Altocumulus Lenticularis



Henry Wojcik

CVEN 4151

Gross Reservoir, CO

September 26, 2026, 01:02 UTC

1. Introduction

The image was taken for the Clouds First Assignment. The goal was to capture clouds in the mountains during sunset. I was not looking for a specific phenomenon, only looking for striking pictures of clouds with the alpenglow lighting.

2. Location

The location of my image was at the Gross Reservoir, in Boulder, CO. It is approximately 30 minutes West via Flagstaff Road. The area of the Reservoir is surrounded by mountains, with the Front Range behind in at the larger interior mountains behind (to the West). The timing of the photo was around sunset, giving the bright red and orange colors.

3. Weather & Physics

According to the NWS in Boulder, the weather the previous day was similar with highs in the mid 70s and around 0.05 in of rainfall. The next day was warmer, with highs in the upper 80s and no rain. The atmosphere was relatively stable, with a CAPE value of 19 J/kg and a lifted index of -0.2 degrees Celsius. From the Skew-T, the dewpoint and temperature were closest around 4.4 - 5.5 km above sea level. This is where the we see stable altocumulus lenticularis clouds. Given the Reservoir is at around 2.2 km, these clouds are around 2.2-2-3 km above the camera. These typically form in the mid atmosphere in stable conditions[1]. The air is pushed over the mountain; the buoyancy of the air causes it rises and falls as it seeks to return to equilibrium. Like something going down a waterfall, it will sink into the water and bob up and down until it floats while traveling along the stream. Named trapped lee waves, they are described lines or bands of clouds with clear spacing in between downwind from the mountain[2].

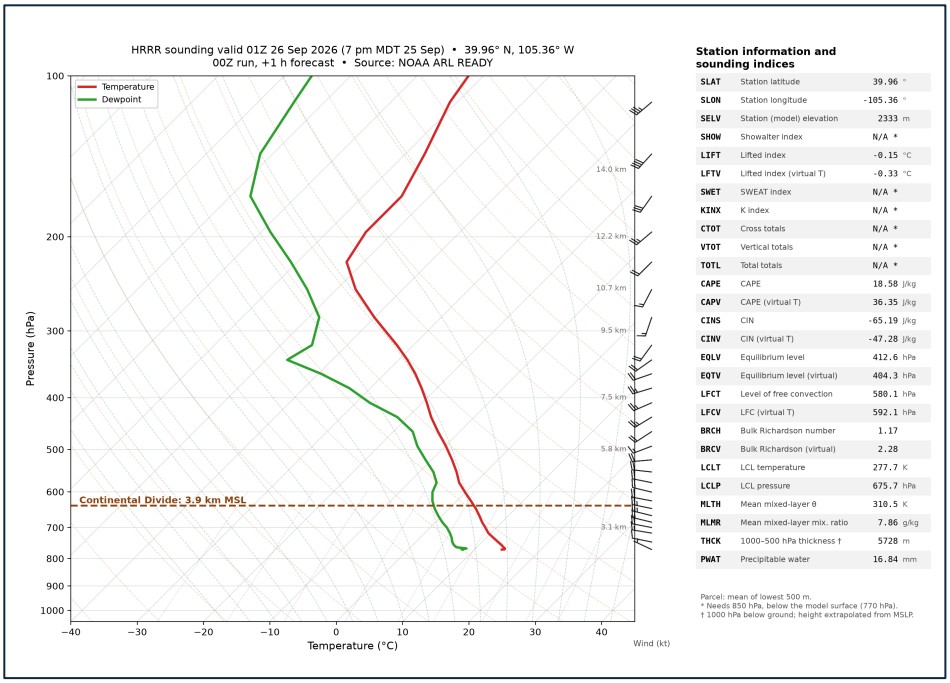


Figure 3.1: Skew-T Graph for Gross Reservoir at 19:00 MDT. Data From NOAA ARL READY[3].

