Winter 2012

Weekly Climate, Water & Drought Assessment

Today's Agenda

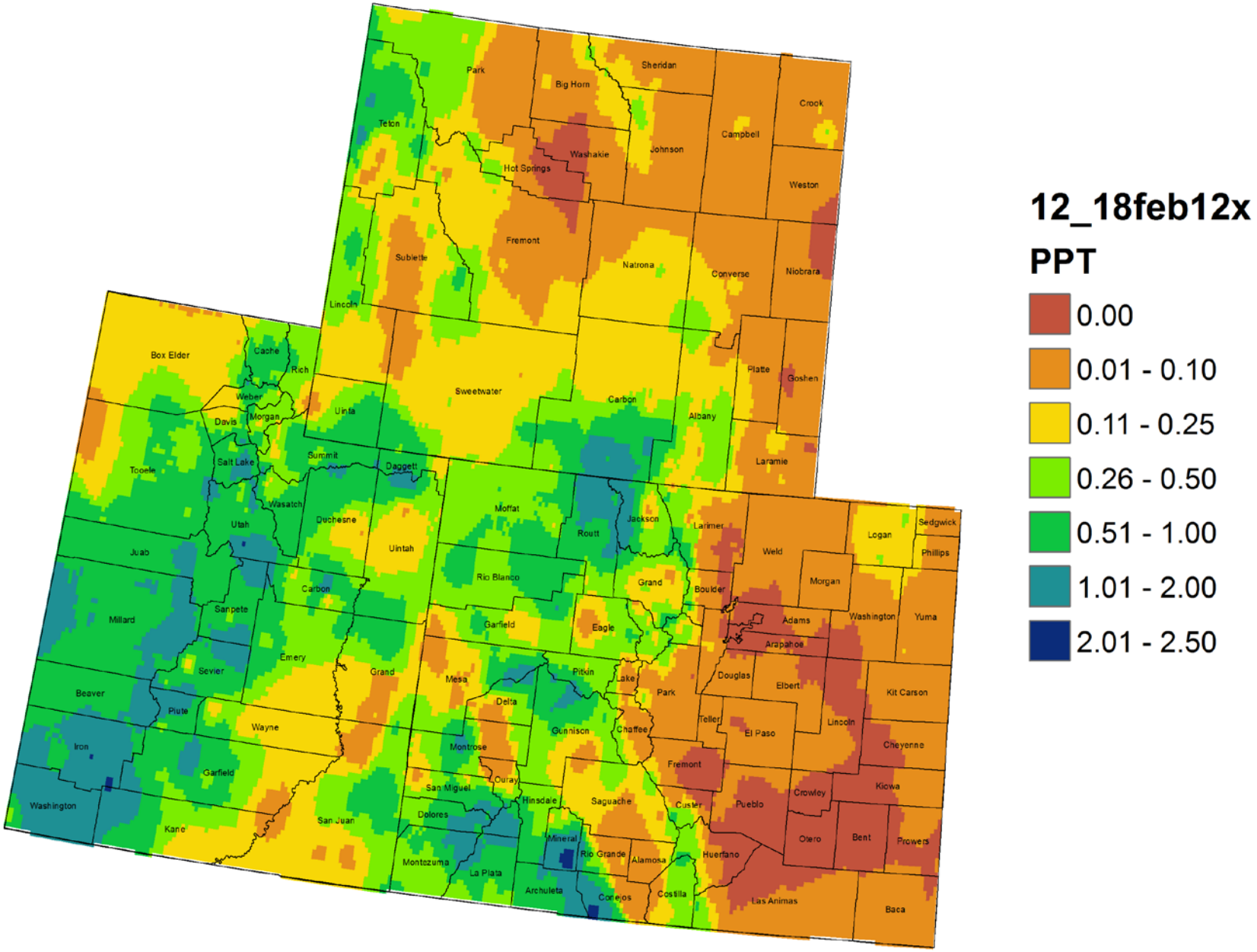
-Assessment of current water conditions

- Precipitation Forecast

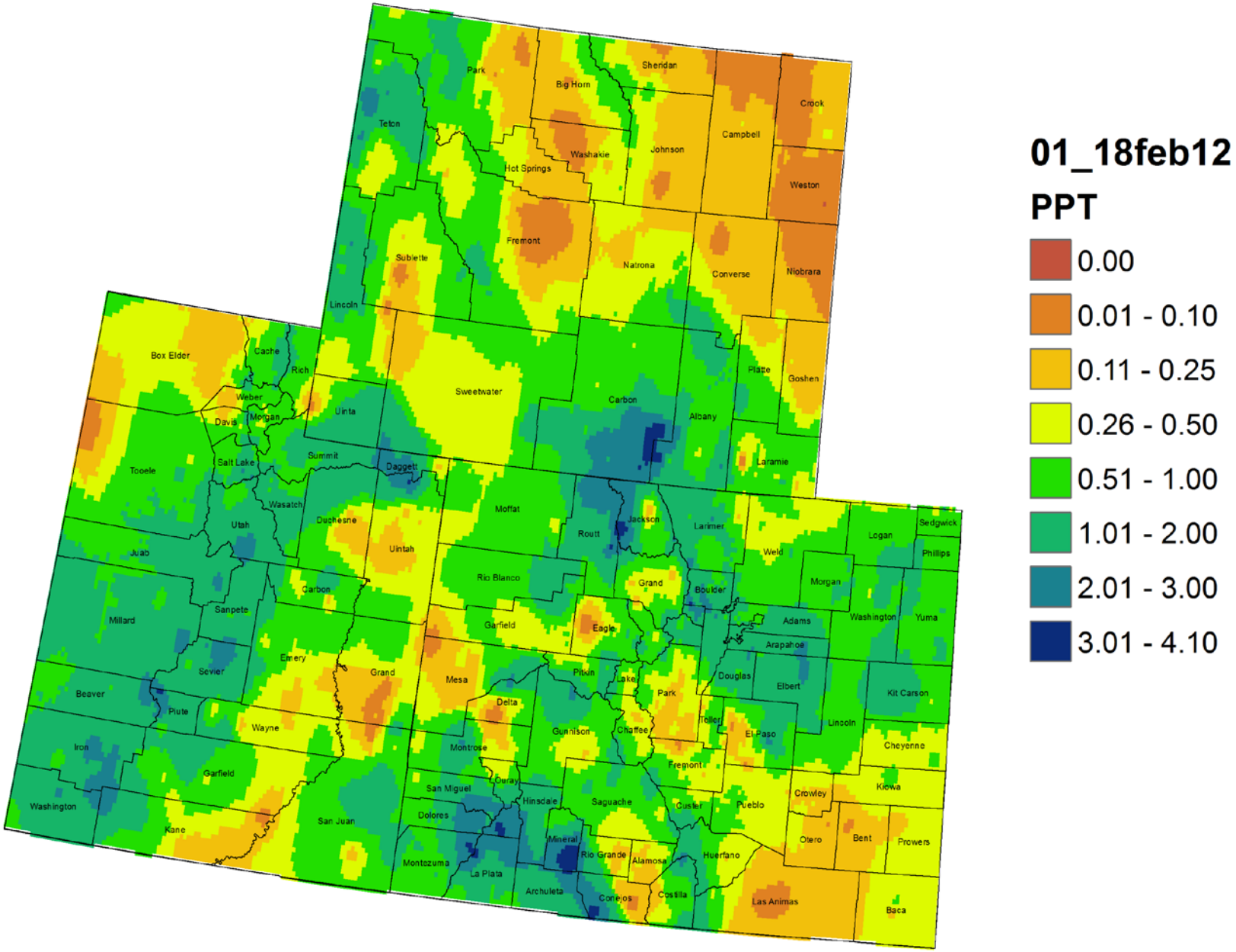
- Recommendations for Drought Monitor

Precipitation/Snowpack Update

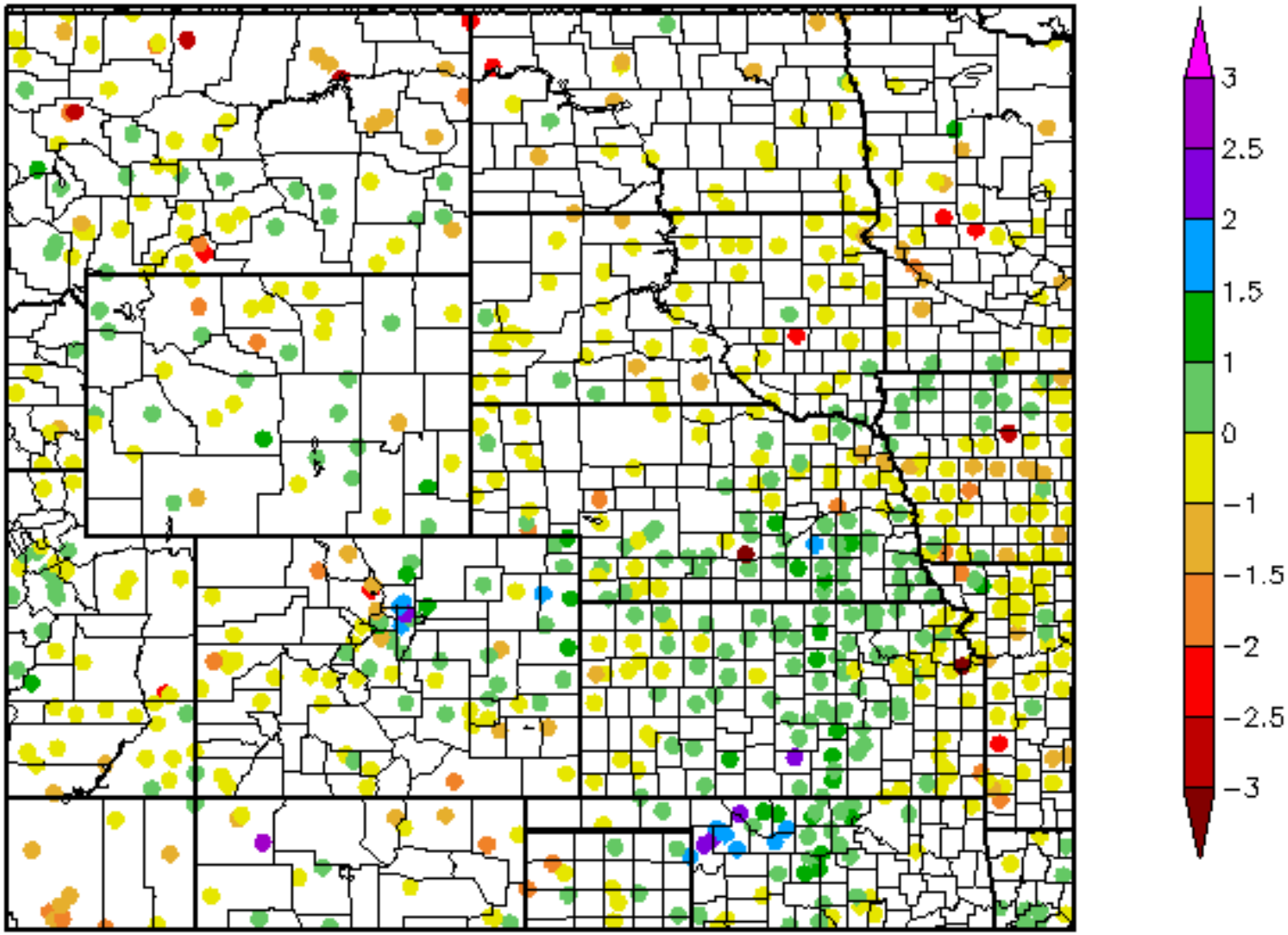
Colorado, Utah and Wyoming 7 Day Precipitation (in)
12 - 18 February 2012



