

### Chapter 3 The Watershed's Role as a Natural System

A natural system consists of the physical and biological components, in this case, of watersheds, that act, without human intervention to keep a dynamic equilibrium. As an interrelated system, it performs essential function including: transport of matter, storage, cycling of nutrients, carbon and the energy created, transformation of elements into usable forms, decomposition to release nutrients and make them available, and ecological succession, both riparian and plant. One function is to maintain healthy phosphorus and nitrogen levels to prevent excessive algae growth (eutrophication). Another important function is allowing for energy to be produced at the lowest level of the food web by maintaining the conditions for the aquatic animals so that energy can be cycled through trophic levels (living things on the same level of the energy pyramid). Riparian succession is dynamic and mixed along a watershed, and so plants adapt various strategies—invading after a disturbance, resisting stress, timing reproduction to endure, waiting out disturbance by producing seed, and avoiding by growing in areas less subject to disturbance.

Through these functions, water is stored, shapes the morphology of the elements of the watershed, and carries and deposits sediments and particulate matter. (*seston*). As water moves, nutrients move back and forth between the physical and biological components.

Included in the chapter are diagrams of energy transfer and loss, and the nitrogen and phosphorus cycles.

### Chapter 6 The Role and function of Wetlands and Estuarine Systems

There are different kinds of wetlands. Estuarine (a partially enclosed body where freshwater flows into salt water) wetlands are part of estuarine systems, which include the stream and the adjacent tidal area. Wetlands are responsible for the production of food and a source of biodiversity. They allow for biogeochemical cycling among biological, physical, geological and chemical processes. They help remove excess phosphorus and nitrogen, sediments, and nutrients from surface water making the water a more balanced environment, and store carbon, moderating global climate. Wetlands optimize the storage and release of water. They improve both flow and quality of water. Wetlands provide essential primary, seasonal and nursery habitat. Wetlands assist in flood protection and protect shorelines from erosion. Wetlands provide habitat for a variety of needs of wildlife and plants.