

Winter 2013



January 15th,
2013

UPPER COLORADO RIVER REGIONAL DROUGHT
EARLY WARNING SYSTEM

Weekly Climate, Water & Drought Assessment

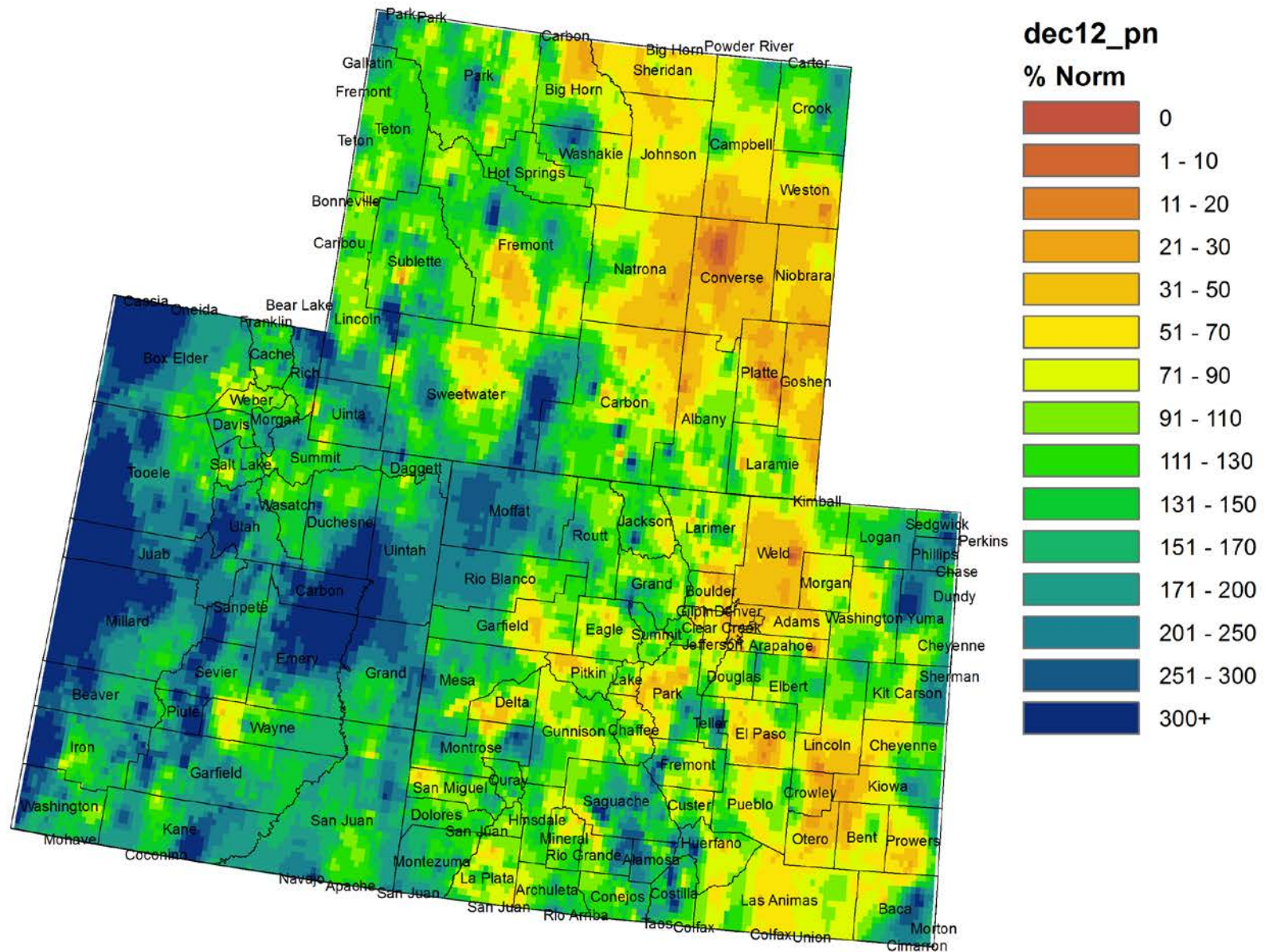
Today's Agenda

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

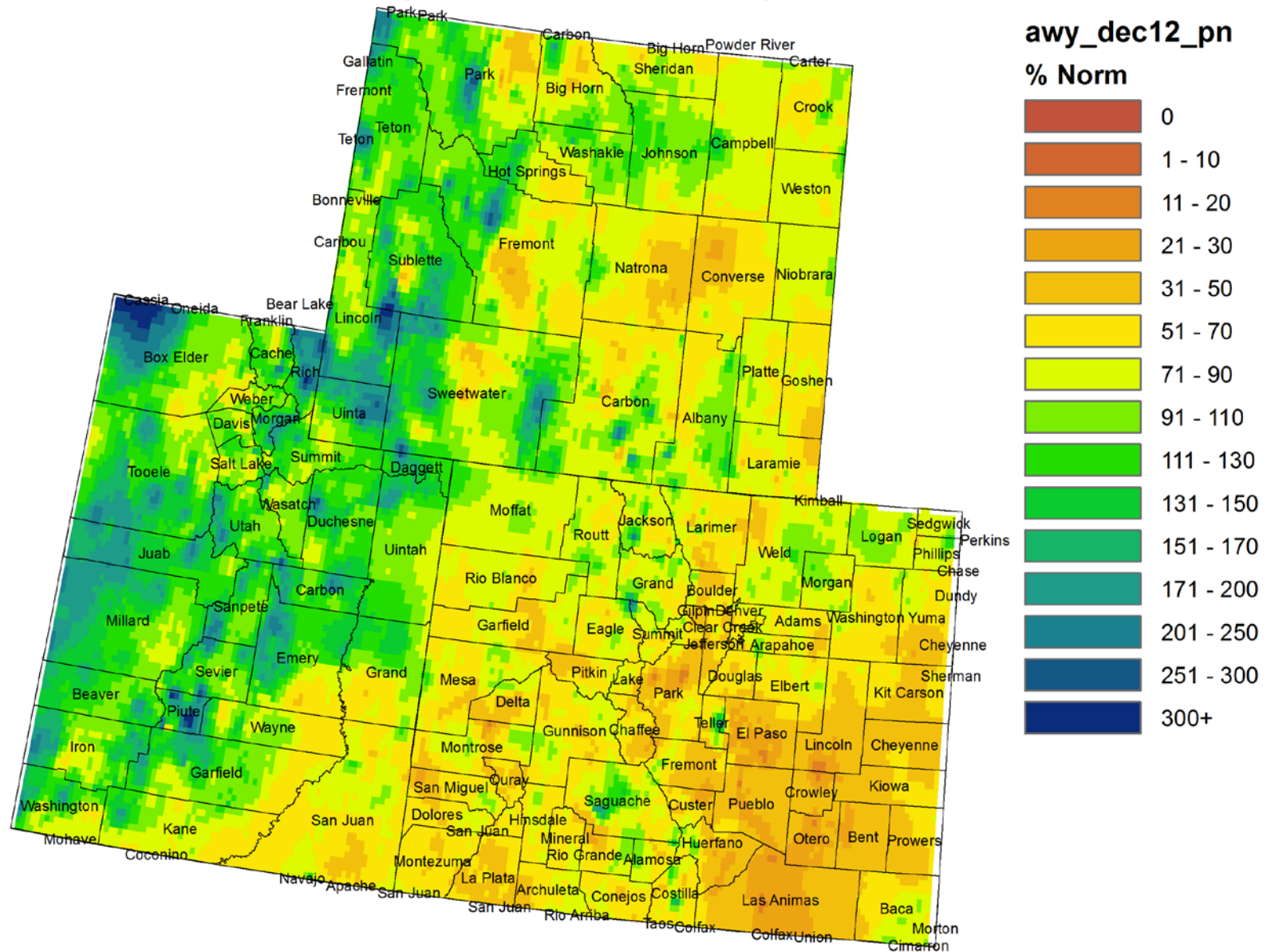
Precipitation/Snowpack Update



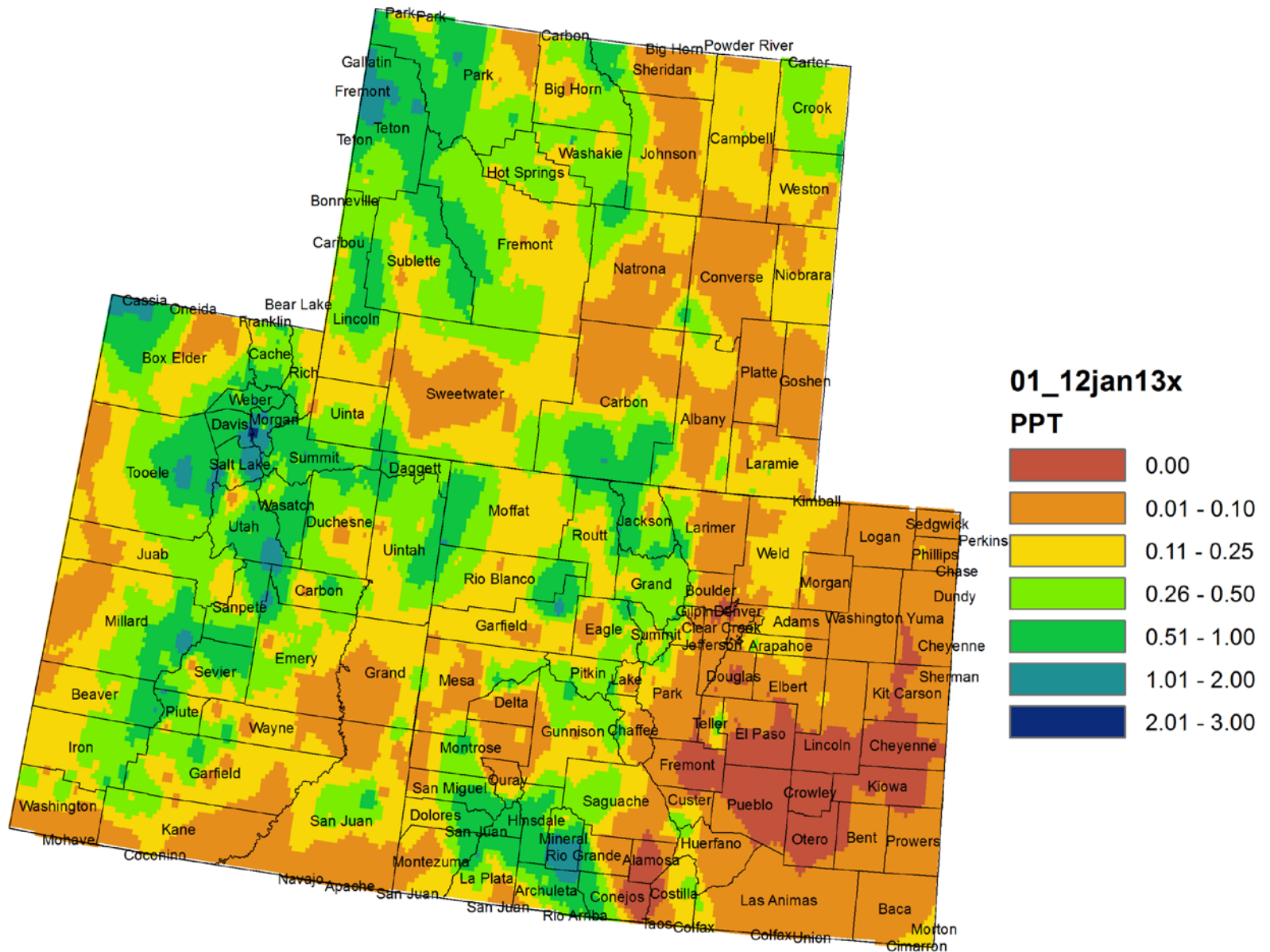
Colorado, Utah and Wyoming December 2012 Precipitation as Percentage of Normal



Colorado, Utah and Wyoming Water Year 2013 Precipitation as Percentage of Normal (Oct 2012 - Dec 2012)

