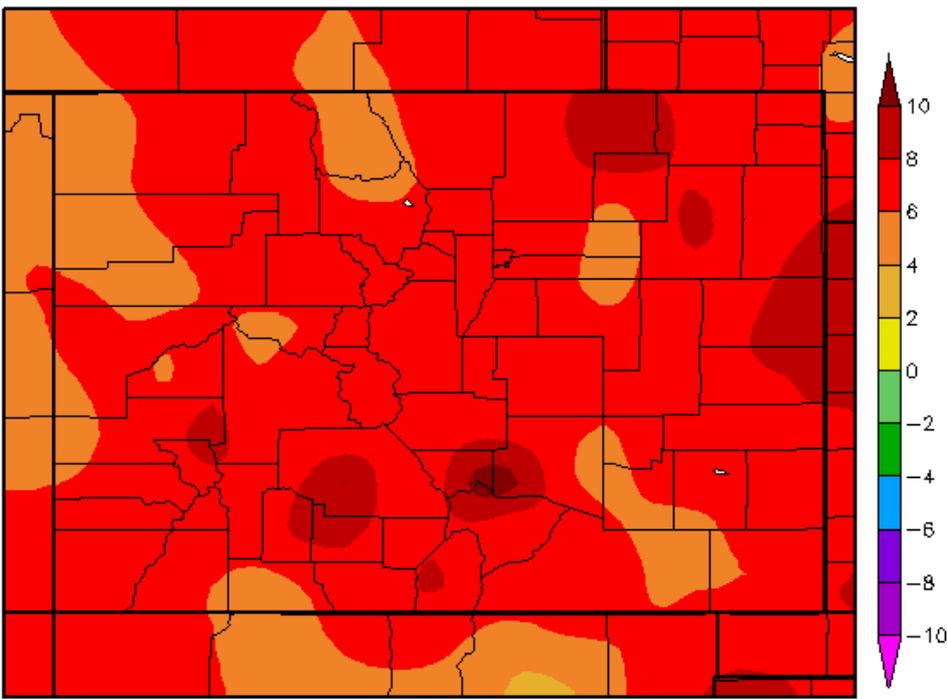


Spring Snowmelt and Water Supply Outlook
North Central & Northeast Colorado
April 10, 2015

Late winter and early spring temperatures have been well above average In Colorado.

Departure from Normal Temperature (F)
3/11/2015 - 4/9/2015



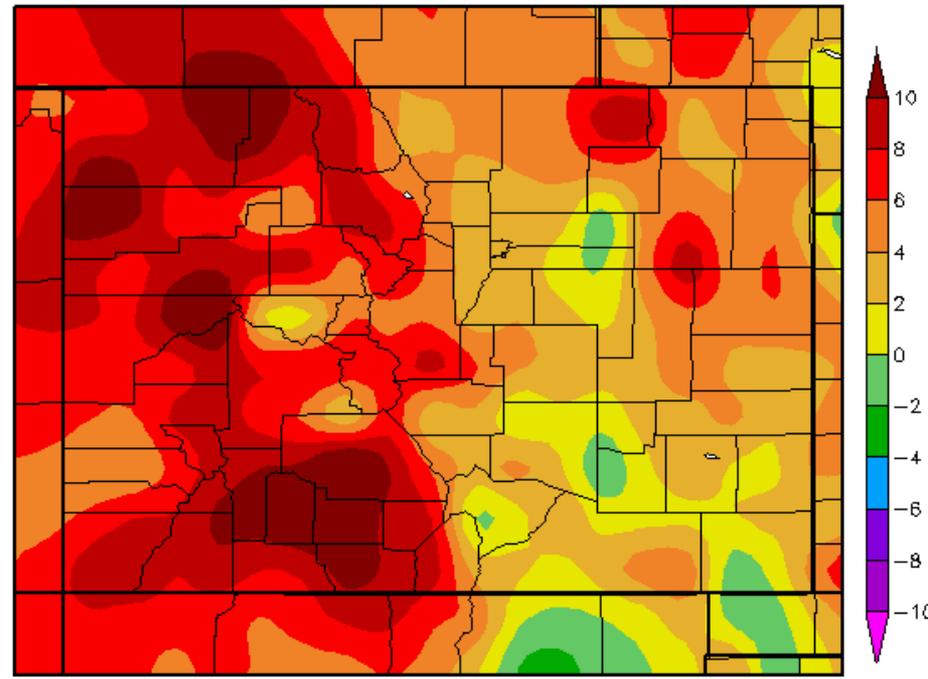
High Plains Regional Climate Center
Generated 4/10/2015 at HPRCC using provisional data.

Past 60 days were well above average especially west of the Continental Divide. →

These HPRCC maps show temperature departures from normal in degrees.

← The past 30 days have been above average across Colorado.

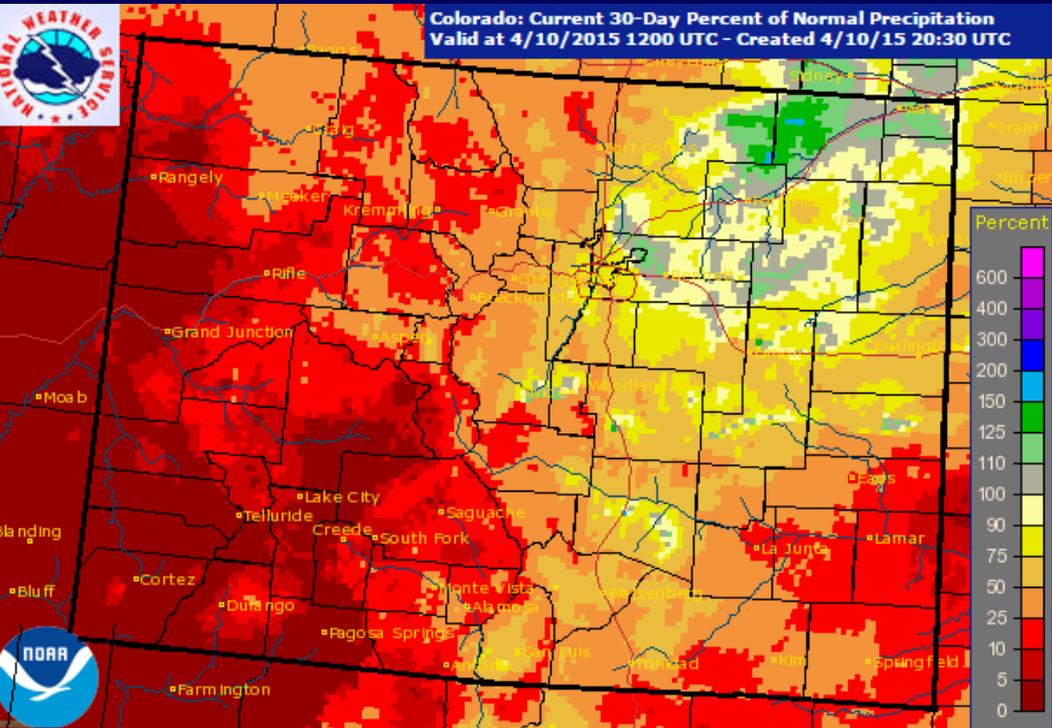
Departure from Normal Temperature (F)
.2/9/2015 - 4/9/2015



High Plains Regional Climate Center
Generated 4/10/2015 at HPRCC using provisional data.

For additional Regional Climate Center climate maps go to:
http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=30d

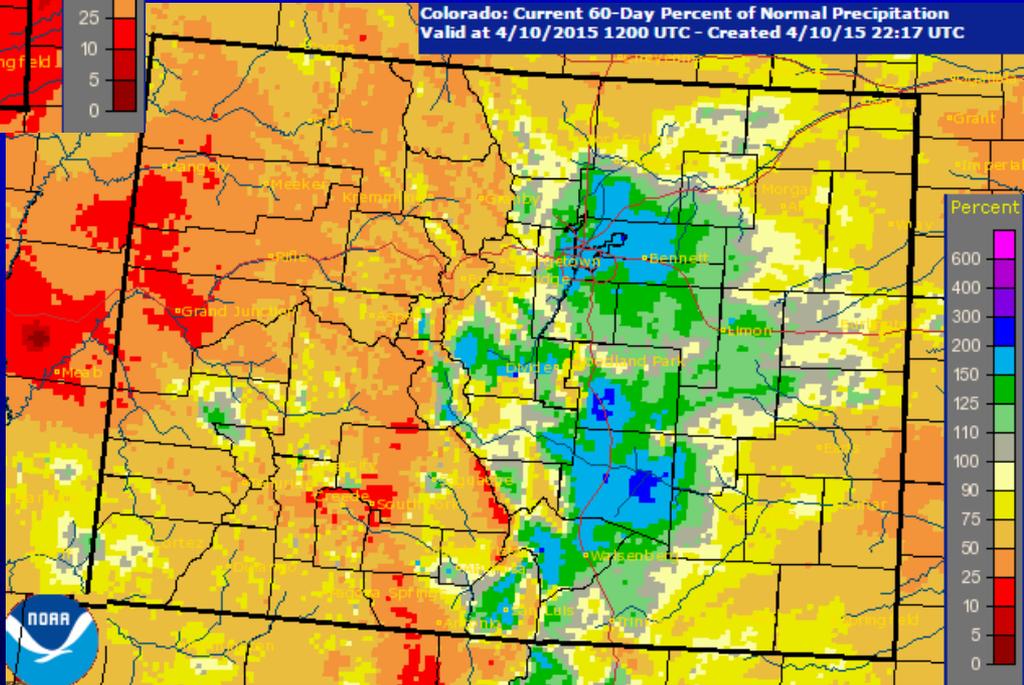
Precipitation the past couple months has been below average west of the Continental Divide and variable east of the Divide.



These NWS maps depict the % of average precipitation.

← Past 30 days have been below average across most of Colorado.

past 60 days map below

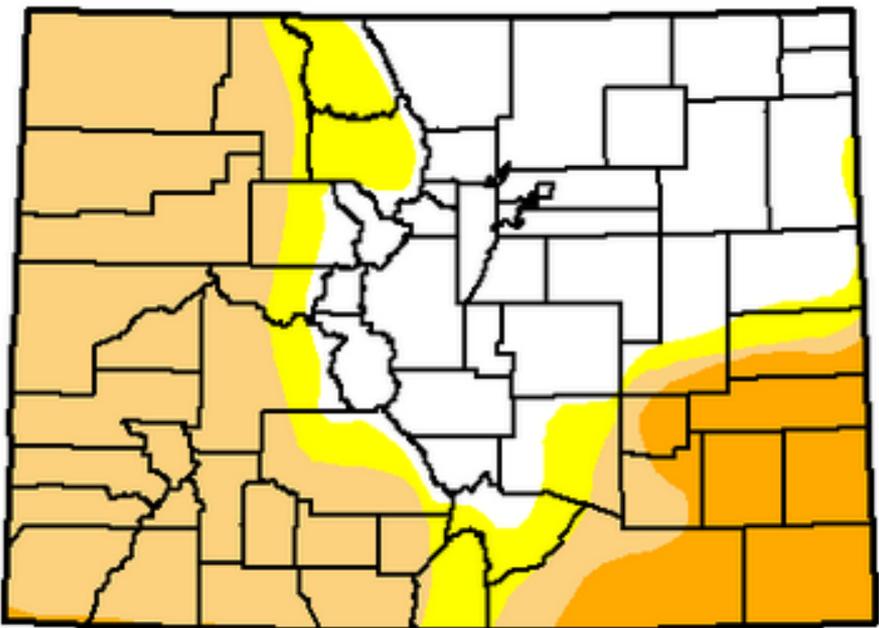


March is traditionally the snowiest month of the year for many NC Colorado mountain locations. However, mountain snowpack has held steady or declined instead.

