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Clouds Second

MCEN 5151

Stratus Clouds/Fog

November 7th, 2019

Unincorporated Jefferson County, Colorado

Throughout the time period of when the cloud for the second cloud assignment could've been captured, the photo above was selected. The reason for this was, as opposed to the many pictures captured by the general class, the clouds I captured were not high in the sky. They were just above the ground or even touching it. With the overall focus of the class assignment being targeted to capture differing types of flows, the cloud assignment allows us to photograph the behavior of water in the atmosphere and see the effects the winds, temperature, etc… has on the ever-present water in the air.

This image was captured in between the cities of Golden and Lakewood, Colorado. Officially, it is known as Unincorporated Jefferson County. It was captured around 10 in the morning just after the Daylight Saving time period ended, meaning the angle of the sun was almost directly above the area, if not a little bit south due to the tilt of the Earth. As seen in the image, the photograph was taken almost parallel to the ground and as stated on the title page, this image was captured on an interesting day for weather on November 7th, 2019.

I believe the type of cloud captured is a stratus cloud. This can be confirmed by both its appearance and the skew-T data accompanying this. Stratus clouds develop horizontally and are usually precipitation free[1]. Low stratus clouds, such as the one in my picture, are common in valleys or on the leeward side of a mountain in the days following a passing of a storm system. Normal stratus clouds are often flat and disk like however, this is not the case in the image I captured. A special type of stratus cloud called fog is essentially layers of stratus clouds on or near the ground[2]. There are two types of fog which are radiation fog and advection fog. Radiation fog develops overnight but begin to burn off in the morning hours. The other type is advection fog, formed from cold surfaces come in contact with warm, moist air. I believe my fog that I captured is radiation fog, as the clouds burned off shortly after they were captured and likely formed overnight the previous night. Clouds in general form when the air temperature and dew point are at the same temperature. This is demonstrated in the following skew-T diagram. When the two black lines meet, the left being dew point and the right being air

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[1] Funk, Ted. *National Weather Service Cloud Classification and Characteristics*, National Oceanic and Atmospheric Administration, www.weather.gov/media/lmk/soo/cloudchart.pdf.
[2] Ibid

temperature, that is likely where a cloud will form. The associated Skew T diagram from that day, in Figure 1 below, does not show any intersection of the dew point and temperature line, meaning there should be no clouds in the sky. The picture also supports this as seen in the sky above is nothing but the blue atmosphere. The CAPE number is also zero, indicating the air was stable.
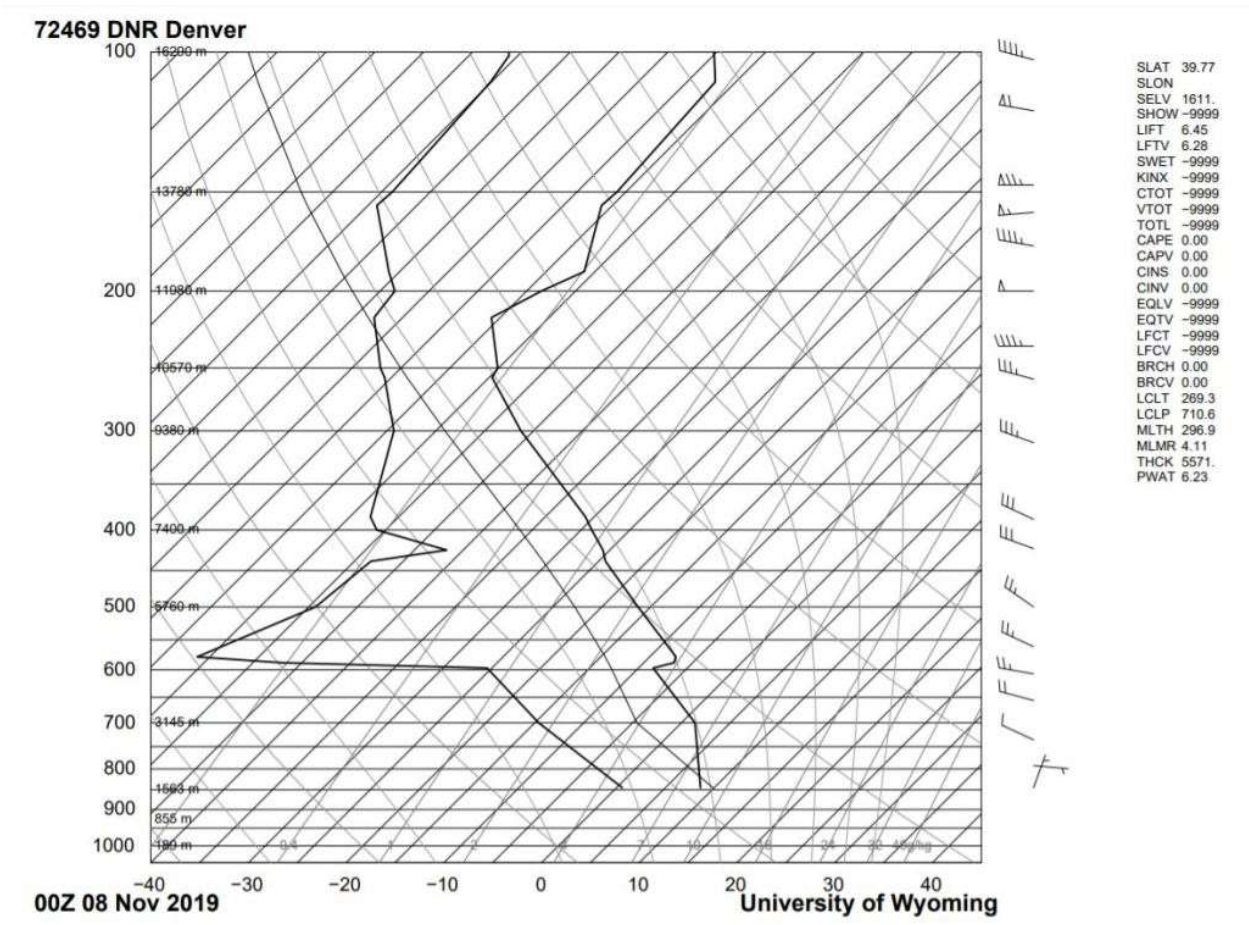