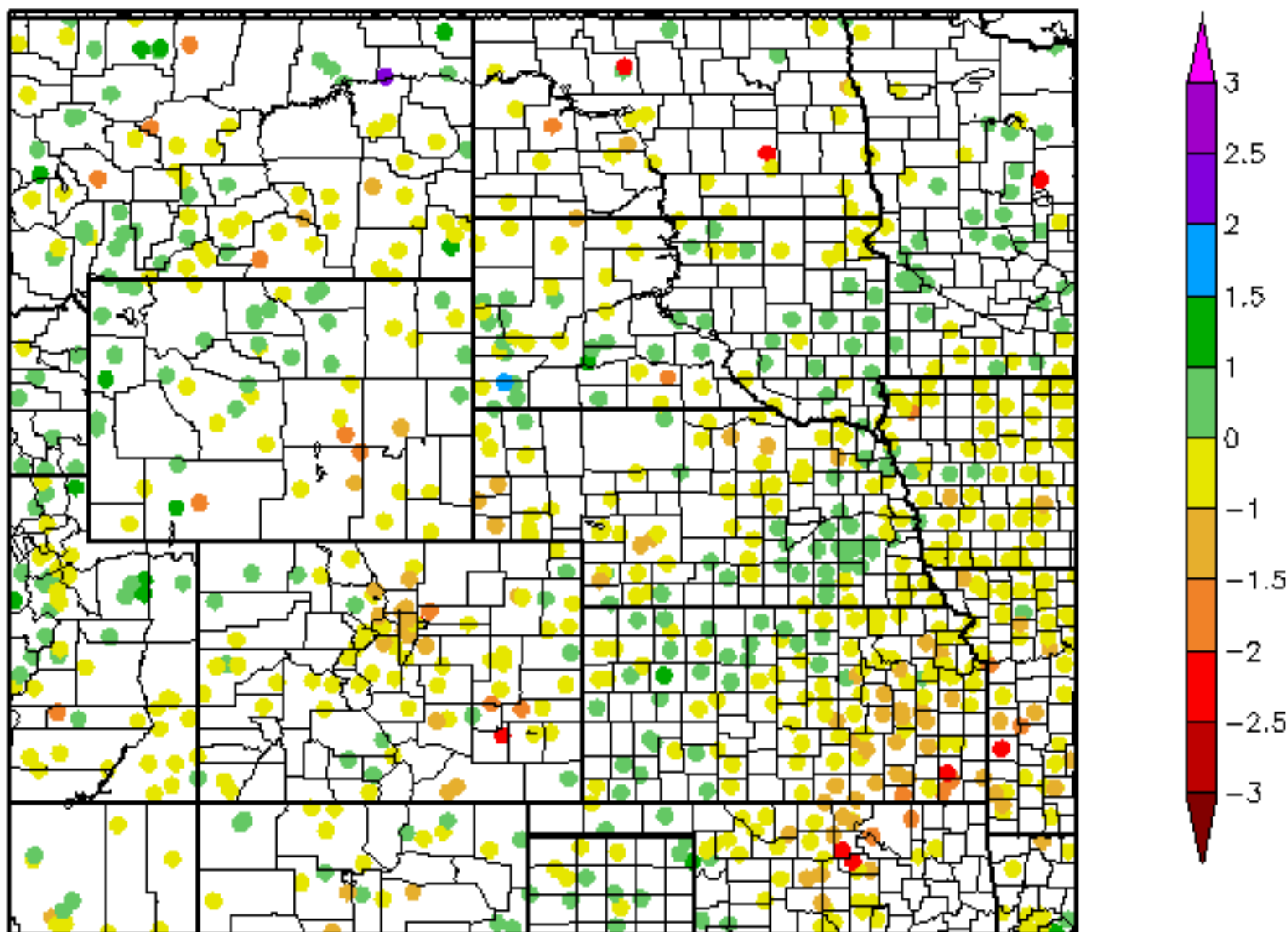


Colorado, Utah and Wyoming Month to Date Precipitation (in) 1 - 12 January 2013



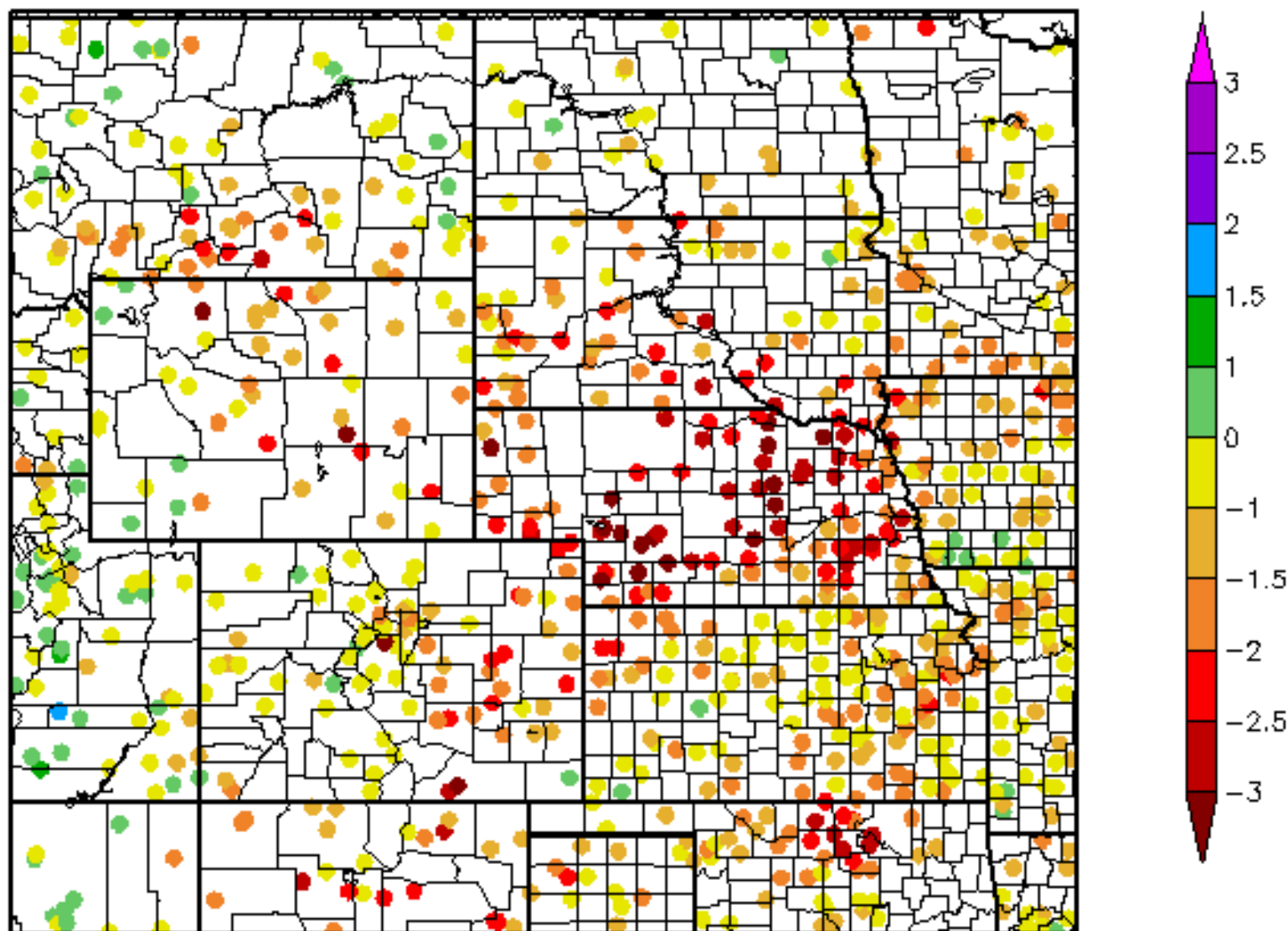
60 Day SPI

11/16/2012 - 1/14/2013

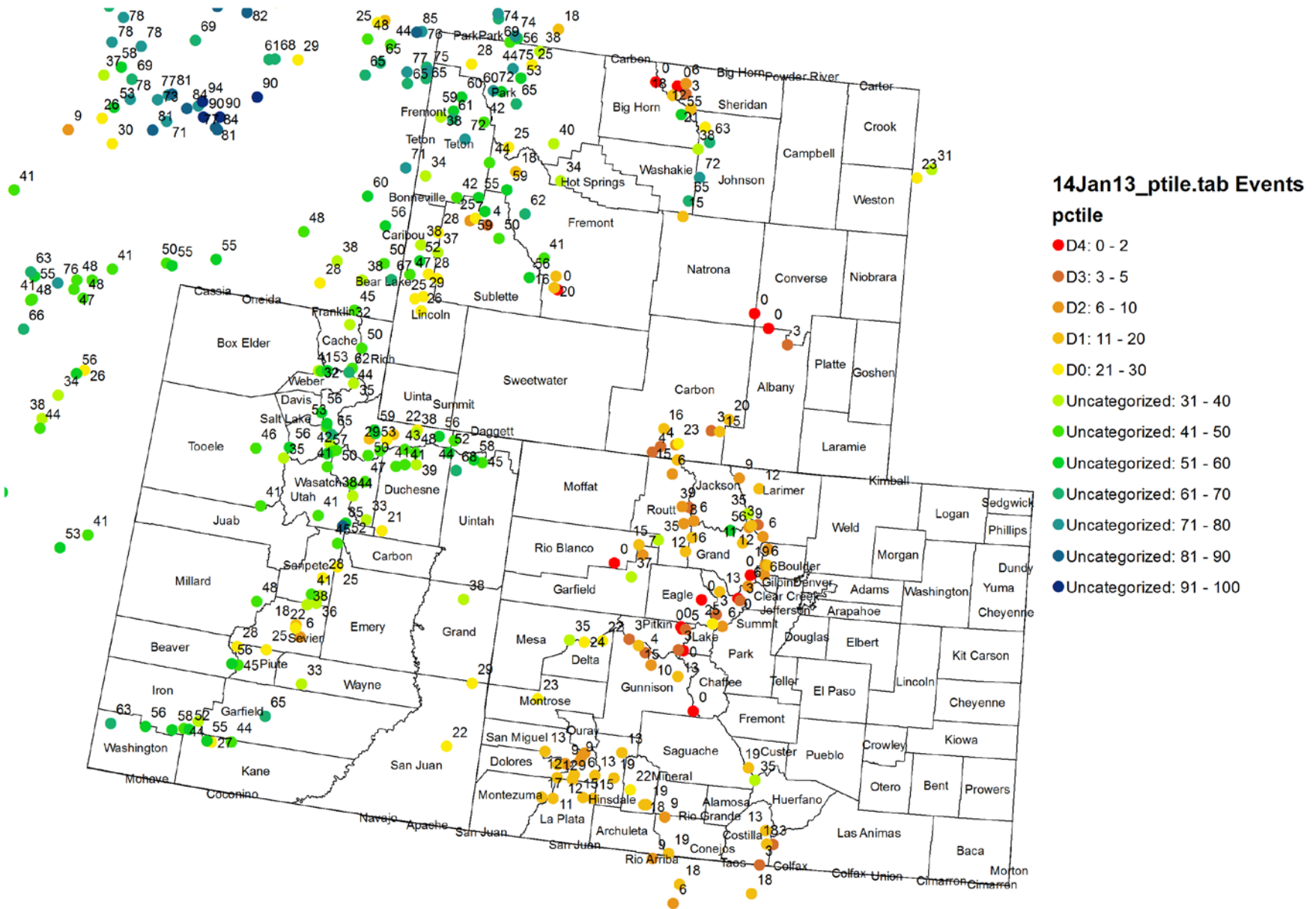


6 Month SPI

7/15/2012 – 1/14/2013



Snotel Water Year Precipitation Percentile Ranking for 14 January 2013 (Stations with 15+ years of data only)



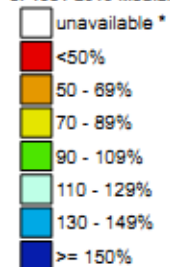
Snowpack



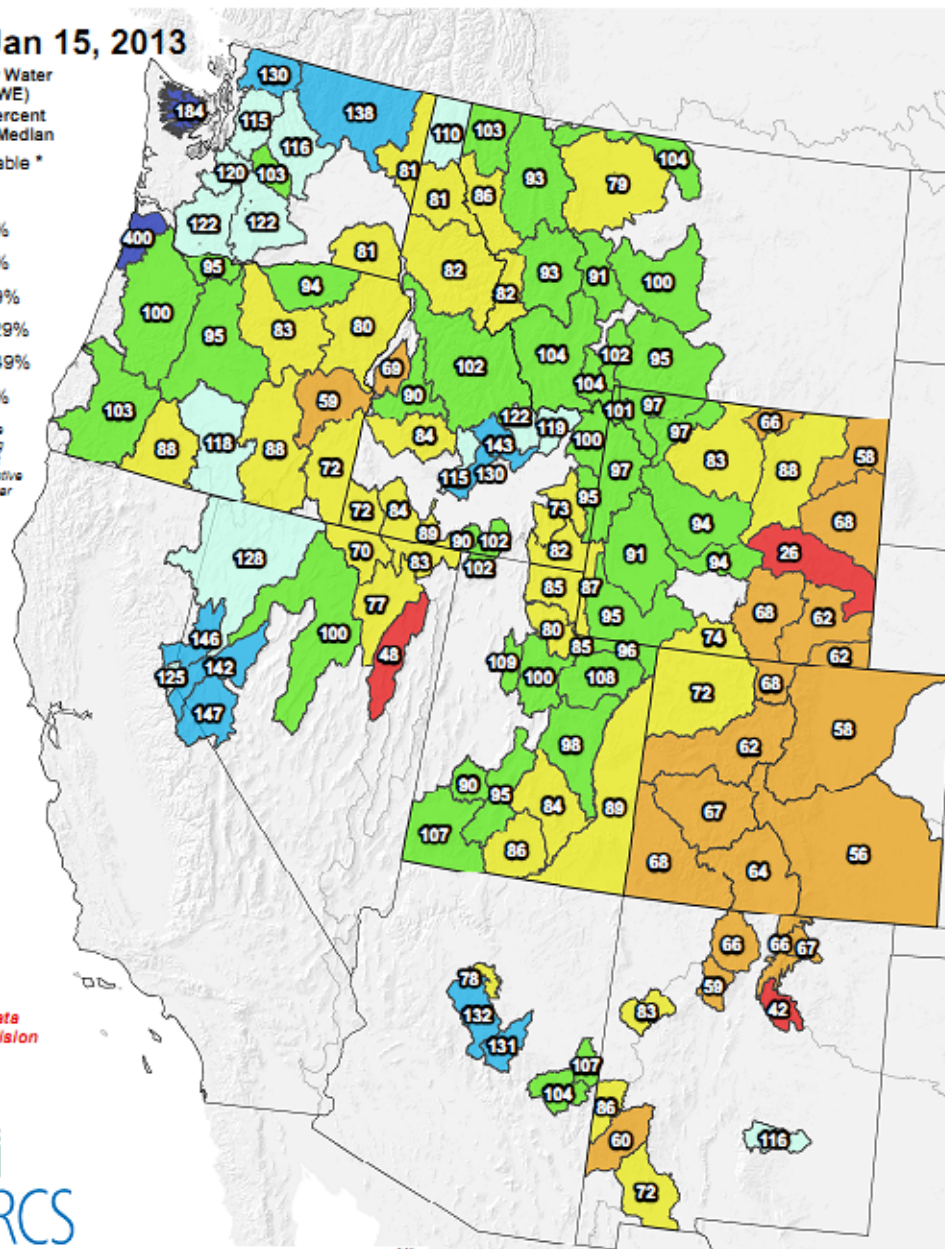
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Jan 15, 2013

Current Snow Water Equivalent (SWE)
Basin-wide Percent
of 1981-2010 Median



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



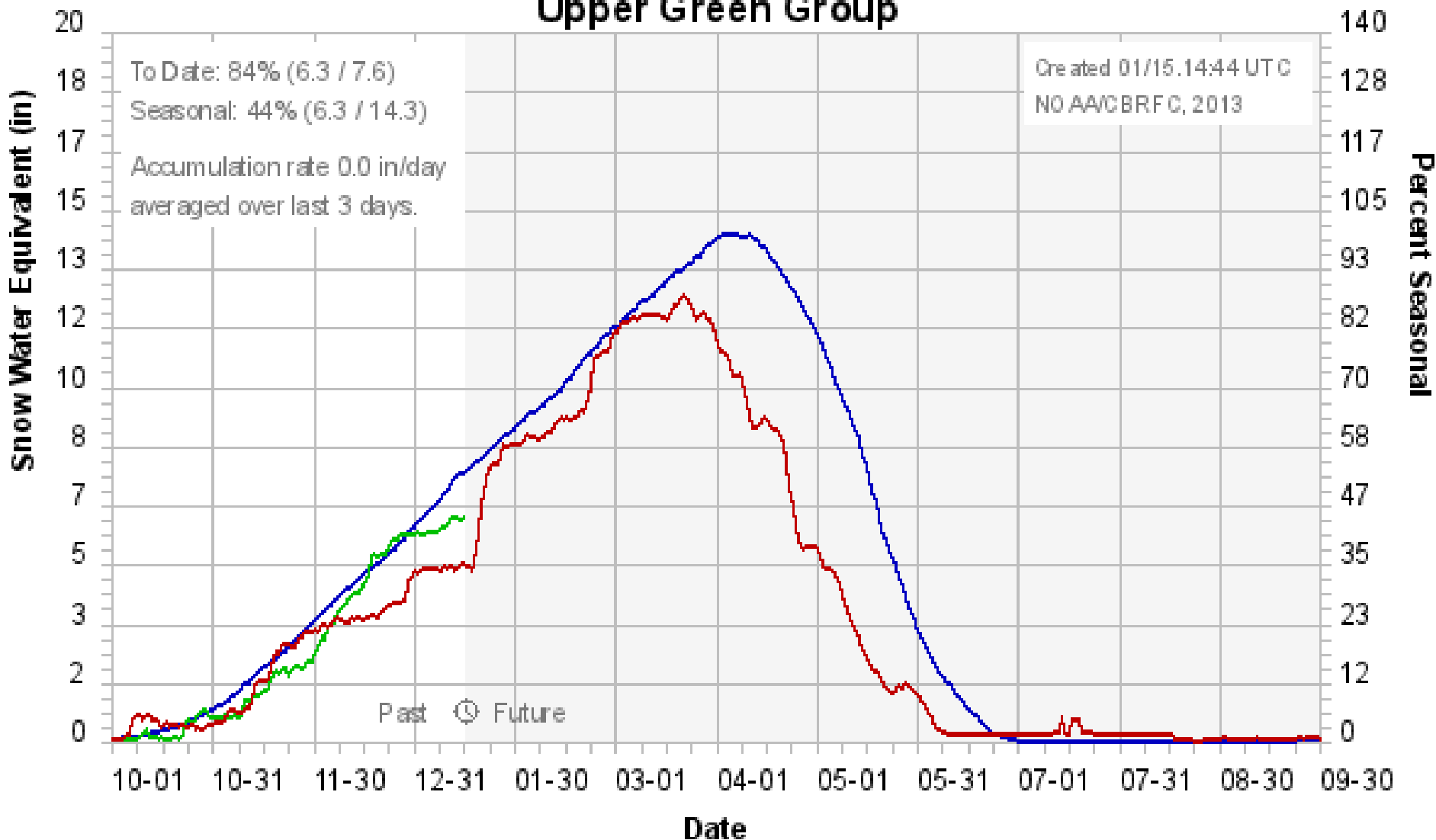
Provisional data
subject to revision



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).

