

# *The Weather Wire*

**November 2017**

**Volume 24 Number 11**

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## **Colorado Snow Statistics**

Skyview Weather has been collecting snowfall data across the Front Range of Colorado for the past 20 years. Now that we're getting into the snow season, we thought it would be interesting to take a look at some snowfall data both from our own records, as well as from data outside of our forecasting areas over the remainder of Colorado. Skyview Weather's data extends from Larimer County southward to El Paso County and west up into the foothills to an elevation of approximately 8,500'. Skyview also has been recording data for the Pueblo/Canon City areas, but these only date back to the last five years.

First, we will take a look at the snowiest locations in the Northern Front Range with at least 10 years of data, which encompasses Boulder and Larimer Counties. Not surprisingly, Nederland has the highest seasonal average of 146.5". For lower elevation areas, Boulder is the snowiest location with a seasonal average of 81.6". Ft. Collins is also listed for comparison, with a lower seasonal average of 51.7".

Northern Front Range		
<b>Location</b>	<b>Average Snowfall</b>	<b>Years of Record</b>
<b>Nederland</b>	146.5"	10
<b>Estes Park</b>	93.0"	16
<b>Boulder</b>	81.6"	17
<b>Louisville</b>	70.5"	20
<b>Ft. Collins</b>	51.7"	10

Next, we will take a look at the snowiest locations in the Central Front Range with at least 10 years of data, which encompasses the Denver Metro area, Douglas County, and Jefferson County. Evergreen and Larkspur both have the highest snowfall averages with over 94" of snow per year. Note that Conifer averages more snowfall than both of these locations, but it only has 9 years of data so is not included in this table. For the lower elevations, southwestern areas such as Roxborough Park and Morrison both have impressive snowfall averages higher than just about anywhere outside of the foothills and Palmer Divide. Castle Rock and Denver snowfall averages are also included for comparison.

Central Front Range		
Location	Average Snowfall	Years of Record
Evergreen	94.4"	17
Larkspur	94.3	19
Roxborough Park	93.9"	19
Morrison	92.4"	20
Sedalia	89.9"	20
Castle Rock	80.7"	20
Denver	57.6"	18

Next, we will take a look at the snowiest locations in the Southern Front Range with at least 10 years of data, which encompasses El Paso and Teller Counties. Monument is the snowiest location in this region with a seasonal average of 105.7", while Woodland Park and Black Forest are the next snowiest locations. These locations in Northern El Paso/Teller receive more than double the average snowfall that is recorded in Colorado Springs.

Southern Front Range		
Location	Average Snowfall	Years of Record
Monument	105.7"	14
Woodland Park	92.5"	13
Black Forest	90.4"	12
Colo Springs NE	42.9"	19

Now let's take a look at snowfall statistics in the mountains of Colorado. Reliable ski area snowfall data is hard to come by, although most sources will show that Wolf Creek Ski Area in the San Juan Mountains averages the most snowfall of any ski area in Colorado with 465" per season. That is, of course, measured from the upper mountain. The Western Regional Climate Center has good snowfall data from many ski towns in Colorado, which are listed below. Keep in mind, these snowfall amounts are taken from the towns themselves rather than up on the mountains, which receive much higher snowfall. For instance, of the seven towns listed, Silverton tends to receive higher snowfall on its upper mountain than any of these other areas.

