



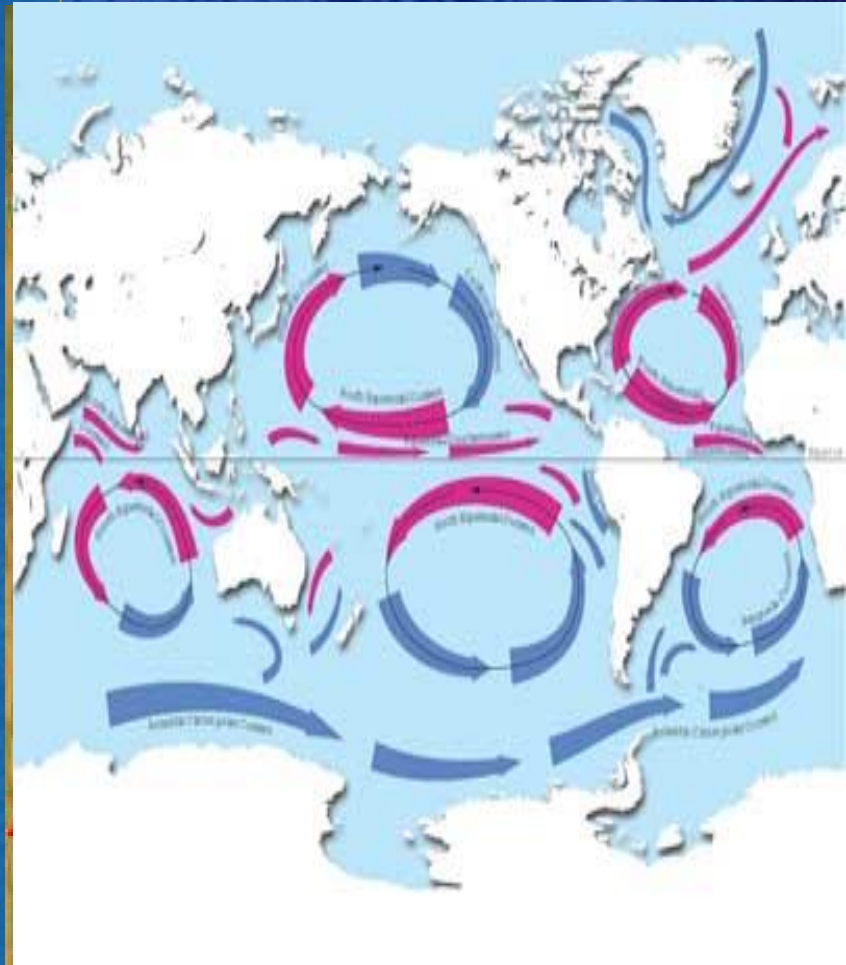
Weather

Weather is the current atmospheric conditions, such as air temperature, wind speed, wind direction, cloud cover, precipitation, relative humidity, air pressure, etc.

Weather Patterns

Changes in the weather patterns occur as the earth tries to equalize the temperature

- Global Wind Currents
- Global Ocean Currents



Air Masses

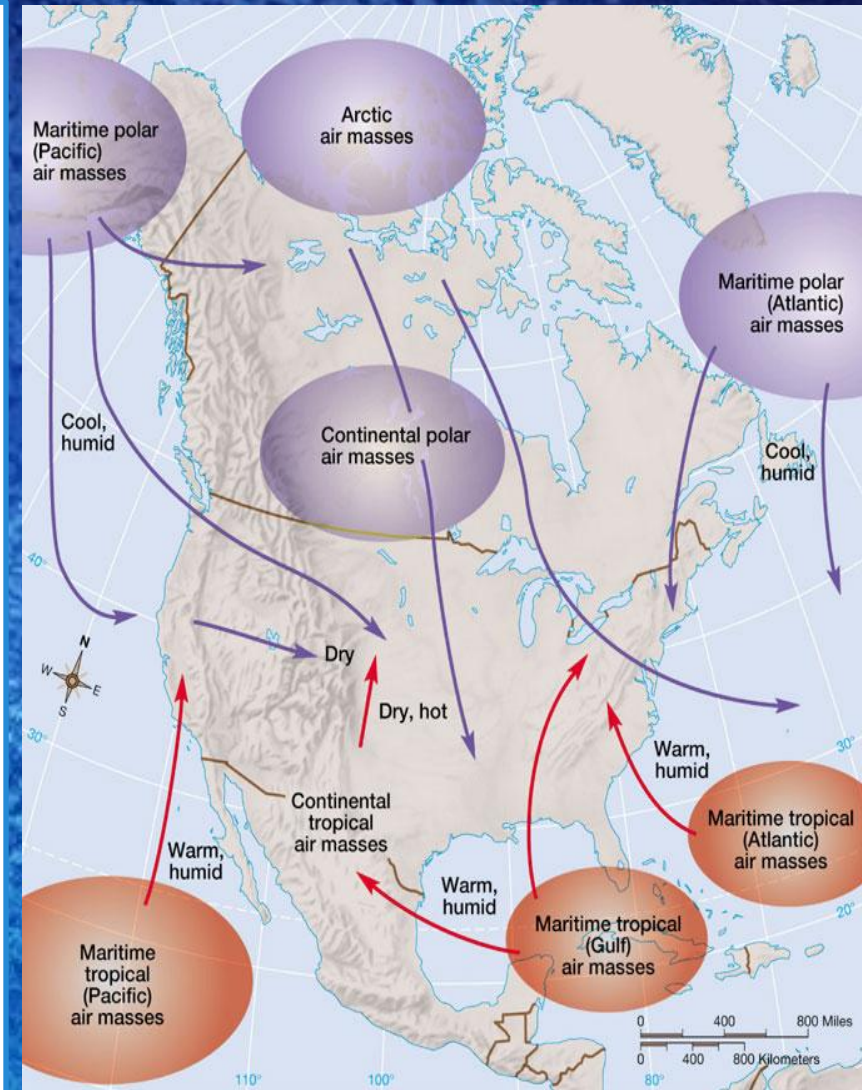
a large body of air that has similar temperature and moisture properties



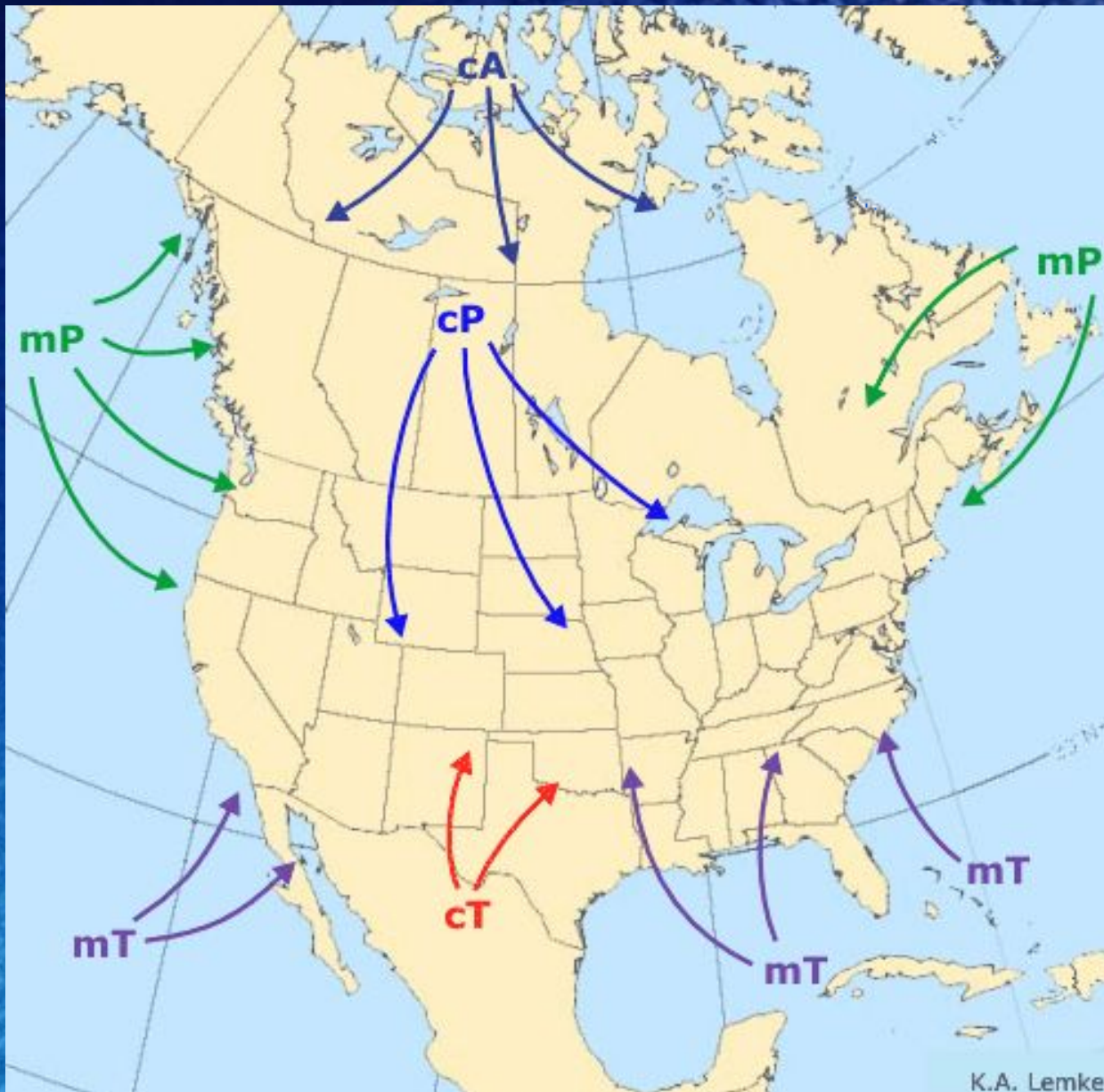
Air Masses

Two ways to identify air masses by the amount of **moisture**

- Continental (c) - Located over large land masses - DRY
- Maritime (m) - Located over the oceans - HUMID



