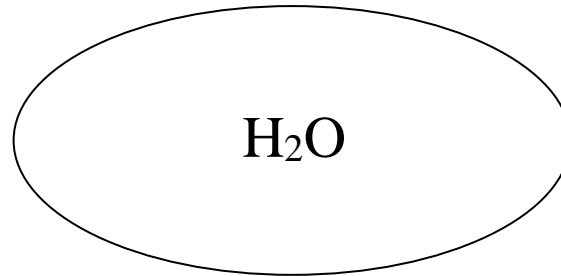


Topic 8: Water and Climate

Part 1



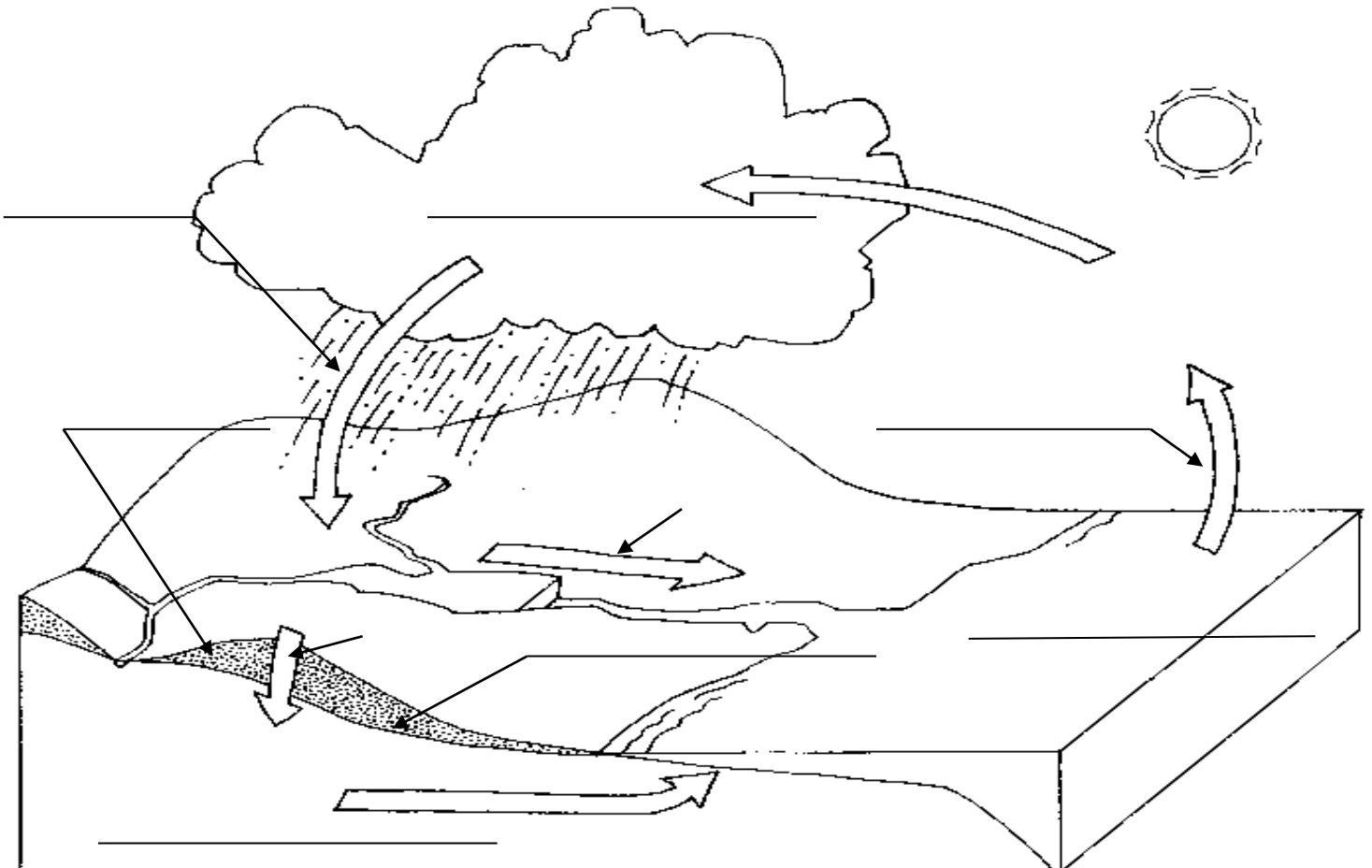
Topic I

Part a. The “Water Cycle” or “Hydrologic cycle”

Key words:

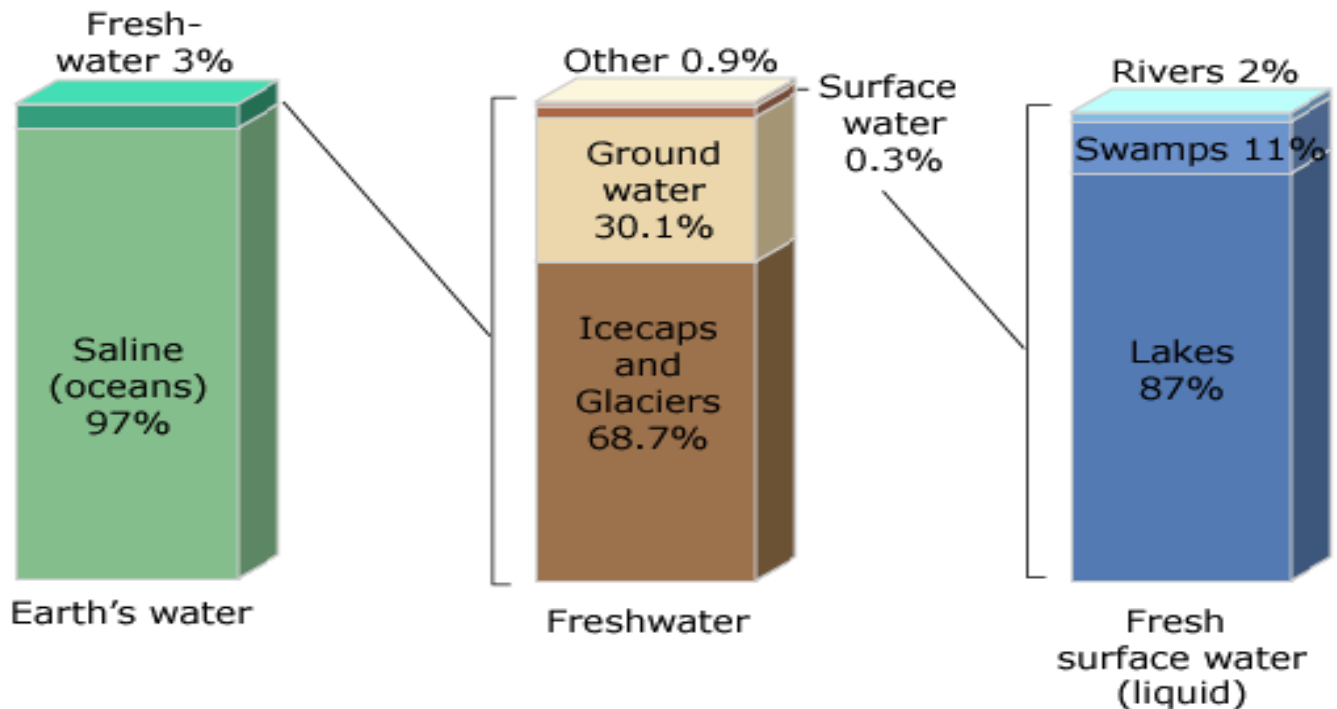
Evaporation, Transpiration, Condensation, Infiltration,
Precipitation, Ocean, Water table, Runoff, Storage,
Groundwater, Zone of saturation, Zone of aeration,

