



# Thursday, Nov 2, 2017

Pick up: none

Today you will:

- Take notes on Air Masses

HOMEWORK:

WB Ch. 20 due Fri

Quiz-Weather-Wednesday, Nov. 8

# AIR MASSES

*What's the definition?*

**A large body of  
air with similar  
characteristics  
throughout**

# AIR MASSES

**MOVE**

From areas of high pressure

TO

**Areas of low  
pressure**

Air pressure differences are caused by unequal heating of Earth's surface. Air over the poles is high pressure. Air over the equator is low pressure.

Most air moves from poles to the equator

Coriolis effect (curving because of Earth's rotation) causes wind belts and storms

**Air masses are classified based on their**

**temperature**

**and amount of**

**moisture**

**Air masses get their characteristics based  
on**

**where  
they  
form**

# When air moves slowly

- It takes on the temperature and humidity (amount of moisture) of its region, becoming an air mass
- Air mass – large body of air with similar temperature and humidity



Continental

**Air mass**

Forms over land

# Continental Air Mass

- Low humidity
- Brings dry weather when it moves to another region.

Maritime

**Air mass**

Forms over water

# Maritime Air Mass

- High humidity
- Brings moist weather when it moves to another region.

**The abbreviations used to classify air masses use the following letters: c, m, T, P, and A. For each letter, describe its property:**

	<b>Word</b>	<b>Means</b>
<b>c</b>	continental	dry
<b>m</b>	maritime	moist
<b>T</b>	Tropical	warm
<b>P</b>	Polar	cold
<b>A</b>	Arctic	very cold

Air Mass	Air condition
Continental tropical	
Continental polar	
Maritime tropical	
Maritime polar	

What would their characteristics be?

