

HARMFUL ALGAL BLOOMS: OHIO SENATE BILL 1 AND THE CHALLENGE OF AGRICULTURAL REGULATION

BRANDI L. STALEY*

I. INTRODUCTION

Summer plans were ruined for those who frequented Lake Erie in 2011.¹ Harmful algal blooms (HABs) spanned across the water and made it unsafe to swim.² And even though cancelled summer plans were extremely inconvenient, this was only the beginning of a growing problem for Ohioans.³

To make matters worse, in August 2014 a large algal bloom at the mouth of the Maumee River crippled Toledo's drinking water.⁴ Nearly 500,000 residents were forbidden to use water from their tap.⁵ A Toledo mother who was nursing her baby reported she was afraid to shower because she did not want to get a skin rash she could pass on to the newborn.⁶

These fears are rational because HABs are toxic to humans and animals.⁷ Lake Erie is sick, and a crisis like the one in Toledo was the

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* J.D., *magna cum laude*, 2017, Capital University Law School; B.S. Environmental and Natural Resources, 2014, Clemson University. I would like to thank the staff and board of Volume 45 of the Capital University Law Review, Professor Dennis Hirsch of Capital University Law School, and Martha Horvitz of the Ohio Environmental Protection Agency for their excellent guidance and tireless revisions of my work.

¹ Michael Wines, *Spring Rain, Then Foul Algae in Ailing Lake Erie*, N.Y. TIMES (Mar. 14, 2013), http://www.nytimes.com/2013/03/15/science/earth/algae-blooms-threaten-lake-erie.html?_r=0 [<http://perma.cc/UV5J-MY23>].

² *Id.* Lake Erie is a popular tourism destination, especially during the summer, and HABs harm the economic security of the region. *Resources Available to Communicate About Harmful Algal Blooms*, OHIO TRAVEL ASS'N (Aug. 27, 2015), http://www.ohiotravel.org/aws/OHTRV/pt/sd/news_article/110861/_PARENT/layout_details/false [<http://perma.cc/5TA2-YPUL>]. "In the eight Ohio Counties alone, [tourism] accounts for \$12.9 billion in annual visitor spending, supporting 119,591 jobs, and contributes \$1.7 billion in federal, state and local revenue." *Id.*

³ Laura Arenschield, *Toledo Bearing Full Brunt of Lake Erie Algae Bloom*, COLUMBUS DISPATCH (Aug. 4, 2014, 8:10 AM), <http://www.dispatch.com/content/stories/local/2014/08/04/this-bloom-is-in-bad-location.html> [<http://perma.cc/R2TH-B5LG>].

⁴ *Id.*

⁵ *Id.*

⁶ Maria Gallucci, *Lake Erie Algae Bloom Crisis Is Putting Pressure on Ohio, Farm States to Tackle Agricultural Pollution Problems*, INT'L BUS. TIMES (Aug. 16, 2014, 7:00 AM), <http://www.ibtimes.com/lake-erie-algae-bloom-crisis-putting-pressure-ohio-farm-states-tackle-agricultural-1660240> [<http://perma.cc/HL4C-8YD7>].

⁷ See *Cyanobacteria Blooms FAQs*, CENTERS FOR DISEASE CONTROL & PREVENTION, http://www.cdc.gov/nceh/hsb/hab/cyanobacteria_faq.pdf [<http://perma.cc/53AM-45FV>].

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push scientists and government agencies needed to take steps to solve this alarming and growing problem.⁸

HABs are a toxic form of algae that is found in both freshwater and saltwater ecosystems.⁹ They are formed by excess nutrients that flow into waterways, which feed the algae and allow it to grow.¹⁰ Nitrogen and phosphorus are the most common and problematic naturally occurring nutrients for Lake Erie.¹¹ For example, nitrogen and phosphorus originate from sources like fertilizer and manure, which flows into water sources such as lakes and rivers in the form of runoff.¹² Therefore, agriculture plays an important role in the production of HABs and should be a key industry to regulate.

This is an issue that has economic, health, and environmental concerns, and these impacts span across more than just Northwestern Ohio.¹³ HABs

Cyanobacteria—also known as HABs—release toxins called cyanotoxins, which are “among the most powerful natural poisons known. They can make people, their pets, and other animals sick.” *Id.*

⁸ See Michael Wines, *Behind Toledo’s Water Crisis, a Long-Troubled Lake Erie*, N.Y. TIMES (Aug. 4, 2014), <http://www.nytimes.com/2014/08/05/us/lifting-ban-toledo-says-its-water-is-safe-to-drink-again.html> [<http://perma.cc/2W46-RTUM>].

⁹ See Lorraine C. Backer & Dennis J. McGillicuddy, Jr., *Harmful Algal Blooms: At the Interface Between Coastal Oceanography and Human Health*, 19 OCEANOGRAPHY, June 2006, at 94, 94, https://tos.org/oceanography/assets/docs/19-2_backer.pdf [<https://perma.cc/7K8A-G9K9>]; CARY B. LOPEZ ET AL., INTERAGENCY WORKING GRP. ON HARMFUL ALGAL BLOOMS, HYPOXIA, & HUMAN HEALTH, SCIENTIFIC ASSESSMENT OF FRESHWATER HARMFUL ALGAL BLOOMS 1 (2008), <https://www.who.edu/files/41023&pt=10&p=19132> [<https://perma.cc/2Q4J-KSYH>].

¹⁰ See *Causes and Prevention*, U.S. ENVTL. PROTECTION AGENCY, <https://www.epa.gov/nutrient-policy-data/causes-and-prevention#what1> [<https://perma.cc/W6LG-933W>].

¹¹ *Id.*

¹² *Nitrogen & Phosphorus*, CHESAPEAKE BAY FOUND., <http://www.cbf.org/about-the-bay/issues/dead-zones/nitrogen-phosphorus> [<http://perma.cc/U9N8-UHAC>]. See also Timothy D. Searchinger, *Cleaning Up the Chesapeake Bay: How to Make an Incentive Approach Work for Agriculture*, 16 SE. ENVTL. L.J. 171, 185 (2007). The Chesapeake Bay in Maryland has also had serious problems with HABs. Many efforts have been undertaken to curb agricultural pollution in this area in order to preserve the bay. *Id.* at 174–75. See also Jack Tuholske & Kenneth Kilbert, *Moving Forward: Legal Solutions to Lake Erie’s Harmful Algal Blooms*, LUCAS COUNTY, OHIO BOARD COUNTY COMMISSIONERS 15 (Apr. 15, 2015), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2667107 [<http://perma.cc/V7PJ-4F5Y>] (phosphorus and nitrogen loading from agricultural sources stimulate growth of certain bacteria that contribute to the creation of hypoxia. Hypoxia occurs when there is an oxygen deficit that prevents proper photosynthesis and plant growth beneath the water.).

¹³ See Colin Miner, *Assessing Algal Blooms’ Economic Impact*, N.Y. TIMES (Nov. 27, 2009, 8:36 AM), http://green.blogs.nytimes.com/2009/11/27/assessing-algal-blooms-economic-impact/?_r=0 [<http://perma.cc/EQX3-TAJ2>]. This issue is impacting multiple

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are a very real challenge for states all over the country; but Ohio and the Great Lakes region have been dealing with HABs on and off for decades.¹⁴

HABs have been plaguing Ohio waterways, and scientific research allows us to better understand how serious the problem is.¹⁵ In April 2009, the results of the 2007 National Lake Survey were released.¹⁶ This study showed that greater than 36% of 19 randomly sampled Ohio lakes had detectable levels of algae, which was a significantly larger percentage than other reporting states.¹⁷ Cities throughout Ohio have spent hundreds of thousands of dollars to combat foul taste and odor in drinking water linked to the accumulation of algae.¹⁸ To this end, Ohio has pioneered legislation to tackle the toxic blooms found in local waterways and beloved lakes around the state.¹⁹

Ohio Senate Bill 1 was signed into law and became effective July 3, 2015 with bipartisan support.²⁰ This bill amends and adds provisions to the Ohio Revised Code to combat HABs and their causes.²¹ The sections most relevant to the discussion in this Comment require that any application of fertilizer or manure comply with new preventative measures.²² At the time the legislation was passed, the primary focus was

states; for example, if the State of Washington was forced to shut down bodies of water during razor clam season, they could lose more than \$22 million in revenue. *Id.*

¹⁴ See Jack Tuholske & Kenneth Kilbert, *Moving Forward: Legal Solutions to Lake Erie's Harmful Algal Blooms*, LUCAS COUNTY, OHIO BOARD COUNTY COMMISSIONERS 5 (Apr. 15, 2015), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2667107 [<http://perma.cc/V7PJ-4F5Y>].

¹⁵ See STATE OF OHIO, HARMFUL ALGAL BLOOM RESPONSE STRATEGY FOR RECREATIONAL WATERS 5 (2016) [hereinafter RESPONSE STRATEGY], <http://www.epa.ohio.gov/portals/35/hab/HABResponseStrategy.pdf> [<http://perma.cc/VBJ4-9KPW>].

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ Spencer Hunt, *Toxic Algae in Hoover Reservoir Cost City \$723,000*, COLUMBUS DISPATCH (Feb. 3, 2014, 1:58 PM), <http://www.dispatch.com/content/stories/local/2014/02/03/toxic-algae-in-hoover-cost-city-723000.html> [<http://perma.cc/NGL9-6P3Y>] (Toxic Algae at Hoover Reservoir in spring of 2014 caused drinking water to smell and taste like “licking a carp” but showed no signs of toxins).

¹⁹ See Amy Graves, *What You Need to Know About Ohio's New Nutrient Law*, OHIO FARM BUREAU (Apr. 23, 2015), <https://ofbf.org/news-and-events/news/4604> [<http://perma.cc/MJ3W-WHV7>].

²⁰ Jeff Grim, Ohio Legislative Service Commission, Final Analysis Sub. S.B. 1, at 1, <https://www.legislature.ohio.gov/download?key=2901&format=pdf> [<https://perma.cc/CWF8-LU3K>].

²¹ Amended sections include: § 333.30 of Am. Sub. H.B. 59 of the 130th General Assembly and § 6109.10 of the Ohio Revised Code. Newly enacted sections include: §§ 903.40, 905.326, 905.327, 1511.10, 1511.11, 3745.50 and 6111.32. See Sub. S.B. 1, 131st Gen. Assemb. (Ohio 2015).

²² See OHIO REV. CODE ANN. §§ 903.40, 905.326, 939.08–09 (West 2016).

HABs present in Lake Erie. However, HABs continue to expand their reach, and therefore, the Ohio legislature needs to as well.²³

This Comment explores the challenges of regulating agriculture as an industry. The Ohio legislation appears to be one of the most expansive bills regulating *when* and *how* farmers can apply fertilizer compared to similar preventative legislation in other states.²⁴ Whether Ohio has gone far enough by enacting this legislation is the key question. Ohio has made significant strides in protecting water quality while attempting to regulate agriculture.²⁵ However, states all over the country are responding to this crisis.²⁶ The regulatory burden on agriculture is extremely light despite the fact algal bloom formation is directly linked to this industry.²⁷ Ohio has pioneered legislation to regulate the agriculture industry, but going forward, this legislation is not comprehensive enough to have long-term impacts on nitrogen and phosphorus pollution in Ohio lakes and waterways because the legislation only applies to a portion of the state and lacks meaningful enforcement.

In order to analyze these questions and theories, this Comment will examine Ohio's current law, Ohio Senate Bill 1.²⁸ First, Part II will discuss the science behind HABs: how are they formed and why they are so dangerous.²⁹ Next, the Comment will review similar legislation in other states as a means of measuring the adequacy of Ohio Senate Bill 1.³⁰ Then, it will explain the agriculture industry, its importance, and why it is

²³ See Laura Arensfield, *Toxic Algae Bloom Found in Ohio River*, COLUMBUS DISPATCH (Aug. 22, 2015, 2:06 AM), <http://www.dispatch.com/content/stories/local/2015/08/21/Toxic-algae-bloom-detected-in-Ohio-River.html> [<http://perma.cc/E6DM-ZBMU>] (demonstrating Lake Erie is not the only body of water in Ohio affected by Harmful Algal Blooms).

²⁴ Codi Kozacek, *Toxic Algae Blooms Prompt Clean-Up Commitment from Great Lakes Governors*, CIRCLE BLUE (Jun. 23, 2015), <http://www.circleofblue.org/2015/world/toxic-algae-blooms-prompt-clean-up-commitment-from-great-lakes-governors> [<http://perma.cc/3FTH-ZBWP>].

²⁵ See Adam Rissien, *Proponent Party Testimony – Substitute Senate Bill 1*, OHIO ENVTL. COUNCIL 1 (Mar. 24, 2015), [<http://perma.cc/7RDS-TXJK>] (Ohio Environmental Council recognizes and supports the efforts of lawmakers to reduce nutrient loading and pollution in Lake Erie. Further, lawmakers have worked to balance enforcement and the needs of the agriculture industry.).

²⁶ See RES. MEDIA & THE NAT'L WILDLIFE FED'N, 2014 HARMFUL ALGAE BLOOM STATE SURVEY: SUMMARY OF RESULTS AND RECOMMENDATIONS 1 (2014) [hereinafter RECOMMENDATIONS], <http://www.hillsborough.wateratlas.usf.edu/upload/documents/The-2014-Harmful-Algal-Bloom-State-Survey.pdf> [<http://perma.cc/3A7L-A8GP>].

²⁷ *Id.* at 4.

²⁸ See *infra* Part V.

²⁹ See *infra* Section II.A.

