

Weather

8.10 B identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts.

8.10 C identify the role of the oceans in the formation of weather systems such as hurricanes.

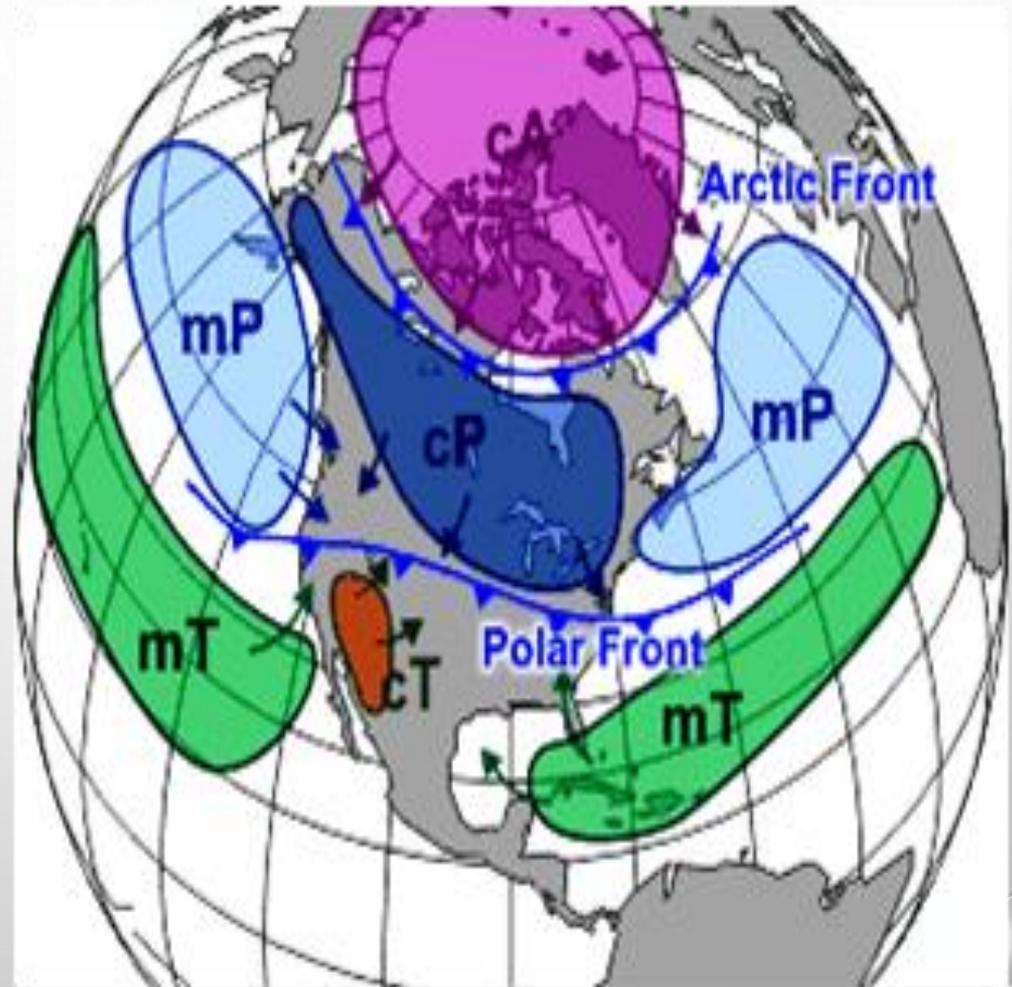
Weather

Essential questions

- ✓ How do global patterns of atmospheric movement influence local weather?
- ✓ How are weather maps used to identify global patterns of atmospheric movement?
- ✓ What is the role of oceans in the formation of weather systems such as hurricanes?

Air Masses

- ▶ Air masses are large areas of air that have the same temperatures and humidity.
- ▶ Weather changes occur as air masses move.



Air Masses

Where Formed	Properties	Stability
cP (<u>C</u> ontinental <u>P</u> olar):	Dry, Cold	Stable
cT (<u>C</u> ontinental <u>T</u> ropical):	Dry, Hot	Stable Air Aloft, Unstable At The Surface
mP (<u>M</u> aritime <u>P</u> olar):	Moist, Cool	Unstable
mT (<u>M</u> aritime <u>T</u> ropical):	Moist, Warm	Unstable

