

Warm-Up

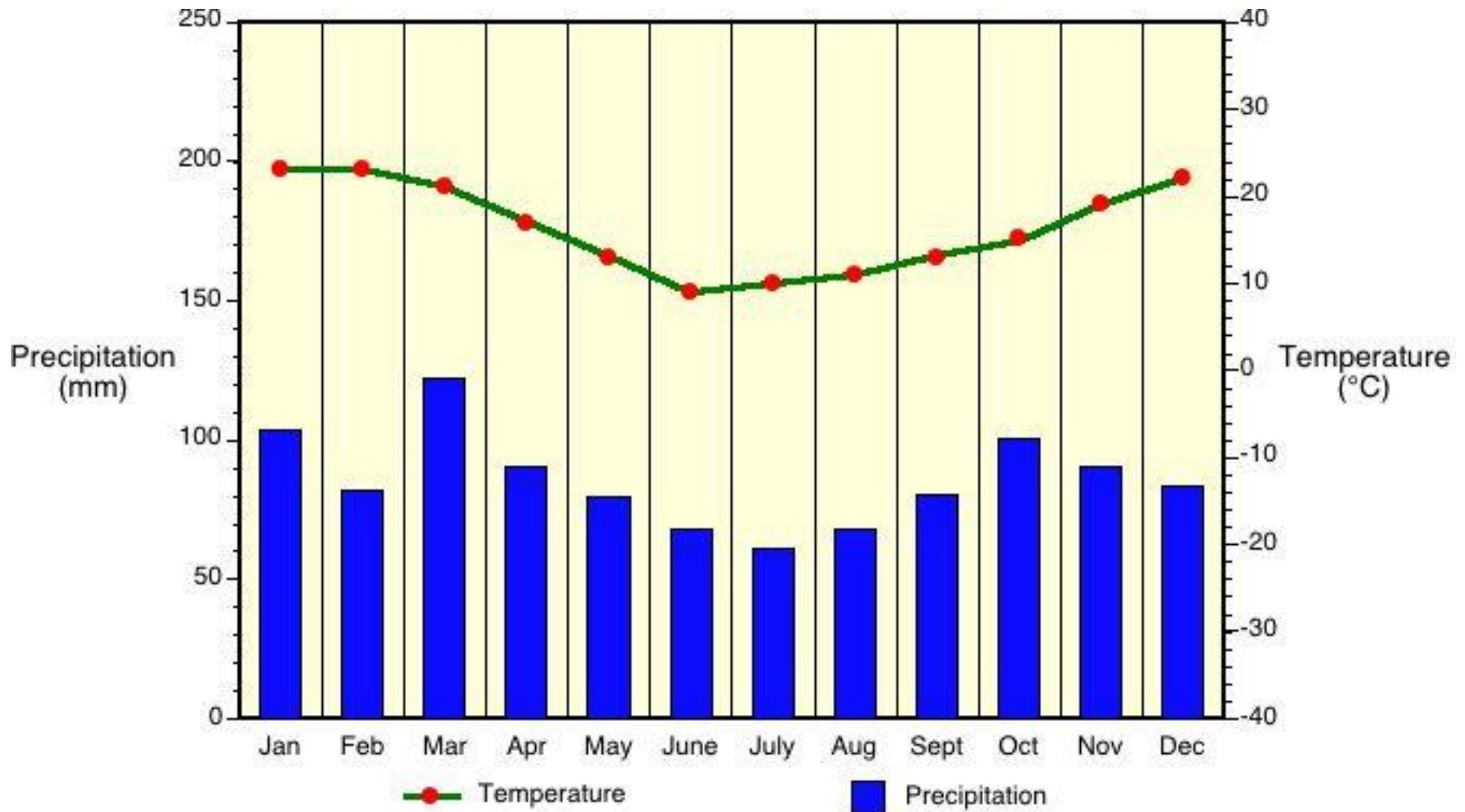
1. Name examples of biotic and abiotic factors in the environment surrounding WHS.
2. Which biomes can be found in Georgia?
3. Define the following terms:
 - population
 - community
 - ecosystem
 - biosphere

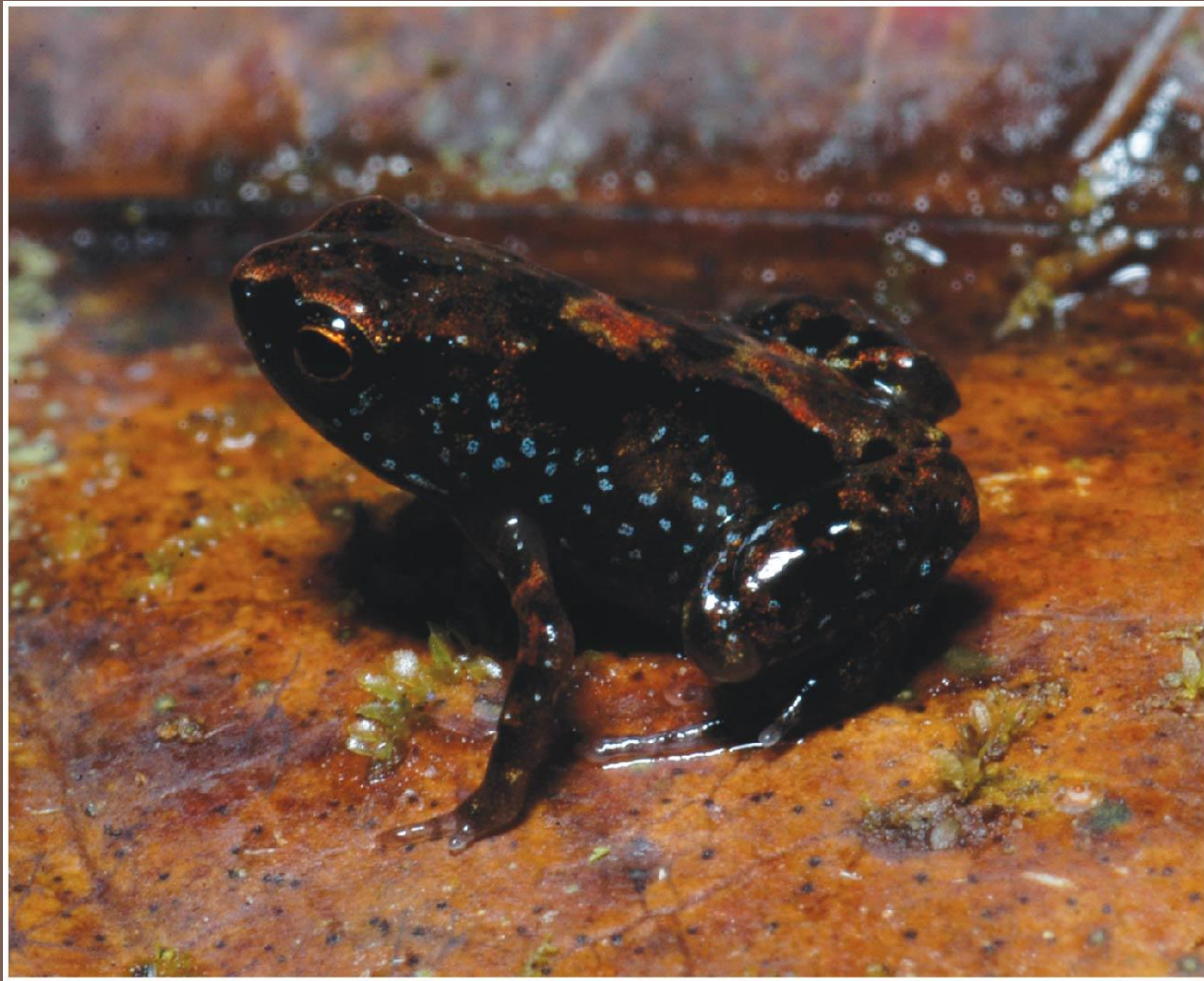
Warm-Up – Generating Hypotheses

- Question: What type of cleaner will kill the most germs?
- Develop a hypothesis based on this question. Be sure to include:
 - ▣ Independent variable (IV)
 - ▣ Dependent variable (DV)
- What will your control be?
- What are some things that you will keep constant between test groups?
- **Vocab terms: biogeography, fixed action pattern, sign stimulus, kinesis, taxis, imprinting, migration**

Identify: What do I see on the graph?

Interpret: What does the info on the graph mean?





Biomes

You Must Know

- ❑ The role of abiotic factors in the formation of biomes.
- ❑ Features of freshwater and marine biomes.
- ❑ Major terrestrial biomes and their characteristics.

