NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

May 3, 2011

Precipitation and Snowpack

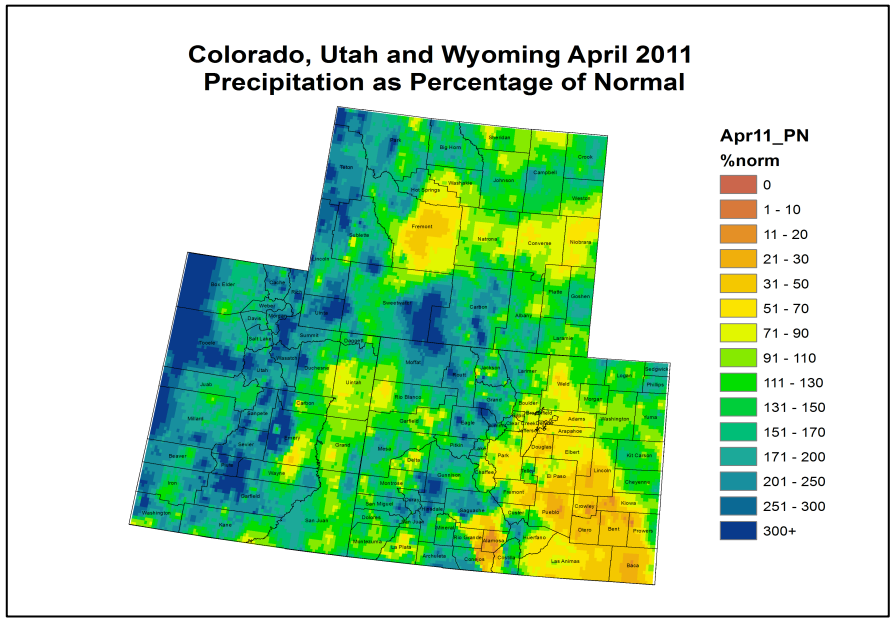


Fig. 1: April precipitation as a percent of average.

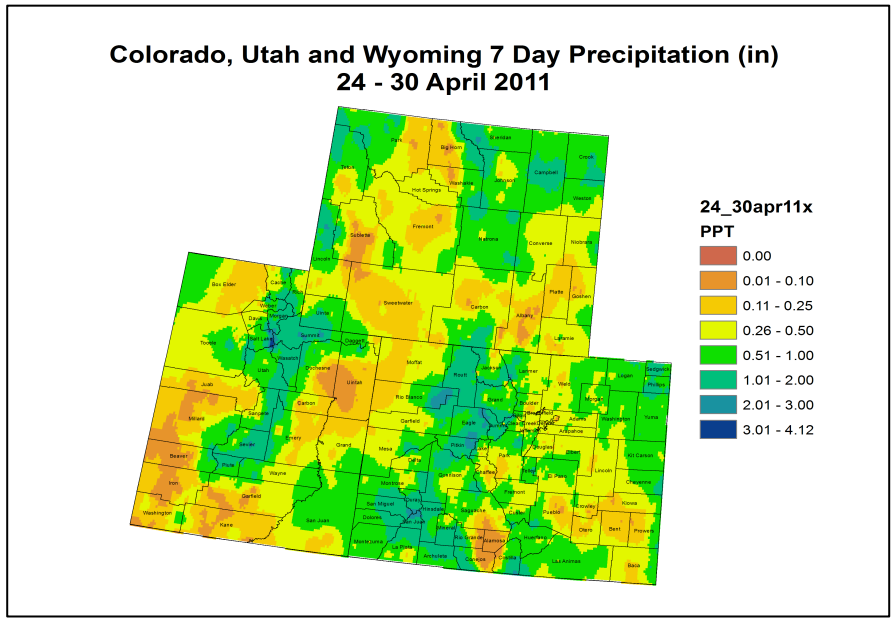


Fig. 2: April 24 – 30 precipitation in inches.

For the month of April, the majority of the Upper Colorado River Basin (UCRB) saw near to above average precipitation (Fig. 1). Some of the valley locations in eastern Utah and western Colorado were slightly drier with around 70% of their average April precipitation. The northeastern plains saw some recovery from dry conditions in April with over 130% of average precipitation. The southeastern plains and the San Luis Valley have seen persistent dry conditions through most of the water year and with less than 50% of their average for April.

