

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

May 10, 2011

Precipitation and Snowpack

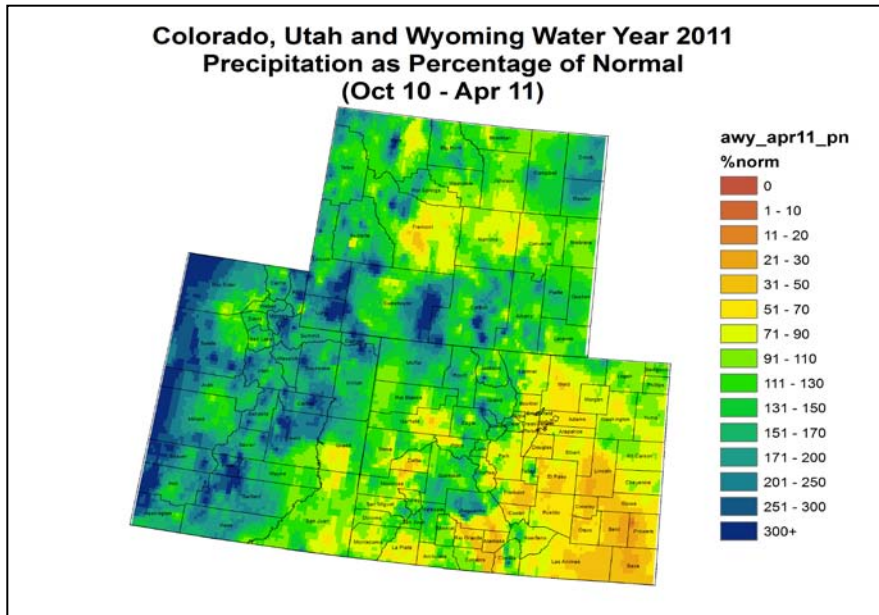


Fig. 1: October – April precipitation as a percent of average.

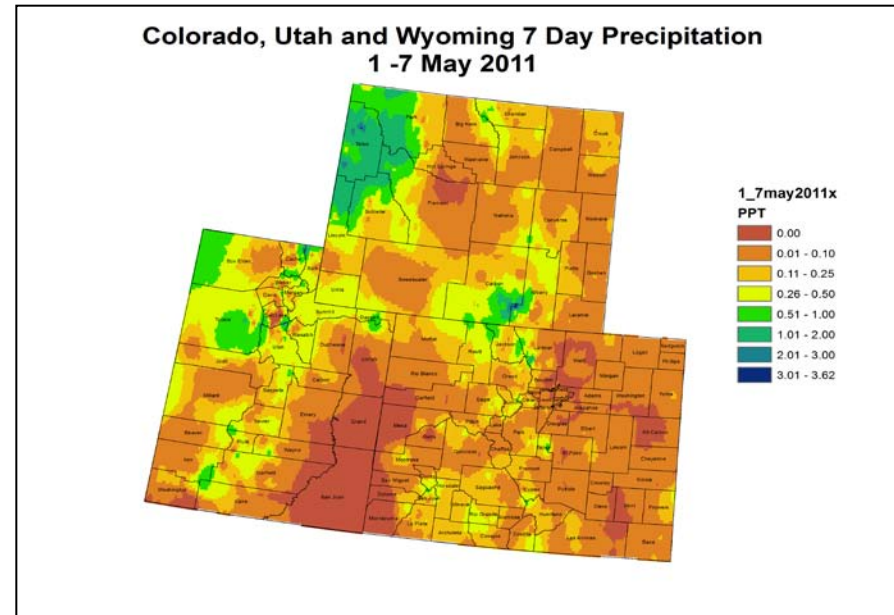


Fig. 2: May 1 – 7 precipitation in inches.

For the current water year, most of the Upper Colorado River Basin (UCRB) has received near or above average precipitation (Fig. 1). The Four Corners region and valley areas have been the driest, seeing around 50 – 90% of average precipitation. Some of the higher elevations of Utah and Wyoming were around 300% of average at the end of April. The San Luis Valley and the southeastern plains of Colorado have been very dry, receiving less than 50% of average precipitation for the water year in many areas.

Last week, precipitation continued to favor the high elevations of the UCRB (Fig. 2). Along the northern boundary of the UCRB in WY, some of the peaks saw more than an inch of moisture. The Wasatch range in UT and the northern mountains of CO mostly saw between a quarter and an inch of precipitation. The eastern plains remained fairly dry, seeing less than a tenth of an inch. Most of the Four Corners region and northward along the CO-UT border received no precipitation for the week.

