

# Clouds 2



MCEN 4151  
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The image described in this report was the second attempt in cloud photography intended for the University of Colorado's Flow Visualization class. The purpose of this image, just as for the first cloud image, was to capture an interesting fluid flow phenomenon in one of the most everyday common places... clouds. For this assignment, I intended to capture an ominous storm brewing cloud.

To achieve my goal, all I could really do was watch the weather and wait for the opportune time to capture my cloud. The day finally came on April 9<sup>th</sup>, 2014 at 6:52 AM. On this particular day, I awoke to the smell of good weather. I grabbed my trusted camera and set off walking to campus from my apartment at Colorado and 30<sup>th</sup> St. which gave me the opportunity to spot and plan the photographic attack of my cloud. I finally found the formation I was looking for and decided to get as high of a vantage point as possible to capture it. Fortunately, I knew that I was going to be walking right passed the Engineering Center parking structure from which I could post up and frame my shot accordingly.

The sky was full of various clouds that morning, however, there was one particular formation that I found most appealing. It is what I believe to be a classic Stratocumulus cloud with small vortex formation in the center. From figure 1, it is seen that the temperature was a steady 55°F with a dew point of 25°F and winds were 3.4 mph and swirling around from all direction. The skew-T plot shown in figure 2 describes the atmosphere on the morning of April 9<sup>th</sup> to be surprisingly stable with a CAPE of 0.00. I was lucky enough that there was actually a decent dark cloud off to the north that I could get a beautiful image of for the assignment.

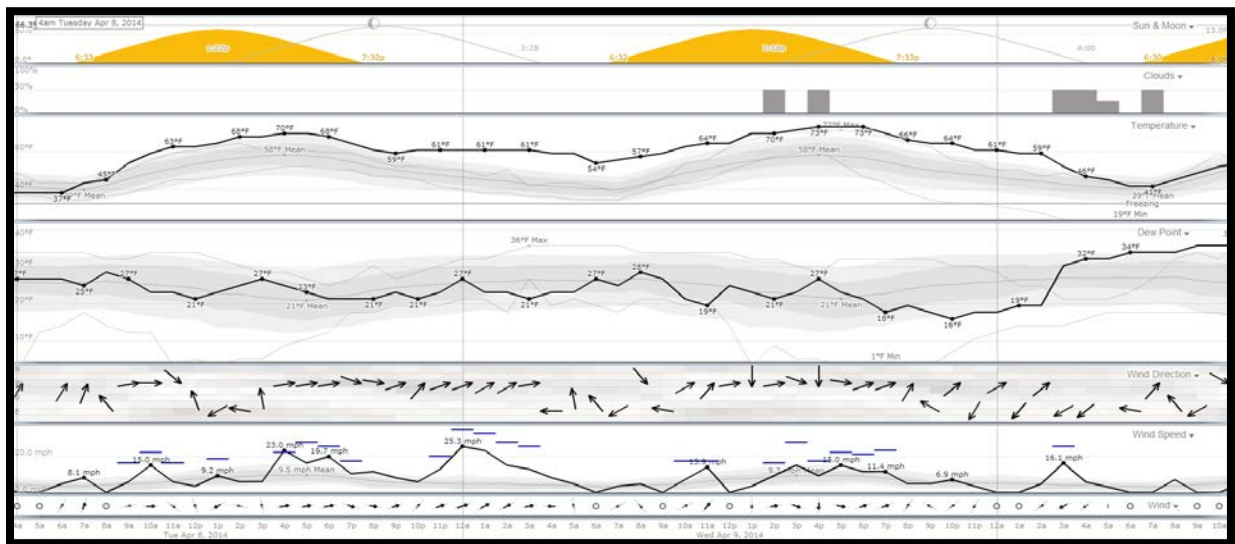


Figure 1: WeatherSpark history graph of solar/lunar cycle, temperature, dew point, wind direction and wind speed for April 9<sup>th</sup>, 2014

(<http://weatherspark.com/#!dashboard;q=Boulder%2C%20CO%2C%20USA>).

