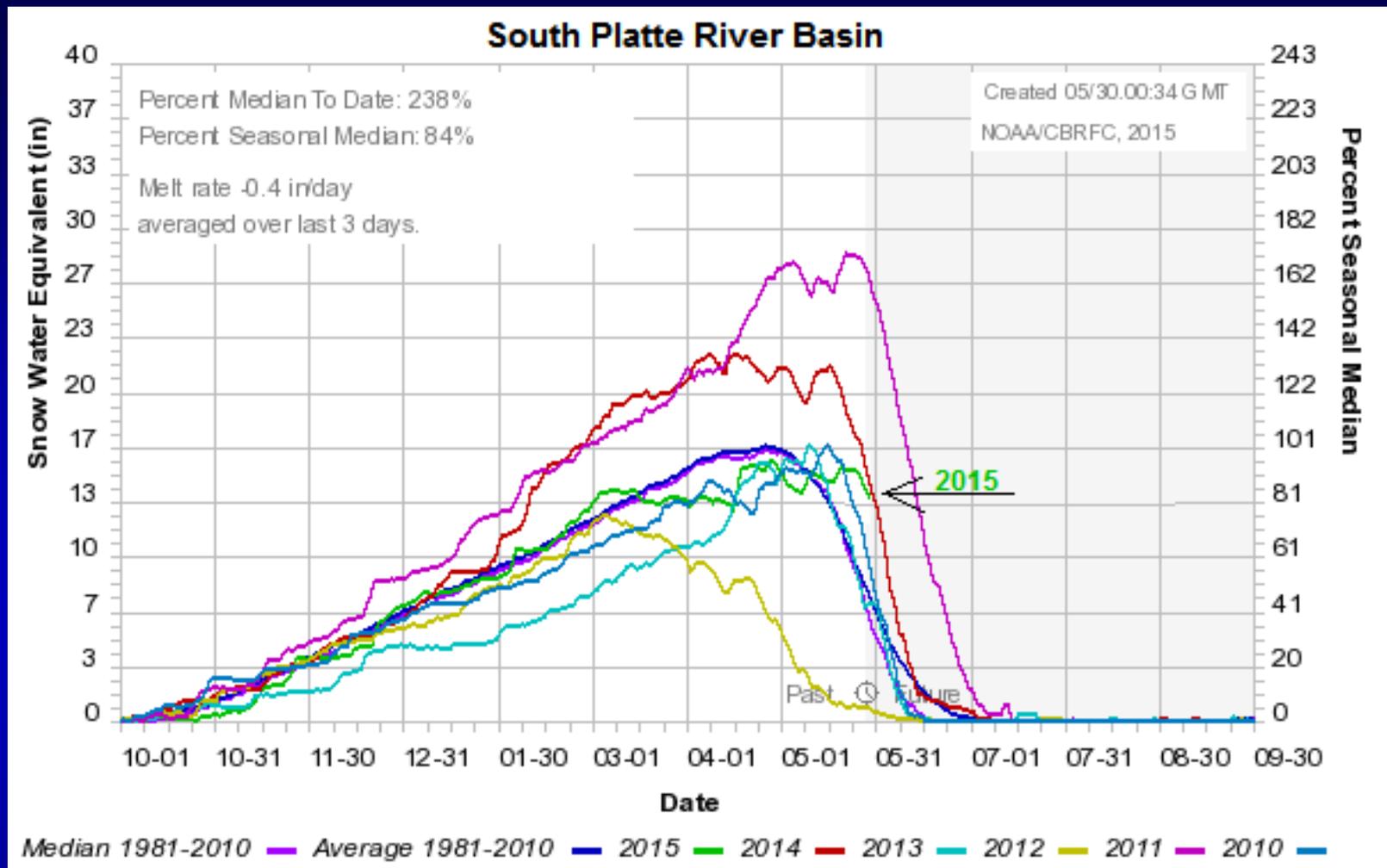


This graph shows how the current season compares to recent years in the upper Colorado and South Platte River Basins. The green line is the current water year. The blue/purple lines represent the median/average.

Generally the snowpack has not melted out at NRCS SNOTEL sites above 9000 feet in the South Platte Basin. Sites above 9500 feet in Grand and Summit Counties still have snowpack.

[Additional time series graphs can be produced on the Colorado Basin RFC website at:](http://www.cbrfc.noaa.gov/station/sweplot/snowgroup.php)  
<http://www.cbrfc.noaa.gov/station/sweplot/snowgroup.php>

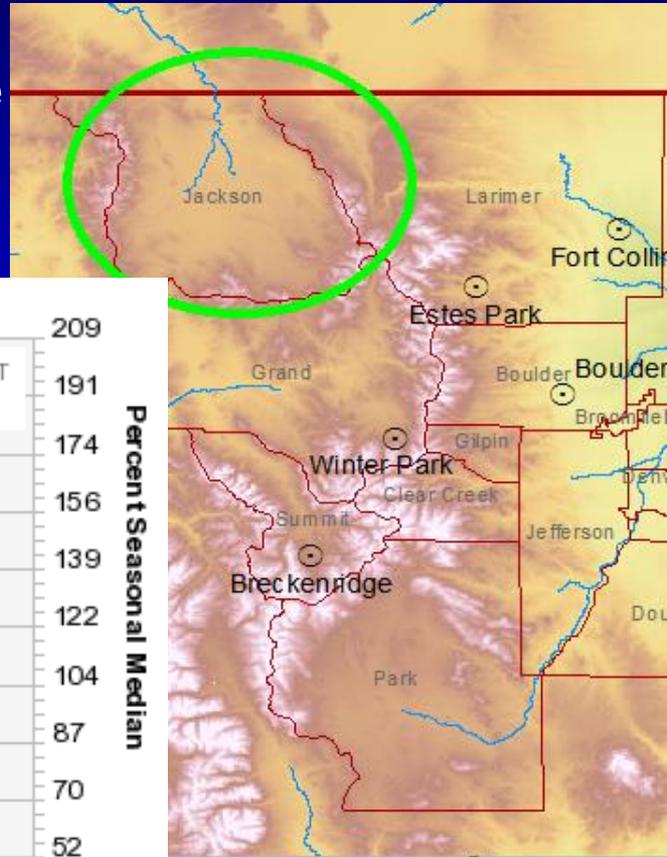
[NRCS Time Series Snowpack Graphs are available at:](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/snow/products/?cid=nrcs144p2_063323)  
[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/snow/products/?cid=nrcs144p2\\_063323](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/snow/products/?cid=nrcs144p2_063323)



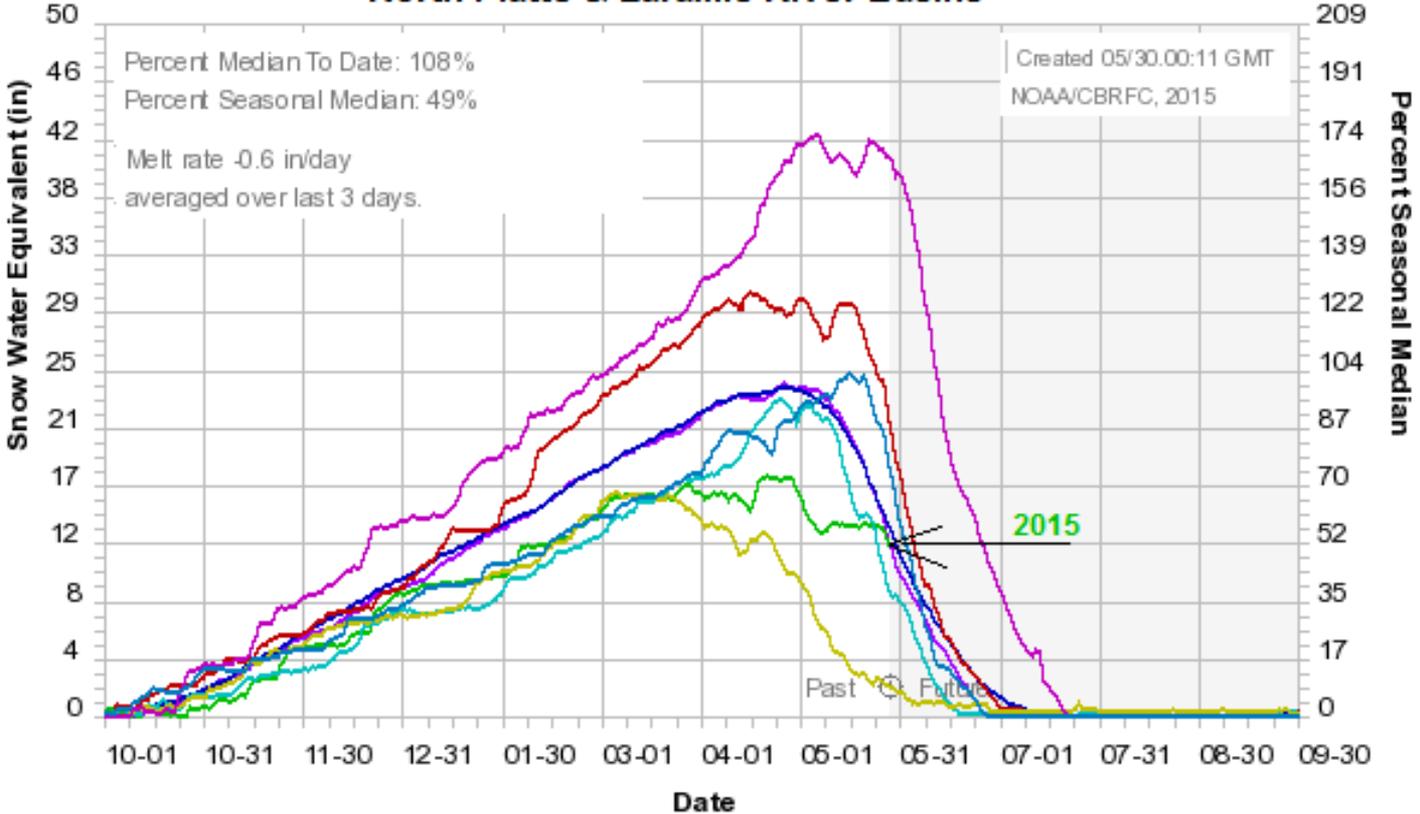
Although the May 29<sup>th</sup>, 2015 mountain snowpack in the South Platte Basin is over twice the normal or median May 29<sup>th</sup> snowpack, it is below the average peak snowpack (purple/blue smoothed line on the graph).

The following time-series graphs show sub-basin SNOTEL snowpack. (Graphs east of the Divide may not include data for all NRCS SNOTEL sites)

The mountain snowpack in North Platte and Laramie River watersheds that flow north into Wyoming is running near the average May 29<sup>th</sup> snowpack.



