

## Biodiversity

- Refers to the variety of life on earth
- Includes genetic diversity within species, species diversity within ecosystems

## Types of diversity

- Ecosystem Diversity – variety of ecosystems within a region (e.g. salt marshes, forests, wetlands)
- Species Diversity – number and abundance of different species in an ecosystem (e.g. birds, crabs, fish)
- Genetic Diversity – variation of genes within a species. Example: different traits in marsh crabs.

## Ecosystems

- Salt march ecosystem
  - They cover much of the low lying areas if sapelo island
  - Characterized by cordgrass (*Spartina alterniflora*) and vital for filtering water, buffering storms, and supporting marine life (e.g., fish nurseries, blue crabs).
- Maritime forest ecosystems
  - Maritime forests grow behind the dunes and include hardy trees and shrubs adapted to salt and wind.
  - Dominated by live oak, red cedar, magnolias and palmetto
  - Provides habitat for birds, mammals, and insects
  - Important for soil stabilization and storm protection
  - Connects inland ecosystems to the coast
- Beaches and dunes
  - Dunes protect inland areas from storm surges
  - Plants help keep dune structure
  - Provide nesting areas for sea turtles
  - Home to mice, crabs, lizards
- Estuaries and tidal creeks
  - Brackish waters are where freshwater mixes with seawater.
  - Highly productive, supporting fish, shrimp, and bird populations.
- Freshwater wetlands and ponds
  - Found in lower elevation areas.
  - Important for amphibians, reptiles, and migratory birds
  - Provide water for birds and small mammals
  - Filter runoff and reduce flooding
  - Host unique plants like sedges and aquatic vegetation
- Sun provides energy to create biomass but cant create the mass itself
- In photosynthesis the plant is removing CO<sub>2</sub> from the atmosphere

## Mutualism

### **mutually beneficial relationship between legumes and nitrogen-fixing bacteria**

- Bacteria benefit because the plant fixes carbon (photosynthesis) that the bacteria can use

- The plant benefits because the bacteria *fix nitrogen*, which means they rearrange atoms to turn  $N_2$  gas into ammonium ( $NH_4^+$ ).
- $N_2$  cannot be used by plants, but  $NH_4^+$  can be converted by nitrifying bacteria into nitrates that they can use.

Phytoplankton are nitrogen limited so when you add nitrogen, they grow.

Decomposers use oxygen for cellular respiration