

Combating Harmful Algal Blooms and Saving America's Waterways

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TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	BACKGROUND.....	3
	A. <i>The Cuyahoga River Fire and a Turn in Environmental Regulation</i>	3
	B. <i>The Distinction: Point Source and Nonpoint Source Pollution</i>	5
	C. <i>The Perfect Storm: Why Lake Erie Is an Ideal Place to Implement New Water Quality Laws</i>	7
III.	FIX WHAT WE CAN: IMPLEMENTING APPROPRIATE REGULATION.....	9
	A. <i>Room to Breathe: Requiring Filter Strips in the Maumee River Watershed</i>	9
	B. <i>Protection Beyond the Water's Edge: Land Acquisition and the Establishment of Environmental Protection Areas</i>	10
	C. <i>What Lies Beneath: Efforts to Reclassify Agricultural Tiling as a Point Source Pollutant Under the Clean Water Act</i>	11
IV.	CONCLUSION.....	12

I. INTRODUCTION

On August 2, 2014, water sample tests from Toledo, Ohio's Collins Park Water Treatment Plant revealed a dire situation.¹ Chemists at the plant

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¹Public Notice, City of Toledo, Ohio, Urgent Water Notice!, (Aug. 2, 2014), <http://toledo.oh.gov/news/2014/08/urgent-water-notice> [https://perma.cc/MU8A-P8BX] [hereinafter Toledo Water Notice]; see also 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> [https://perma.cc/7HTX-C4EZ].

routinely test drinking water samples for microcystin,² a toxic product of harmful algal blooms.³ Harmful algal blooms thrive in waters with excessive nutrients and phosphorus, and have plagued Ohio's Great Lake for decades.⁴

Test results showed abnormally high microcystin levels in the city's drinking water, the result of a recent Lake Erie algal bloom.⁵ The bloom was not as vast as in previous years.⁶ However, strong northerly winds concentrated the bloom in the lake's western basin, specifically near the Toledo shoreline.⁷

The harmful algal bloom and resulting microcystin inundated the water treatment plant, which was ill equipped to handle such high toxicity levels.⁸ Drinking water samples showed toxin levels three times higher than their allowable amount.⁹ The City of Toledo quickly issued an urgent notice,¹⁰ warning that water provided by the city, and running from the taps of over 500,000 citizens,¹¹ was poisonous.

Algal blooms have plagued Lake Erie since the 1920s.¹² However, blooms have reached catastrophic levels over the past decade.¹³ While harmful algal

²For an in-depth overview of microcystin, see OHIO ENVTL. PROT. AGENCY, PUBLIC WATER SYSTEM HARMFUL ALGAL BLOOM RESPONSE STRATEGY (May 2013), <http://epa.ohio.gov/Portals/28/documents/HABs/PWSHABResponseStrategy.pdf> [https://perma.cc/Y6Q8-UHN5].

³Harmful algal blooms are visible amounts of cyanobacteria that discolor and poison the water. *Id.* at 5. For an in-depth overview of harmful algal blooms, see *id.*

⁴*Nutrients/Algae*, LAKE ERIE IMPROVEMENT ASS'N, <http://www.lakeerieimprovement.org/nutrients-algae> [https://perma.cc/VFG4-BXAR].

⁵Toledo Water Notice, *supra* note 1.

⁶The 2011 Lake Erie algal bloom "covered about 2,000 square miles[,] . . . three times [more] than any previously observed Lake Erie algae bloom, including blooms that occurred in the 1960s and 1970s, when the lake was famously declared dead." Jim Erickson, *Record-Breaking 2011 Lake Erie Algae Bloom May Be Sign of Things to Come*, MICH. NEWS (Apr. 1, 2013), <http://www.ns.umich.edu/new/releases/21342-record-breaking-2011-lake-erie-algae-bloom-may-be-sign-of-things-to-come> [https://perma.cc/5Z5A-NR3A].

⁷D'Arcy Egan, *Toxic Algal Bloom Shuts Off Water, but Green Slime Limited So Far to Toledo*, CLEV. PLAIN DEALER (Aug. 2, 2014), http://www.cleveland.com/outdoors/index.ssf/2014/08/toxic_algal_bloom_shuts_off_wa.html [https://perma.cc/BC5E-KX5Q].

⁸Tom Henry & David Patch, *Toledo Got Harsh Warning Before Water Crisis*, COLUMBUS DISPATCH (Aug. 8, 2014), <http://www.dispatch.com/content/stories/local/2014/08/08/toledo-got-harsh-warning-before-water-crisis.html> [https://perma.cc/X7SU-JNK5].

⁹Egan, *supra* note 7.

¹⁰Toledo Water Notice, *supra* note 1.

