Earth Science Name: _____

LAB #13: WEATHER MAPS Date: _____

Weather Maps Lab #13

Discussion: Synoptic weather maps help meteorologists predict the weather by looking for trends.

Purpose: You will construct isolines, interpret station models, identify fronts, and calculate gradients.

Hypothesis: Maps with isolines are models that make it easier to see trends

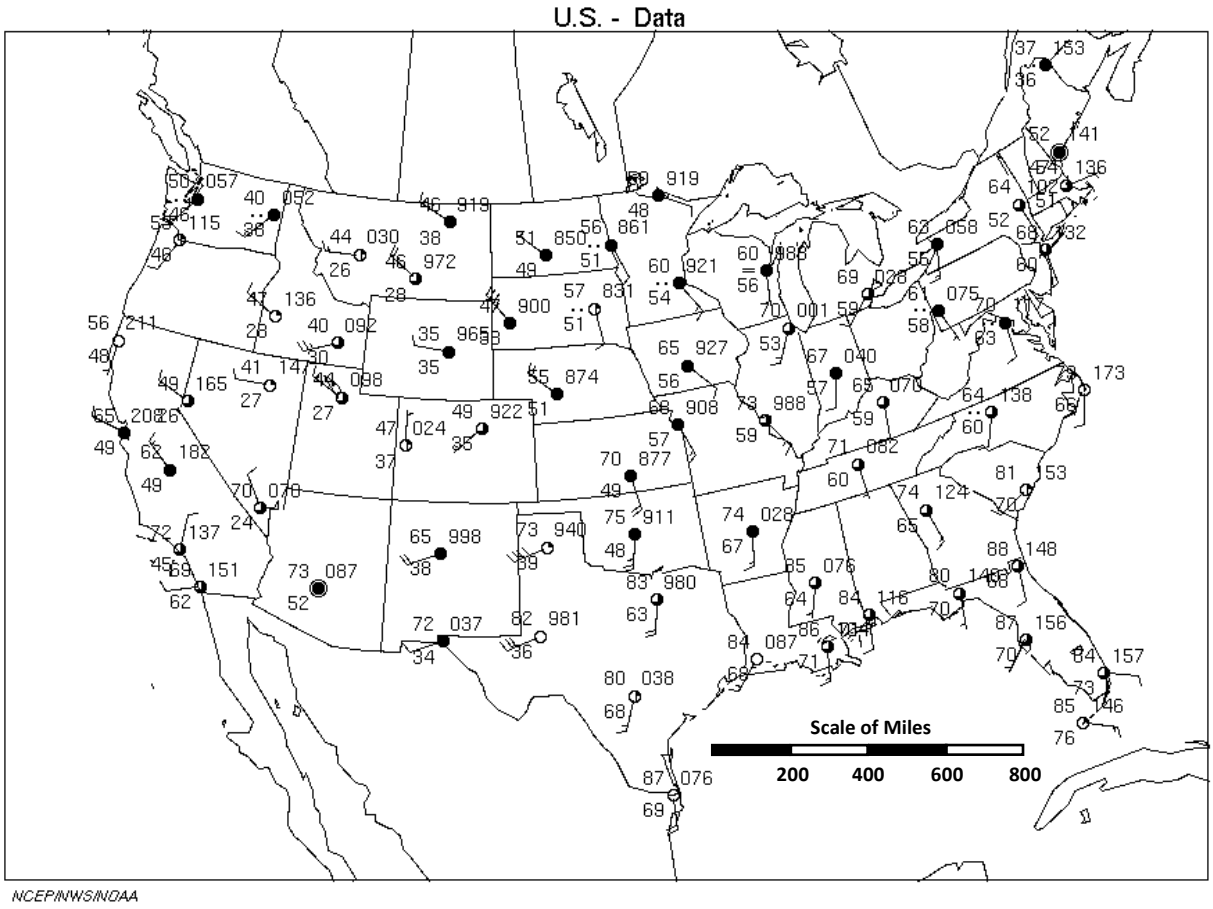
Theory: Comparing a current synoptic weather map with similar past conditions allows weather prediction.

Materials: pencils (or colored pencils) ruler synoptic weather maps

Map A – Method: Temperature Patterns

1. Use a pencil and draw isotherms between station models at 10°F intervals (stay on US land surfaces).
2. Check your work before doing any analysis.
3. Label each isotherm.