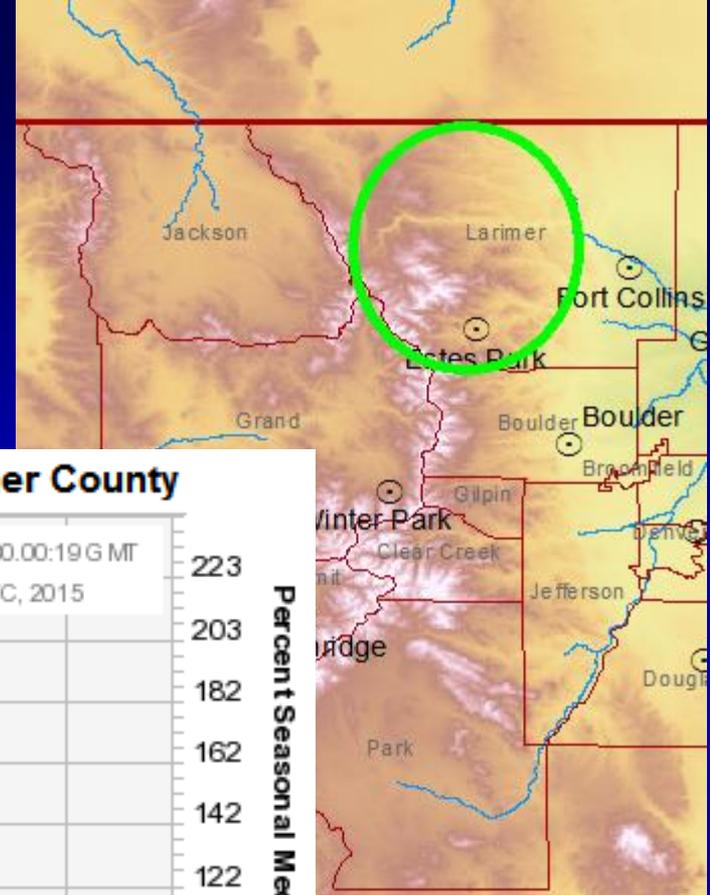
**North Platte & Laramie River Basins**



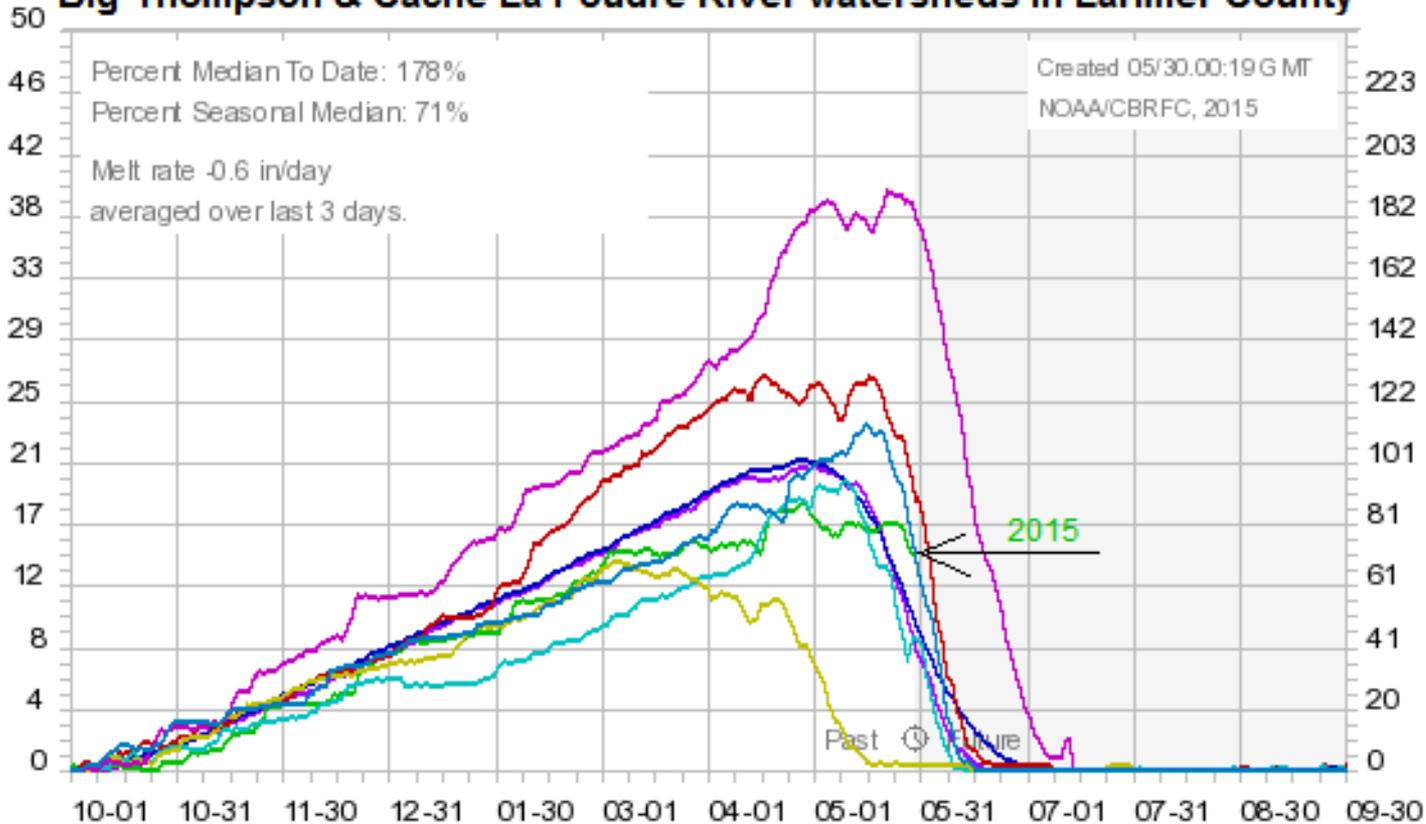
The 2015 mountain snowpack never reached the average peak snowpack in these basins.

Median 1981-2010 — Average 1981-2010 — 2015 — 2014 — 2013 — 2012 — 2011 — 2010 —

The May 29<sup>th</sup>, 2015 mountain snowpack in the Big Thompson and Cache La Poudre River basins in Larimer County is nearly twice the normal May 29<sup>th</sup> snowpack, but hasn't reached the average peak snowpack.



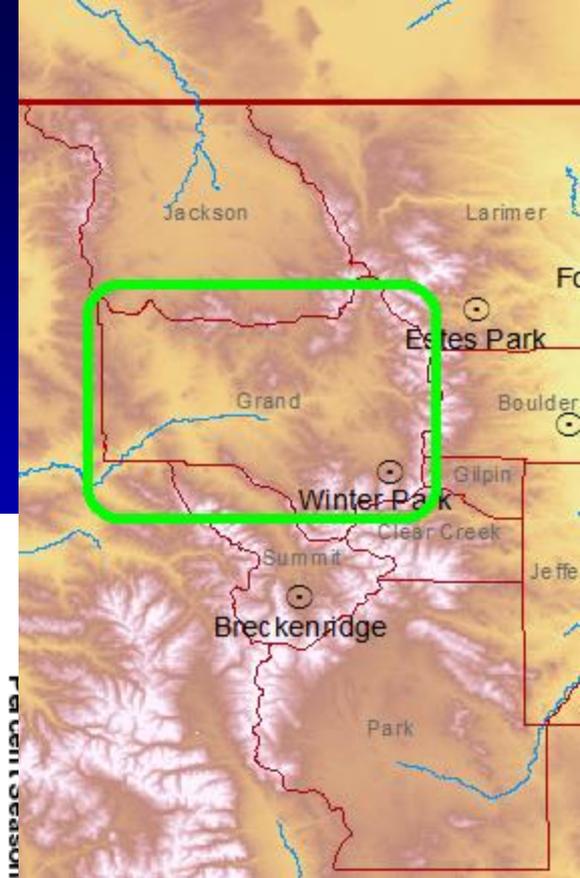
**Big Thompson & Cache La Poudre River watersheds in Larimer County**



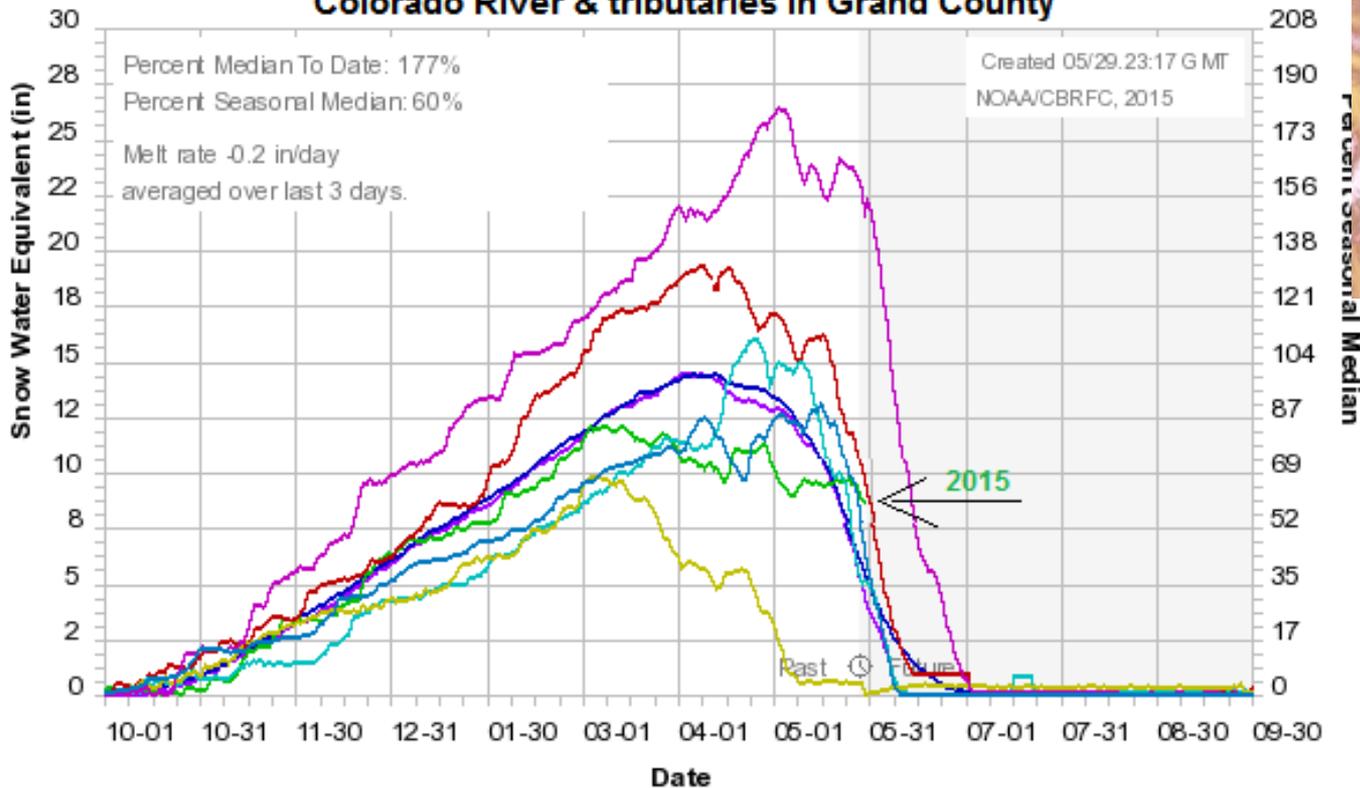
Percent Seasonal Median

Median 1981-2010 — Average 1981-2010 — 2015 — 2014 — 2013 — 2012 — 2011 — 2010 —

The May 29<sup>th</sup>, 2015 mountain snowpack in the Colorado, Fraser, and Williams Fork watersheds in Grand County is nearly twice the normal May 29th snowpack, but hasn't reached the average peak snowpack.



