Unit 9: Severe Weather

Lecture 2

Objectives:

E4.3A - Describe the various conditions of formation associated with severe weather (thunderstorms, hurricanes, floods, waves, and drought).

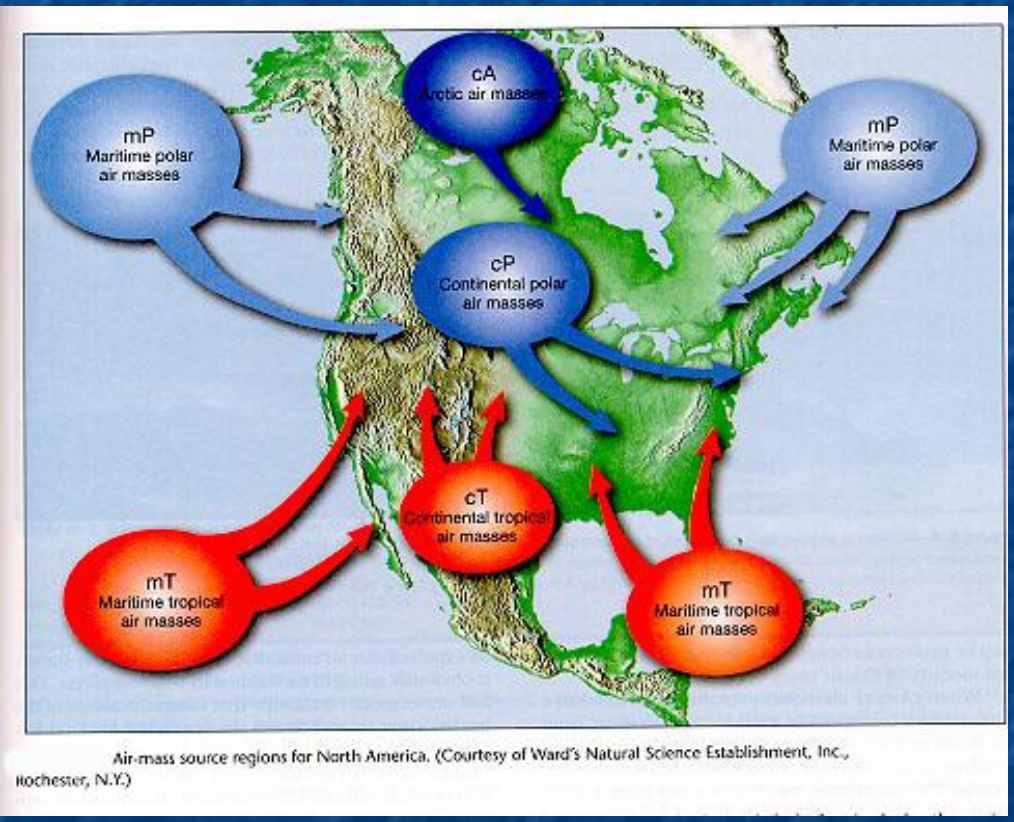
E4.3E - Describe conditions associated with frontal boundaries that result in severe weather (thunderstorms, tornadoes, and hurricanes).

E4.3D - Describe the seasonal variations in severe weather.

What is an Air Mass?

- Air masses are large bodies of air which have temperature and moisture characteristics nearly the same in the horizontal. The characteristics of an air mass derives from the region over which the air mass forms, called its **source region**.

Air Masses



Air-mass source regions for North America. (Courtesy of Ward's Natural Science Establishment, Inc., Rochester, N.Y.)

- **Air Mass Classification Source Region Identifiers**:
- **A** for Arctic,
- **P** for Polar,
- **T** for Tropical;

