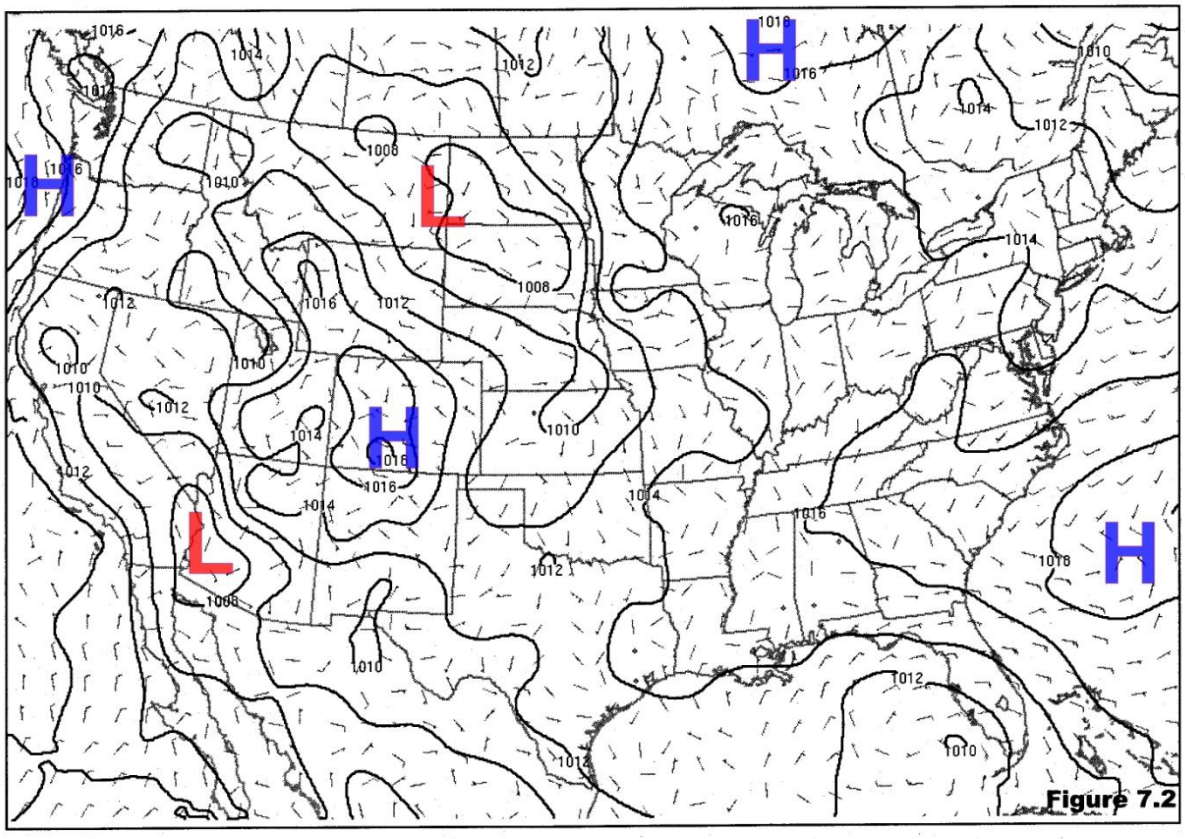
WEATHER & CLIMATE
SALEM STATE UNIVERSITY



1. (a) Locate areas of high and low pressure on Figure 7.2 above. For areas of high pressure, write an 'H' on the map; for areas of low pressure, write an 'L'.

(b) Based on part (a), over which locations would a meteorologist be likely to predict precipitation? Why?

Over areas of LOW pressure. This is because low pressure indicates rising air which often results in cloud formation and precipitation.