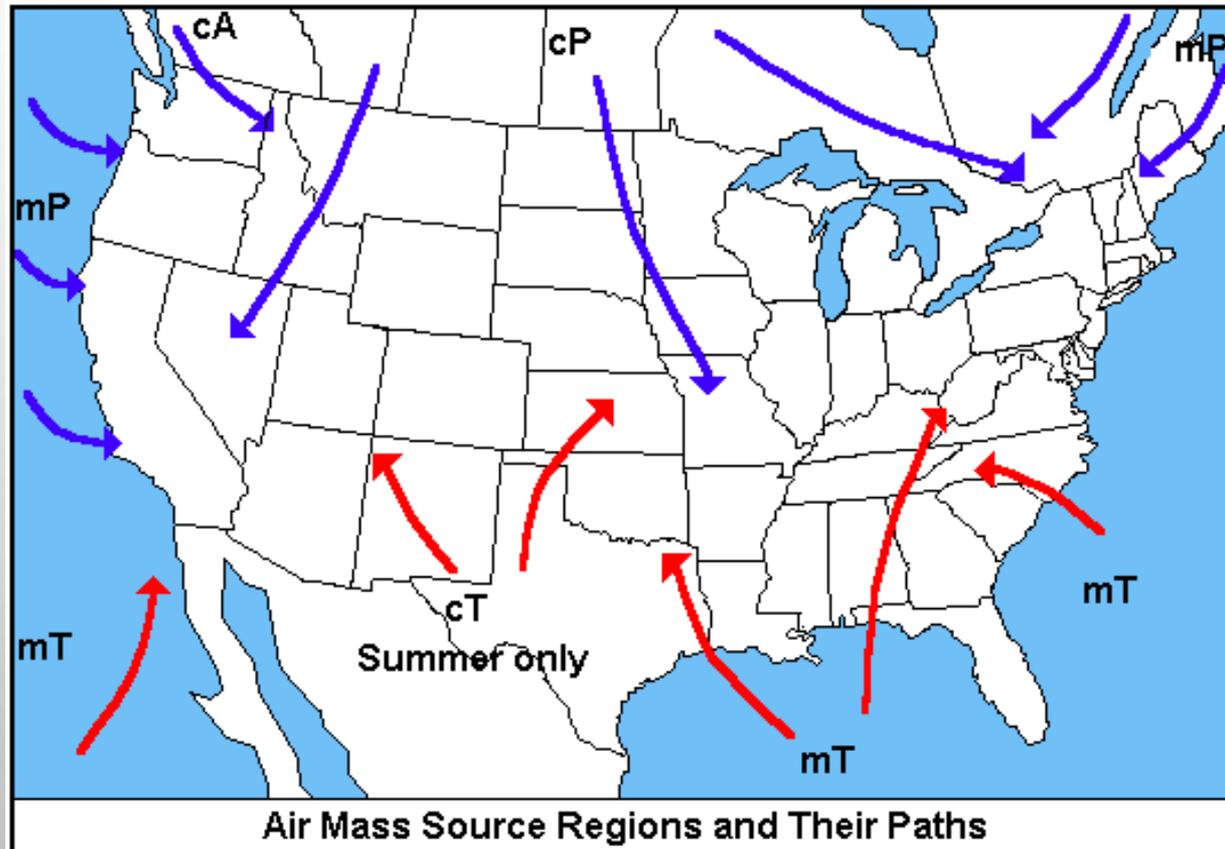
Air masses formed over Continents are **DRY**

Air masses formed over Water are **MOIST**

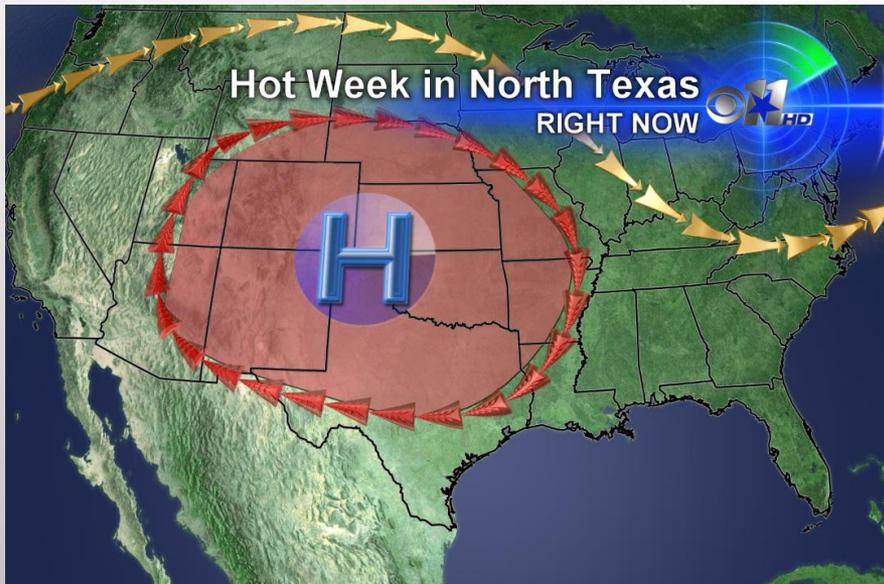
Air masses formed over Polar regions are **COLD**

Air masses formed over Tropical regions are **WARM**

This map shows the air mass source regions and their paths.



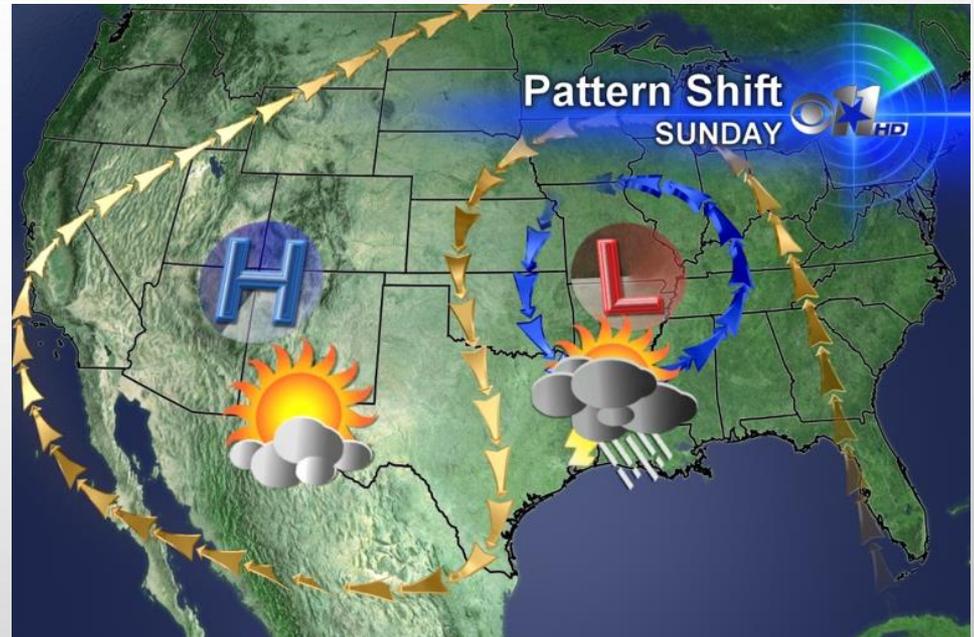
High Pressure System



- High pressure systems bring warm weather and clear skies.
- They spin clockwise.
- Map Symbol – capital **H** usually pictured in blue.

Low Pressure Sytem

- Low pressure systems bring stormy weather.
- They spins counter clockwise.
- Map Symbol – capital **L** usually pictured in red.

