Metr 201: Laboratory #6
Working With Weather Maps and Soundings:
Finding Pressure Features and Fronts
Due Wednesday March 4, 2015 at 11AM (100 points)

All students are to do the analyses exercises and answer the questions, but only the students indicated will be asked to explain to the class. You will all turn in all analyses assigned, but you will work with specific mentors. The mentors will provide guidance to their group of students and serve as a resource independent of the instructor.

Groups: Mentor Students
1 Xiomara Daisy, Karl
2 Amanda Daniel
3 Nick Hadi
4 Naomi Lana
5 Cameron Kurtis, Philip
6 Devin John, Raymond

1. Upper air charts (10 pts):

(a) Print out the following charts for 12 UTC 26 February 2015. (5 pts)

Open a Lab Window. The general syntax to get these charts is: difax 15022612 ua_850 -p as discussed in class.

(b) Indicate troughs, ridges, cyclones, anticyclones, conventionally with proper colors on these charts, and on all charts except 850 mb indicate the polar jet stream as a long broad arrow. (5 pts)

850 mb and 700 mb Groups 1 and 2 will be asked questions about this.
850 mb and 500 mb Groups 3 and 4 will be asked questions about this.
850 mb and 300 mb Groups 5 and 6 will be asked questions about this.
2. Examine the attached surface weather map:
Note the question marks at the center of three pressure systems and the boundary indicated by a solid bold line. (45 pts)

(a) Put values on the isobars. **Group 1 will be asked questions about this.**

(b) Label the boundary. **Group 2 will be asked questions about this.**

(c) Label the pressure systems appropriately. **Group 3 will be asked questions about this.**
3. Examine the two attached soundings. KTFX is Great Falls, Montana, and KBOI is Boise Idaho, indicated by a solid bold line. (Naomi, Cameron, and Amanda will be asked to discuss) (45 pts)

(a) Explain why the bottoms of the soundings are not at 1000 mb.

The bottoms of the soundings are not at 1000 mb because the stations are not at sealevel. The bottom of the soundings are at the actual pressure elevations of Boise and Great Falls. Group 4 will be asked questions about this.

(b) Indicate the Tropopause on both soundings.

Group 5 will be asked questions about this.

(c) The definition of a front is “...a boundary between air masses that have different temperature characteristics, in which the air masses have large horizontal (~1000s km) and vertical (through Troposphere) extent. Comment on how the soundings suggest that there is a front between the two stations.

Group 6 will be asked questions about this.

The environmental lapse rate represents the actual change in temperature with height at a station, and this is shown as “red” on the
two soundings. For there to be a front between the stations, there should be a systematic difference in temperature at all elevations until the Tropopause. For the case considered here, the temperatures at Boise are systematically higher at all levels. Hence, there is a front between Boise and Great Falls, and this corresponds to the surface boundary shown on the surface map.