Colorado, Utah and Wyoming Month to Date Precipitation (in)
1 - 18 February 2012



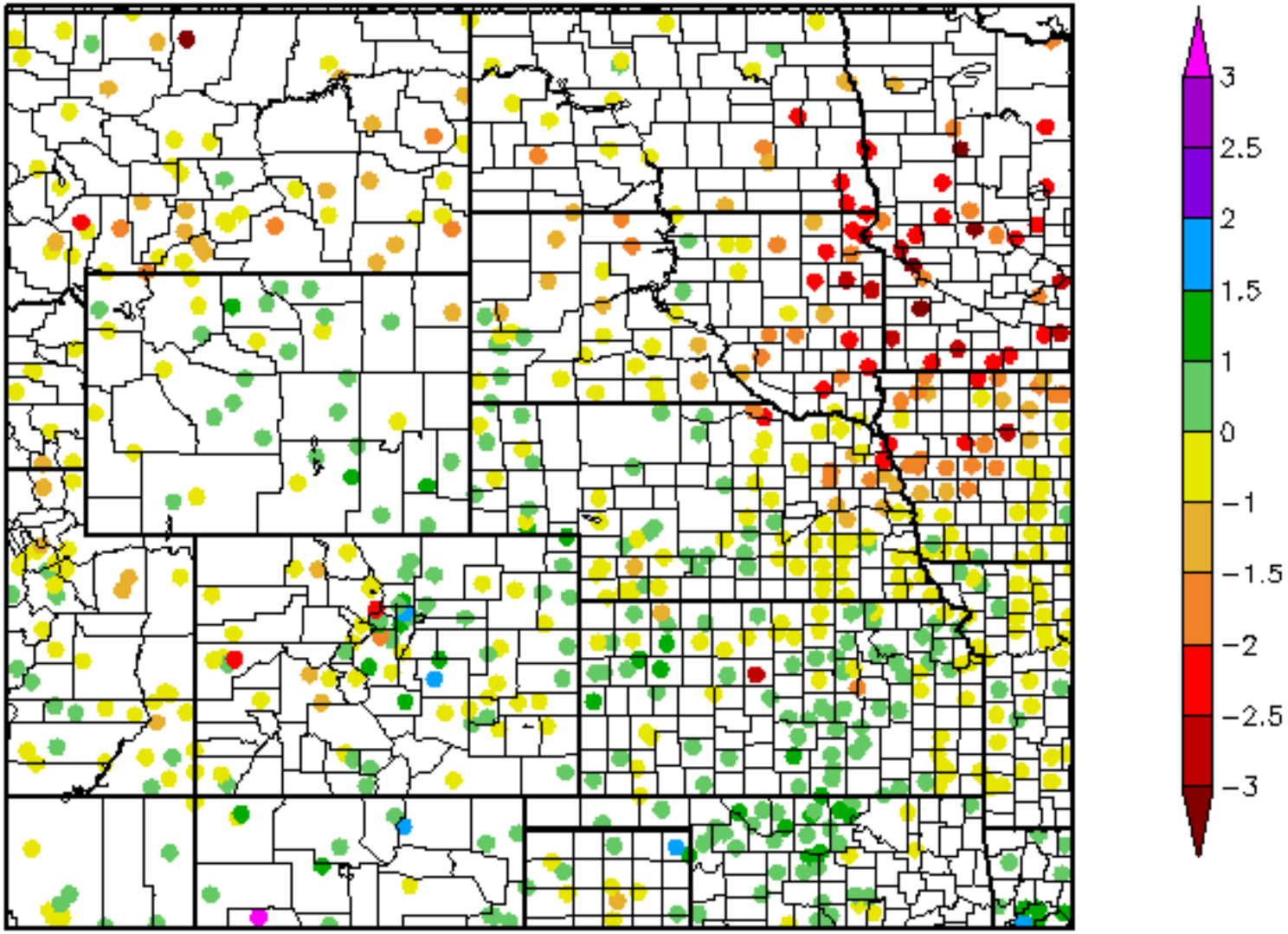
60 Day SPI
12/23/2011 – 2/20/2012



Generated 2/21/2012 at HPRCC using provisional data.

Regional Climate Centers

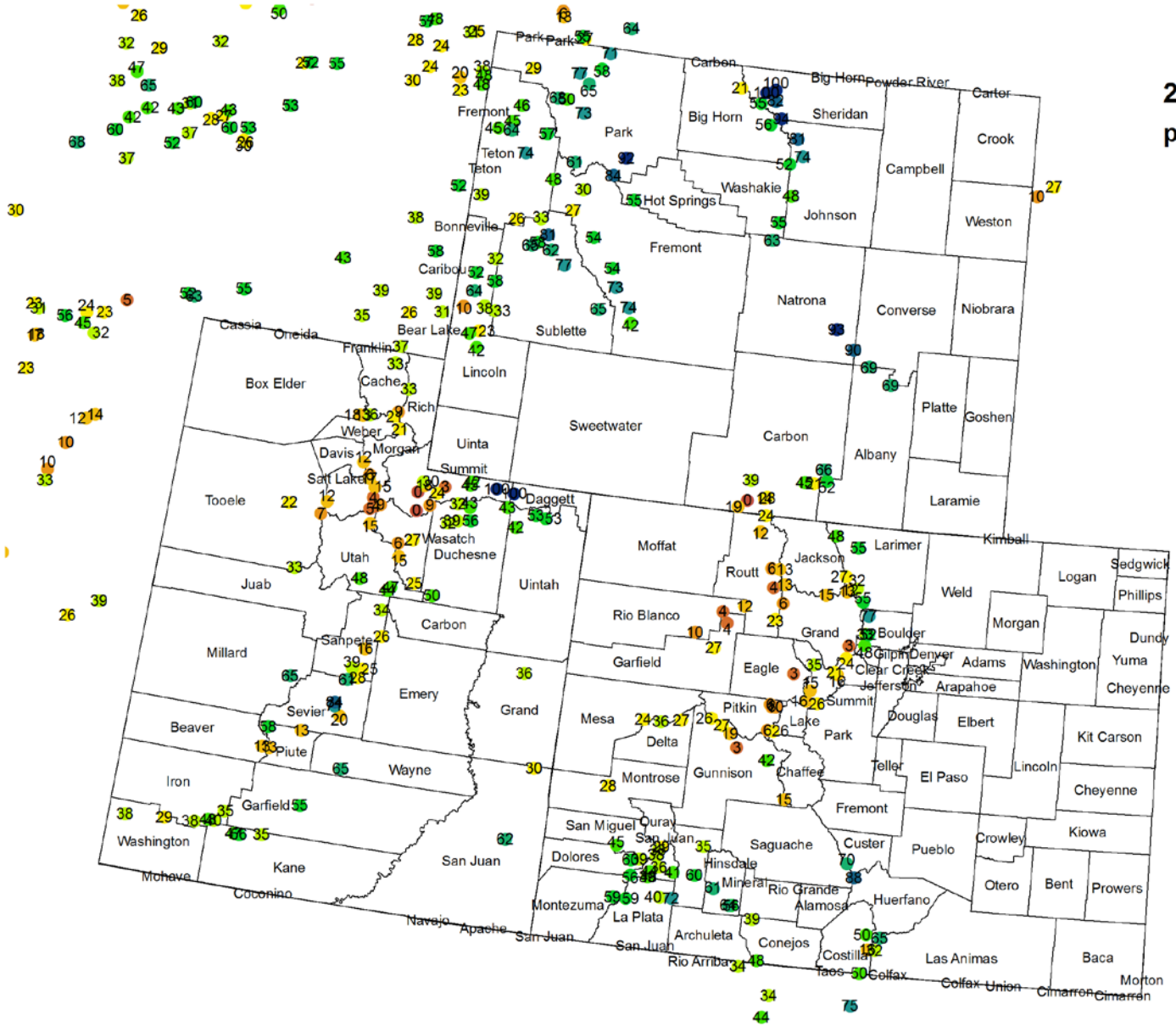
6 Month SPI
8/21/2011 – 2/20/2012



Generated 2/21/2012 at HPRCC using provisional data.

Regional Climate Centers

Snotel Water Year Precipitation Percentile Ranking for 21 February 2012 (Stations with 15+ years of data only)

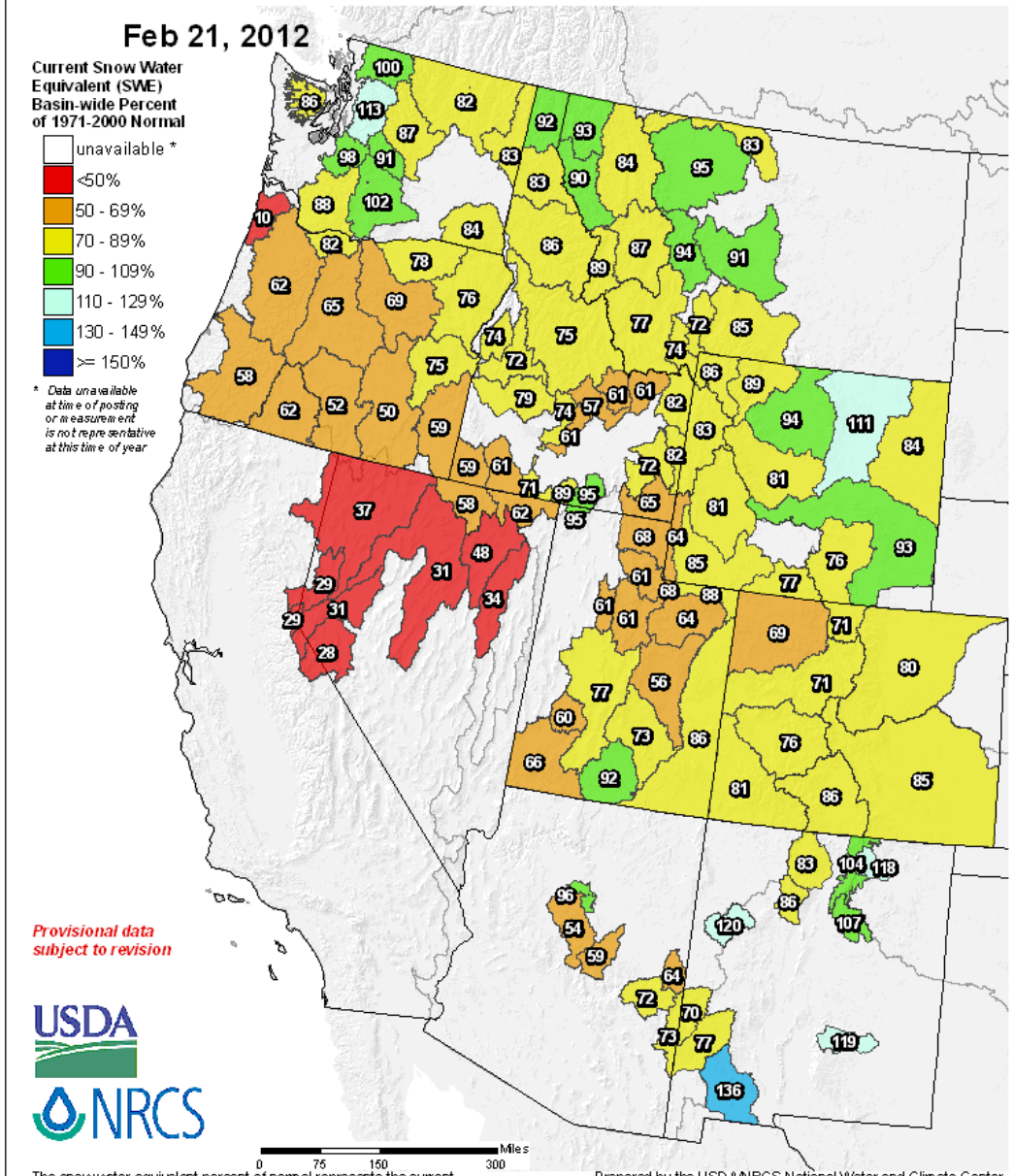


21Feb12_ptile.tab Events

pctile

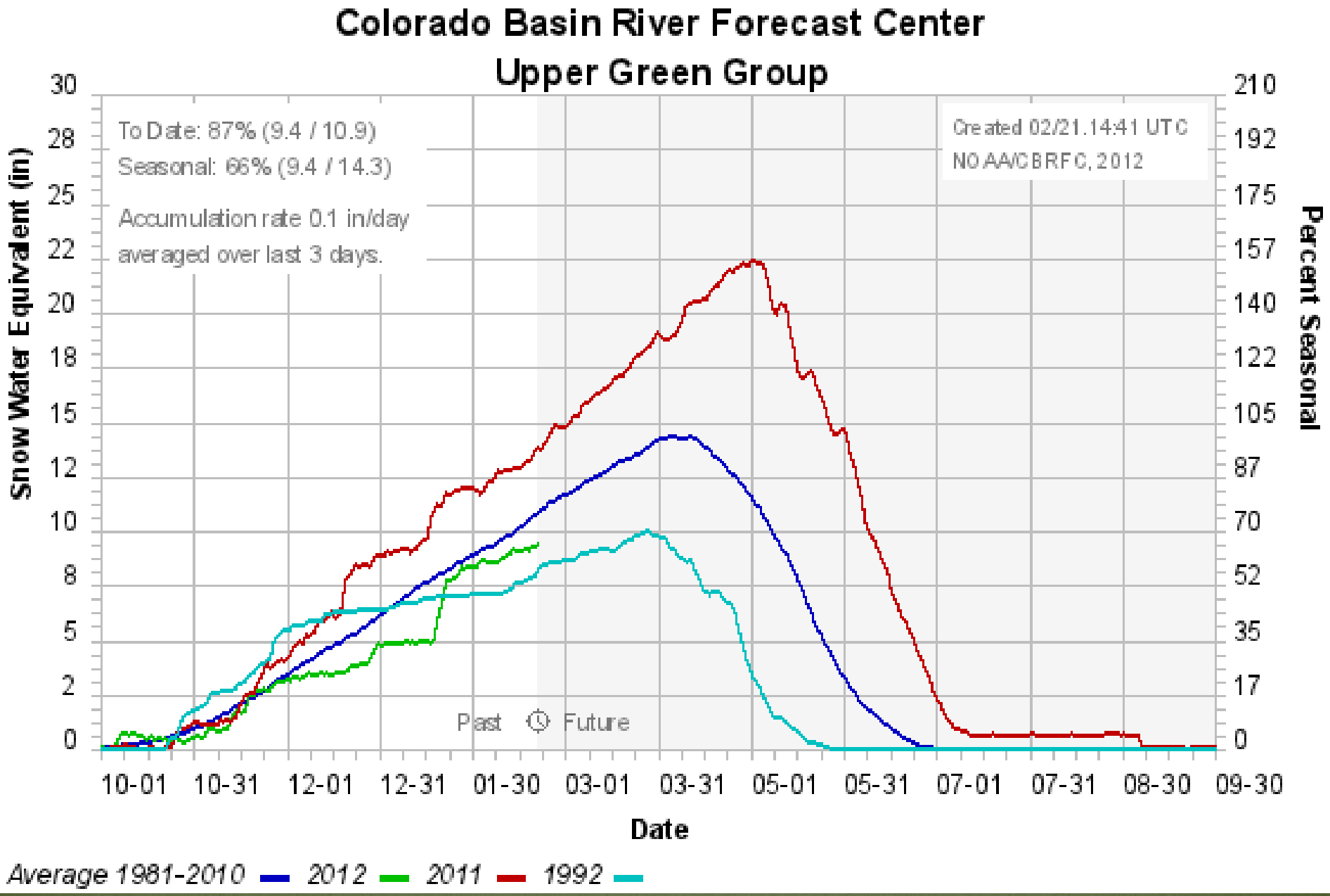
- D4: 0 - 2
- D3: 3 - 5
- D2: 6 - 10
- D1: 11 - 20
- D0: 21 - 30
- Uncategorized: 31 - 40
- Uncategorized: 41 - 50
- Uncategorized: 51 - 60
- Uncategorized: 61 - 70
- Uncategorized: 71 - 80
- Uncategorized: 81 - 90
- Uncategorized: 91 - 100

