

Zack Herzer
Flow Vis Fall 2022
10/24/2022

Picture from 8/27/22, 4:24pm
Location: 2nd Flatiron summit, Boulder
Cumulus and stratocumulous clouds

Clouds First Report

The “Clouds First” assignment is quite open-ended: analyze a picture of clouds that was taken between the start of the semester and now. Personally, I like open-ended assignments as it allows me to take more time to be creative and do something that is interesting to me.

Specifically, I took about 100 pictures of clouds during this time period, so I could pick the one that I found most interesting and personal. I am an avid rock climber, and the 2nd Flatiron is a classic free solo route that I’ve been doing regularly for years; I’ve probably done it 30 or 50 times by now. One thing that is special about it is that the flatirons are a dramatic place where the plains meet the mountains, so climbing on top of them allows the climber to have a totally unobstructed view of the plains going on seemingly forever. Every time I climb it, I enjoy the view and notice differences in the cloud formations, traffic, or the color of the trees in Boulder.

On this particular day, August 27, 2022, Boulder had typical summer weather with afternoon thunderstorms and hot weather. This type of weather is amazing to me as it does not exist in my home town of San Francisco, California, where summers are moderate and dry (except for the fog). There were well defined cumulus, stratocumulus, and cumulonimbus clouds that day. The image is taken at 4:24pm at 7100 feet from the climber’s exit at the top of the Second Flatiron, looking directly east. Baseline Road, which is clearly visible in the middle of the image, is the 40th parallel and goes exactly east-west.

The clouds in this picture are standard cumulus and stratocumulous clouds all the way to the horizon. Along the left side, just above the trees, a less well defined cloud is shown, this cloud is likely a stratus cloud because it is also low elevation. Other than these clouds, the sky is clear except for a belt of smog near the horizon. There were no winds. The picture was taken at 4:24pm, which was an hour or two after lighter than usual afternoon thunderstorms. Boulder summers are often thunderous in the afternoons due to the sun heating air near the ground, which rises to produce clouds. Thunder comes from within the cumulonimbus clouds when the internal currents and precipitation break down the air insulator within the cloud and there is a rapid exchange of electrons between the positively and negatively charged ions. This particular day, the cumulonimbus clouds, which had created the thunderstorms, were now gone, but the cumulus clouds remained. According to the Skew-T diagram provided by the University of Wyoming (00Z 28 August 2022, Grand Junction, CO), the clouds likely existed around 5900 meters because that was where the dew point and temperature lines were closest. This supports that the clouds were cumulous since they were not high altitude. The CAPE value was 366.9, so the weather was slightly unstable. Because the Skew-T diagram was not exactly at the same time that the picture was taken, it can be assumed that the CAPE value was higher before the picture was taken and lower after the picture was taken due to the storm coming and passing.



Fig (1) Edited Image



Fig (2) Original, unedited image

I took this picture with my iPhone XS, which has a 12 MP camera with a 26mm f/1.8 aperture and optical image stabilization. ISO was 25, and 0 ev. The shutter speed was 1/3401 seconds. The picture was taken in the native HEIC format with 4032x3024 pixel resolution. I changed a ton of settings in darktable in order to brighten the trees in the foreground of the image and to create more contrast within the clouds. The main modification was making the RGB curve S-shaped, which accomplished both of these things, but I also changed color balance settings, vignette, saturation, and other settings like sharpness.

This image is a clear representation of a typical summer day in Boulder right after the afternoon thunderstorms. The clouds are clearly shown and are not obscured by other objects, and the image manipulations allow closer detail of the clouds and a more balanced image without overwhelming darkness in the foreground. It was mentioned by a peer that the horizon is not completely horizontal, so that would have been a good thing to edit within darktable. I am happy with my image manipulations in particular, but I do think that using my DSLR would have produced a more detailed image, especially in the foreground.

