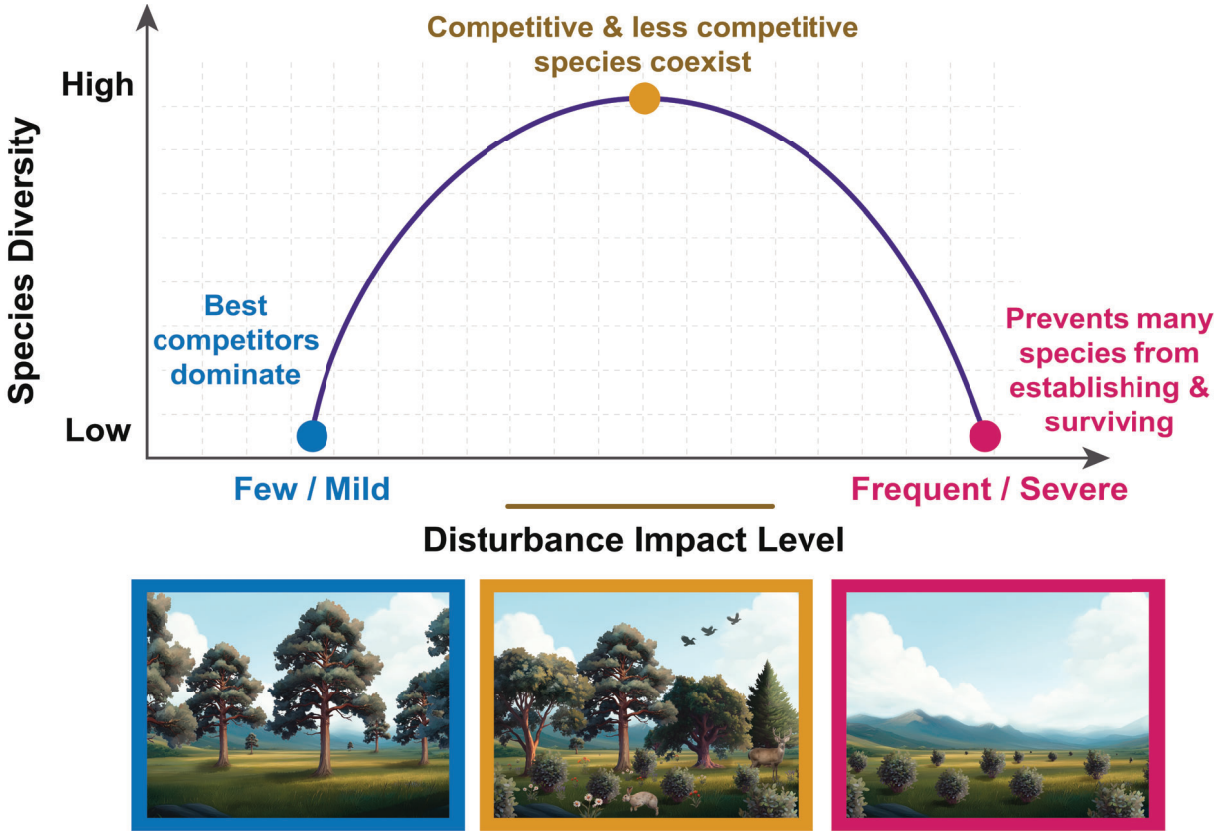
TOPIC: COMMUNITY DYNAMICS

Disturbances Make Communities Dynamic

- *Recall*: **Disturbance:** an event that significantly _____/disrupts a community.
  - Impact-level depends on the *type*, _____, & _____ of the disturbance.
- **Intermediate Disturbance Hypothesis:** *moderate* levels of disturbance foster the _____ species diversity.



PRACTICE

What is the reason that moderate levels of disturbance foster the highest diversity in a community?

a) It opens up more habitat for less competitive species.

b) It prevents r-selected organisms from continually thriving, as they would with frequent/severe disturbances.

c) It prevents the best competitors from dominating, as they would with few/mild disturbances.

d) All of the above.

PRACTICE

Which of the following should lead to an increase in a community's diversity?

a) Fairly frequent, very severe disturbances.

b) Very frequent, moderate disturbances.

c) Fairly frequent, moderate disturbances.

d) Very infrequent, minor disturbances.

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Ecological Succession

- **Ecological Succession:** *gradual* process by which a community's structure _____ over time.
  - Each existing community _____ its environment, allowing new species to thrive.
  - Occurs at all times in all communities, but disturbances _____ the process.
- **Climax Community:** the "_____", most stable stage of ecological succession.

