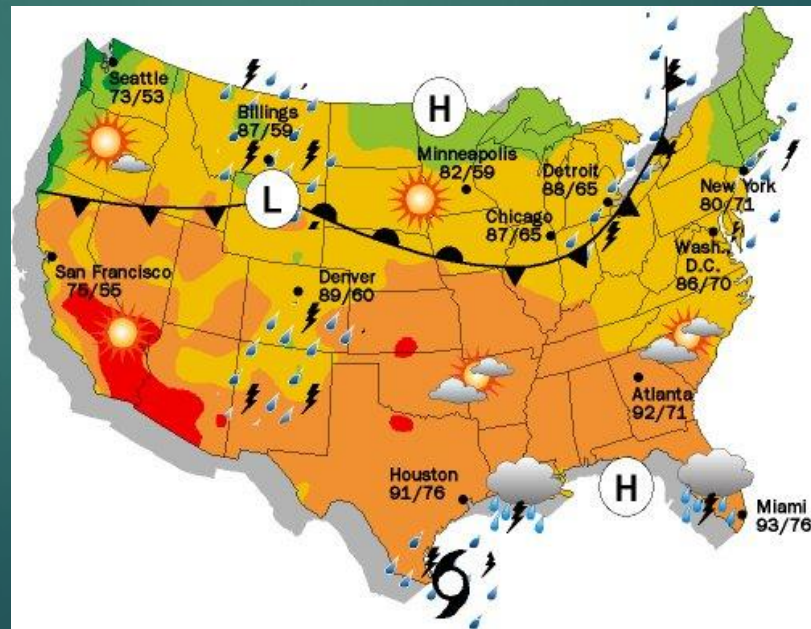




Reading
Weather
Maps and
Forecasting
Weather

Weather Maps

- ▶ Are used to show a variety of weather conditions in a particular area.
- ▶ They show current weather conditions.
- ▶ They are also used to predict future weather conditions.



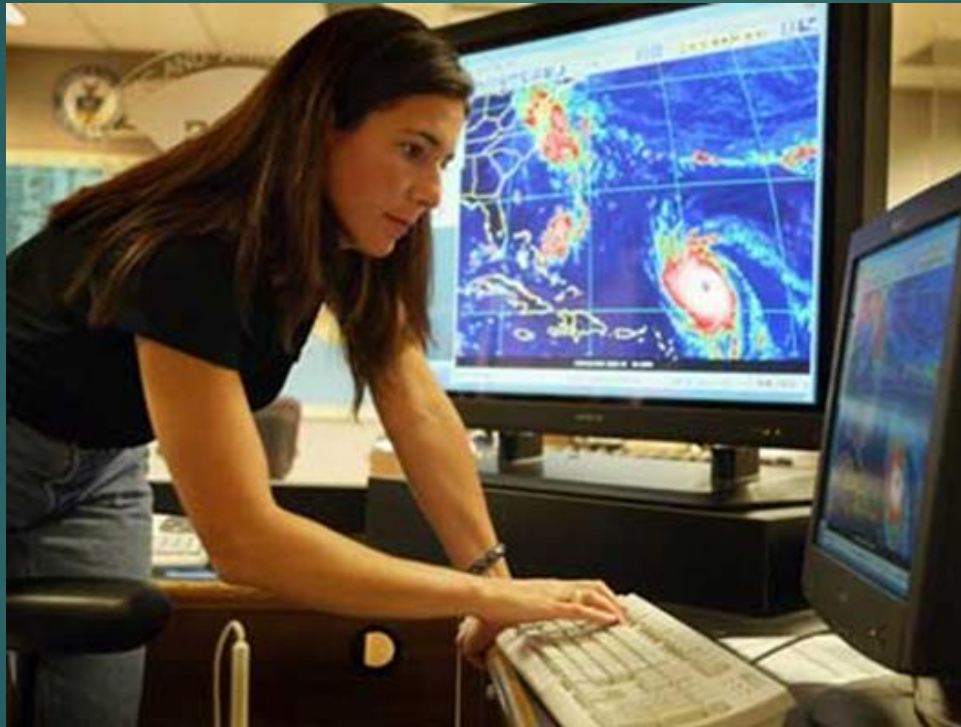
Weather is....

- ▶ The condition of the atmosphere outside at any given time.
- ▶ We need to understand weather because it impacts our daily activities, agriculture, transportation and commerce.



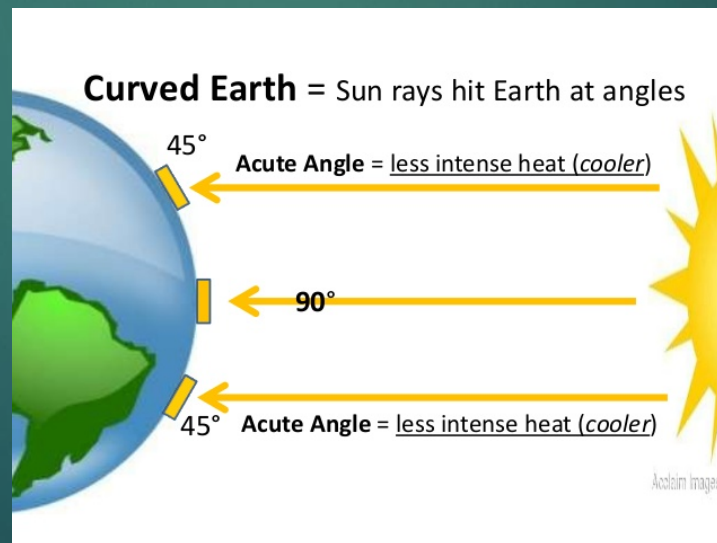
Meteorologists...

- ▶ Scientists who study and predict the weather.



What causes weather?

- ▶ Weather happens because the sun warms the Earth more near the equator than it does at the poles.
- ▶ This uneven heating causes large masses of air with different temperatures to form.
- ▶ As these air masses move, they cause changes in the weather.



Weather Forecasting

- ▶ Forecasting the weather include six main elements:
 - ▶ Temperature
 - ▶ Air Pressure
 - ▶ Wind Speed and Direction
 - ▶ Humidity
 - ▶ Precipitation
 - ▶ Cloud Coverage



Weather Forecasting

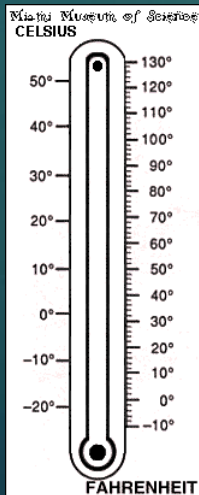


- ◆ The more data meteorologists can gather, the better they can forecast the weather.
- ◆ Meteorologists use a variety of tools to collect data in forecasting the weather.

Weather Forecasting

- ▶ The most common weather instruments are:

A thermometer is a weather tool used to measure the temperature.



An anemometer is a weather tool that measures wind speed.



By observing wind vanes, we can know the direction of the wind.



Barometers measure air pressure. Knowing the air pressure can help predict fair or rainy weather.



Psychrometers measure the wet bulb and dry bulb temperatures. The difference is used to determine humidity in the atmosphere.



A rain gauge is used to collect precipitation.



Weather balloons are launched twice a day

- ▶ To collect data at different altitudes by measuring:
 - ▶ Temperature
 - ▶ Humidity
 - ▶ Air Pressure
- ▶ Ground antennas receive the signals as the balloon rises
- ▶ Computers interpret the signals and send them to the National Weather Service.



