Current laws focus on the management of nutrients or chemical integrity "but ignore the effects of biological integrity (the proliferation of antibiotic resistant bacteria and resistance genes) and the physical integrity (mechanisms by which rivers and streams are impacted by nutrients, bacteria entering via underdrains or tiles,)" they said in the paper.

He also states that no monitoring is being done, nor is any analysis of the antibiotic resistant bacteria being completed.

The Des Moines Register is following a story that's garnering national attention from a variety of groups, including those from agricultural communities and the environment.

In a story last month by Donnelle Eller at the Des Moines Register, the Des Moines Waterworks is suing drainage districts saying its nitrate levels in the Raccoon River, "were nearly four times the amount the federal government says is safe for drinking water."

Treatment cost the waterworks nearly \$1 million in 2013, she reported.

Nationwide, the cost is \$4.8 billion to remove nitrates from drinking water.

Iowa's environmental regulatory body is staying out of the fight, saying it supports voluntary nutrient reduction, Eller said.

And Iowa's agriculture leaders say any new regulations would be "impossible to enforce."

With 9 million acres in drainage districts, "Imagine trying to test every tile line out there and follow around every farmer," the state's ag secretary told Eller.

In Michigan, Borrello said he's not holding out hope that the DEQ will make significant changes and that's frustrating.

Study after study shows the same effects.

"There's no dissent, there's nothing even neutral," he said.

What he is striving for is simply what the Clean Water Act outlined in the beginning.

"...to restore and maintain the chemical, physical and biological integrity of the nation's waters."

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## Will the state pay attention to the problems of the Pine River?

By Linda Gittleman, The Morning Sun

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The Clean Water Act is old and outdated.

Michigan's Department of Environmental Quality has asked for comments as it looks to a possible revision for permits for concentrated animal feeding operations or CAFOS.

The issue centers on CAFOS' impacts on local rivers, streams and waterways.

Alma College Director of Environmental Science Murray Borrello and Associate Professor of Biology Tim Keeton have submitted a 10 page list of comments.

Because of studies they have done, along with a large number of other studies, Borrello and Keeton have concluded that the Pine River in Alma is being seriously polluted with manure, along with the accompanying E-coli and antibiotic resistant bacteria.

Alma gets about 25 percent of its drinking water from the river.

It's possible that smaller farm operations could contribute to the problem, but Borrello said they were able to trace the waste material to specific CAFOs in Gratiot.

"They have a geochemical signature and we can identify that," he said. "Large livestock farms are by far the main source."

But that doesn't mean he is blaming all CAFOS or even the specific large farming operations.

At recent municipal meetings, including the Gratiot County Commission meeting this week, CAFO owners have spoken of the huge number of rules and regulations they are required to follow and do indeed follow. Since they want to leave the farms to their children and grandchildren, they are determined to be "good stewards of the land."

Borrello said he can appreciate that.

"(The rules and regulations) are cumbersome," he said. "It's insane what they have to go through."

But the large number of rules is simply not working.

The quality of the Pine River and various other bodies of water in the mid Michigan area - and throughout the country- are getting worse and are infested with animal waste that can be seen and in fact, smelled. It has to be coming from somewhere.

The blame lies with the regulators and the current regulations, not the farmers, he said.

In his comments, Borrello and Keeton outlined some of the problems.