Name: _____ Date: _____

Weather Maps Labs

Introduction

Advances have been made in weather prediction because of computer development, satellites and radar. The World Meteorological Organization, the National Weather Service, and others coordinate weather data collected from around the planet. Data is entered into computer models that apply known information about how atmospheric properties produce forecasts. In some cases, these forecasts have provided warnings of major storms as much as a week in advance. The behavior of weather systems is sometimes chaotic which makes forecasting the exact details of weather difficult beyond a week or two in advance.

Objective

To create weather maps based on the given data so that one can make weather predictions and forecasts.

Materials

Synoptic weather maps of the US

Colored Pencils

* PENCIL ONLY!

Prelab

Define the following terms: use your NOTES!

1. Isotherm _____

2. Isobar _____

3. Gradient _____

4. Continental Arctic _____

5. Air mass

6. Continental Polar

7. Continental Tropical

8. Maritime Tropical

9. Maritime Polar

10. Front

11. Barometric Pressure

Skip!

~~-Convergent~~

~~-Divergent~~

~~-Velocity~~

12. Dewpoint

13. Relative Humidity

Procedure

Map A: Temperature Patterns (4 pts)

1. Draw isotherms at a 10 degree interval. Use PENCIL!!!
2. Color the map according to the key provided

3. Answer the Map A questions:
   a. What general directions to the isotherms run? Circles or horizontal lines?

   b. How does the temperature change from north to south on the map?

   c. Near which two cities is the temperature gradient the greatest? How do you know?

   d. Calculate the temperature gradient between Galveston and Kansas City. **Show all work in ESA format.** *Round to the nearest hundredth.*

   e. Calculate the temperature gradient between Cincinnati and Chicago. **Show all work in ESA format.** *Round to the nearest hundredth.*

   f. Why do meteorologists use color on temperature maps?

Map B: Barometric Pressure Patterns

1. Draw isobars at a 4 millibar interval. USE PENCIL!!! (These should look like circles. There will be two of them, one on the east coast and one on the west coast)
2. Color the map according to the key provided.
3. Label the high and low pressure systems on this map. (Draw a **BIG Red L** and a **Big Blue H**) These will be the center of the two circles.
4. Answer the Map B questions
    a. What is the general appearance of the isobars on this map? Circular or linear?

    b. The lowest pressure is near which city?

    c. The high pressure is near which city?

    d. What is the highest air pressure on the map?

    e. What is the highest value for an isobar *that you drew*?

    f. As you travel from Salt Lake City to Los Angeles, what change in atmospheric pressure would you observe?

Map C: Surface Wind Patterns

1. Draw arrows to show the direction the wind is blowing. *Remember* winds are named from where they come from. The arrows point to where they are going to.
2. Label the high and low pressure systems on this map (transfer the big H and L from Map B)
3. Answer the following questions
    a. Describe the general wind pattern around a low pressure center. Clockwise or Counterclockwise?

    b. Are the winds around a love pressure center convergent or divergent?

    c. Are the winds at a low pressure rising or sinking?

    d. Where is the greatest wind velocity (Hint: You might need to look at Map B) How do you know?

Map D: Precipitation Patterns

1. Shade in the areas where the precipitation is falling.
2. Label the big L and big H on the map
3. Label the two air masses (mT & cP) on your map.
4. Answer the following questions
    a. Where is the precipitation occurring relative to the two air masses?

    b. What are two characteristics used to describe an air mass?

    c. How do air masses get their characteristics?

    d. Is it snowing any place on the map? If so, where?

Map E: Synoptic Weather Map

1. Label the big L and big H on the map.
2. Draw in the cold and warm fronts on this map. Use the proper symbols and colors (cold front is blue, warm front is red). Be sure that the fronts are drawn facing the correct direction.
3. Label the two air masses (mT & cP)
4. Answer the following questions:
   a. With respect to the cold front, where does precipitation occur?

   b. With respect to the warm front, where does precipitation occur?

   c. Where can we assume the relative humidity is lowest on this map?

   d. What region of the country is likely to have dew points close to the air temperature?

   e. Why are there fewer clouds near a high pressure system?

