

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Period: \_\_\_\_\_

## LAB 29 ; CLIMATE FACTORS

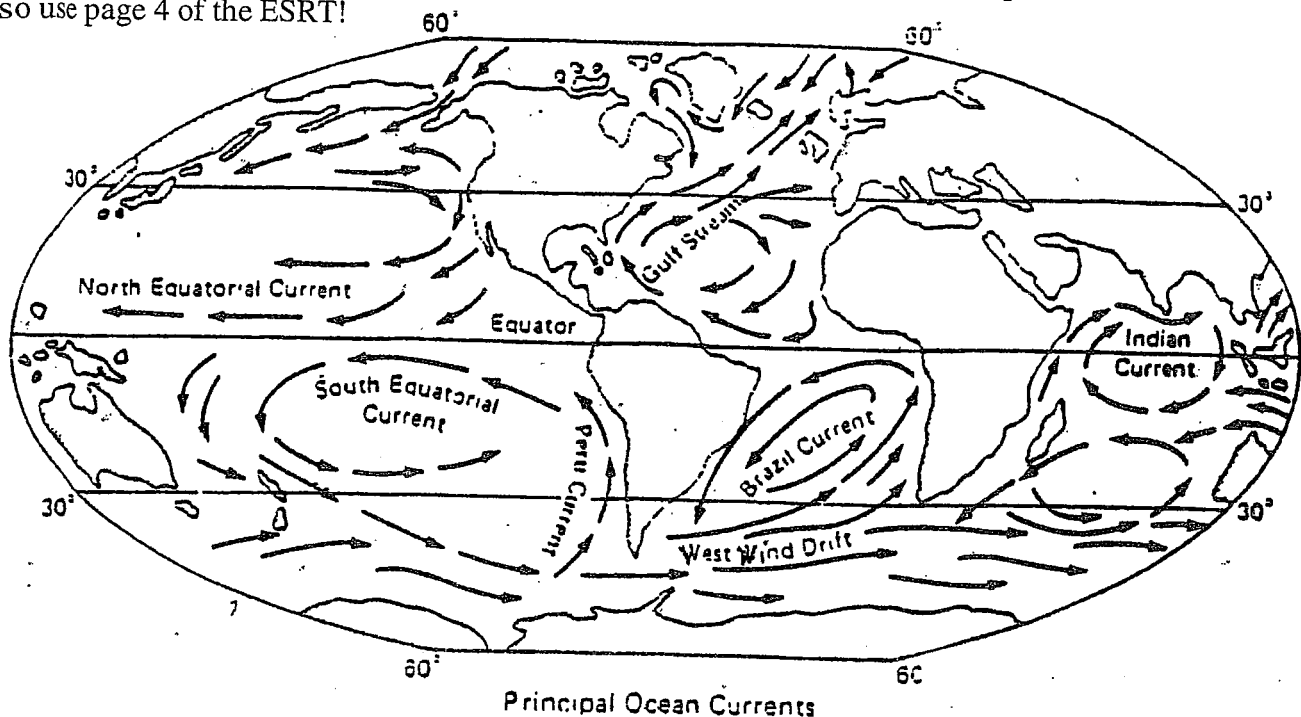
**INTRODUCTION:** In this lab, you will relate variables, such as temperature and humidity, to the climate of a location. Use your notes from the PowerPoint on climate factors to predict the climate found at a specific location.

