

Flow Visualization
Spring 2011
Clouds Assignment #2

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For the second clouds assignment, I had developed an idea of what I wanted to capture but I was also aware that what I was seeking was a seemingly rare occurrence in the Boulder valley. Having grown up in Berkeley California, I recalled my childhood views from our house which overlooked the town of Albany, The Bay and finally the San Francisco skyline. I recall days where I would witness the onset of the fog layer as it creped over San Francisco and made its way across the water up towards our house. As a youngster I was unaware of these mysterious clouds and mistakenly called them fog because that's what my mind thought was correct. About 15 years later I am living in Boulder Colorado and studying engineering at the University of Colorado where I took this picture to cohesively connect the fog in my new location with that of my past.

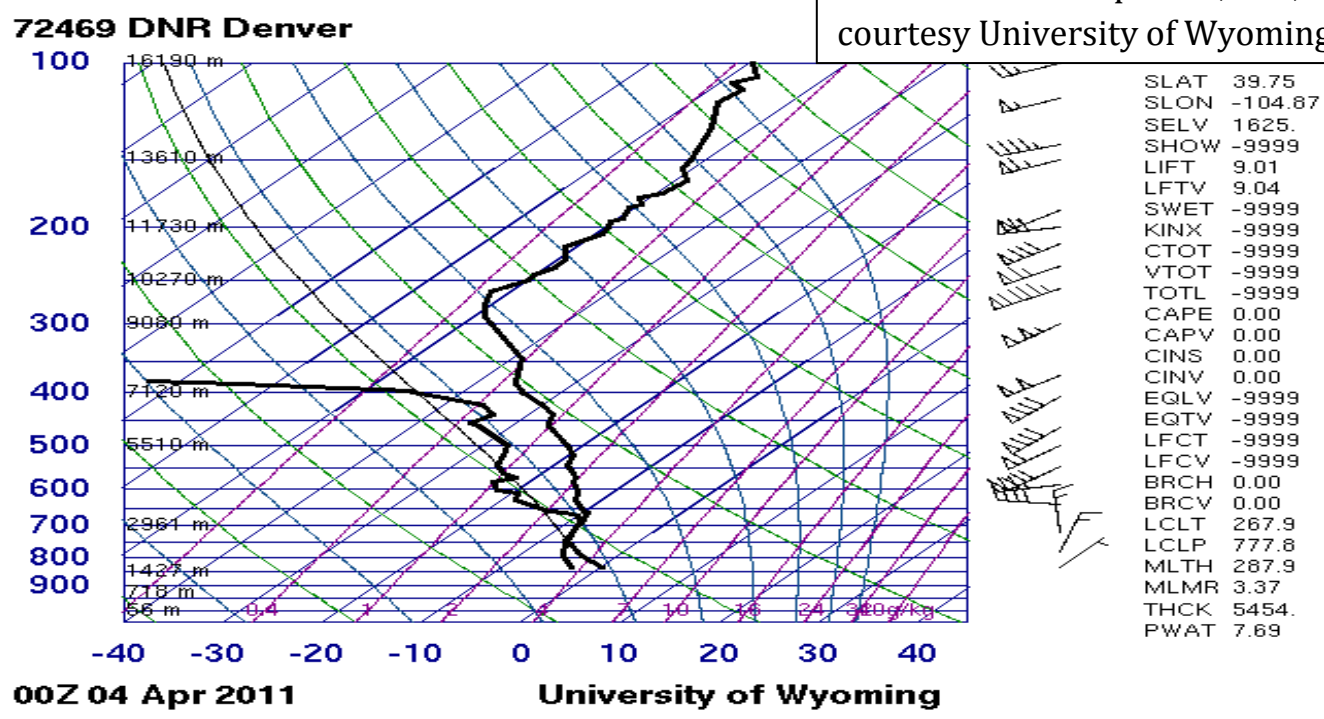


The final image of the fog above the flatirons.

The day this photo was taken, April 3rd, 2011, I had noticed the beginnings of the low hanging clouds along the flatirons so I put on my hiking shoes and started walking west from the parking lot of the National Center for Atmospheric Research (NCAR). I started the hike at around 1PM and made it over the first set of foothills and past the water tank before there was an opening in the trees which provided a great view of the flatirons. The temperature was about 40° Fahrenheit with calm winds and accumulating precipitation. I was able to snap this picture within about five minutes of arriving at this location, and shortly following this moment I was engulfed by clouds which remained present for the following hour before I started the walk back.

