



# *The Weather Wire*

**June 2018**

**Volume 25 Number 6**

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## **Summer 2018 Outlook**

June 1<sup>st</sup> marked the first day of meteorological summer, which means thunderstorm season is well underway across Colorado. Typically, thunderstorms start to become common across the state during the month of May, especially late in the month, with activity picking up as we head into the heart of the summer. May through August actually represent the four wettest months on average in Denver, primarily due to heavy rains that sometimes accompany thunderstorms. Severe weather season usually begins in late May across eastern Colorado and the I-25 corridor, with a peak in severe weather occurring during the month of June. The greatest hazards from severe weather in the Front Range are typically large hail, but damaging straight-line winds can also occur with severe thunderstorms, and even tornadoes occasionally happen along the I-25 corridor, but are more common on the eastern plains. We have already seen several severe weather days across eastern Colorado so far this year, including several tornadoes on the eastern plains that occurred on Memorial Day. In addition to severe weather, lightning is always a threat to those spending time outdoors, and can be deadly no matter how weak or strong a thunderstorm is.

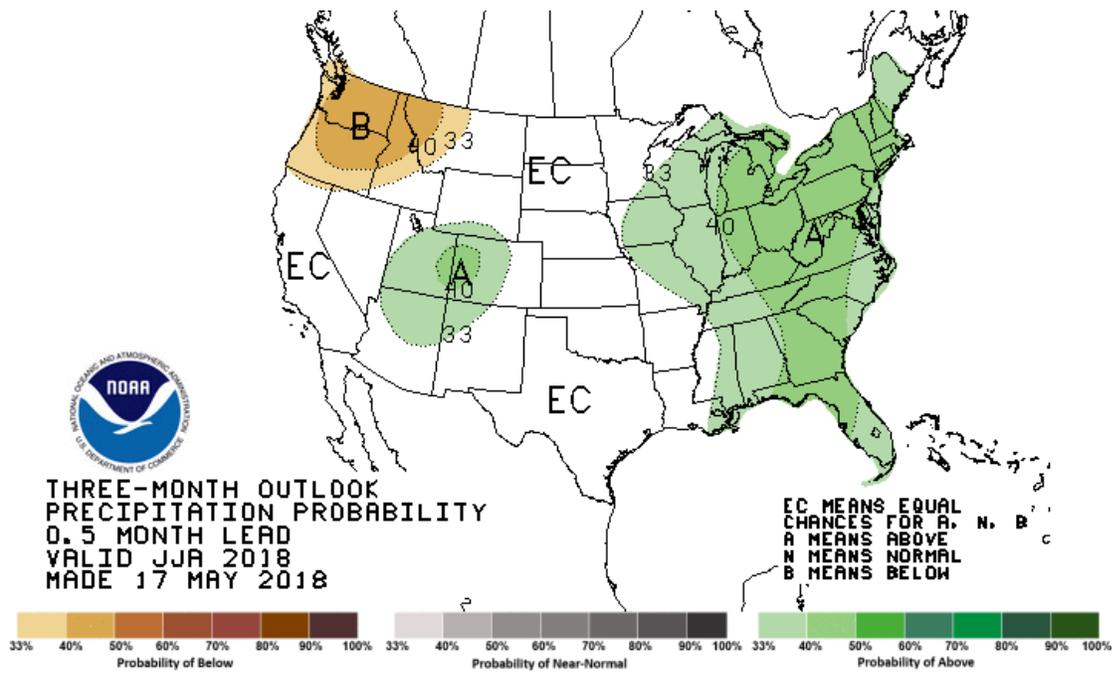
In July, the Southwest Monsoon season gets going, which typically results in abundant subtropical moisture being transported into Colorado from the south and west. During active monsoonal periods, which are common during July and August, thunderstorms are an almost daily occurrence across the mountains and foothills of Colorado, which pose a threat to hikers and climbers who venture above timberline, especially since these storms can often develop by midday. Thunderstorms are quite common across the Denver metro area and I-25 corridor during active monsoonal periods as well. Heading later into the summer, winds at the upper levels of the atmosphere tend to be weaker, which often results in slow-moving thunderstorms, and thus a greater potential for heavy rainfall and flash flooding. The most dangerous flash flooding situations occur when there is deep subtropical moisture in place, low level winds from the east which provide topographic uplift against the Front Range, and upper level winds are weak, resulting in slow-moving or stationary thunderstorms that can be come anchored to the foothills, resulting in heavy rainfall over an area for an extended period of time.