**MATERIALS:** Colored Pencils, World Map, US Map

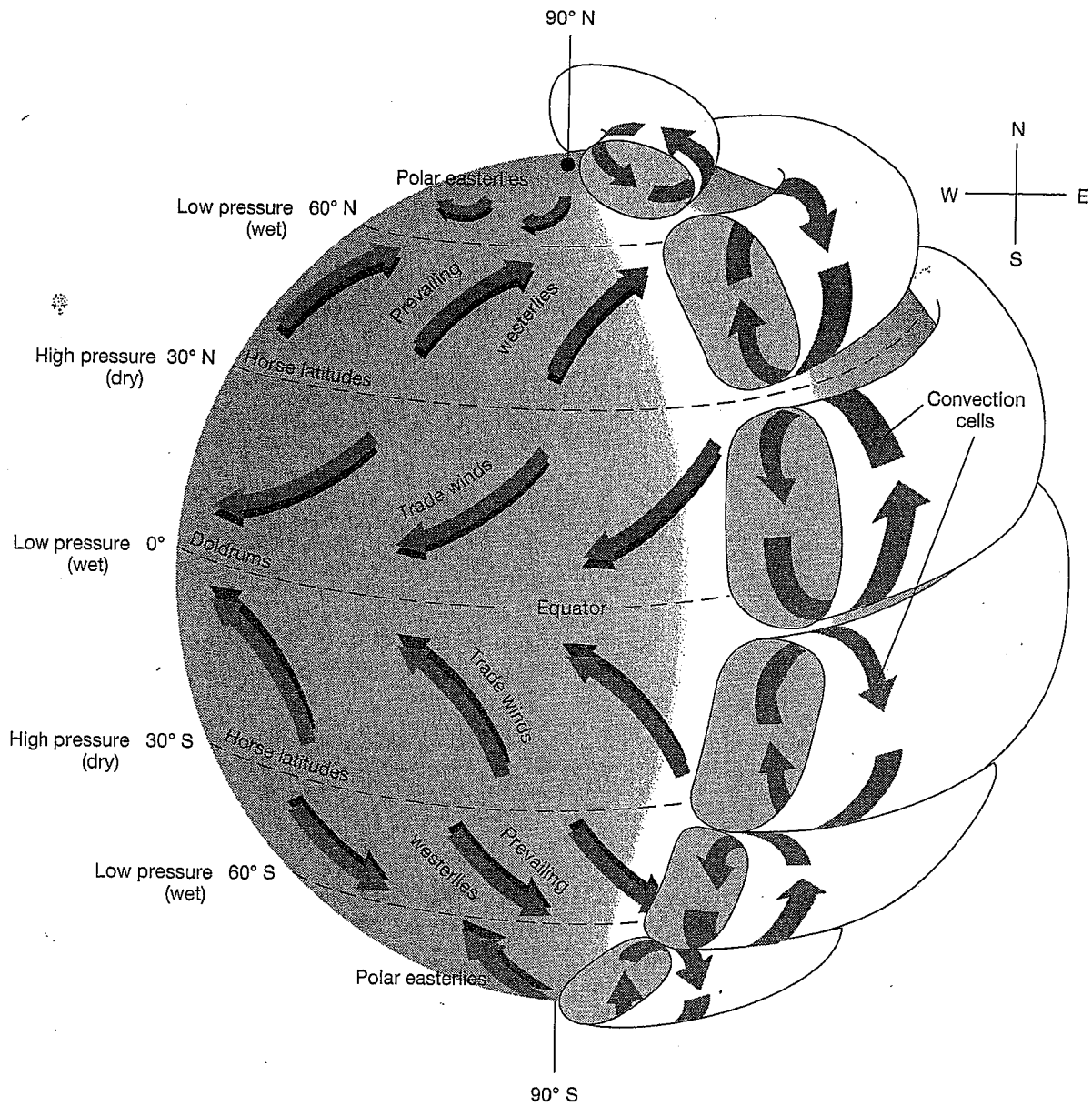
**PROCEDURE:** There of four separate parts to this lab. Complete each using your notes and information provided for each part.

### Part A: Ocean Currents and Wind

The map below shows ocean currents. The map on the next page shows wind patterns. First, color in the ocean currents: *warm* currents in *red* (those near the equator and moving away) and *cool* currents in *blue* (those close to the poles or moving away from them). Then study these maps carefully and compare them to answer the questions. Also use page 4 of the ESRT!