Last week, precipitation continued to favor the high elevations of the UCRB (with amounts ranging from half an inch to 3 inches), while the lower elevations received less than half an inch (Fig. 2). The Four Corners received beneficial moisture last week, with some areas receiving over an inch. The northeastern plains also saw between half an inch to an inch of precipitation. The southeastern plains and the San Luis Valley remained drier, with many areas seeing less than a quarter of an inch of precipitation.

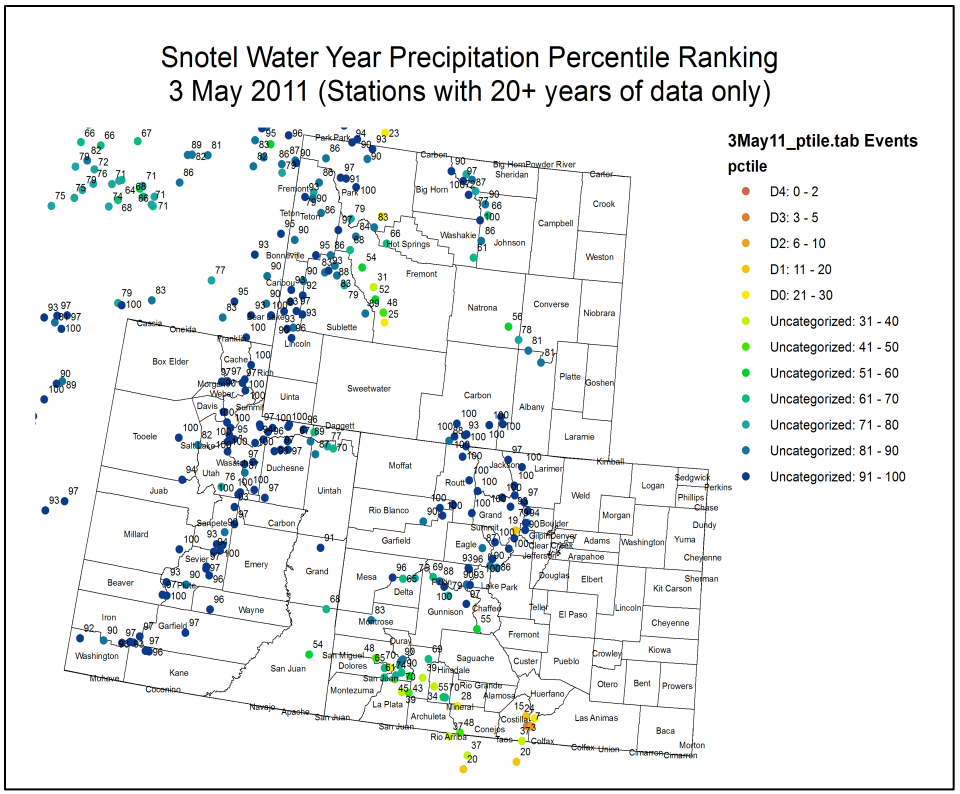


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

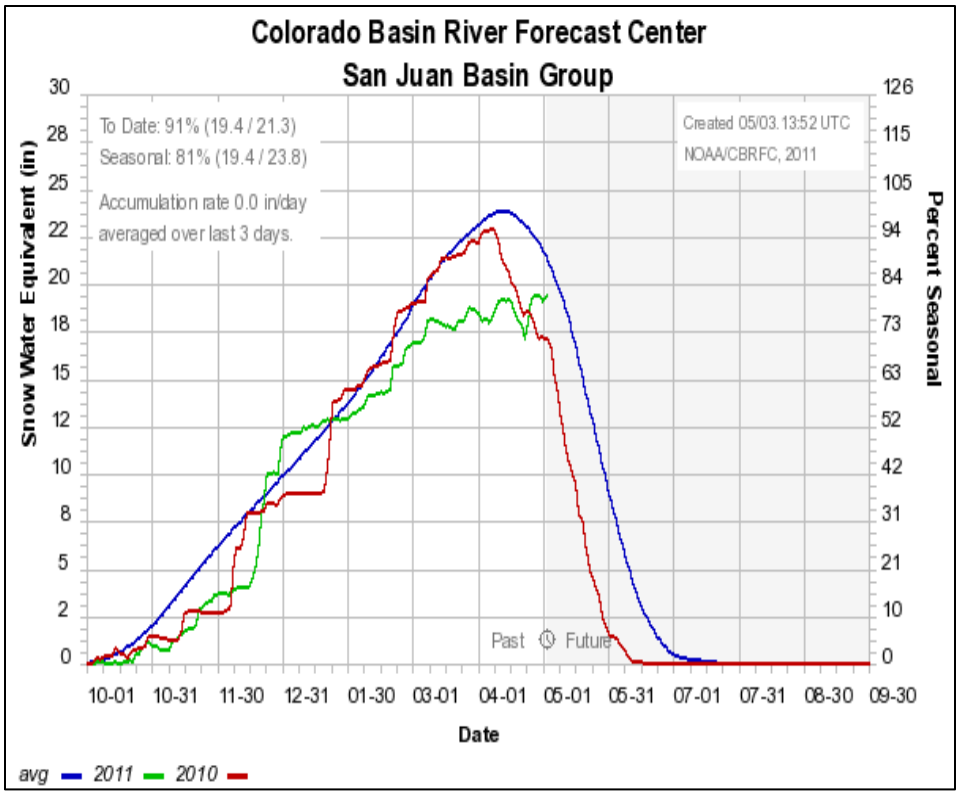


Fig. 4: San Juan Basin averaged accumulation of snow water equivalent, WYTD.

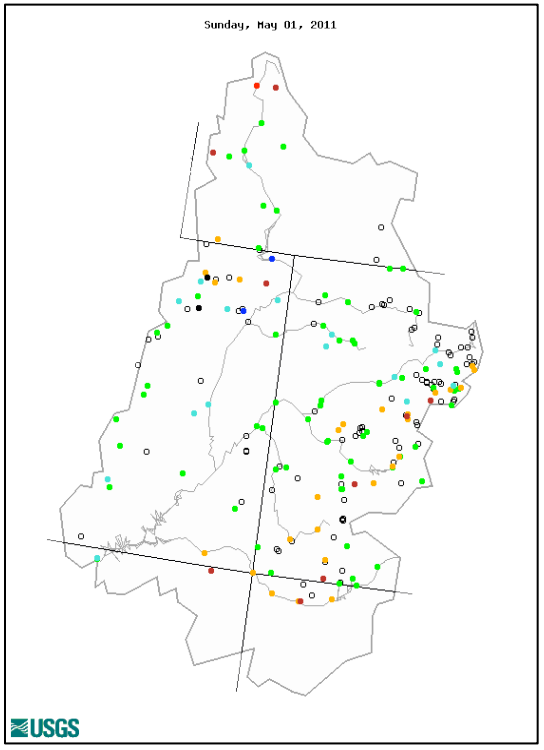
The majority of the SNOTEL sites in the UCRB are showing high percentile rankings for water-year-to-date (WYTD) precipitation (Fig. 3). The Rio Grande and San Juan basins in southern CO are the driest, showing percentile rankings below 50%. Many of the sites in the Upper Rio Grande basin are showing 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 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.

Streamflow

As of May 1st, about 77% 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 130 gages in the basin currently reporting. An increasing number of gages near the upper reaches of the tributaries are recording below normal flows. This is primarily due to the cooler than average temperatures last week that shut off the snowmelt, which is normally ramping up this time of year.

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 65th and 84th percentiles, respectively (Fig. 6). The San Juan River near Bluff, UT is currently recording below normal flows at the 15th percentile.



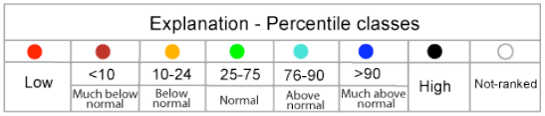


Fig. 5: USGS 7-day average streamflow compared to historical streamflow for May 1st in the UCRB.

