

# Iowa Nutrient Reduction Strategy: Policy Solutions to Actually Reduce Nutrient Pollution in Iowa's Water



## Introduction

Iowa has known for decades that the state's most pressing water quality concern is nutrient pollution. The vast majority of Iowa's land is used for agricultural production and, correspondingly, the majority of nutrients (nitrogen and phosphorus) come from farm fields.<sup>i</sup> Unlike industrial or utility operations, state regulations do not require agricultural operations to mitigate pollution. Instead, Iowa has adopted a voluntary approach to address agricultural pollution. This purely voluntary policy, pushed by the agriculture industry, has not led to widespread or even noticeable water quality improvements.



Inaction on nutrient pollution has and will continue to reduce quality of life for Iowans, burden downstream neighbors, and pose increased risk of serious health issues, including cancer. Creating widespread behavior change and adoption of conservation practices on the landscape to curb nutrient pollution will require changes in state policy. To implement such policy change, state leaders and decision-makers must be clear-eyed and courageous and put the needs of all Iowans over the influence of agricultural interest groups. The recommendations outlined in this paper will deliver large-scale, tangible improvements in our state, but our leaders must have the political courage to act on behalf of all Iowans to adopt them in the face of powerful opposition.

## Background

Iowa and neighboring states in the Mississippi River basin have known for nearly 50 years that nutrient pollution (excess nitrogen and phosphorus) from Midwest farm fields and agricultural operations causes a hypoxic "Dead Zone" in the Gulf of Mexico.<sup>ii</sup> The Dead Zone consists of thousands of square miles in the Gulf that cannot support sea life as decaying algae blooms use up all available oxygen. Excess nutrients increase the size and duration of algae blooms. The Dead Zone continues to cause significant ecological and economic damage to Gulf Coast states. According to Gulf Coast fishery advocates, "Swimming fish, crabs, and shrimp must escape or succumb to the low oxygen concentrations; other, less mobile organisms eventually suffocate and die. The dead zone off the coast of Louisiana is believed to cost untold millions of dollars in fisheries losses annually."<sup>iii</sup>

Nutrient pollution causes much more harm than just the Dead Zone, however. Nutrients threaten Iowans' use and enjoyment of our lakes and rivers, particularly for recreation and safe drinking water. Harmful algae blooms

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(HABs) that produce cyanotoxins have been increasing in Iowa lakes and rivers.<sup>iv</sup> Cyanotoxins can cause severe illness to people and pets, including liver damage. HABs can cause fish kills, prevent boating and other activities, and cause noxious odors that keep visitors away, harming tourism and outdoor recreation economies. Cyanotoxins also threaten drinking water sources and cause serious challenges for drinking water utilities. Additionally, nitrate has been found at elevated levels in drinking water sources across Iowa and is linked to severe health outcomes such as blue baby syndrome and an increased risk for bladder, ovarian, and thyroid cancers.<sup>v</sup>

The history of addressing upper Midwest nutrient pollution is a story of bureaucratic slowness and failure to take difficult but meaningful action to address excessive pollution. In 1997, the U.S. Environmental Protection Agency (EPA) organized states along the Mississippi River into the Gulf Hypoxia Task Force (GHTF). The GHTF developed an action plan in 2001, conducted a re-assessment in 2006, and published an updated action plan in 2008. The 2008 action plan called for a 45 percent reduction of the Dead Zone by 2035 and asked states to develop their own nutrient reduction strategies. From this effort, the Iowa Nutrient Reduction Strategy (NRS)<sup>vi</sup> was born. Throughout its development and implementation, NRS responsibility has been divided between:

- science assessment - Iowa State University (ISU),
- point source policy - the Iowa Department of Natural Resources (IDNR), and
- nonpoint source policy - Iowa Department of Agriculture and Land Stewardship (IDALS).<sup>vii</sup>

In developing the nonpoint source NRS policy, IDALS took little input from the DNR, EPA, or water quality experts and advocates. IDALS did, however, receive significant input from the Iowa Farm Bureau Federation.<sup>viii</sup>

Iowa adopted the NRS in 2013; it calls for mandatory, regulated pollution discharge limits on point sources, such as wastewater treatment plants, factories, and public water systems. For nonpoint sources of nutrient pollution—



primarily agricultural operations—the plan outlines an entirely voluntary menu of conservation practices that can be implemented to reduce nutrient pollution. In 2018, the Iowa legislature codified the NRS as the official state policy for addressing nutrient pollution.<sup>ix</sup> Thus far, the NRS has failed to show a significant increase in implementation and adoption rates of conservation practices across the state,<sup>x</sup> and recent water quality monitoring data show that nitrogen leaving the state has increased, not decreased, over the last several years.<sup>xi</sup>

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The original 45 percent nutrient reduction goal, to be reached in 2035, is now less than fifteen years away. Meanwhile, climate change continues to exacerbate current pollution and ecological problems, rural economies are suffering, and people are getting sick. The state must adopt a renewed sense of urgency to address water quality and take bold action to implement policy change. Without action, the situation will continue to worsen.

### Role of Public Policy

Public policy, and government action in accordance with such policy, is the mechanism by which society sets basic expectations for behavior and promotes and preserves certain elements for the common good. According to Neil Hamilton, former director of the Drake University Agricultural Law Center, public policy should include the following elements:

- a set of articulated standards of expected conduct;
- an identifiable goal toward which progress is being made;
- objective and measurable indicators of progress or compliance; and
- widespread social recognition and acceptance of the value of the effort, and appreciation of the expected benefits.<sup>xii</sup>

***The agriculture industry insists that merely asking people to “do the right thing” is enough. In reality, they know that relying on a policy without clear expectations and consequences for inaction is inherently futile and maintains the status quo. Iowa needs a clear, coherent, balanced, and enforceable public policy to address nutrient pollution.***

When a problem is at a scale large enough that everyone must take action to protect others—for example, requiring seat belts, setting standards for workplace safety, or prohibiting discrimination—change is driven through policy. Policy must set boundaries to protect the common good when the primary behavioral incentive is individual profit. Even within the NRS, industries other than agriculture are required to adhere to regulatory limits. Typically with policy that is designed to protect the public, industry is not allowed to self-regulate. With the NRS, the agriculture industry insists that merely asking people to “do the right thing” is enough. In reality, they know that relying on a policy without clear expectations and consequences for inaction is inherently futile and maintains the status quo.<sup>xiii</sup> Iowa needs a clear, coherent, balanced, and enforceable public policy to address nutrient pollution.

