Amanda Childress
MCEN 4151 Cloud 1 Assignment
March 1st 2012

The purpose of this assignment was to capture a unique photo of a cloud. Clouds have unique fluid phenomenon and show how the atmosphere is reacting to the wind, humidity, and temperature among other properties as well. The shape of a cloud represents the stability of the atmosphere too. The photo that I took was during a sunset in Boulder, Colorado. I specifically took this picture because the cloud was like nothing I had ever seen before, and even though I took this picture with my phone, I believe the beautifulness of the cloud still shines through.

Figure 1: Post-Photoshop Photo

I took my photo from the King Sooper's parking lot on 30th Street & Arapahoe (40.02° N 105.25° W). The picture was taken at 5:23 pm on January 5th 2012, and I was facing west – southwest.

I think these clouds could be classified as stratocumulus or stratus. Both of these types of clouds are stable clouds. I believe them to be stable because they look more smooth looking than big and fluffy. They are low enough in the atmosphere to rule out altostratus. The tallest Flatiron has an elevation of about 7100 feet (2160 m) [1]; this means the clouds are probably 2000 feet above the Flatiron – putting them at roughly 9100 feet (2775 m); or 3700 feet (1125 m) above the city elevation of 5400 feet (1650 m).

The Skew-T chart can be found in the following figure, and I don't think it represents Boulder's atmosphere very accurately. The heavy black right line (temperature) and the heavy black left line (dew

point) never really get close together – which is the most anticipated spot for a cloud to form. The CAPE value also confirms that the clouds are in a stable atmosphere (CAPE >0 means unstable atmosphere).

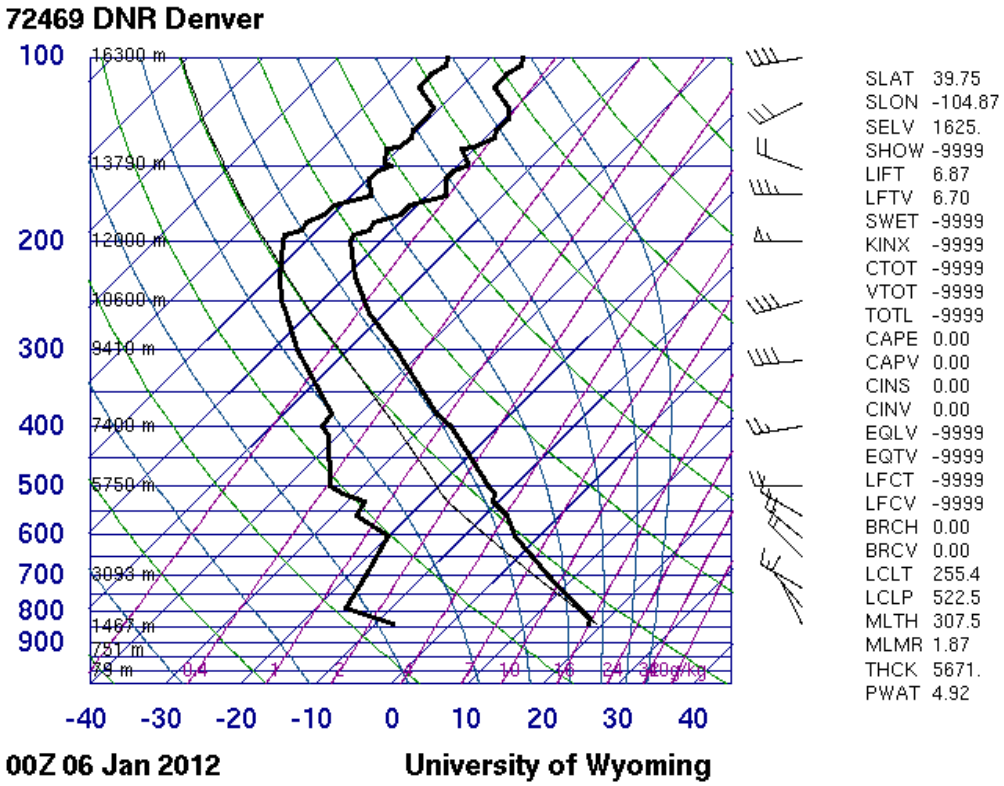

Figure 2: Skew-T [2]

The weather at 5pm was about 60°F and there were 20mph winds coming from the west. You can see in Figure 3 that there was no rain/snow in the previous days. There had been lots of clouds in the preceding days and had been cool (highs of 60°F).

