Winter 2013

Weekly Climate, Water & Drought Assessment

Today's Agenda

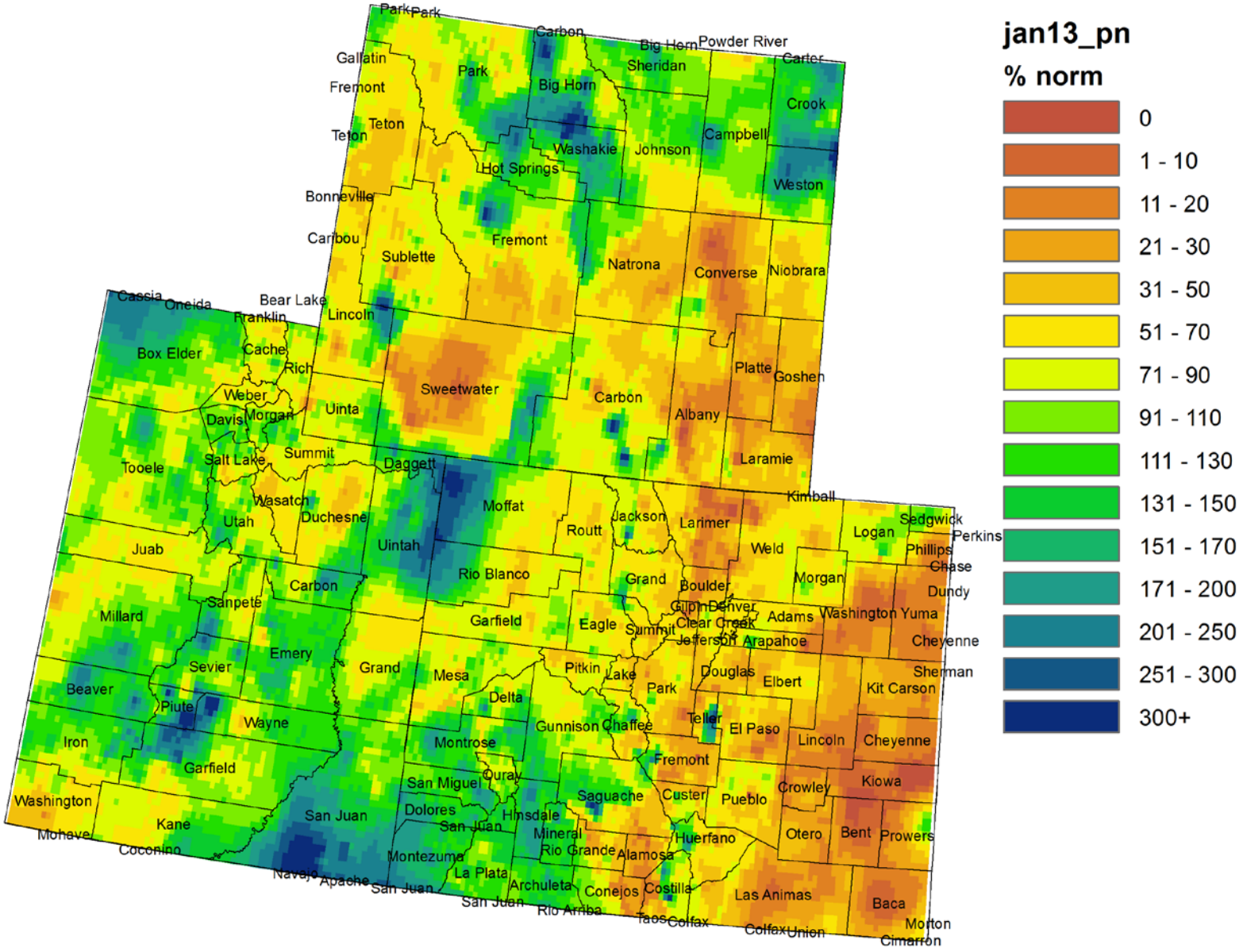
-Assessment of current water conditions

- Precipitation Forecast

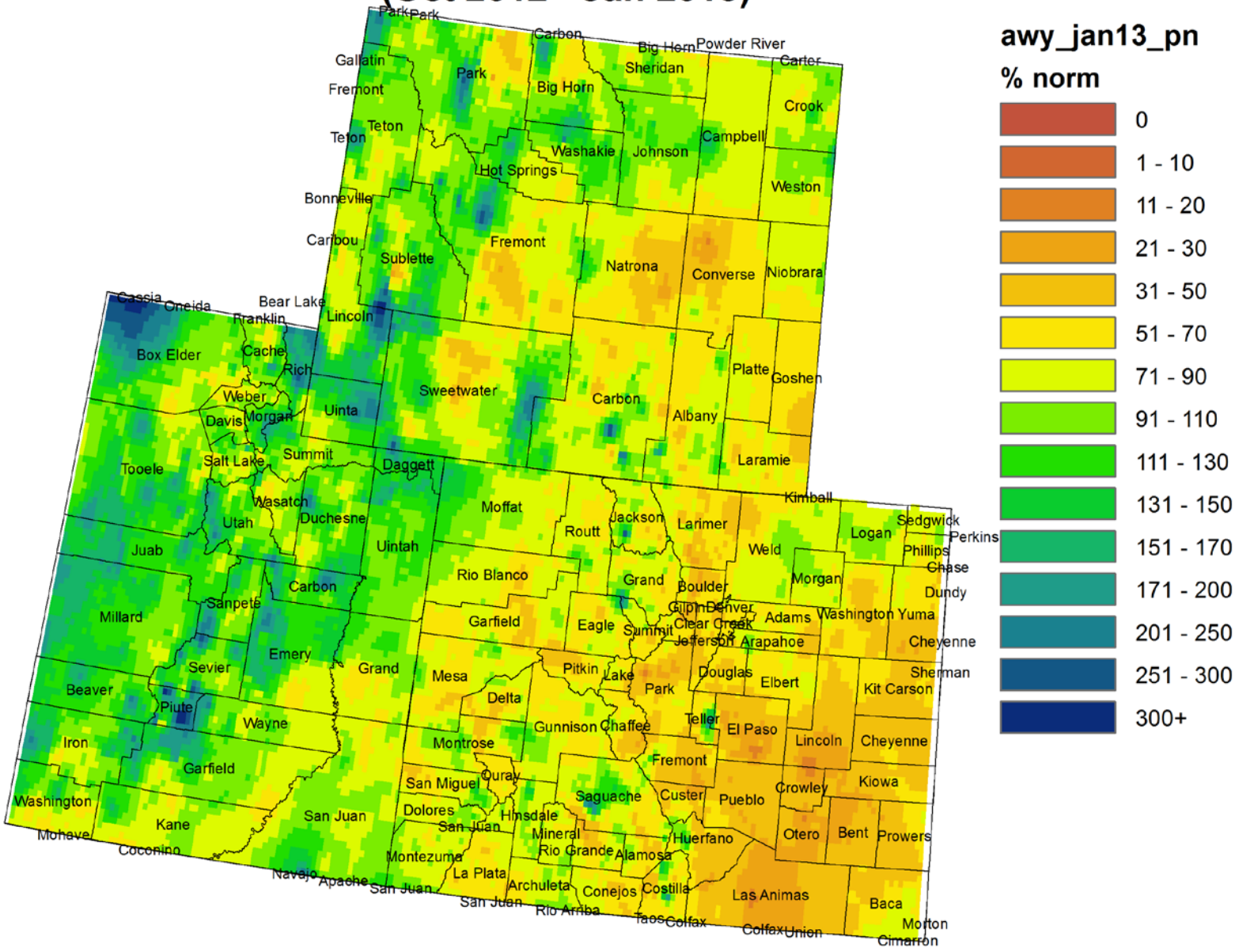
- Recommendations for Drought Monitor

Precipitation/Snowpack Update

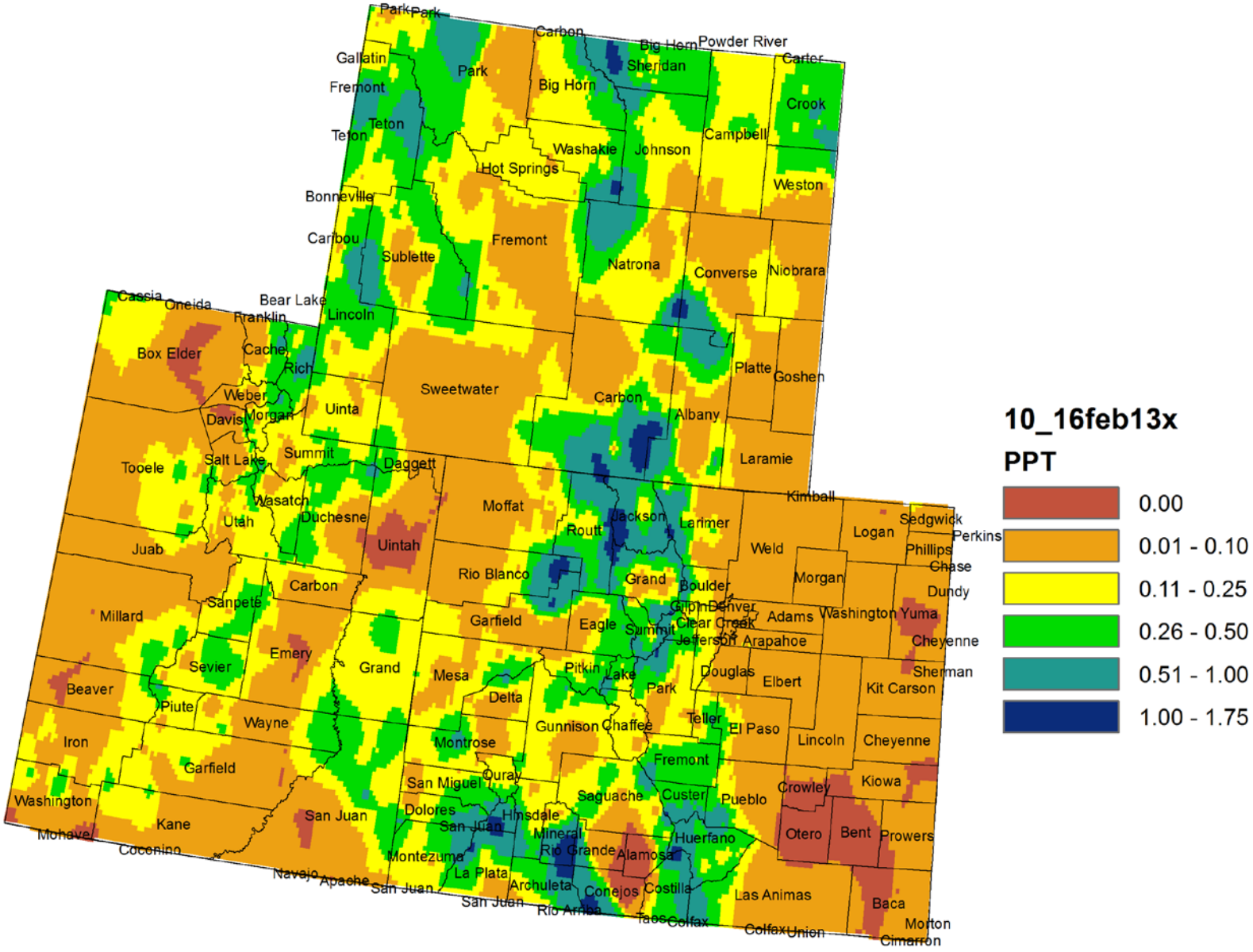
Colorado, Utah and Wyoming January 2013 Precipitation as a Percentage of Normal



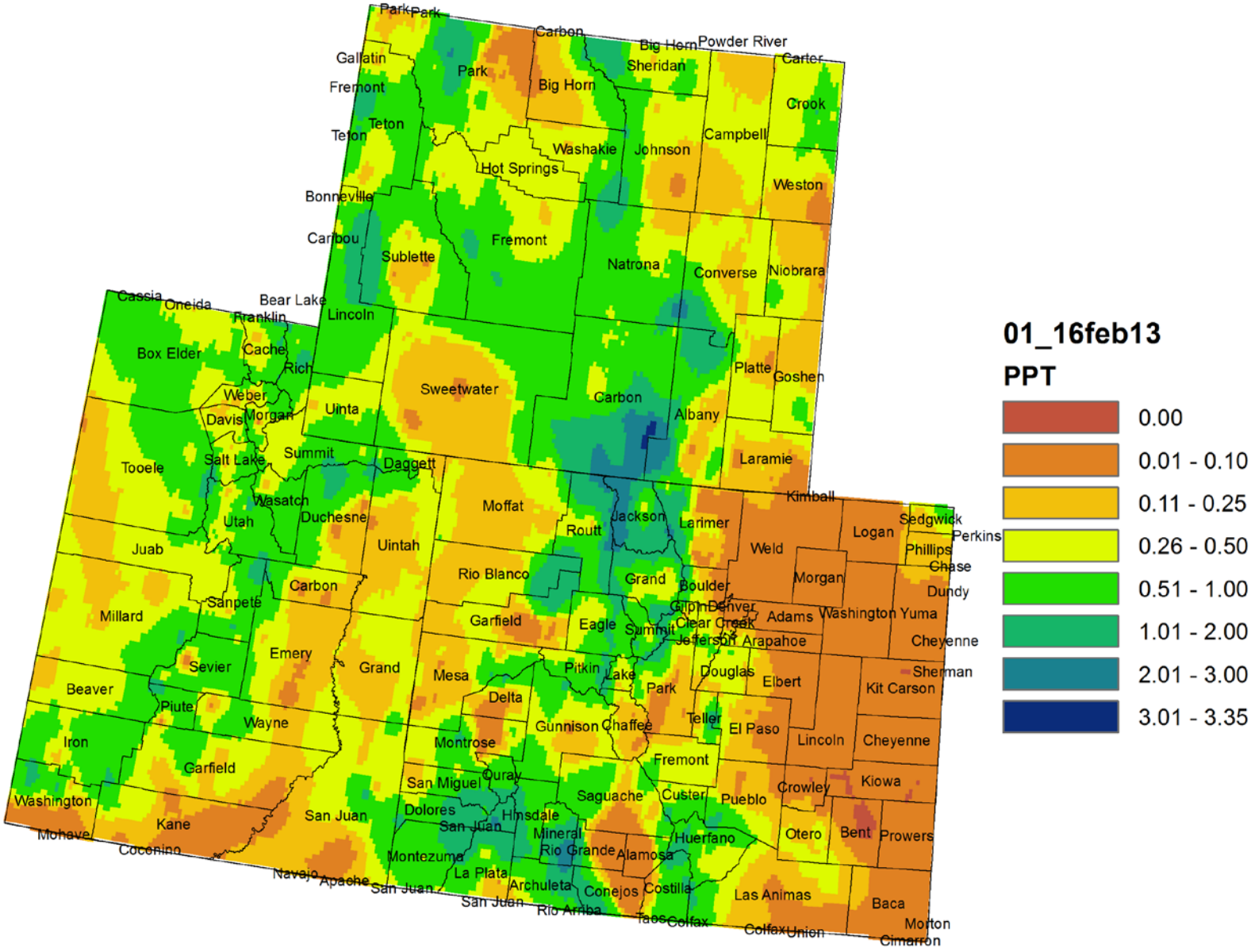
Colorado, Utah and Wyoming Water Year 2013 Precipitation as a Percentage of Normal (Oct 2012 - Jan 2013)