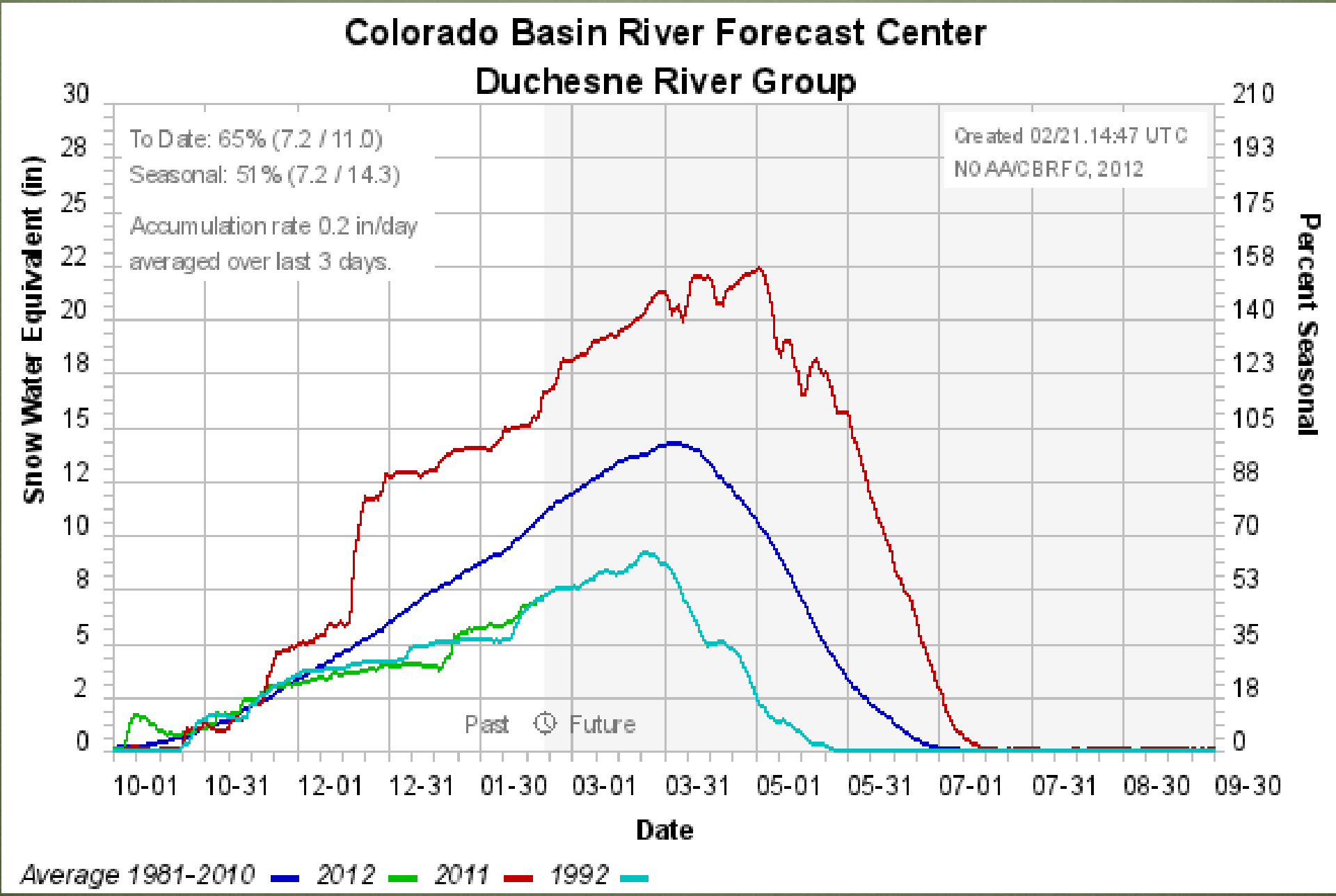
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

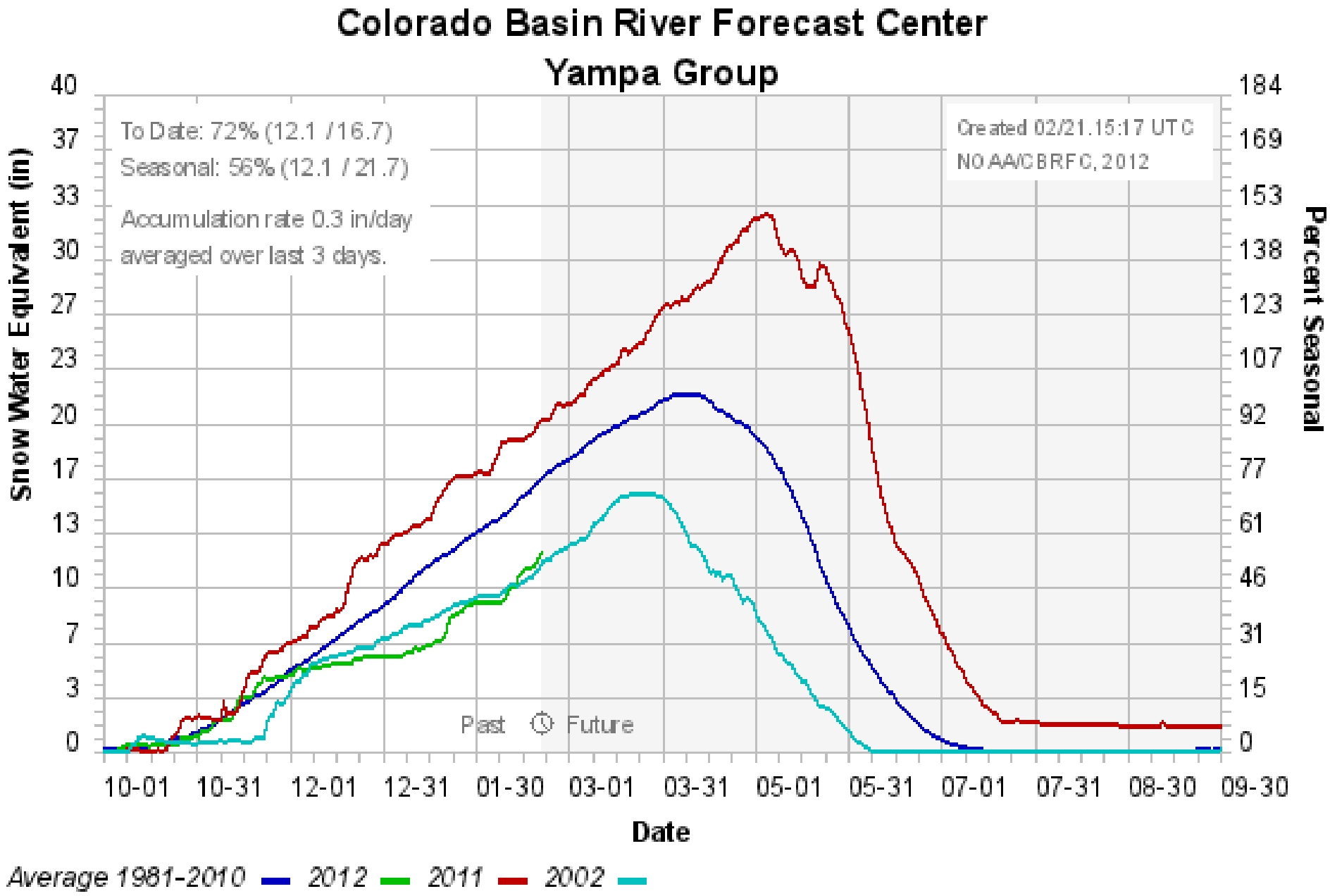


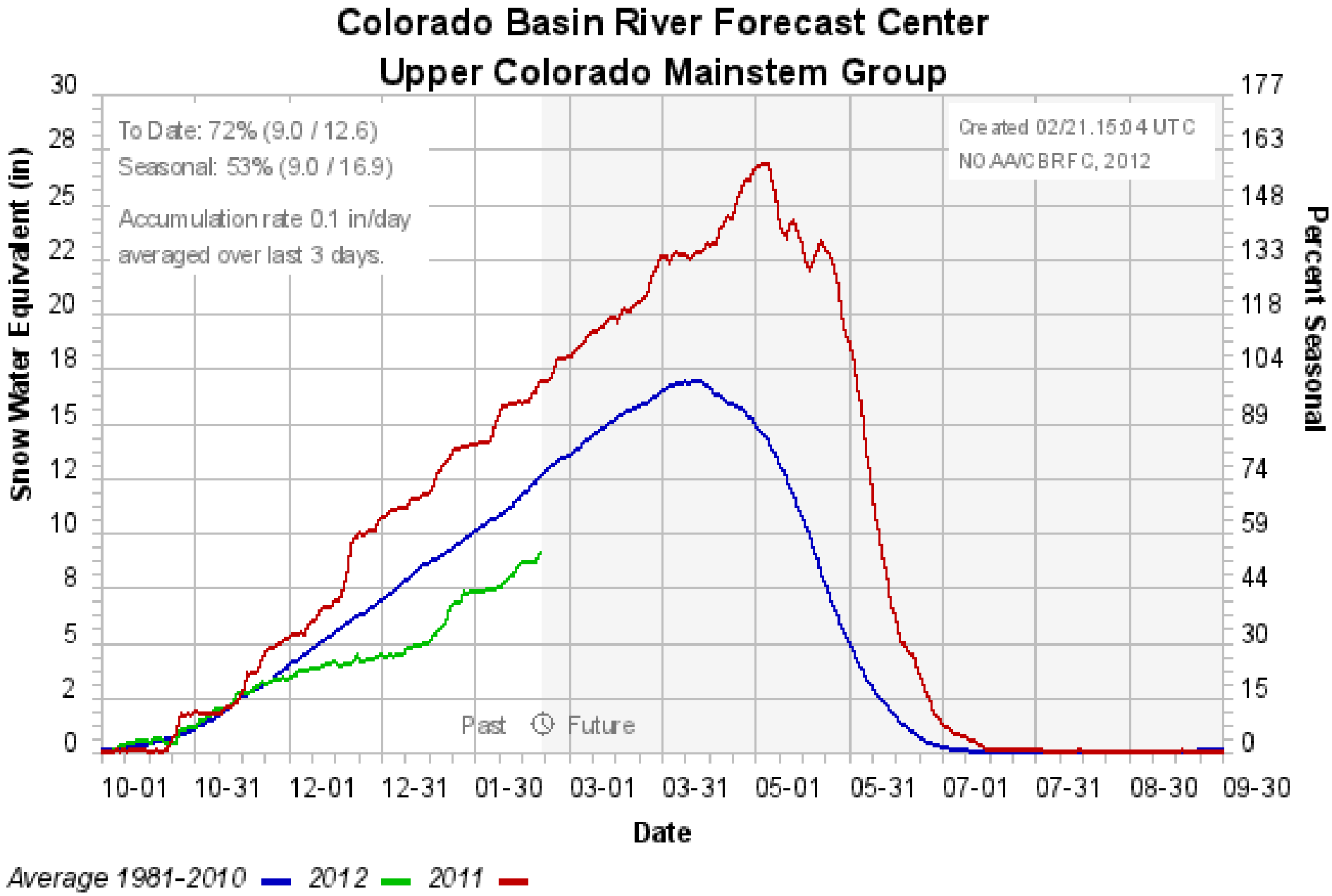
The snow water equivalent percent of normal represents the current snowwater equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