³⁰ See *infra* Part IV.

difficult to regulate.³¹ Finally, States will be grouped based on the type of legislation they use to control potential causes of HABs, such as restrictions on the time and place fertilizer can be spread.³²

Agriculture is not the only cause of HABs; however, it certainly is a significant contributor to their formation. Therefore, in order to show the insufficiency of current legislation, it is important to understand how difficult it is to regulate agricultural activities and production. Regulators historically have had trouble controlling and enforcing policies against the agriculture industry.³³ Today, this inability to provide sufficient direct regulation has manifested as a serious environmental, public health, and economic challenge: the formation of HABs in bodies of water in and around the state and country.³⁴

Ohio's legislation will then be compared with similar legislation from other states to determine what Ohio is doing best, where it could improve, and how other states can learn from Senate Bill 1.³⁵ The Ohio bill is unique in requiring direct regulation of farmers.³⁶ Other states have yet to tackle nutrient pollution in the same way because they have chosen to regulate consumers and manufacturers rather than farmers.³⁷ A certain amount of success can be attributed to that style of regulation; however, progress will not be made in the fight against water pollution if the responsible party is held to a different standard. Therefore, states can improve upon their statutory schemes by implementing restrictions on agriculture. Further, Ohio can learn from other states by ensuring that the restrictions of Ohio Senate Bill 1 or future legislation applies to all counties within the state.

II. BACKGROUND

Federal regulations promulgated under the Clean Water Act³⁸ differentiate between two types of pollution: point source and nonpoint source.³⁹ A nonpoint source pollutant is anything that is not classified as a

³¹ See *infra* Part III.

³² See *id.*

³³ See J.B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 *ECOLOGY L.Q.* 263, 265 (2000) (“[F]arms are virtually unregulated by the expansive body of environmental law that has developed in the United States in the past 30 years.”).

³⁴ See *infra* Section II.B.

³⁵ See *infra* Part VI.

³⁶ RECOMMENDATIONS, *supra* note 26, at 4.

³⁷ See *infra* Part IV.

³⁸ 33 U.S.C. § 1362 (2012).

³⁹ The Clean Water Act defines a point source as follows:

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point source.⁴⁰ One of the primary sources of nonpoint source pollution in the United States derives from runoff.⁴¹ Runoff occurs when rain hits the ground and washes pollutants from the land into local waterways.⁴² Agricultural runoff is *generally* excluded from point source pollution and is, therefore, not regulated by the Clean Water Act.⁴³ In Ohio, there are four common types of nonpoint source pollutants that cause “water quality impairment,” one of which is nutrient loading and sediment.⁴⁴ Further, recent national reports by the United States Environmental Protection Agency (EPA) show that agriculture is one of the major sources of nonpoint source pollution impacting rivers, lakes, and estuaries.⁴⁵ However, both point source and nonpoint source pollutants can contribute to the formation of HABs.⁴⁶ Some point source contributors include sewer systems and publicly owned treatment works, but these are outside the scope of this Comment.⁴⁷

The term “point source” means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

Id. § 1362(14).

⁴⁰ *What is Nonpoint Source Pollution*, U.S. ENVTL. PROTECTION AGENCY, <http://water.epa.gov/polwaste/nps/whatis.cfm> [<http://perma.cc/XCQ8-KGDY>].

⁴¹ See Kenneth Kilbert et al., *Legal Tools for Reducing Harmful Algal Blooms in Lake Erie*, 44 U. TOL. L. REV. 69, 73 (2012).

⁴² See U.S. ENVTL. PROTECTION AGENCY, NATIONAL WATER QUALITY INVENTORY: REPORT TO CONGRESS, 2004 REPORTING CYCLE (2009) [hereinafter NATIONAL WATER QUALITY INVENTORY], https://www.epa.gov/sites/production/files/2015-09/documents/2009_01_22_305b_2004report_2004_305breport.pdf [<http://perma.cc/FR2K-4BF5>].

⁴³ See *id.* There are some scenarios in which “runoff” can be classified as a point source pollutant; however, these are beyond the scope of this Comment.

⁴⁴ *Nonpoint Source Management Plan Update*, OHIO ENVTL. PROTECTION AGENCY 5, http://epa.ohio.gov/Portals/35/nps/NPS_Mgmt_Plan.pdf [<http://perma.cc/WEU2-TQ69>] (Ohio EPA reports the four most common types of nonpoint source pollutants that effect water quality include: hydromodification, habitat alteration, nutrients, and silts or sediments.).

⁴⁵ NATIONAL WATER QUALITY INVENTORY, *supra* note 42, at 1.

⁴⁶ See OHIO DEP’T OF AGRIC. ET AL., OHIO LAKE ERIE PHOSPHORUS TASK FORCE II FINAL REPORT 18 (2013) [hereinafter TASK FORCE II], https://www.motherjones.com/files/task_force_report_october_2013.pdf [<http://perma.cc/PF8Z-W7K2>].

⁴⁷ *Id.* at 18–19.

A. *What are Harmful Algal Blooms?*

There are many species of algae.⁴⁸ However, the HABs plaguing Ohio waterways are not the beautiful marine algae we see in ocean ecosystems.⁴⁹ These blooms are a particular subspecies of algae that pose numerous environmental and health concerns.⁵⁰ Algal blooms can be divided into two categories, cyanobacterial and noncyanobacterial.⁵¹ Each category has multiple species, but the types of HABs relevant to this analysis are cyanobacterial blooms.⁵²

The cyanobacterial HABs are dangerous for many reasons, primarily because they produce potent toxins.⁵³ If humans encounter HABs they can experience a variety of adverse symptoms, some as minor as a skin rash and some as severe as liver damage.⁵⁴ The World Health Organization (WHO) gives a comprehensive list of potential symptoms:

Humans are affected with a range of symptoms including skin irritation, stomach cramps, vomiting, nausea, diarrhea, fever, sore throat, headache, muscle and joint pain, blisters of the mouth and liver damage. Swimmers in water containing [algae] toxins may suffer allergic reactions, such as asthma, eye irritation, rashes, and blisters around the mouth and nose. Animals, birds, and fish can also be poisoned by high levels of toxin-producing [algae].⁵⁵

⁴⁸ Algae base is an online database in which you can search for subspecies of algae. As of April 6, 2017, the database contains information on 148,936 species of algae. ALGAE BASE, <http://www.algaebase.org> [<https://perma.cc/D2MC-TR9N>].

⁴⁹ See Backer & McGillicuddy, Jr., *supra* note 9, at 94.

⁵⁰ *Id.*

⁵¹ HAROLD W. WALKER, HARMFUL ALGAL BLOOMS IN DRINKING WATER: REMOVAL OF CYANOBACTERIAL CELLS AND TOXINS 12 (2015).

⁵² *Id.*

⁵³ See LOPEZ ET AL., *supra* note 9, at 12 (“The most serious impacts of CyanoHABs derive from their production of these potent “cyanotoxins.” The majority of impacts in the United States have included taste-and-odor problems in drinking water and aquaculture resources, animal deaths, and reduced recreational opportunities. Other impacts in the United States include human illnesses . . .”) (internal citations omitted).

⁵⁴ *Water Related Diseases*, WORLD HEALTH ORG., http://www.who.int/water_sanitation_health/diseases-risks/diseases/cyanobacteria/en [<http://perma.cc/7UWN-4AUW>].

⁵⁵ *Id.*

The blooms are also harmful to animals; those most at risk are pets and livestock.⁵⁶ Toxins can accumulate in “primary consumers” in the food web and then work their way up the food chain.⁵⁷ HABs are especially toxic for fish resulting in “massive kills of both farmed and wild fish” and potentially causing the local economy millions of dollars in loss.⁵⁸

The EPA has identified all fifty states as being impacted in one way or another by excess nutrients concentrating in waterways and ultimately creating environmental harms.⁵⁹ Moreover, in a 2014 survey of thirty-nine states, 71% reported HABs are either a “somewhat serious” or “very serious” issue and are found in numerous local waterways.⁶⁰

B. How do Harmful Algal Blooms Form?

HABs can form due to a variety of factors,⁶¹ the most significant of which is excess nutrients like nitrogen and phosphorus running off the land after a storm and accumulating in bodies of water.⁶² This accumulation can come from either point or nonpoint sources.⁶³ Nutrient loading⁶⁴ in bodies of water causes blooms to form either on top of the water or on the floor.⁶⁵ This is known as eutrophication; the water is enriched with excess

⁵⁶ OHIO VETERINARY ASS'N, HARMFUL ALGAL BLOOMS CAN BE DEADLY TO PETS AND LIVESTOCK 1, http://epa.ohio.gov/portals/35/inland_lakes/OhioVeterinaryAssociationArticle40910%20.pdf [<http://perma.cc/Y7P7-5RQG>].

⁵⁷ See LOPEZ ET AL., *supra* note 9, at 14 (“Food web crashes can also result due to the unpalatability and low food quality of many cyanobacteria, which can result in the starvation of consumers and their predators.”).

⁵⁸ See Tuholske & Kilbert, *supra* note 14, at 14.

⁵⁹ *Nutrient Pollution*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/sites/production/files/2013-08/infographic-nutrient-pollution-explained.png> [<http://perma.cc/XWU5-68AP>].

⁶⁰ RECOMMENDATIONS, *supra* note 26, at 2–3.

⁶¹ OHIO SEA GRANT ET AL., HARMFUL ALGAL BLOOMS IN OHIO WATERS (2010), http://www.epa.ohio.gov/portals/35/inland_lakes/HABBrochure.pdf [<http://perma.cc/F2CY-3UHK>] (“Factors that contribute to HABs include: excess nutrients (phosphorus or nitrogen), sunlight, low water or low flow conditions, calm water (low-wind conditions), warmer temperatures, low salinity, and selective grazing . . .”).

⁶² Stacy Brannan, *Cause and Effect: Sediment Plume Creates Perfect Incubator for Microcystis Bloom*, 31 TWINE LINE, Summer/Fall 2009, at 3, 5. See also LOPEZ ET AL., *supra* note 9, at 18 (“Blooms are most likely to occur during summer . . . that receive nutrient rich waste or runoff . . .”).

⁶³ See TASK FORCE II, *supra* note 46, at 18 and accompanying text.

⁶⁴ Nutrient loading is an excess presence of nutrients like nitrogen and phosphorus—two naturally occurring elements—that are flowing into the water. Tuholske & Kilbert, *supra* note 14, at 13.

⁶⁵ *Id.* at 16.

nutrients the algae can feed on, which allows the blooms to grow.⁶⁶ Further, the blooms can spread to the shoreline.⁶⁷

Reducing the nutrients and pollutants added to water can minimize instances of HABs, or even completely eliminate their formation.⁶⁸ These nutrients are a healthy part of the environment, but in excess they can create an area of low oxygen, which is detrimental to aquatic life yet perfect for HAB formation.⁶⁹

As previously mentioned, nitrogen and phosphorus are among the numerous common sources of nutrients that contribute to HAB formation.⁷⁰ Agricultural runoff has been identified as being high in both of those naturally occurring compounds.⁷¹ Sources of phosphorus include fertilizers, agricultural runoff, and organic wastes from multiple sites including wastewater treatment facilities.⁷² Agricultural runoff is considered a nonpoint source pollutant, whereas phosphorus emitted from wastewater treatment facilities would be considered a point source.⁷³ Commercial fertilizers, like those used by farmers, are especially known to have high concentrations of phosphorus.⁷⁴ Agriculture is a large supplier of the nutrients needed for HAB formation.⁷⁵

⁶⁶ See WALKER, *supra* note 51, at 14–15.

⁶⁷ *Id.* See also OHIO SEA GRANT ET AL., *supra* note 61 (HABs can also pollute beaches if they wash ashore, which is commonly known as “scum”).

⁶⁸ See OHIO SEA GRANT ET AL., *supra* note 61.

⁶⁹ *Phosphorus and Water*, U.S. GEOLOGICAL SURV., <http://water.usgs.gov/edu/phosphorus.html> [<http://perma.cc/4LNS-ZMWA>].

⁷⁰ *Supra* notes 9–11, 61–62 and accompanying text. See also LOPEZ ET AL., *supra* note 9, at 21–22.

⁷¹ See Mary Jane Angelo & Jon Morris, *Maintaining a Healthy Water Supply While Growing a Healthy Food Supply: Legal Tools for Cleaning Up Agricultural Water Pollution*, 62 U. KAN. L. REV. 1003, 1005 (2014).

⁷² See OHIO DEP’T OF AGRIC. ET AL., OHIO LAKE ERIE PHOSPHORUS TASK FORCE FINAL REPORT 34–55 (2010) [hereinafter TASK FORCE], http://epa.ohio.gov/portals/35/lakeerie/ptaskforce/Task_Force_Final_Report_April_2010.pdf [<https://perma.cc/9RG7-KR78>]. Section 4 of this early Task Force report demonstrates several major areas of concern: point sources including wastewater treatment plants, bypasses and combined sewer overflows, industrial point sources, and home sewage treatment systems, and nonpoint sources including agriculture. *Id.* at 34–36. The Task Force identified phosphorus fertilizer and manure as primary areas of concern as it pertains to nonpoint sources. See *id.* at 37–39.

⁷³ See TASK FORCE II, *supra* note 46, at 18.

⁷⁴ *The Sources and Solutions: Agriculture*, U.S. ENVTL. PROTECTION AGENCY, <https://www.epa.gov/nutrientpollution/sources-and-solutions-agriculture> [<http://perma.cc/6G85-275J>].

⁷⁵ See *Phosphorus and Water*, *supra* note 69.