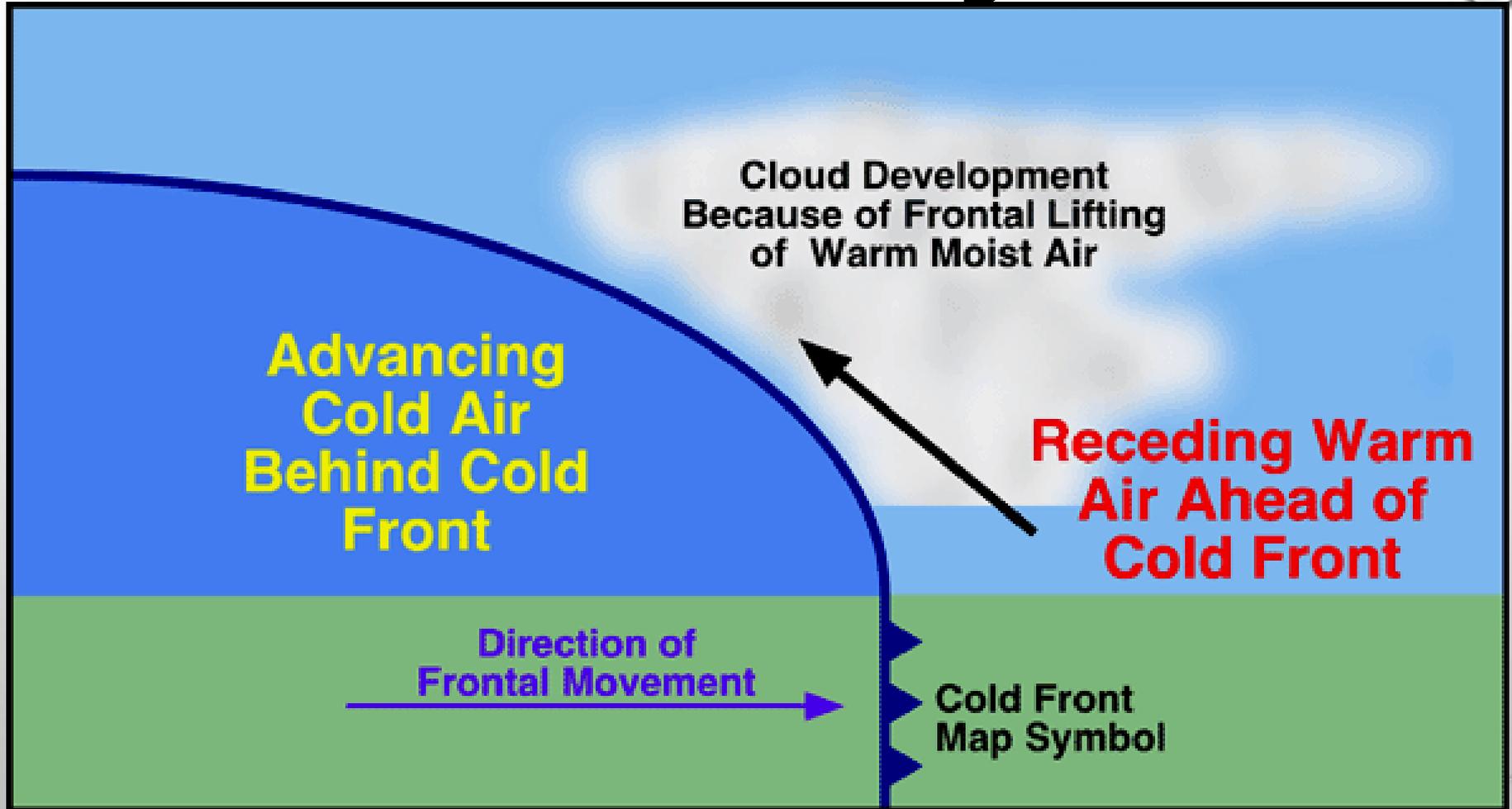


Cold Front

- Cold **dense** air pushes warm air out of the way.
- Cold fronts move very quickly and bring short periods of rain/thunderstorms.
- Lower temperatures are **behind** the front.
- Map Symbol – the direction of the “arrows” points towards the direction the front is moving.



Cold Front Diagram



Precipitation

- Warm, moist air rises.
- Cold air can hold less moisture than warm air
- As the moist air rises, it condenses and forms clouds.
- When the moisture gets heavy enough it falls as rain, snow, sleet or hail.

Warm Front

- Warm air moves up the cold front as it slowly **displaces** the cold air.
- Warm fronts move slowly, and bring many days of steady precipitation.
- Higher temperatures are **behind** the front.
- Map Symbol – direction of “half-moons” is the direction the front is moving