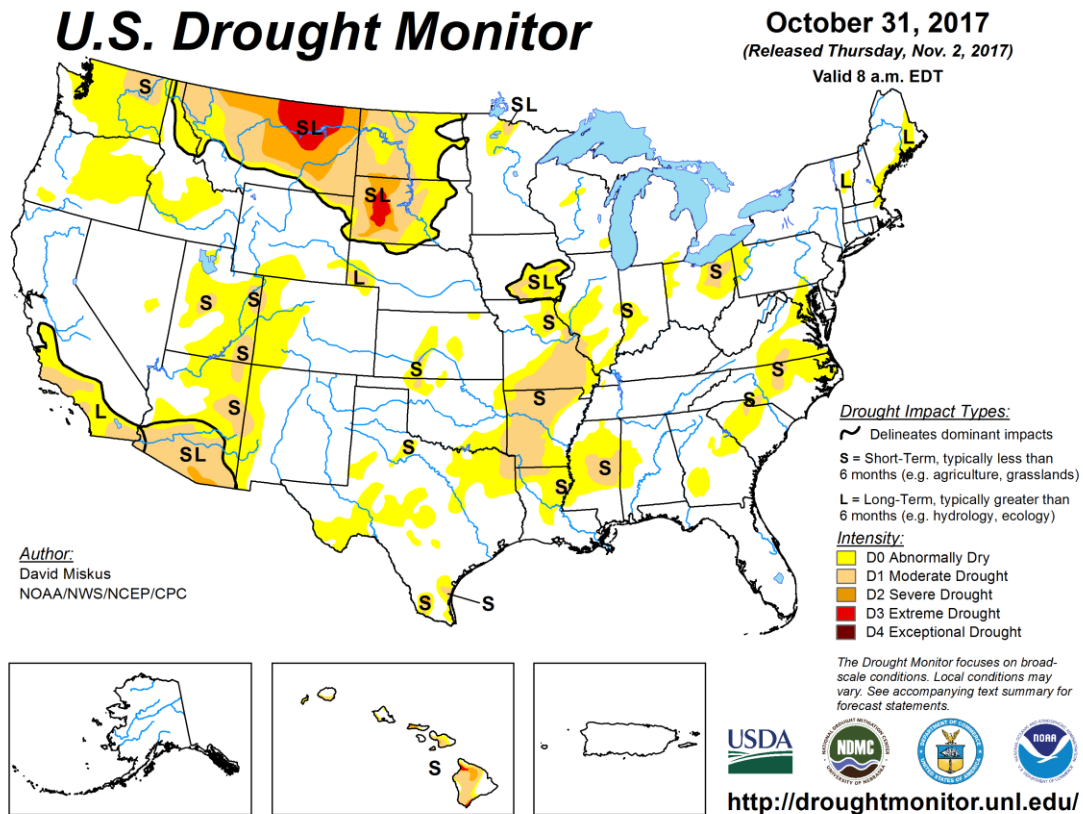
Colorado Ski Towns	
Location	Average Snowfall
Winter Park	224.7"
Crested Butte	197.5"
Vail	183.4"
Telluride	167.0"
Steamboat Springs	166.6"
Breckenridge	163.6"
Silverton	156.1"

Finally, we'll take a look at snow telemetry (SNOTEL) stations across Colorado's high country to get an idea of where the deepest snowpacks exist. These are remote-sensored snow measurement stations located in Colorado's mountain areas at elevations generally ranging from 8,000-11,000'. Although in recent years these stations have been measuring snow depth, over the long-term period, they have measured snow water equivalent accumulated over a season, which is the amount of liquid contained in the snowpack. Below are the top five snowiest locations in Colorado based on the average maximum amount of snow water equivalent contained within the snowpack. The highest value is at Buffalo Pass in the Park Range near Steamboat Springs, while the next highest values are all in the southwestern part of the state.

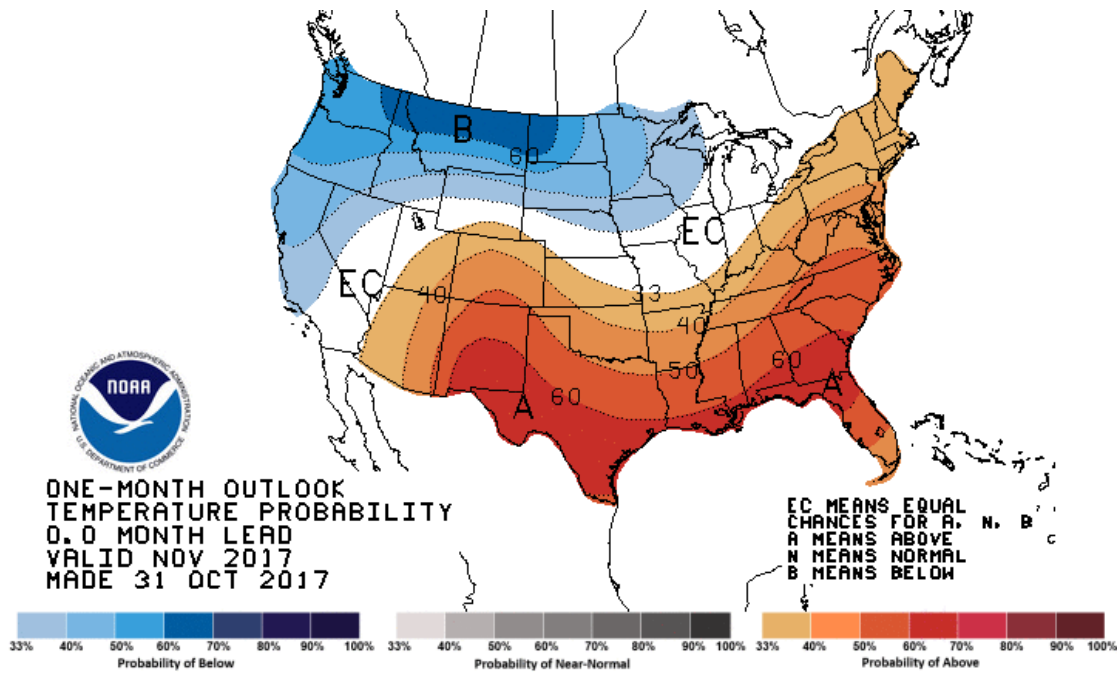
Colorado Snotel Stations		
Snotel Station	Mountain Range	Avg. Peak Snow Water Equiv.
Tower (Buffalo Pass)	Park Range	51.4"
Wolf Creek Summit	San Juan Range	35.2"
Schofield Pass	Elk Range	33.7"
Upper San Juan	San Juan Range	32.3"
Cumbres Trestle	San Juan Range	28.6"

