NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

June 14, 2011

Precipitation and Snowpack

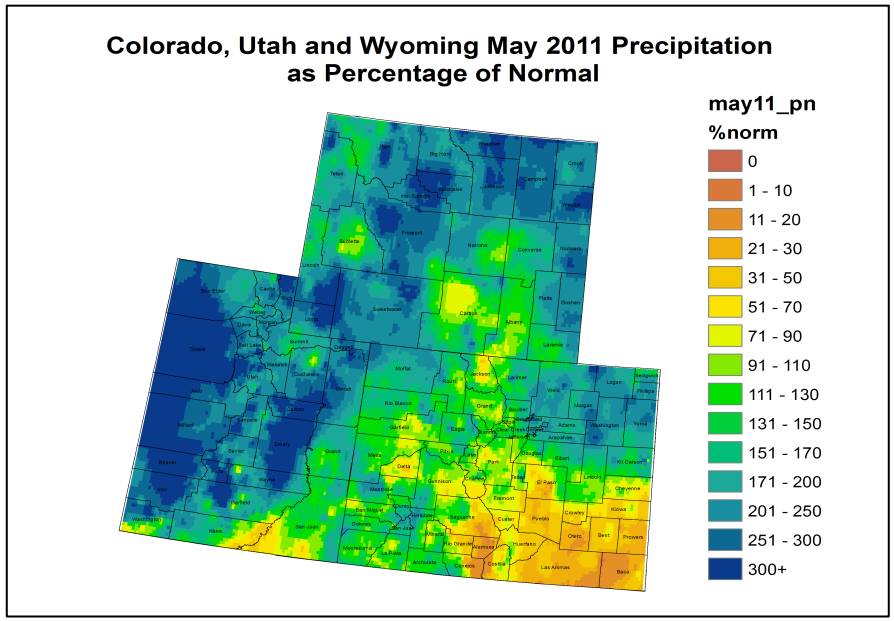


Fig. 1: May precipitation as a percent of average.

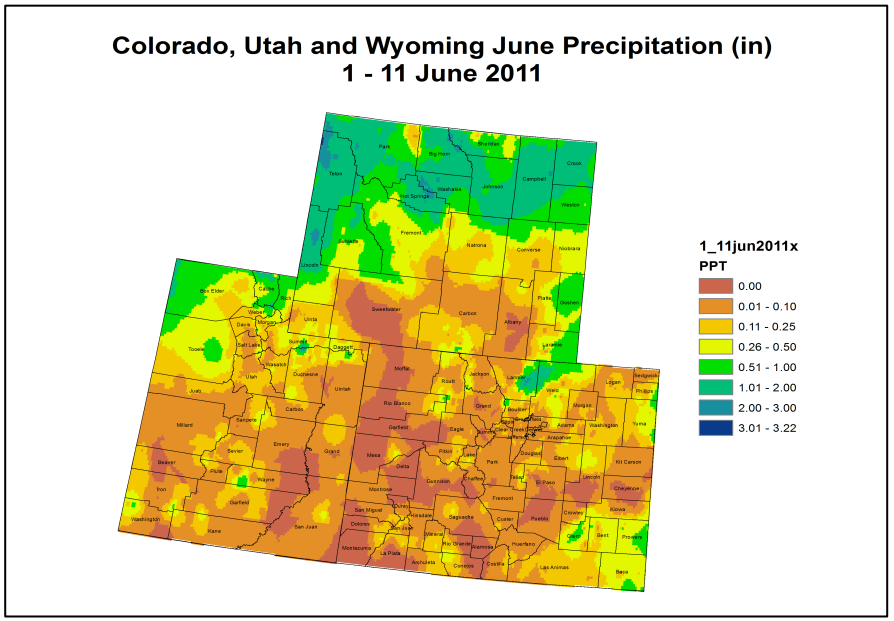


Fig. 2: June month-to-date precipitation in inches.

For the month of May, most of the Upper Colorado River Basin (UCRB) received near or above average precipitation (Fig. 1). Some areas of eastern UT and southwestern WY saw over 300% of their average May precipitation. Some of the lower elevations in western CO and southern UT were a bit drier, receiving around 50 to 70% of their average precipitation for May. Precipitation was well above average for northeast CO, bringing their water year totals to near or above average. Southeast CO and the San Luis Valley saw less than 50% of their average moisture for the month.

