

Cumulus Transitions

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MCEN 5151: Flow Visualization – Clouds First

Cumulus clouds photographed September 5th 5:35pm-7:25pm in Longmont, Colorado

Introduction

The video taken for the first clouds assignment shows a timelapse of cumulus clouds taken in Longmont, Colorado. The purpose of this was to show how cumulus clouds not only move but evolve. The timelapse photos were taken over an hour-and-fifty-minute span, with photos taken every thirty seconds. These images were then compiled into a video.

Location Information

The photos were taken in Longmont, Colorado, with the camera facing due east at an inclination of approximately 10° . The photos were taken on September 5th from 5:35pm-7:25pm local time, near the sunset. As a result, the sky darkens noticeably over the course of the video.

Cloud Description

The focus of the video are the cumulus clouds, though there are some stratus clouds in the background. The sky not pictured in the video was similar in appearance to that in the video. There was little wind near the ground, but the clouds were observed to be moving south. The previous day, there had been a thunderstorm in the area. The skew-T diagram for this time is shown in Figure 1. The atmosphere was stable, and the clouds were estimated from the skew-T diagram to be at an elevation of 4500 m, which agrees with observation, as these were noted to be low clouds. Cumulus clouds are not generally expected in a stable atmosphere and are most likely an effect of the recent storm. Because of the storm, these could be cumulus fractus clouds (Cloud Appreciation Society, n.d.), which form before and after a storm system.

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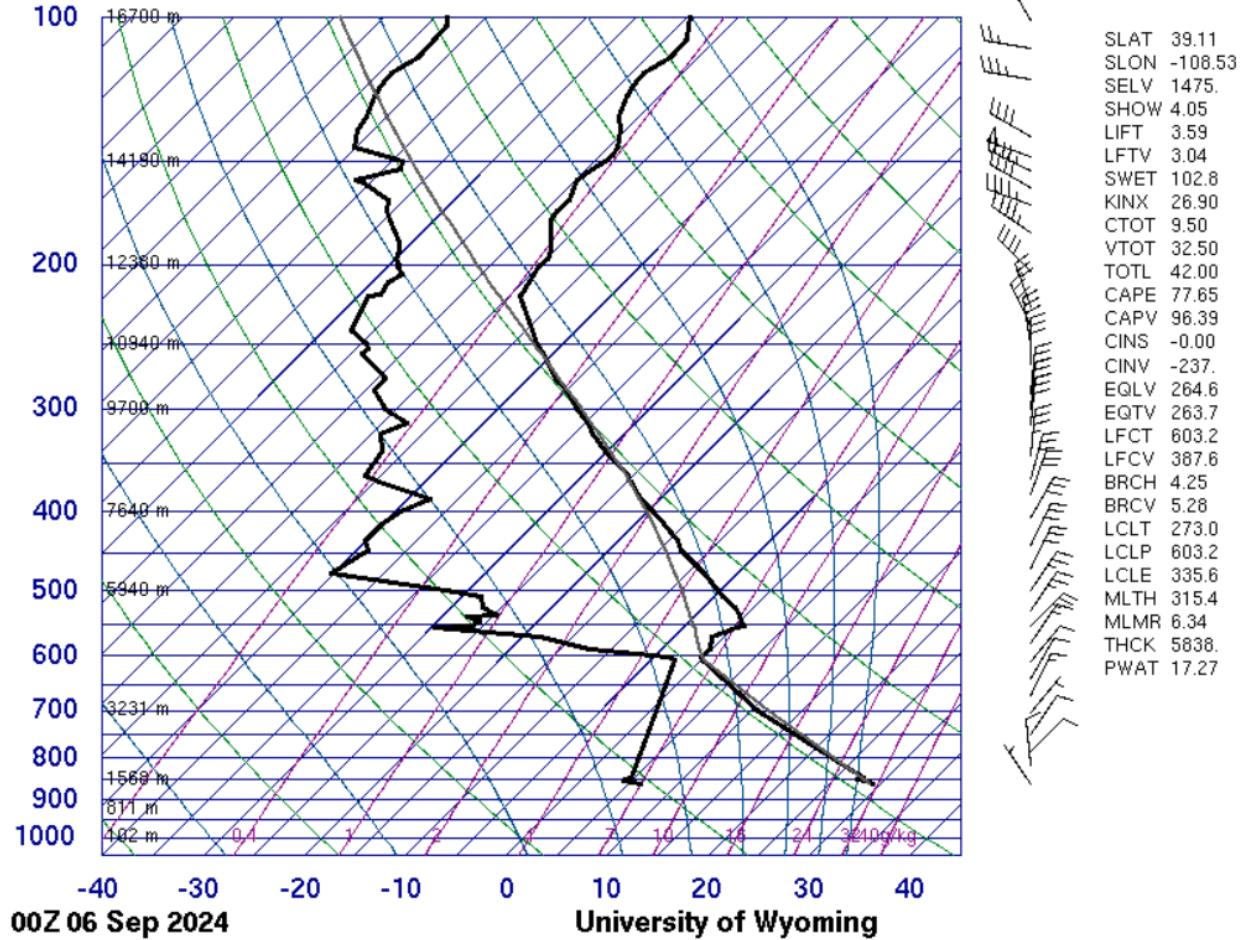


Figure 1: Skew-T

Photographic Technique

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

Table 1: Camera information/settings

Camera model	Canon EOS REBEL T3i
Lens	EF-S18-135mm f/3.5-5.6 IS USM
Focal length	135.0mm
Aperture	5.0
Exposure	1/1250
ISO	200
Image size	5202 x 3464
Cropped image size	4193 x 3513
Field of view	2.7 km x 1.8 km

Based on the estimated angle of inclination and cloud height, the distance to the clouds is estimated to be 16.5 km.

The stills were shot every 30 seconds, then compiled into a video with a frame rate of 15 FPS.

The stills were edited in DaVinci Resolve to crop out the tree branches in the foreground which moved around distractingly when sped up in the timelapse. Additionally, the colors were modified to increase the contrast and decrease the reds in the image. A sample original and edited frame is shown in Figure 2 and Figure 3, respectively.



Figure 2: Original image



Figure 3: Edited image

Conclusion/Recommendations

The video was taken over a long enough time to show the evolution of many cumulus clouds, which gives the viewer a feel for how these clouds change over time, so it fulfills the intent of this project. However, if this was done again, photos would be taken much more often, maybe every five or ten seconds. In this video, a low frame rate had to be chosen to make the timelapse a reasonable length, giving the video a jerky quality. Even when rendered at a higher frame rate, the video maintains that jerky quality since the clouds were moving faster than estimated when the 30-second interval was chosen. Additionally, further care would be taken to plan out the length of the video prior to taking the timelapse.

References

(n.d.). Retrieved 10 13, 2024, from Cloud Appreciation Society:
<https://cloudappreciationsociety.org/cloud-library/fractus/>