

Isobars and Isotherms

In this exercise, you will be drawing isobars on a weather chart. Isobars are lines that connect places at the same pressure. Isotherms are a similar idea but they are lines that connect places of the same temperature. You will also be introduced to what is called the simple surface-station model.

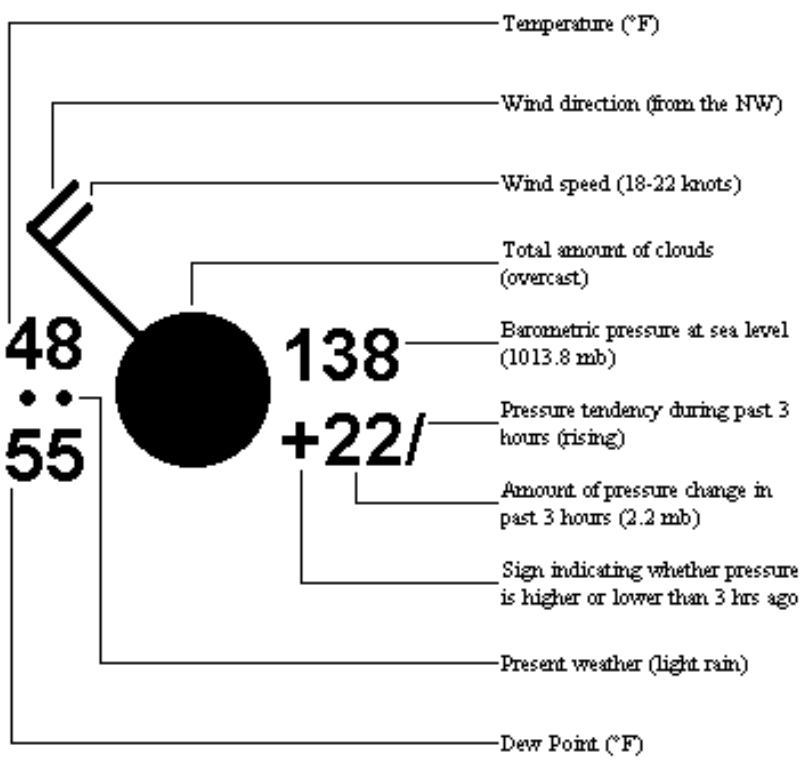
The basic weather elements (temperature, pressure, wind etc.) measured at weather stations are displayed on weather charts using a compact symbol called the surface-station model. In this exercise, we only need to refer to the number shown in the upper right; this is an encoded representation of the surface pressure. To determine the actual pressure in millibars, this number must first be decoded.

Decoding the Pressure Value:

Using the example of 126....First, place a decimal point in front of the right-most digit, i.e. **12.6**. Next, if the number now is between 0 and 55.9, add a leading **10**, i.e. **1012.6**. If the number is between 56.0 and 99.9, add a leading **9**. (note: on the map in this exercise, you should add a leading 10 to all values)

For a complete description of the model, refer to the Simplified Surface-Station Model below.