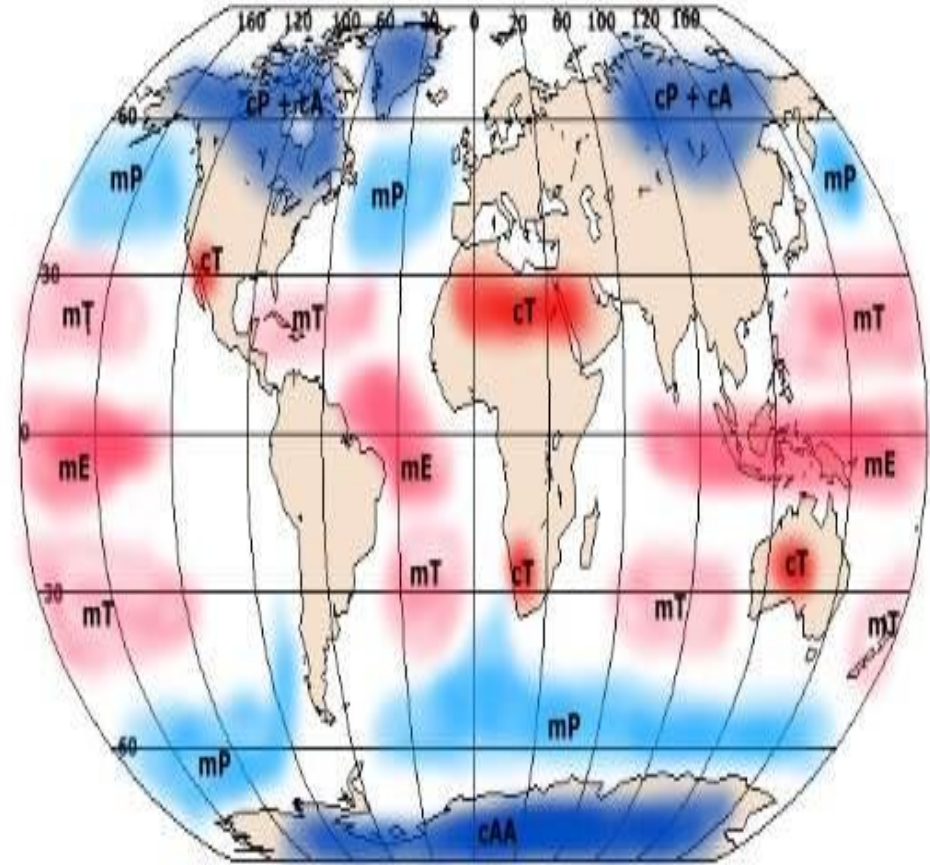
Movement of Air Masses



Air Masses

Two ways to identify air masses by the amount of **temperature**

- Polar (P) - Cooler
- Tropical (T) - Warmer



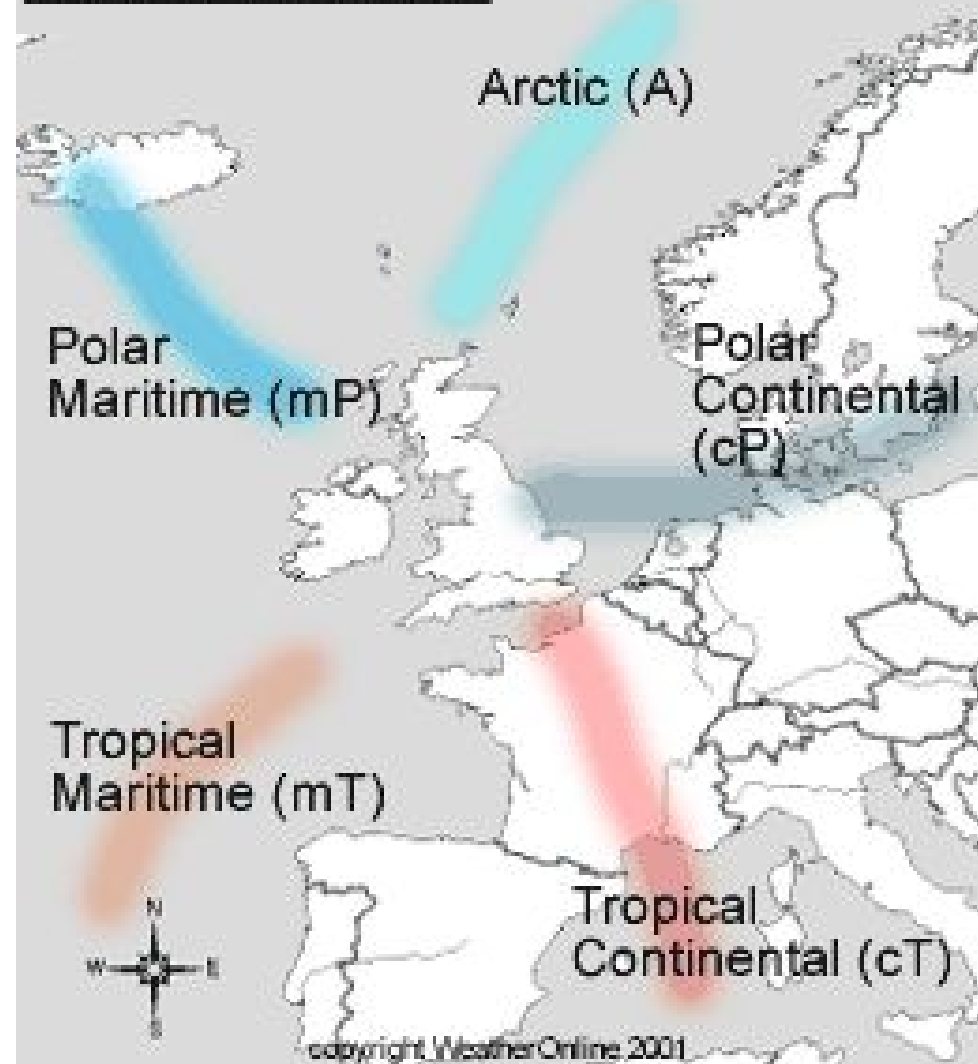
Air Masses

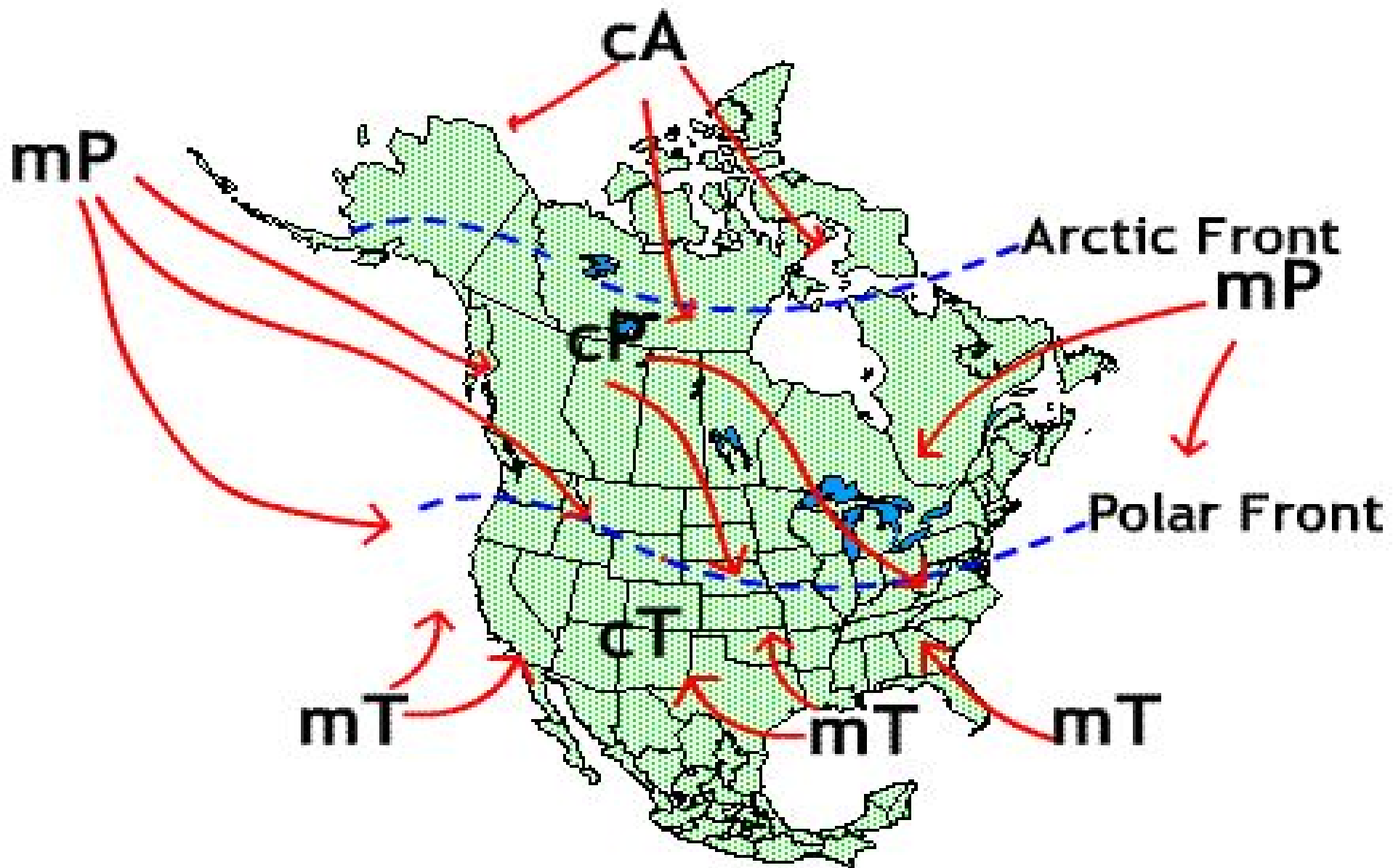
The Battle of the Weather Fronts

They are then put together to describe the air mass

- cT – dry warm
- cP – dry cold
- mT – humid warm
- mP – humid cold

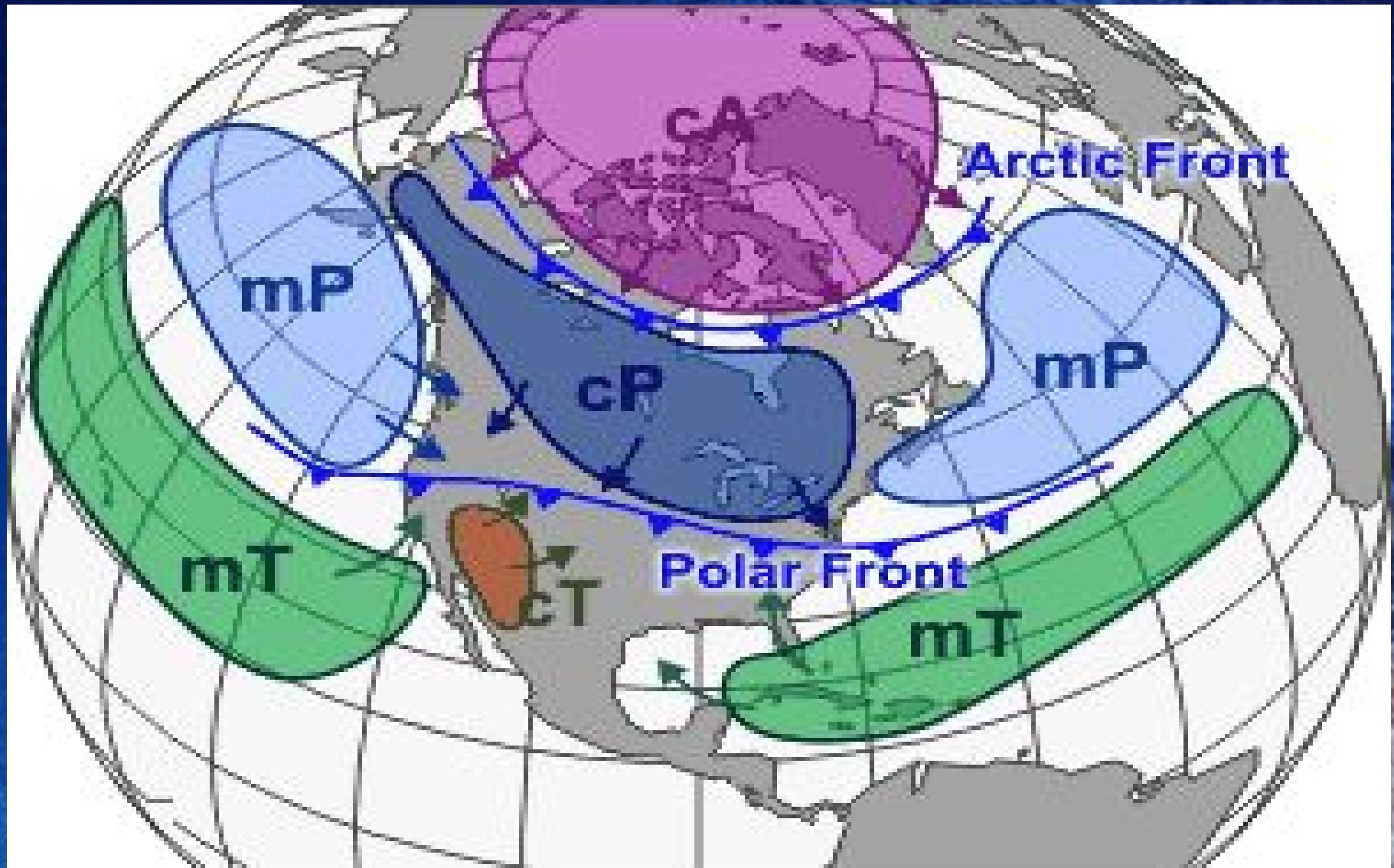
Air masses over Britain



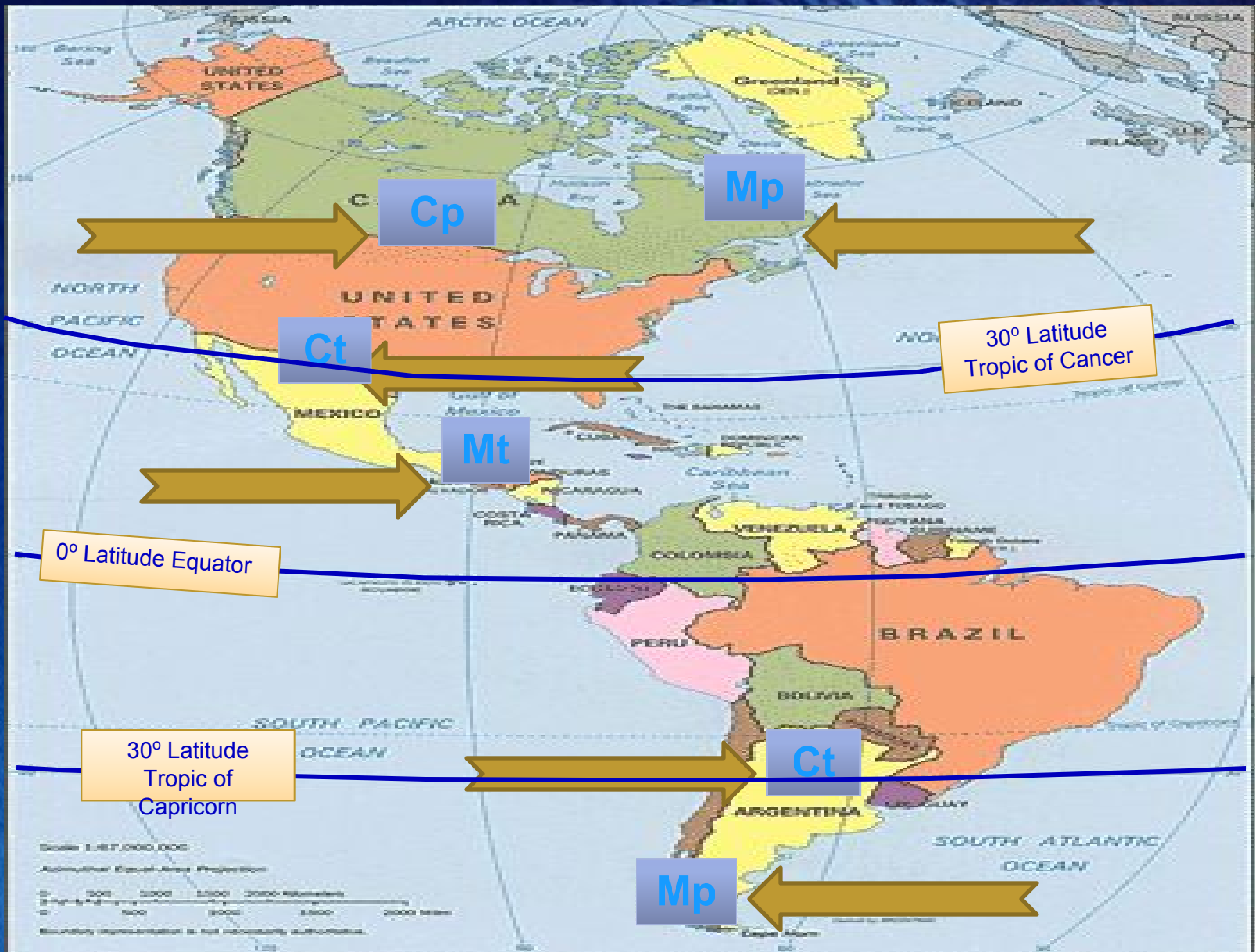


Air Masses of North America

North America Air Masses



Type of Air Masses

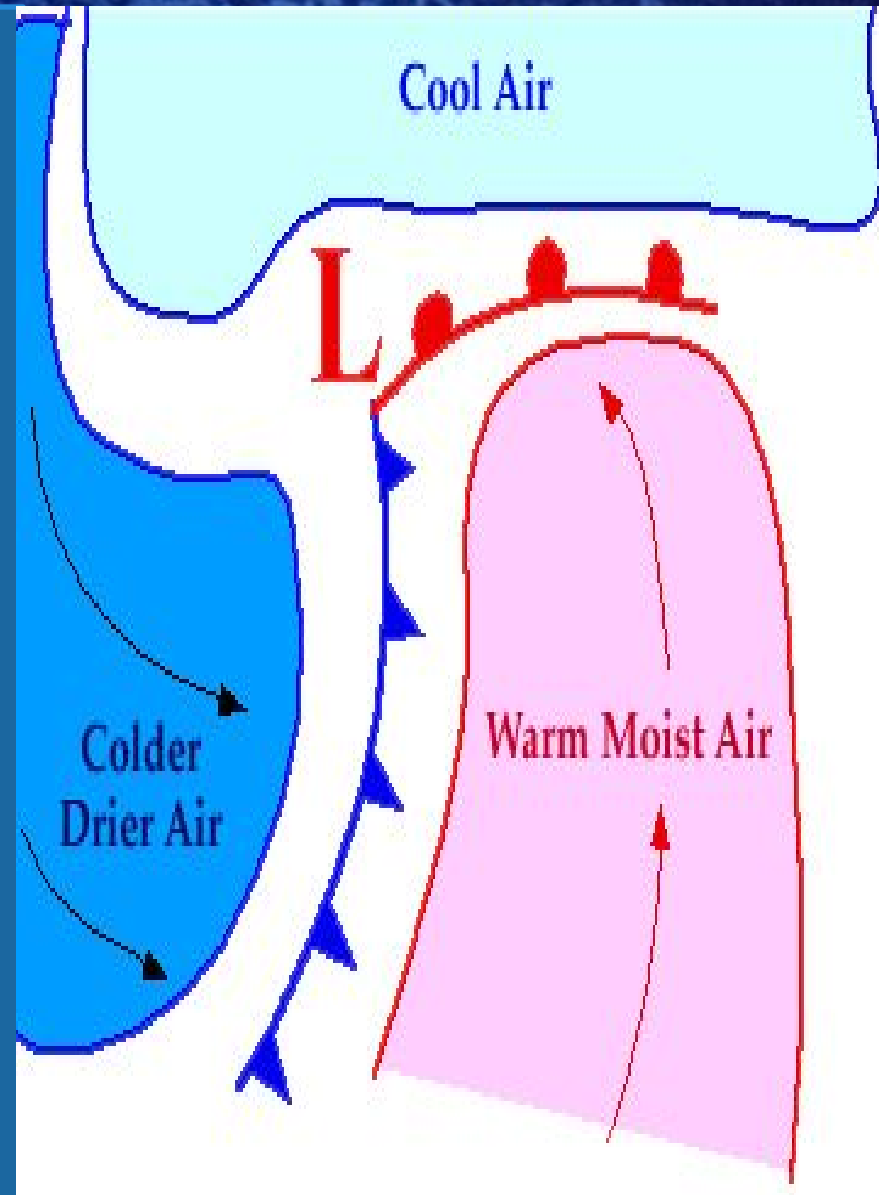




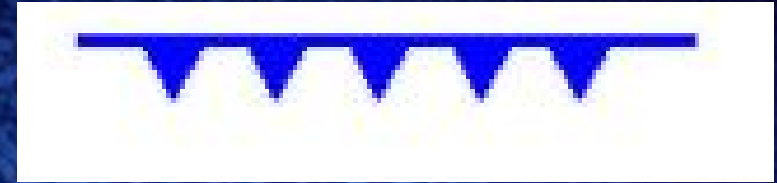
Fronts

Fronts

- the boundary where two air masses that have different characteristics meet
- There are different types of fronts
 - Cold
