

Water Pollution

Recorded by Jonathan Hartline

Penn State Brandywine, May 2, 2011

Yash: Hello, my name is Yash Patel and today I will talk to you about water pollution. The most important point to stress from this podcast is that water is a finite resource on this planet, as most is unavailable to us as drinking water. 2.5% of the world's water is fresh water. Only about 30% of this fresh water is available to us at any given time as groundwater, which is nonrenewable, and less than 1% makes up the lakes, rivers and streams that we all know and love. The pollutants that find themselves in our waterways are a threat to humanity because in some cases polluted waterways make up this 2.5% of freshwater, leaving us with less available water. Today I am here with Jonathan Hartline, who has done some research on water pollution. Good Morning Jonathan.

Jonathan: Good Morning.

Yash: First of all, can you tell us what kinds of things we see in our waterways today that are considered water pollutants?

Jonathan: Sure. We can easily divide pollutants into two categories, which are organic and non-organic. Organic pollutants come from us and our pets mostly, but all living things contribute to this type of pollution. This includes excrement, food waste, and other carbon substances, which can deplete oxygen in water and destroy wildlife, and pathogens and microbes such as cryptosporidium and salmonella, which spread infectious disease. While everything in the world may contribute these things to the water supply to some extent, humans are mostly to blame due to the overpopulation of cities. Because people live in crowded cities and contribute too much of these materials than is sustainable to the environment, our pollutants are more of a problem and need to be treated before they enter our waterways.

Yash: Tell me more about non-organic pollutants. I take it these are all man-made?

Jonathan: Not exactly. Nutrients such as nitrogen and phosphorous and heavy metals such as lead, zinc and copper occur naturally in the environment. For the most part, though, it is human influence that makes these materials toxic to our waterways. The nitrogen- and phosphorous-rich chemicals that are sprayed on farms, for example, run off into streams and cause an overgrowth of algae that the environment cannot support. This depletes the water of oxygen which in turn can suffocate wildlife in an area. This creates what is known as a dead zone, or an area where no fish and other organisms can exist. Mining for heavy metals also creates potential disasters for our waterways in the future. Do you remember the Hungarian spill in October of 2010?

Yash: Where 184 million gallons of industrial waste broke out of a waste-retaining pond at an aluminum-oxide plant?

Jonathan: Yes, disasters such as this one occur because there is a lot of waste that is created through the mining process. This excess waste, known as tailings, is stored in ponds that aren't always built with the best practices. A December 2010 article from National Geographic says that sometimes these tailings are just dumped into an embankment to get rid of them. Mining processes in developing countries is also a problem as techniques which use cyanide and mercury are still in use. Once these chemicals are released into the environment, the impacts are devastating. While the cyanide will kill anything in the river ecosystem, mercury that is introduced into the environment is absorbed by fish that could wind up on someone's dinner plate.

Yash: Wow, it sounds like developing countries contribute a lot to water pollution.

Jonathan: Actually, developing countries only create about 20% of hazardous waste and industrialized countries such as the United States and China have an equal or greater share of the blame. More than 75% of urban river water in China is considered unfit for human consumption, and as a result they rely heavily on groundwater sources, which as you said earlier are nonrenewable. The Mississippi River in the United States also contributes to a growing dead zone in the Gulf of Mexico as nutrient-rich waters run off of farms in the middle of the state. The U.S. also has their own holding pond problems, which range from wastewater in clay holding ponds from food production to the 136 million tons of coal ash produced each year to power homes.

Yash: I guess I didn't think of it like that before. What kinds of problems are being discussed in the Pacific Ocean now as a result of Japan's most recent natural disaster?

Jonathan: Japan's Fukushima Daiichi nuclear power plant is currently leaking radiation into the Pacific Ocean, which will have at least short-term and possibly some long-term impacts on the ecosystem. Radiation is another substance which exists naturally in the environment, but nuclear power plants produce more radiation than the ecosystem can handle. This can kill fish outright, cause genetic mutations in the animals, or travel up the food chain in much the same way that mercury does. An April 1 article on radiation in Japan's seas states that the amount of radioactive iodine was 3,355 times the legal limit for seawater and cesium was also 20 times higher the same day. While the iodine will decay in a short period of time, the cesium may have long-lasting impacts on the ecosystem.

Yash: Well, it looks like we're out of time for today. Jonathan, is there anything else you would like to say before signing off?

Jonathan: The United States' Environmental Protection Agency has more information about water pollutants that you may find in your water. This can be found at www.epa.gov/ebtpages/waterepollutants.html.

Yash: I would also recommend visiting the various bookmarked pages Jonathan has outlined in Delicious. Articles that are related to this podcast can be found at

www.delicious.com/jhart07. These articles are bookmarked with the topic “waterissue.” Information for this podcast was also gathered from Maggie Black and Jannet King’s Atlas of Water. That is all the time we have for today, thank you all for listening.

REFERENCES

- Black, M. & King, J. (2009). The atlas of water: Mapping the world’s most critical resource. (pp. 75-79) Berkeley: University of California Press.
- Dell’Amore, C. (2011, April 1). Radiation in Japan Seas: Risk of Animal Death, Mutation? National Geographic news. Retrieved from:
<http://news.nationalgeographic.com/news/2011/03/110331-japan-radiation-health-mutations-nuclear-animals-ocean-science-world/>
- Handwerk, B. (2010, December 21). Predicting the World’s Next Water Pollution Disaster. National Geographic news. Retrieved from:
<http://news.nationalgeographic.com/news/2010/12/101221-next-water-pollution-disasters-/>