

**Spring
2011**



April 26th, 2011

NIDIS - UPPER COLORADO BASIN PILOT PROJECT

Weekly Climate, Water & Drought Assessment

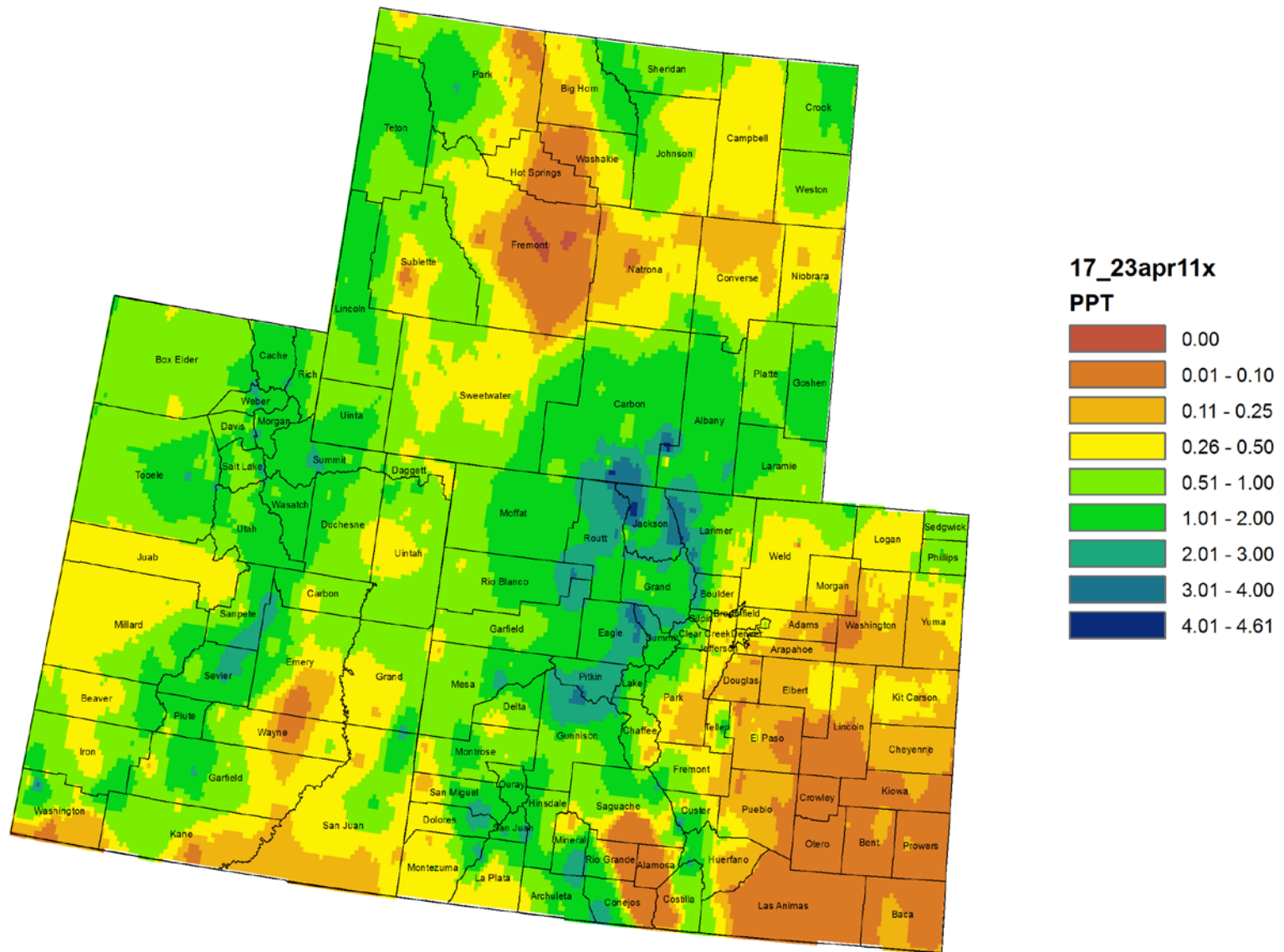
Today's Agenda

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

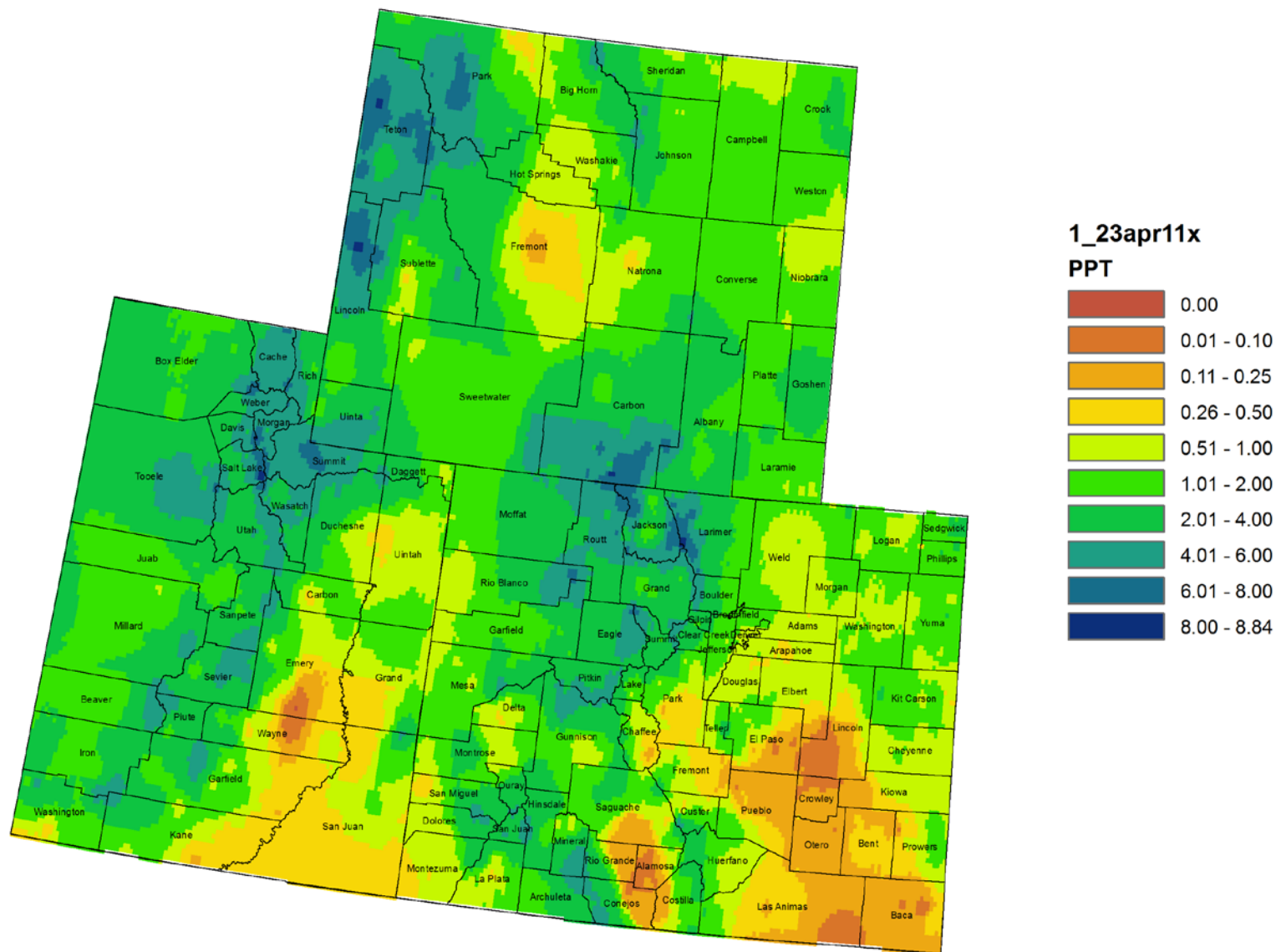
Precipitation/Snowpack Update



Colorado, Utah and Wyoming 7 Day Precipitation (in) 17 - 23 April 2011

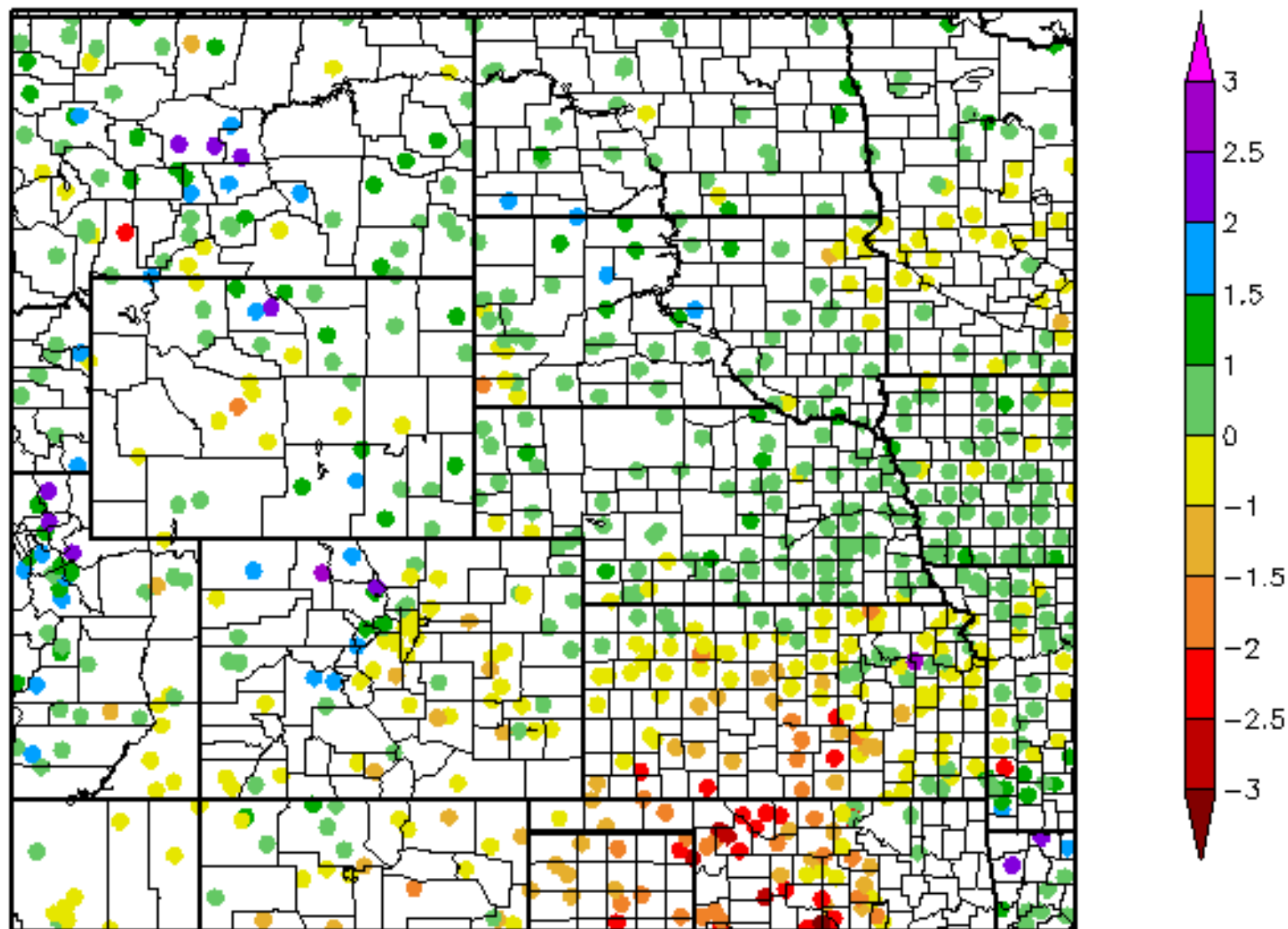


Colorado, Utah and Wyoming April Month to Date Precipitation (in) 1 - 23 April 2011