### NRS Flaws and Opportunities

The NRS has flaws that make it ineffective, but identifying those flaws also provides the opportunity to fix them. The following list identifies flaws that have become clear after years of current policy being in place. Additionally, policy solutions that would more effectively reduce water pollution and benefit all Iowans are included.



### Voluntary and Optional

The most obvious flaw with the NRS approach to nonpoint source pollution is that participation for agricultural operations is entirely voluntary. To tackle a problem as large as nutrient pollution, where pollution costs are externalized, the government must step in. This was the case when the Clean Water Act was passed in 1972 to regulate point source pollution from business and industry. Unlike the businesses and industries that must pay to mitigate their pollution through permits or other requirements, agriculture is exempt from regulatory requirements to address the nutrient pollution resulting from production.<sup>xiv</sup> The fact that Iowa's largest

industry is exempt from accounting for the externalities of its business operations is inequitable for municipalities, businesses, and Iowa taxpayers that bear the costs of addressing water pollution.

Iowa officials, including more than one IDALS Secretary, have often repeated the line that the farmer compliance with NRS is "voluntary, but not optional."<sup>xv</sup> This phrase is nonsensical. If an action is not optional, it is by definition required. Voluntary means that one has the option not to participate, which is why agricultural interests prefer a voluntary policy. Having the option means that agricultural operations need not adopt any conservation measures suggested in the NRS.<sup>xvi</sup>

A common public policy approach to driving behavior change is carrots and sticks, meaning incentives for compliance and penalties for failing to comply. Despite significant efforts to educate and recruit farmers to adopt conservation practices, participation has remained far below the numbers necessary to tackle the nutrient problem. In the Raccoon River watershed, even with 90% cost share available, the vast majority of farmers declined to participate, and 80% of the available funds went unspent.<sup>xvii</sup> As University of Iowa researchers noted, "If a voluntary strategy is going to work, you need volunteers. Farmers are not volunteering in the numbers that we need. Not even close."<sup>xviii</sup>

Voluntary conservation programs have focused on outreach, education, and monetary incentives since the Dust Bowl. The Conservation Reserve Program has operated for more than 35 years, and its success has been limited by the voluntary and temporary nature of the program.<sup>xix</sup> It does not make sense to rely on the same voluntary programs to produce new and expanded results to reach modern goals.

If Iowa were serious about the NRS being "not optional," practices included in the NRS would be mandatory. As Neil Hamilton, former director of the Drake Agricultural Law Center, noted, "It is unlikely our efforts to protect water quality will ever be effective without a regulatory dimension to establish individual duties and to create goals and performance measures for farmers and landowners."<sup>xx</sup> The limited progress in conservation practices and increasing nitrogen pollution confirms this.

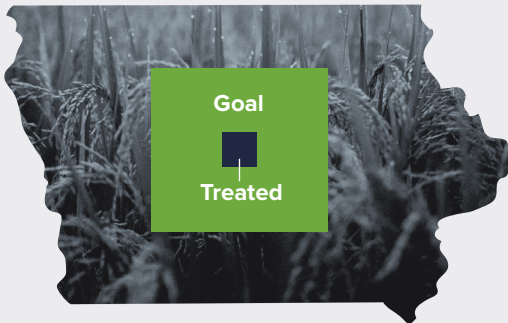


# NUTRIENT REDUCTION STRATEGY PROGRESS: COVER CROPS

## COVER CROPS

Cover crops are crops planted between cash crop seasons to keep a living cover on the landscape.

**NRS Scenario 1 Goal: 12.6 million acres**  
**2018 Achieved: 973,000 acres**  
**WE STILL NEED: 11,627,000 ACRES**

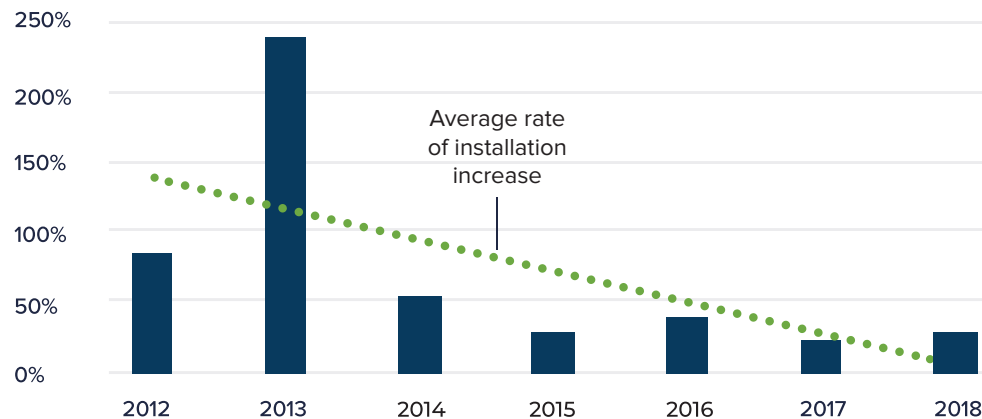


At current pace  
it will take

# 85 YEARS

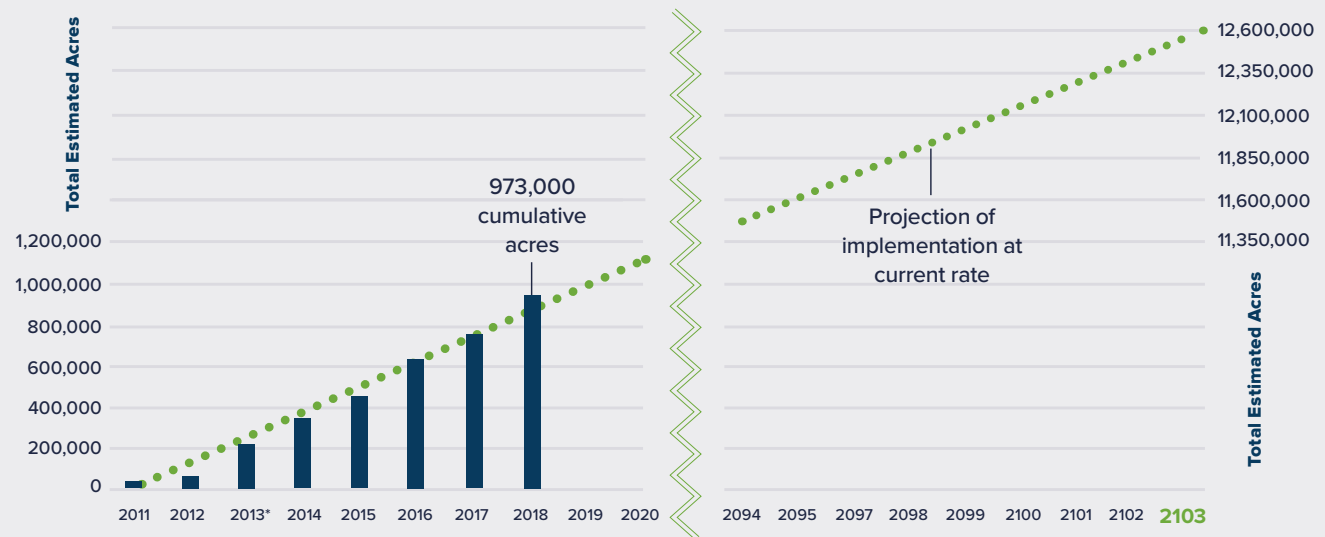
to reach the goal  
for cover crops.