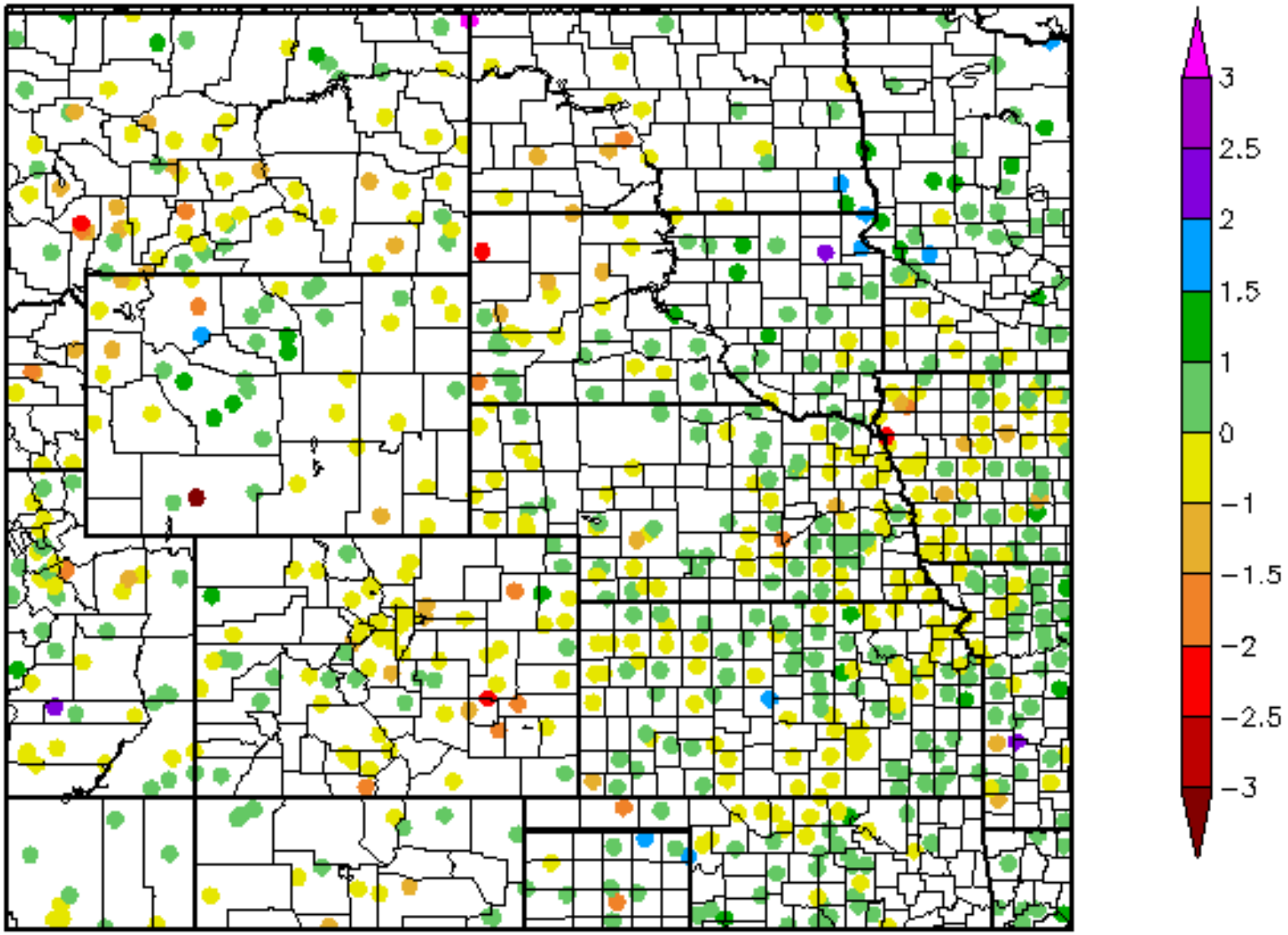
Colorado, Utah and Wyoming 7 Day Precipitation (in)
10 - 16 February 2013



Colorado, Utah and Wyoming Month to Date Precipitation (in)
1 - 16 February 2013



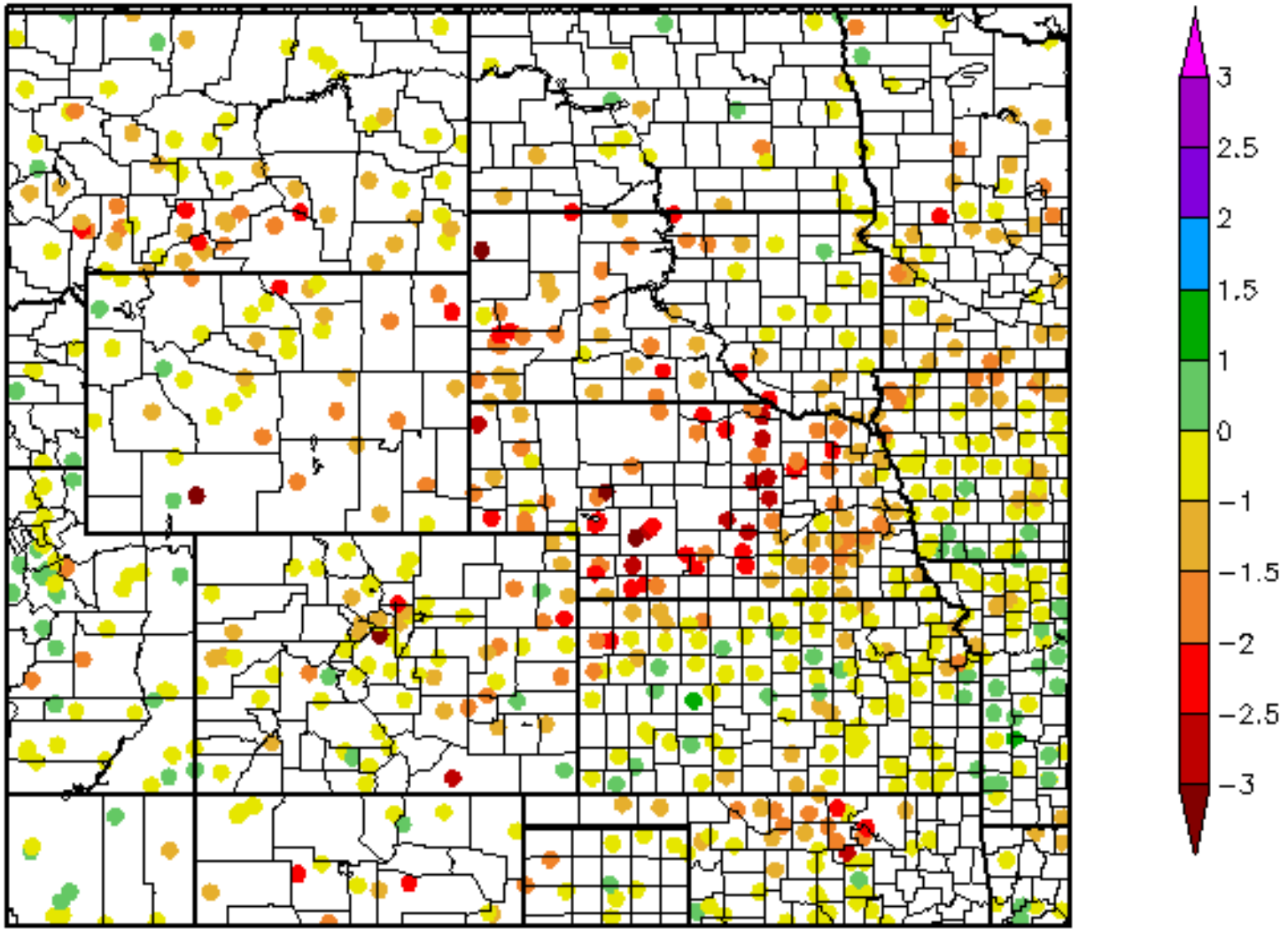
60 Day SPI
12/21/2012 – 2/18/2013



Generated 2/19/2013 at HPRCC using provisional data.

Regional Climate Centers

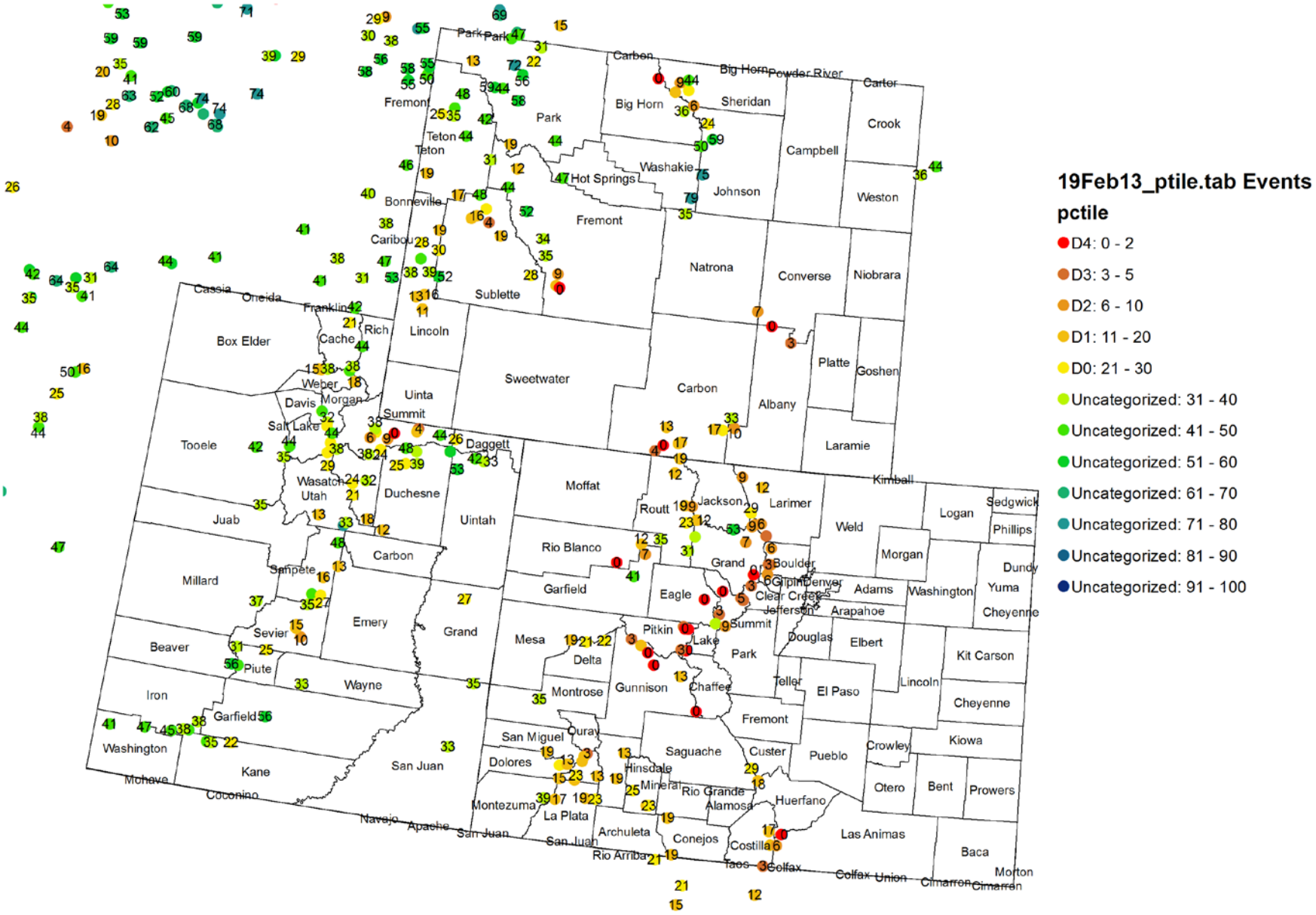
6 Month SPI
8/19/2012 – 2/18/2013



Generated 2/19/2013 at HPRCC using provisional data.

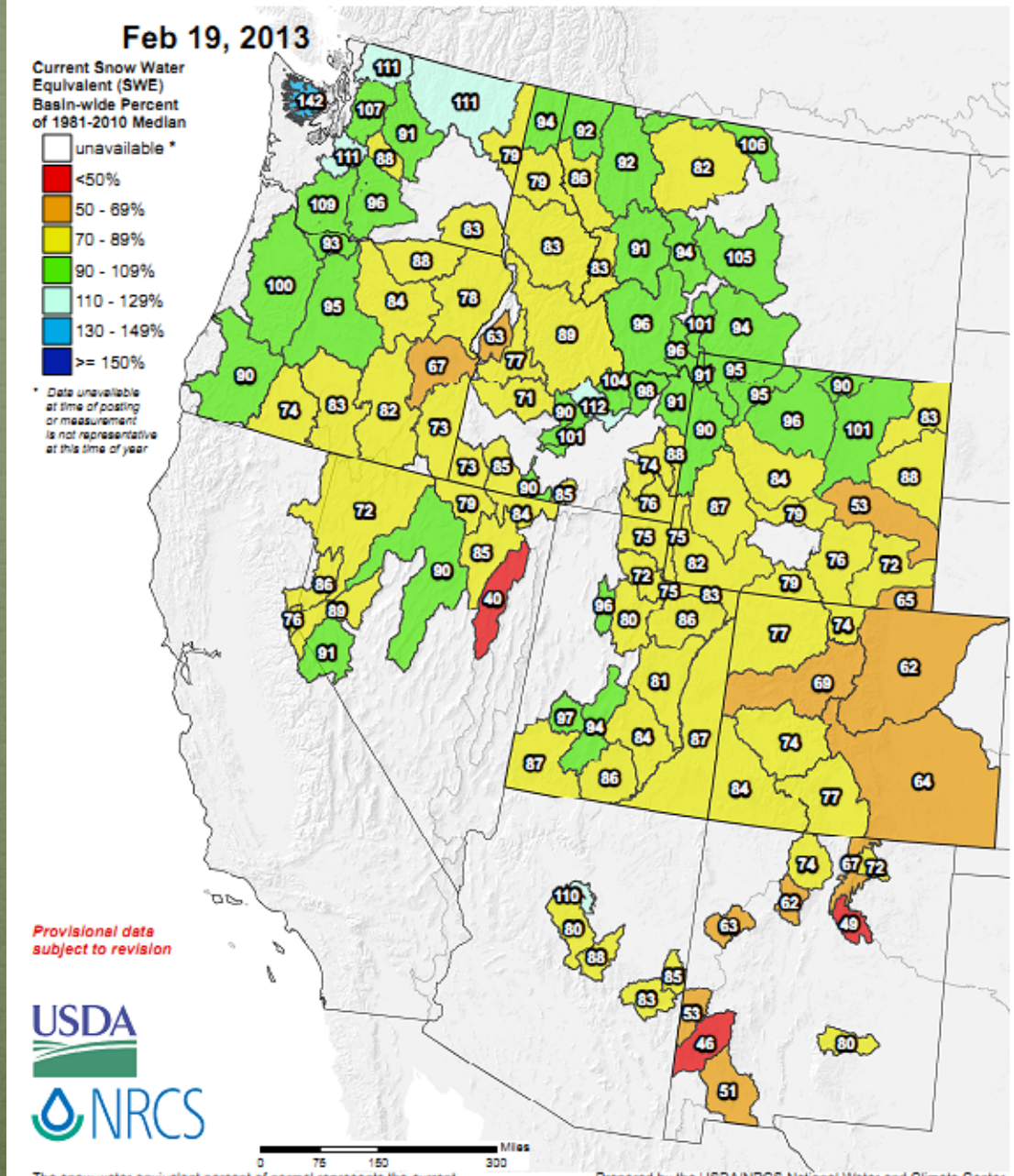
Regional Climate Centers

Snotel Water Year Precipitation Percentile Ranking for 19 February 2013 (Stations with 15+ years of data only)



