

Key Concept 3: Defining Ecological Communities

Learning Objectives

Students will be able to ...

Essential Knowledge

Students need to know that ...

Importance of Biodiversity

ECO 3.1(a) Describe how ecological processes rely on the biological diversity of the community.

ECO 3.1(b) Given a specific biome, describe the ecological services that are provided that benefit humans.

ECO 3.1.1 Reductions in local and global biodiversity can significantly alter the stability of ecosystem processes and services.

- Biologically diverse ecological communities are more resilient to environmental changes.
- Ecosystems rely on biological diversity to sustain necessary processes, such as cycling of nutrients and flow of energy through food webs.
- Diverse ecosystems provide many necessary services that humans rely on, such as regulating climate, storage of carbon, filtering of drinking water, pollination, and flood/erosion control.

Types of Ecological Communities

ECO 3.2(a) Describe differences in the abiotic and/or biotic factors that shape aquatic and terrestrial communities.

ECO 3.2(b) Use data to make predictions about how abiotic and/or biotic factors shape an ecological community.

ECO 3.2.1 Terrestrial ecological communities are classified into distinct biomes based on abiotic and biotic factors.

- Two major abiotic factors that help define biomes are climate (temperature, precipitation) and soil type.
- Biomes also possess variations in their biotic communities (e.g., plants and animals).

ECO 3.2.2 Aquatic systems can be grouped into three unique ecological communities: oceanic, brackish, and freshwater.

- Aquatic communities are shaped by water depth (amount of sunlight), salinity, temperature, nutrients, and flow rates (currents).
- The three major freshwater communities are rivers/streams, lakes/ponds, and freshwater wetlands.
- Estuaries are brackish ecological communities, as they form where freshwater rivers meet the sea. Their communities are shaped by the ocean tides.

Content Boundary: Students should gain an understanding of the type of abiotic and biotic components of ecosystems that shape communities of living organisms. They should be able to describe how these components differ for terrestrial and aquatic ecosystems. However, a deep knowledge of chemical regulatory processes (e.g., dissolved oxygen in aquatic systems) is *beyond the scope* of this course.

Cross Connections: Students should *connect key concepts* of the carbon cycle from earlier in the unit to the importance of forests and ocean ecosystems as important reservoirs for carbon.