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

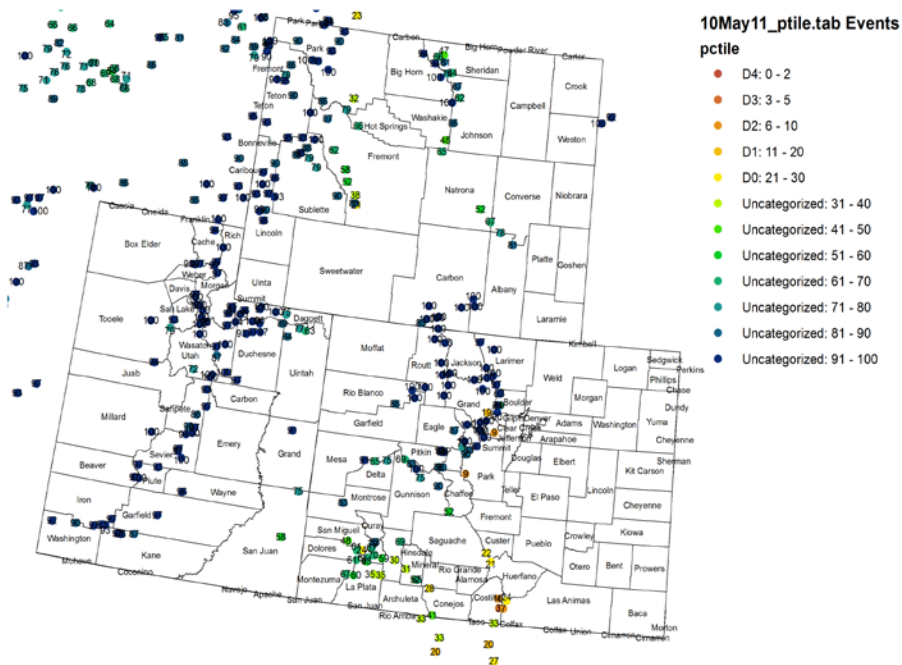


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

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 Upper Rio Grande basin are showing percentiles below 30% (meaning that 70% of the years have been wetter).

Snowpack around most of the UCRB is much above average—snowpack for the entire basin above Lake Powell was 160% of average as of May 2nd. The Upper Green basin in WY, the Upper Colorado above Kremmling, and the Duchesne basin in UT all passed their seasonal peaks for accumulations and for timing. They have all begun to melt in the past week. The San Juan basin in southwestern CO remains the driest, though delayed timing of snowmelt has helped improve conditions somewhat (Fig. 4).

Colorado Basin River Forecast Center
San Juan Basin Group

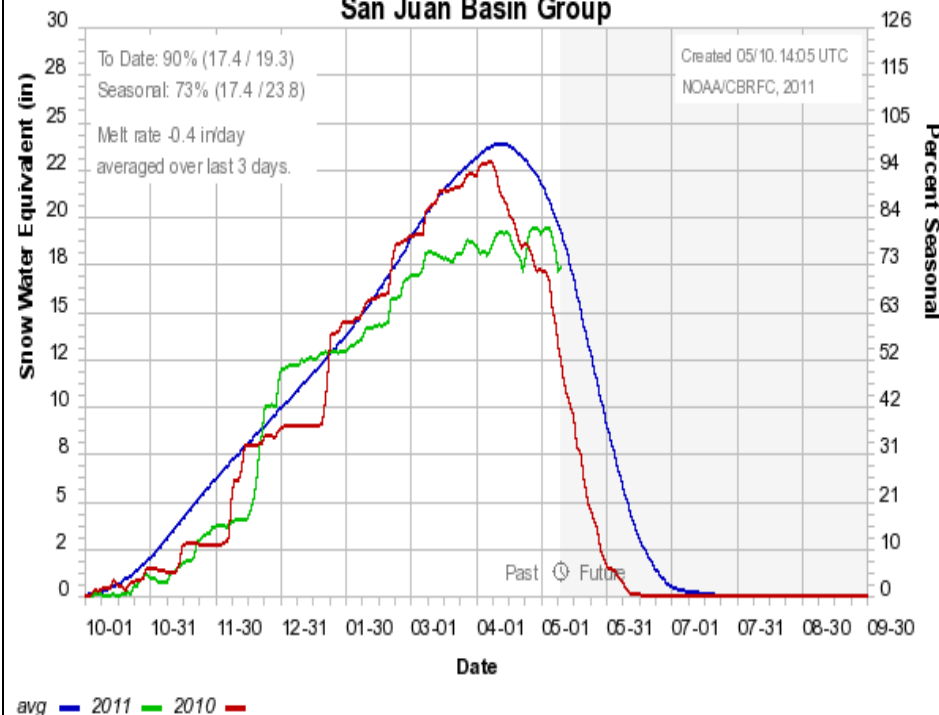
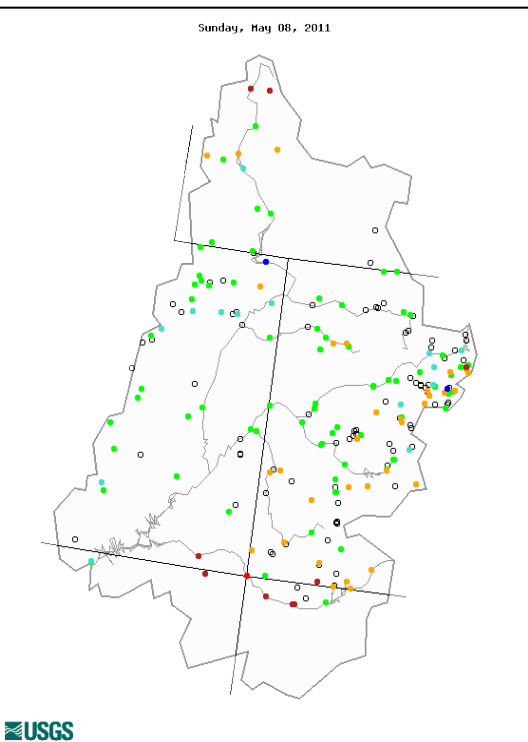


