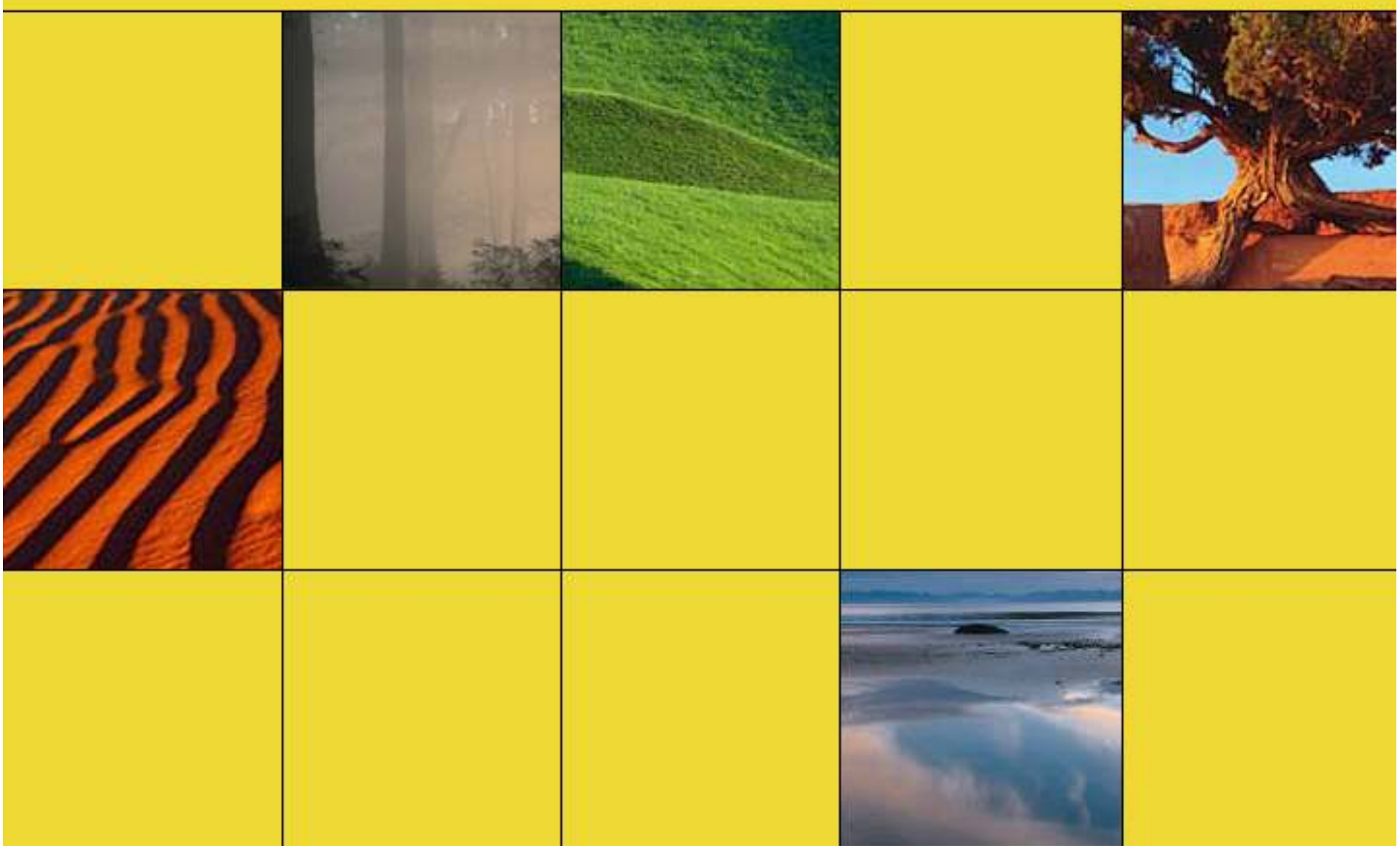