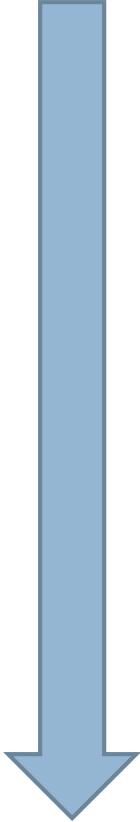


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Ecology: the scientific study of the interactions between organisms and the environment

- The ecological study of species involves biotic and abiotic influences.
 - ▣ Biotic = living (organisms – behaviors & interactions between organisms)
 - ▣ Abiotic = nonliving (temp, water, salinity, sunlight, soil)

Heirarchy

- 
- Organisms
 - Population: group of individuals of same species living in a particular geographic area
 - Community: group of populations of different species in an area
 - Ecosystem: community of organisms + physical factors
 - Landscape: mosaic of connected ecosystems
 - Biosphere: global ecosystem

Global ecology



Landscape ecology



Ecosystem ecology



Community ecology



Population ecology



Organismal ecology

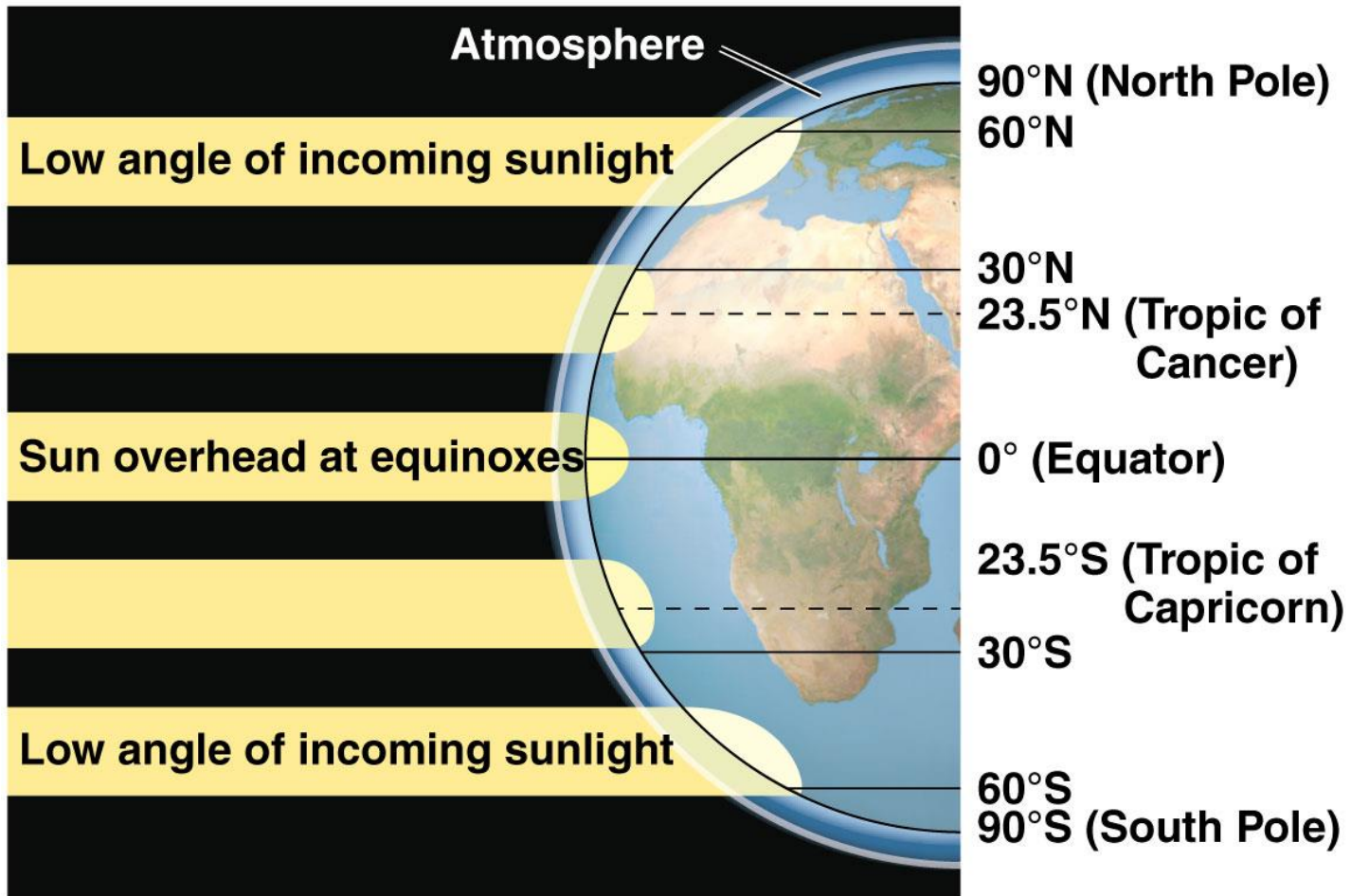


Climate: long-term prevailing weather conditions in a particular area

- Climate = temperature + precipitation + sunlight + wind
- Macroclimate vs. microclimate:
 - ▣ Macro: work at seasonal, regional or local level
 - ▣ Micro: small-scale environmental variation (eg. under a log)
- Climate change: some species may not survive shifting ranges

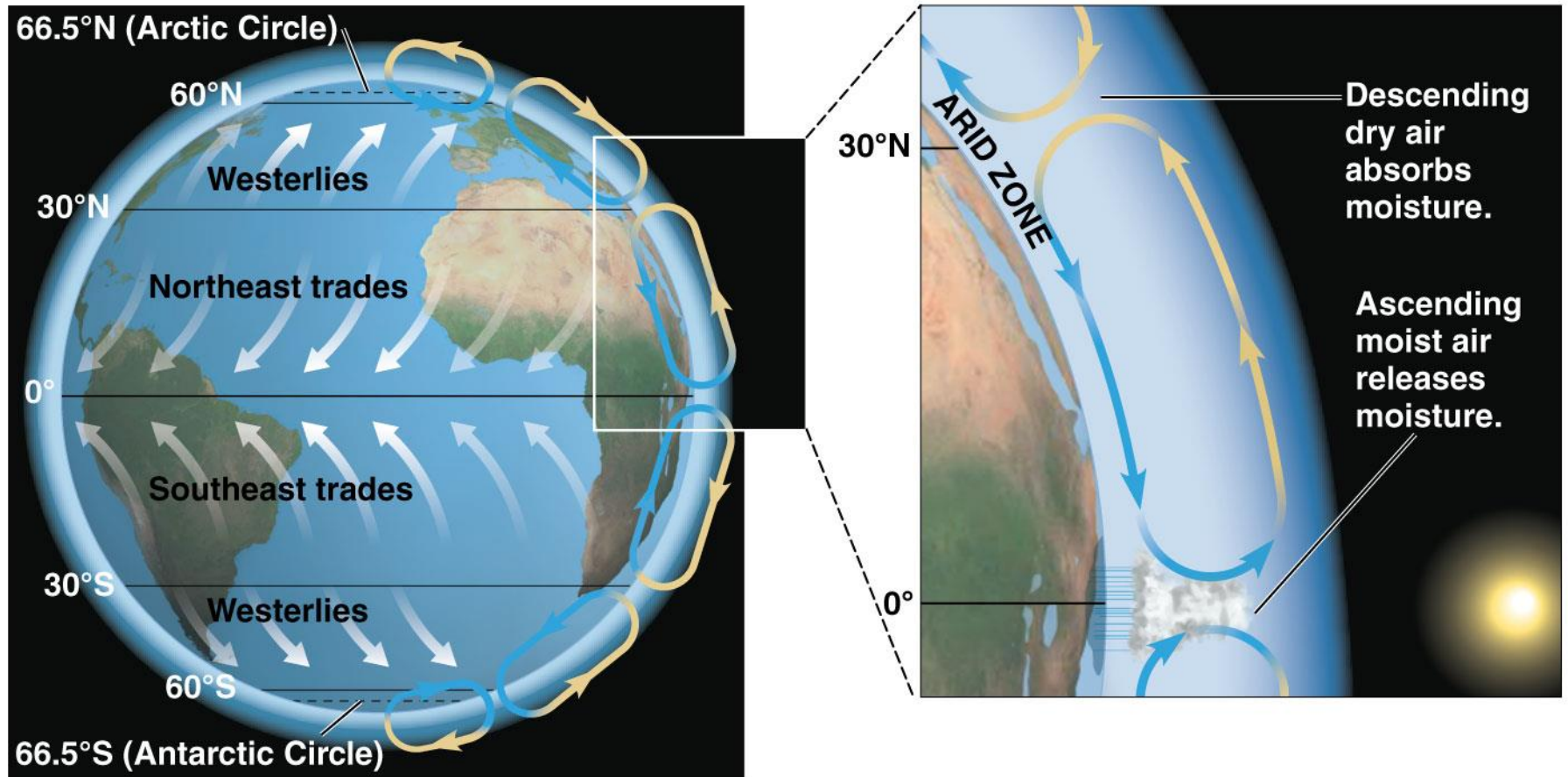
Global Climate Patterns:

Sunlight intensity



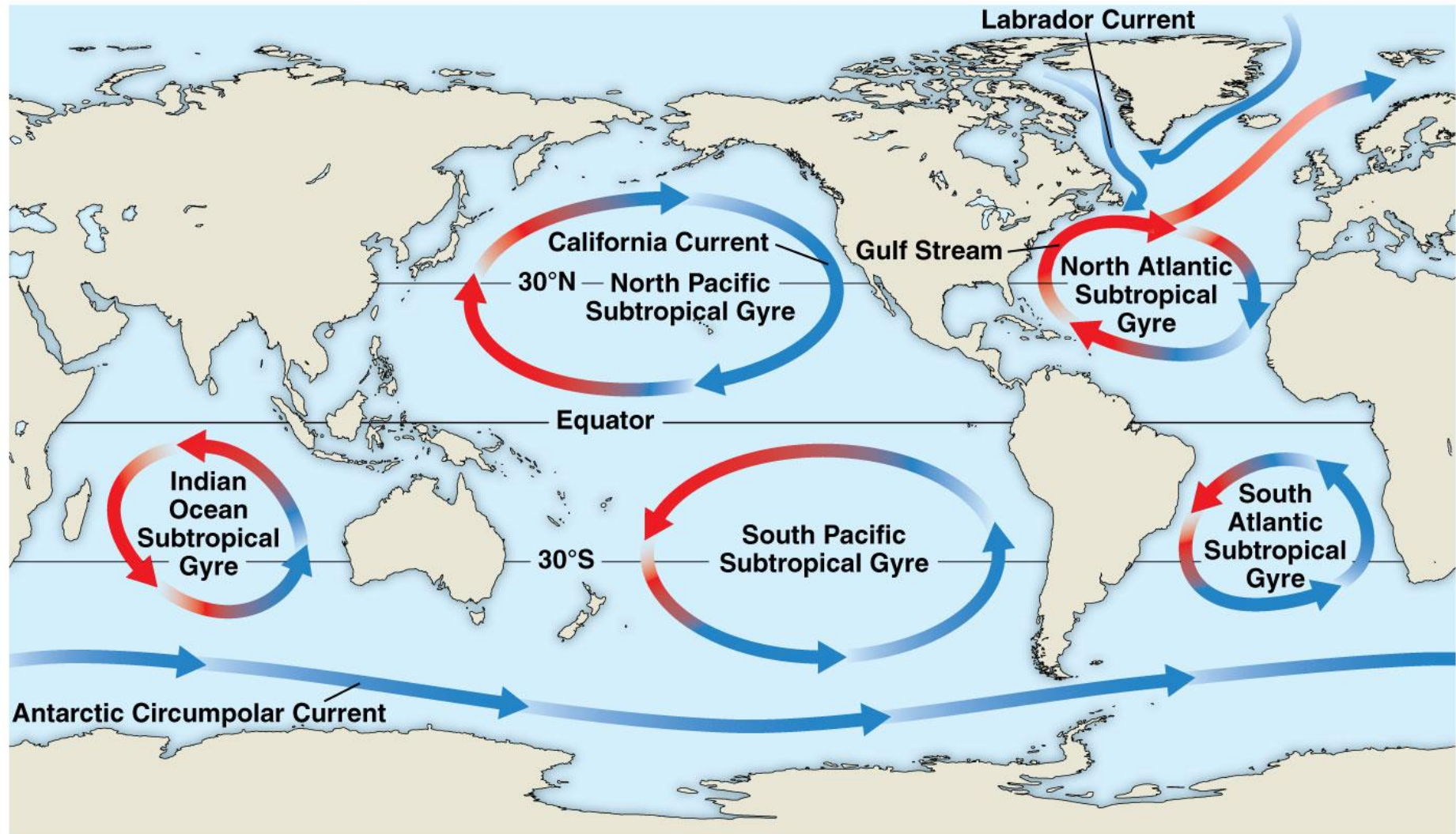
Latitudinal variation in sunlight intensity

