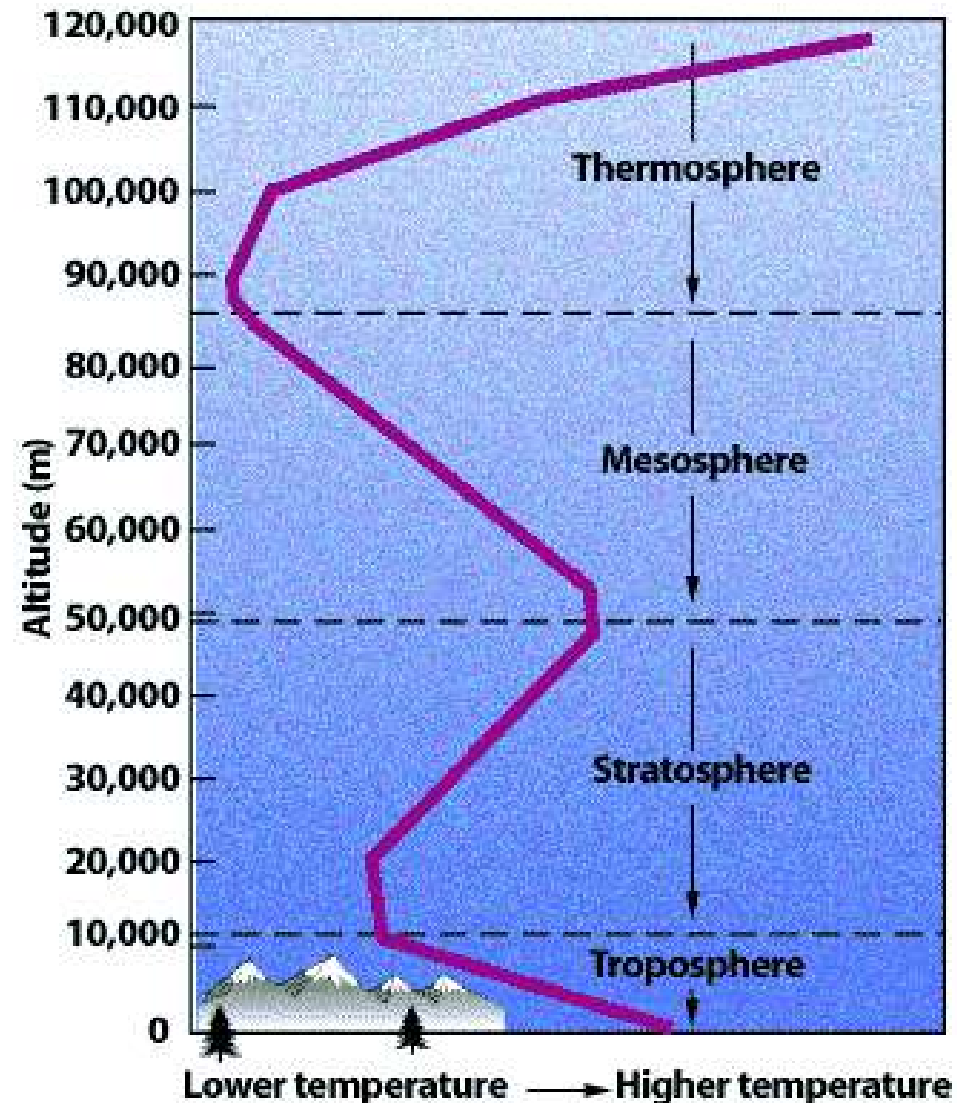


The Atmosphere

- Atmos = “vapor/air”
 - **Atmosphere = layer of gases that surround earth**
- Where **weather** occurs
- Without it, **LIFE WOULD NOT BE POSSIBLE.**
 - Effects climate
 - Protects from UV radiation
 - Provides breathable oxygen