Modern weather observation also includes the use of **radars** and **satellites**

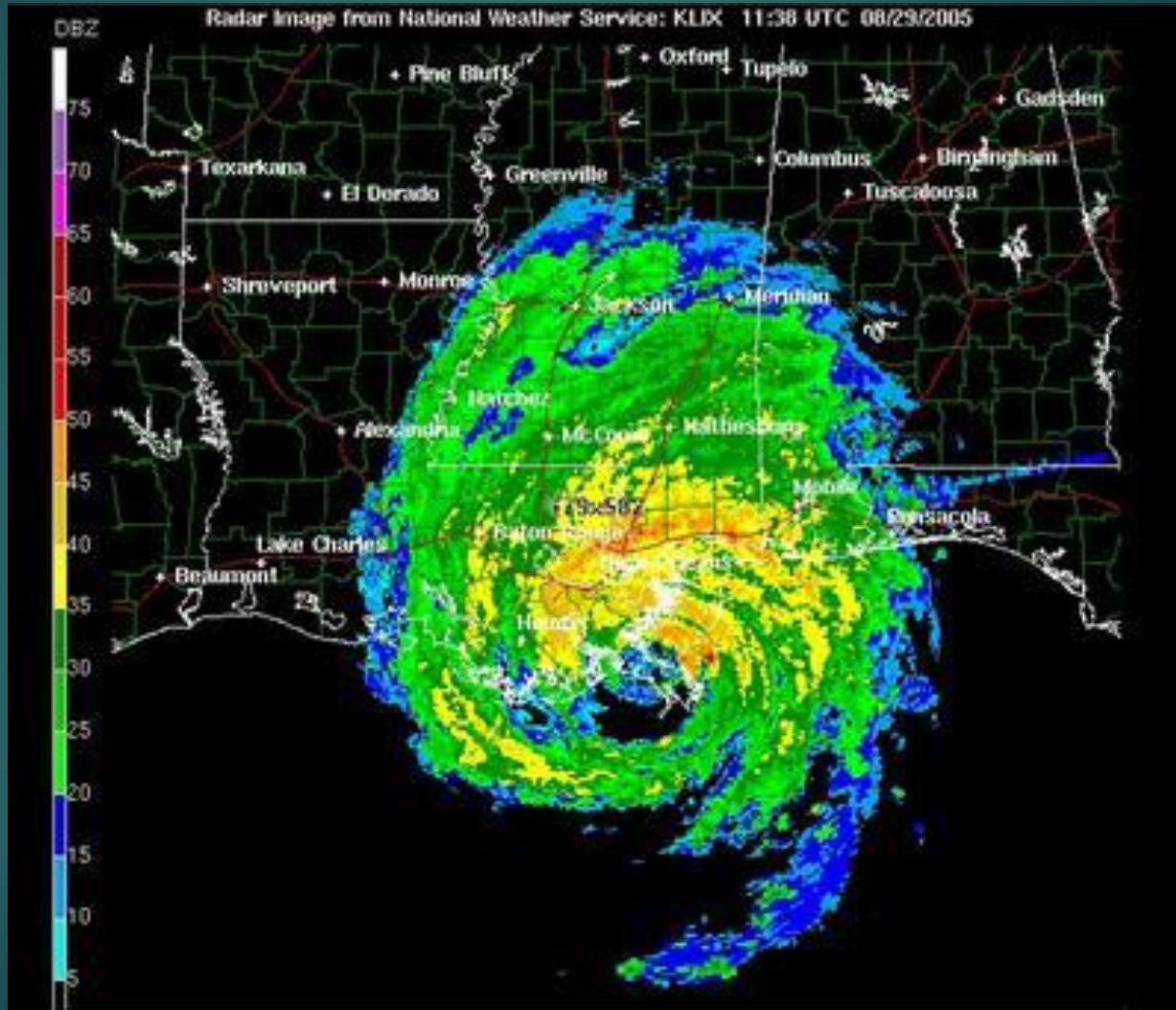
- ▶ **Radars** - monitor clouds, precipitation and winds



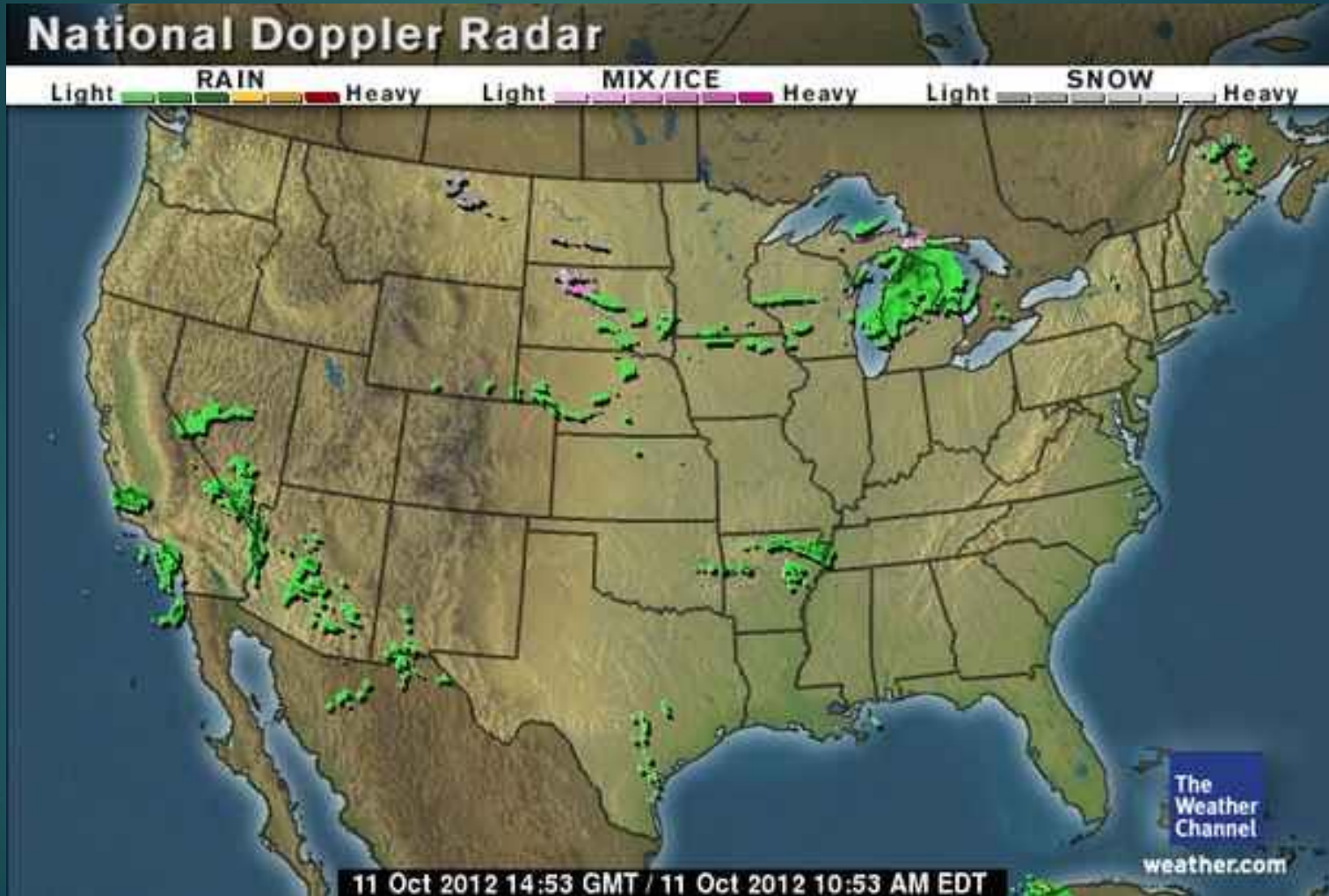
- ▶ **Weather satellites** - provide even larger views of weather systems



