

**Spring  
2012**



**May 8<sup>th</sup>, 2012**

**NIDIS - UPPER COLORADO BASIN PILOT PROJECT**

**Weekly Climate, Water & Drought Assessment**

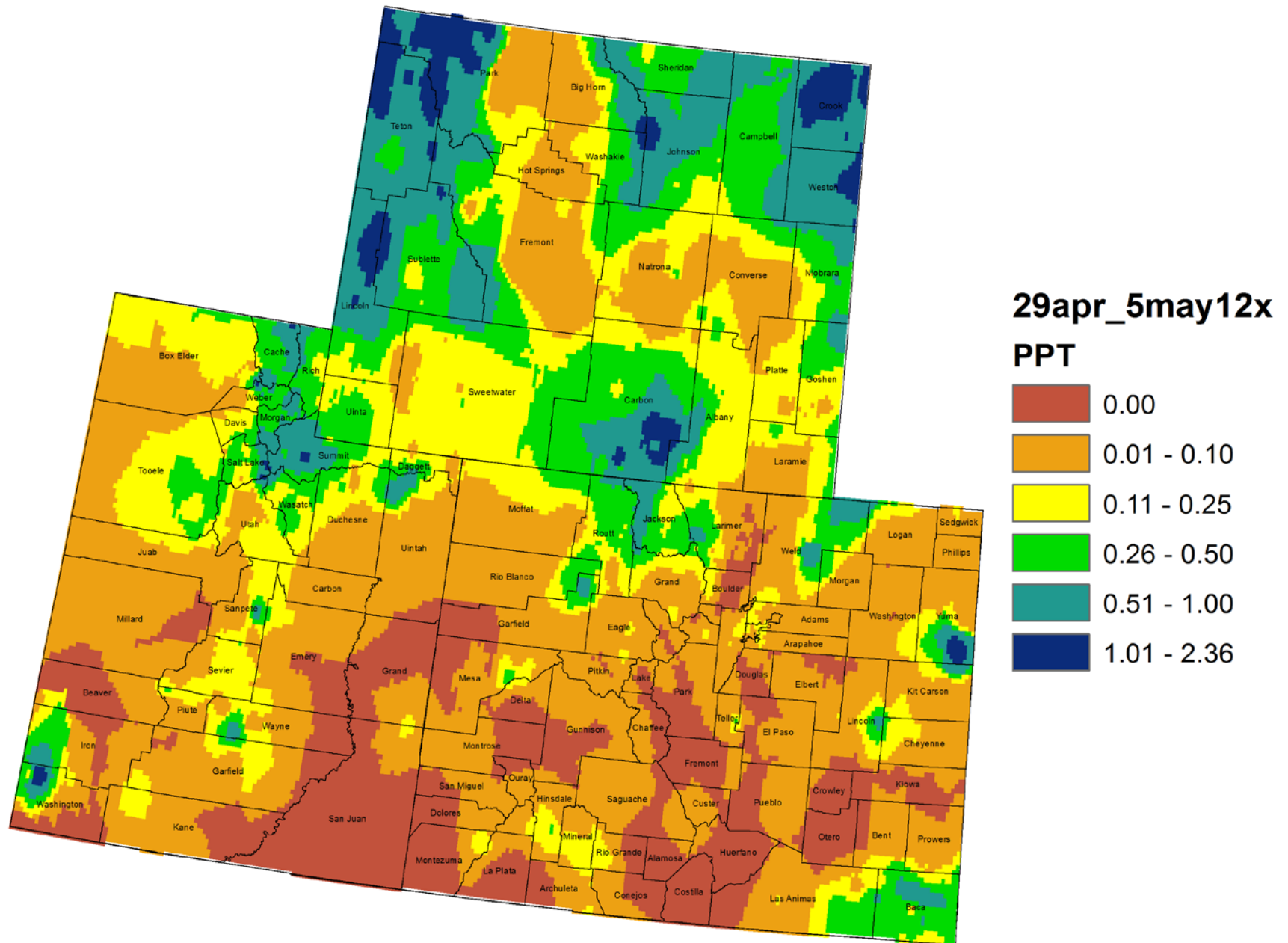
# Today's Agenda

- Assessment of current water conditions
- Precipitation Forecast
- Recommendations for Drought Monitor

