

Sustainable Landscaping

Chapter 2: Sustainability in the Plantscape

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Objectives

- Understand the connection between the environment and plant placement and use
- Relate carbon usage by plants to carbon emissions
- Identify ecosystem services provided by plants
- Be able to describe what an ecosystem is
- Understand the functions and interactions of ecosystems
- Distinguish between the benefits and disadvantages of native and non-native plants
- Understand the role of wildlife in the landscape
- Name some programs that have been designed to encourage wildlife habitat development

Terms to Know

Anthropogenic	Evapotranspiration
Biome	Humus
Carbon footprint	Pre-emergent
Carbon sequestration	Understory
Ecosystem	Xeriscaping
Ecosystem services	Xerophyte

Plantscape

- Human enjoyment and well-being
- The environment
 - Carbon sequestration
 - Release of oxygen to the atmosphere
 - Cooling effect of evapotranspiration
 - Ecosystem
 - Plant-soil interactions
 - Food and habitat for insects, birds, wildlife

Carbon Sequestration

- Uptake of carbon dioxide in the process of photosynthesis and incorporation of it into plant tissues and molecular structures
- Carbon is removed from the atmosphere
- Carbon is stored in plant leaves, roots, and stems
- This carbon may begin to be recycled back to the environment through decomposition

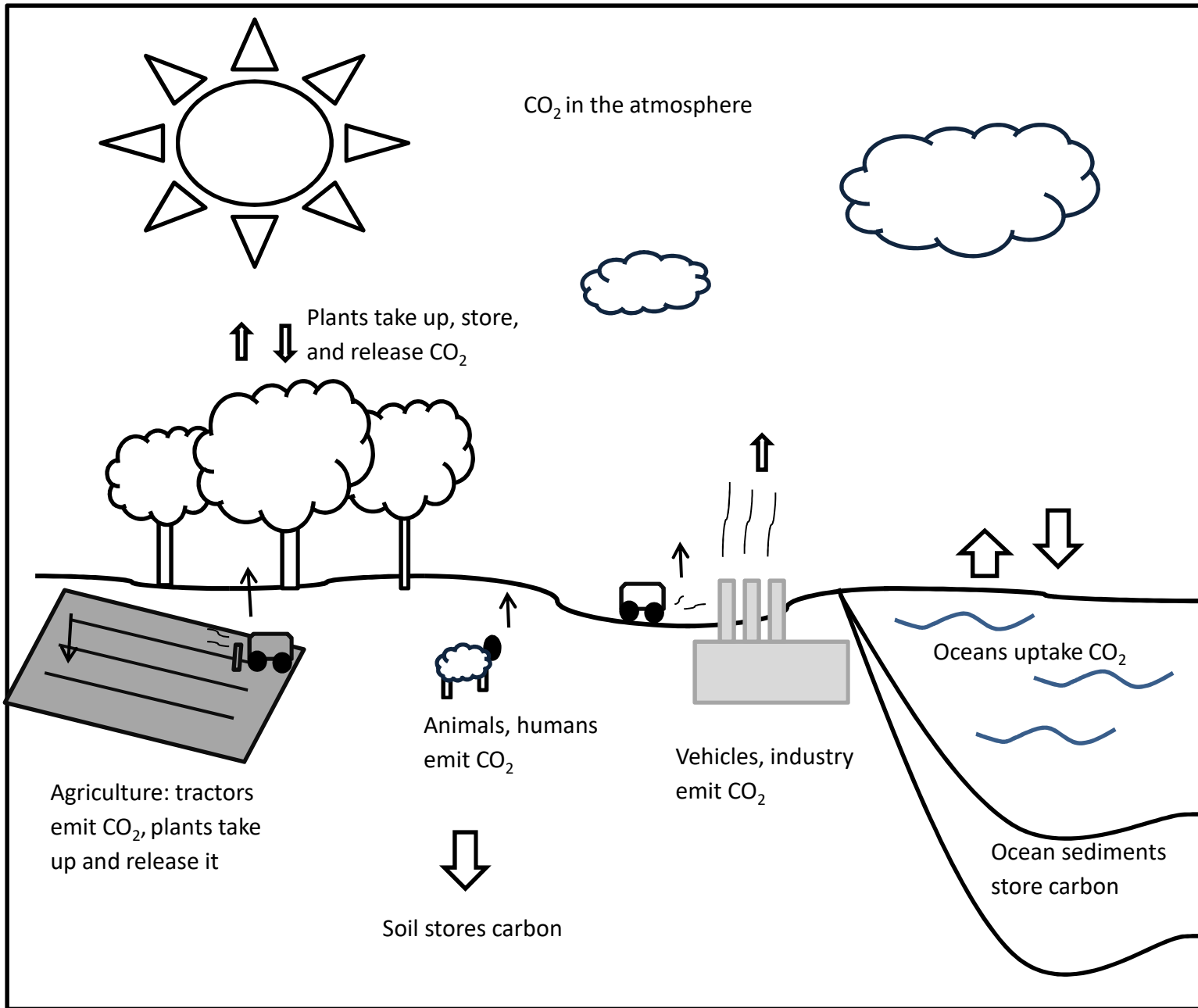


Figure 2.3. The carbon cycle

Oxygen Release

- A mature tree can provide enough oxygen for two people annually
- A 2,500 square foot area of turf produces enough oxygen for four people

Structural Effects

- Shade
- Trap cold air on a slope
- Create dead-air space near a wall
- Funnel the wind or lifting it over structures and areas

Cooling Effect of Plants

- Plants lose water through their leaves in a process known as transpiration
- Temperature, sunlight, and wind can affect the transpiration rate
- When plants transpire, they cool the surrounding air
- Shade also has a cooling effect
- The ground and grass are noticeably cooler than surrounding surfaces, including bare ground
 - When bermudagrass is 100°F, surrounding asphalt is 140°F and artificial turf is 162°F
 - Artificial turf is significantly hotter than natural turf

Turfgrass

- Functional role
- Aesthetics
