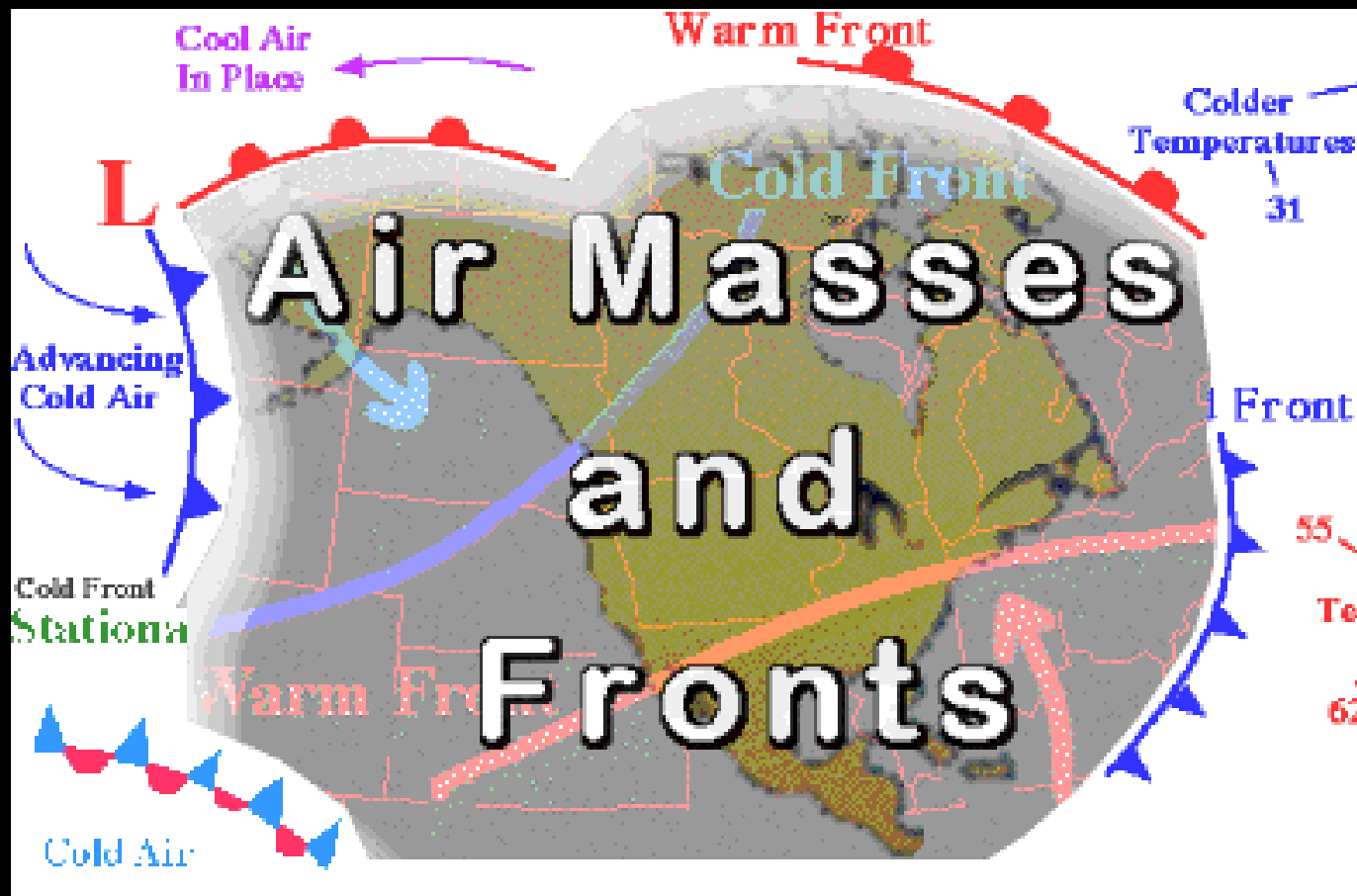


Air Masses and Fronts

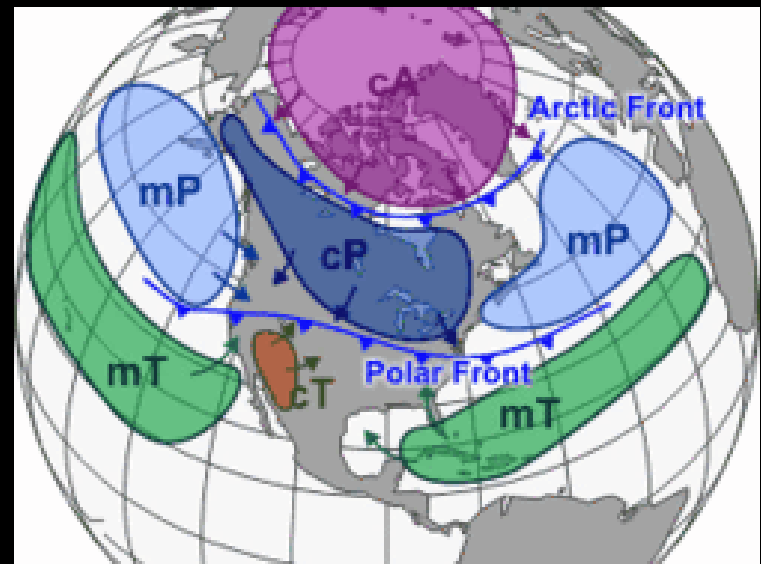


- *Air Mass:*

- An *air mass* is a huge body of air that has similar temperature, humidity, and air pressure at any given height.
- Air masses are classified by 2 characteristics
 1. *Temperature*
 2. *Humidity*
- The characteristics of an air mass depend on the temperatures and moisture content of the region over which the air mass formed.
 - *Tropical: warm, air masses formed in the tropics*
 - *Polar: cold, air masses form near north or south pole*
 - *Maritime: air masses formed on oceans or seas*
 - *Continental: air masses formed over land*

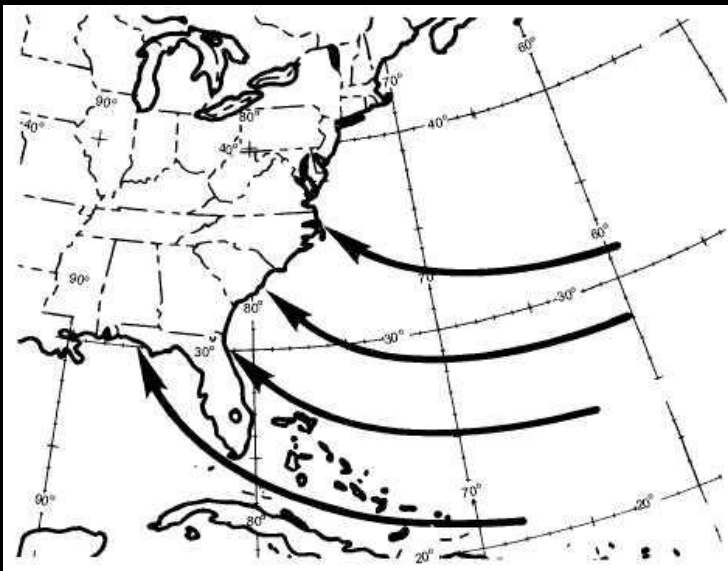
- The colder the air the higher the air pressure subsequently the hotter the air the lower the air pressure.
 - *Cold air → more dense*
 - *Hot air → less dense*
- There are 4 major types of air masses that affect the weather of the U.S.

1. Maritime tropical
2. Maritime polar
3. Continental tropical
4. Continental polar

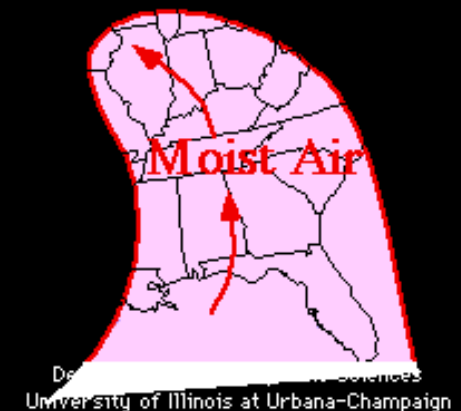


1. Maritime tropical

- Warm, wet air masses
- On the east coast they are formed over the Gulf of Mexico & south Atlantic Ocean.
 - Influence weather along the entire east coast.
 - Summer: thunderstorms & summer showers
 - Winter: heavy snow or rain
- On the west coast they form over the southern Pacific Ocean.