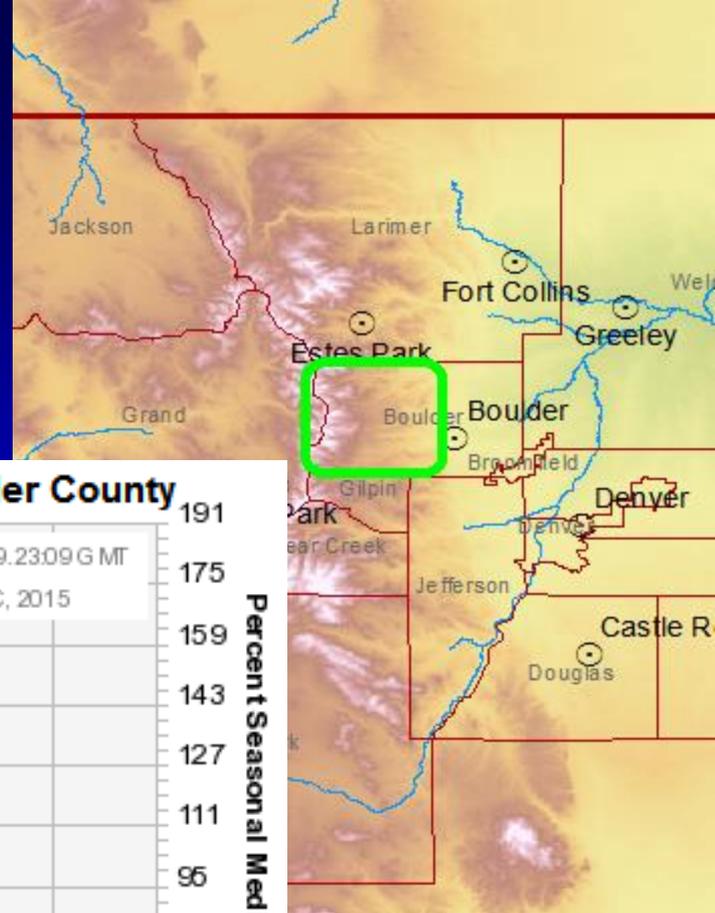
### Colorado Basin River Forecast Center Colorado River & tributaries in Grand County



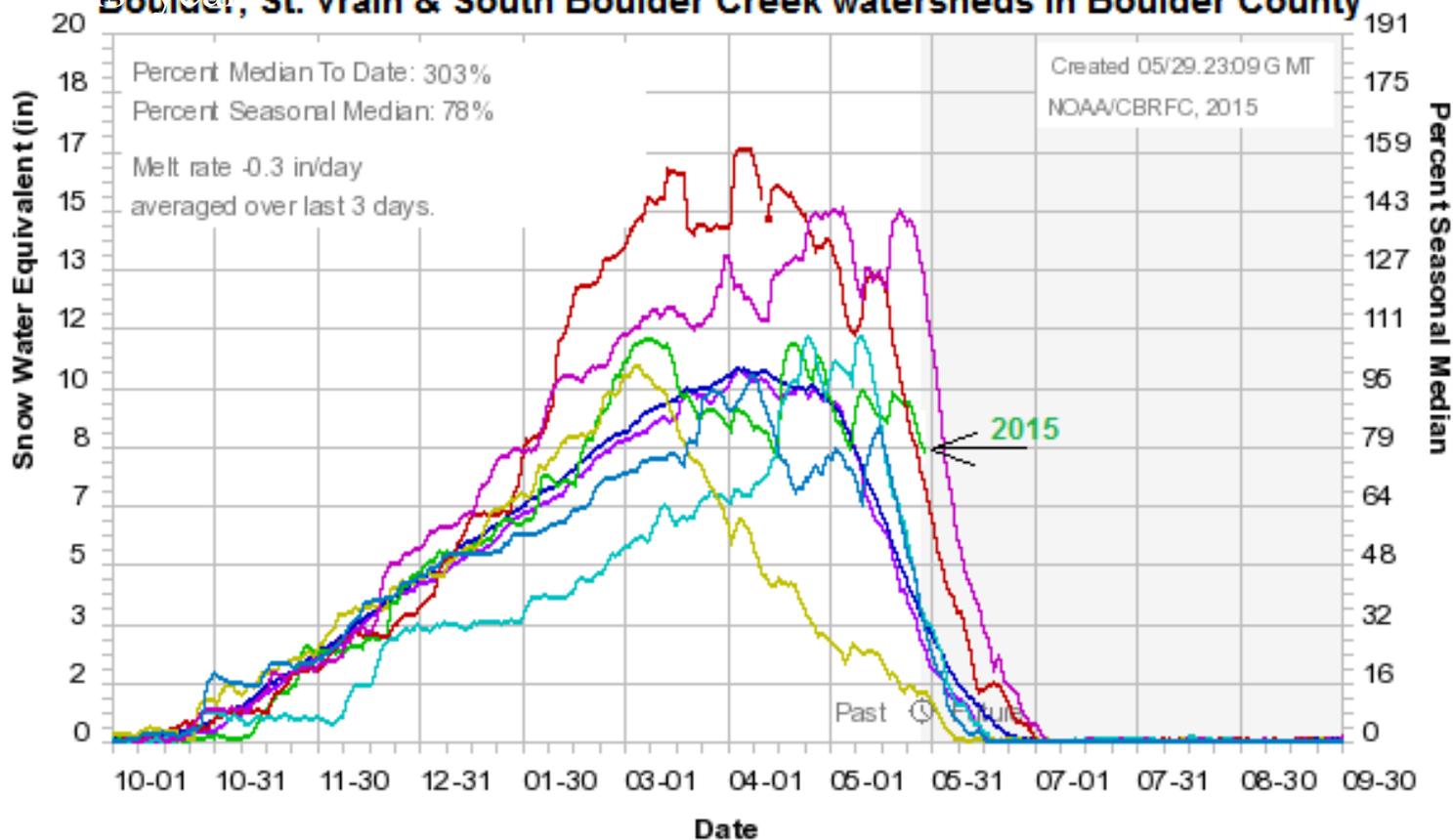
Percent Seasonal Median

Median 1981-2010 Average 1981-2010 2015 2014 2013 2012 2011 2010

The May 29<sup>th</sup>, 2015 mountain snowpack in the Boulder County watersheds is nearly 3 times the normal May 29<sup>th</sup> snowpack, and currently 78% of the average peak snowpack. The mountain snowpack in Boulder did rise above the normal peak snowpack earlier this year.