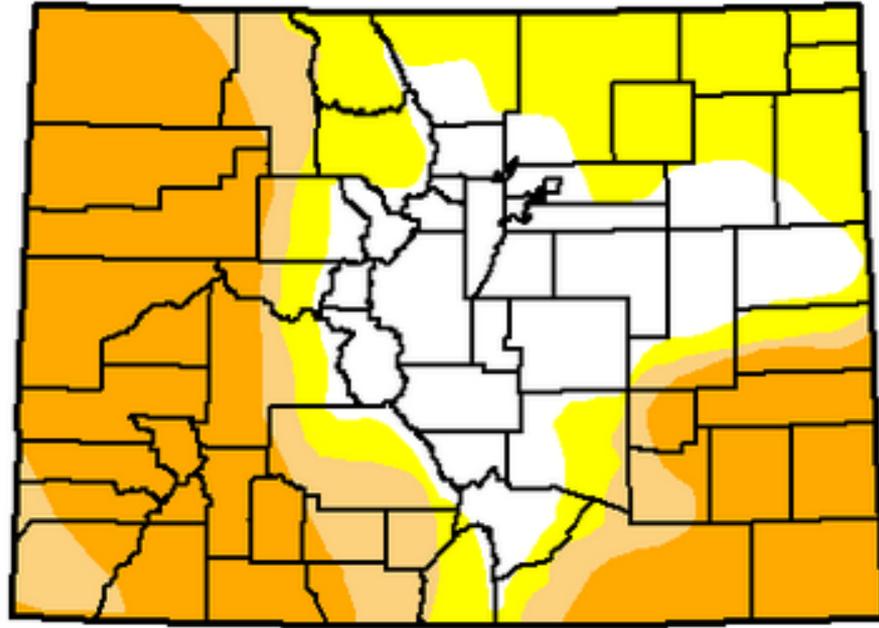
National Weather Service precipitation analysis website:
water.weather.gov/precip/

This is the latest U.S. Drought Monitor compared to a month ago. Abnormally Dry Conditions (D0) have increased on the northeast plains and Severe Drought (D2) has spread across the western third of Colorado.

U.S. Drought Monitor Colorado



March 10, 2015



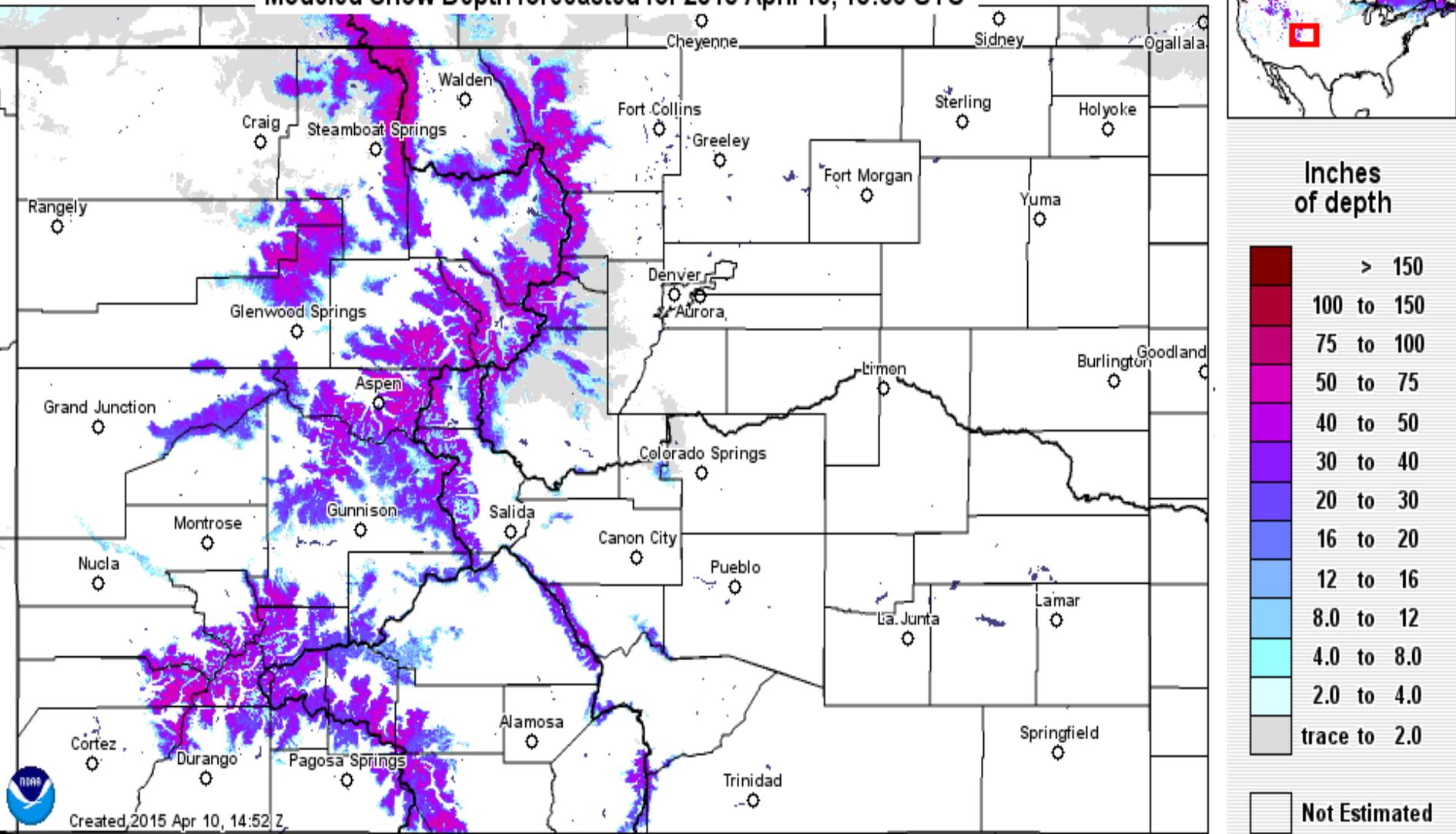
April 7, 2015

- Intensity:*
- D0 Abnormally Dry
 - D1 Moderate Drought
 - D2 Severe Drought
 - D3 Extreme Drought
 - D4 Exceptional Drought

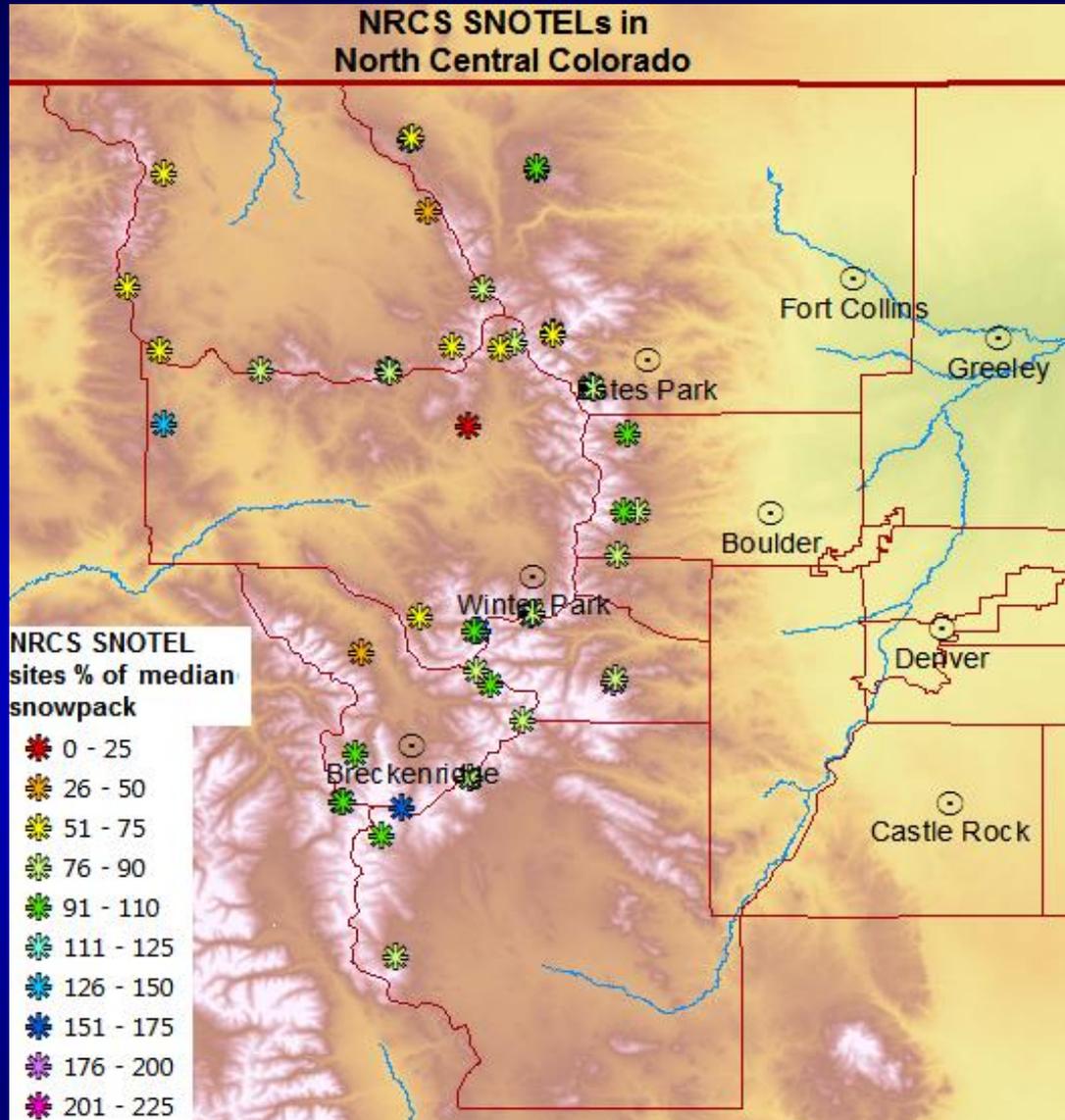
The U.S. Drought Monitor is available at: <http://droughtmonitor.unl.edu/>

Colorado Modeled Snow Depths in inches

National Operational Hydrologic Remote Sensing Center
Modeled Snow Depth forecasted for 2015 April 10, 15:00 UTC



North Central Colorado Mountain Snowpack



The different colors depict the % of median snowpack at NRCS SNOTEL sites.

[Links to additional Colorado snow map & graph links :](http://www.weather.gov/bou/co_snowpack)

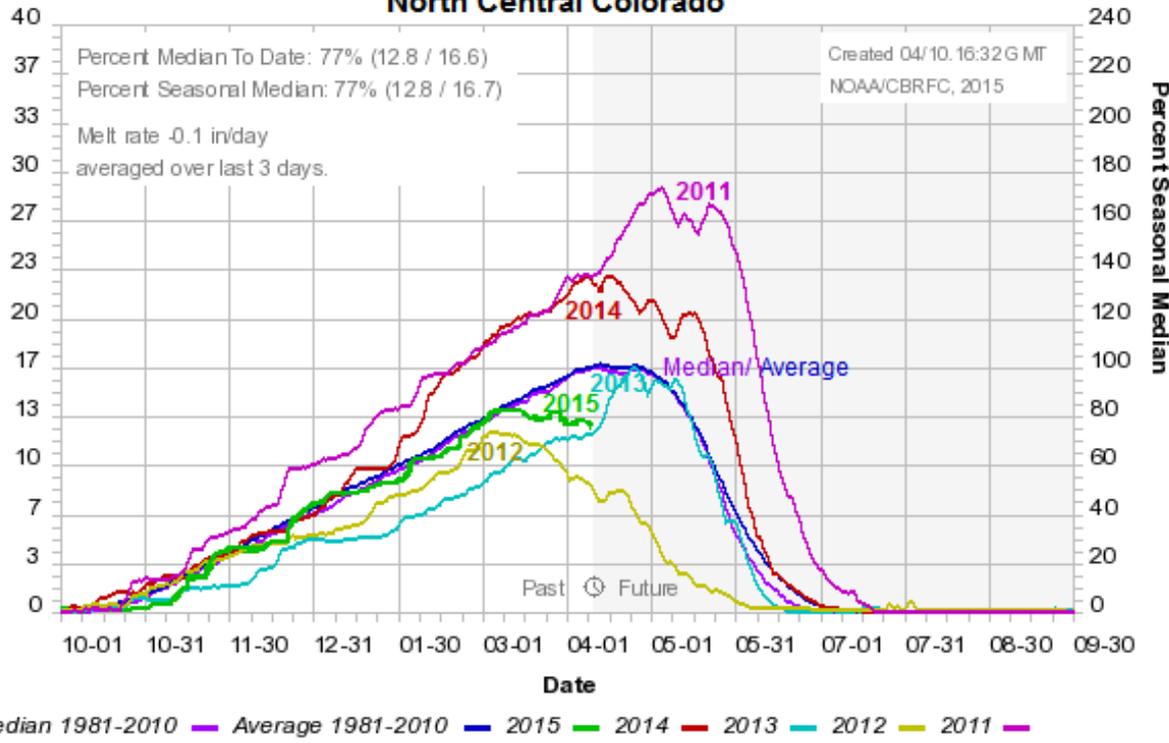
http://www.weather.gov/bou/co_snowpack

Mountain Snowpack Time Series Graph through April 10th, 2015 (each line is a year of mountain snowpack)

This graph shows how the current season compares to recent year in North Central Colorado. The green line is the current water year. The blue/purple lines represent the median/average.