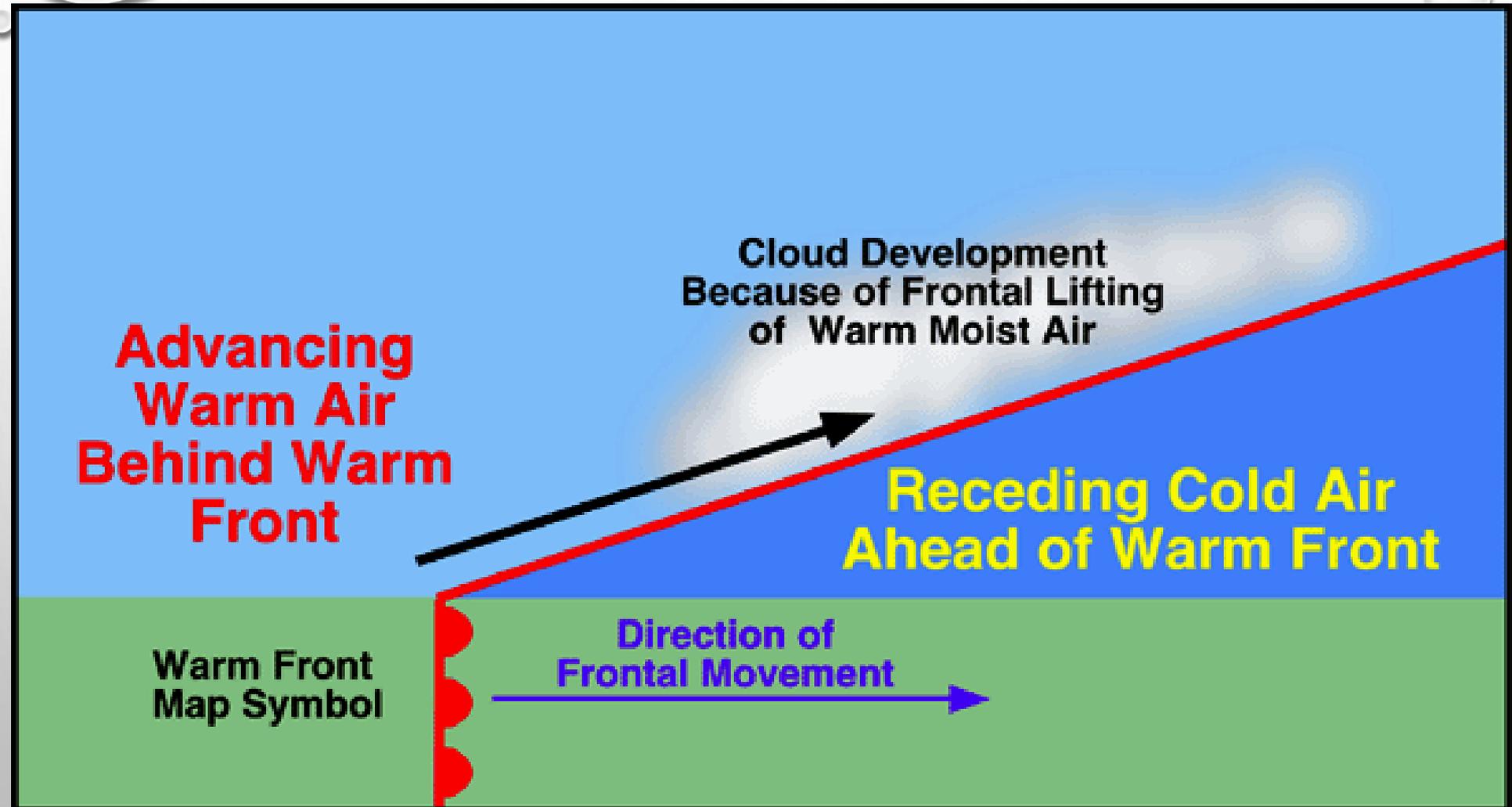
**Advancing
Warm Air
Behind Warm
Front**