¹¹George Tanber, *Toxin Leaves 500,000 in Northwest Ohio Without Drinking Water*, REUTERS (Aug. 2, 2014), <http://www.reuters.com/article/2014/08/02/us-usa-water-ohio-idUSKBN0G20L120140802> [https://perma.cc/KC4Y-9DJ4].

¹²Thomas Bridgeman, Univ. of Toledo, Presentation, An Update on Harmful Algal Blooms in Lake Erie 10 (Nov. 8, 2013), <http://www.utoledo.edu/law/academics/ligl/pdf/2013/Bridgeman%202013%20Algae%20Great%20Lakes.pdf> [https://perma.cc/NX7Q-VYLB].

blooms are heavily researched and well understood, the greatest contributors to algal blooms remain largely unregulated.¹⁴ In Northwest Ohio, this has created tensions between the region's two largest economic engines: agriculture and Lake Erie tourism.¹⁵

This Note considers the effects of harmful algal blooms, as well as state attempts to reclaim polluted waterways. Part II discusses the Clean Water Act and explains the distinction between point source and nonpoint source pollutants. It further explains the environmental conditions that make Lake Erie blooms so potent and the economic conditions that make identifying solutions so important. Part III reviews state attempts to address harmful algal blooms, including: (1) requiring vegetative filter strips along shorelines; (2) establishing environmental protection areas; and (3) reclassifying certain agricultural pollution under the Clean Water Act.

II. BACKGROUND

Lake Erie has long been a focal point for environmentalists and environmental regulation. The 1969 Cuyahoga River fire was a major catalyst for enacting the Clean Water Act. However, the Clean Water Act only created rules for point source pollution, leaving nonpoint source pollution exempt from regulation.

A. *The Cuyahoga River Fire and a Turn in Environmental Regulation*

Lake Erie's 2014 algal bloom received widespread news coverage.¹⁶ However, Lake Erie's most memorable pollution event happened in 1969.¹⁷

¹³ The 2011 bloom was so dense that "when you hit it with a boat, it actually slowed you down . . ." Christy McDonald, *Ohio State Scientists Study Runoff to Stop Toxic Algae in the Great Lakes*, PBS NEWSHOUR (Sept. 4, 2014), <http://www.pbs.org/newshour/bb/michigan-scientists-study-runoff-stop-toxic-algae-great-lakes> [https://perma.cc/KFM8-4U6G] (quoting Jeff Reutter, Director, Ohio Sea Grant College and Stone Lab, Ohio State University).

¹⁴ *Toxic Algae*, OHIO ENVTL. COUNCIL, <http://www.theoec.org/campaign/toxic-algae> [https://perma.cc/JGR2-Y6NE].

¹⁵ See Susan Glaser, *Tourism Officials Compare Lake Erie Algae Problem to Gulf Oil Spill, Say Industry Is Ailing*, CLEV. PLAIN DEALER (Sept. 28, 2015), http://www.cleveland.com/travel/index.ssf/2015/09/tourism_officials_compare_lake.html [https://perma.cc/A5RP-984K].

¹⁶ The algal bloom made headlines from Los Angeles to New York. See, e.g., James Queally, *Toledo's Tap Water Undrinkable for a Second Day; Test Results Delayed*, L.A. TIMES (Aug. 3, 2014), <http://www.latimes.com/nation/nationnow/la-na-nn-toledo-ohio-toxins-water-20140802-story.html> [https://perma.cc/FPZ6-UFVV]; Wines, *supra* note 1.

¹⁷ Another less known environmental blunder was Balloonfest 1986, when the United Way of Cleveland released nearly 1.5 million balloons from Cleveland's Public Square. The world-record balloon release made for memorable photographs, but also left Lake Erie and its shoreline covered in plastic balloons from Cleveland to Ontario, Canada. John

For over one hundred years, Cleveland, Ohio's Cuyahoga River was a vital artery for heavy industry.¹⁸ Shipyards, factories, refineries, and warehouses lined the riverbanks.¹⁹ The city and its workforce benefitted from the industry but faced rampant water pollution issues.²⁰

In 1969, a mixture of oil, industrial waste, and debris caught fire in the Cuyahoga River.²¹ This was not Cleveland's first river fire,²² nor the most destructive.²³ However, news and images of the fire created national outrage.²⁴ Within three years, the Clean Water Act became law, creating historic environmental protections to curb industrial pollution.²⁵

The Clean Water Act was exactly what the Cuyahoga River—and countless other U.S. waterways—desperately needed.²⁶ While cities and states successfully regulated some visible pollution,²⁷ industrial dumping was still routine.²⁸ In Cleveland, for example, nearly a hundred pipes still snaked from

Kroll, *Balloonfest 1986, the Spectacle that Became a Debacle: Cleveland Remembers*, CLEV. PLAIN DEALER (Aug. 15, 2011), http://www.cleveland.com/remembers/index.ssf/2011/08/balloonfest_1986_the_spectacle.html [https://perma.cc/KX8U-BRCD].

