Spring 2011

Weekly Climate, Water & Drought Assessment

Today's Agenda

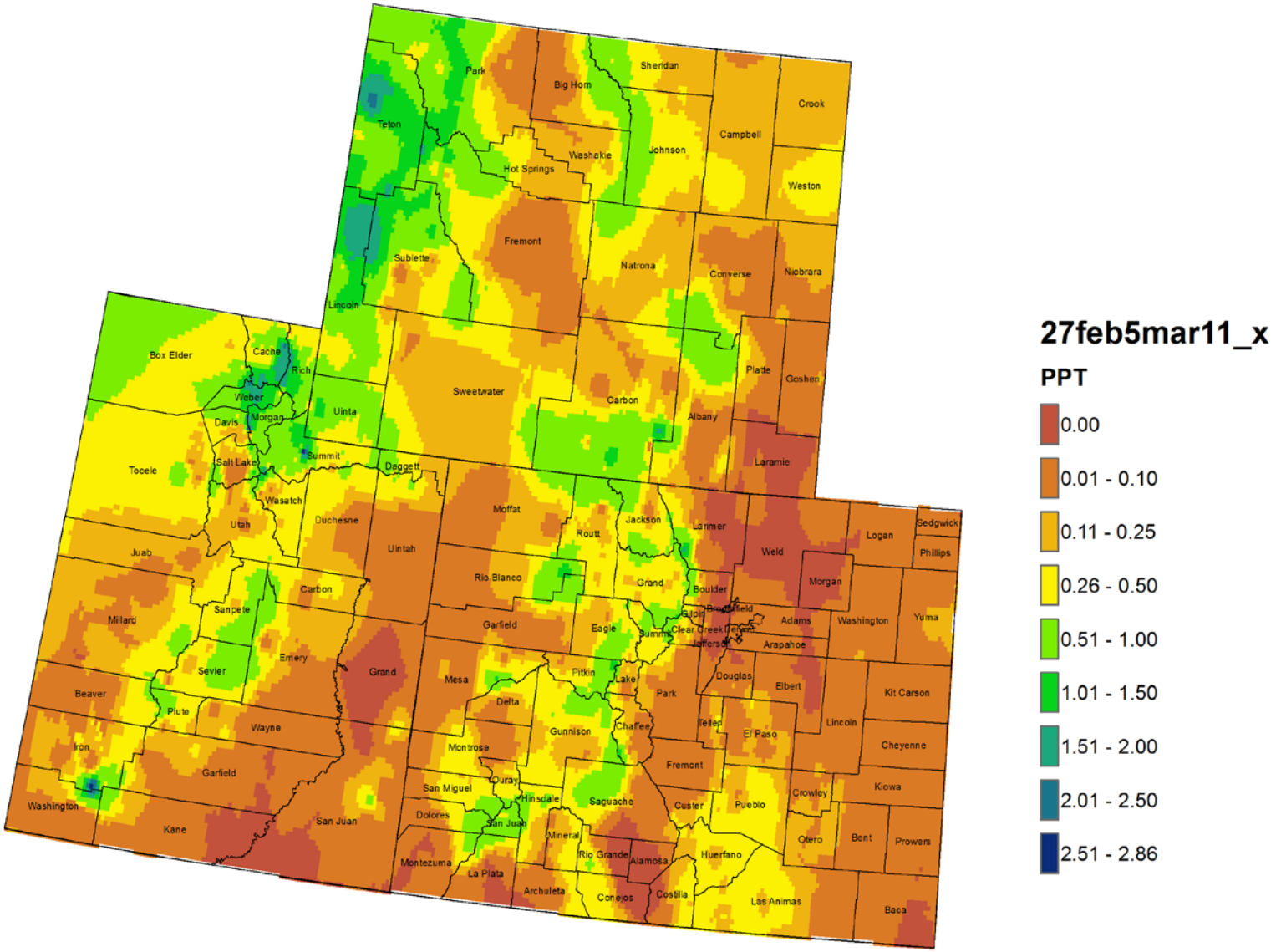
-Assessment of current water conditions

- Precipitation Forecast

- Recommendations for Drought Monitor

Precipitation/Snowpack Update

Colorado, Utah and Wyoming 7 Day Precipitation (in)
27 Feb - 5 March 2011

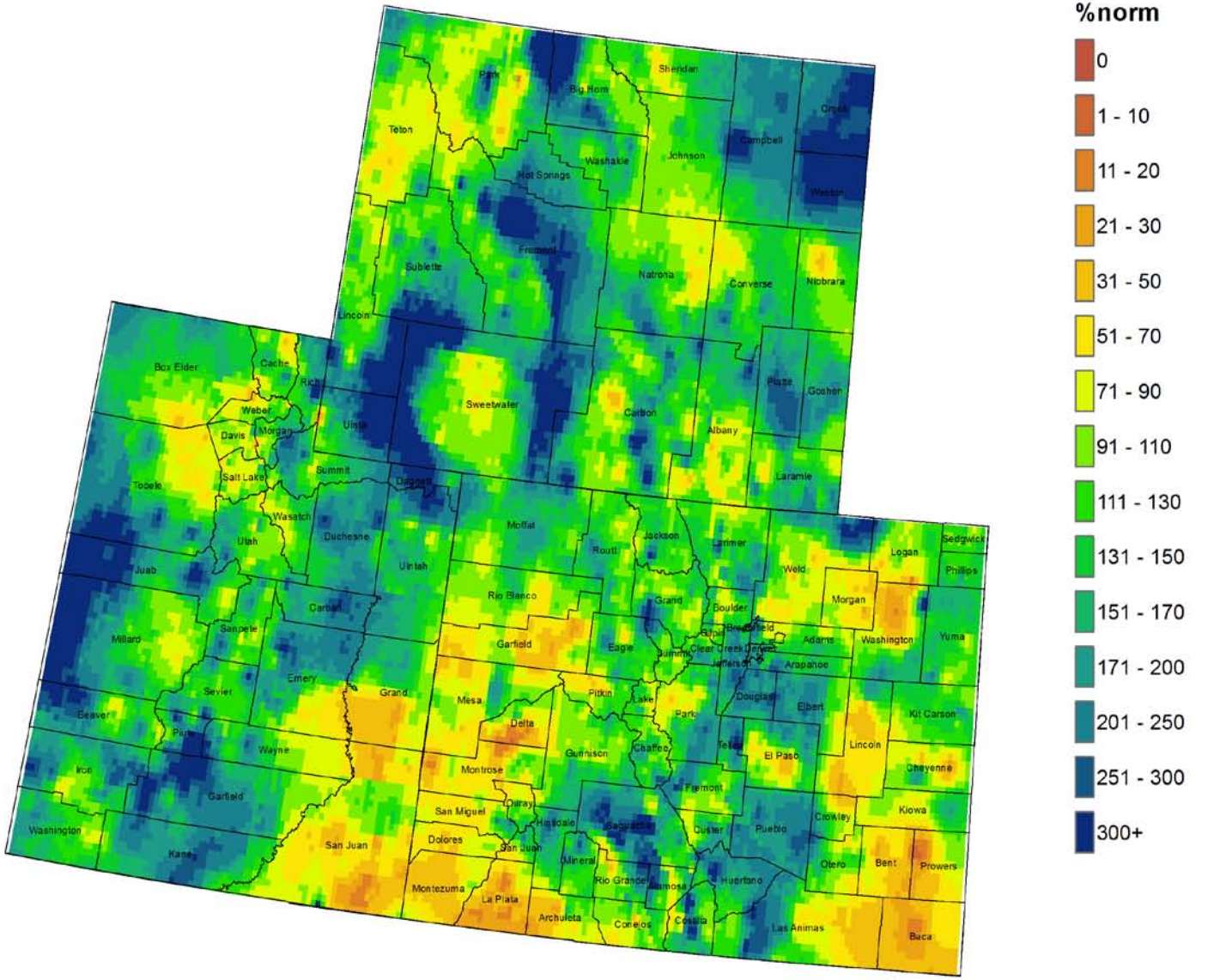


27feb5mar11_x

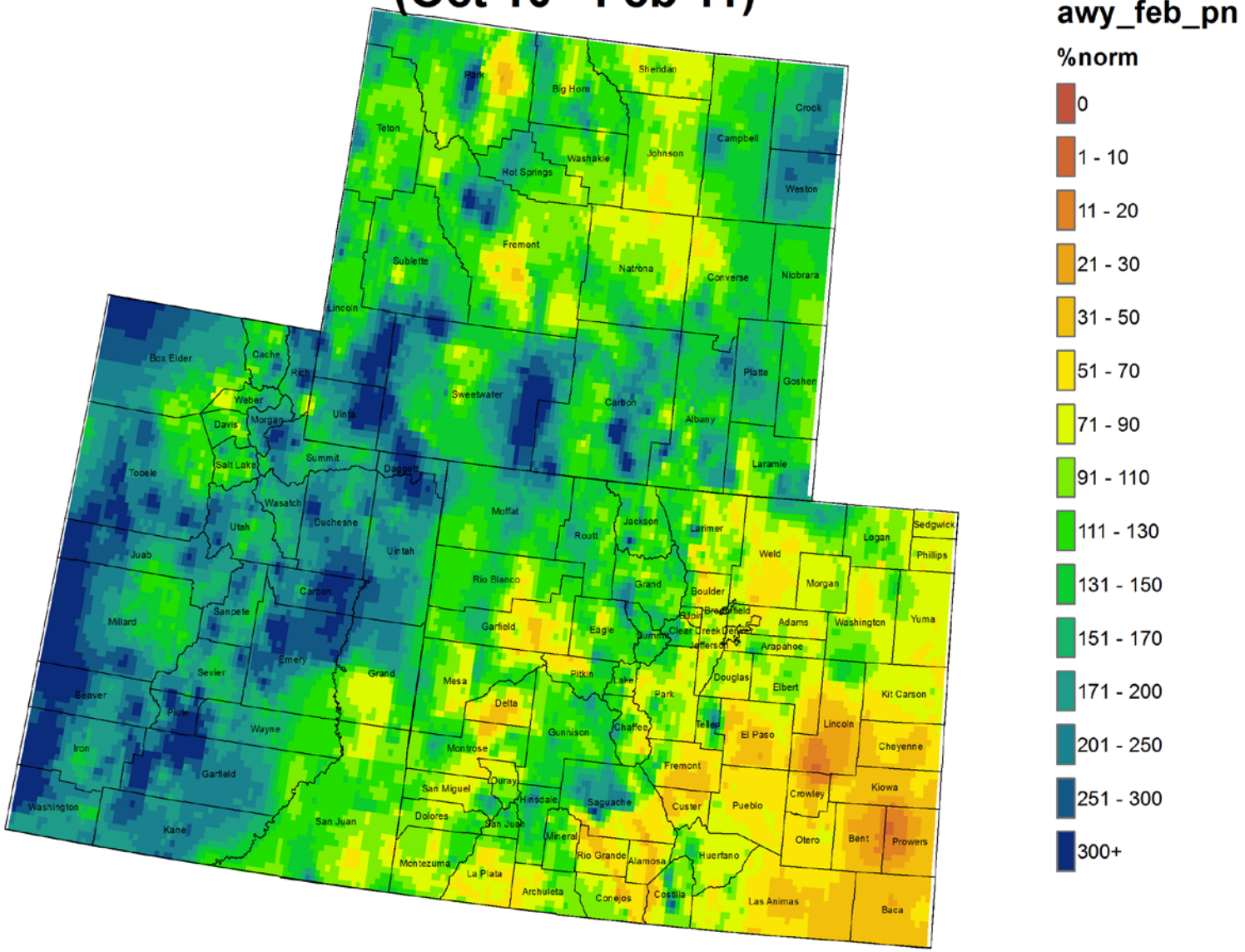
PPT

- 0.00
- 0.01 - 0.10
- 0.11 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 2.86

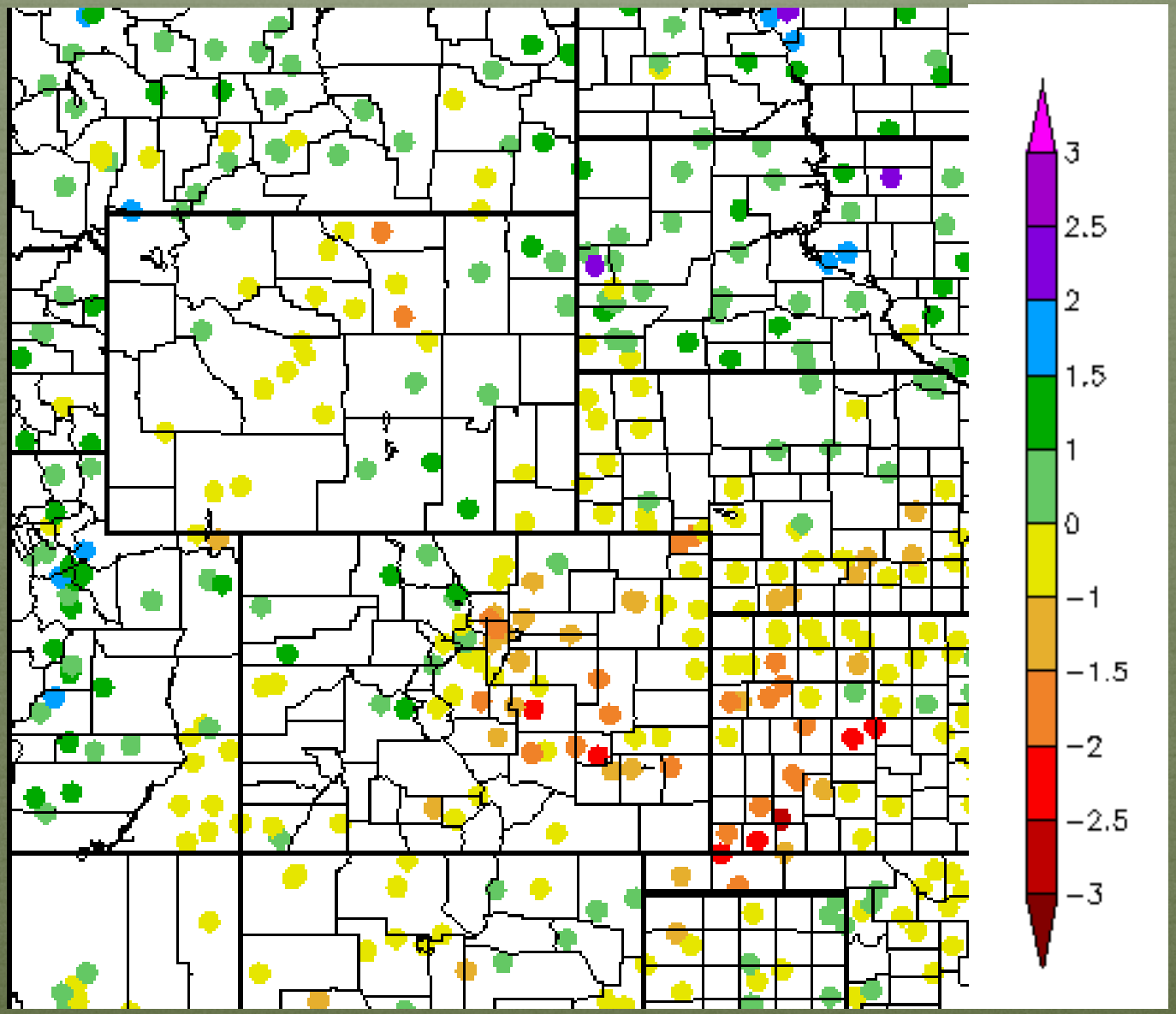
Colorado, Utah and Wyoming February 2011 Precipitation as Percentage of Normal



