

# Chapter 6:

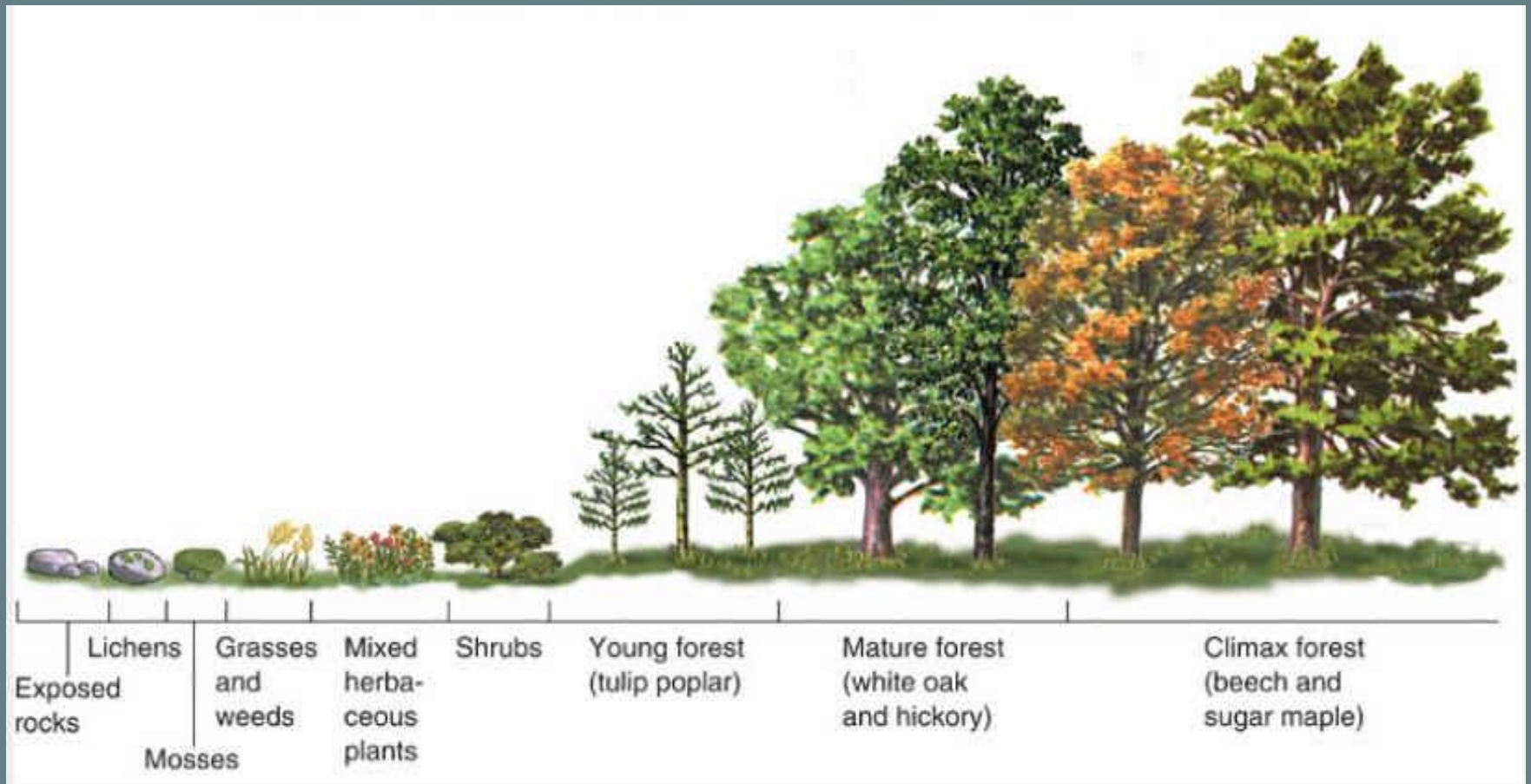
## KINDS OF ECOSYSTEMS AND COMMUNITIES

# MAPPING CHALLENGE:

Label as many countries,  
continents and geological  
features as you can in

8 minutes

# ECOLOGICAL SUCCESSION: PRIMARY AND SECONDARY



# ECOLOGICAL SUCCESSION

- ✦ There are all sorts of disturbances that affect communities. Some examples include:
  - Removal of a keystone species
  - Natural disasters (flood, fire, hurricane, etc.)
  - Spread of invasive species
  - Human impacts
- ✦ Ecological succession is the somewhat predictable series of changes that communities go through after a disturbance.

