

Phenomenology of Colorado Tornadoes:



Morris Weisman NCAR/MMM 08/21/14



May 22, 2008 Windsor, CO



...near Burlington, CO



May 30, 1996...near Elba, CO



June 6, 1990...near Limon Colorado

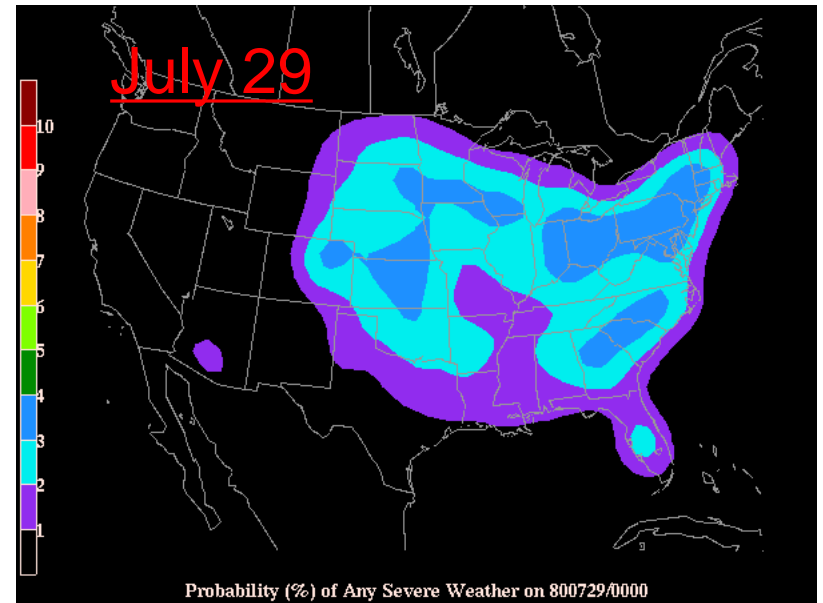
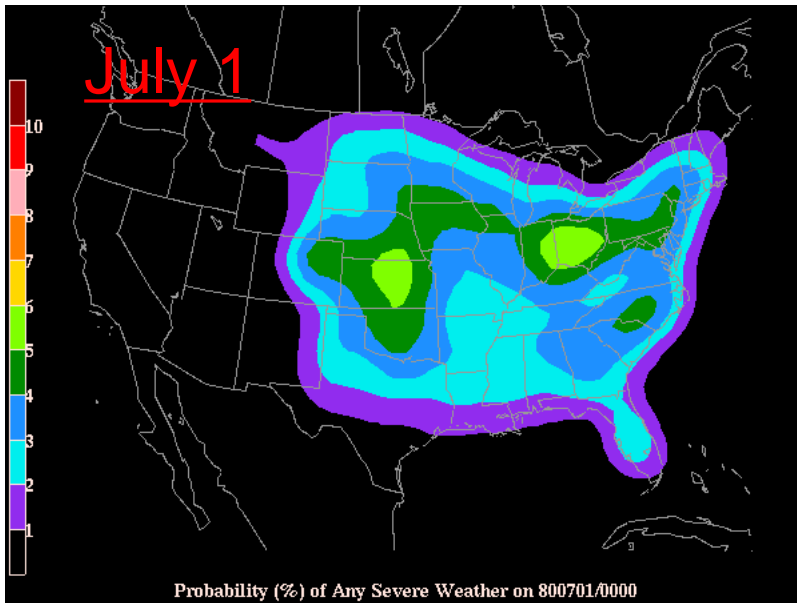
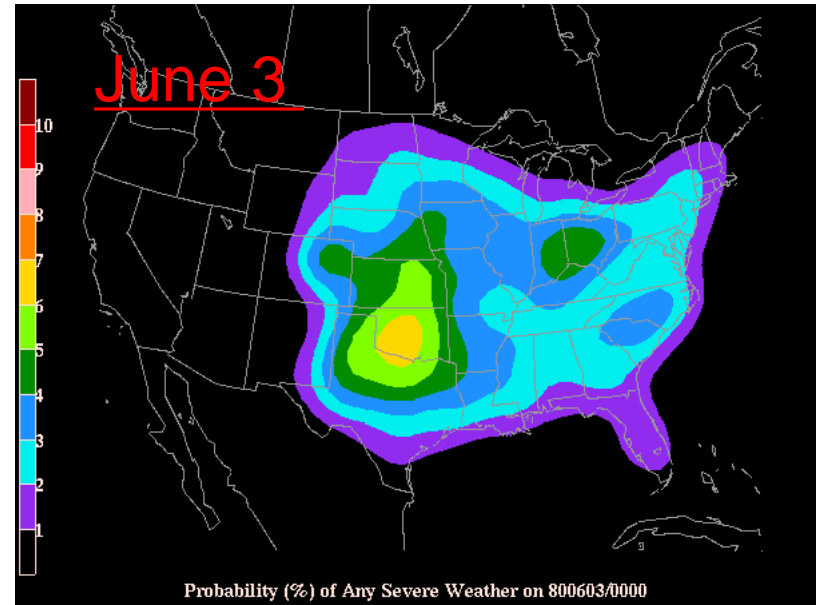
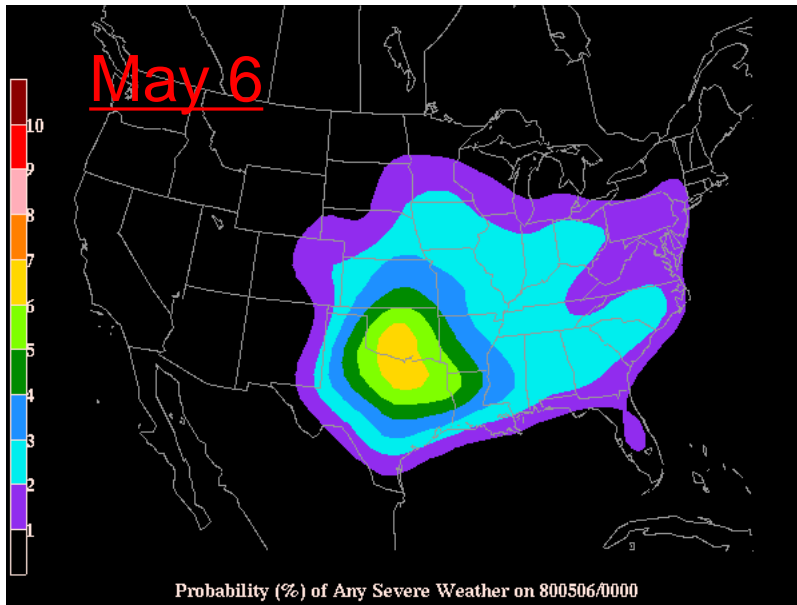


