**AYC Ecology North**

**July 2013**

**Can we create biofuels, fertilizer from Great Lakes algae?**

UB (University of Buffalo) studies the slimy organism's commercial potential and how capturing it can clean our rivers and lakes

By Cory Nelson, [www.buffalo.edu](http://www.buffalo.edu)

<http://www.buffalo.edu/news/releases/2013/07/027.html>

NOTE: See the link for video

David Blersch hates to vacuum.

Yet there he was on the edge of Lake Erie, about 35 miles upriver of Niagara Falls, cheerfully assembling an industrial vacuum on a recent July morning.

There is an explanation for this incongruity: It involves algae, the slimy organism blamed for fish kills, beach closures and other maladies that harm the Great Lakes and other waterways.

Funded by a $30,000 Rochester Institute of Technology grant, Blersch, an environmental engineer at the University at Buffalo, and his students built a system that pumps water ashore down two, 40-foot-long flumes.

The water is recycled into the lake but it leaves behind microscopic cells that form miniature algae blooms. Blersch vacuums the algae and bottles samples to study. He is creating a database that will help scientists, government, industry and others gauge the algae’s potential uses.

“One element of the project is pollution recovery. By using the algae beds to remove excess nutrients from the lake, we can improve water quality,” says Blersch, PhD, research assistant professor in UB’s School of Engineering and Applied Sciences. “The other aspect is studying its properties; is it viable to turn algae into biofuels, fertilizer or other commercial products?”

Of the many species of algae in the Great Lakes, most are not inherently harmful. Algae form the base of the food web and are part of the ecological community that all fish, at some part of their life cycle, depend on for nourishment or habitat.

But some algae, such as the blue-green variety called cyanobacteria that form large blooms in Lake Erie, release toxins and other noxious chemicals that can sicken people and kill pets and wildlife. Algae in excess also help form oxygen-starved zones in the lake’s center that can kill fish.

That’s why algae blooms are considered a serious threat to the Great Lakes and its tourism industry.

A problem in the Chesapeake Bay, the Everglades and other ecologically important bodies of water, algae blooms are the result of warm temperatures, lots of light and an abundance of such nutrients as nitrogen and phosphorus. The excess nutrients typically come from fertilizer, manure and sewage that rains wash into the watershed.

In addition to UB, other academic institutions and industry are addressing the matter. For example, Exxon Mobil Corp. reports investing $100 million since 2009 to develop algae biofuels. It recently announced more research is required to make the product commercially viable.

Turning Great Lakes algae into biofuels, fertilizer or other products may become a reality someday, but for now Blersch is concentrating on improving water quality in Buffalo and beyond.

A pilot project, Blersch’s research is based at SUNY Buffalo State’s Great Lakes Center, a research institute independent of UB.

“I usually hate to vacuum,” he said jokingly as he sucked algae from the flume into the vacuum. “Around the house, I normally do the dishes. It’s similar — dealing with slimy stuff.”

Noting that the system is made almost entirely of parts available at hardware stores, Blersch hopes to build other, perhaps larger, systems and deploy them elsewhere in Buffalo. Potential spots include Hoyt Lake in Delaware Park, the Buffalo River and other waterways with excessive algae and low amounts of oxygen.

Several UB students, including Peter Byrley who graduated in May with a bachelor’s degree in environmental engineering, are participating in the research. Byrley will manage the project when Blersch is away this summer.

“This research is really a unique opportunity to examine issues that delve into sustainable bioenergy and how we can use innovative technology to improve our waterways,” said Byrley, who this fall will attend the University of California, Riverside, on a full scholarship to pursue a doctoral degree in chemical and environmental engineering.

Recently, he and Blersch have been joined by Buffalo high school students working with Groundwork Buffalo, a nonprofit organization whose mission is to build sustainable urban environments.

The students will help the UB engineers gather algae this summer, said Andre McKnight, Groundwork’s executive director in Buffalo. McKnight earned a master’s degree of urban planning from UB in 2011.

Blersch is hopeful their participation will illustrate that citizens can play a role in helping to improve the environment.

“There is plenty of algae out there,” he said gesturing toward the Niagara River. “We just haven’t, up until now, been able to harvest it very easily.”