# 2 TYPES OF SUCCESSION

- ✦ There are 2 types of ecological succession:
  - Primary succession
  - Secondary succession
- ✦ The next few slides will cover both types of succession

# PRIMARY SUCCESSION

- ✦ This type of succession occurs when an area is colonized for the very first time - meaning there was absolutely nothing there to begin with
  - Or, there was a disturbance so severe, that no vegetation or soil life remains from the previous community
- ✦ Big picture = in primary succession, the community is built from scratch!



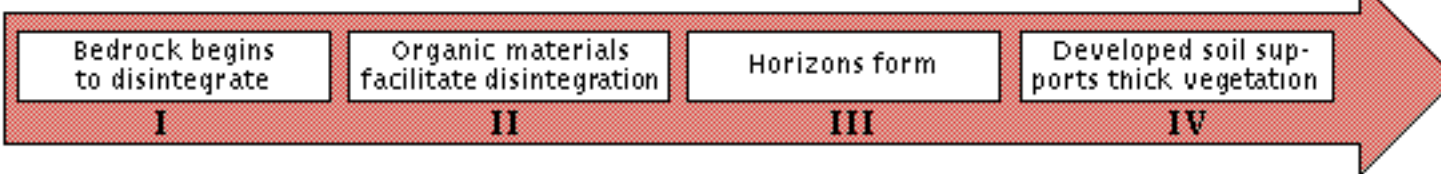
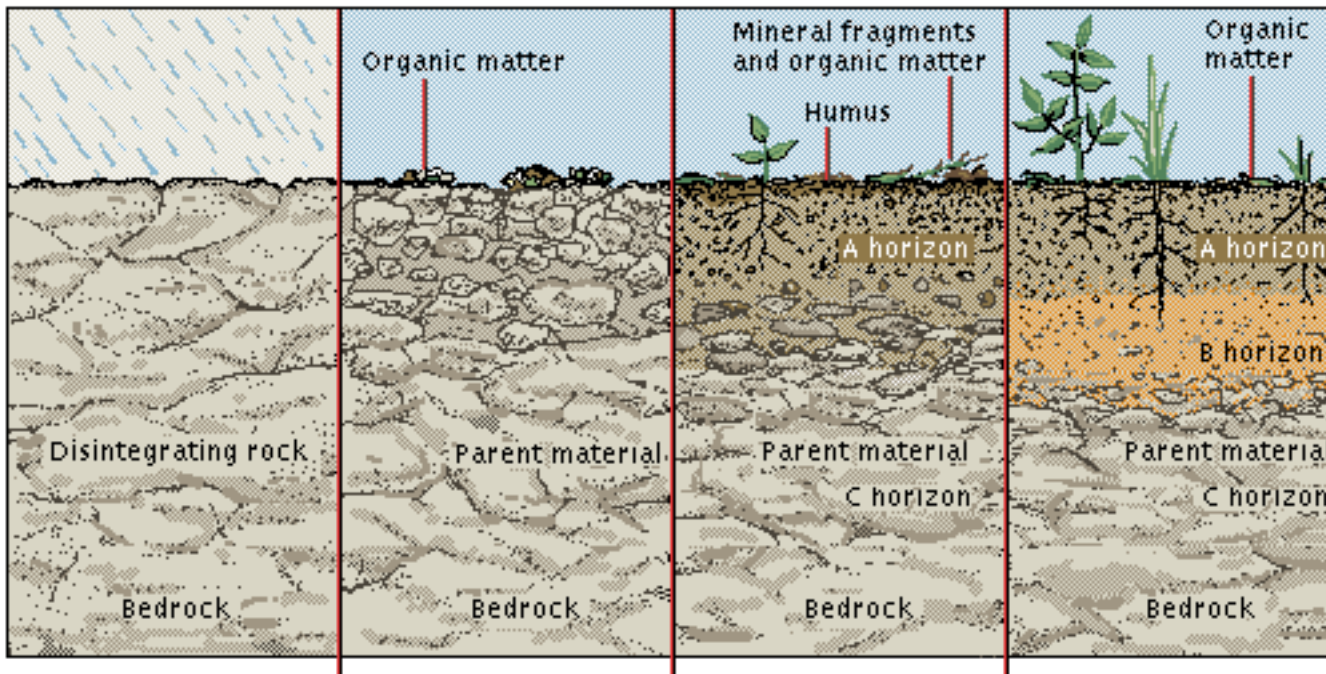
# PIONEER SPECIES

