Flow Visualization Clouds First
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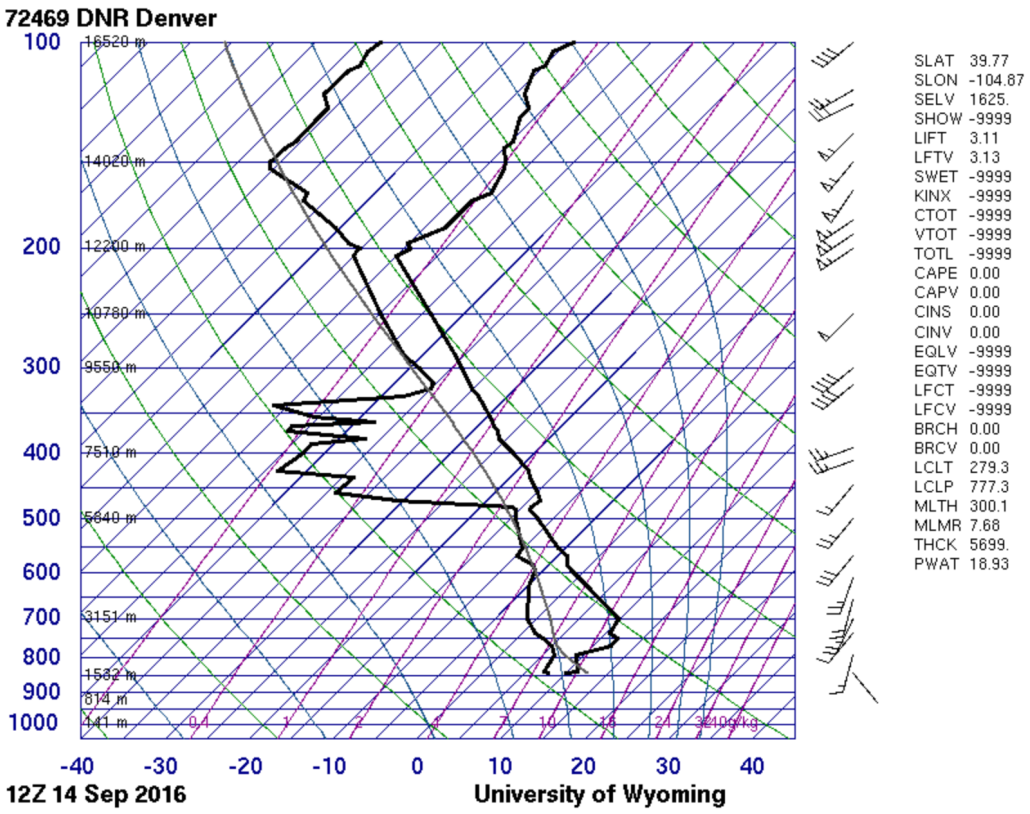
Clouds are something that are a constant part of our life and can show the phenomena happening in the atmosphere all around us that might otherwise go unnoticed. For this image the intent was to capture a cloud where it could be identified and display some of the atmospheric conditions that were occurring during this time. For this assignment I had initially planned to capture the mountain wave cloud phenomena to show the sinusoidal oscillations in the atmosphere and where the clouds develop. Upon taking several mountain wave photos and then taking the above photo, I felt that the above photo left the viewer with more of a feeling for being in the situation than the mountain wave photos. This sense of feeling I feel adds a great deal to the effect of the photo and is why I chose this as my final photo.

This photo was captured from the field south of the Benson Earth Sciences building on the CU campus. For this image the camera was facing southwest at approximately a 45-degree angle above the horizontal. The Elevation of the camera was approximately 5400 feet above sea level. The cloud is estimated to be at approximately 8000 feet above sea level. The cloud approximation is made using the elevation of Green Mountain and the clouds proximity to the summit. This weather system occurred on September 14th at about 12:00 PM MST.



This Photo occurs during the middle of the day, which is right in between the atmospheric measurements that are sent up each day at DIA. Since the photo was right in the middle of the skew-T charts available and the values were quite similar for the stability of the atmosphere I chose to use the morning skew-T. The skew-T for the day stated that there was a stable atmosphere this day, which is curious due to the nature of the cloud since the cloud pictured is the underside of a Cumulonimbus, which occurs during unstable atmospheric conditions. Since this storm system was relatively small and occurred in the middle of the skew-T diagrams it is possible that the atmosphere stabilized before and after this system passed through. Before this cloud there were blue skies in Boulder and these returned quickly after the storm. When viewing the historical weather for this day it is possible to see the barometer fall and rise again coinciding with the cloud and the precipitation that it brought along with it. This cloud brought along minimal precipitation from the estimated value of approximately 8000 feet. There were some minimal winds that brought the front over the planes.

Cumulonimbus clouds are usually formed from moist warm air rising and being cooled (Kolber). When this warm air cool it condenses and forms the towering clouds that are easily recognizable as cumulonimbus. Once the air is cooled and condenses it becomes too heavy for the cloud to hold and falls back to the ground as precipitation. In the case above the precipitation came in the form of rain. Hail is also another common form of precipitation from cumulonimbus clouds and lightning can often occur as well.

For this photo a cannon ESO Digital Rebel XS with an 18-55mm lens was used with the following settings:
ISO = 200
F = 5.6
Shutter = 1/60
The cloud was approximately 1 mile away from the lens at the time of the image was captured with an initial image size of 4272 x 2848. During image processing the overall image was darkened to bring out more contrast from the original photo. I feel as if darkening the image gives more feeling to the cloud. Image was designed to make the viewer feel as if the storm was approaching the viewer. The original can be seen below.

This image shows the underside of a cumulonimbus cloud and a small storm system coming through the boulder area. I feel as if the image achieves the desired effect of the cloud approaching the viewer, which is something that I am happy about. One thing that I would like to improve on the image is making the cloud feel as if it is closer than it actually is. This is something that I thing could be done using a different photography technique or just a different situation all together. The physics of a cumulonimbus cloud are not very well illustrated by this photo as you can only see the underside and not the entire towering cloud pictured above and behind the section in the image. I feel that this was part of the sacrifice in the image to make it feel closer, some of the surrounding context was lost. I would like to keep searching for cumulonimbus cloud situations where the user feels the pressure of a thunderstorm bearing down on them for future images.

References:

Kolber, Brendan. "How Do Cumulonimbus Clouds Form?" *Quora*. Quora, 09 July 2012. Web. 17 Oct. 2016. <https://www.quora.com/How-do-cumulonimbus-clouds-form>.

"72469 DNR Denver Sounding." *72469 DNR Denver Sounding*. University of Wyoming, 14 Sept. 2016. Web. 17 Oct. 2016. <http://weather.uwyo.edu/cgi-bin/sounding?region=naconf&TYPE=GIF%3ASKEWT&YEAR=2016&MONTH=09&FROM=1412&TO=1412&STNM=72469>.