



The Weather Wire

August 2017

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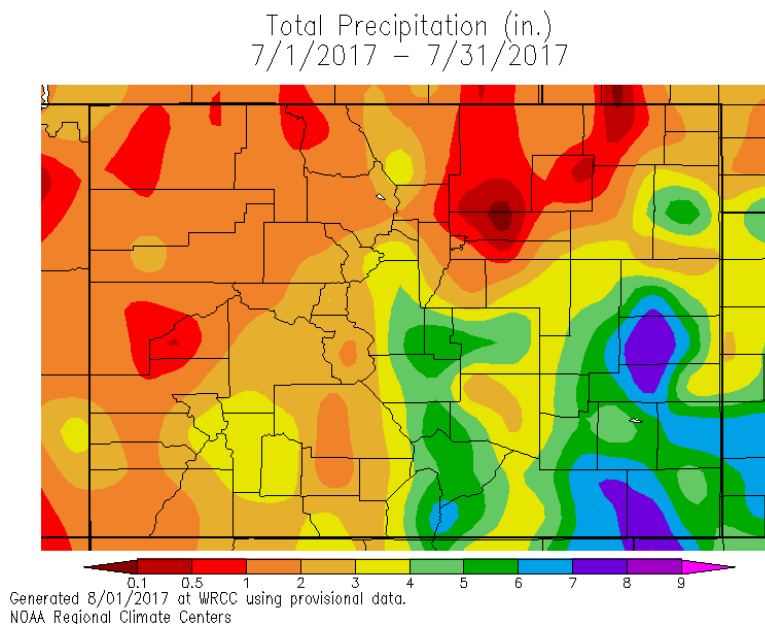
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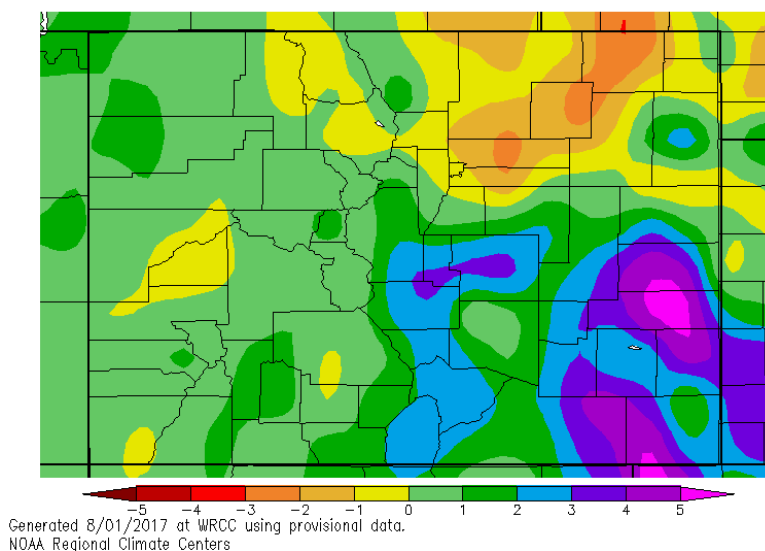
Monsoon favors Southern Colorado in July

The North American Monsoon started a bit later than normal this year, but once it picked up toward the end of July, parts of southern Colorado received well above average rainfall. As is often the case, the geographical gradient of where the higher rainfall totals occur was sharp. North of the Palmer Divide across Denver metro and northeast Colorado, rainfall amounts were below average during July. However, areas along and south of the Palmer Divide experienced well above average rainfall in July.

The two maps below illustrate the precipitation differences well. The first map shows total precipitation amounts in Colorado during July, and the second map shows the departure from average precipitation. Southeast Colorado in particular did very well!



