

AP Environmental Science Exam Prep Session: Earth Systems and Resources

Robert H. Quarles, Pflugerville High School, Pflugerville, Texas

AP Environmental Science Topic Outline

- I. Earth Systems and Resources (10–15%)
 - A. Earth Science Concepts
(Geologic time scale; plate tectonics, earthquakes, volcanism; seasons; solar intensity and latitude)
 - B. The Atmosphere
(Composition; structure; weather and climate; atmospheric circulation and the Coriolis Effect; atmosphere–ocean interactions; ENSO)
 - C. Global Water Resources and Use
(Freshwater/saltwater; ocean circulation; agricultural, industrial, and domestic use; surface and groundwater issues; global problems; conservation)
 - D. Soil and Soil Dynamics
(Rock cycle; formation; composition; physical and chemical properties; main soil types; erosion and other soil problems; soil conservation)

Important Places

Aral Sea, Uzbekistan/Kazakhstan (former Soviet Union): large inland sea is drying up as a result of water diversion.

Aswan High Dam, Egypt: the silt that made the Nile region fertile fills the reservoir. Lack of irrigation controls causes waterlogging and salinization. The parasitic disease schistosomiasis thrives in the stagnant water of the reservoir.

Three Gorges Dam, China: world's largest dam on Yangtze River will drown ecosystems, cities, archeological sites, fragment habitats, and displace 2 million people.

Ogallala Aquifer: world's largest aquifer; under parts of Wyoming, South Dakota, Nebraska, Kansas, Colorado, Oklahoma, New Mexico, and Texas (the Midwest). Holds enough water to cover the U.S. with 1.5 feet of water. Being depleted for agricultural and urban use.

Important Terms

Divergent Plate Boundaries: tectonic plates spreading apart, new crust being formed (ex. mid-ocean ridges, rift valleys).

Convergent Plate Boundaries: tectonic plates with the oldest crustal material on Earth moving together, one moving under another (ex. mid-ocean trenches). Mineral deposits and volcanoes are most abundant at convergent plate boundaries

Transform Fault: tectonic plates sliding past one another (ex. San Andreas fault).

Humus: organic, dark material remaining after decomposition by microorganisms.

Leaching: removal of dissolved materials from soil by water moving downwards through soil.

Loam: perfect agricultural soil with equal portions of sand, silt, and clay.

Soil Conservation Methods: conservation tillage, crop rotation, contour plowing, organic fertilizers.

Soil Salinization: in arid regions, water evaporates leaving salts behind. (ex. Fertile crescent, southwestern US)

Water Logging: water completely saturates soil starves plant roots of oxygen, rots roots

Watershed: all of the land that drains into a body of water.

Aquifer: underground layers of porous rock allow water to move slowly.

Cone of Depression: lowering of the water table around a pumping well.

Salt Water Intrusion: near the coast, over-pumping of groundwater causes saltwater to move into the aquifer.

ENSO: El Nino Southern Oscillation, trade winds weaken & warm surface water moves toward South America, diminished fisheries off South America, drought in western Pacific, increased precipitation in southwestern North America, fewer Atlantic hurricanes.

La Nina: "Normal" year, easterly trade winds and ocean currents pool warm water in the western Pacific, allowing upwelling of nutrient rich water off the West coast of South America.

Troposphere: first layer of atmosphere 0-10 miles above the Earth's surface. Contains weather, greenhouse gases (bad ozone).

Stratosphere: second layer of atmosphere 10-30 miles above the Earth's surface. Contains protective ozone layer (good ozone).

Inversion Layer (Temperature Inversion): a warm layer of air above a cooler layer traps pollutants close to the Earth's surface.