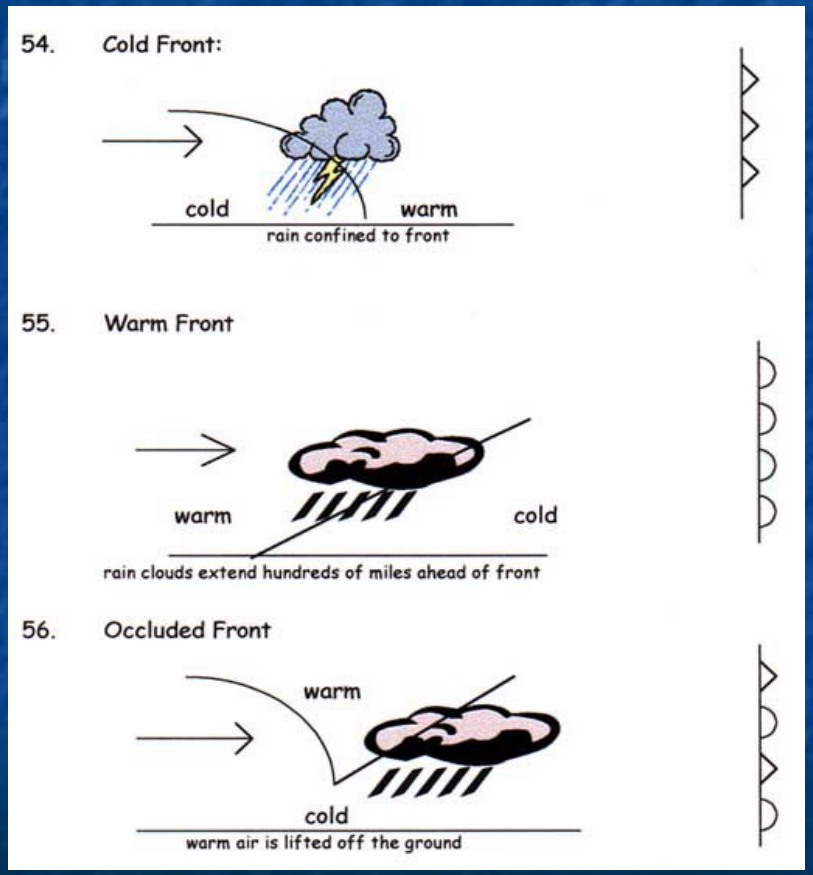
Moisture Content Identifiers:

- **c** for continental (meaning the air is relatively dry),
- **m** for maritime (meaning the air is relatively moist);

Fronts

- A front is simply the transition zone between two air masses of different densities.

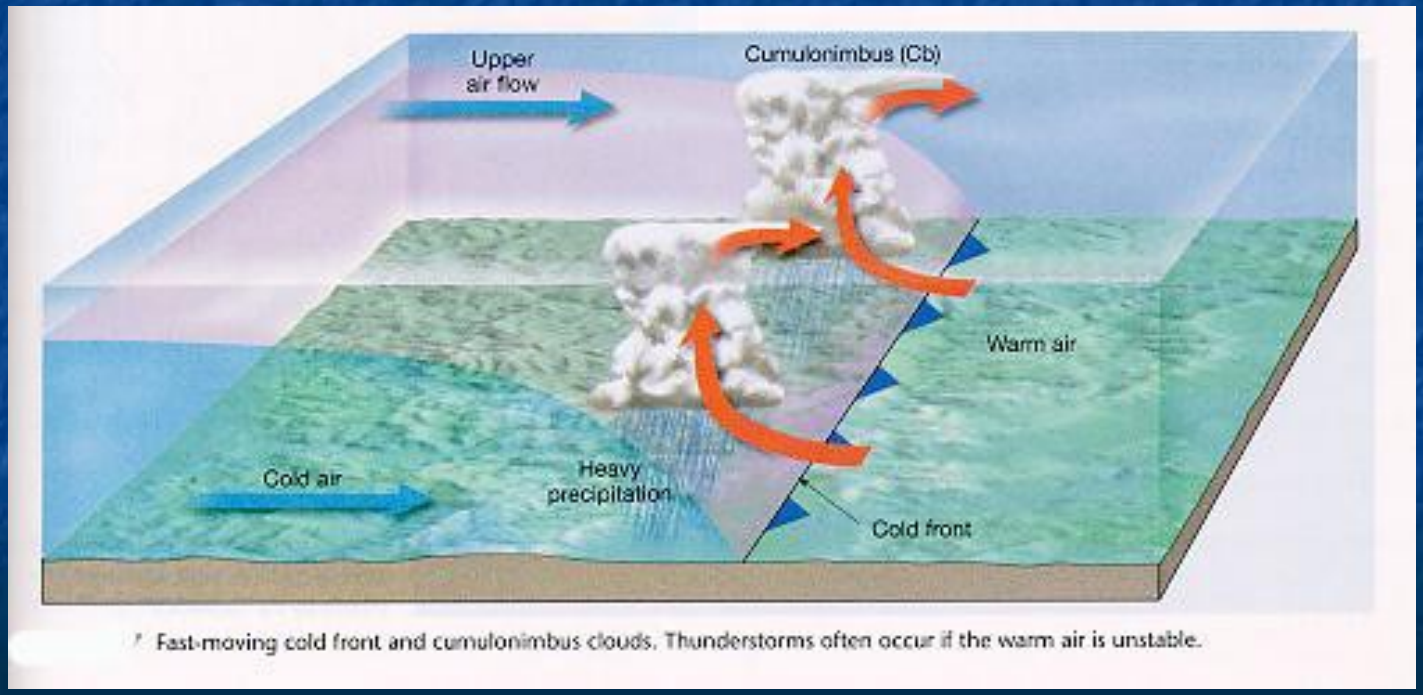
Kinds of Fronts



- **Cold Fronts**
- **Warm Fronts**
- **Stationary Fronts**
- **Occluded Fronts**