Map A – Data Collection and Processing:



Map A – Analysis and Conclusions:

1. Describe any general pattern to your isotherms (look especially from north to south).

   _____

2. Is this map summer, fall or winter? Explain how you determined the season.

   _____

3. Where is the temperature gradient greatest. Explain how you determined this information.

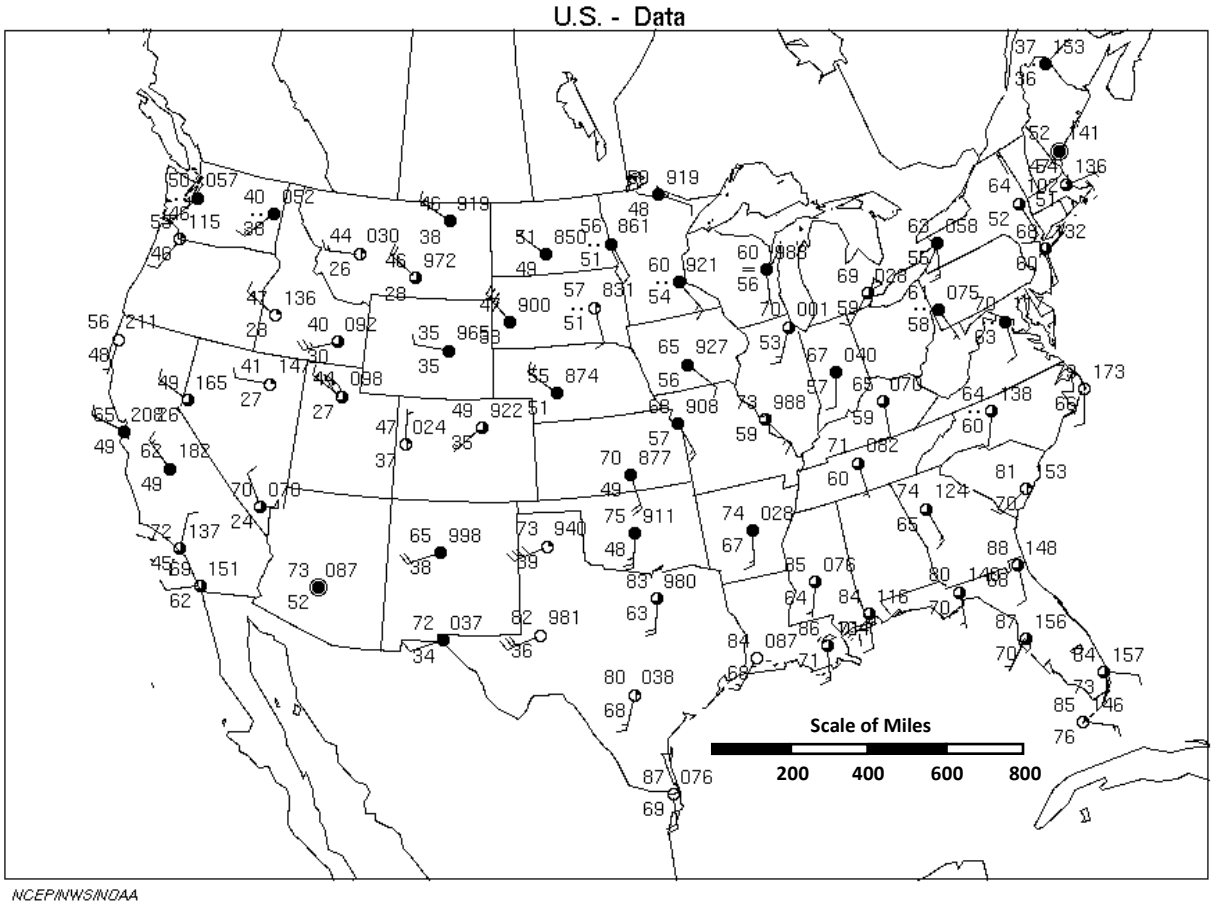
   _____

4. Calculate the temperature gradient from the station model in central Wyoming to the station model in northern Texas. (Write the equation, show substitution with units, and then solve.)

Map B – Method: Barometric Pressure Patterns

1. Use a pencil and draw and label isobars for every 5 millibar interval (stay on US land surfaces)
2. Check your work before doing any analysis and remember the 500 rule.
3. Add H and L to mark the high and low pressure areas.

Map B – Data Collection and Processing:



Map B – Analysis and Conclusions:

1. What is the general shape of the isobars?

   _____

2. Identify any high and low pressure centers by placing L or H on the map.
3. Tell the highest and lowest pressures listed at station models on the map.

