

# *The Weather Wire*

**December 2010**

**Volume 17 Number 12**

## **Contents:**

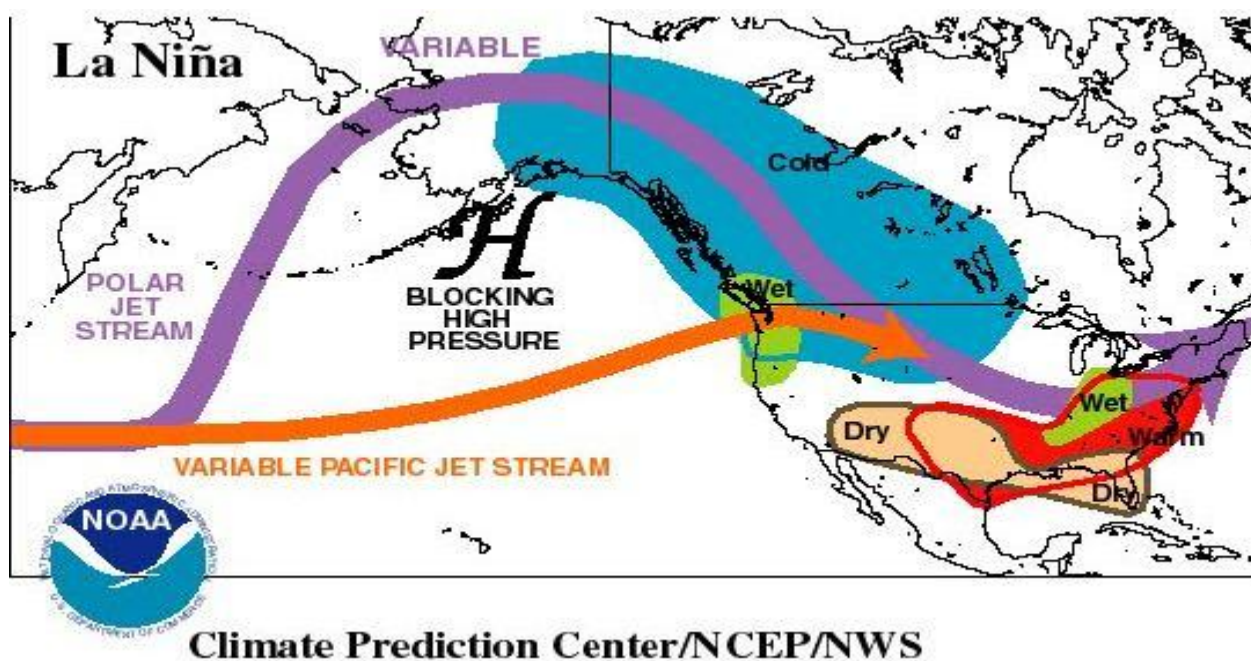
- **Where's the snow?**
- **Drought Monitor**
- **November Summary/Statistics**
- **December Preview**
- **Sunrise/Sunset**
- **Snow Totals**

## **Where's the Snow?**

With above normal snowfall last year for many locations from the Palmer Divide northward this year has paled in comparison with only minor snow amounts measured from Colorado Springs through Fort Collins. As was mentioned in the September newsletter below normal snowfall was expected this winter along the Front Range due to a strong La Nina cycle. This La Nina cycle has developed as expected and has resulted in a strong northern branch of the jet stream sending storm after storm into the Pacific Northwest. These storms are tracking through northern Colorado at a fairly fast pace bringing widespread snow to the mountains but nothing more than brief periods of unorganized/banded snowfall to the I-25 corridor. The fast motion of these storms and the track of the low pressure center being too far north has not exactly put the Denver Metro area in the sweet spot. In order for more significant snow to fall in the Denver Metro area the storm track needs to drop southward allowing for a window of strong "upslope" northeasterly winds to develop through a good portion of the lower atmosphere and this just has not happened yet. A slower moving "cut off"\* low pressure system would also do the trick as long as the track is just right with the center of circulation passing through southeastern Colorado. This track would result in northeasterly winds through a good portion of the atmosphere due to the counter clockwise flow around the low pressure center. If you are beginning to see a pattern here you should, the weather here along the Front Range is driven by winds due to the proximity of the Cheyenne Ridge to the north, Palmer Divide to the south and Continental Divide to the west. The window is open to the east/northeast and this is why an east/northeasterly wind component is crucial for significant snow development in Denver. East/Northeast winds are the only direction where the air is constantly rising due to the terrain. The rising air then produces clouds and subsequently precipitation in the form of rain and snow. Descending air has already been "squeezed" of its moisture and warms and dries as it moves down from the higher terrain. We have witnessed this on numerous occasions so far this winter season. Without any change expected short term there is high likelihood that this year will not feature a "White Christmas" for many along the Front Range.

