Clouds Second Image Report

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This image was taken for the Clouds Second assignment. For this image I was trying to capture clouds from a unique perspective, so I decided to take the image from my flight from Chicago to Denver to capture the clouds from above. You usually only see clouds from underneath of them so I thought getting an image of the top of them and the shadows they cast below them would be interesting.

This image was taken on November 11th, 2019 at 1:28 PM just outside of the Denver International Airport. I was flying from O' Hare International Airport. The image was taken from an elevation of approximately 11,000 feet or 3350 m. Luckily the flight I was on had displays in the seats that displayed information about the flight, including the elevation. The photo was taken through the window next to my seat at an angle of approximately 45 degrees downward from the horizontal. Unfortunately, I am not sure which direction the plane was facing when the photo was taken.

Generally speaking, all clouds are formed from water condensing in the atmosphere and being in a state of vapor liquid equilibrium. This water and vapor mixture diffract light that just vapor would not and results in a cloud that we can observe (Funk). On a skew-T diagram the line on the left indicates the dewpoint temperature at that elevation, or in other words the temperature at that given elevation on that day that water will condense. The line on the right indicates the actual temperature recorded at that elevation on that day. When these two lines pinch in towards each other it indicates that water is likely to be able to condense and form a cloud. These diagrams are very helpful in determining the elevation of the cloud you are interested in and from that the type of cloud it is. The diagram also indicates the stability of the atmosphere which can also help you identify the cloud of interest. Flat wispy stratus clouds form in stable atmospheres while fluffy textured cumulus clouds form in unstable atmospheres (Funk).

I think the clouds captured in this image are altocumulus. Based on the skew-T diagram for the area when image was taken, clouds were very likely to form right around 3500 m where the dewpoint temperature and actual temperature are practically the same. The diagram is pictured below as Figure 1. This is seen on the diagram by the two dark lines coming together. This is consistent with the elevation at which altocumulus clouds form, from 2000 to 6000 m. The CAPE number is 0 which indicates a stable atmosphere, this may suggest that the altocumulus clouds were starting to turn into altostratus clouds or vice versa. There was some snow the morning of the 11th in Denver though, which supports that these clouds may be transitioning from cumulus to stratus clouds after the cumulus clouds let out their precipitation (Fries).

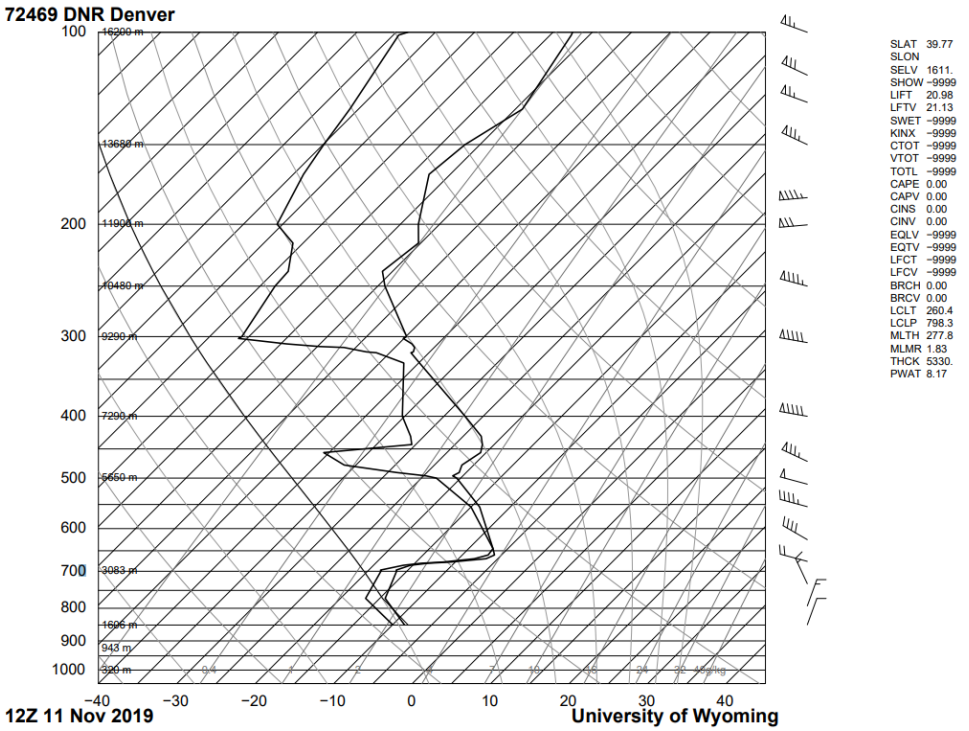

Figure 1: Skew-T Diagram

This image was taken in a Google Pixel 3a smartphone camera. The ISO was 79, the f-stop was 1.8, the shutter speed was 1/2933 seconds, and the focal length was 4.44 mm. These

settings were automatically selected by the phone's software. In post processing I increased the contrast and exposure to help bring the shadows from the clouds out. I also increased the saturation to get rid of the washed out colors the original image had. The post processing was done in the phones built-in editing software. The unedited image is shown below in Figure 2.

Figure 2: Unedited Image

I was very pleased with how the image turned out after the editing. I really liked the contrast of the cloud's shadows to the ground and how clearly they came out. I think I succeeded in capturing the clouds from a different perspective. I like how you can see the shadows below the clouds and overall, how the clouds look from above. If I could redo anything I wish I could have taken the photo though a glass window, I thought some clarity was lost since the photo was taken through a 2 pane, cheap, plastic airline window. Overall, I am very impressed with how the image turned out.

Works Cited

Fries, Tynin. “Colorado Snow Totals for Nov. 11, 2019.” *The Denver Post*, The Denver Post, 11 Nov. 2019, www.denverpost.com/2019/11/11/colorado-snow-totals-nov-11-2019/.

Funk, Ted. “Cloud Classifications and Characteristics.” *Weather.gov*, www.weather.gov/media/lmk/soo/cloudchart.pdf.