Global Climate Patterns: Air Circulation & Precipitation Patterns

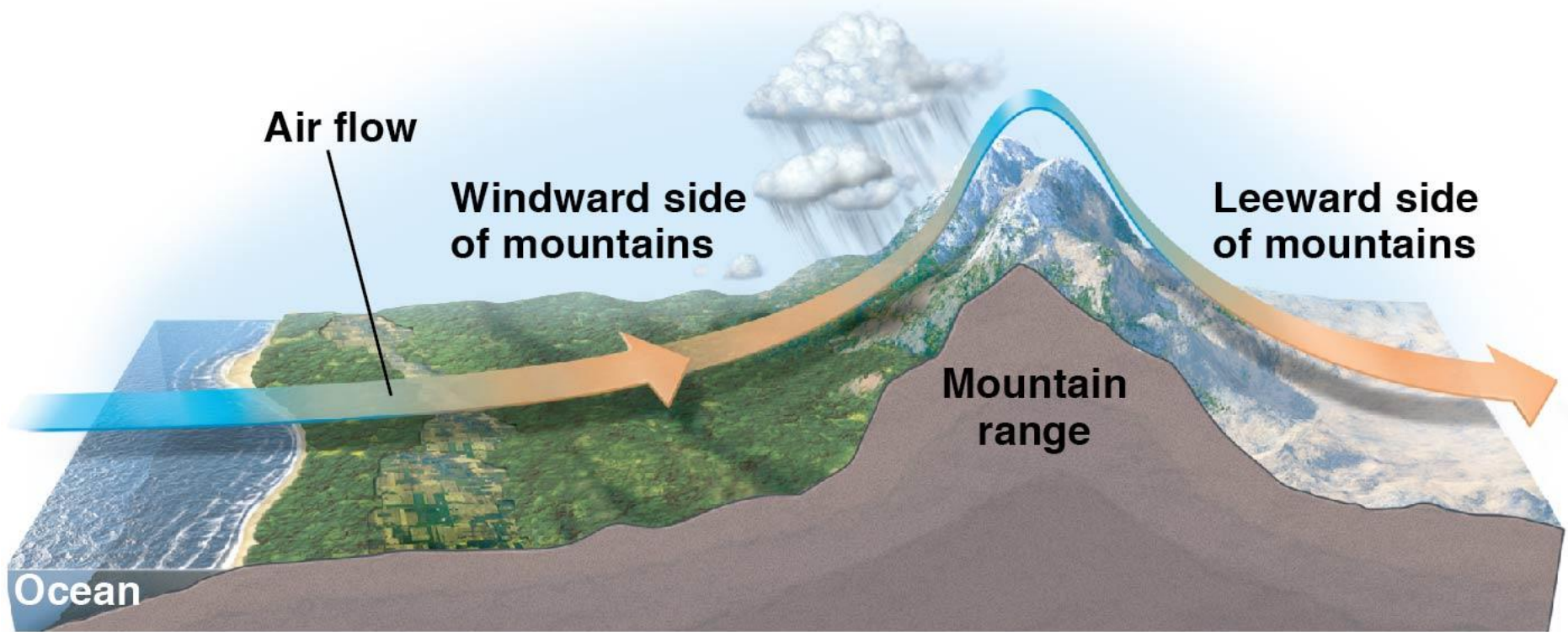


Global air circulation and precipitation patterns

Global Climate Patterns: Ocean Currents



Global Climate Patterns: Mountains affect rainfall

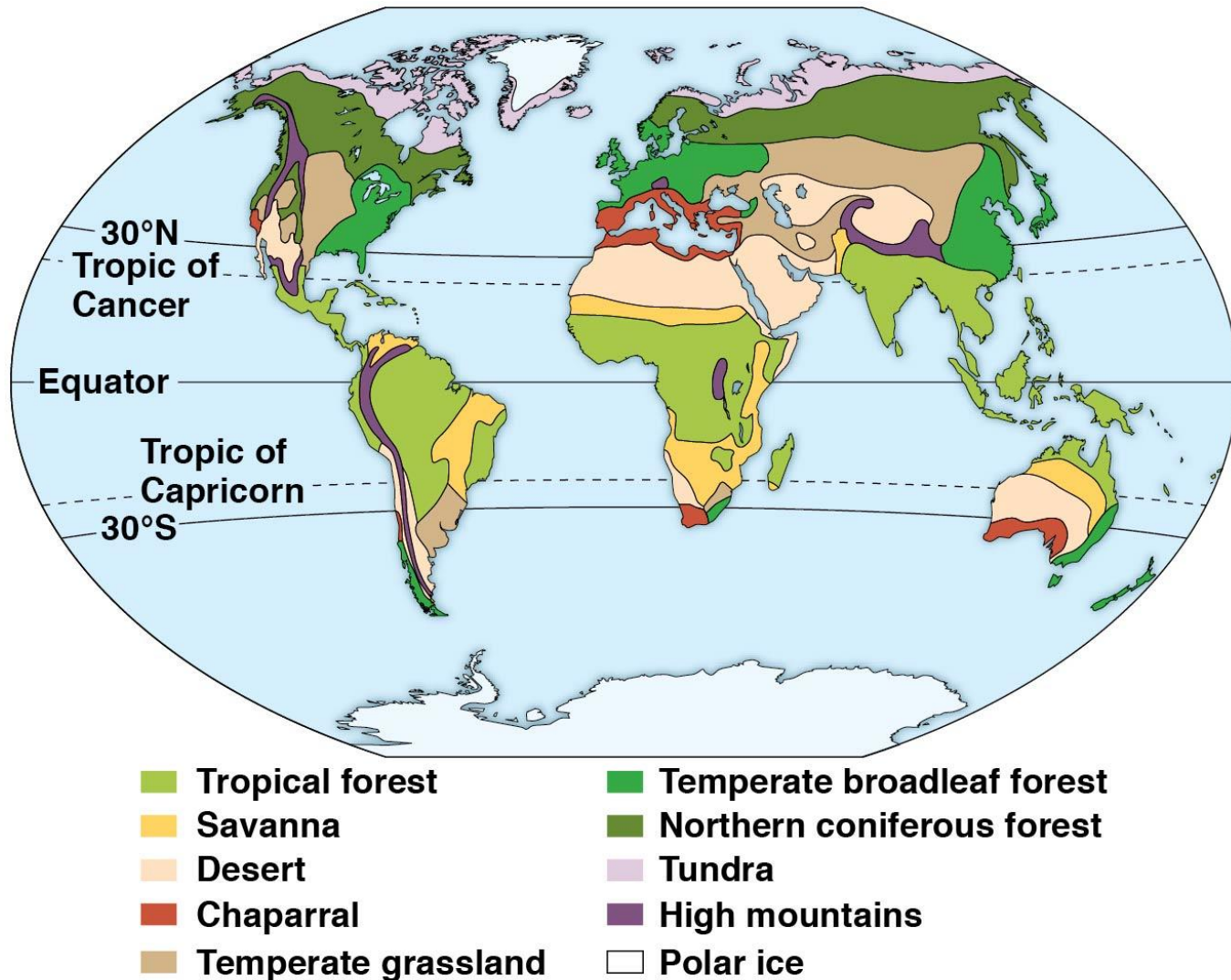


Which side of the canyon has more plants? Why?



Black Canyon of the Gunnison River

Biomes: major types of ecosystems that occupy very broad geographic regions



TERRESTRIAL BIOMES

8 total

Climate, latitude, and elevation determine biomes

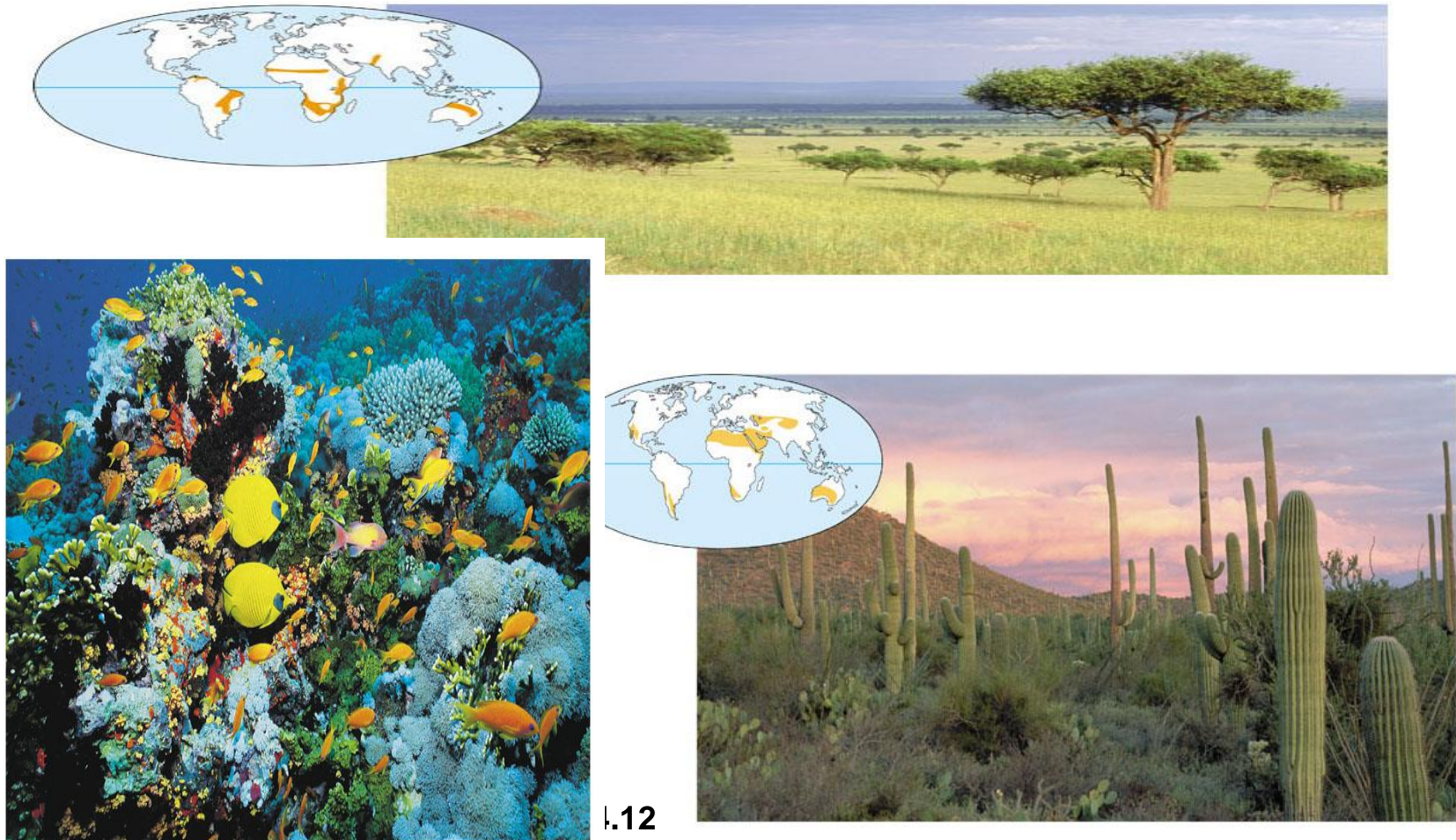
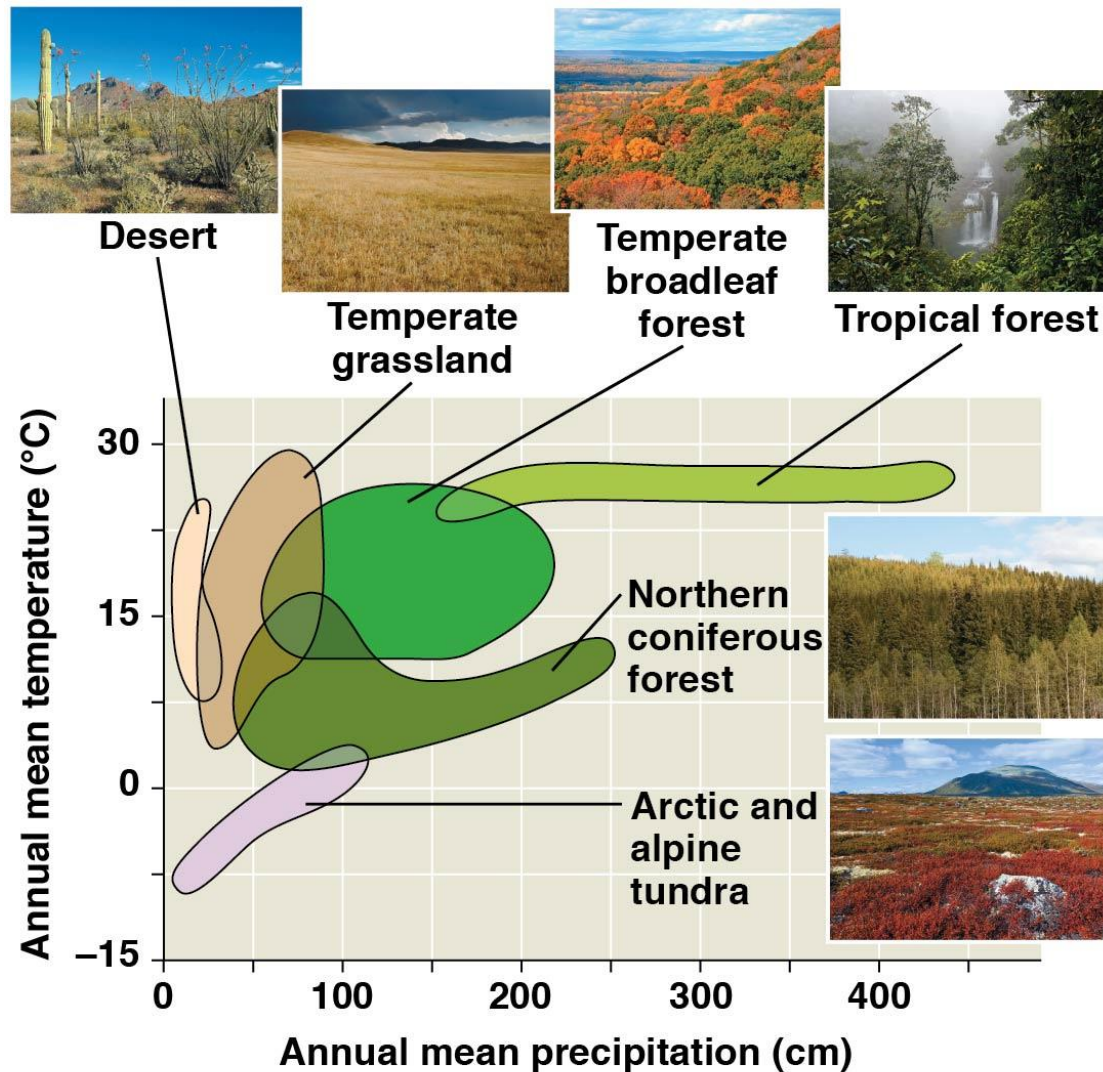
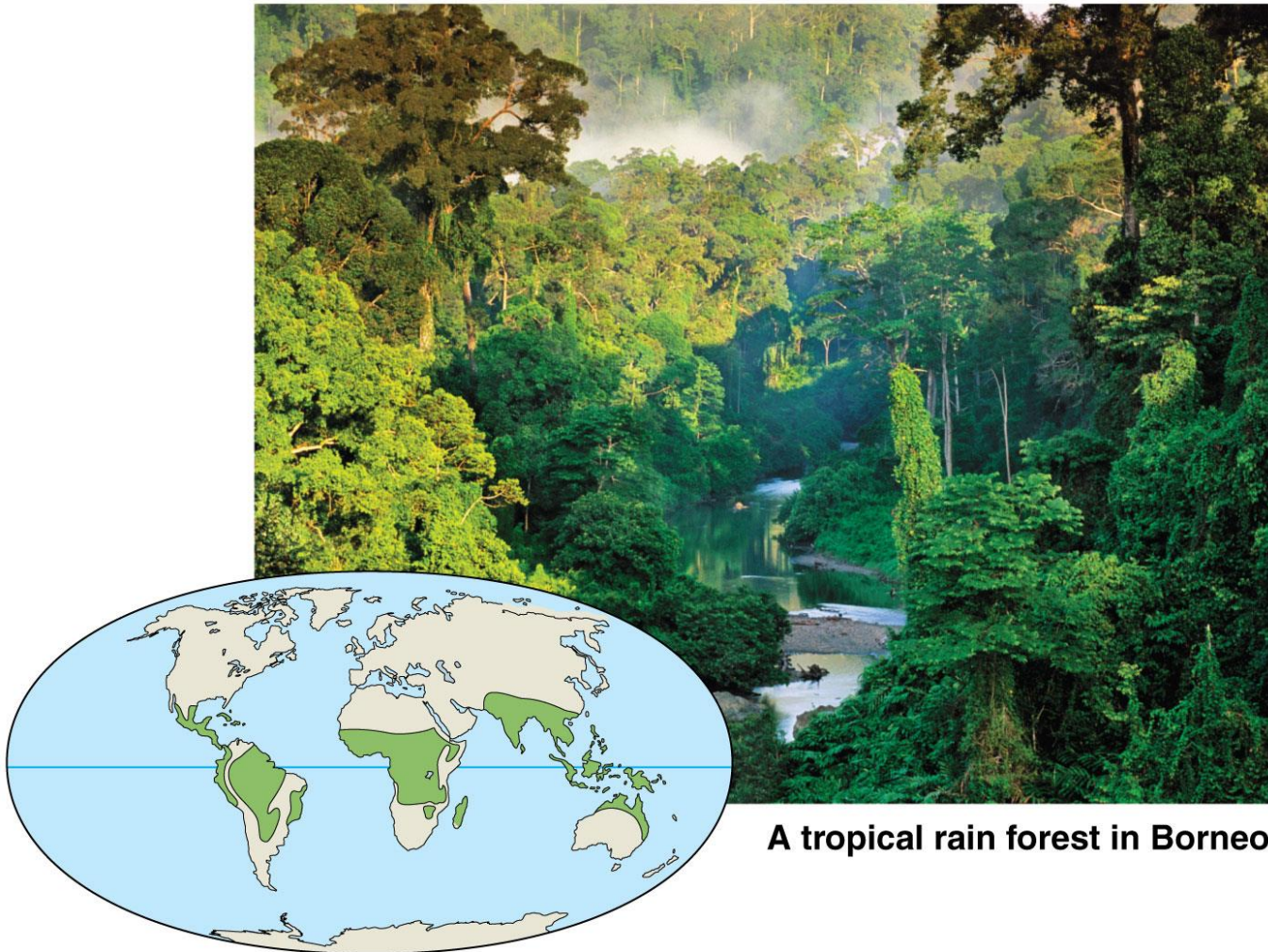