5 Layers of the Atmosphere

- Farther out -> **air is thinner**
- Layers defined by **temperature changes**

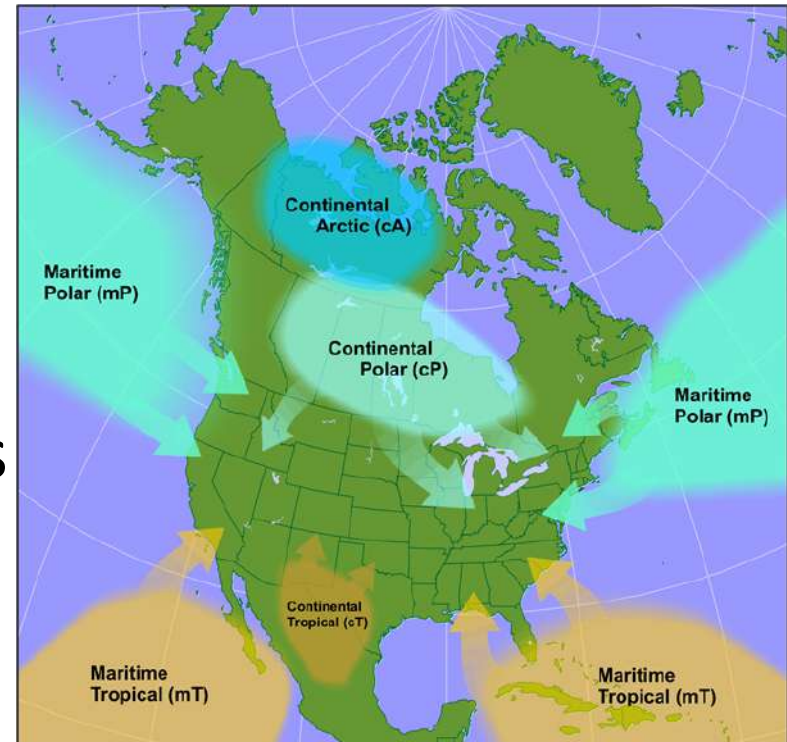


Thanks to the **ATMOSPHERE**, we have a **climate and weather!**

- **Climate** = how the atmosphere "behaves" over relatively **long periods of time** (Florida's climate is warmer than Maine's)
- **Weather** = conditions of the atmosphere are over a **short period of time** (rain, snow, sun, wind)

Air Mass

- Region of atmosphere with the same temperature, density, air pressure and humidity
- Can form over water or land
- Movement of air masses moves over an area, can bring a change in the weather