The snowpack in the high country is only around 77% of normal. Last year the snowpack in the same area was over 130% of normal.

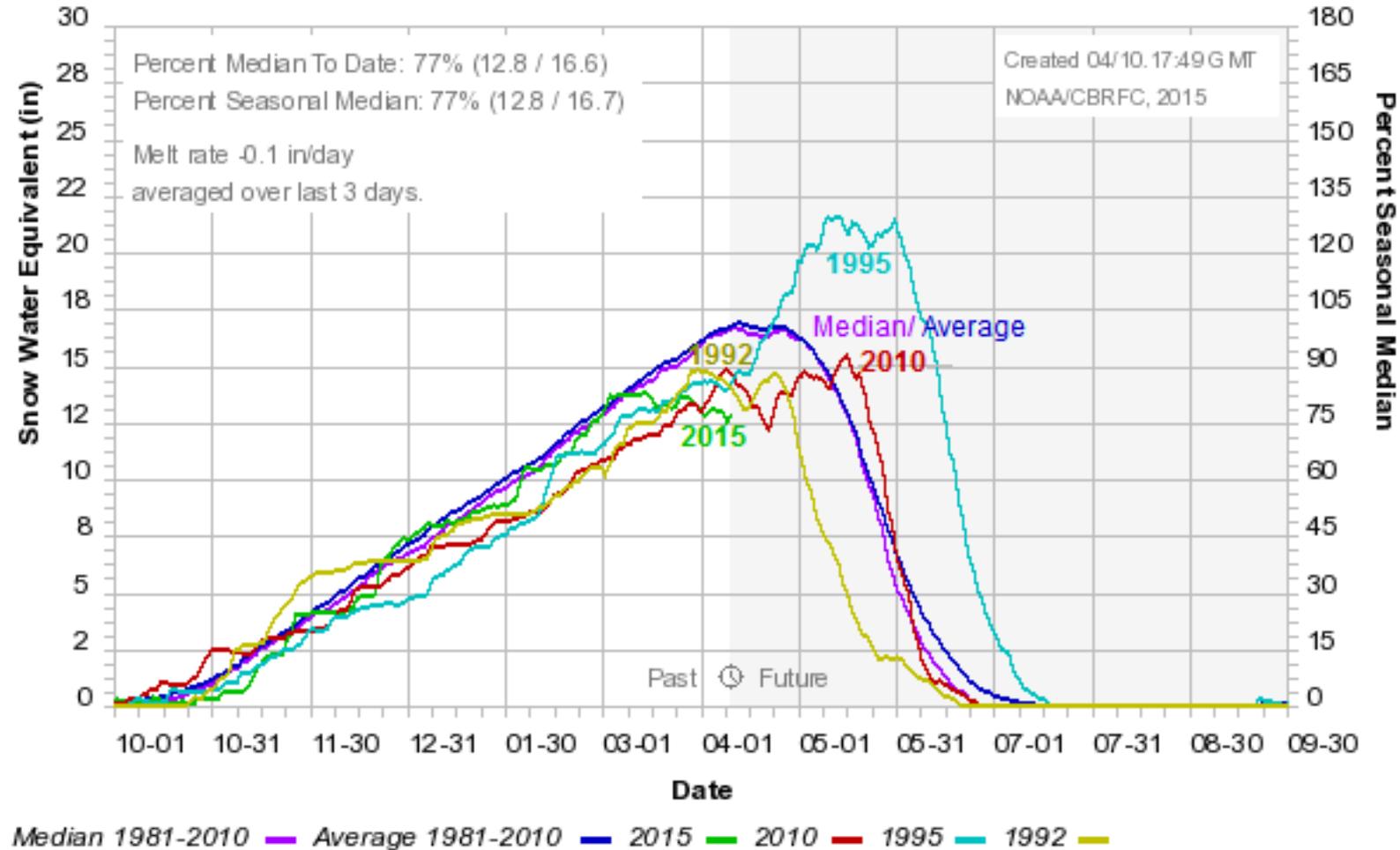
Colorado Basin River Forecast Center North Central Colorado



[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_0633](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/snow/products/?cid=nrcs144p2_0633)

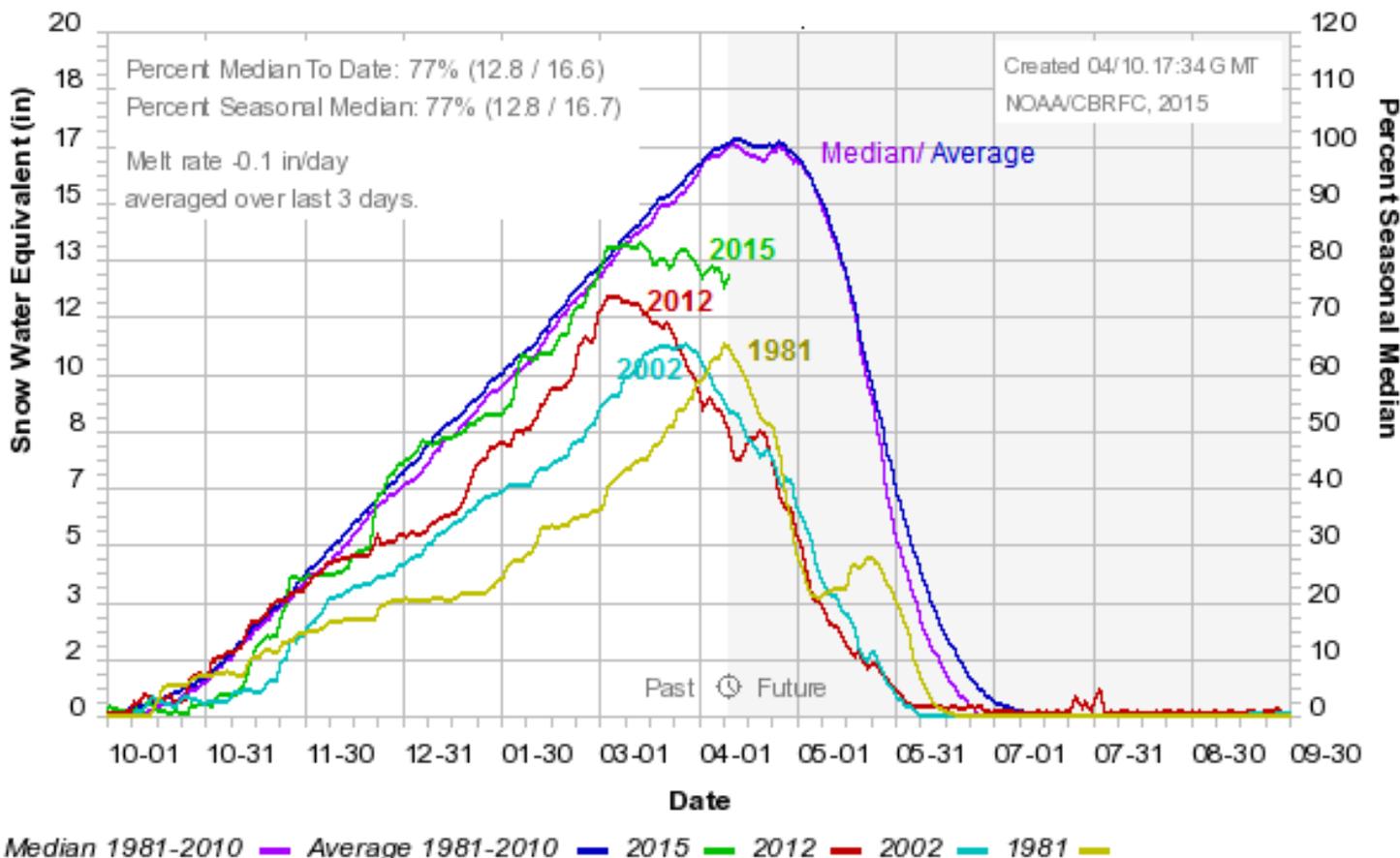
Colorado Basin River Forecast Center North Central Colorado



This graph shows some years that had similar April 1st snowpack to the 2015 water year. Except for this year the snowpack during those years continued to trend upward in April.

North Central Colorado 2015 snowpack is greater than the snow starved years of 1981, 2002, and 2012.

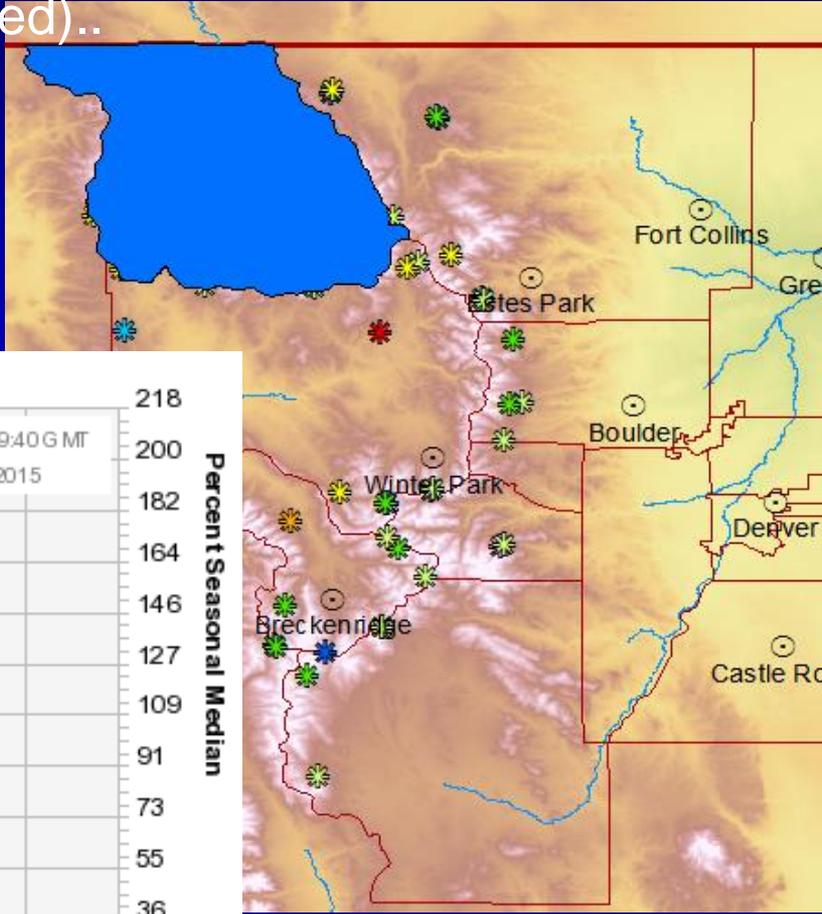
Colorado Basin River Forecast Center North Central Colorado



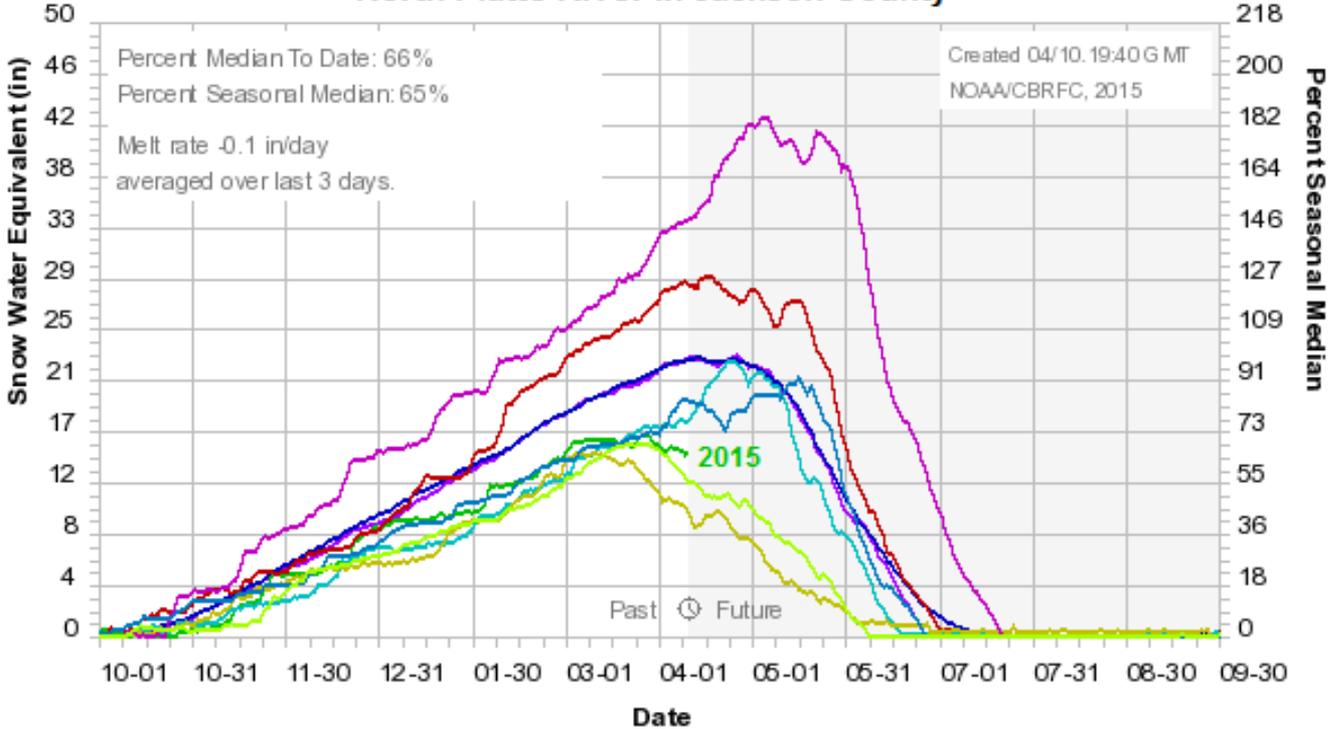
Historically, North Central Colorado has accumulated over 90% of its snowpack by the second week in April.