b. The water cycle is "fueled" by solar energy

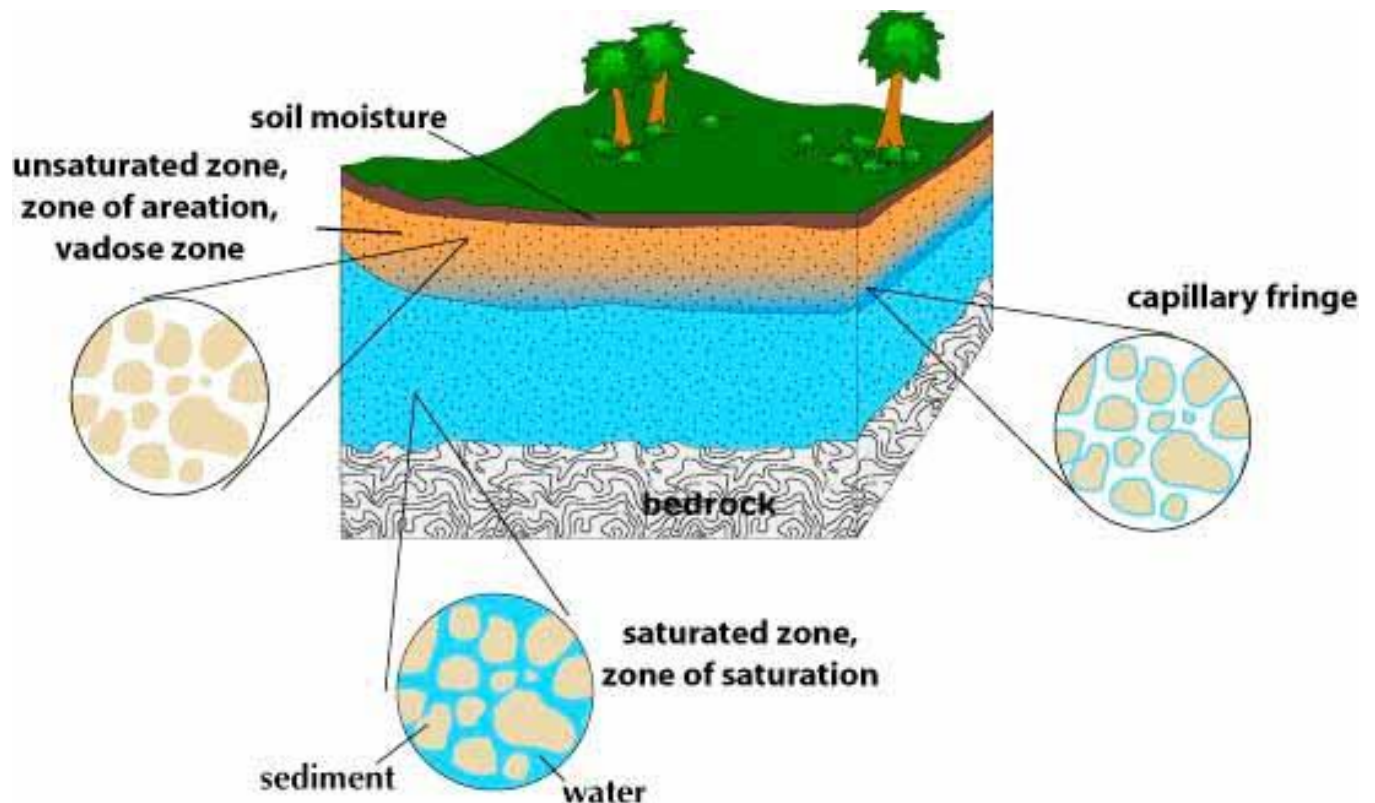


c. The major source for water is the _____ .

Distribution of Earth's Water

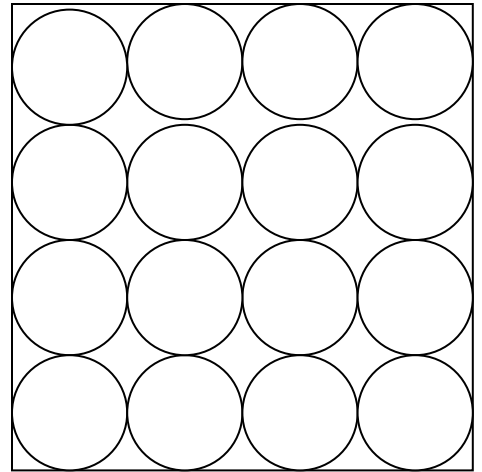


d. Below the Surface Ground water: there are two zo



i. Zone of Aeration:

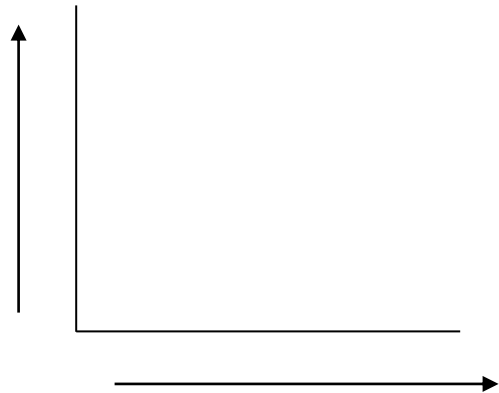
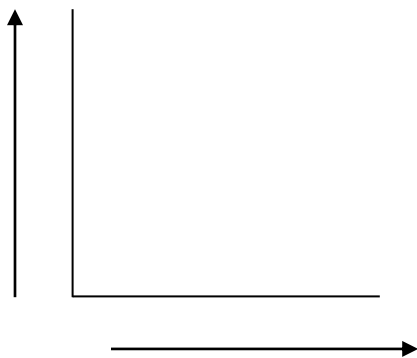
ii. Zone of Saturation:



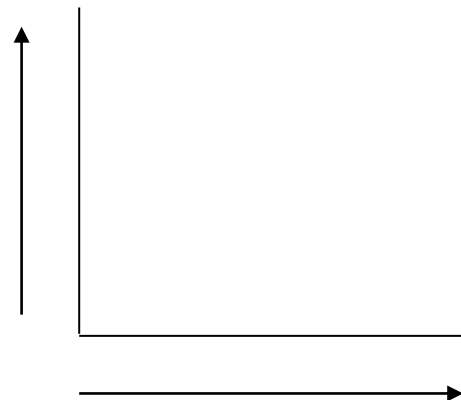
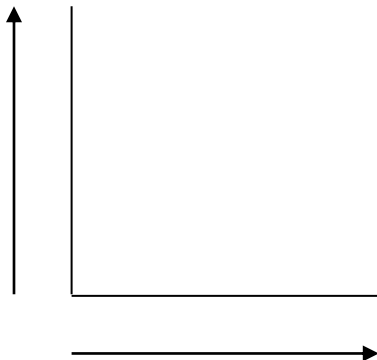
Topic II

