THE WEATHER
AIM 2: What is a synoptic weather map?

HW
- Read "What Is a Synoptic Weather Map?" p167-169

Synoptic weather maps show at one glance a variety of atmospheric conditions.
See ESRT page 13

Wind direction
Winds are named from the direction they come from.
Ex: A southwest wind moves northeast

Barometric pressure
When the first digit is less than 5, add a 10 in front of the number and place a decimal point before the last digit.
Ex: 196 = 1019.6 millibars.

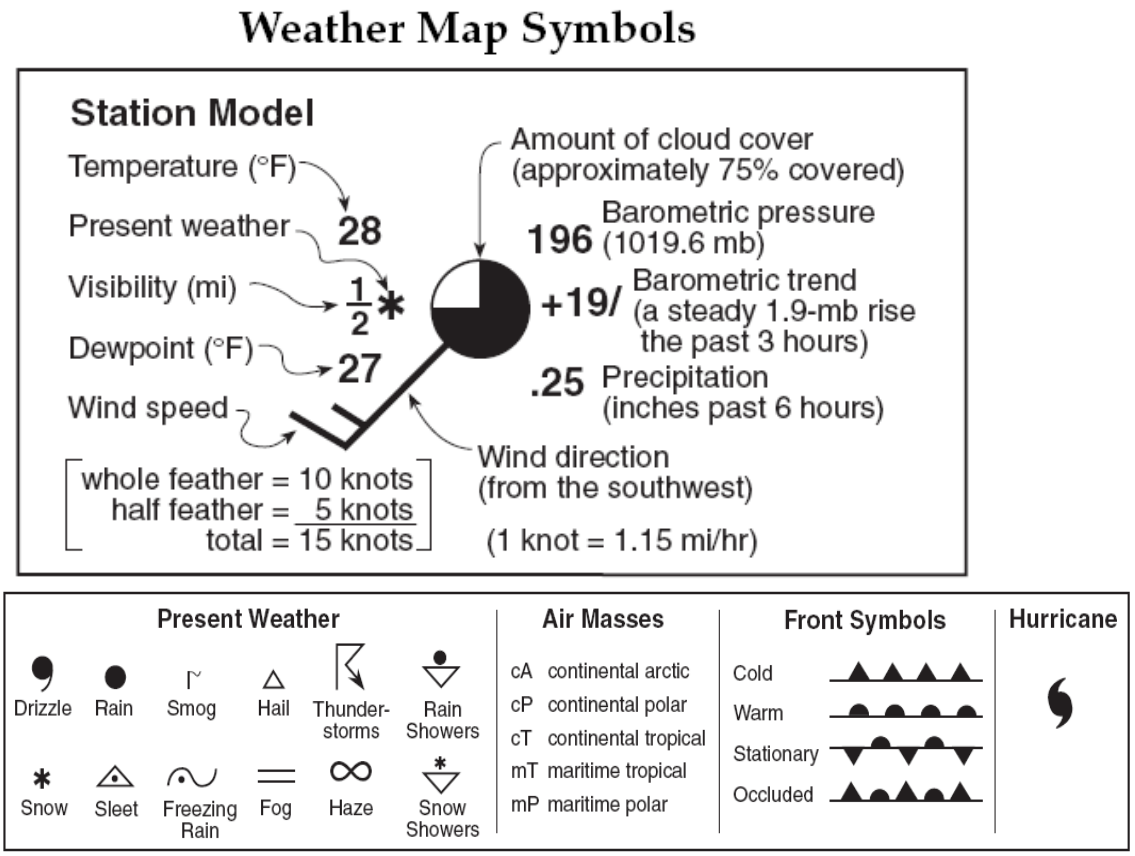
When the first digit is 5 or greater, add a 9 in front of the number and place a decimal point before the last digit.
Ex: 979 = 997.9 millibars.

Barometric trend
A decimal point is place in front of the last digit.

A positive sign in front and a positive slope line at the end of the number indicates a steady rise in atmospheric pressure the past 3 hours. A negative sign is the opposite.
Ex: + 19/ means a steady 1.9 mb rise the past 3 hours. Therefore the pressure 3 hours ago was 1.9 mb less or 1017.7 mb
(1019.6 mb - 1.9 mb = 1017.7 mb)

- Decreasing barometric pressure means the coming of clouds and rain.

