

Topic: Climate and Moisture

Aim: What factors affect the climate of a region?

How is climate different than weather?

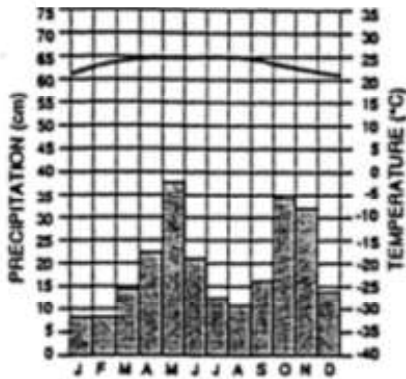
Weather: the day-to-day changes in atmospheric conditions

Climate: the average monthly temperatures, the temperature range, and amount of precipitation of a region

1. **LATITUDE:** As latitude increases (approaching poles), the average temperature decreases. (this is caused by the difference in angle of insolation that strikes the Earth at different latitudes)

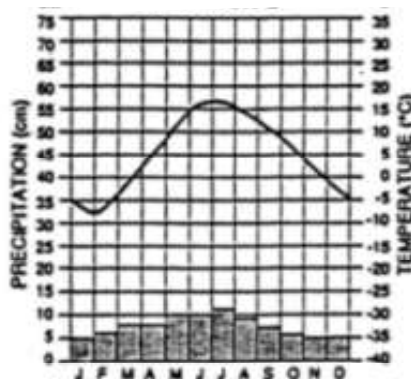
As latitude increases, temperature range increases.

Equator (0° latitude)



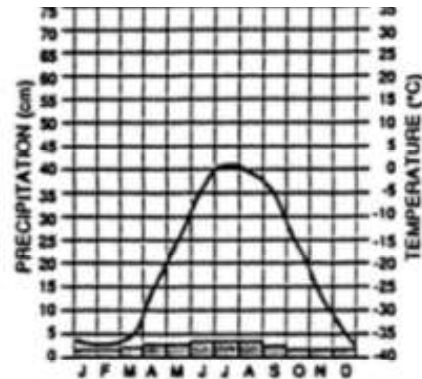
high average monthly temperatures
always warm (small temperature range)
lots of precipitation (Equator is a wet belt)

Mid-Latitude Northern Hemisphere (New York)



average temperature range
average precipitation

North Polar Region (90°N)



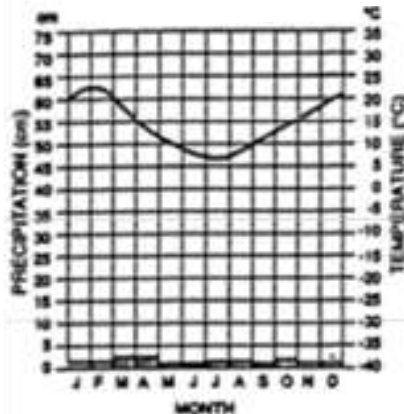
low average monthly temperatures
large temperature range
little precipitation
(North Pole is a dry zone)

Southern Hemisphere (probably 30°S)

Graph shows opposite seasons of Northern Hemisphere

higher temperatures during our winter months and lower temperatures during our summer months

probably at 30°S because of the little precipitation shown (30°S is a dry belt)

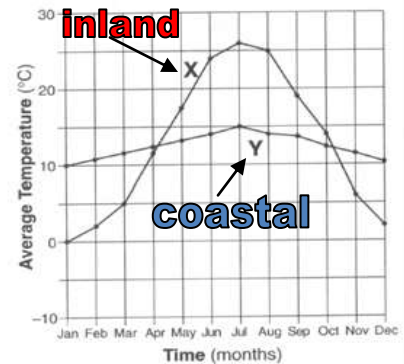


2. ELEVATION: As elevation increases, the average temperature decreases.

3. NEARNESS TO A LARGE BODY OF WATER:

a. Coastal Regions – smaller temperature range
 (cooler summers, warmer winters)
 caused by “the moderating effect of water”
 - more humid (more precipitation)

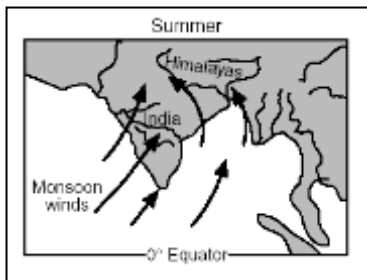
b. Inland Locations – larger temperature range
 (warmer summers, cooler winters)



Monsoons – seasonal shift in the winds and precipitation – especially experienced in places like India

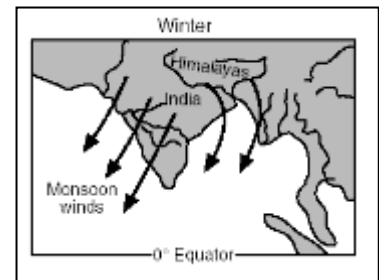
summer

water is cooler than land creating high pressure over water.
 winds blow from water to land all season bringing heavy rains



winter

water retains heat and is warmer than land – high pressure is now over the land and winds blow toward ocean creating an extremely dry season