¹⁸ *Cuyahoga River*, ENCYCLOPEDIA CLEV. HIST., <http://ech.case.edu/cgi/article.pl?id=CR9> [https://perma.cc/Q6XJ-3WJJ] (last updated Mar. 27, 1998).

¹⁹ *Id.*

²⁰ In 1881, Cleveland's mayor called the river "an open sewer through the center of the city." *Id.*

²¹ *Cuyahoga River Fire*, OHIO HIST. CENT., http://www.ohiohistorycentral.org/w/Cuyahoga_River_Fire?rec=1642 [https://perma.cc/SNJ9-XRB6].

²² Historical records indicate at least thirteen Cuyahoga River fires. Jonathan H. Adler, *The Fable of the Burning River, 45 Years Later*, WASH. POST (June 22, 2014), <http://www.washingtonpost.com/news/voikh-conspiracy/wp/2014/06/22/the-fable-of-the-burning-river-45-years-later> [https://perma.cc/2W54-JUK8]. In fact, river fires were actually common nationwide throughout the late 1800s and early 1900s. *Id.*

²³ The most devastating Cuyahoga River happened in 1952 and caused over \$1 million in damage. *Cuyahoga River Fire*, *supra* note 21.

²⁴ *TIME* magazine's photograph of the Cuyahoga River on fire "was seared into the nation's emerging environmental consciousness and fueled the growing demand for greater environmental regulation." However, the picture was actually of a river fire seventeen years earlier. Adler, *supra* note 22.

²⁵ See Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816 (codified as amended in scattered sections of 33 U.S.C.). The Federal Water Pollution Control Act, ch. 758, 62 Stat. 1155 (1948), was the basis of the Clean Water Act. The 1972 Amendments significantly reorganized and expanded the Act and it became commonly known as the "Clean Water Act" in 1972. See Clean Water Act of 1977, Pub. L. No. 95-217, sec. 2, § 518, 91 Stat. 1566, 1566. ("This Act may be cited as the 'Federal Water Pollution Control Act' (commonly referred to as the Clean Water Act).")

²⁶ The Cuyahoga River was not the only waterway in the country that desperately needed help. For example, Washington, D.C.'s Potomac River had "240 million gallons of waste flushed into it each day." Annie Snider, *Clean Water Act: Vetoes by Eisenhower, Nixon Presaged Today's Partisan Divide*, E&E PUB. (Oct. 18, 2012), <http://www.eenews.net/stories/1059971457> [https://perma.cc/J556-GC98].

²⁷ Adler, *supra* note 22.

²⁸ See Michael Scott, *Cuyahoga River Fire 40 Years Ago Ignited an Ongoing Cleanup Campaign*, CLEV. PLAIN DEALER (June 22, 2009), <http://www.cleveland.com/science/inde>

factories directly to the river, despite local cleanup efforts.²⁹ Under the Clean Water Act, this industrial discharge is now illegal.³⁰ Since 1972, the turnaround in Cuyahoga River water quality is touted as a success story.³¹ However, the Clean Water Act was narrowly tailored and does not regulate today's most significant water polluters.

B. *The Distinction: Point Source and Nonpoint Source Pollution*

The Clean Water Act was a response to the industrial era, a time when cities treated rivers like sewers and landfills. The Act focused on discernible water quality problems that could be seen, smelled, and traced to a single source. This meant regulating point source pollution, which is essentially any pollution that comes from a pipe.³² The Act made it illegal to discharge point source pollution without a permit.³³

While the Clean Water Act helped lessen point source pollution, it did not regulate nonpoint source pollution.³⁴ Nonpoint source pollution is any water

x.ssf/2009/06/cuyahoga_river_fire_40_years_a.html [https://perma.cc/ZB36-Y8V6].

²⁹ Cleveland regulators “drove a boat up and down the [Cuyahoga] river and got out and marked the pipes on each side—from No. 1 to maybe a hundred—both the west and east sides [of the river], . . . us[ing] dye to determine the source of the discharge and . . . ‘calling companies to tell them to stop polluting the river.’” *Id.* (quoting Ed Kelly and Jim Schafer, two of the original employees in the city of Cleveland’s Bureau of Industrial Wastes).

³⁰ Clean Water Act § 301, 33 U.S.C. § 1311 (2012); *see also* *Water Enforcement*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/enforcement/water-enforcement> [https://perma.cc/6DSZ-XNL8] (last updated Dec. 14, 2015).