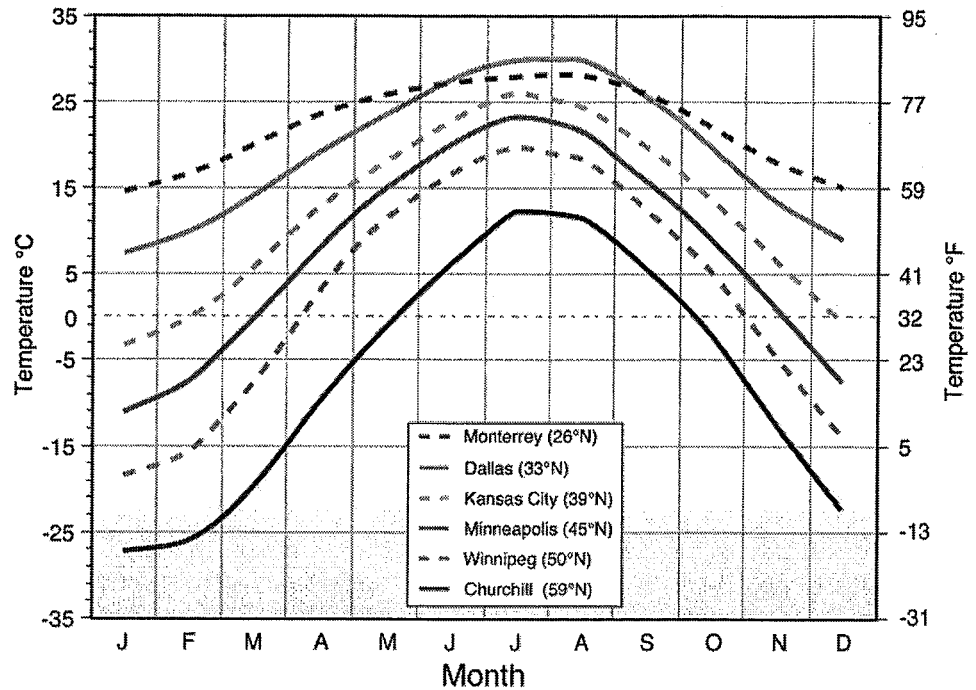
1. Would you expect currents along the Equator and those moving away from it to be warm or cool? \_\_\_\_\_
2. Would you expect currents moving away from Polar areas to be warm or cool? \_\_\_\_\_
3. Find the Gulf Stream. Is it a warm current or cool current? \_\_\_\_\_
4. The Gulf Stream moves water from the Southern US, off the coast of Florida all the way to Europe, where it is called the Norwegian Current. What effect does this current have on the climate of Western Europe?  
\_\_\_\_\_
5. Find the Peru Current. How does this current affect the climate of the west coast of South America?  
\_\_\_\_\_



6. The map above shows global wind belts. Compare the wind patterns to the current patterns on the previous map. Are currents and winds generally similar or dissimilar? \_\_\_\_\_
7. The Antarctic Circumpolar Current used to have a different name. What was this name and why was it called that name? \_\_\_\_\_  
 \_\_\_\_\_
8. Which wind belt moves the water in the Gulf Stream to the Northeast? \_\_\_\_\_
9. Which wind belt moves the water in the Peru Current to the North? \_\_\_\_\_
10. Explain why ocean currents and winds move in the same general direction (think about friction!).  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
11. In general, what would you expect to happen to air blowing over a cold current? \_\_\_\_\_  
 \_\_\_\_\_
12. In general, what would you expect to happen to air blowing over a warm current? \_\_\_\_\_  
 \_\_\_\_\_

## Part B: Latitude and Climate Graphs

Latitude, or the distance from the equator, affects a region's climate. A climate graph, like the graph to the right, shows average monthly temperatures for several cities in North America: Monterrey, Mexico (upper dashed line); Dallas, TX (top solid line); Kansas City, MO (middle dashed line); Minneapolis, MN (middle solid line); Winnipeg, Manitoba (lower dashed line); and Churchill, Manitoba (lower solid line). Locate these cities on a map of North America and note their location and latitude.



Fill in the table below and then answer the questions.

The annual temperature range for a city is the difference between the highest temperature (letter "T" in the Table) and the lowest. The *Median Temperature* is the halfway point between the highest and lowest temperature.

City	Latitude	High T (°C)	Low T (°C)	T Range (°C)	Median T (°C)
Monterrey					
Dallas					
Kansas					
Minneapolis					
Winnipeg					
Churchill					

