

The Weather Wire

November 2016

Volume 23 Number 11

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NWS Winter Weather Watches, Warnings, and Advisories

It's that time of year again to review NWS Winter Weather products as we head into the snow season. Although our snow season is off to a slow start so after a warm and dry October, we will eventually begin to see our first snows of the season across the I-25 corridor as the winter season approaches. Now is a good time to brush up on the terminology used by the NWS to be prepared once the snow starts to fly.

The difference between watches, warnings and advisories

Watches: Indicates that conditions are favorable for the particular weather event in and near the Watch area, and which may pose a risk to life and property. Watches are issued up to 48 hours in advance with forecaster confidence around 50%.

Warnings/Advisories: Indicates that a particular weather event is imminent or occurring. **Advisories** are issued if the weather event will lead to nuisance conditions, while **Warnings** are issued for significant weather events that will pose a risk to life and property. Warnings and advisories are issued up to 48 hours in advance with forecaster confidence of at least 80%.

Snow Products

Winter Storm Watch is issued when hazardous winter storm conditions are possible within the next 3 to 4 days, but the timing, intensity, or occurrence may still be uncertain.

Blizzard Watch is issued when blizzard conditions are possible in the next 12 to 36 hours.

Winter Storm Warning is issued for the occurrence of heavy snow or any combination of heavy snow and other events. Examples of other events include blowing snow or very cold wind chill temperatures.

Winter Storm Warning Criteria for Heavy Snow is defined by the following amounts:

- **Mountains:** 8 inches of snow in 12 hours, or 12 inches or more in 24 hours.
- **Plains:** 6 inches of snow in 12 hours, or 8 inches or more in 24 hours.

Blizzard Warning is issued for the plains when the following conditions are expected to occur for at least 3 hours:

- Sustained winds of 35mph or greater
- Considerable falling and/or drifting snow
- Visibilities frequently less than 1/4 mile

Winter Weather Advisory is issued when:

- **Mountains:** 4 to 8 inches of snow falls in 12 hours, or 6 to 12 inches in 24 hours
- **Plains:** 3 to 6 inches of snow falls in 12 hours, or 4 to 8 inches in 24 hours

Winter Weather Advisory may also be issued when the following conditions are expected:

- When falling snow is accompanied by **blowing snow**, which can cause travel problems due to lower visibilities.
- When wind-blown snow will occasionally reduce visibilities and create a hazard for travelers.
- For **freezing drizzle** or a mix of precipitation types, such as snow and sleet, that will impact travel conditions.

Wind Products

High Wind Warning is issued for the following conditions:

- **Mountains/Foothills:** sustained winds of 50mph or more for at least 1 hour, or gusts of at least 75mph for any duration.
- **Lower elevations:** sustained winds of 40mph or more for at least 1 hour, or gusts of at least 58mph for any duration.

High Wind Watch is issued when high wind conditions are expected to develop in the next 12 to 36 hours.

Wind Chill Warning is issued for the following wind chill temperatures, when combined with sustained winds of at least 10mph:

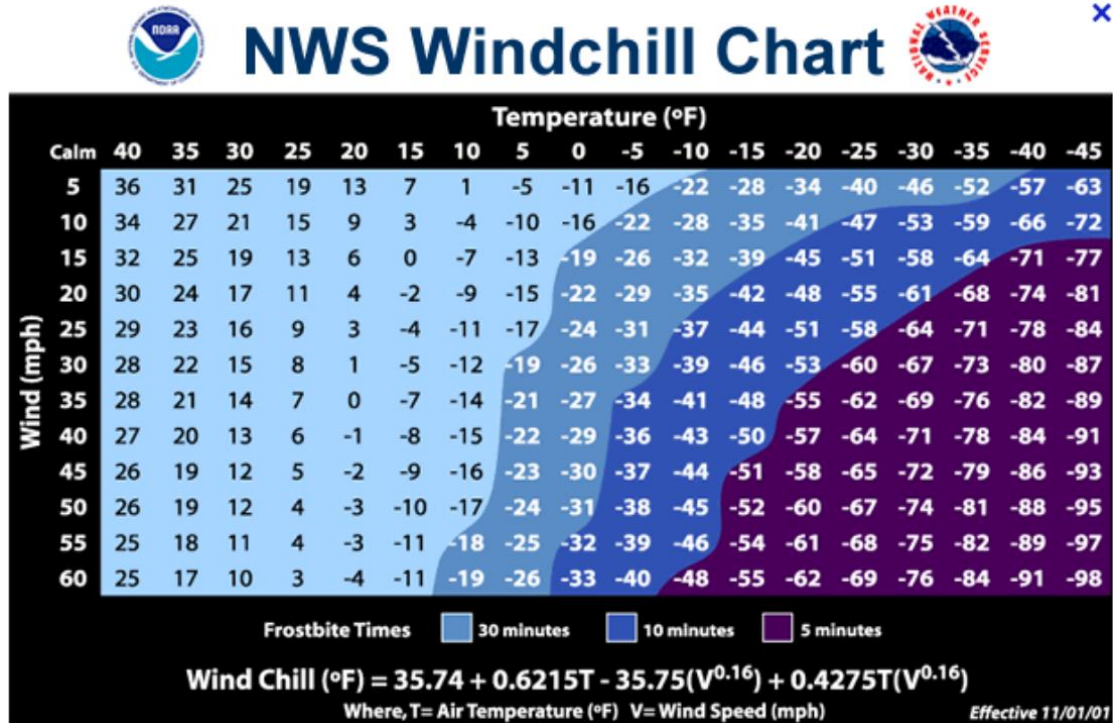
- **Mountains:** 35 degrees below zero Fahrenheit or colder
- **Plains:** 25 degrees below zero Fahrenheit or colder

