Clouds First

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MCEN 5151-003

Original Photo

Edited Photo

For the first cloud image assignment as part of this flow visualization class, I had been on the lookout for interesting cloud formations, but could not find one. Even more interesting, prior to taking this photo there had not been a single cloud in the sky for 3 days. I took this photo and began to research what kind of cloud this was.

This photo was taken at the following 3375 Moorhead Ave, Boulder CO, 80305 (39.9958253 (Latitude) and -105.2520369 (Longitude)) facing just East of due South. The photo was taken on top of my roof at an elevation of about 25 feet with an elevation angle of approximately 15 degrees. The photo was taken on December 8th at 1:59pm.

The days leading up to me taking this photo and including the day I took this photo there was very little wind. The sun had been shining for 3 days straight and the weather was warm. Approximately half of the sky looked like it does in the photo with the other half having small collection of small cirrus clouds but otherwise being clear. The cloud shown in the image is a Altocumulus Cloud (Types of Clouds 1) which can be a sign of an incoming storm front which was absolutely true in this case. The next day, it snowed only about an inch, but due to the warm temperatures Boulder had been experiencing for the past 3 days, the cold weather and snow led to ice forming on the roads and becoming quite dangerous. My estimate for the cloud's elevation is about 6000 ft as it seemed to be about 3 times the height of the flatirons which stand about 1800 ft above Boulder's ground level.

72672 RIW Riverton

SLAT	43.06
SLON	
SELV	1703.
SHOW	−9999
LIFT	5.02
LFTV	4.93
SWET	−9999
KINX	−9999
CTOT	−9999
VTOT	−9999
TOTL	−9999
CAPE	0.00
CAPV	0.00
CINS	0.00
CINV	0.00
EQLV	−9999
EQTV	−9999
LFCT	−9999
LFCV	−9999
BRCH	0.00
BRCV	0.00
LCLT	253.4
LCLP	593.1
LCLE	298.6
MLTH	294.3
MLMR	1.37
THCK	5437.
PWAT	3.31

