Cloud Image 1
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Flow Visualization
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Purpose

The purpose of the "Cloud Image" was to explore clouds and their interaction with the atmosphere. Capturing a still image of clouds allows people to visualize the physics behind the cloud formation, as well as classify the formation based on certain criteria. A cloud is defined as a mass of liquid droplets composed of water and other chemicals that hang suspended in the surrounding atmosphere.

Image Description

The cloud pictured in my image was taken over the flat iron mountains in Boulder, CO on road CO-93, as I was returning from a ski trip in the Rocky Mountains. I directed my camera northwest, approximately 20 degrees above the horizon. The clouds were all pointed downward at a diagonal, leading in a direction toward the beautiful mountains. The image was taken at approximately 3PM (MST), just an hour before sunset, on January 26, 2014. It was particularly good weather that day, for being a day in the middle of winter in Colorado. It was a high of 55 degrees Fahrenheit and a low of 19 degrees Fahrenheit. There was only 0.12 inches of observed precipitation. There weren't a lot of surrounding clouds and the sky was lit up bright blue. It snowed the following day, which could explain the shear instability seen at the bottom of the diagonal clouds. As seen in the Skew-T plot in Figure 1 below, the atmosphere was stable on that day. This is indicated by a cape of zero, provided in the data on the right side of the Skew-T plot.

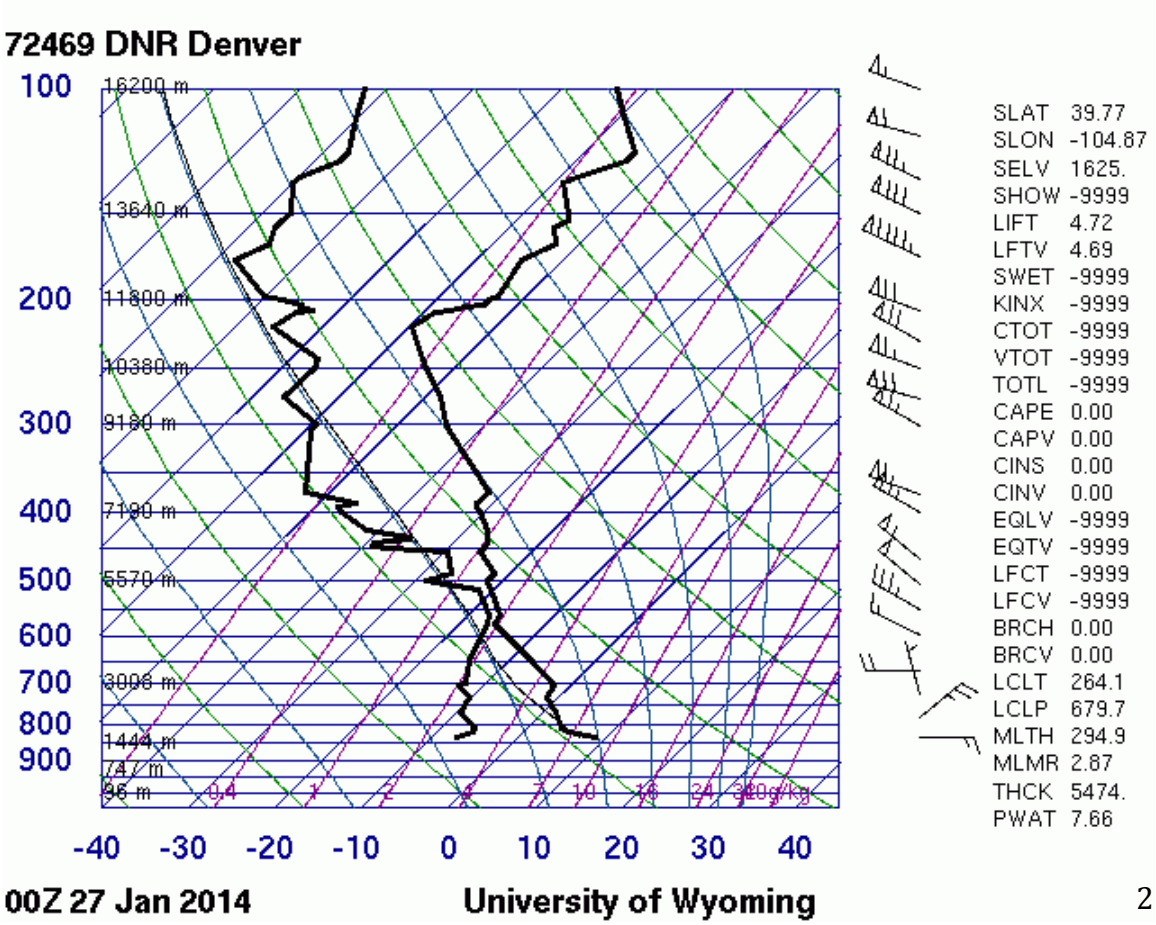

Figure 1: Skew T Diagram 27 Jan 2014

Cloud Classification

There are many classifications of clouds, defined by their density, shape and where they are located in relation to the planetary body they suspend over. It was very difficult to classify the clouds I photographed because they were unlike any clouds I had seen. Based on their height above ground, approximately 1,000 feet, and their diagonal alignment, they fall into the stratocumulus category. A stratocumulus cloud formation is a combination of both a stratus cloud and a cumulous cloud. A status cloud is a lower-level cloud that is uniform and flat and is directed along the horizontal axis. A cumulous cloud is aligned vertically. Both stratus clouds and cumulous clouds are low-level. They occur below 6,500 feet, and typically contain liquid water droplets, except during a cold winter day when ice crystals and snow comprise the majority of the cloud. The day I photographed these clouds was a winter day, but it was not cold enough to actually freeze the water droplets.

Photographic Technique

The camera used to take this image was an Apple iPhone 5s. Although this camera does not have manual focus, I believe a beautiful image was still captured. Sometimes photography cannot be planned, but rather rare and unique moments are captured when you aren't prepared for it. The dimensions of both the original and the edited image are 1704 x 2046 pixels. The focal length was 4.12 with an f-number of 2.2. I estimate that the clouds were approximately 1,000 feet above my camera. The editing technique used was iPhoto. I did not do a great deal of editing. I increased the saturation to get a brighter blue color, as well as lowered the shadows setting to lighten it. Figure 2 below shows the unedited image.

Figure 2: Original Cloud Image

Conclusion

I find that my image displays the physics of the shear instability of clouds, while offering a visually appealing piece of work. The direction of the clouds leads the viewer's eye across the image, and I like that it is only cloud in the field of view because it leaves a lot of room for imagination. I think the edited version shows the shadows and instability better than the original image. I would improve the focus of the image if I could repeat it, but I only had the iPhone 5s camera on hand at the time the image was taken. Overall, I find that this image offers the viewer a peaceful, yet intriguing experience, while still revealing cloud dynamics.

Works Cited

[1] http://www.crh.noaa.gov/lmk/?n=cloud_classification
[2] http://www.weather.com/weather/monthly/80301?month=-1
[3] http://weather.uwyo.edu/upperair/sounding.html