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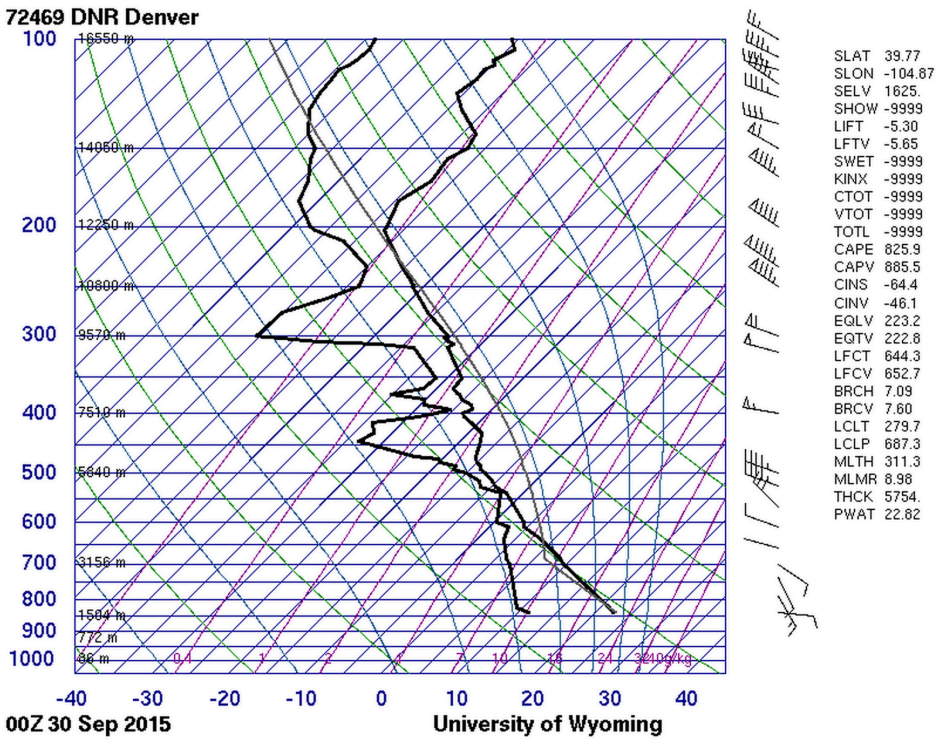
10/15/15
Flow Visualization

Clouds First

The purpose of this project is to take an image of a cloud, learn to identify the cloud, and the reason for its formation. This image is meant to aid in getting students to notice the clouds in the sky and be familiar with what type it is. The image captured for this project is meant to illustrate the details and the pillow like flows of a cumulus cloud.

This image was taken just southeast of the University of Colorado, Boulder's campus from the third story of an apartment building on September 29 at around 2:00 pm. The camera was pointing southwest, at angle of roughly 60°. The clouds were at an elevation of about 5,000 feet above ground level.

The cloud species in this image are cumulus mediocris. They have the "fluffy" look signature to cumulus and cumulonimbus clouds. They also had a gray base and some higher tops. The atmosphere was also unstable that day as seen from the skew-T diagram below (high cape of 825.9), which is also a sign that cumulus clouds would have occurred that day. This skew-T is from DIA on September 29th at 6:00 pm.



Description of the sounding indices.

Later in the day it did rain which also gives evidence of an unstable atmosphere. This image shows what could be the start of a tower that will eventually lead to a cumulonimbus cloud and rain. When clouds appear to be growing upwards is another sign of an unstable atmosphere. At the ground level, there was not much wind that day.

The image was taken with a Nikon D5000 DSLR with a zoom lens attached. The shutter speed was set to 1/640 of a second, the aperture was set to f/13, and the ISO was set to 250. Since it was so bright that day, the shutter speed and aperture was set low to prevent over exposure. The focal length was 55 mm, and since it was a zoom lens, the image did not have the best field of view. The field of view was fairly small. The image actually was not cropped at all even though it seems like there could be more to the image. The clouds are about 5,000 feet away. From that distance it can me estimated that the length of the clouds in the image are about 7,500 feet long. The post processing in Gimp was fairly simple. The curves tool was utilized to make the whites brighter and the blues deeper. This also had an effect on the color of the shadows, making them a little blue, but this effect did not negatively affect the image. The image's pixel dimensions are 4288 x 2848. The image was not cropped so the originals images dimensions are the same.

The image reveals the effect an unstable atmosphere has on clouds. This cloud was starting to form a tower, which might eventually lead to a cumulonimbus cloud. This image shows really well the part of the cloud that is moving up on the left side of the image. I like all of the features that you can see in the cloud, the "cotton ball" look. I also like how bright the image is and the shadows that the clouds created on themselves. On the projector, the image looked a little

overexposed on some of the whites, which I did not like. I would like to change that if that seems to be a common problem for this image. In order to develop the idea farther a time lapse of the cloud could be taken, or several photos of its development across the sky could have been taken.

References

"List of Cloud Types." *Wikipedia*. Wikimedia Foundation, 6 Nov. 2015. Web. 10 Nov. 2015. <https://en.wikipedia.org/wiki/List_of_cloud_types>.