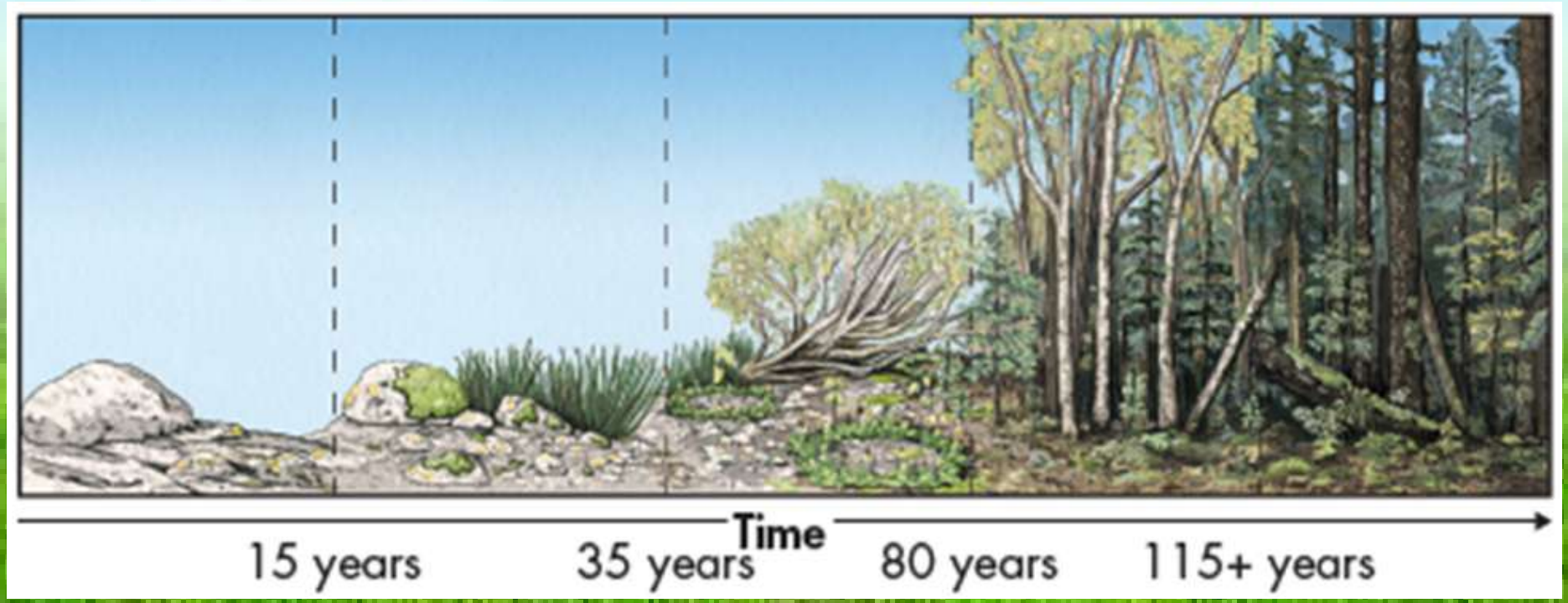
Succession



Daily Objectives

- Describe how ecosystems recover from a disturbance.
- Compare succession after a natural disturbance with succession after a human caused disturbance.

Think About It (not on notes)

- In 1883, the volcanic island of Krakatau in the Indian Ocean was blown to pieces by an eruption. The tiny island that remained was completely barren.

- Within two years, grasses were growing. Fourteen years later, there were 49 plant species, along with lizards, birds, bats, and insects. By 1929, a forest containing 300 plant species had grown. Today, the island is blanketed by mature rain forest.

- How did the island ecosystem recover so quickly?

Succession

- Ecosystems change over time
  - especially after a disturbance
  - some species die out
  - some new species move in
  - succession increase the number of species

Primary Succession

Mount St. Helens

Before

After

Start of Regrowth

Mount St. Helens Today

Mount St. Helens
© Sherwood Imagery/iStockphoto

Primary Succession

- New land created or sterilization occurs
- No remnants of a former community
- Slow process, can take centuries to grow back
- Growth begins at newly exposed surface

Primary Succession

- Pioneer species are the first species to move into an area
  - Ex. Lichens - Help break down rock and form soil.

