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U study: Emissions from fertilizing crops underestimated

Environment Elizabeth Dunbar · Jul 27, 2015

Fertilizing crops in the U.S. Corn Belt emits a potent greenhouse gas, and a new University of Minnesota study shows officials have been underestimating those emissions by as much as 40 percent.

The study, published Monday in the Proceedings of the National Academy of Sciences, looked at nitrous oxide, a greenhouse gas about 300 times more potent than carbon dioxide and 12 times more potent than methane.

Nitrous oxide gas is emitted from rivers and streams that receive agricultural runoff, and the U.S. Environmental Protection Agency estimates that 75 percent of the country's nitrous oxide emissions come from agricultural soil management.

Researchers compared measurements of nitrous oxide across Minnesota and found nitrous oxide emissions from rivers are nine times greater than estimates used by the Intergovernmental Panel on Climate Change, the United Nations organization that's been tackling the problem.

Peter Turner, a PhD candidate at the university and one of the study's authors, said the findings are "an important step forward for understanding the global nitrous oxide budget."

Previous estimates show nitrous oxide contributes to roughly 6 percent of global greenhouse gas emissions, he said.

The study's results will help inform strategies for reducing nitrous oxide emissions, he added. For example, researchers found that smaller streams and those closer to agricultural land were stronger emission sources.

"More work will need to be done to figure out what really drives the differences between all of these stream orders, so that's where we hope to go next," Turner said.

Researchers will also look at agricultural areas elsewhere in the world, such as China and India, which also use nitrogen fertilizers.