## Drought Update

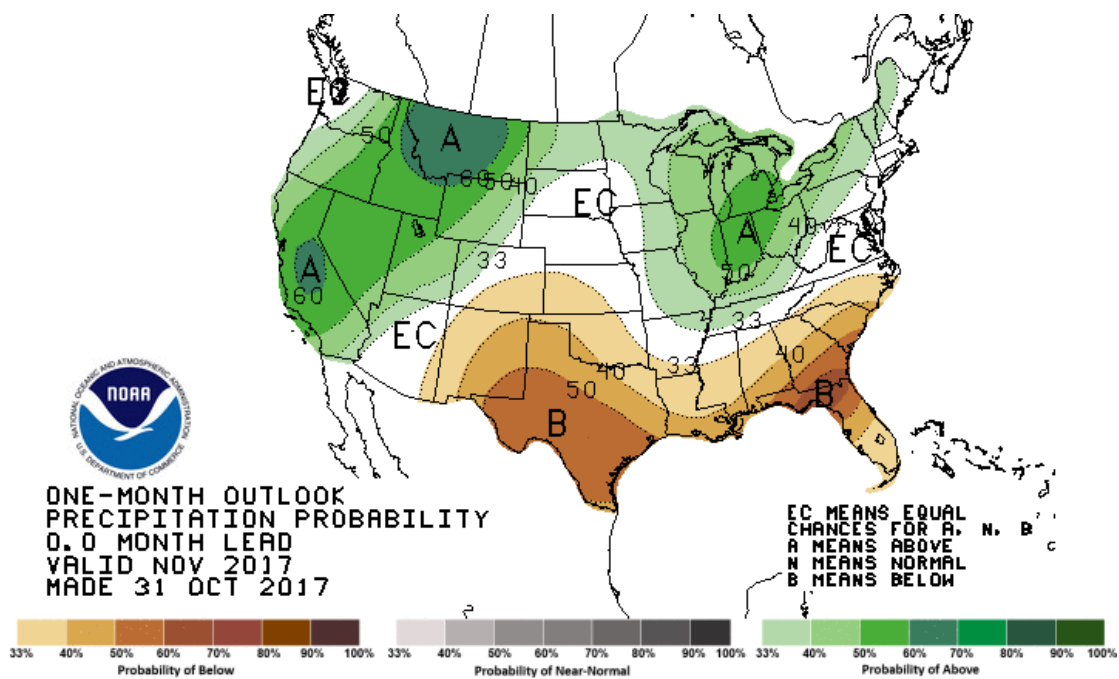
Colorado remains mostly drought-free, aside from a small area of moderate along the Western Slope near the Utah border. Moderate to extreme drought remains over portions of Montana and the Dakotas, although this area has seen improvement over the past month, and most of the Pacific Northwest is now drought-free.



The map below shows forecasted temperature deviances for November 2017. There is a moderate bias toward above normal temperatures across most of Colorado, with the strongest bias across southern portions of the state.