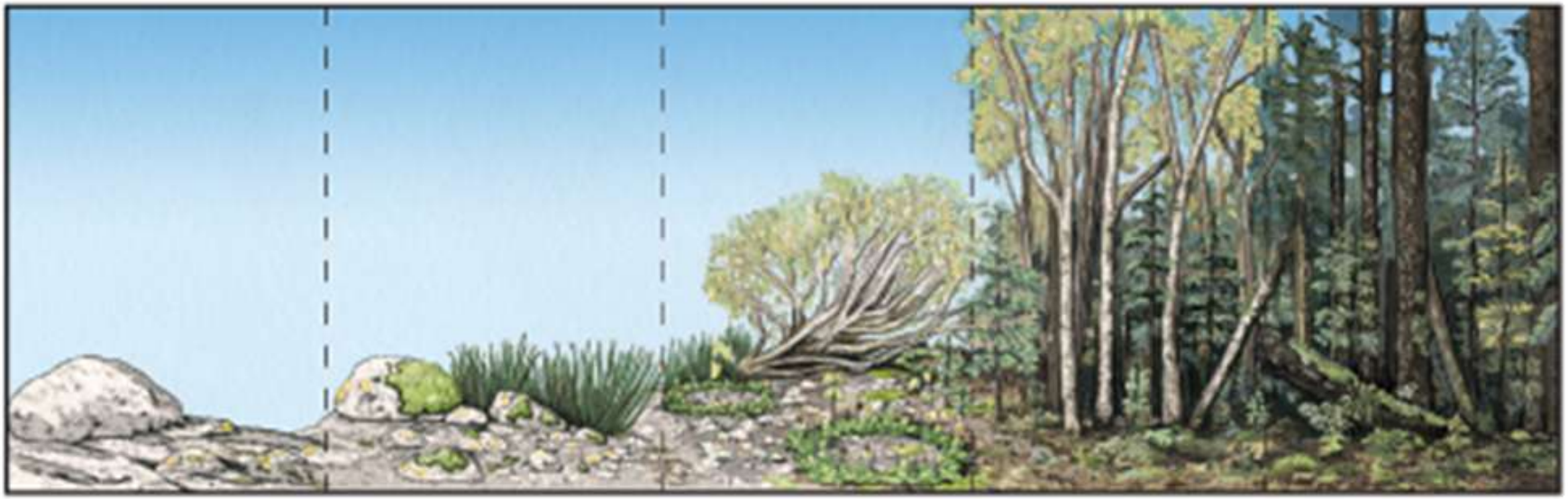
Succession of plant growth:

Bare rock→lichens→grasses→bushes→trees

Primary Succession

- Examples of disturbances that can cause primary succession:
- Volcano eruptions / lava flow
- Retreating glaciers

