

The Weather Wire

October 2016

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Early Season Snow Climatology

It's getting to be that time of year again, when snow begins to enter the picture across the Front Range of Colorado as the seasons change. Although the first few days of October saw temperatures reaching the 80s in Denver, this is also the month when Denver's average first snowfall occurs. Below we will take a look at some autumn snow climatology and historical records in the Denver area.



First Snowfall

Denver's average date for the first measurable snowfall is on October 18. This varies widely year to year, however. The earliest snow on record occurred on September 3, 1961, while the latest first snow on record occurred on November 21, 1934. In recent years, we've experienced later than average starts to the snow season. Last year, Denver's first snow occurred on November 5, and in 2014 the first snow occurred on November 11. Denver's first snowfall has been later than average in 7 of the past 10 years. However, this doesn't mean our snow seasons have been shorter in recent years – Denver's last measurable snow in the springtime has been later than average in 8 of the past 10 years! Below is a look at the first measurable snowfall over the past 10 years:

- Nov 5, 2015
- Nov 11, 2014
- Oct 18, 2013
- Oct 5, 2012
- Oct 25, 2011
- Nov 15, 2010
- Oct 21, 2009
- Nov 14, 2008
- Oct 22, 2007
- Oct 18, 2006

Fall Snowstorms

Historically, the Denver area experiences its heaviest snow events during the spring months, especially in March, but major snow events can occasionally occur during the fall as well. Last year, for instance, some parts of Douglas County received 30" of snow during November! In October 2009, 17.2" of snow fell at DIA, making it the 5th snowiest October on record in Denver. Below are the biggest snow events to ever occur during the meteorological fall season (September-November) in Denver:

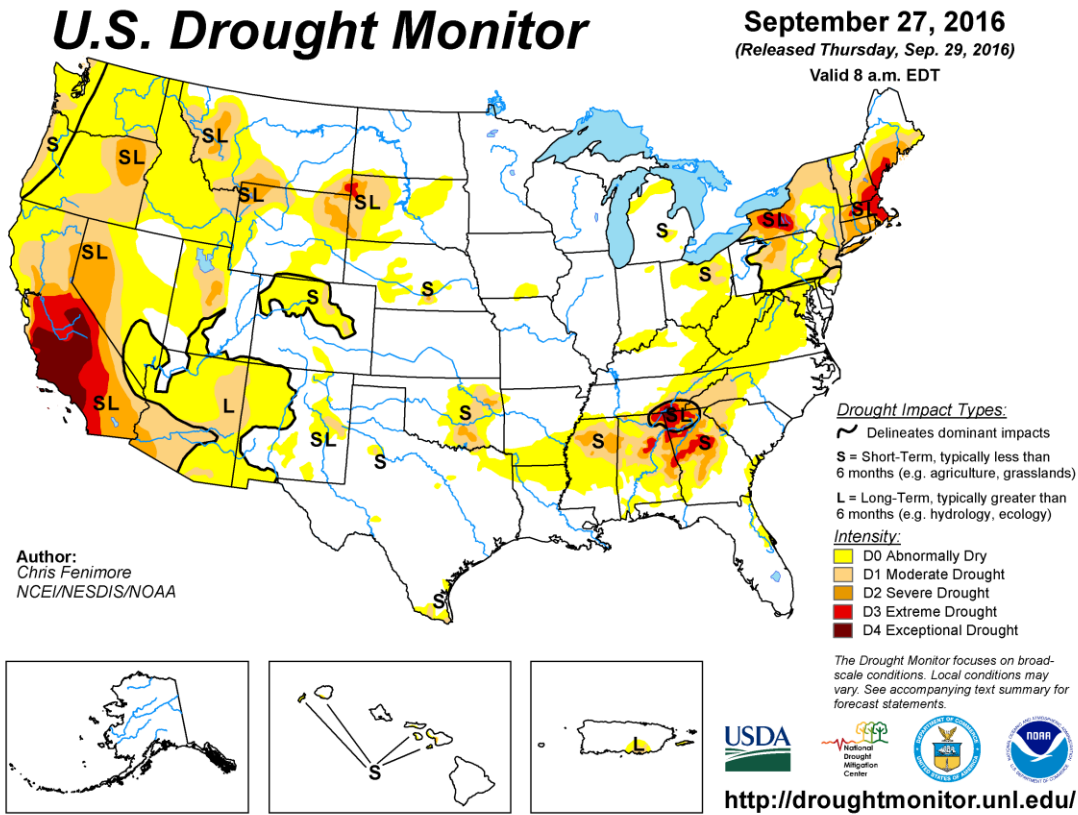
- 30.4" – Nov 2-4, 1946
- 22.7" – Oct 20-23, 1906
- 21.9" – Oct 24-25, 1997
- 21.5" – Nov 26-27, 1983
- 17.7" – Nov 19-21, 1979
- 16.5" – Sep 26-28, 1936