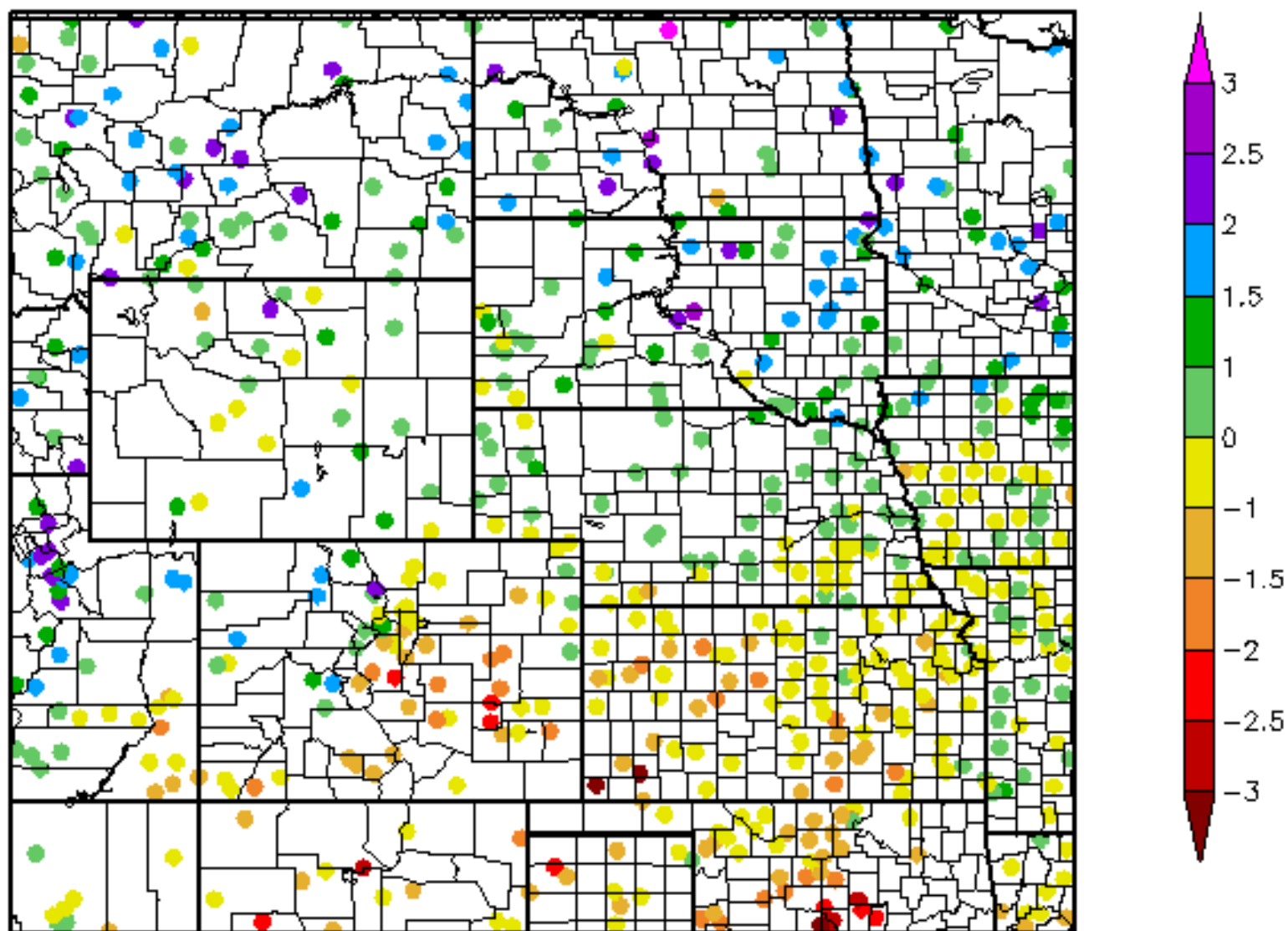
30 Day SPI

3/27/2011 - 4/25/2011



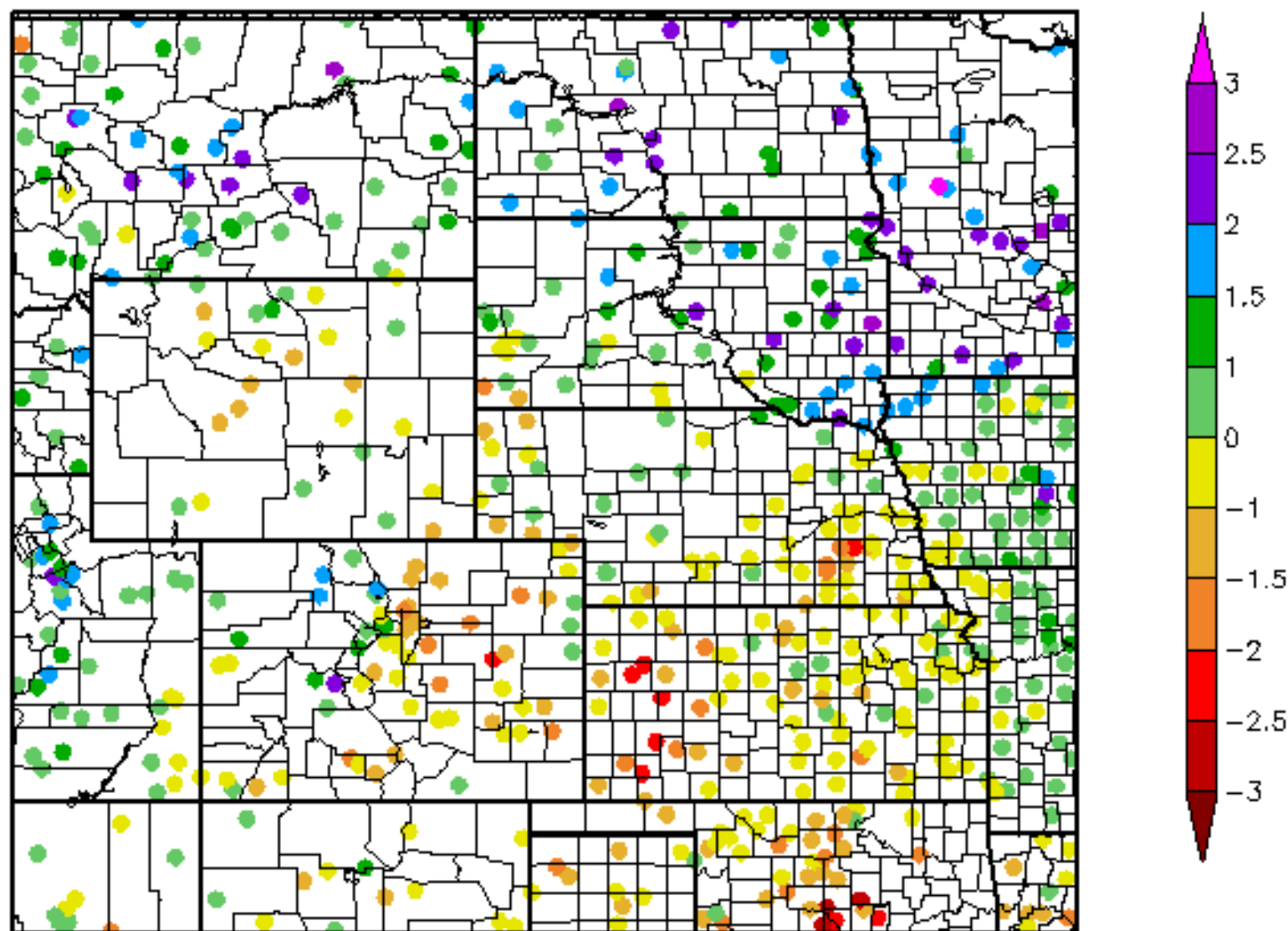
6 Month SPI

10/25/2010 - 4/24/2011

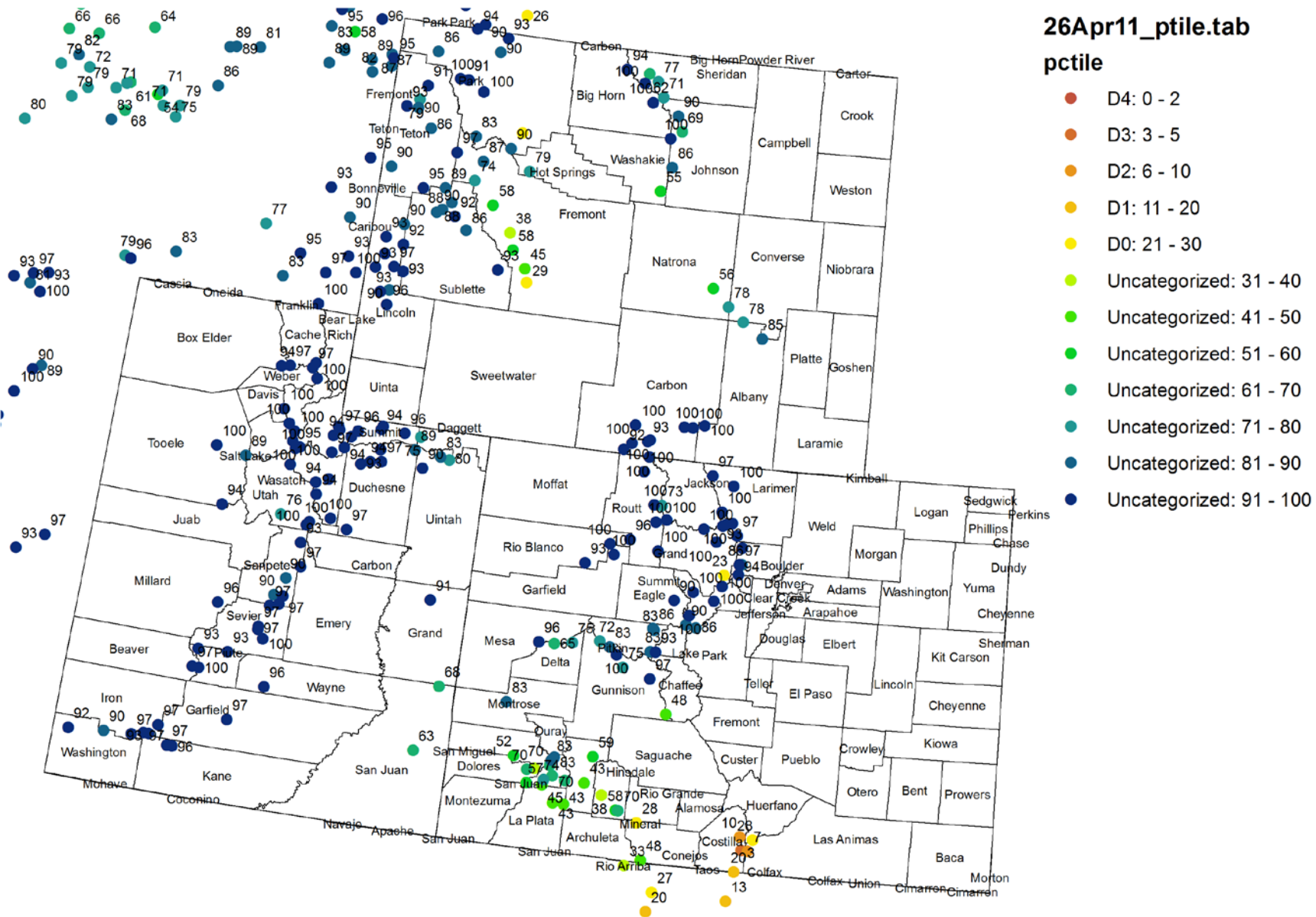


9 Month SPI

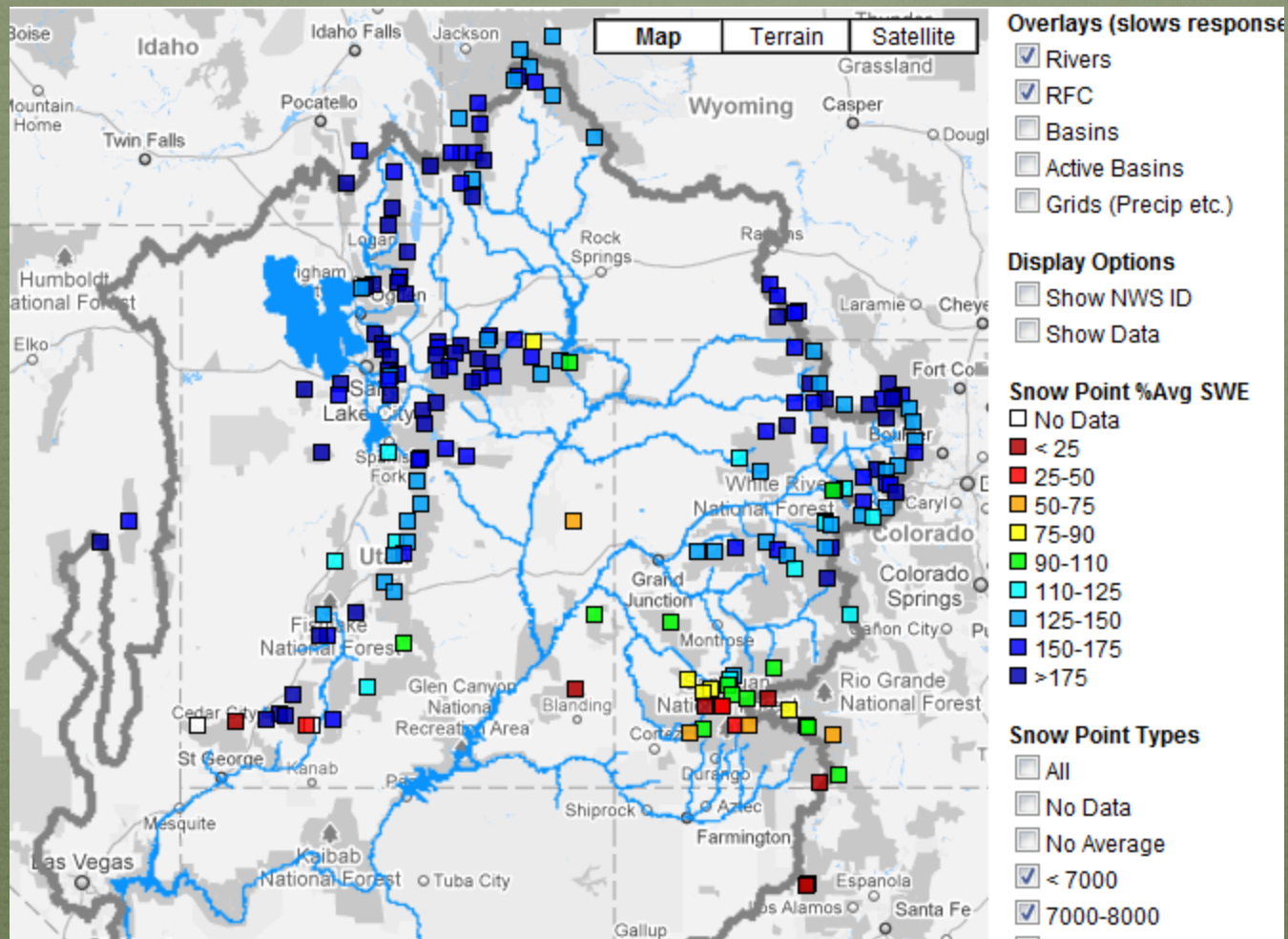
7/25/2010 - 4/24/2011



Snotel Water Year Precipitation Percentile Ranking 26 April 2011 (Stations with 20+ years of data only)

