2020 Clouds First

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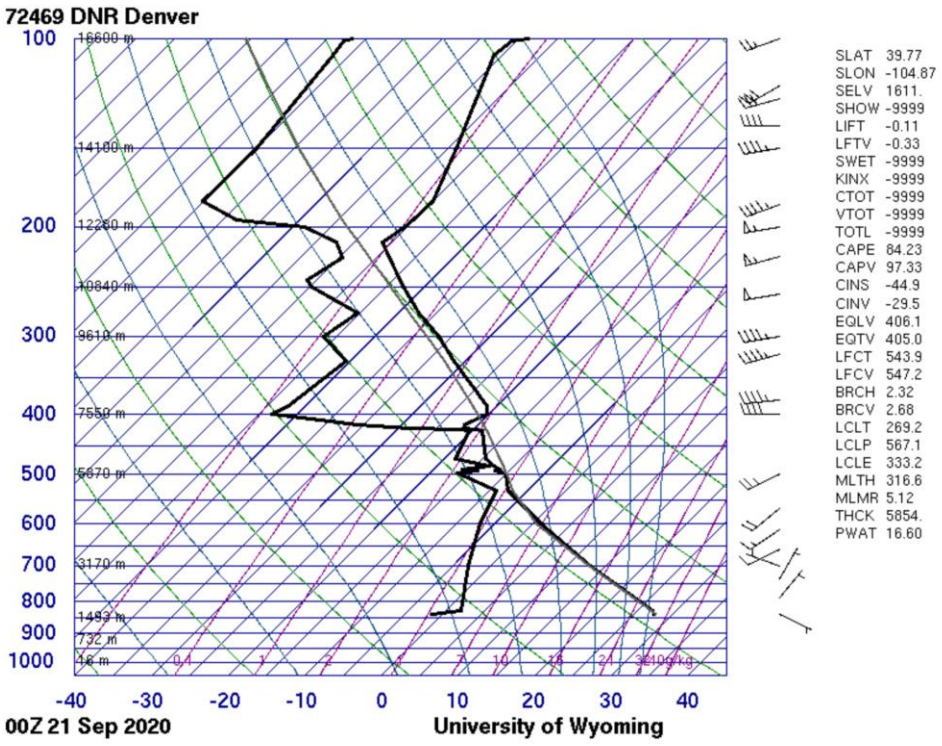
I. Introduction

The purpose of this picture was to explore the concept of flow visualization in the form of clouds. Ultimately, the goal was to generate a image that was aesthetically pleasing, while also indicative of the atmospheric fluid flow conditions that generated the subject cloud. With cloud photography we are looking at what the atmosphere conditions and weather to see how these clouds form and what causes the sky to look so beautiful. Clouds come in many forms and depending on the light a multitude of colors can paint the sky. The cloud analyzed in the following document was taken outside of Denver on top of an office building the at sunset the night of September 20th, 2020. Given the 360-degree vantage point a multitude of clouds could be been including one that had a rainbow going through it. The cloud pictured was to the south facing downtown Denver with Boulder to the right.

II. Flow Phenomenon

Looking at the contextual clues of the image, the skew-T plot, and the weather for the day it was determined that the cloud was most likely a Stratocumulus Praecipitatio. With stratocumulus clouds usually do not produce and precipitation, but when they do it is generally only light rain, like what was seen that day. This cloud was produced the day after a thunderstorm and was taken after a day full of light rain showers.[1]

Stratocumulus clouds are a mix of stratus and cumulus clouds. They are a layer of puffy clouds and are usually found joined. These types of clouds are very similar to altocumulus clouds but are much closer to the ground. This is re-enforced in the skew-T diagram by the University of Wyoming that shows the cloud was most likely formed at around 5870 m. Due to the fact that the atmosphere was not fully unstable, the clouds formed would not be considered cumulonimbus even though there was rain. The CAPE of 84 leads me to believe that if the cloud photo had been taken a few hours later, the cloud would have been classified as just a stratocumulus.



Description of the sounding indices.

Figure 1: Skew-T Diagram on September 20th, 2020

III. Photographic Technique

The camera used for this image was a DSLR Cannon Rebel T7, which comes with a 70 to 300 mm zoom lens. The settings where set to the following specifications, F4.0 aperture value, 1/200 shutter speed, an ISO speed of 100, and using manual focus. These settings where used to compensate for the low lighting of the late evening sunset. The original photograph can be seen in Figure 2 below which has 6000 x 4000 pixels.