- ✦ Pioneer species are species that are rather hardy and are often the first to begin colonizing an area
  - Pretty much plants (lycophytes, mosses, lichen etc.)
- ✦ Lichens make a good pioneer species because of the mutualistic relationship between the fungus and algae that make up a lichen



# Soil Development

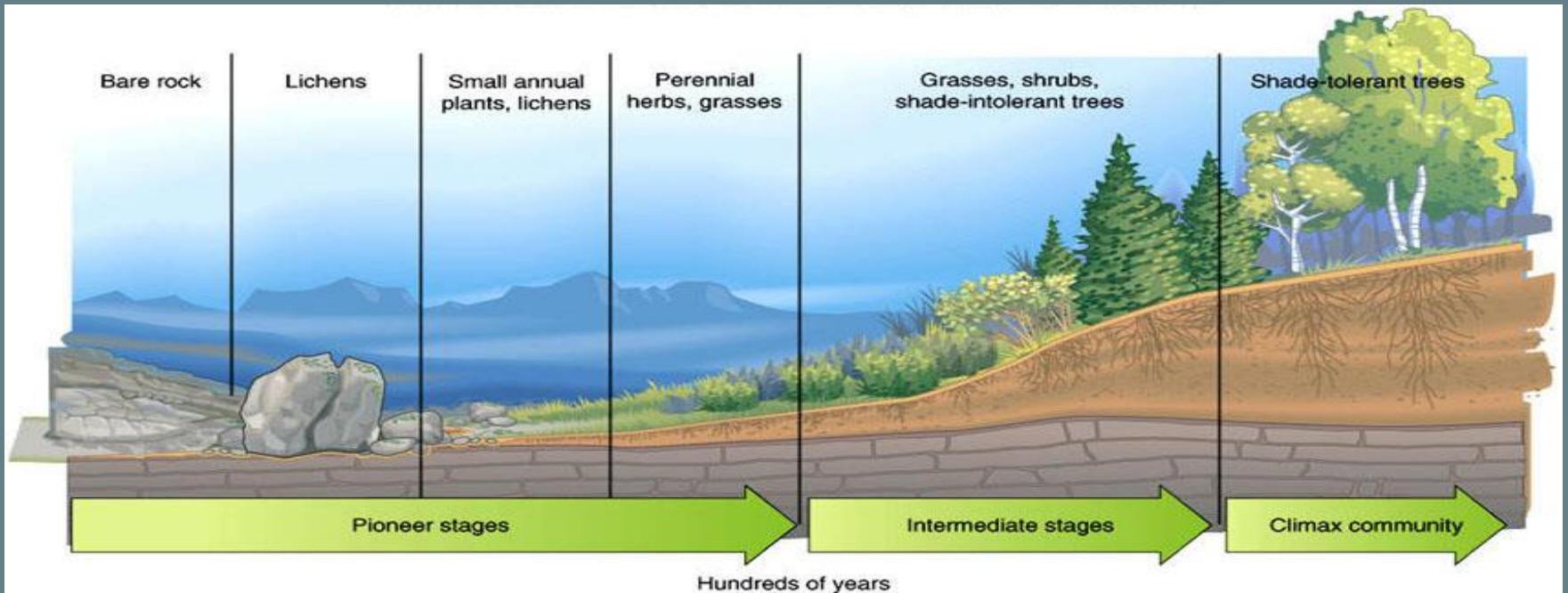
- ✦ It takes time for soil to develop.
- ✦ Typically hundreds to thousands of years.





# SECONDARY SUCCESSION

- ✦ Secondary succession takes place after a disturbance dramatically alters, but does not destroy, all the organisms from the previous community
  - Parts of the previous community remain and serve as “building blocks.”
  - Occurs after fires, hurricanes, farming, logging, etc.



# CLIMAX COMMUNITY

- ✦ A climax community is essentially the end result of succession
- ✦ Climax communities are highly developed, complex, and rather stable communities
- ✦ They are still undergoing succession, but at a much slower pace.