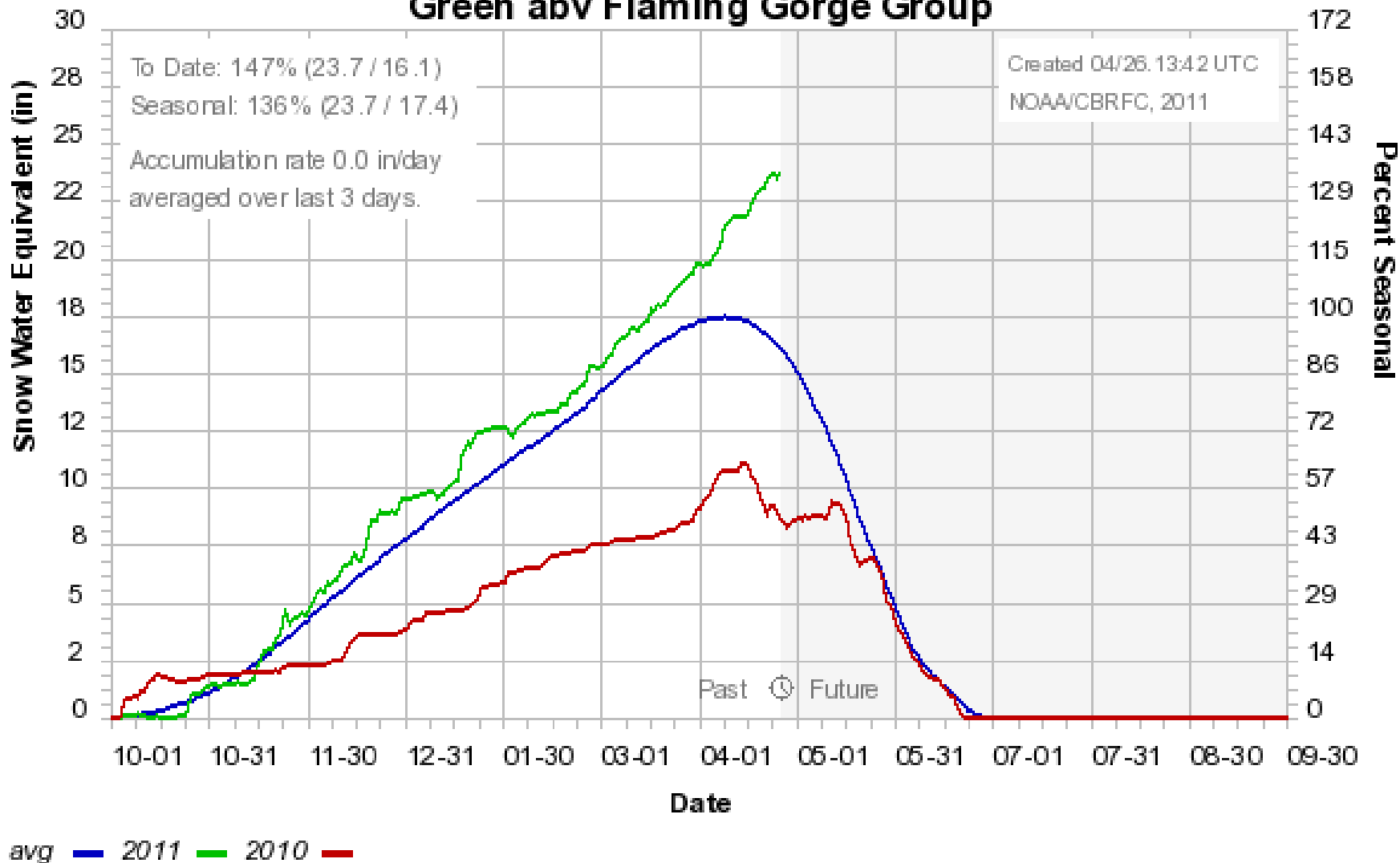


Upper Colorado River Basin Snow



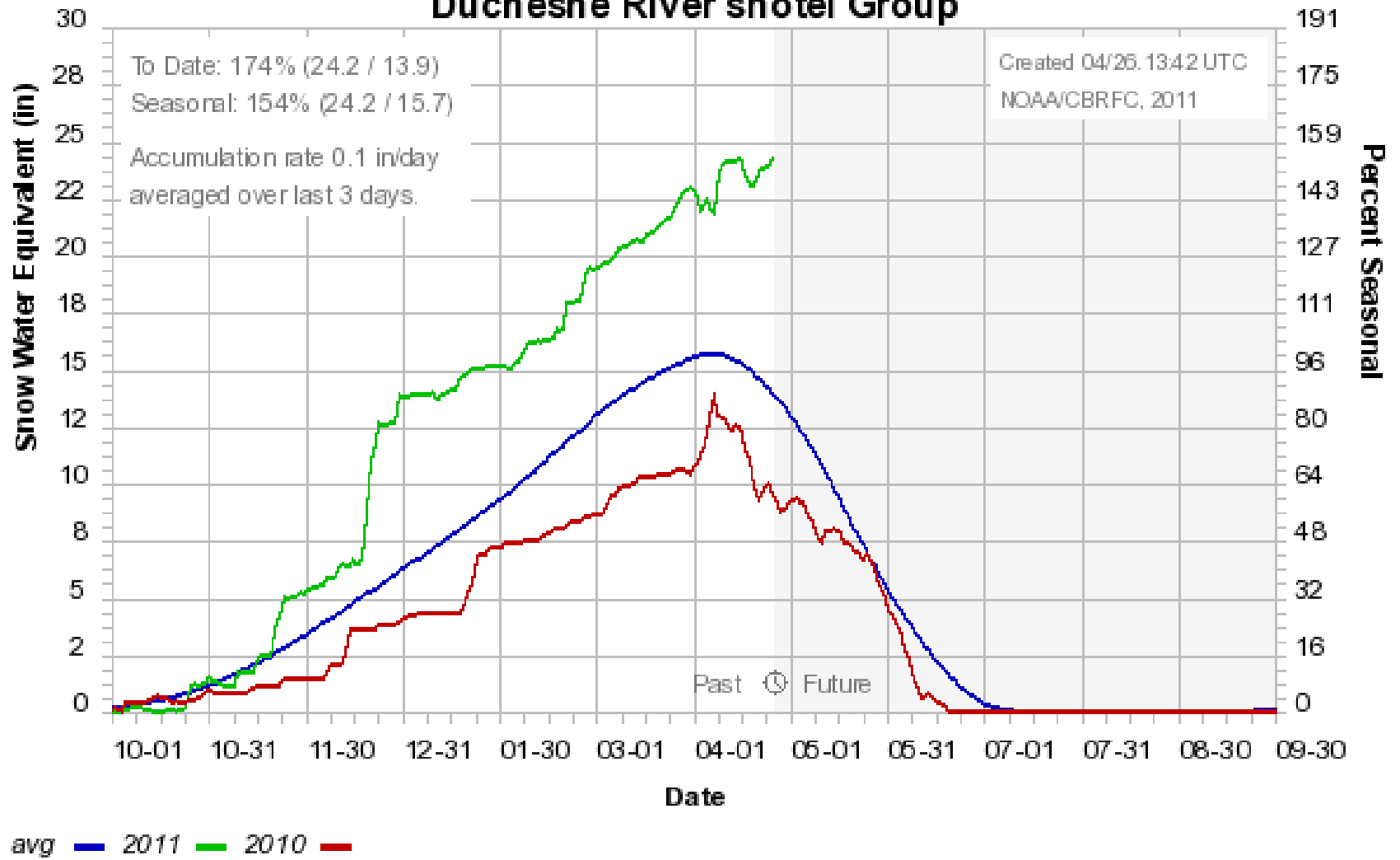
Colorado Basin River Forecast Center

Green abv Flaming Gorge Group



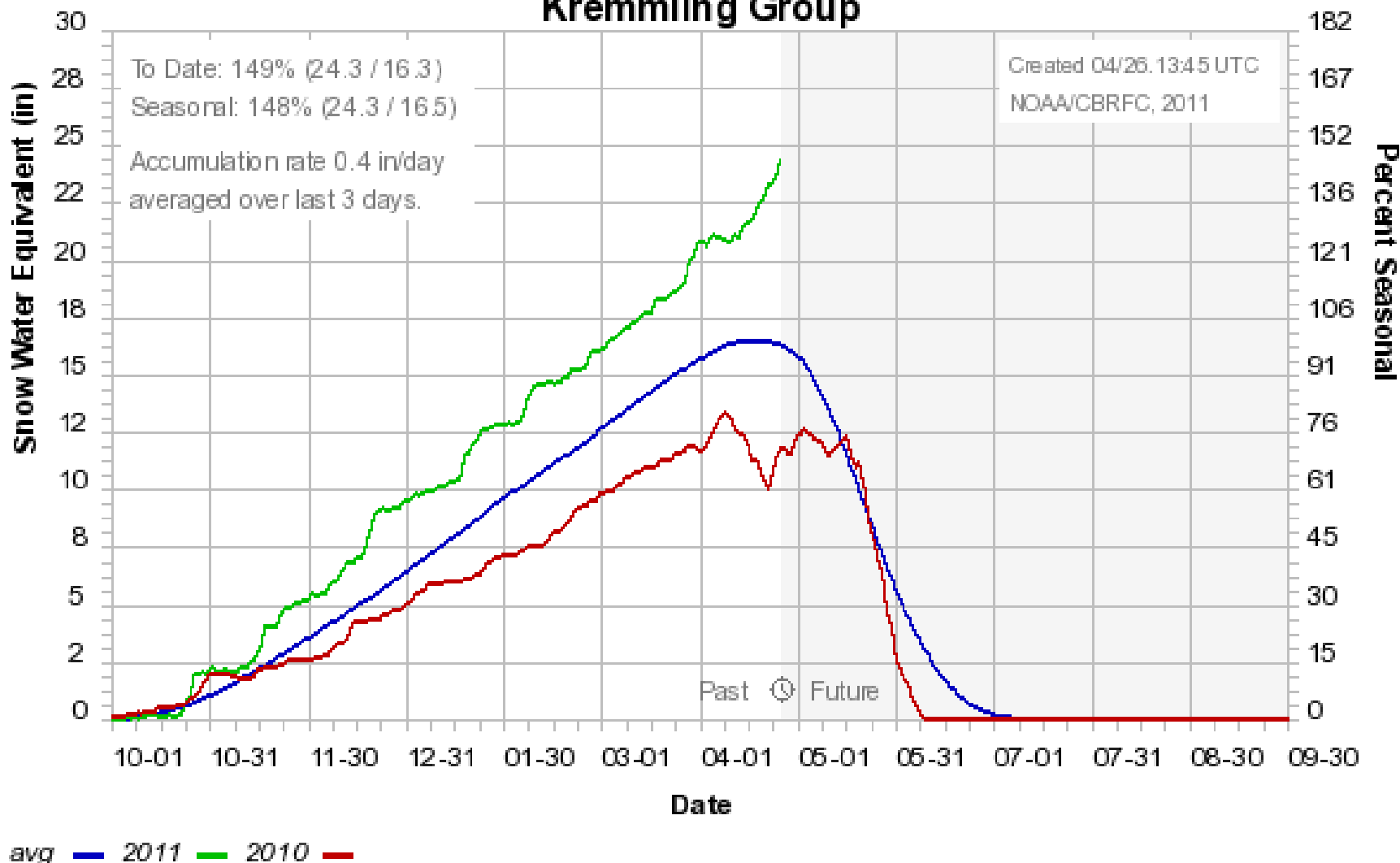
Snowpack % of average to date: 147%
Percent of average peak: 136%

Colorado Basin River Forecast Center Duchesne River snotel Group



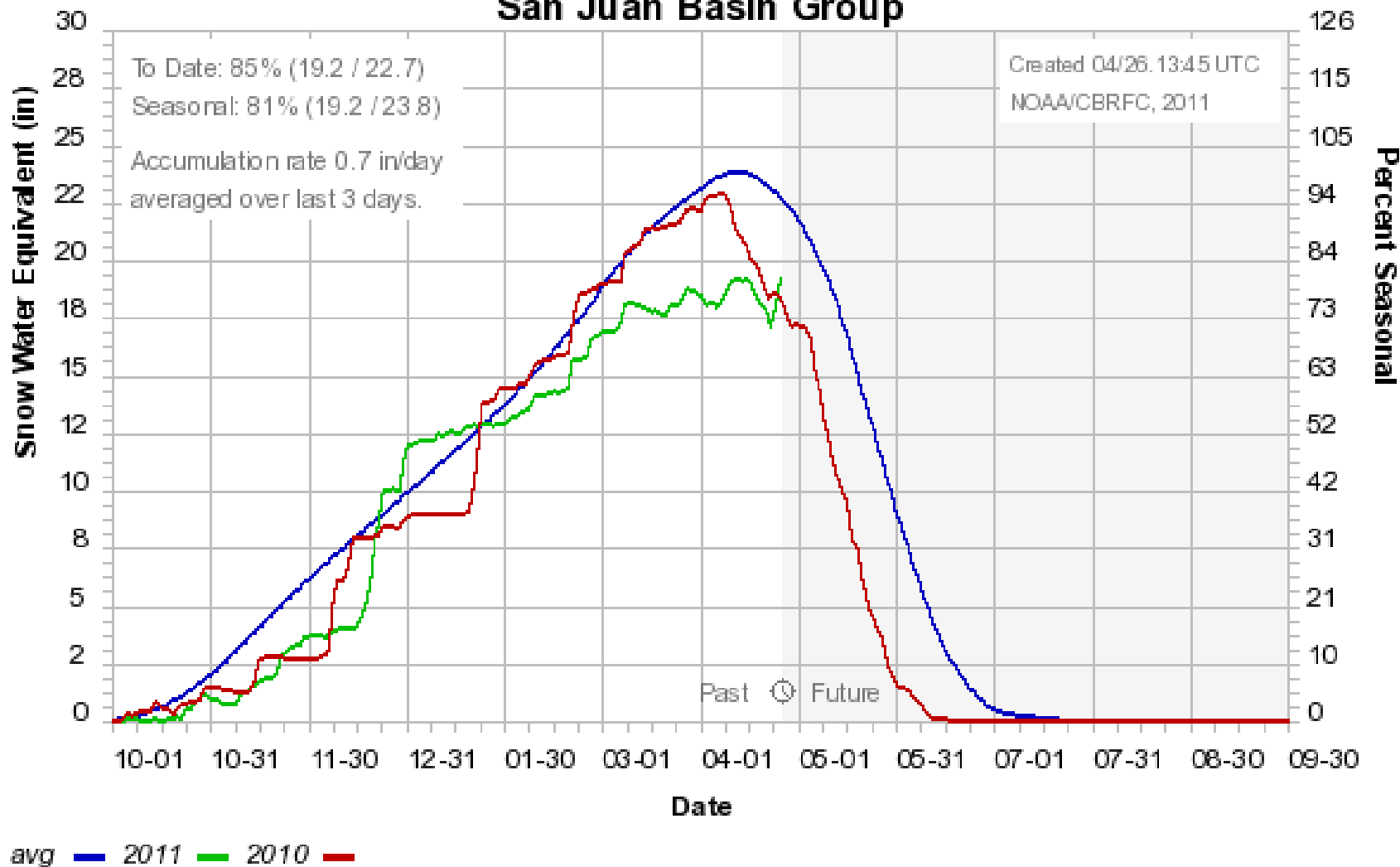
Snowpack % of average to date: 174%
Percent of average peak: 154%

Colorado Basin River Forecast Center Kremmling Group



Snowpack % of average to date: 149%
Percent of average peak: 148%

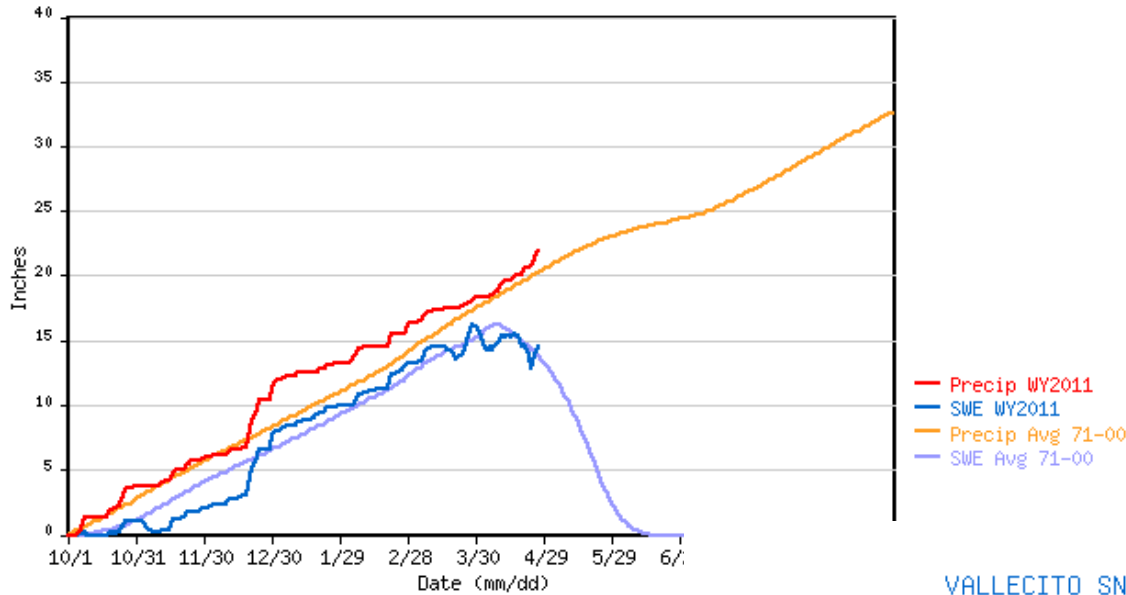
Colorado Basin River Forecast Center San Juan Basin Group



Snowpack % of average to date: 85%
Percent of average peak: 81%

MINERAL CREEK SNOTEL for Water Year 2011

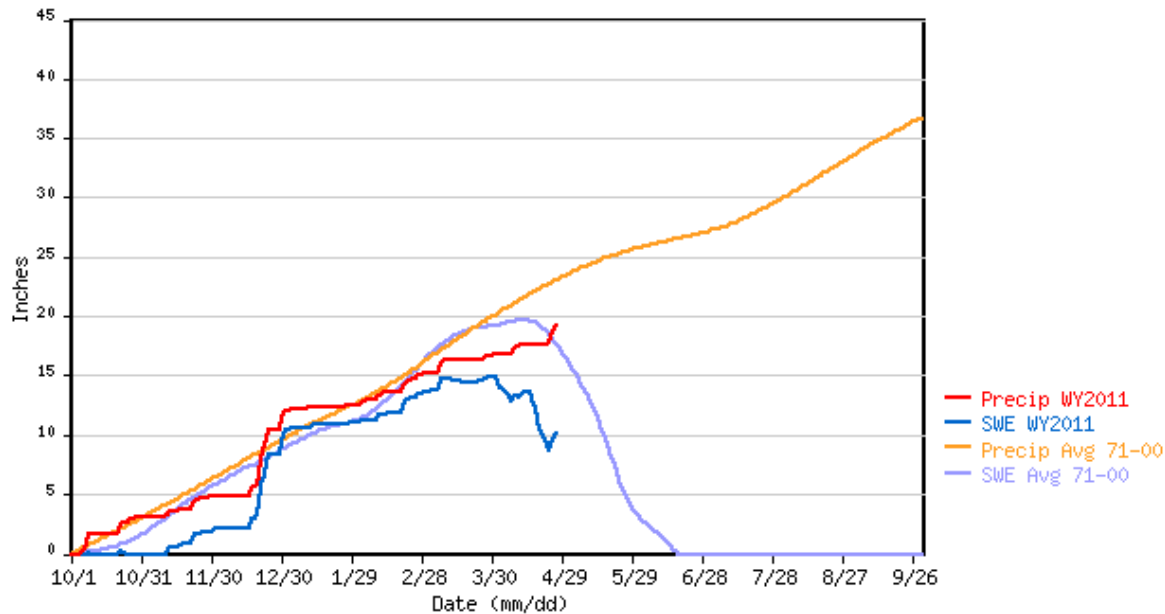
*** Provisional Data, Subject to Change ***



Mineral Creek Snotel
106% Snowpack to date
91% Seasonal Average

VALLECITO SNOTEL for Water Year 2011

*** Provisional Data, Subject to Change ***



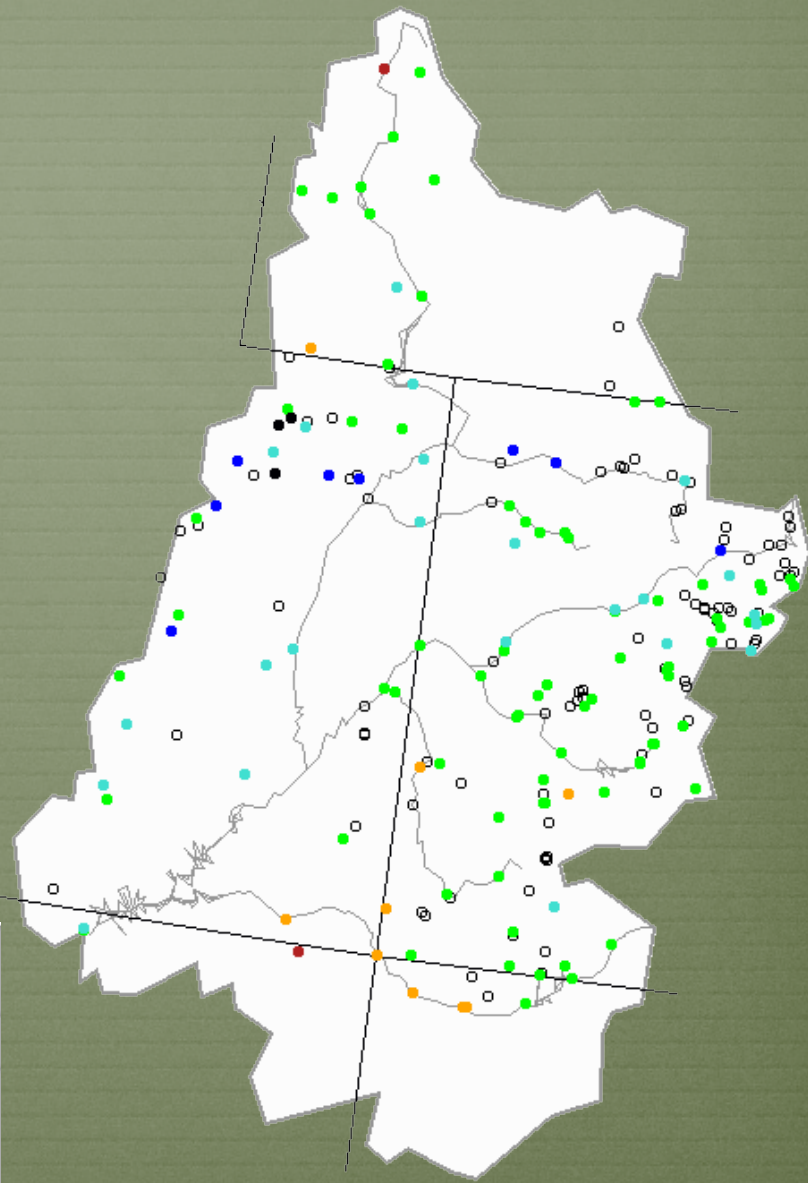
Vallecito Snotel
58% Snowpack to date
52% Average peak

Streamflow Update

Michael Lewis USGS



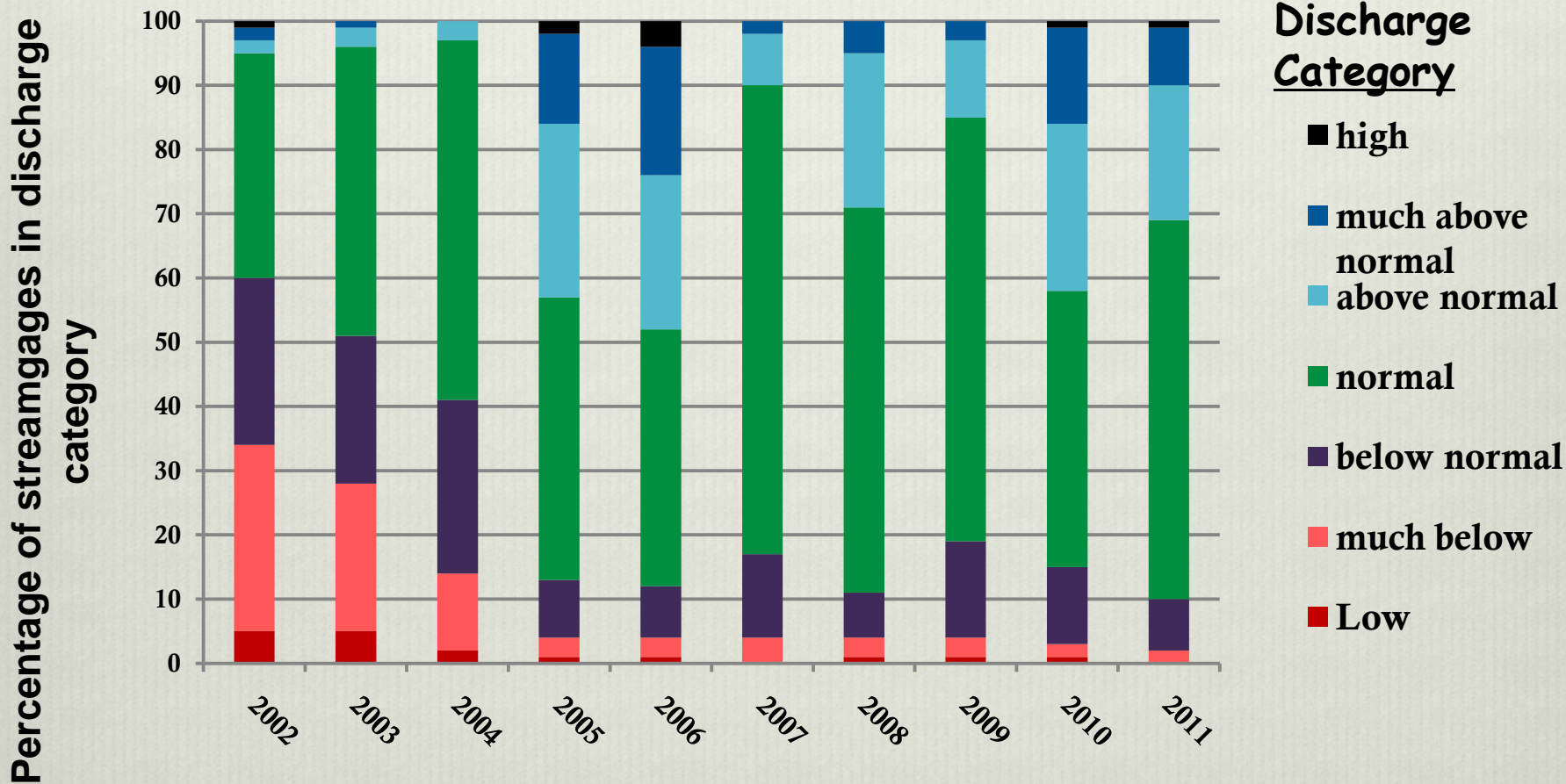
7-day average discharge compared to historical discharge for the day of the year (April 24)



