

Mapping GeoLab

Interpret a Weather Map

The surface weather map on the following page shows actual weather data for the United States. In this activity, you will use the station models, isobars, and pressure systems on the map to forecast the weather.

PREPARATION

Question





How can you use a surface weather map to interpret information about current weather and to forecast future weather?

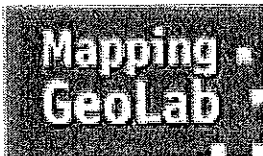
Materials

pencil
ruler
Reference Handbook, Weather Map Symbols.

PROCEDURE

1. Read and complete the lab safety form.
2. The map scale is given in nautical miles. Refer to the scale when calculating distances.
3. The unit for isobars is millibars (mb). In station models, pressure readings are abbreviated. For example, 1021.9 mb is plotted on a station model as 219 but read as 1021.9.
4. Wind shafts point in the direction from which the wind is blowing. Refer to Weather Map Symbols, in the table on the right and the *Reference Handbook* to learn about the symbols that indicate wind speed.
5. Each number around a city represents a different atmospheric measure. By convention, the same atmospheric measure is always in the same relative location in a station model. Refer to **Figure 12.17** and *Weather Map Symbols* in the *Reference Handbook* to learn what numbers represent in a station model.

Symbols Used in Plotting Report	
Fronts and Pressure Systems	
(H) or High	Center of high- or low-pressure systems
(L) or Low	
	Cold front
	Warm front
	Occluded front
	Stationary front



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ANALYZE AND CONCLUDE

1. **Identify** the contour interval of the isobars.

- A) 1 mb
- B) 2 mb
- C) 4 mb
- D) 5 mb

2. **Find** the highest and lowest isobars and where they are located.

- | | | | | |
|----|---|--------------------|---|-------------------|
| #2 | { | A) Highest: 1024mb | } | A) Lowest: 949mb |
| | | B) Highest: 1032mb | | B) Lowest: 1000mb |
| | | C) Highest: 1040mb | | C) Lowest: 988mb |
| | | D) Highest: 1052mb | | D) Lowest: 1008mb |

#3

4. **Describe** the winds across Texas and Louisiana.

- A) South or Southeast
- B) North or Northwest
- C) West or Southwest

5. **Determine** and record with their locations the coldest and warmest temperatures on the map within the United States.

- #5 COLDEST: A) Hudson H (-31) B) Fargo (-12) C) Bismark (-15) D) Ft. McMurray (-19)

- #6 WARMEST: A) Miami (+65) B) Key West (+55) C) Brownsville (+63)

7. **Infer** whether the weather in Georgia and Florida is clear or rainy. Explain.

- #7 A) Clear B) Rainy C) Not Sure

- #8 EXPLAIN: A) Because of the High Pressure along the coast
- B) Because of the Cold Front advancing Southeast

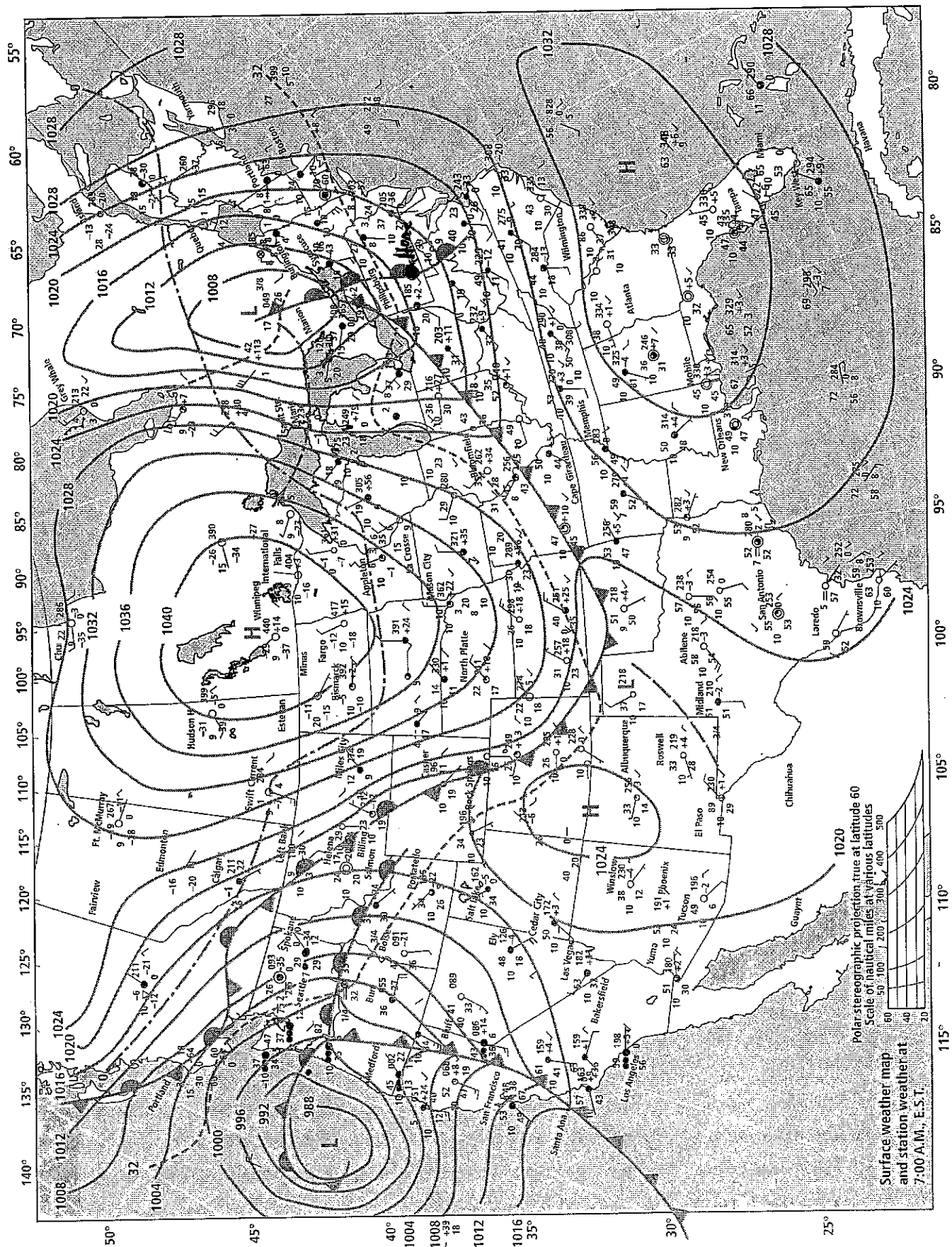
9. **Predict** Low-pressure systems in eastern Canada and off the Oregon coast are moving toward the east at about 24 km/h. Predict short-term weather forecasts for northern New York and Oregon.