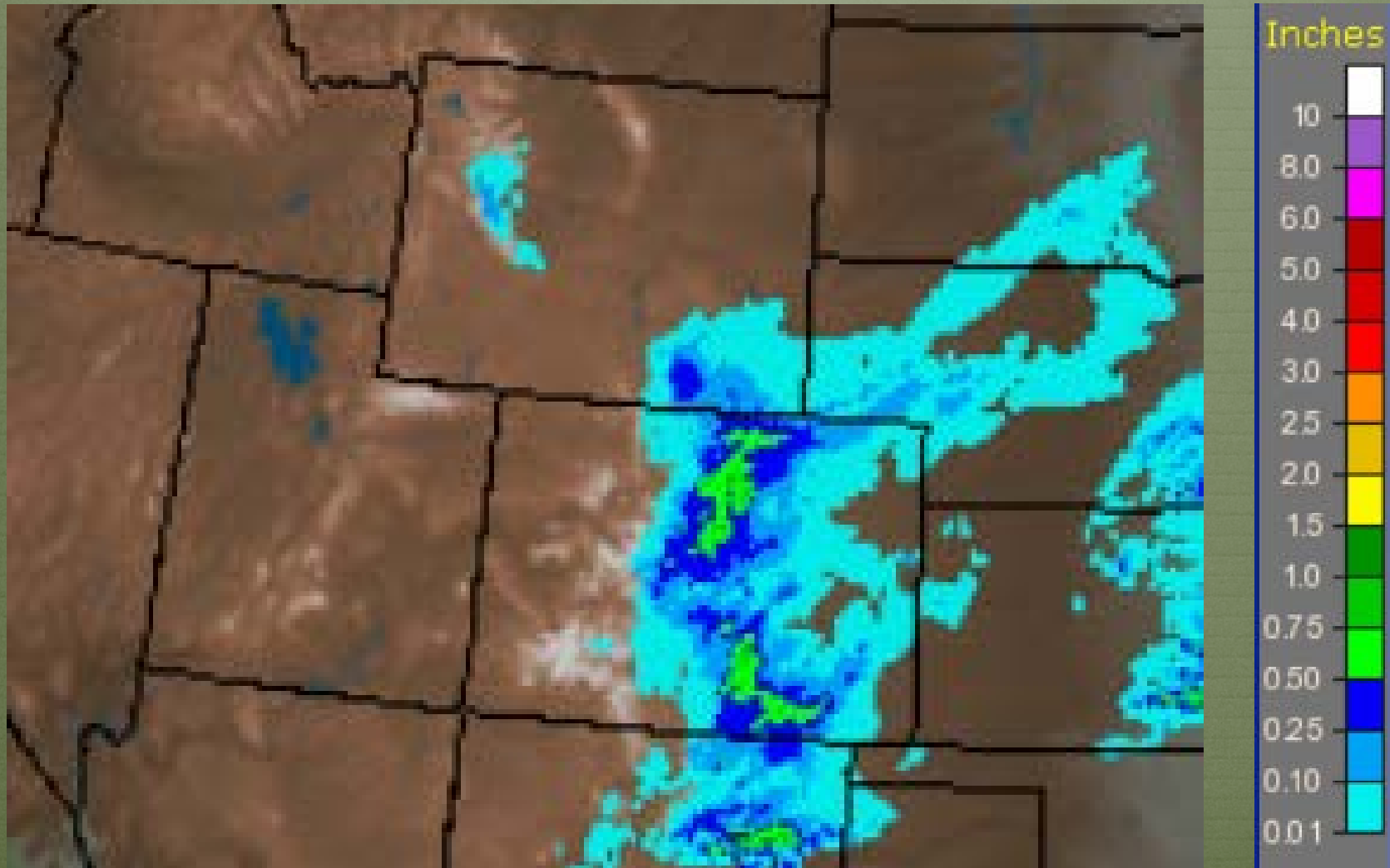
# Precipitation/Snowpack Update



# Colorado, Utah and Wyoming 7 Day Precipitation (in) 29 April - 5 May 2012

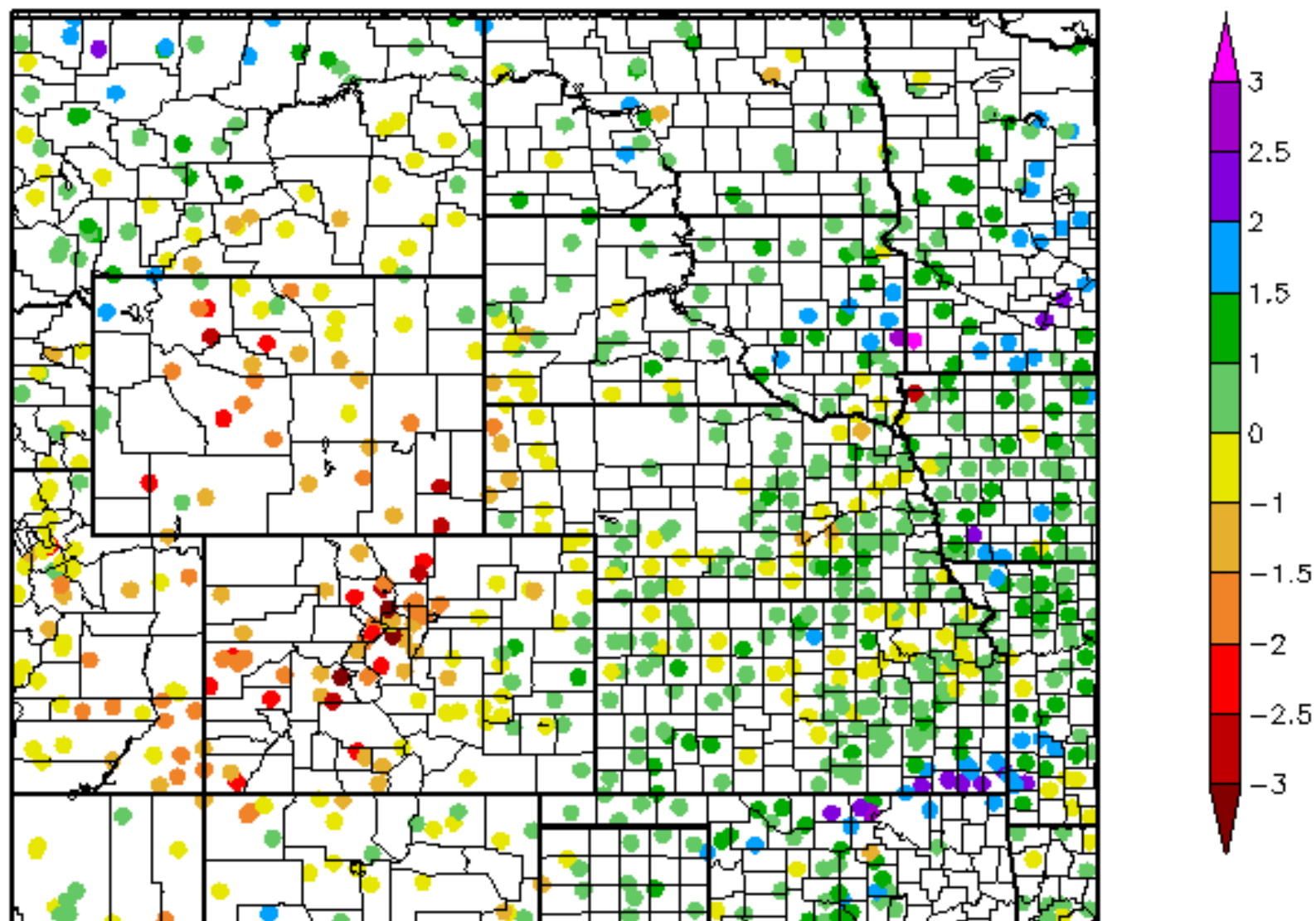


# AHPS Analysis 5/7/12

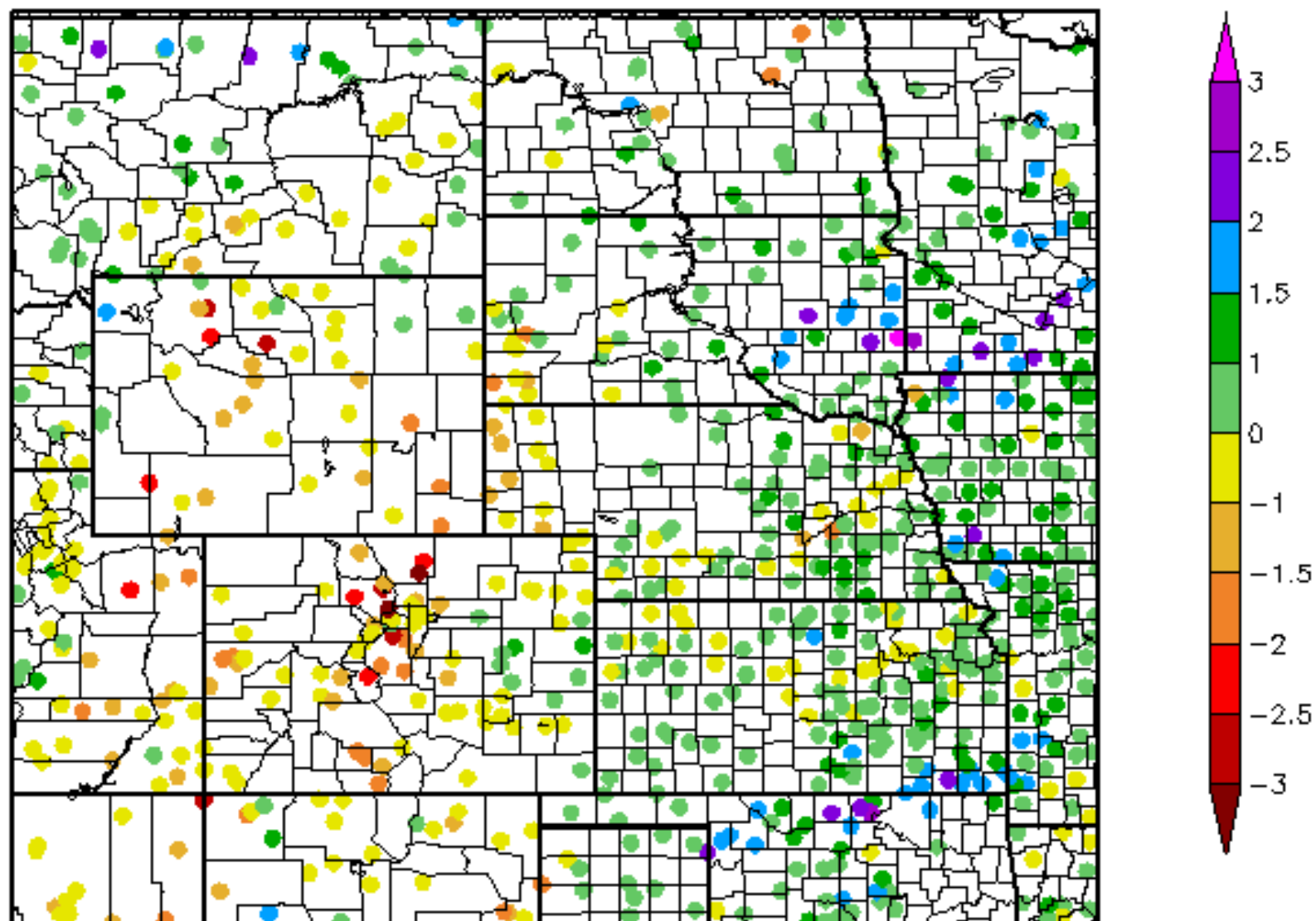


# 60 Day SPI

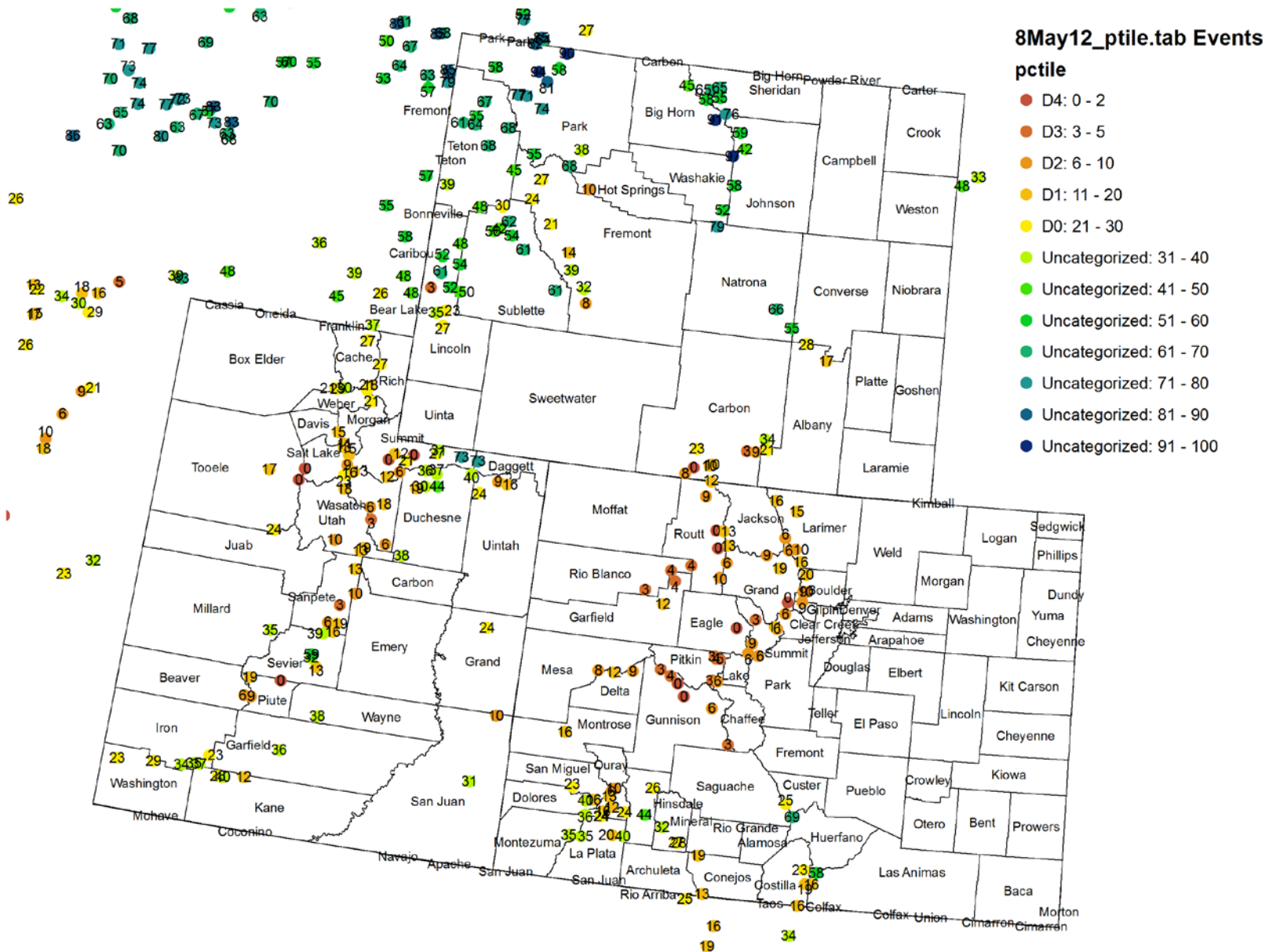
3/9/2012 - 5/7/2012



120 Day SPI  
1/9/2012 - 5/7/2012



# Snotel Water Year Precipitation Percentile Ranking for 8 May 2012 (Stations with 15+ years of data only)

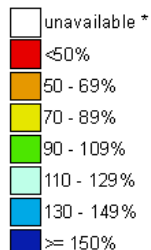




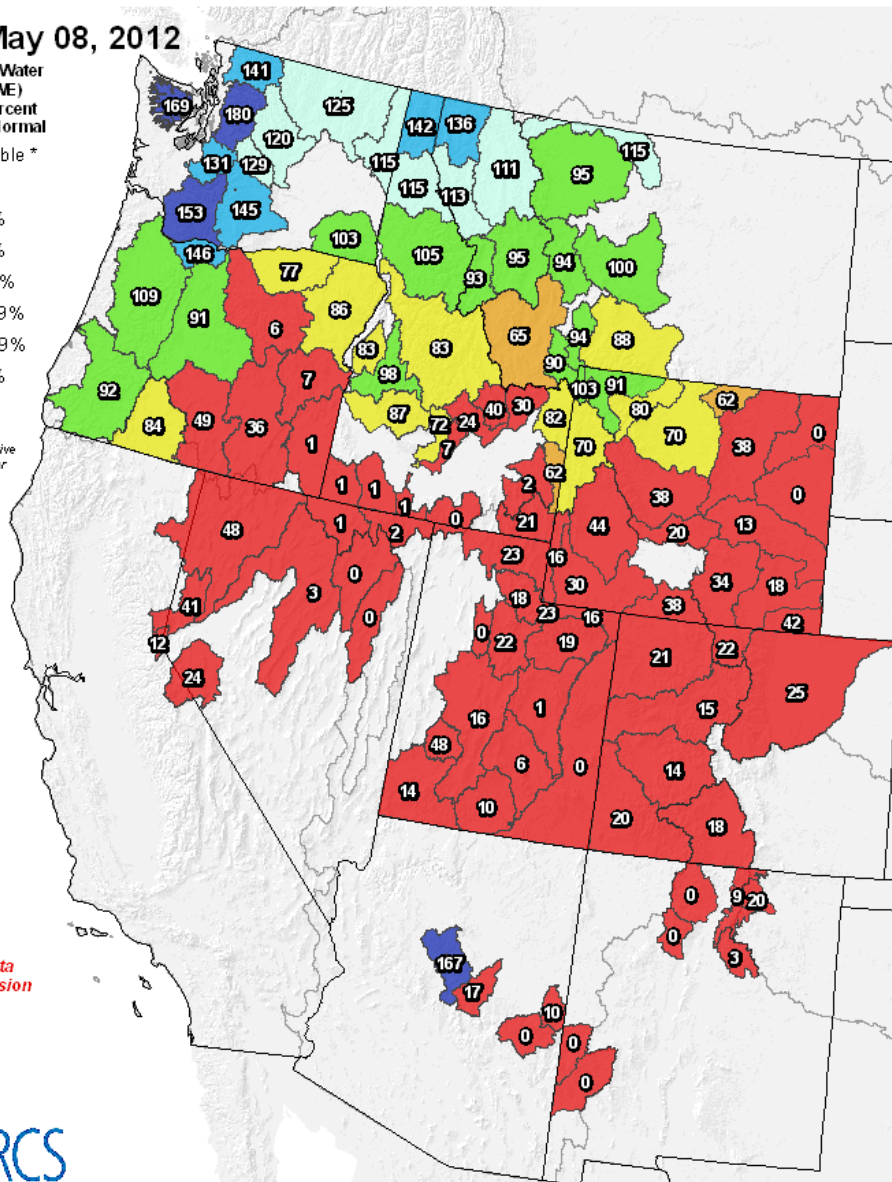
# Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

May 08, 2012

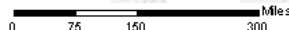
Current Snow Water Equivalent (SWE) Basin-wide Percent of 1971-2000 Normal



\* Data unavailable at time of posting or measurement is not representative at this time of year



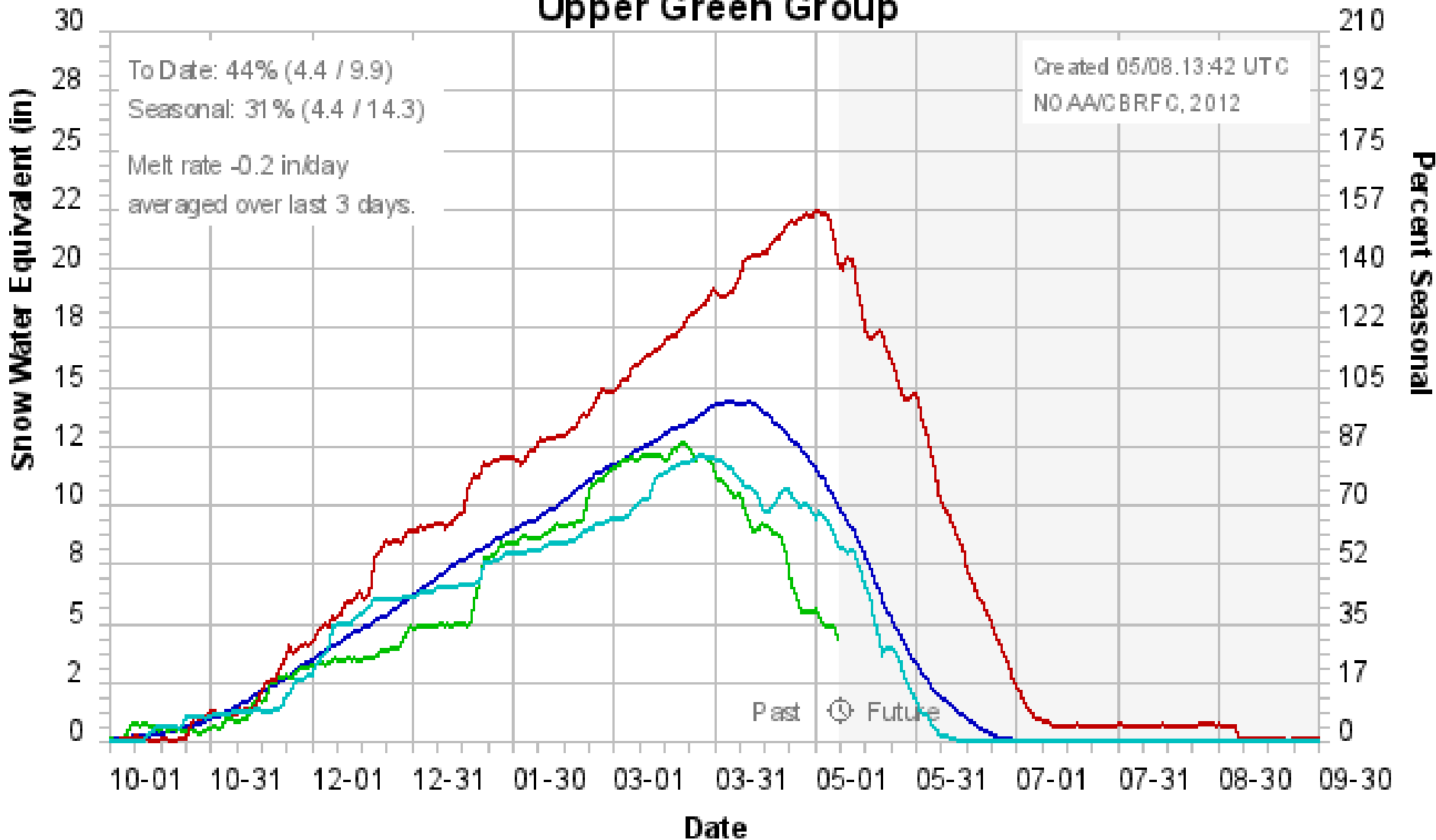
Provisional data subject to revision



The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

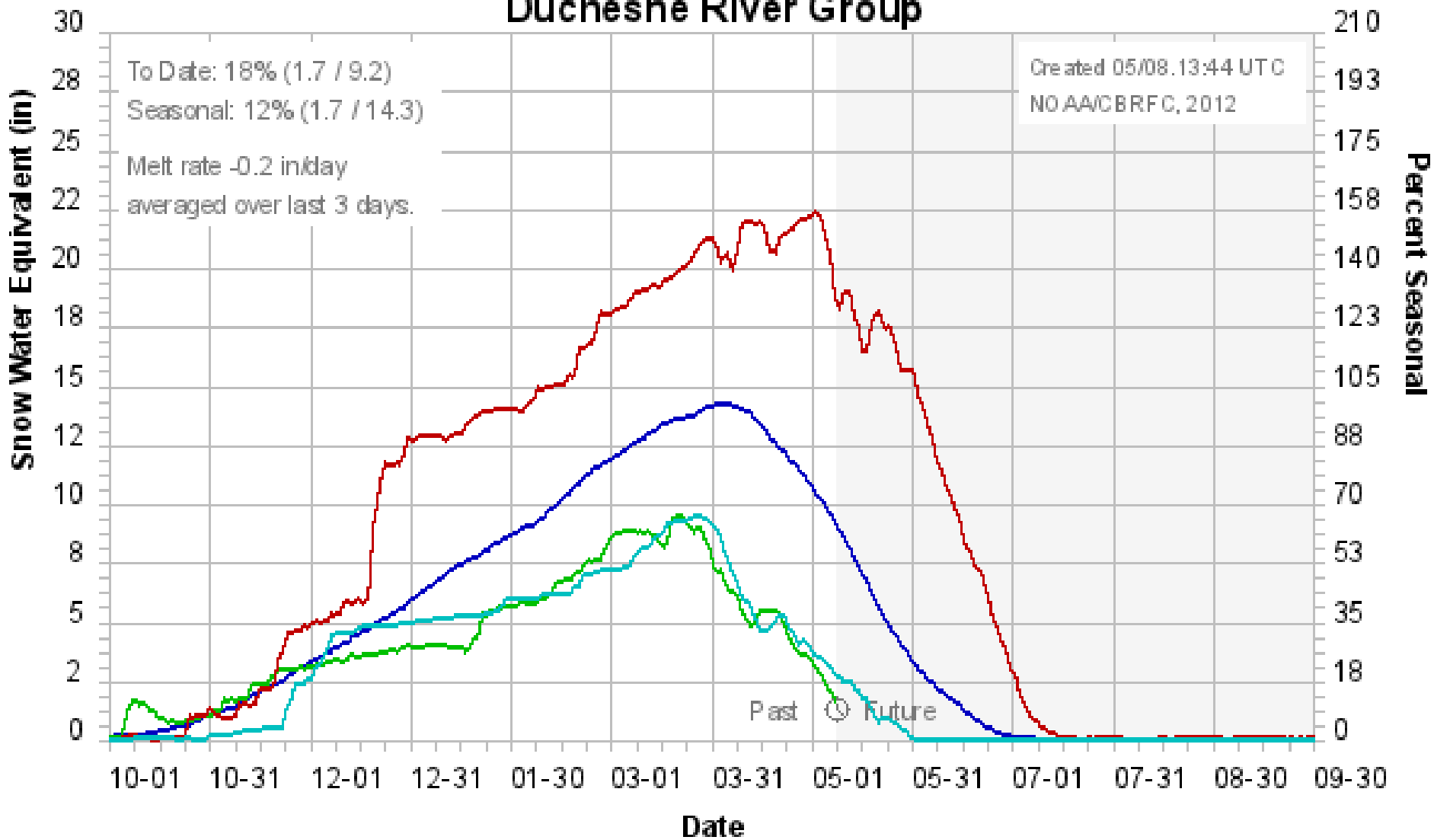
Prepared by the USDA/NRCS National Water and Climate Center  
 Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>  
 Based on data from <http://www.wcc.nrcs.usda.gov/reports/>  
 Science contact: Jim Marron@por.usda.gov 503 414 3047

# Colorado Basin River Forecast Center Upper Green Group



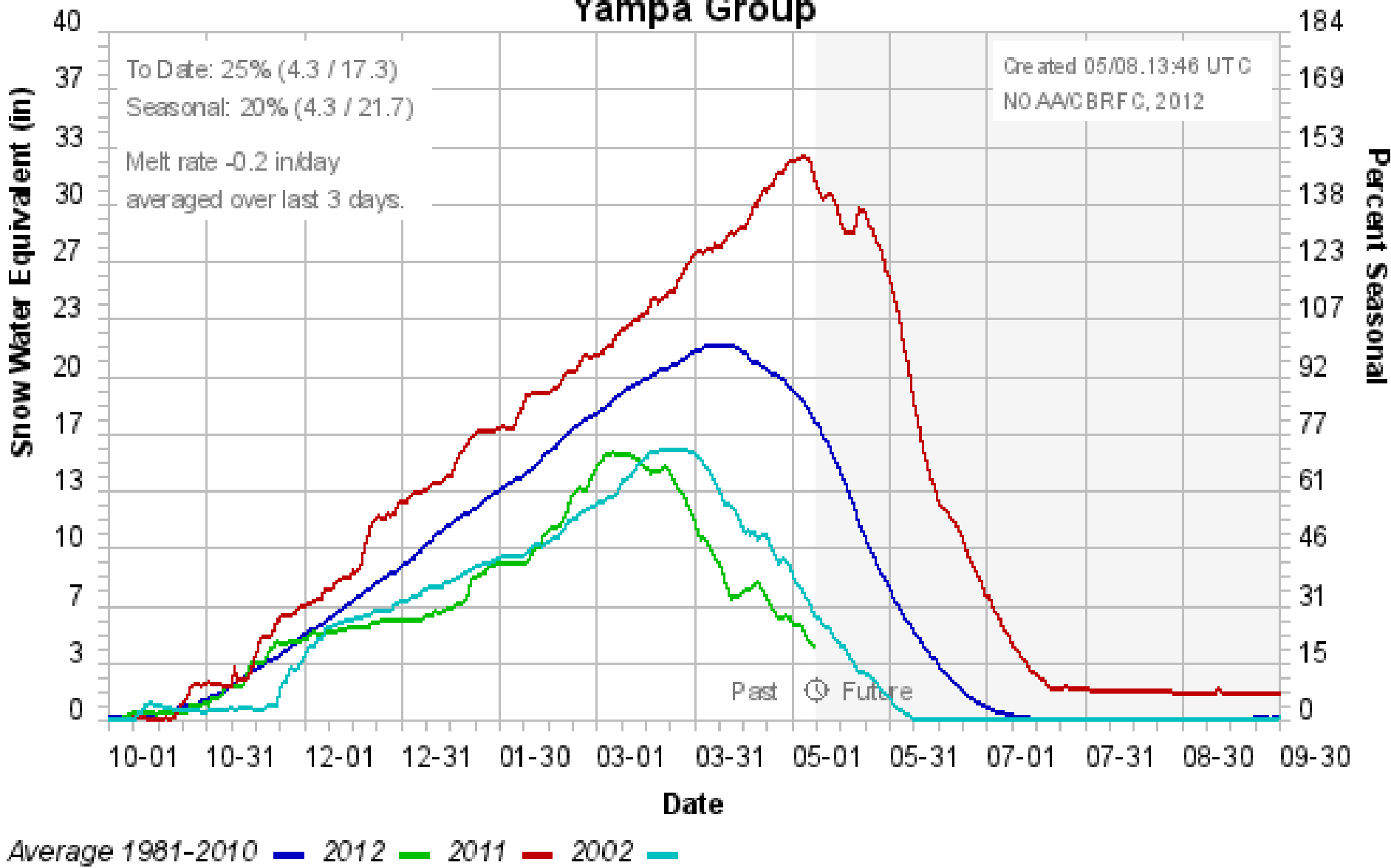
Average 1981-2010    2012    2011    2002