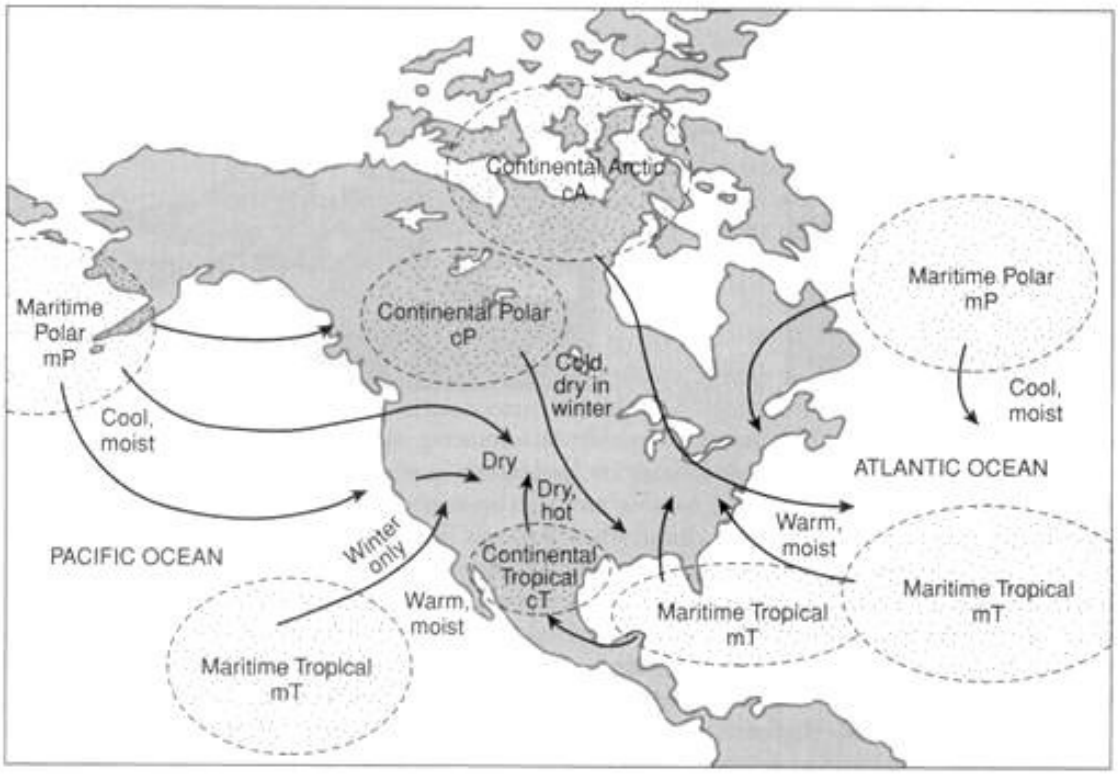
- Rising barometric pressure means improving weather.



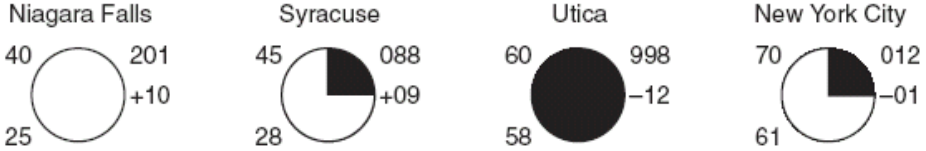
An air masse is a mass of air with atmospheric conditions that originate from a particular region.

See ESRT page 13

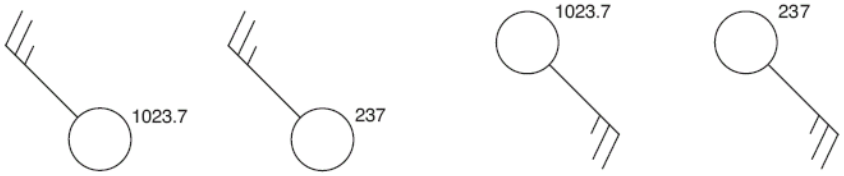
A mass of air that formed over a continent is dry
A mass of air that formed over a maritime (oceanic) region is humid
A mass of air that formed over a cold region is cool therefore, atmospheric pressure is high
A mass of air that formed over a warm region is warm therefore, atmospheric pressure is low



Test your understanding
8/07
12 Which type of air mass is associated with warm, dry atmospheric conditions? (1) cP (2) cT (3) mP (4) mT
Base your answers to questions 54 through 56 on the information on the four station models shown below. The weather data were collected at Niagara Falls, Syracuse, Utica, and New York City at the same time.