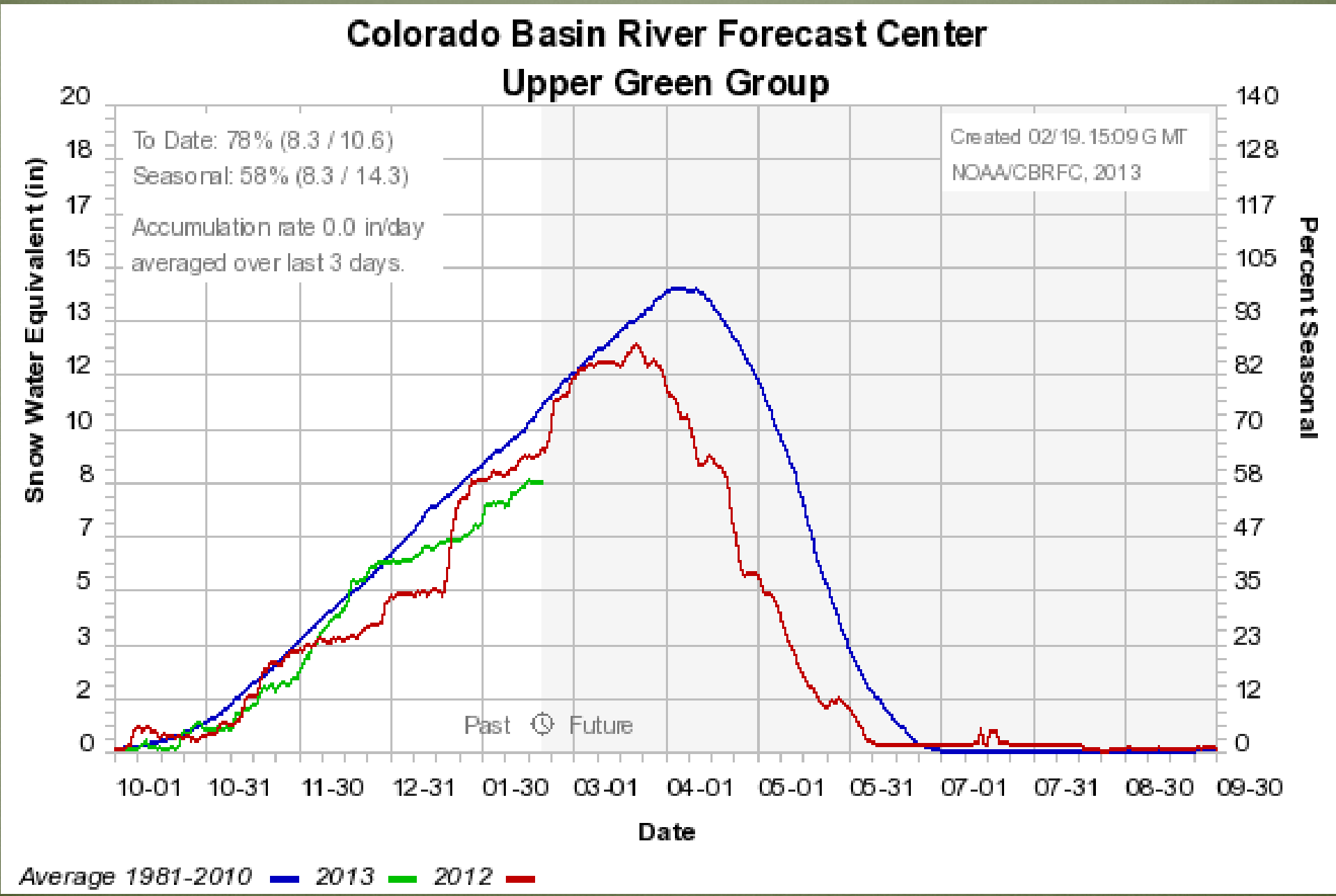
Snowpack

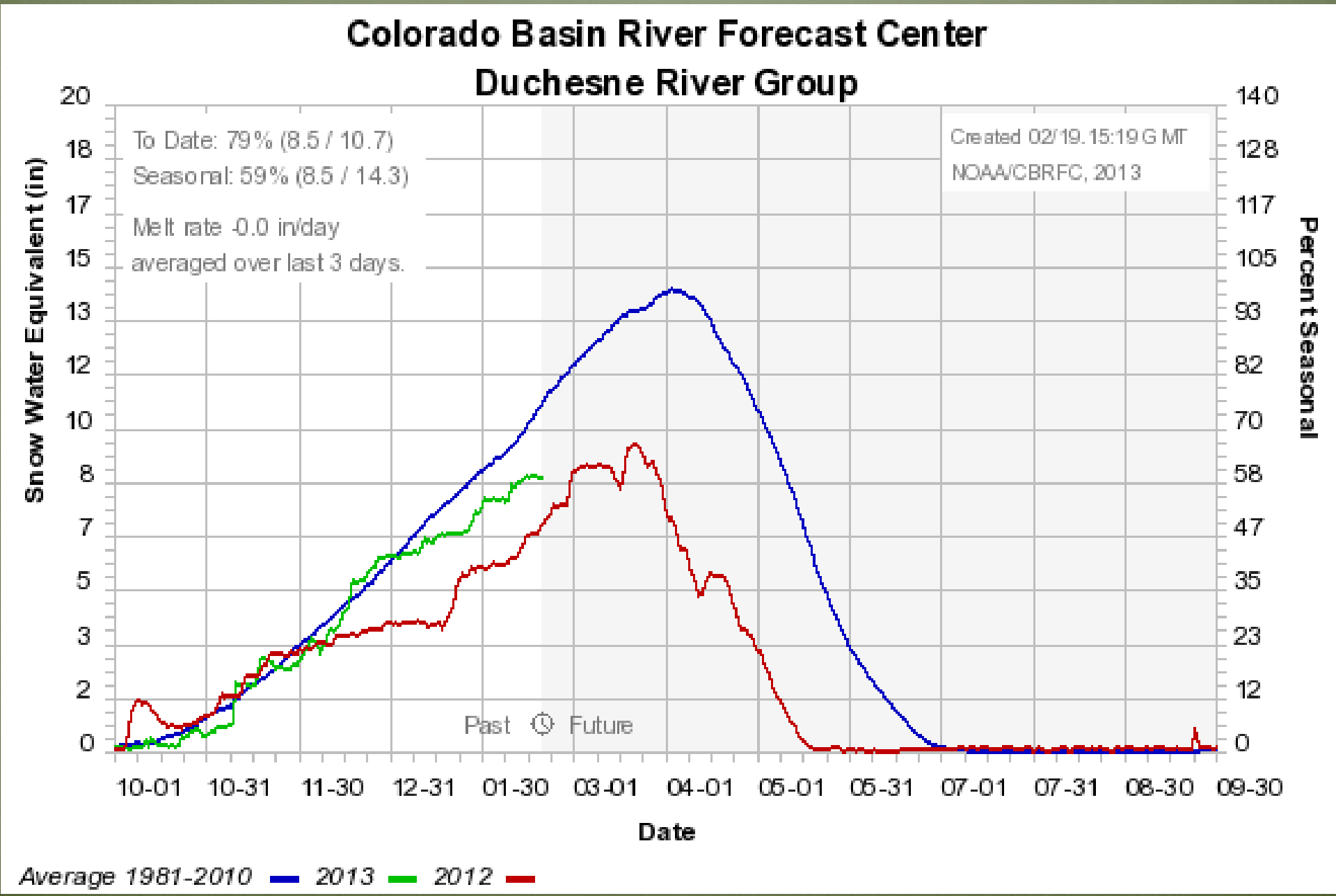
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

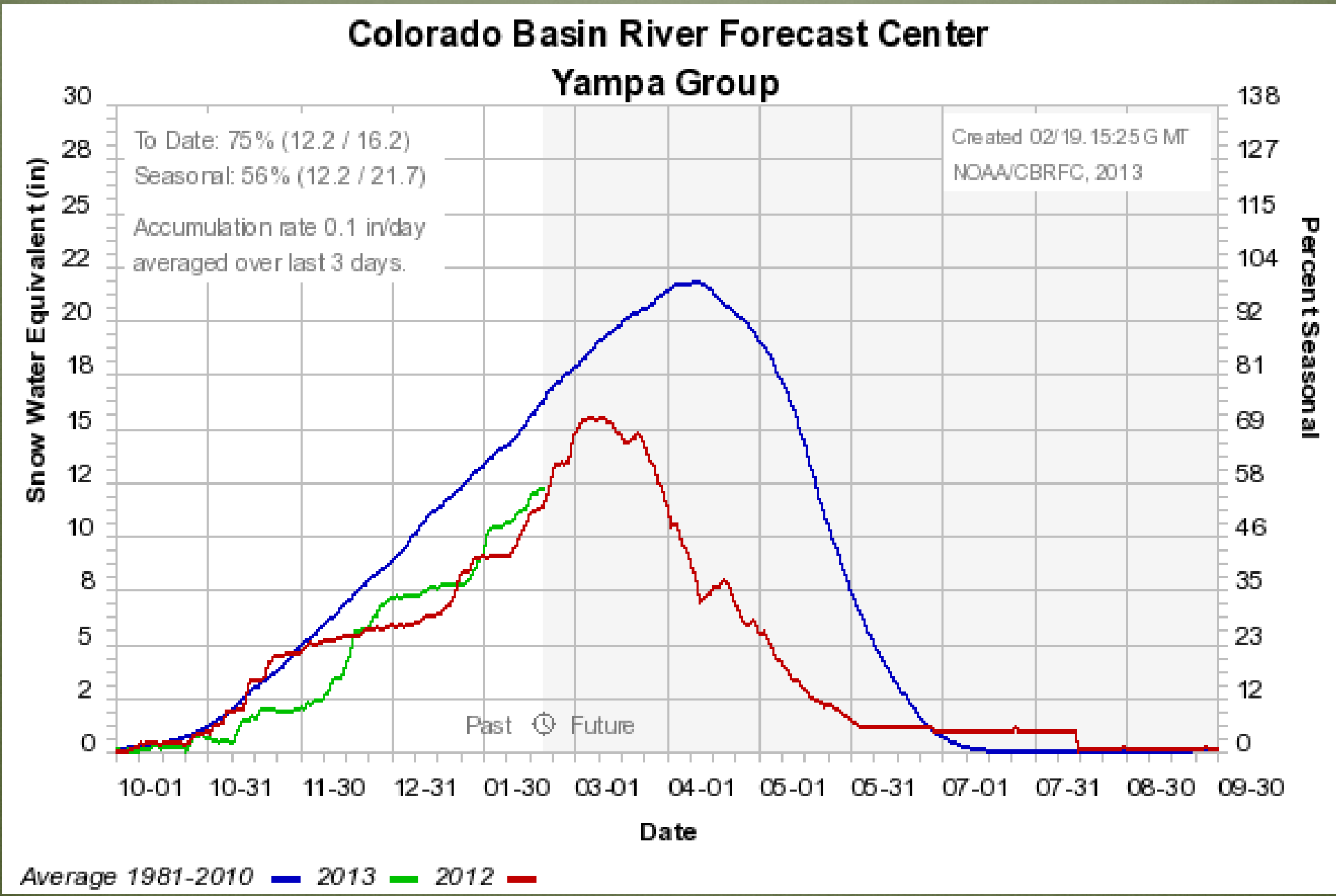


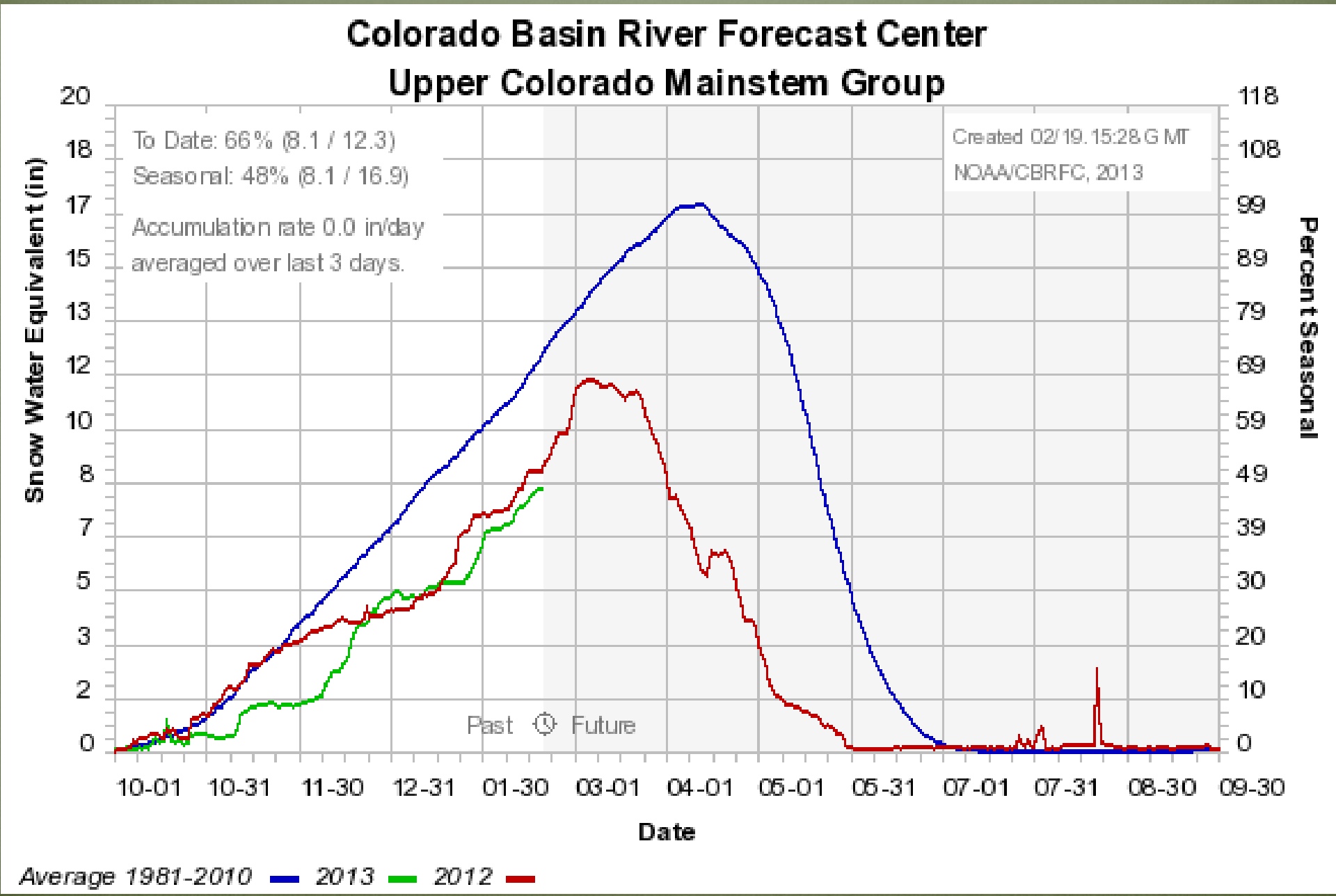
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