What does this mean for the rest of the winter and spring? Well, weather patterns are meant to be broken and this pattern will not last for forever, but it will likely continue through the New Year and into early February. The spring months may provide some relief but a return to drought conditions will likely be the story for this winter season along the Front Range if the spring months do not produce above normal snowfall.

In the intro it was mentioned that there was above normal snowfall last year and we have written in the past how normal only happens on paper here in Colorado so it should not be too much of a surprise to have such wide variability in snow from season to season. The comparisons from the start of last winter to this one are large however as last winter the snow was front loaded into the fall and early part of winter. One winter in recent memory that started out very dry was the winter season of, 2002-2003. That season ended with one of the biggest snowstorms in Denver history on March 18-19<sup>th</sup>, 2003. This storm by itself helped ease the severe drought conditions that had developed previous years and made March of 2003 the snowiest in Denver History with 35.2" for the month. Weather has a way of leveling things out, it may not be in the same year or even in the next 5 years but through time we come up with a "normal" that almost never actually happens. The one thing that is for sure is that rain, snow and temperatures will likely NOT be normal on any given day, week, month or year. Below is a picture of the weather pattern we have been experiencing since September:



This pattern of a strong northern jet stream with northwest flow aloft over Colorado has been quite strong so far this season. There has been heavy snows in the mountains of the Pacific Northwest extending into Idaho, Montana, Utah and out northern neighbors in Wyoming. The only part of Colorado that has benefited from this pattern has been the NW corner of the state.

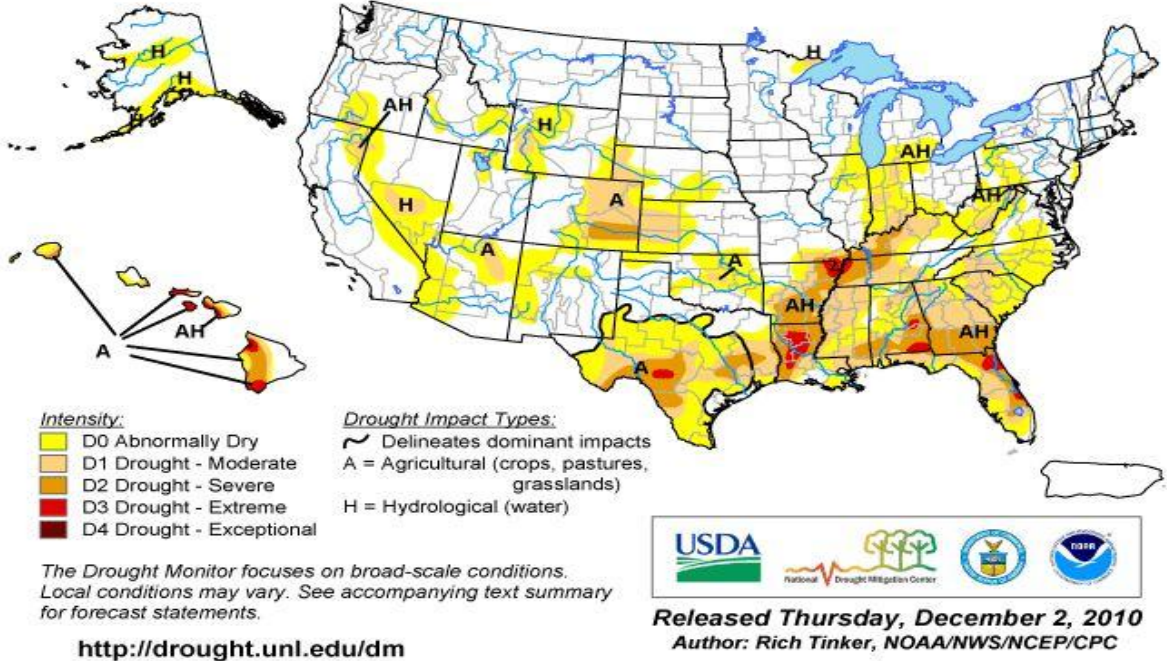
\* cut off = Low pressure system cut off of the main northern branch of the jet stream (typically move very slowly).