Cloud Development
Because of Frontal Lifting
of Warm Moist Air

**Receding Cold Air
Ahead of Warm Front**

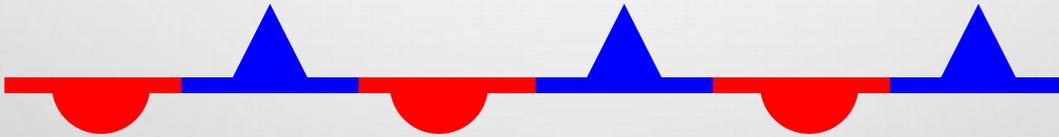
Warm Front
Map Symbol

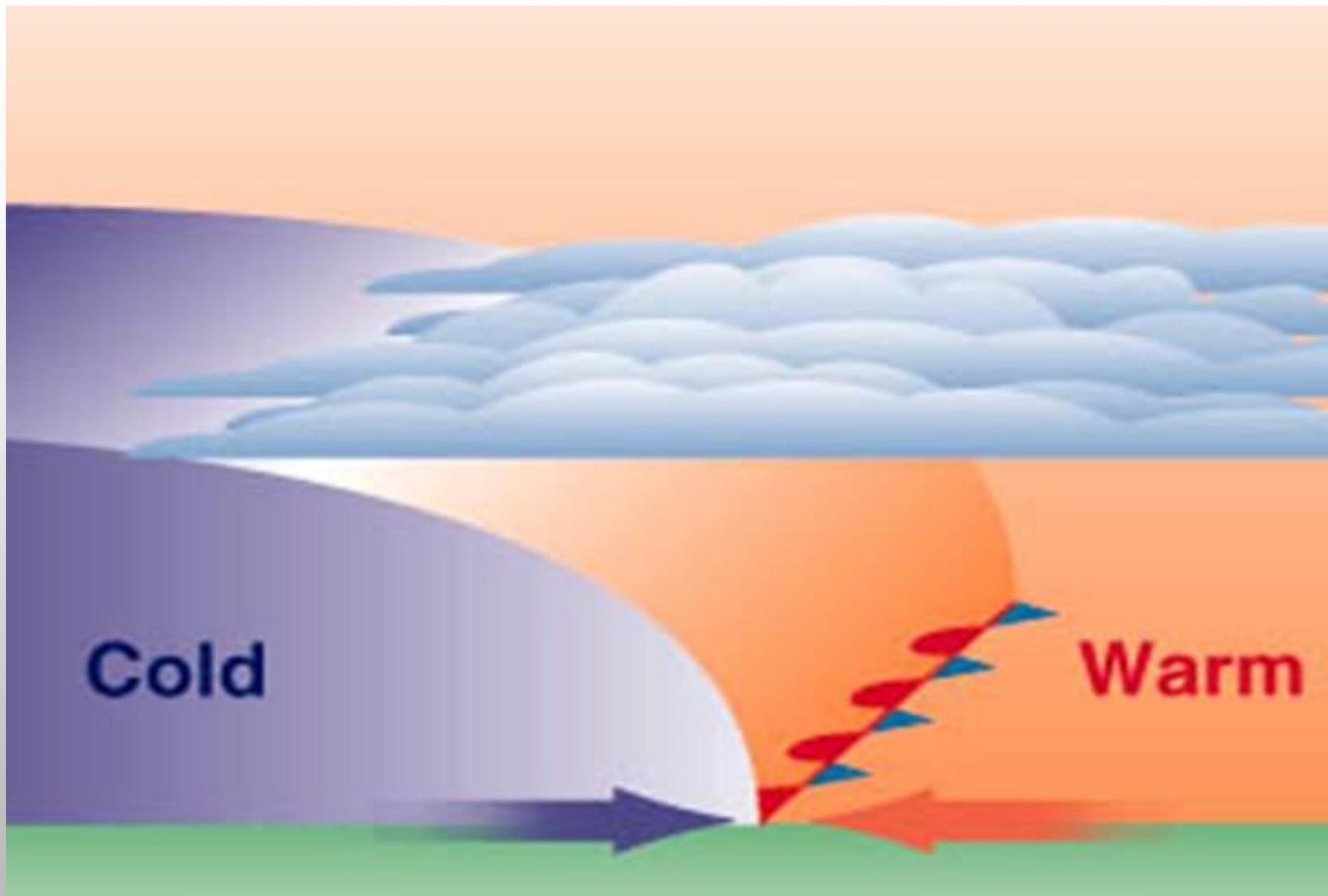
Direction of
Frontal Movement



Stationary Front

- The air from the warm front and cold front meet, but neither is strong enough to move the other.
- These fronts have the same weather as warm fronts.
- Map Symbol – warm and cold fronts are moving in opposite directions, thus making a stationary condition.