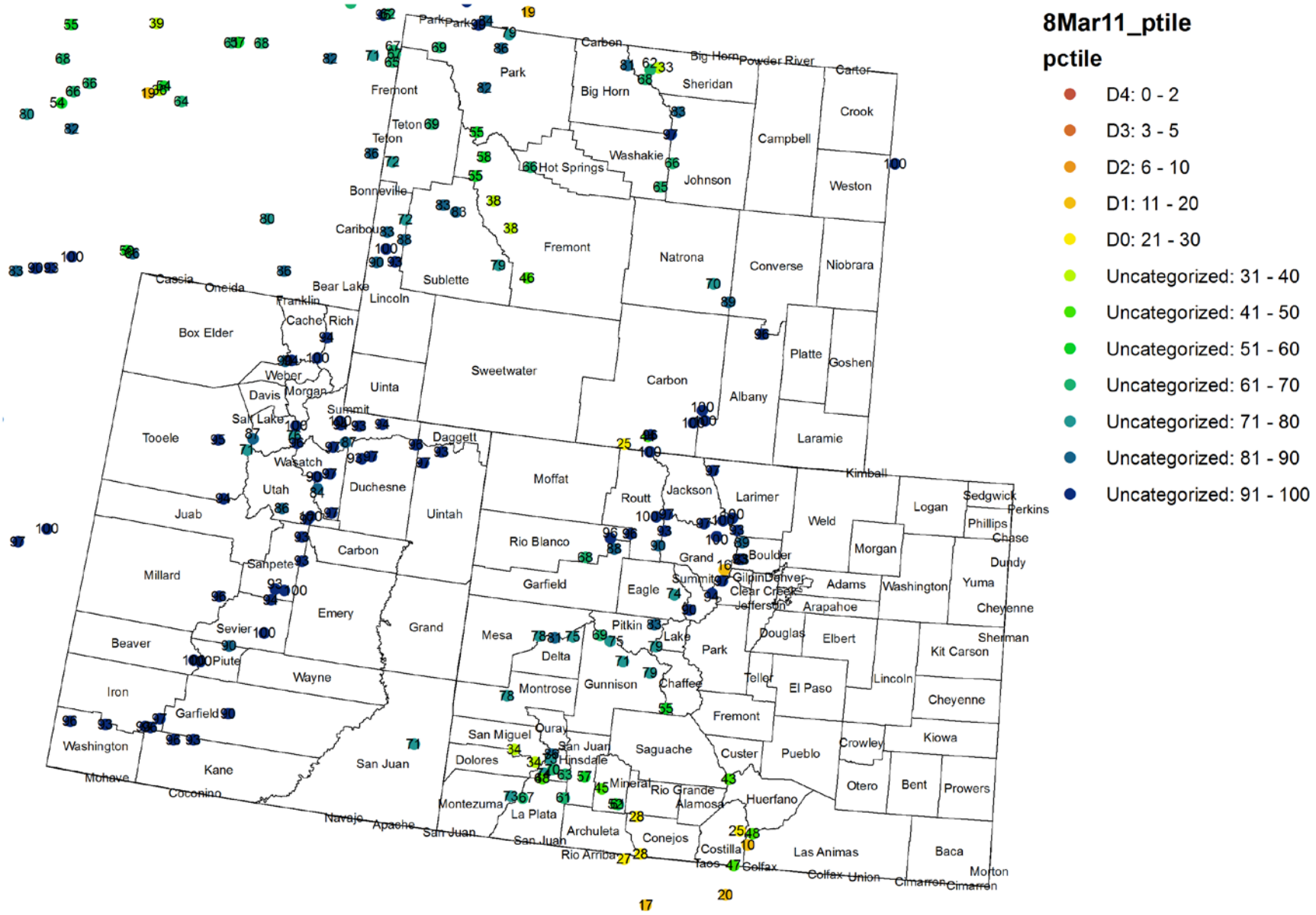
Colorado, Utah and Wyoming Water Year 2011 Precipitation as Percentage of Normal (Oct 10 - Feb 11)



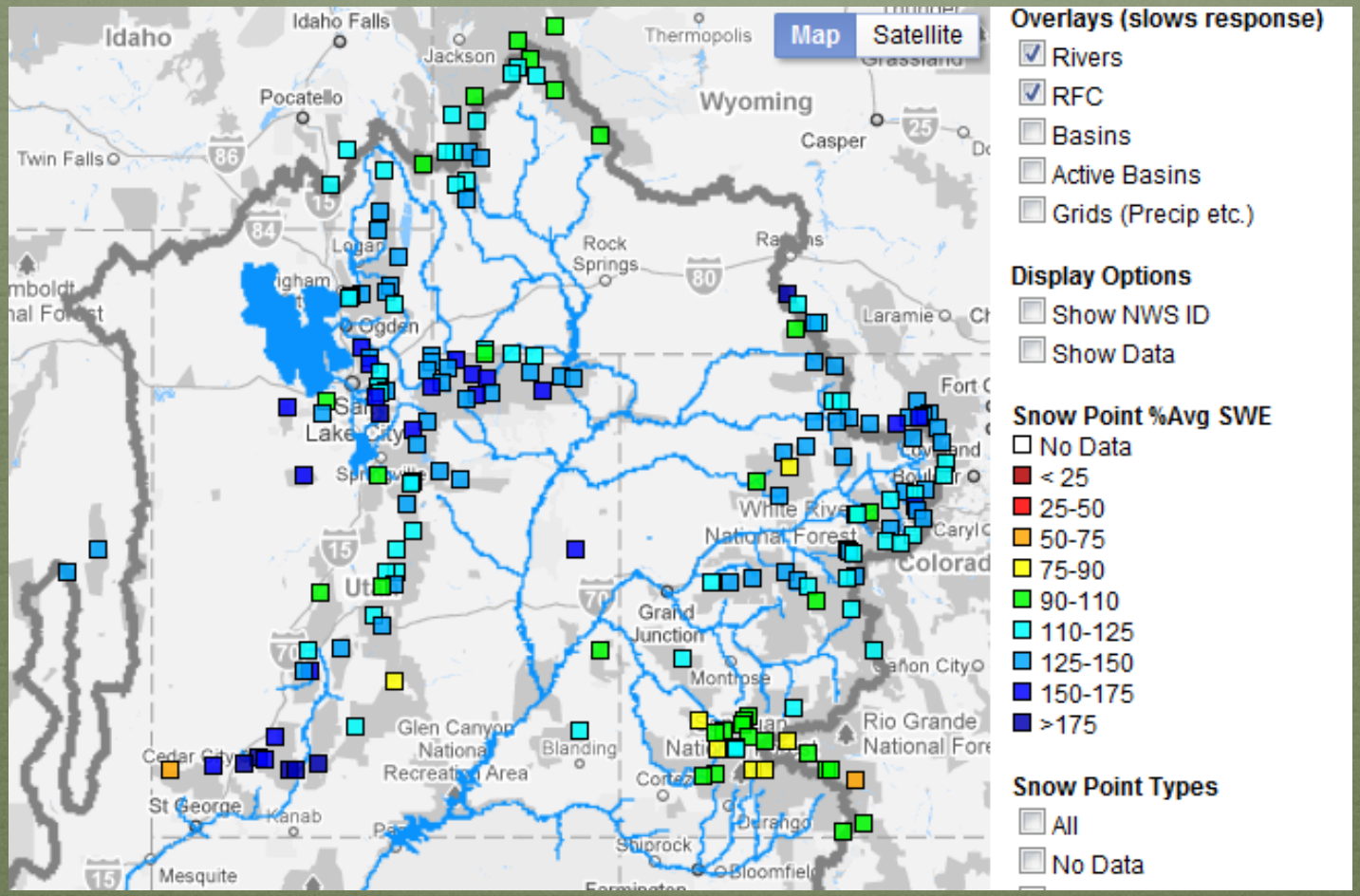
6 Month SPI 9/8/10 – 3/7/11



Snotel Water Year Precipitation Percentile Ranking
8 March 2011

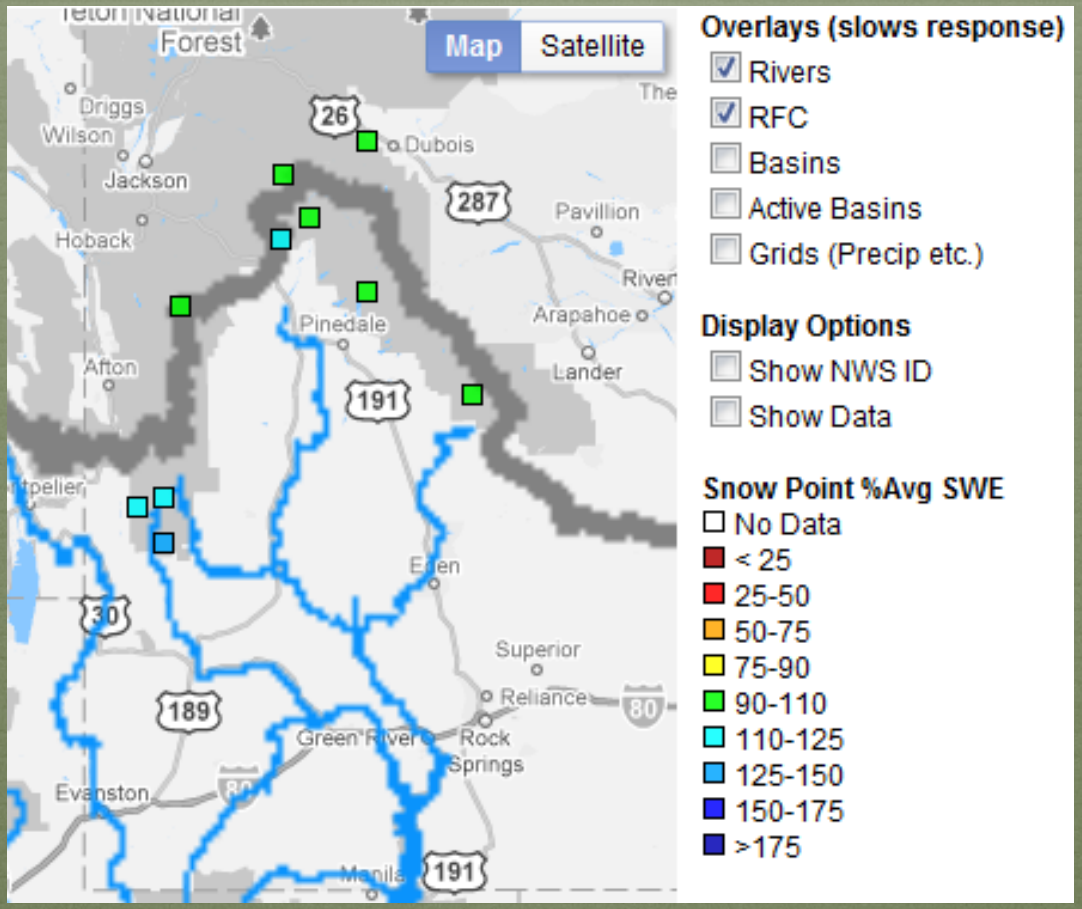


Upper Colorado River Basin Snow



NATIONAL WEATHER SERVICE
Colorado Basin River Forecast Center

Green River Basin above Flaming Gorge



NATIONAL WEATHER SERVICE
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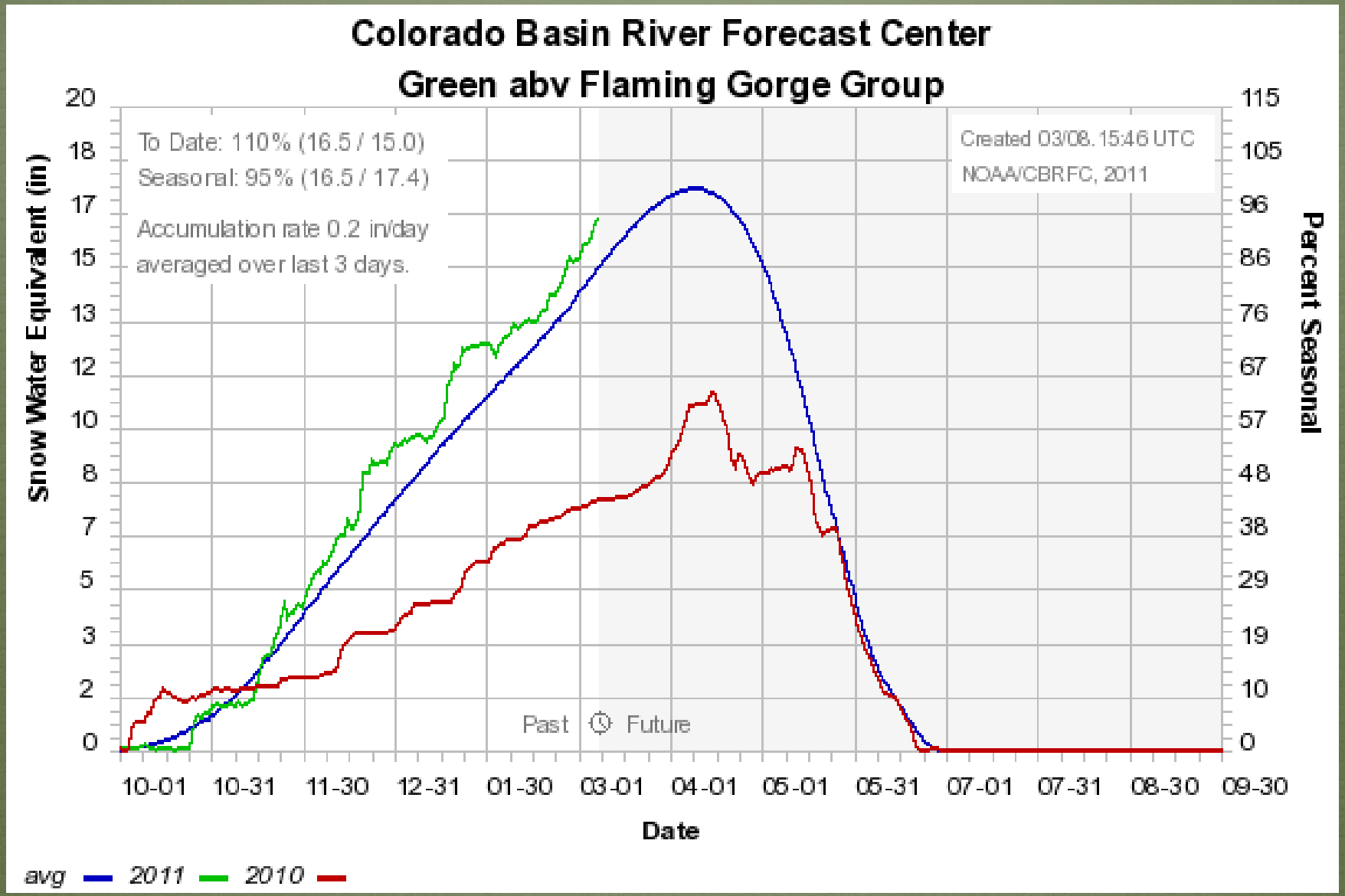
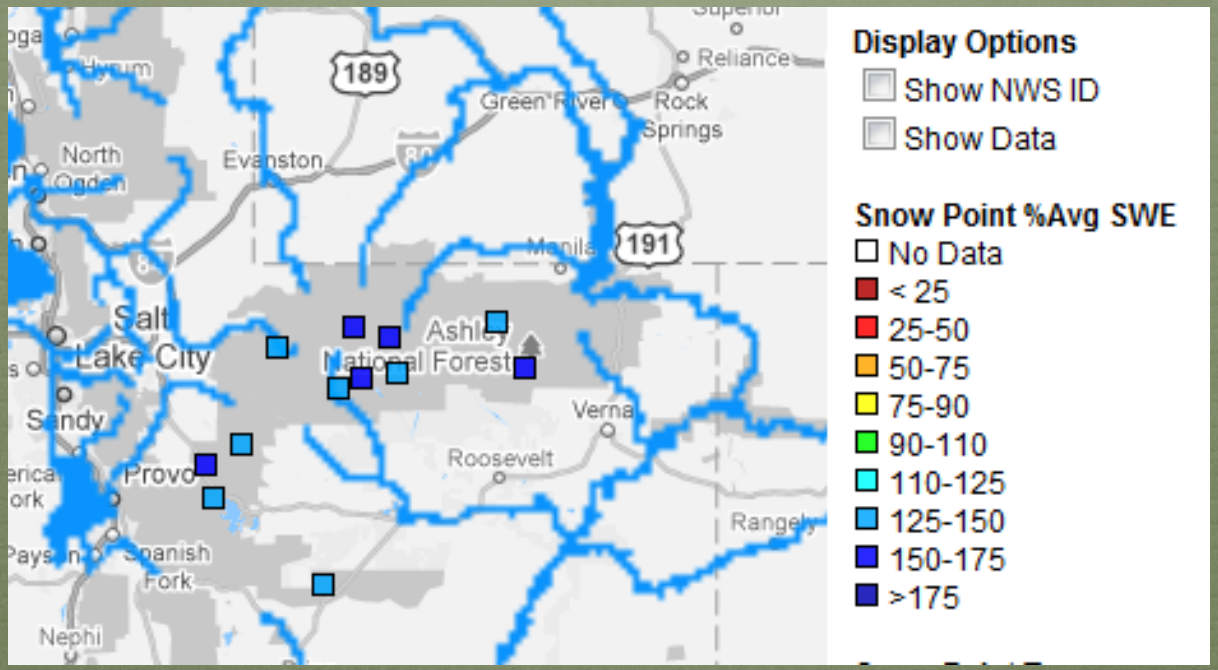