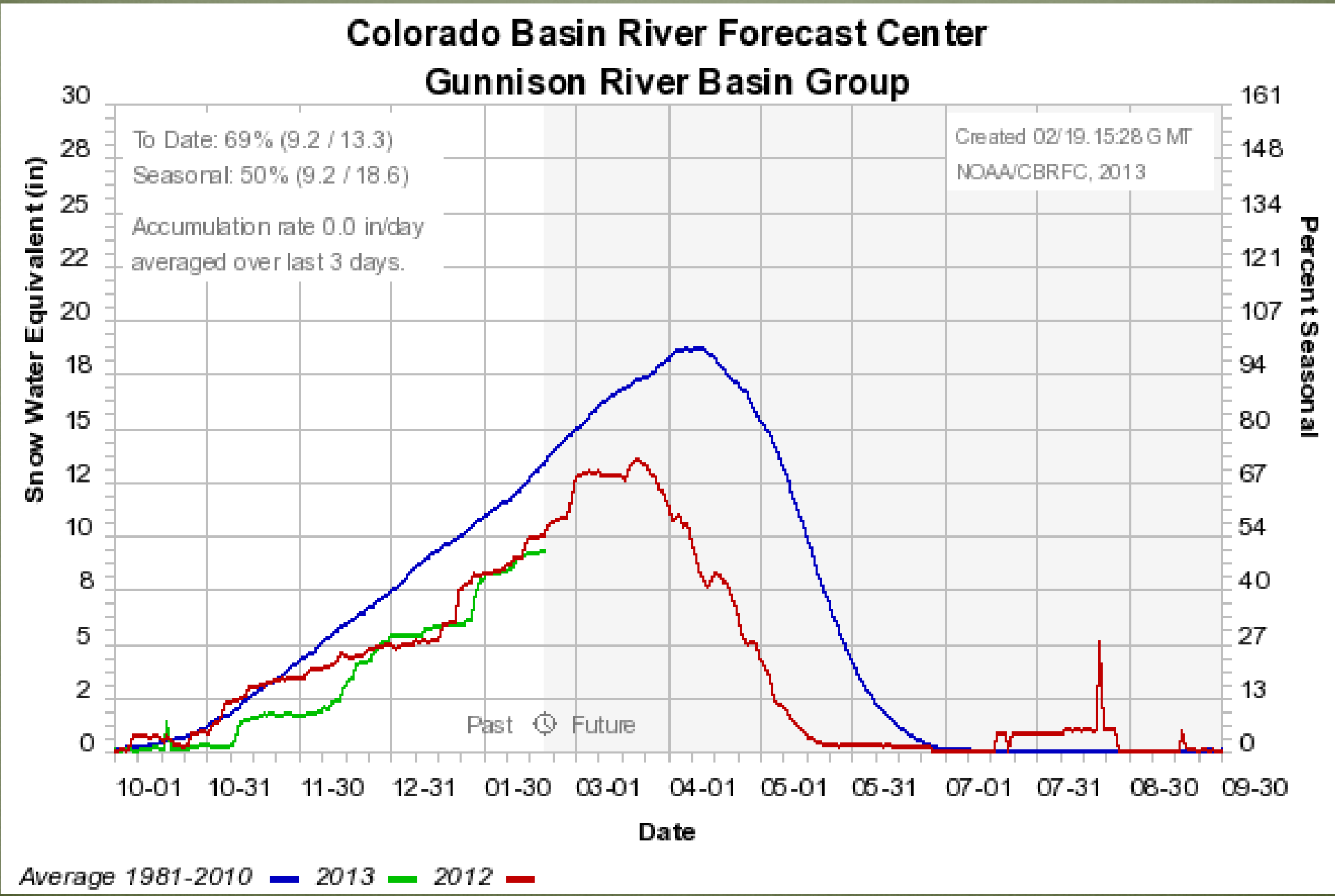
Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon http://www.wcc.nrcs.usda.gov/gis/
Based on data from http://www.wcc.nrcs.usda.gov/reports/
Science contact: Jim.Marron@por.usda.gov 503 414 3047

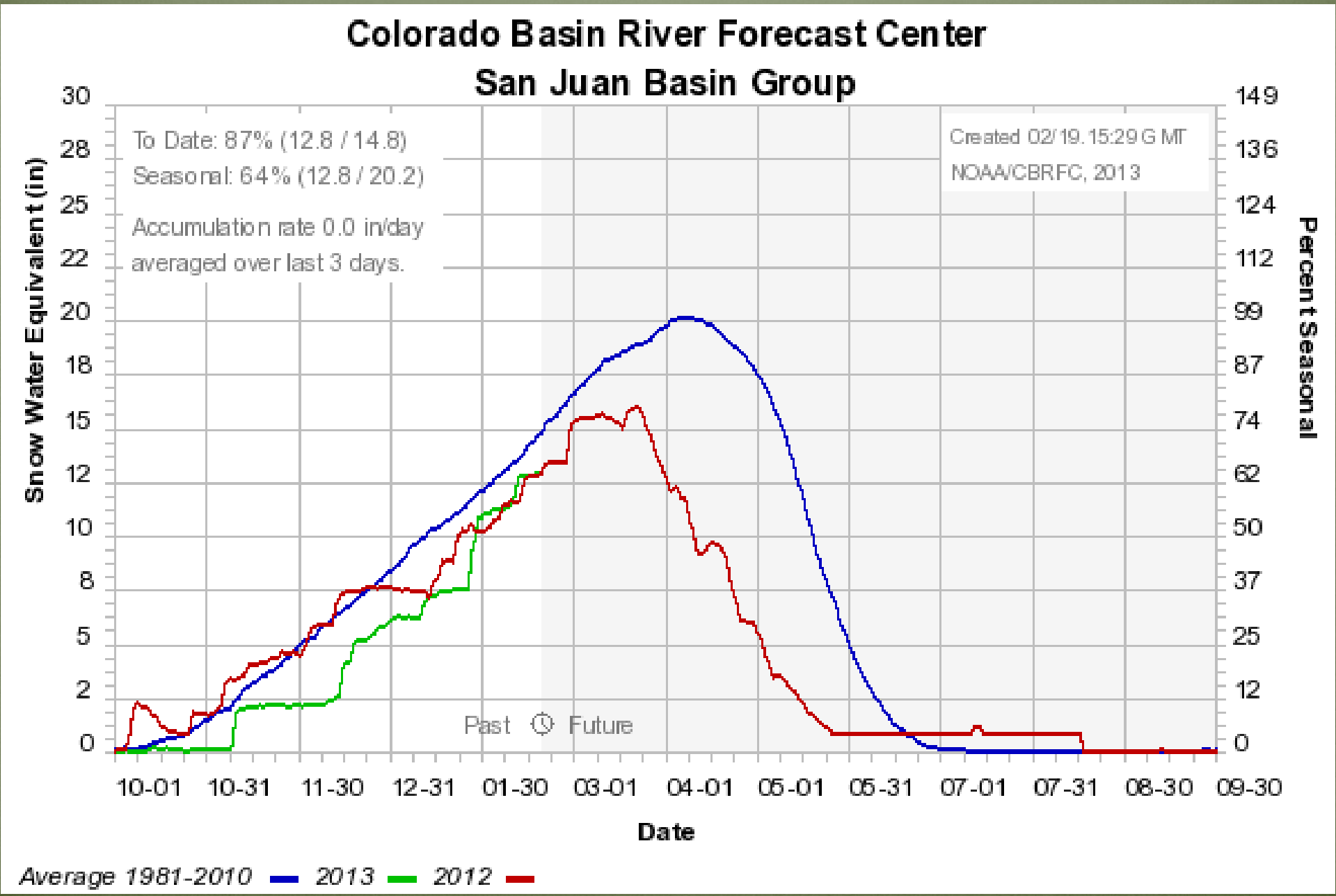

Colorado Basin River Forecast Center
Upper Green Group
To Date: 78% (8.3 / 10.6)
Seasonal: 58% (8.3 / 14.3)
Accumulation rate 0.0 in/day
averaged over last 3 days.
Created 02/19.1509 G MT
NOAA/CBRFC, 2013
Snow Water Equivalent (in)
Percent Seasonal
Past
Future
Date
10-01
10-31
11-30
12-31
01-30
03-01
04-01
05-01
05-31
07-01
07-31
08-30
09-30
Average 1981-2010
2013
2012


Colorado Basin River Forecast Center
Duchesne River Group
To Date: 79% (8.5 / 10.7)
Seasonal: 59% (8.5 / 14.3)
Melt rate -0.0 in/day
averaged over last 3 days.
Created 02/19.15:19 G MT
NOAA/CBRFC, 2013
Past
Future
Snow Water Equivalent (in)
Percent Seasonal
Date
20
18
17
15
13
12
10
8
7
5
3
2
0
140
128
117
105
93
82
70
58
47
35
23
12
0
10-01
10-31
11-30
12-31
01-30
03-01
04-01
05-01
05-31
07-01
07-31
08-30
09-30
Average 1981-2010
2013
2012


Colorado Basin River Forecast Center
Yampa Group
To Date: 75% (12.2 / 16.2)
Seasonal: 56% (12.2 / 21.7)
Accumulation rate 0.1 in/day averaged over last 3 days.
Created 02/19.15:25 G MT
NOAA/CBRFC, 2013
Snow Water Equivalent (in)
Percent Seasonal
30
28
25
22
20
18
15
12
10
8
5
2
0
138
127
115
104
92
81
69
58
46
35
23
12
0
Past
Future
10-01
10-31
11-30
12-31
01-30
03-01
04-01
05-01
05-31
07-01
07-31
08-30
09-30
Date
Average 1981-2010
2013
2012


Colorado Basin River Forecast Center
Upper Colorado Mainstem Group
To Date: 66% (8.1 / 12.3)
Seasonal: 48% (8.1 / 16.9)
Accumulation rate 0.0 in/day
averaged over last 3 days.
Created 02/19.15:28 G MT
NOAA/CBRFC, 2013
Snow Water Equivalent (in)
Percent Seasonal
0
2
3
5
7
8
10
12
13
15
17
18
20
0
10
20
30
39
49
59
69
79
89
99
108
118
Past
Future
10-01
10-31
11-30
12-31
01-30
03-01
04-01
05-01
05-31
07-01
07-31
08-30
09-30
Date
Average 1981-2010
2013
2012

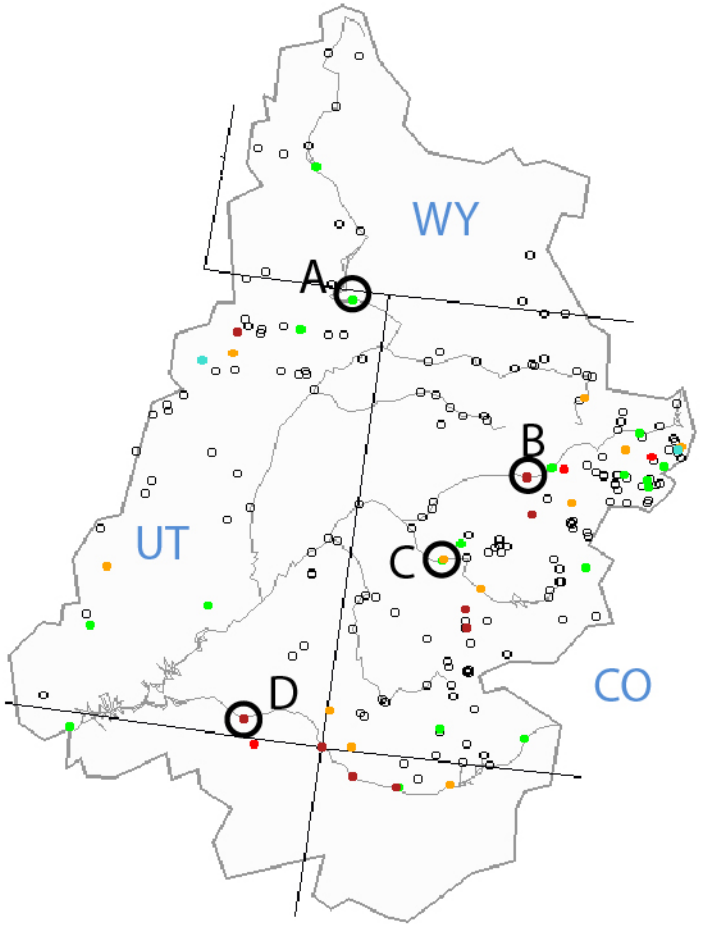

Colorado Basin River Forecast Center
Gunnison River Basin Group
To Date: 69% (9.2 / 13.3)
Seasonal: 50% (9.2 / 18.6)
Accumulation rate 0.0 in/day
averaged over last 3 days.
Created 02/19.15:28 G MT
NOAA/CBRFC, 2013
Snow Water Equivalent (in)
Percent Seasonal
30
28
25
22
20
18
15
12
10
8
5
2
0
161
148
134
121
107
94
80
67
54
40
27
13
0
Past
Future
10-01
10-31
11-30
12-31
01-30
03-01
04-01
05-01
05-31
07-01
07-31
08-30
09-30
Date
Average 1981-2010
2013
2012


Colorado Basin River Forecast Center
San Juan Basin Group
To Date: 87% (12.8 / 14.8)
Seasonal: 64% (12.8 / 20.2)
Accumulation rate 0.0 in/day
averaged over last 3 days.
Created 02/19.15:29 G MT
NOAA/CBRFC, 2013
Snow Water Equivalent (in)
Percent Seasonal
30
28
25
22
20
18
15
12
10
8
5
2
0
149
136
124
112
99
87
74
62
50
37
25
12
0
Past
Future
10-01
10-31
11-30
12-31
01-30
03-01
04-01
05-01
05-31
07-01
07-31
08-30
09-30
Date
Average 1981-2010
2013
2012

