Cloud First Report

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Introduction

This photograph is intended to capture the light and fluffy clouds that are a staple of summers in Colorado and evoke the carefree feeling of summertime. This particular photo was taken in Boulder, Colorado and capture the cloud formations over the Front Range. The cloud formation was sighted on September 3rd, 2016 in the late afternoon at 17:18. As a student in Flow Visualization at the University of Colorado Boulder, we were tasked with taking a photograph of a cloud formation that is both artistic and scientific, and analyze the weather trends that lead to the cloud formation.

Conditions Leading to the Cloud Formation

Based on the conditions at the time of the photo, these clouds would be classified as cumulus clouds. Ambient ground temperature was approximately 80℉, Dew point was 50℉, barometric pressure was at the lowest point that day, at 29.9 Hg, and there was no wind as shown in Figure 1.

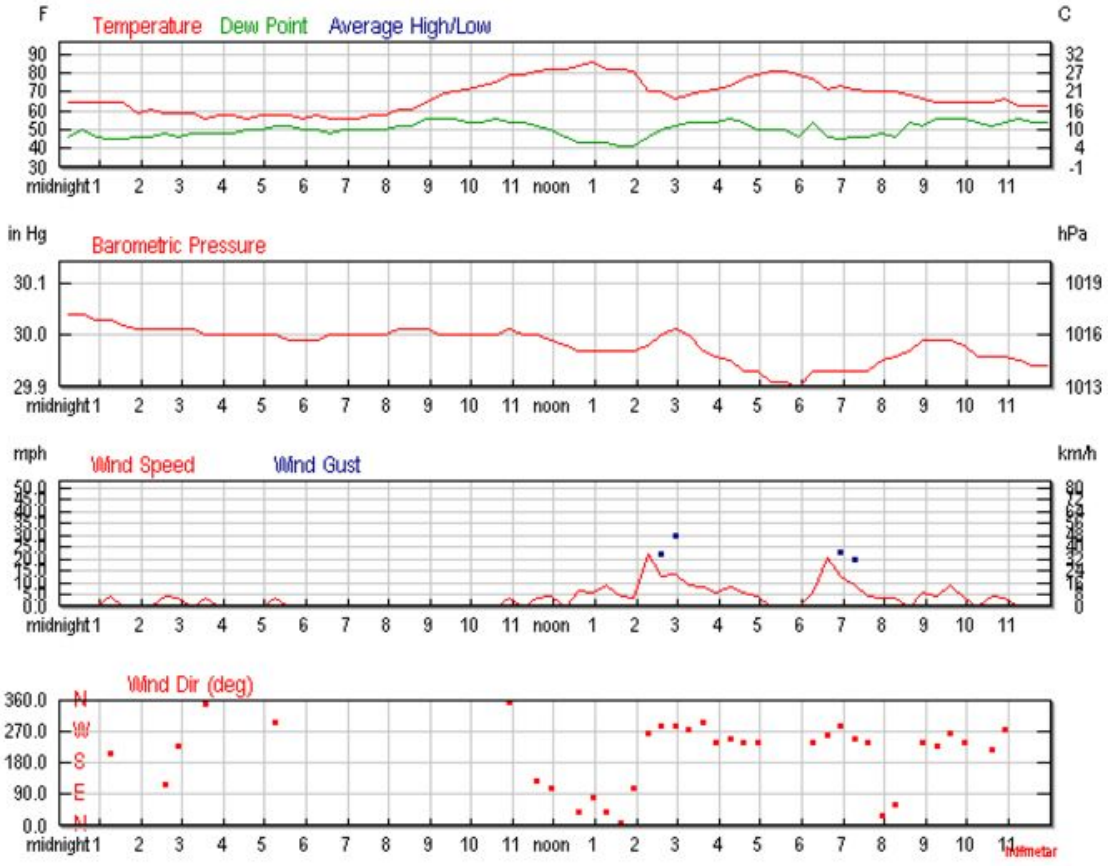

Figure 1: Weather plot for Septemeber 3rd, 2016 in Boulder Colorado.

There was a stable atmosphere, which is what is expected for the formation of cumulus clouds as shown in Figure 2. The clouds are estimated to be at an altitude between 5860m and 7560m, or 4160 to 5860m relative to the ground elevation, as the local temperature approaches the dew point at those altitudes.

