Clouds over Diamond Lake

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1 Introduction

On the 4th of September 2023, I embarked on a hike along the Diamond Lake Trail in Nederland, Colorado. During the hike, I observed the wonderful cloudscape over the serene Diamond Lake and its surrounding mountains. As I did not possess a DSLR camera at the time, I relied on my Samsung Galaxy A22 Android phone to capture the mesmerizing cloud formations. The result was a stunning image that showcased the breathtaking aesthetics of the clouds set against the backdrop of a clear blue sky and the towering coniferous trees.

Fig 1: Clouds over Diamond Lake

2 Location and Time

Nederland, Colorado is renowned for its stunning natural beauty, and the Diamond Lake Trail is one of the area's gems. Situated in the Indian Peaks Wilderness, this trail offers hikers the opportunity to explore pristine alpine lakes, lush forests, and rugged mountain terrain. The

trailhead starts at an elevation of approximately 8,500 feet and ascends to over 10,000 feet, providing ample opportunities for capturing captivating landscapes. The image was captured on 4th September, 11:51 a.m.

3 Post-Processing of the Image

The original image was edited using the Darktable software. The features used in Darktable were Crop and the RGB curve to increase the color range of the picture. The no of pixels in the original image were 4000 x 2250 and the final edited image was 2250 x 2441 (pixels).

Fig 2: a) Unedited (original) image b) Edited (final) image

4 Aesthetics & Cloud Description

Clouds are a dynamic and captivating aspect of the sky, and they play a pivotal role in the aesthetics of any landscape. Their ever-changing forms and patterns can dramatically alter the mood and atmosphere of a scene. On that day in September, the clouds added a layer of drama and wonder to the already picturesque landscape.

The clouds over Diamond Lake Trail exhibited various forms and textures. The clouds observed were mostly **Cumulus clouds**, characterized by their fluffy, cotton-ball-like appearance. Cumulus clouds are typically found at lower to middle altitudes in the Earth's atmosphere, typically between 1,000 and 6,000 meters above sea level. These clouds are generally associated with fair, pleasant weather conditions. The clouds in the image were observed around noon on a bright sunny day. Cumulus clouds tend to form during the daytime when the sun heats the Earth's surface, causing warm air to

rise and cool as it ascends. This cooling process leads to the condensation of water vapor, forming cumulus clouds.

There also seems to be some presence of **Stratocumulus** clouds, which typically appear as a low, thick layer with a uniform, wavy texture. These clouds are generally found at altitudes ranging from the Earth's surface to around 2,000 meters above sea level. These clouds are also typically associated with stable, fair-weather conditions.

5 Skew-T and Atmosphere

he Skew-T plot, a meteorological diagram used for analyzing atmospheric conditions, provides valuable insights into the atmosphere's stability and potential for cloud development. The skew-T plot for the time of the cloud capture is as follows:

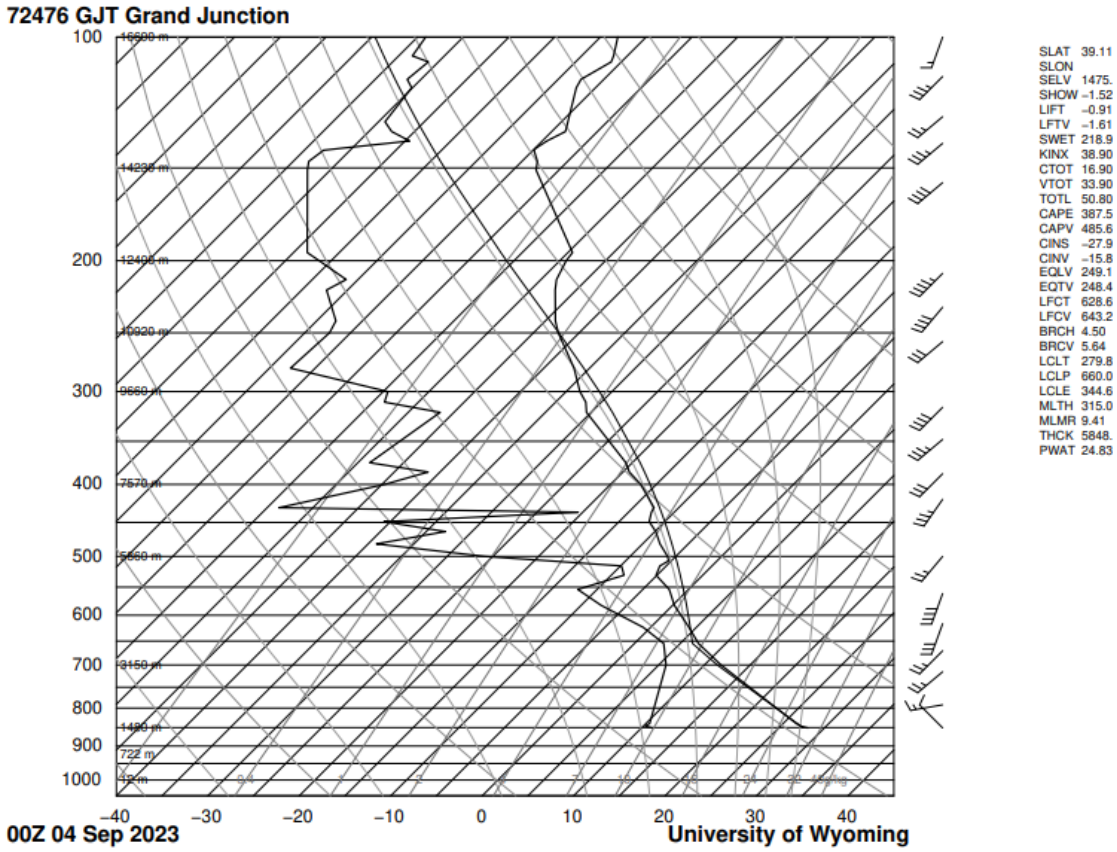

Fig 3: Skew-T for Grand Junction on 4th September

CAPE (Convective Available Potential Energy) measures the amount of energy available in the atmosphere to support vertical air movement and convection, which is essential for cloud formation and the development of thunderstorms. Since Cumulus clouds form between 1,000 and 6,000 meters above sea level, the CAPE value was determined for an average altitude of 3,500 meters to be 100. A CAPE value of 100 indicates that there is some potential for convection and cloud development, but it is relatively weak compared to higher CAPE values seen in severe thunderstorm environments. Cumulus clouds often form in such weakly unstable atmospheres, contributing to fair weather and a picturesque sky.

6 Observations

The current images were taken using an Android camera, which, while adequate, has limitations in terms of image resolution. My future goals include upgrading to a DSLR (Digital Single-Lens Reflex) camera. A DSLR camera will provide me with better image quality, allowing me to capture more detail in the cloud photos. It also offers greater control over the photography process, with settings like aperture, shutter speed, and ISO.

While I have captured the beauty of cumulus clouds, I aim to photograph diverse cloud types. This includes capturing cirrus clouds, cumulonimbus clouds, nimbostratus clouds etc. as each cloud type offers a unique aesthetic.

We should be aware that the Skew-T plot I referenced is based on data from Grand Junction, which is some distance from the Nederland location. This geographical separation can lead to variations in atmospheric conditions.

In summary, my future in cloud photography involves upgrading my equipment and exploring diverse cloud types. This approach will enable me to capture the beauty of the sky with improved clarity and versatility.

References

Types of clouds. (n.d.). NOAA SciJinks – All About Weather. *https://scijinks.gov/clouds/*