Factors Affecting Infiltration and Run-off

a. Slope of the Land:



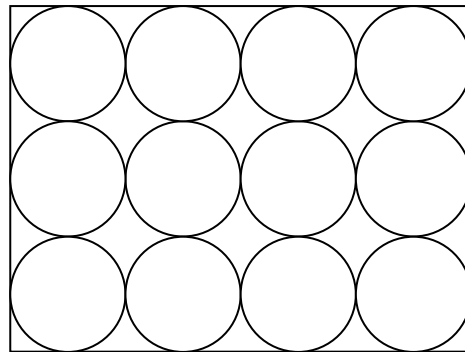
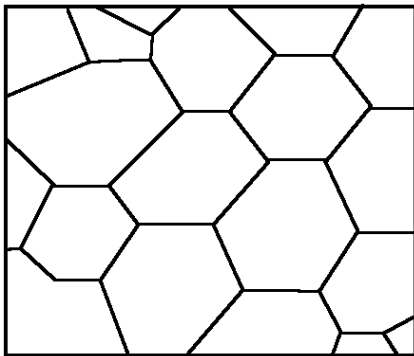
b. Degree of Saturation:



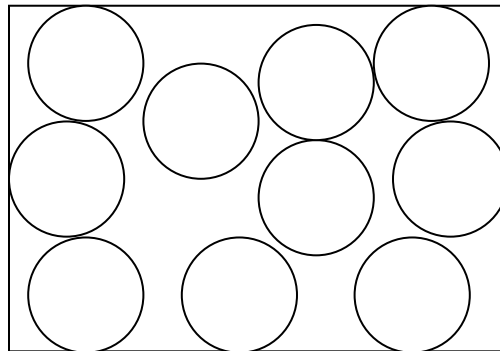
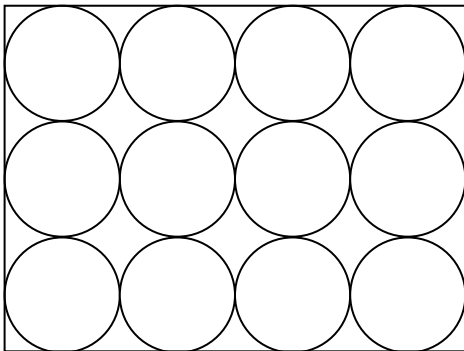
c. **Porosity**: Is the **percentage** of space in a given volume of Soil.

The factors that affect porosity:

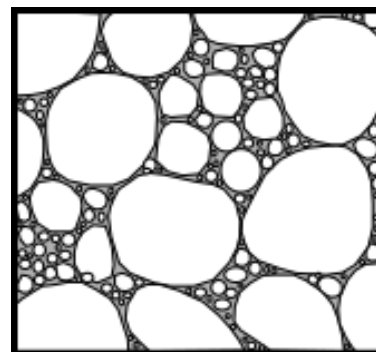
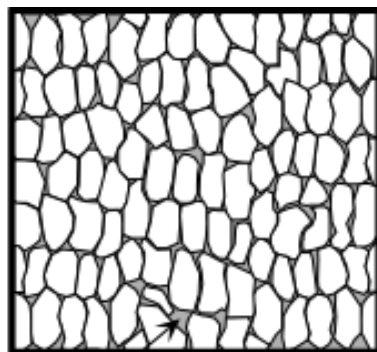
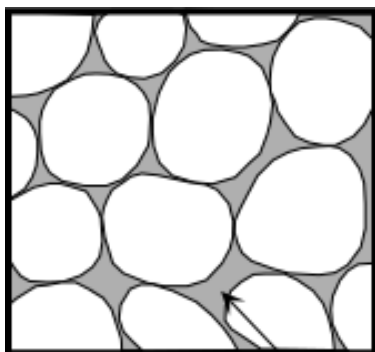
○ **Shape**



○ **Packing**:



○ **Sorting**

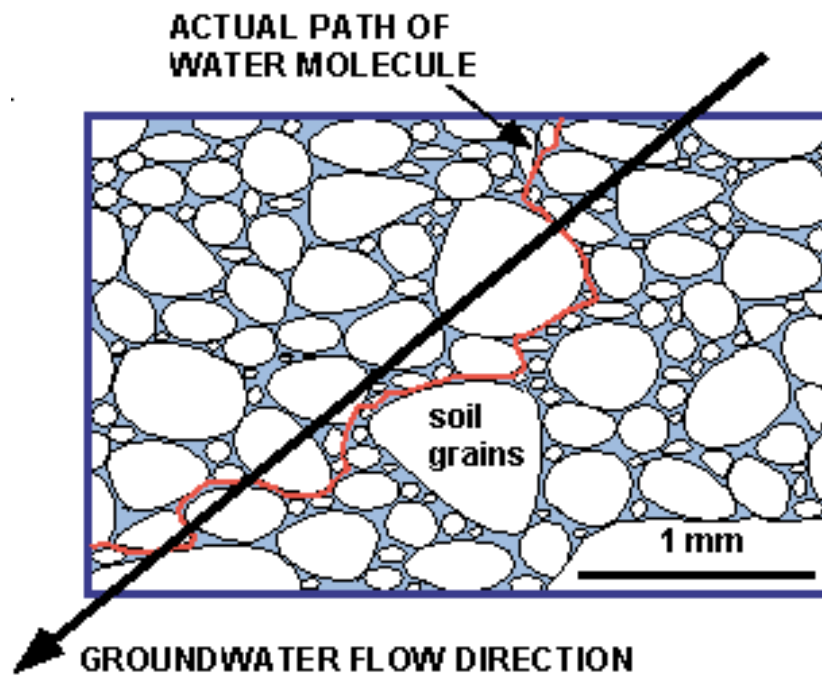


Pore Space

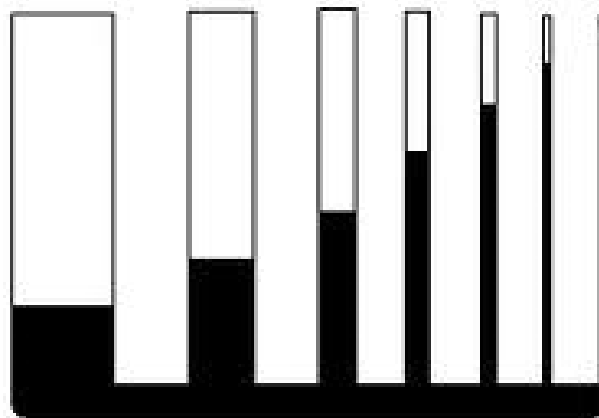
*****With porosity it is important to understand that:

1. if the volumes of the samples are the same and
2. the shape of the particles are the same
3. the porosity of each sample theoretically should be the same.

d. Permeability:

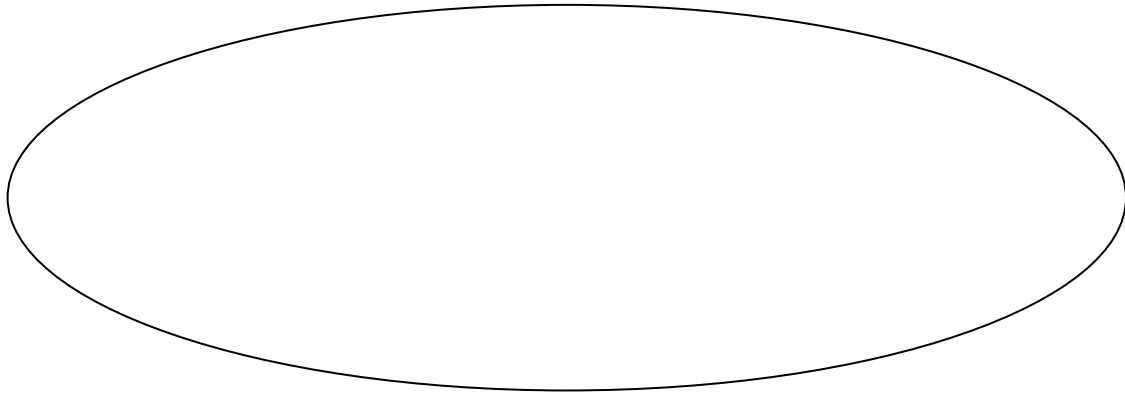


e. Capillarity:



f. Vegetaiton:

Think? How does vegetation influence Runoff or Infiltration?



g. Land use: Buildings, Roads, Farms, nieghborhoods, parking lots

Think? How could land use affect the Run-off or Infiltration?

Topic III

1. Factors Affecting Runoff and Stream Discharge

When does runoff occur?

a. _____

b. _____

c. _____

2. Most Run-off finds itself into a stream

The material that is carried in the stream is called stream discharge.

Flooding:

Flooding poses tremendous danger to both people and property. Since 1900, floods have taken more than 10,000 lives in the United States alone.