Wind Chill Watch is issued when wind chill warning criteria are possible in the next 12 to 36 hours.

Wind Chill Advisory is issued when the following is expected:

- **Mountains:** wind chills between 25 below and 34 below zero
- **Plains:** wind chills between 18 below and 24 below zero

Wind Chill Chart

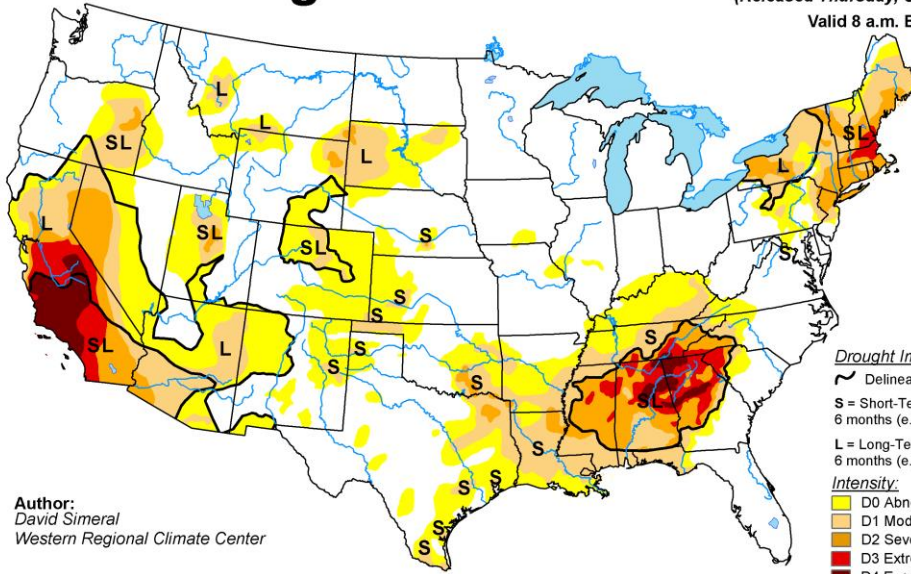


Drought Update

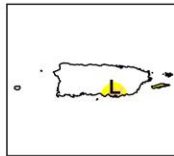
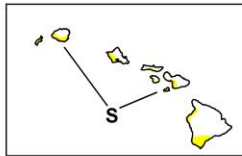
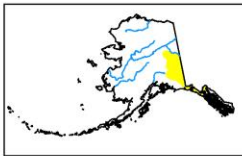
Areas of moderate short-term drought have expanded across the northern I-25 corridor, extending from Douglas County northward into the Denver/Boulder metro areas and up through Ft. Collins. Abnormally dry conditions now exist across all of eastern Colorado as well as portions of the northern and southern mountains. Significant drought improvement has occurred across the Pacific Northwest and Northern Rockies thanks to an exceptionally wet October. Areas of extreme drought remain across central and southern California.