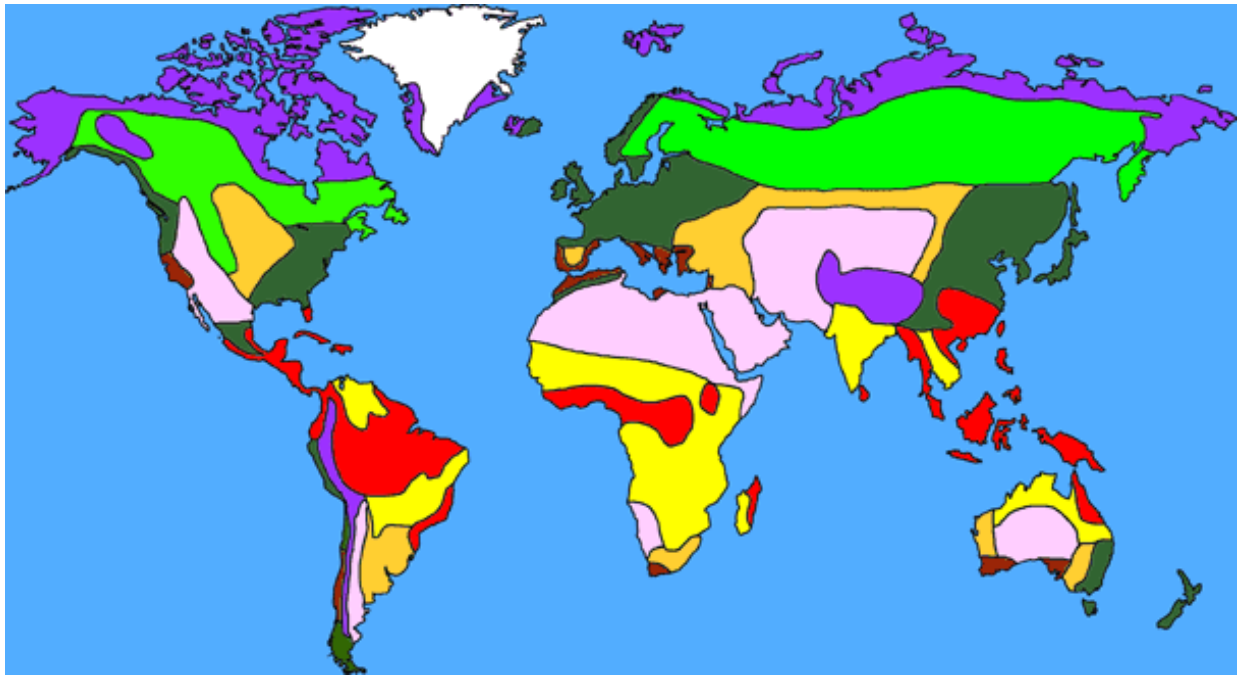
Biomes of the World