## Cover Crop Installation Rate Increase



*The rate of cover crop installation has not accelerated since NRS adoption in 2013.*

## Projected Timeline to Reach Cover Crop Goal



# NUTRIENT REDUCTION STRATEGY PROGRESS: WETLANDS

## WETLANDS

Wetlands improve water quality on tile-drained land. The Iowa Conservation Reserve Enhancement Program (CREP) provides landowner incentives to install wetlands.

**NRS Goal: 7.7 million acres treated**  
**2018 Achieved: 107,000 acres treated**

**WE STILL NEED: 7,593,000 ACRES TREATED**

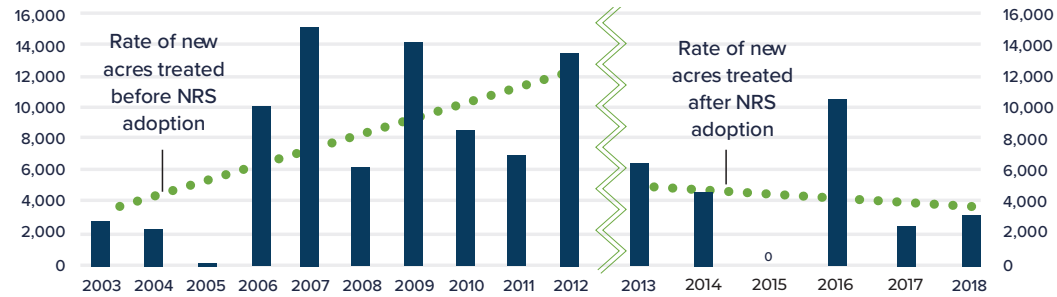


At current pace  
it will take

# 942 YEARS

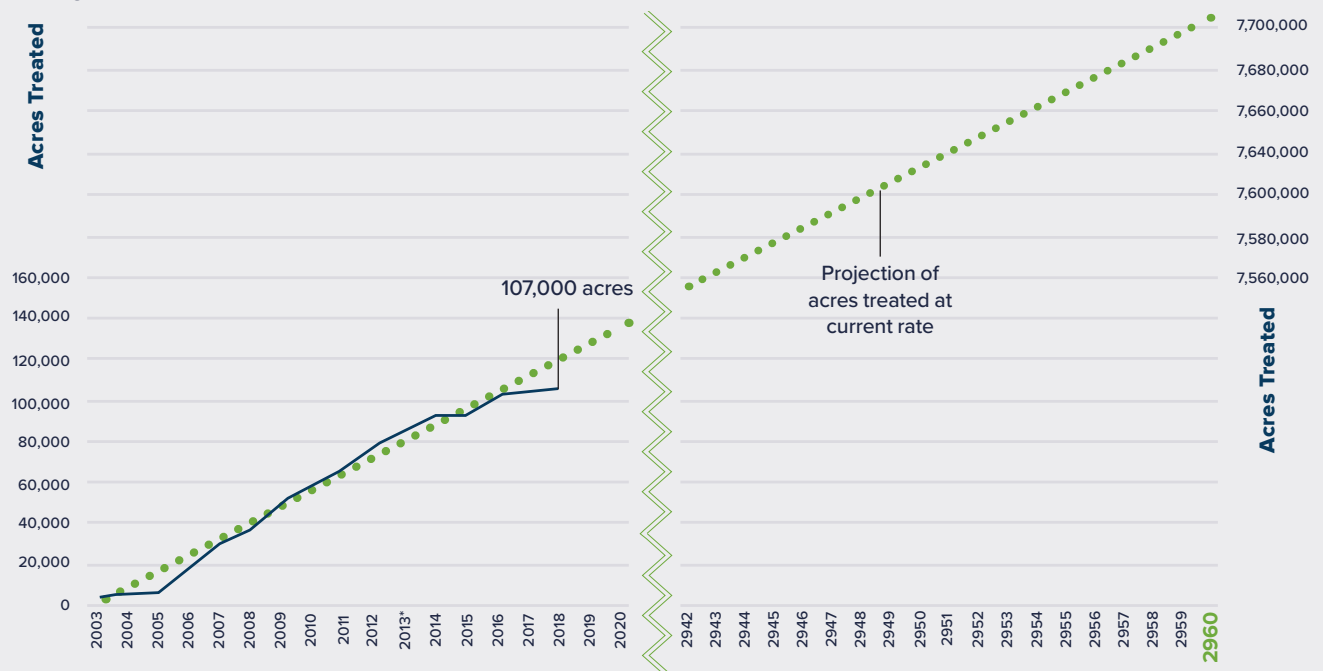
to reach the goal  
for wetlands.

## New Acres Treated by Wetlands



*The rate of new acres treated each year has slowed since the NRS was adopted in 2013.*

## Projected Timeline to Reach Wetlands Goal



# NUTRIENT REDUCTION STRATEGY PROGRESS: BIOREACTORS AND SATURATED BUFFERS

## BIOREACTORS AND SATURATED BUFFERS

Tile-drained water is directed to an underground bed of wood chips (bioreactor) or a perennially vegetated area (saturated buffer) where nitrate is removed naturally before the water reaches a stream.

