NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

November 23, 2010

Precipitation and Snowpack

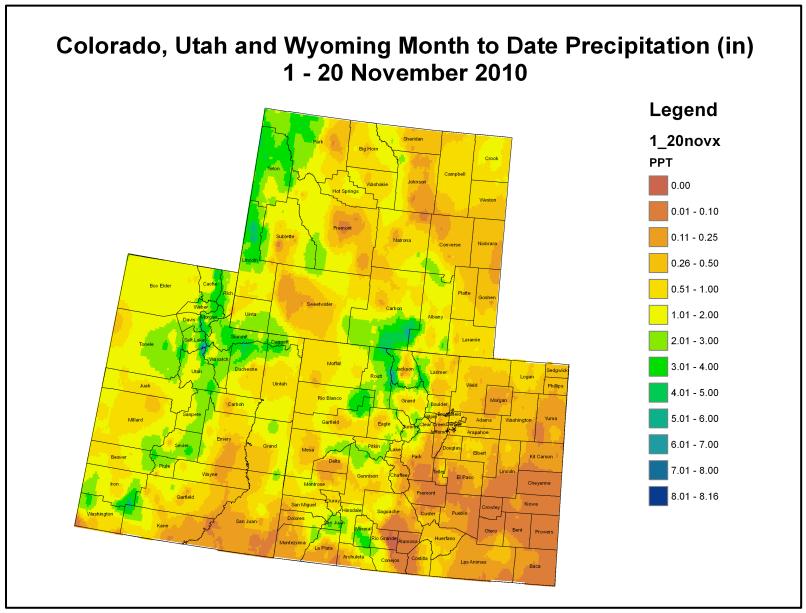


Fig. 1: November month-to-date precipitation in inches.

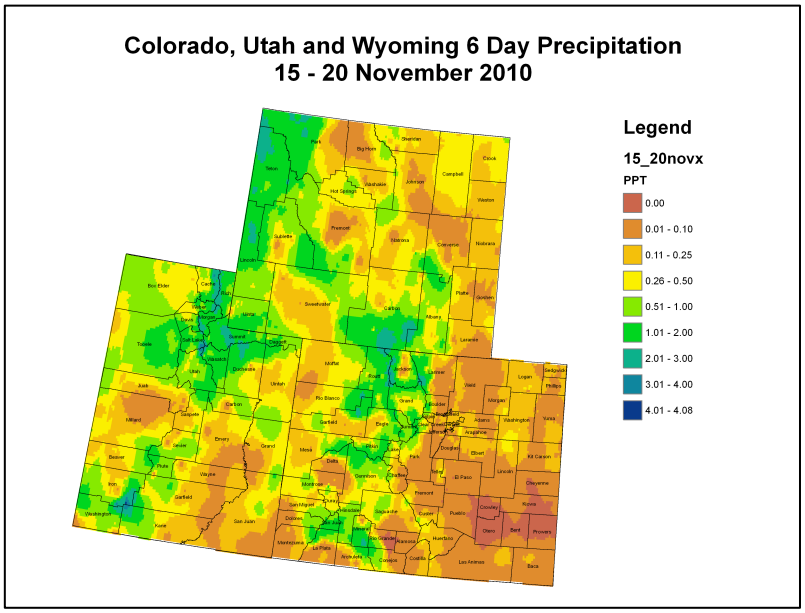


Fig. 2: November 15 – 20 precipitation in inches.

Most of the Upper Colorado River Basin (UCRB) received near or above average precipitation for the month of October. For the first 20 days of November, good amounts of moisture have continued to fall throughout the Yampa-White and Colorado basins and in parts of the Lower Green River basin (Fig. 1). The Upper Green River basin has not received much precipitation for the month so far, and San Juan County, UT is also in a deficit for November. The Rio Grande basin and eastern plains of Colorado have received very little to no moisture for the month.

Last week, more precipitation fell in the northern mountains of Colorado and throughout parts of the Lower and Upper Green River basins (Fig. 2). Some parts of Sweetwater County, WY received some beneficial moisture, but the county is still at a deficit for the month. The Rio Grande basin and eastern CO again saw very little moisture with most counties receiving less than a quarter of an inch last week.

