

### Tropical Rainforest

**Temperature** No temperature variation - warm around 27.2C

**Precipitation** Above temp line - tons of water, no drought

**Growing season** All months

**Species** Most species of any terrestrial biome

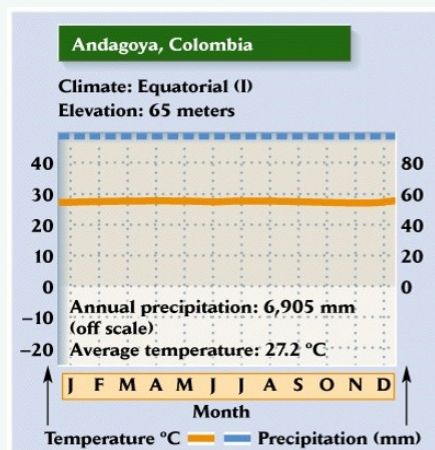
**Plants**

- Warm, wet conditions speed the decomposition of detritus and the reabsorption of released nutrients by plants, so soils cannot support long-term agriculture
- C3 Photosynthesis: Present in most plants, not good at CO2 or H2O conservation but not needed because of plenty moisture in biome
- Plants with drip tips to avoid fungal infection and rotting
- Large, thin leaves

**Animals**

- Black and White Colobus Monkey
- Dung Beetle
- Jaguar
- Agouti

### Tropical Rainforest



### Boreal Forest (Taiga)

**Temperature** Cold until growing season, avg 3.6C

**Precipitation** Rain in growing season. Most precipitation falls as snow (severe winters) in other months.

**Growing season** AMJJASO

**Plants**

- **Poor and acidic soil**
- Cold temperatures limit the decomposition of litter, so soils contain a great deal of organic matter
- Abundance of **conifer trees** like spruces, firs, and pines because they are shared like cones so can **slough off heavy loads of snow** to prevent damage
- Conifers have **needles with thick waxy coatings** and **small surface area** to resist cold conditions and minimize water loss
- Trees are **evergreen** because of a short growing season where there is not enough time to drop leaves and rebuild them every year
- Droughts trigger widespread canopy and soil fires that consume the abundant accumulated organic matter.

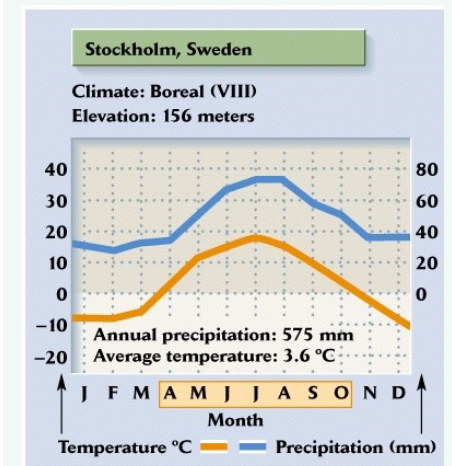
### Boreal Forest (Taiga) (cont)

**Animals**

- Lynx
- Beaver
- Haire
- Elk

**Special** World's largest terrestrial biome. Most in Russia and Canada

### Boreal Forest



### Tropical Savanna/Seasonal Forest

**Temperature** Temperature varies little

**Precipitation** Wet/dry seasons. Dry season between May and October. Outside of May and October is wet

**Growing season** All year

**Plants**

- Tree/grass codominance, often require disturbance to maintain - Dry season makes a "thorn forest" because of many succulents.

### Tropical Savanna/Seasonal Forest (cont)

Animals	- Elephant
	- Giraffe
	- Gaselle
	- Eland

### Desert

Temperature: Line above precip, avg of 21.9C

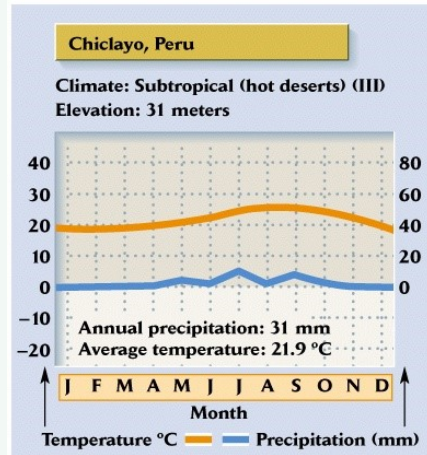
Precipitation: Barely or none

Growing season: All months

Plants: - Plants can leave without water by metabolizing fat to obtain it  
 - Plants are thorny and adapted to conserve water (fleshy stems and leaves)  
 - Thick cuticles  
 - C4 (spatial separation of photosynthesis) and CAM Photosynthesis (temporal separation of photosynthesis)

Animals: - No big mammal because of no shade or water.  
 - Dominant mammals are burrowers - Anochetus ant  
 - Texas horned lizard - squirts blood from eyes to defend itself because blood taste foul to predators  
 - Fat sand rat  
 - Greater roadrunner