# Drought Update

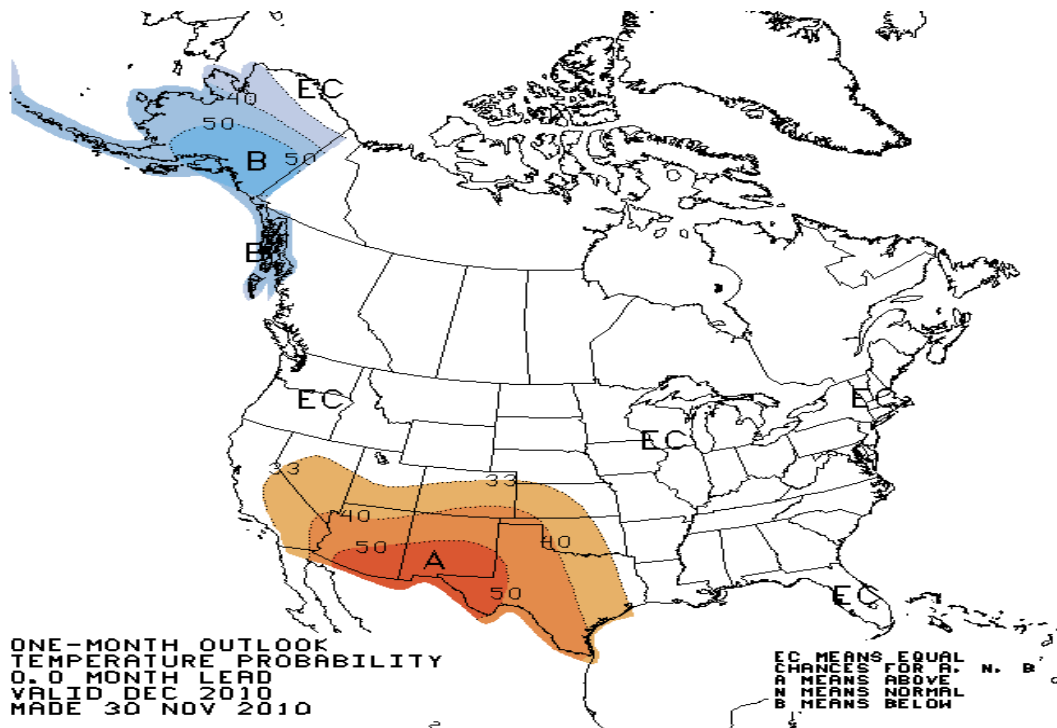
Dry conditions since mid August have brought drought conditions to eastern Colorado which is growing more severe each month.

