

**Oct. 5, Environment class notes, focus on resources: Water, Soil, and Forests  
(Environment chs. 14, 15 and 18)**

**Chapter 14: Water (skip 310, 317-321, 325-331)**

- Why is there such a huge discrepancy between how much people in developed countries pay for water (as little as 0.15% of income) and how much people in developing countries pay (as much as 20% of income)? (see p. 308)
- What is **surface water**? How is it different than **groundwater**? (see Figure 14.5)
- Where do **aquifers** exist, and why are they so important for the world's water supply?
- Is groundwater a renewable or nonrenewable resource, and in what sense?
- What accounts for the large majority of the world's water use? (p.313)
- What are **flood plains**, and why are they both frequently settled and dangerous for habitation?
- How does urban development affect **runoff** and groundwater absorption? (see 14.6)
- What are the causes and effects of **aquifer depletion** and **saltwater intrusion**?
- How is climate change predicted to alter the hydrological cycle?
  - Changes in precipitation and transpiration will be different in different parts of the globe, and they will have different impacts ("one recent study suggests that a 10% decrease in rainfall in one part of Africa will lead to a 17% reduction in drainage, while the same decrease in another area will lead to a 50% reduction in drainage")
- What are the dangers to the world's **water tables** as more and more groundwater is used for global agriculture, etc – India is especially vulnerable in this regard. What can happen when the water table is depleted?
- Why are water resources presented as classic 'public goods' resources requiring international cooperation.
- What happened to the **Aral Sea**, and how could it have been prevented? (Figure 14.17)
- Why would a view of private property that extends 'to the center of the earth' present a problem when it comes to aquifer depletion?
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**Chapter 15: Soil (skip 340-344, 349-353)**

- Why did the Chinese government build millions of trees along its Northern border?
- What is soil? How do **topography** and geological events like receding glaciers contribute to soil fertility?
- Soil is made up of: mineral particles, organic matter, water, and air.
  - How does the organic matter in soil form? What is **humus**?
- What happens to water that is neither absorbed soil nor expelled as runoff?

- How does **leaching** contribute to the different **soil horizons** in a given patch of land?
- What **ecosystem services** do **soil organisms** provide?
- What are the various causes of **soil erosion**?
- How do certain agricultural practices contribute to **mineral depletion** (Figure 15.12)
- Why do tropical rainforests have nutrient-poor soils?
- In what climactic regions does soil **salinization** occur most frequently?
- What is **desertification**? What region of the world is at the greatest current risk for large-scale desertification?

### Chapter 18: section on Forests (409-412)

- What is **transpiration**?
- What are the range of **ecosystem services** trees provide?
- How is an old-growth forest different from a traditional tree plantation?
- What are some of the tenets of **sustainable forestry**?
- Methods of harvesting trees (Figure 18.7)
  - Selective cutting
  - Shelterwood cutting
  - Seed tree cutting
  - Clearcutting
- What are the various causes of **deforestation**?

### Videos for Monday (Water, Soil, Forests)

- **Water resources: 2007 CIA report predicts growing water scarcity by 2015:** [http://www.metacafe.com/watch/621153/cia\\_predicts\\_the\\_future\\_2015\\_water\\_resources/](http://www.metacafe.com/watch/621153/cia_predicts_the_future_2015_water_resources/)
- **Soil resources: simplest possible demonstration of how soil erosion works:** <http://www.youtube.com/watch?v=1D1V-t3UTHA>
- **Forest resources: video on the dangers of palm oil processing in Malaysia:** [http://www.youtube.com/watch?v=v7fFeJyXkBk&feature=PlayList&p=0713E52FFCCA99F7&playnext=1&playnext\\_from=PL&index=1](http://www.youtube.com/watch?v=v7fFeJyXkBk&feature=PlayList&p=0713E52FFCCA99F7&playnext=1&playnext_from=PL&index=1)