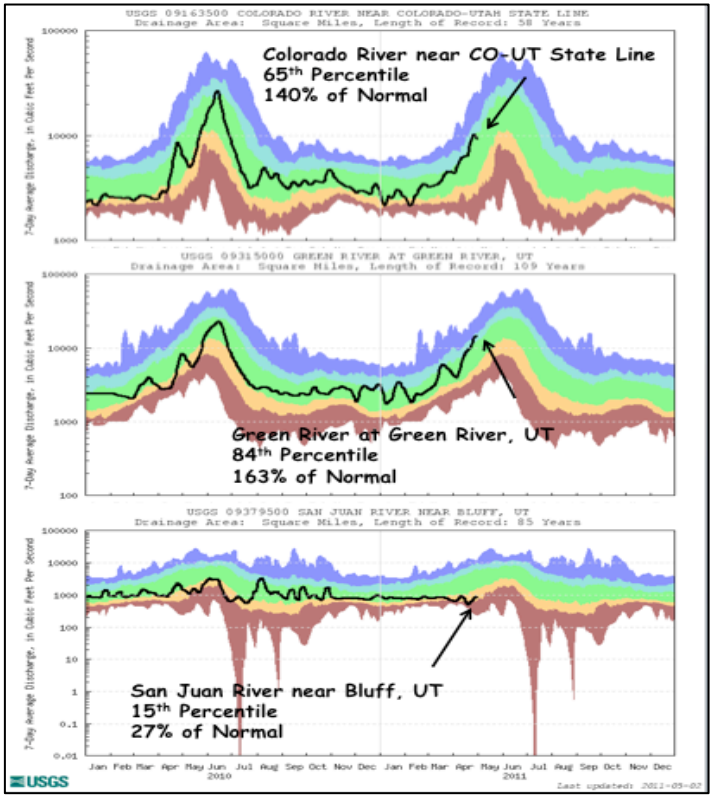


Fig. 6: USGS 7-day average discharge over time at the CO-UT state line (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Last week, the UCRB and surrounding areas experienced cooler temperatures (more than 6°F below average around the UCRB and around 4° to 6° below average along the plains). 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 (Fig. 7). 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. 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 all saw increases in their storage for the month of April.

Precipitation Forecast

The La Nina pattern, which has persisted through most of the water year, has favored the northern mountains of the UCRB with precipitation while leaving the southern portion and the eastern plains drier. This pattern will continue over the next week. A series of waves will pass over the region tonight and through Wednesday, bringing a possible .3 to .4 inches of moisture to the northern mountains in CO and southern WY and around .1 to .2 inches of moisture to the central mountains. By the end of the week, a pattern shift will move the jet to the north, resulting in warmer and drier conditions for most of the UCRB. This could allow for snowmelt to begin again and runoff to increase. A Pacific storm will move into the area late Monday, bringing significant moisture (possibly more than 1 inch) to northeast UT and northwest CO. Though accumulations will be less, this system could also deposit significant amounts around the southern part of the UCRB.

