

# *The Weather Wire*

**January 2016**

**Volume 23 Number 1**

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## **2015 Weather Highlights**

2015 will be remembered for being a wet year overall across Eastern Colorado, although the wet pattern was not consistent with periods of much drier than average conditions interspersed with abnormally wet/active conditions. Below were some of the notable highlights across Eastern Colorado over the course of the year:

### **Snowiest February on record in Denver**

The winter of 2015 was generally poor for snowfall across most of the Western U.S. as a strong and persistent ridge of high pressure dominated the weather pattern across the Pacific states. However, on occasion the ridge would shift far enough west to allow storms systems to reach Colorado from the north, and in some cases bring periods of heavy snowfall. This happened across the Front Range over the second half of February. After a mild start to the month, a very active pattern ensued over the final two weeks bringing a monthly total of 22.4" of snow to DIA, breaking the old record of 22.1" set back in 1912. In addition, most areas in the greater metro area received much higher snowfall than what DIA recorded.

### **An incredibly wet May – the wettest month on record in Colorado Springs!**

Following a quiet pattern during March through about mid April, the pattern turned exceptionally active toward the latter half of April and persisted throughout the month of May. May of 2015 featured everything from heavy rainfall to snow to severe weather, and there were very few breaks in the active weather pattern.

At least a trace of precipitation was recorded on 26 of the 31 days during the month at DIA, and a consecutive days with measurable precipitation streak reached 11 days from April 30-May 10, a new record for Denver! Meanwhile, Colorado Springs recorded an incredible 8.13" of precipitation during May, which set the all-time monthly precipitation record! Many other areas around Colorado Springs recorded nearly 10" of precipitation during the month. The most impressive storm system occurred on May 9-10, with areas of flooding occurring across the Front Range and Eastern Colorado due to heavy rainfall and saturated soils from previous days' rains, as well as a severe weather outbreak which included large hail and several reported

tornadoes across Lincoln and Elbert Counties. To top it all off, an impressive cold blast for so late in the season moved through Eastern Colorado as the low pressure system strengthened over the plains, resulting in a late season snow event across the urban corridor with DIA recording 4.0" of snow. Snowfall of up to 8" fell across southern portions of the Denver metro area to the Palmer Divide. Quite a storm for so late in the year! As the wet pattern continued over the course of the month, the higher elevations of the Front Range continued to receive huge amounts of late season snowfall, which boosted the snowpack to well above average for so late in the year following a somewhat lackluster winter season. This would later result in very high runoff once the snowpack began to rapidly melt in June.

### **An active June with severe weather and continued above-average precipitation**

The active pattern in May continued into June as well, coinciding with Colorado's prime severe weather season. And June 2015 did in fact turn out to be an active season weather month across the state. On June 4, a rare EF-3 tornado occurred along the I-25 corridor, and tracked toward the west/northwest near the town of Berthoud. Fortunately this twister tracked through mostly open and rural areas, but the neighborhoods that took a direct hit did receive significant damage. The westward track this tornado took is very unusual. It did exhibit some similarities to the large tornado that hit Windsor in 2008 in terms of its path, although this tornado was much smaller and less destructive in comparison. On this same day, a particularly photogenic tornado developed near the town of Simla in Elbert County, which ended up being one of the most photographed tornadoes in the country during 2015. Luckily this tornado occurred across mainly rural areas and only caused minor damage. A particularly wet period occurred from the 8th-11th as a slow moving low pressure system moved across Colorado, with the heaviest rain occurring across the urban corridor on the 11th when some areas received up to 4" of rain. June 24th was also a notably active day in which heavy rain and flash flooding occurred across the Denver metro area and a tornado touched down in northeastern Denver. The active pattern continued into the early part of July as the Southwest Monsoon developed, but interestingly enough the pattern gradually trended drier during the heart of monsoon season from mid July through August, in stark contrast to the spring and early summer period. A 10-day stretch of more active monsoonal weather occurred in August, but by late August the pattern turned very dry.

