

# *The Weather Wire*

**June 2011**

**Volume 18 Number 6**

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## **Winter Summary 2010-2011**

The Front Range of Colorado experienced a very dry fall, winter and early spring with drought conditions at severe levels and high fire danger until mid May. Other parts of the US have fared much better with a strong La Nina pattern bringing heavy snows to the Pacific Northwest, Intermountain West and the Great Lakes region extending all the way to the East Coast. In Colorado the northwest flow pattern aloft and fast moving storm systems produced a high frequency of storms that resulted in above normal snowfall to the central and northern mountains of the state. However, east of the Continental Divide extending onto the plains the storms become much weaker and typically produced more wind than rain or snow and has resulted in above normal temperatures during the winter due to the "downsloping" winds off of the mountains. For the entire 2010-2011 season there were only 2 storms that have produced more than 3" of snowfall at DIA. Granted other Denver suburbs have experienced more snow than DIA but all locations along the Front Range ended up well below normal. Colorado Springs airport only received 12.7" the entire season! DIA measured 22.8" which is close to double Colorado Springs but will go down as the 2<sup>nd</sup> driest winter on record since 1888-1889! Only 40% of normal snowfall fell this winter in Denver. In tandem with the lack of snow the above normal temperatures resulted in the snow that fell melting rather quickly which did not help anybody out in the snow removal business. May did provide some relief with precipitation and snow fell in the mountains and foothills but lower elevations below 5,500ft only reported 1" or less of snow for the month.

The climate along the Front Range is highly variable and snowfall totals are no different but all locations along the I-25 corridor from Colorado Springs northward to the Wyoming border share one thing in common, below normal snowfall. There have been months where snowfall was above normal but they were also typically one of the drier winter months on average anyway. The high snowfall months of November, December, March and April were all well below normal which accelerated the snowfall deficit. By looking at each month individually for a few

selected locations one can clearly see the lack of snowfall this winter has produced for the highly populated areas along the I-25 corridor.

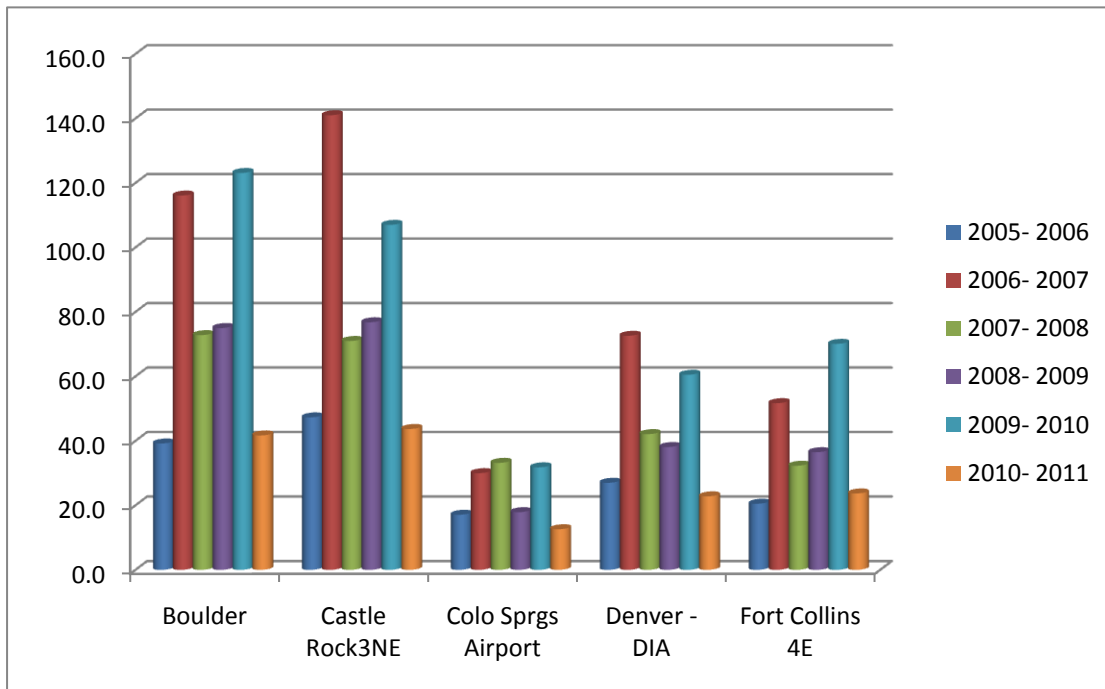
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Totals
	Total	Total	Total	Total	Total	Total	Total	Total	
Location									
<b>Boulder</b>	0.0	2.1	9.5	15.4	10.5	0.5	3.5	0.2	<b>41.7</b>
<b>Castle Rock3NE</b>	0.0	4.4	4.0	8.1	13.0	1.7	4.5	8.0	<b>43.7</b>
<b>Colo Sprgs</b>	0.0	0.2	4.0	1.6	2.5	3.1	1.3	0.0	<b>12.7</b>
<b>Denver - DIA</b>	0.0	1.5	3.3	8.0	5.3	2.5	1.2	1.0	<b>22.8</b>
<b>Fort Collins CSU</b>	0.0	5.0	4.3	6.0	6.3	0.0	2.1	0.0	<b>23.7</b>