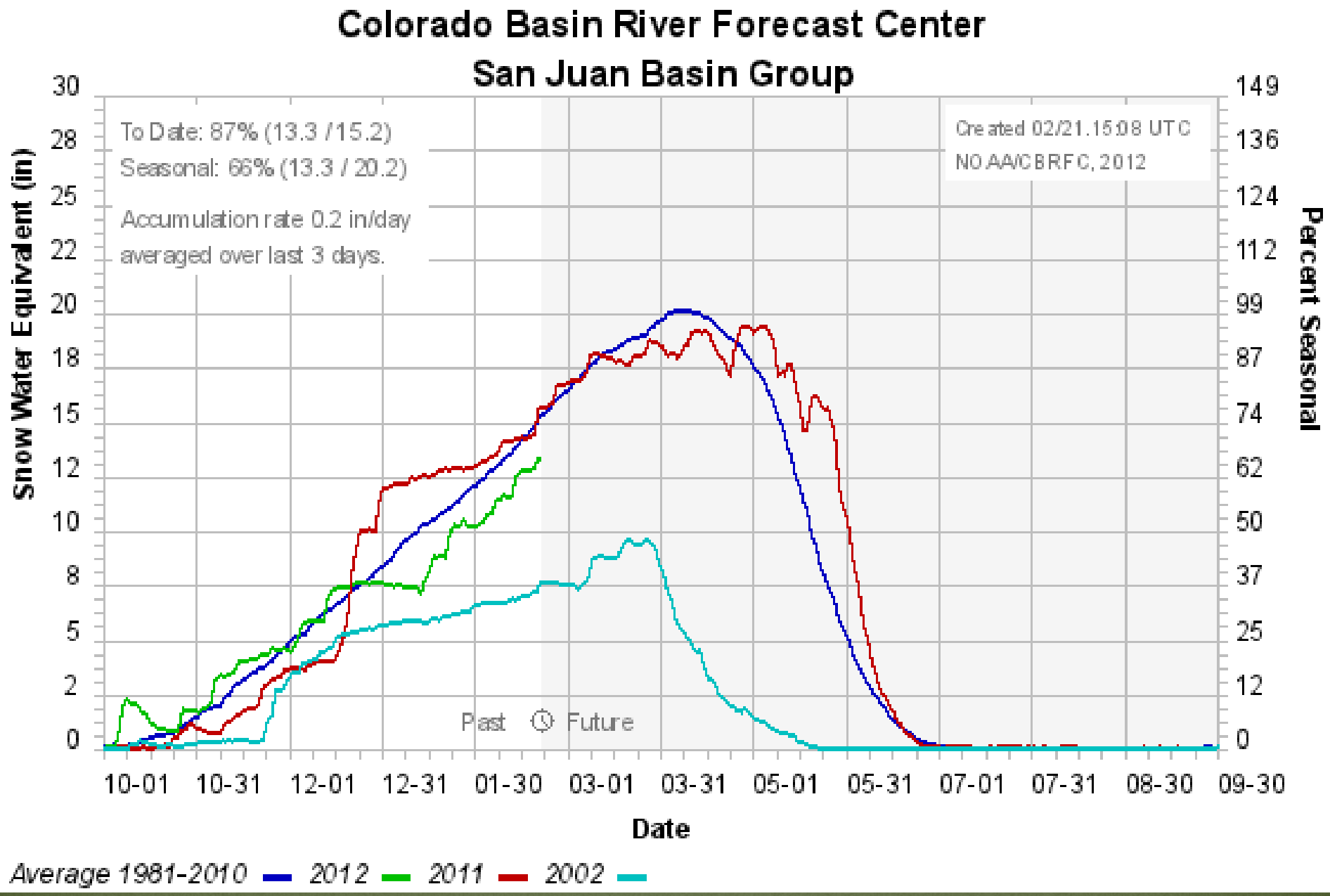
Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon http://www.wcc.nrcs.usda.gov/gis/
Based on data from http://www.wcc.nrcs.usda.gov/reports/
Science contact: Jim.Marron@por.usda.gov 503 414 3047


Colorado Basin River Forecast Center
Upper Green Group
To Date: 87% (9.4 / 10.9)
Seasonal: 66% (9.4 / 14.3)
Accumulation rate 0.1 in/day
averaged over last 3 days.
Created 02/21.14:41 UTC
NOAA/CBRFC, 2012
Past
Future
Snow Water Equivalent (in)
Percent Seasonal
Date
30
28
25
22
20
18
15
12
10
8
5
2
0
210
192
175
157
140
122
105
87
70
52
35
17
0
10-01
10-31
12-01
12-31
01-30
03-01
03-31
05-01
05-31
07-01
07-31
08-30
09-30
Average 1981-2010
2012
2011
1992


Colorado Basin River Forecast Center
Duchesne River Group
To Date: 65% (7.2 / 11.0)
Seasonal: 51% (7.2 / 14.3)
Accumulation rate 0.2 in/day
averaged over last 3 days.
Created 02/21 14:47 UTC
NOAA/CBRFC, 2012
Past
Future
Snow Water Equivalent (in)
Percent Seasonal
Date
30
28
25
22
20
18
15
12
10
8
5
2
0
210
193
175
158
140
123
105
88
70
53
35
18
0
10-01
10-31
12-01
12-31
01-30
03-01
03-31
05-01
05-31
07-01
07-31
08-30
09-30
Average 1981-2010
2012
2011
1992

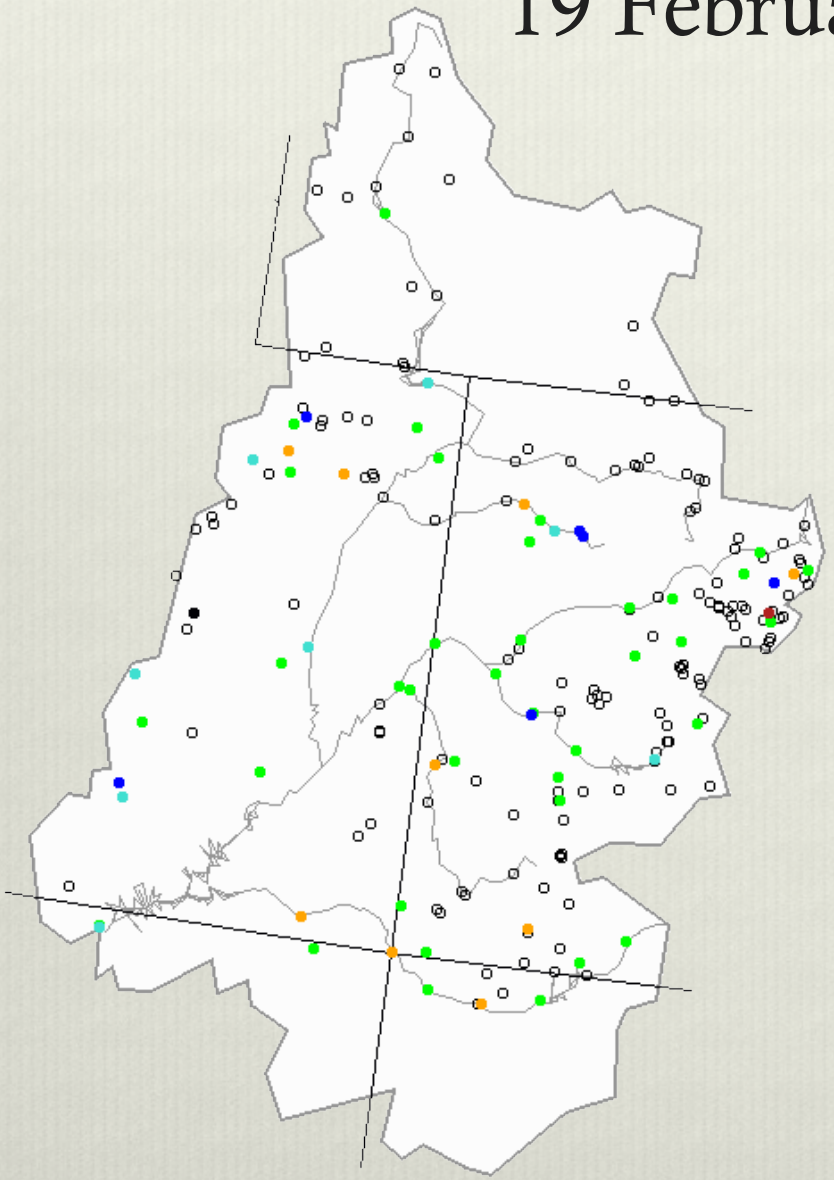

Colorado Basin River Forecast Center
Yampa Group
To Date: 72% (12.1 / 16.7)
Seasonal: 56% (12.1 / 21.7)
Accumulation rate 0.3 in/day
averaged over last 3 days.
Created 02/21.15:17 UTC
NOAA/CBRFC, 2012
Past
Future
Snow Water Equivalent (in)
Percent Seasonal
Date
40
37
33
30
27
23
20
17
13
10
7
3
0
184
169
153
138
123
107
92
77
61
46
31
15
0
10-01
10-31
12-01
12-31
01-30
03-01
03-31
05-01
05-31
07-01
07-31
08-30
09-30
Average 1981-2010
2012
2011
2002


Colorado Basin River Forecast Center
Upper Colorado Mainstem Group
To Date: 72% (9.0 / 12.6)
Seasonal: 53% (9.0 / 16.9)
Accumulation rate 0.1 in/day
averaged over last 3 days.
Created 02/21.15:04 UTC
NOAA/CBRFC, 2012
Past
Future
Snow Water Equivalent (in)
Percent Seasonal
Date
0
2
5
8
10
12
15
18
20
22
25
28
30
0
15
30
44
59
74
89
104
118
133
148
163
177
10-01
10-31
12-01
12-31
01-30
03-01
03-31
05-01
05-31
07-01
07-31
08-30
09-30
Average 1981-2010
2012
2011


Colorado Basin River Forecast Center
San Juan Basin Group
To Date: 87% (13.3 / 15.2)
Seasonal: 66% (13.3 / 20.2)
Accumulation rate 0.2 in/day
averaged over last 3 days.
Created 02/21 15:08 UTC
NOAA/CBRFC, 2012
Past
Future
Snow Water Equivalent (in)
Percent Seasonal
Date
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
10-01
10-31
12-01
12-31
01-30
03-01
03-31
05-01
05-31
07-01
07-31
08-30
09-30
Average 1981-2010
2012
2011
2002

Streamflow Update

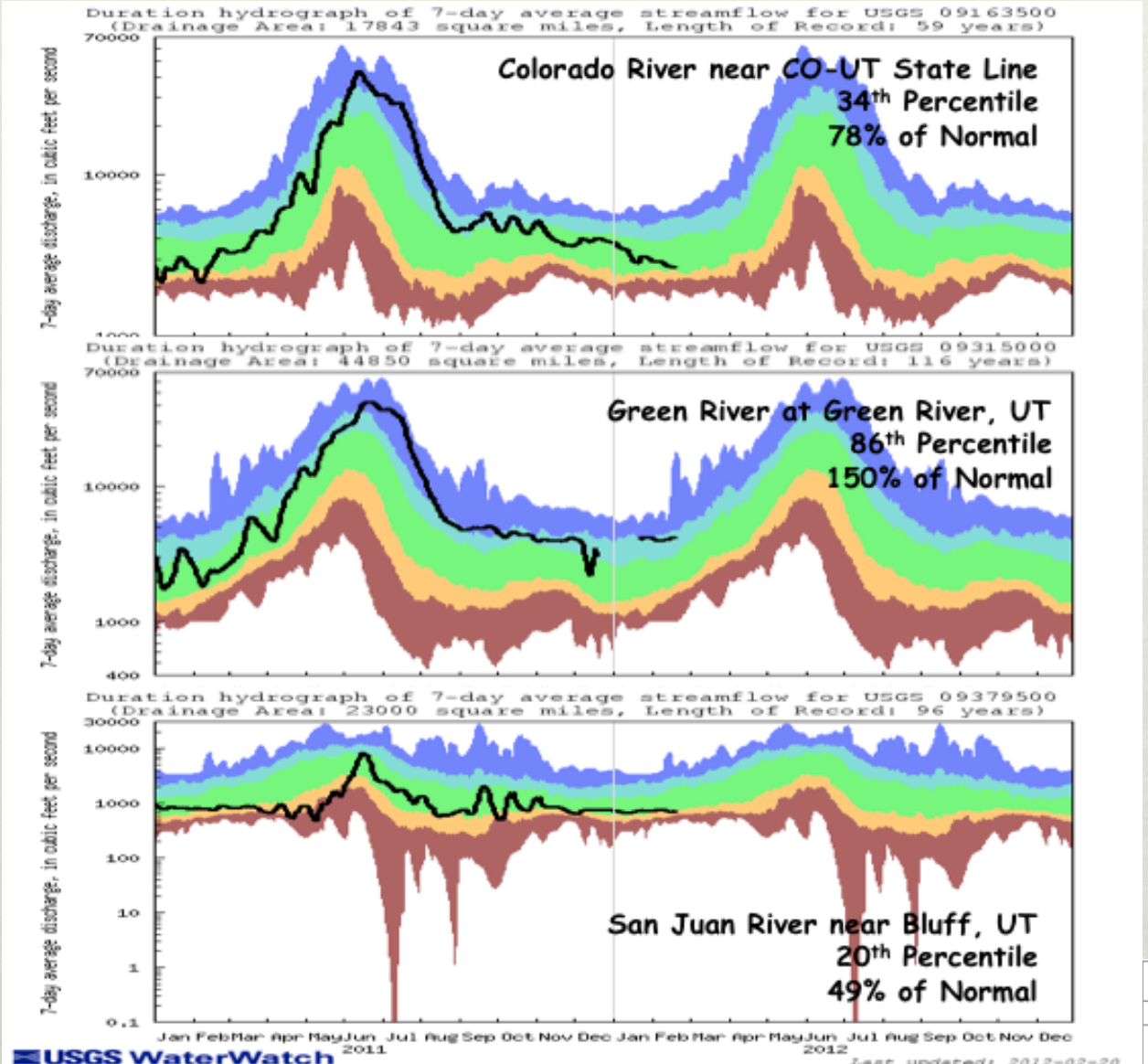
7-Day Average Streamflow
19 February 2012