 - Warm
 - Stationary
 - Occluded



Cold Front

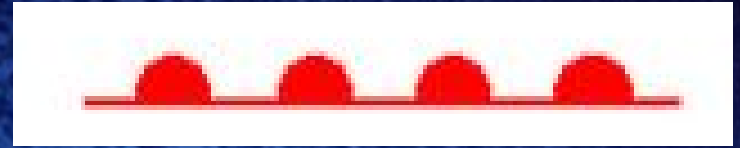


- The cold dense air behind a cold front pushes the warmer air up forming cumulus clouds
- A cold front usually moves fast and causes showers and thunderstorms

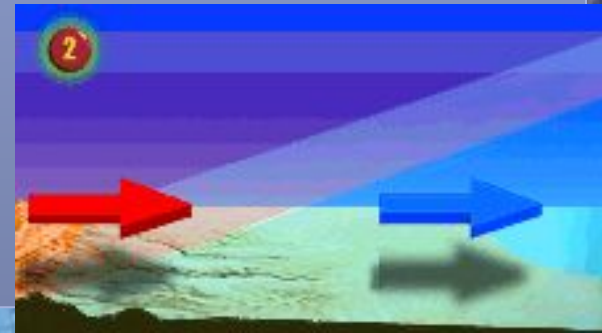


Warm Front

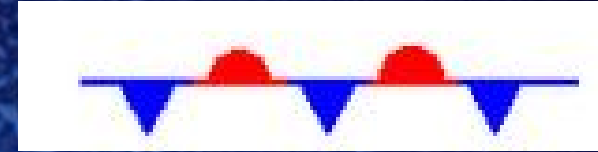
Front Animations



- The warm air behind a warm front pushes over the cooler air ahead of it forming stratus clouds
- A warm front causes steady rain, drizzle and fog



Stationary Front

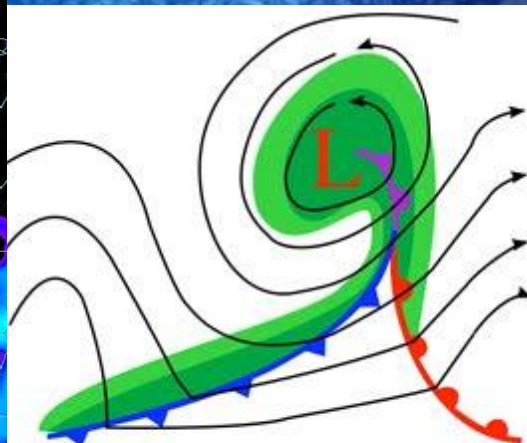
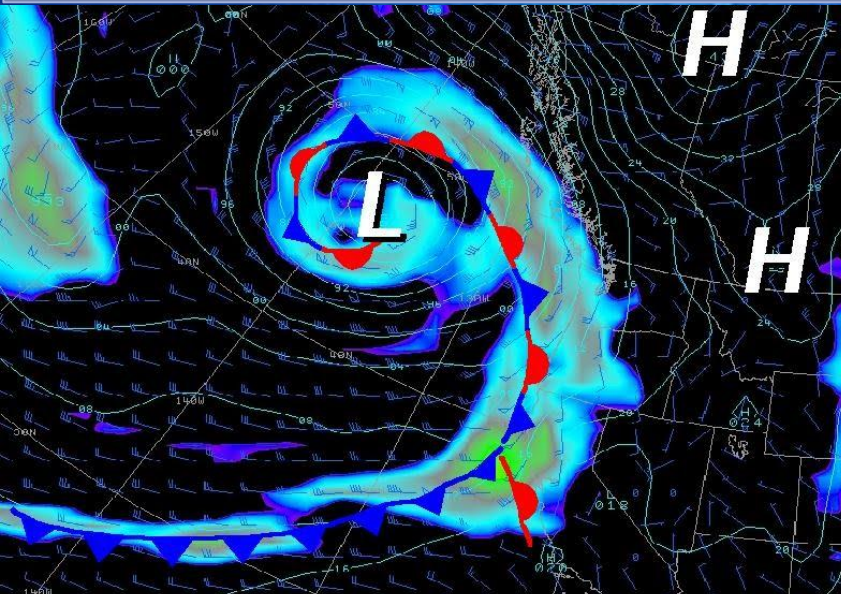


- A stationary front occurs when a front stops moving
- The air is unsteady and sometimes causes rain, and sometimes causes showers

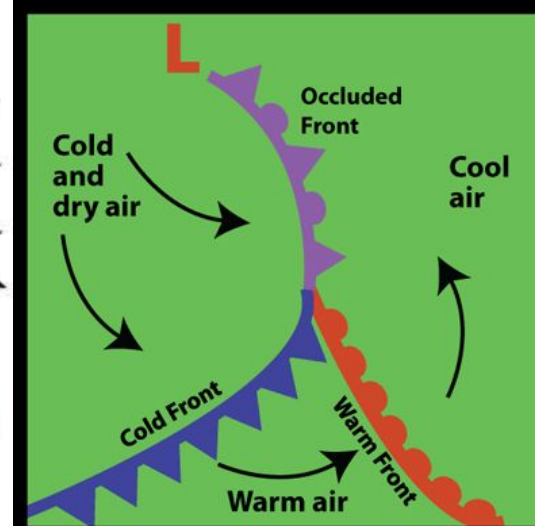


Occluded Front

