Cloud Report 2:

Time Lapse Video

https://vimeo.com/91023759

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I made a time lapse video for the second cloud assignment. I decided to do a time lapse in order to see the movement of the clouds and for an opportunity to attempt to describe multiple cloud formations. Ever since seeing the movie, *Baraka,* time lapse videos have always amazed me and put me into a meditative state, so I couldn't pass up an opportunity to make one myself.

There are 6 separate time lapse videos that will be described in the order they appear in the video. The first two shots in the video (4 to 17 seconds) are shot at Chautauqua Park in Boulder, CO facing west (segment 1) and then Southwest (segment 2) between 12:00 and 1:30 pm on April 2, 2014. Both shots are sped up to 50 X. As seen in figure 1, the camera was placed on a rock about five degrees from horizontal.

Figure 1: Filming location 1 at Chautauqua Park in Boulder, CO

The next 2 shots are set right next to the Cherryvale Open Space Park in South Boulder, CO between 3:00 and 4:00 on April 3, 2014. Both shots are sped up to 100 X. The third segment of the video (18 to 20 seconds) is shot facing east with the camera level with the ground due to it being perched on a fence as seen in figure 2. For the fourth segment (20 to 28 seconds), I parked my car in the direction I wanted to film, southwest, and wedged the camera into the partially open sunroof as seen in figure 3. The camera was approximately 25 degrees above horizontal.

Figure 2: Filming location 2 at Cherryvale Open Space Park facing east for third video segment

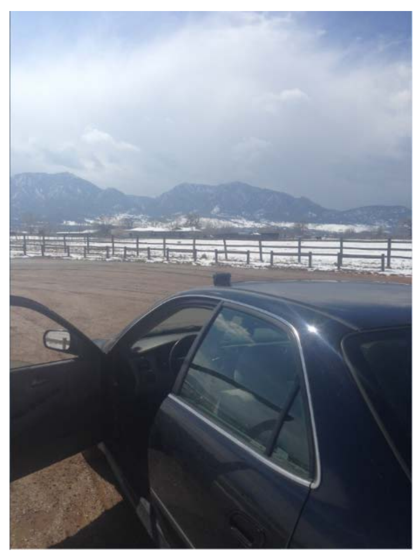

Figure 3: Facing southwest at filming location 2 for fourth segment of video

The third filming location for the fifth segment of the video (29 to 42 seconds) was shot on the roof of a parking garage in Aurora, CO on April 2, 2014 from 4:30 to 5:15 p.m. As seen in figure 4, the parking garage was near S. Parker Rd. and E. Bethany Dr. Similar to the fourth segment, the video was taken with the camera wedged into a partially open sunroof on my car leaving it approximately 25 degrees above horizontal. The camera was facing west.

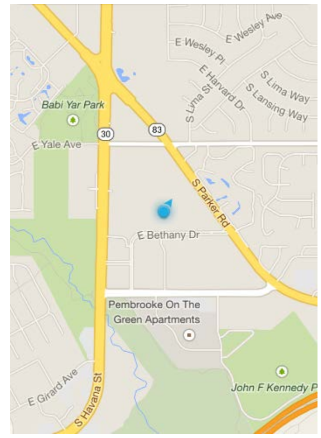

Figure 4: Filming location 3 in Aurora, CO from Google Maps IPhone application

The fourth and final filming location (for sixth segment) was at the first western exposed area I could find going up Flagstaff Rd. in Boulder, CO on the evening of April 3, 2014. The video was shot from about 6:45 to 7:30 as the sunset. As seen in figure 5, the camera was buried in the snow on a fence to give the camera a slight tilt upwards (approximately 10 degrees from horizontal). Because it is difficult to see, a red star is placed to find the location of the camera (at very top of star). The tilt was necessary to get the frame to capture the slim horizon. This filming location was off of a hiking trail so I was not able to use the same sunroof technique used previously. Interesting enough, the snow melted slowly as the video progressed naturally panning the camera upwards. By the end, the camera was probably at 25 to 30 degrees above horizontal.