**Boulder, St. Vrain & South Boulder Creek watersheds in Boulder County**

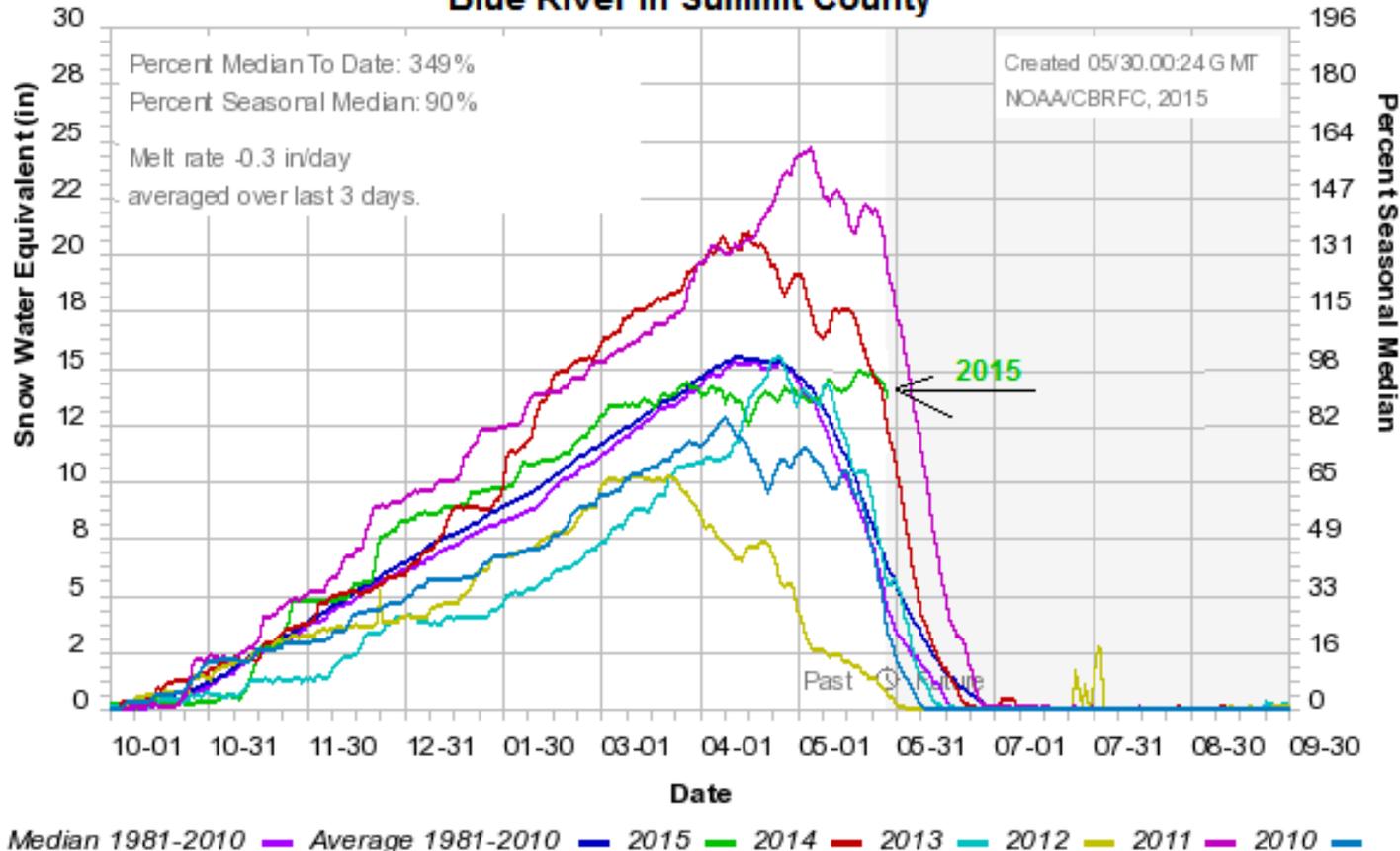


Median 1981-2010 Average 1981-2010 2015 2014 2013 2012 2011 2010

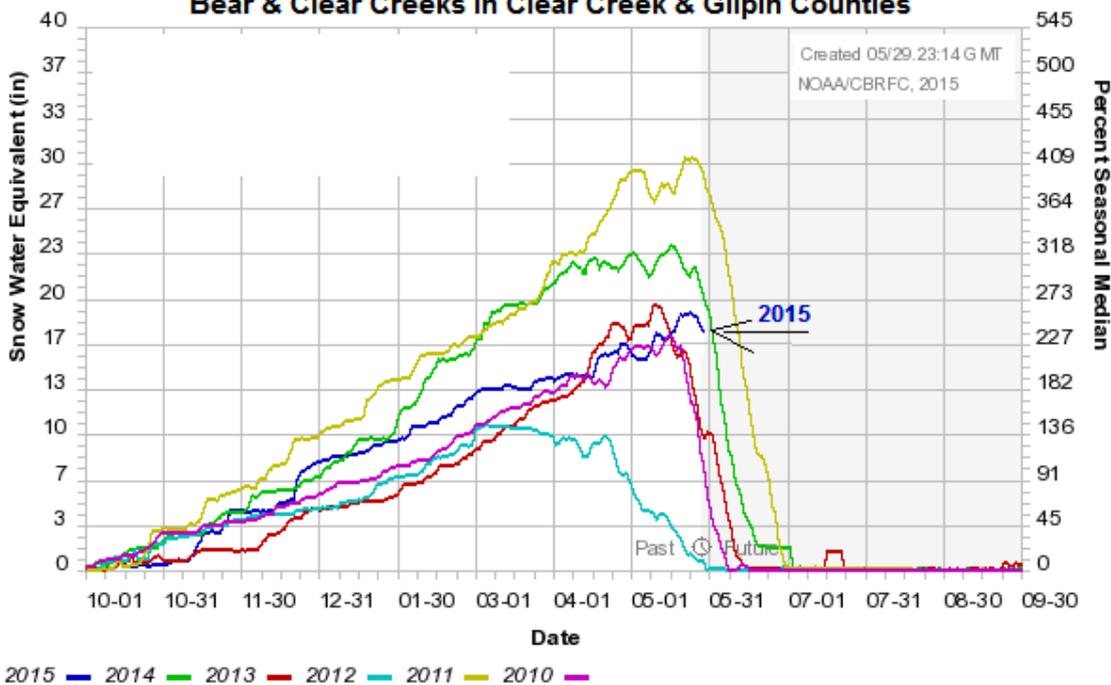
The May 29<sup>th</sup>, 2015 mountain snowpack in Summit County is 3.5 times the normal May 29<sup>th</sup> snowpack, and 90% of the average peak snowpack. It held fairly steady since early February 2015.



### Colorado Basin River Forecast Center Blue River in Summit County



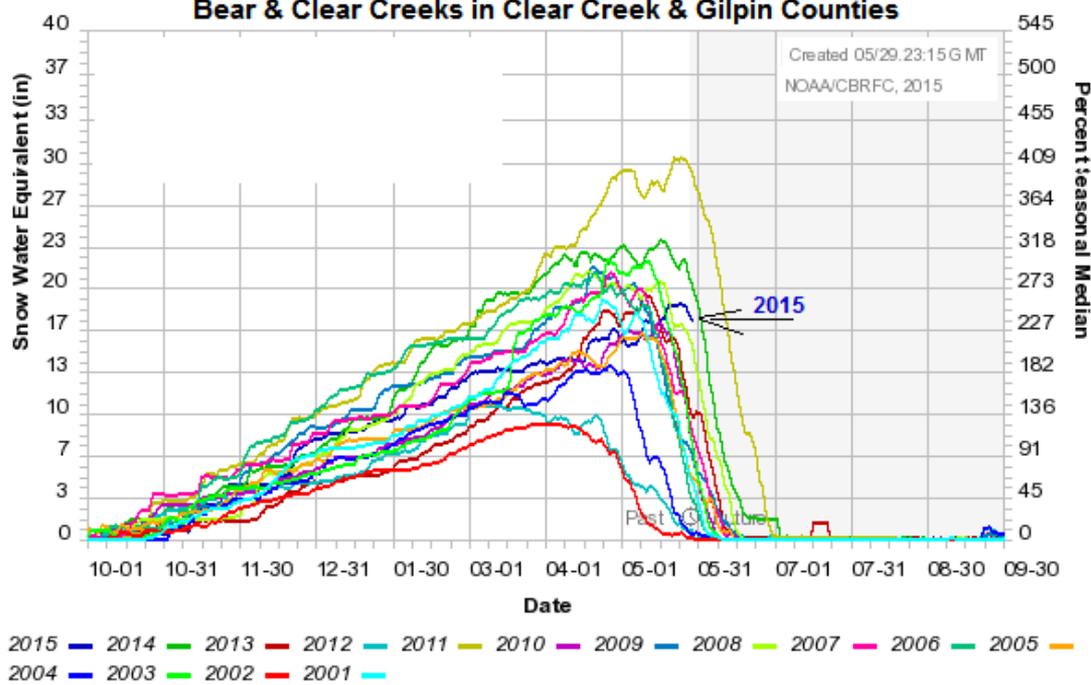
**Bear & Clear Creeks in Clear Creek & Gilpin Counties**



Past 6 years. Normals not available.



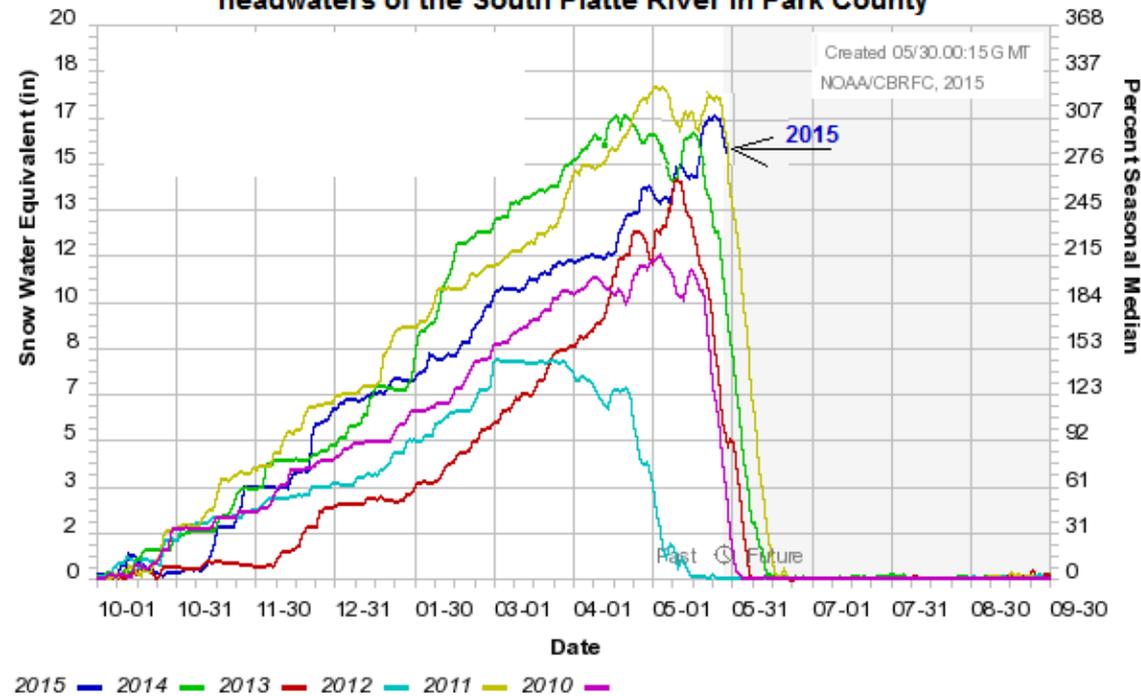
**Bear & Clear Creeks in Clear Creek & Gilpin Counties**



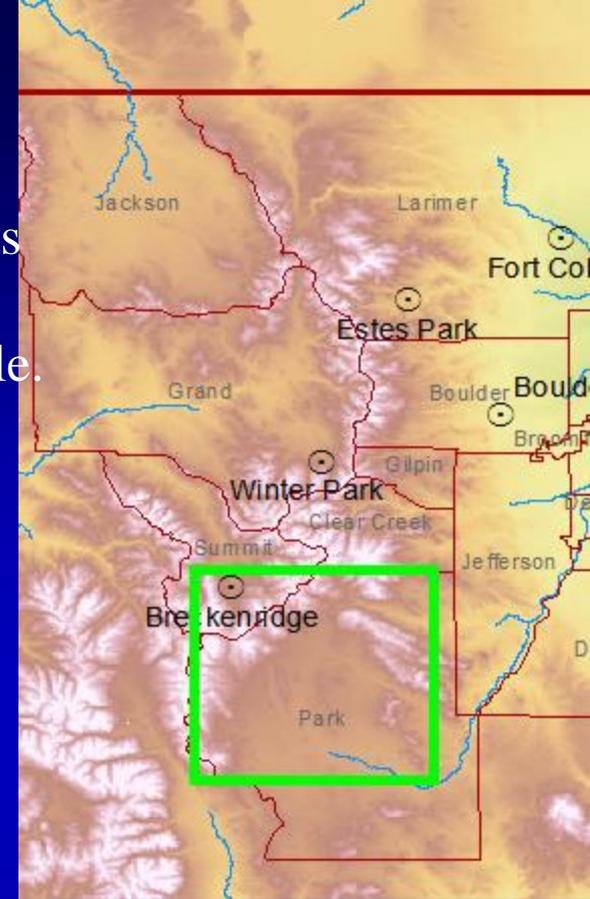
Past 15 years.

Although the 2015 snowpack didn't peak as high as 2014, the May 29<sup>th</sup>, 2015 mountain snowpack in Clear Creek and Gilpin Counties is similar to the May 29<sup>th</sup>, 2014 snowpack.