Moreover, nitrogen is also a prominent contributor to water pollution and HAB formation.⁷⁶ Fertilizer and manure from animals are rich in both nitrogen and phosphorus.⁷⁷ Ammonia is an example of a nitrogen based compound that can be very harmful to fish and other aquatic life if it accumulates in bodies of water.⁷⁸

This problem is especially pervasive in Ohio.⁷⁹ HABs have spread all over the state, and have been identified in more than just Lake Erie and the western basin. For instance, a bloom was even discovered in the Ohio River, located near Belmont County in Southeast Ohio.⁸⁰ But the problem of HABs is not unique to Ohio. Numerous instances of HABs have been documented throughout the country, and especially in the Midwest.⁸¹

III. AGRICULTURE AND ITS REGULATORY CHALLENGES

Agriculture is far less regulated than other common forms of industry in the United States.⁸² The United States has developed substantial regulation in most areas of environmental law since the 1970s.⁸³ However, farms are not seriously policed under these schemes and “[o]ne would be hard pressed to identify another industry with as poor an environmental record and as light a regulatory burden [as the agricultural industry].”⁸⁴

Agriculture as an industry is difficult to regulate for many reasons: (1) it is powerful; (2) it is highly varied; and (3) state and federal laws have largely protected farms while focusing on other industries.⁸⁵ In the United

⁷⁶ *Nitrogen and Water*, U.S. GEOLOGICAL SURV., <https://water.usgs.gov/edu/nitrogen.html> [<https://perma.cc/J9E5-VKWZ>] (“Excess nitrogen can cause overstimulation of growth of aquatic plants and algae.”).

⁷⁷ *The Sources and Solutions: Agriculture*, *supra* note 74.

⁷⁸ *Id.*

⁷⁹ See RESPONSE STRATEGY, *supra* note 15, at 5.

⁸⁰ See Arensfield, *supra* note 23.

⁸¹ WALKER, *supra* note 51, at 13–14. HABs that have been documented in the western United States include: Arizona, California, Colorado, Montana, Nevada, New Mexico, Oregon, Utah, and Washington. *Id.* at 13. As for the northeastern United States, HABs have been documented in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Rhode Island, and Vermont. *Id.* Finally, every state in the Southeast has experienced at least some kind of HAB outbreak. *Id.* at 14.

⁸² See Ruhl, *supra* note 33, at 265.

⁸³ *See id.*

⁸⁴ *See id.* at 269.

⁸⁵ *See id.* at 267–70 (“It may be that farming has escaped attention because ‘agriculture’s vintage—its sheer age as a human activity—obscures its long-term effects on the environment. But the cumulative effects of more than 450 years of crop and livestock farming in America are no longer obscure . . .”).

States, farmers possess a great deal of political power.⁸⁶ They are a compelling political force because farms are traditionally family-owned business, with millions spread across the country.⁸⁷ Agriculture has strength in numbers, and much like other forms of industry, it is difficult for environmental law to regulate so many facilities in a widespread industry. Agricultural census data shows there were 2,109,303 farms in the United States in 2012⁸⁸ and 75,462 in Ohio alone.⁸⁹ In Ohio, farms cover more than thirteen million acres of land.⁹⁰ Further, the annual value of agricultural production in Ohio is estimated to be over \$105 billion.⁹¹ This shows the significance of agriculture as it relates to the local and national economy.⁹²

Agriculture is a dominant industry, even in Ohio.⁹³ The agriculture industry is constantly changing and has become more technologically advanced and industrialized.⁹⁴ A one size fits all regulatory approach is

⁸⁶ See *id.* at 266.

⁸⁷ See *id.* at 269 n.9 (“In fact, American farms comprise one of the most massive, self-interested, economically anti-competitive, and politically powerful industries in our nation’s history.”). *Family Farms are the Focus of New Agriculture Census Data*, U.S. DEP’T. OF AGRICULTURE (Mar. 17, 2015), <https://www.usda.gov/media/press-releases/2015/03/17/family-farms-are-focus-new-agriculture-census-data> [<https://perma.cc/P4WN-J2T8>] (recent agricultural census data found that 97 percent of all farms in the United States are family-owned operations).

⁸⁸ NAT’L AGRICULTURAL STATISTICS SERV., U.S. DEP’T OF AGRICULTURE, 2012 CENSUS OF AGRICULTURE — STATE DATA 245 (2012), http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_US_State_Level/st99_2_001_001.pdf [<http://perma.cc/A3S8-BWSZ>].

⁸⁹ *Id.* at 250.

⁹⁰ The actual acreage according to 2012 census data is 13,960,604 acres of farmland in Ohio. *Id.*

⁹¹ *Census Data Shows Continued Growth in Ohio Ag Industry*, Ohio Dept. of Agriculture, (Feb. 26, 2014), http://www.agri.ohio.gov/public_docs/news/2014/02.26.14%20Census%20Shows%20Continued%20Grown%20for%20Ohio%20Agriculture.pdf [<https://perma.cc/4MJQ-XWQN>].

⁹² *Id.* The significance of agriculture as it pertains to the Ohio economy cannot be sufficiently analyzed without looking at the Ohio economy as a whole. However, the 2012 Census of Agriculture estimates the shows 13.96 million acres of Ohio farmland, and an increase in market values for crops. Importantly, former Ohio Agriculture Director, David T. Daniels, stated “[o]ur farmers are the backbone of our state’s economic growth” *Id.*

⁹³ See *id.*; Tom Feran, *John Kasich Says Agriculture is the “Strongest Industry in Ohio,”* POLITIFACT OHIO (Dec. 12, 2012, 6:00 AM), <http://www.politifact.com/ohio/statements/2012/dec/12/john-kasich/john-kasich-says-agriculture-strongest-industry-oh> [<http://perma.cc/JW7H-QRSP>].

⁹⁴ Neil D. Hamilton, *Feeding Our Future: Six Philosophical Issues Shaping Agricultural Law*, 72 NEB. L. REV. 210, 212 (1993).

unlikely to apply to every farm when dealing with such a diverse and widespread industry.⁹⁵

Federal environmental laws span multiple statutes, and there is not one particular body of law that applies specifically to agriculture.⁹⁶ For example, the Clean Water Act fails to meaningfully regulate nonpoint source pollutants in terms of agriculture,⁹⁷ which some scholars argue creates a “safe harbor” for agriculture.⁹⁸ The impacts of agricultural runoff and water pollution go largely unnoticed or unregulated due to this substantive loophole.⁹⁹ Environmental law and regulation begins primarily with the federal government, and it has largely taken a hands-off approach to agriculture as is evident from most major laws in this subject area.¹⁰⁰

Moreover, on the state end, Ohio has what is known as a “Right to Farm” law.¹⁰¹ In general, this law gives farmers a complete affirmative defense to a nuisance suit if they meet certain qualifications.¹⁰² This protects farmers and their land from the more traditional common law nuisance suit.¹⁰³ These can occur when neighbors and concerned citizens

⁹⁵ Ruhl, *supra* note 33, at 330.

⁹⁶ *See, e.g.*, Clean Water Act, 33 U.S.C. §§ 1251–1275 (2012).

⁹⁷ *See* Ruhl, *supra* note 33, at 299. The Clean Water Act lacks a “concrete, enforceable federal blueprint” to tackle water pollution that derives from nonpoint source pollution such as Agriculture. *Id.* Further, many states have followed in the footsteps of the federal government and only meaningfully regulated point source pollutants. *Id.* at 304.

⁹⁸ *Id.* at 298.

⁹⁹ *See id.*

¹⁰⁰ *See id.*

¹⁰¹ *See* OHIO REV. CODE ANN. § 929.04 (West 2016); OHIO FARM BUREAU FED’N, OHIO’S RIGHT TO FARM LAW (Jan. 2009), http://www.starkfb.org/articles/ohio_right_to_farm.pdf [<http://perma.cc/Q2S6-GFVV>].

¹⁰² § 929.04.

In a civil action for nuisances involving agricultural activities, it is a complete defense if: (A) The agricultural activities were conducted within an agricultural district; (B) Agricultural activities were established within the agricultural district prior to the plaintiff’s activities or interest on which the action is based; (C) The plaintiff was not involved in agricultural production; and (D) The agricultural activities were not in conflict with federal, state, and local laws and rules relating to the alleged nuisance or were conducted in accordance with generally accepted agricultural practices.

The plaintiff may offer proof of a violation independently of proof of a violation or conviction by any public official.

Id.

¹⁰³ Ruhl, *supra* note 33, at 315.

are unhappy with agricultural pollution.¹⁰⁴ This provides yet another example of the challenge and inability to regulate agriculture.

The highly-varied nature of the agriculture industry, and the simple fact they have been given a free pass by many state and federal statutes makes this industry uniquely challenging to regulate.¹⁰⁵ It also has allowed agriculture to contribute to an increase in nitrogen and phosphorus pollution in local waterways, which is directly linked to the formation of HABs.¹⁰⁶

IV. STATE SURVEY OF PREVENTATIVE LEGISLATION

States attempt to regulate pollution and potential environmental harms in many ways. Ohio, however, is the first to pass expansive legislation regulating when and how *farmers*, in particular, can apply fertilizers.¹⁰⁷ Other states across the country have reacted to the HAB crisis in varying ways. Some have passed similar legislation regarding fertilizer and phosphorus pollution.¹⁰⁸ Some state approaches focus on restricting phosphorus in consumer products; others focus on timing and application limitations.¹⁰⁹ However, few have managed to apply regulations to one of the largest contributors to this problem—the agriculture industry.¹¹⁰

States in general are working towards reducing nitrogen and phosphorus levels in their waterways pursuant to state and federal laws.¹¹¹ As of 2014, nineteen states actively monitor previously exposed waterways, but only eighteen reported they have tried to aggressively combat known causes of HABs.¹¹² Further, EPA reports thirty states and

¹⁰⁴ *Id.* at 315.

¹⁰⁵ *Id.* at 271.

¹⁰⁶ *Id.* at 284–85.

¹⁰⁷ See Kozacek, *supra* note 24.

¹⁰⁸ See *id.*

¹⁰⁹ See *infra* Sections IV.A–IV.B.

¹¹⁰ See *supra* Part III.

¹¹¹ See *State Progress Toward Developing Numeric Nutrient Water Quality Criteria for Nitrogen and Phosphorus*, U.S. ENVTL. PROTECTION AGENCY, <http://cfpub.epa.gov/wqsits/nnc-development> [<http://perma.cc/R3RS-Z2SH>]. Most states with impaired waterways aspire to be classified as a Level 5 state by 2016. This means that all waterways and bodies of water within the state will have a nitrogen and phosphorus criteria level that will have to be met. *Id.* Ohio surface water quality criteria and procedures to determine those criteria are found in Ohio Administrative Code 3745-1-33 through 3745-1-43.

¹¹² See RECOMMENDATIONS, *supra* note 26, at 2–3.

the District of Columbia have some form of monitoring or informational programming regarding HABs.¹¹³

Whether it is freshwater or marine, all states suffer from some form of harmful algae.¹¹⁴ It should be noted, however, this Comment is not an exhaustive list of all fifty states and their legislation. Rather, it is a glimpse of how some states are tackling issues like water pollution and HABs.¹¹⁵ Further, there are a multitude of ways in which states have chosen to regulate nitrogen and phosphorus that would not qualify as a nonpoint source and therefore are outside of the scope of this Comment. For example, many states, including Ohio, have restrictions on phosphorus concentrations in household products such as cleaning supplies and laundry detergent.¹¹⁶ However, these sources are regulated through a publicly owned treatment works (POTW) or water treatment plant, which is considered, for the purpose of this Comment, a point source pollutant.¹¹⁷

In order to understand how states are reacting to this growing problem, states have been grouped by their type of restriction. These states generally regulate only phosphorus, whereas some states—including Ohio—have also begun to recognize the negative contribution of nitrogen.¹¹⁸

A. *Restrictions on Fertilizer Application to Lawns and Golf Courses*

Some states are working diligently to combat this widespread problem, but states differ in how they choose to affect change. One common method states have adopted is simple use restrictions on consumers.¹¹⁹ Several states have placed limitations on fertilizer spreading on certain

¹¹³ See *State Monitoring Programs and Information*, U.S. ENVTL. PROTECTION AGENCY, <https://www.epa.gov/nutrient-policy-data/states-monitoring-programs-and-information> [<https://perma.cc/E9VY-CAWE>] (demonstrating more than half the states in the United States have implemented monitoring programs and disseminate information about HABs through their respective environmental organizations).

¹¹⁴ See *Harmful Algal Blooms*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/nutrientpollution/harmful-algal-blooms> [<http://perma.cc/AN2L-WNN6>].

¹¹⁵ See RECOMMENDATIONS, *supra* note 26, at 3. Some states reported that they have taken no action regarding HABs “past, present or future.” *Id.* These states include Alaska, Maine, Nevada, and New Mexico. *Id.* The cited survey did not receive responses from all fifty states, including Ohio, but many are making strides towards mitigating HABs and nutrient loading. *Id.* at 3–4.

¹¹⁶ See, e.g., OHIO REV. CODE ANN. §§ 6111.10, 6111.11 (West 2016).

¹¹⁷ OHIO ADMIN. CODE 3745-36-02(R) (2016).

¹¹⁸ See OHIO REV. CODE ANN. § 905.326(F) (West 2016).