## U.S. Drought Monitor

November 30, 2010  
Valid 7 a.m. EST

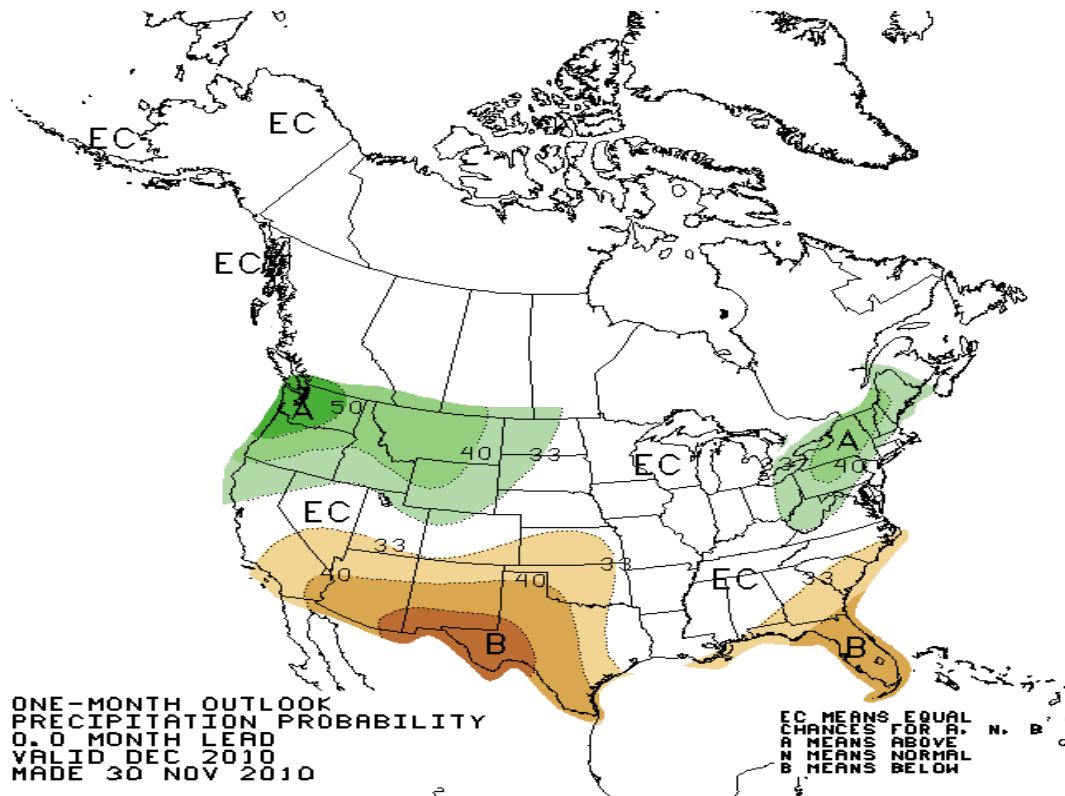


The map below shows forecasted temperature deviances for December 2010. As can be seen, above normal temperatures are expected for much of Colorado for the month.