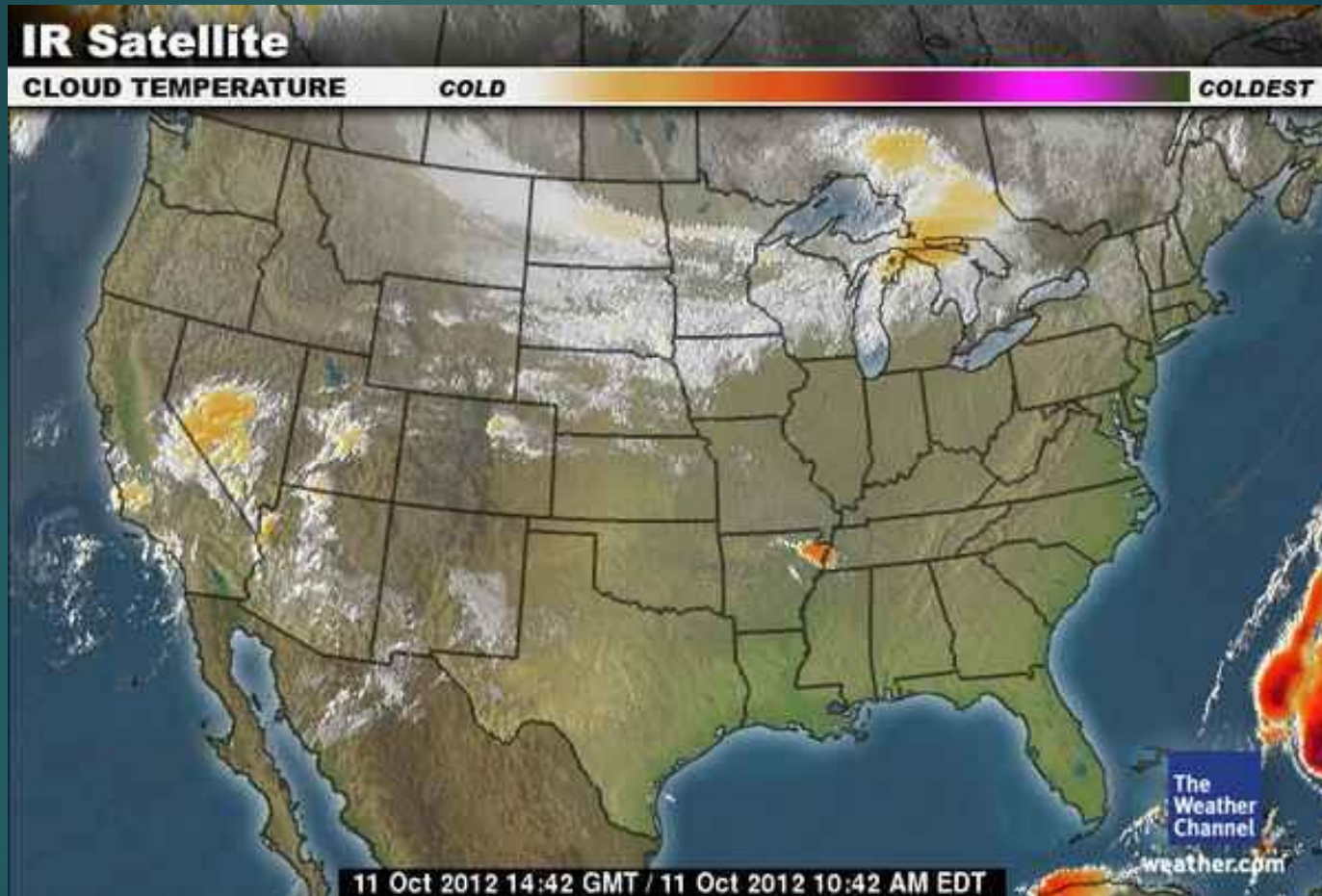
Radar Images



Doppler Radar



Infrared Satellite



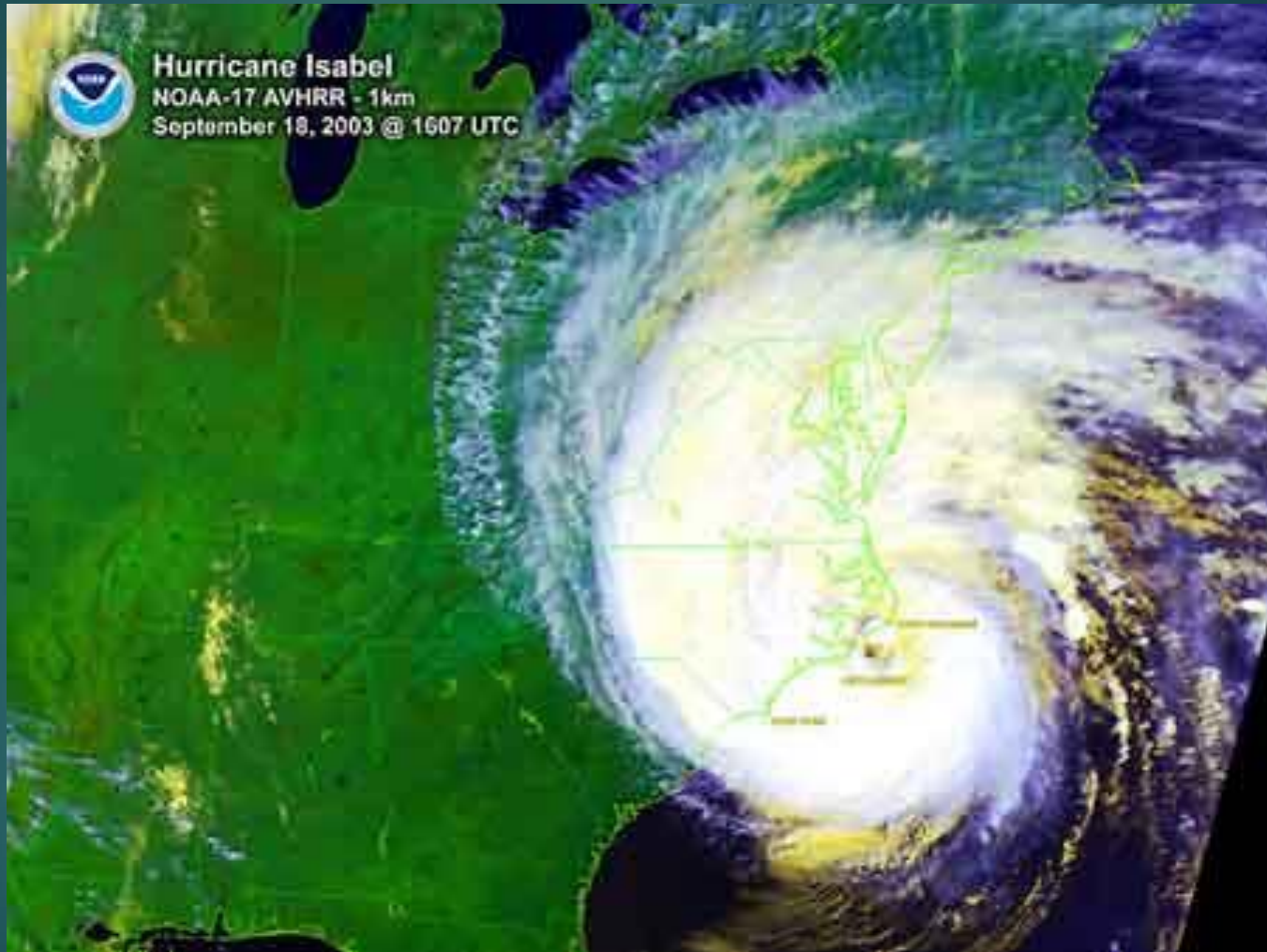
Visible Satellite



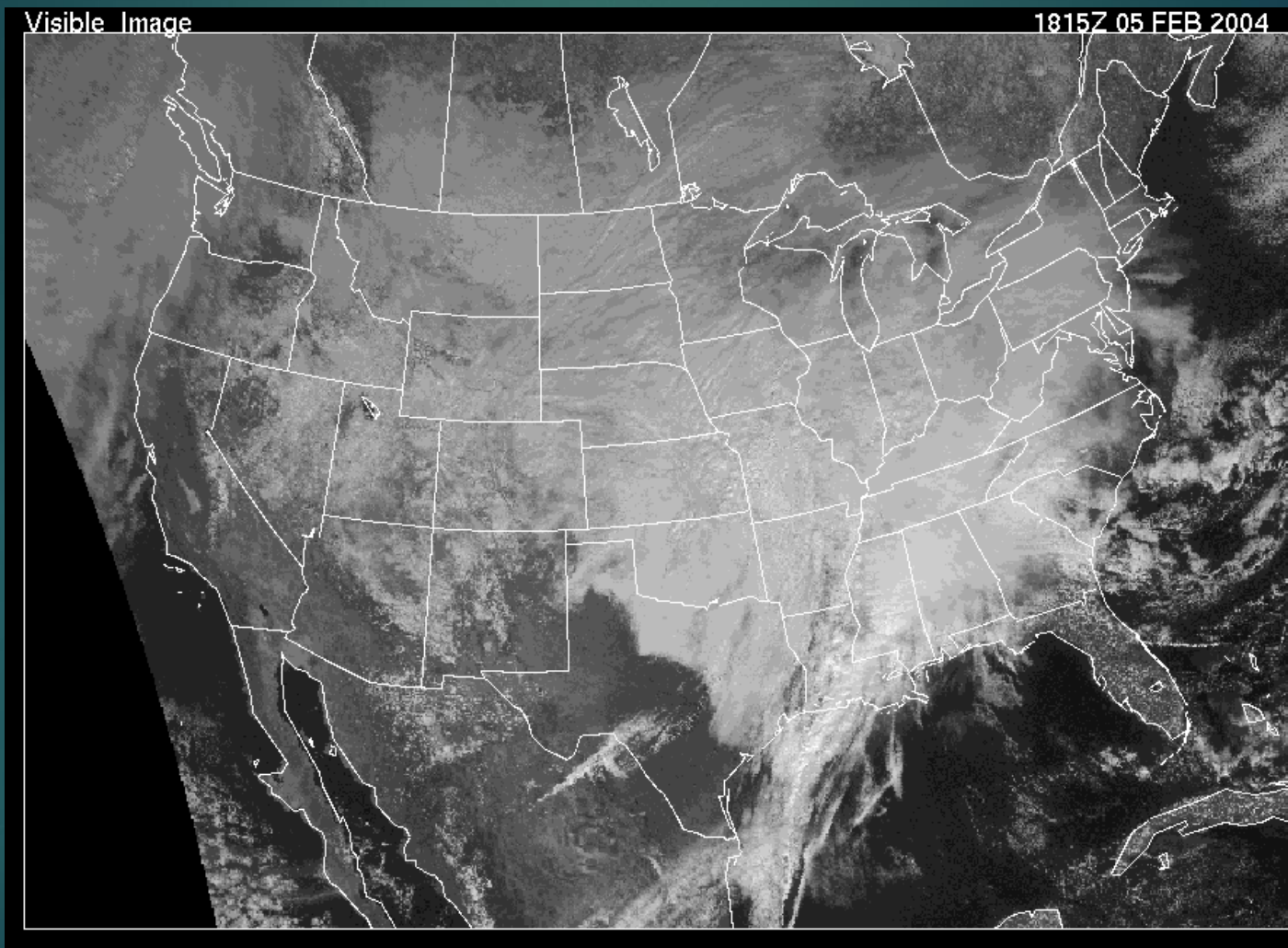
Water Vapor Satellite



Satellite Images

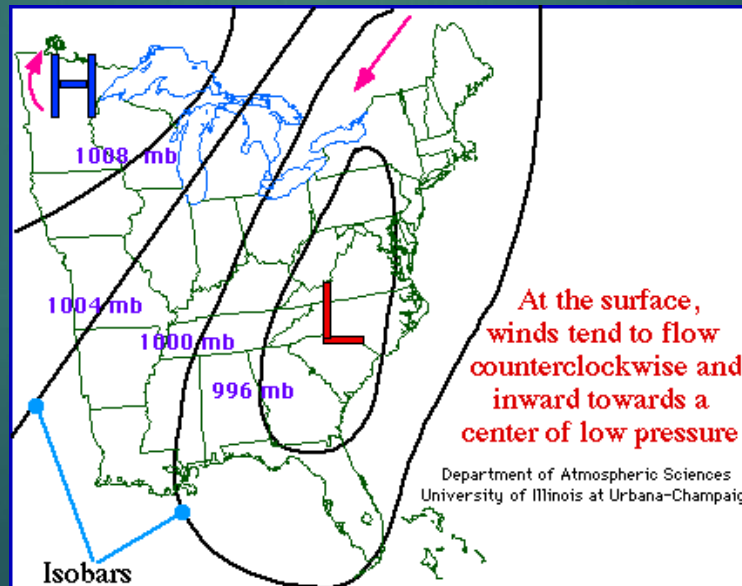


Satellite Images