¹¹⁹ *Id.*; WIS. STAT. § 94.643 (2012); VT. STAT. ANN. tit. 10, § 1266b (2016).

surfaces by traditional consumers of fertilizer.¹²⁰ These surfaces mostly include lawns, golf courses, and other grassy areas.¹²¹ Consumers who are targeted by these restrictions are those who choose to fertilize their own lawn, or grounds keepers who manage large grassy areas like golf courses.¹²²

Many states are working to eliminate the amount of phosphorus spread in fertilizers by preventing application on “turf.”¹²³ However, these states exclude commercial agriculture from spreading requirements.¹²⁴ Some of these states include: Michigan;¹²⁵ Wisconsin;¹²⁶ Vermont;¹²⁷ Minnesota;¹²⁸ and New York.¹²⁹

Like Ohio, Michigan also has a serious problem with HABs, especially those found in Lake Erie.¹³⁰ Residents in southeastern Michigan were also without usable tap water in 2014, when the massive bloom severely impacted Toledo.¹³¹ Michigan, for example, limits the application of

¹²⁰ VT. STAT. ANN. tit. 10, § 1266b(d).

¹²¹ See, e.g., WIS. STAT. § 94.643.

¹²² See, e.g., MICH. COMP. LAWS § 324.8501(dd) (2016) (“Turf means land, including residential, commercial, or industrial property, golf courses, or publicly owned land, that is planted in closely mowed, managed grass, *except* land used in the operation of a commercial farm.”) (emphasis added). The statute specifically restricts application on turf in such a way that it exempts agriculture and directly targets a certain class of consumer.

¹²³ See *id.* and text accompanying note 122.

¹²⁴ See *id.* and text accompanying note 122.

¹²⁵ See *id.* § 324.8501.

¹²⁶ See WIS. STAT. § 94.643.

¹²⁷ See VT. STAT. ANN. tit. 10, § 1266b (2016).

¹²⁸ See MINN. STAT. § 18C.60 (2016).

¹²⁹ See N.Y. ENVTL. CONSERV. LAW § 17-2013 (McKinney 2016).

¹³⁰ See WATER RESOURCES DIVISION, MICH. DEP’T OF ENVTL. QUALITY, MICHIGAN’S IMPLEMENTATION PLAN 1 (2015), http://www.michigan.gov/documents/deq/wrd-western-lake-erie_503547_7.pdf [<http://perma.cc/9F3M-3JUH>]. This is a draft of the plan, which was written in response to the collaborative agreement between Ohio, Michigan, and Ontario, Canada. Michigan published a final implementation plan in early 2016. WATER RESOURCES DIVISION, MICH. DEP’T OF ENVTL. QUALITY, STATUS OF IMPLEMENTATION PLAN FOR THE WESTERN LAKE ERIE BASIN COLLABORATIVE AGREEMENT 2 (2017), http://www.michigan.gov/documents/deq/2016_410_Status_of_the_Implementation_Plan_f_or_the_Western_Lake_Erie_Basin_Collaborative_Agreement_555233_7.pdf [<https://perma.cc/G7QE-FL5S>]. At this stage, Michigan and the other participants will develop a Domestic Action Plan to further phosphorus reduction goals. *Id.* However, Michigan’s actions in implementing the Western Lake Erie Basin Collaborative Agreement are impressive, but beyond the scope of the author’s analysis.

¹³¹ EPA Suggests Triggers for Warning of Algae in Drinking Water, FOX NEWS (May 7, 2015), <http://www.foxnews.com/health/2015/05/07/epa-suggests-triggers-for-warning-algae-in-drinking-water.html> [<https://perma.cc/CCC3-AP8B>].

fertilizer within fifteen feet of water although exceptions apply.¹³² Further, a person is prohibited from applying fertilizer on frozen or water-saturated turf.¹³³ Golf courses are included in the definition of “turf”,¹³⁴ however, Michigan allows application of fertilizer to golf courses if the golf course is certified to follow best management practices in fertilizer application,¹³⁵ or if the soil is phosphorus deficient.¹³⁶ Yet the Michigan statute, and others listed, has a limitation, which is all too common among state legislation.¹³⁷ The definition of “turf” refers to land, but explicitly excludes—for purposes of this statute—land “used in the operation of a commercial farm.”¹³⁸ This demonstrates how government regulation of agriculture tends to be less rigorous than for other sources of water pollution.

Wisconsin has a similar exception written into its statute.¹³⁹ The spreading restrictions do not apply to farms or anyone using their land for agricultural purposes.¹⁴⁰ The Wisconsin statute further requires that “no person may intentionally apply to turf fertilizer which is labeled as containing phosphorus or available phosphate.”¹⁴¹ These “use” restrictions are a common method of curbing excess phosphorus spreading.¹⁴² Wisconsin also includes golf courses in the definition of “turf.”¹⁴³ However, these restrictions do not apply if someone is attempting to sow grass seed,¹⁴⁴ if the soil has a phosphorus deficiency,¹⁴⁵ or to “any other land used for agricultural production,”¹⁴⁶ as previously mentioned.

¹³² MICH. COMP. LAWS § 324.8512b(6) (2014) (this type of “buffer” restriction will be discussed more in a subsequent section *see infra* Section IV.B).

¹³³ MICH. COMP. LAWS § 324.8512f (2014).

¹³⁴ MICH. COMP. LAWS § 324.8501(dd) (2014) (“‘Turf’ means land, including residential, commercial, or industrial property, golf courses, or publicly owned land, that is planted in closely mowed, managed grass, except land used in the operation of a commercial farm.”).

¹³⁵ § 324.8512b(5)(a).

¹³⁶ *Id.* § 324.851b(5)(b)–(c).

¹³⁷ *See* § 324.8501(dd).

¹³⁸ *Id.*

¹³⁹ WIS. STAT. § 94.643(1)(b) (2014).

¹⁴⁰ *Id.* (“‘Turf’ means land, including residential property, golf courses, and publicly owned land, that is planted in closely mowed, managed grass, *except that ‘turf’ does not include pasture, land used to grow grass for sod, or any other land used for agricultural production.*”) (emphasis added).

¹⁴¹ *Id.* § 94.643(2).

¹⁴² *See id.*; MICH. COMP. LAWS § 324.8501(dd).

¹⁴³ § 94.643(1)(b).

¹⁴⁴ *Id.* § 94.643(2)(b)1 (“Paragraph (a) does not apply to a person who applies fertilizer in order to establish grass, using seed or sod, during the growing season in which the person began establishing the grass.”).

Moreover, the state of Vermont has taken similar steps. Persons are prohibited from applying fertilizer that contains nitrogen and phosphorus, with certain exceptions.¹⁴⁷ Phosphorus fertilizer is not to be applied to turf, except when the soil has a phosphorus deficiency,¹⁴⁸ or when attempting to sow grass seed.¹⁴⁹ There is a minor, yet notable, difference between the Vermont statute and that of Wisconsin, and New York explained below. The Vermont statute does not include golf courses at all in its definition of “turf.”¹⁵⁰ Further, it exempts land used for agricultural production from the spreading restrictions.¹⁵¹

Minnesota’s use restrictions are closely related to those already mentioned. Consumers are unable to apply fertilizers containing phosphorus,¹⁵² except in cases stated above, or on a golf course.¹⁵³ Violations are not seriously enforced and only constitute a minor misdemeanor.¹⁵⁴ Where Minnesota differs from some of the states in this category is it has expanded the requirements for mitigating phosphorus pollution under its statute.¹⁵⁵ It has accomplished this by requiring consumers to be supplied with certain information about the fertilizer composition and best management practices of use and spreading.¹⁵⁶ The

¹⁴⁵ *Id.* § 94.643(2)(b)2 (“Paragraph (a) does not apply to a person who applies fertilizer to an area if the soil in the area is deficient in phosphorus, as shown by a soil test performed no more than 36 months before the application by a laboratory.”).

¹⁴⁶ WIS. STAT. § 94.643(1)(b) (2014) and *supra* text accompanying note 140.

¹⁴⁷ VT. STAT. ANN. tit. 10, § 1266b(b)(1)(A)–(B), (c) (2016).

¹⁴⁸ *Id.* § 1266b(b)(1)(A).

¹⁴⁹ *Id.* § 1266b(b)(1)(B).

¹⁵⁰ § 1266b(a)(8)(B)(ii).

¹⁵¹ *Id.* § 1266b(a)(8)(B)(i). For example, there was an estimated 101,096 tons of nitrogen applied to 1,311,000 acres of golf course and 36,810 tons of phosphate applied to 1,131,000 acres in 2006 according to survey results. GOLF COURSE SUPERINTENDENTS ASS’N OF AM., GOLF COURSE ENVIRONMENTAL PROFILE: NUTRIENT USE AND MANAGEMENT ON U.S. GOLF COURSE VOLUME III GOLF 17–18 (2009), <https://www.gcsaa.org/uploadedfiles/Environment/Environmental-Profile/Nutrient/Golf-Course-Environmental-Profile--Nutrient-Management-Report.pdf> [<https://perma.cc/LV2E-Y276>].

¹⁵² MINN. STAT. § 18C.60(a) (2016).

¹⁵³ *See id.* § 18C.60(b); VT. STAT. ANN. tit. 10, § 1266b(a)(8)(B)(ii) (excluding golf courses from the definition entirely). *But see* WIS. STAT. § 94.643(1)(b) (2012) (including golf courses in the definition of turf and therefore including golf courses in Wisconsin’s use restrictions). Michigan takes an intermediate approach by including golf courses in the definition of turf, but allowing spreading if a golf course meets certain prerequisites. MICH. COMP. LAWS §§ 324.8501(dd), 324.8512b(5)(a)–(c) (2014).

¹⁵⁴ MINN. STAT. § 18C.62 (2016) (“Sections 18C.60 and 18C.61 are enforced by local units of government under their existing authority. Violation of a provision in either of these sections is a petty misdemeanor.”). *See also infra* Section IV.E.

¹⁵⁵ *See* MINN. STAT. § 18C.60 (2016).

¹⁵⁶ *See id.* Subdivision 3 entitled “Consumer Information” provides in full:

(continued)

statute also requires a commissioner to assess the effectiveness of the restrictions in terms of water quality and encourages researchers and manufacturers, among others, to assess research needs and encourage more targeted research opportunities.¹⁵⁷ Additionally, Minnesota requires that representatives of the fertilizer industry, activist groups, researchers, etc. are to evaluate the effects of phosphorus pollution and the effectiveness of these restrictions.¹⁵⁸

Finally, New York restricts application of fertilizer on “lawn or non-agricultural turf” for similar reasons.¹⁵⁹ The New York statute does not specifically mention golf courses in the definition of “turf,” and New York deviates from the previously mentioned states in using the term “nonagricultural turf.”¹⁶⁰ Instead, it provides a general prohibition and a list of exclusions;¹⁶¹ leading to an inference that golf courses are included

The commissioner, in consultation with the University of Minnesota Extension Service, fertilizer industry representatives, lakes groups, and other interested or affected parties, must produce consumer information on use restrictions and recommended best practices for lawn fertilizer containing phosphorus, and on best management practices for other residential sources of phosphorus in the urban landscape. The information must be in a format and of a content suitable for posting and distribution at retail points of sale of fertilizer that contains phosphorus and is for use on turf.

Id.
¹⁵⁷ *Id.*

Subdivision 4 entitled “Research [E]valuation; [R]eport” provides: The commissioner, in cooperation with the University of Minnesota and the University of Minnesota Extension Service, and, after consultation with representatives of the fertilizer industry, lakes groups, and other interested or affected parties, shall evaluate research needs and encourage targeted research opportunities to investigate the effects of phosphorous fertilization of turf on urban storm water quality. The commissioner must evaluate the effectiveness of the restrictions on phosphorous fertilizers under this section and report to the legislature by January 15, 2007.

Id.
¹⁵⁸ *Id.* (Subdivision 4 of the statute).

¹⁵⁹ N.Y. ENVTL. CONSERV. LAW § 17-2103(1)(a)–(b) (McKinney 2014).

¹⁶⁰ N.Y. ENVTL. CONSERV. LAW § 17-2101(3) (McKinney 2014) (“Lawn” or “non-agricultural turf” means any non-crop land area that is covered by any grass species.”).

¹⁶¹ *See id.* (“Lawn or non-agricultural turf does not mean flower or vegetable gardens, pasture, hayland, trees, shrubs, turf grown on turf farms, or any form of agricultural production.”).

in the prohibition. The key provision is that this does not apply to lands dedicated for agriculture, or personal vegetable gardens,¹⁶² which is par for the course when analyzing state statutory limits on fertilizer.

It is clear from the above-mentioned statutes that states want to eliminate excess phosphorus and curb water pollution. However, they have chosen regulatory measures that do not apply to farmers and lands used for agricultural production. This demonstrates that states are willing to place restrictions on certain applications of fertilizer for environmental and human health purposes. However, they are not willing to restrict those who are the largest contributors of nitrogen and phosphorus into the water—farms and industrialized agriculture.

B. Restrictions on Timing, Application, and Concentration of Fertilizer

Another common method of restricting fertilizer application is by restricting when and where it can be spread.¹⁶³ Some states prevent application of fertilizer during certain times of the year, on certain surfaces, and it can only be applied within a certain distance from bodies of water. For example, a 2012 legislative study on phosphorus bans for the Connecticut General Assembly identified eight states that prohibited application of fertilizers on impervious surfaces, and six states established a buffer zone from the water.¹⁶⁴

Maryland has had severe problems with pollution and the presence of HABs in the Chesapeake Bay.¹⁶⁵ The state placed restrictions on fertilizer use in an attempt to remedy extreme pollution in the Bay and local waterways.¹⁶⁶ Application of commercial fertilizer that contains nitrogen

¹⁶² *See id.*

¹⁶³ *See, e.g.,* MICH. COMP. LAWS § 324.8512f (2016) (“Release of fertilizer on impervious turf; application of fertilizer on frozen or saturated turf.”).