- An occluded front occurs when two cooler air masses merge, forcing warmer air to rise between them
- Weather similar to a warm front

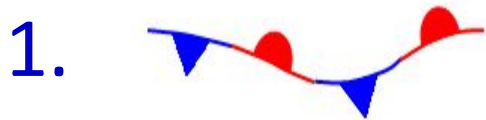


Occluded Front (the cold front has moved under the warm front)



Let's See what you Know

Which statements go with each front below?
There are multiple answers for each front



- Severe rain with thunderstorms.
- Steady rain.
- Conditions do not change until another system moves through.




- Advancing cold air replaces warmer air.
- Warmer, more humid temperatures after frontal passage.

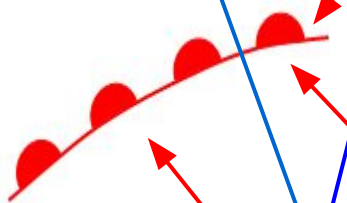


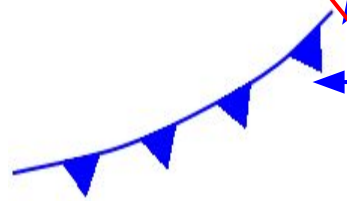
- Cooler, and drier air after frontal passage.
- Warm air replaces cooler air.
- Warm air and cold air block each other.

Let's See what you Know

Which statements go with each front below?
There are multiple answers for each front

1. 