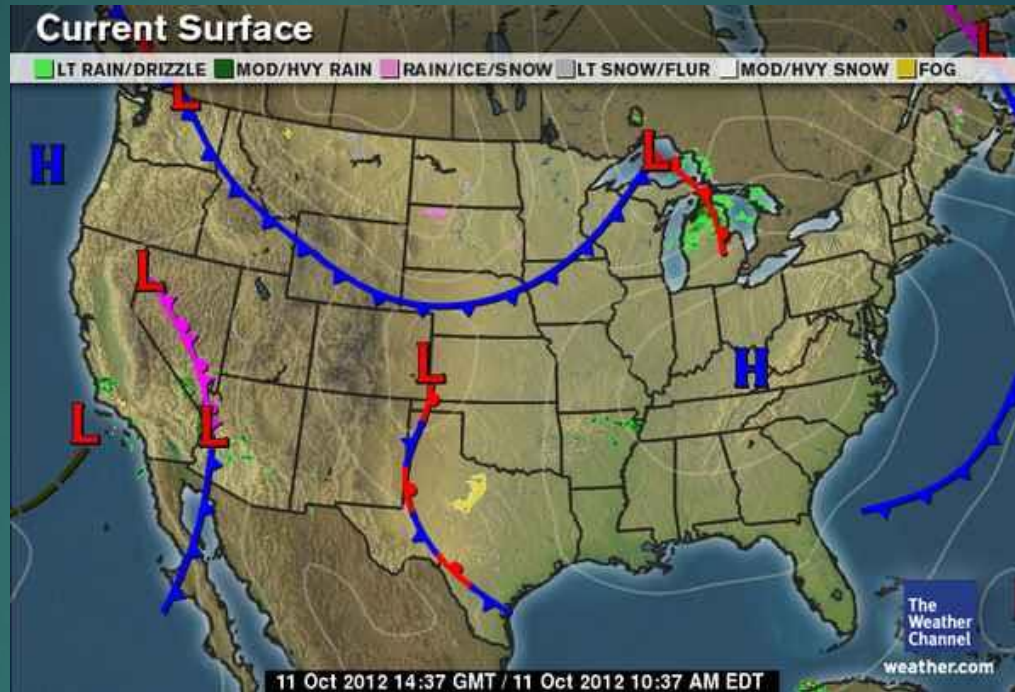


Weather Maps

- ▶ Surface Maps can show pressure systems
 - ▶ The **H** stands for high pressure systems. Highs usually bring clear skies.
 - ▶ The **L** stands for low pressure systems. Lows usually bring cloudy skies with possible precipitation.