**NRS Goal: 6 million acres treated**  
**2018 Achieved: 2,000 acres treated**

**WE STILL NEED: 5,998,000 ACRES TREATED**



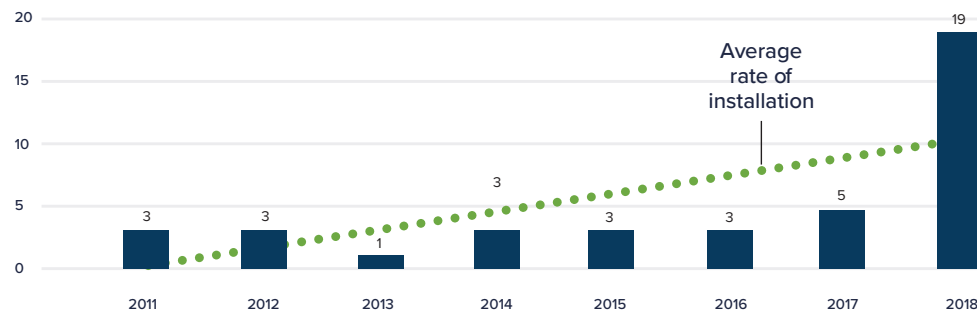
At current pace  
it will take

# 22,325 YEARS

to reach the goal for bioreactors and saturated buffers.

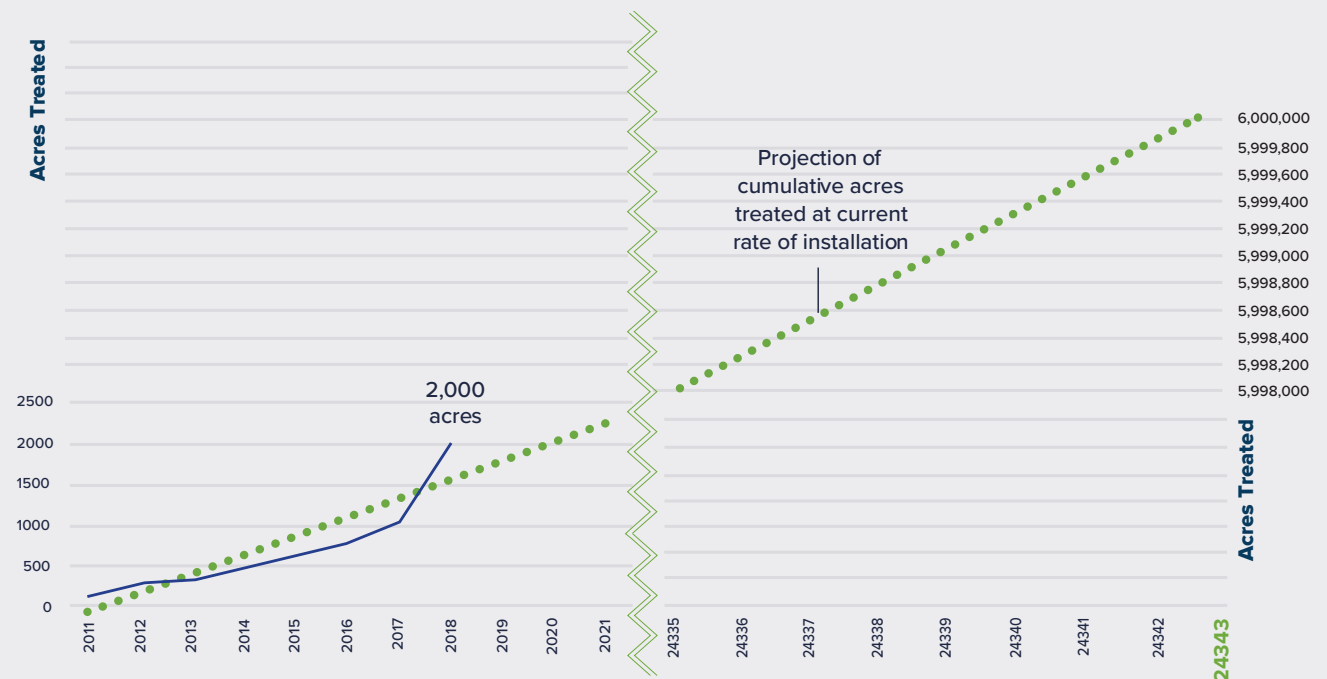


## New Bioreactors and Saturated Buffers Constructed

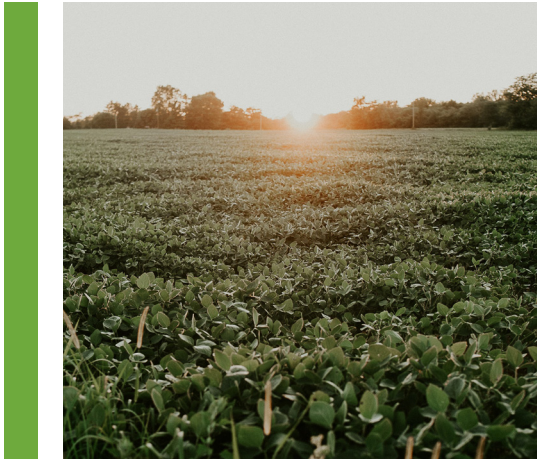


*Iowa would have to install 1,200 bioreactors and saturated buffers per year to reach this goal in 100 years.*

## Acres Treated by Bioreactors and Saturated Buffers



# Nutrient Reduction Policy Solutions



## Not A Strategy, Just A List

Calling the NRS a strategy is a misnomer. The portion of the NRS addressing nonpoint source (agricultural) pollution contains a list of conservation practices that have the potential to reduce nutrient pollution. However, the document does not include a strategy for implementation, benchmarks or timelines, or performance measures. There is no articulation of consequences for failing to meet the 45 percent reduction goal by 2035, nor is there any interim goal or trigger to re-evaluate the strategy and modify the policy if progress is not being made. In short, most of the elements one would expect from a strategy are not present.

The NRS does not include clear expectations for farmers and landowners, which leaves “the right thing” open to individual interpretation, makes it easy to ignore the strategy altogether, and may even put producers who implement conservation practices at a competitive disadvantage. A comprehensive strategy with enumerated benchmarks, expectations for individual compliance, and an adaptive management approach would make it easier for farmers and landowners to comply and for the state to actually realize nutrient pollution reduction.