³¹ Christopher Maag, *From the Ashes of ‘69, a River Reborn*, N.Y. TIMES (June 20, 2009), <http://www.nytimes.com/2009/06/21/us/21river.html> [https://perma.cc/3UCG-AQ9A].

³² Clean Water Act § 502(14), 33 U.S.C. § 1362(14). More specifically, “point source” is defined as:

[A]ny 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.

³³ Clean Water Act §§ 301(a), 402, 33 U.S.C. §§ 1311(a), 1342; *see also* *Water Enforcement*, *supra* note 30.

³⁴ Clean Water Act §§ 301(a), (e), 33 U.S.C. §§ 1311(a), (e). “To gain sufficient congressional support from farm states in 1972, the Clean Water Act largely exempted runoff from agricultural fields and irrigation ditches.” James Salzman, *Why Rivers No Longer Burn*, SLATE (Dec. 10, 2012), http://www.slate.com/articles/health_and_science/science/2012/12/clean_water_act_40th_anniversary_the_greatest_success_in_environmental_law.html [https://perma.cc/2HRH-JBFQ]; *see also* Laura Arenschiold, *Lake Erie’s Problems Were Solved in the ‘70s*, COLUMBUS DISPATCH (Aug. 25, 2014),

pollution that does not meet the legal definition of point source pollution.³⁵ So, pollution entering waterways is free from enforcement so long as it does not come from a pipe. Nonpoint source pollutants are especially prevalent near farms and large cities.³⁶

Nonpoint source pollution is not the nation's sole pollution contributor.³⁷ Publicly owned water treatment plants are significant polluters in coastal areas, especially as treatment plants age and deteriorate.³⁸ While certain water treatment plant exemptions save coastal towns and cities from the financial burden of upgrading water systems,³⁹ the cities to continue discharging phosphorus and contributing to harmful algal blooms.⁴⁰ Many outdated water treatment plants still use combined sewers that collect sewer water and storm water within a single system.⁴¹ During heavy rains, these systems can overflow, sending untreated sewage directly to waterways instead of treatment plants.⁴²

<http://www.dispatch.com/content/stories/local/2014/08/25/lake-erries-problems-were-solved-in-the-70s.html> [<https://perma.cc/YD9D-S57Q>].

³⁵ See *supra* note 32 and accompanying text.

³⁶ According to the U.S. EPA:

The latest *National Water Quality Inventory* indicates that agriculture is the leading contributor to water quality impairments, degrading 60 percent of the impaired river miles and half of the impaired lake acreage surveyed by states, territories, and tribes. Runoff from urban areas is the largest source of water quality impairments to surveyed estuaries (areas near the coast where seawater mixes with freshwater).

U.S. ENVTL. PROT. AGENCY, NONPOINT POINTERS: POINTER NO. 1, NONPOINT SOURCE POLLUTION: THE NATION'S LARGEST WATER QUALITY PROBLEM (Mar. 1996) [hereinafter NONPOINT POINTER], <https://www.epa.gov/polluted-runoff-nonpoint-source-pollution/nonpoint-source-fact-sheets> (follow "Pointer No. 1: Nonpoint Source Pollution: The Nation's Largest Water Quality Problem" hyperlink under "Nonpoint Source Pointers" subsection) [<https://perma.cc/X5Q3-E67H>].

³⁷ See Kelly Kaczala, *Sewer Overflow Contributes Toward Harmful Algal Blooms in Lake*, PRESS (Jan. 19, 2015), <http://www.presspublications.com/newspaper/special-reports/397-saving-lake-erie/15282-sewer-overflow-contributes-toward-harmful-algal-blooms-in-lake> [<https://perma.cc/5MH3-NT6F>].

³⁸ *Id.*

³⁹ Updating outdated water treatment systems is expensive. For example, Fremont, Ohio, a small city in the Lake Erie watershed, spent \$65 million to lessen sewer overflows. Kristina Smith, *Raw Sewage Can Get into Lake Erie, Tributaries*, PORT CLINTON NEWS HERALD (Aug. 22, 2014), <http://www.portclintonnewsherald.com/story/news/local/lake-erie/2014/08/22/raw-sewage-can-get-lake-erie-tributaries/14457391> [<https://perma.cc/X94F-XRVG>].

⁴⁰ *Id.*

⁴¹ *Combined Sewer Overflows (CSOs)*, U.S. ENVTL. PROTECTION AGENCY, <https://www.epa.gov/npdes/combined-sewer-overflows-csos> [<https://perma.cc/F53U-DYTA>] (last updated Nov. 16, 2015).