According to Brian Domonkos at the NRCS Colorado Snow Survey Program “While late season snowstorms large enough to provide the kind of moisture we need in the mountains of Colorado are possible, they are not probable at this point”.

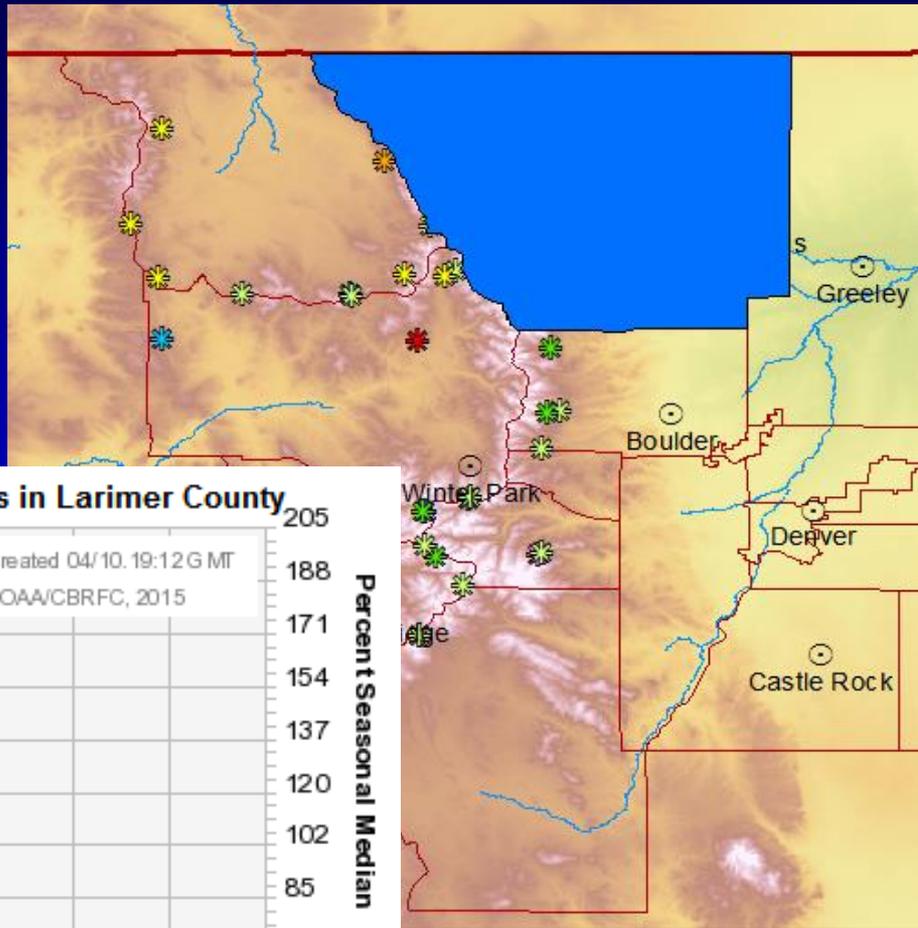
The following time-series graphs show sub-basin SNOTEL snowpack. (Graphs east of the Divide may not include data for all NRCS SNOTEL sites. Average/median data was not available for the last 2 time series graphs so an additional graph of the past 15 years was added)..



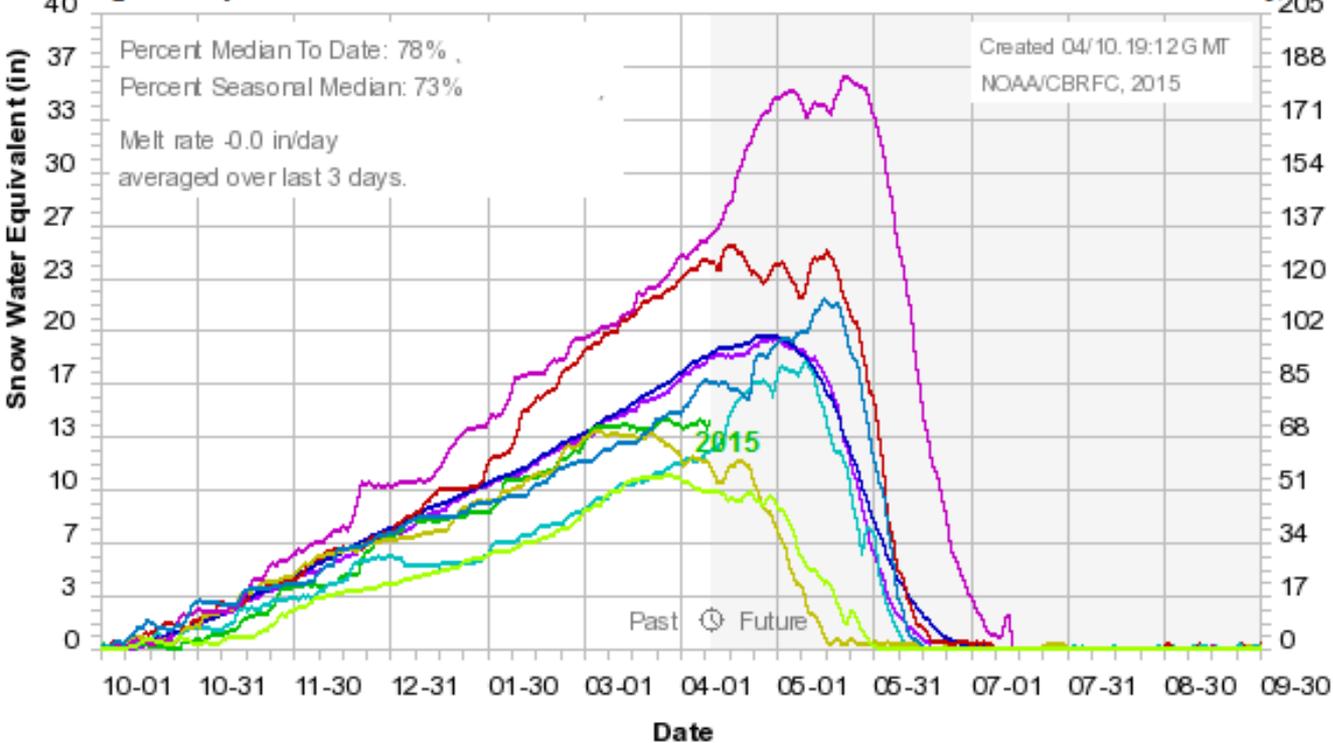
North Platte River in Jackson County



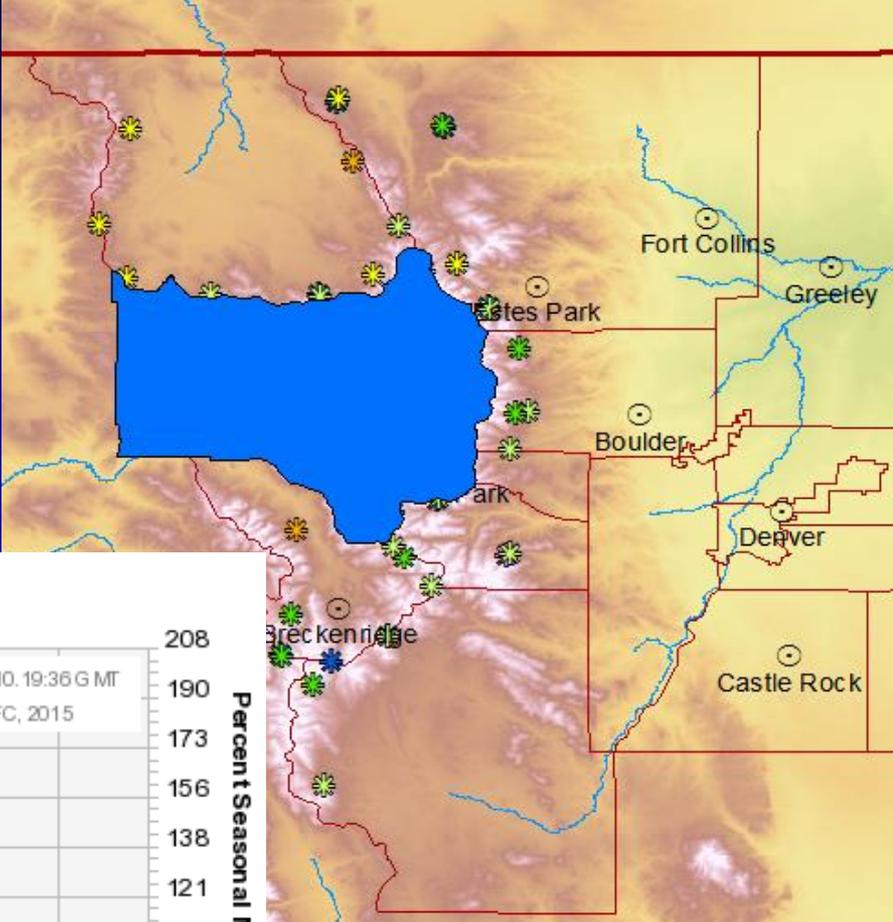
Median 1981-2010 Average 1981-2010 2015 2014 2013 2012 2011 2010 2002



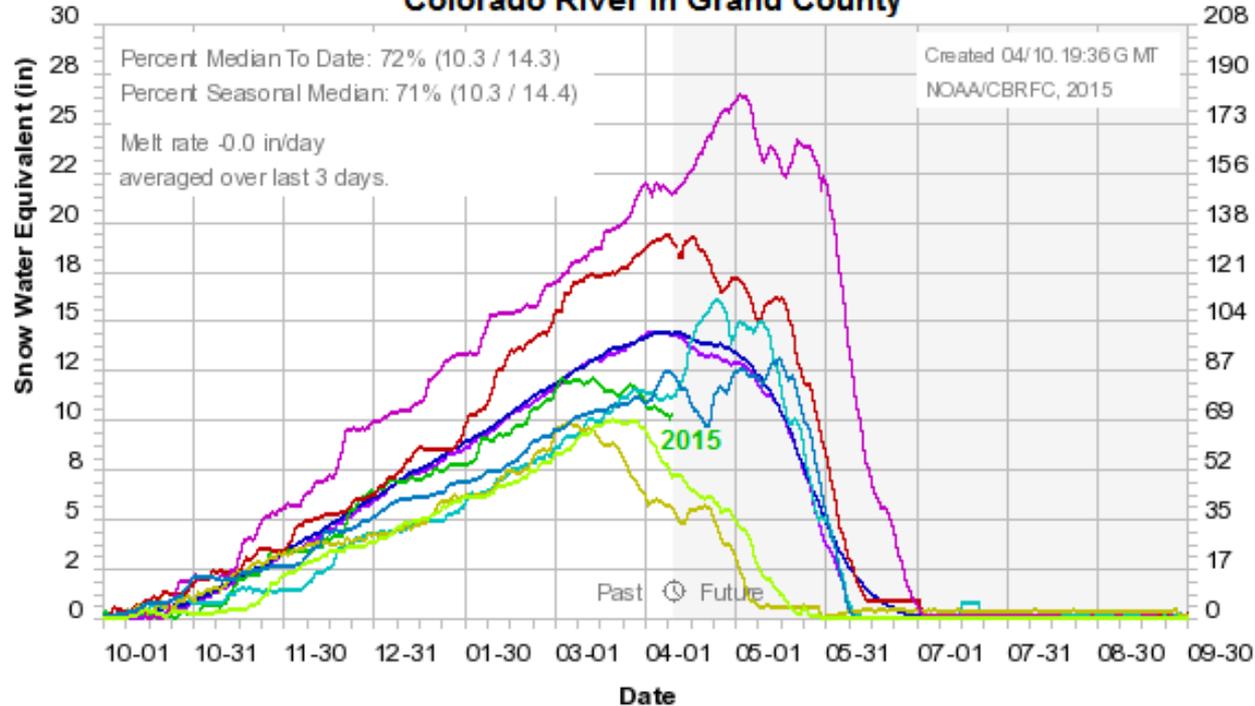
Big Thompson, Cache La Poudre & Laramie River Watersheds in Larimer County