Precipitation Departure from Average (in.)
7/1/2017 – 7/31/2017

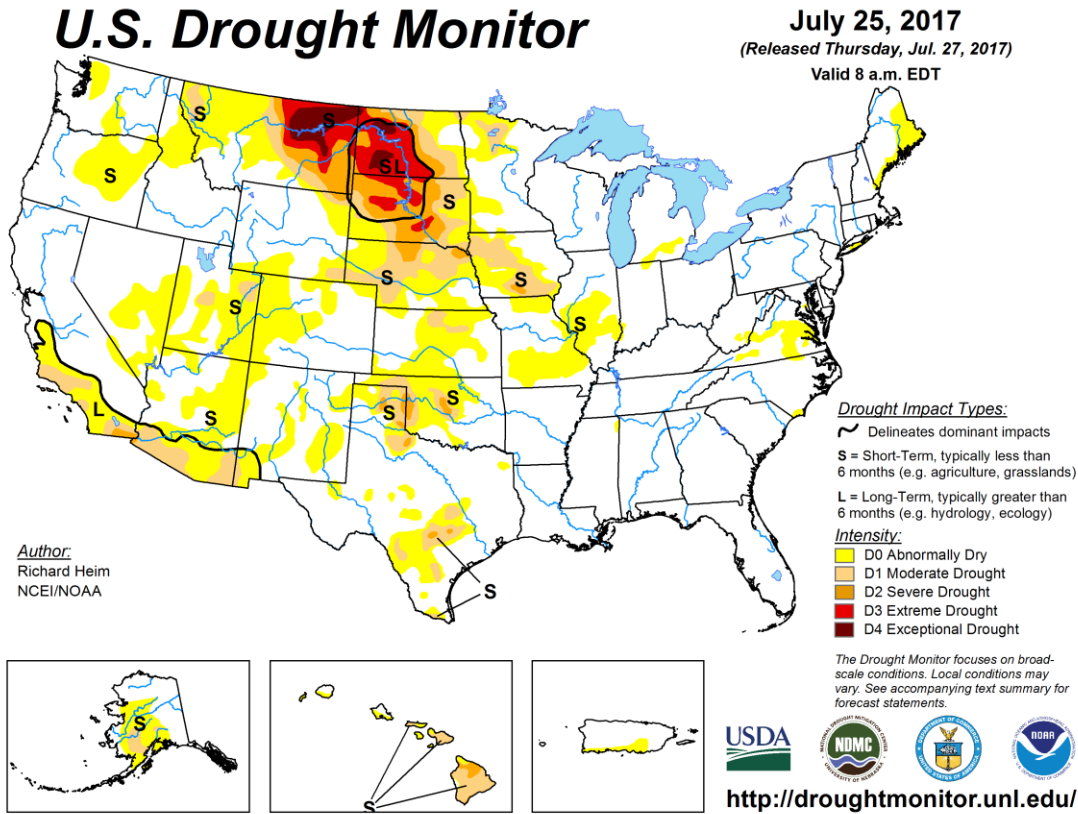


The precipitation totals in Denver vs. Colorado Springs illustrate the differences well. Downtown Denver only received 0.79” of rain and DIA only received 0.47” of rain in July. On the other hand, the Colorado Springs Airport recorded 6.23” of rain in July! Officially, this goes down as the third wettest July on record for Colorado Springs. In addition, the old records are somewhat questionable due to changes in record locations, so by some accounts this could be considered the wettest July on record for Colorado Springs. Here is a look at July rainfall amounts for select locations across the state and the departure from average. Notice how much less rainfall northeast Colorado experienced compared to many other parts of the state.