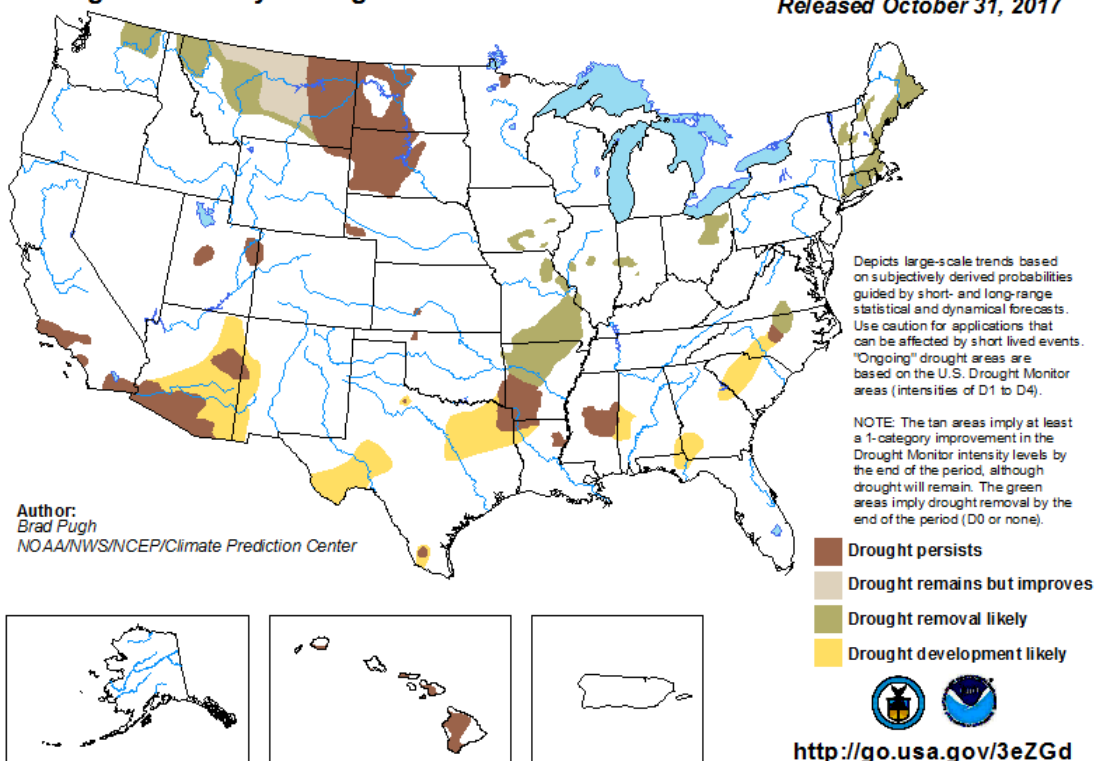
The map below shows forecasted precipitation deviances for November 2017. There is a slight bias toward below normal precipitation across southeast Colorado and a slight bias toward above normal precipitation across northwest Colorado, with equal chances for above or below normal precipitation across central and northeast Colorado.



No change in drought conditions are expected across Colorado this month, with most of the state expected to remain drought-free. Drought improvement or removal is expected across a good portion of Montana, while areas of drought development are expected in southern and eastern Arizona.

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

Valid for November 2017  
Released October 31, 2017



## October Summary

October 2017 featured below average temperatures and near average precipitation, but snowfall ended up a little below average. Even so, the Denver metro area and I-25 corridor received widespread measurable snowfall in October for the first time since 2013 after an unusual three-year drought with no October snow. Total snowfall for the month was 2.8" at DIA and 3.1" in Downtown Denver, which is below the long-term average of 4.0". Most of the snowfall occurred during a single event on the 9<sup>th</sup>, which was also the first snowfall of the season. This was 9 days earlier than the average first snowfall date in Denver, which is on October 18<sup>th</sup>. A couple of very minor snowfall events occurred over the final week of the month, but many areas only ended up with trace amounts at best. Total precipitation for the month at DIA was 0.96", which is just below the average of 1.02", but many areas experienced above average precipitation during the month, most of which fell during the first 10 days of the month. Central and northern areas (Denver northward) in particular experienced above average precipitation, while Douglas and El Paso Counties experienced below average precipitation. Temperatures for the month ended up a little below average, although the typical fall roller coaster in temperatures was experienced with a monthly high of 84 on the 25<sup>th</sup>, which was a daily record, and a monthly low of 13 on the 27<sup>th</sup>, which occurred just two days after the high of 84! The average high for the month was 64.5, which is 0.8 degrees below normal, and the average low for the month was 35.7, which is

0.9 degrees below normal. There were 11 days during the month in which the temperature fell below freezing, which is more than average. There were two days in which the high temperature was only in the 30s at DIA, but there were not any days in which the high was below freezing. There were 3 days in which thunder was recorded at DIA, all over the first week of the month, which is more than normal, and there were also 5 days in which dense fog occurred, which is much above normal.