Snowpack % of average to date: 110%
Percent of average peak: 95%

Duchesne River Basin



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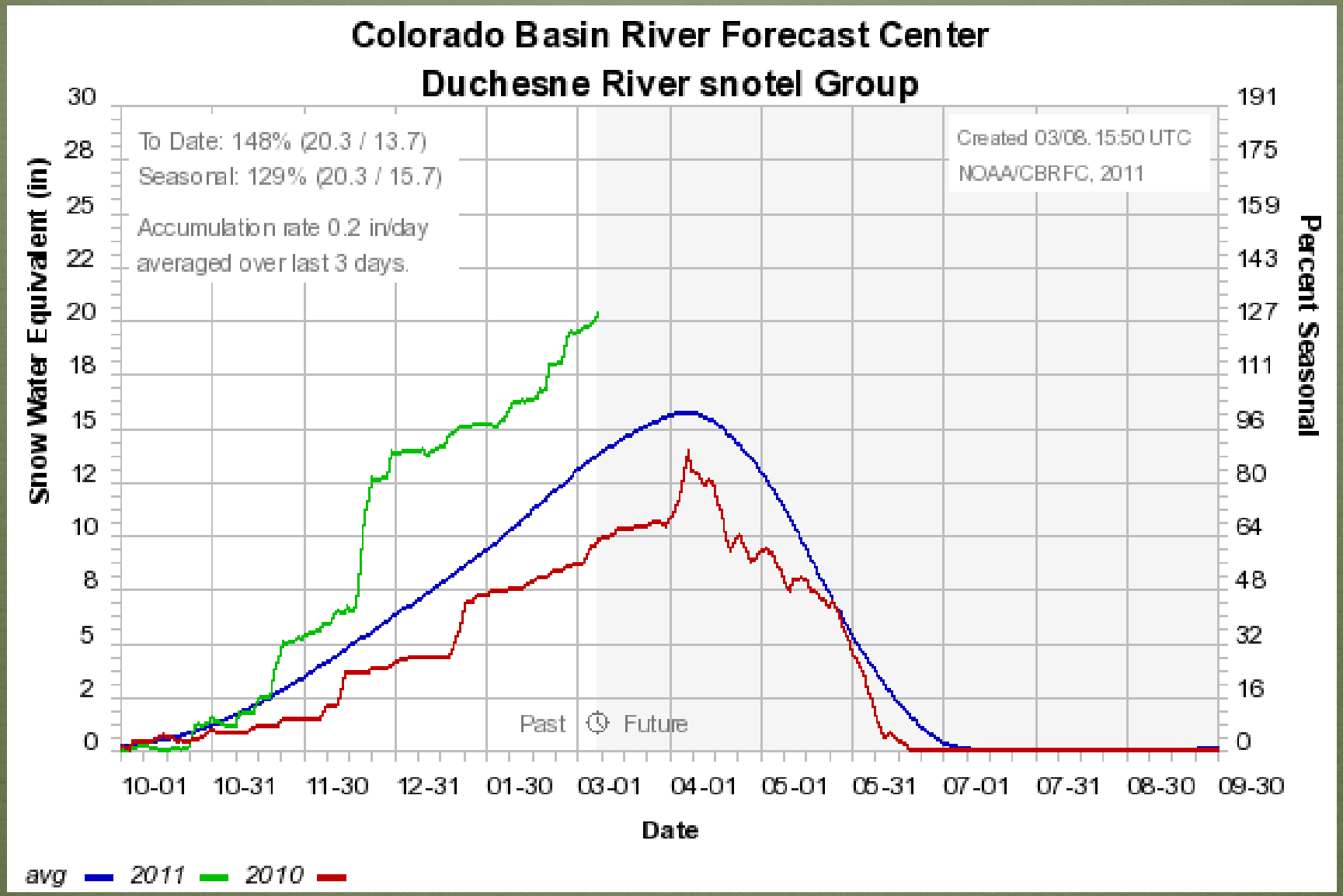
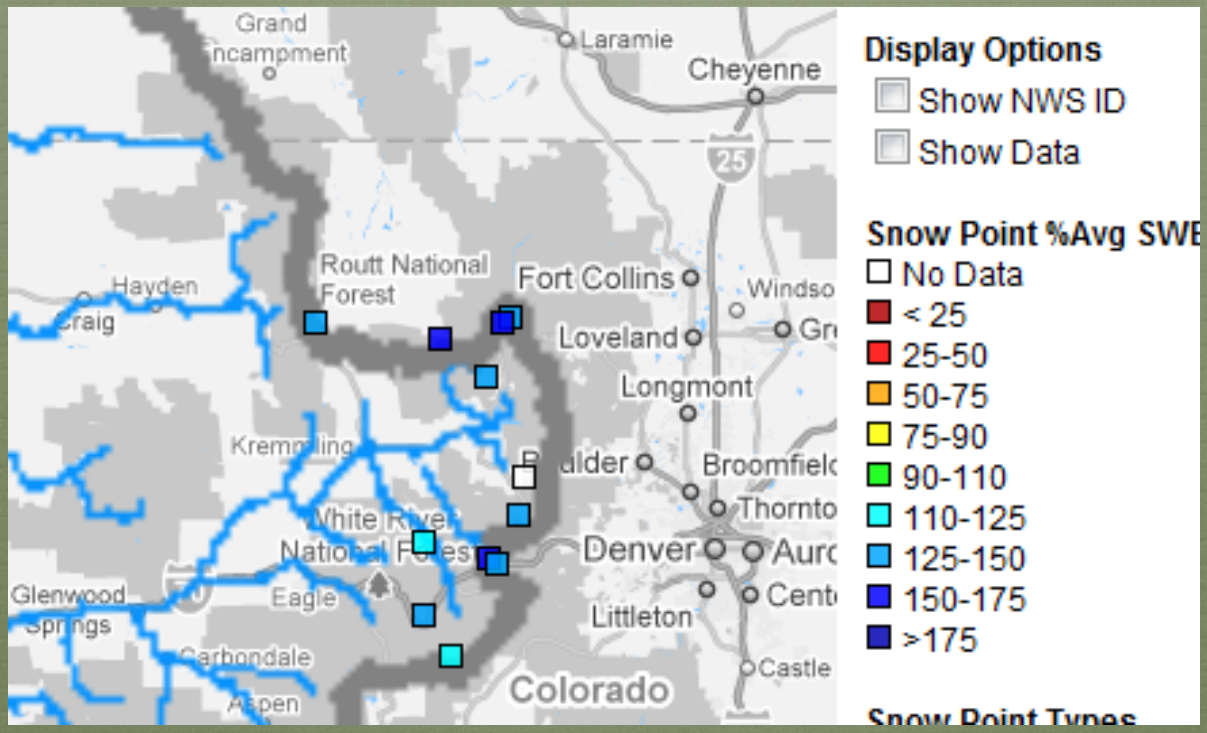
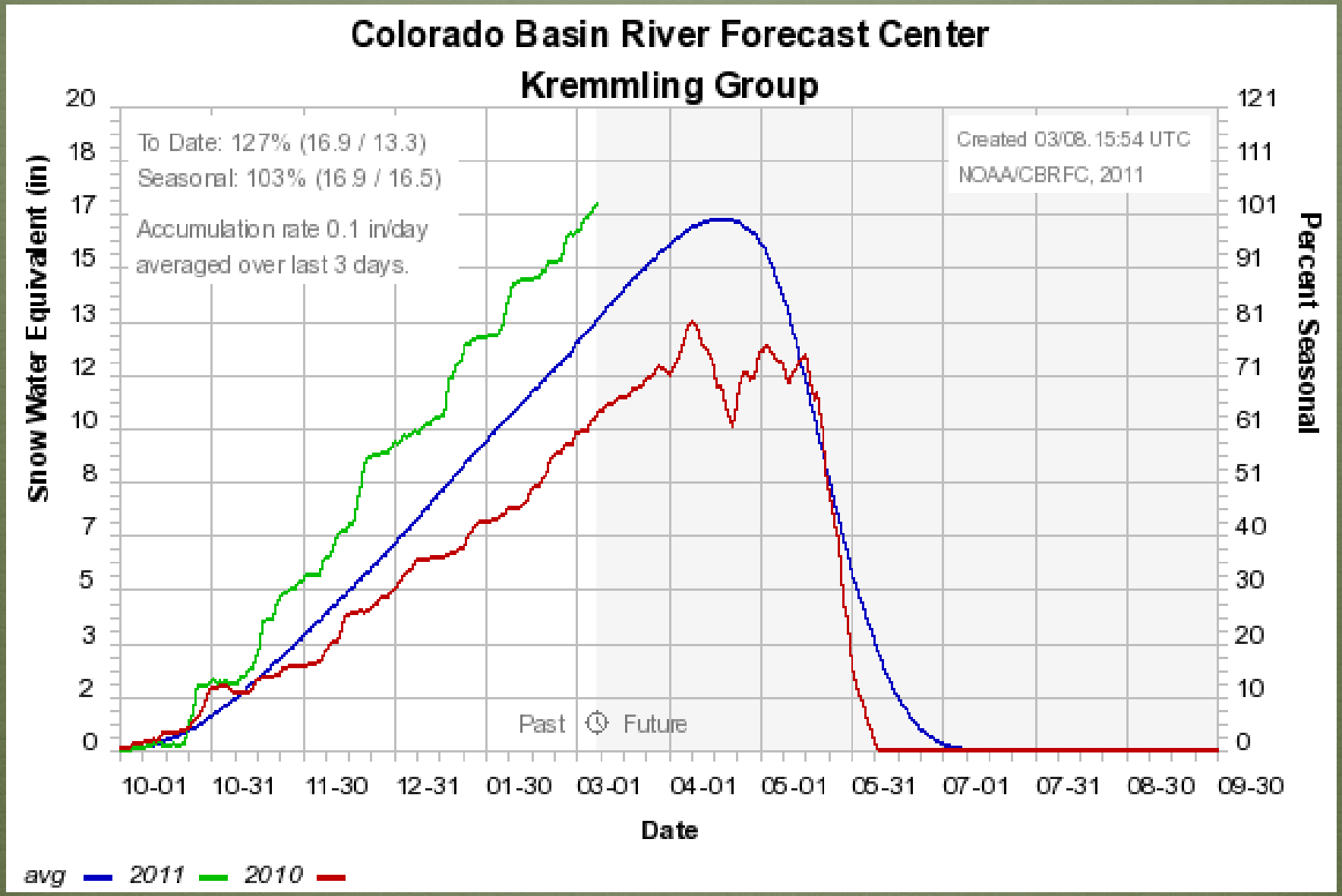