Since the beginning of June, much of the UCRB and surrounding areas have been fairly dry (Fig. 2). A few localized regions received isolated storms last week, resulting in higher accumulations—parts of northern CO and southeast WY have received over half an inch of precipitation. Northeast UT and Southeast CO also saw around a quarter to half an inch of precipitation. Most of the UCRB and eastern plains of CO have only received around a tenth of an inch or less of moisture for the month.

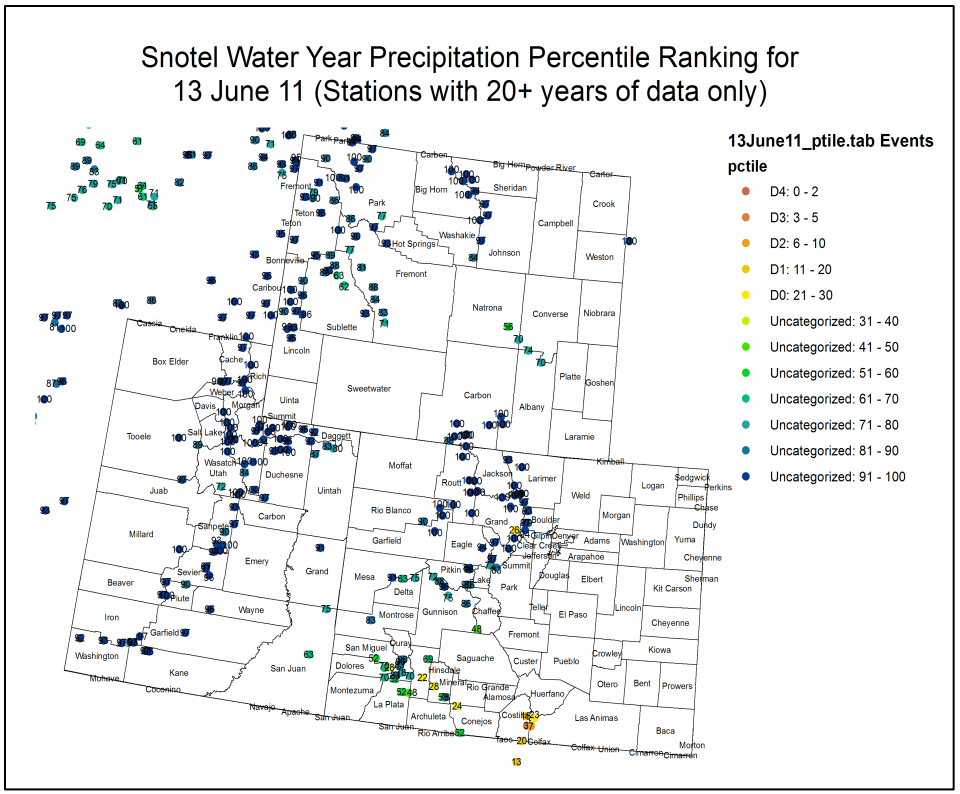


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

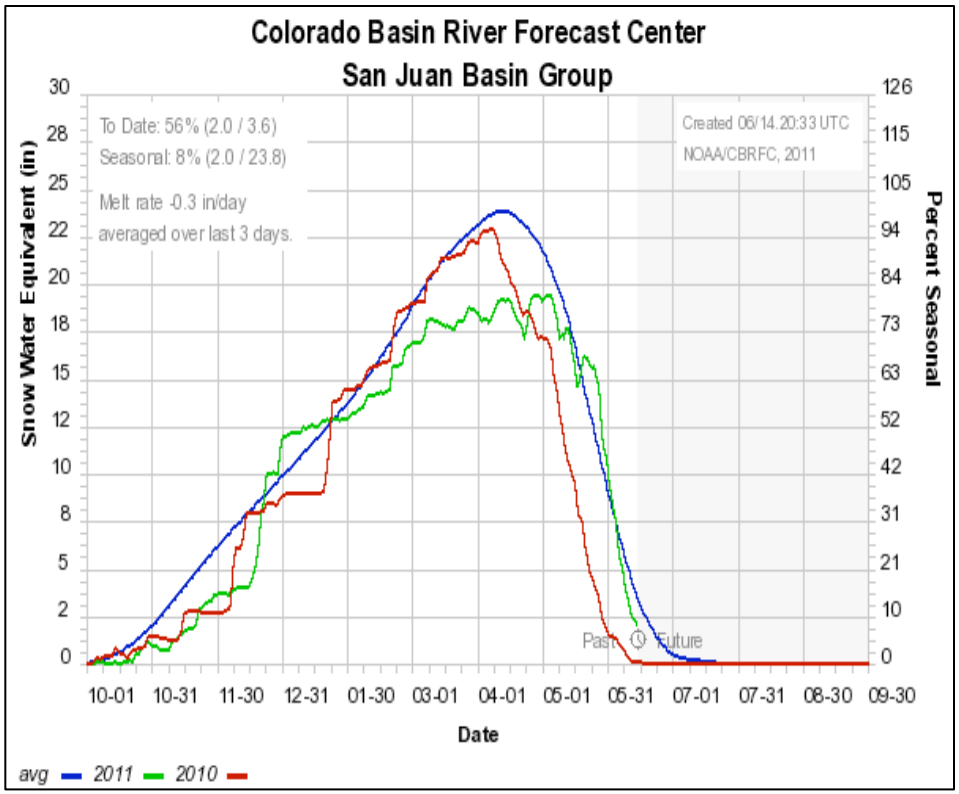


Fig. 4: SNOTEL WYTD accumulated snow water equivalent as a percent of average.

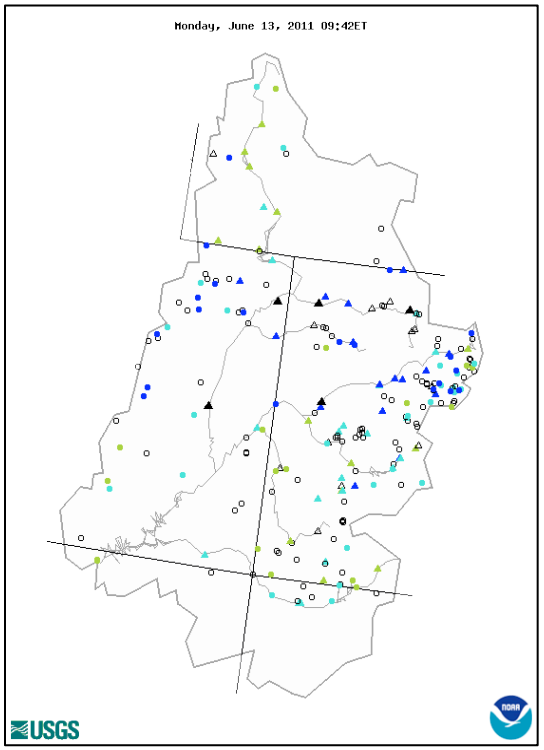
The majority of the SNOTEL sites in the UCRB are showing very high (and in many cases, record high) percentile rankings for water-year-to-date (WYTD) precipitation (Fig. 3). The Rio Grande and San Juan basins in southern CO are the driest, though the higher elevations of the San Juan basin have improved somewhat from the earlier part of the water year. Several sites in the Upper Rio Grande basin are below the 30th percentile.

Many of the SNOTEL sites below 9000 feet have completely melted out over the past few weeks. Many of the higher elevation sites, while still well above average for this time of year, are rapidly melting down (between half an inch to over an inch per day). With the exception of the San Juan basin, all of the sub-basins in the UCRB received above their average seasonal peak snowpacks. The San Juan basin only received about 80% of its average seasonal snowpack and has mostly melted its entire snowpack (Fig. 4).

Streamflow

As of June 12th, about 95% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows with 64% of the gages recording flows above the 75th percentile. As of June 13th, 5 gages were exceeding the National Weather Service flood stage (Fig. 5), though that has since gone down to 2 gages. Many of the gages in the northern part of the UCRB are still recording real-time flows at or above the 99th percentile.