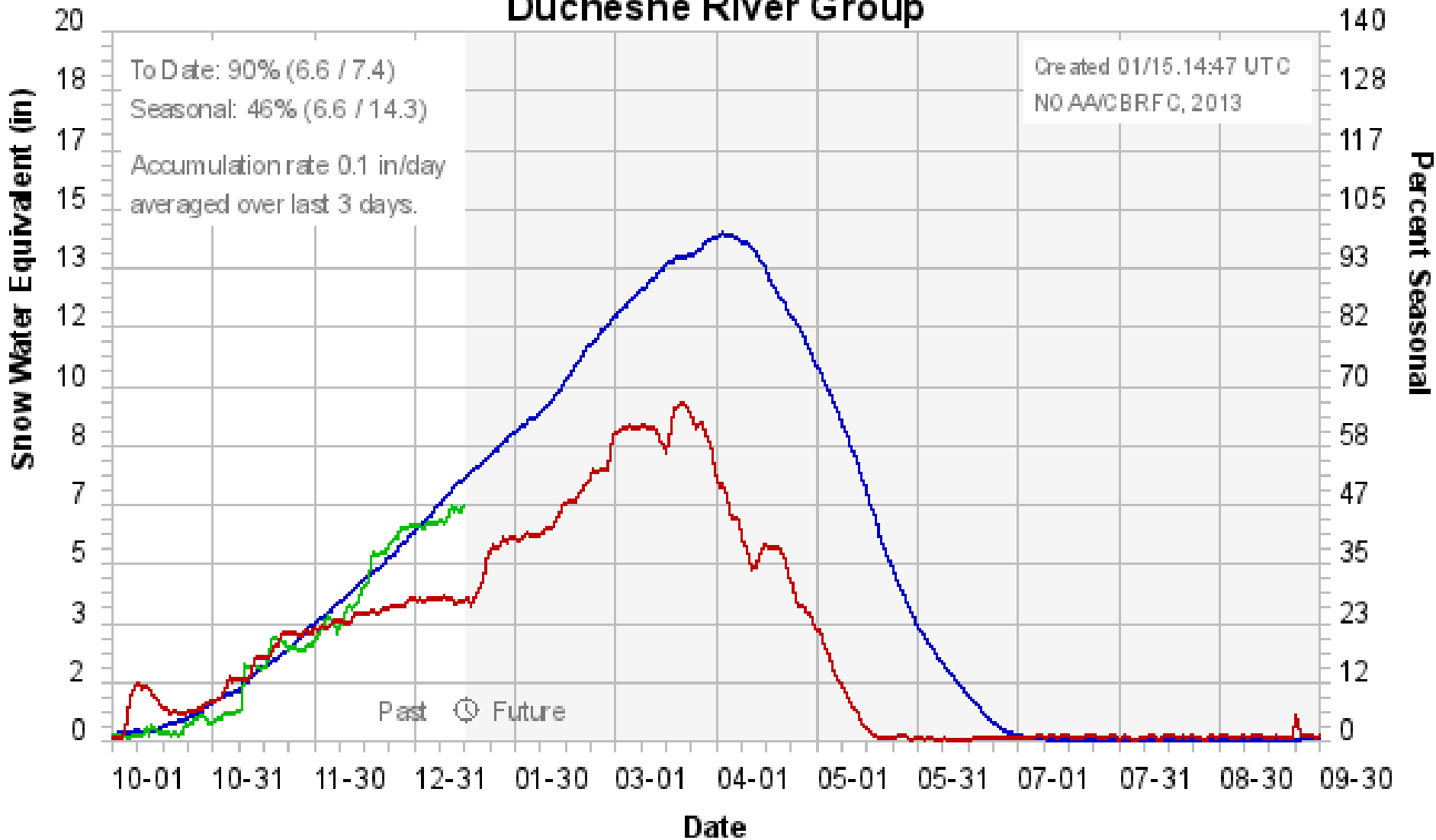
Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>
Based on data from <http://www.wcc.nrcs.usda.gov/reports/>
Science contact: Jim.Marron@por.usda.gov 503 414 3047