Snowpack % of average to date: 148%
Percent of average peak: 129%

Upper Colorado above Kremmling

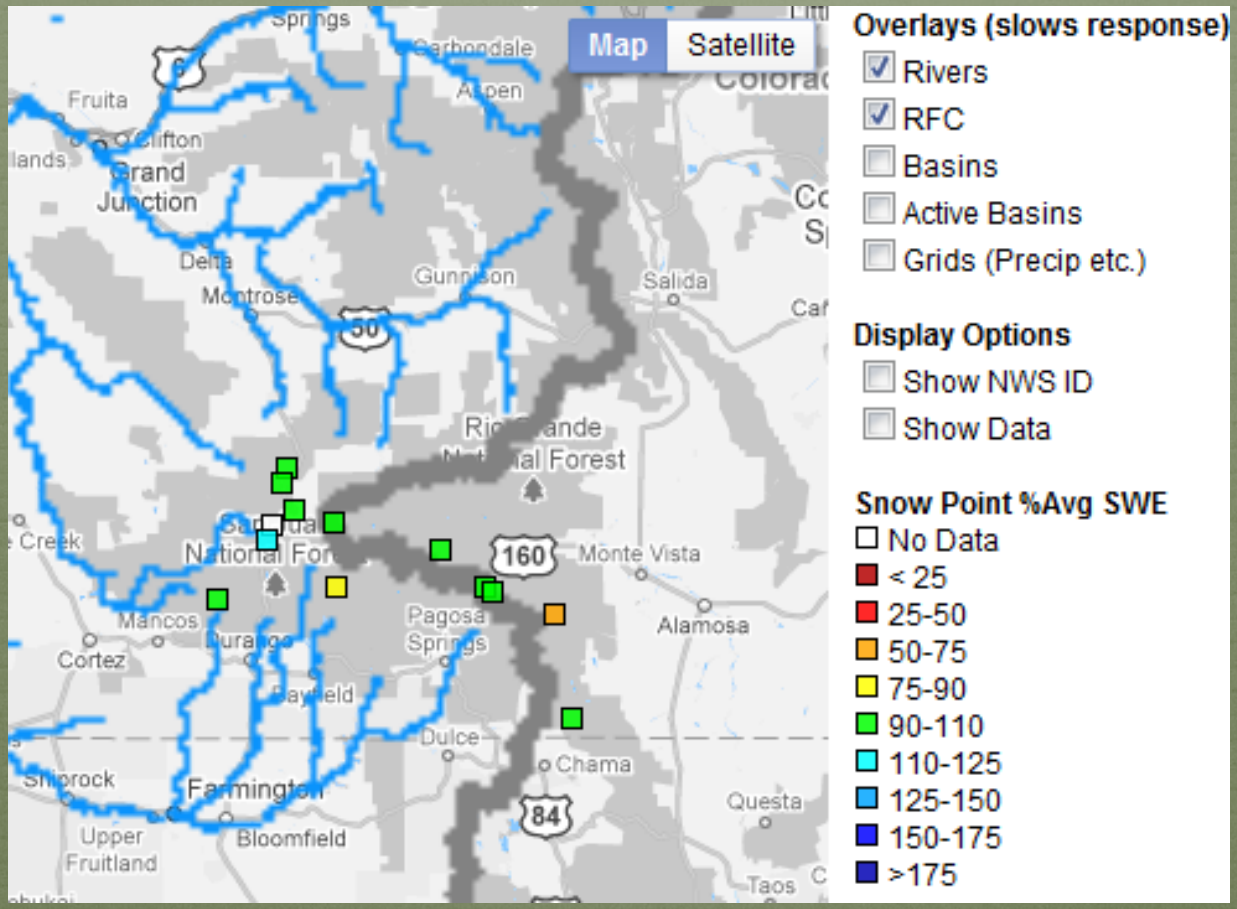


NATIONAL WEATHER SERVICE
Colorado Basin River Forecast Center

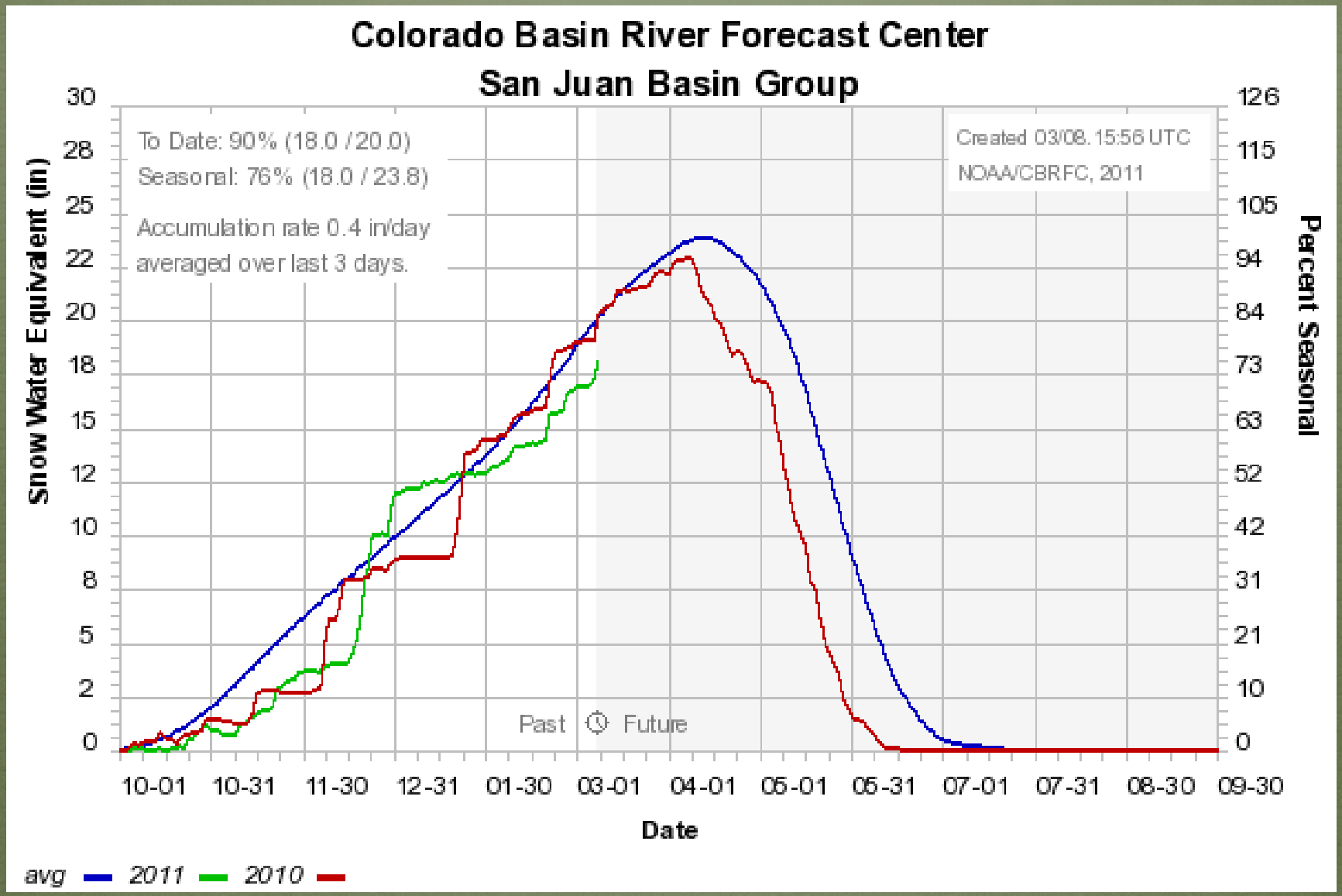


Snowpack % of average to date: 127%
Percent of average peak: 103%

San Juan Basin



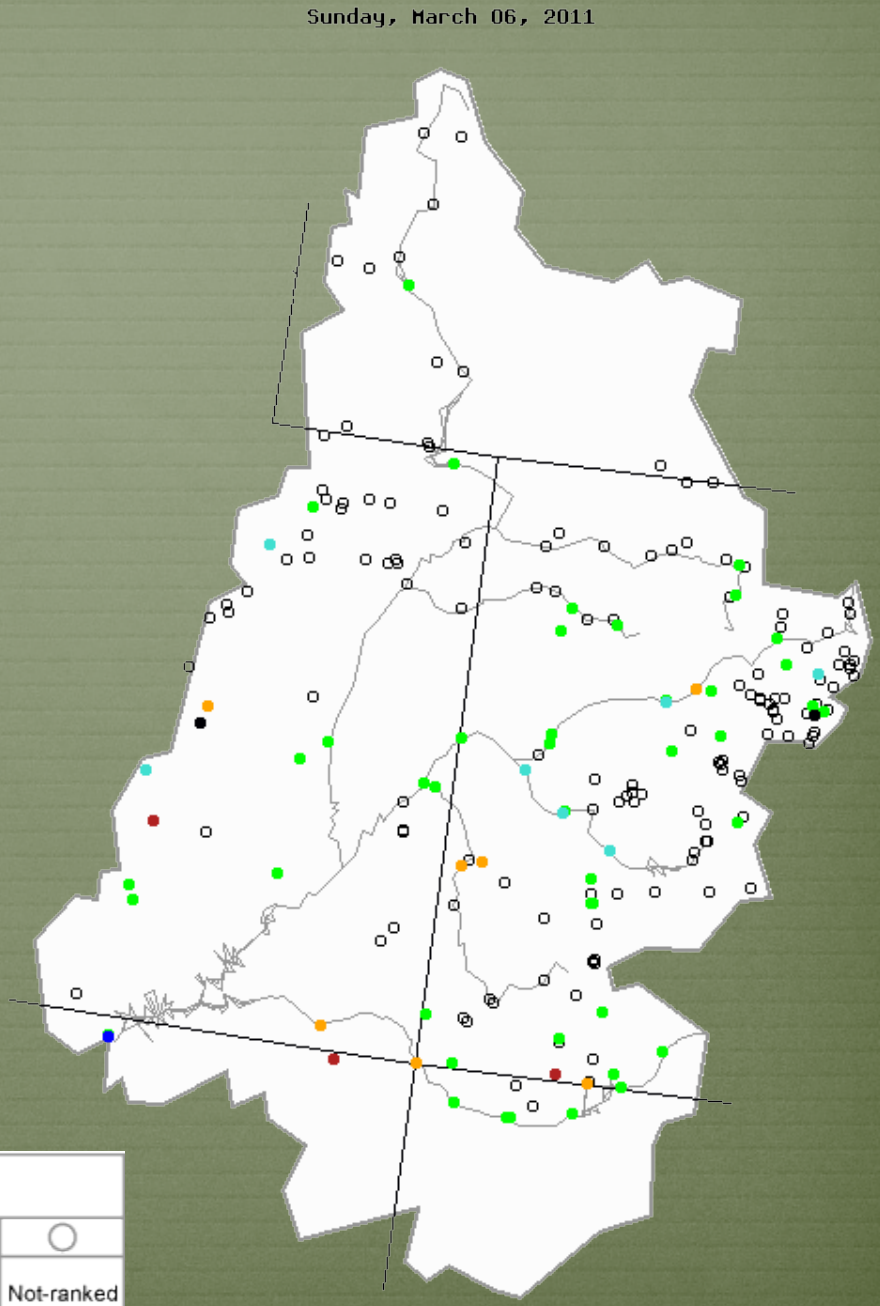
NATIONAL WEATHER SERVICE
Colorado Basin River Forecast Center



Snowpack % of average to date: 90%
Percent of average peak: 76%

Streamflow Update

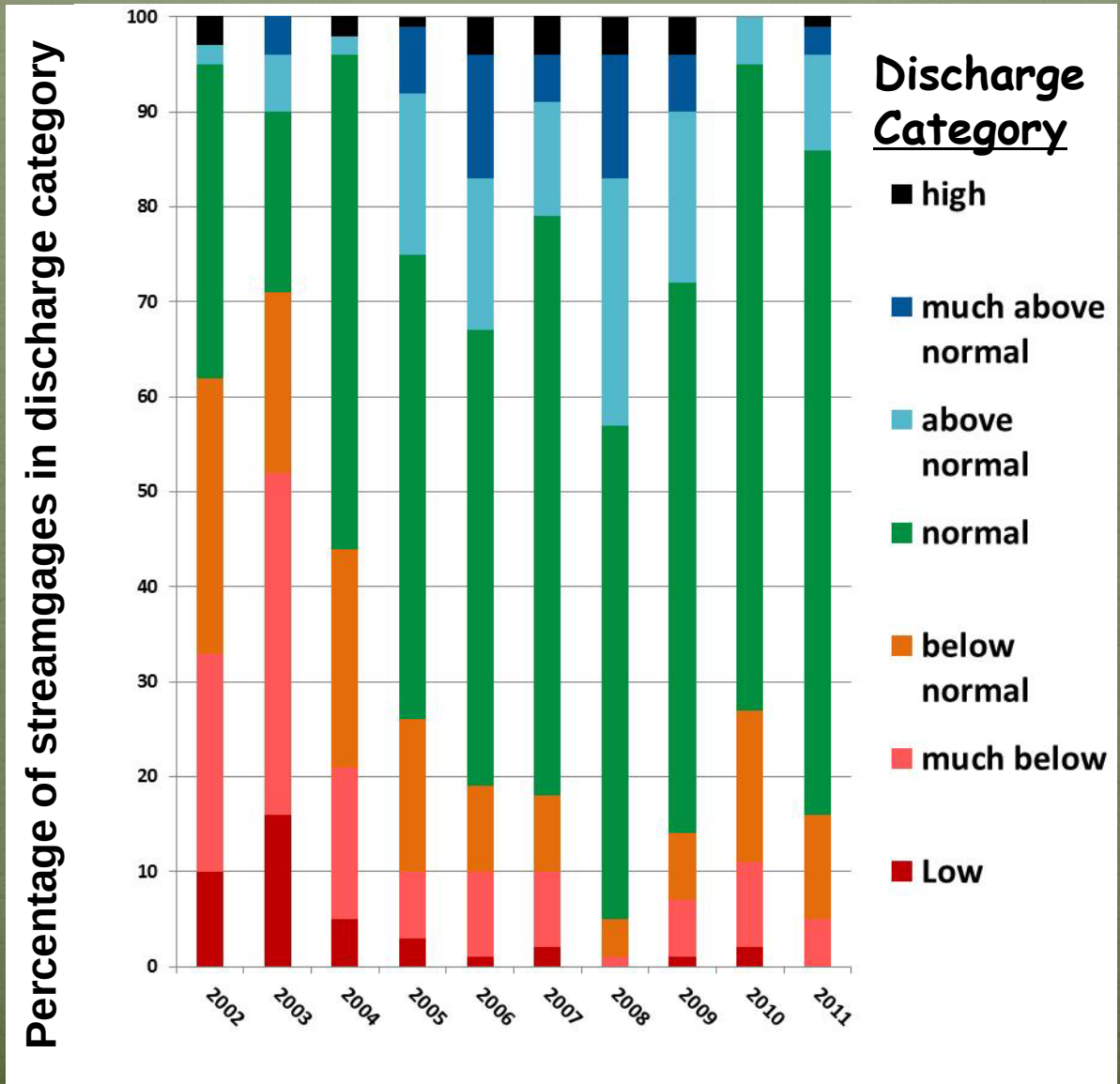
7-day average discharge compared to historical discharge for the day of the year (March 6th)



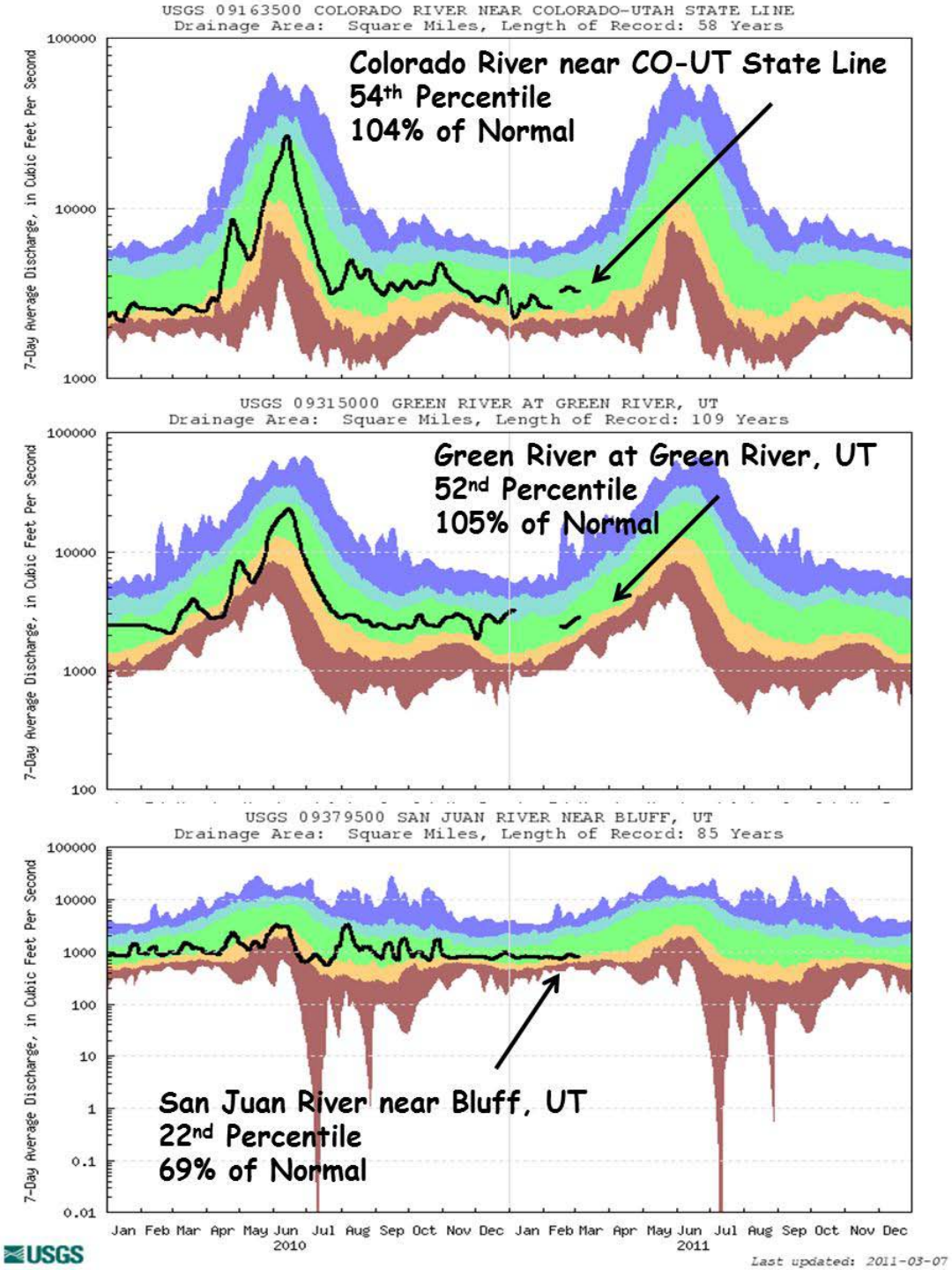
Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

