Clouds 1 Image Report

Stratocumulus and Altocumulus

Scott Carpenter Park: August 30th, 2021 at 7:17pm

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Context

This image was taken for the first clouds image assignment for the Flow Visualization course. The intent was to capture the beautiful cloud formation that happened around sunset one day when I was outside. The sunset created aesthetically pleasing colors around the interesting cloud formations.

Image Circumstances

The image was taken at Scott Carpenter Park on August 30th, 2021. The final image was taken at 7:17pm during a beautiful sunset. A phone camera was used to capture the image and it was angled approximately 45 degrees above the horizon facing towards the mountains in the west.

Clouds Information

In Figure 1 below you can see the shape of the clouds. The clouds present are most likely stratocumulus and altocumulus due to their clumpy shape. In the Skew T diagram seen in Figure 2 the point the lines get close together is around 7500 meters high, and so the clouds are most likely around that elevation which lead to the strato- and alto- aspects of the cumulus clouds.

Figure 1. Final image.

The rest of the sky had some scattered clouds and then the sky to the east had very minimal clouds. There was no expectation of rain, and there was no rain early or later in the day than this image (7pm). Boulder had pretty warm weather and so there was also no expectation of snow any time close to this image date. There were no strong winds surrounding the image so the clouds stayed there for a good duration of time. The clouds the day before were most likely similar, but I do not remember them being as prominent.

