2021 Fall - Cloud Second Report

Bridget Cain
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A. Context and Purpose

The purpose for this image was to capture the beautiful cloud patterns which filled the sky in south Boulder during dusk one evening as shown in Figure 1. When driving from boulder to lakewood one evening, I found myself observing the clouds above the city of boulder as the sun was setting, There were many clouds filling the whole sky, with different types in different directions.

Figure 1. *Final Photo, showing the cloud formation above a neighborhood in south Boulder*

B. Settings of Image

I took this photo when I pulled off of baseline road near a neighborhood in South boulder. The elevation of the picture is roughly 5,430 ft. I took the photos on December 8th at 4:30 pm. The photo was taken facing due east, and the elevation angle is roughly 15° above the horizon.

C. Analysis of Weather

Since these clouds were photographed in Boulder at 4:30 pm on December 8th, the most appropriate Skew-T diagram to select was from Denver at 12:00 am on December 9th. Since Boulder and Denver are within about 200 ft of elevation, we can take the height from the graph at

face value. This diagram, shown in Figure 2, shows us that the cloud formation occurred where the black lines are very close together, from roughly 4,000 m to 10,000 m. In the

Based on the Skew-T heights and the visual appearance of the clouds, the clouds photographed are a mix of altocstratus and cirrus clouds. We define these clouds by both the expected altitudes and the wispy shapes. There were also cumulonimbus clouds to the west, but these are not pictured.

Lastly, the Skew-T CAPE value is helpful for understanding the environment in which these clouds are forming. CAPE is an acronym for convective available potential energy. Our CAPE value is 0, which indicates a positive cape. Larger values, in the 1000s indicated large or extreme potentials. This small positive cape describes a weather system that is developing slowly and is very predictable. This aligns with the weather throughout that day and evening, because the clouds had been present throughout the day and were not changing quickly at all.