Median 1981-2010 Average 1981-2010 2015 2014 2013 2012 2011 2010 2002

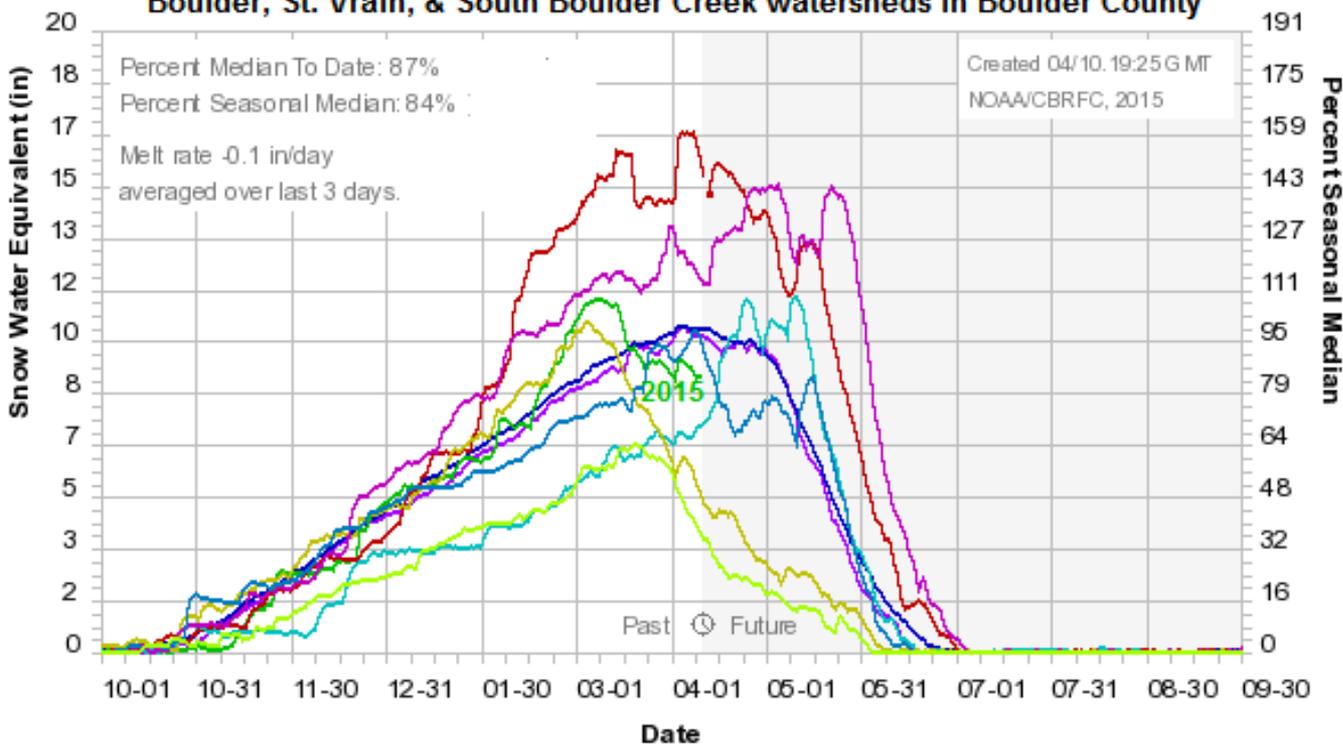


Colorado Basin River Forecast Center Colorado River in Grand County



Median 1981-2010 — Average 1981-2010 — 2015 — 2014 — 2013 — 2012 — 2011 — 2010 — 2002

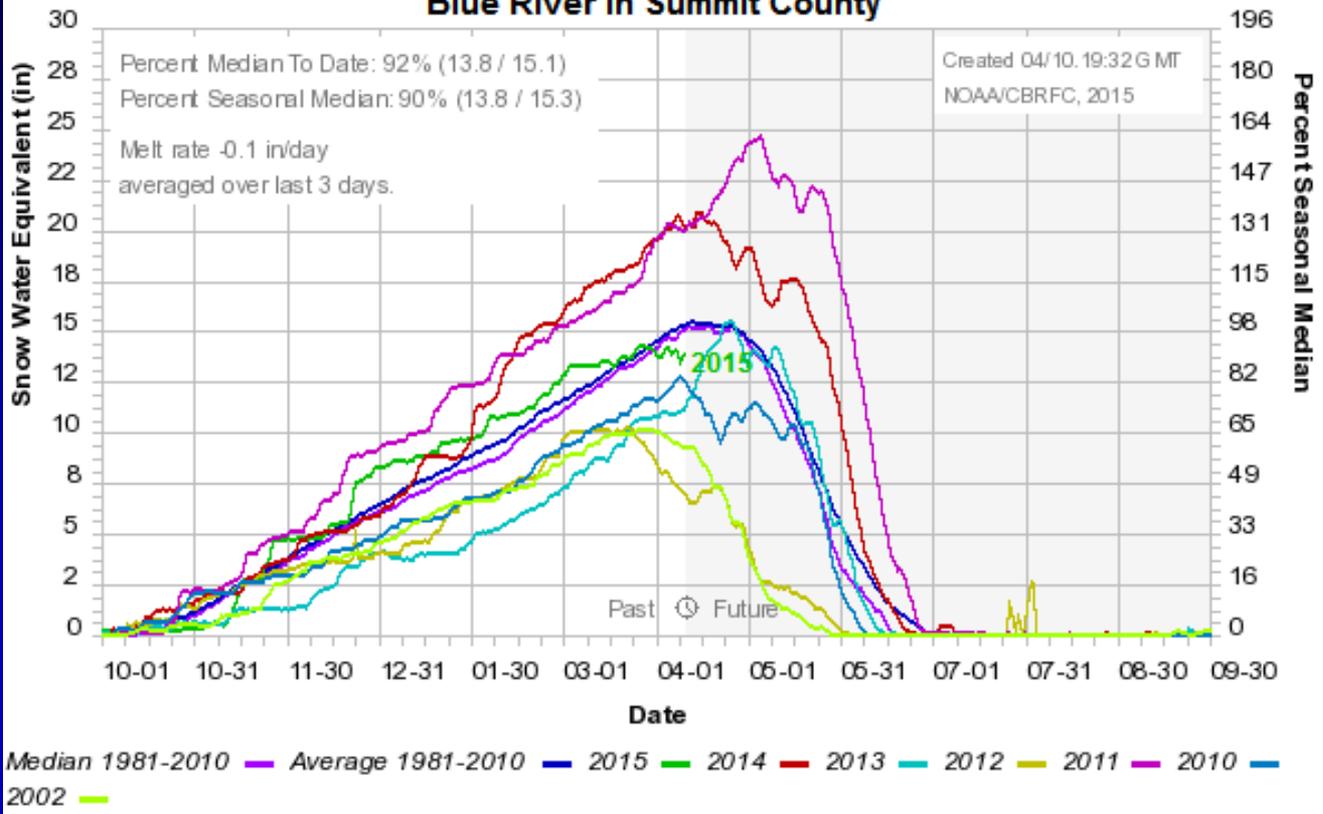
Boulder, St. Vrain, & South Boulder Creek watersheds in Boulder County



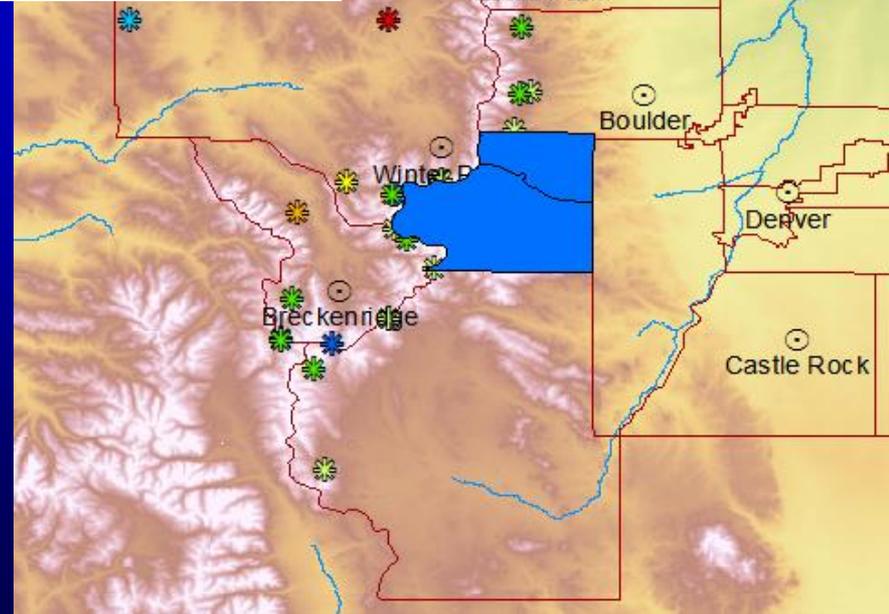
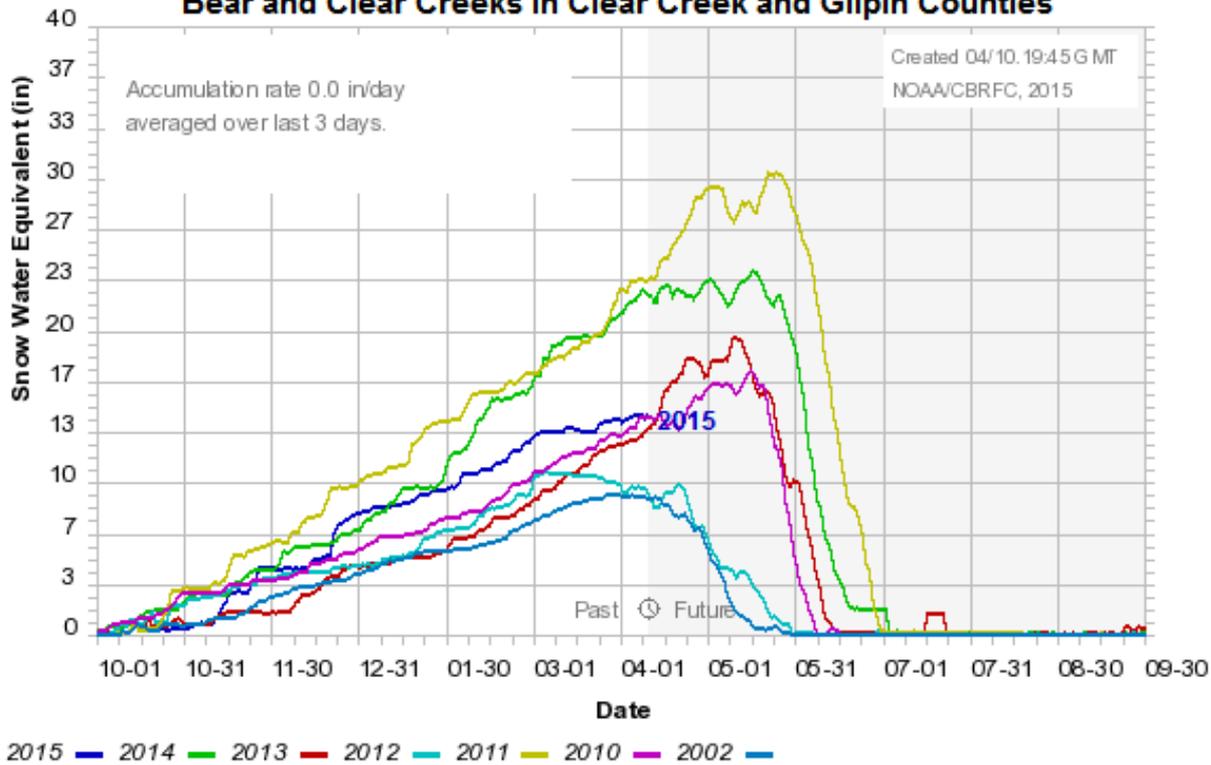
Median 1981-2010 — Average 1981-2010 — 2015 — 2014 — 2013 — 2012 — 2011 — 2010 — 2009 — 2008 — 2007 — 2006 — 2005 — 2004 — 2003 — 2002