# COMMUNITY CHANGE IS VARIABLE

- ✦ Ecological succession outlines the predictable series a community will go through, but exactly when these changes take place is highly variable and unpredictable.
  - Each step in this process from pioneer community to climax community is called a successional stage or seral stage. The entire sequence is called a sere.

# Human effects on succession

- Agriculture
- Logging
- Fire suppression
- Changing water levels (irrigation, flooding, draining etc.)

# HEALTHY FOREST INITIATIVE (HFI)

## *Healthy Forests Restoration Act of 2003*

(In response to big fire season in 2002).

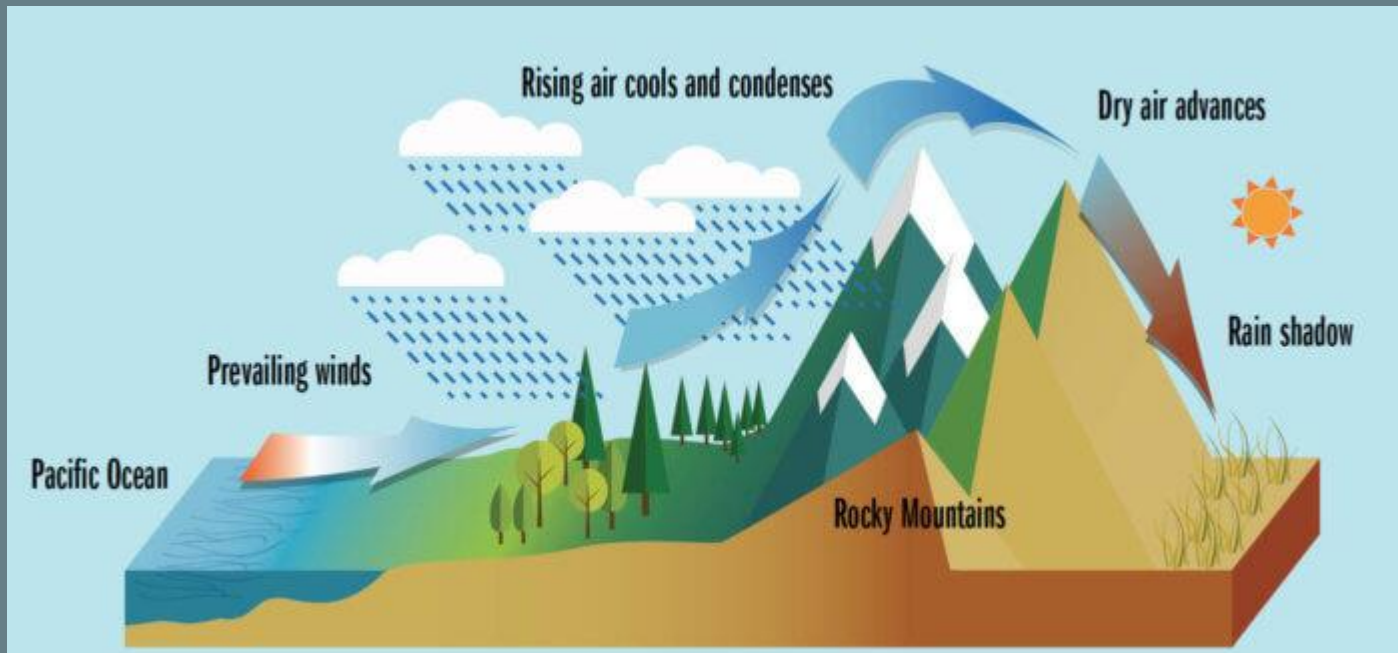
- Thin overstocked stands
- Clear away vegetation and trees to create shaded fuel breaks
- Provide funding and guidance to reduce or eliminate hazardous fuels in National Forests
- Research new methods to halt destructive insects
- Improve forest fire fighting

# Biomes

- Biomes are climax communities that occupy distinct region. The worldwide distribution of biomes is dynamic; the distribution has changed in the past and can change again with global climate changes.
- ✦ Abiotic factors determining biomes
  - Precipitation form and amounts
  - Temperature
  - Wind
  - Fire cycles
  - elevation

# Geography (not just solar energy) affects weather and climate

- **Example:** Mountains (the higher the altitude, the colder the temperatures).
- **Example:** Rain shadow (a region of land that has become drier because a higher elevation area blocks precipitation from reaching the land).