**mT**

**cP**

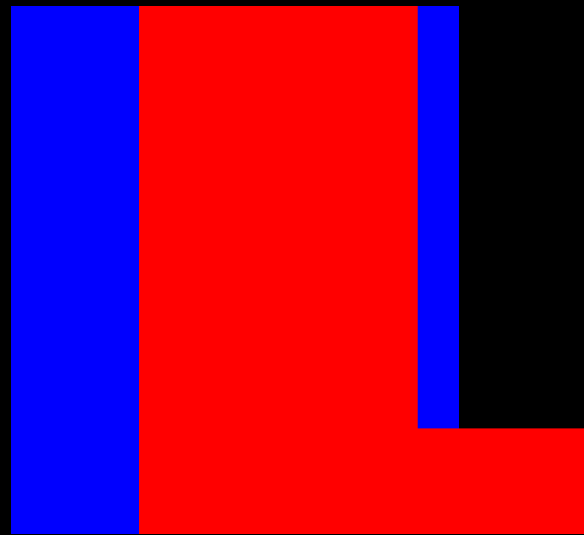
warm and moist

cold and dry

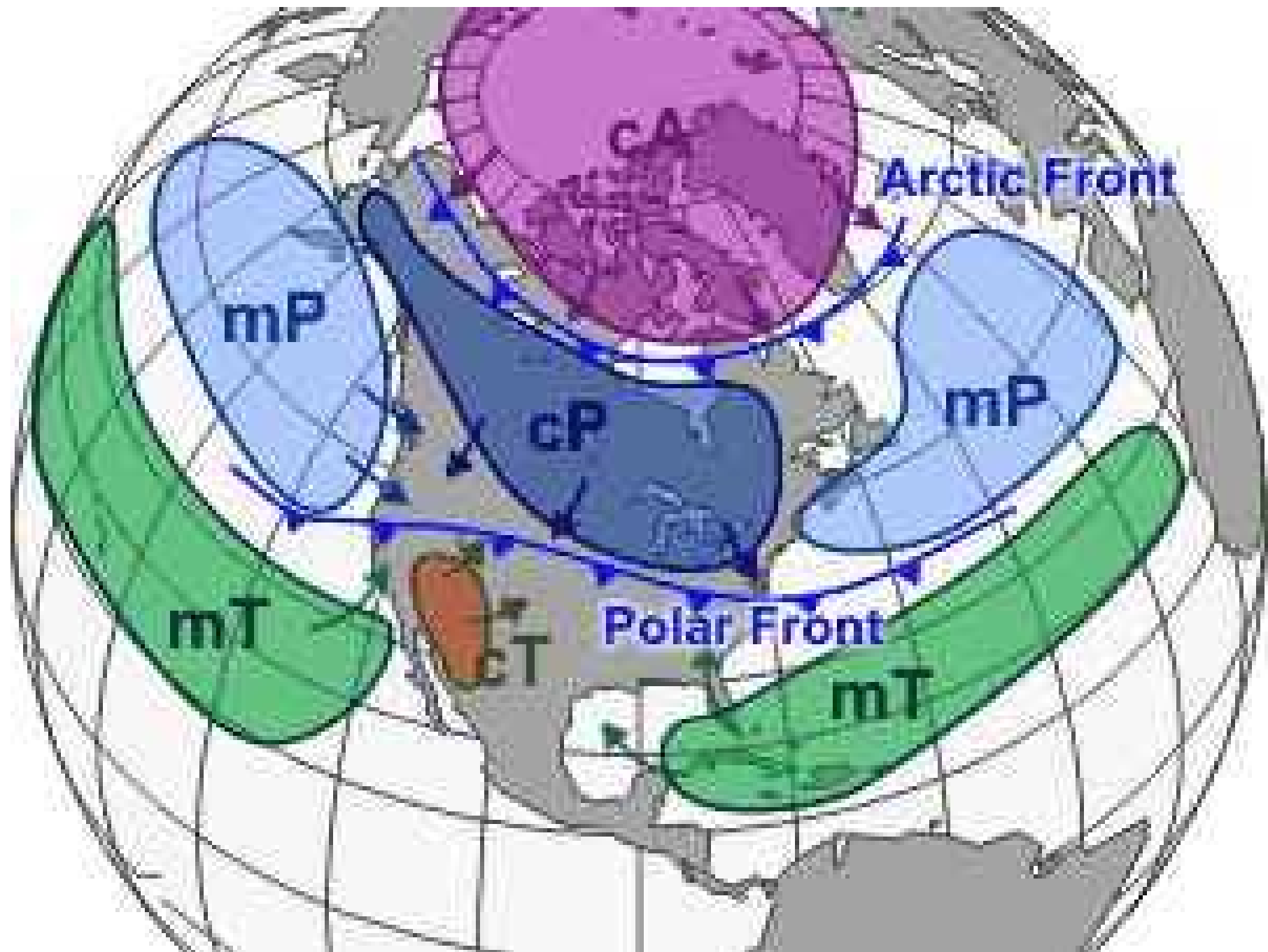
# High or Low Pressure?

