

America's Water and River Basins: The Most Incredible Images of US Waterways

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New technology has allowed geographers to create [stunning maps of U.S. river basins](#). There are 18 major river basins in the continental U.S., with the largest belonging to rivers that feed the Mississippi River.

[The color-coded maps](#) make it easy to visualize the magnitude of the basins, which is otherwise rather abstract.



Seeing the vast expanse of river basins that cover the U.S., and the interconnectedness among them, it's also clear that rivers make up the fabric of America, each with its own story to tell.



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In the short film, “Flint,” for instance, you can hear stories of three people and their connection to Georgia’s Flint River.

There’s Robin McInvale and her story of finding love on the river, Paul DeLoach, a cave diver and co-founder of conservationist group Flint Riverkeeper and Jimmy Miller, who’s been fishing in the Flint since he was a boy.

The personal connections to the river are immense and not unique to the Flint. Similar stories can be found nationwide, and the connections aren’t only sentimental in nature.

The Flint river, for instance, provides water to more than 1 million people but is at risk from pollution, including runoff from agriculture and industry — another common thread among U.S. rivers.

What Is Upstream Will Travel Downstream

While it’s easy to understand the massive effect a large river like the Mississippi has on waters downstream, small streams and wetlands also play an important role in larger downstream waterways. This even includes small streams that only flow after heavy rainfall.

This revelation came from a U.S. Environmental Protection Agency (EPA) report, which reviewed more than 1,200 peer-reviewed scientific studies.¹

The study “unequivocally demonstrates that streams, regardless of their size or frequency of flow, are connected to downstream waters and strongly influence their function.”

In addition, wetlands, floodplains and open waters in transitional areas located between land and water ecosystems (known as riparian areas) act as buffers in helping protect downstream waters from pollution.

Wetlands and floodplains not in riparian areas were also found to affect the integrity of downstream waters, even when they lacked surface water connections. “Some potential

benefits of these wetlands are due to their isolation rather than their connectivity,” the report noted.

The study was particularly important because it helped to define the definition of “waters of the United States” under the Clean Water Act.

Establishing these waters as crucial to protecting waters downstream was then used to establish the Clean Water Rule, which more clearly defines waters protected under the Clean Water Act.

Currently, about 1 in 3 Americans, or 117 million people, get drinking water from streams that are protected under the Clean Water Rule.²

Who Should Pay for Water Pollution in Iowa?

When nitrates from fertilizer runoff pollute waterways, who should pay for cleanup? That is the question facing areas of Iowa, an agricultural mecca.

The U.S. Department of Agriculture (USDA) estimates that removing nitrate from U.S. drinking water costs nearly \$5 billion a year,³ which the industrial agriculture industry has been largely shielded from.

The water utility in Des Moines, Iowa — Des Moines Water Works — sued three counties, alleging they polluted the river with nitrates from agricultural runoff. The water utility has already spent \$1.5 million to remove nitrates from drinking water and wants fertilizer runoff to be regulated as pollution under the Clean Water Act.

If the lawsuit succeeds, the agriculture industry will have to make changes to limit runoff.⁴ But, shouldn't they also be responsible for cleanup? As noted by PBS News in reference to Storm Lake, Iowa, an area with rich farmland:⁵

“Corn is king here, grown mostly for animal feed and ethanol. Corn doesn't like to have its feet wet, and to keep the fields dry, pipes have been installed to drain water off the fields. And with that water goes the fertilizer, fertilizer laden with nitrate.”

Bill Stowe, chief executive officer of Des Moines Water Works, told NPR:⁶

“The big challenge cleaning up the water in the Raccoon and Des Moines Rivers, the rivers that we take from, they're surface waters going through 10,000 square miles of industrial agriculture upstream, is the effects of that industrial agriculture on water quality.

We're seeing water that's so dirty, that we have to build facilities like this, which arguably is the world's largest nitrate-removal facility, to be able to clean up the water to deliver it safely to our customers here in Central Iowa.”

Voluntary Steps to Control Fertilizer Run-Off: Are They Enough?