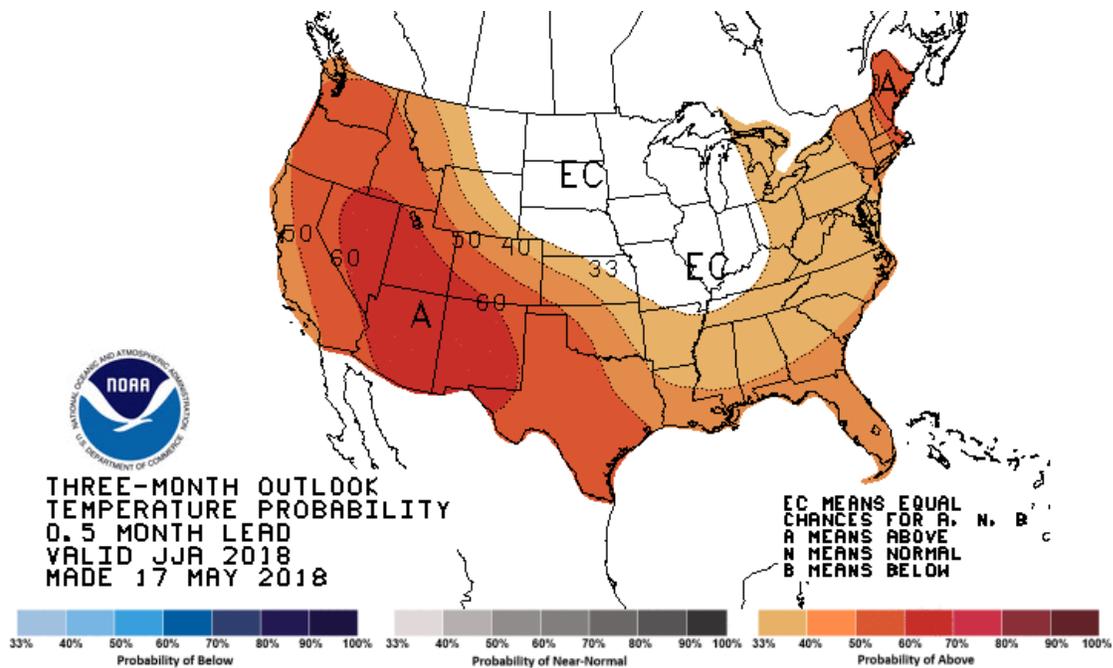
For the summer of 2018, we are quickly transitioning from a La Nina phase to an ENSO-neutral phase. The La Nina we experienced this past winter has now faded, and as a result ENSO is not expected to have much of an impact on summer conditions this year. La Nina phases can often result in below average precipitation across Southern Colorado, and that certainly was the case this past winter and spring. Southern Colorado is currently experiencing a severe drought. In past summers involving a transition from a La Nina phase to a neutral phase, there was a slight trend toward above average precipitation across Southern Colorado, so perhaps some minor drought relief could be in order.

There are also some other signs that the monsoon season could be fairly active this year. While sea surface temperatures are currently close to average across the Western Pacific near the Gulf of California, long-range climate models are forecasting above average ocean temperatures in this region during this summer. Warmer than average ocean temperatures in this region during the summer typically favor more active monsoonal patterns. In addition, the National Hurricane Center is predicting near to above average hurricane season in the Eastern Pacific. Tropical activity in the Eastern Pacific often leads to deep moisture surges into Northern Mexico and the Southwest U.S. that can enhance the North American Monsoon.

The major long-range climate models as well as NOAA's Climate Prediction Center are both indicating good odds for above average precipitation this summer across Western Colorado. Below is a look at NOAA's precipitation outlook for June, July, and August.