**mT**

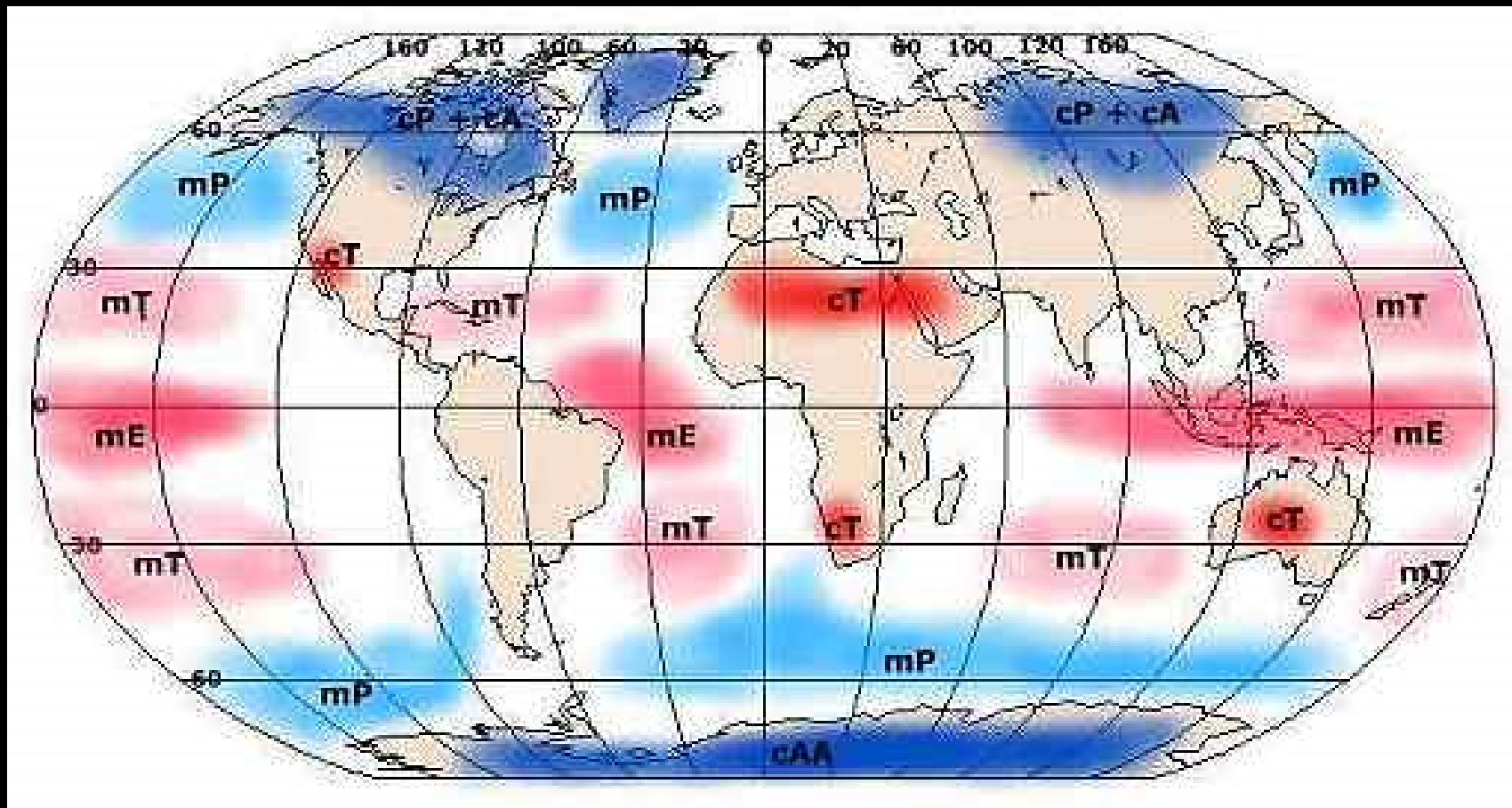
**cP**







# World Air Mass Source Regions







# Fronts

## 4 different types:

1. Cold front
2. Warm front
3. Stationary
4. Occluded



Fronts are the basic building blocks of weather systems.

Fronts occur where two large air masses collide at the earth's surface.

Each air mass has a different temperature associated with it.

Fronts are caused by winds moving one air mass away from its birthplace.

Cold Front



Warm Front



Stationary Front



Occluded Front



## Air Masses and Fronts

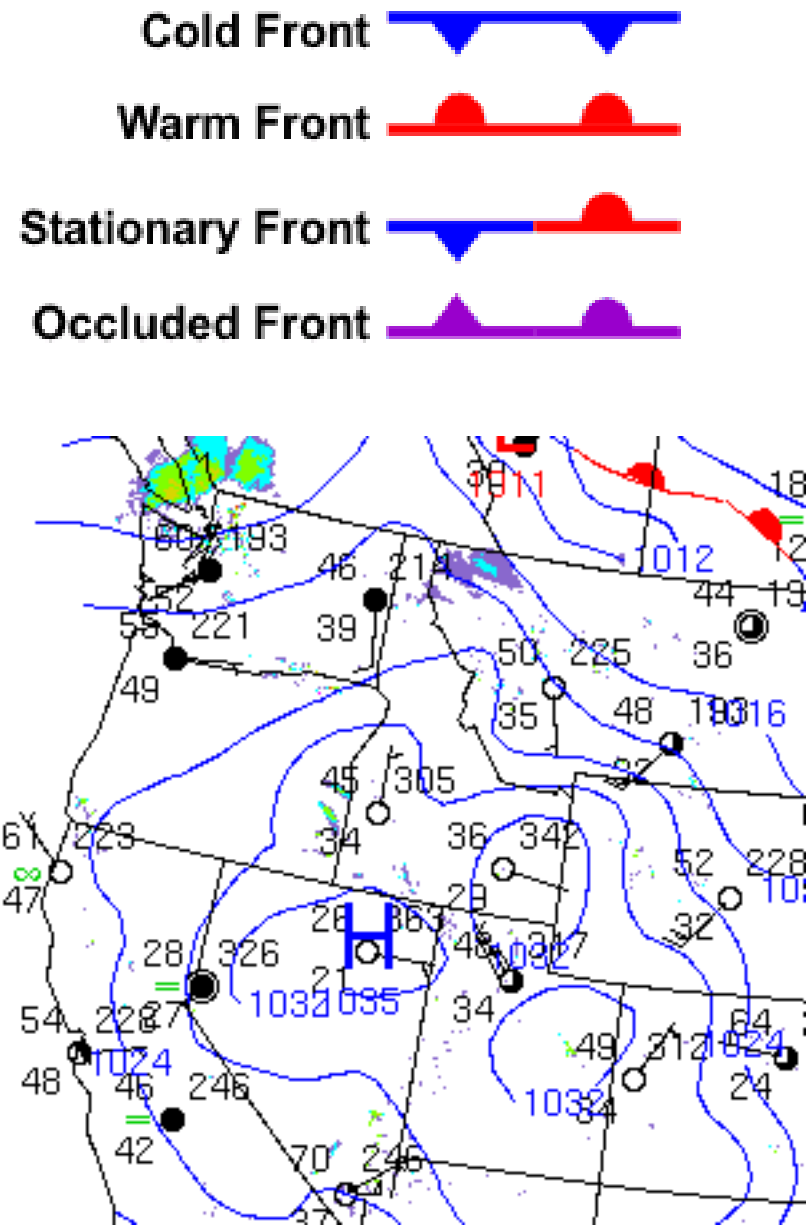
Fronts are the boundaries between two air masses.