What is a biome?



A BIOME is the largest geographic biotic unit, a major community of plants and animals with similar life forms and environmental conditions.

Tropical Rainforest	Grassland
Tropical Savanna	Temperate Deciduous Forest
Desert	Temperate Boreal Forest
Chaparral	Arctic and Alpine Tundra

How are biomes formed?

Biomes are distributed across the Earth based primarily on climate. Therefore, in areas that are far apart, you will sometimes find similar plants and animals because the climate is similar.

One factor affecting climate is latitude. Typically, the farther you move north or south of the equator, the colder the temperature gets. Another factor affecting climate is elevation. The higher you go in elevation, the colder the temperature gets.

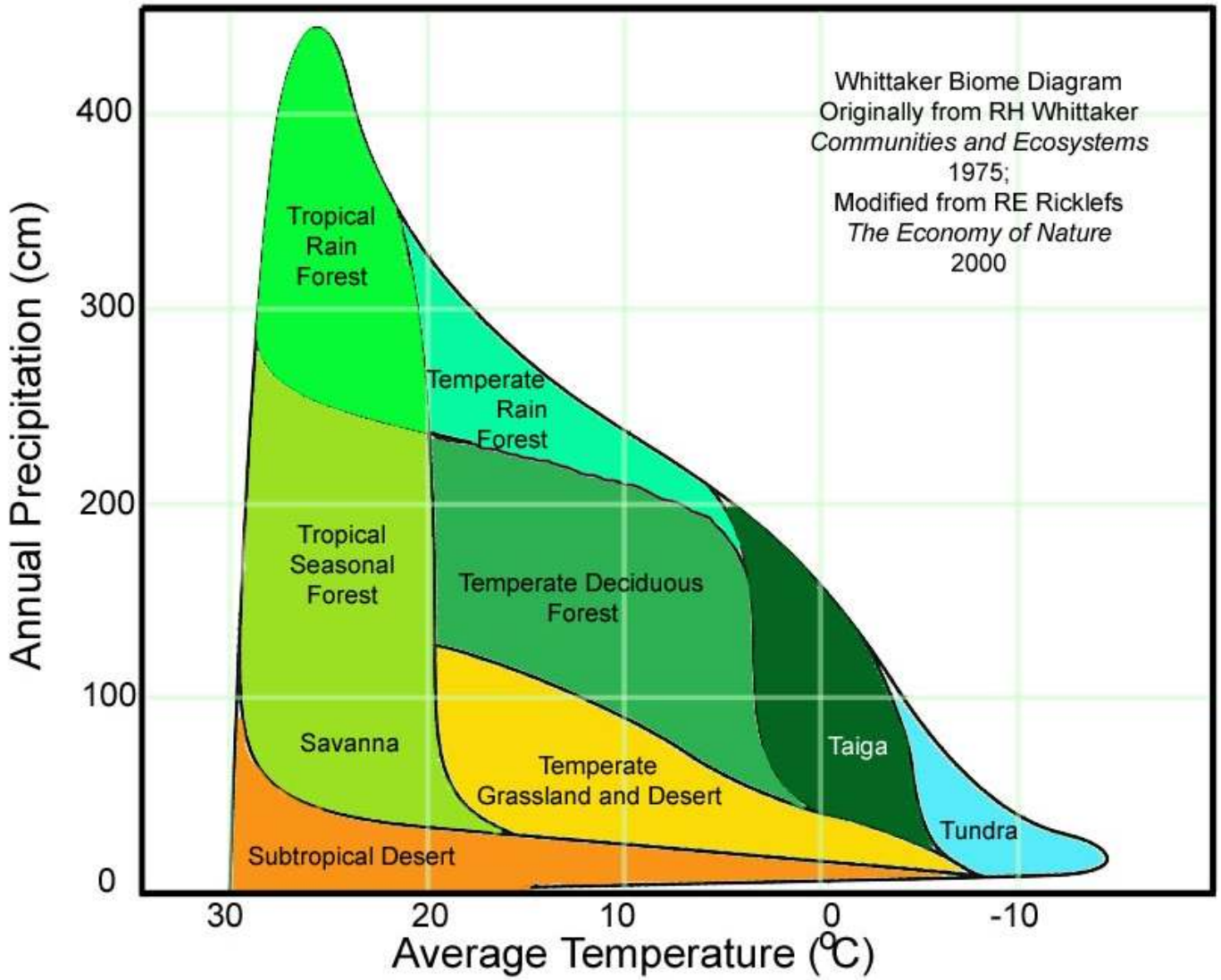
Biomes usually found at cold latitudes far from the equator are sometimes also found on high mountains at low latitudes. Typically, a climb of 100 feet in elevation is equivalent to traveling 600 miles northward.

How many biomes are there?

Or is that 10? ...
12? ...
7? ...

