How Do Humans Influence Water Quality?

Why Do We Care About Water?

Water is one of the most important resources on our planet because it is finite, meaning we cannot create more. About 70% of the Earth is covered in water; however, only 2.5% of that water is freshwater, and breaking that down even further, only 0.5% of that water is drinkable. Human beings themselves are made up of about 60% water and therefore need water daily to perform necessary functions in our bodies like moving around important nutrients. Having clean water is important to make sure our bodies stay healthy, and aren’t harmed by bacteria, viruses, heavy metals, or other pollutants that can be in water.

Freshwater also provides a lot of ecosystem services. Ecosystem services are ways an ecosystem—a group of organisms and their environment—fill a role or benefit another group. For example, freshwater is used for:

- Cleaning
- Growing food such as agriculture crops or fish
- Generating electricity
- Recreation and tourism

Freshwater also supports thousands of organisms and allows diverse communities to exist. For example, a river running through a prairie can provide a spot for plants to grow and aquatic animals to feed the land animals.

Freshwater Pollution: How Does It Get There?

Pollution can have a big impact on the quality of freshwater and how much is available to be used for different ecosystem services. For example, water is used in the production of most of our food and products that human beings use. The amount of water it takes to make just one 1/3 pound hamburger is 2,310 liters. To put that into perspective, the average shower (8.2 minutes) uses 65 liters of water. A lot of this water does not make it back into water’s cyclical journey on Earth called The Water Cycle, and therefore can’t be used again.

After falling down from the sky as precipitation, water can pick up pollutants on its way back into freshwater. When water goes down the drain in our homes and buildings it generally flows through a wastewater treatment plant. This plant uses several techniques to treat the water and make it safe to go back into freshwater ways like streams and rivers. However, these treatments aren’t always 100% effective and often compounds that you use every day are introduced back into streams. For example, during the summer if you wear sunscreen to protect your skin, when you shower later that sunscreen can travel with the water and eventually be deposited into a freshwater system.

Pollutants can also move into freshwater systems by being carried with rain water. During a rain event, water can pick up compounds and move them into a river or stream where it can have an effect on aquatic life. For example, farming uses fertilizers like nitrogen and phosphorus. While these elements occur naturally and are used by aquatic organisms, excess nutrients from manure and other applications can be moved into rivers and streams with rainfall.
How Does Pollution Affect Water?

Several pollutants are found in freshwater. Below are some examples of common pollutants and their effects on aquatic ecosystems:

- **Nutrients**: High levels of nutrients like phosphorus and nitrogen can change ecosystem structure. These changes can lead to harmful effects like algal blooms, in which algae grow in large amounts depleting oxygen for other organisms. Large algal blooms can also produce toxins that can be harmful to aquatic life and even other animals like dogs and humans⁴. When these blooms happen in lakes used for recreation, it can often shut down beaches and other areas leading to very costly removal techniques.

- **Common Use Products**: Lots of products we use every day like hand soaps, shampoos, prescription drugs, sunscreens, antibiotics, and insect repellants are found in freshwater systems⁴. Often, the ingredients in these products are not made to stay in or on the human body. As a result, compounds can get into freshwater systems through wastewater after people use them. They can also enter systems through industrial processes like farming or manufacturing⁵. For example, if cows are treated with antibiotics, those antibiotics can make it into freshwater after manure is applied to a field. Also, a factory that manufactures antibiotics could introduce antibiotics into a river or stream through its wastewater.

The effects of common use products on aquatic organisms are still being studied. Research looking at this issue shows some compounds can affect organism function. Fish are shown to have behavior changes, as well as body changes, that can impact how successful they are at reproducing⁸. If fish are not able to reproduce or survive as well, their population numbers could go down. Decreasing fish populations could have negative impacts on how much fish is available to eat, and how an ecosystem is structured.

How Can We Help?

There are a lot of simple things we can do to help reduce pollution, improve water quality, and promote ecosystem health. We can especially make a difference in reducing the amount of products we use every day:

- Do not flush pills, chemicals, or other medications down the drain
- Clean up after your pets
- Don’t buy more than you need, this will reduce the amount disposed.
- Only take the recommended dosage for the recommended amount of time. If you take extra, that can put more compounds in the environment
- Ask your pharmacy if you can dispose of unused drugs.
- See if your local city hall has a drug take-back day where you can dispose of unused drugs in an environmentally safe way

References:


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