Streamflow Update

Robert Kimbrough | U.S. Geological Survey

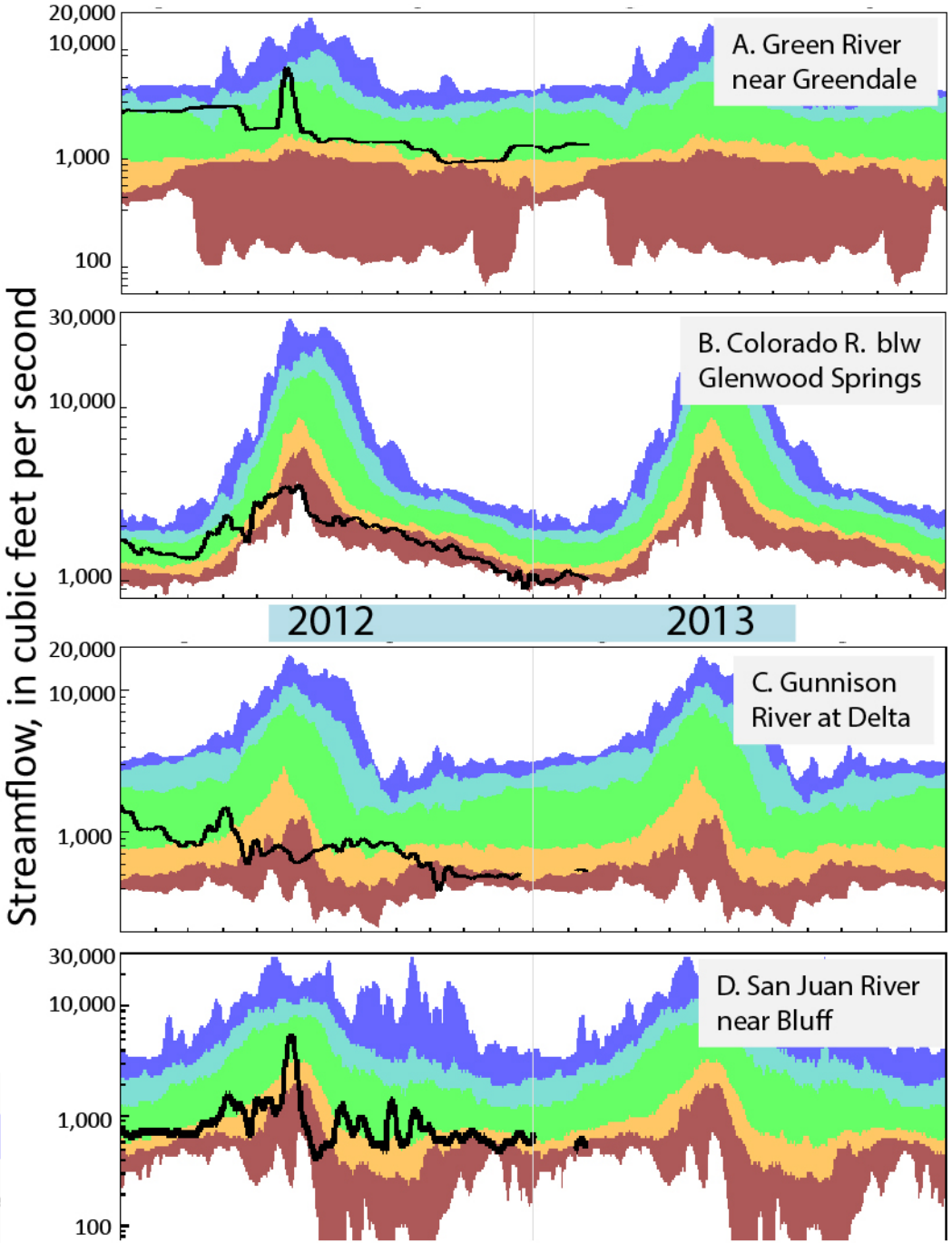
7 Day Average Streamflow
Upper Colorado Basin
February 17, 2013



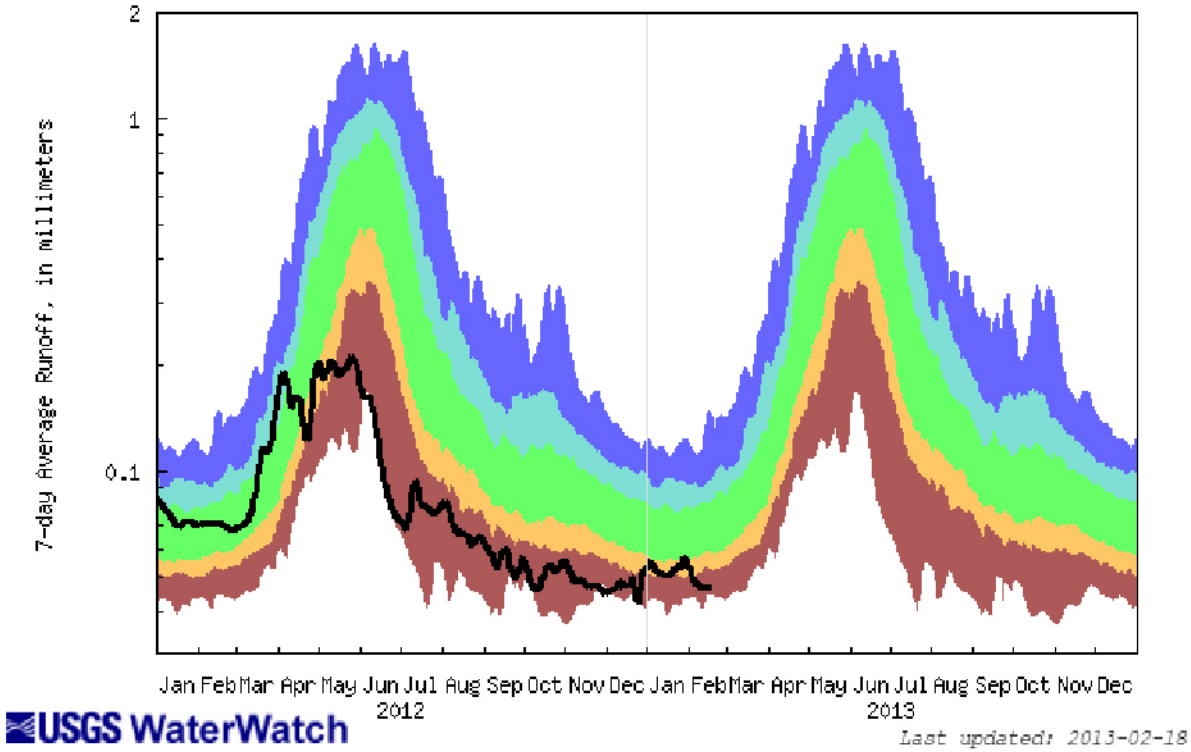
USGS
science for a changing world

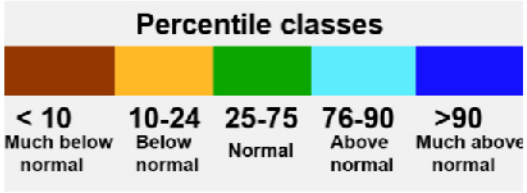
Percentile classes

< 10	10-24	25-75	76-90	>90
Much below normal	Below normal	Normal	Above normal	Much above normal

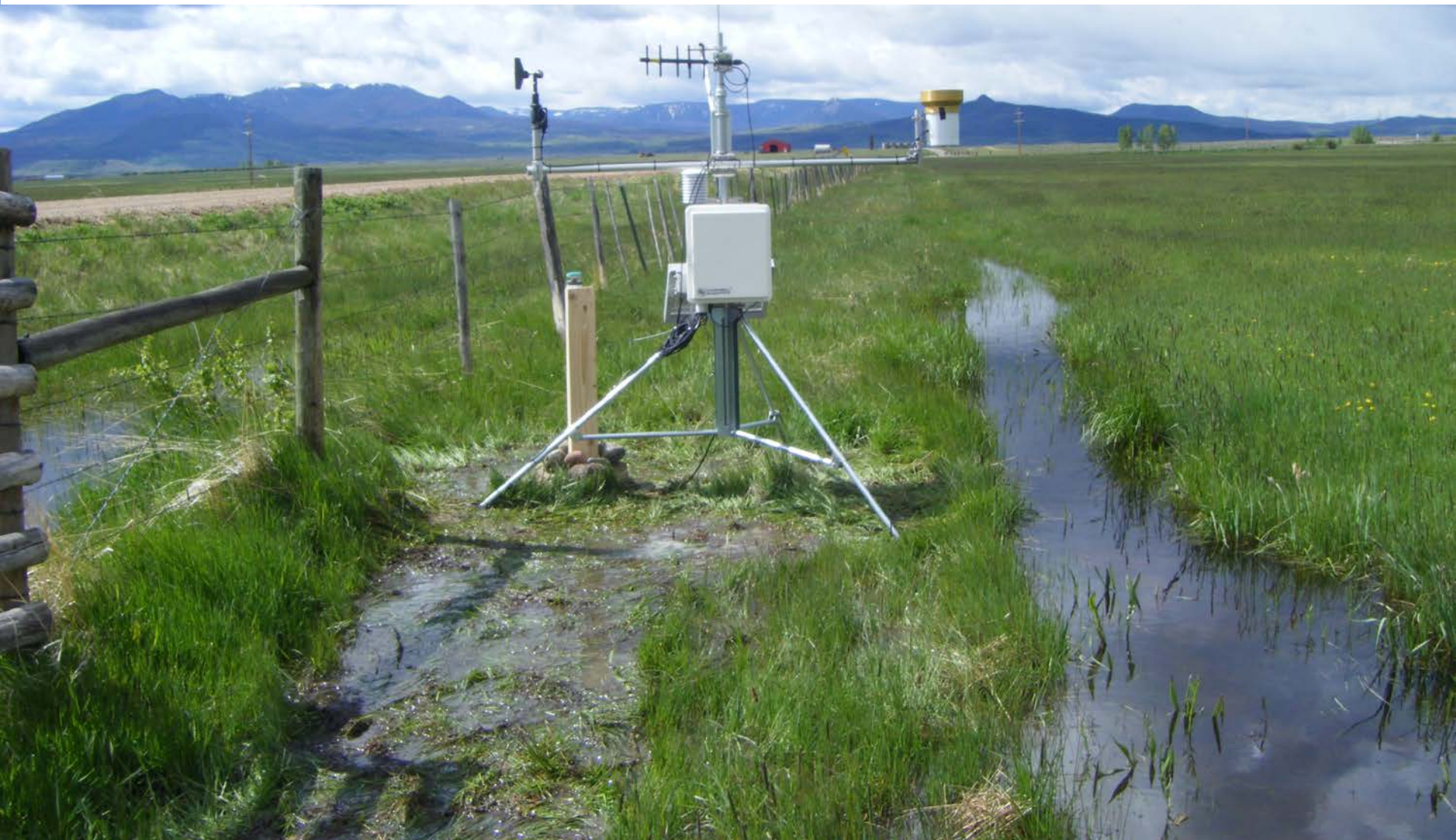


7 Day Average Runoff
Computed from all USGS streamgages in Colorado
February 17, 2013

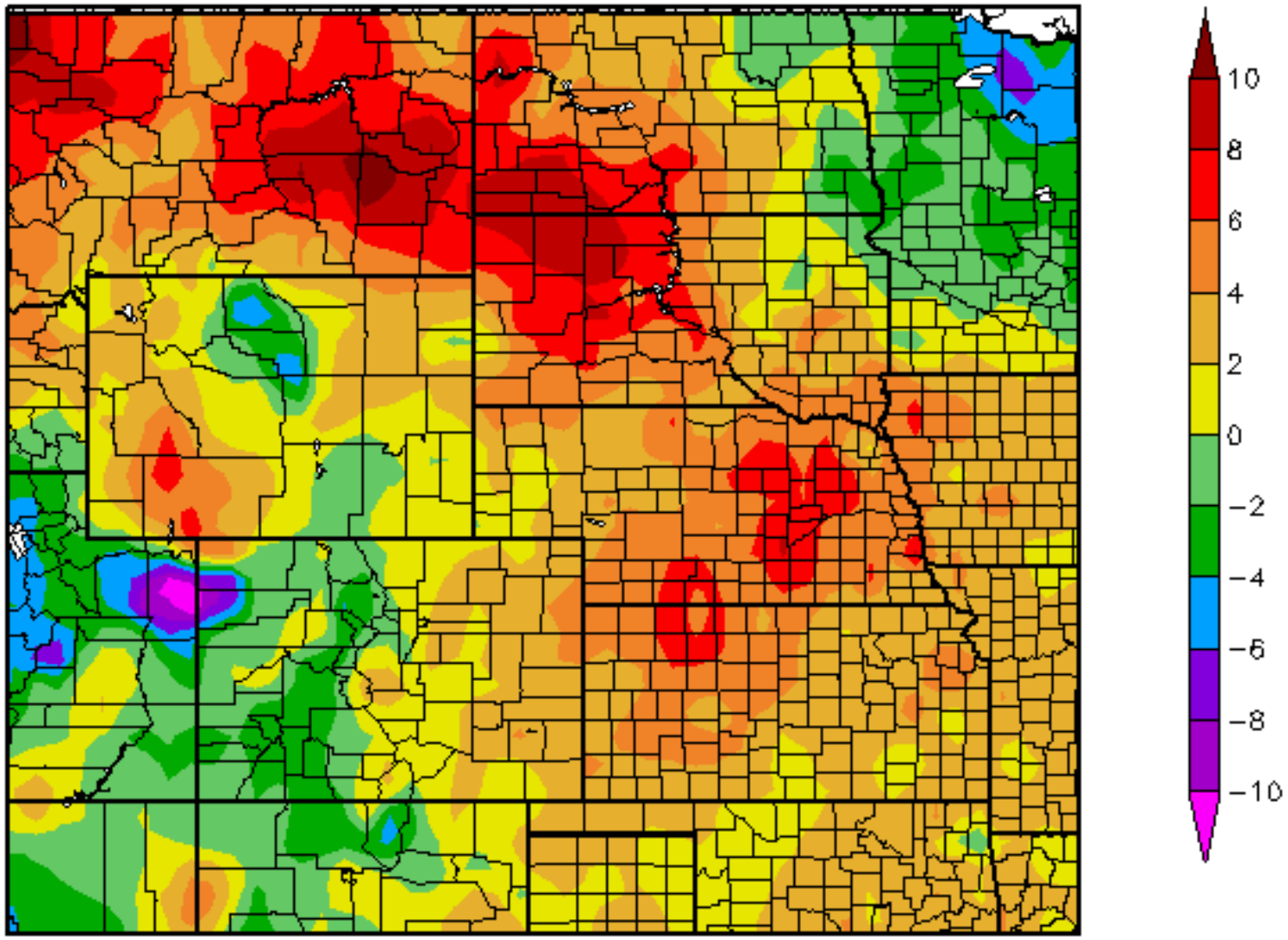




Water Demand

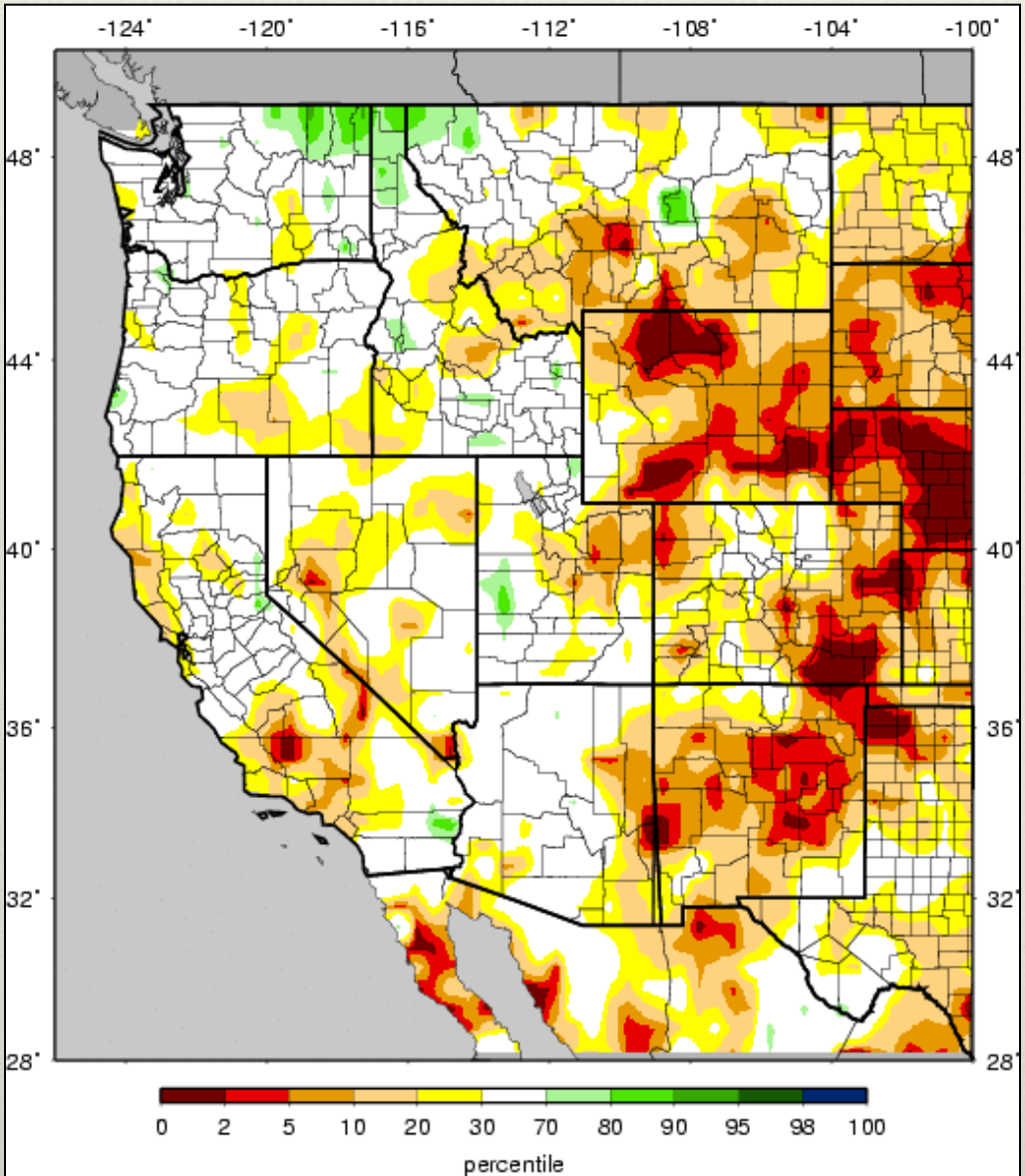


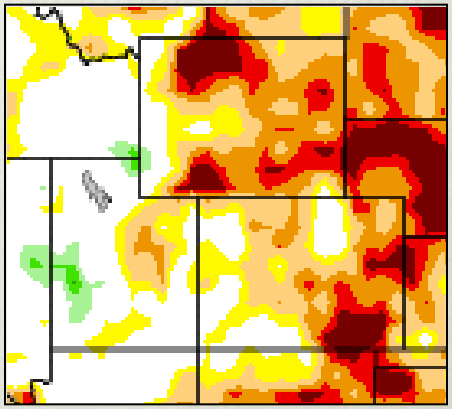
Temperature Departure from Normal
02/01/2013 – 02/17/2013