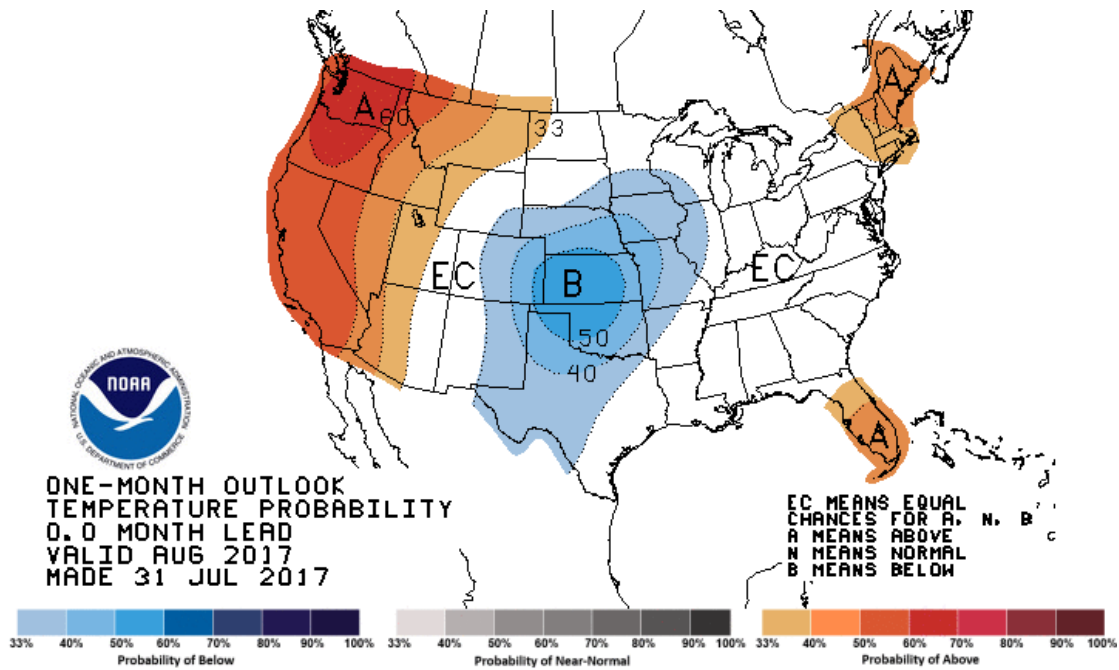
| | July Rainfall | Dept. from Avg. |
|--------------------------|----------------------|------------------------|
| Alamosa | 3.52” | 2.55” |
| Boulder | 1.24” | -0.55” |
| Canon City | 4.70” | 2.73” |
| Castle Rock | 4.69” | 2.13” |
| Colorado Springs | 6.23” | 3.39” |
| Crested Butte | 2.49” | 0.50” |
| Denver (Downtown) | 0.79” | -1.26” |
| Denver (DIA) | 0.47” | -1.58” |
| Ft. Collins | 0.95” | -0.76” |
| Grand Junction | 0.79” | 0.18” |
| Greeley | 0.91” | -0.77” |
| Lamar | 7.24” | 4.88” |
| Leadville | 3.13” | 1.28” |
| Walsenburg | 4.70” | 2.70” |

Drought Update

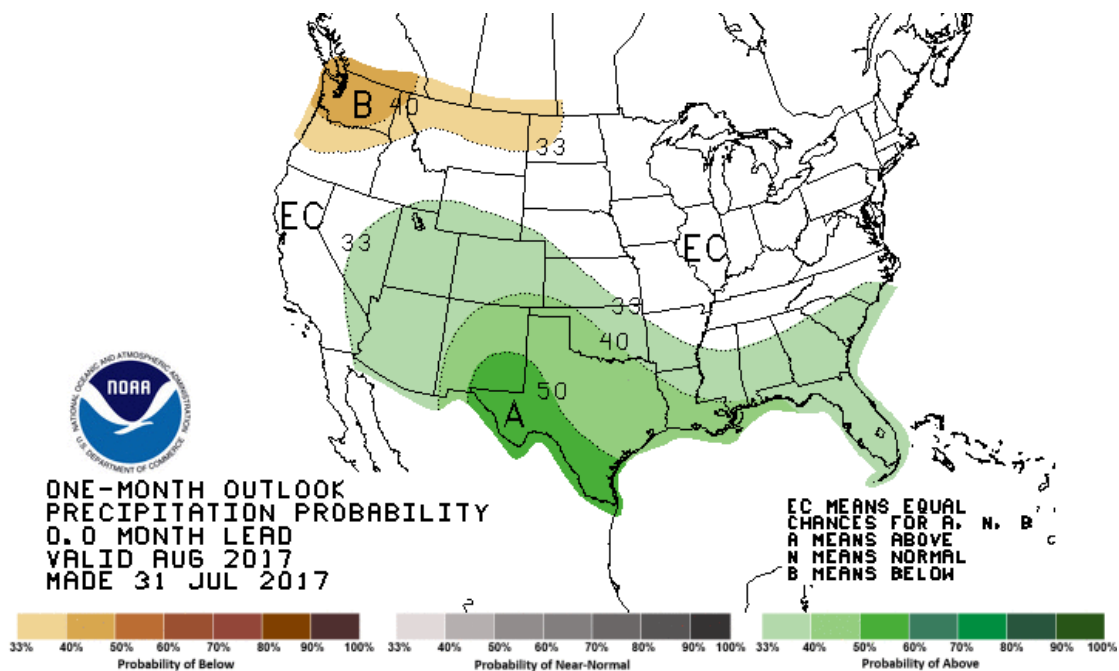
Colorado remains drought-free thanks to a wet spring season, but areas of abnormally dry conditions have increased across north central Colorado and along the Western Slope. Areas of extreme to exceptional drought have expanded across the Dakotas and eastern Montana.