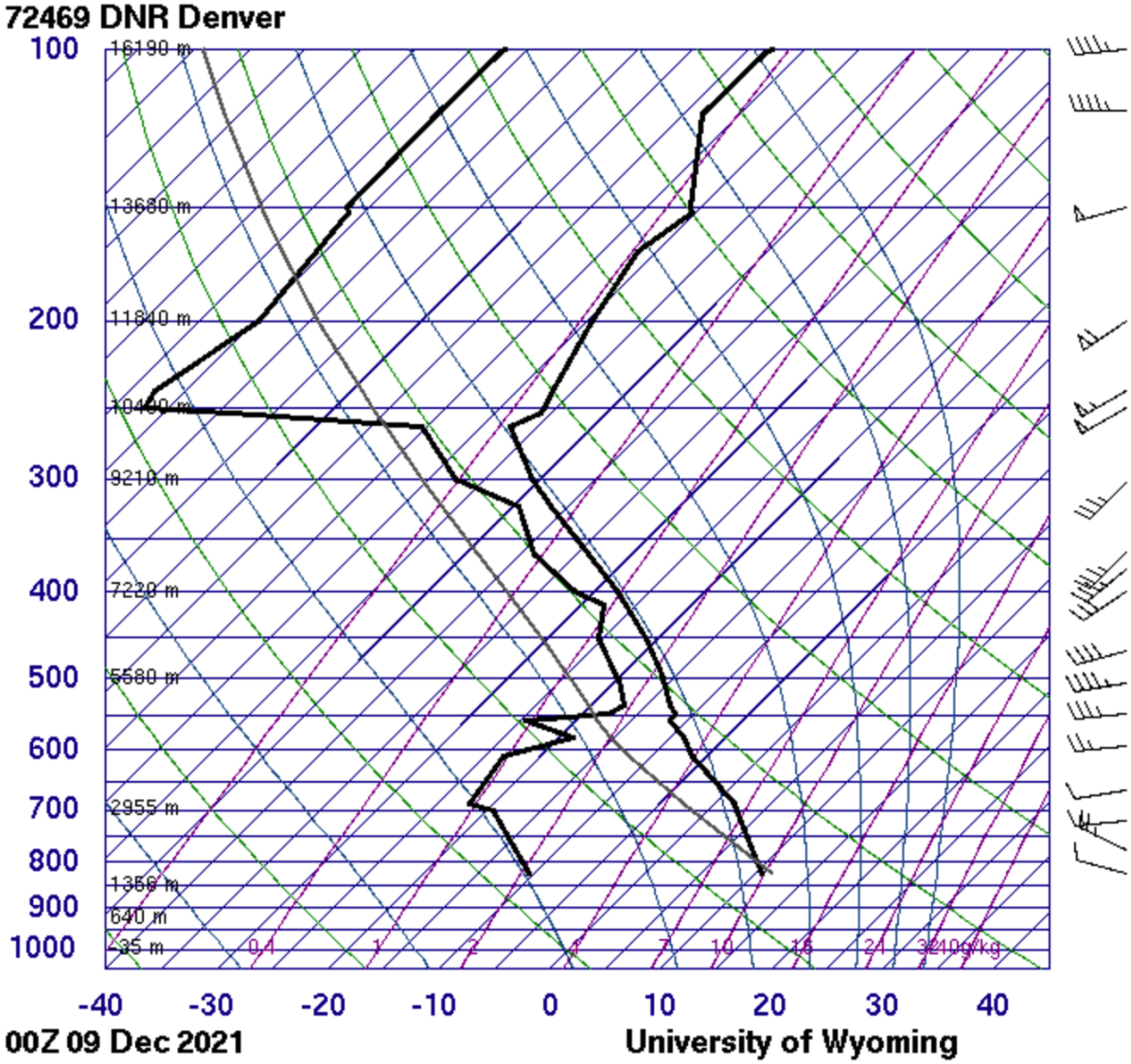


Figure 2. *Skew-T diagram from time of photo. This Diagram was created from Denver at 12:00 am a few hours after the photo was taken[1].*

D. Photographic Technique

These photos, unfortunately, were captured with my iPhone 7. While a nicer camera would have been able to more fully capture the interesting formation, I actually really enjoy the soft tones and lines captured by my phone's camera. For my final photo, the following specifications were recorded [2]:

Camera: Apple iPhone 7 back camera 3.99mm f/1.8
Field View: Unknown
Distance from object: 5000 + meters
Size: 4032 x 2792
File Size: 1.7 MB
ISO: 25
F: f/1.8
SS: 1/40 s

Due to the decreasing light availability, the phone camera was not able to capture the sky as it was seen, but rather captured a more grainy and saturated image. However, the warm colors give the image a calm nostalgic aura which I really enjoy. To enhance the photo slightly, I did a bit of post processing, shown in Figure 3.

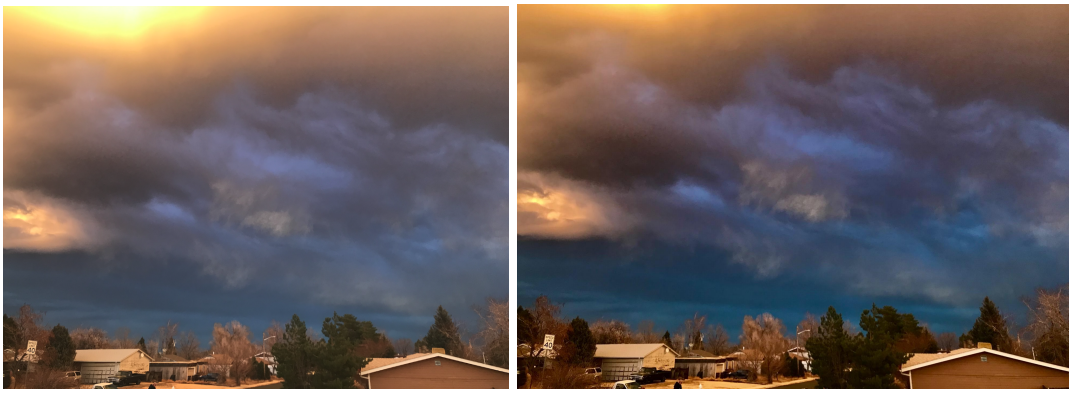


Figure 3. *The original photo is shown on the right, and the post processed image is on the left.*

When post processing, I first focused on cropping the image to remove the bright spot. After this, I darkened the photo and adjusted the saturation hues to bring out the deep blue color of the sky. This contrasted well with the brown neighborhood and the yellow highlights in the sky.

E. Image Commentary

I really enjoyed getting to take this photo. It is starkly different from the previous cloud photo I submitted, which was taken in the mountains. I really like the coloring and the contrast in

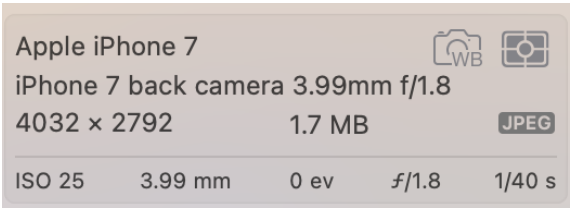
the photo. The warm colors and under defined lines of the clouds make it look similar to a film photograph. A secondary photo taken at the same time shows two boys running across the road with a bike. I show this picture below in Figure 3. Both my final photo and the photo in Figure 3 are a bit old fashioned looking to me, which adds to their beauty.

Figure 3. *Additional photo, showing two boys running across the street with a bicycle.*

F. Appendix and References

[1] Skew-T diagram generated from this website:
(http://weather.uwyo.edu/upperair/sounding.html)

[2] Photography specifications for the final photo:



[3] Information about cloud types and their altitudes was gathered from this website (https://mediawiki.ivao.aero/index.php?title=Types_of_clouds) and from class notes.