Colorado Basin River Forecast Center Upper Green Group



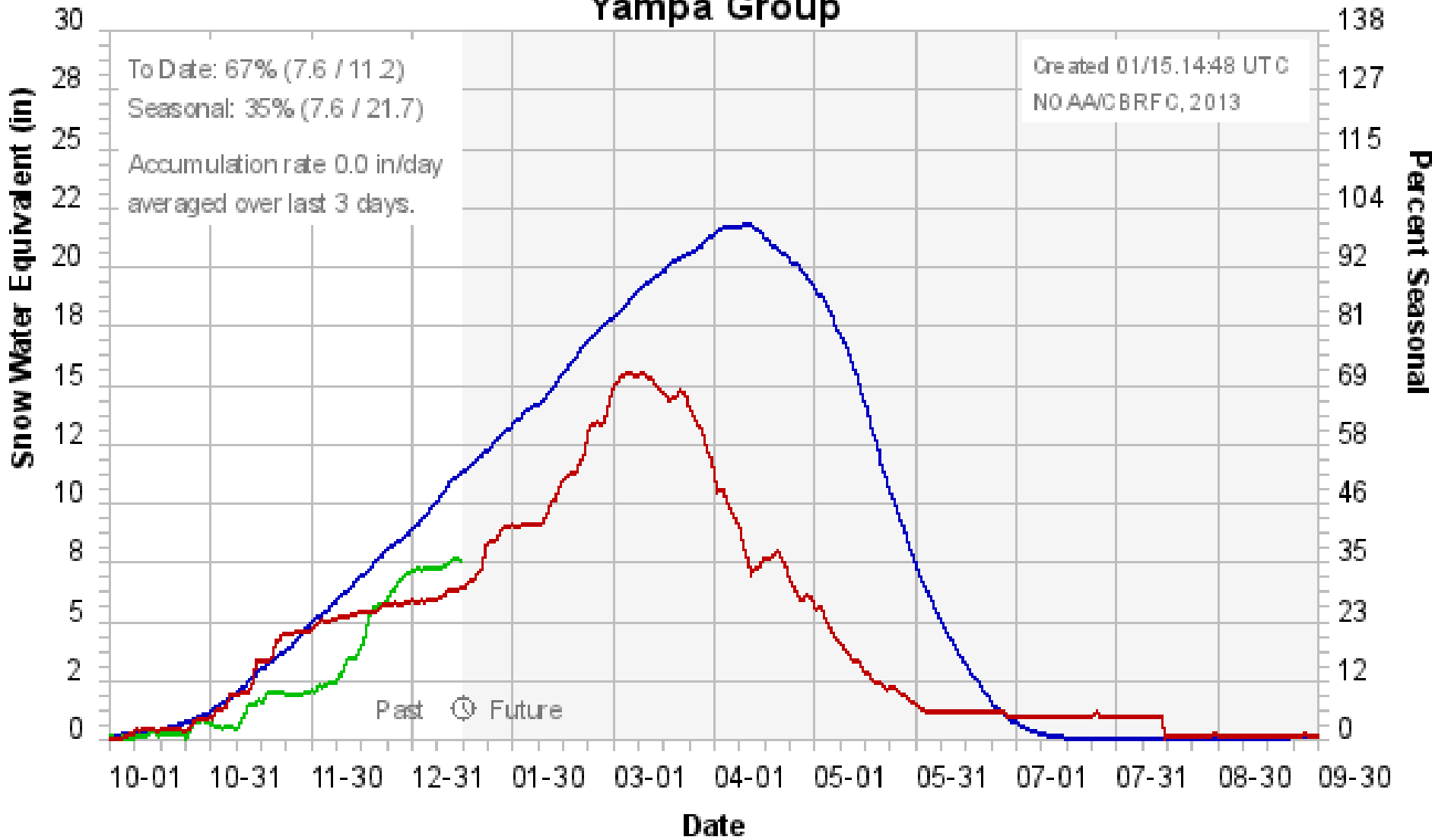
Average 1981-2010 2013 2012

Colorado Basin River Forecast Center Duchesne River Group



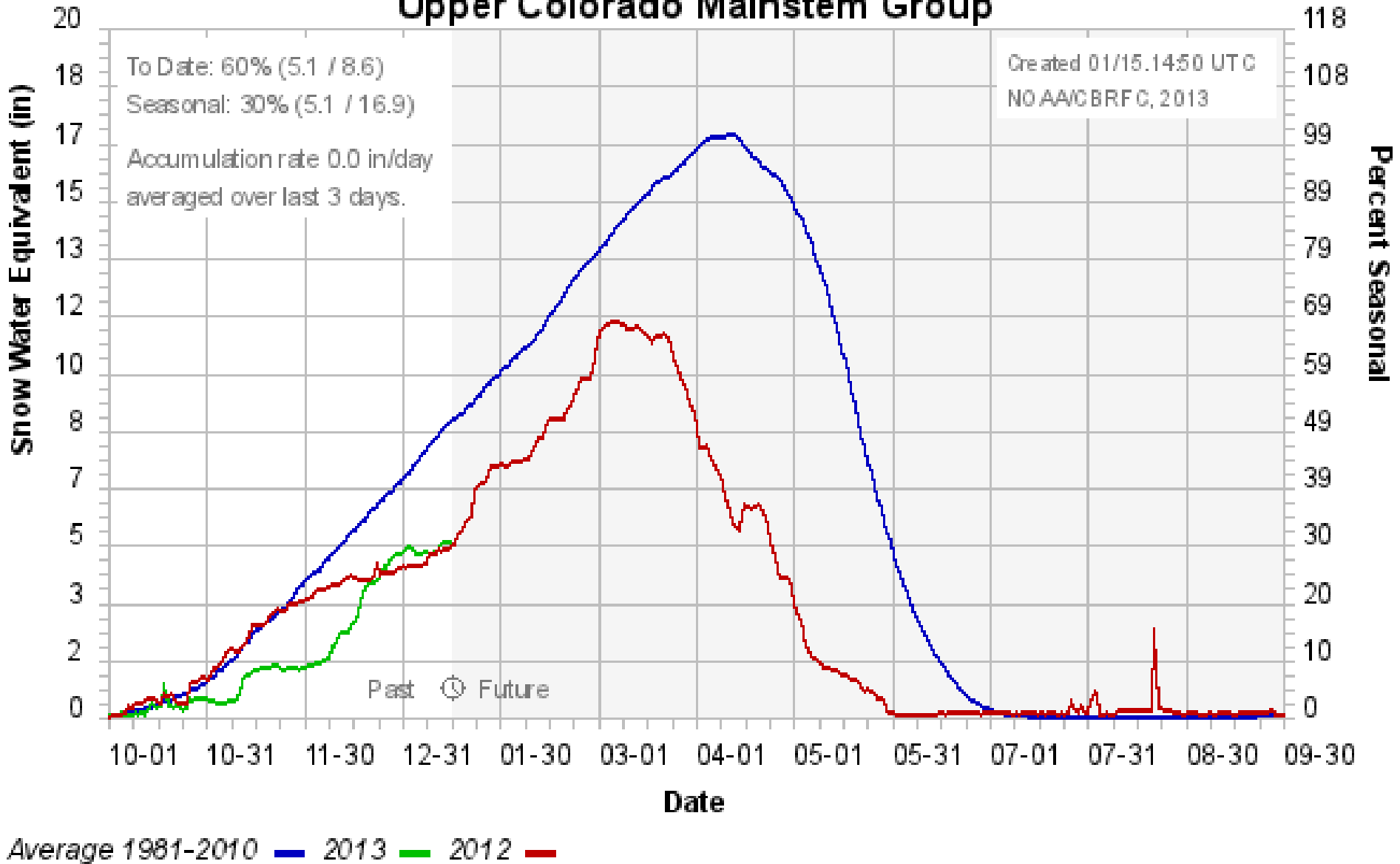
Average 1981-2010 2013 2012

Colorado Basin River Forecast Center Yampa Group

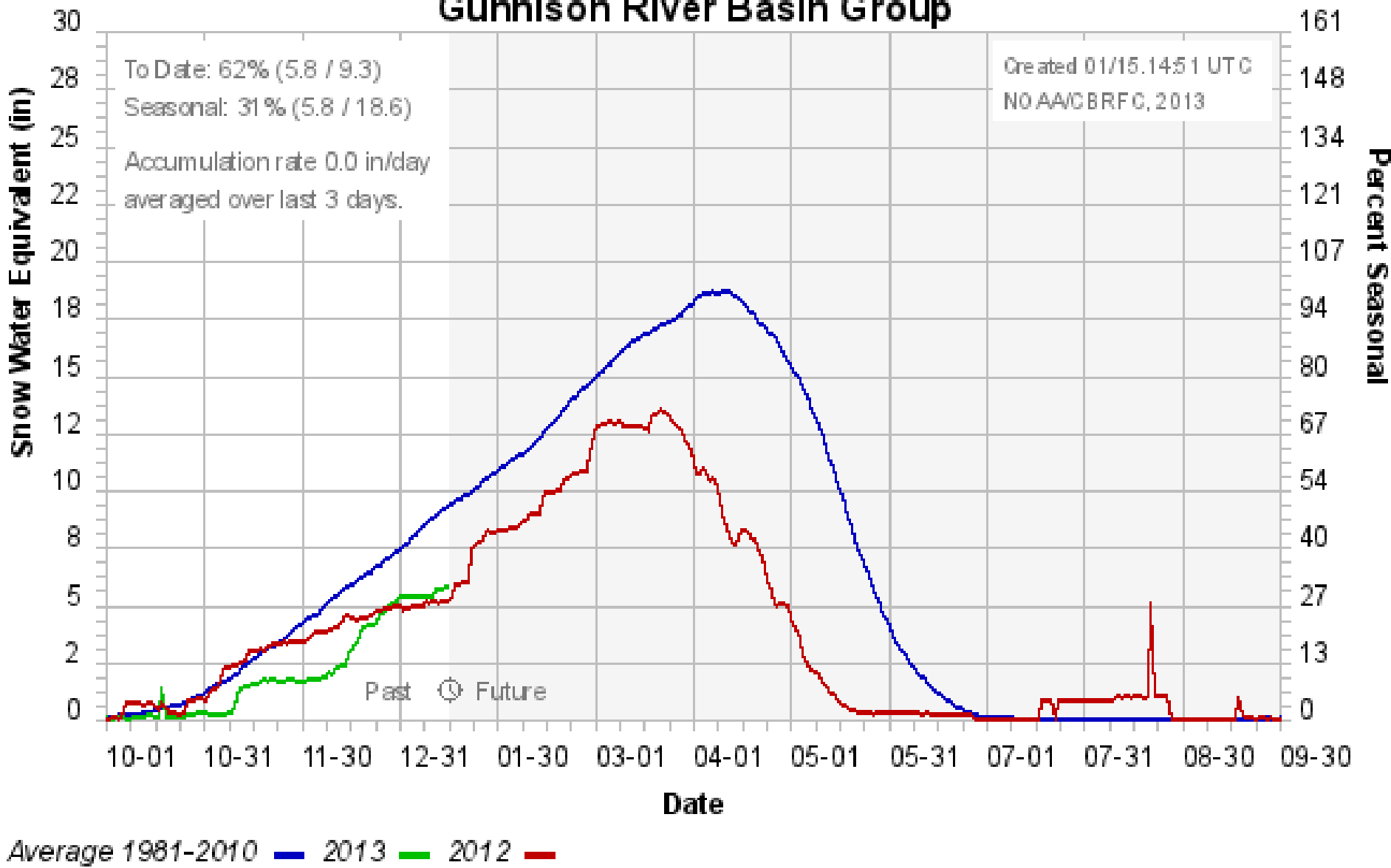


Average 1981-2010 2013 2012

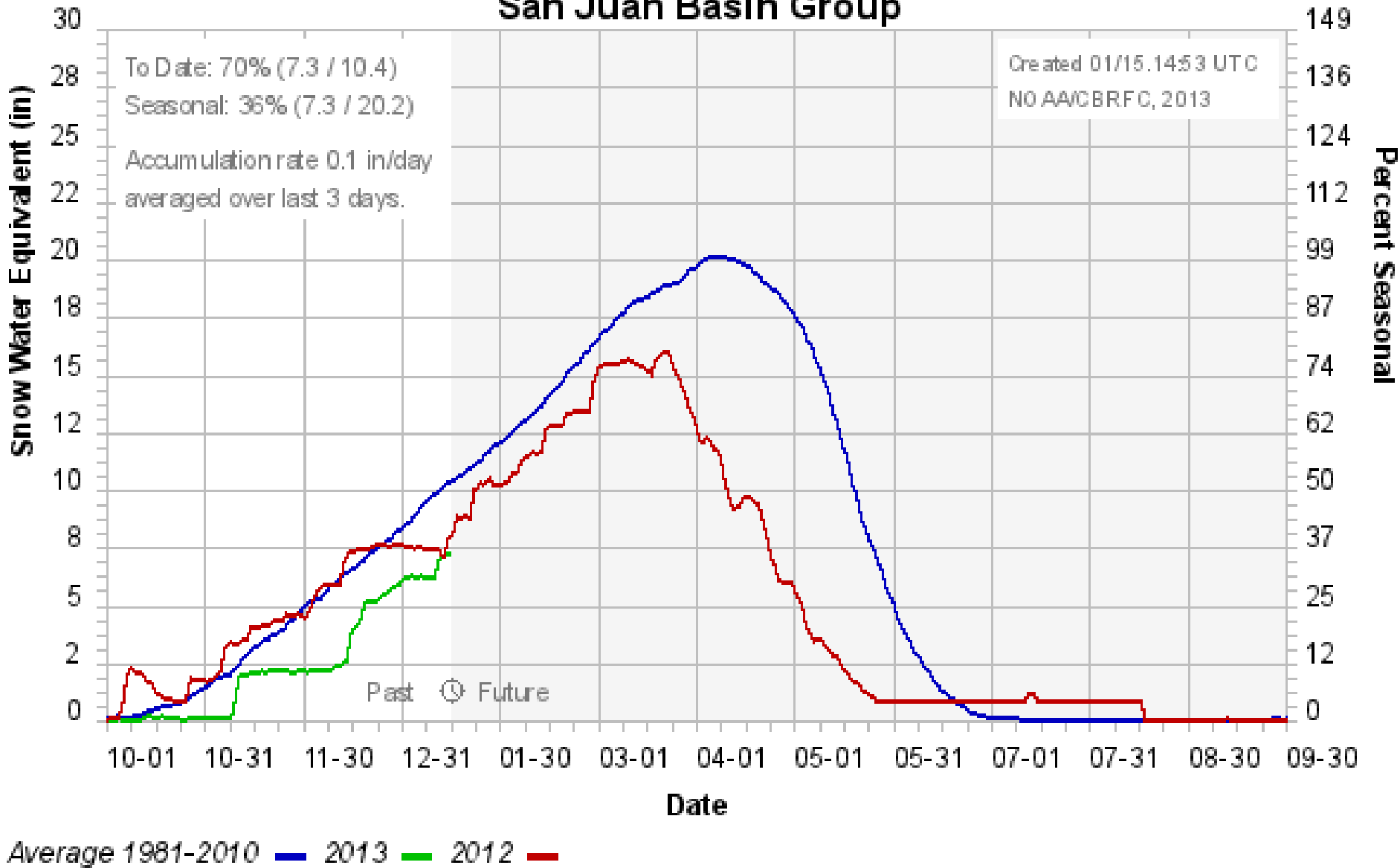
Colorado Basin River Forecast Center Upper Colorado Mainstem Group



Colorado Basin River Forecast Center Gunnison River Basin Group



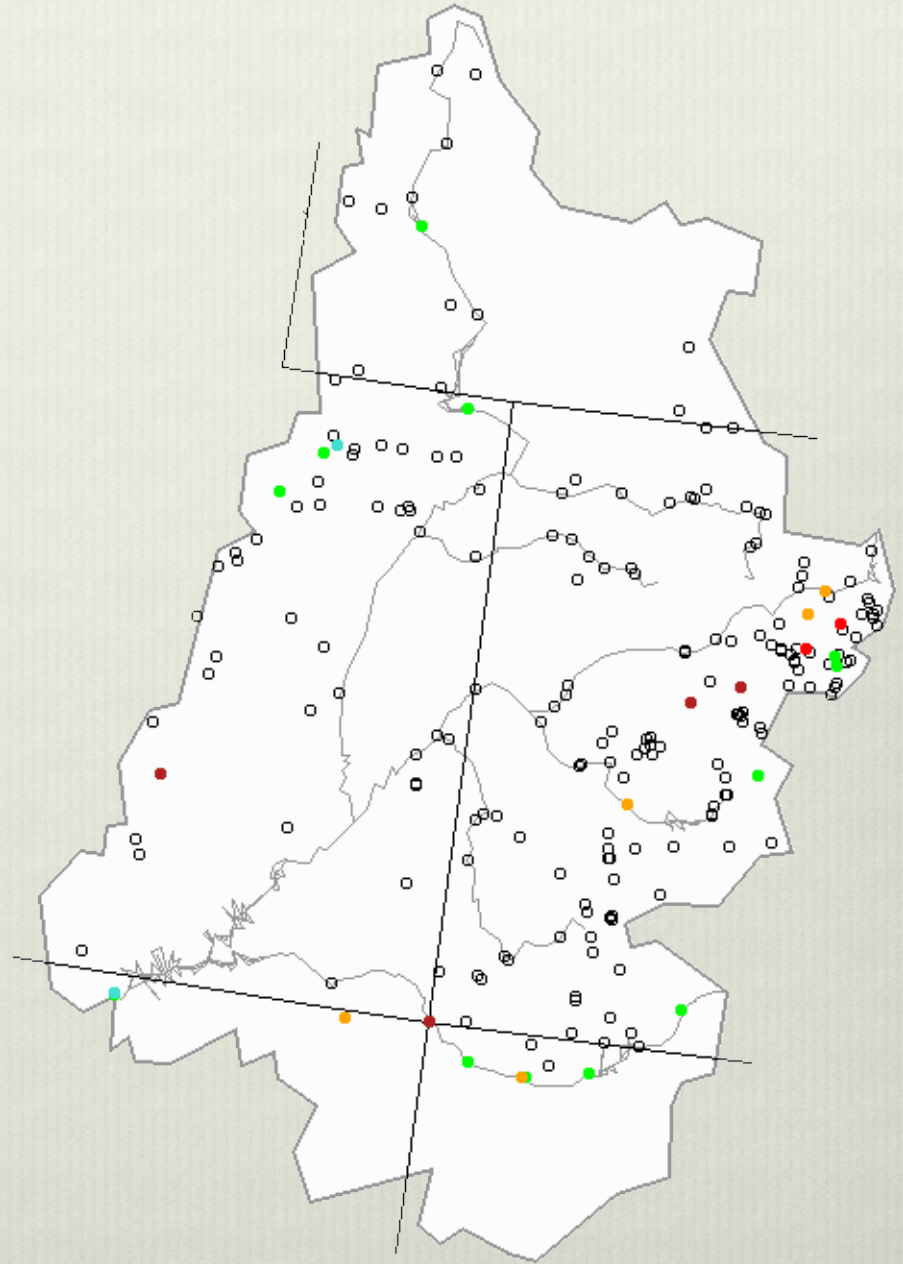
Colorado Basin River Forecast Center San Juan Basin Group



Streamflow Update

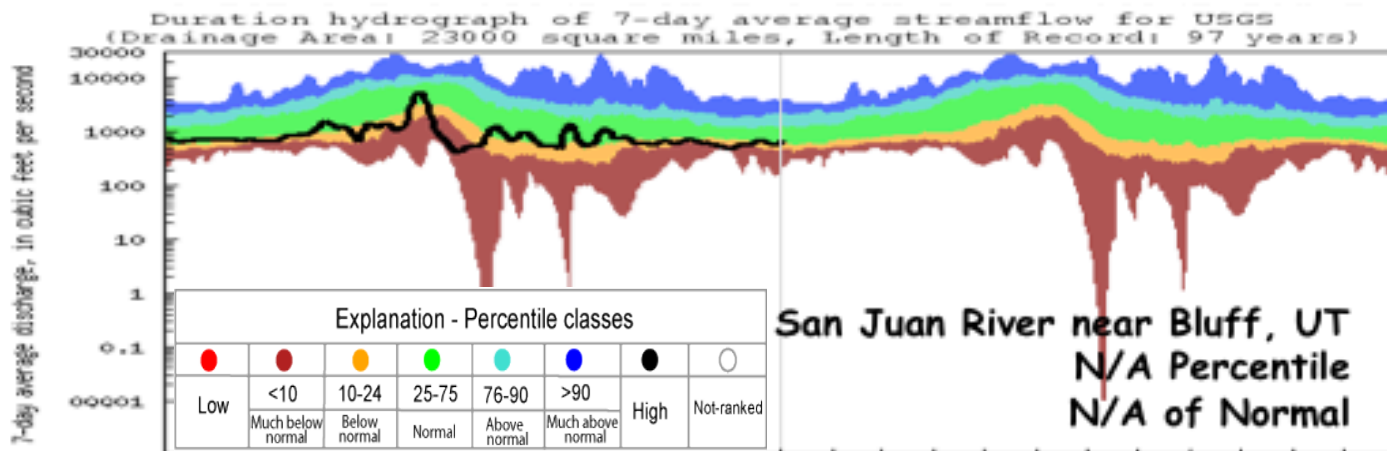
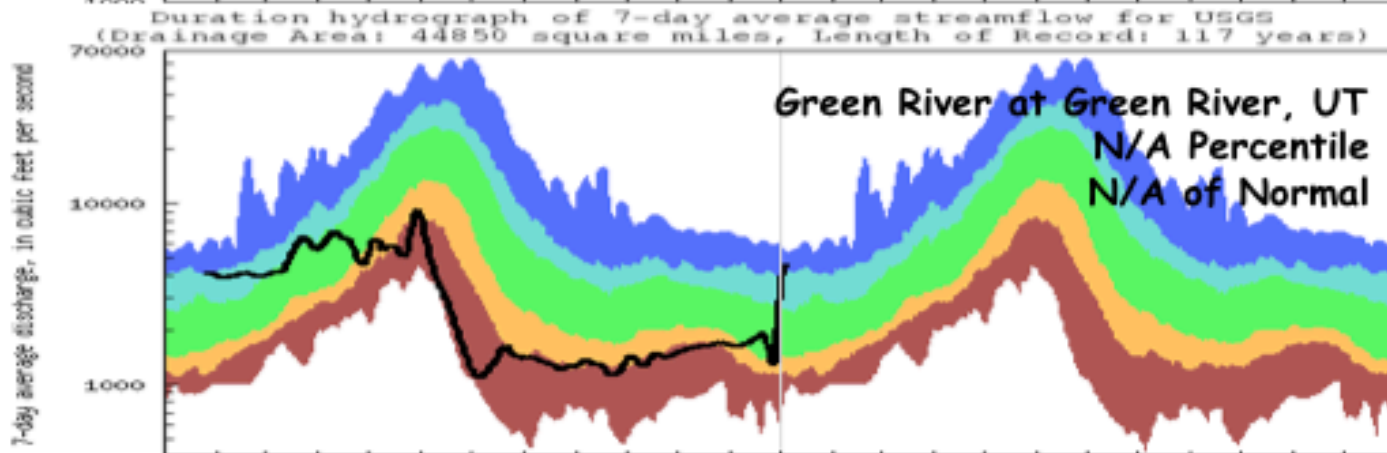
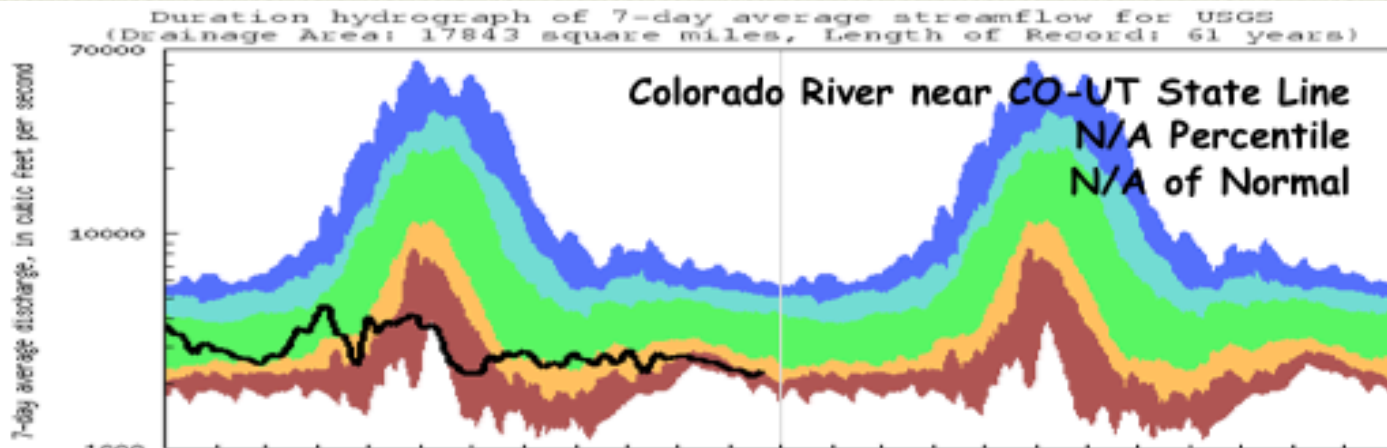