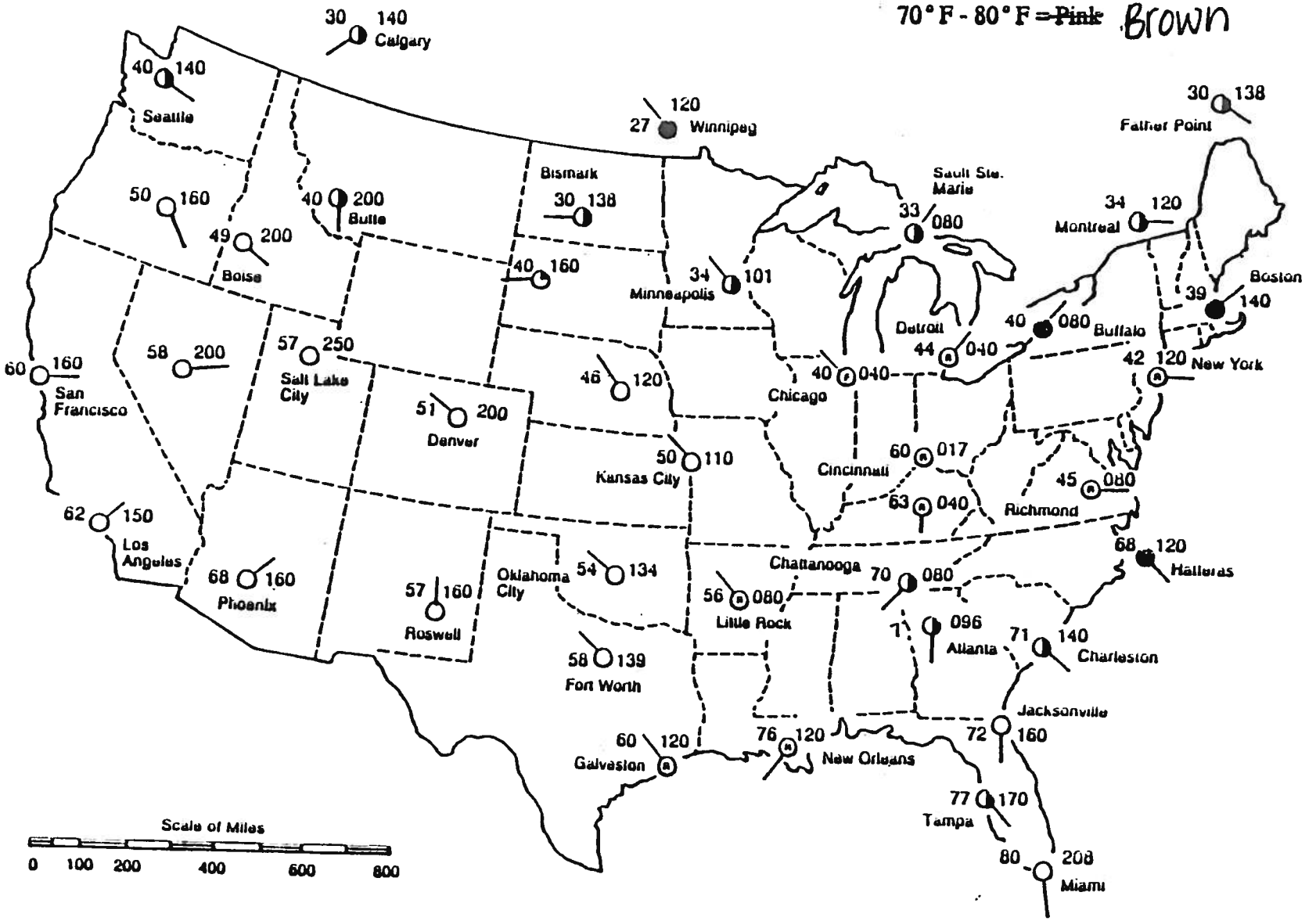
f. Draw a *profile* view of the winds at Salt Lake City. Be sure to include in your drawing: arrows representing the vertical and horizontal movement of air and the ground surface.

g. Draw a *profile* view of the front closest to Richmond, Virginia. Be sure to label the warm air, cold air, and precipitation and clouds (if any).