## What's in it for us?

- The global distribution of nonmineral terrestrial natural resources such as water and trees for lumber, varies because of some combination of climate, geography, latitude and altitude, nutrient availability and soil.





Add to your map:

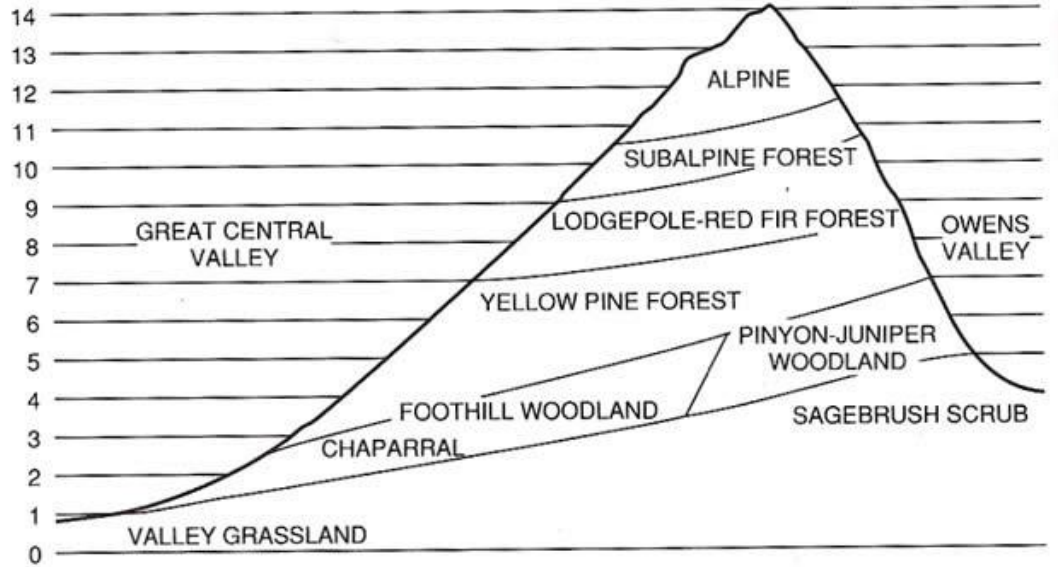
**WITH HELP FROM YOUR  
GROUP, LABEL AS MANY  
BIOMES AS YOU CAN**

**Now add as many  
descriptions for each as  
you can**



1000's  
OF FEET

WEST ----- EAST



Biome	Temperature Description	Precipitation Description	Notes
Temperate deciduous forest (Temp. seasonal forest) S*	Medium	Medium (rain & snow)	Trees lose leaves before freeze; mild climate so lots of people live here = east coast!
Temperate grassland	Medium	Seasonal (when it rains, it pours = rainy season)	Trees and shrubs don't like, but grasses can respond quickly and grow in rainy season; migrating species live here - they have to move with the grass
Temperate rainforest	Medium	Heavy rainfall	Coniferous trees (don't drop leaves/needles), forest is dark and damp, fertile soil
Tropical rainforest	Constant warm	Lots of rain (100-200 inches sometimes)	These forests are very dark because dense growth, therefore many species have vivid bright colors so they can be seen!
Tropical dry forest	Warm year round	Low rainfall and very seasonal	Wet and dry seasons last about half the year each; plants are deciduous and drop leaves during dry season to conserve water

Biome	Temperature Description	Precipitation Description	Notes
Savanna/Tropical grassland	Warm year round	Seasonal rains	Lots of grazing animals; clusters of acacia trees; carnivores found here are very mobile (move with prey and prey moves with grass and water)
Desert	Extreme (hot and cold)	Low (less than 3-10 inches of rain/yr)	Plants adapted to extremes - cactus have needles instead of leaves to conserve water, some look dead much of year and only green out when rains come (example - ocotillo)
Tundra	Cold! (ice cold)	Snow	Permafrost is limiting factor in this biome, plants are shallow rooted (shrubs and mosses), very spongy; arctic is latitude tundra, alpine is elevation tundra
Boreal forest  (Taiga)*	Cold	Lots of snow	Trees have tough needle for leaf so they don't freeze - much of N. Amer consists of this biome (Canada)
Chaparral  (Shrubland)*	Medium, little flux (marine induced)	Seasonal rains, occasionally snow	Mostly shrubs; many plants in this biome are fire-dependent - this biome is meant to have frequent fires; often termed Mediterranean