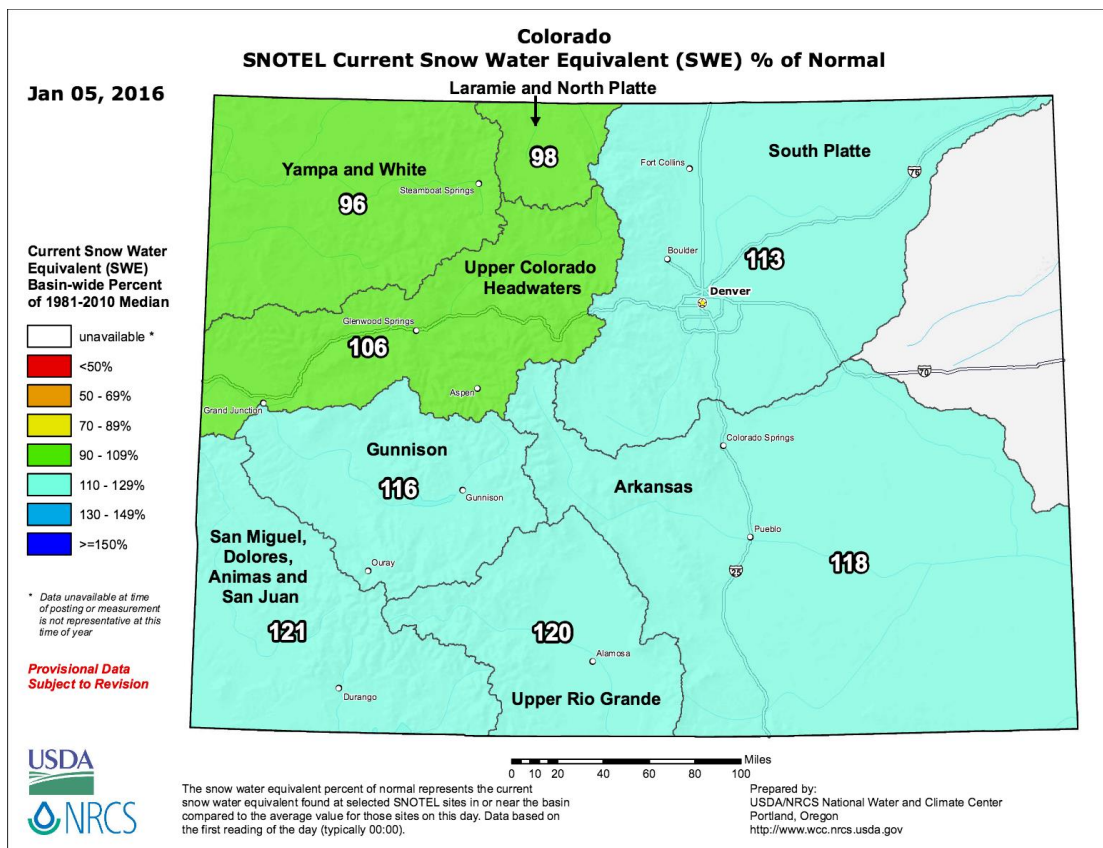
### **Snowy finish to the year in November and December**

The months of September and October were much warmer than average and fairly quiet across Colorado, and by the first of November, Denver had still not seen its first snowfall. However, the pattern flipped in November and remained quite active through the end of the year with above-average snowfall occurring during both months. DIA recorded 11.3" of snow in both November and December, for a total of 22.6" over the period. The most impressive storms occurred on November 16-17th, which mainly favored south metro and the Palmer Divide with up to a foot of snow, and December 15th when a widespread 7-14" fell from Douglas County to Ft. Collins.

### **Colorado Snowpack Updates**

An active December has continued to result in a strong early season snowpack across the high country of Colorado, which is great news as we head into the heart of winter. The image below shows the current snow water equivalent percent of average for the major river drainages in Colorado. The snowpack percent of average values have fallen off slightly during the past week since we have been in a drier

pattern, but still are quite healthy across most of the state. The southern and eastern mountains are in the best shape right now with above average snowpack, while snowpack is closer to average for northwestern portions of the state from Aspen to Steamboat Springs.