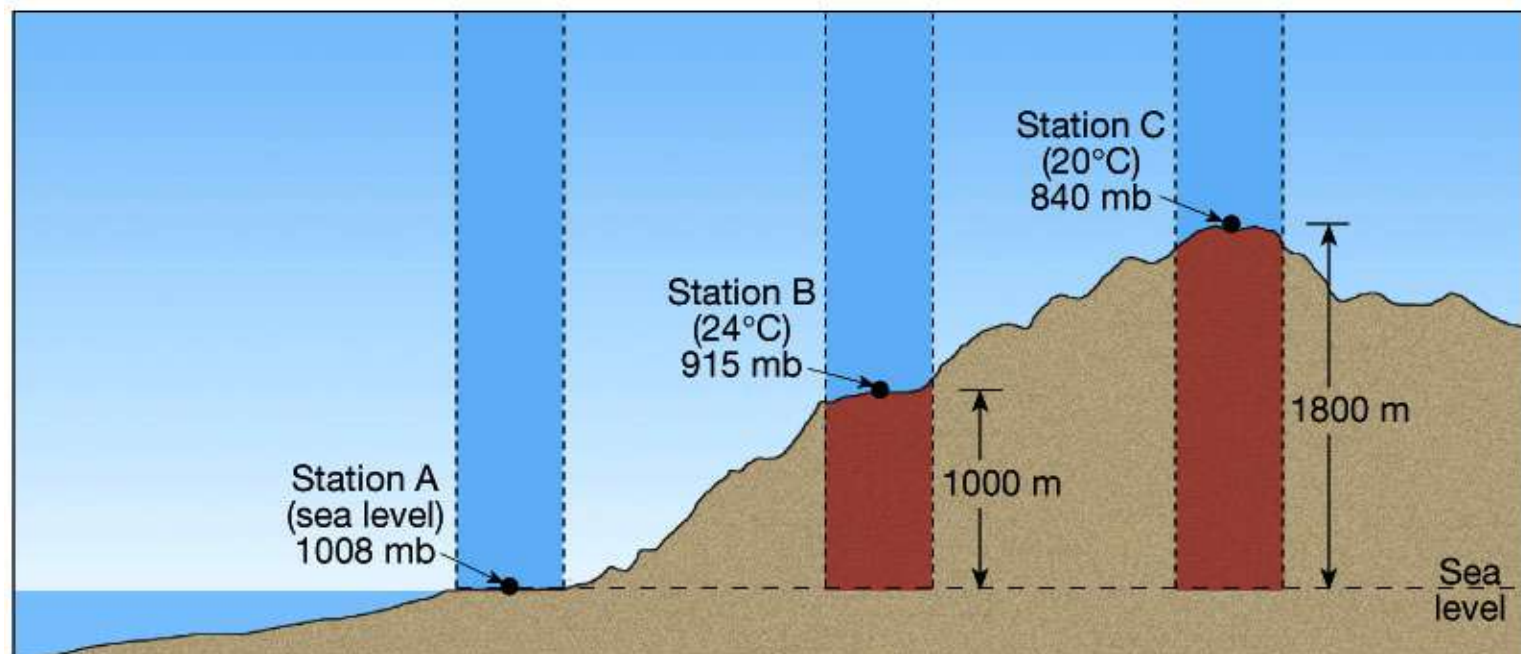


Air Masses

- Tropical maritime – near the equator; over water
 - Warm, moist air
- Polar maritime – near the pole; over water
 - Cold, moist air
- Tropical continental – near the equator; over land
 - warm, dry air
- Polar continental – near the pole; over land
 - Cold, dry air

Air pressure can change

- The higher your altitude, the less air pressure is on you.
 - This is because there is less air above you



Pressure Systems

- High pressure (H)
 - cold, dry air that generally brings fair weather (no precipitation or clouds) and light winds
 - Sinking air = high air pressure = clear skies and sunny
- Low pressure (L)
 - warm, moist air that generally brings stormy weather with strong winds
 - Rising air = low air pressure = clouds and precipitation

Wind

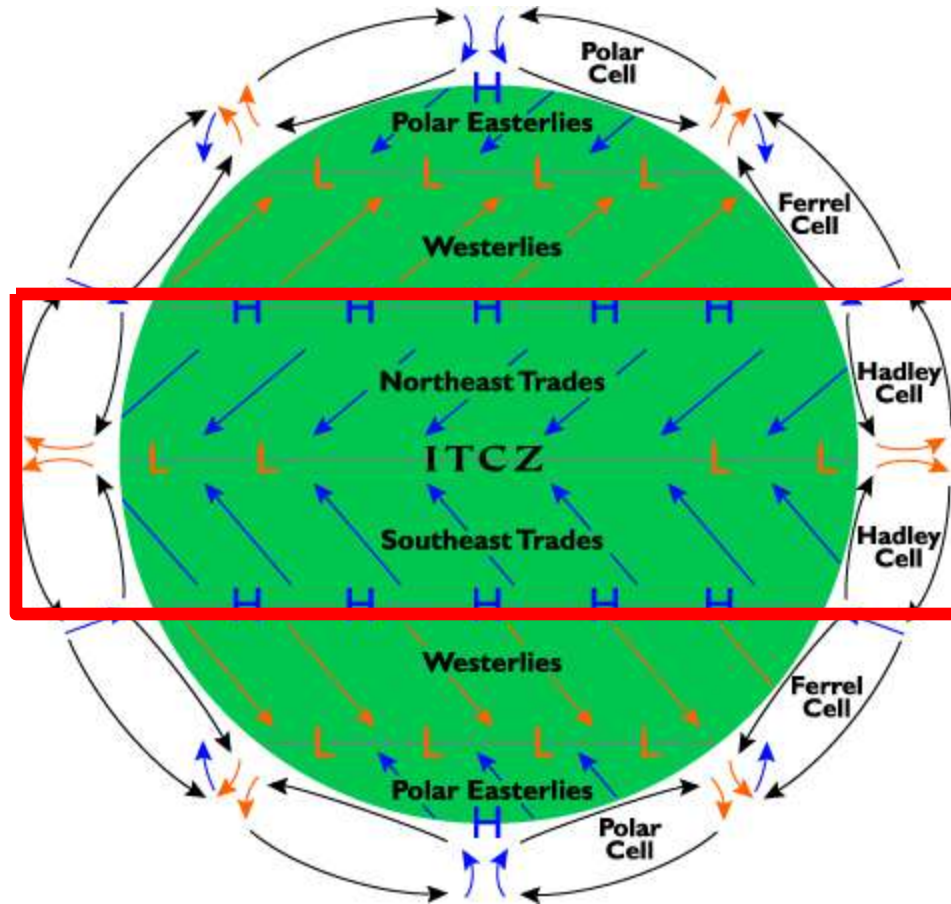
- Horizontal movement of air; differences in air pressure
 - Caused by uneven heating of Earth's surface
 - Water and land absorb heat differently
- Wind flows from high air pressure to low air pressure
 - **Gradient** = amount of change
 - Larger pressure gradient = stronger winds