## October Stats

### TEMPERATURE (IN DEGREES F)

AVERAGE MAX	64.5	NORMAL	65.3	DEPARTURE	-0.8
AVERAGE MIN	35.7	NORMAL	36.6	DEPARTURE	-0.9
MONTHLY MEAN	50.1	NORMAL	50.9	DEPARTURE	-0.8
HIGHEST	84 on 10/25				
LOWEST	13 on 10/27				

DAYS WITH MAX 90 OR ABOVE	0	NORMAL	0.0
DAYS WITH MAX 32 OR BELOW	0	NORMAL	0.4
DAYS WITH MIN 32 OR BELOW	11	NORMAL	8.5
DAYS WITH MIN ZERO OR BELOW	0	NORMAL	0.0

### TEMPERATURE RECORDS

10/25 – Record high of 84 set

### HEATING DEGREE DAYS

MONTHLY TOTAL	455	NORMAL	440	DEPARTURE	15
SEASONAL TOTAL	585	NORMAL	581	DEPARTURE	4

### COOLING DEGREE DAYS

MONTHLY TOTAL	1	NORMAL	5	DEPARTURE	-4
YEARLY TOTAL	881	NORMAL	769	DEPARTURE	112

### PRECIPITATION (IN INCHES)

MONTHLY TOTAL	0.96	NORMAL	1.02	DEPARTURE	-0.06
YEARLY TOTAL	11.19	NORMAL	13.34	DEPARTURE	-2.15
GREATEST IN 24 HOURS	0.35 on 10/9				
DAYS WITH MEASURABLE PRECIP.	5				



## SNOWFALL (IN INCHES)

MONTHLY TOTAL	2.8	NORMAL 4.0	DEPARTURE -1.2
SEASONAL TOTAL	2.8	NORMAL 5.3	DEPARTURE -2.5
GREATEST IN 24 HOURS	2.8"	on 10/9	
GREATEST DEPTH		TR on 10/10	

## WIND (IN MILES PER HOUR)

AVERAGE SPEED	10.3 mph
PEAK WIND GUST	59 mph from the NW on 10/14

## MISCELLANEOUS WEATHER

NUMBER OF DAYS WITH THUNDERSTORM	3	NORMAL	1
NUMBER OF DAYS WITH HEAVY FOG	5	NORMAL	1
NUMBER OF DAYS WITH HAIL	0		
NUMBER OF SUNNY DAYS	11		
NUMBER OF PARTLY CLOUDY DAYS	15		
NUMBER OF CLOUDY DAYS	5		
AVERAGE RELATIVE HUMIDITY	48%		

## November Preview

Temperatures begin to cool off significantly during the month of November as the start of meteorological winter nears, and November is also the second snowiest month on average in Denver, behind only March. Over the course of the month, the average high in November falls from 59 on the 1st to 46 by the 30th. Overall, the average high for the month is 52.1 and the average low for the month is 24.5. The all-time record high for November of 80 degrees first occurred in 2006, and was tied just last year 11/16/2016. The all-time record low of -18 occurred way back in 1877. Often, the first arctic cold front of the season occurs in late November with the first single-digit or subzero temperatures. A remarkable mid-November cold snap occurred just two years ago in 2014, with low temperatures of -13 and -14 on the 12<sup>th</sup> and 13<sup>th</sup> respectively, marking the earliest instance of a -10 degree reading in Denver's history. Denver typically experiences 2-4 measurable snowfall events over the course of November with a monthly average of 8.7", and occasionally can experience major snowstorms similar to those that occur in the spring. Denver's largest snow event on record in November occurred in 1946 when 30.4" fell. This is also the third largest snowstorm ever in Denver's history. Some Novembers are fairly quiet in the Denver area, however, such



as in 2016 when only 1.7” of snow was recorded at DIA. An average of 0.61” of precipitation occurs in Denver in November, with much of this usually falling as snow. Snowfall in early and mid November is often heavier and wetter in nature, but toward the end of the month, snow tends to be colder/drier and more easily accumulates on pavement due to colder temperatures and lower solar angles. For November 2017, we are expecting warmer and drier than average conditions with below average snowfall, as the pattern looks to favor more of a western Pacific storm track that would bring more snow to the northern/western mountains of Colorado and less precipitation to areas east of the mountains. However, we will likely experience 1-2 light/moderate measurable snowfall events in the Denver area, with a greater likelihood of this occurring over the second half of the month as the first half of the month looks drier.