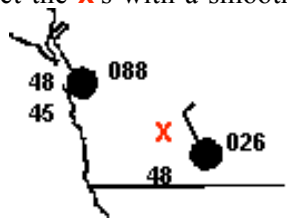
Simplified Surface-Station Model



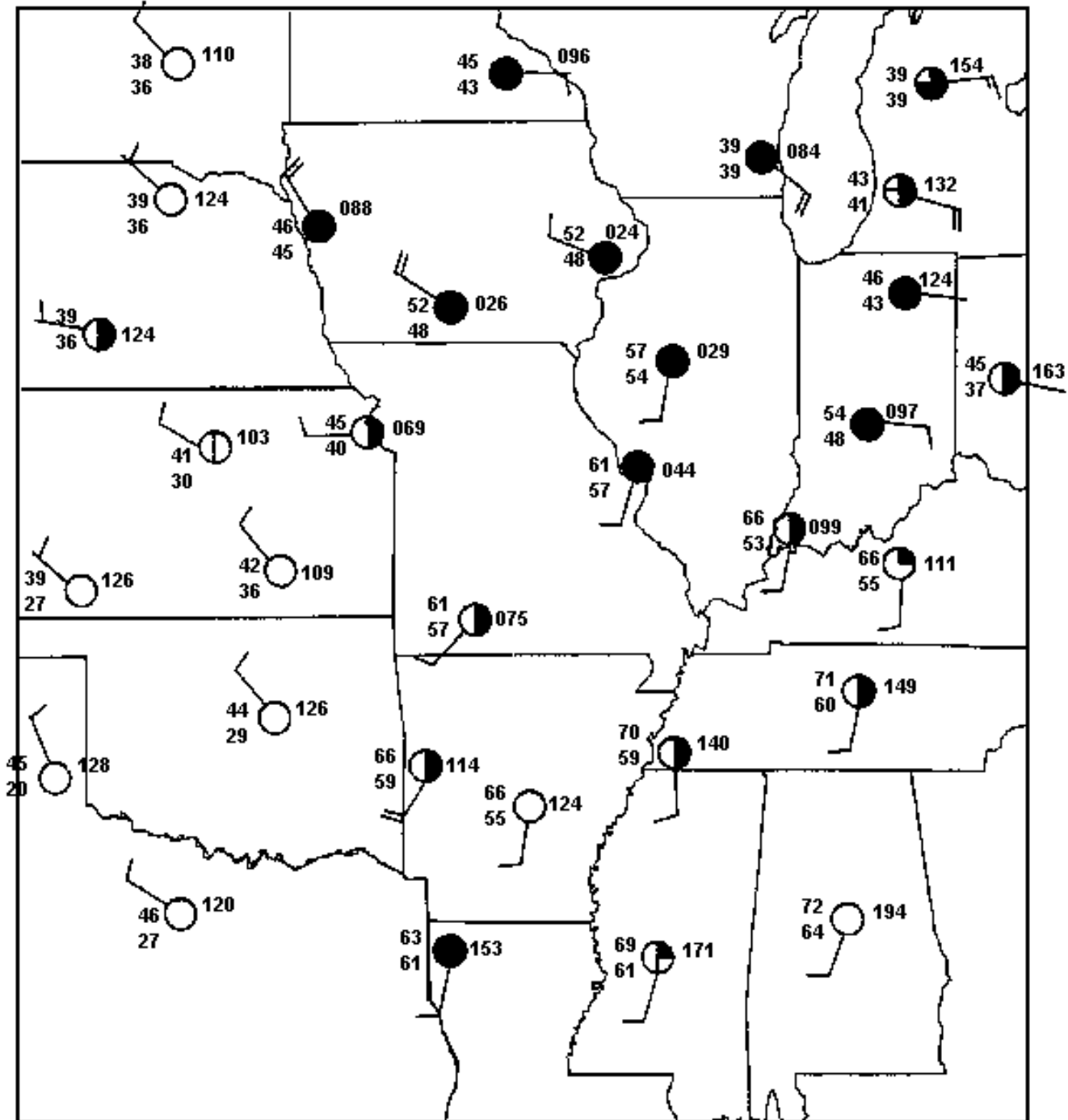
Instructions:

To draw a 1004 mb isobar, you need to locate a number of places on the chart at 1004 mb. It is unlikely that many stations will report exactly 1004, so you will need to do some estimating. To estimate these points, you would find pairs of adjacent stations close to 1004 mb; one station above 1004 and the other below 1004. Looking at the chart below, we find the upper station is at 1008.8 and the lower one at 1002.6. Mark the location where you estimate it to be 1004 mb with an **x**. In this example, you would place the **x** closer to the station at 1002.6.

If a station reports exactly 1004, then place the **x** at the station. Continue this process for all stations reporting near 1004. Finally, you would connect the **x**'s with a smooth, curved line to complete the 1004 mb isobar.



Draw isobars at 1004 mb, 1008 mb, 1012 mb. Once you have completed this worksheet, you should answer the questions below.



Questions:

1. What is an isobar? _____

2. What units are used for the barometric pressures on this map? _____

3. How far apart are barometric pressures usually marked on an isobar map? _____

4. What device is used to measure barometric pressure? _____

5. What is the barometric pressure at Milwaukee, WI? _____

6. How do you know whether to put a 9 or a 10 in front of the number on the weather station? _____

7. Roughly where is the center of Low pressure located? (Explain here and draw an L on the map.) _____

8. What is the difference between an isobar map and an isotherm map? _____

9. What sort of weather activity would be associated with a low pressure system? _____