Fig. 4: San Juan Basin averaged accumulation of snow water equivalent, WYTD.

Streamflow

As of May 8th, about 68% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). Many gages near the upper reaches of the tributaries are recording below normal flows, primarily due to the cooler than average temperatures the past couple of weeks that shut off the snowmelt. However, temperatures warmed over the latter part of last week, and real time discharge at many sites quickly responded with rapid increases in flows, as can be seen on Gore Creek near Eagle River in Colorado (Fig. 6).

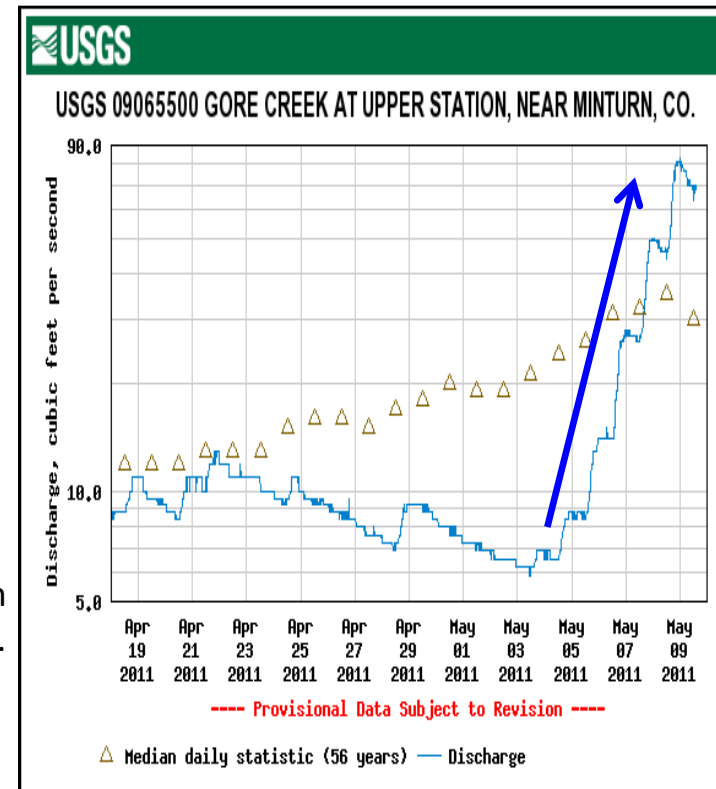
Key gages on the Colorado River near the CO-UT state line and the Green River at Green River, UT are both currently recording above normal discharge at the 54th and 64th percentiles, respectively, while the San Juan River near Bluff, UT is currently recording much below normal flows at the 4th percentile.



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 May 8th in the UCRB.

Fig. 6: USGS real-time discharge on Gore Creek near Vail, CO.