KEY:

20° F – 30° F = Blue
30° F - 40° F = Green
40° F - 50° F = Yellow
50° F - 60° F = Orange
60° F - 70° F = Red
70° F - 80° F = ~~Pink~~ Brown

Weather Data Map



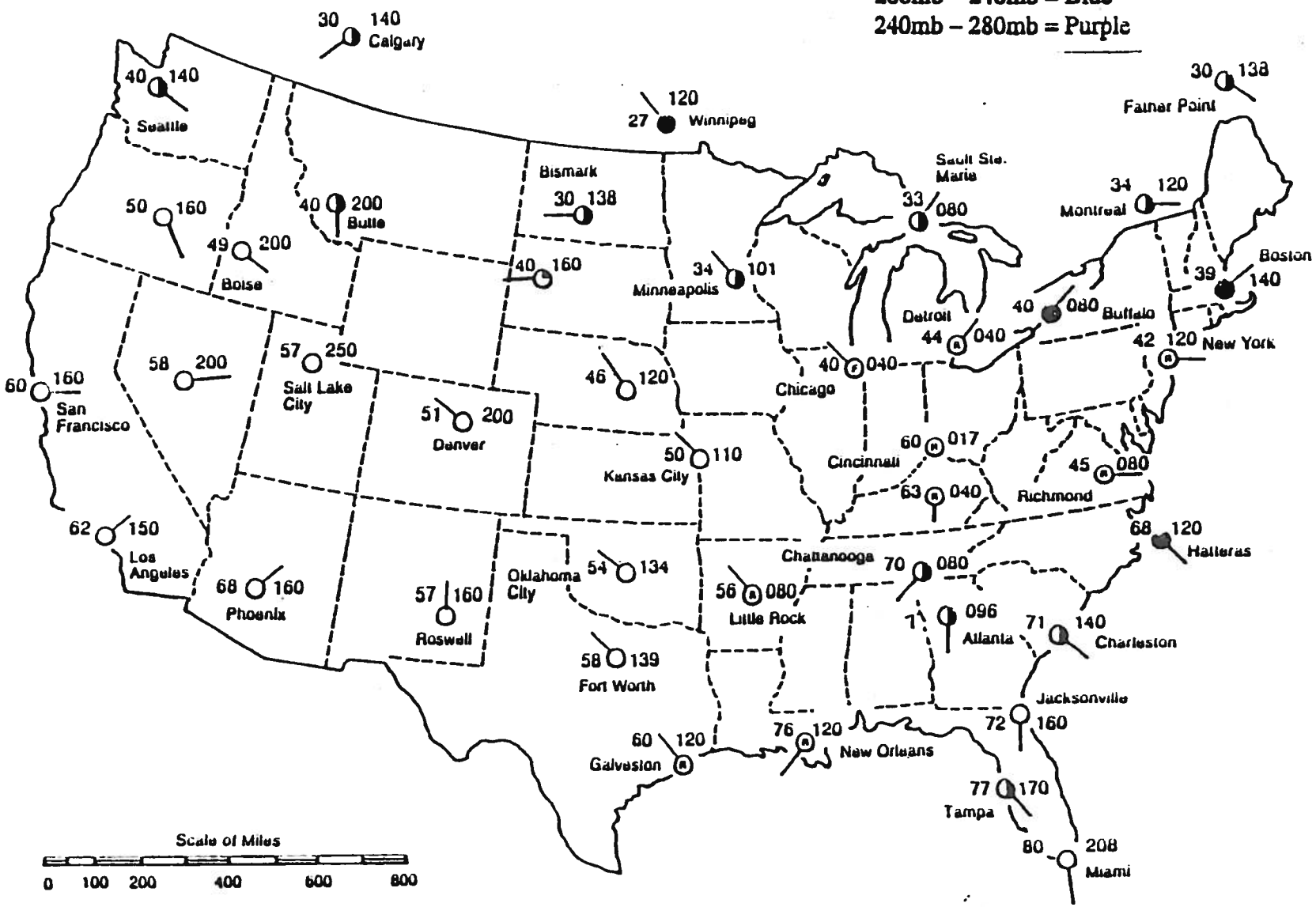
MAP A: TEMPERATURE PATTERNS