For temperatures, NOAA's Climate Prediction Center is favoring above average warmth across all of Colorado this summer. However, some of the other climate models are indicating near average temperatures in July and August, which is likely a result of temperature moderation that could occur during an active monsoon with more precipitation and more cloud cover.

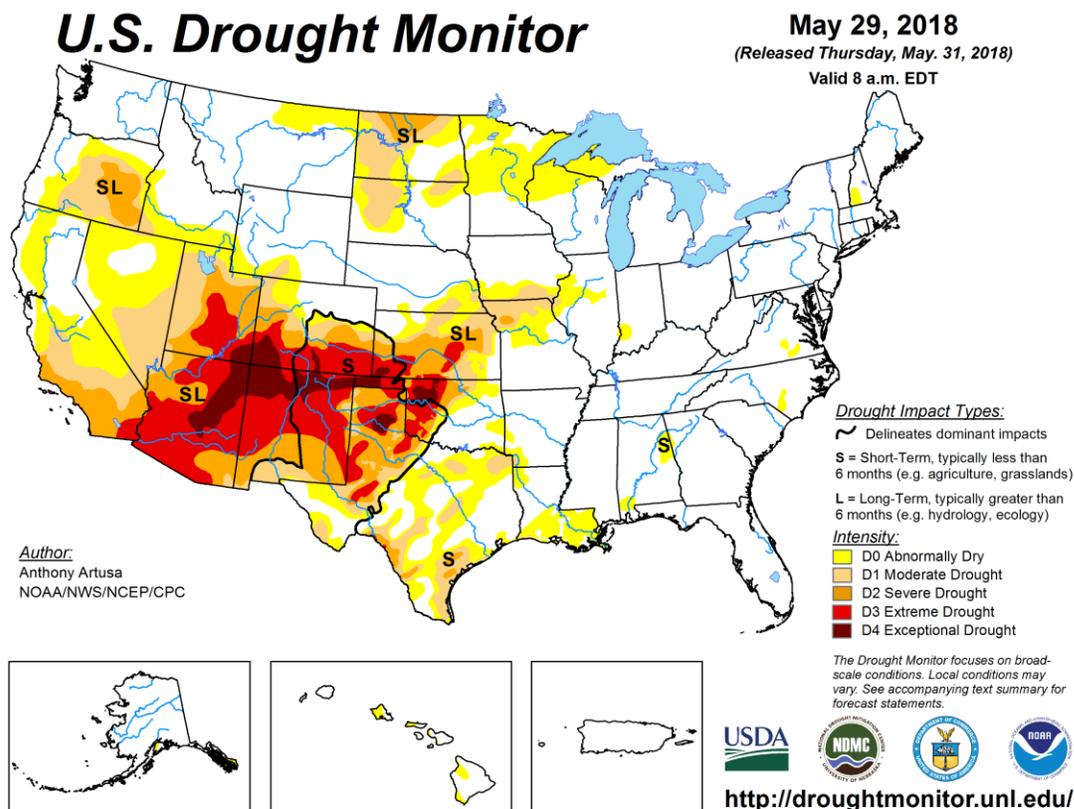


For the summer of 2018, Skyview Weather is expecting a relatively quiet start in June, giving way to more active weather in July and August. Over the next month, high pressure looks to be a dominant feature across Colorado, which will likely result in hotter and drier than average early summer conditions prior to the monsoon. The dry early start to the summer will result in significant wildfire concerns across southern and western parts of the state. Severe weather activity will likely be lower than usual in June after an active May.