⁴² *Id.*; see, e.g., Smith, *supra* note 39.

Household sewage systems also contribute to water pollution.⁴³ Individual home sewage systems and septic tanks are common in rural areas and are, unfortunately, susceptible to leaks.⁴⁴ Individual leaks may seem like a miniscule problem, but widespread septic tank use makes them a significant contributor to increased phosphorus levels.⁴⁵

While outdated water treatment plants and home septic systems contribute to water pollution, their combined effects are insignificant compared to the phosphorus loads from unregulated agricultural runoff.⁴⁶ Over 60% of Lake Erie's watershed is used for agriculture,⁴⁷ and farming is the largest contributor to increased phosphorous loads.⁴⁸ Phosphorus loads increase as farmers demand more from the land, sometimes multiplying fertilizer use to encourage plant growth.⁴⁹

C. The Perfect Storm: Why Lake Erie Is an Ideal Place to Implement New Water Quality Laws

While harmful algal blooms are now an annual event in Lake Erie,⁵⁰ they are primarily the byproduct of vital agriculture practices.⁵¹ Agriculture's economic importance and the farming community's political power make legislative reform more difficult.⁵² However, the economic discussion is not

⁴³ An estimated 20% of U.S. households utilize on-site septic systems. INT'L JOINT COMM'N, A BALANCED DIET FOR LAKE ERIE: REDUCING PHOSPHORUS LOADINGS AND HARMFUL ALGAL BLOOMS 58 (Feb. 2014) [hereinafter IJC REPORT], <http://www.ijc.org/files/publications/2014%20IJC%20LEEP%20REPORT.pdf> [<https://perma.cc/G4HP-TF3P>].

⁴⁴ *Id.*

⁴⁵ There are over 250,000 on-site septic systems being used in the Lake Erie watershed. Of those systems, an estimated 38% were failing and pumping over eighty-eight metric tons of phosphorus into waterways each year. *Id.* For comparison, combined sewer overflows from Ohio discharge an estimated 90.4 metric tons of phosphorus into Lake Erie each year. *Id.* at 61.

⁴⁶ *Id.* at 30.

⁴⁷ *Id.* at 24, 25 fig.2-1; Leslie Baehr, *Lake Erie Is Turning to Slime*, BUS. INSIDER (Mar. 8, 2014), <http://www.businessinsider.com/lake-erie-algal-blooms-are-out-of-control-2014-3> [<https://perma.cc/LV66-8NH9>].

⁴⁸ IJC REPORT, *supra* note 43, at 30.

⁴⁹ *Id.* at 7.

⁵⁰ John Mangels, *Record-Sized Lake Erie Algae Bloom of 2011 May Become Regular Occurrence, Study Says*, CLEV. PLAIN DEALER (Apr. 1, 2013), http://www.cleveland.com/science/index.ssf/2013/04/record-sized_lake_erie_algae_b.html [<https://perma.cc/A2DW-UV2J>].

⁵¹ Agriculture amounts to 10% of Ohio's gross domestic product and 14% of Ohio's jobs. Bill LaFayette, *Ohio's Agricultural Economy*, 130 ON THE MONEY, Nov. 8, 2013, at 1, http://regionomicsllc.com/wp-content/uploads/2014/06/On_the_Money-2013-11.pdf [<https://perma.cc/NQF3-TWQT>].

⁵² Laura Arenschield, *Agriculture Industry Has History of Making Political Donations*, COLUMBUS DISPATCH (Sept. 21, 2014), <http://www.dispatch.com/content/storie>

one-sided. Lake Erie not only provides essential conditions for agriculture, but also for tourism.⁵³

Lake Erie is a popular tourist destination within the region. The area includes Cedar Point amusement park, known as “The Roller Coaster Capital of the World.”⁵⁴ Port Clinton, Ohio, a harbor town boasting excellent fishing conditions, is called the “Walleye Capital of the World.”⁵⁵ Beyond the hyperbole, Lake Erie tourism is a serious economic force in Ohio, generating nearly \$1.8 billion in business in 2013.⁵⁶ However, tourist dollars are at risk each summer as harmful algal blooms affect fishing and recreation.⁵⁷ In fact, the area’s prized walleye population has dropped almost 80% from its highest levels in the 1980s.⁵⁸ Harmful algal blooms contribute to the decline.⁵⁹

There may be no better place for harmful algal blooms to thrive than Lake Erie. After all, Lake Erie is warmer, shallower, and has a greater surrounding population density than all other Great Lakes.⁶⁰ Warm, shallow water is ideal for harmful algal blooms, and greater population density creates further opportunity for phosphorus runoff from both urban and rural areas.⁶¹ This susceptibility, combined with competing agricultural and tourist-economy interests, makes Lake Erie a perfect test site for implementing water quality initiatives.

s/local/2014/09/20/will-cash-influence-limits-on-ag-runoff.html [https://perma.cc/72FM-JM9J].