Iowa has a voluntary program in place — the Iowa Nutrient Reduction Strategy — to help control fertilizer runoff, but it's still in its beginning stages even though it started four years

ago. Many have questioned whether voluntary programs go far enough. Stowe told PBS:7

“It’s the ag folks that really are driving this problem. And, in this state, we regulate, and some would argue over-regulate, cities and towns. But we leave unregulated industrial agriculture.

And, of course, agriculture is the king of the block. Therefore, leave it alone, and hopefully a voluntary system will bring in conservation practices that will improve water quality. We say, no pun intended, hogwash to that, hasn’t worked, won’t work.”

Iowa has long faced problems with elevated levels of nitrates in drinking water and has been identified as a top contributor to pollution (nitrates and phosphorus) causing the [dead zone in the Gulf of Mexico](#). Fertilizer runoff has also been blamed for [toxic algae](#) taking over Florida coastlines.

A report released by the Iowa Environmental Council (IEC) has attempted to summarize the related health risks of such nitrates in drinking water.⁸

Researchers reviewed over 100 studies on the health effects of nitrates in drinking water and found multiple studies linked them to birth defects, bladder cancer and [thyroid cancer](#).

While many of the health problems were found with nitrate levels higher than the drinking water standard of 10 mg/L, some studies suggested nitrate levels lower than the drinking water standard may still pose health risks. About 15 percent of private wells in Iowa may have nitrate levels that exceed federal standards.⁹

Minnesota Rivers Also Threatened From Industrial Agriculture

The Mississippi River was named the second-most polluted waterway in the U.S. in 2012,¹⁰ but it still maintained swatches that were considered to be relatively pristine, particularly in the Upper Mississippi in Minnesota.

However, hundreds of miles of forest, marshes and grasslands in the area have been lost to agriculture (mostly corn, soy and potato fields) and urban development in recent years. As a result, the natural areas that played a part in keeping the Upper Mississippi pristine are being quickly lost.

Remember, what is upstream will travel downstream, so pollution in this area — the headwaters of the Mighty Mississippi — will quickly become pollution throughout much of the U.S. Among the environmental assaults already being seen include increased nitrate contamination in drinking water, which is the result of fertilizer pollution. Park Rapids, Minnesota spent \$3 million to dig deeper wells due to nitrate contamination.

It’s estimated that 10 percent of private drinking wells in the area may have nitrate levels that pose dangers to pregnant women and infants.¹¹

Purifying Your Water Is Crucial

It’s going to take change on a global scale — to industry, agriculture and public policy — to stop the water pollution that’s already taking a health and environmental toll, but you can

also act on an individual level to help the problem and protect yourself. For starters, choose [organically grown foods](#), which are grown without the synthetic fertilizers that are now devastating so many waterways.

In addition, it's best to assume yours is less than pure and take steps to remedy it, such as using a high-quality water filtration system (unless you can verify the purity of your water). If you have well water, it would be prudent to have your water tested for nitrates and other contaminants. If you have public water, you can get local drinking water quality reports from the EPA.

To be certain you're getting the purest water you can, filter the water both at the point of entry and at the point of use. This means filtering all the water that comes into the house, and then filtering again at the kitchen sink and shower.

Unfiltered water can also expose you to dangerous chlorine vapors and chloroform gas. The U.S. Food and Drug Administration (FDA) and other U.S. government agencies report that most homes in the U.S. have measurable levels of chloroform gas, courtesy of chlorinated tap water.

Unless you have a [whole house water filter](#), chlorine will vaporize from every toilet bowl in your home and every time you wash your clothes, dishes or take a shower or bath. Chloroform gas, chlorine vapors and the associated DBPs may increase your risk of asthma, airway inflammation and respiratory allergies. Chloroform gas alone can cause dizziness, nausea and general fatigue.

If you get your water from a municipal water supply and don't have a whole house filter, it really is important to open up windows on opposing sides of your home so you get cross ventilation. Keep the windows open for five to 10 minutes a day to remove these gases. Ideally, use a whole house filtration system.

One of the best I've found so far is the Pure & Clear Whole House Water Filtration System, which uses a three-stage filtration process — a micron sediment pre-filter, a KDF water filter and a high-grade carbon water filter — to filter out chlorine, disinfection byproducts (DBPs) and other contaminants. You can find more information about water filters in my video below.

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