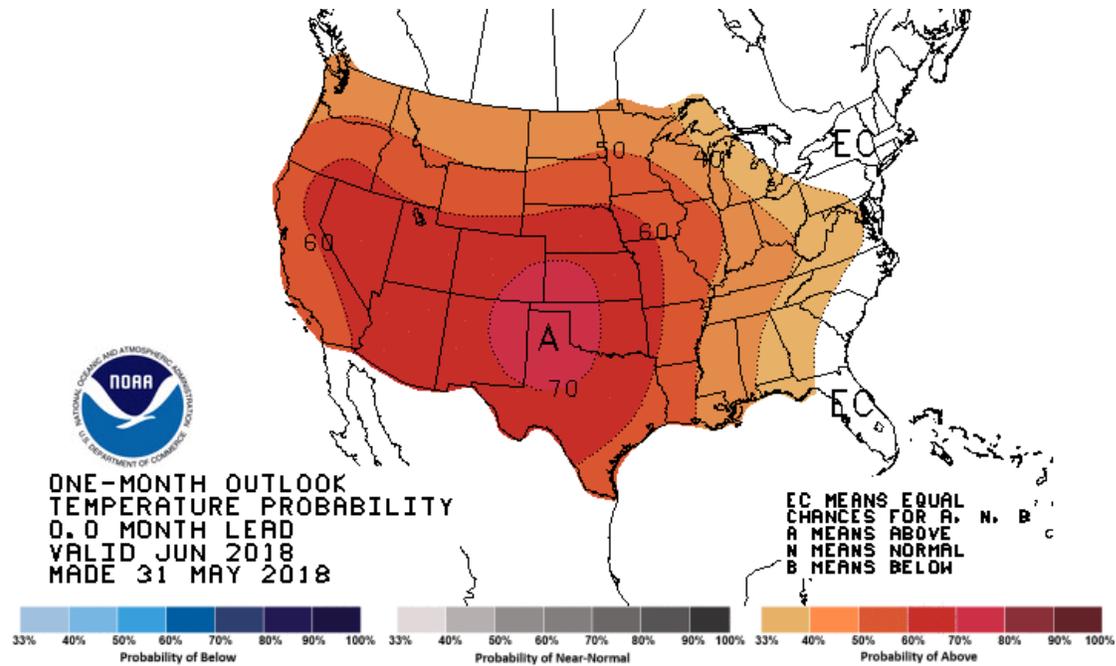
Skyview Weather is expecting a relatively active monsoon season in July and August with frequent thunderstorms and near to above average precipitation across most of Colorado. During the more active monsoonal periods, the potential for heavy rainfall and flash flooding will increase as well. Some drought and wildfire relief could be in store once the monsoon gets going. However, with convective precipitation the higher precipitation amounts tend to be hit-or-miss, and it will take longer stretches of better precipitation beyond just the summer to bring significant drought improvement. Temperatures in July and August will likely be closer to average, but occasional heat waves can be expected.

## Drought Update

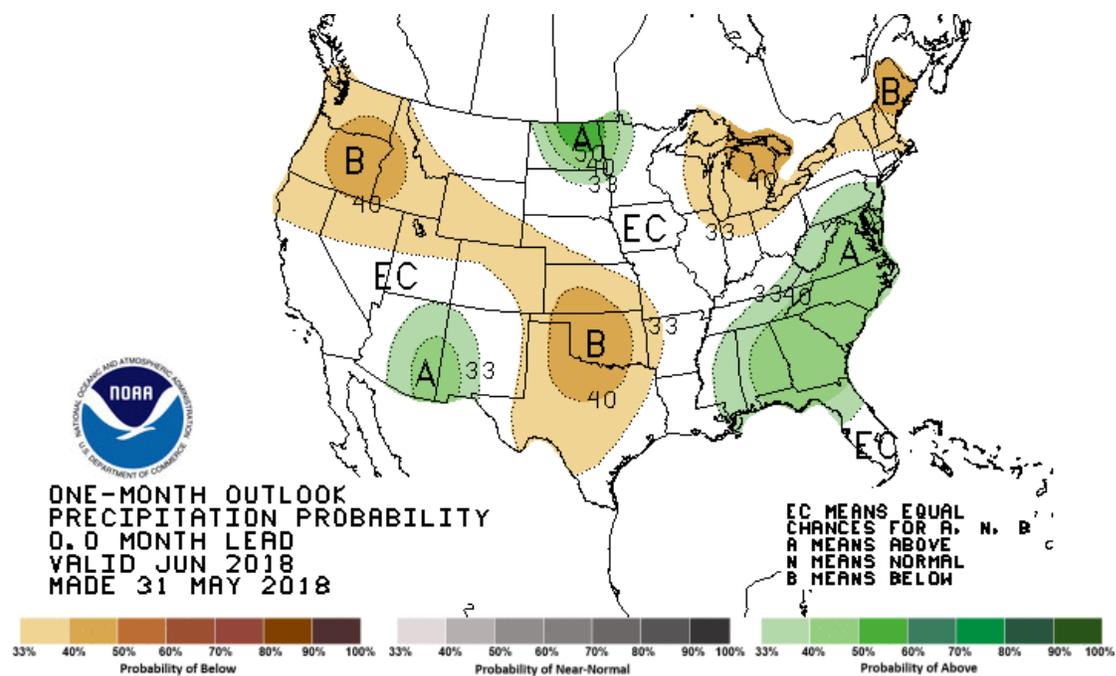
Much of Colorado remains under drought conditions heading into June. Extreme to exceptional drought conditions remain over southern and western Colorado, while areas of moderate to severe drought are occurring along and south of the Palmer Divide and into the Colorado Springs area. The Denver metro area is currently drought-free, but considered abnormally dry, while the north central Colorado mountains and northeast plains are also drought-free.