Factors

- The **global distribution pattern**: Where each biome is found and how each varies geographically. A given biome may be composed of different taxa on different continents. Continent-specific associations of species within a given biome are known as formations and often are known by different local names. For example, the temperate grassland biome is variously called prairie, steppe, pampa, or veld, depending on where it occurs (North America, Eurasia, South America, and southern Africa, respectively).
- The general characteristics of the **regional climate** and the limitations or requirements imposed upon life by specific temperature and/or precipitation patterns.
- Aspects of the physical environment that may exert a stronger influence than climate in determining common plant growthforms and/or subclimax vegetation. Usually these factors are conditions of the **substrate** (e.g., waterlogged; excessively droughty, nutrient-poor) or of disturbance (e.g., periodic flooding or burning).
- The **soil order(s)** that characterize the biome and those **processes** involved in soil development.
- The dominant, characteristic, and unique **growthforms; vertical stratification; leaf shape, size, and habit; and special adaptations** of the vegetation. Examples of the last are peculiar life histories or reproductive strategies, dispersal mechanisms, root structure, and so forth.
- The types of **animals** (especially vertebrates) characteristic of the biome and their **typical morphological, physiological, and/or behavioral adaptations to the environment**.


Whittaker Biome Diagram
Originally from RH Whittaker
Communities and Ecosystems
1975;
Modified from RE Ricklefs
The Economy of Nature
2000
Annual Precipitation (cm)
400
300
200
100
0
Tropical Rain Forest
Temperate Rain Forest
Tropical Seasonal Forest
Temperate Deciduous Forest
Savanna
Taiga
Temperate Grassland and Desert
Tundra
Subtropical Desert
30
20
10
0
-10
Average Temperature (°C)

How many biomes are there?

Tundra and Polar Ice

Coniferous Forest (Taiga)

Tropical Rainforest

Temperate Deciduous Forest

Grassland

Steppe

Desert Savanna

Chaparral

Freshwater

Alpine

Marine

Although there is some disagreement among scientists on how to divide up the Earth's biomes, most can agree on the following eight:

- Tropical Rainforest
- Tropical Savanna
- Desert
- Chaparral
- Grassland
- Temperate Deciduous Forest
- Temperate Boreal Forest
- Tundra

Taiga
Alpine
Desert-scrub
Cave
Ponds
Marshs
Wetlands
Benthic
Coral Reef
Ocean

Tropical Rainforest

- Typically found near the equator
- Receives more than 200 cm of rain annually
- Temperatures typically fall between 20^{o}C and 25^{o}C for the entire year
- As many as 50% of all the world's animal species may be found here

Tropical Savanna

- Grasslands with a few scattered trees
- Experience a wet and dry season
- Hot temperatures
- Annual rainfall is between 50 and 127 cm
- More species of grazing mammals than any other biome

Desert

- Typically found between 25° and 40° latitude
- Receives less than 25 cm of rain each year
- Temperatures typically range between 20°C and 25°C but some extreme deserts can reach temperatures higher than 38°C and lower than –15°C

Chaparral

- Found between 32^{o} and 40^{o} latitude on the west coast of continents
- Receives between 35 and 70 cm of rain, usually in the winter
- Extremely resistant to drought and weather events

Grassland

- Because of the dry climate, trees are found only near water sources such as streams
- Usually receives between 50 and 90 cm of rainfall each year
- Summer temperatures can reach up to 38°C, and winter temperatures can fall to –40°C

Temperate Deciduous Forest

- Moderate climate
- Most trees will lose their leaves in the winter
- Temperatures range between –30^{o}C and 30^{o}C
- Averages from 75 to 150 cm of precipitation
- Well developed understory

Temperate Boreal Forest

- Also known as Taiga
- Typically found between 45^{o} and 60^{o} North latitude
- Cold climate with summer rains
- Very few reptiles
- Limited understory
- Snow is primary form of precipitation (40 – 100 cm annually)

Tundra

- Means treeless or marshy plain
- Characterized by permafrost – permanently frozen soil starting as high as a few centimeters below the surface – which severely limits plant growth
- Winter temperatures average – 34°C while summer temperatures usually average below 10°C
- Low precipitation (15–25 cm per year) but ground is usually wet because of low evaporation

Credits

- Text:
  - http://www.physicalgeography.net/fundamentals/9k.html
  - http://www.ucmp.berkeley.edu/glossary/gloss5/biome/index.html
- Pictures:
  - http://www.worldbiomes.com/
  - http://www.ucmp.berkeley.edu/glossary/gloss5/biome/index.html
  - http://www.blueplanetbiomes.org/
- PowerPoint:
  - Arizona Game and Fish Department, 2005