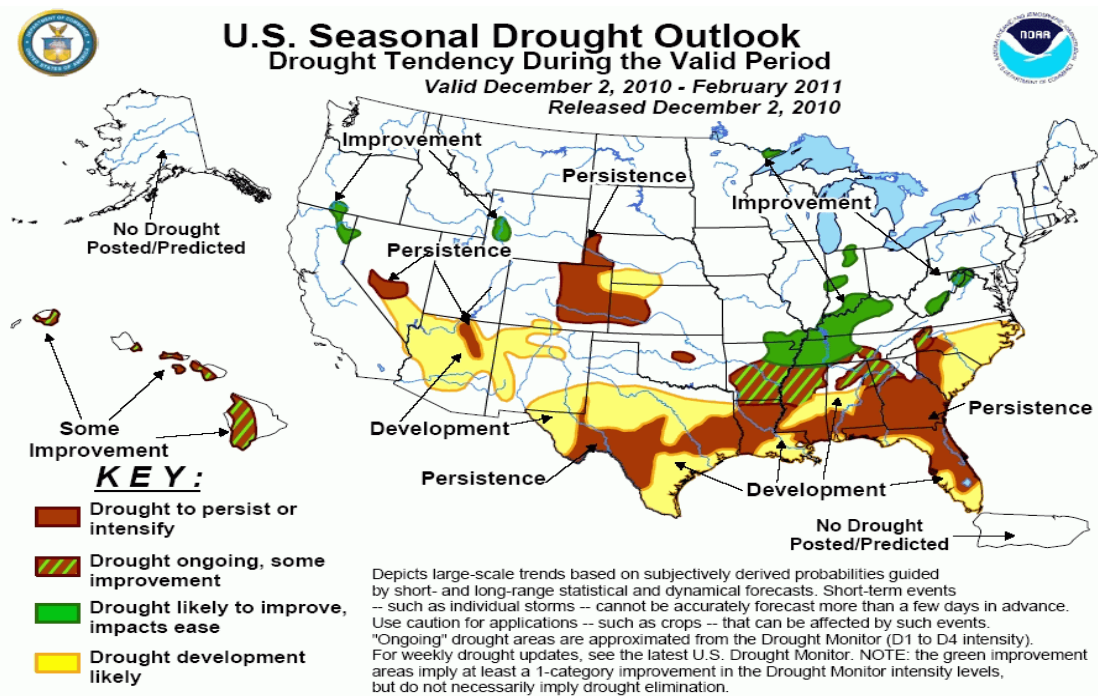




The map below shows forecasted precipitation deviances for December 2010. Above normal precipitation is expected for northwest Colorado, with below normal precipitation for southeastern Colorado, with the remainder of the state seeing normal precipitation.



More widespread areas of drought are expected to persist or intensify across eastern Colorado.



## November Summary

November of 2010 was rather boring weather wise as there was not much snowfall for being the 2<sup>nd</sup> snowiest month of the year on average behind March and just ahead of April. Temperatures continued to be above normal with an average high of 52.6 and an average low of 24.0 compared to 51.5 and 23.5 normally. The high and low temperatures combined resulted in a monthly mean of 38.3 degrees compared to 37.5 on average. Precipitation also continues to be below normal every month since July with only 0.50" reported at DIA for the month compared to 0.98" on average. Much of the western and southwestern suburbs of Denver received even less precipitation in the form of rain and snow. As of December 1<sup>st</sup> the yearly precipitation total stands at 11.65" which is now 2.68" below the normal of 14.33". Snowfall for the month was only 1.5" but again western and southwestern suburbs received even less than that. The average snowfall for November is 10.7" resulting in a snowfall deficit of 9.2" for the month and 15.4" for the winter season so far.

## November Stats

### TEMPERATURE (IN DEGREES F)

AVERAGE MAX	52.6	NORMAL 51.5	DEPARTURE 1.1
AVERAGE MIN	24.0	NORMAL 23.5	DEPARTURE 0.5
MONTHLY MEAN	38.3	NORMAL 37.5	DEPARTURE 0.8
HIGHEST	77 on the 6th		
LOWEST	4 on the 25 <sup>th</sup>		

DAYS WITH MAX 90 OR ABOVE	0	NORMAL	0
DAYS WITH MAX 32 OR BELOW	1	NORMAL	2.5
DAYS WITH MIN 32 OR BELOW	24	NORMAL	24.4
DAYS WITH MIN ZERO OR BELOW	0	NORMAL	0.3

### TEMPERATURE RECORDS

No temperature records tied or broken.

### HEATING DEGREE DAYS

MONTHLY TOTAL	793	NORMAL 826	DEPARTURE -33
SEASONAL TOTAL	1128	NORMAL 1408	DEPARTURE -280

### COOLING DEGREE DAYS

MONTHLY TOTAL	0	NORMAL 0	DEPARTURE 0
YEARLY TOTAL	870	NORMAL 696	DEPARTURE 174

### PRECIPITATION (IN INCHES)

MONTHLY TOTAL	0.50	NORMAL 0.98	DEPARTURE -0.48
YEARLY TOTAL	11.6	NORMAL 14.33	DEPARTURE -2.68
GREATEST IN 24 HOURS	0.15" on the 16th		
DAYS WITH MEASURABLE PRECIPITATION			

### SNOWFALL (IN INCHES)

MONTHLY TOTAL	1.5	NORMAL 10.7	DEPARTURE -9.2
SEASONAL TOTAL	1.5	NORMAL 16.9	DEPARTURE -15.4
GREATEST IN 24 HOURS	1.5"		
GREATEST DEPTH	NA		