The map below shows forecasted temperature deviances for June 2018. There is a strong bias toward above normal temperatures for all of Colorado.



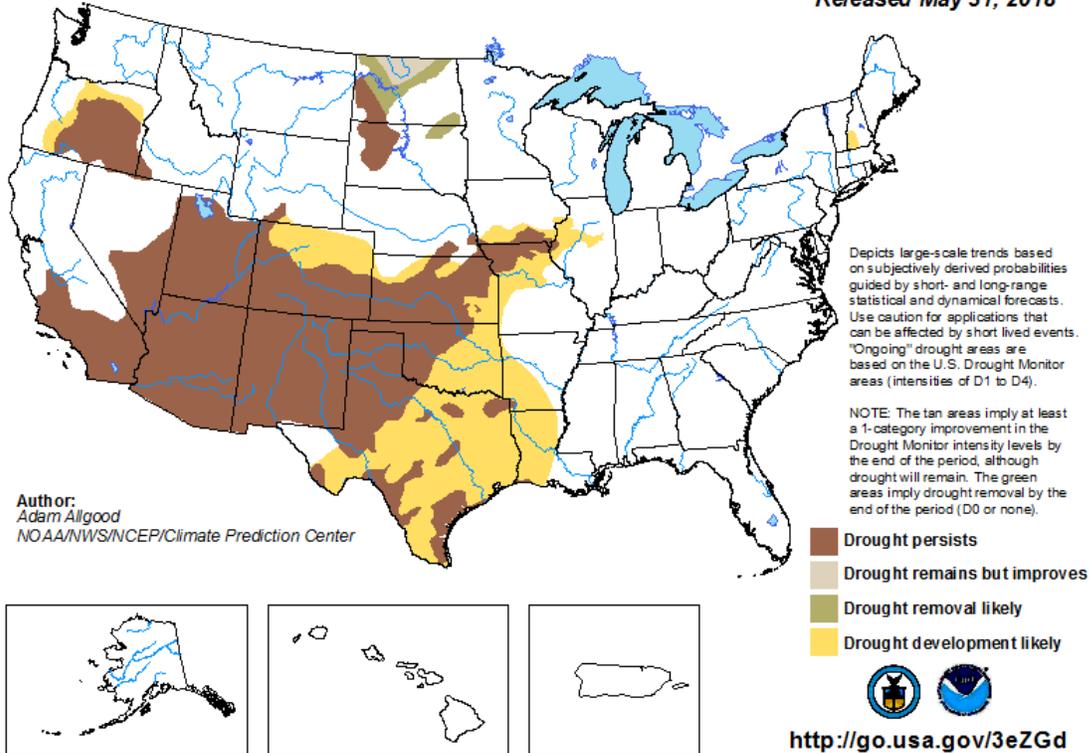
The map below shows forecasted precipitation deviances for June 2018. There is a slight bias toward below normal precipitation across northern and eastern Colorado, with equal chances for above or below normal precipitation across southwest Colorado.