GLOBAL WINDS

1. Trade Winds

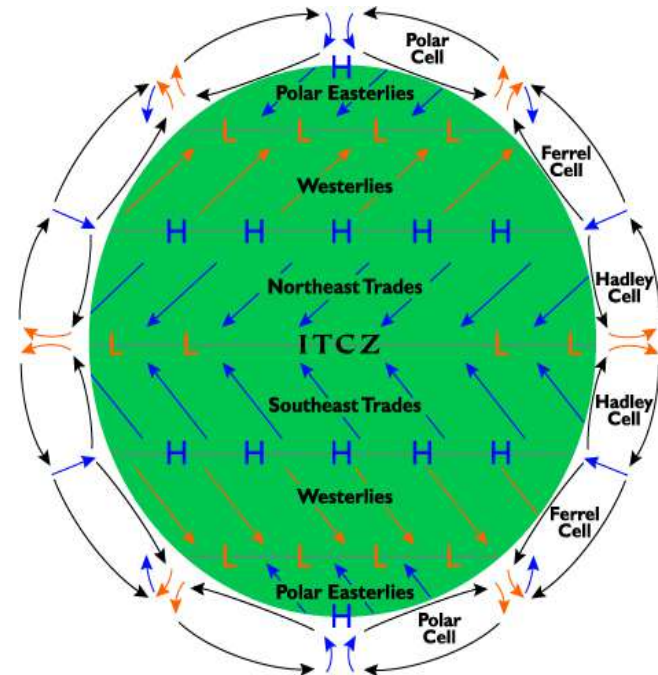
1. Prevailing
WESTerlies

1. Polar
EASTerlies



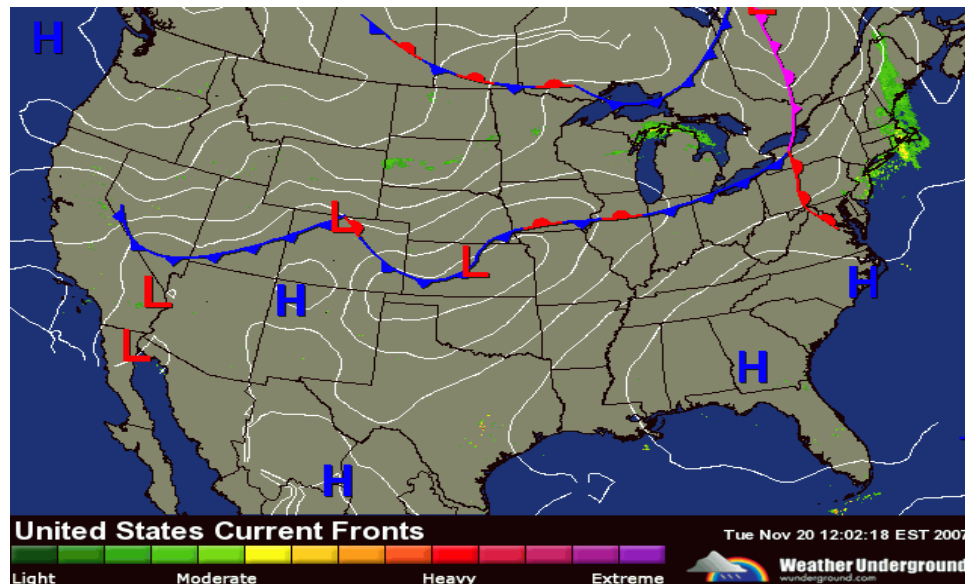
Effects of Global Winds

- Redistribute heat around Earth
 - Why is this important?
- **Control** movement of **weather and storms**
 - Why is this important?
 - Ex. Storms in America generally move **West to East** due to the **Prevailing Westerlies**