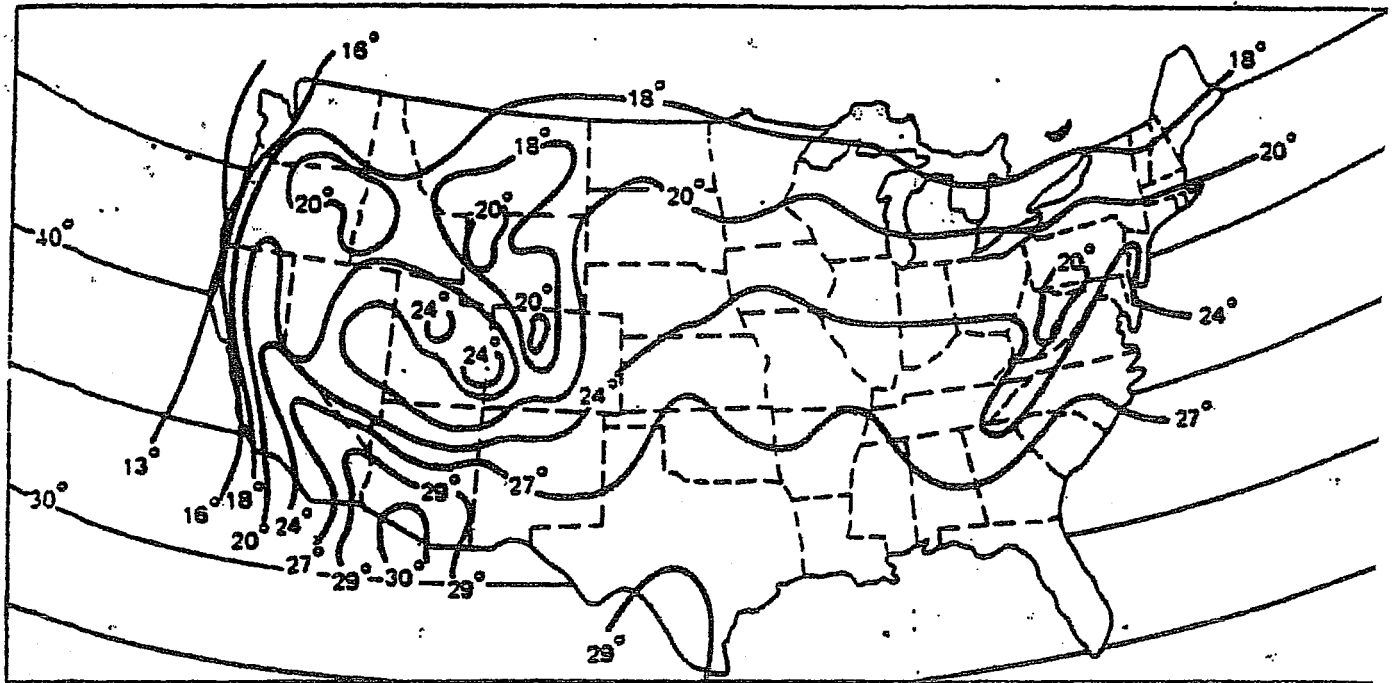
- Which city is closest to the equator? \_\_\_\_\_ How do you know?  
\_\_\_\_\_
- State the relationship between the latitude of a city and its median temperature.  
\_\_\_\_\_
- State the relationship between the latitude of a city and its temperature range.  
\_\_\_\_\_
- Which city has the warmest climate? \_\_\_\_\_ Explain why.  
\_\_\_\_\_
- What is one possible climate factor that might account for the higher summer temperature in Dallas than in Monterrey, even though Monterrey is closer to the equator? Explain! \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Part C: What can Isotherms tell us about Mountains and Bodies of Water?

