Clouds 2

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Intent

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I recently traveled to Texas and thought it would be interesting to photograph some clouds from a different area since most students in the class use images of local cloud formations. While visiting the Buffalo Flats wind farm in Abilene, Texas, I observed some beautiful cloud formations. I wanted to capture the wind turbines in my cloud image while still having the image focus centered on the clouds. I ended up with a beautiful image of cirrus clouds hanging above several wind turbine rotors, and I'm very pleased with my image.

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Atmospheric Physics and Conditions

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My image generally depicts cirrus clouds; however the individual streaks in the top of the frame are a specific cirrus species known as cirrus fibratus.
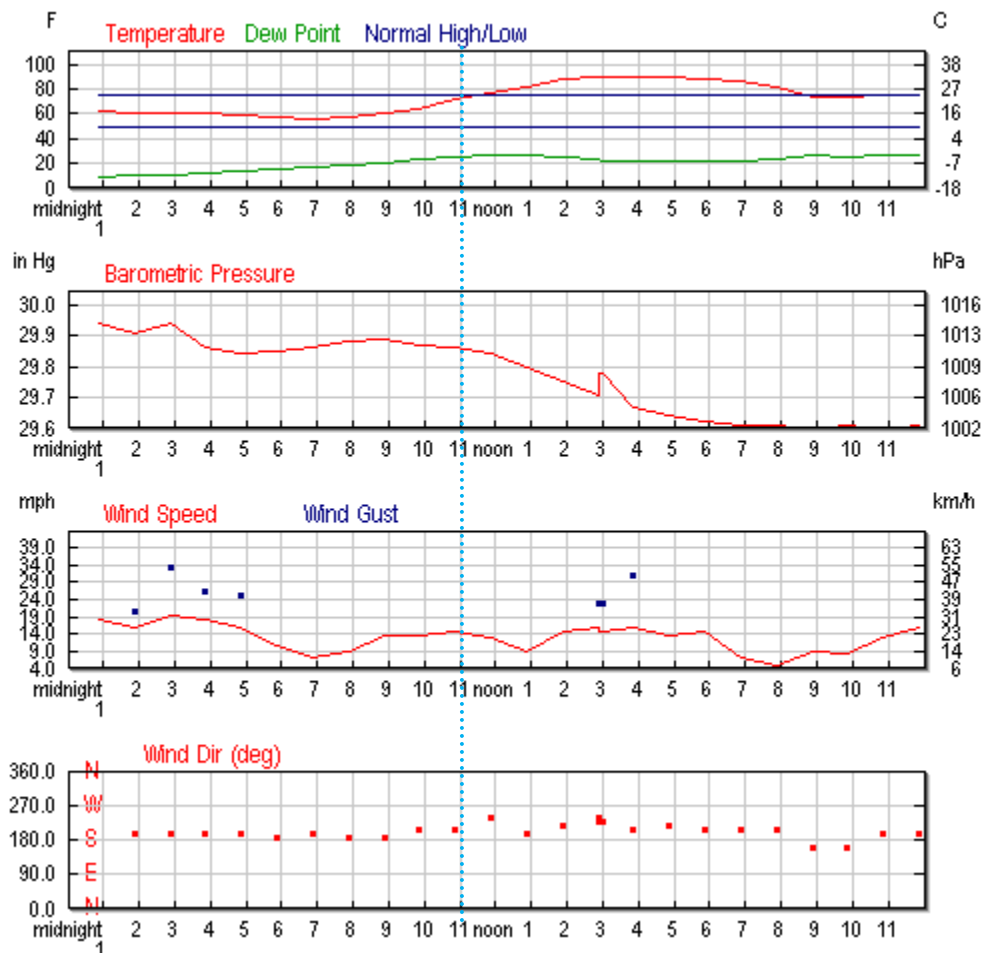

Figure 1: Weather Conditions for April 8, 2009 [Weather Underground]

Figure 1 shows local weather data for the Abilene area on the date of the photograph. The dashed blue line marks the time that the photograph was taken. The winds were blowing from the SSW, and since the wind turbines in the photograph face into the wind, it indicates that I was facing NNE when I took the photograph.