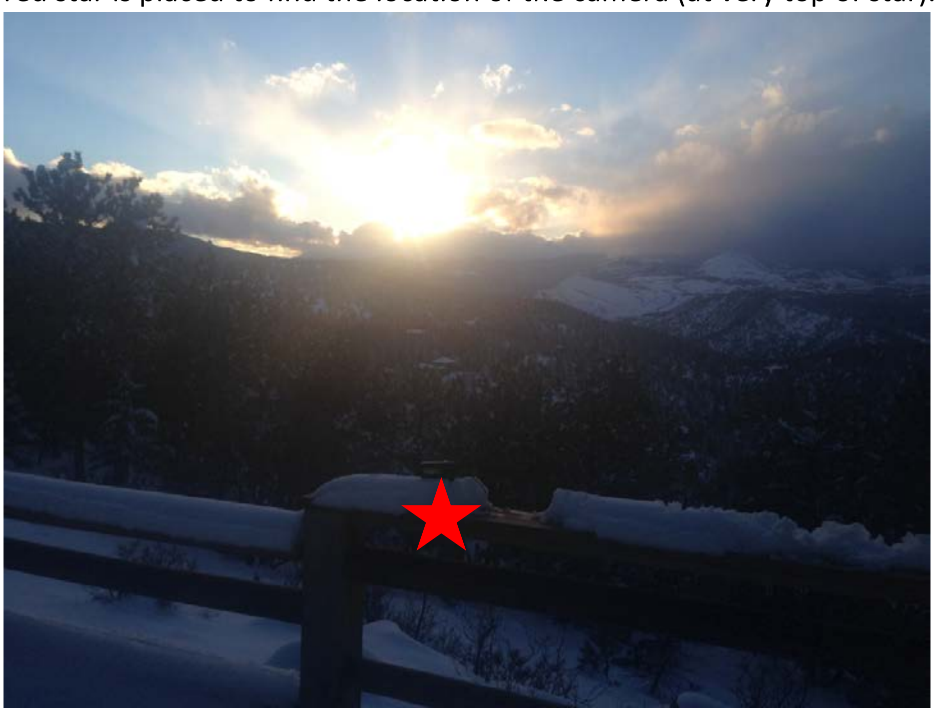
Figure 5: Filming location 4 off of Flagstaff Rd. in Boulder, CO

Skew-T diagrams can provide hints to where cloud formation occurs as well as the stability of the atmosphere from the CAPE value. CAPE is the convective available potential energy and represents a stable atmosphere only if this number is zero. Anything above zero represents unstable layers in the atmosphere.[i] Sadly, completely valid Skew-T diagrams are only available for two out of the six sections (five and six), because all of the data from April 2, 2014 is missing from the University of Wyoming website that displays Skew-T diagrams. When the temperature and dew point lines (the darker lines on the plot) are close to equal, relative humidity is large and clouds develop.[ii]

The Skew-T diagram in figure 6 is most representative of the fifth segment in Aurora, CO and has the CAPE at 0.00 (stable) and the cloud layer most likely between 3,000 meters (10,000 feet) and 5,000 meters (16,000 feet). The Skew-T diagram in figure 7 is most representative of the sixth segment on Flagstaff and has the cloud layer most likely at around 3,500 meters (11,500 feet) and the CAPE at 2.27.