⁵³ See Tom Troy, *Sen. Brown Discusses Algae’s Impact on Lake, Tourism*, NORWALK REFLECTOR (Sept. 5, 2014), <http://www.norwalkreflector.com/News/2014/09/05/Sen-Brown-discusses-algae-039-s-impact-on-lake-tourism.html> [https://perma.cc/2Y85-TYBJ].

⁵⁴ CEDAR POINT, <https://www.cedarpoint.com> [https://perma.cc/DT5E-V46G].

⁵⁵ WALLEYE MADNESS AT MIDNIGHT, <http://www.walleyemadness.com> [https://perma.cc/G75H-CMC7]. Port Clinton even celebrates New Year’s Eve by lowering a twenty-foot long fiberglass walleye at midnight in the town’s main intersection. Thousands of visitors have join the spectacle every year. *Ohio’s New Year’s Eve Event Celebrates 20 Years!*, LAKE ERIE SHORES & ISLANDS (Dec. 19, 2016), <http://www.shoresandislands.com/blog/2016/12/19/Ohio-New-Years-Eve-Event-Celebrate-s-20-Years> [https://perma.cc/J2C6-5DAY].

⁵⁶ Press Release, Lake Erie Shores & Islands, 2013 Economic Impact of Tourism (Aug. 21, 2014), <http://www.shoresandislands.com/media/research.aspx> (follow “2013 Economic Impact of Tourism Download” hyperlink) [https://perma.cc/5YVD-94KE].

⁵⁷ IJC REPORT, *supra* note 43, at 39–40.

⁵⁸ A *Primer on Phosphorus in Lake Erie*, U.S. ENVTL. PROTECTION AGENCY, <https://web.archive.org/web/20150910202548/http://www.epa.gov/greatlakes/lakeerie/primer.html> (as archived on Sept. 10, 2015) [https://perma.cc/9YBF-G8QM].

⁵⁹ Dick Martin, *Algae Blooms Are Bad News for Lake Erie Anglers*, FREMONT NEWS-MESSENGER (June 3, 2014), <http://www.thenews-messenger.com/story/news/2014/06/03/algae-blooms-are-bad-news-for-lake-erie-anglers/9903173/> [https://perma.cc/G55Y-MA22].

⁶⁰ Christina Dierkes, *Harmful Algal Bloom Q&A and Updates*, OHIO SEA GRANT (Aug. 5, 2014), <http://ohioseagrant.osu.edu/news/?article=697> [https://perma.cc/7DCC-UKUY].

⁶¹ IJC REPORT, *supra* note 43, at 24, 30.

III. FIX WHAT WE CAN: IMPLEMENTING APPROPRIATE REGULATION

In order to mitigate harmful algal blooms, states must regulate the amount of phosphorus entering waterways.⁶² With Toledo providing a national spotlight for water quality issues, the Maumee River watershed is the perfect place to reduce phosphorus loads. Luckily, other states provide a blueprint for addressing these issues.

A. Room to Breathe: Requiring Filter Strips in the Maumee River Watershed

Over 60% of Lake Erie's watershed is used for agriculture,⁶³ and the biggest single area used for agriculture is the Maumee River watershed. The Maumee River watershed is the largest tributary into Lake Erie, and over 80% of the watershed is cropland.⁶⁴ Reducing phosphorus loads in the watershed would significantly curb Lake Erie's summer algal blooms. While it is not practical or advisable to eliminate farming practices in the area, requiring vegetative filter strips would lessen the agricultural impact on water quality.

Filter strips "are land areas of either planted or indigenous vegetation, situated between" cropland and waterways.⁶⁵ Instead of allowing phosphorus-packed runoff to travel directly from farm fields to streams and rivers, filter strips serve as a filtration system.⁶⁶ The strips slow runoff, absorb excess nutrients, and filter the water, creating thriving conditions in the filter strip while keeping the nutrients out of waterways.⁶⁷

Filter strips are not a new concept. In fact, Minnesota has been utilizing filter strips since 1990.⁶⁸ Minnesota drainage laws require filter strips that are

⁶² *Id.* at 4.

⁶³ *Id.* at 24, 25 fig.2-1; Baehr, *supra* note 47.

⁶⁴ *Detroit River-Western Lake Erie Basin Indicator Project: Phosphorus Loads and Concentrations from the Maumee River*, U.S. ENVTL. PROTECTION AGENCY, http://web.archive.org/web/20150907003830/http://www.epa.gov/med/grosseile_site/indiat_ors/maumee-p.html (as archived on Sept. 7, 2015) [<https://perma.cc/86WP-VYAS>].

