

CHAPTER 7

AQUATIC BIODIVERSITY

Summary

1. Salinity determines the types of organisms found in aquatic environments. The basic types of aquatic life zones are the surface, middle, and bottom layers. The life in aquatic life zones are influenced by temperature, access to sunlight for photosynthesis, dissolved oxygen content, and availability of nutrients.
2. Marine systems provide many ecological services (e.g., climate moderation, nutrient cycling, storm impact reduction). The major types of saltwater life zones are the coastal zone and the open sea. Coastal ecosystems include estuaries, wetlands, and mangrove swamps. Coral reefs form in warm coastal waters of the tropics and subtropics, and they are ecologically complex. Because of their close proximity to human activities, coastal areas are under constant assault from water pollution, industrial runoff, construction and soil erosion, agricultural pesticides flowing into rivers and streams, and aquaculture farming.

In the open sea, the euphotic zone (the lighted upper zone of the ocean), the dysphotic zone (the dimly lit layer underneath the euphotic zone), and the aphotic zone (the dark, cold, deepest zone) are all being undermined by human activities: over-harvesting, oil spills, pollution, rising sea levels, and careless fishing and trawling techniques.

3. The major types of freshwater life zones are lakes, wetlands, and rivers. The ecological services that they provide include climate moderation, nutrient cycling, waste treatment and dilution, flood control.
4. The four zones of lakes are the littoral, limnetic, profundal, and benthic zones. The epilimnion is above the thermocline, whereas the hypolimnion is below the thermocline. Oligotrophic lakes are low in nutrients and productivity, whereas eutrophic lakes are high in nutrients and productivity.
5. The watershed includes all of the land area that drains water, sediment, and dissolved substances into a stream. The three zones of a river system are the source, transition, and floodplain zones.
6. Wetlands (marshes, swamps, fens, and bogs) absorb and store water, improve water quality, reduce erosion, help in flood control, and store greenhouse gases.
7. Human activities, such as dams or canals, flood control levees and dikes, and industrial, urban, and agricultural pollutants, all affect the flow and health of freshwater zones. Many of Canada's wetlands have been drained and filled for farming and to construct homes and businesses. These actions increase flood potential and encourage drought. People overfish the waters, pollute the streams, rivers, and lakes, and dump excessive nutrients, pesticides, and wastes into freshwater sources.