



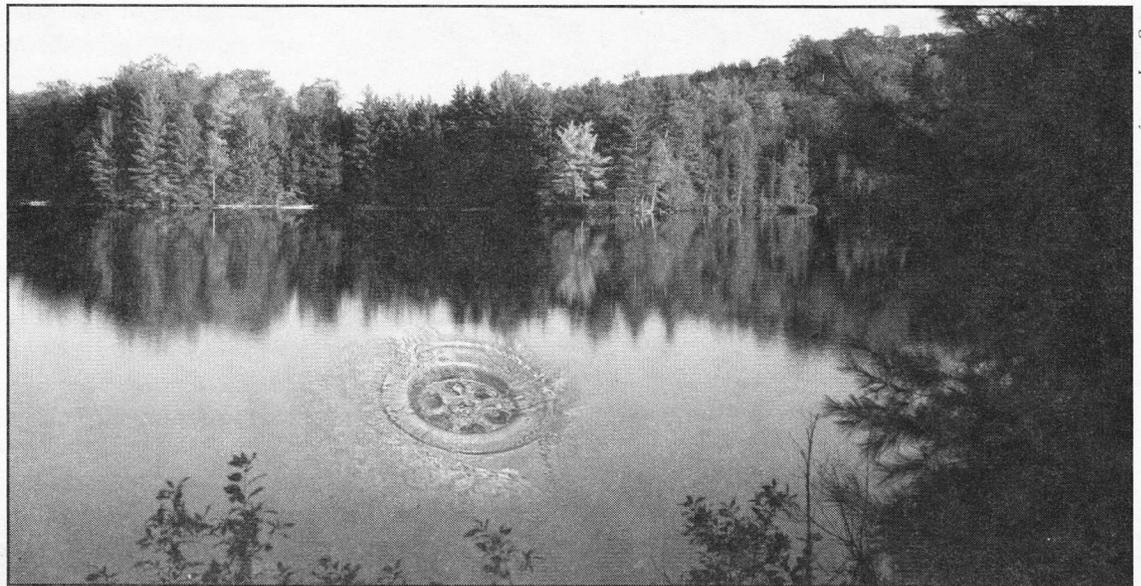
## Microbeads

### Down the drain and into our food web?

Research and analysis published over the past year has revealed a new threat to lake health coming from an unlikely source: face wash. The companies that make face wash have been increasingly using tiny plastic "microbeads" to improve the scrubbing capabilities of their products. The microbeads, often under one millimeter in diameter, slip through most municipal wastewater treatment systems. Their ability to stay suspended in liquids is both part of what makes plastic microbeads popular with manufacturers (prevents the exfoliant from settling to the bottom of a container) and part of what makes them so problematic (once floating in open water, they resemble insect eggs and other food sources to fish). The accumulation of microbeads in lakes and rivers is beginning to alarm scientists who are just starting to understand the ecological implications.

**F**or many years, ocean researchers have pointed to the ocean gyres - the most famous being the "great Pacific garbage patch" - as evidence that human waste products are wreaking havoc on a global scale. The currents of the oceans have steadily steered floating debris into relatively small, concentrated areas. Floating on or just below the surface, plastic bags and all sorts of various flotsam gradually breaks down into smaller and smaller pieces. Fish and birds perceive the bits of floating plastic as food. The debris can quickly cause health problems, as is found too often on the remote Midway Islands where nesting albatrosses feed their young a diet of plastic garbage until their chicks die on the nest. A more complex problem arises from the toxins that tend to concentrate on the floating plastic: PCBs and other endocrine disruptors that then bioaccumulate in the food web and impact species that are not directly feeding on plastic debris.

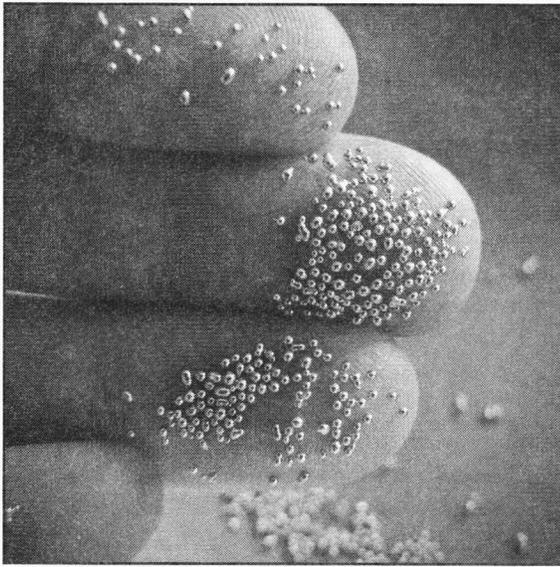
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Original photo by Robert Korth

(Microbeads, continued)

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Microbeads are often under one millimeter in diameter.

In the realm of inland lakes, we have taken a number of steps to minimize the amount of large floating plastic debris. Wastewater systems and stormwater sewers generally intercept a great deal of litter before it hits the water, and it is now socially unacceptable in

most places to simply throw garbage into a lake. The microbeads in our cleaning products threaten to introduce the bioaccumulation problem into more midwestern food webs, potentially even impacting people who catch and eat fish from lakes.

Superior. She began her research on pollutants associated with plastic debris found near Baja, California in the 1990s. In 2012, Lorena participated in a research project to see how common floating plastic debris was in the Great Lakes. While large plastic debris was uncommon, the research showed surprising amounts of microbeads. The concentration generally increased along a downstream gradient in the Great Lakes system, with the highest amounts - over half a million pieces per square kilometer - found in Lake Erie. Another plastic pollution survey conducted by Dr. Sherri Mason and her team during the summers of 2012 and 2013, revealed over twice that amount in Lake Ontario (1.1 million per square kilometer). Mason, a chemistry professor at the State University of New York, Fredonia, found that approximately 70% of the plastic they skimmed off the top of the Great Lakes was between one-third and one millimeter in diameter!

