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Urea nitrogen generation linked to wetland processes

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Sabrina Klick, first author of the article, taking water temperature, oxidation-reduction potential, pH, and dissolved oxygen metrics from water in an agricultural drainage ditch. Photo by Joseph Haymaker.

Algal blooms can become more toxic when urea is present in coastal waters, and urea is the most commonly used form of nitrogen fertilizer. But toxic algal blooms feeding on urea in late summer months occur long after the spring application of urea-containing fertilizers. Urea in soil is quickly converted to other nitrogen forms, so where is that urea coming from if not from fertilizers used in agriculture?

In a new *Journal of Environmental Quality* article, scientists from the University of Maryland Eastern Shore and USDA-ARS showed that natural microbial processes that decompose organic matter in wetlands, and wetland-like agricultural drainage ditch bottoms, generate urea, especially during the hot summer months. That urea can be flushed out to sea by a heavy summer rainfall event and contribute to the occurrence of a toxic algal bloom.

Producers can help stamp out toxic algae by not holding water back in the ditch in hopes of providing a little more water in the root zone. The authors recommend keeping ditch bottoms as dry as possible in the summer.

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Klick, S.A., Pitula, J.S., Bryant, R.B., Collick, A.S., Hashem, F.M., Allen, A.L., & May, E.B. (2020). Seasonal and temporal factors leading to urea N accumulation in surface

waters of agricultural drainage ditches. *Journal of Environmental Quality*.

<https://doi.org/10.1002/jeq2.20173> (in press).

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