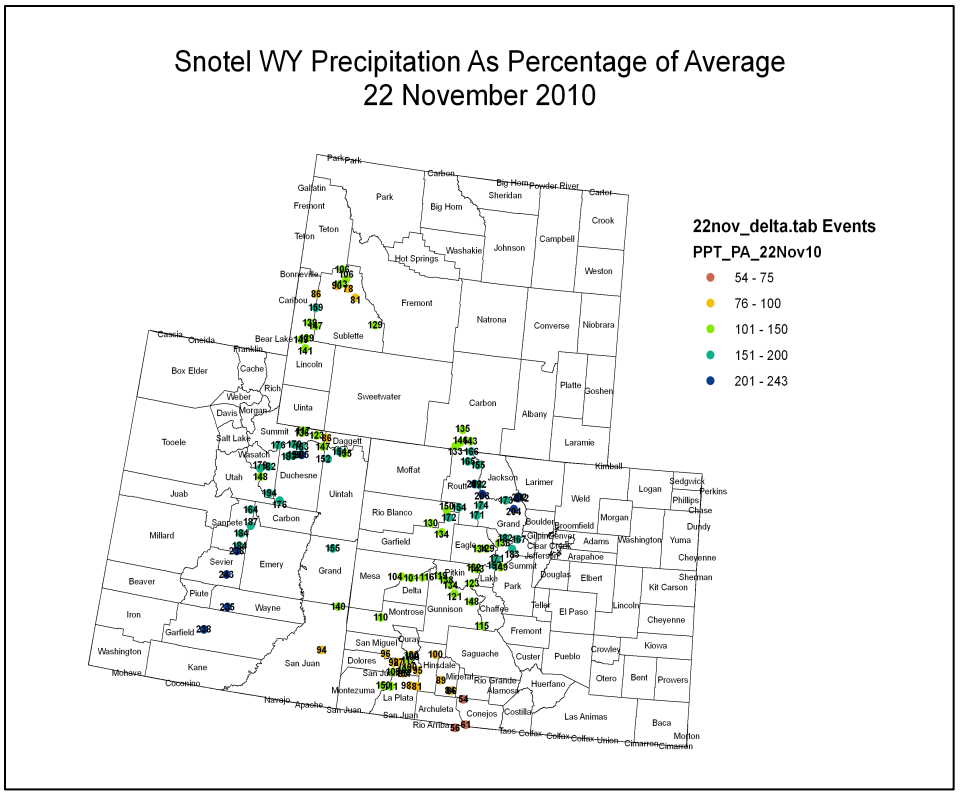


Fig. 3: SNOTEL WYTD precipitation percent of average.