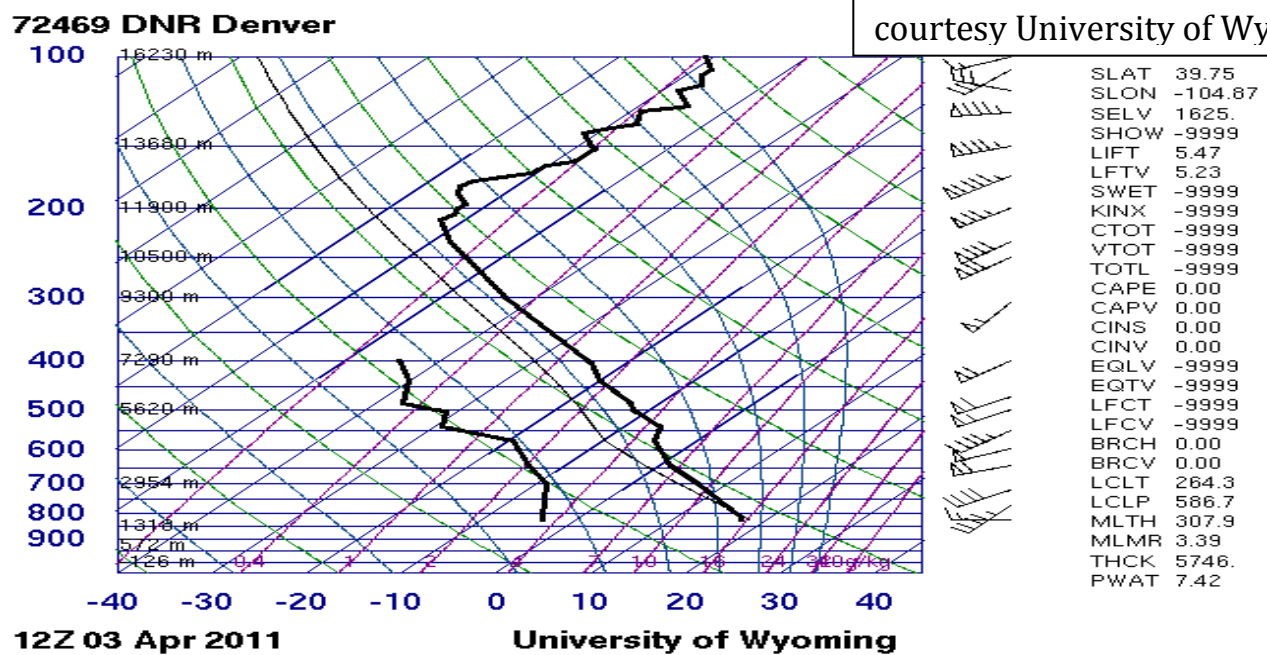
The clouds presented in this image definitely bring me back to my childhood where I would observe and become engulfed in fog. The clouds can be technically labeled as nimbostratus due to their undefined shape and their grayish hue. Another characteristic of nimbostratus clouds is their altitude, which is typically below 3000 meters and occasionally reaches down to the surface.¹ This fact is reinforced when observing the skew-T plot for 6PM of the same day from the Denver International Airport, which is presented below. The converging black lines at the lower altitudes indicate the presence of clouds and the lines diverge when approaching 3000 meters indicating that the sky had scattered clouds and was clearing as the altitude increased.

Skew-T for 6PM April 3rd, DIA;
courtesy University of Wyoming³



The skew-T for the morning, (shown below) indicates a CAPE value of 0.0 which means that the atmosphere was stable and the black lines do not converge at any point on the plot, therefore this indicates that the clouds developed and grew as the day when on, which I can confirm as an observer.

Skew-T for 6AM April 3rd, DIA;
courtesy University of Wyoming⁴



The photo was taken with a Casio EX-FS10 camera which is an economical and portable digital camera with nine megapixels, 3x optical zoom and high speed video capabilities. I was about a half mile to a mile away from the flatirons shown in the photo and the width of the scenery in the photo is about a mile wide. The final image has been cropped slightly down to 3456 pixels wide by 2154 pixels high and the camera metadata states that the F-stop value was f/8.4, the ISO was set to 100 and the focal length was 11.5 mm, the aperture value was f/3.9, while the shutter speed was not recorded. The original image is 3456 pixels wide by 2592 pixels high with only minor color alterations using the curves feature and the cropping of some of the landscape at the bottom of the photograph using Adobe Photoshop CS3.

Overall I am very happy with this picture and I feel like I was able to capture the Boulder version of the 'fog effect' with great precision and framing with the flatirons. The original image is shown below and has more of the scenery that was previously mentioned. One good suggestion made by a classmate was to switch the image to black and white because it is already very close. Although this is a great idea, I am a fan of capturing the beauty as it was presented to me naturally and when I view this picture I am brought back to the location and I recall feeling the humidity that was present and watching the clouds move across the mountain. The Boulder fog is just as mysterious as the Berkeley fog and they both bring a sense of comfort and warmth to me.



The original image taken from Enchanted Mesa Trail April 3rd 1:30 PM

References

1. Wikipedia, Nimbostratus clouds;

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

2. University of Wyoming, Skew-T appendix;

<http://weather.uwyo.edu/upperair/sounding.html>

3. University of Wyoming, Skew-T chart 6PM;

<http://weather.uwyo.edu/cgi-bin/sounding?region=naconf&TYPE=GIF%3ASKEWT&YEAR=2011&MONTH=04&FROM=0400&TO=0400&STNM=72469>

4. University of Wyoming, Skew-T chart 6AM;

<http://weather.uwyo.edu/cgi-bin/sounding?region=naconf&TYPE=GIF%3ASKEWT&YEAR=2011&MONTH=04&FROM=0312&TO=0312&STNM=72469>