

# Cloud Second Report

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Flow Visualization - MCEN 4151

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## Introduction

This photograph was intended to capture cloud formations commonly seen in the Rocky Mountains during the summer. I wanted a photo that would remind the viewer of skiing, hiking, or even rock climbing on a sunny day in the mountains. The image was taken on October 16<sup>th</sup>, 2016 in Fraser, Colorado from the top of a small hill. It was taken at 11:03 am facing south-east. The purpose of this assignment is to capture an image of clouds that are both artistic and hold scientific validity.

## Conditions Leading to the Cloud Formation

Based on the weather conditions in Fraser at 11 am, the clouds in the foreground of this image would be classified as cumulus clouds while the wispy clouds in the background would be classified as cirrus clouds. Ambient ground temperature was approximately 50°F, dew point was 15°F. Barometric pressure at the time was 30.24 Hg with wind speeds of 26 mph blowing due West as shown in Figure 1.

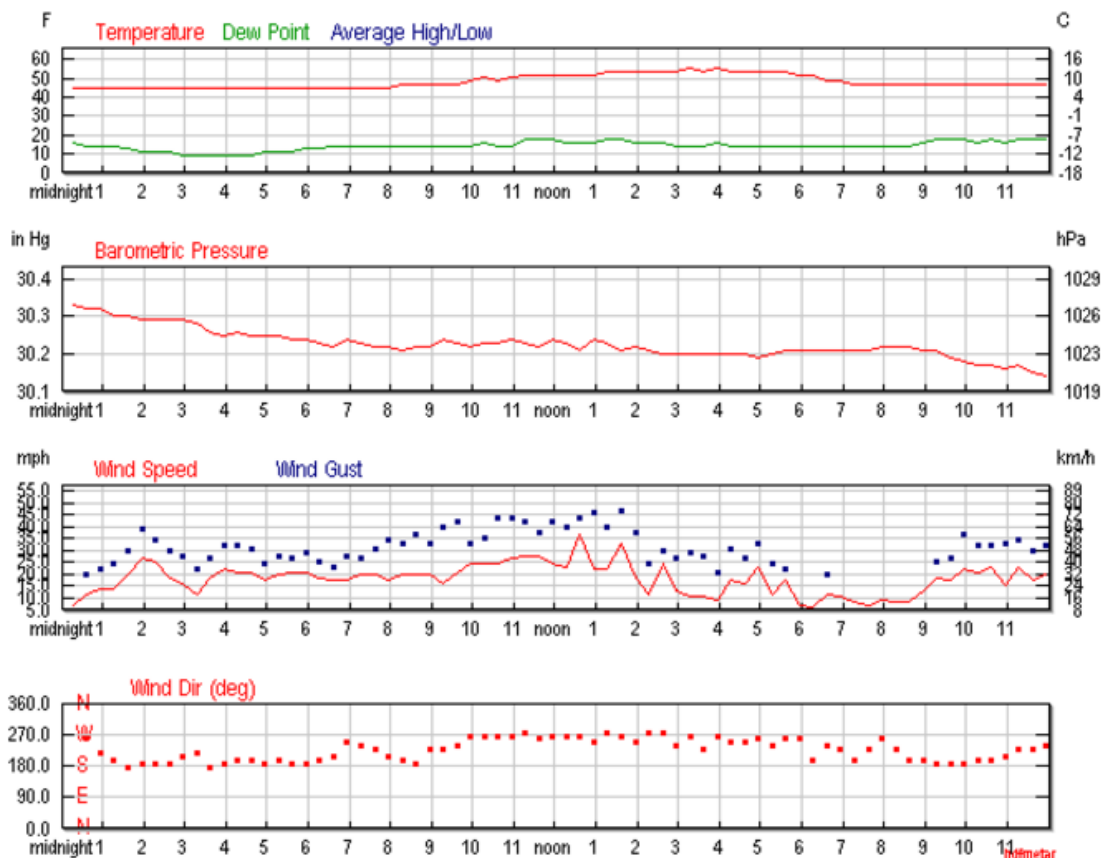


Figure 1: Weather plot for October 26<sup>th</sup>, 2016 in Fraser, Colorado.

The closest atmospheric sounding data is in Denver, a fair distance from Fraser, giving only ballpark atmospheric data for the time, shown in Figure 2. There was a stable atmosphere, which is expected for the formation of cumulus clouds. The clouds are estimated to be at an altitude between 2000 and 3000m relative to the ground elevation of 2743m.