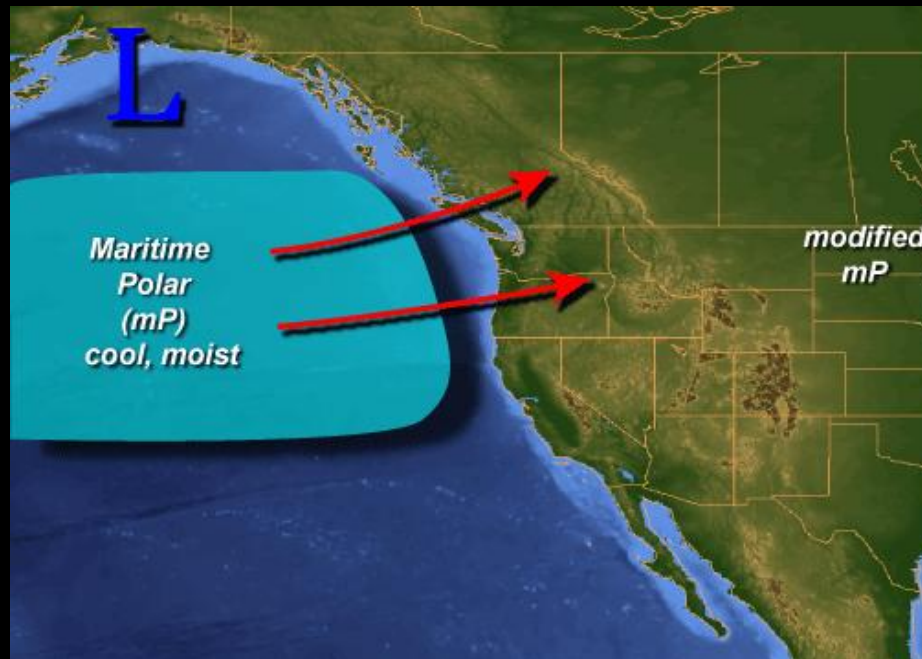


Source of Moisture



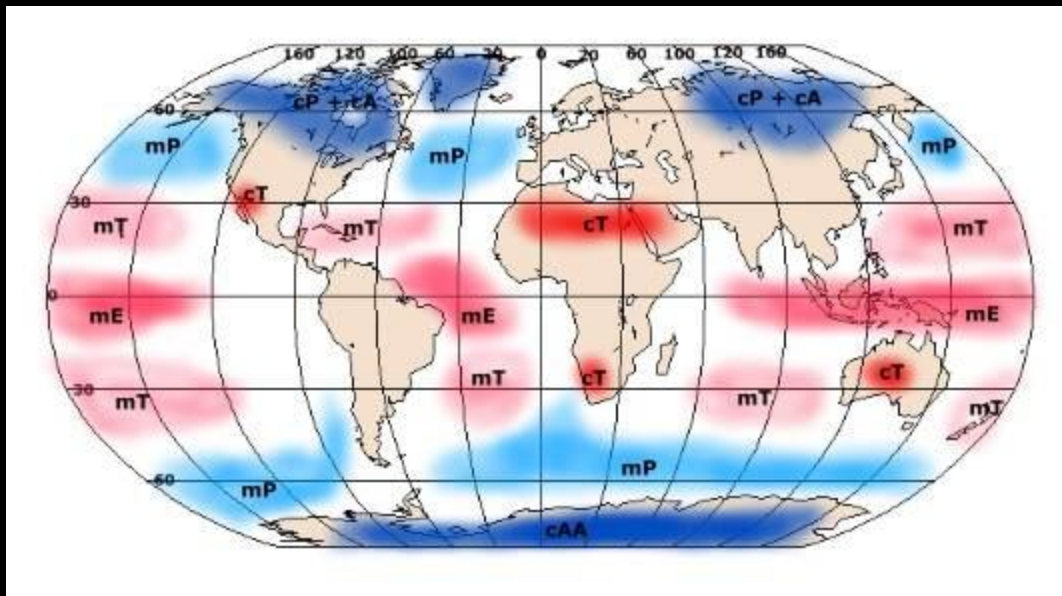
2. Maritime polar

- Cold, wet air masses
- On the east coast they are formed over the north Atlantic Ocean.
- On the west coast they are formed over the north Pacific Ocean.
- Influence the weather of the west coast more so than that of the east coast.
 - Summer/Winter: fog, rain, & cooler temperatures