First Freeze

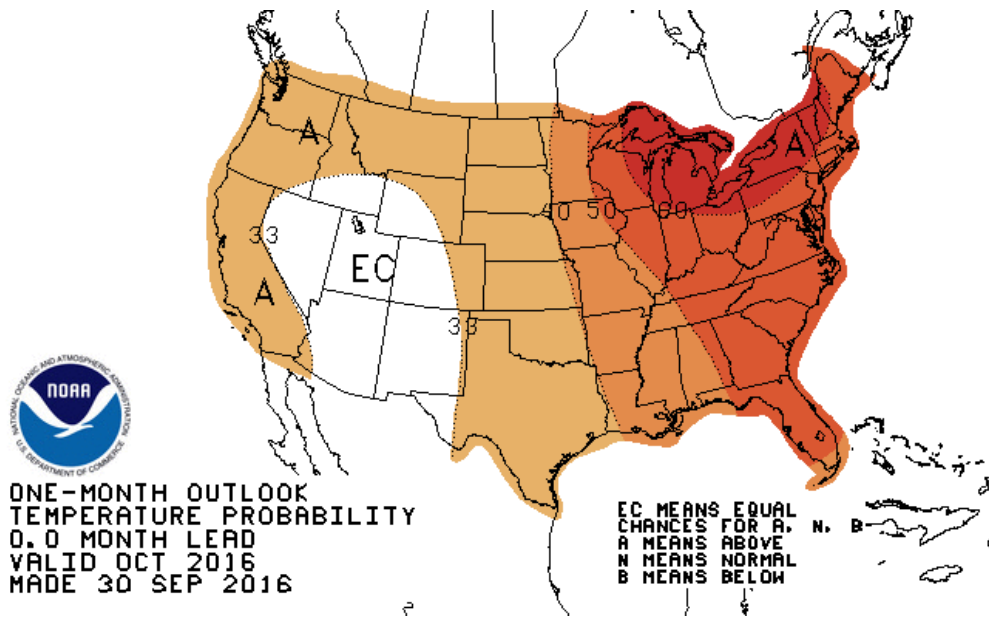
Denver's first freeze of the season usually occurs during October as well, with an average first freeze date of October 7th. The earliest freeze on record occurred on September 8, 1962 and the latest freeze on record occurred on November 15, 1944. Last year, Denver had an unusually late first freeze on October 28th, but from 2012-2014, the first freeze occurred in the first week of October prior to the 7th in all three years. This year Denver is likely to experience its first freeze right around the average date.