High Plains Regional Climate Center

VIC Soil Moisture
17 February 2013

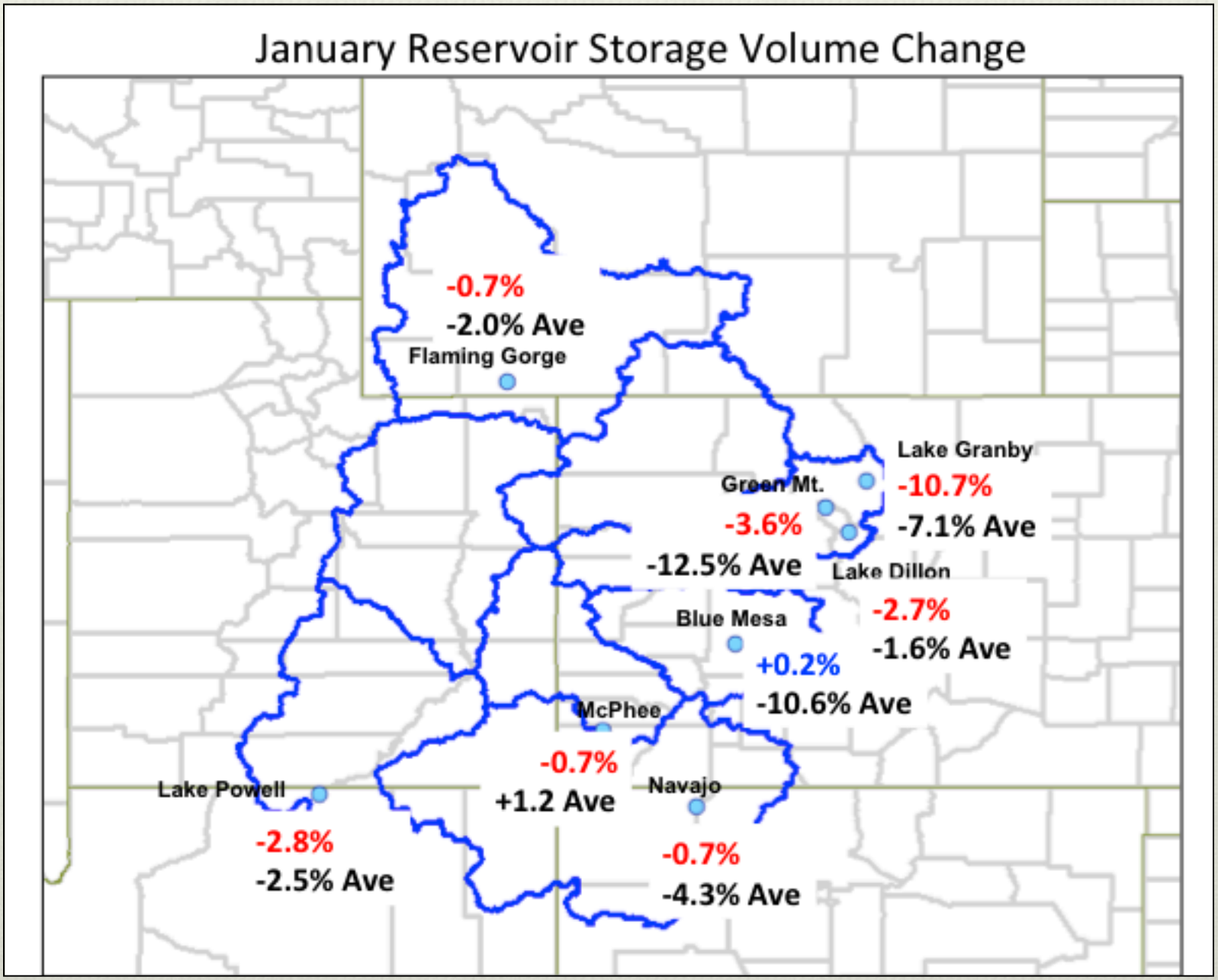




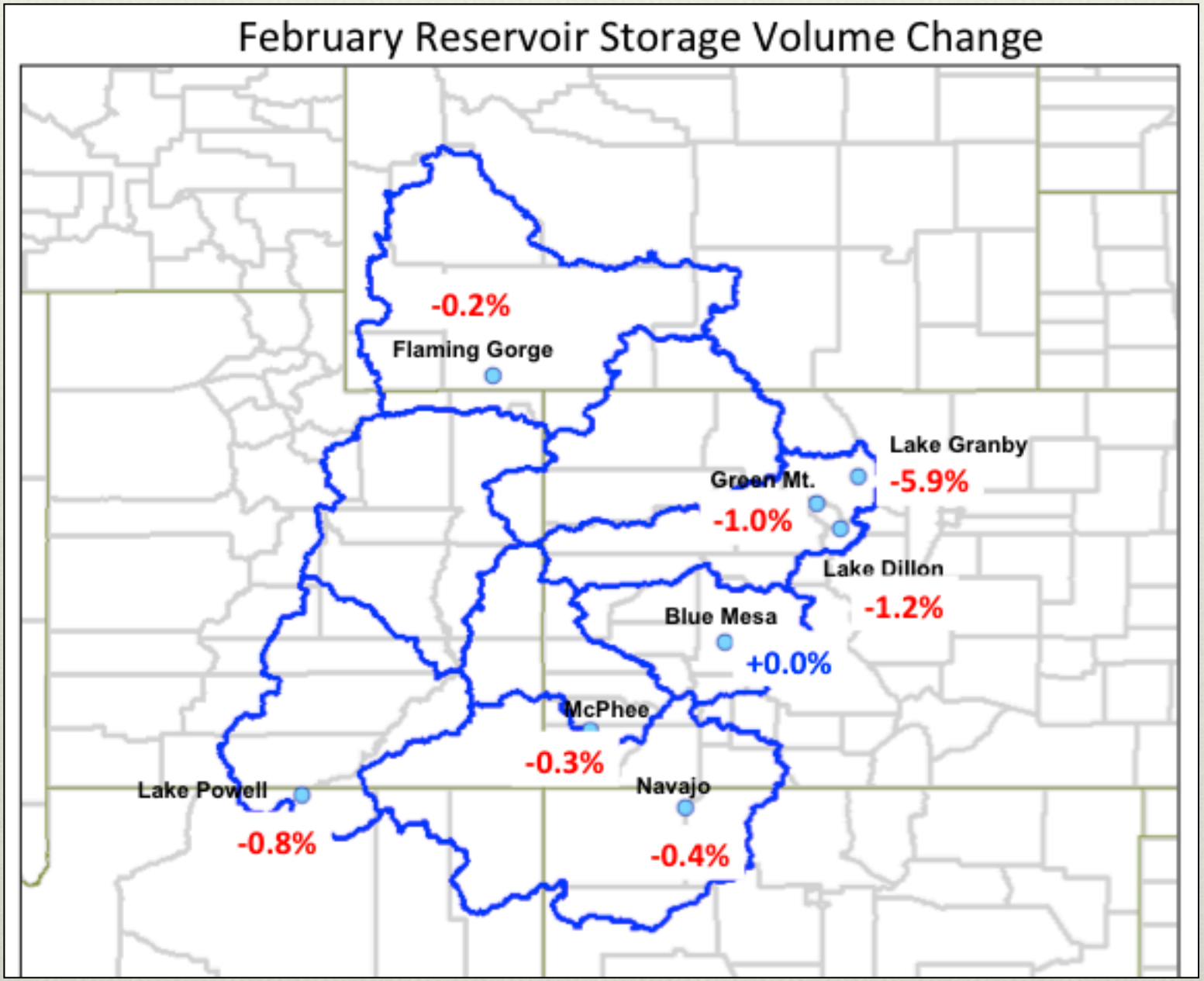
VIC + SWE

Reservoir Update

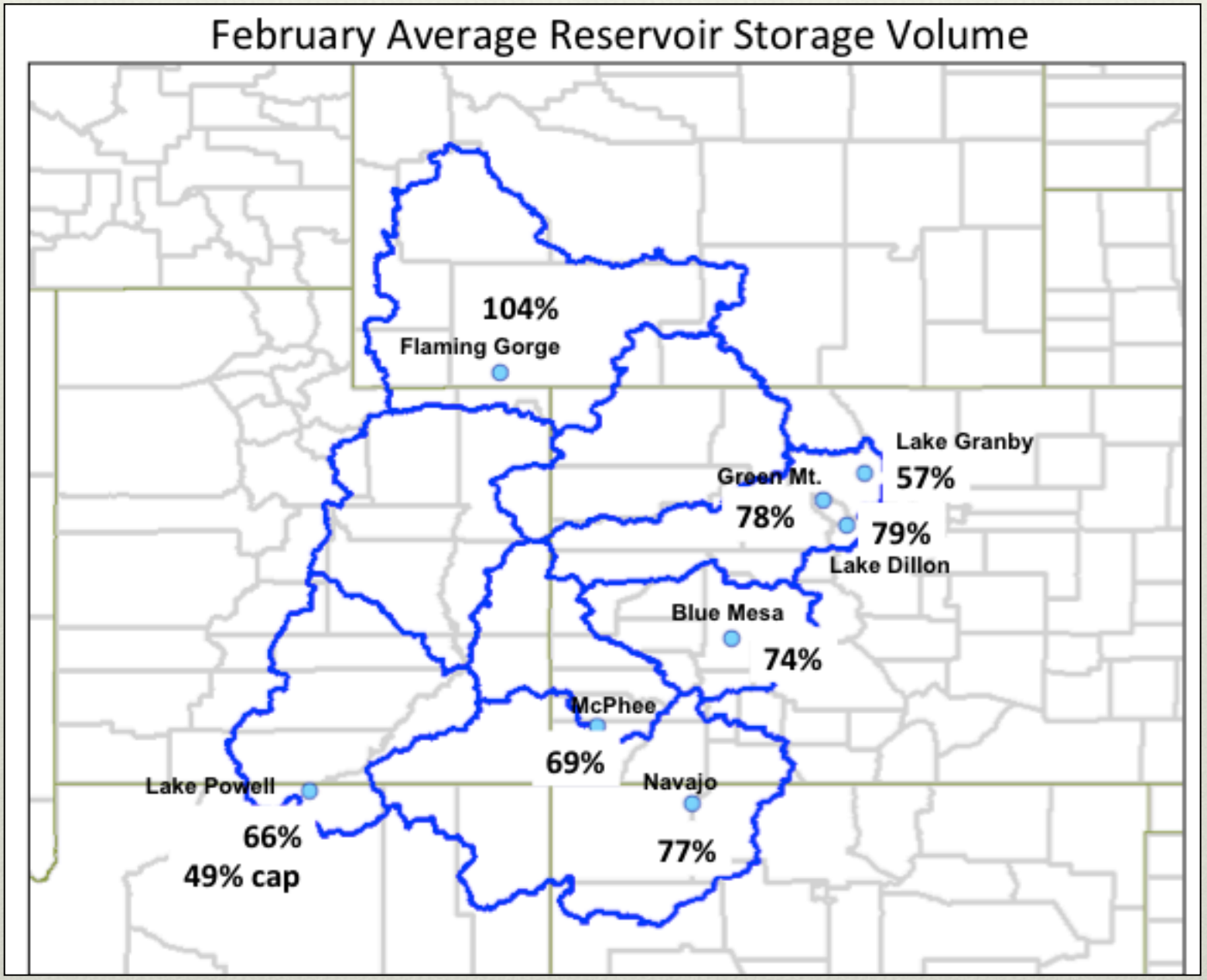
January Reservoir Storage Volume Change



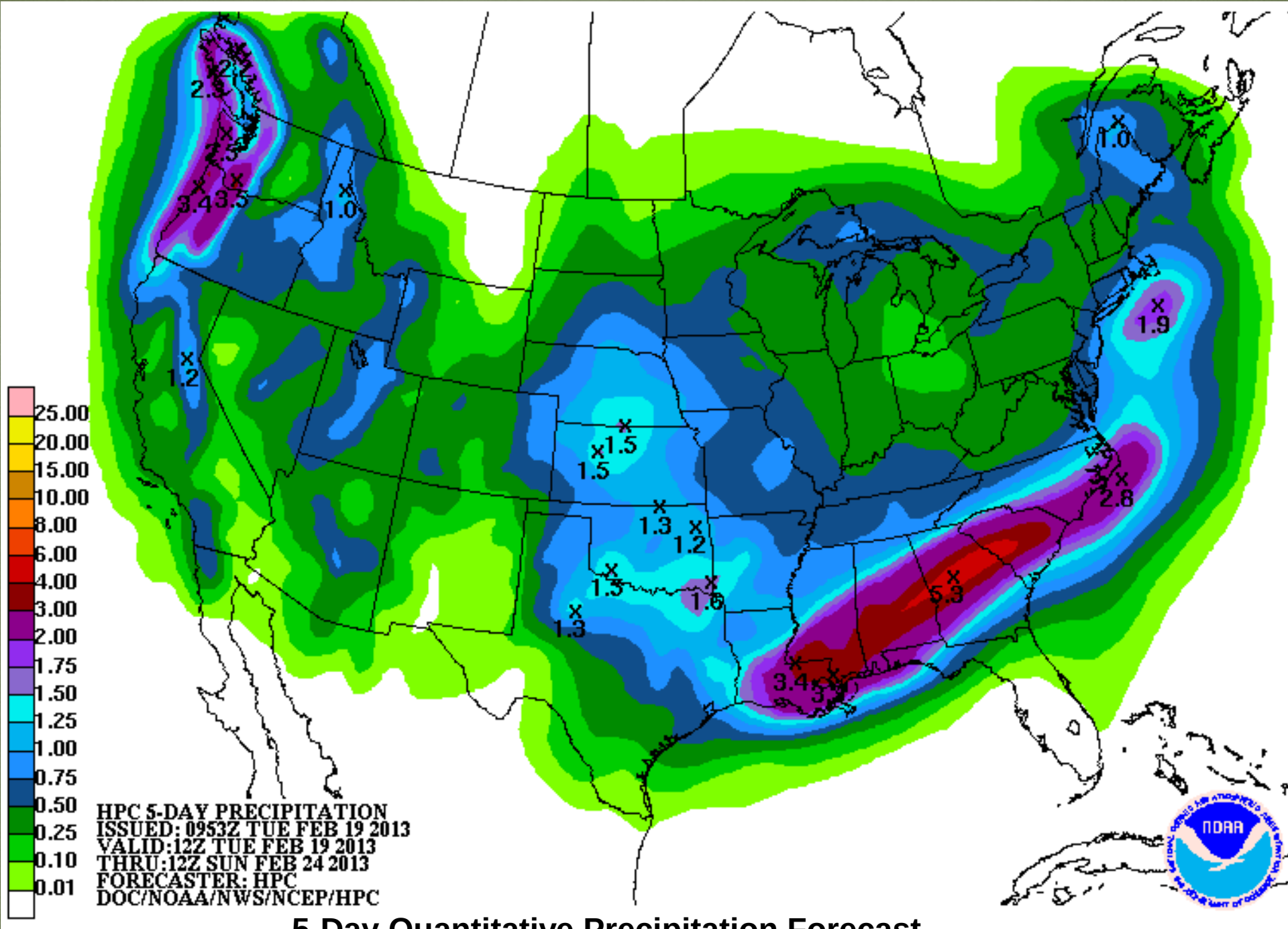
February Reservoir Storage Volume Change



