MCEN 4228 – Flowvis
Cloud Assignment 2
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Föhn Wall Could

On April 18, 2006, I have observed a huge wall cloud forming over the mountain ridge around 4:30pm in the afternoon. The day was dry and wind was blowing from North West direction. The cloud formed during Foehn.

Foehn is a warm and dry wind on the lee side of a mountain range. The temperature increases as the wind descends the slope. It is created when air flows downhill from a high elevation, raising the temperature by adiabatic compression. The picture was taken on the engineering parking tower top floor looking directly toward the mountain on the west. The clouds form when the wind follows top of the mountains cool down the air to the dew point. The clouds stop forms when the wind starts to slide down the slope with adiabatic heating condition. Massive amount of clouds form and discontinues right at the edge of the mountain slope. It creates big wall looking clouds standing behind the mountains.

According to the weather underground[1], the Boulder outside temperature was 50°F with humidity of 26%. Dew point recorded 17.8 °F/ -8°C and clouds formed 9000ft/2743m above the ground level. The altitude of the clouds that I took was around 9000ft. Figure 1 is the skew-T plot that shows the condition of the atmosphere on April 18, 2006[2]. The skew-T plot give more atmospheric data on that day the picture was taken. The yellow line in the figure denotes the trajectory of an air parcel movement in vertical direction through the atmosphere. The white lines represent the dew point and temperature profiles, from left to right, respectively. When the white lines are to the left of the yellow line, the conditions are unstable. As skew-t plot shows, the atmospheric condition of the day was unstable due to raising warm air. I saw many big and small local cumulus clouds were formed east of the mountain flat ground area. The heated air by Foehn effect blew down along with the down slope of the mountain lifted air and cooled down in lower atmosphere. The classification of the cloud found in Cloud Dynamics book[3].

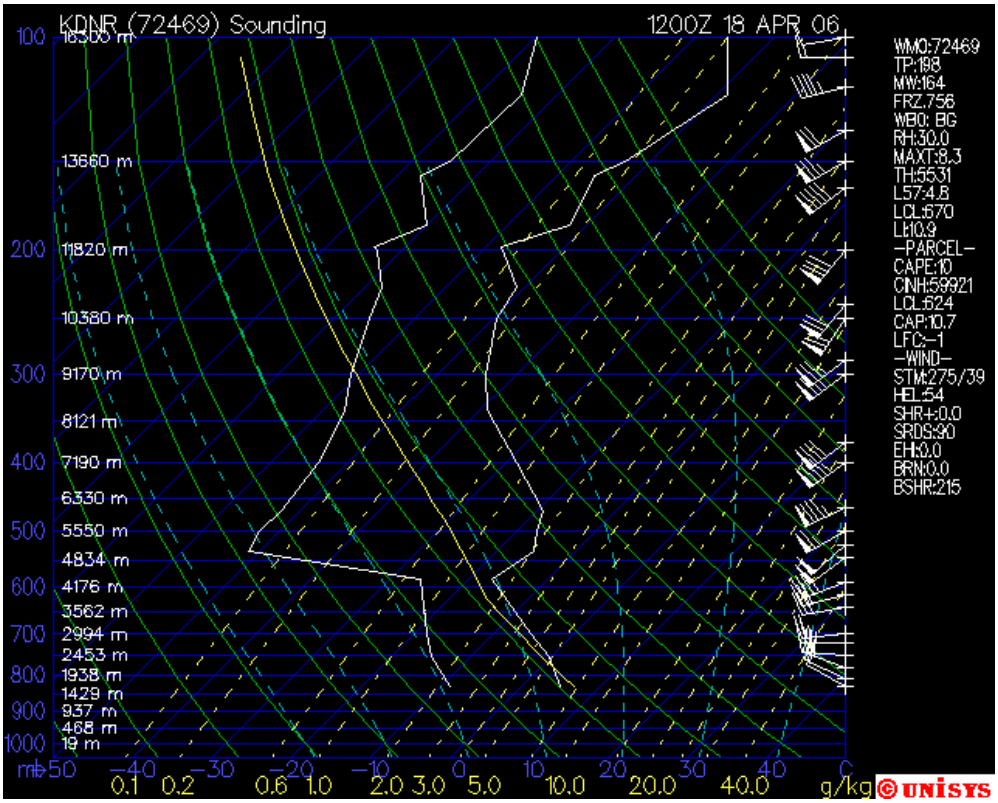

Figure 1: Skew_T plot in Denver on April 18, 2006

The figure 2 is from weather underground website that shows a satellite picture around boulder. I could see better how the could formed near ridge of the mountains and looked like sitting on the mountain.

