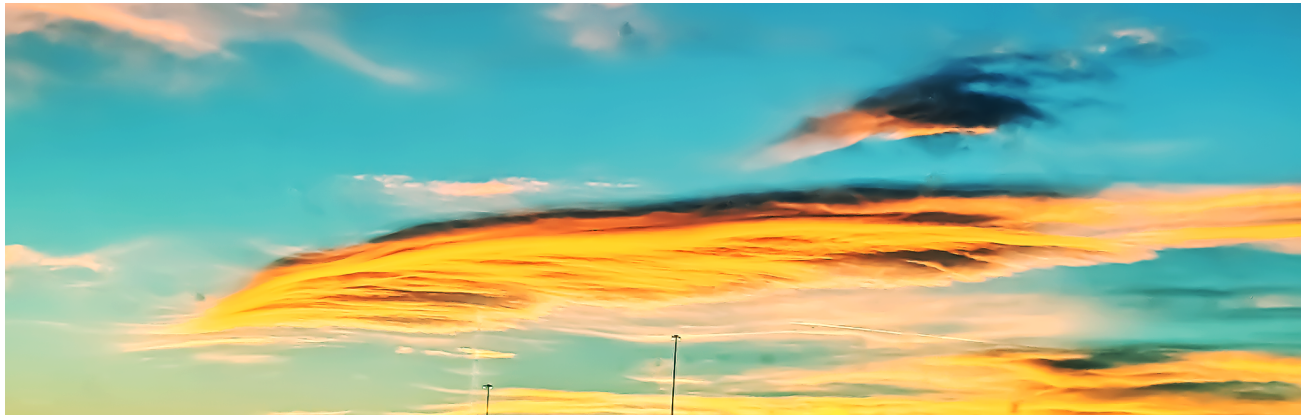


Alexander Hernacki
ATLAS 4151
12/12/21

Cloud Image 2



Introduction

This project's goal was to capture cloud formations that were simply visually interesting. This was the final Image for the Flow Visualization class and as such I wanted to experiment with the more artistic side of flow visualization. All of my previous images set out to highlight interesting fluid phenomena, in this image I wanted to highlight the interesting composition of the cloud, rather than the specific phenomena at play.

Set Up

This image was taken at 4:48 PM MDT 11/28/21 outside the Denver International airport in Denver , Colorado. As such it was taken at an elevation of approximately 5300 ft. The approximate weather conditions leading to the cloud formation can be seen below in the Skew-T diagram.