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		

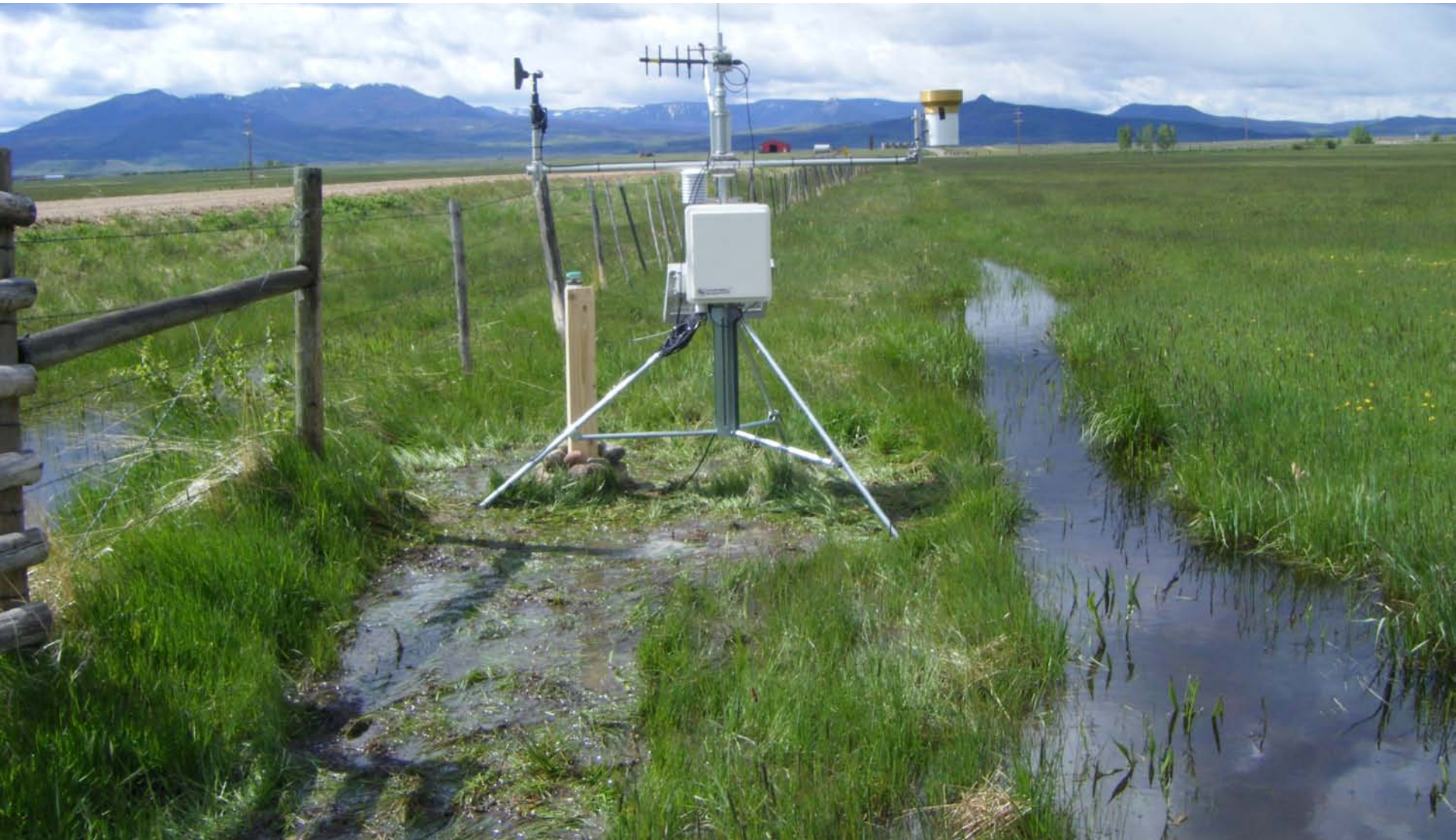
USGS

7-Day Average Hydrographs
19 February 2012

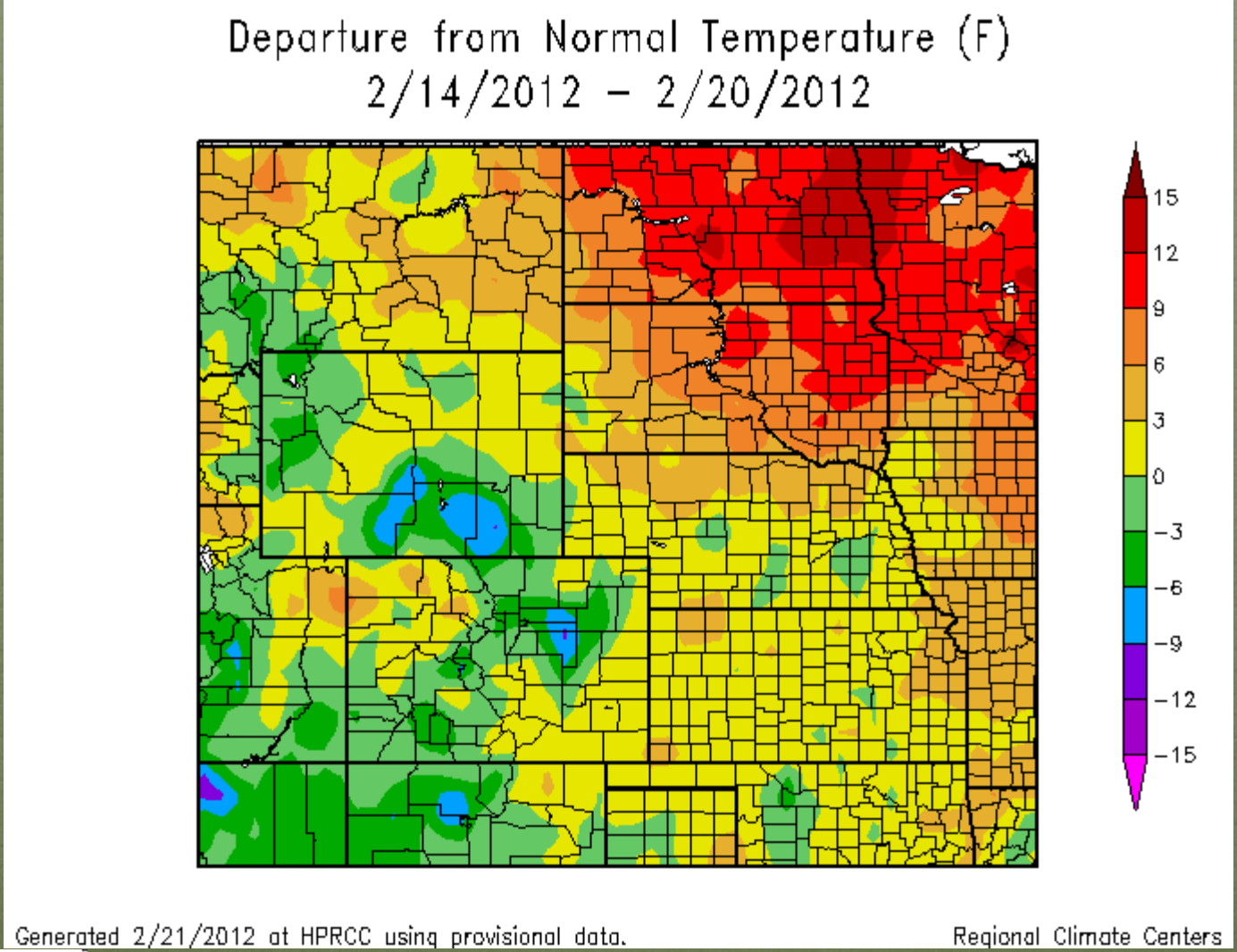


Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Water Demand

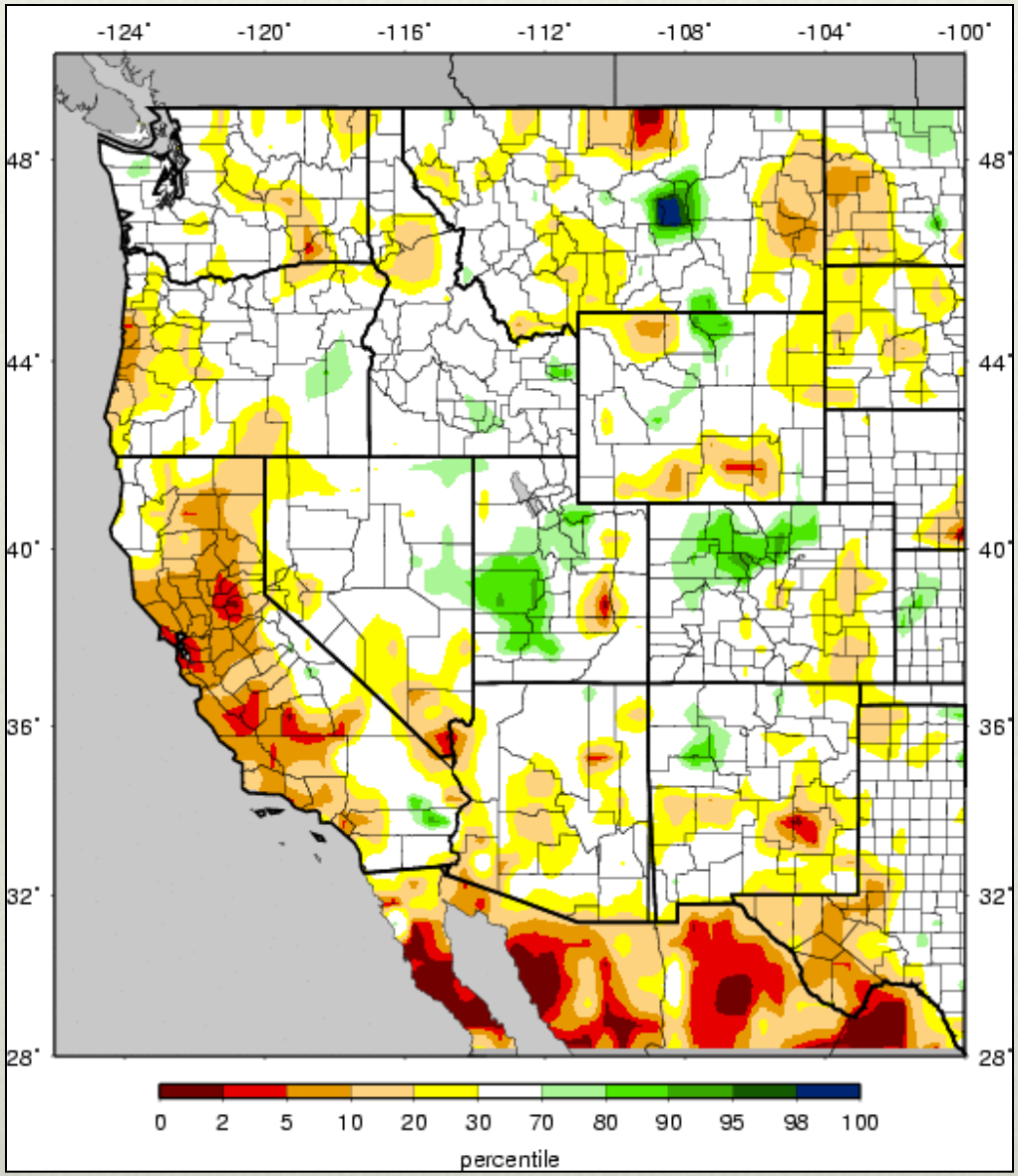


Temperature Departure from Normal 02/14/2012 – 02/20/2012