Precipitation maps can be found at:

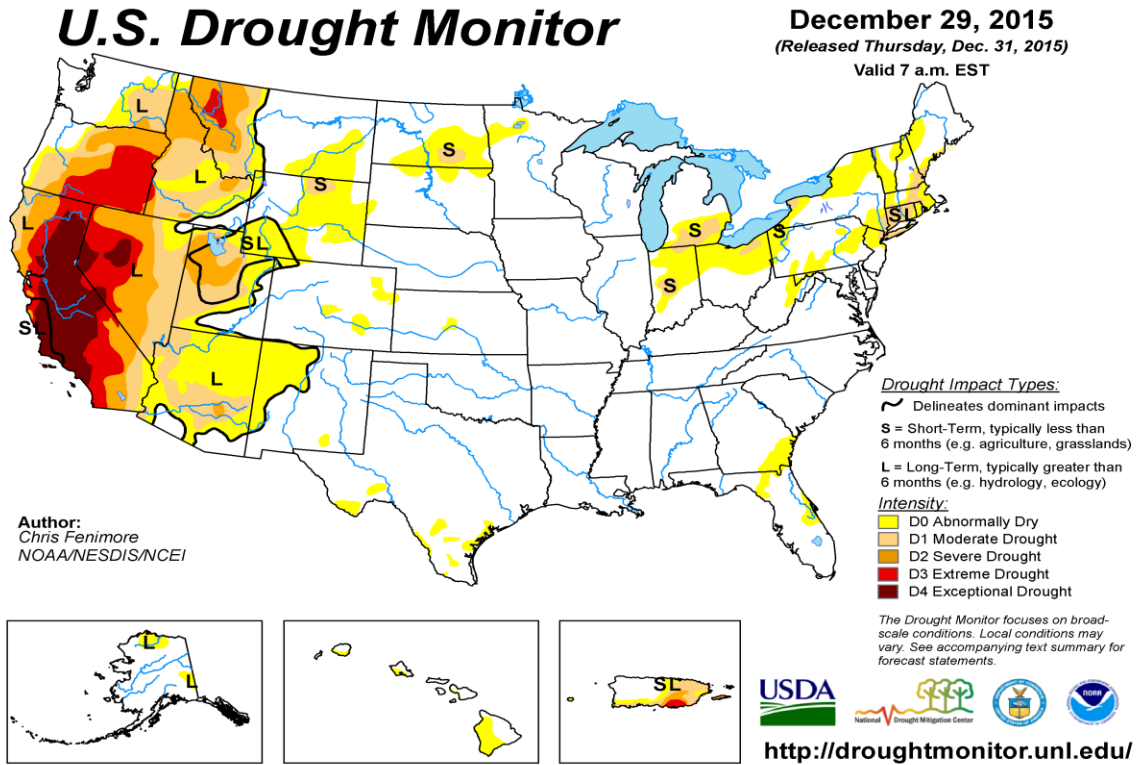
<http://droughtmonitor.unl.edu/SupplementalInfo/Forecasts.aspx>

Colorado Snow Water Equivalent maps can be found on the web at:

