

Clouds Second Report

MCEN 4151: Flow Visualization

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1. Introduction

This is the fourth assignment in MCEN 4151 (Flow Visualization). I chose to do a cloud image for this assignment since I took a cool picture of clouds this semester. The purpose of this assignment is to show and interpret the Skew-T plot at the time the image was taken. In this report, I am going to go over the background, analysis of the Skew-T plot, the photographing technique and conclusion. In this photo, I aimed to take a picture of a Stratocumulus cloud that is at a high elevation.

2. Background

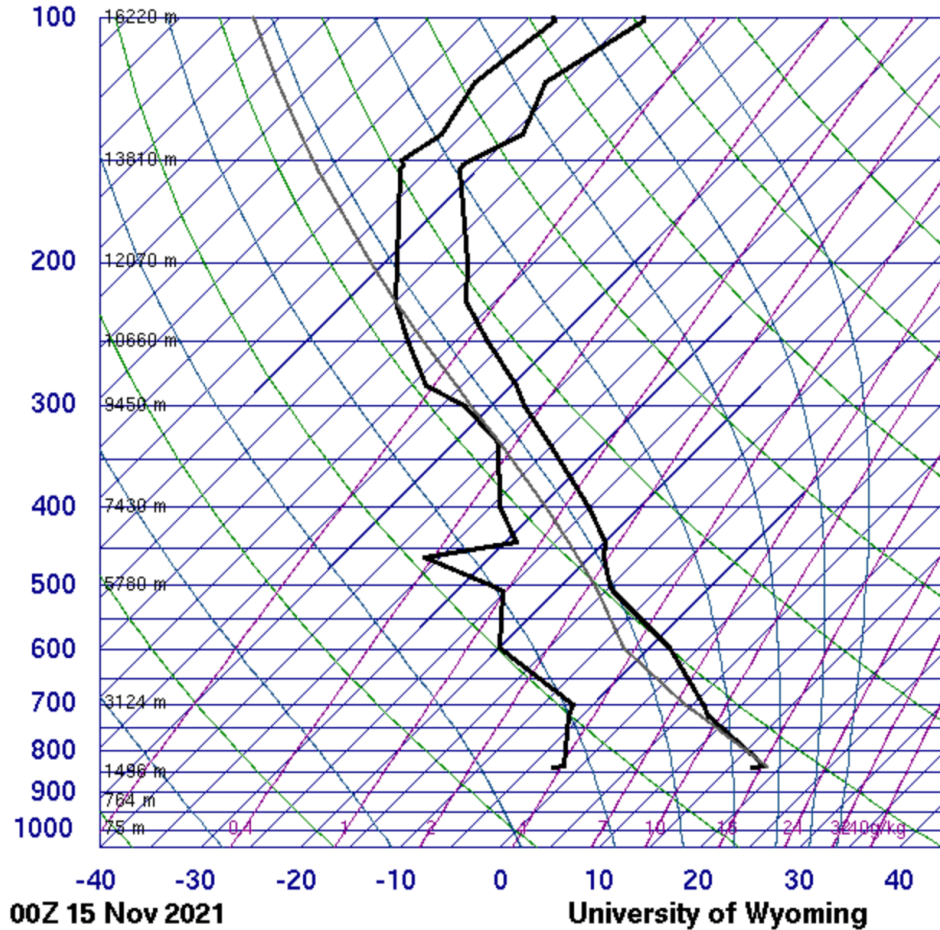
The reason behind choosing this image is because it shows a stunning cloud formation. The image was taken at US 36 & Broomfield Station in Broomfield County at approximately 5420 ft. The picture was taken on Nov 15 at 4:47 P.M. The iPhone X camera was facing the west while the clouds were moving toward the northeast at an incidence angle of 25 degrees.

3. Analysis

The identification of the clouds is that they are Stratocumulus because they were forming a puffy layer in the sky [1]. In addition, the Stratocumulus clouds heights are usually ranging between 2000 – 7000 ft [1]. From where I was standing, the clouds seemed to relatively close to me. Looking at the picture you can observe that the clouds are kind of clouds to the building on the far right. The wind speed at 4:53 P.M was 7mph which is a moderate speed [2]. Moreover, at 4:53 P.M, the temperature was 60 F and no precipitation was recorded on that day.

The Skew-T plots are used to get information regarding the upper air observations like clouds. Broomfield county is not available in the Skew-T Wyoming website, so I chose Denver which is the closest place to Broomfield county. The Skew-T plot below is for Nov 15, 2021 at 00Z which implies 6:00 P.M at sunset. This is approximately one hour after I took the picture. The atmosphere is stable since the CAPE value in the Skew-T plot below is 0. The Skew-T plot shows cloud formation around 1500 m.

72469 DNR Denver



SLAT	39.77
SLON	-104.87
SELV	1611.
SHOW	-9999
LIFT	1.58
LFTV	1.39
SWET	-9999
KINX	-9999
CTOT	-9999
VTOT	-9999
TOTL	-9999
CAPE	0.00
CAPV	0.00
CINS	0.00
CINV	0.00
EGLV	-9999
EGTV	-9999
LFCT	-9999
LFCV	-9999
BRCH	0.00
BRCV	0.00
LCLT	266.8
LCLP	611.6
LCLE	319.5
MLTH	307.1
MLMR	3.94
THCK	5705.
PWAT	9.69

4. Photographic Technique

The cloud image was captured using an iPhone X camera with a 52mm lens. Furthermore, the image was captured using a 16 ISO, f2.4 aperture, and 1/207 second shutter speed. The photograph was post-processed using the Lightroom editing software, the shadows of the bottom of the picture were reduced using a linear gradient to reduce distracting elements like the buses and the cars. Moreover, the saturation of the colors red and orange were increased to make those two colors pop up in the picture. Also, I enabled the lens correction to make the buildings look more realistic. Additionally, the original image size was 4032 x 3024 pixels, and the final image size was 4x5.



Original Image



Final Image

5. Conclusion

The photo shows clouds with Stratocumulus formation. Lightroom software was used to edit the image perspective, shadows and colors. I am so happy with the final result; I like how the image draws the eyes to the clouds and I also like the colors. The Skew-T plot shows that the clouds are formed around 1500 m which is a valid interpretation for Stratocumulus clouds. Overall, I feel like I fulfilled my intent of this project and I am more than satisfied with the result.

6. References

[1] *Learn about stratocumulus clouds: Low, puffy layer.* whatsthiscloud. (n.d.). Retrieved December 12, 2021, from <https://whatsthiscloud.com/cloud-types/stratocumulus/>.

[2] *Denver, CO weather history star_ratehome.* Weather Underground. (n.d.). Retrieved December 12, 2021, from <https://www.wunderground.com/history/daily/us/co/denver/KDEN/date/2021-11-15>.