Compared to the last five years most locations received less than 50% of the 5-year average snowfall. The winters of 2006-2007 and 2009-2010 provided well above normal snowfall with 2005-2006 actually quite similar to this year with well below normal snowfall. Here are how the last 5 years breaks down:

	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	5-Year Avg	Normal	2010-2011	% of 5yr Avg	% of Normal
Location										
<b>Boulder</b>	39.2	116.1	72.8	75.0	123.1	85.2	<b>79.4</b>	41.7	<b>48.9</b>	<b>52.5</b>
<b>Castle Rock3NE</b>	47.3	141.0	71.0	76.8	107.0	88.6	<b>60.0</b>	43.7	<b>49.3</b>	<b>72.8</b>
<b>Colo Sprgs Airport</b>	17.1	30.0	33.2	17.9	31.8	26.0	<b>45.2</b>	12.7	<b>48.8</b>	<b>27.9</b>
<b>Denver - DIA</b>	27.0	72.6	42.1	38.1	60.5	48.1	<b>61.7</b>	22.8	<b>47.4</b>	<b>37.0</b>
<b>Fort Collins 4E</b>	20.5	51.7	32.3	36.5	70.1	42.2	<b>47.2</b>	23.7	<b>56.1</b>	<b>50.2</b>

*Italics = Estimate or Stapleton Site*

Here is a graphical version of the last 6 years of snowfall:



**Summary:** Above normal temperatures and below normal precipitation has been the theme of this winter season into the spring with the exception of May. September was the 5<sup>th</sup> driest on record and nearly 5 degrees above normal in temperature. October as the only the 15<sup>th</sup> October since 1872 without even a trace of snow reported in Denver. In November the first snow fell but there was only 1.5" reported at DIA. December was nearly 5 degrees above normal in temperature and there was only 3.3" of snow measured at DIA. For all of 2010 11.87" of precipitation was measured resulting in yearly deficit of 3.09". January of 2011 began promising with slightly above normal snowfall and precipitation but not enough to even begin to make up for the lack of snow for previous months. February was actually below normal in temperatures due to a couple of arctic outbreaks sending the temperatures below zero. Snowfall was above normal for many locations but this trend would not last. March of 2011 came very close to being the driest on record were it not for some snow at the very end of the month which put it as the 8<sup>th</sup> driest on record. In April drought conditions became worse as less than half of normal precipitation fell and snow totals were once again below normal. May finally provided much needed moisture with double normal precipitation for many NE Colorado locations with near normal precipitation south of the Denver Metro area. Most of the precipitation fell as rain at lower elevations. This snow season will go down as one of the least snowiest since 2005-2006 and for some areas such as Denver the least snowiest since the late 1800's. Many locations along the I-25 Corridor only reported 25-50% of normal snowfall with areas above 6,000ft doing a little better due to some late season storms that were mainly rain for lower elevations.