# Colorado Basin River Forecast Center Duchesne River Group

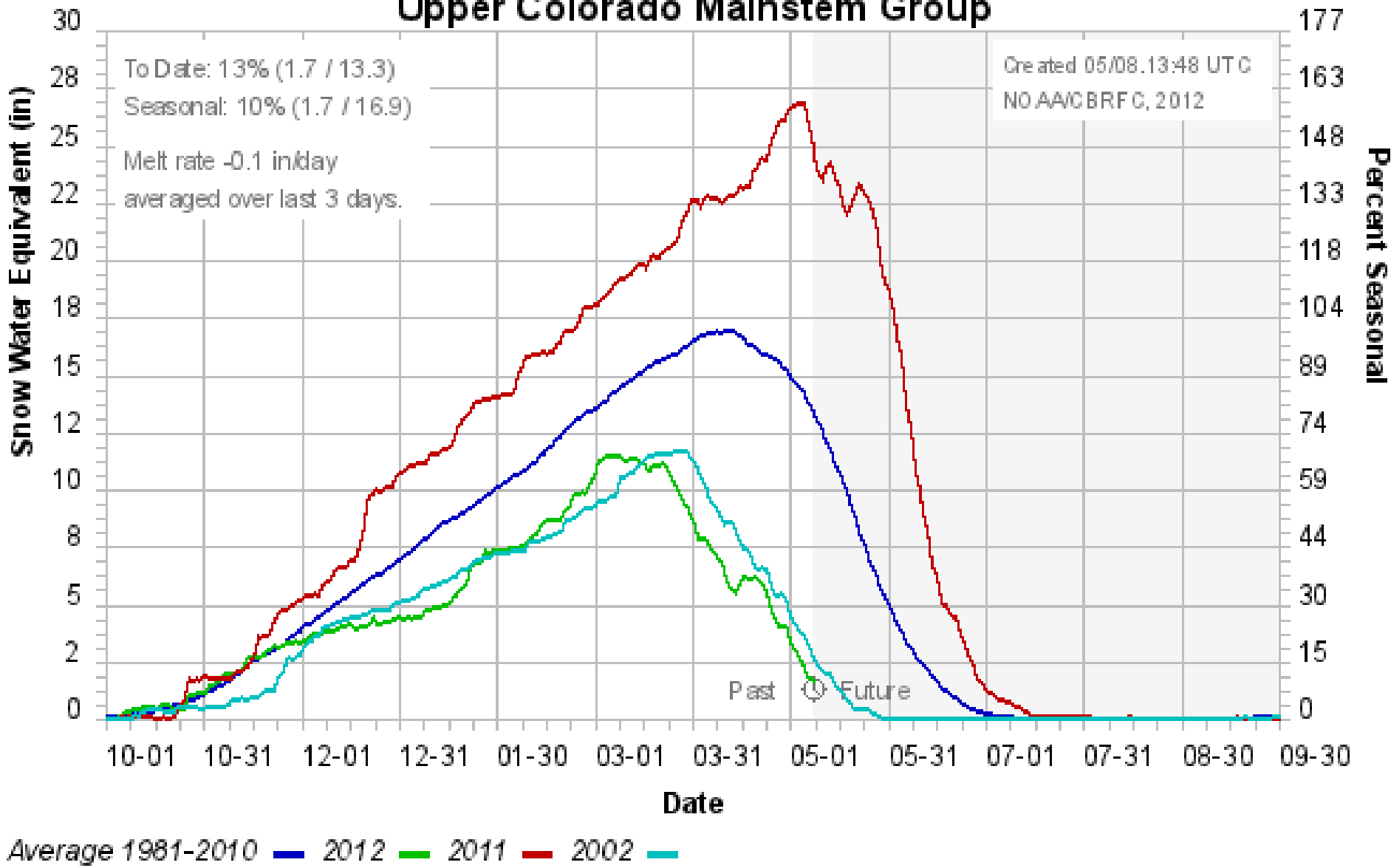


Average 1981-2010    2012    2011    2010    2002

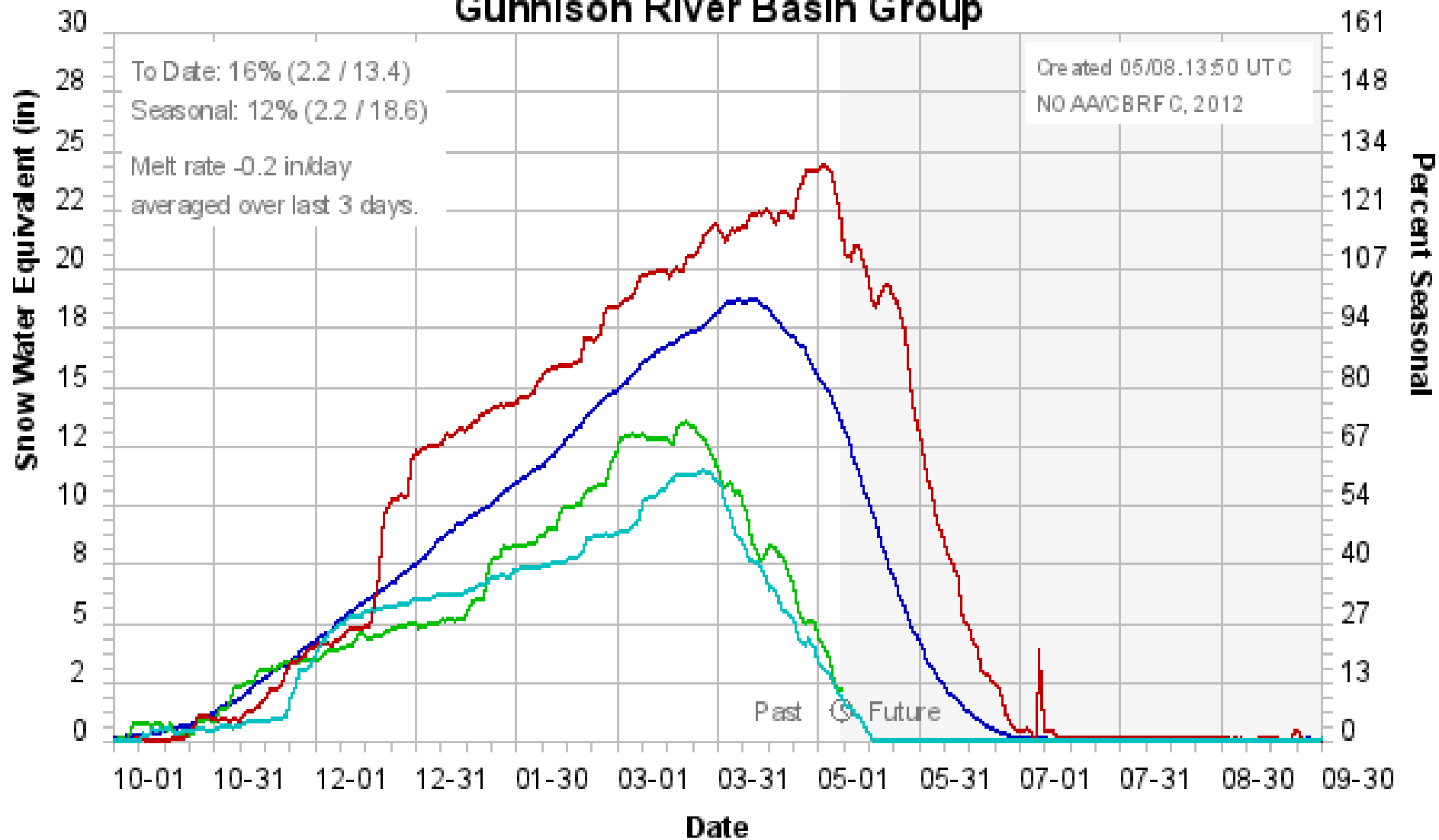
# Colorado Basin River Forecast Center Yampa Group



# Colorado Basin River Forecast Center Upper Colorado Mainstem Group

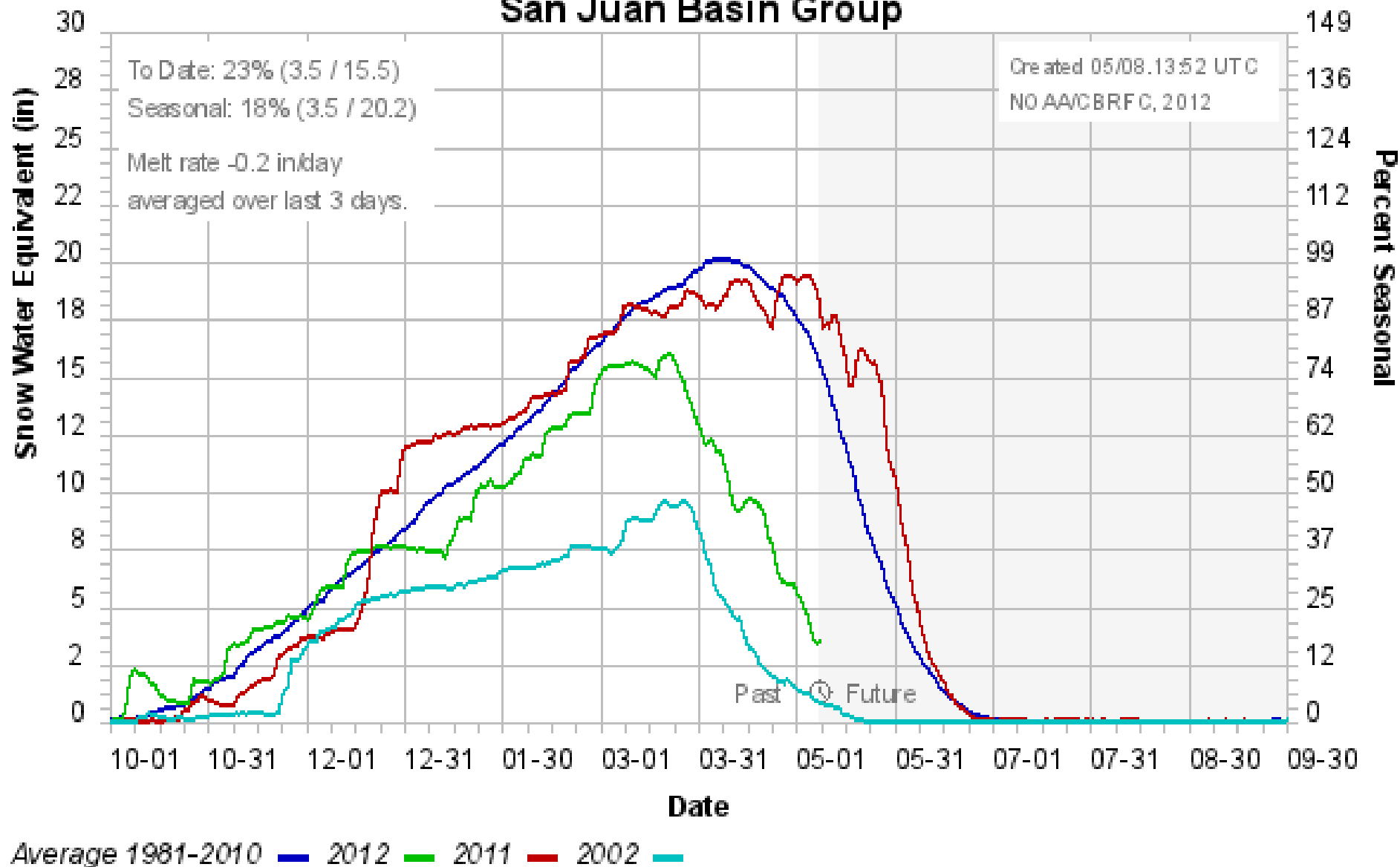


# Colorado Basin River Forecast Center Gunnison River Basin Group



Average 1981-2010    2012    2011    2002

# Colorado Basin River Forecast Center San Juan Basin Group











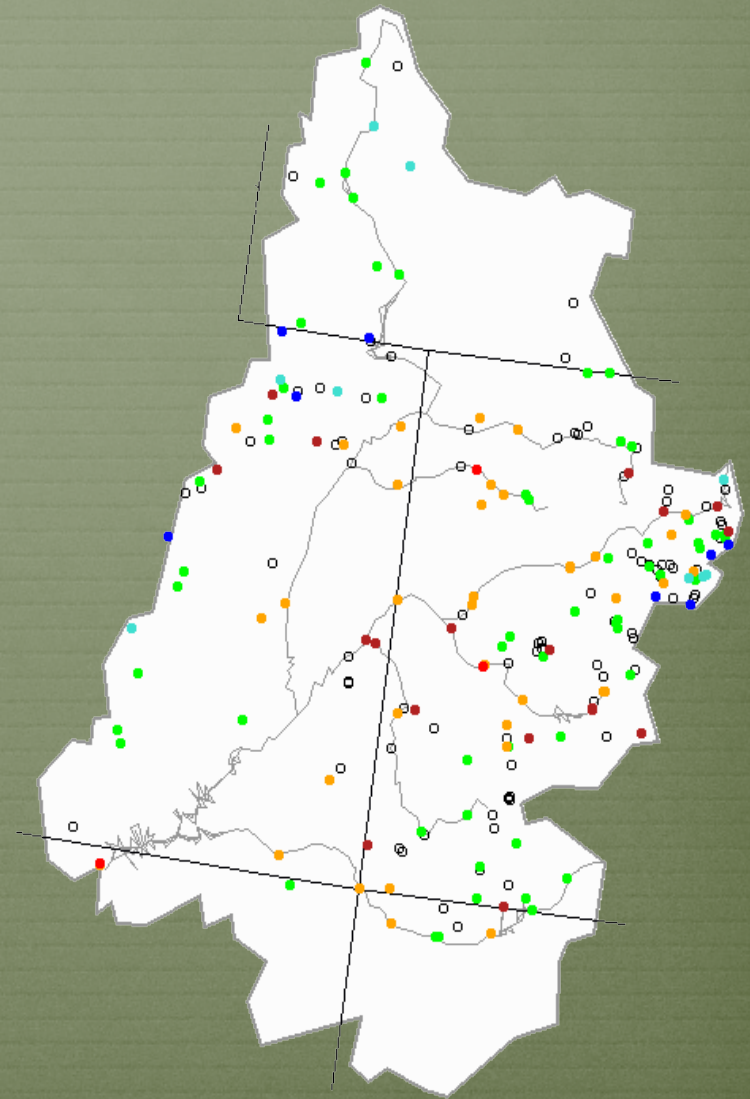
# Streamflow Update





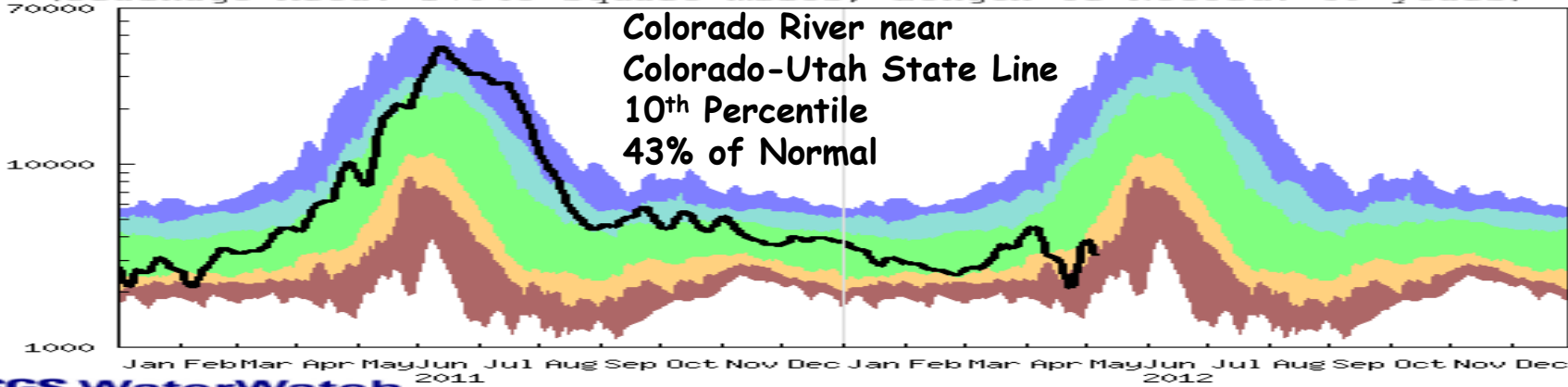
# 7-day average discharge compared to historical discharge for the day of the year (May 6)

Explanation - Percentile classes							
							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		



Duration hydrograph of 7-day average streamflow for USGS 09163500  
 (Drainage Area: 17843 square miles, Length of Record: 59 years)

