

Cloud 1 Assignment



Cloud Assignment #1

MCEN 5151

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Introduction:

This photo, depicting stratocumulus clouds, provides what I see as a dynamic representation of a still image. I intended to capture the swirling effect of the clouds in the top of the photo and decided to include the University of Colorado buildings to provide a sense of scale and orientation. In this report, I will discuss the artistic intent, the setup for the image, and an analysis of the skew-T diagram.

Artistic Intent:

In Boulder, there are rarely cloud-covered skies. Therefore, I set out to capture a cloud image where most of the sky was full. By centering the image on a calmer region of the sky, I intended to achieve a dynamic effect with the cloud coverage. The whirling clouds on the top and sides of the image help the viewer feel as though they are looking at a time lapse, though it is a still photo. I also included some buildings from the University of Colorado campus for scale and orientation. Although I typically post-process my photos, in this case I decided to keep the original because I didn't see a reason to edit. The framing was exactly how I wanted, and the clouds are clear and crisp. I'm quite satisfied with how the image turned out.

Image Setup:

This photo was taken on an iPhone 12 Pro Max using the native camera app. I used the ultra-wide lens to capture a wide range of clouds. This lens has an aperture of F2.4 and a focal length of 13 mm. Because this photo was taken on my phone, I used auto ISO and autofocus. This photo was taken from the business quad at the University of Colorado Boulder. The specific location was 40°00'19.3"N 105°15'42.0"W, and I was facing northwest. This photo was taken at

4:04 PM on October 6th, 2021. In order to ensure I ended with the photo I set out to take, I captured multiple images to analyze later. Some of these can be seen here:



Figure 1 - Images from the same day

Skew-T Analysis:

To gain a better understanding of the atmospheric state during this photo, I have included a skew-T diagram, shown here:

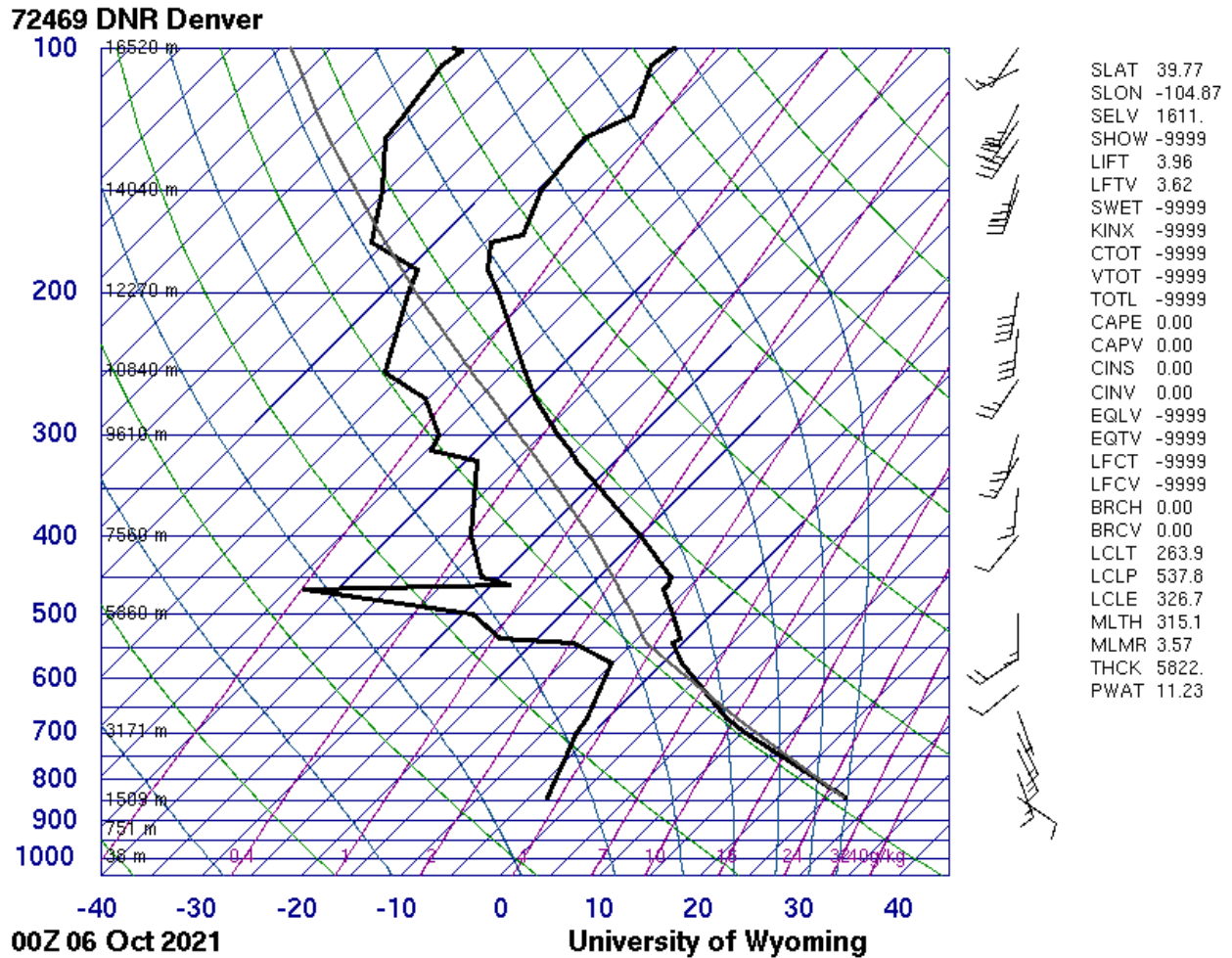


Figure 2 - Skew-T diagram [1]

The skew-T diagram can illustrate many parts of the behavior of the atmosphere. One important variable to consider when looking at clouds is the CAPE value. This value can help determine if the overall atmosphere was stable or unstable. Because the CAPE was 0.00 when this photo was taken, we can conclude that the atmosphere was stable. Another important variable the skew-T diagram can address is the altitude of the clouds. According to the skew-T above, the clouds in

the photo are resting around 625 m above Denver, or about 2,200 m above sea level. It is also important to note that around that elevation there was a change in wind direction, which helps make the clouds look more turbulent and illustrates the dynamic movement I was hoping to capture.

Conclusion:

This photo successfully captures stratocumulus clouds on an autumn day in October. The image makes the clouds look like they are moving quickly even though this is a still image. The skew-T diagram illuminates the atmospheric conditions during the photo setup, providing insight on the stability of the atmosphere and the elevation of the clouds. Overall, this image is a great depiction of stratocumulus clouds in Boulder, Colorado.

Bibliography

- [1] L. Oolman, "Department of Atmospheric Science," 6 10 2020. [Online]. Available: <http://weather.uwyo.edu/upperair/sounding.html>.