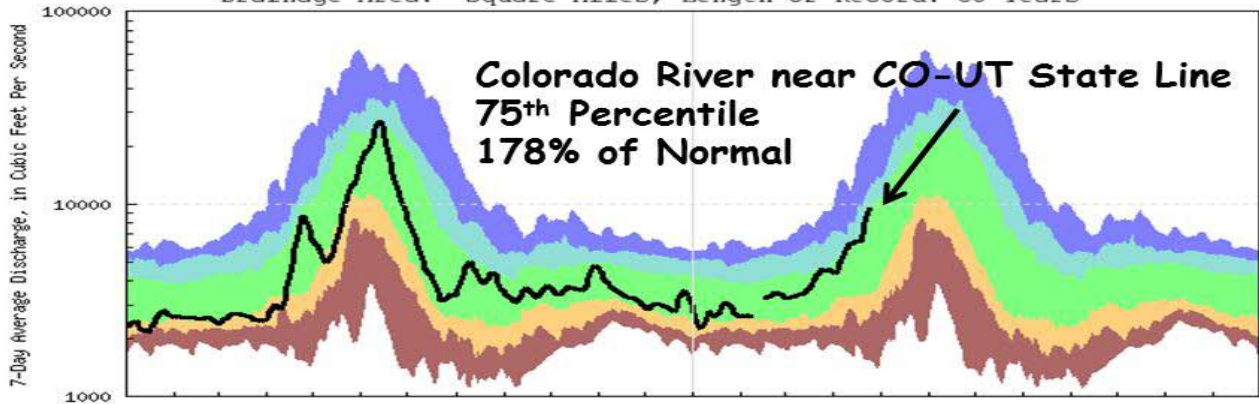
Explanation - Percentile classes

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

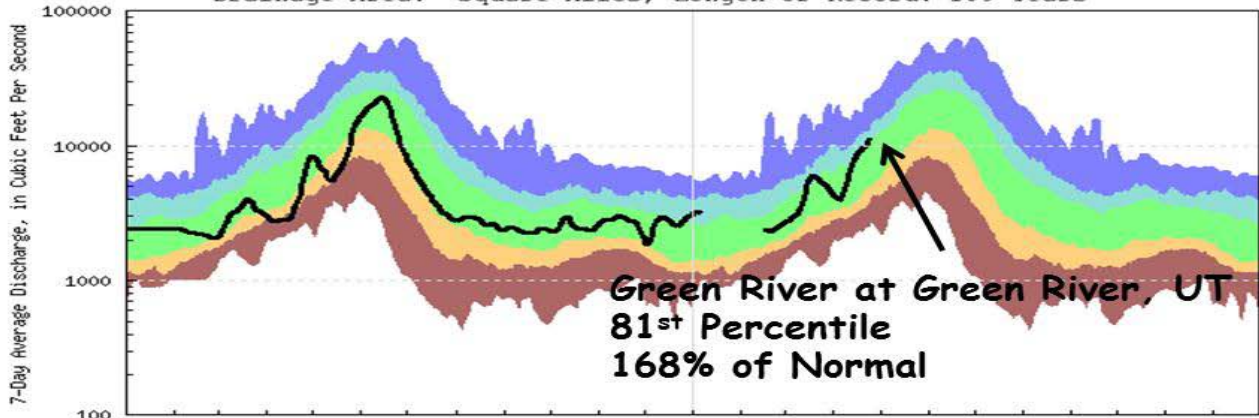
-Upper Colorado River Basin- Comparison of 7-day Average Discharge For April 24, 2002-2011



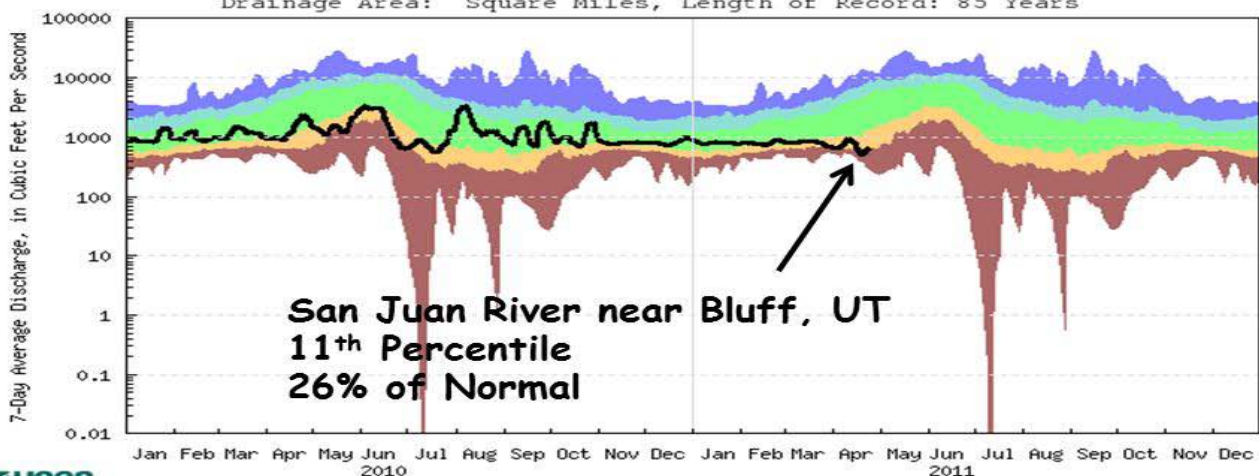
USGS 09163500 COLORADO RIVER NEAR COLORADO-UTAH STATE LINE
Drainage Area: Square Miles, Length of Record: 58 Years

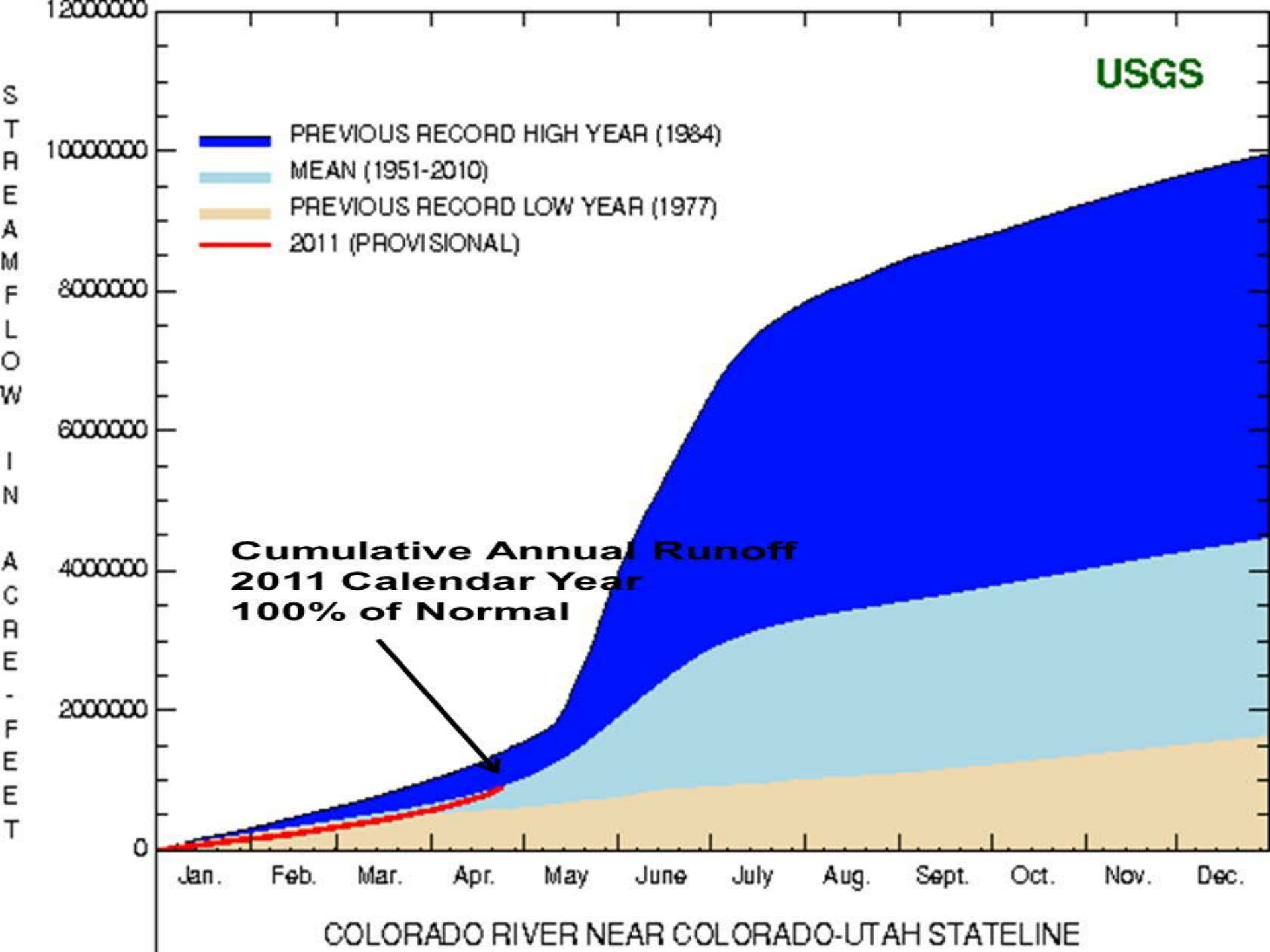


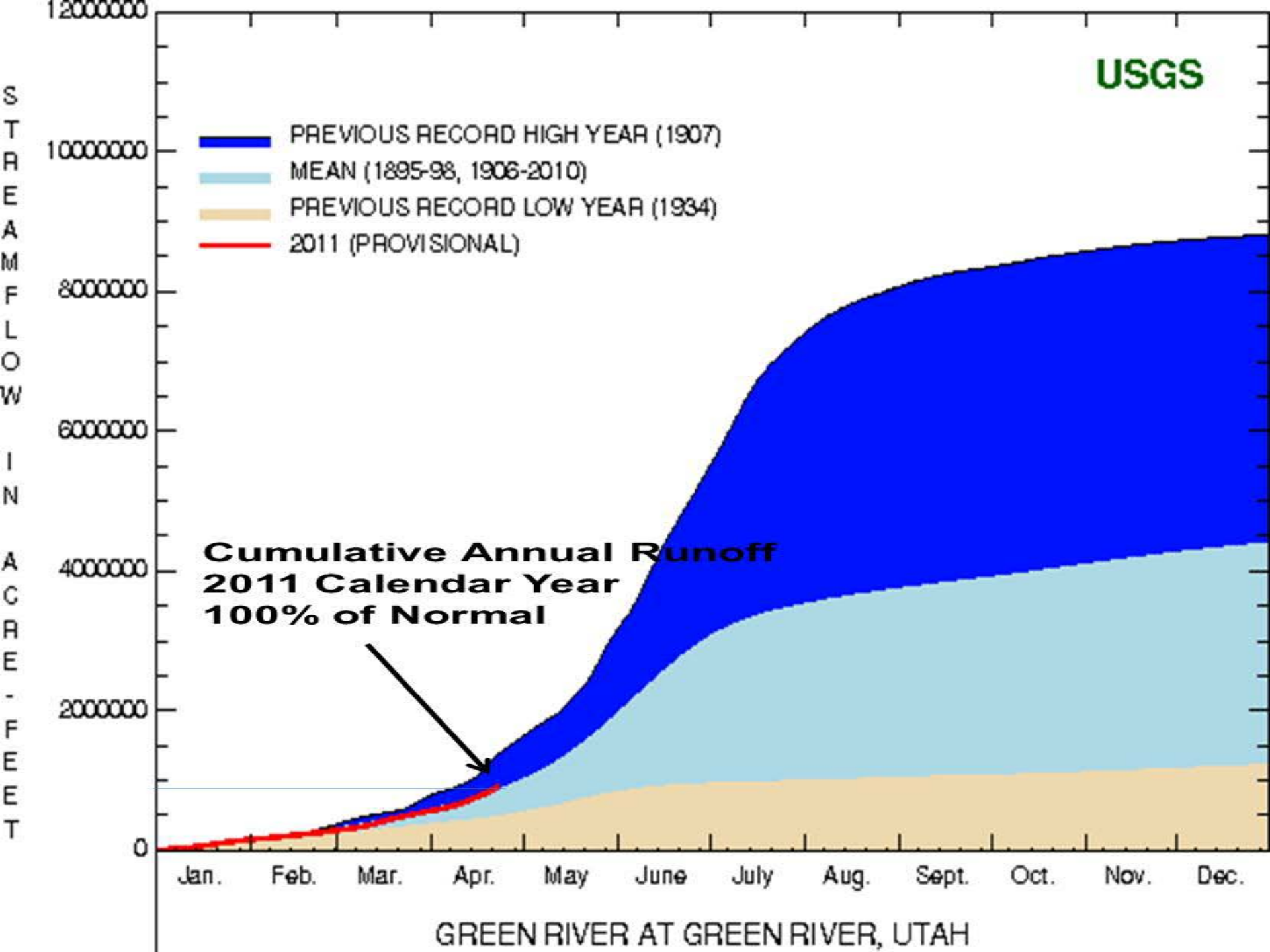
USGS 09315000 GREEN RIVER AT GREEN RIVER, UT
Drainage Area: Square Miles, Length of Record: 109 Years

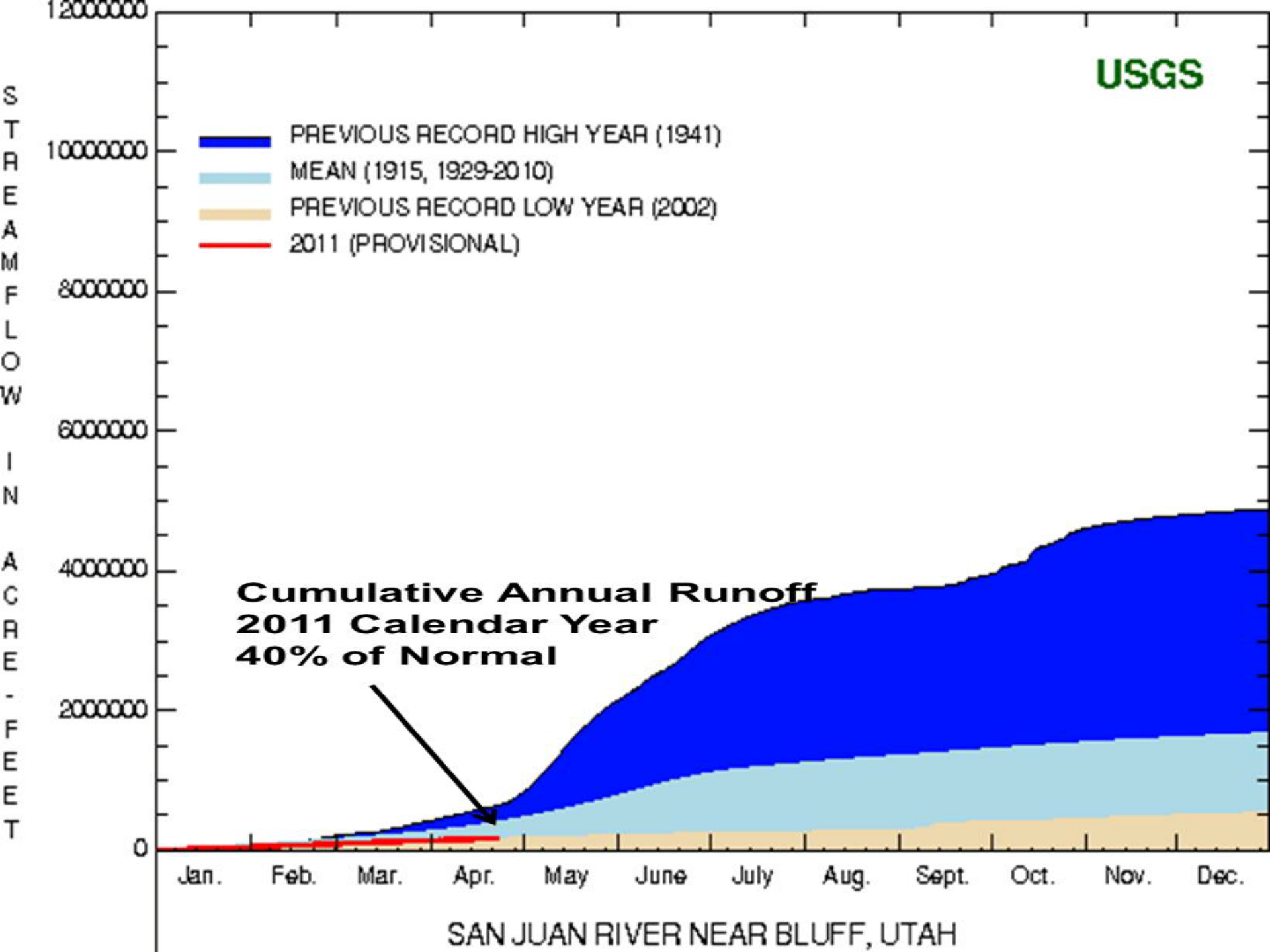


USGS 09379500 SAN JUAN RIVER NEAR BLUFF, UT
Drainage Area: Square Miles, Length of Record: 85 Years

