

Cloud Image 2



Cloud Image 2

MCEN 5151: Flow Visualization

University of Colorado Boulder

December 10, 2021

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Introduction

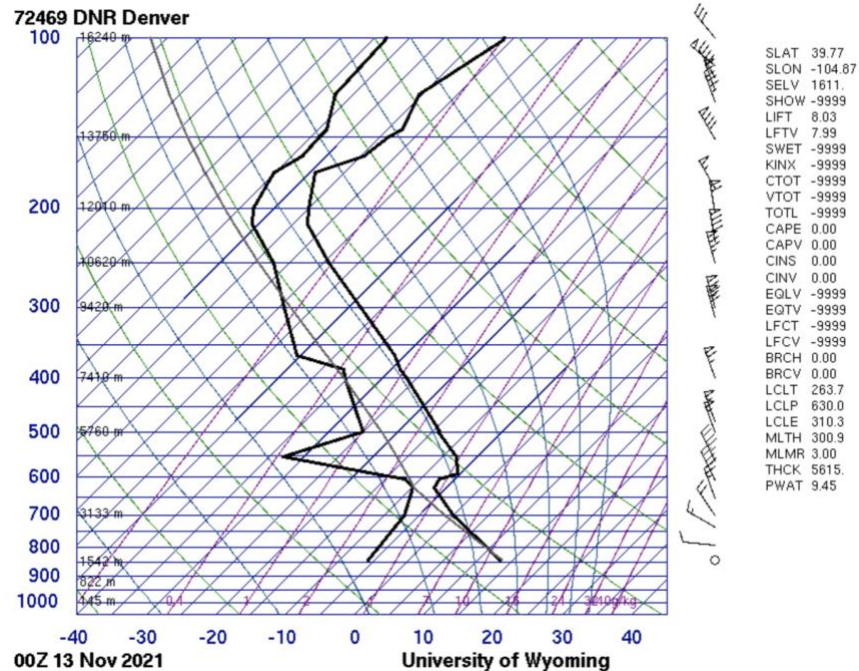
The report will discuss the cloud image, circumstances of the image, analysis of the cloud with a skew-T plot, photographic technique, and conclusions about the image. This report is for Cloud Image 2 assignment in MCEN 5151 Flow Visualization, and the purpose is to allow students to explore and learn more about the formations of cloud. The intent for this photo is to visualize the fog/stratus clouds during sunset.

Circumstances of the image

The image was taken on November 12, 2021, at 5:03 pm. The location is in Westminster, CO on Sheridan Blvd near the Walmart on 92nd Ave. The direction of the clouds is West, and the incidence angle was around 30 degrees. The clouds seem to be at around 5000 ft above ground or less.

Analysis

I identified the clouds as stratus clouds because they appear to be very low, thick, and large clouds [1]. These are typically less than 2000 meters or about 6500 feet [1]. Precipitation does not normally occur with stratus clouds, but mist and drizzle may be observed [1]. When doing more research on the weather that day, I found that the temperature was 43 degrees Fahrenheit with zero inch of precipitation and 7 mph wind from SE [2]. This data shows that precipitation did not occur at that time and proves the nature of stratus clouds. The Skew-T plot shown in *Figure 1* is for November 13, 2021, 00Z which is November 12, 2021, 6pm (mountain time) [3]. The photo was captured at 5:03pm that day, so the data only has a difference of about one hour. The plot indicates a CAPE value of 0, which shows stable atmosphere [3]. Again, this points toward no precipitation at that time, which is supported by other researched data. On the plot, where the dewpoint temperature and true temperature lines are close, shows cloud formations. The plot indicates cloud formation at around 4000 meters [3]. When accounting for the altitude of Westminster, CO, this makes sense, and the height of the clouds are around the stratus clouds range.



[3]

Figure 1. Skew-T plot for Denver, CO 00Z 13 Nov 2021

Photographic Technique

The image was taken with an iPhone XS in normal mode. The size of the image was 3024 x 4032 pixels with a resolution of 72 x 72. The lens is iPhone XS back dual camera with 6mm f/2.4. The aperture value is 2.5261 and shutter speed of 1/122. The focal length is 6mm with an ISO speed of 125.

I uploaded the image to Gimp and made edits. I cropped the image to focus more on the clouds and straightened the overall image. Initially, I thought the streetlamp was on the way of the clouds, but now I like that it serves as a reference point and a contrast to the colors of the cloud. I slightly increased the exposure as well as the contrast levels. This overall improves the quality of the image and makes the sunset a little more colorful. *Figure 2* shows the before and after edits on the photo.



Figure 2. Before and After Edit on Gimp

Conclusion

Overall, the image reveals low fog/stratus clouds with a sunset. I enjoyed capturing this image because it was beautiful. I was stopped at a red light, and I knew I had to capture this sunset. I like how the color of the sunset and the cloud makes it look like an inversed image. I liked how I captured the streetlamp along with the clouds to show a reference point, and the aesthetics it adds to the photo. The Skew-T plot and the weather data matches this image by showing cloud formation at lower altitude with no precipitation. Next time, I would like to capture thicker clouds that are higher up on a windy day. I am curious to see what pattern it can create rather than focusing on the colors.

Reference

- [1]: *Clouds!*, <http://weather.ou.edu/~smglenn/clouds.html>
- [2]: “Denver, CO Weather historystar_ratehome.” *Weather Underground*,
<https://www.wunderground.com/history/daily/us/co/denver/KDEN/date/2021-11-3>
- [3]: 72469 DNR Denver Sounding, <http://weather.uwyo.edu/cgi-bin/sounding?region=naconf&TYPE=GIF%3ASKEWT&YEAR=2021&MONTH=11&FROM=1300&TO=1300&STNM=72469>