Drought Update

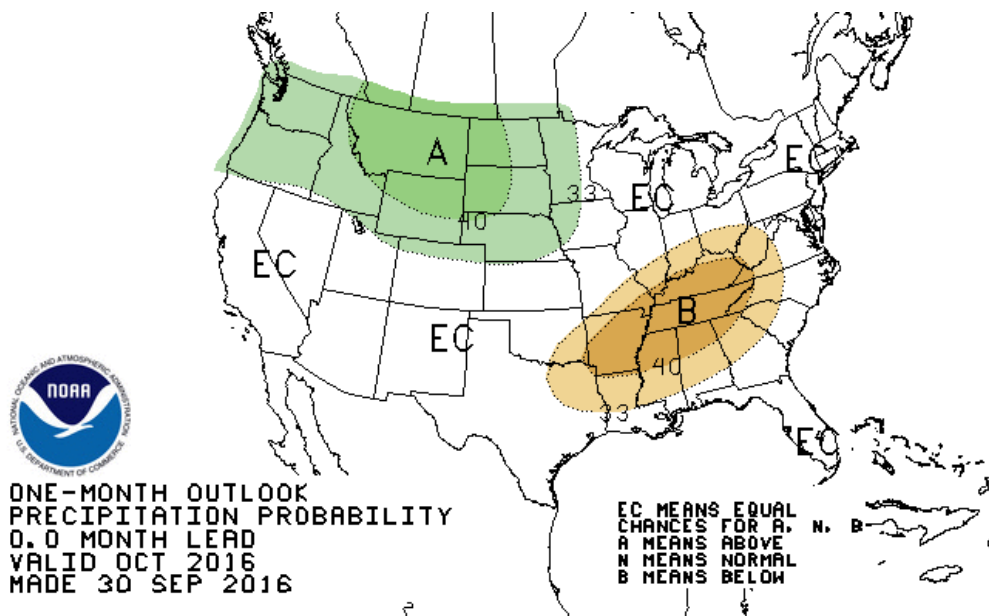
Areas of moderate short-term drought have developed across portions of the northern Colorado Front Range and eastern plains, while much of north central and northwestern Colorado remain abnormally dry. Areas of extreme to exceptional drought remain across much of southern/central California, with areas of severe drought in western Nevada and northeastern Oregon.



The map below shows forecasted temperature deviances for October 2016. There is a slight bias toward above normal temperatures across eastern Colorado, with equal chances for above or below normal temperatures across the western two-thirds of the state.



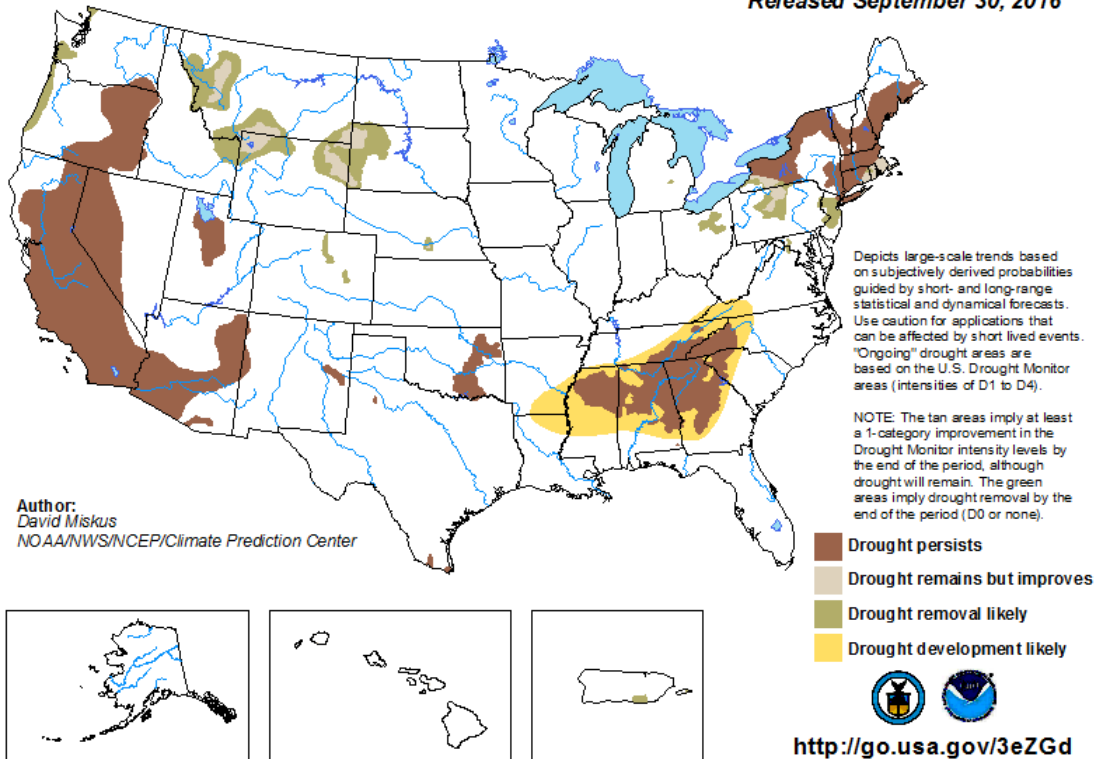
The map below shows forecasted precipitation deviances for October 2016. There is a slight bias toward above normal precipitation across far northern Colorado, and equal chances for above or below normal precipitation across the rest of the state.