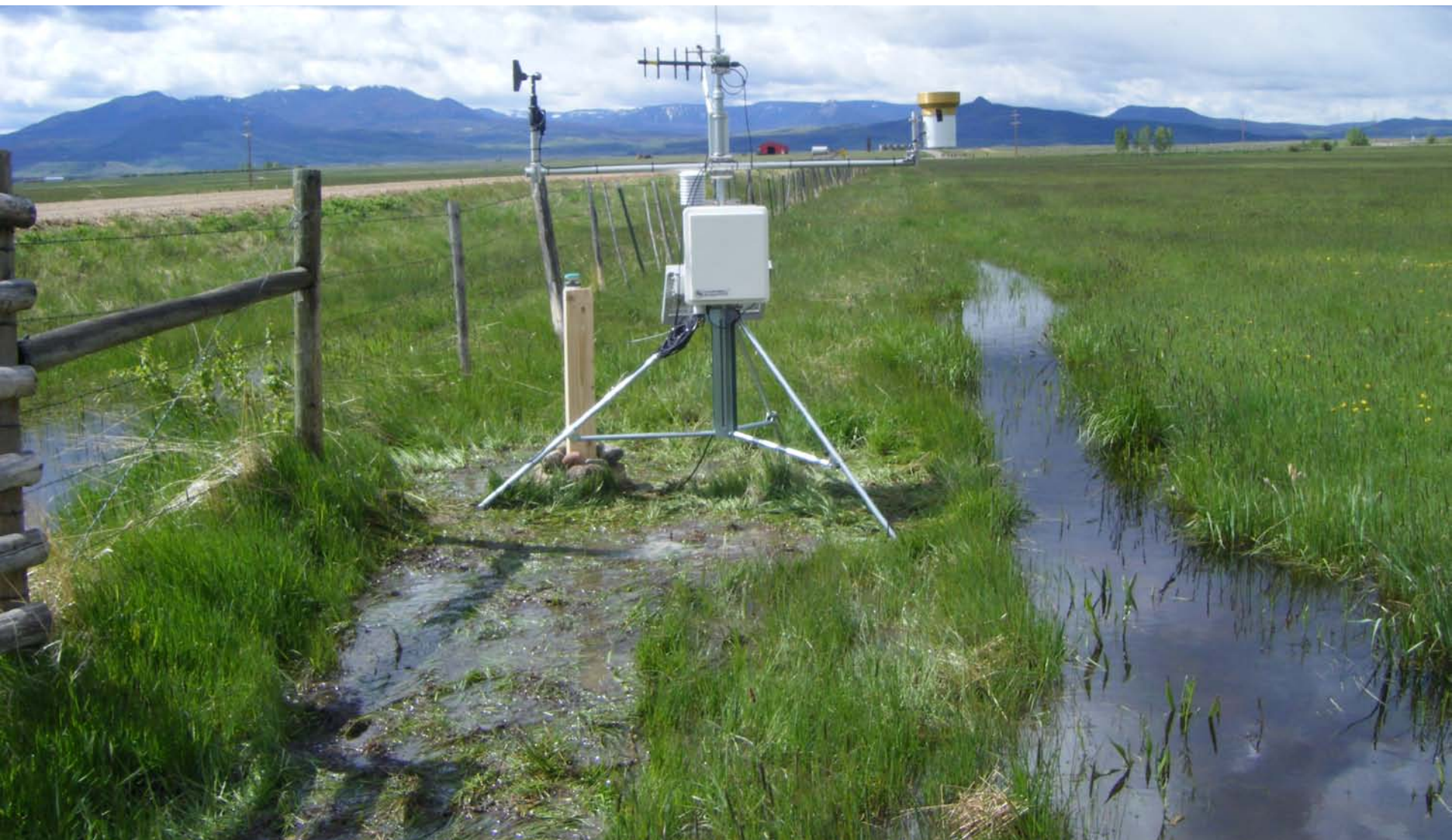




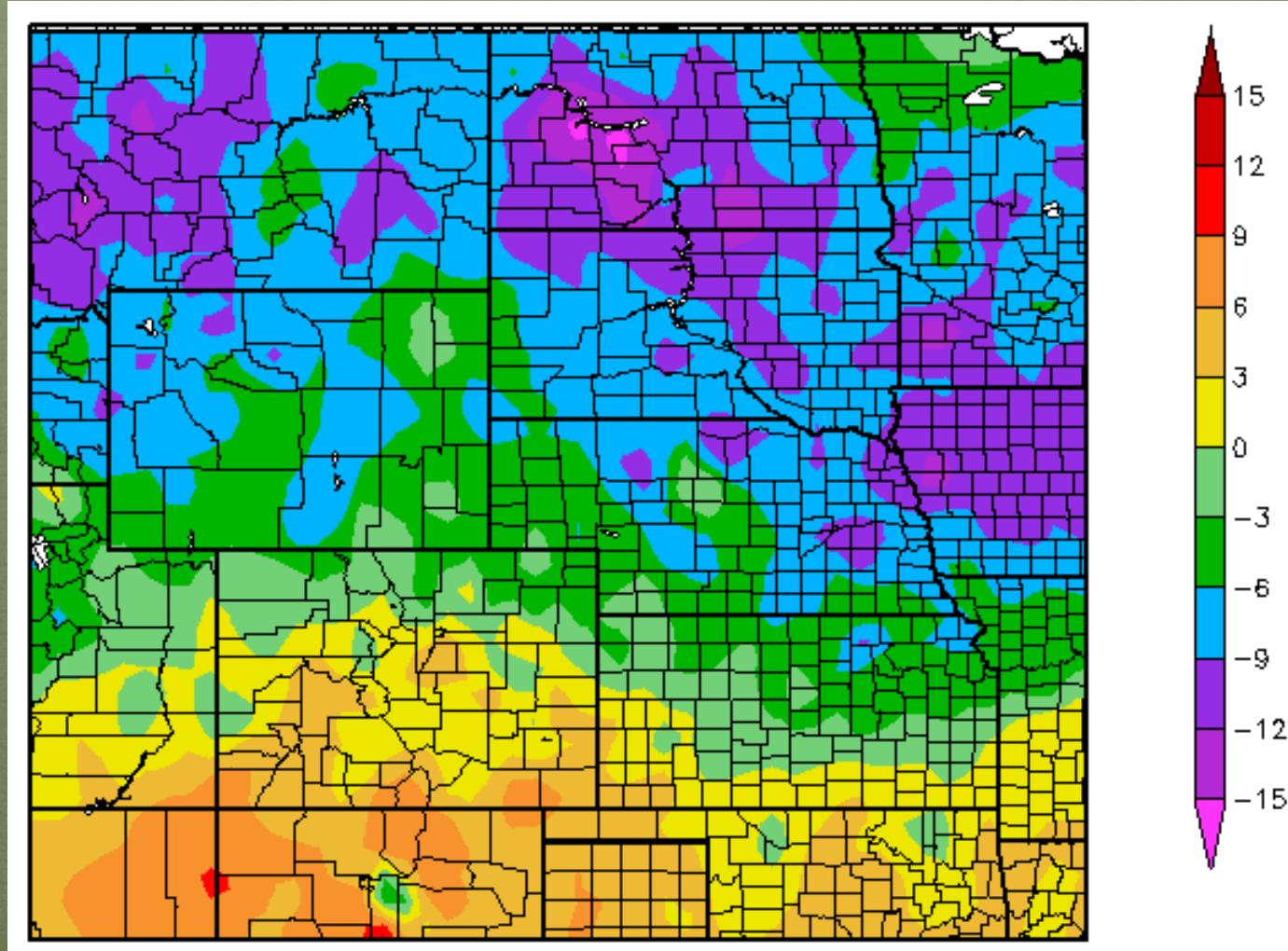




Water Demand

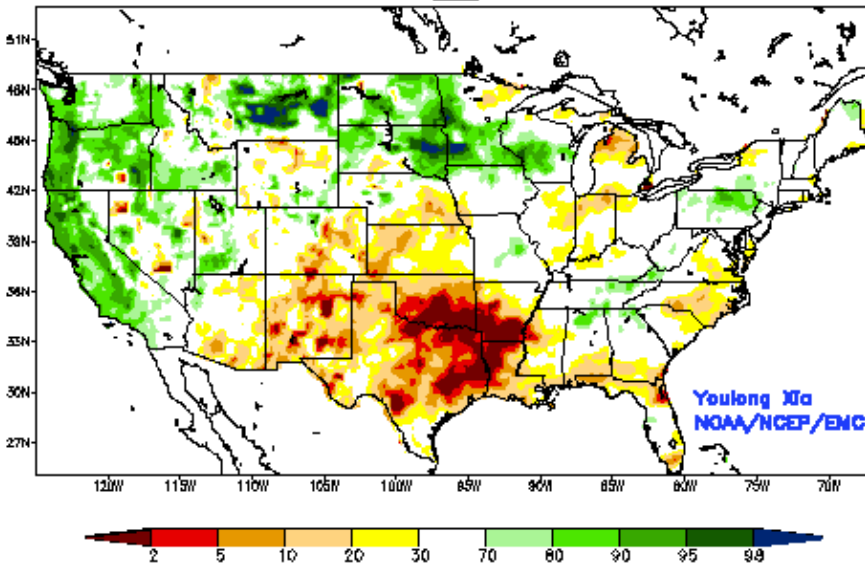


Temperature Departure from Normal 04/18/2011 – 04/24/2011



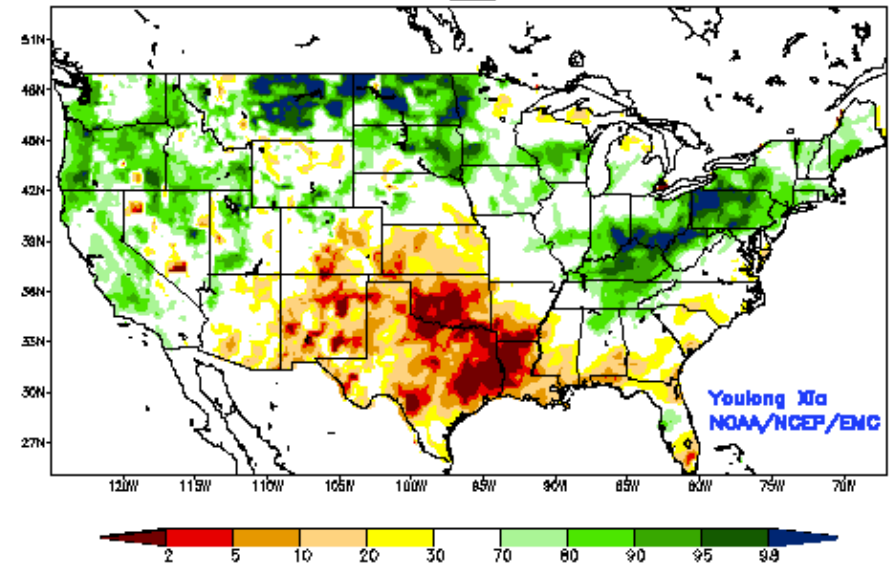
NLDAS Ensemble Total Column Soil Moisture

Ensemble-Mean – Current Total Column Soil Moisture Percentile
NCEP NLDAS Products Valid: MAR 30, 2011



Soil Moisture 30 March, 2011

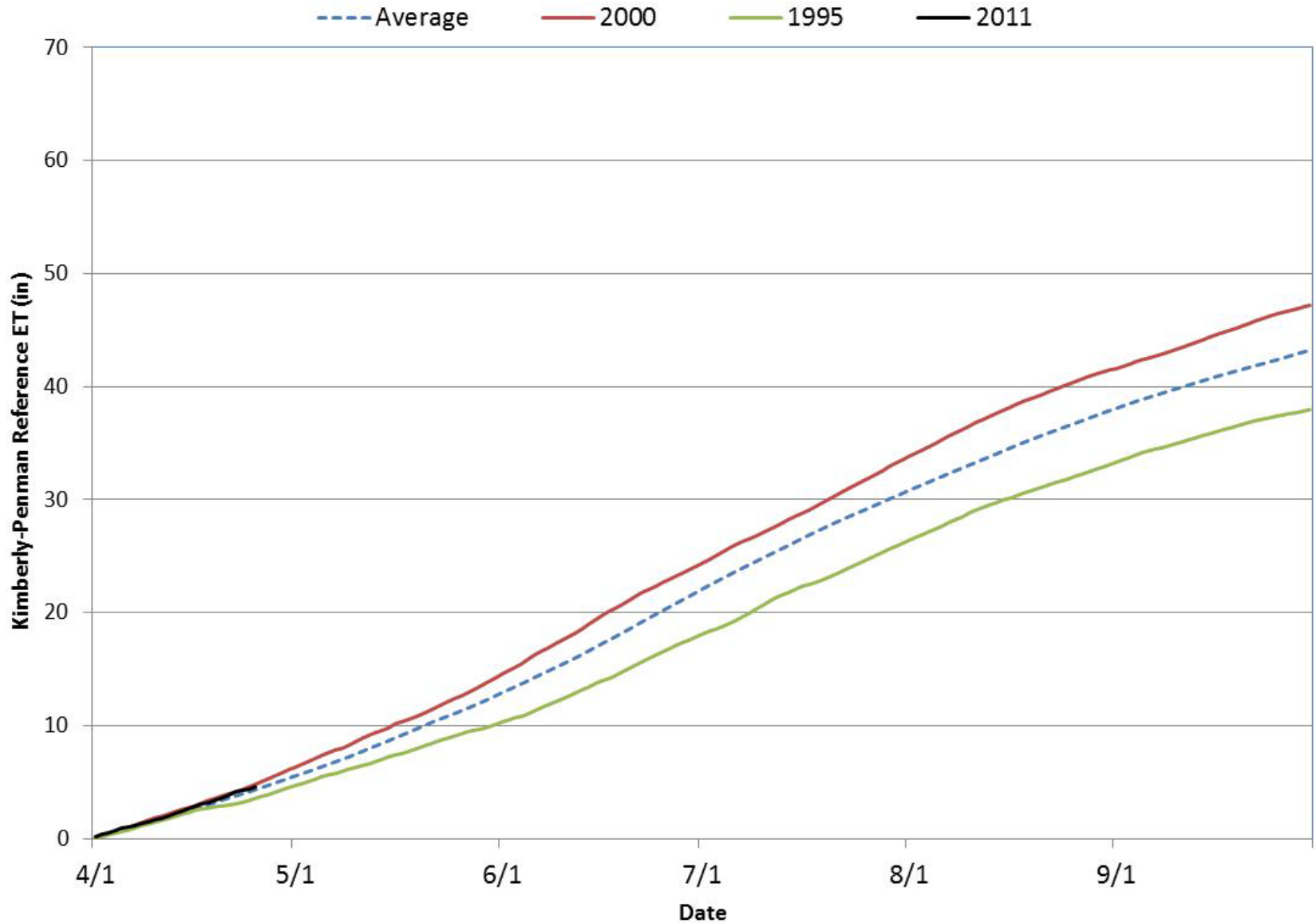
Ensemble-Mean – Current Total Column Soil Moisture Percentile
NCEP NLDAS Products Valid: APR 20, 2011



Soil Moisture 20 April, 2011

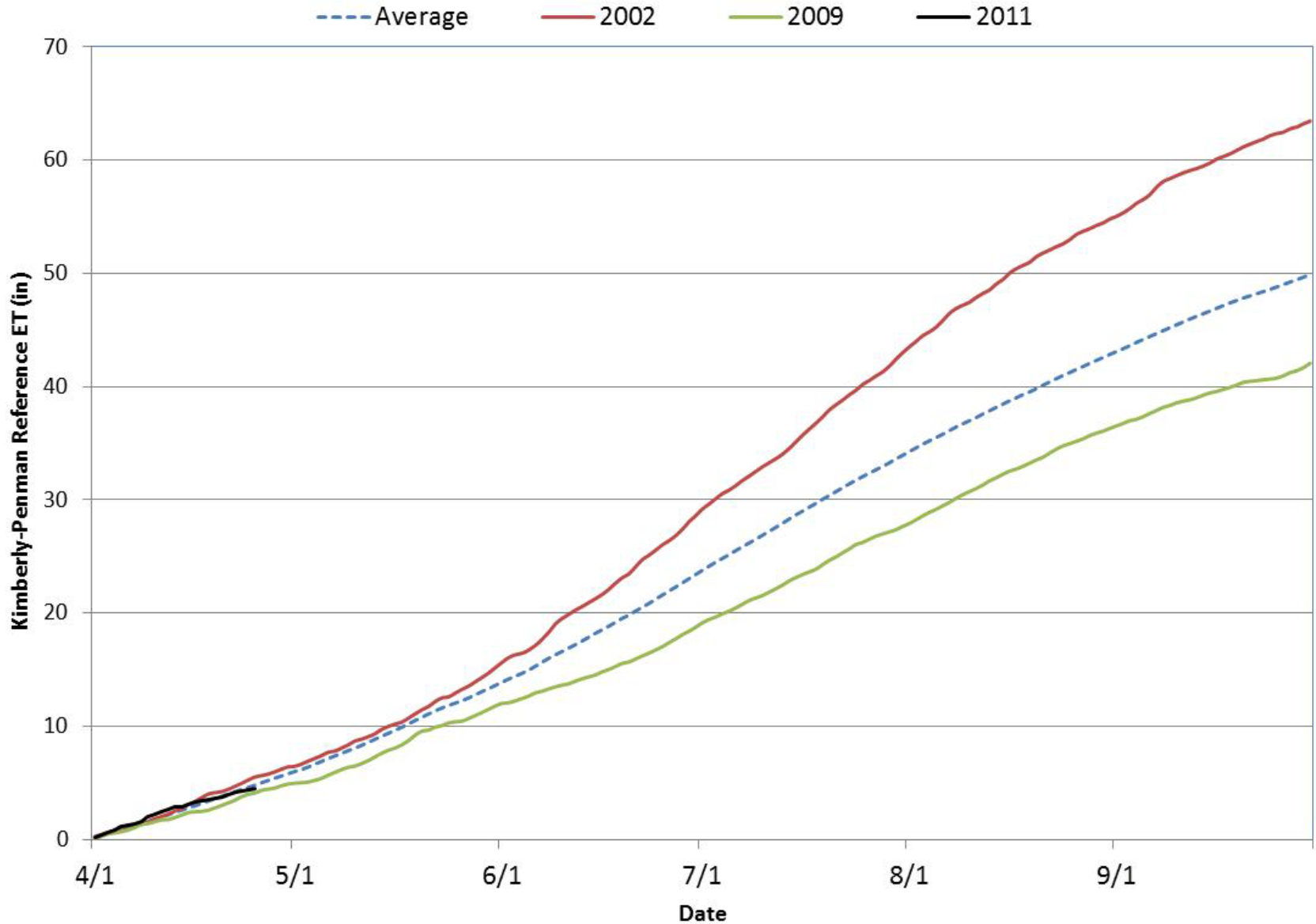
Cortez Reference ET

CTZ01 Kimberly-Penman Reference ET (1992 - 2011)