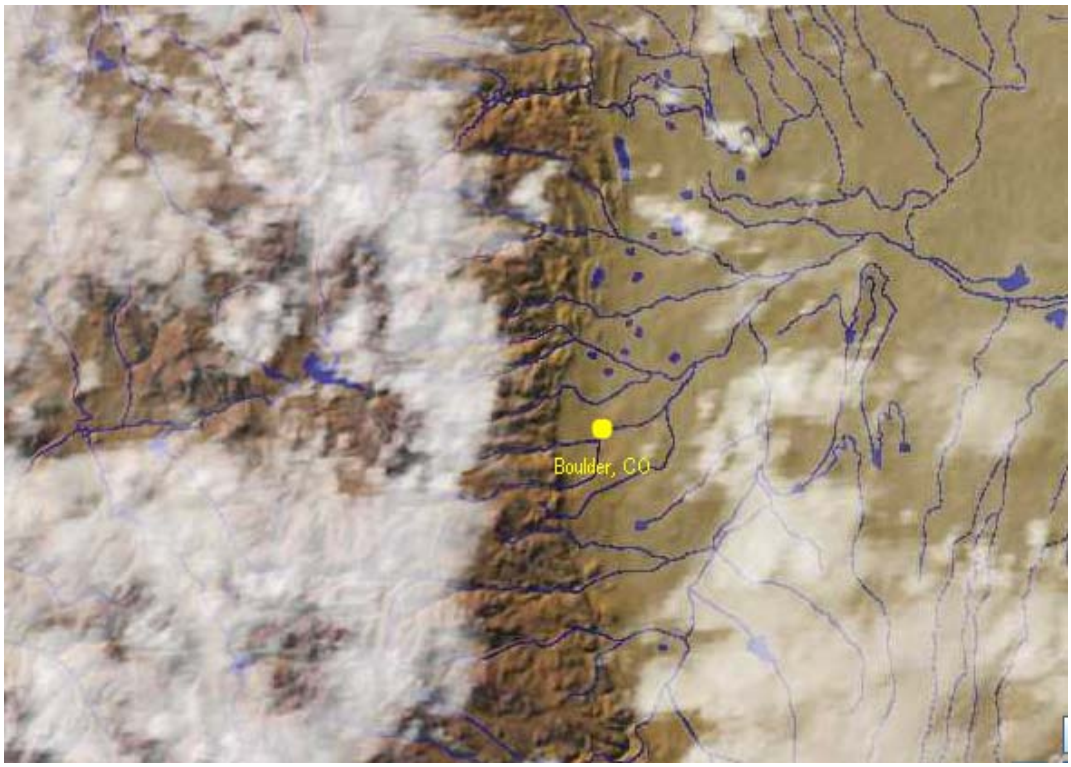

Figure 2: Satellite picture of the Boulder Area on April 18, 2006 5:00pm

The photo graphic technique was normal setting and shutter speed.

- **Focal Length:** 7mm
- **Focal point:** f/5.6
- **Exposure time:** 1/250sec
- **ISO:** 64
- **Original Image Size:** 3264 x 2448 pixels
- **Modified Image Size:** 1958 x 499 pixels

References

[1] Weather Underground, boulder local

<http://www.wunderground.com/US/CO/Boulder.html>

[2] Skew-T plot for Denver

,<http://weather.unisys.com/upper_air/skew/skew_KDNR.html>

[3] Robert A. Houze, Jr. Could Dynmics University of Washington