

## Drawing Isobaric and Isothermal Maps<sup>1</sup>

### Barometric Pressure

The map shows the reported sea level pressures for stations throughout the U.S. recorded in millibars. Surface barometric pressures are corrected for elevation and the value represents what the pressure would be if the recording station were at sea level. In this way, barometric pressures can be used to predict horizontal wind movement. Draw isobars (lines) that connect identical values of sea level pressure at increments of every 4 millibars (your isobars will have values of 1000, 1004, 1008, etc.). Isobars are a type of isoline; an isoline is a line on a map where there is a constant value of a parameter (barometric pressure, temperature, elevation, precipitation, etc.).

Rules regarding isobars (and other types of isolines):

1. Isobars are drawn in 4-millibar intervals.
2. Always label the isobar value.
3. Pressures lower than the isobar value are always on one side of the isobar and higher pressures are consistently on the other side.
4. Draw an isobar until it reaches the end of the plotted data or closes off a loop as it encircles data.
5. Neighboring isobars tend to take similar paths.
6. Isobars never cross and never split or fork.
7. More than one isobar of the same value can appear on a map.

Hint: begin drawing the 1024 millibar isobar starting in Four Corners region. Repeat the procedure with the next isobar value (1020 millibar). Then continue with the remaining values until you have isobars that connect all of the stations on the map.

### Analysis

1. Isobars can be used to identify regions of high pressure and low pressure. Label the center of the high pressure area with a large "H" and label the center of the low pressure area with a large "L".
2. High-pressure regions are usually associated with dry weather because as the air sinks it warms and the moisture evaporates. Low-pressure regions usually bring precipitation because when the air rises it cools and the water vapor condenses. Shade the region you would expect to see precipitation. Shade the region you would expect to see clear weather.
3. Draw arrows around the high-pressure area to indicate the wind direction. Draw arrows around the low-pressure area to indicate the wind direction. Remember that wind does not blow directly from high pressure to low pressure and account for the factors that affect how wind blows across isobars.

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<sup>1</sup> Activity based on NWS Drawing Conclusions - Surface Air Pressure Map & Surface Temperature Map

# Surface Air Pressure Map



## **Surface Temperature**

The map shows the reported surface temperatures for stations throughout the U.S. recorded in °F. Draw isotherms (isolines that are contoured for temperature) that connect identical values of temperature at increments of every 10°F (your isotherms will have values of 20, 30, 40, etc.). Isothermal maps are used to identify warm and cold air masses.

This exercise requires that values be interpolated between stations. For example, examination of the map indicates that the temperature at the Oregon coast is 50°F and immediately to the east the temperature is 30°F in Idaho. The location of the 40°C isotherm in that region can be estimated by picking a location that is midway between the 50°F (Oregon coast) and 30°F (Idaho) stations. You should be careful when drawing isotherms to interpolate the location of temperatures between reporting stations where there is a gap in the data. For example, in Texas, you will need to interpolate to correctly draw the 50, 60 and 70°F isotherms.