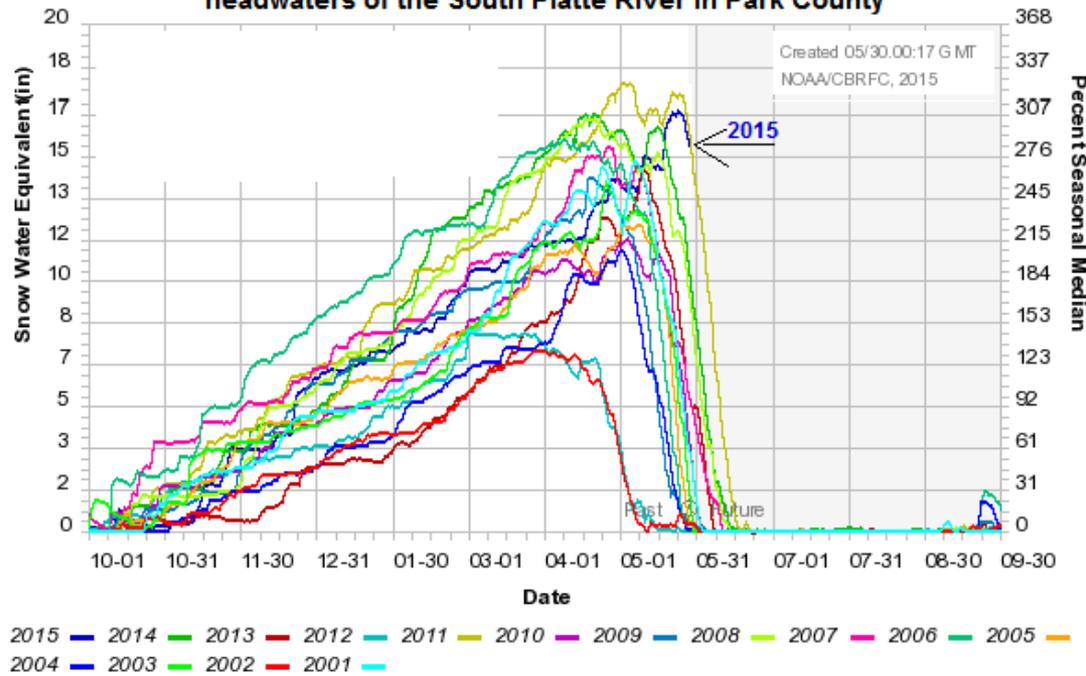
headwaters of the South Platte River in Park County



Past 6 years. Normals not available.



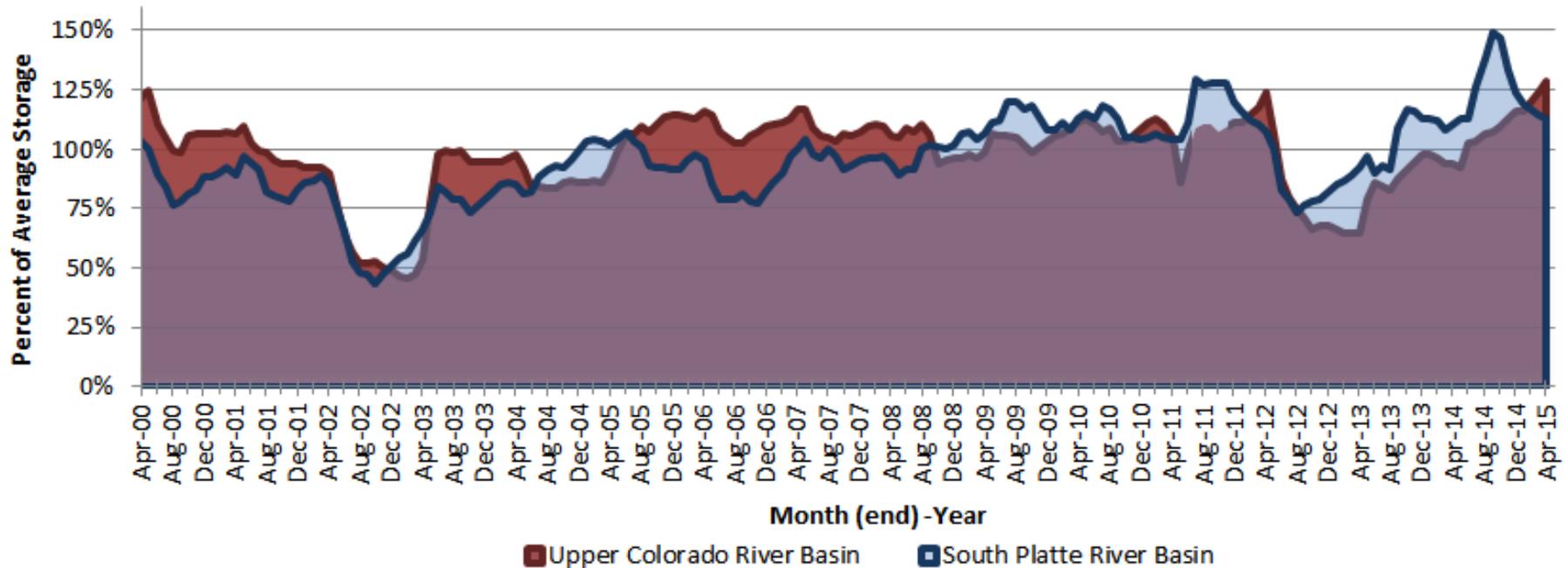
headwaters of the South Platte River in Park County



Past 15 years

The 2015 snowpack at some SNOTEL sites in Park County is up near the 2011 snowpack (which is high).

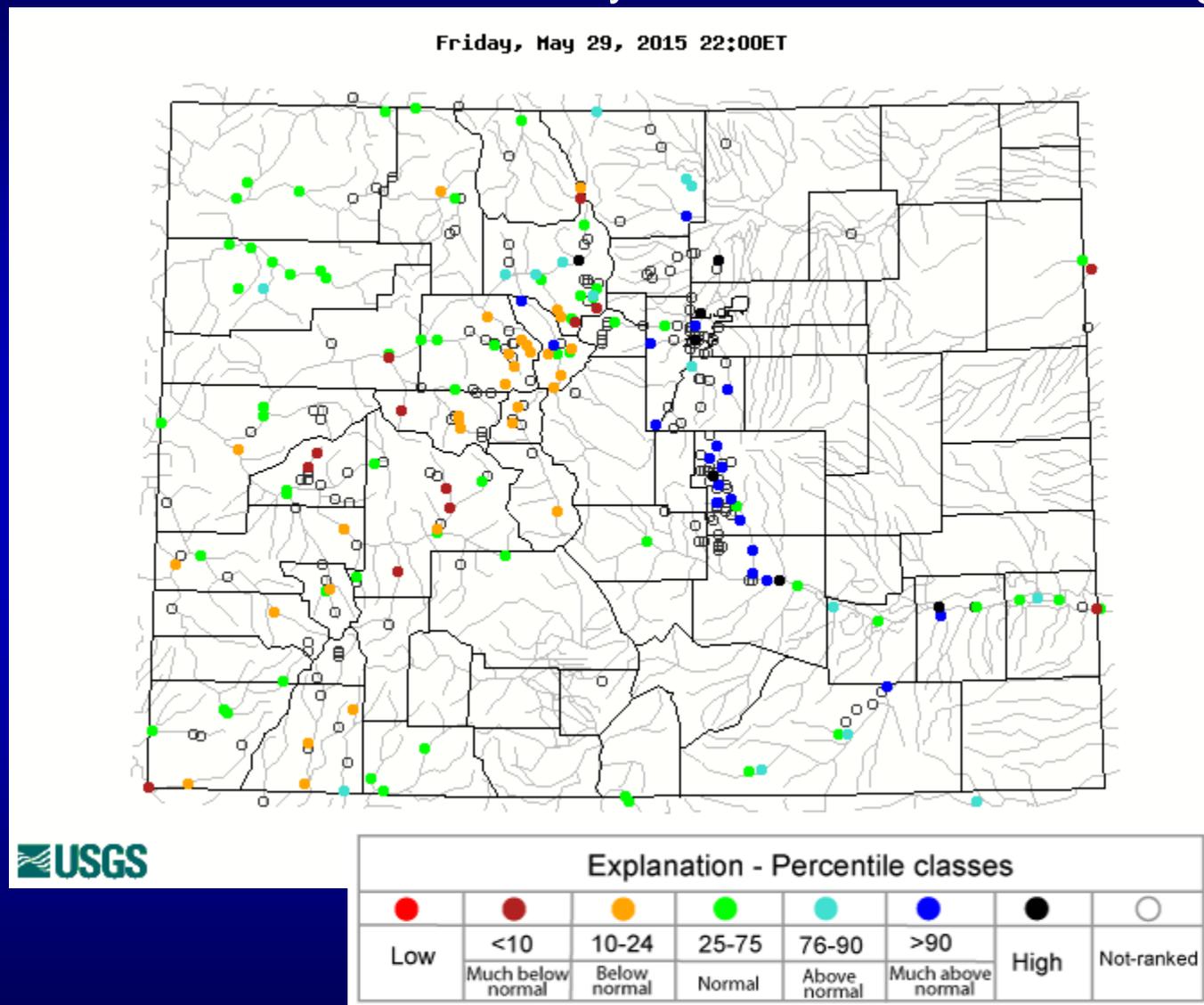
## Combined Reservoir Storage for Basins in North Central and Northeast Colorado April 30, 2000 - April 30, 2015



Combined reservoir storage remained above average in North Central and Northeast Colorado. Storage was 113% of average in the South Platte Basin, and 129% of average in the upper Colorado River Basin at the end of April 2015. However, with all the precipitation in May storage has likely increased since then!

[For an NRCS Reservoir Basin Storage Map of Colorado go to:  
ftp://ftp-fc.sc.egov.usda.gov/CO/Snow/resv/watershed/monthly/resmap.pdf](ftp://ftp-fc.sc.egov.usda.gov/CO/Snow/resv/watershed/monthly/resmap.pdf)