## Insufficient State Funding

According to the 2018-2019 NRS Annual Progress Report, \$560 million was spent in Iowa on “NRS-related efforts”, including Conservation Reserve Program rent payments.<sup>xxi</sup> Of that total, less than \$24 million was spent on NRS-focused programs such as the Water Quality Initiative.<sup>xxii</sup> In 2018, the Iowa legislature passed SF 512, which allocates \$282 million to Water Quality Initiative (WQI) projects over the next 12 years. Even with this additional money spread across a dozen years for NRS-focused program funding, it is still a minimal amount compared to the scale of the nutrient pollution problem. The NRS estimates the annual costs of implementing the strategy to be between \$77 million and \$1.2 billion per year.<sup>xxiii</sup> Based on current implementation rates, the incentives put toward the NRS thus far have not been sufficient to drive large-scale adoption of conservation practices across the state.

Additionally, the lack of a targeted approach to WQI project implementation and monitoring of progress toward articulated goals does not guarantee taxpayers are getting the most nutrient reduction for their tax investment. It is not clear whether and to what degree WQI project selection and implementation follows a watershed approach. Not only is state spending on nutrient reduction efforts far below what the NRS estimates is necessary to achieve results, it is also unclear whether the projects the state decides to fund are the most efficient use of public resources.

## Lack of Transparency

Admittedly, Iowa reports more on NRS-related activities than most of its neighboring states. This publication



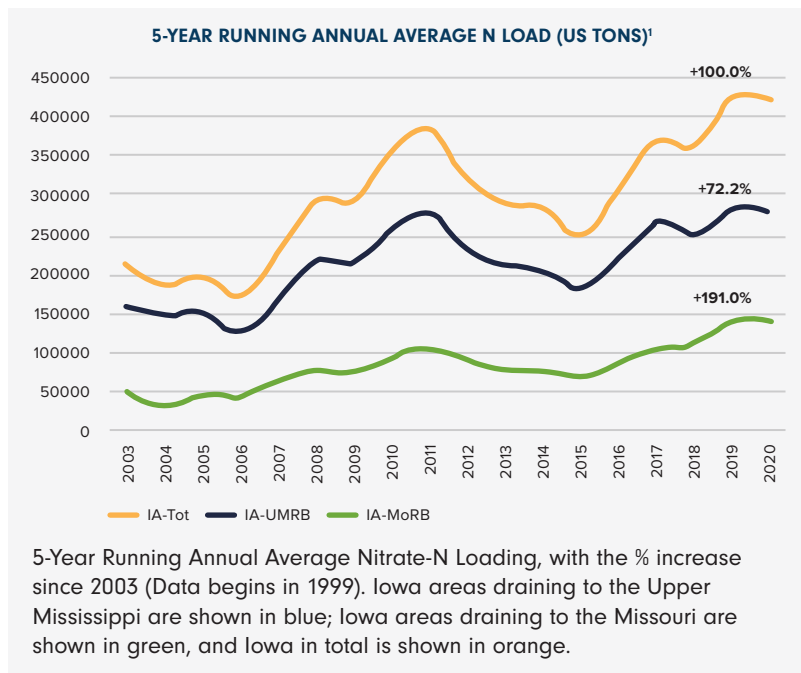
## Nutrient Reduction Policy Solutions

is not intended to downplay the efforts that have been made thus far to compile and report NRS-related information; these reports are critical for transparency and public understanding of whether the NRS is successful. Unfortunately, however, there are still transparency concerns to address.

NRS reports have historically been lengthy, dense, and difficult for the general public to understand. The progress reports primarily measure success based on implementation rates of the suggested voluntary practices. That data does not translate into actual reduction of nutrients in Iowa's waters. This allows for NRS leadership, particularly IDALS, to cherry-pick evidence to present in public statements that overstate the progress being made on nutrient reduction or gloss over less favorable data. For instance, as of 2018, Iowa had 973,000 acres of cover crops.<sup>xxv</sup> This sounds like a large, positive number until it is put into context: to reach the cover crop acreage necessary to reach 45 percent nutrient reduction, 12.6 million acres must be in cover crops. In other words, 973,000 is less than 8 percent of the acres needed to be in cover crops.

Reporting on the NRS has also failed to put actual water quality data into context, which is crucial to understanding the effectiveness of the state's efforts toward nutrient reduction. The 2018-19 progress report included nitrogen load export over time. However, the report failed to compare the nitrogen export data to the 1980-96 baseline for reporting. Without this comparison, there is no assessment of progress toward the 45 percent nutrient reduction goal. Continuing to insist that the state is making progress without properly contextualizing the pace and scale of that progress is, at best, disingenuous and misleading.

NRS leadership has indicated that they will be modifying their reporting approach to respond to feedback about length and clarity of reports, but reports in the new format have yet to be released.



## Policy Recommendations

The significant issues with the NRS have contributed to the lack of progress toward nutrient reduction in Iowa. The following recommendations would transform Iowa's nutrient reduction policy and make significant water quality improvements in Iowa, along the Mississippi River, and in the Gulf of Mexico.

<sup>1</sup> Dr. Chris Jones, IIHR Research Engineer, IIHR Hydroscience and Engineering, University of Iowa. Source: [https://www.iihr.uiowa.edu/cjones/manure-matters-ia-2020-nitrate-summary/?doing\\_wp\\_cron=1622148427.7259531021118164062500](https://www.iihr.uiowa.edu/cjones/manure-matters-ia-2020-nitrate-summary/?doing_wp_cron=1622148427.7259531021118164062500)

# Nutrient Reduction Policy Solutions

## Restore the Balance of Public and Private Rights

Under Iowa law, the waters of the state are public resources that the state must protect for the public's use and enjoyment. The purpose of regulation is to balance public and private rights and protect the public's rights from private actions that would unduly harm public resources. Based on data available from the last few decades, the state has largely abdicated its duty to protect Iowa's waterways for the common good. Instead, dangerously poor water quality has become an externality of agricultural production that Iowans must now tolerate, pay millions of dollars each year to mitigate, and suffer untold adverse health outcomes as a result.