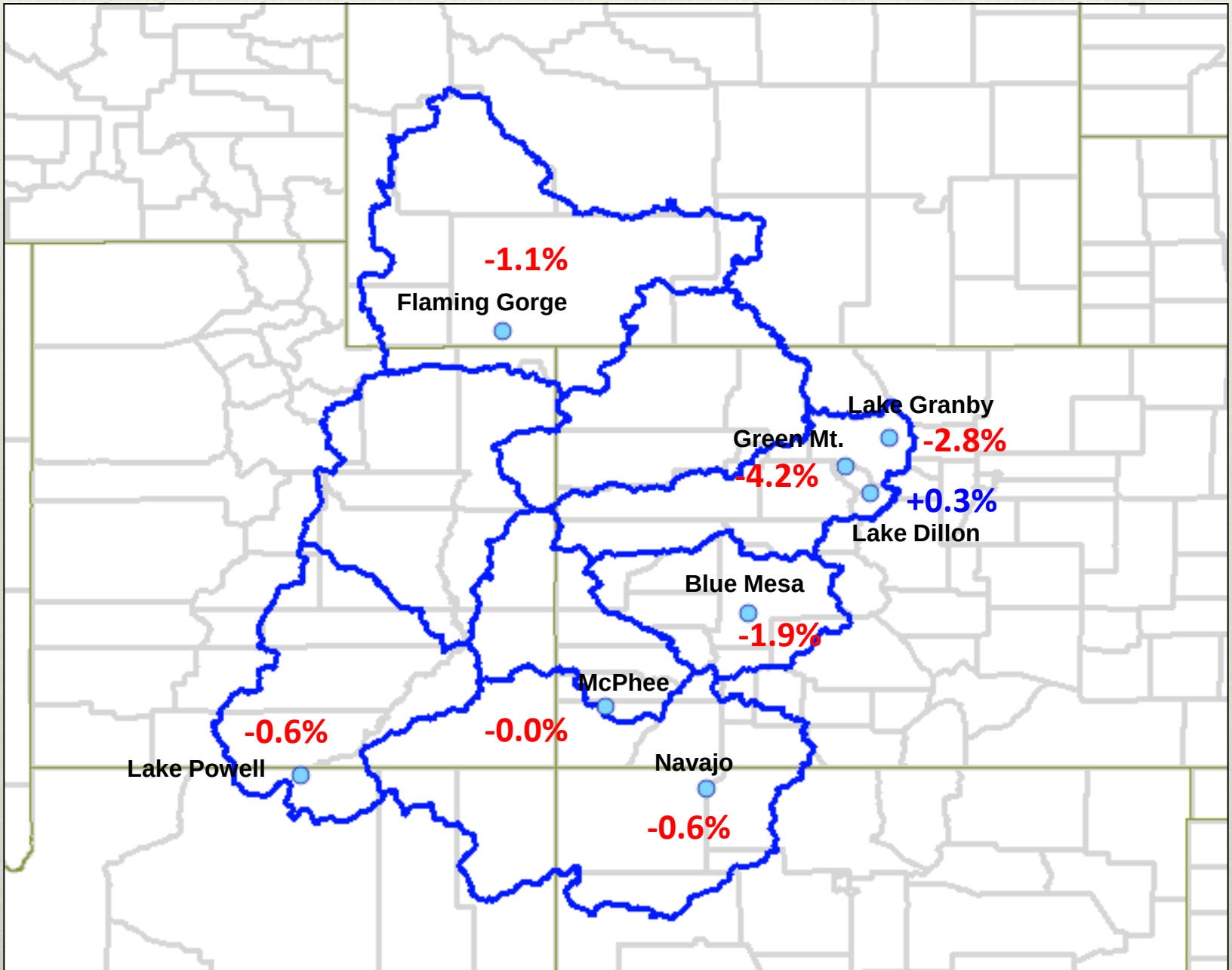
High Plains Regional Climate Center

VIC Soil Moisture
19 February 2012

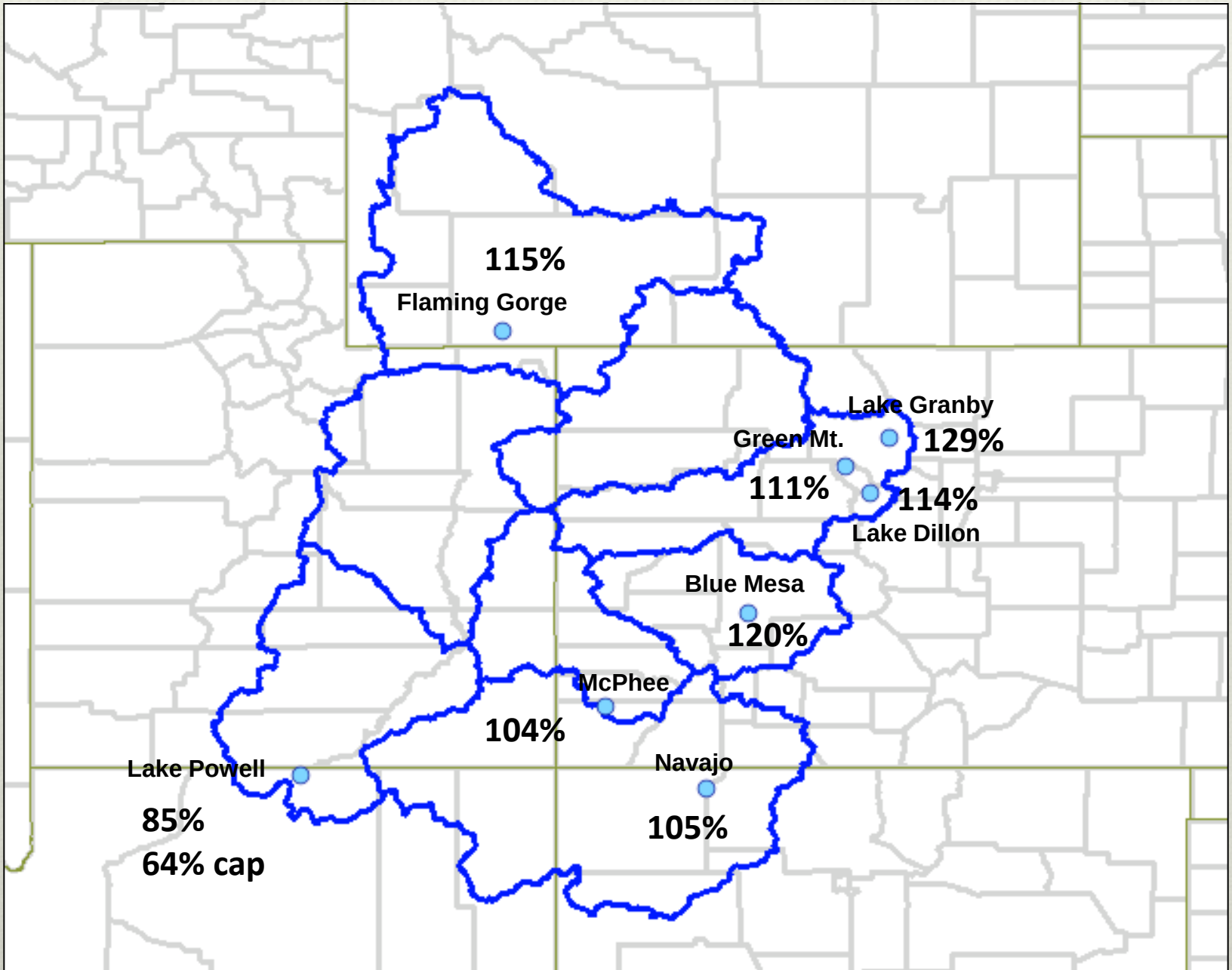


Reservoir Update

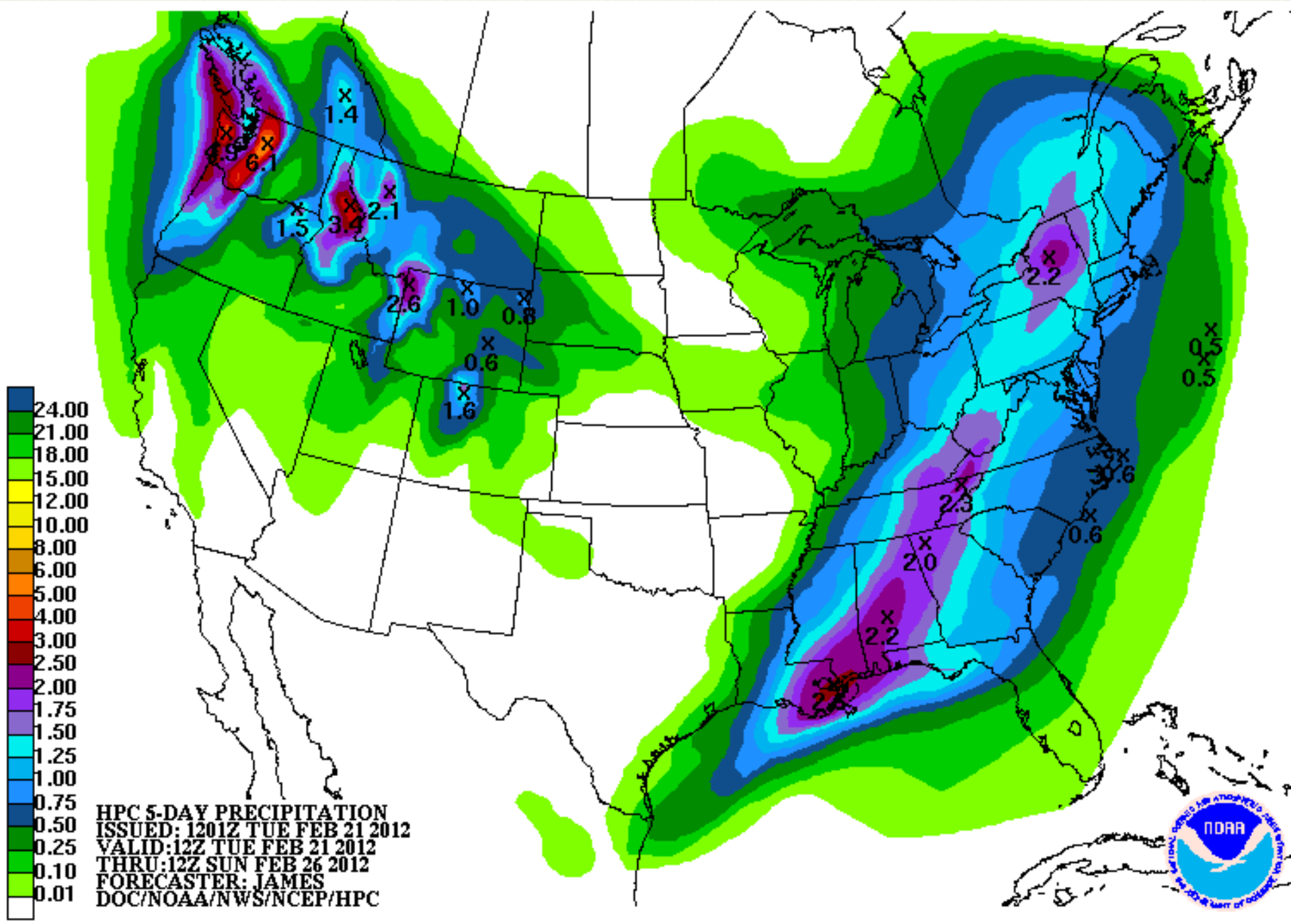
February Reservoir Storage Volume Change



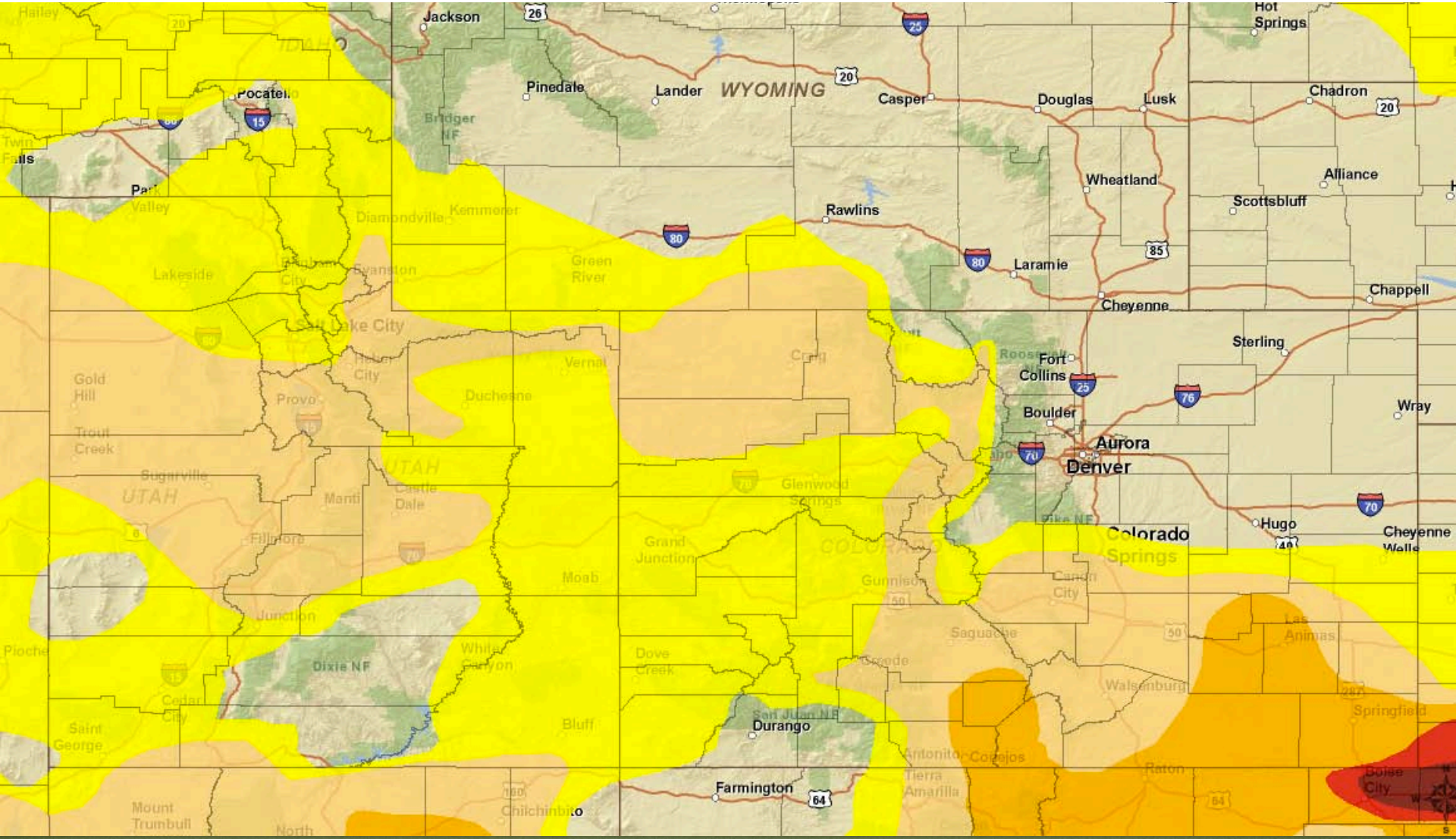
Reservoir Storage as Percent of February Average