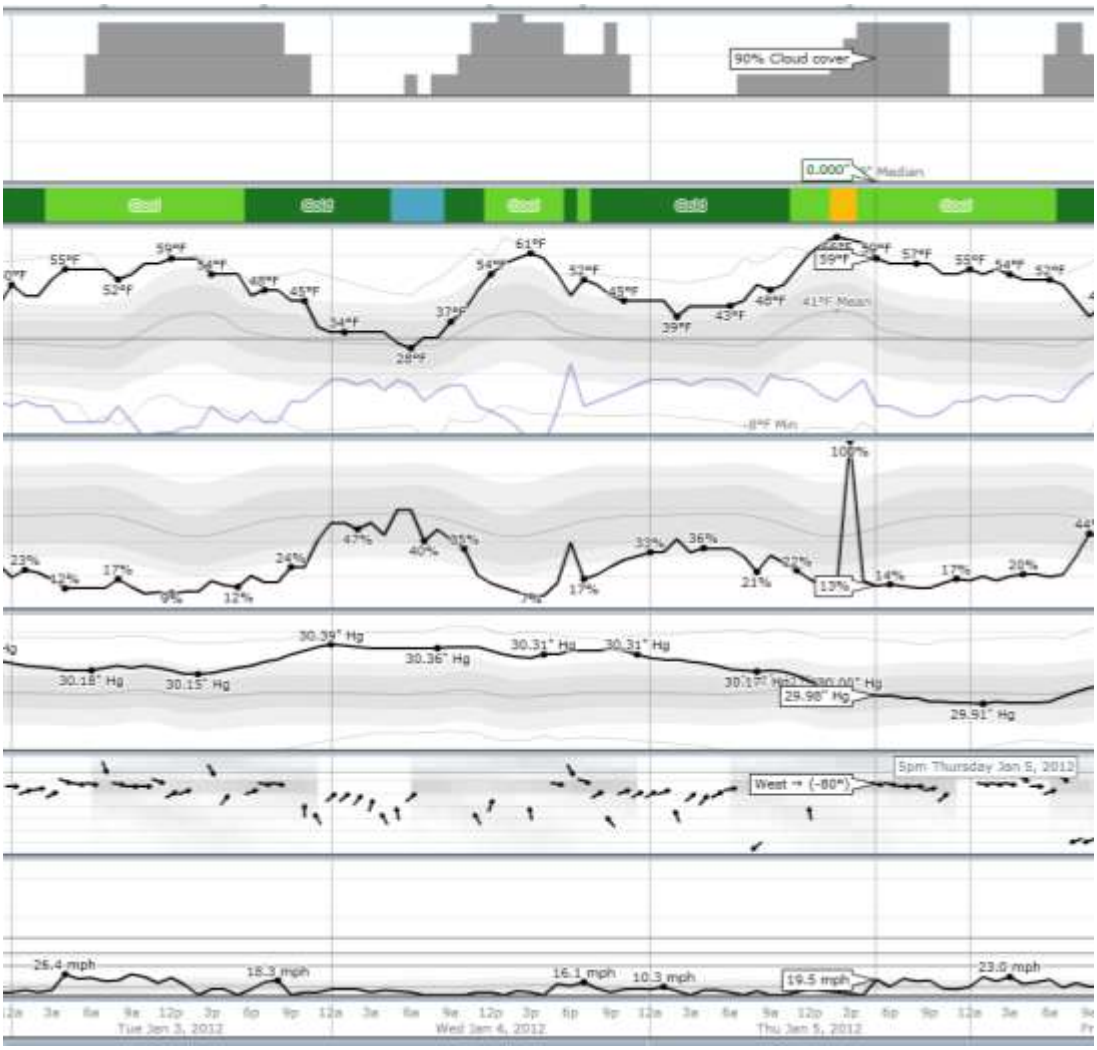

Figure 3: Weather Data [3]

I did Photoshop my original picture a bit. I cropped it and saturated the color. I decided to go with the red color hue in the clouds because I thought the cloud kind of looked like a rose bud. I also took out some distracting objects in the original – the lamppost and some of the trees near the mountain skyline.

Figure 4: Pre-Photoshop Photo

This photo was taken with my iPhone 4S camera with the following specifications:

Table 1: Camera Settings & Specifications

Lens focal length	4.28 mm
Aperture	f/2.4
Shutter Speed	1/15 sec
ISO	800

Table 2: Number of Pixels

	Height	Width
Pre Photoshop	768*	1024*
Post Photoshop	528	995

*The number of pixels reported are from Photoshop and are different than specified from my iPhone.

I believe this photo does capture a unique and beautiful cloud. If I were to do this assignment again I would not have chosen to picture it with my iPhone. I do like how my final photo came out without the lamppost and the color of the sky and clouds. I would like to understand how a horizontal vortex-like cloud is created – my only guess would be if the wind was going east to west and ran into the mountain and swirled upward and circular.

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[1] "Flatiron #1 – 2.9 miles". ProTrails. Uploaded 2012. Website. Accessed March 2nd, 2012. <http://www.protrails.com/trails/view/141>

[2] "Weather". University of Wyoming – College of Engineering – Department of Atmospheric Science. Website. Accessed March 2nd, 2012. <http://weather.uwyo.edu/upperair/sounding.html>

[3] WeatherSpark.com. Website. Accessed March 2nd, 2012. <http://weatherspark.com/#!graphs;a=USA/CO/Boulder>