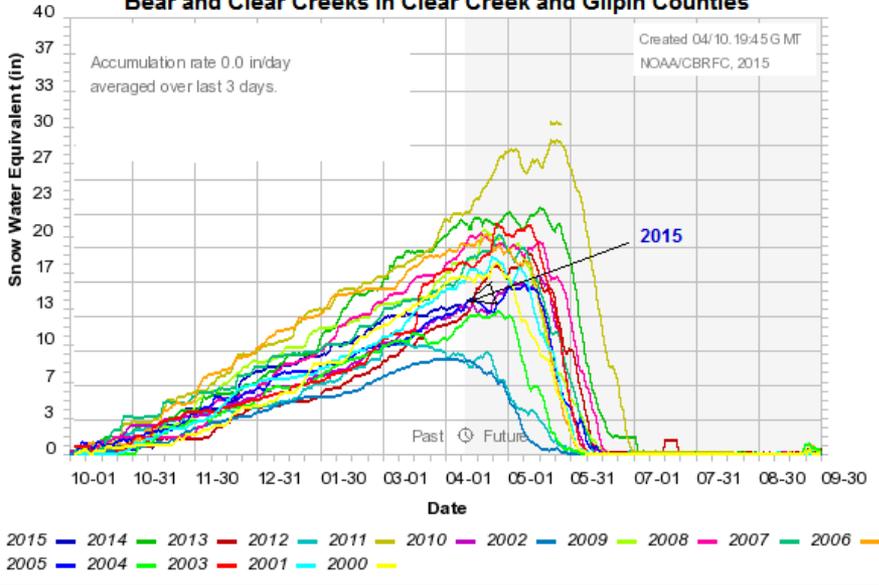
Colorado Basin River Forecast Center Blue River in Summit County



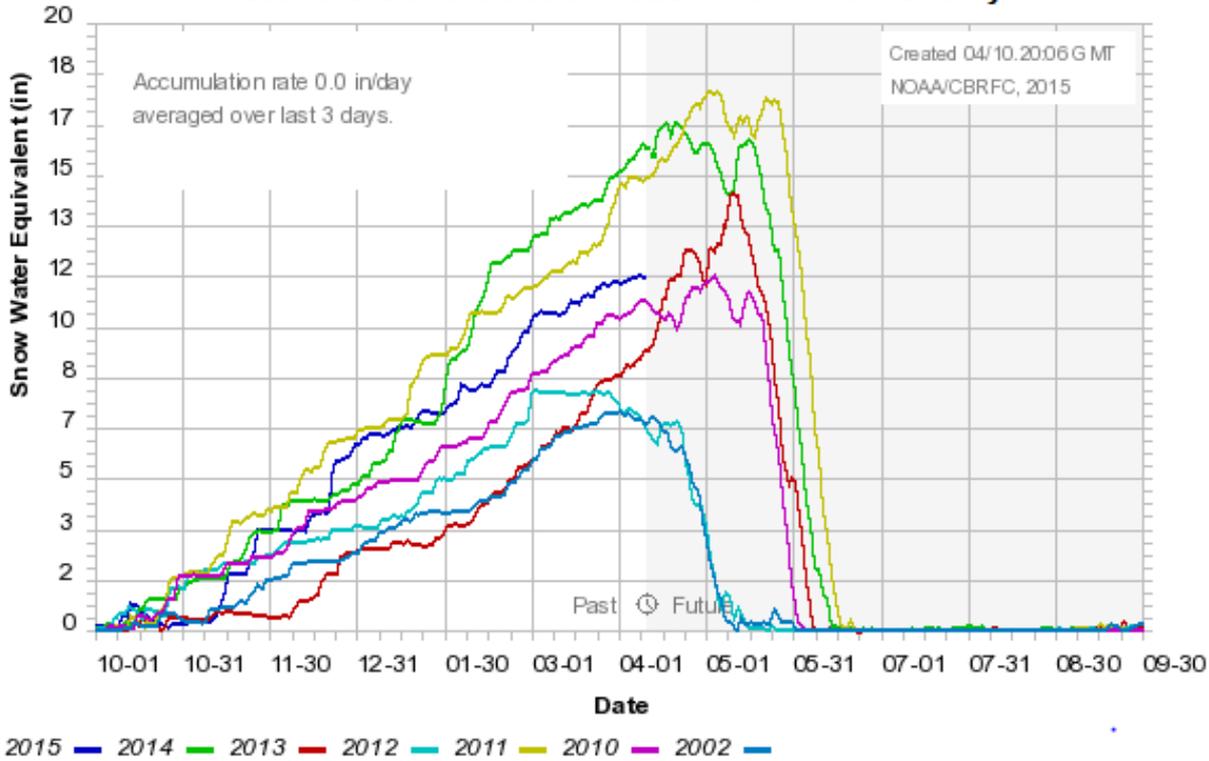
Bear and Clear Creeks in Clear Creek and Gilpin Counties



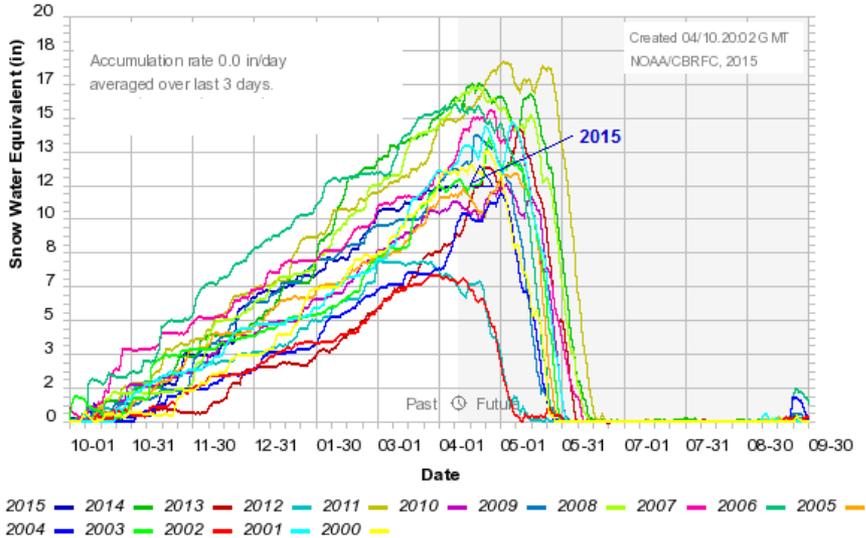
Bear and Clear Creeks in Clear Creek and Gilpin Counties



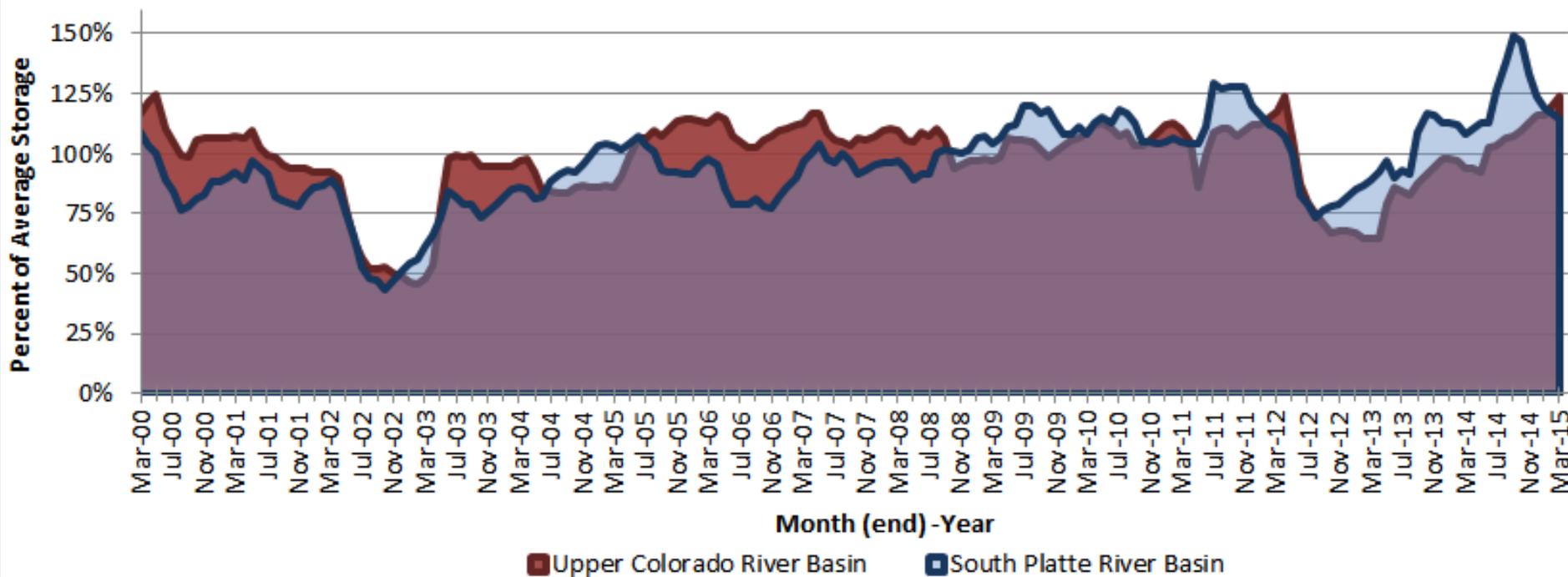
headwaters of the South Platte River in Park County



headwaters of the South Platte River in Park County



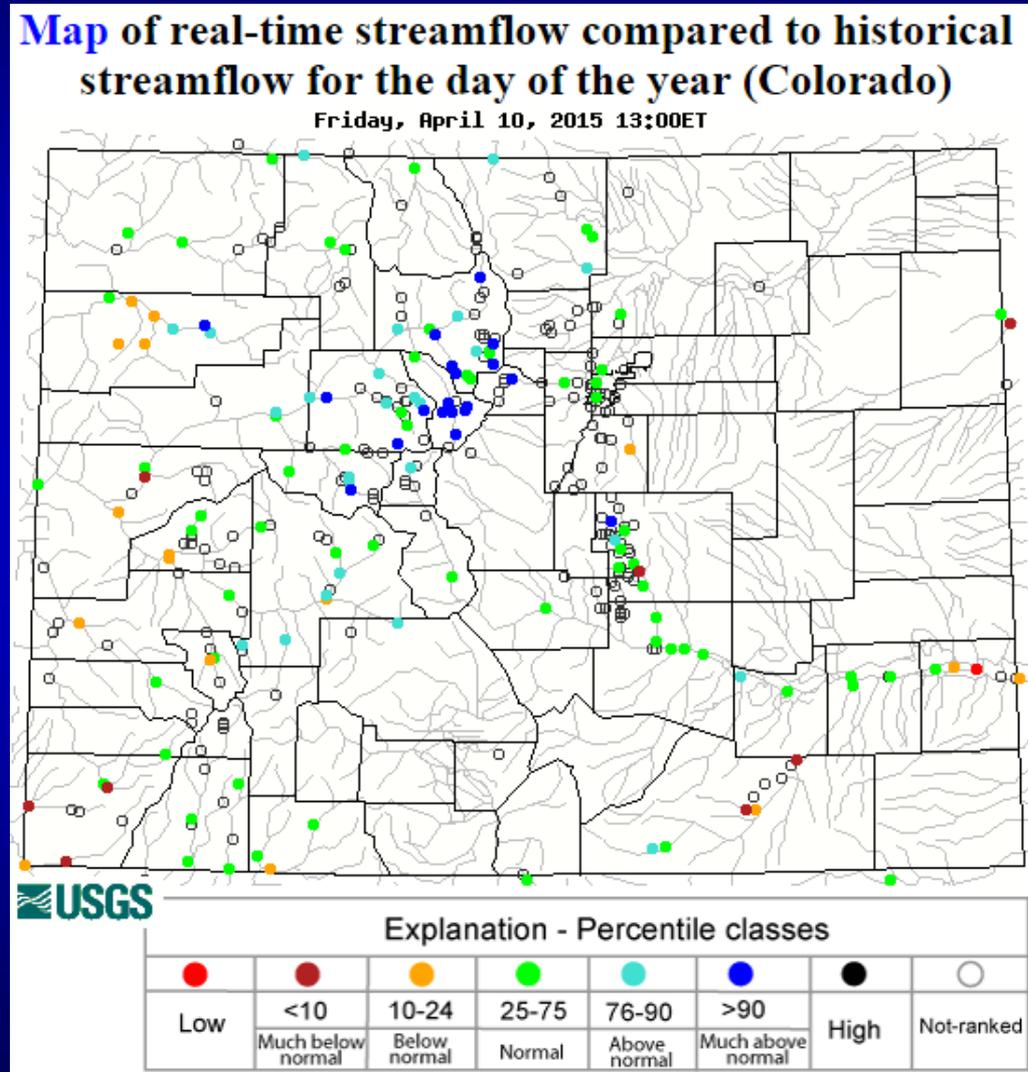
Combined Reservoir Storage for Basins in North Central and Northeast Colorado March 31, 2000 - March 31, 2015



Combined reservoir storage remains above average in North Central and Northeast Colorado. Storage was 114% of average in the South Platte Basin, and 124% of average in the upper Colorado River Basin at the end of March 2015.