Precipitation Forecast


24.00
21.00
18.00
15.00
12.00
10.00
8.00
6.00
5.00
4.00
3.00
2.50
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.10
0.01
HPC 5-DAY PRECIPITATION
ISSUED: 1201Z TUE FEB 21 2012
VALID:12Z TUE FEB 21 2012
THRU:12Z SUN FEB 26 2012
FORECASTER: JAMES
DOC/NOAA/NWS/NCEP/HPC
NOAA

Recommendations



INFO

For more information

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

February 21, 2012

Precipitation and Snowpack

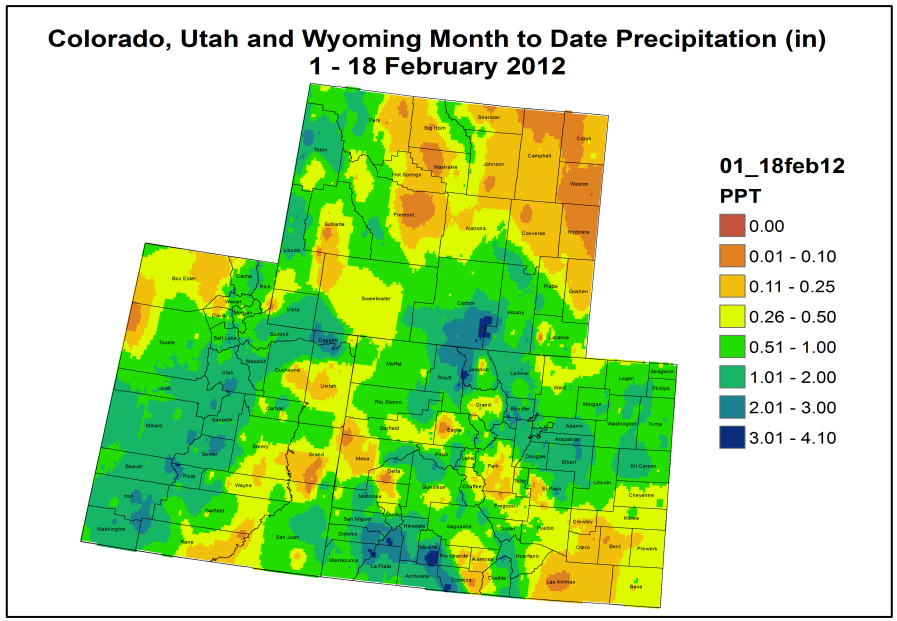


Fig. 1: February month-to-date precipitation in inches.

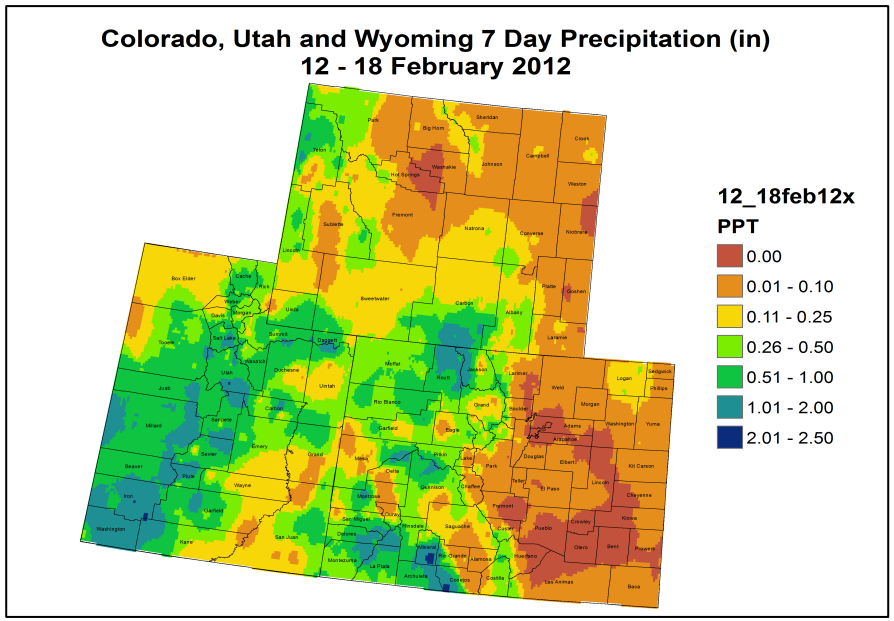


Fig. 2: February 12 – 18 precipitation in inches.

For the month of February so far, precipitation has favored the higher elevations of the Upper Colorado River Basin (UCRB, Fig. 1). Since the beginning of the month, the northern and central mountains of Colorado, the Wasatch range in Utah, and the San Juan mountains in southern CO have seen accumulations of around an inch to 3 inches, which is about average for this time of year. The lower elevations in southwest Wyoming and in eastern UT and western CO have been drier, with many areas receiving less than half an inch for the month. East of the basin, northeast CO has received between half an inch to 2 inches of moisture, while southeast CO and the San Luis Valley have received less than half an inch.

Last week, precipitation totals of half an inch to 2 inches were reported in the northern CO mountains, in the Wasatch mountains, and over the San Juan mountains (Fig. 2). The northern part of the basin and the lower elevations did not benefit as much from storms, with many of those areas receiving less than a quarter inch of precipitation for the week. Little to no precipitation fell in eastern CO or the San Luis Valley.

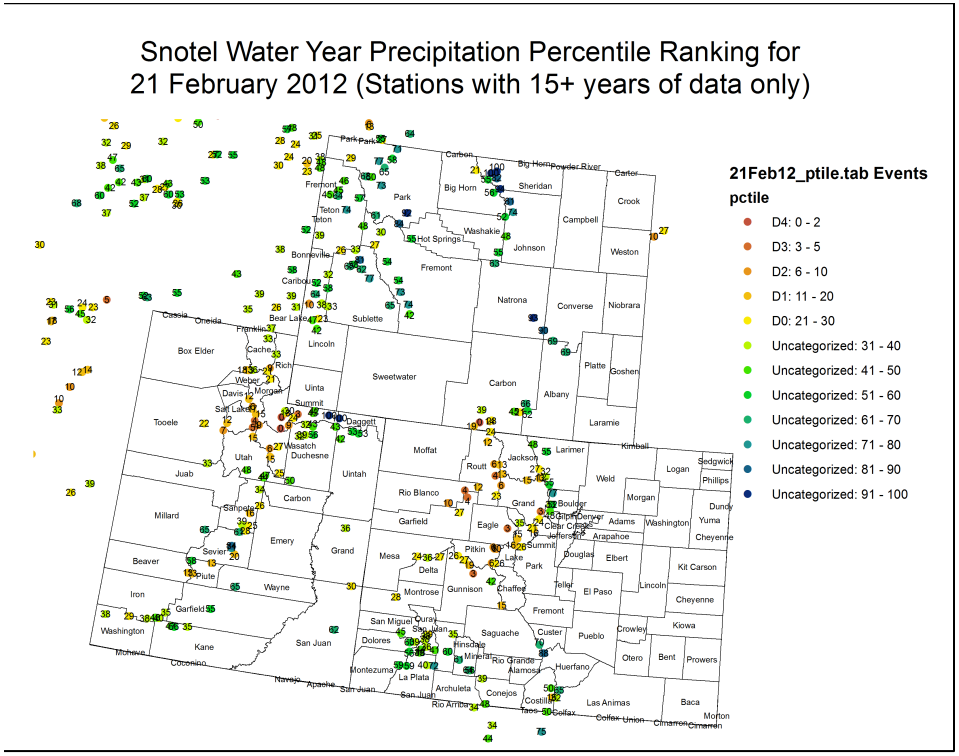


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor D0 category).

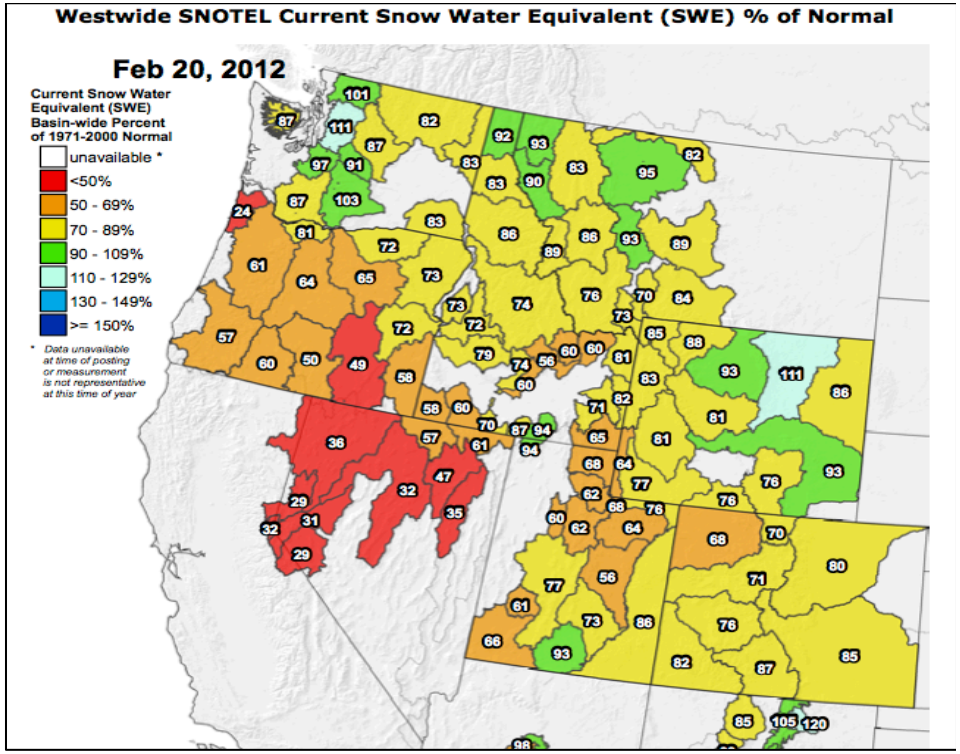


Fig. 4: Basin snow water equivalent (SWE) as a percent of average.

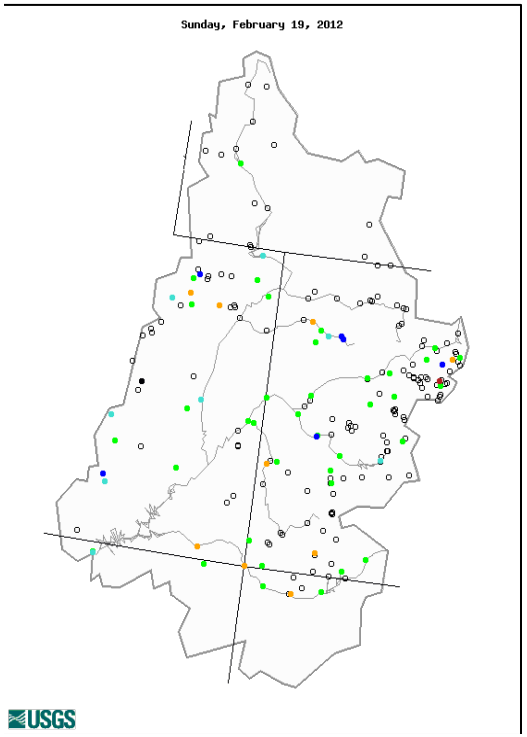
Water-year-to-date (WYTD), SNOTEL precipitation percentiles are low for much of the Yampa and Colorado headwaters basins, and along the Wasatch range in UT (Fig. 3). Percentiles in those areas range from the single digits to around the 20th percentile, with the higher values mainly in the Uintas in UT or east of the Continental Divide in CO. The Gunnison basin is also dry, recording between the 20th and 30th percentiles. SNOTEL percentiles in the Upper Green basin in WY are generally above the 50th percentile, and most in the San Juan basin in southern CO are near the 50th percentile.

