

Beer, Tomatoes and Great Lakes Water, Part 2 (Virtual Water)

Hi. I'm Jesse Schomberg and you're listening to the Sea Grant Files.

In the last episode we introduced "virtual water" ...no, it's not a computer game, it's a term coined in 1993. It's been defined in a few different ways but for the purposes of today's episode of The Sea Grant Files, know that when I say "virtual water" I am referring to the flow of water that happens when food or other commodities are traded from one place to another, like when a Florida orange is eaten in Duluth.

Could you ever have imagined that it takes an estimated 36 gallons (140 liters) of water to make a cup of coffee? That's the amount of water used in growing, producing, packaging, and shipping the beans ... plus the one cup in your mug.

Tony Allan, a political geography professor of King's College in London, came up with the term 'virtual water', and went on to write a book about it; aptly titled *Virtual Water*. "The aim of the book is to get both food consumers and farmers to grasp their role in future global water scarcity," wrote Allan, going on to reference the Aral Sea, the Colorado River and the Yellow River in China as examples of major water systems that have been fundamentally altered.

As freshwater resources come under increased global demand, greater attention is being paid to how the flow of virtual water affects water resources worldwide. Like the regional ramifications of carbon emission predictions, our understanding of the flow of virtual water in the Great Lakes is rudimentary.

One of the few regional studies was conducted by Melissa Scanlan, Vermont Law School professor, and Jenny Kehl, associate professor at University of Wisconsin-Milwaukee. They relied on State Commodity Flow Surveys to examine food and its associated virtual water. Measurements for virtual water require an understanding of climate conditions, seasonal precipitation, evapotranspiration, social conditions, technology, efficiency, production methods and other variables of hydrology. Calculating virtual water flow is not an undertaking for a computer geek sitting in a solitary office.

Among other things, Scanlan and Kehl determined that it takes 119 gallons of water to produce one ear of corn and that legal mechanisms should be put in place to address the emerging understanding that if enough water leaves the basin in produce and product exports, humans could alter the hydrology of the Great Lakes in unfortunate ways.

Thankfully, the Governors and Premiers of states and provinces surrounding the Great Lakes signed the Great Lakes Compact of 2008, a protective agreement to treat groundwater, surface water and Great Lakes tributaries as a single ecosystem. Exports of water out of the Great Lakes are banned, with only some limited exceptions; and for the exceptions the water must ultimately be returned back to the Great Lakes. The loss of water from the Great Lakes by producing water-intensive products, such as paper, beer, and corn that are then exported is a whole different ball game.

The Compact allows individual states and provinces to determine at what level they will regulate these so-called “in basin” uses of water. This amount varies state by state but is generally between 100,000 and 500,000 gallons per day (up to almost 2 million liters) in a consecutive 30-90 day period before a permit is required. Most states involved in the Compact created regulations allowing unregulated water use for agriculture.

When the Compact was signed, the complexities of virtual water were little known. As the Great Lakes Region plays an increasing role as an exporter of commodities, it is clear that we need to understand more about the true water cost of producing things like corn, tomatoes and beer. How much water is being used to produce and ship these commodities; and how much is leaving the Basin in the process, and how much does it matter? With data from 2009-2012, Scanlan and Kehl calculated that a net 1.8 billion gallons of water per day leave the Great Lakes states in the form of virtual water in agricultural products, even after adding back the virtual water imports to these states, such as the Florida orange mentioned earlier.

While the Great Lakes are ... well, great ... they are finite. Less than 1% of Great Lakes water is renewed annually through rainfall and snowmelt.

Do the current policies of the Great Lakes Compact adequately address virtual water loss? Sea Grant is planning to review this question of binational importance this coming March at the Upper Great Lakes Law and Policy Symposium in Duluth.

Efforts to understand and manage Great Lakes water use and water levels are ongoing and involve the International Joint Commission, the Environmental Protection Agency, the U.S. Army Corps of Engineers, and the Great Lakes Commission, the National Oceanic and Atmospheric Administration (including Sea Grant) and others. The Great Lakes waters are a public trust held by two national governments. Corporations don't own them, cities don't own them, and you don't own them. The government is the trustee with a duty to carefully manage and preserve the water trust not only for today, but for future generations.

The next time you sit down for lunch with a friend, ask them if they've heard of "virtual water." Before they think it's just another computer game, share this: There are 634 gallons of virtual water in your burger and 2,900 gallons in your jeans. Now that should get the conversation started.

This episode of the Sea Grant Files was produced by Jennifer Gasperini, Sharon Moen, Mariah Schumacher and, me, Jesse Schomberg. For more information, or to listen to other episodes of the Sea Grant Files visit Minnesota Sea Grant at www.seagrants.umn.edu. You can also follow Minnesota Sea Grant on Facebook or Twitter. Thanks for listening!

