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MCEN 4151

Cloud Report 2



This is a picture of a stratus cloud and a strato-cumulus cloud taken near CU in Boulder, CO at around 2:00 p.m on December 13, 2021. This is the second cloud assignment, and the purpose of this image was to photograph clouds in a way that added ambience to the picture. I was looking for a subject, which in this case is the building, and clouds to give tone to that subject. I also wanted to avoid saturating the sky to make it bright blue because I have done that two assignments in a row.

The direction of this photo was toward the north-west with approximately a 50 degree angle with the horizon. The field that I was standing in was at around 1700m in elevation from sea level. The building pictured is one of the towers that make up William's Village at CU, and I have had friends who don't go to CU describe the top of the buildings as "castley." I figured this would be a great subject to try and establish a tone in the photo, and that tone would be a bit

more brooding, with the building being a beacon of color to catch the eye's attention. Also, the clouds sort of look like a big exclamation point if you squint hard enough, so it would be cool if the picture was able to match that energy.

The biggest cloud appears to be a big stratus cloud at an elevation of about 10,000m, while the smaller cloud would be at around 7,500m. This is due to the skew-T diagram (**Fig. 1**), where the lines are closest just above the 7390m line, and halfway between the 10690m and 9390m lines. This signifies a high chance of clouds between these altitudes, and the lines are near converging below the halfway line between the altitude markers at around 7500m, and at around 10,000m. The small cloud is also stratocumulus according to the images in the article, Cloud Type for Observers¹ on page 7 in the Cumulus and Stratocumulus section, and the big cloud looks similar to a stratus cloud from the same article on page 12.

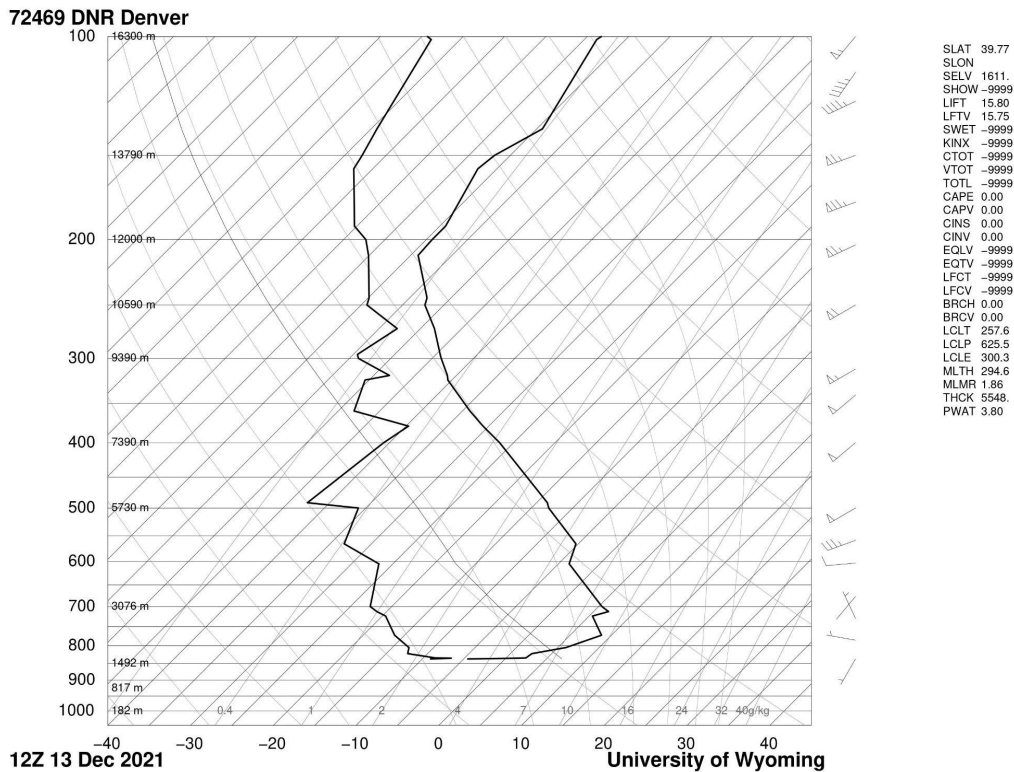


Fig. 1: Skew-T Diagram on 10/14/21 from the Denver recording tower

There were many clouds like the ones pictured on the day of the photograph, but the image just captures a small section of them. There was very minimal wind the day that the image was captured as well, and this also shows with a CAPE value of 0.00 (**Fig. 1**). The CAPE value indicates a stable atmosphere. From the lecture notes, the physics of the stratocumulus clouds being made is by water droplets or ice moving upwards. In Colorado, this is usually due to orographics, which means the terrain, usually mountains, provides the lift mechanism for the water. Cumulus clouds are usually formed from convection, which is the process of water vapor condensing into clouds.

The picture for this photo was taken with an iPhone XR, using only my arms to stabilize the phone and point them towards the clouds. The camera that I usually take fluid photos with does not have the ability to capture clouds in high enough detail while zoomed in for this project, so that is the reason that I decided to use the iPhone. The settings of the camera are in **Fig. 2**.

Camera	iPhone XR
Aperture	f/1.8
Exposure	1/500
Focal Length	26mm
ISO:	100
Width	75.70mm
Height	150.90mm

Fig 2: iPhone XR camera settings

As for the post processing in the photo, the main alteration I made was changing the color balance of the image. Instead of applying saturation to bring out a more pastel blue in the sky, I tried to make the nice orange/brown of the building the star of the show and made those the dominant colors of the image. I also tried to add tone by making the sky and clouds a bit darker too, and it also makes the picture look like it was taken close to sunset. I also edited the image to be horizontal this time, after the ratio of cloud to sky in my previous vertical photo was slightly suboptimal.



Fig. 3: Before (left) and after (right) post-processing

The cloud image reveals the way color correction can be used to establish tone in a picture. I really like the way that the building is much more colorful and clear after post-processing, even though the sky had a more full blue before the post-processing. I think if I were to take this picture again, I would try to preserve more of that blue towards the bottom of the initial picture towards the treeline, and use that to give the sky more tones of color than faded-blue. I think overall, the picture has much more of a setting after post-processing, and I am happy with it.

References

¹“Cloud Types for Observers - Weather and Climate Change.” *Met Office*, United Kingdom, 2014, https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/library-and-archive/library/publications/weather--climate-guides/cloud_types_for_observers_rev_2014.pdf.