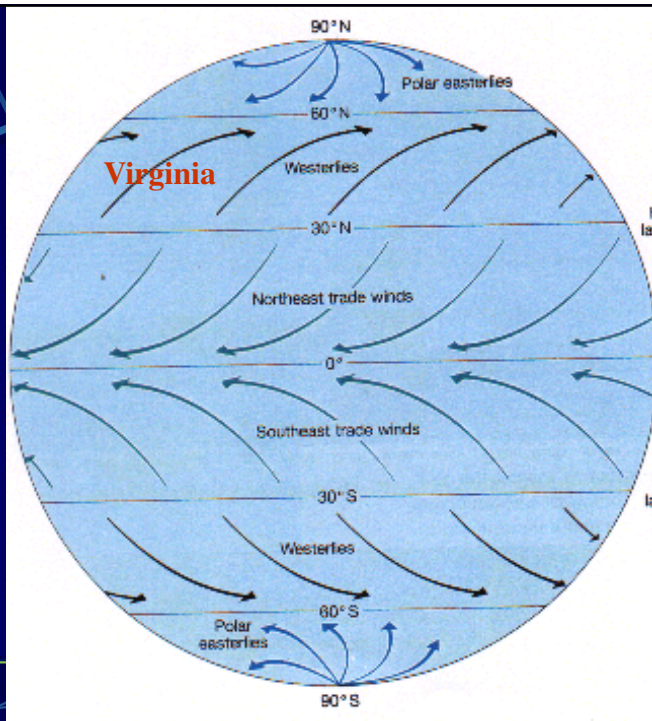


Air Masses & Fronts

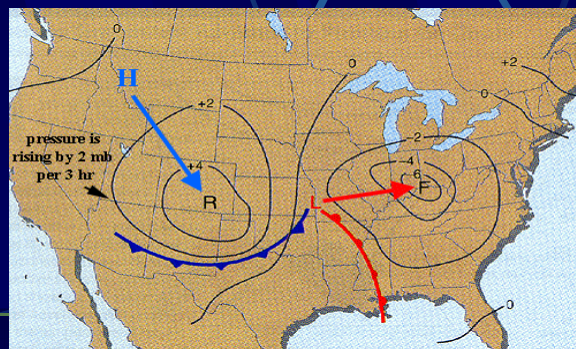


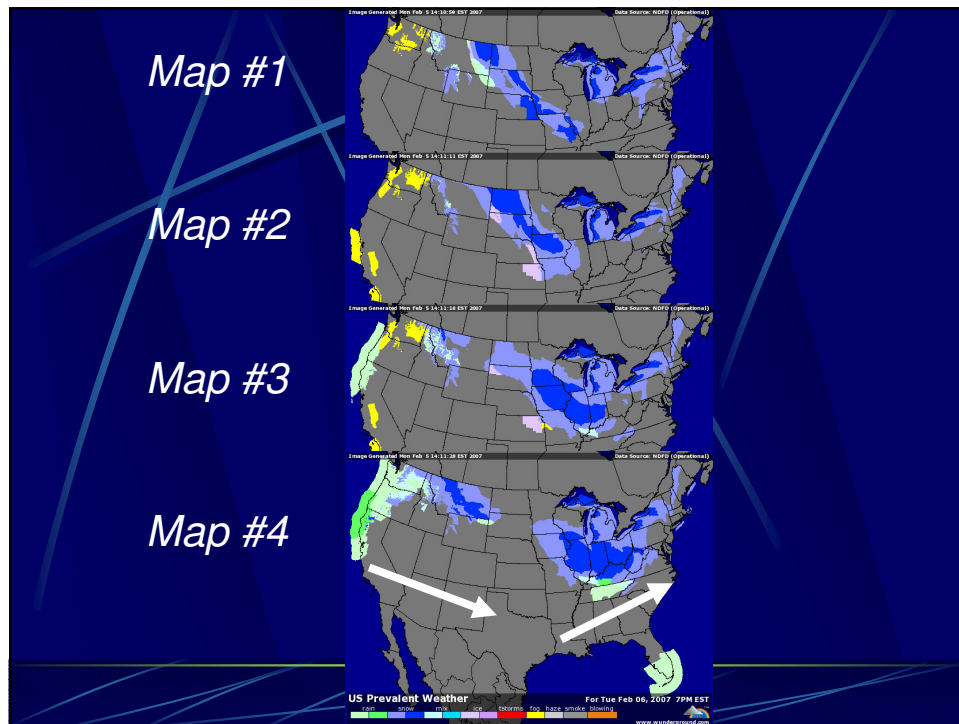
Global Wind Patterns



Weather Movement in the Contiguous United States

- We are in the prevailing westerly wind belt, so our weather tends to move from the southwest to the northeast.