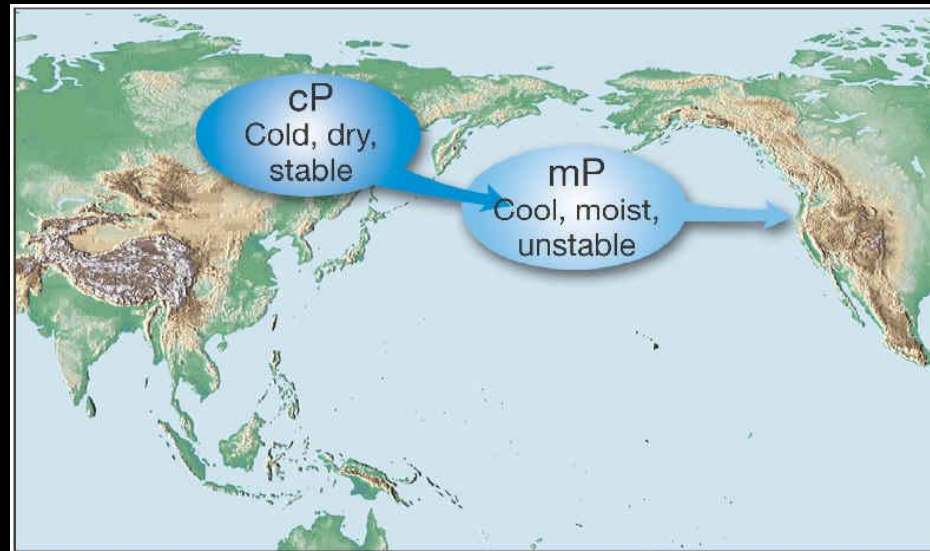
3. Continental tropical

- Warm, dry air masses
- Typically form over the southwest (New Mexico, Arizona, Nevada, as well as northern Mexico) during the summer months.
- Influence the weather of the southwestern part of the US & southern Great Plains (Kansas, Oklahoma, Texas, Iowa).
 - Summer: Hot, dry



4. Continental polar

- Cold, dry air masses
- Typically form over central & northern Canada as well as Alaska.
- Influence the weather of the entire United States.
 - Winter: Clear, cold, dry
 - Summer: Potential for storms due to interaction with Maritime tropical air moving up from the Gulf of Mexico.



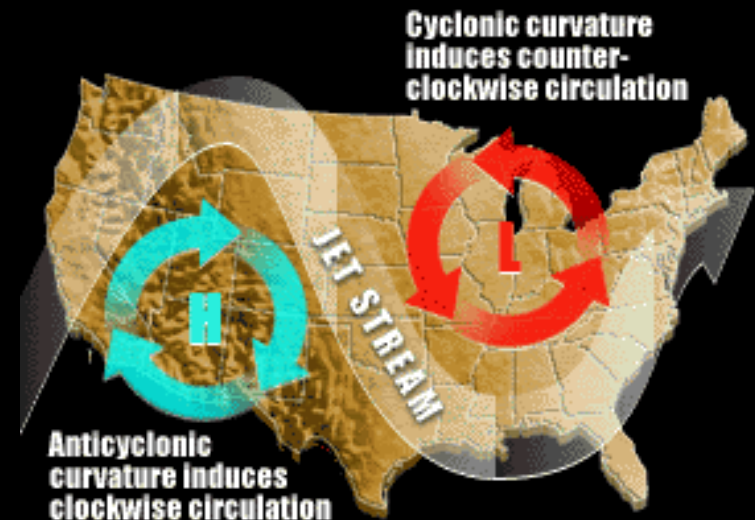
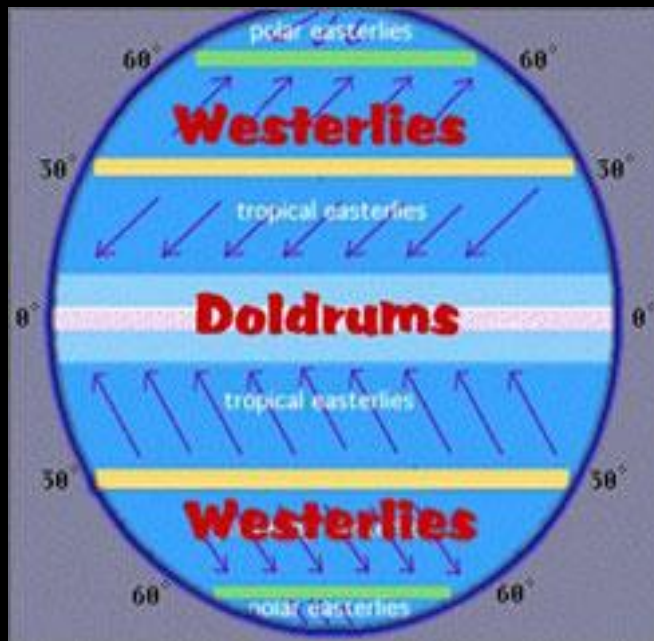
- 2 primary methods for air mass movement

1. Prevailing Westerlies

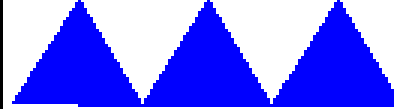
- Pushes air masses from west to east.