The [Big Thompson Canyon \(Colorado\) Flood](#), which killed 140 people in 1976, proved a tragic illustration of a sobering statistic 95% of those killed in a flash flood try to outrun the waters along their path rather than climbing rocks or going uphill to higher grounds.

Most people are unaware that:

- 80% of flood deaths occur in vehicles.
- Just 6 inches of rapidly moving floodwater can knock a person down.
- A mere 2 feet of water can float a large vehicle even a bus.
- One-third of flooded roads and bridges are so damaged by water that any vehicle trying to cross stands only a 50% chance of making it to the other side.

Beyond the risk of fatalities, floods devastate homes, towns, and even entire regions. The great [Mississippi River Flood of 1993](#) covered an area 500 miles long and 200 miles wide. More than 50,000 homes were damaged and 12,000 miles of farmland were washed out.

Part 2 Climate:

Two biggest factors in climate

1. Temperature and 2. Moisture

Temperature: much more is factored in than just the air temperature.

a. Potential for evapotranspiration:

b. Actual evapotranspiration:

The amount of moisture and the potential for evapotranspiration can be used in a formula to classify climate

Precipitation / Potential for Evapotranspiration = climate type

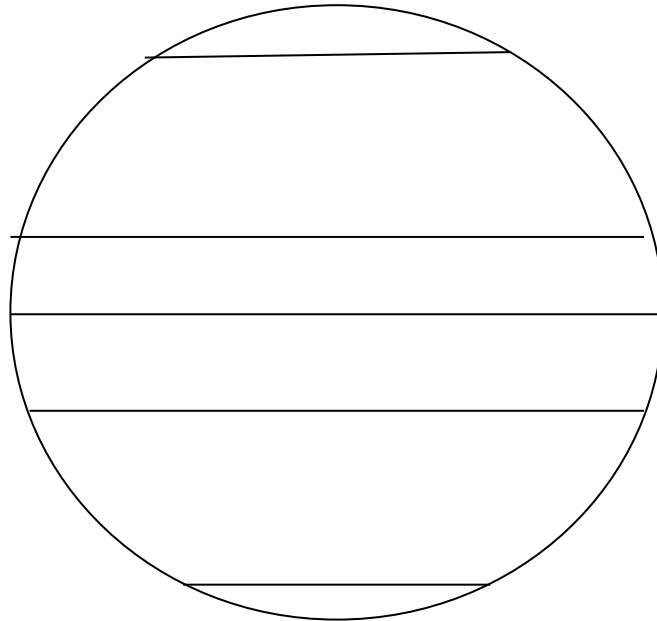
P/E_p	Climate Type
Less than 0.4	Arid
0.4–0.8	Semiarid

P/E_p	Climate Type
0.8–1.2	Subhumid
Greater than 1.2	Humid

Factors Affecting climate

These are other factors that can effect the climate of a location.

a. Latitude and Temperature



b. Latitudeinal climatic patterns:

Based on the wind patterns shown on the above diagram.
Pressure belts form giving areas predictable climatic patterns.

30° North and south have the worlds largest _____ climates

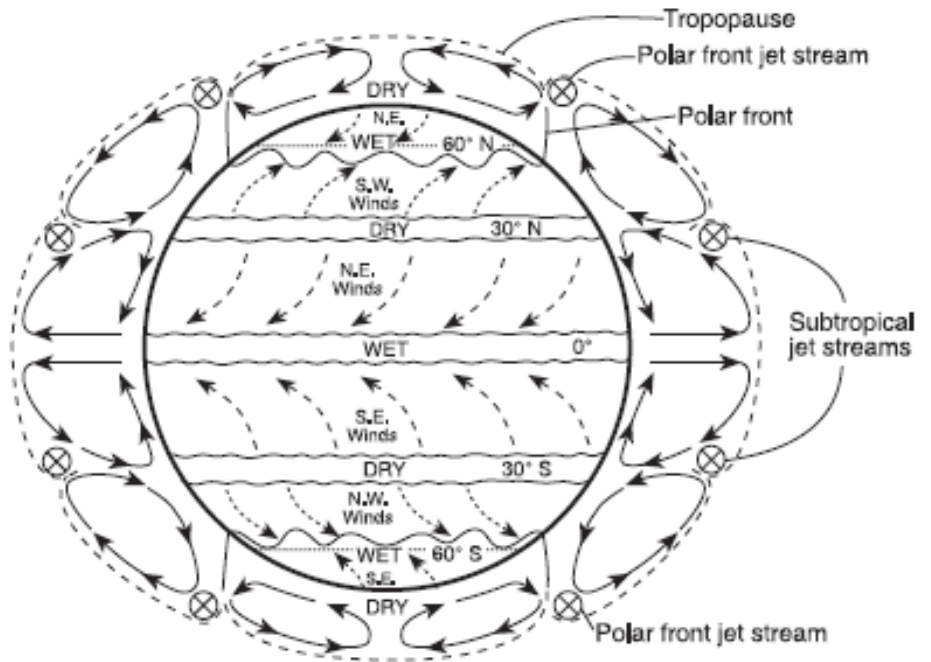
0° on the equator the worlds largest rain _____ exist.

c. Large bodies of water:

How do Bodies of water affect the climate of an area?

