

# First Cloud 2016

MCEN 4151: Flow Visualization  
University of Colorado Boulder



By: Michael Waterhouse  
October 6, 2016

To begin with the cloud image assignment, I tried to take as many images of clouds as possible and then pick my favorite one. I was able to capture multiple beautiful images of several different types of clouds. I found that the images that turned out the best were ones around dusk and dawn. I began to try and take images every day when I woke up to try and get one that really popped. The image I ended up with showed beautiful stratocumulus clouds with vibrant colors throughout.

I woke up early on September 30th to the sun barely beginning to light up the sky. I noticed the changing color as I began to eat breakfast. I ran to grab my camera and went out on my deck at my apartment. My deck was on the second floor overlooking a golf course in Broomfield, CO. The image was taken looking southeast at around 6:30 am. I was able to keep the camera relatively level looking straight out toward downtown Denver. The original image taken is shown below in Figure 1.



Figure 1: Original Image of the Sunrise on September 30th, 2016

In the image you can see many stratocumulus clouds forming all over the sky. There was no front moving in that morning. The high temperature for the day was 73 degrees Fahrenheit and the low was 55 degrees Fahrenheit. No precipitation happened before or after the time the image was taken. The dew point temperature in the morning was 40 degrees Fahrenheit. The actual temperature at the time the image was taken was 59 degrees Fahrenheit, with a dew point at 41 degrees Fahrenheit. The wind was strongest at this time with a wind speed of 11.5 mph in the northwest direction. It was clear up until 5:45 am and then began to get cloudy. The atmosphere was stable with a CAPE of 0.00 seen on the Skew T diagram in Figure 2.

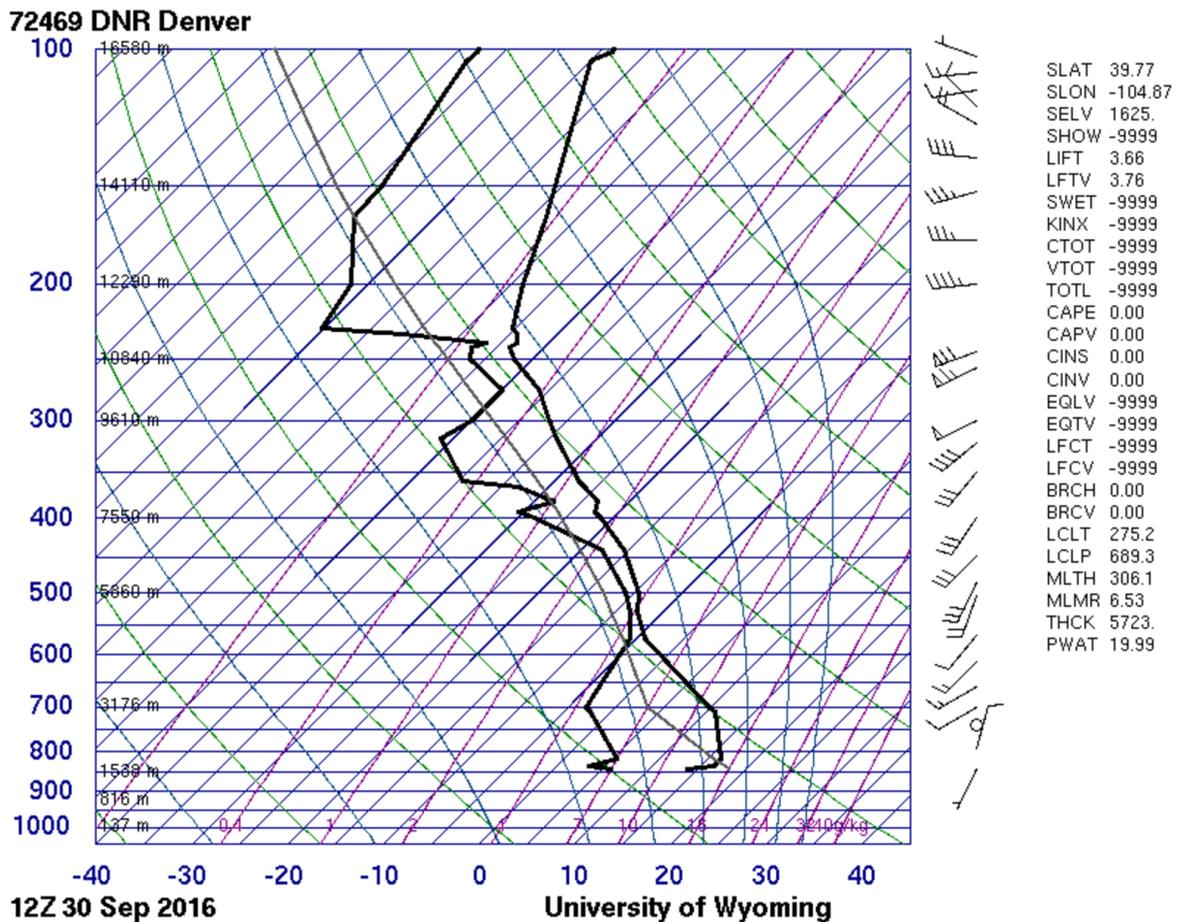


Figure 2: Skew T Diagram for September 30th, 2016 at 6 am

The clouds look relatively low in the image. I would estimate them to be around 5,000 to 8,000 feet in altitude, meaning the clouds in the image are either stratocumulus or altostratus. Since the atmosphere was stable the clouds were calm. They moved slowly in a uniform structure.

The camera I used to take the image was a Canon EOS Rebel T5 with an 18-55mm lens. The ISO was set to 400 and a f stop of f/5. Since the f stop was small I was able to get a relatively large depth of field. The original image size was 5184 x 3456 pixels. The lens focal length was set to 39mm. Below in Figure 3 is the edited image I made using the GIMP software.



Figure 3: Edited Image of the Sunrise on September 30th, 2016

I slightly changed the contrast to bring out more color in the clouds. I darkened the terrain at the bottom to draw more attention to the clouds. The edited image size is the same as the original.

I should have cropped the image to get rid of the black terrain at the bottom and reduced the pixel size of the image.

The image reveals the beauty of a sunrise. The sun has the ability to change the colors of the clouds as it rises and sets, creating awesome spectrums of color. When editing the image, I should have cropped more of the terrain out at the bottom so there would be less blank space in the image. This would brighten the image by focusing more on the bright colors in the clouds. The physics of the clouds are hard to analyze. The clouds are thick and cover the whole sky. They were moving slowly, not showing the trails of direction of flow. It would be interesting to see a view from above the clouds to see if more fluid flow is shown. If I were able to retake the image I would change the location and angle. I would use a larger depth of field to capture more of the clouds in the sky.

#### Citations:

Skew T Diagram DNR. (n.d.). Retrieved October 13, 2016, from <http://weather.uwyo.edu/cgi-bin/sounding?region=naconf>

Weather History for KBJC - September 30th, 2016. (n.d.). Retrieved October 13, 2016, from [https://www.wunderground.com/history/airport/KBJC/2016/9/30/DailyHistory.html?req\\_city=Broomfield](https://www.wunderground.com/history/airport/KBJC/2016/9/30/DailyHistory.html?req_city=Broomfield)