

MCEN 4228 – Flow Visualization
Clouds Project 1

Edge of the Snow Storm

The intent of this image was to capture the boundary between clear skies and cloudy/inclement weather. Personally it has always been a point of interest to witness the influx of thick clouds into clear skies. It feels literary and maybe a little surreal in contrast to the pleasant day that was just being experienced. This was not easy to “hunt” and required patience and persistent observation of the sky and weather forecast. The goal was not to capture a single cloud image but rather a system of clouds so as to perceive a large magnitude and wider variety of cloud images.

The image was taken just East of Boulder near the town of Superior along a suburban residential road. It was Friday, February 20, 2009 at 5:24 pm. Shooting toward the end of the day was favorable in this respect because it was around the time the weather was due to change and also when the sunlight produced some interesting lighting. The camera was positioned facing the South-Eastern sky at an estimated angle of 55 degrees above horizontal.

The image is pretty broad and captures a number of different clouds. There appears to be a large presence of stratocumulus clouds indicated by the large dark, rounded clumps grouped into the left side of the frame. In the distance, around the lower center of the frame, puffy, clean-edged cumulus clouds are present (Cartwright, 1). Additionally, to the right side of the frame and outlined by blue skies, there are layered rolls of altocumulus clouds. Altocumulus clouds are indicative of a cold front so it is not surprising that it snowed later in that evening. The appearance of the sky at that time was rather two-faced with the Southern sky remaining quite clear and blue and the Northern sky escorting in escalating cloud cover and darker colors. Figure 1 below shows the nearest Skew-T plot for that time of day (2/21 00Z corresponding to 6:00pm on 2/20). In the 1400m to approximately 4000m elevation range, the temperature sounding follows the adiabatic line almost exactly with a large gap between the dew point sounding signifying stable, dry conditions at those elevations. This is not surprising because there was nice breezy weather during the day that remained until the imaged clouds completely moved in over the region. From 4000m and above, the Skew-T displays a temperature sounding line with an increasingly steeper slope with respect to the adiabatic line. This indicates a slightly unstable atmosphere at those higher elevations and the narrower gap between the temperature and dew

point indicates a better likelihood of cloud formation. Therefore higher altocumulus cloud formation is not surprising (wikipedia, para. 1).