USGS

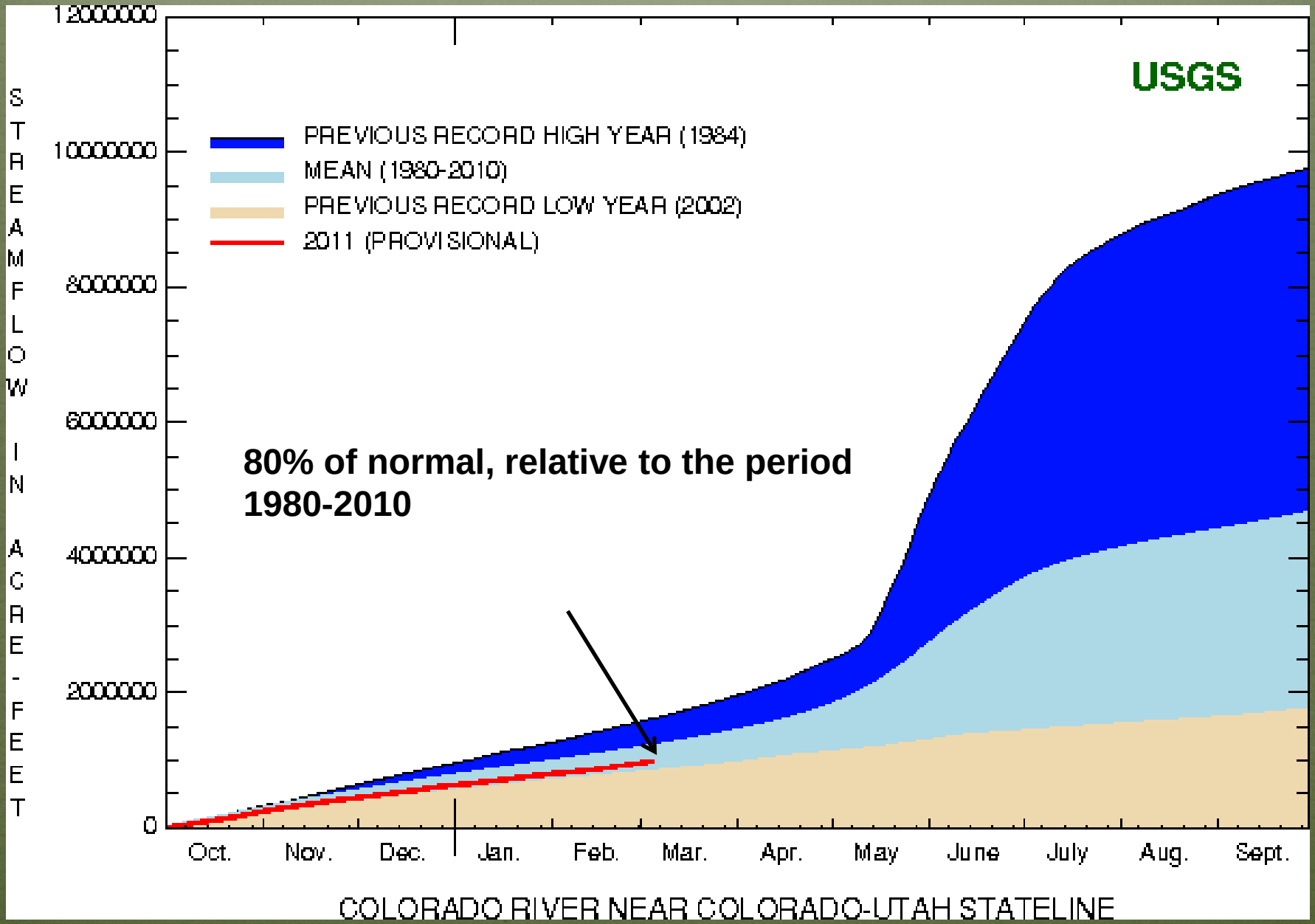
Upper Colorado River Basin- Comparison of 7-day Average Discharge March 5, 2002-2011



USGS

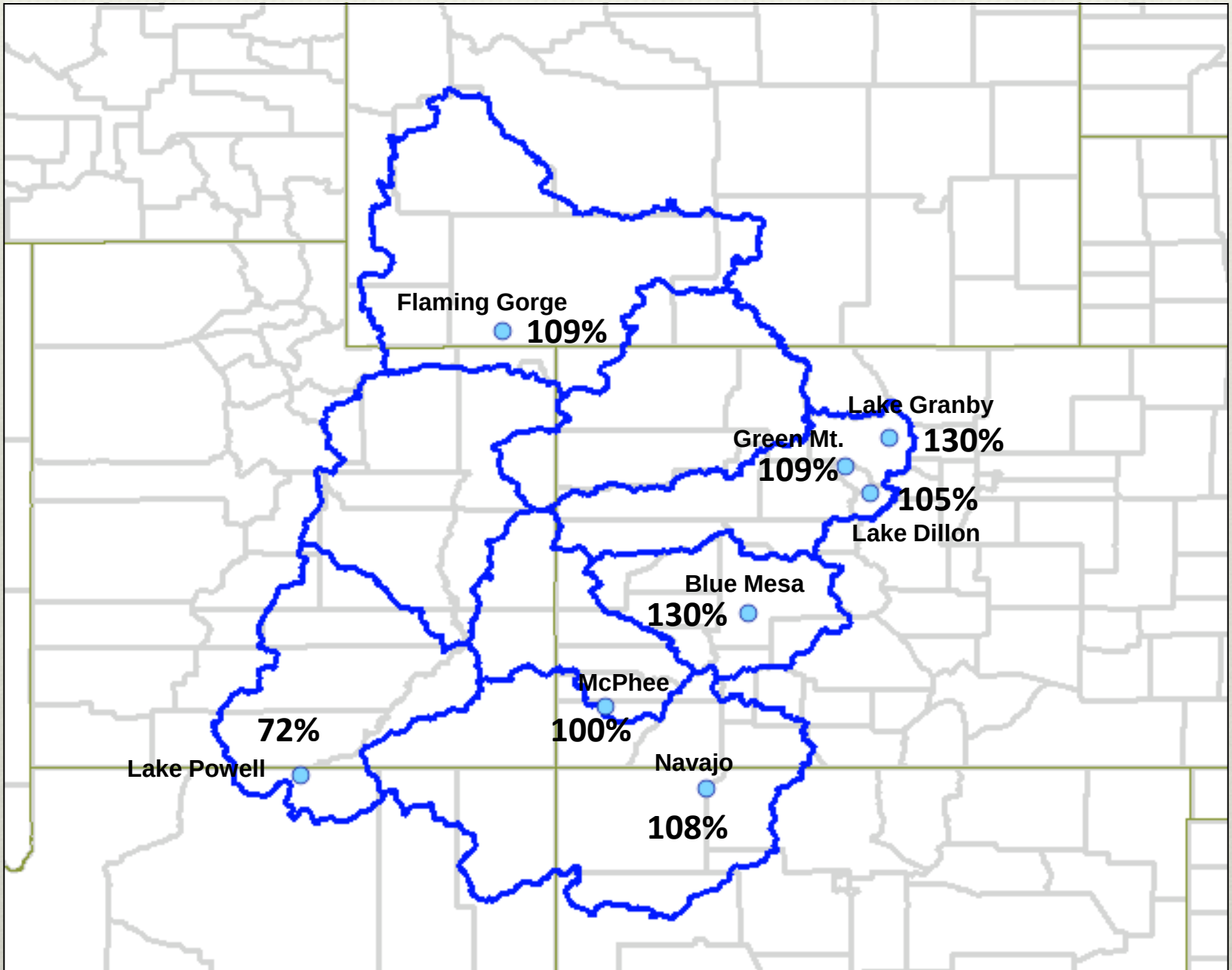

USGS 09163500 COLORADO RIVER NEAR COLORADO-UTAH STATE LINE
Drainage Area: Square Miles, Length of Record: 58 Years
Colorado River near CO-UT State Line
54th Percentile
104% of Normal
7-Day Average Discharge, in Cubic Feet Per Second
100000
10000
1000
USGS 09315000 GREEN RIVER AT GREEN RIVER, UT
Drainage Area: Square Miles, Length of Record: 109 Years
Green River at Green River, UT
52nd Percentile
105% of Normal
7-Day Average Discharge, in Cubic Feet Per Second
100000
10000
1000
100
USGS 09379500 SAN JUAN RIVER NEAR BLUFF, UT
Drainage Area: Square Miles, Length of Record: 85 Years
San Juan River near Bluff, UT
22nd Percentile
69% of Normal
7-Day Average Discharge, in Cubic Feet Per Second
100000
10000
1000
100
10
1
0.1
0.01
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2010
2011
USGS
Last updated: 2011-03-07

Cumulative Annual Runoff 2011 Water Year
Colorado River nr CO-UT Stateline

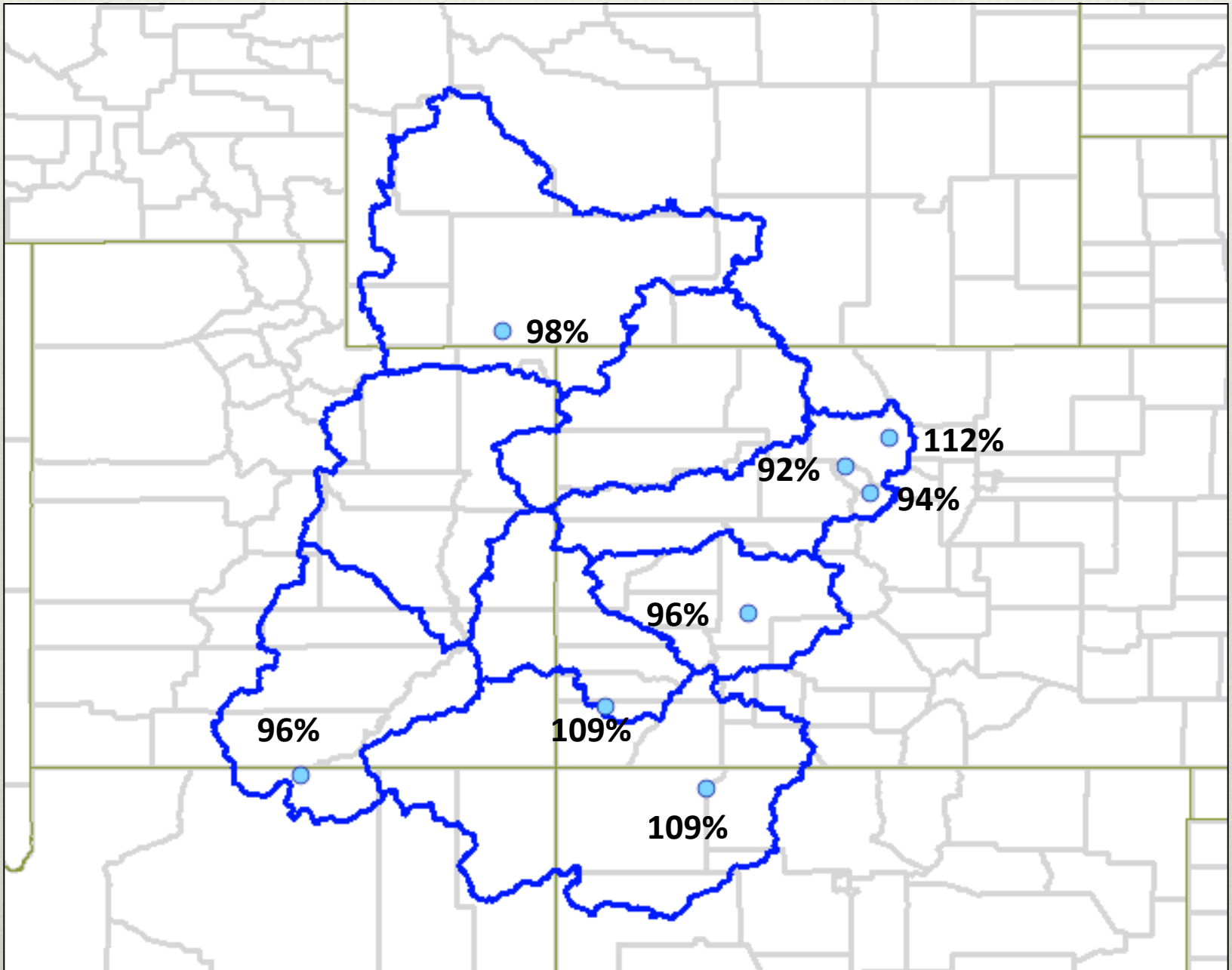


Reservoir Update

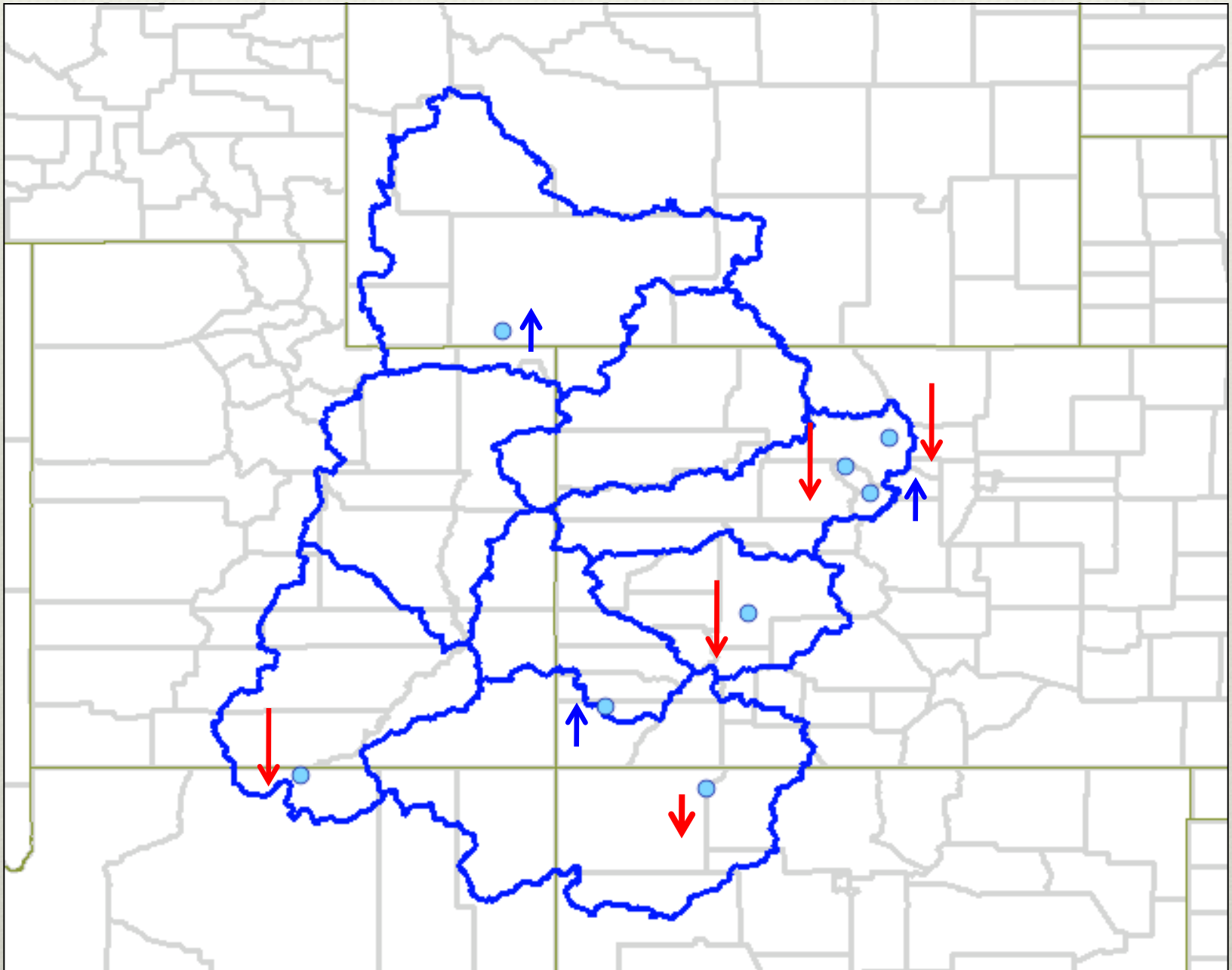
Reservoir Level Percents of Average – 3/6/2011