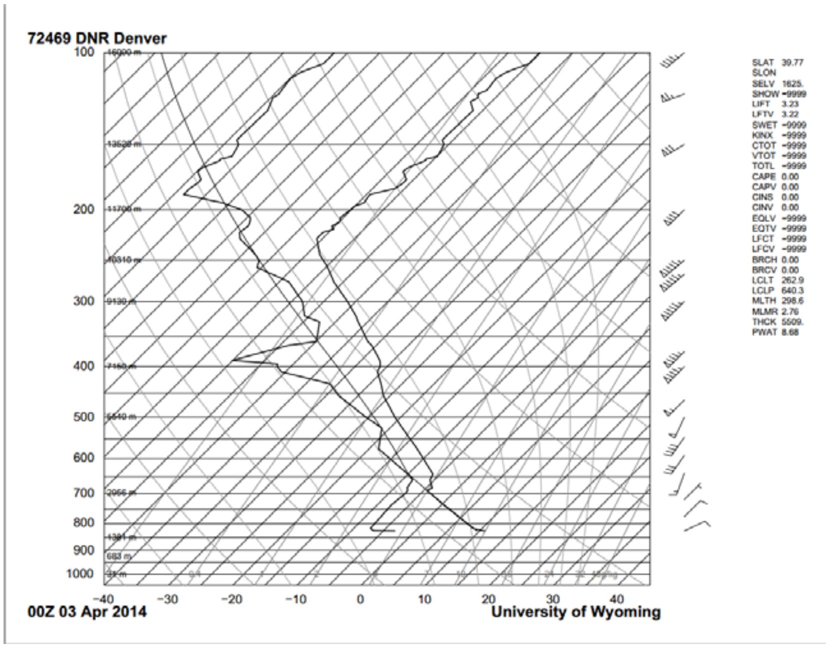

Figure 6: Skew-T for 6:00 pm on April 2, 2014 from http://weather.uwyo.edu/upperair/sounding.html

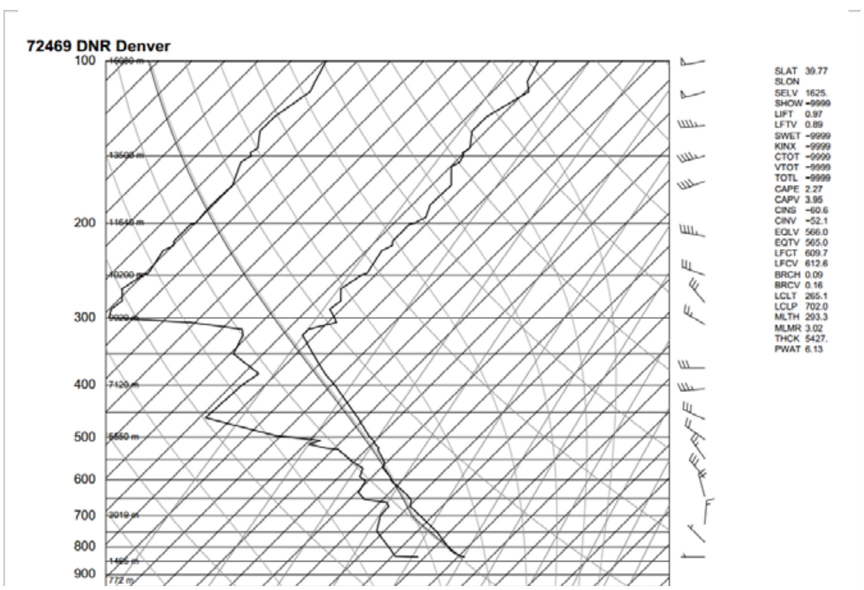

Figure 7: Skew-T for 6:00 pm on April 3, 2014 from http://weather.uwyo.edu/upperair/sounding.html

For the first two segments of the video, as seen in figure 8, the visible cloud layer is most likely at 640 meters (2100 feet). The stable CAPE value from figure 6 most likely still applies to these clouds even though the Skew- T was from about five hours after the video. The clouds shown in these segments are stratocumulus. “Stratocumulus are low layers or patches of cloud, with well-defined bases” (Pretor- Pinney 92). Stratocumulus clouds are typically at 2,000 to 6,500 ft. above the surface putting these Chautauqua clouds right at the bottom of that spectrum. They are of the perlucidus variety, because there are gaps between the cloud elements (Pretor- Pinney 92). These clouds are constantly changing and taking up more and more space in the sky as they progress forward in time.

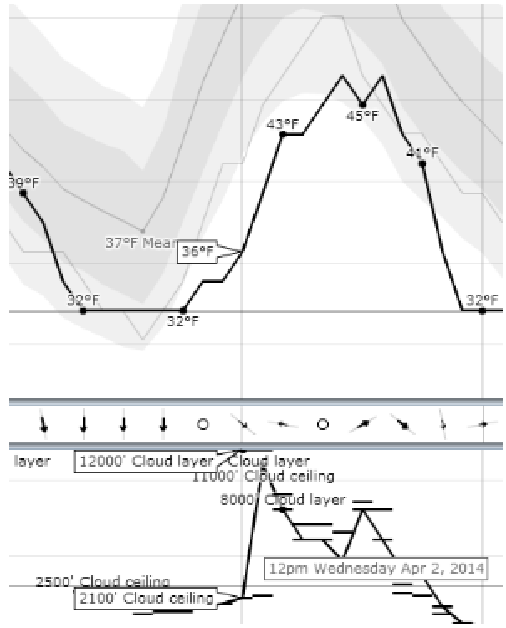

Figure 8: Graph showing temperature and cloud layer for segments 1 and (at Chautauqua Park, CO). From weatherspark.com

