Synoptic Meteorology II: The Life Cycle of Mid-Latitude Cyclones Exercise

Due: 3 February 2015, at the start of class

For this week's exercise, you are to identify a developing mid-latitude, synoptic-scale cyclone and to follow it in time (i.e., considering at least two distinct times twenty-four or more hours apart). As you do so, please answer the following question: how well does its evolution compare to our conceptual model? You will want to make sure that your answer addresses, at a minimum, the following elements:

- Where did the surface cyclone form? (Answer this question with respect to both geography and the antecedent meteorological conditions.)
- How does the position of the surface cyclone and its fronts compare to the position of the middle-to-upper tropospheric features that accompany it?
- How do the amplitude and/or wavelength of the middle-to-upper tropospheric feature change as they surface cyclone changes in intensity?
- How do the temperature contrasts across the surface cyclone's fronts evolve with time?
- Where are clouds and precipitation found with respect to the surface cyclone?
- Do you see evidence on isobaric analyses of the warm conveyor belt, cold conveyor belt, and/or dry intrusion? If so, what?
- How is the surface cyclone positioned with respect to an upper tropospheric jet streak, and how does this positioning change from one time to another?

Your answer may be in paragraph or list form. Please include relevant images that provide graphical evidence in support of your narrative. Analyze on these images any feature(s) that you believe should be analyzed to support your narrative – please do not assume that I (or anyone else reading your narrative) can read your mind! Please also make sure that you include the times and dates of the data that you analyzed if they are not visible on each chart. You may find the following references useful as you complete this exercise:

- Surface data: http://weather.rap.ucar.edu/surface/
- Upper air data: http://weather.rap.ucar.edu/upper/
- Satellite data: http://weather.rap.ucar.edu/satellite/
- Radar data: http://weather.rap.ucar.edu/radar/

However, you are free to use any observational (not model) products that you wish. Your final write-up should be less than 1 pg single-spaced, 12 pt font, with 1" margins. You should include no more than four (or so) images in support of your narrative.