Surface Maps - also show fronts



Warm front



Cold front



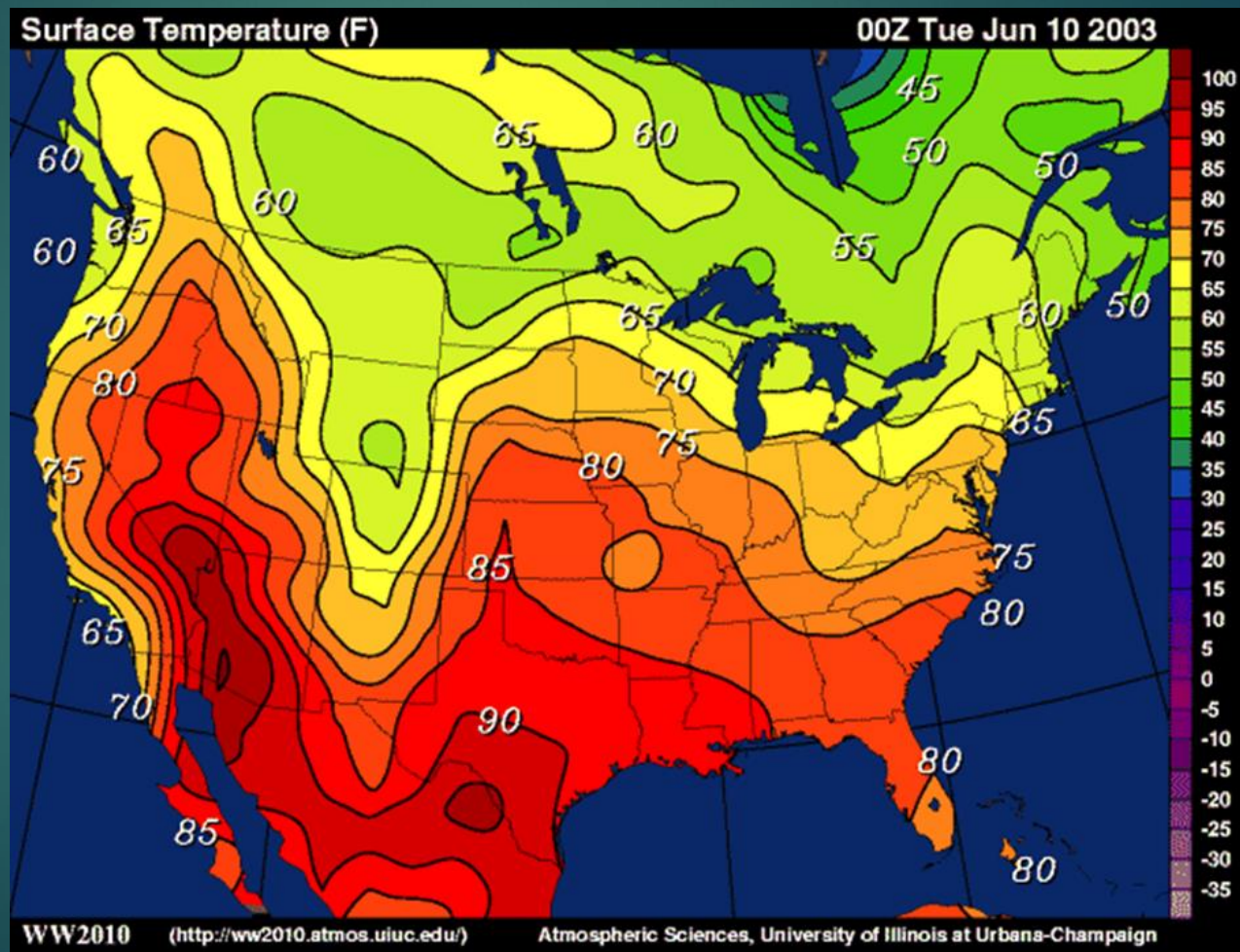
Stationary front



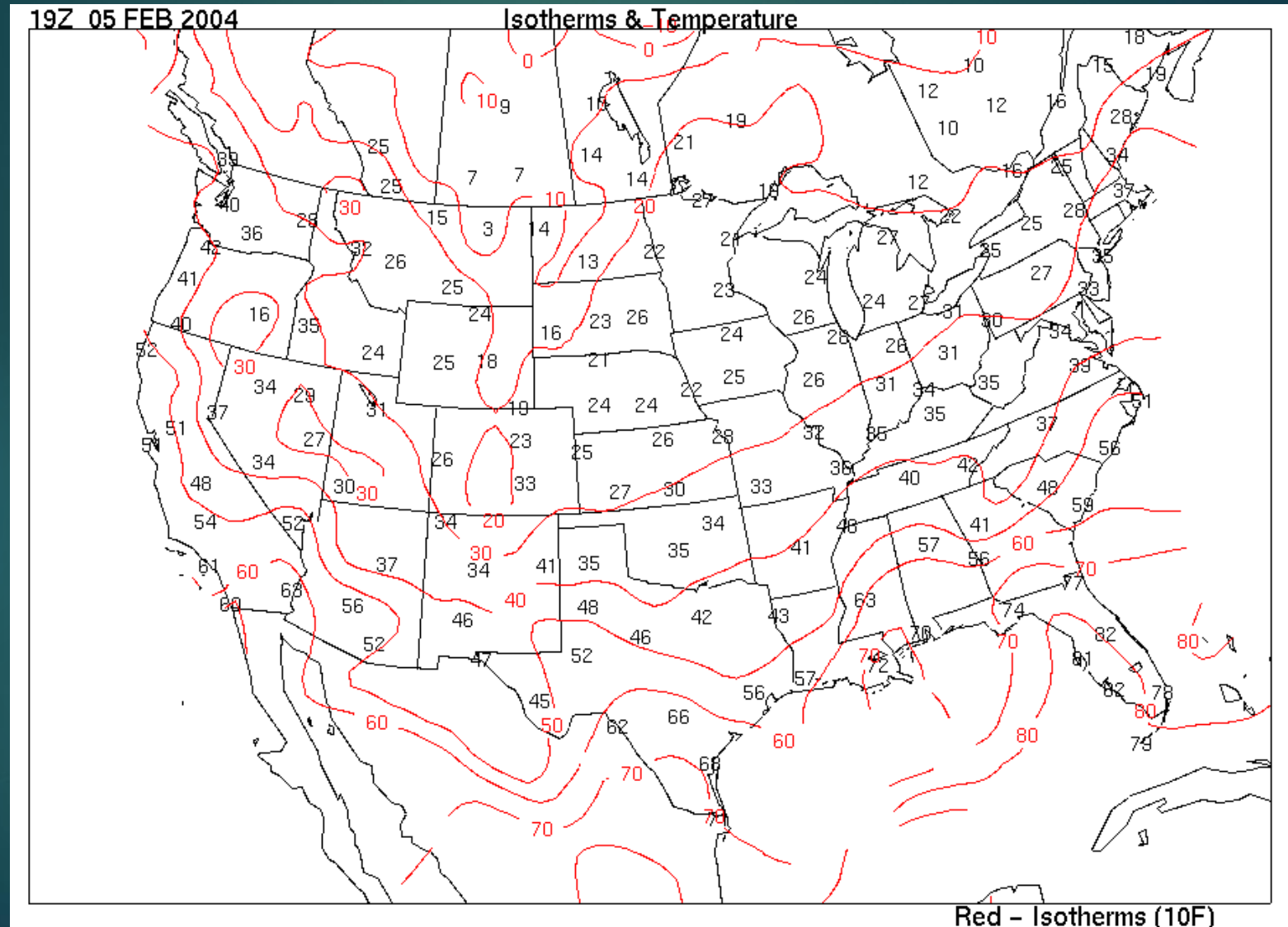
Occluded front



Isotherms – contour lines on a map that connect areas of equal temperature.

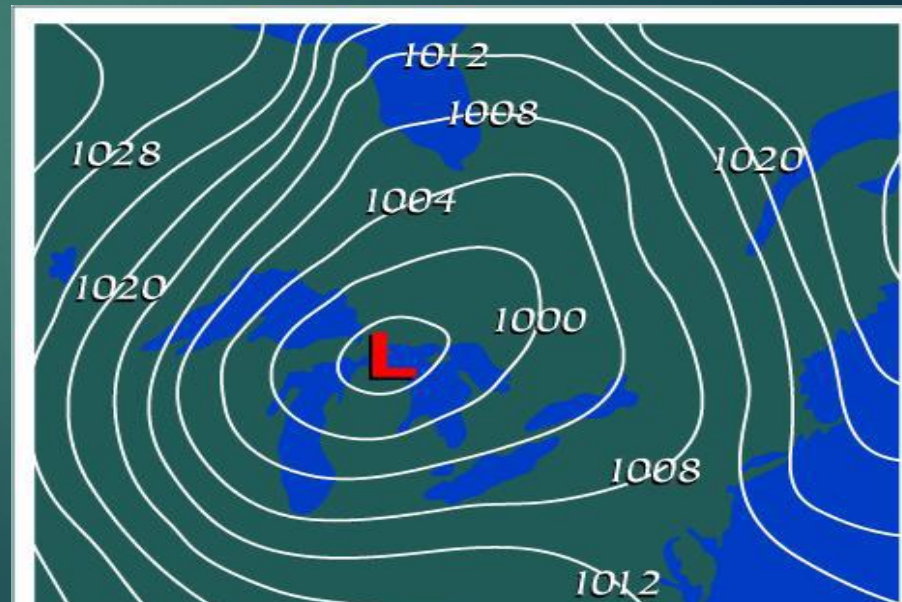
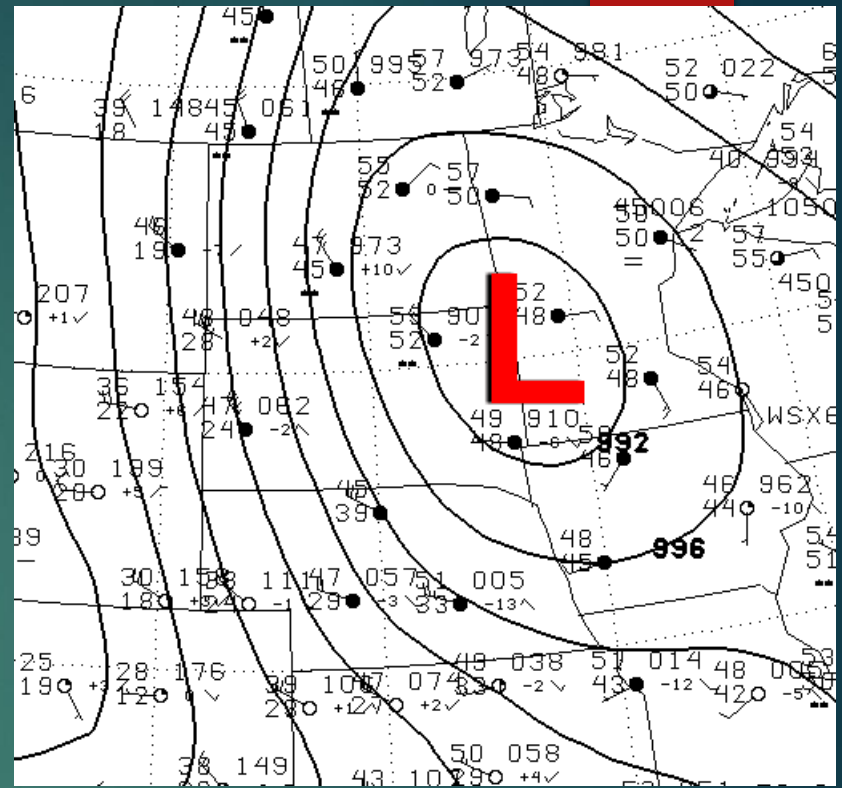