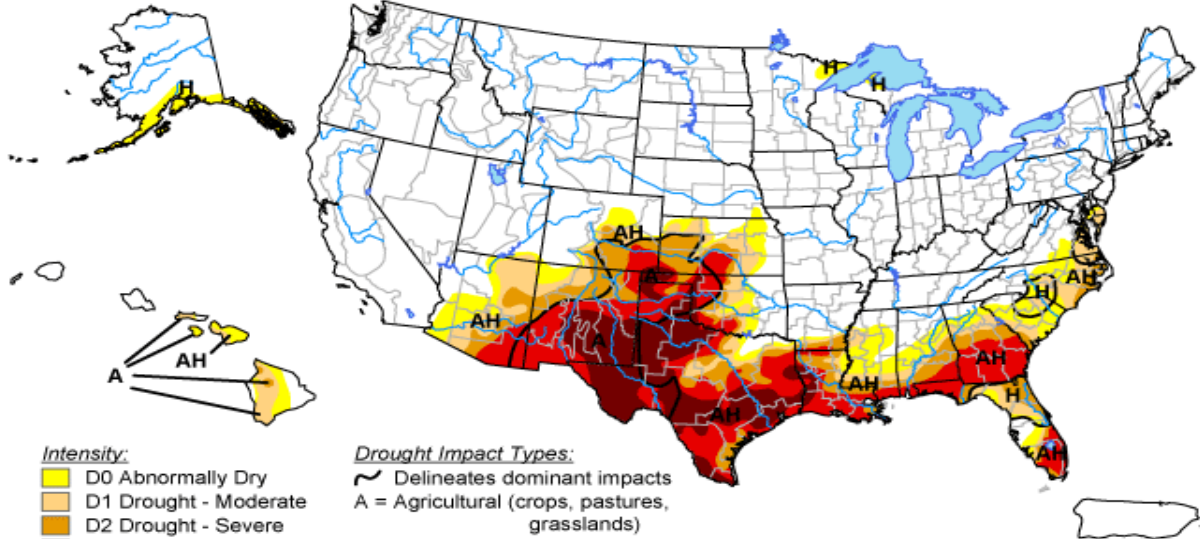
**Note:** Remember snow totals are taken by trained spotters and are not official data but do represent the area very well. Temperatures for each month were taken from DIA which is where the official high and low temperatures are for Denver. The 2007-2008 season was the last year that snow was measured at Stapleton with DIA now the official site for Denver snowfall.

## Drought Update

Conditions since mid August of 2010 have brought severe drought conditions to parts of eastern and southeastern Colorado but improvement is expected this month. Drought conditions have improved significantly for northeastern Colorado due to well above normal precipitation in May.