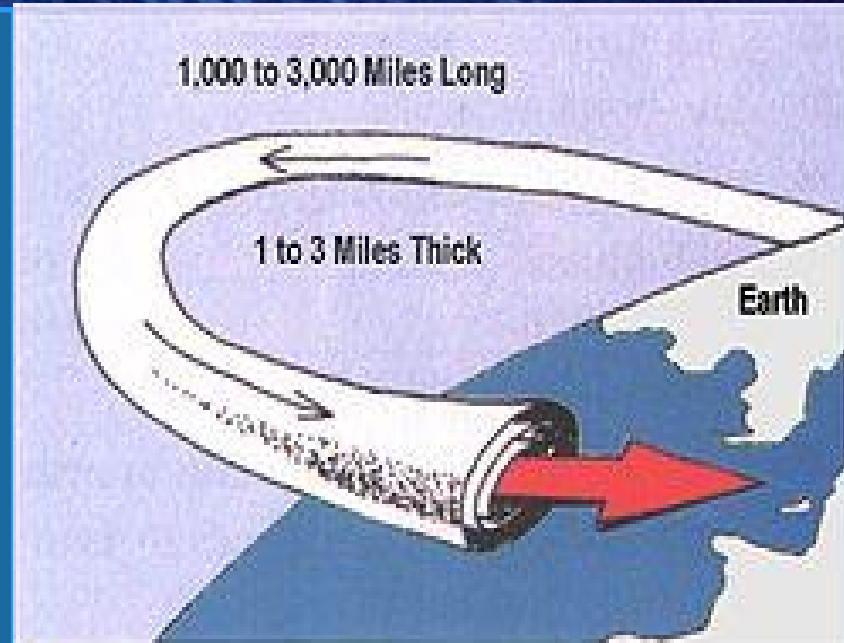
2. 

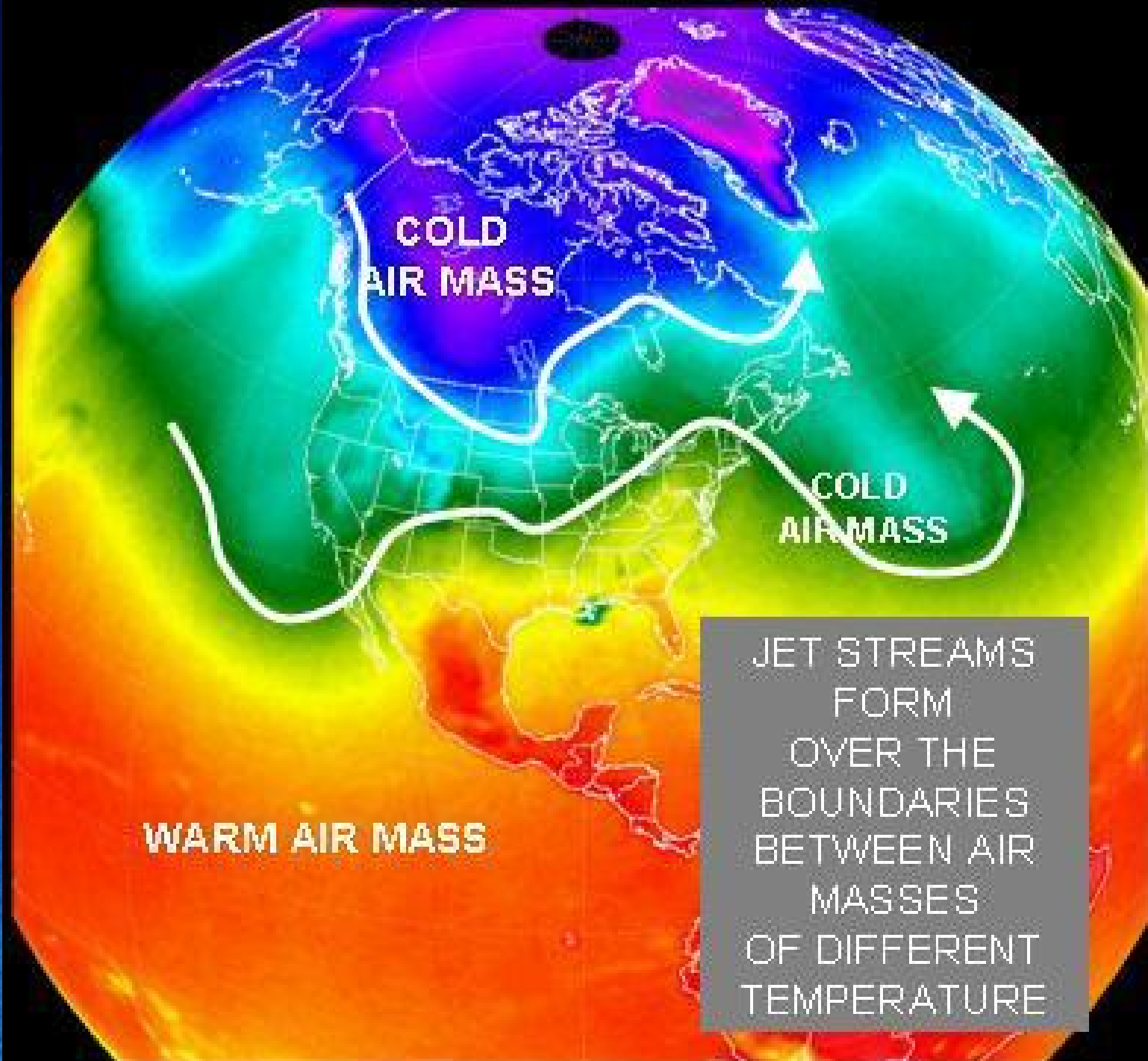
3. 

- Severe rain with thunderstorms.
- Steady rain.
- Conditions do not change until another system moves through.
- Advancing cold air replaces warmer air.
- Warmer, more humid temperatures after frontal passage.
- Cooler, and drier air after frontal passage.
- Warm air replaces cooler air.
- Warm air and cold air block each other.

THE JET STREAM

- The jet stream is a river of fast moving air high in the atmosphere that pushes fronts and controls other weather patterns
- Usually blows **west to east** (200 to 400 km/hr)
 - Airplanes are aided by jet streams when traveling east
 - They form over the boundaries between air masses of different temperatures





**COLD
AIR MASS**

**COLD
AIR MASS**

WARM AIR MASS

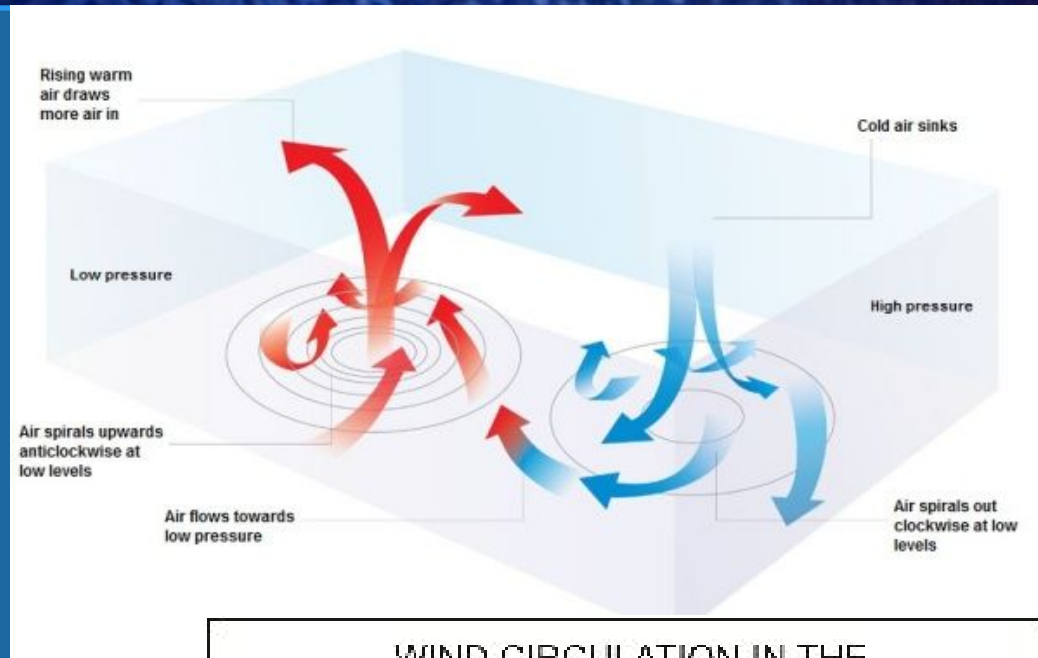
JET STREAMS
FORM
OVER THE
BOUNDARIES
BETWEEN AIR
MASSES
OF DIFFERENT
TEMPERATURE



