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Where Does Wastewater Go?



By [Gemma Alexander](#)

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Other materials may cost more money than clean water, but no resource is more precious than the fresh water that we literally flush down the drain. Most Americans can turn on the tap and expect clean, drinkable water to come out. Our dirty water disappears down the drain and we don't really think about where it goes. But we should understand wastewater treatment systems, because our lives literally depend on clean water.

Earth is the "blue planet" because 70% of its surface area is covered in water. But most of that is salty ocean. Only [3% of global water](#) is freshwater, and only 1% is easily accessible. Around the world, about [80% of the water](#) we use flows back into the environment untreated. Despite that, Americans tend to take fresh, clean

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water for granted, even using it to fill our [toilets](#) while more than a half billion people around the planet go without any sanitary facilities. Worldwide, almost [1.6 million people](#) died from waterborne diarrheal diseases in 2017.

Even with extensive wastewater treatment systems, American sewage treatment plants release [3-10 billion gallons](#) of untreated waste annually. Industrial facilities often release wastewater directly into waterways. Nutrients in untreated water contribute to eutrophication. Sewage pollution also [contributes](#) to desalination, sedimentation, and shading in marine ecosystems. Even treated water introduces an “[alphabet soup](#)” of medications and chemicals from personal care products into waterways.

Most Americans are connected to a municipal [sewer system](#). In a sanitary sewer system, wastewater pipes convey wastewater from homes and businesses to a wastewater treatment facility. Combined sewers are designed to collect both sewage and stormwater runoff in a single-pipe system. When wastewater reaches the [treatment plant](#), solids (what you flushed away) are separated from liquids. The solids are physically and chemically treated to produce a semisolid, nutrient-rich product known as [biosolids](#). Biosolids may be used as fertilizer or disposed as garbage.

In secondary treatment of the liquids, the wastewater treatment plant uses bacteria break down remaining organic material and other contaminants in the water as it is filtered and aerated. These facilities often include circulating pools and fountain-like features to expose the water to the air. Then the water is allowed to settle in a sedimentation tank and disinfected with chlorine to kill remaining pathogens. Newer, modern systems may also use special treatment technologies to remove additional contaminants like nitrogen and phosphorus, which accumulate from fertilizers used on lawns and gardens.

Wastewater Treatment Can Fail

Unfortunately, wastewater treatment systems do not always live up to the ideal. Wet weather can overwhelm sewer systems, forcing untreated water into the environment. Sewer overflows are surprisingly common. Each year, New York Harbor alone receives more than 27 billion gallons of raw sewage and polluted stormwater due to [460 combined sewer overflows](#). EPA estimates there are [23,000 – 75,000 sanitary sewer overflows](#) in the U.S. every year.

The American Society of Civil Engineers gave the U.S.’ wastewater infrastructure a “[D+” grade](#). (Find [your state’s score](#) here.) ASCE reports that the nation’s treatment plants are, on average, operating at 81% of capacity, which leaves them with little ability to handle increased flows during wet weather. For example, during Hurricane Harvey in 2017, 18 of Houston’s 39 wastewater treatment facilities were submerged in floodwater and 30% of the city’s sewage collection system was under water for a week.

Some 15% of treatment plants are at or have exceeded capacity. Many of these are also approaching the end of their designed lifespan; not only are these older systems subject to more frequent pipeline and equipment failures, but they also lack the advanced treatment technologies that remove any but the most basic contaminants.

Septic Systems

Nearly [a quarter](#) of Americans rely on a [septic system](#) to handle their wastewater. These systems usually combine a septic tank that holds the water and a drain field. Wastewater collects in the tank, where solids settle to the



bottom. [This sludge](#) must eventually be pumped out and may be applied to land as a fertilizer, delivered to a wastewater treatment plant, or buried in a landfill. After the sludge settles, the remaining water and waste, known as [effluent](#), passes into the drain field where it percolates through the soil to reach groundwater.

Despite distributing dirty water into the ground, septic systems can be as effective as wastewater treatment plants. But when groundwater rises due to climate change, a system is overloaded due to heavy use or extreme wet weather, or a system is improperly maintained or worn out, septic systems can back up. The results can [contaminate groundwater](#) and contribute to other [environmental problems](#).

Better Water

You can do your part to protect freshwater from contamination by wastewater by conserving water and sending less unnecessary waste down the drain. Upgrade your [toilet](#), and don't use it as a garbage can. Even "flushable" items like [wet wipes](#) and [contact lenses](#) challenge treatment plants because they don't break down in water.

Save water by using efficient, aerating faucets and [showerheads](#), and by turning off the tap instead of letting water run while you wash [dishes](#) or brush your teeth.

In the kitchen, choose an efficient [dishwasher](#), and fill it up before you use the eco-cycle. Scrape plates for composting instead of using the [garbage disposal](#), which wastes up to five gallons per use. Keep grease out of your pipes to prevent [fatbergs](#).

In the laundry room, choose an efficient [washing machine](#) and run full loads on a standard or eco-cycle. Go [easy on the laundry detergent](#). If your machine doesn't have one, buy a [microfiber filter](#).

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By [Gemma Alexander](#)

Gemma Alexander has an M.S. in urban horticulture and a backyard filled with native plants. After working in a genetics laboratory and at a landfill, she now writes about the environment, the arts and family. See more of her writing [here](#).