

Clouds First Report: Cumulus Congestus on August 30th in Medicine Bow National Forest

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Figure 1: The final image submitted to FlowVis for the Clouds First assignment. Taken in Medicine Bow National Forest and primarily shows a large cumulus congestus cloud with a scud type cloud below.

1 Introduction

This image was taken for the FlowVis 'Clouds First' assignment which encourages students to keep an eye out for clouds each day. We are interested in clouds in this class because they are able to both show off the fluid physics going on in the atmosphere in these grand scales while being both interesting and accessible to photograph.

This image was take on August 30th at 4:30 pm from the north side of Mirror Lake in Medicine Bow National Forest in Wyoming. Mirror lake sits at 10,500 ft or 3,200 m of elevation. This cloud was fairly low at 20 degrees above the horizon to the south and appeared to start around 4,000 m of

elevation which matches where we expect to see clouds based on the skew-T in figure 2. This shows the dew point line and temperature lines closest together in this range (around 650 mb).

2 Cloud Identification

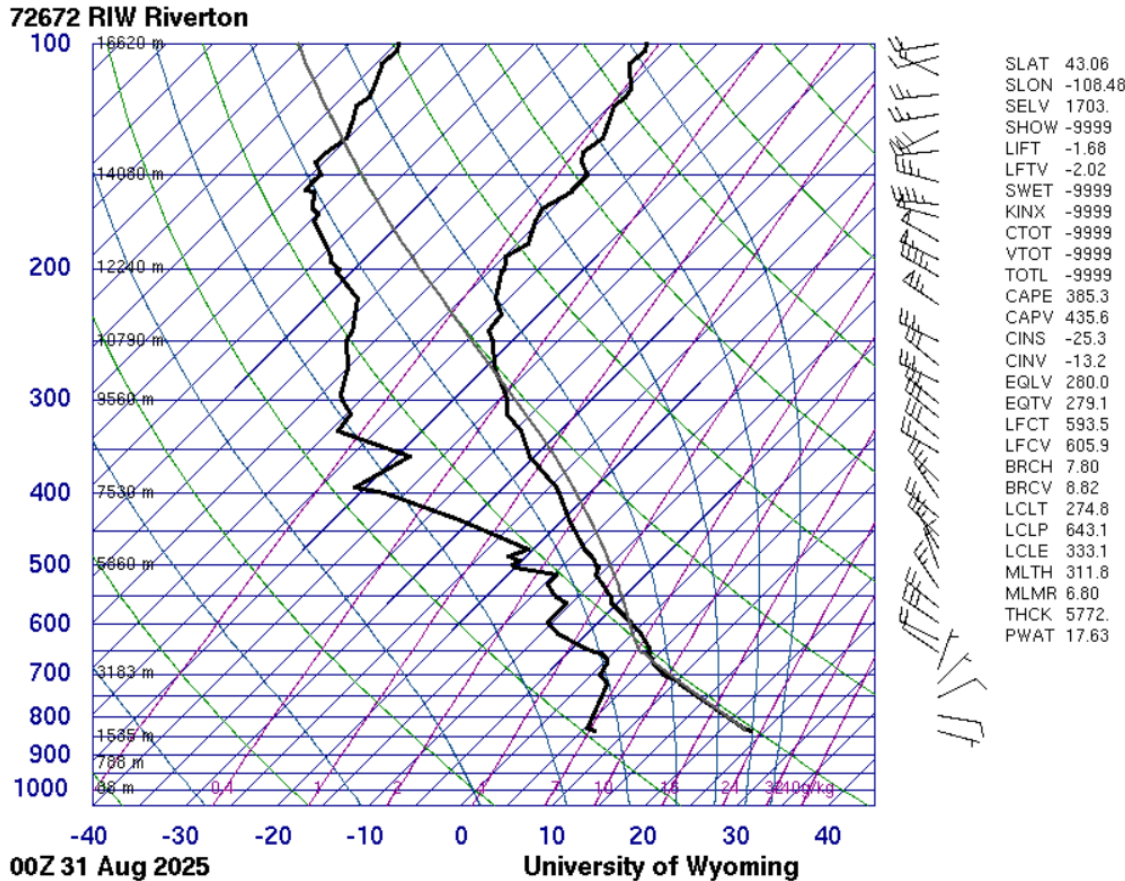


Figure 2: Skew-T from the Riverton weather station which was acquired using the University of Wyoming catalog [1]. The Riverton location was used because of its proximity to Medicine Bow National Forest.

The main cloud featured in this image appears to be a cumulus congestus due to the vertical height. Underneath this large cloud we also see another cloud formation that seems to be a scud cloud. Scud clouds tend to form underneath cumulus clouds due to the drafts of caused by storm systems. The atmosphere was fairly unstable in this region looking at the skew T diagram from the University of Wyoming around this time. The CAPE value was only 385 which suggests some instability in the atmosphere but not as much as a large thunderstorm. We did experience some precipitation. The weather around the time of this image was an interesting mix of small batches of hail followed by sunshine. This seems to match up with the instability we can see in the skew-T at this elevation and the mid-range CAPE value. This was the first day of a camping trip in the area and luckily the weather was perfect for hiking and fishing the next two days with a CAPE value of 0, showing off a stable atmosphere for the rest of my trip.

3 Visualization and Photo Details

This image was taken with a Nikon D3100 with 200 mm focal length, f/29, 1/125 exposure time, and iso 100. The original image size was 4644 x 3084 pixels. The final image was cropped slightly to 4634 x 3076. For the editing of this image I increased the exposure to create some more contrast with the

brighter and darker areas. I also added a s curve to the RGB color curve. Both of these adjustments were made in the darktable program. This cloud appeared to be around 2000 m away from the camera, judging by how it appears to be just over a few ridges from where the image was taken.



Figure 3: Original image captured before post-processing.

4 Reflection

This was definitely one of my favorite cloud images I took this semester—hence why I chose it to be my submission. I like how grand and defined this structure looks. I was originally tempted to use an edit where I cropped out the trees, leaving just the cloud but I felt it lost some scale and the power. I have grown to enjoy the trees framing the bottom of the image. Overall improvements that I would make is more on the side of saving important information. While most is saved in the meta data, in the future I want to record more information on the surroundings and conditions especially at a location that I do not have constant access to and even less familiarity with. Cloud images are mainly ones of luck and can happen in such small moments and at random; so remembering to take down information even if you are not in love with the images in the moment is an important habit and skill. Having this information allows to more easily understand and reconstruct why our clouds may look a certain way.

References

- [1] University of Wyoming Department of Atmospheric Science. Atmospheric sounding data. <http://weather.uwyo.edu/upperair/sounding.html>, 2025. Accessed: 2025-10-20.