U.S. Drought Monitor

October 25, 2016
 (Released Thursday, Oct. 27, 2016)
 Valid 8 a.m. EDT



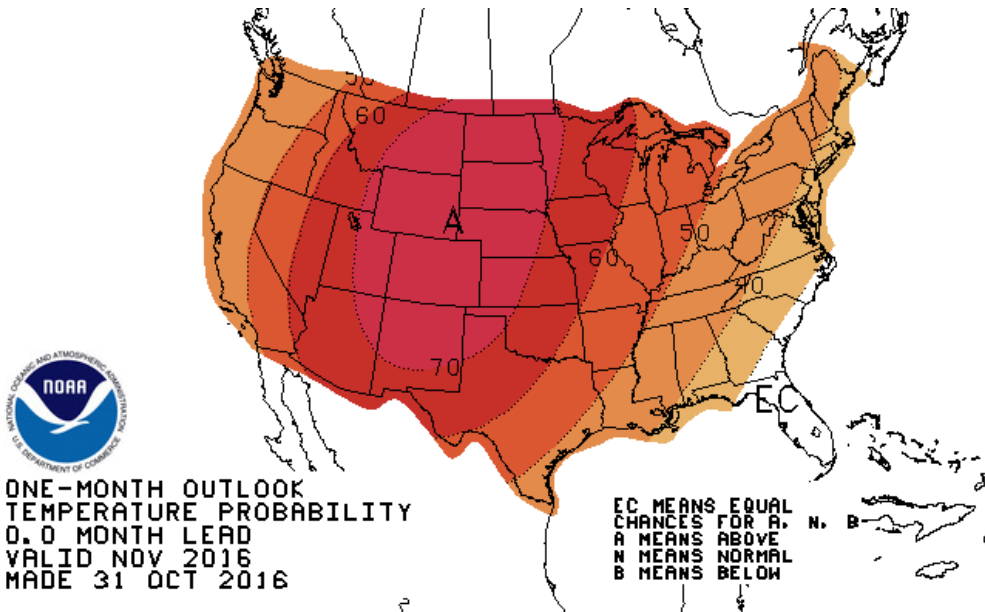
Author:
 David Simeral
 Western Regional Climate Center



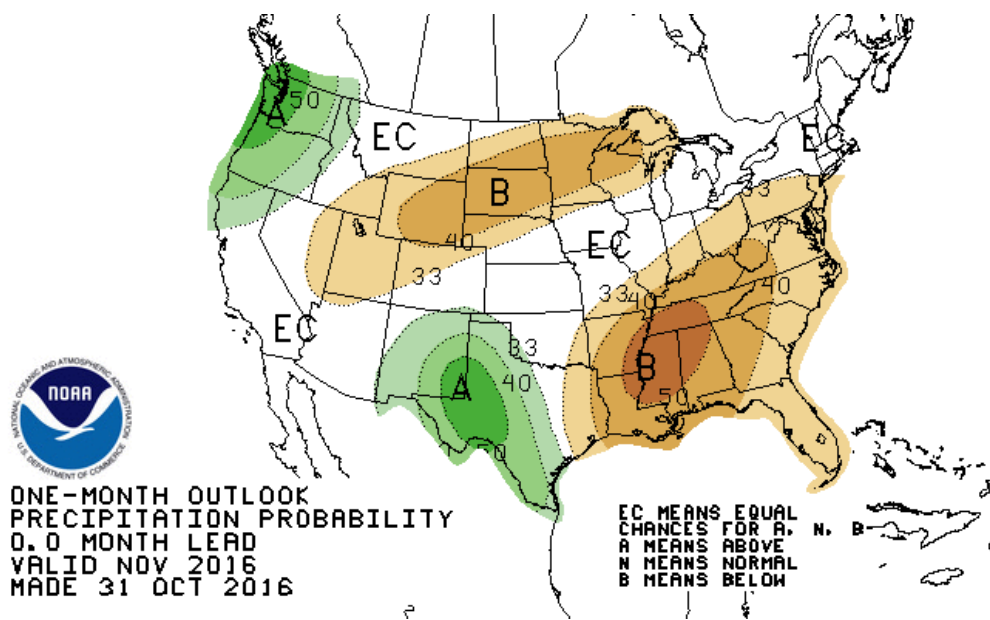
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu/>

The map below shows forecasted temperature deviances for November 2016. There is a very strong bias toward above normal temperatures for all of Colorado.