PRACTICE

Which of the following statements most accurately describes ecological succession?

a) The population of predators and prey increase & decrease in cycles.

b) The species that make up the community gradually change over time as the environment changes.

c) The diversity of a community increases over time.

d) A stable, unchanging community that changes due to a severe disturbance.

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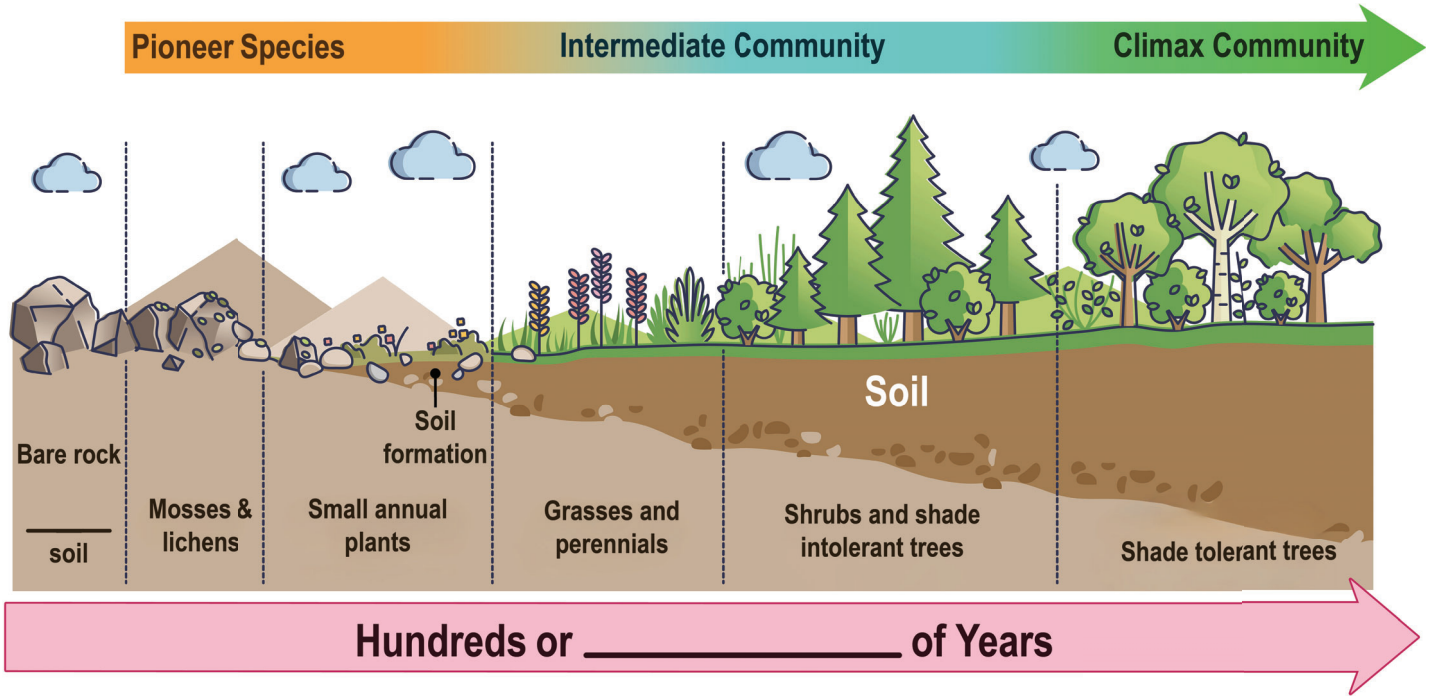
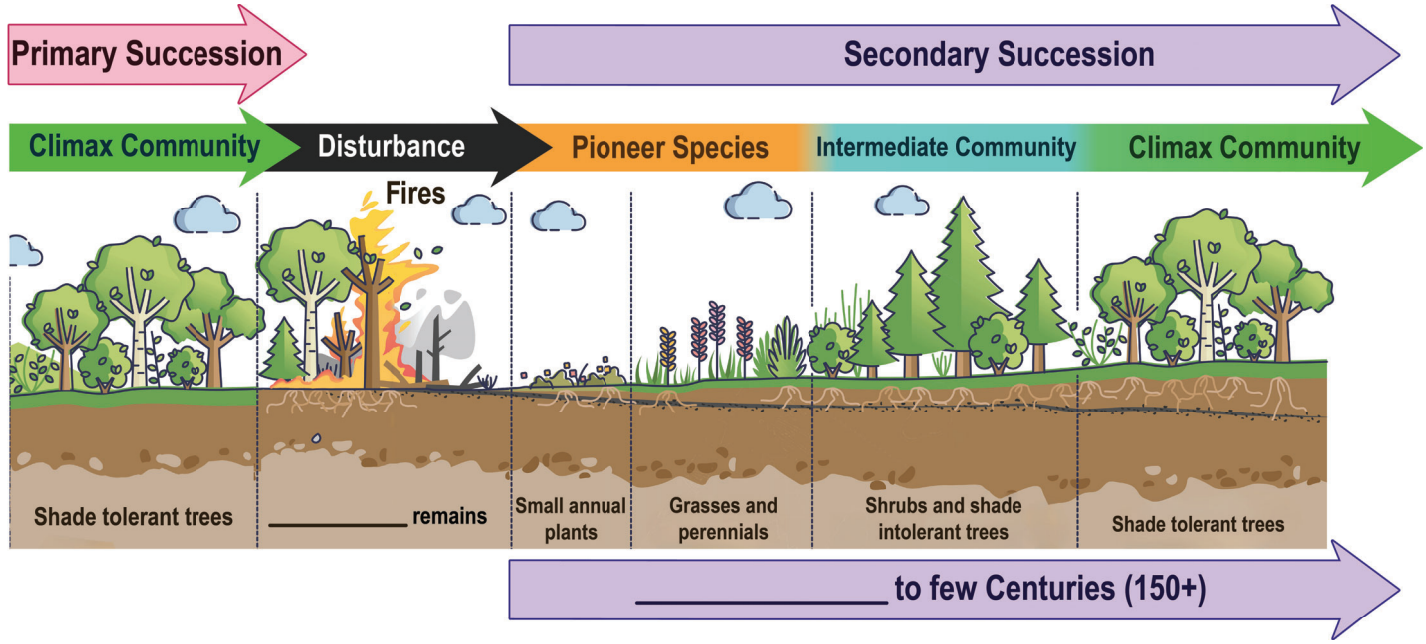
Primary Ecological Succession