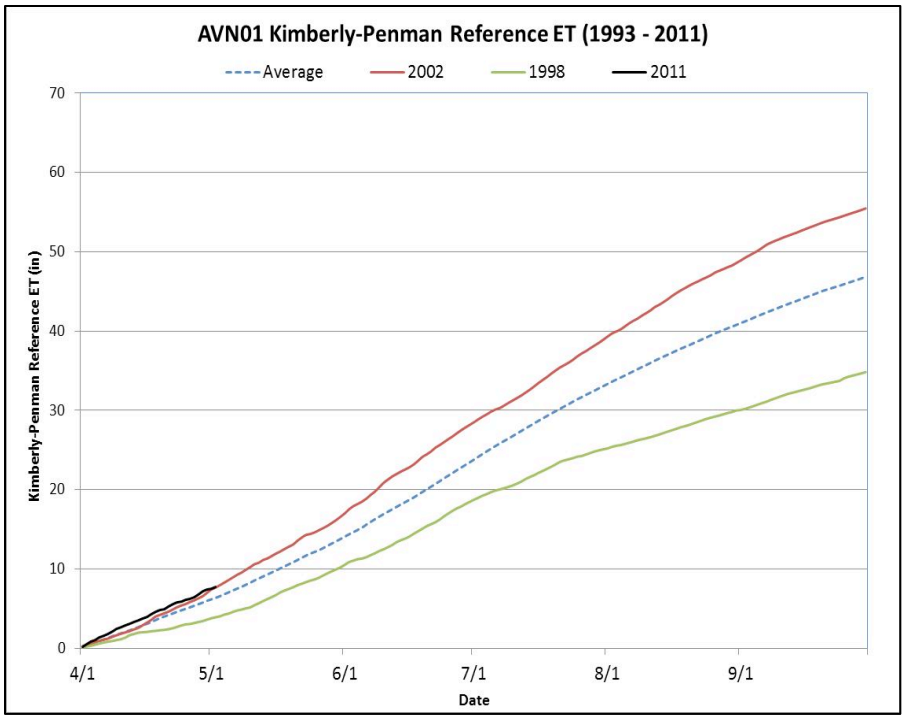
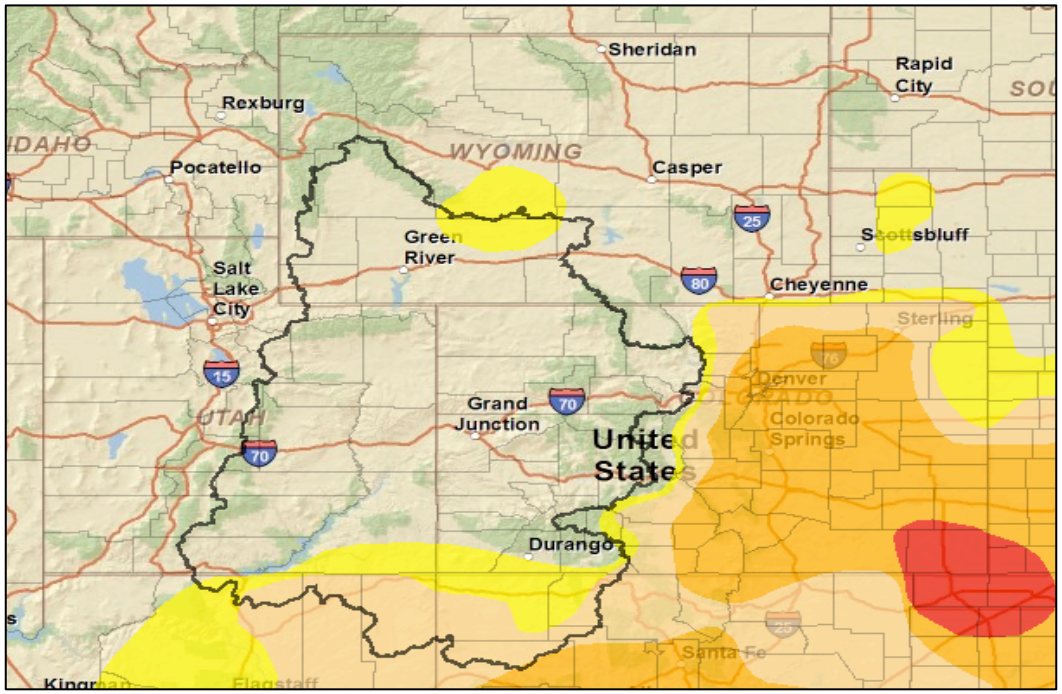
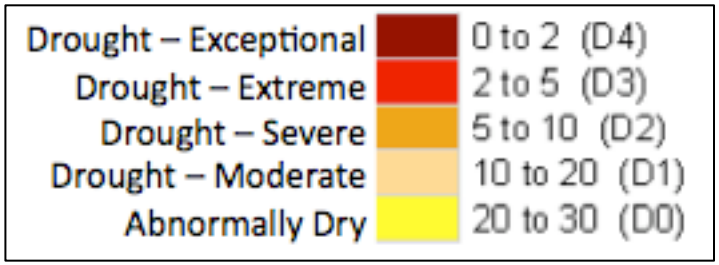


Fig. 7: Reference evapotranspiration (ET) since April 1st at Avondale, CO in the Arkansas basin, compared to high and low ET years.

Drought and Water Discussion





Drought categories and their associated percentiles

Fig. 8: April 26th 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. 8). Precipitation fell through most of the drought affected locations last week, so no degradations are needed. However, not quite enough precipitation fell to warrant any improvements. The mountain areas of the Arkansas basin will be examined over the next couple of weeks though for possible category improvements.

The USDM author has removed the small amounts of D0 that had remained in WY. The author also has made a slight change in far southeastern CO. Expansion of D4 in the Oklahoma panhandle was extended into extreme southeastern Baca County to maintain the smoothness of the lines. As this area is very data sparse, but all indicators are that the region is very dry, this is justifiable.