*This past September findings indicate that plastic concentrations in sediment of the St. Lawrence River are similar to the most contaminated ocean sediment samples.*

*~ Canadian Journal of Fisheries and Aquatic Sciences*

Lorena Rios-Mendoza is an assistant professor of chemistry at the University of Wisconsin -

More recently, scientists from McGill University in Canada reported measurable

## What you can do:

### Individuals

#### **“There’s an app for that”**

Download the *Beat the Microbead* app to your smartphone. Simply scan a product’s bar code to learn if it contains microbeads! You can also tell by looking for the ingredients *polyethylene* or *polypropylene*, meaning the product contains plastic.

#### **“Shop smart!”**

Single-use shopping bags are another source of unintentional plastic pollution; reusable cloth bags are increasingly available at stores and often are compact enough to stow in a purse or pocket.

#### **“Learn more!”**

Learn more about plastic waste and efforts to control it from the *5 Gyres Institute*, a global non-profit whose mission is to conduct research and communicate about the global

impact of plastic pollution in the world’s oceans and employ strategies to eliminate the accumulation of plastic pollution in the five subtropical ocean gyres: [www.5gyres.org](http://www.5gyres.org)

### Groups

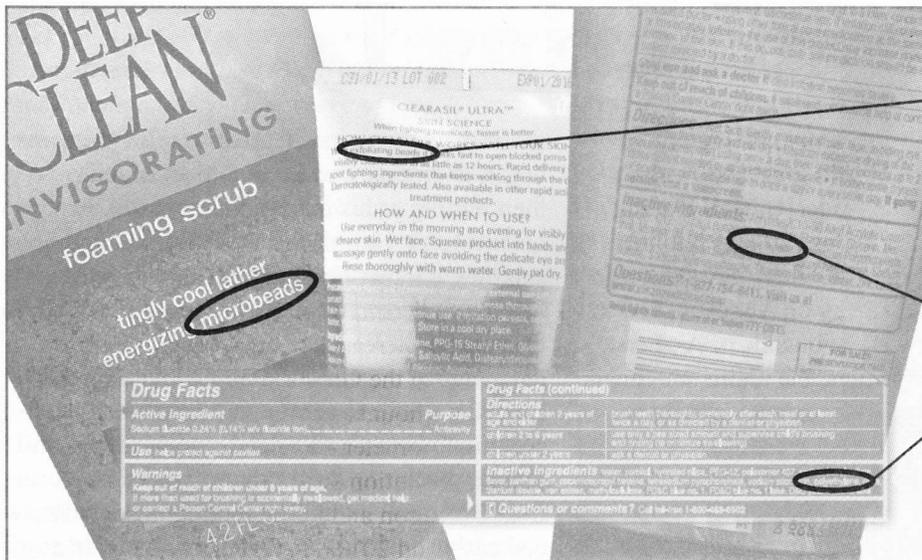
#### **“Clean it up!”**

Many lake groups organize clean up days. These are great opportunities to meet your neighbors and reduce the amount of plastic and other debris that could be entering your lake’s food web.

#### **“Encourage visitors to help!”**

Consider installing a fishing line recycling bin at nearby boat landings to encourage proper disposal of fishing line. You can find a video showing how to make an inexpensive bin and request informational decals from the Boat Owners Association of the United States webpage: [www.boatus.com/foundation/monofilament/](http://www.boatus.com/foundation/monofilament/)





**exfoliating beads**

Face and body scrubs, even toothpaste and makeup products, may contain these tiny plastic beads.

**Polyethylene**

concentrations of plastic microbeads in the river sediment of the St. Lawrence River. Their findings, published in the *Canadian Journal of Fisheries and Aquatic Sciences* this past September, indicate that plastic concentrations in river sediment are similar to the most contaminated ocean sediment samples.

Manufacturers are already responding, with industry giant Unilever pledging to eliminate microbeads in their products by 2015. In the meantime, millions of pounds of new microbeads will join the untold amounts already moving through our waterways.

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No research has been done yet to look at how microbeads are impacting smaller inland lakes and rivers. However, it is highly likely that microbeads are being carried along with treated wastewater from municipal systems that discharge into rivers or lakes. We also know very little about how microbeads move and affect private on-site wastewater systems (septics). Since some septic waste is pumped and then treated at municipal plants, they too could be delivering plastic debris to the environment.

While the growing amount of microscopic plastic debris is troubling, society is already figuring out ways to turn off this pollution spigot. The most simple remedy is to stop buying and using products that contain microbeads. This includes not only soaps and toothpaste, but certain makeup products as well. This past summer, the State of Illinois passed a law that gradually bans the sale of products with microbeads, eliminating them from store shelves by 2019. According to a recent news article in Racine's *Journal Times*, State Senator Bob Wirth and State Representative Tod Ohnstad are planning to introduce a bill in the next legislative session to create a similar ban in Wisconsin.

## Water Megatrends

The Center for Land Use Education (CLUE) recently released the latest publication in the Wisconsin Land Use Megatrends series, Water Megatrends. CLUE worked with staff from UW-Extension Lakes, the Center for Community Economic Development, the Center for Watershed Science and Education, the Wisconsin Wetlands Association, and Water Action Volunteers to complete the publication. Water Megatrends is 16 pages with lots of maps, figures, and charts. Topics include the water cycle, Wisconsin's water resources, water use, health, economics, recreation, and water policies. Water Megatrends is available on the CLUE website at the following link: <http://www.uwsp.edu/cnr-ap/clue/Pages/publications-resources/LandUseMegatrends.aspx>