¹⁶⁴ Kristen L. Miller, *State Laws Banning Phosphorus Fertilizer Use*, OLR RES. REP. (Feb 1, 2012), <https://www.cga.ct.gov/2012/rpt/2012-R-0076.htm> [<http://perma.cc/XP4W-M7FH>]. States that prohibit application of fertilizer on impervious surfaces include Illinois, Maryland, Minnesota, New Jersey, New York, Vermont, Washington, and Wisconsin. *Id.* Those that establish a buffer zone are Illinois, Maryland, Michigan, New Jersey, New York, and Vermont. *Id.* Ohio Senate Bill 1 in Ohio establishes similar restrictions. *See infra* Part V.

¹⁶⁵ *See Nitrogen & Phosphorus*, *supra* note 12. Nitrogen and Phosphorus feed algae blooms that block sunlight, change the pH of the water, and emit a toxin that can be harmful to aquatic life, humans, and animals. *Id.*

¹⁶⁶ Timothy B. Wheeler, *State Fertilizer Rules Moving Ahead over Objections*, BALT. SUN (Nov. 21, 2011), http://articles.baltimoresun.com/2011-11-21/features/bs-gr-nutrient-plans-20111121_1_new-rules-proposed-changes-state-farmers [<http://perma.cc/QL7S-VMWU>].

or phosphorus is prohibited in several circumstances.¹⁶⁷ It can only be applied between March 1st and November 15th of every year,¹⁶⁸ and may not be applied when the ground is frozen.¹⁶⁹ Moreover, and most notably, no fertilizer, which contains nitrogen or phosphorus, can be applied within fifteen feet of: surface water within the state's jurisdiction;¹⁷⁰ the Chesapeake Bay;¹⁷¹ or a pond, lake, river, stream, ditch, or public drainage system within the state.¹⁷²

Maryland's restrictions are very helpful in protecting local waterways. However, these are once again limited to traditional consumers using fertilizer for their lawns, grassy areas, and turf.¹⁷³ The restrictions do not apply to fertilizer spread on property used for agricultural purposes or use on commercial farms.¹⁷⁴ However, fertilizer can be applied to turf containing phosphorus if the person determines that the soil needs fertilizer,¹⁷⁵ or they are establishing vegetation or reestablishing turf.¹⁷⁶

Minnesota also prohibits application of fertilizer to an impervious surface.¹⁷⁷ Here, an impervious surface is one that "prevents infiltration of water into soil."¹⁷⁸ However, Minnesota does not have a provision establishing a "buffer zone" like the Maryland statute.¹⁷⁹ This is surprising simply because Minnesota is colloquially known as the "Land of 10,000 Lakes"¹⁸⁰ and every one of these lakes would likely be at risk of nutrient loading from fertilizers and other products containing phosphorus.

Finally, New York prohibits the application of fertilizer to a lawn or turf not used for agriculture between December 1st and April 1st of every year.¹⁸¹ This is a longer period than the state of Maryland for example,¹⁸² but it is likely attributed to a colder climate in the state of New York.

¹⁶⁷ See MD. CODE ANN., AGRIC. § 8-803.4(d)(1) (LexisNexis 2015).

¹⁶⁸ *Id.* § 8-803.4(d)(1)(i).

¹⁶⁹ *Id.* § 8-803.4(d)(1)(ii).

¹⁷⁰ *Id.* § 8-803.4(e)(1)(i).

¹⁷¹ *Id.* § 8-803.4(e)(1)(ii).

¹⁷² *Id.* § 8-803.4(e)(1)(iii)–(ix).

¹⁷³ MD. CODE ANN., AGRIC. § 8-803.5(b)(1)(i) (LexisNexis 2015).

¹⁷⁴ *Id.* § 8-803.5(b)(1)(ii), (b)(2).

¹⁷⁵ *Id.* § 8-803.5(e)(1).

¹⁷⁶ *Id.* § 8-803.5(e)(2)–(3).

¹⁷⁷ MINN. STAT. § 18C.61(a) (2014).

¹⁷⁸ *Id.* § 18C.61(b).

¹⁷⁹ See Miller, *supra* note 164.

¹⁸⁰ *Minnesota Became the 32nd State*, LIBR. CONGRESS, http://www.americaslibrary.gov/jb/reform/jb_reform_minnesota_1.html [http://perma.cc/22Z3-6ERD].

¹⁸¹ N.Y. ENVTL. CONSERV. LAW § 17-2103(3)(a) (McKinney 2014).

¹⁸² See MD. CODE ANN., AGRIC. § 8-803.5(c)(2)(i) (LexisNexis 2015).

Moreover, the statute prohibits application to an impervious surface¹⁸³ and on “any lawn or non-agricultural turf on any real property within twenty feet of any surface water.”¹⁸⁴ This buffer provision does not apply when there is at least ten feet of “continuous natural vegetative buffer” or when it is being applied to a new lawn or nonagricultural turf the first year it is being grown.¹⁸⁵

The final five states pursuant to the previously mentioned 2012 study¹⁸⁶ include: Illinois;¹⁸⁷ New Jersey;¹⁸⁸ Vermont;¹⁸⁹ Washington;¹⁹⁰ and Wisconsin.¹⁹¹ These states have similar bans on application of fertilizer to impervious surfaces.¹⁹² Moreover, Maryland and New York have established a buffer provision along with Illinois,¹⁹³ Michigan,¹⁹⁴ New Jersey,¹⁹⁵ and Vermont.¹⁹⁶

These restrictions are insufficient when it comes to addressing HAB formation. Agriculture and farmland makes up such a large portion of overall property in the United States, and in terms of area, this equates to a larger portion of land in which fertilizers, manure, and chemicals are spread.¹⁹⁷

C. *Alternative Programs*

Some states have used a combination of methods or developed their own means of tackling this issue. For example, Rhode Island enacted the Phosphate Reduction Act of 1995,¹⁹⁸ which essentially placed restrictions on household cleaning products containing certain concentrations of

¹⁸³ N.Y. ENVTL. CONSERV. LAW § 17-2103(3)(b) (McKinney 2014).

¹⁸⁴ *Id.* § 17-2103(3)(c).

¹⁸⁵ *Id.*

¹⁸⁶ See Miller, *supra* note 164.

¹⁸⁷ 415 ILL. COMP. STAT. ANN. 65/5a(a)(2) (West 2014).

¹⁸⁸ N.J. STAT. ANN. § 58:10A-62(a)(2) (West 2016).

¹⁸⁹ VT. STAT. ANN. tit. 10, § 1266b(d)(1) (2016).

¹⁹⁰ WASH. REV. CODE ANN. § 15.54.500(1)(c) (West 2014).

¹⁹¹ WIS. STAT. § 94.643(2)(d) (2014).

¹⁹² See *supra* notes 187–191 and accompanying text.

¹⁹³ 415 ILL. COMP. STAT. ANN. 65/5a(a)(3) (West 2014).

¹⁹⁴ MICH. COMP. LAWS § 324.8512b(6) (2014).

¹⁹⁵ N.J. STAT. ANN. § 58:10A-63(f)(1) (West 2016).

¹⁹⁶ VT. STAT. ANN. tit. 10, § 1266b(d)(3) (2016).

¹⁹⁷ U.S. DEP’T OF AGRIC., NAT’L AGRIC. STATISTICS SERV., 2012 CENSUS OF AGRICULTURE – HISTORICAL HIGHLIGHTS: 2012 AND EARLIER CENSUS 7 (2012), https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_US/st99_1_001_001.pdf [<https://perma.cc/C5FU-FT3L>] (citing the number of farms in the United States as 2,109,303 for a total acreage of 914,527,657 acres).

¹⁹⁸ See 46 R.I. GEN. LAWS § 46-29-1 (2015).

phosphorus.¹⁹⁹ Further, Rhode Island required the state Department of Environmental Management to implement measures to reduce nutrient loading²⁰⁰ by 50% by the year 2008.²⁰¹ These measures include strategies to reduce the amount of nitrogen loaded into local waters.²⁰² The regulations carve out several potential scenarios and state even greater reductions could be achieved with the implementation of best management practices.²⁰³

Iowa as part of the Mississippi River Basin Healthy Watershed Initiative mandated the Department of Agriculture and Land Stewardship²⁰⁴ to establish a voluntary program that minimizes runoff of nitrogen and phosphorus into local waterways.²⁰⁵ This is actually a thirteen-state initiative in partnership with the Natural Resources Conservation Service.²⁰⁶ These states help farmers implement voluntary conservation practices that protect water quality concerns resulting from nutrient loading.²⁰⁷ This program demonstrates not only how widespread water quality concerns are, but it shows that states and the federal government recognize the role of agriculture in causing nutrient loading, and how they can help to reduce it.

Moreover, Florida has taken a unique approach by developing a Harmful Algal Bloom Task Force.²⁰⁸ The purpose behind this task force is to determine research priorities, and make recommendations to the Fish and Wildlife Research Institute regarding detection, prevention, and

¹⁹⁹ 46 R.I. GEN. LAWS § 46-29-3(a) (2015). As previously stated, these restrictions are typically regulated as point sources. *See supra* notes 41–42 and accompanying text. Further, the state of Ohio began regulating phosphorus in household products long before the implementation of Senate Bill 1. OHIO REV. CODE ANN. §§ 6111.10–6111.11 (West 2016).

²⁰⁰ This includes nitrogen, phosphorus, and other nutrients, which could lead to the development of HABs, or hypoxia and eutrophication. 46 R.I. GEN. LAWS § 46-12-2(f) (2014).

²⁰¹ *Id.* *See also* 16-1-10 R.I. CODE R. §§ 440.3C, 440.4C (LexisNexis 2016) (These sections provide a discussion of the impacts of fertilizer runoff from laws and agricultural facilities on the Greenwich Bay and watershed in Rhode Island as part of the administrative regulations that govern the goal of nutrient reduction).

²⁰² 16-1-10 R.I. CODE R. § 440.6(1) (LexisNexis 2016).

²⁰³ 16-1-10 R.I. CODE R. § 440.6A(1) (LexisNexis 2016).

²⁰⁴ IOWA CODE § 161G.1(1) (2015).

²⁰⁵ *See* IOWA CODE § 161G.3 (2015).

²⁰⁶ *Mississippi River Basin Healthy Watershed Initiative*, U.S. DEP'T OF AGRIC., <http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/home/?cid=stelprdb1048200> [<http://perma.cc/A7UA-K28L>].

²⁰⁷ *Id.*

²⁰⁸ *See* FLA. STAT. § 379.2271 (2015).

control of HABs in the state.²⁰⁹ Federal, state, and private contributors fund this program,²¹⁰ with the ultimate goal of attempting to mitigate the effects of HABs.²¹¹ Moreover, the Florida legislature identified nitrogen and phosphorus as being a serious enough problem to warrant research and management of fertilizer use.²¹²

These states have unique and notable programs to fight the formation of HABs and nutrient loading. They focus on research and voluntary best management practices as opposed to direct regulation.²¹³ However, agriculture continues to be left out of the regulatory scheme. Iowa, for example, as part of a multi-state initiative attempts to implement voluntary practices, but states are generally leaving this industry to regulate itself.²¹⁴

D. Ontario, Canada

HABs do not abide by international borders. Countries around the world also struggle with an excess of nutrients in their waterways leading to algal growth.²¹⁵ Canada, as our neighbor, shares many of the same bodies of water with the United States. The United States and Canada first entered into the Great Lakes Water Quality Agreement (GLWQA) in 1972 under President Nixon.²¹⁶ In an updated version of this agreement, Annex 4 targets phosphorus pollution and nutrient loading in the Great Lakes.²¹⁷ This agreement was left to the EPA and Environment Canada to implement.²¹⁸ Congress implemented guidance drafted by the EPA in the federal Clean Water Act, which requires states to achieve certain levels of

²⁰⁹ *Id.* § 379.2271(2)(a)–(d).

²¹⁰ FLA. STAT. § 379.2272(2) (2015).

²¹¹ *Id.* § 379.2272(1)(a).

²¹² FLA. STAT. § 576.045 (2015).

²¹³ *See* §§ 379.2271, 379.2272.

²¹⁴ *See Mississippi River Basin Healthy Watershed Initiative, supra* note 206.

²¹⁵ *See Harmful Algal Blooms*, NAT'L WILDLIFE FED'N, <https://www.nwf.org/Wildlife/Threats-to-Wildlife/Pollutants/Algal-Blooms.aspx> [<http://perma.cc/W54V-ZEY6>].

²¹⁶ *See* Noah D. Hall & Benjamin C. Houston, *Law and Governance of the Great Lakes*, 63 DEPAUL L. REV. 723, 733 (2014).

²¹⁷ Great Lakes Water Quality Agreement, U.S.-Can., Sep. 7, 2012, Annex 4, https://www.ec.gc.ca/grandslacs-greatlakes/A1C62826-72BE-40DB-A545-65AD6FCEAE92/1094_Canada-USA%20GLWQA%20_e.pdf [<http://perma.cc/8GYV-B6XD>]; *see also Western Lake Erie Basin Collaborative Implementation Plan*, OHIO EPA 1 (Feb. 2017) [hereinafter *Implementation Plan*], <http://epa.ohio.gov/Portals/33/documents/WLEBCollaborative.pdf> [<http://perma.cc/TTL2-HGSD>].