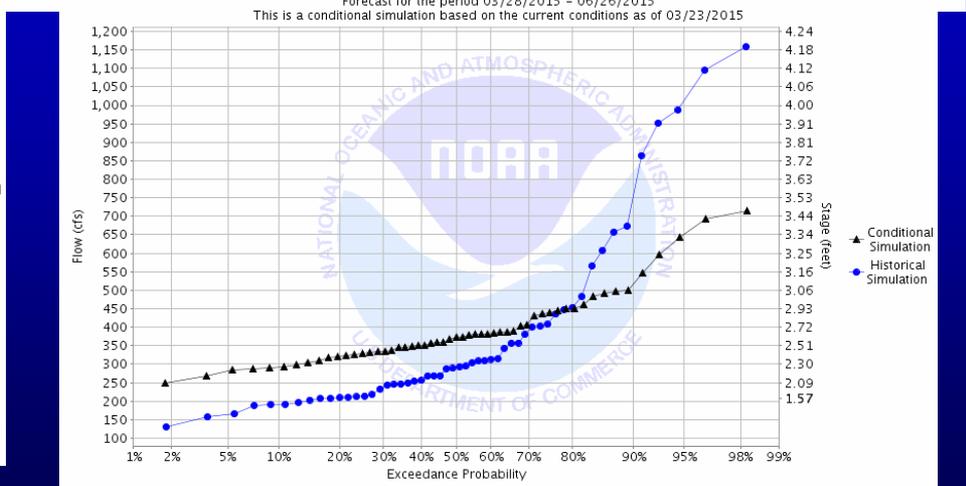
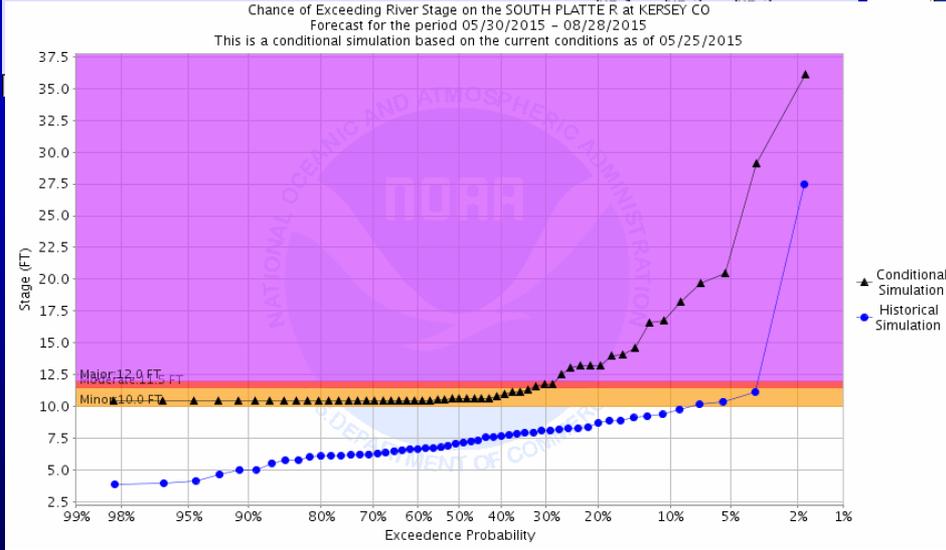
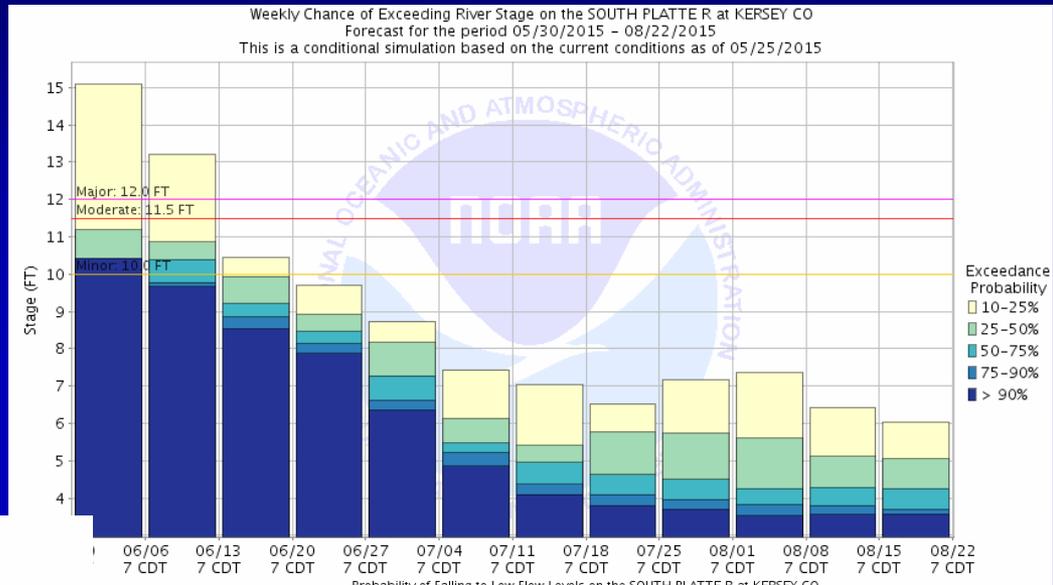
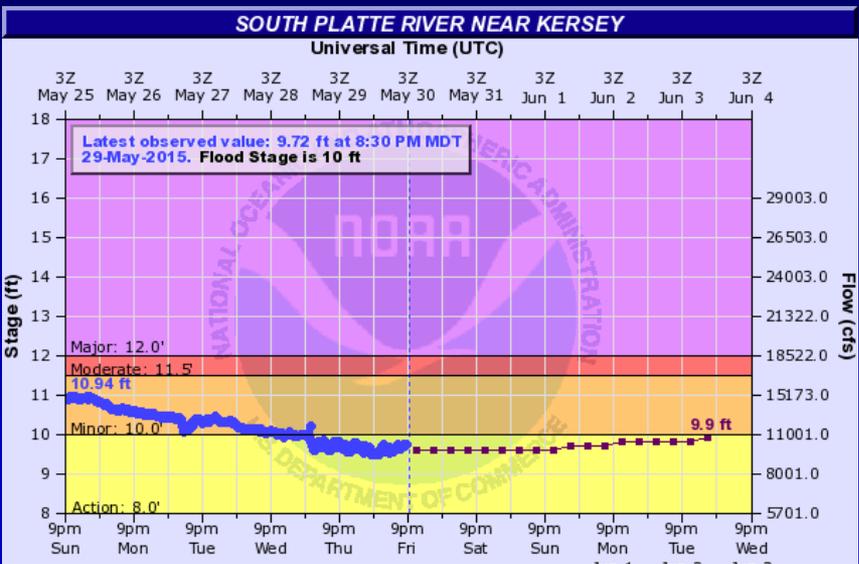
This is a USGS map comparing streamflow to historical streamflow. All the precipitation has led to high stream levels in the South Platte River Basin. Below average flows in the Blue River Basin may be due to the below average May temperatures at the high elevations in Summit County.



USGS WaterWatch is available at: <http://waterwatch.usgs.gov/?m=real&r=co>

River forecasts and probabilistic river outlooks are available for numerous forecast points in AHPS. To view the probabilistic outlooks Just click a forecast point on the AHPS map. Then choose 'Probability Information' above

the



# Snowmelt Flood Potential Outlook

## North Central & Northeast Colorado

Mountain snowmelt alone is not expected to cause significant flooding, but may produce lowland flooding along some streams this June. It should be noted an extended period of moderate to heavy rainfall during snowmelt could produce significant flooding. Also, thunderstorms with heavy rain on top of already high streamflow could also cause more localized issues.

### Some factors that can impact the mountain snowmelt runoff:

- Future rainfall amounts and timing
- Future temperatures impacting how fast the snow melts (freezing and thawing in the mountains)
- Stream levels during the melt
- Soil moisture/groundwater
- Reservoir Storage
- Dry winds
- Dust reducing the albedo of the snow
- Warm rain falling on the snowpack

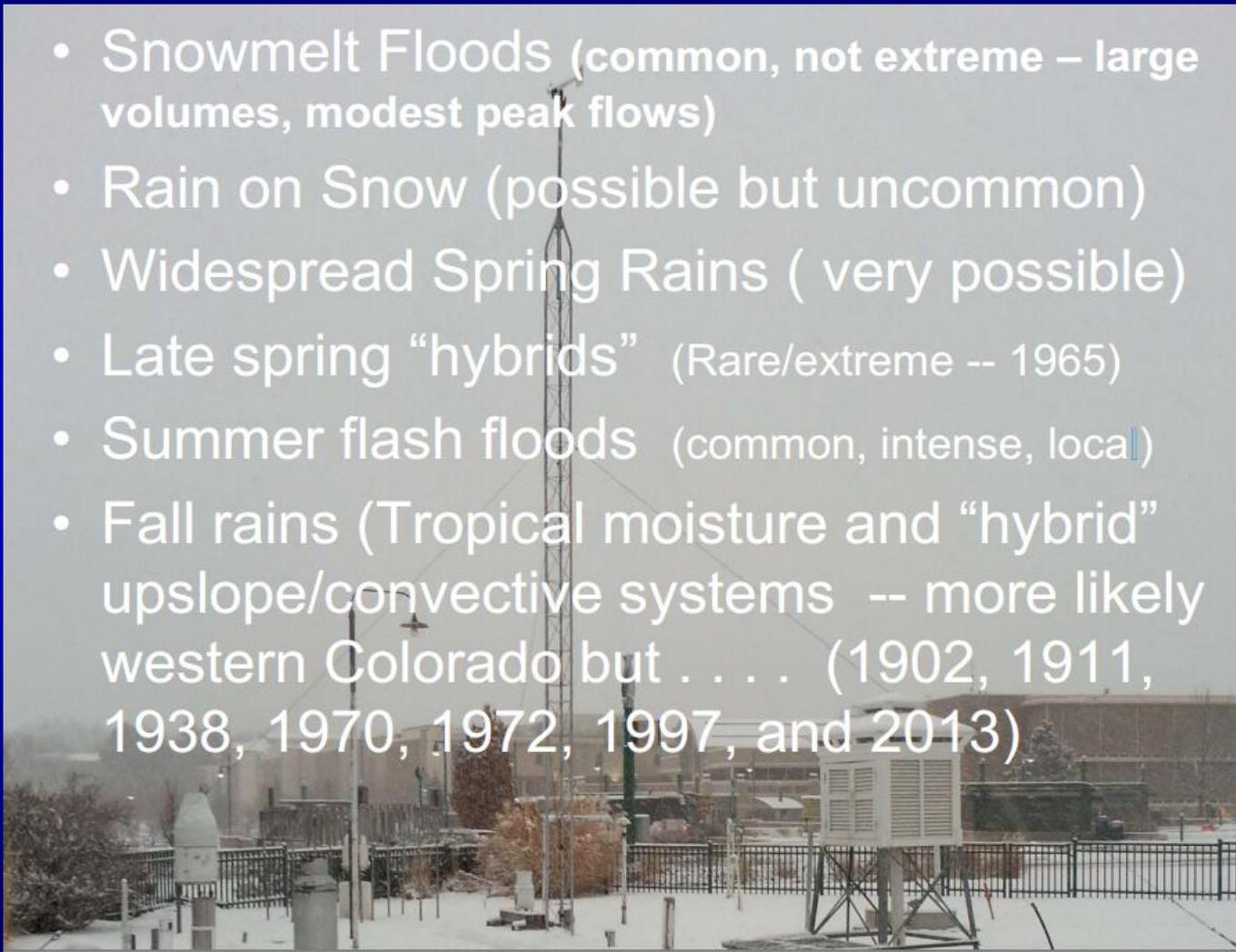
The current snowpack in many watersheds in north central Colorado is unusually high for the end of May, but still below the average peak snowpack. Mountain snowpack in most drainages is also below the snowpack at the end of May 2011. The current snowpack is about where it was at the same time a year ago.

Warmer temperatures will lead to increased snowmelt and cause water levels to rise again, particularly in the headwaters and mountain streams starting the first week of June.

Warmer temperatures alone are not expected to bring the significant rises (like those that occurred due to the May 2015 rainfall). However, widespread and/or extended periods of moderate to heavy rain could cause significant flood issues in the next 2 to 3 weeks. The reason is that numerous reservoirs are full. Streams are already running high, and the snow in the high elevations of the mountains has only just begun to melt out.

Baseflow in streams, groundwater, and reservoir storage are higher than normal currently and during May 2014. The 2011 & 2014 snowmelt runoff seasons were well behaved. How the snowpack melts out and future rainfall will be key again this June.

