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Clouds Second
Flow Visualization 2023
12/15/2023

The image above was taken for the Clouds Second assignment in the Fall 2023 section of Flow Visualization. The purpose of this assignment is to take pictures of clouds and explain the art and science behind the images that we obtain. I took a number of pictures for this assignment, but decided on this one due to the larger scale of the cloud as well as the other elements that I included such as the lake and mountains.

The picture was taken on December 7th, 2023 at 12:55 PM in Erie, Colorado. The camera was facing northwest at an angle of approximately 30° with the horizon. This day was particularly windy with gusts reaching 35 mph when the photo was taken. However, it was also a warm day as the temperature outside was 62° F at the time of the photo (Weather Underground).

The primary cloud in this photo is a stratus or stratocumulus cloud. This was determined by the elevation of the cloud being relatively low in conjunction with the Skew-T plot, seen below, having a CAPE value of 0. This indicates a stable atmosphere. Stratus clouds form in stable atmospheric conditions as the vapor in the sky is able to fall to lower elevations. However, stratus clouds often cover much of the sky. This leads to this cloud being a stratocumulus cloud. These clouds are formed from stratus clouds breaking up. In addition, stratocumulus clouds often form during changing weather conditions (MET Office). Given the cold front that can be seen moving over the mountains in the background and the large amount of wind, it would be reasonable to assume that the weather was about to change. When checking the weather data for December 8th, 2023 this is exactly the case with a low of 26° F and a small amount of precipitation coming in the evening (Weather Underground).

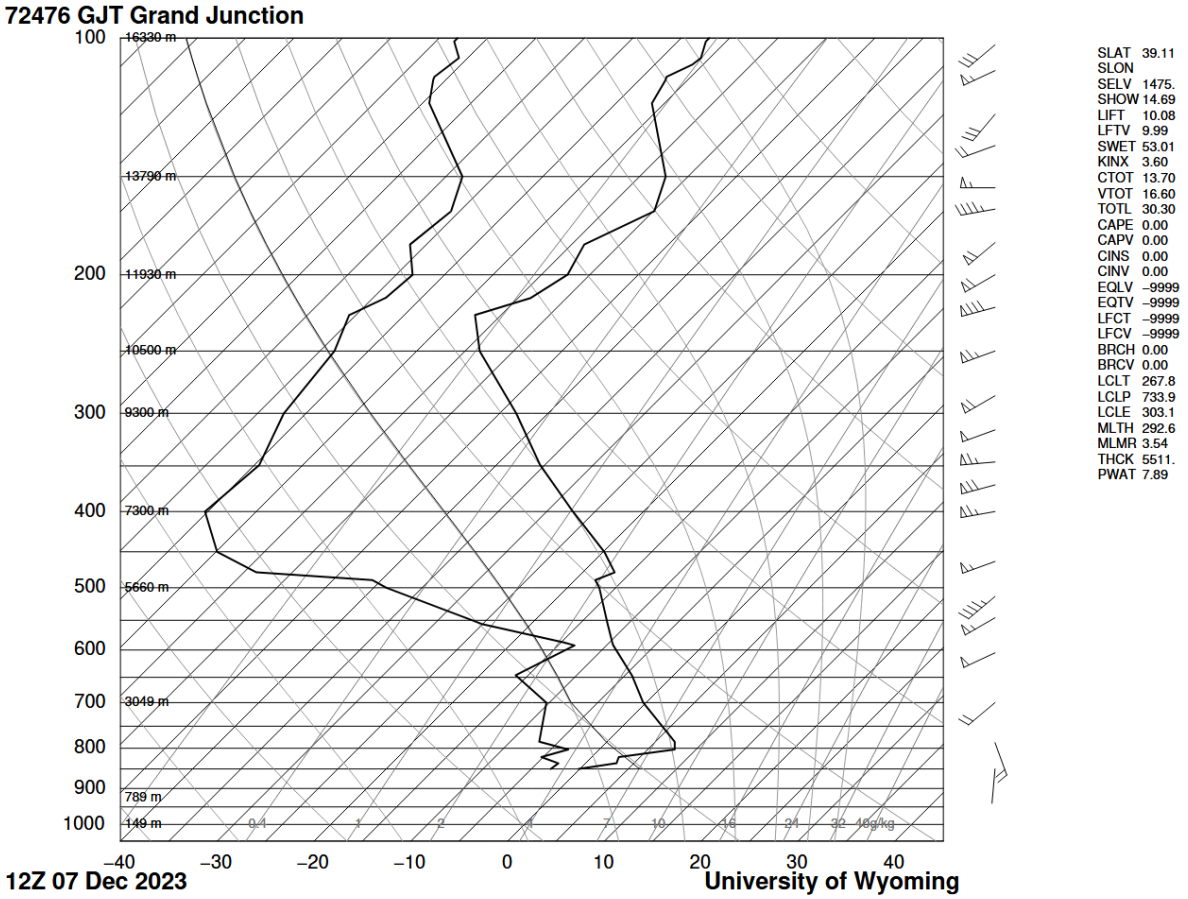

Figure 2: Skew-T Plot Credit: University of Wyoming

From studying the Skew-T plot for the time that the photo was taken, most clouds would have been forming at lower elevations. This can be determined from the distance between the temperature and dew lines. These lines are close at the bottom before the distance increases at around 4000 meters. This data aligns with the observational data that was given from the photo to make the categorization of a stratocumulus cloud as the cloud pictured was at a lower elevation with no clouds above it.

Figure 2: Original image

Figure 3: Final image

The photo was taken using a Google Pixel 7 Pro with an aperture of 1.85, an ISO of 45, and a focal length of 6.81mm. The original photo was 4032 x 2268 and was cropped to 4032 x 1216. In addition, some color correction was applied using Google's photo editing software to make the sky more blue and the clouds more sharp. While everything but the cloud could have been cropped out, I decided to keep the full view of the mountains and lake in the photo as it creates a breathtaking landscape.

I really enjoy this photo. While the assignment is focused on clouds, the inclusion of other elements adds to the overall composition of the photo. It was also really interesting doing research on how this cloud was formed and how to categorize it. In conclusion, my intent was fulfilled for this assignment as I really enjoyed both the fluid mechanics and the art that make up the final image.

Citations:

"Atmospheric Soundings." University of Wyoming Department of Atmospheric Science, *http://weather.uwyo.edu/upperair/sounding.html*

Erie, Co Weather Calendarstar_ratehome." Weather Underground, *https://www.wunderground.com/weather/us/co/erie/KCOERIE126*

"Stratocumulus Clouds." Met Office, *https://www.metoffice.gov.uk/weather/learn-about/weather/types-of-weather/clouds/low-level-clouds/stratocumulus*