February Average Reservoir Storage Volume

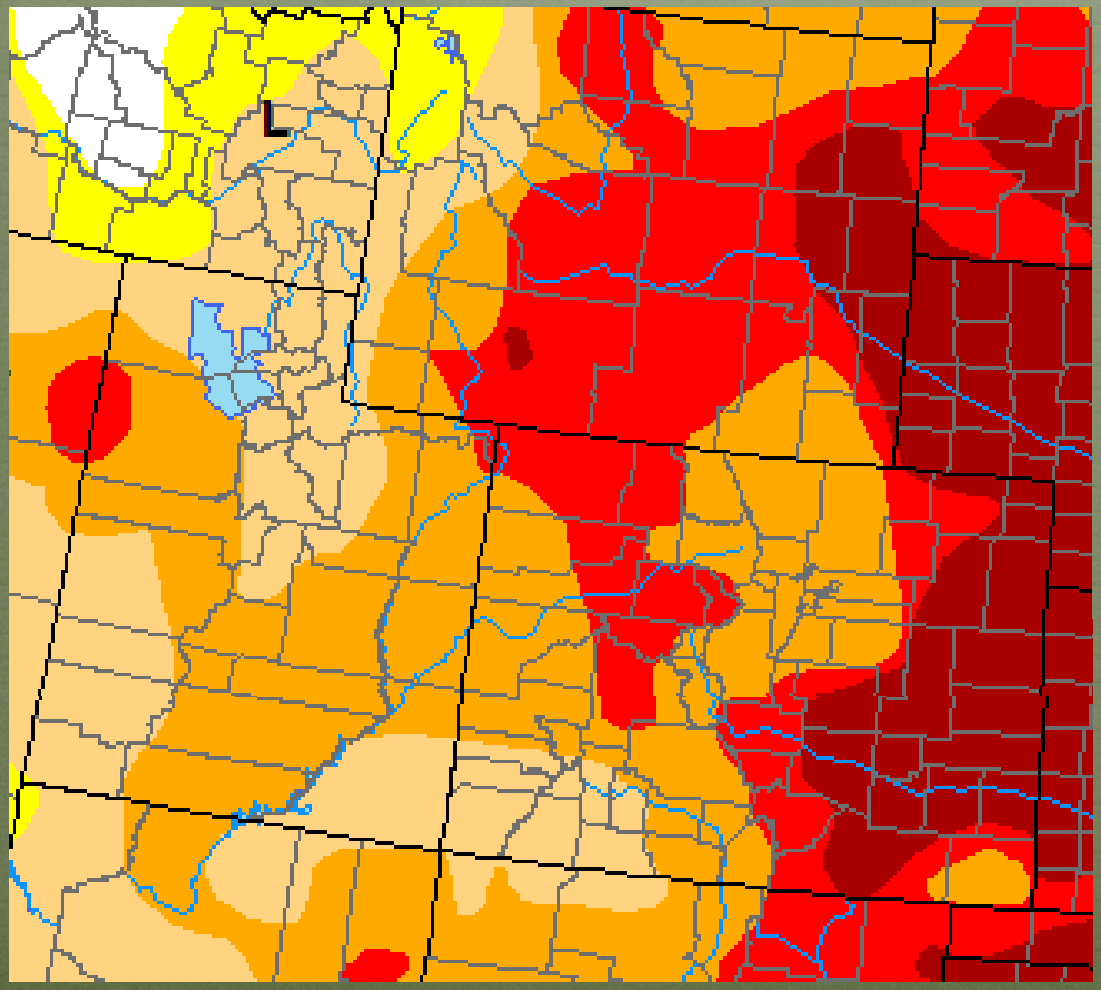


Precipitation Forecast



5-Day Quantitative Precipitation Forecast

Recommendations



Intensity:

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

INFO

For more information

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

February 19, 2013

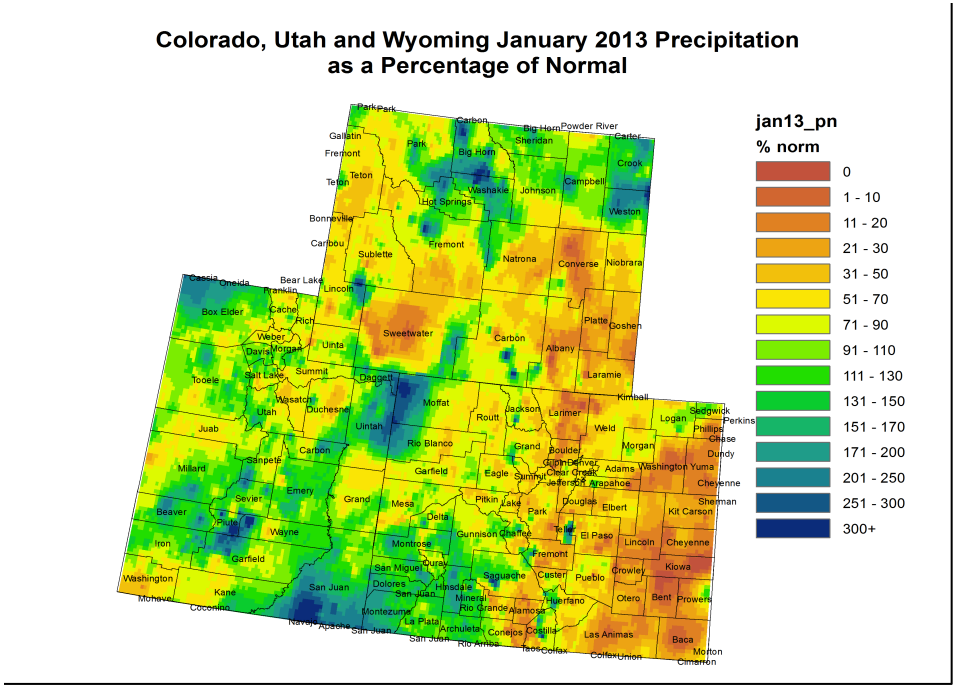


Fig. 1: January precipitation as a percent of average.

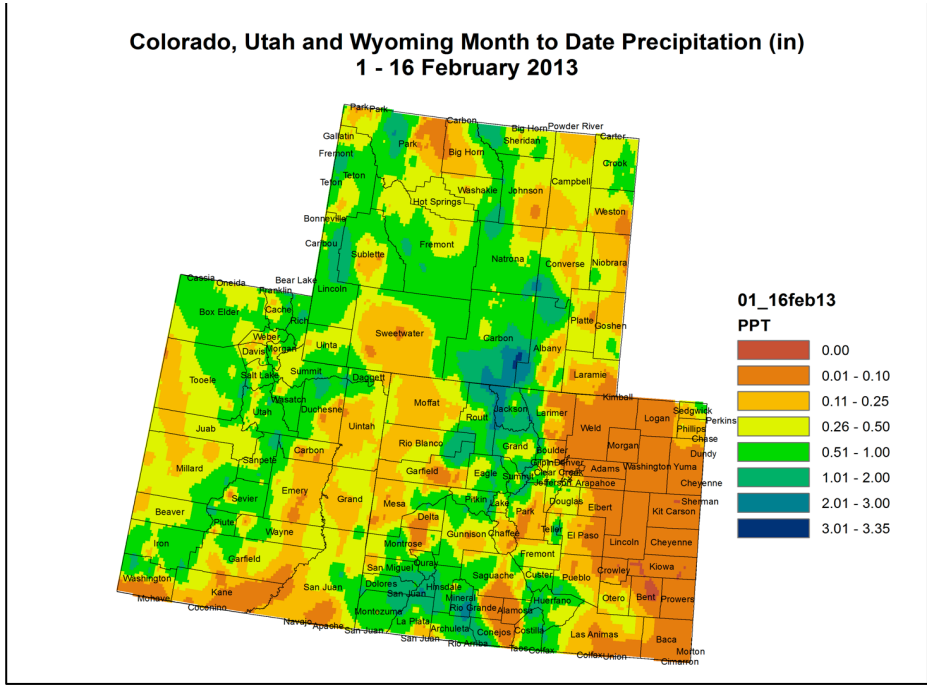


Fig. 2: February 1 – 16 precipitation in inches.

Precipitation

For the month of January, precipitation around the Upper Colorado River Basin (UCRB) ranged between 30% to over 200% of average (Fig. 1). The southern portion of the basin fared the best, with most of southeast Utah and southwest Colorado receiving between 100% and 300% of average for the month. The northern and central mountains of CO were a bit drier, around 50% to 90% of average, and Wyoming was also a bit drier, with Sweetwater County receiving less than 50% of average last month. East of the basin, eastern CO was ver dry, with most areas receiving between 10% to 70% of average.

Since the beginning of February, much of the higher elevations of the UCRB have received beneficial moisture (Fig. 2). The San Juan mountains in southwest CO and the northern CO mountains have received between .5 and 3 inches of precipitation, month-to-date. Most of the remaining higher elevations in the basin have received between .5 and 1 inch of moisture, while the lower elevations have received less than .25 inches in many spots. Most of eastern CO has received less than .10 inches since the beginning of the month.

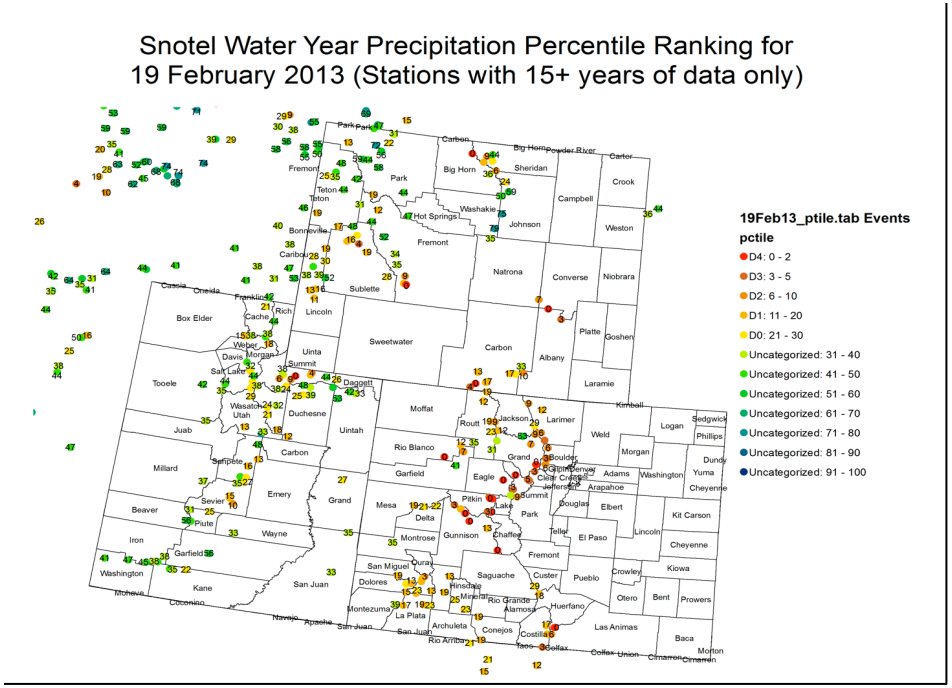


Fig. 3: WYTD SNOTEL precipitation percentiles (50th percentile is median, 30th percentile is D0 drought category) as of February 19th.

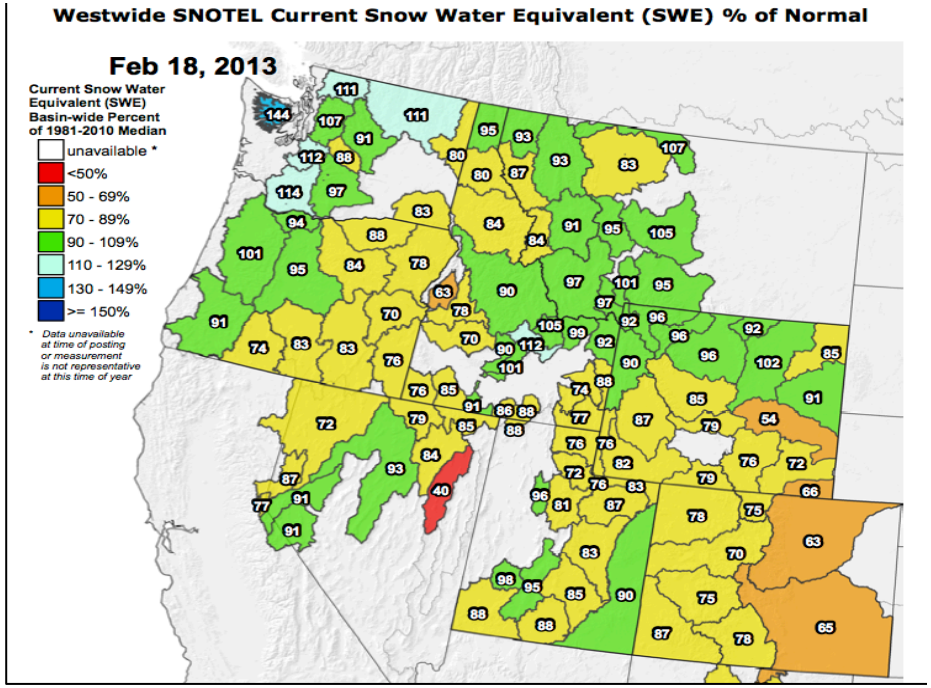


Fig. 4: Basin-averagd snow water equivalent as a percent of normal (median), as of February 18th.