IDNR and the Environmental Protection Commission (EPC), the governor-appointed citizen board that oversees IDNR, are ultimately responsible for ensuring compliance with state and federal water quality laws and regulations through delegated authority from the EPA. In fact, the portion of the Iowa Code that established the NRS as Iowa's state policy for nutrient reduction is in a chapter under the EPC's jurisdiction and outlines the jurisdiction of the IDNR.<sup>xxvi</sup>



According to the NRS itself, 80% of phosphorus and 92% of nitrogen come from nonpoint sources.<sup>xxvii</sup> Based on these numbers, IDALS has an outsized role in addressing nutrient pollution, but it is not the agency that is typically tasked with writing and enforcing rules that protect water quality. IDALS does not have delegated authority under the Clean Water Act (CWA) from the EPA to protect Iowa's waters. Instead, IDALS, an agency with close ties to agricultural interests and little experience in water quality regulation, is responsible for addressing the majority of the state's largest water quality problem. It flies in the face of typical principles of environmental

protection for an agency with no regulatory responsibility for Clean Water Act compliance to lead nonpoint pollution mitigation efforts and administer taxpayer funds without any meaningful oversight and accountability.

The state, with public input, should convene a review board to evaluate the current NRS and make recommendations for ensuring substantial state-wide nutrient reduction with a proper balance of public and private interests. This board should establish individual duties, interim goals and benchmarks, and triggers to reevaluate the effectiveness of the nutrient reduction strategy. This board should be comprised of scientists and policy experts with expertise in water quality and nutrient pollution. In particular, the board should review the three-agency structure of NRS responsibility and determine whether responsibility for and oversight of nonpoint source pollution should be approached differently. The Iowa legislature should consider and adopt appropriate review board recommendations, and the executive branch should implement such recommendations.

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### Establish an Individual Duty to Protect Surface Waters

The Iowa Code includes an individual duty to protect groundwater, but not surface water. Surface water is also a public resource to be used for the benefit of all Iowans.<sup>xxviii</sup> A large proportion of Iowans get their drinking water from surface water or influenced groundwater sources (46 percent), and many businesses and communities rely on recreational tourism.<sup>xxix</sup> Natural resources and outdoor recreation have been shown to enhance public health, quality of life, and community satisfaction. Because of these and other benefits, it makes sense to create an individual duty to protect surface waters.



Iowa Code section 455E.5(4) creates a responsibility for everyone to protect groundwater: “all persons in the state have the duty to conduct their activities so as to prevent the release of contaminants into groundwater.” Iowa Code chapter 455B could be amended to include a similar provision for surface waters.

Additionally, other states have adopted Environmental Rights Acts that allow citizens to bring lawsuits for environmental degradation or violation of environmental standards.<sup>xxx</sup> These laws let citizens directly protect their rights to public resources.

### Adopt Numeric Nutrient Criteria

The goal of the Clean Water Act is to eliminate the discharge of pollutants into our nation’s navigable waters<sup>xxxi</sup> with the objective of restoring and maintaining their “chemical, physical, and biological integrity.”<sup>xxxii</sup> This includes a goal to protect waters for fish, other aquatic life, and recreation.<sup>xxxiii</sup> To achieve these broad national goals, the CWA establishes specific roles for states, articulating their discretionary and mandatory duties under the statute.<sup>xxxiv</sup>

Despite substantial evidence that nutrient pollution in Iowa is resulting in unsafe conditions due to high nitrate concentrations, along with harmful algal blooms and their associated toxins, Iowa has failed to establish numeric standards necessary to protect its lakes and rivers. In fact, the state has used the existence of the NRS as justification for not setting nutrient standards.<sup>xxxv</sup> However, the continued and worsening problem of nutrient pollution in Iowa waterways underscores the need for additional tools to identify and address pollution. Establishing numeric standards to protect against excess phosphorus and nitrogen in surface water is not only necessary to protect Iowa waters, but also quite practicable. EPA has developed the scientific support and other states have adopted such standards.

Adopting numeric standards would add to IDNR’s tools to interpret the state’s existing narrative standard, which prohibits excess nutrients without specifying a limit. Moreover, the Iowa DNR already uses an advisory

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concentration of microcystin, a toxin released by cyanobacteria, to evaluate recreational use of lakes.

Relying on the existing narrative standard fails to meet the requirements of the Clean Water Act and allows DNR to claim no impairment of recreation even where DNR advises Iowans not to swim. This is a disservice to Iowans who face the threat of algae blooms and their toxins every summer in waters across the state.



### Address Livestock Operations and Manure

Many areas of the state have seen increases in the construction of concentrated animal feeding operations. Manure from these operations is spread on nearby farm fields as fertilizer for crops. This has created a situation where fields can receive more nutrients from manure and other fertilizer than crops can take up, resulting in excess nutrients leaving the fields through surface runoff or subsurface drainage tile lines and entering Iowa

waterways. Some producers also apply synthetic fertilizer in addition to manure, further exacerbating the problem. Achieving water quality suitable for public use statewide will require a systemic change in agricultural practices, but several policy near-term changes would eliminate loopholes, provide immediate benefits, and are reasonable steps under the existing agricultural production system.

First, sensitive areas must be protected from CAFOs. These include areas of karst topography, where groundwater and surface water have frequent and unpredictable interactions. Similarly, locations near drinking water sources should be protected from nitrate contamination. Other sensitive features like floodplains allow frequent, direct pollution of surface water. The siting requirements for CAFOs should be amended to protect these sensitive areas.

Additionally, state law currently allows manure application on frozen and snow-covered ground except for specific circumstances.<sup>xxxvi</sup> Applying manure on frozen or snow-covered ground makes it far more likely that manure or its nutrients will enter surface water as a result of precipitation or snowmelt; obviously no crops will take up the nutrients while the ground is frozen. Although the statute does prohibit liquid manure application within a set timeframe by total confinement operations, even that prohibition contains an exception for loosely-defined unforeseen circumstances. Expanding the prohibition would end a practice that has no value for crops and contributes directly to water pollution.

More broadly, the state of Iowa is far too lenient in its approach to CAFO regulation and has become a safe haven for industrial livestock operations. CAFOs are allowed to be sited near each other in high concentrations, producing more manure than the surrounding landscape can possibly handle. DNR needs greater capacity and courage in its oversight of animal feeding operations. DNR does not typically review the inputs to manure management plans before approving them and does not maintain electronic records to compare fields receiving manure in different plans. It does not impose penalties high enough to prevent frequent manure releases causing



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fish kills. There is no transparency or oversight of manure and fertilizer application. In short, the state does not act as a reasonable protector of all lowans' interests in the face of the animal agriculture industry.

As noted above, outside of federal programs, the state has not dedicated nearly the amount of financial resources necessary to adequately address nutrient pollution. The Iowa legislature passed SF 512 in 2018, but that funding has yet to be fully realized and is still well below the amount the NRS recognized as necessary for achieving water quality improvements.