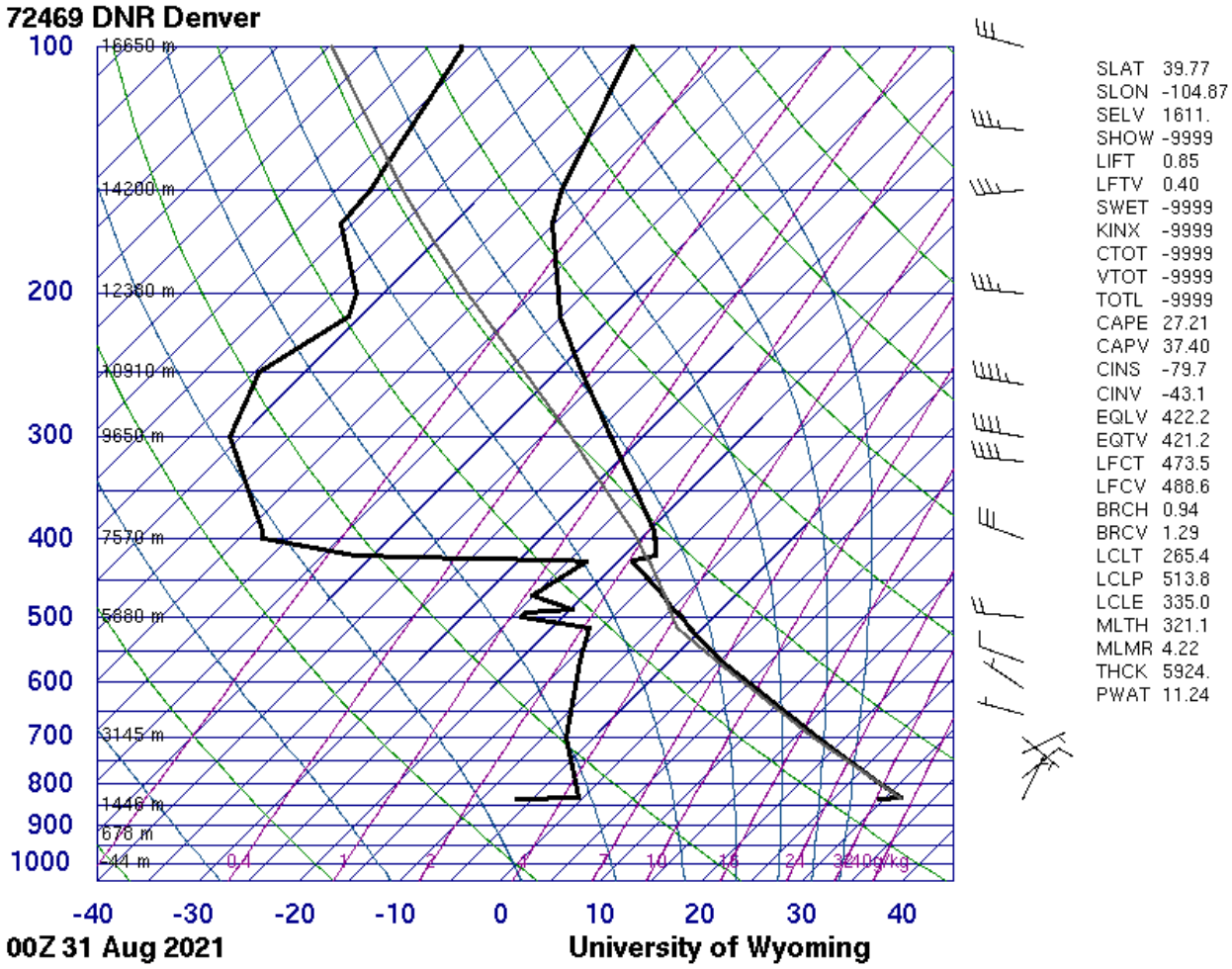

Figure 2. Skew T graph from University of Wyoming Website.

The Skew T diagram is for Denver at 00Z 31 August 2021 sounding which correlates to August 31st at 6pm in Colorado. This was the closest sounding to August 31st at 7:17pm. The atmosphere was unstable around this image because the CAPE value is a positive value, 27.21, as seen in Figure 2. As mentioned before the expected heist of the clouds is between 5900 and 7500 meters in elevation. This is the point on Figure 2 where the temperature and dew point lines get the closest together. These aspects agree with the observation of the stratocumulus and altocumulus clouds because they are typically in unstable atmospheres and are bumpy in nature. The height of the altocumulus clouds agrees with the observation that some of the clouds are expected to be above 6500 meters because altocumulus clouds form around 6500 to 2300 meters of elevation. The altocumulus clouds are commonly mountainous terrain. This terrain produces waves in the atmosphere which form clouds [1]. The stratocumulus clouds are also most likely correct since they are low clouds which form between 0 and 6500 meters in elevation with not very much vertical development, and Figure 2 points toward clouds within the upper limits of that range. Also, since the CAPE value is below 500 rain was in fact not expected.

Visualization Technique

To take this image an iPhone 11 pro camera lens was used at 1x zoom ratio. The default settings were all used to capture this image. The field of view is roughly 15 feet by 12 feet. The focus of this image was the clouds so that the lighting would not make any foreground in the image too dark or take away from the focus on the clouds. The comparison between the original and the final image can be seen in Figure 3 below.

Figure 3. Edited versus original image (right to left).

For post processing the first change made was rotating and cropping the image slightly so that there were no treetops present in the image. The color was also enhanced through increasing the contrast, increasing the appearance of reds, and increasing the saturation just slightly. The original image can be seen in more detail in Figure 4 below to compare with the final image seen on the cover page.

Figure 4. Original cloud image.

Conclusion

The image reveals the beautiful display of clouds and light that a mountainous sunset can create while highlighting. I like the coloring and the light rays in this image, as well as the sharpness that the clouds can be seen in so it shows the shape of them well. Also, having trees in the original image helps give perspective into the field of view the image was taken in. One suggestion for the future would be to pay more attention to the weather surrounding the image. Documentation of the weather and environment the clouds were created in after deciding on a cloud image. For editing the image one aspect I would like to learn more about would be enhancing the light rays seen around the clouds. Overall, I would say the intent of the image was fulfilled.

References

[1] "Altocumulus Clouds." *Met Office*, https://www.metoffice.gov.uk/weather/learn-about/weather/types-of-weather/clouds/mid-level-clouds/altocumulus.

[2] Website for animated Skew T diagram:
72469 DNR Denver Observations at 12Z 30 Aug 2021 - 00Z 31 Aug 2021 (uwyo.edu)