The map below shows forecasted temperature deviances for August 2017. There is a slight bias toward below normal temperatures across central Colorado, a moderate bias toward below normal temperatures across eastern Colorado, and equal chances for above or below normal temperatures across western Colorado.



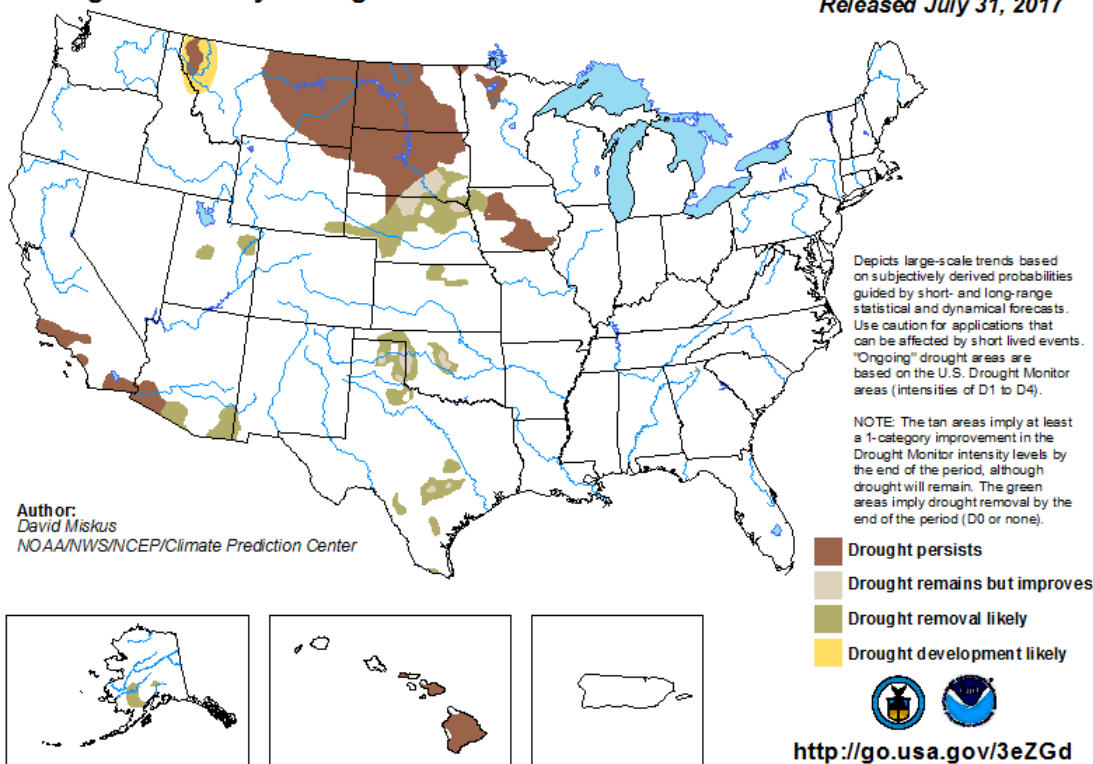
The map below shows forecasted precipitation deviances for August 2017. There is a slight bias toward above normal precipitation across most of Colorado and a moderate bias toward above normal precipitation for far southeast Colorado.



Colorado is expected to remain drought-free this month, while areas of drought are expected to persist across the Dakotas and eastern Montana, with additional areas of drought development likely across northwest Montana.

U.S. Monthly Drought Outlook Drought Tendency During the Valid Period

Valid for August 2017
Released July 31, 2017



July Summary

July 2017 was hotter and drier than average across the Denver metro area, though areas south of Denver in Douglas County experienced above average precipitation. High pressure and a later than usual start to monsoon season resulted in hot and dry conditions over the first half of the month, while the pattern turned more active over the second half of the month and especially over the final 10 days of the month as monsoonal moisture increased across the region. Even so, the heaviest precipitation toward the end of the month occurred just south of the Denver metro area. The monthly total rainfall at DIA was only 0.47", well below the average value of 2.16", and downtown Denver did only slightly better with 0.79" of rainfall. In contrast, Castle Rock received 4.69" of rainfall during July. Overall, there were 9 thunderstorm days recorded at DIA which is a little below average, but areas south and west of Denver experienced a higher number of thunderstorm days. The average high for the month at DIA was 91.5, which is 2.1 degrees above normal, and the average low was 61.3, which is 2.4 degrees above normal. There were 20 days in which the high exceeded 90 degrees and the high also reached 100 twice, on the 6th and on the 20th. The low temperature for the month was 51, which occurred on the 1st.