Exercise #7 Lab Activity

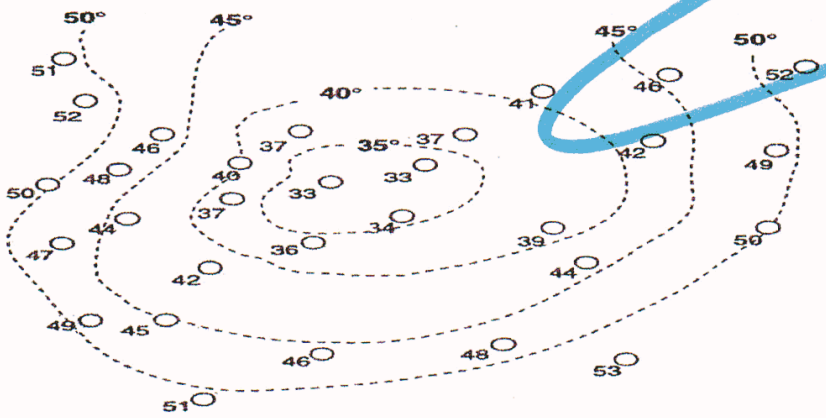
Name: BRIAN

Isoline Mapping

Lab Section: _____

Please show your work. If necessary please use additional paper to show work.

Figure 7.1 Isoline Map



Drawing Isopleths

The diagram above provides an example of an isoline map. The diagram below gives you the opportunity to draw isopleths.