72476 GJT Grand Junction

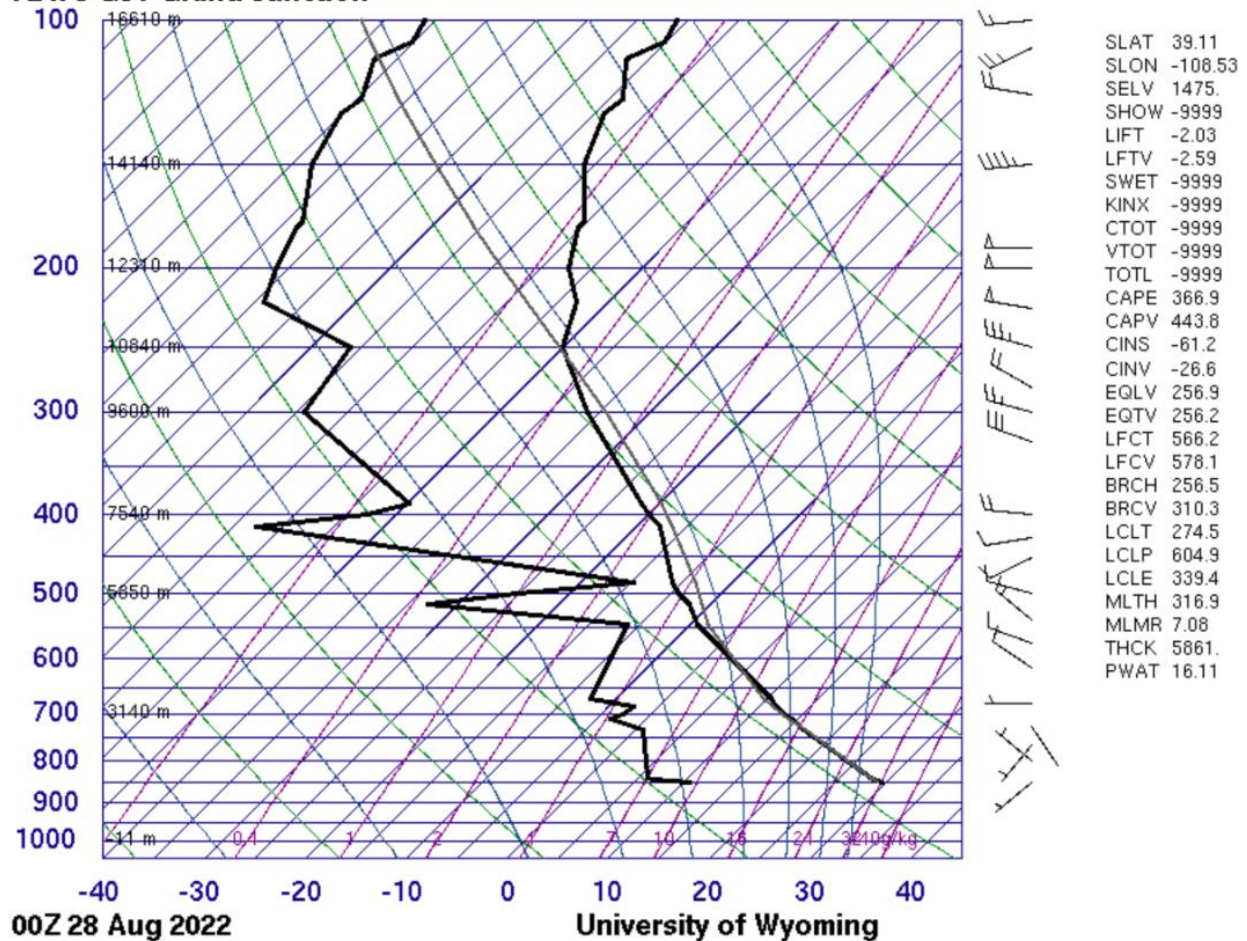


Fig (3) Skew-T diagram