



# The EPA Blog

Posted on [February 7, 2013](#)

## Good Beer? It's in the Water

By *Christina Catanese*

If you're a beer drinker, when you crack open a cold bottle or sip a freshly poured draft beer, the first thing you think about probably isn't the quality of the water that was used to create your brew. You probably notice the color, the aroma, the head, the flavor, the hops, the malt...but what of the water?

When I was in grad school, I worked at a microbrewery for some extra cash, and it changed what I thought I knew about beer. I became familiar with the process of making beer: from malting, to mashing, to lautering, to boiling, to fermenting, to conditioning, and to filtering. At each point in the process, water plays a key role, and it can make up over 95% of the finished product poured into your pint.

I had a lot of discussions with our brewer about how much the [source water quality affects the brewing process and product](#). There's the obvious impact of the flavor of the water used in the brewing process, but the chemistry of the water can alter the process itself.

He described how yeast convert sugars into alcohol to ferment the beer, and how changes in water chemistry impact the activity of the yeast. The chlorine that is added to most municipal drinking water to eliminate harmful bacteria can impact the flavor and aroma of beer, but the presence of bacteria can spoil a batch of beer.

I learned that the pH of the water also affects the sugar composition, which in turn affects how strong the beer will be. Like hoppy beers? Harder water brings out the hops' flavor. Softer water can result in milder flavored beers, so some brewers add water hardeners during the brewing process to amp up the hops and flavor.

Something as simple as a change in the treatment process at the local drinking water plant can have an impact. So, too, can a new upstream pollution source or change in the health of the source water body.

You might wonder why breweries don't just purify their water to start with some H<sub>2</sub>O that is as neutral as possible to start with. But the thing is, what's in the water is what makes the process work, and what makes gives each beer a unique regional character. Overly purifying water through filtering or other methods takes everything out of the water, even the things a brewer wants to be there.

The brewery I worked at also strived to be a sustainable operation – the spent grains from the brewing process were picked up by a farmer to be used for livestock feed. A few times, our brewer even asked me if he could borrow my hydrology and soils text books so he could have a better knowledge of how the health of the environment would affect the beer he made.

Throughout the history of beer making, brewers have been careful to site their breweries in the places with the highest quality water, and the health of a brewery's home watershed is of prime importance to their brewers.



— Photo Courtesy of the CDC



To recognize the connection of good beer with good water, the [Schuylkill Action Network](#) has partnered with brewers in the watershed to develop a special brew that pays tribute to its source water.

Have you ever thought about how water quality affects your happy hour? What other unexpected ways does water impact our lives?

*About the Author: Christina Catanese has worked at EPA since 2010, in the Water Protection Division's Office of Program Support. Originally from Pittsburgh, Christina has lived in Philadelphia since attending the University of Pennsylvania, where she studied Environmental Studies, Political Science, and Hydrogeology. When not in the office, Christina enjoys performing, choreographing and teaching modern dance.*

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