- **Primary Succession:** when organisms colonize a currently uninhabited area with _____ soil.
  - **Pioneer Species:** the _____ species to colonize during primary succession (help form soil).



Secondary Ecological Succession

- **Secondary Succession:** when a community _____ after a disturbance that leaves the soil _____.



TOPIC: COMMUNITY DYNAMICS

EXAMPLE

Identify whether each of the following scenarios are examples of primary succession (PS), secondary succession (SS), a climax community (CC), or none of the above (X):

- After a severe landslide washes away all the soil in a forest, new species colonize the area. _____
- An apex predator population in a river community declines due to a new disease. _____
- An ocean community has been stable for many years but still experiences occasional disturbances. _____
- A volcanic eruption underwater creates a new oceanic island, which takes years for plants to colonize. _____
- A big wildfire kills virtually an entire community, but the soil is left intact for new plant species to grow. _____

PRACTICE

Listed below are 4 stages of ecological succession in Glacier Bay, Alaska. However, they are in the wrong order.

Select the answer option that puts these events in the correct chronological order.

I. The area is invaded by alder trees, which grow up to 9 meters tall.

II. Small flowers (*dryas*) begin to dominate the plant community.

III. Over hundreds of years, large trees such as spruce & hemlock become the dominant vegetation.

IV. Glacier ice melts, exposing bare rock with no living organisms. Mosses & liverworts colonize this area.

a) IV, I, III, II.

b) II, I, III, IV.

c) III, I, IV, II.

d) IV, II, I, III.

TOPIC: COMMUNITY DYNAMICS

Effects of Early-Arriving Species on Late-Arriving Species

◆ In ecological succession, there are _____ ways that early-arriving species can affect late-arriving species:

- **Facilitation:** early-arriving species make conditions _____ favorable for certain later species.
- **Tolerance:** existing species do _____ effect the arrival of certain later species.
- **Inhibition:** presence of a certain species _____ establishment or regrowth of another.

Facilitation **Tolerance** **Inhibition**

PRACTICE

Match the following terms to each of the scenarios below:

◆ Facilitation ◆ Tolerance ◆ Inhibition

1. Large trees create large, shaded areas, making it difficult for photosynthetic organisms to thrive.
2. Presence of alder plants increases nitrogen content in soil, allowing willow & poplar seedlings to thrive.
3. The early growth of algae in a community has no significant impact on the future presence of birds.

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a) 1 – facilitation, 2 - tolerance, 3 – inhibition.

b) 1 – tolerance, 2 – facilitation, 3 – inhibition.

c) 1 – inhibition, 2 – tolerance, 3 – facilitation.

d) 1 – inhibition, 2 – facilitation, 3 – tolerance.