Snowpack conditions around the UCRB are all below normal (Fig. 4) with most of the sub-basins recording 85% of average or less for snowpack. The southern part of the basin is showing around 75% to 85% of average snowpack for the season, while northwest CO and areas in northeast UT are drier, with less than 70% of average snowpack. After a wet January, the northern portion of the basin has seen dropping percentages and is now showing around 80% of average snowpack.

Streamflow

As of February 19th, 85% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). About 25% of the gages in the basin are recording above normal flows, while about 15% of the gages in the basin are recording below normal flows. The number of reporting gages in the basin has increased over the past week from under 50 to over 60, indicating warmer temperatures causing some early season melting. There are currently 10 gages, scattered throughout the basin, recording below normal flows.

Key gages throughout the basin are showing variable conditions (Fig. 6). Flows on the Colorado River near the CO-UT state line have been steadily dropping since the beginning of the calendar year and are now recording at the low end of the normal range at the 34th percentile. The San Juan River near Bluff, UT is now recording below normal flows at the 20th percentile. The Green River near Green River, UT is recording at the 86th percentile (above normal flow).



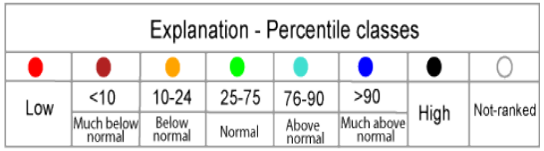


Fig. 5: 7-day average discharge compared to historical discharge for February 19th.

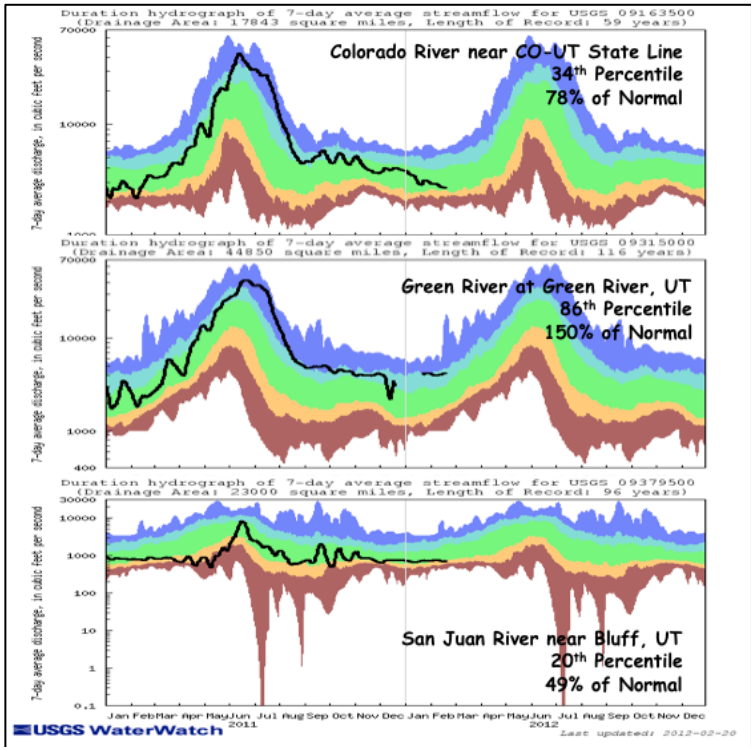


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Much of the UCRB saw warmer than average temperatures last week, with some areas in northwest CO and northeast UT seeing temperatures more than 3 degrees warmer than average. The southern part of the basin was slightly cooler than average. Cooler than average temperatures were also prevalent east of the basin. The VIC model continues to show dry soil moisture conditions in southeast CO, in UT around the Colorado River valley, and in southern WY (Fig. 7). The VIC shows wet soils around the Colorado headwaters region and in the Wasatch mountains. Near normal soil moisture conditions are being observed in the Four Corners and San Juan mountains region and in the northern part of the UCRB.

All of the major reservoirs above Lake Powell are above their February averages. Most reservoirs saw storage decreases in January, which is normal for this time of year. However, some showed decreases less than what is normal for this time of year. In February, Lake Powell, Navajo, and McPhee have seen very minor decreases while Dillon has increased slightly. Lake Powell is currently at 85% of average and 64% of capacity (compared to 56% one year ago).

Precipitation Forecast

A large ridge of high pressure will be forming over the west coast putting the UCRB under a moist northwest flow for most of the upcoming week. This type of pattern tends to favor the northern mountains of the basin, especially the Park and Elkhead ranges where the precipitation amounts are likely to be highest. Snowfall will be enhanced by several weak disturbances moving through the brisk northwest flow, and periods of heavy snow for the above mentioned areas are likely on Wednesday morning and again on Thursday. By Friday liquid accumulations are expected to range from 1.00 to 1.50 inches across the northern mountains with localized accumulations of near 1.75 inches on favored northwest slopes (Fig. 8). The absence of a large storm system will limit precipitation in valley locations to less than 0.25 inches across the northern reaches of the basin, with little or no precipitation expected for the Four Corners region. The west coast ridge shifts over the UCRB for the weekend, but will be progressive as the next series of Pacific storms brings a return to unsettled conditions for early next week.

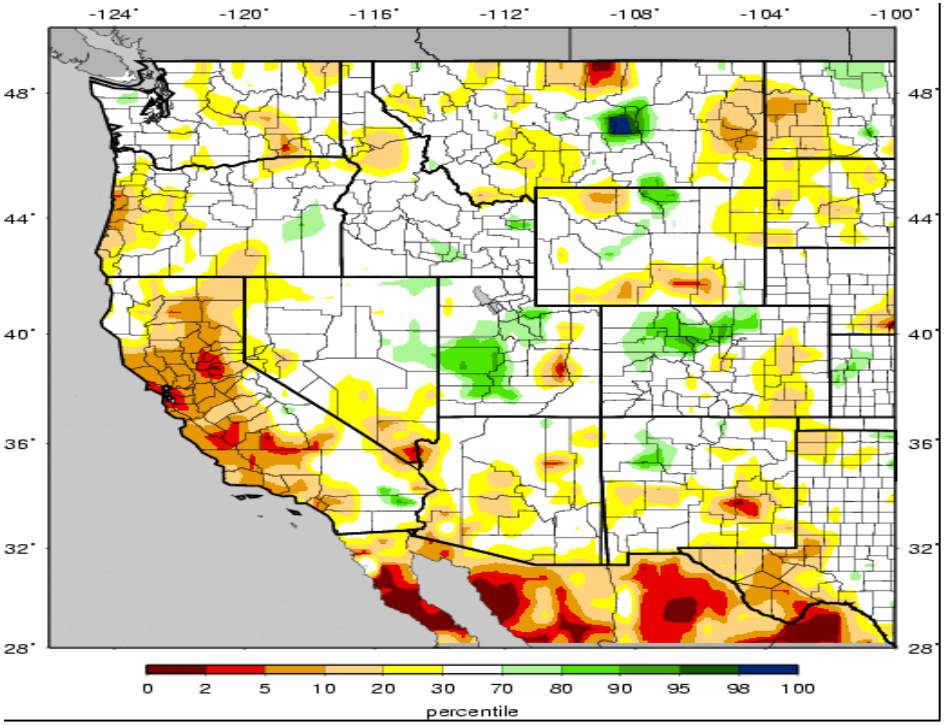


Fig. 7: VIC soil moisture percentiles as of February 19th.

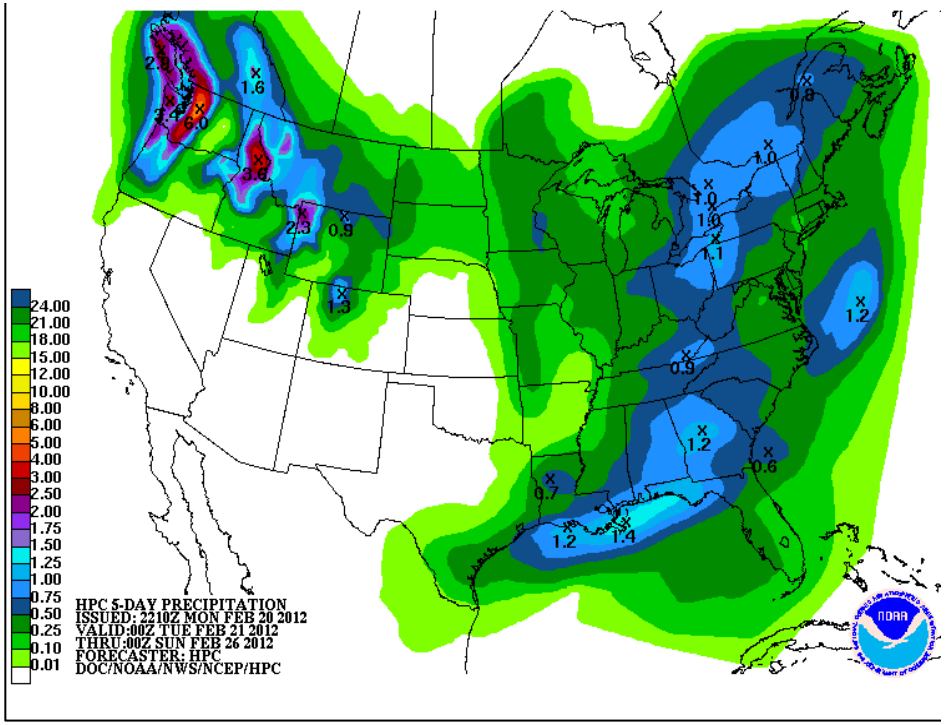


Fig. 8: HPC Quantitative Precipitation Forecast (QPF) through 0Z Sunday.

Drought and Water Discussion

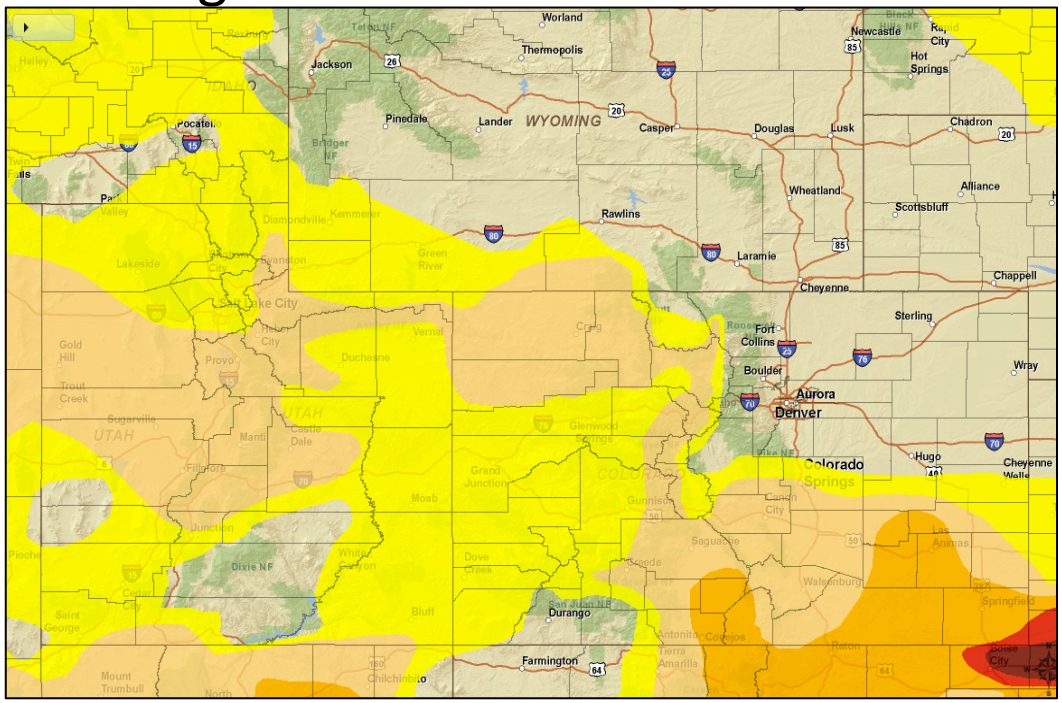


Fig. 9: February 14th release of U.S. Drought Monitor for the UCRB

Drought – Exceptional		0 to 2 (D4)
Drought – Extreme		2 to 5 (D3)
Drought – Severe		5 to 10 (D2)
Drought – Moderate		10 to 20 (D1)
Abnormally Dry		20 to 30 (D0)

Drought categories and their associated percentiles

Status quo is recommended for the UCRB in the current depiction of the U.S. Drought Monitor (USDM) map (Fig. 9). Most of the higher elevations received near to slightly below average precipitation for the week, preventing any further degradations at this time. With the lower elevations not benefiting from many of the recent storms over the basin, and only minor accumulations in the short-term forecast, the area could see some possible degradations in the USDM next week. An expansion of the D1 to cover the lower elevations of western CO and eastern UT can be expected as a topic of discussion next week.

Status quo is again recommended for eastern CO.