**“Colorado floods come in several flavors”, is from Nolan Doeskin, Colorado State Climatologist. His slide below presents an overview of flood potential in Colorado.**

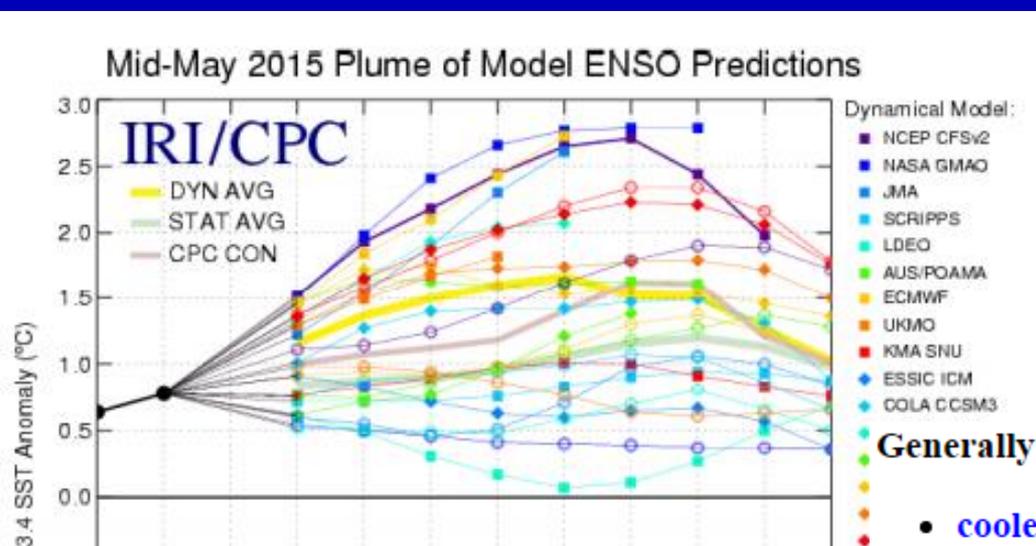


- Snowmelt Floods (common, not extreme – large volumes, modest peak flows)
- Rain on Snow (possible but uncommon)
- Widespread Spring Rains ( very possible)
- Late spring “hybrids” (Rare/extreme -- 1965)
- Summer flash floods (common, intense, local)
- Fall rains (Tropical moisture and “hybrid” upslope/convective systems -- more likely western Colorado but . . . . (1902, 1911, 1938, 1970, 1972, 1997, and 2013)

# What about the rest of the summer?

The Climate Prediction Center is calling for above average precipitation and near to below average temperatures for northeast and north central Colorado this summer.

This is likely influenced by the El Nino conditions. There is a 90% chance that El Nino conditions will continue through this summer, and a greater than 80% chance they will last through 2015. Models generally indicate the El Nino could strengthen, but there is a large amount of spread in the models.

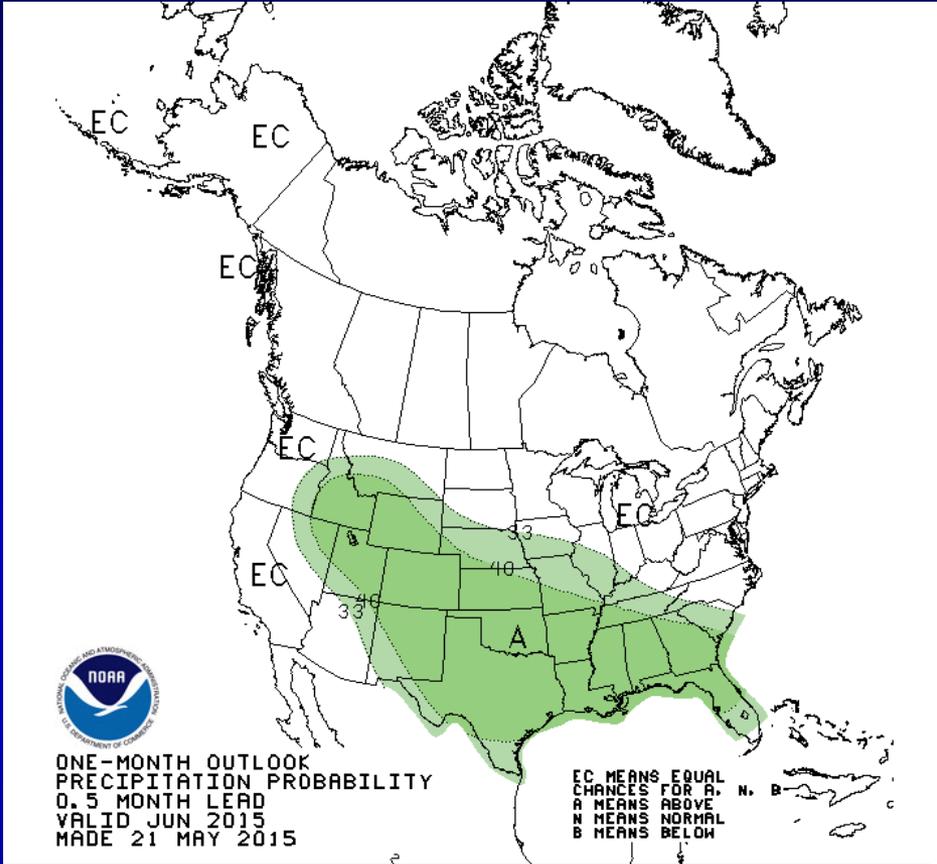


El Nino: +0.5 or higher  
3.4 SST Anomaly. Moderate  
El Nino +1 to +1.4. Strong El  
Nino +1.5 to +1.9.

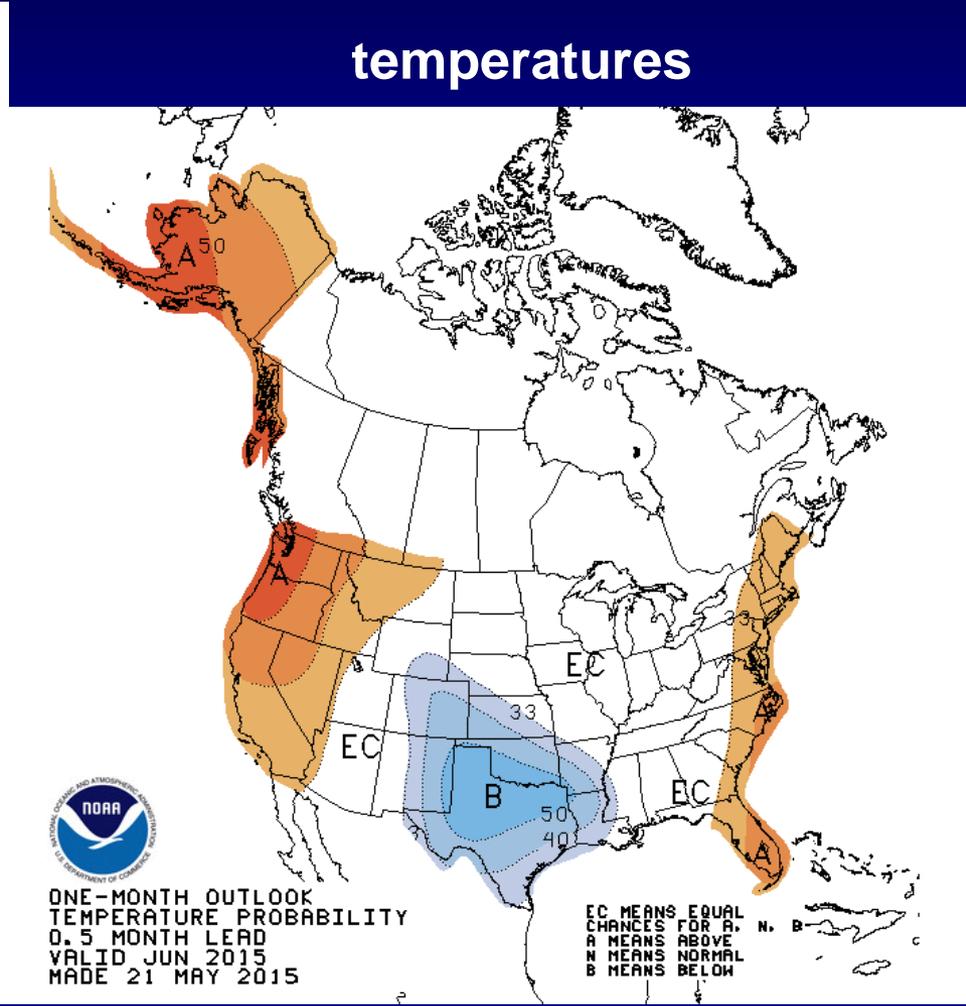
## Generally speaking El Niño brings:

- cooler and wetter weather to the southern United States
- warmer weather to western Canada and southern Alaska
- drier weather to the Pacific Northwest
- cooler weather to northern Canada
- wetter weather to southern California

# Climate Prediction Center Precipitation & Temperature Outlooks for June.



precipitation



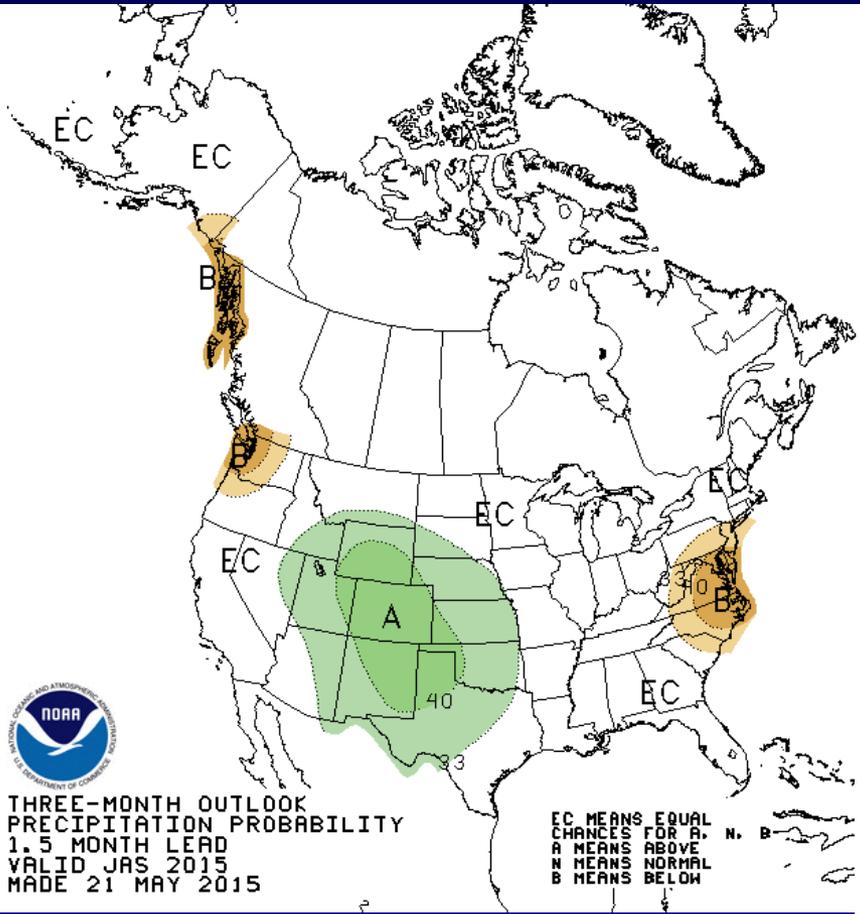
temperatures

CPC Outlooks are available at: <http://www.cpc.ncep.noaa.gov/products/predictions/>

