IC5.1: Optional Job Sheet

Tropopause Pressure

Objective: Apply the knowledge gained from the winter weather AWOC IC 5 Lesson 1 training module to a case study.

Data: 15 March 2004 winter storm event in the Midwest. You will be using your WES machine in case review mode.

Instructions for questions 1-5:

- On your WES machine, load the 15 March 2004 case, DMX localization, and set the clock to 15 March 2004, 13:00 UTC. Focus on the 12 UTC 15 March NAM 40 and NAM 80 analysis for each question in this jobsheet, unless otherwise noted.
- On the CONUS map scale, load into a four panel, the following (watch the model type closely):

1. Into all four panels, the NAM 80 700mb frontogenesis loaded as an image.
2. Into the upper-left panel, the NAM 80 300-500 mb Qvector divergence, divergence, 300-500 mb Qvectors, and 500mb temperature .
3. Into the upper-right panel, the NAM 80 tropopause pressure and wind.
4. Into the lower left panel, the NAM 80 500mb height, wind and vorticity.
5. Into the lower right panel, NAM80 MSLP, the GOES-IR, lightning, surface obs.

Question 1. Identify all the short-wave troughs that you see in the tropopause pressure analysis (upper-right) that are impacting the CONUS. Where are they located?

Question 2. Consider the Qvector convergence in northern NM, and SW CO, is there a short-wave trough in the tropopause pressure map?

Question 3. Which wave is most likely to result in cyclogenesis, the one in the northern Plains, or the one in northern MX? Why?

Question 4. Load the NAM 80 potential temperature difference from the ground to the tropopause pressure surface on one of the panels. Which wave is likely to yield the strongest vertical velocities at 700 mb (Northern Plains, Northern MX)?

Question 5. Which field shows the best clarity in terms of identifying areas of potential upper-level forcing?

Instructions for question 6:

- Keep the same time but swap the four-panel with a fresh one.
- On a regional scale, load the following:

1. Into the upper-left panel, the NAM 80 div Q for the 500-300mb layer.
2. Into the upper-right panel, the NAM 80 tropopause pressure and wind.
3. Into the lower-left panel, the NAM 40 div Q for the 500-300mb layer.
4. Into the lower-right panel, the NAM 40 tropopause pressure and wind

Question 6. Which forcing diagnostic appears to be more noisy as the model grid spacing goes from 80 to 40 km?

Question 7. Load the GOES WV imagery on all of the panels (load to all panels). Which forcing diagnostic appears to best match the shape of the ascent field as inferred by the clouds for the northern Plains shortwave?