Clouds 2 Image Report

Altostratus

South Boulder: November 9th, 2021 at 3:20pm

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Context

This image was taken for the fourth image or video assignment, also known as the second clouds assignment for the FLow Visualization course. The intent of this image was to capture the various shapes of clouds present in one beautiful sky. The late afternoon sun provided the right lighting to prevent overexposure and emphasize the shapes of the clouds.

Image Circumstances

These clouds were captured in South Boulder at 3:20pm on November 9th, 2021. The camera used to capture the image was an iPhone 13 Pro angled approximately 70 degrees upwards from horizontal and approximately in the south to south-west direction.

Clouds Information

In Figure 1 below you can see the final image which shows the shape of the clouds. These clouds are most likely altostratus clouds. In the Skew T diagram shown in Figure 2 the point the lines get close together ranges between 8000 m to 12000 m in elevation. This range of elevations correlates to Alto-, or middle, clouds and the smooth shape points towards the stratus cloud type.

Figure 1. Final image.

The weather surrounding this image did not change very fast. Over the next couple of days the temperature lowered slightly, but there were no dramatic changes in temperature. The clouds in days prior to the image were similar in height and shape.
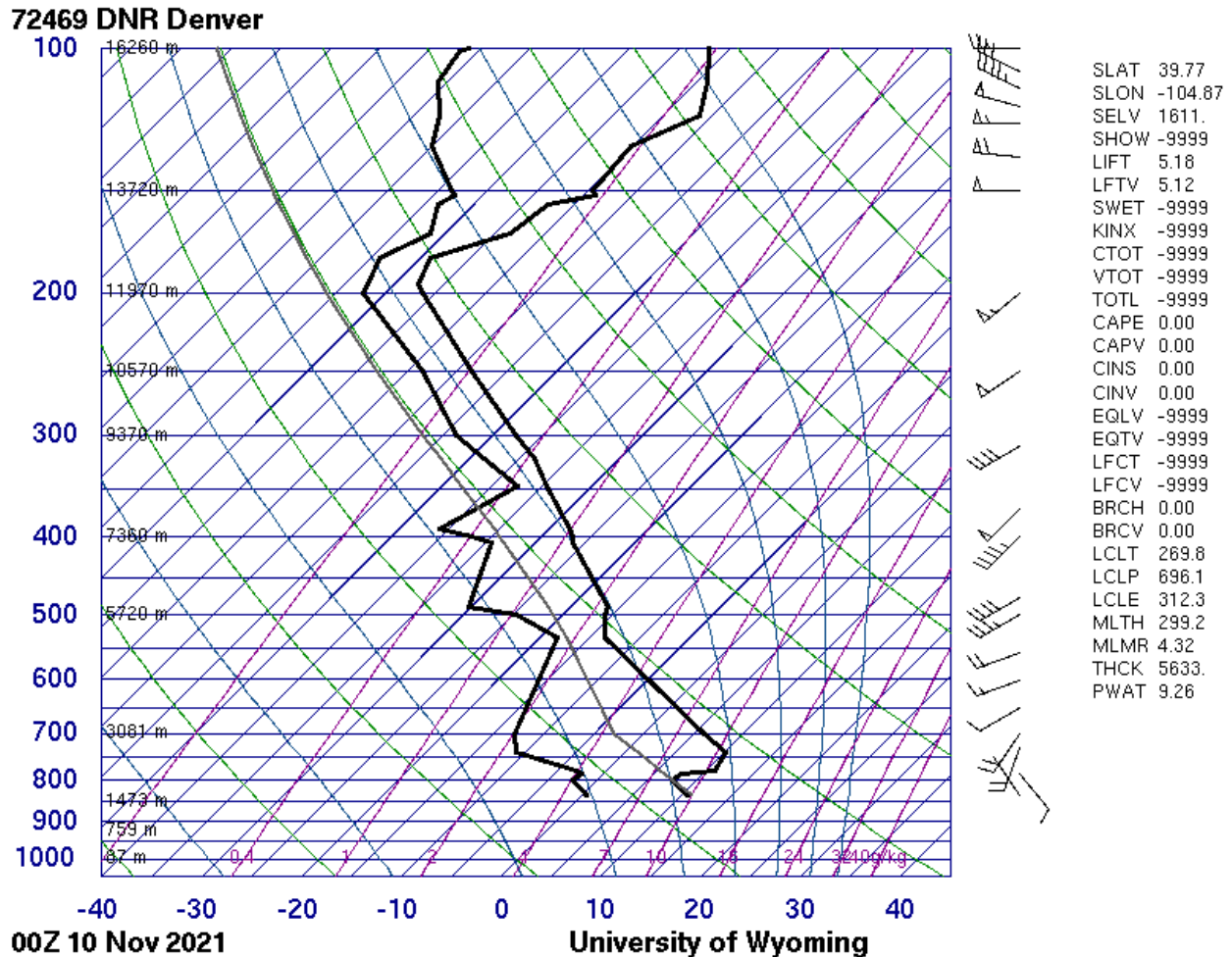
Figure 2. Skew T graph from University of Wyoming Website [1].