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

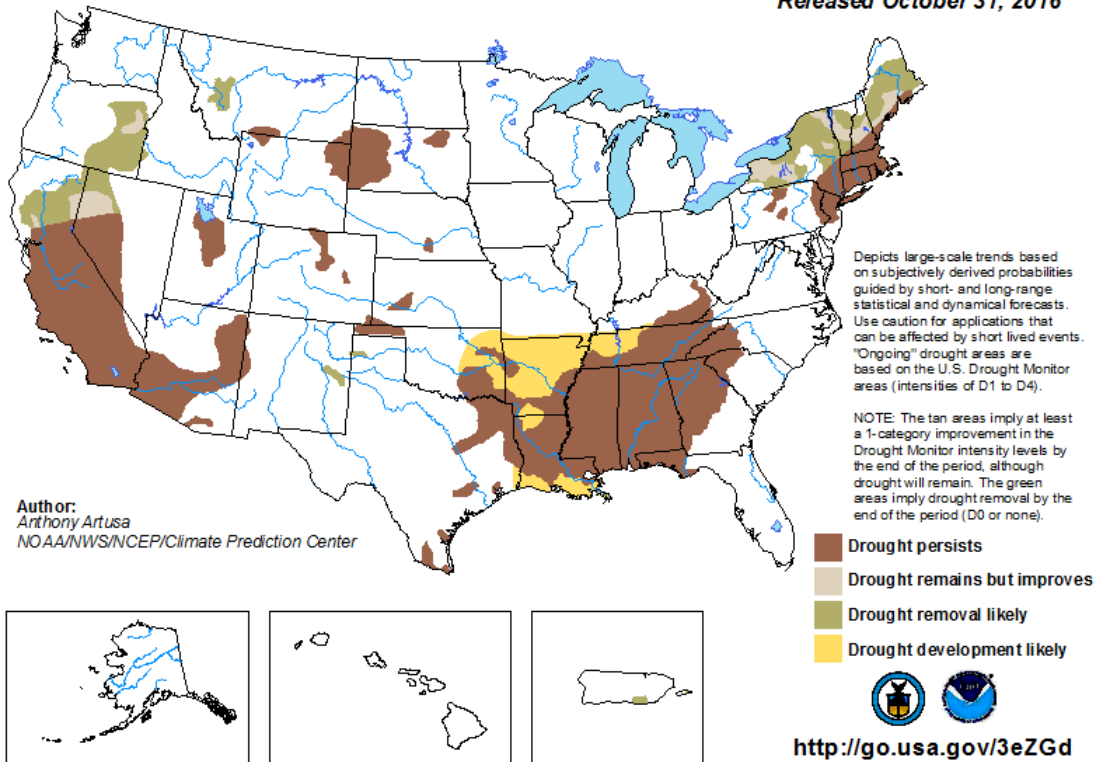


Drought conditions are expected to persist across the northern I-25 corridor during November. Drought persistence is also likely across central and southern California, while drought improvement or removal is expected for portions of northern California and eastern Oregon.

U.S. Monthly Drought Outlook

Drought Tendency During the Valid Period

Valid for November 2016
Released October 31, 2016



October Summary

October 2016 was much warmer and drier than average, and will go down as the 4th warmest October on record. The average high for the month was 74.5, which is 9.2 degrees above average, and the average low for the month was 41.2, which is 4.6 degrees above average. Four record high temperatures were set over the course of the month on the 15th, 27th, 28th, and 29th, while the highest temperature of the month of 86 degrees occurred on the 16th. Overall, there were 9 days in which the high temperature reached or exceeded 80 at DIA, which is very unusual for October. Despite the overall warmth, there were a handful of chilly mornings, with the first freeze of the season occurring right around the average date on the 6th, and the low temperature for the month of 25 occurring on the 20th. Precipitation was below average as high pressure dominated the weather pattern for most of the month. Only three days of measurable precipitation occurred at DIA, with a total of 0.26" for the month, which is well below normal but still outside of the top 20 driest Octobers. No snow fell in Denver this month, making it a third straight October in which Denver did not receive snow – the first time this has ever happened since weather records began in Denver. Even in the foothills, the only light snow event of the month occurred on the 5th-6th, with no measurable snow over the remainder of the month.

October Stats

TEMPERATURE (IN DEGREES F)

AVERAGE MAX	74.5	NORMAL 65.3	DEPARTURE 9.2
AVERAGE MIN	41.2	NORMAL 36.6	DEPARTURE 4.6
MONTHLY MEAN	57.8	NORMAL 50.9	DEPARTURE 6.9
HIGHEST	86 on 10/16		
LOWEST	25 on 10/20		

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	3	NORMAL	8.5
DAYS WITH MIN ZERO OR BELOW	0	NORMAL	0.0

TEMPERATURE RECORDS

10/15 – record high of 85 set

10/27 – record high of 83 set

10/28 – record high of 82 set

10/29 – record high of 82 set, record high minimum temp of 55 set

HEATING DEGREE DAYS

MONTHLY TOTAL	231	NORMAL 440	DEPARTURE -209
SEASONAL TOTAL	310	NORMAL 581	DEPARTURE -271

COOLING DEGREE DAYS

MONTHLY TOTAL	17	NORMAL 5	DEPARTURE 12
YEARLY TOTAL	878	NORMAL 769	DEPARTURE 109

PRECIPITATION (IN INCHES)