In New York there are obviously Three large bodies that affect climate. What are they?

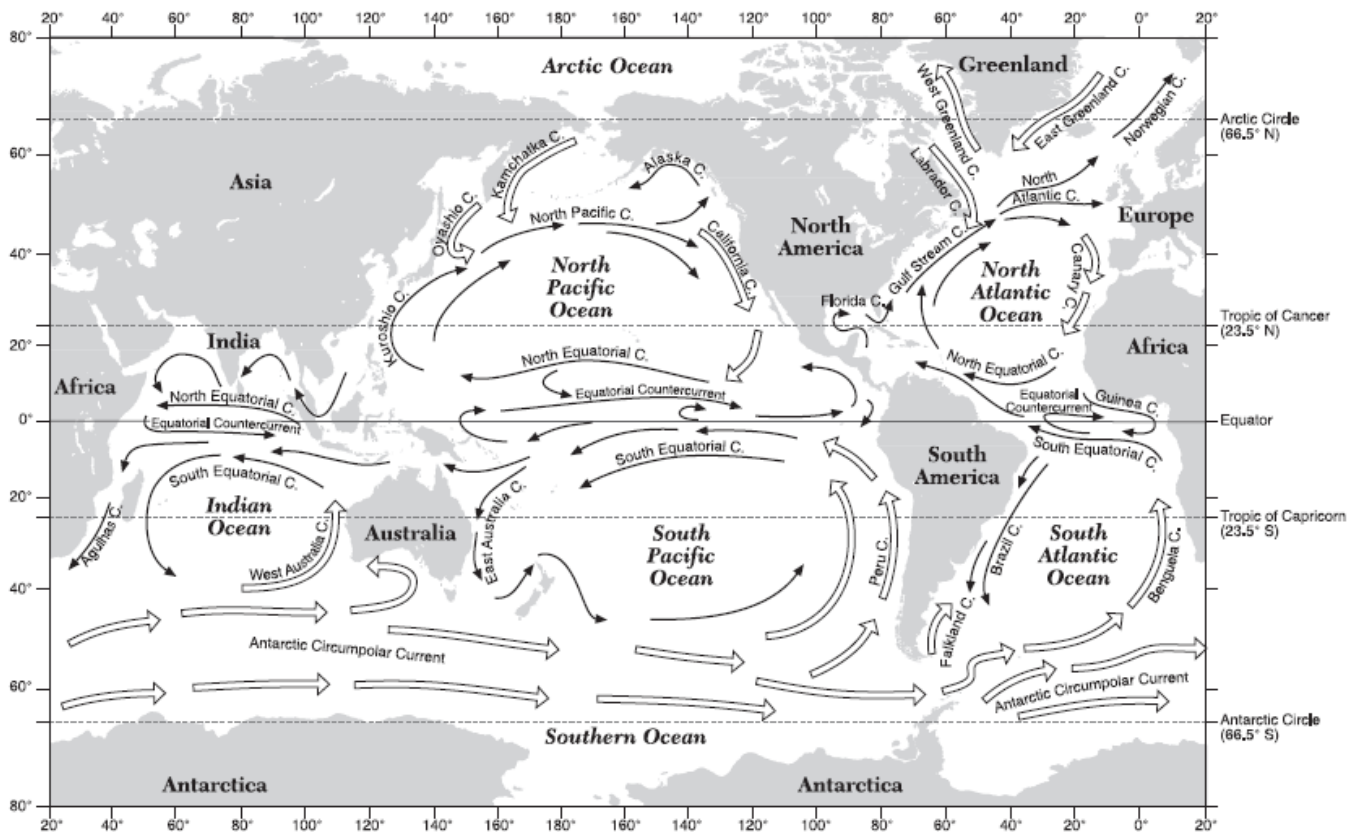
d. Prevailing wind:



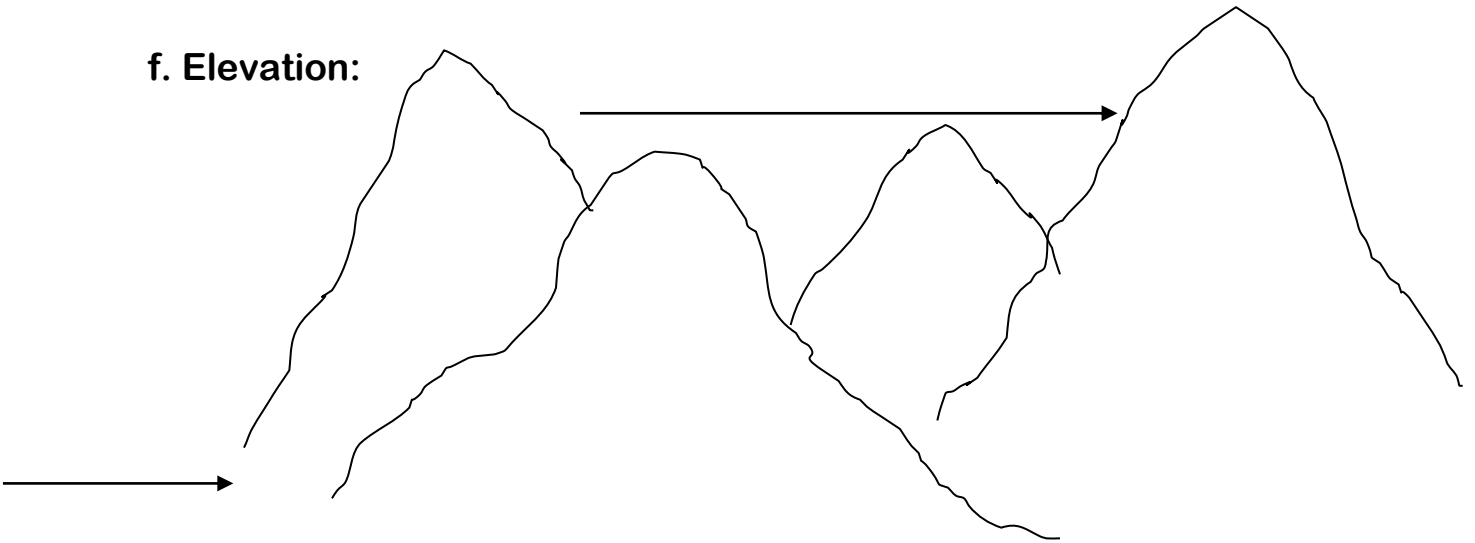
e. Surface Ocean Current:

Cold Currents _____

Warm currents _____



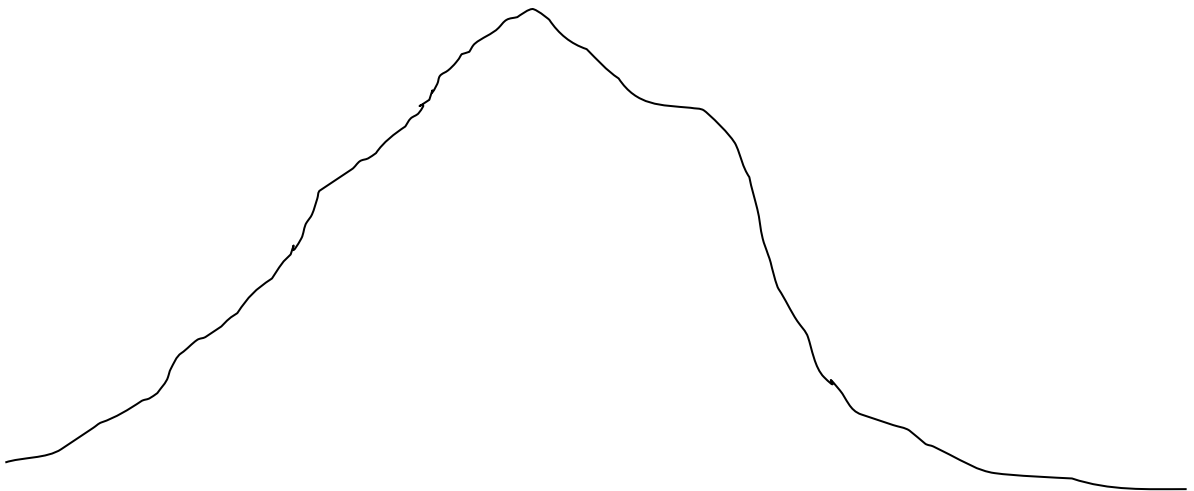
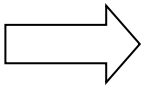
f. Elevation:



g. Mountains:

Name two ways mountains can affect the climate of an area

a.



h. Vegetation:

How does vegetation affect the climate?

i. Cloud Cover—Pressure belts can produce or change the amount of cloud cover. Obviously, more clouds can cause less insolation from reaching the ground, also produce more rain fall.

Climatic Change:

A hot topic in today's world.

The study of ancient climates is called paleoclimatology.

The climates of the earth have changed many times since the earth was formed.

Several sources can give us clues to past climates

The two biggest are

1. _____ --

2. _____ --