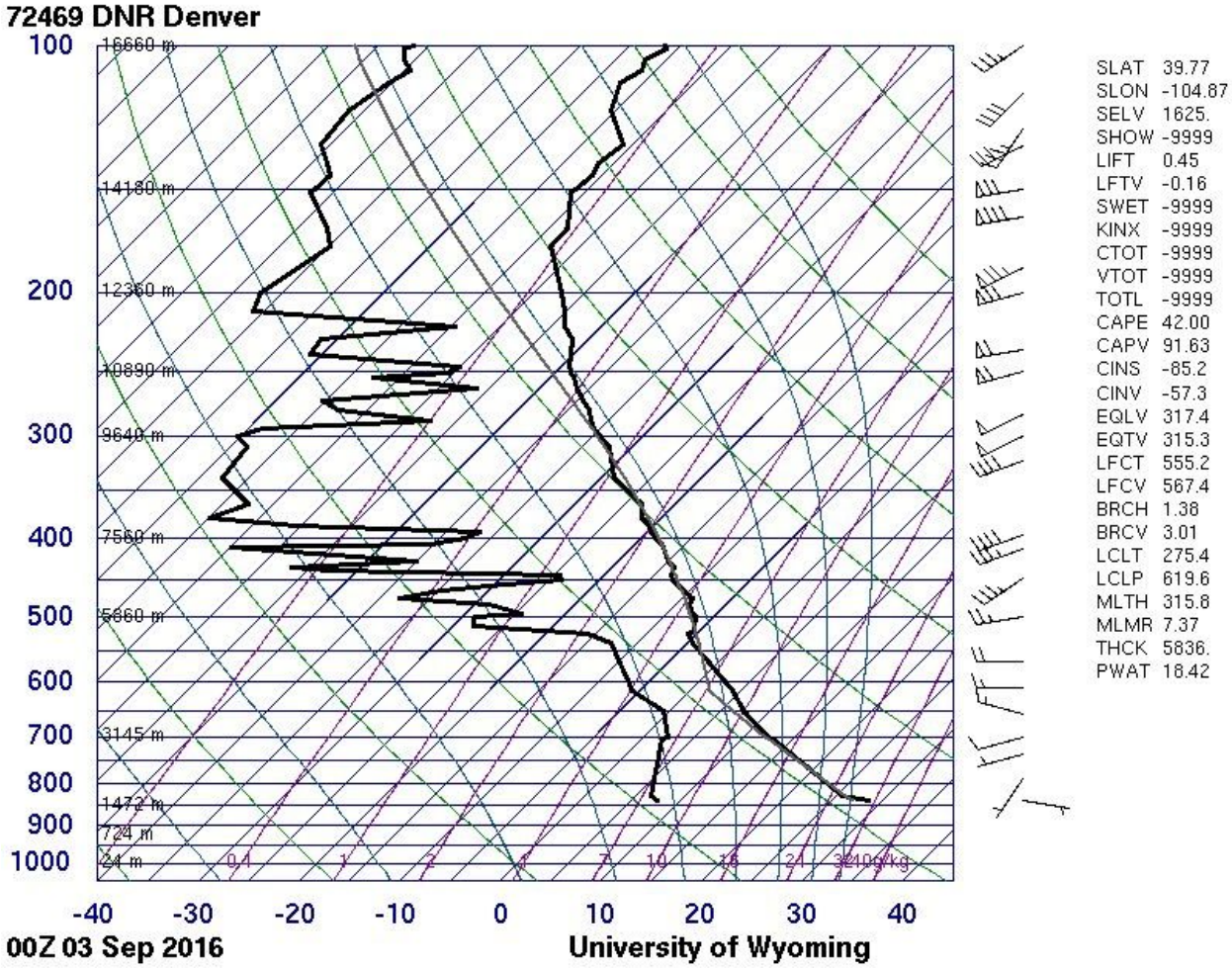

Figure 2: Skew-T diagram for Boulder on September 3rd.

Photographic Technique

The image was taken using a Nikon D5000 DSLR using a VR 18-200mm f/3.5-5.6G lens. With a focal length of only 18mm, the lens acts as a wide-angle lens to capture the large area of sky in a single shot. An aperture of f/14 was used alongside a quick shutter speed of 1/800s and a low ISO of 200. Since the sun was visible in the frame, there was plenty of light to justify such a quick shutter speed. The photo was then edited in GIMP 2 in order to simply increase the contrast of the photo and force the foreground plants to act as silhouettes. The contrast was increased in order to avoid an overly saturated photo from the sun in the center. Figure 3 shows the unedited photograph while Figure 4 shows the final edited photo to contrast the edits.

The photo was taken facing south-west looking up at the sky from a sunken patio in order to get some perspective on the clouds. A decision to take the photograph through a lavender plant added to the perspective achieved from the lowered vantage point.

Figure 3: Original unedited photograph

Figure 4: Final edited photograph

References:

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