Pressure Systems

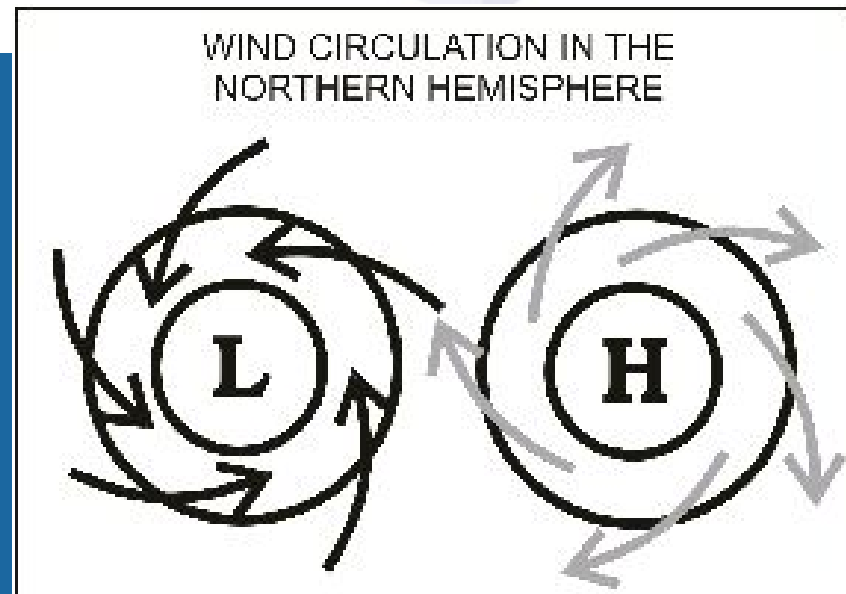
1) High Pressure

- winds go clockwise
- good weather
- few clouds
- no rain



2) Low Pressure

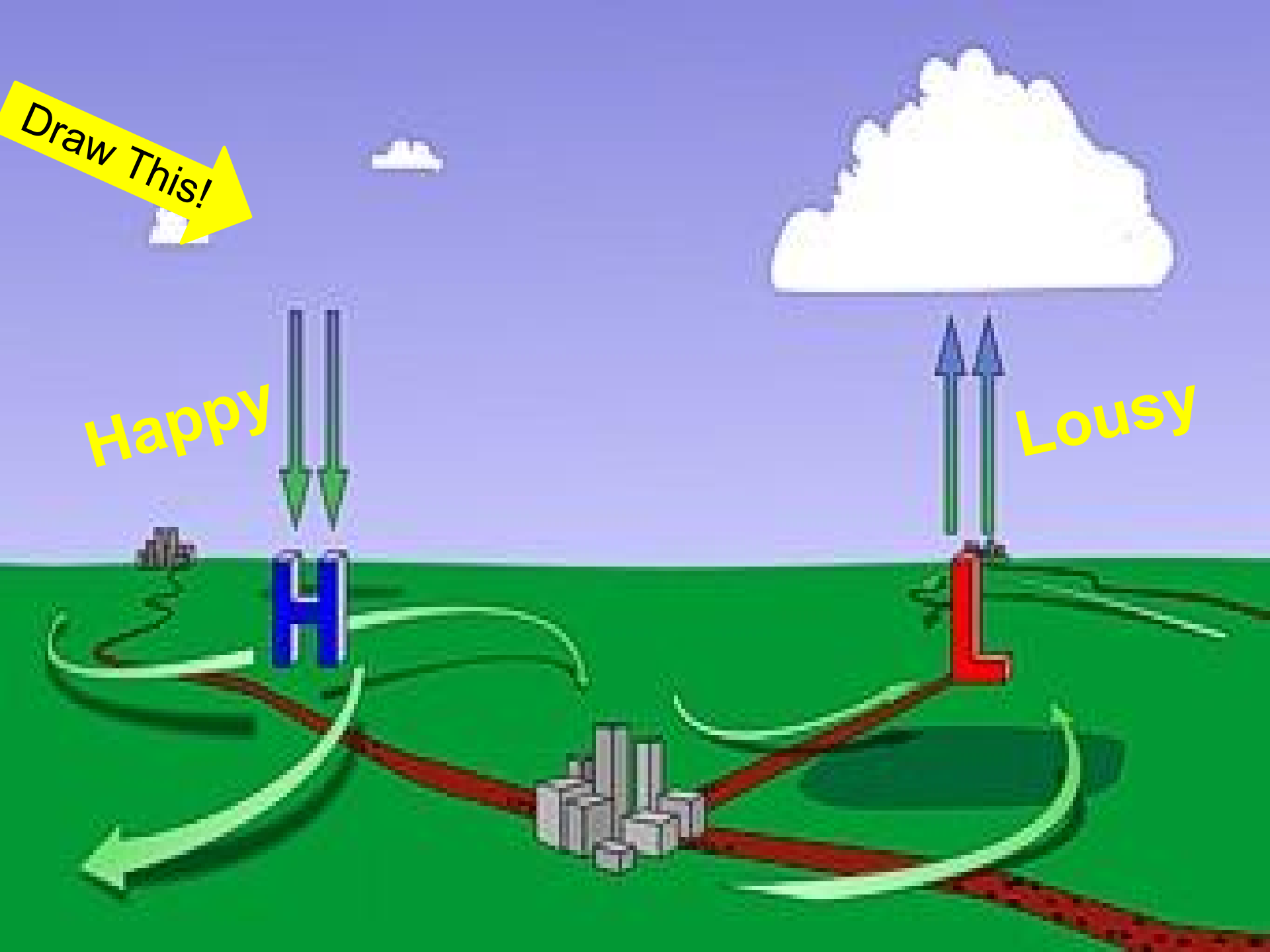
- winds go counter-clockwise
- usually means bad weather
- lots of clouds
- rain is more common



Draw This!