Water Supply and Demand

Last week, the UCRB and surrounding areas experienced near average temperatures, though the latter half of the week saw warmer temperatures in many areas. Soil moisture conditions remain poor for southeastern CO and the Upper Rio Grande basin in southern CO, though soil moisture has slightly improved since the end of March. At Avondale, CO (in the Arkansas basin in southeastern CO) evapotranspiration is currently tracking along with the year of highest recorded ET, which was during the drought of 2002. This could mean that water demand will be very high this summer.

Due to delayed snowmelt in the higher elevations, most of the reservoir levels in the UCRB are below their average May levels (Fig. 7). Storage volumes at Green Mountain, Lake Granby, and Lake Dillon continue to decrease in preparation for the large inflow volumes that are expected to begin soon. Lake Powell, McPhee, and Navajo Reservoirs storages (all in the southern portion of the basin) have all been increasing since early April.

Precipitation Forecast

The next system to affect the area enters the Four Corners region late tonight/early tomorrow and could bring around half an inch of moisture to the southern portion of the UCRB. The system will track northeast and will exit the region late Wednesday and into Thursday. The central mountains of Colorado will receive most of the moisture from this storm with some higher elevations seeing between 7 and 10 inches of new snow. The lower elevations and northeastern plains of Colorado will mainly receive rain from this storm. Most of the region will return to above average temperatures later this week and into this weekend as a ridge builds over the area, though a few disturbances are possible. Early next week, there is a slight chance of a cold front coming down the front range which can spawn some thunderstorms, mainly for the northern and central plains. A slow moving low in the western U.S. will continue to dig and set up a southwest flow regime for the region, bringing mainly dry conditions but with the possibility of some convective precipitation over the plains.

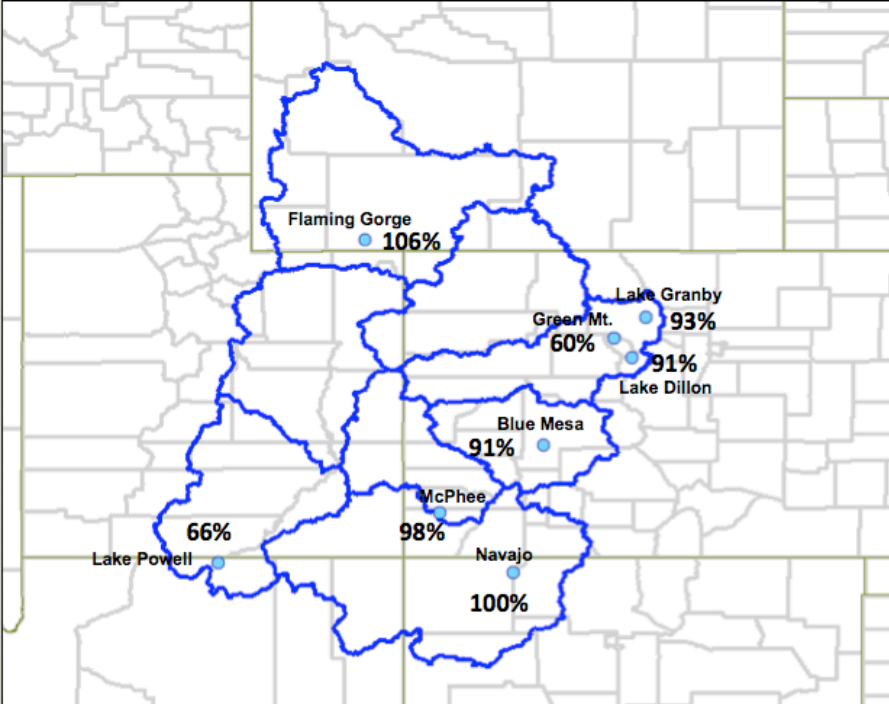


Fig. 7: May 8th reservoir storages as a percent of May averages.

