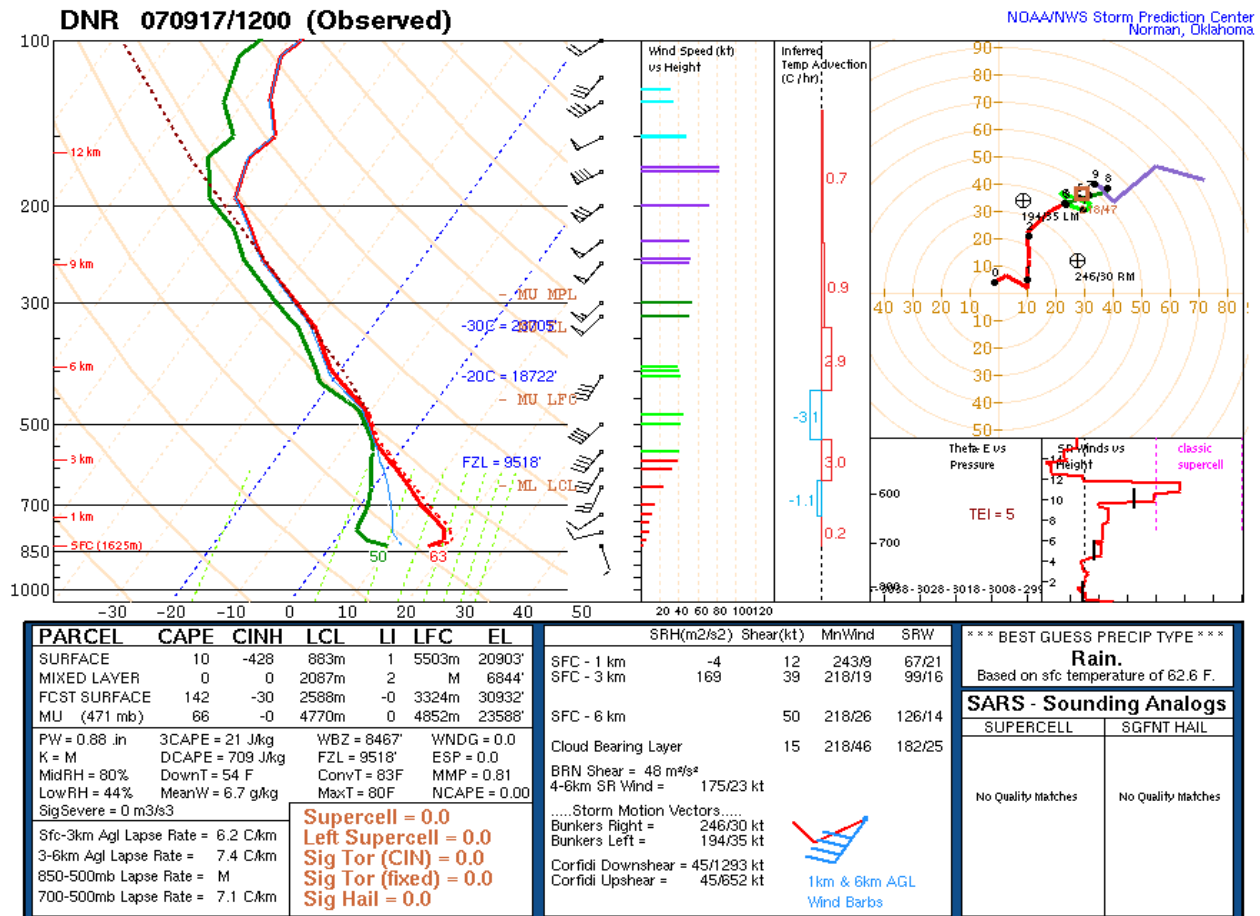Gordon Browning

10/8/2007

Flow Visualization

Professors Jean Hertzberg and Alex Sweetman

Clouds I

I believe this assignment is more a reflection of the observational instincts and appreciation for natural beauty of the photographer than it is a reflection of technical skill and artistic expertise. Nature is the one composing the image, and all you have to do is have the sense to recognize that something beautiful is happening and pick up your camera. So, I can not really take credit for any aesthetic interest in my image, but I can hope that it communicates the feelings and experience I had at the moment I decided to take it. Whenever I see weird behavior and phenomenon from clouds, it always makes me think of the end of the world. I don't know why, but something about the drama and the extraordinary colors and the fading light all combine to make me feel like I'm living through the last chapter of the world, and that the Four Horsemen of the Apocalypse are about to come stampeding from the sky. That's basically what this picture makes me think of, and I hope that my own appreciation for the emotion and drama inherent in nature is shared by everyone who looks at my picture.