Fronts are classified as to which type of air mass (cold or warm) is replacing the other.

A **cold front** separates the leading edge of a cold air mass displacing a warmer air mass.

A **warm front** is the leading edge of a warmer air mass replacing a colder air mass.

If the front is essentially not moving (i.e. the air masses are not moving) it is called a **stationary front**.



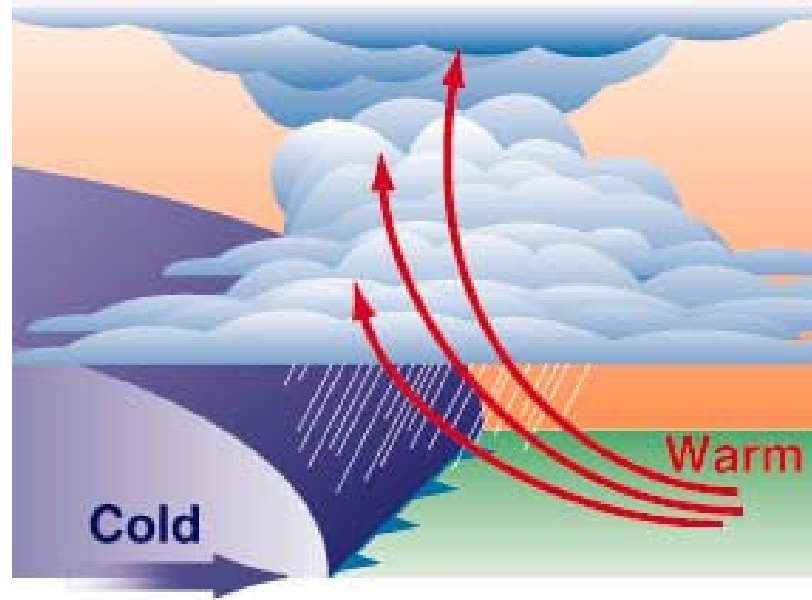
# Cold Fronts



Cold fronts – cold air mass over takes a warm air mass. Remember, warm air rises.  
Storms – short-lived and sometimes violent  
Squall line – line of heavy thunderstorms at a cold front

# Fronts

## 1. Cold front



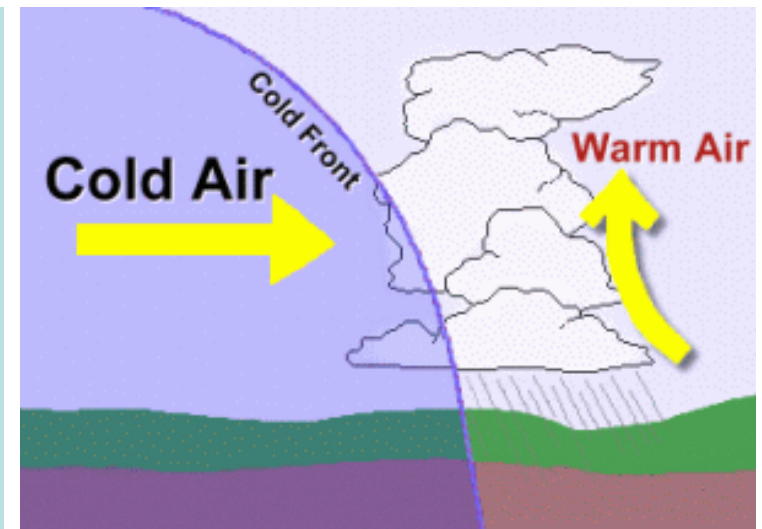
Cold fronts occur when heavy cold air displaces lighter warm air, pushing it upward.