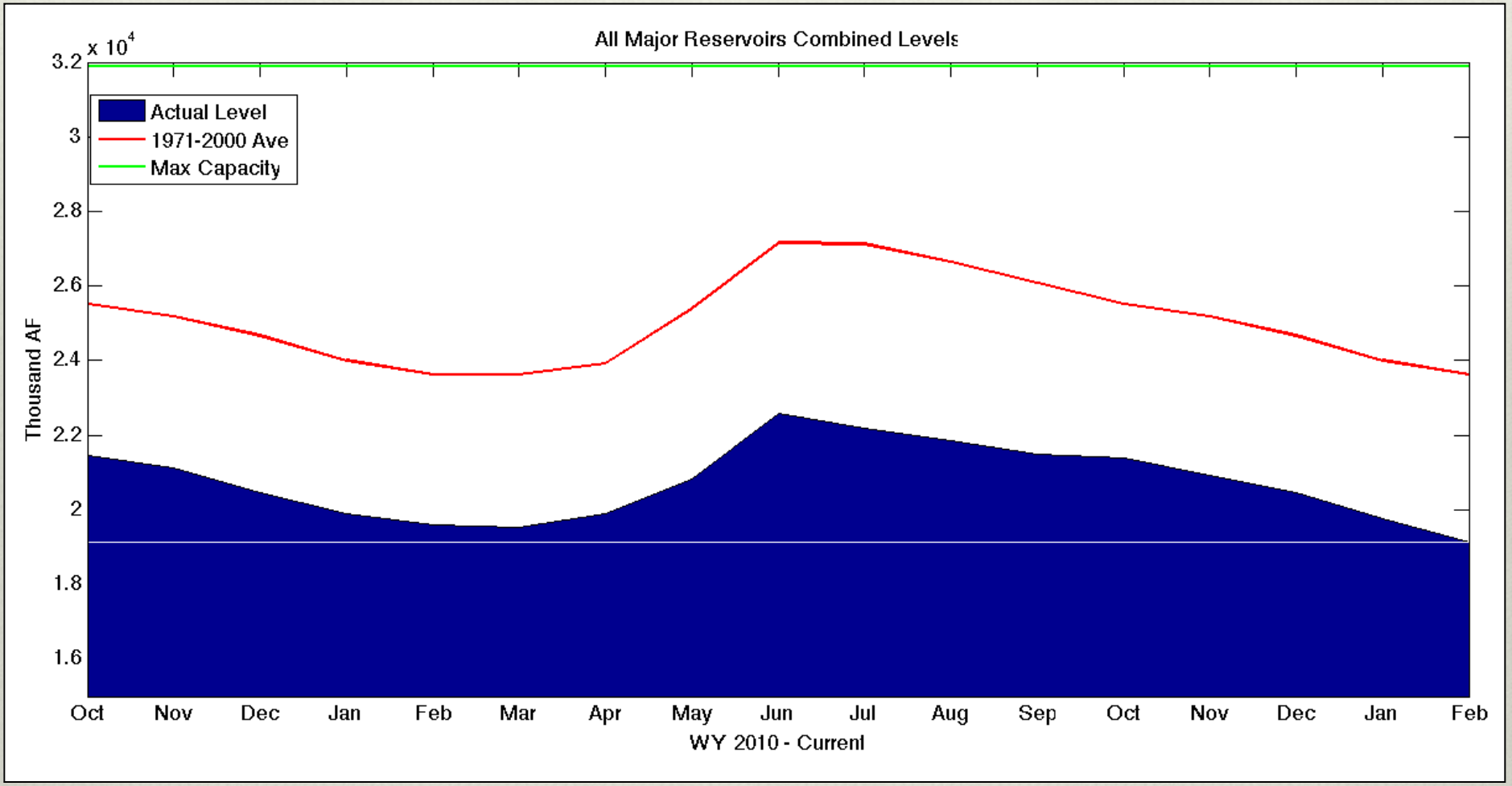


Reservoir Level Percents of Last Year – 3/6/2011

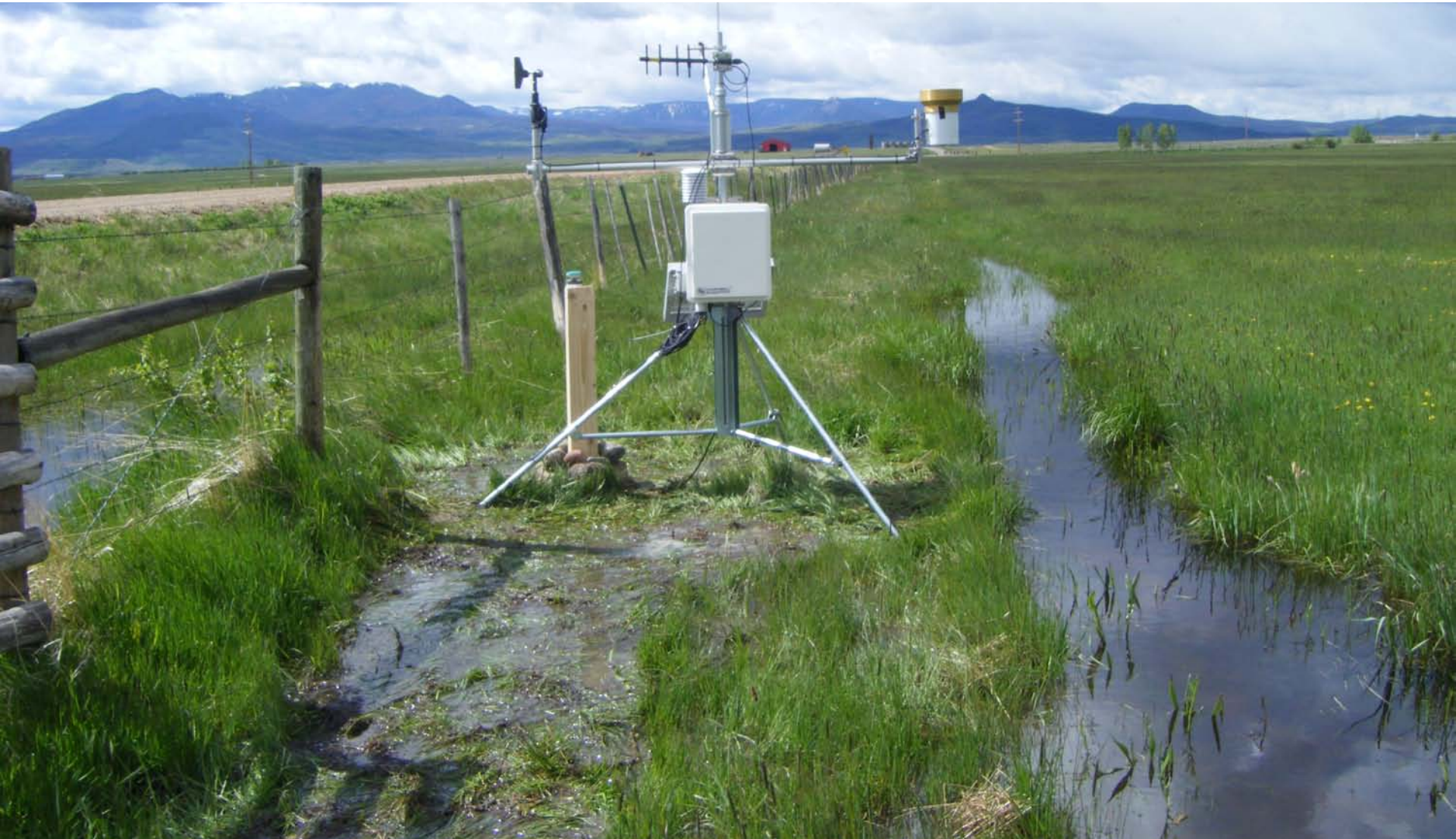


Reservoir Level Weekly Change – 3/6/2011

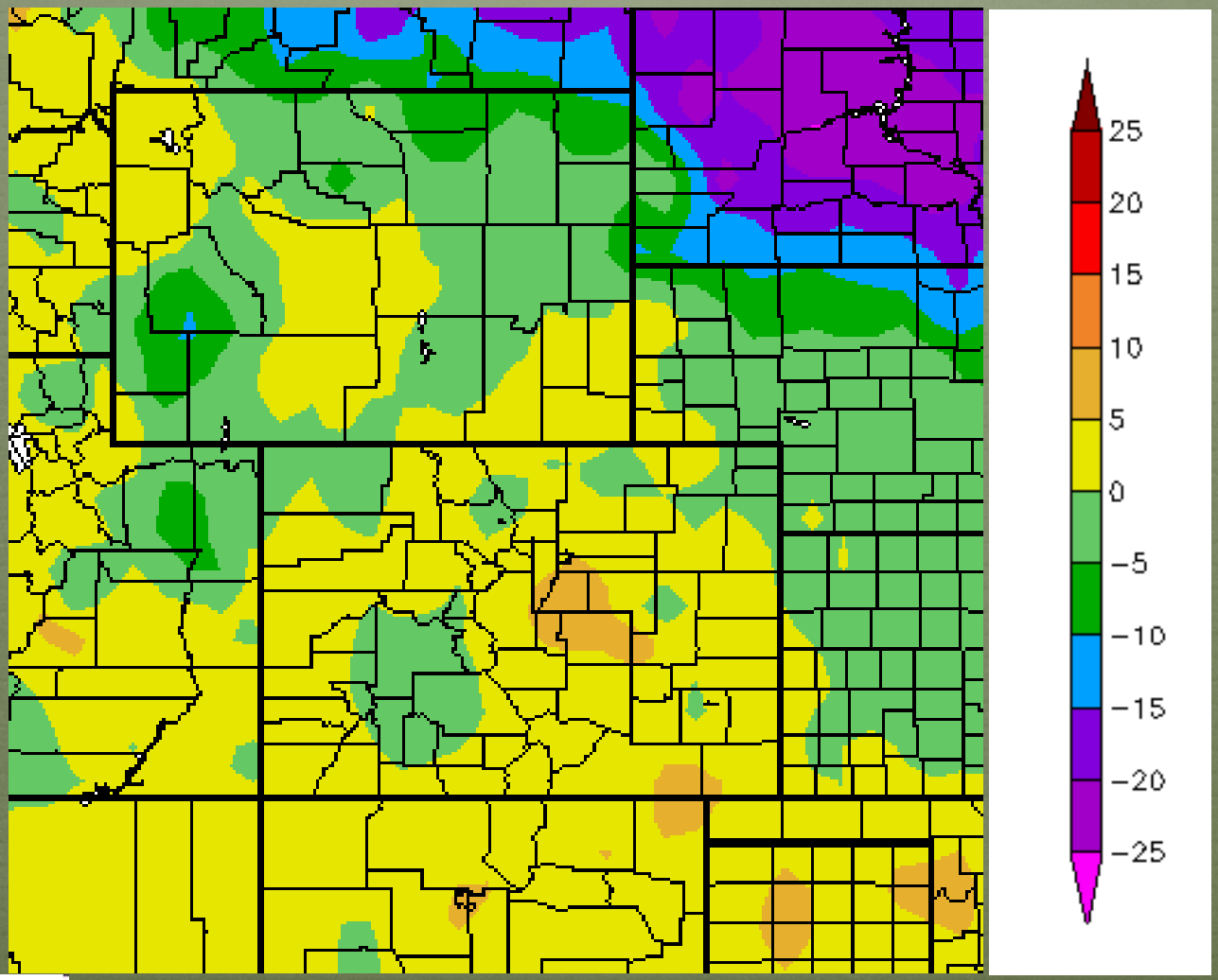



All Major Reservoirs Combined Levels
x 10^4
3.2
3
2.8
2.6
2.4
2.2
2
1.8
1.6
Thousand AF
Actual Level
1971-2000 Ave
Max Capacity
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
WY 2010 - Current

Water Demand

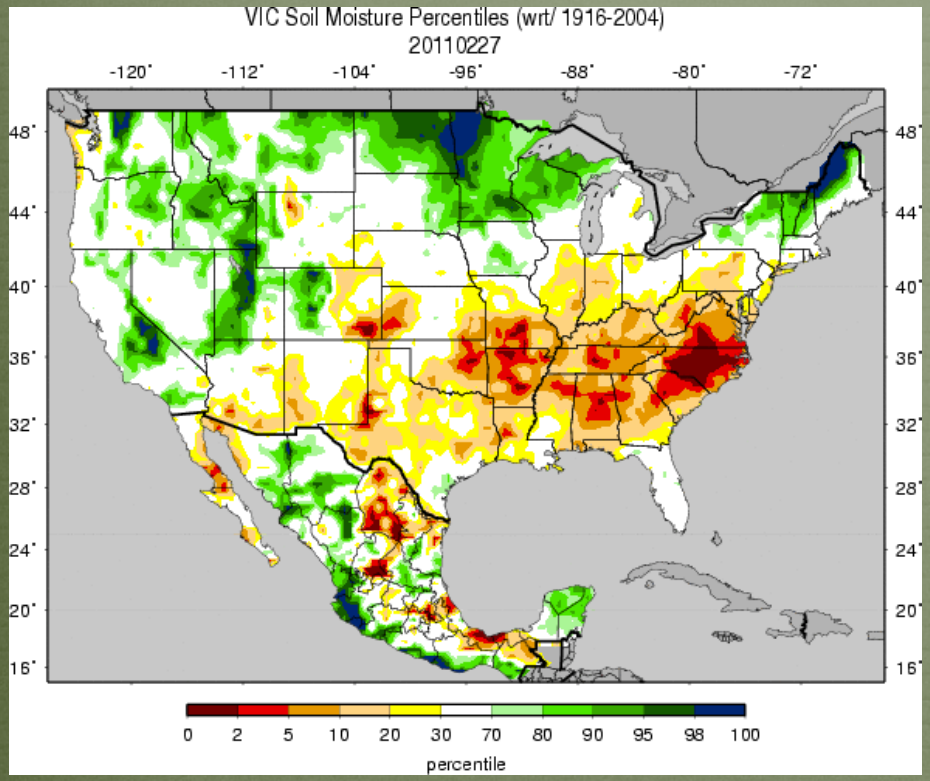


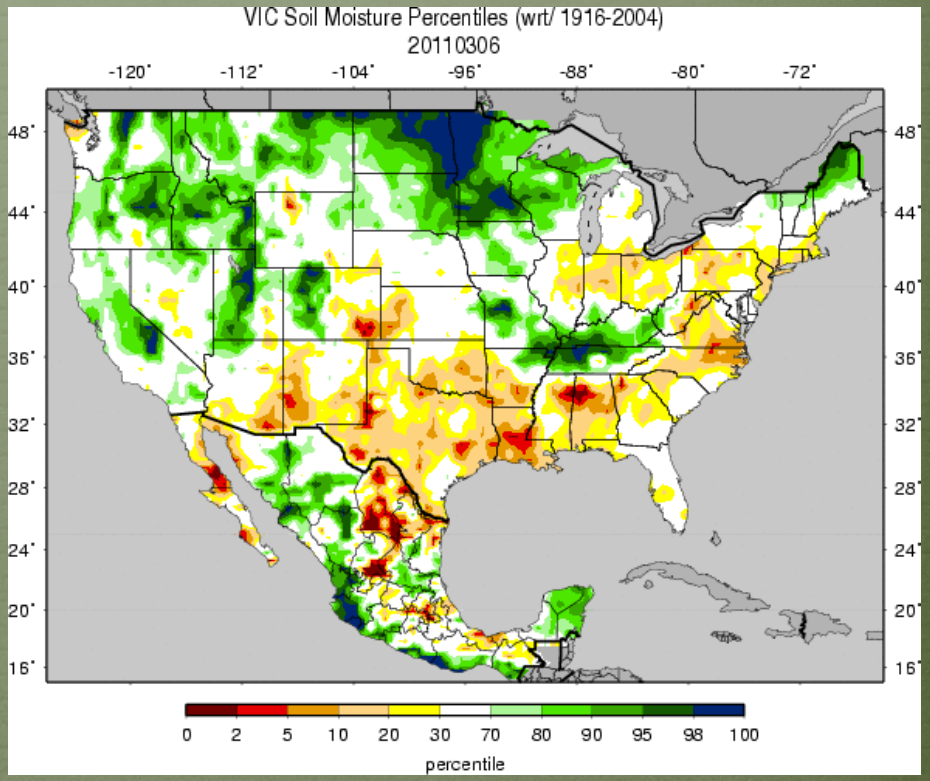
Temperature Departure from Normal
03/01/2011 – 03/07/2011