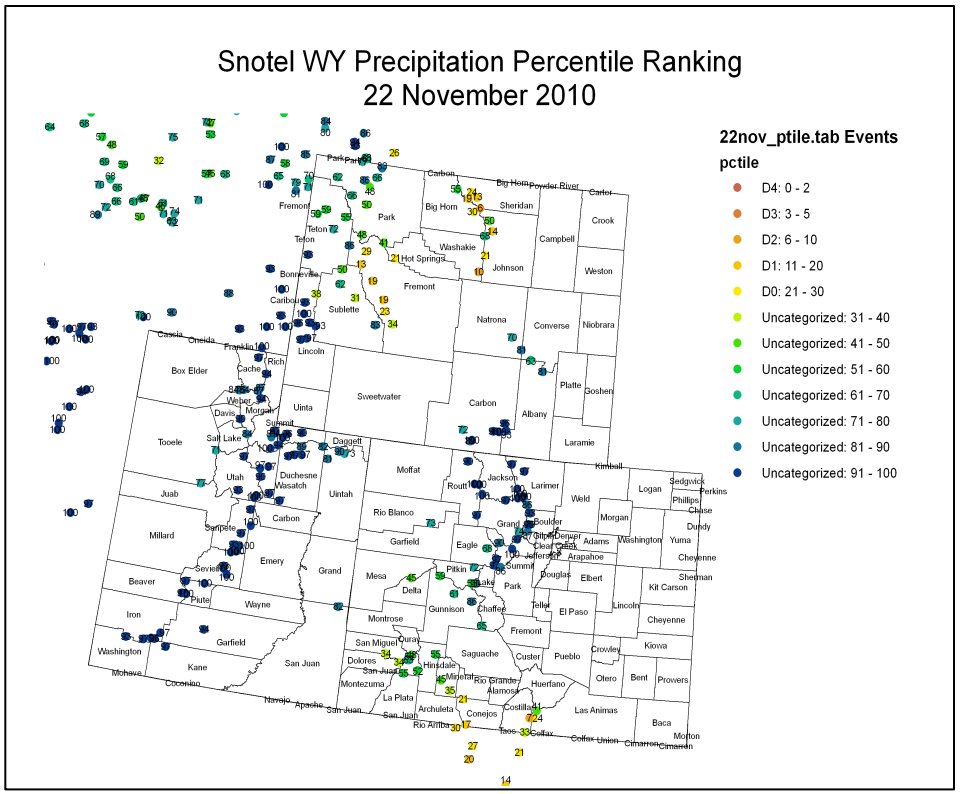


Fig. 4: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

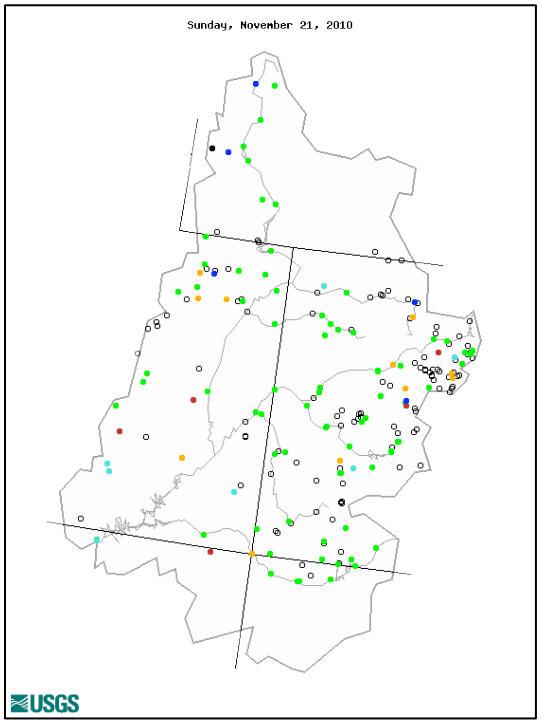
For most of the UCRB, SNOTEL water-year-to-date (WYTD) precipitation has been near or above average (Fig. 3). Around the Colorado headwaters region, WYTD percents of average are around 150%, and precipitation along the western boundary of the UCRB in Utah is around 200% of average. The lowest percents of average are in the San Juan basin (values around 80%) and in the Upper Green River basin (values around 80%), though improvements have been made this past week in the Upper Green.

Percentile rankings for the SNOTEL stations around the UCRB show most stations ranked fairly high (Fig. 4). Aside from a few stations in the Rio Grande basin and along the eastern border of the Upper Green River basin, most stations are showing percentiles in the 70s to 90s—meaning less than thirty percent of the water years on record have been wetter by this time. The lowest percentiles match up with the areas of lowest percents of average, meaning that it is rare for these areas to have such dry beginnings to the water year.

Streamflow

As of November 21st, around 85% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). After a dry September and October, which forced many more gages to report below normal flows, conditions in the basin have improved. The Colorado headwaters region currently has the highest density of gages reporting below normal flows, with a few below normal gages also showing up in the Lower Green River basin.

Looking at hydrographs from several sites around the UCRB, continued improvement can be seen along the Green and San Juan Rivers, while discharge decreased on the Colorado River (Fig. 6). The Colorado River at the CO-UT state line is currently at 88% of normal (a 4% decrease from last week). The Green River at Green River, UT and the San Juan River near Bluff, UT are at 120% and 86% of normal, respectively. All three gages show 7-day average discharge within the normal percentile range, though all show below normal cumulative runoff for the calendar year.



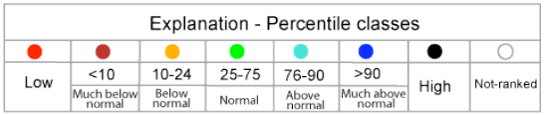


Fig. 5: USGS 7-day average streamflow compared to historical streamflow for November 21st in the UCRB.