Drought removal is likely this month across the small portions of the northern Front Range and eastern plains where moderate short-term drought currently exists. No other changes in drought conditions are expected for the remainder of Colorado. Drought is expected to persist across California, western Nevada, and eastern Oregon, while drought improvement or removal is likely for portions of the Northern Rockies.

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

Valid for October 2016
Released September 30, 2016



September Summary

September 2016 was warmer and drier than normal in Denver with generally quiet conditions for most of the month. The average high temperature for the month was 82.3, which is 3.8 degrees above normal, and the average low for the month was 49.7, which is 1.4 degrees above normal. The temperature reached 90 degrees or higher 6 times, with a monthly high of 93 occurring on the 5th. Occasional cold fronts throughout the month resulted in brief cool-downs, with a monthly low of 37 occurring on the 10th. Precipitation was unimpressive across the Denver area once again. There were occasional unsettled periods of weather involving isolated rain showers, but most of these produced little if any rain in the Denver area. Monthly precipitation totaled 0.28" at DIA, which is well below the long-term average of 0.96". There were only 4 days in which measurable precipitation occurred at DIA, although there were 6 days in which thunder was recorded. No snowfall was recorded during September, which extends Denver's "September snow drought" to 16 years, with the last measurable September snow occurring in 2000.

September Stats

TEMPERATURE (IN DEGREES F)

AVERAGE MAX	82.3	NORMAL 78.5	DEPARTURE 3.8
AVERAGE MIN	49.7	NORMAL 48.3	DEPARTURE 1.4
MONTHLY MEAN	66.0	NORMAL 63.4	DEPARTURE 2.6
HIGHEST	93 on 9/5		
LOWEST	37 on 9/10		

DAYS WITH MAX 90 OR ABOVE	6	NORMAL	3.4
DAYS WITH MAX 32 OR BELOW	0	NORMAL	0.0
DAYS WITH MIN 32 OR BELOW	0	NORMAL	0.8
DAYS WITH MIN ZERO OR BELOW	0	NORMAL	0.0

TEMPERATURE RECORDS

N/A

HEATING DEGREE DAYS

MONTHLY TOTAL	64	NORMAL 125	DEPARTURE -61
SEASONAL TOTAL	79	NORMAL 141	DEPARTURE -62

COOLING DEGREE DAYS

MONTHLY TOTAL	99	NORMAL 76	DEPARTURE 23
YEARLY TOTAL	861	NORMAL 764	DEPARTURE 97

PRECIPITATION (IN INCHES)

MONTHLY TOTAL	0.28	NORMAL 0.96	DEPARTURE -0.68
YEARLY TOTAL	10.29*	NORMAL 12.32	DEPARTURE -2.03*
GREATEST IN 24 HOURS	0.18 on 9/12		
DAYS WITH MEASURABLE PRECIP.	4		

*Error on 3/23 due to undercatch from snow

SNOWFALL (IN INCHES)

MONTHLY TOTAL	0.0	NORMAL 1.3	DEPARTURE -1.3
SEASONAL TOTAL	0.0	NORMAL 1.3	DEPARTURE -1.3
GREATEST IN 24 HOURS	0		

GREATEST DEPTH 0

WIND (IN MILES PER HOUR)

AVERAGE SPEED 9.5 mph
PEAK WIND GUST 51 mph from the SSW on 9/4

MISCELLANEOUS WEATHER

NUMBER OF DAYS WITH THUNDERSTORM	6	NORMAL	4
NUMBER OF DAYS WITH HEAVY FOG	3	NORMAL	1
NUMBER OF DAYS WITH HAIL	0		
NUMBER OF SUNNY DAYS	13		
NUMBER OF PARTLY CLOUDY DAYS	13		
NUMBER OF CLOUDY DAYS	4		
AVERAGE RELATIVE HUMIDITY	45%		