54 What was the air pressure in Niagara Falls?
55 Explain how the weather conditions shown on the station models suggest that Utica had the greatest chance of precipitation.
56 New York City was experiencing a wind blowing from the south at 10 knots with hazy conditions limiting visibility to 34 of a mile. On a station model place, in the proper location and format, the information below.
• wind direction
• wind speed
• present weather
• visibility
6/07
29 Which station model shows the correct form for indicating a northwest wind at 25 knots and an air pressure of 1023.7 mb?



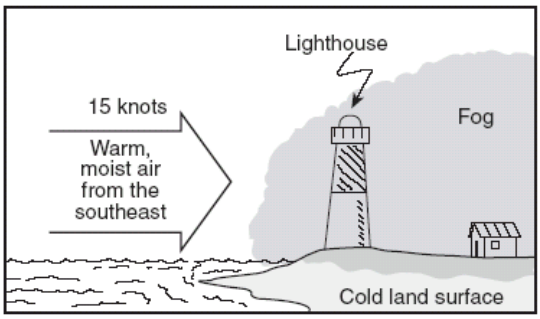
(1) (2) (3) (4)

1/07

20 Which weather map symbol represents air masses that normally form just south of the United States over the Caribbean Sea?

(1) cP (2) cT (3) mP (4) mT

51 The diagram below shows conditions that commonly cause fog to form over land in coastal areas.

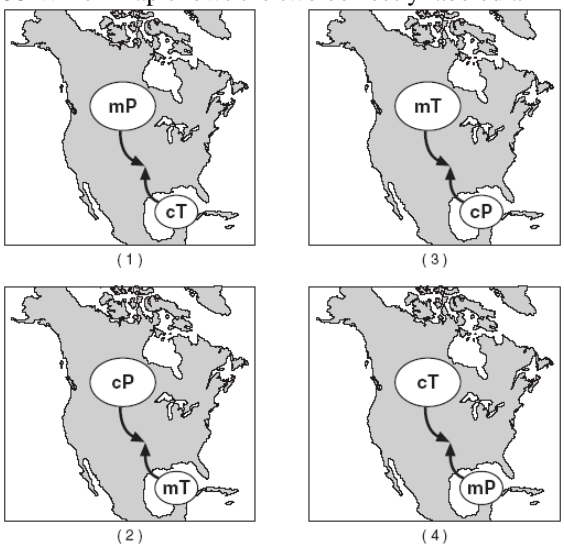


A weather station at the lighthouse records a temperature of 36°F and an air pressure of 1016.4 mb. Using the proper weather map symbols, place the following information in the correct positions on a weather station model.

- Present weather
- Dewpoint
- Air pressure
- Wind direction
- Wind speed

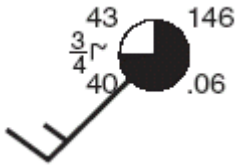
6/06

33 Which map shows the two correctly labeled air masses that frequently converge in the central plains to cause tornadoes?



1/06

18 Various weather conditions at LaGuardia Airport in New York City are shown on the station model below.



What were the barometric pressure and weather conditions at the airport at the time of the observation?

(1) 914.6 mb of pressure and smog (2) 914.6 mb of pressure and a clear sky

(3) 1014.6 mb of pressure and smog (4) 1014.6 mb of pressure and a clear sky

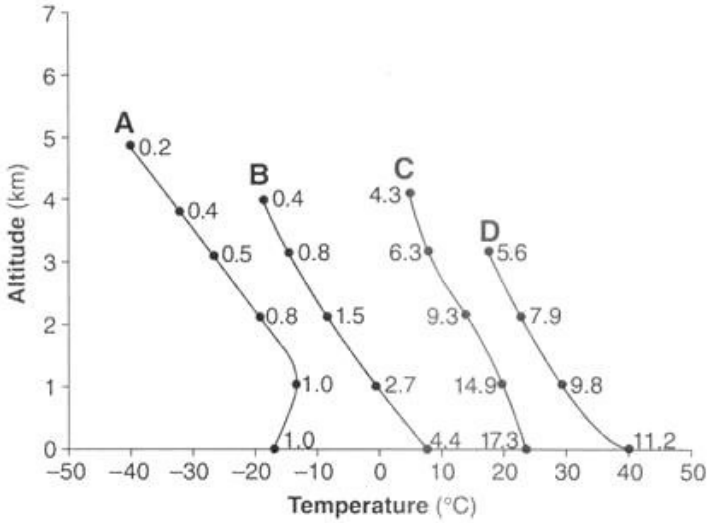
19 The properties of an air mass are mostly determined by the

(1) rate of Earth's rotation (2) direction of Earth's surface winds

(3) source region where the air mass formed (4) path the air mass follows along a land surface

6/04

11 The graph below shows changes in the atmosphere occurring above typical air-mass source regions *A, B, C,* and *D.* Changes in air temperature and altitude are shown as the graphed lines. Changes in water-vapor content, in grams of vapor per kilogram of air, are shown as numbers on each graphed line.