# U.S. Drought Monitor

May 31, 2011  
Valid 8 a.m. EDT



**Intensity:**

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

**Drought Impact Types:**

- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

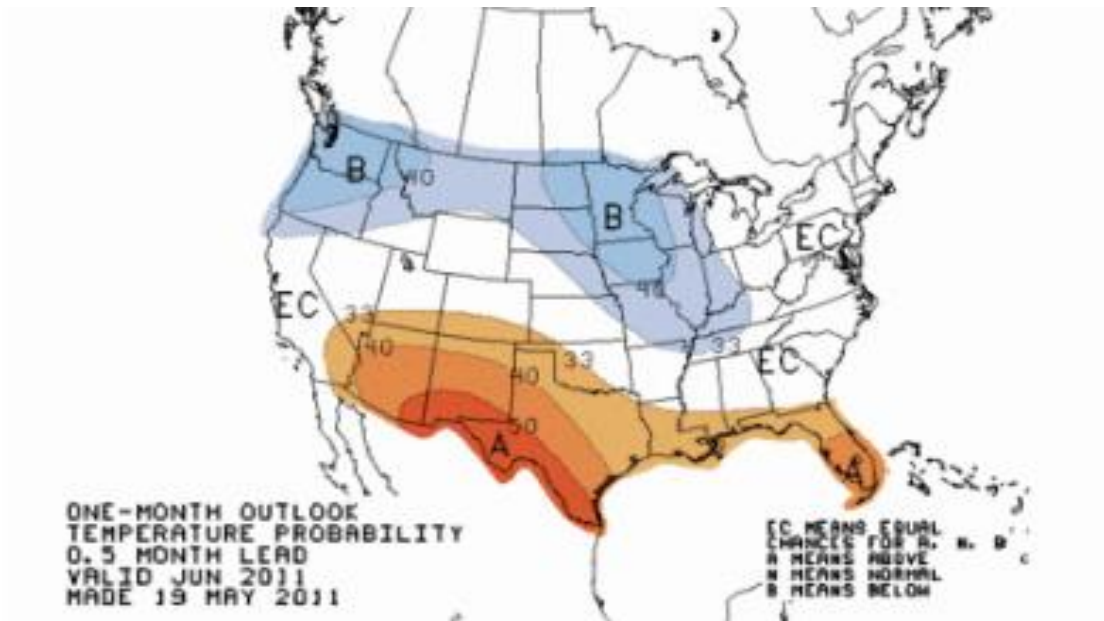
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

