**Source:** Walter Dodds, 785-532-6998, wkdodds@k-state.edu
http://www.k-state.edu/media/mediaguide/bios/doddsbio.html
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**Findings Published in Nature:**
**K-STATE BIOLOGIST, RESEARCH TEAM FIND THAT MICROORGANISMS FILTER NITROGEN FROM SMALL STREAMS, KEEPING LARGER WATERWAYS CLEANER**

MANHATTAN — To understand how nitrogen accumulates in large rivers and oceans miles and miles away, scientists like Walter Dodds looked at small streams flowing closer to home.

Dodds, a professor of biology at Kansas State University, didn't have to look any farther than his own campus for a testing site. Campus Creek at K-State was one of nine small waterways in the Manhattan area that Dodds used to study how nitrogen is removed from streams. With a grant from the National Science Foundation, he and his 30 colleagues from across the United States and Puerto Rico studied nitrogen removal in streams in their own geographical areas. Their research appears in the March 13 issue of the journal Nature.

Nitrogen makes its way into streams from various sources, and Dodds said that agricultural runoff is only one of these sources. In urban settings, Dodds said that nitrogen runoff can be blamed on such sources as automobiles burning fossil fuels and golf courses and homeowners using fertilizers.

In previous studies, researchers looked mostly at pristine waterways, but Dodds said that this time researchers also wanted to evaluate urban and agricultural waterways where humans leave a mark.

"People tend to add a lot of fertilizer to their lawns," he said.

With 31 scientists examining 72 streams across the United States and Puerto Rico, Dodds said the study included data from waterways in environments ranging from tropical forests to deserts to prairies.

"The significant thing about this project is that we all did the same experiments everywhere," he said.

The researchers looked at dynamics of nitrogen in streams, using special nitrogen tracers analyzed by mass spectrometry to see how far nitrogen travels through waterways.

"When trying to account for nitrogen, we see that not all of it makes it down to the ocean," Dodds said. "We wanted to know how this is happening in streams."

What Dodds and the other scientists learned is that organisms like bacteria, algae and fungi are responsible for removing nitrogen from small streams. This reduces the amount that makes its way into larger rivers, lakes and in oceans, where nitrogen can trigger excessive growth of algae and aquatic plants. The researchers learned that the filtration process works best if small streams are allowed to do their job before merging with larger

waterways. But small streams can do a better job of filtering if less nitrogen gets into the streams in the first place.

"An important thing to take away from this research is to understand how we're saturating our streams with nitrogen," Dodds said. "As you increase nitrogen, small streams become overwhelmed and cannot do their job."

Knowing the role that microorganisms play in removing nitrogen from small streams presents opportunities for research that can make waterways cleaner.

"What we can ask is which microorganisms are removing nitrogen and what management approach is most likely to stimulate that occurring," Dodds said.

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