2. Jet streams

- Pushes fast moving air masses from west to east.



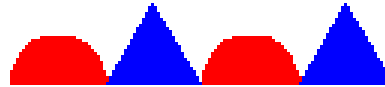
Fronts



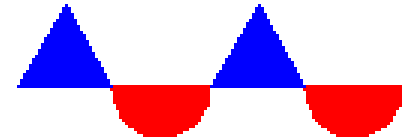
Cold Front



Warm Front



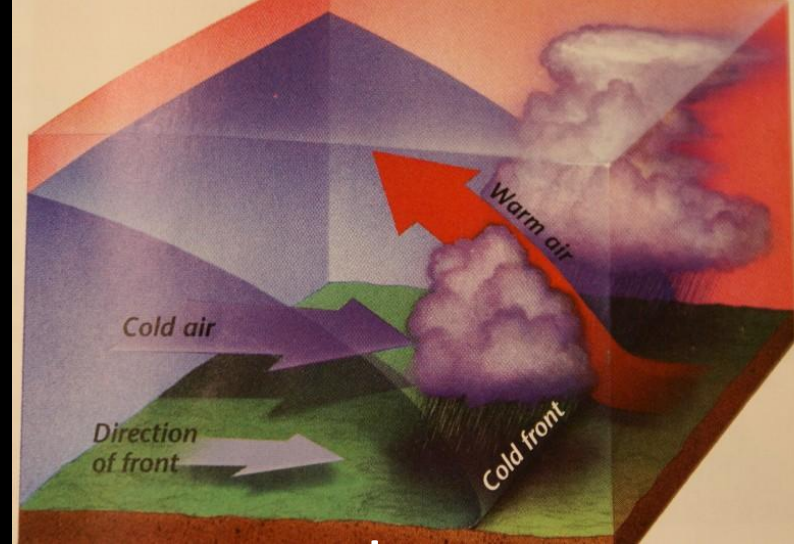
Occluded Front



Stationary Front

- The boundary between two air masses.
 - Air masses do not easily mix with each other due to the differences in...
 - *Density (Air pressure)*
 - *Temperature*
 - *Moisture content*
 - Storms & different types of weather phenomena occur along fronts.

Fronts



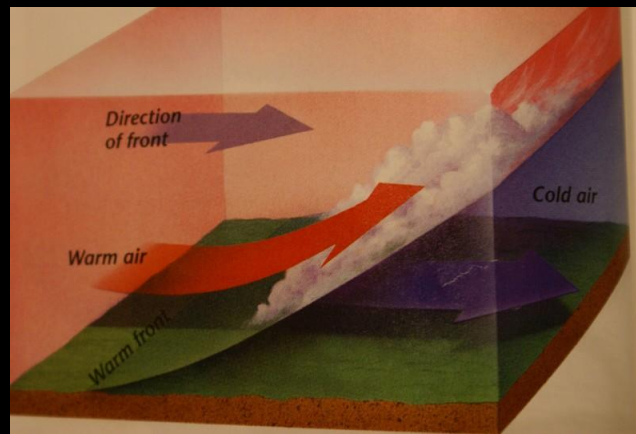
1. Cold front

- Fast moving cold air mass overtakes a slower moving warm air mass.
- Can cause abrupt weather changes particularly thunderstorms.
- Clear skies, a change in wind, & lower temperatures usually follow a cold front.

<http://www.youtube.com/watch?v=XcHHiULyrPY>

2. Warm front

- A fast moving warm air mass overtakes a slow moving cold air mass.
- Can cause extended periods of rainy or cloudy weather.
- Warm, humid weather usually follows a warm front.
- <http://www.youtube.com/watch?v=huKYKykjcm0&feature=related>



3. Stationary front

- A cold and warm air mass meet but neither can move the other.
- Can cause extended periods of precipitation; snow, rain, fog or clouds.



4. Occluded front

- A warm air mass is caught between 2 cooler air masses.
- http://www.phschool.com/atschool/phsciexp/active_art/weather_fronts/



Cyclones (Greek for “wheel”)

- Formed around centers of low pressure.
- Caused as the boundary between fronts become distorted by surface features; mountains or strong winds.
- Represented on weather maps by an *L*.
- Warm air rises and spins counterclockwise around the center.
- Storms and precipitation are associated with areas of low pressure.

Anticyclones

- Formed around centers of high pressure.
- Represented on weather maps by an *H*.
- Cold air sinks and spins clockwise around the center.
- Dry weather and clear skies are associated with areas of high pressure.