²¹⁸ *See* Hall & Houston, *supra* note 216, at 733.

nutrient reduction.²¹⁹ Ohio, Michigan, and the province of Ontario subsequently entered into the Western Basin Collaborative Agreement.²²⁰

As part of the Western Basin Collaborative Agreement,²²¹ Ontario has developed a twelve-point plan for addressing the issue of HABs in the province.²²² Primarily its plan is based on communication and working with states like Ohio and Michigan, with which it shares the Great Lakes.²²³ The goal is to reduce nutrients flowing into the lakes through legislation and regulation, scientific innovation, and investments in drinking water and public health protection.²²⁴ Ontario's response plan is very comprehensive, and it addresses agriculture.²²⁵ The province has spent billions of dollars in attempts to combat HABs, and the Ministry of the Environment and Climate Change prioritizes public health and environmental safety.²²⁶ As part of its comprehensive plan, Ontario relies on regulatory and legislative tools to protect water quality.²²⁷ For example, regulations promulgated under the Nutrient Management Act²²⁸ state that farms of certain sizes are specifically required to make nutrient management plans.²²⁹ These plans are designed to protect water quality and prevent nutrient loading.²³⁰ Therefore, our neighbors to the north have taken significant steps towards regulating agriculture in order to prevent water pollution and HABs.

²¹⁹ *Implementation Plan*, *supra* note 217, at 3–4, 13.

²²⁰ *Id.* at 1 (“The Collaborative is intended to advance efforts toward the proposed nutrient reduction targets put forth in the Great Lakes Water Quality Agreement (GLWQA). . . . The Collaborative will focus on the western basin watersheds of the Maumee, Portage, and Toussaint rivers and the Sandusky River. The GLWQA through the Domestic Action Plan will include the Central Basin tributaries of the Huron and Cuyahoga rivers . . .”).

²²¹ This agreement will be discussed in greater detail in Part V, *infra*, in relation to how Ohio Senate Bill 1 was born.

²²² Glen Murray, *Blue-Green Algae*, MINISTRY ENV'T & CLIMATE CHANGE, <http://www.ontario.ca/page/blue-green-algae> [<http://perma.cc/9AVY-3ZU4>].

²²³ *Id.*

²²⁴ *Id.*

²²⁵ *Id.*

²²⁶ *Id.*

²²⁷ *Id.*

²²⁸ Nutrient Management Act, S.O. 2002, c 33 (Can.).

²²⁹ Nutrient Management, O. Reg. 267/03 (Can.).

²³⁰ Nutrient Management Act, S.O. 2002, c 33 (Can.).

E. How Are the State Provisions Enforced?

The state statutes provide little about how these restrictions are enforced. For example, in the state of Wisconsin, if someone is found to have violated the restrictions on the use and sale of fertilizer containing phosphorus, they must pay a minimal monetary fine.²³¹ The first violation will cost the responsible party not more than \$50, and the second violation can cost no less than \$200 but no more than \$500.²³² However, the statute mentions nothing about who is responsible for reporting these violations, or how a violator is identified.²³³

In Minnesota, local government enforces the use restrictions, and violations are only considered petty misdemeanors.²³⁴ Local government authority and the ability to enforce the regulations vary with great degree. For example, in Washington County on the outskirts of Minneapolis, any individual may report an environmental problem on the local county website.²³⁵

In the state of South Carolina, if a person violates the restrictions on the sale of household items containing phosphorus, they will only receive a written warning for the first violation, and will be charged with a misdemeanor for subsequent violations.²³⁶ Subsequent violations can carry fines and jail time.²³⁷ The Department of Health and Environmental Control enforces violations,²³⁸ and because the restrictions apply to manufacturers and distributors, they may be easier to enforce than the restrictions that apply specifically to consumers.

In general, the penalties are minimal, and it is difficult to see how states will be able to force homeowners into compliance.²³⁹ Threat of enforcement is low and, therefore, the incentive to comply is minimal.²⁴⁰

²³¹ WIS. STAT. § 94.643(5) (2014).

²³² *Id.*

²³³ *See id.*

²³⁴ MINN. STAT. § 18C.62 (2014).

²³⁵ *Environmental Services*, WASH. COUNTY MINN., <https://www.co.washington.mn.us/index.aspx?NID=603> [<http://perma.cc/2XHW-89BD>] (This is meant to serve as an example of how little information there is about local government enforcement measures. As far as can be discerned, any individual may report a violation and then the local government would check it out.).

²³⁶ S.C. CODE ANN. § 44-53-50(E) (2014).

²³⁷ *Id.*

²³⁸ *Id.* § 44-53-50(D) (2014).

²³⁹ Catherine Janasie, *State Fertilizer Bills: The Greenest Way to a More Natural Landscape?*, 13 RUTGERS J.L. & PUB. POL'Y 1, 42 (2015) (finding homeowners are not likely to be incentivized by penalties in light of the fact states are reluctant to enforce them).

²⁴⁰ *Id.*

Moreover, these state restrictions have had varying success. For example, a Minnesota study was conducted in 2007 in response to the state's phosphorus lawn fertilizer law.²⁴¹ Researchers reported an overall decrease in the use of lawn fertilizer, but stated the law was essentially unenforced.²⁴² As states begin to assess the impact of these restrictions, they are likely to come to similar conclusions.

The methods these states have employed have had varying success in combating excess nutrients. In summary, states take a variety of approaches to regulating products with phosphorus and fertilizer spreading. Of the five states mentioned that restrict lawn fertilizer application, all five restrict application on "turf."²⁴³ Their definitions of turf differ; some include golf courses, which are notorious for using a lot of fertilizer.²⁴⁴ However, all of them exempt agriculture.²⁴⁵

Next, when looking at states that employ timing and application restrictions, eight of those discussed prohibit application of fertilizers on impervious surfaces.²⁴⁶ These are surfaces where the fertilizer could not be absorbed and will be the most likely to runoff into local waterways after a heavy rain.²⁴⁷ Moreover, six states require a buffer zone, where fertilizer cannot be spread within a certain distance from the water.²⁴⁸

V. OHIO SENATE BILL 1

Ohio is working diligently to solve the HAB problem. However, it is a multifaceted environmental and health issue that depends heavily on government's ability to regulate agriculture. Some scholars believe the unique nature of agricultural regulation requires "approaches that may be outside the box of conventional environmental law."²⁴⁹ There is, and has been, a recognized need for stricter regulation regarding nitrogen and phosphorus pollution in waterways in and around Ohio.²⁵⁰ So, Ohio has

²⁴¹ *Effectiveness of the Minnesota Phosphorus Lawn Fertilizer Law*, MINN. DEP'T AGRIC. 1, <http://consensus.fsu.edu/fertilizer-task-force/pdfs/07phoslawrptsumm1.pdf> [<http://perma.cc/Z6EB-VP6W>].

²⁴² *Id.*

²⁴³ *See supra* Section IV.A.

²⁴⁴ *See supra* Section IV.A.

²⁴⁵ *See supra* Section IV.A.

²⁴⁶ *See Miller, supra* note 164.

²⁴⁷ *See id.*

²⁴⁸ *See id.*

²⁴⁹ Ruhl, *supra* note 33, at 271.

²⁵⁰ *See Western Basin of Lake Erie Collaborative Agreement*, June 13, 2015 [hereinafter *Collaborative Agreement*], <http://www.michigan.gov/documents/snyder/>

(continued)

attempted to take a so-called outside of the box approach by enacting Senate Bill 1.²⁵¹ Supporters claim the ability of the bill to “balance[] clean water and food production” will allow it to be successful while not placing an unbearable regulatory burden on farmers.²⁵²

Before Senate Bill 1 was introduced and passed, Ohio mostly relied on voluntary participation in pollution reduction programs.²⁵³ Farmers were asked to either enroll in programs or follow certain measures to aid in pollution control and reduction.²⁵⁴ This included cost-sharing programs to help farmers implement “Best Management Practices.”²⁵⁵ If followed, these Best Management Practices could potentially allow farmers to be eligible for state and federal funding to “alleviate burdens associated with [their] practice.”²⁵⁶ However, environmental groups in the state have recognized that voluntary actions alone are not enough to curb water pollution stemming from agricultural runoff.²⁵⁷ There was a need to go

Western_Basin_of_Lake_Erie_Collaborative_AgreementLieutenant_Governor_491709_7.pdf [http://perma.cc/A7D3-FKXB].

²⁵¹ See Sub. S.B. 1, 131st Gen. Assemb. (Ohio 2015), <https://www.legislature.ohio.gov/legislation/legislation-documents?id=GA131-SB-1> [http://perma.cc/AZ3L-47HK].

²⁵² Graves, *supra* note 19.

²⁵³ See OHIO DEP’T OF AGRIC., DIV. OF SOIL & WATER CONSERVATION, OHIO’S AGRICULTURE POLLUTION ABATEMENT PROGRAM: PROTECTING OUR SOIL AND WATER RESOURCES, [hereinafter POLLUTION ABATEMENT PROGRAM], http://soilandwater.ohiodnr.gov/portals/soilwater/pdf/soil/Pollution_Abatement.pdf [http://perma.cc/N2WT-HDM7].

²⁵⁴ *Id.*

²⁵⁵ *Id.* Best Management Practices are those methods or practices that are deemed “technically sound” and successfully achieve a measure of water quality control. National Menu of Best Management Practices (BMPs) for Stormwater, U.S. ENVTL. PROTECTION AGENCY, <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu> [https://perma.cc/FRY9-NCBA]. In other words, these practices are shown to reduce water pollution. *Id.* They include a variety of practices such as public outreach and education. *Id.*

²⁵⁶ See POLLUTION ABATEMENT PROGRAM, *supra* note 253.

²⁵⁷ Adam Rissien, *Testimony on Senate Bill 1 “Clean Lake Erie Bill,”* OHIO ENVTL. COUNCIL (Feb. 4, 2015), <http://www.theoec.org/sites/default/files/Ohio%20Environmental%20Council%20Senate%20Bill%201%20Testimony%20for%20Feb.%204rd%20Hearing.pdf> [http://perma.cc/VZV8-QRJF]. For example, Adam Rissien, the Agricultural & Water Policy Director of the Ohio Environmental Council has stated:

While the [Ohio Environmental Council] certainly supports and applauds voluntary actions, Ohio cannot rely on them alone to prevent another water crisis or prevent toxic algae from once again threatening Ohio’s shoreline communities and Lake Erie’s \$12.9 billion tourism industry. We need stronger laws to protect us from harmful algal blooms and the deadly toxins they produce.

beyond voluntary compliance and implement direct regulation of agriculture.

In response to this need, the governors of Ohio, Michigan, and Ontario signed the Western Basin Collaborative Agreement in 2015.²⁵⁸ This agreement is designed to achieve a reduction in phosphorus entering Lake Erie's western basin.²⁵⁹ The ultimate goal is to reduce the phosphorus load by 40% by the year 2025 with an interim goal of 20% by 2020.²⁶⁰ This agreement targets phosphorus because of its connection to HAB production.²⁶¹ Data from the year 2008 will be a baseline by which to measure progress.²⁶² As part of the agreement, each state is responsible for developing and implementing a plan to achieve this phosphorus reduction goal.²⁶³ Senate Bill 1 is Ohio's plan for carrying out the goals set forth in the collaborative agreement.²⁶⁴

A. Substantive Provisions of Ohio Senate Bill 1

Ohio Senate Bill 1 adds several new sections to the Ohio Revised Code.²⁶⁵ One key feature of the legislation is that it only applies to all or part of twenty-four counties in the northwestern region of the state of Ohio.²⁶⁶ The bill is designed to govern the application of fertilizer and allow the Director of Agriculture to "administer and enforce" the provisions.²⁶⁷ This bill defines fertilizer as one that specifically contains phosphorus *or* nitrogen.²⁶⁸ Further, separate codified sections of the Ohio Revised Code limit surface application of manure.²⁶⁹

The bill not only limits application of fertilizer and manure, it contains provisions that address sewage sludge as well as monitoring public

²⁵⁸ Collaborative Agreement, *supra* note 250.

²⁵⁹ *Id.*

²⁶⁰ *Id.*

²⁶¹ *Id.*; Kozacek, *supra* note 24.

²⁶² Collaborative Agreement, *supra* note 250.

²⁶³ *Id.*

²⁶⁴ *See* Kozacek, *supra* note 24.

²⁶⁵ *See supra* note 21 and accompanying text.

²⁶⁶ Peggy Hall & Glen Arnold, *Senate Bill 1*, C.O.R.N. NEWSLETTER (Agronomic Crops Network, Ohio State Univ.), July 2015, <http://agcrops.osu.edu/newsletter/corn-newsletter/2015-07/senate-bill-1> [<http://perma.cc/PS9D-W72Z>]. Counties included in the bill are: Williams, Fulton, Lucas, Ottawa, Defiance, Henry, Wood, Sandusky, Paulding, Putnam, Hancock, Van Wert, Allen and Wyandot. As well as parts of Mercer, Erie, Seneca, Crawford, Hardin Auglaize, Marion, Shelby, Richland and Huron counties. *Id.*

²⁶⁷ Grim, *supra* note 20, at 6.

²⁶⁸ *Id.*

²⁶⁹ *See* OHIO REV. CODE ANN. § 939.08 (West 2016).

treatment works for phosphorus, and material dredged from Lake Erie.²⁷⁰ It further emphasizes a “Healthy Lake Erie Fund” and appoints a “Harmful algae management and response coordinator.”²⁷¹ Some of these provisions expand on protocols already in place.²⁷² Together, these provisions have made a comprehensive state bill that is tackling many sources of phosphorus pollution.

1. Fertilizer

Ohio Senate Bill 1 has many substantive pieces that fit into one regulatory framework. Fertilizer has been identified as being high in nitrogen and phosphorus,²⁷³ making fertilizer a sensible product to regulate when attempting to mitigate the formation of HABs. Senate Bill 1 prohibits the application of surface fertilizer if one of these circumstances occurs: (a) it is applied to snow-covered or frozen soil; (b) there is two inches of soil saturated with water; or (c) there is a greater than 50% chance of precipitation within twelve hours.²⁷⁴ The third prohibition, (c), specifies no one is able to apply fertilizer in granular form when there is a chance of precipitation.²⁷⁵ However, these limitations do not apply if the fertilizer is being: (a) injected; (b) incorporated into the soil within twenty-four hours of being applied; or (c) it is applied on a growing crop.²⁷⁶ As the exceptions suggest, farmers can continue to apply fertilizer. There is only a short list of prohibitions and restrictions and a myriad of exceptions.