MAP B: BAROMETRIC PRESSURE PATTERNS

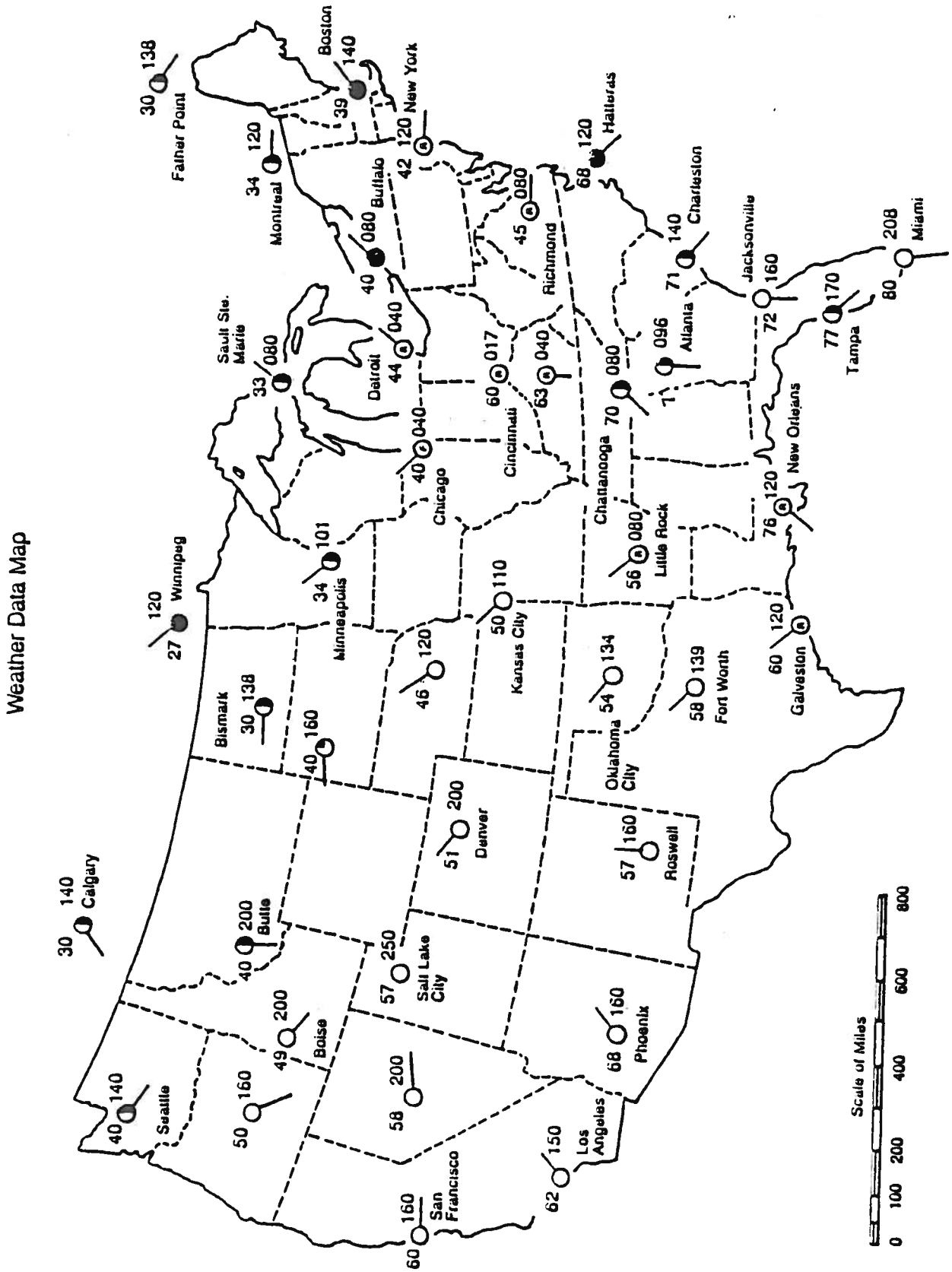
Key:

000mb - 040mb = ~~Pink~~ Brown
040mb – 080mb = Red
080mb – 120mb = Orange
120mb – 160mb = Yellow
160mb – 200mb = Green
200mb – 240mb = Blue
240mb – 280mb = Purple