### Fund the Natural Resources and Outdoor Recreation Trust Fund

In 2010, the citizens of Iowa voted overwhelmingly in favor of creating a constitutionally protected trust fund for environmental purposes, where  $\frac{3}{8}$  of one cent of the next sales tax increase would go toward the Natural Resources and Outdoor Recreation Trust Fund.

Funding from the Trust would, among other priorities, pay for projects and conservation practices to improve water quality across the state. However, that funding should not be

used simply to give taxpayer money to private landowners or farmers to install conservation practices with no strategy, monitoring, or oversight. A watershed approach should be used to target dollars where practices can most efficiently reduce nutrient pollution. Responsible use of taxpayer funds requires a strategy to spend dollars efficiently, evaluation of progress toward water quality goals, and adjustment in strategy when necessary.

Trust fund dollars would also be beneficial for supporting Watershed Management Authorities (WMAs) and corresponding watershed coordinators. WMAs are well-suited to bring state and local partners together at a watershed scale to coordinate projects and measure water quality improvements. Unfortunately, these entities suffer from a lack of resources, which lead to high turnover and lack of stability for watershed coordinators. Reliable funding for watershed coordinators is necessary to increase the efficacy of these organizations.

Despite passing over a decade ago, the legislature has not increased the state sales tax since the Trust's creation, and thus the Trust has remained empty. It is time to fund the trust to aid as a tool to improve Iowa's water quality.

## Conclusion

To be an effective strategy, Iowa's NRS needs an overhaul. The NRS has been in place for nearly a decade, yet nutrient pollution continues to increase. IDALS in particular must stop greenwashing on behalf of corporate agriculture interests and start working for the benefit of all lowans. The above policy proposals are reasonable, achievable, and would significantly reduce the amount of nutrient pollution in Iowa's waterways. lowans deserve better, and it is time for Iowa's state leadership to step up.

## Endnotes

- <sup>i</sup> Iowa Nutrient Reduction Strategy, IOWA STATE UNIVERSITY, <http://www.nutrientstrategy.iastate.edu/> (last visited Apr. 28, 2021).ii
- <sup>ii</sup> Malakoff, David. 1998. "Death by Suffocation in the Gulf of Mexico." *Science* 281(5374): 190-92.
- <sup>iii</sup> Brief Amicus Curiae Of Gulf Organized Fisheries In Solidarity And Hope, Inc. and Mississippi Commercial Fisheries United, Inc., Iowa Citizens for Community Improvement v. State of Iowa, Docket No. 19-1644, SUP CT. IOWA (2019), available at <https://iowaappeals.com/wp-content/uploads/2020/05/Amicus-Brief-of-Gulf-Organized-Fisheries-in-Solidarity-and-Hope-Inc..pdf>.
- <sup>iv</sup> Buckingham, Carolyn, Skopec, Mary & Osterberg, David. 2018. "Blue-Green Algae: Unclear Water Raises Issues of Danger." Iowa Policy Project. Available at <https://www.iowapolicyproject.org/2018docs/180621-cyano.pdf>.
- <sup>v</sup> Iowa Environmental Council. 2016. "Nitrate in Drinking Water: A Public Health Concern for all Iowans.", available at [https://www.iaenvironment.org/webres/File/News%20%26%20Resources/Publications/Nitrate\\_in\\_Drinking\\_Water\\_Report\\_Web.pdf](https://www.iaenvironment.org/webres/File/News%20%26%20Resources/Publications/Nitrate_in_Drinking_Water_Report_Web.pdf).
- <sup>vi</sup> Iowa Department of Agriculture and Land Stewardship, Iowa Department of Natural Resources, Iowa State University College of Agriculture and Life Sciences. Updated December 2017. "Iowa Nutrient Reduction Strategy: A science and technology-based framework to assess and reduce nutrients to Iowa waters and the Gulf of Mexico" ("Iowa NRS"), available at [http://www.nutrientstrategy.iastate.edu/sites/default/files/documents/2017%20INRS%20Complete\\_Revised%202017\\_12\\_11.pdf](http://www.nutrientstrategy.iastate.edu/sites/default/files/documents/2017%20INRS%20Complete_Revised%202017_12_11.pdf).
- <sup>vii</sup> Iowa Nutrient Reduction Strategy, IOWA STATE UNIVERSITY, <http://www.nutrientstrategy.iastate.edu/> (last visited Apr. 28, 2021).
- <sup>viii</sup> "New Water Quality Policy Stacked Against Public Input, for Big Ag", *Bleeding Heartland*, Nov. 20, 2012, available at <https://www.bleedingheartland.com/2012/11/20/new-water-quality-policy-stacked-against-public-input-for-big-ag/>.
- <sup>ix</sup> 2018 Iowa Acts, ch. 1001, §20 (codified at IOWA CODE § 455B.177(3)).
- <sup>x</sup> "The Slow Reality of the Iowa Nutrient Reduction Strategy," Iowa Environmental Council (2019) available at [https://www.iaenvironment.org/webres/file/slow%20reality%20of%20the%20nrs\\_final\\_7\\_16\\_19.pdf](https://www.iaenvironment.org/webres/file/slow%20reality%20of%20the%20nrs_final_7_16_19.pdf).
- <sup>xi</sup> Jones, Christopher S., Weber, Larry et al., Iowa Stream Nitrate and the Gulf of Mexico, *PLOS One* (Apr. 12, 2018), available at <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0195930>.
- <sup>xii</sup> Hamilton, Neil, "Missing Links: A Real Strategy to Implement the NRS," SOIL Conference presentation Nov. 4, 2019), available at <https://aglawcenter.wp.drake.edu/wp-content/uploads/sites/99/2019/11/2019-SOIL-Missing-Link-Hamilton-Presentation.pdf>.
- <sup>xiii</sup> While there are certainly situational differences, the state's approach to the Covid-19 pandemic is another example of a voluntary approach that failed to sufficiently protect the general public. "Demonstrators Deliver 800 'failing report cards' to Iowa Governor for Covid-19 Response", *Des Moines Register*, Nov. 21, 2020, available at <https://www.desmoinesregister.com/story/news/2020/11/21/coronavirus-iowa-iowa-cci-gives-iowa-gov-kim-reynolds-failing-grade-covid-19-response/3778735001/>.
- <sup>xiv</sup> Iowa NRS, §1, at 8 ("Nonpoint sources do not have this requirement, but rather use voluntary state and federal conservation programs.").
- <sup>xv</sup> Neely, Todd "Damages Not Allowed in Iowa Runoff Case," *PROGRESSIVE FARMER* (Jan. 27, 2017), available at <https://www.dtnpf.com/agriculture/web/ag/news/article/2017/01/27/iowa-high-court-rules-des-moines>; Donnelle Eller, "Hurricane cut size of this summer's Gulf 'dead zone,' but work remains for Iowa, other states," *Des Moines Register* (Aug. 4, 2020), available at <https://www.desmoinesregister.com/story/money/agriculture/2020/08/04/hurricane-hanna-gulf-mexico-dead-zone-iowa-other-states-have-work-do/3288479001/>
- <sup>xvi</sup> "The Slow Reality of the Iowa Nutrient Reduction Strategy," Iowa Environmental Council (2019) available at [https://www.iaenvironment.org/webres/file/slow%20reality%20of%20the%20nrs\\_final\\_7\\_16\\_19.pdf](https://www.iaenvironment.org/webres/file/slow%20reality%20of%20the%20nrs_final_7_16_19.pdf) (finding that the conservation measures in scenario 1 are on pace to be achieved in 93 years, 913 years, and 31,103 years).
- <sup>xvii</sup> Cullen, Tom, "Raccoon Watershed Authority Can Barely Give It Away", *STORM LAKE TIMES*, May 8, 2020, available at <https://www.stormlake.com/articles/raccoon-watershed-authority-can-barely-give-it-away/>.
- <sup>xviii</sup> Jones, Chris, Benjamin Maas, & Silvia Secchi, "Opinion: Farm Runoff Plagues Iowa's Rivers. Rep. Miller-Meeks Should Wake Up and Smell the Manure", *DES MOINES REG.*, April 20, 2021, available at <https://www.desmoinesregister.com/story/opinion/2021/04/20/guest-opinion-farm-runoff-plagues-iowas-rivers-mariannette-miller-meeks-should-wake-up-smell-manure/7276577002/>
- <sup>xix</sup> Honoring 86 Years of USDA, A Brief History, Natural Resources Conservation Service, UNITED STATES DEPT. OF AG., [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/about/history/?cid=nrcs143\\_021392](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/about/history/?cid=nrcs143_021392) (last visited Apr. 28, 2021).
- <sup>xx</sup> Hamilton, Neil, "Missing Links: A Real Strategy to Implement the NRS," SOIL Conference presentation (Nov. 4, 2019), available at <https://aglawcenter.wp.drake.edu/wp-content/uploads/sites/99/2019/11/2019-SOIL-Missing-Link-Hamilton-Presentation.pdf>.
- <sup>xxi</sup> Iowa Department of Agriculture and Land Stewardship, Iowa Department of Natural Resources, Iowa State University College of Agriculture and Life Sciences. 2020. "Iowa Nutrient Reduction Strategy: 2018-19 Annual Progress Report." INRC 0017.
- <sup>xxii</sup> Id.
- <sup>xxiii</sup> Iowa NRS Section 1 at 4. The \$77 million annual cost would follow an initial investment of \$4 billion. Id., section 2 at 46.
- <sup>xxiv</sup> Request for Proposals, Water Quality Initiative Nutrient Reduction Strategy Targeted Watershed Implementation Practices, Iowa Department of Agriculture and Land Stewardship (2019), at 3 (listing experience installing practices in a priority watershed in a targeted and efficient manner is only one of several evaluation factors for