Isotherms



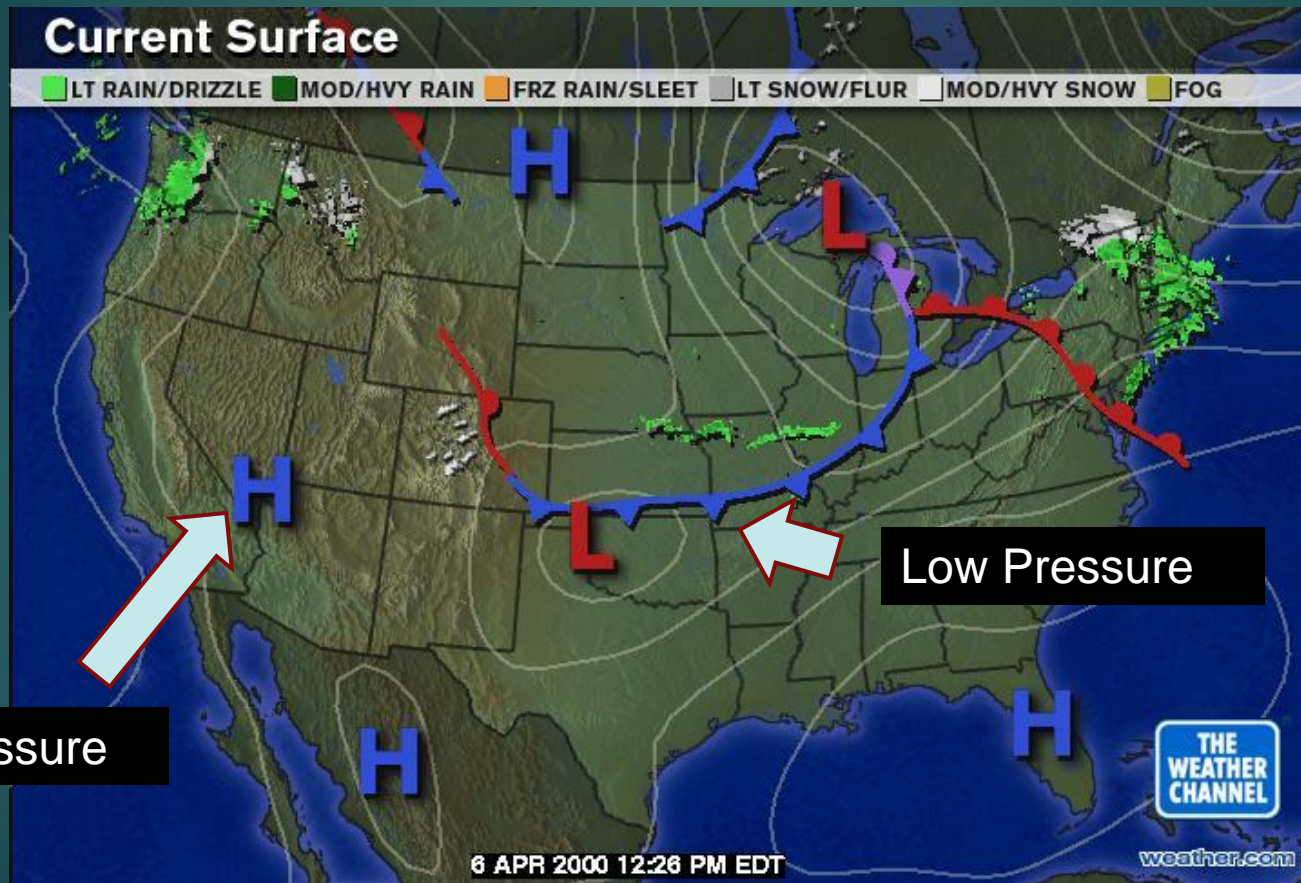
Isobars – contour lines on a map that connect areas of equal atmospheric pressure.

Isobars and isotherms are somewhat “fluid” measures, so their lines on a map tend to be curved and irregular.



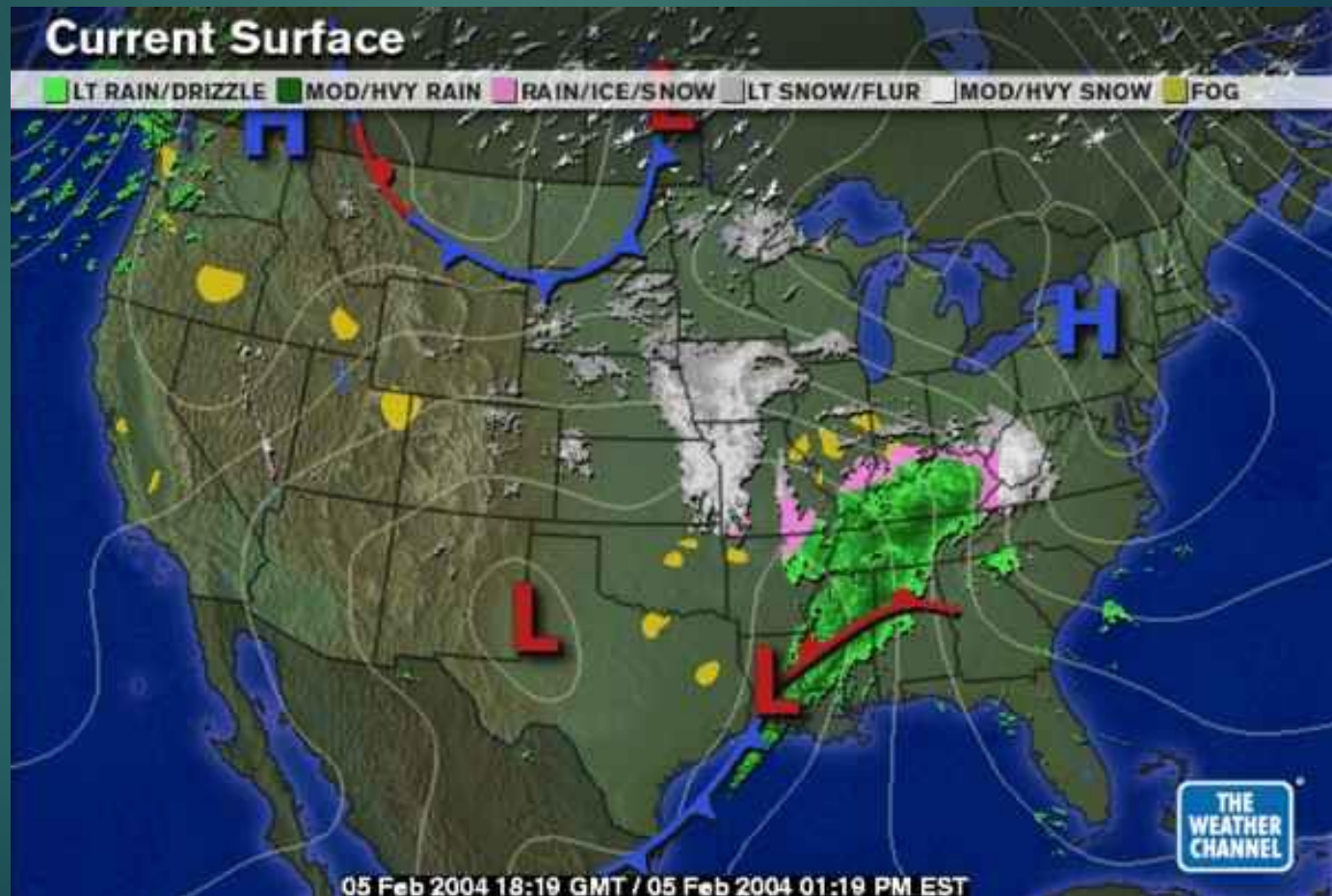
Weather Map Practice

Where are high pressure and low pressure systems on this map?