July Stats

TEMPERATURE (IN DEGREES F)

| | | | |
|--------------|---------------------|-------------|---------------|
| AVERAGE MAX | 91.5 | NORMAL 89.4 | DEPARTURE 2.1 |
| AVERAGE MIN | 61.3 | NORMAL 58.9 | DEPARTURE 2.4 |
| MONTHLY MEAN | 76.4 | NORMAL 74.2 | DEPARTURE 2.2 |
| HIGHEST | 100 on 7/6 and 7/19 | | |
| LOWEST | 51 on 7/1 | | |

| | | |
|-----------------------------|----|-------------|
| DAYS WITH MAX 90 OR ABOVE | 20 | NORMAL 16.0 |
| DAYS WITH MAX 32 OR BELOW | 0 | NORMAL 0.0 |
| DAYS WITH MIN 32 OR BELOW | 0 | NORMAL 0.0 |
| DAYS WITH MIN ZERO OR BELOW | 0 | NORMAL 0.0 |

TEMPERATURE RECORDS

None

HEATING DEGREE DAYS

| | | | |
|----------------|---|----------|--------------|
| MONTHLY TOTAL | 0 | NORMAL 6 | DEPARTURE -6 |
| SEASONAL TOTAL | 0 | NORMAL 6 | DEPARTURE -6 |

COOLING DEGREE DAYS

| | | | |
|---------------|-----|------------|--------------|
| MONTHLY TOTAL | 360 | NORMAL 289 | DEPARTURE 71 |
| YEARLY TOTAL | 533 | NORMAL 444 | DEPARTURE 89 |

PRECIPITATION (IN INCHES)

| | | | |
|------------------------------|--------------|-------------|-----------------|
| MONTHLY TOTAL | 0.47 | NORMAL 2.16 | DEPARTURE -1.69 |
| YEARLY TOTAL | 7.11 | NORMAL 9.67 | DEPARTURE -2.56 |
| GREATEST IN 24 HOURS | 0.15 on 7/21 | | |
| DAYS WITH MEASURABLE PRECIP. | 6 | | |

SNOWFALL (IN INCHES)

| | | | |
|----------------------|------|-------------|-----------------|
| MONTHLY TOTAL | 0.0 | NORMAL 0.0 | DEPARTURE 0.0 |
| SEASONAL TOTAL | 21.8 | NORMAL 53.8 | DEPARTURE -32.0 |
| GREATEST IN 24 HOURS | NA | | |

GREATEST DEPTH NA

WIND (IN MILES PER HOUR)

AVERAGE SPEED 9.6 mph
PEAK WIND GUST 53 mph from the SE on 7/15

MISCELLANEOUS WEATHER

| | | | |
|----------------------------------|-----|--------|----|
| NUMBER OF DAYS WITH THUNDERSTORM | 9 | NORMAL | 11 |
| NUMBER OF DAYS WITH HEAVY FOG | 1 | NORMAL | <1 |
| NUMBER OF DAYS WITH HAIL | 0 | | |
| NUMBER OF SUNNY DAYS | 6 | | |
| NUMBER OF PARTLY CLOUDY DAYS | 21 | | |
| NUMBER OF CLOUDY DAYS | 4 | | |
| AVERAGE RELATIVE HUMIDITY | 45% | | |