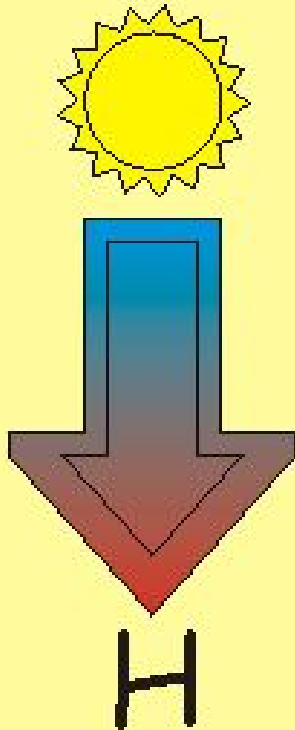
Happy

Lousy

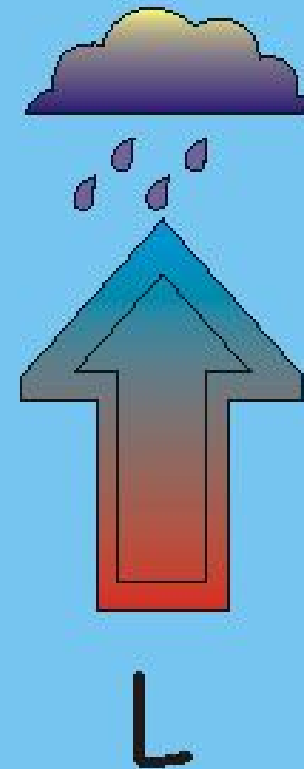


Pressure Systems

Weather Fronts and Pressure Systems



air falling produces
high pressure at the
Earth's surface and
clear, sunny skies



air rising produces
low pressure at the
Earth's surface and
rainfall

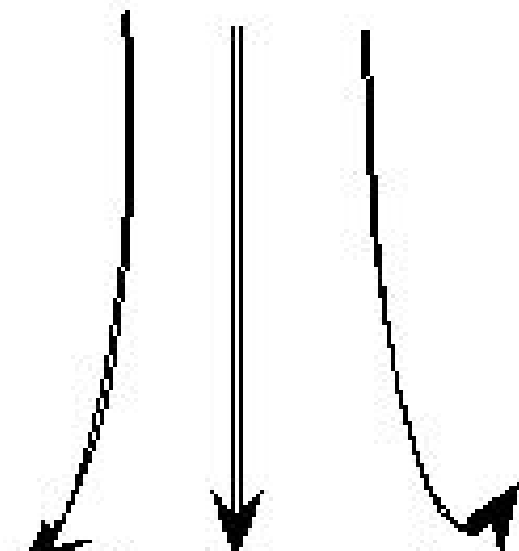
High Pressure



Calm, clear weather

H

Cold air sinks



Diverging winds

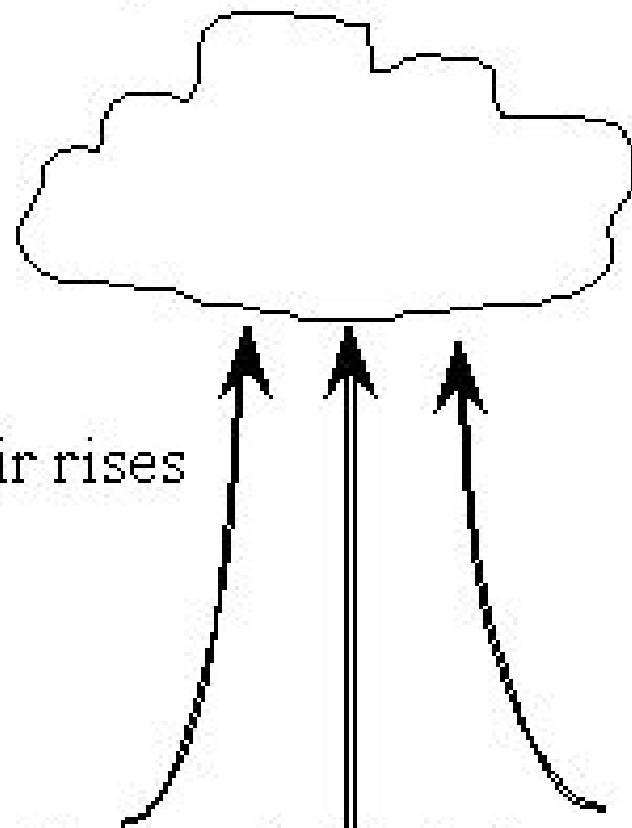
**HIGH PRESSURE
ANTICYCLONE**

Low Pressure

Stormy, cloudy weather

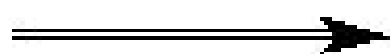
L

Hot air rises



Converging winds

**LOW PRESSURE
CYCLONE**



Weather Map Symbols

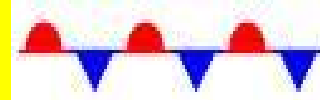
• Cold Front



• Warm Front



Stationary Front



Occluded Front



• High Pressure

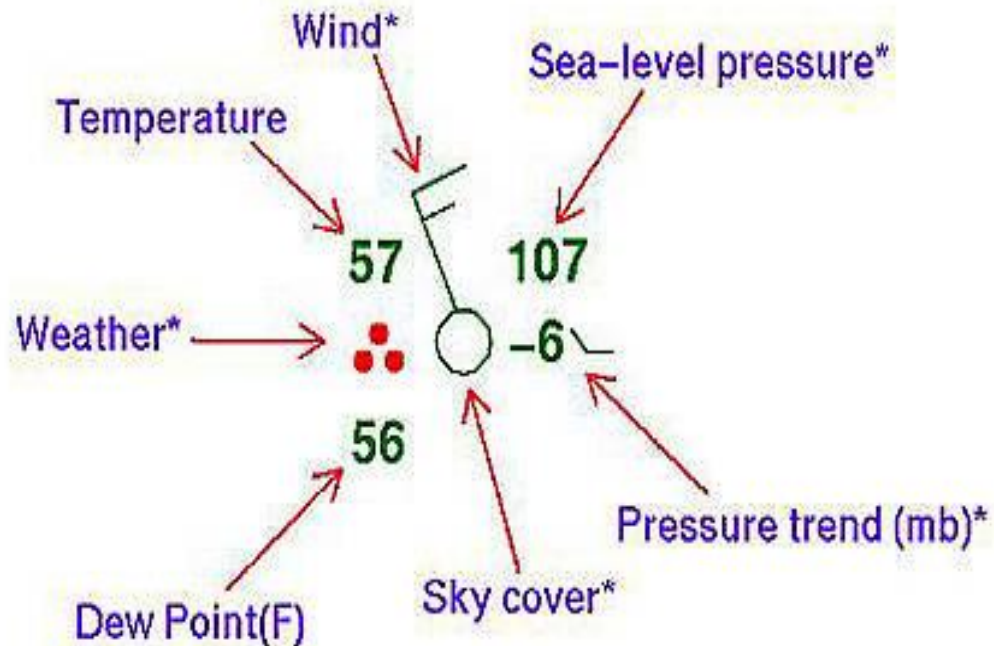


• Low Pressure



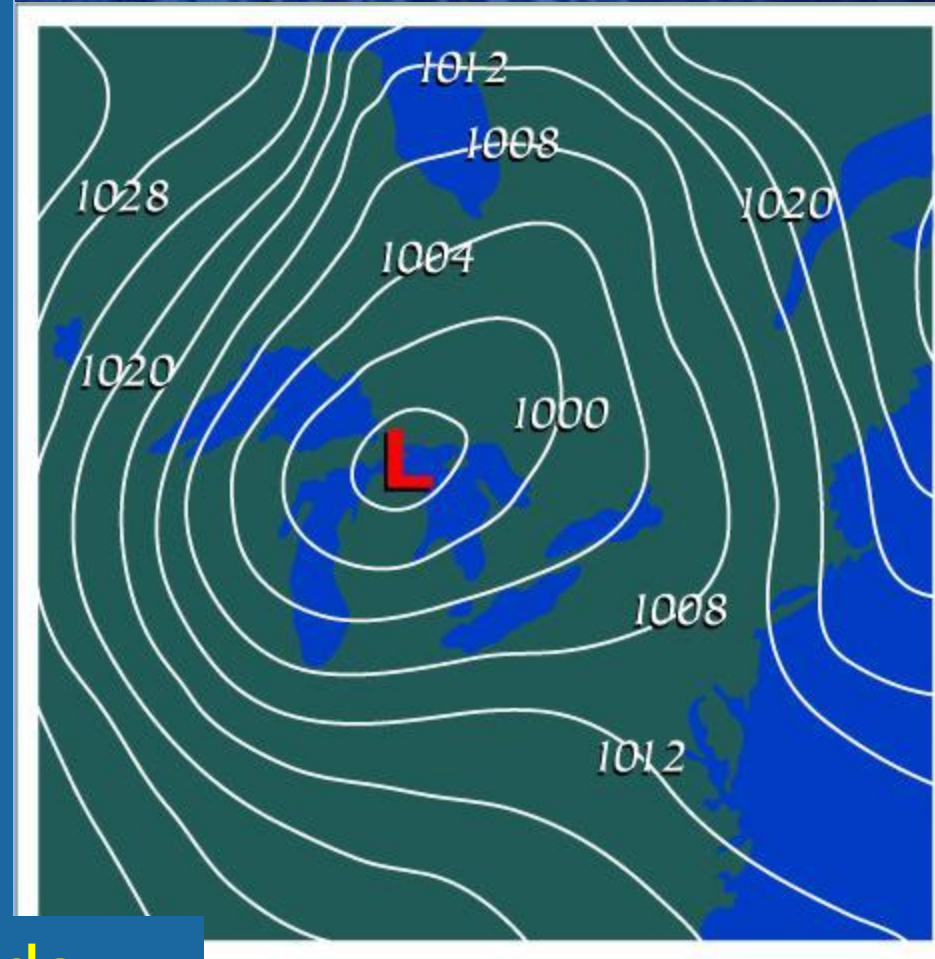
Cloud Coverage

- Clear
- ◐ 1/8ths
- ◑ Scattered
- ◒ 3/8ths
- ◓ 4/8ths
- ◔ 5/8ths
- ◕ Broken
- ◖ 7/8ths
- ◗ Overcast
- ⊗ Obscured
- ⊙ Missing



Isobars

- lines on a map that connect areas of equal atmospheric pressure
- highest wind speeds are found where the isobars on a weather map are spaced closest together
- close lines = faster winds
- wide lines = slower winds



Wind



Isobars FAR
apart =
slower winds



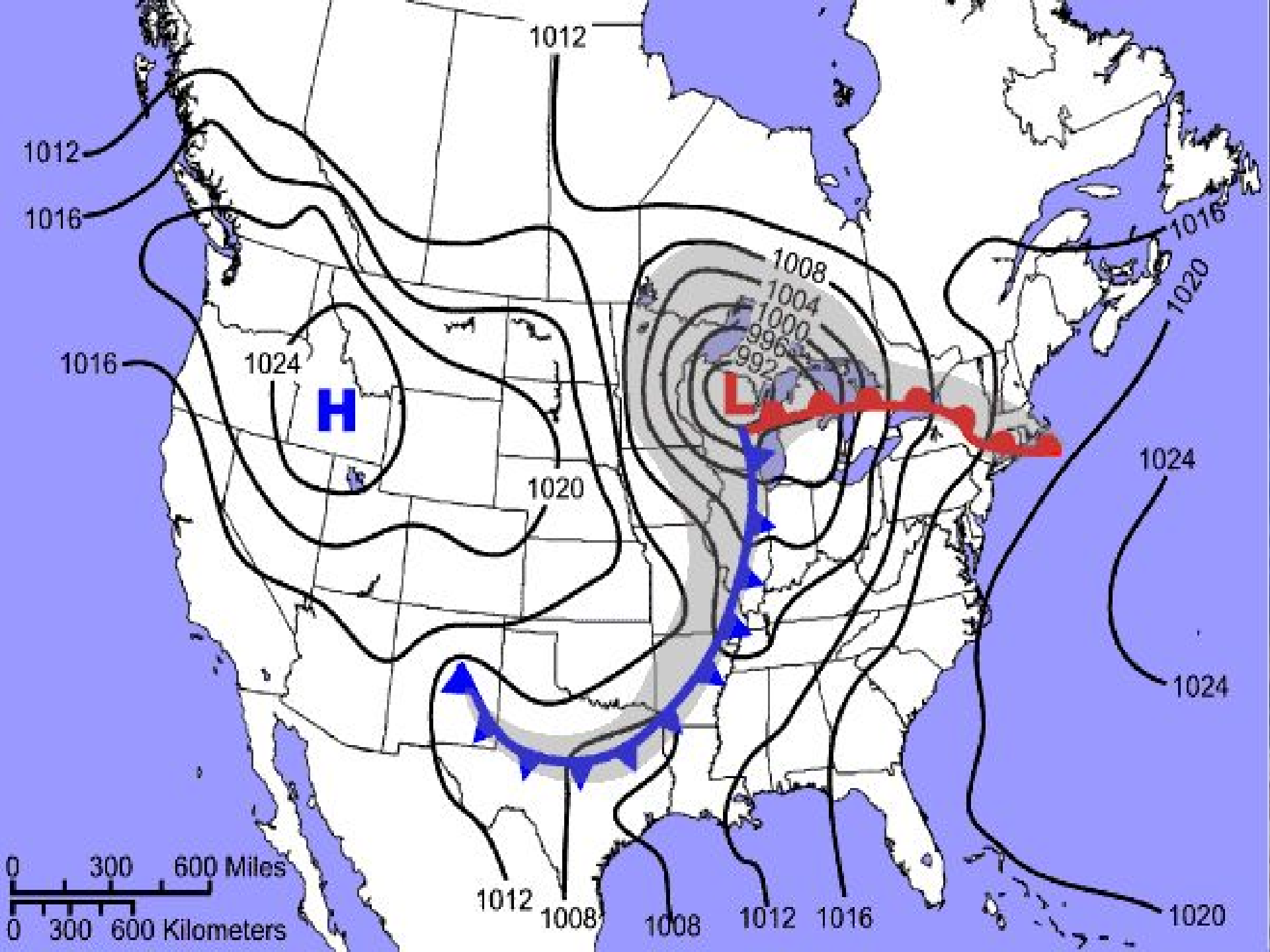
High pressure



Isobars CLOSE
together =
faster winds



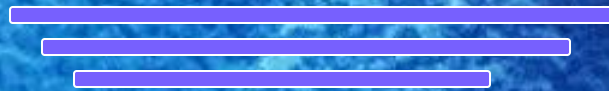
Low pressure

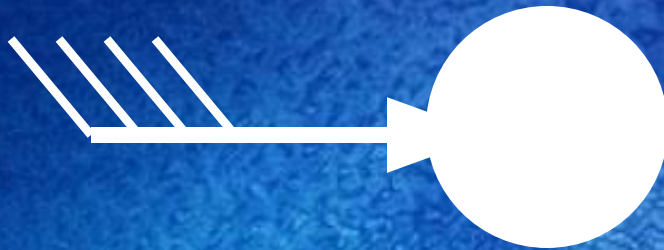
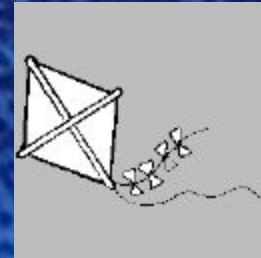