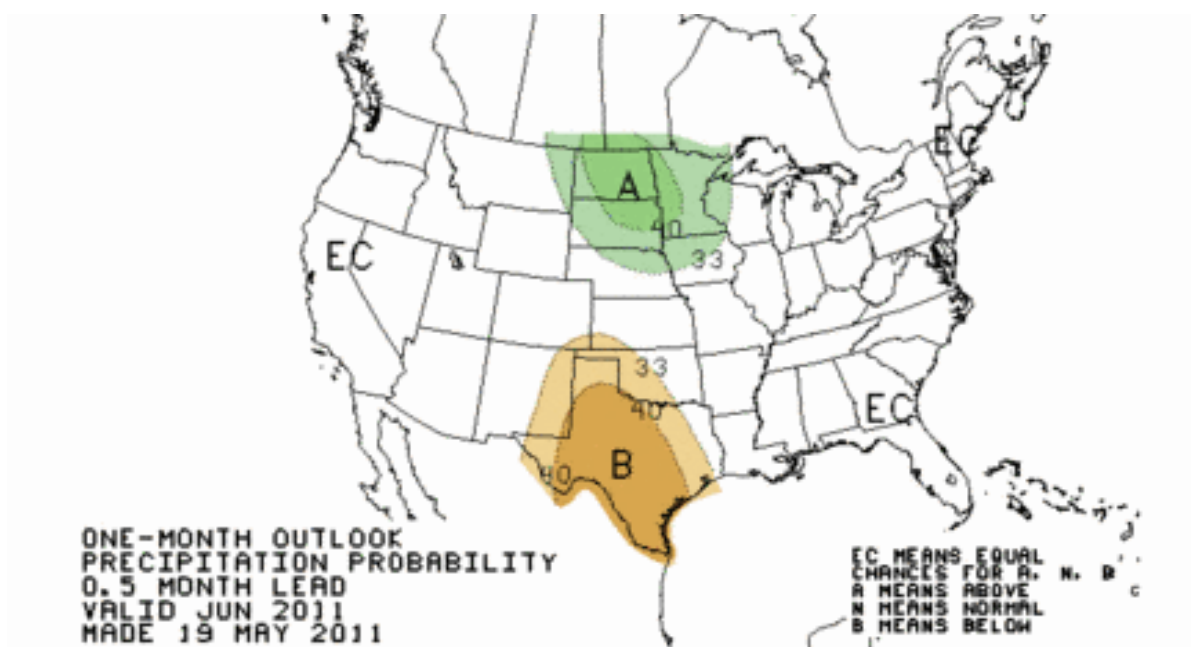


Released Thursday, June 2, 2011  
Author: Anthony Artusa, NOAA/NWS/NCEP/CPC

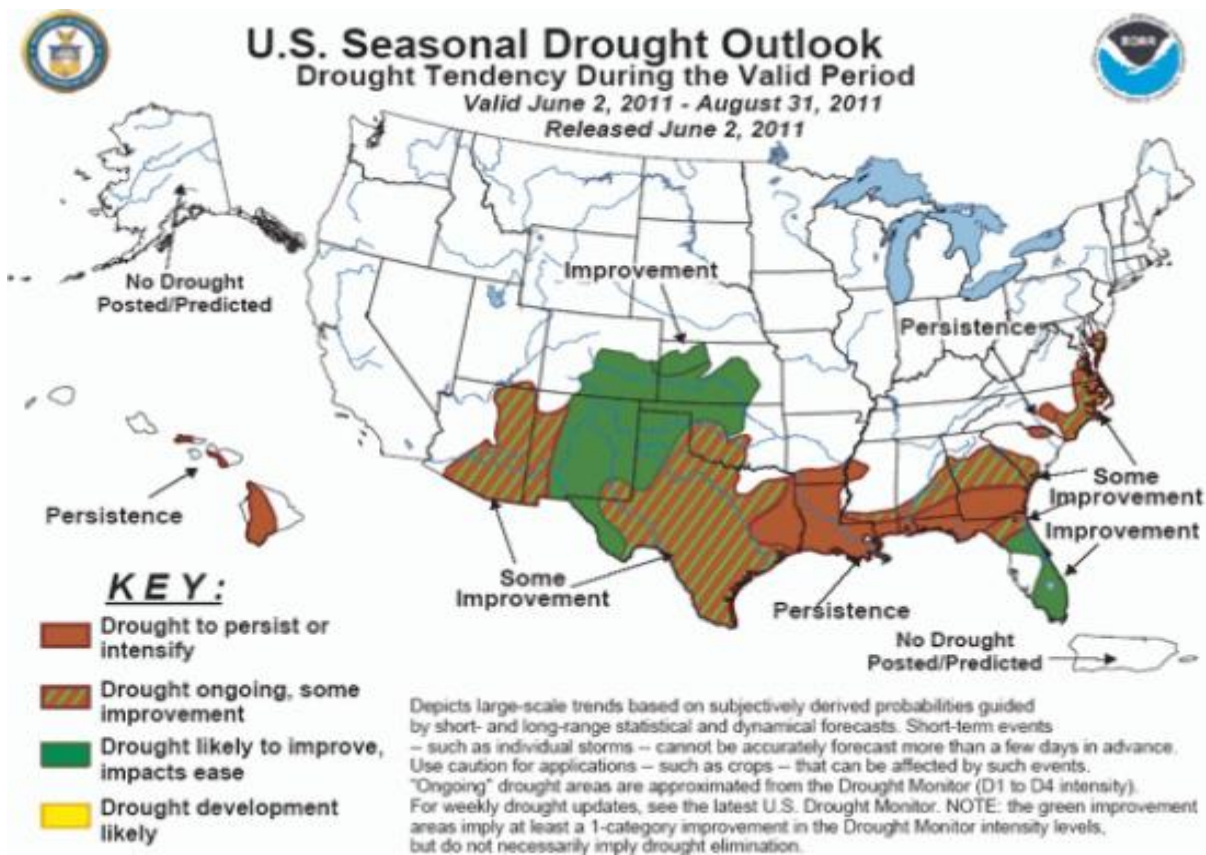
The map below shows forecasted temperature deviances for June 2011. As can be seen, near normal to slightly above normal temperatures are expected for much of Colorado for the month.



The map below shows forecasted precipitation deviances for June 2011. Near normal precipitation amounts are expected across most of Colorado with below normal precipitation extreme southeastern areas.