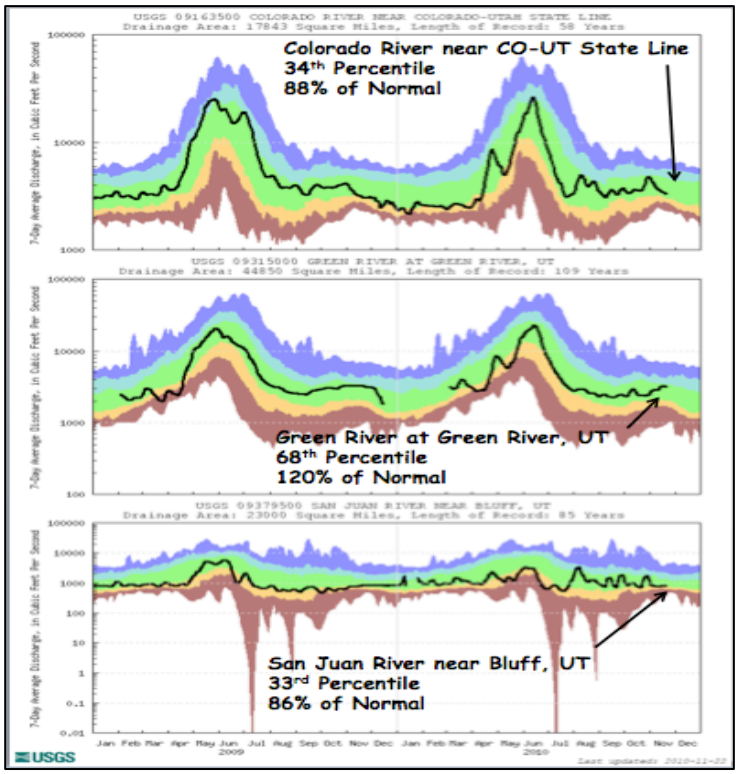


Fig. 6: USGS 7-day average discharge over time at the CO-UT state line (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

After one cooler than average week, the UCRB returned to above average temperatures for last week. Since the beginning of the month, temperatures in the UCRB have been as much as 6°F above average in certain areas, and temperatures along the eastern plains of Colorado have been about 4°F above average for the month so far. VIC soil moisture continues to show very dry soils on the eastern plains of Colorado and Wyoming with near normal conditions throughout most of the UCRB (Fig. 7). Soil conditions near the four-corners region continue to deteriorate.

Only minor fluctuations in lake levels this past week. Green Mountain and Lake Dillon saw no changes in levels while Blue Mesa Reservoir experienced an increase in levels. For the month, most of the reservoirs in the UCRB saw volume decreases of less than 5,000 acre feet. Flaming Gorge, McPhee, Navajo Lake, and Lake Granby are all above average storage for this time of year. Lake Powell dropped another 80,000 acre feet last week, bringing its total releases for the month to over 268,000 acre feet. Lake Powell is currently 78% of average and 62% of capacity.

Precipitation Forecast

The UCRB will remain underneath the influence of a large trough centered over the middle of the US, with several pieces of energy forecast to rotate through the area over the next few days. The next storm will impact the region on Tuesday night and into Wednesday in the form of a powerful Arctic cold front. Expect to see 0.25 to 0.5 inches of liquid accumulation in the mountains of UT and CO through Thursday, with northern areas benefiting the most. It is worth noting that precipitation will be light to non-existent for areas east of the Continental Divide during this series of storms. The pattern changes over to weak ridging for the upcoming weekend. Several weak disturbances may bring a chance of snow showers back to the northern mountains over the weekend, with other areas remaining dry and seasonable. Forecast models have been inconsistent both between runs and each other with regards to the pattern beyond the weekend.