Wind Direction

Winds are named for the direction
that they come

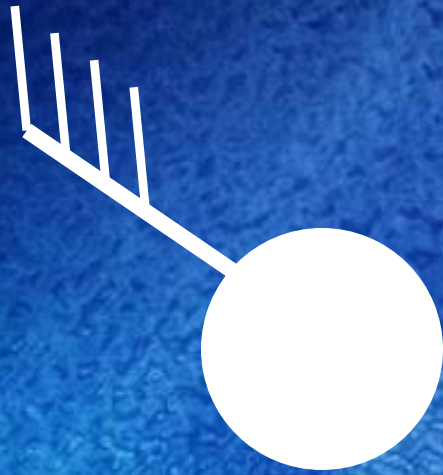
FROM





Westerly Wind





North Westerly Wind



Southern Wind



Wind Symbols: Speed



Calm



Less than 5kts









5 kts



10 kts



50 kts

Examples of wind speed and direction plots		
Calm 	NW / 5 kts 	SW / 20 kts 
E / 35 kts 	N / 50 kts 	W / 105 kts 

Now You Try It



15kts



20kts



30kts



40kts



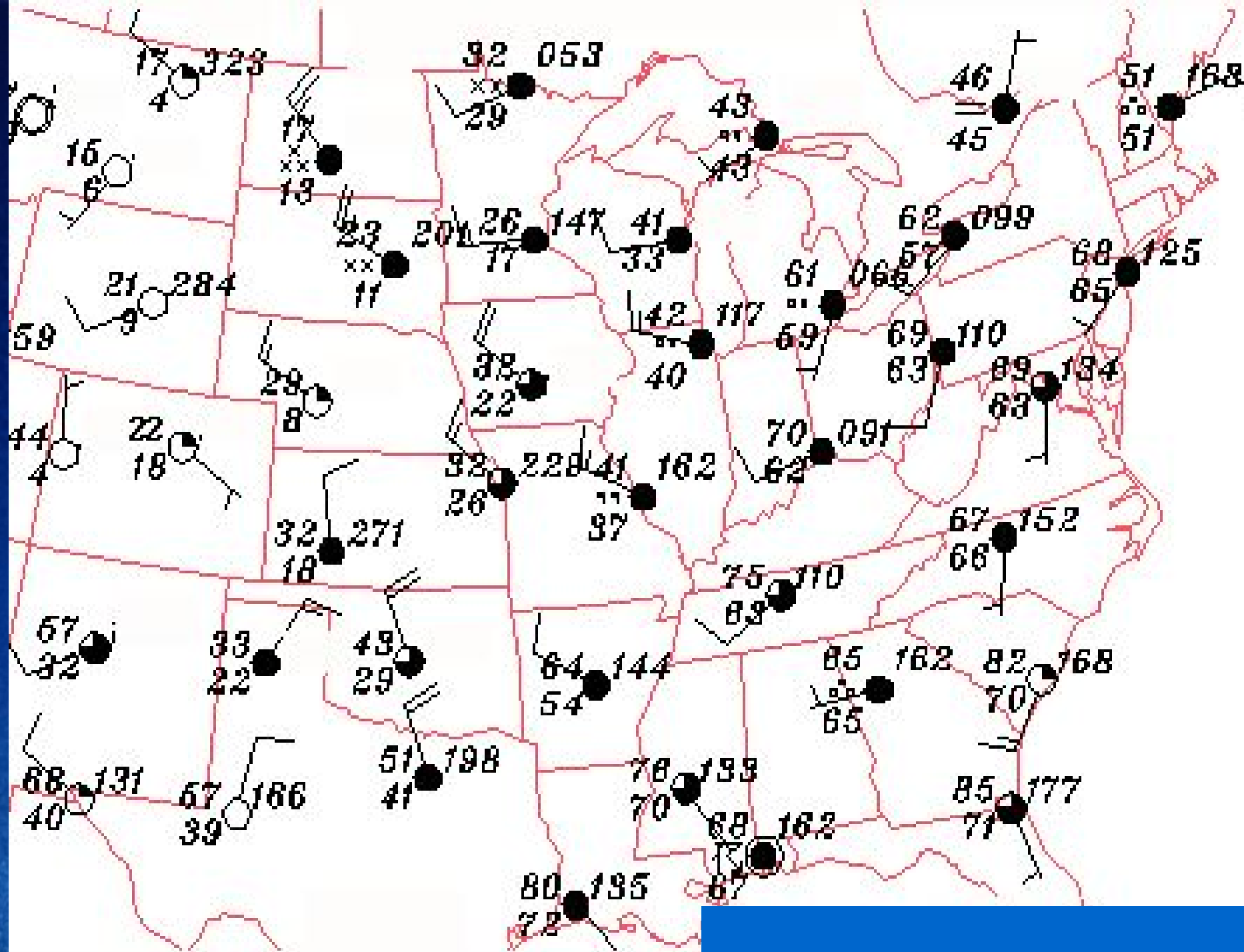
45kts



25kts



35kts



Current Surface Winds (kts)

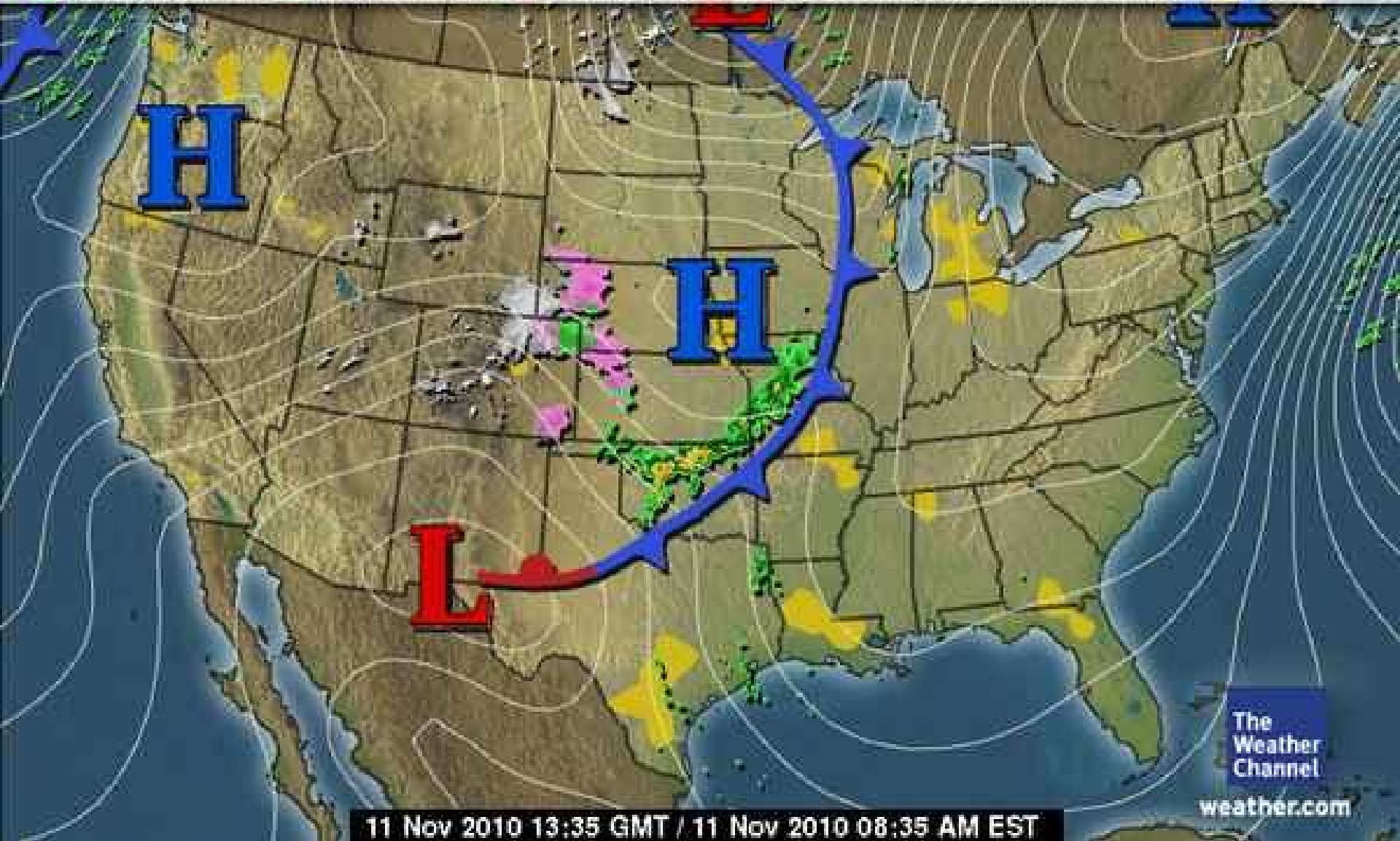


27 Sep 2002 05:08 AM EDT



Current Surface

LT RAIN/DRIZZLE MOD/HVY RAIN RAIN/ICE/SNOW LT SNOW/FLUR MOD/HVY SNOW FOG



11 Nov 2010 13:35 GMT / 11 Nov 2010 08:35 AM EST

The Weather Channel
weather.com