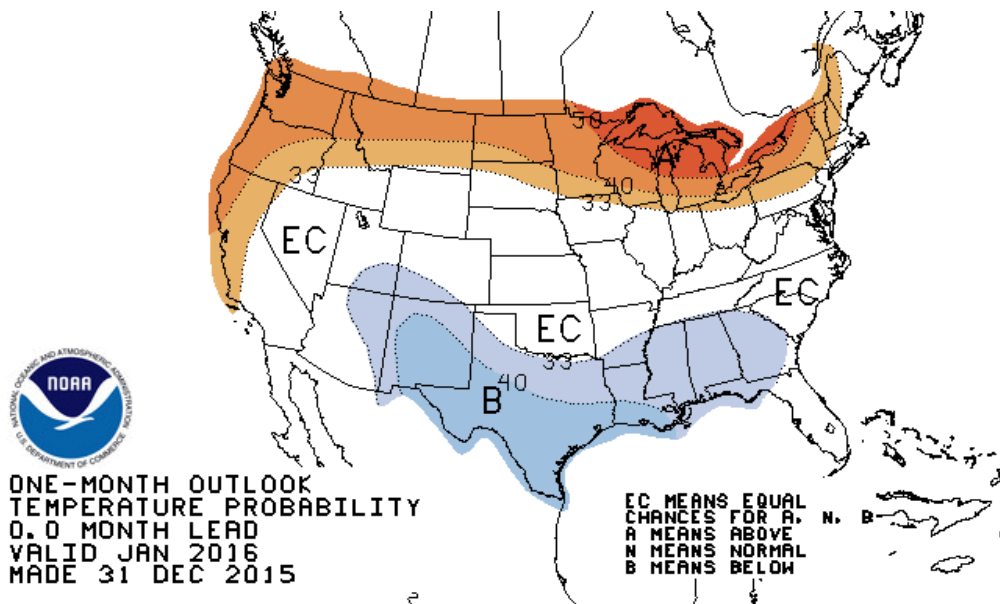
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# Drought Update

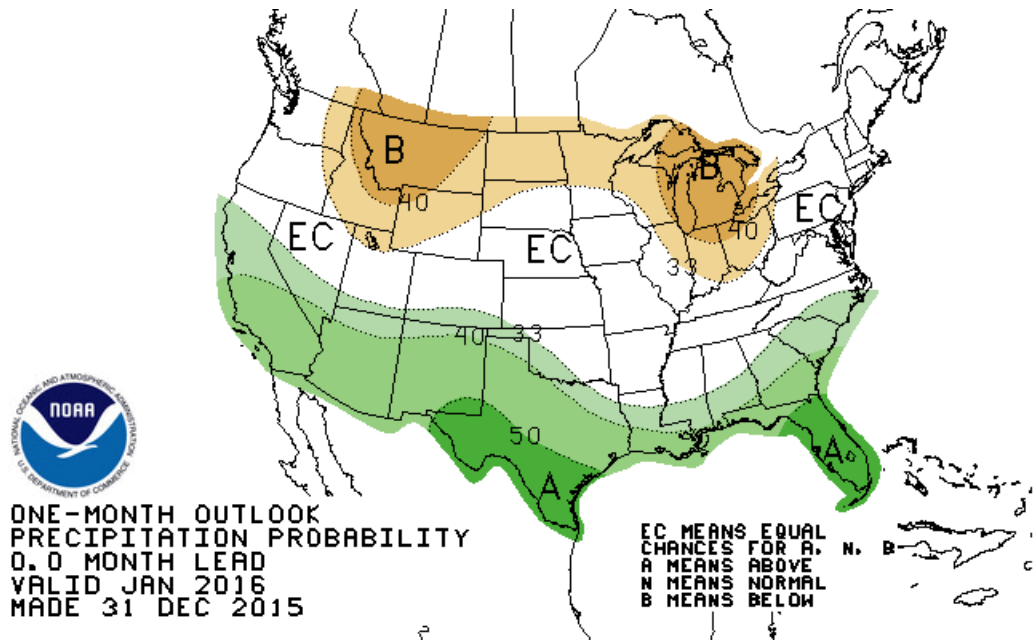
Colorado remains drought-free although a few pockets of abnormally dry areas still exist due to a lack of moisture in August and September. Large areas of severe to exceptional drought still remain across much of California, as well as portions of Nevada and Oregon. Drought status has been removed across a good portion of the Pacific Northwest following a very wet and snowy December.



The map below shows forecasted temperature deviances for January 2016. Most of Colorado is projected to have equal chances for above or below normal temperatures. However, there is a slight bias toward below normal temperatures for southwestern portions of the state.