In the diagram below, you will see many 1's, 2's, 3's, 4's, 5's, 6's, 7's, 8's, and 9's. After examining the chart, draw isopleths for the values 2, 4, 6, and 8. After connecting the numbers, you will see a definite pattern displayed.

Figure 7.2 Practice Isopleth map.

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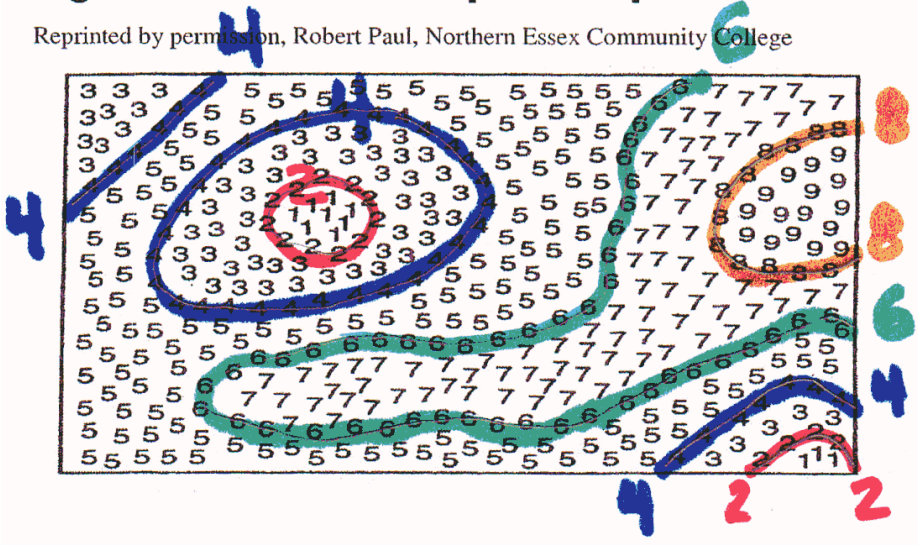
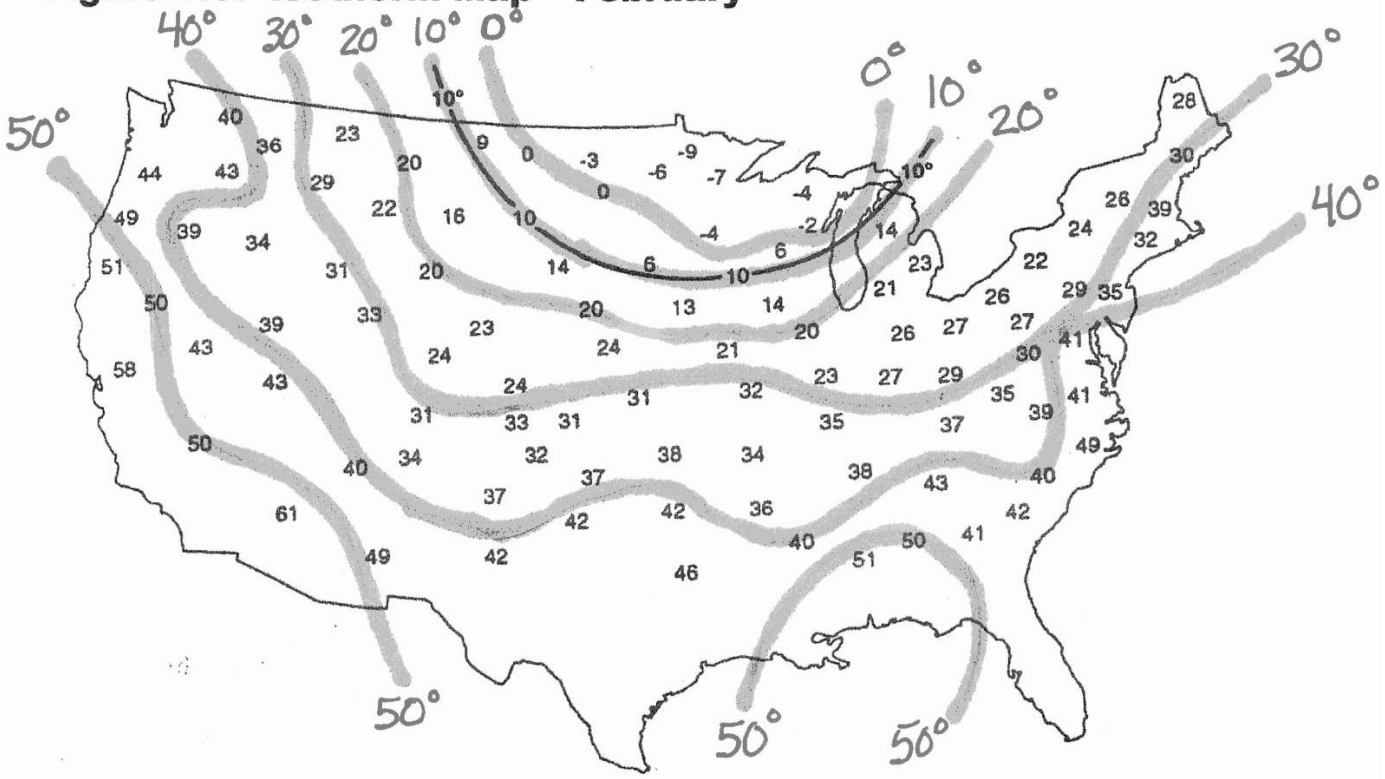