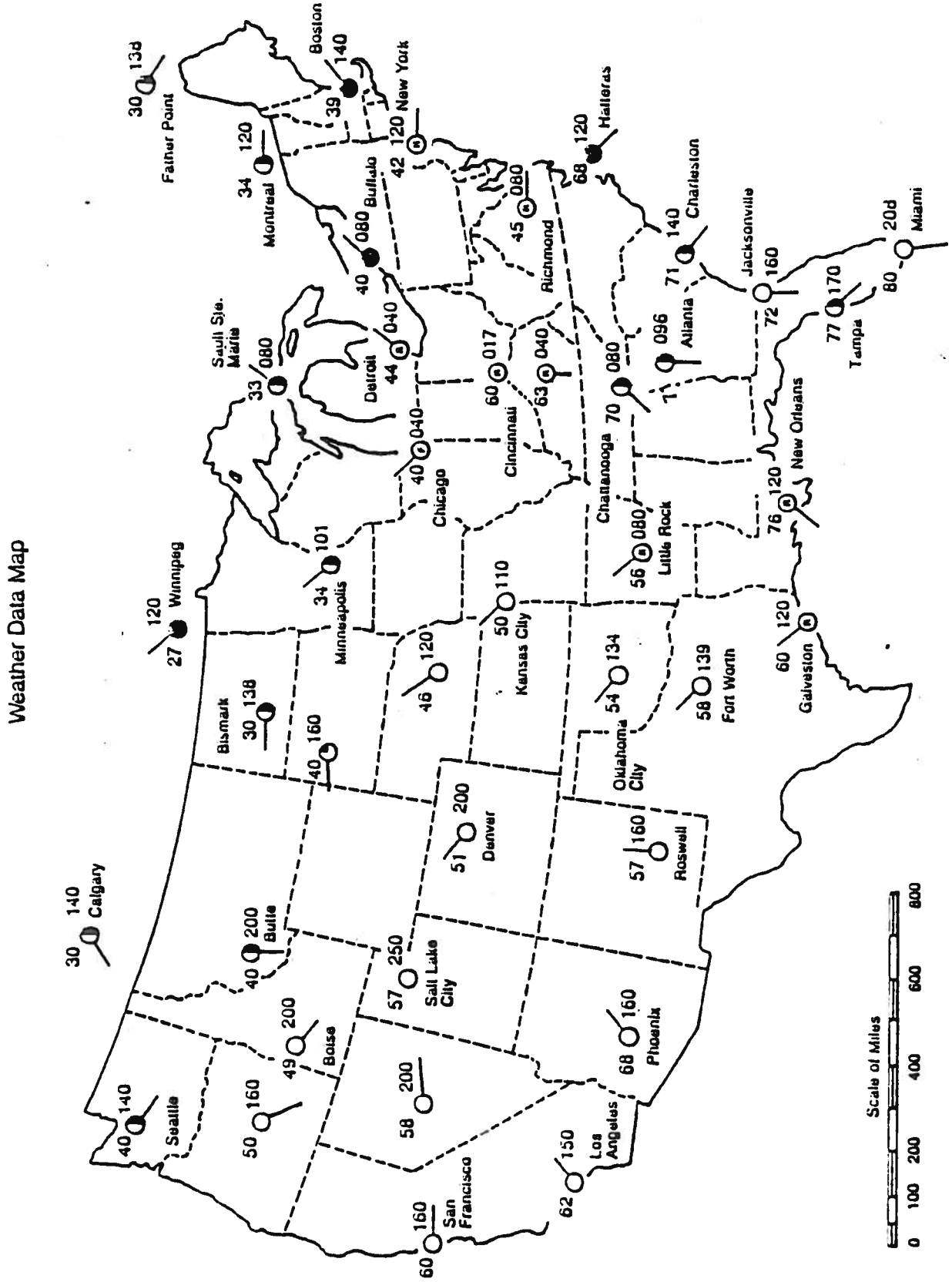
Weather Data Map



MAP C: SURFACE WIND PATTERNS



MAP D: PRECIPITATION PATTERNS



MAP E: SYNOPTIC WEATHER MAP