7-day average discharge, in cubic feet per second



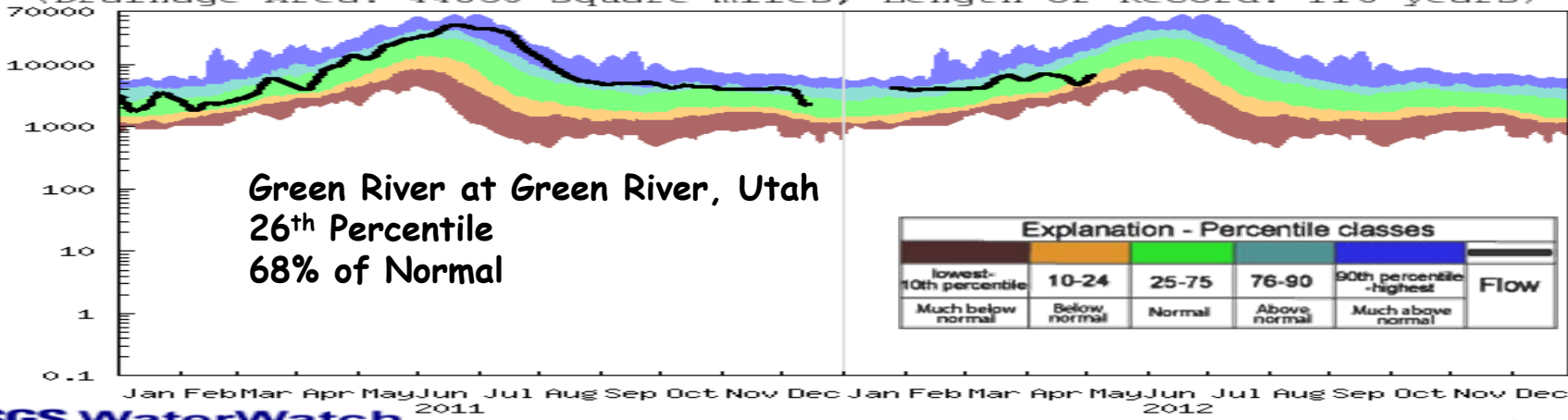
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2011 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2012

**USGS WaterWatch**

Last updated: 2012-05-07

Duration hydrograph of 7-day average streamflow for USGS 09315000  
 (Drainage Area: 44850 square miles, Length of Record: 116 years)

7-day average discharge, in cubic feet per second



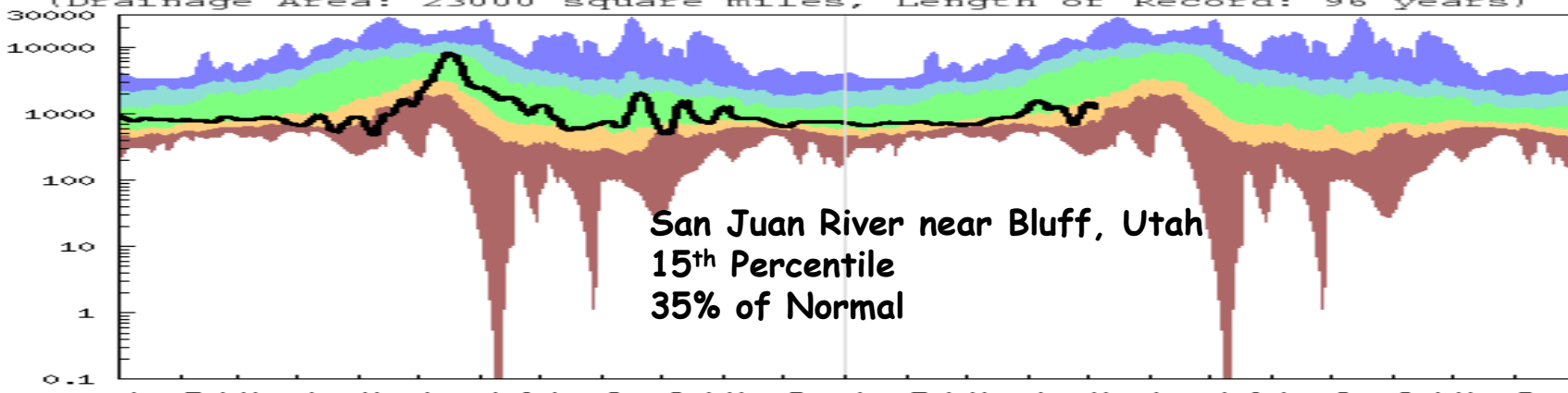
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2011 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2012

**USGS WaterWatch**

Last updated: 2012-05-07

Duration hydrograph of 7-day average streamflow for USGS 09379500  
 (Drainage Area: 23000 square miles, Length of Record: 96 years)

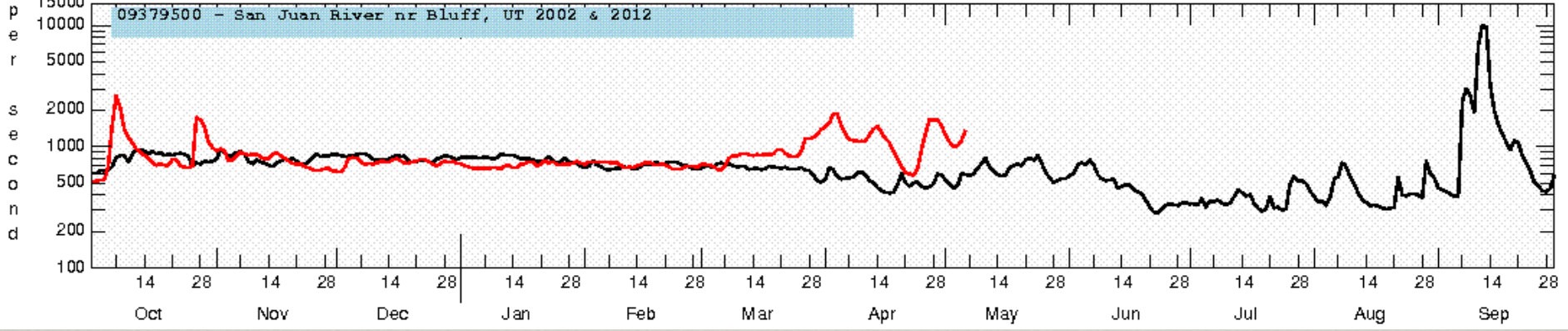
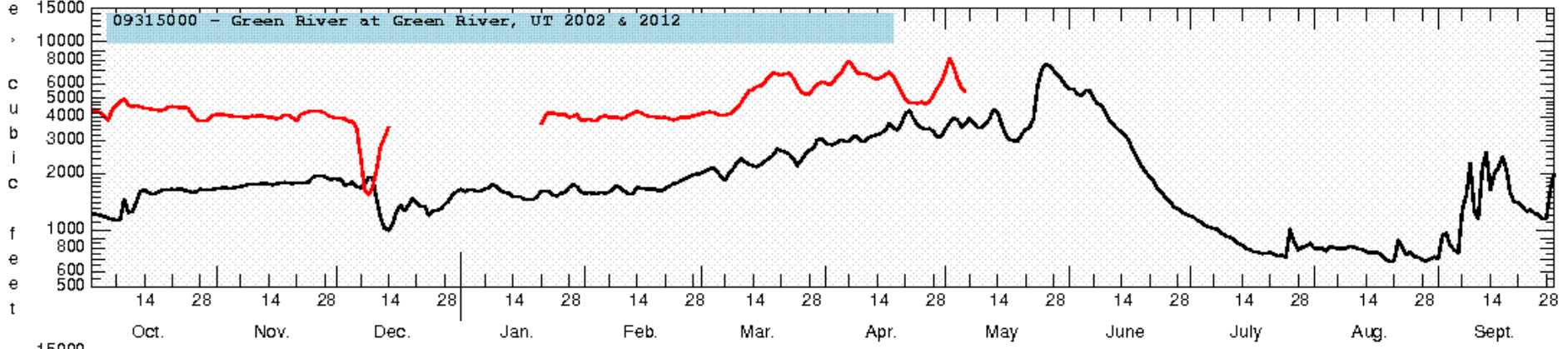
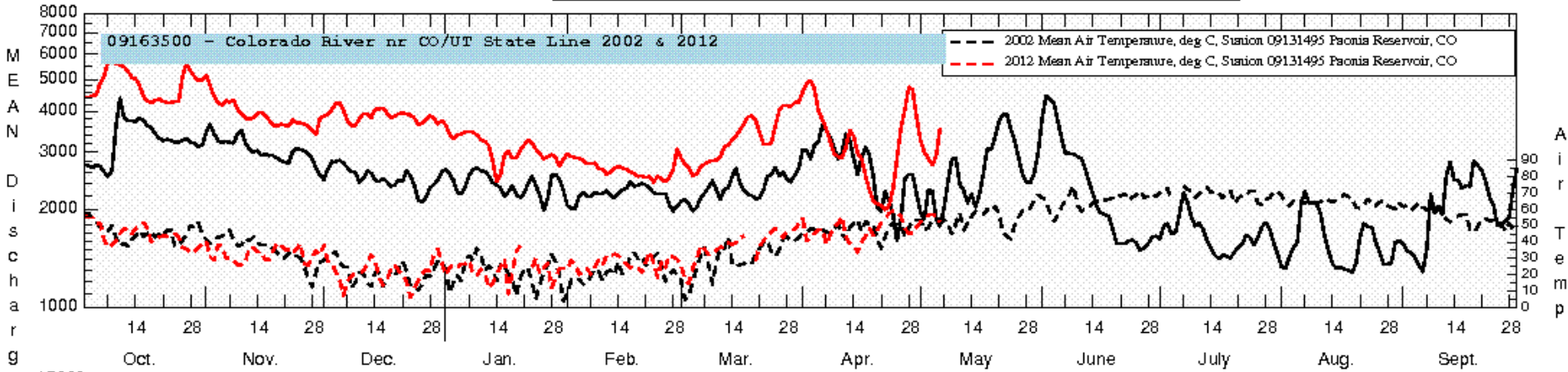
7-day average discharge, in cubic feet per second



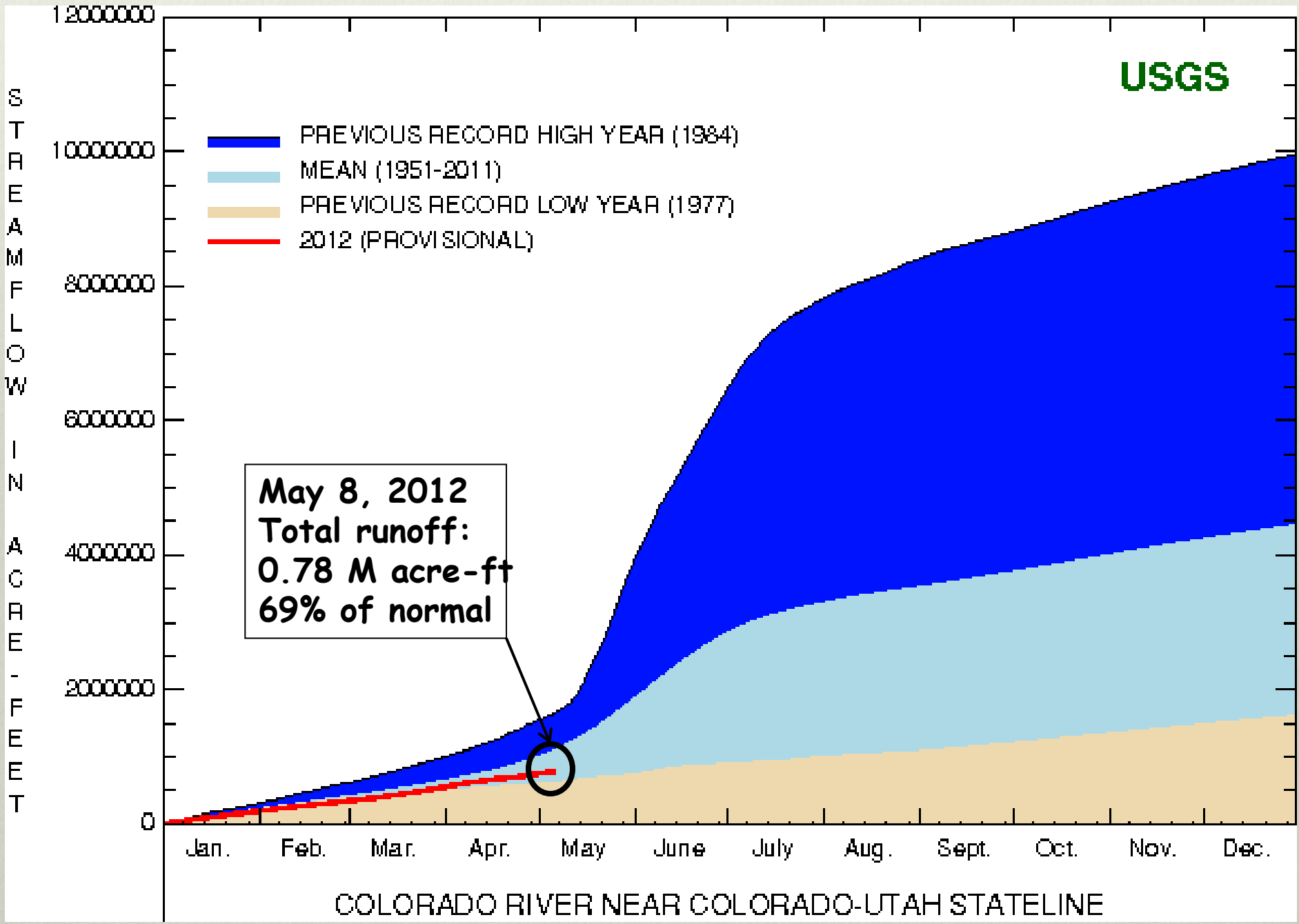
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2011 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2012

# Colorado River Basin 2002 vs. 2012 Mean Daily Discharge Comparison at Select Stations

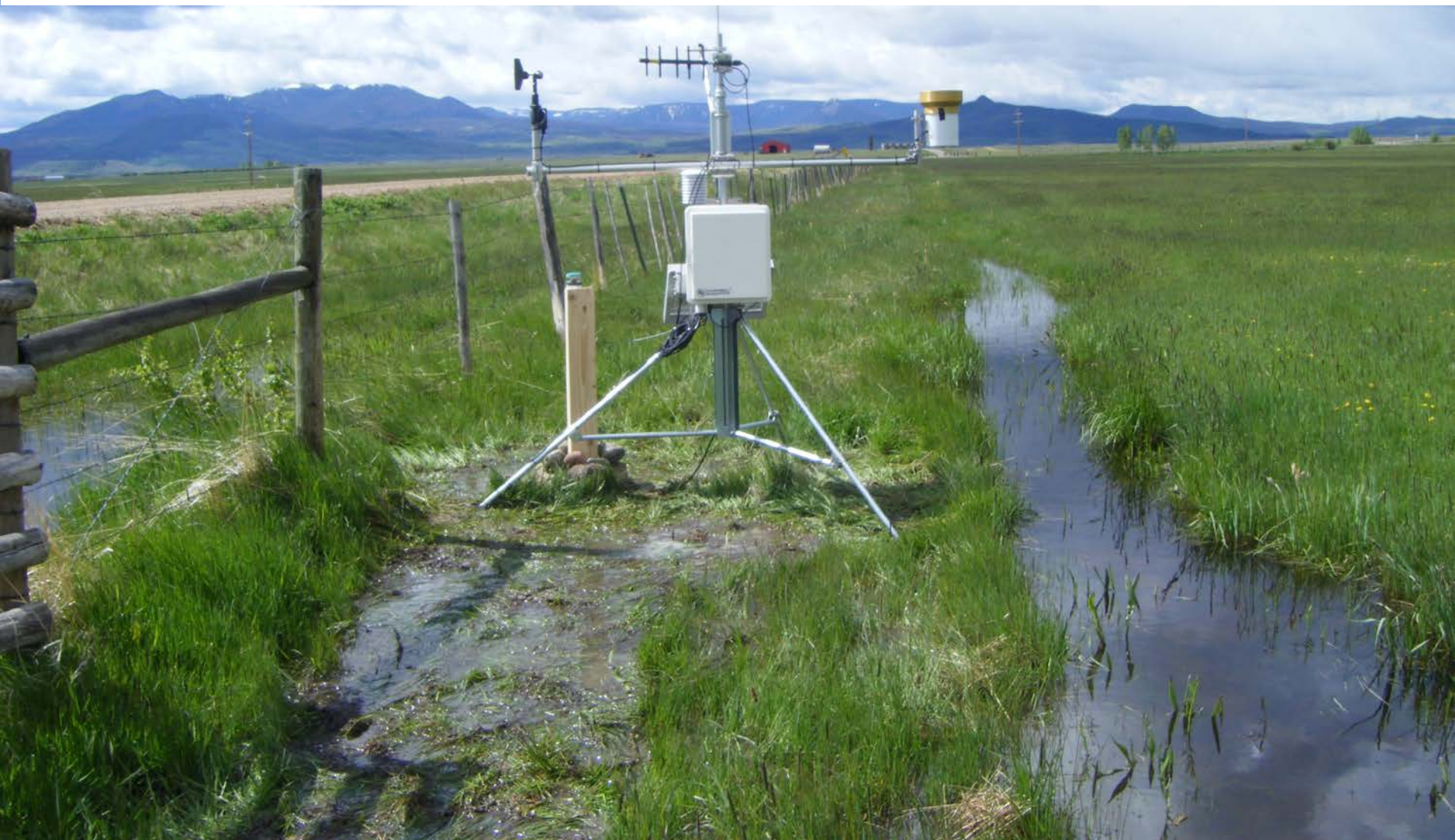
— Water Year 2002 Mean Daily Discharge  
— Water Year 2012 Mean Daily Discharge (Provisional)