Figure 34.7C

Climograph: plot of annual mean temperature & precipitation in a particular region



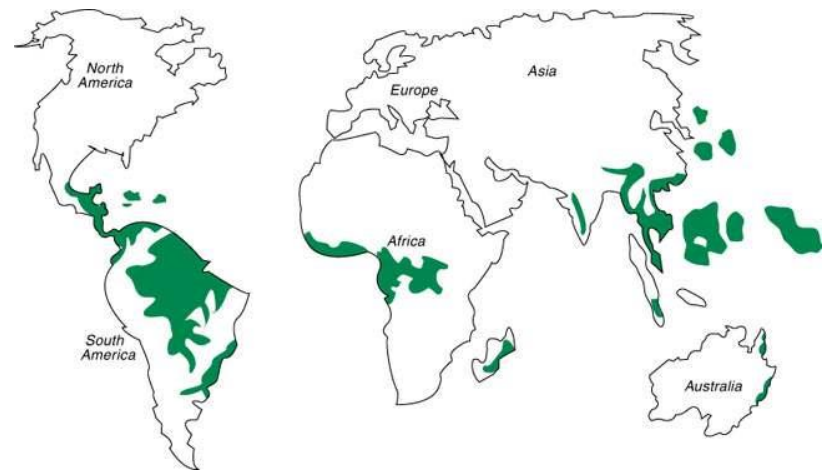
Tropical Rainforest



A tropical rain forest in Borneo

TROPICAL RAINFOREST

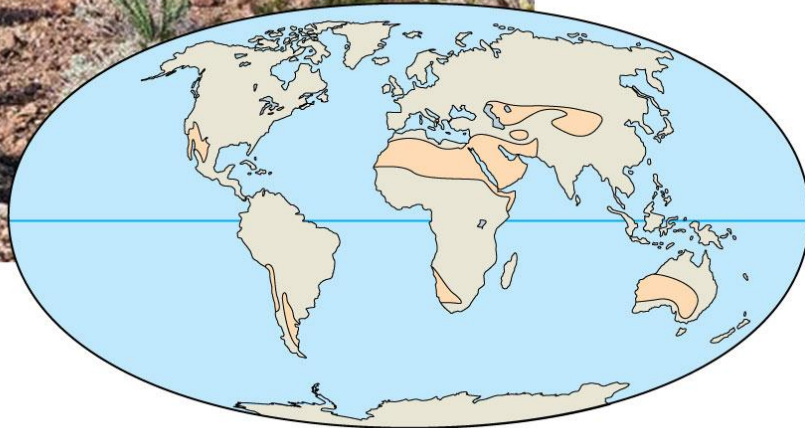
- ❑ **Located around equator- most biodiverse place on planet.**
- ❑ Warm & wet all year- 250cm rain/year, no distinct seasons.
- ❑ **Soil- low nutrients due to high # of decomposers**
- ❑ Diverse Plant life
 - ❑ Forest floor- moss, ferns
 - ❑ Understory- saplings, shrubs
 - ❑ Canopy- most trees
 - ❑ Emergent Layer- a few taller trees
- ❑ Monkeys, jaguars, sloths, raptors, insects, tapirs
- ❑ Threats: deforestation, farming



Desert



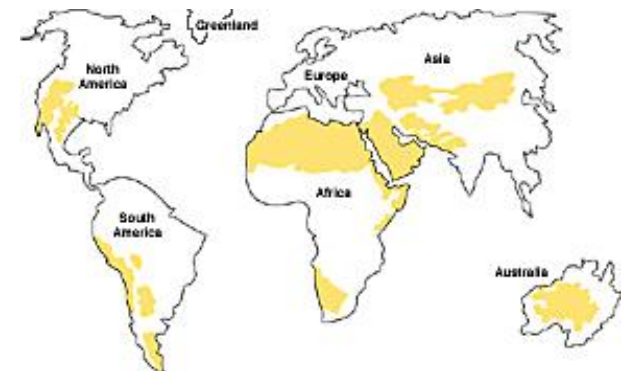
A desert in the southwestern United States



