EAS270, "The Atmosphere"   Assignment 2   Due 5 pm, 1 Dec., 2010

Professor: J.D. Wilson   Value: 10%

Skill of the CMC 48-hr Weather Forecast — a Case Study

Preamble: Students are permitted (but not obliged) to work in teams on this assignment. Teams may number up to four students, and each team is to submit a single report, identifying all participants. Please deliver your assignment (hard copy; labelled with names and ID numbers) to the instructor or to the drop-off box outside Tory 3-40. A two mark penalty will be applied for late assignments received before noon Thursday 2 Nov. After that time, the late penalty will be five marks.

Task: You are to compare *a single* 48-hr forecast, and the corresponding analysis. CMC weather forecasts provided by the "regional run" of the Global Environmental Multiscale (GEM) model are available at `http://www.weatheroffice.gc.ca/model_forecast/index_e.html`

For your case study you may pick any day[1], and any one of the four daily initialization times; as a convenience the instructor will archive the progs (and corresponding analyses) from the GEM runs initialized at 12 Zulu. You may focus your discussion on whatever region of the map you wish, e.g. a particular province, or Western Canada, or North America in its entirety.

Your discussion is to be based on the "Black and White Charts" and specifically the upper right panel of the four-panel chart (the attached Fig. 1 is an example), which gives both the sea-level pressure field ("MSLP") and the 1000-500 hPa thickness field ΔZ. Please understand that if your *48-hr forecast* is initialized at *nn* Zulu on day X then you must compare it with the *0-hr forecast* initialized at *nn* Zulu on day X+2. That is, the 48-hr forecast and the 00-hr forecast (analysis) *must both be valid at the same time*.

Format & Content of Report: Your report is restricted to a title page (listing names and ID's) plus **two** single-sided, standard pages, of which one gives *only* your two maps, with the appropriate captions. The maps could (and perhaps should) be cropped and re-scaled (e.g. in PowerPoint) to focus attention on the particular geographic area of interest. Your narrative may be in point or essay form. In either case it must be ordered (coherent) and legible. Use appropriate headings. **Use double spacing. If using a word processor, use 12-point font size**. Briefly interpret the meteorological situation, and comment on the accuracy (or inaccuracy) of the 48-hr prognosis. Relate your discussion very specifically to the maps, and focus on *factual* elements (i.e. elements unambiguously indicated by the map or maps), rather than conjecture.

Marking Scheme:

- Summary of the *most important elements* of the prevailing meteorological situation (e.g. dominant pressure system, thermal gradients, pattern of the winds,...) [5%]

- Comparison/contrast of the forecast with the analysis [3%]

- Legibility — organization — clarity [2%]

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[1]The task should be more interesting for you if you focus on an inherently dramatic weather situation, e.g. a forecast that anticipates strong winds, or rapid advective warming or cooling, or a frontal passage, etc.

Figure 1: CMC GEM 0h prog (i.e. analysis) valid at 12Z on 3 Nov., 2010.