Which list best identifies each air-mass source region?

(1) A — cT, B — cP, C — mP, D — mT
(2) A — cP, B — mP, C — mT, D — cT
(3) A — mP, B — mT, C — cT, D — cP
(4) A — mT, B — cT, C — cP, D — mP

8/03

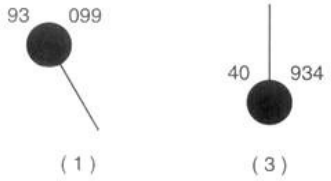
12 An air mass classified as mP usually forms over which type of Earth surface?

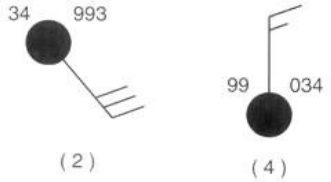
(1) warm land (2) warm ocean (3) cool land (4) cool ocean

55 On a weather station model, draw the proper symbols to indicate a wind of 25 knots blowing from the southeast.

6/03

13 Which weather-station model shows an air pressure of 993.4 millibars?





14 An Earth science student observed the following weather conditions in Albany, New York, for 2 days: The first day was warm and humid with southerly winds. The second day, the temperature was 15 degrees cooler, the relative humidity had decreased, and wind direction was north-west. Which type of air mass most likely had moved into the area on the second day?

(1) continental tropical (2) continental polar (3) maritime tropical (4) maritime polar

1/03

18 Which weather station model shows the highest relative humidity?

8/02

54 A weather station records the following data: Air pressure is 1,001.0 millibars. Wind is from the south. Wind speed is 25 knots. Using the proper weather map symbols, place this information in the correct locations on a weather station model.

6/02

Base your answers to questions 67 through 69 on the weather map provided in your answer booklet. The weather map shows a low-pressure system over part of North America. Five weather stations are shown on the map. Lines AB, BC, and BD represent surface frontal boundaries. Line AB represents an occluded front that marks the center of a low-pressure system. Symbols cP and rnT represent different air masses.

67 On the weather map provided in your answer booklet, place the proper front symbols on lines AB, BC, and BD. Place the front symbols on the correct side of each line to show the direction of front movement.

68 Name the geographic region over which the mT air mass most likely formed.

69 Other than low pressure, state two weather conditions associated with a low- pressure center.

51 Using the proper format, place the following data on a weather station model.

Dewpoint = 74°F Cloud cover = 100%

1/02

58 The following weather data was collected at Boonville, New York.

Air temperature	65°F
Dewpoint	64°F
Visibility	2 miles
Present weather	drizzle
Wind direction	from the west
Wind speed	5 knots
Amount of cloud cover	100%
Barometric pressure	996.2 millibars

On the station model provided in your answer booklet, using the proper format, record:

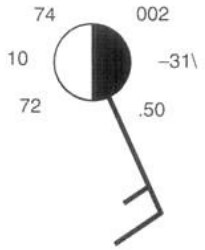
- the amount of cloud cover
- the barometric pressure
- the symbol for the present weather

8/02

10 In New York State, dry, cool air masses (cP) often interact with moist, warm air masses (mT). Which statement correctly matches each air mass with its usual geographic source region?

(1) cP is from the North Atlantic Ocean and mT is from the deserts of the southwestern United States.
(2) cP is from northern Canada and mT is from the deserts of the southwestern United States.
(3) cP is from northern Canada and mT is from the Gulf of Mexico.
(4) cP is from the North Atlantic Ocean and mT is from the Gulf of Mexico.

52 The station model below shows the weather conditions at Massena, New York, at 9 a.m. on a Particular day in June.



What was the barometric pressure at Massena 3 hours earlier on that day? (1) 997.1 mb (2) 999.7 mb (3) 1003.3 mb (4) 1009.1 mb

6/01

13 Which type of air mass usually contains the most moisture? (1) mT (2) mP (3) cT (4) cP