Drought conditions are expected to see some improvement over eastern and southeastern Colorado.



## May Summary

May is typically the wettest month of the year and 2011 did not disappoint as there was a large scale weather pattern change with slow moving upper level low pressure systems moving through the state which had been absent all fall and winter. May of 2011 recorded 4.79" of precipitation at DIA which was 7<sup>th</sup> all time and 2.47" above normal which is more than double the average May precipitation. The Front Range of Colorado and eastern plains really needed the moisture as drought conditions were becoming severe in some areas and the fire danger had become unusually high this early in the spring season. Areas south of the Denver Metro area did not receive as much moisture (near normal) but northern areas fared quite well with above normal precipitation. Along with the moisture came cooler than normal temperatures with highs more than 5 degrees below the average of 70.5. There was 1.0" of snow reported at DIA which was 0.3" below normal. The 2010-2011 winter season only tallied 22.8" of snow which was 33.5" below normal and became the 2<sup>nd</sup> least snowiest season on record since 1888-1889! There were 12 days with measureable precipitation and 3 days with hail. There was not officially any thunderstorms reported at DIA but I find this hard to believe as the Denver Metro area had at least 5 thunderstorm days according to Skyview Weather data.

## May Stats

### TEMPERATURE (IN DEGREES F)

AVERAGE MAX	65.4	NORMAL 70.5	DEPARTURE -5.1
AVERAGE MIN	40.7	NORMAL 43.8	DEPARTURE -3.1
MONTHLY MEAN	53.1	NORMAL 57.2	DEPARTURE -4.1
HIGHEST	86 on the 7 <sup>th</sup> and 8 <sup>th</sup>		
LOWEST	28 on the 5 <sup>th</sup>		

DAYS WITH MAX 90 OR ABOVE	0	NORMAL	0.4
DAYS WITH MAX 32 OR BELOW	0	NORMAL	0.0
DAYS WITH MIN 32 OR BELOW	3	NORMAL	1.5
DAYS WITH MIN ZERO OR BELOW	0	NORMAL	0.0

### TEMPERATURE RECORDS

No temperature records tied or broken.

### HEATING DEGREE DAYS

MONTHLY TOTAL	372	NORMAL 267	DEPARTURE 105
SEASONAL TOTAL	5681	NORMAL 6068	DEPARTURE -387

### COOLING DEGREE DAYS

MONTHLY TOTAL	9	NORMAL 23	DEPARTURE -14
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YEARLY TOTAL 9 NORMAL 25 DEPARTURE -16

**PRECIPITATION (IN INCHES)**

MONTHLY TOTAL 4.79 NORMAL 2.32 DEPARTURE 2.47  
YEARLY TOTAL 7.11 NORMAL 6.53 DEPARTURE 0.58  
GREATEST IN 24 HOURS 1.95" from 5/11 to 5/12  
DAYS WITH MEASURABLE PRECIP. 12

**SNOWFALL (IN INCHES)**

MONTHLY TOTAL 1.0 NORMAL 1.3 DEPARTURE -0.3  
SEASONAL TOTAL 22.8 NORMAL 56.3 DEPARTURE -33.5  
GREATEST IN 24 HOURS 1.0" on the 11th  
GREATEST DEPTH NA

**WIND (IN MILES PER HOUR)**

AVERAGE SPEED 10.4mph  
PEAK WIND GUST 74mph from the SSE

**MISCELLANEOUS WEATHER**

NUMBER OF DAYS WITH THUNDERSTORM 0 NORMAL 6  
NUMBER OF DAYS WITH HEAVY FOG 3 NORMAL 1  
NUMBER OF DAYS WITH HAIL 3  
NUMBER OF SUNNY DAYS 3  
NUMBER OF PARTLY CLOUDY DAYS 19  
NUMBER OF CLOUDY DAYS 9  
AVERAGE RELATIVE HUMIDITY 55%