Moreover, injection is a method of applying fertilizer where it is injected into the soil near the roots of the plant.²⁷⁷ This method appears to be an environmental design standard, which is a regulatory strategy for

²⁷⁰ Sub. S.B. 1, 131st Gen. Assemb. (Ohio 2015).

²⁷¹ *See id.*

²⁷² *See infra* Section V.C. Section V.C. briefly discusses these other provisions and why they are significant.

²⁷³ *See Estimated Animal Agriculture Nitrogen and Phosphorus from Manure*, U.S. ENVTL. PROTECTION AGENCY [hereinafter *Estimated Animal Agriculture*], <http://www.epa.gov/nutrient-policy-data/estimated-animal-agriculture-nitrogen-and-phosphorus-manure> [<http://perma.cc/8L9Y-8ALH>].

²⁷⁴ OHIO REV. CODE ANN. § 905.326(A)(1)(a)–(b), (A)(2) (West 2016).

²⁷⁵ *Id.*

²⁷⁶ *Id.* § 905.326(B)(1)–(3).

²⁷⁷ Bernd Niemoeller et al., *Injection of Liquids into the Soil with a High Pressure Jet*, 13 AGRIC. ENGINEERING INT’L: CIGR J. 1 (2011), <http://www.cigrjournal.org/index.php/Ejournal/article/view/1458> [<http://perma.cc/MX5N-88H7>].

achieving environmental goals.²⁷⁸ Injection is most commonly used with nitrogen fertilizers.²⁷⁹ Further, the hallmark of this process is that it is safe from being washed away by rain unlike traditional fertilizer applied to the surface.²⁸⁰ In looking forward, it will be interesting to see whether injection technology is the solution to the fertilizer problem, or if it creates new environmental and public health problems of its own.

2. Manure

Manure spreading is also restricted under Ohio Senate Bill 1.²⁸¹ Animal manure has a high concentration of nitrogen and phosphorus, and is a major contributor to water pollution.²⁸² These nutrients often flow into surface water or are infiltrated into ground water and can negatively impact water quality.²⁸³ Manure is present in high concentrations on farms, especially animal operations, so this implicates the agricultural industry.

Much like the provisions governing fertilizer application and spreading in Senate Bill 1, persons are prohibited from spreading manure in the western basin if: (1) there is snow on the ground or the soil is frozen; (2) there is two inches of wet soil from precipitation; or (3) there is a greater than 50% chance of rain that could possibly exceed 1.5 inches within twenty-four hours.²⁸⁴ These prohibitions work to protect nutrients in manure from entering waterways and contributing to HAB formation.

3. Exceptions and Exemptions

The restrictions established by Senate Bill 1 are whittled away by exceptions and exemptions imbedded in the legislation. The prohibitions already only apply to a subset of the state—the western basin—but further exemptions and exceptions apply.²⁸⁵ As expansive as this bill appears to be, certain facilities are still excluded from restrictions. If the farmer has

²⁷⁸ See Dennis D. Hirsch, *Globalization, Information Technology and Environmental Regulation: An Initial Inquiry*, 20 VA. ENVTL. L.J. 57, 62 (2001) (“Design standards prescribe a specific pollution control approach for all plants within a given industry.”).

²⁷⁹ Niemoeller et al., *supra* note 277, at 1.

²⁸⁰ *Id.*

²⁸¹ Grim, *supra* note 20, at 7; OHIO REV. CODE ANN. § 1151.10(A)–(D) (West 2016).

²⁸² See *Estimated Animal Agriculture*, *supra* note 273.

²⁸³ *Id.*

²⁸⁴ OHIO REV. CODE ANN. § 939.08(A)(1)–(3) (West 2016).

²⁸⁵ See Hall & Arnold, *supra* note 266.

been issued a livestock manager certificate, or has been certified to apply manure by the director of agriculture, the farmer is exempted from the restrictions set forth in the chapter.²⁸⁶ Manure and fertilizer, although slightly different in application, are generally subject to the same stated restrictions and exemptions.²⁸⁷

Moreover, a person is prohibited from applying granular fertilizer if there is possible precipitation, but there are exceptions if fertilizer is injected, incorporated within twenty-four hours into the soil, or is being used for crops.²⁸⁸ These same general requirements and exceptions apply if someone attempts to spread surface manure.²⁸⁹ It is obvious the legislature intended to prevent the possibility the fertilizer will runoff the land into the water. This demonstrates that Ohio is working diligently to regulate agriculture. However, the numerous exemptions granted to farmers suggests the legislature is potentially using too light a hand.

B. Enforcement

When a state chooses to regulate pollution from agricultural runoff, it usually employs one of three techniques: (1) programs that incentivize farms with state financial assistance; (2) trading programs that operate similar to federal programs; or (3) direct regulation.²⁹⁰

Senate Bill 1 employs a direct regulatory technique. The Ohio Department of Natural Resources has control over the enforcement process.²⁹¹ Enforcement depends on interested parties filing a complaint.²⁹² Therefore, if someone suspects a violation, they can contact

²⁸⁶ OHIO REV. CODE ANN. § 903.40(A)(1)–(2) (West 2016).

²⁸⁷ Grim, *supra* note 20, at 7.

²⁸⁸ OHIO REV. CODE ANN. § 905.326(B)(1)–(3) (West 2016).

²⁸⁹ § 939.08(A), (B).

²⁹⁰ Angelo & Morris, *supra* note 71, at 1018. Direct regulation includes the implementation of Best Management Practices (BMPs). *Id.*

To date, most states have relied heavily upon BMPs, either through direct imposition or voluntary programs that incentivize the use of BMPs. In recent years, some states have experimented with using water quality trading programs as a way to further reduce water quality degradation from agricultural run-off. These approaches, as implemented, have met with very limited success.

Id.

²⁹¹ *Summary of SB 1*, OHIO FARM BUREAU, https://ofbf.org/app/uploads/2015/04/Summary_of_Senate_Bill_1.pdf [<https://perma.cc/52MP-T3UA>].

²⁹² Graves, *supra* note 19.

the Ohio Department of Agriculture or the Ohio Department of Natural Resources to report it.²⁹³ If a violation is found, an inspection and an administrative hearing can ultimately result in up to a \$10,000 fine for each violation.²⁹⁴

If the Director of Agriculture receives a complaint that someone has potentially violated restrictions on surface application of manure, the Department of Natural Resources is permitted to do a reasonable investigation of the claim.²⁹⁵ If someone violates the prohibitions outlined for both manure and fertilizer, they can be assessed a civil penalty.²⁹⁶ However, they must first be given an option for an administrative hearing.²⁹⁷ Each day a person is found to have acted in violation of the statutory requirements, is deemed to be a separate violation for purposes of the civil penalty.²⁹⁸

This high price tag on violations could serve as a massive incentive for farmers to comply. However, supporters such as the Ohio Farm Bureau have expressed their opinion that compliance with the regulations should not be particularly challenging.²⁹⁹ Further, the enforcement process begins with a complaint.³⁰⁰ Because the process is complaint driven, enforcement depends heavily on people caring enough to report violations, or even knowing that someone is in direct violation of the fertilizer and manure restrictions. Without that key first step, no administrative proceedings will take place and enforcement will be theoretically nonexistent.

C. Other Provisions

Ohio Senate Bill 1 contains many provisions that are designed to combat HABs and excess nutrients.³⁰¹ It also calls for measures such as monitoring the amount of phosphorus in public treatment works, a Healthy Lake Erie fund, and a harmful algae management and response

²⁹³ *Id.*

²⁹⁴ OHIO REV. CODE ANN. § 905.327(C)–(D) (West 2016).

²⁹⁵ OHIO REV. CODE ANN. § 905.326(C) (West 2016).

²⁹⁶ OHIO REV. CODE ANN. § 905.327(A) (West 2016).

²⁹⁷ *Id.*

²⁹⁸ *Id.* § 905.327(C).

²⁹⁹ Graves, *supra* note 19.

³⁰⁰ *Id.*

³⁰¹ OHIO ENVTL. PROTECTION AGENCY, PUBLIC WATER SYSTEM HARMFUL ALGAL BLOOM RESPONSE STRATEGY 9 (July 2016), http://epa.ohio.gov/Portals/28/documents/habs/PWS_HAB_Response_Strategy.pdf [<https://perma.cc/6MFL-XHWT>].

coordinator.³⁰² These provisions demonstrate Ohio's dedication to nitrogen and phosphorus reduction in the western basin of Lake Erie. Further, it brings together multiple government agencies and state departments to work together towards completing a two-fold goal: eliminating future HABs and maintaining the health of Ohio's lakes and waterways.

For example, the Healthy Lake Erie Fund was established in 2012 in response to growing environmental and economic concerns due to the HABs.³⁰³ The fund has helped farmers in the western basin implement "agricultural nutrient reduction practices" on more than 35,000 acres since April 2013.³⁰⁴ Ohio Senate Bill 1 adds a new fiscal provision to this fund.³⁰⁵ Now the money is to be appropriated for conservation measures in the western basin of Lake Erie.³⁰⁶ These measures include soil testing, crop cover, and abating animal waste.³⁰⁷

The harmful algae management and response provisions require that the director of the Environmental Protection Agency will coordinate the response team.³⁰⁸ This team consists of members from the Ohio EPA, Department of Agriculture, Health, and Natural Resources, representatives from local government, and publicly owned treatment works.³⁰⁹ This group is required to develop action plans for reducing instances of HABs and to manage nutrient loading in the lake.³¹⁰

Ohio Senate Bill 1 establishes several prohibitions, and furthers state programs designed to mitigate the amount of nitrogen and phosphorus entering local waterways.³¹¹ The object is to ultimately reduce the instance of HABs.³¹² These blooms have become a human health, environmental, and economic concern for the state as they continue to occur and appear.³¹³

³⁰² See *supra* Section V.A.

³⁰³ TASK FORCE II, *supra* note 46, at 8.

³⁰⁴ *Id.*

³⁰⁵ OHIO LEGISLATIVE SERV. COMM'N, FISCAL NOTE & LOCAL IMPACT STATEMENT: S.B. 1, at 3 (Mar. 31, 2015), <https://www.legislature.ohio.gov/download?key=2907&format=pdf> [<http://perma.cc/XVR8-HNWS>].

³⁰⁶ *Id.*

³⁰⁷ Grim, *supra* note 20, at 13.

³⁰⁸ *Id.* at 13–14. See also OHIO REV. CODE ANN. § 3745.50(A), (B) (West 2014).

³⁰⁹ *Id.* § 3745.50(B).

³¹⁰ *Id.* § 3745.50(B), (C).

³¹¹ Peggy Kirk Hall, *Ohio Senate Approves Agricultural Nutrient Management Bill*, AGRIC. L. & TAX'N, OHIO ST. U. (Jan. 24, 2014), <http://aglaw.osu.edu/blog/fri-01242014-1326/ohio-senate-approves-agricultural-nutrient-management-bill> [<https://perma.cc/X5MR-X265>].

³¹² Jackie Borchardt, *Bill Targeting Lake Erie Algal Blooms Passes Ohio Senate*, CLEVELAND.COM (Feb. 18, 2015, 2:38 PM), <http://www.cleveland.com/open/index.ssf>

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VI. WHERE TO GO FROM HERE: RECOMMENDATIONS

It is clear that Ohio and other states are taking strategic steps to combat HABs and water pollution.³¹⁴ Preventing excess nutrients like nitrogen and phosphorus from entering local waterways is a top environmental, social, and economic priority throughout the country.³¹⁵ Agriculture is such a unique and ancient industry, and it has historically been difficult to regulate by environmental law.³¹⁶ Some scholars suggest there is a duty of stewardship attached to farming and using land for agricultural purposes, going as far as to say “[if] farmers adopt new practices to protect the environment, the negative environmental effects creating public pressure to regulate agriculture should subside.”³¹⁷ Over time it appears that farmers have taken great pride in stewardship of their land; however, the presence of HABs and agricultural water pollution suggest we have lost sight of the importance of stewardship as it relates to clean water.

Ohio has purposefully attempted to regulate agriculture and farmers through the enactment of Senate Bill 1. As a state, Ohio recognized this powerful industry contributes greatly to the local economy but also uses a substantial amount of fertilizer.³¹⁸ This fertilizer, in turn, contains high levels of nitrogen and phosphorus.³¹⁹ These chemicals then run off into the water and contribute to the formation of HABs.³²⁰ Ohio and other states have taken similar and yet very different approaches to this problem.³²¹

/2015/02/bill_targeting_lake_erie_algal_blooms_passes_ohio_senate.html
[<https://perma.cc/Z5NL-8PKX>].

³¹³ *Harmful Algal Blooms*, OHIO DEP’T HEALTH (June 10, 2016), <https://www.odh.ohio.gov/odhprograms/eh/HABs/algalblooms.aspx> [<https://perma.cc/S68L-MB75>].

³¹⁴ See *supra* Parts IV, V.

³¹⁵ See *supra* notes 111–12 and accompanying text.

³¹⁶ See Ruhl, *supra* note 33, at 267–70 and text accompanying note 85.

³¹⁷ See Hamilton, *supra* note 94, at 239.

By merging economics and environmental stewardship, sustainable agriculture holds great potential for the United States. It may offer a way to reduce the tension between the environmental community and the farm sector, and help preserve consumer confidence in the quality of our food. It may provide a basis for justifying continued public funding of agricultural programs.

Id.