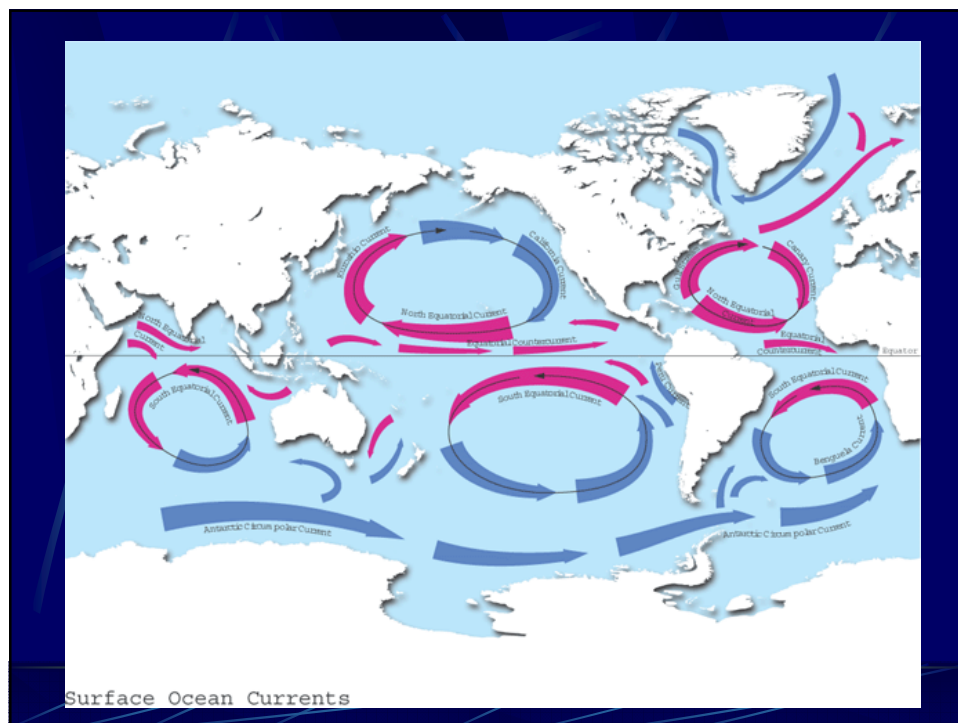
Formation of Waves on Surface Water

- Wind blowing over water produces waves.



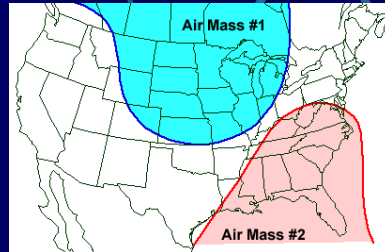
Formation of Surface Ocean Currents

- The direction of ocean currents is affected by the prevailing winds because the wind blows over the water causing the currents.
- Currents tend to spin clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere (due to the Coriolis Effect)



Air Mass

- A large body of air in the lower troposphere that has similar characteristics throughout



- Temperature & humidity depend on origin and move with the air mass

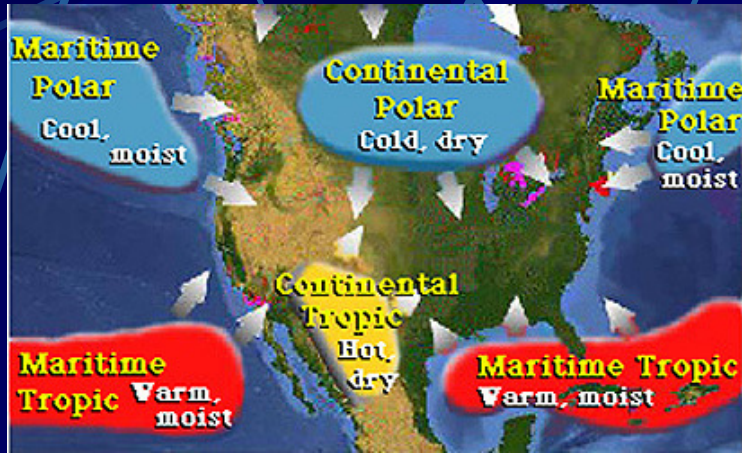
Types of Air Masses

Continental: dry Polar: cold

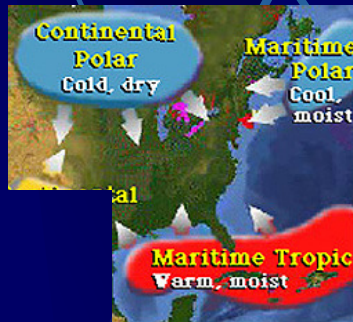
Maritime: wet Tropical: warm

- continental polar (cP): cold & dry (Canada)
- continental tropical (cT): warm & dry (Mexico)
- maritime polar (mP): cold & wet (north oceans)
- maritime tropical (mT): warm & wet (south oceans)