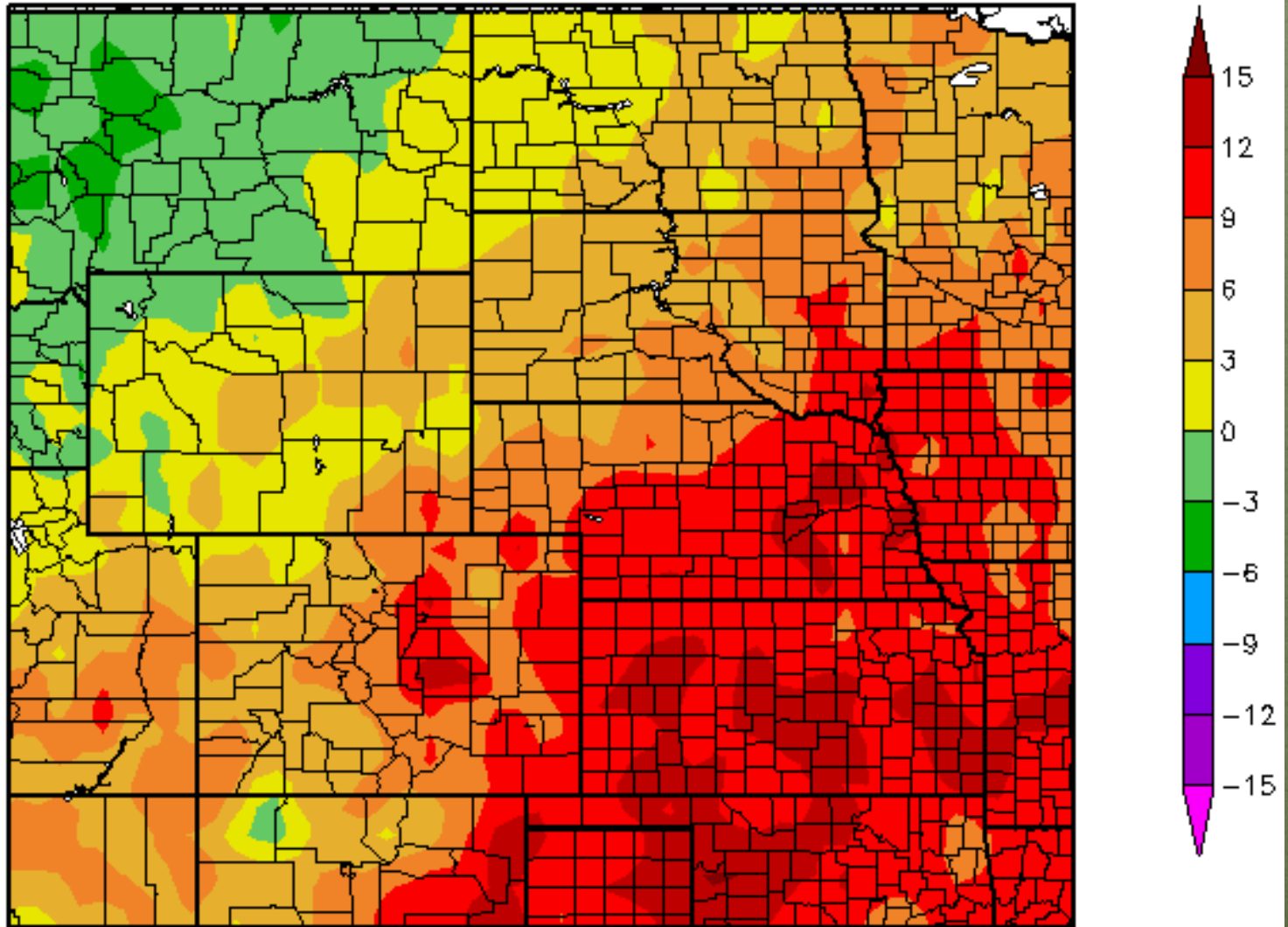
USGS



# Water Demand

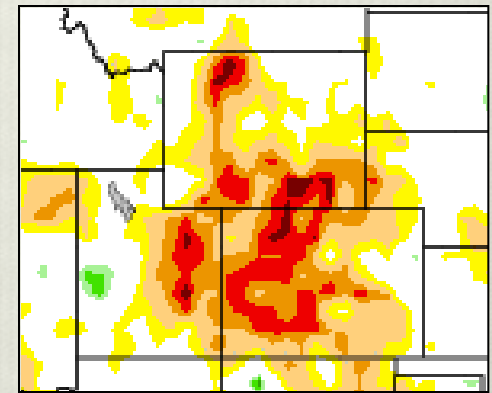
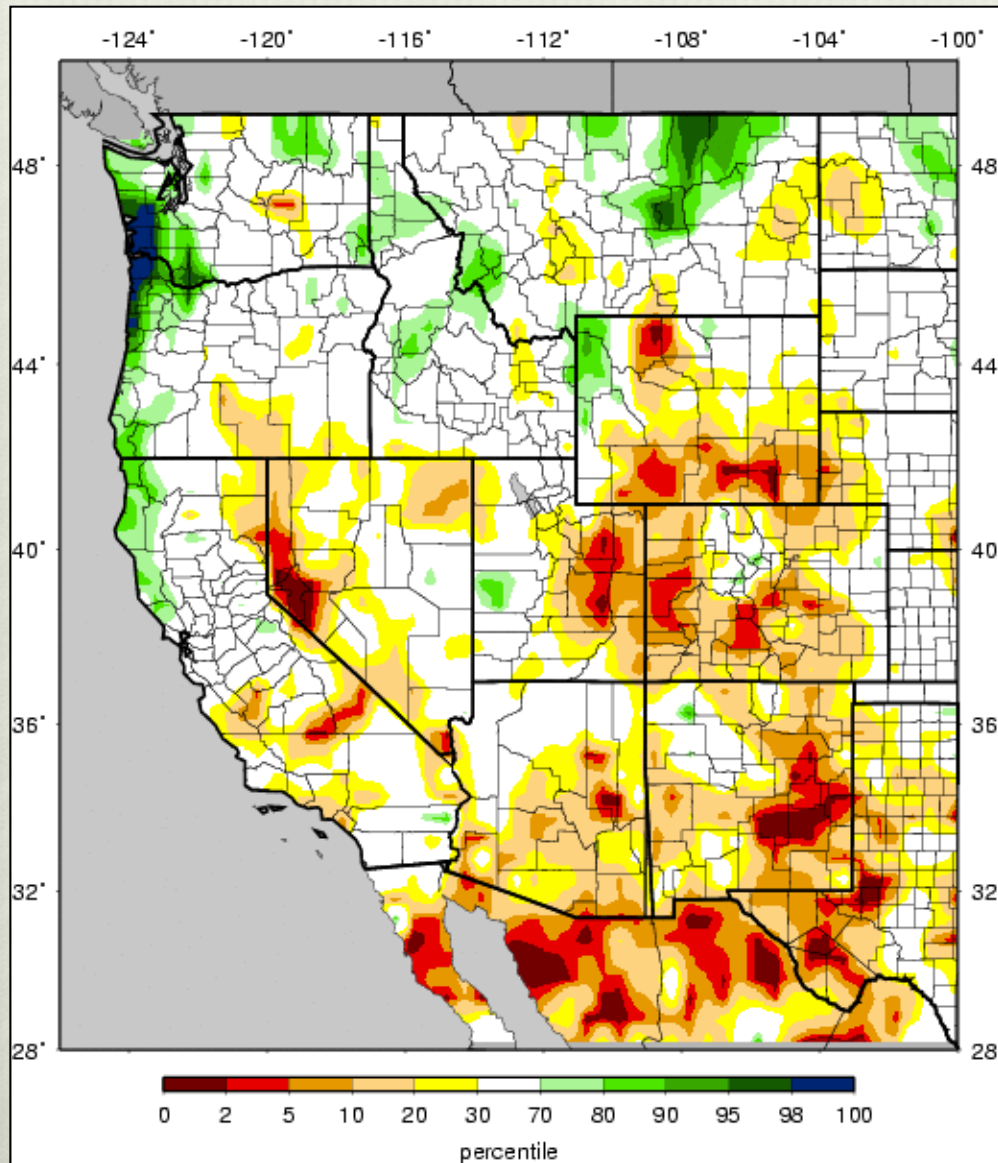