Key gages on the Colorado River near the CO-UT state line and the Green River at Green River, UT have above normal 7-day average streamflow at the 94th and 93rd percentiles, respectively (Fig. 6). 7-day average streamflow on the San Juan River near Bluff, UT is at the 62nd percentile—a combined result of localized runoff and increased releases of about 5000 cfs from Navajo Reservoir. These releases are expected to continue until about June 16th at which time they are planned to be decreased to about 500 cfs.



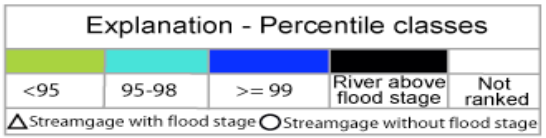


Fig. 5: Real-time flood and high-flows conditions at USGS streamgages as of June 13th.

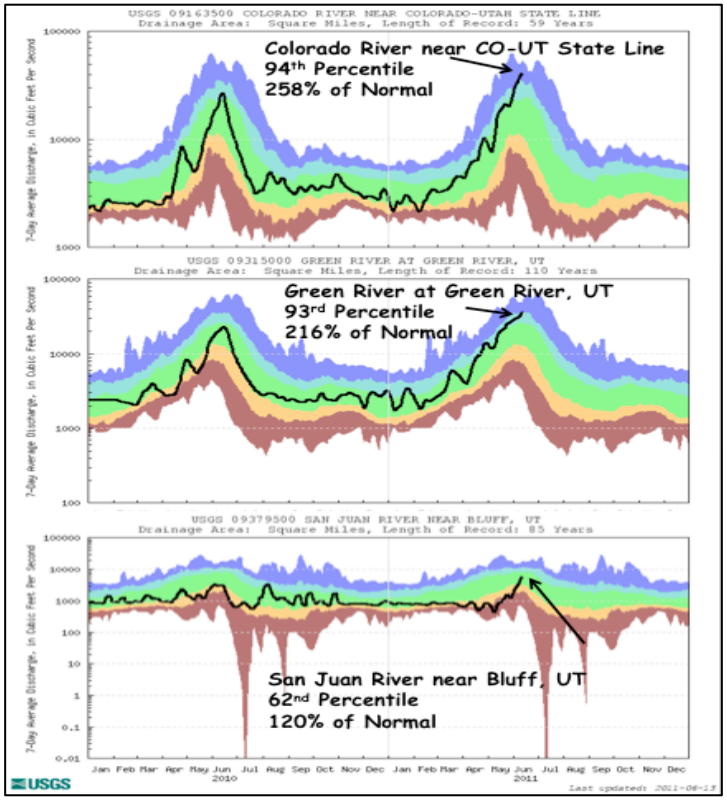


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Last week, near average temperatures were prevalent over the UCRB, with much warmer than average temperatures seen over southeast CO and cooler than average temperatures over northeaster UT. Soil moisture conditions remain poor for southeastern CO and the San Luis Valley. Soil moisture is above average along the Wasatch range in UT and has significantly improved over northeastern CO (Fig. 7).

Since May 15th, all of the major reservoirs in the UCRB (with the exception of Dillon) have been increasing in storage. Daily inflows into Flaming Gorge, Blue Mesa, Navajo, and Lake Powell are all well above their averages for this time of year. Storage volume increases at Navajo have leveled off somewhat as releases out of the reservoir have increased. Green Mountain Reservoir has experienced very large increases in the last two weeks, as flows along the Blue River have rapidly increased over the past week. Storage volumes at Dillon have been adjusting over the last month to help mitigate the anticipated response of the Blue River flows to near record snowpack that has begun to melt in the region. Dillon's storage volume has been increasing since the beginning of June.

Precipitation Forecast

Several disturbances are expected to pass over the UCRB over the next week (Fig. 8). An upper-level disturbance will move over the area on Thursday, initially bringing warmer than average temperatures with it (about 5 to 10 degrees above average). Scattered thunderstorms and showers are expected in the northern part of the UCRB with this system. Cooler air arrives as this system exits the region. Near normal temperatures are expected for the region again for the weekend with another chance for showers in the northern part of the basin possible on Sunday. As another system approaches, bringing northwesterly flow with it, temperatures in the region are expected to be much cooler than average for the beginning of next week. Not too much precipitation is expected from this system, but it is expected to slow the snowmelt currently occurring in the higher elevations.