## June Preview

June is well known for producing quite a few thunderstorm days with severe weather being a fairly common occurrence along and east of I-25. Large hail is the most common occurrence but there are quite a few tornadoes as well with more tornadoes in the month of June than any other calendar month of the year. Precipitation for June drops off from May at 1.56" but is still one of the wetter months of the year. For northeastern Colorado normal to below normal precipitation is expected with normal to above normal temperatures. Temperatures really begin to climb in June as there is abundant sunshine with the longest days of the year. Average high temperatures are around 82 degrees with average lows above 50 which really gets the plants in the garden growing. 9 days of the month or roughly 30% of all days in June typically have some sort of measureable precipitation. Winds tend to weaken in June as the temperature gradient from north to south lessens and the jet stream heads northward. Average wind speeds are under 9mph and predominantly from a south direction. In the mountains there is above normal snow pack currently along and east of the Continental Divide and if you have plans to be in the high country for vacation this month rivers and streams will be running high through the end of the month with flooding in some areas.

### ENVER'S NOVEMBER CLIMATOLOGICALLY NORMAL (NORMAL PERIOD 1971-2000)

#### TEMPERATURE

AVERAGE HIGH	82.1
AVERAGE LOW	53.0
MONTHLY MEAN	67.6
DAYS WITH HIGH 90 OR ABOVE	6
DAYS WITH HIGH 32 OR BELOW	0
DAYS WITH LOW 32 OR BELOW	0
DAYS WITH LOWS ZERO OR BELOW	0

#### PRECIPITATION

MONTHLY MEAN	1.56"
DAYS WITH MEASURABLE PRECIPITATION	9
AVERAGE SNOWFALL IN INCHES	Trace
DAYS WITH 1.0 INCH OF SNOW OR MORE	0

#### MISCELLANEOUS AVERAGES

HEATING DEGREE DAYS	60
COOLING DEGREE DAYS	136
WIND SPEED (MPH)	8.9mph
WIND DIRECTION	South
DAYS WITH THUNDERSTORMS	10
DAYS WITH DENSE FOG	Less than 1
PERCENT OF SUNSHINE POSSIBLE	70%



## EXTREMES

RECORD HIGH	104 on 6/26/1994
RECORD LOW	30 on 6/2/1951
WARMEST	73.5 in 1994
COLDEST	60.6 in 1967
WETTEST	4.96" in 1882
DRIEST	Trace in 1890
SNOWIEST	0.4" in 1919
LEAST SNOWIEST	0.0"