CPC Interactive 8 to 14 Day Outlooks:

<http://www.cpc.ncep.noaa.gov/products/predictions/814day/interactive/index.php>

# Climate Prediction Center Precipitation & Temperature Outlooks for July through September.

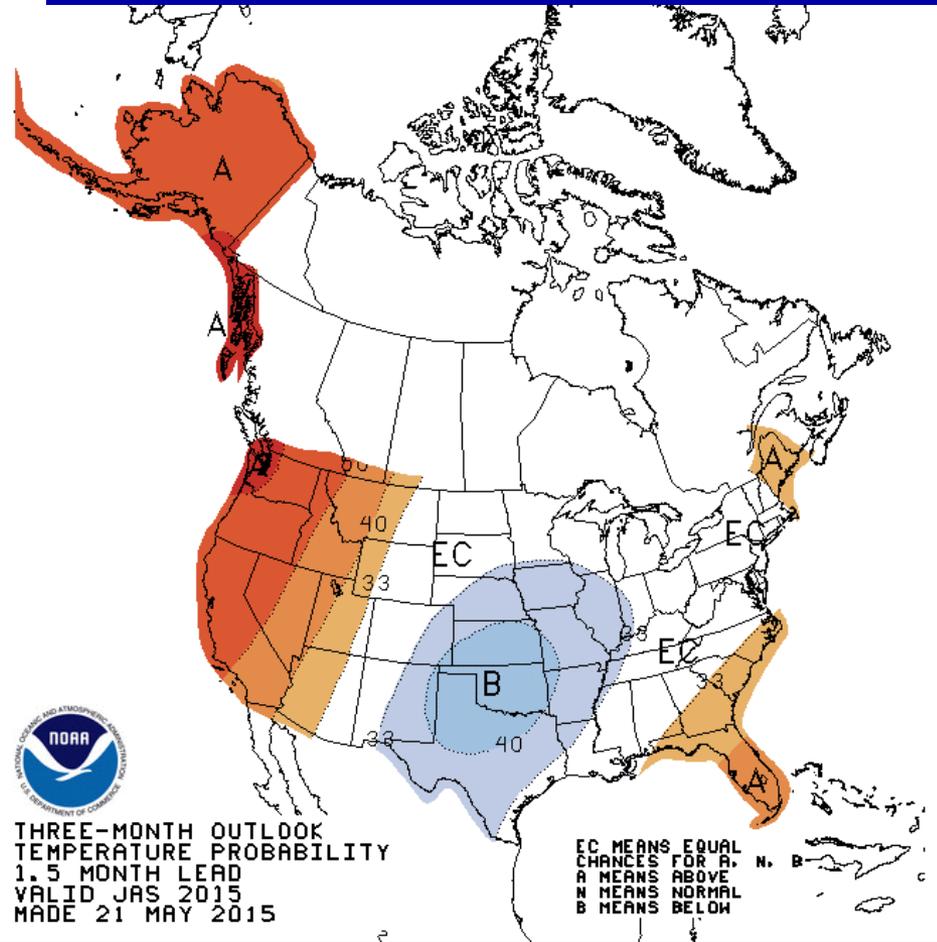


THREE-MONTH OUTLOOK  
 PRECIPITATION PROBABILITY  
 1.5 MONTH LEAD  
 VALID JAS 2015  
 MADE 21 MAY 2015

EC MEANS EQUAL CHANCES FOR A, N, B  
 A MEANS ABOVE  
 N MEANS NORMAL  
 B MEANS BELOW

precipitation

# temperatures

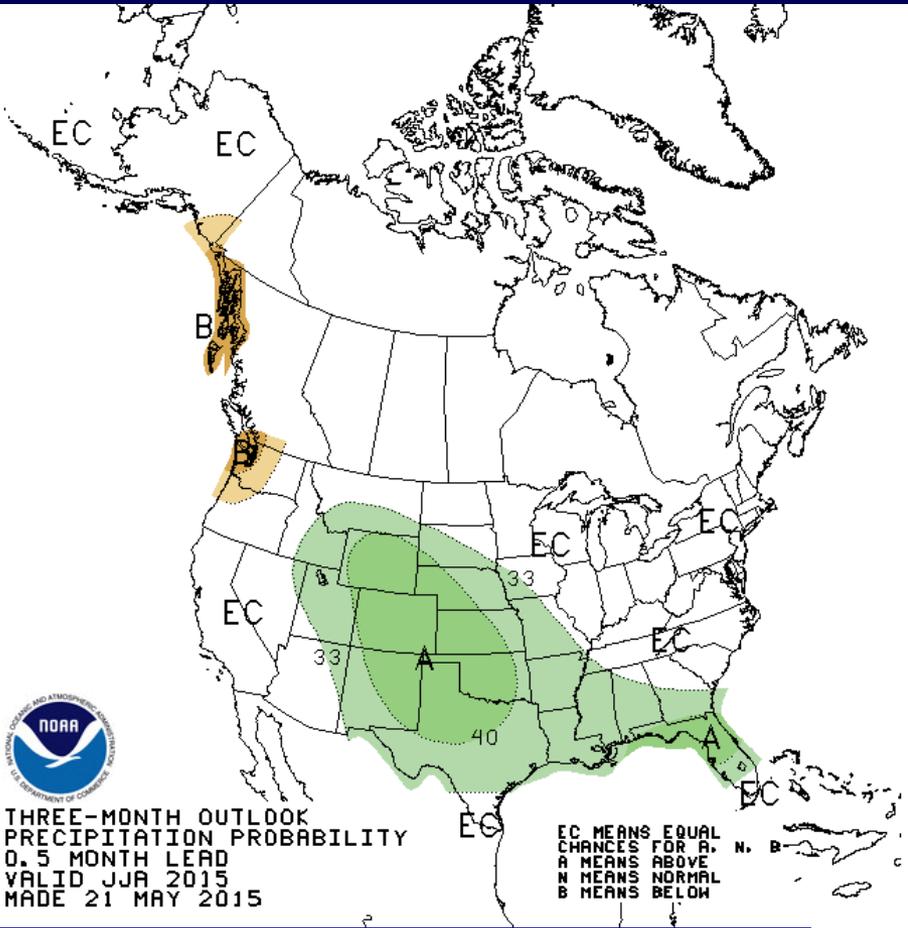


THREE-MONTH OUTLOOK  
 TEMPERATURE PROBABILITY  
 1.5 MONTH LEAD  
 VALID JAS 2015  
 MADE 21 MAY 2015

EC MEANS EQUAL CHANCES FOR A, N, B  
 A MEANS ABOVE  
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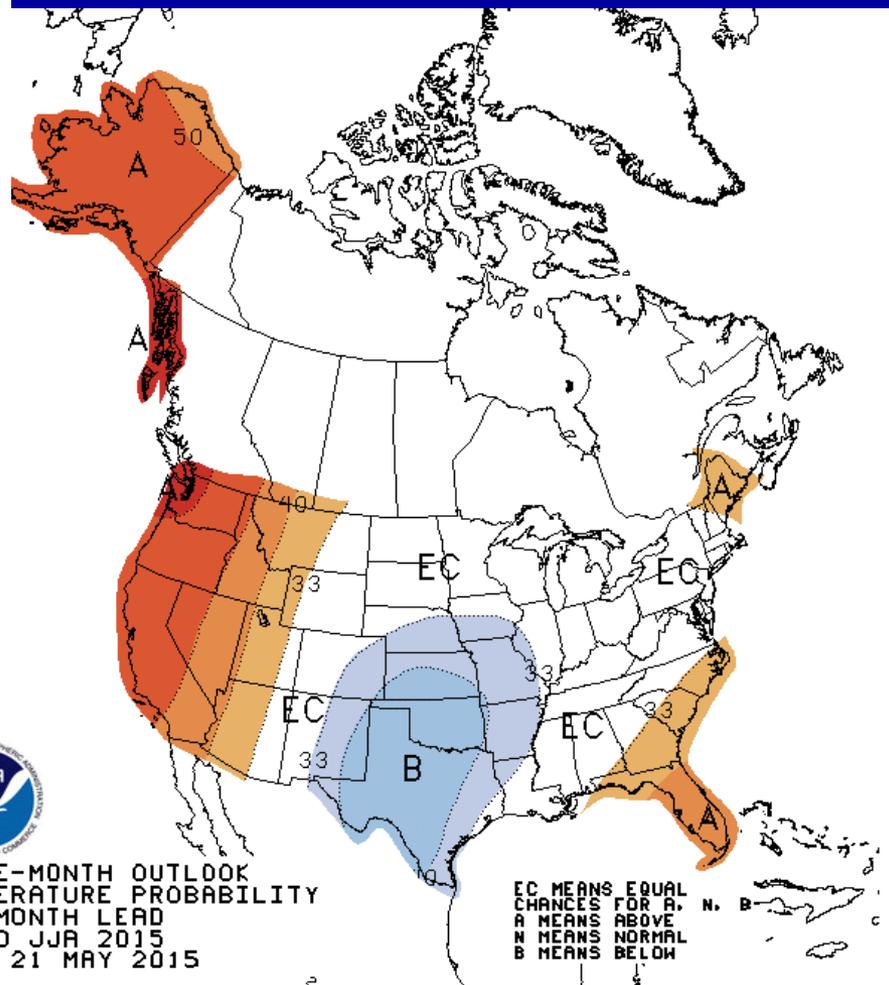
# Climate Prediction Center Precipitation & Temperature Outlooks for June through August.

temperatures



THREE-MONTH OUTLOOK  
PRECIPITATION PROBABILITY  
0.5 MONTH LEAD  
VALID JJA 2015  
MADE 21 MAY 2015

precipitation



THREE-MONTH OUTLOOK  
TEMPERATURE PROBABILITY  
0.5 MONTH LEAD  
VALID JJA 2015  
MADE 21 MAY 2015

## Don't wait, be prepared for flooding:

- Create a Communications Plan - It is important to be able to communicate with your family and friends in the event of a disaster. Whether it is having a specific person identified to contact for status updates or a safe location to meet up with family members, having a plan in place will give you peace of mind if disaster does strike.
- Prepare your Family & Pets – Planning can help you and your family evacuate faster. Also, have a plan for your pets so you won't be delayed in the danger zone. Don't wait until the last moment to gather the essentials for yourself, your family and/or your pets.
- Plan to Go to a Safe Location – Identify locations located at higher ground in case of flooding. Know more than one way to get to your safe locations on foot if necessary.
- Assemble an Emergency Kit - It is good practice to have enough food, water and medicine on hand at all times to last you at least 3 days in the case of an emergency. Water service may be interrupted or unsafe to drink and food requiring little cooking and no refrigeration may be needed if electric power is interrupted. You should also have batteries, blankets, flashlights, first aid kit, rubber boots, rubber gloves, and a NOAA Weather Radio or other battery operated radio easily available.