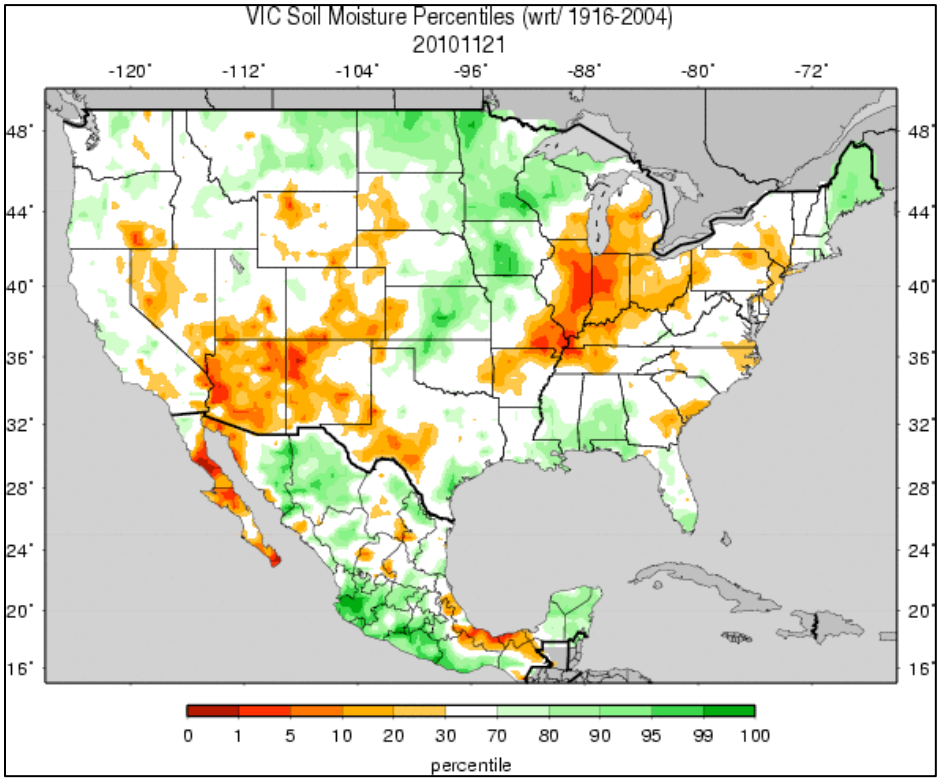


Fig. 7: VIC soil moisture percentiles as of November 21st.