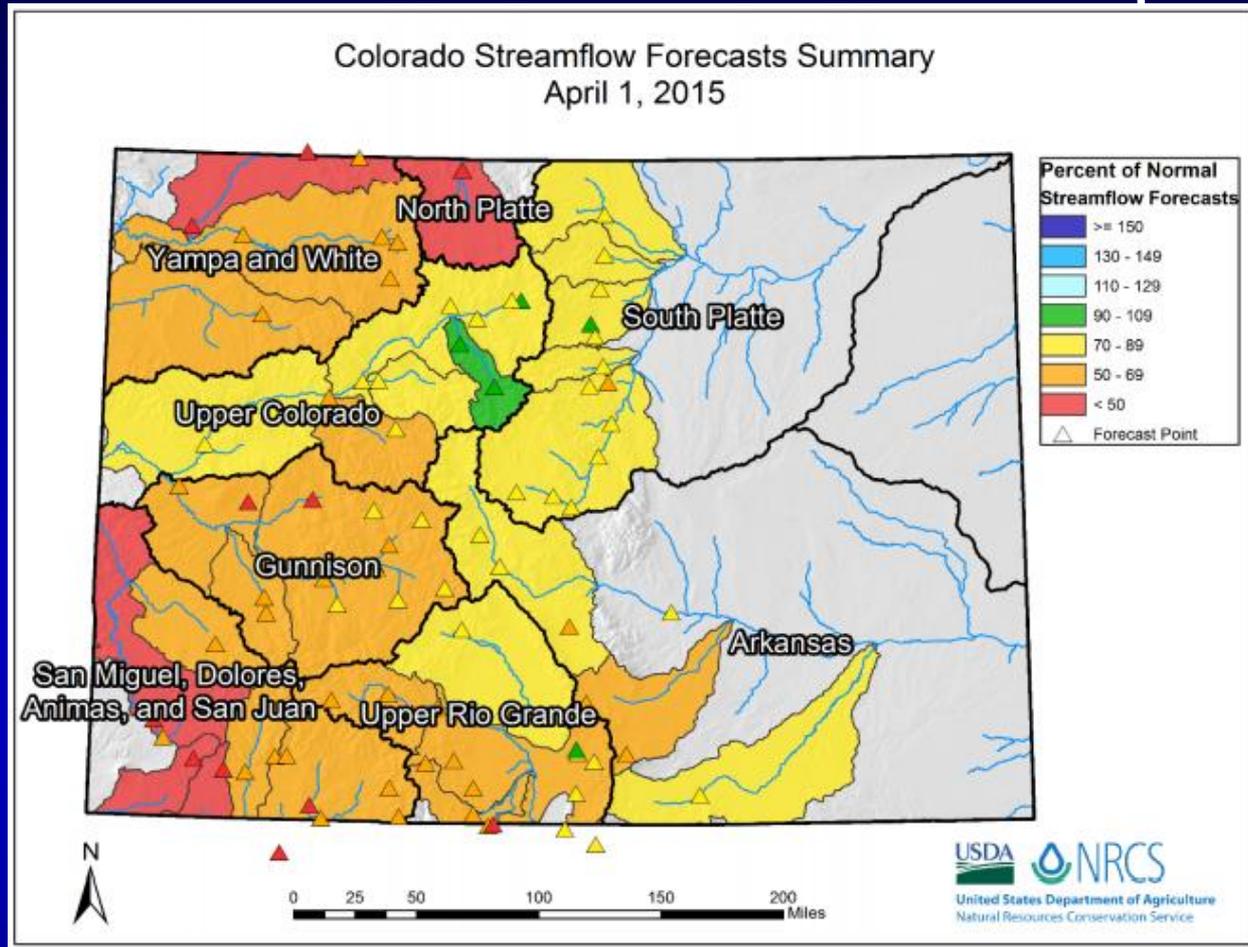
[For an NRCS Reservoir Basin Storage Map of Colorado go to:
ftp://ftp-fc.sc.egov.usda.gov/CO/Snow/resv/watershed/monthly/resmap.pdf](ftp://ftp-fc.sc.egov.usda.gov/CO/Snow/resv/watershed/monthly/resmap.pdf)

This is a USGS map comparing streamflow to historical streamflow. Lack of precipitation and warm temperatures are leading to early snowpack melt/runoff. Many streams are running normal to much above average in North Central Colorado, despite stagnant mountain snowpack conditions.



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

NRCS Colorado Streamflow Forecast Map

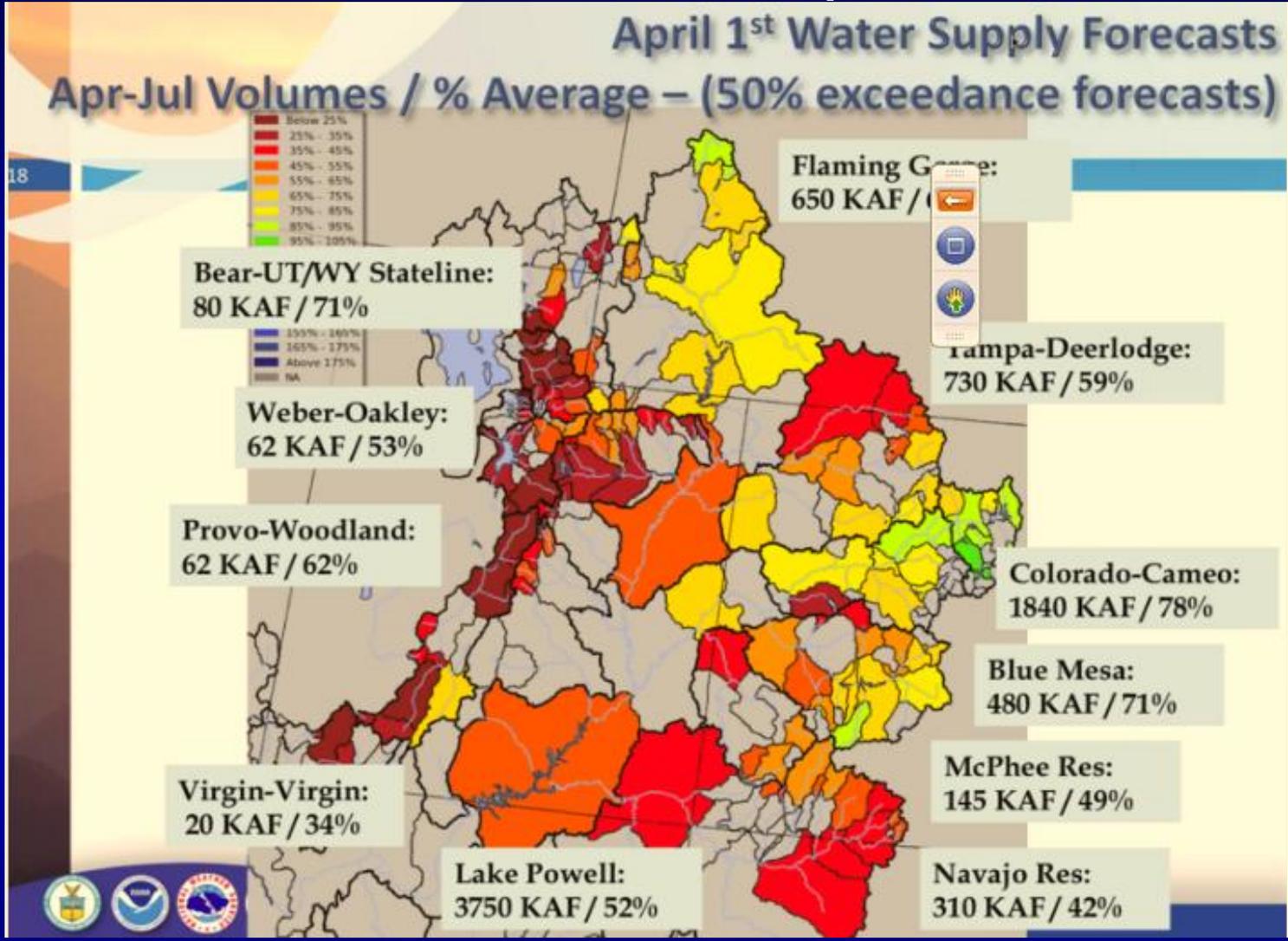


With the lack of precipitation this spring and early snowmelt, streamflow forecasts are well below to near average. The North Platte River near Northgate is forecast to have only half its average streamflow volume through the summer of 2015.

For NRCS Colorado Streamflow Forecast Information go to:

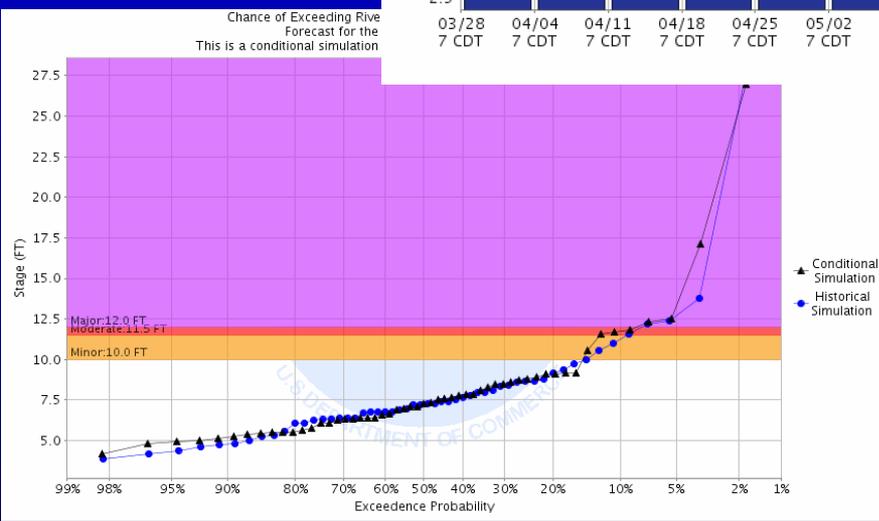
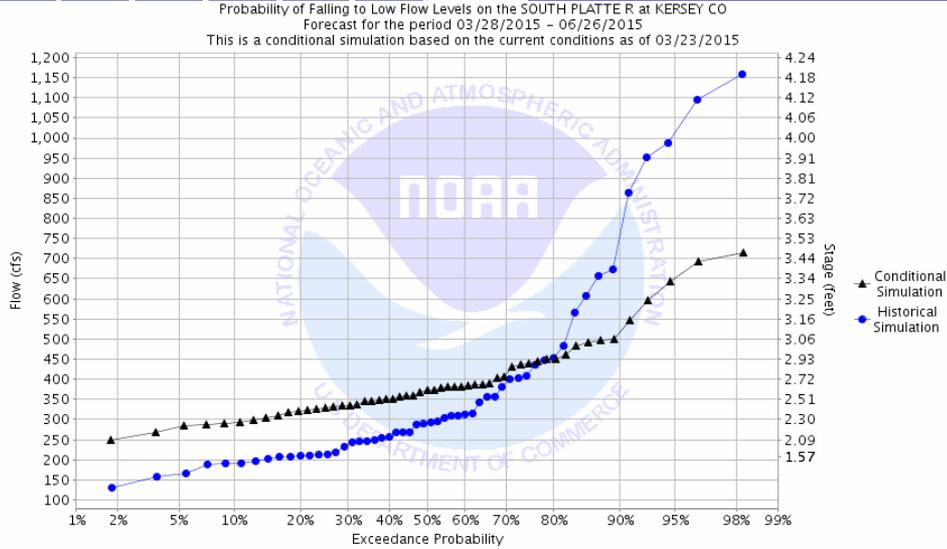
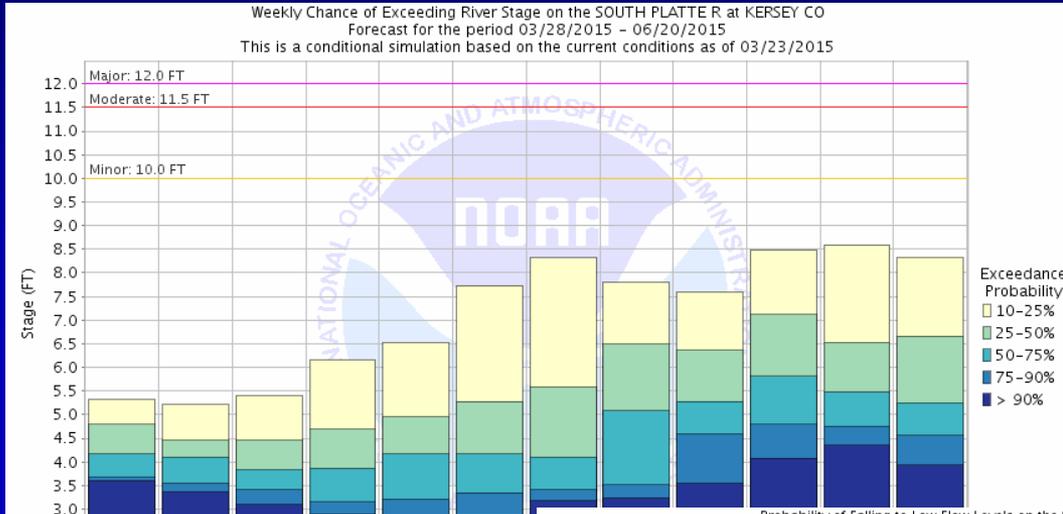
http://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/snow/?cid=nrcs144p2_063205

