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CVEN 5153

Clouds First

The purpose of this report is to describe the location, setting, and cloud occurrence captured in my posted Clouds First project on Flowvis.org. I captured a cumulonimbus cloud rolling over the approximate area between the outskirts of Louisville and Gunbarrel, Colorado.I have both a video and image capturing the cloud, where the video does show lightning flashes.

Both the image and video were taken on September 5th, 2026, between 7:58 to 8 PM. The sun was nearing the end of its sunset. This image was taken on the US 36 bike path going southbound in Superior Colorado, about half a mile south of the Costco in Superior. The camera was facing slightly northeast, approximately 1.7m high and angled roughly 20º from horizontal.

The cloud is a cumulonimbus, and can be identified by the prominent bursts of lightning in the video (Clouds Instability Slide). The cumulonimbus stretched over much of the troposphere, and seemed to stop along the tropopause. Cloud movement flowed easterly and seemed to approach Boulder. Cirrus clouds were up above my area but the rest of the sky seemed relatively clear. I identified cirrus clouds due to the thin wispy streaks. A cumulonimbus often occurs in tandem with cold fronts due to its formation of a squall line for these clouds to rapidly rush warm air up and cause storms and rain showers. Since a cumulonimbus occurs under a relatively short time (Mark Piper), its patterns cannot be related to the day before, but September 4th did appear to have cumulus and cirrus clouds similar to the sky prior to the cumulonimbus. Rain did not occur in my area after this image. **Figure 1** (University of Wyoming) shows the Skew T diagram taken from the Grand Junction at 6 pm on September 5, 2026 (00Z Dec 3). From the image, you can see a cloud base/LCL at roughly 550mb with a positive CAPE, suggesting that the cloud measured at Grand Junction is an altocumulus due to the unstable condition. Since a westerly wind exists from the Grand Junction to Superior, it can be hypothesized that this altocumulus cloud rushed over the Rocky Mountain range and carried enough energy and mixing to contribute to this cumulonimbus. Additionally, an unstable atmosphere at the Grand Junction does relate to the cloud conditions for the cumulonimbus to form, as it needs rapid mixing of hot and cold air to cause rain and thunder storms. However, my conversation with Dr. Mark Piper also confirmed my other opinion that since cumulonimbus clouds are sudden and caused by local weather patterns, it would be hard to discern whether this cloud identified from 280+ miles away could have contributed to this storm cloud within 2 hours.

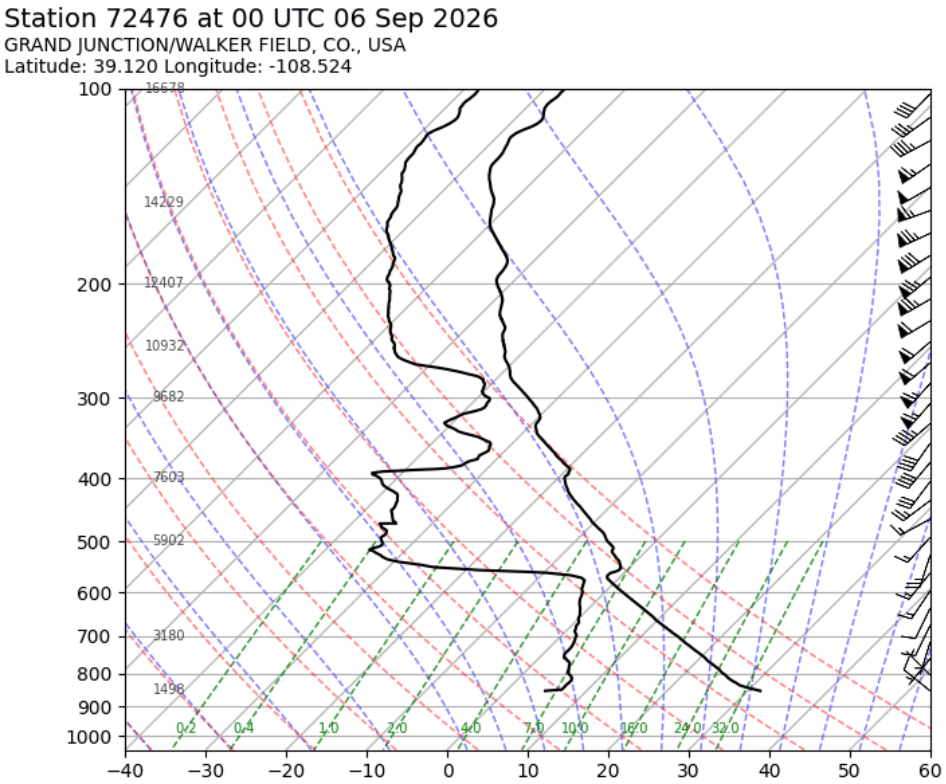


Figure 1: Skew T diagram of Grand Junction at 6 PM MT on September 6 (00Z September 6).

Two formats were taken: photograph and video, both on the IPhone 15 Pro Max (digital camera). Both images were taken on the IPhone's main 24mm lens at f1.78, which is roughly equivalent to a traditional 35mm full frame lens and has a field of view around 85 degrees. The cumulonimbus was roughly 10-20 miles away and no zoom was used. The image utilized the IPhone's native shutter speed to capture more light in order to make the image brighter; the video has the actual lighting. Image specifications for the cloud is provided: ISO640, 82mm digital zoom/crop from the 24mm lens, 5 MP, 1/5s shutter speed, and 1739 x 3092 pixels—no editing was done for this photo. Video specifications is provided: ISO 5000, 77mm digital zoom/crop from the 24mm main camera, 60fps, 7MP, and 1980 x 3520 pixels— only noise, and sharpness were adjusted to reduce the grain of this video.

The image reveals a cumulonimbus cloud rushing over the outskirts of Louisville and Gunbarrel, during the end of sunset. I think I did a great job capturing both a video and photo, with the video showing cloud physics while the photo conveying cloud art, especially since it captured a lightning burst. On a microscale, cloud physics is not shown well but this video is a great example of a cumulonimbus. One aspect I would like to improve is just the video quality, but I feel that I did the best I could have given that I was not at home and had to quickly capture this before it left. I would like to have a Skew T diagram closer to Louisville, such as in Denver. I think it would be great to capture a lightning burst in black and white while being closer to the cumulonimbus, I think B&W photography is effective and a skill I would like to be better at.

References

Sunberg, Laura, “Clouds Instability Slide”. (2025). CVEN 5153, https://canvas.colorado.edu/courses/143429/files/85603103?module_item_id=7821863. Accessed on October 19, 2026.

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University of Wyoming Atmospheric Science Radiosonde Archive. (2025). Uwyo.Edu. https://weather.uwyo.edu/upperair/sounding.shtml. Accessed on October 19, 2026.