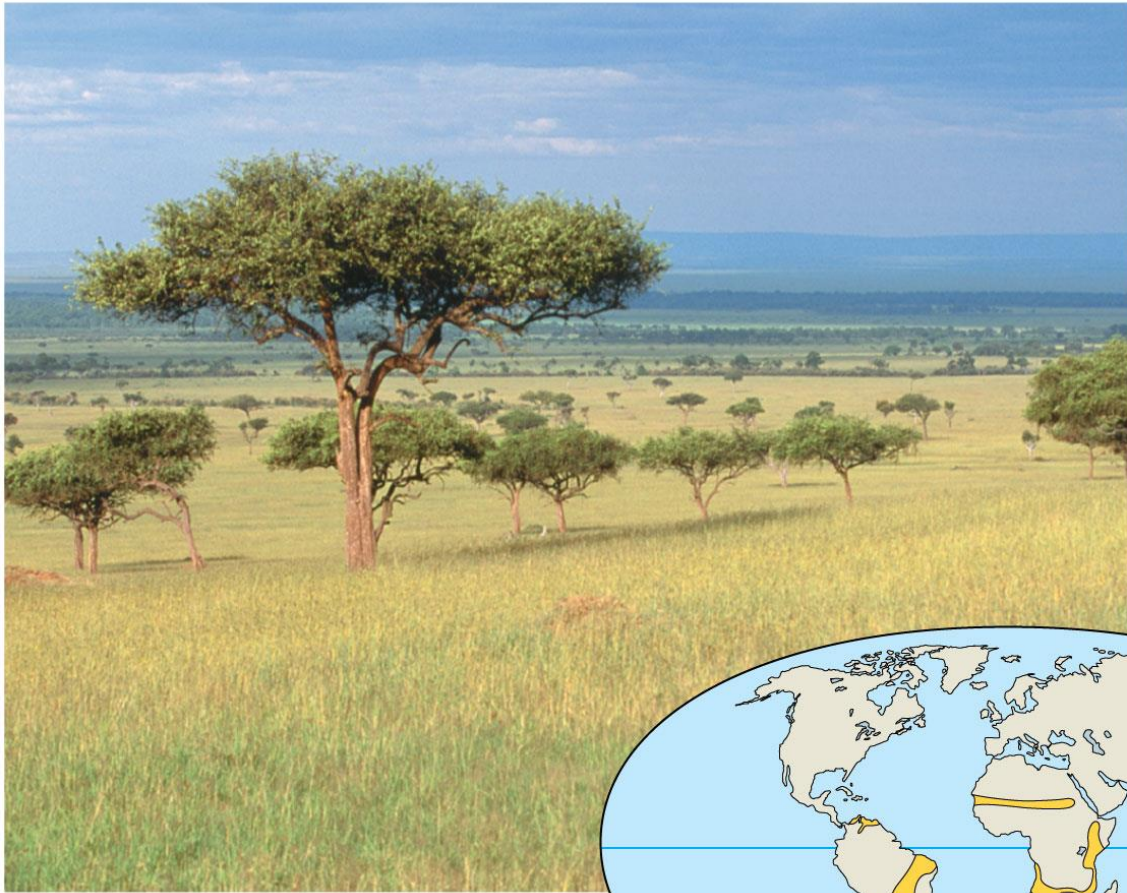
DESERT



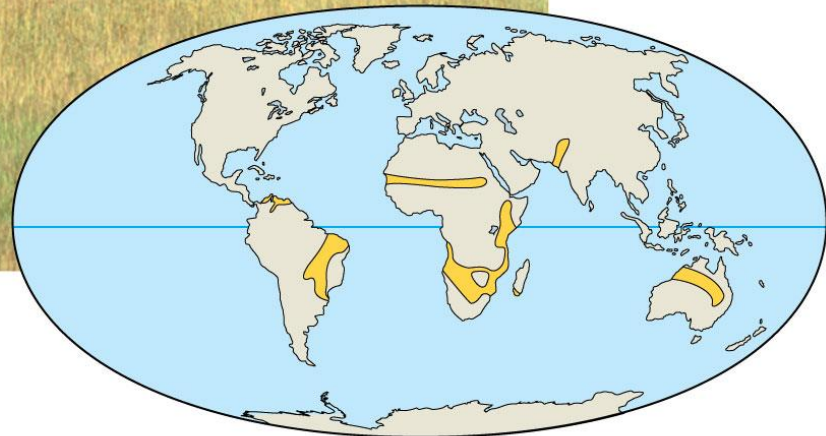
- **Arid regions – can be hot or cold deserts.**
- Receives 10-25 cm of rain each year. Hot days/cold nights (no clouds to hold heat in)
- **Soil high in minerals, low in organic matter- slow decomposition**
- Plants adapted to dry conditions
 - Thick stems to store water
 - Thorns to deter herbivores & conserve water
 - Shallow roots- infrequent rains
- Rodents, reptiles, raptors, camels, jackrabbits, coyote
 - Nocturnal
 - Large ears to dissipate heat
- Threats- ATV's, only growing biome



Savanna



A savanna in Kenya



SAVANNAS

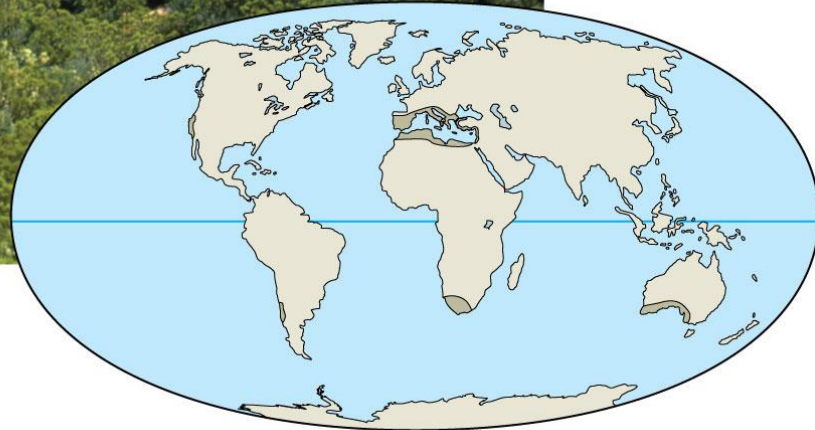
- **Most of Africa, some of S. America & Australia**
- Receive a little more rainfall than prairie.
- **Soil- rich in nutrients**
- More trees here due to increased rain- Acacia trees
- Cheetah, giraffes, zebras, lions, etc.
- Threats: habitat destruction, poaching



Chaparral

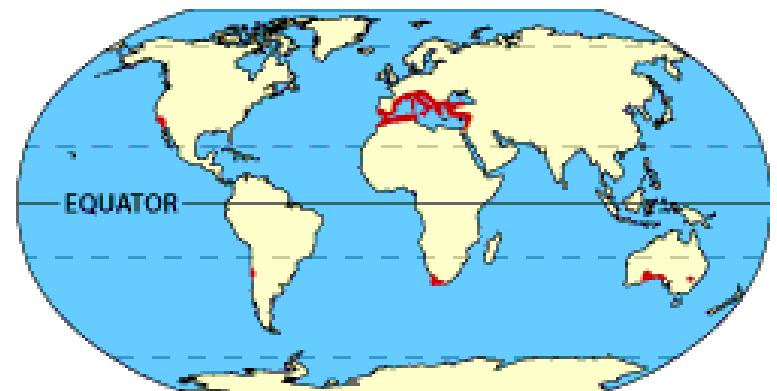


**An area of chaparral
in California**

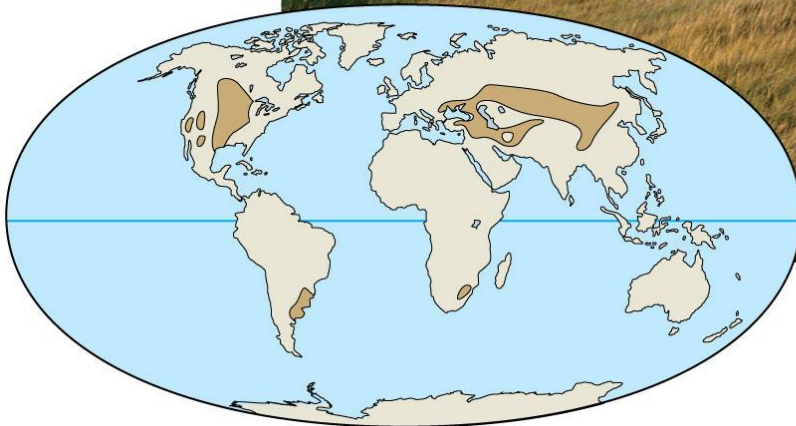


CHAPARRAL

- **Edges of deserts**
- Mild rainy winter, long hot summers
- **Soil- more nutrients due to higher rain**
- Shrubs, cacti- adapted to frequent fires- seed germination, soil nutrients
- Seed eating birds, rodents, deer, rodents
- Threats- land development