Cirrus clouds form in the upper troposphere and are very thin clouds, which is why they always appear white rather than grey. They consist of small falling ice crystals. The fibratus variety in my photo demonstrates the presence of the very high wind speeds in the upper troposphere. Cirrus clouds are often a sign that the weather is about to change. This held true, because on April 8 the winds picked up and brought light rain and heavier clouds to the area.
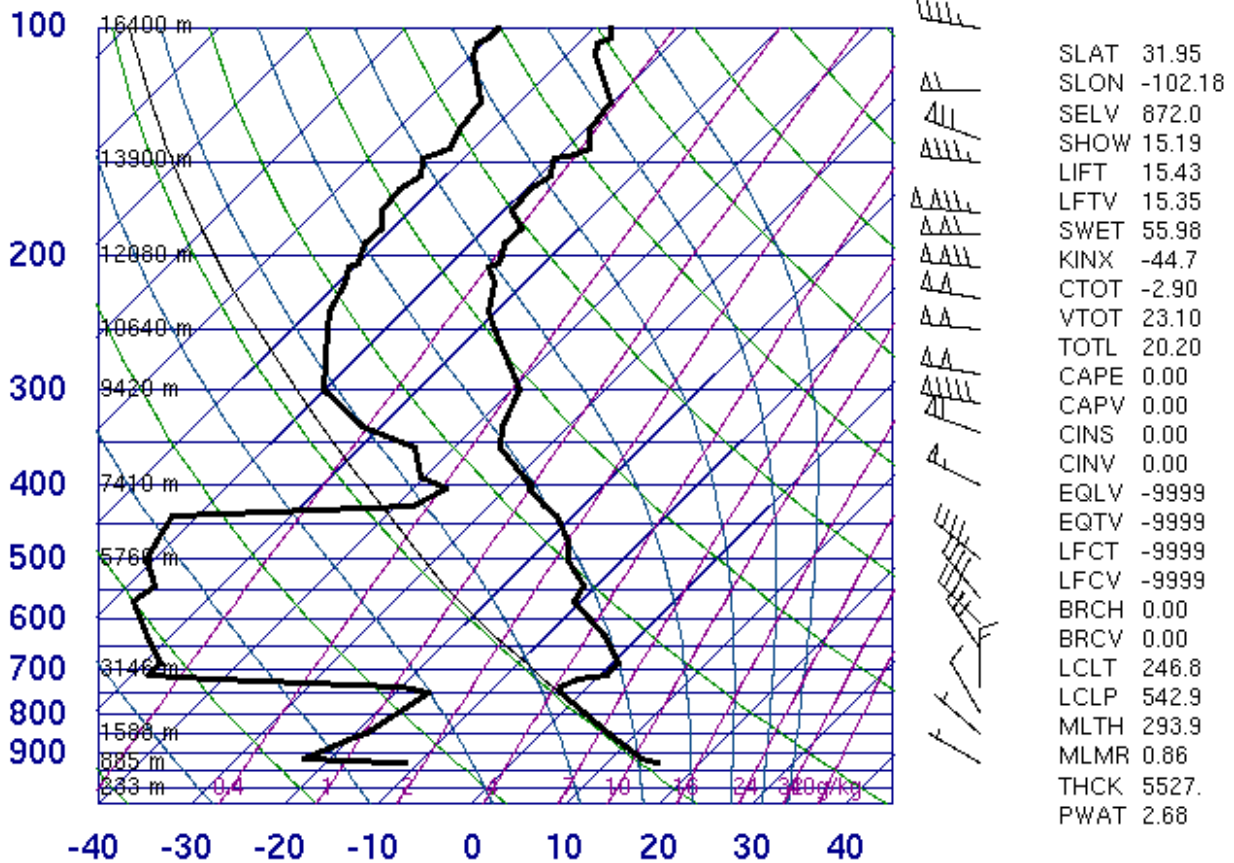
Figure 2: Skew-T Diagram for April 7, 2009

Figure 2 shows a skew-T diagram that represents atmospheric conditions near Abilene at 11:00 AM on April 7, 2009, about five hours before the photograph was taken. The actual air temperature is depicted as the right-most thick black line in the figure, whereas the left-most thick black line represents the dew point temperature. The thin black line depicts the dry, adiabatic temperature profile. The skew-T diagram demonstrates that atmospheric conditions were very stable near the time of the photograph, which is expected because the weather was very calm and clear.

Photographic Techniques

All photographs were taken using an Olympus FE-370 8.0 megapixel digital camera. This camera has a focal length range of 6.3-31.5mm and an aperture range of 1:3.5-5.6. The photograph was taken using the camera's "outdoor" setting with automatic focus and no flash. The camera was held in hand for all photographs. Table 1 lists detailed information about the final photograph.

Table 1: Details of photograph

Photograph Date and Time	Apr 7, 2009 11:00AM
Direction Facing	NNE
Location	Abilene, TX
Lens Focal Length	6.33 mm
Original Image Size	3264 x 2448 pixels
Final Image Size	3121 x 2448 pixels
Shutter Speed	1/640 sec
Aperture	f/5.6
ISO Setting	100

Image processing was performed using the Paint.NET image editing software. The image was cropped slightly to remove distracting elements on the left side of the frame. Also, the contrast was slightly increased using the "curves" feature to bring out the details of the light cirrus clouds. Lastly, I removed some distracting elements from the image with the "clone stamp" tool, such as power lines and a communications tower. The original image can be found in the Appendix.

Image Discussion

I am very pleased with my image for several reasons. First, I think the soft texture of the clouds depicted in the image balance well with the rigid wind turbines. I think the combination of the clouds and turbines creates a beautiful and interesting image, and the multiple turbine rotors move the observer's eyes around the image and create depth. I was also glad that I had the opportunity to photograph some clouds from an area that most of the students probably have not been to, which also allowed me to learn about the atmospheric behavior of another region.

References

Pretor-Pinney, Gavin. *The Cloudspotter's Guide.* The Penguin Group, New York. (2006)

University of Wyoming Department of Atmospheric Science:
http://weather.uwyo.edu/upperair/sounding.html

Weather Underground:
http://www.wunderground.com/history/airport/KABI/2009/4/8/DailyHistory.html?req_city=NA&req_state=NA&req_statename=NA

Appendix

Original Photograph