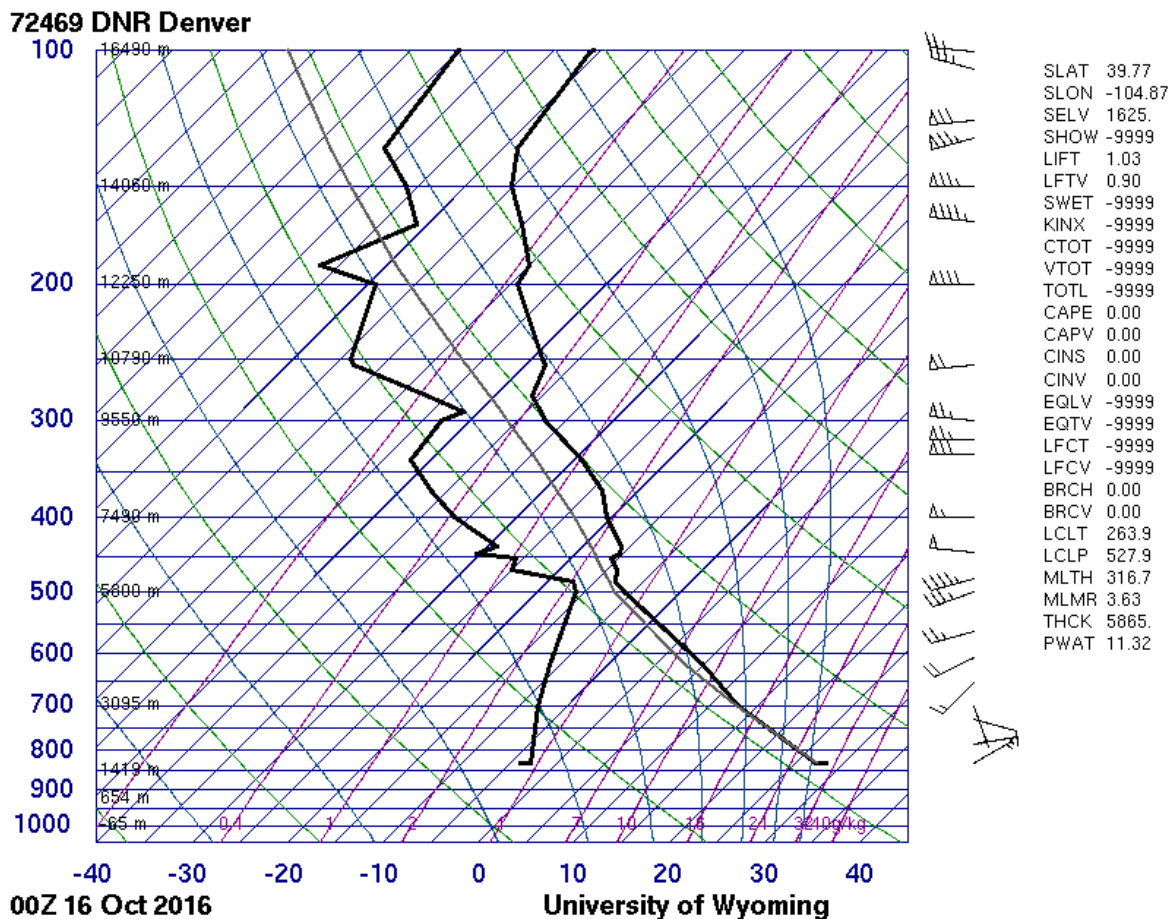


Figure 2: Skew-T diagram for Denver on October 16<sup>th</sup>, 2016.

## Photographic Technique

The image was taken using a Nikon D5000 DSLR using a VR 18-200mm f/3.5-5.6G lens. The lens was set to a focal length of 70mm to frame the clouds with the tree silhouettes on the bottom. An aperture of f/16 was used alongside a quick shutter speed of 1/600s and a low ISO of 360. There was plenty of light from the sun to illuminate the clouds sufficiently. The photo was then edited in GIMP 2 in order to simply increase the contrast of the photo, force the foreground trees to act as silhouettes, and slightly crop out telephone wires on the bottom left. The contrast was increased to bring out the blue in the sky and eliminate the detail in the trees. Figure 3 shows the unedited photograph while Figure 4 shows the final edited photo to compare the edits.



Figure 3: Original unedited photograph



Figure 4: Final edited photograph

## References:

<http://weather.uwyo.edu/cgi-bin/sounding?region=naconf&TYPE=GIF%3ASKEWT&YEAR=2016&MONTH=10&FROM=1600&TO=0412&STNM=72469>

[https://www.wunderground.com/history/airport/KCCU/2016/10/16/DailyHistory.html?req\\_city=Frisc&req\\_state=CO&req\\_statename=&reqdb.zip=80443&reqdb.magic=1&reqdb.wmo=99999&MR=1](https://www.wunderground.com/history/airport/KCCU/2016/10/16/DailyHistory.html?req_city=Frisc&req_state=CO&req_statename=&reqdb.zip=80443&reqdb.magic=1&reqdb.wmo=99999&MR=1)