4.1

* Ocean coasts support plant and animal life
  + Ocean waters contain many environments
    - Each has its own special characteristics
  + The shoreline supports many plants and animals
    - **Habitat** – an environment that has all the necessary requirements for an organism to live
    - **Intertidal zone** – habitat at the edge of the ocean – the narrow ocean margin between the high tide mark and the low tide mark
      * At low tide, this area is dry and exposed to direct sunlight
      * At high tide, this area is covered with water
  + Fresh water and salt water meet on the coasts
    - **Estuaries** – the fresh water from rivers mixes with salt water from the ocean in shoreline areas
      * Bays, inlets, harbors
      * Water is not as salty as ocean water or as fresh as river water
      * Salinity changes with the tide
    - **Wetlands** – wet, swampy areas that are often flooded with water
      * Salt marshes – away from the equator in cooler regions
      * **Mangrove forests** – closer to the equator in tropical regions
  + Human activity affects shorelines
    - Can harm estuary environment
      * Filled in to get more room for housing developments

4.2

* Conditions differ away from shore
  + Ocean environments change with depth and distance from shore
    - **Near shore** – waters over the continental shelf – sunlight reaches most of the way to the ocean bottom
  + The waters near shore support diverse life forms
    - **Coral reefs** – built up limestone deposits formed by large colonies of ant-size organisms called corals
      * Corals produce a hard limestone covering that remains after the corals die out
      * **Kelp forests** – large communities of seaweed, found only in the waters near shore where sunlight reaches to the ocean floor. Provide habitats for many organisms
  + Environments in the open ocean change with depth
    - **Surface zone** – sunlit top 200 meters (650ft)
      * Phytoplankton – microscopic floating organisms live at or near the sunlit surface
        + Go through photosynthesis
      * Organisms in the surface zone must keep from sinking – have large surface areas, or use an air bladder to keep them afloat
    - **Deep Zone** – dark and cold, lies under the surface zone, no sunlight reaches the deep zone
      * Most organisms have adaptations to allow them to survive in the deep zones
  + New discoveries about ocean life continue
    - Many new discoveries each year
    - **Hydrothermal vents** – openings in the Earth’s crust where heated water from Earth’s interior rises up and gushes out into the ocean

4.3

* The ocean contains natural resources
  + The ocean supports living resources
    - **Seafood and algae** – often used to thicken common foods like cheese, ice cream, and pudding. Also used for nonfood products
    - **Overfishing** – catching fish at a faster rate than they can reproduce
    - **By-catch** – the portion of animals that are caught in a net and then thrown away
    - Saltwater aquaculture
  + The ocean contains nonliving resources
    - Desalination of water gives us drinkable water
    - Energy resources – oil and gas
    - Minerals and rocks – ores and minerals
  + Pollution affects the ocean
    - Solid and liquid waste