- A) High pressure system moving Southeast would create clear skies
- B) Low pressure system would cause air to rise and produce clouds and rain.

10. **Forecasting** Find your area on the map. Based on the data shown in the map, use the extrapolation method to forecast the next day's weather for your location.

- A) Stormy (RAINY) and chilly
- B) Snowy and cold
- C) Clear and warm
- D) Clear and cold

Interpret a Weather Map



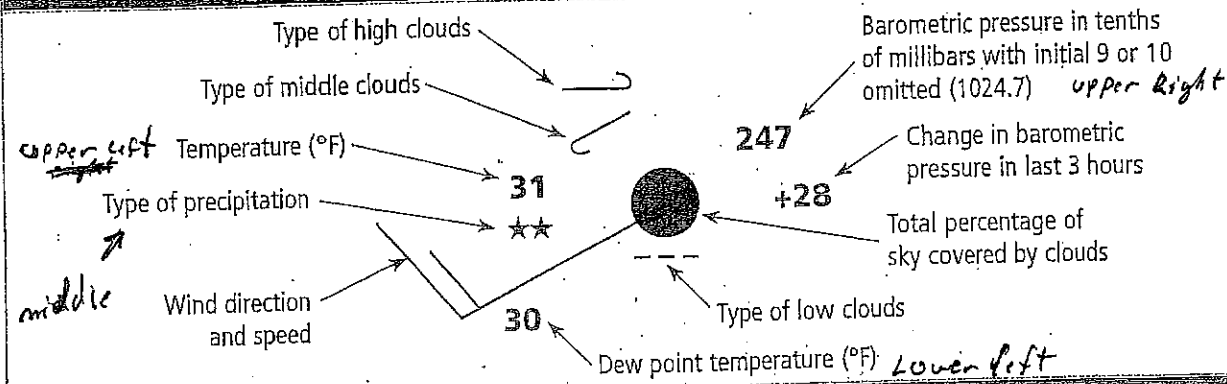
$$^{\circ}F = \frac{9}{5}(^{\circ}C) + 32$$

$$\frac{1 \text{ mi}}{1.6 \text{ km}} \times \frac{1.6 \text{ km}}{1 \text{ mi}} \times \frac{1 \text{ knot}}{1.852 \text{ km/h}} = \frac{\text{knot}}{1.852}$$

$$^{\circ}C = \frac{5}{9}(^{\circ}F - 32)$$

1 mile = 1.61 km

Sample Plotted Report at Each Station



Pressure Range on EARTH
1050 - 980

Symbols Used in Plotting Report

Precipitation	Wind Direction and Speed	Sky Coverage	Fronts and Pressure Systems	
Fog Snow Rain Thunderstorm Drizzle Showers	<p>1 knot = 1.852 km/h</p> <p><i>Barb</i> 0 calm 1-4 knots 5-9 knots 10-14 knots 15-29 knots 20-24 knots 25-29 knots 50+ knots</p> <p><i>1/2 feather</i> <i>whole feather</i></p>	No cover [Clear] 1/10 or less 2/10 to 3/10 [Fair] 4/10 1/2 [Partly] 6/10 7/10 Overcast with openings Completely overcast	Center of high- or low-pressure system low-pressure system Cold front Warm front Occluded front Stationary front	
<p><i>30-34</i> <i>35-39</i> <i>40-49</i> </p>		<p>Some Types of High Clouds</p> Scattered cirrus Dense cirrus in patches Veil of cirrus covering entire sky Cirrus not covering entire sky	<p>Some Types of Middle Clouds</p> Thin altostratus layer Thick altostratus layer Thin altostratus in patches Thin altostratus in bands	<p>Some Types of Low Clouds</p> Cumulus of fair weather Stratocumulus Fractocumulus of bad weather Stratus of fair weather