Chapter 17 Highlights

1. The production of electricity uses a great deal of water for cooling power plants, although most of that use is non-consumptive. Changes in how electricity is produced can have major effects on water use: A shift from ***once-through*** to ***recirculating cooling*** decreases withdrawal but increases consumption; a shift towards wind and solar tends to decrease both withdrawal and consumption; and a shift towards hydropower increases consumption due to reservoir evaporation.
2. Because of its dependence on cooling water, electricity production is vulnerable to hydrologic change, particularly drought and higher water temperatures.
3. The increased use of ***biofuels*** has increased the water footprint of the transportation sector, although the significance of that water footprint depends on whether it is green or blue (i.e., whether the biofuel crops were irrigated).
4. The extraction, transportation, and use of fossil fuels are significant sources of water, soil, and air pollution. Among the issues of greatest concern: the storage and disposal of ***coal ash***; the transportation of ***dilbit***; the contamination of drinking-water aquifers by ***fracking*** operations; and the targeting of communities of color as points of least resistance for pipelines and other hazardous infrastructure.
5. ***Produced water*** from fracking, conventional oil and gas, and coalbed methane presents a disposal problem and, in some cases, a potential new source of water for irrigation or other uses.
6. Over the last 65 years, water use in US manufacturing (per unit of industrial production) has gone down by more than 90%, due to increased water-use efficiency and a shift away from the production of water-intensive metals and chemicals.
7. In addition to direct water use, manufactured products also have upstream and downstream water footprints, but it is critical to distinguish between blue and green components of those footprints.
8. Historically, poorly-regulated industrial activities have been major sources of toxic compounds to water, soil, air, fish, and people, including well-publicized tragedies like Bhopal, Minimata, and Love Canal. Many banned ***legacy contaminants*** are extremely difficult to remove from soils and groundwater, so we are still dealing with their effects. Much of the burden of industrial toxins falls on low-income and minority communities.
9. The transition to a carbon-free economy will require increased mining of certain elements such as lithium and copper, but mining can be a significant source of water contamination and competition over water supply.
10. The recent corporate interest in water stewardship is encouraging, but *water neutrality* is not a scientifically valid goal.