

Chesapeake Notebook

DONATI

Air emissions from farms a growing source of water pollution, study finds

Better controls on power plants have helped water quality, but ammonia from fertilizer and manure use largely unchecked

May 16, 2016

1



Air

Ammonia emissions from farms are producing a growing share of nitrogen deposition falling on land and in water, study finds. (Dave Harp)

pollution regulations on smokestacks and tailpipes have sharply reduced atmospheric deposition of nitrogen in the United States over the past two decades, but future improvements will likely hinge on the ability to control emissions from agriculture, a new paper suggests.

Over the past half century, atmospheric deposition has been a major source of the excess nitrogen that has acidified streams and soils, reduced species biodiversity and contributed to eutrophication of coastal waters, including the Chesapeake Bay.

In the early 1990s, the vast majority of that deposition stemmed from nitrogen oxide (NO_x) emissions – a byproduct of fossil fuel combustion. But the paper, published May 9 in the [Proceedings of the National Academy of Sciences](#), said that by 2010-12, ammonia was the primary source of nitrogen falling to the ground at 69 percent of monitoring sites nationwide.

“Future progress toward reducing US nitrogen deposition will be increasingly difficult without a reduction in ammonia emissions,” the researchers said in the paper.

That may be hard to accomplish, though. While NOx emissions from power plants, factories and vehicles have been heavily regulated over the past two decades – primarily to reduce smog and particulate pollution, which threatens human health – ammonia emissions have not. The vast majority of ammonia volatilizes into the air from chemical fertilizers and animal manures used in agriculture, which are largely unregulated.

While NOx emissions declined 41 percent from 1990 through 2010, the paper said emissions of ammonia increased by 11 percent during that same period. The greatest increase is in areas with intense agricultural activity, primarily the Midwest and parts of California.

“We’ve worked hard at decreasing nitrates by reducing emissions of nitrogen oxides from fossil fuel combustion, but if we want to continue to make progress on reducing nitrogen deposition, we need to think about ammonia as well,” said Jeffrey Collett, head of the Colorado State University Department of Atmospheric Science.

He led the study team that produced the paper, which also included scientists from the [Environmental Protection Agency](#), the [National Park Service](#) and the [National Atmospheric Deposition Program](#), a cooperative effort among public and private entities to monitor precipitation chemistry.

Past modeling has shown trends in the Bay region similar to those the paper reported nationally. NOx once accounted for 75 percent of all nitrogen deposition on the Bay and its 64,000-square-mile watershed and ammonia 25 percent.

But in recent years, the state-federal [Bay Program](#) estimates that both sources have contributed roughly the same amount of deposition, as those stemming from [NOx emissions have dropped sharply](#) while deposition from ammonia has remained about the same.

The models used in the new paper will be employed later this year to update air deposition estimates for the Bay Program, which is reexamining nutrient sources as part of its [midpoint assessment](#) of progress toward meeting the Chesapeake Bay [Total Maximum Daily Load](#).

Category: [Pollution](#)



About Karl Blankenship

Karl Blankenship is editor of the Bay Journal and executive director of Chesapeake Media Service. He has served as editor of the Bay Journal since its inception in 1991. [Send Karl an e-mail](#).

Read more articles by [Karl Blankenship](#)