7-day average discharge compared to historical discharge for the day of the year (January 13th)



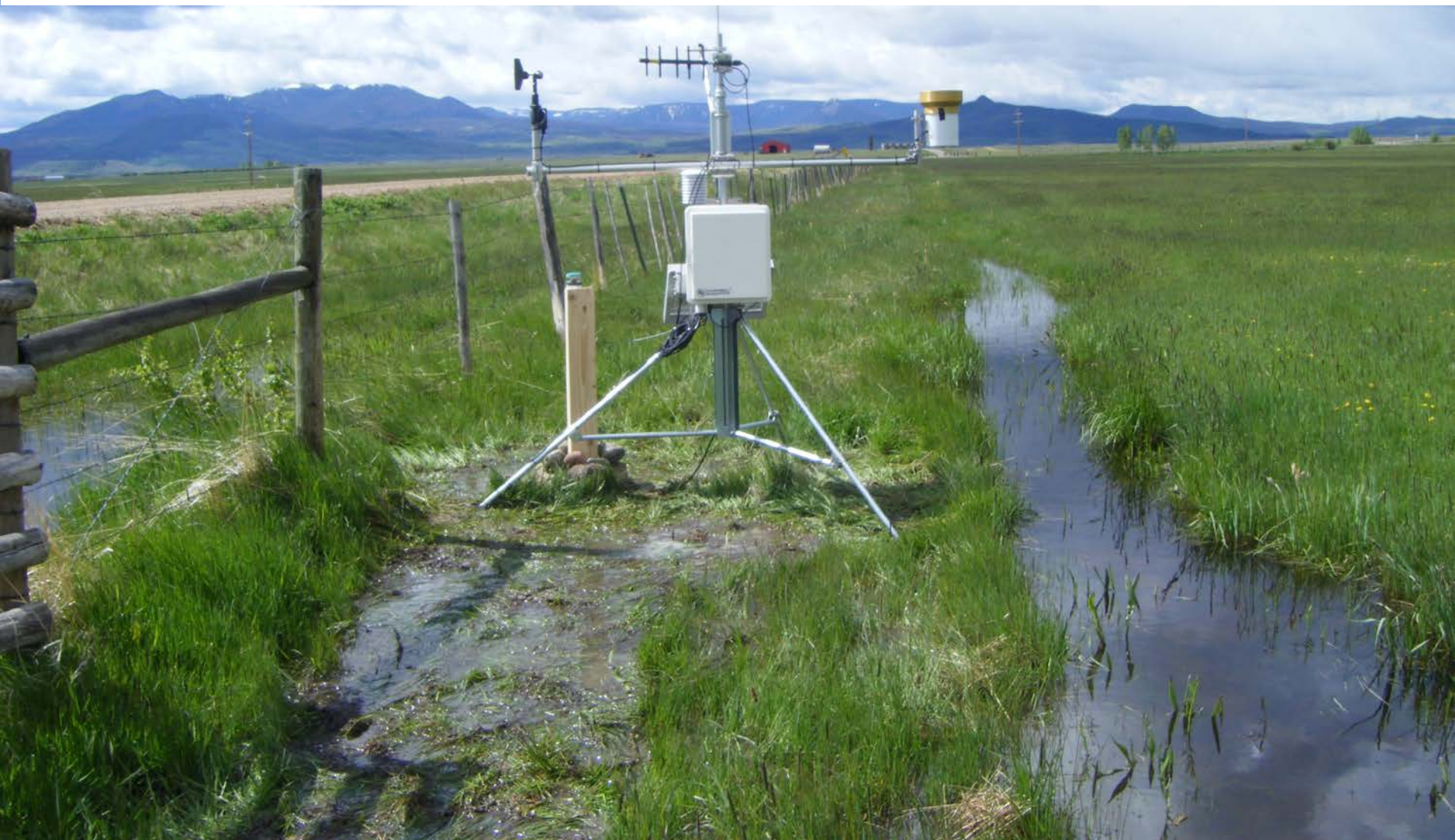
Explanation - Percentile classes

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

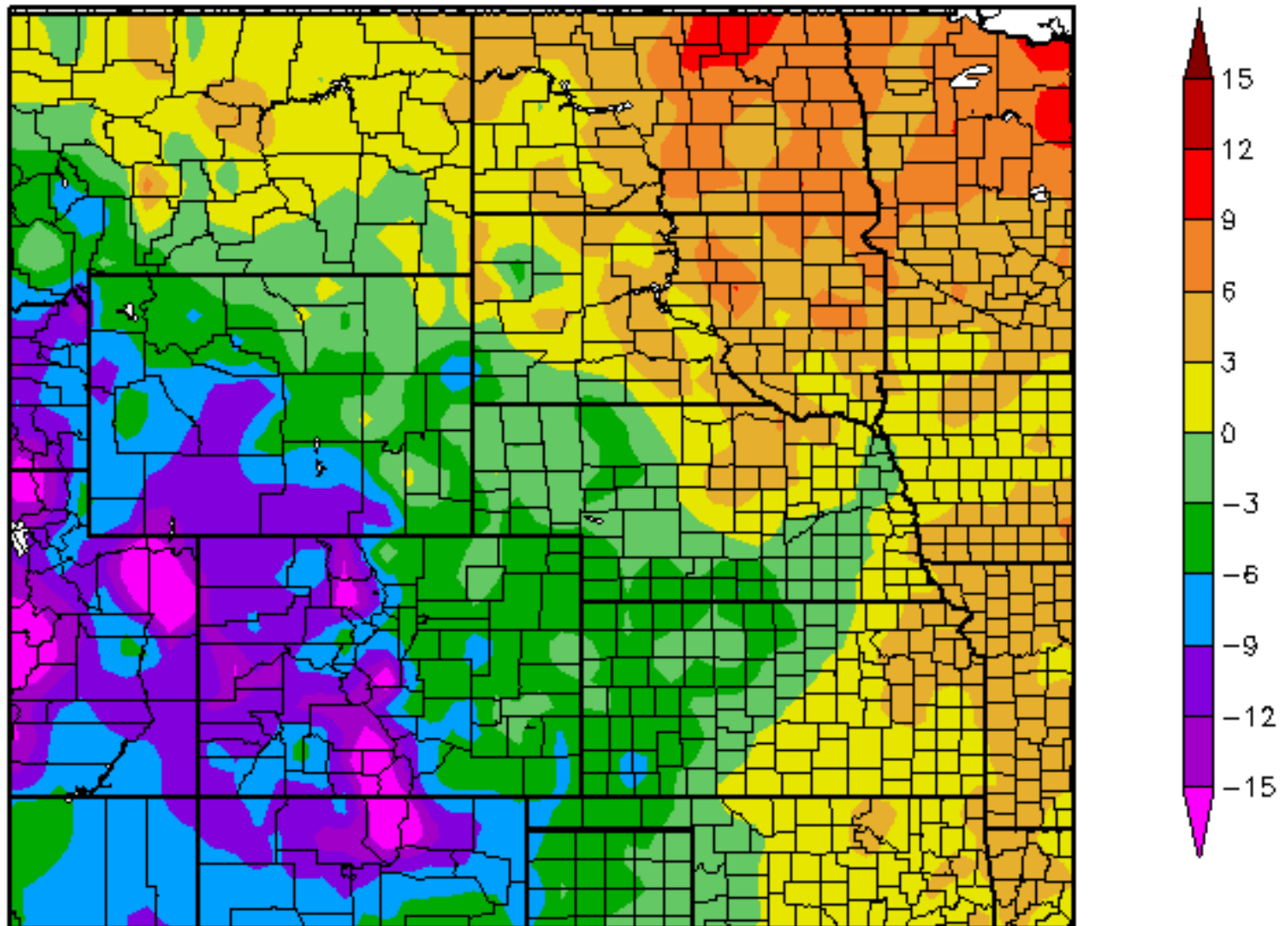


Explanation - Percentile classes							
●	●	●	●	●	●	●	○
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Water Demand

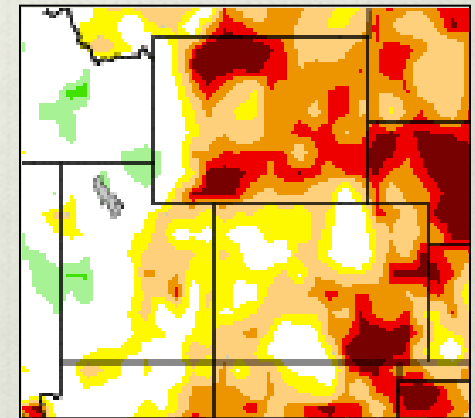
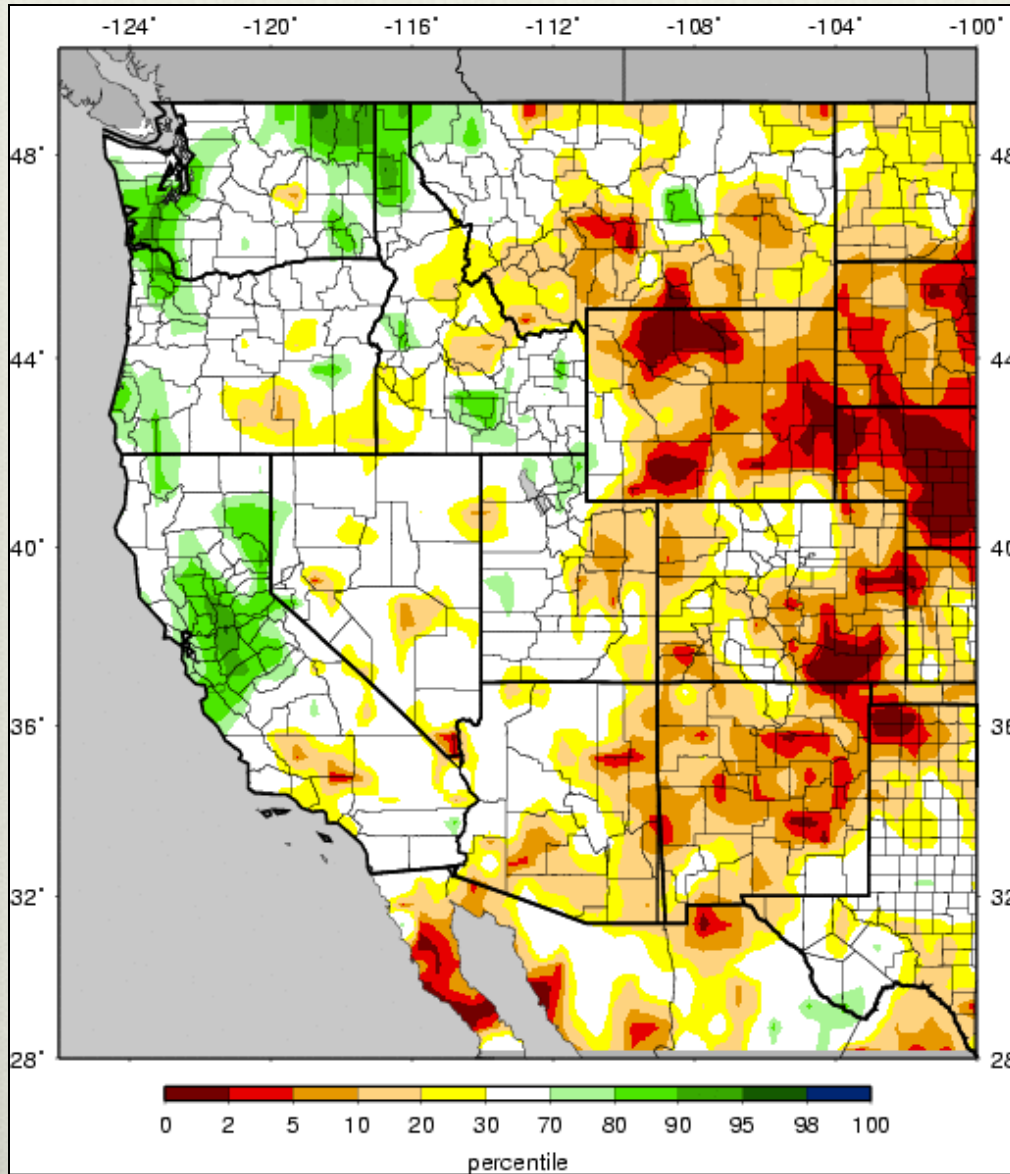