³¹⁸ See *supra* notes 91–93 and accompanying text.

³¹⁹ *The Sources and Solutions: Agriculture*, *supra* note 74.

³²⁰ See TASK FORCE II, *supra* note 46.

³²¹ *Id.*

States have taken a variety of approaches to mitigating the impacts of HABs.³²² Some states have relied on a common method known as a “use restriction”³²³ These limitations restrict certain applications of fertilizers during certain times and on certain surfaces.³²⁴ The hallmark of these limitations is they generally do not apply to the agriculture industry.³²⁵

Similarly, Ohio Senate Bill 1 incorporates use limitations, although with a slight variation. This bill places restrictions on timing and application of fertilizer and manure.³²⁶ Contrary to the limitations states like Michigan, Wisconsin, and Minnesota have put in place, Ohio does not limit the spreading of fertilizer on grassy surfaces like “turf.”³²⁷ These states have declared that fertilizer should not be spread on certain surfaces, whereas Ohio limits surface application during certain times of year and under certain conditions like expected rain.³²⁸ Ohio’s limitations are generally focused on agriculture.³²⁹ Further, in contrast to many states, Ohio does not establish buffer provisions that would prevent spreading near water.³³⁰ These restrictions place an extra protection, an extra buffer if you will, between excess nutrients and the water.

Moreover, Ohio places prohibitions on spreading manure as well as fertilizer.³³¹ Other states have yet to address manure as a potential source of phosphorus and therefore a contributor to nutrient loading. It is reasonable to assume, however, that states would not begin to regulate manure considering they have yet to regulate pollution from agriculture as a whole.

This demonstrates Ohio’s primary weakness when combating water pollution problems arising from excess nutrients. Ohio limits application of these restrictions to only a few counties, whereas other states do not

³²² See *supra* Part IV.

³²³ See *supra* Section IV.A.

³²⁴ See *supra* Section IV.A.

³²⁵ See, e.g., MICH. COMP. LAWS § 324.8501(dd) (2016) (“Turf means land, including residential, commercial, or industrial property, golf courses, or publicly owned land, that is planted in closely mowed, managed grass, *except* land used in the operation of a commercial farm.”) (emphasis added).

³²⁶ See OHIO REV. CODE ANN. § 905.326(A)(1)(a)–(b), (A)(2) (West 2016); OHIO REV. CODE ANN. § 1151.10(A)–(D) (West 2016).

³²⁷ Compare *supra* Section IV.A (states regulate application of fertilizers on “turf” but tend to exclude agricultural operations), with *supra* Section V.A (Ohio is more specific with spreading requirements).

³²⁸ Compare *supra* Sections IV.A, IV.B, with *supra* notes 274, 284 and accompanying text.

³²⁹ See *supra* Part V.

³³⁰ See *supra* Section IV.B.

³³¹ OHIO REV. CODE ANN. § 939.08 (West 2014); *supra* Section V.A.2.

differentiate.³³² Lake Erie may have been the primary focus at the time the legislature was considering Senate Bill 1. However, this problem is pervasive and it is reasonable to believe Senate Bill 1 may have more force if applied across the state.

A major challenge presented by Ohio Senate Bill 1 and other state legislation is enforcement. Enforcement proves difficult because of lack of resources and lack of information by the public.³³³ For example, those who are found to be in violation with the use restrictions in Minnesota are only guilty of a “petty misdemeanor.”³³⁴ Other states have minor fines, and written warnings but the statutes do not really specify who enforces them or how someone could be found in violation.³³⁵ Enforcement through Senate Bill 1 is purely based on good faith actors. There is a complaint driven, peer-enforcement process.³³⁶ The only way it is going to get enforced is if someone sees a violation and reports it.³³⁷

However, there is a principle in environmental law known as the “precautionary principle.”³³⁸ This explains that it is better to be proactive and precautionary by implementing regulation, than reactionary and waiting to regulate until necessary.³³⁹ Here, regulation is clearly necessary, so maybe, it is better to have *some* regulation in the form of the current legislation, than to not have any regulation at all. Even though enforcement is challenging and quite possibly ineffective, it is better to attempt to change behavior than to wait until it is too late.

Ohio Senate Bill 1 is a new attempt at legislating against pollution, and only time will tell what its impacts will be. Other states have yet to enact provisions that are as restrictive to agriculture as Ohio. Even supporters of

³³² Compare *supra* Sections IV.A, and IV.B, with note 266 and accompanying text.

³³³ See Janasie, *supra* note 239, at 51 (“[S]tates must be more willing to enforce against individuals, both by making enforcement more efficient and by providing higher penalties for individual [violators]. States should encourage local governments or community groups to increase enforcement. Further, states should think of ways to incentivize compliance . . .”).

³³⁴ *Supra* note 234 and accompanying text.

³³⁵ See, e.g., *Effectiveness of the Minnesota Phosphorus Lawn Fertilizer Law*, *supra* note 241.

³³⁶ See Graves, *supra* note 19.

³³⁷ *Id.*

³³⁸ See Frank B. Cross, *Paradoxical Perils of the Precautionary Principle*, 53 WASH. & LEE L. REV. 851, 851 (1996) (“The precautionary principle simply reflects the classic adage: Better safe than sorry.”).

³³⁹ See *id.*; Janasie, *supra* note 239, at 45–46.

Ohio Senate Bill 1 recognize the need for the provisions to be expanded.³⁴⁰ If other states are going to follow suit, they will likely want to bolster provisions like those in Senate Bill 1 and tailor them to their own interests.

Moreover, Ohio Senate Bill 1 only applies to certain counties in the western basin; it does not apply to the entire state whereas legislation in other states is all encompassing and applies to all consumers, manufacturers, or whatever the relevant target group may be.³⁴¹ The specific counties in the western basin do have a high concentration of farms and land used for agricultural purposes, and their proximity to Lake Erie leads to a conclusion that they are the only ones who should be regulated. This is a logical fallacy. There are HABs in lakes and rivers *around the state*.³⁴² Moreover, the Ohio River Valley, which is outside the western basin, contains an abundance of land for agriculture, and the number of farms has consequently lead to HABs forming in the Ohio River due to nutrient loading.³⁴³

Testimony by the Ohio Environmental Council for Senate Bill 1 in early 2015 drew attention to this issue.³⁴⁴ It stated that spreading fertilizer and manure laden with nitrogen and phosphorus has the ability to impact all of Ohio's waterways, not just Lake Erie or those in the western basin.³⁴⁵ This is supported by research conducted by the Ohio EPA.³⁴⁶

³⁴⁰ See, e.g., Rissien, *supra* note 25 (“Of course more needs to be done to reduce Lake Erie’s nutrient pollution, both by municipalities as well as by agricultural producers in the Maumee River watershed.”).

³⁴¹ *Supra* note 266 and accompanying text; OHIO REV. CODE ANN. § 905.326(E) (West 2016).

³⁴² See *supra* notes 15–19 and accompanying text.

³⁴³ Michael Wines, *Toxic Algae Outbreak Overwhelms a Polluted Ohio River*, N.Y. TIMES (Sep. 30, 2015), http://www.nytimes.com/2015/10/01/us/toxic-algae-outbreak-overwhelms-a-polluted-ohio-river.html?_r=0 [<http://perma.cc/4WV8-M8PU>]; *supra* Section II.B.

³⁴⁴ See Rissien, *supra* note 257.

³⁴⁵ *Id.*

Since the Toledo water crisis, and even before, it has been widely accepted that agricultural pollution is a major source of toxic algae outbreaks in Lake Erie, as well as in several of Ohio’s inland lakes.

....

If spreading manure and applying fertilizer in the specified circumstances is bad for watersheds in the western Lake Erie basin, it is also bad for all of Ohio’s streams and lakes.

Id. at 1–2.

³⁴⁶ See *Ohio Board of Regents Funding Tackles Harmful Algal Blooms: A Coordinated Statewide Effort*, OHIO SEA GRANT (May 18, 2015, 12:00 PM), <https://ohioseagrant.osu.edu>

(continued)

Further, the presence of algae blooms inland, away from the western basin show the problem is not strictly limited to a specific area of the state.³⁴⁷ HABs were also discovered in other lakes around the state,³⁴⁸ which prompted the Ohio EPA to determine the cause.³⁴⁹ As far back as 2010, signs were posted at sixteen lakes throughout the state warning swimmers of HABs.³⁵⁰ Forty-four people statewide had reported symptoms health officials believed could have been caused by algae blooms.³⁵¹ Further, these potentially infected lakes spanned the state from Lake Erie to Shawnee State Park outside of Cincinnati.³⁵²

Ohio Senate Bill 1 has meaningful support in the agricultural community.³⁵³ The fact that it has been so well received alludes to the idea this is a better-case scenario for farmers. It prevents the enactment of more stringent regulation on agriculture. Agriculture has always been a challenging industry to regulate. Now that Ohio has proactively acted to restrict farmers and agricultural practices, they are not pushing back. Many believe the bill balances the interest of agriculture while still prioritizing clean water and reducing instances of HABs.³⁵⁴

It is challenging to evaluate each statute and determine which state is *better* in the sense it is more protective of environmental and human health as well as the rights of farmers. Each state has the same problem as the

/news/2015/qmh1k/Ohio-BOR-HABs [http://perma.cc/V4TU-SMN8] (leaders from all over the state have come together to tackle this problem showing it is a crisis that plagues more than just the western basin).

³⁴⁷ Jessica White, *State Issues Toxic Algae Warning for Buckeye Lake*, COLUMBUS DISPATCH (June 5, 2014), <http://www.dispatch.com/content/stories/local/2014/06/04/Algae-warnings-issued-for-Buckeye-Lake.html> [http://perma.cc/5MQL-79V5]. In 2014, it was the fourth straight summer that algae blooms were found in Buckeye Lake, located in Newark, Ohio. *Id.* Newark is located in the eastern portion of the state and not included in the western basin. See Hall & Arnold, *supra* note 266.

³⁴⁸ See, e.g., *St. Mary's Algae Likely Sickened 7, State Says*, COLUMBUS DISPATCH (Sep. 10, 2010, 2:35 PM), <http://www.dispatch.com/content/stories/local/2010/09/09/st--marys-algae-likely-sickened-7-state-says.html> [http://perma.cc/8YHS-TUWK] (discussing the toxic blue-green algae found in Grand Lake St. Marys in western Ohio).

³⁴⁹ Jordan Hoewischer, *On-Farm Nutrient Management to Improve Water Quality*, OHIO FARM BUREAU 9, http://www.ohiowea.org/docs/Hoewischer_On-Farm_Nutrient.pdf [http://perma.cc/34LS-4SWY].

³⁵⁰ See *St. Mary's Algae Likely Sickened 7, supra* note 348.

³⁵¹ See *id.*

³⁵² See *id.*

³⁵³ See Graves, *supra* note 19 (discussing support of the bill by the Ohio Farm Bureau).

³⁵⁴ *Toledo Blade: Gov. Kasich Signs Algae Bill into Law*, ENVTL. L. & POL'Y CTR. (Apr. 3, 2015), <http://elpc.org/issues/climate-change/toledo-blade-gov-kasich-signs-algae-bill-into-law> [https://perma.cc/Z8PW-WZ99].

rest; its restrictions do not apply to the agricultural industry. However, as shown, Ohio is now focused predominantly on this industry.

VII. CONCLUSION

HABs are more than just a local problem for Ohioans. These blooms have a widespread impact, as is shown by their presence in lakes and rivers around the state. Ohio has taken massive strides in protecting water quality as part of the Western Basin Collaborative Agreement.³⁵⁵ The restrictions, which regulate farmers, are some of the most expansive in the country, yet, there are several exclusions and exemptions.³⁵⁶

Other states across the country have been dealing with this problem as well. In response, many have enacted legislation to curb the amount of phosphorus in consumer products.³⁵⁷ They also have restricted the application of fertilizers in an attempt to keep it from flowing into local waterways.³⁵⁸ These regulations in other states are virtually unenforced, but have contributed to phosphorus reduction.³⁵⁹ The problem with other states' statutes is that they do not address agriculture in a meaningful way.³⁶⁰

Ohio has sought to correct this oversight, and has taken on regulation of this unique and challenging industry. But, Ohio's statute is wanting. Senate Bill 1 and the overall restrictions on agriculture do not apply to the entire state.³⁶¹ Yes, these counties have a large percentage of Ohio farms that flow directly into Lake Erie, but farming is also one of Ohio's largest industries.³⁶² Moreover, the adverse side effects of agricultural pollution are not restricted to Lake Erie and the western basin.³⁶³

Therefore, the regulations established by Senate Bill 1 would better serve the people and the environment if it applied to counties across the state. The restrictions that other states enforce apply to the entire state. To bolster this point, Ohio regulates phosphorus in household cleaning

³⁵⁵ See Collaborative Agreement, *supra* note 250.

³⁵⁶ See *supra* Section IV.A.

³⁵⁷ See *supra* Part IV.

³⁵⁸ See *supra* Sections IV.A–IV.B.

³⁵⁹ See *supra* Section IV.E.

³⁶⁰ See *supra* Part IV.

³⁶¹ Hall & Arnold, *supra* note 266.

³⁶² *Supra* notes 89–91 and accompanying text.

³⁶³ See Wines, *supra* note 343.

products but this regulation also only applies to a specific list of counties.³⁶⁴ Unless Senate Bill 1 is applied state wide, the remaining Ohio counties will continue to suffer from excess nitrogen and phosphorus in local waterways. Thus, in order to properly combat the ever-growing presence of HABs, statewide applicability is needed to allow Senate Bill 1 to meet its full potential.

³⁶⁴ OHIO REV. CODE ANN. § 6111.10 (West 2016).