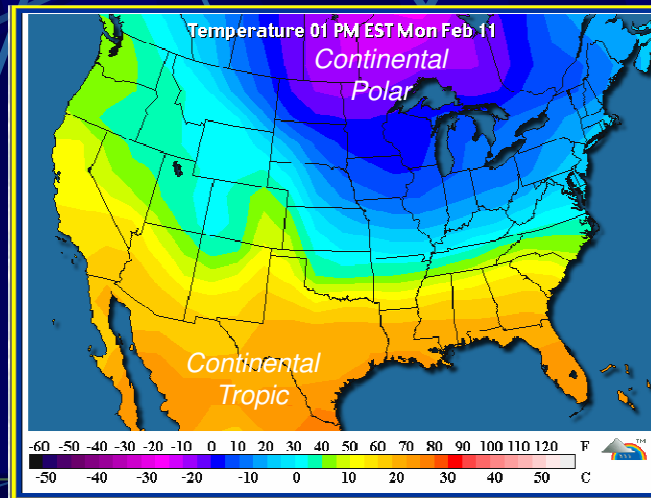
Types of Air Masses



Local Air Masses



Weather Example

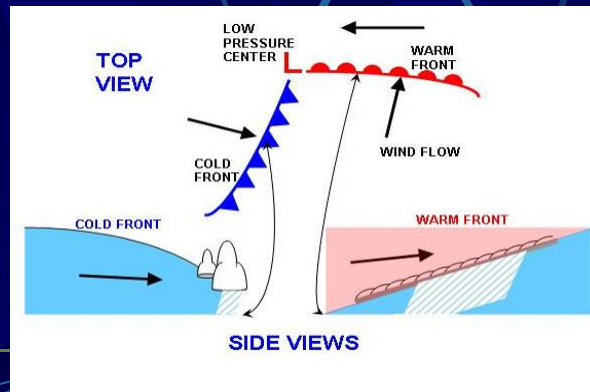


Weather Example



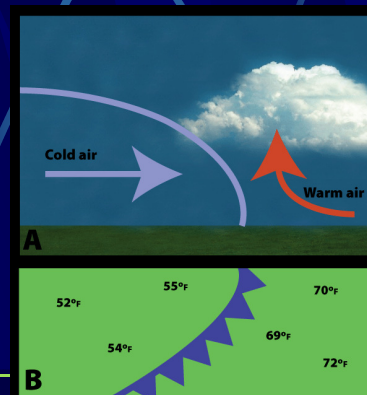
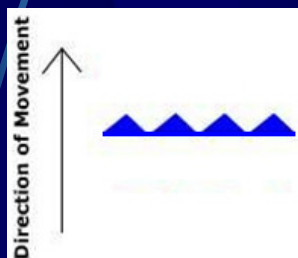
Fronts

- **Front**- an interface or boundary between 2 air masses of different characteristics



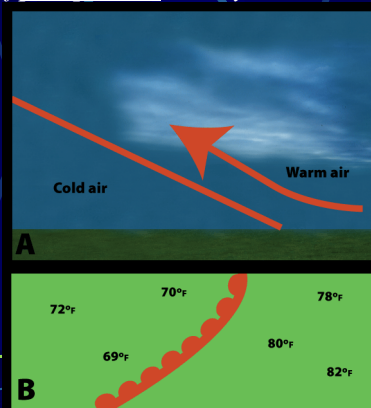
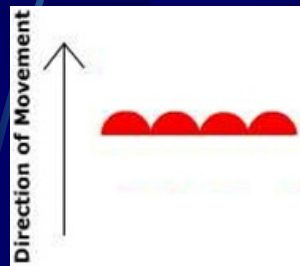
Fronts

- **Cold Front:** boundary between advancing cold air mass & a warmer air mass it is displacing/pushing aside
 - Rising warm air usually produces precipitation if wet
 - Air becomes colder after front passes
 - Steep slopes, rapid changes in weather, thunderstorms, hail, tornadoes



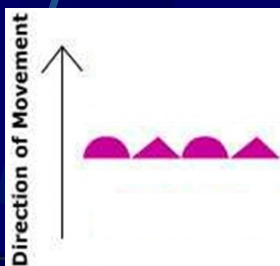
Fronts

- **Warm Front:** *boundary between advancing hot air mass & a colder air mass it is displacing/pushing aside*
 - 1st clouds days in advance, then RAIN
 - Air becomes warmer after front passes
 - Gentle slope, long periods of precipitation and layered clouds

