United States Environmental Protection Agency

The Facts about Nutrient Pollution

Nutrient pollution is one of America's most widespread, costly and challenging environmental problems. It is caused by too much nitrogen and phosphorus in the air and water. Nutrients are chemical elements that all living organisms—plants and animals—need to grow. When too much nitrogen and phosphorus enter the environment—usually from a wide range of human activities—the air and water can become polluted.

Sources of Nutrient Pollution

The primary sources of nutrient pollution are runoff of fertilizers, animal manure, sewage treatment plant discharges, stormwater runoff, car and power plant emissions, and failing septic tanks. In the Mississippi River Basin, which spans 31 states and ultimately drains into the Gulf of Mexico, nutrients from row crops and concentrated animal feeding operations contribute the most nutrient pollution.

Effects of Nutrient Pollution

Excessive nitrogen and phosphorus in water and the air can cause health problems, damage our land and water, and take a heavy toll on the economy.

Human Health

Nutrients can lead to a massive overgrowth of algae, known as an algae bloom. Certain types of algae emit toxins. Coming into contact with these toxins can cause stomach aches, rashes and more serious problems for humans. Excess nitrogen is a common drinking water contaminant in agricultural areas and can pose particular risk to infants younger than six months old. Chemicals used to treat nutrient-polluted drinking water pose additional risks to human health. These chemicals, including chlorine, can react with the algae in the water to form disinfection by-products that have been associated with reproductive and developmental health problems. Nitrogen pollutants in the air from burning fossil fuels contribute to a variety of respiratory problems for children, the elderly and those with lung ailments.

The Environment

Nutrient pollution damages the environment and harms water quality. Algal blooms consume large amounts of oxygen that fish, shellfish and other aquatic organisms need to survive. They make water cloudy, reduce the ability of aquatic life to find food, and clog fish gills. Toxins in some algal blooms can sicken or kill pets, marine mammals, fish and shellfish.

The impacts of nutrient pollution are found in all types of water bodies. Pollutants often enter upstream waters like creeks and streams, and

Photo: Russ Gibson, Ohio Environmental Protection Agency

Avoid direct contact with water having visible surface scum and keep pets out of the water.

Nutrient Pollution by the Numbers

- EPA's 2010 National Lakes Assessment found that almost 20 percent of the nation's lakes have high levels of nitrogen and phosphorus pollution. The report also showed that poor lake conditions related to nitrogen or phosphorus pollution doubled the likelihood of poor ecosystem health.*
- According to EPA's 2006 Wadeable Stream Assessment, 30 percent of streams across the country have high levels of nitrogen or phosphorus.*
- States have identified about 15,000 water bodies in the United States as having one or more nutrient-related impairments and there are likely many more since not all waters have been monitored.
- Reported drinking water violations for nitrates have doubled in the last eight years. **

*National Aquatic Resource Surveys (*www.epa.gov/aquaticsurveys*)

***An Urgent Call to Action: Report of the State-EPA Nutrient Innovations Task Group*, Aug. 2009

then flow into larger water bodies like lakes, rivers and bays. Excess nitrogen and phosphorus can also travel thousands of miles to coastal areas where the effects of the pollution are felt in the form of massive dead zones, such as those in the Gulf of Mexico and Chesapeake Bay.

Airborne nitrogen also poses environmental risks. Nitrogen compounds released into the air by burning fossil fuels causes *acid rain*, which damages streams, estuaries, forests and grasslands.

The Economy

Nutrient pollution has diverse and far-reaching effects on the U.S. economy, impacting many sectors that depend on clean water. The U.S. tourism industry loses close to $1 billion each year, mostly from losses in fishing and recreational activities because of nutrient-polluted water bodies. In Mississippi alone, tourism in the three counties that border the Gulf Coast accounts for about $1.6 billion in visitor expenditures, 32 percent of state travel and tourism tax revenues, and 24,000 direct jobs.

Nutrient pollution causes annual losses to the commercial fishing and shellfish industry in the tens of millions of dollars. When oxygen levels are low, fishery yields are reduced. During harmful algal blooms, consumers become wary that seafood could be tainted by toxins. Algal blooms can also negatively impact waterfront property values. Algal blooms in drinking water sources can drastically increase treatment costs and subsequently increase consumer utility bills. Costs to clean up polluted water bodies, such as the Chesapeake Bay, can cost billions of dollars. Airborne nutrient pollution can also affect visibility at outdoor tourist destinations, such as national parks and even damage structures, especially ones made of marble and limestone.

Photo: Bill Yates, St. John's River, Florida

Nutrient pollution causes green slime that affects drinking water, recreation, businesses and property values.

How Are We Addressing Nutrient Pollution?

EPA is working with its many partners to address nutrient pollution across the country. EPA

- Awards grants to states, watershed groups, and wastewater facilities to address nutrient-driven water quality problems
- Works with state and federal partners on the Mississippi River/Gulf of Mexico Watershed Nutrient Taskforce to reduce the "dead zone" in the Gulf
- Works to support states in their development of state nitrogen and phosphorus pollution reduction strategies (see Nutrients Framework Document and Memorandum, March 2011, at *www.epa.gov/nutrientpollution*)
- Works to support states in their identification of waters that are impaired by nutrients and to develop nutrient budgets for those waters.
- Provides technical guidance and resources to help states develop water quality criteria for nutrients
- Oversees permits that restrict nutrient discharges from industries
- Conducts research

State environmental agencies are working to develop water quality criteria for nutrients. Some states have already developed statewide nutrient criteria for certain types of water bodies. Other states have developed site-specific nutrient criteria. Still others are just beginning to develop criteria and have identified important milestones toward proposing and approving nutrient criteria.

What Can You Do?

We can all take action to reduce nutrient pollution through the choices we make on our farms, around our homes, with our pets, in lawn care and in transportation. Find out more about the health of your local waterway and to learn how to join community efforts to restore and protect it for the benefit of people and wildlife. Visit: ***www.epa.gov/nutrientpollution***.

For More Information, Visit:

EPA Nutrient Pollution website:
www.epa.gov/nutrientpollution

Natural Resources Conservation Service website:
www.nrcs.usda.gov/wps/portal/nrcs/main/national/water

U.S. Geological Survey website:
http://water.usgs.gov/nawqa/nutrients/

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