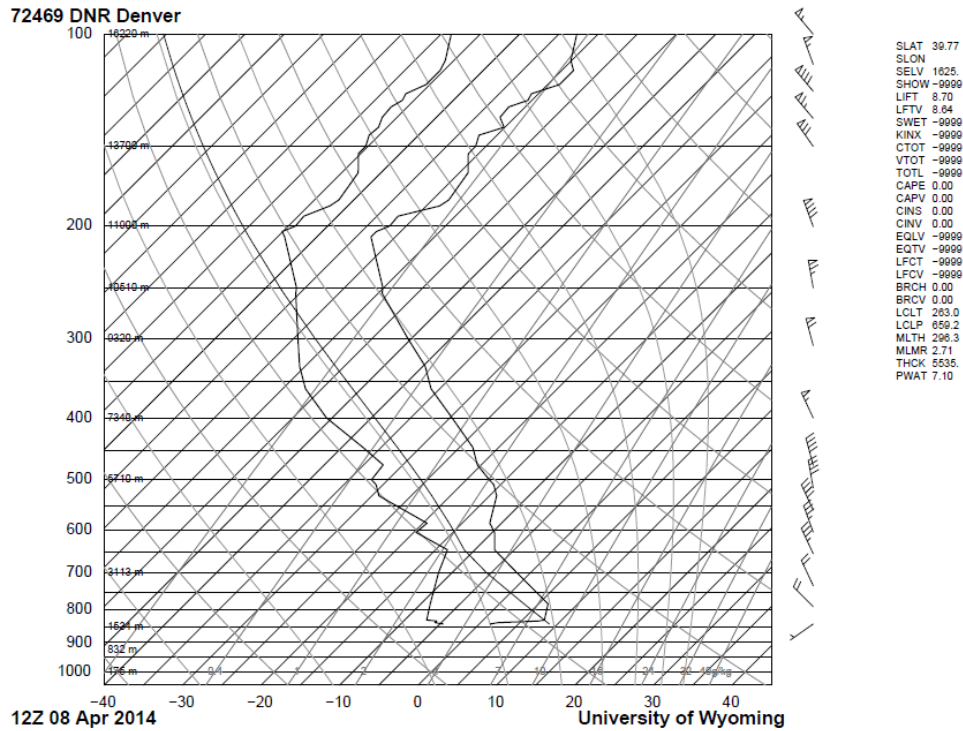


Figure 2: Skew-T plot for the morning of April 9<sup>th</sup>, 2014 generated by the University of Wyoming (<http://weather.uwyo.edu/upperair/sounding.html>).

This photo was taken on a Nikon P7100 10.1 Mega Pixel digital camera. The focal length was 8.8 mm with a sensor size of 7.6x5.7 mm resulting in a 46.7° horizontal and 35.9° vertical angle of view when calculated using equation 1.

$$\alpha = 2\arctan\left(\frac{d}{2f}\right) \quad \text{Equation 1}^1$$

where  $\alpha$  is the angle of view,  $d$  is the chosen dimension (sensor dimension in this case) and  $f$  is the effective focal length. This field of view was chosen as to really focus in on the cloud formation I was after that morning. The camera was set to a fixed ISO 100 value and an f-Stop of  $f/3.2$  was chosen to decrease image noise. A shutter speed of  $1/400$  sec was selected to allow adequate exposure without washing out the image. Finally, Photoshop was utilized to alter the image. In Photoshop, the brightness/contrast was adjusted as well as curves to achieve the dark, contrasted and detailed aesthetic I was after. The image was also cropped to really highlight the cloud formation. The original image can be seen in figure 3 for comparison.

<sup>1</sup> [http://en.wikipedia.org/wiki/Angle\\_of\\_view](http://en.wikipedia.org/wiki/Angle_of_view)



Figure 3: Comparison of original image (upper) and Photoshop altered image (bottom).

This image captures what I find to be some of my most favorite cloud formations... ones that are dark and fill you with an uneasiness about what the future is going to be. Ones that usually end in thunder and hail striking deep memories into your psyche. I really enjoyed being able to capture the interesting spiral vortex looking formation in the cloud, almost like it will spout off a tornado if you could stop staring at it. In the future I would love to join a storm chaser team and possibly capture true tornado just about to drip out of the sky.