ATS 641 – Spring 2022
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SOME SUGGESTIONS FOR ANALYZING SURFACE AND UPPER-AIR MAPS

- Start with a pencil and eraser – do an initial analysis, then refine it. Don't use permanent ink until you're sure of your analysis!
- Beware of bad data points. If a station has values that differ significantly from its neighbors, is there a reason why? Or might it be a bad observation that should be disregarded? At the surface, there can be good reasons for points that seem to be "outliers", such as convection or other mesoscale flow features. Use your best judgment to determine whether an observation is real. Especially at upper levels, your analysis should be relatively smooth, without many sharp "wiggles".
- Make sure your contours are evenly divisible by the contour interval. For instance, if plotting surface isobars at an interval of 4 hPa, use 1000 hPa as a "baseline" – it is evenly divisible by 4. Thus you will contour 996, 1000, 1004, etc.
- Interpolate. If you are drawing a 1000-hPa contour and you are going between stations with pressures of 999 hPa and 1003 hPa, draw your contour closer to the 999.
- Fronts should be analyzed on the warm edge of a strong temperature gradient. Fronts and other boundaries are often (but not always) associated with a wind shift and a "kink" in the pressure field. (More on this later in the semester.)
- When labeling surface pressure contours (in hPa or mb), it is customary to drop the leading "9" or "10", so that 1004 hPa becomes "04", 988 hPa becomes "88", and so forth.
- When labeling isoheights on an upper-level pressure map, it is customary to drop the last zero, so that 5400 m becomes "540".
- Don't close your contours at the edge of the map.
- A decent example of a manual analysis is the "Unified Surface Analysis" put out by several of the NCEP centers. It is available from
  `https://ocean.weather.gov/unified_analysis.php`
- Links to websites that may be helpful:
  Explanation of METAR code:
  `https://sites.google.com/a/tamu.edu/atmo203tutorials/home/how-to-read-hourly-weather-observations`

http://weather.cod.edu/notes/metar.html

Station model key (abbreviated):
http://www.rap.ucar.edu/weather/info/index.php?referrer=surface

Station model key (detailed):
http://www.wpc.ncep.noaa.gov/dailywxmap/wxsymbols.html

Present weather symbols:
http://www.rap.ucar.edu/weather/info/wxSymbols_anno1.pdf