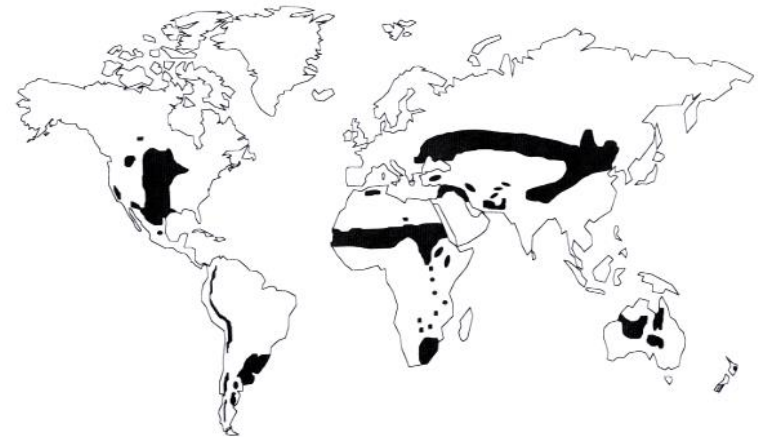
Temperate Grassland



**Grasslands National Park,
Saskatchewan**

TEMPERATE GRASSLANDS

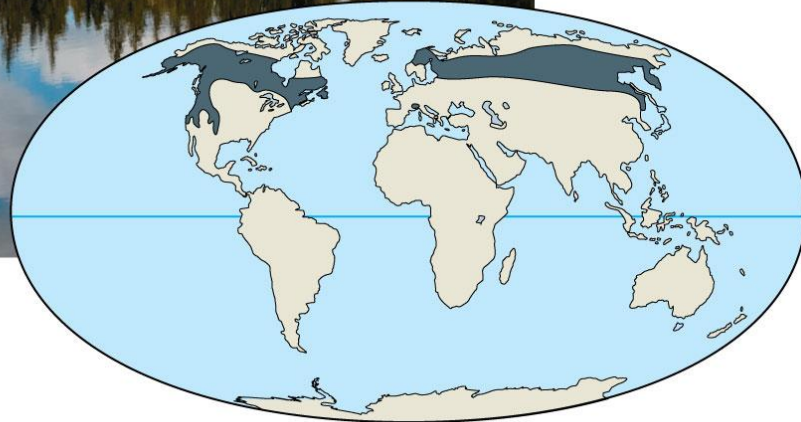
- **Eastern side of mountains**
- Cold winters, hot summers- little rainfall
- **Soil- rich in nutrients**
- Grasses dominant plant- thick mat-like roots; increased rainfall = taller grasses
- Bison, antelope, prairie dogs, burrowing animals
- Threats: desertification; misuse by ranchers/farmers



Taiga (or Northern Coniferous Forest)



A forest in Norway

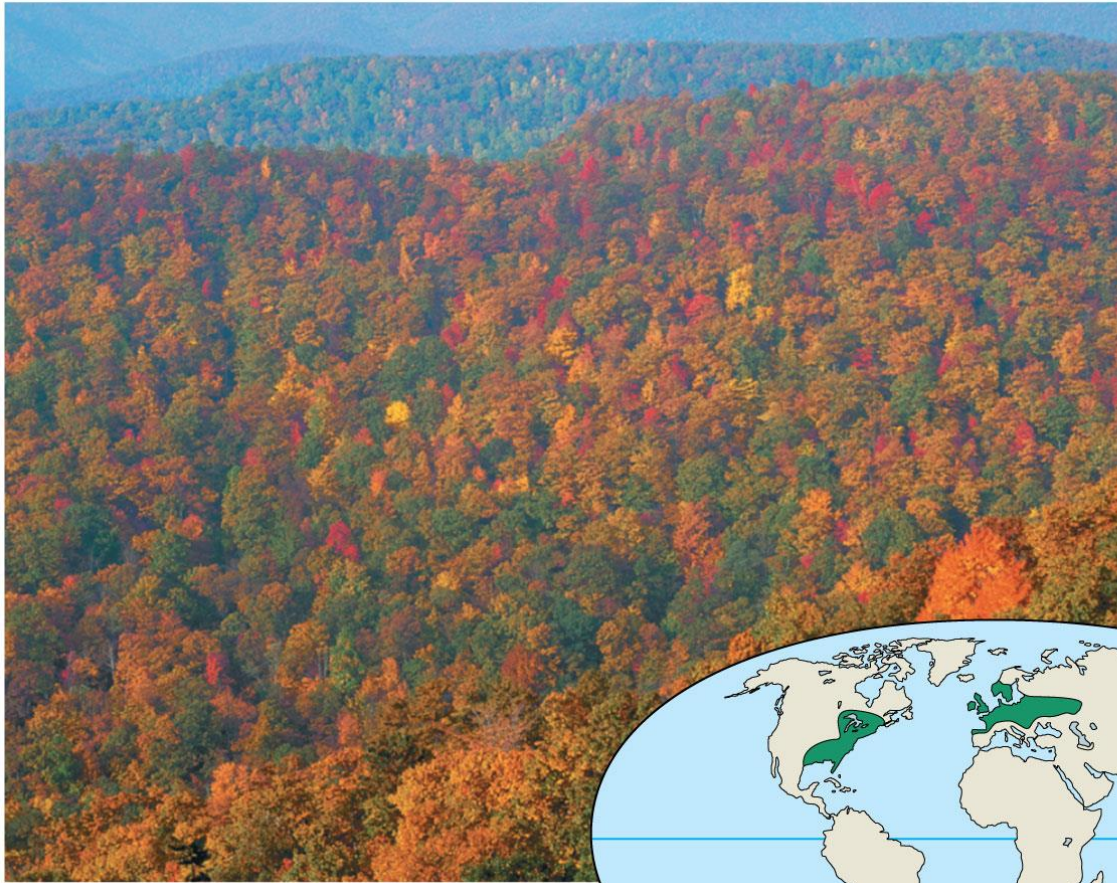


TAIGA

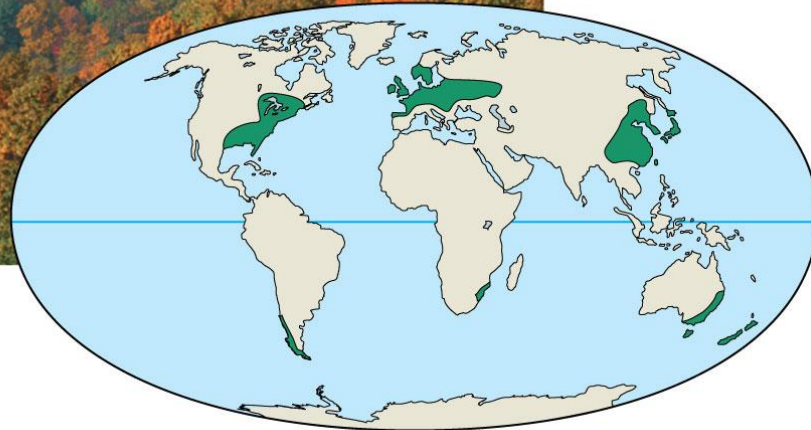
- ❑ **Below tundra**
- ❑ Long cold winters, summer 3-4 months; more precip than tundra (snow)
- ❑ **Soil acidic due to evergreen needles.**
- ❑ Mostly coniferous trees-plant biodiversity low due to acidic soil.
- ❑ Grizzlies, wolverines, moose, cougars
- ❑ Threats- deforestation



Temperate Deciduous Forest



**Great Smoky Mountains
National Park in
North Carolina, in autumn**



TEMPERATE DECIDUOUS FOREST

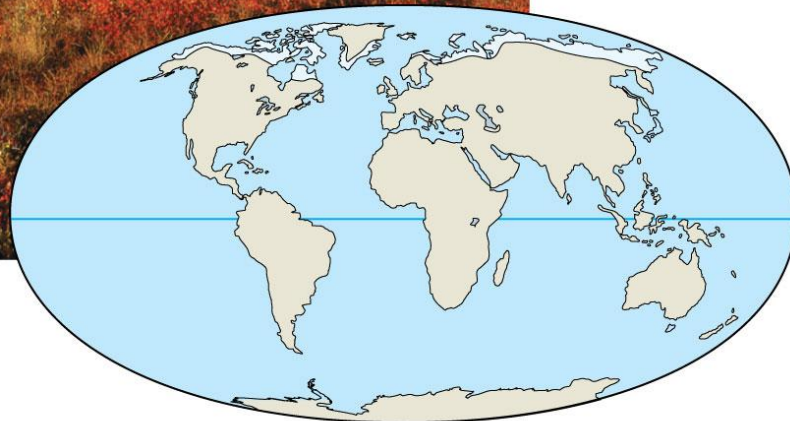
- **Mid-latitudes**
- Moderate winters & summers; moderate precip.
- **Soil rich in humus-decaying matter.**
- Deciduous trees- drop leaves in winter to conserve water.
- Deer, rabbits, rodents, raptors,
- Threats: Deforestation