⁶⁵ Rob Leeds et al., *Fact Sheet: Vegetative Filter Strips: Application, Installation and Maintenance*, OHIO ST. U. EXTENSION, <http://web.epa.state.oh.us/dsw/401Applications/SRBS/Attachment%2011.pdf> (as archived on July 3, 2013) [<https://perma.cc/ZW7D-M6CN>].

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ SAMPLE SHORELAND MANAGEMENT ORDINANCE § 5.32(D)(11) (Minn. Dep't of Nat. Res. 1990), <http://files.dnr.state.mn.us/publications/waters/shoreland.pdf> [<https://perma.cc/46RX-UVGD>]. The Minnesota Department of Natural Resources encourages use of filter strips and local ordinances to build upon state standards. *Id.* § 6. Additionally, filter strips have been established within the Maumee River watershed in Fort Wayne, Indiana. *Case Study Detail—USA: Indiana: Maumee River Riparian Zone Restoration, Allen County*, GLOBAL RESTORATION NETWORK (July 15, 2009), <http://www.globalrestorationnetwork.org/database/case-study/?id=280> [<https://perma.cc/M>].

at least 16.5 feet wide along public drainage ditches and at least 50 feet wide on agricultural land in shoreland areas.⁶⁹

Requiring filter strips in the Maumee River watershed could have a sizeable impact on the health of Lake Erie. To do so, the State of Ohio should create filter strip requirements in the Maumee River watershed. Ohio could limit the legislation to the Maumee River watershed by having it apply only to large waterways and those with a high percentage of cropland. Since the Maumee River watershed is Lake Erie's largest tributary, and over 80% of the watershed is cropland, it can be targeted as the biggest agricultural contributor to algal blooms. Because filter strips could be an expensive prospect for local farmers, landowners should have a number of years to comply and access to government grants to mitigate costs.

B. Protection Beyond the Water's Edge: Land Acquisition and the Establishment of Environmental Protection Areas

A law requiring filter strips throughout the Maumee River watershed would lessen the amount of phosphorous entering Lake Erie. However, while agriculture is by far the largest contributor to algal blooms, it is not the sole contributor. Construction activities, storm water runoff, and combined sewers also add to Lake Erie's phosphorus problem.⁷⁰ To address all waterpollutants, Ohio should look to Florida for guidance.

Once spanning over 11,000 square miles, the Florida Everglades are roughly half the size they were a century ago.⁷¹ Concerted draining efforts sacrificed marshlands in order to create usable farmland and provide fresh drinking water.⁷² However, the state created the Everglades Protection Area to restore lands diminished by agriculture and development.⁷³

In 2009, Florida bought nearly 72,500 acres of farmland in order to restore the natural waterways that once connected the Everglades to Lake

8ZT-T9M8]. Between 2000 and 2006, Fort Wayne reforested 47 acres of Maumee River shoreline previously used for agriculture. *Id.*

⁶⁹ *Conservation Practices/Minnesota Conservation Funding Guide: Grass Filter Strips*, MINN. DEP'T AGRIC., <http://www.mda.state.mn.us/protecting/conservation/practices/buffergrass.aspx> [<https://perma.cc/B5NW-MSDG>]. Shoreland areas include land within 1,000 feet of lakes or 300 feet of perennial rivers and streams. *A Guide for Buying and Managing Shoreland—Section 6: Statewide Shoreland Management Standards*, MINN. DEP'T NAT. RESOURCES, http://www.dnr.state.mn.us/shorelandmgmt/guide/standards_tables.html [<https://perma.cc/DFP5-US95>].

⁷⁰ IJC REPORT, *supra* note 43, at 4.

⁷¹ *Brief History of the Everglades*, FLA. DEP'T ENVTL PROTECTION (Feb. 11, 2009), <http://www.dep.state.fl.us/evergladesforever/about> [<https://perma.cc/D54T-HFPQ>] (last updated Feb. 11, 2009).

⁷² *Id.*

⁷³ Everglades Forever Act, FLA. STAT. ANN. § 373.4592 (West 2015); *Everglades Forever Act (EFA)*, FLA. DEPT. ENVTL. PROTECTION, <http://www.dep.state.fl.us/everglades/efa.htm> [<https://perma.cc/FVM4-6ENN>] (last updated Dec. 13, 2013).