May 22, 2008 Windsor, CO

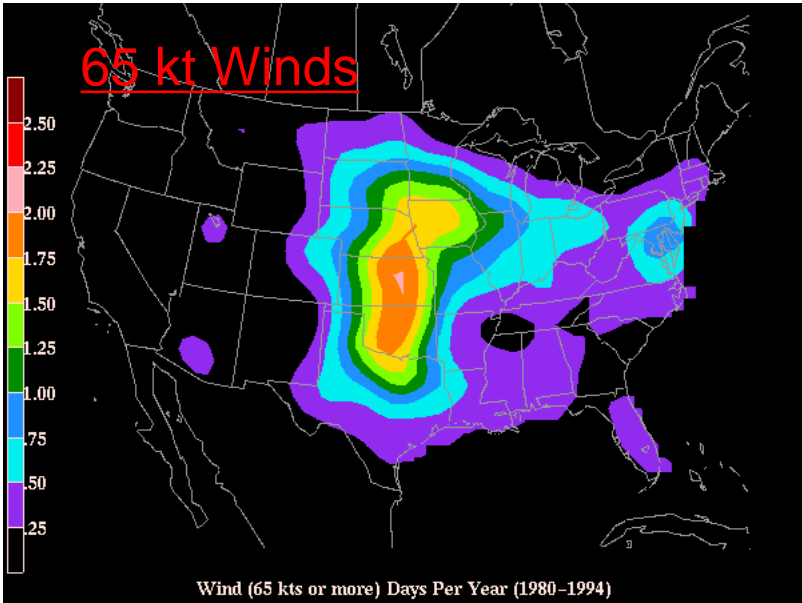
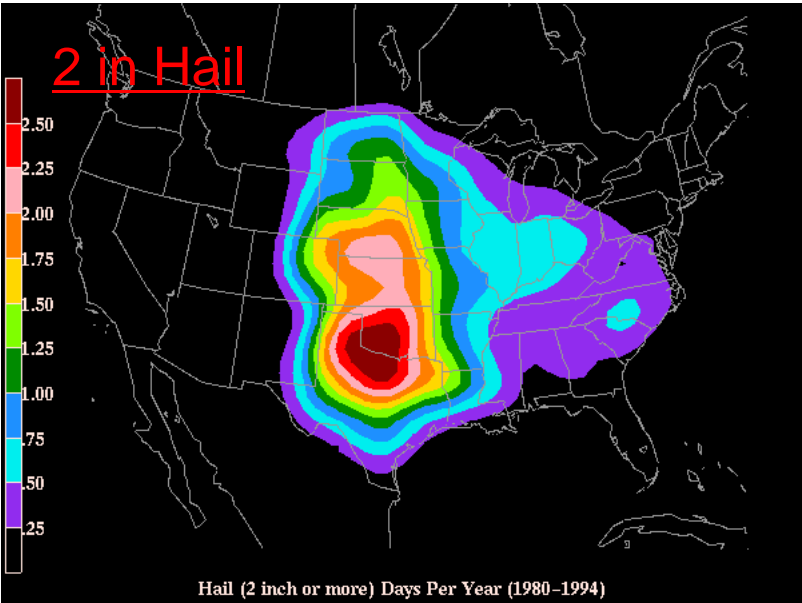
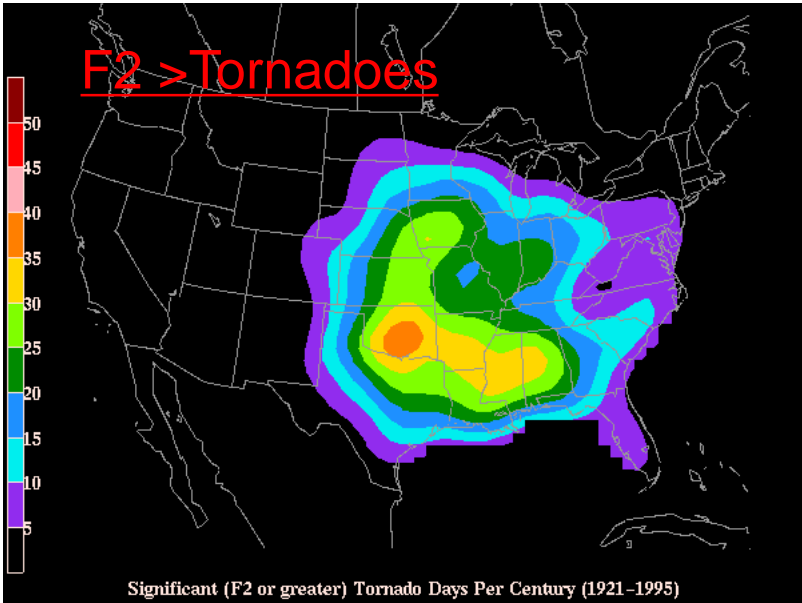
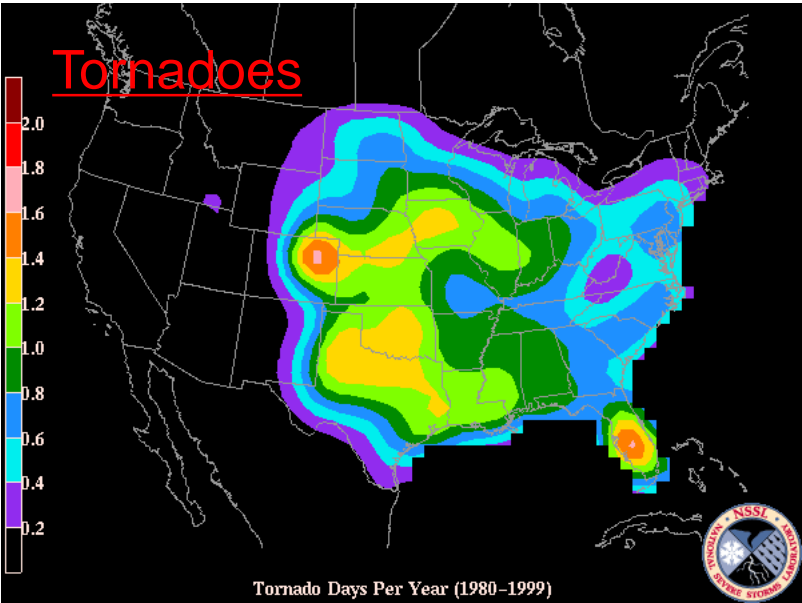


KUSA

Severe Storm Climatology

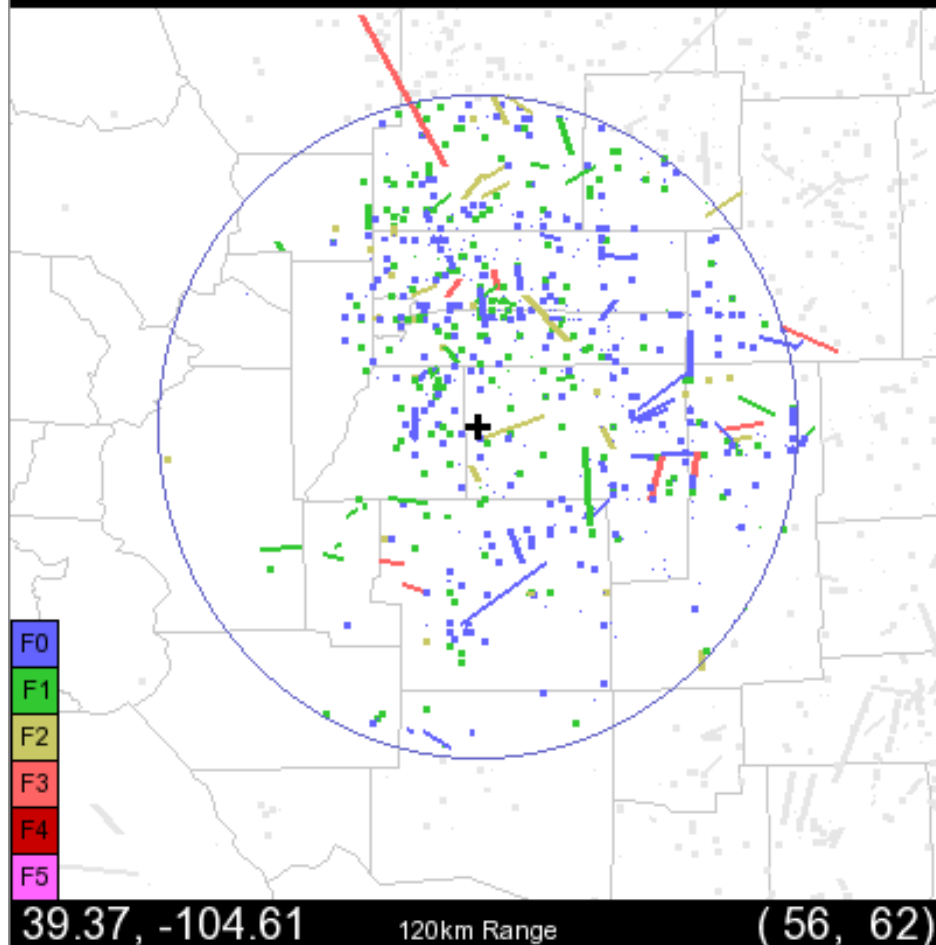


Severe Weather Types

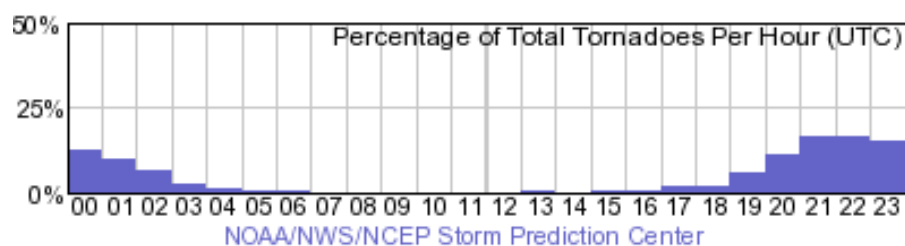
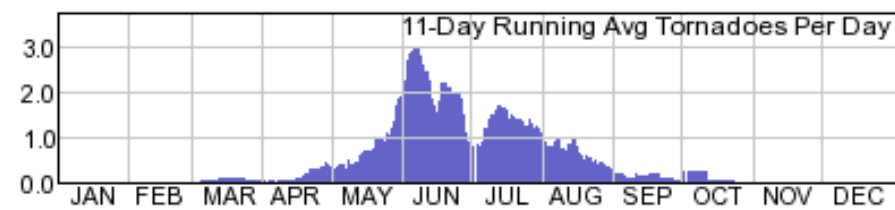


Denver Area Tornado Statistics (SPC):