Drought conditions are expected to persist across southern, central, and western Colorado, while drought development is likely this month across the remainder of northern Colorado. Drought conditions are also expected to persist across the remainder of the Four Corners region with new drought development likely across Texas and Oklahoma.

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

Valid for June 2018  
Released May 31, 2018



## May Summary

May 2018 featured well above average temperatures and near average precipitation. Overall it was a relatively active month, but Northern Colorado was much more favored for precipitation than areas south of Denver. A storm system at the beginning of the month brought significant moisture to portions of the Northern I-25 corridor as well as heavy snow to the foothills. For the rest of the month, much of the precipitation that fell was in the form of convective showers and thunderstorms as a warm season pattern took hold over the region. Precipitation amounts were a mixed bag across the urban region. Downtown Denver received 2.96" of precipitation in May, which is above average, but DIA received only 1.86" of precipitation, which is below the monthly average of 2.12". In general, areas west and north of Denver received above average precipitation in May, while areas south of Denver and into Colorado Springs received below average precipitation. No snowfall occurred in Denver during May of this year, although higher elevation areas west and south of Denver did receive some snowfall on the 2<sup>nd</sup>-3<sup>rd</sup> of the month, with heavy amounts occurring in the foothills above 7,000'. Thunderstorm activity was above normal during May of this year, including several occurrences of severe weather across portions of the I-25 corridor and across the eastern plains. Although there were no tornadoes observed along the I-25 corridor, on Memorial Day there were several tornadoes reported across the

plains of Eastern Colorado. Temperatures ended up running well above normal across the greater Denver area during May. The average high for the month was 75.4, which is 3.9 degrees above normal, and the average low for the month was 47.5, which is 4.8 degrees above normal. Denver did not receive any freezing temperatures this month, and not even any days in the 30's as the low temperature for the month was 40. Denver did experience some early summer heat as well with four days of temperatures in the 90's, which is well above average for May. The high temperature for the month was 94, which occurred on the 26<sup>th</sup>. Also, the high of 90 on the 10<sup>th</sup> set a record high for the date.

## May Stats

### TEMPERATURE (IN DEGREES F)

AVERAGE MAX	75.4	NORMAL 71.5	DEPARTURE 3.9
AVERAGE MIN	47.5	NORMAL 42.7	DEPARTURE 4.8
MONTHLY MEAN	61.4	NORMAL 57.1	DEPARTURE 4.3
HIGHEST	94 on 5/26		
LOWEST	40 on 5/2, 5/3, 5/20		

DAYS WITH MAX 90 OR ABOVE	4	NORMAL	0.8
DAYS WITH MAX 32 OR BELOW	0	NORMAL	0.0
DAYS WITH MIN 32 OR BELOW	0	NORMAL	1.9
DAYS WITH MIN ZERO OR BELOW	0	NORMAL	0.0

### TEMPERATURE RECORDS

5/10 – Record high of 90 set

### HEATING DEGREE DAYS

MONTHLY TOTAL	151	NORMAL 265	DEPARTURE -114
SEASONAL TOTAL	5401	NORMAL 5996	DEPARTURE -595

### COOLING DEGREE DAYS

MONTHLY TOTAL	46	NORMAL 21	DEPARTURE 25
YEARLY TOTAL	48	NORMAL 22	DEPARTURE 26

### PRECIPITATION (IN INCHES)

MONTHLY TOTAL	1.86	NORMAL 2.12	DEPARTURE -0.26
YEARLY TOTAL	4.59	NORMAL 5.53	DEPARTURE -0.94
GREATEST IN 24 HOURS	0.49 on 5/3, 5/18		
DAYS WITH MEASURABLE PRECIP.	8		

### SNOWFALL (IN INCHES)

MONTHLY TOTAL	0.0	NORMAL 1.1	DEPARTURE -1.1
SEASONAL TOTAL	25.7	NORMAL 53.8	DEPARTURE -28.1
GREATEST IN 24 HOURS	NA		
GREATEST DEPTH	0		

