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MCEN 4151

This is a picture of stratocumulus clouds taken near CU in Boulder, CO at around 11:00 a.m on October 14, 2021. This is the first cloud assignment, and the purpose of this image was to capture clouds that looked like they were painted in the sky. I was looking for clouds that were blotchy and had clearly different hues of white and grey. I also wanted the blues in the sky to be as different in color as they could be.

The direction of this photo was towards the east with approximately a 50 degree angle with the horizon. The reason the picture has no background is because the picture was taken with an iPhone, so the horizon would have taken clarity from the sky and not been as in focus as I would like it to have been. I decided to opt for just capturing the clouds and the sky so that the phone would not have problems with focus. The field that I was standing in when the photo was taken was at around 1700m in elevation from sea level.

The clouds appear to be stratocumulus at an elevation of 6100m. This is due to the skew-T diagram **(Fig. 1**), where the lines are closest between the 5600m and 7220m 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 6100m. The clouds are also stratocumulus according to the images in the Cloud Type for Observers[1] on page 7 in the Cumulus and Stratocumulus section.

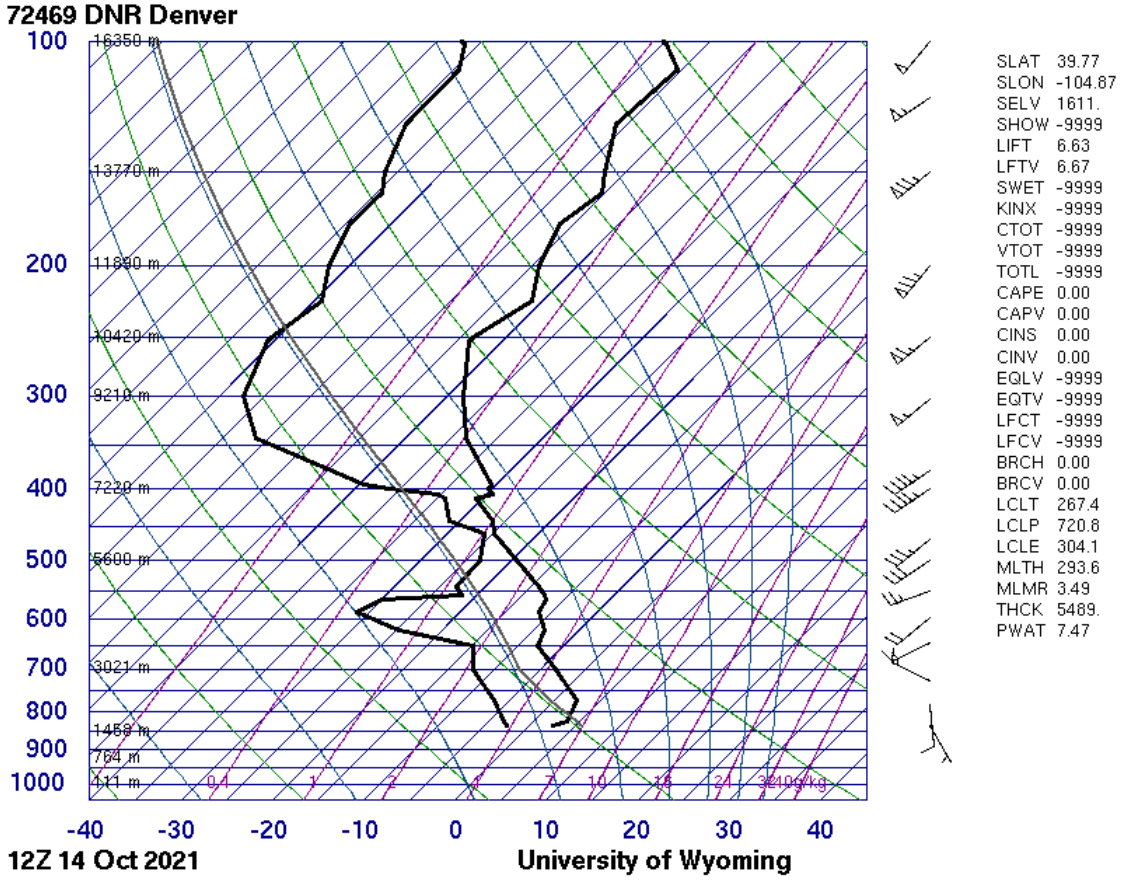

Fig. 1: Skew-T Diagram on 10/14/21 from the Denver recording tower

There were many clouds like the ones pictured, 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 increasing the saturation of the photo. I found that it increased the differences of the greys and whites in the cloud, like someone had mixed different paints and brushed them onto the page. It also made the edges of the clouds more blotchy and fuzzy on purpose, which I think makes up for the iPhone's image quality. I also pitched the shadow colors toward dark blue and the main color pallet to light blue to accentuate the differences between the different parts of the sky. It didn't turn the clouds too blue, so I think it makes the picture look more like a painting again because of the contrast between the colors.

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

The cloud image reveals the way saturation can accentuate the contrast in the colors within the clouds. The top-left part of the picture is my favorite part of the image because of the different blotches of white and grey. I think that it would be better if there was a horizon or background object to ground the image more. It would also add more colors than blue, white, and grey to the image, which it would really benefit from. I did not like the shape of the picture either. I am thinking about taking the photo horizontally next time so that the height and width of the picture are at a better ratio. I think overall, the picture fulfilled my intent of looking like a blotch painting, 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.