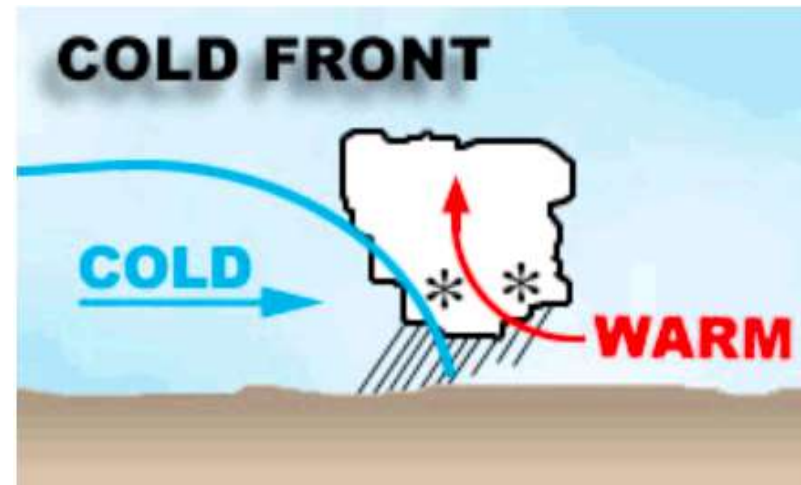
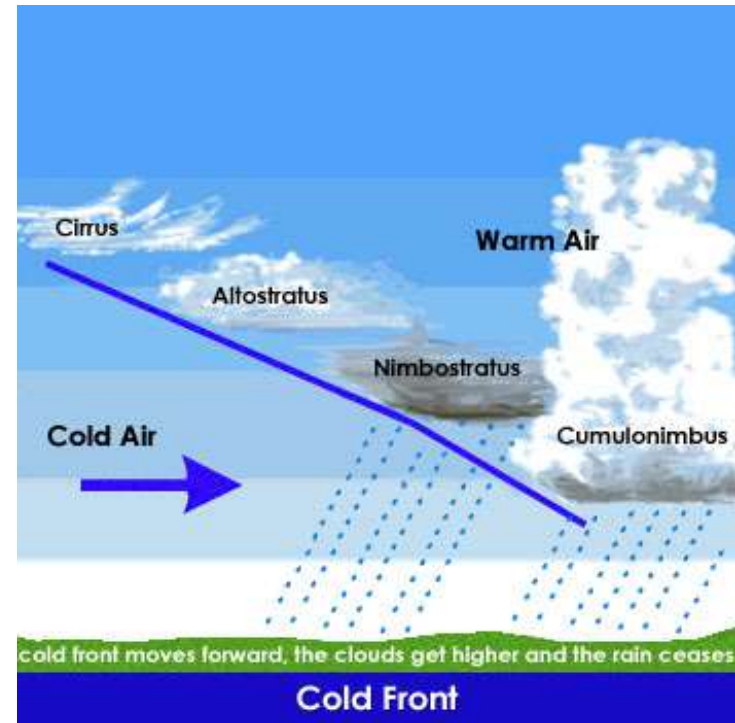
Front

- Boundary between 2 air masses
 - Narrow region separating high or low pressures
 - Differences in pressure caused by differences in temperature, pressure, and humidity.
- 4 main types of fronts - **cold, warm, stationary, occluded**
 - Cold - **colder** air replaces the **warmer** air
 - Warm - **warmer** air replaces the **cooler** air