It had snowed from about 11:00 p.m. to 6:00 a.m. the night of April 2 and morning of April 3. The third and fourth segments are shot at the same location, but the clouds pictured are in different directions. I estimated the location of the clouds for the third segment to be straight east of the filming location in either Lafayette, CO or Erie, CO. As seen in figure 9, the lowest cloud layer is at 1,800 meters (6,000 feet). Because of the skinniness of the cloud layer, the altitude, and the well-defined base of the cloud, the cloud is also most likely stratocumulus. This one is of the castellanus species, because the cloud elements have crenellated tops as they roll along. The clouds in the fourth segment start above the

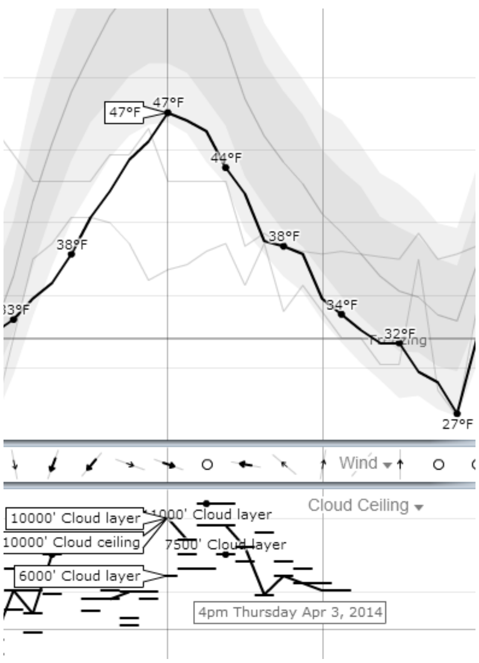

Figure 9: Graph showing temperature and cloud layer for segment 3 (at Lafayette, CO). From weatherspark.com

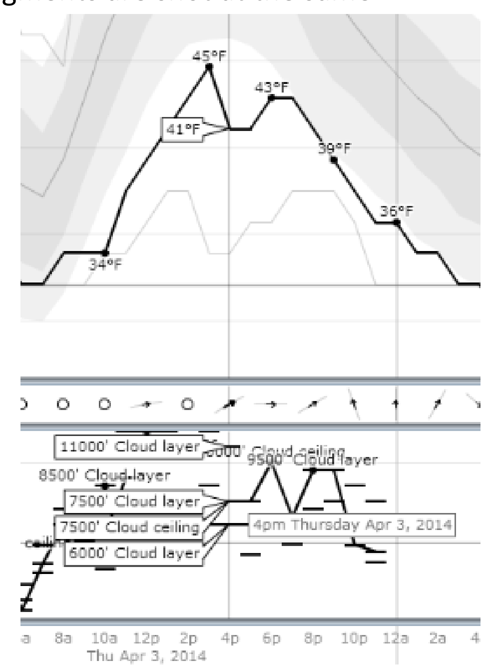

Figure 10: Graph showing temperature and cloud layer for segment 4 (at S. Boulder Peak). From weatherspark.com

Flatirons and travel all the way out to the filming location. Figure 10, shows the lowest cloud layer also at around 1,800 meters (6,000 feet). These begin as stratocumulus clouds over the mountains. At the beginning, they are of the lenticularis species, having one or more mass of clouds in a smooth, solid-looking almond shape (Pretor- Pinney 92). However, the clouds that eventually spread across the sky appear to be altostratus, which are thin mid-level layers of grey cloud (Pretor-Piney 136). These clouds seem to dominate the sky.

