

## Ecological Succession

Directions: Read all the directions. Answer all questions in your lab notebook. Be sure to visit all the websites indicated. When visiting the websites, make sure you read all the information and look over the images and answer any associated questions.

### Ecological Succession – Overview

**“Change in the species composition of a community over time.”**

**Primary succession** follows the formation of new land surfaces consisting of rock, lava, volcanic ash, sand, clay or some other mineral substrate.

- This means that there is NO SOIL present.
- Soil is a mixture of mineral, decaying organic material and living organisms.

**Secondary succession** follows the destruction or partial destruction of the vegetation area by some sort of disturbance, like a fire, windstorm, or flood that leaves the soil intact.

**Pioneer species** initiate recovery following disturbance in both primary AND secondary succession. Pioneer species pave the way for later species by altering the biotic and abiotic environment: soil stabilization, nutrient enrichment (nitrogen fixation), increased moisture, light availability, temperature and wind exposure.

Species composition tends towards a **Climax Community** through succession. The complex community describes an end product of succession that persists until disturbed by environmental change. Succession occurs on large scales involving higher plants and animals, but may involve microbial communities on a smaller scale.

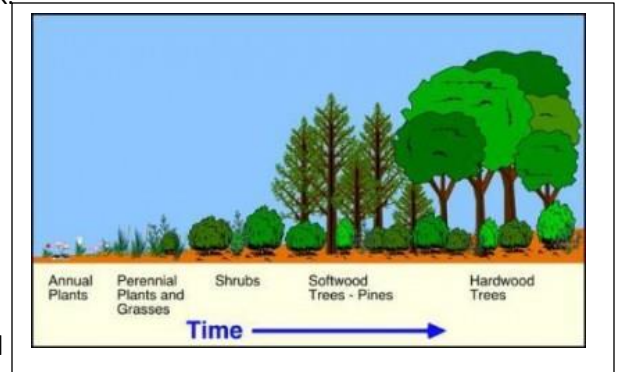
Visit: <http://www.mrp-home.net/mrp/succession.swf>

Read each tab to the animation and answer the following questions.

1. How does primary succession proceed differently when there is a lot of moisture and high temperatures? Relate this in terms of time, nutrients, and topsoil.
2. What are the first organisms to arrive during primary succession?
3. What are the first organisms to arrive during secondary succession?
4. How does the amount of time to reach a climax community compare between primary and secondary succession?
5. Why does primary succession take longer?
6. Complete the quiz.

Visit [http://www.wiley.com/college/strahler/0471480533/animations/ch23\\_animations/animation1.html](http://www.wiley.com/college/strahler/0471480533/animations/ch23_animations/animation1.html)

7. Is the story of the bog succession an example of primary or secondary succession? Why?
8. What are some characteristics of a bog area?
9. Describe how water is diverted and how that contributes to the death of trees and many plants.
10. How is the bog in the animation eventually changed into a bog forest?



Visit: <http://www.pol2e.com/at44.01>

11. What are some of the “pioneer” species in glacial moraines?
12. How do alder trees affect nitrogen content in soil?
13. How do the alder trees influence spruce tree growth?

Choose ONE of the succession examples below to investigate thoroughly. If the resources I have provided are not sufficient, feel free to do an internet search to find more information.

### **Mount Saint Helens**

Mount Saint Helens erupted in 1980, and while it devastated the surrounding land and property, it was a unique opportunity for ecologists to study primary succession. Use the two links to answer the questions below.

1. Describe the plant/animal community that was present before the eruption.
2. Describe the pioneer species that helped start the succession process after the eruption of Mt. St. Helens.
3. How long do you think it will take for Mt. St. Helens to reach a climax community - explain your answer.

Use the PDF posted on our class website to help answer the above questions.

[Images of Mount Saint Helens](#)

### **The Hayman Fire**

The Hayman Fire occurred in June, 2002, here in Colorado, and was one of the worst fires in Colorado (and western United States) history. It also provides an opportunity for scientists to study succession and fire regimes of the Ponderosa Pine ecosystem. Use the report to answer the questions below.

1. Describe the plant/animal community that was present before the fire.
2. Describe the pioneer species that helped start the succession process after the Hayman Fire.
3. Is fire a normal part of the ecosystem where the Hayman Fire occurred? Explain your answer.
4. How long do you think it will take for the Hayman Fire area to reach a climax community? Explain your answer.

Use the PDF on our class website to help answer the above questions.