This cloud is a Cumulonimbus with Mamma[1]. It is distinguishable by the fact that it is very heavy and dense, producing the dark sections, and because of the very notable mamma which often form in the middle of these types of clouds.

DNR 070917/1200 (Observed)

Wind Speed (kt) vs Height

Inferred Temp Advection (C / hr)

12 km
9 km
6 km
3 km
1 km
SFC (1625m)

MU MPL
-30C = 23705'L
-20C = 18722'
MU LFC
FZL = 9518'
ML LCL

Theta E vs Pressure

SR Winds vs Height

classic supercell

TEI = 5

1km & 6km AGL Wind Barbs

PARCEL	CAPE	CINH	LCL	LI	LFC	EL
SURFACE	10	-428	883m	1	5503m	20903'
MIXED LAYER	0	0	2087m	2	M	6844'
FCST SURFACE	142	-30	2588m	-0	3324m	30932'
MU (471 mb)	66	-0	4770m	0	4852m	23588'

PW = 0.88 .in
K = M
MidRH = 80%
LowRH = 44%
SigSevere = 0 m3/s3

3CAPE = 21 J/kg
DCAPE = 709 J/kg
DownT = 54 F
MeanW = 6.7 g/kg

WBZ = 8467'
FZL = 9518'
ConvT = 83F
MaxT = 80F

WNDG = 0.0
ESP = 0.0
MMP = 0.81
NCAPE = 0.00

Sfc-3km Agl Lapse Rate = 6.2 C/km
3-6km Agl Lapse Rate = 7.4 C/km
850-500mb Lapse Rate = M
700-500mb Lapse Rate = 7.1 C/km

Supercell = 0.0
Left Supercell = 0.0
Sig Tor (CIN) = 0.0
Sig Tor (fixed) = 0.0
Sig Hail = 0.0

	SRH(m2/s2)	Shear(kt)	MnWind	SRW
SFC - 1 km	-4	12	243/9	67/21
SFC - 3 km	169	39	218/19	99/16
SFC - 6 km		50	218/26	126/14
Cloud Bearing Layer		15	218/46	182/25

BRN Shear = 48 m²/s²
4-6km SR Wind = 175/23 kt

.....Storm Motion Vectors.....
Bunkers Right = 246/30 kt
Bunkers Left = 194/35 kt

Corfidi Downshear = 45/1293 kt
Corfidi Upshear = 45/652 kt

* * * BEST GUESS PRECIP TYPE * * *
Rain.
Based on sfc temperature of 62.6 F.

SARS - Sounding Analogs

SUPERCELL	SGFNT HAIL
No Quality Matches	No Quality Matches

This is the Skew-T plot of the day on which I photographed the cloud. This data shows that the atmosphere for this day was stable, and that rain was predicted. Rain is often associated with Cumulonimbus clouds—however it did not actually rain that day, although it looked like it was going to. I took my picture at 7:03 pm on September 17th, 2007, during sunset.

I took this picture with a Nikkor 28-80 mm lens on a Nikon D50 DSLR body. The pixel height was 2000 on the y-axis, and 3008 on the x-axis. The setting sun was the lighting. The exposure time was 1/200th of a second, with an f-stop of 5.6. The focal length for the image was 80 mm. I also applied a "Curves" adjustment in Photoshop CS2 to heighten the contrast and emphasize the color saturation (I believe the original image was a little underexposed.) I have absolutely no idea what the scale of this image is or the distance to it—it's a cloud. They are gigantic things that are often times much larger or smaller (on a scale of miles even) than you

might expect, so I think even an estimate would be misleading and irrelevant. I can say that the part of the cloud photographed appeared to be 1/50th of the total cloud size. It was a very large Cumulonimbus cloud that towered in the sky.

In conclusion, I am very happy with this image. I believe it illustrates an extremely interesting and beautiful cloud phenomenon—Mamma on Cumulonimbus clouds. I like the contrast between the orange clouds and the dark underside of the larger cloud, the apparent movement from the lower left center of the frame, and the smooth but slightly churned and distended texture. I fulfilled my intent to communicate a resplendent moment of nature-watching, and I can't say that there is anything that I would want to improve upon for an assignment like this. Given the time frame with which I was working, I feel lucky to have been present to such a beautiful moment in time.

References

1. "International Cloud Atlas." World Meteorological Organization, 1969.