Primary Succession



- Primary succession on retreating glacier, Glacier Bay, Alaska

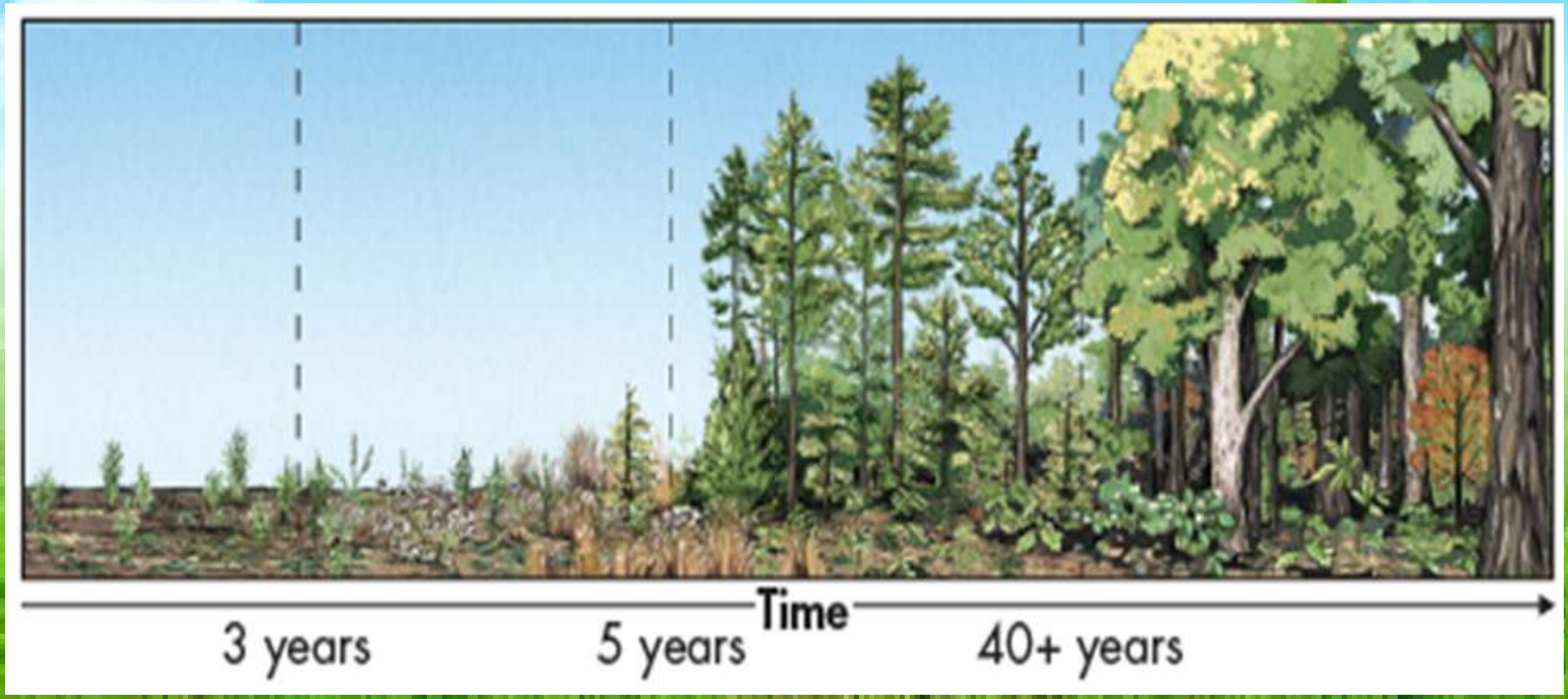
Secondary Succession

- Existing community is not completely destroyed
- New and surviving vegetation can regrow
- Re-growth proceeds quicker because soil survives the disturbance

Secondary Succession

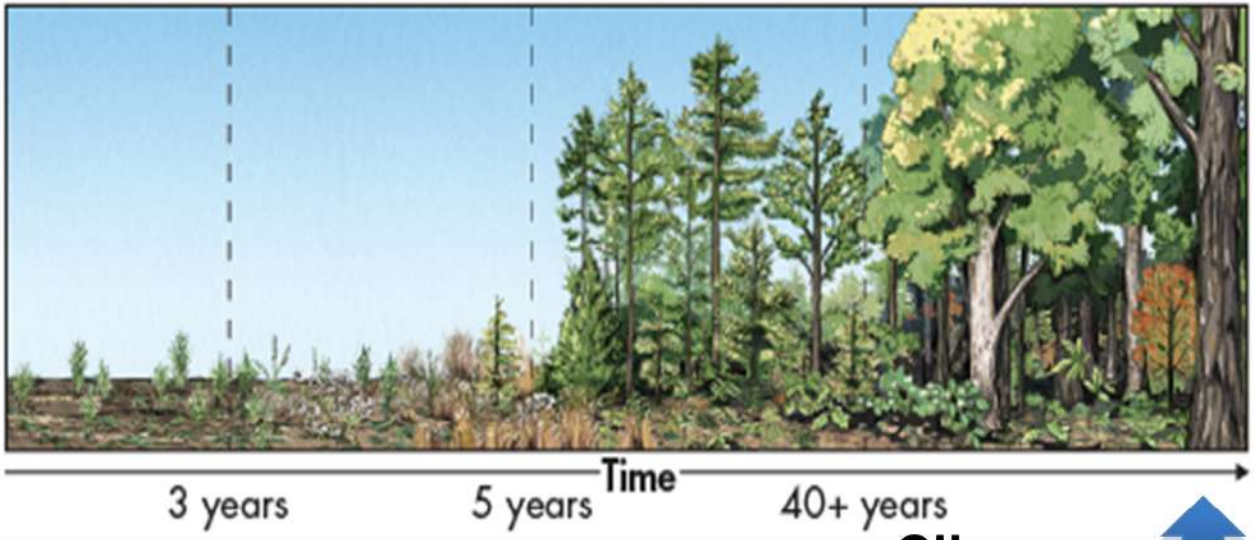
- Examples of disturbances that can cause secondary succession:
  - Forest wildfires
  - Hurricanes
  - Other natural disturbances

Secondary Succession



Climax Communities

- "Stable" community that results after hundreds of years
- Characterized by mature trees



Climax Communities

- Ecologists used to think that succession in a given area always proceeds through the same stages to produce a specific and stable climax community.
- Recent studies have shown that succession doesn't always follow the same path, and that climax communities are not always uniform and stable.

Succession *AFTER* Natural Disturbances

- Secondary succession in *healthy ecosystems* following natural disturbances often reproduces the original climax community.

- Healthy coral reefs and tropical rain forests often recover from storms

- Healthy temperate forests and grasslands recover from wildfires.

Succession *AFTER* Human Caused Disturbances

Ecosystems *may or may not* recover from extensive **human-caused disturbances**.

Example:
Clearing and farming of tropical rain forests can change the microclimate and soil enough to prevent re-growth of the original community.