

Clouds Second Report



Cumulus clouds over Dercum mountain, Keystone, Colorado, 7:58 a.m.

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I woke up early to ski on March 27th and walked out on the deck outside of my room. The sun was out and the clouds seemed frozen in the sky. I went back to my room to get my camera to take pictures of the clouds, illuminated by the sun. They were spaced well across the sky and foreshadowed that I had an excellent day of skiing ahead of me.

On the deck of my house I was at about 9,173 feet in elevation, facing South towards the Keystone ski resort. I took the picture at approximately 25 degrees up from the horizon, as the clouds were far away, about 10 miles by my guess.

I estimate that the clouds were about 4,000 feet above the ground. The clouds had great shape and showed no signs of being blown out by the wind. I guess that these were cumulus clouds because they were low in elevation but held a full shape. The days leading up to this were very warm and calm, and this day was no different. I believe that the clouds were caused by simply the moisture in the air rising as the sun came up.¹ The atmosphere was unstable according to the skew-T diagram because there is a CAPE value of 37.69. However, the clouds show that the atmosphere was more stable. The weather station was in Denver so I believe that the atmosphere there was unstable, but it was stable in Keystone.

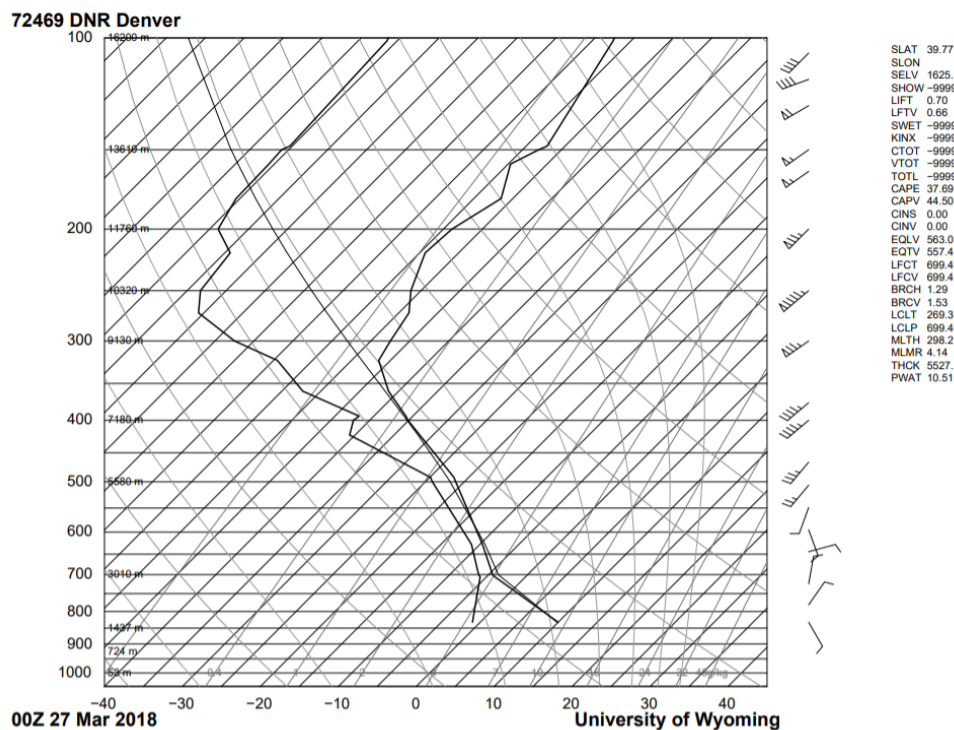


Figure 1. Skew T for 27 March 2018.

The field of view is about a 5 miles wide by my estimation, as the clouds that I took a picture of were about 5 miles away from me. The camera I used was a Nikon D3000 with an 50 mm lens, which has a focal length of 14.83 inches. The photo was taken with aperture at f5.6, a shutter speed of 1/250, and ISO at 800. I edited the image with Adobe Photoshop CC, I increased the contrast of the image to bring out the definition of the clouds. I had to increase the brightness

of the image by about +15 since the shutter speed was so quick on the original image. I cropped out a lot of the original image because there was a lot of the foreground showing, but I wanted to keep the mountain in the shot because it adds a intrigue and perspective to the photo. I also changed the saturation and hue of the blues to purple, this made the image really interesting. Although, on my computer screen, the purples were not so dramatic, but on other screens they were apparent. I think the post processing made the image a lot better than it was before and I'm happy with the results. The original image is shown below:



And the final image, after post:



The image reveals the formation of clouds deep into the Rocky Mountains. I had no clear intent for this image, but I was glad that I was able to see some well-formed clouds on a beautiful morning. I could only give a guess to why the clouds were formed, it would be nice to know what a meteorologist would say about the formation of the clouds. I can do more research into the effects of temperature changes and high winds in the Rockies, as well as chinook winds² that cause the formation of clouds in the Rocky Mountain regions. These clouds could be a result of the chinook or the Foehn cloud effect, which is seen in mountainous regions³.

References

- Schmunk, Robert. "Cloud Climatology." *NASA International Satellite Cloud Climatology Project*, 1990, <https://isccp.giss.nasa.gov/role.html>.
- Waddel, Elizabeth. "Chinook Winds." *National Park Service*, 31 Mar. 2012, www.nps.gov/romo/winds.htm.
- Jeffery, Billiam A. "FOEHN – CLOUD STRUCTURE IN SATELLITE IMAGES." *Colorado State University*. 17 Oct. 2001. <http://rammb.cira.colostate.edu/wmovl/vrl/tutorials/satmanu-eumetsat/satmanu/cms/fh/structure.htm>