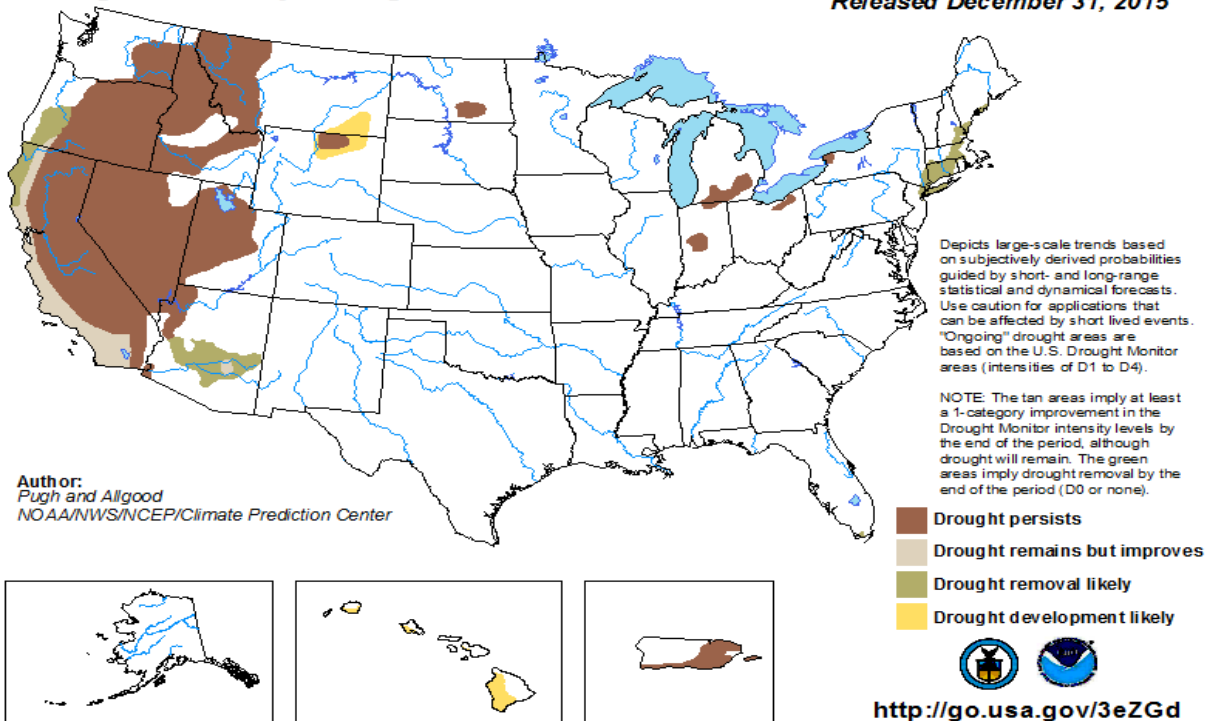
The map below shows forecasted precipitation deviances for January 2016. Most of Colorado is in an area of equal chances for below normal or above normal precipitation, although there is slight bias toward above-average precipitation across far southern portions of the state.



No drought is forecast for Colorado in the near term. Drought is expected to persist across much of the Great Basin Region and Inland Northwest, as well as the Sierra Nevada Mountains in California. However, drought improvement is expected across the entire coastline of California as an active El Niño pattern takes hold, and drought removal is likely across the Northern California Coast and portions of southwestern Oregon.