### WIND (IN MILES PER HOUR)

AVERAGE SPEED	9.7mph
PEAK WIND GUST	55mph from the NW on the 16th

### MISCELLANEOUS WEATHER

NUMBER OF DAYS WITH THUNDERSTORMS	0	NORMAL	< 1
NUMBER OF DAYS WITH HEAVY FOG	7	NORMAL	1
NUMBER OF DAYS WITH HAIL	0		
NUMBER OF SUNNY DAYS	9		
NUMBER OF PARTLY CLOUDY DAYS	17		
NUMBER OF CLOUDY DAYS	4		
AVERAGE RELATIVE HUMIDITY	51%		

## December Preview

The northwest flow pattern aloft that has persisted through fall will continue to favor areas west of the Continental Divide and north of the I-70 corridor during the month of December resulting in eastern and southern Colorado remaining relatively warm and dry. There are typically 5 days with measureable precipitation and that will likely occur but the amount of precipitation in will likely fall short of normal which is 0.63" for the month. With the less than normal precipitation expected snowfall will likely end up on the light side as well. There is typically an arctic air mass or two that moves into eastern Colorado in December with the record monthly low of -25 degrees set back in 1990. Nothing that cold is expected this month but do not be surprised to see some sub zero temperatures towards the end of the month.

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

#### TEMPERATURE

AVERAGE HIGH	44.1
AVERAGE LOW	16.4
MONTHLY MEAN	30.3
DAYS WITH HIGH 90 OR ABOVE	0
DAYS WITH HIGH 32 OR BELOW	5
DAYS WITH LOW 32 OR BELOW	29
DAYS WITH LOWS ZERO OR BELOW	3

#### PRECIPITATION

MONTHLY MEAN	0.63"
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	1078
COOLING DEGREE DAYS	0
WIND SPEED (MPH)	8.4mph
WIND DIRECTION	South
DAYS WITH THUNDERSTORMS	0
DAYS WITH DENSE FOG	1
PERCENT OF SUNSHINE POSSIBLE	67%

#### EXTREMES

RECORD HIGH	79 on 12/5/1939
RECORD LOW	-25 on 12/22/1990, 12/24/1876
WARMEST	43.8 in 1933
COLDEST	17.5 in 1983
WETTEST	5.21" in 1913
DRIEST	0.00" in 1881
SNOWIEST	57.4" in 1913
LEAST SNOWIEST	0.0" in 1881

