Attached to this page are SPC mesoanalysis charts and a visible satellite image for a day on which the SPC issued a high risk of severe thunderstorms. **Our focus for this lab is on anticipating supercells: this day produced a large number of tornadoes and high-end hail reports.** You should refer to your handout “A basic, ingredients-based approach to the convective forecasting process” as well as the lecture slides from 1/28 and the supercells unit (available on the class web page). The emphasis here is on the quality of your reasoning, not the exact placement of every severe weather report on this day.

Complete the following, and write your responses on a separate sheet of paper:

1. Let us begin with step 1 of the handout “A basic, ingredients-based approach to the convective forecasting process”. List all locations where convective storms are at least possible. **Make sure you justify your answer using the maps provided.**

2. Continue on to step 2 of the handout “A basic, ingredients-based approach to the convective forecasting process”. Which among the regions that you identified for question 1 appear to be favorable for the actual initiation of storms? Be sure to use your surface chart and the visible satellite image. **Make sure you justify your answer using the maps provided.**

3. Now we will consider step 3 of the handout “A basic, ingredients-based approach to the convective forecasting process”. Assess the vertical wind shear of the environment. Which among the regions that you identified for question 2 appear to be favorable for supercells? If not supercells, then which appear to be favorable for multicells? If neither supercells or multicells, then make a note that you expect ordinary cells in the region. **Make sure you justify your answer using the maps provided.**

4. Combine what you’ve learned from above to provide a severe weather outlook.

   a) On the included blank map, draw and label an outline for “general thunderstorms”. This would correspond to SPC’s “10% thunder” line. This is where you anticipate thunderstorms of any kind. Remember the convention that thunderstorms are expected to the right of the line.  
   b) Next, on the included blank map, draw and label an outline for your supercell threat area. This should be the area where you think that there is a significant threat for supercell development.  
   c) Finally, write a brief SPC-style discussion explaining the reasoning behind your outlines for parts a) and b). **Make sure you justify your answer using the maps provided.**

5. Pick a point that is in the center of your supercell threat outlook area. Using the values for CAPE, 0-6 km shear, and 0-3 km SRH at that point, compute the following approximation for the supercell composite parameter:

   \[ SCP = \frac{CAPE}{1000} \times \frac{0 - 6 \text{ km shear}}{20 \text{ m s}^{-1}} \times \frac{0 - 3 \text{ km SRH}}{100 \text{ m}^2 \text{s}^{-2}} \]

   Then, comment on what this value means and whether it is consistent with your diagnosis from questions 3 and 4.
This is the map on which you should draw your thunderstorm and supercell threat areas