Colorado Basin RFC Streamflow Forecast Map for the Colorado River Basin.



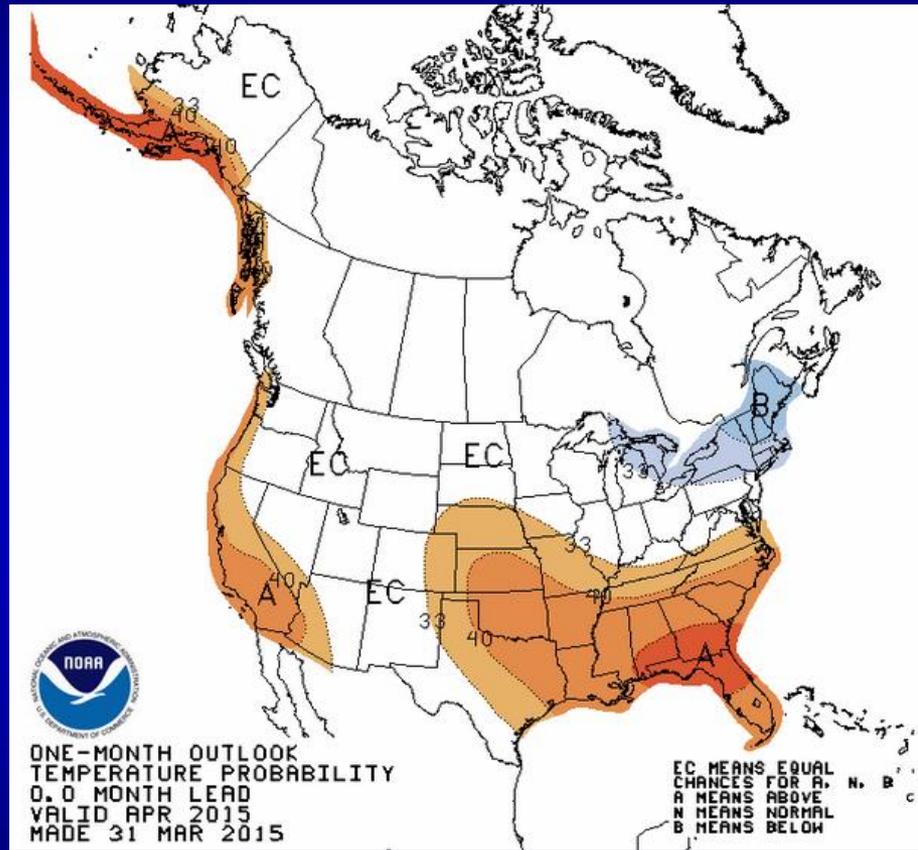
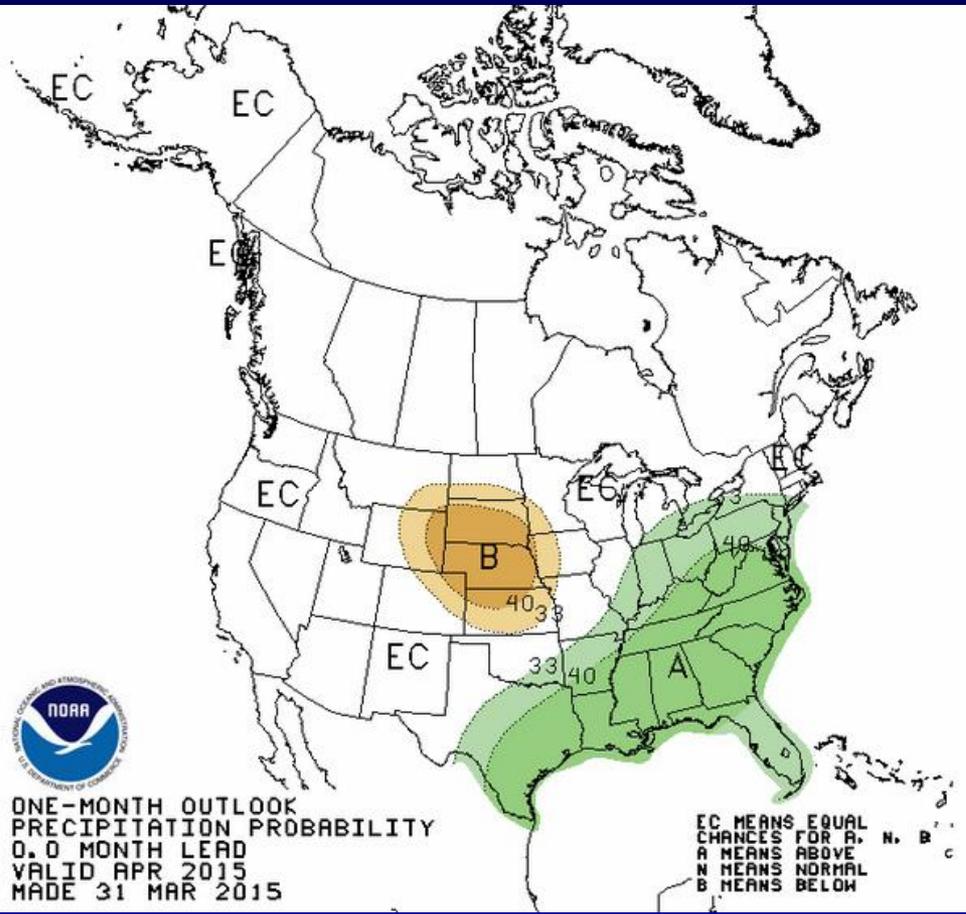
In contrast, the Blue River in Summit County is expected to see average volumes through mid summer 2015.

Probabilistic river forecasts are available for numerous points in AHPS. Just click a forecast point on the AHPS map. Then choose 'Probability Information' above the hydrograph. 'How low could the river get?' is under Additional Information.



Denver/Boulder AHPS: <http://water.weather.gov/ahps2/index.php?wfo=bou>

Climate Prediction Center Precipitation & Temperature Outlooks for April.



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>

2015 U.S. Spring Flood Risk



Be prepared: Visit www.floodsafety.noaa.gov
and follow @NOAA and @NWS on Twitter

Spring Snowmelt Flood Potential Outlook

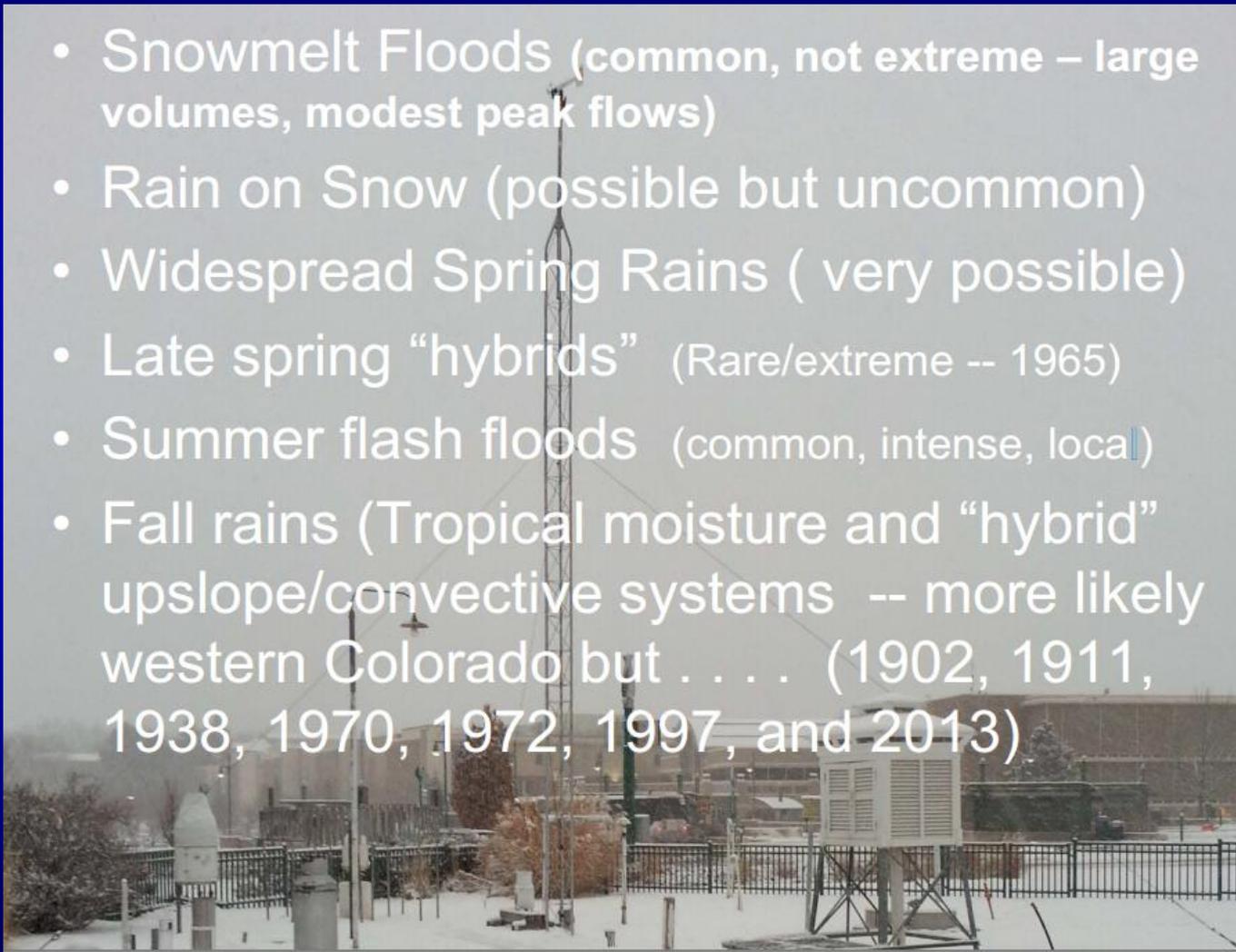
North Central & Northeast Colorado

Mountain snowmelt alone is not expected to cause flooding this spring. However, it should be noted that like every spring an extended period of heavy rainfall falling on top of the snowpack can produce flooding. Also, thunderstorms with heavy rain can produce flash flooding in the spring.

Some factors that can impact the mountain snowmelt runoff this spring:

- Future snowfall
- Stream levels during the melt
- When and how fast the snow melts (freezing and thawing in the mountains)
- Future rainfall amounts and timing
- Whether rain (especially a warm rain) falls on the snowpack
- Soil moisture/groundwater
- Dry winds
- Dust reducing the albedo of the snow

“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)

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.
- Prepare Your Home - If you have access to sandbags or other materials, you may be able to use them to protect your home from flood waters if you have sufficient time to do so. Filling sandbags can take more time than you may think.