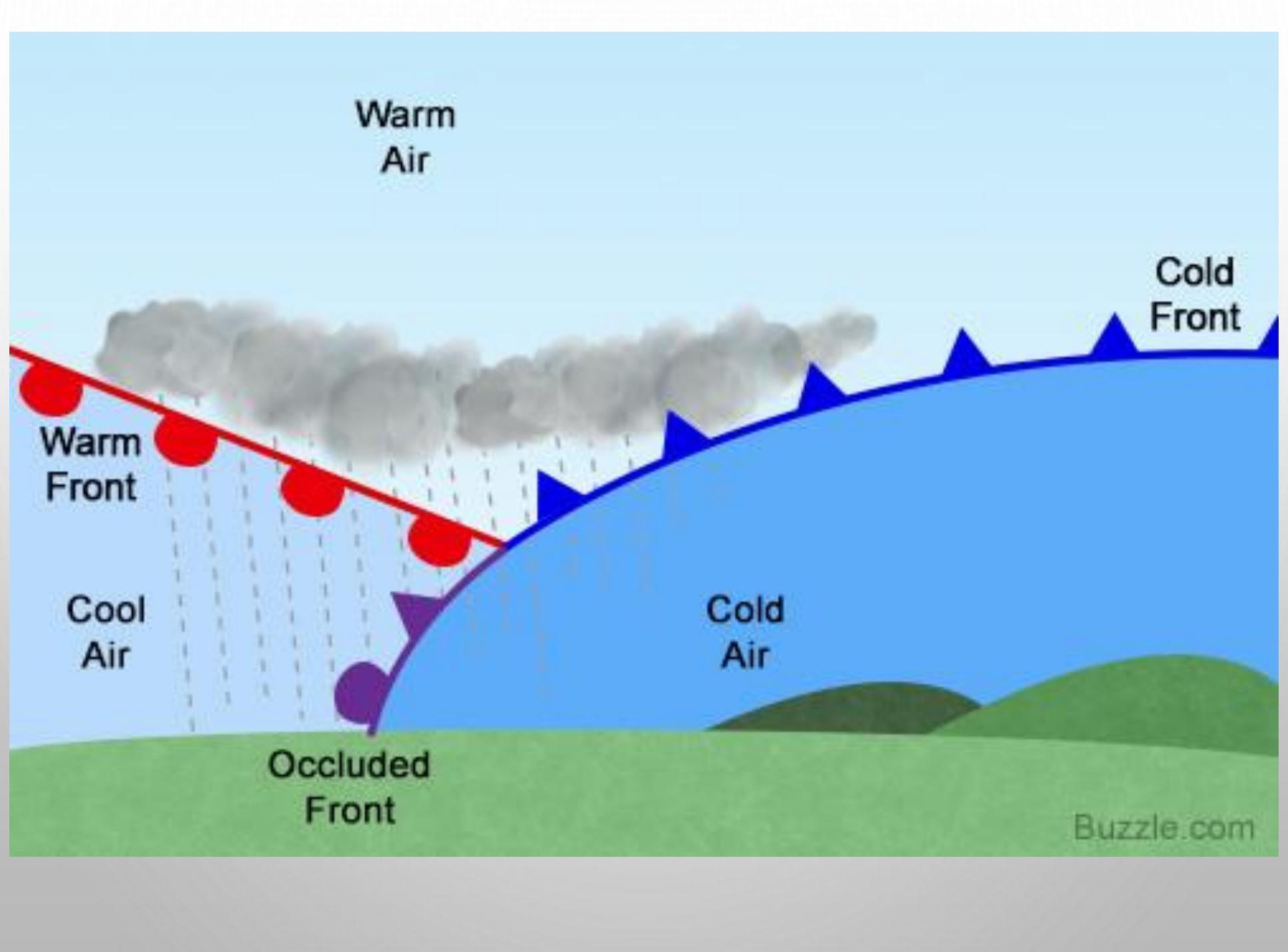




Occluded Fronts

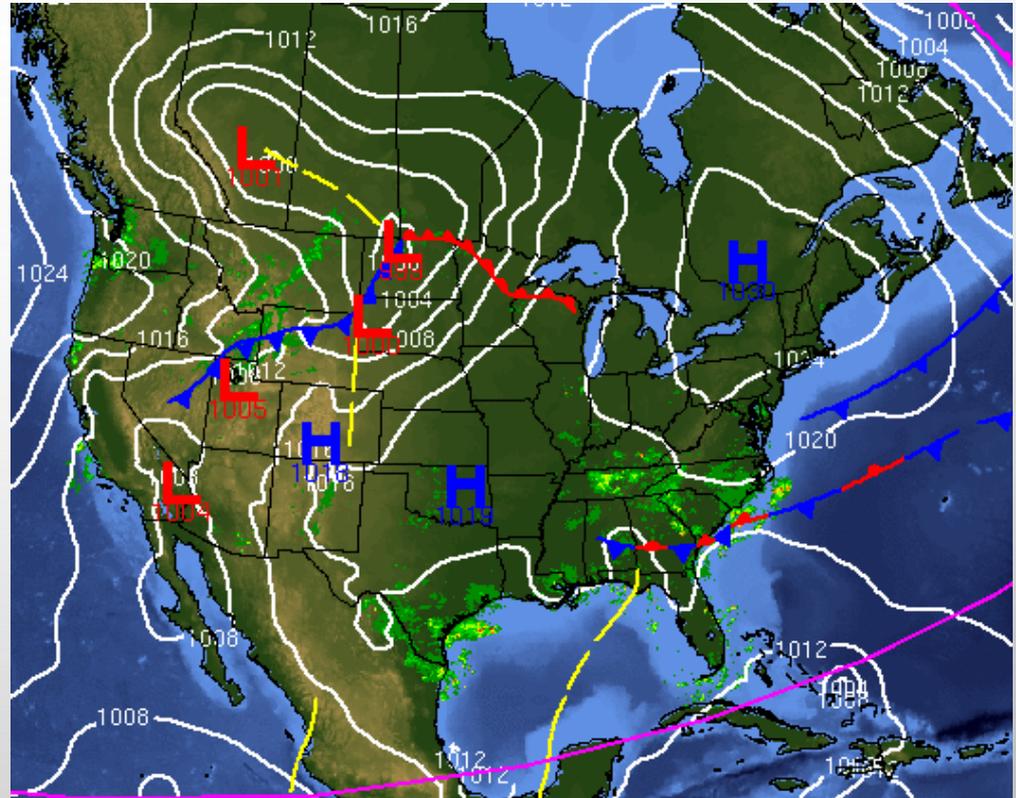
- Cold front overtakes warm front.
- Often found close to a low pressure center.
- Map Symbol - Purple halfmoons and triangles



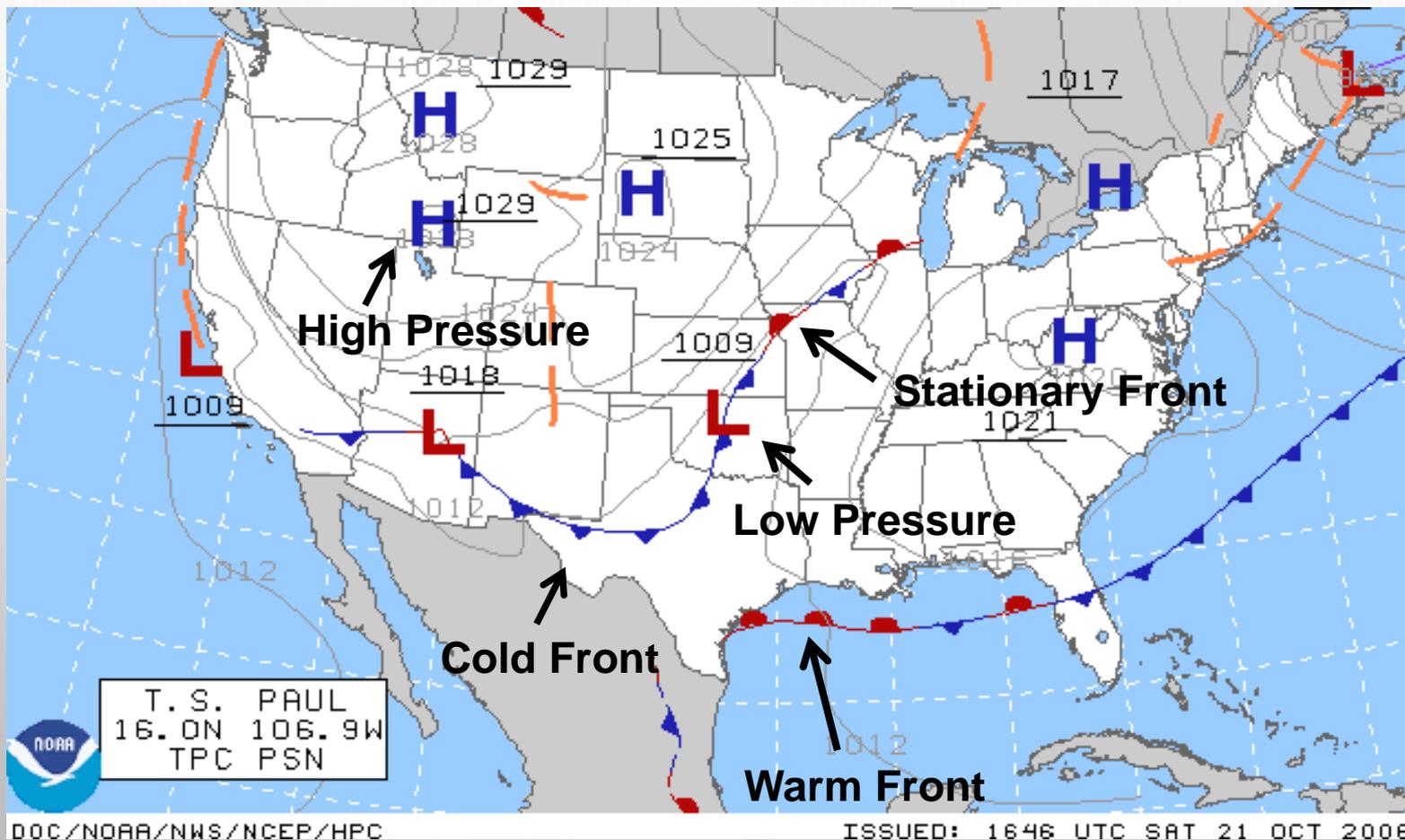


Weather Map

- A map that shows weather conditions and can be used to predict weather.

