How Minnesota's little, polluted Crow River clouds the Mississippi

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Credit: Unsplash/CC0 Public Domain

Carrie Jennings flits around the South Fork Crow River like a water bug in the old one-seat canoe she bought years ago for $100, then pauses midstream to peer down at the brown water.

"This is crazy cloudy," she mutters.

She has come to check out this upper reach of the Crow River as it starts its journey through central Minnesota farm country to the Mississippi River—showing how one little river can cause so much damage.

The paddle comes as work gets underway on a major new multi-county water quality plan for the South Fork Crow watershed under the state's "One Watershed, One Plan" framework.

The stakes are high.

The state's cherished Mississippi River is clean as it emerges in northern Minnesota and heads south. Then it meets the Crow River, the first major agricultural river emptying into it, and its nutrient pollution doubles, state pollution officials say, adding phosphorous, nitrogen and sediment. You can see the water change at the intersection, some paddlers say.

The Minnesota Pollution Control Agency stuck a fat exclamation point on the spot, near Dayton north of the Twin Cities, on its map of the Upper Mississippi.

Jennings, research and policy director with the St. Paul nonprofit Freshwater Society, points with her paddle to some key reasons why.

Large black plastic pipes jut from the banks of the South Fork Crow River near Cosmos in Meeker County, pouring water into it at nearly every bend. It's tile drainage water, coming from under fields that are filled mostly with corn and soybeans here, about 80 miles west of where the Crow joins the Mississippi.

The nearly invisible network of pipes is like a vast underground highway system, draining away water to maximize crop yields. The tile line drainage carries farm chemicals—state pollution regulators say it's the

single biggest source of nitrate in the Mississippi, delivering 43% of it.

Along with the surface runoff, the tile drainage also increases the Crow's volume. High flows claw at its banks, a dynamic only worsened by climate change's heavier rains.

The scouring exposes the roots of mighty cottonwoods and other trees on the banks, many of which have toppled into the river. There should be a sandy, gravelly mix on the Crow's banks and riverbed, Jennings said. Instead there is a thick black mud, like a quicksand, that sucks off shoes.

Scoured river banks, as opposed to fields, have been a growing source of the sediment in the Mississippi River, she said. Top soil washed off fields is still significant, she said, "it's just that the huge increase has been from the non-field sources."

Jennings said she expects to see water that brown in the Minnesota River, the state's notoriously dirty agricultural river to the south, but not in the Crow. And this is just the Crow's start. It only picks up more as it rolls downstream through heavy ag country such as Renville County before joining the main Crow River at Rockford.

From there the Crow runs to the Mississippi, bringing its share of the pollution driving the large and growing oxygen-depleted "dead zone" in the Gulf of Mexico.

"If our system of agriculture does this to rivers this far up in the Mississippi River watershed, imagine the cumulative damage by the time you reach the Gulf," Jennings said. "This is not a mystery that needs to be solved. We know why these are rivers impaired and we know how to fix them."

Agriculture isn't the only source of the Crow's pollution, but it's a

significant one. Waste water treatment plants and city storm water runoff factor in. The bottom line is that the majority of the land in the Crow River's watersheds is in agriculture, as row cropping marches farther north in Minnesota.

At issue are problematic agricultural practices such as overapplying nitrogen fertilizer and manure, excess drain tiling with pipes that dump straight into ditches and streams, and over-tilling the soil. East of Cosmos, where Jennings paddled, the South Fork Crow meanders naturally; upstream it is an unnaturally straight farm drainage channel.

Since the Clean Water Act exempts ag drainage and runoff, environmental regulators rely on convincing farmers to voluntarily adopt best management practices: applying fertilizer more precisely, planting cover crops to capture more nitrogen in the soil and altering tile drain outlets. One fix is draining tile water into a wetland or basin first.

Such practices still aren't mainstream. Change has been slow. It could all take decades, said MPCA watershed project manager Scott Lucas: "So many different things have to change."

Large stretches of both of the Crow's main forks remain impaired for aquatic recreation or fish consumption, and for aquatic life such as insects. While there's been progress over the years cutting phosphorous in the Mississippi River, there's been almost none on cutting nitrate, pollution officials say.

Local farmers say they're aware of the problems and want to be good stewards of the land. But weighing conservation vs. production can be difficult when farm profit margins are thin. And changing entrenched farming practices is hard, said Joe Norman, district technician with the Meeker County Soil & Water Conservation District.

Yet, slowly, practices are evolving. For example, government programs have funded 81 wetland restorations in the South Fork Crow River Watershed since 2004, state data show. However, while they may benefit water quality, most aren't the type designed to collect and treat tile drainage runoff, said David Wall, environmental research scientist at the Minnesota Pollution Control Agency.

Doug Adams, who farms 1,500 acres with his family near Cosmos, including land on the South Fork Crow, said he switched to strip tilling, which disturbs the soil less and leaves plant debris on the surface for better soil cover. It cut his fertilizer use by 40%, he said. It also keeps his topsoil in place and reduces runoff into the river, with no change in his crop yield.

But cutting back on his tile drainage system? Not an option. This spring was wet and late, he said. Fields were waterlogged.

"I don't know when we would have been able to plant without the tile," Adams said.

Adams said he doesn't think his tile water is polluted, and that he wouldn't be afraid to drink it.

Cities, too, are making changes. Nearby, Hutchinson is embarking on a multi-million dollar project to address sediment and pollution the South Fork Crow carries into Otter and Campbell lakes, two shallow lakes in the city. That means working with local landowners, shoring up crumbling stream banks, restoring wetlands and adding native buffer plantings, among other things.

The Crow River's impact on the Mississippi River is well known in the watershed world, but it's difficult to make people care, said John Paulson, Hutchinson's project environmental regulatory manager.

Communities need to address the problem locally, where they can see it.

That's what Kandiyohi County did. It just finished a decadeslong project to restore a large drained prairie wetland in the headwaters area of the South Fork Crow near Willmar. More than a dozen families sold the state permanent conservation easements to rebuild Grass Lake. It now holds and filters farm drainage and storm water from Willmar, said Kandiyohi County drainage manager Loren Engelby. A large gate valve allows them to manage water levels.

Already, frogs and turtles and birds are returning, Engelby said. Grass Lake's water flows to Lake Wakanda and Little Kandiyohi Lake, impaired lakes that are the official headwaters of the South Fork Crow River.

But you could argue that the river's true source is the old Kandi Mall parking lot in Willmar, said DNR wildlife supervisor Cory Netland, who works in the area. The mall was built over a cow pasture made from a drained wetland, and the parking lot drains into a large ditch that runs to Grass Lake.

Engelby calls Grass Lake "a big kidney" that he expects will significantly reduce nitrate, phosphorous and sediment washing into the South Fork Crow.

"This is a big piece of the puzzle," he said, "but it's a very large puzzle."