High Plains Regional Climate Center

Soil Moisture Change from Feb 27th, 2011





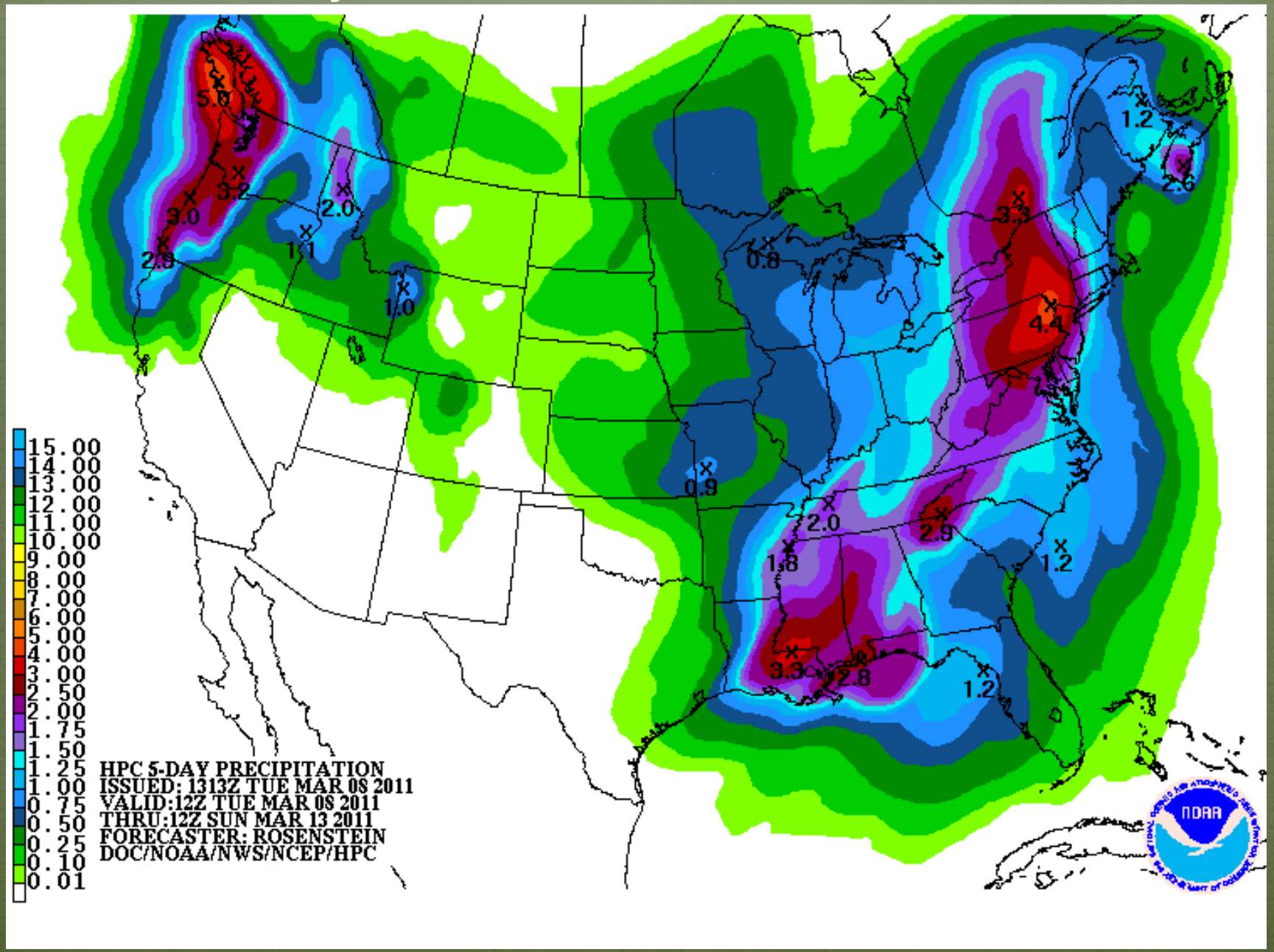
27 February 2011

6 March 2011

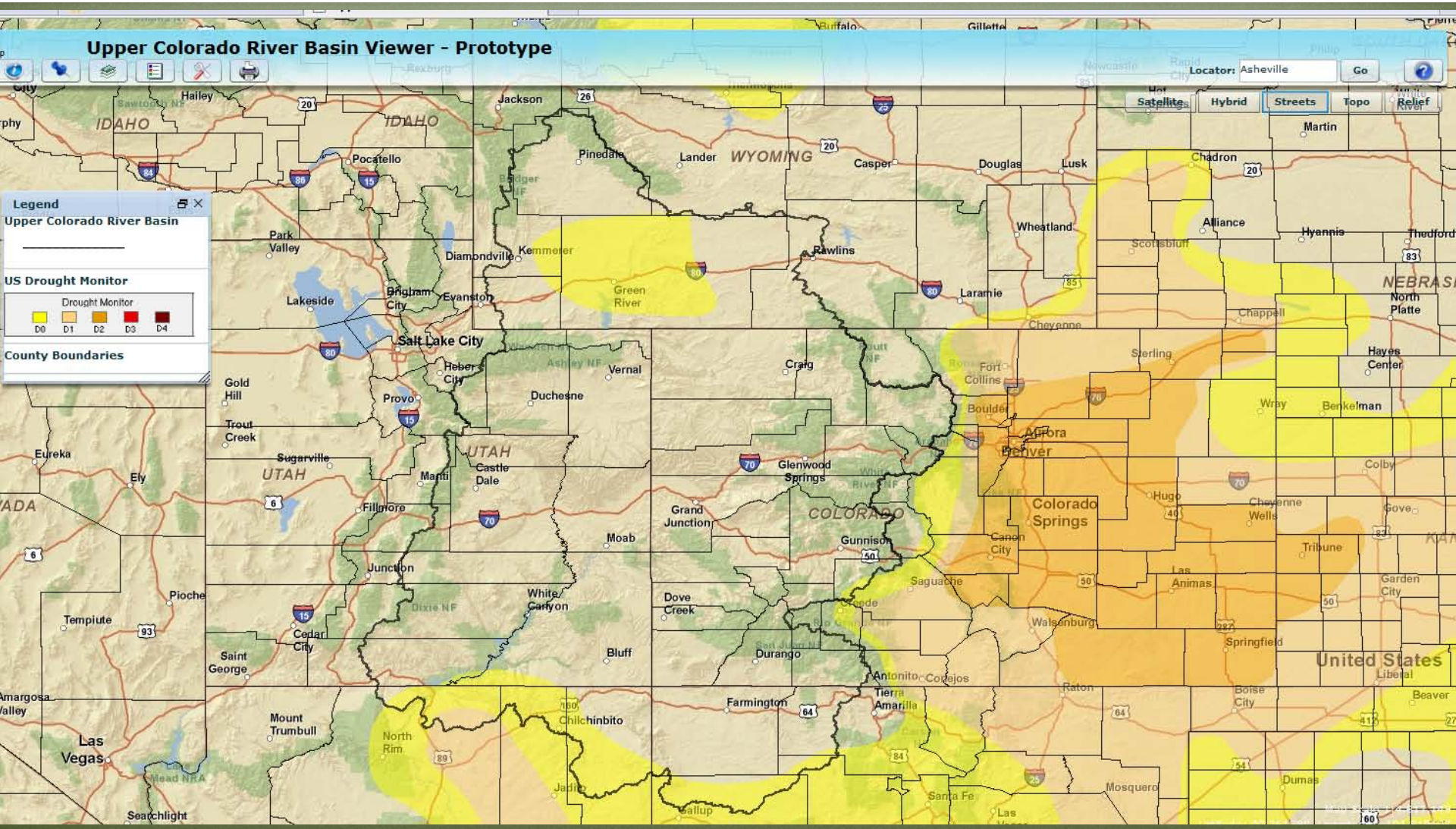
University of Washington

Precipitation Forecast

5 Day QPF 8-13 March 2011



Recommendations



INFO

For more information

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

March 8, 2011

Precipitation and Snowpack

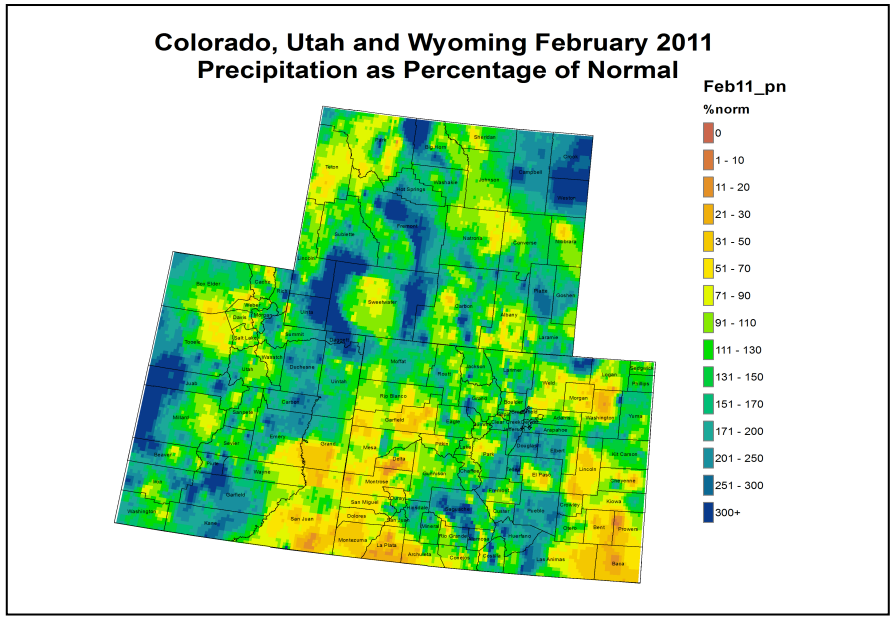


Fig. 1: February precipitation as percent of average.

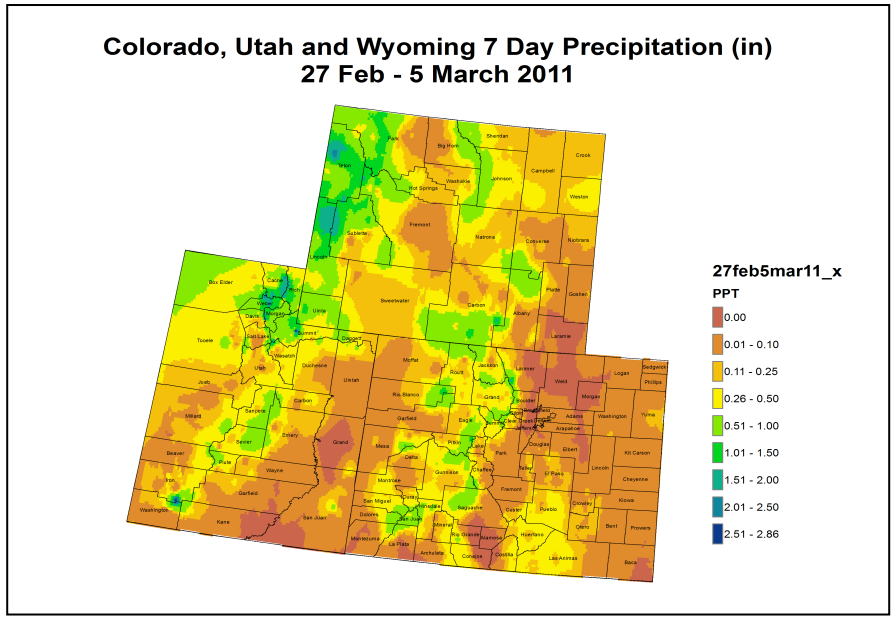


Fig. 2: February 27 – March 5 precipitation in inches.

For the month of February the Wasatch and Uintas in Utah, areas of southwestern Wyoming, the Sangre de Cristos in southern Colorado and the northern mountains of Colorado received above average moisture (Fig. 1). Many counties along the Front Range also saw above average precipitation for the month, though because February is not typically a wet month, their water-year-to-date numbers are still at a deficit. The valleys of western CO and eastern UT, the Four Corners region and the southeastern plains remained dry for the month.

Last week, the highest amounts of precipitation fell along the border of western Wyoming and on the high peaks of the northern and central mountains in Colorado (Fig. 2). Totals in western Wyoming ranged from half an inch to over an inch and a half. Along the Continental Divide, the Colorado mountains received around an inch of moisture. The Colorado-Utah border and the northern plains of Colorado were fairly dry for the week, seeing less than a tenth of an inch of precipitation.

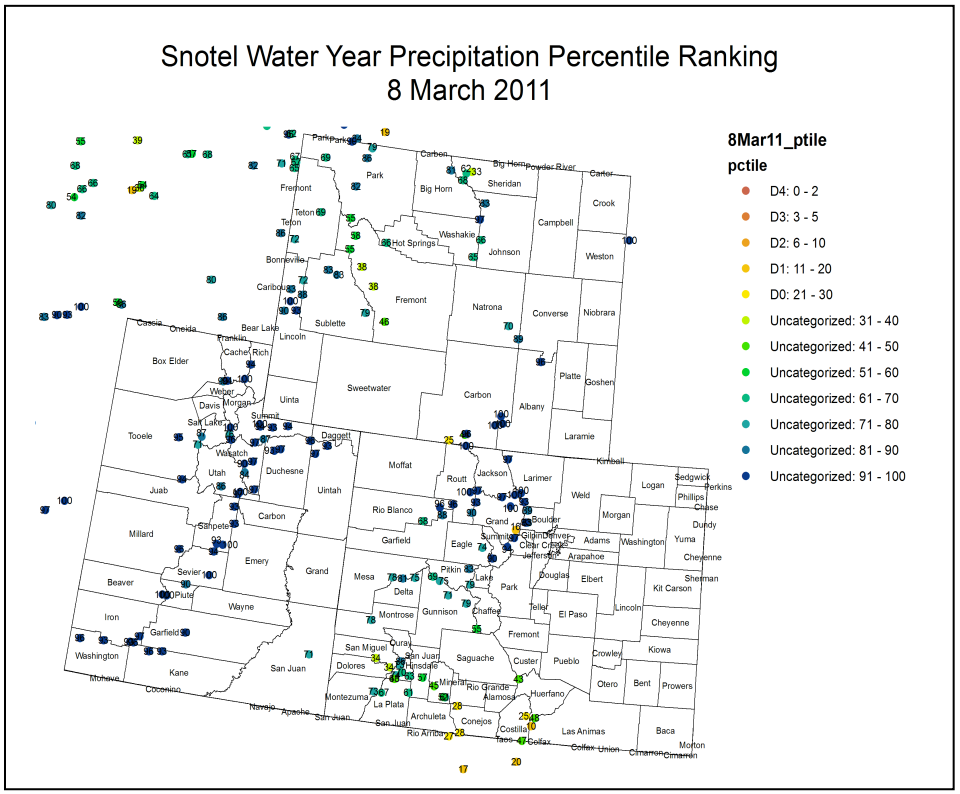


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

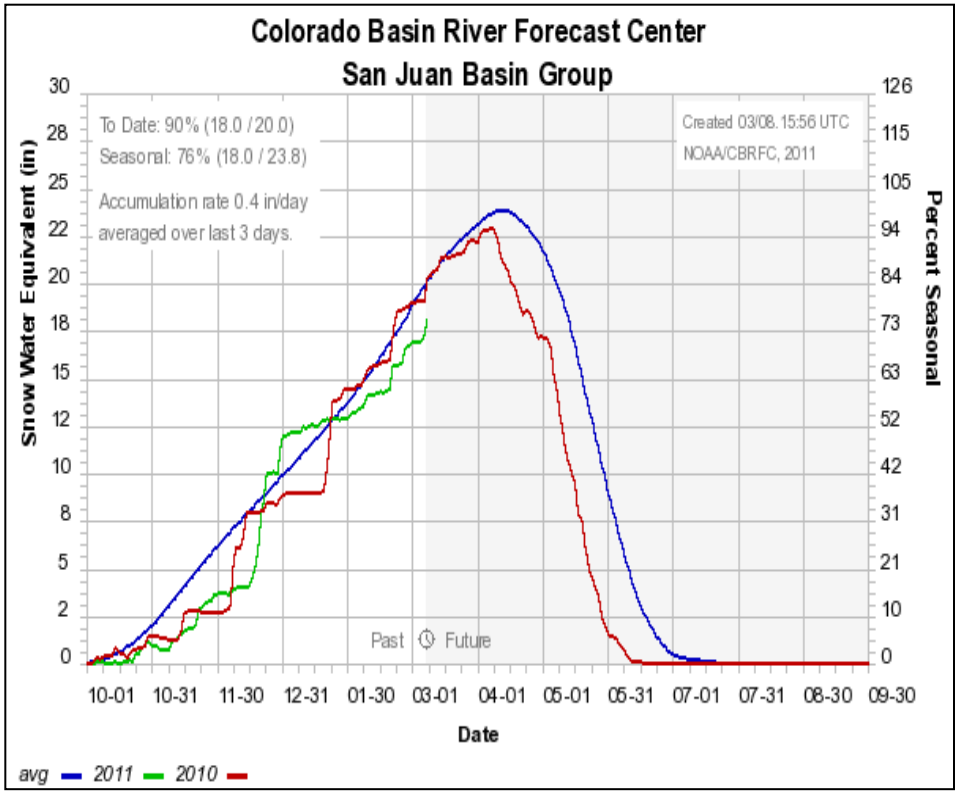


Fig. 4: San Juan basin averaged accumulations of snow water equivalent, WYTD.