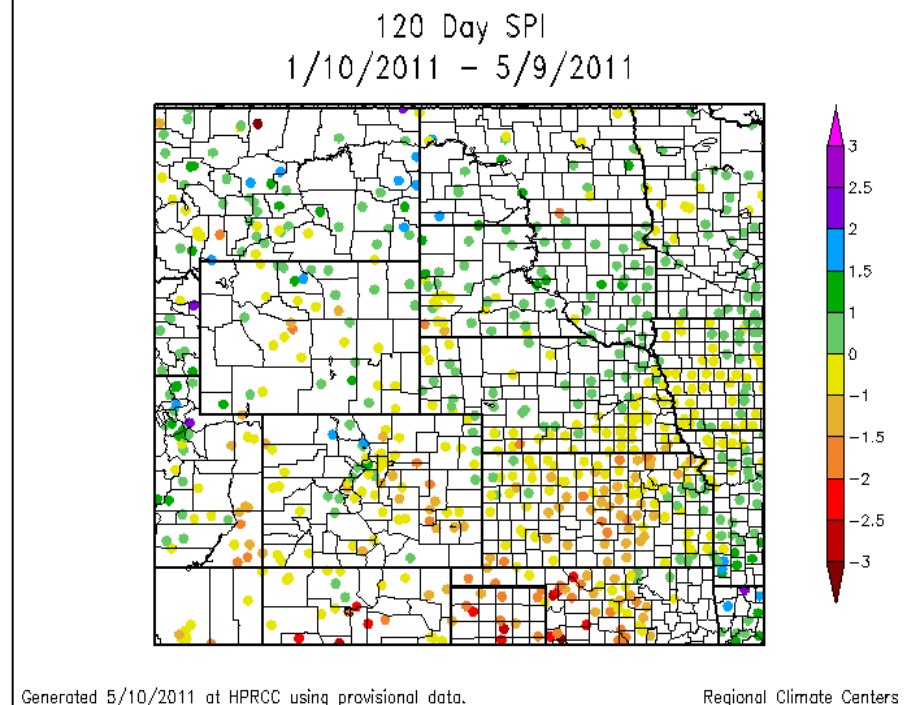
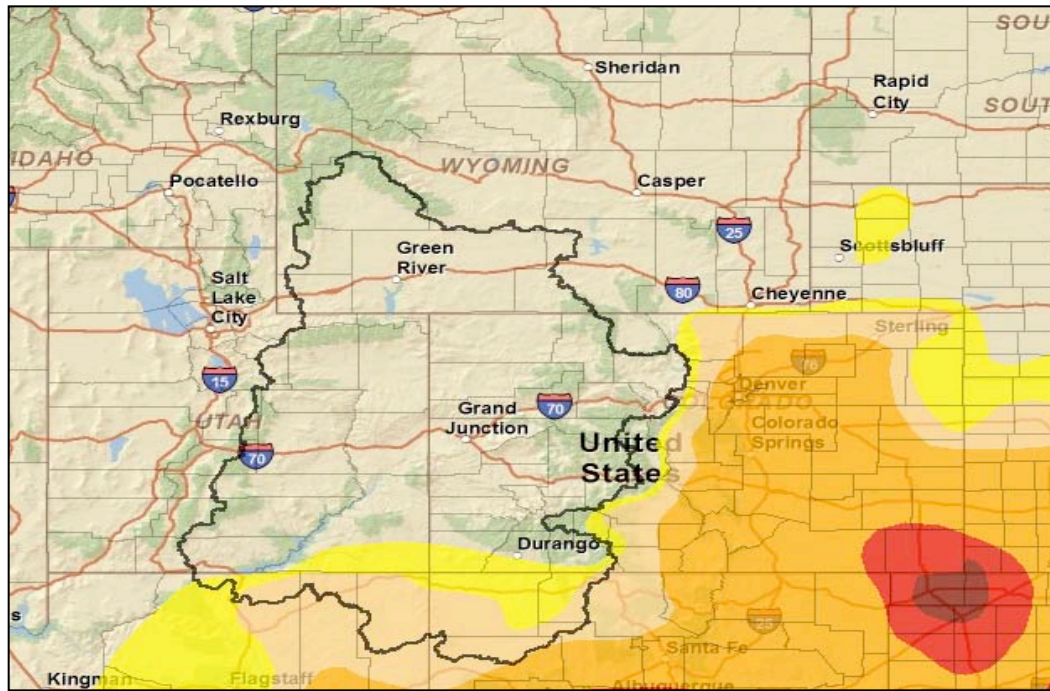


Fig. 8: 120-day standardized precipitation index (SPI) as of May 9th.

Drought and Water Discussion



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

Fig. 9: May 3rd release of U.S. Drought Monitor for the UCRB

No changes have been recommended for the current U.S. Drought Monitor (USDM) map in the UCRB or the eastern plains (Fig. 9). Continued dryness has been observed over the plains, however local experts have recommended status quo for the region. It will be closely monitored over the next couple of weeks for any further needed deterioration. With mixed indicators in the Four Corners region, status quo is again recommended for that region—soil moisture conditions are fair, and though streamflows are low, it is believed that some of that could be because of man-made regulations in the region. SPIs in the region are slightly negative on most timescales and very negative on the 120-day timescale (Fig. 8). However, impacts are not being reported, and local experts feel that any expansion of D0 (or any degradations) is not warranted at this time. This area will also continue to be closely monitored.