Stella Newman

Clouds First Report

Flow Visualization Fall 2020

Altocumulus, cirrus, and mountain wave clouds

September 5, 2020

7:24 pm

Image taken at the intersection of 11th St. and Pearl St.



This image captures not only a fascinating sunset over Pearl Street in Bouder, Colorado, but also demonstrates the phenomena of multiple cloud types. As I was walking down Pearl Street around 7:30pm I noticed the sunset and was intrigued by the altocumulus cloudlets in contrast to the cirrus and mountain wave clouds. I took multiple images of the sunset that evening but this one was my favorite because of the two small altocumulus clouds, the other images were more colorful, but after postproduction my final image captured both stunning colors and cloud phenomena.

On September 5th, 2020 I was going out to dinner on Pearl Street downtown Boulder, Colorado, when I noticed the beautiful sunset and took my image for our first Clouds Image assignment. This image was taken on the corner of 11th street and Pearl Street at 7:24 pm, just in time to express another one of Colorado's beautiful sunsets. The camera was facing the North-West direction angled so the buildings would not be a distraction, capturing only the clouds.

There are a few different cloud types pictured in this image. There are cirrus and altostratus, these are the wispy pink and orange clouds pictured here. There are also altocumulus clouds, these are the two smaller clouds that look like little puff balls. Between Megan and I's images that were taken on the same day, we have concluded there was a smokey element present on this day. The smoke can be seen as the darker brownish smog seen in my image. I have come to the conclusion that these are the cloud types based on the weather on and surrounding the date when this image was taken, September 5, 2020. As seen in the Skew-T diagram the CAPE value was 147.2 this is not incredibly unstable, but it is unstable enough to result in some clouds in the sky. The biggest instability can be seen on the Skew-T at approximately 6,800 meters above ground level. This instability helped me determine the altostratus and altocumulus cloud types. Attached below (figure 2) is an image of the weather reports on and around the day this image was taken. Because the weather was dry for the few days leading up to and following September 5th, the clouds could not be cumulonimbus or any sort of storm clouds carrying precipitation.

You can also see in the weather report that the humidity was only at 12% around the time that my image was taken and the wind was blowing from the North-West at a speed of 11.807 miles per hour. The next day the sky was noticeably more smokey and the cloud type changed to more stratocumulus, this could be a result of the warm front moving North-East away from Colorado, pictured in figure 3.

I took this image with my iPhone XR because when I saw this sunset I did not have my camera on me, however I think the image still came out with decent quality. The field of view in this image I would approximate to be 1 mile wide by .5 mile in height. Because I am capturing clouds in this image the field of view is fairly large. The clouds seen in this image range from around 5000 to 12000 meters above ground level, so the distance from the lens of my camera to the clouds is similar. In post production I just created an s-curve to increase contrast and played with the exposure, highlights, shadows, and color balance in order to extenuate the colors of the sunset and the contrast between the altocumulus and cirrus clouds. An original image can be seen below in figure 4. After post production I was able to see in darktable the exposure specs my iPhone XR used which were an aperture of f/1.8, an exposure of 1/122, an ISO of 32, and a focal length of 4mm.

In conclusion, this image demonstrates a few different cloud types which is something I admire about this photo. I also love the colors I was able to expose in the final image, I think it made the clouds look beautiful and the smoke began to stand out. When developing my knowledge of cloud physics further I would like to observe the weather surrounding the time I take my image more in depth and I would also like to understand more about cloud movement. Overall, I am happy with my image and how there is smoke and cloud elements taking place.



Figure 1; Skew-T Diagram for September 5th at 6pm

http://weather.uwyo.edu/cgi-bin/sounding?region=naconf&TYPE=PDF%3ASKEWT&YEAR=2 020&MONTH=09&FROM=0600&TO=0600&STNM=72469



September 2020 Weather in Boulder - Graph

Figure 2; Weather report for the dates surrounding September 5th https://www.timeanddate.com/weather/usa/boulder/historic?month=9&year=2020



Figure 3; Fronts on September 5th

https://www.wpc.ncep.noaa.gov/archives/web_pages/sfc/sfc_archive_maps.php?arcdate=09/05/2 020&selmap=2020090518&maptype=usfntsfc



Figure 4; Original Image