### Desert



### Temperate Forest

Temperature: Avg temp 10.8C

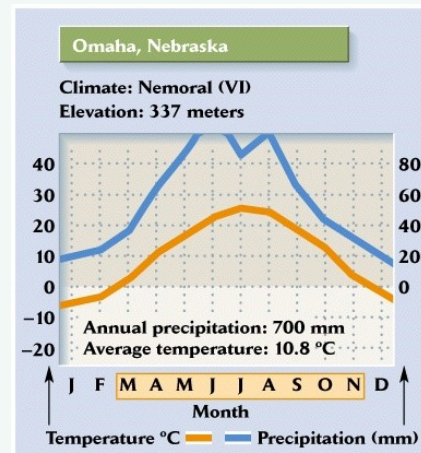
Precipitation: - Summers are moist - Distinct winter season with frost and snow

Growing season: MAMJJASON

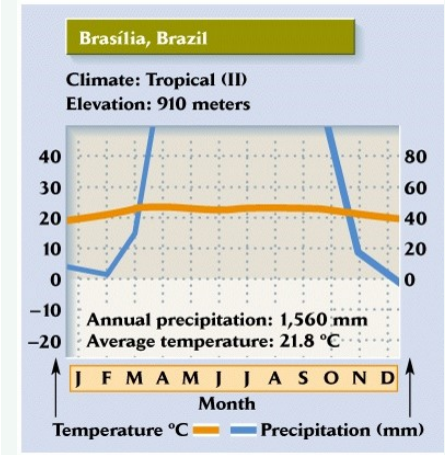
Plants: - Soils are fertile and low acidity

Animals: - Bobcat  
 - Grizzly Bear  
 - Squirrel  
 - Deer

### Temperate Forest



### Tropical Savanna/Seasonal



### Tundra

3 Types: Artic, Antartica, Alpine Tundra

Temperature: Cold, severe winters, avg - 11.9C

Precipitation: Some rain but not much, similar to a desert. Cold air holds little moisture so most moisture is locked up as snow.

Growing season: JJAS - short growing season due to very severe winters

### Tundra (cont)

**Plants**

- Almost no trees due to permafrost
- Permafrost is a massive carbon storage area: with global warming, tundra (which used to be a sink) is now a source of carbon and methane (greenhouse gases)
- Most plants low to ground
- Plants produce anti-freeze protein
- Lichens, moss, heath - Slow decomposition of organic matter, so soil is infertile and low in oxygen

**Animals**

- Migration of animals out in cold months and in during growing season
- species-poor
- Peary caribou
- Lemming (don't run off cliffs)
- Wolf
- Polar bear

### Temperate Grassland/Shrubland

**Temperature** Temp line crosses precipitation line. Hot summers and cold winters

**Precipitation** Some precipitation

**Growing season** MAMJJASON

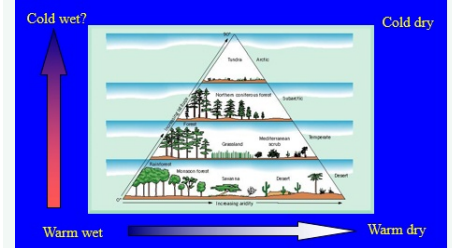
**Plants**

- Few trees, dominated by grasses - May become forest without disturbances when precipitation is high

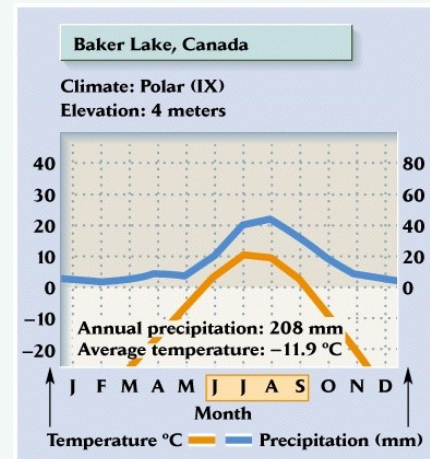
**Animals**

- Bison
- Kangaroo
- Cheetah
- Prairie dogs

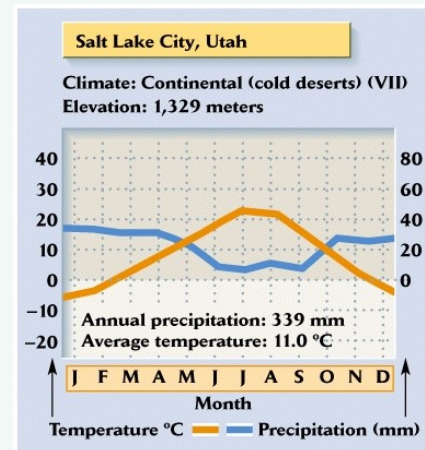
### Patterns



### Tundra



### Temperate Grassland/Shrubland



### Graph