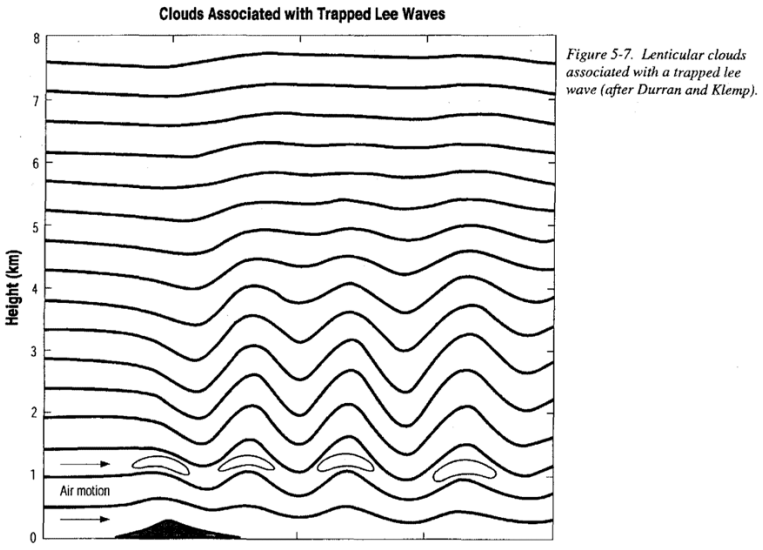


Figure 3.2: Mountain wave formation due to trapped lee waves[1].

4. Camera Settings & Editing

Camera	Nikon Z50 II
Lens	Nikkor Z DX 16-50mm f/3.5-6.3 VR
Original Image Size	5600 px× 3728 px
Final Image Size	1300 px × 900 px
Aperture	f/22
ISO	6400
Shutter Speed	1/60 s
Focal Length (35 mm equivalent)	19.5 mm (29.0 mm)

The intention was to capture a wide area, with a further focal point. I achieved this by using a small aperture to increase depth of field. This forced me to use a higher ISO, causing a grainer photo. However, the depth of field allowed me to focus on the main wave of the cloud shown, while also including the landscape and a cloud breaking up in the top corner. My goal with editing was to bring out the colors without affecting the overall image to much. There was an artifact removed on the left side. Using darktable, I turned up the vibrance, contrast, and color temperature.



Figure 4.1: Raw image.

5. Reflection

The image captures the wave formation of the clouds, and the bands as they dissipate. We often associate striking clouds with extreme weather and turbulent winds, but this image can capture a satisfying cloud formation without extreme weather. This allows the sunset lighting to play a bigger role, something I was going for in my image. My only intent was to capture a striking image of clouds at sunset and I believe I accomplished such. The aspect I would like to improve on is taking a wider photo, and perhaps with a longer exposure. Since I was holding my camera, I had to keep the shutter speed relatively fast to reduce blur, requiring a high ISO. This causes a grain effect in the photo. In the future, I would go back out with a tripod and use a longer shutter speed. I would also like to use a wider focal length, perhaps down to 16mm to see the waves more broadly.

References:

1. Buri, L. (2018). *Altocumulus Lenticularis* [Clouds First report, MCEN 5151 Flow Visualization, University of Colorado Boulder]. Retrieved October 20, 2026, from https://www.flowvis.org/wp-content/uploads/2018/01/Altocumulus-Lenticularis.pdf
2. Federal Aviation Administration. (1997). *Hazardous Mountain Winds and Their Visual Indicators* (Advisory Circular AC 00-57). U.S. Department of Transportation, Washington, D.C. Retrieved October 20, 2026, from https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_00-57.pdf
3. Rolph, G., Stein, A., & Stunder, B. (2017). Real-time Environmental Applications and Display sYstem: READY. *Environmental Modelling & Software*, 95, 210–228. https://doi.org/10.1016/j.envsoft.2017.06.025