October Preview

October is one of Denver's drier months on average, but it also is the month when typically the first taste of winter occurs. The average date of Denver's first freeze of the season is on October 7th and the average date of the first measurable snow of the season is on October 18th. The average high for the month of October is 65.3 and the average low for the month is 36.6, with an average of 8.5 days of below freezing temperatures. October is also the month in which Denver's latest 90 degree day and earliest subzero day have occurred, although it's been about 100 years or more since either of these instances occurred. The hottest temperature on record in October is 90, which occurred in 1892, and the coldest temperature on record in October is -2, which occurred in 1917. Typically, 1-3 cool, wet systems will occur during the month, most of which produce light to moderate precipitation with an average monthly precipitation of 1.02" and an average monthly snowfall of 4.0". Most of the snowfall events that occur during October are "wet" in nature and have limited impacts on pavement due to typical warmer surface temperatures. However, heavy snowfall events can occasionally occur during October, which can significantly impact roadways, especially when snowfall rates exceed 1"/hour. The biggest snow event on record in October occurred in 1906 when 22.7" fell, but the second heaviest October snow event of 21.9" occurred more recently in 1997. The snowiest October on record occurred in 1969 with a monthly total of 31.2". October 1969 was also the coldest and wettest October on record. The most notable "cold and snowy" October in recent years occurred in 2009, which was the second coldest and fifth snowiest October on record. For October 2016, we are expecting near to slightly above normal temperatures and near to slightly below normal precipitation and snowfall, but there is a good chance the first measurable snowfall will occur sometime over the second half of the month, even if it ends up on the lighter side.

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

TEMPERATURE

AVERAGE HIGH	65.3
AVERAGE LOW	36.6
MONTHLY MEAN	50.9
DAYS WITH HIGH 90 OR ABOVE	0
DAYS WITH HIGH 32 OR BELOW	0.4
DAYS WITH LOW 32 OR BELOW	8.5
DAYS WITH LOWS ZERO OR BELOW	0

PRECIPITATION

MONTHLY MEAN	1.02"
DAYS WITH MEASURABLE PRECIPITATION	5.3
AVERAGE SNOWFALL IN INCHES	4.0"
DAYS WITH 1.0 INCH OF SNOW OR MORE	NA

MISCELLANEOUS AVERAGES

HEATING DEGREE DAYS	440
COOLING DEGREE DAYS	5
WIND SPEED (MPH)	8.8mph
WIND DIRECTION	South
DAYS WITH THUNDERSTORMS	1
DAYS WITH DENSE FOG	1
PERCENT OF SUNSHINE POSSIBLE	72%

EXTREMES

RECORD HIGH	90 on 10/1/1892
RECORD LOW	-2 on 10/29/1917
WARMEST	59.0 in 1950
COLDEST	38.9 in 1969
WETTEST	4.17" in 1969
DRIEST	Trace in 1934
SNOWIEST	31.2" in 1969
LEAST SNOWIEST	0.0" in many years

Rainfall

May 2016 to October 2016

City	May	Jun	Jul	Aug	Sep	Oct	Total
Aurora (Central)	2.64"	1.42"	2.09"	1.06"	0.24"		7.45"
Brighton	2.52"	1.57"	0.59"	0.55"	0.28"		5.51"
Broomfield	1.42"	0.35"	0.12"	1.26"	0.28"		3.15"
Castle Rock	2.64"	2.95"	0.59"	0.91"	0.20"		7.09"
Colo Sprgs Airport	2.38"	1.04"	3.04"	2.43"	0.16"		9.05"
Denver DIA	2.38"	1.62"	1.07"	0.22"	0.28"		5.57"
Denver Downtown	1.54"	2.83"	0.51"	0.59"	0.12"		5.59"
Golden	1.26"	1.00"	1.20"	2.52"	0.04"		6.02"
Fort Collins	2.05"	0.22"	0.94"	0.96"	0.25"		4.42"
Highlands Ranch	0.79"	2.20"	0.47"	2.01"	0.55"		5.55"
Lakewood	0.98"	2.68"	0.94"	2.01"	0.20"		6.81"
Littleton	0.94"	1.06"	2.01"	0.98"	0.04"		5.03"
Parker	2.32"	2.72"	0.98"	0.35"	0.12"		6.49"
Sedalia - Hwy 67	2.32"	2.48"	0.32"	1.72"	0.08"		6.92"
Thornton	1.26"	0.39"	0.12"	1.26"	0.00"		3.03"
Westminster	0.83"	1.50"	0.63"	2.20"	0.16"		5.31"
Wheat Ridge	1.02"	2.09"	0.24"	0.87"	0.20"		4.42"

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