Temperature Departure from Normal 01/01/2013 – 01/13/2013



VIC Soil Moisture

13 January 2013

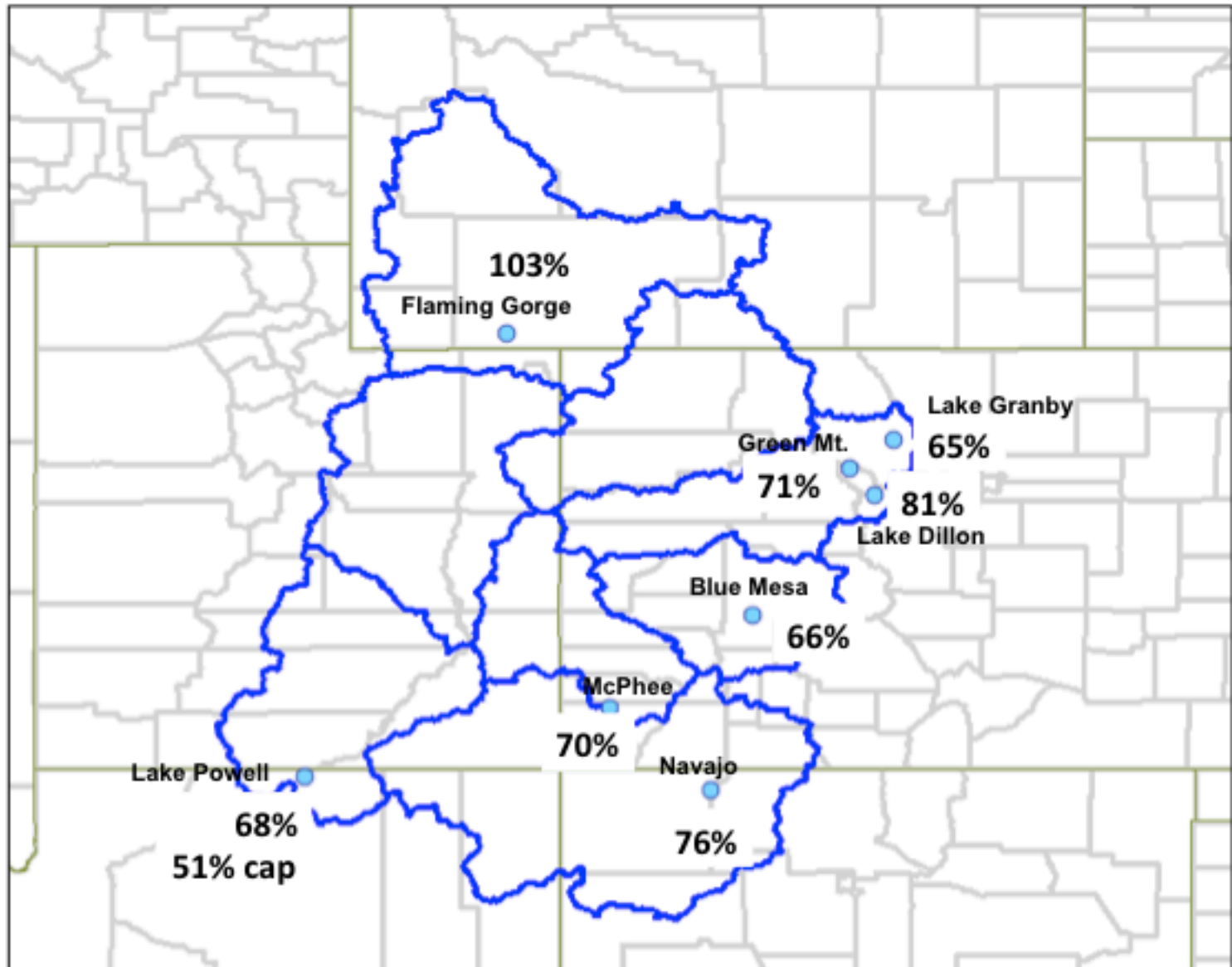


VIC + SWE

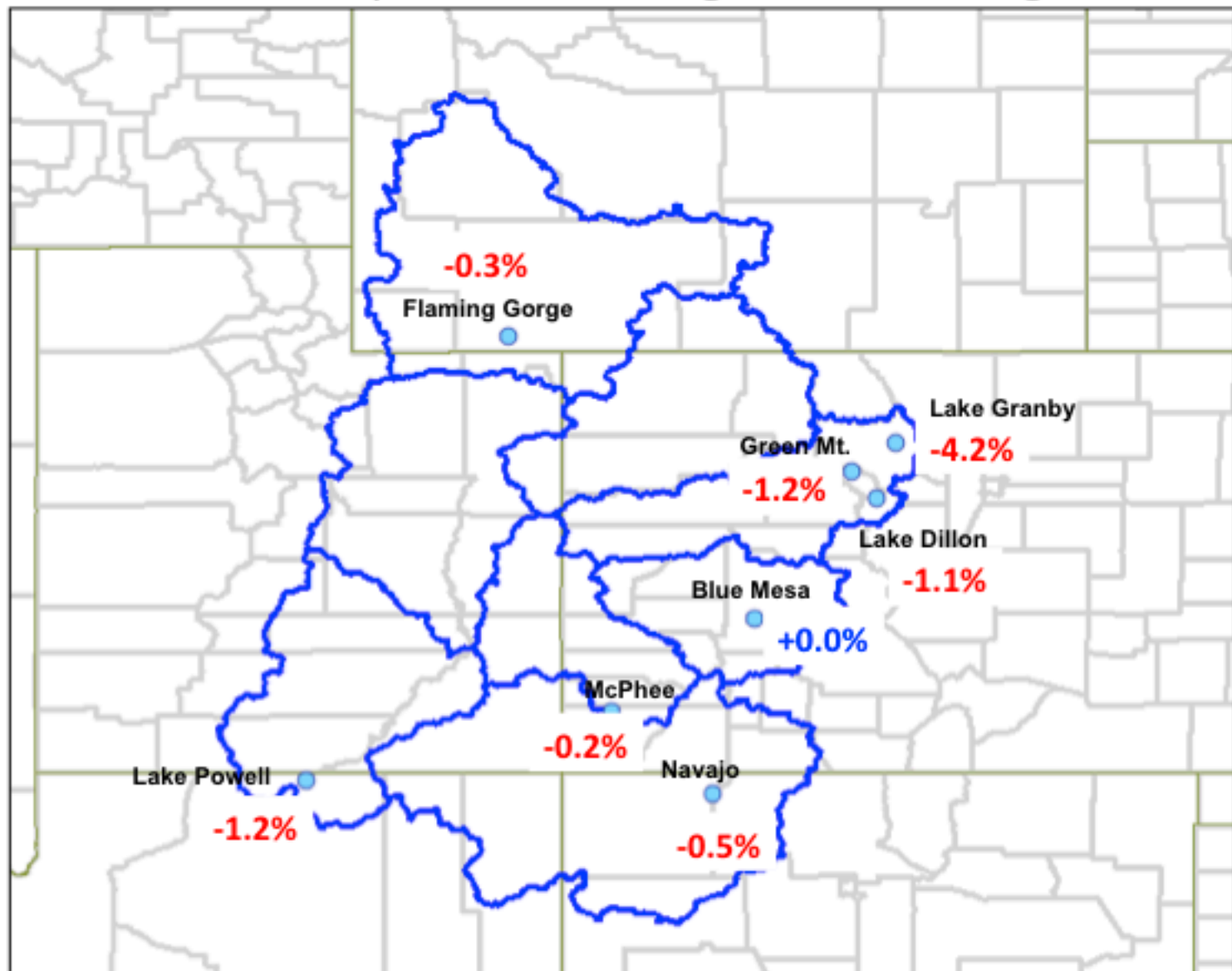
Reservoir Update



January Average Reservoir Storage Volume



January Reservoir Storage Volume Change



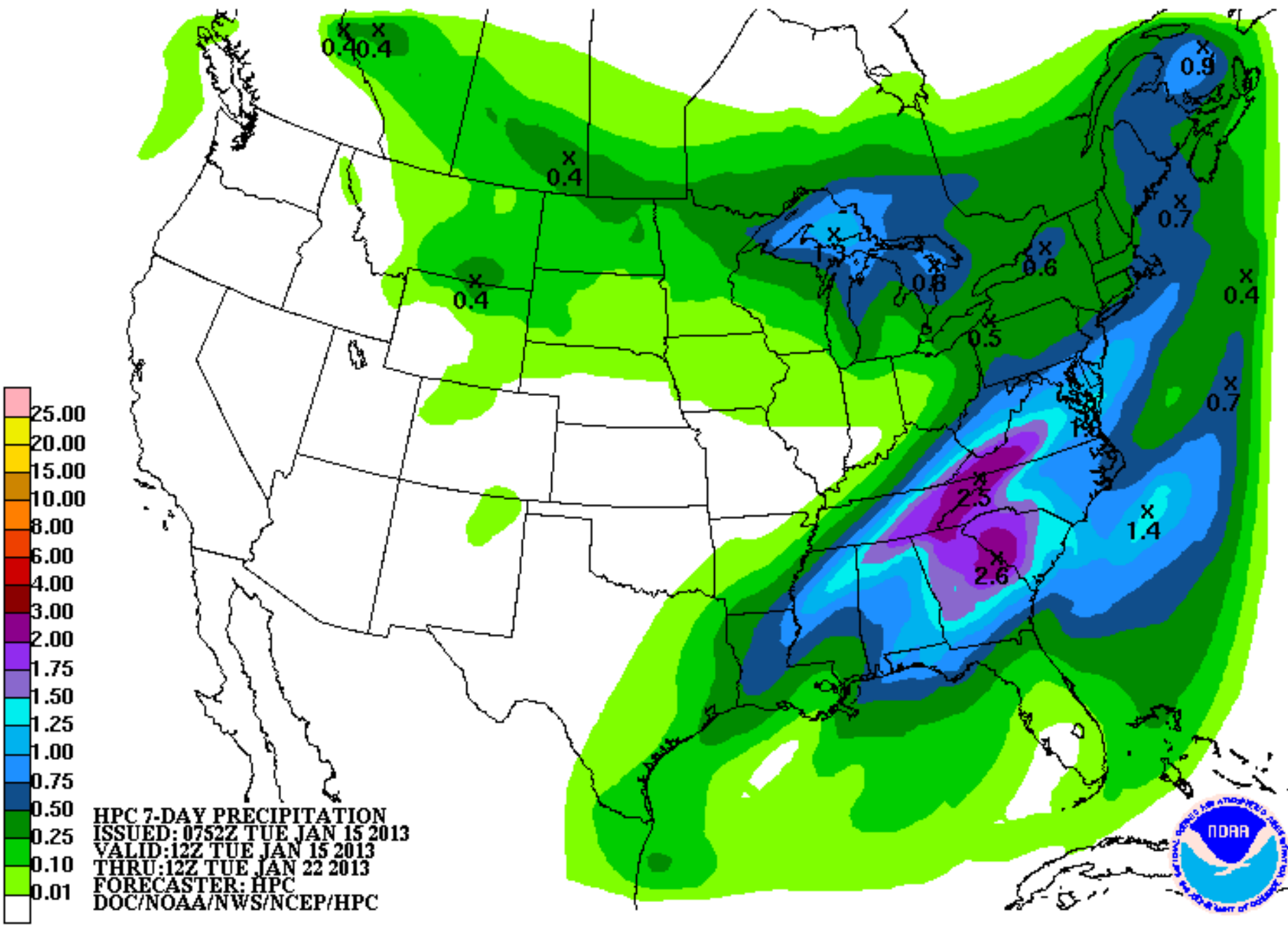
Wyoming Update:

Wyoming Asst. State Climatologist
Tony Bergantino

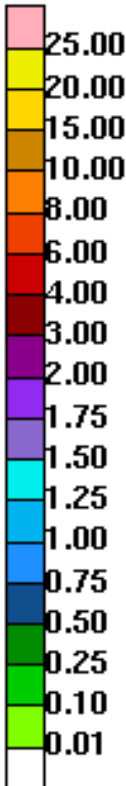


Precipitation Forecast

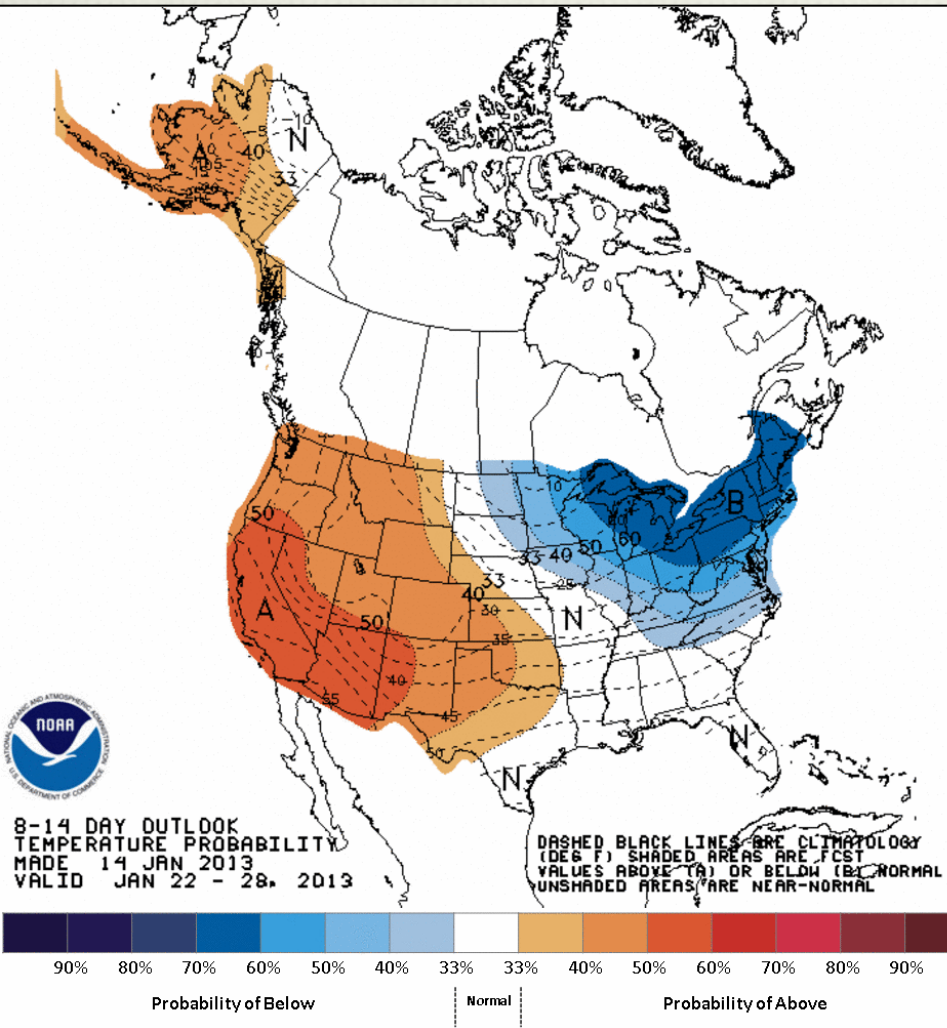




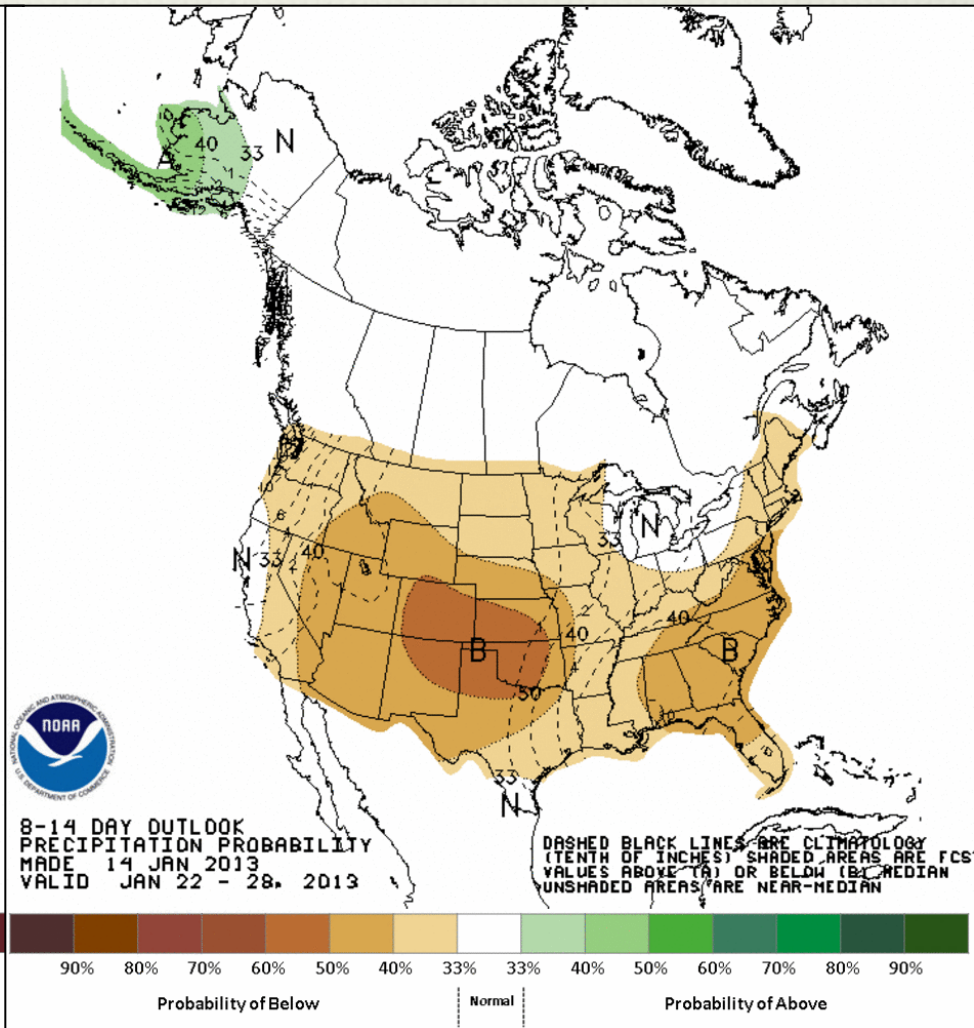
HPC 7-DAY PRECIPITATION
ISSUED: 0752Z TUE JAN 15 2013
VALID: 12Z TUE JAN 15 2013
THRU: 12Z TUE JAN 22 2013
FORECASTER: HPC
DOC/NOAA/NWS/NCEP/HPC



January 22 – 28 Outlook

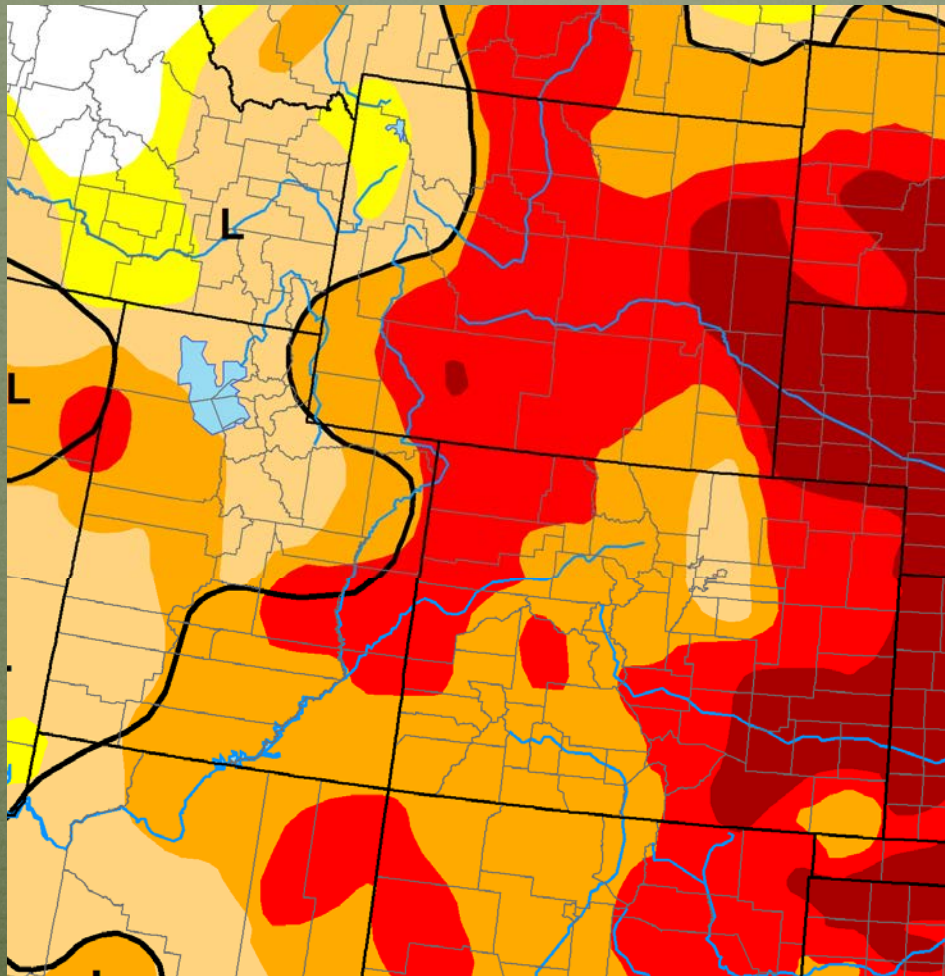


Temperature Anomalies



Precipitation Anomalies

Recommendations



**O
F
N
I**



CONTACT:

COLORADO CLIMATE CENTER

COLORADO STATE UNIVERSITY

FORT COLLINS, CO 80523

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NIDIS - UPPER COLORADO BASIN PILOT PROJECT

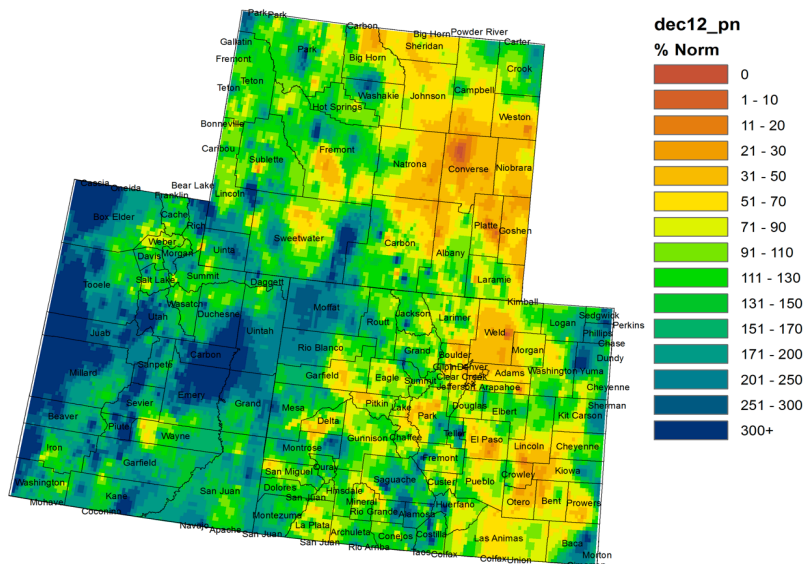
For more information

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

January 15, 2013

Colorado, Utah and Wyoming December 2012 Precipitation as Percentage of Normal



Colorado, Utah and Wyoming Month to Date Precipitation (in) 1 - 12 January 2013

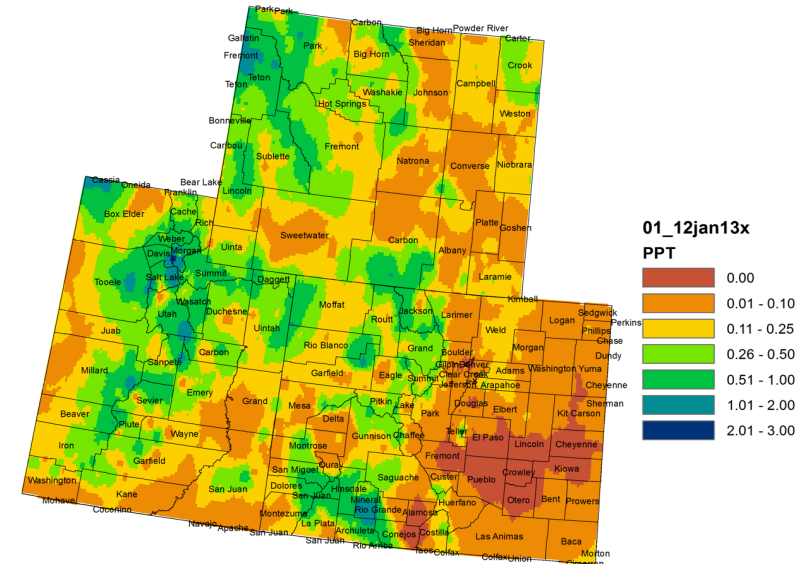


Fig. 1: December precipitation as a percent of average.

Fig. 2: January 1 – 12 precipitation in inches.

Precipitation

For the month of December, most of the Upper Colorado River Basin (UCRB) received near average precipitation (Fig. 1). Areas of eastern Utah, southwest Wyoming, and northwest Colorado received about 200% of average precipitation or more for the month. Some isolated lower elevation spots in western CO received less than 90% of average precipitation. East of the basin, much of eastern CO was drier than average, with many areas receiving between 30% and 90% of average precipitation. The far eastern borders of CO and southern CO around the San Luis Valley received average to above average precipitation for December.

Since the beginning of January, most of the higher elevations of the UCRB have received between .25 and 1 inch of precipitation (Fig. 2), which is below average for this time of year. Parts of the San Juans (in CO) and the Wasatch (in UT) have seen between 1 and 2 inches of moisture. Most of the lower elevations have received less than .25 inches since the beginning of the month. East of the basin, eastern CO has received little to no precipitation for January. Snow that has fallen in the region in the past two weeks has had very little moisture content.

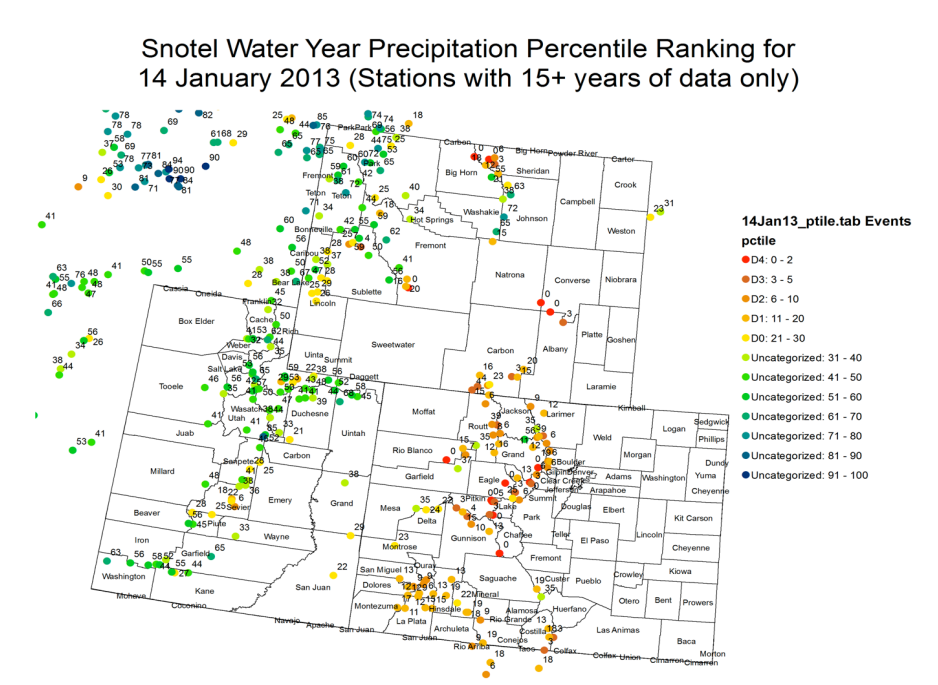


Fig. 3: WYTD SNOTEL precipitation percentiles (50th percentile is median, 30th percentile is D0 drought category) as of January 14th.

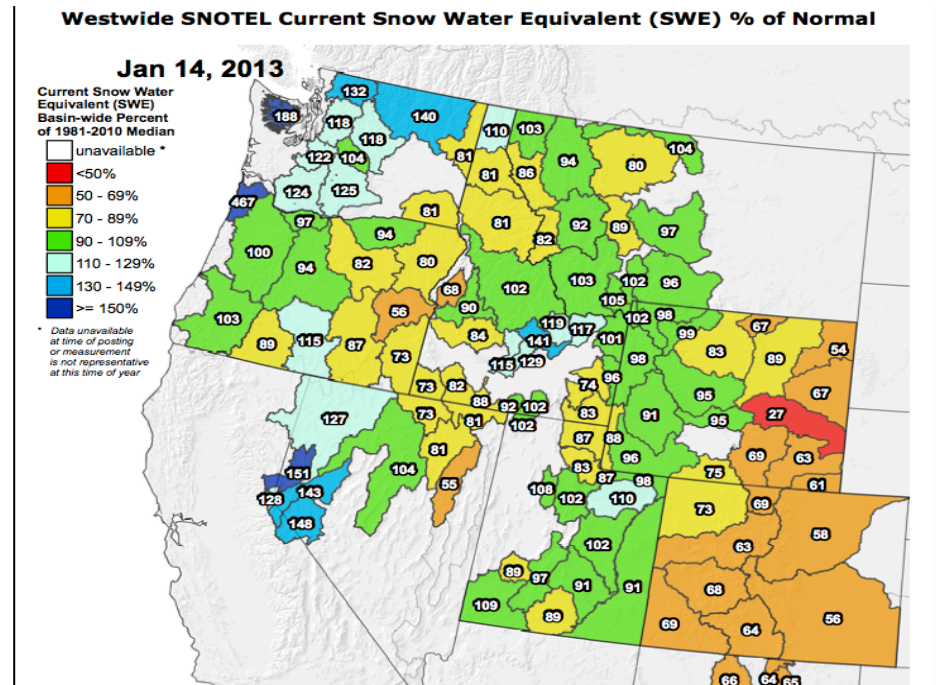


Fig. 4: Basin-averagd snow water equivalent as a percent of normal (median), as of January 14th.