Tornado Occurrences 1962-2011

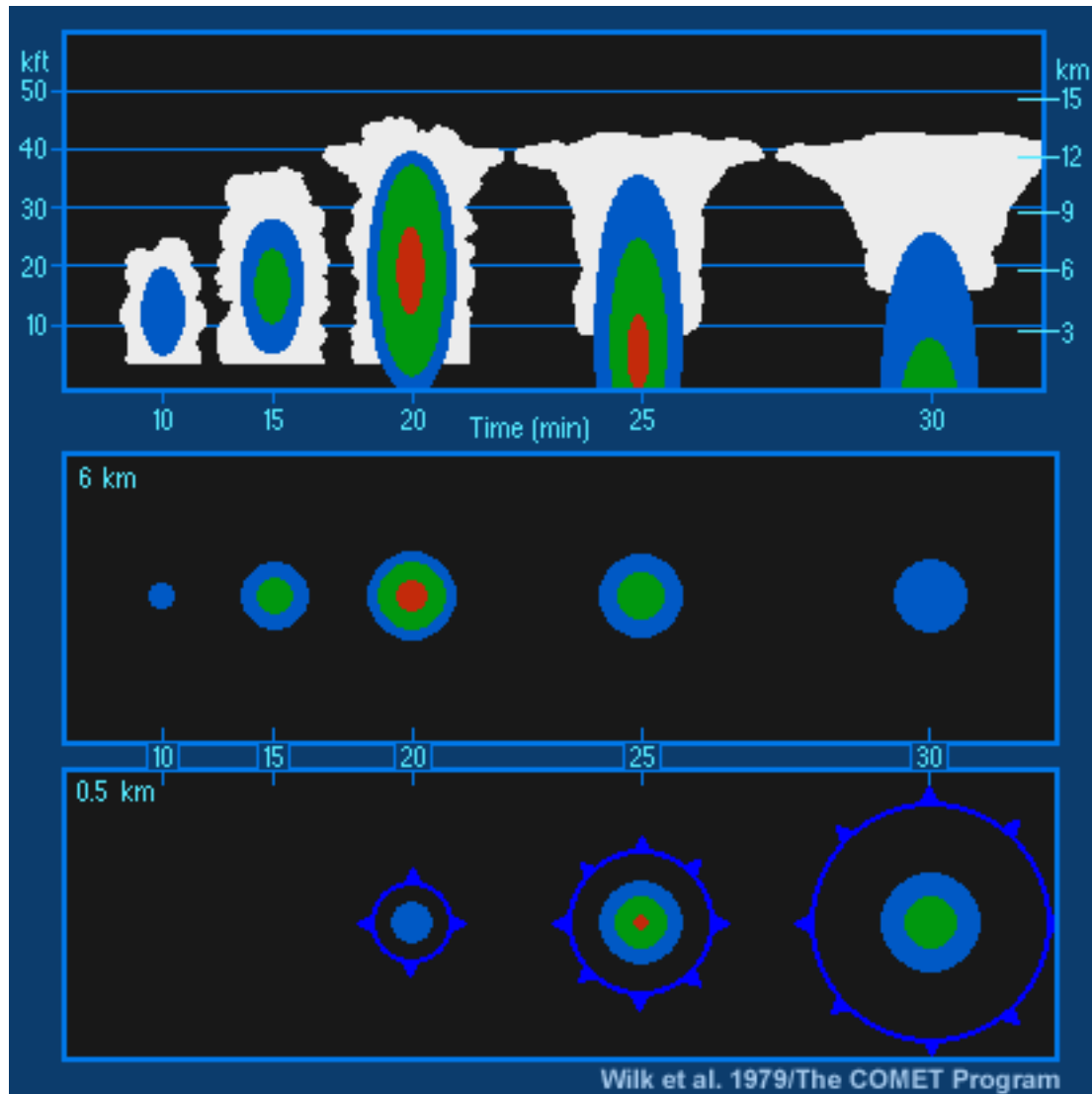


Scale	Num	Fat	Inj	PLen	Area	DPI
F0	485	0	0	208.42	16.9	16.9
F1	245	0	20	236.83	11.3	22.6
F2	39	0	61	108.3	9.8	29.5
F3	10	1	106	90.49	46.9	187.5
F4					0.0	0.0
F5					0.0	0.0
TOT	779	1	187	644.0	84.9	256.5

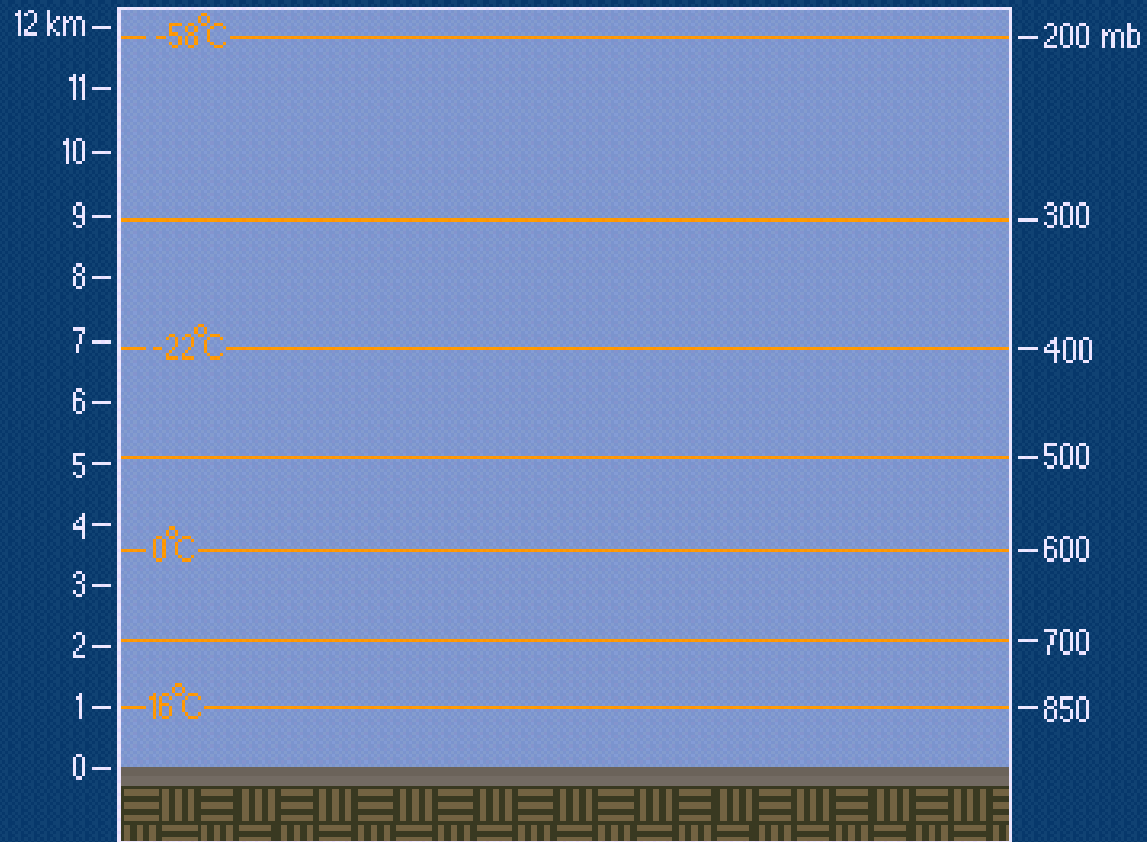


NOAA/NWS/NCEP Storm Prediction Center

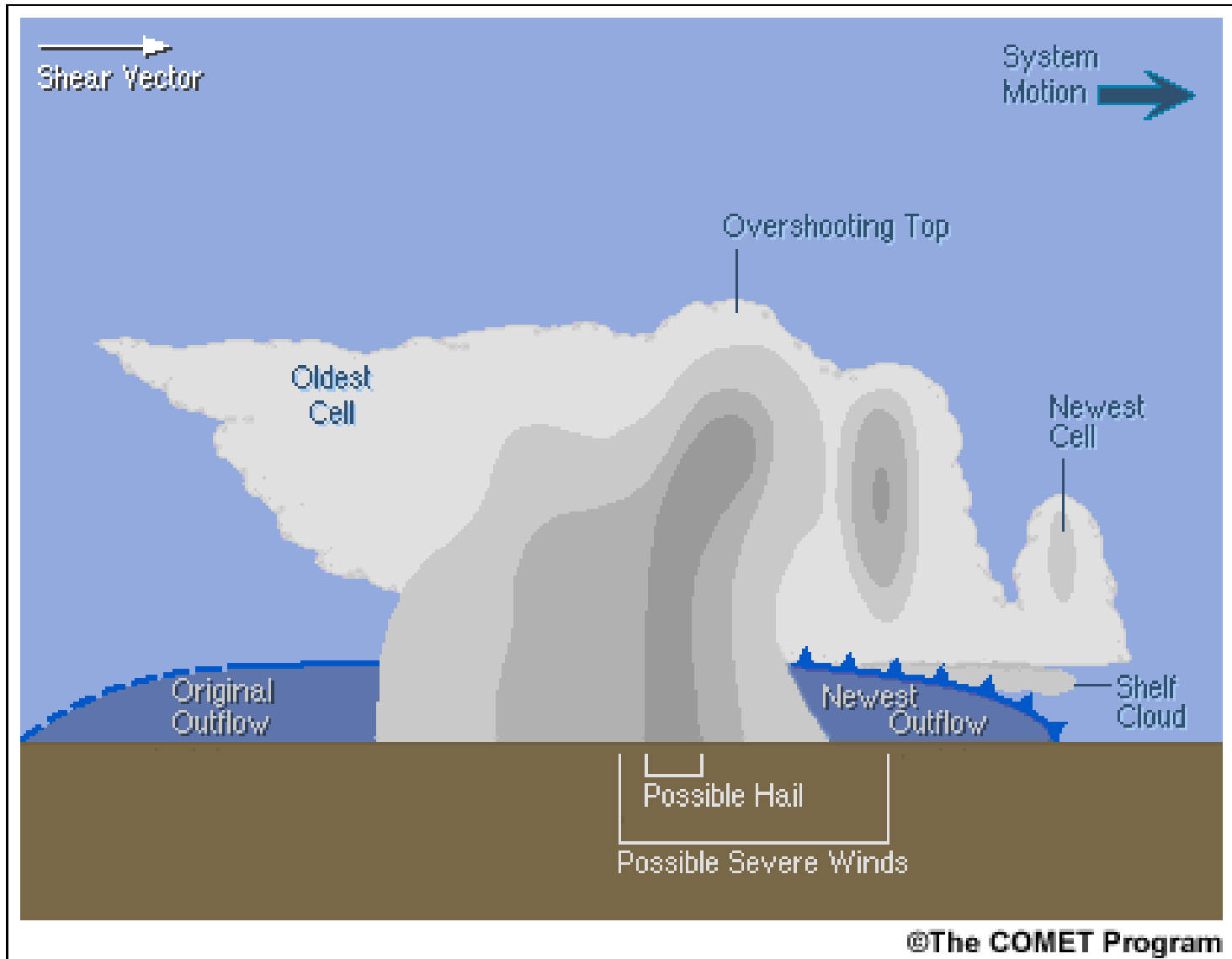
Ordinary Cell:



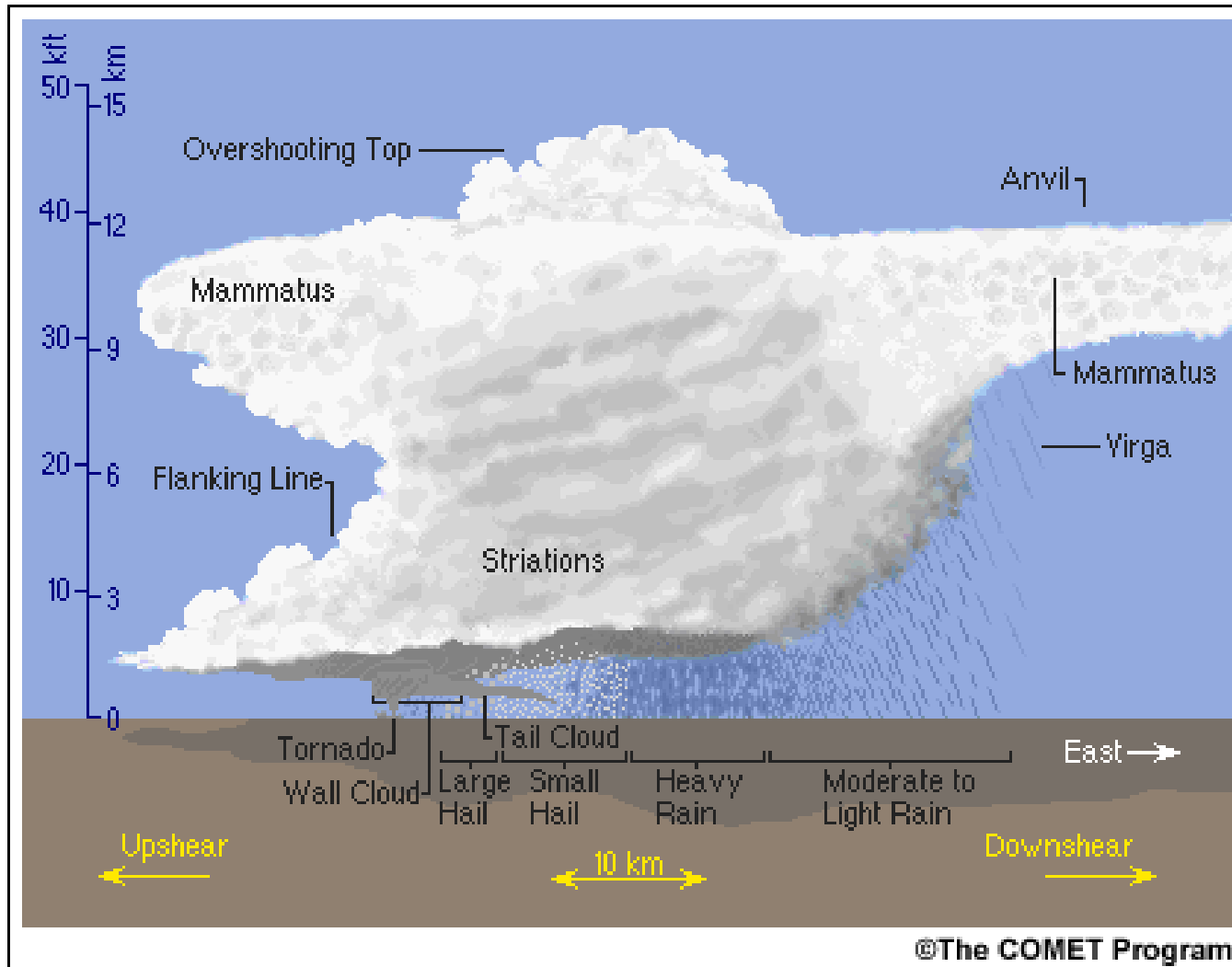
Ordinary Cell Evolution:



Multicell:



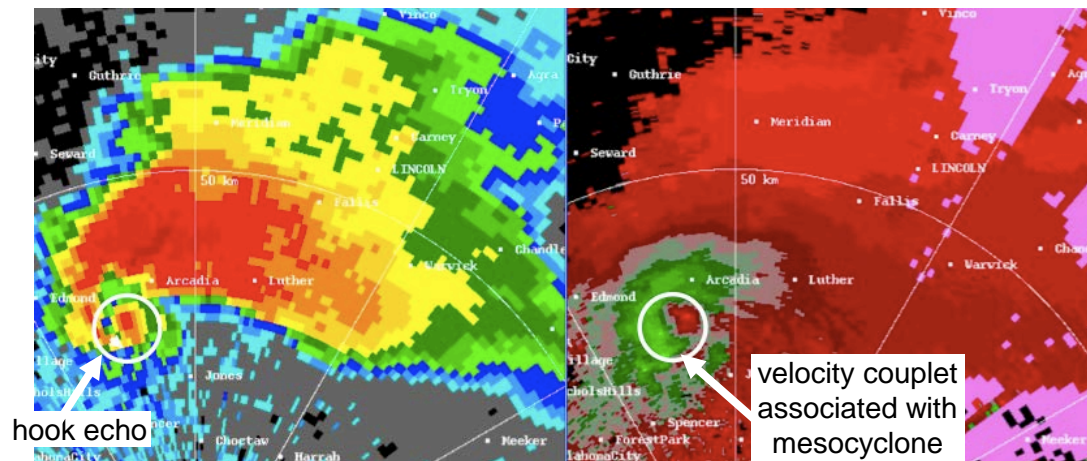
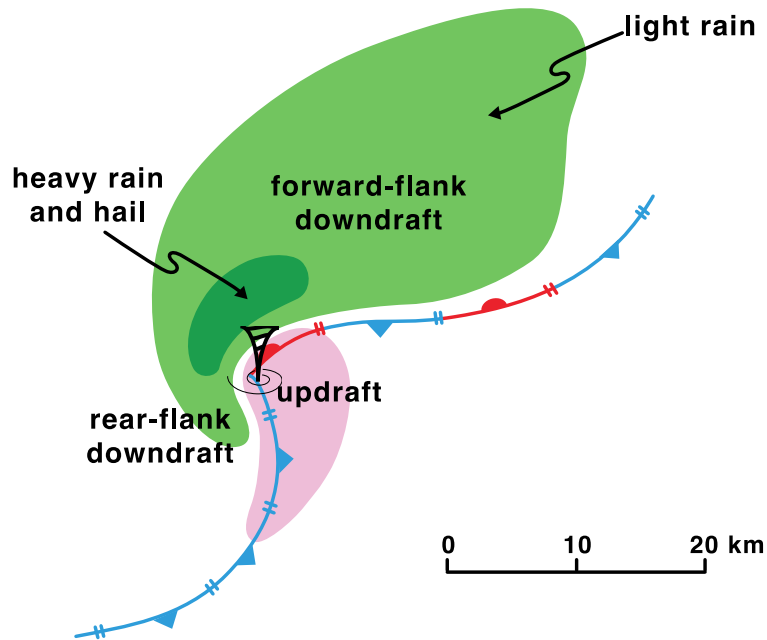
Supercell:



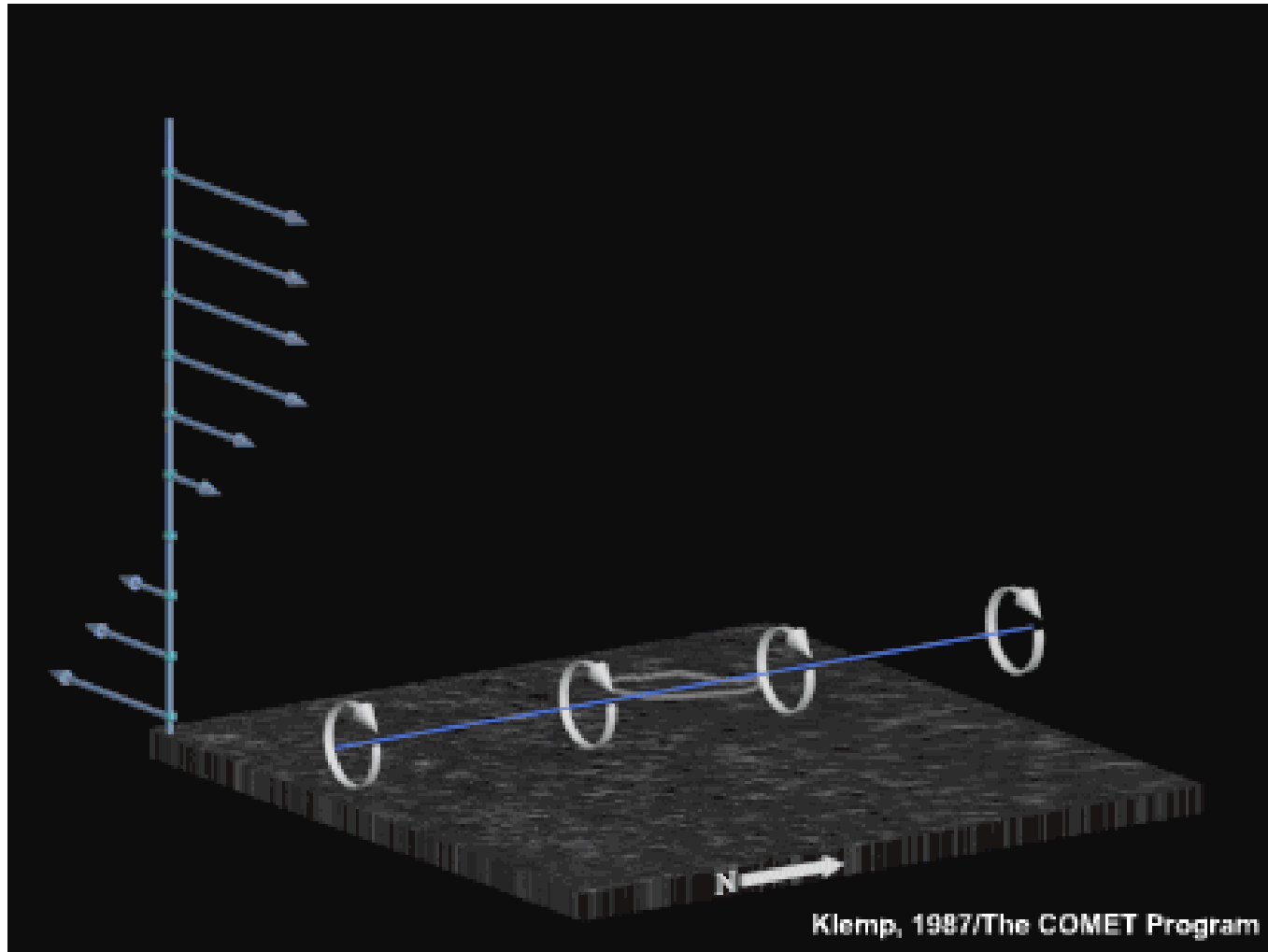
Observed Supercell Along Front Range:



Supercell Surface Features

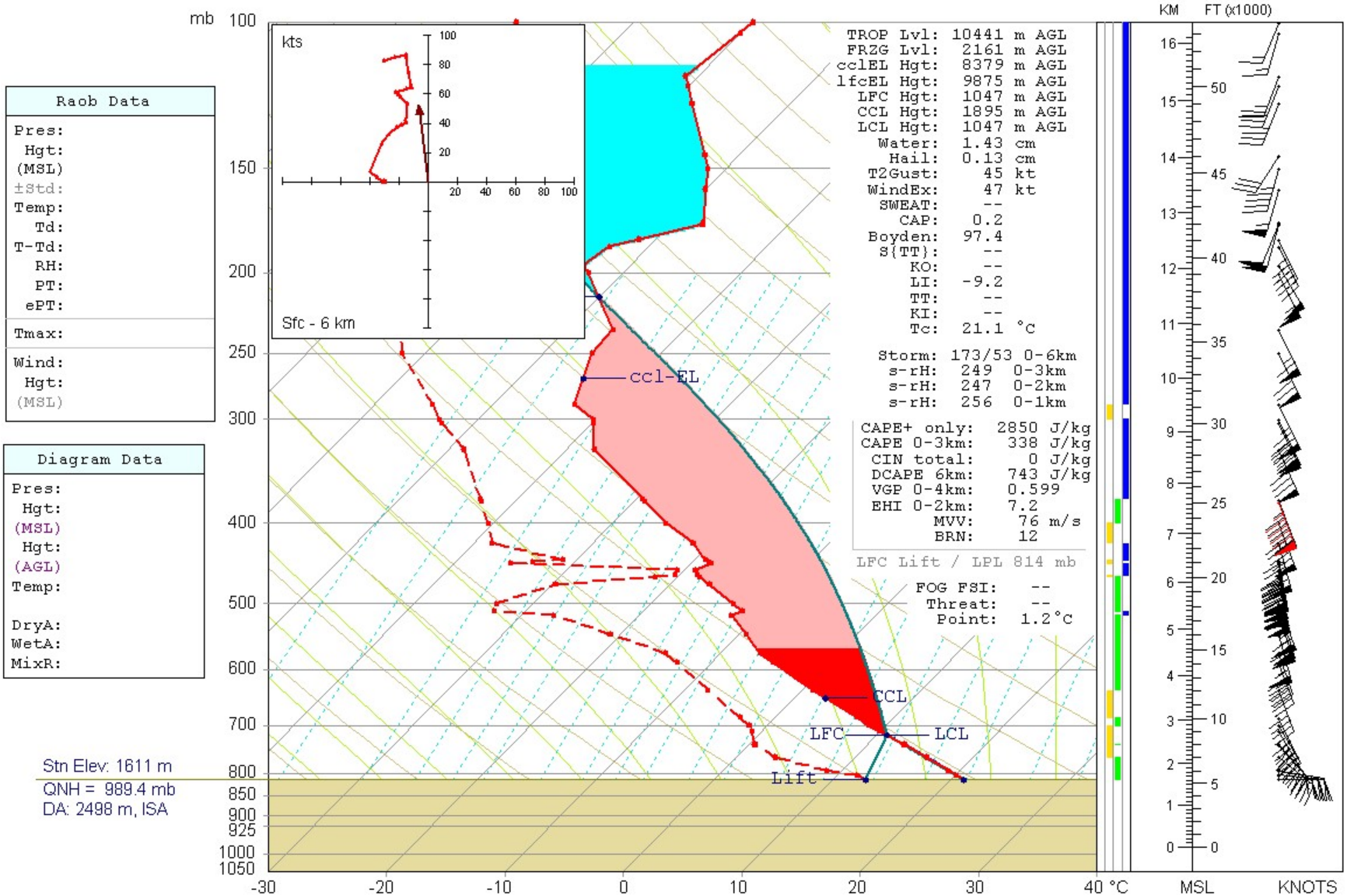


Development of Supercell Rotation:

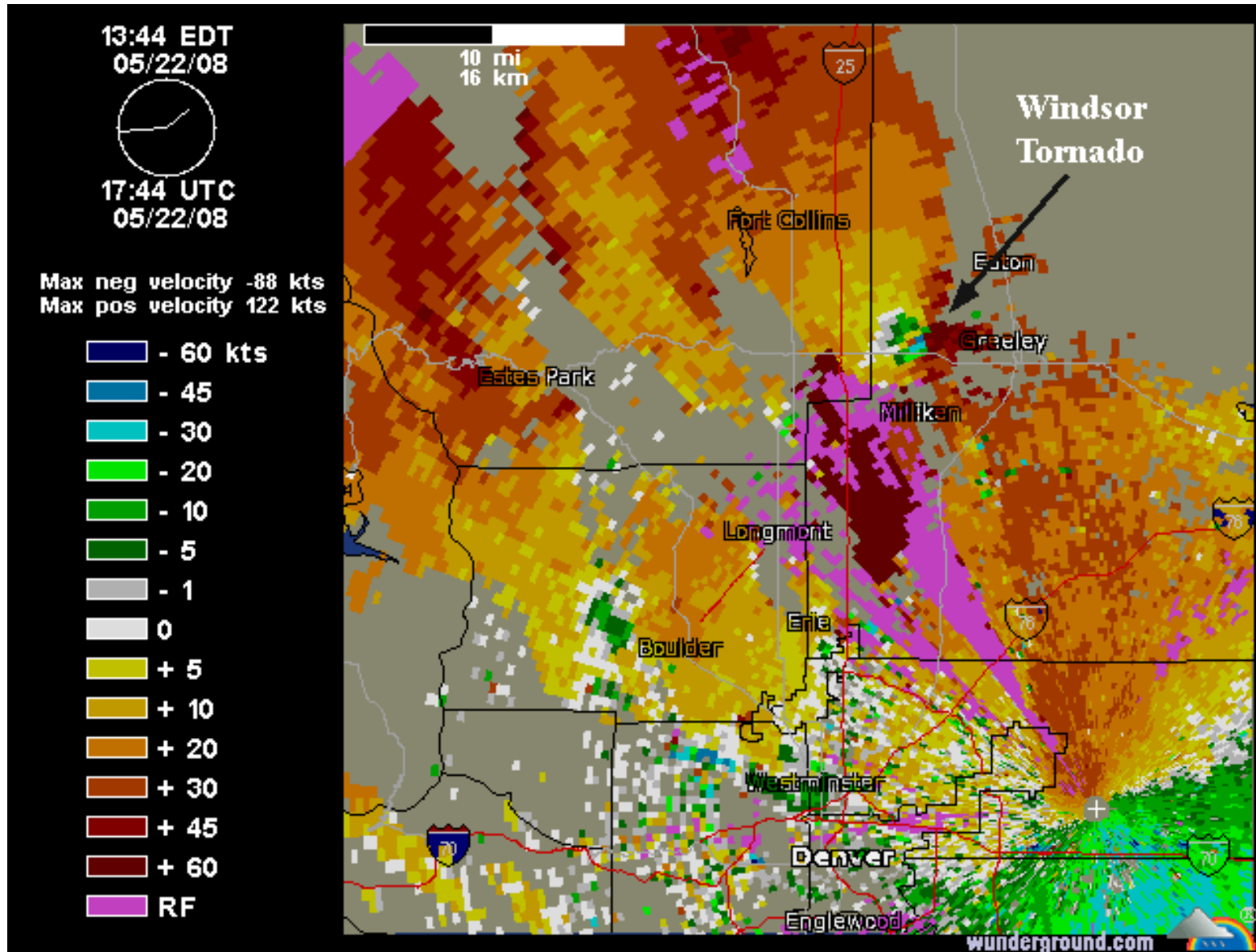


*need strong variation of winds with height:
e.g., environmental vertical wind shear...

