Flow Visualization

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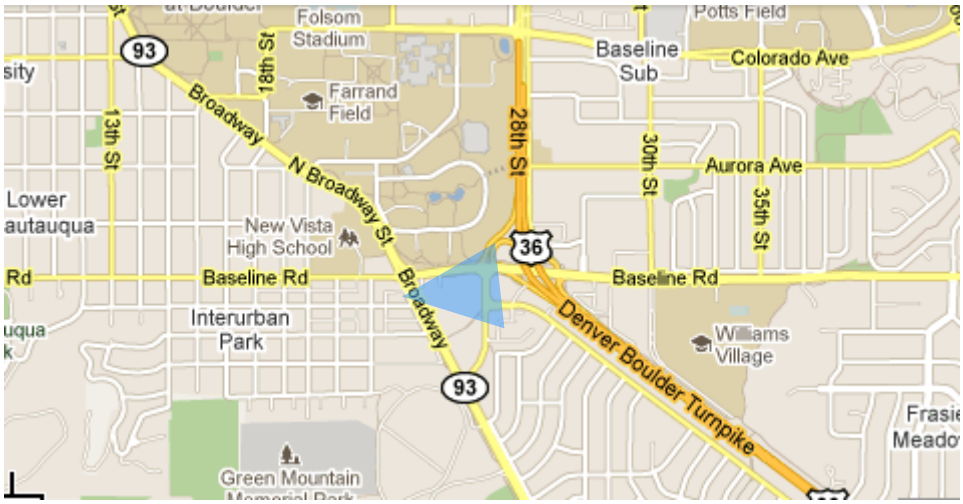
Spring 2011

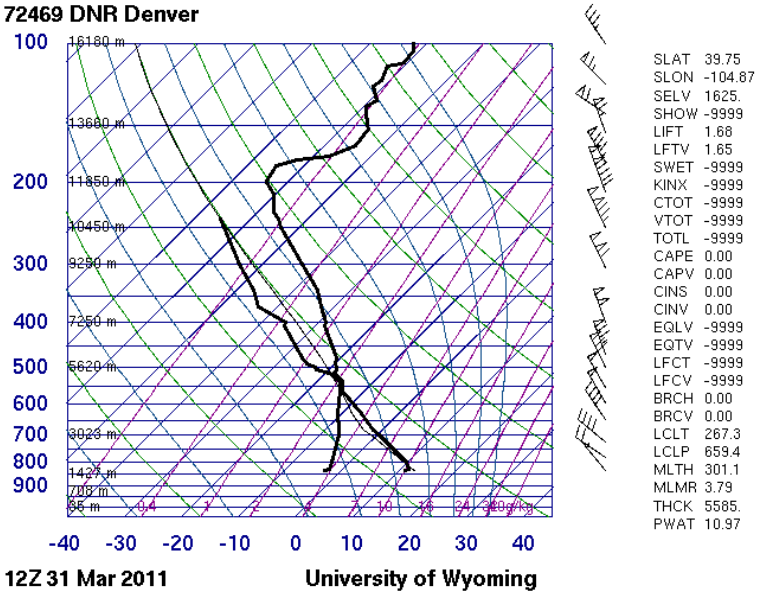
CLOUDS ASSIGNMENT 2

This picture was taken on March 31st, in Boulder (see map below). It was 8:30am, I was waiting for the bus and the sky was beautiful: many clouds were obstructing the sun, but with wide holes allowing seeing the blue sky.



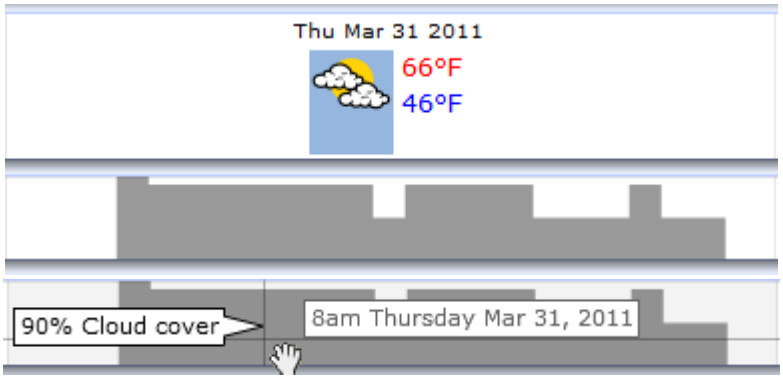
Point of view from where the picture was taken

The weather was fine however, even if many clouds were threatening. I did not know at first if they were altocumulus or stratocumulus. In their broken form, they can be confused. Looking at the skew-T diagram below, taken from the University of Wyoming website, it appears that they were at about 5000m from the ground. So, they are stratocumulus.



