

Lisa Rose Logel
ME ID 560-050
Flow Visualization
MCEN 4151

Clouds I Image Report

The objective of the Clouds I assignment was to capture as many images of clouds as possible between the dates January 10 and February 21, 2011. For each cloud photo session, the information of when and where the photo was captured was recorded. With this information, the atmospheric sounding data was then looked-up the physics within the cloud was analyzed.

The picture I captured is shown below in Figure 1 and was taken on Valentine's Day, February 14, 2011, at approximately noon mountain standard time. "Whale's Tail" was taken from my apartment in Boulder, CO while facing south. The sun was very near the cloud in the frame, thus the angle from the horizon could be approximated at 90° .



Figure 1: Clouds I Assignment photo titled, "Whale's Tale"

The type of cloud observed in “Whale’s Tale” is an Altopululus Fractus.

The day I photographed “Whale’s Tale” it was extremely windy and there were many clouds in the sky. However, the temperature was pleasant and the clouds were spaced and light enough to allow for a fairly sunny day.

The skew-t plot provided in Figure 2 provides the useful information necessary to describe the physics of the clouds on the day and time the picture was taken. There was an unstable atmosphere on February 14th in Boulder, CO, for the slope of the T-curve is greater than the slopes of the dry and saturated adiabats. Also, the lines of the T-Curve and Dew Point Curve come nearest each other at approximately 6500 m (21400 ft) so it is expected that clouds will form nearest this elevation¹.

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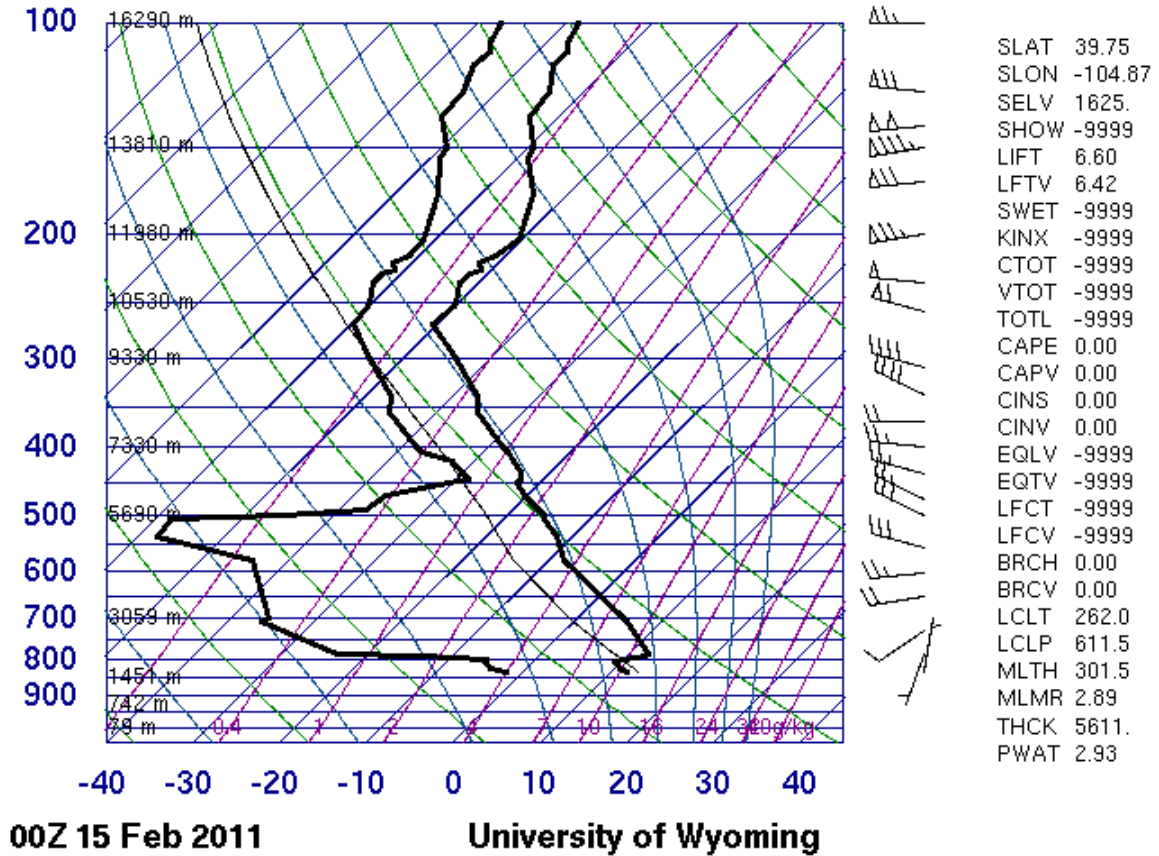


Figure 2: Skew-t plot for February 15, 2011 00Z

The type of clouds expected from the unstable atmosphere and elevation of 21000 ft are autocoluuous, specifically autocoluuous fractus. The cloud in the picture lasted less than five minutes from the time I first saw it and because it resembled a whale’s tale, I really wanted this cloud for my Clouds I assignment. Within the few minutes it

took me to ready my camera and capture a good image, the clouds has immensely changed shape with ragged edgesⁱ.

As a result of the rapid change of shape of the cloud, the image of a whale's tale that I initially saw has lost some of the distinct features. Therefore I attempted to bring back some of those features in Adobe Photoshop. First, I adjust the contrast levels to increase the focus on the "Whale's Tale" cloud and less on the clouds in the background. Also, to make the picture more dramatic, I saturated the photo with a nice indigo. With these changes, I hoped to force the viewer to see the curves and depths I first did when I view this cloud and hopefully make out an image of a whale's tale.

I am very pleased with how this photo turned out. I feel that I captured a very unique cloud and that I did a good job in Adobe Photoshop to make a beautiful picture. The direction I intend to go with my next clouds assignment is to capture a storm cloud. I feel they are very difficult to capture, but there is so much physics involved in a storm cloud that I would enjoy analyzing the data.

References

ⁱ "Atmospheric Soundings." *Wyoming Weather Web*. University of Wyoming. Web. 21 Feb. 2011. <<http://weather.uwyo.edu/upperair/sounding.html>>.

ⁱⁱ Smith, Janice. "Cumulous." *The Cloud Collector's Handbook*. The Cloud Appreciation Society. Web. 21 Feb. 2011. <<http://cloudappreciationsociety.org/collecting/janice-smith/>>.