

MCEN 5151: Flow Visualization

December 12, 2021

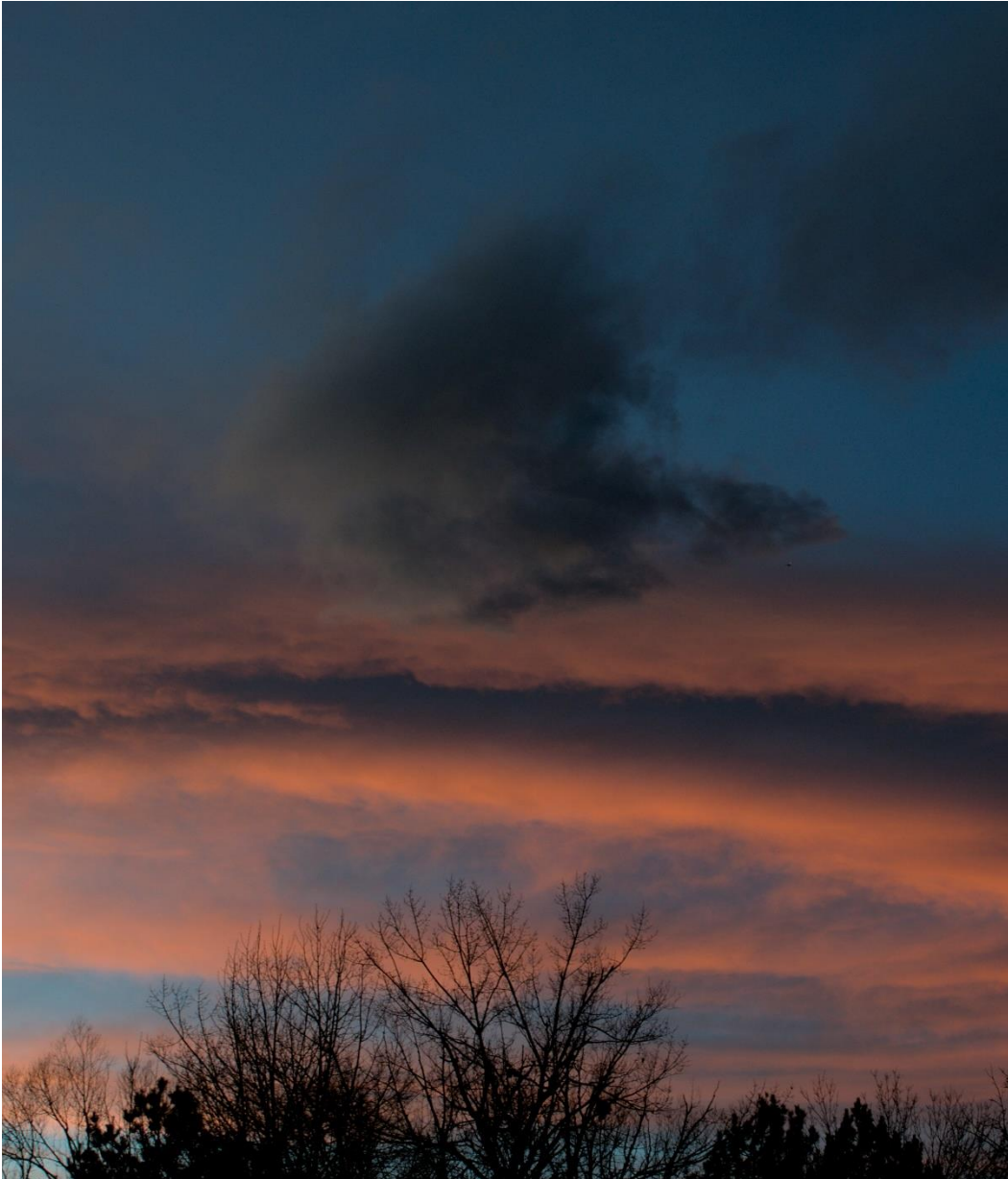


Figure 1: Western clouds at sunset

Robert Sasse

Flow Visualization Clouds 2

Introduction

I took this photograph on December 4th at 5:00 pm in Boulder, just north of east campus. The goal of this assignment was to take a photograph of an interesting cloud formation and to complete some analysis of the atmospheric flow conditions at the time of the photograph. I chose this photograph because I liked the juxtaposition of the lower grey cloud with the higher pink clouds. I like the contrast between the type of clouds, and I think it is interesting to photograph two different types of clouds against each other.