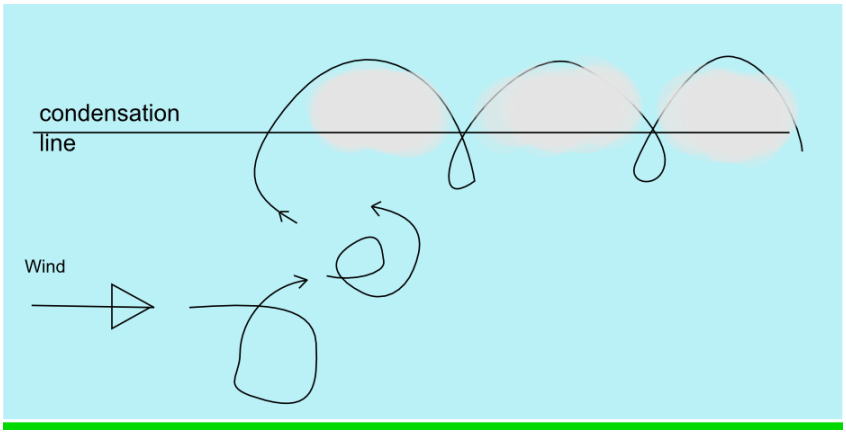
Skew-T Diagram

The atmosphere was very stable. According to the skew-T report, we can see that the CAPE coefficient is zero. However, it was a very cloudy day. From *weatherspark* website, we can see that most of the day was cloudy. The grey part on the graph represents the percentage of the sky covered with clouds.

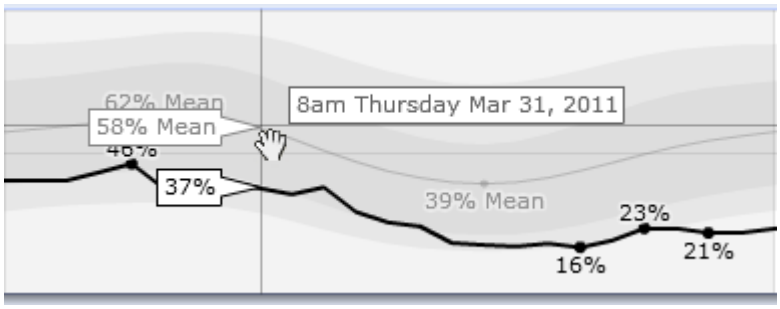


Cloudy State of the Sky

Stratocumulus usually develops in wind stream, in the same direction as the wind at the surface. Friction created by Earth causes eddies' perturbations. If sufficient moisture, condensation will create clouds in the lower layer of the atmosphere. The number of clouds is linked with the amount of moisture in the air at this altitude. As presented on the humidity report below, the humidity rate was high. This explains the amount of stratocumulus in the sky.

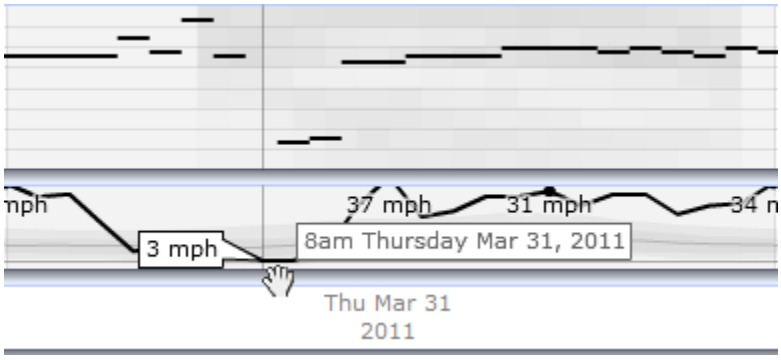


Stratocumulus Formation Diagram



Humidity Report

According to the report given below, the wind was very low at this hour, so it is difficult to know in which direction it was. However, the clouds were moving from the South to the North, so the winds direction at this altitude was probably the same.



Wind Report

On the picture a corona effect can be seen. The sunlight creates a kind of rainbow, reflecting in the water molecules. If the clouds density were constant in the sky, we would have seen a whole corona. I actually saw this once when I was flying to the United States: the whole corona was visible on the clouds layer. This is a beautiful optical effect I did not know before taking this class. I thought it was due to the airplane window, or due to the light deformation created by the vapor behind the engines.

The sky looks dark. It is due to the fact that the sun is coming straight into the camera as I took the picture. The effect was very beautiful to the naked eye but I did not know how it would be into the picture. Moreover, this picture was not taken with my usual camera, since I did not have it with me, but with my point-and-shoot. However, I like the colors. I did not want to change the contrast or whatever, since I like the effect between the sunlight, the corona effect and the darker sky as a background.