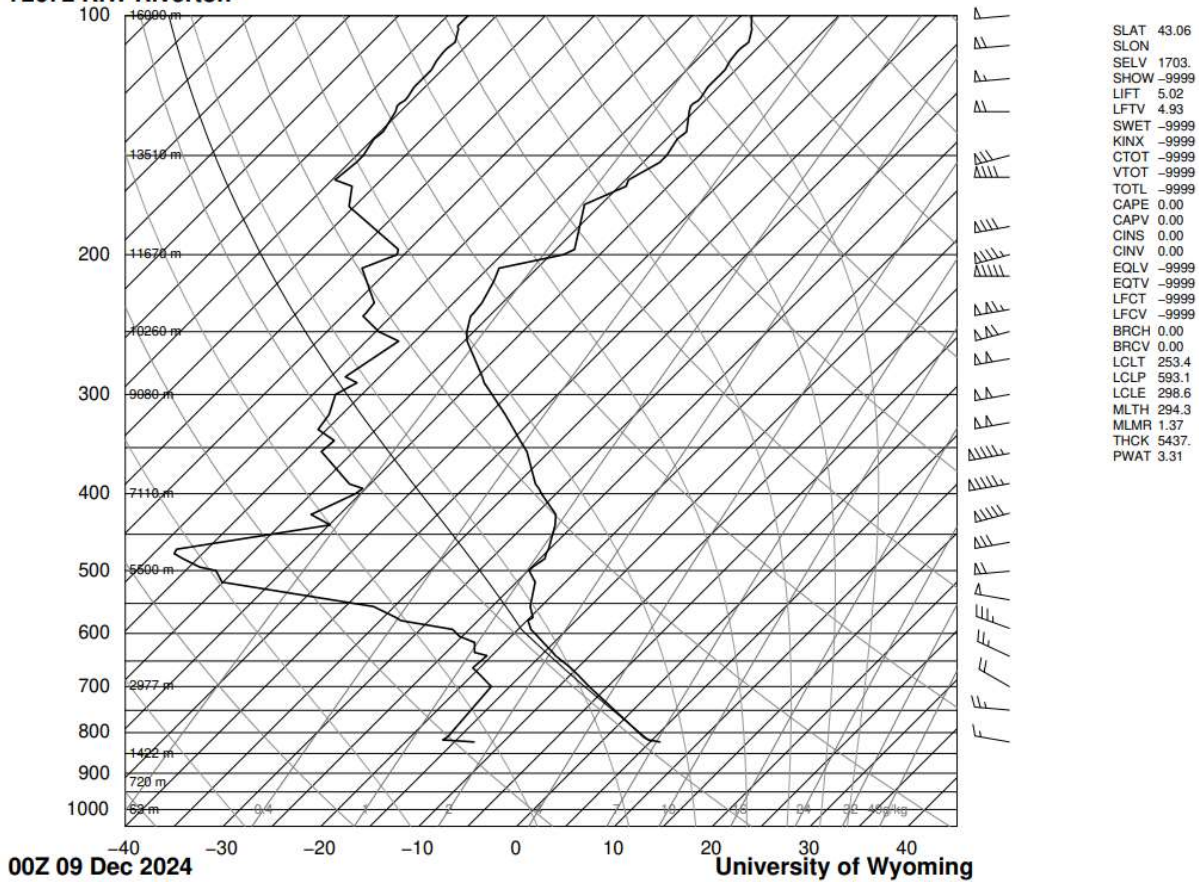00Z 09 Dec 2024   University of Wyoming

Image from Atmospheric Surroundings - University of Wyoming

These skew-T plots can be used to determine the cloud heights expected and which clouds would be expected from the stability of the general weather. By reading the skew-T plot we can see that the line is moving to the right of the dry adiabatic lapse rate which means that the atmosphere is unstable. This would mean that we are likely to see cumulus-type clouds or cumulonimbus clouds which we did not see the day of this photo, but it does match the next day to a certain extent. We did see cumulus-type clouds the next day but nothing formed into cumulonimbus clouds. I used the standard altimeter formula to estimate the altitude (Atmospheric soundings): $H = \frac{(P_0 - P)}{0.12}$ where H = Elevation, P_o = Sea Level Pressure (1013.25 hPa), P = Pressure at given height (~530 hPa from Skew-T Plot). This gave us an elevation of 4027.08 ft. This is low for a typical Altocumulous cloud, but is not surprising to me as it matches my estimation of elevation well. Given the Skew-T Plot and other information, I would make assumptions that the following weather would be colder and most likely come with some precipitation.

This photo was taken using a Canon EOS R100. Some specific specifications for the settings include: Shutter Speed (1/320), Aperture Value (F10), ISO speed (ISO100), Exposure (-0.5) and a Lens Focal Length (18mm). The shutter speed was relatively fast as I was trying to capture

the outside of the cloud and did not want to have a 3D effect. Both the ISO speed and aperture value were selected to allow a good amount of light which looked the best. The photo field size is difficult to estimate but it covered about ⅓ of the overall sky. In editing, the contrast was increased, saturation was increased to make the sky look more blue and prominent, and the highlights were decreased.

This image reveals some of the first clouds you are going to see if there is weather incoming. Even though the weather had been excellent leading up to it, the weather the next day made driving scary. This image shows us a sort of warning for this bad weather. As a climbing who needs to worry about weather like this, I will be on the lookout for clouds like this and prepare for weather the next day. The fluid and movement of the water in the clouds is clear in my image after the editing but was difficult to see before editing. I really liked how the whole image was encompassed by one cloud despite using a wide focal length. I did not like how dark it was and wish the sun was at a different angle or brighter. To develop this idea further, it would be interesting to track times when an Altocumulous clouds are sighted and see if the weather the next day is full of snow and rain.

Work Cited

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