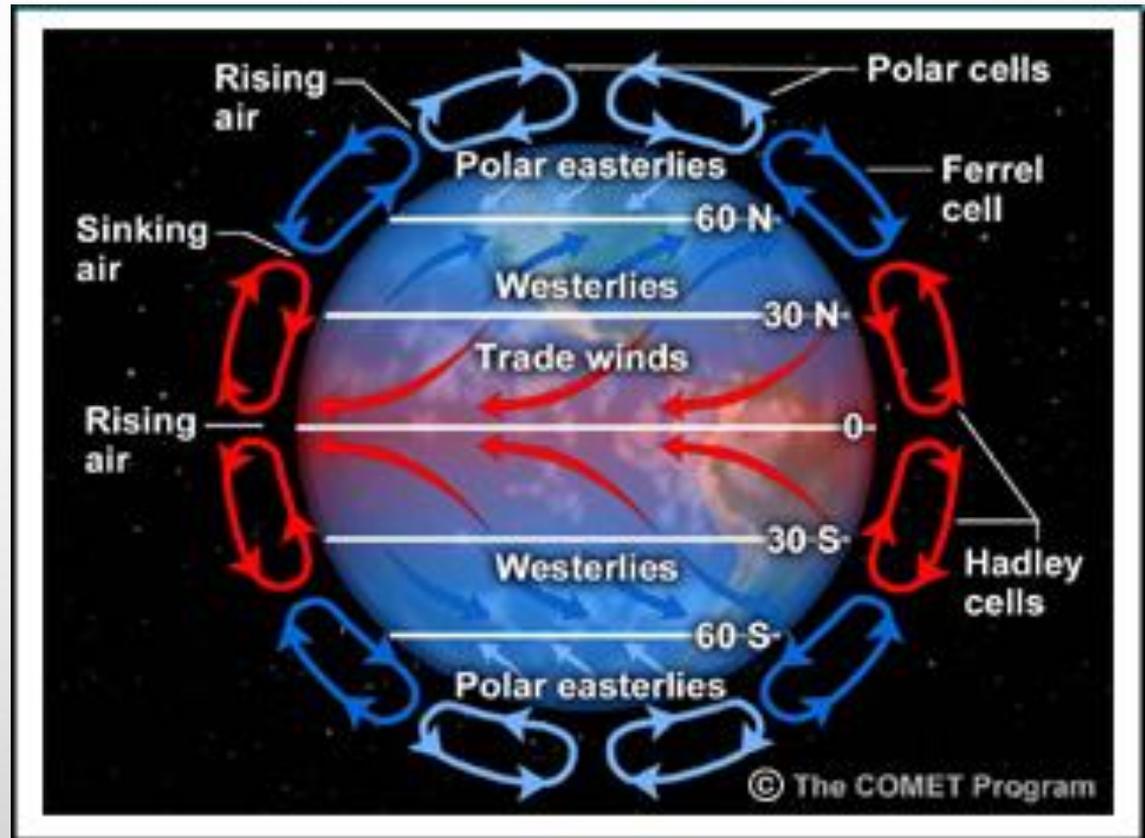


Weather Map



Global Patterns

- ▶ A global pattern is something that affects the entire world.
- ▶ Weather patterns are examples of global patterns.

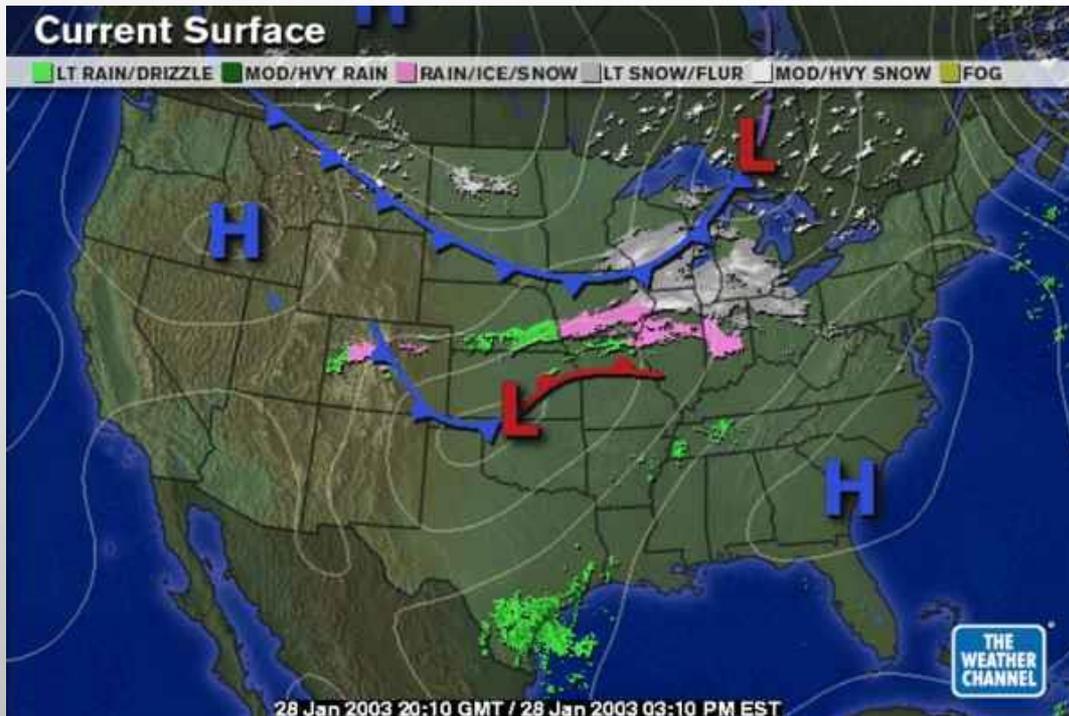


Jet Stream

- A jet stream is a fast flowing, “river” of air.
- They form at the boundaries of connecting air masses that have big differences in temperature, such as of the polar region (very cold air) and the warmer air to the south (very hot air).
- Because of the earth's rotation, jet streams flow west to east.