Cold Front

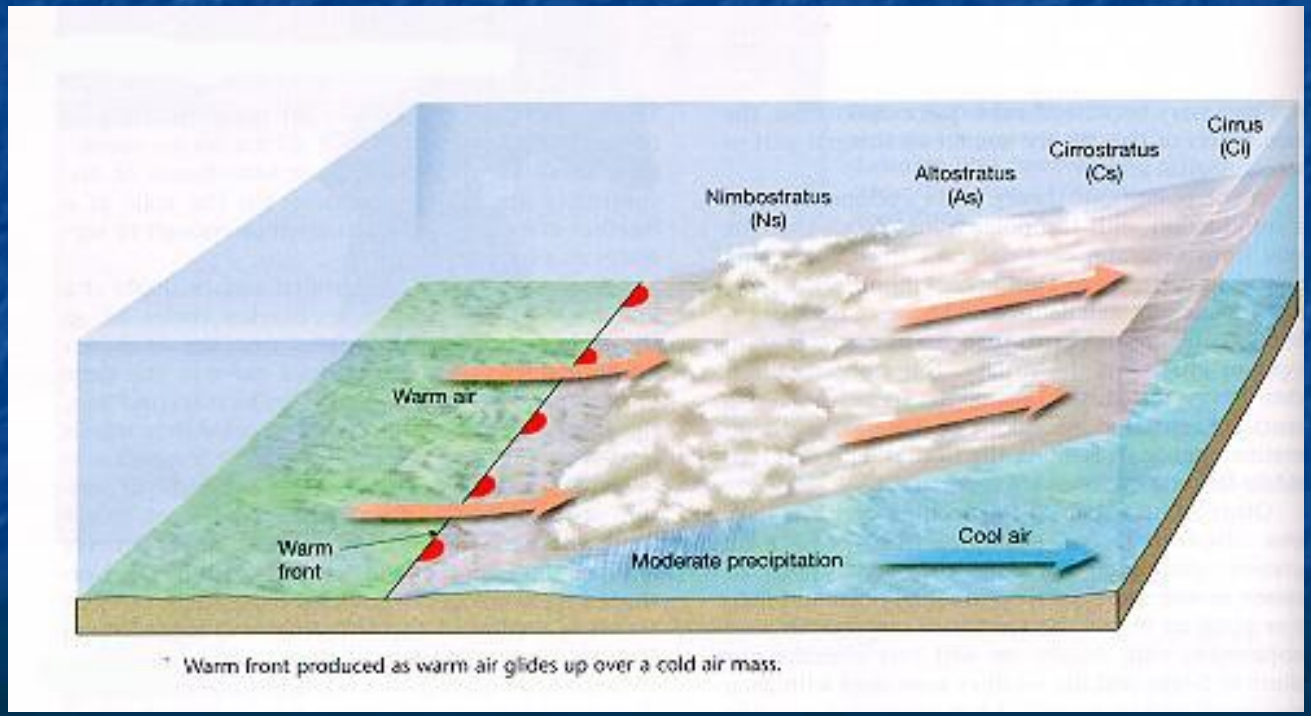
- A cold front occurs when a more dense air mass pushes under a less dense air mass.



Fast-moving cold front and cumulonimbus clouds. Thunderstorms often occur if the warm air is unstable.