In Figure 2 above the Skew T diagram is for Denver at 00Z 10 November 2021 sounding which correlates to November 9th at 6pm in Denver, Colorado. This is the closest sounding time to when the image was taken at 3:20pm. From this sounding we can see there is a CAPE value of 0.0 which indicates a stable atmosphere. This supports the observation that there was no dramatic change in weather such as rain, as rain is expected when the CAPE value is above 500 and an unstable atmosphere is recorded at CAPE values above 0.0. Having a stable atmosphere along with the previously mentioned observation that clouds are most likely to form between elevations of 8000 m to 12000 m supports the conclusion that the clouds in the image are altostratus clouds.

Visualization Technique

To take this image an iPhone 13 Pro camera lens was used. The default settings are listed as follows:

> Wide camera - 26mm f 1.5
> 12MP * 3024 x 4032 * 1.9 MB
> ISO 50   0 ev   1/4274 s

The field of view is estimated using the original image seen in Figure 3, and is roughly 20 feet by 30 feet. The focus in this image is the clouds and the trees were kept in the image for reference, as well as to prevent cropping out too much of the cloud shapes present.

Figure 3. Original versus edited image (left to right).

For post processing the first change was to crop the image to remove the top of the building seen in the bottom left corner in Figure 3 above. After this the exposure was reduced to eliminate harsh light on the right side of the bottom cloud. As mentioned earlier the trees were left in view because I liked them and also didn't want to cut out that much of the clouds. Another change was to increase the sharpness of the image slightly to enhance the shapes and presence of the clouds. The post processing history from darktable is shown in Figure 4 below to note other small changes to enhance the coloring of the image.
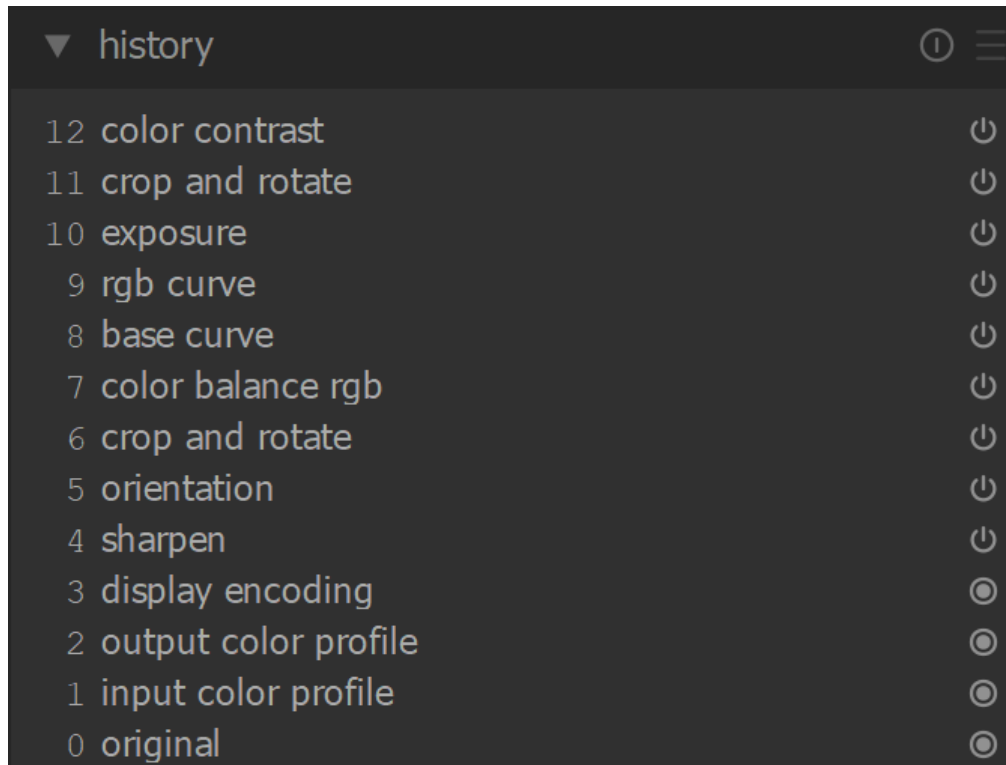
Figure 4. Darktable editing history.

Conclusion

This image reveals the organic and unique shapes that clouds take on each day. The calmness of the image as well as the variety in clouds captured makes the image visually appealing. Including the trees and building in the original image was intentional to help create perspective when analyzing the cloud types and comparing to the sounding in Figure 2. One suggestion for the future would be to carry around a higher quality camera when planning on taking a cloud image so that the quality of the image can be improved. For editing I also was considering making the image black and white, but would need to improve on other post processing techniques to maintain the same amount of crispness and quality as the colored image. Overall, the intent of the image was fulfilled.

References

[1] Website for animated Skew T diagram:
72469 DNR Denver Observations at 12Z 09 Nov 2021 - 00Z 10 Nov 2021 (uwyo.edu)