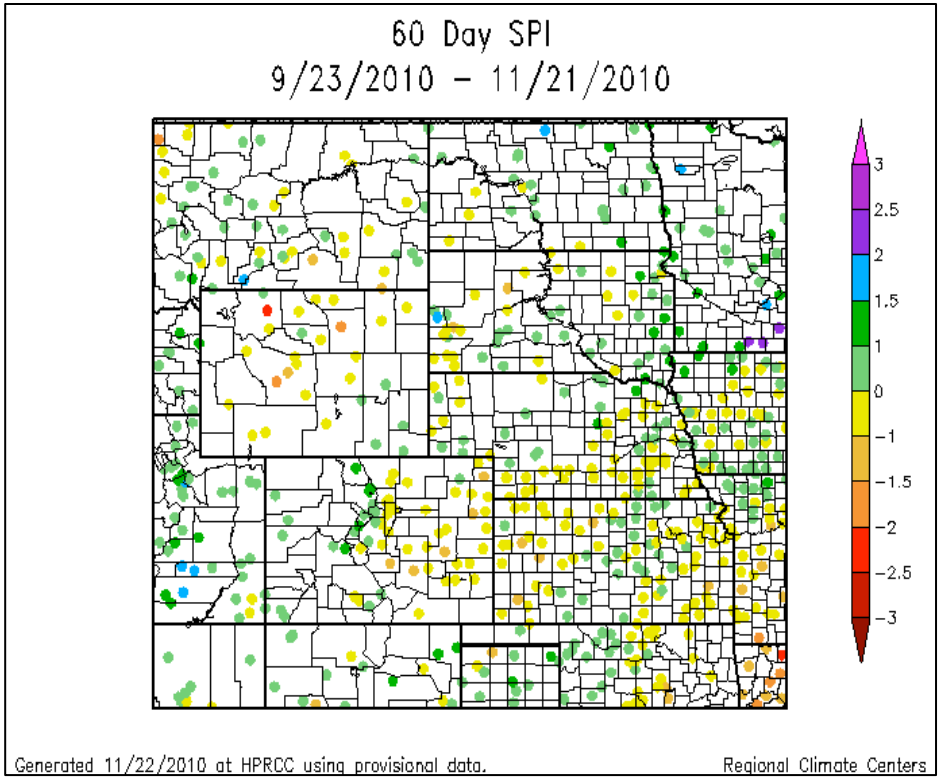
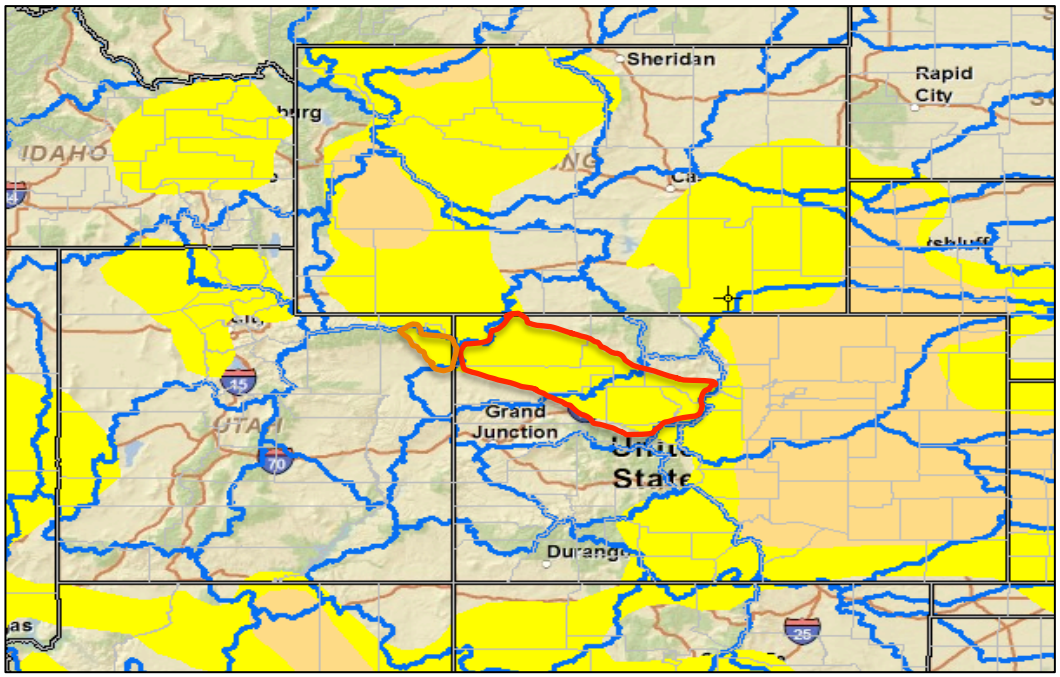
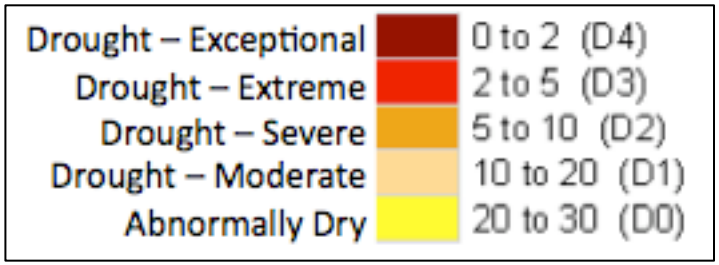


Fig. 8: 60 day standardized precipitation index.

Drought and Water Discussion





Drought categories and their associated percentiles

Fig. 9: November 16th release of U.S. Drought Monitor for the UCRB

The current 60-day Standardized Precipitation Index (SPI) map, as well as other time periods, show continued improvement west of the Continental Divide in Colorado (Fig. 8). Streamflow and soil moisture in the area have improved, and the region continues to receive good amounts of moisture each week since the beginning of the water year. It is therefore being recommended that D0 be completely removed from the Yampa-White and Colorado basins (Fig. 9, red line). Conditions also look good throughout the Lower Green River basin, so a D0 removal is recommended for that region as well (Fig. 9, orange line). These improved conditions have not seemed to spread north into the Upper Green River basin, so status quo is recommended for that basin.

Status quo is also recommended for the rest of the UCRB and bordering areas. However, if more precipitation doesn't fall soon, it may be necessary to expand D0 in the four-corners area, expand D1 into the Rio Grande basin and possibly introduce D2 in eastern Colorado. These areas should be watched closely in the coming weeks.