Cumulus Sunset

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MCEN 5151: Flow Visualization – Clouds Second

Cumulus clouds photographed October 14th at 5:32pm in Longmont, Colorado

Figure 1: Clouds near sunset from Longmont, CO

Introduction

The image in Figure 1 shows cumulus clouds during a sunset taken from Longmont, Colorado. The purpose of this photo was to try to capture the rays of light visible in the air, as they create a striking image. A few different cloud types are visible, but the cumulus ones blocking the sun are the most prominent.

Location Information

The photos were taken in Longmont, Colorado, with the camera facing due west. The camera was level, and the clouds are estimated to be at in angle of inclination of approximately 10°. The photo was taken on October 14th at 5:32pm local time, near the sunset.

Cloud Description

The skew-T diagram for this time is shown in Figure 2. The atmosphere was stable, and the clouds were estimated from the skew-T diagram to be at an elevation of 5500 m, which agrees with observation, as these were noted to be low clouds. The clouds blocking the sun are cumulus clouds (Pretor-Pinney, 2007). To the left there is virga under one of the clouds. There was some sparse precipitation the day this photo was taken, and the day after from a small storm system in the area. This likely gives the clouds their ragged, disorderly appearance. They do not have a neat appearance of typical cumulus clouds, looking long and stretched out.
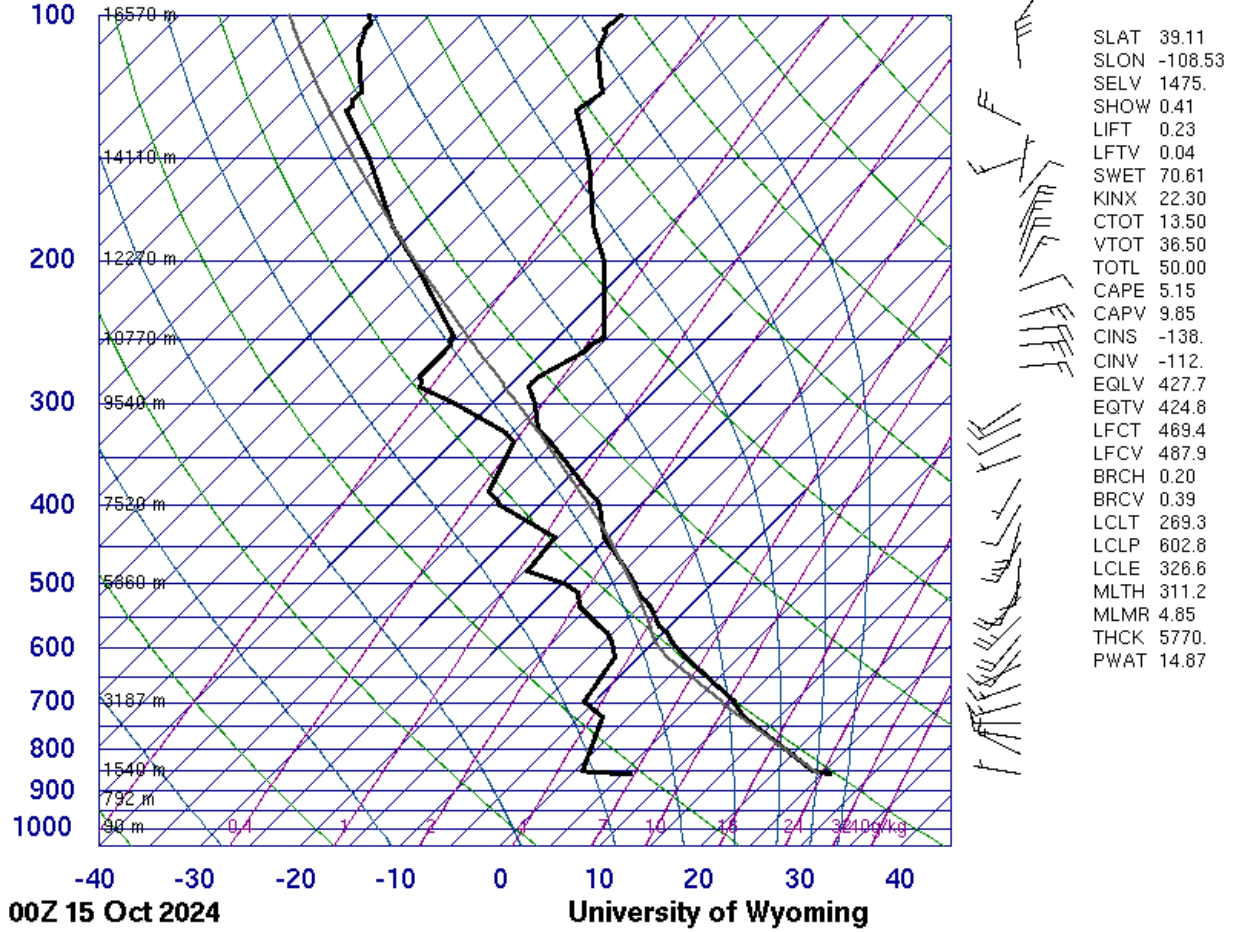
Figure 2: Skew-T

Photographic Technique

Table 1 lists the camera information and the size of the original image.

Table 1: Camera information/settings

Camera model	Google Pixel 6
Focal length	7.0mm
Aperture	1.8
Exposure	1/3906
ISO	37
Image size	4080 x 3072
Cropped image size	3481 x 1958
Field of view	100 km (horizontal)

Based on the estimated angle of inclination and cloud height, the distance to the clouds is estimated to be 23 km.

The image was edited with a combination of Google's native photo editor and Darktable. The original image has several tall lights which protrude into the sky. These were removed with Google's "magic eraser" tool, which uses AI to remove unwanted objects from images. The remainder of the image editing was done in Darktable. The tone curve was adjusted slightly to increase the contrast in the sky, bringing out the rays of light. A mask was applied to the ground area, which was artificially darkened to reduce the distracting elements in the lower half of the image and bring the focus onto the sky. In the sky, the blue and yellow hues were increased in saturation. The image was cropped so that the dark ground takes up a third of the image. The original and edited pictures are shown in Figure 3 and Figure 4, respectively.

Figure 3: Original image

Figure 4: Edited image

Conclusion/Recommendations

This photo shows clouds partially silhouetted by the setting sun. This lighting clearly shows the shape of the cloud and highlights the density variances throughout it in a way that would be difficult with other lighting. After some editing, the rays emanating from the cloud draw focus to it in the image, and the result is a striking cloud photo.

References

Pretor-Pinney, G. (2007). *The Cloudspotter's Guide*. Sceptre.