Cloud Report 2

Flow Visualization
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Introduction

 The purpose of this assignment was to observe and identify different cloud structures. This was done over the course of a month and a half and students picked their favorite photograph of clouds. Photos were allowed to be taken between October 6, 2016 to November 14, 2016. The photo above was the image I picked, and it was taken on November 13, 2016. In addition to taking and identifying the cloud structure above, I have documented where the image was taken, and the atmospheric qualities at the time the photograph was taken. The process allowed me to get a better understanding of fluid flow mechanics in clouds.

Location and Environment

The photograph as taken in the field south of the ITLL. The address for this location is located in the appendix. The photo was taken at 12:30pm. The temperature of Boulder at the time was 54 degrees Fahrenheit. The dew point on this day was 25 degrees Fahrenheit. The humidity at the time was 35%. There was zero precipitation on this day. The wind speed at the time time was 5.8 miles per hour coming from the west southwest ("Weather History for KBDU - November, 2016."). Overall the atmosphere was very stable. The CAPE for the time the photograph was taken was 0.00 ("72469 DNR Denver Sounding.”). This metric was provided by the University of Wyoming with the Skew-T provided in the Appendix.

Cloud Discussion

The main horizontal cloud is a stratus formation. We know this because the cloud is very low, indicated in the Skew-T diagram. stratus clouds are "found at very low levels (less than 2000 meters, or 6500 feet) [and] stratus clouds are thick, large, heavy-looking grey clouds" (Aherns). Precipitation is also very unlikely to occur with this cloud formation, which is consistent with no precipitation on the day the photograph was taken. If the cloud is heavy enough it is possible to produce a light drizzle ("Ten Basic Cloud Types.").

As well as stratus clouds, in the upper right hand corner of the photograph, we see some cumulus clouds. The national weather service describes these clouds as "detached, generally dense clouds and with sharp outlines that develop vertically in the form of rising mounds, domes or towers with bulging upper parts often resembling a cauliflower" ("Ten Basic Cloud Types"). When over land, these clouds typically forms on sunny days with clear skies. Typically the cloud forms in the mornings, but they can stick around for much of the day if the atmosphere is stable.

Photographic Technique

The photograph was taken on an iPhone 6 using the panoramic option. This was used to capture all of the horizontal cloud structure as well as the Flatirons. The image size was originally 1600x905 pixels. The resolution for the photo was 72 pixels per inch. The ISO of the image was 1600. The image was processed first by adding a white border above and below the panoramic image. This was done to give the image more of a square structure. The brightness and contrast were then increased.

Conclusion

Overall I am very happy with my image. I love how I was able to capture the whole horizontal cloud as well as the Flatirons in the background. I think how nice and bright it was out that day have the image a very positive happy vibe. There are a few different things I wish I could change about the image. First, I wish I was able to capture the image without any people in the image. The guy in the black T-shirt in the lower right side is very distracting. The group of people in the middle of the left side of the image also are a little distracting. I also wish I removed a little more of the bottom to focus more on the cloud structures above. Despite these few problems, the image came out very well. Boulder gives a beautiful landscape for image taking.

Appendix

Resources:

"72469 DNR Denver Sounding." 72469 DNR Denver Sounding. University of Wyoming, 13
Nov. 2016. Web.
<http://weather.uwyo.edu/cgi-bin/sounding?region=naconf&TYPE=GIF%3ASKEWT&
YEAR=2016&MONTH=11&FROM=1312&TO=1312&STNM=72469&ICE=1&REPL
OT=1>.

"Ten Basic Cloud Types." Cloudwise. N.p., n.d. Web.
<http://www.srh.noaa.gov/srh/jetstream/clouds/cloudwise/types.html>.

Aherns, Donald C. "Clouds!" Clouds! University of Oklahoma, n.d. Web.
<http://weather.ou.edu/~smglenn/clouds.html>.

"Weather History for KBDU - November, 2016." Weather History for Boulder Muni, Boulder,
CO, CO | Weather Underground. N.p., 13 Nov. 2016. Web.
<https://www.wunderground.com/history/airport/KBDU/2016/11/13/DailyHistory.html?r
eq_city=Boulder&req_state=CO&req_statename=&reqdb.zip=80301&reqdb.magic=1&r
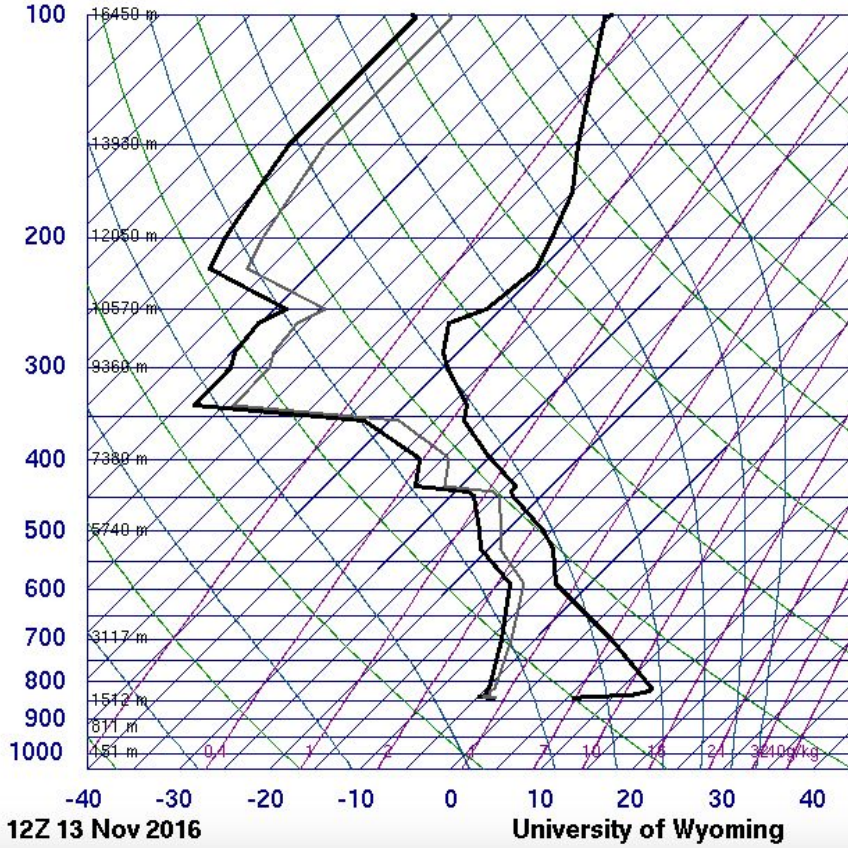eqdb.wmo=99999>.

Address of Photograph Taken:

1111 Engineering Drive
433 UCB ECOT 417
Boulder, CO 80309

Unedited Image

Skew-T Diagram:

72469 DNR Denver

12Z 13 Nov 2016   University of Wyoming

SLAT	39.77
SLON	-104.87
SELV	1625.
SHOW	-9999
LIFT	4.77
LFTV	4.73
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	265.0
LCLP	630.7
MLTH	302.3
MLMR	3.31
THCK	5589.
PWAT	9.83