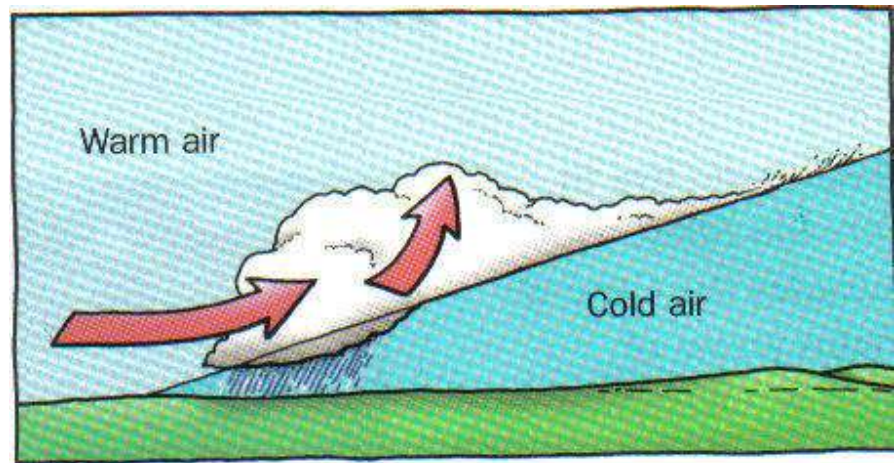
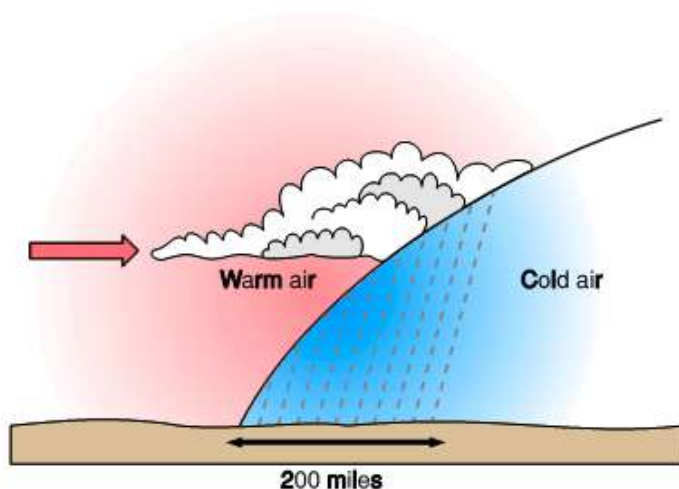
Cold Front

- Cold air pushes warm air and forces it upwards quickly
 - Warm air rises and condensation happens (CLOUDS)
 - Causes showers and thunderstorms.
 - SEVERE STORMS
- Squall line = band of high winds and storms associated with a cold front