The Westerlies



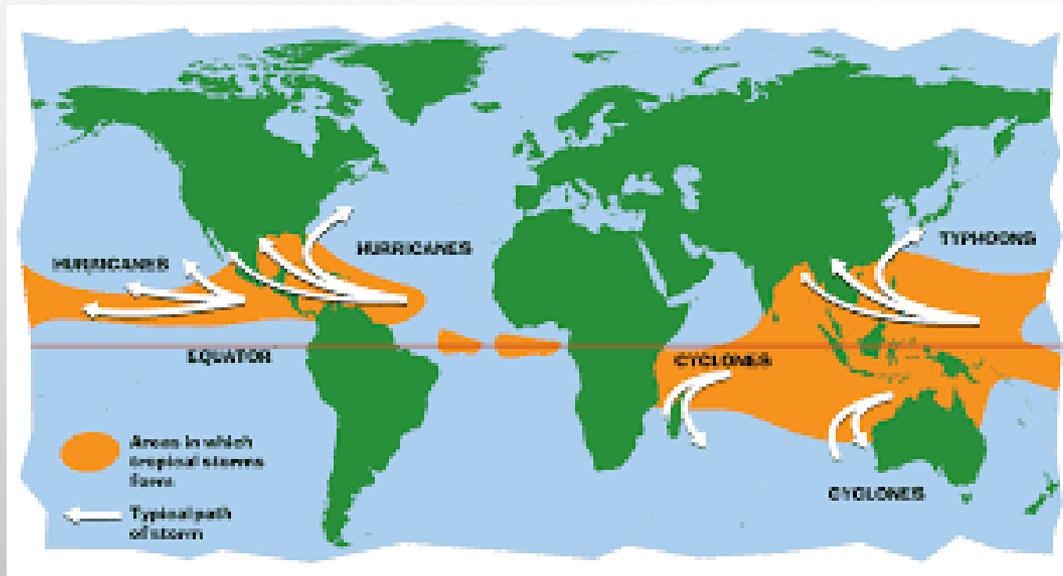
- Because of our latitude, most of our weather comes from the west
- Looking at the weather map, what type of weather might we expect?
- What type of weather might we expect in a few days?

What is a hurricane?

- A Hurricane is a large rotating storm with high speed winds that forms over warm waters in tropical areas.
- Hurricanes have sustained winds of at least 74 miles per hour and an area of low air pressure in the center called the eye.

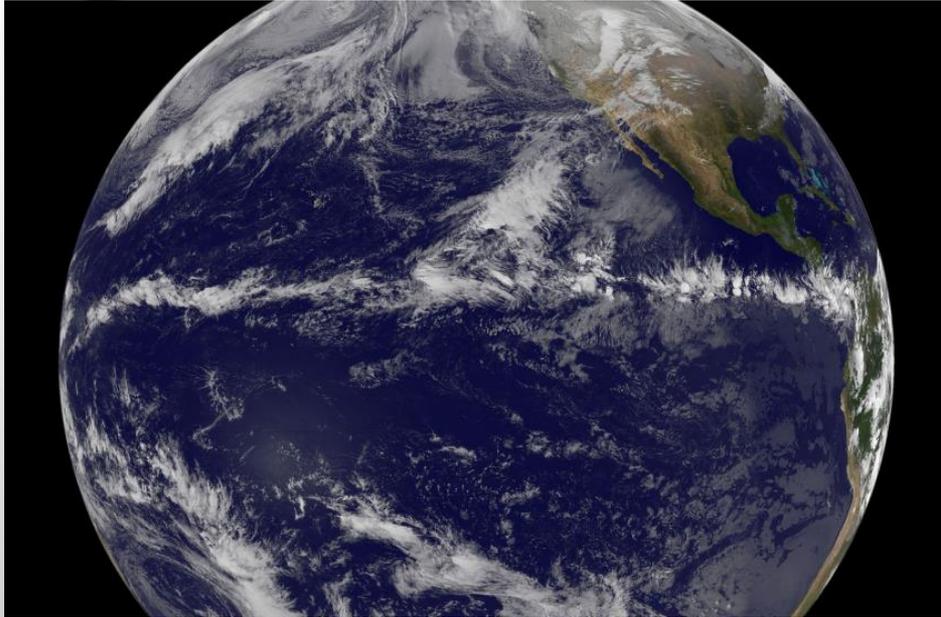


Where Do Hurricanes Form?

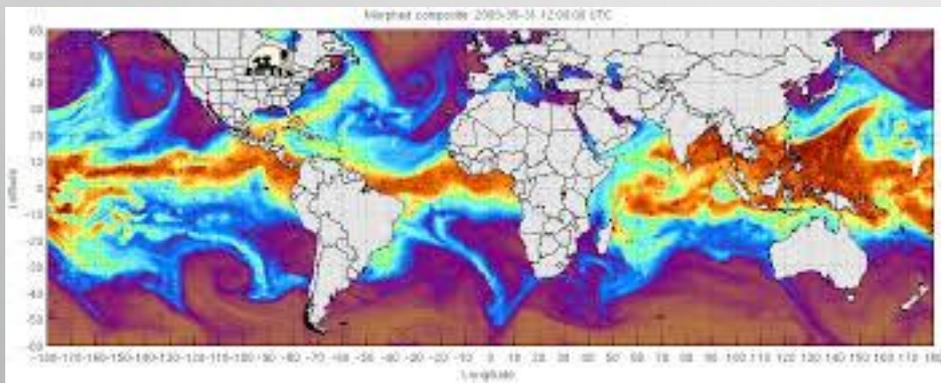


- Hurricanes form in the warm waters of the tropics.

Where Do Hurricanes Form?



- This area is known as the **ITCZ** or inter tropical convergence zone.



- The waters here are very warm.

Hurricane Formation

WHAT
DOES
A
HURRICANE
NEED?

