

Botkin & Keller: Environmental Science: Earth as a Living Planet, 8th Edition
APES- Chapter #18- Water Supply, Use and Management

Name: _____

Learning Objectives: *At the end of this chapter, students will understand:*

- *Why water is one of the major resource issues of the 21st century*
- *What a water budget is, and why it is useful in analyzing water supply problems and potential solutions*
- *What groundwater is, and what environmental problems are associated with its use*
- *How water can be conserved at home and in industrial and agricultural practice*
- *Why sustainable water management will become more difficult as the demand for water increases*
- *Why sustainable water management will become more difficult as the demand for water increases*
- *The concepts of virtual water and a water footprint and their link to water management and conservation*
- *What the environmental impacts are of water projects such as dams, reservoirs, canals and channelization*
- *What a wetland is, how wetlands function, and why they are important*
- *Why we are facing a growing global water shortage linked to our food supply*

Case Study: Palm Beach County, Florida: Water Use, Conservation and Reuse

What are some of the benefits of using reclaimed water?

1: What are some of the factors that make ***water so special?***

2: What is the ***largest reservoir of water*** on Earth?

What is the ***largest reservoir of freshwater*** on Earth?

3: What is the ***residence time of water*** in the atmosphere?

Groundwater and Streams

4: What is the *water table*?

5: What is a *discharge zone*?

6: What is an *aquifer*?

What is a *cone of depression*? *How is it created*?

7: What is an *effluent stream*?

What is a stream that **flows all year** called?

8: What is an *influent stream*?

What is a stream that **doesn't flow all year** called?

Water Supply: A U.S. Example

9: What is a **water budget**? *How is it calculated*?

Precipitation and Runoff Patterns

10: What is the *average water use for people in the U.S.*?

What is the *average water use for people in Europe*?

What is the *average water use for people in Sub-Saharan Africa*?

Groundwater Use and Problems

11: How many people in the U.S. use groundwater as *a source of drinking water*?

12: *What problems* can **groundwater overdraft** cause?

13: What is happening to the **Ogallala Aquifer (High Plains Aquifer)**?

Desalination as a Water Source

14: What is the **percentage of salt** in saltwater? _____%

15: To be used as a *freshwater source*, the **salt content must be reduced** to about _____%

16: What are some of the *environmental impacts of desalination*?

Water Use

17: Describe the *difference between off-stream use and in-stream use*.

18: What is one of the issues with **off-stream use in the Pacific Northwest**?

19: Describe what happened to the **Aral Sea**.

Some Trends in Water use

20: What are the **two biggest users** of freshwater withdrawals?

Water Conservation

21: What are some of the *suggestions for improved irrigation* to conserve water?

Public Supply and Domestic Use

22: *Domestic use* of water (homes) accounts for _____% of total national water withdrawals.

23: What is **Southern California (San Diego)** doing to help with water shortages in the future?

24: List **5 things** that you can do at home to help conserve water usage

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Virtual Water

25: What is *virtual water*?

26: How much water does it take to *make a cup of coffee*?

27: How much water does it take to *raise beef*?

Wetlands

28: How do we define **wetlands**?

29: Wetlands are *very important*, what are the **natural service functions** of wetlands?

30: How much of the original wetlands of the U.S. have disappeared? ____%

Restoration of Wetlands

31: What did the **National Environmental Policy Act** of 1969 require?

Dams and the Environment

32: Explain the *environmental impacts of dams*

33: What are the ***PROS and CONS*** of the Three Gorges Dam?

34: What are some of the *issues associated with removing of dams?*

Global Water Shortage Linked to Food Supply

35: What are the environmental issues associated with global water shortage and food supply?

36: Water is one of our most abundant resources, *why are we concerned about its availability in the future?*

Study Questions

1: Which is more important from a national point of view, conservation of water use in agriculture or in urban areas? *Why?*