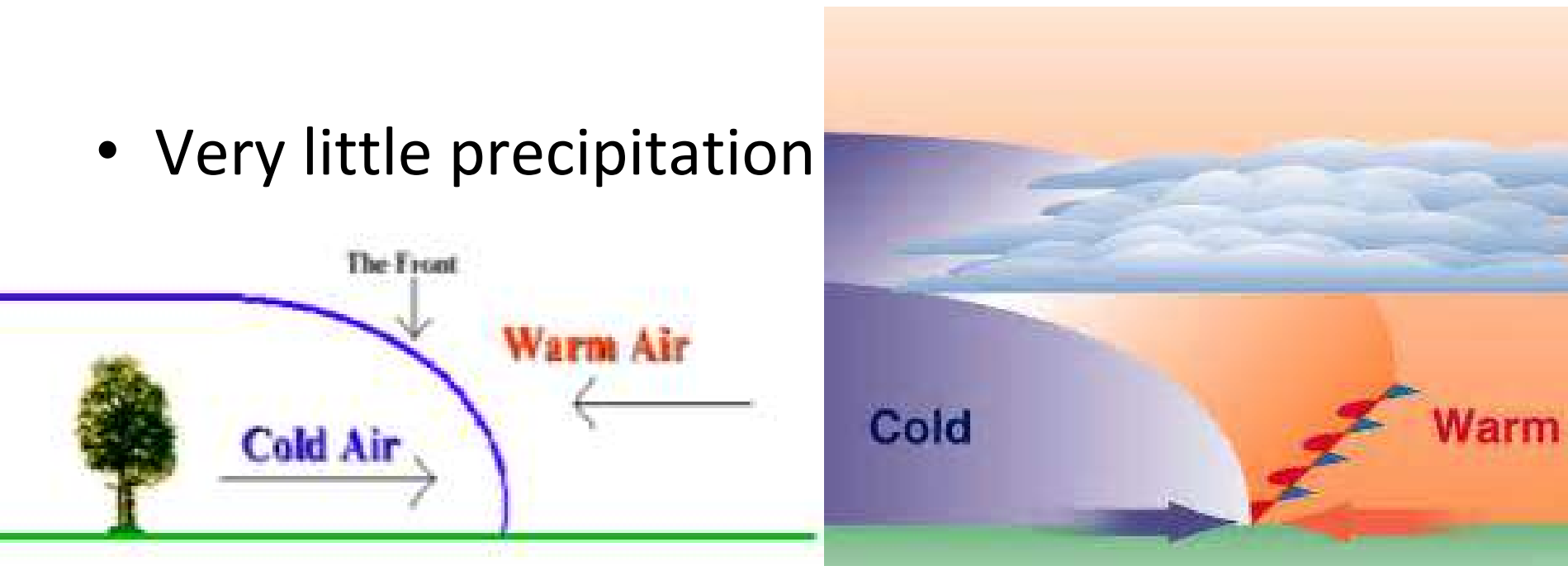
Warm Front

- Warm air moves in and replaces a colder air mass
- Temperature and humidity increase
- Precipitation (rain, snow, drizzle, etc) found ahead of warm front
 - **Fog** common ahead of front



Stationary Front

- **Two air masses meet and neither can move forward**
 - Undergo air mass modification so that pressure and temperature of the fronts are similar
- Very little precipitation



Occluded Fronts

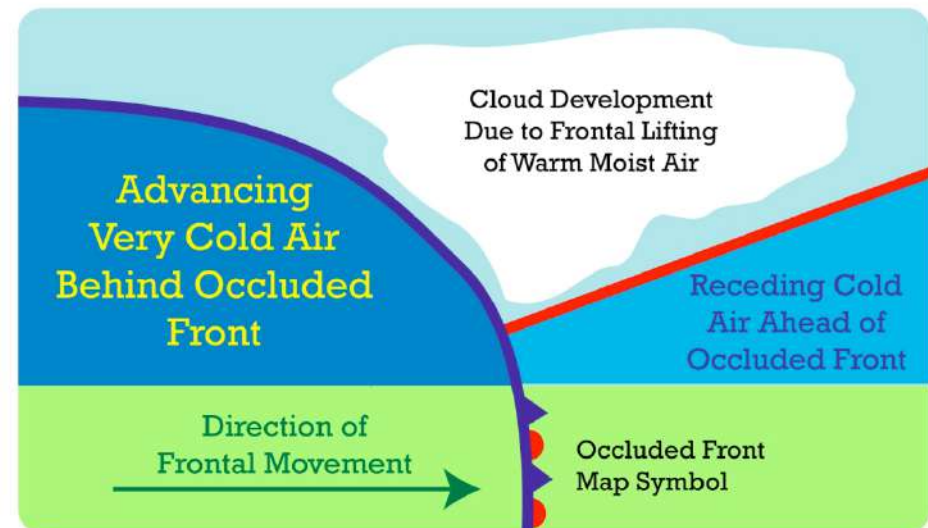
- Very rapid cold front moves into a warm front

- Cold air forces the warm air directly above it
 - Traps the warm air above the cold air.

- Causes precipitation



Occluded Front



Cyclonic Storms

- Changes in air density
 - Temperature of air ... altitude of air
 - Cold air = dense = sinks
 - Warm air = less dense = rises
- Tropical depression
- Tropical storm
- Tropical cyclone
- Hurricane
- Typhoon
- Super- cells
- Tornadoes

Human Impacts

- Acid rain – factories, power plants, & cars release chemicals that mix with water in the atmosphere to form acid rain that kills aquatic life and trees
- pH – acidic water
- Aerosols & Chlorofluorocarbons (CFCs)
- Over farming
- Over burning



Acid Rain Impacts



- Aside from oceans and runoff water, acid rain can significantly impact **forests**.
 - As acid rain falls on trees, it can make them:
 - lose their leaves
 - damage their bark
 - stunt their growth
 - By damaging these parts of the tree, it **makes them vulnerable to disease, extreme weather, and insects**
- Acid falling on a forest's **soil is also harmful** because it:
 - disrupts soil nutrients
 - kills microorganisms in the soil

Global Climate Change Effects

- **Hotter world**

- Rising ocean levels
- Dying crops/dry soils
- More extreme weather
- Ocean acidification (kills sea creatures)
- Messes up ecosystem balance and diversity
 - Causes instability of ecosystems AND makes it hard for species to adapt to all the changes