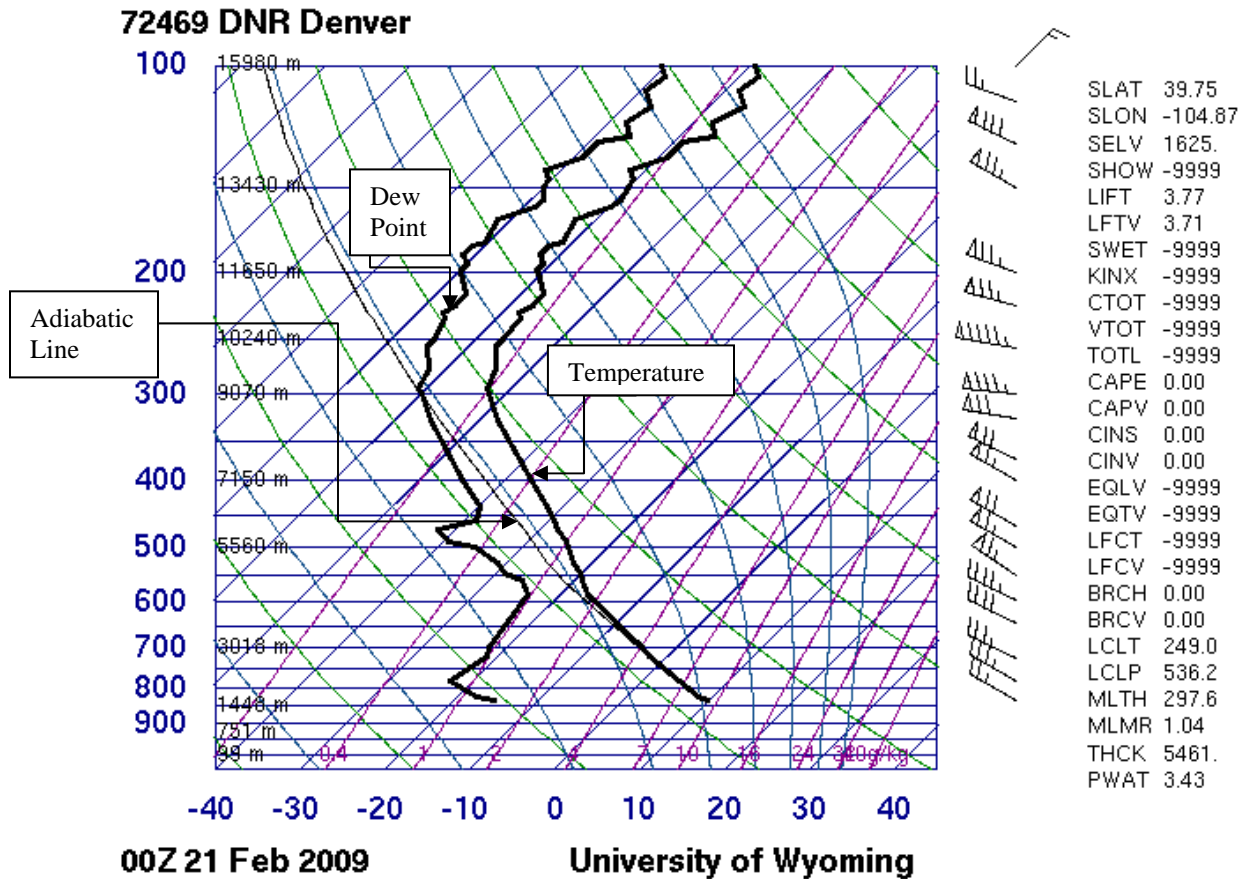


Figure 1

The best estimate at the elevation of the clouds is anywhere in the 4000-10,000m range offering abundant mid to high level formations. It is difficult to estimate due to the abundance of clouds present. The Skew-T indicates increasingly strong winds with increasing elevations which is probably why the snow storm moved in rather abruptly at sunset. The system was undoubtedly a cold front ushered in from the north. This caused a drop in pressure resulting in some atmospheric instability which combined with very low temperatures to produce snow throughout the evening.

The camera specifications for the image are as follows:

- Camera Type: Olympus FE-340, 8.0 megapixel, 5x optical zoom
- Lens: AF ZOOM 6.3 – 31.5mm, 1:3.5-5.6
- Field of View: Foreground ~ 100 yards, Background = cannot tell (upper atmosphere)

- Shutter Speed: 1/160 sec
- Max Aperture: 3.62, f number = 3.5
- Focal Length: 6.3mm
- ISO: 64
- No Zoom
- Resolution: final image = 12059 x 9044 pixels

Photoshop was used to enhance the color and contrast of the image. The curves function was used to sharpen and enhance contrast between the light and dark elements. Also, a green photo filter was applied to better bring out the color of the sky and clouds. No cropping was performed and there is not a considerably drastic difference between the original and post-Photoshop images. I feel that a lot should not be modified so that the clouds in the image closely resemble how they looked to the naked eye at the time.

The final image reveals a great balance between bright blue, clear skies and darker, thick cloud cover. I like the boundary line showing the clear skies with the wavy altocumulus clouds melting into the dark stratocumulus clouds. Also, I like the glowing yellow light of the setting sun illuminating the background in the lower left side of the frame. I don't know how I feel about the trees and houses in the lower edge of the frame. On one hand I like the perspective it offers the image, but on the other I feel that they may just be an obstruction. I decided not to crop it out because it would have omitted some of the interesting clouds in the background. If I had a second chance I would have sought out a more open space environment to capture the clouds. Also a larger depth of field could help differentiate and clarify between near and far objects. Observing a greater contrast in clear skies and stormy weather would be nice to observe as well. Patience, preparation and close observation is simply necessary to fulfill this desire. All in all I feel the image turned out well.

References

“Alto cumulus Cloud,” Wikipedia Entry. Obtained 24 February 2009,
<http://en.wikipedia.org/wiki/Alto cumulus_cloud>

Cartwright, Dr. Tina. “Cloud Identification Guide: A Dichotomous Key,” West Virginia
Climatology, Obtained 24 February 2009
<<http://www.wvclimate.org/documents/cloud/CloudID.pdf>>