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

Valid for January 2016  
Released December 31, 2015





## December Summary

Similar to November, December of 2015 featured near average temperatures and above average snowfall. The average high temperature for the month at DIA was 40.9 degrees, which is 1.9 degrees below normal, and the average low temperature for the month was 17.9 degrees, which is 0.8 degrees above normal. The overall monthly average temperature of 29.4 degrees was 0.6 degrees below normal. The warmest temperature for the month was 69 degrees, which occurred on the 9th. The coldest temperature for the month was 0 degrees, which occurred twice, on the 17th and again on the 28th. There were 10 days in which the high temperature was below 32 degrees at DIA, which is more than average for December. The first 11 days of the month were dry and mild, with no precipitation and 8 days in which the high temperature exceeded 50 degrees. However, the pattern changed on December 12th, which more active weather and much colder temperatures over the final 20 days of the month. The first light snow event of the month occurred on the 12th, when 1-3" of snow fell across Denver, including 1.3" at DIA. Then, a much stronger storm brought heavy snowfall across much of the region from Douglas County to Larimer County on the morning of the 15th, with a widespread 7-14" reported. Snowfall of 7.7" was recorded at DIA, which was actually one of the lighter reports around the Denver area. The snow that fell on the 15th made up a large portion of the monthly snowfall totals across the area. The only other snow event of note occurred on Christmas Day when a general 1-3" fell across the Denver metro area, including 2.3" at DIA, and isolated higher totals of 4-5" across northern portions of the metro area. An impressive cold spell took hold across northeastern Colorado over the final week of the month. While there were not any exceptionally cold days with widespread subzero temperatures, the month ended with seven consecutive days with below freezing high temperatures at DIA from the 25th through the 31st. The coldest high temperature of the month occurred on the 26th when the temperature peaked at just 19 degrees. Snowfall for the month totaled 11.3" at DIA, which is identical to the amount of snow that fell in November and 2.6" above the long-term average snowfall of 8.7" in December. Most of the metro area received more snowfall than what DIA recorded, with monthly totals generally ranging from 12-18" from the Palmer Divide to Ft. Collins. Precipitation for the month at DIA totaled 0.71", which is about double the long-term average.

## December Stats

### TEMPERATURE (IN DEGREES F)

AVERAGE MAX	40.9	NORMAL 42.8	DEPARTURE -1.9
AVERAGE MIN	17.9	NORMAL 17.1	DEPARTURE 0.8
MONTHLY MEAN	29.4	NORMAL 30.0	DEPARTURE -0.6
HIGHEST	69 on 12/9		
LOWEST	0 on 12/17, 12/28		
DAYS WITH MAX 90 OR ABOVE	0	NORMAL	0
DAYS WITH MAX 32 OR BELOW	10	NORMAL	5.8
DAYS WITH MIN 32 OR BELOW	28	NORMAL	29.4
DAYS WITH MIN ZERO OR BELOW	2	NORMAL	2

### TEMPERATURE RECORDS

N/A

### HEATING DEGREE DAYS

MONTHLY TOTAL	1097	NORMAL 1086	DEPARTURE 11
SEASONAL TOTAL	2187	NORMAL 2468	DEPARTURE -281

### COOLING DEGREE DAYS

MONTHLY TOTAL	0	NORMAL 0	DEPARTURE 0
YEARLY TOTAL	877	NORMAL 769	DEPARTURE 108

### PRECIPITATION (IN INCHES)

MONTHLY TOTAL	0.71	NORMAL 0.35	DEPARTURE 0.36
YEARLY TOTAL	18.31	NORMAL 14.30	DEPARTURE 4.01
GREATEST IN 24 HOURS	0.32" on 12/15		
DAYS WITH MEASURABLE PRECIP	5		

### SNOWFALL (IN INCHES)

MONTHLY TOTAL	11.3	NORMAL 8.7	DEPARTURE 2.6
SEASONAL TOTAL	22.6	NORMAL 22.5	DEPARTURE -0.1
GREATEST IN 24 HOURS	7.7" on 12/15		
GREATEST DEPTH	7" on 12/16		

### WIND (IN MILES PER HOUR)

AVERAGE SPEED	9.8 mph
PEAK WIND GUST	64mph from the WNW on 12/15

### MISCELLANEOUS WEATHER

NUMBER OF DAYS WITH THUNDERSTORM	0	NORMAL	0
NUMBER OF DAYS WITH HEAVY FOG	3	NORMAL	1
NUMBER OF DAYS WITH HAIL	0		
NUMBER OF SUNNY DAYS	5		
NUMBER OF PARTLY CLOUDY DAYS	22		
NUMBER OF CLOUDY DAYS	4		
AVERAGE RELATIVE HUMIDITY	58%		