Horizontal Distribution of Temperature – Isotherms

A map comprised of isotherms can best show the distribution of air temperature over large areas. Isotherms are lines connecting points of equal air temperature. The construction of isotherms is very similar to that of drawing contours on a topographic map or lines of equal amounts of rainfall (isohyets) and so learning this technique will be useful in a number of instances. The accompanying map of the coterminous United States shows mean air temperatures for the month of February. The 10-degree isotherm has already been plotted to illustrate isotherm construction. You should now draw in the location (plot) of the isotherms with values of 0, 20, 30, 40 and 50 degrees. Note that it is possible for you to show the location of an isotherm, e.g., 30 degrees, without ANY 30 values being on the map. All you need are values above and below that amount to see where the line should go. Drawing in the isoline for 30 degrees will require the practice of *interpolation*, a common practice in cartography. Interpolation involves drawing the isoline between higher and lower data points. When interpolating an isoline between data points, the line should be drawn proportionally to the intervening value, that is, drawn closer to the nearer value (see figure 7-1 above to see how the isoline was interpolated between values).

Figure 7.3. Isotherm Map – February



1. Describe the pattern you see in the isotherm map for February.

COOLEST IN THE NORTH, WITH A COLD BULGE IN THE CENTER. WARMER AT THE COASTS, AND MUCH WARMER IN THE SOUTH

2. Which portion of the country is:

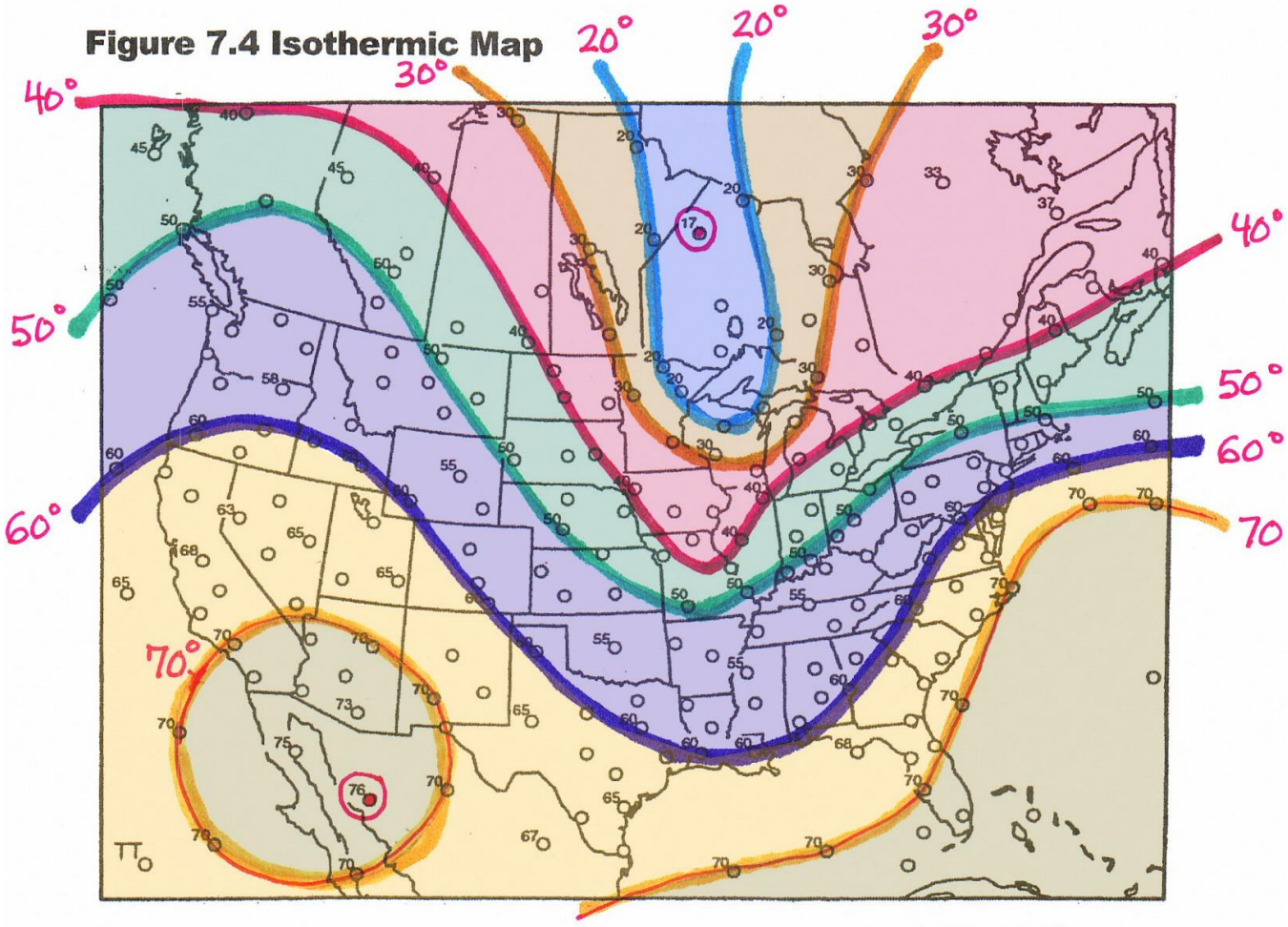
a. coldest NORTH CENTRAL

b. warmest SOUTH WEST

Drawing Isotherms

Look at the map below (Figure 7.4). Each circle shows a location where a temperature observation has been made at 7AM. The temperatures have been plotted to the upper left of each station circle. When you draw your isotherms, they should be drawn through the appropriate station circles, not through the temperature numbers. Use a pencil to start and when you are confident that you have drawn them correctly, use a felt-tip pen to make the lines. Use different colored pencils to shade between isolines to indicate regions of temperature. The isolines should have a constant interval of 10-degerees and should run in a sequence from 20° F, 30° F, etc.

Figure 7.4 Isothermic Map



3. The coldest temperatures on this map are located over: ONTARIO, CAN. The lowest temperature on the map is: 17°. Weather generally moves from west to east in the midlatitudes; what do you think the coming temperatures will be in New England? COLDER.