# Temperature Departure from Normal 04/30/2012 – 05/06/2012



# VIC Soil Moisture

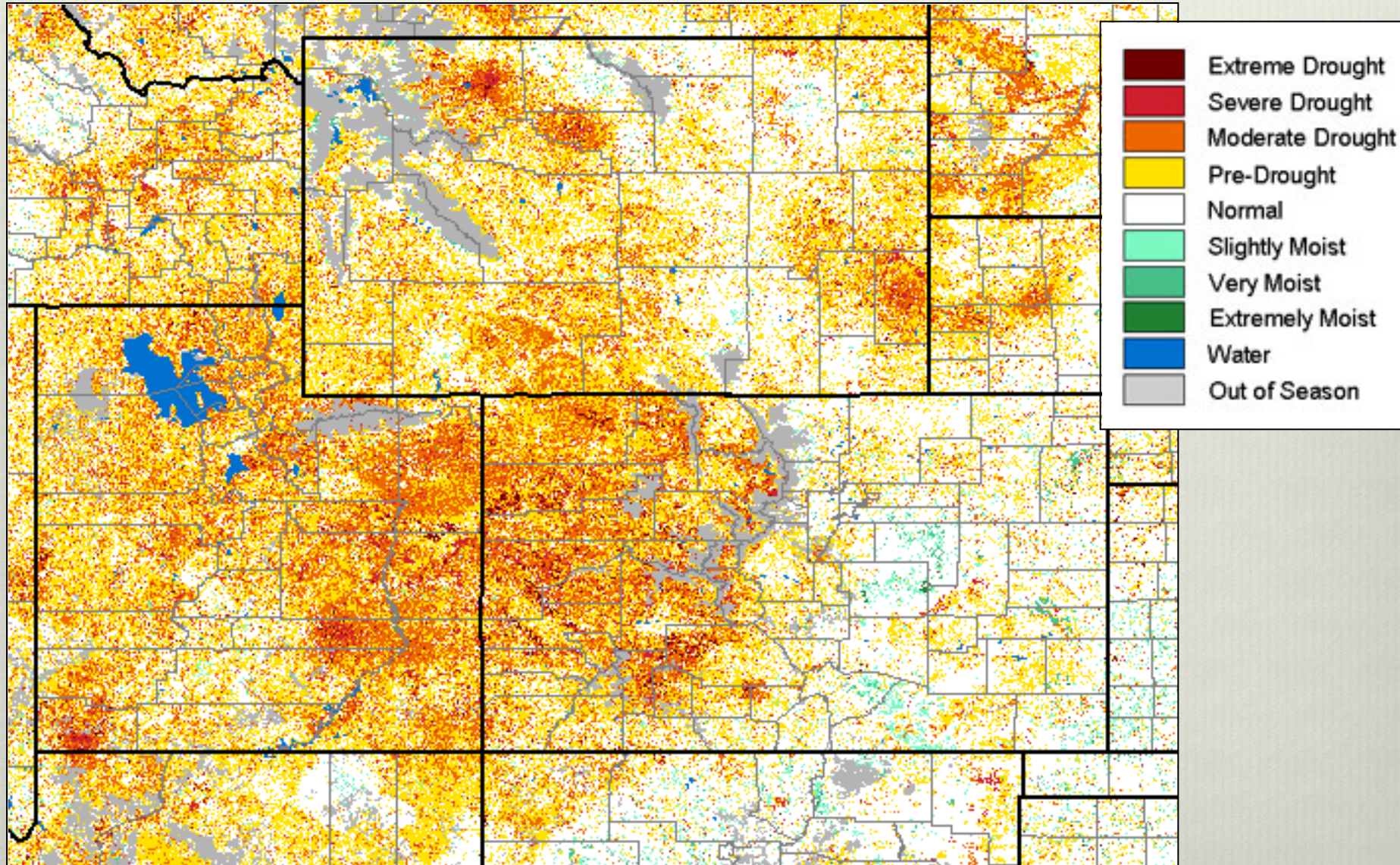
## 6 May 2012



**SWE + SOIL MOISTURE =  
TOTAL MOISTURE  
STORAGE**

# eMODIS VegDRI Vegetation

## 6 May 2012

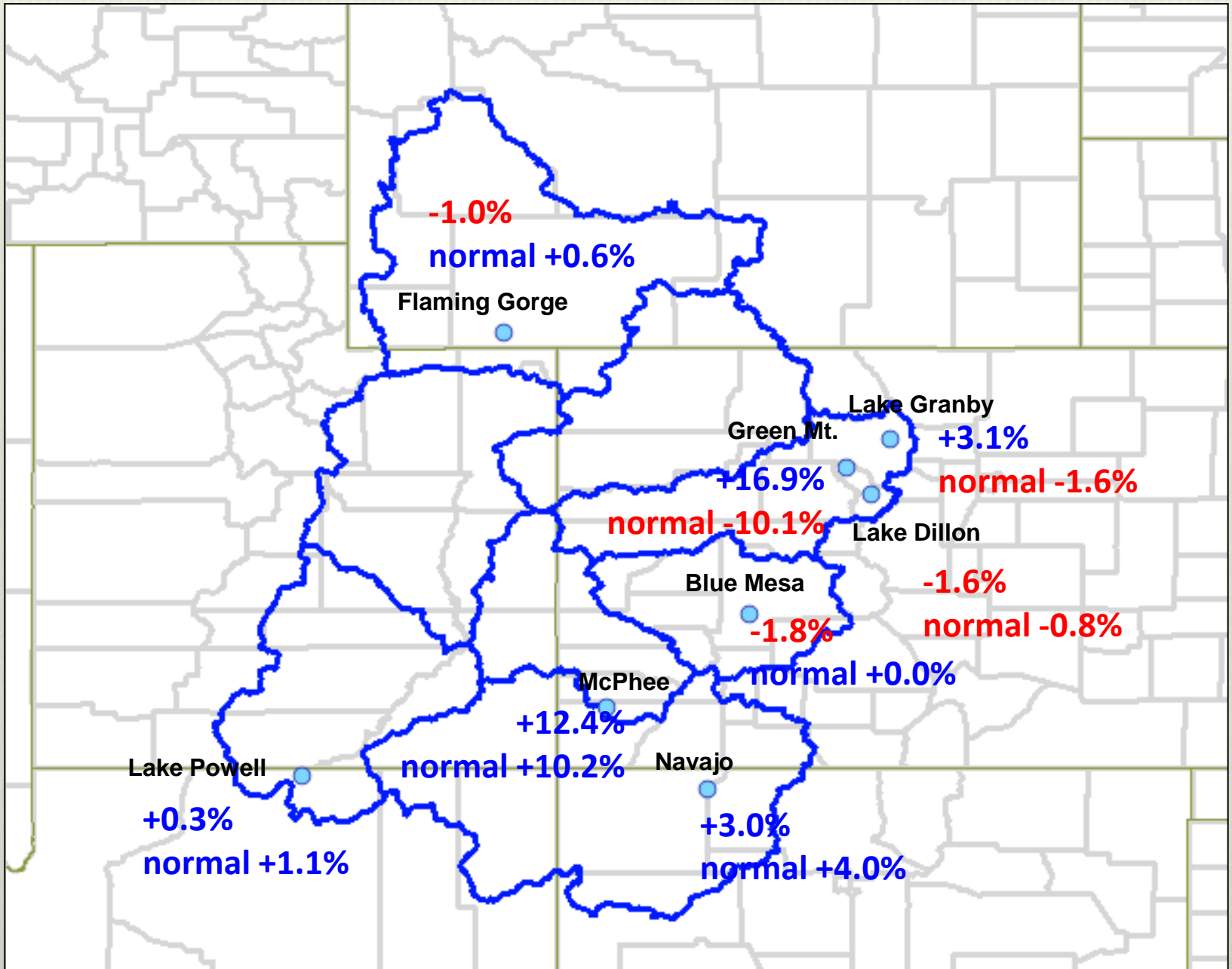




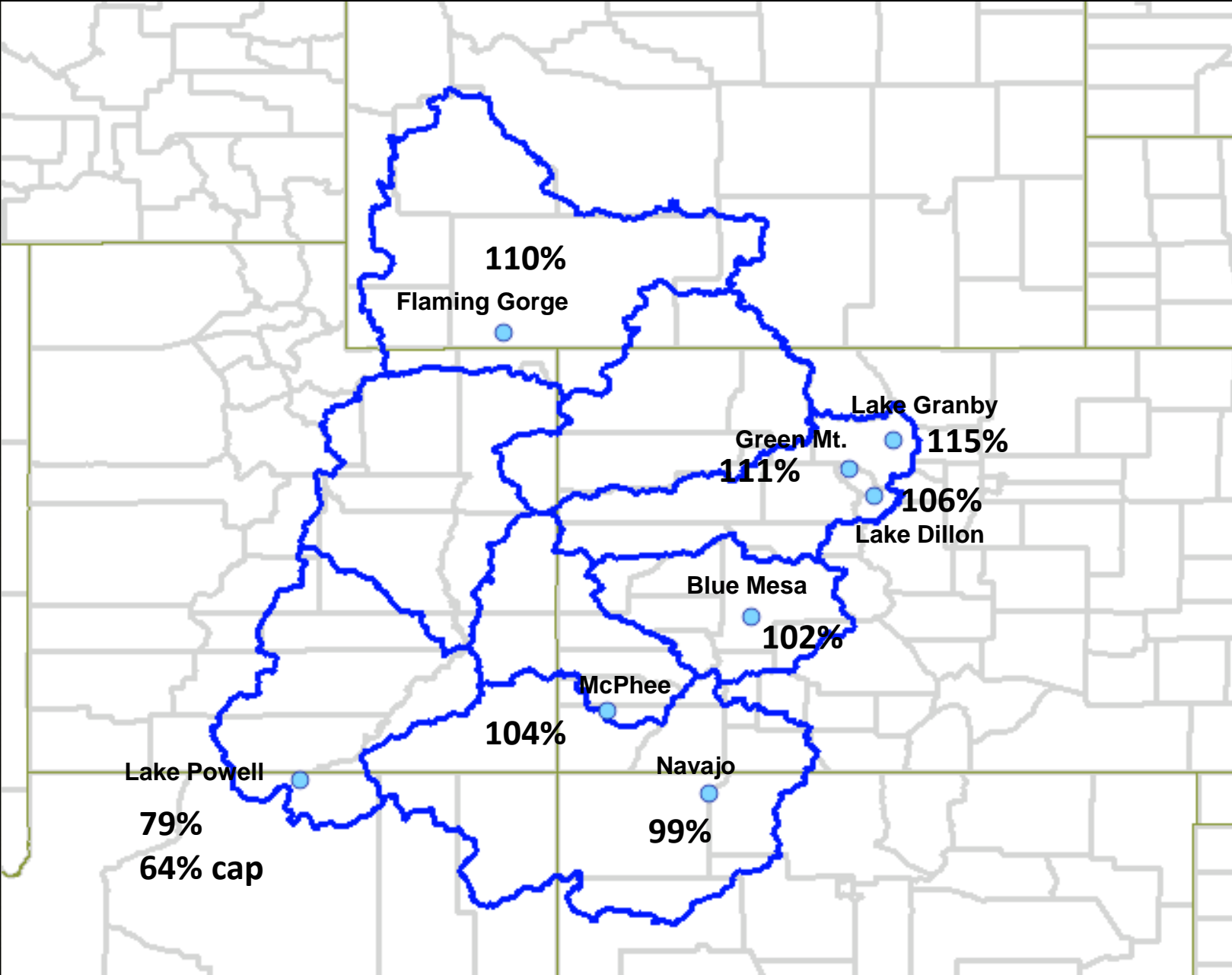
# Reservoir Update



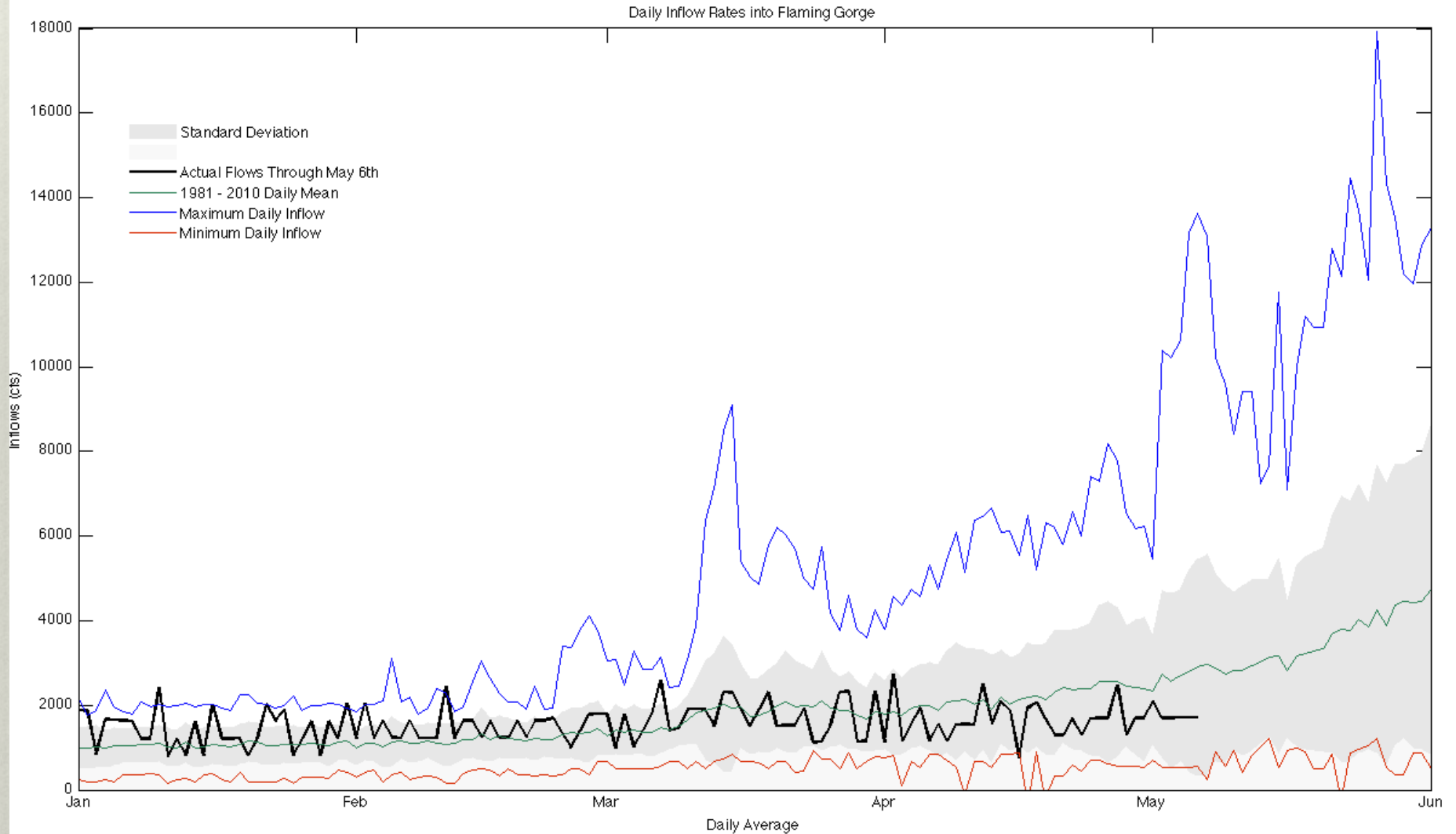
# April Reservoir Storage Volume Change



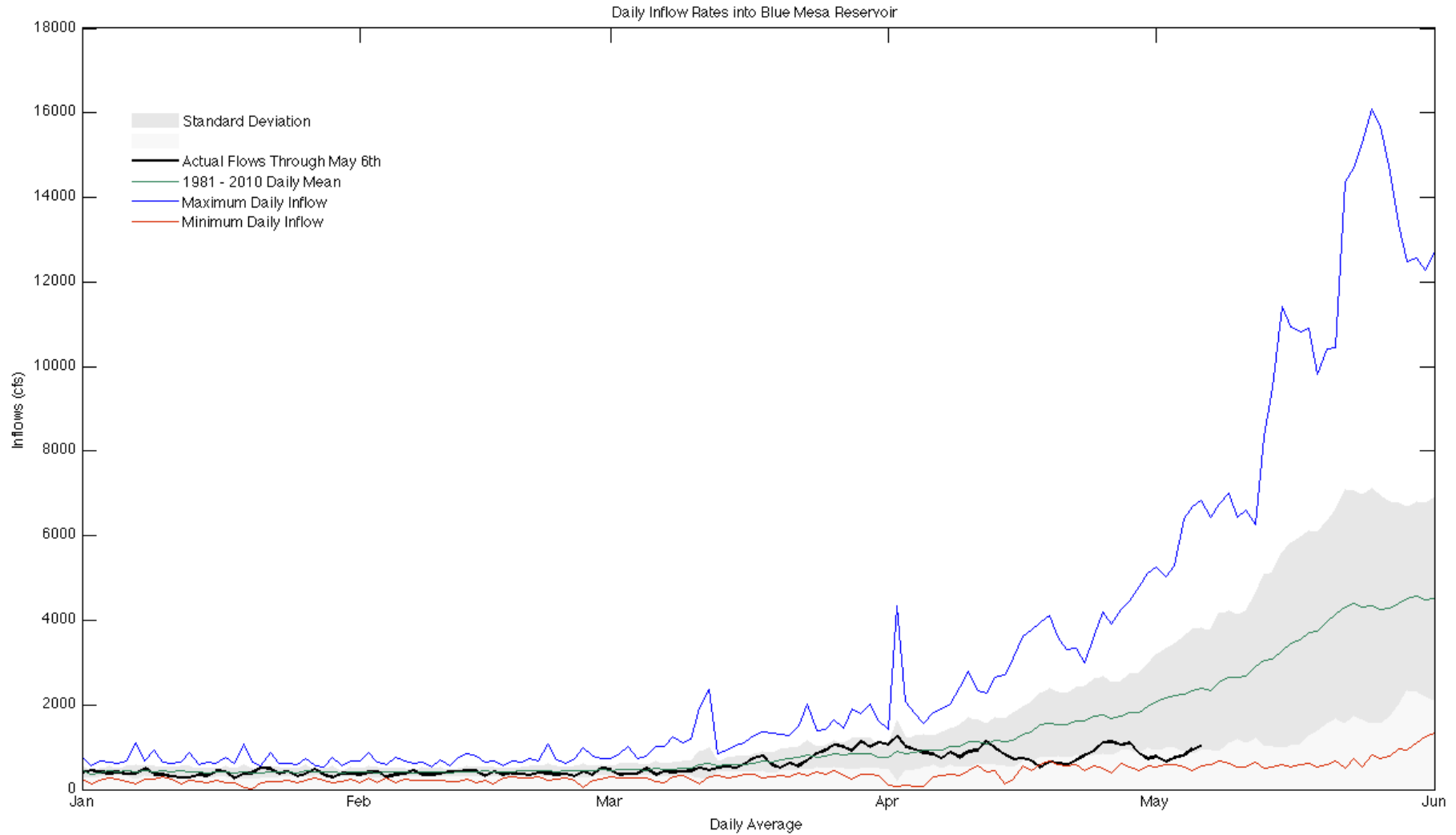
# May Average Reservoir Storage Volume



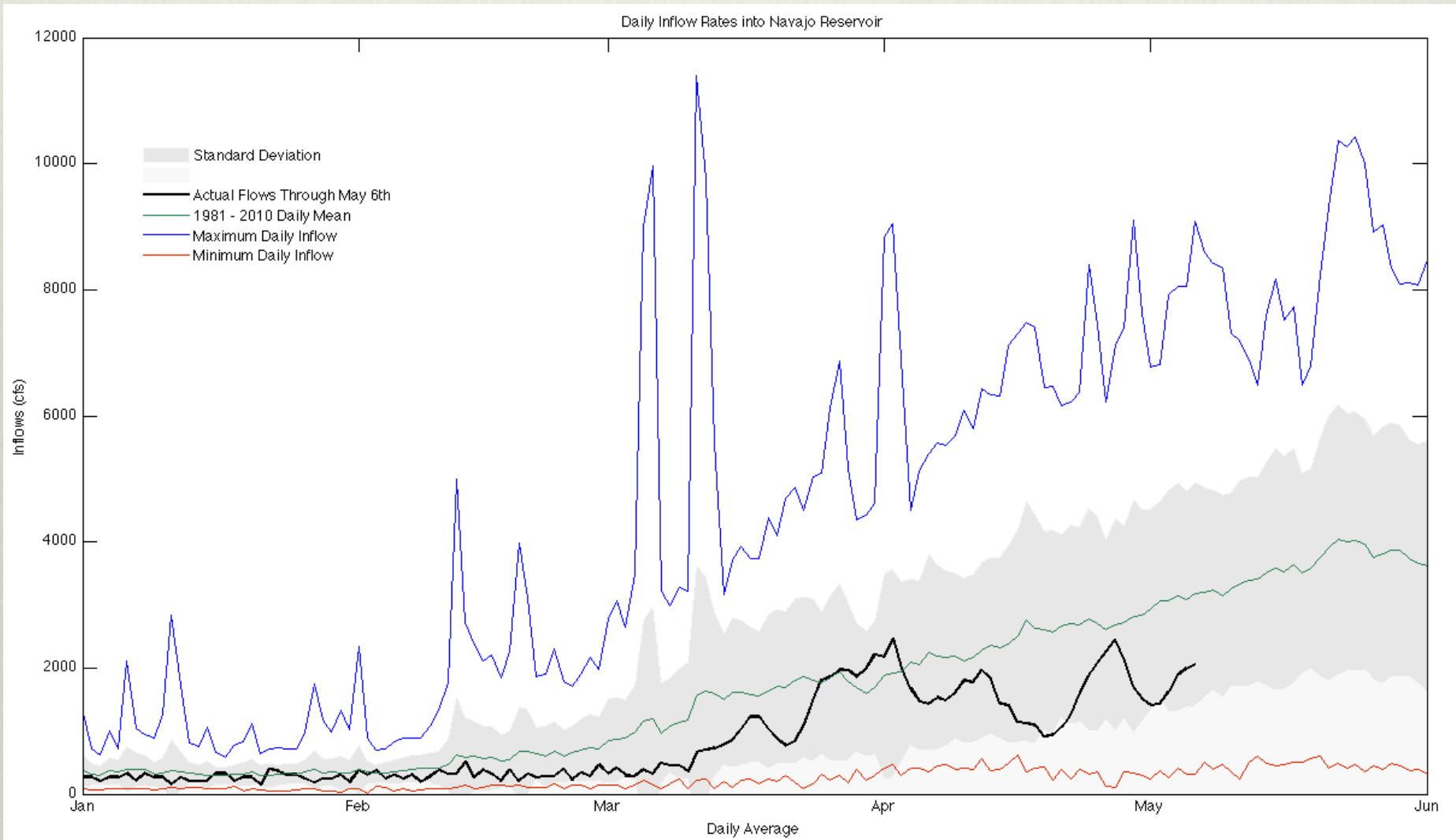
# Daily Inflows into Flaming Gorge



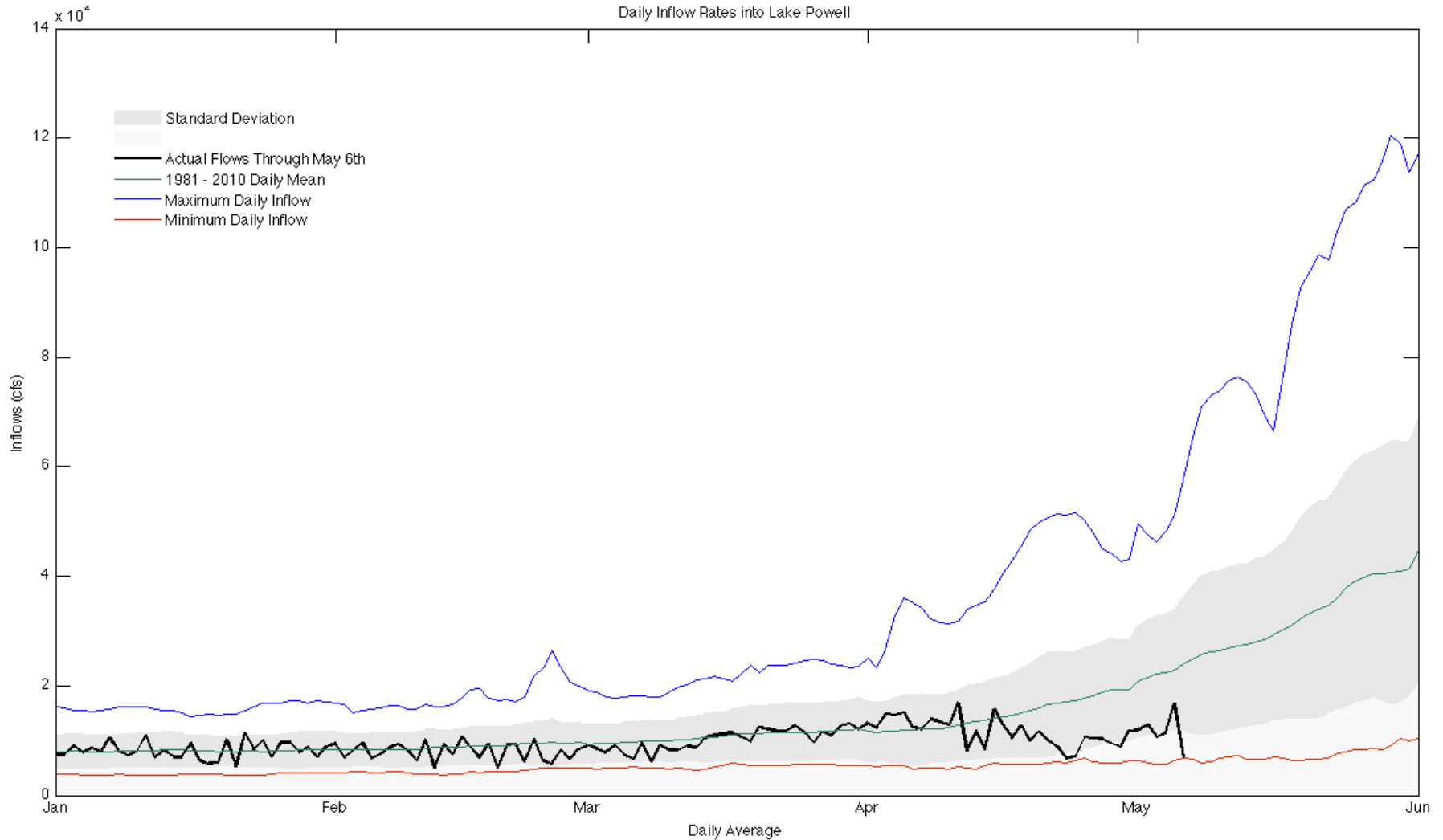
# Daily Inflows into Blue Mesa



# Daily Inflows into Navajo



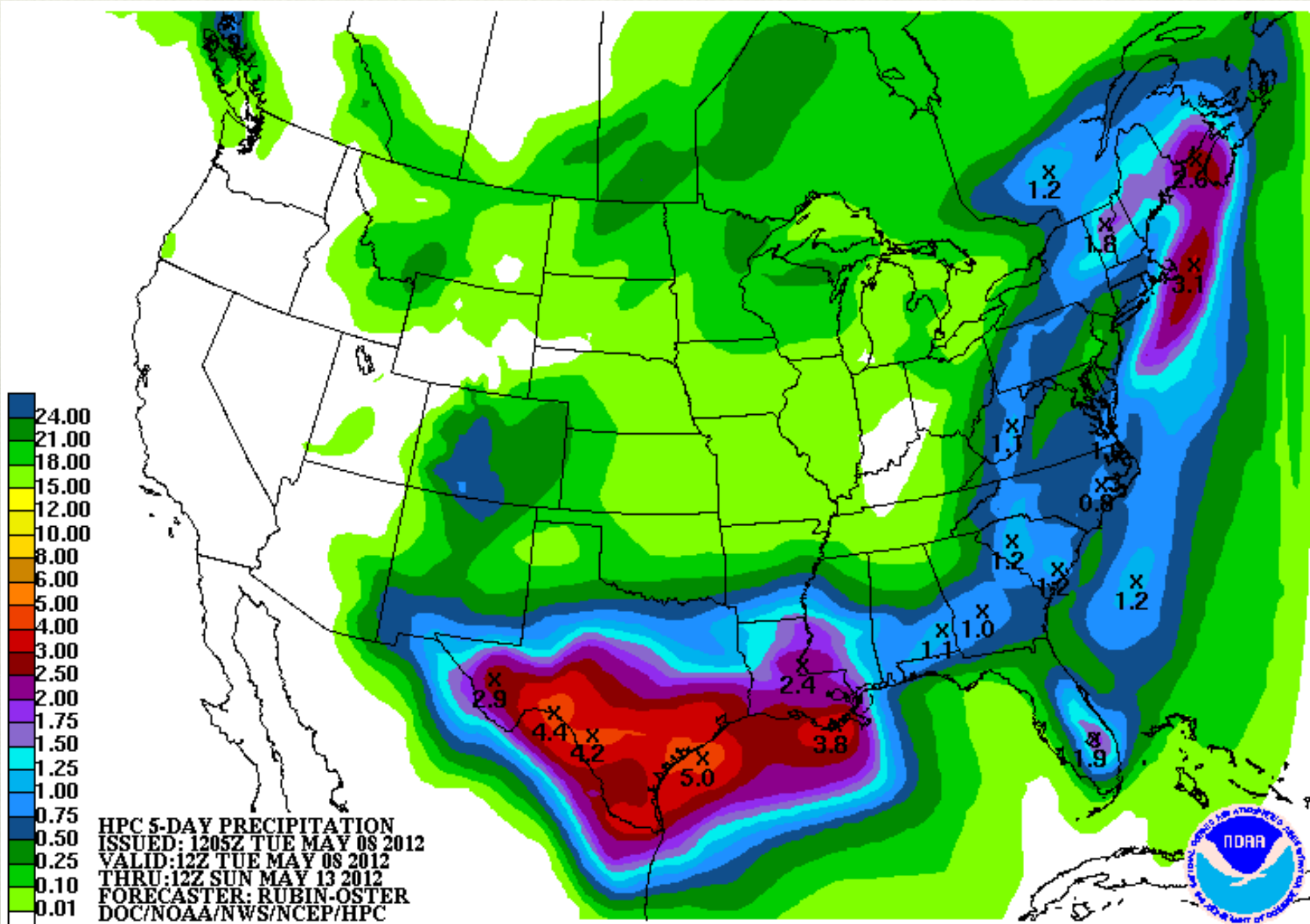