Cumulus clouds form and usually grow into snow storms.

Temperatures drop anywhere from 5° to 15°.

Winds become gusty and erratic.

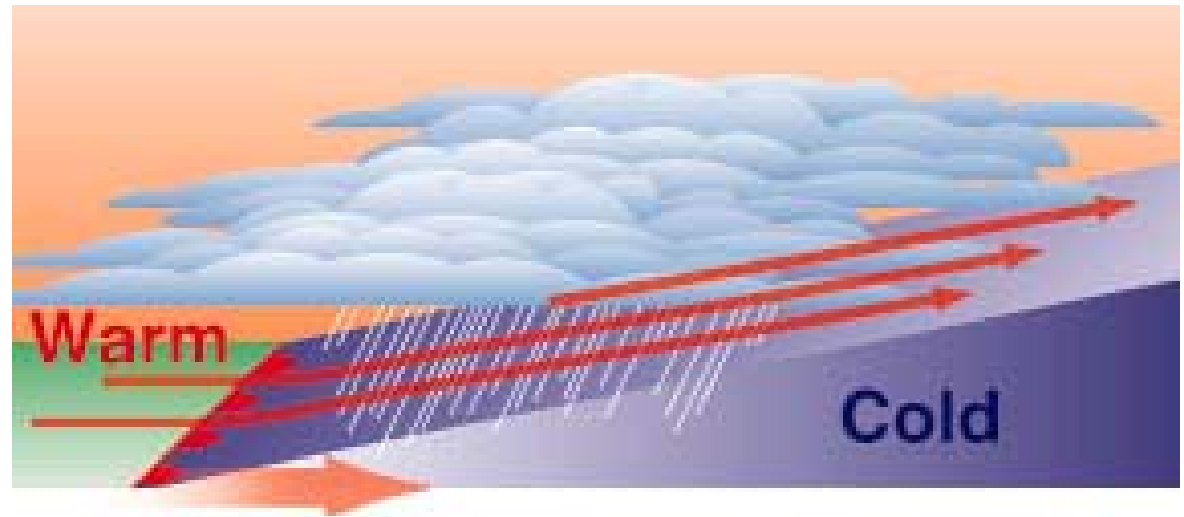
Rain, snow, sleet, and hail can occur with a cold front.





# Fronts

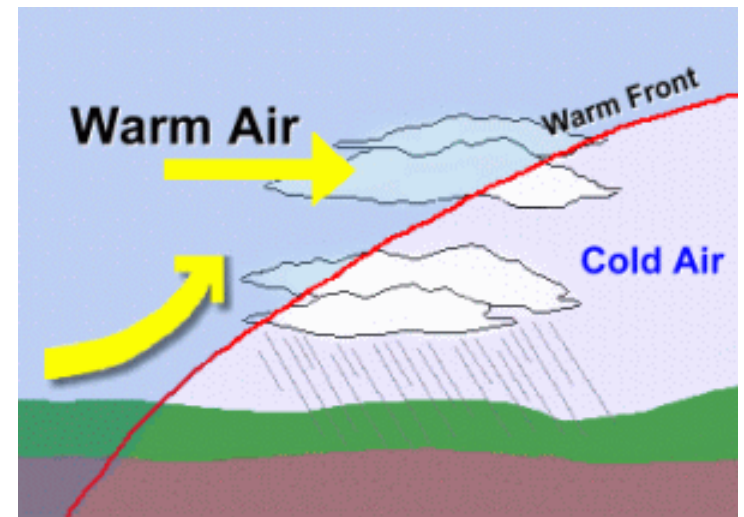
Warm front – a warm air mass takes over a cold air mass  
Produce precipitation over a large area  
Occasionally violent



Altostratus clouds form and may be associated with rain, snow, or sleet.

