



Clouds First

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Photo Taken on February 7, 2018
ATLS 4519

Purpose

For the Clouds First assignment, I had the freedom to capture any type of cloud under any condition. Clouds have always been fascinating, particularly those multi-colored ones that appear during sunrise and sunset due to the place of the sun in our sky. My intent in capturing this image was to intentionally go outside around sunset and capture any areas of the sky that looked especially interesting. For this sunset, I created a time lapse that lasted an hour to really capture the formation and deformation of the clouds. The automatic changing of the brightness in my phone's camera distracted from the clouds, so I took a screenshot from that video and used that for my final image.

Time and Space

This image was taken in Boulder, Colorado on February 7, 2018 at 5:30 pm. I was on campus at CU on the east side of the Center for Community. The camera was facing S SW at 80° from the ground with the camera facing outward. This was captured from ground level which is approximately 5,430 ft in elevation in Boulder.

Conditions and Clouds

The darker clouds in the foreground are stratocumulus mountain wave clouds. There were clouds forming and deforming in that same lateral west-to-east direction. There was little ground wind during the time of this photo, and the average wind for this day, according to Wunderground for February 7th, 2018, was 5 mph NNW. There was no precipitation the day before, the day of, or the day after this photo was taken. This image was taken from a time lapse, so the behavior of the clouds was apparent. The starting border of the dark clouds were starting all at the same point, and the ending border was at the same point as well. What this implies is that there were patches of sky, at the same altitude, where clouds were forming and deforming. This cloud behavior is what is known as mountain wave clouds.

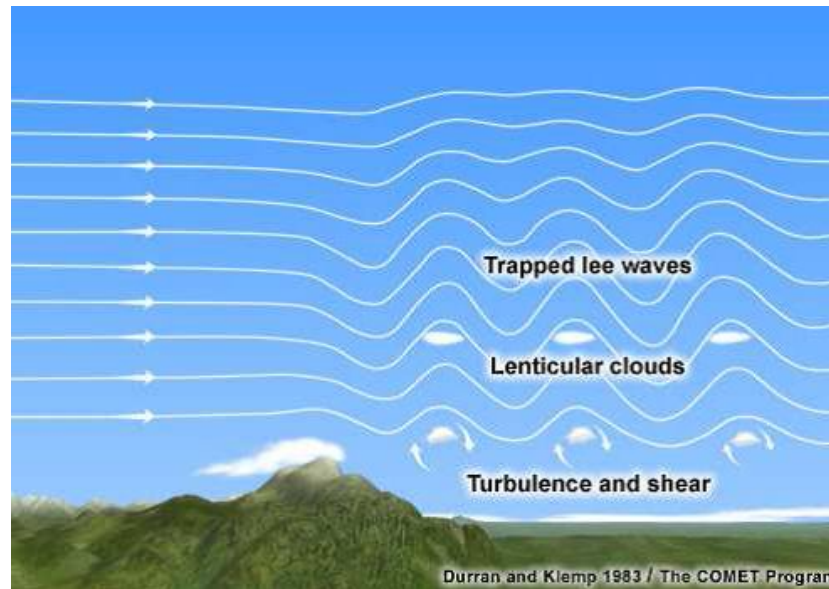


Figure 1. Formation of mountain wave clouds

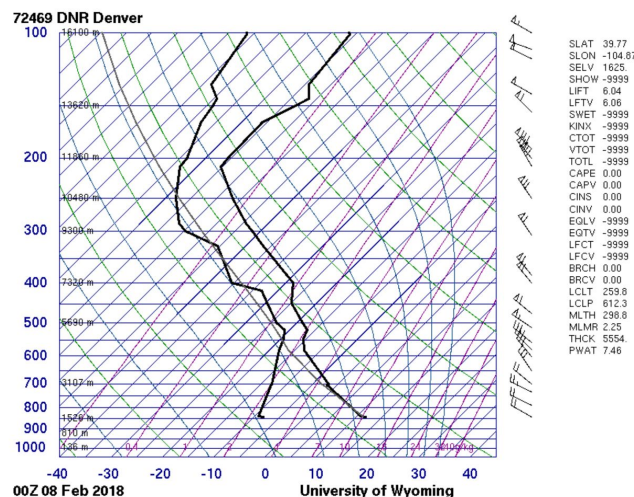


Figure 2. Skew T diagram for February 7, 2018 at 6 pm

Various types of clouds can be considered mountain wave clouds. According to figure 2, the atmosphere was stable near the time that the image was taken. A stable atmosphere is one in which the colder, denser air is below the less dense warm air. If it was unstable, the warm air would be under the cold air and cause an upward motion, given that dense things sink beneath things less dense. These clouds are stratocumulus. Stratocumulus clouds are a type of cumulus that form closer to the ground than others in its family and typically form in an unstable atmosphere. This conflicts with the Skew T diagram, but it is possible. According to the Skew T, the clouds that would form on that day at that time were lower and very close to the

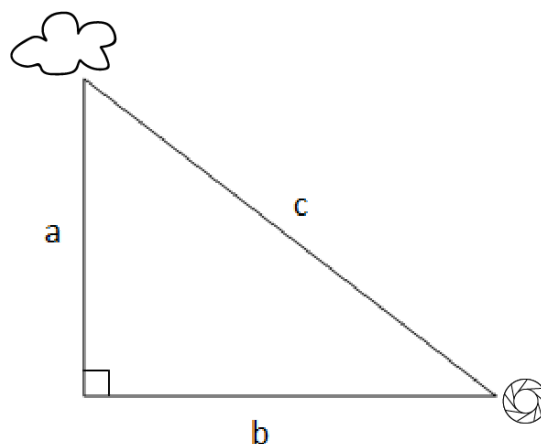
observed cloud height. The elevation of these clouds was approximately 4000 meters above ground.

Photographic Technique

I used the “hyperlapse mode” on my Galaxy s7, so I was unable to adjust my exposure settings. I have no direct information on my camera settings from the video specifically, but I did take an image around the same time as the video with the same sky as the focus. I will give an estimate on my camera settings for this image based on the numbers from the other image:

- ISO: 40
- Aperture: F1.7
- Shutter Speed: 1/231s
- Resolution: 1920x1080
- Focal Length: 4.20 mm

To get an estimate on how far my camera was from the clouds in the foreground, I will estimate how far away the ground is from me where the clouds are hovering above and how high the clouds are. This will give me a triangle with two edges of known length, so I will be able to find the diagonal length (the distance of my phone to the clouds).



Since the clouds were roughly 4,000 m above the ground and the point where a and b meet was approximately 12 miles, or 19,312 m, away, the distance from the clouds to the camera was approximately 19,726 m, or 12.25 miles.



The photos above document my process. Top left is my original screenshot from my video before any edits. Top right shows a cropped image with heavier contrast and saturation. The bottom one is my final image where I edited out the street lamp and the random foliage.

Reflection on Image

This image reveals the wide range of colors that can come from sunsets and having a sky full of different types of clouds at different heights. I am always taken away by what the clouds and the sky can show us and I really like the true color range and contrast of this image. Without a heavy edit, it is even more beautiful to me. It interests me why there was such a dynamic height to the clouds and why there was a pucker in the plane trail on the right side of the image. I would have liked to have more control over the exposure in the original time lapse of these clouds, because it was truly spectacular to see the clouds breathing. The automatic exposure adjustments were just too distracting.