Tundra

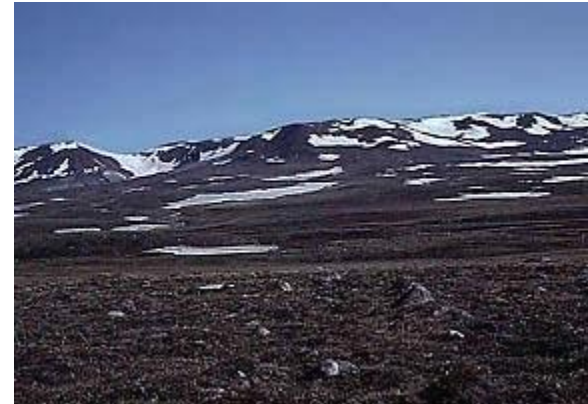


**Denali National Park, Alaska,
in autumn**



TUNDRA

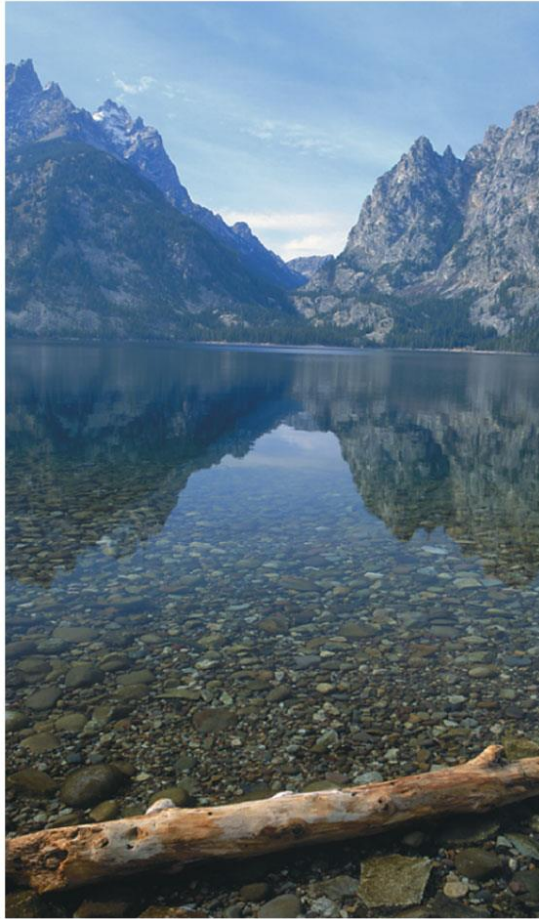
- **Extreme northern hemisphere**
- Long cold winters, short cool summers; very little precip.- called “arctic desert”
- **Permafrost- soil frozen**
- Short plants, lichen, moss- no trees (too windy, thin soil)
- Reindeer, polar bears, arctic fox, insects, birds
- Threats: fragile food webs, oil spills, global warming



AQUATIC BIOMES



Lakes



An oligotrophic lake in Grand Teton National Park, Wyoming

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A eutrophic lake in the Okavango Delta, Botswana

Wetlands



A basin wetland in the United Kingdom

Streams & Rivers



A headwater stream in the Great Smoky Mountains

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The Loire river (in France) far from its headwaters

Estuaries



An estuary in the southeastern United States

Intertidal Zones



Oceanic Pelagic Zone (Open Water)



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Coral Reefs

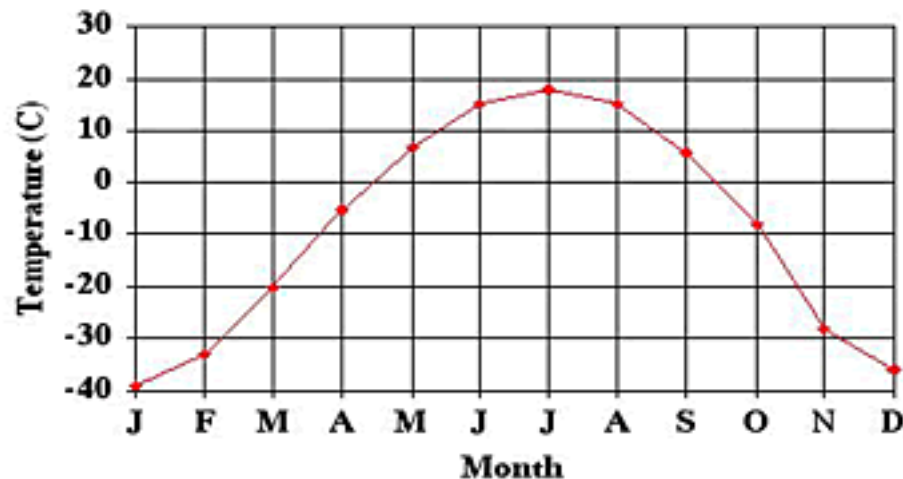


Marine Benthic Zone

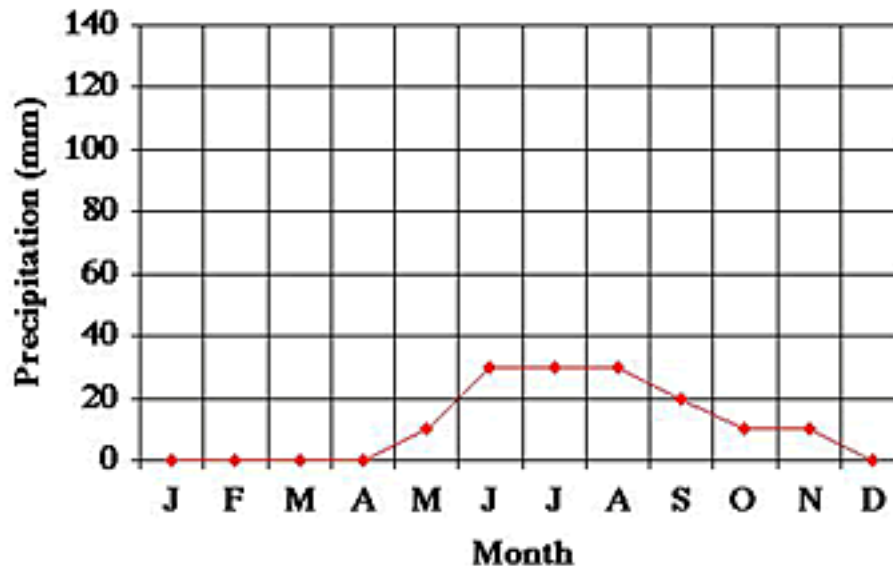


A deep-sea hydrothermal vent community

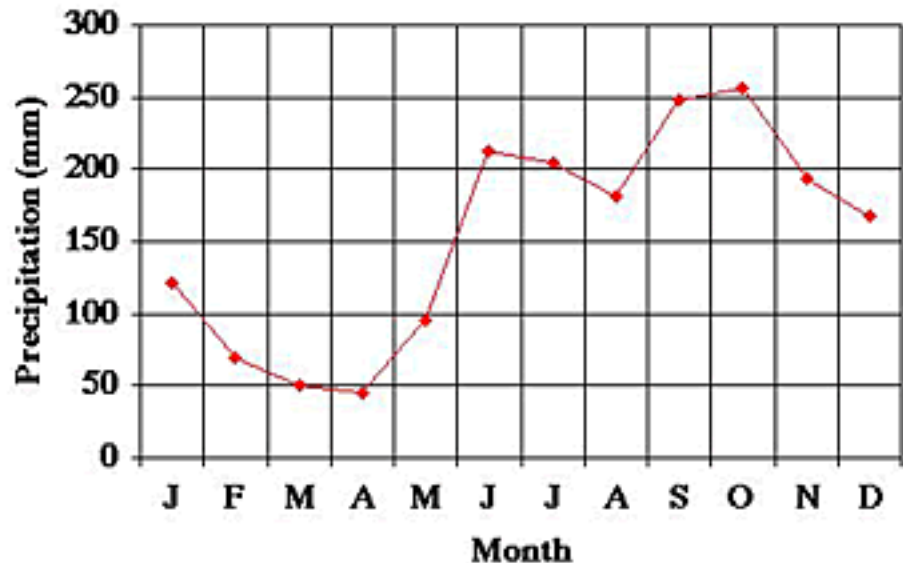
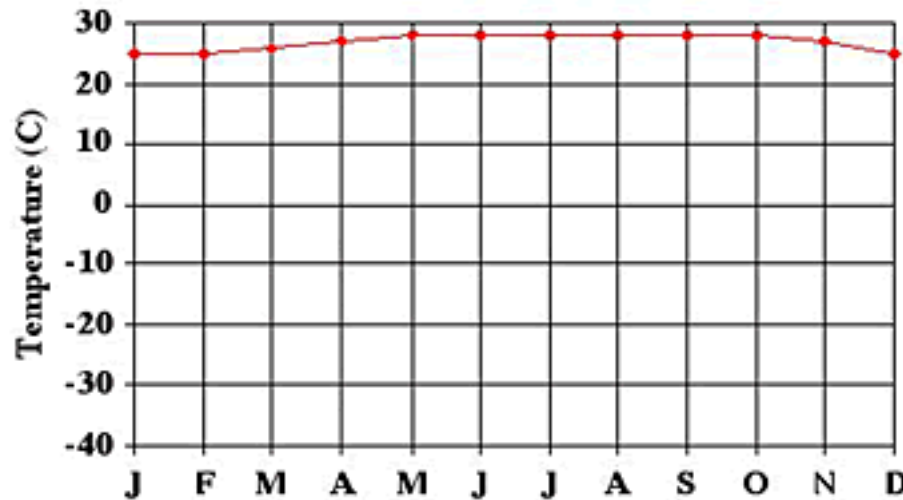
Which biome do these graphs represent?



**Yakutsk, Russia
(Tundra)**



Which biome do these graphs represent?



**Campa Pita, Belize
(Rainforest)**

Biogeography: geographic distribution of species

□ Factors:

- Dispersal – movement away from area of origin
- Behavior – habitat selection
- Biotic factors – other species, food resources, competition, pollinators, predators
- Abiotic factors – temp, water, oxygen, salinity, sunlight, rocks & soil

What factors may have influenced the distribution of this species?

