Clouds 2

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Flow Visualization

4/14/09

Introduction

The purpose of the second cloud assignment was to capture an image of a cloud that shows unique physics and an intriguing image. Clouds are a great example of flow visualization because clouds are water particles suspended in a sea of air, where air currents and flows can shape the clouds and provide insight into upcoming weather conditions.

Body

The image was taken in Boulder, Colorado on the corner of 14th St. and Euclid, and was taken on April 8, 2009 at 12:27 PM. The camera was angled at approximately 30° above the horizon and was facing south.

According to the skew-T plot for this day, the atmosphere was very stable at all elevations. The skew-T plot shows that clouds are most likely to be forming within the region of approximately 23,000 ft to 39,400 ft (7km to 12 km). I think that there are three different types of clouds in this image. I believe that the high thinly layered clouds are cirrocumulus clouds. The main bunch of clouds near the bottom of the image are cumlus humilis clouds, and small clouds on the right side of the image are cumulus clouds. The cirocumulus clouds are around 36,000 feet in elevation. The cumulus humilis and cumlus clouds are around 23,000 feet in elevation. The winds are coming from the west, carying the clouds over the mountains and into the plains. These clouds generally form by a pocket of warm air rising in the atmosphere until it reaches a cooler temperature where the water in the air condenses. It is possible that this pocket of air rose up as it traveled over the mountains and condensed at different elevations to create the assortment of clouds seen in this image.

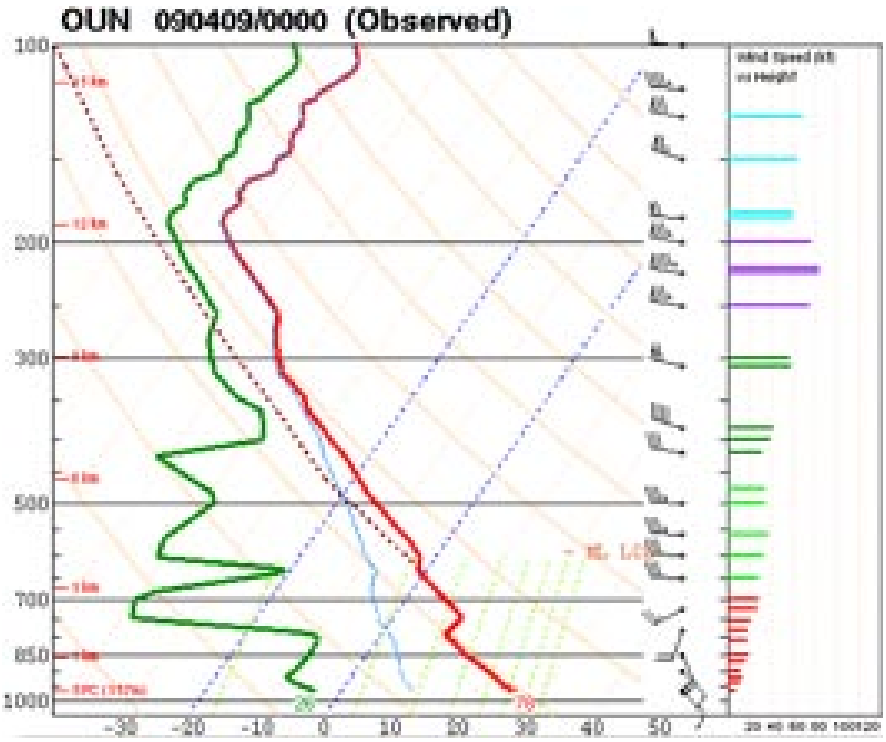

Fig.1 Skew-T Plot for 4/8/09 at 6 PM

Technique

The size of the field of view was approximately five miles across by seven miles vertically. The distance from the object to the lens was various depending on the cloud formation. The distance was estimated to be between five and eight miles. The focal length of the lens was 7.9 mm. The camera used was a digital Sony CyberShot DSC-P200. The original image had an image width of 2,304 pixels, and an image height of 3,072 pixels. The final image had an image width of 2,298 pixels, and an image height of 2,261 pixels. The aperture was set to f/5.6. The shutter speed was 1/1250 of a second. The ISO was set to 100. The original image was cropped using iPhoto.

Conclusion

This image reveals a few different types of clouds in one area. I really enjoy the light wispy clouds at the top of the image. I wish that I could have had a larger perspective of the area that the clouds were in. I think that cloud physics are well depicted in this image. I fulfilled my intent with this image. I would like to widen the field of view to

capture more clouds that were in the area at the time. To develop this image further, possibly using a fisheye lens would have made for a more intriguing image.

References:

http://en.wikipedia.org/wiki/Cumulus_clouds

http://w1.spc.woc.noaa.gov/exper/soundings/09040900_OBS/