Okeechobee.⁷⁴ While the state originally hoped to acquire more land, the purchase was still the largest land acquisition in Florida's history.⁷⁵ In all, the project will restore wetlands in an area twice the size of Orlando.⁷⁶

The establishment of a Maumee River Protection Area would allow the state to acquire lands for reclamation and regulate more pollution than currently possible under Clean Water Act. More importantly, this solution would allow the state to address all water pollution, not just agricultural water pollution. Any money raised from new regulations could fund state land acquisition in the region. Combined, requiring filter strips and establishing a Maumee River Protection Area would lessen phosphorus loads and mitigate harmful algal blooms.

C. What Lies Beneath: Efforts to Reclassify Agricultural Tiling as a Point Source Pollutant Under the Clean Water Act

Even with the Clean Water Act in place, "approximately 40 percent of surveyed rivers, lakes, and estuaries are not clean enough to meet basic uses such as fishing or swimming."⁷⁷ While the Act exempted agricultural rainwater and irrigation runoff from enforcement,⁷⁸ new debate centers on the practice of agricultural tiling.

Throughout Midwestern states, which historically included large areas of wetlands, farmers utilize underground piping to collect and remove excess water from fields.⁷⁹ This process, called tiling, means that contaminated water is not absorbed in the ground but instead discharges directly into ditches and waterways.⁸⁰ Tiling "essentially short-circuit[s] the natural filtration system that would normally allow some [nutrients] to be taken up by plants."⁸¹

Officials from Des Moines, Iowa argue that excess water removed through tiling is fundamentally different from agricultural runoff exempted from the

⁷⁴The land purchase cost \$533 million. Josh Hafenbrack & Andy Reid, *Crist Announces Scaled-Back Deal to Buy U.S. Sugar Land*, SUN SENTINEL (Apr. 1, 2009), <http://www.sun-sentinel.com/news/sfl-0401-everglades-story.html> [<https://perma.cc/T777-99GV>].

⁷⁵Florida originally planned to purchase a 187,000-acre tract. *Id.*

⁷⁶*Id.*

⁷⁷NONPOINT POINTER, *supra* note 36.

⁷⁸*See supra* note 34 and accompanying text.

⁷⁹Annie Snider, *Water Pollution: Iowa Utility's Lawsuit Takes New Stab at Old Nutrient Problems*, E&E PUB. (Jan. 29, 2015), <http://www.eenews.net/stories/1060012531> [<https://perma.cc/8NPS-97KE>] ("Large swaths of farmland stretching through parts of the Dakotas, Minnesota, Iowa, Illinois, Indiana and Ohio were left as soggy wetlands when glaciers from the last ice age retreated over 12,000 years ago. That process left particularly rich soils but also made farming nearly impossible. So early settlers, often with government encouragement, installed artificial drainage systems.").

⁸⁰*Id.*

⁸¹*Id.*

Clean Water Act.⁸² The city's drinking water contains dangerous levels of nitrates because of major upstream agriculture operations.⁸³ The city paid \$900,000 in 2013 to lower nitrate levels but faces \$100 million facility upgrades to address the problem completely.⁸⁴ Instead of facing those costs alone, the city filed a lawsuit against three upstream agricultural counties, arguing that rainwater artificially drained through tiling is "fundamentally different" than agricultural runoff exempted under the Clean Water Act.⁸⁵ The federal trial is scheduled for June 2017.⁸⁶

While filter strips alleviate excess nutrients from the soil top, they cannot filter contaminated water passing through underground tiling systems. The Iowa trial will help determine whether states may regulate agricultural runoff both above ground and below.

IV. CONCLUSION

While Lake Erie is a prime breeding ground for harmful algal blooms, it is also an ideal location for implementing new water quality protections. A number of factors make Lake Erie particularly susceptible to algal blooms, but the tension between major economic interests makes legislative action vitally important. Ohio should establish a Maumee River Protection Area, require vegetative filter strips in the region, and work with farmers to reclaim rivers and streams within the Maumee River watershed. Legal developments in Iowa may give Ohio legislators additional guidance on addressing problems with agricultural tiling.

⁸² *Id.*

⁸³ Donnelle Eller, *Will Des Moines Water Lawsuit Change Farming Rules?*, DES MOINES REG. (Jan. 19, 2015), <http://www.desmoinesregister.com/story/money/agriculture/2015/01/18/water-pollution-lawsuit/21929897> [<https://perma.cc/9H6P-6G2T>].

⁸⁴ *Id.*

⁸⁵ Snider, *supra* note 79.

⁸⁶ Donnelle Eller, *Des Moines Water Works Trial Delayed until Next Year*, DES MOINES REG. (May 13, 2016), <http://www.desmoinesregister.com/story/money/2016/05/13/des-moines-water-works-trial-delayed-until-next-year/84322342/> [<https://perma.cc/PQJ4-QHXH>].