

Ecology Notes: Part III

Environmental Change

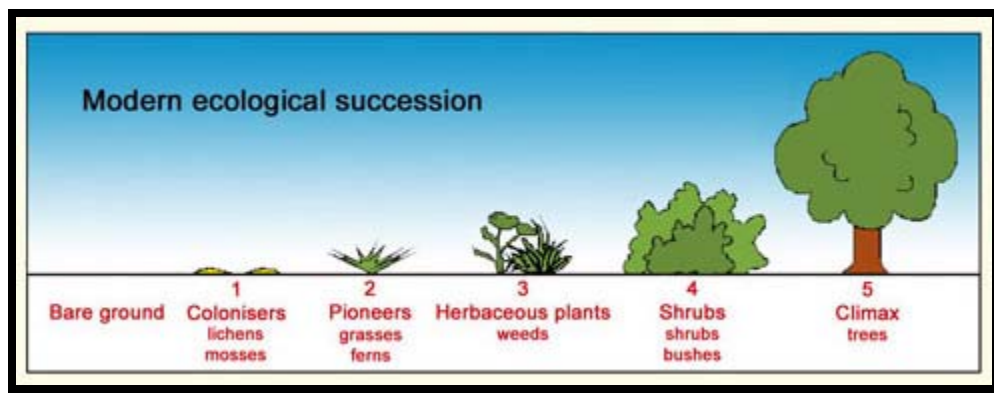
Ecological Succession

- + The series of changes where one community is replaced by another until a stable stage is reached.
- + **Pioneer Organisms:** first organisms to populate a given area or location.
 - for example. lichen (symbiotic relationship between fungus and algae) are often the first organisms to inhabit an area. These pioneer organisms live on bare rock, creating "soil" from the rock so that other plants can begin to grow in this area.
- + Each community modifies its environment.
 - These modifications result in changes in the environment, making it more favorable for another community to move in.
 - Competition usually results between the new species and the original species for limited resources and niches.
 - The new species are usually more successful in the changing environment and become the dominant species.
- + *At any stage of ecological succession, the plant species (flora) dominate* because they are the most abundant food source and provide the most energy to the consumers (think energy pyramid).
- + *Therefore, plants are a major limiting factor in determine animal (fauna) succession.*
- + **Climax Community:** self-perpetuating community in which populations remain stable and exist in balance with one another and with the environment.
- + Typically, land (terrestrial) succession moves from:

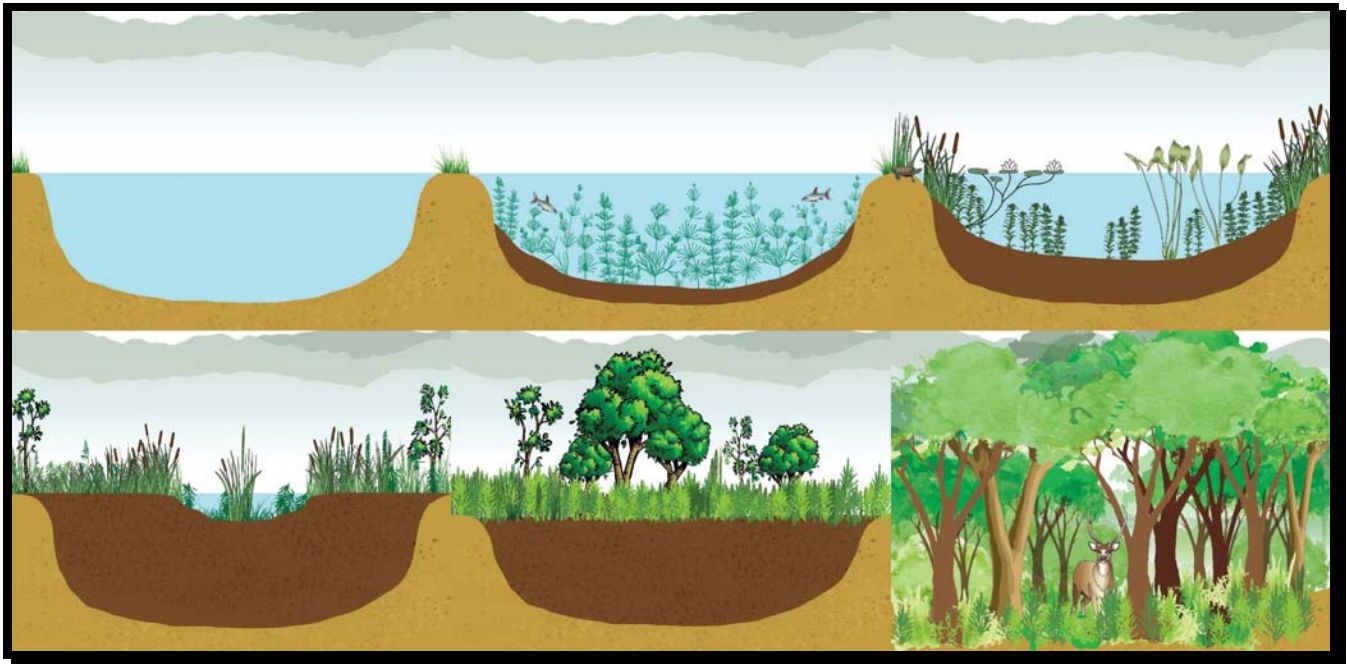
Bedrock → Lichens → mosses → grasses → trees and shrubs → forest