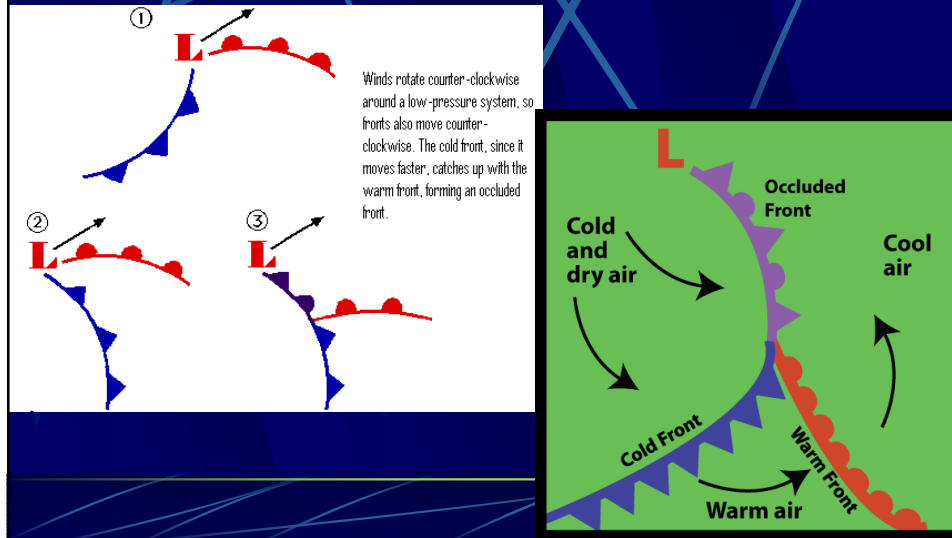


Fronts

- **Occluded Front:** *when cold front 'catches up' to a warm front, producing clouds & precipitation as the warmer air mass between them is forced to rise*
 - Forms mid-latitude cyclones (lows)

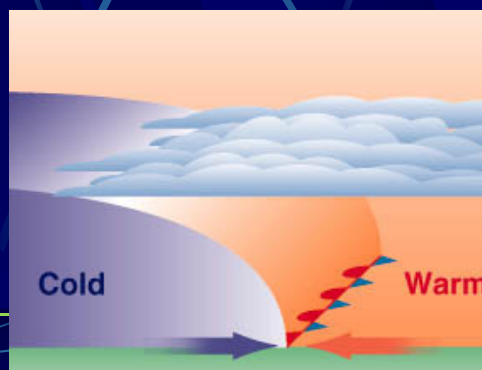


Forming an Occluded Front



Fronts

- **Stationary front:** *when a front stops moving forward, producing clouds & precipitation – causes floods if stationary too long*



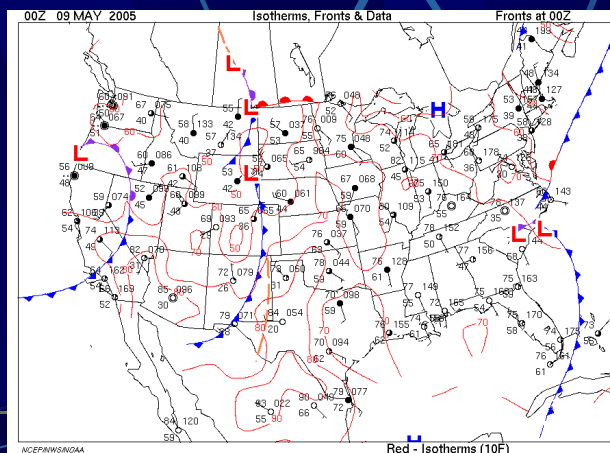
Fronts and Weather Maps

- Front Symbols (the symbols point in the direction the front is moving)



Locating a Front

- Wind direction changes
- Temperature changes sharply
- Dew Point changes sharply



ID That Front!

- Air Temperature changing as front passes
(<http://earthstorm.mesonet.org/materials/coldfrontch/TAIR10171996.mov>)
- Dew Point Temp changing as front passes
(<http://earthstorm.mesonet.org/materials/coldfrontch/TDEW10171996.mov>)
- Wind Direction changing as front passes
(<http://earthstorm.mesonet.org/materials/coldfrontch/WIND11061996.mov>)

What type of front is this?

Keys to Weather Forecasting

- (1) Storms move southwest to northeast in US
- (2) L is stormy, winds are counterclockwise (low pressure)
- (3) H is clear, winds are clockwise (high pressure)
- (4) Precipitation forms near the center of a L and along a front

Where would precip be?

