

MCEN 4151: Flow Visualization

Section 001

Cloud Second Report

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The Cloud Second Assignment gave me another opportunity to capture a photo of nature and all its beauty. It also gave me the opportunity to learn and research more about different cloud types and why certain clouds form given different environmental conditions. I gained more experience analyzing Skew-T plots and further understood the stability of different types of clouds. I ended up taking my picture on November 13th, 2019 at around 10am on the University of Colorado Boulder Business Field. This photo was taken while looking in the southeast direction up at about a 45° angle at the sky. The type of clouds I was able to capture in my image were a combination of Cirrus and Stratocumulus clouds.

To better understand what type of clouds can be seen in my photo, I used a mixture of Skew-T diagram analysis and visual analysis.

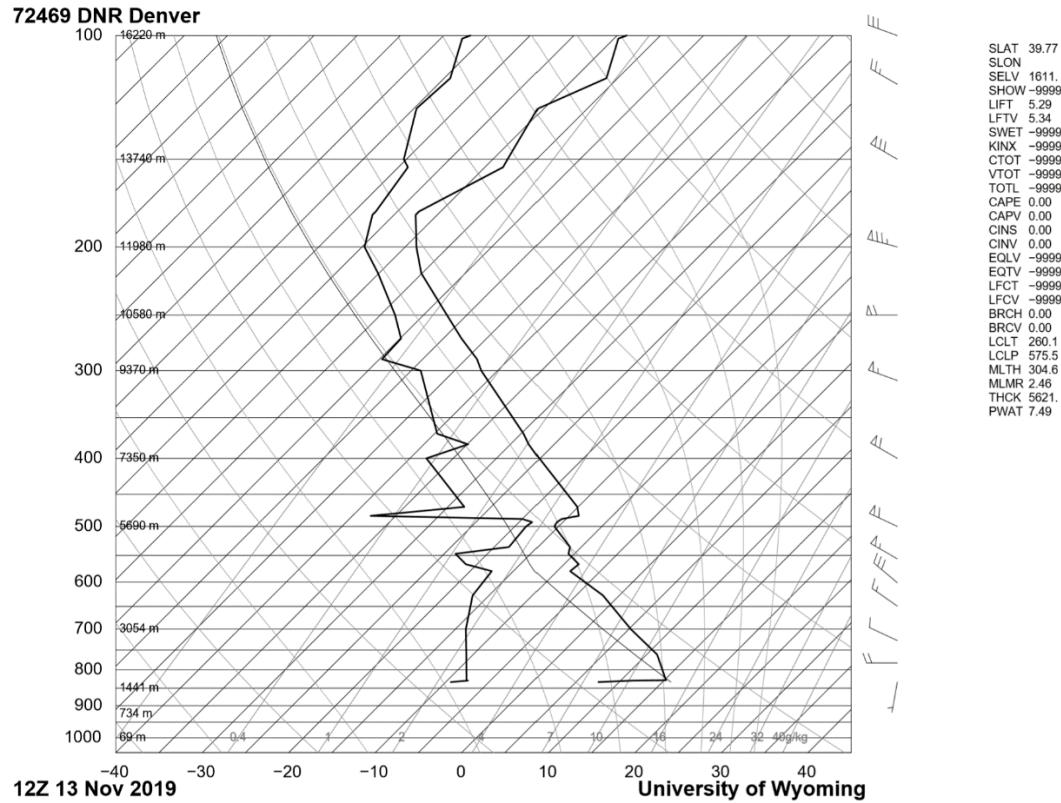


Figure 1. Skew-T Diagram @ 12Z 13 November 2019

According to **Figure 1**, the value of CAPE = 0.00, signifying that the clouds at this particular time were stable. To gain an understanding of the altitude of the clouds, we can look at the point on the Skew-T Diagram where the Dewpoint Curve and the Temperature Curve are closest. This point occurs at an altitude of about 5700m. Given all of this information and how the clouds visually look, we can assume that the clouds are a combination of Cirrus and Stratocumulus clouds.

The photograph was taken about 5700m away from the subject at a focal length of 4mm, an exposure time of 1/8000s, and an f-stop f/1.8. An Apple iPhone X camera was used to capture this 4,032 x 3,024-pixel image. At this point in time there were a wide variety of clouds in the sky and they were easily visible. I also decided to keep the sun in the photo because I thought it added an interesting element to the image and provided some directional context. During the post-production phase, I used the built-in editing feature in the Photos app to enhance the exposure, contrast, brightness, and saturation of the image to make

the clouds more distinct and visually pleasing. The difference after post-production can be visualized in **Figure 2**.



Figure 2. Side by side comparison between non-edited image (left) and edited image (right)

In conclusion, I am pleased with the outcome of my photo. I believe the photo I captured was a nice demonstration of Cirrus and Stratocumulus clouds. I also enjoy the post-production version of my image; I think it lessens the harshness of the sun while also making the colors and different cloud types stand out. The intent of my photo was fulfilled, but I wish the colors could have been more vibrant and that there were less clouds in the sky. This image does not have very much balance, as the clouds overpower the blue sky but it is a good representation of capturing a variety of cloud types.

References

Atmospheric Soundings, weather.uwyo.edu/upperair/sounding.html.