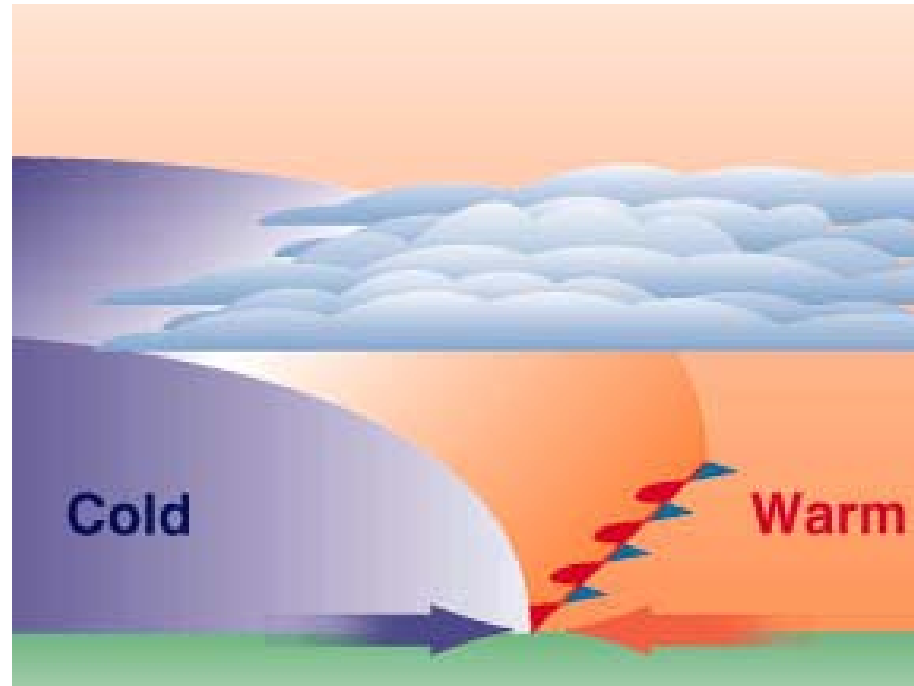
Temperatures may warm slightly.

Winds are usually gentle with this kind of front.



# Fronts

**3. Stationary front –**  
air masses move  
slowly or not at all



Stationary fronts occur when neither warm nor cold air advances.

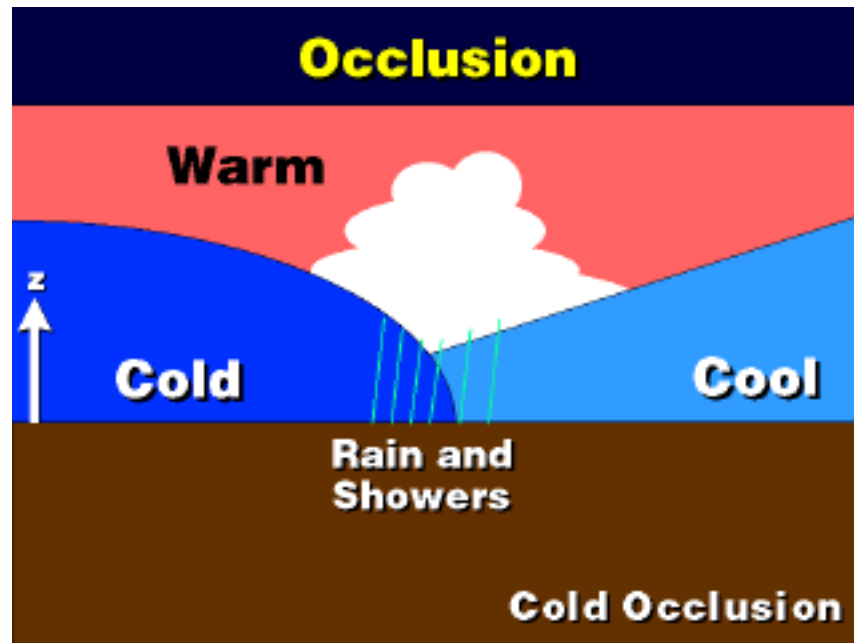
The two air masses reach a stalemate.

These type of conditions can last for days, producing nothing but Altocumulus clouds.

Temperatures remain stagnant and winds are gentle to nil.

# Fronts

4. Occluded front – cold air mass lifts warm air mass completely



Cold occlusion: When a cold air mass follows a warm air mass, the cold air mass, which moves faster, eventually catches up the warm front.