## Sunrise/Sunset (July - Dec Denver area)

	JUL	AUG	SEP	OCT	NOV	DEC	
	Sr - Ss	Sr - Ss	Sr - Ss	Sr - Ss	Sr - Ss	Sr - Ss	
01	0535-0831	0558-0813	0627-0732	0656-0643	0728-0558	0701-0436	01
02	0536-0831	0559-0812	0628-0731	0657-0642	0729-0556	0702-0435	02
03	0536-0831	0600-0811	0629-0729	0658-0640	0731-0555	0703-0435	03
04	0537-0831	0601-0810	0630-0727	0659-0639	0732-0554	0704-0435	04
05	0537-0831	0602-0809	0631-0726	0700-0637	0733-0553	0705-0435	05
06	0538-0831	0603-0808	0632-0724	0701-0635	0734-0552	0706-0435	06
07	0539-0830	0604-0807	0633-0723	0702-0634	0635-0451	0707-0435	07
08	0539-0830	0605-0806	0634-0721	0703-0632	0636-0450	0708-0435	08
09	0540-0830	0606-0804	0635-0719	0704-0631	0637-0449	0709-0435	09
10	0541-0829	0607-0803	0636-0718	0705-0629	0639-0448	0710-0435	10
11	0541-0829	0608-0802	0637-0716	0706-0628	0640-0447	0710-0435	11
12	0542-0828	0609-0801	0638-0715	0707-0626	0641-0446	0711-0435	12
13	0543-0828	0610-0759	0639-0713	0708-0625	0642-0445	0712-0436	13
14	0543-0827	0611-0758	0640-0711	0709-0623	0643-0445	0713-0436	14
15	0544-0827	0612-0757	0641-0710	0710-0622	0644-0444	0713-0436	15
16	0545-0826	0612-0755	0641-0708	0711-0620	0645-0443	0714-0436	16
17	0546-0826	0613-0754	0642-0706	0712-0619	0646-0442	0715-0437	17
18	0546-0825	0614-0753	0643-0705	0713-0617	0648-0442	0715-0437	18
19	0547-0825	0615-0751	0644-0703	0714-0616	0649-0441	0716-0437	19
20	0548-0824	0616-0750	0645-0701	0715-0614	0650-0440	0716-0438	20
21	0549-0823	0617-0749	0646-0700	0716-0613	0651-0440	0717-0438	21
22	0550-0822	0618-0747	0647-0658	0717-0612	0652-0439	0717-0439	22
23	0551-0822	0619-0746	0648-0656	0718-0610	0653-0439	0718-0439	23
24	0551-0821	0620-0744	0649-0655	0719-0609	0654-0438	0718-0440	24
25	0552-0820	0621-0743	0650-0653	0720-0608	0655-0438	0719-0441	25
26	0553-0819	0622-0741	0651-0652	0722-0606	0656-0437	0719-0441	26
27	0554-0818	0623-0740	0652-0650	0723-0605	0657-0437	0719-0442	27
28	0555-0817	0624-0738	0653-0648	0724-0604	0658-0437	0720-0443	28
29	0556-0816	0625-0737	0654-0647	0725-0602	0659-0436	0720-0443	29
30	0557-0815	0626-0735	0655-0645	0726-0600	0700-0436	0720-0444	30
31	0558-0814	0627-0734		0727-0559		0720-0445	31



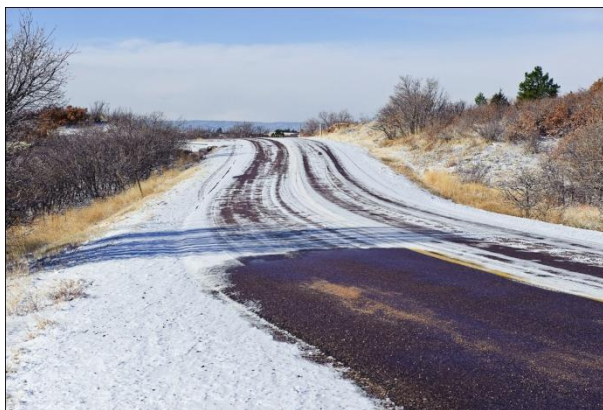
# Snowfall

## Sept 2010 to May 2011

City	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Aurora (Central)	0.0	0.0	3.3							3.3
Brighton	0.0	0.0	0.7							0.7
Broomfield	0.0	0.0	1.6							1.6
Castle Rock 4 NE	0.0	0.0	4.4							4.4
Colo Sprgs Airport	0.0	0.0	0.2							0.2
Denver DIA	0.0	0.0	1.5							1.5
Denver Downtown	0.0	0.0	3.1							3.1
Golden	0.0	0.0	1.7							1.7
Fort Collins	TR	0.0	5.0							5.0
Highlands Ranch	0.0	0.0	1.5							1.5
Lakewood	0.0	0.0	1.1							1.1
Littleton	0.0	0.0	0.2							0.2
Parker	0.0	0.0	4.9							4.9
Sedalia - Hwy 67	0.0	0.0	5.0							5.0
Thornton	0.0	0.0	0.6							0.6
Westminster	0.0	0.0	2.0							2.0
Wheatridge	0.0	0.0	1.5							1.5



November 10, 2010 Franktown, CO



November 29, 2010 Castle Rock, CO

**Skyview Weather**  
 2350 N Rocky View Rd  
 Castle Rock, CO 80108

Phone: (303) 688-9175  
 Fax: (303) 380-3338

E-mail: [tim@skyview-wx.com](mailto:tim@skyview-wx.com)  
 On the web at [www.skyview-wx.com](http://www.skyview-wx.com)

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