AOS 330
Upper Air Scavenger Hunt

1 Objective

An upper air scavenger hunt — find soundings from around the world meeting selected criteria. You will gain insight into what kinds of soundings are typical for certain regions and seasons.
Important: This lab must be turned in at the end of the period in order to be eligible for the extra points described below!

2 Resources

- Lab computers with internet access, browser.
- The following web address: `http://weather.uwyo.edu/upperair/sounding.html`

3 Procedure

This is a contest to find soundings exhibiting "the most" or "the least" of a particular quality. Search the soundings at the University of Wyoming upper air site. For some categories, it may be easier to find what you need by viewing the list form of the sounding ('text'); for others, you might want to view the graphic form ('Skew-T gif'). Note that calculated stability indices, precipitable water, etc., are given on both the lists and the plots, though less cryptically for the text version.
When you find one that you think is a "winner" in a particular category, write down the date, time, station ID (three letters), country or region that it is found in, the category that it satisfies, and the value of the relevant variable.
Important: In order to qualify, the sounding itself must be complete and without obvious artifacts. In particular,

- Temperature profile must extend to at least 100 hPa with no missing data anywhere below that level.
- Dewpoint profile must extend to at least the -40 isotherm.
- No unphysical temperature glitches, as indicated for example by a strongly superadiabatic layer followed immediately by an inversion, or vice versa.

If you're not sure whether a sounding looks complete and correct, please show it to the instructor before relying on it!

1. The sounding with the coldest surface temperature.
2. The sounding with the warmest surface temperature.
3. The sounding with the most negative Lifted Index.
4. The sounding with the most CAPE.
5. The sounding with the highest SWEAT index. Hint: Keep in mind the role of strong wind shear in determining this index. In addition, consider the seasons and regions most affected by severe thunderstorms and tornadoes.
6. The sounding with the highest surface dewpoint. Hint: You might have go to another continent for this.
7. The sounding with the highest wind speed at any level. Hint: When is the jetstream strongest? And where?

8. The sounding with the strongest *above-surface* inversion (based on the temperature difference between the top and the bottom of the inversion) below 500 hPa. The base of the inversion must lie at least 50 hPa above the surface.

9. The sounding with the strongest *surface* inversion, defined here as the warmest temperature above the surface minus the temperature AT the surface. Hint: During what season and at what latitudes are very strong persistent surface inversions

10. The sounding with the most precipitable water (column-integrated water vapor).

As you find soundings meeting the above criteria, compare the values you get with those recorded on the board by the instructor. If yours beats the value already recorded, call it out! Your high value *must* be recorded on the board by the end of the lab period in order to qualify for the *extra* point described below.
Scoring of the lab will be handled in the following way: By default you will get one point in each category. HOWEVER, if you found the *best* example in a particular category, you will get an *extra* point. If your team reported the *worst* example in a category, you will lose the point for that category.
Bottom line: If you do an average job in every category, you'll still get ten points. But it's theoretically possible to earn double credit (up to 20 points) by "winning" in every category. Likewise, it's possible to lose significant points by coming in last in one or more categories.
However, there is a safety net: no one will get fewer than five points for the lab, as long as they make a good faith effort in all ten categories.