

# Clouds Image One

## Flow Visualization

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This image was taken for the first cloud assignment. The intent of the image was to capture the beauty and essence of the clouds on a particular day. This specific image was used to capture the clouds coming over the mountains, showing mountain waves with clear bands of parallel clouds.

On Friday February 5, at roughly 3:15 in the afternoon the image was taken looking west from an overlook site on Flagstaff Rd. The camera was held at a 5-10 degree angle from horizontal, allowing for the clouds to dominate the image rather than the mountains.

The clouds seen in the image are mostly mountain wave clouds, altocumulus lenticularis, but also seen in the center above a wave cloud is a cirrostratus, very wispy and higher than the wave clouds [3]. In the background appearing to be resting on the mountains is a foehn cloud wall. All of these clouds are a result of a stable atmosphere as seen in the skew-T plot below.

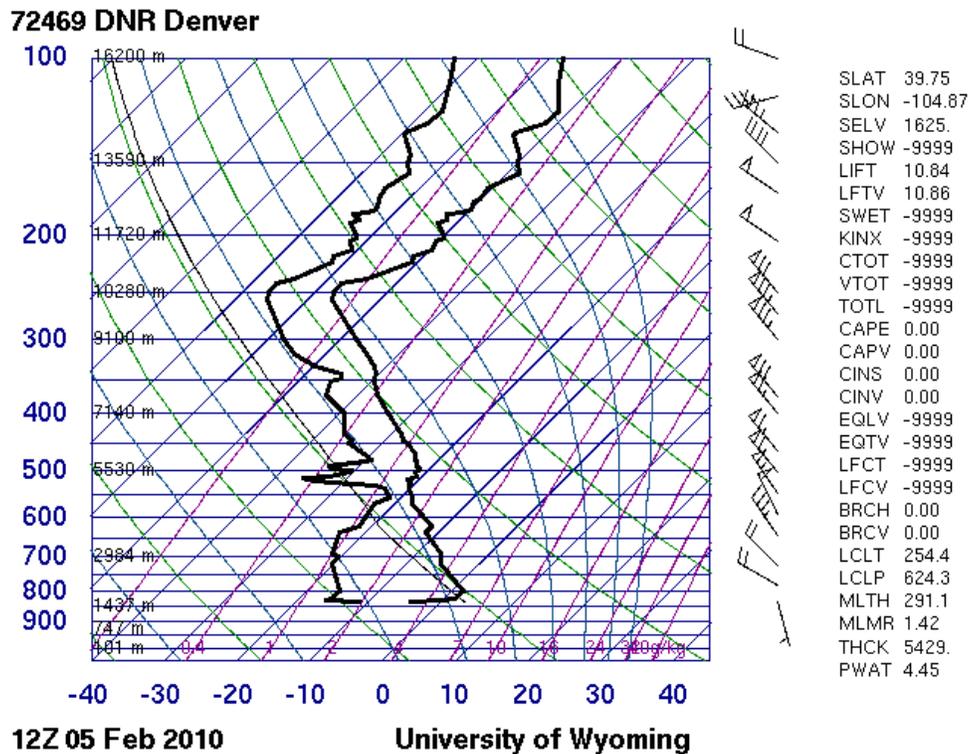


Figure 1: skew-T plot 6am Feb. 5 '10 [2]

Also, seen from the skew-T is that the clouds altitude is around 5500-6000m which is consistent with altocumulus clouds. The last important piece of information to take from the figure is that the winds were relatively calm below the cloud level but as the altitude approaches about 6000m it begins to become windy. This skew-T only represents the morning atmosphere on the 5<sup>th</sup> of Feb. however to better assess what was occurring skew-Ts from the previous day and following day were also studied. These skew-Ts were consistent in showing a stable atmosphere with no precipitation occurring [2]. This stable atmosphere is what allows for the mountain waves to occur; they are a result of rising and falling air as the air moves over the mountains. The air as it flows over a mountain range will undergo repeated uplift and descent, the clouds form at the crests of these waves when there is moisture in the air and the gaps form as a result of evaporation from adiabatic heating upon descent of the air the final result being bands of evenly spaced parallel clouds [3]. The foehn wall also forms from a stable atmosphere as a foehn event is occurring; warm dry air blowing off the lee slopes of a mountain range. The cloud wall forms and is seen from the lee side as the dry air blows off the slopes [1].

The photograph's field of view is difficult to gauge, however, could be estimated to be roughly 3 miles wide (in the foreground) and from the vantage point to the clouds can be estimated at around 2.5 miles away. The image was captured using a Nikon D50 with a normal orientation and no flash. The original image was 2256 x 1496 pixels and the edited image after cropping is 2253 x 1183 pixels. The focal length was 55mm, with an aperture of f/11.0, and an exposure time of .003s (1/400). Picasa 3 was used to enhance the contrast of the image by increasing the shadows and highlights and also some lens spots were retouched to clear the image up and take away distracting marks.

The image reveals mountain wave clouds rolling in with a foehn wall and a single cirrostratus cloud in the center. Personally I like the image as a whole and specifically I like how the mountains ground the image while not becoming overbearing. I also like the contrast and colors that were achieved in the final image, the clouds really stand out and make a bold statement above the snow-capped mountains. The wave clouds and foehn wall are displayed nicely in the image the cirrostratus cloud is slightly less noticeable, but is not the focus which I like. I believe my intent of capturing a vivid picture of clouds rolling over the mountains was fulfilled. However, moving forward I would like to play with various effects including black and white, possibly trying color filter effects to enhance an image to create a more dramatic photo.

## References

- [1] *AMS Glossary*. American Meteorology Society. Web. 26 Feb. 2010.  
<<http://amsglossary.allenpress.com/glossary/search?id=mountain-wave-cloud1>>.
- [2] "Atmospheric Soundings." *Wyoming Weather Web*. Web. 26 Feb. 2010.  
<<http://weather.uwyo.edu/upperair/sounding.html>>.
- [3] "Lenticular cloud -." *Wikipedia, the free encyclopedia*. Web. 26 Feb. 2010.  
<[http://en.wikipedia.org/wiki/Lenticular\\_cloud](http://en.wikipedia.org/wiki/Lenticular_cloud)>.