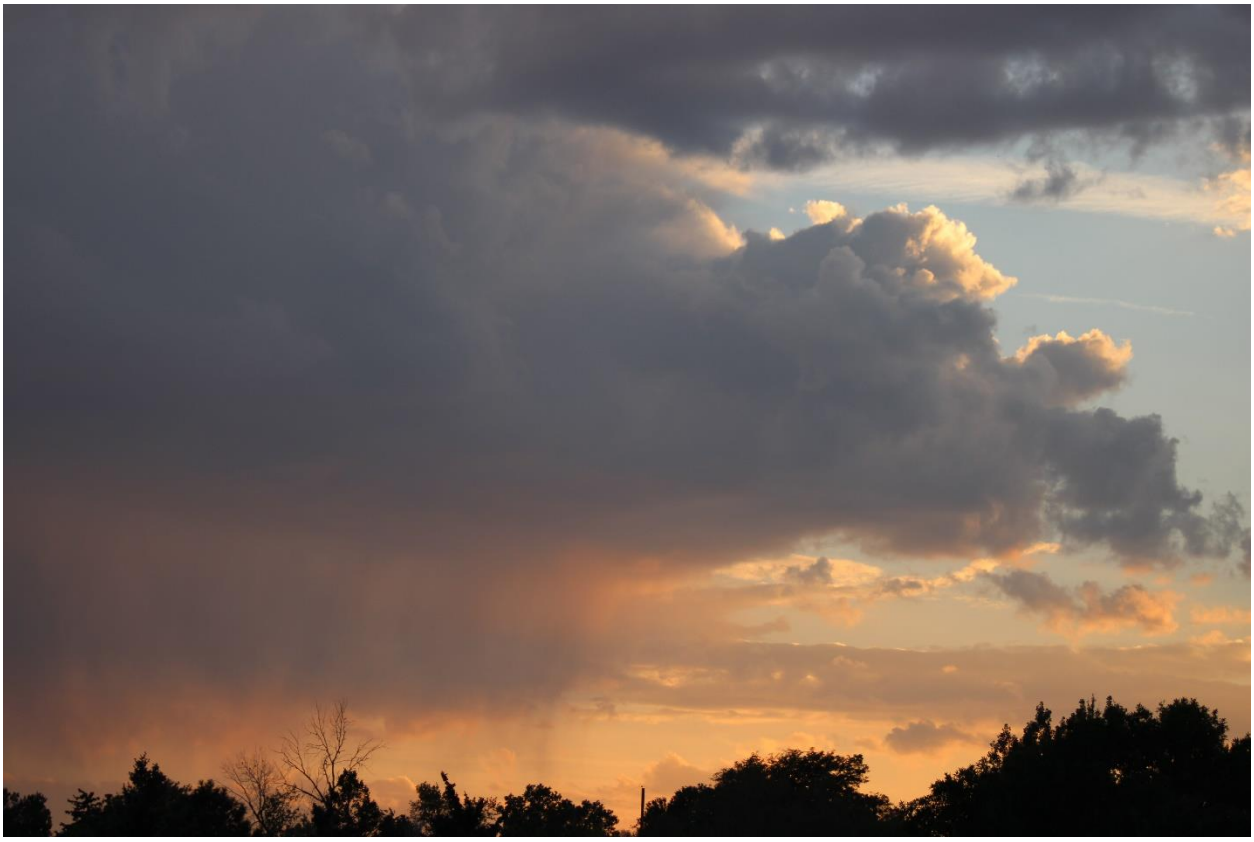


Figure 2: Original Photo of Highlighter Ink in Water

Post processing on this photo was done in Digital Photo Professional 4 by Cannon. In the processed photo, the highlight done by the overhead light was cropped out. To increase the contrast and to make the natural colors of the sunset really stand out, the highlighting in the photo was increased, the color tone was decreased, and then fine-tuned the colors to make the green pop more.

Figure 3: Post Processed Photo

IV. Conclusion

I really enjoyed working with this image and researching the clouds and weather patterns within it. I felt like this image is an incredible representation of the power, beauty, and vastness of our natural environment and how simple it is to appreciate it every day. In the future I would like to take more images of clouds and possibly take more measurements like barometric pressure, temperature, and wind speed on location to give a better understanding of what clouds may have and/or will form. I enjoyed learning more about the science of cloud mechanics through this report, providing me with an appreciation variety of the clouds above us and scientific knowledge to back up my mountain weather intuition

References

[1] "Startocumulus Clouds: Low, Puffy Layer" (n.d.): n. pag. Whatsthiscloud. 27 July 2011. Web. 24 Sept. 2020.