### WIND (IN MILES PER HOUR)

AVERAGE SPEED	9.9	mph
PEAK WIND GUST	52	mph from the NNW on 5/29

### MISCELLANEOUS WEATHER

NUMBER OF DAYS WITH THUNDERSTORM	11	NORMAL	6
NUMBER OF DAYS WITH HEAVY FOG	6	NORMAL	1
NUMBER OF DAYS WITH HAIL	3		
NUMBER OF SUNNY DAYS	6		
NUMBER OF PARTLY CLOUDY DAYS	15		
NUMBER OF CLOUDY DAYS	10		
AVERAGE RELATIVE HUMIDITY	57%		

## June Preview

June is typically the peak of severe weather season for the Denver metro area and eastern Colorado, with an overall average of 10 thunderstorm days during the course of the month. More tornadoes occur in June in Colorado than any other month, with the greatest threat occurring for areas east of I-25, but occasionally tornadoes can occur across central and western portions of the metro area. The threat for large hail is also higher during June compared to other months. Average temperatures continue their upward trend during June, which is the first month of meteorological summer. The average high temperature during June is 82.4 degrees, with an average of 9 days exceeding 90 degrees during the month. The average low temperature for the month is 52.3. Freezing temperatures are very rare in Denver during June, but it has occurred in the past with an all-time monthly record low of 30 occurring in 1951. Snow is also extremely rare in June in Denver, but it has occurred before with a record amount of 0.5" occurring in 1953. Average precipitation in June is 1.98", making it the third wettest month on average behind May and July. Often, the bulk of the month's precipitation can occur from just one or two heavy thunderstorms, and precipitation amounts tend to be more variable in June than during other months due to the convective nature of precipitation. For June 2018, we are expecting hotter and drier than average conditions across the region as high pressure looks to be the dominant feature through at least the first half of the month. Given the time of year, there will be occasional bouts of severe weather, but overall severe thunderstorm frequency will likely be lower than normal (and less than what was experienced in May), with high-based light rainfall producing thunderstorms likely to be more of the norm.

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

#### TEMPERATURE

AVERAGE HIGH	82.4
AVERAGE LOW	52.3
MONTHLY MEAN	67.4
DAYS WITH HIGH 90 OR ABOVE	8
DAYS WITH HIGH 32 OR BELOW	0
DAYS WITH LOW 32 OR BELOW	0
DAYS WITH LOWS ZERO OR BELOW	0

#### PRECIPITATION

MONTHLY MEAN	1.98"
DAYS WITH MEASURABLE PRECIPITATION	8
AVERAGE SNOWFALL IN INCHES	0.0"
DAYS WITH 1.0 INCH OF SNOW OR MORE	0

#### MISCELLANEOUS AVERAGES

HEATING DEGREE DAYS	133
COOLING DEGREE DAYS	62
WIND SPEED (MPH)	8.9mph
WIND DIRECTION	South
DAYS WITH THUNDERSTORMS	10
DAYS WITH DENSE FOG	<1
PERCENT OF SUNSHINE POSSIBLE	70%

## EXTREMES

RECORD HIGH	105 on 6/25/2012, 6/26/2012
RECORD LOW	30 on 6/2/1951
WARMEST	75.0 in 2012
COLDEST	60.6 in 1967
WETTEST	4.96" in 1882
DRIEST	TR in 1890
SNOWIEST	0.5" in 1953
LEAST SNOWIEST	0.0" in numerous years

## Rainfall

### May 2016 to October 2016

City	May	Jun	Jul	Aug	Sep	Oct	Total
Aurora (Central)	2.05						2.05
Boulder	4.75						4.75
Brighton	1.35						1.35
Broomfield	2.50						2.50
Castle Rock	2.26						2.26
Colo Sprgs Airport	1.46						1.46
Denver DIA	1.86						1.86
Denver Downtown	2.96						2.96
Golden	2.54						2.54
Fort Collins	4.98						4.98
Highlands Ranch	2.25						2.25
Lakewood	3.66						3.66
Littleton	2.40						2.40
Parker	2.29						2.29
Sedalia - Hwy 67	2.33						2.33
Thornton	1.74						1.74
Westminster	2.10						2.10
Wheat Ridge	2.66						2.66

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