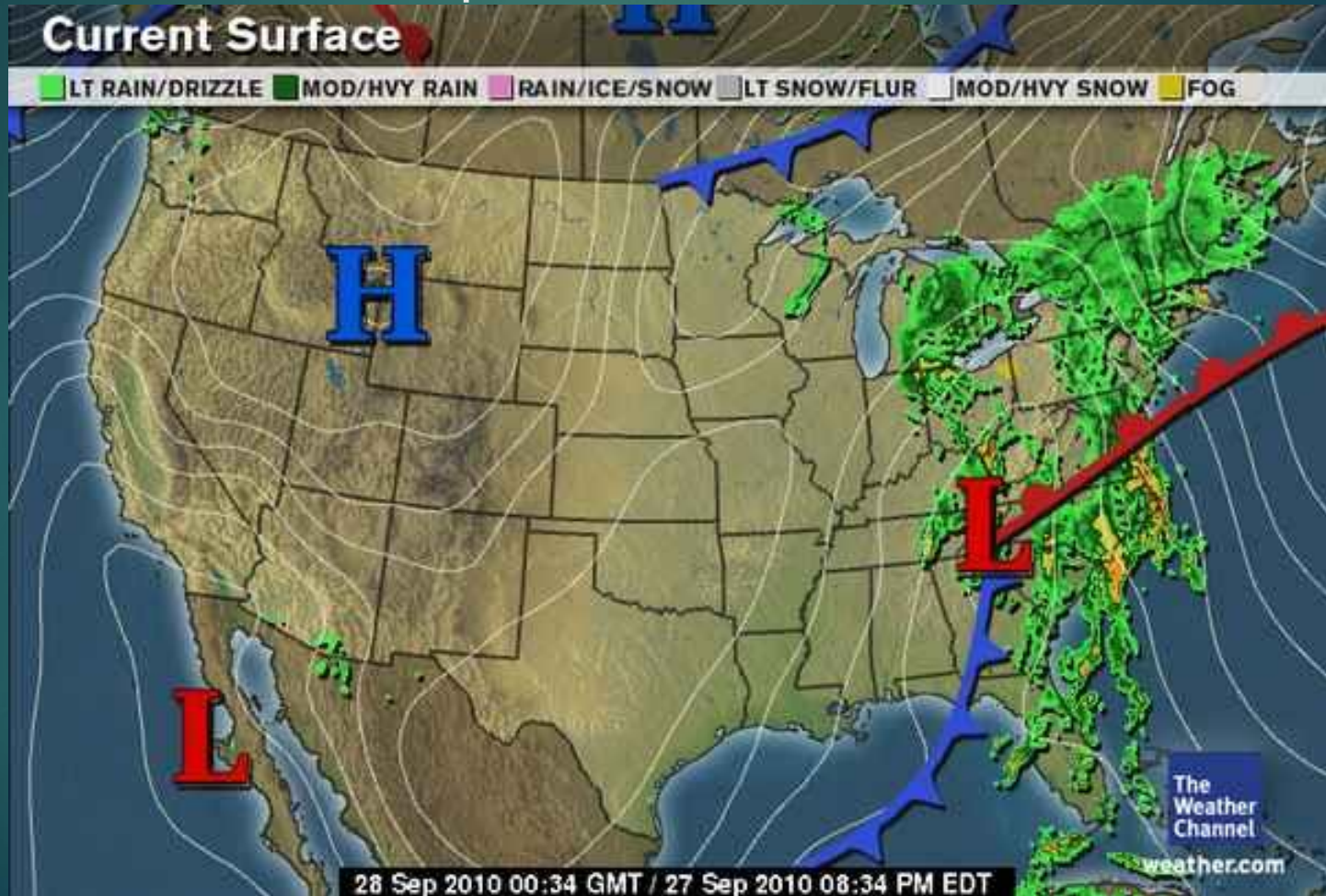


Where are the fronts?

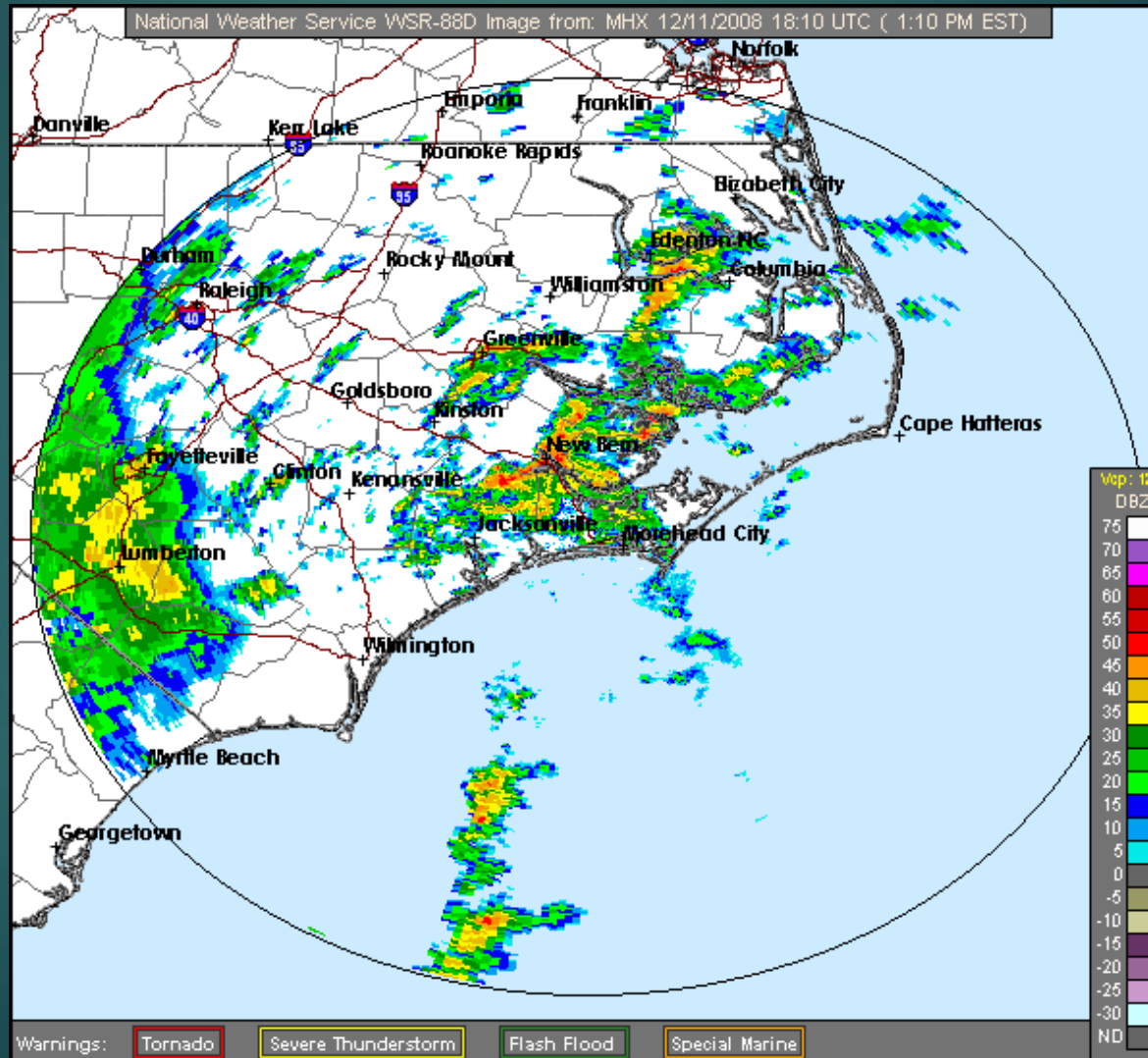
What types of precipitation are on this surface map?