Warm Front

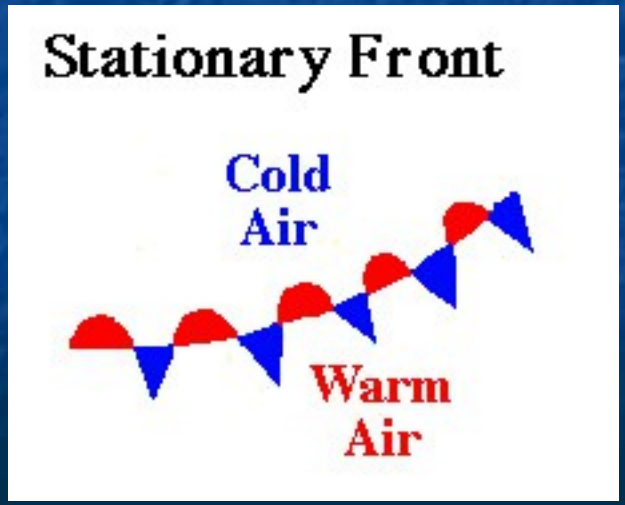
- A warm front occurs when a less dense air mass rides up over a more dense air mass.



Warm front produced as warm air glides up over a cold air mass.

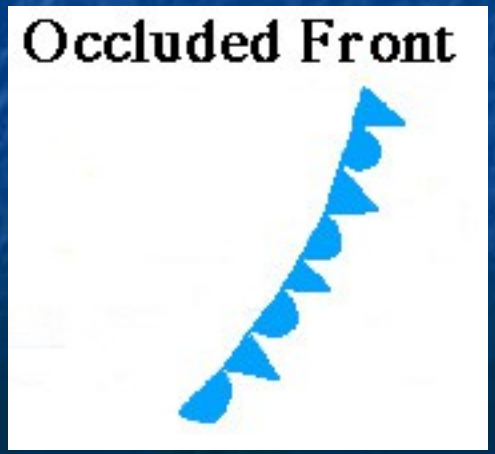
Stationary Front

- A stationary front occurs when the air masses on either side of the front are not moving toward each other. On surface maps, a stationary front is depicted by alternating the cold/warm depiction as shown.

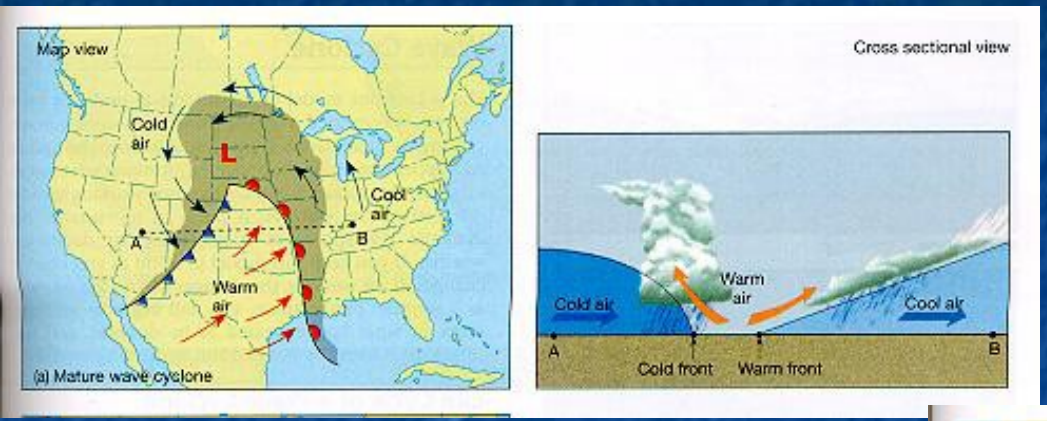


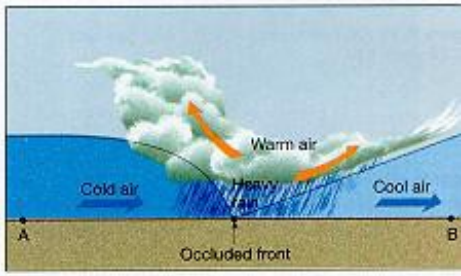
Occluded Front

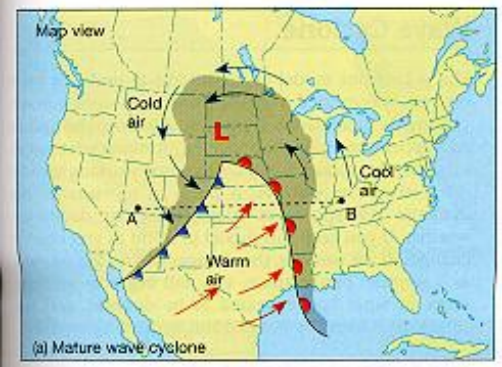
- On a surface map, an occluded front is shown by alternating a triangle and half circle symbol along the frontal line with both symbols on the same side of the frontal line and pointing in the direction toward which the front is moving.