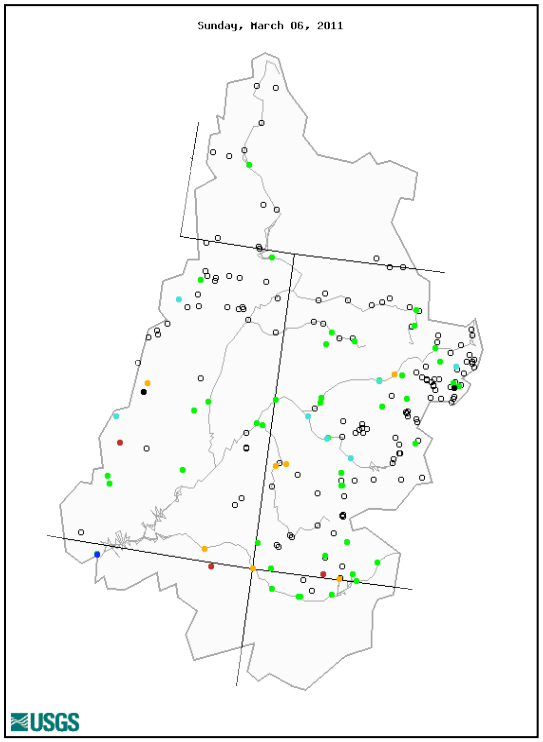
The majority of the SNOTEL sites in the Upper Colorado River Basin (UCRB) are showing high percentile rankings for water-year-to-date (WYTD) precipitation (Fig. 3). The Rio Grande and San Juan basins in southern CO are the driest, showing percentile rankings below 50%. Some of the sites in the Rio Grande basin are showing percentiles below 30% (meaning that 70% of the years have been wetter).

Snowpack around most of the UCRB is in good condition—currently snowpack for the entire basin above Lake Powell is 121% of average. The northern boundary of the Upper Green River basin shows accumulated snowpack levels slightly below average. The San Juan basin shows the lowest percents of average for snowpack in the UCRB, with a basin average snowpack of 90% (Fig. 4). Only a couple of good storms could help boost this basin to at or above average snowpack for the season.

Streamflow

As of March 6th, about 84% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). There are about 65 gages in the basin currently reporting, but new gages are coming out of icy conditions on a daily basis. By the end of the month, up to 100 gages could be reporting again. There are currently no clear spatial patterns for below normal gages in the basin.

At key gages around the basin, above normal flows are being recorded at two of the three sites (Fig. 6). Both the Colorado River at the CO-UT state line and the Green River at Green River, UT are recording above average flows. The San Juan River near Bluff, UT has dropped over the past week and is now recording flows in the below normal range (10th – 24th percentile). We are arriving at a time period when many of the sites could start showing some short-term peaks in flow before the big seasonal peaks—this will be highly dependent on temperature patterns (i.e. higher runoff during warm temperature anomalies).



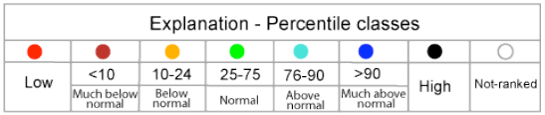


Fig. 5: USGS 7-day average streamflow compared to historical streamflow for March 6th in the UCRB.

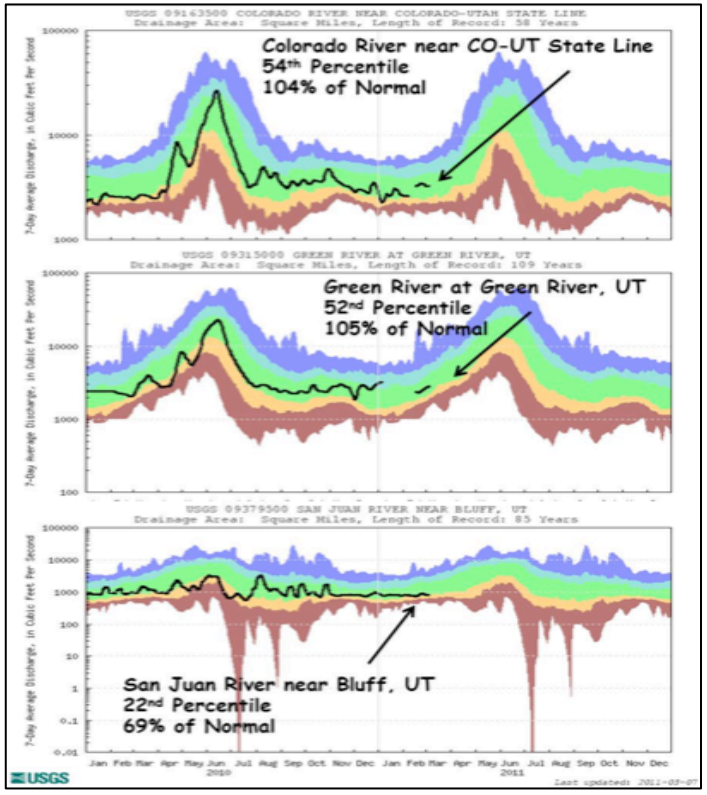


Fig. 6: USGS 7-day average discharge over time at the CO-UT state line (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

For the month of February, temperatures were below average for most of the UCRB and the eastern plains of Colorado. For the first week of March, temperatures were mostly near average for most of the basin and surrounding areas. A small pocket of the Upper Green River basin saw below average temperatures and a small area on the Front Range showed above average temperatures. Soil moisture in the UCRB is in good condition, with dry soils still showing up in eastern Colorado (Fig. 7). The driest soils are located in southeastern Colorado.

For the month of February, most of the reservoirs saw their levels drop, with the exception of Lake Dillon, which saw a slight increase in its levels. Lake Powell volume decreased by over half a million acre feet during February, with inflows into the lake slightly below what had been projected. Lake Granby has also seen a larger decrease in volume, likely to prevent spilling from occurring this summer as its levels are currently very high. Most of the reservoirs are near or above average levels for this time of year, with the exception of Lake Powell, currently at 72% of average. For the first week of March, storage volumes increased slightly at Lake Dillon, Flaming Gorge, and McPhee Reservoirs.

Precipitation Forecast

The current storm affecting the mountains and Front Range of Colorado will exit to the east with a few remaining scattered showers possible for the mountains and far eastern plains. High pressure builds across the area on Wednesday with the next trough set to move into the region late Thursday and into Friday. Moisture will mostly be confined to the northern half of the UCRB. The next system to move into the area, Saturday night and into Sunday, will likely bring more precipitation to the northern part of the UCRB. The European model shows a lower and deeper trough which could also bring some precipitation further south and east onto the plains. Otherwise, dry conditions could persist across the southern part of the UCRB and the eastern plains of Colorado.

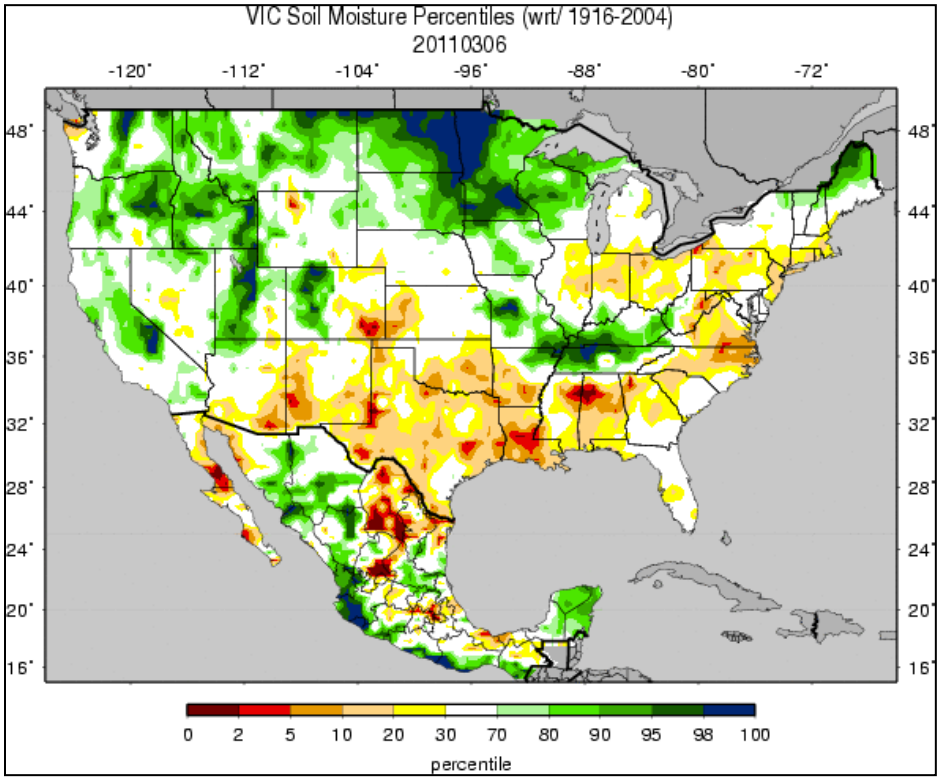


Fig. 7: VIC soil moisture as of March 6th.

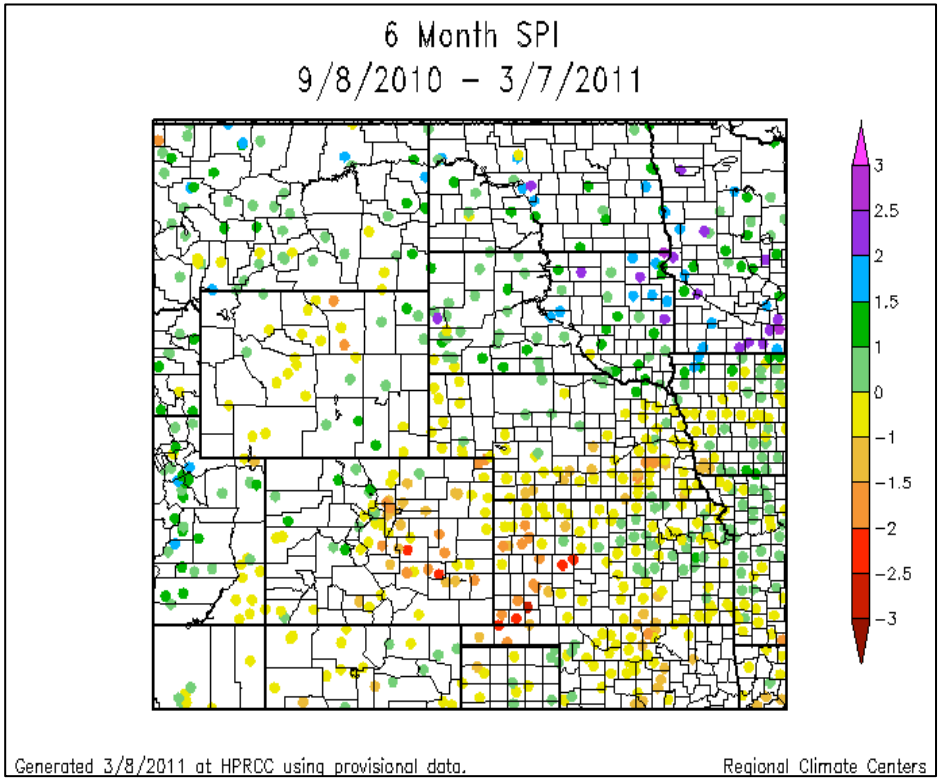


Fig. 8: 6 month standardized precipitation index (SPI) as of March 7th.

Drought and Water Discussion

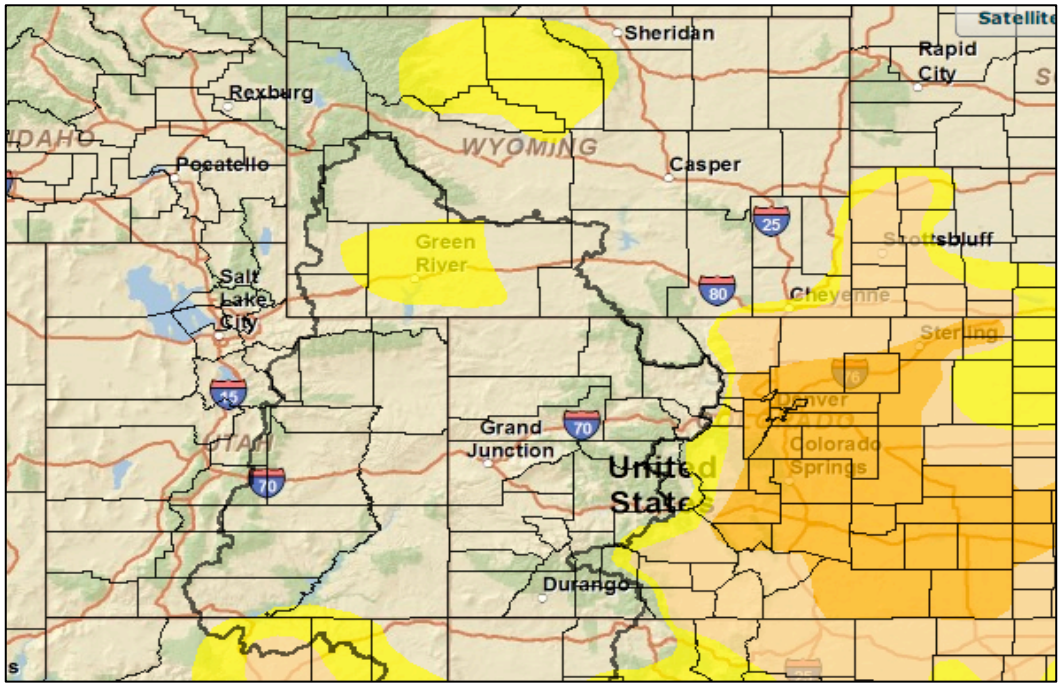
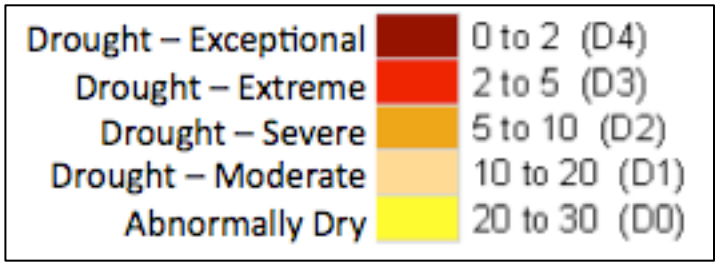


Fig. 9: March 1st release of U.S. Drought Monitor for the UCRB



Drought categories and their associated percentiles

Six month SPIs show the driest conditions over the eastern plains of Colorado (Fig. 8). Values in eastern Colorado mainly range from -1 to -3. Slightly negative SPI values are also in the Upper Green River basin (where a small amount of D0 remains), in the Four Corners region and in the Rio Grande basin (currently in D1). Positive SPI values are prevalent in northeastern Utah and northwestern Colorado.

Conditions across the UCRB and surrounding areas have changed little since last week. Not enough precipitation has fallen over the plains to warrant improvement in drought categories, and no further deterioration is needed after the D2 expansion last week. So, status quo is being recommended for the current depiction of the U.S. Drought Monitor map (Fig. 9).