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Clouds Second Report
MCEN 4151 Flow Visualization
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Clouds Second Report

The Clouds Second is another assignment that is designed for taken pictures or videos of clouds to learn about their formation and the science behind them. The first assignment was a great start for students to go outside and capture interesting clouds. Now we get another chance to do the same and share our amazing photos. My intent for this assignment was to take a picture of clouds on a nice fair day where the clouds are clear and stable.

This image was captured on the evening of October 31, 2019, at 4:45 pm. I was walking from the Fleming building to the Engineering Center, and as I passed by the Center for Community building, I saw these beautiful clouds and decided to capture them and share them with the rest of the class. The exact location was 40° 00' 15.8" N 105° 15' 51.8" W. Since this image was taken in Boulder CO, the elevation at which the image was taken was about 5370 ft. The angle at which I took this image from horizontal was about 65°. The following figure shows the location on Google Maps.

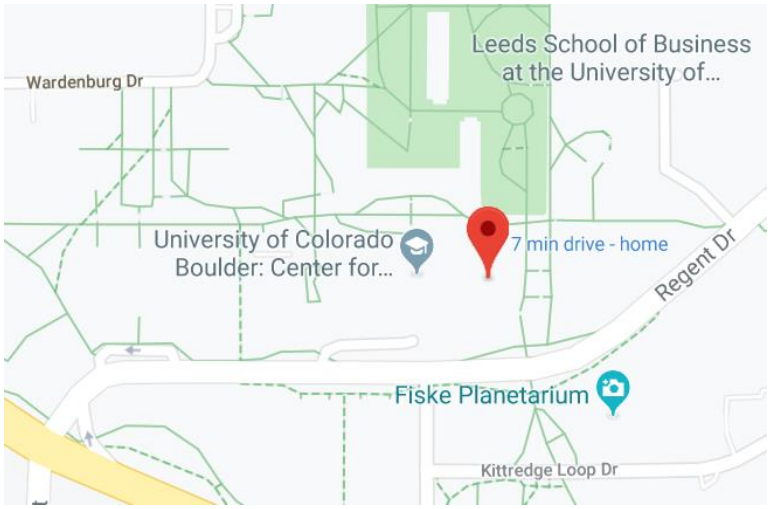

Figure 1. The location where this picture was taken [1].

Using the Weather Underground website, I was able to look up the information about the weather on this day. Starting with the temperature, the lowest was 5 F and the highest was 42 F,

with an average temperature of 18.18 F. The temperature at 4:45 pm when I took this image was about 35 F. Overall, this day was calm, but it was windy at some points with a maximum wind speed of 7 mph. To be precise, during the time I took this image, the wind speed was about 6 mph. The sky was mostly fair during the day and partly cloudy at certain times during the night, so it did not rain nor snow in this day [2]. The clouds captured in this image were stratocumulus clouds formed at an estimated elevation of 5000-7000 ft. Looking up the Skew-T diagram, the atmosphere of these clouds was stable with a CAPE value of zero [3].

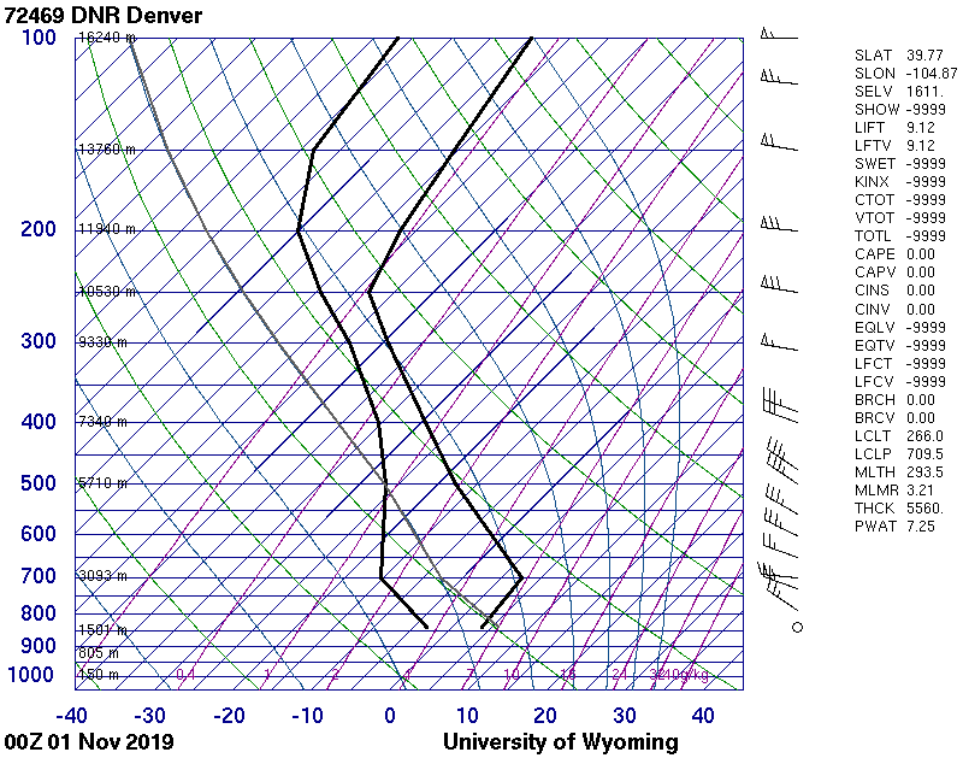

Figure 2. Skew-T Diagram at 6:00pm on October 31, 2019.

To take this image, I used my iPhone 8 Plus which has a dual 12-megapixel camera. I adjusted the focus and the brightness manually to get a sharp photo, but nothing else was changed as my phone does not have more settings for users to edit. Looking up the metadata, I was able to retrieve the following information, the aperture was F1.8, ISO 20, focal length 4 mm, and exposure of 1/4367. The length was 3024 and width 4032. It is hard to estimate the distance to the object but if I were to estimate it, I would say it was about 5000 ft. For post-processing the image, the only thing I did was cropping the bottom right corner to eliminate the top branch of a

tree that was showing up. However, I did not change the contrast nor the highlight. The following two pictures represent the original and the edited versions.

Figure 3. The original image.

Figure 4. The edited image.

In conclusion, this image has a lot of meaning to it. I love how you could see one cloud in the front and another one in the back making it interesting to look at. I tried to frame and shape the image in a way that makes it great as a wallpaper for phones, and I think that worked well as it looks nice on mine. In short, I feel like this image delivered its purpose and I am happy with it for this Clouds Second assignment.

References

[1] Google. (n.d.). Retrieved from https://www.google.com/maps/place/ChargePoint+Charging+Station/@40.0043945,-105.2649966,19z/data=!3m1!4b1!4m5!3m4!1s0x876bedcaec7ec4f1:0xa8c95b57a04abc5f!8m2!3d40.0043945!4d-105.2644494

[2] Loveland, CO Weather History. (n.d.). Retrieved from https://www.wunderground.com/history/daily/us/co/loveland/KFNL/date/2019-10-31.

[3] Weather.uwyo.edu. (2019). *Atmospheric Soundings*. [online] Available at: http://weather.uwyo.edu/upperair/sounding.html [Accessed 27 Nov. 2019].