Objectives:
1) Recognize that plant communities can predictably change through time.
2) Recognize that matter cycles within and across ecosystems.
3) Know the basic ecosystem level carbon and nitrogen cycles.

Succession

Starts with a Disturbance
Disturbance: Discrete event that dramatically changes the plant canopy.

Are disturbances good or bad for an ecosystem?

After the Disturbance
Trajectory depends on the scale of the disturbance–patch or landscape level?

Trajectory depends on the ecosystem–Coastal sage scrub or temperate hardwood forest?

Succession is the predictable sequence of changes in the plant community after the disturbance.

- Species turnover is the fundamental process in succession.
  Ex: Southern Forest

- Not all disturbances produce species change.
  Ex: Chaparral

- Some disturbances produce state changes.
  Ex: Chaparral
Carbon Cycle

- Carbon is the basic constituent of biological molecules.
- Organic molecules hold most of the energy in organisms.
- The carbon cycle is the subject of dramatic economic and social policies.

Fig. 25.15, Berg 26.18

Features of the Carbon Cycle:

- Photosynthesis and respiration are the major constituent processes.
- The cycle takes carbon from the atmosphere and assimilates it into plant bodies.
- The carbon then moves to the soil, herbivores, or back to the atmosphere.
- Decomposers or fire release carbon back into the atmosphere.

Global Atmospheric CO2 Change:

Fig 20.9

Net Sources of Atmospheric Carbon

- Fossil fuels (burning)
- Deforestation (burning, decomposition)
- Tundra (decomposition)

IPCC Figs

Local Carbon Emissions Breakdown

USD Figs

Nitrogen Cycle

- Nitrogen availability is a major limit on plant growth
- Nitrogen is the dominant component of air (N2).
- Plants can't use N2. They can only utilize NH4 and NO3⁻
- Microbes run the nitrogen cycle.
- Nitrogen is lost to the atmosphere due to microbial activity and leaching.

Fig 49.11

End of Lecture Outline