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projects; 13% of scoring criteria are in line with NRS goals), available at <https://www.iowaagriculture.gov/soil/pdf/2019/Targeted%20Watershed%20Implementation%20RFP.pdf>.

<sup>xxxv</sup> Progress Toward Nutrient Reduction Goals, Iowa Environmental Council (2019), available at [https://www.iaenvironment.org/webres/File/NRS%20Implementation%20FINAL%207\\_16\\_19.pdf](https://www.iaenvironment.org/webres/File/NRS%20Implementation%20FINAL%207_16_19.pdf).

<sup>xxxvi</sup> IOWA CODE § 455B.177

<sup>xxxvii</sup> Iowa NRS Section 1 at 8.

<sup>xxxviii</sup> Silverman, Claire, "An Overview of the Public Trust Doctrine: Public Rights in Surface Water", THE MUNICIPALITY (2019), available at <http://www.lwm-info.org/DocumentCenter/View/3200/Miscellaneous-5R-1-an-overview-of-the-public-trust-doctrine---public-rights-in-surface-water>.

<sup>xxxix</sup> State of Iowa Public Drinking Water Program 2019 Annual Compliance Report, Iowa Department of Natural Resources (Jun. 2020), available at <http://publications.iowa.gov/32843/1/SAR2019.pdf>.

<sup>xxx</sup> See, e.g., Minn. Stat. ch. 116B.

<sup>xxxi</sup> 33 U.S.C. § 1251(a)(1).

<sup>xxxii</sup> 33 U.S.C. § 1251(a).

<sup>xxxiii</sup> 33 U.S.C. § 1251(a)(2).

<sup>xxxiv</sup> See 40 C.F.R. § 131.4; 40 C.F.R. § 131.5; see also PUD NO. 1 of Jefferson Cty. v. Washington Dept. of Ecology, 511 U.S. 700, 704 (1994).

<sup>xxxv</sup> Eller, Donnelle, Should Iowa Adopt Stricter Standards for Recreational Lakes? Environmental Commission Says No", Des Moines Register, Feb. 19, 2019, available at <https://www.desmoinesregister.com/story/money/business/2019/02/19/state-agency-rejects-tougher-water-quality-standards-recreational-lakes-iowa-dnr-farming-environment/2916301002/>.

<sup>xxxvi</sup> IOWA CODE § 459.313A.

<sup>xxxvii</sup> Konopacky, Jamie and Soren Rundquist. "EWG Study and Mapping Show Large CAFOS in Iowa Up Fivefold Since 1990." Environmental Working Group (Jan. 2020), available at <https://www.ewg.org/interactive-maps/2020-iowa-cafos/>.



**Authors:**

Ingrid Gronstal, IEC Water Program Director

Alicia Vasto, IEC Associate Water Program Director

Michael Schmidt, IEC Staff Attorney

515.244.1194

[iaenvironment.org](http://iaenvironment.org)

[iecmal@iaenvironment.org](mailto:iecmal@iaenvironment.org)

505 Fifth St., Suite 850 • Des Moines, IA 50309