

20 Most Important Things To Know About Water

1. The water distribution on earth is as follows: approximately
97% in the ocean (salty);
2% in the ice caps and glaciers (fresh);
Less than 1% in the lakes, rivers, atmosphere, and underground aquifers (fresh).
2. The Water Cycle – *precipitation to rivers, lakes, ocean, aquifers, biota*
To evaporation, transpiration
To precipitation
3. The #1 water pollution problem for humans in the world is the lack of disease-free drinking water.
4. Fresh water is not evenly distributed to the countries of the world. Some countries such as Canada and Brazil have an ample supply while others such as Egypt and Saudi Arabia have almost none.
5. There are eleven major water pollutants:
 - a) **Thermal pollution** – heated water from power plant cooling or other industrial processes
 - b) **Sewage** – human waste that contains nutrients and pathogens
 - c) **Sediment** – suspended soil particles cause by excessive erosion
 - d) **Radioactive waste** – leakage of radioactive wastes into natural waterways
 - e) **Nutrients** – phosphorous and nitrogen fertilizers that can lead to eutrophication
 - f) **Organic chemicals** – includes a wide variety of toxic chemicals such as pesticides, herbicides, and dioxins.
 - g) **Organic matter** – includes agricultural waste which increases biological oxygen demand **BOD**
 - h) **Heavy metals** – includes lead, arsenic, mercury, selenium, and cadmium, all extremely toxic to living things
 - i) **Inorganic chemicals** – these include most acids, bases, and salts
 - j) **Oil** – oil pollution occurs from major spills and from routine maritime operations
 - k) **Garbage** – this is trash thrown into any body of water or waterway from boats or from offshore
6. **Point sources** of water pollution include power plants, mining activities, chemical plants, sewage treatment plants, and manufacturing facilities.
Non-point sources of water pollution include urban runoff and erosion from poor agricultural and tree harvesting practices.
7. **Fecal coliform test** – based on the amount of Escherichia coli (E. coli) bacteria in a 100ml sample
Drinking water: maximum number of E. coli. Allowed = 0;
Swimming water: 200 E. coli. allowed.
8. **Fresh water treatment** for urban use includes settling, filtration, and disinfection with chlorine, ozone, iodine, or UV radiation.
9. **Waste water treatment** involves three major steps plus sludge processing and disinfection of the final effluent before it is released into the environment. The three major steps are
Primary Treatment (physical separation of solids from liquids),

Secondary Treatment (biological breakdown of wastes), and Tertiary or Advanced Treatment (chemical detoxification of harmful organic and inorganic materials).

10. **Federal water legislation**

Clean Water Act 1972, 1977 (Money to improve sewage treatment and reduce water pollution)

Safe Drinking Water Act (Sets standards for contaminants in drinking water)

Water Quality Act (Established a policy to control non-point sources of water pollution)

11. **Global water use** Agriculture= 69%;

 Industry= 24%;

 Domestic= 7%

12. **Indoor domestic use in the United States**

Flushing toilets – 38%

Bathing – 31%

Laundry and dishes – 20%

Drinking and cooking – 6%

Brushing teeth and shaving – 5%

13. **BOD – biological oxygen demand** This is the amount of oxygen needed to degrade or decompose a specific amount of organic waste that has entered into a body of water such as a stream or lake.

14. **DO – dissolved oxygen** the amount of oxygen in a body of water in parts per million (ppm):

 0 to 4 ppm low;

 5 to 7 ppm moderate;

 8 to 20 ppm high

15. **Watershed/Drainage** – A large area of land that collects precipitation and eventually concentrates it into a specific river or aquifer.

16. **Water Table** – The top of the zone of saturation in an underground aquifer.

17. **Oligotrophic versus Eutrophic bodies of water** –

Oligotrophic lakes have little or no nutrients and are therefore very clear with only minimum amounts of living things in them; whereas,

Eutrophic lakes have high levels of nutrients and are therefore full of living things such as algae and insects.

18. **Aquifer** – An underground, porous area of soil that has been saturated with water; confined if it is sandwiched in between impervious layers of strata, and unconfined if it is not.

19. **Saltwater intrusion** – This occurs when excessive amounts of water are removed from a fresh water aquifer and adjacent saline water moves in to replace the fresh water.

20. **Subsidence** – This occurs when the ground level drops due to excessive removal of water from an underground aquifer.