Cloud Analysis

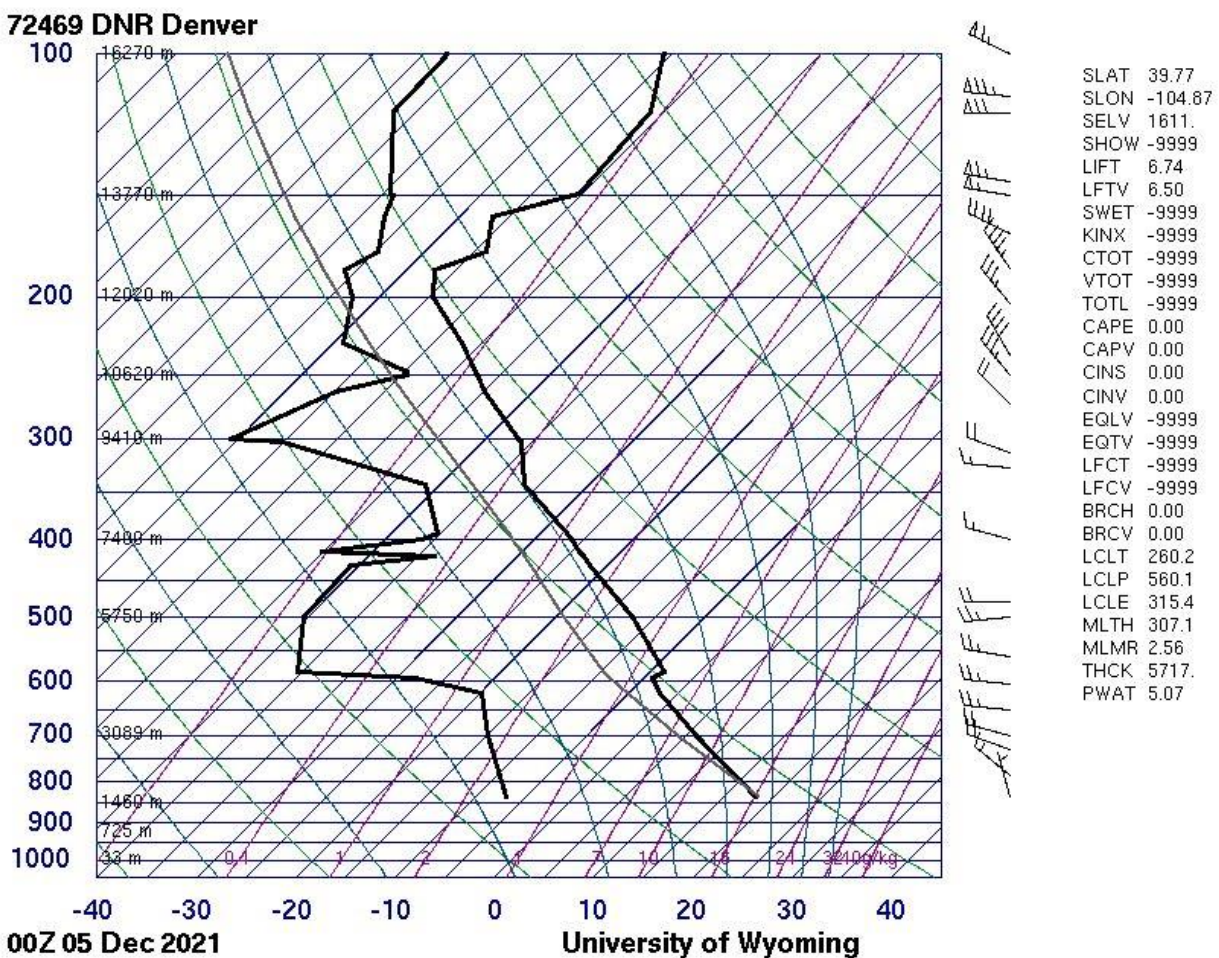


Figure 2: Skew-T Diagram¹

The clouds photographed for this assignment are fall into two categories. The first cloud is dark grey. That's because it is in the shadow of the flat irons –likely in the lower

atmosphere. This cloud has some shape to it and is likely stratocumulus (consistent with low altitude and shape). Then behind the first cloud there are pink clouds. These must be higher up because they are out of the shadows of the mountains. They could be cirrostratus clouds.

Based on the Skew T diagram about it seems like the stratocumulus cloud could be at altitude between 4000-4500 meters. The second set of clouds could be at an altitude of about 9 km. This is consistent with cirrostratus clouds. For this Skew T diagram, the information was taken from the Denver station at 6 pm the same day. The convective available potential energy (CAPE) is given as 0 – indicating stable atmosphere around Denver for this time. Then there would be little change of storm. This is consistent with the weather for that day – it was quite calm.

Imaging Technique:

Camera: Nikon D3300

Image Size: 6000 x 2834

Focal Length	Exposure	f/	ISO
22 mm	1/30	7.1	200

To take the picture I held the camera by hand. I wanted to make sure there were some trees in the picture to give some reference for the size and height of the clouds. I also didn't want to over edit the photo. I cropped the photo slightly and I used the editing software dark table and altered the hues slightly hoping to create a bluer sky with more contrast between the clouds and the sky.

Results of Final Image and Revelations:

I was happy with the results of this image. I really like the color of the cirrostratus clouds. I feel confident that I was able to accurately identify the clouds photographed. I think I was able to present a good example of a stratocumulus cloud and cirrostratus clouds.

References

1. University of Wyoming. Atmospheric Sounding. <http://weather.uwyo.edu/upperair/sounding.html>
2. Skew-T: A Look at Cape. The Weather Prediction, <http://weather.uwyo.edu/cgi-bin/sounding?region=naconf&TYPE=GIF%3ASKEWT&YEAR=2021&MONTH=12&FROM=0500&TO=0500&STNM=72469>
3. <https://www.zmescience.com/science/types-of-clouds/>