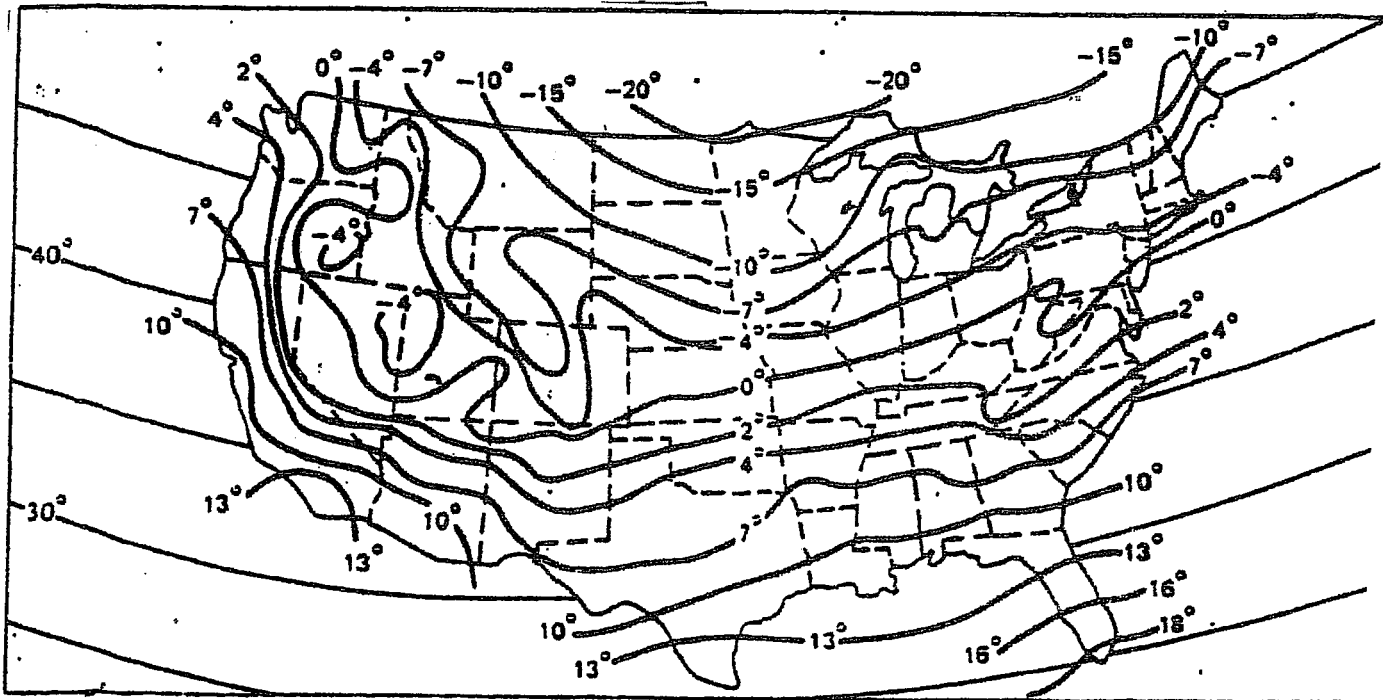
Start by lightly shading in the area between the 30° and 24° isotherm in red; between the 24° and 18° isotherm in yellow; between the 18° and 0° isotherm in blue, and between the 0° and -20° isotherm in purple.

Study both maps carefully and notice that the degrees on the edges of the map are latitude not temperature (they both have a "°" symbol!). Then answer the questions on the next page.

July Isotherms (°C)



January Isotherms (°C)



Use the maps on the previous page to answer the following questions. For the first 10 questions, imagine that you are travelling across the US along a latitude of 40° (the 40<sup>th</sup> parallel) from east to west.

1. Follow the 40° latitude line from east to west. What is the highest temperature and the lowest temperature along this route in July: High: \_\_\_\_\_ Low: \_\_\_\_\_
2. Which region of the US has the lowest temperature in July?  
\_\_\_\_\_
3. Find two of the climate factors from your notes to explain this. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. Which 3 regions of the US have the highest temperature in July? 1<sup>st</sup>: \_\_\_\_\_  
2<sup>nd</sup>: \_\_\_\_\_ 3<sup>rd</sup>: \_\_\_\_\_
5. Find at least one climate factor from your notes to explain why each region is so hot during July.  
Region 1: \_\_\_\_\_  
Region 2: \_\_\_\_\_  
Region 3: \_\_\_\_\_
6. Follow the 40° latitude line from east to west for January: High: \_\_\_\_\_ Low: \_\_\_\_\_
7. Which region of the US has the highest temperature in January? \_\_\_\_\_  
\_\_\_\_\_
8. Explain how the same region can both have the highest temperature in January and the lowest in July.  
\_\_\_\_\_  
\_\_\_\_\_
9. Which 2 regions of the US have the lowest temperature in January?  
1<sup>st</sup>: \_\_\_\_\_ 2<sup>nd</sup>: \_\_\_\_\_
10. Find at least one climate factor from your notes to explain why each region is so cold during January.  
Region 1: \_\_\_\_\_  
Region 2: \_\_\_\_\_
11. How do mountains effect the shape of isotherms? Explain, using examples from the maps.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_