 - Pleasing color and texture
- Groundcover
 - Recreational activities
 - Light traffic

Drought tolerant turf

- Tall fescue, *Festuca arundinacea*
 - cool-season and intermediate zone
- Buffalo grass, *Buchloe dactyloides*
- Fine fescue species, *Festuca rubra species*
 - Some types of fine fescue are sold as "low mow" or "no mow" turfgrass.
 - Whereas the fine fescues are somewhat drought tolerant, they do not tolerate heat very well, and grow best in partial shade

Salt-tolerant Turf

- Paspalum grass (*Paspalum vaginatum*) is a salt-tolerant grass
- Used in coastal areas for golf courses
- It may replace bermudagrass
- Management of Paspalum grass can be as demanding as other golf course turf species, it has the added benefit of tolerating higher salinity levels in water.
- Works well at golf courses that are exposed to:
 - flooding, hurricanes, or brackish water may benefit from using this grass, effluent or other water that has high salt content, or in locations with saline soils.

Sustainable Turf Management

- Identify indicator weeds of problem areas
- Aerate to alleviate compaction
- Raise mowing height during dormant periods

Woody Plant Management

- Use the proper plant in the proper place
- Use proper pruning practices
- Avoid invasive ants for your area

Ecology and Plants

- Understand your eco-region
 - Forests and woodland
 - Prairies
 - Meadows
 - Riparian zones
 - Deserts
- Select appropriate plants for your climate and soil

Attracting Wildlife

- National Wildlife Federation
 - Backyard wildlife Habitat
- Audubon Society
 - The Sustainable Communities Program
 - The Green Neighborhoods Program
 - The Audubon Cooperative Sanctuary Program
 - Audubon Partners for the Environment Program

Aeration of Turf

- Lawn aeration is a cultural practice that can alleviate compaction and the weeds and diseases that it encourages.
- Lawn areas become compacted due to regular foot traffic and even rain fall.
- Aeration once a year is usually recommended in areas that experience routine use.

Mowing Turf

- Raise mowing height during dormant periods for turf. In the northern half of the United States, this is summer during droughty periods, in the south it is in winter. By raising mowing height, turf roots can grow deeper into the soil, accessing water that is held further underground.