- + In New York State, the typical sequence would be:
Pioneer, grass, shrub, conifer (cone bearing tree), and deciduous woodland (trees that lose their leaves in the winter). The deciduous woodland would be the climax community.
- + Only a major catastrophic change, such as a forest fire, abandoned farmlands (loss of topsoil), hurricanes, severe floods, can alter or change a climax community.
- + If a climax community is destroyed, ecological succession begins again, leading to the re-establishment of the climax community or if the environment has been permanently altered, the formation of a new climax community.

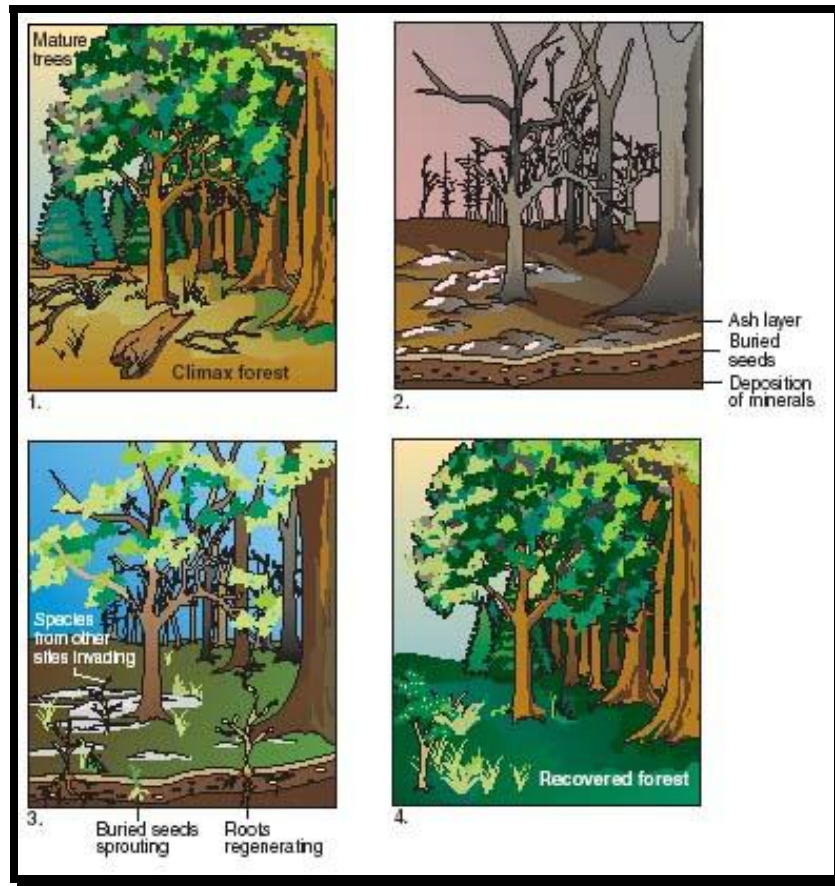
Example of Land (Terrestrial) Succession:



Example of Freshwater Ecological Succession of a Pond



Example of Secondary Ecological Succession after a Forest Fire



Biomes

+ Biomes refers to the most common ecosystems that will form in large climatic areas. Biomes are either terrestrial or aquatic.

+ **Terrestrial Biomes:** land ecosystems found in the major climatic areas of the world, modified by local land and water conditions, which then determine the major plant and animal associations.

--major terrestrial biomes include tropical rain forests, deserts, grasslands, temperate deciduous forests, taiga, and tundra (see chart below)

Terrestrial Biome	Common Plants/ Animals	Interesting Features	Weather/Climate
Rainforest	Gorilla, Vine snake Banyan Tree Peacock plant	Two types of rainforest: Temperate and Tropical	Warm weather (tropical) Cold (temperate)
Tundra	Arctic Fox Caribou Lichen	Permanent ice exists meters from surface	-60F (Winter) 50F (Warmest weather)
Taiga	Moose, hawk owl Needles, conifer	Winters are cold Summers are warm	-65F (Winter) 20F (Summer)
Desert	Yucca, cactus Dingo	Deserts are caused by rainshadow effect	excess of 100 degrees
Temperate	Cardinal, turkey	Changes seasons	50 degrees Fahrenheit
Grasslands	Lion, Ostrich Prarie flowers	No bushes in grasslands	10-30 inches of rain per year