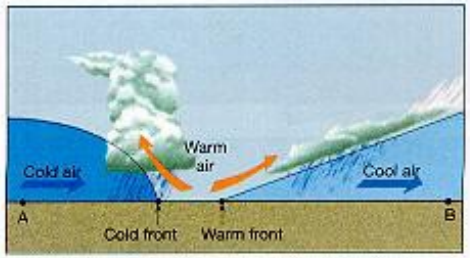


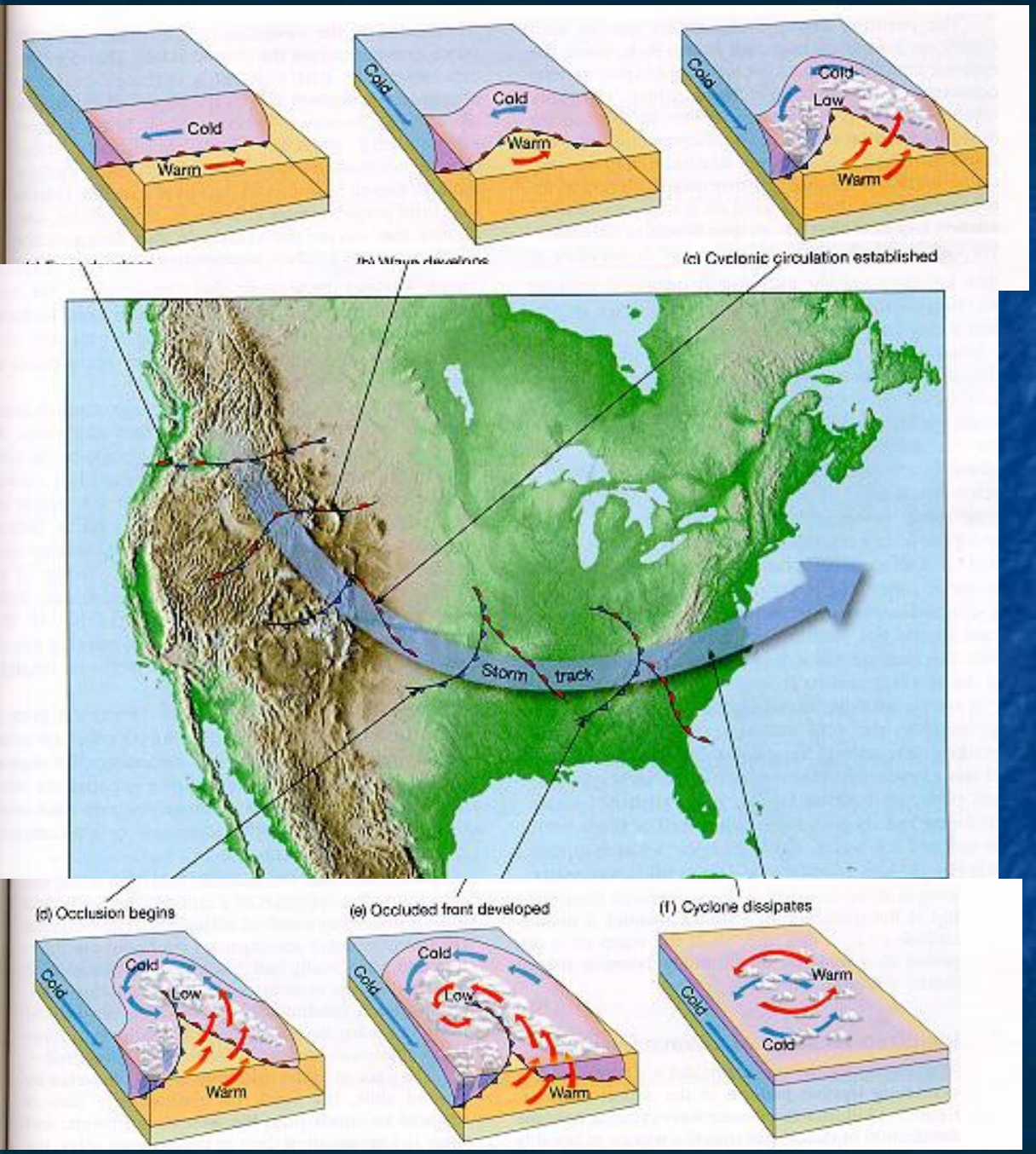
Occluded Front Formation











How Mid-Latitudes Lows Form

Counter-Clockwise rotation

Weather in a High

- Clockwise Rotation
- Diameter 1500km
- Bright, Clear Weather