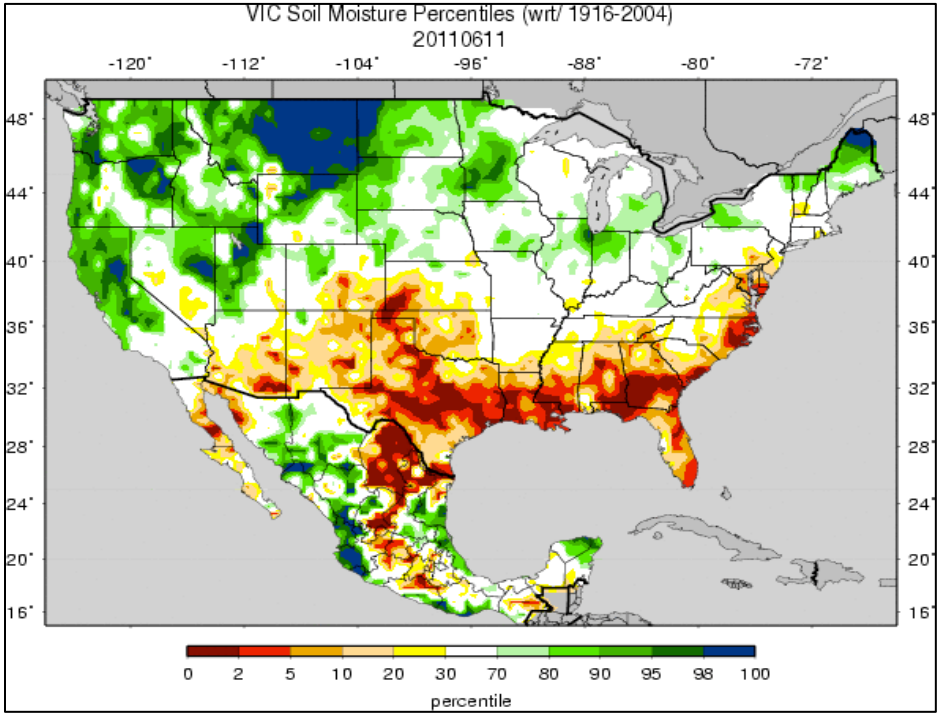


Fig. 7: VIC soil moisture percentiles as of June 11th.

