

Clouds Report #1



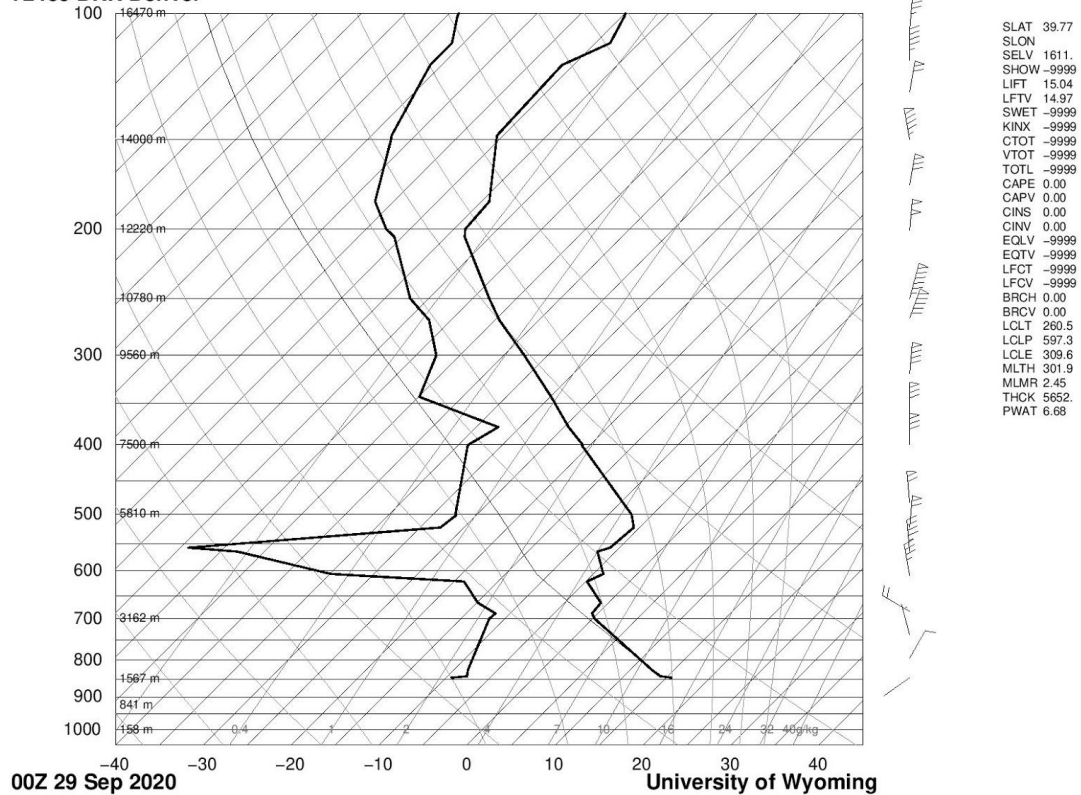
(Final Edited Image 1300 x 868 Pixels)

Image Taken 9/28/20 at 7:25pm Near Scott Carpenter Park in Boulder

In this assignment we were required to capture an image of a cloud. For most of September and October clouds were quite few and far between. In my opinion, most of the pictures of white clouds on a blue background looked rather plain and boring. For this reason I tried to get an image that had some interesting colors as well as a little context. The scenery in the image allowed for a little depth of field as well as some nice framing.

This image was taken in Boulder, Colorado looking west towards the Flatirons in the area near Scott Carpenter Park. It was taken from my balcony on the third floor at an angle of about 20 degrees above horizontal. Being in Boulder this image was taken at an elevation of about 5300 feet. The colorful sky in the image is a result of the evening sun setting.

72469 DNR Denver



Skew-T Diagram for Denver on the 28th of September at 6pm

Looking at the skew-T plot for this day at 6pm, there are no clear cloud altitudes. It must be estimated based on the nearest points between the two lines while referencing the picture. Starting with the picture these clouds appear to be quite thin and rather high in the atmosphere. With that knowledge the clouds can either be Cirrostratus or Altostratus which are both layered clouds. Using the skew-T it appears that the two lines are closest to each other around 3200 meters and 8000 meters. Based on the image, we can clearly see that the clouds are quite high in the sky meaning they are likely at 8000m. My initial guess for these clouds was cirrostratus. These are pale veil-like layer clouds that form at altitudes from about 6-13km. It was also suggested from the critiques that these clouds could be altostratus clouds. Altostratus clouds are lower than cirrostratus at between 2-7km and usually appear a little darker. With this in mind the weather from that day was observed as a high of 61 F where the next day was 81 F. This large temperature difference between the two days supports the cirrostratus category of clouds. This is because these clouds can signal the approach of a warm front and the temperature difference shown in the temperature difference between the two days[1].

Looking at the wind pattern from this day, we can see that the wind is coming directly from the north. At this time there are a few wildfires in Colorado as well as Mullen fire on the Wyoming/Colorado border that could have been suspending ash in the air to help facilitate the colors produced. This is because the particles in the air scatter the light in a random direction but

the longer wavelengths such as the reds and oranges pass right through[2]. This is why the image has so many reds and orange colors.

This image was taken with a DSLR Canon Rebel ESO SL1 using a 55-250mm lens. A focal length of 70mm was used to capture a field of view of about 2000ft. A regular shutter speed of 1/100 second was used. The image also had an aperture f/4.5 and an ISO of 320.



Original Image (5184 x 3456 Pixels)

Edited Image (1300 x 868 Pixels)

This image was also edited in darktable to help focus the image and touch up some spots. To start, a simple crop was used to cut the distracting light pole on the left side to draw a greater focus to the clouds. In order to make the image flow a little better between the tree and mountain background that are very far apart, I changed the RGB curve at the bottom left to make the blacks very black. This creates a little more continuity between the mountain and the tree now that they are the same color. The image also had a little fuzziness because of how dark it already was outside, the denoise tool was used in order to help smooth out the busyness.

This image reveals the complexities of clouds as well as partially how to categorize them. The clouds themselves are rather plain, but exhibit interesting colors. It is the dark outlines of the trees and mountains that really give the image some context. The image also shows the refraction of light in the higher wavelengths while the longer wavelengths seem to travel through. Overall this image may seem rather simple, but there is a lot of underlying physics happening.

References

- [1] Vekteris, Donna (2004). *Scholastic Atlas of Weather*. Scholastic Inc. p. 14. ISBN 0-439-41902-6.
- [2] Fritz, A. (2014). *Photos: Wildfire smoke provided beautiful sunsets on thursday night*. Washington: WP Company LLC d/b/a The Washington Post. Retrieved from <https://colorado.idm.oclc.org/login?url=https://www-proquest-com.colorado.idm.oclc.org/docview/1552190863?accountid=14503>