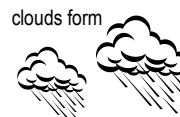
4. MOUNTAIN BARRIERS:

windward side

(side that the prevailing winds approach)

cooler, moist air is brought in by the prevailing winds
 (in the U.S. the SW planetary winds a.k.a.: the prevailing westerlies)

the air rises, expands, cools to the dewpoint



leeward side

drier air sinks, compresses, and warms

Rocky Mountains



Climate on Windward Side:

- cooler temperatures, more humid
- more precipitation

Climate on Leeward Side:

- warmer, drier (arid)

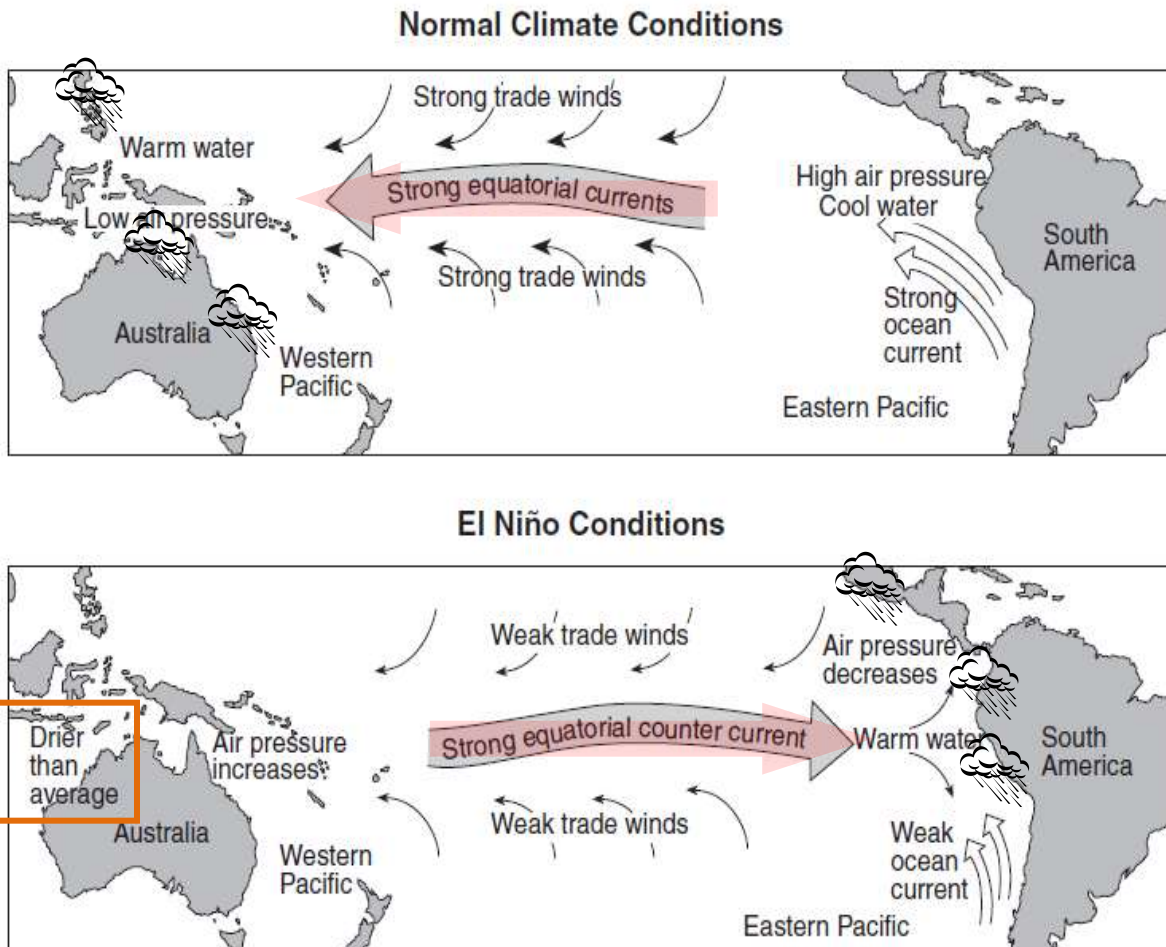
5. PLANETARY WIND and MOISTURE BELTS (ESRT page 14):

High Pressure Belts - 30°N & 30°S, the poles - dry zones of diverging winds (location of many of the world's deserts)

Low Pressure Belts - 60°N & 60°S, the Equator - wet zones of converging winds (location of rainforests)

6. SURFACE OCEAN CURRENTS (ESRT page 4):

- a. "rivers" of water in the ocean that are driven by the planetary winds
- b. specific ocean currents bring warmer or cooler water to coastal locations modifying the climate (example: the Gulf Stream brings warm water from the Gulf of Mexico to western Europe)



El Niño

a re-occurring ocean current (approx. every 5 years)
that shifts the trade winds and precipitation patterns in the Pacific Ocean

During an El Niño event, the west coast of North and South America have more precipitation,
and SE Asia and Australia experience drought-like conditions.