

Matt Feddersen

MCEN4151: Flow Visualization

Professor Hertzberg

Spring 2011

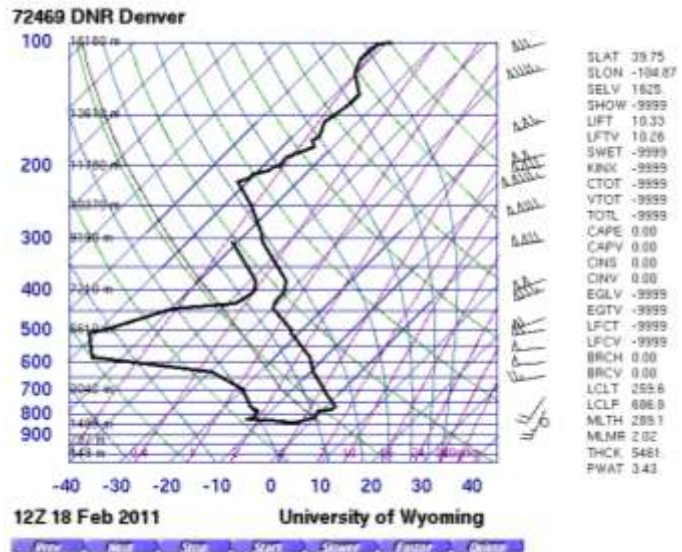
Clouds 1



For this image, I initially was just looking to get a “cool” picture of clouds. As time progressed, I decided that I would really like to get a picture that showed clouds being torn apart; however, I still wanted the clouds to be thick, not wispy. When I took the image that I submitted, it was a very windy day in Boulder, which meant that at altitude the wind was probably even stronger. This resulted was clouds that were rapidly changing, exactly as I had hoped for. I took multiple pictures of different areas and tried different perspectives with relation to both the ground and the sun. With everything said and done, I found my final image; and it had exactly what I wanted in it.

This image was taken here on campus. The camera was aimed nearly straight up to take the shot with the top of the frame pointing to the North-West. The sun was just to the right of the frame creating the sky’s blue gradient in the image. The image was snapped at 12:52 on February 18, 2011.

The clouds in my image are Mountain Wave clouds. Based on the skew-T plot at DIA for 6am the day of the image, the atmosphere was too dry to produce clouds. The image was taken shortly before the cloud completely dissolved. In general clouds in the sky around the time of the image were changing very rapidly, forming new clouds and dissolving old ones. The sky was constantly changing. This also helps to verify that the cloud is a Mountain Wave cloud because the cloud was probably in the trough of the wave form, and therefore in very turbulent conditions, which caused the cloud to have such a short life span. Looking at the skew-T, it is clear that the atmosphere is stable; this is verified by seeing that the CAPE is 0.00. The clouds were at an elevation of approximately 20000 feet. This estimation is from the shape of the clouds with a little bit of input from the skew-T; it appears that there might be moisture in the atmosphere around 6500 meters, which corresponds to 21000 feet. As previously mentioned, there is a lot of turbulence surrounding the clouds in the image, thus giving them the fractus look.



The image was taken using a Canon EOS20D, an older SLR camera. Since the image was taken with the camera pointing nearly straight up, the distance to the object is around 20000 feet. The photo was shot with a 35mm lens and the focal length was set at 28mm. The F-stop was f/7.1 and the exposure time was 1/125 seconds. The ISO speed was 100 and the max aperture was 3.625. Once imported to Photoshop, all that needed to be changed was the contrast. I played

with curves for a bit and found the gradient in the sky that really accented the clouds. The image didn't need to be cropped.

The image really shows how clouds can be torn apart. Additionally, I really like that the sky has a gradient; that background is what makes the image great to me. In the turbulent surrounding of the Mountain Wave cloud, the clouds are constantly changing, which is absolutely awesome to just watch. The image also shows a little bit about the flow of the wind at altitude since the clouds are swirling a bit. I would really like to be able to see a bit more of the overall wind flow at altitude. It would be interesting to see the streamlines, and just see what the clouds atmosphere is doing. For my image, I wish that I was able to capture the clouds at the top and bottom of the frame so that the entire cloud was "contained" in the frame. I think that it would be really interesting to get an image of this same situation but taken from the same elevation from in a plane.

Sources

"Atmospheric Soundings." *Wyoming Weather Web*. Web. 10 Mar. 2011.

<<http://weather.uwyo.edu/upperair/sounding.html>>.