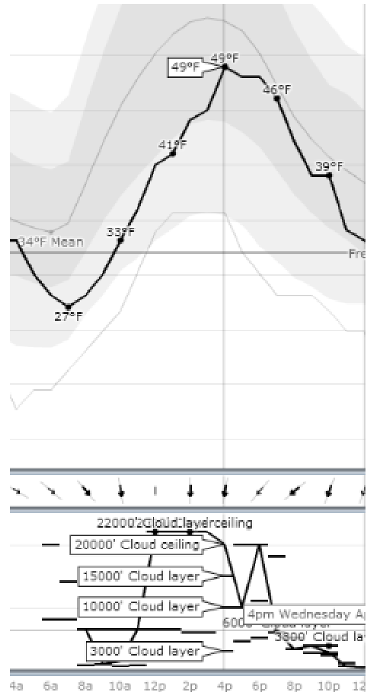

Figure 11: Graph showing temperature and cloud layer for segment 5 (at S. Parker rd. and E. Hampden ave.). From weatherspark.com

The fifth segment shows what appears to be mountain wave clouds. The Weatherspark graph in figure 11 shows the lowest cloud layer to be at 900 meters (3,000 feet). The cloud layer is very thin most of the time, which is enough to warp the image of the sun but not completely mask it. Due to the low elevation, these may just be stratus clouds. There appear to be many stratus clouds of the fractus species, which is when the cloud is not particularly thick and in separate, ragged segments. These clouds are also of the translucidus variety, because the outline of the sun can be easily seen (Pretor-Piney 72).

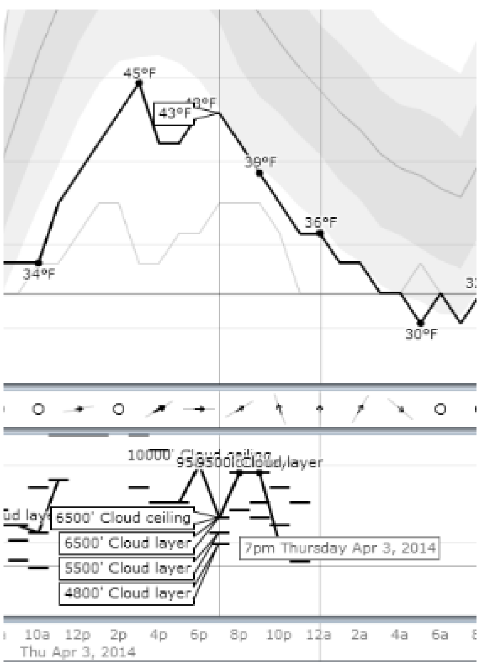

Figure 12: Graph showing temperature and cloud layer for segment 6 (at Gross Reservoir). From weatherspark.com

The sixth and final segment had clouds west of the filming location off of Flagstaff rd. so I have the cloud location estimated as Gross Reservoir. From the Weatherspark graph in figure 12, the cloud layers are shown to be between 1500 and 2000 meters (4800 and 6500 feet) also putting these in the “low cloud” range. Due to their clumpy look and elevation, these clouds are also probably altocumulus. They are of the stratiformis species, because the rolls extend over a very large area and of the opacus variety, because the layer completely masks the sun (Pretor- Pinney 92). The sun is only seen through the corona created by the clouds.

The camera used was the digital camera, Canon PowerShot SX260 HS in video mode. All of the camera settings were automatic. The specific settings could not be found, because the videos got corrupted after the final video was edited. All video editing was done in IMovie. In order to speed the video up past 40 X (IMovie’s limit), JES Deinterlacer was used.

I believe the video shows a lot of beautiful cloud movement. It was fun to scope out great spots to see the clouds and successfully film them. In the future, I would use a better video camera, so longer shots could be taken without the battery dying and have a tripod to use. The variety of shots captured made it very difficult to describe the exact cloud formations of each one, but at the same time I believe that keeps the audience's interest.

Bibliography

Pinney, Gavin, and Bill Sanderson. *The cloudspotter's guide: the science, history, and culture of clouds*. Perigee hardcover ed. New York: Berkley Pub. Group, 2006. Print.

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[i] http://www.colorado.edu/MCEN/flowvis/course/Lecture2014/08.Clouds2.pdf
[ii] http://www.ucar.edu/communications/gcip/m8clclchange/m8pdfc1.pdf