May 22, 2008 Windsor, CO



May 22, 2008 Windsor, CO

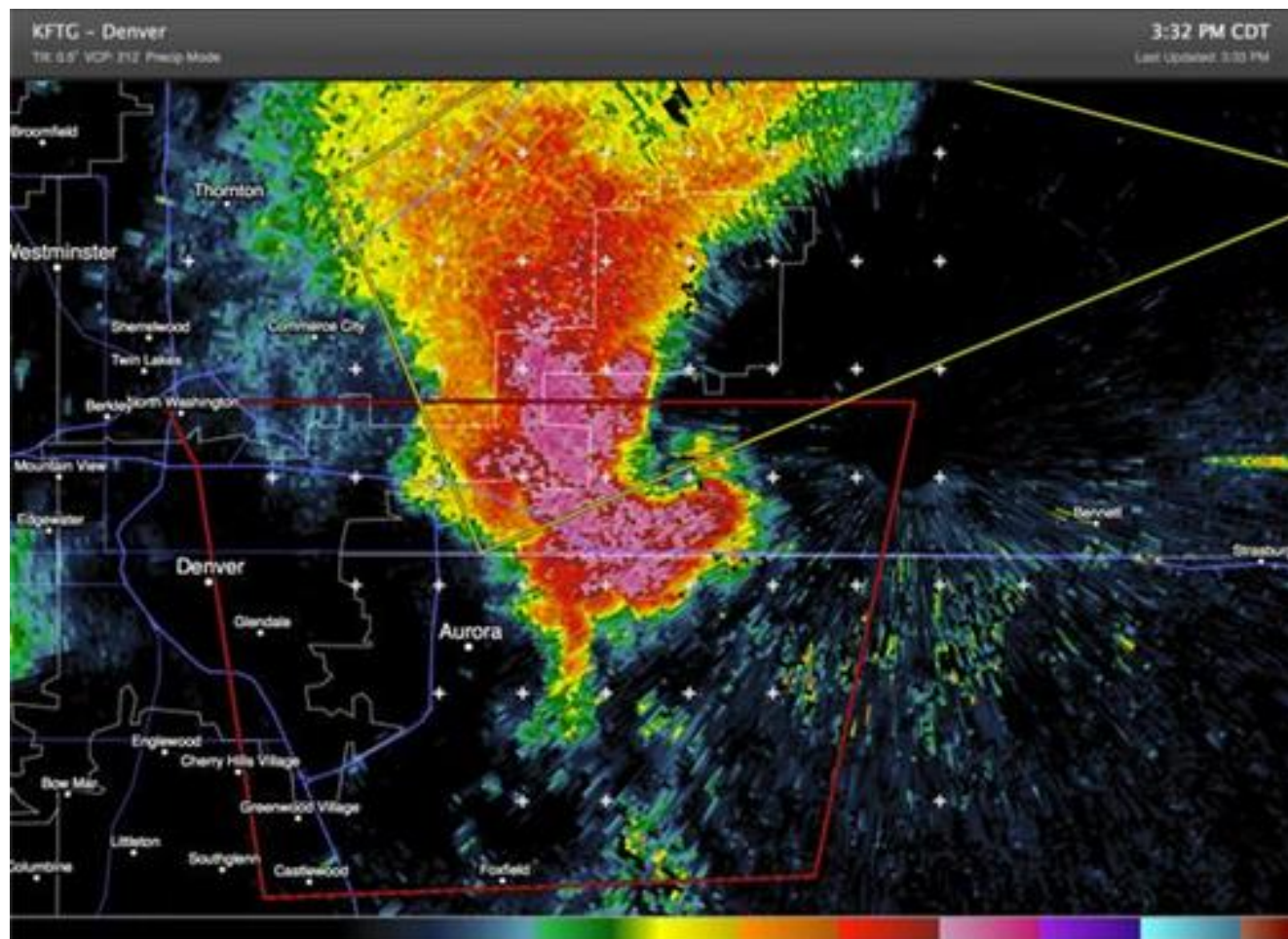


May 22, 2008 Windsor, CO

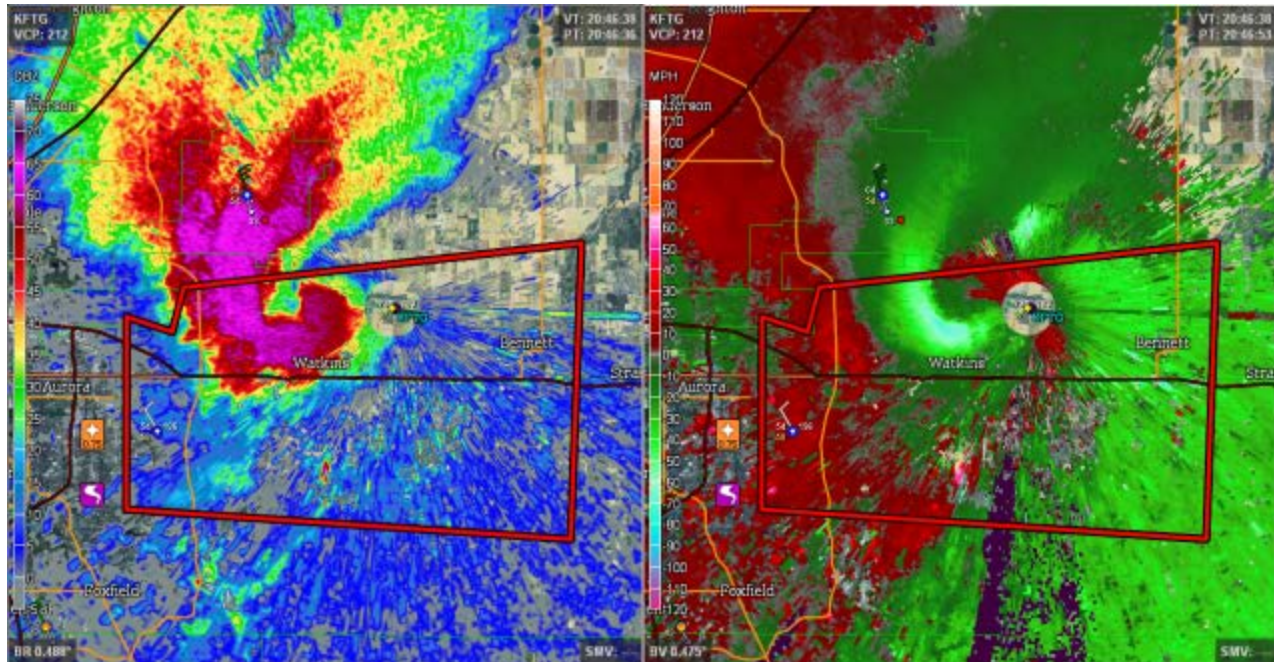
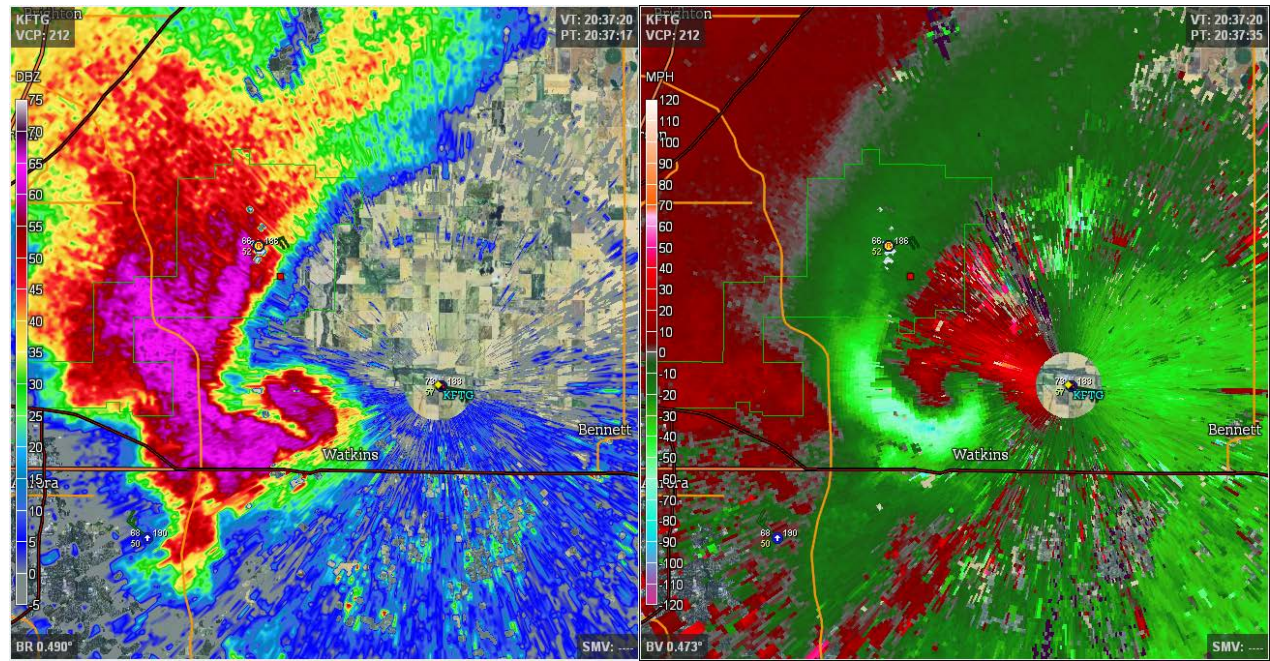