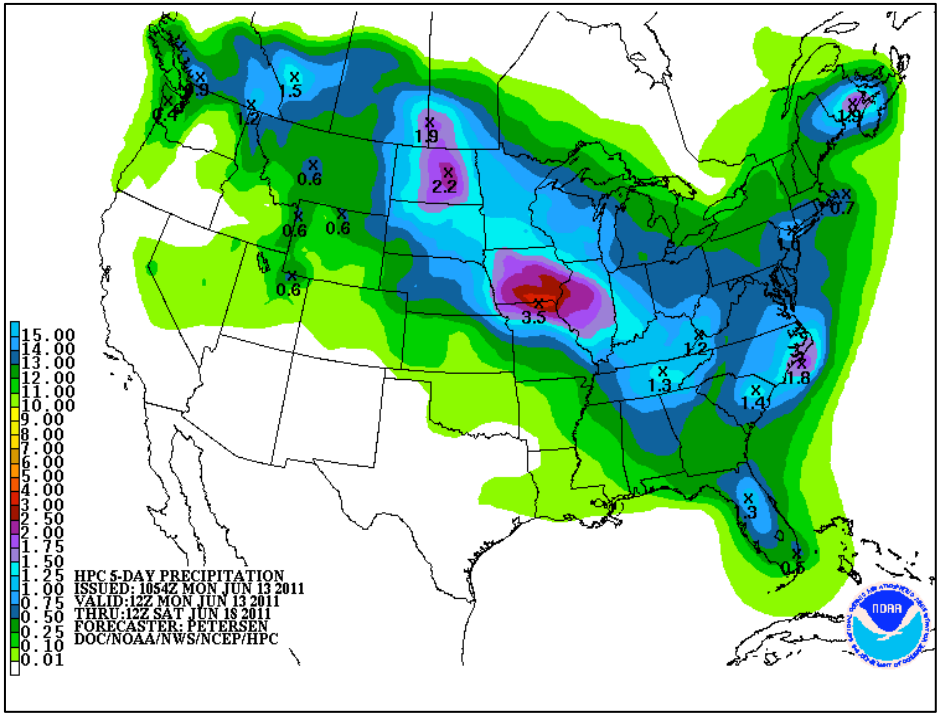
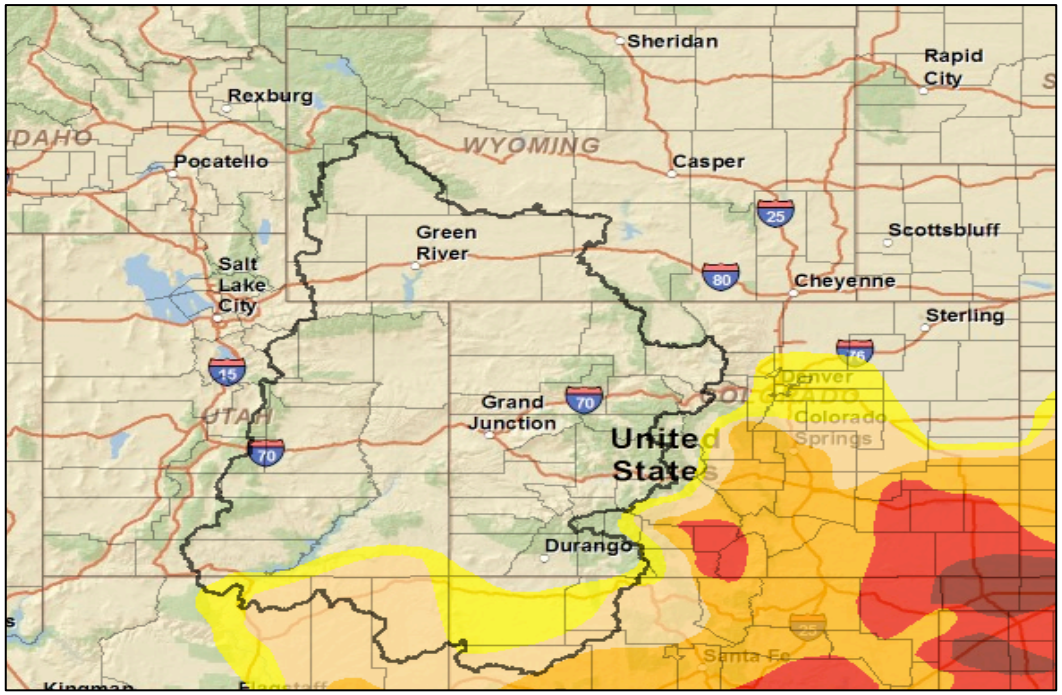
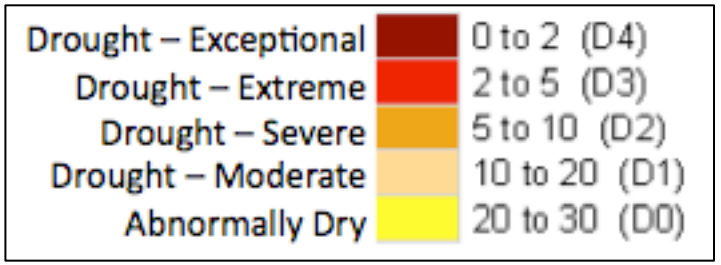


Fig. 8: HPC quantitative precipitation forecast 5-day accumulations for June 13 – 18.

Drought and Water Discussion





Drought categories and their associated percentiles

Fig. 9: June 7th release of U.S. Drought Monitor for the UCRB

Status quo is being recommended for the UCRB in the current U.S. Drought Monitor (USDM) map (Fig. 9), though the Four Corners region is being watched closely as dryness continues and the threat of wildfires increases. East of the UCRB, an expansion of D2 and D3 is being recommended in the Arkansas basin. The D2 expansion would cover the remainder of El Paso, Pueblo and Crowley counties. The D3 expansion would extend northwestward from Otero and Las Animas counties and would cover much of central Pueblo and El Paso counties.

Abnormal dryness is also being observed in the valleys around Park and Chaffee counties. A slight westward expansion of the D0 and D1 lines in that area would be justified, though the gradients would remain fairly tight and the adjustment would be very minor.