

UNIVERSITY OF COLORADO, BOULDER

Mountain Wave Cloud

Cloud Assignment 1

Amanda Kennedy

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MCEN 4151
Flow Visualization

The purpose of this image was to capture the beautiful flow phenomenon of clouds. This was the first of two cloud assignments for the CU Boulder Flow Visualization course. The intent was to capture the sharp contrast between the ominous dark clouds, the light clouds, and the vivid blue sky. In addition, it was intended to capture the smooth leading edges of the cloud, as well as the details in the dark portions of the cloud. The result was an intense image of a mountain wave cloud formation.

This image was taken on February 18, 2014 around 6pm in Littleton, CO. The camera was slightly northwest, towards the mountains, and was pointed approximately 75 degrees upward of the horizontal axis. The clouds captured in this image can be classified as altocumulus lenticularis, or more commonly known as mountain wave clouds. The surrounding sky was mostly calm and clear to the west with remnant clouds scattered to the east. Wind was low, which made for a beautiful evening to photograph the sky. The weather had been about the same on the previous day, but the day to follow was expected to bring some minor thunderstorms with snow to follow that on February 20. The skew-T plot below confirms that the atmosphere was stable (CAPE = 0) during the time the picture was taken.

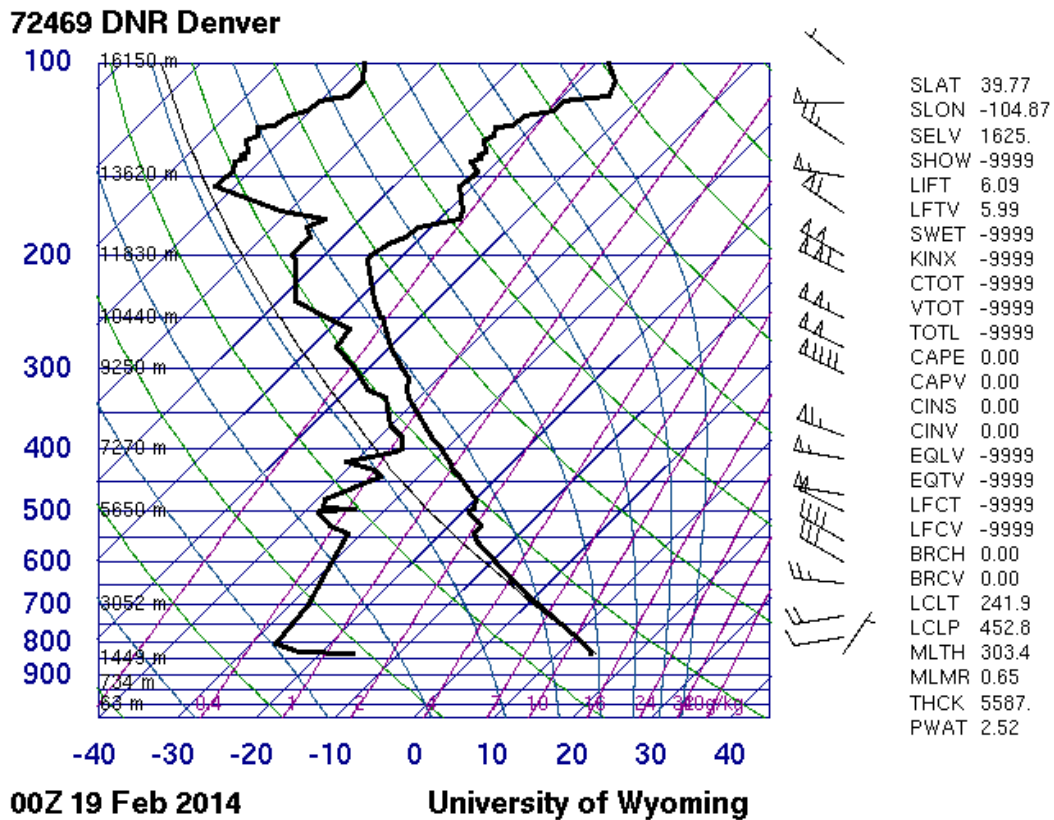


Figure 1: Skew-T Feb 19 00Z (Wyoming)

The skew-T diagram also shows some jaggedness, which makes sense when you notice the “stack-like” layers in the clouds. The mountain wave cloud is pretty common in this location, especially with atmospheric conditions similar to those present during the photograph date. The coloring is unique to the position of the sun at the time the image was captured. The clouds to the east were dark, but the

setting sun casted a beautiful light effect on the leading edges of the clouds, leading the illuminated clouds to contrast nicely with the rich blue sky.

The image was captured using a Nikon D40X digital camera with a focal length of 19mm. I used the aperture-priority setting with an f-number of f/9, ISO of 1600, and shutter speed of 1/1250. I chose a high ISO because I didn't need a large depth of field, and I loved the natural light from the clouds, so I wanted a high sensitivity to capture it the best I could.



Figure 2: Original Image (3900 x 2613 pixels)

Because of my position relative to the clouds, I captured several trees around the edges. I decided to crop the bottom of the image, but I left the tree on the upper left because I loved the depth it added. A good comment was made during the feedback session that the tree seemed to be in good focus, which means the camera was likely not focused at infinity. That is something I will keep in mind and be aware of while shooting my next cloud image. I minimized the post-processing because I really liked the tonality and details present in the original image. The main edits I made were cropping the image and increasing the contrast (mainly the highlights) just slightly.

Overall, I was pleased with my final image. I do think I could have included more of the original image, and possibly use Photoshop to get rid of the trees at the bottom so more of the cloud formation is visible. I also could have increased the depth of the shadows in the clouds to make it more dramatic, but

the image doesn't necessarily need it. The formation of the mountain wave cloud is shown well, but could be improved by including a larger range of the clouds to the east; unfortunately my house was in the way so I wasn't able to improve the orientation.

Works Cited

Wyoming, University of. *72469 DNR Denver Sounding*. 19 February 2014.