74455 DVN Davenport

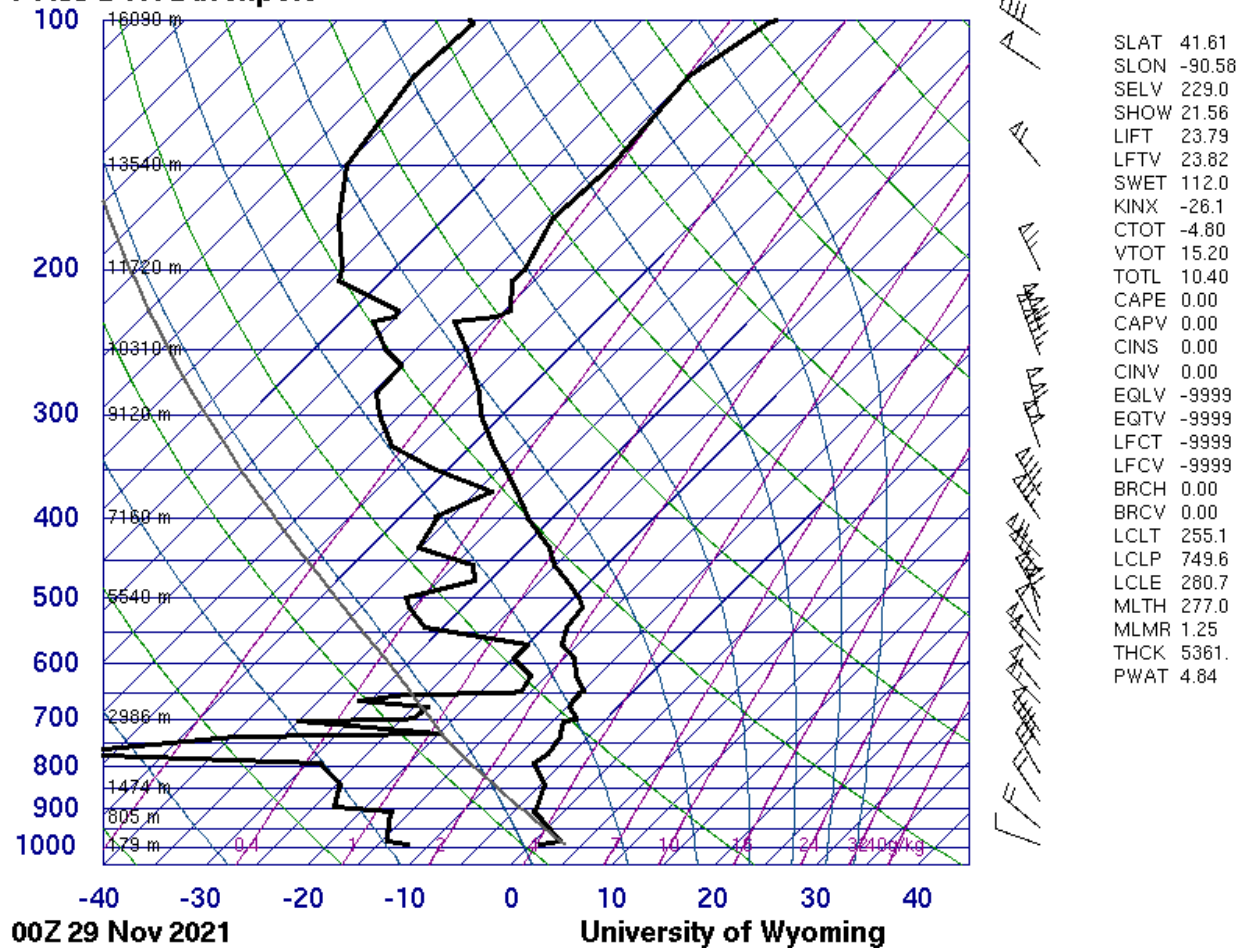


Figure 1: Denver Skew-T diagram

Fluid Dynamics

Looking at the Skew-T plot in Denver, on the day this photo was taken, there are a few likely areas for cloud formation. At approximately 2,500 m, 4,000 m, 8,000 m, and 11,000 m the temperature line is closest to the dew point line, thus precipitation is likely to form. The form of the cloud suggests that they are Stratus or Altostratus clouds, thus it can be concluded that these clouds likely formed around 2,500 m or 4,000 m in the air.

Visualization

All visualization techniques in this photo were naturally occurring due to the nature of the cloud and were further enhanced via post processing. The most common technique that allows us to visualize clouds is the seeded boundary between the water molecules and the surrounding air. The second technique occurs due to the setting of the sun, and that is the variable index of refraction of the cloud and the surrounding air. Both techniques combined provided a thorough contrast between the cloud and its surroundings, which was further enhanced in post.

Photographic Technique



Figure 3: Raw image before post processing.

This image was taken on a Pixel 3 with an aperture of F 1.8, a shutter speed of 1/3356 sec, a focal length of 4.44mm, and an ISO of 66. These settings were automatically determined by the

phone camera and thus could not be changed to enhance the image. The first edit done in Photoshop was to crop the size from 4032 X 3024 to 3759 X 1200 in order to remove the road and excess space around the subject cloud. After this any dirt spots from the window between the camera and the cloud, as well as one lamp post that protruded into the cloud were removed with the healing brush. Next the image was opened in Camera Raw and the noise reduction and sharpness tools were tuned such that the edges of the cloud were smoothed out and blended with its surroundings to embellish the already wispy nature of the cloud. Then the image was taken back to Photoshop, where the color balance was adjusted such that the highlights were made drastically more yellow, the middle tones were pushed towards a cyan, and the shadows were made drastically more blue. Finally a brightness/ contrast layer was added and the overall brightness of the image was adjusted.

Conclusion

The goal of this project was to capture a cloud which was first and foremost visually interesting. The vivid colors and unique form of the cloud provide an interesting contrast between the extreme contrast in color and the minimal definition of the clouds boundaries. As such this image succeeds in providing an interesting visual of a cloud. If this image were to be redone, I would have liked to experiment with more advanced balancing of the colors via the images color curves and use of the blur tool to further the wispy form of the cloud. In the future the use of pushing highlights and lowlights towards different colors could be used to add visual interest to other images I take regardless of their end purpose.

Bibliography

Atmospheric Soundings, University of Wyoming,
<http://weather.uwyo.edu/upperair/sounding.html>.