# Daily Inflows into Lake Powell



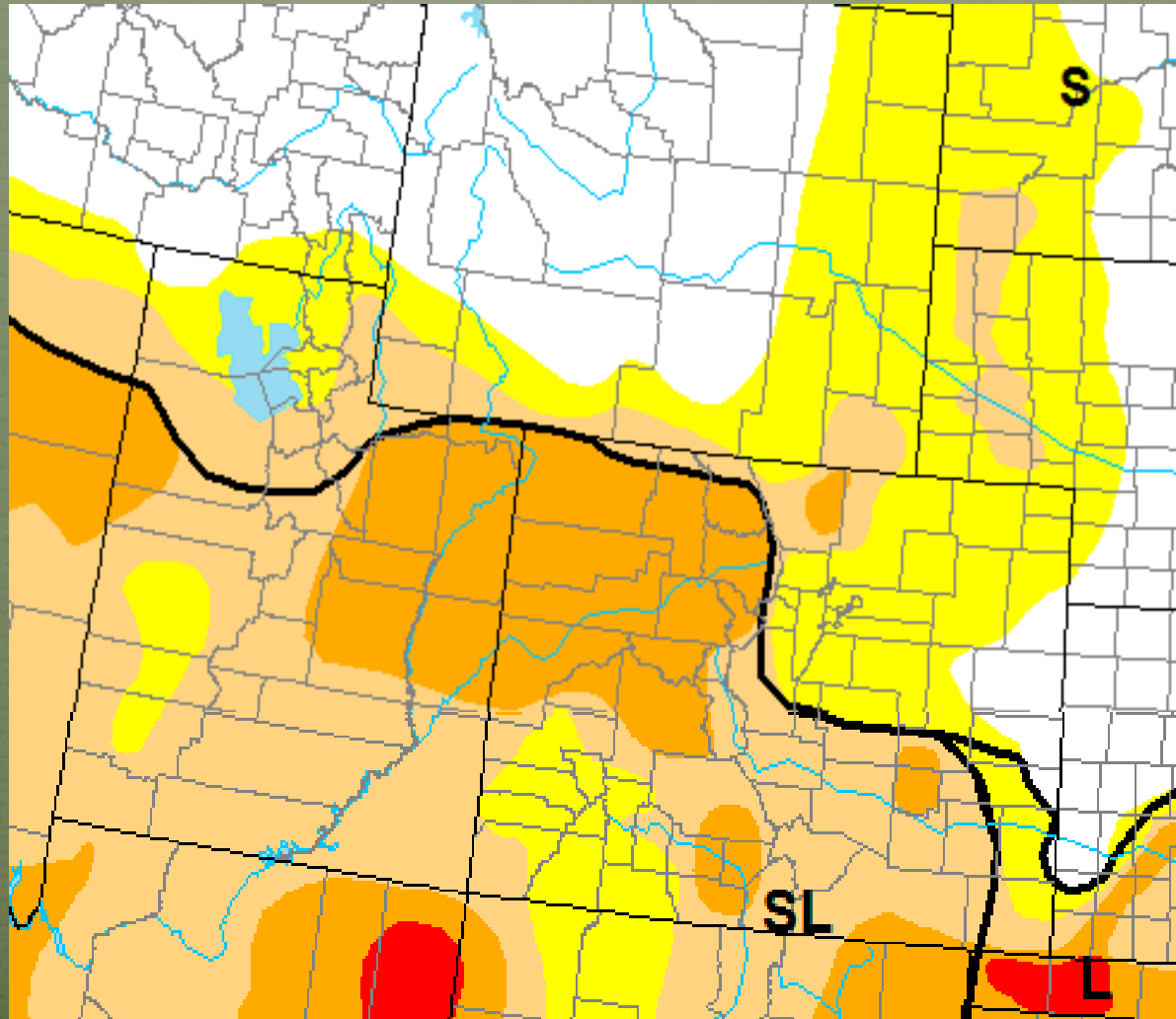
# Precipitation Forecast





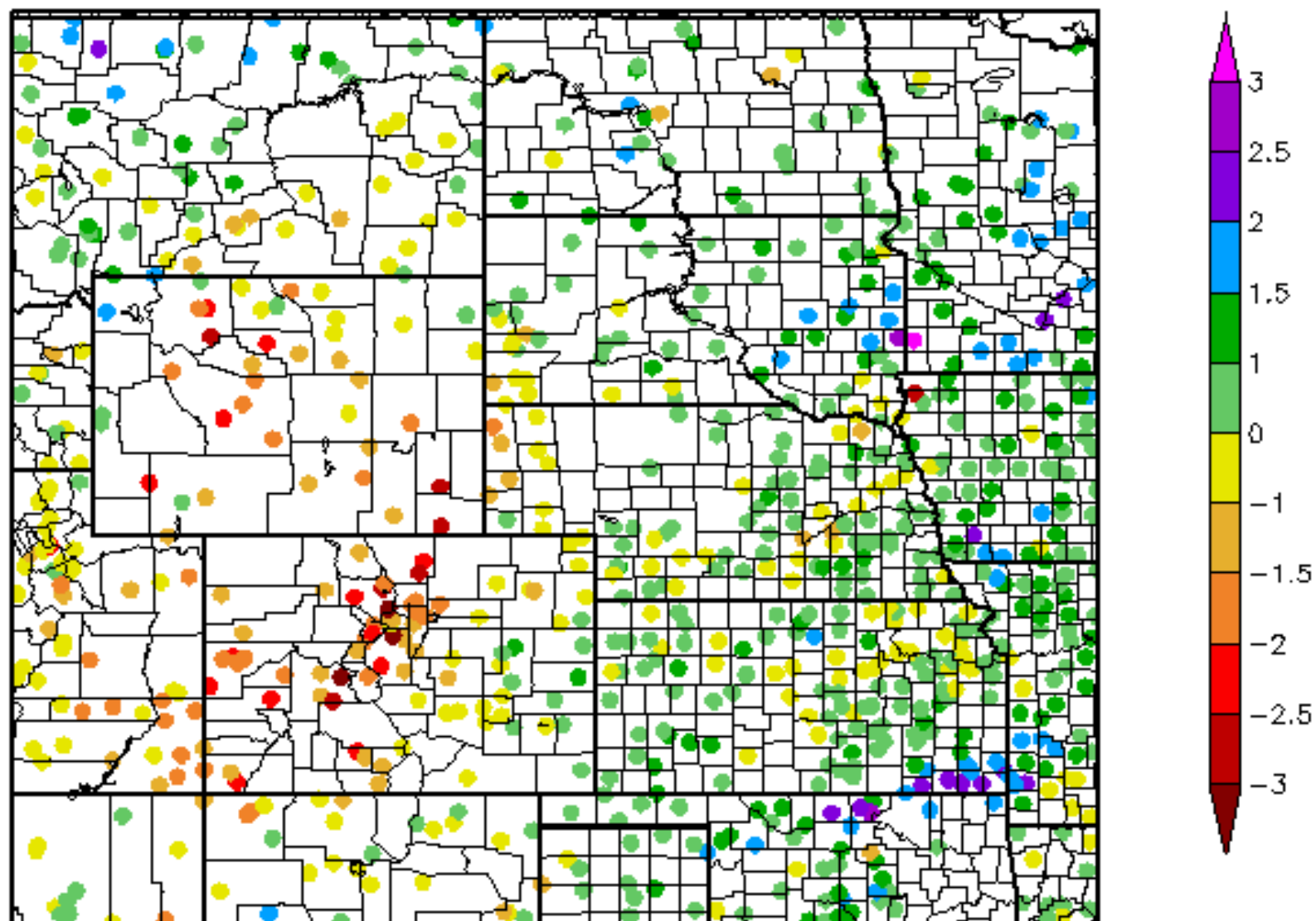


# Recommendations

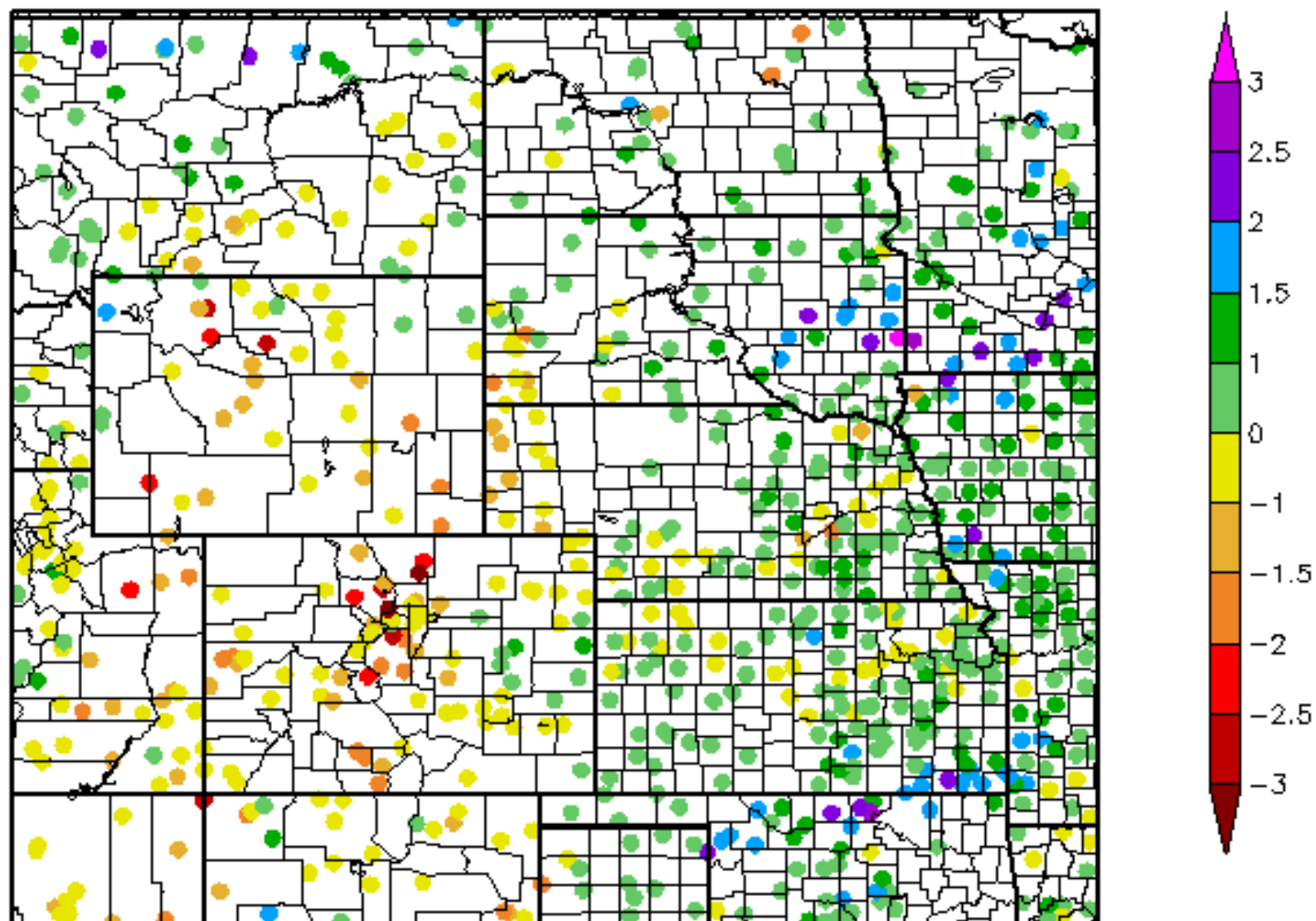


# 60 Day SPI

3/9/2012 - 5/7/2012



120 Day SPI  
1/9/2012 - 5/7/2012



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**CONTACT:**

**COLORADO CLIMATE CENTER**

**COLORADO STATE UNIVERSITY**

**FORT COLLINS, CO 80523**

**970 - 491 - 8545**

**NIDIS - UPPER COLORADO BASIN PILOT PROJECT**

**For more information**

# NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

May 8, 2012

# Precipitation and Snowpack

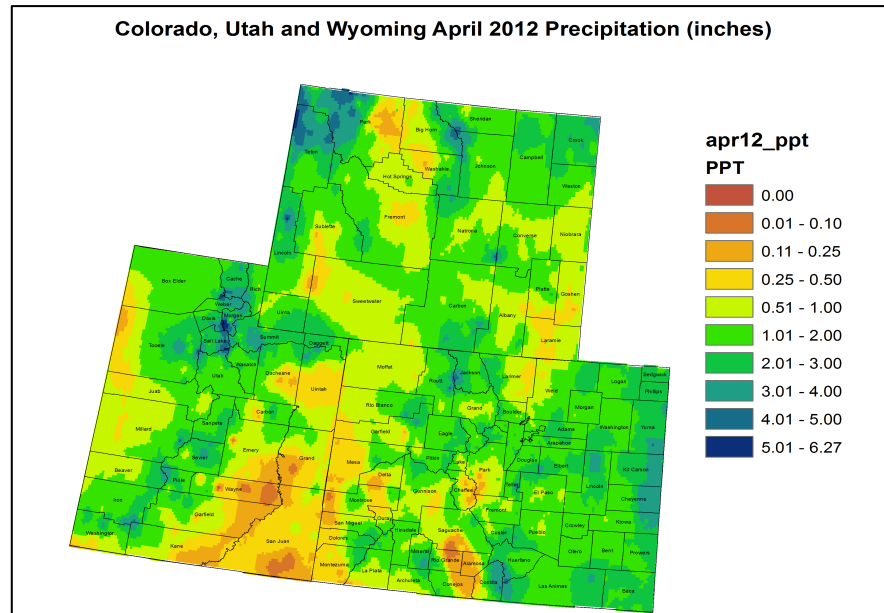


Fig. 1: April precipitation in inches.