Where are the fronts?
What types of precipitation are on
this surface map?



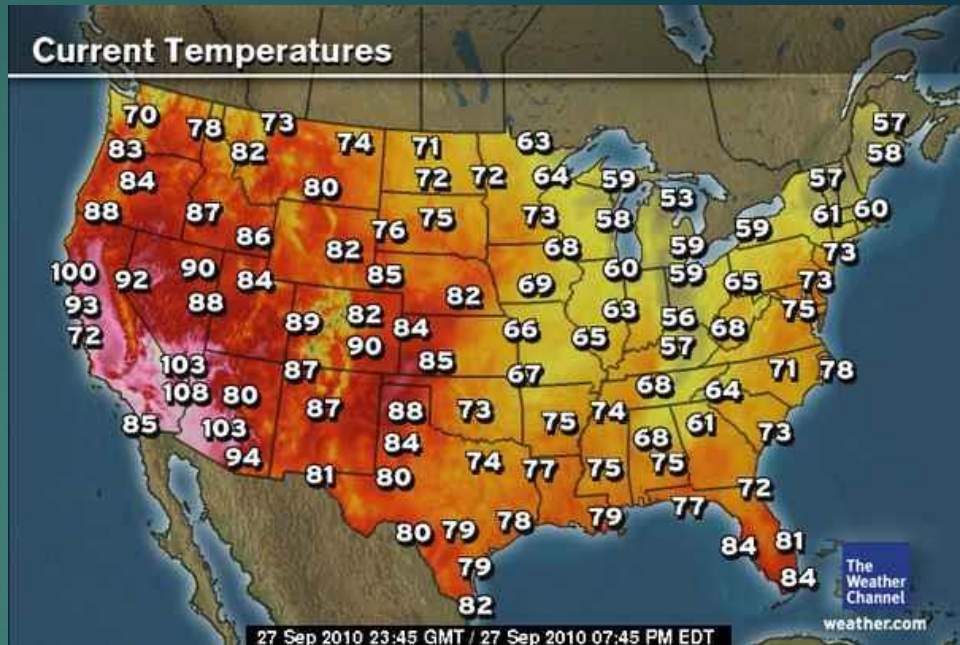
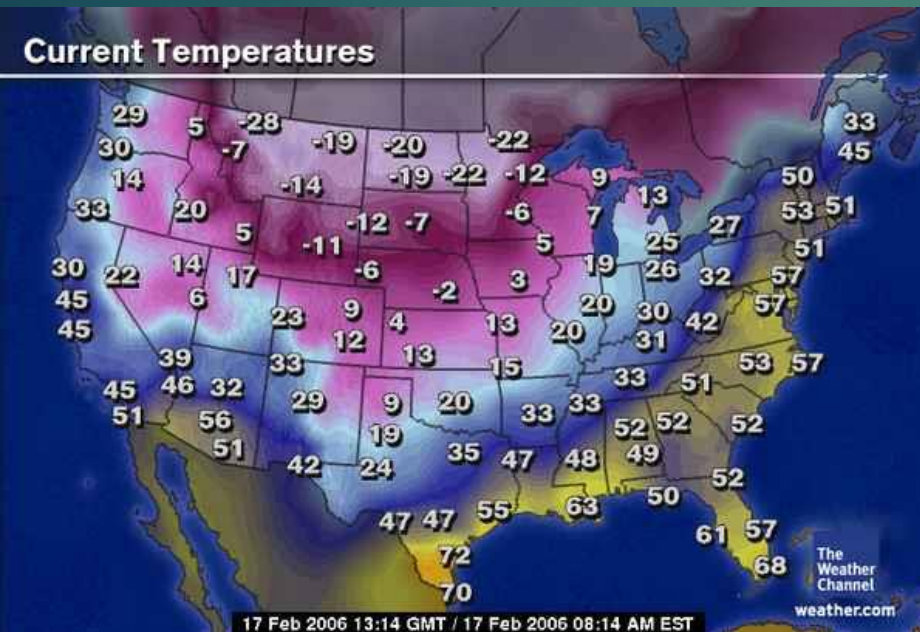
What do the different colors represent?



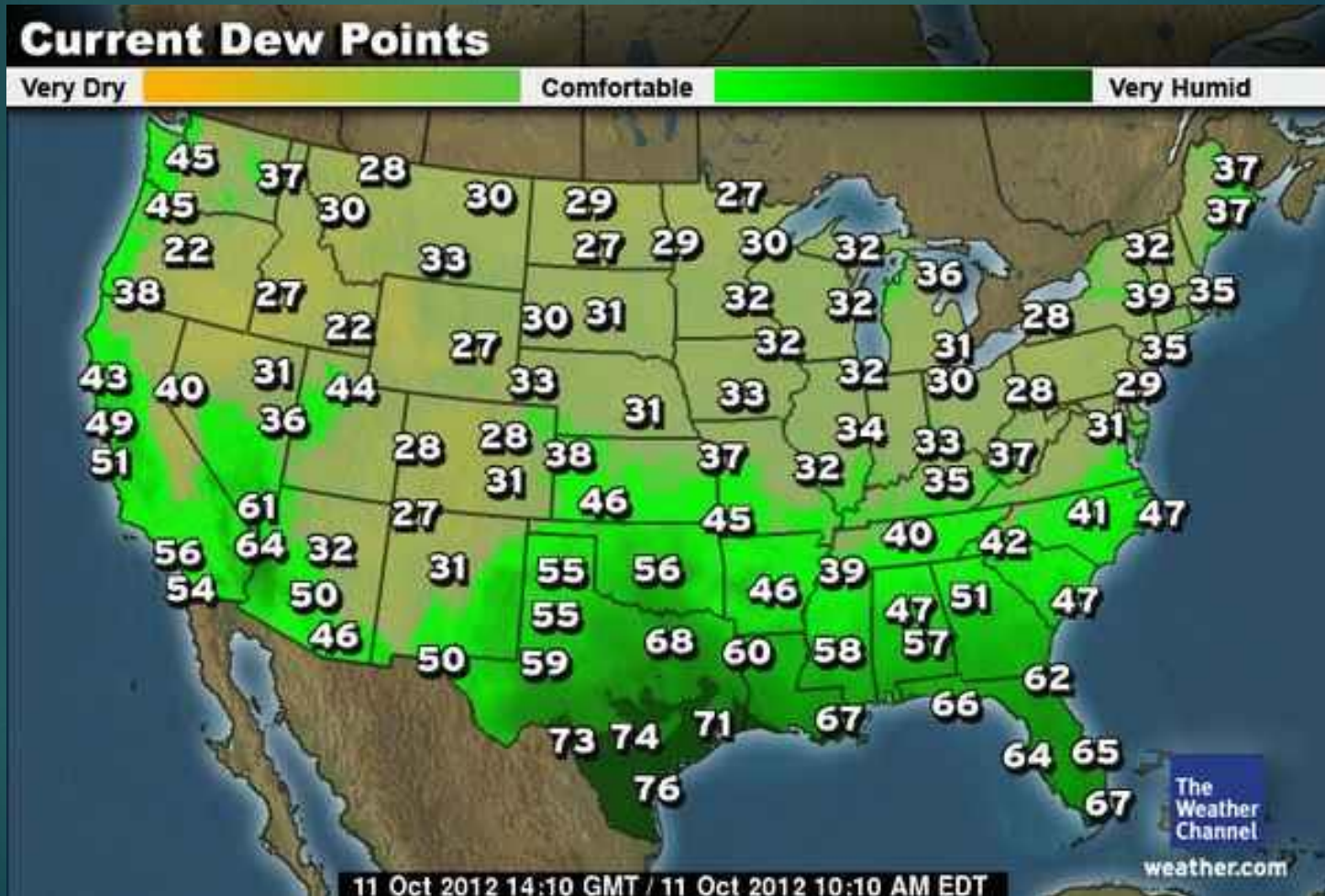
What does this map tell us?



What is different with these maps?



Where would it be uncomfortable to visit? Why?



Explain what we can learn from this map.



What does this map tell us about the forecast?



Reflection Questions

- ▶ Why does the Earth have weather?
- ▶ How do weather maps show how global patterns of atmospheric movement influence local weather?