KUSA

05/21/14



05/21/14



05/21/14



05/21/14



05/21/14



05/21/14



June 6, 1990...near Limon Colorado



June 6, 1990...near Limon Colorado



June 6, 1990...near Limon Colorado



June 6, 1990...near Limon Colorado



June 6, 1990...near Limon Colorado



June 6, 1990...near Limon Colorado



June 6, 1990...near Limon Colorado



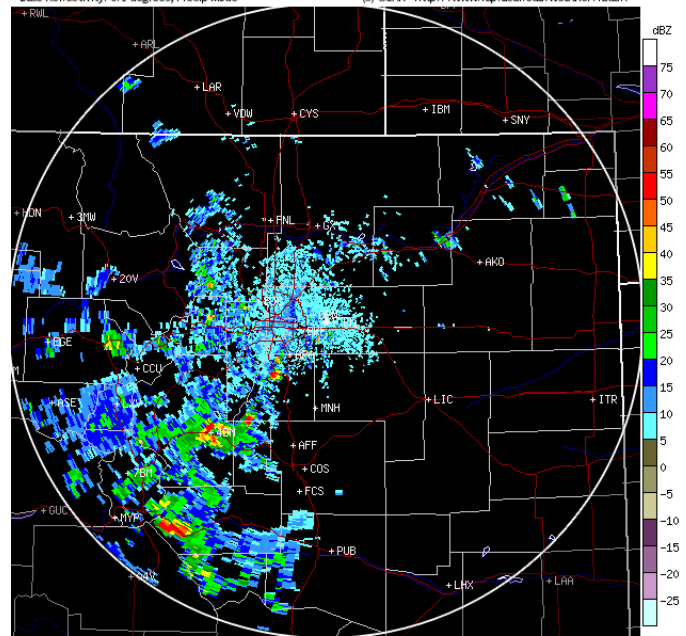
...near Watkins,
CO



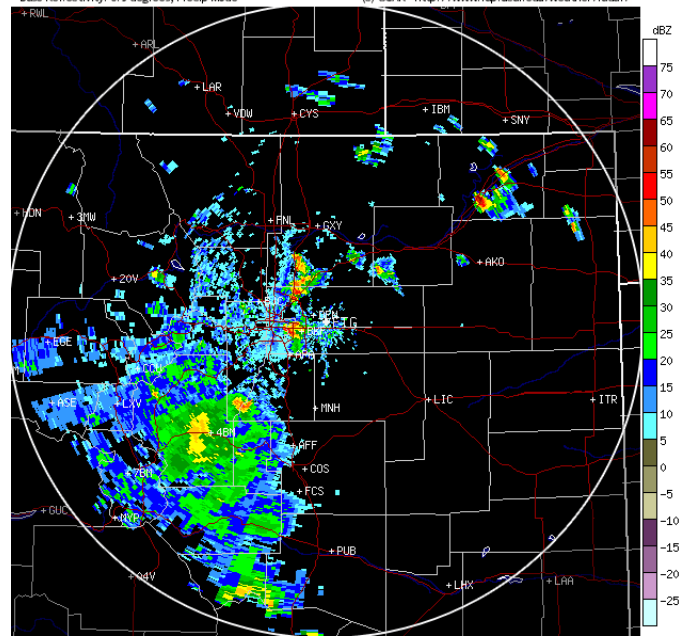
07/28/14



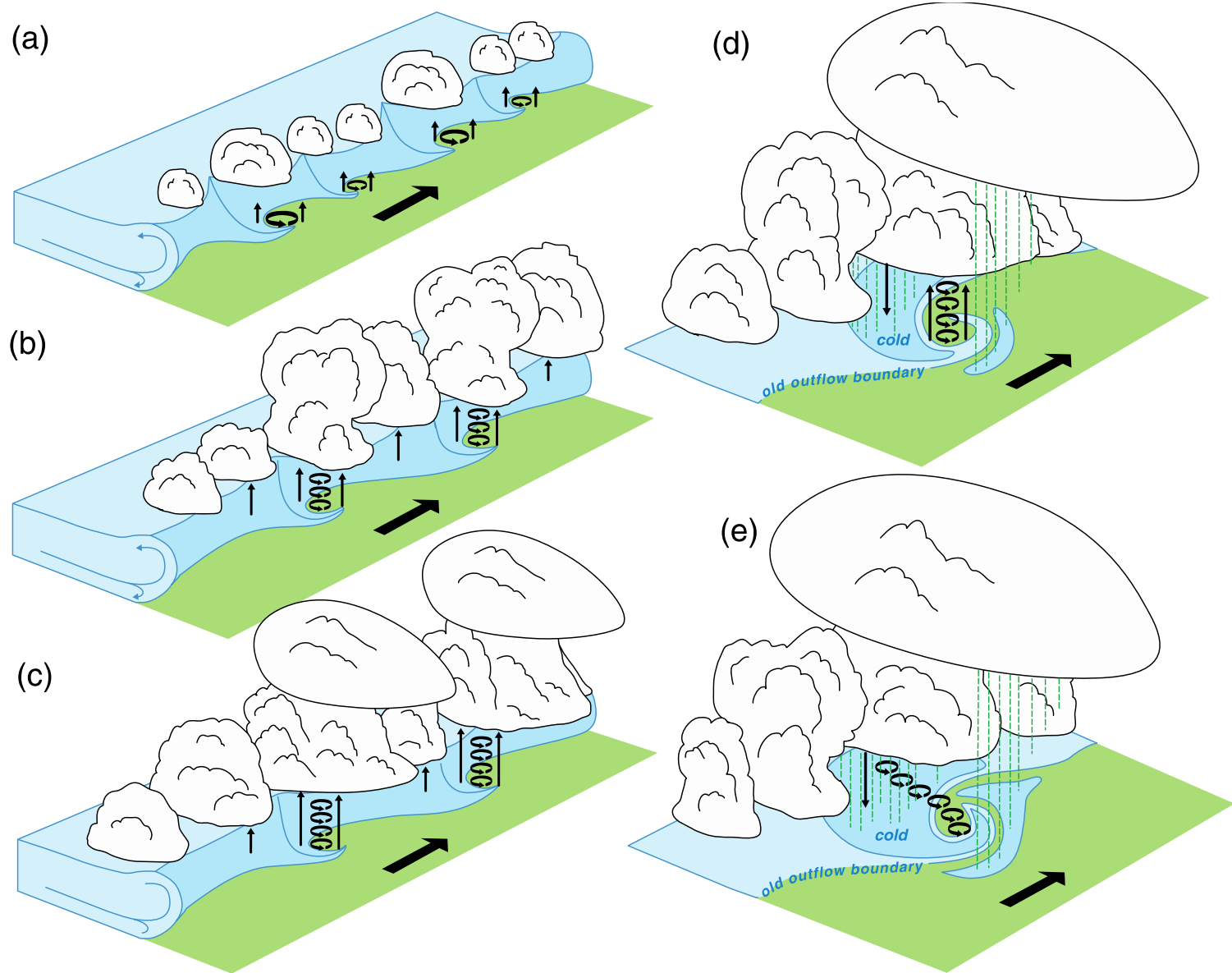
KFTG -- Denver, CO/Front Range airport 21:00:48 UTC Mon 28 July 2014
Base Reflectivity: 0.5 degrees, Precip Mode (c) UCAR <http://www.rap.ucar.edu/weather/radar/>



KFTG -- Denver, CO/Front Range airport 22:21:54 UTC Mon 28 July 2014
Base Reflectivity: 0.5 degrees, Precip Mode (c) UCAR <http://www.rap.ucar.edu/weather/radar/>



Landspout Mechanisms:



Landspout Mechanisms:

Conservation of angular momentum



Copyright © Addison Wesley

Example of the Denver Cyclone:

