

ATM 311 Severe Weather Assignment

(1) Six soundings have been posted on the course website. **Pick two of the six** soundings, and summarize the potential for severe weather for each sounding in a brief (~half page) write-up for each sounding.

Be sure to clearly identify the soundings you are discussing, and make sure to address the specific risks associated with the sounding (wind / hail / tornadoes) by using the severe weather indices discussed in class. Many are listed on the right side of each sounding. For each sounding, the wet-bulb zero height and 0-3 km helicity are given on the course website.

Some items to look for:

Mixed layers (high CAPE)
Wind shear, directional and speed
Capping inversion (cinh) preventing convection
Time of sounding
...and more...

(2) Refer to the UCAR COMET module on the convective storm matrix, as shown in class, and in the link below (*note: you will have to create an account, which is very quick and easy...and worth it for all of the great COMET modules available!*):

<https://www.meted.ucar.edu/convectn/csmatrix>

Note that the lower numbers on each hodograph indicate the magnitude of the wind shear, while the upper number indicates the depth (above ground level) in km of the shear layer.

- a. Which simulation (e.g., N3) produces one of the strongest right-moving supercells? Describe the environment (shear and instability) associated with this simulation.
- b. Which simulation produces dominant left-moving supercells? Again, describe the environment (shear and instability) associated with this simulation.
- c. Pick a simulation where convection completely (or nearly completely) dissipates by the end of the simulation. Why does this particular buoyancy/shear environment result in short-lived convection? For this answer, be sure to also note which simulation you've chosen.