Figure 1: Skew T diagram from Denver Colorado, taken on November 8th, 00:00 zulu time

The general weather the day this photo was taken was interesting, as even as late as 7 AM, the sky was overcast from a storm system that had brought a few inches of snow to the Denver metro region. However, the storm quickly moved out as the morning progressed, leaving behind fog all across the front range foothills.

This picture was taken while standing stationary at the base of the foothill. Since the clouds were touching the ground, calculating the horizontal distance is simple. The clouds were

approximately a mile away from where I had taken the image. This picture was taken on a Samsung Galaxy S9 with the model of the camera in the phone being SM-G950U. The dimensions of the picture was 3024 x 4032 pixels. The maximum aperture was 1.53, the focal length was 4 mm, the exposure time was 1/3135 seconds and the F-stop number was f/1.7. The original, unedited image can be found below in Figure 2. The contrast curve of how the picture was edited can be seen in Figure 3.

Figure 2: Original, unedited image
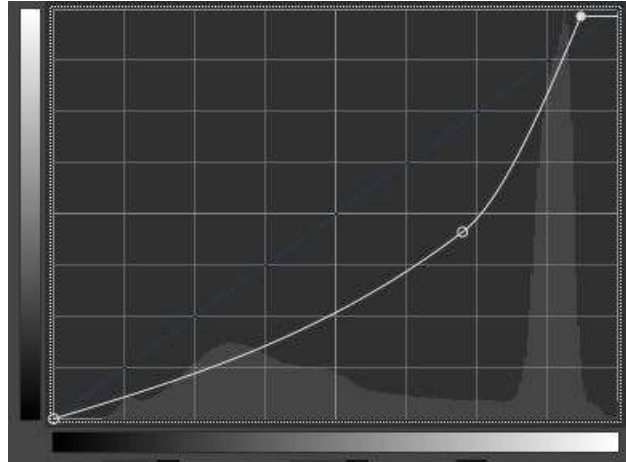
Figure 3: Contrast curve, comparing how the picture was edited from the original. The white curve represents how the image was edited from the original curve in blue

I am happy with the final image. It paints a picture for how the weather had been not only for that day, but can show the viewer how the weather had been behaving the hours before this cloud formation appeared. I think the edits I made in Gimp during the post editing process were appropriate as well. I cropped out a lot of blue sky that served little importance in the overall image and made the sky slightly darker to help accent the clouds more. I decided to leave the foreground with the railing and horses in as to me, this helped put into perspective how close the clouds actually were. Though some may argue they are distracting to the overall image, I would disagree with them. I do not think I could improve this image in anyway and I am very pleased with the outcome.