Snowpack

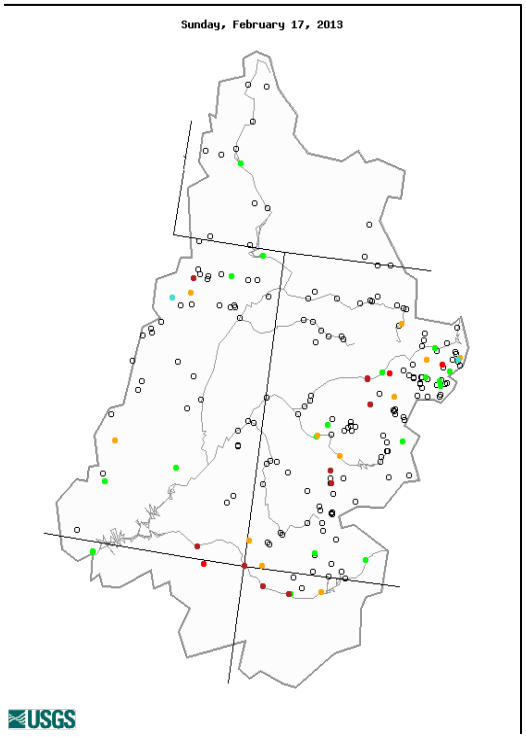
Water-year-to-date SNOTEL precipitation percentiles in the UCRB are closer to the median on the west side of the basin and much lower on the east side of the basin (Fig. 3). Along the Wasatch and Uintah ranges in UT and up to the Upper Green in WY, most percentiles range from 30 to 50, though there has been a decrease in the past week and some percentiles are in the teens and 20s. The northern and central CO mountains are 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 to 20s.

Accumulated snowpack is currently less than normal across the entire UCRB (Fig. 4). Sub-basins in western CO range between 70% - 87% of normal snowpack. The northeast UT and southwest WY basins, which had been closer to normal for most of the water year, saw decreases over the past week, and are ranging from 76% of normal to 90% of normal for the season.

Streamflow

As of February 17th, about 46% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) to above normal 7-day average streamflows (Fig. 5). About 29% percent of the gages in the basin are recording much below normal or low (i.e. lowest on record) streamflows, an increase from 20% one week ago. Many of the gages throughout the basin are under frozen conditions. However, the number of reporting stations (not ice-affected) has increased from a low of 19 near the beginning of the calendar year, to 45 gages.

Two of the three key gages across the basin are still ice affected and not reporting (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 has very recently come out of frozen conditions and is reporting much below normal flows at the 8th percentile.



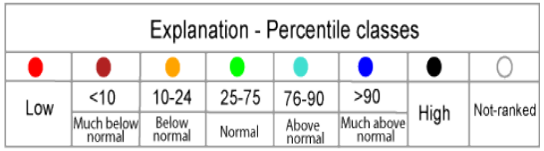


Fig. 5: 7-day average discharge compared to historical discharge for February 17th.

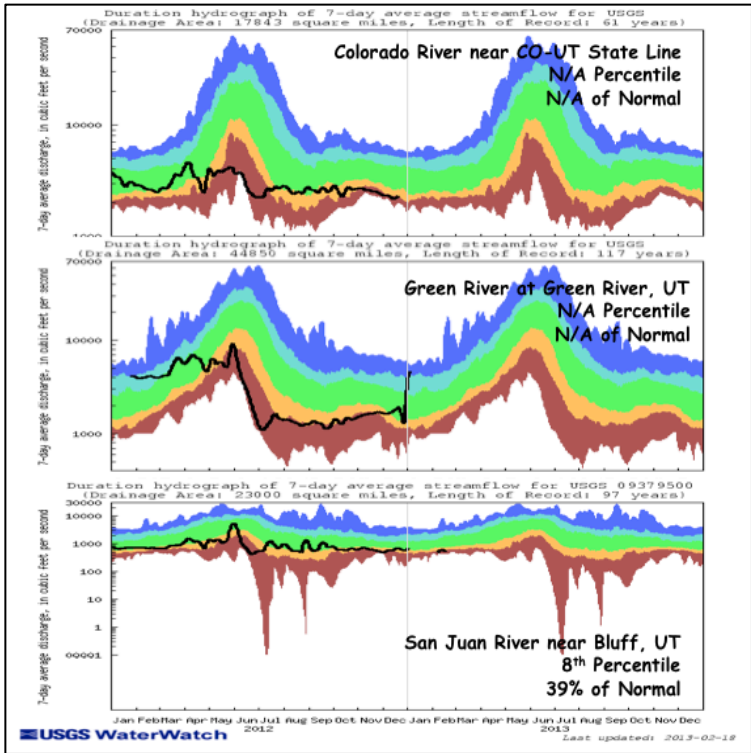


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Last week, most of the UCRB saw cooler than average temperatures, with parts of northeast UT and much of western CO experiencing temperatures more than 6 degrees below average. East of the basin, the rest of CO saw temperatures near average to 6 degrees below average. 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 northeast UT and parts of western CO. Soil moisture has improved over the Four Corners, and shows near normal conditions when including SWE (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 January, 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. Navajo, Flaming Gorge, and Green Mountain all saw smaller volume decreases than what is normal. Lake Granby saw larger volume decreases than what is normal for this time of year. McPhee normally begins increasing this time of year, but is currently still decreasing. Flaming Gorge volume is slightly above its February average while the rest of the reservoirs are around 60% to 80% of average for February.

Precipitation Forecast

Strong southwest flow aloft will prevail over the UCRB through Wednesday ahead of a potent storm system currently making landfall in the Pacific Northwest. Expect to see shower activity on the increase throughout the day on Wednesday, beginning first in the southern mountains and gradually spreading northward during Wednesday night. Most of the energy with this sytem is expected to quickly move into the plains, with liquid accumulations generally remaining around 0.1 to 0.25 inches over southern UT and CO through Friday (Fig. 8). Areas in the San Juan could do slightly better than this with isolated amounts of 0.75 possible underneath the heaviest showers. Additional energy dropping down the back side of Wednesday's system will keep light snow going over much of the basin into the weekend, however accumulations look to remain light. This unsettled pattern will persist moving into next week as yet another big trough is expected to approach the area late on Sunday, bringing more snow showers back into the extended forecast.

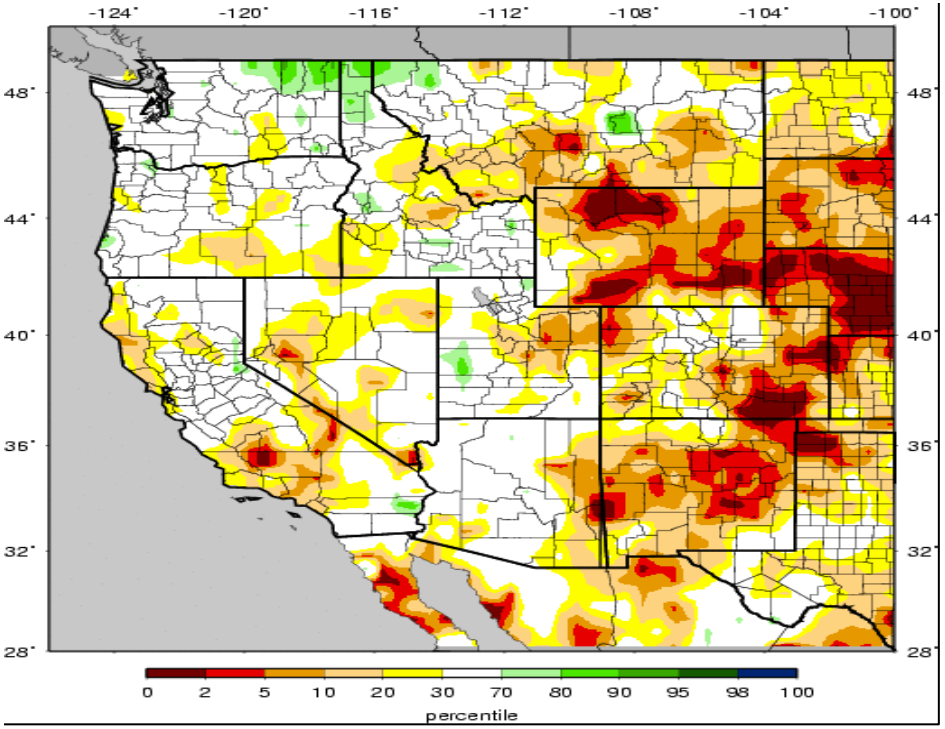
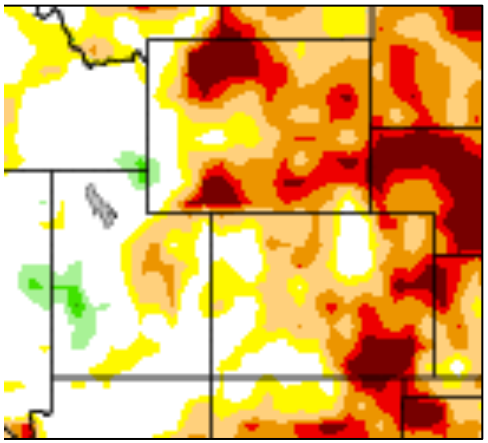


Fig. 7: VIC modeled soil moisture percentiles for the western U.S. as of February 17th. The map below combines soil moisture and SWE.



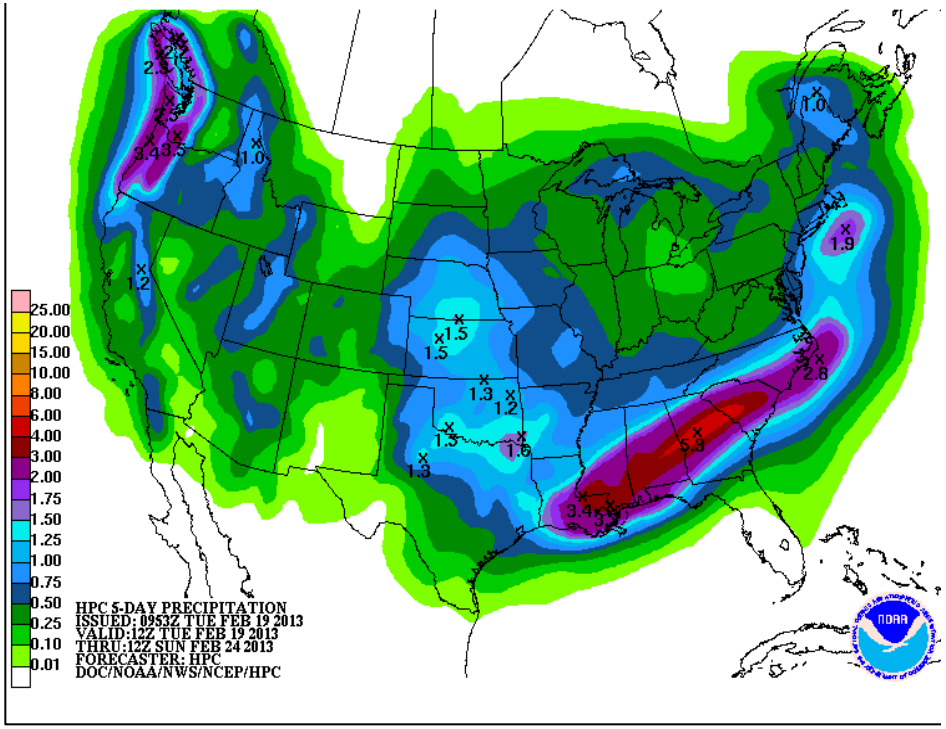
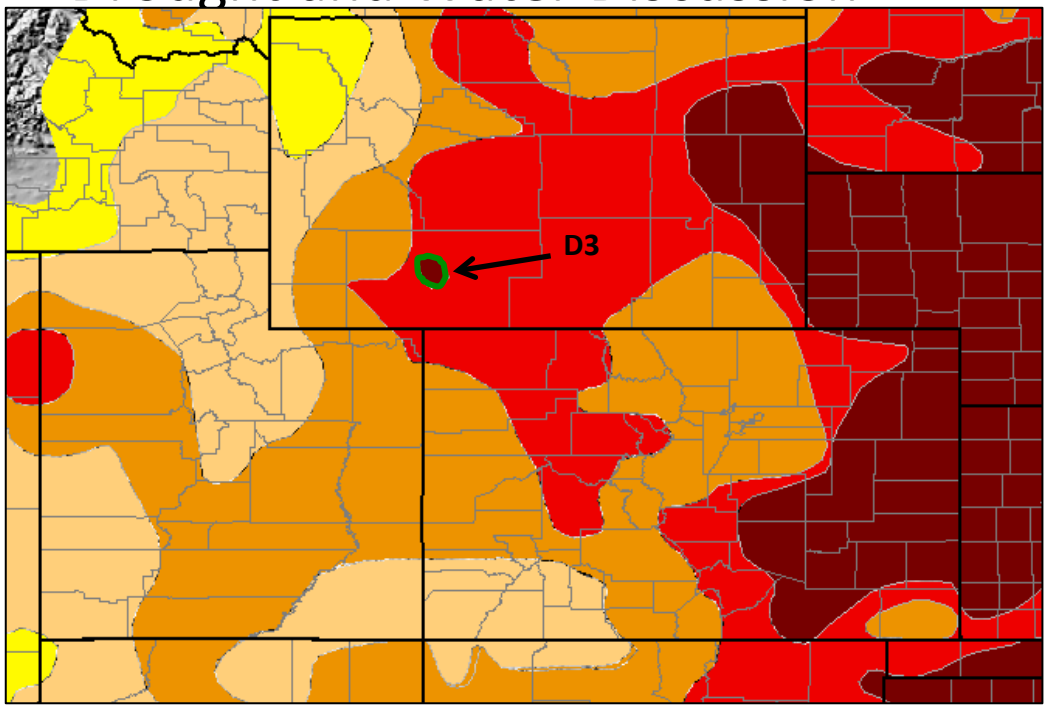
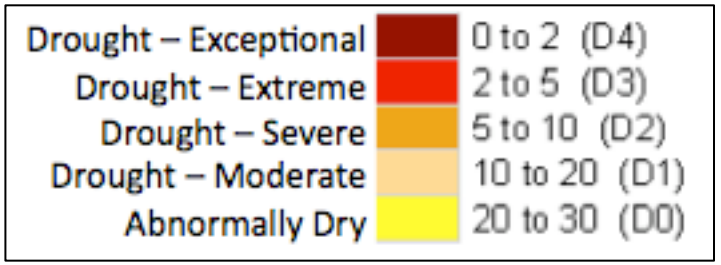


Fig. 8: Quantitative precipitation forecast (QPF) by the Hydrologic Prediction Center out to 12UTC Sunday.

Drought and Water Discussion





Drought categories and
their associated percentiles

Fig. 9: February 12th release of U.S. Drought Monitor for the UCRB.

UCRB: Only one minor change is recommended for the UCRB in the most recent depiction of the U.S. Drought Monitor (USDM) map. The small area of D4 in Sweetwater County, WY should be removed (Fig. 9, green outline). This area of D4 was driven by a datapoint that is now considered erroneous and is likely not that much drier than the surrounding area. Status quo is recommended for the rest of the UCRB, though parts of northeast UT and northwest CO may be examined next week for possible improvements after the passage of the next series of disturbances.

Eastern CO: Status quo is recommended for the rest of CO. Deteriorating conditions in nearby OK, TX, and KS have prompted an evaluation of the D2 conditions in Baca County. It has been determined that Baca County is still doing much better than surrounding counties, so the strong gradient in D-lines is justified.