4. The warmest temperatures on the map are located over NORTH WEST, MEXICO. The highest temperature is 76°. When the warm air moves eastward it will heat up which state TEXAS and to what temperatures? MID 70'S.

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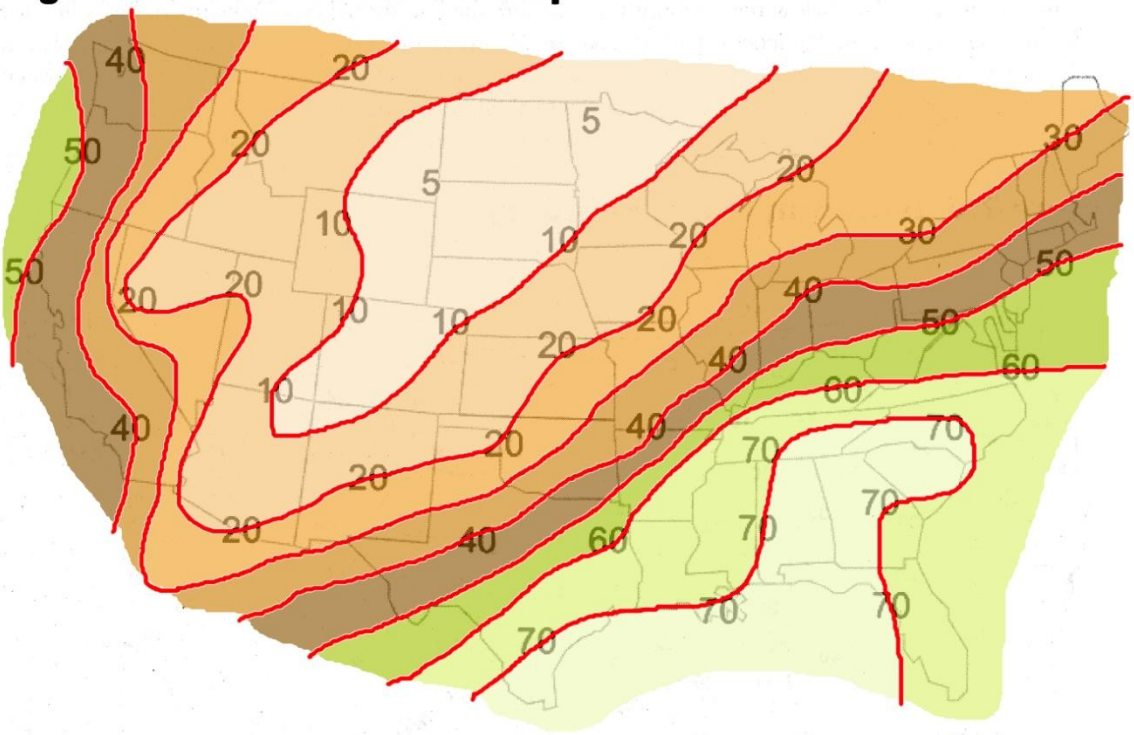
Drawing Isodrosotherms (Moisture)

Look at the map below (Figure 7.4). The numbers indicate dew point temperature observations in °F. Isodrosotherms are lines of equal dew point temperatures which indicate the amount of moisture present in the air. Use a pencil to start and when you are confident that you have drawn them correctly, use a felt-tip pen to make the lines. Use different colored pencils to shade between isolines to indicate regions of moisture. The isolines should have a constant interval of 10-degrees and should run in a sequence from 20° F, 30° F, etc.

Figure 7.6 Isodrosothermic Map



4. The driest areas on this map are located over: **North Central US**. The lowest dew point on the map is: **5 degrees**. Weather generally moves from west to east in the midlatitudes; what do you think the coming dew points will be in New England? **Lower: 5-20 degrees**

5. The areas with the most moisture on the map are located over **South Eastern US** The highest dew point is **70 degrees**. Suppose air temperatures in Florida and California were both 90° F. Where would the heat index be highest? **Florida** Why? **The actual temperature is closer to the dew point temperature, thus the relative humidity will be higher.**