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

**TEMPERATURE**

AVERAGE HIGH	52.1
AVERAGE LOW	24.5
MONTHLY MEAN	38.3
DAYS WITH HIGH 90 OR ABOVE	0
DAYS WITH HIGH 32 OR BELOW	2.3
DAYS WITH LOW 32 OR BELOW	23.4
DAYS WITH LOWS ZERO OR BELOW	0.6

**PRECIPITATION**

MONTHLY MEAN	0.61”
DAYS WITH MEASURABLE PRECIPITATION	4.7
AVERAGE SNOWFALL IN INCHES	8.7”
DAYS WITH 1.0 INCH OF SNOW OR MORE	NA

**MISCELLANEOUS AVERAGES**

HEATING DEGREE DAYS	801
COOLING DEGREE DAYS	0
WIND SPEED (MPH)	8.2mph
WIND DIRECTION	South
DAYS WITH THUNDERSTORMS	0
DAYS WITH DENSE FOG	1
PERCENT OF SUNSHINE POSSIBLE	64%

**EXTREMES**

RECORD HIGH	80 on 11/16/2016, 11/8/2006
RECORD LOW	-18 on 11/29/1877
WARMEST	50.9 in 1949
COLDEST	22.0 in 1880
WETTEST	3.21” in 1946

DRIEST  
 SNOWIEST  
 LEAST SNOWIEST

Trace in 1949, 1901, 1899  
 42.6" in 1946  
 0.0" in 1949

## Snowfall

### October 2017 to May 2018

City	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Aurora (Central)	5.4								5.4
Boulder	8.0								8.0
Brighton	1.8								1.8
Broomfield	7.7								7.7
Castle Rock	4.0								4.0
Colo Sprgs Airport	0.9								0.9
Denver DIA	2.8								2.8
Denver Downtown	3.1								3.1
Golden	8.0								8.0
Fort Collins	1.6								1.6
Highlands Ranch	4.5								4.5
Lakewood	3.7								3.7
Littleton	3.3								3.3
Parker	3.0								3.0
Sedalia - Hwy 67	5.0								5.0
Thornton	4.4								4.4
Westminster	5.3								5.3
Wheat Ridge	6.2								6.2

## Rainfall

### May 2017 to October 2017

City	May	Jun	Jul	Aug	Sep	Oct	Total
Aurora (Central)	3.39	0.31	0.94	1.93	1.42	0.93	8.92
Boulder	5.94	0.28	0.83	1.50	1.93	2.37	12.85
Brighton	4.92	1.10	0.55	1.06	0.94	1.61	9.38
Broomfield	4.72	0.51	0.47	1.06	1.46	2.20	10.42
Castle Rock	2.20	0.20	4.69	0.94	1.50	0.63	10.16
Colo Sprgs Airport	3.15	0.50	6.23	2.43	2.77	0.23	15.08
Denver DIA	3.66	0.33	0.47	1.86	1.26	0.96	6.32
Denver Downtown	4.13	0.91	0.79	1.14	1.14	1.23	8.20
Golden	5.79	0.31	0.55	3.03	1.85	2.12	13.65
Fort Collins	4.38	0.26	1.54	1.69	2.24	1.59	11.70

Highlands Ranch	4.25	1.14	2.56	1.46	1.50	1.18	12.09
Lakewood	4.69	0.83	0.35	1.54	1.22	1.43	10.06
Littleton	3.70	0.67	2.17	0.83	1.02	1.53	9.92
Parker	3.70	0.59	1.93	2.95	1.46	0.69	11.32
Sedalia - Hwy 67	3.60	0.20	1.24	1.60	1.28	0.77	8.69
Thornton	4.09	0.35	1.87	0.98	1.10	1.83	9.12
Westminster	4.80	0.67	1.10	1.14	1.34	1.92	10.97
Wheat Ridge	3.70	0.39	0.63	1.50	1.57	1.93	9.72

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