This then lifts the warm air (behind the warm front) off the ground, creating an occluded front, where the two fronts are joined.

Usually associated with rain or snow and cumulus clouds.

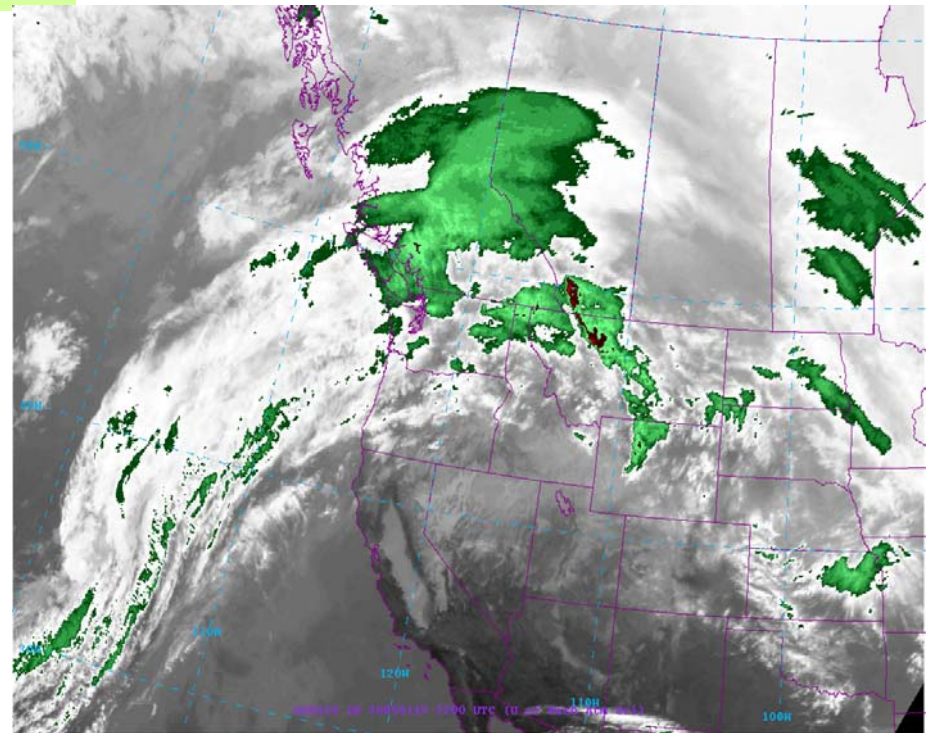
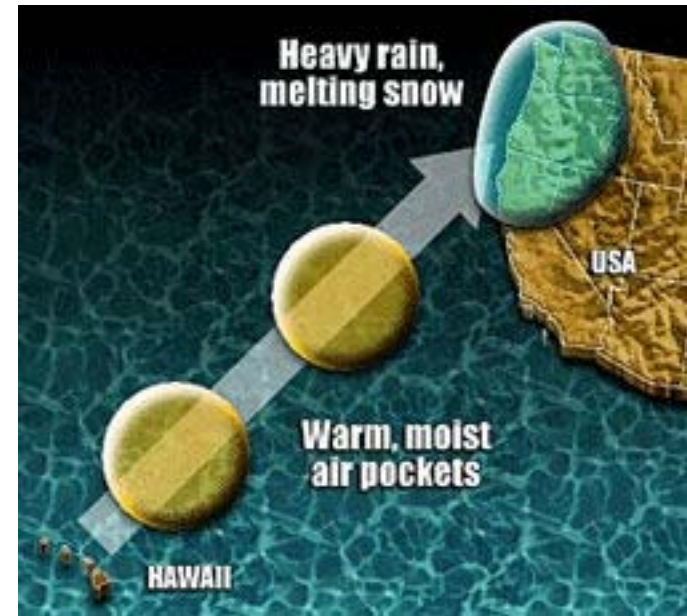
Temperature fluctuations are small and winds are gentle.

May indicate the end of a storm cycle

# Storm Tracks

## Pineapple Express

- SW Storm Track
- These storms can leave over 7" of water
- High snow accumulation at the highest of elevations in the mountains
- High elevation freezing levels



# Storm Tracks

**Polar front** – polar air mass meets tropical air mass.

**Mid latitude cyclone** - storm with a low pressure center that forms when a bend in a cold front causes low pressure center to start having rotating winds moving toward the central region.

**Anti-cyclone** – high pressure center