

**In this lab assignment, you will need to do 2 tasks:**

1. You will again reanalyze the surface chart for 0630Z on 21 March 1955. This time you will locate surface fronts based upon the isobars and isotherms & isodrosotherms that you did in the previous two labs (lab 4 & 5). Please print a blank map for 0630Z on 21 March 1955 ([http://faculty.fiu.edu/~hajian/MET3502/SFC\\_21MAR55\\_0630Z.tif](http://faculty.fiu.edu/~hajian/MET3502/SFC_21MAR55_0630Z.tif)). You should start the analysis by sketching the high and low centers. Then with your surface analysis you did in lab 4 under the blank plotted map, sketch in the fronts. See the “**How to locate surface fronts**” section below as directions. Also, below in page 2 is a copy of final surface frontal analysis chart for this time. Please refer to this before you finalize your front locations. Once you have the fronts located, trace your previous isobars, modifying them as necessary to conform with known frontal characteristics.
2. You will do a full surface pressure (isobars) and frontal analysis of the surface weather twelve hours later at 1830Z on 21 March 1955. The blank map can be accessed at [http://faculty.fiu.edu/~hajian/MET3502/SFC\\_21MAR55\\_1830Z.tif](http://faculty.fiu.edu/~hajian/MET3502/SFC_21MAR55_1830Z.tif). Please print it out first. In preparation for the 1830Z analysis, trace the 0630 Z fronts and centers of action (lightly) on the chart. Locate these features at the later time based upon extrapolation and the plotted data. Scan the chart to see if **any new features** have appeared. If so analyze them. Then fill in the isobars. Continuity with past charts is important, but so is sensitive response to what the data show. You should find that the final fronts on 1830Z chart are very different with those on the 0630Z chart.

**How to locate surface fronts:**

The key to analysis is to use tight temperature and dewpoint gradients combined with the properties of fronts in relation to pressure and surface weather to locate the fronts.

- Fronts are zones of strong gradients in temperature, humidity, wind, vertical motion, and local rotation (vorticity) normal to the frontal surface
- Frontal gradients appear discontinuous on a synoptic chart
- Local pressure minimum (trough) lies along the front
- Fronts are long and narrow, with characteristic dimensions
  - Along front ~1000 km
  - Across-front ~100 km
- Confluence occurs along fronts
- Maximum in vorticity (local rotation) lies along the front
- Rapid changes in cloud and precipitation occur across front
- Surface fronts are shallow

