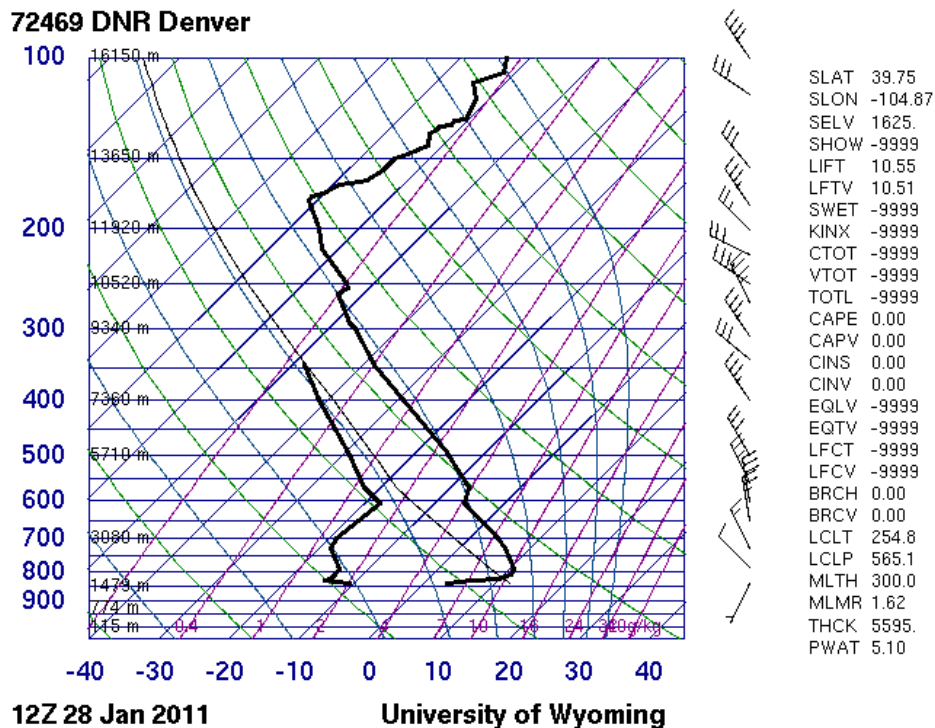


Nathan Sheiko  
 MCEN 5151  
 2/28/11  
 Clouds #1

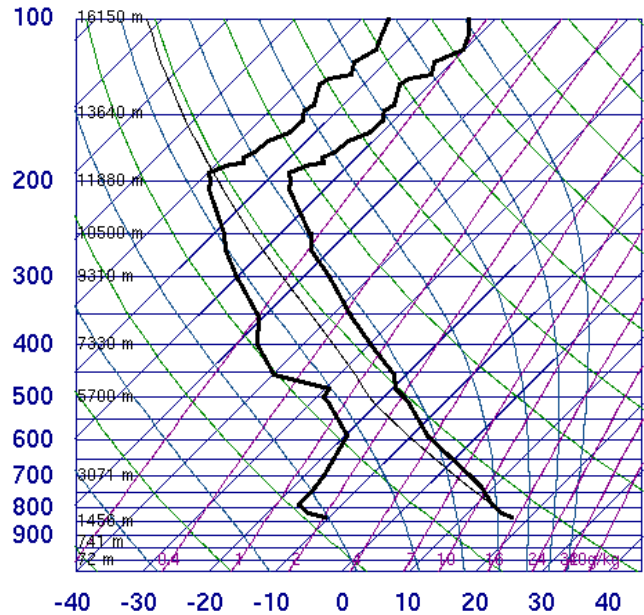
For the first cloud assignment, I took many images of clouds on different days throughout January and February 2011. I was also able to take some images from an airplane over the clouds in Wyoming. Unfortunately, the airplane photos were taken late in the evening resulting in very low light and poor image quality. The final image chosen for submission shows mountain wave clouds over the Flatirons.

The image was taken on January 28<sup>th</sup>, 2011 at 11:14am from the roof of the engineering center parking garage at CU. I was facing west with a camera elevation of approximately 5° above the horizon. Most of the lower foreground was cropped out, making the image look like it was taken at a higher elevation above the horizon.

The clouds in the image are mountain wave clouds, or altocumulus lenticularis. Mountain waves are created by underdamped air oscillating downwind of the mountains, and the resulting clouds are trapped at the peaks of the oscillations. As expected, the atmosphere was stable the day the image was taken. The skew-t plots below confirm the stable atmosphere. I decided to include the two skew-t plots because the image was taken at 11am, almost exactly halfway between the two times shown on the two plots.



**72469 DNR Denver**



- SLAT 39.75
- SLON -104.87
- SELV 1625.
- SHOW -9999
- LIFT 5.07
- LFTV 4.98
- SWET -9999
- KINX -9999
- CTOT -9999
- VTOT -9999
- TOTL -9999
- CAPE 0.00
- CAPV 0.00
- CINS 0.00
- CINV 0.00
- EQLV -9999
- EGTV -9999
- LFCT -9999
- LFCV -9999
- BRCH 0.00
- BRCV 0.00
- LCLT 253.4
- LCLP 520.4
- MLTH 305.4
- MLMR 1.57
- THCK 5628.
- PWAT 5.07

00Z 29 Jan 2011

University of Wyoming

The elevation of clouds is somewhat difficult to discern from the image, but I believe they were less than 10,000ft. The stable skew-t plots do not help in estimating a likely cloud altitude, as the two black lines never come together. The winds on the day were from the northwest, creating the mountain waves perpendicular to the wind direction. The stable atmosphere was created by a high-pressure system that also lead to an unseasonably warm temperature of 66°F. The high-pressure system remained for the next two days

I took many images of the same cloud group over the course of 2 hours during the morning of January 28<sup>th</sup>. Early in the morning around 9am, the clouds were slightly broken up. As the clouds began to develop further, they became more laminar around 11am, which lead to more visually appealing photos. With a significant number of photos to choose from, it was difficult to decide between different perspectives. Eventually, I decided I liked the wide aspect ratio more than any of the close-up shots. To further increase the wide aspect ratio, I horizontally stitched two consecutive photos together using Canon PhotoStitch software. The list below summarizes the image parameters. The distance to the clouds was ~10 miles and the width of the field of view was at least 10 miles.

Camera:	Canon PowerShot SD870 IS
Focal Length:	6.1mm
ISO:	ISO 80
Shutter Speed:	1/200 s
Aperture:	f/9
Original Pixel Size:	2824 x 1118
Final Pixel Size:	2728 x 820

After the two photos were stitched together, there was a significant vertical line of darker pixels showing the stitch merge line. I removed the line using the Photoshop clone tool, and then I cropped out the entire foreground except for the Flatirons. I felt like the resulting image was visually appealing with an extremely wide aspect ratio and dramatic mountains. Next, I increased the contrast to increase the detail in the slightly over-exposed clouds on the far left side of the image. Next, I played with different colors to see if I could find something more interesting than the natural tones. First, I inverted the image colors which lead to a very cool hand drawn look for the Flatirons and made the clouds black. Unfortunately, the background was a dirty yellow/brown so I tried several alternatives using the hue/saturation adjustment tool. Eventually, after many different options, I went with a red background that gave the image a somewhat ominous quality.

Overall, I felt like I produced a dramatic image with unique contrast between the white Flatirons and black clouds. Some people might like the natural colors better, but I feel like the artificial colors lead to a more unique image.