Cloud 1 Report

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Flow Visualization Fall 2024 Cloud

Captured: September 11th, 2:28 pm

Boulder, CO 80309

Context:

This is the first cloud assignment for the Flow Visualization course at CU Boulder. I was captured by the blueness of the sky contrasted with the vibrantly shadowed bottoms and highlighted tops of the clouds. I also liked that the clouds were both poofy and dynamic. The combination of powerful central clouds to focus on and smaller clouds fanning out around the top left edge of the image was intriguing to me. I took several similar photos of this general cloud cluster, and this one was most visually appealing due to its strong diagonal and sense of motion.

Circumstances:

This photo was taken in Boulder, CO, particularly from the Herbst Plaza under the University of Colorado, Boulder's Engineering Center. Orientation-wise, the bottom of the image is more-or-less East, with a slight rotation towards the south. The camera was pointed almost directly up, with perhaps 7 degrees down from fully vertical. The time of capture was 2:28 pm on September 11th.

Discussion:

I believe that the clouds are cumulus clouds. The are clumpy and, I believe, fairly low-down. They are thick, as evidenced by the darkness of the bottoms of the clouds, and the fact that the sun can't shine through all the way, up in the top right of the image. Additionally, holding my hand out at arm's length, the clouds were each too large to cover with three fingers, indicating that they are fairly low.

The sky was very blue, and it was a warm day with a mild-to-moderate breeze on the ground. There had not been any precipitation, nor was there any later in the day.
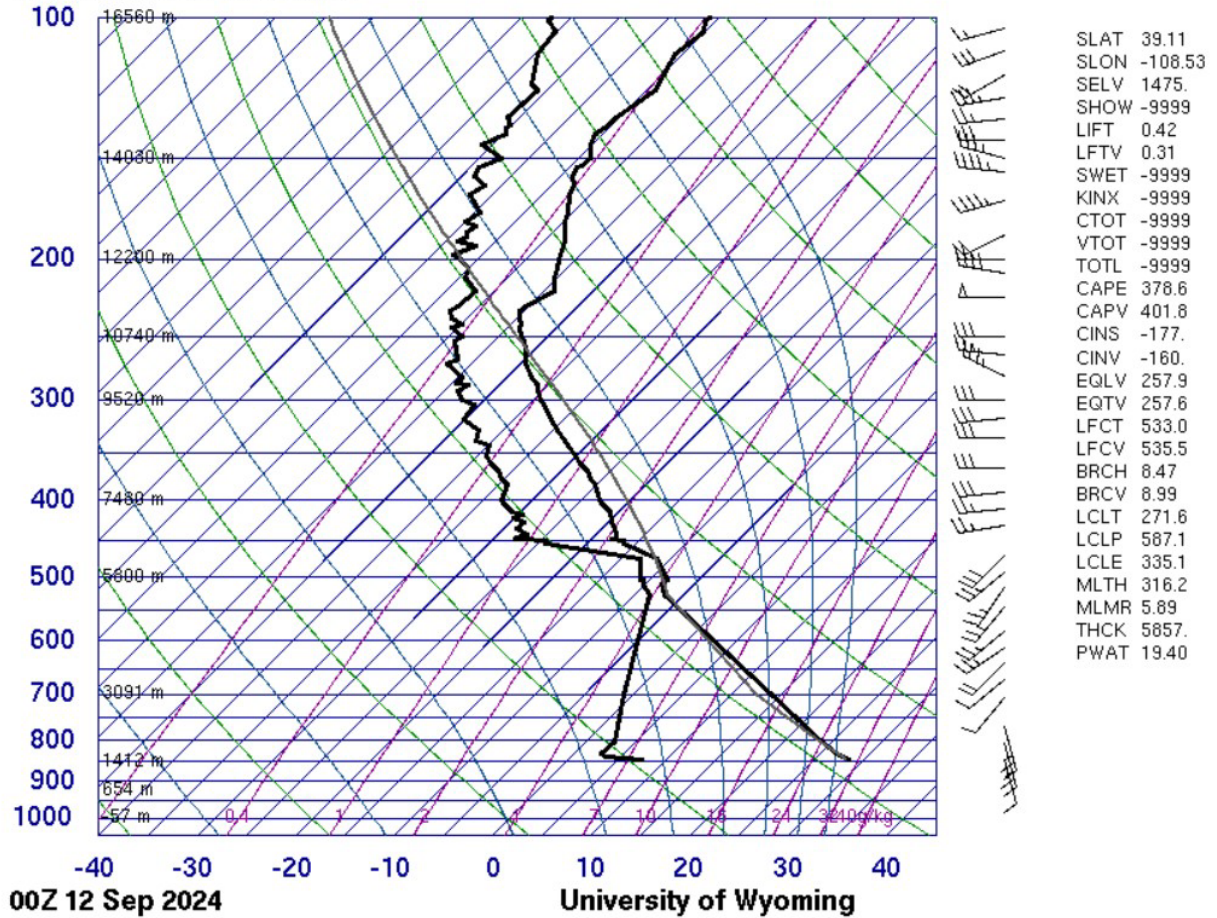
The Skew-T Plot can be seen below:

Figure 1. Skew-T Plot

The clouds appear to be at an elevation of around 5800 m above sea level. This is actually right around the dividing height between different elevations of clouds. Low clouds should end a bit below the cloud formation point indicated on the Skew-T plot, and cirrus clouds should begin a t the upper end of the cloud formation range indicated, while alto clouds are right in the expected range.

The CAPE value of 378.6 indicates an unstable atmosphere. The instability in the atmosphere would have caused the lift necessary for the clouds to exist and perpetuate themselves; the relatively high CAPE number indicates that the clouds could have grown fairly quickly, rather than remaining small cumulus humilis clouds.

Photographic Technique:

The field of view is large. It would really depend on how high the clouds actually were, which is unclear/I can only speculate, so the field of view is unknown, as is the distance from the object to the lens. I used my Samsung Note 22 (SM-S908U1 camera, according to the image specifications) to take the photo, focused on infinity, with automatic aperture, shutter speed, and

ISO. The focal length was 6 mm, aperture was f/1.8, exposure time was 1/7111 sec, ISO-12, and the max aperture was 1.69. The original photo and the final photo were both 4000x3000 pixels.

Figure 2. Image Before Editing

In post-processing, I used color equalizer to make the blue of the sky pop even more, since it was a significant part of what made the initial image appealing to me. I tried enhancing the rainbow effect around the sun in the top right corner, but I found the results more distracting than enticing. I also altered the local contrast slightly to bring out more of the highlights and shadows of the clouds. The original, unedited image can be seen above in Figure 2.

Conclusion:

Overall, I am pleased with how this image turned out. I took several photos framed slightly differently from one another, and this one had the strongest diagonal and most interesting sense of motion. I am particularly fond of how the rays of light filter around the clouds; it increases the drama and heavenly aura of the image. I wish that I had taken better note of the circumstances surrounding the image's capture, but I was focused more on capturing the interesting cloud motion in the moment than I was on proper scientific procedure. I would like to be better at the postprocessing, as I feel like the image could be even more impressive, but I was unsure what to

do in particular to achieve my vision. The bottom of the cloud on the right just feels so heavy compared to the other aspects of the photo, and I am unsure how to resolve that.

Sources:

Skew-T from
https://weather.uwyo.edu/cgibin/sounding?region=naconf&TYPE=GIF%3ASKEWT&YEAR=2024&MONTH=09&FROM=1200&TO=1 200&STNM=GJT -
https://weather.uwyo.edu/upperair/sounding.html