MONTHLY TOTAL	0.26	NORMAL 1.02	DEPARTURE -0.76
YEARLY TOTAL	10.55*	NORMAL 13.34	DEPARTURE -2.79*
GREATEST IN 24 HOURS	0.2 on 10/5-10/6		
DAYS WITH MEASURABLE PRECIP.	3		

*Error on 3/23 due to undercatch from snow

SNOWFALL (IN INCHES)

MONTHLY TOTAL	0.0	NORMAL 4.0	DEPARTURE -4.0
SEASONAL TOTAL	0.0	NORMAL 5.3	DEPARTURE -5.3
GREATEST IN 24 HOURS	0		
GREATEST DEPTH	0		

WIND (IN MILES PER HOUR)

AVERAGE SPEED	10.0 mph
PEAK WIND GUST	42 mph from the W on 10/3

MISCELLANEOUS WEATHER

NUMBER OF DAYS WITH THUNDERSTORM	0	NORMAL	1
NUMBER OF DAYS WITH HEAVY FOG	3	NORMAL	1
NUMBER OF DAYS WITH HAIL	0		
NUMBER OF SUNNY DAYS	10		
NUMBER OF PARTLY CLOUDY DAYS	17		
NUMBER OF CLOUDY DAYS	4		
AVERAGE RELATIVE HUMIDITY	40%		

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. Last year started similar to this year with warmer than average temperatures and no snow in October, but as you may remember, the pattern flipped in November and above-average snowfall occurred across most of the region. 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 occurred in 2006, while 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 12th and 13th 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. 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 with better melt on pavement occurring, but toward the end of the month, snow tends to more easily accumulate on pavement due to colder temperatures and lower solar angles. For November 2016, we are expecting another month of warmer than average temperatures and below average snowfall. The signal for warmer and drier conditions is strongest over the first half of the month, when high pressure is expected to dominate the weather pattern. We should finally see our first meaningful snows of the season by mid to late November when high pressure is likely to weaken.

**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	3
DAYS WITH LOW 32 OR BELOW	23
DAYS WITH LOWS ZERO OR BELOW	1

PRECIPITATION

MONTHLY MEAN	0.61"
DAYS WITH MEASURABLE PRECIPITATION	5
AVERAGE SNOWFALL IN INCHES	8.7"
DAYS WITH 1.0 INCH OF SNOW OR MORE	3

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 11/8/2006
RECORD LOW	-18 on 11/29/1877
WARMEST	50.9 in 1949
COLDEST	22.0 in 1880
WETTEST	3.21" in 1946
DRIEST	Trace in 1949, 1901, 1899
SNOWIEST	42.6" in 1946
LEAST SNOWIEST	0.0" in 1949

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"	0.35"	7.80"
Brighton	2.52"	1.57"	0.59"	0.55"	0.28"	0.39"	5.90"
Broomfield	1.42"	0.35"	0.12"	1.26"	0.28"	0.43"	3.58"
Castle Rock	2.64"	2.95"	0.59"	0.91"	0.20"	0.08"	7.17"
Colo Sprgs Airport	2.38"	1.04"	3.04"	2.43"	0.16"	Trace	9.05"
Denver DIA	2.38"	1.62"	1.07"	0.22"	0.28"	0.26"	5.83"
Denver Downtown	1.54"	2.83"	0.51"	0.59"	0.12"	0.35"	5.94"
Golden	1.26"	1.00"	1.20"	2.52"	0.04"	0.28"	6.02"
Fort Collins	2.05"	0.22"	0.94"	0.96"	0.25"	0.53"	4.95"
Highlands Ranch	0.79"	2.20"	0.47"	2.01"	0.55"	0.20"	5.75"
Lakewood	0.98"	2.68"	0.94"	2.01"	0.20"	0.39"	7.20"
Littleton	0.94"	1.06"	2.01"	0.98"	0.04"	0.28"	5.03"
Parker	2.32"	2.72"	0.98"	0.35"	0.12"	0.12"	6.61"
Sedalia - Hwy 67	2.32"	2.48"	0.32"	1.72"	0.08"	0.16"	7.08"
Thornton	1.26"	0.39"	0.12"	1.26"	0.00"	0.24"	3.27"
Westminster	0.83"	1.50"	0.63"	2.20"	0.16"	0.51"	5.82"
Wheat Ridge	1.02"	2.09"	0.24"	0.87"	0.20"	0.39"	4.81"

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