Why effects can vary among waterways with the same amount

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When bacteria don’t have enough oxygen to survive, they start consuming sulfate. The end result is hydrogen sulfide, and that’s what damages wild rice.

“It’s not the presence of sulfate but the conversion (by bacteria) to hydrogen sulfide that causes the problem,” said Ed Swain, research scientist for the Minnesota Pollution Control Agency.

That means sulfate will affect wild rice differently in different kinds of waters. In fast-moving, well-oxygenated water, sulfate is not an issue, Swain noted.

“In (low-oxygen) waters, it’s a different story,” Swain said. “That’s where the conversion occurs.’’

John Pastor, a University of Minnesota Duluth scientist who has studied wild rice in recent years, said the conversion of sulfate in sediments can stunt wild rice roots, making it harder for the plant to find critical nutrients like phosphorous and nitrogen. The rice plant itself can be shorter, turn yellow and have fewer and smaller seeds. Eventually, the rice withers and dies and doesn’t come back.