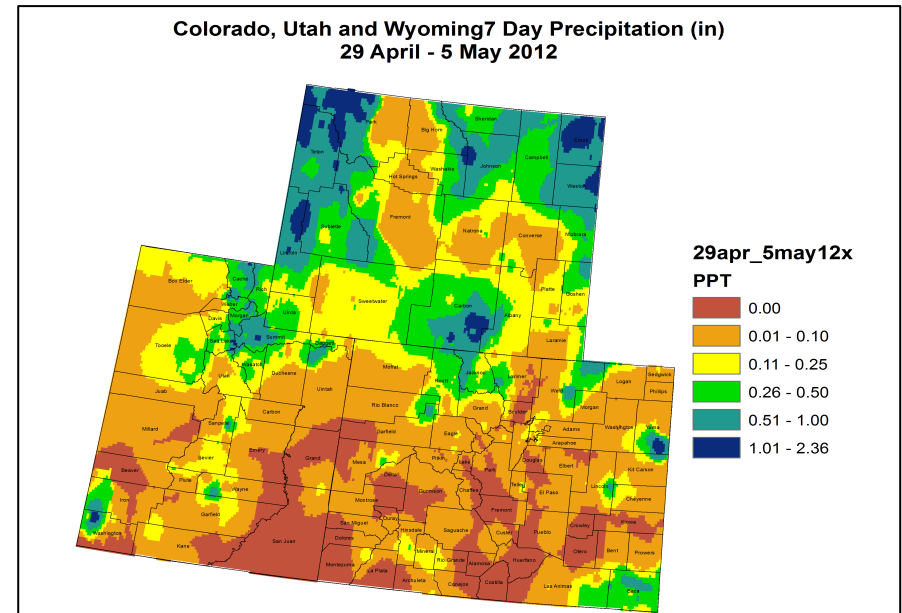


Fig. 2: April 29 – May 5 precipitation in inches.

For the month of April, the Upper Colorado River Basin (UCRB) higher elevations saw precipitation amounts ranging between 1 and 3 inches, with spotty amounts of over 3 inches in the Wasatch mountains in Utah (Fig. 1). The lower elevations of western Colorado and eastern UT received amounts ranging between a quarter inch and 1 inch, with the Colorado River valley just above Lake Powell receiving less than a quarter inch for the month. Most of CO, east of the UCRB, received between 1 and 2 inches of precipitation, though short-term dryness shows up in northern CO and in the South Park valley for the month. The San Luis Valley was also drier, seeing less than a quarter of an inch for the month.

Last week, the heaviest precipitation fell in northeast UT and northern CO with amounts ranging between .25 and 1 inch (Fig. 2). Most of the basin was fairly dry for the week, with most areas receiving less than a tenth of an inch and no precipitation falling in the southern part of the basin. Not shown on these maps, recent precipitation did fall along the Continental Divide and west toward Eagle County and south into the Gunnison basin and along the Arkansas headwaters, with amounts ranging between half an inch and an inch.

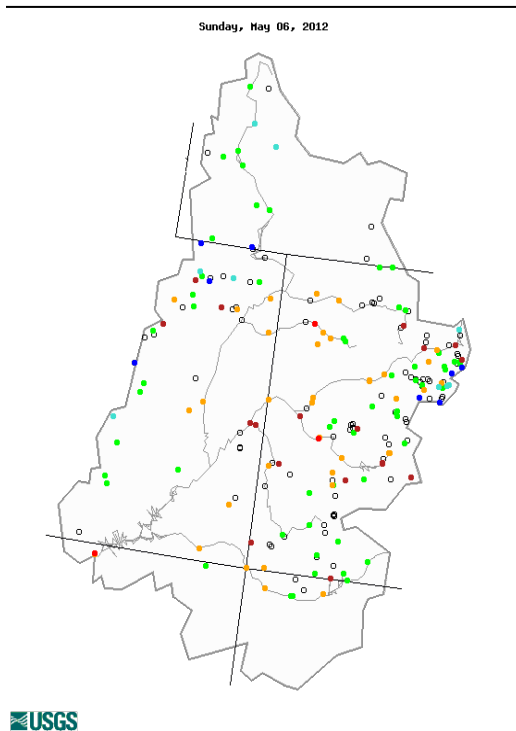




# Streamflow

As of May 6<sup>th</sup>, 58% of the USGS streamgages in the UCRB recorded normal (25<sup>th</sup> – 75<sup>th</sup> percentile) or above normal 7-day average streamflows (Fig. 5). About 14% of the gages in the basin are recording above normal flows, while about 43% of the gages in the basin are recording below normal flows. Most of the gages on the Green River in WY are showing near normal flows, though flows on the Green are dropping. Streamflow on the Colorado and Gunnison rivers are below normal. Streamflow along the San Juan River is variable and has increased in the last week. Higher flows are concentrated near the Colorado headwaters region.

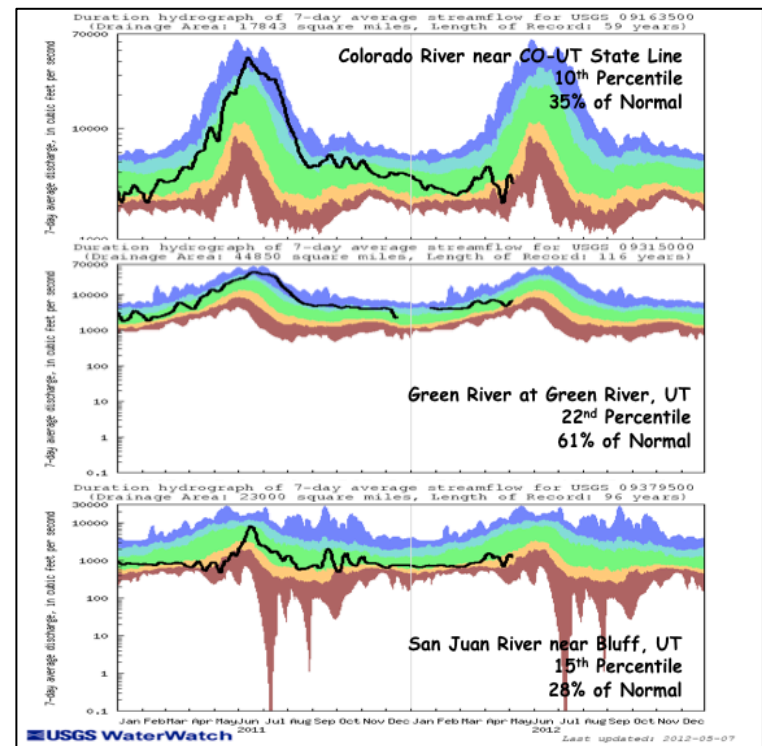
Flows on two key gages in the UCRB showed slight decreases last week, while one increased (Fig. 6). Flows on the Green River at Green River, UT increased slightly and is currently at the 22<sup>nd</sup> percentile. Flows on the Colorado River near the CO-UT state line and the San Juan River near Bluff, UT both decreased to the 10<sup>th</sup> and 15<sup>th</sup> percentiles, respectively. All three gages are currently recording in the below normal range.



Explanation - Percentile classes							
	●	●	●	●	●	●	○
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Fig. 5: 7-day average discharge compared to historical discharge for May 6<sup>th</sup>.

Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).



# Water Supply and Demand

Almost all of the UCRB experienced above average temperatures for the week, with the northern-most part of the basin seeing closer to average temperatures. All of eastern CO also experienced much warmer than average temperatures last week. The VIC model shows dry soil moisture conditions for almost all of the UCRB (with the exception of the Green River headwaters in WY), and also dry soils for much of the CO Front Range and plains (Fig. 7). There are no regions of wet soils, though near normal soil moisture conditions show up around the Colorado River headwaters. However, when taking SWE into account, the entire area shows a total moisture storage deficit (Fig. 7).

All of the reservoirs above Lake Powell are currently near or above their May storage averages. For the month of April, Blue Mesa, Flaming Gorge and Lake Dillon dropped more than they normally do. All the other reservoirs saw volume increases for the month, though Lake Powell's and Navajo's increases were less than an average April increase. Lake Powell is currently at 79% of average and 64% of capacity (compared to 52% of capacity at the same time one year ago).

## Precipitation Forecast

The UCRB is currently between a ridge building in from the northwest and an upper level low pressure area sinking slowly southward into New Mexico. What remains of the low pressure system will continue to wrap moisture into extreme southern parts of the basin through Wednesday while other areas experience warm and dry conditions courtesy of the strengthening ridge. By Thursday evening this ridge begins to move eastward allowing energy from the west to impinge on the basin. Showers and afternoon thunderstorms will become more numerous on Friday, particularly in the southern zones and along the eastern periphery of the basin where the best moisture will reside. Precipitation amounts through Sunday will range from 0.75 inches of liquid accumulation over the San Juan mountains to 0.25-0.50 inches along the Continental Divide in Colorado (Fig. 8). Expect above average temperatures and mostly dry conditions beyond the weekend, with a small chance of isolated convection over the high terrain each day.

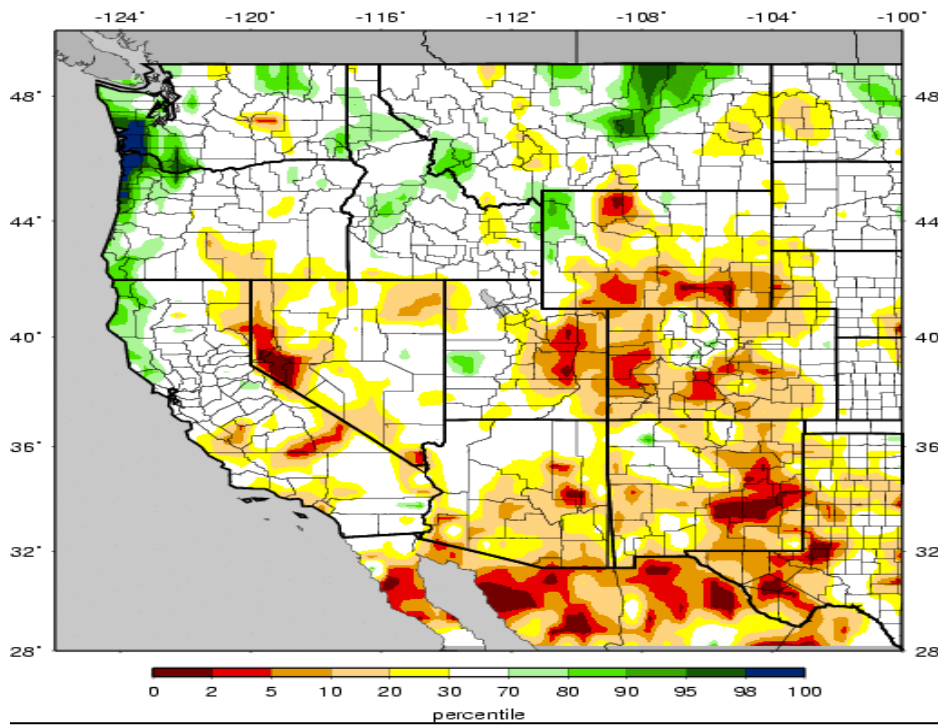


Fig. 7: VIC soil moisture percentiles as of May 6<sup>th</sup>, with total moisture storage (SWE and soil moisture) below.

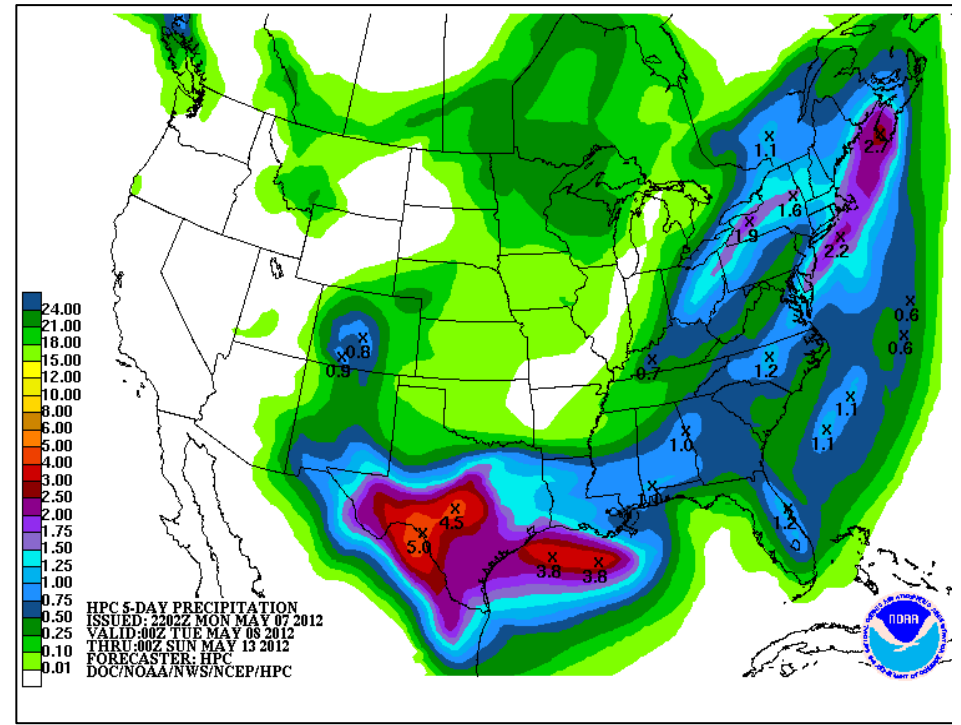
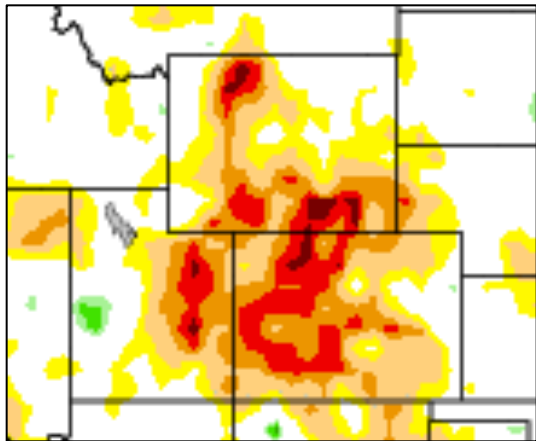


Fig. 8: Hydrologic Prediction Center's Quantitative Precipitation Forecast (QPF) through 00UTC Sunday.

# Drought and Water Discussion

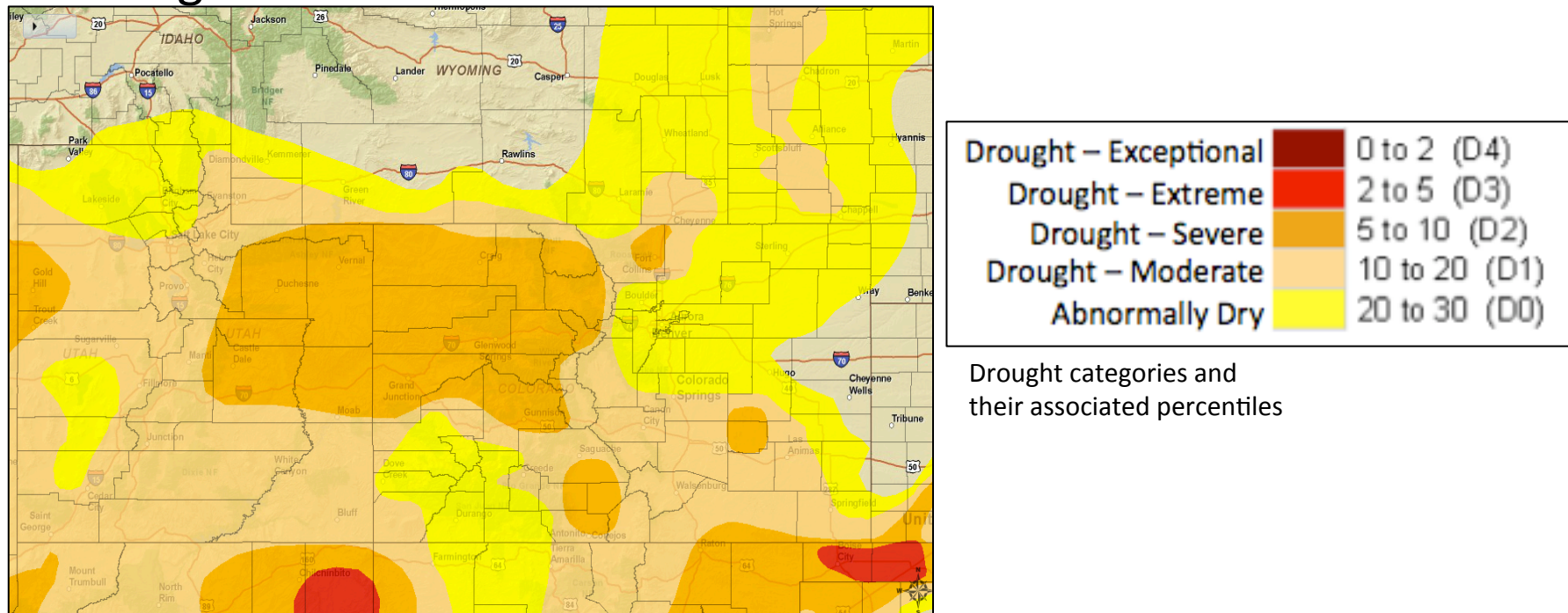


Fig. 9: May 1<sup>st</sup> release of U.S. Drought Monitor for the UCRB.

Status quo is recommended for the UCRB in the current depiction of the U.S. Drought Monitor (USDM) map (Fig. 9). At this time, it doesn't appear that D3 should be introduced yet and that "severe drought" is an accurate description of the conditions in the Yampa, Colorado, Gunnison, and Lower Green River basins. Status quo is also recommended for northeast CO, southeast CO and the San Luis Valley where enough precipitation fell in the past couple days to prevent any further deteriorations at this time.

The current USDM author is considering further degradations for western UT. We will defer to the author and other local experts on any changes in that area.