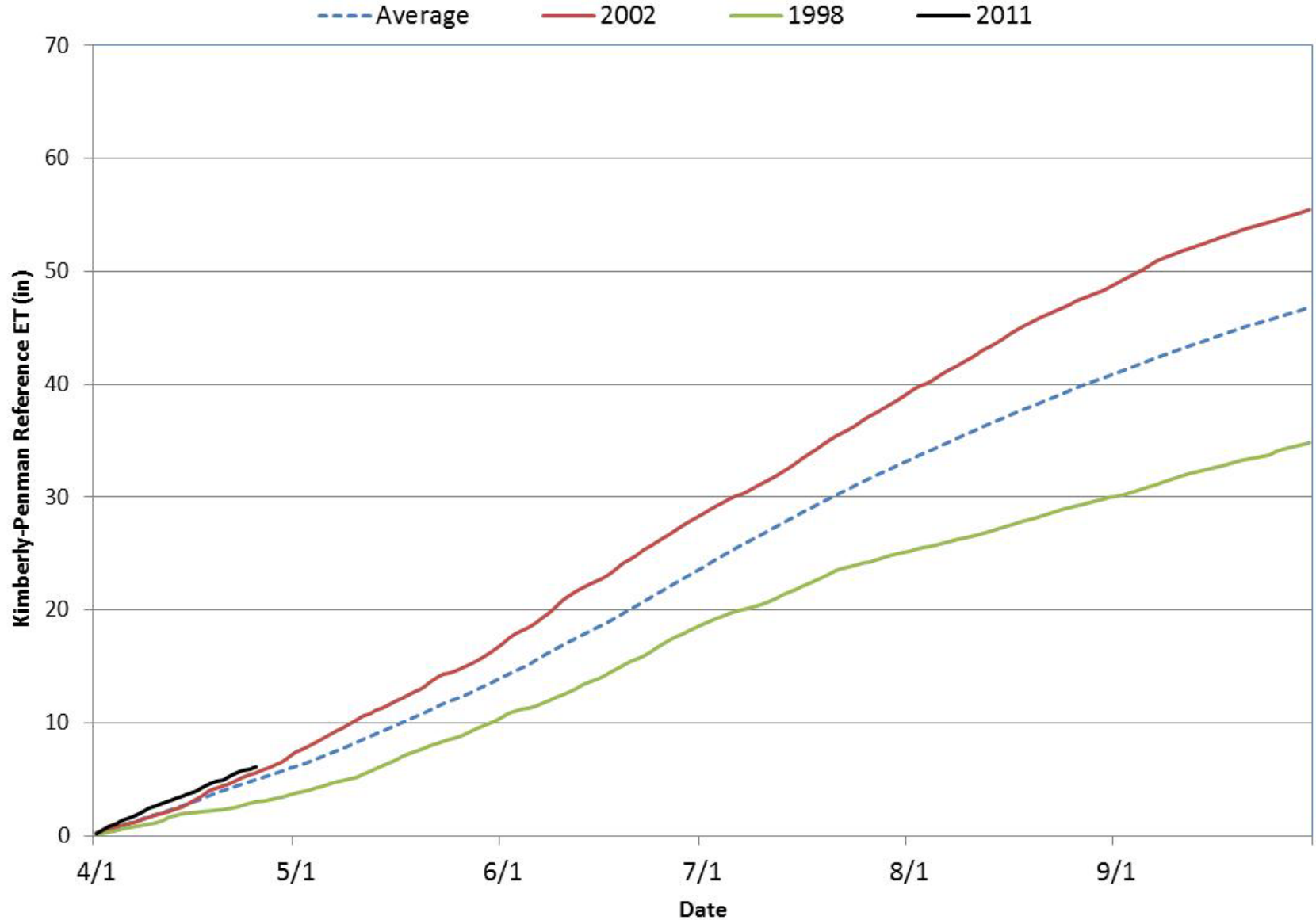
Idalia Reference ET

IDL01 Kimberly-Penman Reference ET (1992 - 2011)



Avondale Reference ET

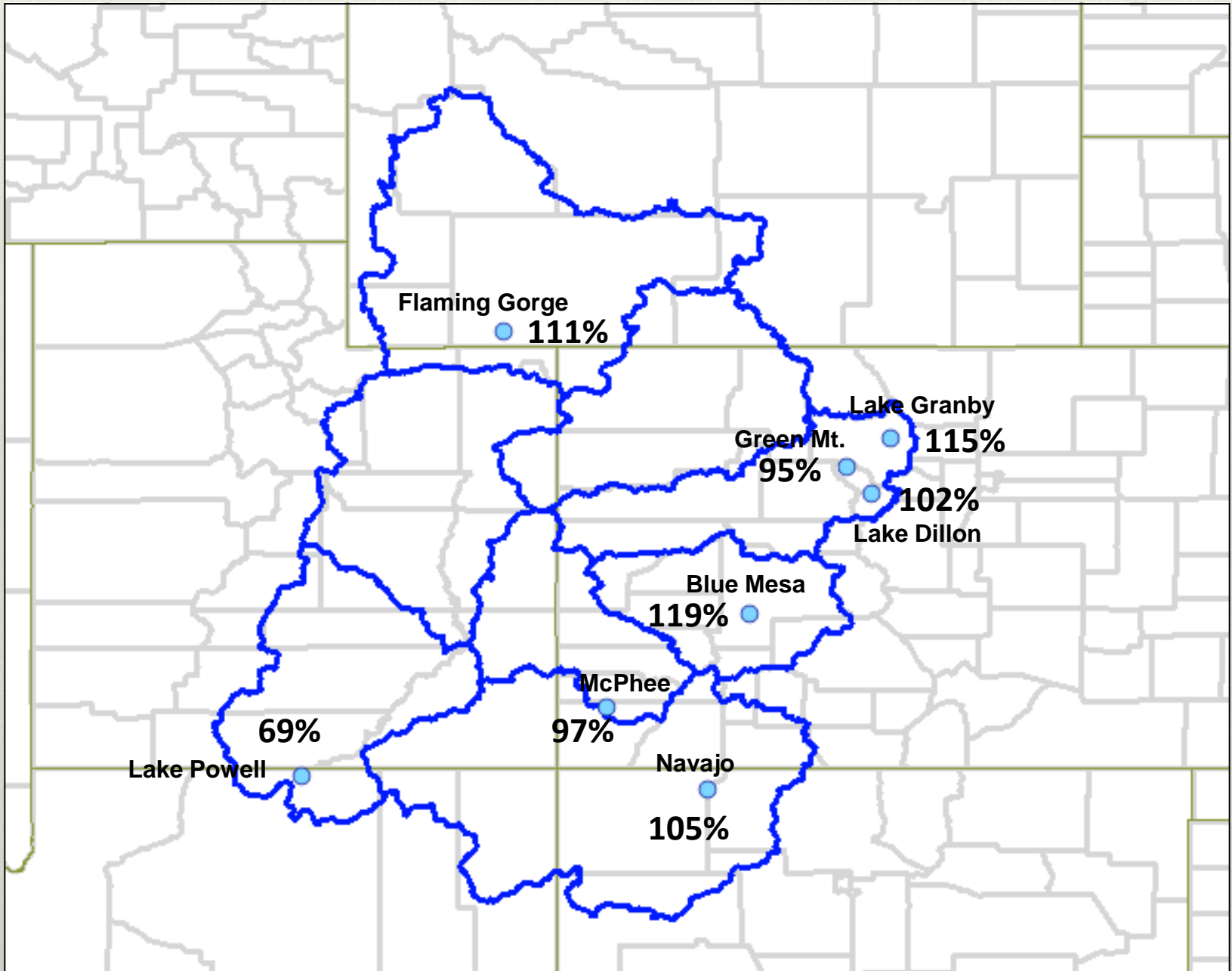
AVN01 Kimberly-Penman Reference ET (1993 - 2011)



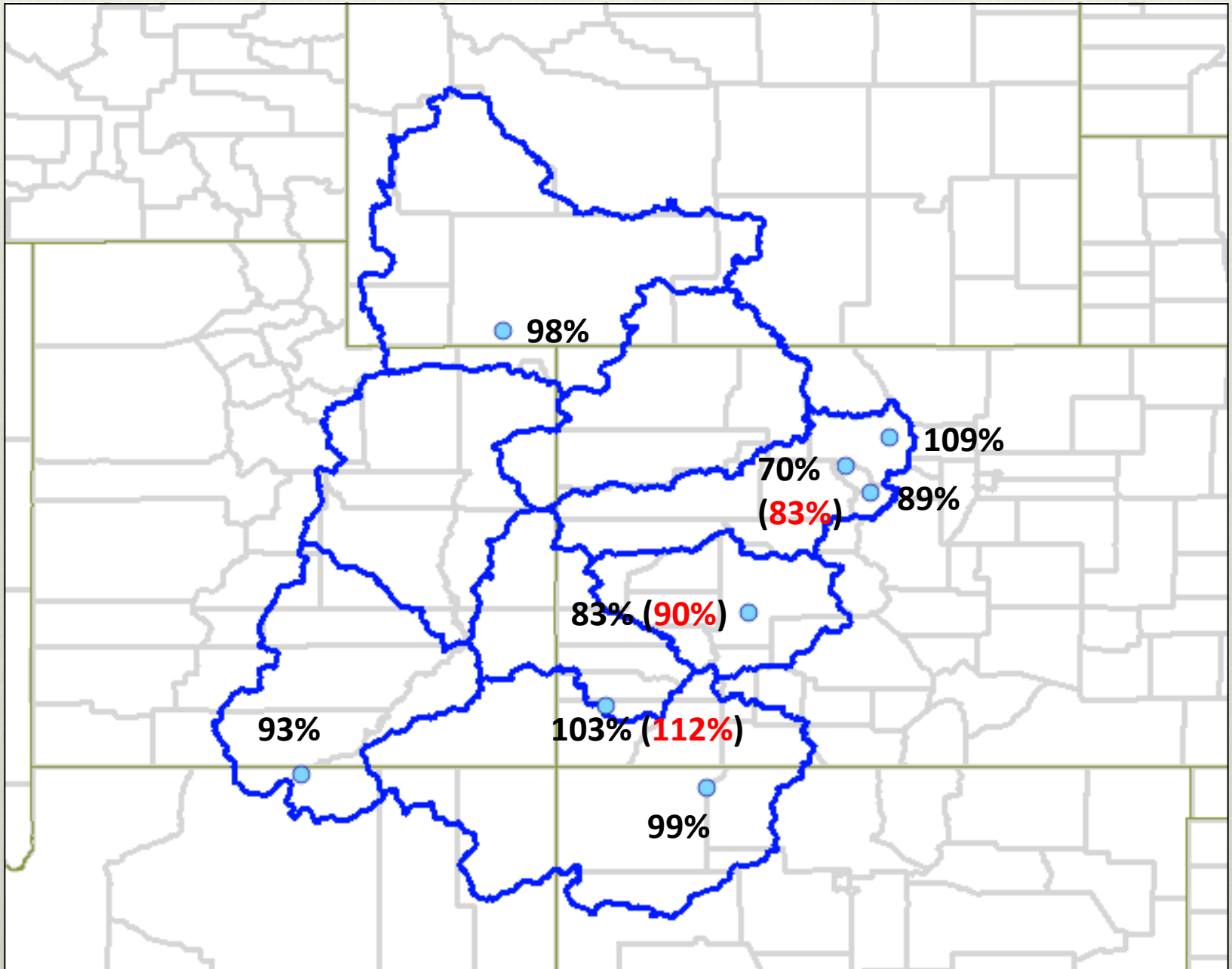
Reservoir Update



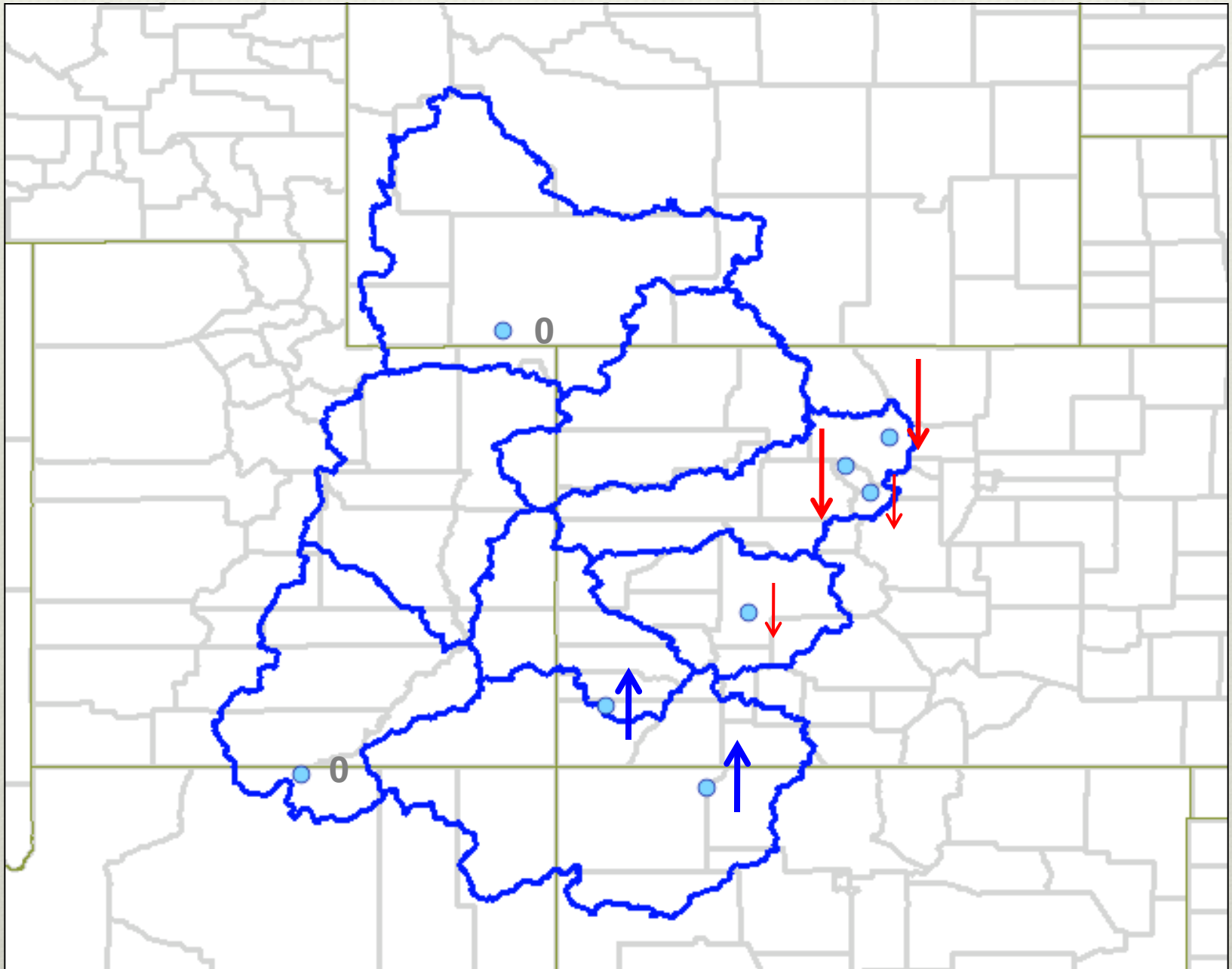
Reservoir Level Percents of Average – 4/24/2011