## January Preview

The month of January is the second coldest month on average in Denver, just slightly warmer than December by 0.7 degrees. However, the all-time record low temperature for Denver of -29 degrees occurred during the month of January, way back on January 9, 1875. January is typically a drier month for Denver and is only the 4th snowiest month with an average of 7.0". Major snow events are relatively rare in Denver during January. Instead, lighter but cold and "powdery" type snowfalls are more common, especially following arctic cold fronts from the north, which are fairly common at this time of year. Average precipitation during January is only 0.41", which also owes to the low-moisture content that is typical of snowfall events at this time of year. Temperatures can be very cold at times in January with an average of two days below zero, but mild spells with high temperatures in the 60s are not uncommon either. The warmest temperature on record in Denver in January was 76 degrees set back in 1888. We actually came very close to matching this record during a stretch of unseasonably warm weather last January when a high temperature of 75 occurred. It is highly unlikely we will experience anything remotely close to those values this January, though. January 2016 is likely to feature near average temperatures overall, but we may be susceptible to a cold outbreak or two as longer range models have hinted at a pattern favorable for arctic intrusions into the Central U.S., with the first one occurring as early as the 10th. We are entering a classic El-Nino pattern this month, with precipitation and snowfall likely to favor southern Colorado and the San Juan Mountains, whereas Northeastern Colorado does not show any strong signals toward above or below average precipitation. We will most likely experience 1-3 appreciable snow events over the course of the month, but the chances of seeing any major snow events is quite low.

### DENVER'S JANUARY CLIMATOLOGICALLY NORMAL (NORMAL PERIOD 1981-2010 DIA Data)

#### TEMPERATURE

AVERAGE HIGH	44.0
AVERAGE LOW	17.4
MONTHLY MEAN	30.7
DAYS WITH HIGH 90 OR ABOVE	0
DAYS WITH HIGH 32 OR BELOW	6
DAYS WITH LOW 32 OR BELOW	29
DAYS WITH LOWS ZERO OR BELOW	2

#### PRECIPITATION

MONTHLY MEAN	0.41"
DAYS WITH MEASURABLE PRECIPITATION	4
AVERAGE SNOWFALL IN INCHES	7.0"
DAYS WITH 1.0 INCH OF SNOW OR MORE	2

#### MISCELLANEOUS AVERAGES

HEATING DEGREE DAYS	1063
COOLING DEGREE DAYS	0
WIND SPEED (MPH)	8.6mph



WIND DIRECTION	South
DAYS WITH THUNDERSTORMS	0
DAYS WITH DENSE FOG	1
PERCENT OF SUNSHINE POSSIBLE	71%

### EXTREMES

RECORD HIGH	76 on 1/27/1888
RECORD LOW	-29 on 1/9/1875
WARMEST	40.3 in 1986
COLDEST	16.9 in 1930
WETTEST	2.35" in 1883
DRIEST	0.01" in 1933
SNOWIEST	24.3" in 1992
LEAST SNOWIEST	TR in 2003, 1994

## Snowfall

### October 2015 to April 2016

City	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Aurora (Central)	0.0	18.3	14.5					32.8
Brighton	0.0	13.9	15.9					29.8
Broomfield	0.0	17.0	17.4					34.4
Castle Rock	0.2	30.8	14.5					45.3
Colo Sprgs Airport	0.0	5.6	4.3					9.9
Denver DIA	0.0	11.3	11.3					22.6
Denver Downtown	0.0	17.1	13.8					30.9
Golden	0.0	18.5	17.6					36.1
Fort Collins	0.0	8.4	16.0					24.4
Highlands Ranch	0.0	24.1	14.5					38.6
Lakewood	0.0	13.3	13.2					26.5
Littleton	0.0	21.9	15.4					37.3
Parker	0.0	23.4	12.4					35.8
Sedalia - Hwy 67	0.0	31.1	12.2					43.3
Thornton	0.0	18.2	18.4					36.6
Westminster	0.0	18.2	15.0					33.2
Wheat Ridge	0.0	14.5	15.9					30.4

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