

November 11, 2015

### **Finishing up Unit 25**

(5) Temperate Forest, several varieties including temperate deciduous forest biome (in Cf) – oak, beech, birch, walnut, maple, ash, some conifers, temperate evergreen forest (in Cf or Cs) – needle-leaf trees in northern hemisphere such as doug firs and redwoods, in New Zealand trees there are broadleaf and small-leaf. (6) Mediterranean Scrub (in Cs) – pine, oak, hot dry summers and cool moist winters, California/Mediterranean, central Chile, South Africa Cape Province, dense human population. (7) Northern Coniferous Forest (in D climates) – boreal forest, taiga, needle-leaf trees, some adaptation to freezing and waterlogged soils. (8) Tundra – frozen soils, no trees, but instead sedges, mosses, lichens, dwarf trees in some places, xeriphytic adaptations.

### **Unit 26**

Zoogeography, animal range, habitat, ecological niche, example of Kirtland's warbler and jack pine, natural selection, mutations, von Humboldt and Darwin and Alfred Russel Wallace, Wallace's Line vs. Weber's Line, Zoogeographic realms, Examples of realms such as Paleotropic, Madagascar, New Zealand, etc., convergent evolution. Ecological zoogeography, island biogeography, island size vs. number of species, balance of between arrivals of new species and extinctions of those already present, island biogeography and conservation efforts, habitat preservation.

### **Unit 27**

Earth's interior, evidence of denser materials nearer the earth's center, earthquakes and seismic waves, speed of waves and material density, mapping interior structure with seismic waves. Inner Core (solid, iron+nickel, 760 miles thick), Outer Core (liquid, nickel & iron, 1400 miles thick, earth's magnetic field), Lower Mantle (solid, iron, magnesium, silicon, 1385 miles thick), Upper Mantle (solid, 415 miles thick, lower portion is mostly solid but 'plastic', upper part is more rigid), Mohorovicic discontinuity (Moho) – significant density and composition change, Earth's crust – oceanic (~5 miles thick) vs. continental (~ 25 miles average thickness). Felsic vs. Mafic rocks. Lithosphere (crust + uppermost rigid part of the mantle) vs. the asthenosphere – but boundary is not abrupt. Lithospheric plates, the crustal surface, patterns and reasons for topographic relief, high vs. low relief. Continental shields vs. orogenic belts, cratons. Canadian Shield, Guyana Shield, Brazilian Shield, African Shield, Scandinavian, Siberian, Indian Shield, Australian, Antarctic Shields. Orogenies, examples such as Appalachians, Sierra Nevada, Andes, Alps, Himalayas. Weathering and erosion.

### **Unit 28**

Minerals vs. Rocks, Crystalline structure, chemical composition, properties such as hardness/color, etc., Mineral types such as silicates (which can include quartz, feldspar) and carbonate minerals. Classification of rock types, igneous rocks, sedimentary rocks, metamorphic rocks, magma, lava, intrusive igneous rocks, extrusive igneous rocks, granite vs. basalt. Intrusive batholiths and stocks, etc. Jointing and exfoliation in igneous rocks.

### **Unit 29**

Sedimentary rocks, lithification, compaction and cementation, clastic vs. nonclastic sedimentary rocks. Conglomerates, sandstones, and shales as examples of clastic sedimentary rocks. Limestone as an example that could be clastic, but usually is nonclastic. Strata, stratigraphy, importance of unconformities. Metamorphic rocks, foliation. Metamorphic rock types such as quartzite, marble, slate, gneiss. The Rock Cycle. The geologic time scale.

### **Unit 30**

Plates of the lithosphere. Alfred Wegener, Pangaea, continental drift, plate tectonics, seafloor spreading, rifting, lithospheric plates, movement of the plates, things that can happen at plate boundaries such as subduction, earthquake map of the world, divergent vs. convergent plate boundaries, ocean-ocean plate convergence & island arcs, continent-continent plate convergence, ocean-continent plate convergence – example of Cascadia. Transform plate boundaries.

### **Unit 31**

Mechanism of plate motion, isostasy, the linkage between plate tectonics, isostasy, mountain building, and erosion. Ice sheets and isostatic rebound, dams and crustal equilibrium. Evolution of the continents with shields at the centers, and younger terranes added on.