Reservoir Level Percents of Last Year – 4/24/2011

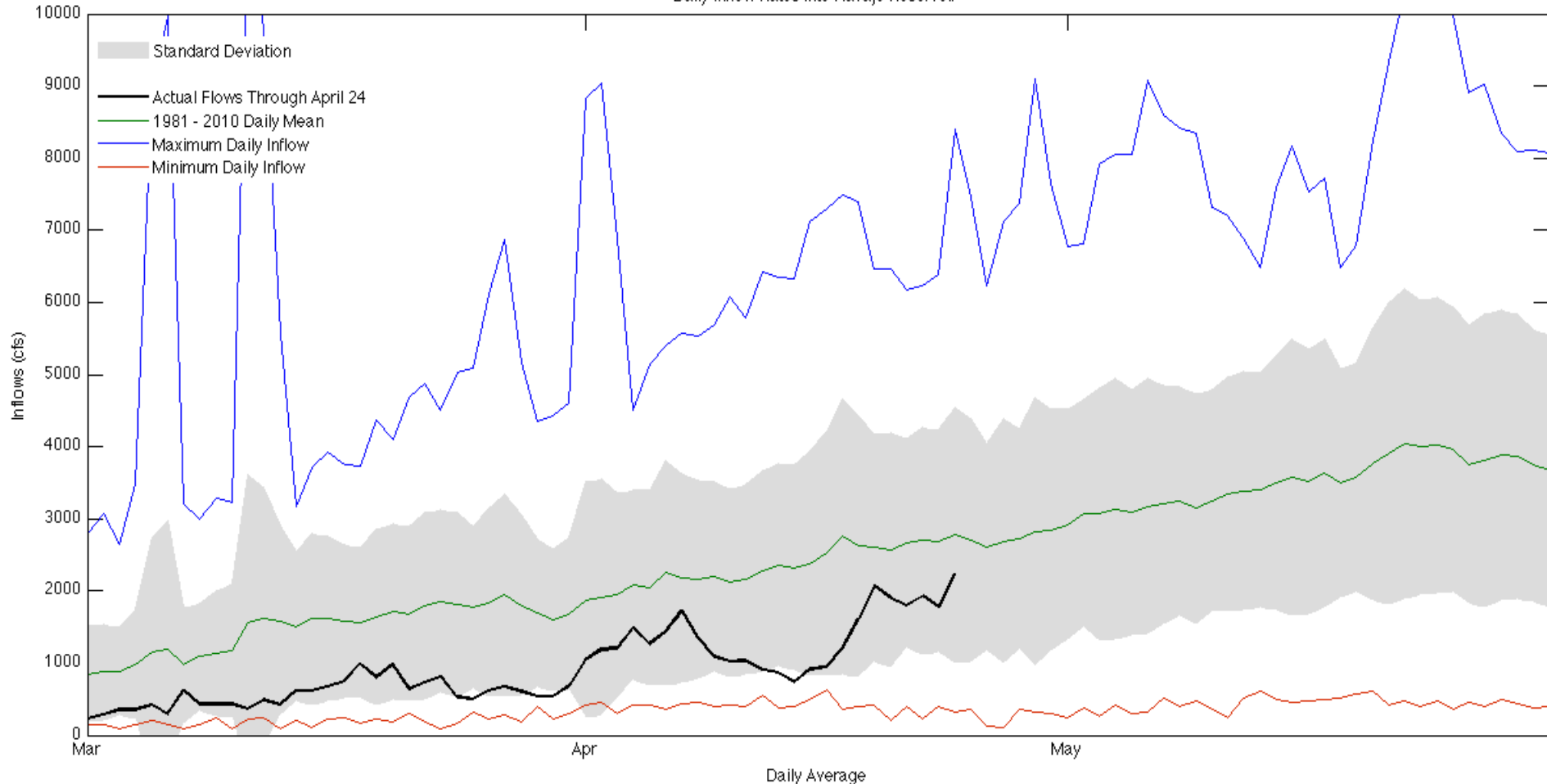


Reservoir Level Month-to-Date Change – 4/24/2011

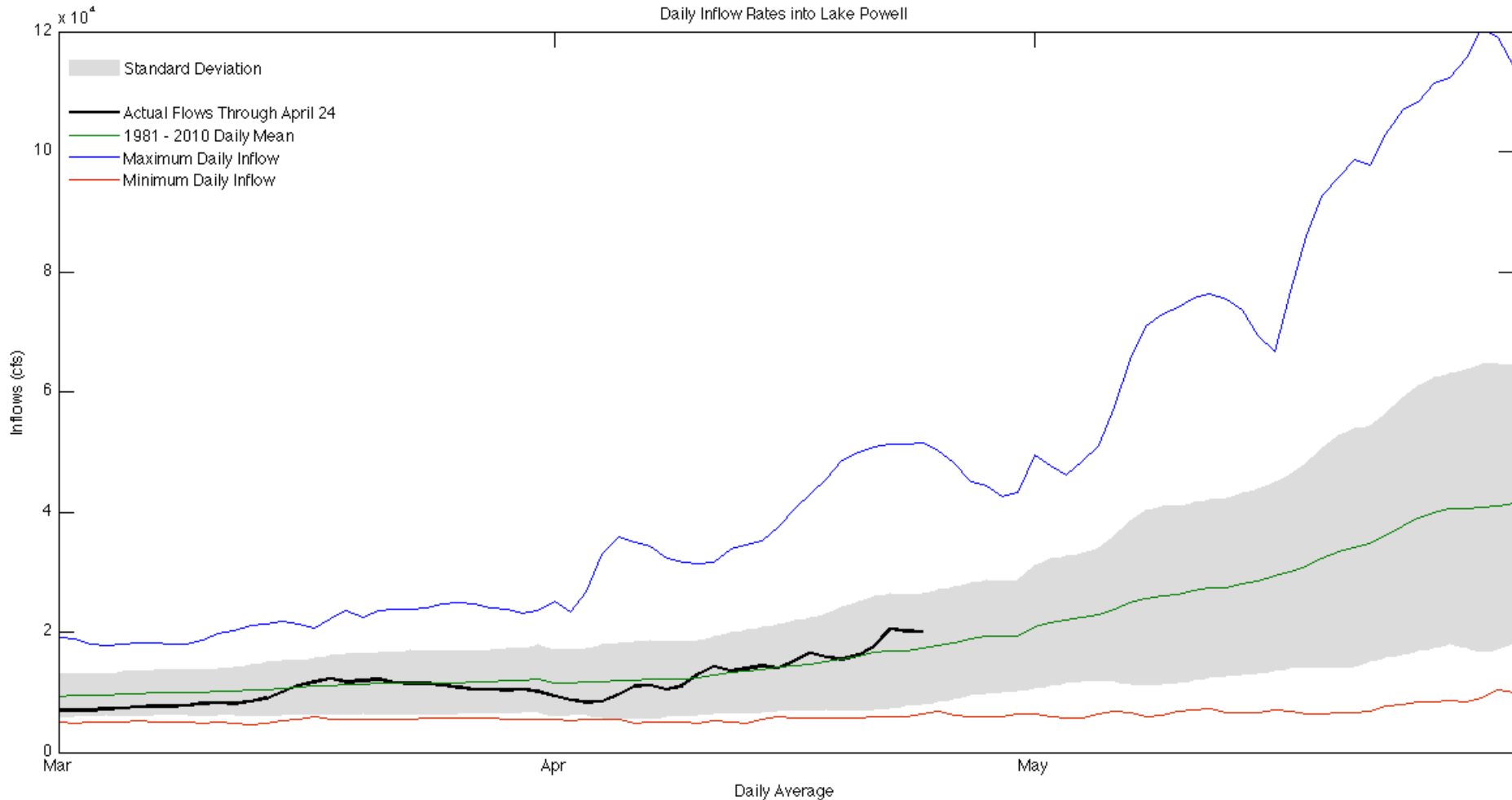


Navajo Reservoir Daily Inflow Through 24 April, 2011

Daily Inflow Rates into Navajo Reservoir

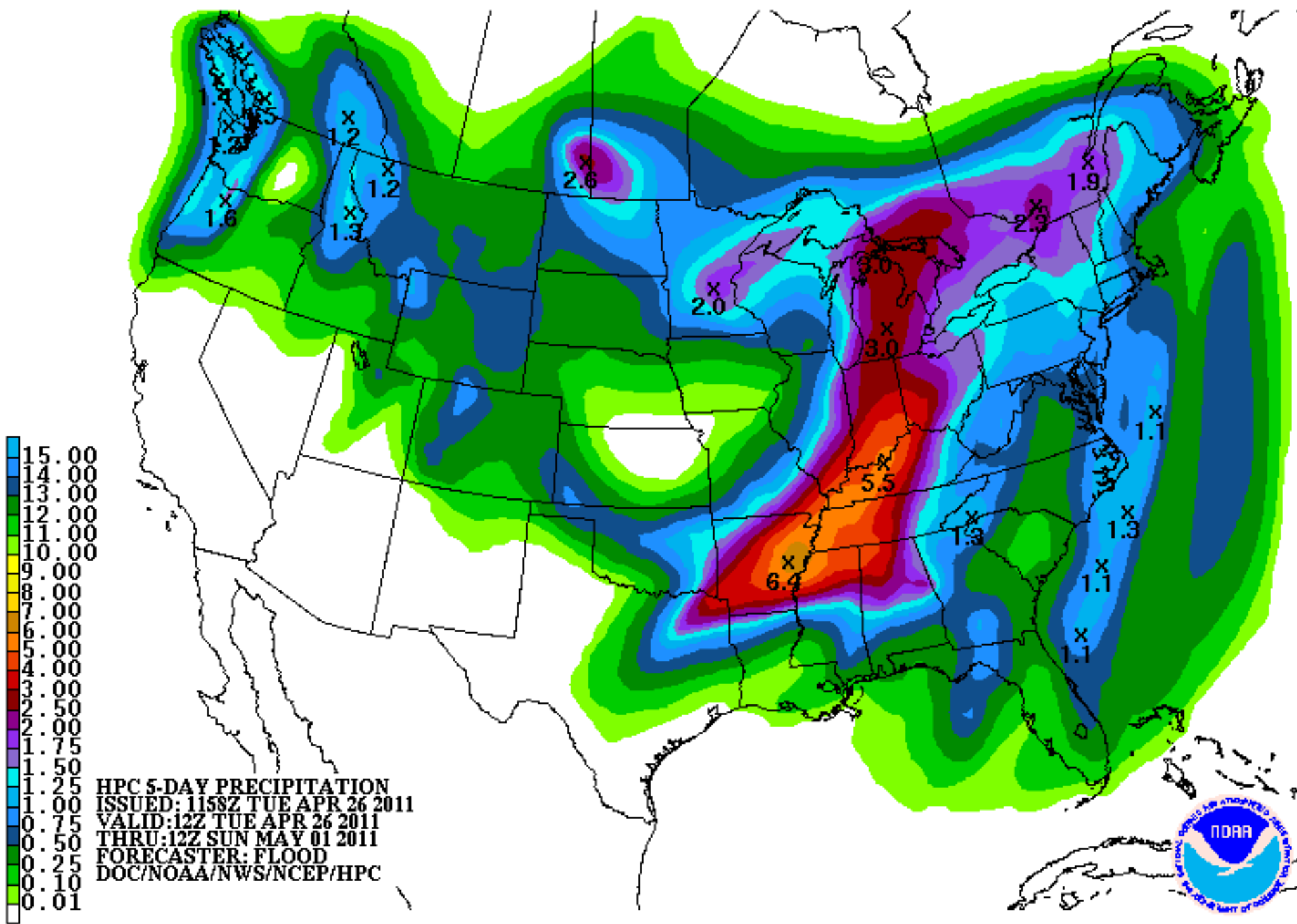


Lake Powell Daily Inflow Through 24 April, 2011

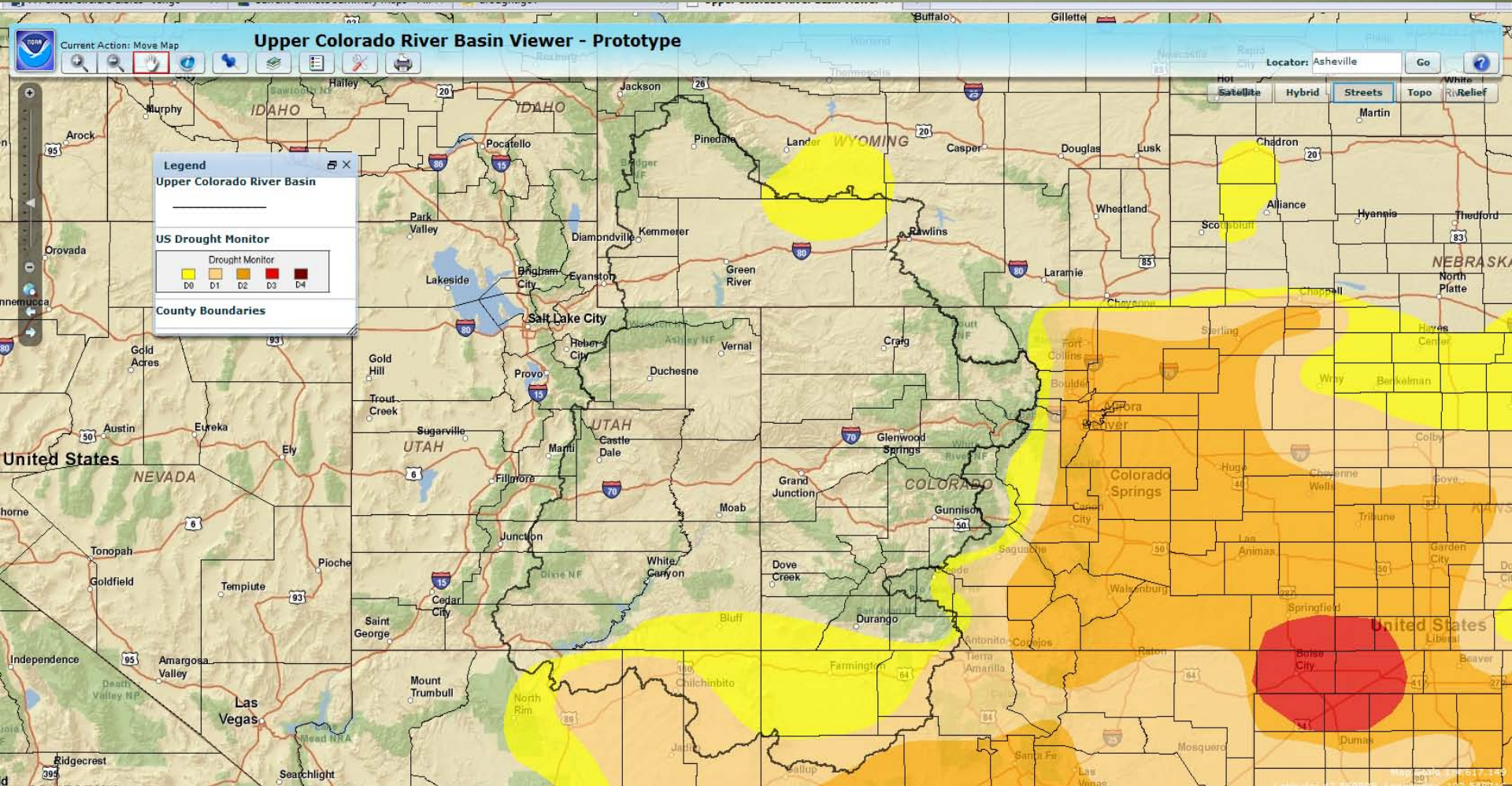


Precipitation Forecast





Recommendations



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NIDIS - UPPER COLORADO BASIN PILOT PROJECT

F o r m o r e i n f o r m a t i o n

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

April 26, 2011

Precipitation and Snowpack

Colorado, Utah and Wyoming April Month to Date Precipitation (in)
1 - 23 April 2011

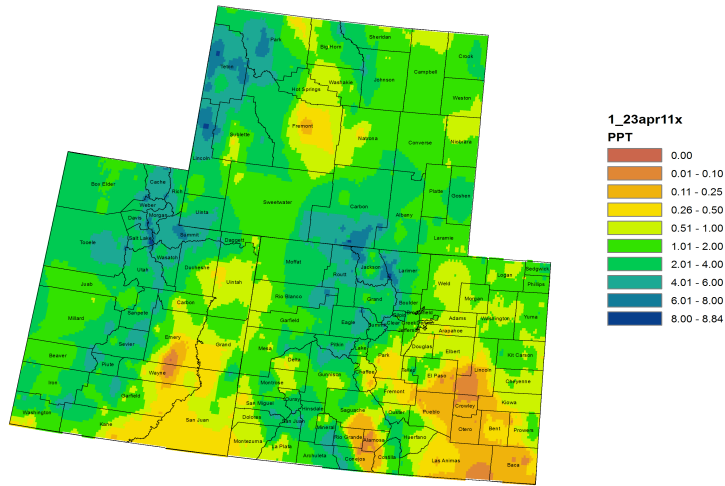


Fig. 1: April month-to-date precipitation in inches.

Colorado, Utah and Wyoming 7 Day Precipitation (in)
17 - 23 April 2011

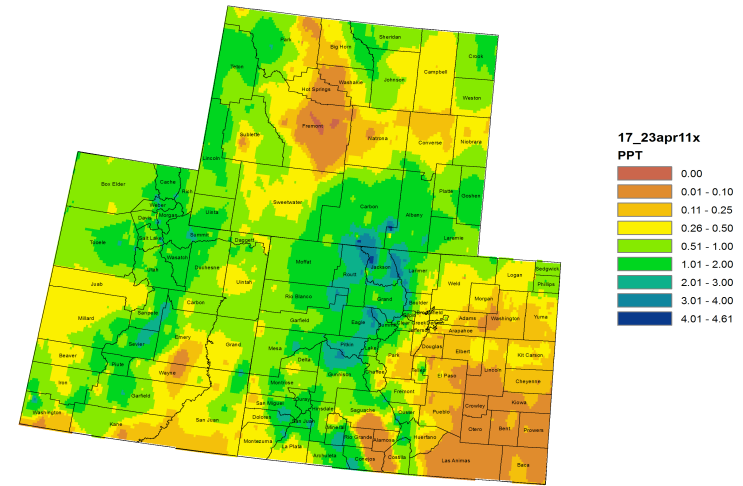


Fig. 2: April 17 – 23 precipitation in inches.

During most of April, the higher elevations of Colorado, northeastern Utah, and southwestern Wyoming have seen above average moisture, with amounts around 2 inches and up to 6 inches in some areas (Fig. 1). The valleys of western Colorado and eastern Utah have been relatively drier with amounts between half an inch to 1 inch. After a fairly dry winter, northeastern Colorado has seen some recovery with more than an inch of precipitation so far for the month. Areas of the southeastern plains of Colorado, and the Upper Rio Grande in southern Colorado have received less than a quarter inch of moisture for the month.