Snowpack

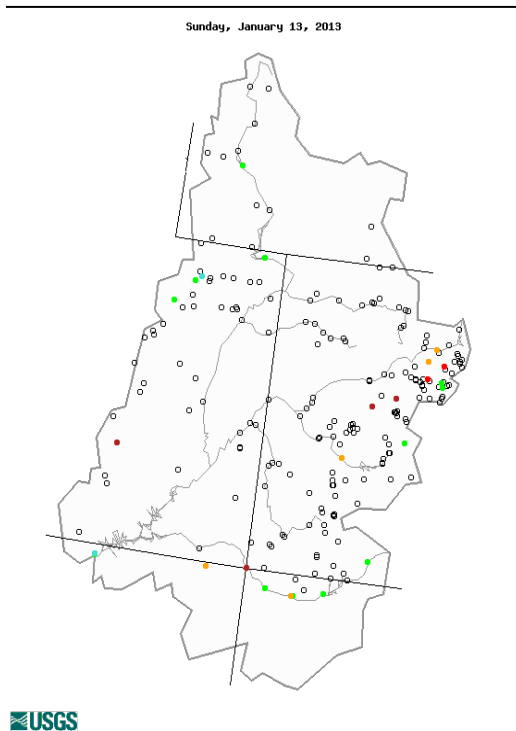
Water-year-to-date SNOTEL precipitation percentiles in the UCRB are near the median on the west side of the basin and much lower on the east side of the basin (Fig. 3). Along the Wasatch and Uintah ranges in UT, percentiles are in the 40s and 50s, with slightly lower percentiles in the Upper Green River basin in southwest WY. The northern and central CO mountains are showing precipitation below the 20th percentile at most locations, with several sites recording below the 5th percentile. Percentile rankings in southwest CO in the San Juan mountains are mostly in the teens.

Accumulated snowpack is currently less than normal on the east side of the UCRB and near normal on the west side of the basin (Fig. 4). Sub-basins in western CO are all between 65% and 75% of normal snowpack. Northeast UT and southwest WY basins are around 100% of normal snowpack. All sub-basins have seen very little to no change in snowpack percents of normal in the past week.

Streamflow

As of January 13th, about 56% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) to above normal 7-day average streamflows (Fig. 5). About 24% percent of the gages in the basin are recording much below normal or low (i.e. lowest on record) streamflows, and two gages recorded above normal flows. Many of the gages throughout the basin are under frozen conditions, and the number of reporting sites has decreased from 72 gages just over one month ago to 25 gages now. This, however, is an increase from only 19 reporting gages last week.

The three key gages across the basin are all currently ice affected (Fig. 6). Flows on the Colorado River near the CO-UT state line have been ice affected since late December. Though flows on the Green River at Green River, UT had increased to near normal conditions at the end of the year, it is now under frozen conditions, which also happened this time last year. The San Juan River near Bluff, UT became ice affected after experiencing below normal conditions for the previous few weeks.



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 January 13th.

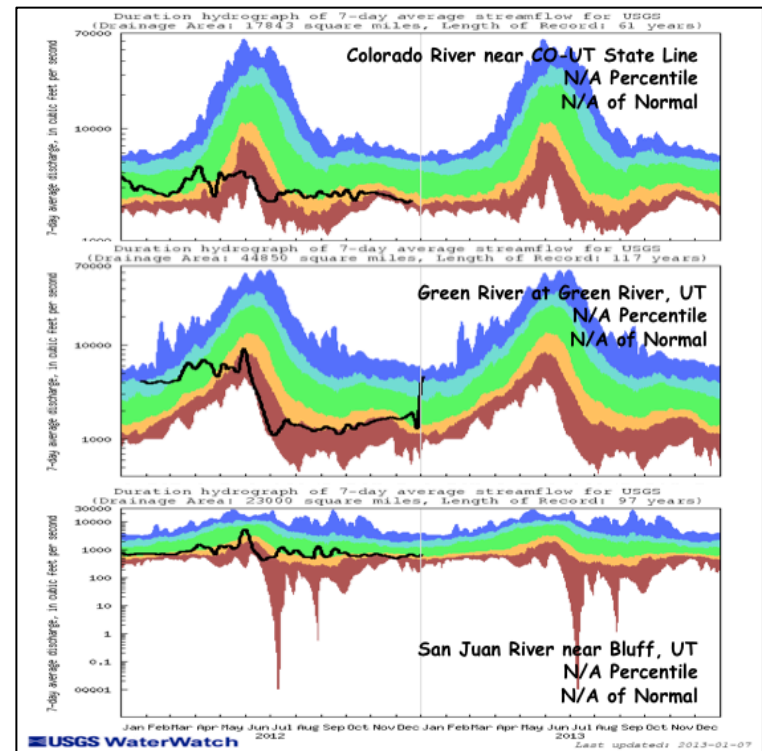


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Since the beginning of the month, the UCRB has experienced cooler than average temperatures, ranging between 6 and 15 degrees below average. East of the basin, eastern CO has also seen cooler temperatures, ranging between 3 and 6 degrees cooler than average for most of the state. The VIC soil moisture model continues to show dry soils through most of WY with near normal soil moisture in far southwest WY (Fig. 7). Soil dryness is below the 20th percentile in eastern UT and much of western CO. Drier soils (less than the 10th percentile) are now showing up over southwest CO, but are less pronounced when SWE is included (Fig. 7). Dry soils also show up in southeast CO and far eastern CO with near normal soil moisture in north-central CO and around the Rio Grande Basin in southern CO.

For the month of December, most of the major reservoirs in the UCRB saw minor volume decreases, though Blue Mesa Reservoir saw a very slight increase since the beginning of the month. Volume decreases are normal for this time of year, and most of the reservoirs decreased less than what is normal. Lake Granby has seen larger volume decreases so far for this month. Flaming Gorge volume is near its January average while the rest of the reservoirs are between 65% and 80% of average for January.

Precipitation Forecast

A slight chance of light precipitation is expected today over northwest CO with an exiting trough. As this current trough moves out of the region, a building ridge is expected to move over the UCRB and surrounding areas later this week, bringing more moderate temperatures and drier conditions (Fig. 8). By the end of the week, temperatures throughout most of the region will be near seasonal to slightly above average (with the exception of strong inversions keeping valley temperatures cooler). Dry conditions will prevail into next week, and according to the Climate Prediction Center, precipitation is likely to be below average for much of the rest of January.

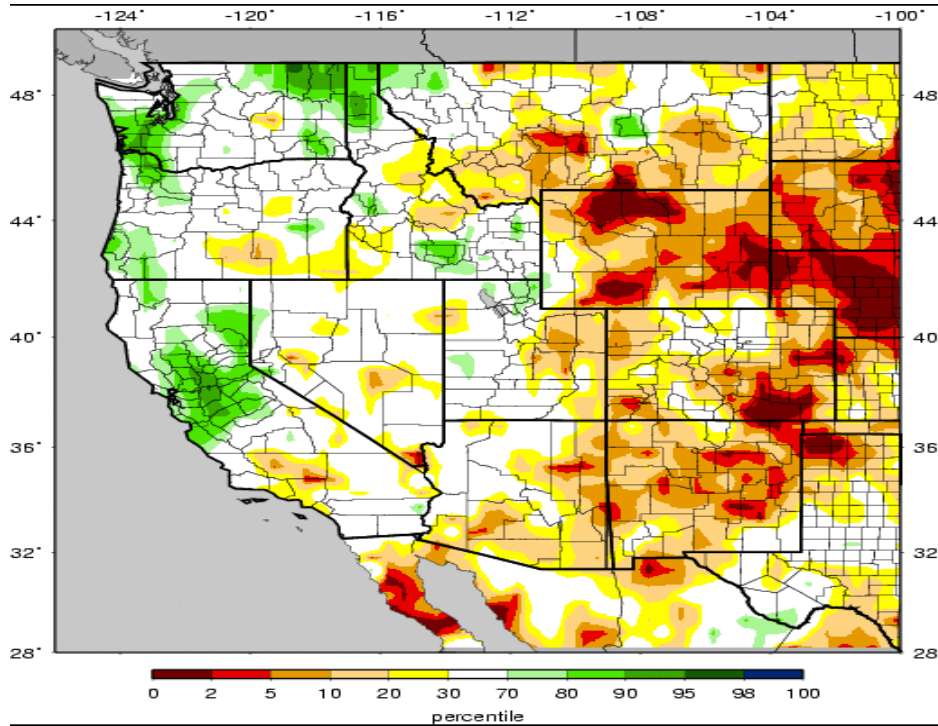


Fig. 7: VIC modeled soil moisture percentiles for the western U.S. as of January 13th. The map below combines soil moisture and SWE.

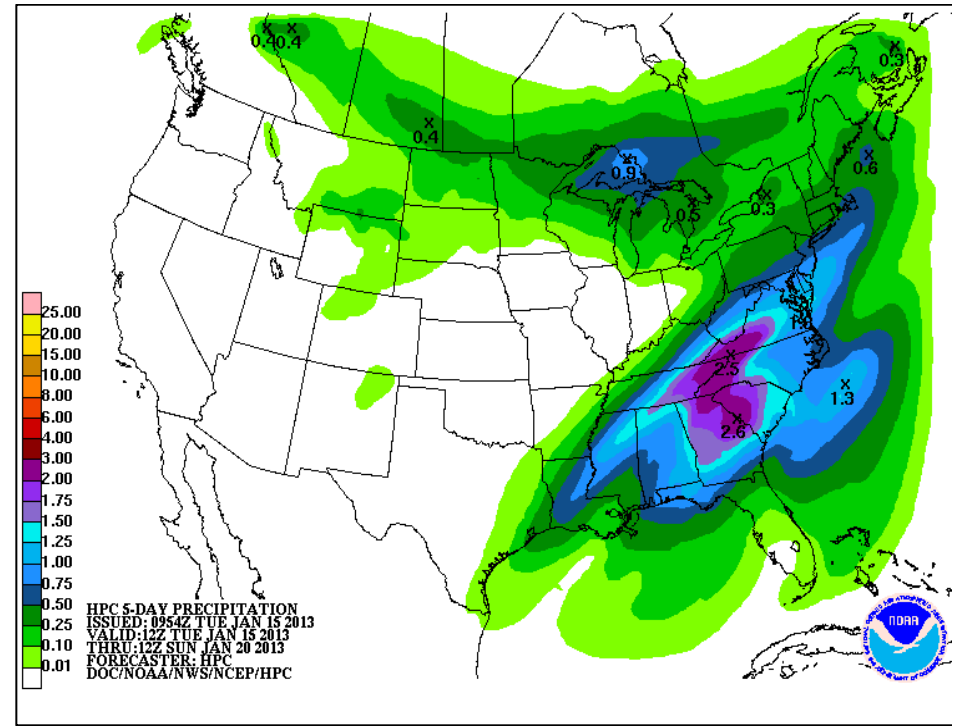
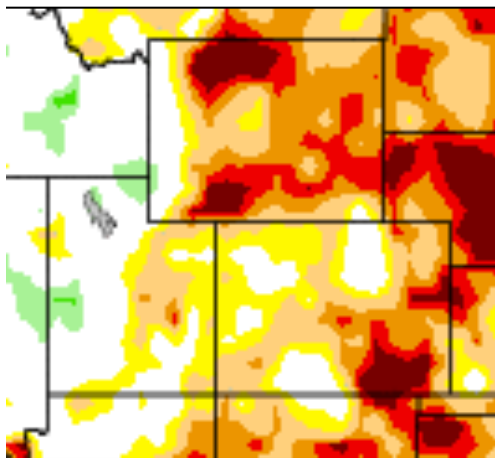


Fig. 8: Quantitative precipitation forecast (QPF) by the Hydrologic Prediction Center out to 12UTC Sunday.

Drought and Water Discussion

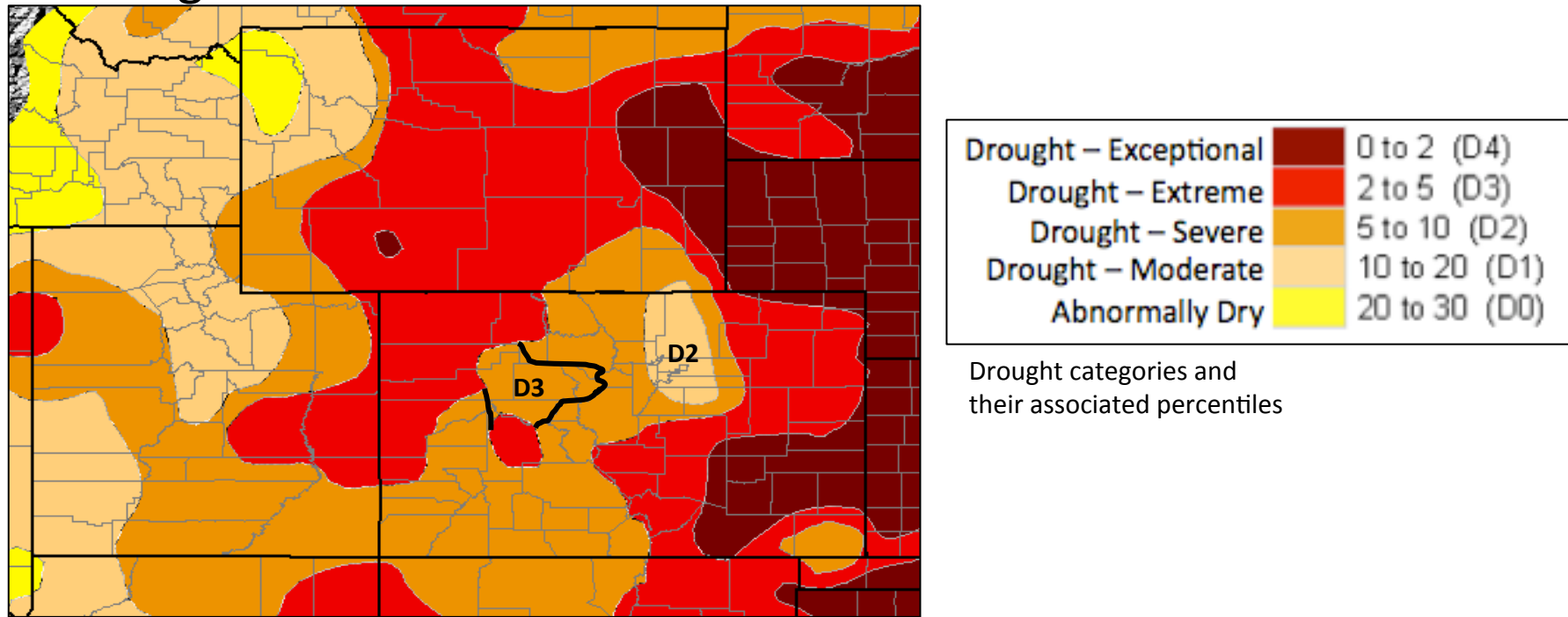


Fig. 9: January 8th release of U.S. Drought Monitor for the UCRB.

UCRB: An expansion of D3 is recommended in the eastern part of the UCRB in the current depiction of the U.S. Drought Monitor (USDM) map (Fig. 9, black line). The D3 should cover Pitkin, Eagle, and Summit counties and should extend to the Continental Divide. Though this area saw near average snow for December, the rest of the water year has been much drier than average, and most regions have much lower snow cover on the ground than what is expected for this time of year. Status quo is recommended for the rest of the UCRB in UT, WY, and southwest CO.

Eastern CO: It is recommended that the D1 along the Front Range be deteriorated to D2 (Fig. 9). Though the area did receive beneficial moisture early in the water year, it has been dry since, and the little snow that has recently fallen has had very little moisture content. Status quo is recommended for the rest of eastern CO. Conditions have been dry, and though the winter wheat has not been dire, it is still struggling, so the D3 and D4 are still representative at this time.