

November 23, 2015

### **Unit 32**

Volcanism and its landforms. Distribution of volcanic activity, Pacific Ring of Fire, Hotspots, Spreading centers and subduction zones, active, dormant, and extinct volcanoes. Properties of magma, viscosity and gasses, pyroclastics, flood basalts. Landforms such as calderas, composite volcanoes [lahars, pyroclastic flows], cinder cones, shield volcanoes [Aa vs. pahoehoe], basalt plateaus and plains, hot spots. Volcanoes and human history: Krakatau [1883], Tambora [1815, year without a summer], Santorini [~1645 BC] and the Minoans. Modern society and volcanic hazards.

### **Unit 38**

Hydraulic civilizations, Surface parts of the hydrologic cycle, interception, permeability, infiltration, infiltration rate, effects of humans, runoff, snow vs. rain, water flow in streams: slope, vertical profile of velocity, resistance to flow, helicoidal flow, which is faster on average -- a big low-slope river, or a high mountain stream? Discharge,  $Q=VA$ , hydrograph, groundwater, vadose vs. saturated zone, soil moisture and field capacity, water table, aquifers, aquicludes, groundwater discharge, springs, perched water table, groundwater recharge, hydrothermal water, traditional wells, artesian wells, drawdown, cone of depression, groundwater pollution

### **Unit 39**

Fluvial processes, infiltration capacity, rainsplah erosion, sheet erosion, rills and gullies, stream networks, drainage basins/watersheds, drainage divides, sediment yield, alluvium. The work of streams, deltas, floods, recurrence interval. Erosion through hydraulic action, abrasion, corrosion. Transportation through bedload, suspended load, dissolved load. Deposition/aggradation, importance of base level, stream incision. We are skipping the parts of the unit on stream power, energy and work in stream systems, and the concept of the graded river system.

### **Unit 40 (Part)**

Landscapes shaped by fluvial erosion. Patterns of erosion shaped by climate factors, bedrock type, tectonics and various geologic structures, time? Drainage density, dendritic drainage vs. others such as radial or rectangular. We are skipping the rest of the Unit – you can learn about these things in Geomorphology class.

### **Unit 41**

Landforms of the fluvial system. Alluvial fans (ephemeral streams, fans, bajadas). Landforms of River Valleys (alluvium, meanders, point bars, cutbanks, oxbow lakes, braided streams). The Floodplain (floodplains, meander belts, natural vs. artificial levees, floodplain use by humans). Terraces. Deltas and distributaries.