Last week, the highest amounts of precipitation fell along the Continental Divide, with accumulations of over 2 inches in many areas (Fig. 2). The higher elevations in the Upper Colorado River Basin (UCRB) continued to receive precipitation while the southeastern CO plains and the San Luis Valley in southern CO remained very dry, receiving less than a tenth of an inch for the week. The Four Corners region did receive about a half inch of moisture for the week, and northeastern CO also saw some beneficial moisture.

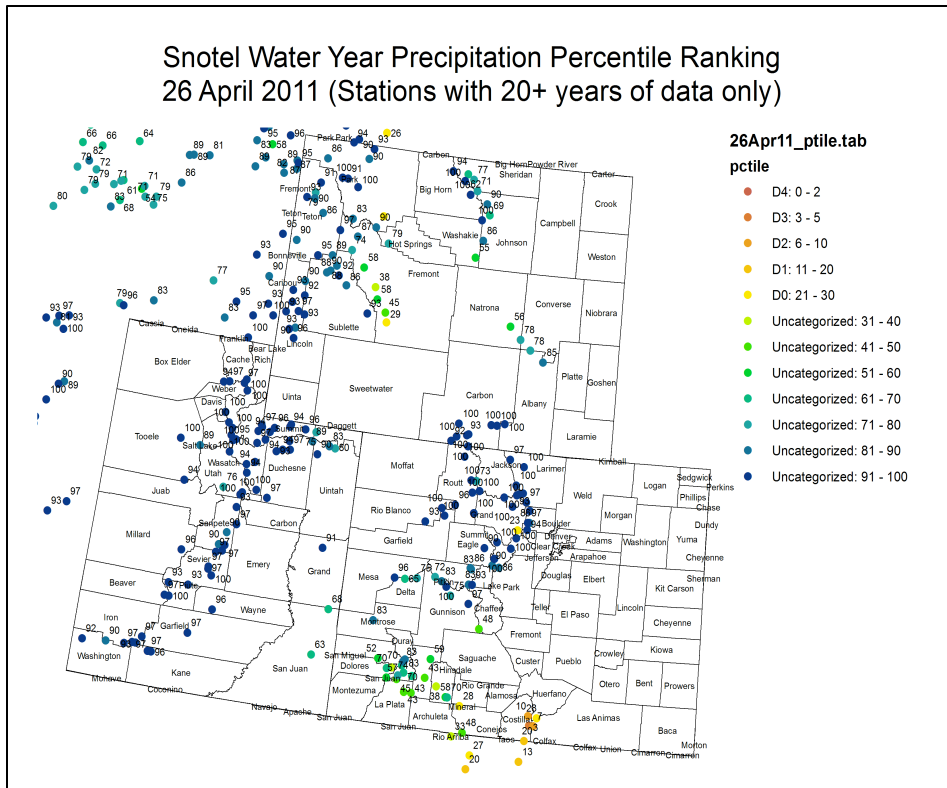


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor’s D0 category).

The majority of the SNOTEL sites in the 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%. Many of the sites in the Rio Grande basin are showing percentiles well below 30% (meaning that 70% of the years have been wetter).

Snowpack around most of the UCRB is in good condition—snowpack for the entire basin above Lake Powell was 122% of average as of April 20th (Fig. 4). The Upper Green basin in WY, the Upper Colorado above Kremmling, and the Duchesne basin in UT are still accumulating and are well above their average seasonal peaks. The San Juan basin in southwestern CO continues to struggle, only reaching 81% of its seasonal peak, though fortunately significant mid-spring snowmelt has been stalled.

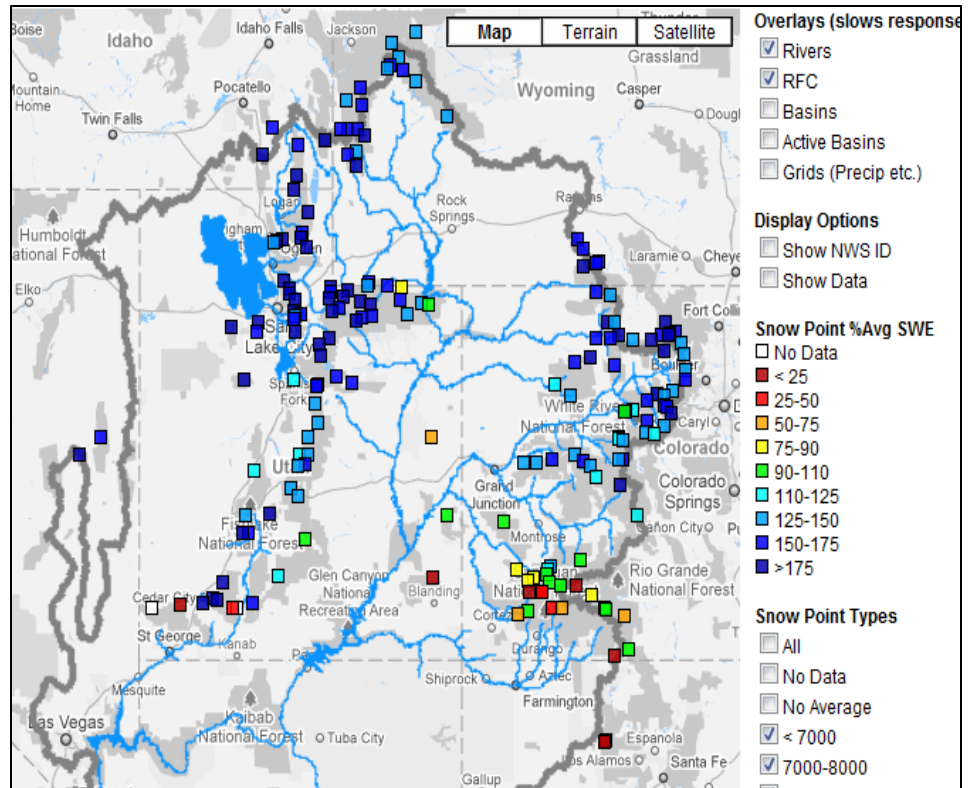
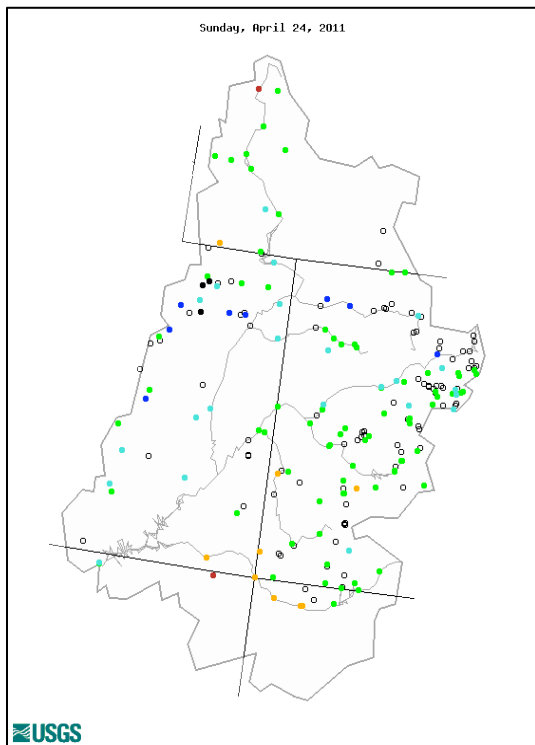


Fig. 4: SNOTEL WYTD accumulated snow water equivalent as a percent of average.

Streamflow

As of April 24th, about 90% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). Most of the gage network is now fully operational with about 123 gages in the basin currently reporting. A cluster of gages recording high flows is evident in northeastern UT. So far, high flows have not been attributed to much snowmelt. However, flooding could soon be a concern as the snowmelt season progresses. Below normal flows in the San Juan basin have persisted, but this could change in the next week as the snowmelt season in that region begins.

The gages on the Colorado River near the CO-UT state line and the Green River at Green River, UT are both currently recording above normal discharge at the 75th and 81st percentiles, respectively. The San Juan River near Bluff, UT is currently recording below normal flows (less than the 24th percentile), and total cumulative runoff for the calendar year is about as low as it has ever been at 40% of normal (Fig. 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		

Fig. 5: USGS 7-day average streamflow compared to historical streamflow for April 24th in the UCRB.

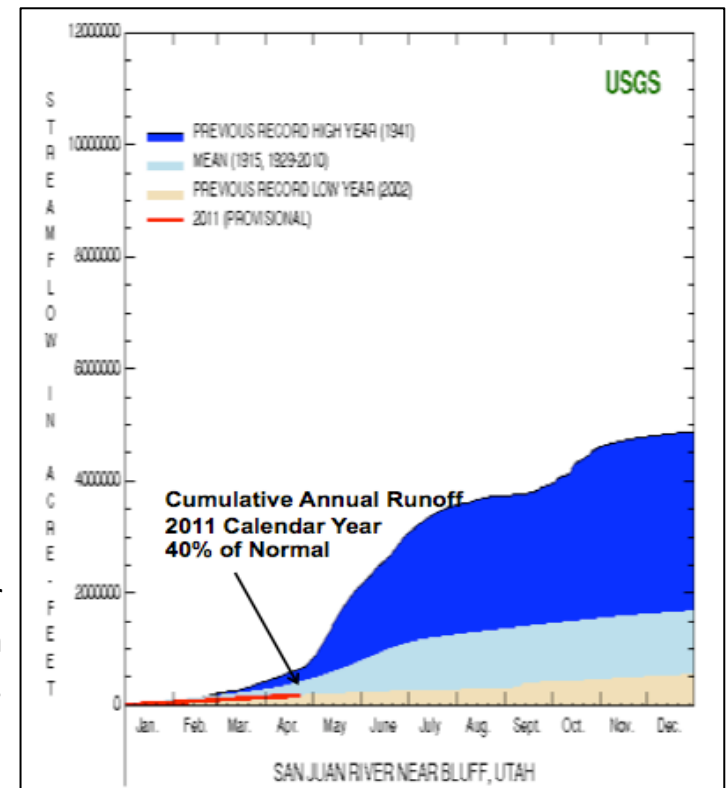


Fig. 6: USGS cumulative runoff for the calendar year on the San Juan River near Bluff, UT.

Water Supply and Demand

Last week, the northern part of the UCRB saw cooler temperatures (-3 to -6° below average) while the southern part of the basin experienced warmer temperatures (3 to 6° above average). A similar pattern emerged along the plains, with northeastern CO seeing cooler temperatures and southeastern CO seeing warmer temperatures. Soil moisture conditions remain poor for southeastern CO and the Upper Rio Grande basin in southern CO (Fig. 7).

Most of the major reservoirs in the UCRB are currently near or above their average levels for this time of year. Many of the reservoirs are below last year's levels (in preparation for the imminent high flows), but are in fairly good condition at the start of the snowmelt season. McPhee and Navajo Reservoirs storages have been increasing since the beginning of April, while Blue Mesa and Lake Powell have begun to see storage increases around the middle of the month. The reservoirs around the headwaters of the Colorado River continue to see storage decreases as they prepare for the large runoff season that will begin very soon.

Precipitation Forecast

The region will continue to see a progressive flow with a number of systems passing through. The current trough will continue to provide more snow for the northern and central mountains of CO, with continued possibilities for showers over the northeastern plains. On Wednesday, the trough begins to move east and the region will see a slow warm-up as a ridge of high pressure builds. The next system will move into the region over the weekend and could bring as much as 1.5 inches of moisture to the northern and central mountains of CO. The main trough will move over the region on Friday, bringing moisture to the northern portion of the UCRB. The southern part of the trough will lag and break apart, deepening around the Four Corners region. This will linger through Monday, bringing moisture to the Four Corners region, and then to the southeastern plains. A weak ridge returns early next week before the next system moves in by the middle of the week.

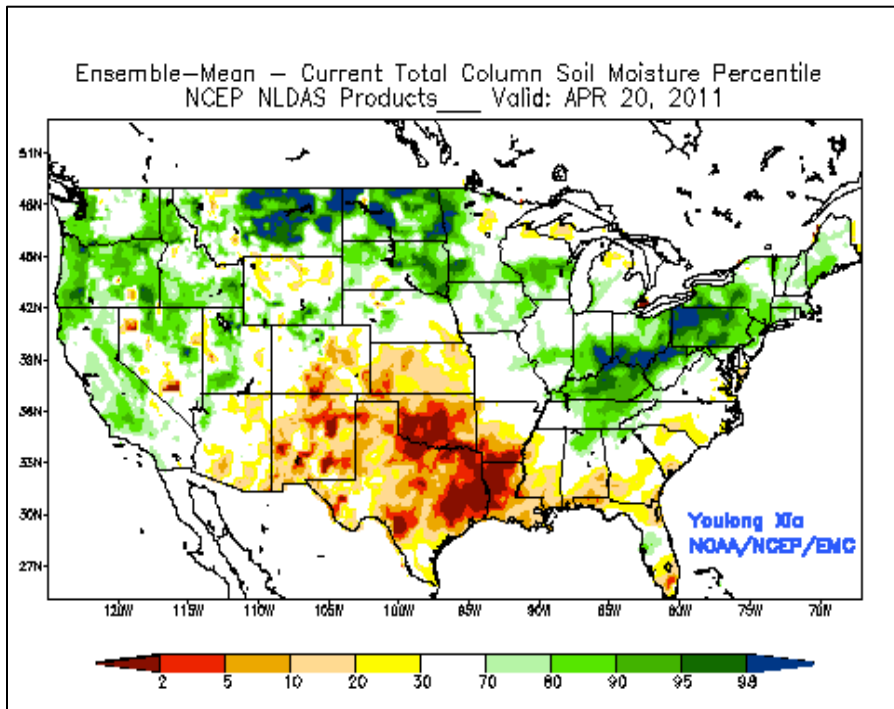


Fig. 7: NLDAS ensemble total column soil moisture percentiles as of April 20th.

Drought and Water Discussion

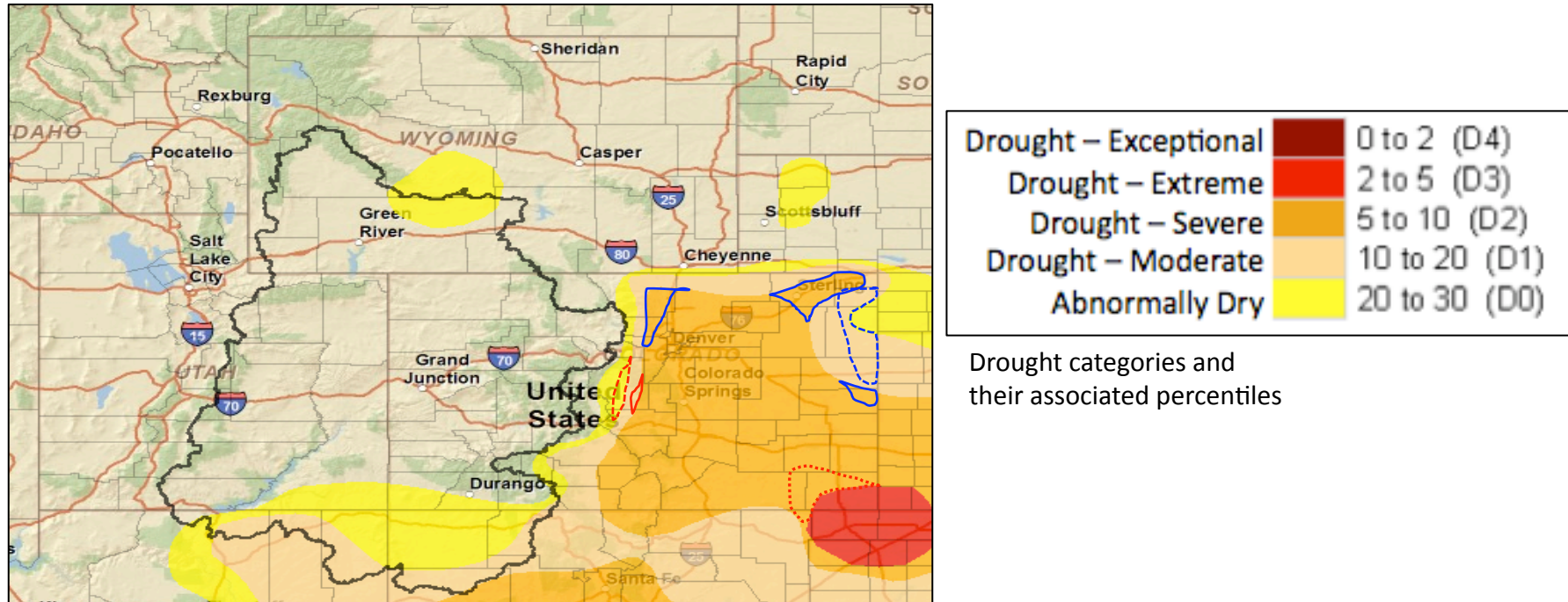


Fig. 8: April 19th release of U.S. Drought Monitor for the UCRB

The US Drought Monitor (USDM) author has expanded the D1 line in the Four Corners region to cover more of AZ and NM—this line just crosses the CO and UT borders as well. Conditions are still being closely monitored in this area, though with the recent precipitation, no further expansions are warranted at this time.

With the beneficial moisture that has recently fallen over northeastern CO, reductions in the D2 and D1 lines are being proposed (Fig. 8, solid blue lines for D2 reductions, dashed blue line for D1 reduction). An expansion of D2 and D1 in Park County has also been proposed, where long term dryness has persisted (Fig. 8, solid red line for D2 expansion, dashed red line for D1 expansion). Finally, a further expansion of the D3 in southeastern Colorado has been proposed to cover some of Las Animas County as they have requested a drought disaster declaration (Fig. 8, dotted red line).