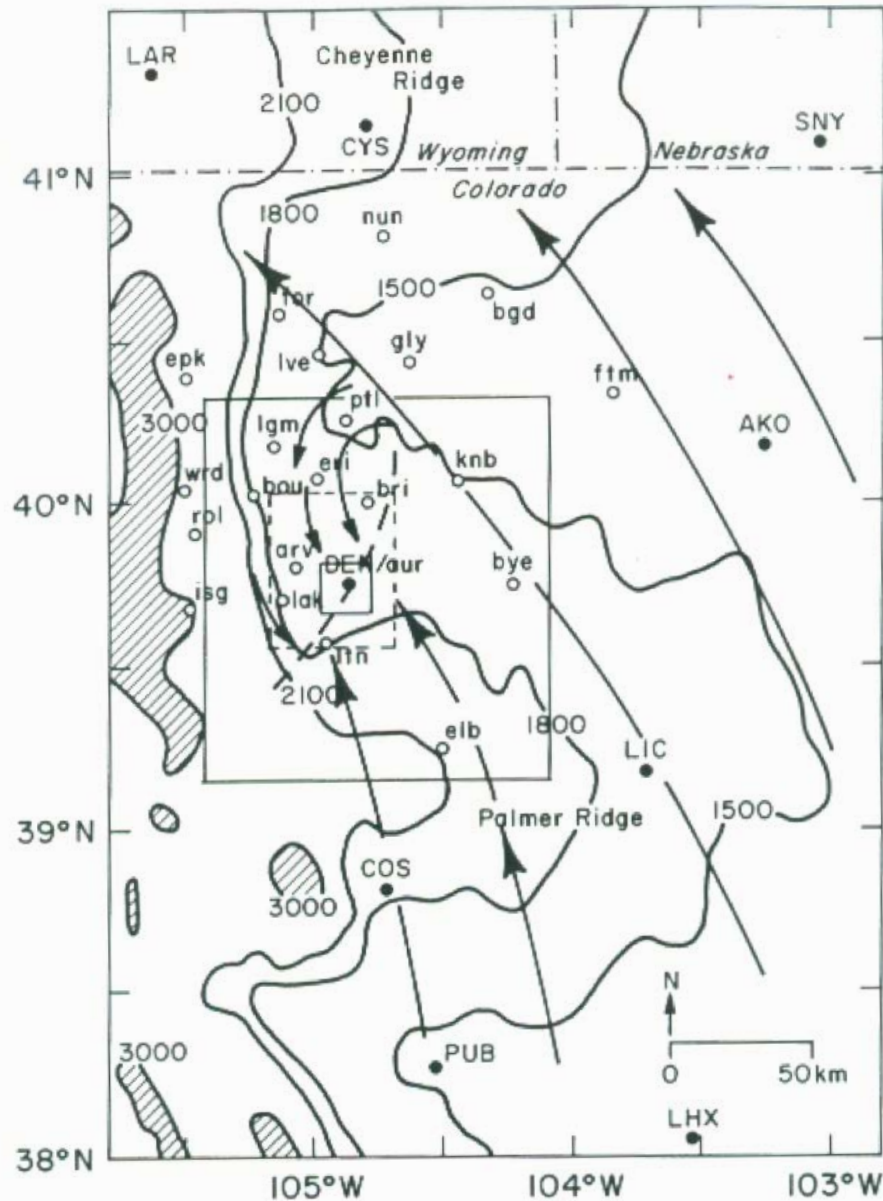


Fig. 1. Elevation contours (meters) of northeastern Colorado, shaded above 3000 m, with the NOAA/FSL meteorological stations (open circles), SAO stations (closed circles), schematic flow for the DCVZ (with "mean" location shown by the dashed line), analysis areas for Figures 10a-10f (two solid boxes), and area in Figure 4 (dashed box).



14 10 35



14 24 38



15 04 50



15 25 00



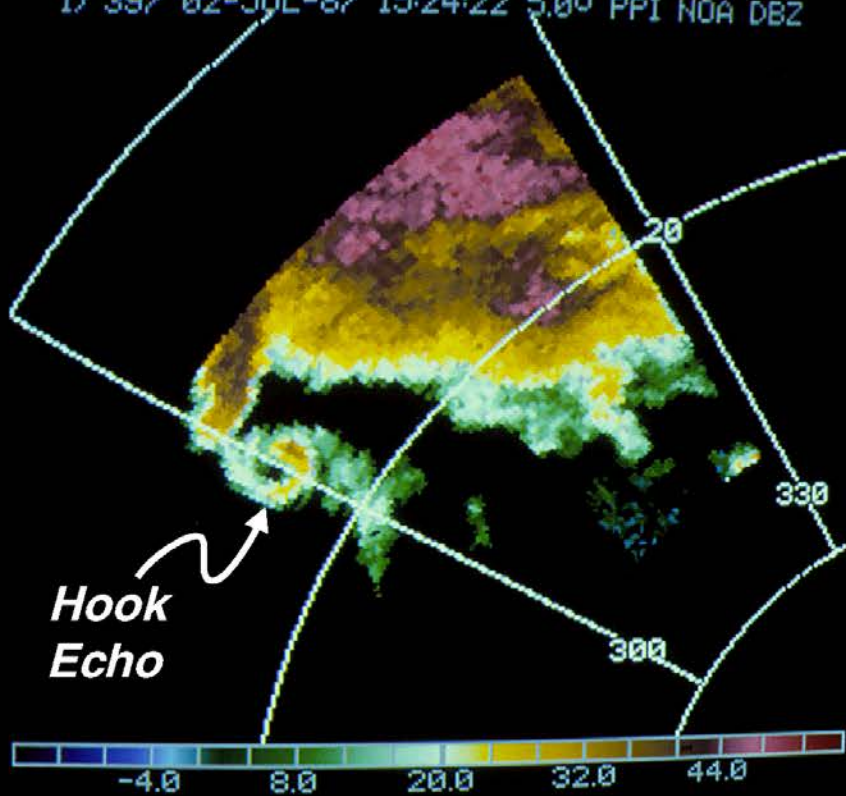
15 31 57



15 35 50

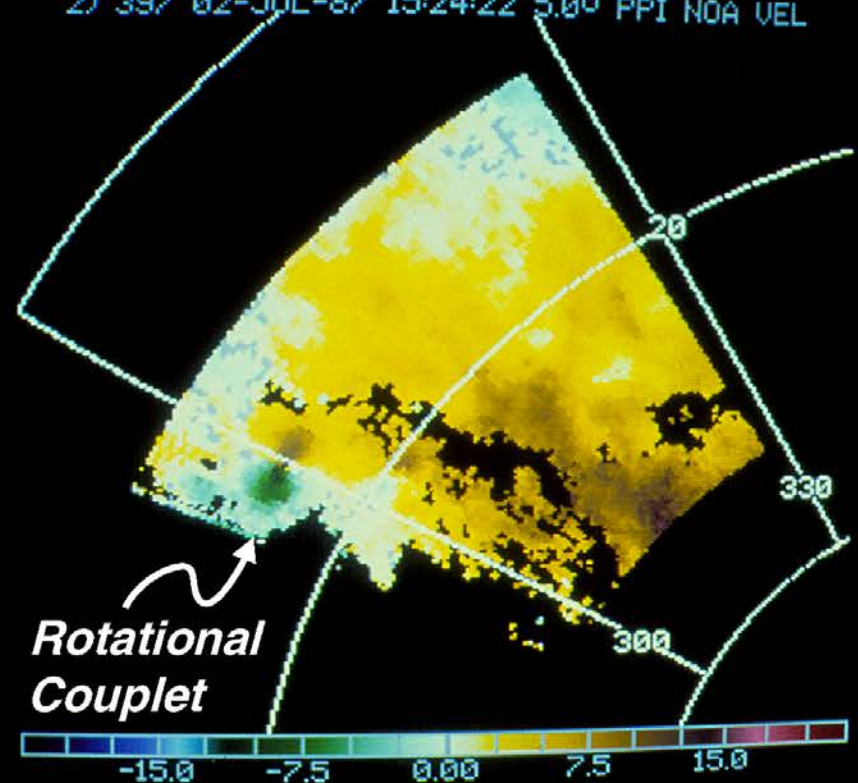
July 2, 1987 Tornado

1) 397 02-JUL-87 15:24:22 5.0° PPI NOA DBZ



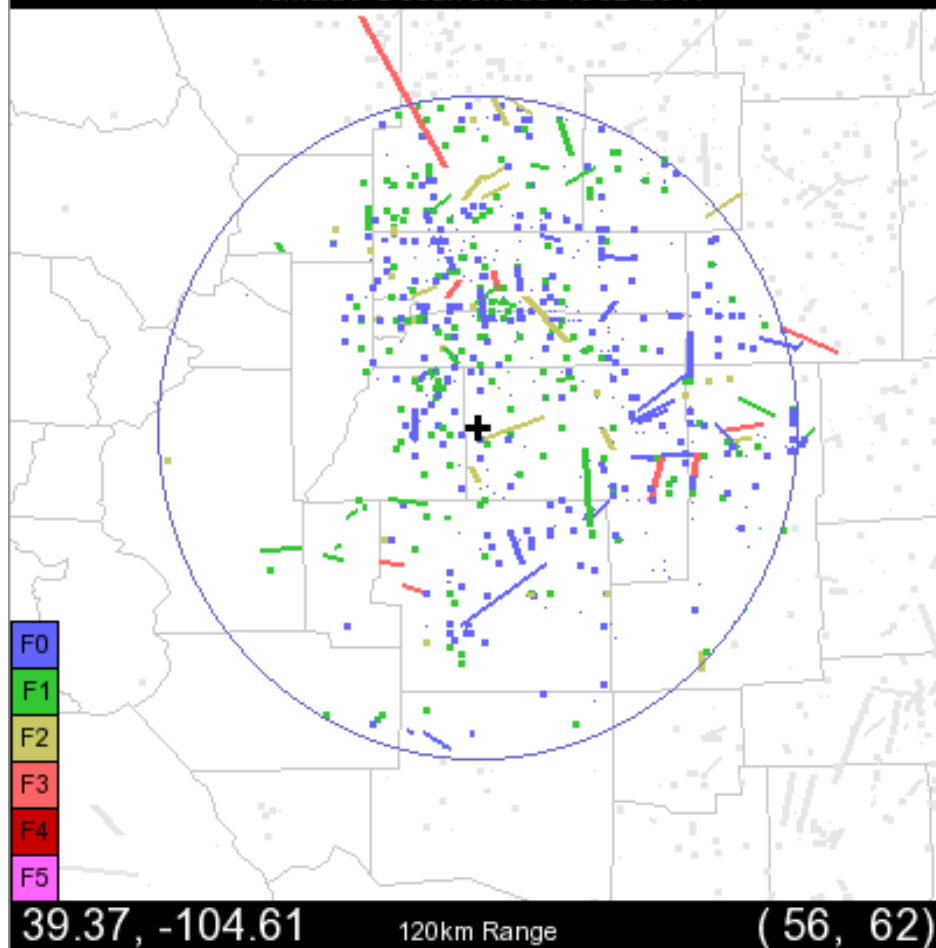
1524:22 MDT

2) 397 02-JUL-87 15:24:22 5.0° PPI NOA VEL



Denver Area Tornado Statistics (SPC):

Tornado Occurrences 1962-2011



Scale	Num	Fat	Inj	PLen	Area	DPI
F0	485	0	0	208.42	16.9	16.9
F1	245	0	20	236.83	11.3	22.6
F2	39	0	61	108.3	9.8	29.5
F3	10	1	106	90.49	46.9	187.5
F4					0.0	0.0
F5					0.0	0.0
TOT	779	1	187	644.0	84.9	256.5