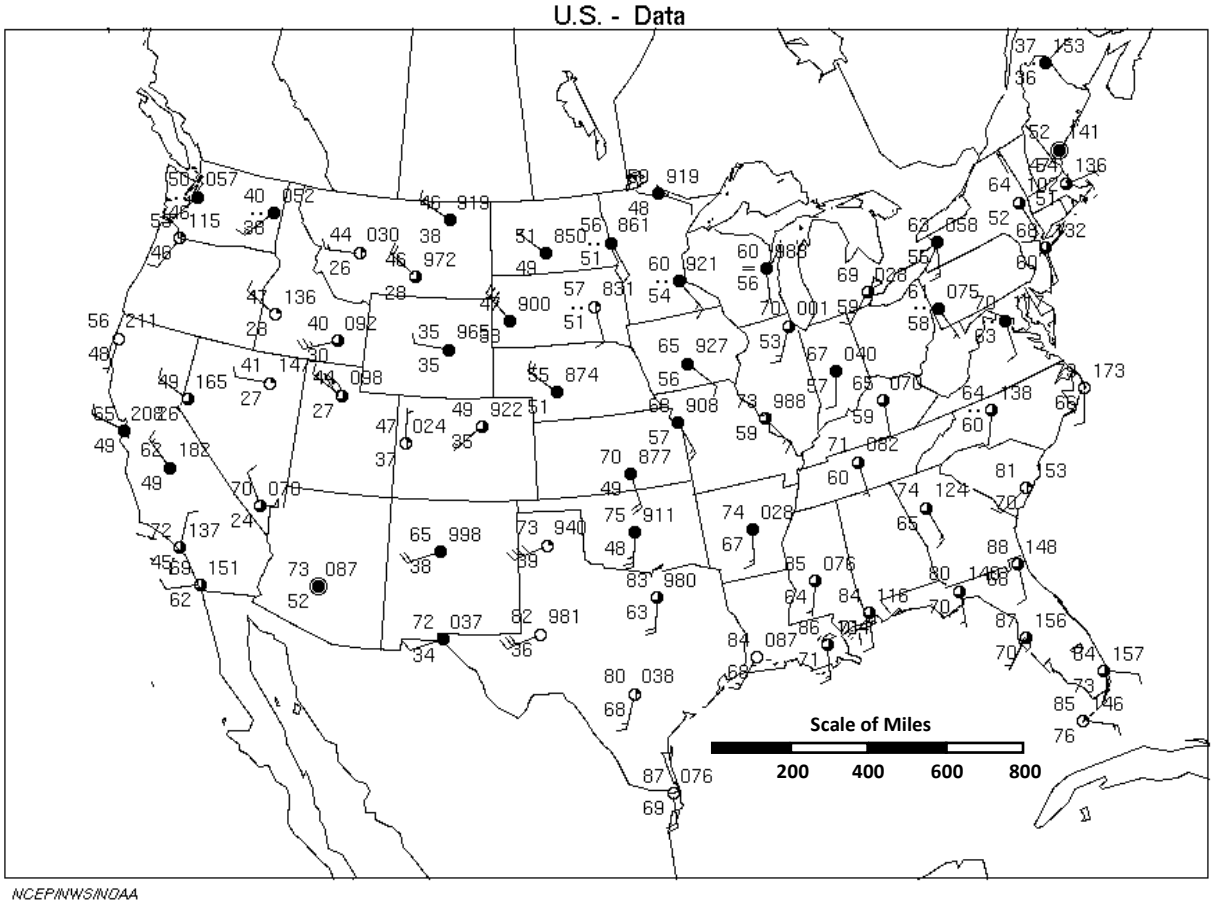
   High: _____ Low: _____

4. Calculate the pressure gradient from the station model in eastern South Dakota to the station model on the coast of northern California. (Write the equation, show substitution with units, and then solve.)

Map C – Method: Synoptic Weather Maps

1. Transfer the H and L pressure areas from Map B to Map C.
2. Using the H and L areas and the isotherms from Map A, sketch in warm and cold fronts (remember fronts start in the middle of L pressure centers).
3. Locate areas where it is raining. Put circles over areas of rain and shade them in.

Map C – Data Collection and Processing:



Map C – Analysis and Conclusions:

1. Where does precipitation occur relative to cold fronts?

   _____

2. Where does precipitation occur relative to warm fronts?

   _____

3. What two characteristics are used to identify an air mass?
   (a): _____ (b): _____

4. How many air masses are on the map? Give their general locations.

   _____

   _____

   _____

5. Compare the temperature before and behind a cold front.
   (before): _____ (behind): _____

6. Compare the pressure before and behind a warm front.
   (before): _____ (behind): _____

7. Compare the wind direction before and behind a cold front.
   (before): _____ (behind): _____

8. Give the wind speed and direction for Buffalo, New York.
   speed: _____ direction: _____

9. In a high pressure area, temperatures are _____, winds are _____, and sky conditions are _____.