## Sunrise/Sunset (Jan - June Denver area)

	JAN	FEB	MAR	APR	MAY	JUN	
	SR - SS	SR - SS	SR - SS	SR - SS	SR - SS	SR - SS	
01	0721-0446	0707-0518	0633-0550	0644-0722	0600-0753	0534-0821	01
02	0721-0447	0707-0519	0631-0551	0642-0723	0559-0754	0533-0821	02
03	0721-0447	0706-0520	0630-0552	0641-0724	0558-0755	0533-0822	03
04	0721-0448	0705-0521	0628-0553	0639-0725	0557-0756	0533-0823	04
05	0721-0449	0704-0522	0627-0555	0638-0726	0556-0757	0532-0823	05
06	0721-0450	0703-0524	0625-0556	0636-0727	0554-0758	0532-0824	06
07	0721-0451	0701-0525	0624-0557	0635-0728	0553-0759	0532-0825	07
08	0721-0452	0700-0526	0622-0558	0633-0729	0552-0800	0532-0825	08
09	0720-0453	0659-0527	0621-0559	0631-0730	0551-0801	0531-0826	09
10	0720-0454	0658-0528	0619-0600	0630-0731	0550-0801	0531-0826	10
11	0720-0455	0657-0530	0618-0601	0628-0732	0549-0802	0531-0827	11
12	0720-0456	0656-0531	0616-0602	0627-0733	0548-0803	0531-0827	12
13	0719-0457	0655-0532	0714-0703	0625-0734	0547-0804	0531-0828	13
14	0719-0458	0653-0533	0713-0704	0624-0735	0546-0805	0531-0828	14
15	0719-0459	0652-0534	0711-0705	0622-0736	0545-0806	0531-0829	15
16	0718-0500	0651-0535	0710-0706	0621-0737	0544-0807	0531-0829	16
17	0718-0500	0650-0537	0708-0707	0619-0738	0543-0808	0531-0830	17
18	0717-0501	0648-0538	0706-0708	0618-0739	0543-0809	0531-0830	18
19	0717-0503	0647-0539	0705-0709	0617-0741	0542-0810	0531-0830	19
20	0716-0504	0646-0540	0703-0710	0615-0742	0541-0811	0532-0830	20
21	0716-0505	0644-0541	0702-0711	0614-0743	0540-0812	0532-0831	21
22	0715-0506	0643-0542	0700-0712	0612-0744	0539-0813	0532-0831	22
23	0715-0507	0641-0543	0658-0713	0611-0745	0539-0814	0532-0831	23
24	0714-0508	0640-0545	0657-0714	0610-0746	0538-0814	0532-0831	24
25	0713-0509	0639-0546	0655-0715	0608-0747	0537-0815	0533-0831	25
26	0712-0511	0637-0547	0654-0716	0607-0748	0537-0816	0533-0831	26
27	0712-0512	0636-0548	0652-0717	0605-0749	0536-0817	0533-0832	27
28	0711-0513	0634-0549	0650-0718	0604-0750	0536-0818	0534-0832	28
29	0710-0514		0649-0719	0603-0751	0535-0818	0534-0832	29
30	0709-0515		0647-0720	0602-0752	0535-0819	0535-0832	30
31	0708-0517		0646-0721		0534-0820		31

# Snowfall

## Sept 2010 to May 2011

City	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Aurora (Central)	0.0	0.0	3.3	3.0	8.8	10.0	2.8	1.0	0.5	29.4
Brighton	0.0	0.0	0.7	4.0	6.6	5.4	1.3	0.7	0.0	18.7
Broomfield	0.0	0.0	1.6	4.1	8.9	10.5	1.9	2.2	TR	29.2
Castle Rock 4 NE	0.0	0.0	4.4	4.0	8.1	13.0	1.7	4.5	8.0	43.7
Colo Sprgs Airport	0.0	0.0	0.2	4.0	1.5	2.5	3.1	1.3	0.0	12.6
Denver DIA	0.0	0.0	1.5	3.3	8.0	5.3	2.5	1.2	1.0	22.8
Denver Downtown	0.0	0.0	3.1	4.2	11.0	11.9	1.1	1.1	TR	32.4
Golden	0.0	0.0	1.7	8.1	13.8	15.5	2.6	2.9	1.7	46.3
Fort Collins	TR	0.0	5.0	4.3	6.0	6.3	TR	2.1	TR	23.7
Highlands Ranch	0.0	0.0	1.5	5.8	11.6	14.5	2.1	4.8	2.0	42.3
Lakewood	0.0	0.0	1.1	3.5	8.7	10.6	3.0	2.3	TR	29.2
Littleton	0.0	0.0	0.2	5.5	10.5	15.0	2.6	3.7	TR	37.5
Parker	0.0	0.0	4.9	2.5	9.6	11.7	2.0	2.5	5.0	38.2
Sedalia - Hwy 67	0.0	0.0	5.0	4.0	9.3	12.8	2.5	3.0	2.5	39.1
Thornton	0.0	0.0	0.6	4.7	8.1	7.3	2.2	1.5	0.0	24.4
Westminster	0.0	0.0	2.0	4.6	10.9	11.2	0.2	1.5	0.0	30.4
Wheatridge	0.0	0.0	1.5	5.7	11.4	15.5	2.2	1.8	0.1	38.2



May 12, 2011 Snowfall 4 miles NE of Castle Rock, CO

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