August Preview

Monsoon season typically peaks during the first week of August, before dropping off over the second half of the month with thunderstorms becoming weaker and a little less frequent than what is typical during July. Average precipitation during August is 1.69” and there is an average of eight thunderstorm days at DIA during the month. Although it happens on occasion, severe weather is less likely in August compared to May, June, and July, due to typically weaker winds aloft and warmer air at the mid to upper levels of the atmosphere (this has a stabilizing effect) compared to early summer. However, the weaker upper level winds also favor slower-moving storms, so heavy rainfall is a common threat during active monsoonal periods. August is the second hottest month on average in Denver, just a little cooler than July with an average high of 87.2 and an average low of 57.9. The month often starts out hot, but temperatures do start to trend downward over the second half of the month with Canadian cold fronts occasionally bringing brief tastes of fall. The all-time record high in August is 105, set in 1878, and the all-time record low is 40, which has occurred on multiple dates in 1910. For August 2017, we are expecting below average temperatures and above average precipitation, especially over the first half of the month as a more active than usual upper level pattern will likely interact with monsoonal moisture to result in wet conditions at times. The second half of the month may feature relatively warmer and drier conditions, although sustained heat waves become less likely after mid August.

**DENVER'S AUGUST CLIMATOLOGICALLY NORMAL
(NORMAL PERIOD 1981-2010 DIA Data)**

TEMPERATURE

| | |
|------------------------------|------|
| AVERAGE HIGH | 87.2 |
| AVERAGE LOW | 57.9 |
| MONTHLY MEAN | 72.5 |
| DAYS WITH HIGH 90 OR ABOVE | 12 |
| DAYS WITH HIGH 32 OR BELOW | 0 |
| DAYS WITH LOW 32 OR BELOW | 0 |
| DAYS WITH LOWS ZERO OR BELOW | 0 |

PRECIPITATION

| | |
|------------------------------------|-------|
| MONTHLY MEAN | 1.69" |
| DAYS WITH MEASURABLE PRECIPITATION | 9 |
| AVERAGE SNOWFALL IN INCHES | 0.0" |
| DAYS WITH 1.0 INCH OF SNOW OR MORE | 0 |

MISCELLANEOUS AVERAGES

| | |
|------------------------------|--------|
| HEATING DEGREE DAYS | 10 |
| COOLING DEGREE DAYS | 244 |
| WIND SPEED (MPH) | 8.0mph |
| WIND DIRECTION | South |
| DAYS WITH THUNDERSTORMS | 8 |
| DAYS WITH DENSE FOG | 1 |
| PERCENT OF SUNSHINE POSSIBLE | 71% |

EXTREMES

| | |
|----------------|----------------------|
| RECORD HIGH | 105 on 8/18/1878 |
| RECORD LOW | 40 on multiple dates |
| WARMEST | 77.0 in 2011 |
| COLDEST | 66.5 in 1915 |
| WETTEST | 5.85" in 1979 |
| DRIEST | 0.02" in 1924 |
| SNOWIEST | 0.0" |
| LEAST SNOWIEST | 0.0" |

Rainfall

May 2017 to October 2017

| City | May | Jun | Jul | Aug | Sep | Oct | Total |
|--------------------|------|------|------|-----|-----|-----|-------|
| Aurora (Central) | 3.39 | 0.31 | 0.94 | | | | 4.64 |
| Boulder | 5.94 | 0.28 | 0.83 | | | | 7.05 |
| Brighton | 4.92 | 1.10 | 0.55 | | | | 6.57 |
| Broomfield | 4.72 | 0.51 | 0.47 | | | | 5.70 |
| Castle Rock | 2.20 | 0.20 | 4.69 | | | | 7.09 |
| Colo Sprgs Airport | 3.15 | 0.50 | 6.23 | | | | 9.88 |
| Denver DIA | 3.66 | 0.33 | 0.47 | | | | 4.46 |
| Denver Downtown | 4.13 | 0.91 | 0.79 | | | | 5.83 |
| Golden | 5.79 | 0.31 | 0.55 | | | | 6.65 |
| Fort Collins | 4.38 | 0.26 | 1.54 | | | | 6.18 |
| Highlands Ranch | 4.25 | 1.14 | 2.56 | | | | 7.95 |
| Lakewood | 4.69 | 0.83 | 0.35 | | | | 5.87 |
| Littleton | 3.70 | 0.67 | 2.17 | | | | 6.54 |
| Parker | 3.70 | 0.59 | 1.93 | | | | 6.22 |
| Sedalia - Hwy 67 | 3.60 | 0.20 | 1.24 | | | | 5.04 |
| Thornton | 4.09 | 0.35 | 1.87 | | | | 6.31 |
| Westminster | 4.80 | 0.67 | 1.10 | | | | 6.57 |
| Wheat Ridge | 3.70 | 0.39 | 0.63 | | | | 4.72 |

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